* TM 1-1520-238-23-7-1

FLIGHT CONTROLS
MAINTENANCE – GENERAL

FLIGHT CONTROLS
MAINTENANCE – MECHANICAL

TECHNICAL MANUAL

AVIATION UNIT AND INTERMEDIATE MAINTENANCE MANUAL

VOLUME 7 OF 9

PART 1 OF 2

HELICOPTER, ATTACK, AH-64A APACHE (NSN 1520-01-106-9519) (EIC: RHA)

CHAPTER 11
FLIGHT CONTROLS
PART 1

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16 MAY 1994

CHANGE NO. 7

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Aviation Unit and Intermediate Maintenance Manual

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A through D	A through D
11–23 and 11–24	11–23 and 11–24
11–29 and 11–30	11–29 and 11–30
11–35 through 11–38	11–35 through 11–38
11–43 and 11–44	11–43 and 11–44
11–47 and 11–50	11–47 and 11–50
11–127 through 11–130	11–127 through 11–130
11–181 through 11–184	11–181 through 11–184
11–351 and 11–352	11–351 and 11–352
11–433 and 11–434	11–433 and 11–434
11–437 and 11–438	11–437 and 11–438
11–443 and 11–444	11–443 and 11–444
11–447 and 11–448	11–447 and 11–448
11–479 and 11–480	11–479 and 11–480
11–483 and 11–484	11–483 and 11–484
11–521 through 11–524	11–521 through 11–524
11–529 through 11–540	11–529 through 11–540
11–587 and 11–588	11–587 and 11–588
11–591 and 11–592	11–591 and 11–592
11–721 through 11–732	11–721 through 11–732
11–739 and 11–740	11–739 and 11–740
11–753 through 11–756	11–753 through 11–756

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TM 1-1520-238-23-7–1
C 7

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———	A through D
11–19 through 11–24	11–19 through 11–24
11–27 through 11–40	11–27 through 11–40
11–43 through 11–46	11–43 through 11–46
11–59 and 11–60	11–59 and 11–60
11–67 and 11–68	11–67 and 11–68
11–105 through 11–108	11–105 through 11–108
11–115 and 11–116	11–115 and 11–116
11–116.1 and 11–116.2	11–116.1 and 11–116.2
11–125 and 11–126	11–125 and 11–126
11–131 and 11–132	11–131 and 11–132
11–179 and 11–180	11–179 and 11–180
11–185 and 11–186	11–185 and 11–186
11–189 and 11–190	11–189 and 11–190
11–195 and 11–196	11–195 and 11–196
11–199 and 11–200	11–199 and 11–200
11–207 and 11–208	11–207 and 11–208
11–219 and 11–220	11–219 and 11–220
11–269 and 11–270	11–269 and 11–270
11–283 and 11–284	11–283 and 11–284
11–287 through 11–290	11–287 through 11–290
11–295 and 11–296	11–295 and 11–296
11–317 and 11–318	11–317 and 11–318
11–321 through 11–324	11–321 through 11–324
11–355 and 11–356	11–355 and 11–356
11–373 and 11–374	11–373 and 11–374
11–651 and 11–652	11–651 and 11–652
11–655 and 11–656	11–655 and 11–656
11–679 and 11–680	11–679 and 11–680

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Remove pages	Insert pages
11–27 through 11–30	11–27 through 11–30
11–97 and 11–98	11–97 and 11–98
11–115 and 11–116	11–115 and 11–116
11–129 and 11–130	11–129 and 11–130
11–179 and 11–180	11–179 and 11–180
11–185 and 11–186	11–185 and 11–186
11–195 and 11–196	11–195 and 11–196
11–289 through 11–292	11–289 through 11–292
11–655 and 11–656	11–655 and 11–656
11–683 and 11–684	11–683 and 11–684

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Remove pages	Insert pages
11–29 and 11–30	11–29 and 11–30
11–35 through 11–38	11–35 through 11–38
11–53 through 11–58	11–53 through 11–58
11–63 and 11–64	11–63 and 11–64
11–67 and 11–68	11–67 and 11–68
11–71 and 11–72	11–71 and 11–72
11–75 through 11–78	11–75 through 11–78
11–78.1 through 11–78.2	11–78.1 through 11–78.2
– – – – –	11–78.3 through 11–78.4
11–79 through 11–84	11–79 through 11–84
11–87 through 11–90	11–87 through 11–90
11–90.1/(11–90.2 blank)	11–90.1/(11–90.2 blank)
11–91 through 11–98	11–91 through 11–98
11–103 through 11–108	11–103 through 11–108
11–113 through 11–116	11–113 through 11–116
11–116.1 and 11–116.2	11–116.1 and 11–116.2
(11–117 blank)/ 11–118	(11–117 blank)/ 11–118
11–121 through 11–124	11–121 through 11–124
11–181 through 11–184	11–181 through 11–184
11–195 and 11–196	11–195 and 11–196
11–209 and 11–210	11–209 and 11–210
11–217 through 11–220	11–217 through 11–220
11–253 and 11–254	11–253 and 11–254
11–257 and 11–258	11–257 and 11–258
11–263 through 11–266	11–263 through 11–266
11–281 and 11–282	11–281 and 11–282
11–285 through 11–288	11–285 through 11–288
11–291 and 11–292	11–291 and 11–292
– – – – –	11–292.1 and 11–292.2
11–293 and 11–294	(11–293 blank)/ 11–294
11–313 through 11–316	11–313 through 11–316
11–357 through 11–360	11–357 through 11–360
11–363 and 11–364	11–363 and 11–364
11–373 and 11–374	11–373 and 11–374
11–377 through 11–380	11–377 through 11–380

Remove pages	Insert pages
11–433 and 11–434	11–433 and 11–434
11–437 and 11–438	11–437 and 11–438
11–443 and 11–444	11–443 and 11–444
11–447 and 11–448	11–447 and 11–448
11–479 and 11–480	11–479 and 11–480
11–483 and 11–484	11–483 and 11–484
11–521 through 11–524	11–521 through 11–524
11–529 through 11–540	11–529 through 11–540
11–587 and 11–588	11–587 and 11–588
11–591 and 11–592	11–591 and 11–592
11–645 through 11–648	11–645 through 11–648
11–687 through 11–690	11–687 through 11–690
11–721 through 11–732	11–721 through 11–732
11–739 and 11–740	11–739 and 11–740
11–753 through 11–756	11–753 through 11–756
11–763 through 11–768	11–763 through 11–768
11–771 through 11–776	11–771 through 11–776
11–779 and 11–780	11–779 and 11–780
11–797 through 11–804	11–797 through 11–804
11–815 and 11–816	11–815 and 11–816
11–823 and 11–824	11–823 and 11–824

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11–5 and 11–6	11–5 and 11–6
11–11 and 11–12	11–11 and 11–12
11–23 through 11–38	11–23 through 11–38
11–43 through 11–46	11–43 through 11–46
11–65 through 11–68	11–65 through 11–68
11–75 and 11–76	11–75 and 11–76
11–79 through 11–90	11–79 through 11–90
11–95 through 11–98	11–95 through 11–98
11–105 through 11–108	11–105 through 11–108
11–111 and 11–112	11–111 and 11–112
11–201 through 11–206	11–201 through 11–206
11–249 and 11–250	11–249 and 11–250
11–253 through 11–256	11–253 through 11–256
11–259 through 11–264	11–259 through 11–264
11–281 and 11–282	11–281 and 11–282
11–295 through 11–302	11–295 through 11–302
11–511 through 11–512	11–511 through 11–512
11–567 and 11–568	11–567 and 11–568
11–569 through 11–572	– – – – –
11–671 and 11–672	11–671 and 11–672
11–677 and 11–678	11–677 and 11–678
11–759 through 11–762	11–759 through 11–762
– – – – –	E–mail instruction page

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11–1 and 11–2	11–1 and 11–2
11–15 and 11–16	11–15 and 11–16
11–29 and 11–30	11–29 and 11–30
11–37 and 11–38	11–37 and 11–38
11–49 through 11–58	11–49 through 11–58
11–63 through 11–78	11–63 through 11–78
-———	11–78.1 and 11–78.2
11–79 through 11–90	11–79 through 11–90
-———	11–90.1/(11–90.2 blank)
11–91 through 11–98	11–91 through 11–98
-———	11–98.1/(11–98.2 blank)
11–99 through 11–108	11–99 through 11–108
-———	11–108.1/(11–108.2 blank)
11–109 through 11–116	11–109 through 11–116
-———	11–116.1 and 11–116.2
11–117 and 11–118	(11–117 blank)/11–118
11–119 through 11–124	11–119 through 11–124
11–133 through 11–136	11–133 through 11–136
11–141 and 11–142	11–141 and 11–142
11–145 and 11–146	11–145 and 11–146
11–149 and 11–150	11–149 and 11–150
11–153 through 11–156	11–153 through 11–156
-———	11–156.1 and 11–156.2
11–157 and 11–158	11–157 and 11–158
11–161 through 11–178	11–161 through 11–178
11–211 through 11–214	11–211 through 11–214
11–361 and 11–362	11–361 and 11–362
11–791 through 11–796	11–791 through 11–796

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11–45 through 11–50	11–45 through 11–50
11–91 through 11–94	11–91 through 11–94
11–105 through 11–108	11–105 through 11–108
11–245 through 11–252	11–245 through 11–252
11–255 through 11–266	11–255 through 11–266
11–281 and 11–282	11–281 and 11–282
11–285 through 11–288	11–285 through 11–288
11–299 and 11–300	11–299 and 11–300
11–307 and 11–308	11–307 and 11–308
11–313 and 11–314	11–313 and 11–314
11–351 and 11–352	11–351 and 11–352
11–361 and 11–362	11–361 and 11–362
11–365 and 11–366	11–365 and 11–366
11–371 through 11–374	11–371 through 11–374
11–665 through 11–670	11–665 through 11–670

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Date of issue for original and change pages are:

Original . . . . . 0 . . . . . 16 May 1994
Change . . . . . 1 . . . . . 17 May 1995
Change . . . . . 2 . . . . . 16 February 1996
Change . . . . . 3 . . . 30 September 1996
Change . . . . . 4 . . . . 19 December 1997
Change . . . . . 5 . . . . . 10 May 2000
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Change . . . . . 7 . . . . . 15 May 2002

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 850, CONSISTING OF THE FOLLOWING:

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Blank	0
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11-2	2
11-3 – 11-5	0
11-6	3
11-7 – 11-11	0
11-12	3
11-13 – 11-15	0
11-16	2
11-17 – 11-18	0
11-19	6
11-20 – 11-21	0
11-22	6
11-23	0
11-24	7
11-25 – 11-26	3
11-27	6
11-28	3
11-29	7
11-30 – 11-32	6
11-33	3
11-34	6
11-35	7
11-36	4
11-37 – 11-38	7
11-39	6
11-40 – 11-43	0
11-44	7
11-45	6
11-46	3
11-47 – 11-49	7
11-50 – 11-52	2
11-53	4
11-54	0
11-55 – 11-57	4
11-58 – 11-59	0
11-60	6
11-61 – 11-62	0
11-63	4
11-64	2
11-65	0
11-66 – 11-67	3
11-68	6
11-69	2
11-70	0
11-71 – 11-72	4
11-73 – 11-74	2
11-75	0
11-76	4
11-77	2
11-78	4
11-78.1 – 11-78.2	4
11-78.3 – 11-78.4 Added	4
11-79 – 11-84	4
11-85	2
11-86	3
11-87	4
11-88	2
11-89	3
11-90	4
11-90.1	4
11-90.2 Blank Added	2
11-91	4
11-92	2
11-93 – 11-95	4
11-96	2
11-97	5
11-98	4
11-98.1 Added	2
11-98.2 Blank Added	2
11-99 – 11-102	2
11-103	4
11-104	2
11-105	6
11-106	4
11-107 – 11-108	6
11-108.1 Added	2
11-108.2 Blank Added	2
11-109 – 11-110	2
11-111	3
11-112 – 11-113	2
11-114	4
11-115	5
11-116	6

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11-116.2 Added	2
11-117 Blank	2
11-118	4
11-119 – 11-120	2
11-121 – 11-123	4
11-124	0
11-125	6
11-126 – 11-127	0
11-128 –11–129	7
11-130 – 11-131	0
11-132	6
11-133	0
11-134 – 11-136	2
11-137 – 11-140	0
11-141	2
11-142 – 11-145	0
11-146	2
11-147 – 11-148	0
11-149 – 11-150	2
11-151 – 11-152	0
11-153 – 11-155	2
11-156	0
11-156.1 – 11-156.2 Added	2
11-157 – 11-158	2
11-159 – 11-161	0
11-162 – 11-163	2
11-164 – 11-165	0
11-166 – 11-167	2
11-168 – 11-169	0
11-170	2
11-171	0
11-172 – 11-175	2
11-176	0
11-177	2
11-178 – 11-179	0
11-180	6
11-181	0
11-182	7
11-183	0
11-184	7
11-185	0
11-186	6
11-187 – 11-189	0
11-190	6
11-191 – 11-194	0
11-195	6
11-196	4
11-197 – 11-199	0
11-200	6
11-201	0
11-202 – 11-203	3
11-204	0
11-205	3
11-206 – 11-207	0
11-208	6
11-209	4
11-210 – 11-211	0
11-212 – 11-214	2
11-215 – 11-217	0
11-218	4
11-219	6
11-220	4
11-221 – 11-245	0
11-246 – 11-249	1
11-250	3
11-251	0
11-252	1
11-253	3
11-254	4
11-255 – 11-256	3
11-257	1
11-258	4
11-259	3
11-260	1
11-261 – 11-263	3
11-264	4
11-265	1
11-266	4
11-267 – 11-268	0
11-269	6
11-270 – 11-280	0
11-281 – 11-282	4
11-283	0
11-284	6
11-285	0
11-286	4
11-287	6
11-288	4
11-289	0
11-290	6
11-291	5
11-292	4
11-292.1 – 11-292.2 Added	4
11-293 Blank	4
11-294	4
11-295	6
11-296 – 11-301	3
11-302 – 11-306	0
11-307	1
11-308 – 11-312	0
11-313	1
11-314 – 11-315	4
11-316	0

***Zero in this column indicates an original page.**

INSERT LATEST CHANGED PAGES: DESTROY SUPERSEDED PAGES.

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11-317	6
11-318 – 11-320	0
11-321	6
11-322	0
11-323	6
11-324 – 11-350	0
11-351	7
11-352	1
11-353 – 11-354	0
11-355	6
11-356	0
11-357 – 11-360	4
11-361	1
11-362	2
11-363	4
11-364	0
11-365	1
11-366 – 11-371	0
11-372	1
11-373	6
11-374	4
11-375 – 11-376	0
11-377 – 11-379	4
11-380 – 11-433	0
11-434	7
11-435 – 11-437	0
11-438	7
11-439 – 11-443	0
11-444	7
11-445 – 11-447	0
11-448	7
11-449 – 11-479	0
11-480	7
11-481 – 11-483	0
11-484	7
11-485 – 11-510	0
11-511	3
11-512 – 11-520	0
11-521	7
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CHAPTER 11
FLIGHT CONTROL SYSTEM
PART 1 OF 2

CHAPTER OVERVIEW

Chapter 11 contains the maintenance instructions for the flight control system. Flight control system description, operation, and troubleshooting information is contained in TM 1-1520-238-T.

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SECTION I. FLIGHT CONTROLS MAINTENANCE – GENERAL

11.1. SELF-RETAINING BOLT FIT CHECK

11.1.1. Description

This task covers: Bolt Fit Check.

11.1.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
0.0015 - 0.0250-inch thickness gage (item 152, App H)

Personnel Required:

67R Attack Helicopter Repairer

NOTE

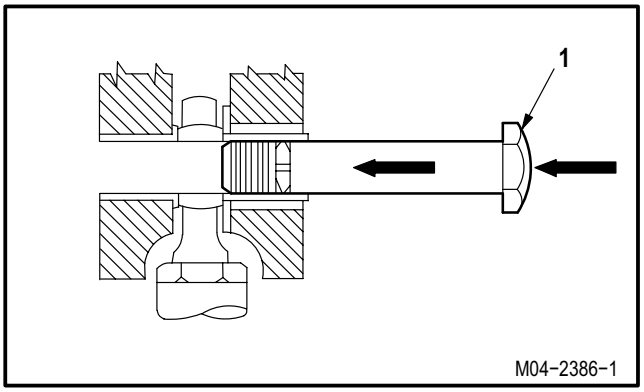
The self-retaining bolt and attaching surfaces shall be clean and dry. No lubrication shall be used for installation.

11.1.3. Bolt Fit Check

a. **Install self-retaining bolt (1) through items to be assembled.**

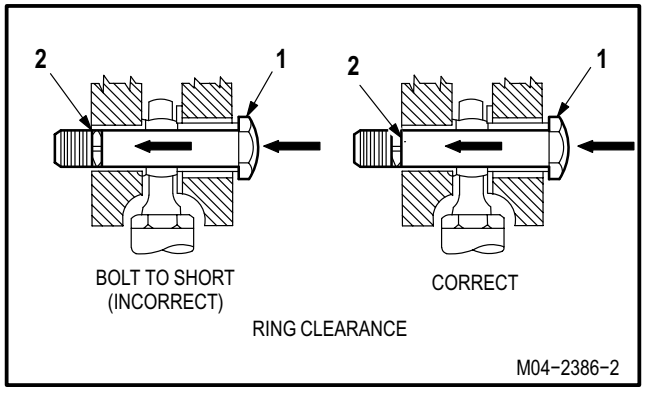
(1) Aline bores of items to be assembled.

(2) Push bolt (1) through assembly until fully seated.



b. **Check for retaining ring (2) clearance.**

(1) If retaining ring (2) does not completely emerge through other side of assembly, bolt (1) is too short and must be replaced.



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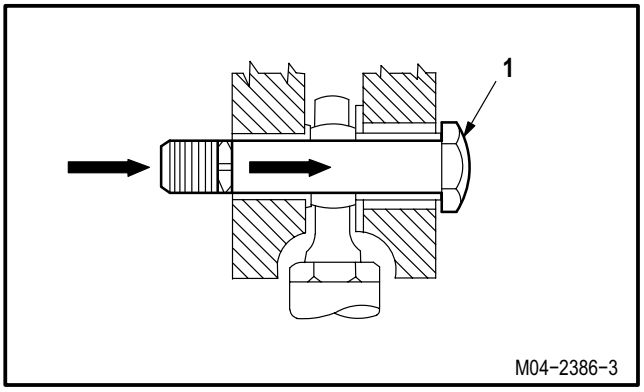
11.1. SELF–RETAINING BOLT FIT CHECK – continued

c. **Check for proper retention.**

(1) If bolt (1) can be pulled out of assembly without any restraining force, bolt (1) and assembly should be checked for proper size.



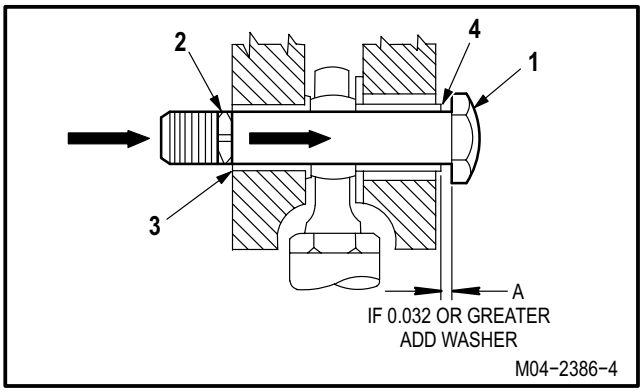
d. **Check gap under head of bolt (1).**

(1) Pull on bolt (1) until retaining ring (2) inside edge is flush with surface (3).

(2) Measure gap between head of bolt (1) and surface (4). Use thickness gage.

(3) If gap A is **0.032 INCH** or more, add AN960 washer under head of bolt (1).

(4) Maximum thickness of washer combination to be added is **0.128 INCH** (two washers **0.063 INCH** thick) or a combination of one thick washer and a **0.032 INCH** thick washer for a lesser gap).



e. **Check that retaining ring (2) clears surface (3) completely.**

(1) Remove one washer and replace with thinner washer if retaining ring (2) does not clear surface (3).

END OF TASK

11.2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD ADJUSTABLE ROD END BEARING ASSEMBLY REPLACEMENT/ADJUSTMENT

11.2.1. Description

This task covers: Removal. Cleaning. Inspection. Installation. Adjustment.

11.2.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Materials/Parts:

Wire (item 224, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

WARNING

FLIGHT SAFETY PART

The rod end assemblies are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.

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11.2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD ADJUSTABLE ROD END BEARING ASSEMBLY REPLACEMENT/ADJUSTMENT – continued

NOTE

This task is typical for the following push-pull rods:

Collective F.S. 164.95
Collective F.S. 161.60
CPG collective
CPG directional SPAD
Lateral cyclic
Directional F.S. 112.50
Directional F.S. 159.98
Directional F.S. 275
Lateral F.S. 83.45
Lateral F.S. 111.50
Lateral F.S. 132.84
Lateral F.S. 159.13
Lateral F.S. 164.95
Longitudinal F.S. 82.80
Longitudinal F.S. 96.59
Longitudinal F.S. 137.20
Longitudinal F.S. 159.62
Longitudinal F.S. 164.38

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11.2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD ADJUSTABLE ROD END BEARING ASSEMBLY REPLACEMENT/ADJUSTMENT – continued

11.2.3. Removal

a. **Measure and record distance A from center of bolt hole in rod end bearing (1) to top of fixed nut (2).**

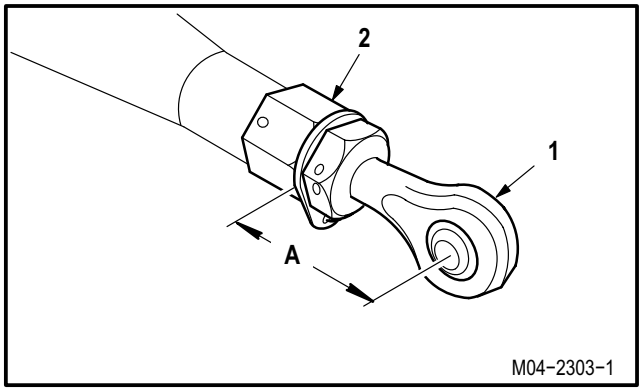
b. **Remove and discard rod end bearing (1) from push-pull rod (3).**

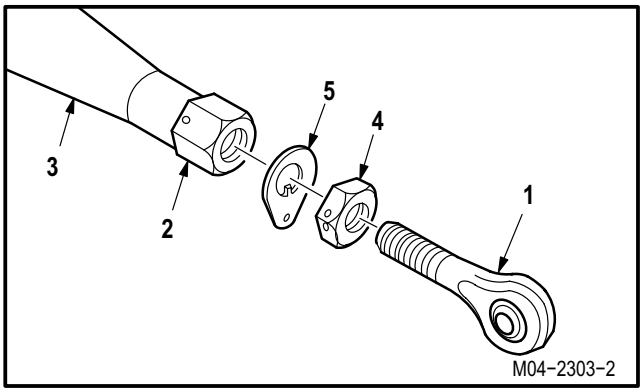
(1) Remove lockwire.

(2) Hold fixed nut (2). Loosen nut (4).

(3) Remove rod end bearing (1) from rod (3).

(4) Remove keywasher (5) and nut (4) from rod end bearing (1). Discard rod end bearing (1).





11.2.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.2.5. Inspection

a. **Check removed and attaching parts for damage and wear** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

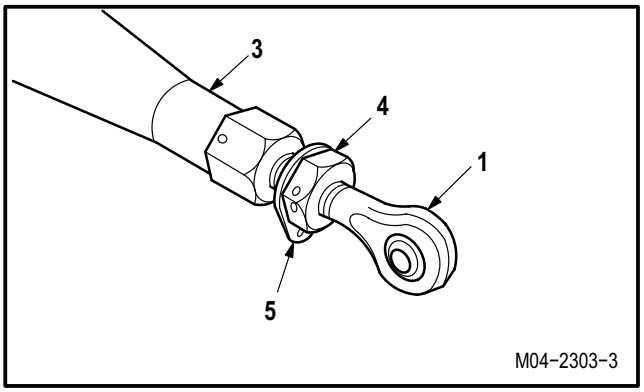
11.2.6. Installation

a. **Install new rod end bearing (1) on rod (3).**

(1) Install nut (4) on rod end bearing (1) as far as it will go.

(2) Install keywasher (5) on rod end bearing (1) as far as it will go.

(3) Install rod end bearing (1) on rod (3).



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11.2. FLIGHT CONTROL SYSTEM PUSH-PULL ROD ADJUSTABLE ROD END BEARING ASSEMBLY REPLACEMENT/ADJUSTMENT – continued

11.2.7. Adjustment

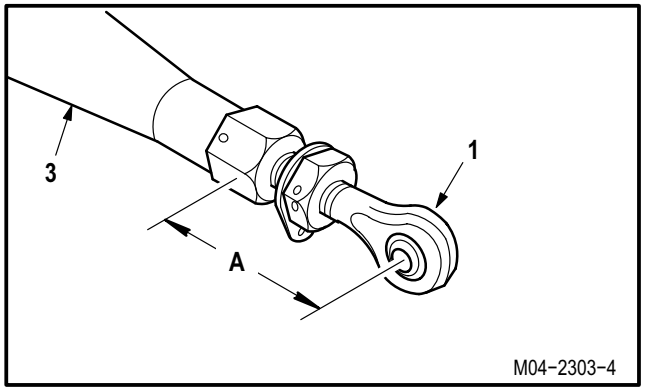
a. **Adjust rod end bearing (1) on rod (3) to obtain distance A recorded in paragraph 11.2.3.**

(1) Hold rod end bearing (1) in position.

(2) Hold fixed nut (2).

(3) Tighten nut (4) against keywasher (5).

(4) Ensure that rod end position has not been disturbed.



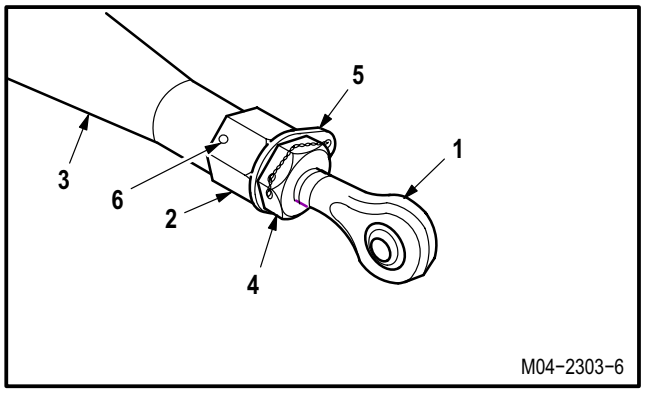
b. **Check for proper thread engagement by attempting to insert wire in witness hole (6).**

(1) If wire can be inserted in witness hole (6), thread engagement is not correct. Use wire (item 224, App F).

(2) Check for correct parts and adjust push-pull rod during rigging procedure.

(3) If wire cannot be inserted in witness hole (6), thread engagement is correct.

(4) Lockwire nut (4) to keywasher (5). Use wire (item 224, App F).



c. **Inspect (QA).**

d. **Perform rig check on collective, directional, lateral, or longitudinal flight control system, as required** (para 11.280)**.**

END OF TASK

11.3. FLIGHT CONTROL SYSTEM PUSH-PULL ROD NON-ADJUSTABLE ROD END BEARING REPLACEMENT

11.3.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.3.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Materials/Parts:

Wire (item 224, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

NOTE

This task is typical for the following push-pull rods:

Directional F.S. 121.40

Longitudinal F.S. 129.25

Collective F.S. 118.50

11.3.3. Removal

a. **Remove rod end bearing (1) from push-pull rod (2).**

(1) Remove lockwire.

(2) Remove nut (3) and washer (4).

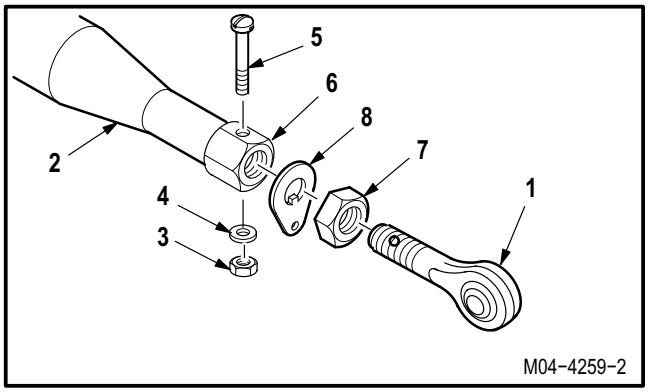
(3) Remove clevis bolt (5).

(4) Hold fixed nut (6). Loosen nut (7).

(5) Lift keywasher (8) clear of slot in rod (2).

(6) Remove rod end bearing (1) from rod (2).

(7) Remove keywasher (8) and nut (7) from rod end bearing (1). Discard rod end bearing (1).



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11.3. FLIGHT CONTROL SYSTEM PUSH-PULL ROD NON-ADJUSTABLE ROD END BEARING REPLACEMENT – continued

11.3.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.3.5. Inspection

a. **Check clevis bolt, nuts, and washers for damage and wear** (para 11.5)**.**

b. **Check clevis bolt, nuts, and washers for corrosion** (para 1.49)**.**

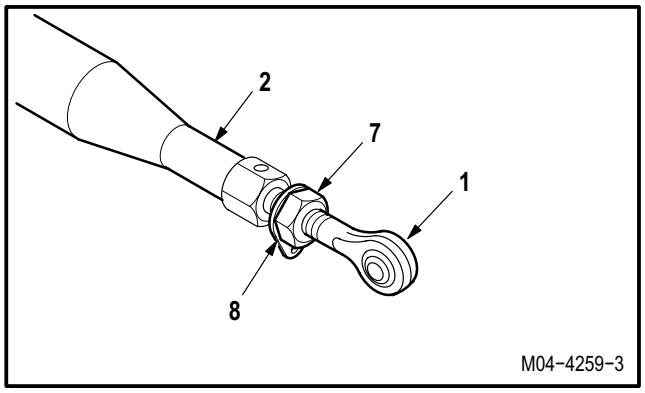
11.3.6. Installation

a. **Install new rod end bearing (1) on rod (2).**

(1) Install nut (7) on rod end bearing (1) as far as it will go.

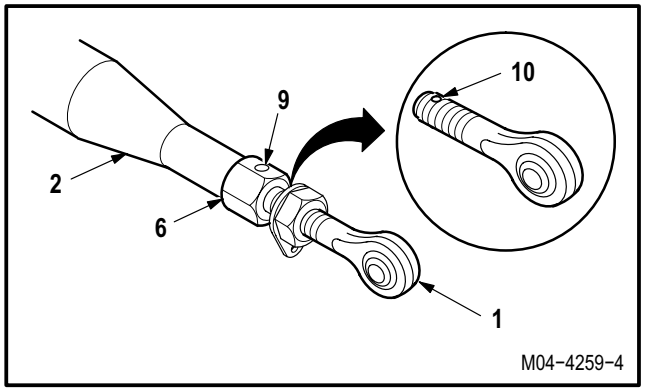
(2) Install keywasher (8) on rod end bearing (1) as far as it will go.

(3) Install rod end bearing (1) on rod (2).



(4) Aline bolt hole (9) in fixed nut (6) with hole (10) in rod end bearing (1).

(5) Hold rod end bearing (1) in position and slide keywasher (8) down to engage key in slot in rod (2).



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11.3. FLIGHT CONTROL SYSTEM PUSH-PULL ROD NON-ADJUSTABLE ROD END BEARING REPLACEMENT – continued

b. **Install clevis bolt (5), washer (4), and nut (3).**

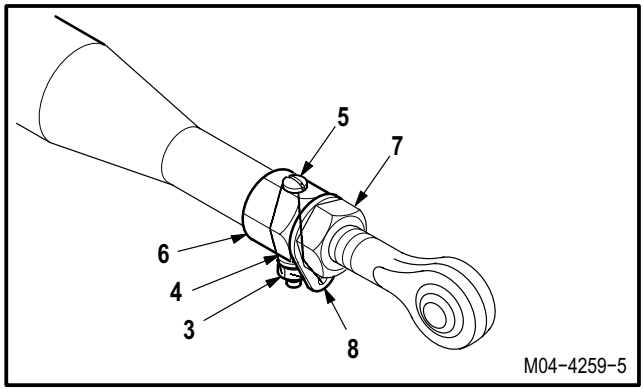
(1) Hold fixed nut (6).

(2) Tighten nut (7) against keywasher (8).

(3) Lockwire clevis bolt (5) to keywasher (8) and nut (3). Use wire (item 224, App F).

c. **Inspect (QA).**

d. **Perform rig check on collective, directional, lateral, or longitudinal flight control system, as required** (para 11.280)**.**



END OF TASK

11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM)

11.4.1. Description

This task covers: Removal. Cleaning. Inspection. Installation (Slip or Pressure Fit Method). Installation (Temperature Differential Fit Method).

11.4.2. Initial Setup

Tools:

Aircraft maintenance tool kit (item 372, App H)
Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
0.000 - 6.000-inch outside micrometer caliper set (item 52, App H)
Fly cutter assembly (item 104, App H)
0.3700 - 0.6300-inch cylinder gage (item 141, App H)
0.6300 - 1.0000-inch cylinder gage (item 142, App H)
1.0000 - 1.5300-inch cylinder gage (item 143, App H)
1.5000 - 2.1600-inch cylinder gage (item 144, App H)
Chemical protective gloves (item 154, App H)
Electric gun type heater (item 163, App H)
2-ton hydraulic hand operated arbor press (item 235, App H)
Universal puller kit (item 241, App H)
Adjustable air filtering respirator (item 262, App H)
Staking tool kit (item 392, App H)
Bearing removal tool – main/tail rotor pitch links (figure D-443, App D)
0 - 75 inch-pound 1/4-inch drive dial indicator torque wrench (item 446, App H)
Staking tool – main/tail rotor pitch links (figure D-451, App D)
Staking tool PN AH64-0010 (figure D-471, App D)
Staking tool PN AH64-0011 (figure D-471, App D)
Staking tool PN AH64-0012 (figure D-471, App D)

Materials/Parts:

Adhesive (item 5, App F)
Brush (item 34, App F)
Carbon dioxide (item 40, App F)
Metal cleaner (item 43, App F)
Corrosion preventive compound (item 62, App F)
Sealing compound primer (item 146, App F)
Primer coating (item 147, App F)
Sealing compound (item 165, App F)
Sealing compound (item 167, App F)
Sealing compound (item 168, App F)
Sealing compound (item 170, App F)
Sealing compound (item 176, App F)

Personnel Required:

67R Attack Helicopter Repairer
68D Aircraft Powertrain Repairer/NDI
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1500-204-23
TM 1-1520-264-23
TM 55-1500-322-24

WARNING

FLIGHT SAFETY PART

Some of the flight control bellcranks, brackets, housings, arms, etc., in this task are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

CAUTION

Hydraulic ram pressure is not staking pressure. Maximum hydraulic ram pressure refers to maximum pressure allowed to press fit bearing/bushing into mating bore using a hydraulic arbor press. This pressure shall not exceed 500 times the bearing/bushing OD.

NOTE

This task is typical for bearing/bushing removal and installation procedures for various bellcranks, brackets, housings, arms, etc., within the flight control system. Refer to Table 11-1 to determine the applicable parts, mating bore size, bearing/bushing OD, type of fit, type plating, maximum hydraulic press ram pressure allowed, and applicable notes. The notes block lists applicable tools, expendables, and special instructions. The (FSP) in the Next Higher Assembly block identifies flight safety parts. Read all special instructions before starting removal or installation procedures.

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-115114052	SA4-16A41 (HS5396-004)	0.9990 0.9995	0.9995 1.0000	Temp	Yes	500	1, 2, 3, 4, 5
7-115116034	MS27647-4A	0.6238 0.6243	0.6245 0.6250	Temp	Yes	313	1, 2, 3, 4, 5
7-115116035	HS606S4-8	0.3757 0.3762	0.3762 0.3768	Temp	No	188	1, 2
7-115116036	MS27647-4A	0.6238 0.6243	0.6245 0.6250	Temp	Yes	313	1, 2, 3, 4, 5
7-115116040	MS27647-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 4, 5
7-115116042	MS27647-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 4, 5
7-115116046	MS27647-4A	0.6238 0.6243	0.6245 0.6250	Temp	Yes	313	1, 2, 3, 4, 5
7-115116048	MS27647-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 4, 5
7-115116049	HS606S4-11	0.3757 0.3762	0.3762 0.3768	Temp	No	188	1, 2

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-115116050	MS27647-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 4, 5
7-115116051	HS606S4-11	0.3757 0.3762	0.3762 0.3768	Temp	No	188	1, 2
7-115117005	MS27647-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 4, 5
7-115117030	MS27647-4A	0.6238 0.6243	0.6245 0.6250	Temp	Yes	313	1, 2, 3, 4, 5
7-115117037	MS27647-4A	0.6238 0.6243	0.6245 0.6250	Temp	Yes	313	1, 2, 3, 4, 5
7-115117041	MS27647-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2
7-115117042	HS606S4-12	0.3757 0.3762	0.3762 0.3768	Temp	No	188	1, 2
7-115117044	MS27641-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2
	MS27641-4	0.7500 0.7505	0.7495 0.7500	Press	Yes	375	1
7-115117047	HS606S4-12	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-115121005	HS606S4-16	0.3757 0.3762	0.3762 0.3768	Temp	No	188	1, 2, 6
7-211516038	MS27647-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 4, 5
7-211516039	HS606S4-6	0.3757 0.3762	0.3762 0.3768	Temp	No	188	1, 2
7-211516063	MS27641-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 5

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-211517054	MS27641-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 5
	MS27641-4	0.7505 0.7510	0.7495 0.7500	Slip	Yes	N/A	1
7-211517056	MS27641-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 5
	MS27641-4	0.7505 0.7510	0.7495 0.7500	Slip	Yes	N/A	1
7-211521010	MS14103-4	0.6248 0.6253	0.6245 0.6250	Press	No	313	7
7-211521043	HS5542-04082	0.4370 0.4380	0.4364 0.4369	Press	Yes	218	1, 36
7-211521044	MS14104-4	0.6560 0.6567	0.6557 0.6562	Press	No	328	7
7-211523013	MS27640-4	0.9002 0.9007	0.9009 0.9014	Temp	Yes	450	1, 2, 3, 5
	MS27640-4	0.9019 0.9024	0.9009 0.9014	Slip	Yes	N/A	26
7-211525044	MS27647-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 4, 5
7-211525045	MS27647-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 4, 5
7-211525046	MS27640-4	0.9002 0.9007	0.9009 0.9014	Temp	Yes	450	1, 2, 3, 4, 5
	MS27640-4	0.9014 0.9019	0.9009 0.9014	Slip	Yes	450	26

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-311511117 (FSP)	HS4618-26C031B	1.8783 1.8791	1.8768 1.8773	Press	No	939	9, 10
	HS4618-26C023B	1.8783 1.8791	1.8768 1.8773	Press	No	939	9, 10
	7-311511118-3	1.9370 1.9380	1.9395 1.9400	Temp	No	970	2, 7, 11
	7-311511118-5	1.9370 1.9380	1.9395 1.9400	Temp	No	970	2, 7, 11
	7-311511120	0.8745 0.8755	0.8759 0.8764	Temp	No	438	2, 7, 12
	7-311511121	1.1250 1.1255	1.1261 1.1266	Temp	No	563	2, 7, 11
	7-311511202-11	1.8783 1.8791	1.8803 1.8808	Temp	No	940	2, 7, 10
	7-311511202-13	1.1245 1.1255	1.1261 1.1266	Temp	No	563	2, 7, 12
	7-311511206	1.8783 1.8791	1.8803 1.8808	Temp	No	940	2, 7, 10
7-311511123 (FSP)	7-311511124	1.9998 2.0008	2.0020 2.0025	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-311511202-13	1.1245 1.1255	1.1261 1.1266	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-311511202-21	0.9995 1.0005	1.0010 1.0010	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-311511203	0.8745 0.8755	0.8759 0.8764	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-311511208	0.9995 1.0005	1.0010 1.0015	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-311511125 (FSP)	7-311511202-19	0.8120 0.8130	0.8133 0.8138	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-311511207-5	0.8120 0.8130	0.8133 0.8138	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-211511146	1.3158 1.3168	1.3143 1.3148	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-211511147	1.3158 1.3168	1.3143 1.3148	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-211511148	1.3158 1.3168	1.3143 1.3148	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
7-311511130	7-211511168	1.1239 1.1244	1.1245 1.1250	Temp	No	563	2, 4, 5, 7, 31
7-311511137 (FSP)	HS4810-KR12 CEGH	1.5619 1.5628	1.5620 1.5625	Temp	No	781	2, 4, 7, 28, 30, 34, 35, 38
7-311511139 (FSP)	7-211511198-7	0.9410 0.9418	0.9388 0.9398	Slip	No	N/A	10, 14
7-311511158	7-211511167	1.0005 1.0015	0.9995 1.0000	Slip	No	N/A	15, 16, 36
7-311511159	7-211511163	1.1918 1.1933	1.1893 1.1898	Temp	No	N/A	15
7-311511161	HS4810-KR12 CEGH	1.5608 1.5619	1.5620 1.5625	Temp	No	781	2, 4, 7, 34, 35, 38
7-311511175 (FSP)	7-311517075	0.3757 0.3766	0.3763 0.3768	Temp	No	189	2, 7, 10, 16
	7-211511198-7	0.9403 0.9417	0.9388 0.9398	Slip	No	N/A	7

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-311511181 (FSP)	HS4810-KR12 CEGH	1.5613 1.5618	1.5620 1.5625	Temp	No	781	2, 7
	7-211511192	2.1880 2.1886	2.1879 2.1885	Temp	No	1094	2, 7, 17
	7-311511121	1.1250 1.1254	1.1261 1.1266	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
7-311511182 (FSP)	HS4810-KR12 CEGH	1.5619 1.5628	1.5620 1.5625	Temp	No	781	2, 4, 7, 28, 30, 34, 35, 38
7-311511186 (FSP)	7-211511198-7	0.9403 0.9412	0.9388 0.9398	Slip	No	N/A	10, 15
7-311511187	HS606S4-12	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2, 16
7-311512064	MS27645-3A	0.6260 0.6265	0.6245 0.6250	Slip	Yes	N/A	18, 19
7-311512087	7-211514095-3	0.3754 0.3759	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-311514101	0.4401 0.4406	0.4381 0.4391	Slip	No	N/A	15
7-311512088	7-311514096	0.3750 0.3755	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
7-311512090	MS27642-16	1.7505 1.7510	1.7490 1.7500	Slip	Yes	N/A	7
7-311512107	MS27645-3A	0.6260 0.6265	0.6245 0.6250	Slip	Yes	N/A	18
7-311513002	MS27642-16	1.7500 1.7505	1.7490 1.7500	Slip	Yes	N/A	7
7-311513003	7-311514096	0.3750 0.3755	0.3761 0.3766	Temp	Yes	188	1, 2
7-311513004	7-311514101	0.4375 0.4380	0.4381 0.4391	Temp	No	220	2, 7

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-311514005	HS606S4-7	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311514023	MB545DDFS464	2.6260 2.6270	2.6240 2.6250	Slip	Yes	N/A	15
	MS27641-5	0.8127 0.8132	0.8120 0.8125	Press	Yes	406	1, 15
7-311514076	MS27641-5	0.8113 0.8118	0.8120 0.8125	Temp	Yes	406	1, 2
7-311514088	HS606S4-6	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
	7-211514095-3	0.3754 0.3759	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-311514101	0.4396 0.4401	0.4381 0.4391	Slip	No	N/A	18
7-311514089	HS606B9-28	0.6875 0.6880	0.6885 0.6890	Temp	No	345	2, 7
	7-311514096	0.3750 0.3755	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
7-311515005	HS606S4-6	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311515055	HS4173C3-0.09	0.3129 0.3134	0.3135 0.3140	Temp	No	157	1, 2, 7
7-311515075	M81934/2-12C024	0.9403 0.9408	0.9388 0.9393	Slip	No	N/A	18
	7-311514096	0.3750 0.3755	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
7-311515081	7-211514095-3	0.3754 0.3759	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-311514101	0.4396 0.4401	0.4381 0.4391	Slip	No	N/A	15

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-311516037	HS606S4-6	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311516041	HS606S4-12	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311516047	HS606S4-8	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311516060	HS606S4-13	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311516061	MS27641-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2
7-311516062	HS606S4-9	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311516064	HS606S4-10	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311516065	HS606S10-12	0.7500 0.7505	0.7510 0.7515	Temp	Yes	376	1, 2
	MS27646-40	1.3126 1.3135	1.3115 1.3125	Press	Yes	626	1
7-311516066	HS606S4-14	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
	MS27646-40	1.3126 1.3135	1.3115 1.3125	Press	Yes	626	1, 3, 8
	7-311514096	0.3750 0.3755	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
7-311516067	7-211514095-3	0.3754 0.3759	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-311514101	0.4396 0.4401	0.4381 0.4391	Slip	No	N/A	15
7-311516076	HS606S3-4	0.3129 0.3134	0.3135 0.3140	Temp	Yes	157	1, 2, 6

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-311516078	HS606S3-5	0.3129 0.3134	0.3135 0.3140	Temp	Yes	157	1, 2
7-311517002	MS27647-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3, 4, 5, 8
7-311517003	HS606S4-11	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311517012	MS27646-38	1.0608 1.0613	1.0615 1.0625	Temp	Yes	531	1, 2
	MS27646-38	1.0627 1.0632	1.0615 1.0625	Press	Yes	531	1
7-311517020	HS606S4-15	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2, 16
7-311517038	HS606S4-7	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2, 16
7-311517039	MS27641-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3
	MS27641-4	0.7500 0.7505	0.7495 0.7500	Press	Yes	375	1
7-311517040	HS606S4-7	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311517043	HS606S4-18	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311517052	MS27640-4	0.9002 0.9007	0.9009 0.9014	Temp	Yes	450	1, 2, 3
	MS27640-4	0.9019 0.9024	0.9009 0.9014	Slip	Yes	N/A	1
7-311517053	HS606S4-9	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311517055	HS606S4-11	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-311517057	HS606S10-12	0.7502 0.7507	0.7510 0.7515	Temp	Yes	375	1, 2
7-311517058	HS060S4-12	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
	HS610SP2490K134T0550	0.2500 0.2505	0.2486 0.2490	Slip	Yes	N/A	15
	HS610SP2490K103T0550	0.2500 0.2505	0.2486 0.2490	Slip	Yes	N/A	15
	MS27646-40	1.3126 1.3135	1.3115 1.3125	Press	Yes	656	1, 3, 8, 23
	7-211514095-3	0.3754 0.3759	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
	7-311514101	0.4396 0.4401	0.4381 0.4391	Slip	No	N/A	15
7-311517059	7-311514096	0.3750 0.3755	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
7-311517060	HS606S4-18	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
7-311517061	MS27641-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3
	MS27641-4	0.7505 0.7510	0.7495 0.7500	Slip	Yes	N/A	1
7-311517062	MS27641-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 3
	MS27641-4	0.7505 0.7510	0.7495 0.7500	Slip	Yes	N/A	1
7-311517063	7-211517066	0.3754 0.3759	0.3754 0.3757	Temp	No	188	2, 7

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-311517064	7-311514101	0.4396 0.4401	0.4381 0.4391	Slip	No	N/A	15
	7-311514096	0.3750 0.3755	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
7-311517065	7-211514095-3	0.3754 0.3759	0.3761 0.3766	Replacement of this bearing/bushing is not currently authorized at AVUM/AVIM level.			
7-311517074	HS606S4-18	0.3757 0.3766	0.3762 0.3768	Temp	Yes	188	1, 2
7-311518003	MS27646-38	1.0625 1.0635	1.0615 1.0625	Press	Yes	531	1
	MS27646-38	1.0645 1.0655	1.0615 1.0625	Slip	Yes	N/A	18
7-311518006	MS27641-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2, 7
	MS27641-4	0.7505 0.7510	0.7495 0.7500	Slip	Yes	N/A	1
7-311518007	MS27645-4	0.9002 0.9007	0.9009 0.9014	Temp	Yes	450	1, 2, 3, 4, 5
7-311518010	MS14104-4	0.6560 0.6567	0.6557 0.6562	Press	No	328	3, 4, 5, 7, 25, 39,40
7-311518020	MS27641-4	0.7488 0.7493	0.7495 0.7500	Temp	Yes	375	1, 2
	MS27641-4	0.7501 0.7506	0.7495 0.7500	Slip	Yes	N/A	1
7-311518021	MS27646-38	1.0625 1.0635	1.0615 1.0625	Press	Yes	531	1
	MS27646-38	1.0630 1.0635	1.0615 1.0625	Slip	Yes	N/A	1
7-311521002	MS27646-39	1.1875 1.1885	1.1865 1.1875	Press	Yes	594	1, 3, 6

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-311521006	MS14104-4	0.6560 0.6567	0.6557 0.6562	Press	No	328	3, 6, 18
7-311521007	HS4608-4	0.7400 0.7405	0.7395 0.7400	Press	No	370	3, 4, 5, 7
7-311521013	MS27647-8	1.4380 1.4385	1.4370 1.4375	Slip	Yes	N/A	1
7-311521018	HS606S4-12	0.3757 0.3762	0.3762 0.3768	Temp	Yes	188	1, 2
	M8193412-16C008	1.1878 1.1888	1.1893 1.1898	Temp	Yes	595	1, 2
7-311521046	HS4608-4	0.7400 0.7405	0.7395 0.7400	Press	No	370	3, 4, 5, 6, 7
7-311523014	MS27640-4	0.9002 0.9007	0.9009 0.9014	Temp	Yes	450	1, 2, 3
	MS27640-4	0.9015 0.9019	0.9009 0.9014	Press	Yes	450	1, 3
7-311524009	MS27640-4	0.9002 0.9007	0.9009 0.9014	Temp	Yes	450	1, 2, 3, 5
7-311524010	MS27640-4	0.9024 0.9029	0.9009 0.9014	Slip	Yes	N/A	15
	MS27640-4	0.9014 0.9019	0.9009 0.9014	Press	Yes	450	1, 3
	MS27649-4	0.7505 0.7510	0.7495 0.7500	Slip	No	N/A	26, 36
7-311525062 (FSP)	7-311525074	0.8121 0.8130	0.8135 0.8140	Temp	No	407	2, 26, 37
7-311525063 (FSP)	HS4736KR5 CWGH	0.6869 0.6878	0.6870 0.6875	Temp	No	344	2, 4, 7, 27, 30, 32
	7-211525060	0.6876 0.6886	0.6870 0.6875	Press	No	344	26, 36

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

TABLE 11-1 Flight Control System Bearing/Bushing Replacement Data – continued

Next Higher Assembly P/N	Bearing/ Bushing P/N	Mating Bore Size (inches)	Bearing/ Bushing OD (inches)	Slip, Press, or Temp Fit	Cadmium Plated	Max Hyd Ram Pressure (pounds)	Notes
7-311525064 (FSP)	HS4619-11C010B	0.8749 0.8759	0.8762 0.8767	Temp	No	438	2, 7
	MS14103-12	1.3750 1.3760	1.3745 1.3750	Press	No	687	4, 7, 33
7-311527009	7-115127019	0.4997 0.5005	0.5007 0.5017	Temp	No	251	2, 7
	7-115127020	0.4997 0.5005	0.5007 0.5017	Temp	No	251	2, 6, 7
7-311527035 (FSP)	HS4736KR 6CWGH	0.8119 0.8128	0.8120 0.8125	Temp	No	406	2, 4, 7, 27, 29, 34, 35, 39
	7-211527014	1.5619 1.5628	1.5620 1.5625	Temp	No	781	2, 4, 7, 28, 30, 34, 35,38, 39

NOTE

1. Apply primer coating (item 147, App F) using brush (item 34, App F) on mating bore. Install bearing/ bushing while primer is still wet.
2. Use carbon dioxide (item 40, App F) (dry ice). If necessary, use heater.
3. Use staking tool kit (TM 55-1500-322-24). Determine correct staking pressure in accordance with TM 55-1500-322-24.
4. Stake both sides (TM 55-1500-322-24).
5. Use fly cutter if necessary for removal. If removing bearing from aluminum housing, use of fly cutter is mandatory.
6. Use appropriate bushing driver set.
7. Apply sealing compound (item 176, App F) using brush (item 34, App F) on mating bore. Install bearing/bushing while sealing compound is still wet.
8. Use ring stake method (TM 55-1500-322-24).
9. Use adhesive (item 5, App F).
10. Aline inside diameters to be within **0.0005 INCH**.
11. Install with care to prevent damage to surface finish on flange surface.
12. Bushing 7-311511120 must be installed before bushing 7-311511202-13.
13. Clean ID of bearing/bushing. Use cleaner (item 43, App F).

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

14. Apply sealing compound primer (item 146, App F) using brush (item 34, App F) on mating bore. Allow primer to dry **2 HOURS**. Apply sealing compound (item 168, App F) using brush (item 34, App F) on mating bore. Install bearing/bushing while sealing compound is still wet.
15. Apply sealing compound primer (item 146, App F) using brush (item 34, App F) on mating bore. Allow primer to dry **2 HOURS**. Apply sealing compound (item 167, App F) using brush (item 34, App F) on mating bore. Install bearing/bushing while sealing compound is still wet.
16. Apply primer coating (item 147, App F) using brush (item 34, App F) on mating bore. Allow primer to dry **2 HOURS**. Apply corrosion preventive compound (item 62, App F) using brush (item 34, App F) on mating bore. Install bearing/bushing.
17. Remove six rivets and two retaining plates from connecting link (TM 1-1500-204-23). After installing bearing install two retaining plates. Install six rivets wet and flush both sides. Use primer coating (item 147, App F) and brush (item 34, App F) (TM 1-1500-204-23).
18. Apply sealing compound primer (item 146, App F) using brush (item 34, App F) on mating bore. Allow primer to dry **2 HOURS**. Apply sealing compound (item 165, App F) using brush (item 34, App F) on mating bore. Install bearing/bushing while sealing compound is still wet.
19. Install bearing/bushing **0.000 to 0.002 INCH** under surface (TM 55-1500-322-24).
20. Install bearing/bushing **0.000 to 0.005 INCH** under surface (TM 55-1500-322-24).
21. Apply sealing compound primer (item 146, App F) using brush (item 34, App F) on mating bore. Allow primer to dry **2 HOURS**. Apply sealing compound (item 170, App F) using brush (item 34, App F) on mating bore. Install bearing/bushing while sealing compound is still wet.
22. Install bearing/bushing **0.000 to 0.010 INCH** under surface (TM 55-1500-322-24).
23. Staking load 34,000 ±500 pounds (ring stake) (TM 55-1500-322-24).
24. Breakaway torque on bearing must not exceed **6 INCH-POUNDS** after installation.
25. Stake bearing. Use intermittent retention method (TM 55-1500-322-24).
26. No primer required.
27. Breakaway torque on bearing must not exceed **15 INCH-POUNDS** after installation.
28. Breakaway torque on bearing must not exceed **40 INCH-POUNDS** after installation.
29. Use 14,000 pounds staking pressure (TM 55-1500-322-24).
30. Use 30,000 pounds staking pressure (TM 55-1500-322-24).
31. Use staking tool PN AH64-0010 (figure D-471, App D) (7-311511130 housing/7-211511168 bearing).
32. Use staking tool PN AH64-0011 (figure D-471, App D) (7-311525063 housing/HS4736KR5CWGH bearing).
33. Use staking tool PN AH64-0012 (figure D-471, App D) (7-311525064 housing/MS14103-12 bearing).
34. Use bearing removal tool – main/tail rotor pitch links (figure D-443, App D).
35. Use staking tool main/tail rotor pitch links (figure D-451, App D).
36. Replacement of this bearing/bushing is authorized at AVUM level.
37. Apply a continuous bead of sealing compound (item 176, App F) to faying surfaces of bushing and support.
38. Use bearing cutting tool for removal (figure D-477, App D).
39. Use torque wrench. (item 446, App H).
40. Breakaway torque on bearing must not exceed **3 INCH-POUNDS** after installation.

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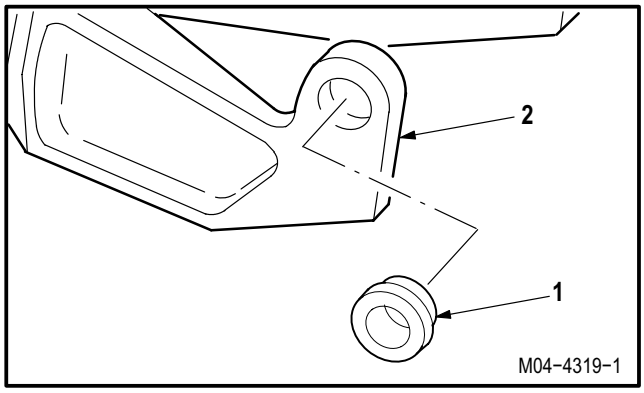
11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM)

11.4.3. Removal

a. **Remove defective bearing/bushing (1) from housing (2) mating bore.** Use puller kit (TM 55-1500-322-24).

b. **Discard bearing/bushing (1).**



11.4.4. Cleaning

a. **Clean housing mating bore(s)** (para 1.47)**.**

11.4.5. Inspection

a. **Check housing for cracks.**

(1) If cracks are suspected, perform nondestructive inspection (TM 1-1520-264-23).

b. **Check housing for scoring, nicks, and scratches.**

(1) Scoring, nicks, and scratches are acceptable if less than **0.025 INCH** deep.

c. **Check housing for corrosion** (para 1.49)**.**

d. **Measure diameter of mating bore(s) in housing (QA).**

(1) Diameter shall not exceed maximum listed in Table 11-1. Use appropriate cylinder gage and caliper set.

(2) Out-of-roundness tolerance shall not exceed one-half the diametrical (size) tolerance listed in Table 11-1. The tolerance shall be maintained for the total depth of the housing mating bore(s). Use appropriate cylinder gage and caliper set.

NOTE

There are three types of bearing/bushing installation procedures: slip fit, press fit, and temperature differential fit. Refer to Table 11-1 for applicable method.

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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

11.4.6. Installation (Slip or Pressure Fit Method)

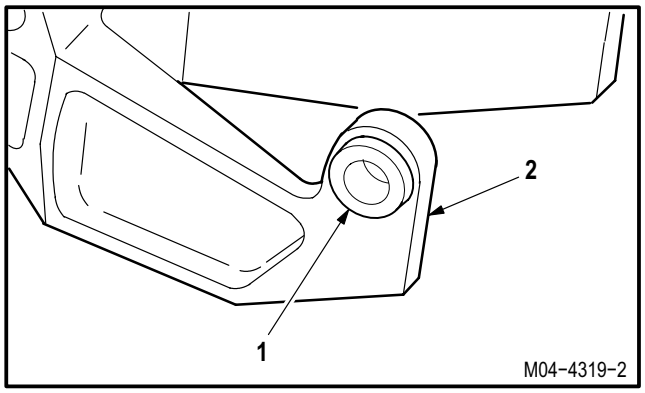
CAUTION

Do not allow compounds to enter bearing(s). Bearing(s) can be damaged.

a. **Apply appropriate primer or sealing compound on mating bore in housing (2).** Refer to Table 11-1 notes column.

CAUTION

Do not exceed maximum ram pressure stated in Table 11-1 or housing may be damaged.



b. **Install bearing/bushing (1) in housing (2) mating bore while primer or sealing compound is still wet** (TM 55-1500-322-24)**.** Install manually or use arbor press.

(1) Install flange type bearing(s)/bushing(s):

(a) Use ram pressure applied against flange.

(b) Ensure no primer or sealing compound is present under flange.

(c) Ensure flange is fully seated against housing surface.

(2) Install sleeve type bearing(s)/bushing(s) until seated or flush with housing surface.

(3) Install in-line bearing(s)/bushing(s) so that they are alined with one another during installation.

GO TO NEXT PAGE

11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

c. **Apply appropriate primer or sealing compound around housing (2) and bearing/bushing to form a fillet seal.** Refer to Table 11-1 notes column.

d. **Inspect (QA).**

11.4.7. Installation (Temperature Differential Fit Method)

CAUTION

Do not freeze sealed bearings below -65 °F (-53 °C). Do not freeze all other bearing(s)/bushing(s) below -321 °F (-196 °C).

a. **Freeze bearing/bushing (1) in freezer at 0 °F (-18 °C) or below for 3 hours or use carbon dioxide (item 40, App F).** Use carbon dioxide (dry ice).

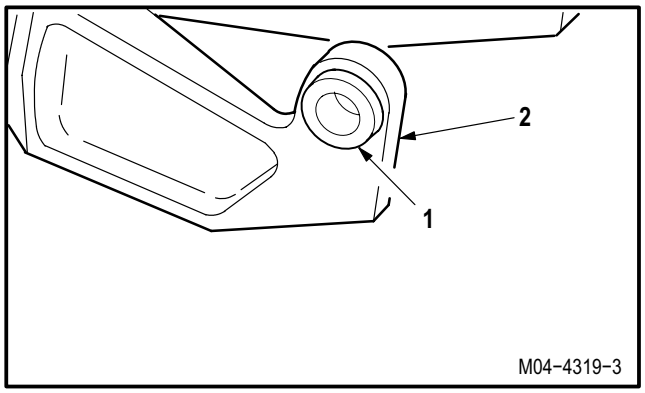
WARNING

Do not place heater near flammable material or allow heater to contact skin: severe burns can result. Wear protective equipment. If injury occurs, seek medical aid.

CAUTION

Do not heat ferrous parts over 350 °F (177 °C) and nonferrous parts over 200 °F (93 °C).

b. **If necessary, heat housing (2) mating bore.** Use heater.



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11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

CAUTION

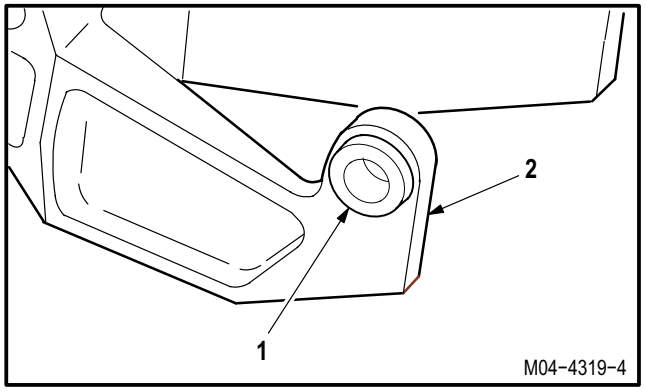
Do not allow compounds to enter bearing(s). Bearing(s) may be damaged.

c. **Apply appropriate primer or sealing compound on mating bore in housing (2).** Refer to Table 11-1 notes column.

CAUTION

Do not exceed maximum ram pressure stated in Table 11-1. Housing may be damaged.

d. **Install frozen bearing/bushing (1) in housing (2) mating bore while primer or sealing compound is still wet** (TM 55-1500-322-24)**.** Install manually or use arbor press.



(1) Install flange type bearing(s)/bushing(s):

(a) Use ram pressure applied against flange.

(b) Ensure no primer or sealing compound is present under flange.

(c) Ensure flange is fully seated against housing surface.

(2) Install sleeve type bearing(s)/bushing(s) until seated or flush with housing surface.

(3) Install in-line bearing(s)/bushing(s) so that they are alined with one another during installation.

e. **Apply appropriate primer or sealing compound around housing (2) and bearing/bushing to form a fillet seal.** Refer to Table 11-1 notes column.

GO TO NEXT PAGE

11.4. FLIGHT CONTROL SYSTEM BEARING/BUSHING REPLACEMENT (AVIM) – continued

f. **Allow bearing/bushing and housing to return to room temperature.**

g. **Inspect (QA).**

END OF TASK

SECTION II. FLIGHT CONTROLS MAINTENANCE – MECHANICAL

11.5. FLIGHT CONTROLS – INSPECTION (MAIN ROTOR)

11.5.1. Description

This task covers: Inspection.

11.5.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Fluorescent inspection kit (item 138, App H)
0.000 - 0.125-inch dial indicator depth gage (item 145, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)

Materials/Parts:

Brush (item 34, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1500-204-23
TM 1-1500-344-23
TM 1-1520-264-23
TM 55-1500-322-24

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

11.5.3. Inspection

a. **General.**

(1) Dents, gouges, scratches, or corrosion in control rods, brackets, supports, idlers, and other components.

(a) Damage in component bore within 1 and 1/2 times bore diameter is not to exceed 10 percent of material thickness or **0.040 INCH**, whichever is less.

(b) Damage in bulkhead or deck attachment is not to exceed 25 percent of item area and no more than 20 percent of material thickness after repair.

(2) Cracks in control rods, brackets, supports, idlers, and other components. No cracks allowed.

(a) If cracks are suspected, perform nondestructive inspection (TM 1-1520-264-23).

b. **Push-pull rods.**

NOTE

Replace excessively worn bearing(s) (para 11.2 or para 11.3).

(1) Straightness must be within **0.030 INCH**. Use depth gage.

(2) Gouges not to exceed **0.010 INCH** or 10 percent of wall thickness in depth, whichever is less, and **1.0 INCH** in length. Use depth gage.

GO TO NEXT PAGE

11.5. FLIGHT CONTROLS – INSPECTION (MAIN ROTOR) – continued

(3) Dents not to exceed **0.020 INCH** in depth. Must be blended out. Use depth gage.

(4) Scratches and gouges not to exceed **1/3** circumference of rod after repair.

(5) Ratcheting ball bearing rod ends must be replaced.

(6) Maximum allowable spherical rod end bearing radial play **0.010 INCH**.

(7) For additional limits refer to TM 1-1500-204-23.

c. **Scissors.**

(1) Maximum allowable spherical bearing radial play **0.014 INCH**.

(2) Maximum allowable spherical bearing axial play **0.030 INCH**.

(3) Tubular sections – gouges and scratches not to exceed **0.020 INCH** in depth. Dents not to exceed **0.032 INCH** in depth. Must be blended out. Use depth gage.

(4) Intermediate and end block sections – gouges, dents, and scratches not to exceed **0.015 INCH** in depth. Must be blended out. Use depth gage.

(5) Transition zones between tubular and block sections – gouges, dents, and scratches not to exceed **0.010 INCH** in depth. Must be blended out. Use depth gage.

(6) Axial play wear limit between upper and lower arms of load bearing scissors may not exceed **0.010 INCH**.

(7) Axial play wear limit between load bearing scissors and lower shoe not to exceed **0.010 INCH**.

d. **Bushings and bearings.**

NOTE

- Maximum allowable damage limits are given in (TM 55-1500-322-24).
- Replace excessively worn bushing(s) and/or bearing(s) (para 11.4).

(1) Radial play with bolt in bushing or bearing inside diameter **0.004 INCH**.

(2) Radial play with sliding bushing in flanged inside diameter **0.004 INCH**.

(3) Radial play in ball bearing **0.002 INCH**.

(4) Radial play of Teflon bearing **0.006 INCH**.

(5) Radial play in push-pull rod end bearing **0.002 INCH**.

(6) Axial play in Teflon bearing **0.016 INCH**.

(7) Axial play in push-pull rod end bearing **0.009 INCH**.

(8) Radial play in servocylinder universal link bushings **0.005 INCH**.

(9) Axial play in servocylinder universal link bushings **0.009 INCH**.

GO TO NEXT PAGE

11.5. FLIGHT CONTROLS – INSPECTION (MAIN ROTOR) – continued

(10) Radial play in servocylinder rod end bearings and clevis bearings **0.005 INCH**.

(11) Axial play in servocylinder rod end bearings and clevis bearings **0.020 INCH**.

e. **Pitch links.**

(1) Gouges and scratches not to exceed **0.020 INCH** in depth and **0.070 INCH** in length for the area **3 INCHES** inboard of either rod end bearing; **0.003 INCH** in depth and **0.010 INCH** in length for the midspan of the link. Irregularities must be blended out.

(2) Rod end threads should be snug but free to turn in barrel with jam nuts loosened.

(3) Maximum allowable radial play **0.014 INCH**.

(4) Maximum allowable axial play **0.030 INCH**.

(5) Wear and chafing (metal-to-metal) with swashplate clevis, maximum allowable rod damage depth **0.010 INCH**. Use depth gage.

(6) Jam nuts replaced if nicked substantially.

f. **Swashplate – spherical bearing freeplay.**

(1) Maximum allowable radial play **0.020 INCH** between uniball and inner ring.

(2) Maximum allowable axial play **0.063 INCH** between uniball and inner ring.

(3) Maximum allowable radial play **0.020 INCH** between uniball and mast. (Axial play does not apply.)

(4) Friction not to restrict freedom of movement on shaft.

(5) Wear or chafing with pitch link, maximum allowable damage depth **0.015 INCH**. Use depth gage.

(6) Swashplate. Gouges, dents, and scratches not to exceed **0.050 INCH** in depth. Must be blended out. Use depth gage.

(7) Swashplate rod end ears.

(a) Gouges, dents, and scratches not to exceed **0.050 INCH** in depth. Must be blended out. Use depth gage.

(b) Ear thickness shall not be less than **0.617 INCH** after blending.

(8) Swashplate self-lubricating fabric bearing liners. Nicks and gouges not to exceed **0.010 INCH**. May be blended out if blended area does not exceed 20 percent of bearing width, and does not exceed **1.00 INCH** in length (TM 55-1500-322-24).

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11.5. FLIGHT CONTROLS – INSPECTION (MAIN ROTOR) – continued

g. **Lateral links.**

(1) Maximum allowable radial play **0.014 INCH** and maximum allowable axial play **0.030 INCH**.

(2) Gouges and dents not to exceed **0.010 INCH** in depth. Must be blended out. Use depth gage.

h. **Torque link.**

(1) Maximum allowable radial play **0.014 INCH** and maximum allowable axial play **0.030 INCH**.

(2) Maximum allowable lower sleeve bushing radial play **0.004 INCH**.

(3) Maximum allowable lower sleeve bushing axial play **0.050 INCH**.

i. **CPG/Pilot shear pin activated decoupler (SPAD).**

NOTE

- The following SPAD inspection criteria is typical for all SPAD's in the aircraft.
- If shear pin(s) cannot be removed by conventional means after repeated attempts from any of the SPAD assemblies (CPG or pilot), deliberately shearing the pin is permitted. Ensure the ends of the pins are removed.

(1) (SPAD) shear pins.

(a) Inspect removed shear pins for straightness (bent/bowed) and deep material scratches. None allowed.

(b) Minor surface scratches along pin shank are permitted, as are tooling marks and gouges, resulting from removal process, on ends of pin (head/taper).

(2) Bracket surfaces. Gouges, dents, and scratches not to exceed **0.015 INCH** in depth, must be blended out. Use depth gage.

(3) Rigging pin ears. Gouges and dents not to exceed **0.015 INCH** in depth. Use depth gage.

(4) Rigging pin holes. Hole stop not to exceed **0.010 INCH**.

(5) Connect pin holes. Maximum allowable pinhole elongation **0.002 INCH**.

(6) (SPAD) microswitches.

(a) Check anodized surface for galling. None allowed.

(b) Torque strip on fastening hardware (mounting plate to SPAD Assembly).

(c) Bent switch arms (roller arms).

(d) Potting compound visible on one of the fasteners (nut/bolt) for the switch mounting plate (mounting plate to SPAD Assembly).

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11.5. FLIGHT CONTROLS – INSPECTION (MAIN ROTOR) – continued

j. **Mixer bellcrank.** Gouges, dents, and scratches not to exceed **0.030 INCH** in depth and **1.0 INCH** in length. Replace bearings if loose in housing. Use depth gage.

k. **Bellcranks.** Gouges and dents not to exceed **0.015 INCH** in depth. Must be blended out. Use depth gage.

l. **Swashplate inspection – ball bearing condition.**

NOTE

A new swashplate bearing is 100 percent grease filled. It is normal for the bearing to purge excessive grease, at a decreasing rate, for up to 25 flight hours.

(1) Inspect for grease leakage between rotating and nonrotating portions of main rotor swashplate by wiping finger along inner circumference of swashplate for a distance of at least 3 inches in three different locations around swashplate. A grease film on these parts is normal. If this is observed, inspection is complete. If an abnormal accumulation of grease is deposited on finger, after 25 flight hours, replace swashplate.

(2) Inspect for freeplay and smoothness of operation.

(a) Disconnect pitch links (para 11.14), load bearing scissors (para 11.16), and secondary scissors (para 11.18) at lower ends.

NOTE

Rotate swashplate in direction of rotation.

(b) Inspect swashplate for smoothness of rotation. Inspect for axial play between rotating and nonrotating swashplate. No axial play allowed.

(c) Visually inspect for condition of parts between rotating and nonrotating swashplate to include seal material, seal retainer plate, lower bearing retaining ring, and bearing cage material. If any abnormalities are found, replace swashplate.

(3) Check main rotor swashplate clevis and pitch change link rod end for general condition, wear, or chafing.

(a) Blend and finish (TM 1-1500-344-23) if wear or chafing in swashplate clevis area does not exceed limits (para 11.5).

(b) Replace swashplate (para 11.6 and para 11.7) if wear of chafing damage in swashplate clevis area exceeds limits (para 11.5).

(c) Blend and finish (TM 1-1500-344-23) if damage to pitch change link rod ends does not exceed limits (para 11.5).

(d) Replace rod end (para 11.15) if damage to pitch change link rod end exceeds limits (para 11.5).

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11.5. FLIGHT CONTROLS – INSPECTION (MAIN ROTOR) – continued

(4) Check helicopters with main rotor swashplate spherical and slider bearings which have chromium oxide – coated (dark brown) spherical balls.

(a) Check spherical ball for flaking.

(b) Replace main rotor swashplate (para 11.6 and para 11.7) if flaking is visible on surface of spherical ball.

(c) No further action required if blistering (without flaking) is visible on spherical ball.

(5) Check helicopters with main rotor swashplate spherical and slider bearings which have chrome – coated spherical balls.

(a) Check spherical ball for chipping, flaking and pitting:

1 Pitting is limited to **0.002 INCH** in depth. Use depth gage.

2 No single chip or flake larger than **0.10 SQUARE-INCH** allowed; total area of all chips and flakes shall be no more than **0.25 SQUARE-INCH**.

(b) Replace main rotor swashplate (para 11.6 and para 11.7) if limits listed above are exceeded on chrome-coated spherical ball.

(6) Inspect self–lubricating fabric bearing liners for nicks and gouges. Defects must not exceed **0.10 INCH** in depth and **1.00 INCH** in length. Defects may be blended out if blended area will not exceed 20 percent of bearing width. Use depth gage.

m. **Feel spring cartridges.**

(1) Dents, gouges, scratches, nicks, wear, or corrosion not to exceed a depth of 10 percent of material thickness after repair. Use depth gage.

(2) Radial play of spherical rod end bearing not to exceed **0.006 INCH**.

(3) Radial play of ball bearing not to exceed **0.002 INCH**.

(4) Check for proper torque and safety of nuts on shaft and rod end bearing. Also check for proper backlash and safety of cartridge cap.

n. **Pilot and CPG collective sticks.**

(1) Check pilot and CPG collective stick chop collars for proper installation and condition of copper breakaway safety wire.

END OF TASK

11.6. MAIN ROTOR SWASHPLATE REMOVAL

11.6.1. Description

This task covers: Removal. Cleaning. Inspection.

11.6.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Aircraft mounted crane (item 69, App H)
Rotor universal sling (item 292, App H)
1 1/16 x 1/2-inch drive socket wrench socket (item 305, App H)
1 1/16 & 1 1/4-inch open end wrench (item 416, App H)

Materials/Parts:

Cloth (item 54, App F)
Wire (item 229, App F)

Personnel Required:

67R Attack Helicopter Repairer
One person to assist

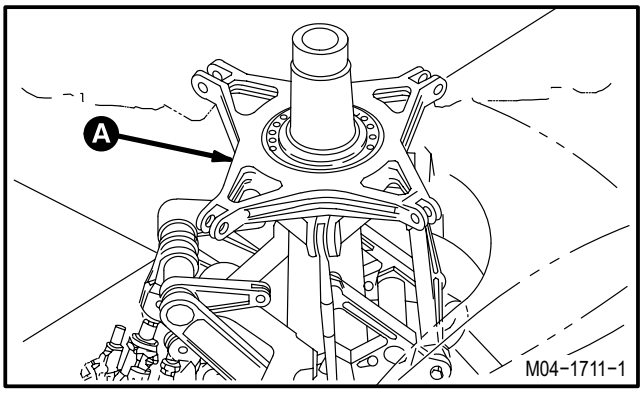
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access doors T250L, T250R, T290L, T290R, and L325 opened
5.21	Main rotor head removed
11.182	Motional transducer removed
11.16	Load bearing main rotor scissor removed
11.18	Secondary main rotor scissor removed
11.14	Main rotor pitch links removed

WARNING

FLIGHT SAFETY PART

The main rotor swashplate is a flight safety part. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.



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11.6. MAIN ROTOR SWASHPLATE REMOVAL – continued

11.6.3. Removal

a. **Attach sling (1) on swashplate (2).**

(1) Install one strap through each arm of swashplate (2).

(2) Hook and adjust straps to same length.

b. **Install crane hook (3) on sling (1).** Use crane.

(1) Raise crane hook (3) to remove slack from sling (1).

CAUTION

Lateral links and torque link may be damaged if allowed to fall.

c. **Remove torque link (4) from swashplate (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (5).

(3) Hold nut (6). Remove bolt (7). Use socket and open end wrench.

(4) Remove washer(s) (8) (if installed), and bushing (9).

(5) Remove link (4).

d. **Remove left lateral link (10) from swashplate (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (11).

(3) Remove nut (12).

(4) Remove bolt (13), washer(s) (14) (if installed), and bushing (15).

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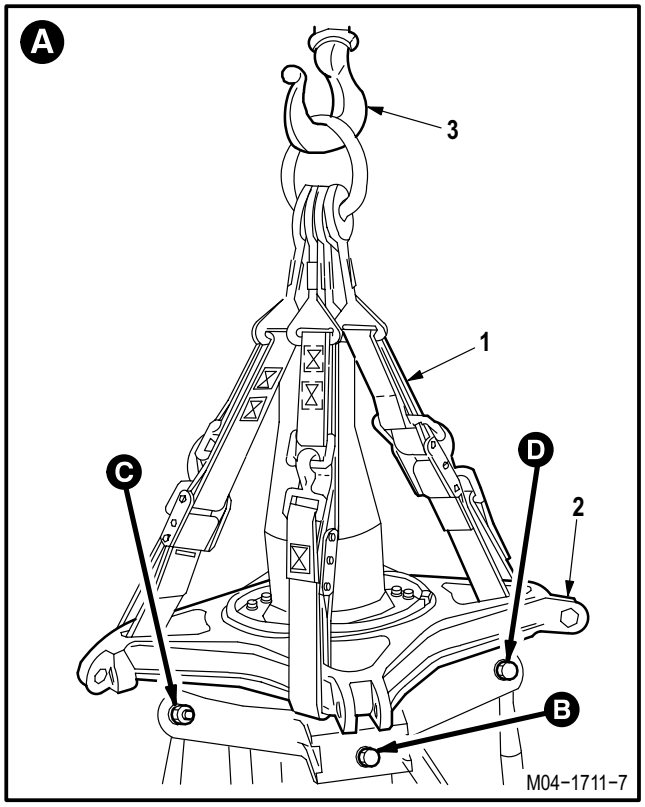
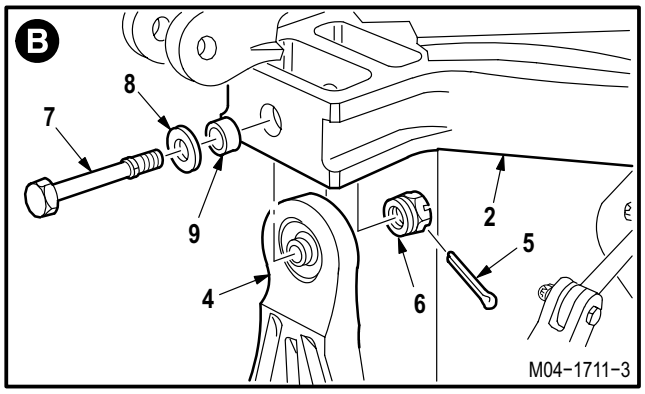
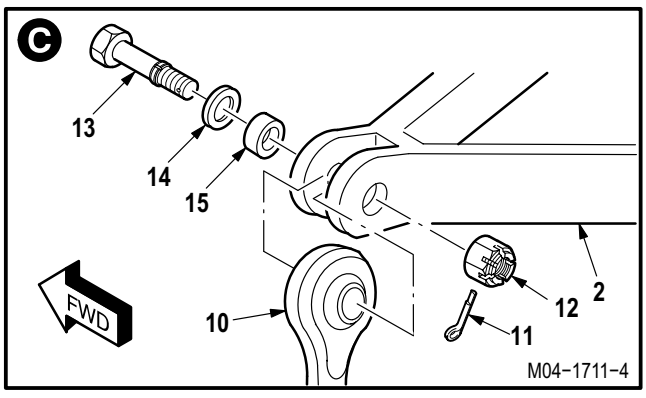






11.6. MAIN ROTOR SWASHPLATE REMOVAL – continued

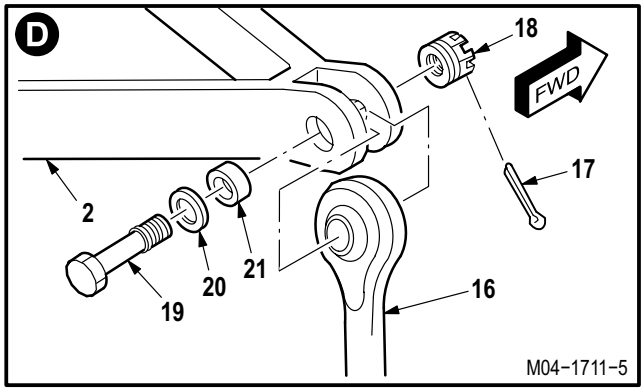
e. **Remove right lateral link (16) from swashplate (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (17).

(3) Remove nut (18).

(4) Remove bolt (19), washer(s) (20) (if installed), and bushing (21).



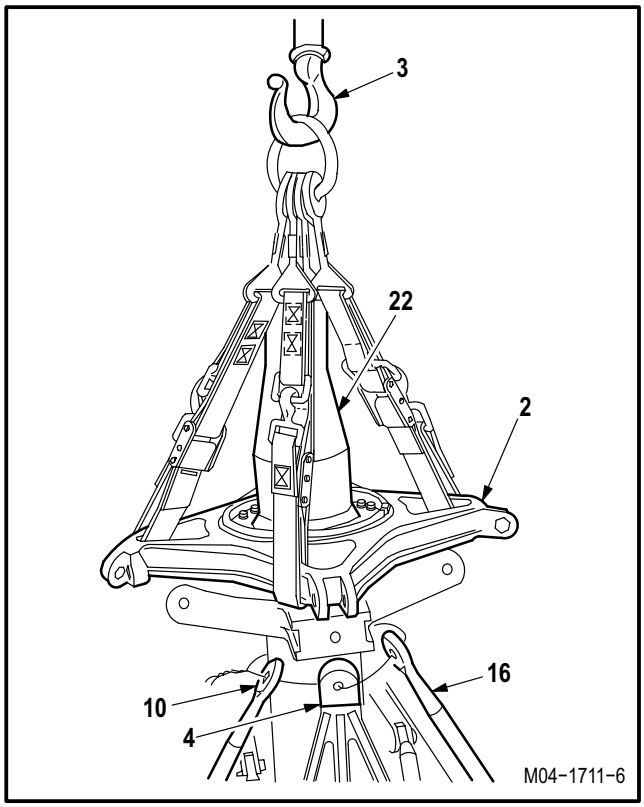
f. **Pad and secure links (4), (10), and (16) with lockwire to main rotor mast (22).** Use cloth (item 54, App F) and wire (item 229, App F).

CAUTION

One person must guide swashplate to prevent damage to mast threads.

g. **Remove swashplate (2) from main rotor mast (22).**

(1) Lift swashplate (2) from mast (22). Use crane hook (3).



11.6.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.6.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check swashplate assembly radial and axial play and freedom of movement** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

END OF TASK

11.7. MAIN ROTOR SWASHPLATE INSTALLATION

11.7.1. Description

This task covers: Installation.

11.7.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Aircraft mounted crane (item 69, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
Rotor universal sling (item 292, App H)
1 1/16 x 1/2-inch drive socket wrench socket (item 305, App H)
1 1/16 & 1 1/4-inch open end wrench (item 416, App H)
0 - 175 foot-pound 1/2-inch drive dial indicator torque wrench (item 444, App H)

Materials/Parts:

Cotter pin (3)
Corrosion preventive compound (item 62A, App F)
Sealing compound (item 176, App F)

Personnel Required:

67R Attack Helicopter Repairer
One person to assist
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

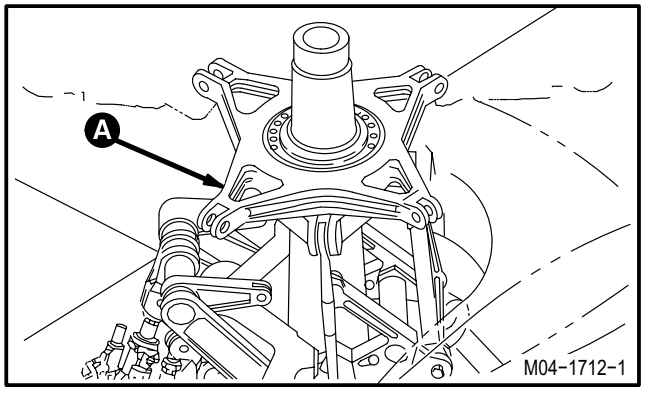
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

WARNING

FLIGHT SAFETY PART

The main rotor swashplate is a flight safety part. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.



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11.7. MAIN ROTOR SWASHPLATE INSTALLATION – continued

11.7.3. Installation

a. **Install sling (1) on swashplate (2).**

(1) Install one strap through each arm of swashplate (2).

(2) Hook and adjust straps to same length.

b. **Install crane hook (3) on sling (1).** Use crane.

CAUTION

- The entire weight of swashplate must be supported by crane until both lateral links and torque link are connected. One person must guide swashplate as it is lowered on mast to prevent damage to mast threads.
- Lateral links and torque link may be damaged if allowed to fall.

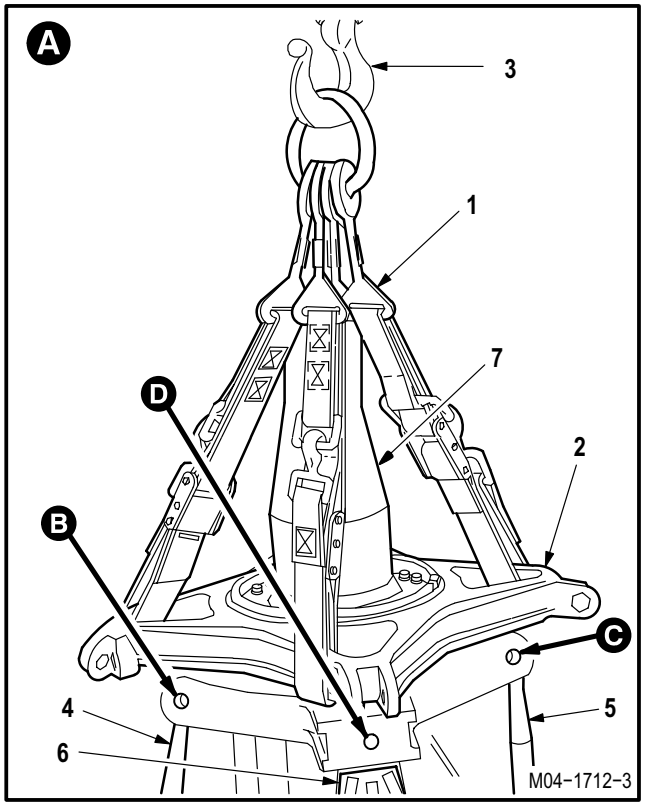
c. **Remove padding and lockwire securing two lateral links (4) and (5) and torque link (6) from main rotor mast (7).**

d. **Install swashplate (2) on mast (7).**

(1) Lift and position swashplate (2) above mast (7).

(2) Guide and aline swashplate (2) in position for links (4), (5), and (6) connection.

(3) Lower swashplate (2) on mast (7).



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11.7. MAIN ROTOR SWASHPLATE INSTALLATION – continued

e. **Install left lateral link (4) on swashplate (2).** Torque nut (8) **75 to 91 FOOT-POUNDS**.

(1) Aline link (4) with swashplate (2).

(2) Install bushing (9) in swashplate (2).

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

NOTE

A maximum of two washers are allowed under bolt head (if required) to ensure bushing clamp-up alines with pin hole.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (10). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (10) through washer(s) (11), bushing (9), swashplate (2), and link (4).

(5) Check fit of self-retaining bolt (10) (para 11.1).

(6) Install nut (8).

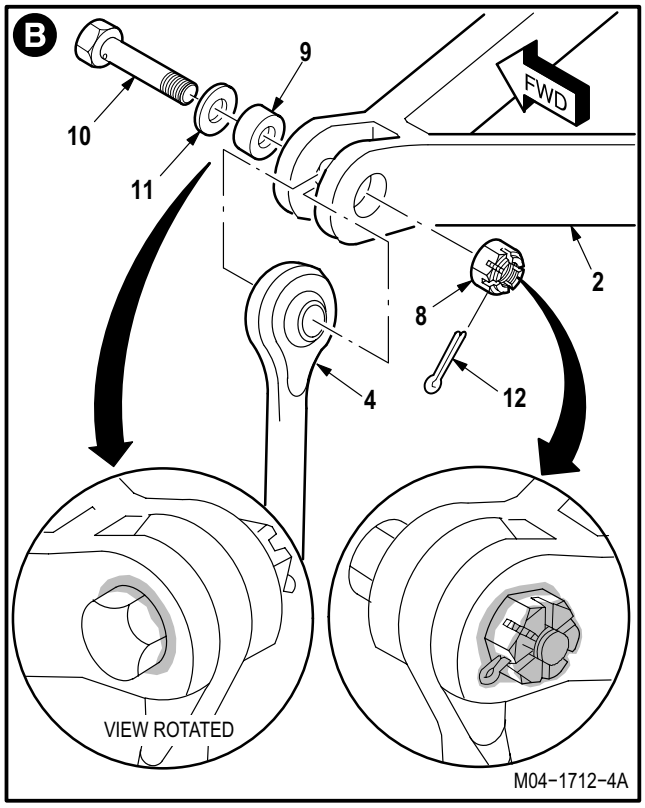
(7) Hold bolt (10). Use open end wrench.

(8) Torque nut (8) to **75 FOOT-POUNDS**. Use torque wrench and socket.

(9) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(10) Install new cotter pin (12).

(11) Apply sealing compound around bolt (10) head, washer (11), and nut (8). Use sealing compound (item 176, App F).



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11.7. MAIN ROTOR SWASHPLATE INSTALLATION – continued

f. **Install right lateral link (5) on swashplate (2).** Torque nut (13) **75 to 91 FOOT-POUNDS**.

(1) Aline link (5) with swashplate (2).

(2) Install bushing (14) in swashplate (2).

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

NOTE

A maximum of two washers are allowed under bolt head (if required) to ensure bushing clamp-up alines with pin hole.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (15). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (15) through washer(s) (16), bushing (14), swashplate (2), and link (5).

(5) Check fit of self-retaining bolt (15) (para 11.1).

(6) Install nut (13).

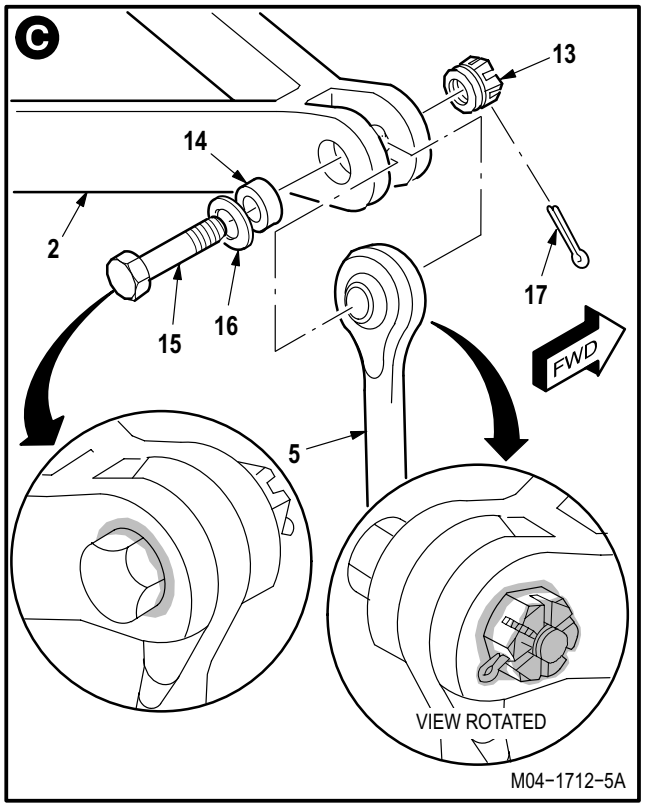
(7) Hold bolt (15). Use open end wrench.

(8) Torque nut (13) to **75 FOOT-POUNDS**. Use torque wrench and socket.

(9) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(10) Install new cotter pin (17).

(11) Apply sealing compound around bolt (15) head, washer (16), and nut (13). Use sealing compound (item 176, App F).



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11.7. MAIN ROTOR SWASHPLATE INSTALLATION – continued

g. **Install torque link (6) on swashplate (2).** Torque bolt (18) **75 to 91 FOOT-POUNDS**.

(1) Aline link (6) and swashplate (2).

(2) Install bushing (19) in swashplate (2).

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

NOTE

A maximum of two washers are allowed under bolt head (if required) to ensure bushing clamp-up alines with pin hole.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (18). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (18) through washer(s) (20), bushing (19), swashplate (2), and link (6).

(5) Check fit of self-retaining bolt (18) (para 11.1).

(6) Install nut (21).

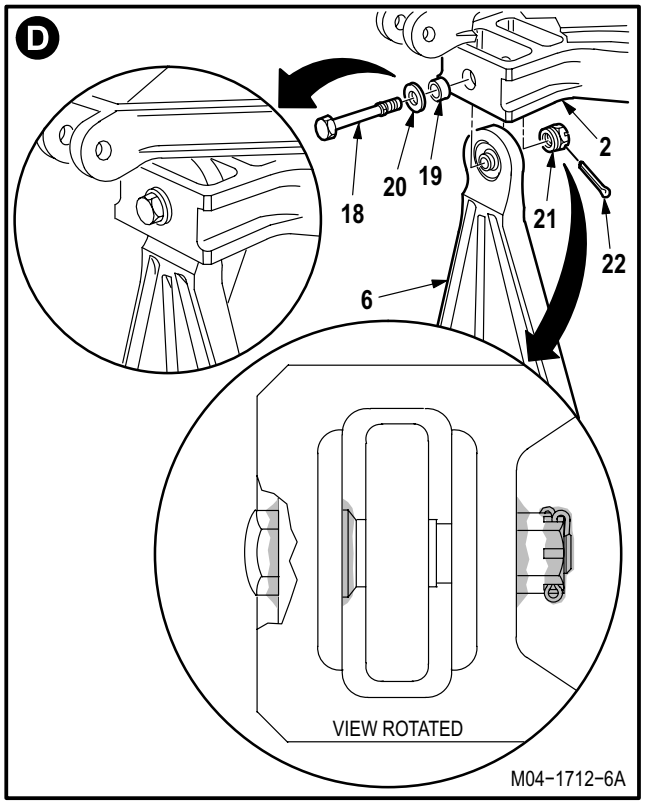
(7) Hold nut (21). Use open end wrench.

(8) Torque bolt (18) to **75 FOOT-POUNDS**. Use torque wrench and socket.

(9) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(10) Install new cotter pin (22).

(11) Apply sealing compound around bolt (18) head, washer (20), and nut (21). Use sealing compound (item 176, App F).



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11.7. MAIN ROTOR SWASHPLATE INSTALLATION – continued

h. **Release tension on sling (1).**

(1) Lower crane hook (3) to slacken sling (1).

i. **Remove crane hook (3) from sling (1).**

j. **Remove sling (1) from swashplate (2).**

k. **Inspect (QA).**

l. **Install main rotor pitch links** (para 11.14)**.**

m. **Install load bearing main rotor scissors** (para 11.16)**.**

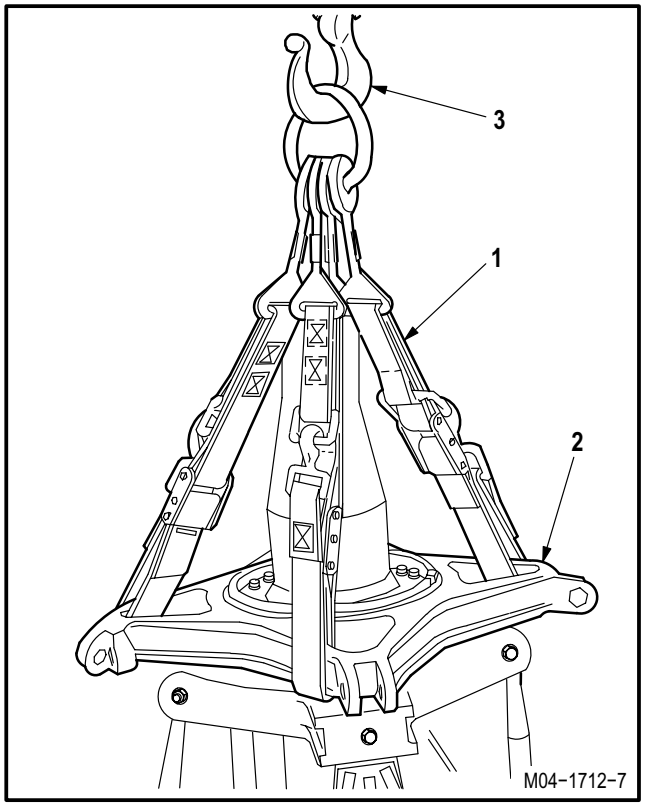
n. **Install secondary main rotor scissors** (para 11.18)**.**

o. **Install main rotor head** (para 5.21)**.**

p. **Install motional transducer** (para 11.182)**.**

q. **Secure doors T250L, T250R, T290L, T290R, and L325** (para 2.2)**.**

r. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.8. MAIN ROTOR SWASHPLATE SHOULDER PIN REPLACEMENT

11.8.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.8.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
0.20 - 1.00-inch inside micrometer caliper (item 50, App H)
Heat protective gloves (item 155, App H)
Electric gun type heater (item 163, App H)
Portable hydraulic press (item 237, App H)
Adjustable air filtering respirator (item 262, App H)
Pyrometer and thermocouple tester (item 351, App H)
0 - 175 foot-pound 1/2-inch drive dial indicator torque wrench (item 444, App H)

Materials/Parts:

Cotter pin
Nut
Pin
Washer
Carbon dioxide (item 40, App F)

Personnel Required:

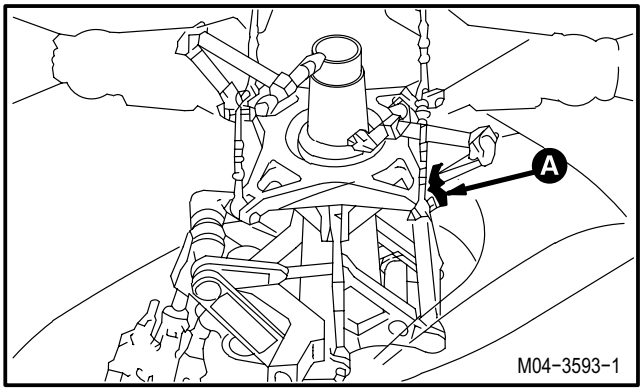
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.16	Load bearing main rotor scissor removed or
11.18	Secondary main rotor scissor removed
11.14	Lower end of pitch link detached

NOTE

This replacement task is typical for both the load bearing scissor shoulder pin and the secondary scissor shoulder pin.



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11.8. MAIN ROTOR SWASHPLATE SHOULDER PIN REPLACEMENT – continued

11.8.3. Removal

WARNING

A heater can cause severe burns. Do not allow heater to contact skin. Wear protective equipment. If injury occurs, seek medical aid.

a. **Remove shoulder pin (1) from swashplate (2).**

(1) Remove and discard cotter pin (3).

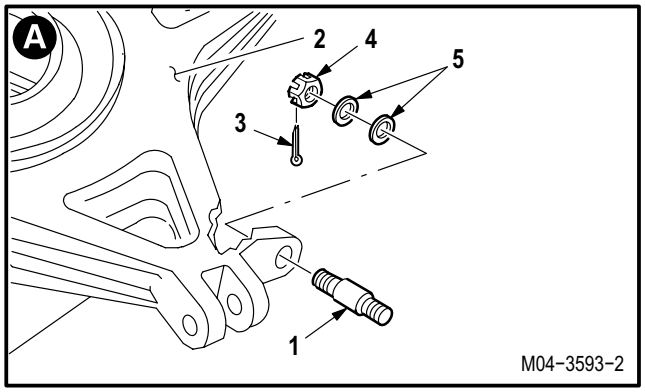
NOTE

The maximum number of washers stacked up behind nut is two.

(2) Remove nut (4) and two washers (5) from pin (1).

(3) Heat area of pin orifice area to 200 °F (93.3 °C). Use heater and pyrometer and thermocouple tester.

(4) Remove pin (1) from swashplate (2). Use hydraulic press.



11.8.4. Cleaning

a. **Clean swashplate shoulder pin mating bore and surrounding area** (para 1.47)**.**

11.8.5. Inspection

a. **Check swashplate shoulder pin mating bore for cracks** (para 11.5)**.**

b. **Check swashplate shoulder pin mating bore for gouges.** Not to exceed **0.005 INCH**.

c. **Check swashplate shoulder pin mating bore for corrosion** (para 1.49)**.**

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11.8. MAIN ROTOR SWASHPLATE SHOULDER PIN REPLACEMENT – continued

d. **Measure diameter of pin mating bore in swashplate.** Diameter shall not exceed **0.8135 INCH**. Use caliper. Replace swashplate if measurement exceeds limits.

11.8.6. Installation

WARNING

- **A heater can cause severe burns. Do not allow heater to contact skin. Wear protective equipment. If injury occurs, seek medical aid.**
- **Handling frozen items presents a serious low temperature burn potential. Temperature resistant gloves are required.**

a. **Install shoulder pin (1) in swashplate (2).** Torque nut (4) **55 to 66 FOOT-POUNDS**.

(1) Freeze shoulder pin (1) in freezer at 0 °F (-18 °C) or below for 3 hours or use carbon dioxide (item 40, App F).

(2) Heat swashplate pin orifice area to 200 °F (93.3 °C). Use heater and pyrometer and thermocouple tester.

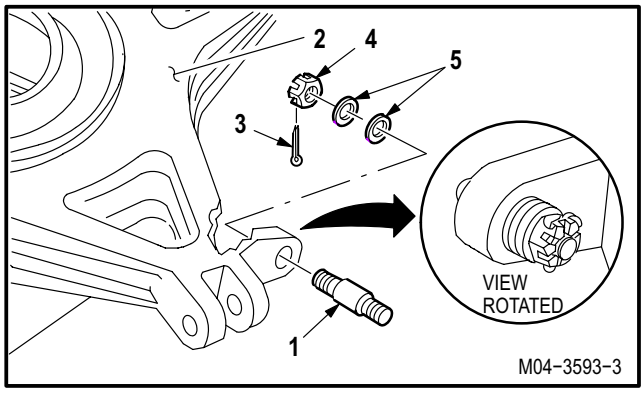
(3) Install shoulder pin (1) in swashplate (2). Use hydraulic press.

(4) Install two washers (5) and nut (4) on shoulder pin (1).

(5) Torque nut (4) to **55 FOOT-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **66 FOOT-POUNDS**.

(7) Install new cotter pin (3).



b. **Inspect (QA).**

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11.8. MAIN ROTOR SWASHPLATE SHOULDER PIN REPLACEMENT – continued

c. **Attach lower end of pitch link** (para 11.14)**.**

d. **Install load bearing or secondary main rotor scissor** (para 11.16 or para 11.18)**.**

END OF TASK

11.9. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION

11.9.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.9.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
1 13/16 x 3/4-inch drive socket wrench socket (item 307, App H)
1 5/8 & 1 13/16-inch open end wrench (item 422, App H)
0 - 600 foot-pound 3/4-inch drive deflecting frame torque wrench (item 443, App H)

References:

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Materials/Parts:

Cotter pin (2)
Corrosion preventive compound (item 62A, App F)
Sealing compound (item 176, App F)

Personnel Required:

67R	Attack Helicopter Repairer One person to assist
67R3F	Attack Helicopter Repairer/Technical Inspector

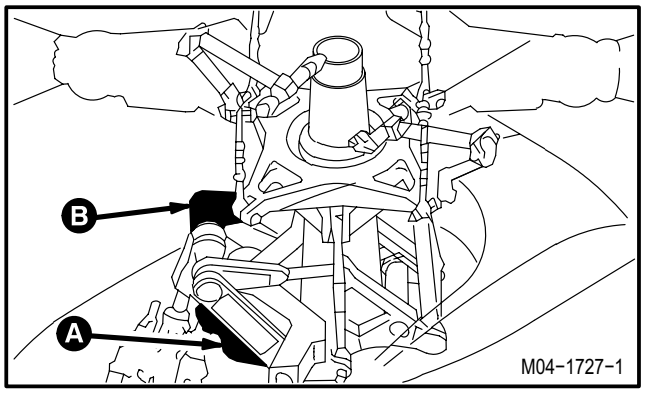
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access fairings T205L and T205R removed; panels L200 and R200 removed
11.10	Lateral bellcrank and lateral links removed
11.13	Longitudinal links removed
11.12	Aft longitudinal bellcrank removed

WARNING

FLIGHT SAFETY PART

The forward longitudinal bellcrank and the collective bellcrank are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.



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11.9. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION – continued

11.9.3. Removal

a. **Remove longitudinal bellcrank (1) and collective bellcrank (2) from left mixer support (3).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (4).

(3) Hold bolt (5). Loosen nut (6). Use open end wrench and socket.

(4) Press retention device (7).

(5) Remove nut (6) and washer (8). Use open end wrench and socket.

NOTE

Do not remove right mixer support bolt until left bolt is to be removed.

b. **Remove bellcranks (1) and (2) from right mixer support (9).**

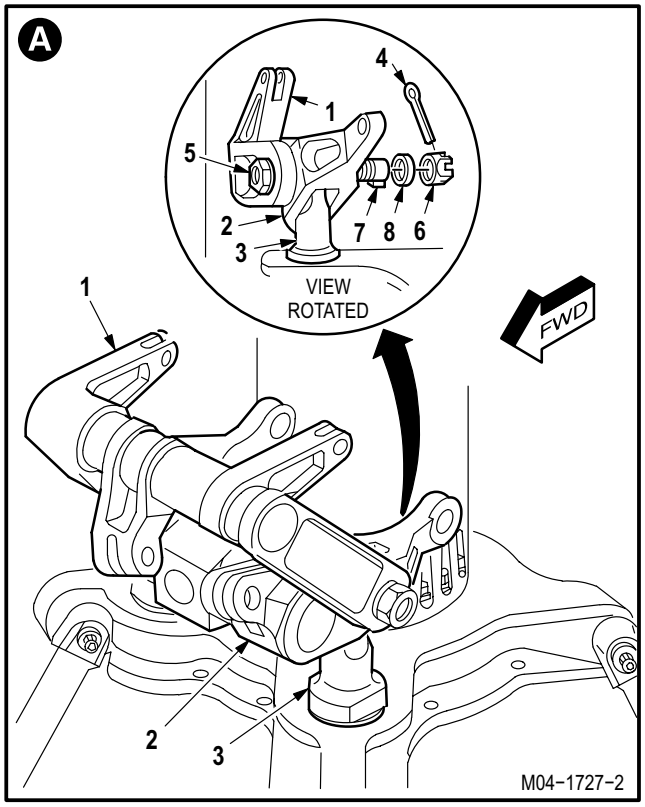
(1) Remove sealant from attaching hardware (para 1.47).

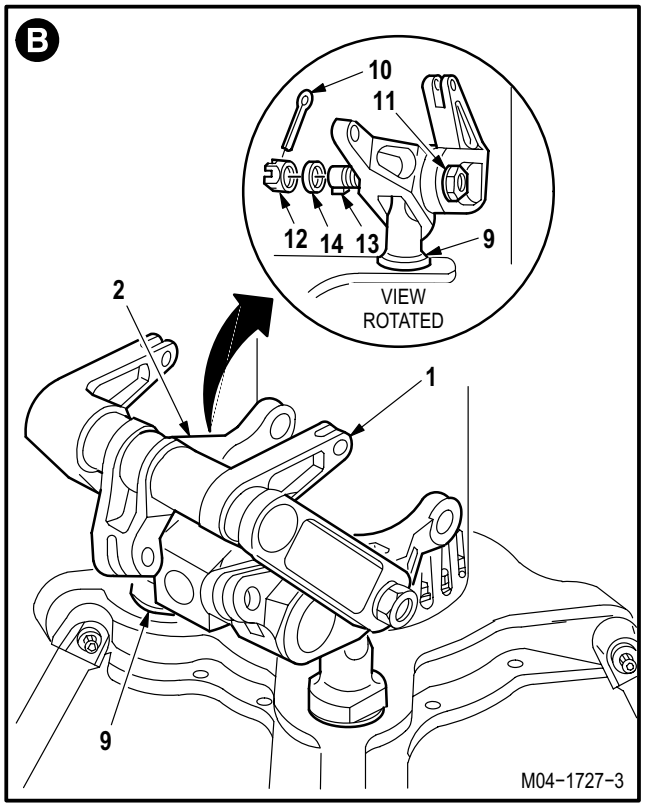
(2) Remove and discard cotter pin (10).

(3) Hold bolt (11). Loosen nut (12). Use open end wrench and socket.

(4) Press retention device (13).

(5) Remove nut (12) and washer (14). Use open end wrench and socket.





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11.9. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION – continued

WARNING

FLIGHT SAFETY PART

- **Heat treated condition of forward longitudinal and collective bellcranks and bolts, is critical to their serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. These parts must be protected from unscheduled heating and external impact during inspection and other handling procedures.**

- **Shot-peened surfaces of forward longitudinal bellcrank are critical. This part shall be replaced or have the peening restored if surface has had peening removed by wear or other cause. It also must be protected from unscheduled heating and external impact during inspection and other handling procedures.**

- **To prevent personal injury or equipment damage, two persons are required for lifting and removing bellcranks. If injury occurs, seek medical aid.**

CAUTION

To prevent damage to bolt, press retention device lock fully when removing bolt.

NOTE

Do not remove bolts until bellcranks are to be removed from helicopter.

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11.9. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION – continued

c. **Remove bellcrank (1) and bellcrank (2).**

(1) Support bellcrank (1).

(2) Support bellcrank (2).

(3) Remove sealant from attaching hardware (para 1.47).

(4) Press retention device (7).

(5) Remove bolt (5) and washer (15).

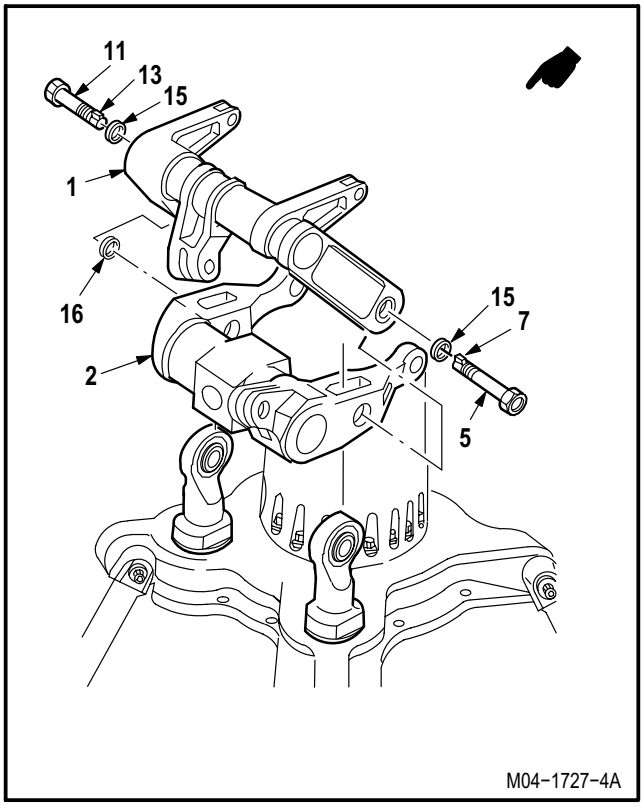
(6) Press retention device (13).

(7) Remove bolt (11), washer (15), and washer (16).

(8) Remove bellcranks (1) and (2).

(9) Remove bushing (17) and bearing (18) from bellcrank (1).

(10) Remove bushing (19) and bearing (20) from bellcrank (2).



11.9.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

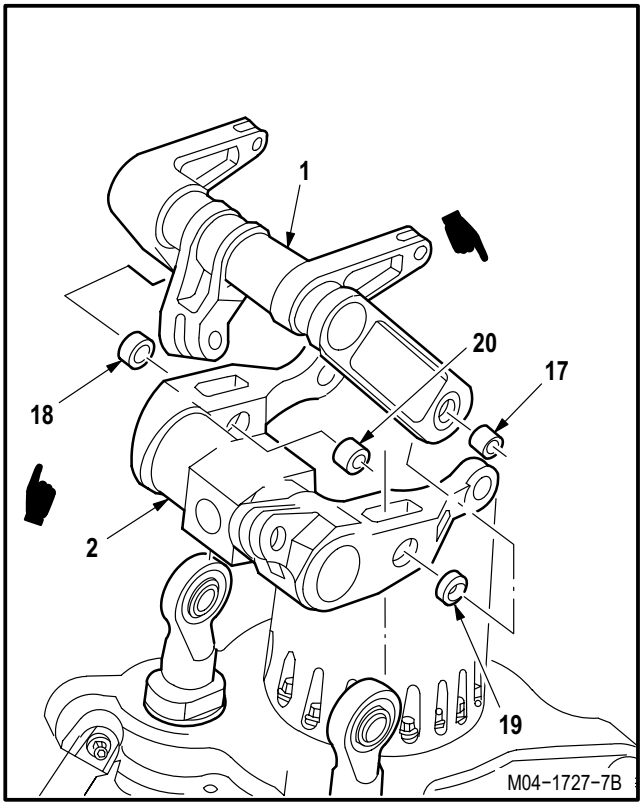
11.9.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**



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11.9. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION – continued

11.9.6. Installation

WARNING

To prevent injury to personal or damage to equipment, two persons are required for lifting and positioning bellcranks. If injury occurs, seek medical aid.

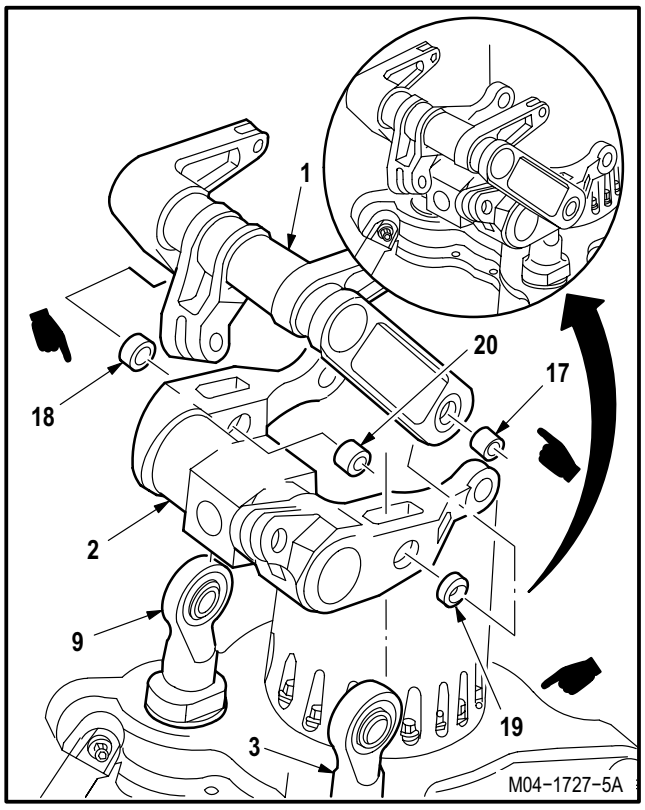
a. **Position bellcrank (2) and bellcrank (1) for installation on mixer supports (3) and (9).**

(1) Install bushing (19) and bearing (20) in bellcrank (2).

(2) Install bushing (17) and bearing (18) in bellcrank (1).

(3) Aline bellcrank (2) with supports (3) and (9).

(4) Aline bellcrank (1) with supports (3) and (9) and bellcrank (2).



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11.9. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION – continued

CAUTION

- To prevent damage to self-retaining bolts, press retention device fully down when installing bolt.
- Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

NOTE

The maximum thickness for washer stackup is **0.064 INCH** for this bellcrank pivot point.

b. **Install bellcranks (1) and (2) on supports (3) and (9).** Torque two nuts (6) and (12) **175 to 200 FOOT-POUNDS**.

(1) Install washer (16) between bellcranks (1) and (2) on right support (9).

(2) Apply a light coat of corrosion preventive compound to shank of bolts (5) and (11). Use corrosion preventive compound (item 62A, App F).

(3) Install bolt (11) through washer (15), bellcrank (1), washer (16), bellcrank (2), and support (9).

(4) Install bolt (5) through washer (15), bellcranks (1) and (2), and left support (3).

(5) Hold two bolts (5) and (11).

(6) Install two washers (8) and (14), and nuts (6) and (12).

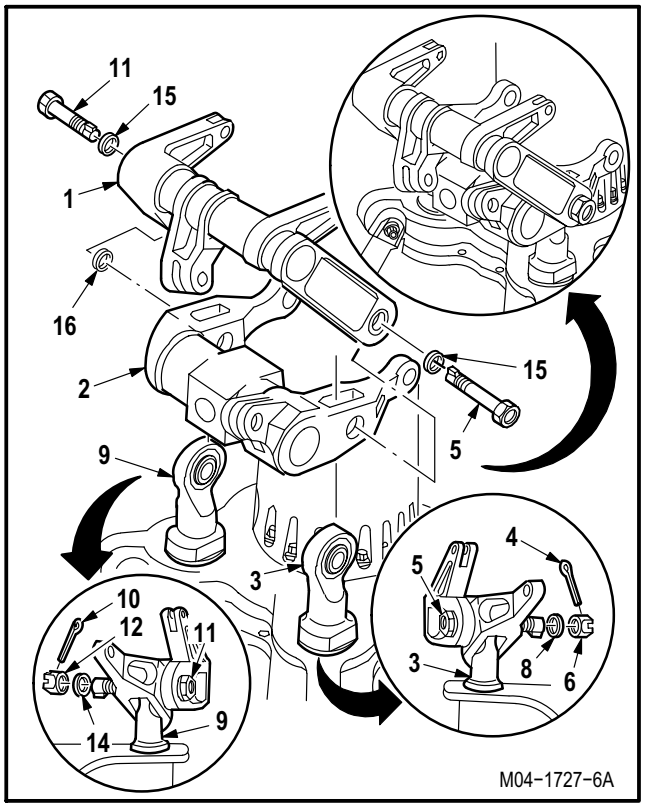
(7) Support bellcrank (2) and bellcrank (1).

(8) Hold bolts (5) and (11). Use open end wrench.

(9) Torque two nuts (6) and (12) to **175 FOOT-POUNDS**. Use torque wrench and socket.

(10) Increase torque to aline cotter pin hole, but do not exceed **200 FOOT-POUNDS**.

(11) Install two new cotter pins (4) and (10).



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11.9. LONGITUDINAL AND COLLECTIVE BELLCRANKS REMOVAL/INSTALLATION – continued

(12) Apply sealing compound around bolt heads (5) and (11), washers (8), (14), and (15), and nuts (6) and (12). Use sealing compound (item 176, App F).

c. **Install aft longitudinal bellcrank** (para 11.12)**.**

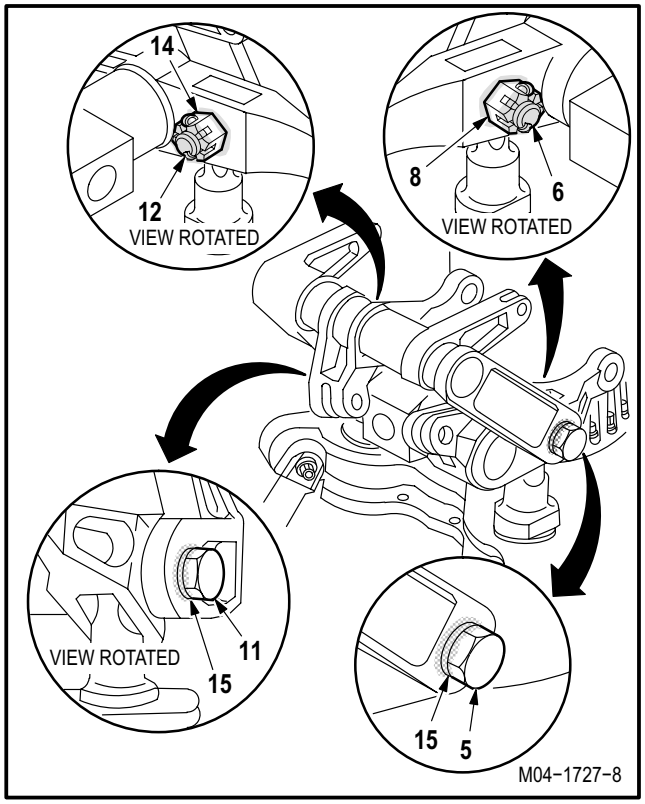
d. **Install longitudinal links** (para 11.13)**.**

e. **Install lateral bellcrank and lateral links** (para 11.11)**.**

f. **Inspect (QA).**

g. **Install fairings T205L and T205R; install panels L200 and R200** (para 2.2)**.**

h. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.10. LATERAL BELLCRANK AND LATERAL LINKS REMOVAL

11.10.1. Description

This task covers: Removal. Cleaning. Inspection.

11.10.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
1 13/16 x 1/2-inch drive open end box socket wrench crowfoot attachment (item 73, App H)
9-inch x 1/2-inch drive hinged socket wrench handle (item 171, App H)
1 1/16 x 1/2-inch drive socket wrench socket (item 305, App H)
Strap assembly (item 345, App H)
1 11/16 & 1 7/8-inch open end wrench (item 415, App H)
1 1/16 & 1 1/4-inch open end wrench (item 416, App H)

Personnel Required:

67R Attack Helicopter Repairer
One person to assist

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access panels L200 and R200 removed
11.13	Longitudinal links removed

WARNING

FLIGHT SAFETY PART

The lateral bellcrank and lateral links are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.

NOTE

This task is typical for either lateral link.

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11.10. LATERAL BELLCRANK AND LATERAL LINKS REMOVAL – continued

11.10.3. Removal

a. **Install two cargo straps (1) around swashplate (2) and main rotor hub (3).** Use strap assembly.

b. **Tighten cargo straps (1) evenly until weight of swashplate (2) is supported by hub (3).**

c. **Remove lateral link (4) from swashplate (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (5).

(3) Hold bolt (6). Remove nut (7). Use open end wrench and socket.

(4) Remove bolt (6), washer(s) (8) (if installed), and bushing (9).

CAUTION

To prevent damage to rigid hydraulic tubes, ensure upper end of servocylinder is supported when rod end is disconnected from the longitudinal link.

d. **Remove lateral servocylinder (10) from lateral bellcrank (11).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (12).

(3) Hold bolt (13). Remove nut (14). Use open end wrench and socket.

NOTE

Do not remove nylon washer unless it is loose or excessively worn.

(4) Remove bolt (13), washer(s) (15) (if required), nylon washer (16) (if necessary), and bushing (17).

(5) Remove servocylinder (10).

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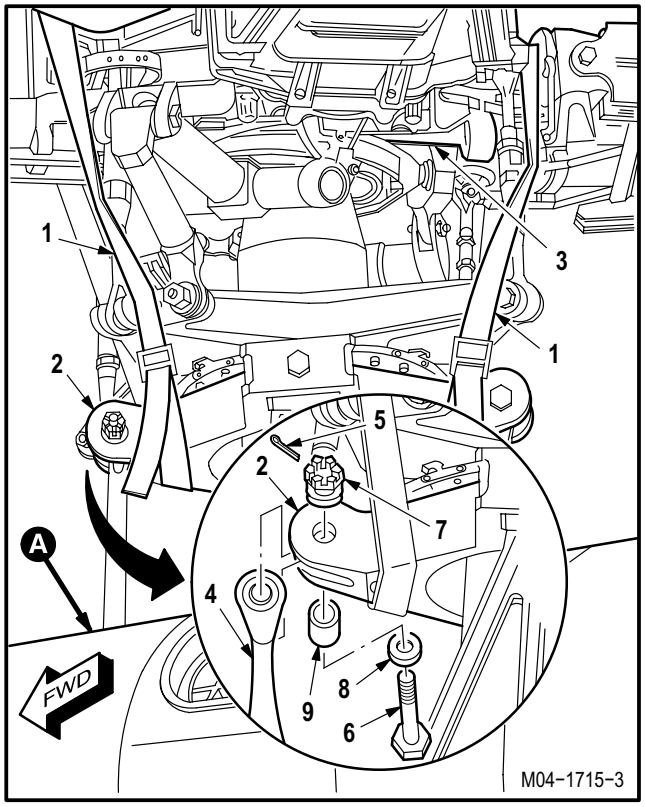
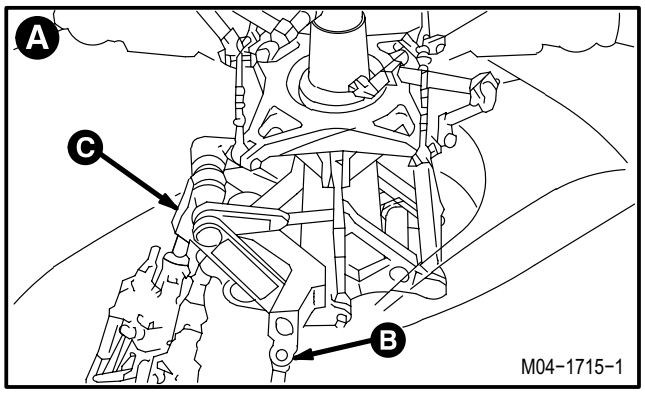
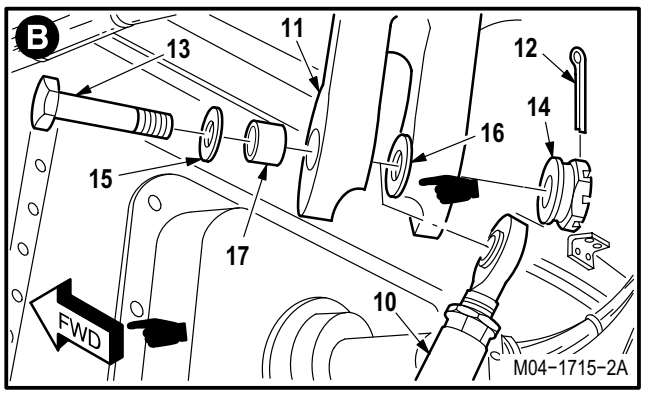






11.10. LATERAL BELLCRANK AND LATERAL LINKS REMOVAL – continued

WARNING

Support longitudinal bellcrank before disconnecting servocylinder to prevent longitudinal bellcrank movement and possible injury. If injury occurs, seek medical aid.

e. **Remove longitudinal servocylinder (18) from longitudinal bellcrank (19).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (20).

(3) Hold bolt (21). Remove nut (22). Use open end wrench and socket.

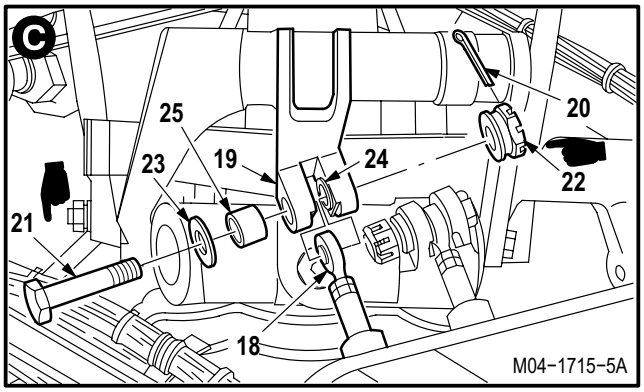
NOTE

Do not remove nylon washer unless it is loose or excessively worn.

(4) Support bellcrank (19).

(5) Remove bolt (21), washer(s) (23) (if required), nylon washer (24) (if necessary), and bushing (25) (if required).

(6) Remove servocylinder (18).



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11.10. LATERAL BELLCRANK AND LATERAL LINKS REMOVAL – continued

WARNING

FLIGHT SAFETY PART

Heat treated condition of lateral bellcrank and bolt is critical to their serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. These parts must be protected from unscheduled heating and external impact during inspection and other handling procedures.

CAUTION

To prevent damage to bushings, press retention device lock fully when removing bolt.

f. **Remove bellcrank (11) from collective bellcrank (26).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (27).

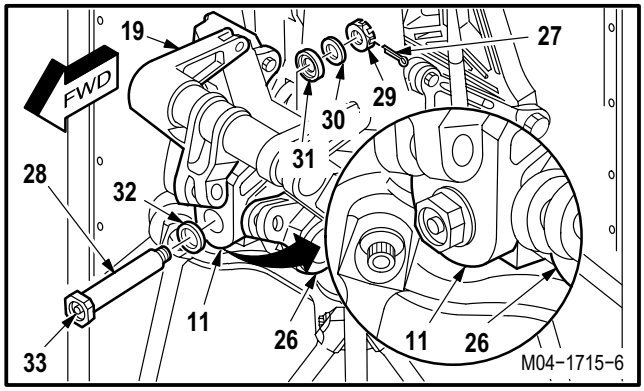
(3) Raise bellcrank (19).

(4) Hold bolt (28). Use open end wrench.

(5) Remove nut (29), washer (30), and nylon washer (31). Use hinged handle and crowfoot.

(6) Remove bolt (28) and nylon washer (32) by pressing button (33).

(7) Lower bellcrank (19) as far as it will go.



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11.10. LATERAL BELLCRANK AND LATERAL LINKS REMOVAL – continued

WARNING

FLIGHT SAFETY PART

- **Heat treated condition of lateral bellcrank and lateral links is critical to their serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. These parts must be protected from unscheduled heating and external impact during inspection and other handling procedures.**
- **To prevent injury to personnel or damage to equipment, two persons are required for lifting and removing the lateral bellcrank. If injury occurs, seek medical aid.**

g. **Remove bellcrank (11).**

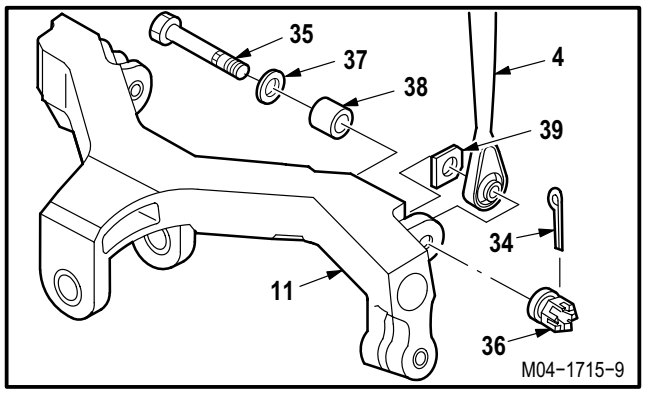
h. **Remove link (4) from bellcrank (11).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (34).

(3) Hold bolt (35). Remove nut (36). Use open end wrench and socket.

(4) Remove bolt (35), washers (37) (if installed), bushing (38), and limiter (39).



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11.10. LATERAL BELLCRANK AND LATERAL LINKS REMOVAL – continued

11.10.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.10.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

END OF TASK

11.11. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION

11.11.1. Description

This task covers: Installation.

11.11.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
3/8 x 1/2-inch drive socket wrench adapter (item 6, App H)
Light duty laboratory apron (item 27, App H)
1 13/16 x 1/2-inch drive open end box socket wrench crowfoot attachment (item 73, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
1 1/16 x 1/2-inch drive socket wrench socket (item 305, App H)
1 11/16 & 1 7/8-inch open end wrench (item 415, App H)
1 1/16 & 1 1/4-inch open end wrench (item 416, App H)
150 - 750 inch-pound 3/8-inch drive click type torque wrench (item 442, App H)
0 - 175 foot-pound 1/2-inch drive dial indicator torque wrench (item 444, App H)

Materials/Parts:

Bolt MS27576-10-46 (for alinement)
Cotter pin (7)
Adhesive (item 3, App F)
Cloth (item 47, App F)
Cloth (item 51, App F)
Corrosion preventive compound (item 62A, App F)
Methyl ethyl ketone (item 124, App F)
Sealing compound (item 176, App F)

Personnel Required:

67R Attack Helicopter Repairer
One person to assist
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

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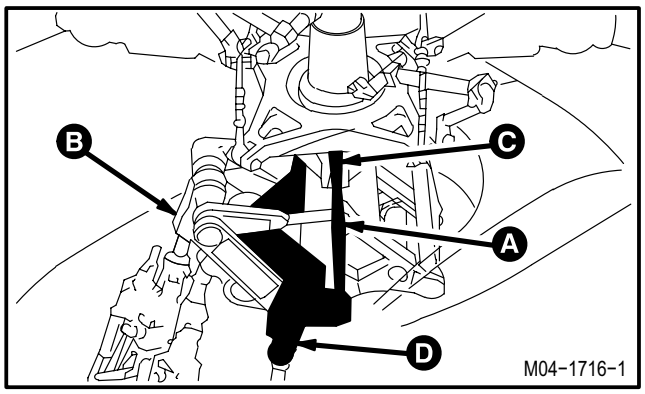
11.11. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

WARNING

FLIGHT SAFETY PART

- **The lateral bellcrank and lateral links are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.**
- **Heat treated condition of lateral bellcrank and links is critical to their serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. These parts must be protected from unscheduled heating and external impact during inspection and other handling procedures.**



NOTE

This task is typical for either lateral link.

GO TO NEXT PAGE

11.11. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

11.11.3. Installation

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

NOTE

End of link with minimum dimension A shall be connected to swashplate. If both ends have same dimension either end may be connected to swashplate.

a. **Install lateral link (1) on lateral bellcrank (2).** Torque nut (3) **75 to 91 FOOT-POUNDS**.

(1) Aline link (1) with bellcrank (2).

(2) Install bushing (4) and limiter (5) in bellcrank (2).

(3) Apply a light coat of corrosion preventive compound to shank of bolt (6). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (6) through washer(s) (7) (if required), bushing (4), limiter (5), link (1), and bellcrank (2).

(5) Check fit of self-retaining bolt (6) (para 11.1).

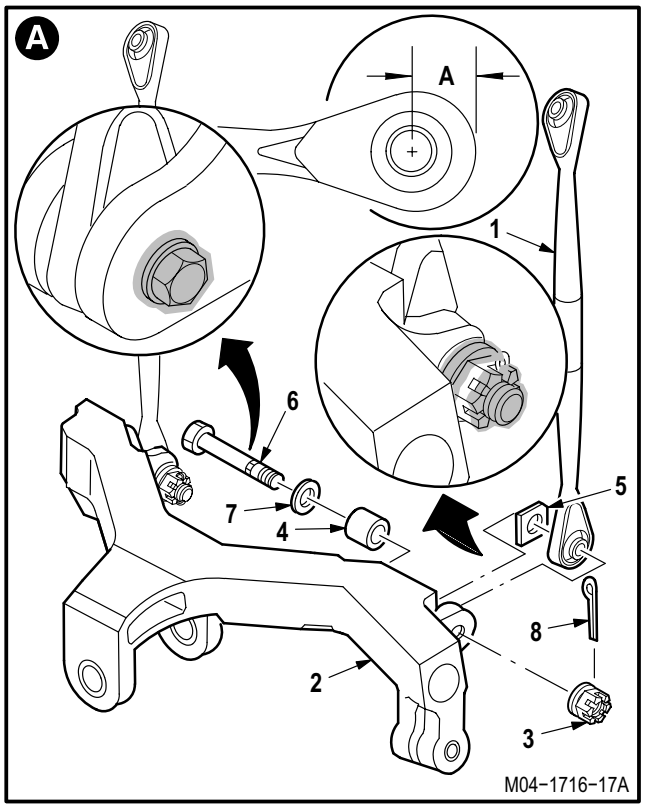
(6) Hold bolt (6). Install nut (3). Use open end wrench.

(7) Torque nut (3) to **75 FOOT-POUNDS**. Use socket and torque wrench.

(8) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(9) Install new cotter pin (8).

(10) Apply sealing compound around bolt (6) head, washer (7), and nut (3). Use sealing compound (item 176, App F).



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11.11. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

WARNING

FLIGHT SAFETY PART

- **Heat treated condition of bolt is critical to its serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. This part must be protected from unscheduled heating and external impact during inspection and other handling procedures.**
- **To prevent injury to personnel or damage to equipment, two persons are required for lifting and positioning the lateral bellcrank. If injury occurs, seek medical aid.**

CAUTION

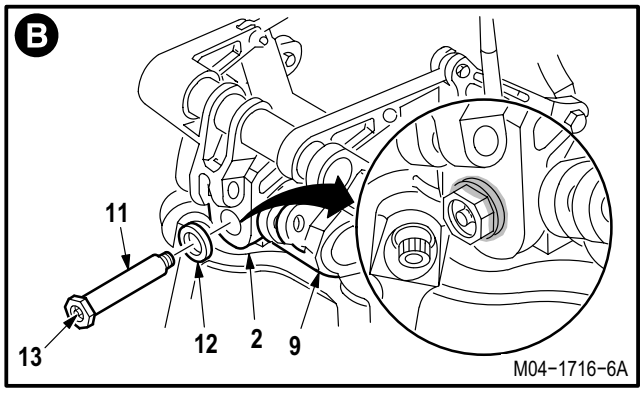
Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

b. **Install bellcrank (2) on collective bellcrank (9).** Torque nut (10) **300 to 400 INCH-POUNDS**.

(1) Aline bellcrank (2) with bellcrank (9).

(2) Apply a light coat of corrosion preventive compound to shank of bolt (11). Use corrosion preventive compound (item 62A, App F).

(3) Install bolt (11) through nylon washer (12) and bellcranks (2) and (9) while pressing button (13).



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11.11. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

(4) Hold bolt (11). Use open end wrench.

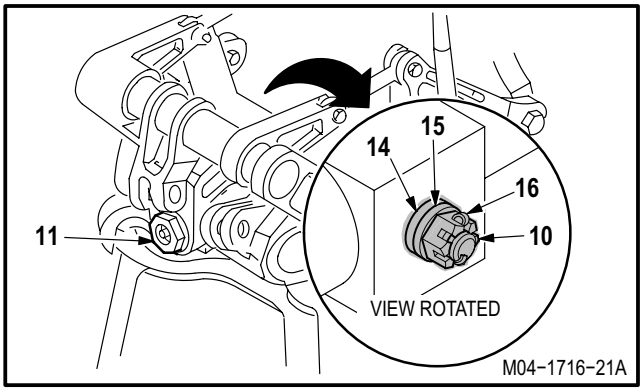
(5) Install nylon washer (14), washer (15), and nut (10).

(6) Torque nut (10) to **300 INCH-POUNDS**. Use crowfoot, torque wrench, and adapter.

(7) Increase torque to aline cotter pin hole, but do not exceed **400 INCH-POUNDS**.

(8) Install new cotter pin (16).

(9) Apply sealing compound around bolt (11) head, washer (15), and nut (10). Use sealing compound (item 176, App F).



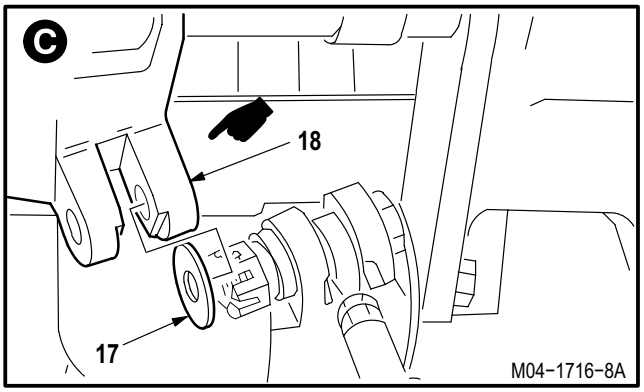
c. **Install nylon washer (17) on bellcrank (18), if removed.**

(1) Lightly abrade mating surfaces until old adhesive and surface of bellcrank (18) are free of contaminants (glossy). Use cloth (item 47, App F).

(2) Wipe bellcrank (18) free of contaminants. Use methyl ethyl ketone (item 124, App F) and cloth (item 51, App F).

(3) Wipe bellcrank (18) dry. Use cloth (item 51, App F).

(4) Allow bellcrank (18) to air dry **30 to 120 MINUTES**.



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11.11. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

NOTE

Adhesive must be applied within **2 HOURS** after solvent cleaning. If adhesive is not applied within **2 HOURS** after solvent cleaning, perform steps c.(2) thru c.(4).

(5) Mix adhesive per manufacturers specifications. Use adhesive (item 3, App F).

(6) Apply a thin even coat of adhesive (item 3, App F) to mating surfaces.

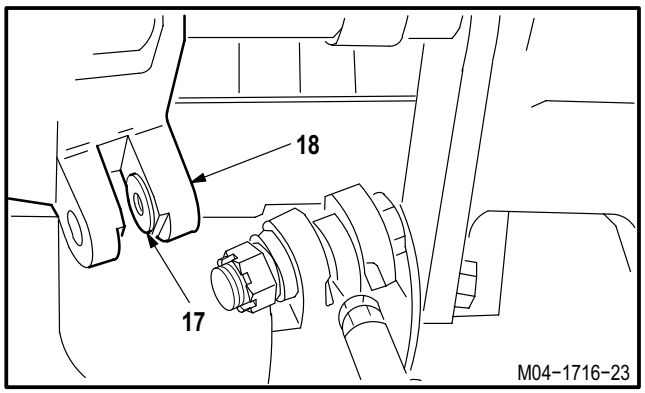
(7) Place washer (17) in position on bellcrank (18).

(a) Ensure hole alinement.

(8) Maintain contact pressure on washer (17) throughout cure time.

(9) Wipe excess adhesive squeezed out from assembly. Use cloth (item 51, App F).

(10) Allow adhesive to cure **24 HOURS** at ambient temperature or force cure **1 HOUR** at 200 °F (93 °C).

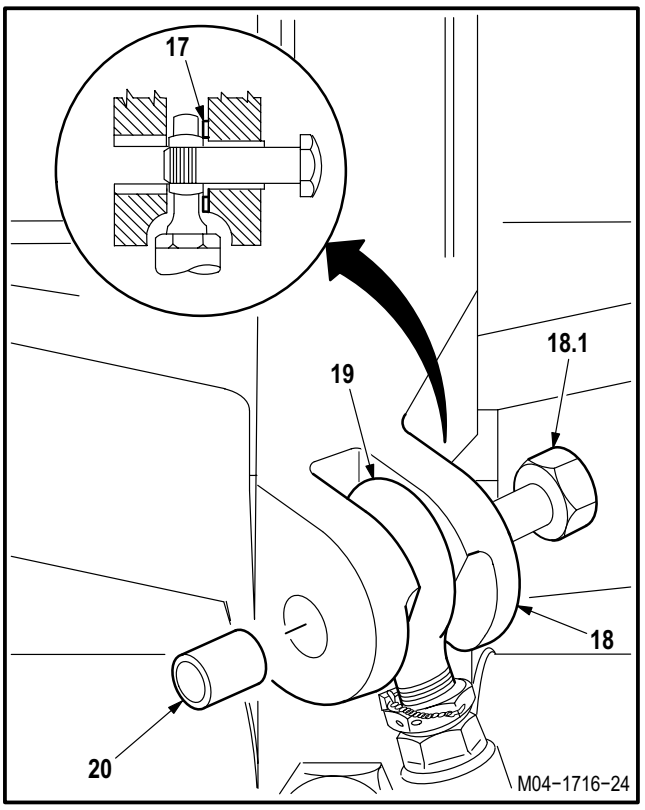


d. **Install longitudinal servocylinder (19) on bellcrank (18).**

(1) Aline servocylinder (19) with bellcrank (18).

(2) Insert alinement bolt (18.1) halfway through nylon washer (17), bellcrank (18), and servocylinder (19) from inboard side of bellcrank.

(3) Insert bushing (20) through bellcrank (18) until it seats against servocylinder (19).



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11.11. LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

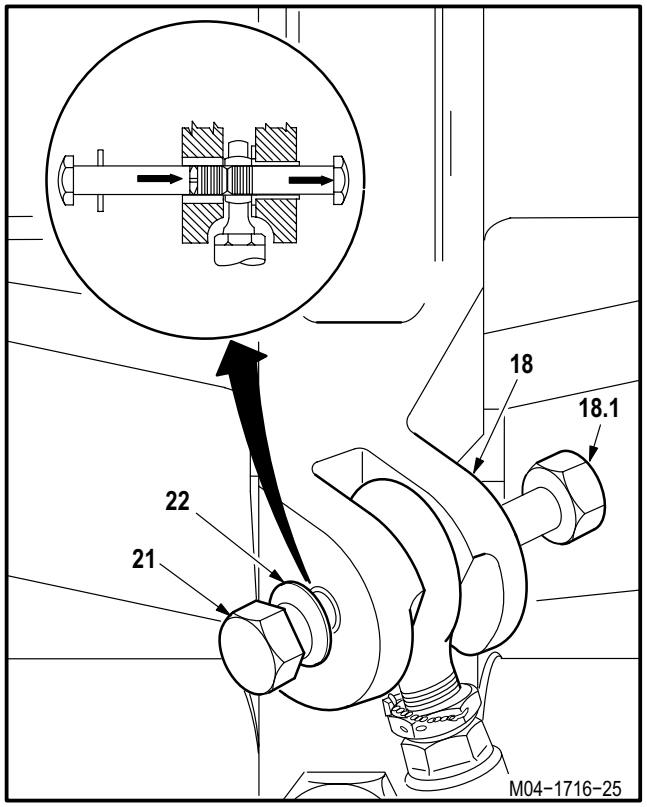
CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(4) Apply a light coat of corrosion preventive compound to shank of bolt (21). Use corrosion preventive compound (item 62A, App F).

(5) Install bolt (21) through washer(s) (22), (if required) and force alinement bolt (18.1) out of bellcrank (18).

(6) Check fit of self-retaining bolt (21) (para 11.1).



e. **Install nut (23) on bolt (21).** Torque nut (23) **75 to 91 FOOT-POUNDS**.

(1) Hold bolt (21). Use box wrench.

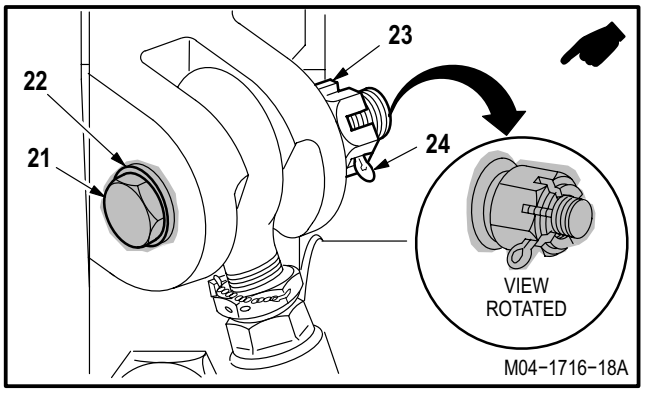
(2) Install nut (23).

(3) Torque nut (23) to **75 FOOT-POUNDS**. Use socket and torque wrench.

(4) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(5) Install new cotter pin (24).

(6) Apply sealing compound around bolt (21) head, washer (22), and nut (23). Use sealing compound (item 176, App F).



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11.11 LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

NOTE

End of link with minimum dimension A shall be connected to swashplate. If both ends have same dimension A either end may be connected to swashplate.

f. **Install link (1) on swashplate (25).** Torque nut (26) **75 to 91 FOOT-POUNDS**.

(1) Aline link (1) with swashplate (25).

(2) Install bushing (27) in swashplate (25).

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (28). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (28) through washer(s) (29) (if required), bushing (27), swashplate (25), and link (1).

(5) Check fit of self-retaining bolt (28) (para 11.1).

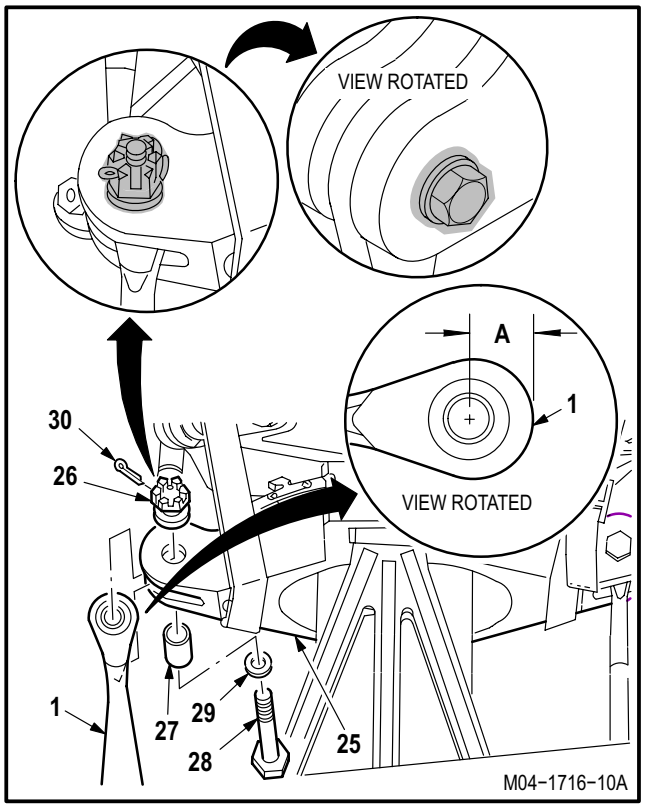
(6) Hold bolt (28). Install nut (26). Use open end wrench.

(7) Torque nut (26) to **75 FOOT-POUNDS**. Use socket and torque wrench.

(8) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(9) Install new cotter pin (30).

(10) Apply sealing compound around bolt (28) head, washer (29), and nut (26). Use sealing compound (item 176, App F).



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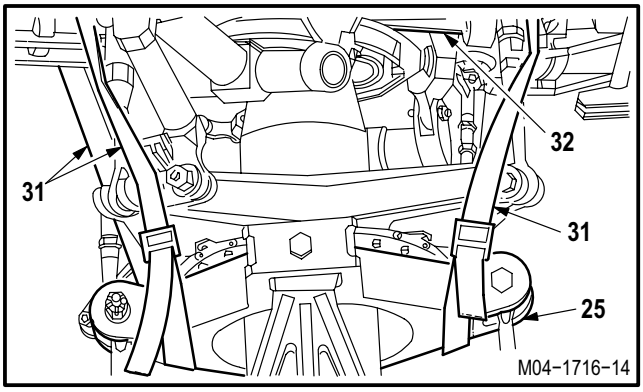
11.11 LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

g. **Remove two cargo straps (31) from main rotor hub (32) and swashplate (25).**



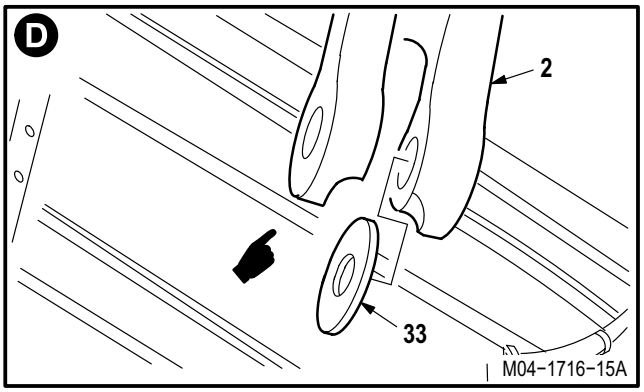
h. **Install nylon washer (33) on bellcrank (2), if removed.**

(1) Lightly abrade mating surfaces until old adhesive and surface of bellcrank (2) are free of contaminants (glossy). Use cloth (item 47, App F).

(2) Wipe bellcrank (2) free of contaminants. Use methyl ethyl ketone (item 124, App F) and cloth (item 51, App F).

(3) Wipe bellcrank (2) dry. Use cloth (item 51, App F).

(4) Allow bellcrank (2) to air dry **30 to 120 MINUTES**.



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11.11 LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

NOTE

Adhesive must be applied within **2 HOURS** after solvent cleaning. If adhesive is not applied within **2 HOURS** after solvent cleaning, perform steps h.(2) thru h.(4).

(5) Mix adhesive, 1 part B to 2 parts A (by weight). Use adhesive (item 3, App F).

(6) Apply a thin even coat of adhesive (item 3, App F) to mating surfaces.

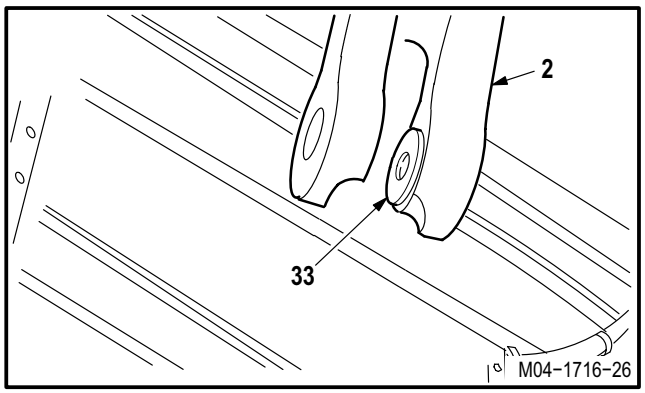
(7) Place washer (33) in position on bellcrank (2).

(a) Ensure hole alinement.

(8) Maintain contact pressure on washer (33) throughout cure time.

(9) Wipe excess adhesive squeezed out from assembly. Use cloth (item 51, App F).

(10) Allow adhesive to cure **24 HOURS** at ambient temperature or force cure **1 HOUR** at 200 °F (93 °C).

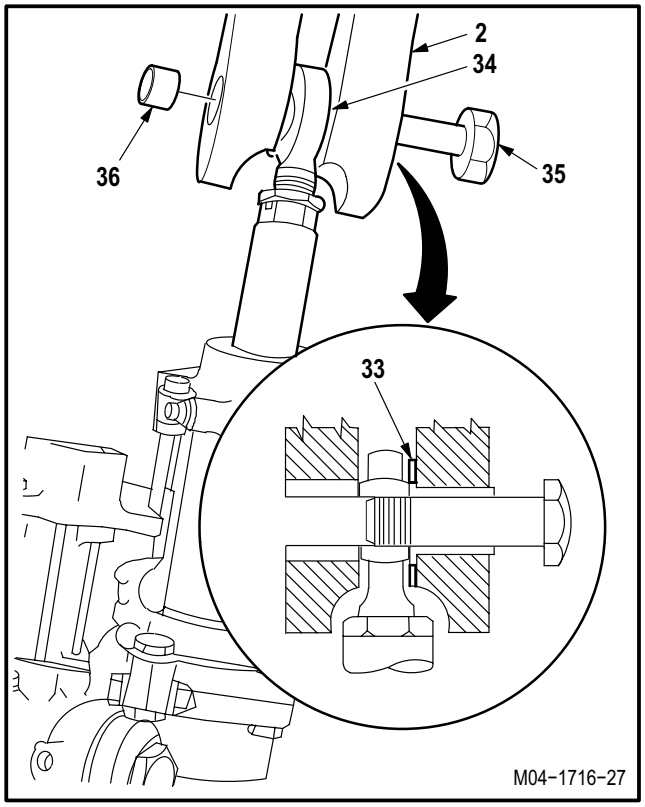


i. **Install lateral servocylinder (34) on bellcrank (2).**

(1) Aline servocylinder (34) with bellcrank (2).

(2) Insert alinement bolt (35) halfway through bellcrank (2), nylon washer (33), and servocylinder (34) from inboard side of bellcrank.

(3) Insert bushing (36) through bellcrank (2) until it seats against servocylinder (34).



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11.11 LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

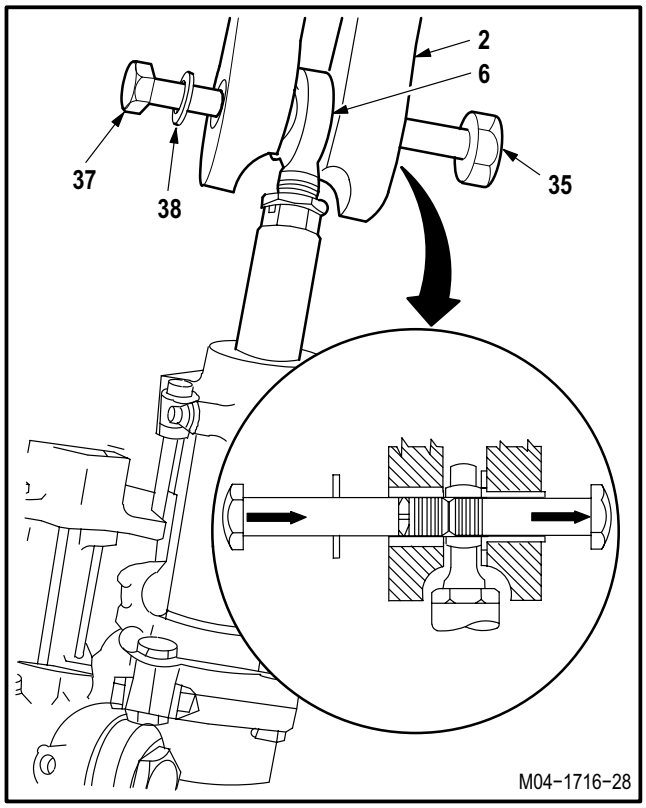
CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(4) Apply a light coat of corrosion preventive compound to shank of bolt (37). Use corrosion preventive compound (item 62A, App F).

(5) Install bolt (37) through washer(s) (38) (if required) and force alinement bolt (35) out of bellcrank (2).

(6) Check fit of self-retaining bolt (37) (para 11.1).



j. **Install nut (39) on bolt (37).** Torque nut (39) **75 to 91 FOOT-POUNDS**.

(1) Hold bolt (37). Use open end wrench.

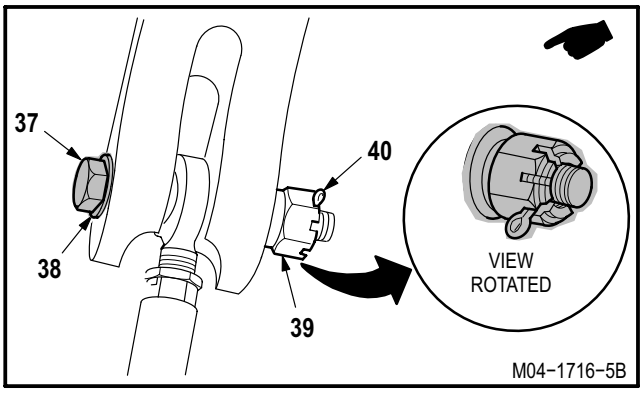
(2) Install nut (39).

(3) Torque nut (39) to **75 FOOT-POUNDS**. Use socket and torque wrench.

(4) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(5) Install new cotter pin (40).

(6) Apply sealing compound around bolt (37) head, washer(s) (38), and nut (39). Use sealing compound (item 176, App F).



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11.11 LATERAL BELLCRANK AND LATERAL LINKS INSTALLATION – continued

k. **Install two longitudinal links** (para 11.13)**.**

l. **Inspect (QA).**

m. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

n. **Install access panels L200 and R200** (para 2.2)**.**

END OF TASK

11.12. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION

11.12.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.12.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
3/8 x 1/2-inch drive socket wrench adapter (item 6, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
1 1/16 x 1/2-inch drive socket wrench socket (item 305, App H)
1 7/16 x 1/2-inch drive socket wrench socket (item 315, App H)
1 1/16 & 1 1/4-inch open end wrench (item 416, App H)
1 3/8 & 1 7/16-inch open end wrench (item 421, App H)
150 - 750 inch-pound 3/8-inch drive click type torque wrench (item 442, App H)
0 - 175 foot-pound 1/2-inch drive dial indicator torque wrench (item 444, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Materials/Parts:

Bolt MS27576-10-46 (for alinement)
Cotter pin (3)
Adhesive (item 3, App F)
Cloth (item 47, App F)
Cloth (item 51, App F)
Corrosion preventive compound (item 62A, App F)
Methyl ethyl ketone (item 124, App F)
Sealing compound (item 176, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access panels L200 and R200 removed; fairings T205L and T205R removed
11.10	Lateral bellcrank and lateral links removed
11.19	Torque link removed

WARNING

FLIGHT SAFETY PART

The aft longitudinal bellcrank and/or components of the bellcrank are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.

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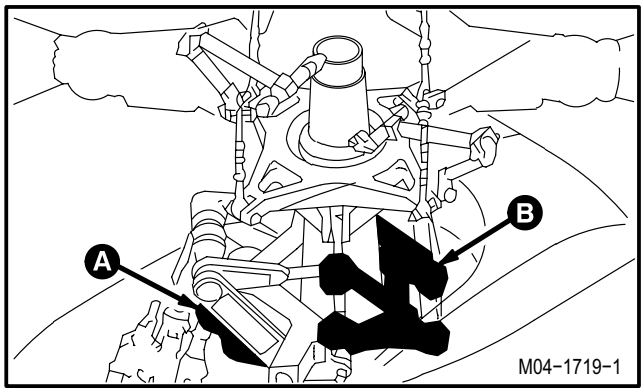
11.12. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION – continued

11.12.3. Removal

WARNING

To prevent bellcrank movement and possible injury, support bellcrank before disconnecting servocylinder. If injury occurs, seek medical aid.



CAUTION

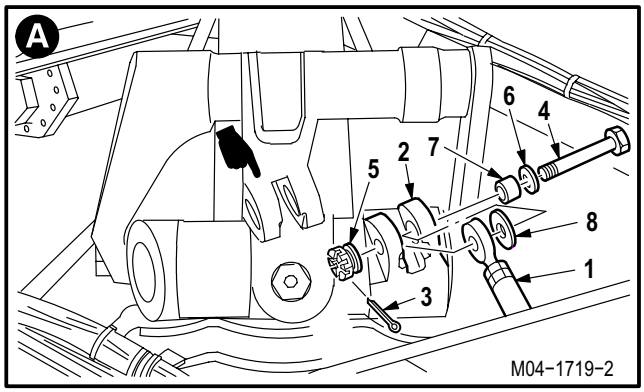
To prevent damage to rigid hydraulic tubes, ensure upper end of servocylinder is supported when rod end is disconnected from bellcrank.

a. **Remove servocylinder (1) from bellcrank (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (3).

(3) Hold bolt (4). Remove nut (5). Use open end wrench and socket.



NOTE

Do not remove nylon washer unless it is loose or excessively worn.

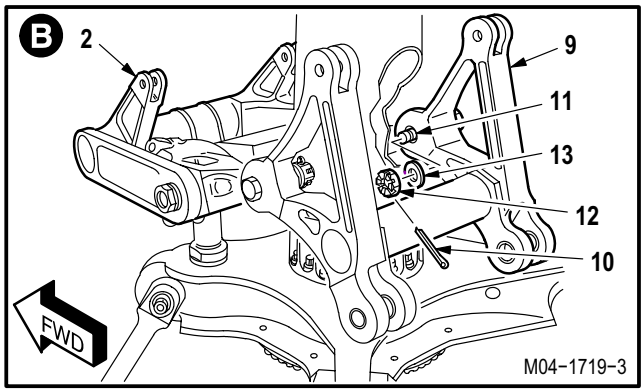
(4) Remove bolt (4), washer(s) (6), bushing (7), and nylon washer (8) (if necessary).

b. **Remove right side of bellcrank (9) from bellcrank (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (10).

(3) Hold bolt (11). Remove nut (12) and washer (13). Use socket and open end wrench.



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11.12. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION – continued

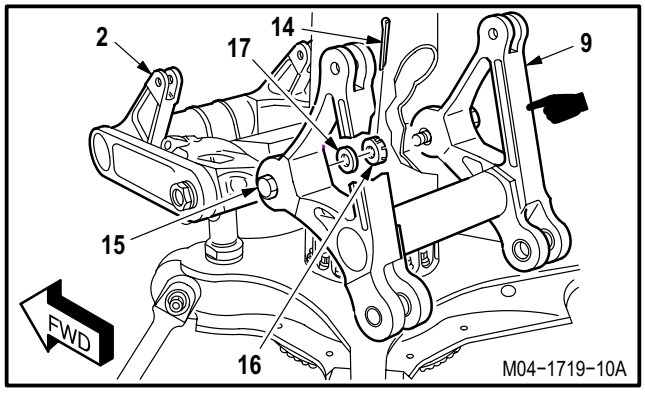
c. **Remove left side of bellcrank (9) from bellcrank (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (14).

(3) Hold bolt (15). Use socket.

(4) Remove nut (16) and washer (17). Use open end wrench.



WARNING

FLIGHT SAFETY PART

Heat-treated condition of aft longitudinal bellcrank and bolts is critical to their service ability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. These parts must be protected from unscheduled heating and external impact during inspection and other handling procedures.

NOTE

Do not remove bolt until bellcrank is to be removed.

d. **Remove bellcrank (9) from bellcrank (2).**

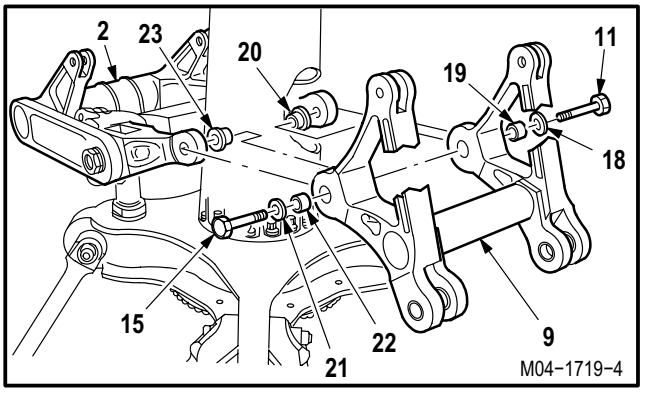
(1) Remove sealant from attaching hardware (para 1.47).

(2) Position and support bellcrank (2) to allow removal of bolt (11).

(3) Remove bolt (11), washer (18) (if installed), bushing (19), and spacer (20).

(4) Position and support bellcrank (2) to allow removal of bolt (15).

(5) Remove bolt (15), washer (21) (if installed), bushing (22), and spacer (23).



11.12.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

GO TO NEXT PAGE

11.12. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION – continued

11.12.5. Inspection

a. **Check removed and attaching parts for damage and wear** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.12.6. Installation

a. **Install bellcrank (9) on bellcrank (2).**

(1) Install spacer (23) and bushing (22) in bellcrank (2).

(2) Aline bellcrank (9) with bellcrank (2).

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

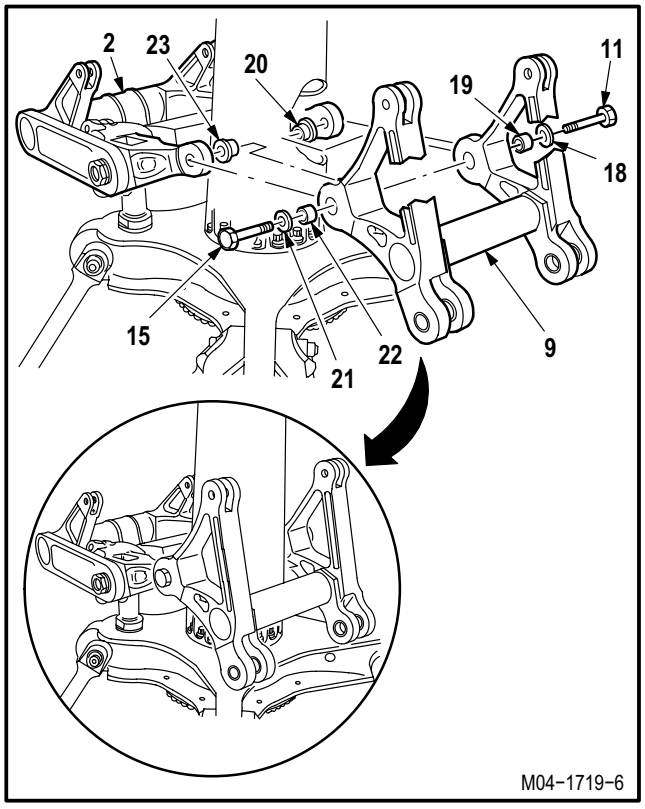
(3) Apply a light coat of corrosion preventive compound to shank of bolts (15) and (11). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (15) through washer (21) (if required), bushing (22), spacer (23), bellcrank (9), and bellcrank (2).

(5) Install spacer (20) and bushing (19) in bellcrank (2).

(6) Aline bellcrank (9) with bellcrank (2).

(7) Install bolt (11) through washer (18) (if required), bushing (19), spacer (20), bellcrank (9), and bellcrank (2).



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11.12. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install left side of bellcrank (9) on bellcrank (2).** Torque bolt (15) **300 to 700 INCH-POUNDS**.

(1) Install washer (17) and nut (16) on bolt (15).

(2) Hold nut (16). Use open end wrench.

(3) Torque bolt (15) to **300 INCH-POUNDS**. Use socket, adapter, and torque wrench.

(4) Increase torque to aline cotter pin hole, but do not exceed **700 INCH-POUNDS**.

(5) Install new cotter pin (14).

(6) Apply sealing compound around bolt (15) head, washer (17), and nut (16). Use sealing compound (item 176, App F).

c. **Install right side of bellcrank (9) on bellcrank (2).** Torque bolt (11) **300 to 700 INCH-POUNDS**.

(1) Install washer (13) and nut (12) on bolt (11).

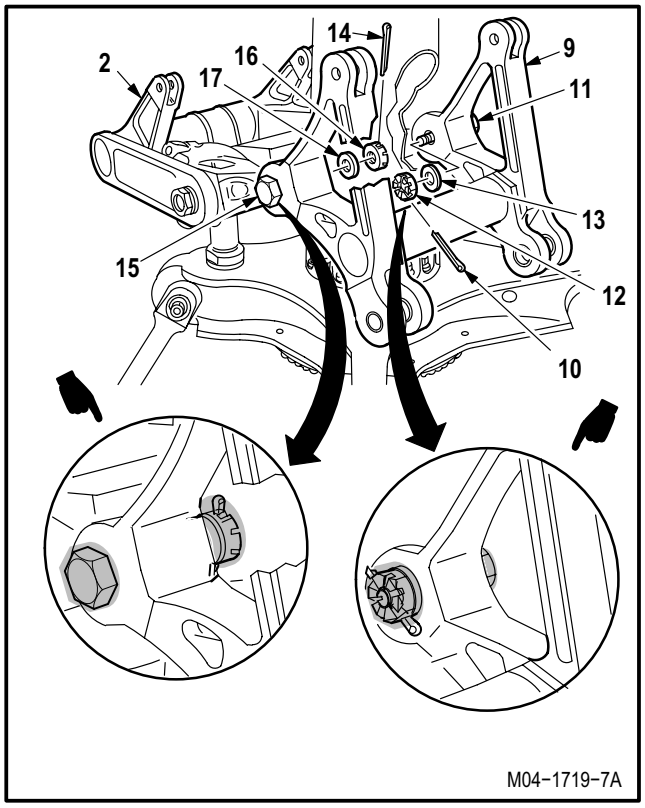
(2) Hold nut (12). Use open end wrench.

(3) Torque bolt (11) to **300 INCH-POUNDS**. Use socket, adapter, and torque wrench.

(4) Increase torque to aline cotter pin hole, but do not exceed **700 INCH-POUNDS**.

(5) Install new cotter pin (10).

(6) Apply sealing compound around bolt (11) head, washer (13), and nut (12). Use sealing compound (item 176, App F).



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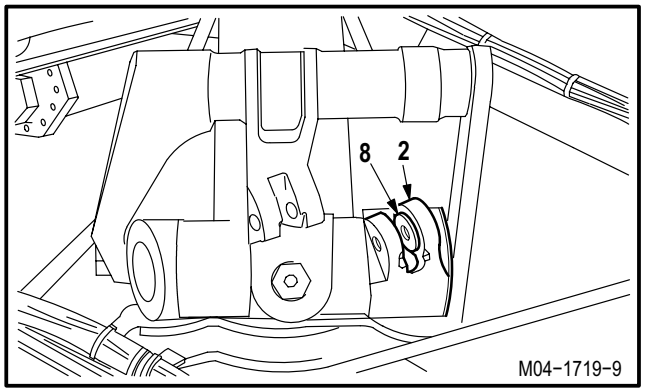
11.12. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION – continued

d. **Install nylon washer (8) on bellcrank (2) (if removed).**



(1) Lightly abrade mating surfaces until the old adhesive and surface of bellcrank (2) are free of contaminants (glossy). Use cloth (item 47, App F).

(2) Wipe bellcrank (2) free of contaminants. Use methyl ethyl ketone (item 124, App F) and cloth (item 51, App F).

(3) Wipe bellcrank (2) dry. Use cloth (item 51, App F).

(4) Allow bellcrank (2) to air dry **30 to 120 MINUTES**.

NOTE

Adhesive must be applied within **2 HOURS** after solvent cleaning. If adhesive is not applied within **2 HOURS** after solvent cleaning, perform steps d.(2) thru d.(4).

(5) Mix adhesive per manufacturers specifications. Use adhesive (item 3, App F) and scale.

(6) Apply a thin, even coat of adhesive (item 3, App F) to mating surfaces.

(7) Place nylon washer (8) in position on bellcrank (2).

(a) Ensure hole alinement.

(8) Maintain contact pressure on nylon washer (8) throughout cure time.

(9) Wipe excess adhesive squeezed out from assembly. Use cloth (item 51, App F).

(10) Allow adhesive to cure **24 HOURS** at room temperature or force cure **1 HOUR** at 200 °F (93 °C).

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11.12. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION – continued

e. **Install servocylinder (1) on bellcrank (2).**

(1) Aline servocylinder (1) with bellcrank (2).

(2) Insert alinement bolt (2.1) halfway through bellcrank (2), nylon washer (8), and servocylinder (1) from inboard side of bellcrank.

(3) Insert bushing (7) through bellcrank (2) until it seats against servocylinder (1).

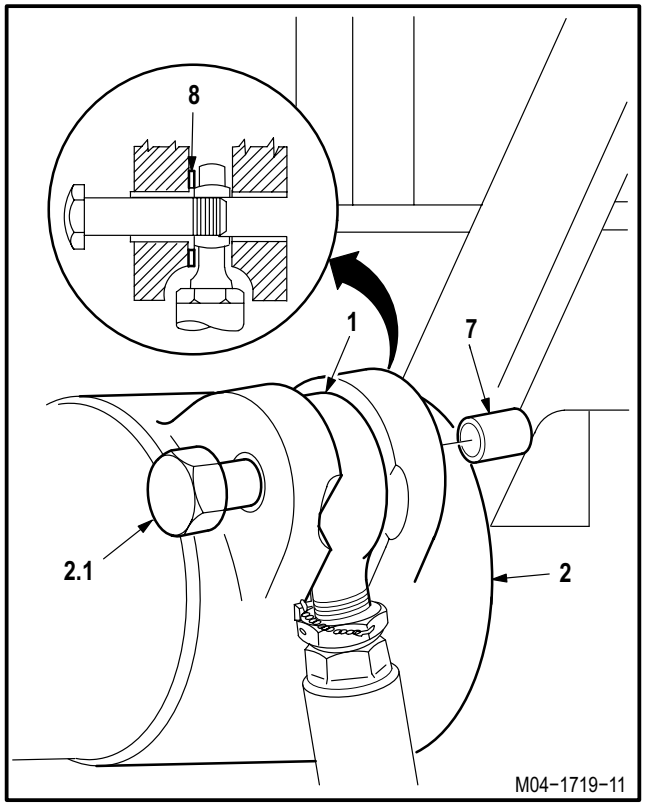
CAUTION

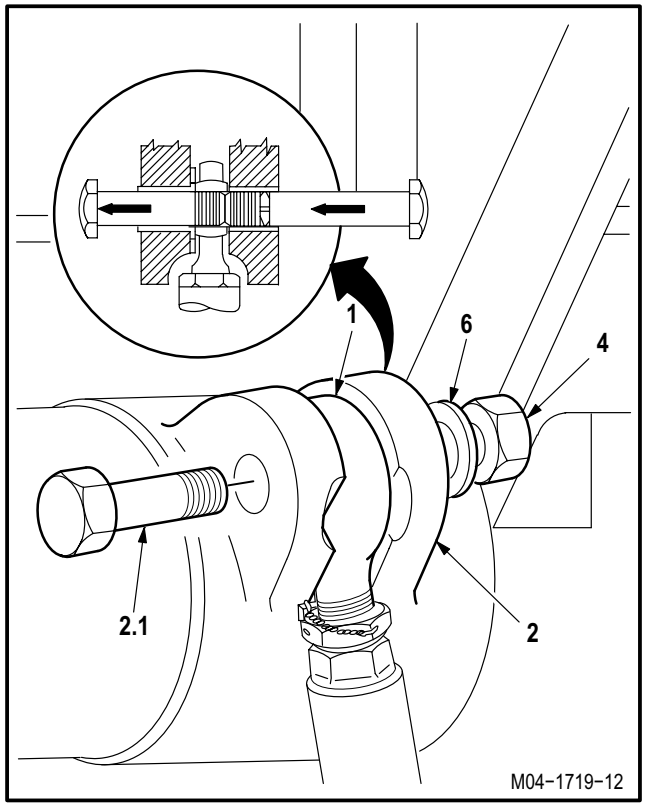
Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(4) Apply a light coat of corrosion preventive compound to shank of bolt (4). Use corrosion preventive compound (item 62A, App F).

(5) Install bolt (4) through washer(s) (6) (if required) and force alinement bolt (2.1) out of bellcrank (2).

(6) Check fit of self-retaining bolt (4) (para 11.1).





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11.12. AFT LONGITUDINAL BELLCRANK REMOVAL/INSTALLATION – continued

f. **Install nut (5) on bolt (4).** Torque nut (5) **75 to 91 FOOT-POUNDS**.

(1) Hold bolt (4). Use box wrench.

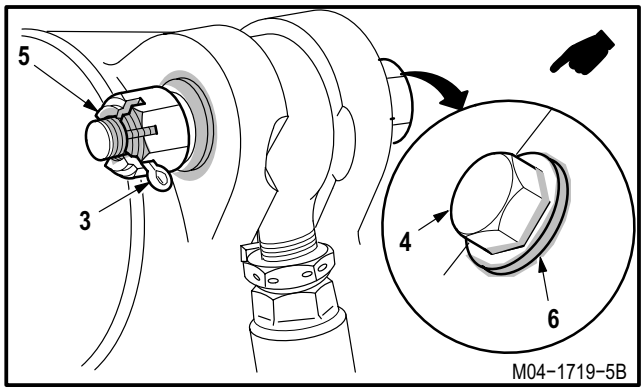
(2) Install nut (5).

(3) Torque nut (5) to **75 FOOT-POUNDS**. Use socket and torque wrench.

(4) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(5) Install new cotter pin (3).

(6) Apply sealing compound around bolt (4) head, washer (6), and nut (5). Use sealing compound (item 176, App F).



g. **Inspect (QA).**

h. **Install torque link** (para 11.19)**.**

i. **Install lateral bellcrank and lateral links** (para 11.11)**.**

j. **Inspect (QA).**

k. **Install access fairings T205L and T205R; install panels L200 and R200** (para 2.2)**.**

l. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.13. LONGITUDINAL LINKS REMOVAL/INSTALLATION

11.13.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.13.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
0 - 600 inch-pound 3/8-inch drive dial indicator torque wrench (item 447, App H)

Materials/Parts:

Cotter pin (2)
Corrosion preventive compound (item 62A, App F)
Sealing compound (item 176, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

WARNING

FLIGHT SAFETY PART

- **The longitudinal links are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.**
- **Heat-treated condition of the longitudinal links is critical to serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. This part must be protected from unscheduled heating and external impact during inspection and handling procedures.**

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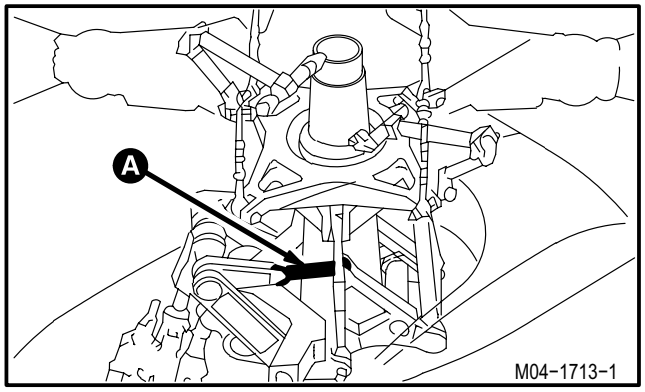
11.13. LONGITUDINAL LINKS REMOVAL/INSTALLATION – continued

NOTE

This task is typical for either longitudinal link.



11.13.3. Removal

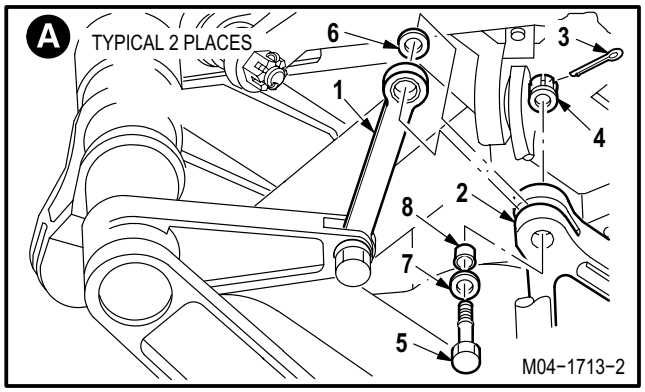
a. **Remove longitudinal link (1) from aft longitudinal bellcrank (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (3).

(3) Remove nut (4).

(4) Remove bolt (5), nylon washer (6), washer(s) (7) (if installed), and bushing (8).



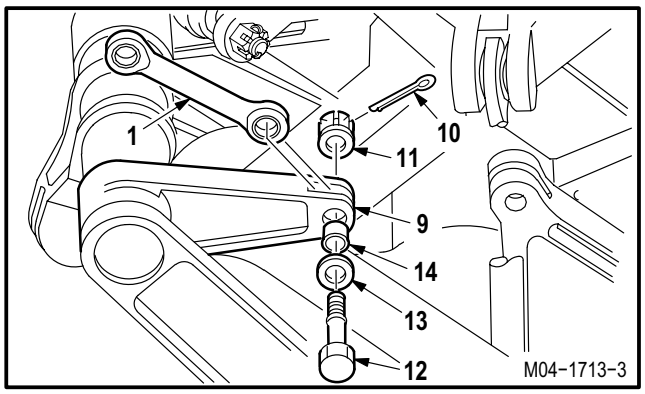
b. **Remove link (1) from forward longitudinal bellcrank (9).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (10).

(3) Remove nut (11).

(4) Remove bolt (12), washer(s) (13) (if installed), and bushing (14).



11.13.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.13.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.13. LONGITUDINAL LINKS REMOVAL/INSTALLATION – continued

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.13.6. Installation

a. **Install link (1) on forward bellcrank (9).** Torque nut (11) **280 to 400 INCH-POUNDS**.

(1) Aline link (1) with bellcrank (9).

(2) Install bushing (14) in bellcrank (9).

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (12). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (12) through washers (13) (if required), bushing (14), bellcrank (9), and link (1).

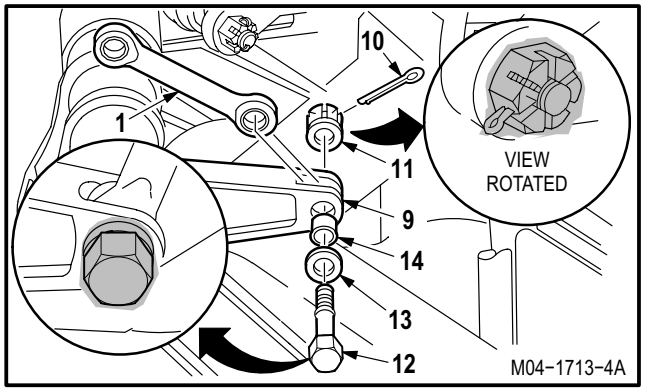
(5) Check fit of self-retaining bolt (12) (para 11.1).

(6) Install nut (11). Torque nut (11) to **280 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **400 INCH-POUNDS**.

(8) Install new cotter pin (10).

(9) Apply sealing compound around bolt (12) head, washer (13), and nut (11). Use sealing compound (item 176, App F).



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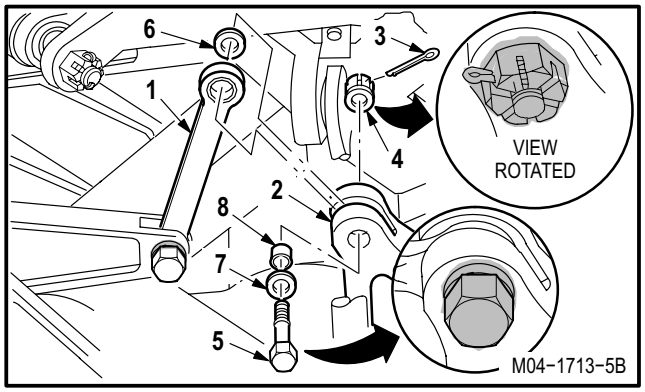
11.13. LONGITUDINAL LINKS REMOVAL/INSTALLATION – continued

b. **Install link (1) on aft bellcrank (2).** Torque nut (4) **280 to 400 INCH-POUNDS**.



(1) Aline link (1) with bellcrank (2).

(2) Install bushing (8) in bellcrank (2).

(3) Position nylon washer (6) between link (1) and bellcrank (2).

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(4) Apply a light coat of corrosion preventive compound to shank of bolt (5). Use corrosion preventive compound (item 62A, App F).

(5) Install bolt (5) through washers (7) (if required), bushing (8), bellcrank (2), and link (1).

(6) Check fit of self-retaining bolt (5) (para 11.1).

(7) Install nut (4). Torque nut (4) to **280 INCH-POUNDS**. Use torque wrench.

(8) Increase torque to aline cotter pin hole, but do not exceed **400 INCH-POUNDS**.

(9) Install new cotter pin (3).

(10) Apply sealing compound around bolt (5) head, washer (7), and nut (4). Use sealing compound (item 176, App F).

c. **Inspect (QA).**

d. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.14. MAIN ROTOR PITCH LINK REMOVAL/INSTALLATION

11.14.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.14.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
3/8 x 1/2-inch drive socket wrench adapter (item 6, App H)
Light duty laboratory apron (item 27, App H)
1 5/16 x 3/8-inch drive open end socket wrench crowfoot attachment (item 95, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
1 1/16 x 1/2-inch drive socket wrench socket (item 305, App H)
1 1/16 & 1 1/4-inch open end wrench (item 416, App H)
1 1/4 & 1 5/16-inch open end wrench (item 419, App H)
0 - 175 foot-pound 1/2-inch drive dial indicator torque wrench (item 444, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)
Corrosion preventive compound (item 62A, App F)
Sealing compound (item 176, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

WARNING

FLIGHT SAFETY PART

- **The main rotor pitch link and/or components of the pitch link are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.**
- **Shot-peened surfaces of main rotor pitch links are critical. This part shall be replaced or have the peening restored if surface has had peening removed by wear or other cause. It also must be protected from unscheduled heating and external impact during inspection and other handling procedures.**
- **Heat treated condition of main rotor pitch links is critical to their serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. These parts must be protected from unscheduled heating and external impact during inspection and other handling procedures.**

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11.14. MAIN ROTOR PITCH LINK REMOVAL/INSTALLATION – continued

NOTE

This task is typical for all four pitch links. Identify and tag pitch link with pitch housing for installation in same position.

11.14.3. Removal

a. **Remove main rotor pitch link (1) from pitch change horn (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (3).

(3) Hold bolt (4). Remove nut (5). Use socket and open end wrench.

(4) Remove bolt (4), washer(s) (6) (if installed), and bushing (7).

b. **Remove link (1) from swashplate (8).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (9).

(3) Hold bolt (10). Remove nut (11). Use socket and open end wrench.

(4) Remove bolt (10), limiter (12), washer(s) (13) (if installed), and bushing (14).

11.14.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.14.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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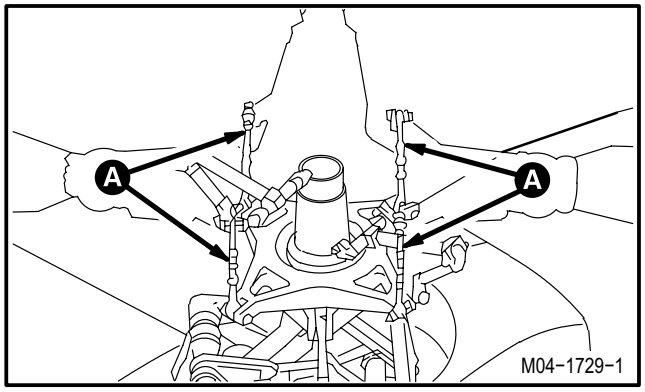
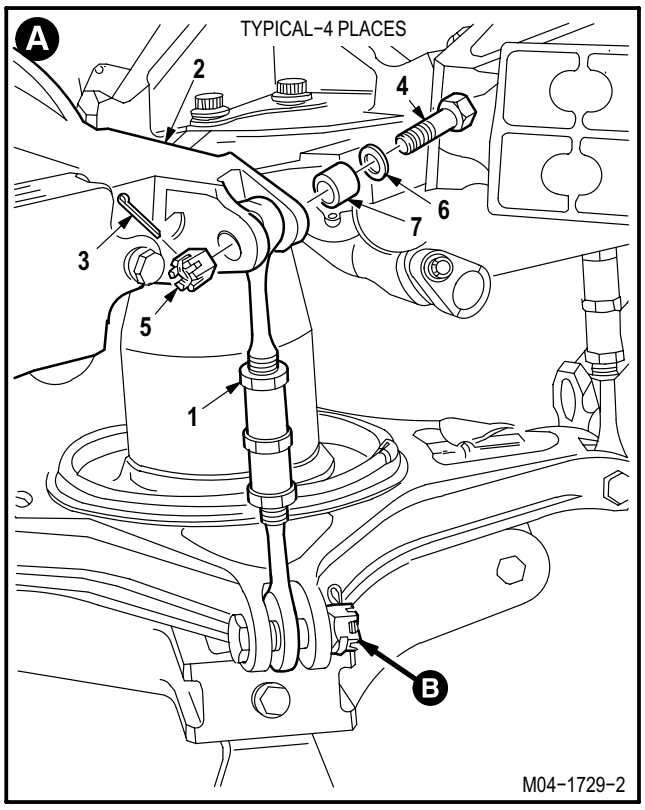
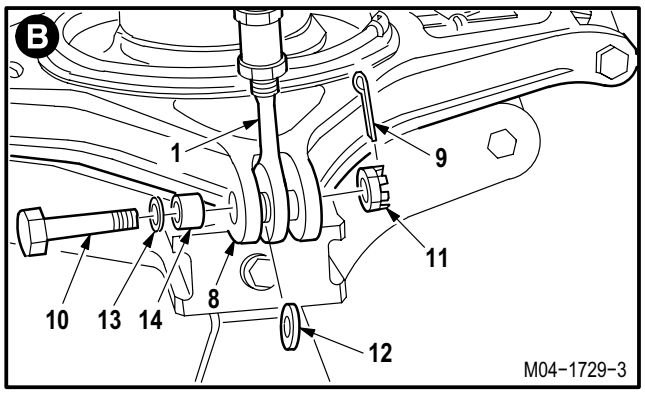






11.14. MAIN ROTOR PITCH LINK REMOVAL/INSTALLATION – continued

11.14.6. Installation

a. **Install link (1) on pitch change horn (2).** Torque nut (5) **75 to 91 FOOT-POUNDS**.

(1) Position link (1) so that left-hand threaded rod end is on top side of barrel and alined with pitch change horn (2).

(2) Install bushing (7) in pitch change horn (2).

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

NOTE

A maximum of four washers are allowed under bolt head (if required) to ensure bushing clamp-up and pin hole alines.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (4). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (4) through washer(s) (6), bushing (7), pitch change horn (2), and link (1).

(5) Check fit of self-retaining bolt (4) (para 11.1).

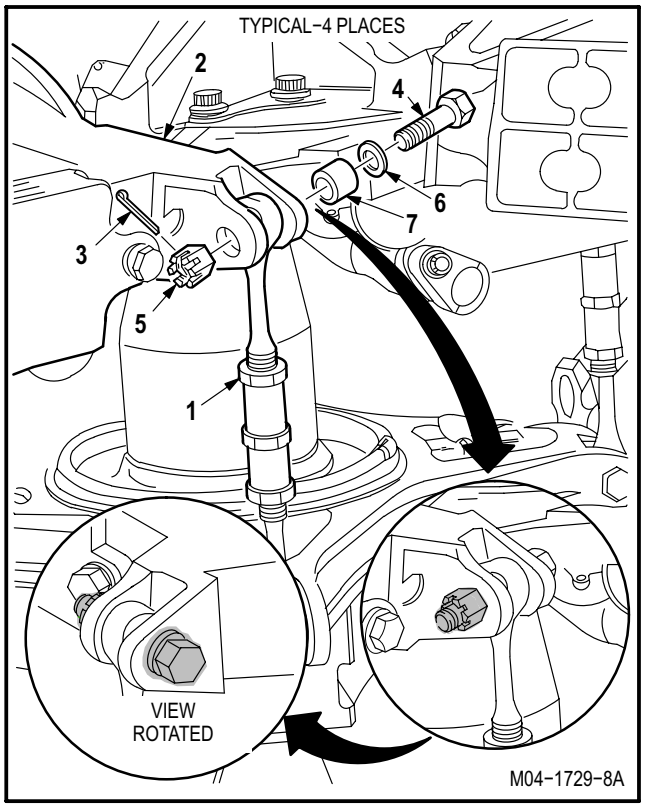
(6) Hold bolt (4). Install nut (5). Use open end wrench.

(7) Hold bolt (4). Torque nut (5) to **75 FOOT-POUNDS**. Use torque wrench, socket, and open end wrench.

(8) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(9) Install new cotter pin (3).

(10) Apply sealing compound around bolt (4) head, washer (7), and nut (5). Use sealing compound (item 176, App F).



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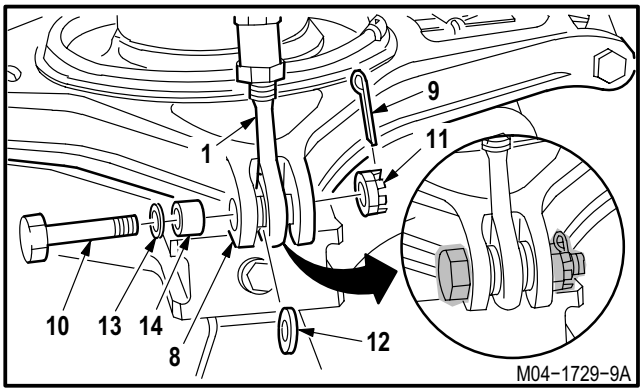
11.14. MAIN ROTOR PITCH LINK REMOVAL/INSTALLATION – continued

b. **Install link (1) to swashplate (8).** Torque nut (11) **75 to 91 FOOT-POUNDS**.



NOTE

Beveled side of limiter is to face bearing on link.

(1) Aline link (1) and limiter (12) with swashplate (8).

(2) Install bushing (14) in swashplate (8).

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

NOTE

A maximum of four washers are allowed under bolt head (if required) to ensure bushing clamp-up and pin hole alines.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (10). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (10) through washer(s) (13), bushing (14), swashplate (8), limiter (12), and link (1).

(5) Check fit of self-retaining bolt (10) (para 11.1).

(6) Hold bolt (10). Install nut (11). Use socket and open end wrench.

(7) Hold bolt (10). Torque nut (11) to **75 FOOT-POUNDS**. Use torque wrench, socket, and open end wrench.

(8) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(9) Install new cotter pin (9).

(10) Apply sealing compound around bolt (10) head, washer (13), and nut (11). Use sealing compound (item 176, App F).

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11.14. MAIN ROTOR PITCH LINK REMOVAL/INSTALLATION – continued

c. **Inspect (QA).**

d. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

e. **Perform main rotor track and balance maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.15. MAIN ROTOR PITCH LINK DISASSEMBLY/ASSEMBLY

11.15.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.15.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
#16 spline x 3/8-inch drive torque wrench adapter (item 17, App H)
Light duty laboratory apron (item 27, App H)
1 5/16 x 3/8-inch drive open end socket wrench crowfoot attachment (item 95, App H)
Fluorescent inspection kit (item 138, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
1 1/4 & 1 5/16-inch open end wrench (item 419, App H) (2)
0 - 175 foot-pound 1/2-inch drive dial indicator torque wrench (item 444, App H)

Materials/Parts:

Primer coating (item 147, App F)
Sealing compound (item 176, App F)
Wire (item 226, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 55-1500-335-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.14	Main rotor pitch link removed

WARNING

FLIGHT SAFETY PARTS

- **The main rotor pitch link and/or components of the pitch link are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.**
- **Shot-peened surfaces of main rotor pitch links are critical. This part shall be replaced or have the peening restored if surface has had peening removed by wear or other cause. It also must be protected from unscheduled heating and external impact during inspection and other handling procedures.**
- **Heat treated condition of main rotor pitch links is critical to their serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. These parts must be protected from unscheduled heating and external impact during inspection and other handling procedures.**

GO TO NEXT PAGE

11.15. MAIN ROTOR PITCH LINK DISASSEMBLY/ASSEMBLY – continued

11.15.3. Disassembly

CAUTION

Rotating rod ends in opposite directions will damage the pitch link assembly.

a. **Remove rod ends (1) and (2) from barrel (3).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove lockwire.

(3) Hold barrel (3). Use open end wrench.

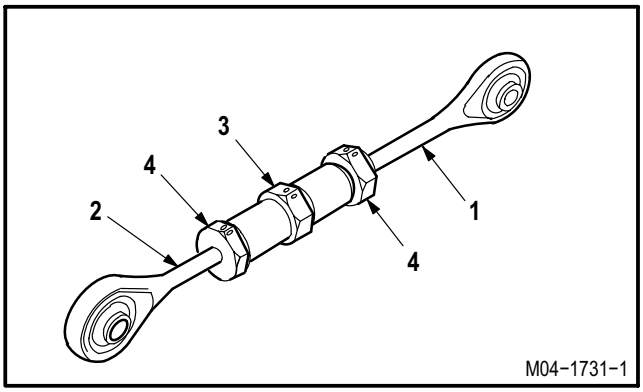
(4) Loosen two nuts (4). Use open end wrench.

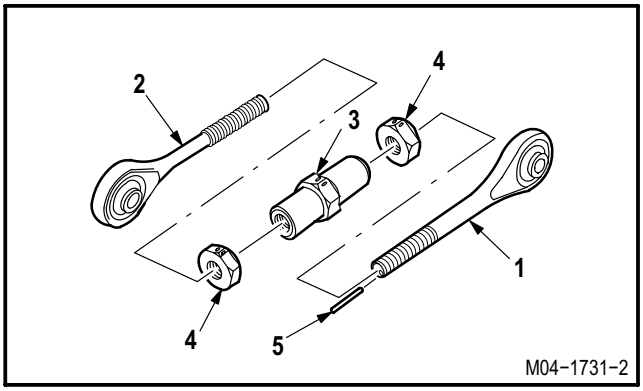
(5) Hold rod ends (1) and (2) securely.

(6) Rotate barrel (3) to free it from rod ends (1) and (2).

(7) Remove alinement pin (5) from rod end (1) or (2).

(8) Remove two nuts (4) from rod ends (1) and (2).





11.15.4. Cleaning

a. **Wipe removed and attaching parts with clean rag.**

11.15.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check barrels using fluorescent inspection method** (TM 55-1500-335-23)**.** Use fluorescent inspection kit.

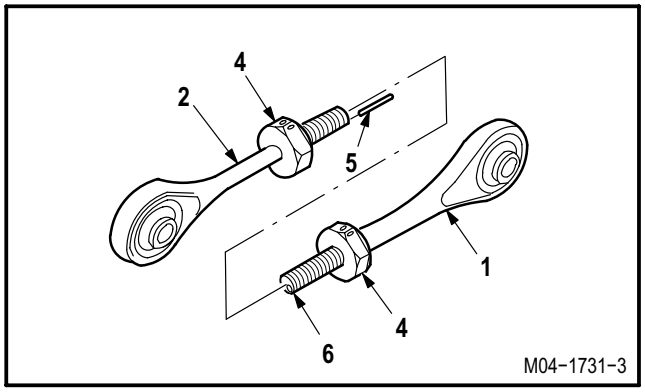
c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

GO TO NEXT PAGE

11.15. MAIN ROTOR PITCH LINK DISASSEMBLY/ASSEMBLY – continued

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**



11.15.6. Assembly

a. **Install nuts (4) on rod ends (1) and (2).**

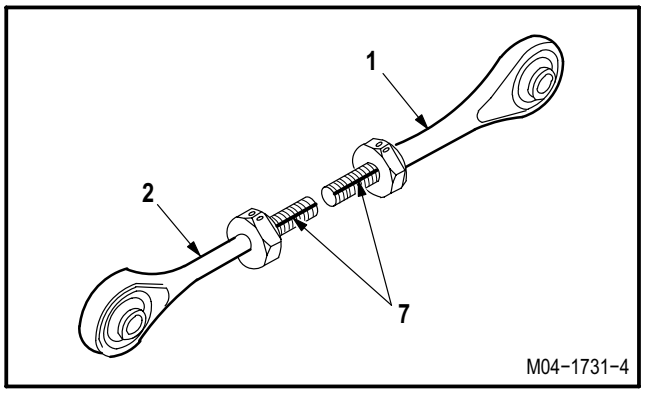
(1) Install nuts (4) to the maximum limit of the threaded portions of both rod ends (1) and (2).

(2) Insert alinement pin (5) in alinement hole (6).

(3) Aline rod ends (1) and (2).

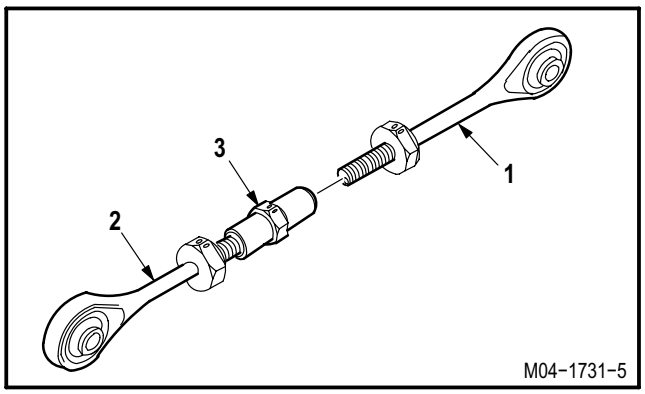
(4) Draw alinement line (7) length of threaded portion of rod ends (1) and (2).

(5) Separate rod end (1) from rod end (2).



b. **Install rod ends (1) and (2) on barrel (3).**

(1) Rotate barrel (3) two complete turns on rod end (2).



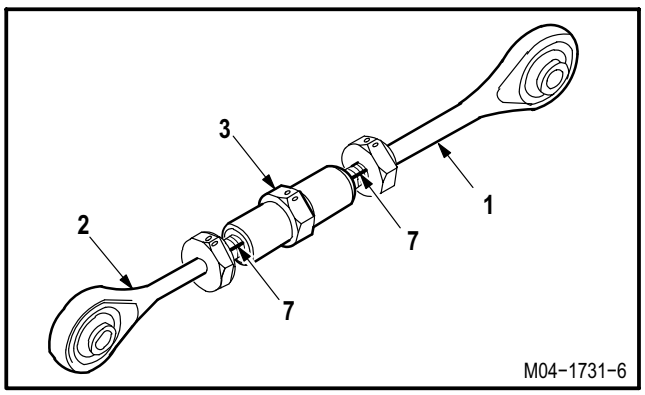
(2) Hold barrel (3) while rotating rod end (1) two complete turns in barrel (3).

(3) Mate rod end alinement lines (7).

(4) Hold rod ends (1) and (2) securely.

NOTE

Bearing alinement pin will be entering bearing assembly alinement hole when both rod ends appear in barrel inspection holes. If binding occurs, loosen barrel.



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11.15. MAIN ROTOR PITCH LINK DISASSEMBLY/ASSEMBLY – continued

(5) Rotate barrel (3) on rod ends (1) and (2) until ends of rod ends can been seen in the two barrel inspection holes (8).

(6) Continue rotating barrel (3) on rod ends (1) and (2) until barrel (3) reaches two nuts (4).

c. **Adjust pitch link to 13.5 to 14.5 INCHES.** Torque two nuts (4) to **75 FOOT-POUNDS**.

(1) Measure distance from center-to-center of rod end holes.

(2) Hold rod ends (1) and (2) securely.

(3) Rotate barrel (3) to bring link to correct length.

(4) Torque two nuts (4) to **75 FOOT-POUNDS**. Use torque wrench, torque wrench adapter, and crowfoot.

(5) Lockwire two nuts (4) to barrel (3). Use wire (item 226, App F).

(6) Apply a light coat of corrosion preventive compound to exposed threads and holes (8). Use primer coating (item 147, App F).

CAUTION

Threads of bolt and nut shall be clean, and primer free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

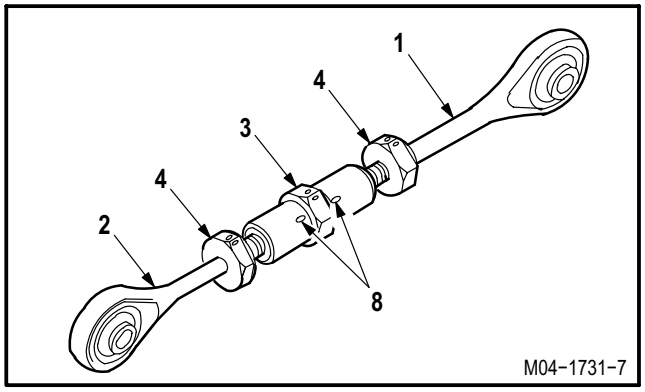
(7) Apply sealing compound to mating surfaces of barrel (3) and two nuts (4). Use sealing compound (item 176, App F).

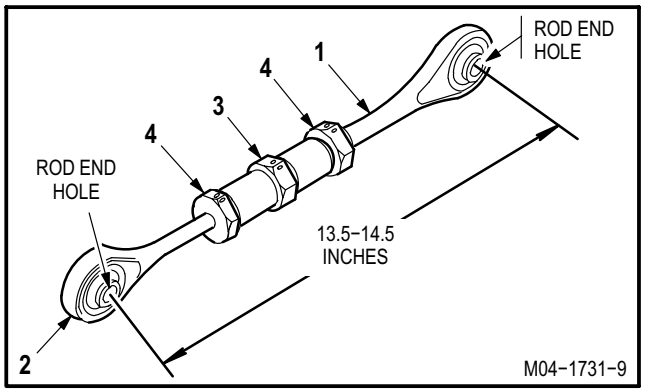
(8) Apply sealing compound to two holes (8). Use sealing compound (item 176, App F).

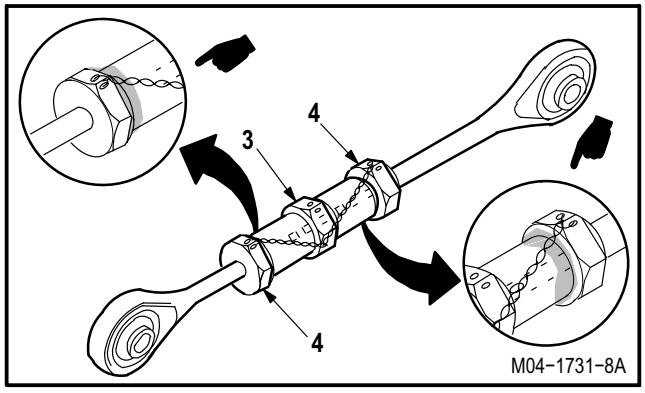
d. **Inspect (QA).**

e. **Install main rotor pitch link** (para 11.14)**.**

END OF TASK







11.16. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION

11.16.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.16.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
0 - 300 inch-pound 3/8-inch drive click type torque wrench (item 439, App H)
0 - 600 inch-pound 3/8-inch drive dial indicator torque wrench (item 447, App H)

Materials/Parts:

Cotter pin (3)
Laminated washer (as required)
Corrosion preventive compound (item 62A, App F)
Sealing compound (item 176, App F)

Personnel Required:

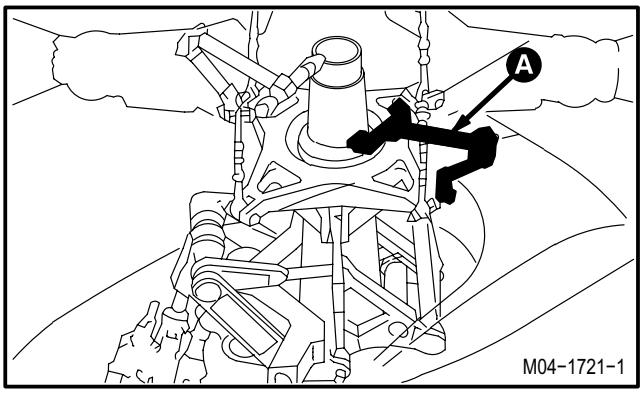
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed



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11.16. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION – continued

11.16.3. Removal

CAUTION

To prevent damage to main rotor and scissors assemblies, the load bearing scissors must be identified and marked prior to removal to ensure proper installation.

a. **Remove one side of load bearing main rotor scissor (1) from main rotor hub lower shoe (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (3).

(3) Remove nut (4) and washer (5).

(4) Remove bolt (6), washer (7), laminated washer (8), bearing (9), and bushing (10).

b. **Remove other side of scissor (1) from shoe (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (11).

(3) Remove nut (12) and washer (13).

(4) Remove bolt (14), washer (15), laminated washer (16), bearing (17), and bushing (18).

c. **Remove scissor (1) from swashplate (19).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (20).

(3) Remove nut (21), washer (22), and retaining washer (23).

(4) Remove scissor (1) and washer (24) from pin (25) and swashplate (19).

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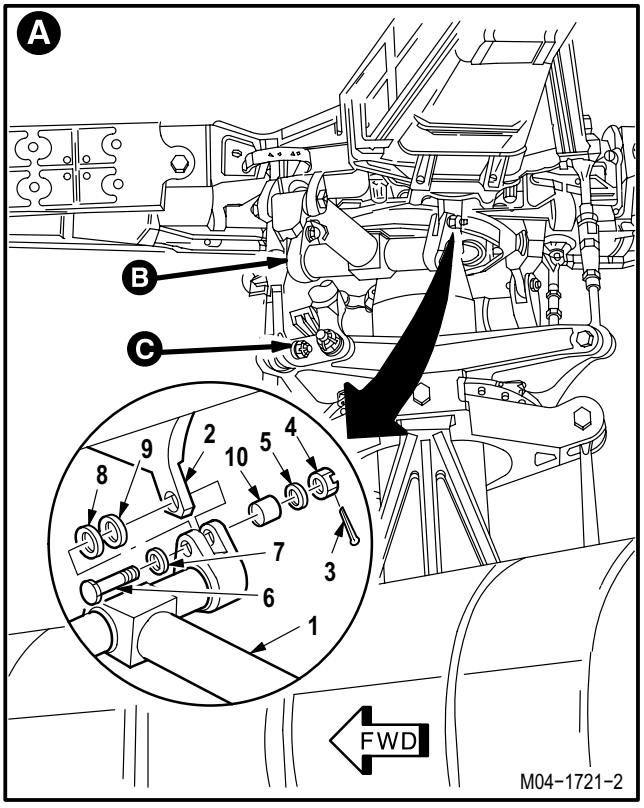
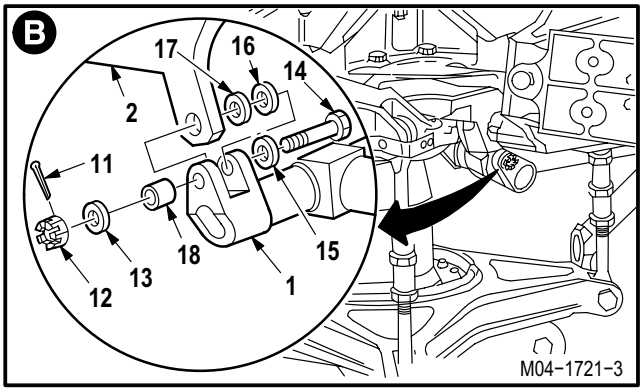
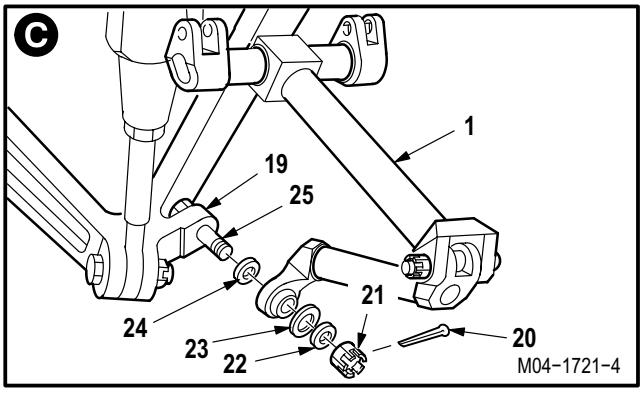






11.16. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION

11.16.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.16.5. Inspection

a. **Check removed and attaching parts for scratches, wear, and elongation.**

(1) Damage in a bore area within **1-1/2 TIMES** the bore diameter is not to exceed **10 PERCENT** of the material thickness or **0.040 INCH**, whichever is less.

b. **Check removed and attaching parts for cracks** (para 11.5)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

e. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.16. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION – continued

11.16.6. Installation

a. **Aline load bearing main rotor scissor (1) with mounting points on main rotor hub lower shoe (2).**

b. **Install one side of scissor (1) to shoe (2).**

(1) Install bearing (9) and laminated washer (8) between scissor (1) and shoe (2).

(2) Install bushing (10) in scissor (1) and shoe (2).

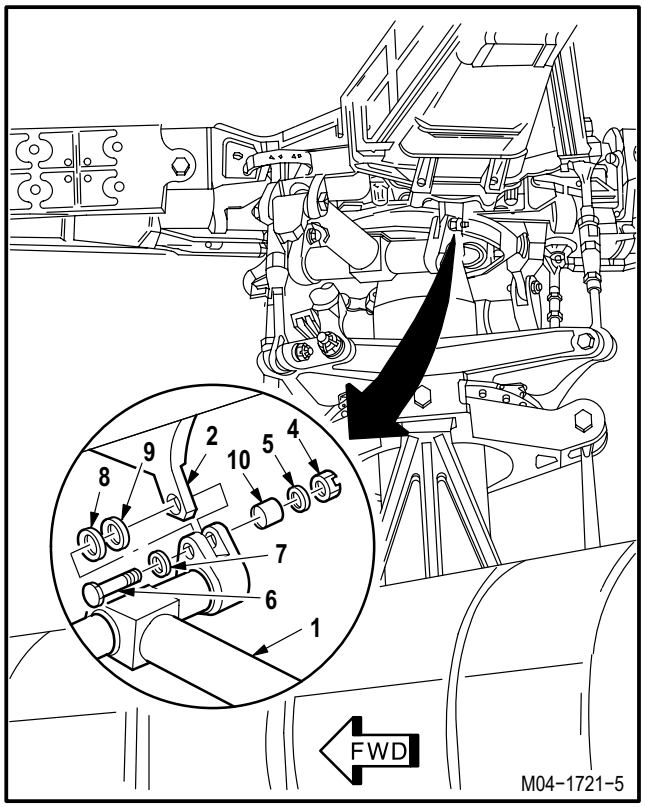
CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (6). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (6) through washer (7) (with countersunk side of washer adjacent to bolt head), scissor (1), laminated washer (8), bearing (9), shoe (2), and bushing (10).

(5) Install washer (5) and nut (4).



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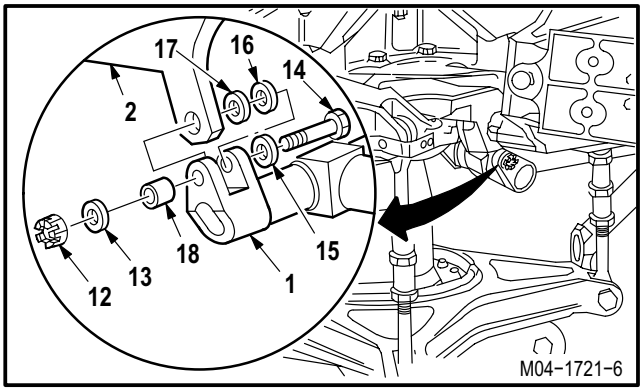
11.16. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION – continued

c. **Install other side of scissor (1).**

(1) Install bearing (17) and laminated washer (16) between scissor (1) and shoe (2).

(2) Install bushing (18) in scissor (1) and shoe (2).



CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (14). Use corrosion preventive compound (item 62A, App F).

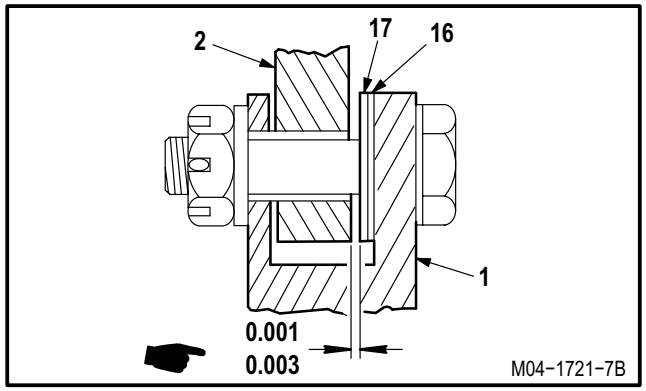
(4) Install bolt (14) through washer (15) (with countersunk side of washer adjacent to bolt head), scissor (1), laminated washer (16), bearing (17), shoe (2), and bushing (18).

(5) Install washer (13) and nut (12).

d. **Check for total axial play of 0.001 to 0.003 INCH between bearings (9) and (17) and shoe (2).**

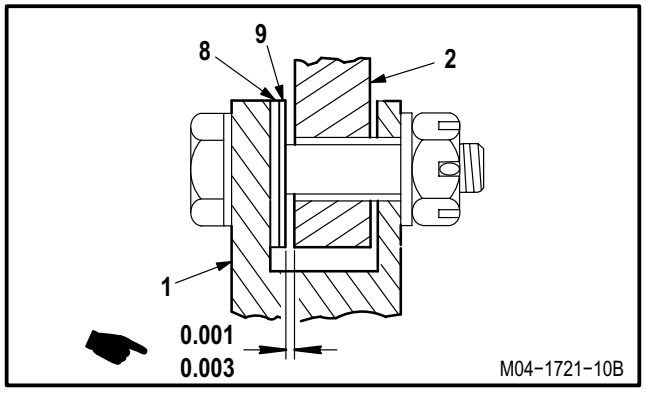
(1) Measure clearance between shoe (2) and bearing (17).

(a) Allowable clearance is **0.001 to 0.003 INCH**.



(2) Measure clearance between shoe (2) and bearing (9).

(a) Allowable clearance is **0.001 to 0.003 INCH**.



(3) If clearances are within limits, go to step e.

(4) Remove scissor (1) from shoe (2) if clearances are not within limits.

(5) Add or peel laminated washers (8) and (16) using equal thickness as required to within **0.002 INCH** on both sides of scissor mounting points.

(6) Repeat steps b. through d.

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11.16. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION – continued

e. **Torque nuts (4) and (12) 170 to 200 INCH-POUNDS.**

(1) Torque nuts (4) and (12) to **170 INCH-POUNDS**. Use torque wrench.

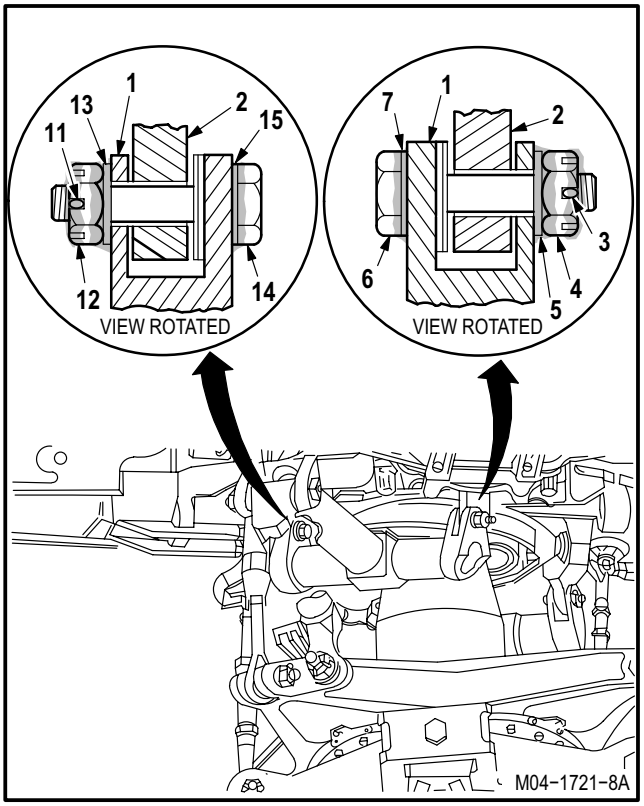
(2) Increase torque to aline cotter pin hole, but do not exceed **200 INCH-POUNDS**.

f. **Recheck clearances measured in step d.**

(1) If **0.001 to 0.003 INCH** total axial play is maintained, install new cotter pins (3) and (11) and go to step g.

(2) If clearance has changed, remove scissor (1) from shoe (2) and repeat steps d. and e.

(3) Apply sealing compound around bolt heads (6) and (14), washers (7) and (13), nuts (3) and (14), and washers (5) and (15). Use sealing compound (item 176, App F).



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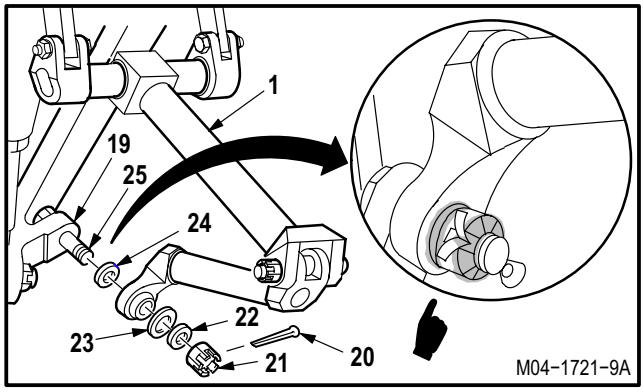
11.16. LOAD BEARING MAIN ROTOR SCISSOR REMOVAL/INSTALLATION – continued

g. **Install lower end of scissor assembly (1) on swashplate (19).**

(1) Install washer (24) and scissor (1) on pin (25).

(2) Install washers (23) and (22) and nut (21) on pin (25).



h. **Torque nut (21) 250 to 300 INCH-POUNDS.**

(1) Torque nut (21) to **250 INCH-POUNDS**. Use torque wrench.

(2) Increase torque to aline cotter pin hole, but do not exceed **300 INCH-POUNDS**.

(3) Install new cotter pin (20).

(4) Apply sealing compound around washers (22) and (23), and nut (21). Use sealing compound (item 176, App F).

i. **Inspect (QA).**

j. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.17. LOAD BEARING SCISSOR DISASSEMBLY/ASSEMBLY

11.17.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.17.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
0.000 - 6.000-inch outside micrometer caliper set (item 52, App H)
2 - 12-inch inside micrometer caliper (item 56, App H)
1 1/4 x 1/2-inch drive socket wrench socket (item 308, App H)
1 1/16 & 1 1/4-inch open end wrench (item 416, App H)
0 - 300 inch-pound 3/8-inch drive click type torque wrench (item 439, App H)

Materials/Parts:

Cotter pin
Laminated washers (2)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
11.16	Load bearing main rotor scissor removed

11.17.3. Disassembly

a. **Remove lower arm (1) from upper arm (2).**

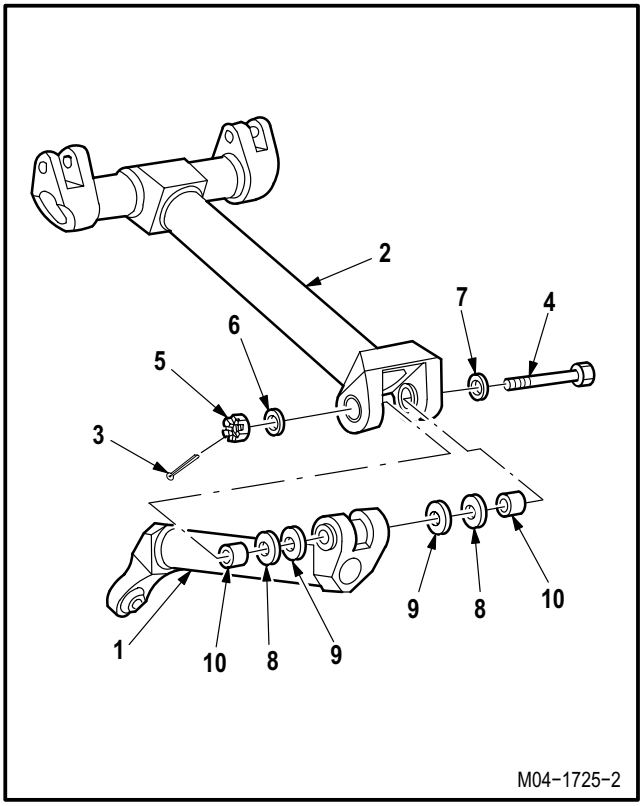
(1) Remove and discard cotter pin (3).

(2) Hold bolt (4). Use open end wrench.

(3) Remove nut (5) and washer (6). Use socket.

(4) Remove bolt (4), flat washer (7), two bearings (8), laminated washers (9), and bushings (10).

(5) Discard two laminated washers (9).



11.17.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

GO TO NEXT PAGE

11.17. LOAD BEARING SCISSOR DISASSEMBLY/ASSEMBLY – continued

11.17.5. Inspection

a. **Check removed and attaching parts for scratches and elongation.**

(1) Damage in a bore area within 1-1/2 times the bore diameter is not to exceed 10 percent of the material thickness or **0.040 INCH**, whichever is less.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for wear** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

e. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

f. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.17.6. Assembly

a. **Measure clearance between lower arm (1) and upper arm (2).**

(1) Measure combined thickness of two bearings (8). Use caliper set.

(a) Record this as dimension A.

(2) Measure width of lower arm (1) lug. Use caliper set.

(a) Record this as dimension B.

(3) Install two bushings (10) in upper arm (2).

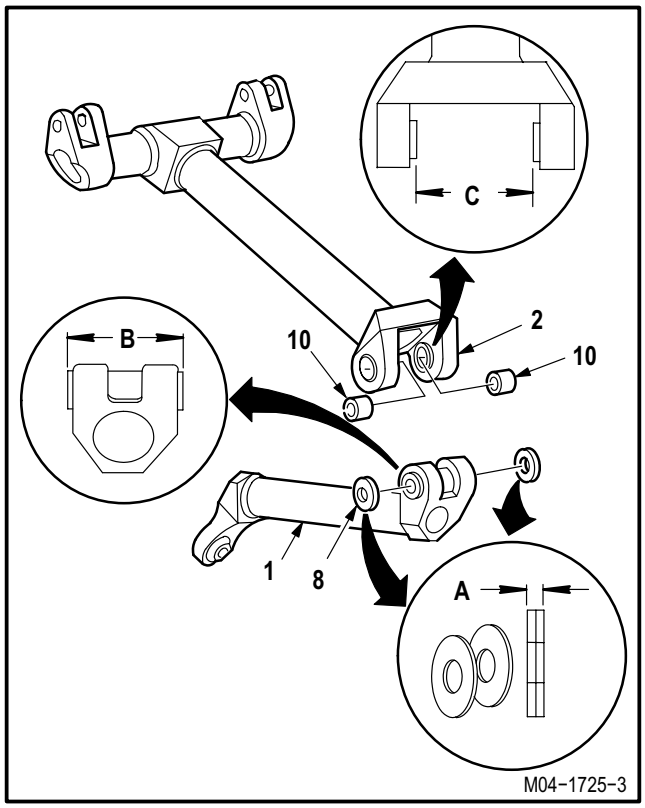
(4) Measure inside dimension of upper arm (2) between bushings (10). Use caliper.

(a) Record this as dimension C.

(5) Subtract total of dimension A and B from dimension C.

(6) The result equals combined thickness of two laminated washers plus axial play.

(a) Record measurement for reference during assembly.



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11.17. LOAD BEARING SCISSOR DISASSEMBLY/ASSEMBLY – continued

NOTE

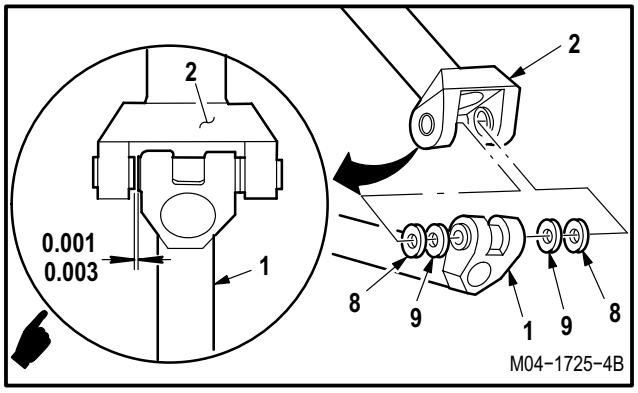
Refer to notes taken when measuring clearance to get proper laminated washer thickness.

b. **Install lower arm (1) on upper arm (2).** Torque nut (5) **100 to 200 INCH-POUNDS**.

(1) Aline lower arm (1) with upper arm (2).

NOTE

Use equal thickness, within **0.002 INCH**, of laminated washers on both sides as required, to limit total axial play to **0.001 to 0.003 INCH**.

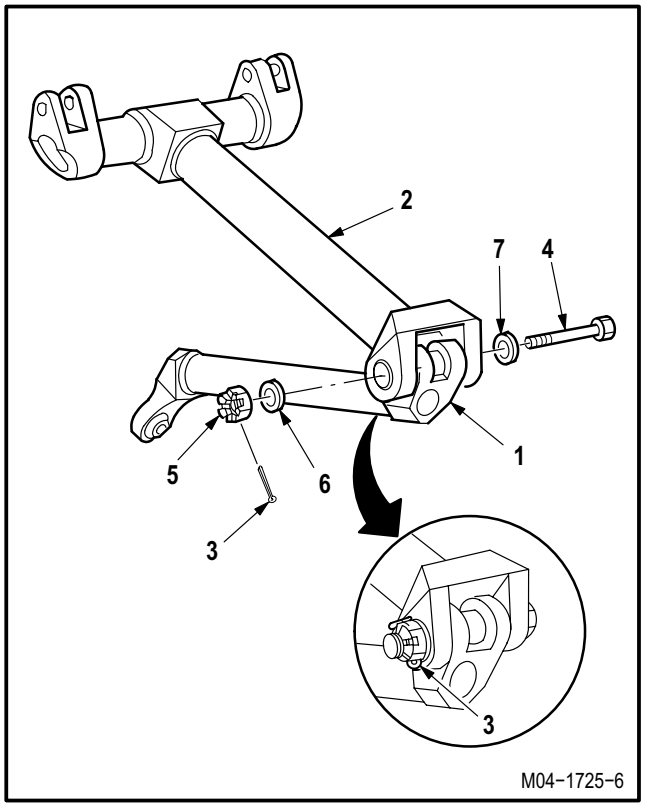


(2) Peel laminated washers (9) as needed to obtain proper clearance.

(3) Position two laminated washers (9) and bearings (8).

NOTE

Verify axial play of **0.001 to 0.003 INCH** clearance between upper arm and lower arm.



(4) Install bolt (4) through washer (7) (with countersunk side of washer adjacent to bolt head), upper arm (2), and lower arm (1).

(5) Install washer (6) and nut (5) on bolt (4).

(6) Hold bolt (4). Use open end wrench.

(7) Torque nut (5) to **100 INCH-POUNDS**. Use torque wrench and socket.

(8) Increase torque to aline cotter pin hole, but do not exceed **200 INCH-POUNDS**.

(9) Install new cotter pin (3).

c. **Inspect (QA).**

d. **Install load bearing main rotor scissor** (para 11.16)**.**

END OF TASK

11.17A. SECONDARY SCISSOR DISASSEMBLY/ASSEMBLY

11.17A.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.17A.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
0.000 - 6.000-inch outside micrometer caliper set (item 52, App H)
2 - 12-inch inside micrometer caliper (item 56, App H)
1 1/4 x 1/2-inch drive socket wrench socket (item 308, App H)
1 1/16 & 1 1/4-inch open end wrench (item 416, App H)
0 - 300 inch-pound 3/8-inch drive click type torque wrench (item 439, App H)

Materials/Parts:

Cotter pin

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
11.18	Secondary main rotor scissor removed

11.17A.3. Disassembly

a. **Remove lower arm (1) from upper arm (2).**

(1) Remove and discard cotter pin (3).

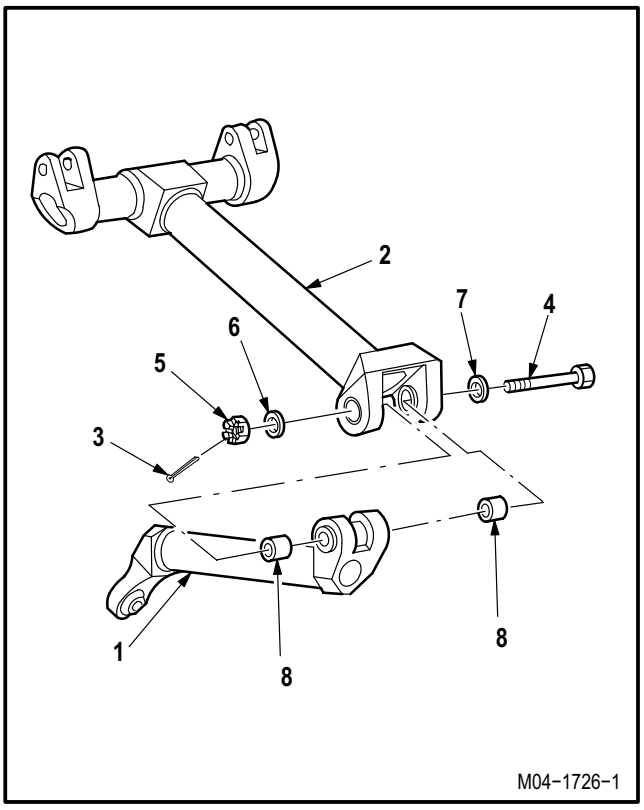
(2) Hold bolt (4). Use open end wrench.

(3) Remove nut (5) and washer (6). Use socket.

(4) Remove bolt (4), flat washer (7), and bushings (8).

11.17A.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**



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11.17A. SECONDARY SCISSOR DISASSEMBLY/ASSEMBLY – continued

11.17A.5. Inspection

a. **Check removed and attaching parts for scratches and elongation.**

(1) Damage in a bore area within 1-1/2 times the bore diameter is not to exceed 10 percent of the material thickness or **0.040 INCH**, whichever is less.

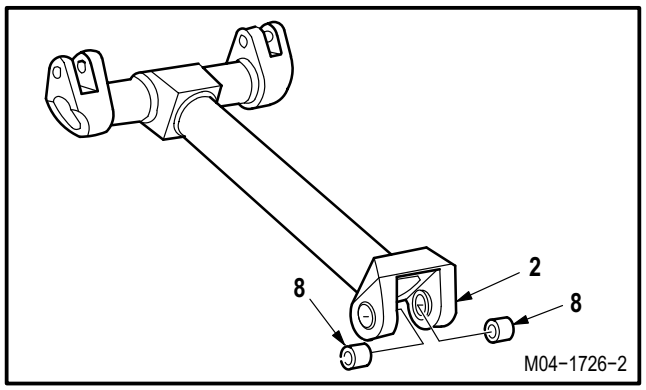
b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for wear** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

e. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

f. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**



11.17A.6. Assembly

a. **Install lower arm (1) on upper arm (2).** Torque nut (5) **100 to 200 INCH-POUNDS**.

(1) Install two bushings (8) in upper arm (2).

(2) Aline lower arm (1) with upper arm (2).

(3) Install bolt (4) through washer (7) (with countersunk side of washer adjacent to bolt head), upper arm (2), and lower arm (1).

(4) Install washer (6) and nut (5) on bolt (4).

(5) Hold bolt (4). Use open end wrench.

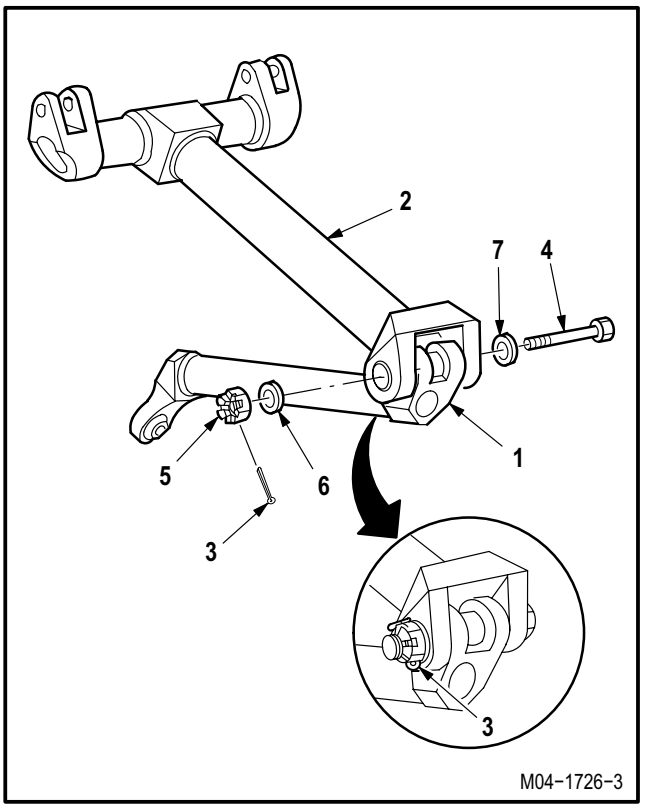
(6) Torque nut (5) to **100 INCH-POUNDS**. Use torque wrench and socket.

(7) Increase torque to aline cotter pin hole, but do not exceed **200 INCH-POUNDS**.

(8) Install new cotter pin (3).

b. **Inspect (QA).**

c. **Install secondary main rotor scissor** (para 11.18)**.**



END OF TASK

11.18. SECONDARY MAIN ROTOR SCISSOR REMOVAL/INSTALLATION

11.18.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.18.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
0 - 300 inch-pound 3/8-inch drive click type torque wrench (item 439, App H)
0 - 600 inch-pound 3/8-inch drive dial indicator torque wrench (item 447, App H)

Materials/Parts:

Cotter pin (3)
Corrosion preventive compound (item 62A, App F)
Sealing compound (item 176, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

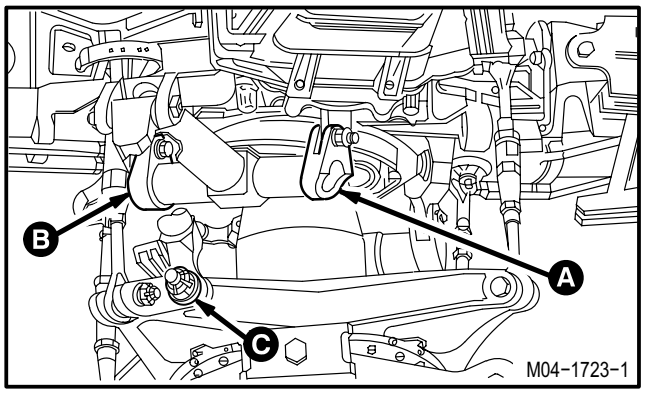
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

11.18.3. Removal

CAUTION

To prevent damage to main rotor and scissors assemblies, the secondary scissors must be identified and marked prior to removal to insure proper installation.



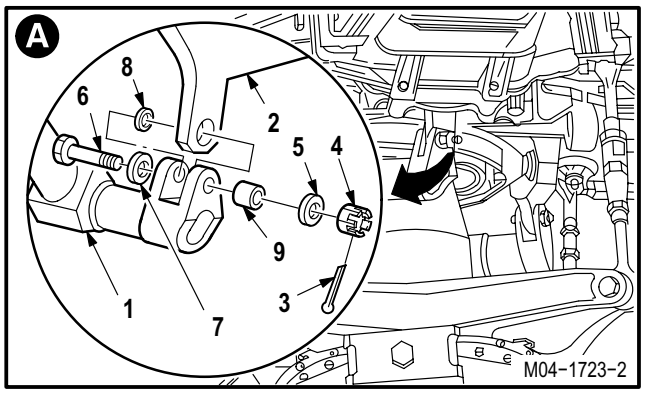
a. **Remove one side of secondary main rotor scissor (1) from main rotor hub lower shoe (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (3).

(3) Remove nut (4) and washer (5).

(4) Remove bolt (6), washer (7), bearing (8), and bushing (9).



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11.18. SECONDARY MAIN ROTOR SCISSOR REMOVAL/INSTALLATION – continued

b. **Remove other side of scissor (1) from hub lower shoe (2).**

(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (10).

(3) Remove nut (11) and washer (12).

(4) Remove bolt (13), washer (14), bearing (15), and bushing (16).

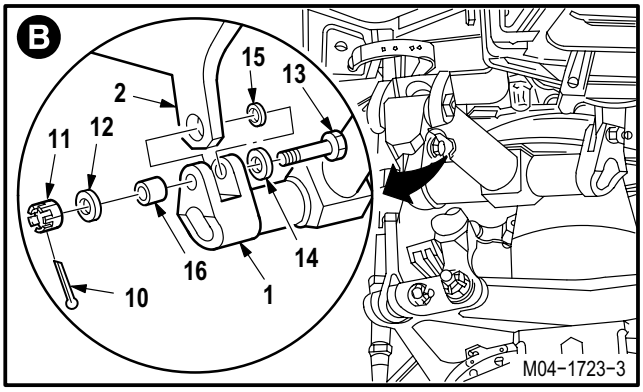
c. **Remove scissor (1) from swashplate (17).**

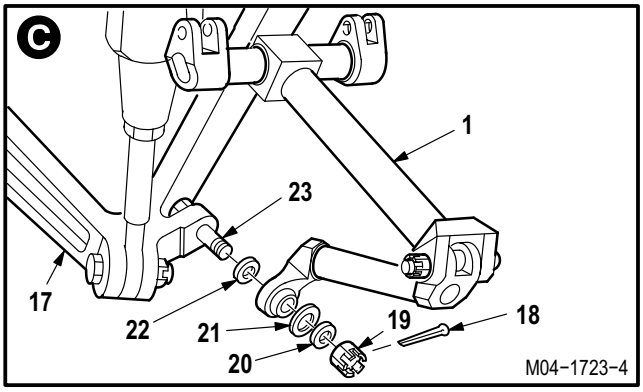
(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (18).

(3) Remove nut (19), washer (20), and retaining washer (21).

(4) Remove scissor (1) and washer (22) from pin (23).





11.18.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.18.5. Inspection

a. **Check removed and attaching parts for for scratches, and elongation.**

(1) Damage in a bore area within 1-1/2 times the bore diameter is not to exceed 10 percent of the material thickness or **0.040 INCH**, whichever is less.

b. **Check removed and attaching parts for wear** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

f. **Check removed and attaching parts for cracks** (para 11.5)**.**

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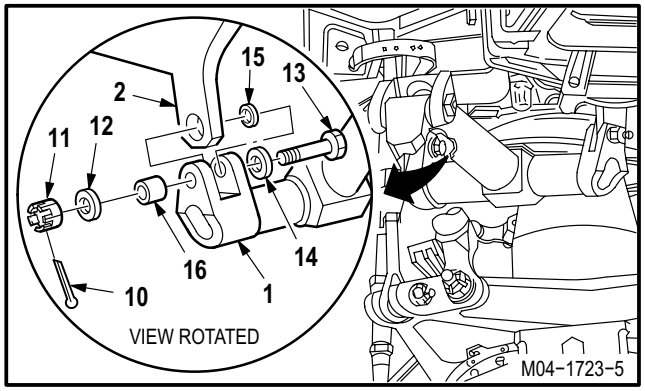
11.18. SECONDARY MAIN ROTOR SCISSOR REMOVAL/INSTALLATION – continued

11.18.6. Installation

a. **Aline scissor (1) with mounting points on main rotor hub lower shoe (2).**



b. **Install one side of scissor (1) to shoe (2).**

(1) Install bearing (15) between scissor (1) and shoe (2).

(2) Install bushing (16) in scissor (1) and shoe (2).

CAUTION

Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (13). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (13) through washer (14) (with countersunk side of washer adjacent to bolt head), scissor (1), bearing (15), shoe (2), and bushing (16).

(5) Install washer (12) and nut (11).

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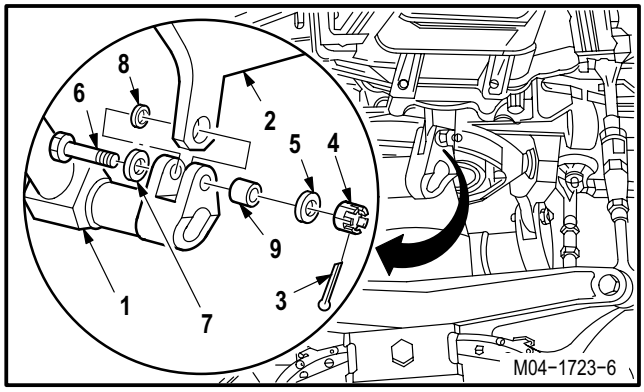
11.18. SECONDARY MAIN ROTOR SCISSOR REMOVAL/INSTALLATION – continued

c. **Install other side of scissor (1).**



(1) Install bearing (8) between scissor (1) and shoe (2).

(2) Install bushing (9) in scissor (1) and shoe (2).

CAUTION

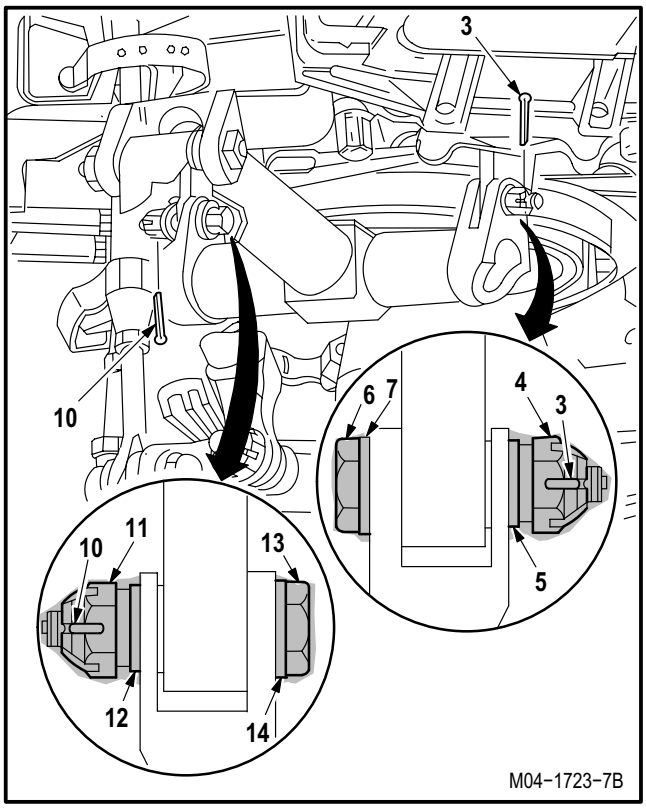
Threads of bolt and nut shall be clean and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (6). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (6) through washer (7) (with countersunk side of washer adjacent to bolt head), scissor (1), bearing (8), shoe (2), and bushing (9).

(5) Install washer (5) and nut (4).

d. **Torque nuts (4) and (11) 170 to 200 INCH-POUNDS.**



(1) Hold two bolts (6) and (13).

(2) Install nuts (4) and (11). Torque nuts (4) and (11) to **170 INCH-POUNDS**. Use torque wrench.

(3) Increase torque to aline cotter pin hole, but do not exceed **200 INCH-POUNDS**.

(4) Install new cotter pins (3) and (10).

(5) Apply sealing compound around bolt heads (6) and (13), washers (7) and (14), nuts (4) and (11), and washers (5) and (12). Use sealing compound (item 176, App F).

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11.18. SECONDARY MAIN ROTOR SCISSOR REMOVAL/INSTALLATION – continued

e. **Install scissor (1) on swashplate (17).**

(1) Install washer (22) and scissor (1) on pin (23).

(2) Install retaining washers (21) and (20) and nut (19).

f. **Torque nut (19) 250 to 300 INCH-POUNDS.**

(1) Install nut (19). Torque nut (19) to **250 INCH-POUNDS**. Use torque wrench.

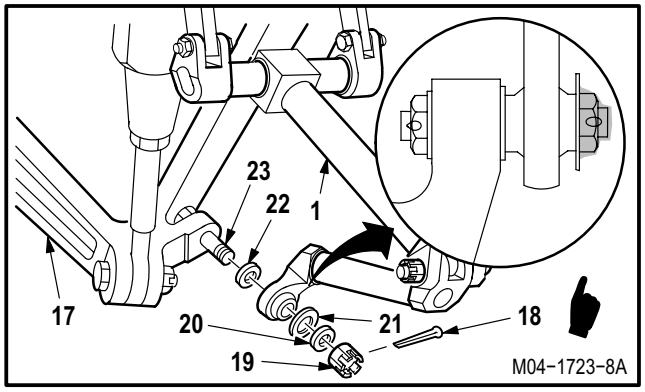
(2) Increase torque to aline cotter pin hole, but do not exceed **300 INCH-POUNDS**.

(3) Install new cotter pin (18).

(4) Apply sealing compound around washer (20), and nut (19). Use sealing compound (item 176, App F).

g. **Inspect (QA).**

h. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.19. TORQUE LINK REMOVAL/INSTALLATION

11.19.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.19.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
3/8 x 1/2-inch drive socket wrench adapter (item 6, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
1 1/2 x 1/2-inch drive socket wrench socket (item 306, App H)
1 1/16 & 1 1/4-inch open end wrench (item 416, App H)
150 - 750 inch-pound 3/8-inch drive click type torque wrench (item 442, App H)
0 - 175 foot-pound 1/2-inch drive dial indicator torque wrench (item 444, App H)

Materials/Parts:

Cotter pin (3)
Corrosion preventive compound (item 62A, App F)
Sealing compound (item 176, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access fairing T205L removed

WARNING

FLIGHT SAFETY PART

- **The link assembly and support bolt are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.**
- **Heat treated condition of the link assembly and support bolt is critical to its serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. This part must be protected from unscheduled heating and external impact during inspection and handling procedures.**

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11.19. TORQUE LINK REMOVAL/INSTALLATION – continued

11.19.3. Removal

CAUTION

To prevent damage to self-retaining bolt, press retention device lock fully when removing bolt.

a. **Remove torque link (1) from right side of aft longitudinal bellcrank (2).**

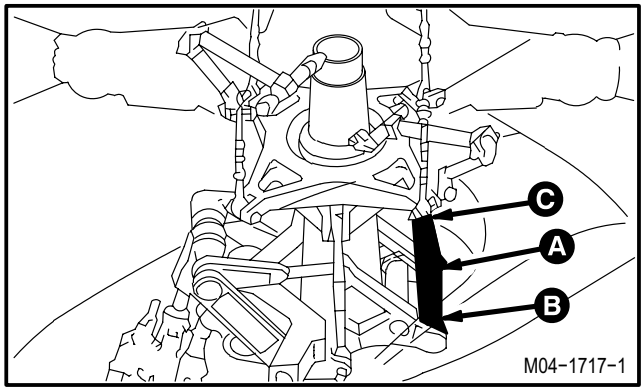
(1) Remove sealant from attaching hardware (para 1.47).

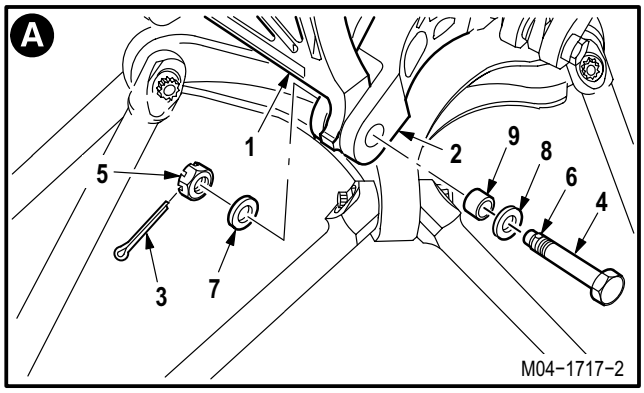
(2) Remove and discard cotter pin (3).

(3) Hold bolt (4) and loosen nut (5). Use open end wrench and socket.

(4) Press retaining device (6) on bolt (4). Remove nut (5) and washer (7).

(5) Remove bolt (4), washer(s) (8) (if required), and spacer (9).





CAUTION

To prevent damage to self-retaining bolt, press retention device lock fully when removing bolt.

b. **Remove link (1) from left side of bellcrank (10).**

(1) Remove sealant from attaching hardware (para 1.47).

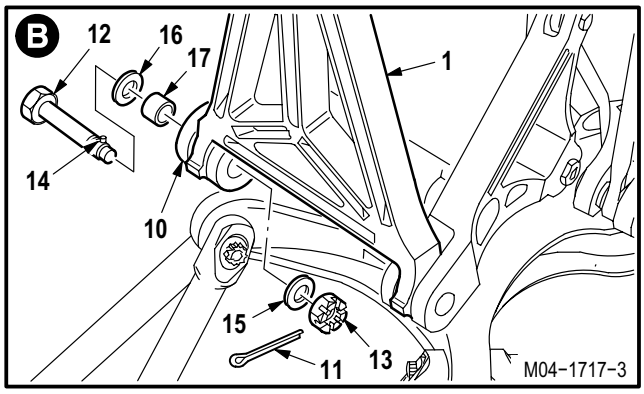
(2) Remove and discard cotter pin (11).

(3) Hold bolt (12). Loosen nut (13). Use open end wrench and socket.

(4) Press retaining device (14) on bolt (12).

(5) Remove nut (13) and washer (15).

(6) Remove bolt (12), washer(s) (16) (if required), and spacer (17).



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11.19. TORQUE LINK REMOVAL/INSTALLATION – continued

c. **Remove link (1) from swashplate (18).**

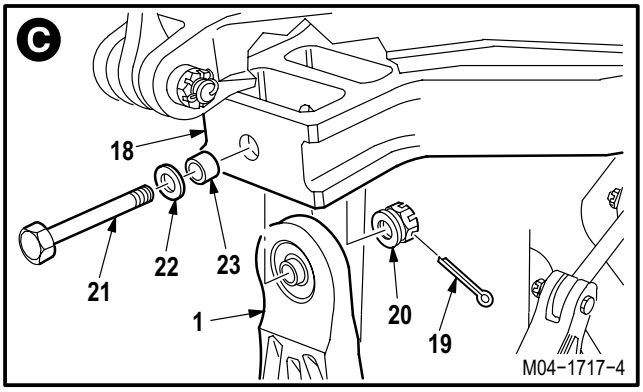
(1) Remove sealant from attaching hardware (para 1.47).

(2) Remove and discard cotter pin (19).

(3) Hold and support link (1).

(4) Hold nut (20). Use open end wrench.

(5) Remove bolt (21), washer(s) (22) (if required), bushing (23), and nut (20) from swashplate (18) and link (1). Use open end wrench.



11.19.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.19.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.19. TORQUE LINK REMOVAL/INSTALLATION – continued

11.19.6. Installation

NOTE

When installing torque link, ensure tooling bosses are facing outboard.

a. **Install link (1) on swashplate (18).** Torque bolt (21) **75 to 91 FOOT-POUNDS**.

(1) Aline link (1) with swashplate (18).

(2) Install bushing (23) in swashplate (18).

(3) Position nut (20).

CAUTION

Threads of bolt and nut shall be clean, and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

(4) Apply a light coat of corrosion preventive compound to shank of bolt (21). Use corrosion preventive compound (item 62A, App F).

(5) Install bolt (21) through washer(s) (22) (if required), bushing (23), swashplate (18), and link (1).

(6) Check fit of self-retaining bolt (21) (para 11.1).

(7) Hold bolt (21). Install nut (20). Use open end wrench and socket.

(8) Torque bolt (21) to **75 FOOT-POUNDS**. Use torque wrench and socket.

(9) Increase torque to aline cotter pin hole, but do not exceed **91 FOOT-POUNDS**.

(10) Install new cotter pin (19).

(11) Apply sealing compound around bolt (21) head, washer (22), and nut (20). Use sealing compound (item 176, App F).

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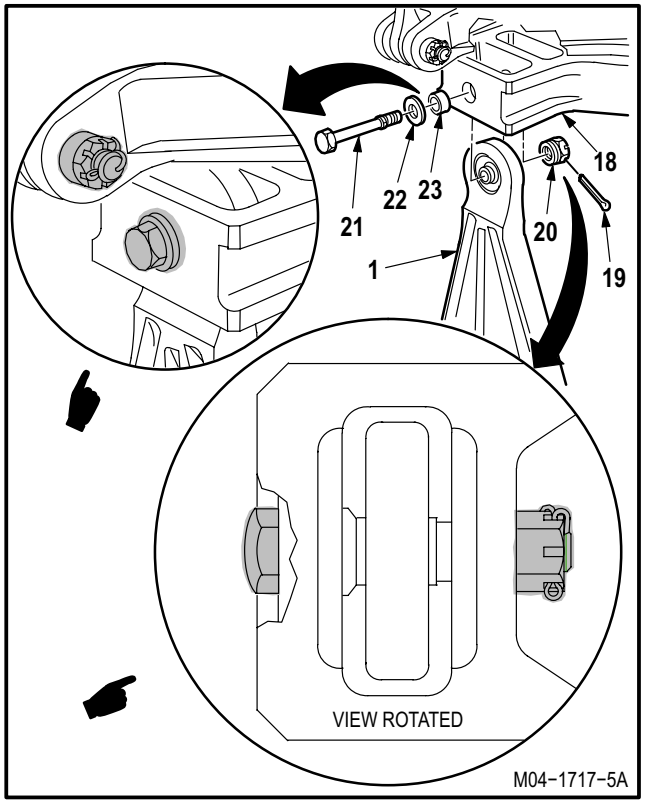
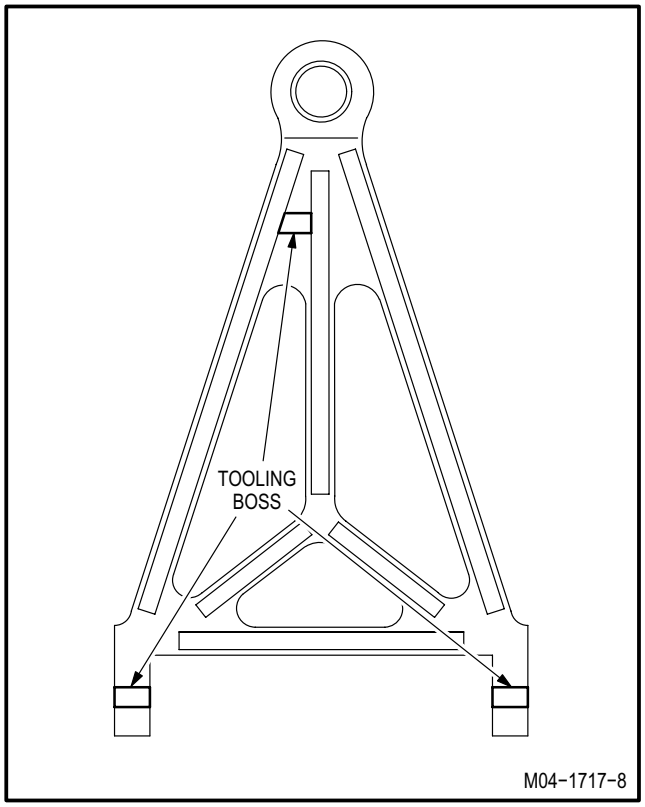




11.19. TORQUE LINK REMOVAL/INSTALLATION – continued

b. **Install link (1) to left side of aft bellcrank (10).** Torque nut (13) **300 to 700 INCH-POUNDS**.

(1) Aline link (1) with bellcrank (10).

(2) Install spacer (17) in bellcrank (10).

CAUTION

Threads of bolt and nut shall be clean, and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

NOTE

Maximum of two washers allowed under bolt head to ensure bearing clamp-up and pin alinement.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (12). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (12) through washer(s) (16) (if required), spacer (17), bellcrank (10), and link (1).

(5) Hold bolt (12). Install washer (15) and nut (13). Use open end wrench and socket.

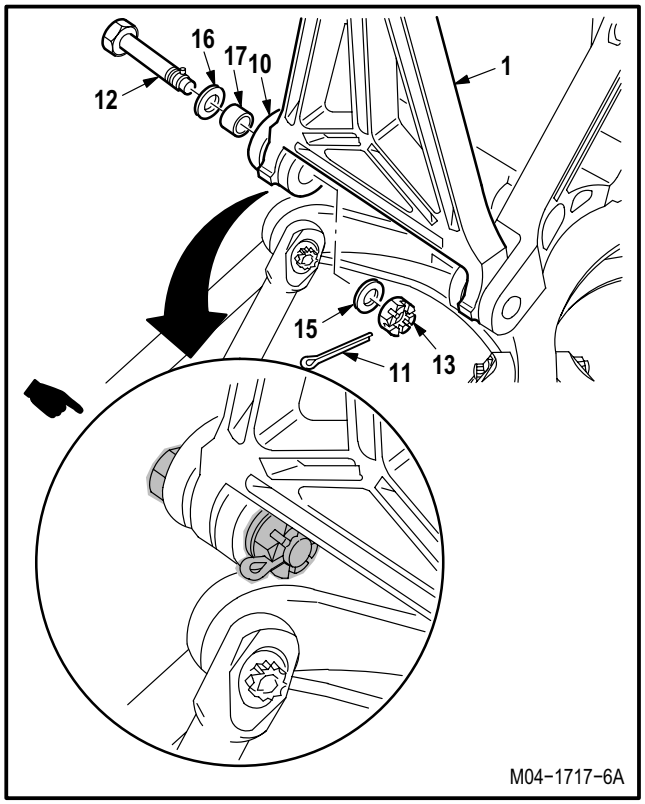
(6) Hold bolt (12). Use open end wrench.

(7) Torque nut (13) to **300 INCH-POUNDS**. Use torque wrench, adapter, and socket.

(8) Increase torque to aline cotter pin hole, but do not exceed **700 INCH-POUNDS**.

(9) Install new cotter pin (11).

(10) Apply sealing compound around bolt (12) head, washer (16), and nut (13). Use sealing compound (item 176, App F).



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11.19. TORQUE LINK REMOVAL/INSTALLATION – continued

c. **Install torque link (1) to right side of bellcrank (2).** Torque nut (5) **300 to 700 INCH-POUNDS**.

(1) Aline link (1) with bellcrank (2).

(2) Install spacer (9) in bellcrank (2).

CAUTION

Threads of bolt and nut shall be clean, and compound free. Contaminated threads can cause improper torque, which may cause damage to flight control system.

NOTE

Maximum of two washers allowed under bolt head to ensure bearing clamp-up and pin alinement.

(3) Apply a light coat of corrosion preventive compound to shank of bolt (4). Use corrosion preventive compound (item 62A, App F).

(4) Install bolt (4) through washer(s) (8) (if required), spacer (9), bellcrank (2), and link (1).

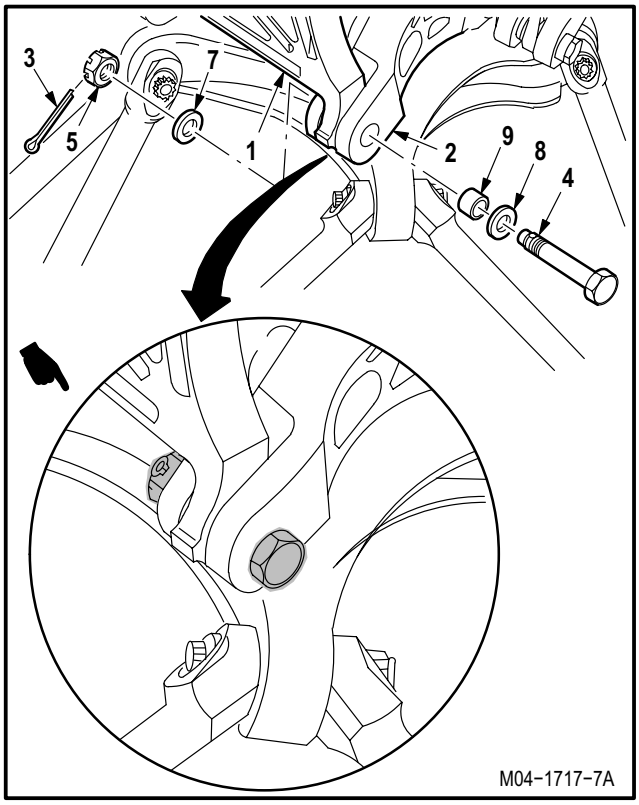
(5) Hold bolt (4). Install washer (7) and nut (5). Use open end wrench and socket.

(6) Torque nut (5) to **300 INCH-POUNDS**. Use torque wrench, adapter, and socket.

(7) Increase torque to aline cotter pin hole, but do not exceed **700 INCH-POUNDS**.

(8) Install new cotter pin (3).

(9) Apply sealing compound around bolt (4) head, washer (8), and nut (5). Use sealing compound (item 176, App F).



d. **Inspect (QA).**

e. **Install access fairing T205L** (para 2.2)**.**

f Perform flight control system maintenance operational check (TM 1-1520-238-T).

END OF TASK

11.20. PILOT OR CPG COLLECTIVE STICK REMOVAL

11.20.1. Description

This task covers: Removal. Cleaning. Inspection.

11.20.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer

Equipment Conditions:

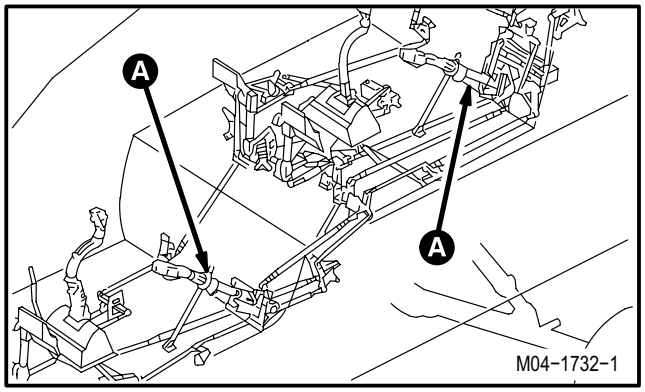
Ref	Condition
1.57	Helicopter safed
11.44	Collective stick cover removed

NOTE

This task is typical for pilot and CPG collective stick except as noted.

11.20.3. Removal

a. **Enter pilot or CPG station** (para 1.56)**. Observe all safety precautions.**



NOTE

Hydraulic power may be required to reposition stick for ease of removal.

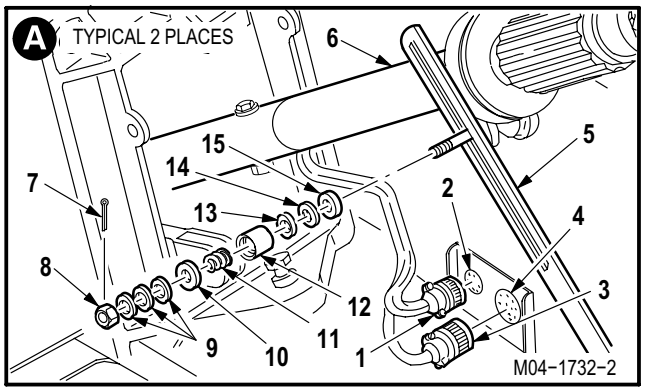
b. **Detach connector P1 (pilot)/P1 (CPG) (1) from receptacle J993 (pilot)/J994 (CPG) (2) and connector P107 (pilot)/P108 (CPG) (3) from receptacle J107 (pilot)/J108 (CPG) (4).**

c. **Remove guide (5) from collective stick (6).**

(1) Remove and discard cotter pin (7).

(2) Remove nut (8).

(3) Remove flat washers (9) (if necessary), flat washer (10), spring (11), retainer (12), concave washer (13), shouldered washer (14), and flat washer (15).



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11.20. PILOT OR CPG COLLECTIVE STICK REMOVAL – continued

d. **Remove stick (6) from arm (16).**

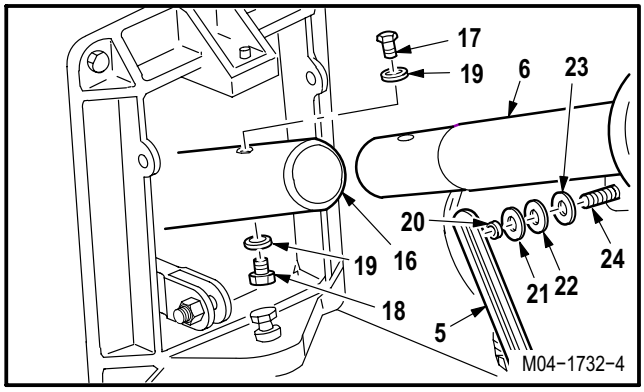
(1) Remove lockwire from bolt (17).

(2) Remove bolts (17) and (18) and two washers (19).

(3) Remove guide (5) from stick (6).

(4) Remove bushing (20), flat washer (21), shouldered washer (22), and concave washer (23) from shaft (24).

(5) Remove stick (6) from arm (16).



11.20.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.20.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

END OF TASK

11.21. PILOT OR CPG COLLECTIVE STICK INSTALLATION

11.21.1. Description

This task covers: Installation. Adjustment.

11.21.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
0.0 - 10.0-pound weighing scale (item 272, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)
Wire (item 220, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

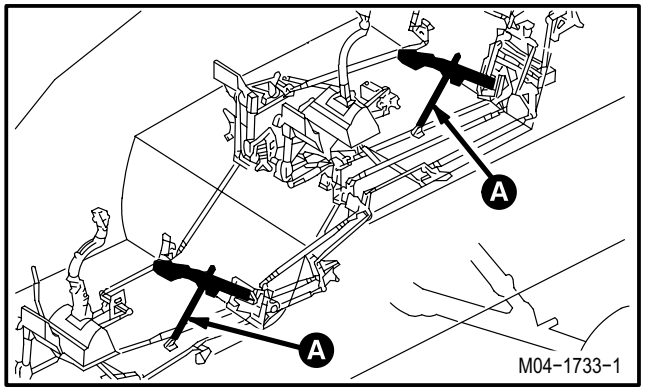
Ref	Condition
1.57	Helicopter safed
1.72	External hydraulic power connected

NOTE

This task is typical for pilot and CPG collective sticks except as noted.

11.21.3. Installation

a. **Enter pilot or CPG station** (para 1.56)**. Observe all safety precautions.**



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11.21. PILOT OR CPG COLLECTIVE STICK INSTALLATION – continued

b. **Install concave washer (1), shouldered washer (2), washer (3), and bushing (4) on shaft (5).**

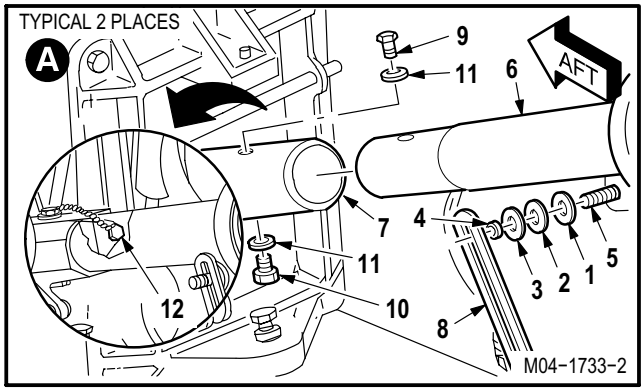
c. **Install stick (6) in arm (7).**

(1) Position stick (6) so that shaft (5) engages guide (8), and stick (6) will enter arm (7).

(2) Install stick (6) in arm (7).

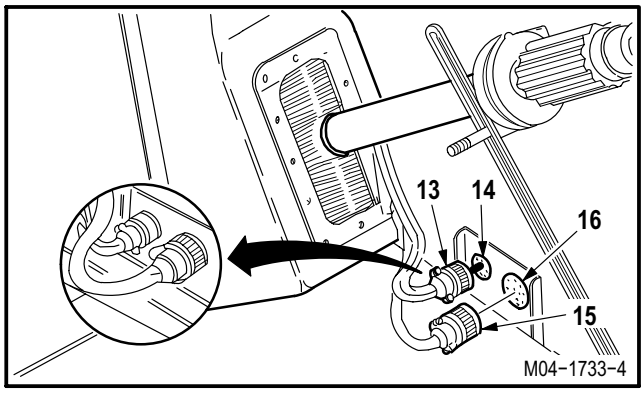
(3) Install two bolts (9) and (10) and washers (11).

(4) Lockwire bolt (9) to retainer (12). Use wire (item 220, App F).



d. **Attach connector P1 (pilot)/P1 (CPG) (13) to receptacle J993 (pilot)/J994 (CPG) (14) and connector P107 (pilot)/P108 (CPG) (15) to receptacle J107 (pilot)/J108 (CPG) (16).**

e. **Install collective stick cover** (para 11.44)**.**



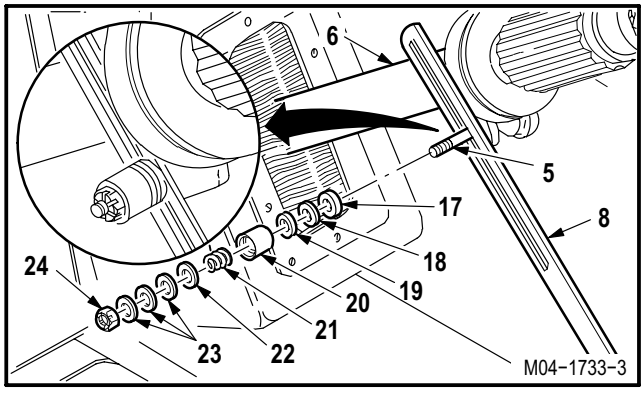
f. **Install collective stick (6) on guide (8).**

NOTE

Ensure retainer is installed flat side facing washers.

(1) Install washer (17), shouldered washer (18), concave washer (19), retainer (20) (with flat side facing washers), spring (21), washer (22), and washers (23) (as required) on shaft (5).

(2) Install nut (24) on shaft (5) so that nut (24) does not enter retainer (20).



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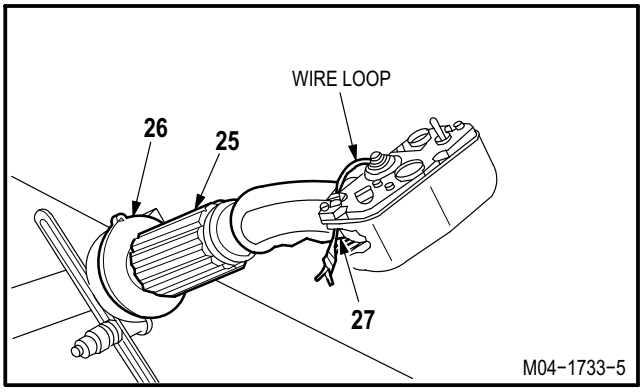
11.21. PILOT OR CPG COLLECTIVE STICK INSTALLATION – continued

g. **Turn grip handle (25) on pilot and CPG collective sticks to indicate zero on dial (26).**

h. **Make wire loop at grip (27) for attaching scale when making friction adjustments.** Use wire (item 220, App F).



11.21.4. Adjustment

WARNING

- **Application of hydraulic power could cause injury to personnel. Make certain all switches and controls are in safe condition before applying hydraulic power. Inform all personnel working on helicopter that hydraulic power is to be applied. If injury occurs, seek medical aid.**

- **To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.**

a. **Apply external hydraulic power** (para 1.72)**.**

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11.21. PILOT OR CPG COLLECTIVE STICK INSTALLATION – continued

NOTE

- Ensure CPG collective stick is adjusted before adjusting pilot collective stick.
- Ensure nut on pilot collective friction is loosened prior to adjusting CPG collective friction.

b. **Adjust friction range on CPG collective stick (6) (0.25 to 1.00 pound).** Use scale.

(1) Attach scale to wire loop at grip (27).

(2) Check for friction pull of **0.25 to 1.00 POUND**.

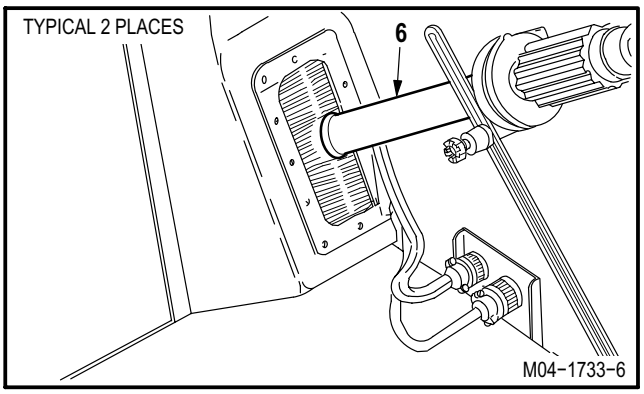
(a) If friction is within the required limits, go to step b.(4).

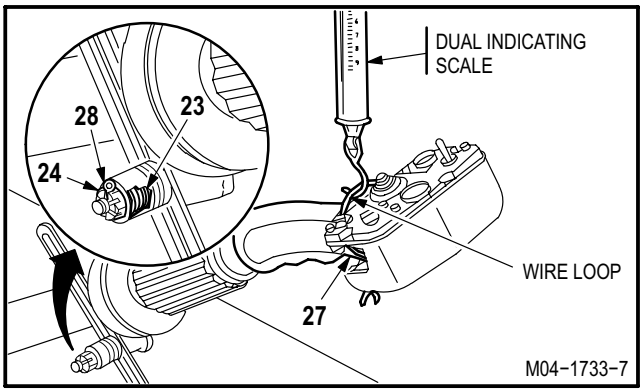
(b) If pull is less than **0.25 POUND**, remove nut (24) and add washers (23) until desired pull is obtained.

(c) If pull is greater than **1.00 POUND**, remove nut (24) and washers (23) until desired pull is obtained.

(3) Install nut (24).

(4) Aline cotter pin hole and install new cotter pin (28).

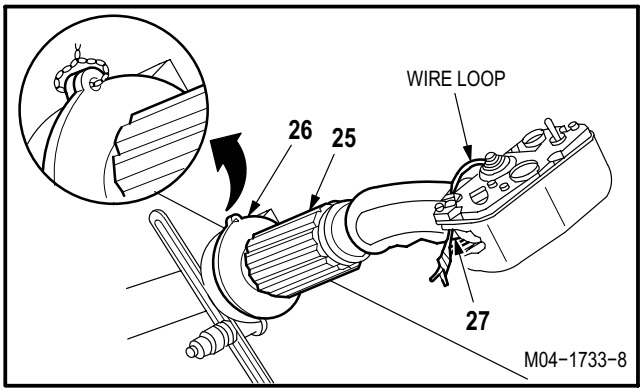




(5) Lockwire grip handle (25) to dial (26). Use wire (item 220, App F).

c. **Remove wire loop from grip (27).**

d. **Inspect (QA).**



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11.21. PILOT OR CPG COLLECTIVE STICK INSTALLATION – continued

e. **Adjust friction range on pilot collective stick (6) (4.00 to 6.00 POUNDS).**

(1) Attach scale at pilot grip (27).

(2) Check for friction pull of **4.0 to 6.0 POUNDS**.

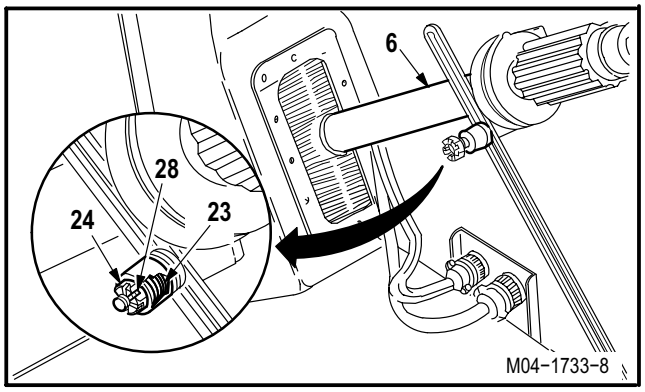
(a) If friction is within the required limits, go to step e.(4).

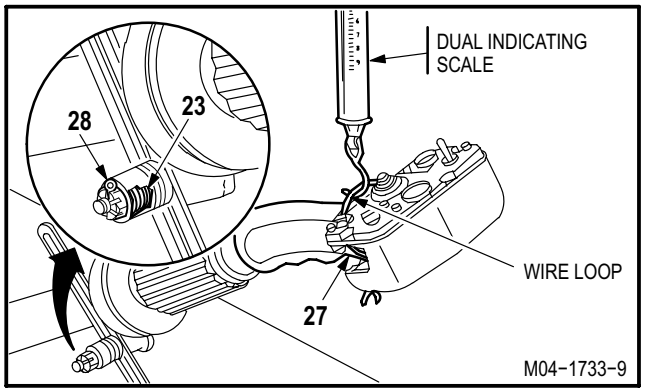
(b) If pull is less than **4.0 POUNDS**, remove nut (24) and add washers (23) until desired pull is obtained.

(c) If pull is greater than **6.0 POUNDS**, remove nut (24) and washers (23) until desired pull is obtained.

(3) Install nut (24).

(4) Aline cotter pin hole and install new cotter pin (28).





f. **Remove wire loop from grip (27).**

g. **Inspect (QA).**

h. **Remove primary external power hydraulic** (para 1.72)**.**

i. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.22. FRICTION GUIDE REMOVAL/INSTALLATION

11.22.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.22.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

Materials/Parts:

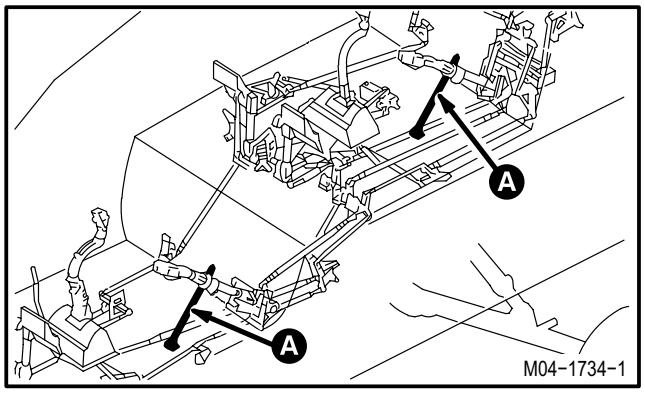
Cotter pin (2)

NOTE

This task is typical for pilot or CPG collective stick.

11.22.3. Removal

a. **Enter pilot or CPG station** (para 1.56)**. Observe all safety precautions.**

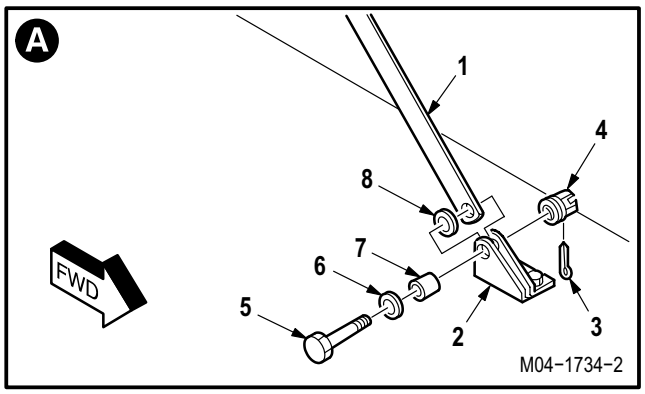


b. **Remove guide (1) from base (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), bushing (7), guide (1), and washer (8).



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11.22. FRICTION GUIDE REMOVAL/INSTALLATION – continued

c. **Remove guide (1) from collective stick (9).**

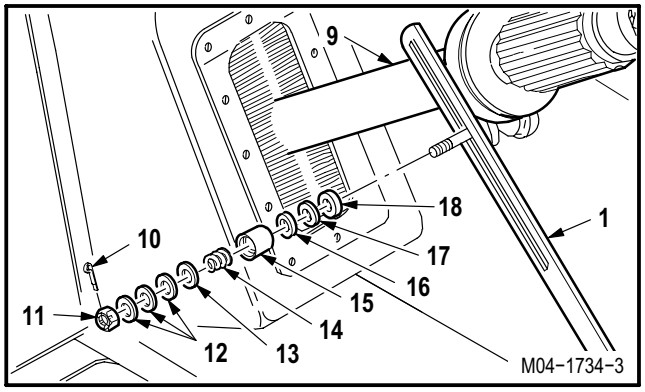
(1) Remove and discard cotter pin (10).

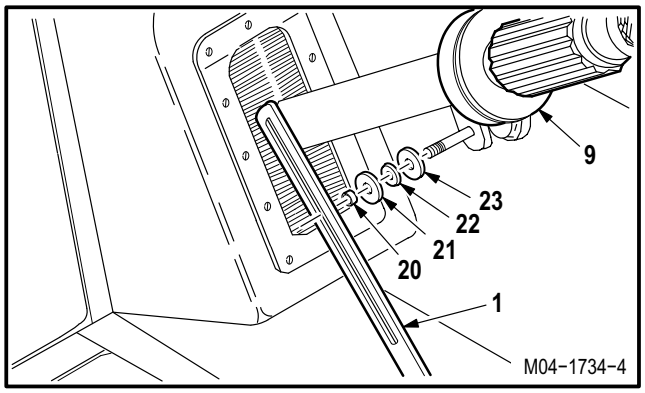
(2) Remove nut (11).

(3) Remove washers (12) (if necessary), washer (13), spring (14), retainer (15), concave washer (16), shouldered washer (17), and washer (18).

(4) Remove guide (1) from collective stick (9).

(5) Remove bushing (20), washer (21), shouldered washer (22), and concave washer (23).





11.22.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.22.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.22. FRICTION GUIDE REMOVAL/INSTALLATION – continued

11.22.6. Installation

a. **Install guide (1) on collective stick (9).**

(1) Install concave washer (23), shouldered washer (22), washer (21), and bushing (20) on stud (24).

(2) Install guide (1) on shaft (24).

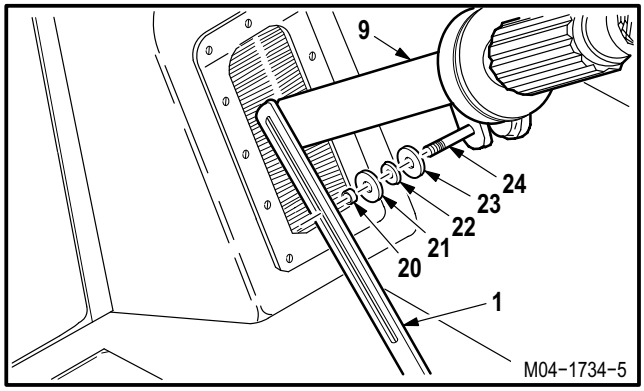
NOTE

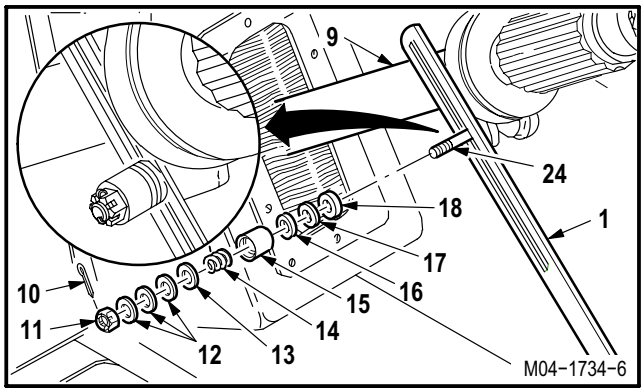
Be sure to install retainer with flat side facing washers.

(3) Install washer (18), shouldered washer (17), concave washer (16), retainer (15) (with flat side facing washers), spring (14), washer (13), and washer(s) (12) (if necessary) on shaft (24).

(4) Install nut (11).

(5) Install new cotter pin (10).





b. **Install guide (1) on base (2).**

(1) Aline guide (1) with base (2).

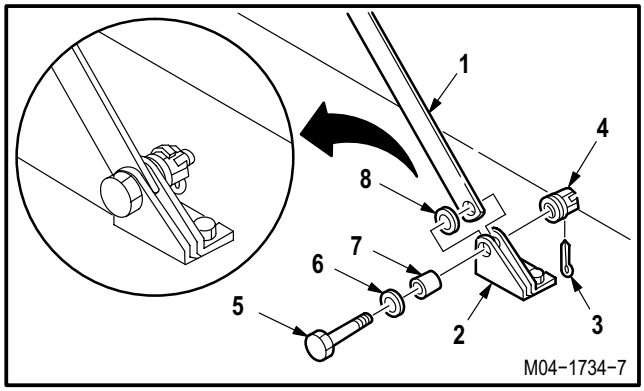
(2) Install washer (8) between guide (1) and base (2).

(3) Install bushing (7) in base (2).

(4) Install bolt (5) through washer (6), bushing (7), base (2), washer (8), and guide (1).

(5) Install nut (4).

(6) Install new cotter pin (3).



c. **Inspect (QA).**

11.22.7. Adjustment

a. **Adjust friction range on CPG and pilot collective stick** (para 11.21)**.**

END OF TASK

11.23. PILOT COLLECTIVE STICK SHEAR PIN REPLACEMENT

11.23.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.23.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Materials/Parts:

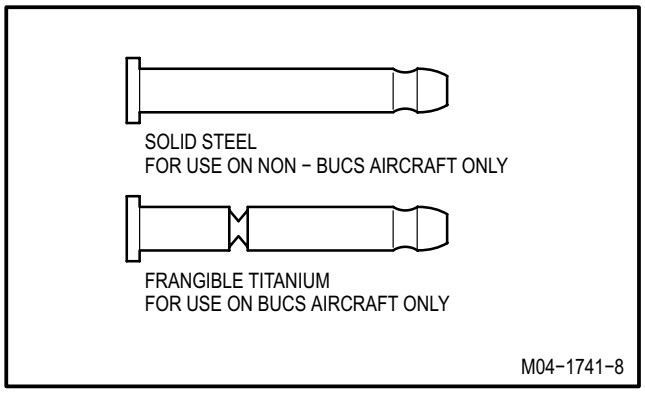
- Shear pin
- Petrolatum (item 138, App F)
- Wire (item 220, App F)

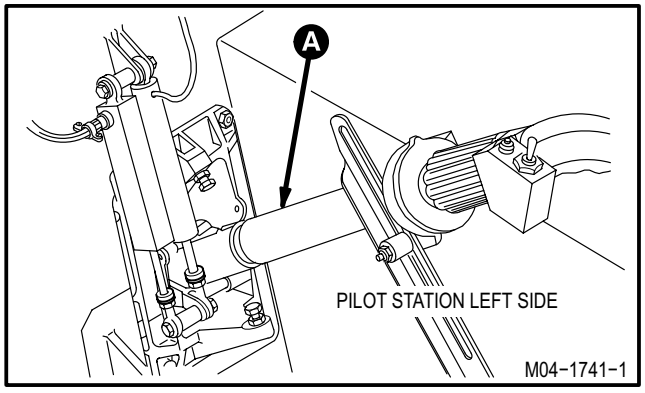
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.44	Collective stick cover removed

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.





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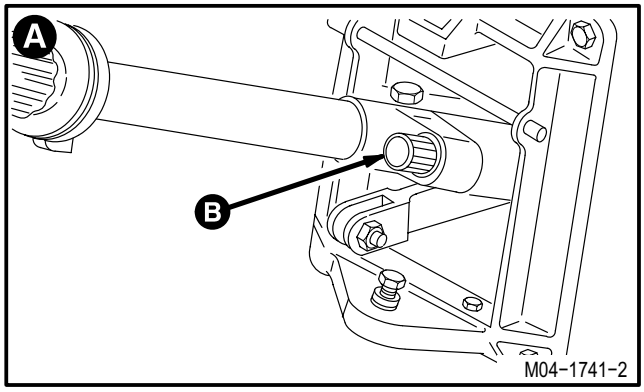
11.23. PILOT COLLECTIVE STICK SHEAR PIN REPLACEMENT – continued

11.23.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

NOTE

If shear pin(s) cannot be removed by conventional means, after repeated attempts from any of the SPAD assemblies (CPG or pilot), deliberately shearing the pin is permitted. Ensure the ends of the pins are removed.



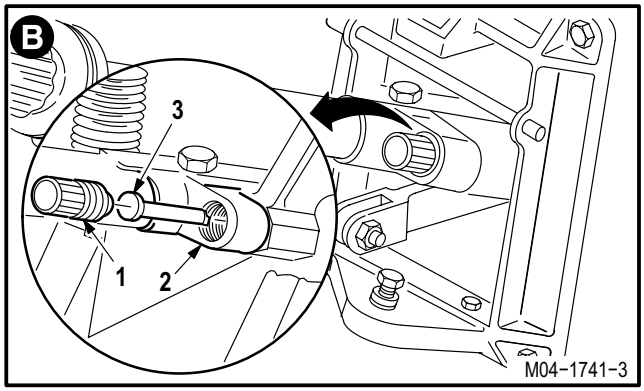
b. **Remove shear pin retainer (1) from arm (2).**

(1) Remove lockwire.

(2) Remove retainer (1).

NOTE

Remove shear pin in pieces if sheared.

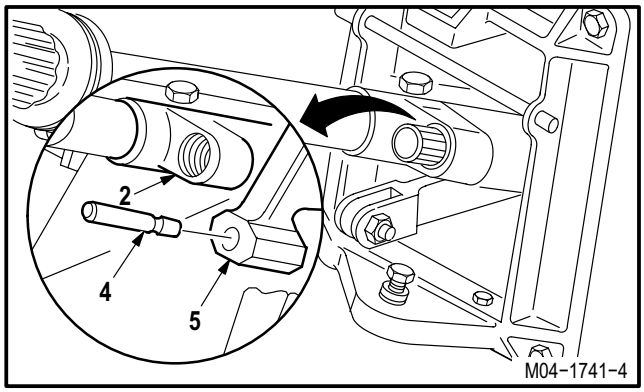


c. **Remove and discard shear pin half (3) from arm (2).**

d. **Remove and discard shear pin half (4) from lever (5).**

(1) Move arm (2) to allow access to shear pin half (4).

(2) Remove and discard shear pin half (4) from lever (5).



11.23.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.23.5. Inspection

a. **Check retainer for damaged threads.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.23. PILOT COLLECTIVE STICK SHEAR PIN REPLACEMENT – continued

11.23.6. Installation

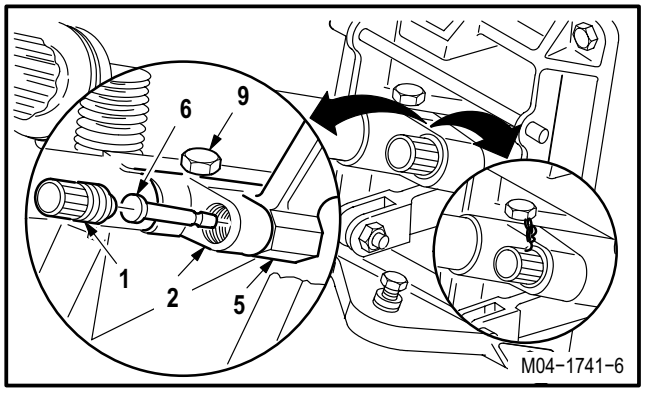
a. **Install new shear pin (6) in arm (2) and lever (5).**

(1) Apply petrolatum to tapered end of shear pin (6). Use petrolatum (item 138, App F).

(2) Aline arm (2) with lever (5).

(3) Ensure that switch detent (7) and switch position lever (8) are engaged.

(4) Install shear pin (6) through arm (2) and lever (5).



NOTE

Install retainer finger tight.

b. **Install retainer (1) on arm (2).**

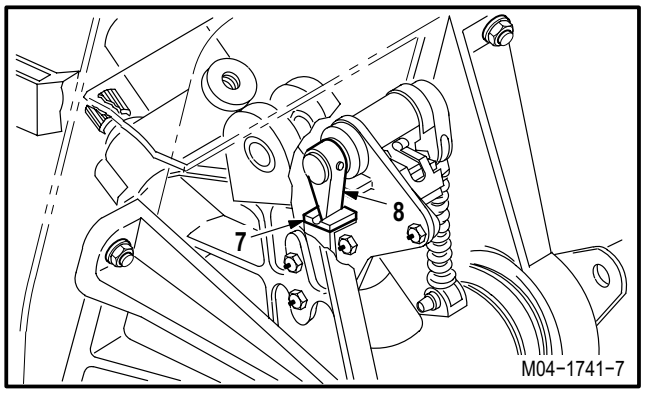
c. **Lockwire retainer (1) to bolt (9).** Use wire (item 220, App F).

d. **Inspect (QA).**

e. **Install collective stick cover** (para 11.44)**.**

f. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

g. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.24. COLLECTIVE STICK GRIP ASSEMBLY REMOVAL/INSTALLATION

11.24.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.24.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Multimeter (item 215, App H)

References:

TM 55-1500-323-24

Materials/Parts:

Tape (item 202, App F)
Wire (item 222, App F)

Personnel Required:

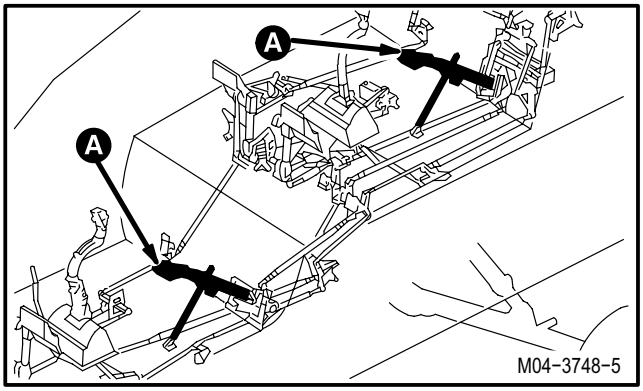
68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

NOTE

This task is typical for pilot or CPG collective stick.



11.24.3. Removal

a. **Enter pilot or CPG station** (para 1.56)**. Observe all safety precautions.**

GO TO NEXT PAGE

11.24. COLLECTIVE STICK GRIP ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Detach connector P107 (pilot)/P108 (CPG) (1) from receptacle J107 (pilot)/J108 (CPG) (2).**

c. **Depin wire bundles (3) and (4) from connector (1).**

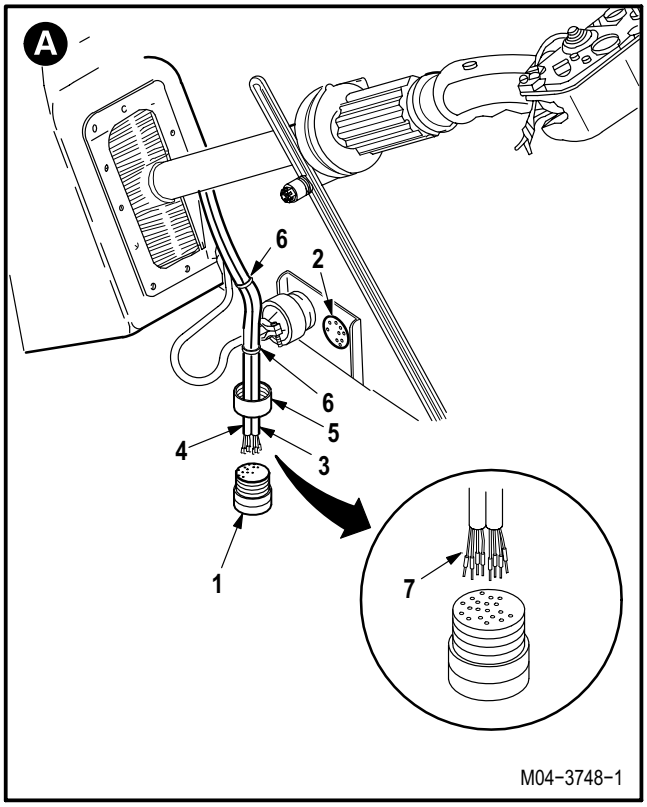
(1) Remove backshell (5) from connector (1).

(2) Cut and remove all tape (6) from wire bundles (3) and (4).

(3) Identify and depin all wires (7) in wire bundles (3) and (4) from connector (1) (TM 55-1500-323-24).

(4) Slide backshell (5) off wire bundles (3) and (4).

(5) Retain backshell (5) and connector (1).

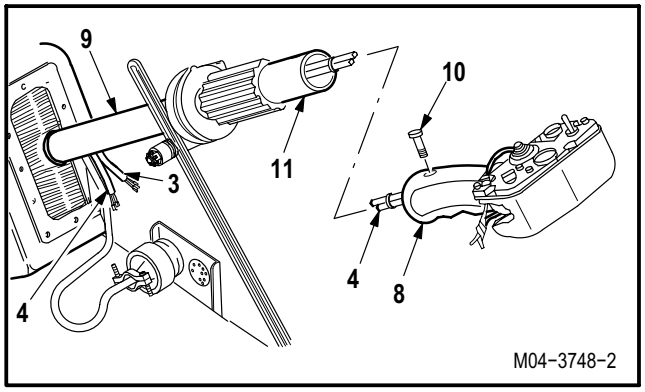


d. **Remove grip assembly (8) and wire bundles (3) and (4) from collective stick assembly (9).**

(1) Remove bolt (10).

(2) While pulling grip (8), feed wire bundles (3) and (4) into tube (11) of stick (9).

(3) Remove grip (8) and wire bundles (3) and (4).



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11.24. COLLECTIVE STICK GRIP ASSEMBLY REMOVAL/INSTALLATION – continued

11.24.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.24.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

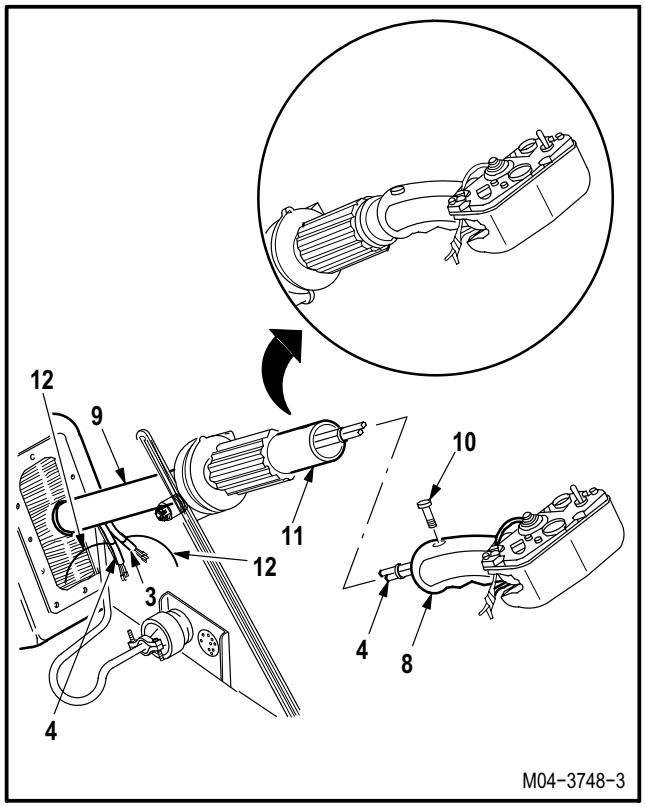
11.24.6. Installation

a. **Install grip (8) on stick (9).**

(1) Feed wire bundles (3) and (4) into tube (11) of stick (9).

(a) Use lockwire (12) to aid installation of wire bundles (3) and (4). Use wire (item 222, App F).

(2) Install bolt (10).



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11.24. COLLECTIVE STICK GRIP ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Pin wire bundles (3) and (4) to connector (1).**

(1) Remove lockwire (12) (if used).

(2) Slide backshell (5) over wire bundles (3) and (4).

(3) Pin identified wires (7) from wire bundles (3) and (4) to connector (1) (TM 55-1500-323-24).

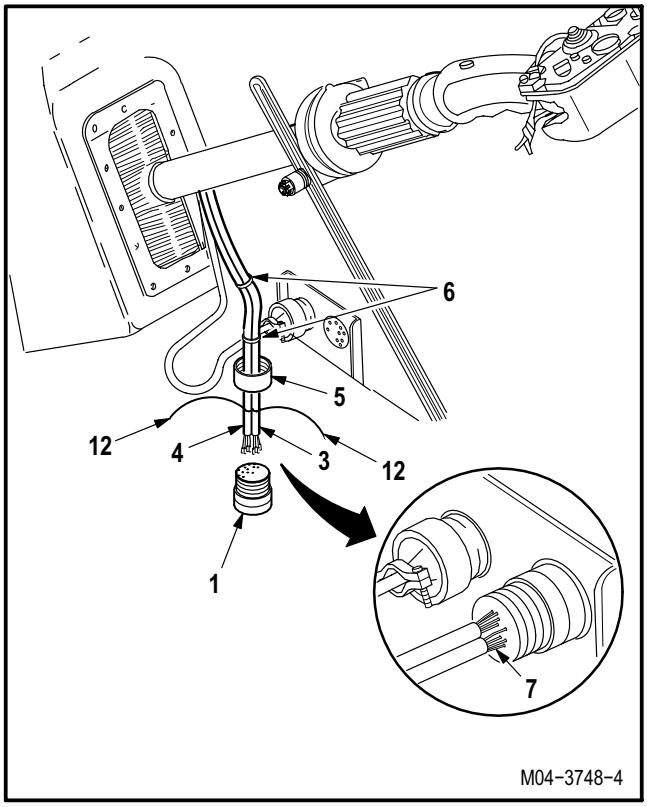
(4) Install backshell (5) on connector (1).

(5) Install new tape (6) on wire bundles (3) and (4) (as required). Use tape (item 202, App F).

c. **Perform continuity test.** Use multimeter (TM 55-1500-323-24).

d. **Attach connector P107 (pilot)/P108 (CPG) (1) to receptacle J107 (pilot)/J108 (CPG) (2).**

e. **Inspect (QA).**



END OF TASK

11.25. COLLECTIVE STICK GRIP CONTROL COLLAR REPLACEMENT

11.25.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.25.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
11.24	Collective stick grip assembly removed
11.34	Collective stick switch and bracket assembly removed

NOTE

This task is typical for pilot or CPG collective stick.

11.25.3. Removal

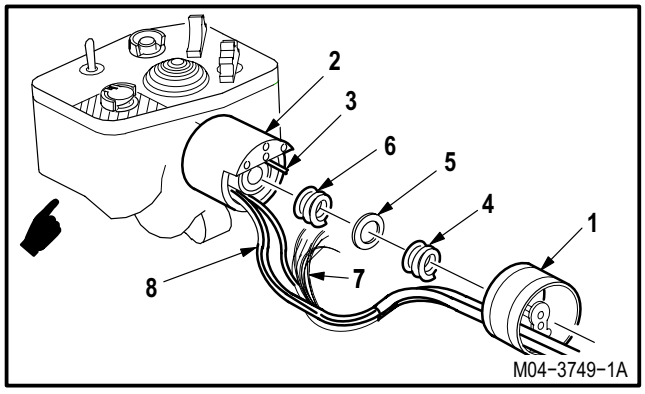
a. **Remove grip control collar (1) from control grip (2).**

(1) Pull collar (1) away from straight pin (3) and grip (2).

(2) Remove spring (4), washer (5), and spring (6).

(3) Slide collar (1) over wire bundles (7) and (8).

(4) Discard collar (1).



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11.25. COLLECTIVE STICK GRIP CONTROL COLLAR REPLACEMENT – continued

11.25.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.25.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage.** None allowed.

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check switch and bracket assembly detent area where the straight pin from the grip control collar interfaces.**

(1) Maximum allowable gouging in detent area is **0.010 INCH** deep and **0.035 INCH** wide.

11.25.6. Installation

a. **Install collar (1) on grip (2).**

(1) Install spring (6), washer (5), and spring (4).

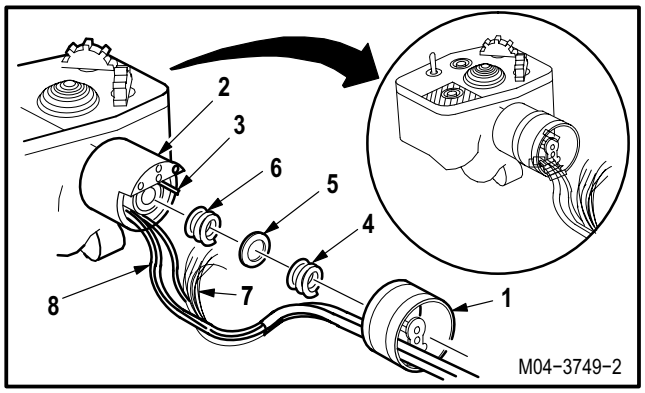
(2) Slide collar (1) over wire bundles (7) and (8).

(3) Aline collar (1) on straight pin (3) and install.

b. **Inspect (QA).**

c. **Install collective stick switch and bracket assembly** (para 11.34)**.**

d. **Install collective stick grip assembly** (para 11.24)**.**



END OF TASK

11.26. COLLECTIVE STICK STABILATOR MANUAL SWITCH REMOVAL/INSTALLATION

11.26.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.26.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

References:

TM 1-1520-238-T
TM 55-1500-323-24

Materials/Parts:

Solder (item 189, App F)

Personnel Required:

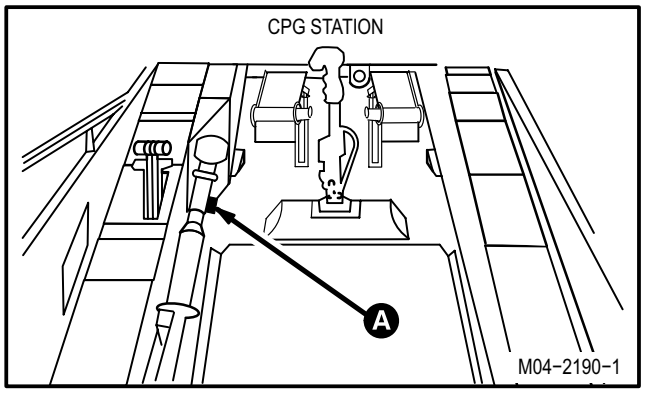
68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.24	Collective stick grip assembly removed

NOTE

This task is typical for CPG or pilot station switch assembly. CPG switch assembly shown.



11.26.3. Removal

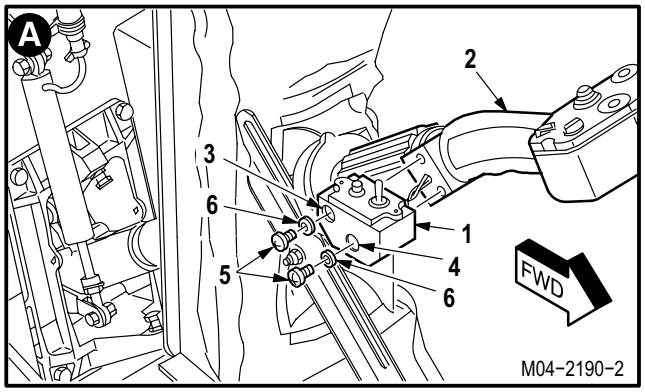
a. **Enter pilot/CPG station** (para 1.56)**. Observe all safety precautions.**

b. **Remove switch chassis (1) from collective stick (2).**

(1) Install screwdriver through holes (3) and (4) in chassis (1).

(2) Remove two screws (5) and washers (6).

(3) Remove chassis (1).



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11.26. COLLECTIVE STICK STABILATOR MANUAL SWITCH REMOVAL/INSTALLATION – continued

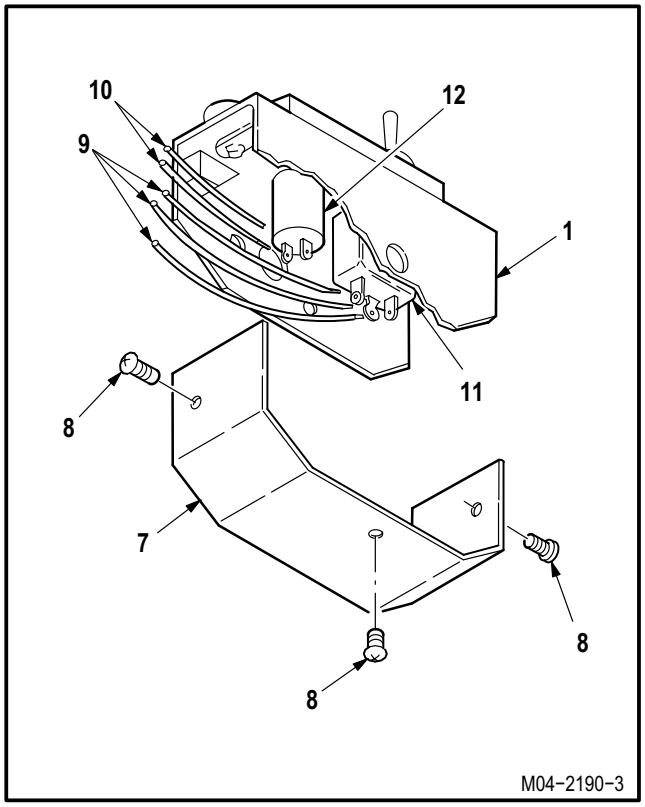
c. **Remove cover (7) from chassis (1).**

(1) Remove three screws (8).

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

d. **Identify and desolder wires (9) and (10) from switches (11) and (12).** Use soldering iron (TM 55-1500-323-24).



11.26.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.26.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.26. COLLECTIVE STICK STABILATOR MANUAL SWITCH REMOVAL/INSTALLATION – continued

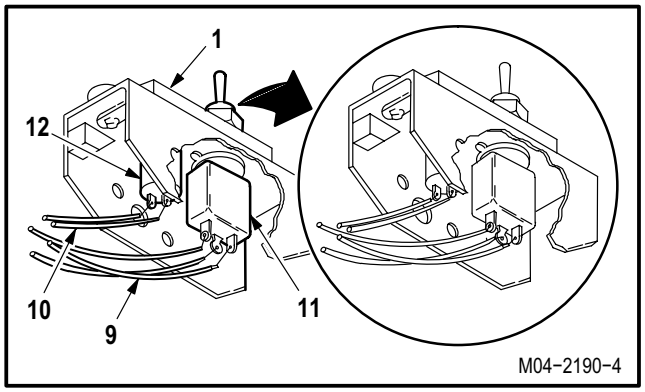
11.26.6. Installation

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

a. **Solder identified wires (9) and (10) to switches (11) and (12).** Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).

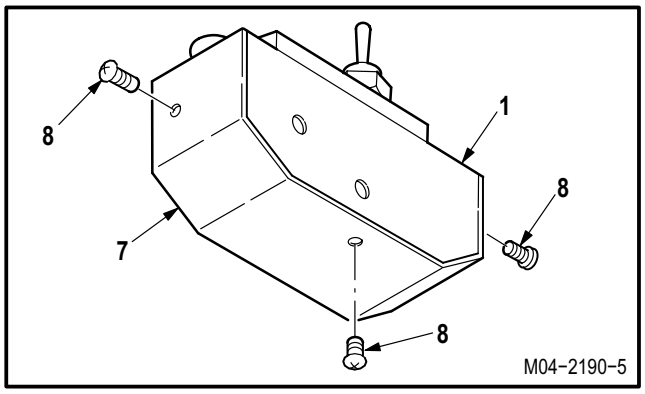
b. **Inspect (QA).**



c. **Install cover (7) on chassis (1).**

(1) Position cover (7) on chassis (1).

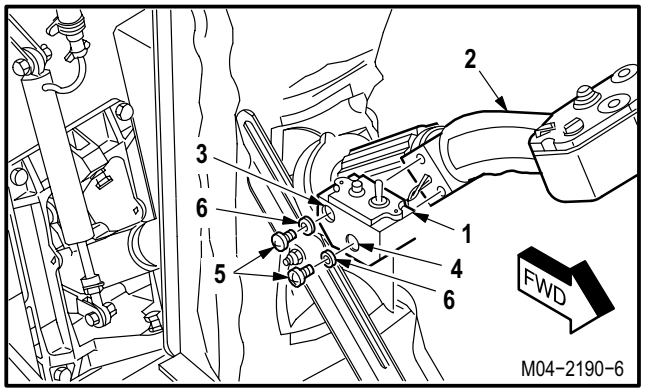
(2) Install three screws (8).



d. **Install switch assembly (1) on collective stick (2).**

(1) Position switch assembly (1) on stick (2).

(2) Install two screws (5) and washers (6) through holes (3) and (4) into stick (2).



e. **Inspect (QA).**

f. **Install collective stick grip assembly** (para 11.24)**.**

g. **Perform stabilator maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.27. COLLECTIVE STICK SEARCHLIGHT ON/OFF SWITCH REPLACEMENT

11.27.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.27.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

References:

TM 1-1520-238-T
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.24	Collective stick grip assembly removed

NOTE

This task is typical for pilot or CPG collective stick.

11.27.3. Removal

a. **Remove knobs (1) and (2).**

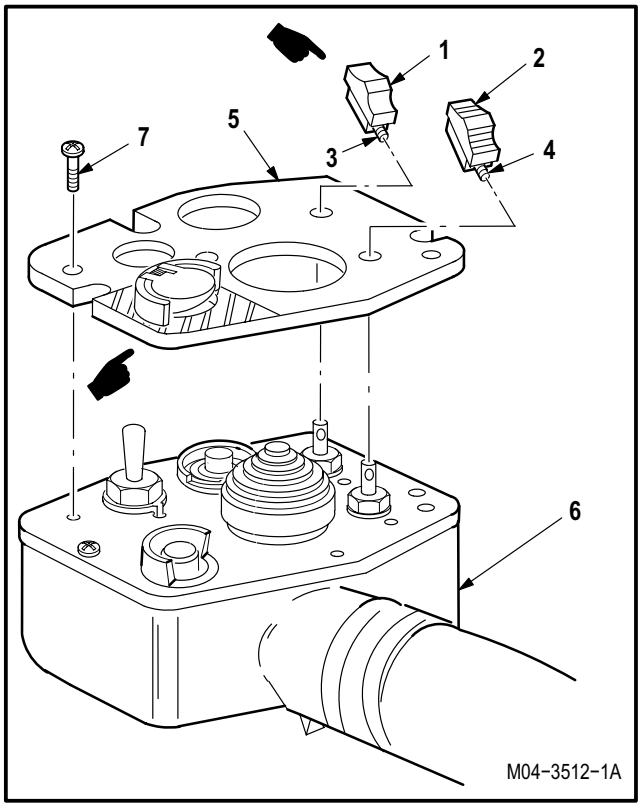
(1) Loosen setscrews (3) and (4).

(2) Remove knobs (1) and (2).

b. **Remove indicator panel (5) from collective grip (6).**

(1) Remove three screws (7).

(2) Remove panel (5).



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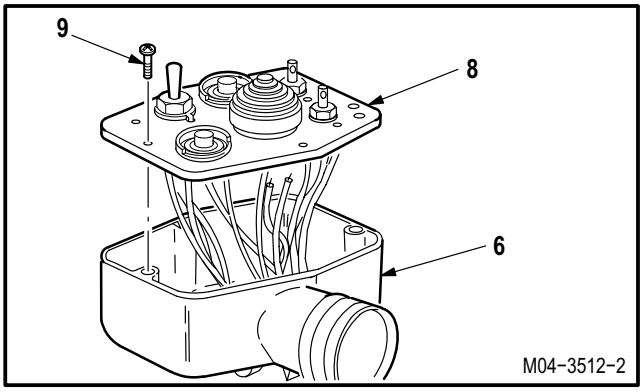
11.27. COLLECTIVE STICK SEARCHLIGHT ON/OFF SWITCH REPLACEMENT – continued

c. **Remove switch mounting plate (8) from grip (6).**

(1) Remove three screws (9).

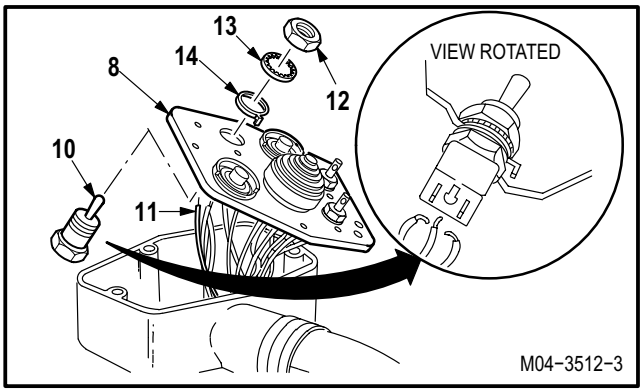
(2) Remove plate (8).



d. **Remove adhesive from switch (10) terminals** (para 1.47)**.**

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.



e. **Desolder wires (11) from switch (10).**

(1) Identify and desolder wires (11) from switch (10). Use soldering iron (TM 55-1500-323-24).

f. **Remove switch (10) from switch mounting plate (8).**

(1) Remove nut (12) and washer (13).

(2) Remove and discard switch (10) and key-washer (14).

11.27.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

GO TO NEXT PAGE

11.27. COLLECTIVE STICK SEARCHLIGHT ON/OFF SWITCH REPLACEMENT – continued

11.27.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

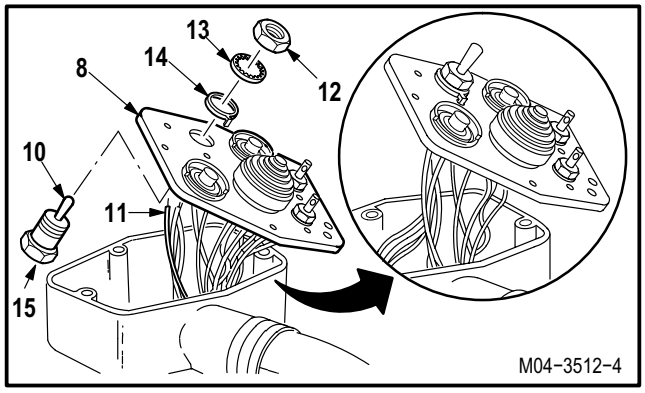
11.27.6. Installation

a. **Install new switch (10) on plate (8).**

(1) Adjust nut (15) on switch (10) ensuring that only two threads extend below nut (15).

(2) Install switch (10) on plate (8).

(3) Install keywasher (14), washer (13), and nut (12) on switch (10).

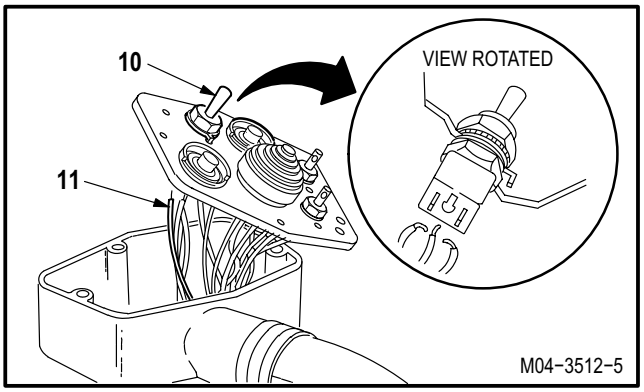


WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

b. **Solder wires (11) to switch (10).**

(1) Solder identified wires (11) to switch (10). Use solder (item 189, App F) and soldering iron (TM 55-1500-323-24).



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11.27. COLLECTIVE STICK SEARCHLIGHT ON/OFF SWITCH REPLACEMENT – continued

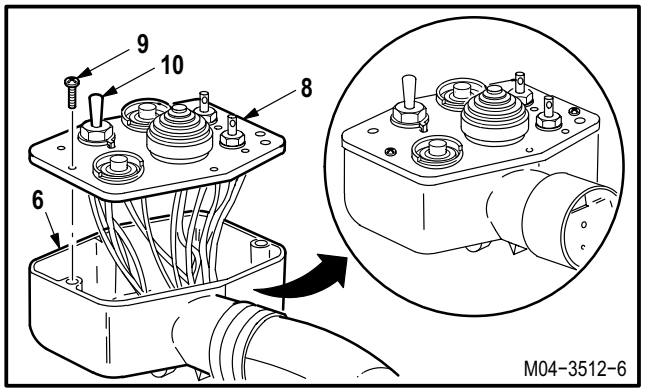
c. **Apply a thin coat of adhesive over switch (10) terminals and bare wires.** Use adhesive (item 14, App F).

d. **Inspect (QA).**

e. **Install plate (8) on grip (6).**

(1) Install plate (8) on grip (6).

(2) Install three screws (9).



f. **Install panel (5) on grip (6).**

(1) Install panel (5) on grip (6).

(2) Install three screws (7).

g. **Install knobs (1) and (2).**

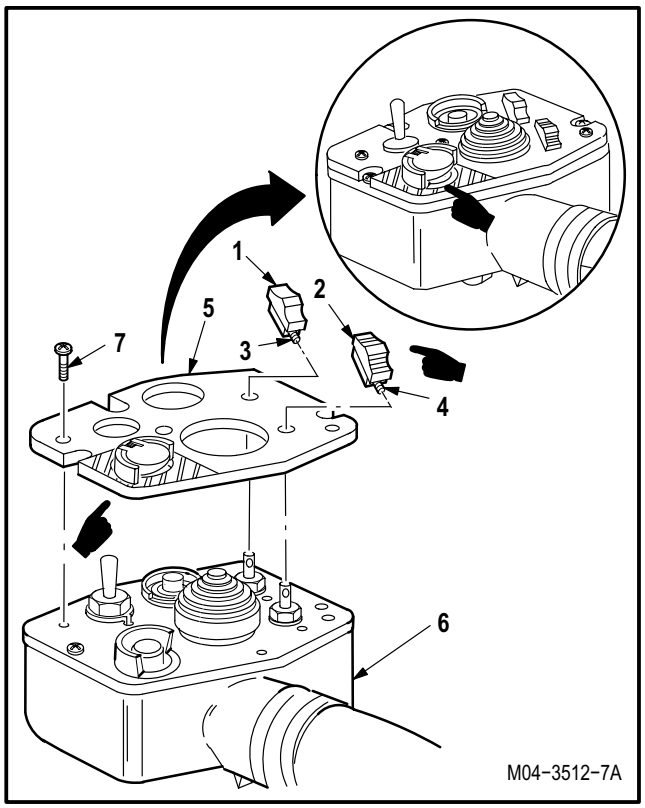
(1) Install knobs (1) and (2).

(2) Tighten setscrews (3) and (4).

h. **Inspect (QA).**

i. **Install collective stick grip assembly** (para 11.24)**.**

j. **Perform landing/searchlight maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.28. COLLECTIVE STICK SEARCHLIGHT DIRECTIONAL SWITCH REPLACEMENT

11.28.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.28.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

References:

TM 1-1520-238-T
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.24	Collective stick grip assembly removed

NOTE

This task is typical for pilot or CPG collective stick.

11.28.3. Removal

a. **Remove knobs (1) and (2).**

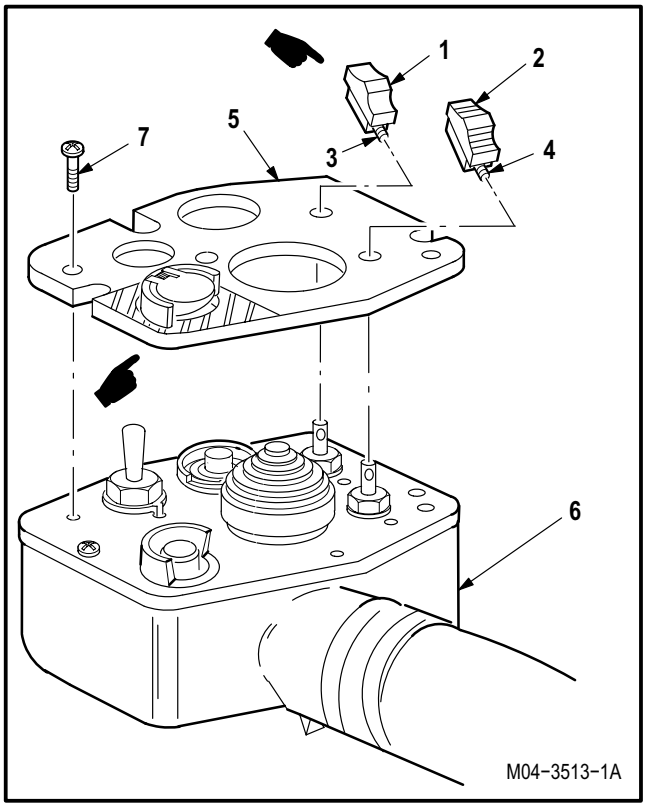
(1) Loosen setscrews (3) and (4).

(2) Remove knobs (1) and (2).

b. **Remove indicator panel (5) from grip (6).**

(1) Remove three screws (7).

(2) Remove panel (5).



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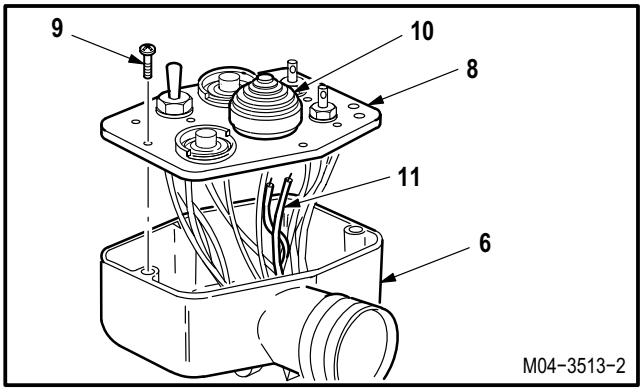
11.28. COLLECTIVE STICK SEARCHLIGHT DIRECTIONAL SWITCH REPLACEMENT – continued

c. **Remove switch mounting plate (8) from grip (6).**

(1) Remove three screws (9).

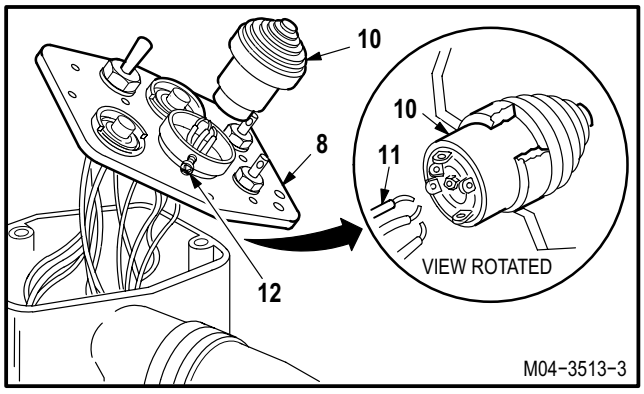
(2) Remove plate (8).



d. **Remove adhesive from switch (10) terminals** (para 1.47)**.**

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.



e. **Desolder wires (11) from switch (10).**

(1) Identify and desolder wires (11). Use soldering iron (TM 55-1500-323-24).

f. **Remove switch (10) from plate (8).**

(1) Loosen setscrew (12).

(2) Remove and discard switch (10).

11.28.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

GO TO NEXT PAGE

11.28. COLLECTIVE STICK SEARCHLIGHT DIRECTIONAL SWITCH REPLACEMENT – continued

11.28.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.28.6. Installation

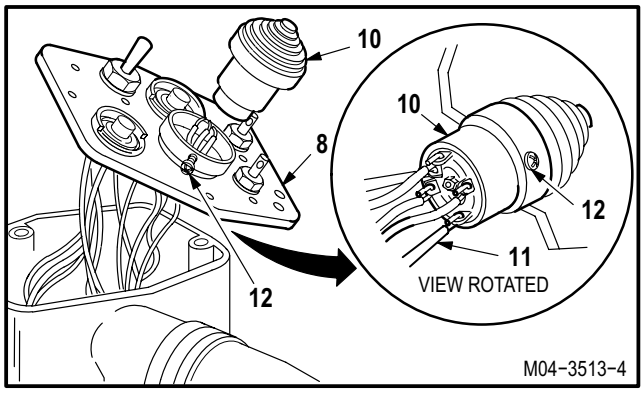
a. **Install new switch (10) on plate (8).**

(1) Install switch (10) on plate (8).

(2) Tighten setscrew (12).

WARNING

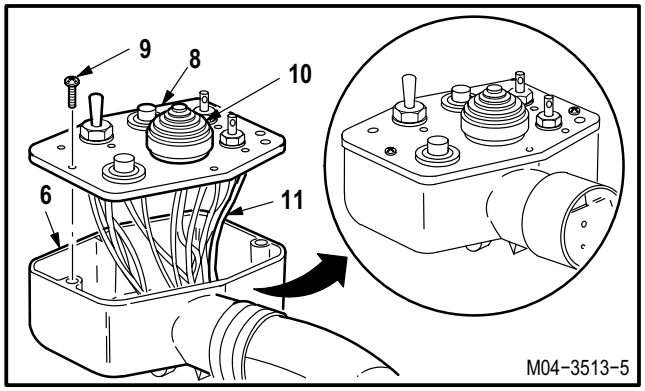
Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.



b. **Solder wires (11) to switch (10).**

(1) Solder identified wires (11) to switch (10). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).

c. **Apply a thin coat of adhesive over switch (10) terminals and bare wires.** Use adhesive (item 14, App F).



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11.28. COLLECTIVE STICK SEARCHLIGHT DIRECTIONAL SWITCH REPLACEMENT – continued

d. **Inspect (QA).**

e. **Install plate (8) on grip (6).**

(1) Position plate (8) on grip (6).

(2) Install three screws (9).

f. **Install panel (5) on grip (6).**

(1) Position panel (5) on grip (6).

(2) Install three screws (7).

g. **Install knobs (1) and (2) on grip (6).**

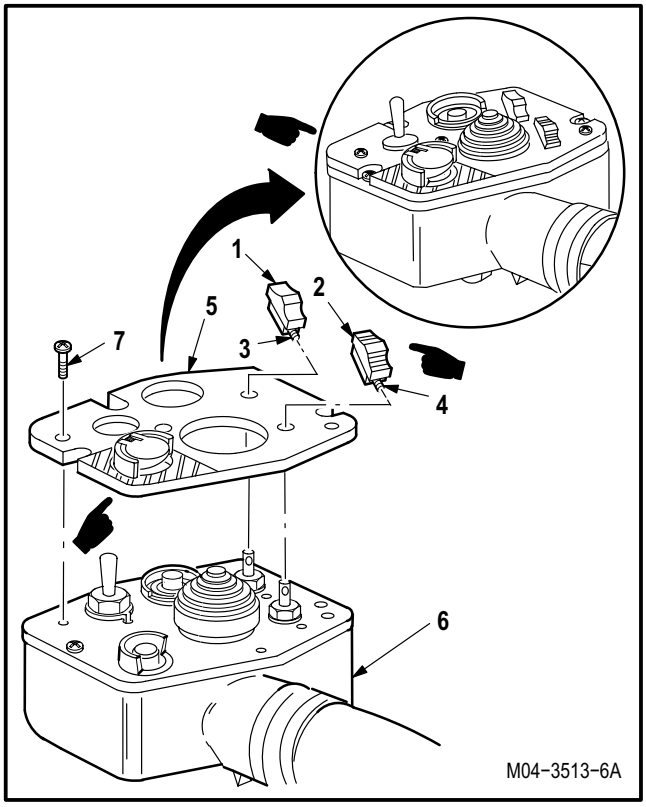
(1) Position knobs (1) and (2) on grip (6).

(2) Tighten setscrews (3) and (4).

h. **Inspect (QA).**

i. **Install collective stick grip assembly** (para 11.24)**.**

j. **Perform landing/searchlight maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.29. COLLECTIVE STICK STORES JETTISON SWITCH REPLACEMENT

11.29.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.29.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

References:

TM 1-1520-238-T
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)

Personnel Required:

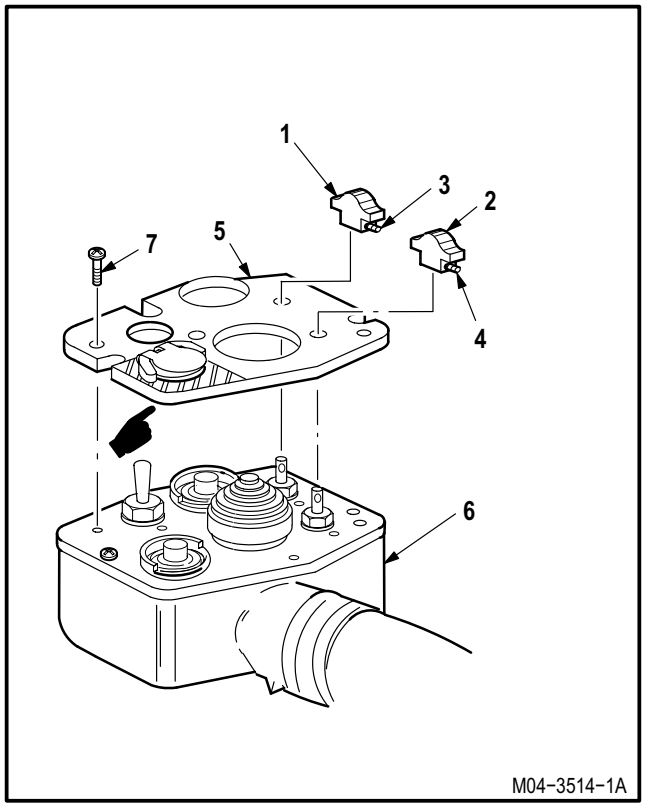
68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.24	Collective stick grip assembly removed

NOTE

This task is typical for pilot or CPG collective stick.



11.29.3. Removal

a. **Remove knobs (1) and (2).**

(1) Loosen setscrews (3) and (4).

(2) Remove knobs (1) and (2).

b. **Remove indicator panel (5) from collective grip (6).**

(1) Remove three screws (7).

(2) Remove panel (5).

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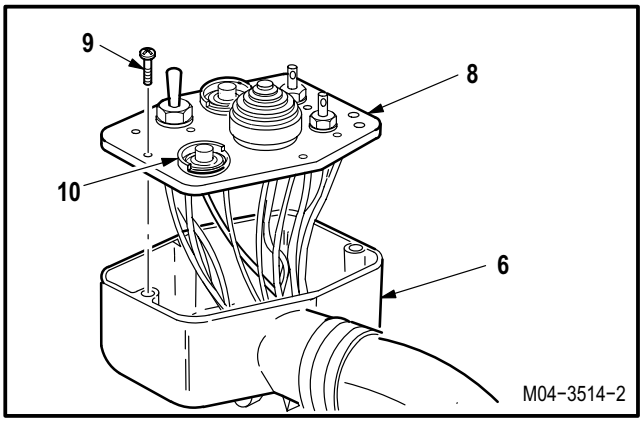
11.29. COLLECTIVE STICK STORES JETTISON SWITCH REPLACEMENT – continued

c. **Remove switch mounting plate (8) from collective grip (6).**

(1) Remove three screws (9).

(2) Raise plate (8).



d. **Remove sealant from switch (10) terminals** (para 1.47)**.**

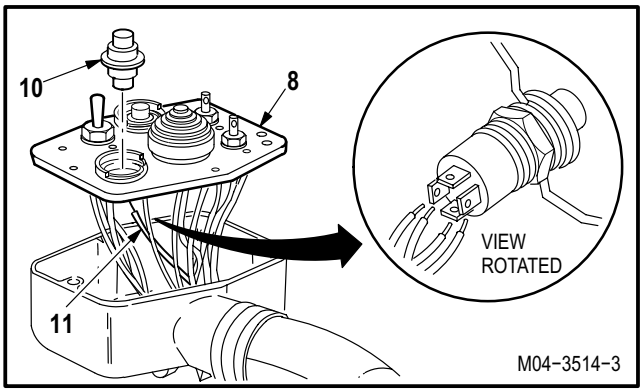
WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

e. **Detach wires (11) from switch (10).**

f. **Debond and remove switch (10) from plate (8).**

(1) Identify and desolder wires (11). Use soldering iron (TM 55-1500-323-24).



11.29.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.29.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

e. **Check switch cover for damage.** Repair cover (para 11.29A).

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11.29. COLLECTIVE STICK STORES JETTISON SWITCH REPLACEMENT – continued

11.29.6. Installation

a. **Install switch (10) on mounting plate (8).**

(1) Apply a small bead of adhesive to base of switch (10). Use adhesive (item 14, App F).

(2) Press switch (10) in mounting plate (8).

(3) Allow adhesive to cure.

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

b. **Solder wires (11) to switch (10).**

(1) Solder identified wires (11) to switch (10). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).

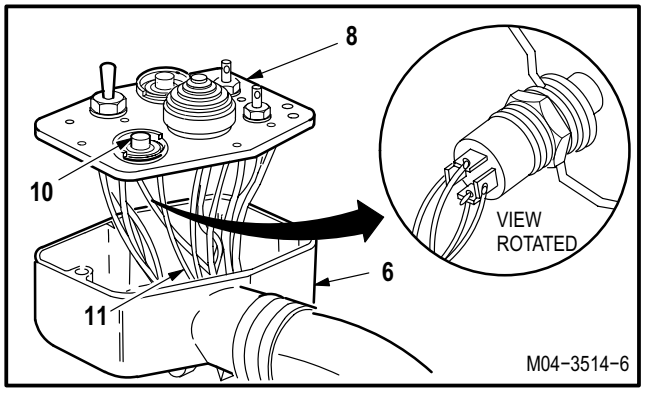
c. **Apply a thin coat of adhesive over terminals and bare wires.** Use adhesive (item 14, App F).

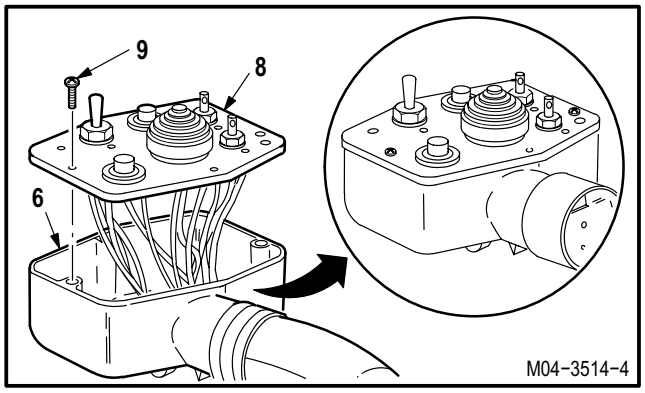
d. **Inspect (QA).**

e. **Install switch mounting plate (8) on collective grip (6).**

(1) Install plate (8) on grip (6).

(2) Install three screws (9).





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11.29. COLLECTIVE STICK STORES JETTISON SWITCH REPLACEMENT – continued

f. **Install indicator panel (5) on grip (6).**

(1) Install panel (5) on grip (6).

(2) Install three screws (7).

g. **Install knobs (1) and (2) on collective grip (6).**

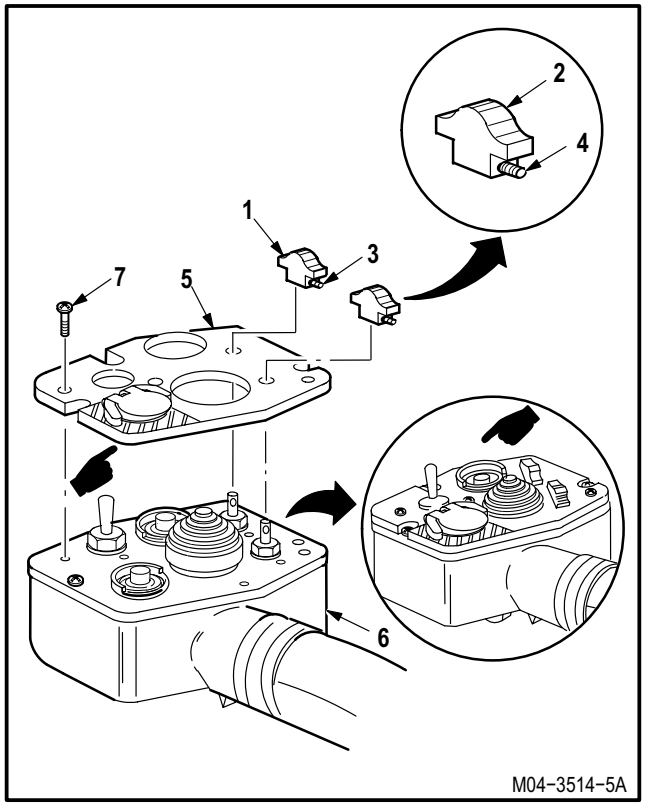
(1) Install knobs (1) and (2) on grip (6).

(2) Tighten setscrews (3) and (4).

h. **Inspect (QA).**

i. **Install collective stick grip assembly** (para 11.24)**.**

j. **Perform external stores jettison maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.29A. COLLECTIVE STICK STORES JETTISON SWITCH COVER REPLACEMENT

11.29A.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.29A.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)

References:

TM 1-1520-238-T
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 8, App F)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

Equipment Conditions:

Ref	Condition
11.29	Collective stick grip indicator panel removed

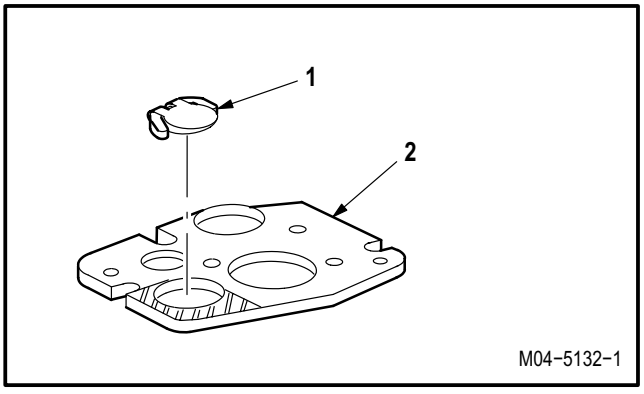
NOTE

This task is typical for pilot or CPG collective stick.

11.29A.3. Removal

a. **Remove switch cover (1) from panel (2).**

b. **Remove sealant from panel (2)** (para 1.47)**.**



11.29A.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.29A.5. Inspection

a. **Check indicator panel for cracks.** None allowed.

b. **Check indicator panel for damage** (para 11.5)**.**

c. **Check indicator panel for corrosion** (para 1.49)**.**

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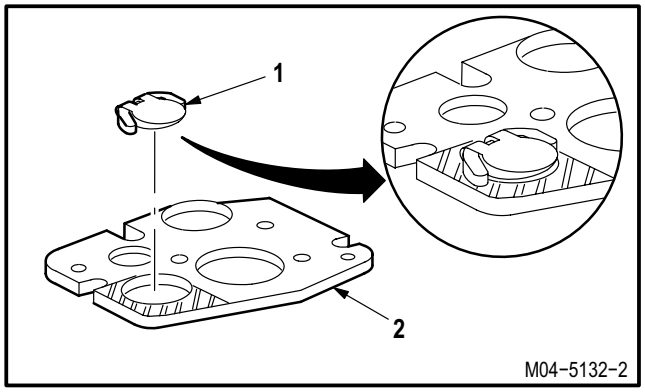
11.29A. COLLECTIVE STICK STORES JETTISON SWITCH COVER REPLACEMENT – continued

11.29A.6. Installation

a. **Install switch cover (1) on indicator panel (2).**



CAUTION

Ensure switch cover bevel edges are alined to match bevel edges of brow around **ST JTSN** switch. Damage to equipment may occur.

(1) Apply a small bead of adhesive to base of cover (1). Use adhesive (item 8, App F).

(2) Press cover (1) on panel (2).

(3) Allow adhesive to cure.

b. **Inspect (QA).**

c. **Install collective stick grip indicator panel** (para 11.29)**.**

END OF TASK

11.30. COLLECTIVE STICK RF OVERRIDE SWITCH REPLACEMENT

11.30.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.30.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Multimeter (item 215, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 1-1520-238-T
TM 55-1500-323-24

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.24	Collective stick grip assembly removed

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)

NOTE

This task is typical for pilot or CPG collective stick.

11.30.3. Removal

a. **Remove knobs (1) and (2).**

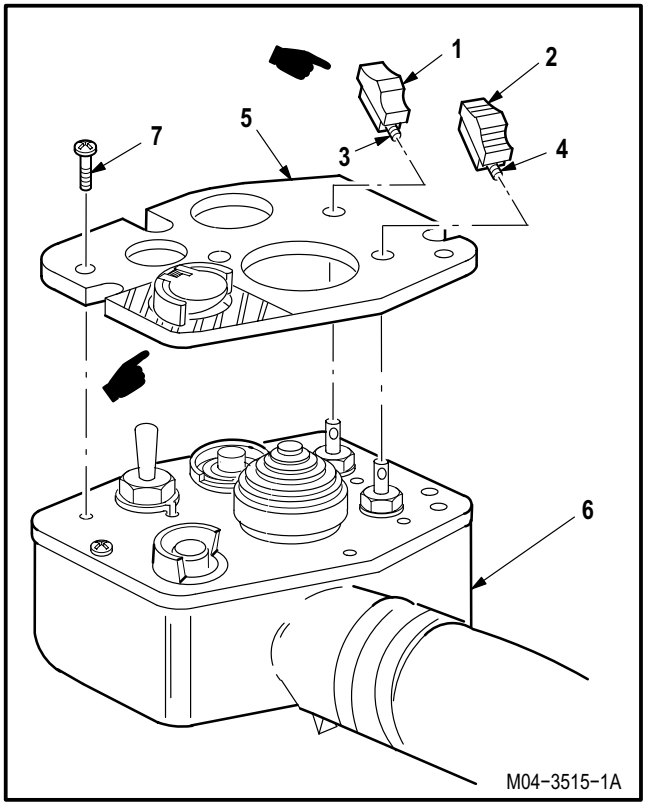
(1) Loosen setscrews (3) and (4).

(2) Remove knobs (1) and (2).

b. **Remove indicator panel (5) from grip (6).**

(1) Remove three screws (7).

(2) Remove panel (5).



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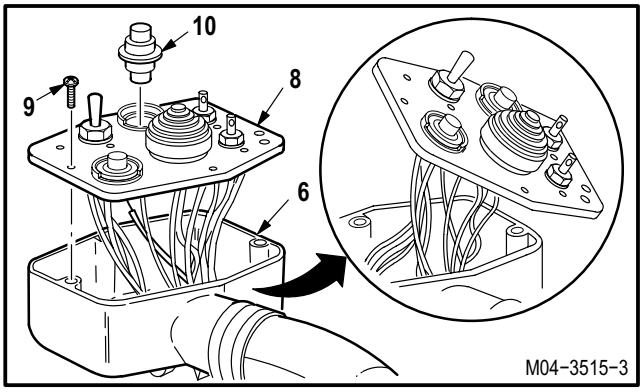
11.30. COLLECTIVE STICK RF OVERRIDE SWITCH REPLACEMENT – continued

c. **Remove switch mounting plate (8) from collective grip (6).**

(1) Remove three screws (9).

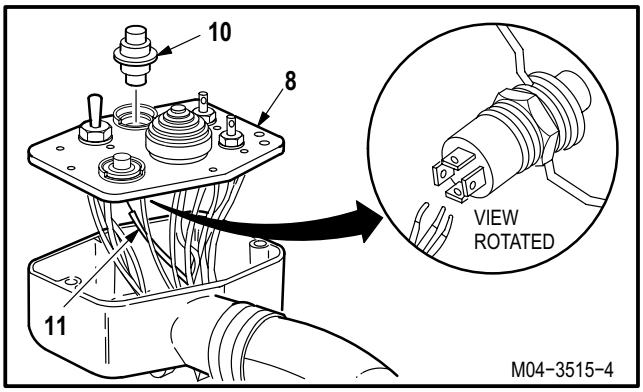
(2) Remove plate (8).



d. **Remove sealant from switch (10) terminals** (para 1.47)**.**

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.



e. **Desolder wires (11) from switch (10).**

(1) Identify and desolder wires (11). Use soldering iron (TM 55-1500-323-24).

f. **Debond and remove switch (10) from plate (8).**

11.30.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

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11.30. COLLECTIVE STICK RF OVERRIDE SWITCH REPLACEMENT – continued

11.30.5. Inspection

a. **Check for cracked broken wires.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for cracks.** None allowed.

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

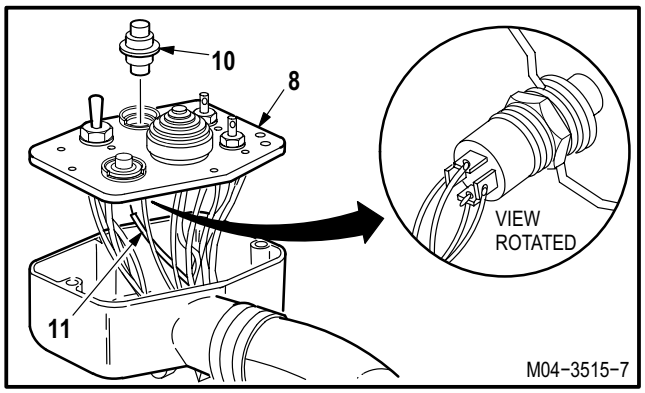
11.30.6. Installation

a. **Install new switch (10) to mounting plate (8).**

(1) Apply small bead of adhesive to base of switch (10). Use adhesive (item 14, App F).

(2) Press switch (10) on plate (8).

(3) Allow adhesive to cure.



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11.30. COLLECTIVE STICK RF OVERRIDE SWITCH REPLACEMENT – continued

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

b. **Solder wires (11) to switch (10).**

(1) Solder identified wires (11) to switch (10). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).

c. **Apply a thin coat of adhesive over switch (10) terminals and bare wires.** Use adhesive (item 14, App F).

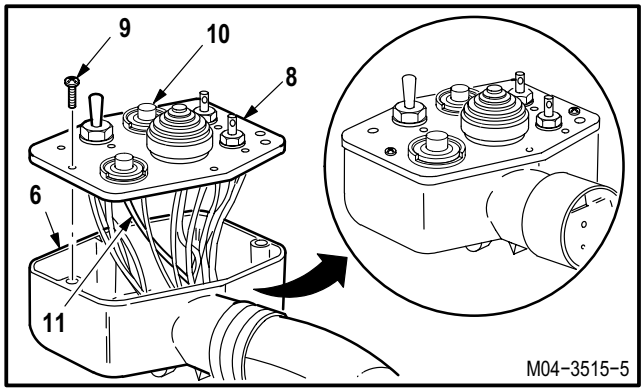
d. **With switch (10) depressed, check for continuity between pins X and Y on connector P107 (pilot) or connector P108 (CPG).** Use multimeter.

e. **Inspect (QA).**

f. **Install plate (8) on collective grip (6).**

(1) Position plate (8) on grip (6).

(2) Install three screws (9).



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11.30. COLLECTIVE STICK RF OVERRIDE SWITCH REPLACEMENT – continued

g. **Install panel (5) on grip (6).**

(1) Position panel (5) on grip (6).

(2) Install three screws (7).

h. **Install knobs (1) and (2).**

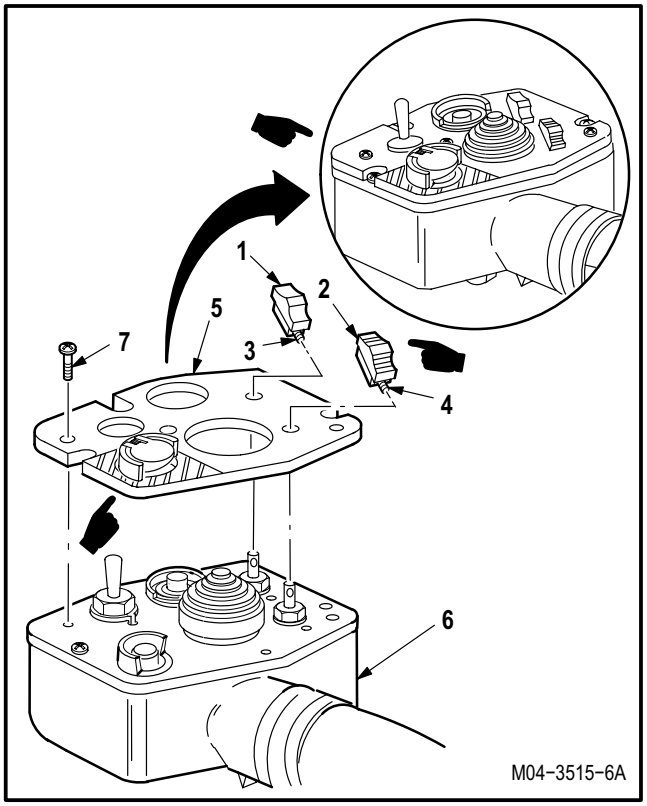
(1) Position knobs (1) and (2).

(2) Tighten setscrews (3) and (4).

i. **Inspect (QA).**

j. **Install collective stick grip assembly** (para 11.24)**.**

k. **Perform external stores jettison maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.31. COLLECTIVE STICK BORESIGHT SWITCH REPLACEMENT

11.31.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.31.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

References:

TM 9-1270-221-23
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.24	Collective stick grip assembly removed

NOTE

This task is typical for pilot or CPG collective stick.

11.31.3. Removal

a. **Remove knobs (1) and (2).**

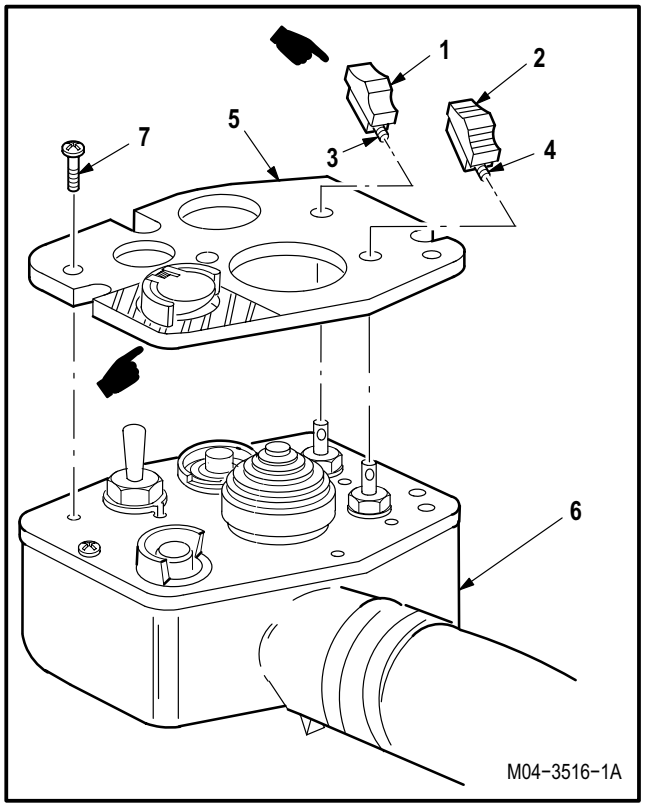
(1) Loosen setscrews (3) and (4).

(2) Remove knobs (1) and (2).

b. **Remove indicator panel (5) from collective grip (6).**

(1) Remove three screws (7).

(2) Remove panel (5).



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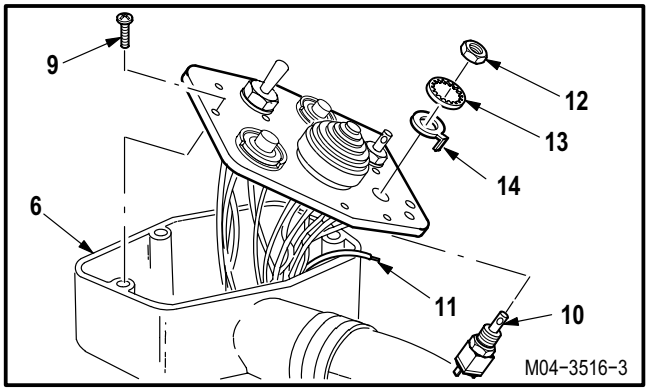
11.31. COLLECTIVE STICK BORESIGHT SWITCH REPLACEMENT – continued

c. **Remove switch mounting plate (8) from collective grip (6).**

(1) Remove three screws (9).

(2) Remove plate (8).



d. **Remove adhesive from switch (10) terminals** (para 1.47)**.**

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

e. **Desolder wires (11) from switch (10).**

(1) Identify and desolder wires (11). Use soldering iron (TM 55-1500-323-24).

f. **Remove switch (10) from plate (8).**

(1) Remove nut (12), lockwasher (13), and key washer (14).

(2) Remove and discard switch (10).

11.31.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

GO TO NEXT PAGE

11.31. COLLECTIVE STICK BORESIGHT SWITCH REPLACEMENT – continued

11.31.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

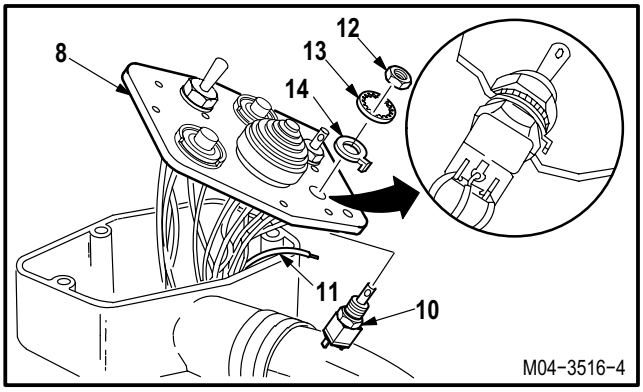
d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.31.6. Installation

a. **Install switch (10) on plate (8).**

(1) Position switch (10) on plate (8).

(2) Install keywasher (14), lockwasher (13), and nut (12).



WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

b. **Solder wires (11) to switch (10).**

(1) Solder identified wires (11) to switch (10). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).

c. **Apply a thin coat of adhesive over switch (10) solder joint and bare wires (11).** Use adhesive (item 14, App F).

GO TO NEXT PAGE

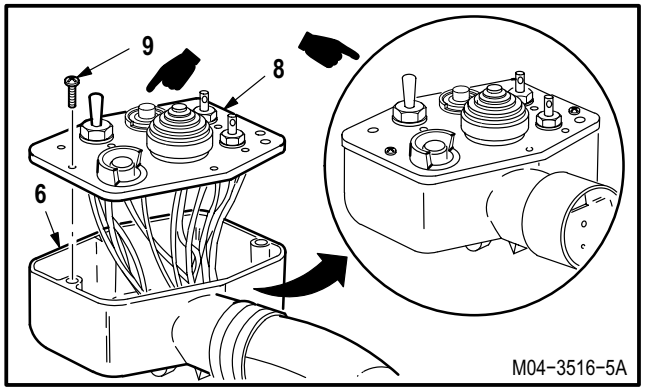
11.31. COLLECTIVE STICK BORESIGHT SWITCH REPLACEMENT – continued

d. **Inspect (QA).**

e. **Install plate (8) on grip (6).**

(1) Position plate (8) on grip (6).

(2) Install three screws (9).



f. **Install panel (5) on grip (6).**

(1) Position panel (5) on grip (6).

(2) Install three screws (7).

g. **Install knobs (1) and (2).**

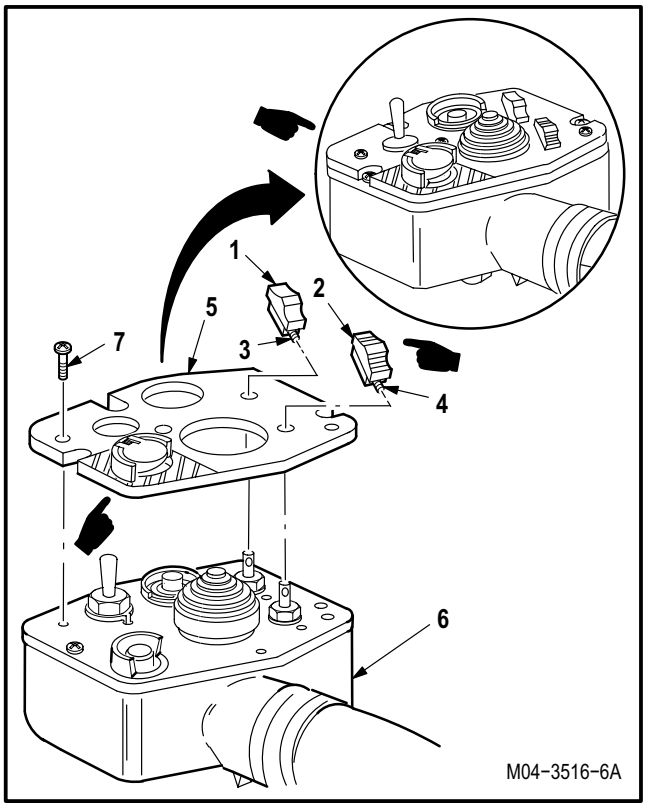
(1) Position knobs (1) and (2).

(2) Tighten setscrews (3) and (4).

h. **Inspect (QA).**

i. **Install collective stick grip assembly** (para 11.24)**.**

j. **Perform IHADSS maintenance operational check** (TM 9-1270-221-23)**.**



END OF TASK

11.32. COLLECTIVE STICK TADS/PNVS SWITCH REPLACEMENT

11.32.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.32.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Multimeter (item 215, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 55-1500-323-24

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.24	Collective stick grip assembly removed

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)

NOTE

This task is typical for pilot or CPG collective stick.

11.32.3. Removal

a. **Remove knobs (1) and (2).**

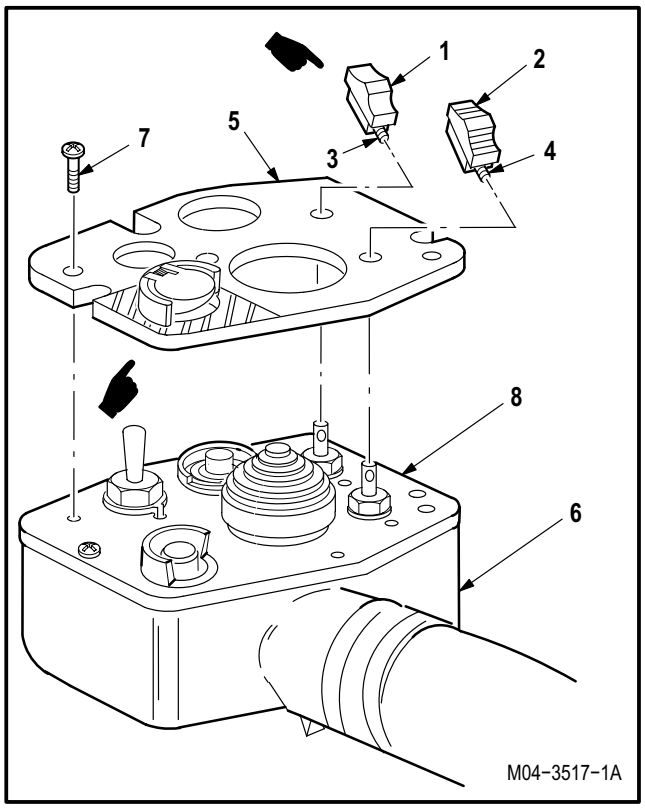
(1) Loosen setscrews (3) and (4).

(2) Remove knobs (1) and (2).

b. **Remove indicator panel (5) from collective grip (6).**

(1) Remove three screws (7).

(2) Remove panel (5).



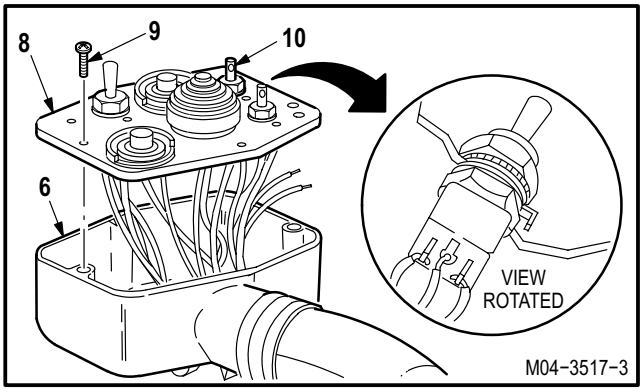
GO TO NEXT PAGE

11.32. COLLECTIVE STICK TADS/PNVS SWITCH REPLACEMENT – continued

c. **Remove switch mounting plate (8) from grip (6).**

(1) Remove three screws (9).

(2) Remove plate (8).



d. **Remove adhesive from switch (10) terminals** (para 1.47)**.**

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

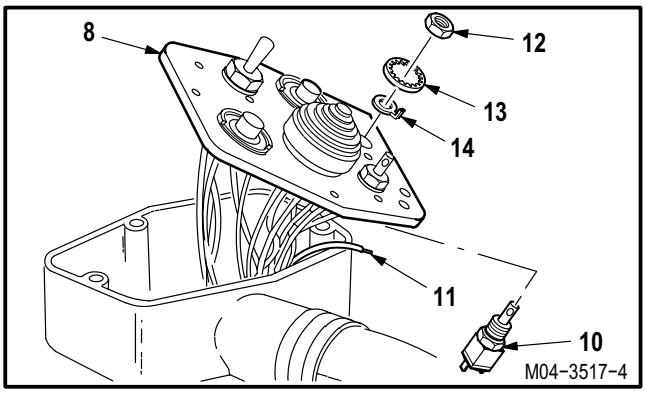
e. **Desolder wires (11) from switch (10).**

(1) Identify and desolder wires (11) from switch (10). Use soldering iron (TM 55-1500-323-24).

f. **Remove switch (10) from plate (8).**

(1) Remove nut (12) and lockwasher (13).

(2) Remove switch (10) and keywasher (14). Discard switch (10).



11.32.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

GO TO NEXT PAGE

11.32. COLLECTIVE STICK TADS/PNVS SWITCH REPLACEMENT – continued

11.32.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

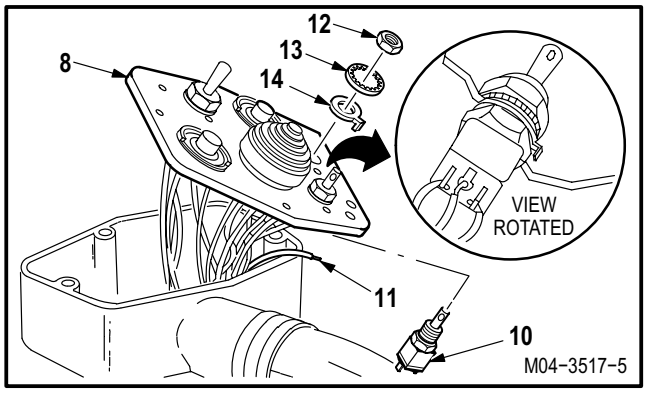
11.32.6. Installation

a. **Install switch (10) on plate (8).**

(1) Install keywasher (14) on switch (10).

(2) Position switch (10) with keywasher (14) on plate (8).

(3) Install lockwasher (13) and nut (12).



WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

b. **Solder wires (11) to switch (10).**

(1) Solder identified wires (11) to switch (10). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).

GO TO NEXT PAGE

11.32. COLLECTIVE STICK TADS/PNVS SWITCH REPLACEMENT – continued

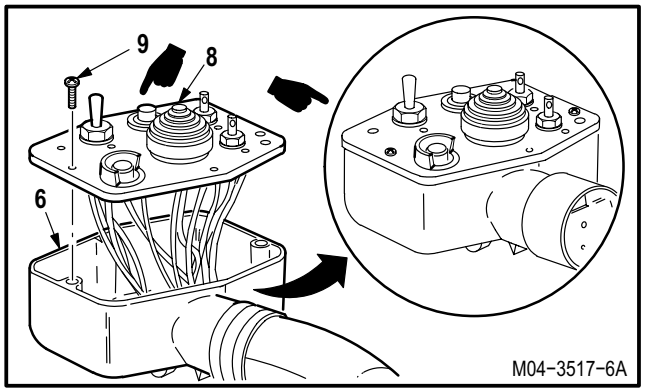
c. **Apply a thin coat of adhesive over switch (10) terminals and bare wires.** Use adhesive (item 14, App F).

d. **Inspect (QA).**

e. **Install plate (8) on the grip (6).**

(1) Position plate (8) on grip (6).

(2) Install three screws (9).



f. **Install panel (5) on grip (6).**

(1) Position panel (5) on grip (6).

(2) Install three screws (7).

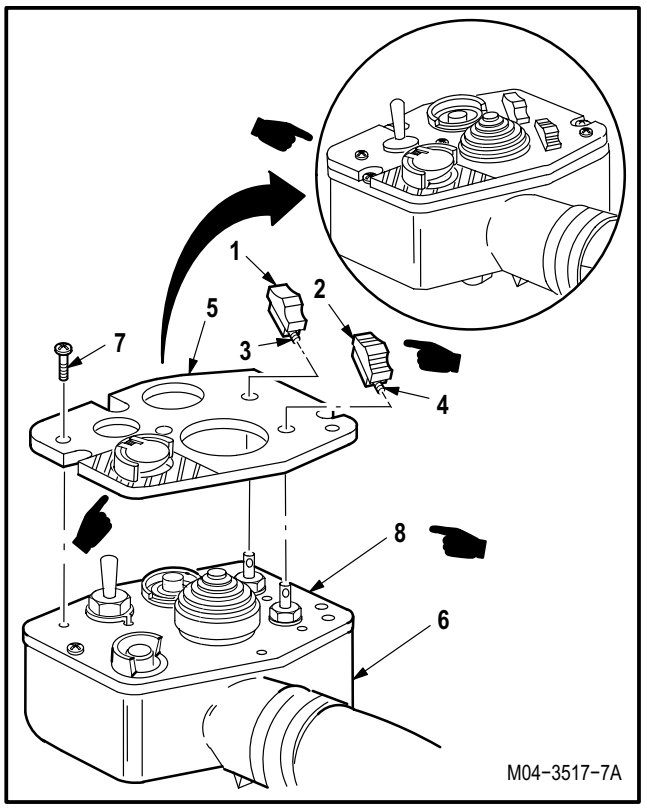
g. **Install knobs (1) and (2).**

(1) Position knobs (1) and (2).

(2) Tighten setscrews (3) and (4).

h. **Inspect (QA).**

i. **Install collective stick grip assembly** (para 11.24)**.**



END OF TASK

11.33. CPG COLLECTIVE STICK BUCS SELECT TRIGGER GRIP SWITCH REPLACEMENT

11.33.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.33.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Multimeter (item 215, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

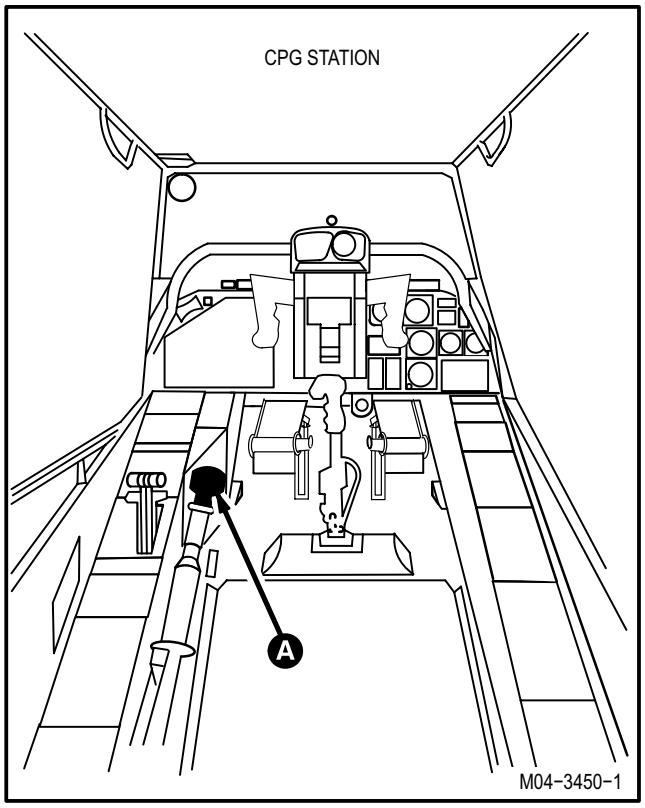
TM 1-1520-238-T
TM 55-1500-323-24

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.24	Collective stick grip assembly removed

Materials/Parts:

Adhesive (item 8, App F)
Solder (item 189, App F)



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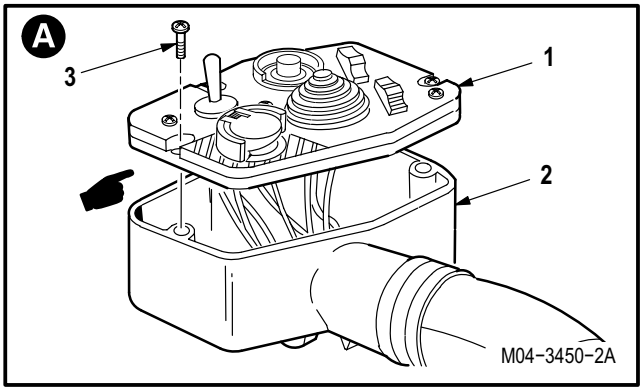
11.33. CPG COLLECTIVE STICK BUCS SELECT TRIGGER GRIP SWITCH REPLACEMENT – continued

11.33.3. Removal

a. **Remove switch mounting plate (1) from collective grip (2).**

(1) Remove three screws (3).



WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

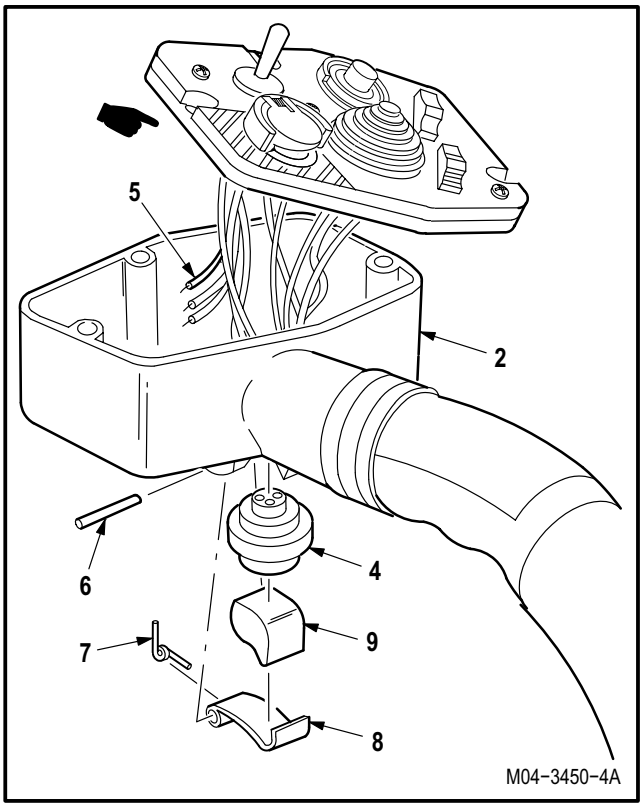
b. **Remove trigger grip switch (4) from grip (2).**

(1) Identify and desolder wires (5) (TM 55-1500-323-24). Use soldering iron.

(2) Remove grip control pin (6).

(3) Remove spring (7), trigger guard (8), and trigger (9).

(4) Remove switch (4) from grip (2).



11.33.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.33.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

GO TO NEXT PAGE

11.33. CPG COLLECTIVE STICK BUCS SELECT TRIGGER GRIP SWITCH REPLACEMENT – continued

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.33.6. Installation

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

a. **Install switch (4) on grip (2).**

(1) Apply a small bead of adhesive around the circumference of switch mounting shoulder (10). Use adhesive (item 8, App F).

(2) Press switch (4) in mounting hole of grip (2).

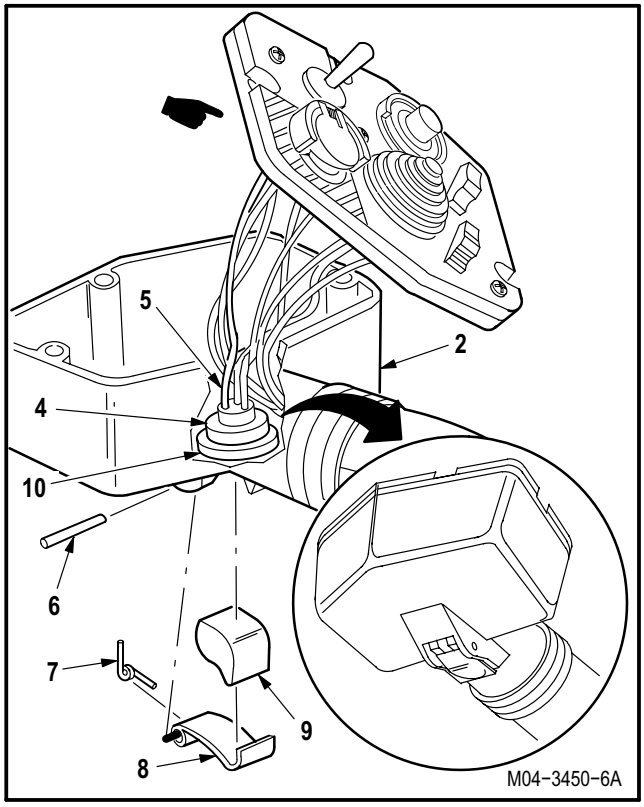
(3) Wipe away excessive adhesive.

(4) Install trigger (9), trigger guard (8), and spring (7) on grip (2).

(5) Install control grip pin (6).

(6) Secure grip control pin (6) at both ends with a small drop of adhesive. Use adhesive (item 8, App F).

(7) Solder identified wires (5) to switch (4). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).



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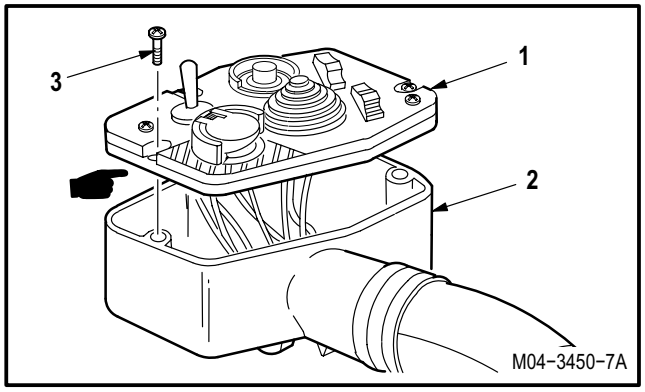
11.33. CPG COLLECTIVE STICK BUCS SELECT TRIGGER GRIP SWITCH REPLACEMENT – continued

b. **Install plate (1) on grip (2).**

(1) Position plate (1) on grip (2).

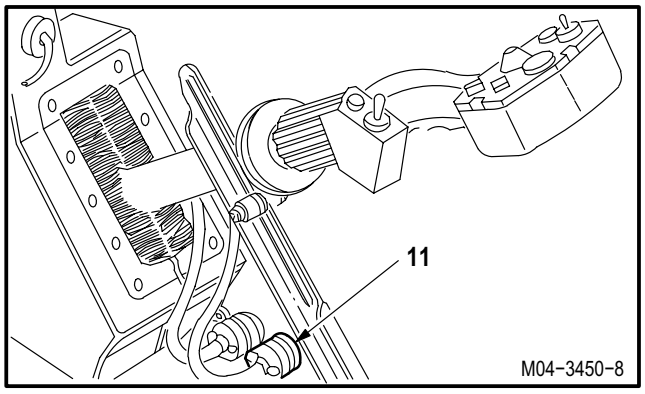
(2) Install three screws (3).



c. **Detach connector P108 (11).**

(1) Check for continuity between connector P108 pins h and e with BUCS select trigger in normal position. Use multimeter.

(2) Check for continuity between connector P108 pins i and h with BUCS select trigger depressed. Use multimeter.



d. **Attach connector P108 (11).**

e. **Inspect (QA).**

f. **Install collective stick grip assembly** (para 11.24)**.**

g. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.34. COLLECTIVE STICK SWITCH AND BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.34.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.34.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Multimeter (item 215, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 55-1500-323-24

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.24	Collective stick grip assembly removed

Materials/Parts:

Solder (item 189, App F)
Wire (item 220, App F)

NOTE

This task is typical for pilot or CPG collective stick.

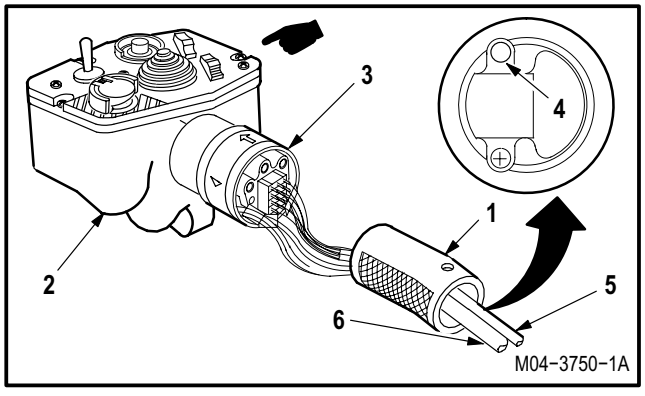
11.34.3. Removal

a. **Remove bottom control grip (1) from top control grip (2).**

(1) Remove lockwire from grip (1) and grip control collar (3).

(2) Remove two screws (4).

(3) Remove grip (1) by sliding grip (1) over wire bundles (5) and (6).



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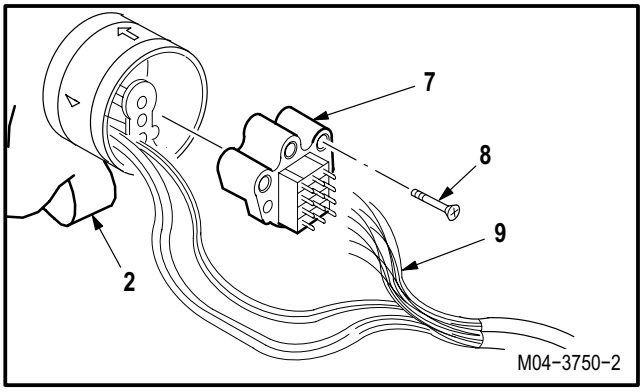
11.34. COLLECTIVE STICK SWITCH AND BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Remove switch and bracket assembly (7) from grip (2).**

(1) Remove three screws (8).

(2) Remove switch and bracket assembly (7).



WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

c. **Desolder wires (9) from switch and bracket assembly (7).**

(1) Identify and desolder wires (9) from switch and bracket assembly (7). Use soldering iron (TM 55-1500-323-24).

11.34.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.34.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.34. COLLECTIVE STICK SWITCH AND BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

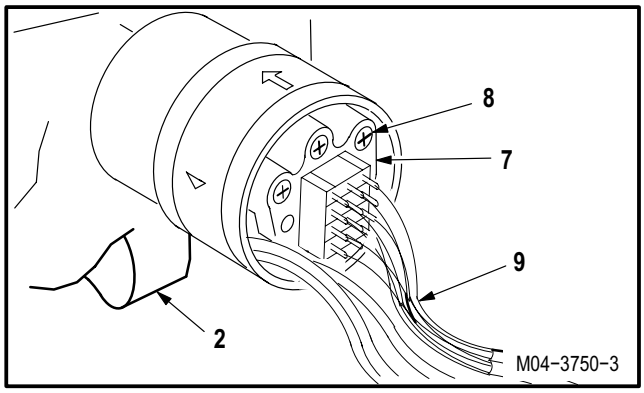
11.34.6. Installation

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

a. **Solder wires (9) to switch and bracket assembly (7).**

(1) Solder identified wires (9) to switch and bracket assembly (7). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).



b. **Perform continuity test** (TM 55-1500-323-24)**.** Use multimeter.

c. **Install switch and bracket assembly (7) on grip (2).**

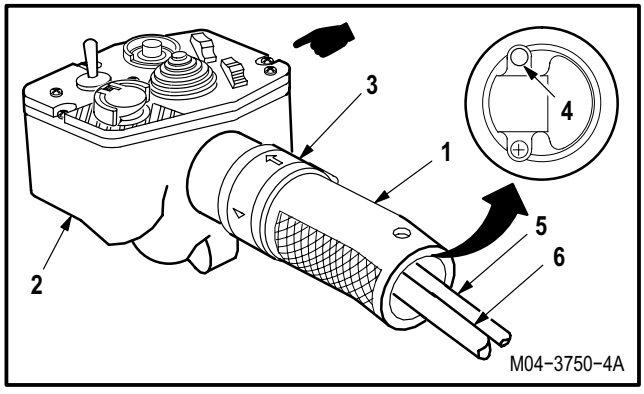
(1) Position switch and bracket assembly (7) on grip (2).

(2) Install three screws (8).

d. **Install grip (1) on grip (2).**

(1) Install grip (1) by sliding grip (1) up wire bundles (5) and (6).

(2) Install two screws (4).



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11.34. COLLECTIVE STICK SWITCH AND BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

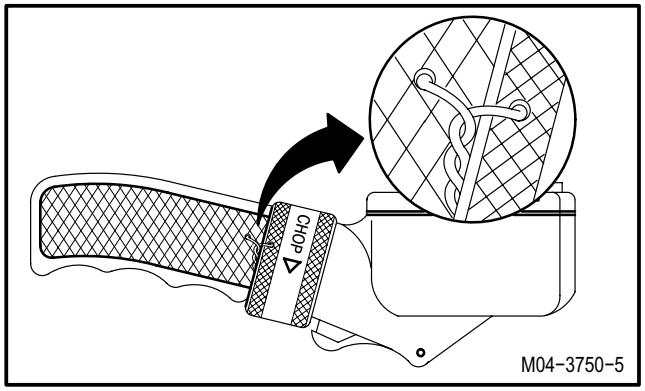
WARNING

To prevent injury to personnel or damage to equipment, use only shear lockwire (0.020 INCH copper) to safety chop collar.

e. **Install lockwire on grip (1) and grip control collar (3).** Use wire (item 220, App F).

f. **Inspect (QA).**

g. **Install collective stick grip assembly** (para 11.24)**.**



END OF TASK

11.35. COLLECTIVE STICK TUBE ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.35.1. Description

This task covers: Disassembly. Cleaning. Inspection. Repair. Assembly.

11.35.2. Initial Setup

Tools:

Airframe repairman's tool kit (item 377, App H)

Personnel Required:

68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

Rivet (5)

References:

TM 1-1500-204-23

NOTE

This task is typical for pilot and CPG collective stick tube assemblies.

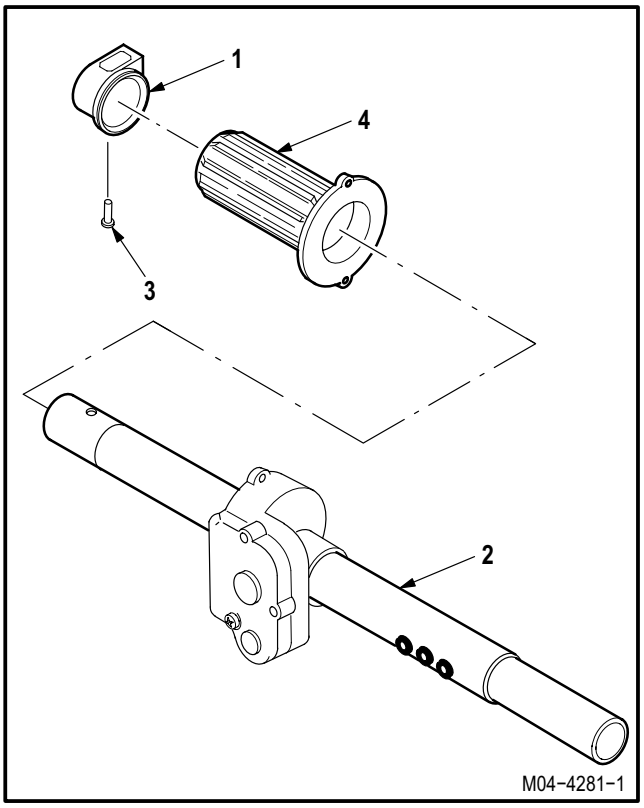
11.35.3. Disassembly

a. **Remove retainer (1) from collective stick tube (2).**

(1) Remove and discard two rivets (3) from retainer (1) (TM 1-1500-204-23).

(2) Slide retainer (1) off tube (2).

b. **Remove handle (4) from tube (2).**



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11.35. COLLECTIVE STICK TUBE ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

c. **Remove rotor housing (5) from tube (2).**

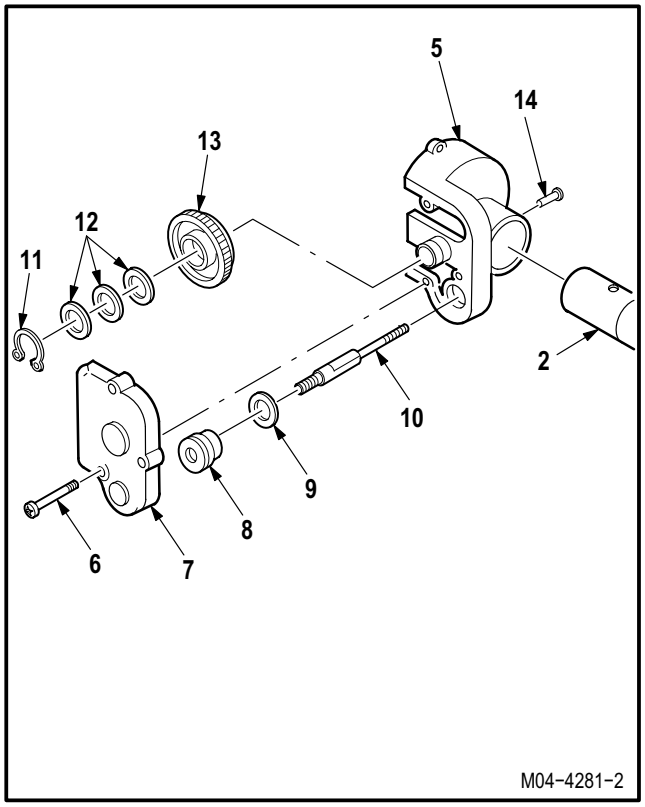
(1) Remove three screws (6) and cover (7).

(2) Remove spur gear (8), washer (9), and friction shaft (10).

(3) Remove retaining ring (11), three washers (12), and bevel gear (13).

(4) Remove and discard three rivets (14) from housing (5) (TM 1-1500-204-23).

(5) Slide housing (5) off tube (2).



11.35.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.35.5. Inspection

a. **Check removed and attaching parts for excessive wear, nicks, or distortions** (para 11.5)**.**

b. **Check tube assembly nutplates for stripped threads or loose rivets.** None allowed.

c. **Check housing threaded inserts for stripped or damaged threads.** None allowed.

d. **Check removed and attaching parts for cracks.** None allowed.

e. **Check removed and attaching parts for damage** (para 11.5)**.**

f. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.35.6. Repair

a. **Replace tube assembly nutplates as necessary** (TM 1-1500-204-23)**.**

b. **Replace housing threaded inserts as necessary** (TM 1-1500-204-23)**.**

GO TO NEXT PAGE

11.35. COLLECTIVE STICK TUBE ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.35.7. Assembly

a. **Install housing (5) on tube (2).**

(1) Slide housing (5) on tube (2) and aline.

(2) Install three new rivets (14) in housing (5) (TM 1-1500-204-23).

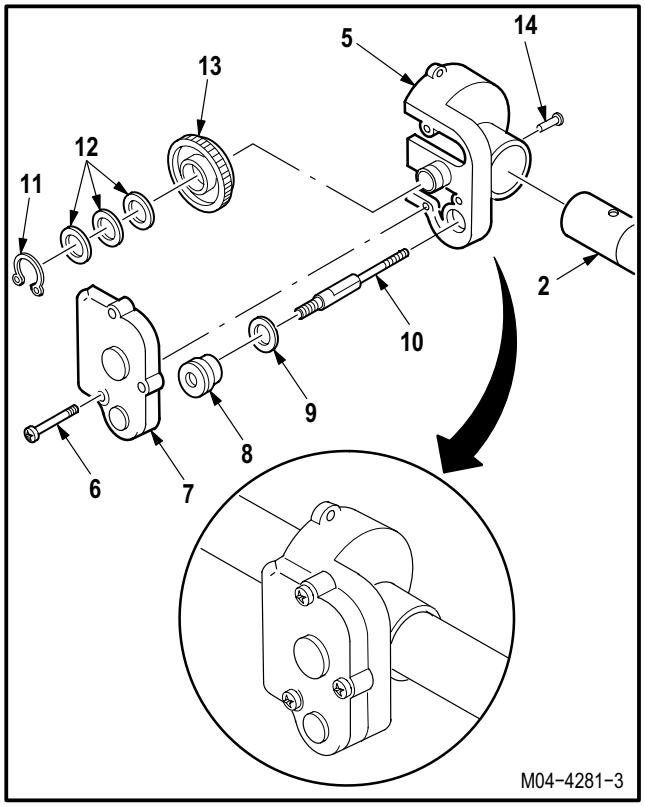
(3) Install gear (13), three washers (12), and retaining ring (11) on housing (5).

(4) Check axial clearance of gear (13).

(a) Add or remove washers (12) to maintain axial clearance of **0.005 INCH to 0.010 INCH**.

(5) Install shaft (10), washer (9), and gear (8) on housing (5).

(6) Install cover (7) and three screws (6) on housing (5).



b. **Install handle (4) on tube (2).**

(1) Slide handle (4) on tube (2).

(2) Install handle (4) in housing (5).

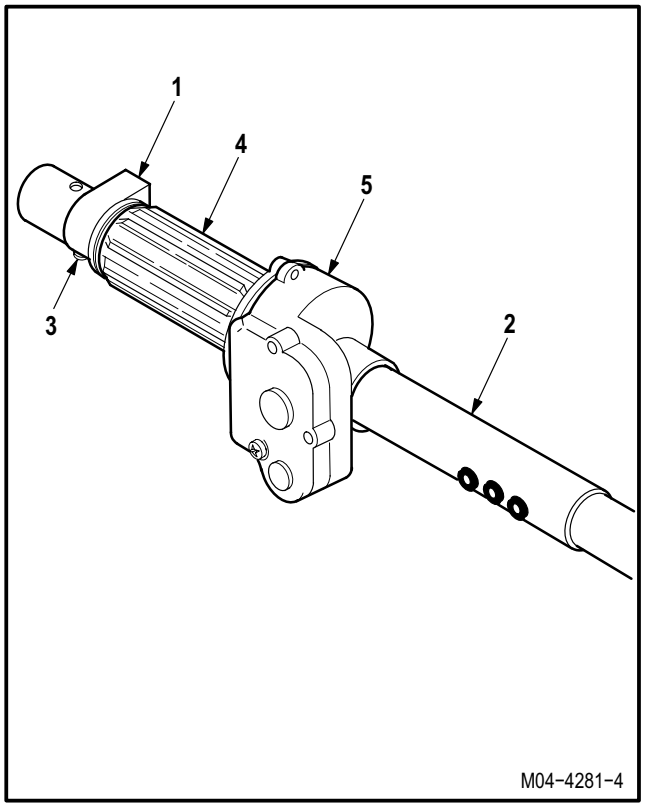
(a) Aline lockwire hole in handle (4) with lockwire hole in housing (5).

c. **Install retainer (1) on tube (2).**

(1) Slide retainer (1) on tube (2) and aline.

(2) Install two new rivets (3) in retainer (1) (TM 1-1500-204-23).

d. **Inspect (QA).**



END OF TASK

11.36. PILOT COLLECTIVE STICK CYLINDER ASSEMBLY REMOVAL/INSTALLATION

11.36.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.36.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

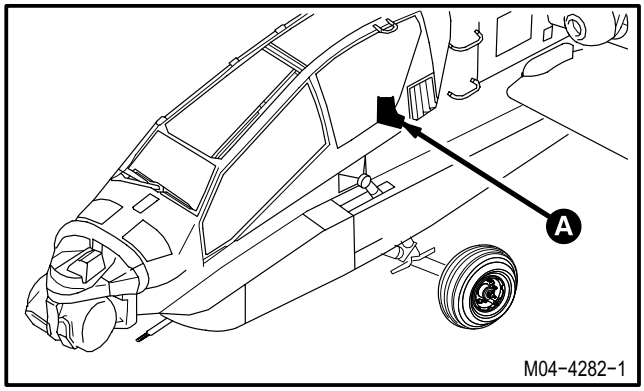
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
10.52A	Forward fuel cell retainer panel removed (if installed)
11.281	Pilot collective stick rig pin installed

Materials/Parts:

Cotter pin (2)



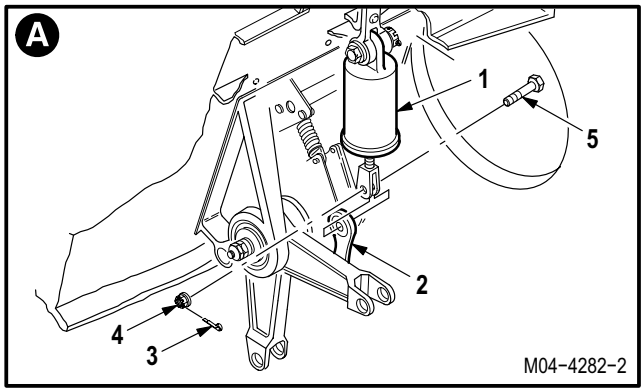
11.36.3. Removal

a. **Remove cylinder assembly (1) from arm (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5) and cylinder (1).



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11.36. PILOT COLLECTIVE STICK CYLINDER ASSEMBLY REMOVAL/INSTALLATION – continued

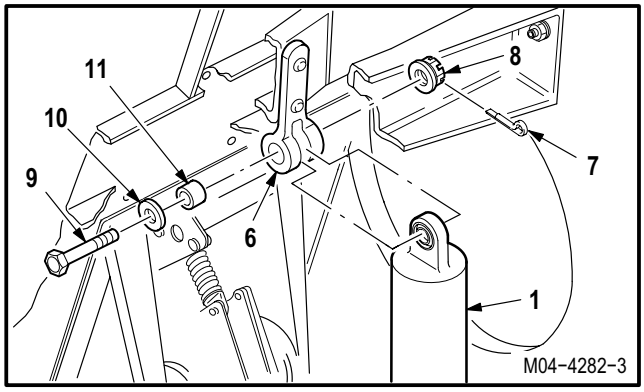
b. **Remove cylinder (1) from bracket (6).**

(1) Remove and discard cotter pin (7).

(2) Remove nut (8).

(3) Remove bolt (9), washer (10), and bushing (11).

(4) Remove cylinder (1).



11.36.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.36.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.36.6. Installation

a. **Install cylinder (1) on bracket (6).**

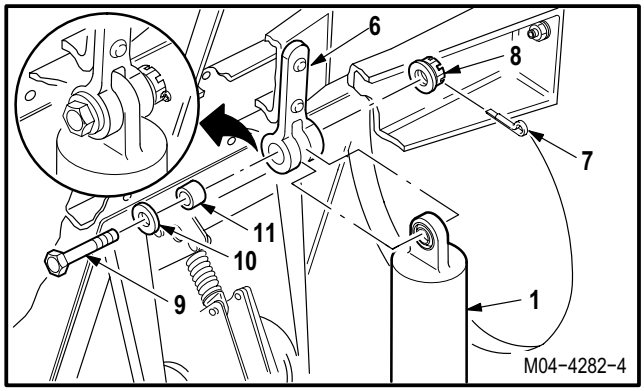
(1) Position cylinder (1) on bracket (6).

(2) Install bolt (9) through bushing (11), bracket (6), cylinder (1), and washer (10).

(3) Check fit of self-retaining bolt (9) (para 11.1).

(4) Install nut (8).

(5) Install new cotter pin (7).



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11.36. PILOT COLLECTIVE STICK CYLINDER ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install cylinder (1) on arm (2).**

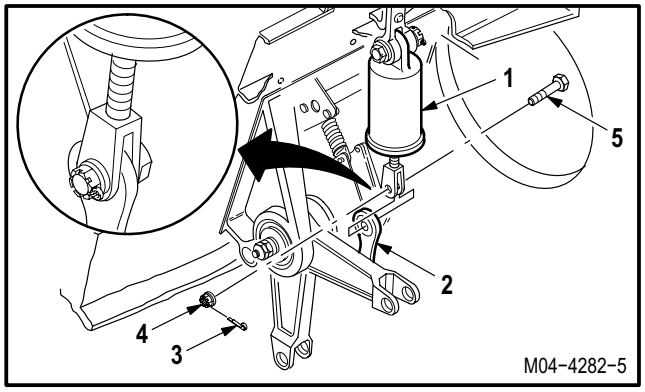
(1) Position cylinder (1) on arm (2).

(2) Install bolt (5) through cylinder (1) and arm (2).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4).

(5) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Remove rig pin from pilot collective stick** (para 11.281)**.**

e. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

END OF TASK

11.37. COLLECTIVE STICK CYLINDER ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.37.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.37.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Materials/Parts:

Wire (item 226, App F)

Personnel Required:

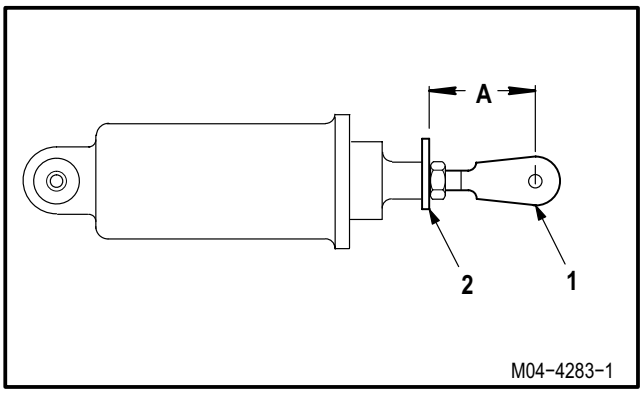
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

NOTE

This task is typical for disassembly/assembly of pilot and CPG collective stick cylinder assemblies.

11.37.3. Disassembly

a. **Measure and record dimension A from center of hole in clevis (1) to top of washer (2).**



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11.37. COLLECTIVE STICK CYLINDER ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

b. **Remove clevis (1) from piston (3).**

(1) Remove lockwire from nut (4).

(2) Loosen nut (4).

(3) Remove clevis (1), nut (4), and washer (2).

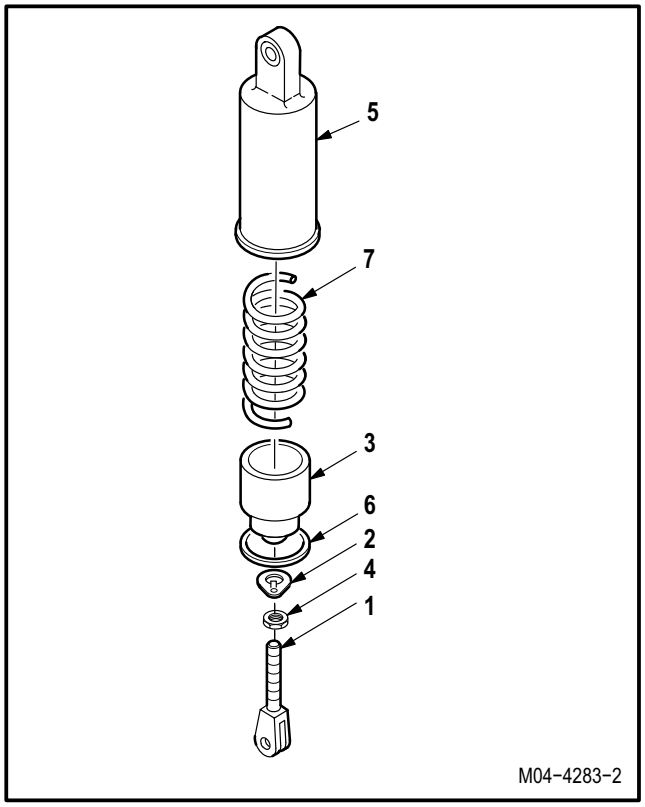
WARNING

Piston is under spring tension. Be careful when removing or installing retaining ring to prevent injury. If injury occurs, seek medical aid.

c. **Remove piston (3) from cylinder (5).**

(1) Remove retaining ring (6) from cylinder (5).

(2) Remove piston (3) and spring (7).



11.37.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.37.5. Inspection

a. **Check clevis for bending, stripped or damaged threads, and hole elongation** (para 11.5)**.**

b. **Check spring for nicks or breaks.** None allowed.

c. **Check removed and attaching parts for cracks.** None allowed.

d. **Check removed and attaching parts for damage** (para 11.5)**.**

e. **Check removed and attaching parts for corrosion** (para 1.49)**.**

f. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

g. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.37. COLLECTIVE STICK CYLINDER ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.37.6. Assembly

WARNING

When installing retaining ring, be careful as spring will be under 54 pounds of compression. If injury occurs, seek medical aid.

a. **Install piston (3) in cylinder (5).**

(1) Install spring (7) and piston (3) in cylinder (5).

(2) Compress piston (3) in cylinder (5).

(3) Install retaining ring (6) on cylinder (5).

b. **Install clevis (1) on piston (3).**

(1) Install clevis (1), nut (4), and washer (2).

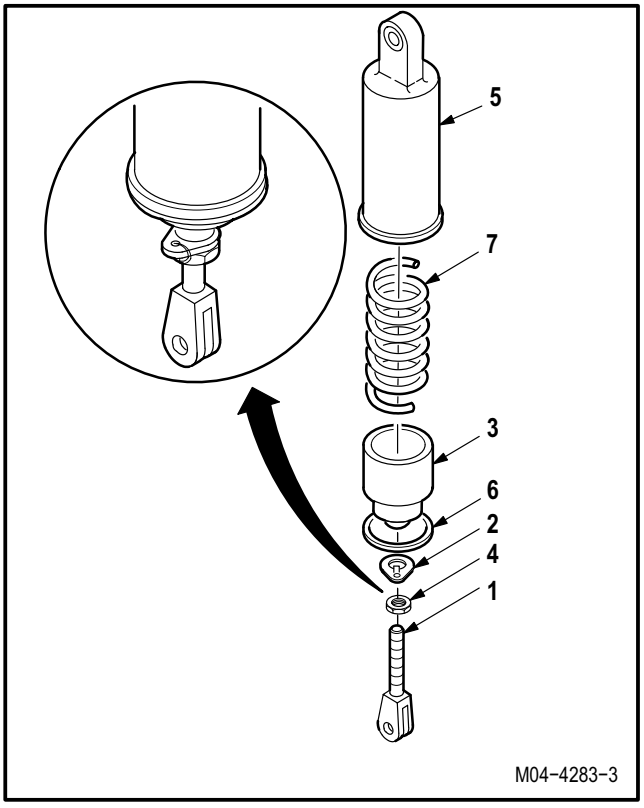
(2) Screw clevis (1) until recorded dimension A is attained.

(3) Aline hole in clevis (1) and hole in cylinder (5) in direct line with each other.

(4) Tighten nut (4).

(5) Lockwire nut (4) to washer (2). Use wire (item 226, App F).

c. **Inspect (QA).**



END OF TASK

11.38. PILOT COLLECTIVE STICK SUPPORT REMOVAL/INSTALLATION

11.38.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.38.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (4)

Personnel Required:

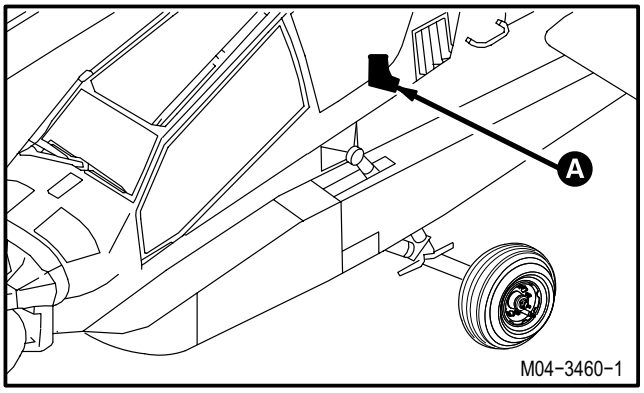
67R Attack Helicopter Repairer
One person to assist
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed
11.20	Pilot collective stick removed
11.207	Pilot collective control position LVDT removed
11.205	Pilot collective control variable resistor removed
11.165	Directional F.S. 156.07 bellcrank removed
11.36	Pilot collective stick cylinder assembly removed



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11.38. PILOT COLLECTIVE STICK SUPPORT REMOVAL/INSTALLATION – continued

11.38.3. Removal

a. **Remove rod end (1) from collective bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod end (1).

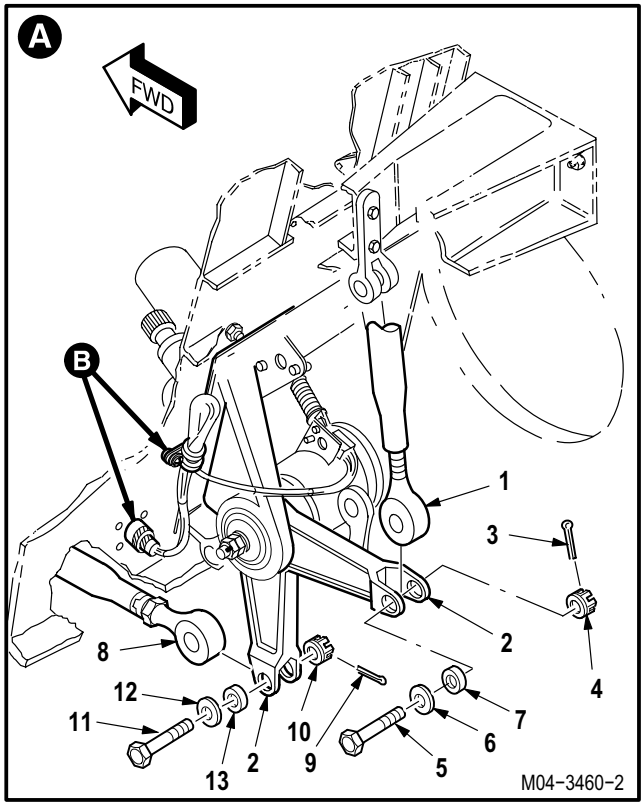
b. **Remove rod end (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

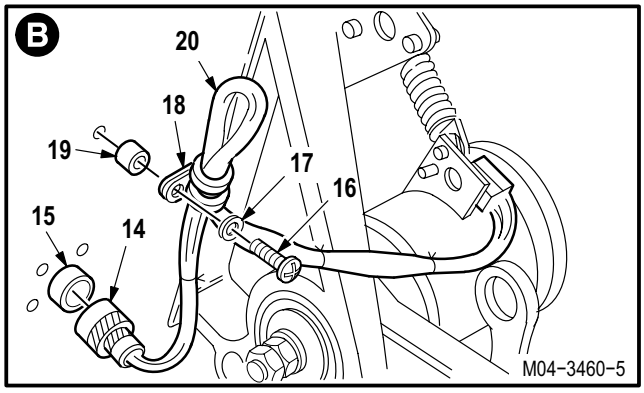
(4) Remove rod end (8).



c. **Detach connector (A334)P1 (14) from receptacle J272 (15).**

(1) Remove screw (16), washer (17), clamp (18), and spacer (19) from wire harness (20).

(2) Detach connector (A334)P1 (14) from receptacle J272 (15).



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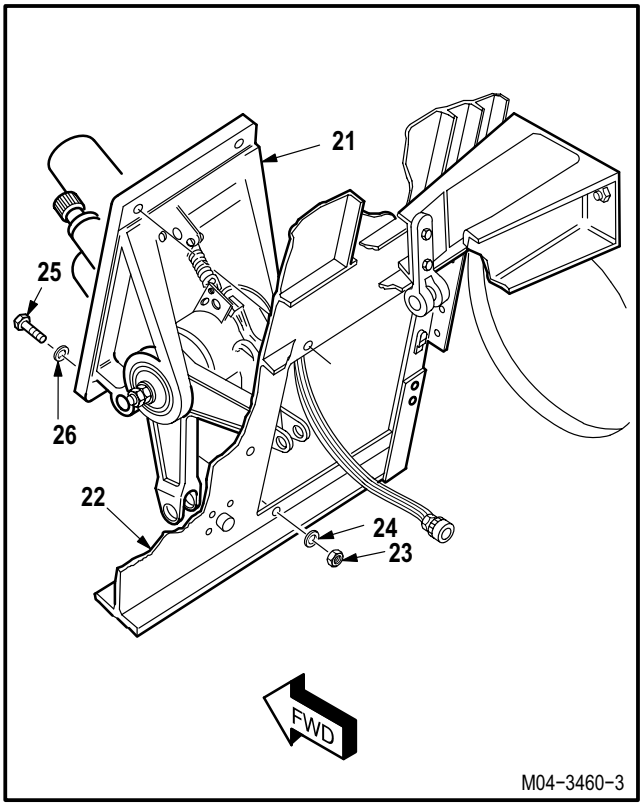
11.38. PILOT COLLECTIVE STICK SUPPORT REMOVAL/INSTALLATION – continued

d. **Remove collective support (21) from airframe (22).**

(1) Remove four nuts (23) and washers (24).

(2) Remove four bolts (25) and washers (26) from support (21) and airframe (22).

(3) Remove support (21).



11.38.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.38.5. Inspection

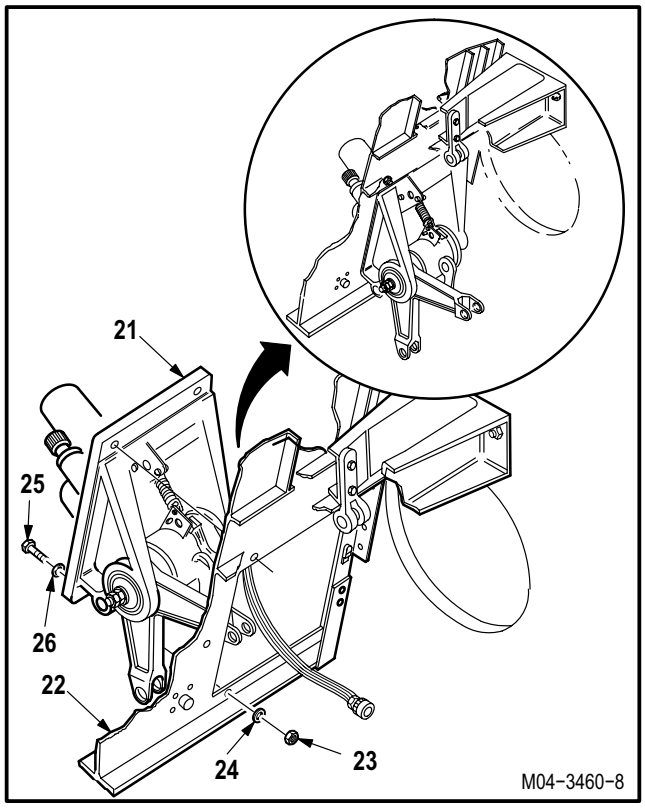
a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**



11.38.6. Installation

a. **Install support (21) on airframe (22).**

(1) Aline support (21) on forward side of airframe (22).

(2) Install four bolts (25) through washers (26), support (21), and airframe (22).

(3) Install four washers (24) and nuts (23).

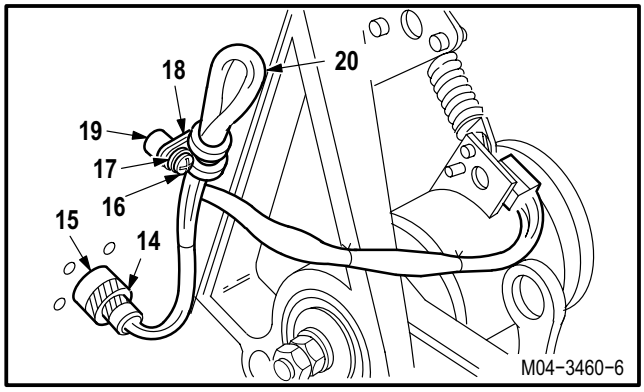
GO TO NEXT PAGE

11.38. PILOT COLLECTIVE STICK SUPPORT REMOVAL/INSTALLATION – continued

b. **Attach connector (A334)P1 (14) to receptacle J272 (15).**

(1) Attach connector (A334)P1 (14) to receptacle J272 (15).

(2) Install screw (16) through washer (17), clamp (18), and spacer (19) on wire harness (20).



c. **Install rod end (8) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (8) with bellcrank (2).

(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod end (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10) on bolt (11). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).

d. **Install rod end (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (1) with bellcrank (2).

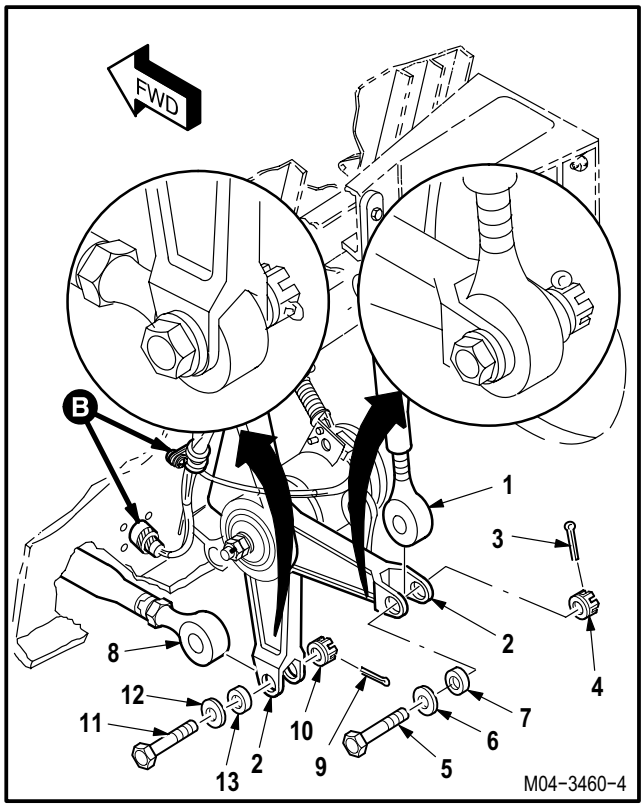
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod end (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4) on bolt (5). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



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11.38. PILOT COLLECTIVE STICK SUPPORT REMOVAL/INSTALLATION – continued

e. **Inspect (QA).**

f. **Install directional F.S.156.07 bellcrank** (para 11.165)**.**

g. **Install pilot collective control variable resistor** (para 11.205)**.**

h. **Install pilot collective control position LVDT** (para 11.208)**.**

i. **Install pilot collective stick cylinder assembly** (para 11.36)**.**

j. **Install pilot collective stick** (para 11.21)**.**

k. **Install pilot seat** (para 2.161)**.**

l. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.39. PILOT COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.39.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.39.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)
Light duty laboratory apron (item 27, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (4)
Packing
Rivet MS20470A3 (2)
Shear rivet MS20470AD3 (2)
Petrolatum (item 138, App F)

Personnel Required:

67R Attack Helicopter Repairer
68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1500-204-23

Equipment Conditions:

Ref	Condition
11.64	Pilot collective SPAD switch removed

11.39.3. Disassembly

a. **Remove collective arm (1) from support assembly (2).**

(1) Remove and discard cotter pin (3) from nut (4).

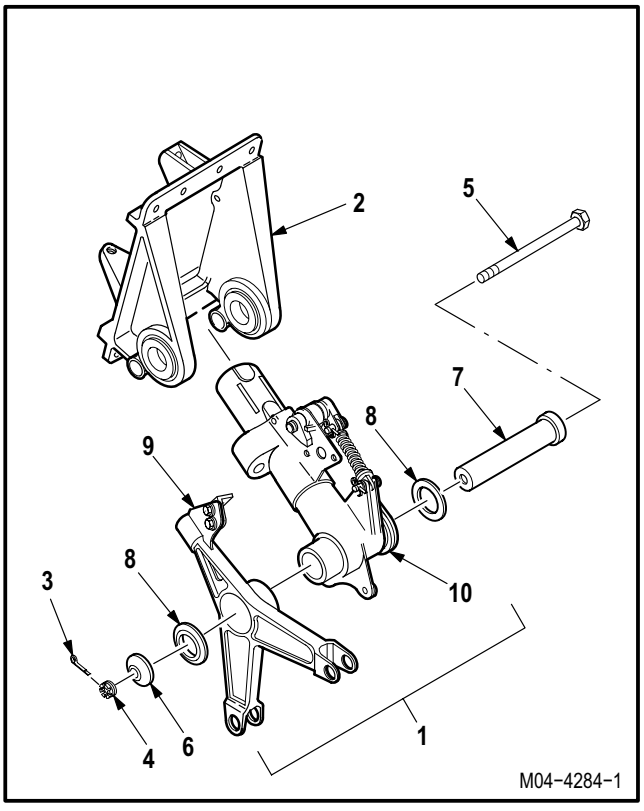
(2) Remove nut (4).

(3) Remove bolt (5) and retainer (6).

(4) Remove pin (7).

(5) Remove arm (1) and two retainers (8).

b. **Remove output arm (9) from input arm (10).**



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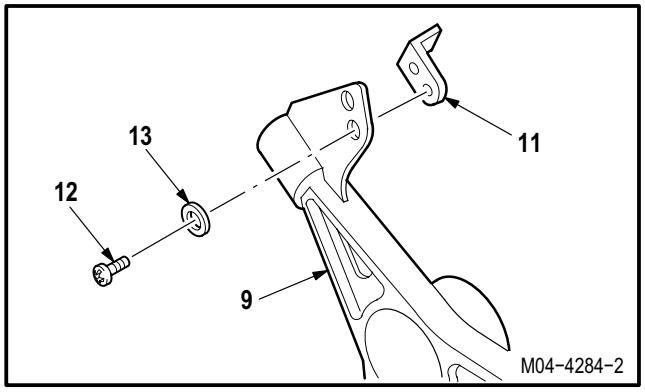
11.39. PILOT COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

c. **Remove detent (11) from arm (9).**

(1) Remove lockwire from two screws (12).

(2) Remove two screws (12) and washers (13).

(3) Remove detent (11).



d. **Remove lever (14) from arm (10).**

(1) Remove rivet (15) (TM 1-1500-204-23).

(2) Remove lever (14).

e. **Remove arm (16) from arm (10).**

(1) Remove and discard cotter pin (17) from nut (18).

(2) Remove nut (18).

(3) Remove bolt (19) and bushing (20).

(4) Remove rivet (21) (TM 1-1500-204-23).

(5) Remove arm (16).

f. **Remove internal spring guide (22) from arm (10).**

(1) Remove cotter pin (23), washer (24), and pin (25).

(2) Discard cotter pin (23).

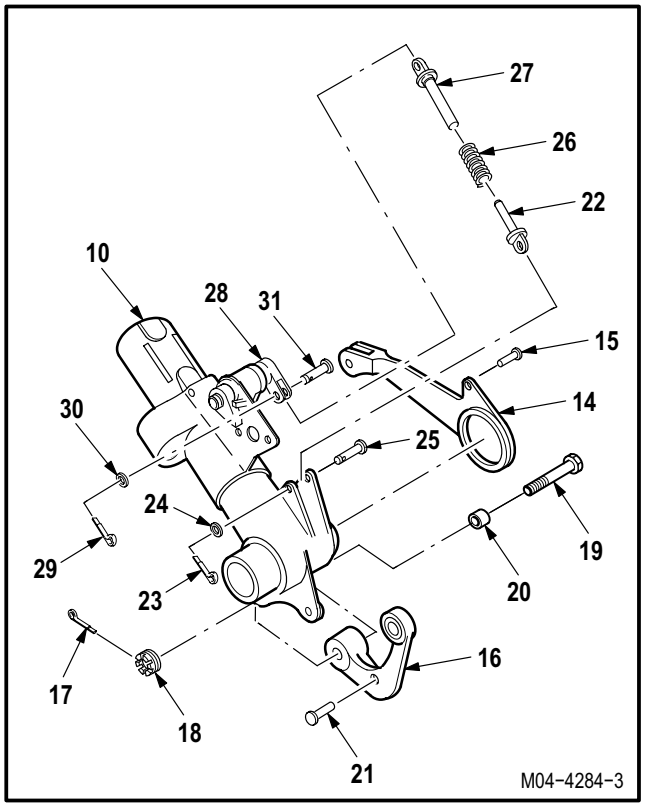
(3) Remove guide (22) and spring (26).

g. **Remove external spring guide (27) from actuator switch shaft (28).**

(1) Remove cotter pin (29), washer (30), and pin (31).

(2) Discard cotter pin (29).

(3) Remove guide (27).



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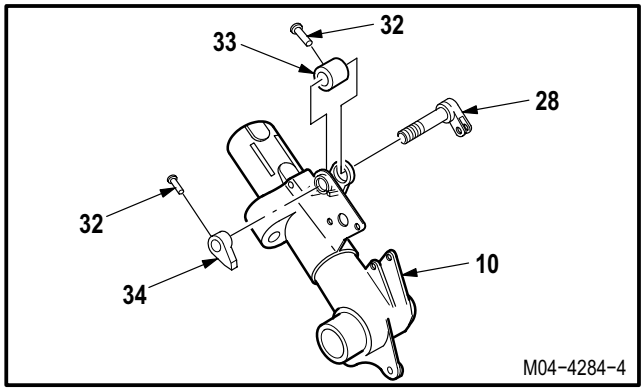
11.39. PILOT COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

h. **Remove shaft (28) from arm (10).**

(1) Remove two rivets (32) from cam (33) and lever (34) (TM 1-1500-204-23).

(2) Remove lever (34), cam (33), and shaft (28).

i. **Remove and discard packing (35) from arm (10).**



11.39.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

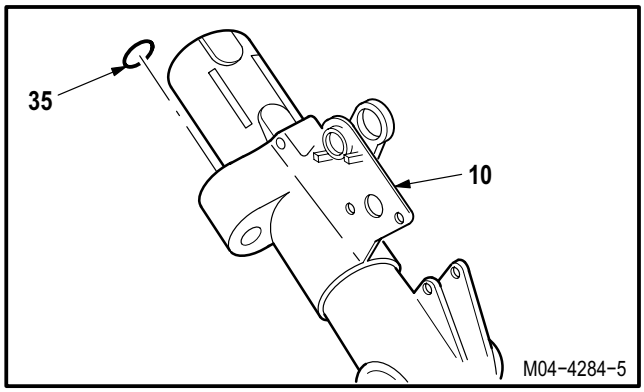
11.39.5. Inspection

a. **Check arms and lever for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

b. **Check cam for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.



c. **Check removed and attaching parts for excessive wear, nicks, elongated holes, stripped or damaged threads, or distortions** (para 11.5)**.**

d. **Check removed and attaching parts for cracks.** None allowed.

e. **Check removed and attaching parts for damage** (para 11.5)**.**

f. **Check removed and attaching parts for corrosion** (para 1.49)**.**

g. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

h. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.39. PILOT COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.39.6. Assembly

a. **Lubricate and install new packing (35) in arm (10).** Use petrolatum (item 138, App F).

b. **Install shaft (28) on arm (10).**

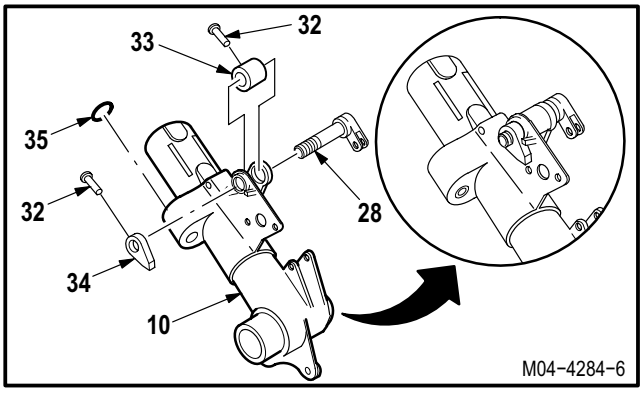
(1) Install shaft (28) through arm (10), cam (33), and lever (34).

NOTE

Ensure shaft arm, cam valley, and lever tip are facing same direction.

(2) Aline cam (33) and lever (34) with holes in shaft (28).

(3) Install two new rivets (32) on cam (33) and lever (34) (TM 1-1500-204-23).



CAUTION

Ensure that pin is no longer than **0.453 INCH**. A longer pin may interfere with SPAD assembly function.

c. **Install guide (27) on shaft (28).**

(1) Install pin (31) through shaft (28), guide (27), and washer (30).

(2) Install new cotter pin (29).

CAUTION

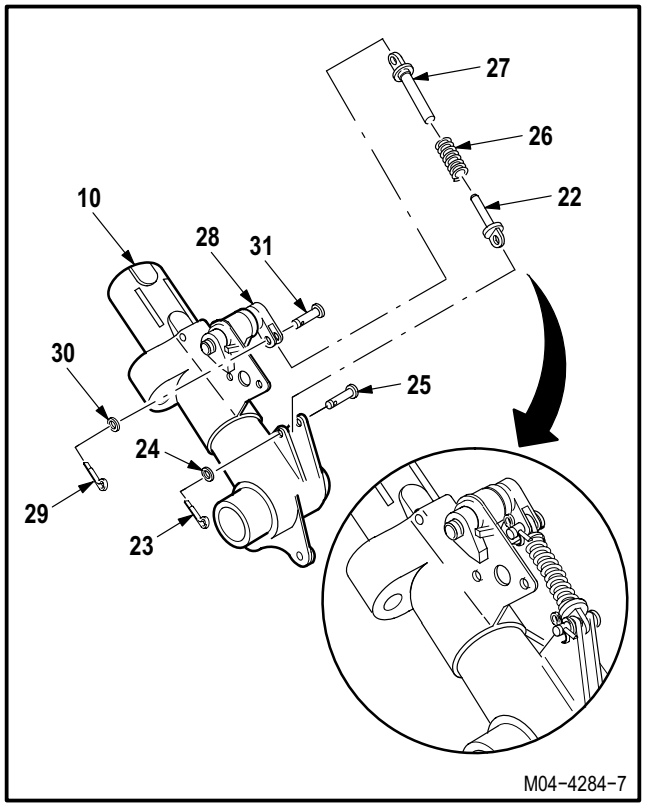
Ensure that pin is no longer than **0.453 INCH**. A longer pin may interfere with SPAD assembly function.

d. **Install guide (22) on arm (10).**

(1) Install spring (26) and guide (22) on guide (27).

(2) Install pin (25) through arm (10), guide (22), and washer (24).

(3) Install new cotter pin (23).



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11.39. PILOT COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

e. **Install arm (16) on arm (10).**

(1) Install bolt (19) through bushing (20), arm (10), arm (16), and nut (18).

(2) Install new cotter pin (17).

(3) Aline arm (16) and arm (10) and install new shear rivet (21) dry (TM 1-1500-204-23).

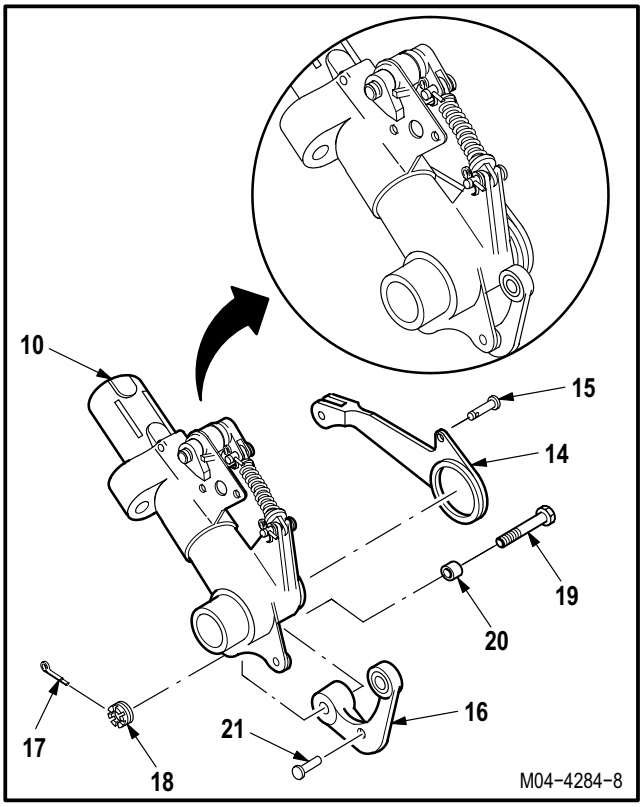
NOTE

Maintain a gap of **0.002 INCH** between lever and arm.

f. **Install lever (14) on arm (10).**

(1) Install lever (14) on arm (10).

(2) Install new shear rivet (15) dry (TM 1-1500-204-23).



g. **Install detent (11) on arm (9).**

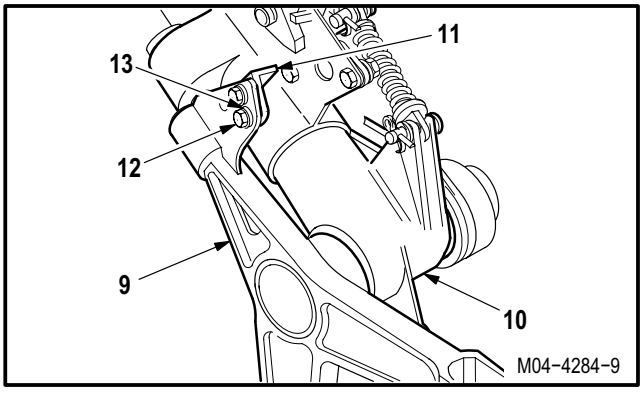
(1) Aline detent (11) with arm (9).

(2) Install two screws (12) and washers (13).

NOTE

Detent will be secured and adjusted when SPAD switch is installed.

h. **Install arm (9) on arm (10).**



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11.39. PILOT COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

i. **Install arm (1) on support (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline arm (1) and two retainers (8).

(2) Install pin (7) through support (2), retainer (8), arm (1), retainer (8), and support (2).

(3) Install bolt (5) through pin (7) and retainer (6).

(4) Check fit of self–retaining bolt (5) (para 11.1).

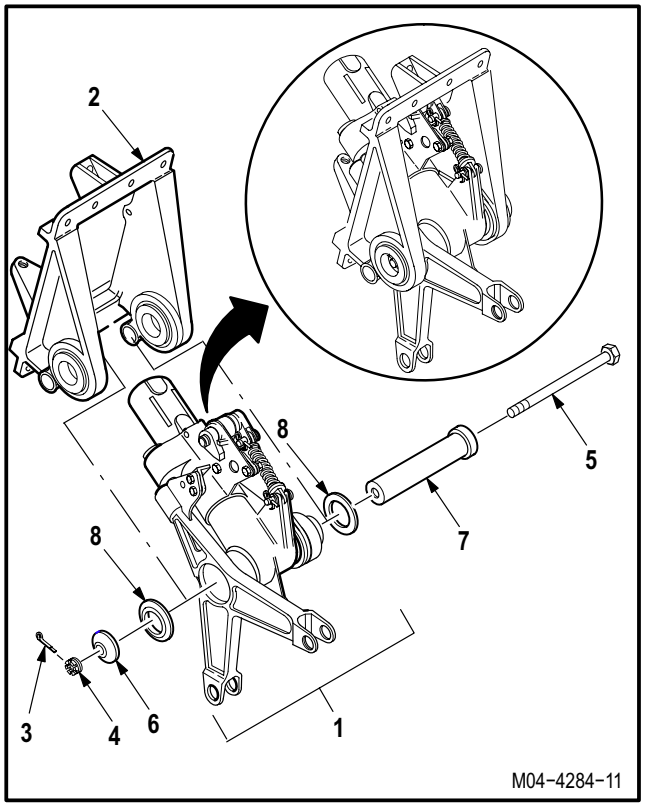
(5) Install nut (4) on bolt (5). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (3).

j. **Install pilot collective SPAD switch** (para 11.64)**.**

k. **Inspect (QA).**



END OF TASK

11.40. CPG COLLECTIVE STICK CYLINDER REMOVAL/INSTALLATION

11.40.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.40.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

References:

TM 9-1090-208-23-1

Materials/Parts:

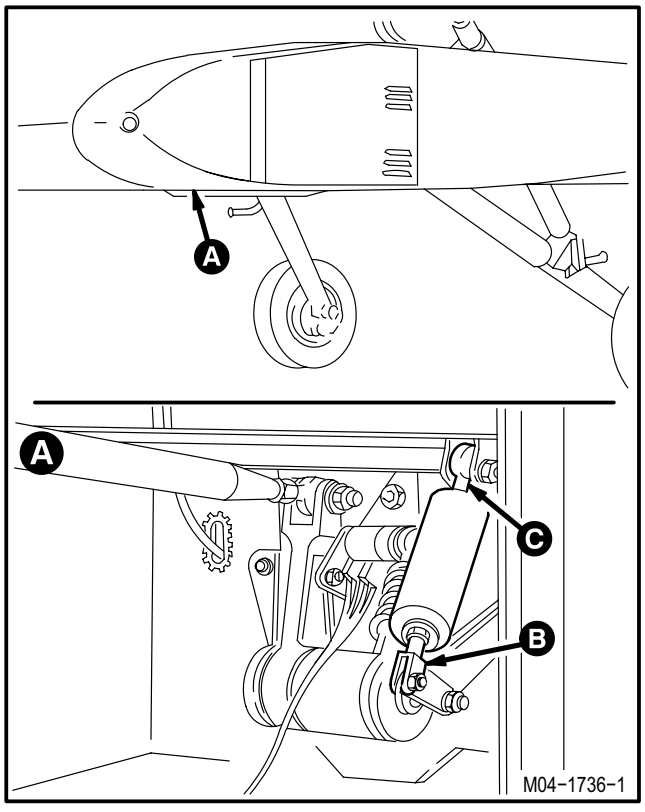
Cotter pin (2)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23-1	Area weapon, turret, and flex chute removed
11.281	CPG collective rig pin installed

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector



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11.40. CPG COLLECTIVE STICK CYLINDER REMOVAL/INSTALLATION – continued

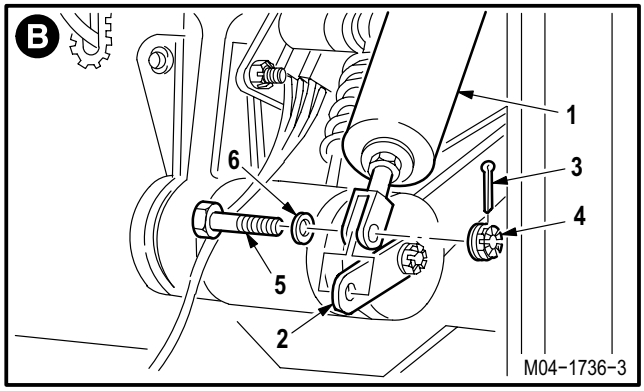
11.40.3. Removal

a. **Remove cylinder (1) from arm (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5) and washer (6).

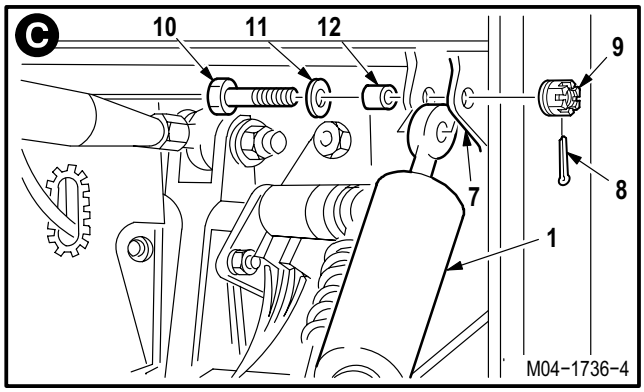


b. **Remove cylinder (1) from bracket (7).**

(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10), washer (11) and bushing (12).



11.40.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.40.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.40. CPG COLLECTIVE STICK CYLINDER REMOVAL/INSTALLATION – continued

11.40.6. Installation

a. **Install cylinder (1) on bracket (7).**

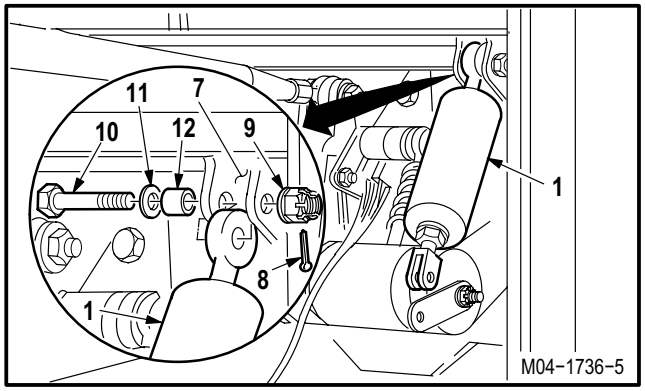
(1) Aline cylinder (1) with bracket (7).

(2) Install bolt (10) through washer (11), bushing (12), bracket (7), and cylinder (1).

(3) Check fit of self-retaining bolt (10) (para 11.1).

(4) Install nut (9).

(5) Install new cotter pin (8).



b. **Install cylinder (1) on arm (2).**

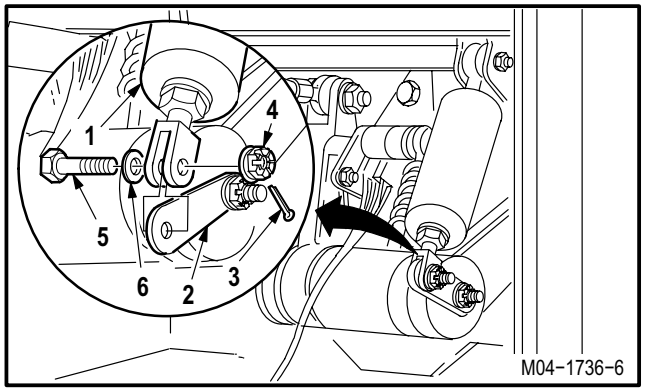
(1) Aline cylinder (1) with arm (2).

(2) Install bolt (5) through washer (6), cylinder (1), and arm (2).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4).

(5) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Remove collective rig pin** (para 11.281)**.**

e. **Install area weapon, turret, and flex chute** (TM 9-1090-208-23-1)**.**

END OF TASK

11.41. CPG COLLECTIVE STICK SUPPORT REMOVAL/INSTALLATION

11.41.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.41.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T
TM 9-1090-208-23-1

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
1.61	Parking brake released
2.161	CPG seat removed
11.20	CPG collective stick removed
11.40	CPG collective stick cylinder removed
11.204	CPG collective control position LVDT removed
TM 9-1090-208-23-1	Area weapon, turret, and flex chute removed

GO TO NEXT PAGE

11.41. CPG COLLECTIVE STICK SUPPORT REMOVAL/INSTALLATION – continued

11.41.3. Removal

a. **Remove CPG collective push-pull rod end (1) from collective support (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

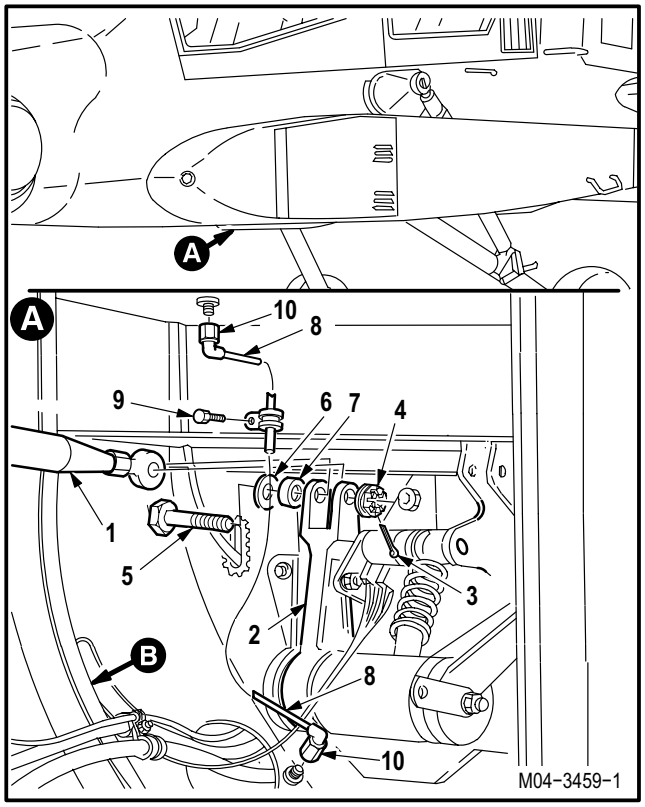
(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod end (1).

b. **Remove brake line (8).**

(1) Remove clamp screw (9) and two brake line nuts (10).

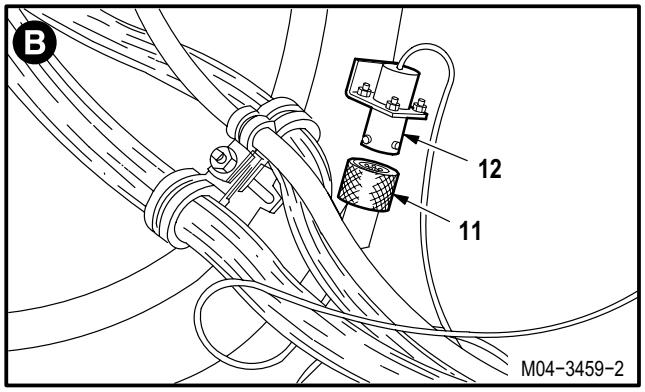
(2) Remove brake line (8).



c. **Detach connector (A334)P1 (11) from receptacle J268 (12).**

CAUTION

To prevent damage to flight controls or airframe structure, hold collective support when removing attaching hardware. Failure to do so may allow support to fall as fourth nut is removed.

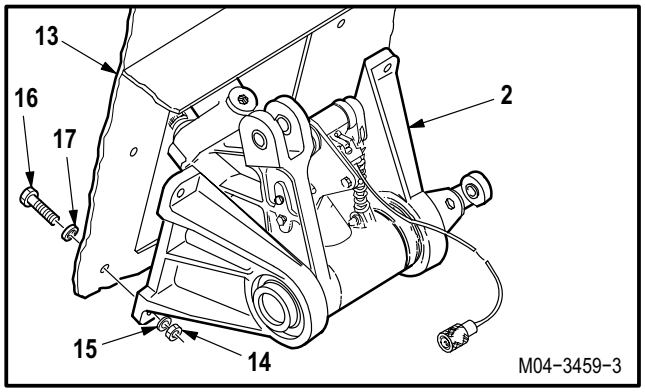


d. **Remove support (2) from airframe (13).**

(1) Remove four nuts (14) and washers (15).

(2) Remove four bolts (16) and washers (17).

(3) Remove support (2).



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11.41. CPG COLLECTIVE STICK SUPPORT REMOVAL/INSTALLATION – continued

11.41.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.41.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

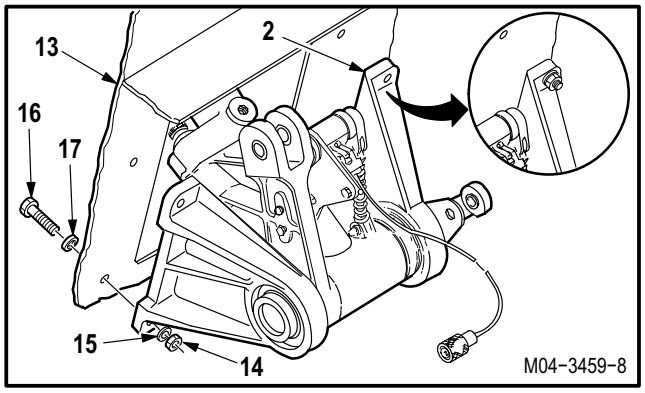
11.41.6. Installation

a. **Install support (2) on airframe (13).**

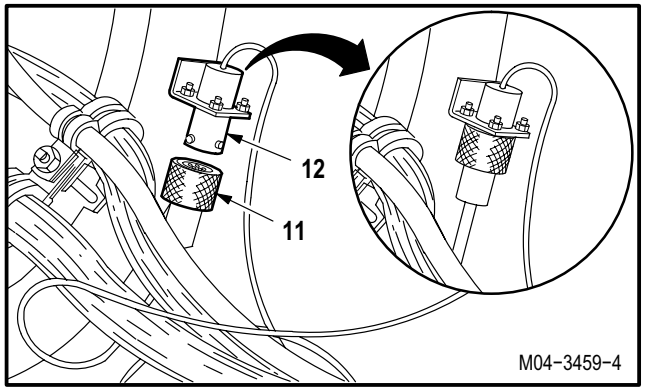
(1) Position support (2) on airframe (13).

(2) Install four bolts (16) and washers (17) through airframe (13) and support (2).

(3) Install four washers (15) and nuts (14).



b. **Attach connector (A334)P1 (11) to receptacle J268 (12).**



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11.41. CPG COLLECTIVE STICK SUPPORT REMOVAL/INSTALLATION – continued

c. **Install rod end (1) on support (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (1) with support (2).

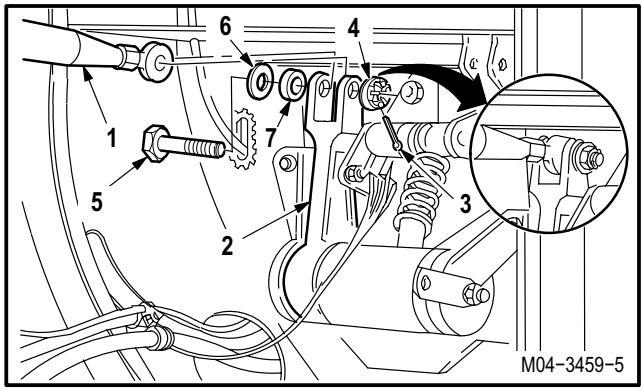
(2) Install bolt (5) through washer (6), bushing (7), support (2), and rod end (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Install brake line (8).**

(1) Install two nuts (10).

(2) Install clamp screw (9).

e. **Install CPG collective stick cylinder** (para 11.40)**.**

f. **Install CPG collective control position LVDT** (para 11.204)**.**

g. **Install CPG collective stick** (para 11.21)**.**

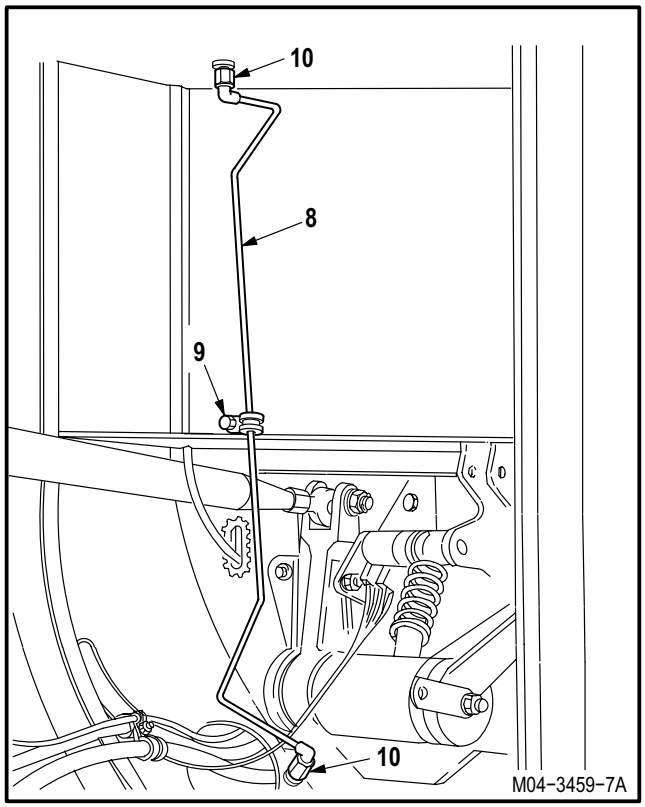
h. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

i. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

j. **Install CPG seat** (para 2.161)**.**

k. **Service and bleed main landing gear system** (para 1.45)**.**

l. **Install area weapon, turret, and flex chute** (TM 9-1090-208-23-1)**.**



END OF TASK

11.42. CPG COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.42.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.42.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)
Light duty laboratory apron (item 27, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (3)
Packing
Rivet MS20470A3 (2)
Shear rivet MS20470AD3
Petrolatum (item 138, App F)

Personnel Required:

67R Attack Helicopter Repairer
68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1500-204-23

Equipment Conditions:

Ref	Condition
11.64	CPG collective SPAD switch removed

11.42.3. Disassembly

a. **Remove collective arm assembly (1) from base (2).**

(1) Remove and discard cotter pin (3) from nut (4).

(2) Remove nut (4) and washer (5).

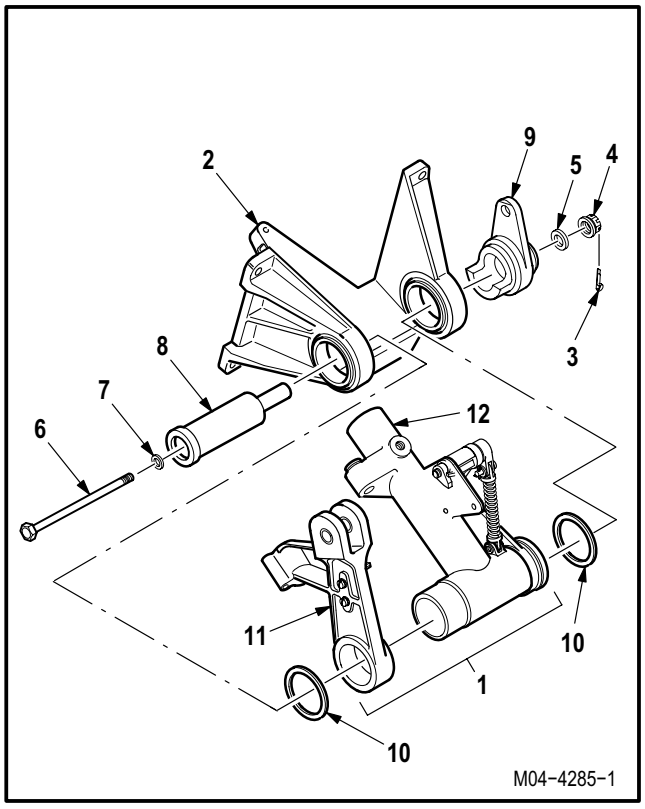
(3) Remove bolt (6) and washer (7).

(4) Remove pin (8).

(5) Remove drive arm (9) from arm (1).

(6) Remove arm (1) and two retainers (10).

b. **Remove output arm (11) from input arm (12).**



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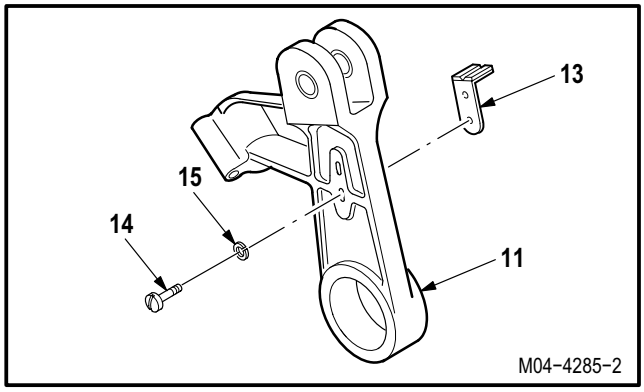
11.42. CPG COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

c. **Remove detent (13) from arm (11).**

(1) Remove lockwire from two screws (14).

(2) Remove two screws (14) and washers (15).

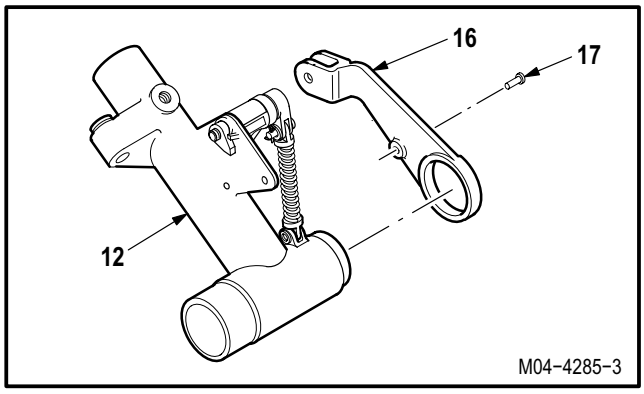
(3) Remove detent (13).



d. **Remove lever (16) from arm (12).**

(1) Remove rivet (17) (TM 1-1500-204-23).

(2) Remove lever (16).



e. **Remove internal spring guide (18) from arm (12).**

(1) Remove cotter pin (19), washer (20), and pin (21).

(2) Discard cotter pin (19).

(3) Remove guide (18) and spring (22).

f. **Remove external spring guide (23) from actuator switch shaft (24).**

(1) Remove cotter pin (25), washer (26), and pin (27).

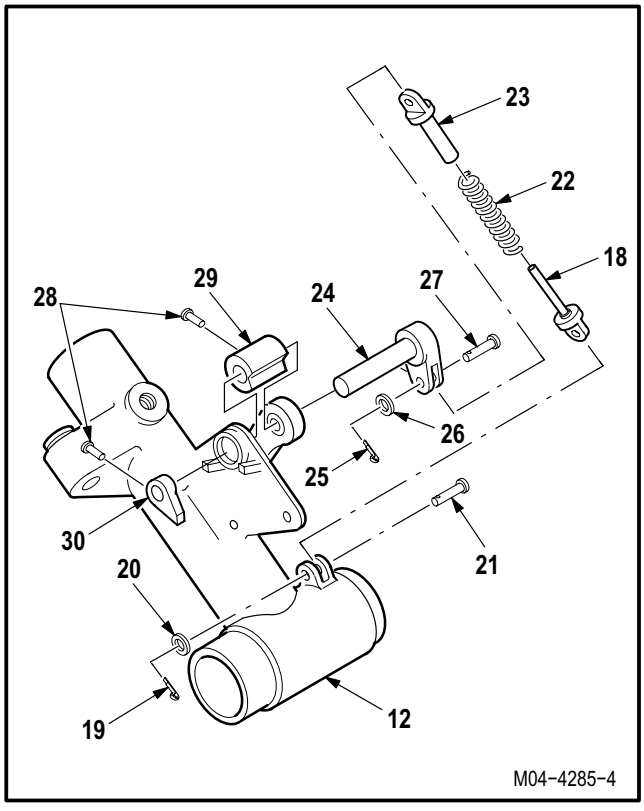
(2) Discard cotter pin (25).

(3) Remove guide (23).

g. **Remove shaft (24) from arm (12).**

(1) Remove two rivets (28) from cam (29) and lever (30) (TM 1-1500-204-23).

(2) Remove lever (30), cam (29), and shaft (24).



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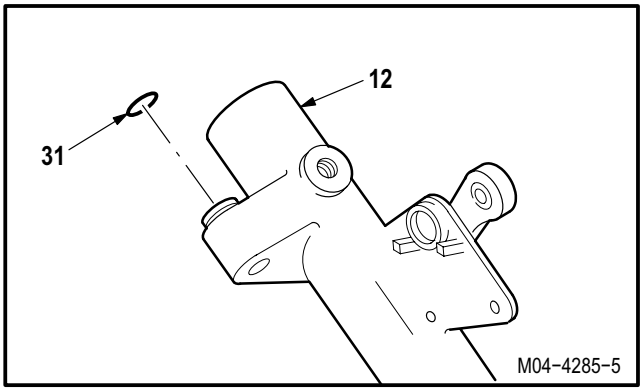
11.42. CPG COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

h. **Remove and discard packing (31) from arm (12).**



11.42.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.42.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check arms and lever for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

c. **Check cam for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

d. **Check removed and attaching parts for damage** (para 11.5)**.**

e. **Check removed and attaching parts for corrosion** (para 1.49)**.**

f. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

g. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.42. CPG COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.42.6. Assembly

a. **Lubricate and install new packing (31) in arm (12).** Use petrolatum (item 138, App F).

b. **Install shaft (24) on arm (12).**

(1) Install shaft (24) through arm (12), cam (29), and lever (30).

NOTE

Ensure shaft arm, cam valley, and lever tip are facing same direction.

(2) Aline cam (29) and lever (30) with holes in shaft (24).

(3) Install two new rivets (28) in cam (29) and lever (30) (TM 1-1500-204-23).

CAUTION

Ensure that pin is no longer than **0.453 INCH**. A longer pin may interfere with SPAD assembly function.

c. **Install guide (23) on shaft (24).**

(1) Install pin (27) through shaft (24), guide (23), and washer (26).

(2) Install new cotter pin (25).

CAUTION

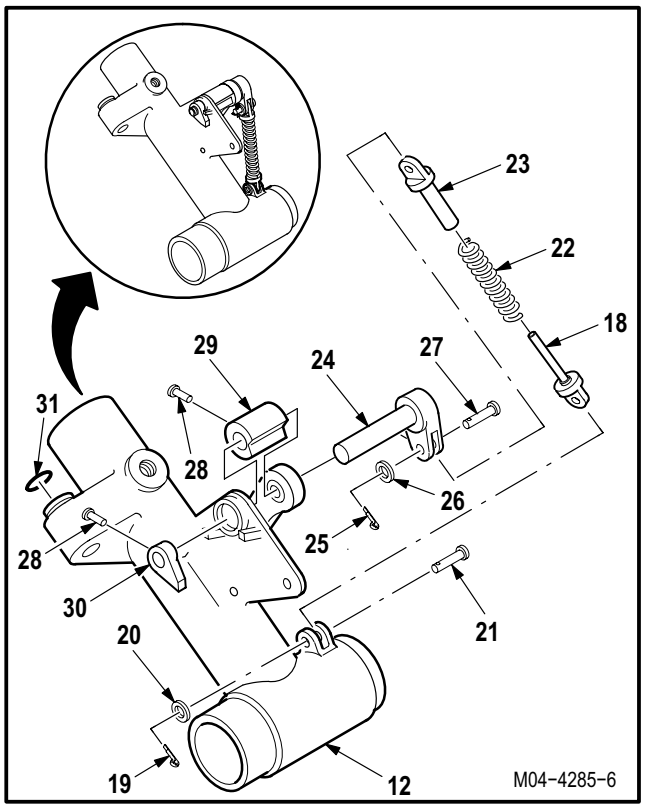
Ensure that pin is no longer than **0.453 INCH**. A longer pin may interfere with SPAD assembly function.

d. **Install guide (18) on arm (12).**

(1) Install spring (22) and guide (18) on guide (23).

(2) Install pin (21) through arm (12), guide (18), and washer (20).

(3) Install new cotter pin (19).



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11.42. CPG COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

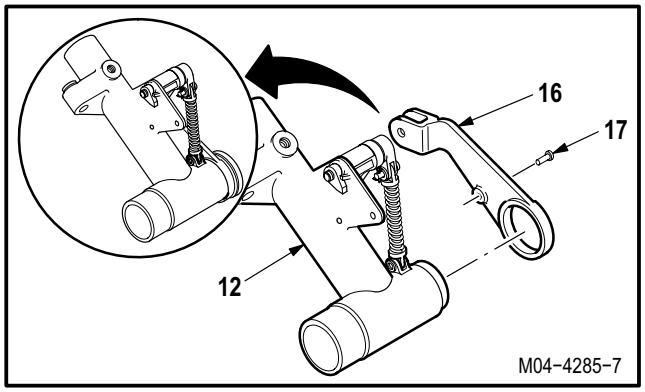
NOTE

Maintain a gap of **0.002 INCH** between lever and arm.

e. **Install lever (16) on arm (12).**

(1) Position lever (16) on arm (12).

(2) Install new shear rivet (17) dry (TM 1-1500-204-23).



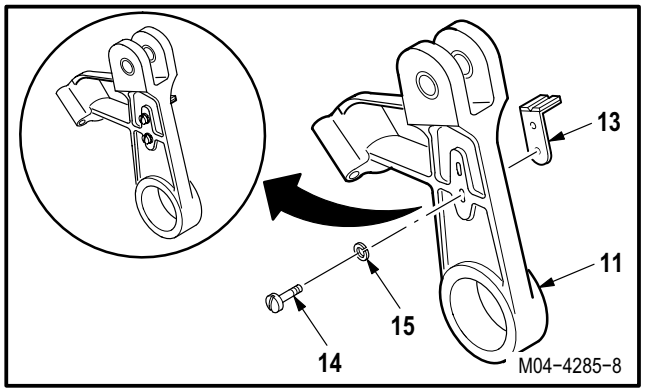
f. **Install detent (13) on arm (11).**

(1) Position detent (13) on arm (11).

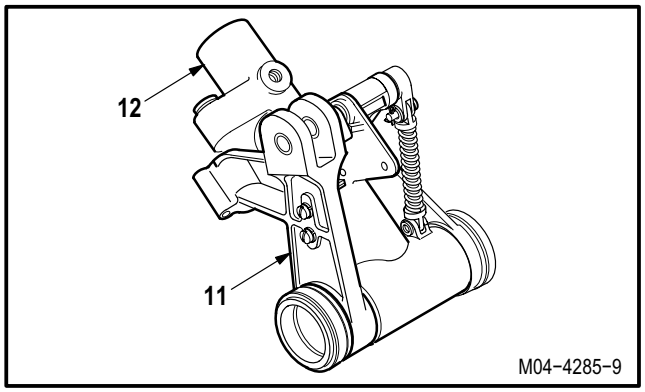
(2) Install two screws (14) and washers (15).

NOTE

Detent will be secured and adjusted when SPAD switch is installed.



g. **Install arm (11) on arm (12).**



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11.42. CPG COLLECTIVE STICK SUPPORT ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

h. **Install arm assembly (1) on base (2).** Torque bolt (6) **30 to 40 INCH-POUNDS**.

(1) Position arm (1) and two retainers (10) on base (2).

(2) Install pin (8) through base (2), retainer (10), arm (1), retainer (10), and base (2).

(3) Install bolt (6) through washer (7), pin (8), arm (9), and washer (5).

(4) Check fit of self-retaining bolt (6) (para 11.1).

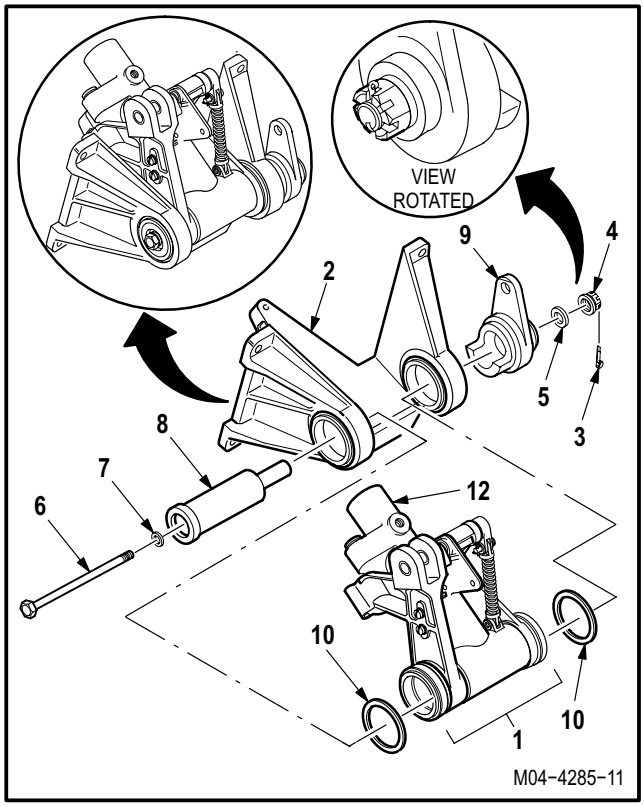
(5) Install nut (4) on bolt (6). Torque bolt (6) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (3).

i. **Inspect (QA).**

j. **Install CPG collective SPAD switch** (para 11.64)**.**



END OF TASK

11.43. CPG COLLECTIVE STICK SHEAR PIN REPLACEMENT

11.43.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.43.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Materials/Parts:

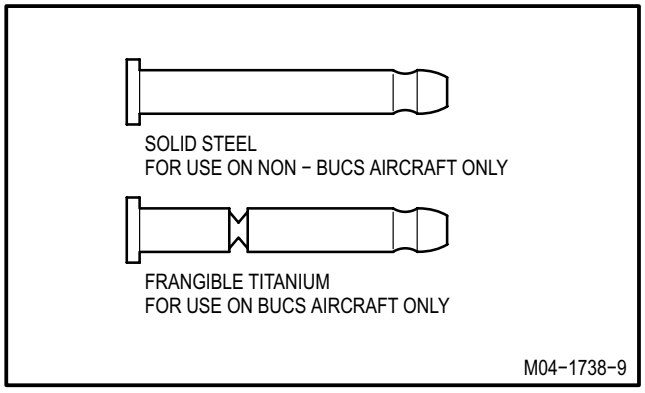
Shear pin
Petrolatum (item 138, App F)
Wire (item 220, App F)

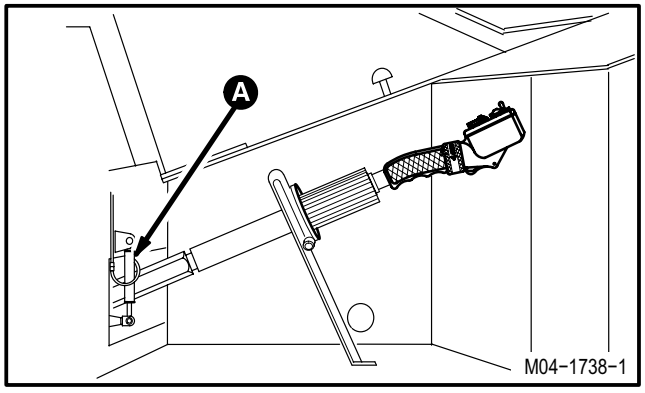
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.44	Collective stick cover removed

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.





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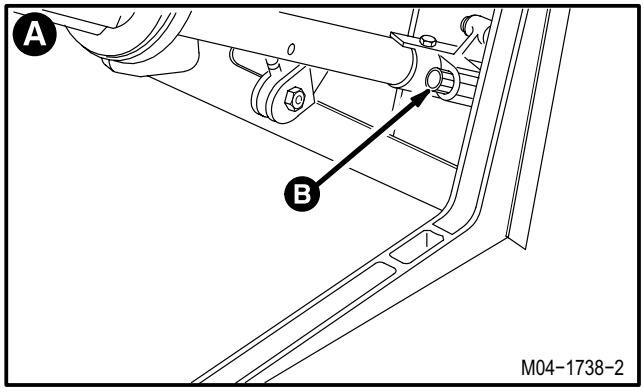
11.43. CPG COLLECTIVE STICK SHEAR PIN REPLACEMENT – continued

11.43.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**

NOTE

If shear pin(s) cannot be removed by conventional means, after repeated attempts from any of the SPAD assemblies (CPG or pilot), deliberately shearing the pin is permitted. Ensure the ends of the pins are removed.



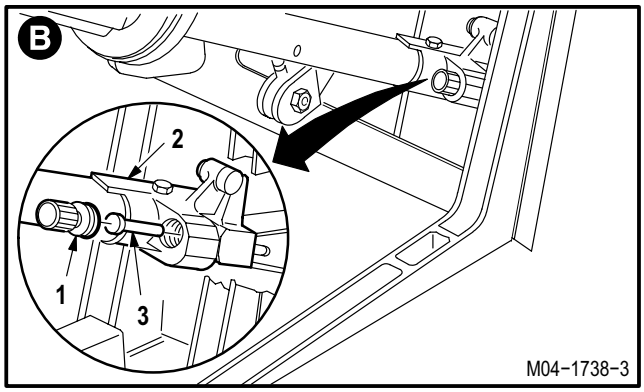
b. **Remove shear pin retainer (1) from arm (2).**

(1) Remove lockwire.

(2) Remove retainer (1).

NOTE

Remove shear pin in pieces if sheared.

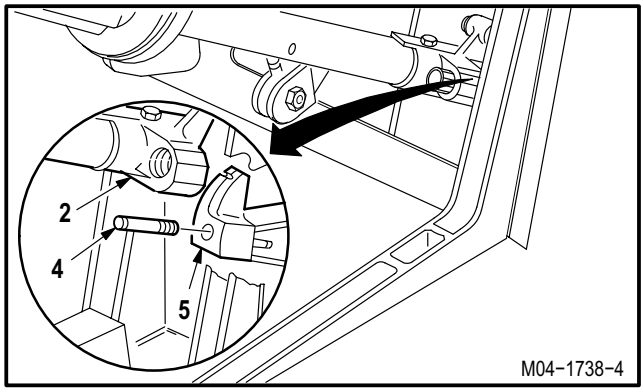


c. **Remove shear pin half (3) from arm (2).**

d. **Remove and discard shear pin half (4) from lever (5).**

(1) Move arm (2) to allow access to shear pin half (4).

(2) Remove and discard shear pin half (4).



11.43.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.43.5. Inspection

a. **Check retainer for damaged threads.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.43. CPG COLLECTIVE STICK SHEAR PIN REPLACEMENT – continued

11.43.6. Installation

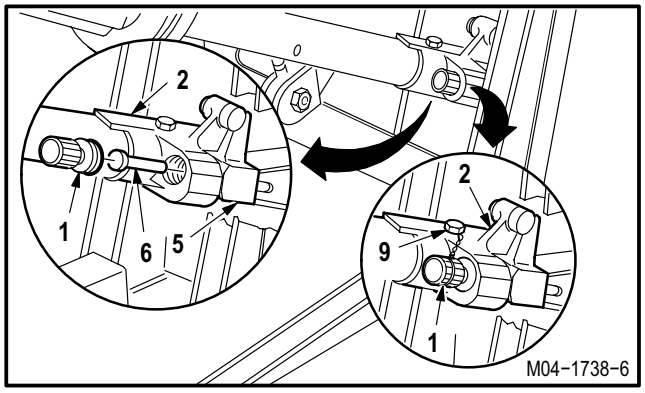
a. **Install new shear pin (6) in arm (2) and lever (5).**

(1) Apply petrolatum to tapered end of shear pin (6). Use petrolatum (item 138, App F).

(2) Aline arm (2) with lever (5).

(3) Ensure that switch detent (7) and switch position lever (8) are engaged.

(4) Install shear pin (6) through arm (2) and lever (5).



NOTE

Install retainer finger tight.

b. **Install retainer (1) on arm (2).**

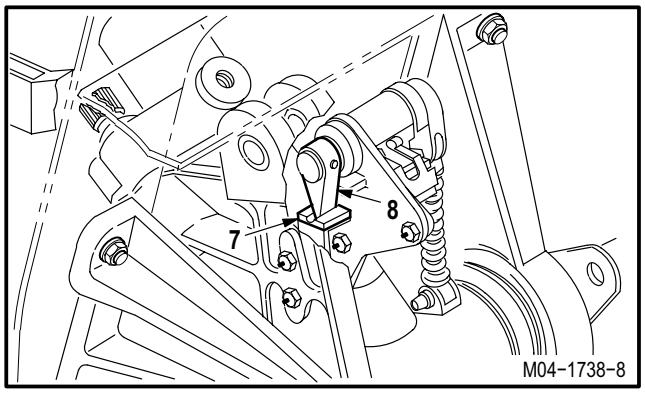
c. **Lockwire retainer (1) to bolt (9).** Use wire (item 220, App F).

d. **Inspect (QA).**

e. **Install collective stick cover** (para 11.44)**.**

f. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

g. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.44. COLLECTIVE STICK COVER REMOVAL/INSTALLATION

11.44.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.44.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

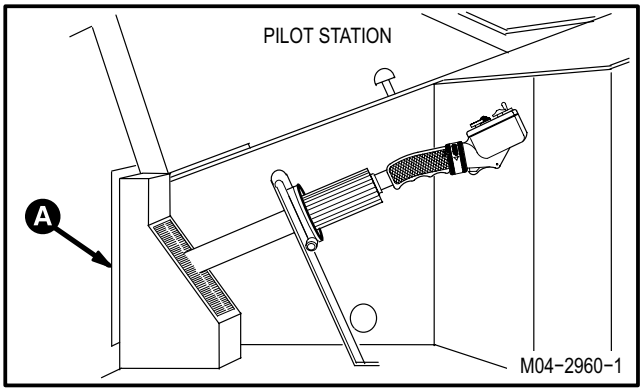
Ref	Condition
1.57	Helicopter safed

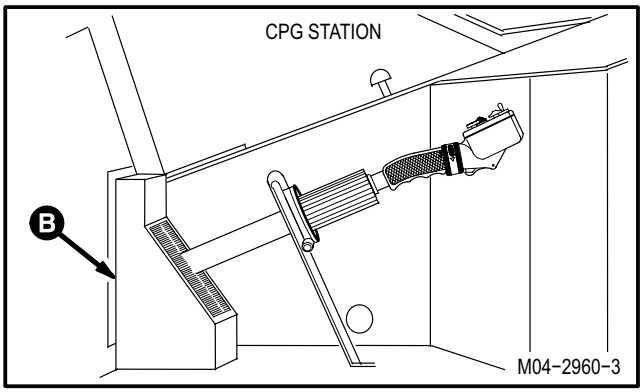
NOTE

This task is typical for either pilot or CPG collective stick cover, except where indicated.

11.44.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**





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11.44. COLLECTIVE STICK COVER REMOVAL/INSTALLATION – continued

b. **On pilot center circuit breaker panel, open ASE AC, DC, and BUCS circuit breakers.**

c. **In pilot station, detach receptacle J230 (1) from connector P230 (2).**

d. **In CPG station, detach receptacle J234 (1) from connector P234 (2).**

e. **Remove collective stick cover (3).**

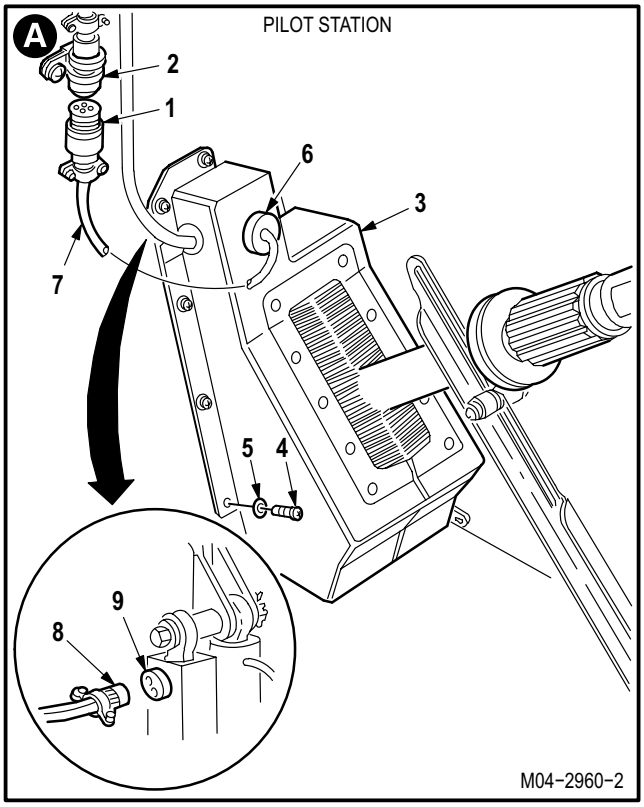
(1) Remove six screws (4) and washers (5) from pilot cover (3).

(2) Remove five screws (4) and washers (5) from CPG cover (3).

(3) Remove grommet (6) and LVDT cable (7) from cover (3).

(4) In pilot station, detach potentiometer cable connector P1121 (8) from N_R droop compensator receptacle (A656)J1 (9).

(5) Remove cover (3).



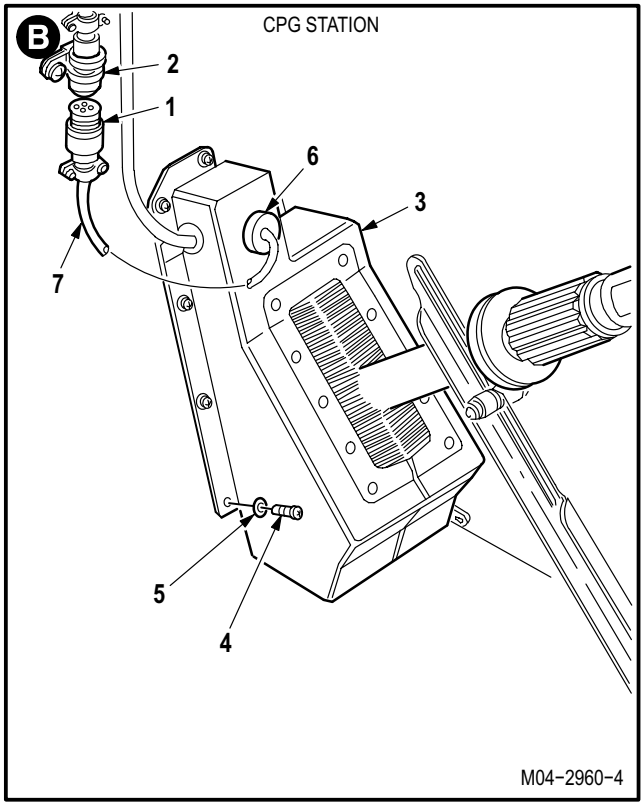
11.44.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.44.5. Inspection

a. **Check removed and attaching parts for damage.** None allowed.

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**



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11.44. COLLECTIVE STICK COVER REMOVAL/INSTALLATION – continued

11.44.6. Installation

a. **Install cover (3).**

(1) Position LVDT cable (7) in grommet (6).

(2) Install grommet (6) in cover (3).

(3) In pilot station, attach potentiometer cable connector P1121 (8) to N_R droop compensator receptacle (A656)J1 (9).

(4) Position cover (3).

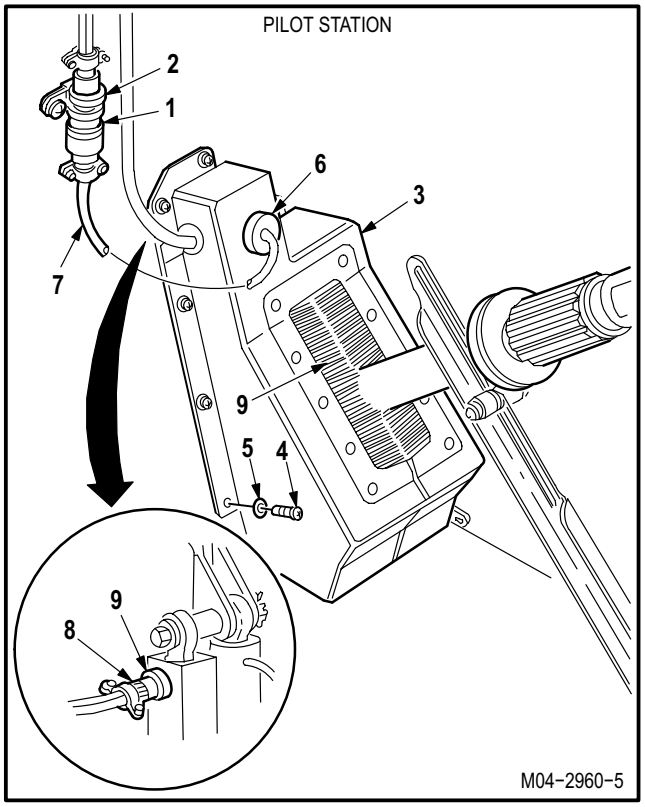
(5) Install six screws (4) through washers (5) and pilot cover (3).

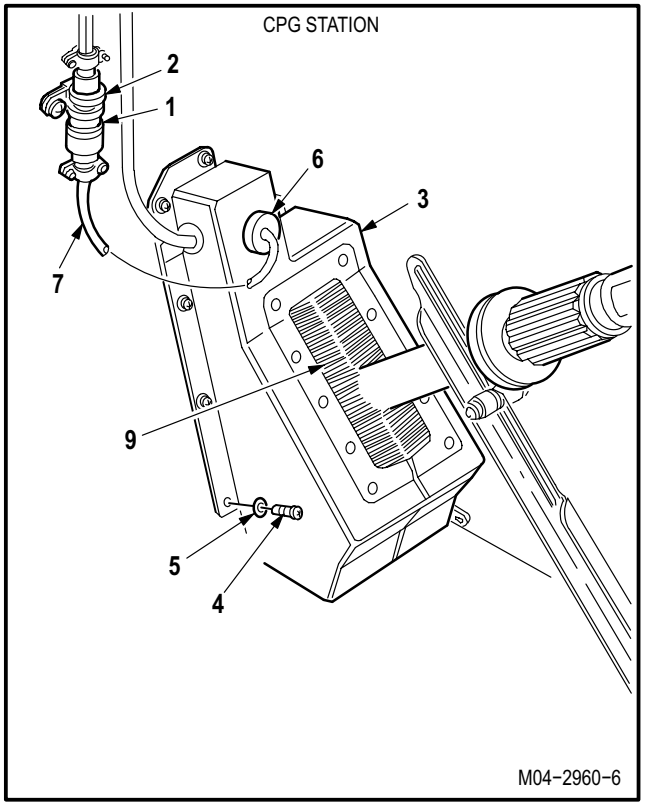
(6) Install five screws (4) and washers (5) on CPG cover (3).

b. **In pilot station, attach receptacle J230 (1) to connector P230 (2).**

c. **In CPG station, attach receptacle J234 (1) to connector P234 (2).**

d. **Inspect (QA).**





END OF TASK

11.45. PILOT CYCLIC STICK REMOVAL/INSTALLATION

11.45.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.45.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)
Industrial faceshield (item 129, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

67R Attack Helicopter Repairer
68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1500-204-23
TM 1-1520-238-T

Materials/Parts:

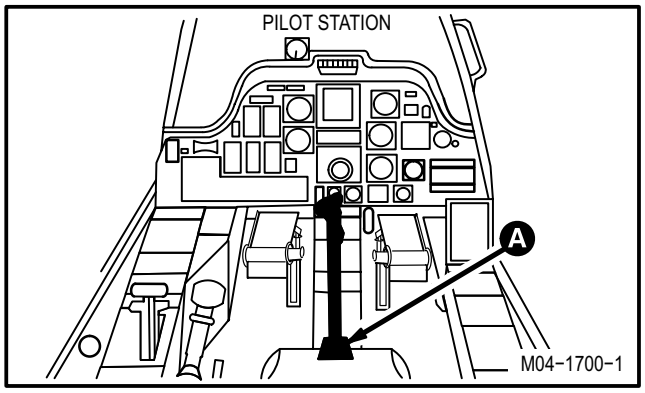
Cotter pin (3)
Rivet MS20470A3 (2)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.46	Pilot cyclic stick cover removed

11.45.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

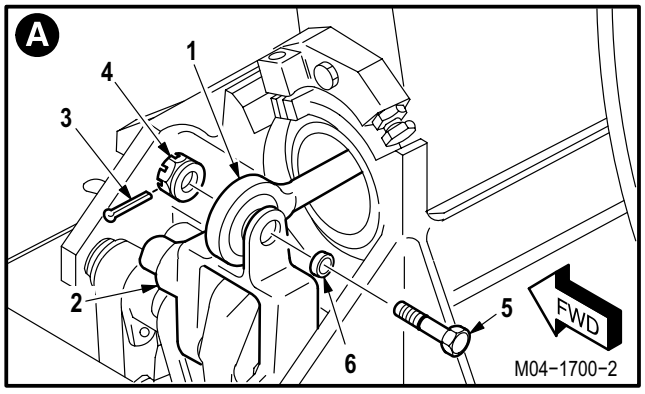


b. **Remove link (1) from arm (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5) and bushing (6).



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11.45. PILOT CYCLIC STICK REMOVAL/INSTALLATION – continued

c. **Remove cyclic stick (7) from housing (8).**

(1) Remove and discard cotter pin (9).

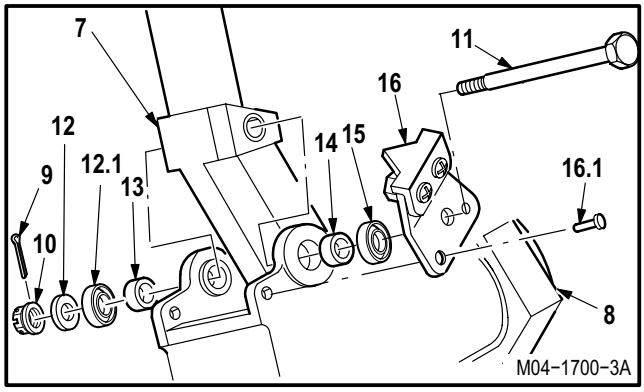
(2) Remove nut (10).

(3) Remove bolt (11), washer (12), bearing (12.1), and sleeve spacer (13).

(4) Remove two rivets (16.1) (TM 1-1500-204-23).

(5) Remove bracket (16) with indicator.

(6) Remove bearing (15) and spacer ring (14).

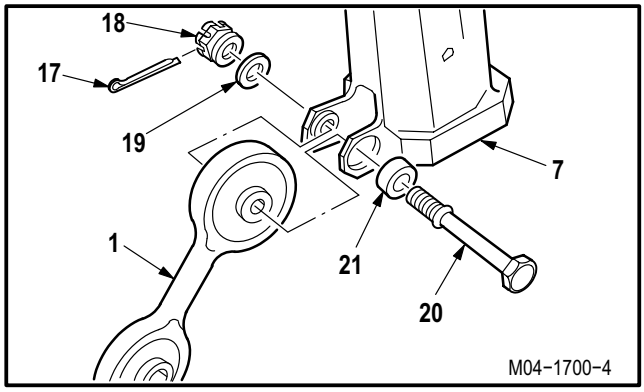


d. **Remove link (1) from stick (7).**

(1) Remove and discard cotter pin (17).

(2) Remove nut (18) and washer (19).

(3) Remove bolt (20) and bushing (21).



11.45.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.45.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

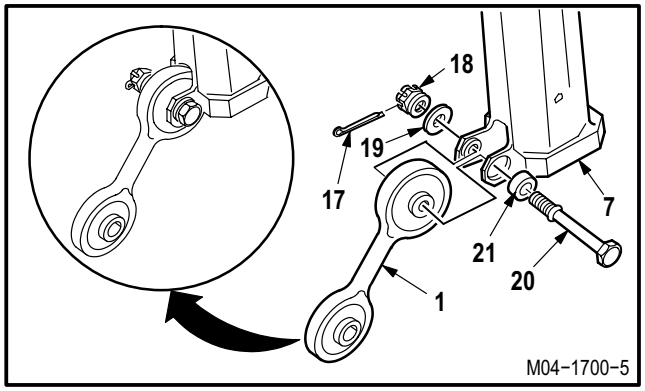
e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.45. PILOT CYCLIC STICK REMOVAL/INSTALLATION – continued

11.45.6. Installation

a. **Install link (1) on cyclic stick (7).**



(1) Aline link (1) with stick (7).

(2) Install bushing (21) in stick (7).

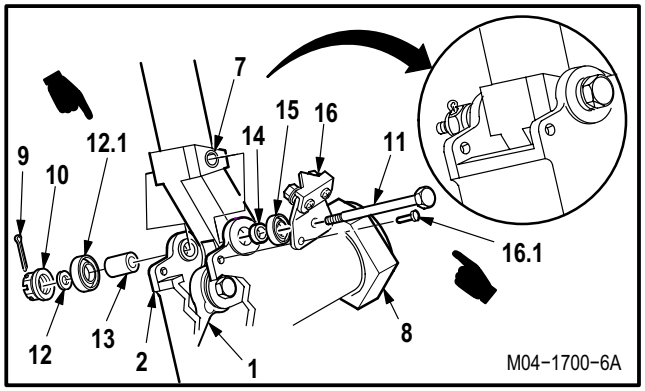
(3) Install bolt (20) through bushing (21), stick (7), and link (1).

(4) Check fit of self-retaining bolt (20) (para 11.1).

(5) Install washer (19) and nut (18).

(6) Install new cotter pin (17).

b. **Install stick (7) on housing (8).**



(1) Install spacer ring (14) and bearing (15) in housing (8).

(2) Position bracket (16) with indicator on housing (8).

(3) Install two new rivets (16.1) (TM 1-1500-204-23).

(4) Position stick (7) in housing (8) so that link (1) is alined with arm (2).

(5) Install bolt (11) through bracket (16) with indicator, bearing (15), spacer ring (14), housing (8), stick (7), sleeve spacer (13), bearing (12.1), and washer (12).

(6) Check fit of self-retaining bolt (11) (para 11.1).

(7) Install nut (10).

(8) Install new cotter pin (9).

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11.45. PILOT CYCLIC STICK REMOVAL/INSTALLATION – continued

c. **Install link (1) on arm (2).** Torque nut (4) **20 to 25 INCH-POUNDS**.

(1) Aline link (1) and arm (2).

(2) Install bushing (6) in arm (2).

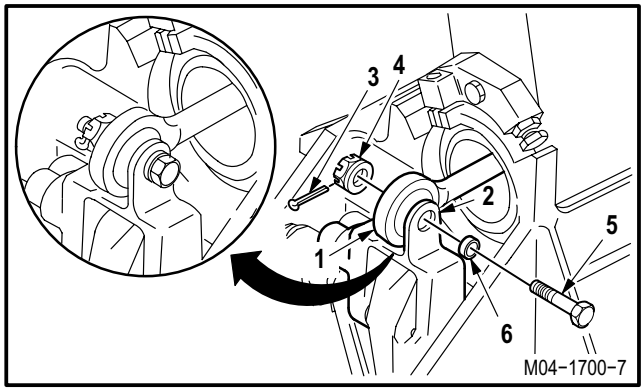
(3) Install bolt (5) through bushing (6), arm (2), and link (1).

(4) Check fit of self-retaining bolt (5) (para 11.1).

(5) Install nut (4). Torque nut (4) to **20 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **25 INCH-POUNDS**.

(7) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Install pilot cyclic stick cover** (para 11.46)**.**

f. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.46. PILOT CYCLIC STICK COVER REMOVAL/INSTALLATION

11.46.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.46.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

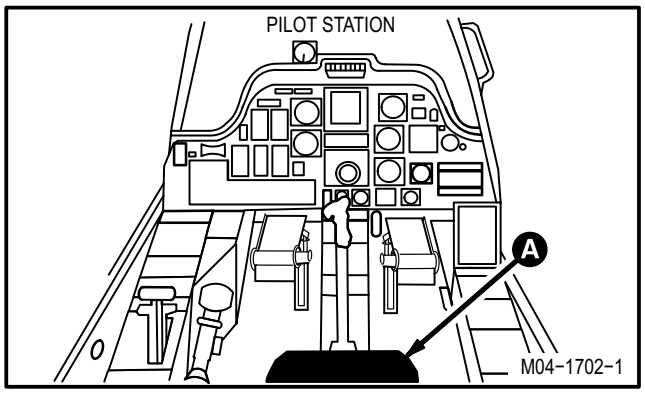
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

11.46.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**



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11.46. PILOT CYCLIC STICK COVER REMOVAL/INSTALLATION – continued

b. **Remove forward and aft covers (1).**

(1) Remove two nuts (2) and washers (3).

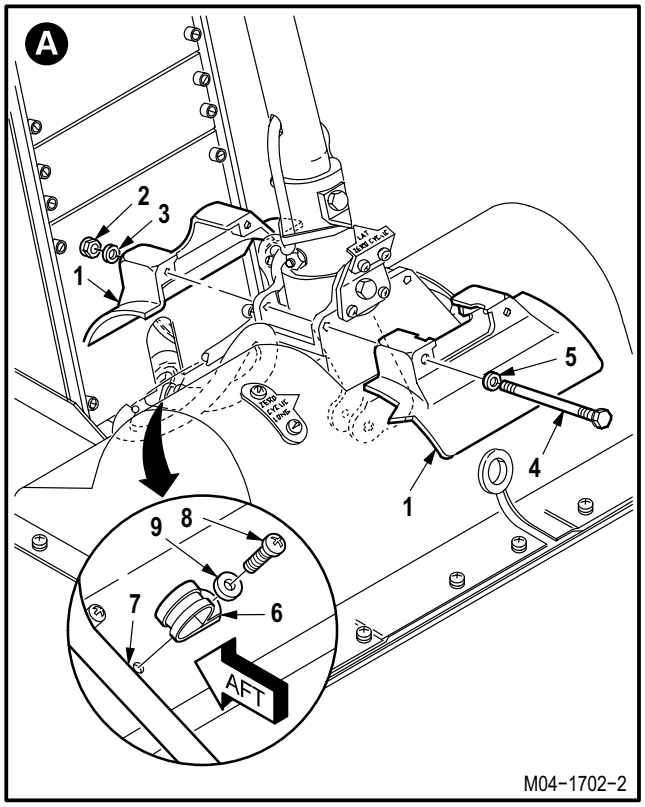
(2) Remove two bolts (4) and washers (5) from covers (1).

(3) Remove two covers (1).

c. **Remove clamp (6) from wire harness (7).**

(1) Remove screw (8) and washer (9) from clamp (6).

(2) Remove clamp (6) from wire harness (7).

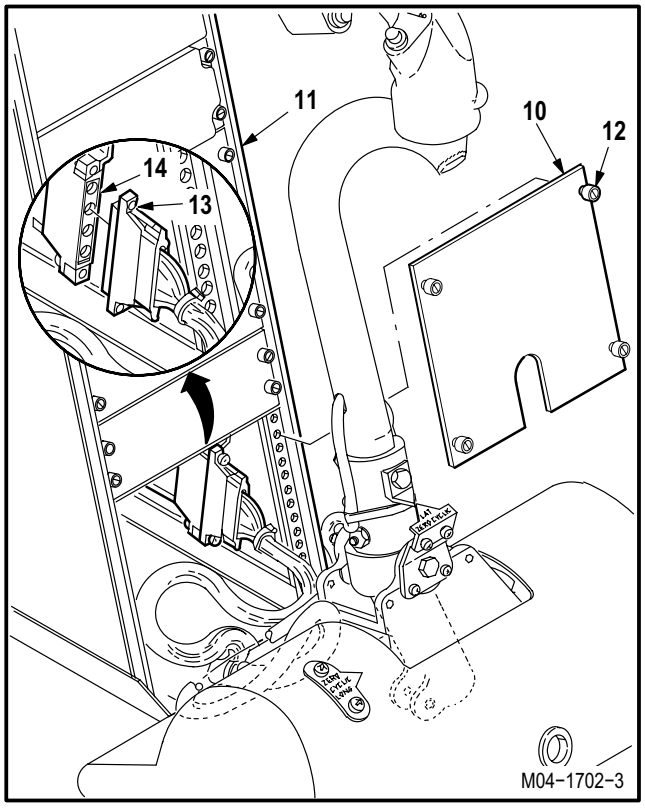


d. **Remove lower plate (10) from center console (11).**

(1) Loosen four fasteners (12).

(2) Remove plate (10).

e. **Detach connector P113 (13) from receptacle J113 (14).**



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11.46. PILOT CYCLIC STICK COVER REMOVAL/INSTALLATION – continued

f. **Remove cover (15) from cyclic stick (16).**

(1) Remove four screws (17) and washers (18) from cover (15) and housing (19).

(2) Remove 17 screws (20) and washers (21) from cover (15) and floor (22).

(3) Remove cover (15).

11.46.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47).

11.46.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage.** None allowed.

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

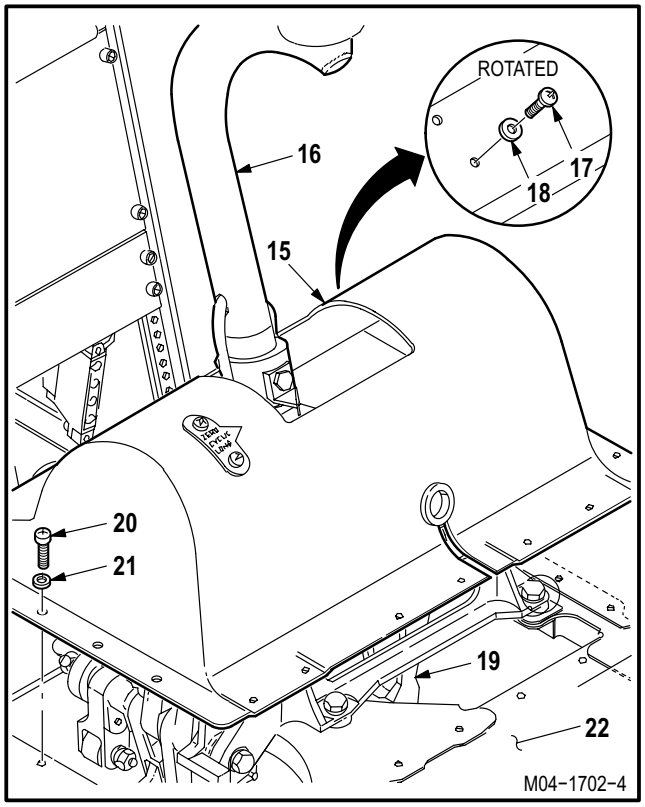
11.46.6. Installation

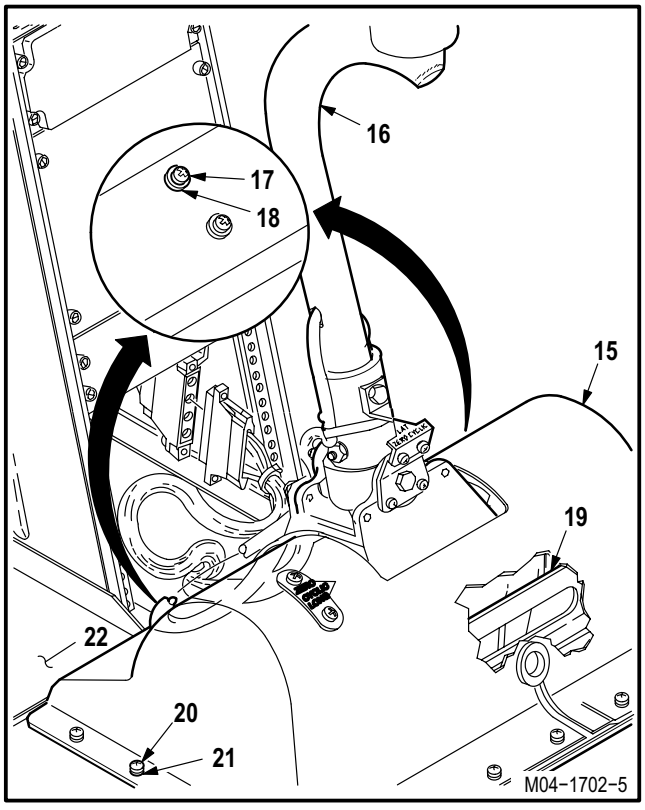
a. **Install cover (15) on cyclic stick (16).**

(1) Position cover (15) over cyclic stick (16).

(2) Install 17 screws (20) and washers (21) through cover (15) into floor (22).

(3) Install four screws (17) and washers (18) through cover (15) into housing (19).





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11.46. PILOT CYCLIC STICK COVER REMOVAL/INSTALLATION – continued

b. **Install forward and aft covers (1) on housing (19).**

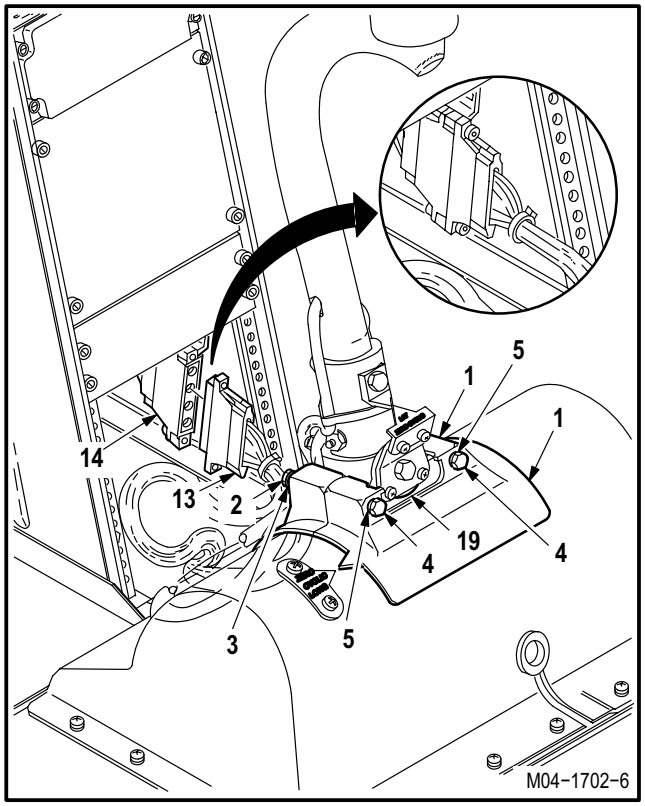
(1) Install forward and aft covers (1) on housing (19).

(2) Install two bolts (4) through washers (5), forward cover (1), housing (19), and aft cover (1).

(3) Install two washers (3) and nuts (2) on bolts (4).

c. **Attach connector P113 (13) to receptacle J113 (14).**

d. **Inspect (QA).**



e. **Install clamp (6) on wire harness (7).**

(1) Position clamp (6) on wire harness (7).

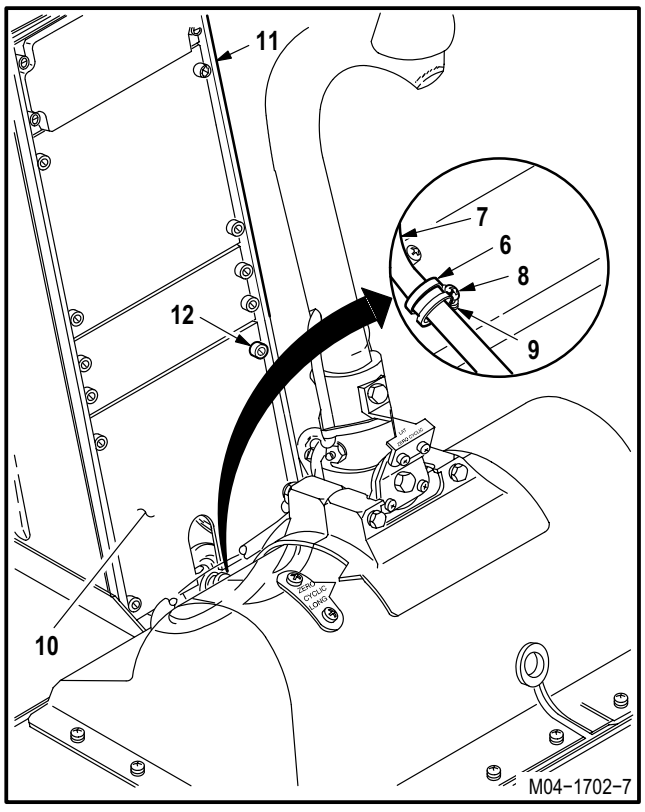
(2) Install screw (8) and washer (9).

f. **Install lower plate (10) on center console (11).**

(1) Position lower plate (10) on center console (11).

(2) Tighten four fasteners (12).

g. **Inspect (QA).**



END OF TASK

11.47. PILOT CYCLIC STICK TRIM AND FORCE FEEL RELEASE SWITCH REPLACEMENT

11.47.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.47.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 1-1520-238-T
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)
Tape (item 202, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

11.47.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

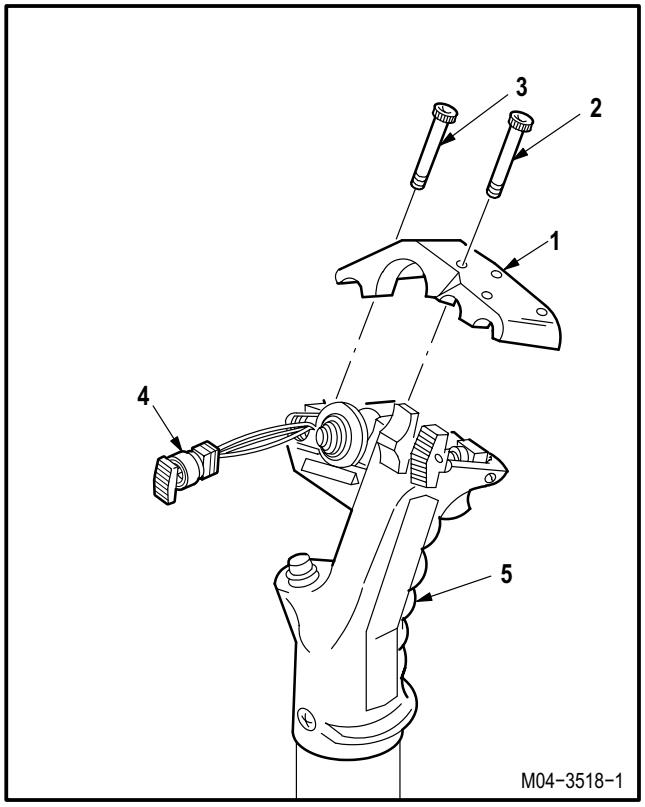
b. **Remove grip cap (1).**

(1) Remove adhesive from heads of five screws (2) and screw (3).

(2) Remove five screws (2) and screw (3).

(3) Remove cap (1).

c. **Debond and remove switch (4) from grip (5).**



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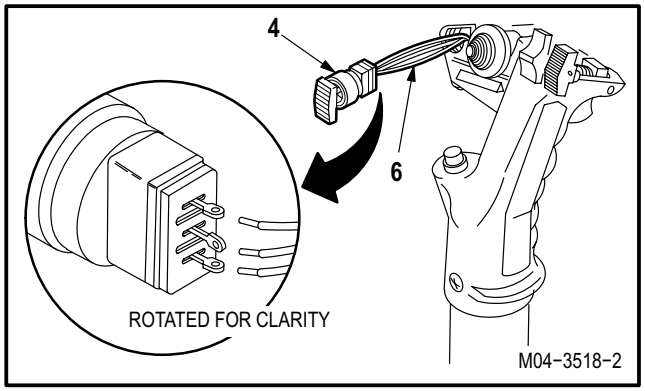
11.47. PILOT CYCLIC STICK TRIM AND FORCE FEEL RELEASE SWITCH REPLACEMENT – continued

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

d. **Desolder wires (6) from switch (4).**

(1) Identify and desolder wires (6) from switch (4). Use soldering iron (TM 55-1500-323-24).



11.47.4. Cleaning

a. **Clean adhesive from removed and attaching parts** (para 1.47)**.**

11.47.5. Inspection

a. **Check wires for cracks or broken insulation.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage.** None allowed.

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.47. PILOT CYCLIC STICK TRIM AND FORCE FEEL RELEASE SWITCH REPLACEMENT – continued

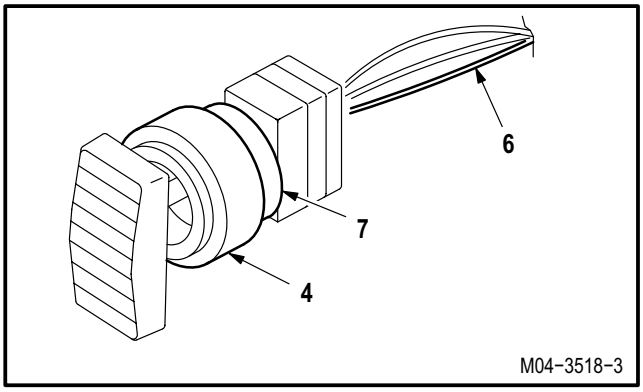
11.47.6. Installation

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

a.. **Solder wires (6) to switch (4).**

(1) Solder identified wires (6) to switch (4). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).



WARNING

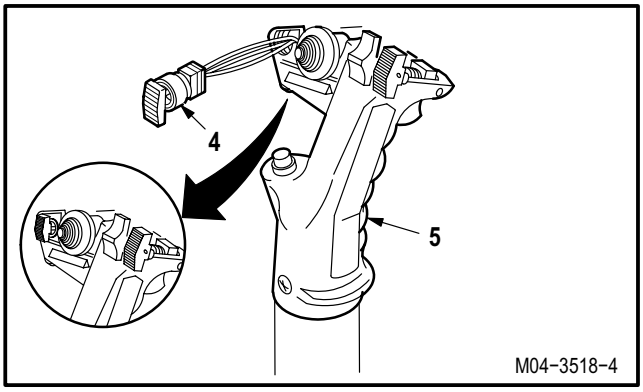
Ensure wiring inside the cyclic grip is properly restrained with lacing tape prior to reassembly. Failure to comply may cause uncommanded firing of a weapon system.

b. **Install switch (4) on grip (5).**

(1) Apply a small bead of adhesive to mating surface of switch mounting shoulder (7). Use adhesive (item 14, App F).

(2) Install switch (4) in grip (5).

(3) Restrain wires (6). Use tape (item 202, App F) (TM 55-1500-323-24).



c. **Inspect (QA).**

GO TO NEXT PAGE

11.47. PILOT CYCLIC STICK TRIM AND FORCE FEEL RELEASE SWITCH REPLACEMENT – continued

d. **Install cap (1).**

(1) Position cap (1) on grip (5).

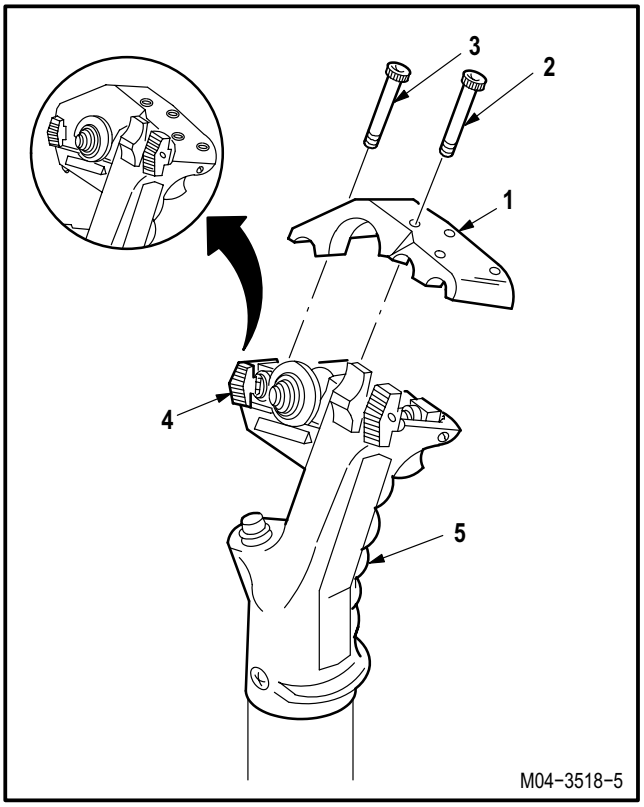
(2) Install five screws (2) and screw (3).

(3) Apply a light coat of adhesive over heads of screws (2) and (3). Use adhesive (item 14, App F).

e. **Clean excess adhesive from grip** (para 1.47)**.**

f. **Inspect (QA).**

g. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.48. PILOT CYCLIC STICK REMOTE TRANSMITTER SELECTOR SWITCH REPLACEMENT

11.48.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.48.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 1-1520-238-T
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)
Tape (item 202, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

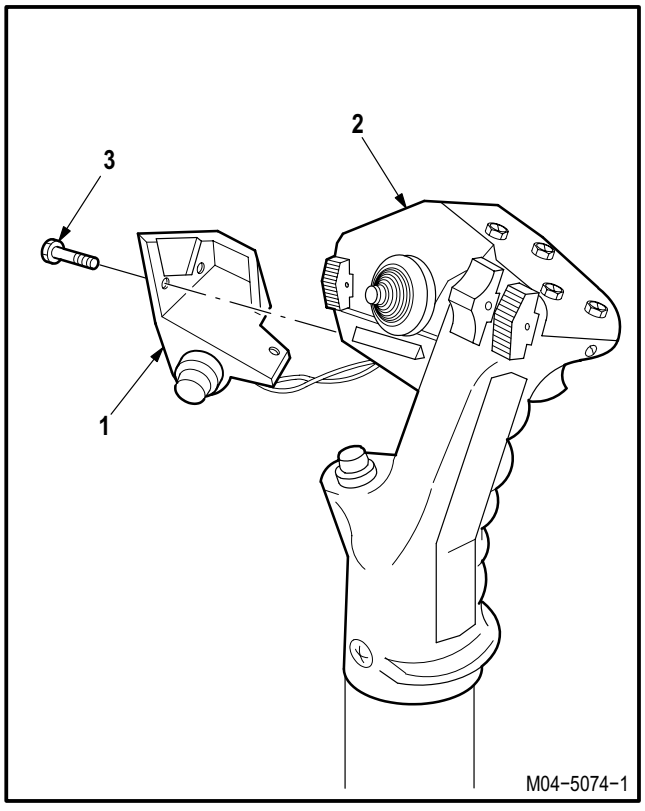
11.48.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **Remove actuator switch adapter (1) from control grip (2).**

(1) Remove three screws (3) from adapter (1).

(2) Remove adapter (1) from grip (2).



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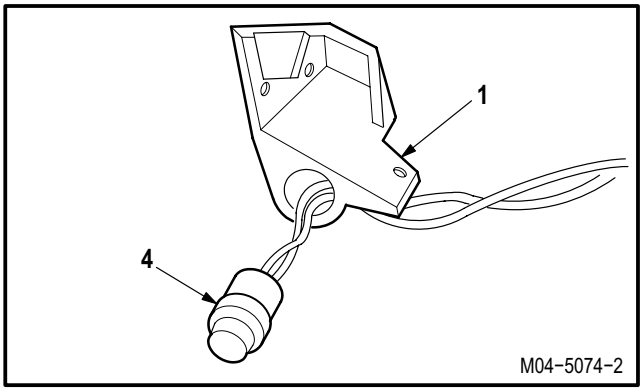
11.48. PILOT CYCLIC STICK REMOTE TRANSMITTER SELECTOR SWITCH REPLACEMENT – continued

c. **Debond and remove switch (4) from adapter (1).**

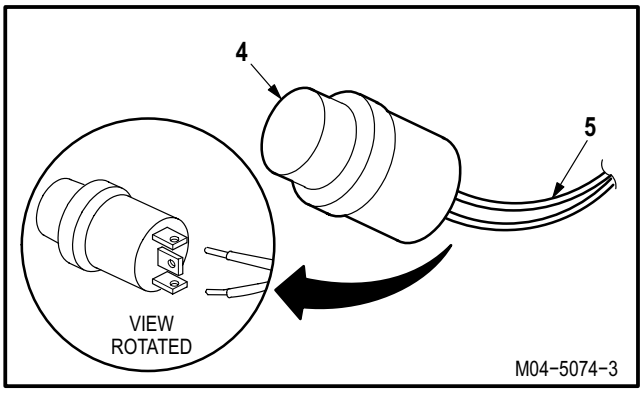


WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

d. **Desolder wires (5) from switch (4) terminals.**

(1) Identify and desolder wires (5) from switch (4). Use soldering iron (TM 55-1500-323-24).



11.48.4. Cleaning

a. **Clean adhesive from removed and attaching parts** (para 1.47)**.**

11.48.5. Inspection

a. **Check wires for cracked or broken insulation.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage.** None allowed.

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.48. PILOT CYCLIC STICK REMOTE TRANSMITTER SELECTOR SWITCH REPLACEMENT – continued

11.48.6. Installation

WARNING

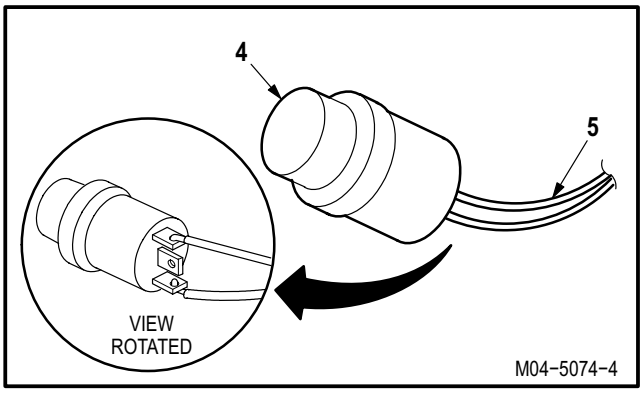
Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

a. **Solder wires (5) to switch (4).**

(1) Solder identified wires (5) to switch (4). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).

WARNING

Ensure wiring inside the cyclic grip is properly restrained with lacing tape prior to reassembly. Failure to comply may cause uncommanded firing of a weapon system.



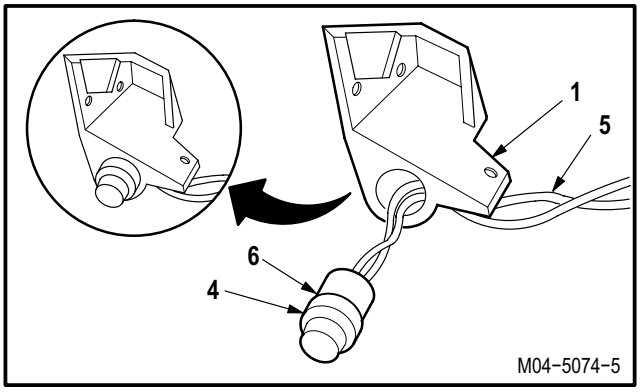
b. **Install switch (4) on adapter (1).**

(1) Apply a small bead of adhesive to mating surface of switch mounting shoulder (6). Use adhesive (item 14, App F).

(2) Install switch (4) in mounting slot.

(3) Restrain wires (5) (TM 55-1500-323-24). Use tape (item 202, App F).

c. **Inspect (QA).**



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11.48. PILOT CYCLIC STICK REMOTE TRANSMITTER SELECTOR SWITCH REPLACEMENT – continued

d. **Install adapter (1).**

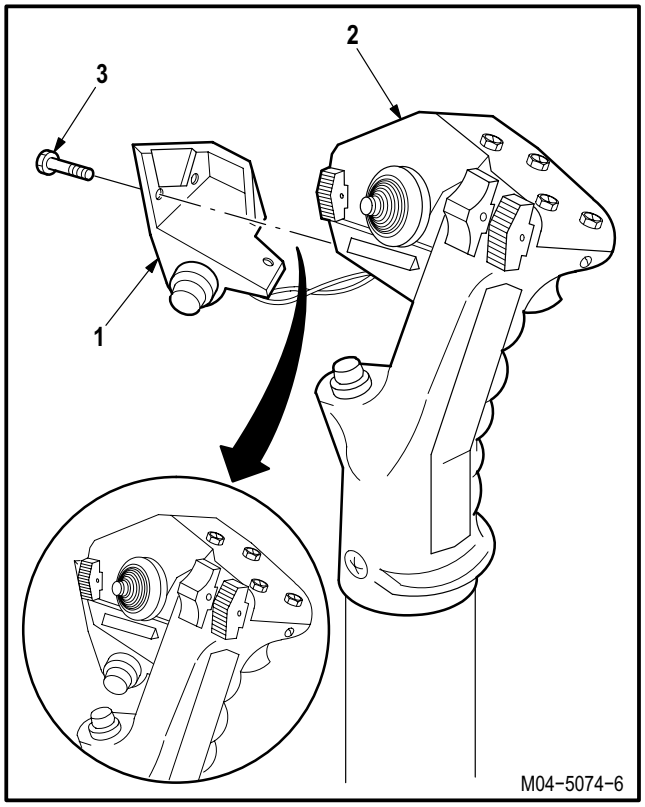
(1) Aline adapter (1) on grip (2).

(2) Install three screws (3).

e. **Clean excess adhesive from grip (2)** (para 1.47)**.**

f. **Inspect (QA).**

g. **Perform flight control system, maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.49. CYCLIC STICK ASE RELEASE SWITCH REPLACEMENT

11.49.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.49.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 1-1520-238-T
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Sealing compound (item 169, App F)
Solder (item 189, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

NOTE

This task is typical for either pilot or CPG cyclic stick.

11.49.3. Removal

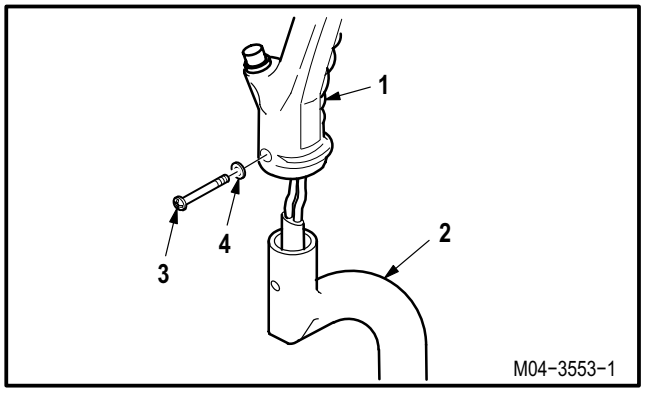
a. **Enter pilot or CPG station** (para 1.56)**. Observe all safety precautions.**

NOTE

Separate control grip from cyclic stick only enough to allow wiring to be free of obstruction.

b. **Remove grip (1) from stick (2).**

(1) Remove screw (3) and lockwasher (4).



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11.49. CYCLIC STICK ASE RELEASE SWITCH REPLACEMENT – continued

c. **Debond and remove switch (5) from grip (1).**

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

d. **Desolder wires (6) from switch (5) terminals.**

(1) Identify and desolder wires (6). Use soldering iron (TM 55-1500-323-24).

11.49.4. Cleaning

a. **Clean adhesive from removed and attaching parts** (para 1.47)**.**

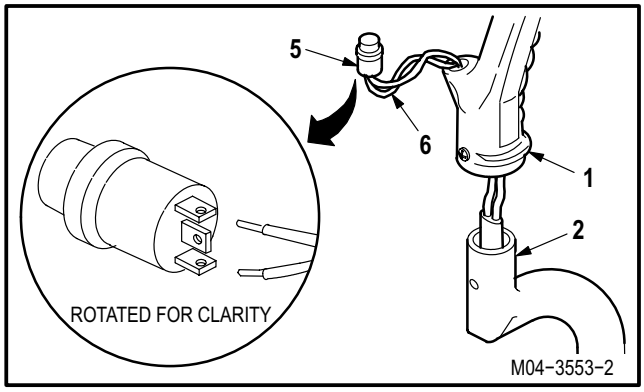
11.49.5. Inspection

a. **Check wires for cracked or broken insulation.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**



GO TO NEXT PAGE

11.49. CYCLIC STICK ASE RELEASE SWITCH REPLACEMENT – continued

11.49.6. Installation

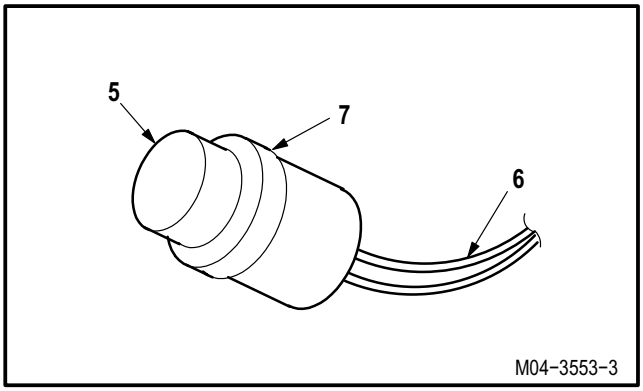
WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

a. **Solder wires (6) to switch (5).**

(1) Solder identified wires (6) to switch (5). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).

b. **Inspect (QA).**

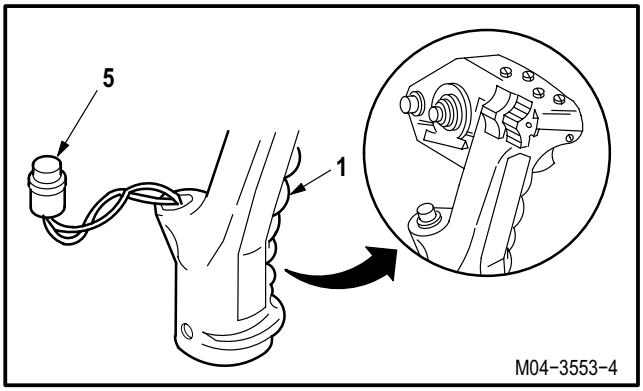


c. **Install switch (5) on grip (1).**

(1) Apply a small bead of adhesive around switch mounting shoulder (7). Use adhesive (item 14, App F).

(2) Install switch (5) on grip (1) and press in place.

d. **Clean excess adhesive from grip (1)** (para 1.47)**.**



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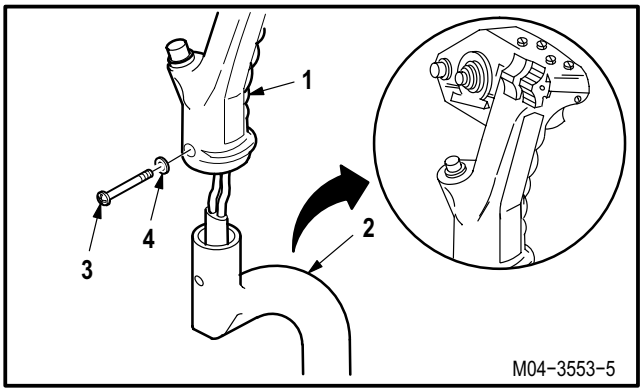
11.49. CYCLIC STICK ASE RELEASE SWITCH REPLACEMENT – continued

e. **Install grip (1) on stick (2).**

(1) Position grip (1) on stick (2).

(2) Apply sealing compound to threads of screw (3). Use sealing compound (item 169, App F).

(3) Install screw (3) and lockwasher (4).



f. **Inspect (QA).**

g. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.50. CYCLIC STICK RADIO-ICS SWITCH REPLACEMENT

11.50.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.50.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 11-1520-238-23-2
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)
Tape (item 202, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

NOTE

This task is typical for either pilot or CPG cyclic stick.

11.50.3. Removal

a. **Enter pilot or CPG station** (para 1.56)**. Observe all safety precautions.**

b. **Remove grip cap (1).**

(1) Remove adhesive from heads of five screws (2) and screw (3).

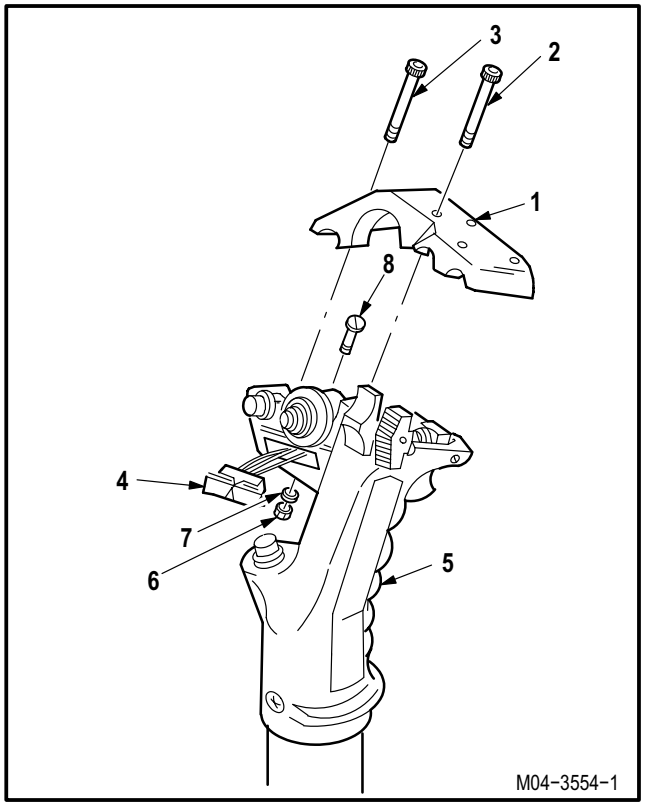
(2) Remove five screws (2) and screw (3).

(3) Remove cap (1).

c. **Debond and remove switch (4) from grip (5).**

(1) Remove two nuts (6), washers (7), and screws (8).

(2) Remove switch (4).



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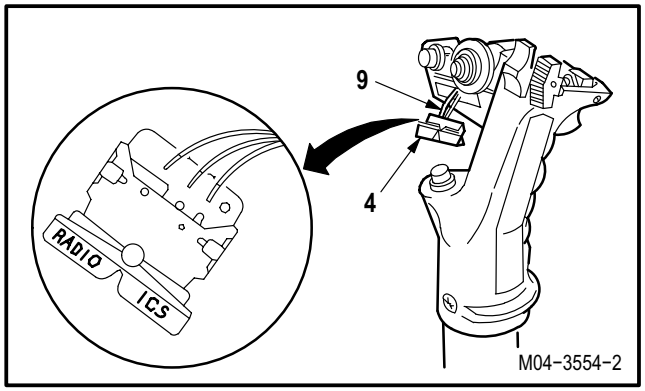
11.50. CYCLIC STICK RADIO-ICS SWITCH REPLACEMENT – continued

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

d. **Desolder wires (9) from switch (4).**

(1) Identify and desolder wires (9) from switch (4). Use soldering iron (TM 55-1500-323-24).



11.50.4. Cleaning

a. **Clean adhesive from removed and attaching parts** (para 1.47)**.**

11.50.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.50. CYCLIC STICK RADIO-ICS SWITCH REPLACEMENT – continued

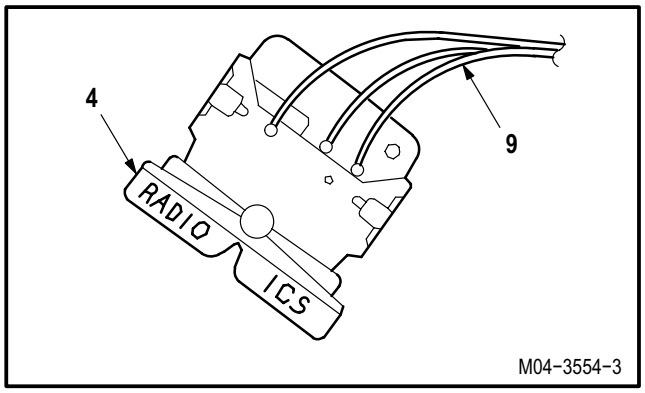
11.50.6. Installation

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

a. **Solder wires (9) to switch (4).**

(1) Solder identified wires (9) to switch (4). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).



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11.50. CYCLIC STICK RADIO-ICS SWITCH REPLACEMENT – continued

WARNING

Ensure wiring inside the cyclic grip is properly restrained with lacing tape prior to reassembly. Failure to comply may cause uncommanded firing of a weapon system.

b. **Install switch (4) on grip (5).**

(1) Apply a small bead of adhesive on the mating surface of switch mounting shoulder (10). Use adhesive (item 14, App F).

c. **Install switch in mounting hole (11).**

(1) Install two screws (8).

(2) Install two washers (7) and nuts (6).

(3) Restrain wires (9) (TM 55-1500-323-24). Use tape (item 202, App F).

d. **Inspect (QA).**

e. **Install cap (1).**

(1) Install cap (1) on grip (5).

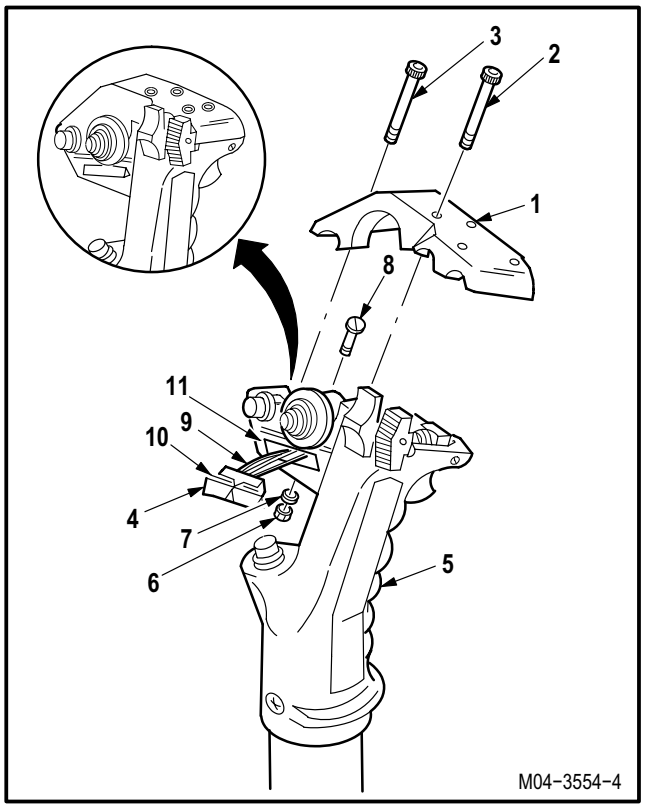
(2) Install five screws (2) and screw (3).

(3) Apply a light coat of adhesive over heads of five screws (2) and head of screw (3). Use adhesive (item 14, App F).

f. **Clean excess adhesive from grip (5)** (para 1.47)**.**

g. **Inspect (QA).**

h. **Perform intercommunications system (ICS) maintenance operational check** (TM 11-1520-238-23-2)**.**



END OF TASK

11.51. CYCLIC STICK WEAPONS ACTION SWITCH REPLACEMENT

11.51.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.51.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 9-1090-208-23-2
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)
Tape (item 202, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

NOTE

This task is typical for either pilot or CPG cyclic stick.

11.51.3. Removal

a. **Enter pilot or CPG station** (para 1.56)**. Observe all safety precautions.**

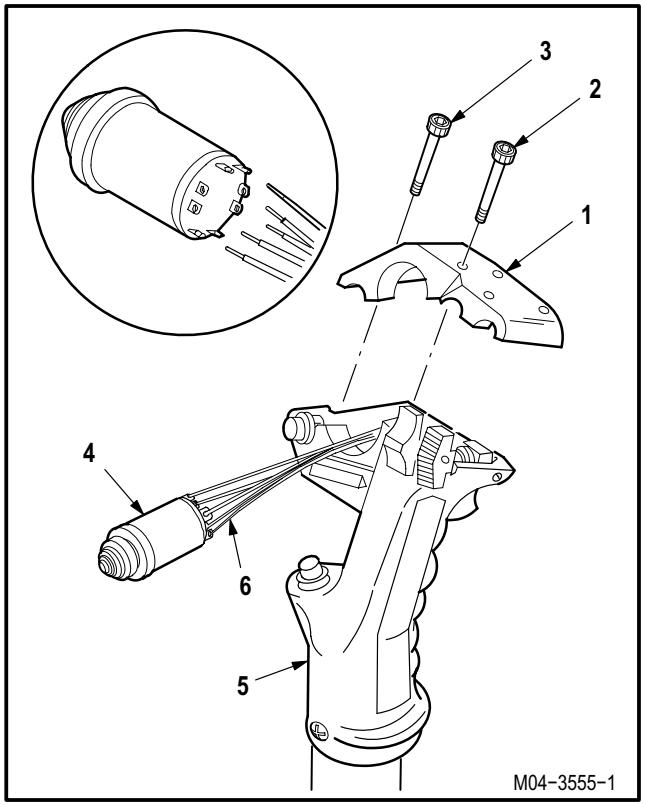
b. **Remove grip cap (1).**

(1) Remove adhesive from heads of five screws (2) and screw (3).

(2) Remove five screws (2) and screw (3).

(3) Remove cap (1).

c. **Debond and remove switch (4) from control grip (5).**



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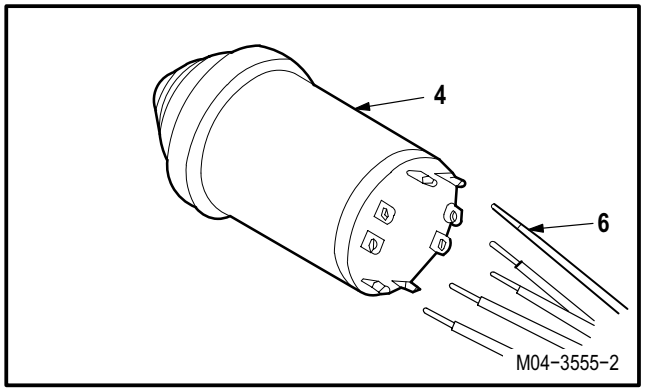
11.51. CYCLIC STICK WEAPONS ACTION SWITCH REPLACEMENT – continued

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

d. **Desolder wires (6) from switch (4).**

(1) Identify and desolder wires (6) from switch (4). Use soldering iron (TM 55-1500-323-24)**.**



11.51.4. Cleaning

a. **Clean adhesive from removed and attaching parts** (para 1.47)**.**

11.51.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.51. CYCLIC STICK WEAPONS ACTION SWITCH REPLACEMENT – continued

11.51.6. Installation

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

a. **Solder wires (6) to switch (4).**

(1) Solder identified wires (6) to switch (4). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).

b. **Inspect (QA).**

WARNING

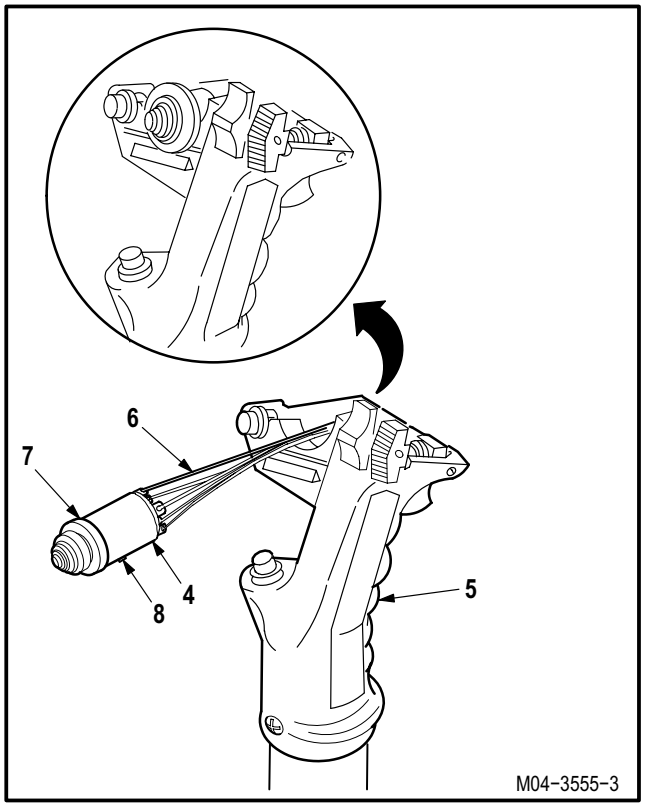
Ensure wiring inside the cyclic grip is properly restrained with lacing tape prior to reassembly. Failure to comply may cause uncommanded firing of a weapon system.

c. **Install switch (4) on grip (5).**

(1) Apply a small bead of adhesive to mating surface of switch mounting shoulder (7). Use adhesive (item 14, App F).

(2) Install switch (4) in mounting slot with location boss (8) down.

(3) Restrain wires (6) (TM 55-1500-323-24). Use tape (item 202, App F).



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11.51. CYCLIC STICK WEAPONS ACTION SWITCH REPLACEMENT – continued

d. **Install grip cap (1).**

(1) Install cap (1) on grip (5).

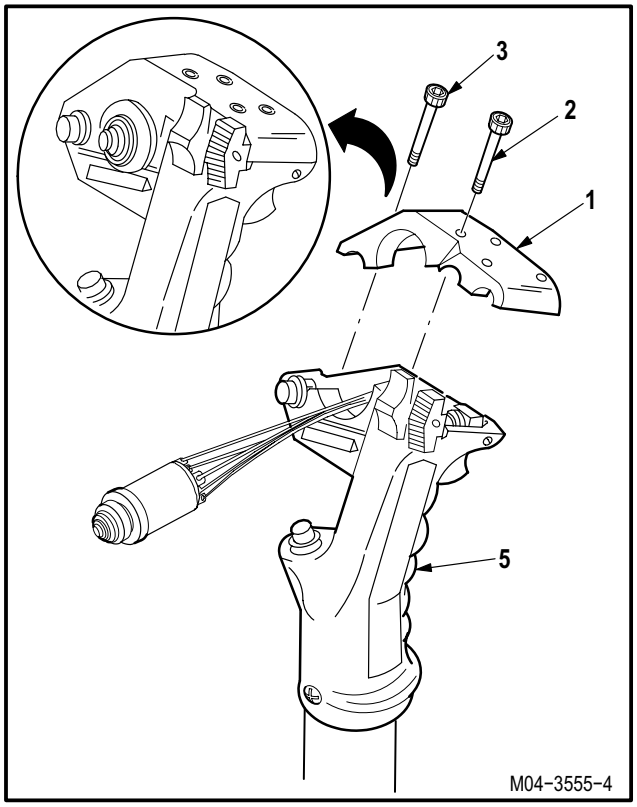
(2) Install five screws (2) and screw (3).

(3) Apply a light coat of adhesive over heads of five screws (2) and head of screw (3). Use adhesive (item 14, App F).

e. **Clean excess adhesive from grip (5)** (para 1.47)**.**

f. **Inspect (QA).**

g. **Perform aerial rocket control system and area weapons maintenance operational checks** (TM 9-1090-208-23-2)**.**



END OF TASK

11.52. CYCLIC STICK TRIGGER SWITCH REPLACEMENT

11.52.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.52.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 9-1090-208-23-2
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)
Tape (item 202, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

NOTE

This task is typical for pilot or CPG cyclic stick.

11.52.3. Removal

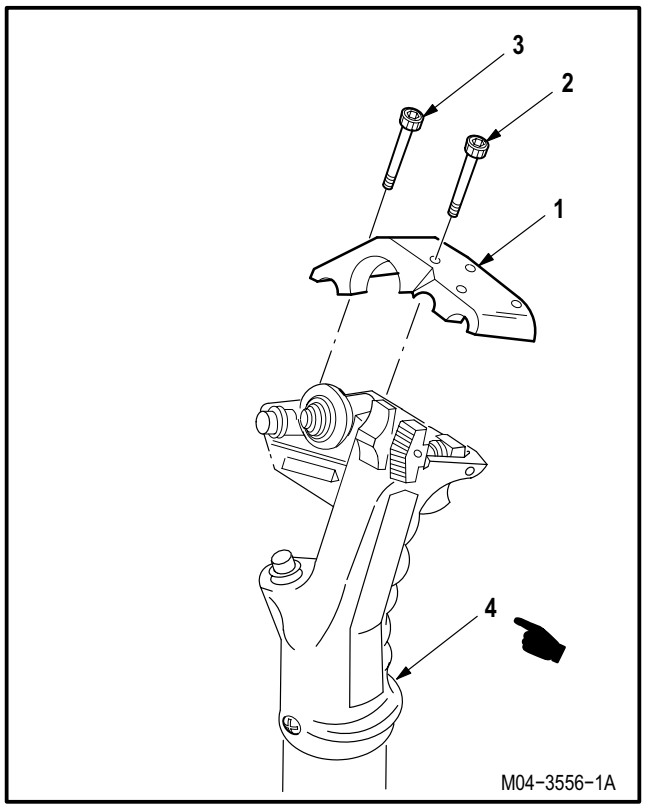
a. **Enter pilot or CPG station** (para 1.56)**. Observe all safety precautions.**

b. **Remove grip cap (1).**

(1) Remove sealant from heads of five screws (2) and screw (3).

(2) Remove five screws (2) and screw (3).

(3) Remove cap (1) from grip (4).



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11.52. CYCLIC STICK TRIGGER SWITCH REPLACEMENT – continued

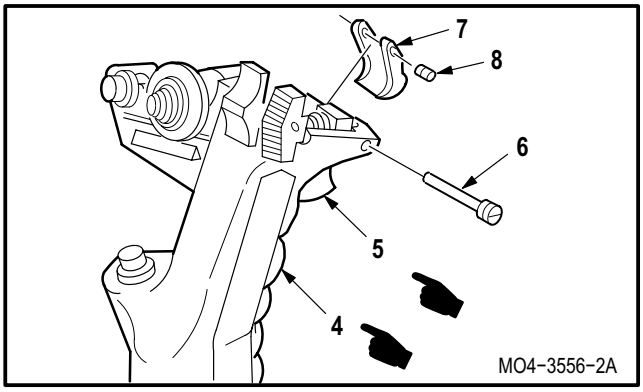
c. **Remove switch (5) from grip (4).**

(1) Remove adhesive from head of pin (6).

(2) Remove pin (6).

(3) Remove trigger guard (7) and spring (8).

(4) Remove switch (5) from grip (4).

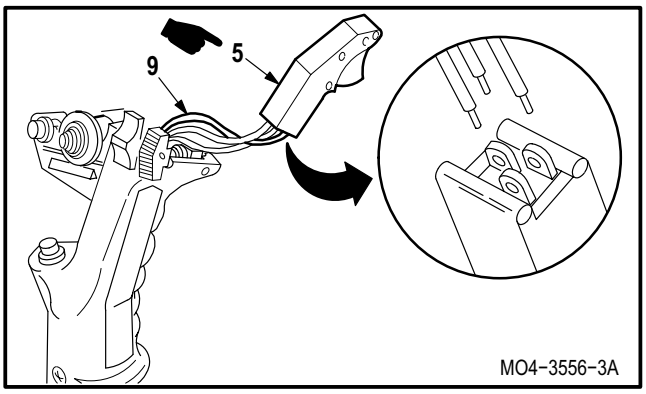


WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

d. **Desolder wires (9) from switch (5).**

(1) Identify and desolder wires (9) from switch (5). Use soldering iron (TM 55-1500-323-24)**.**



11.52.4. Cleaning

a. **Clean sealant from removed and attaching parts** (para 1.47)**.**

GO TO NEXT PAGE

11.52. CYCLIC STICK TRIGGER SWITCH REPLACEMENT – continued

11.52.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

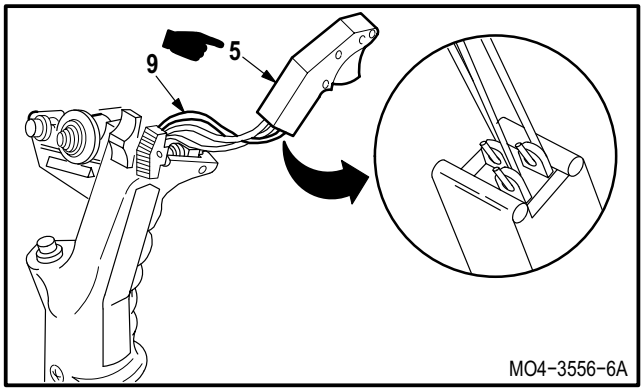
11.52.6. Installation

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

a. **Solder wires (9) to switch (5).**

(1) Solder identified wires (9) to switch (5). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).



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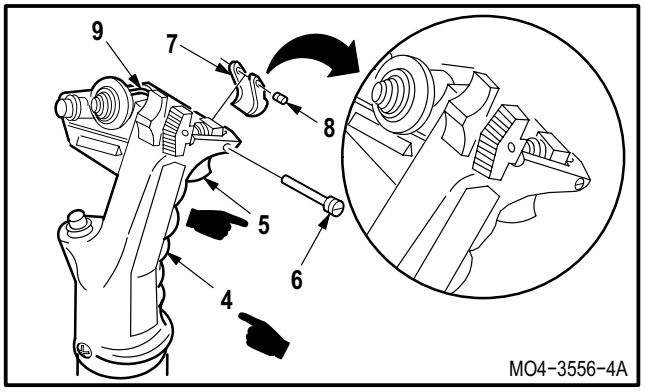
11.52. CYCLIC STICK TRIGGER SWITCH REPLACEMENT – continued

b. **Install switch (5) on grip (4).**

(1) Restrain wires (9) (TM 55-1500-323-24). Use tape (item 202, App F).

(2) Install switch (5), spring (8), and guard (7) in grip (4).

(3) Install grip control pin (6).



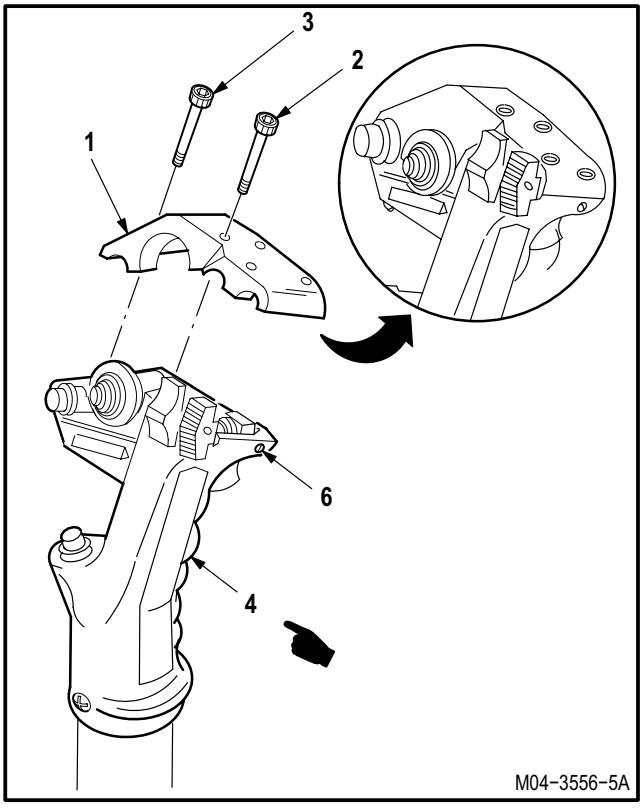
c. **Inspect (QA).**

d. **Install cap (1).**

(1) Install cap (1) on grip (4).

(2) Install five screws (2) and screw (3).

(3) Apply a light coat of adhesive over heads of five screws (2), head of screw (3), and head of grip control pin (6). Use adhesive (item 14, App F).



e. **Clean excess sealant from grip (4)** (para 1.47)**.**

f. **Inspect (QA).**

g. **Perform aerial rocket control system and area weapons maintenance operational checks** (TM 9-1090-208-23-2)**.**

END OF TASK

11.53. CYCLIC STICK SYMBOL SELECT SWITCH REPLACEMENT

11.53.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.53.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Multimeter (item 215, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)
Tape (item 202, App F)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 11-1520-238-23-2
TM 55-1500-323-24

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

NOTE

This task is typical for pilot or CPG cyclic stick.

11.53.3. Removal

a. **Enter pilot or CPG station** (para 1.56)**. Observe all safety precautions.**

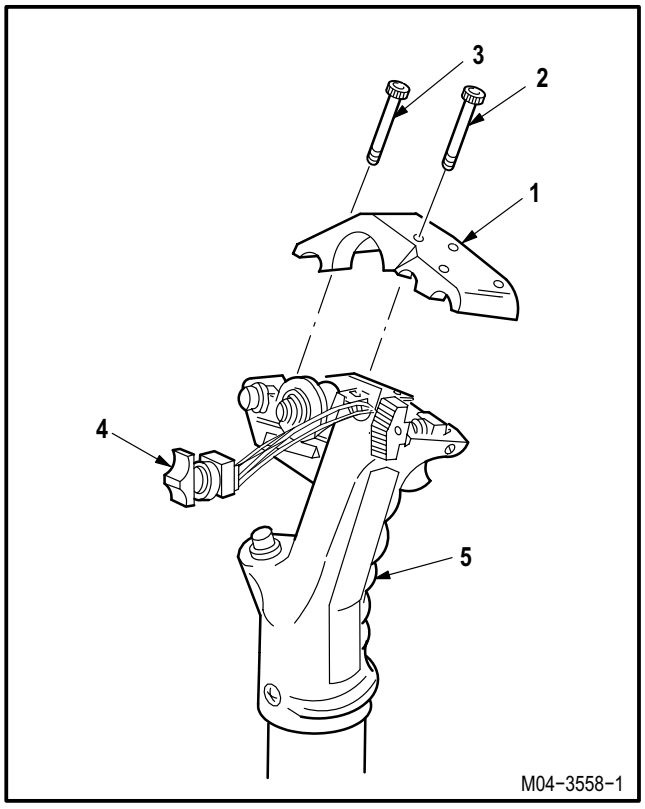
b. **Remove grip cap (1).**

(1) Remove sealant from heads of five screws (2) and screw (3).

(2) Remove five screws (2) and screw (3).

(3) Remove cap (1).

c. **Debond and remove switch (4) from grip (5).**



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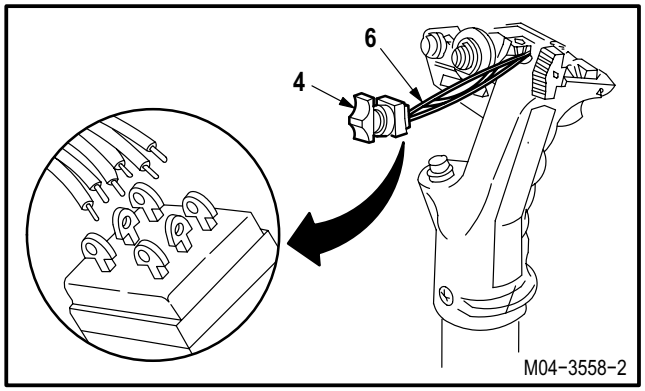
11.53. CYCLIC STICK SYMBOL SELECT SWITCH REPLACEMENT – continued

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

d. **Desolder wires (6) from switch (4).**

(1) Identify and desolder wires (6) from switch (4).Use soldering iron and solder (item 189, App F).



11.53.4. Cleaning

a. **Clean sealant from removed and attaching parts** (para 1.47)**.**

11.53.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.53. CYCLIC STICK SYMBOL SELECT SWITCH REPLACEMENT – continued

11.53.6. Installation

WARNING

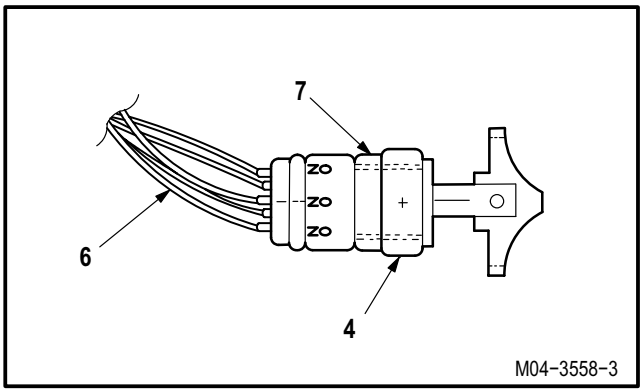
Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

a. **Solder wires (6) to switch (4).**

(1) Solder identified wires (6) to switch (4). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).

WARNING

Ensure wiring inside the cyclic grip is properly restrained with lacing tape prior to reassembly. Failure to comply may cause uncommanded firing of a weapon system.



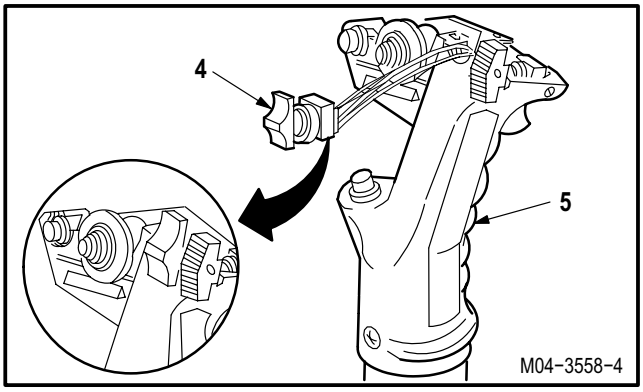
b. **Install switch (4) on grip (5).**

(1) Apply a small bead of adhesive around circumference of switch mounting shoulder (7). Use adhesive (item 14, App F).

(2) Install switch (4) on grip (5).

(3) Restrain wires (6). Use tape (item 202, App F) (TM 55-1500-323-24).

c. **Inspect (QA).**



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11.53. CYCLIC STICK SYMBOL SELECT SWITCH REPLACEMENT – continued

d. **Install cap (1).**

(1) Install cap (1) on grip (5).

(2) Install five screws (2) and screw (3).

(3) Apply a light coat of sealing compound over heads of screws (2) and (3). Use adhesive (item 14, App F).

e. **Clean excess sealant from grip (5)** (para 1.47)**.**

f. **Inspect (QA).**

g. **Detach connector P113 (8) (pilot) or P118 (9) (CPG) as required.**

(1) Check for continuity between pilot connector P113 pins B5 and B9; pins B8 and B19 or CPG connector P118 pins 21 and 26; pins 22 and 23, with symbol select switch in center position. Use multimeter.

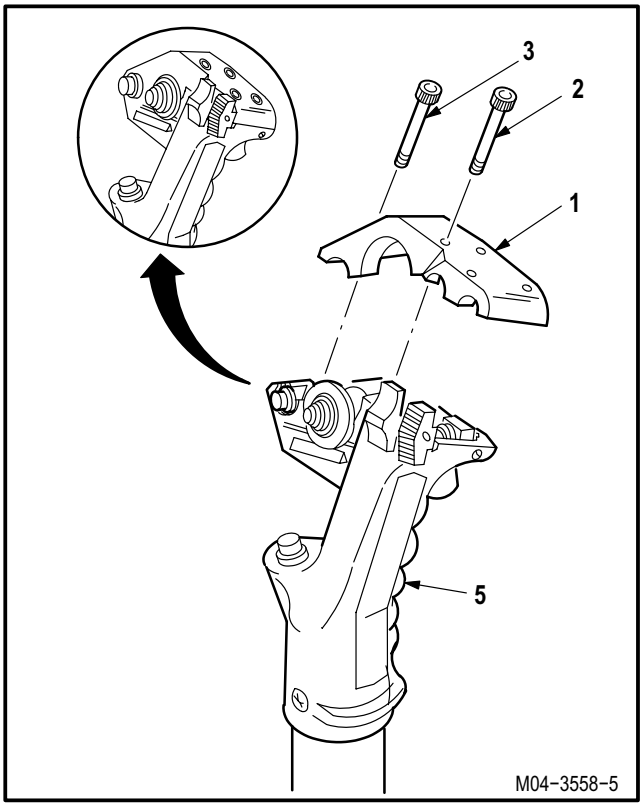
(2) Check for continuity between pilot connector P113 pins B5 and B9; pins B7 and B8 or CPG connector P118 pins 21 and 25; pins 22 and 23, with symbol select switch in CT position. Use multimeter.

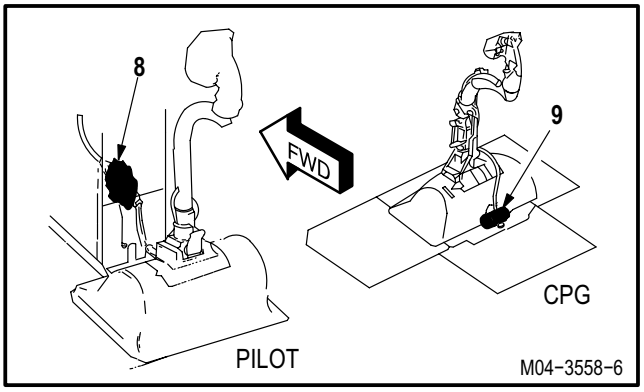
(3) Check for continuity between pilot connector P113 pins B5 and B6; pins B8 and B19 or CPG connector P118 pins 21 and 26; pins 22 and 24, with symbol select switch in HB position. Use multimeter.

h. **Attach connector P113 (8) (pilot) or P118 (9) (CPG) as required.**

i. **Inspect (QA).**

j. **Perform symbol generator maintenance operational check** (TM 11-1520-238-23-2)**.**





END OF TASK

11.54. PILOT CYCLIC STICK HOUSING REMOVAL

11.54.1. Description

This task covers: Removal. Cleaning. Inspection.

11.54.2. Initial Setup

Tools:

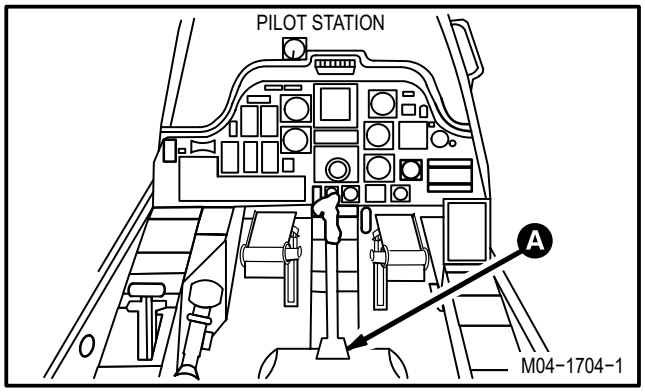
Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.185	HDU holster removed
11.45	Pilot cyclic stick removed
13.28	Pilot lower right floor duct removed



11.54.3. Removal

a. **Remove access cover (1).**

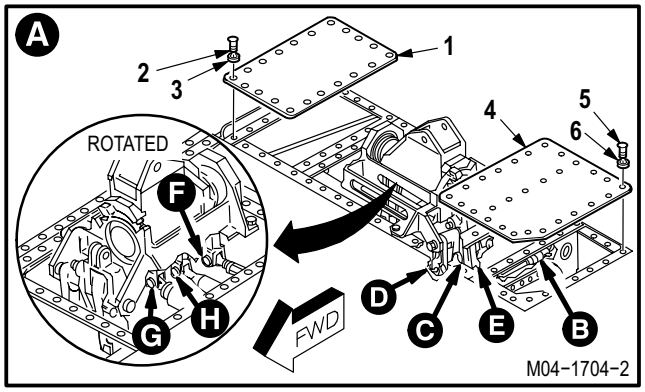
(1) Remove 18 screws (2) and washers (3).

(2) Remove cover (1).

b. **Remove access cover (4).**

(1) Remove 33 screws (5) and washers (6).

(2) Remove cover (4).



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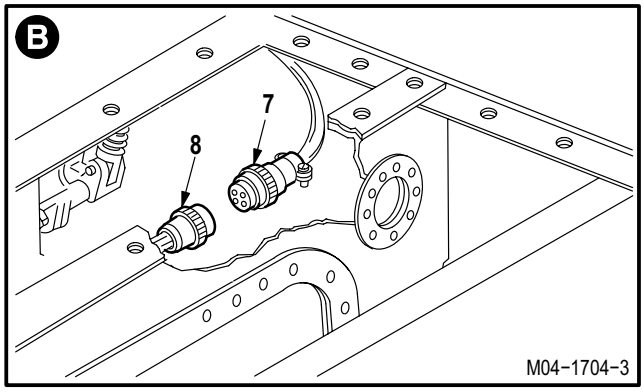
11.54. PILOT CYCLIC STICK HOUSING REMOVAL – continued

c. **Detach connector (A334)P1 (7) from receptacle J270 (8).**



CAUTION

Shaft of LVDT may become disconnected from LVDT. If shaft becomes disconnected from LVDT, reinsert shaft in LVDT.

d. **Remove lateral transducer shaft (9) from rod end (10).**

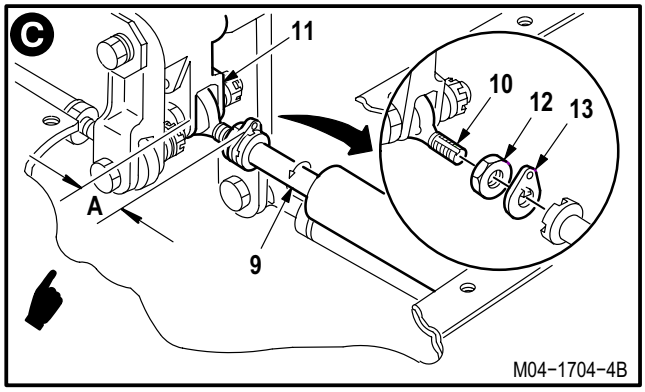
(1) Measure distance A between end of shaft (9) and edge of arm (11). Record measurement for installation.

(2) Remove lockwire.

(3) Loosen nut (12).

(4) Rotate shaft (9) counterclockwise until free of rod end (10).

(5) Remove nut (12) and keywasher (13) from rod end (10).



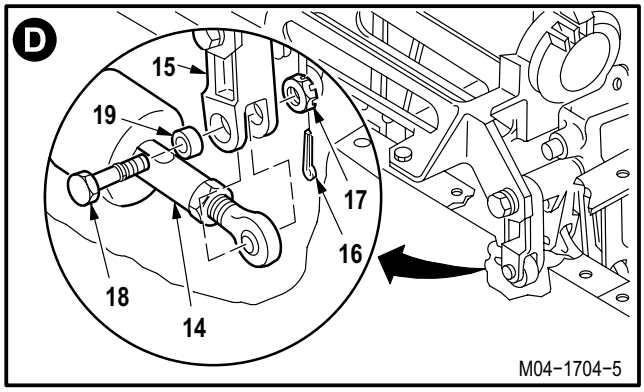
e. **Remove lateral feel spring cartridge (14) from arm (15).**

(1) Remove and discard cotter pin (16).

(2) Remove nut (17).

(3) Remove bolt (18) and bushing (19).

(4) Remove cartridge (14).



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11.54. PILOT CYCLIC STICK HOUSING REMOVAL – continued

f. **Remove push-pull rod (20) from arm (21).**

(1) Remove and discard cotter pin (22).

(2) Remove nut (23).

(3) Remove bolt (24), washer (25), and bushing (26).

(4) Remove rod (20).

g. **Remove longitudinal transducer shaft (27) from arm (28).**

(1) Measure distance A between end of shaft (27) and edge of arm (28). Record measurement for installation.

(2) Remove lockwire.

(3) Loosen nut (29).

(4) Rotate shaft (27) counterclockwise until free of rod end (30).

(5) Remove nut (29) and keywasher (31) from rod end (30).

h. **Remove longitudinal feel spring cartridge (32) from arm (33).**

(1) Remove and discard cotter pin (34).

(2) Remove nut (35).

(3) Remove bolt (36) and bushing (37).

(4) Remove cartridge (32).

i. **Remove longitudinal push-pull rod (38) from arm (39).**

(1) Remove and discard cotter pin (40).

(2) Remove nut (41).

(3) Remove bolt (42), washer (43), and bushing (44).

(4) Remove rod (38).

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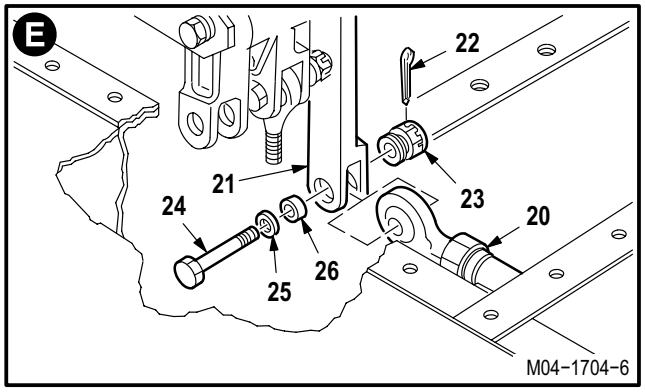
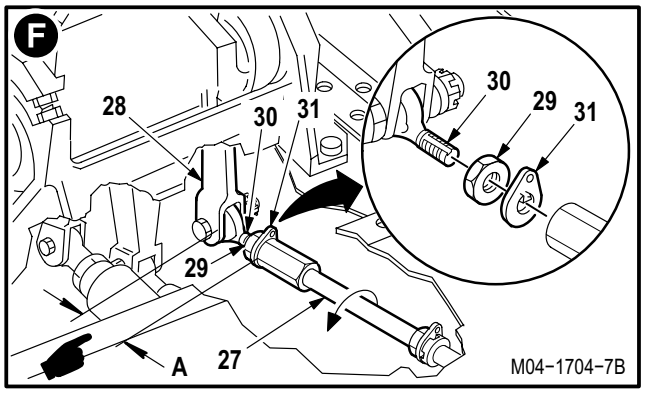
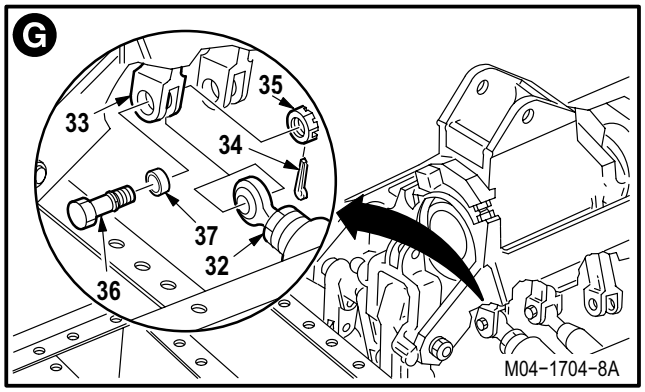
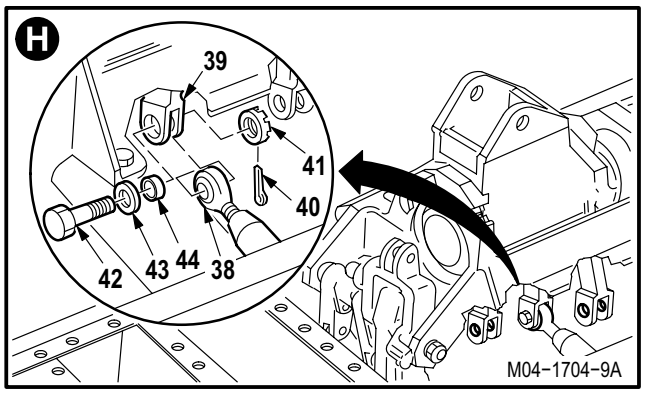






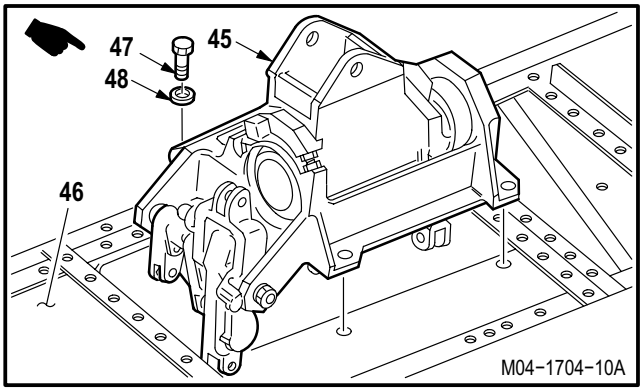


11.54. PILOT CYCLIC STICK HOUSING REMOVAL – continued

j. **Remove housing (45) from floor (46).**

(1) Remove four bolts (47) and washers (48).

(2) Remove housing (45).



11.54.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.54.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

END OF TASK

11.55. PILOT CYCLIC STICK HOUSING INSTALLATION

11.55.1. Description

This task covers: Installation.

11.55.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Materials/Parts:

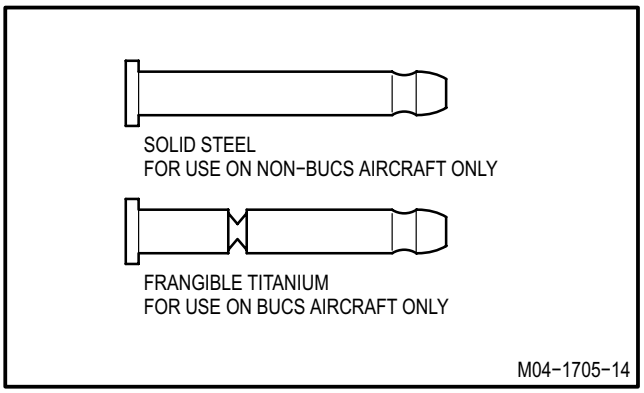
Cotter pin (5)
Wire (item 226, App F)

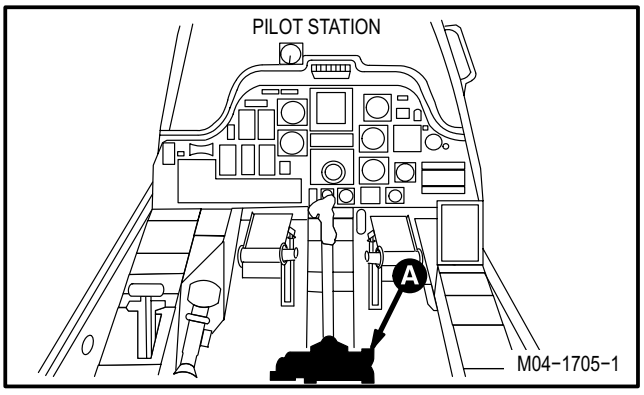
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.





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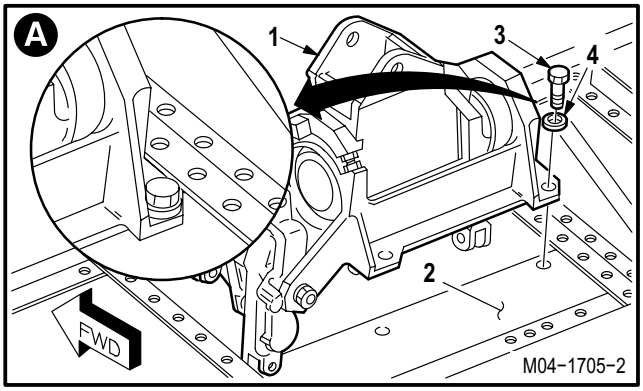
11.55. PILOT CYCLIC STICK HOUSING INSTALLATION – continued

11.55.3. Installation

a. **Install housing (1) on floor (2).**

(1) Position housing (1) on floor (2).

(2) Install four bolts (3) and washers (4).



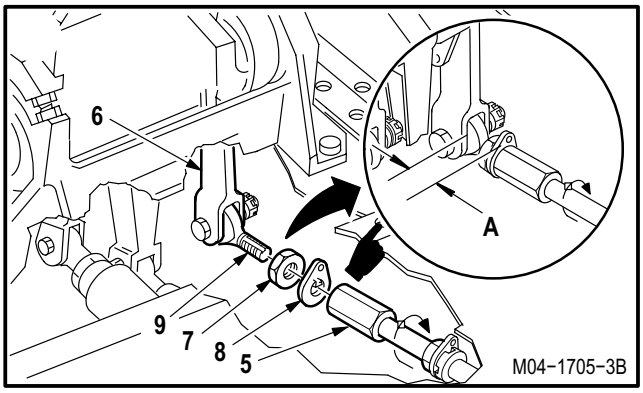
b. **Install longitudinal transducer shaft (5) on arm (6).** Use measurement A recorded during removal.

(1) Install nut (7) and keywasher (8) on rod end (9).

(2) Engage threads and rotate shaft (5) clockwise until required measurement A has been obtained.

(3) Tighten nut (7).

(4) Lockwire nut (7) to keywasher (8). Use wire (item 226, App F).



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11.55. PILOT CYCLIC STICK HOUSING INSTALLATION – continued

c. **Install longitudinal feel spring cartridge (10) on arm (11).** Torque nut (12) **30 to 40 INCH-POUNDS**.

(1) Aline cartridge (10) with arm (11).

(2) Install bushing (13) in arm (11).

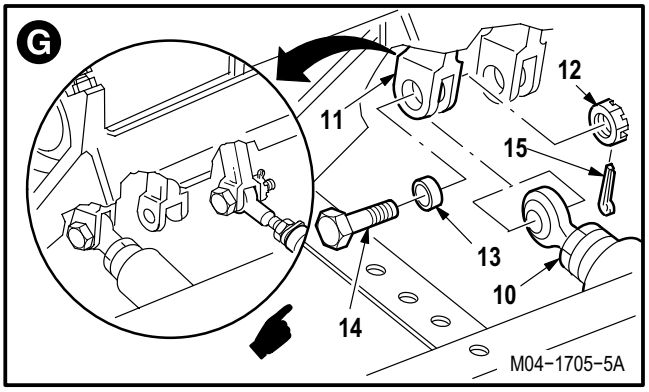
(3) Install bolt (14) through bushing (13), cartridge (10), and arm (11).

(4) Check fit of self-retaining bolt (14) (para 11.1).

(5) Install nut (12). Torque nut (12) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (15).



d. **Install longitudinal push-pull rod (16) on arm (17).** Torque nut (18) **30 to 40 INCH-POUNDS**.

(1) Aline rod (16) with arm (17).

(2) Install bushing (19) in arm (17).

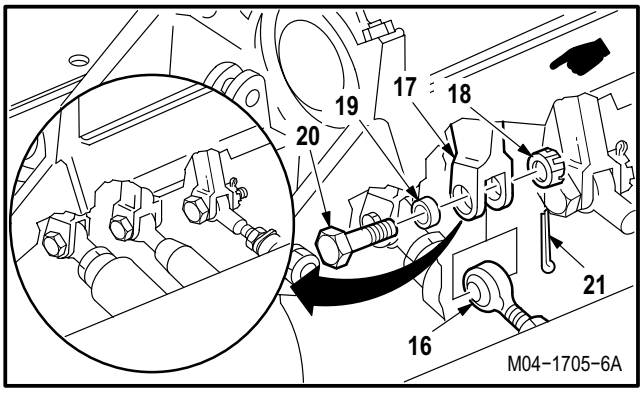
(3) Install bolt (20) through bushing (19), rod (16), and arm (17).

(4) Check fit of self-retaining bolt (20) (para 11.1).

(5) Install nut (18). Torque nut (18) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (21).



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11.55. PILOT CYCLIC STICK HOUSING INSTALLATION – continued

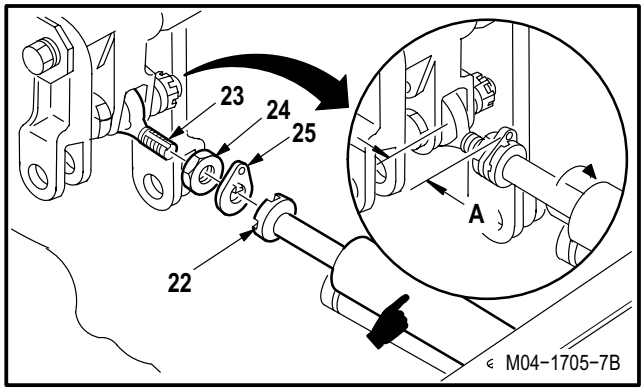
e. **Install lateral transducer shaft (22) on rod end (23).** Use measurement A recorded during removal.

(1) Install nut (24) and keywasher (25) on rod end (23).

(2) Engage threads and rotate shaft (22) clockwise until required measurement A has been obtained.

(3) Tighten nut (24).

(4) Lockwire nut (24) to keywasher (25). Use wire (item 226, App F).



f. **Install lateral feel spring cartridge (27) on arm (28).** Torque nut (29) **30 to 40 INCH-POUNDS**.

(1) Aline cartridge (27) with arm (28).

(2) Install bushing (30) in arm (28).

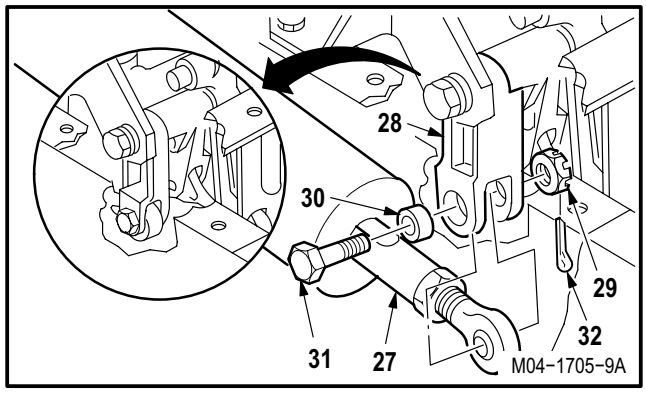
(3) Install bolt (31) through bushing (30), cartridge (27), and arm (28).

(4) Check fit of self-retaining bolt (31) (para 11.1).

(5) Install nut (29). Torque nut (29) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (32).



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11.55. PILOT CYCLIC STICK HOUSING INSTALLATION – continued

g. **Install lateral push-pull rod (33) on arm (34).** Torque nut (35) **30 to 40 INCH-POUNDS**.

(1) Aline rod (33) with arm (34).

(2) Install bushing (36) in arm (34).

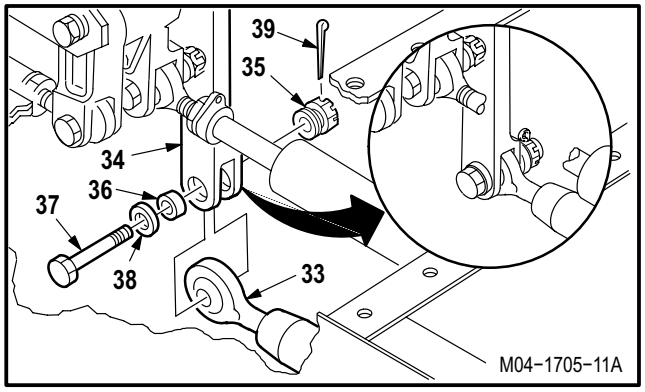
(3) Install bolt (37) through washer (38), bushing (36), rod (33), and arm (34).

(4) Check fit of self-retaining bolt (37) (para 11.1).

(5) Install nut (35). Torque nut (35) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (39).



h. **Attach connector (A334)P1 (40) to receptacle J270 (41).**

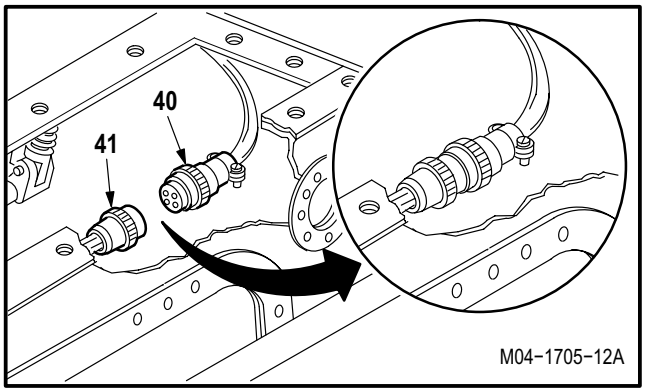
i. **Install pilot cyclic stick** (para 11.45)**.**

j. **Inspect (QA).**

k. **Perform longitudinal (cyclic) flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

l. **Perform lateral (cyclic) flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

m. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**



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11.55. PILOT CYCLIC STICK HOUSING INSTALLATION – continued

n. **Install access cover (42) on floor (43).**

(1) Install cover (42) on floor (43).

(2) Install 33 screws (44) and washers (45).

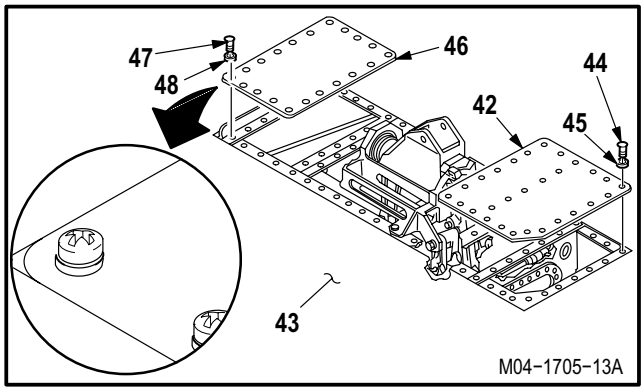
o. **Install access cover (46) on floor (43).**

(1) Install cover (46) on floor (43).

(2) Install 18 screws (47) and washers (48).

p. **Install pilot lower right floor duct** (para 13.28)**.**

q. **Install HDU holster** (para 2.185)**.**



END OF TASK

11.56. PILOT CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT

11.56.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.56.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Materials/Parts:

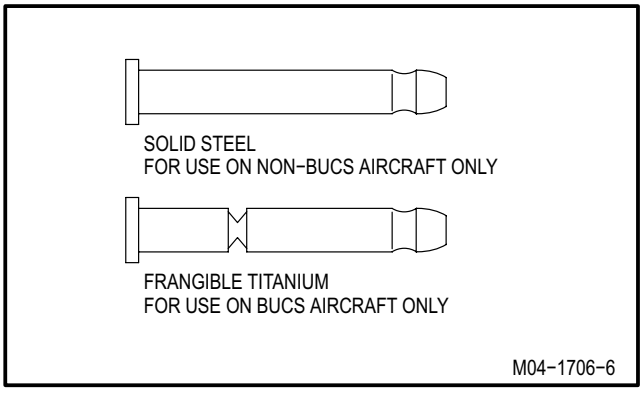
Shear pin
Petrolatum (item 138, App F)
Wire (item 220, App F)

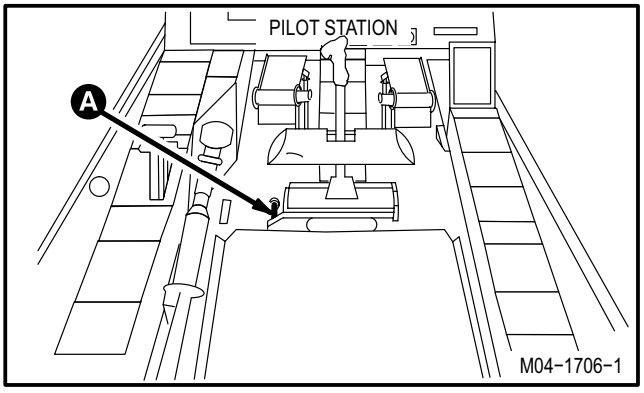
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.46	Pilot cyclic stick cover removed

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.





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11.56. PILOT CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT – continued

11.56.3. Removal

NOTE

If a shear pin(s) cannot be removed by conventional means, after repeated attempts from any of the SPAD assemblies (CPG or pilot), deliberately shearing the pin is permitted. Ensure the ends of the pins are removed

a. **Remove retainer (1) from arm (2).**

(1) Remove lockwire.

(2) Remove retainer (1).

NOTE

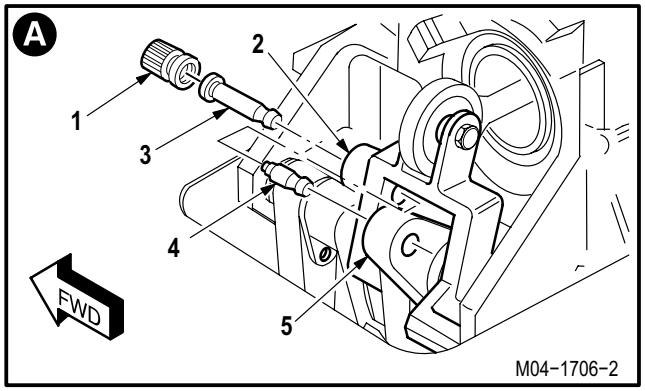
Remove shear pin in pieces if sheared.

b. **Remove shear pin half (3) from arm (2).**

c. **Remove shear pin half (4) from arm (5).**

(1) Aline arm (2) with arm (5).

(2) Remove shear pin half (4) through arm (2).



11.56.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.56.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

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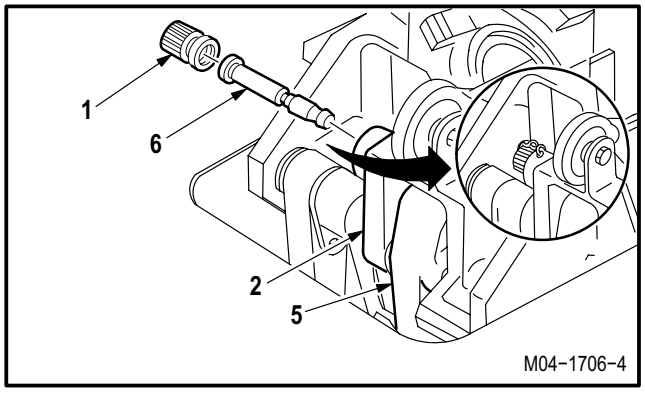
11.56. PILOT CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT – continued

11.56.6. Installation

a. **Install new shear pin (6) in arm (2) and arm (5).**

(1) Apply petrolatum to the tapered end of shear pin (6). Use petrolatum (item 138, App F).

(2) Aline arm (2) with arm (5).



(3) Ensure that switch detent (7) and switch position lever (8) are engaged.

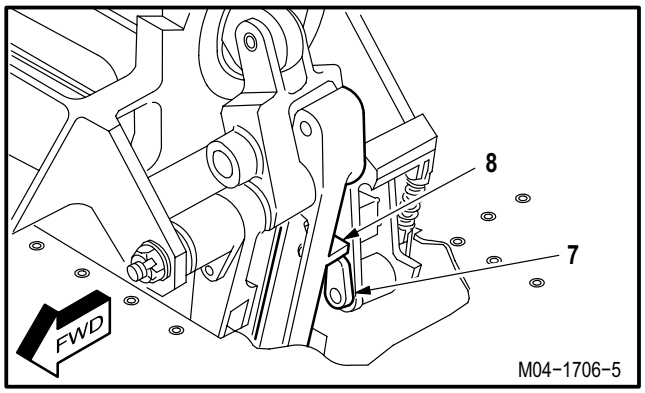
(4) Install shear pin (6) through arm (2) and arm (5).

NOTE

Install retainer finger tight.

b. **Install retainer (1) on arm (2).**

(1) Lockwire retainer (1) to arm (2). Use wire (item 220, App F).



c. **Inspect (QA).**

d. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

e. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install pilot cyclic stick cover** (para 11.46)**.**

END OF TASK

11.57. LATERAL FEEL SPRING CARTRIDGE REMOVAL

11.57.1. Description

This task covers: Removal. Cleaning. Inspection. Repair.

11.57.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)

Personnel Required:

67R Attack Helicopter Repairer

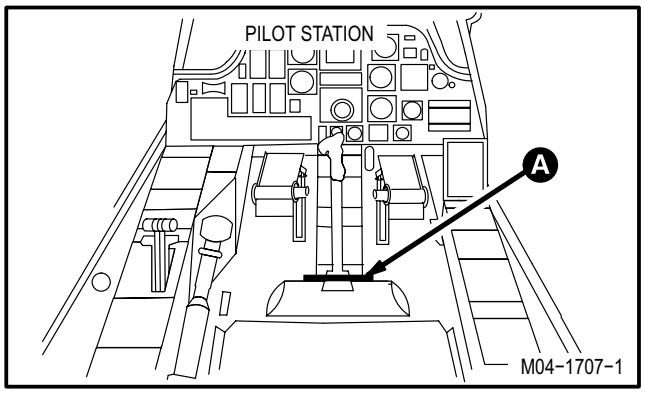
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.185	Pilot HDU holster removed
11.46	Pilot cyclic stick cover removed
13.28	Pilot ECS crew station duct removed

11.57.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

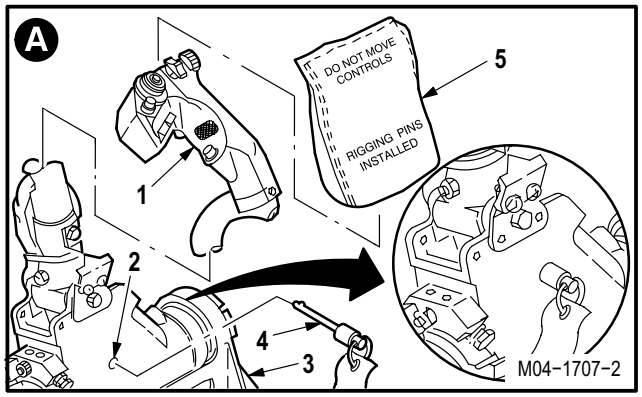
b. **On pilot center circuit breaker panel, open ASE AC, ASE DC, and BUCS circuit breakers.**



c. **Slowly move pilot cyclic stick (1) to aline lateral rig pin hole (2) in cyclic stick base (3).**

d. **Install -5 rig pin (4) in hole (2).**

e. **Install cyclic stick warning cover (5) on stick (1).**



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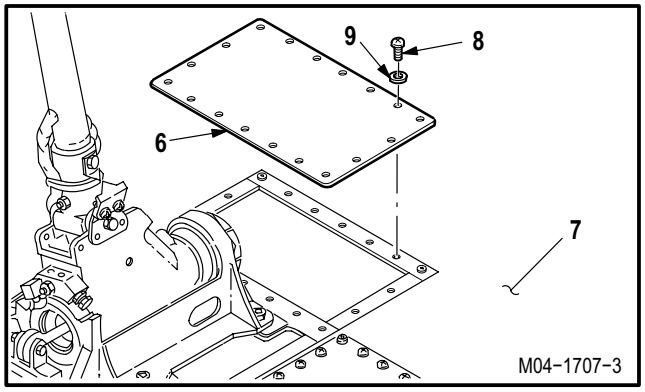
11.57. LATERAL FEEL SPRING CARTRIDGE REMOVAL – continued

f. **Remove access cover (6) from pilot floor (7).**

(1) Remove 16 screws (8) and washers (9) from floor (7).

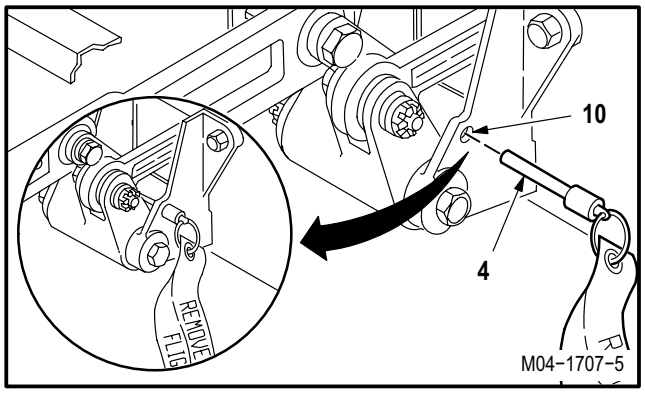
(2) Remove cover (6).



WARNING

To prevent FOD in fuel cell area, place rag under work area to catch any hardware that may be dropped during removal of feel spring cartridge.

g. **Install -7 rig pin (4) in rig pin hole (10).**



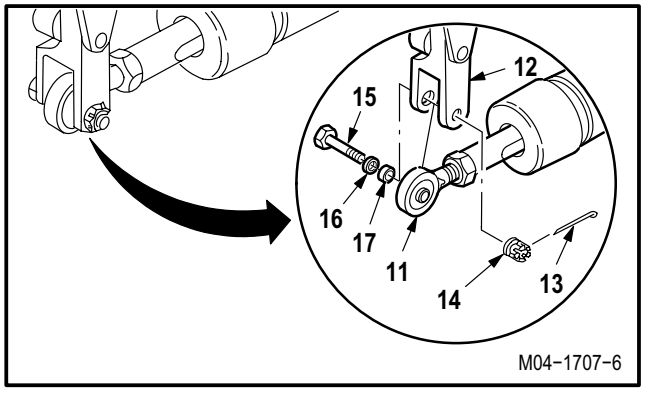
h. **Remove rod end (11) from bellcrank (12).**

(1) Remove and discard cotter pin (13).

(2) Remove nut (14).

(3) Remove bolt (15), washers (16) (if installed), and bushing (17).

(4) Remove rod end (11).



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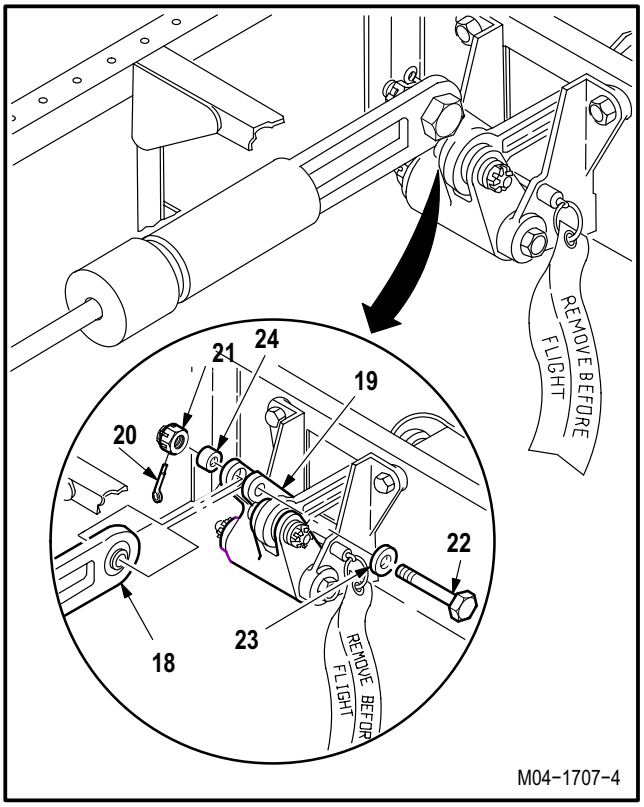
11.57. LATERAL FEEL SPRING CARTRIDGE REMOVAL – continued

i. **Remove feel spring cartridge (18) from magnetic brake arm (19).**

(1) Remove and discard cotter pin (20).

(2) Remove nut (21).

(3) Remove bolt (22), washers (23) (if installed), bushing (24), and cartridge (18).



11.57.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.57.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.57.6. Repair

a. **Repair feel spring cartridge (18) by replacing worn parts as required** (para 11.179)**.**

END OF TASK

11.58. LATERAL FEEL SPRING CARTRIDGE INSTALLATION

11.58.1. Description

This task covers: Installation.

11.58.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
9/16 x 1/4-inch drive open end box socket wrench crowfoot attachment (item 85, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)
30 - 150 inch-pound 1/4-inch drive click type torque wrench (item 435, App H)

Materials/Parts:

Cotter pin (2)
Wire (item 224, App F)

Personnel Required:

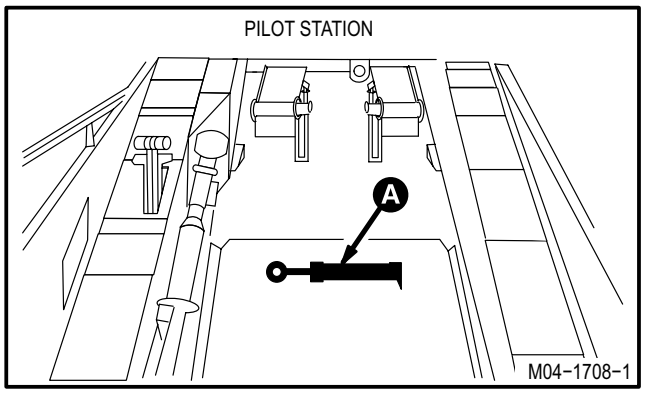
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed



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11.58. LATERAL FEEL SPRING CARTRIDGE INSTALLATION – continued

11.58.3. Installation

WARNING

To prevent FOD in fuel cell area, place rag under work area to catch any hardware that may be dropped during installation of feel spring cartridge.

a. **Install feel spring cartridge (1) on magnetic brake arm (2).** Torque nut (3) **30 to 40 INCH-POUNDS**.

(1) Aline cartridge (1) with arm (2).

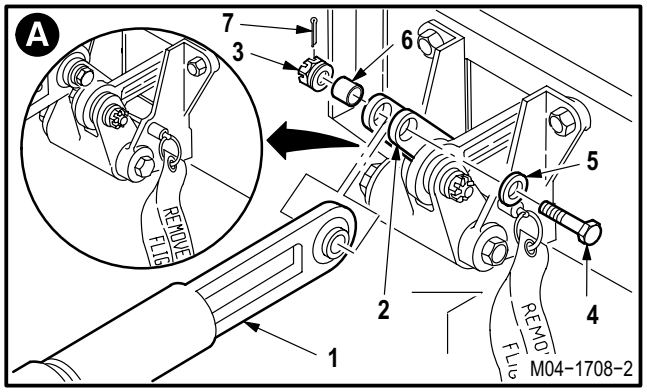
(2) Install bolt (4) through washers (5) (as required), arm (2), cartridge (1), and bushing (6).

(3) Check fit of self-retaining bolt (4) (para 11.1).

(4) Install nut (3). Torque nut (3) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (7).



CAUTION

To prevent operational failure of feel spring cartridge, do not stretch rod end to aline rod end with bellcrank.

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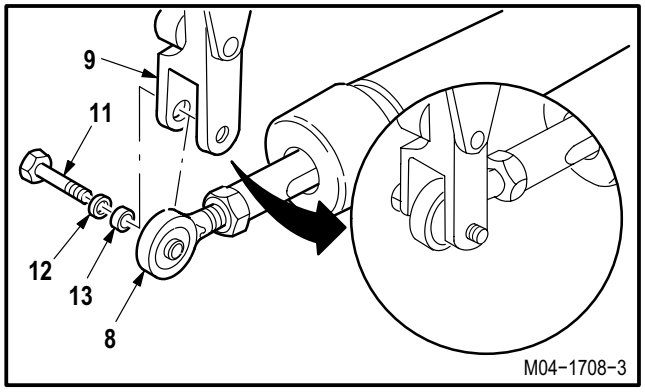
11.58. LATERAL FEEL SPRING CARTRIDGE INSTALLATION – continued

b. **Install rod end (8) on bellcrank (9).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Install bolt (11) through washers (12) (as required), bushing (13), bellcrank (9), and rod end (8) to aline rod end (8) with bellcrank (9).

(a) If rod end (8) alines with bellcrank (9), go to step b.(11).

(b) If rod end (8) does not aline with bellcrank (9), go to step b.(2).



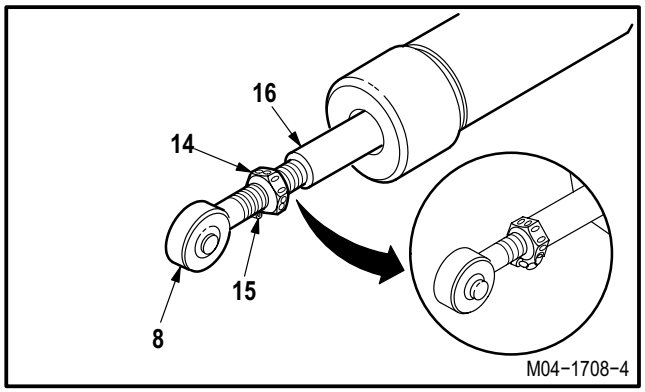
(2) Remove lockwire from rod end (8).

(3) Loosen nut (14) until lock (15) is free of shaft (16).

(4) Adjust rod end (8) to aline bellcrank (9).

(5) Turn rod end (8) clockwise to decrease length or counterclockwise to increase length.

(6) Hold rod end (8). Tighten nut (14) until lock engages shaft (16).



(7) Remove cartridge (para 11.57).

(8) Hold rod end (8). Torque nut (14) to **105 INCH-POUNDS**. Use torque wrench and crowfoot.

(9) Install lockwire through nut (14) and lock (15). Use wire (item 224, App F).

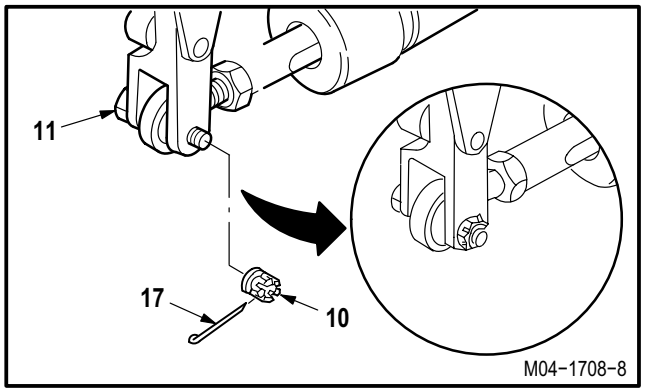
(10) Go to step a.

(11) Check fit of self-retaining bolt (11) (para 11.1).

(12) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(13) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(14) Install new cotter pin (17).



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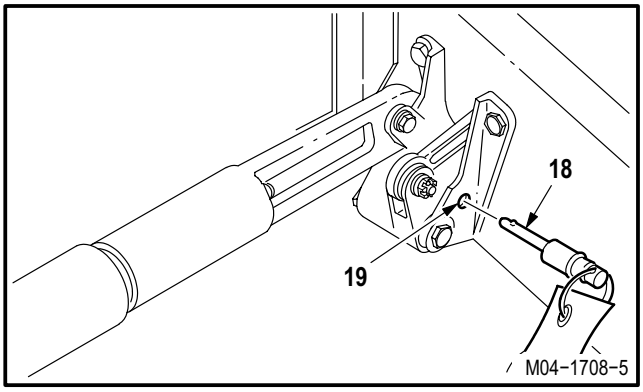
11.58. LATERAL FEEL SPRING CARTRIDGE INSTALLATION – continued

c. **Inspect (QA).**

d. **Remove -7 rig pin (18) from rig pin hole (19).**



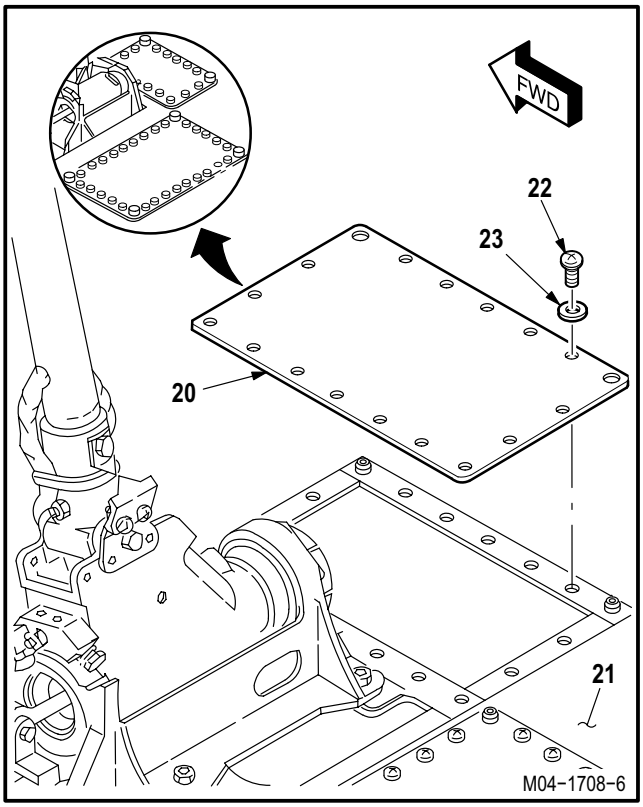
WARNING

To prevent interference with flight controls, ensure all rags and FOD are removed before installing access covers.

e. **Install access cover (20) on pilot floor (21).**

(1) Install cover (20) on floor (21).

(2) Install 16 screws (22) and washers (23).



f. **Remove cyclic stick warning cover (24) from cyclic stick (25).**

g. **Remove -5 rig pin (26) from rig pin hole (27).**

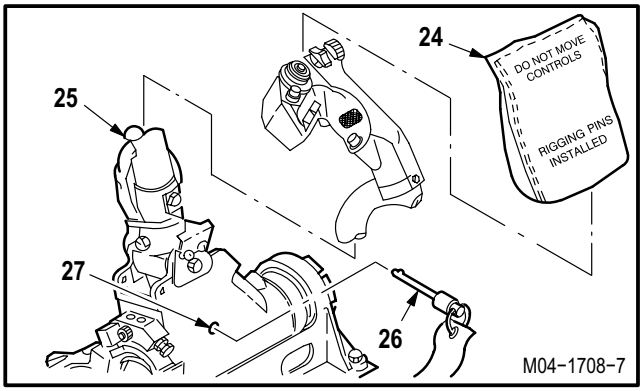
h. **Install pilot cyclic stick cover** (para 11.46)**.**

i. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

j. **Install pilot ECS crew station duct** (para 13.28)**.**

k. **Install pilot HDU holster** (para 2.185)**.**

END OF TASK



11.59. LONGITUDINAL FEEL SPRING CARTRIDGE REMOVAL

11.59.1. Description

This task covers: Removal. Cleaning. Inspection. Repair.

11.59.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)

Personnel Required:

67R Attack Helicopter Repairer

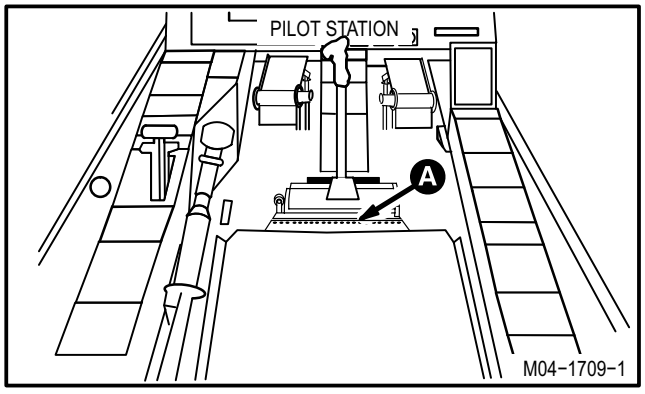
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed
2.185	Pilot HDU holster removed
11.46	Pilot cyclic stick cover removed
13.28	Pilot ECS crew station duct removed

11.59.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **On pilot center circuit breaker panel, open ASE AC, DC, and BUCS circuit breakers.**



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11.59. LONGITUDINAL FEEL SPRING CARTRIDGE REMOVAL – continued

c. **Remove access cover (1) from pilot floor (2).**

(1) Remove 16 screws (3) and washers (4).

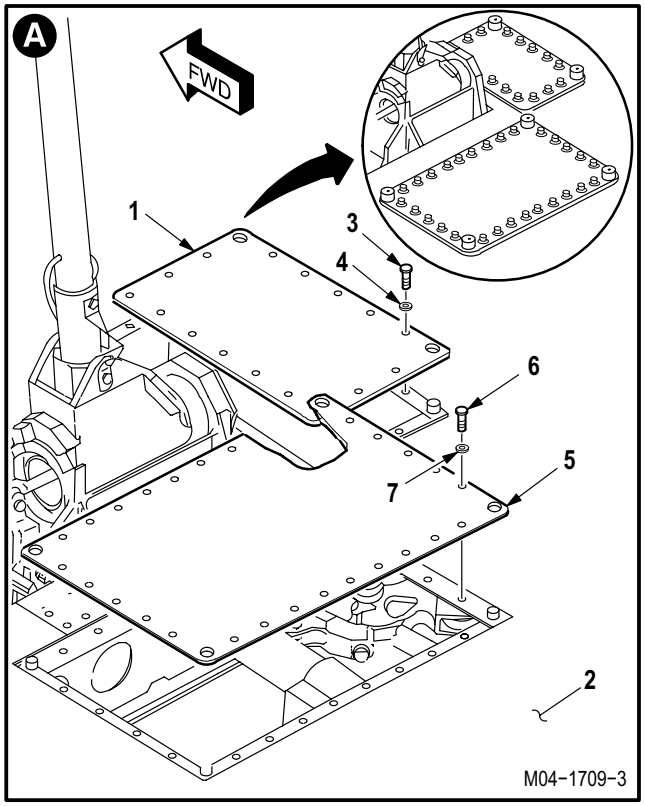
(2) Remove cover (1).

d. **Remove access cover (5) from pilot floor (2).**

(1) Remove 28 screws (6) and washers (7).

(2) Remove cover (5).

e. **Slowly move pilot cyclic stick (8) to aline longitudinal rig pin hole (9) in cyclic stick base (10).**

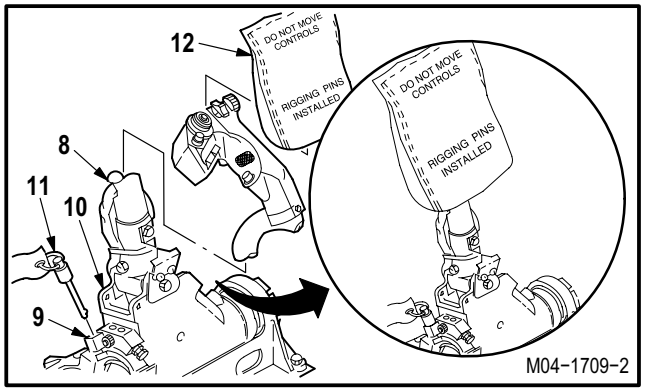


f. **Install -9 rig pin (11) into rig pin hole (9).**

g. **Install cyclic stick warning cover (12) on stick (8).**

WARNING

To prevent FOD in fuel cell area, place rag under work area to catch any hardware that may be dropped during removal of feel spring cartridge.



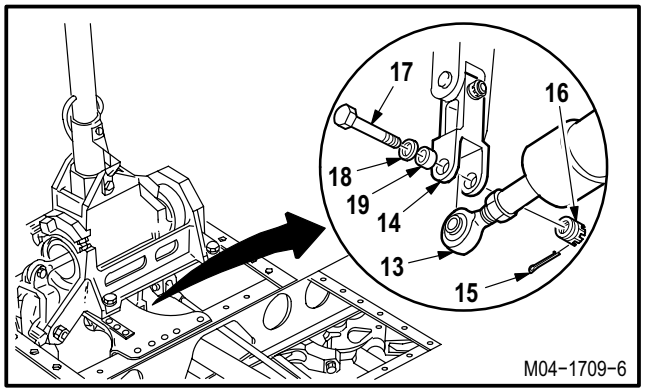
h. **Remove rod end (13) from bellcrank (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washers (18) (if installed), and bushing (19).

(4) Remove rod end (13).



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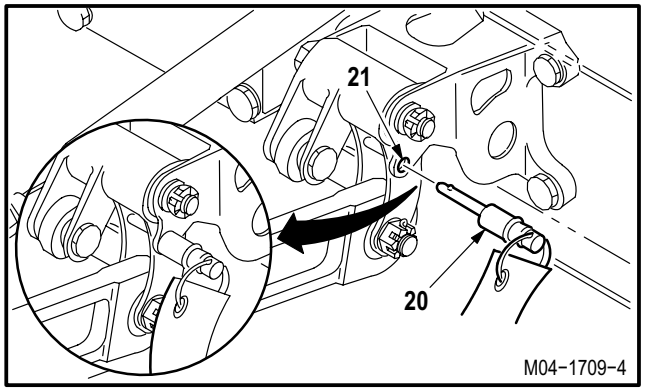
11.59. LONGITUDINAL FEEL SPRING CARTRIDGE REMOVAL – continued

i. **Install -7 rig pin (20) in rig pin hole (21).**

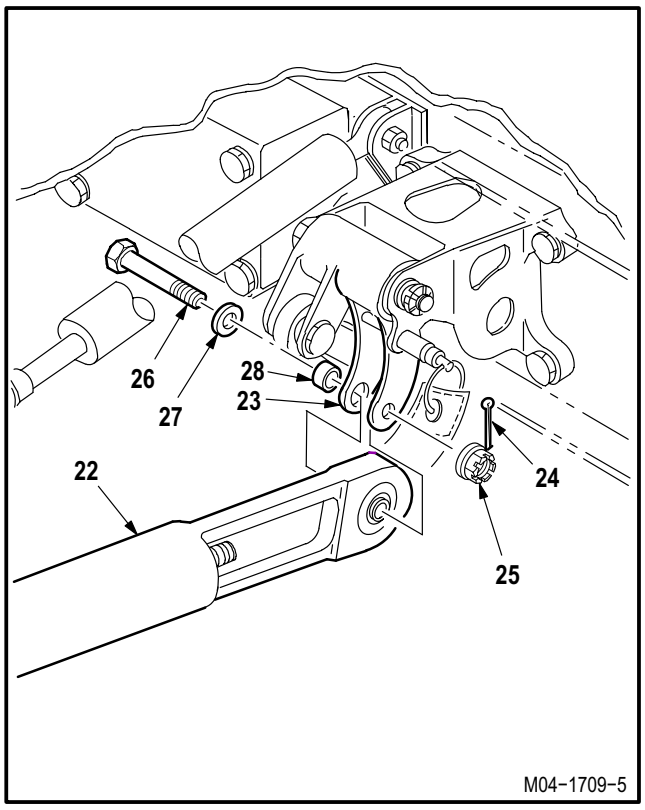


j. **Remove feel spring cartridge (22) from magnetic brake arm (23).**

(1) Remove and discard cotter pin (24).

(2) Remove nut (25).

(3) Remove bolt (26), washers (27) (if installed), bushing (28), and cartridge (22).



11.59.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.59.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.59.6. Repair

a. **Repair feel spring cartridge (22) by replacing worn parts as required** (para 11.179)**.**

END OF TASK

11.60. LONGITUDINAL FEEL SPRING CARTRIDGE INSTALLATION

11.60.1. Description

This task covers: Installation.

11.60.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
9/16 x 1/4-inch drive open end box socket wrench crowfoot attachment (item 85, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)
30 - 150 inch-pound 1/4-inch drive click type torque wrench (item 435, App H)

Materials/Parts:

Cotter pin (2)
Wire (item 224, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

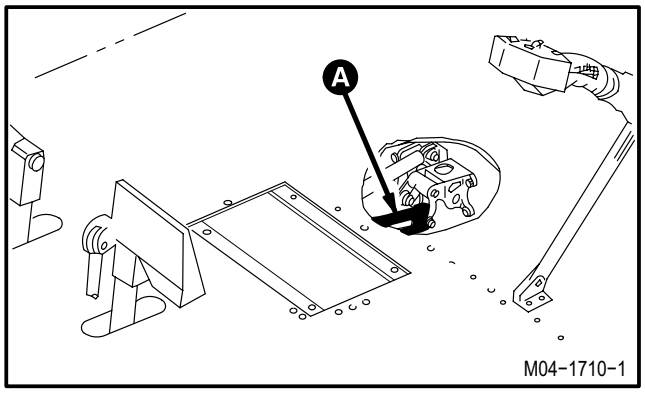
TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

WARNING

To prevent FOD in fuel cell area, place rag under work area to catch any hardware that may be dropped during removal of feel spring cartridge.



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11.60. LONGITUDINAL FEEL SPRING CARTRIDGE INSTALLATION – continued

11.60.3. Installation

a. **Install feel spring cartridge (1) on magnetic brake arm (2).** Torque nut (3) **30 to 40 INCH-POUNDS**.

(1) Aline cartridge (1) with arm (2).

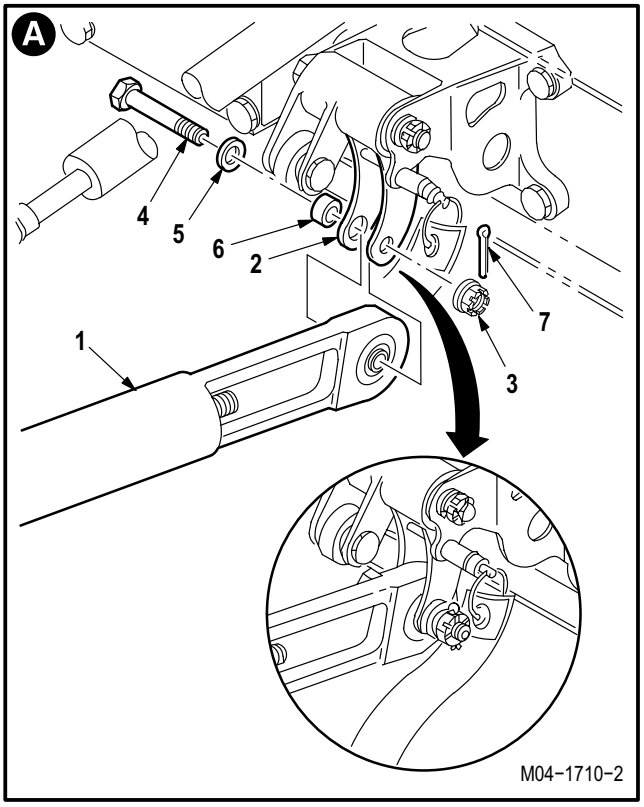
(2) Install bolt (4) through washers (5) (as required), bushing (6), arm (2), and cartridge (1).

(3) Check fit of self-retaining bolt (4) (para 11.1).

(4) Install nut (3). Torque nut (3) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (7).



CAUTION

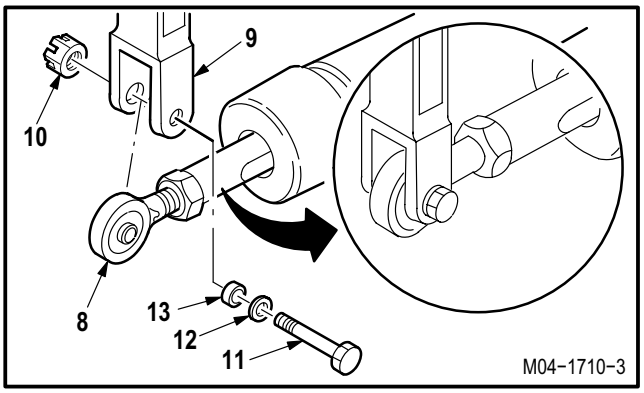
To prevent operational failure of feel spring cartridge, rod end shall not be stretched to aline rod end with bellcrank.

b. **Install rod end (8) on bellcrank (9).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Install bolt (11) through washers (12) (as required), bushing (13), bellcrank (9), and rod end (8) to aline rod end (8) with bellcrank (9).

(a) If rod end (8) alines with bellcrank (9), go to step b.(10).

(b) If rod end (8) does not aline with bellcrank (9), go to step b.(2).



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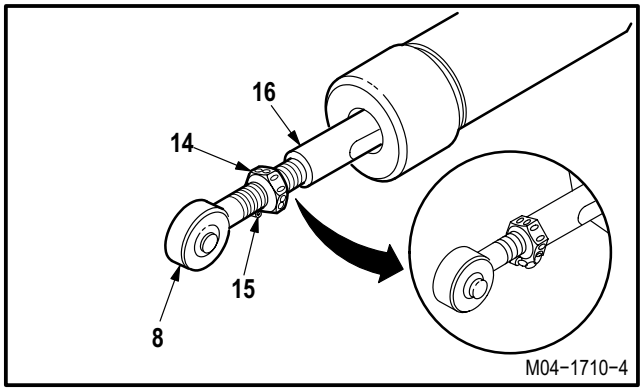
11.60. LONGITUDINAL FEEL SPRING CARTRIDGE INSTALLATION – continued

(2) Remove and discard lockwire from rod end (8).

(3) Loosen nut (14) until lock (15) is free of shaft (16).

(4) Adjust rod end (8) to aline with bellcrank (9). Turn rod end (8) clockwise to decrease length or counterclockwise to increase length.



(5) Hold rod end (8). Tighten nut (14) until lock (15) engages shaft (16).

(6) Remove cartridge (para 11.59).

(7) Hold rod end (8). Torque nut (14) to **105 INCH-POUNDS**. Use torque wrench and crowfoot.

(8) Install lockwire through nut (14) and lock (15). Use wire (item 224, App F).

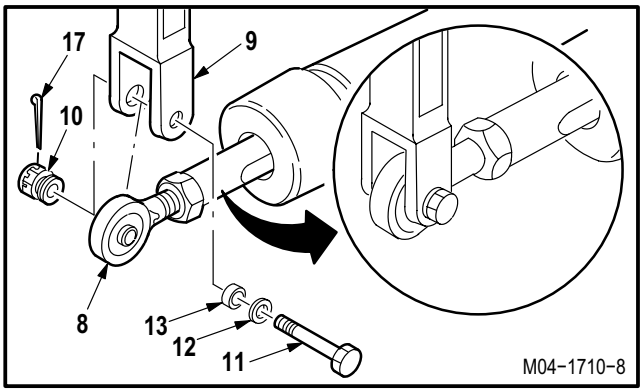
(9) Go to step b.(1).

(10) Check fit of self-retaining bolt (11) (para 11.1).

(11) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

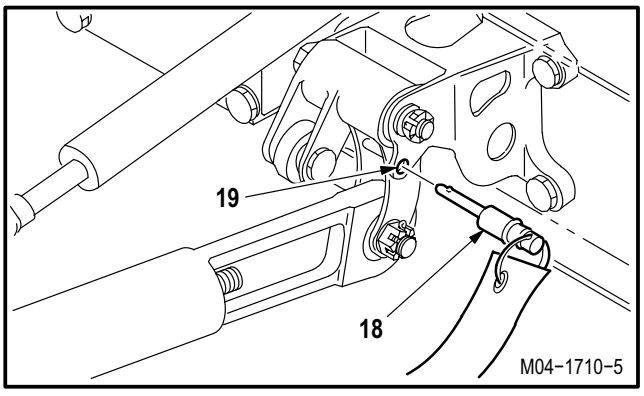
(12) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(13) Install new cotter pin (17).



c. **Inspect (QA).**

d. **Remove -7 rig pin (18) from rig pin hole (19).**



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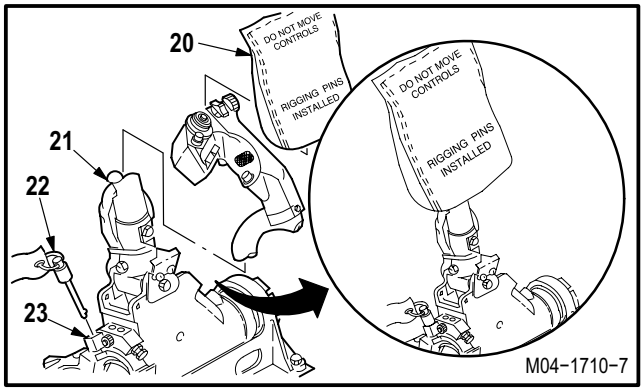
11.60. LONGITUDINAL FEEL SPRING CARTRIDGE INSTALLATION – continued

e. **Remove cyclic stick warning cover (20) from cyclic stick (21).**

f. **Remove -9 rig pin (22) from cyclic stick base (23).**



WARNING

To prevent interference with flight controls, ensure all rags and FOD are removed before installing access covers.

g. **Install access cover (24).**

(1) Install cover (24) on floor (25).

(2) Install 28 screws (26) and washers (27).

h. **Install access cover (28).**

(1) Install cover (28) on floor (25).

(2) Install 16 screws (29) and washers (30).

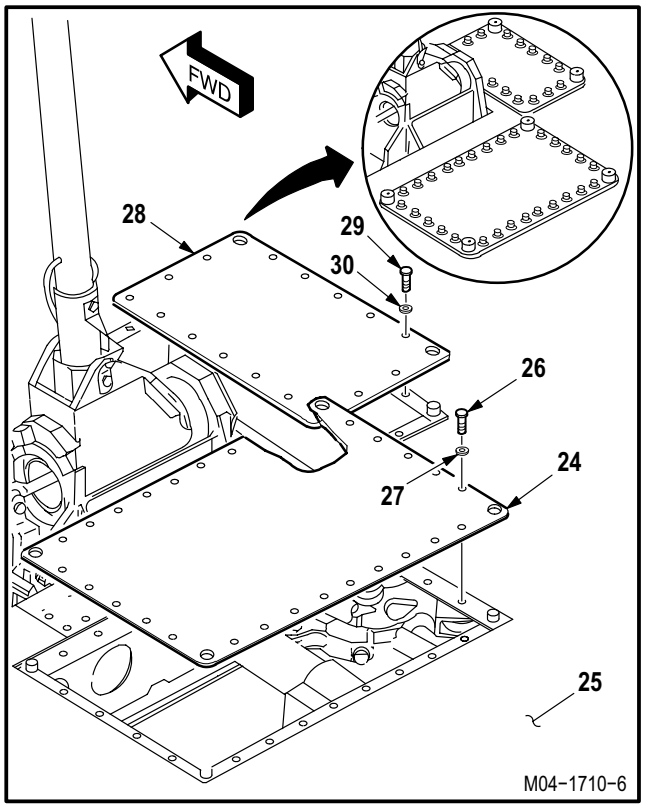
i. **Install pilot cyclic stick cover** (para 11.46)**.**

j. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

k. **Install pilot ECS crew station duct** (para 13.28)**.**

l. **Install pilot HDU holster** (para 2.185)**.**

m. **Install pilot seat** (para 2.161)**.**



END OF TASK

11.61. PILOT CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.61.1. Description

This task covers: Disassembly. Cleaning. Inspection. Repair. Assembly.

11.61.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
2 3/4 x 3/8-inch drive open end socket wrench crowfoot attachment (item 96, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)
Heat protective gloves (item 155, App H)
Electric gun type heater (item 163, App H)
Adjustable air filtering respirator (item 262, App H)
1/2-inch drive 1 3/4 - 4-inch socket wrench spanner attachment set (item 335, App H)
150 - 750 inch-pound 3/8-inch drive click type torque wrench (item 442, App H)

Materials/Parts:

Cotter pin (2)
Packing
Rivet
Antiseize compound (item 26, App F)
Primer (item 145, App F)
Sealing compound (item 170, App F)
Wire (item 224, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1500-204-23

Equipment Conditions:

Ref	Condition
11.62	Pilot cyclic stick flight control arm removed

GO TO NEXT PAGE

11.61. PILOT CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.61.3. Disassembly

a. **Remove main rotor retainer (1) from cyclic support (2).**

(1) Remove lockwire from retainer (1).

(2) Remove retainer (1). Use crowfoot.

b. **Remove bearing retainer (3) from cyclic housing assembly (4).**

(1) Remove lockwire from retainer (3).

(2) Remove retainer (3). Use spanner attachment set.

c. **Remove input arm (5) from housing (4).**

(1) Remove two nuts (6).

(2) Remove two bolts (7) and washers (8).

d. **Remove rod end (9) from arm (5).**

(1) Remove and discard cotter pin (10) from nut (11).

(2) Remove nut (11).

(3) Remove bolt (12), washer (13), bushing (14), and rod end (9).

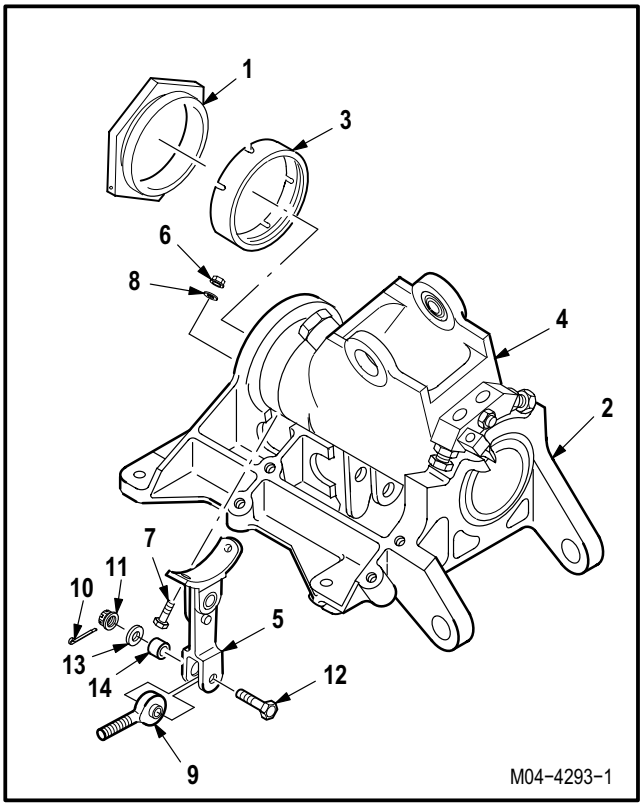
e. **Remove clevis (15) from housing (4).**

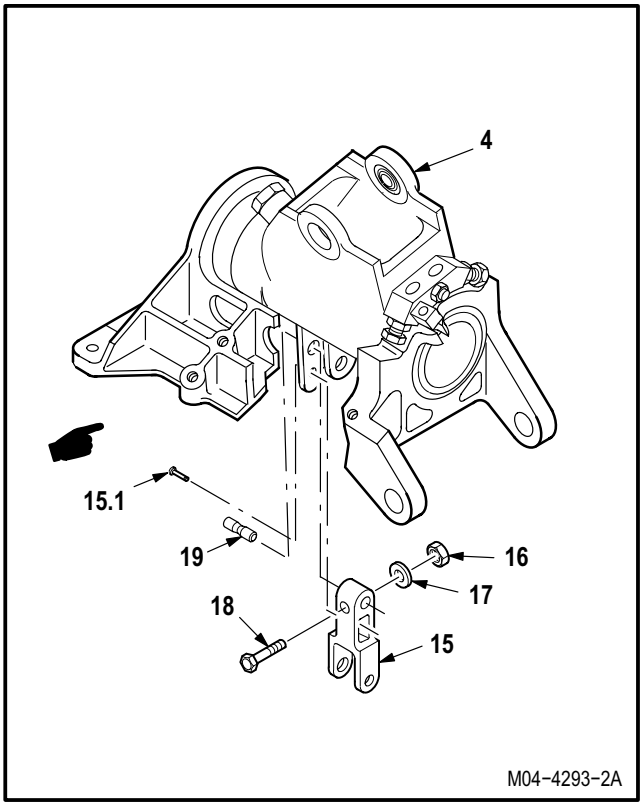
(1) Remove rivet (15.1) (TM 1-1500-204-23).

(2) Remove nut (16) and washer (17).

(3) Remove bolt (18).

(4) Remove shaft pivot (19) and clevis (15).





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11.61. PILOT CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

WARNING

Do not place heater near flammable material or allow heater to contact skin: severe burns can result. Wear protective equipment. If injury occurs, seek medical aid.

f. **Remove housing (4) from support (2).**

(1) Apply heat on bearing (20). Use protective gloves and heater.

(2) Hold support (2) and pull housing (4) in opposite direction of bearing (20) until housing (4) is free of support (2).

(3) Remove bearing (21).

(4) Remove housing (4) and bearing (20).

NOTE

Go to step g if replacing housing; if not, go to paragraph 11.61.4.

g. **Remove two bolts (22) and nuts (23) from housing (4).**

(1) Measure and record dimensions A from housing (4) to top of bolts (22).

(2) Remove lockwire.

(3) Remove two bolts (22) and nuts (23).

h. **Remove bolt (24) and nut (25) from housing (4).**

(1) Measure and record dimension B from housing (4) to top of bolt (24).

(2) Remove lockwire.

(3) Remove nut (25).

(4) Remove bolt (24).

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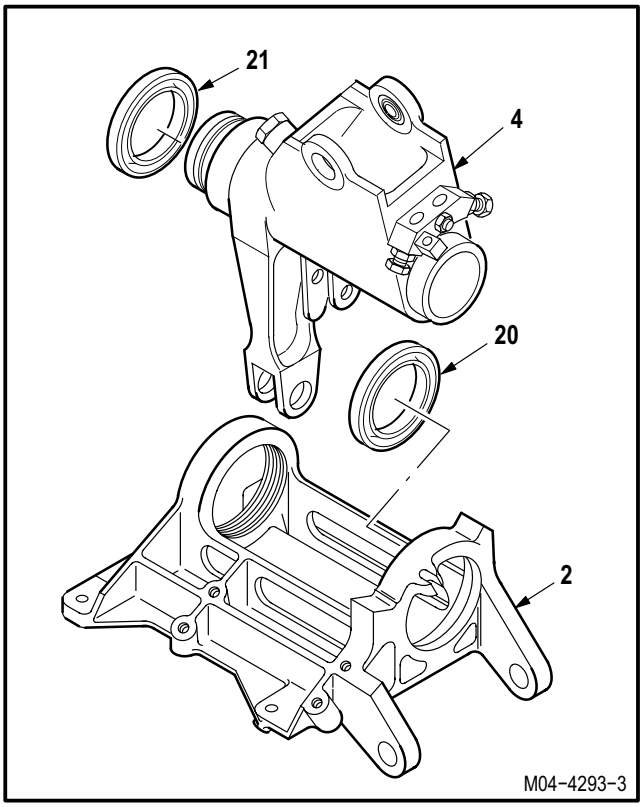
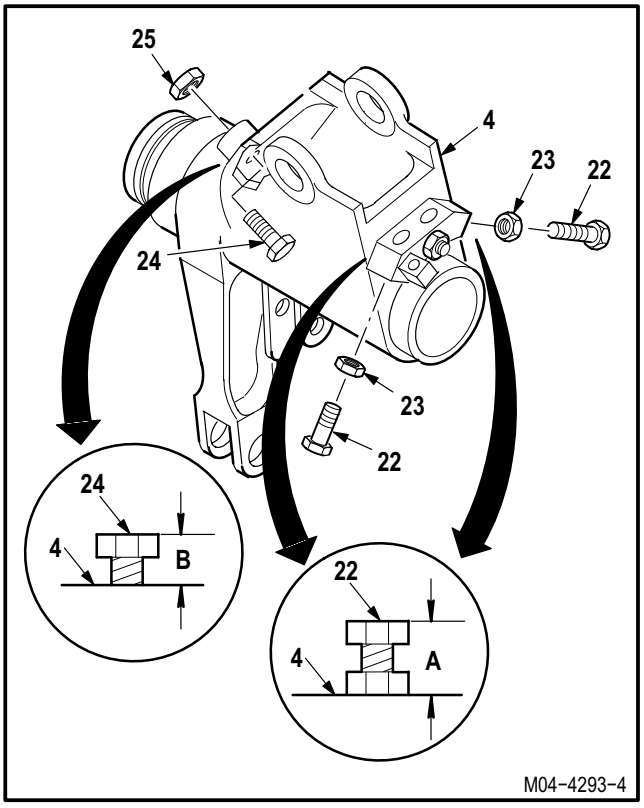




11.61. PILOT CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

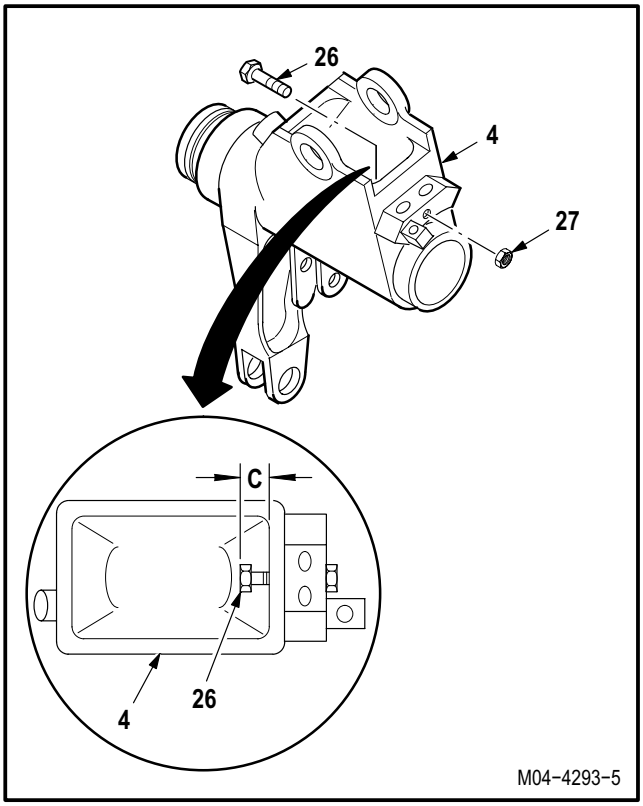
i. **Remove bolt (26) and nut (27) from housing (4).**

(1) Measure and record dimension C from housing (4) to top of bolt (26).

(2) Remove lockwire.

(3) Remove nut (27).

(4) Remove bolt (26).



11.61.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.61.5. Inspection

a. **Check support, housing, arm, and clevis for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

b. **Check removed and attaching parts for cracks** (para 11.5)**.**

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

e. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

f. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.61.6. Repair

a. **Replace threaded inserts as necessary** (TM 1-1500-204-23)**.**

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11.61. PILOT CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.61.7. Assembly

a. **If removed, install bolt (26) and nut (27) on housing (4).**

NOTE

Refer to dimension C as recorded earlier.

(1) Install bolt (26) on housing (4) until dimension C is attained.

(2) Install nut (27).

b. **If removed, install bolt (24) and nut (25) on housing (4).**

NOTE

Refer to dimension B as recorded earlier.

(1) Install bolt (24) on housing (4) until dimension B is attained.

(2) Install nut (25).

(3) Lockwire nut (25) to housing (4). Use wire (item 224, App F).

c. **If removed, install two bolts (22) and nuts (23) on housing (4).**

NOTE

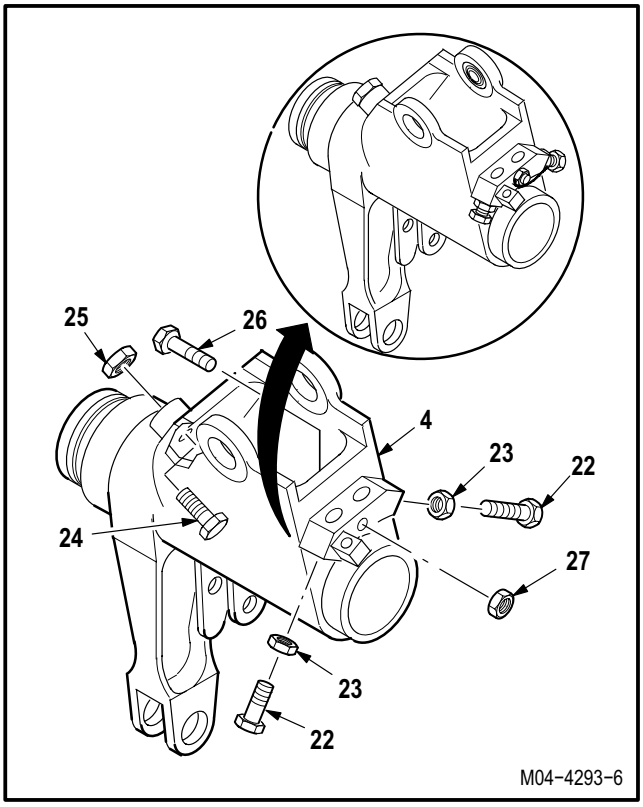
Refer to dimensions A as recorded earlier.

(1) Install two bolts (22) through housing (4) and nuts (23) until dimension A is attained.

(2) Tighten two nuts (23).

(3) Lockwire two bolts (24) together. Use wire (item 224, App F).

(4) Lockwire two nuts (23) and nut (27) together. Use wire (item 224, App F).



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11.61. PILOT CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

d. **Install housing (4) on support (2).**

(1) Apply primer on bearing mount surface of support (2). Use primer (item 145, App F).

(2) Allow primer to air dry **30 MINUTES**.

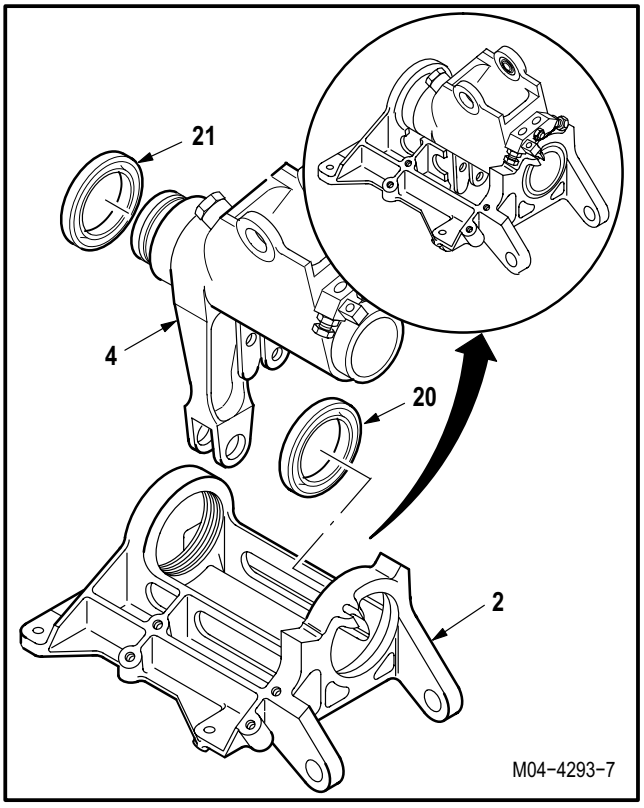
(3) Apply sealing compound on bearing (20) mount surface of support (2). Use sealing compound (item 170, App F).

(4) Press bearing (20) on housing (4) (para 11.5).

(5) Install housing (4) on support (2).

(6) Ensure bearing (20) is properly seated in support (2).

(7) Install bearing (21) on housing (4) until properly seated in support (2).

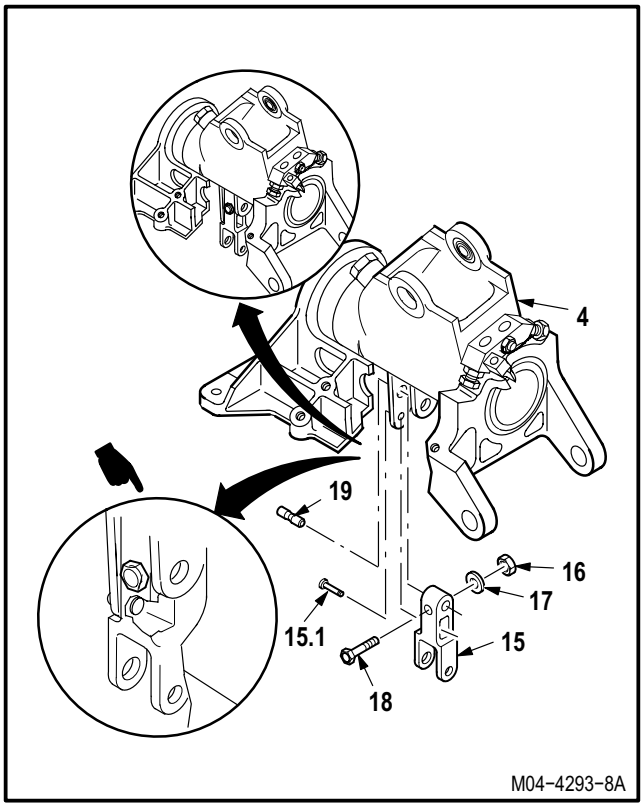


e. **Install clevis (15) on housing (4).**

(1) Install pivot (19) through housing (4) and clevis (15).

(2) Install bolt (18) through clevis (15), washer (17), and nut (16).

(3) Install new rivet (15.1) dry (TM 1-1500-204-23).



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11.61. PILOT CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

f. **Install bearing (9) on arm (5).**

(1) Install bolt (12) through arm (5), bearing (9), bushing (14), washer (13), and nut (11).

(2) Install new cotter pin (10) on nut (11).

g. **Install arm (5) on housing (4).**

(1) Install two bolts (7) through arm (5) and housing (4).

(2) Install two washers (8) and nuts (6).

h. **Install retainer (3) on housing (4).** Torque retainer (3) to **500 INCH-POUNDS**.

(1) Apply thin coating of antiseize compound to threads of retainer (3) and install. Use antiseize compound (item 26, App F).

(2) Torque retainer (3) to **500 INCH-POUNDS**. Use torque wrench and spanner attachment set.

(3) Lockwire retainer (3) to cyclic housing (4). Use wire (item 224, App F).

i. **Install retainer (1) on support (2).** Torque retainer (1) to **500 INCH-POUNDS**.

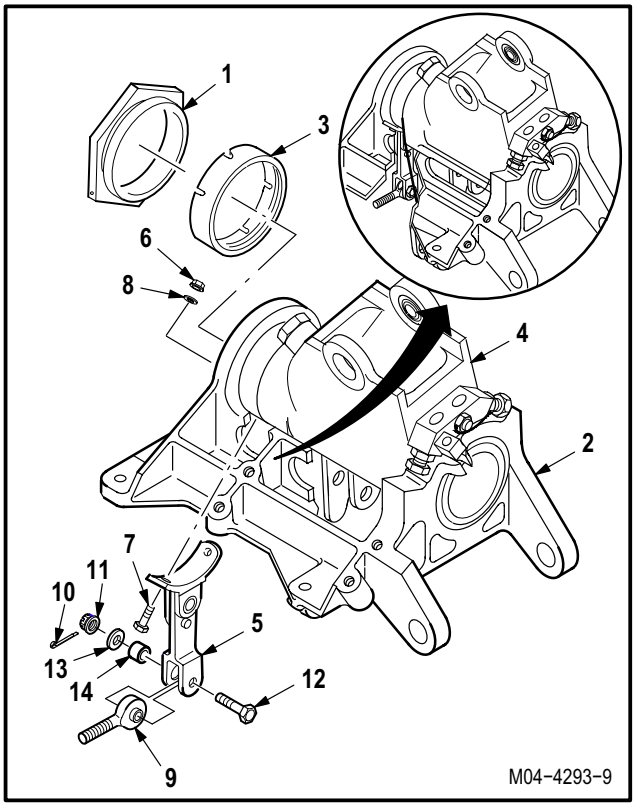
(1) Apply thin coating of antiseize compound to threads of retainer (1) and install. Use antiseize compound (item 26, App F).

(2) Torque retainer (1) to **500 INCH-POUNDS**. Use torque wrench and crowfoot.

(3) Lockwire retainer (1) to support (2). Use wire (item 224, App F).

j. **Inspect (QA).**

k. **Install pilot cyclic stick flight control arm** (para 11.62)**.**



END OF TASK

11.62. PILOT CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.62.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.62.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
30 - 150 inch-pound 1/4-inch drive click type torque wrench (item 435, App H)

Materials/Parts:

Cotter pin (3)
Packing
Rivet MS20470AD3 (3)
Adhesive (item 3A, App F)
Damping fluid (item 69, App F)
Petrolatum (item 138, App F)

Personnel Required:

67R Attack Helicopter Repairer
68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1500-204-23

Equipment Conditions:

Ref	Condition
11.64	Pilot cyclic lateral SPAD switch removed

11.62.3. Disassembly

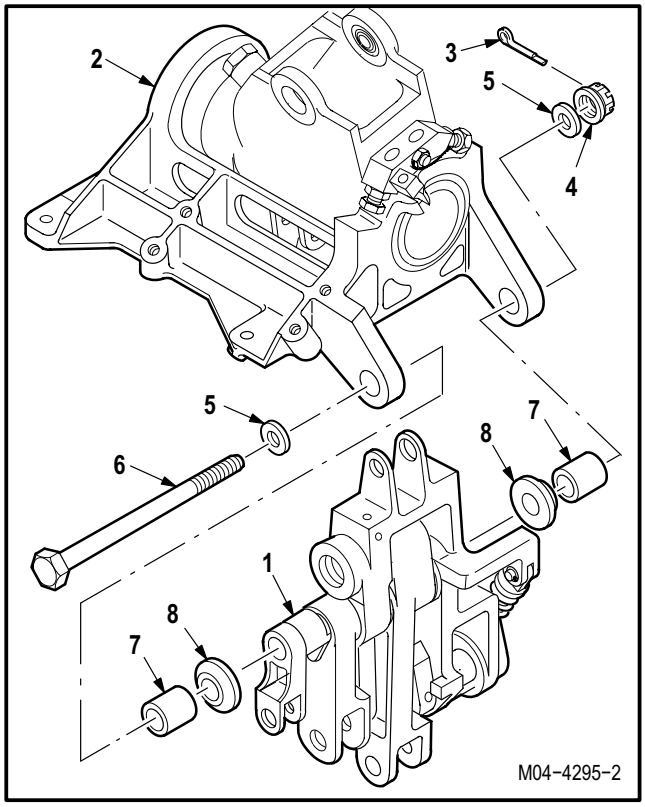
a. **Remove flight control arm (1) from cyclic support (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4) and washer (5).

(3) Remove bolt (6) and washer (5).

(4) Remove two spacers (7) and retainers (8) from arm (1).



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11.62. PILOT CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

b. **Remove remote control lever (9) from arm (1).**

(1) Remove rivet (10) (TM 1-1500-204-23).

(2) Remove lever (9) from output arm shaft (11).

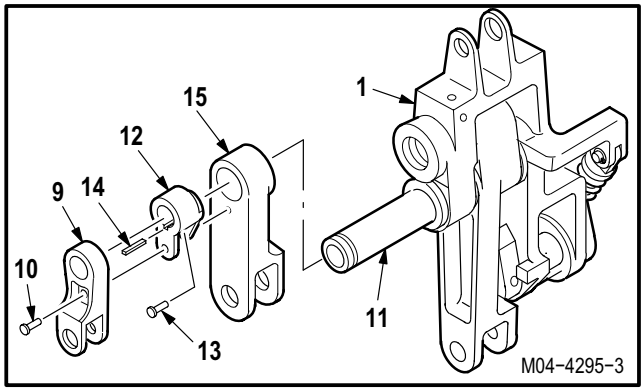
c. **Remove drive collar (12) from arm (1).**

(1) Remove rivet (13) (TM 1-1500-204-23).

(2) Remove collar (12) from output arm shaft (11).

(3) Remove key (14).

d. **Remove transducer input arm (15) from shaft (11).**

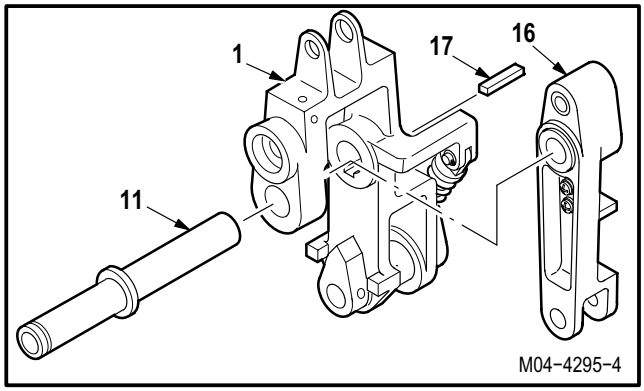


e. **Remove arm (16) from arm (1).**

(1) Remove shaft (11).

(2) Remove key (17).

(3) Remove arm (16) from arm (1).



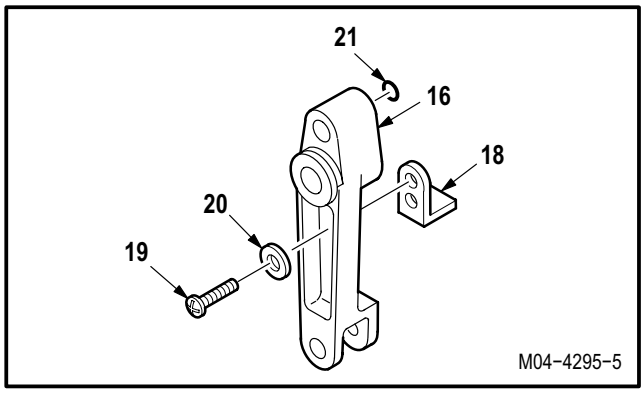
f. **Remove detent (18) from arm (16).**

(1) Remove lockwire from two screws (19).

(2) Remove two screws (19) and washers (20).

(3) Remove detent (18).

g. **Remove and discard packing (21) from arm (16).**



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11.62. PILOT CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

h. **Remove internal spring guide (22) from actuator switch shaft (23).**

(1) Remove cotter pin (24), washer (25), and pin (26).

(2) Remove guide (22) and spring (27).

i. **Remove external spring guide (28) from arm (1).**

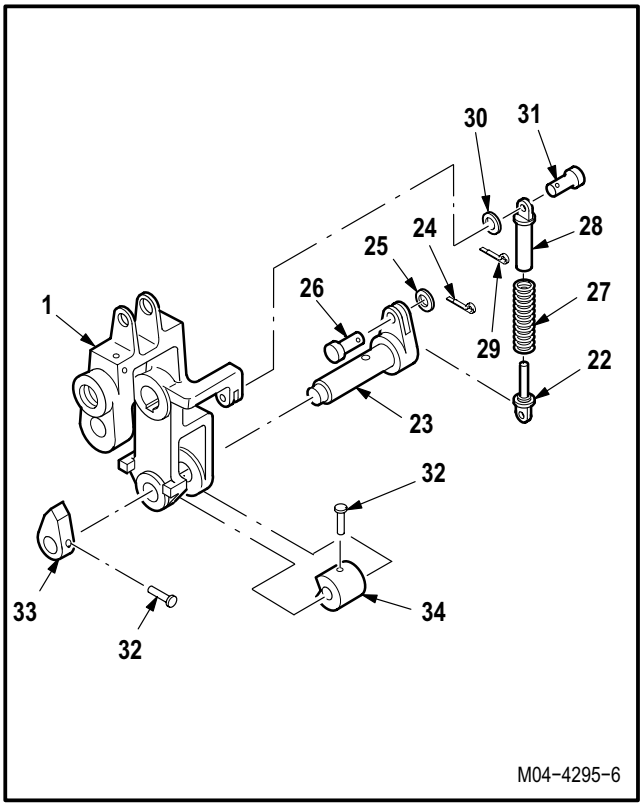
(1) Remove cotter pin (29), washer (30), and pin (31).

(2) Remove guide (28).

j. **Remove shaft (23) from arm (1).**

(1) Remove two rivets (32) (TM 1-1500-204-23).

(2) Remove lever (33), cam (34), and shaft (23).



11.62.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.62.5. Inspection

a. **Check support and arms for gouges.** Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

b. **Check cam for gouges.** Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

c. **Check removed and attaching parts for elongated holes, stripped or damaged threads, or distortions** (para 11.5)**.**

d. **Check removed and attaching parts for cracks.** None allowed.

e. **Check removed and attaching parts for damage** (para 11.5)**.**

GO TO NEXT PAGE

11.62. PILOT CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

f. **Check removed and attaching parts for corrosion** (para 1.49)**.**

g. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

h. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.62.6. Assembly

a. **Install shaft (23) on arm (1).**

(1) Install shaft (23) through arm (1), cam (34), and lever (33).

(2) Install two new rivets (32) in cam (34) and lever (33) (TM 1-1500-204-23).

b. **Install guide (28) on arm (1).**

(1) Install pin (31) through arm (1), guide (28), and washer (30).

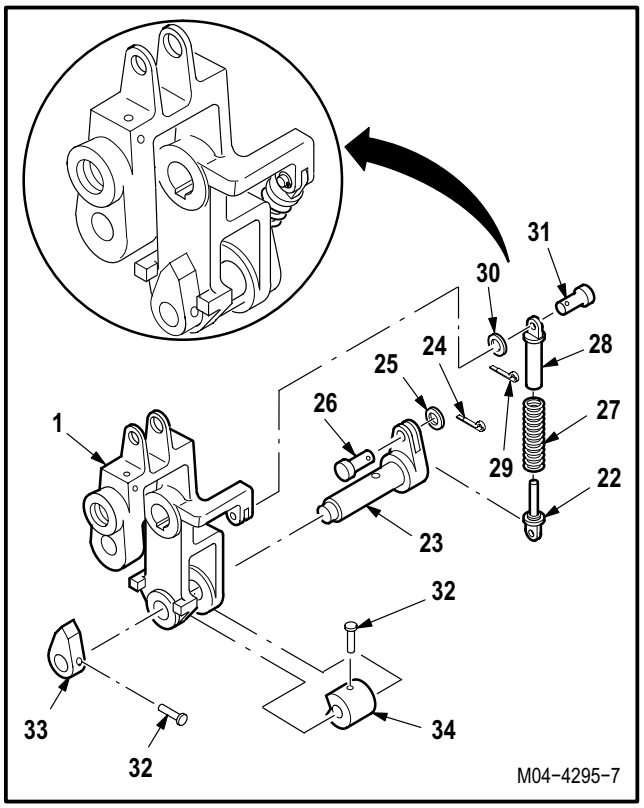
(2) Install new cotter pin (29).

c. **Install guide (22) on shaft (23).**

(1) Install spring (27) and guides (22) and (28).

(2) Install pin (26) through shaft (23), guide (22), and washer (25).

(3) Install new cotter pin (24).



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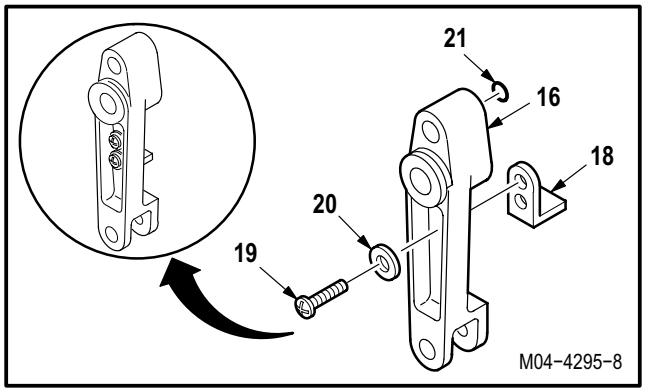
11.62. PILOT CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

d. **Install new packing (21) on arm (16).**

(1) Lubricate new packing (21). Use petrolatum (item 138, App F).

(2) Install packing (21) on arm (16).



e. **Install detent (18) on arm (16).**

(1) Position detent (18) on arm (16).

NOTE

Detent will be secured, adjusted, and lockwired when SPAD switch is installed.

(2) Install two screws (19) and washers (20).

f. **Install arm (16) on arm (1).**

(1) Apply lubricant to faying surfaces of arm (1) and arm (16) that contact shaft (11). Use damping fluid (item 69, App F).

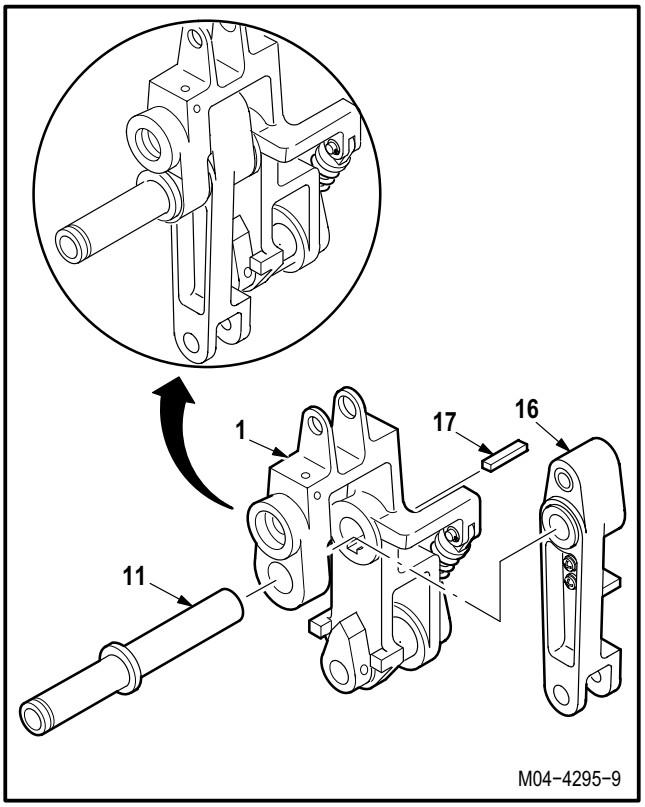
(2) Apply adhesive to shaft (11) key seat. Use adhesive (item 3A, App F).

(3) Install shaft (11) through arm (1) and arm (16).

(4) Apply adhesive to key (17). Coat all surfaces except end to be inserted first. Use adhesive (item 3A, App F).

(5) Aline arm (16) and arm (1).

(6) Install key (17). Wipe excess adhesive from key (17).



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11.62. PILOT CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

g. **Install arm (15) on shaft (11).**

(1) Apply lubricant to faying surfaces and bore of arm (15) that contact shaft (11). Use damping fluid (item 69, App F).

(2) Install arm (15) on shaft (11).

h. **Install collar (12) on shaft (11).**

(1) Apply lubricant to faying surfaces of collar (12) that contact shaft (11). Use damping fluid (item 69, App F).

(2) Apply adhesive to shaft (11) Key seat. Use adhesive (item 3A, App F).

(3) Apply adhesive to key (14). Coat all surfaces except end to be inserted first. Use adhesive (item 3A, App F).

(4) Install key (14). Wipe excess adhesive from key (14).

(5) Aline and install collar (12) with key (14) and shaft (11).

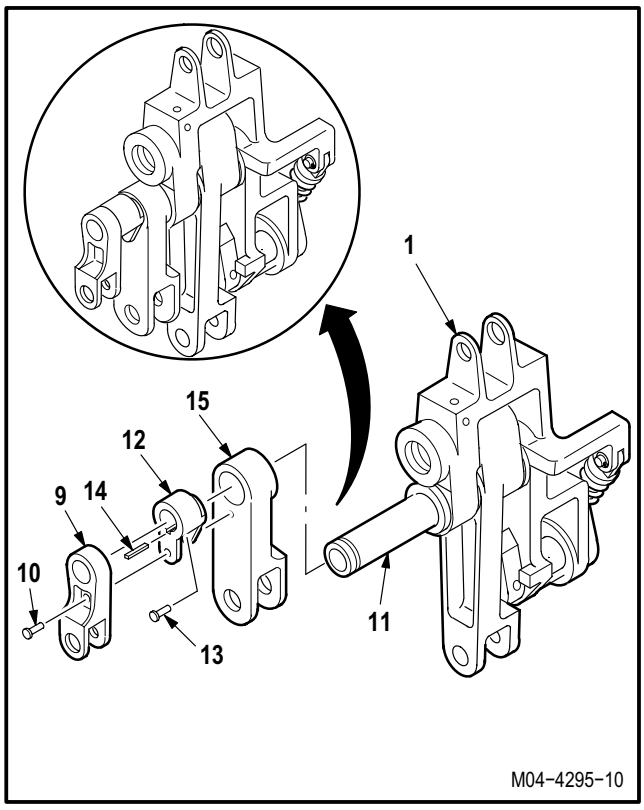
(6) Install new rivet (13) dry (TM 1-1500-204-23).

i. **Allow adhesive to cure 12 HOURS at ambient temperature or cure 1.5 HOURS at 135 °F (57 °C).**

j. **Install lever (9) on arm (1).**

(1) Aline lever (9) on shaft (11).

(2) Install new rivet (10) dry (TM 1-1500-204-23).



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11.62. PILOT CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

k. **Install arm (1) on support (2).** Torque nut (4) **65 to 85 INCH-POUNDS**.

(1) Aline arm (1) with two retainers (8) and spacers (7).

(2) Install bolt (6) through washer (5), support (2), spacer (7), retainer (8), arm (1), retainer (8), spacer (7), and support (2).

(3) Install washer (5).

(4) Check fit of self-retaining bolt (6) (para 11.1).

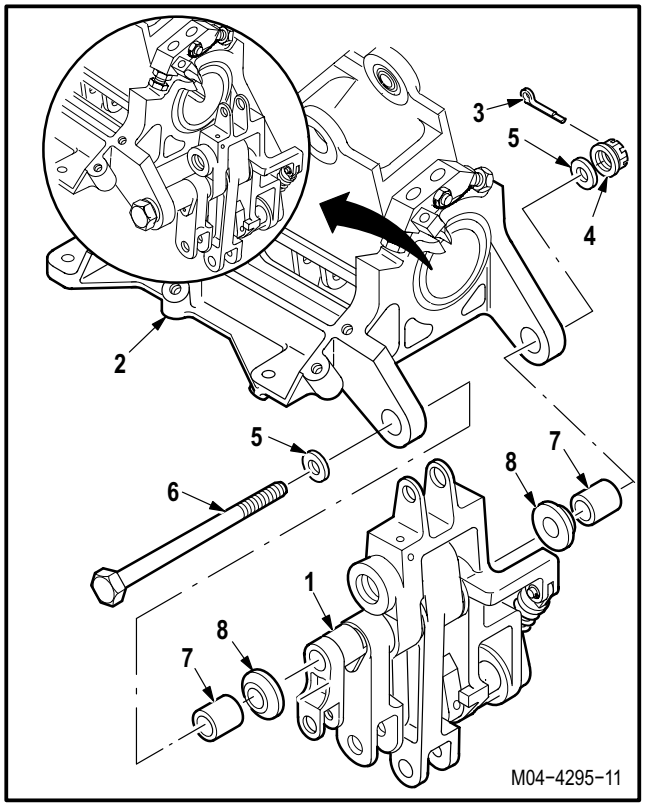
(5) Install nut (4). Torque nut (4) to **65 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **85 INCH-POUNDS**.

(7) Install new cotter pin (3).

l. **Install pilot cyclic lateral SPAD switch** (para 11.64)**.**

m. **Inspect (QA).**



END OF TASK

11.63. CYCLIC INPUT ARM ASSEMBLY REPAIR (AVIM)

11.63.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.63.2. Initial Setup

Tools:

Airframe repairman's tool kit (item 377, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)

Personnel Required:

68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

Bushing
Rivet (2)
Brush (item 34, App F)
Corrosion resistant coating (item 66, App F)
Polyurethane coating (item 141, App F)

References:

TM 1-1500-204-23
TM 55-1500-345-23

NOTE

This task is typical for pilot or CPG cyclic input arm repair.

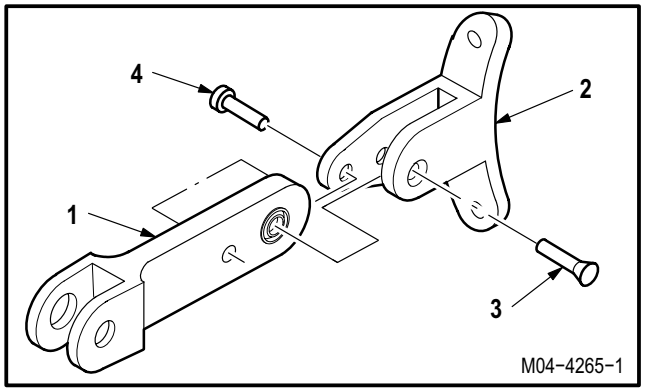
11.63.3. Removal

a. **Remove input arm assembly (1) from base (2).**

(1) Remove and discard rivet (3) (TM 1-1500-204-23).

(2) Remove and discard rivet (4) (TM 1-1500-204-23).

(3) Remove arm (1).



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11.63. CYCLIC INPUT ARM ASSEMBLY REPAIR (AVIM) – continued

11.63.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

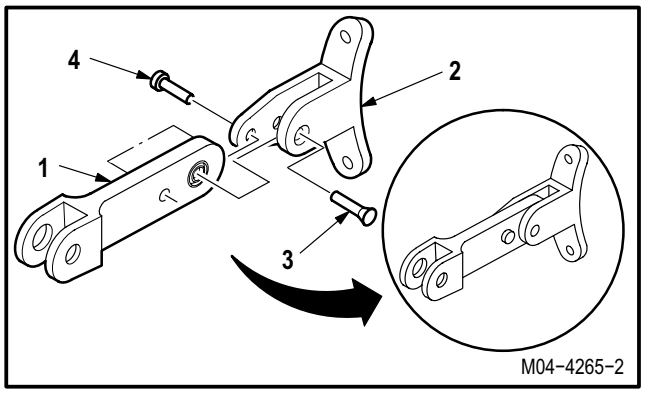
11.63.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.63.6. Installation

a. **Install arm (1) on base (2).**



(1) Position arm (1) on base (2).

(2) Install new rivet (3) (TM 1-1500-204-23).

(3) Apply corrosion resistant compound to new rivet (4). Use corrosion resistant coating (item 66, App F).

(4) Install rivet (4) wet (TM 1-1500-204-23).

b. **Apply polyurethane coating to rivets (3) and (4).** Use polyurethane coating (item 141, App F) and brush (item 34, App F) (TM 55-1500-345-23).

c. **Inspect (QA).**

END OF TASK

11.64. SHEAR PIN ACTIVATED DECOUPLER (SPAD) SWITCH REPLACEMENT (AVIM)

11.64.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.64.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
0.0015 - 0.0250-inch thickness gage (item 152, App H)
Chemical protective gloves (item 154, App H)
Industrial goggles (item 156, App H)
Multimeter (item 215, App H)
Adjustable air filtering respirator (item 262, App H)
0 - 30 inch-pound 1/4-inch drive dial indicator torque wrench (item 445, App H)

Materials/Parts:

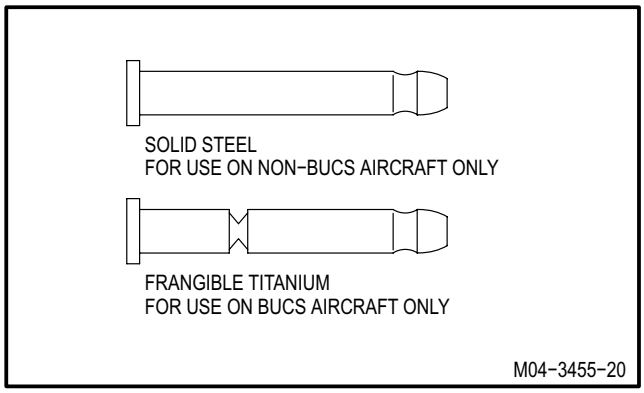
Adhesive (item 1, App F)
Adhesive (item 19, App F)
Cloth (item 52, App F)
Depressor (item 70, App F)
Methyl ethyl ketone (item 124, App F)
Wire (item 220, App F)
Wire (item 223, App F)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.



NOTE

This task is typical for all SPAD switches.

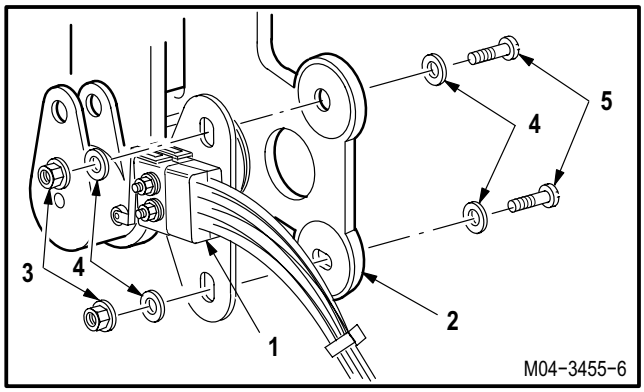
11.64.3. Removal

a. **Remove SPAD switch (1) from SPAD (2).**

(1) Remove two nuts (3) and washers (4).

(2) Remove two screws (5) and washers (4).

(3) Remove switch (1).



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11.64. SHEAR PIN ACTIVATED DECOUPLER (SPAD) SWITCH REPLACEMENT (AVIM) – continued

b. **Check cam lever (6) and detent (7) for 0.000 to 0.005 INCH gap.**

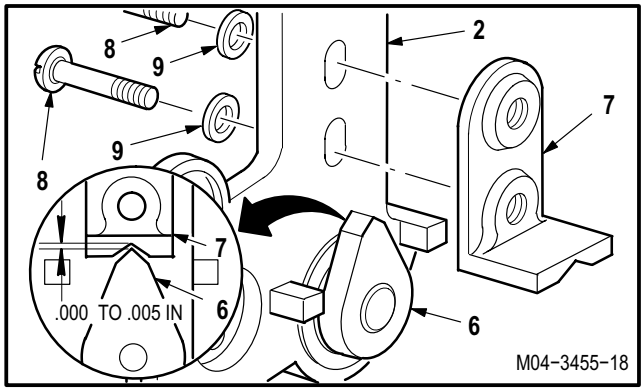
(1) If detent is not within tolerance, go to step c. If detent is within tolerance, go to paragraph 11.64.4.

c. **Remove detent (7) from SPAD (2).**

(1) Remove lockwire from two screws (8).

(2) Remove two screws (8) and washers (9) from detent (7).

(3) Remove detent (7).



11.64.4. Cleaning

a. **Remove adhesive from SPAD slotted screw holes, switch attach screws, detent, and detent mounting area (if detent removed).** Use methyl ethyl ketone (item 124, App F) and cloth (item 52, App F).

b. **Wipe switch mounting area with a clean rag.** Use cloth (item 52, App F).

11.64.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.64. SHEAR PIN ACTIVATED DECOUPLER (SPAD) SWITCH REPLACEMENT (AVIM) – continued

11.64.6. Installation

a. **Install new switch (1) on SPAD (2).**

(1) Apply a thin layer of adhesive on mating surfaces of switch (1) and SPAD (2). Use adhesive (item 19, App F).

(2) Position switch (1) on SPAD (2).

(3) Install two screws (5) through washers (4), SPAD (2), and switch (1).

(4) Install two washers (4) and nuts (3).

(a) Hand tighten nuts (3).

NOTE

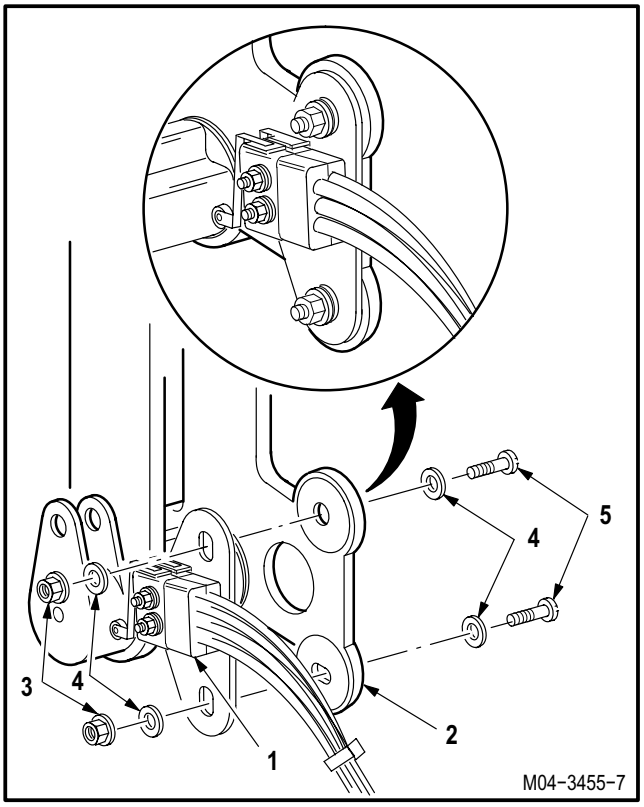
- Ensure that step b. is completed before adhesive has cured.
- Both mounting screws must be loose to facilitate proper adjustment.
- Ensure SPAD shear pin is installed prior to start of adjustment.

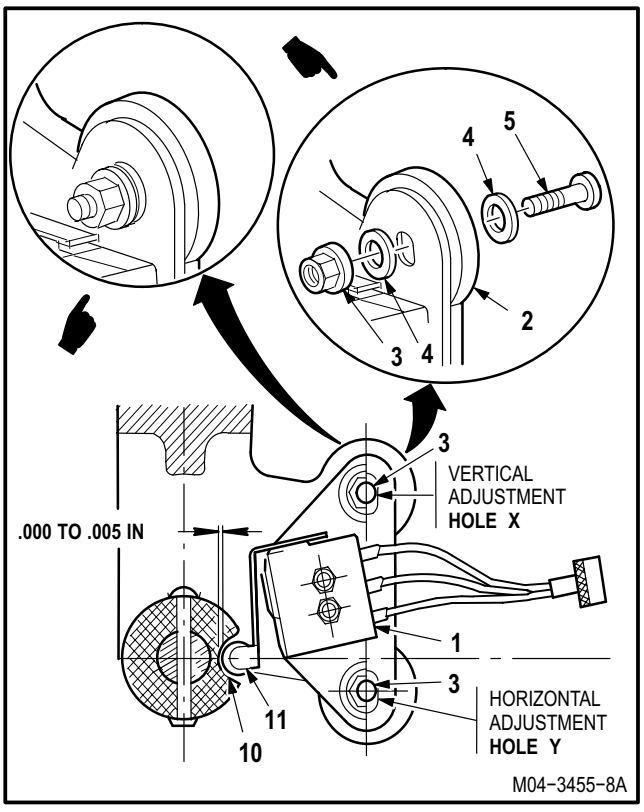
b. **Adjust switch (1) to cam actuator valley (10)**. Torque nut (3) to **8 INCH-POUNDS**.

(1) Adjust switch (1) vertically to aline switch cam rollers (11) with center of the cam actuator valley (10).

(2) Adjust switch (1) horizontally to provide a **0.000 to 0.005 INCH** gap between cam actuator valley (10) and switch cam rollers (11). Use thickness gage.

(3) Tighten screw (5) in round hole X in the SPAD (2) only enough to prevent switch (1) from slipping but free to rotate.





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11.64. SHEAR PIN ACTIVATED DECOUPLER (SPAD) SWITCH REPLACEMENT (AVIM) – continued

(4) Rotate switch (1) toward cam (12), keeping rollers (11) in center of cam actuator valley (10), until screw (5) bottoms out in hole Y. If audible clicks are heard while rotating switch (1), back switch (1) off enough to allow switch (1) to open.

(5) Torque nut (3) in round hole X in SPAD (2) to **8 INCH-POUNDS** plus run-on torque. Use torque wrench.

NOTE

If a shear pin cannot be removed by conventional means, after repeated attempts from any SPAD assemblies, deliberately shearing the shear pin is permitted. Ensure both ends of pin are removed.

(6) Remove SPAD shear pin (13) from SPAD (2).

(a) Remove lockwire from shear pin retainer (14).

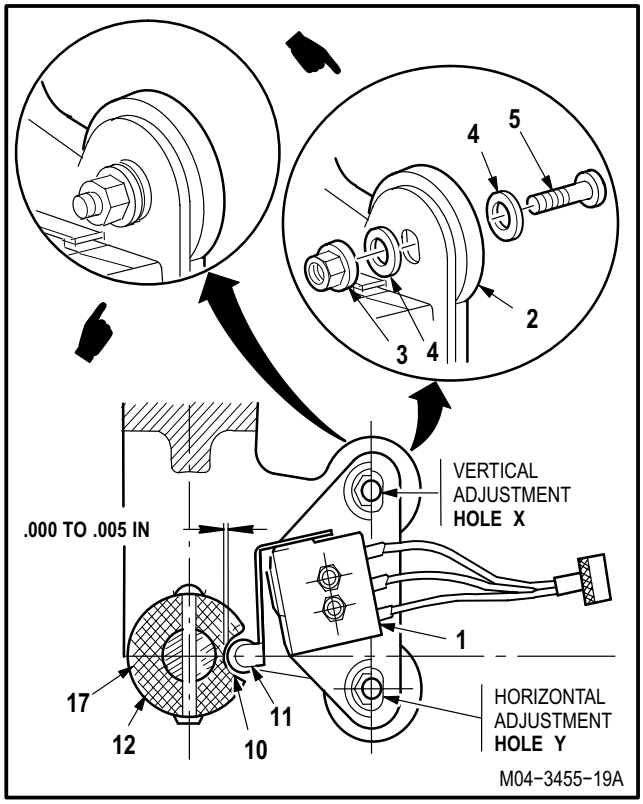
(b) Remove retainer (14) from SPAD (2).

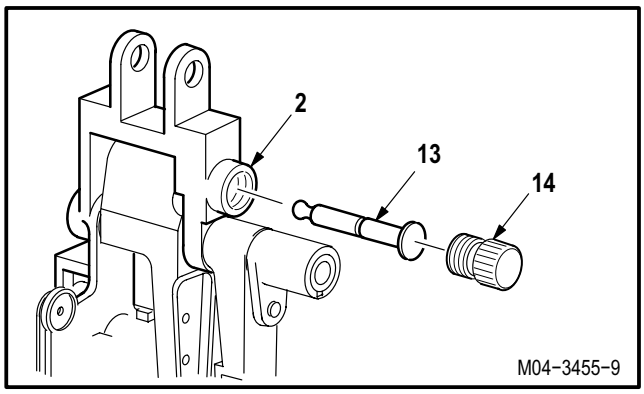
(c) Remove shear pin (13) from SPAD (2).

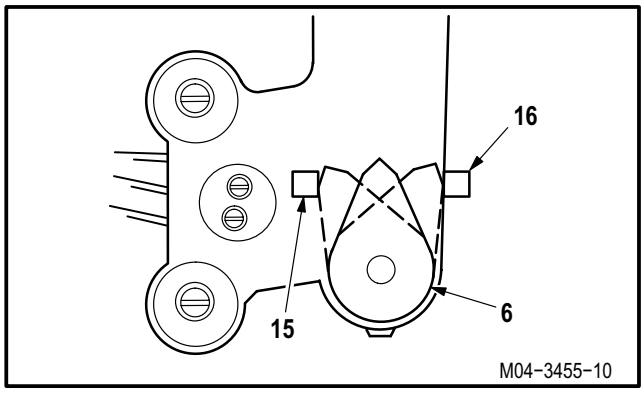
NOTE

Roller overtravel on cylindrical surface to be approximately **0.030 INCH** measured at slotted hole Y in casting.

(7) Ensure lever (6) is against stop (15) or stop (16) and rollers (11) are on cylindrical surface (17) of cam (12).







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11.64. SHEAR PIN ACTIVATED DECOUPLER (SPAD) SWITCH REPLACEMENT (AVIM) – continued

c. **Check for continuity between contacts of switch (11).** Torque nut (3) to **8 INCH-POUNDS**.

(1) With cam lever (6) resting against stop (15), ensure continuity exists between: P1-1 and P1-2; P1-1 and P1-4. Use multimeter.

(2) With lever (6) resting against stop (16) ensure continuity exists between: P1-1 and P1-2; P1-1 and P1-4. Use multimeter.

(3) With rollers (11) centered in cam actuator valley (10), install shear pin (13) in SPAD (2).

(a) Install shear pin (13) in SPAD (2).

(b) Install retainer (14) in SPAD (2).

(c) Lockwire retainer (14). Use wire (item 220, App F).

(4) If detent (7) is removed, install on SPAD (2).

(a) Apply adhesive to faying surface of detent (7). Use adhesive (item 19, App F).

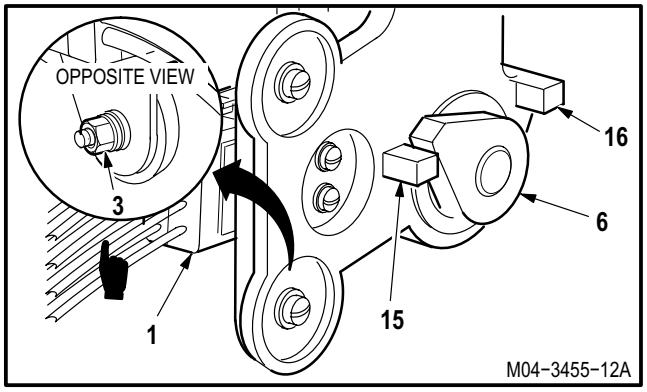
(b) Install detent (7) on SPAD (2).

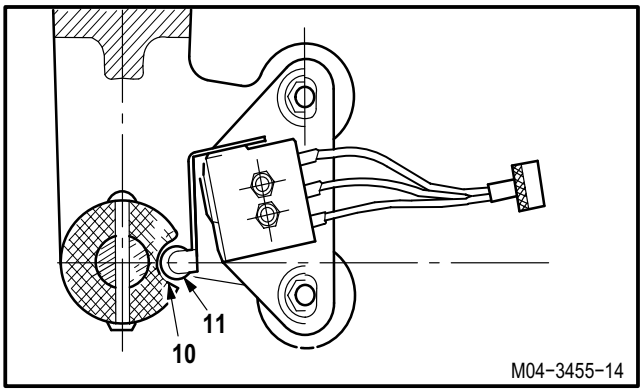
(c) Install two screws (8) and washers (9) in detent (7) and SPAD (2).

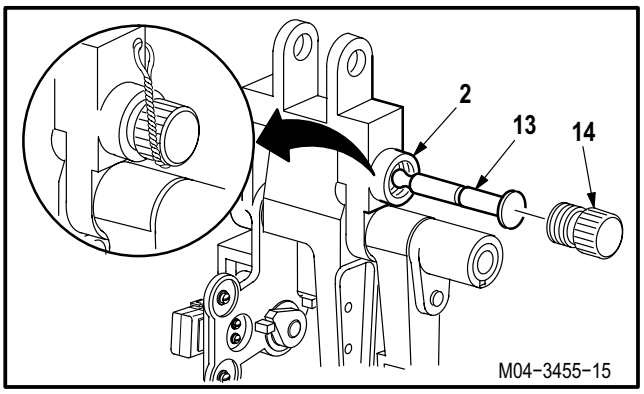
(d) Tighten two screws (8) only enough to maintain contact with SPAD (2) without binding detent (7).

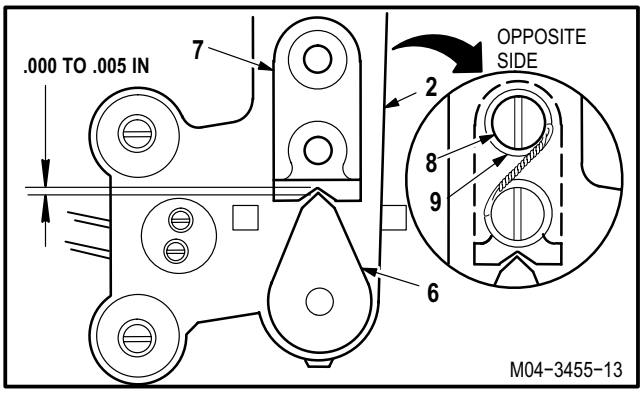
(5) Aline lever (6) and detent (7) to provide a **0.000 to 0.005 INCH** gap between lever (6) and detent (7). Use thickness gage.

(6) Tighten two screws (8) and lockwire. Use wire (item 223, App F).









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11.64. SHEAR PIN ACTIVATED DECOUPLER (SPAD) SWITCH REPLACEMENT (AVIM) – continued

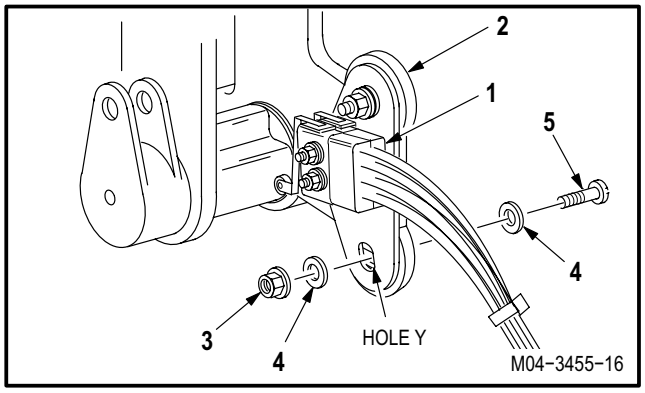
(7) Ensure open condition exists between: P1-1 and P1-2; P1-1 and P1-4. Use multimeter.

(8) If open condition does not exist, repeat steps b.(1) thru b.(5).

(9) Remove nut (3), two washers (4), and screw (5) from slotted hole Y in SPAD (2).

(10) Fill slotted hole Y in SPAD (2) and slotted hole in switch (1) with adhesive. Use adhesive (item 1, App F) and depressor (item 70, App F).

(11) Install screw (5), two washers (4), and nut (3) in slotted hole Y in SPAD (2). Rotate screw (5) while inserting in hole Y to ensure screw threads are coated with adhesive.



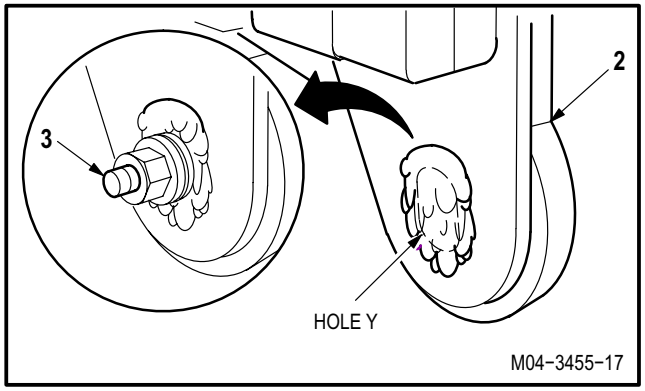
(12) Torque nut (3) in slotted hole Y in SPAD (2) to **8 INCH-POUNDS** plus run-on torque. Use torque wrench.

(13) Allow adhesive to cure **24 HOURS** at ambient temperature.

NOTE

Shear pin must be installed and switch deactivated to perform step (14).

(14) Ensure open condition exists between: P1-1 and P1-2; P1-1 and P1-4. Use multimeter.



NOTE

Shear pin must be removed and switch activated to perform step (15).

(15) Repeat steps b.(6) through c.(3) to ensure continuity exists between: P1-1 and P1-2; P1-1 and P1-4. Use multimeter.

(16) If either open condition in step (14) or continuity condition in step (15) does not exist, remove adhesive and repeat steps b.(1) through c.(15).

d. **Inspect (QA).**

END OF TASK

11.65. CPG CYCLIC STICK COVER REMOVAL/INSTALLATION

11.65.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.65.2. Initial Setup

Tools:

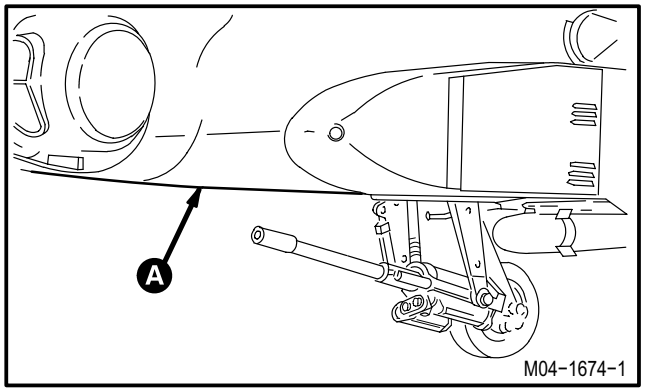
Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

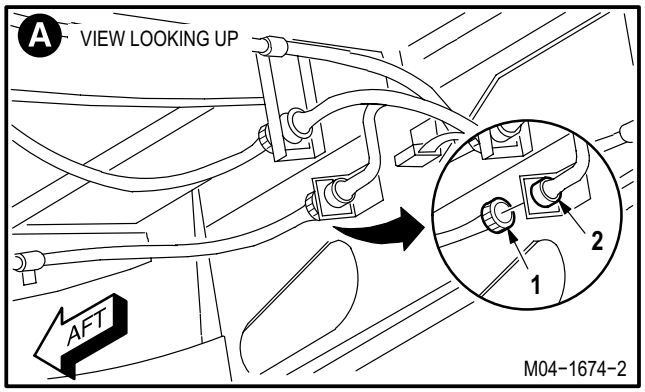
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access door B60 removed



11.65.3. Removal

a. **Detach connector P118 (1) from receptacle J118 (2).**



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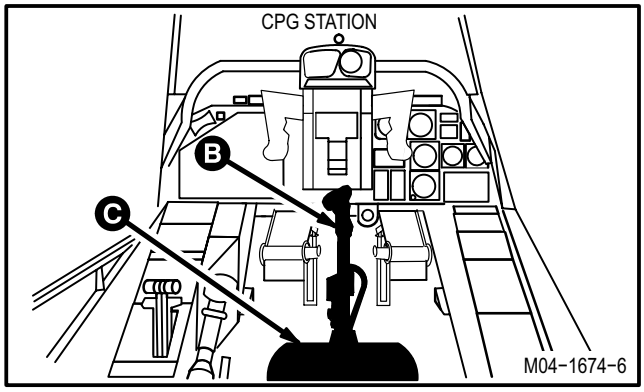
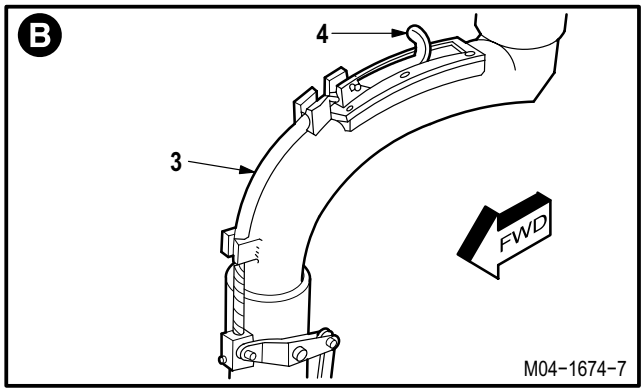
11.65. CPG CYCLIC STICK COVER REMOVAL/INSTALLATION – continued

b. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**



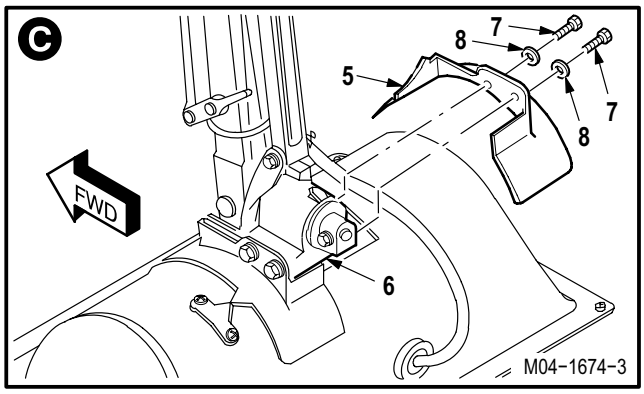
c. **Raise CPG cyclic stick (3) to extended position.**

(1) Pull finger lock lever (4).



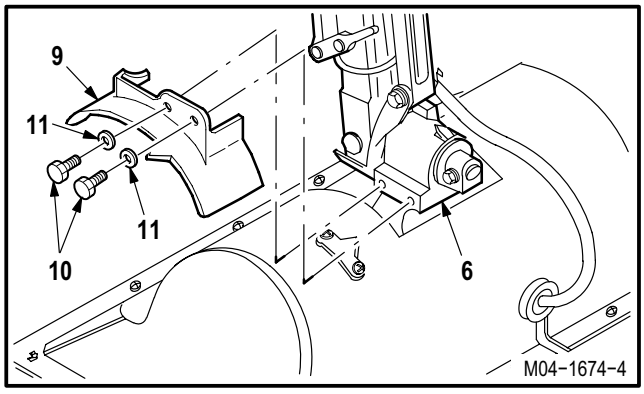
d. **Remove right shroud cover (5) from cyclic stick housing (6).**

(1) Remove two bolts (7) and washers (8).



e. **Remove left shroud cover (9) from housing (6).**

(1) Remove two bolts (10) and washers (11).



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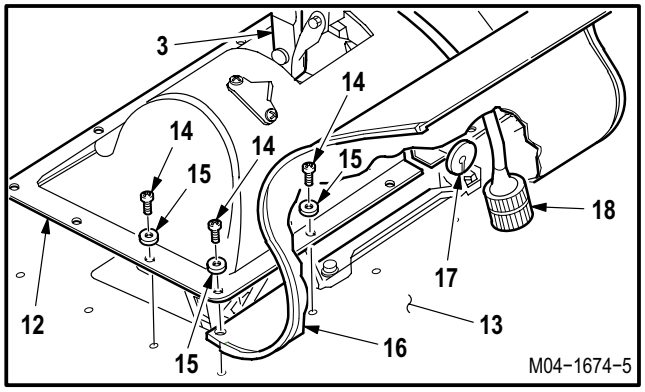
11.65. CPG CYCLIC STICK COVER REMOVAL/INSTALLATION – continued

f. **Remove cyclic stick cover (12) from CPG station floor (13).**

(1) Remove 14 screws (14) and washers (15) from cover (12) and foot guard (16).

(2) Remove grommet (17) and cable (18) from cover (12).

(3) Remove cover (12) from stick (3).



11.65.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.65.5. Inspection

a. **Check removed and attaching parts for damage and wear** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.65.6. Installation

a. **Install cover (12) on stick (3).**

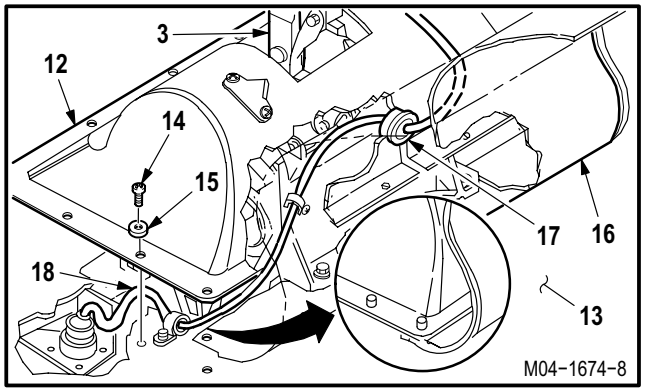
(1) Position cable (18) in grommet (17).

(2) Install grommet (17) in cover (12).

(3) Position cover (12) and foot guard (16) on floor (13).

(4) Aline mounting holes.

(5) Install 14 screws (14) through washers (15), cover (12), foot guard (16), and floor (13).



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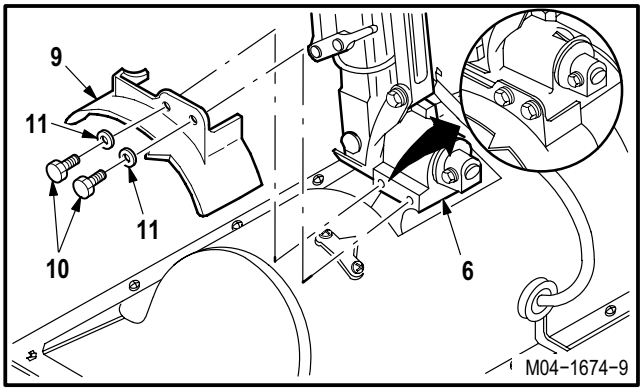
11.65. CPG CYCLIC STICK COVER REMOVAL/INSTALLATION – continued

b. **Install left shroud cover (9) on stick housing (6).**

(1) Aline cover (9) with housing (6).

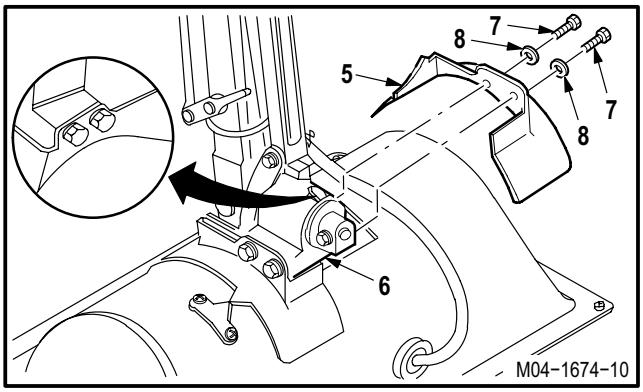
(2) Install two bolts (10) and washers (11) through cover (9) and in housing (6).



c. **Install right shroud cover (5) on housing (6).**

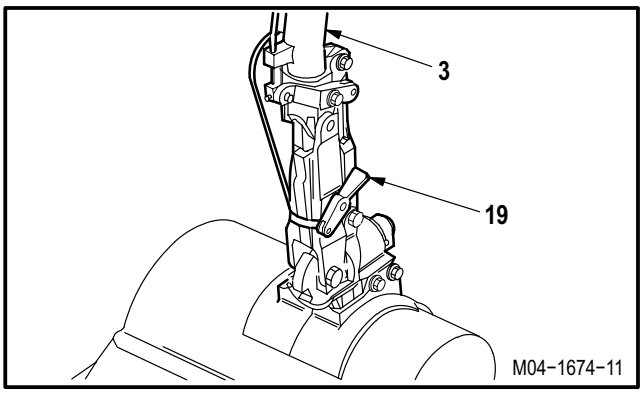
(1) Aline cover (5) with housing (6).

(2) Install two bolts (7) and washers (8) through cover (5) and in housing (6).



d. **Lower stick (3) to folded position.**

(1) Push lock handle (19) down.

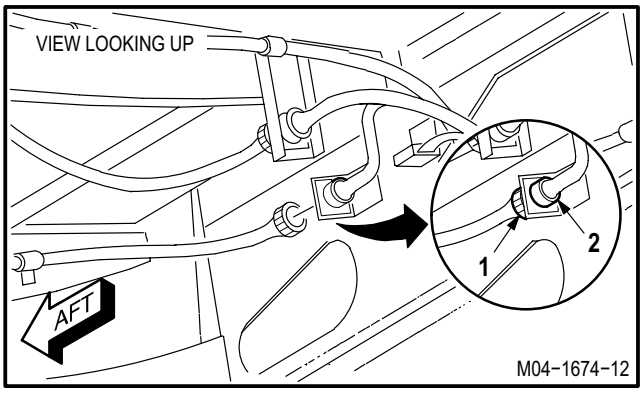


e. **Attach connector P118 (1) to receptacle J118 (2).**

f. **Inspect (QA).**

g. **Install access door B60** (para 2.2)**.**

h. **Inspect (QA).**



END OF TASK

11.66. CPG CYCLIC STICK AND LATERAL LINK REMOVAL

11.66.1. Description

This task covers: Removal. Cleaning. Inspection.

11.66.2. Initial Setup

Tools:

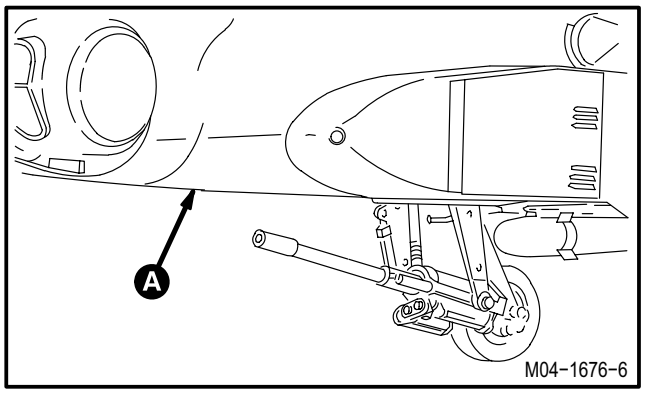
Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.65	CPG cyclic stick cover removed
2.2	Access door B60 removed



11.66.3. Removal

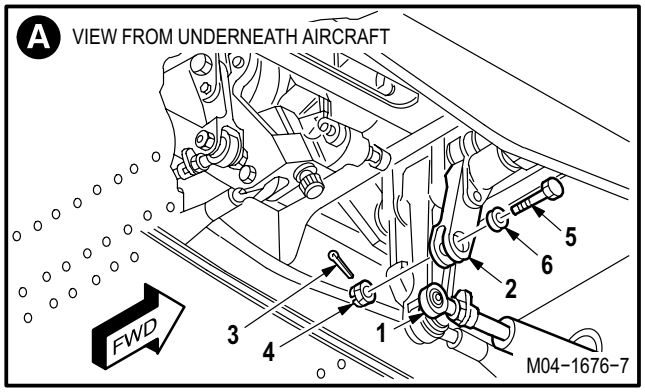
a. **Remove lateral transducer (1) from arm (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5) and bushing (6).

(4) Remove transducer (1).



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11.66. CPG CYCLIC STICK AND LATERAL LINK REMOVAL – continued

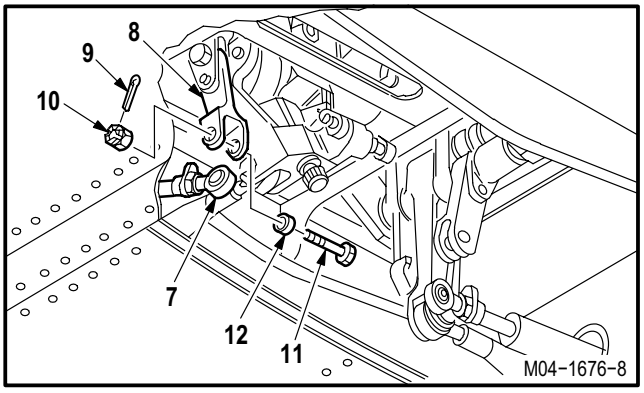
b. **Remove longitudinal transducer (7) from arm (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11) and bushing (12).

(4) Remove transducer (7).



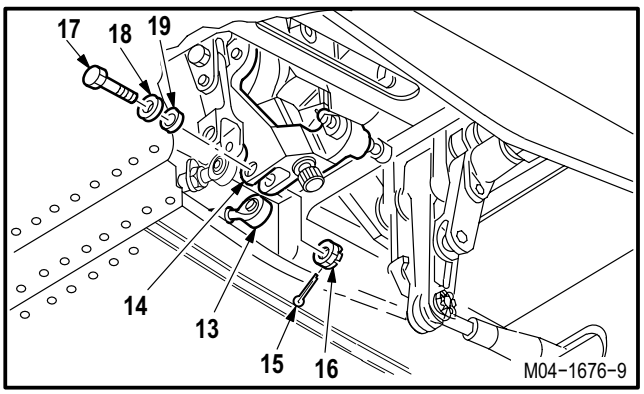
c. **Remove longitudinal push-pull rod (13) from yoke (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove rod (13).



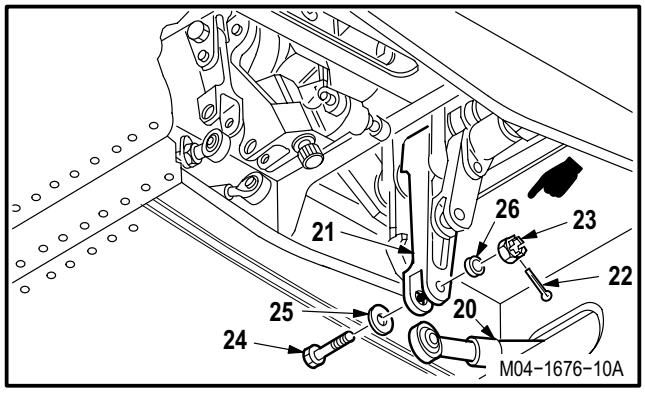
d. **Remove lateral push-pull rod (20) from arm (21).**

(1) Remove and discard cotter pin (22).

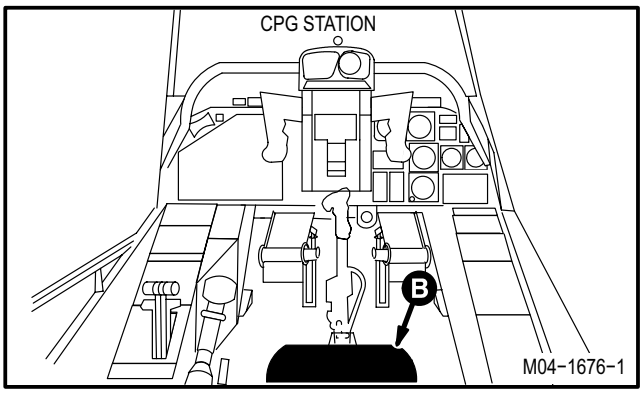
(2) Remove nut (23).

(3) Remove bolt (24), washer (25), and bushing (26).

(4) Remove rod (20).



e. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**



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11.66. CPG CYCLIC STICK AND LATERAL LINK REMOVAL – continued

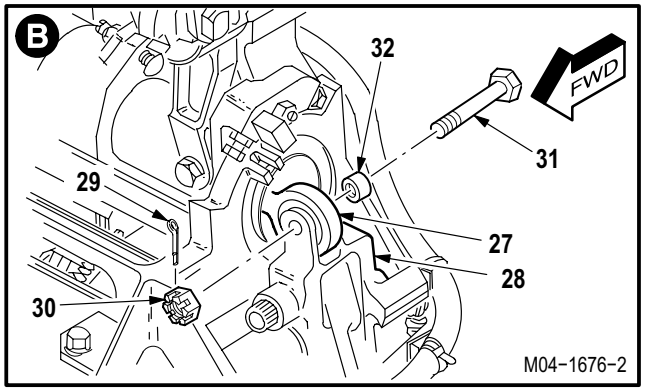
f. **Remove lateral cyclic stick link (27) from arm (28).**

(1) Remove and discard cotter pin (29).

(2) Remove nut (30).

(3) Remove bolt (31) and bushing (32).

(4) Remove link (27).



g. **Remove retainer (33) from pin (34).**

(1) Remove nut (35) and washer (36).

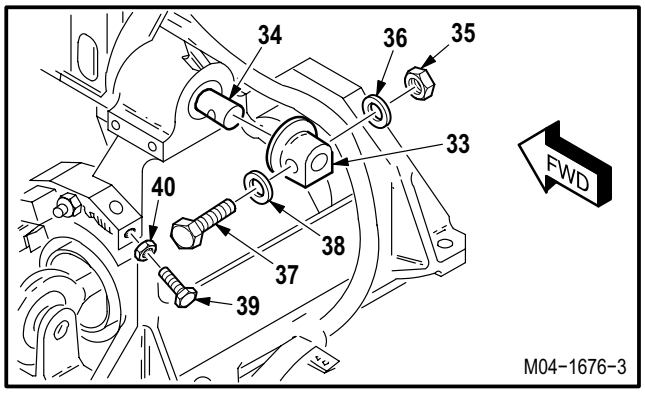
(2) Remove bolt (37) and washer (38).

(3) Remove retainer (33).

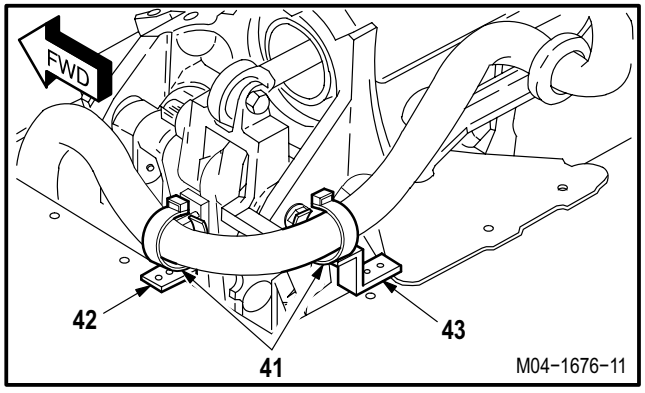
h. **Remove aft stop bolt (39) and nut (40).**

(1) Remove lockwire.

(2) Loosen nut (40). Remove stop bolt (39) and nut (40).



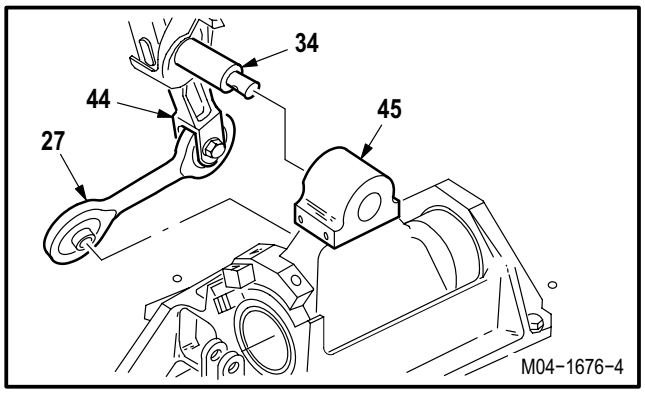
i. **Remove two tiedown straps (41) from brackets (42) and (43).**



j. **Remove cyclic stick (44) with link (27) from housing (45).**

(1) Hold housing (45) in **FULL AFT** position.

(2) Slide stick (44) forward until pin (34) is clear of housing (45).



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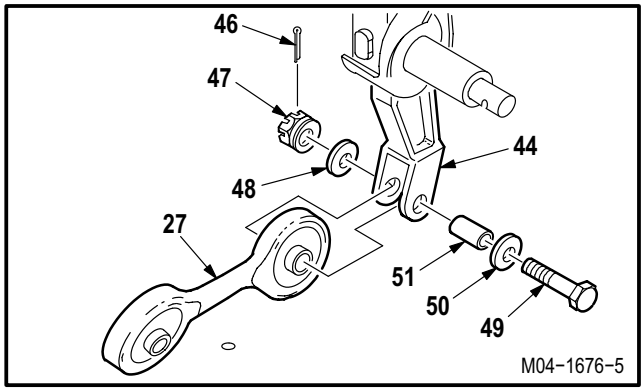
11.66. CPG CYCLIC STICK AND LATERAL LINK REMOVAL – continued

k. **Remove link (27) from stick (44).**

(1) Remove and discard cotter pin (46).

(2) Remove nut (47) and washer (48).

(3) Remove bolt (49), washer (50), and bushing (51).



11.66.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.66.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

END OF TASK

11.67. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION

11.67.1. Description

This task covers: Installation.

11.67.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Materials/Parts:

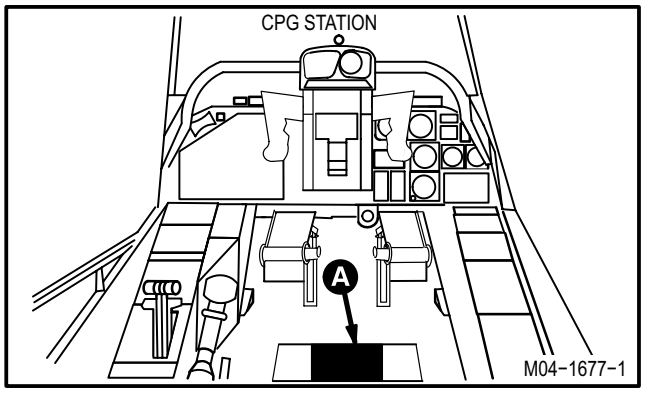
Cotter pin (6)
Strap (item 192, App F)
Wire (item 226, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

11.67.3. Installation

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**



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11.67. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION – continued

b. **Install cyclic stick link (1) on CPG cyclic stick (2).** Torque nut (3) **30 to 40 INCH-POUNDS**.

(1) Aline link (1) and stick (2).

(2) Install bushing (4) in stick (2).

(3) Install bolt (5) through washer (6), bushing (4), stick (2), and link (1).

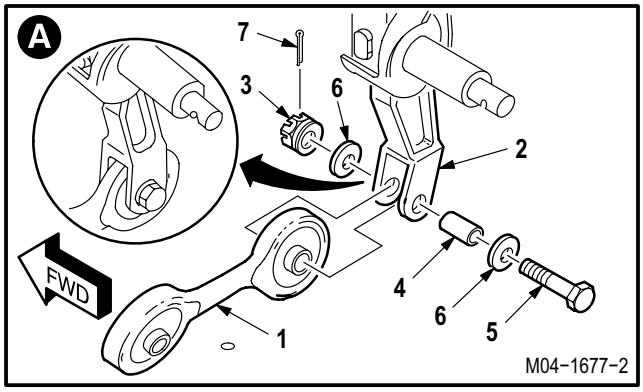
(4) Check fit of self-retaining bolt (5) (para 11.1).

(5) Install washer (6) and nut (3).

(6) Torque nut (3) to **30 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(8) Install new cotter pin (7).

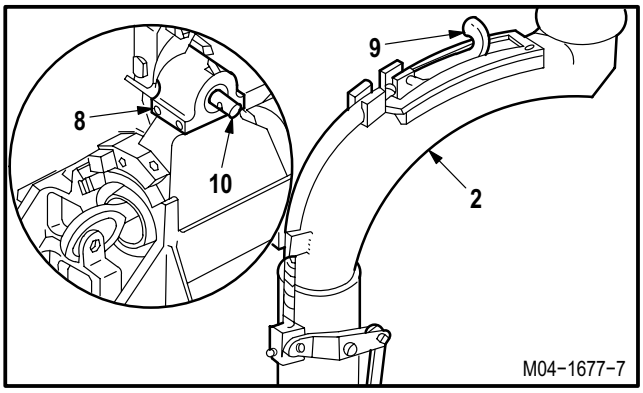


c. **Install stick (2) on housing (8).**

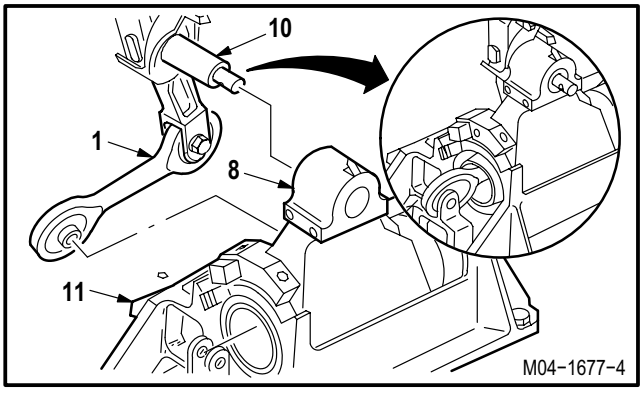
(1) Extend stick (2).

(a) Pull finger lock lever (9).

(2) Hold housing (8) in full aft position.



(3) Slide pin (10) aft through housing (8) and link (1) in arm assembly (11).



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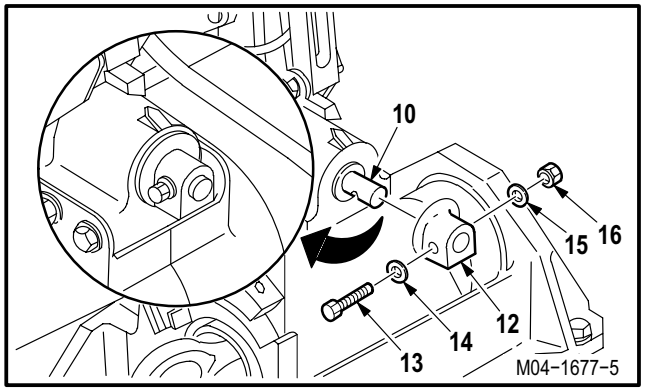
11.67. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION – continued

d. **Install retainer (12) on pin (10).**

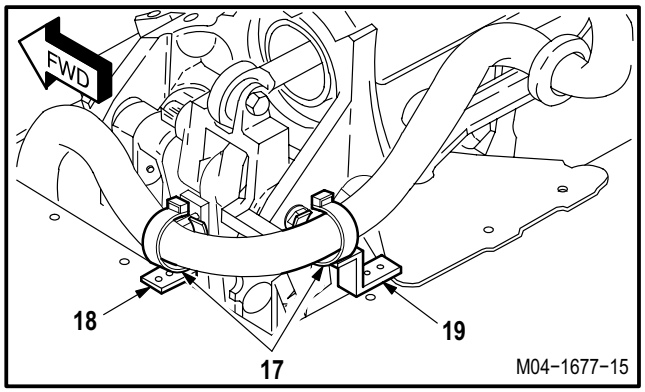
(1) Position retainer (12) on pin (10).

(2) Install bolt (13) through washer (14) and retainer (12).

(3) Install washer (15) and nut (16).



e. **Install two tiedown straps (17) on brackets (18) and (19).** Use strap (item 192, App F).



f. **Install link (1) on arm (11).** Torque nut (20) **30 to 40 INCH-POUNDS**.

(1) Install bushing (21) in arm (11).

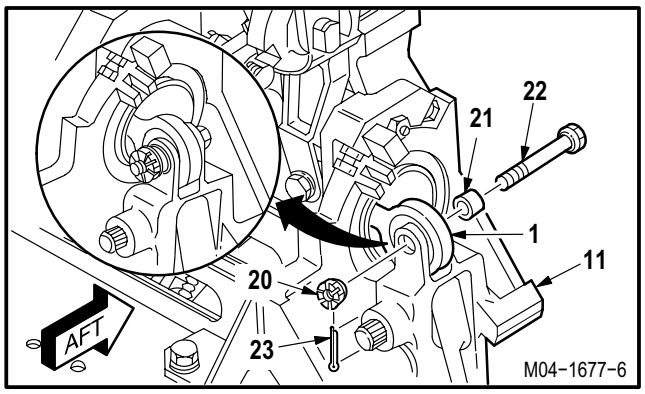
(2) Install bolt (22) through bushing (21), arm (11), and link (1).

(3) Check fit of self-retaining bolt (22) (para 11.1).

(4) Install nut (20). Torque nut (20) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (23).



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11.67. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION – continued

g. **Install aft stop bolt (24) on housing (8).**

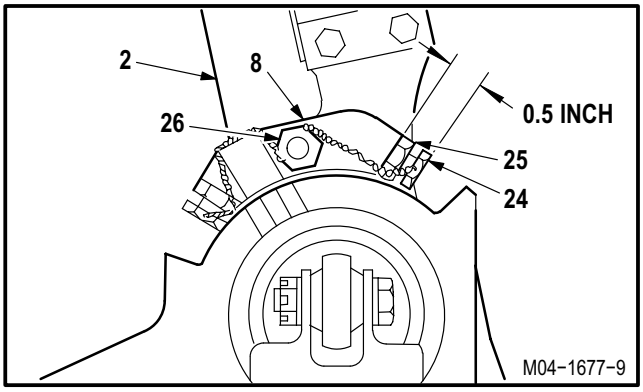
(1) Hold cyclic stick (2) in full forward position.

(2) Install stop bolt (24) with jam nut (25) on housing (8).

(3) Adjust length of stop bolt (24) to **0.50 INCH**.

(4) Hold bolt (24). Tighten jam nut (25).

(5) Lockwire stop bolt (24), jam nut (25) and jam nut (26). Use wire (item 226, App F).



CAUTION

- To prevent damage to flight control system, install bolts with heads in direction as shown.
- To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

h. **Install lateral push-pull rod (26) on arm (27).** Torque nut (28) to **30 to 40 INCH-POUNDS**.

(1) Aline rod (26) with arm (27).

(2) Install bushing (29) in arm (27).

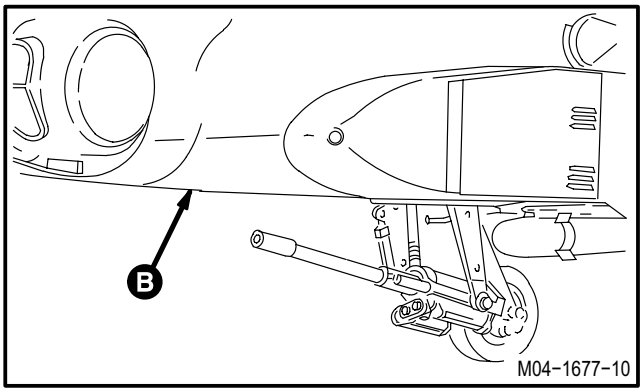
(3) Install bolt (30) through washer (31), arm (27), rod (26), and bushing (29).

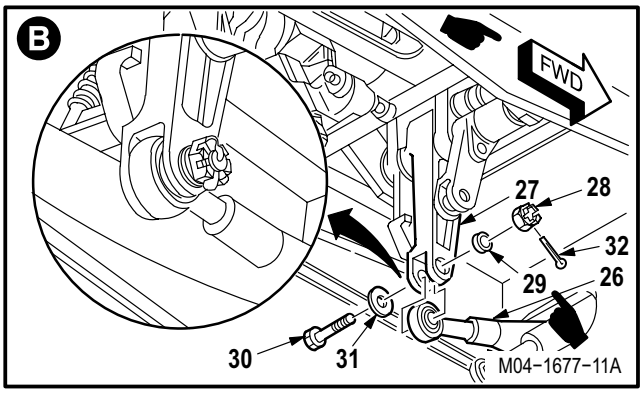
(4) Check fit of self-retaining bolt (30) (para 11.1).

(5) Install nut (28). Torque nut (28) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (32).





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11.67. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION – continued

i. **Install longitudinal push-pull rod (33) on yoke (34).** Torque nut (35) **30 to 40 INCH-POUNDS**.

(1) Aline rod (33) with yoke (34).

(2) Install bushing (36) in yoke (34).

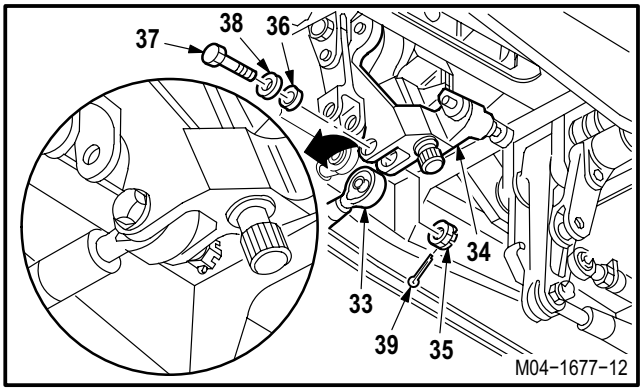
(3) Install bolt (37) through washer (38), bushing (36), yoke (34), and rod (33).

(4) Check fit of self-retaining bolt (37) (para 11.1).

(5) Install nut (35). Torque nut (35) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (39).



j. **Install longitudinal transducer (40) on arm (41).** Torque nut (42) **30 to 40 INCH-POUNDS**.

(1) Aline transducer (40) with arm (41).

(2) Install bushing (43) in arm (41).

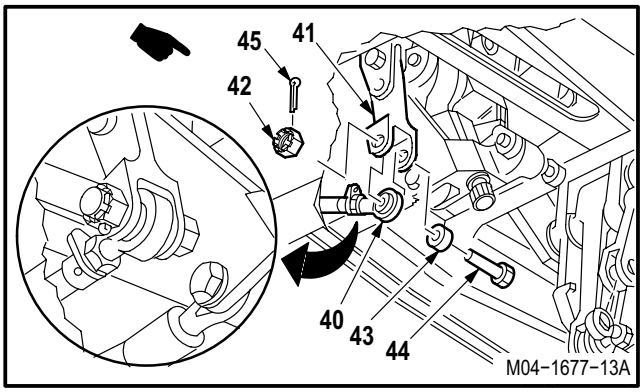
(3) Install bolt (44) through bushing (43), arm (41), and transducer (40).

(4) Check fit of self-retaining bolt (44) (para 11.1).

(5) Install nut (42). Torque nut (42) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (45).



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11.67. CPG CYCLIC STICK AND LATERAL LINK INSTALLATION – continued

k. **Install lateral transducer (46) on arm (47).** Torque nut (48) **30 to 40 INCH-POUNDS**.

(1) Aline transducer (46) with arm (47).

(2) Install bushing (49) in arm (47).

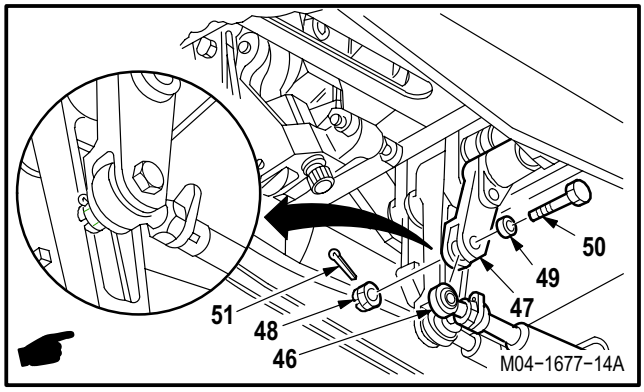
(3) Install bolt (50) through bushing (49), arm (47), and transducer (46).

(4) Check fit of self-retaining bolt (50) (para 11.1).

(5) Install nut (48). Torque nut (48) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (51).



l. **Inspect (QA).**

m. **Install CPG cyclic stick cover** (para 11.65)**.**

n. **Install access door B60** (para 2.2)**.**

o. **Inspect (QA).**

p. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.68. CPG ADJUSTABLE CYCLIC STICK LINK REMOVAL/INSTALLATION

11.68.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.68.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
0 - 30 inch-pound 1/4-inch drive dial indicator torque wrench (item 445, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

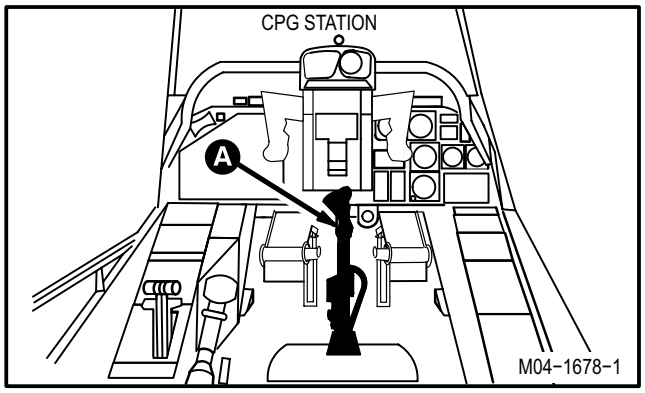
Cotter pin (2)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

11.68.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**

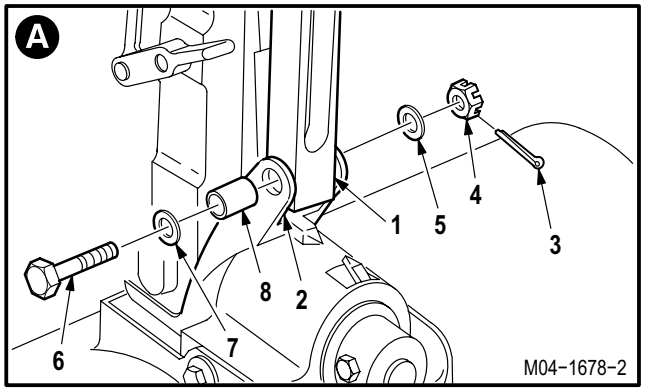


b. **Remove lower end of link (1) from base (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4) and washer (5).

(3) Remove bolt (6), washer (7), and bushing (8).



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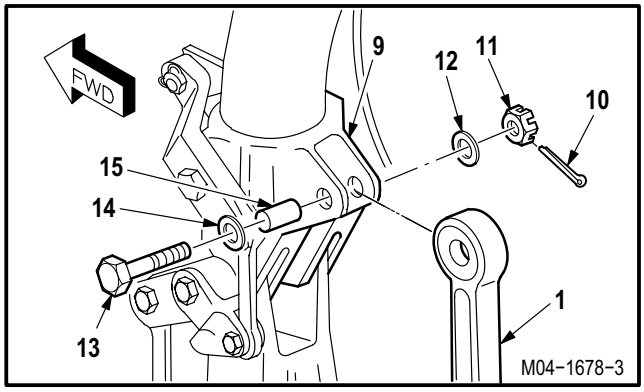
11.68. CPG ADJUSTABLE CYCLIC STICK LINK REMOVAL/INSTALLATION – continued

c. **Remove upper end of link (1) from lever (9).**

(1) Remove and discard cotter pin (10).

(2) Remove nut (11) and washer (12).

(3) Remove bolt (13), washer (14), and bushing (15).



11.68.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.68.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.68. CPG ADJUSTABLE CYCLIC STICK LINK REMOVAL/INSTALLATION – continued

11.68.6. Installation

a. **Install upper end of link (1) to lever (9).** Torque nut (11) **12 to 25 INCH-POUNDS**.

(1) Aline link (1) with lever (9).

(2) Install bushing (15) through lever (9) and link (1).

(3) Insert bolt (13) through washer (14), bushing (15), lever (9), and link (1).

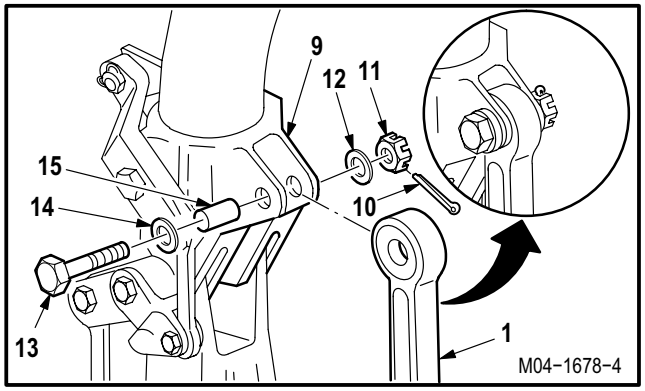
(4) Install washer (12).

(5) Check fit of self-retaining bolt (13) (para 11.1).

(6) Install nut (11). Torque nut (11) to **12 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **25 INCH-POUNDS**.

(8) Install new cotter pin (10).



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11.68. CPG ADJUSTABLE CYCLIC STICK LINK REMOVAL/INSTALLATION – continued

b. **Install lower end of link (1) to base (2).** Torque nut (4) **12 to 25 INCH-POUNDS**.

(1) Aline link (1) with base (2).

(2) Install bushing (8) through base (2) and link (1).

(3) Insert bolt (6) through washer (7), bushing (8), base (2), and link (1).

(4) Install washer (5).

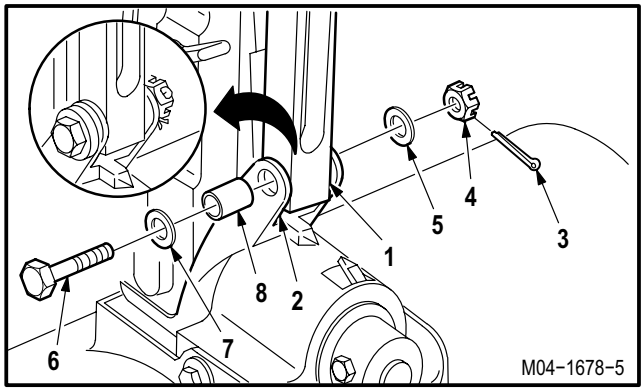
(5) Check fit of self-retaining bolt (6) (para 11.1).

(6) Install nut (4). Torque nut (4) to **12 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **25 INCH-POUNDS**.

(8) Install new cotter pin (3).

c. **Inspect (QA).**



END OF TASK

11.69. CPG CYCLIC STICK FORWARD LINK REMOVAL/INSTALLATION

11.69.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.69.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

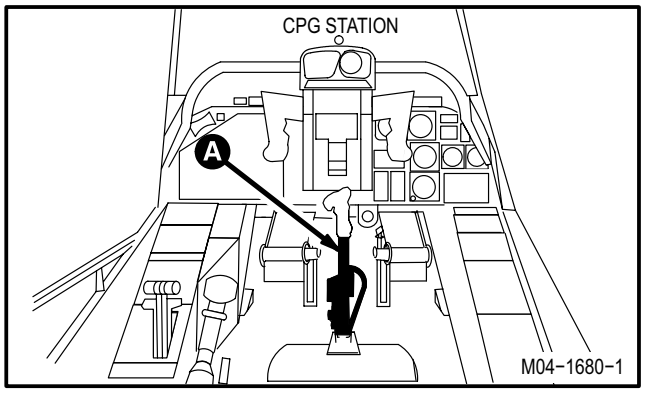
Ref	Condition
1.57	Helicopter safed

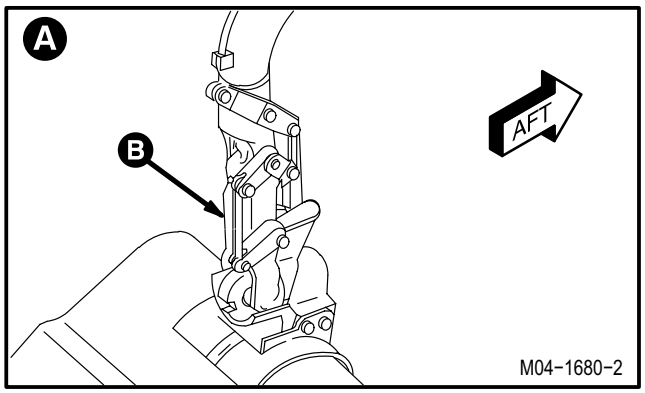
Materials/Parts:

Cotter pin (2)

11.69.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**





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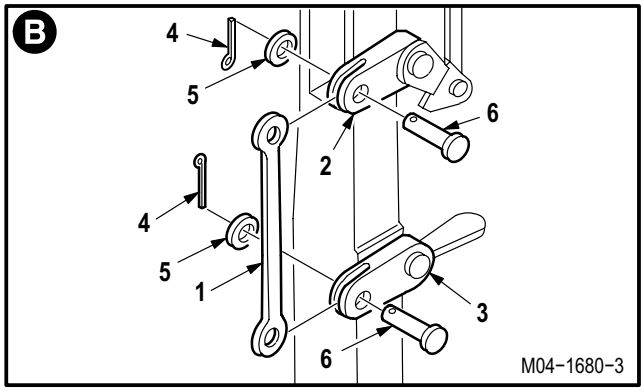
11.69. CPG CYCLIC STICK FORWARD LINK REMOVAL/INSTALLATION – continued

b. **Remove link (1) from levers (2) and (3).**

(1) Remove and discard two cotter pins (4).

(2) Remove two washers (5) and pins (6).

(3) Pull link (1) from levers (2) and (3).



11.69.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.69.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.69.6. Installation

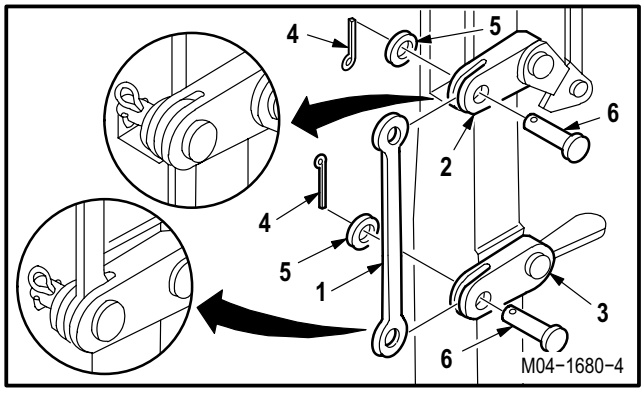
a. **Install link (1) between levers (2) and (3).**

(1) Aline link (1) with levers (2) and (3).

(2) Install two pins (6) through levers (2) and (3) and link (1).

(3) Install two washers (5) on pins (6).

(4) Install two new cotter pins (4) through pins (6).



b. **Inspect (QA).**

END OF TASK

11.70. CPG CYCLIC STICK AFT LINK REMOVAL/INSTALLATION

11.70.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.70.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

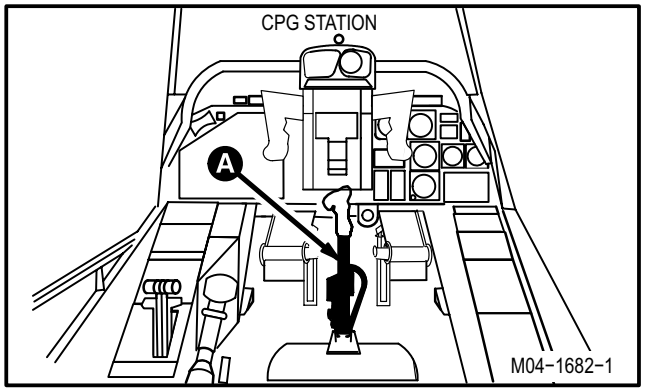
Ref	Condition
1.57	Helicopter safed

Materials/Parts:

Cotter pin (2)

11.70.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**



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11.70. CPG CYCLIC STICK AFT LINK REMOVAL/INSTALLATION – continued

b. **Remove link (1) from levers (2).**

(1) Remove and discard two cotter pins (3).

(2) Remove two washers (4) and pins (5).

(3) Remove link (1).

11.70.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.70.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.70.6. Installation

a. **Install link (1) on two levers (2).**

(1) Aline link (1) with levers (2).

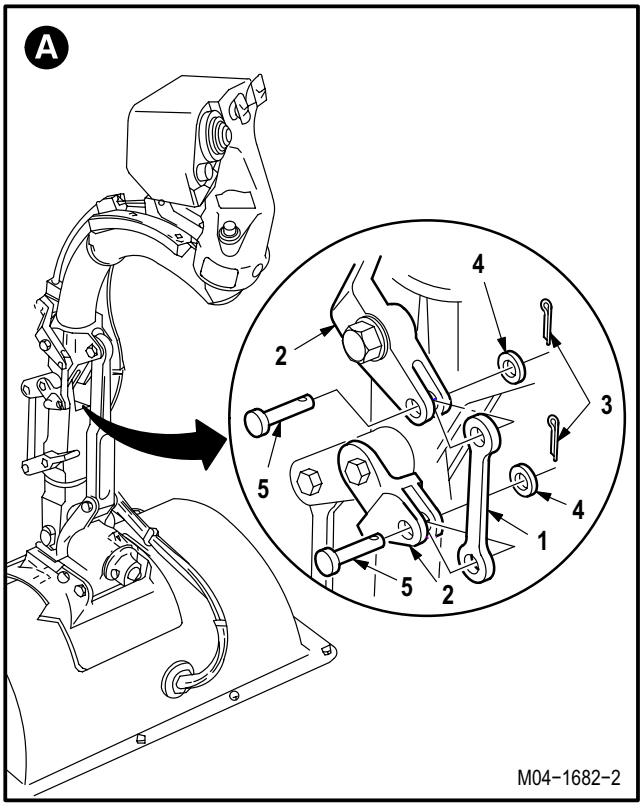
(2) Install two pins (5) through levers (2) and link (1).

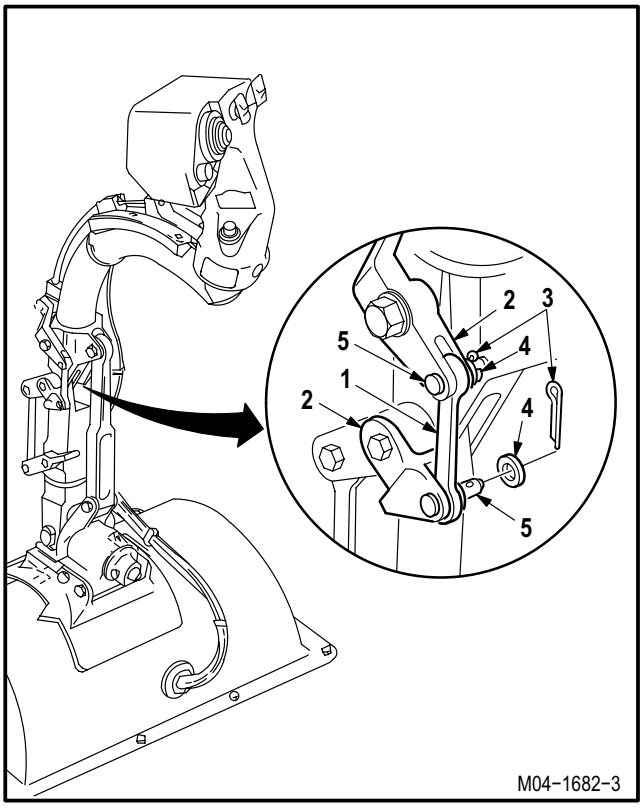
(3) Install two washers (4).

(4) Install two new cotter pins (3).

b. **Inspect (QA).**

END OF TASK





11.71. CPG LOCK RELEASE LEVER REMOVAL/INSTALLATION

11.71.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.71.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

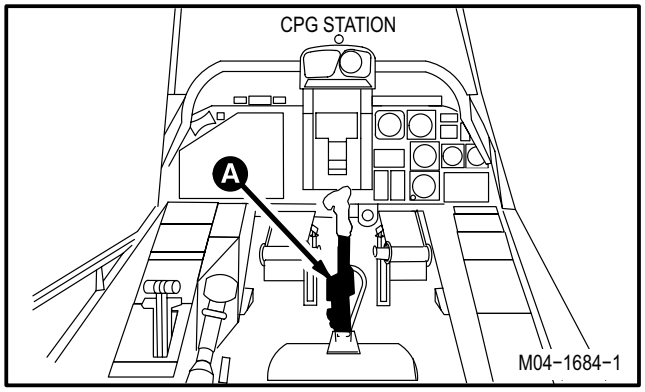
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

Materials/Parts:

Cotter pin (3)



11.71.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**

b. **Remove upper link (1) from lever assembly (2).**

(1) Remove and discard cotter pin (3).

(2) Remove washer (4) from pin (5).

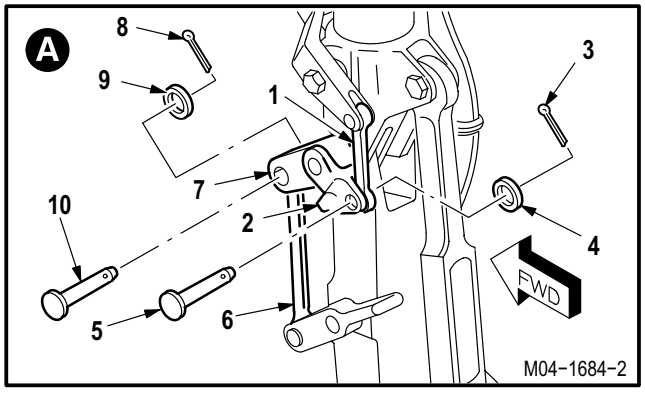
(3) Remove pin (5) and link (1).

c. **Remove lower link (6) from idler lever (7).**

(1) Remove and discard cotter pin (8).

(2) Remove washer (9) from pin (10).

(3) Remove pin (10) and link (6).



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11.71. CPG LOCK RELEASE LEVER REMOVAL/INSTALLATION – continued

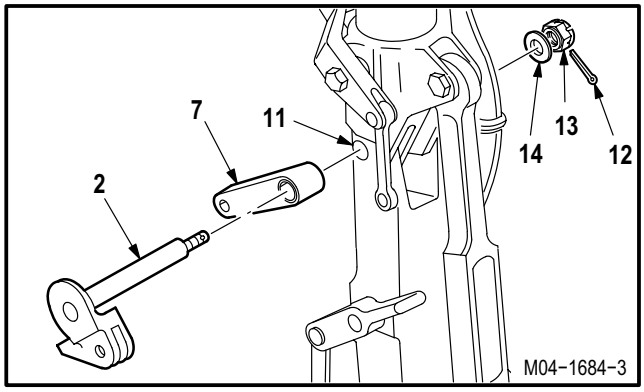
d. **Remove lever (2) with idler lever (7) from fitting (11).**

(1) Remove and discard cotter pin (12).

(2) Hold lever (2).

(3) Remove nut (13) and washer (14).

(4) Remove lever (2) with idler lever (7) from fitting (11).



e. **Remove idler lever (7) from lever (2).**

11.71.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

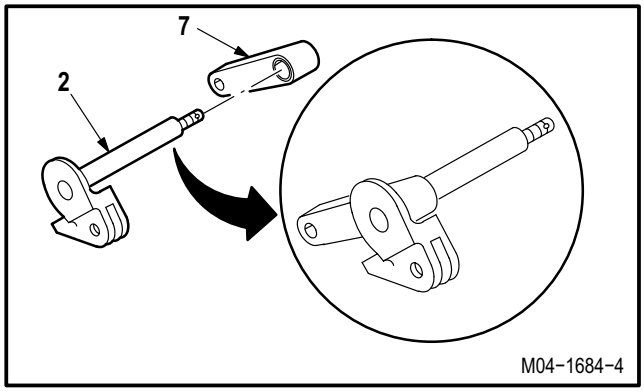
11.71.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.71.6. Installation

a. **Position idler lever (7) on lever (2).**



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11.71. CPG LOCK RELEASE LEVER REMOVAL/INSTALLATION – continued

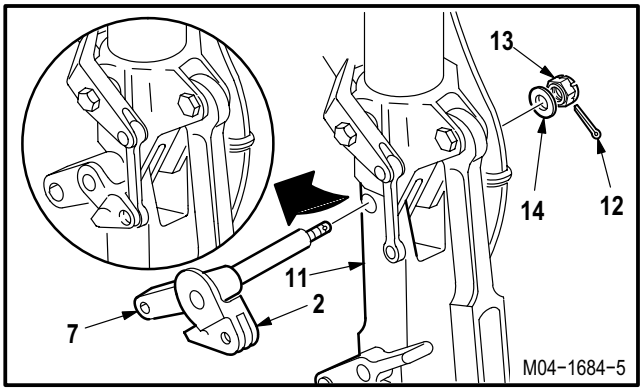
b. **Install lever (2) with idler lever (7) in fitting (11).**

(1) Install shaft of lever (2) through fitting (11).

(2) Hold lever (2).

(3) Install washer (14) and nut (13).

(4) Install new cotter pin (12).



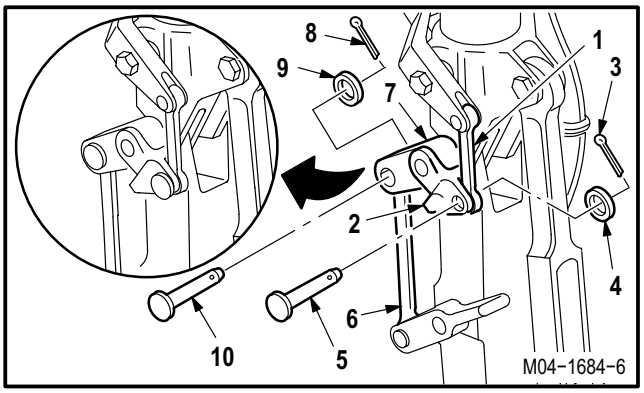
c. **Install lower link (6) on idler lever (7).**

(1) Position link (6) inside idler lever (7) and aline mounting holes.

(2) Install pin (10) through idler lever (7) and link (6).

(3) Install washer (9) on pin (10).

(4) Install new cotter pin (8) through pin (10).



d. **Install upper link (1) on lever (2).**

(1) Position link (1) inside lever (2) and aline mounting holes.

(2) Install pin (5) through lever (2) and link (1).

(3) Install washer (4) on pin (5).

(4) Install new cotter pin (3).

e. **Inspect (QA).**

END OF TASK

11.72. CPG CYCLIC STICK REMOTE CONTROL LEVER REMOVAL/INSTALLATION

11.72.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.72.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
0 - 75 inch-pound 1/4-inch drive dial indicator torque wrench (item 446, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

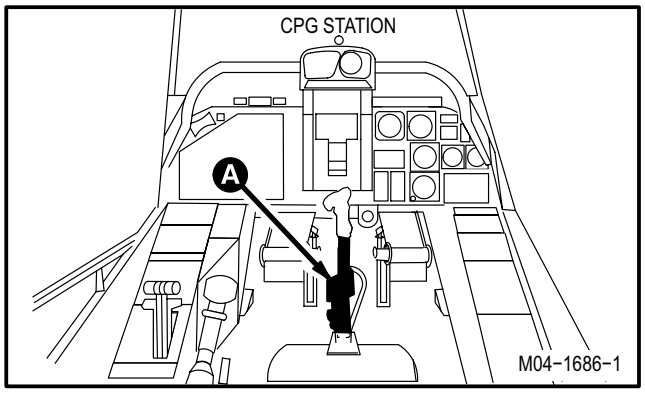
Ref	Condition
1.57	Helicopter safed

Materials/Parts:

Cotter pin (3)

11.72.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**



b. **Remove lever (1) from upper fitting (2).**

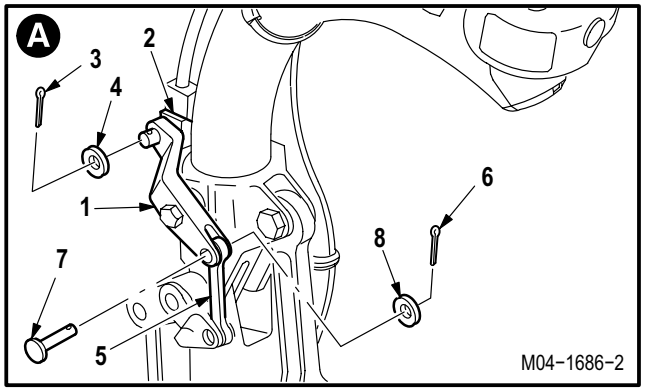
(1) Remove and discard cotter pin (3).

(2) Remove washer (4).

c. **Remove lever (1) from link (5).**

(1) Remove and discard cotter pin (6).

(2) Remove pin (7) and washer (8).



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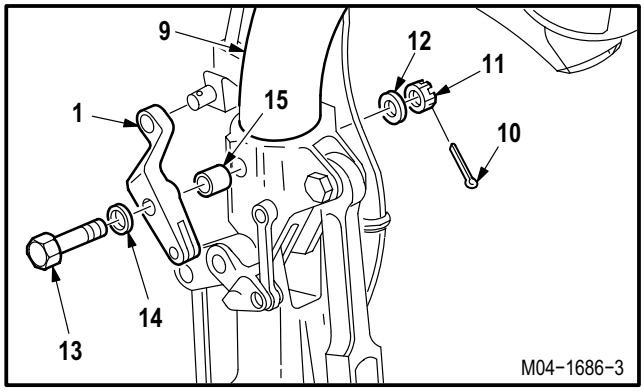
11.72. CPG CYCLIC STICK REMOTE CONTROL LEVER REMOVAL/INSTALLATION – continued

d. **Remove lever (1) from cyclic stick (9).**

(1) Remove and discard cotter pin (10).

(2) Remove nut (11) and washer (12).

(3) Remove bolt (13), washer (14), lever (1), and bushing (15).



11.72.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.72.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.72.6. Installation

a. **Install lever (1) on stick (9).** Torque nut (11) **30 to 65 INCH-POUNDS**.

(1) Aline lever (1) with stick (9) and fitting (2).

(2) Install bushing (15) on lever (1).

(3) Install bolt (13) through washer (14), lever (1), bushing (15), and stick (9).

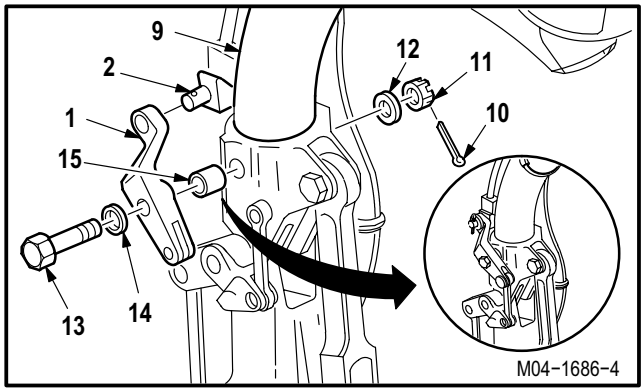
(4) Check fit of self-retaining bolt (13) (para 11.1).

(5) Install washer (12) and nut (11).

(6) Torque nut (11) to **30 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **65 INCH-POUNDS**.

(8) Install new cotter pin (10).



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11.72. CPG CYCLIC STICK REMOTE CONTROL LEVER REMOVAL/INSTALLATION – continued

b. **Install lever (1) on fitting (2).**

(1) Position washer (4) on fitting (2).

(2) Install new cotter pin (3).

c. **Install link (5) on lever (1).**

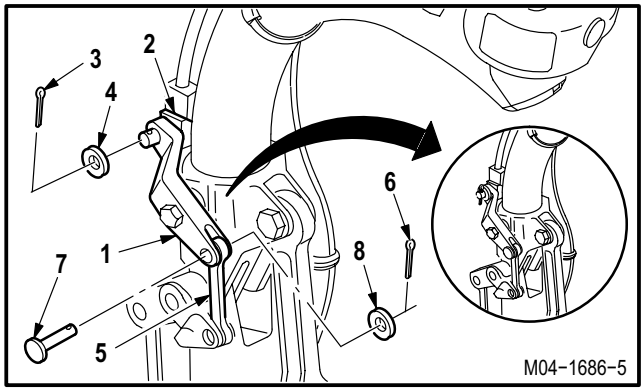
(1) Aline link (5) with lever (1).

(2) Install pin (7) through lever (1) and link (5).

(3) Install washer (8) on pin (7).

(4) Install new cotter pin (6).

d. **Inspect (QA).**



END OF TASK

11.73. CPG CYCLIC STICK FITTING ASSEMBLY REMOVAL/INSTALLATION

11.73.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.73.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

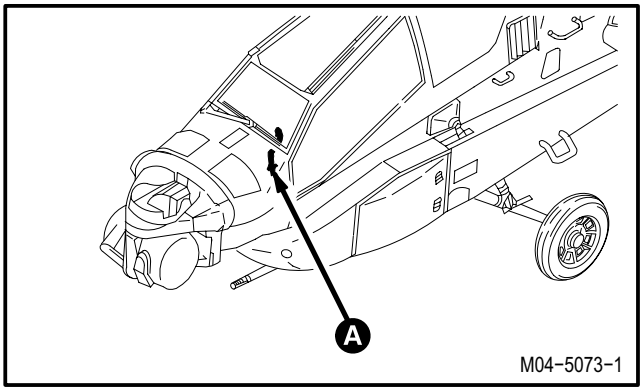
Ref	Condition
1.57	Helicopter safed
11.68	CPG adjustable cyclic stick link removed
11.71	CPG lock release lever removed
11.72	CPG remote control lever removed

Materials/Parts:

Cotter pin

11.73.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**



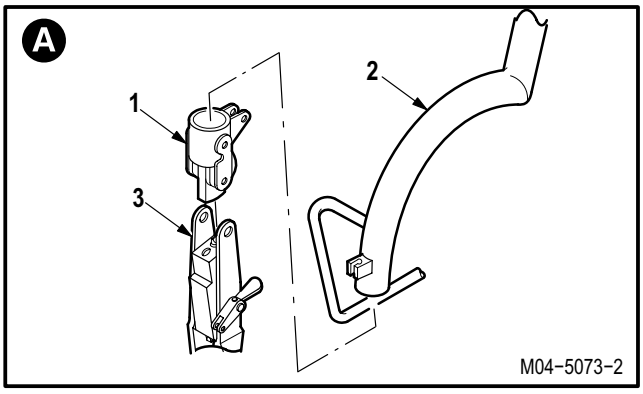
CAUTION

Do not apply excessive tension on cyclic stick wiring when lifting cyclic stick from fitting assembly.

b. **Remove fitting assembly (1) from cyclic stick (2) and cyclic adjust lock assembly (3).**

(1) Lift cyclic stick (2) from fitting assembly (1).

(2) Remove fitting assembly (1) from cyclic adjust lock assembly (3).



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11.73. CPG CYCLIC STICK FITTING ASSEMBLY REMOVAL/INSTALLATION – continued

11.73.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.73.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.73.6. Installation

a. **Install fitting (1) on lock assembly (3) and cyclic stick (2).**

(1) Position fitting (1) on lock assembly (3).

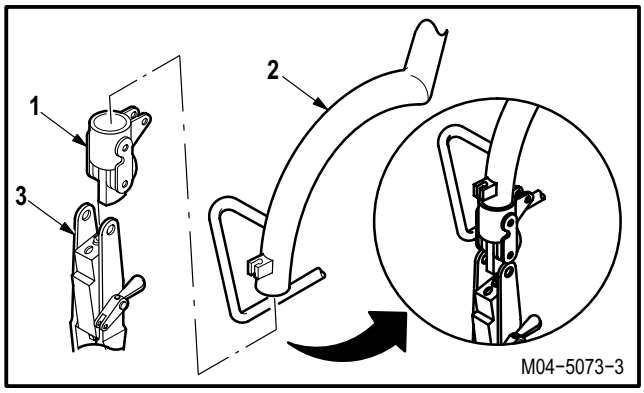
(2) Position cyclic stick (2) on fitting (1).

b. **Inspect (QA).**

c. **Install CPG remote control lever** (para 11.72)**.**

d. **Install CPG lock release lever** (para 11.71)**.**

e. **Install CPG adjustable cyclic stick link** (para 11.68)**.**



END OF TASK

11.74. CPG CYCLIC STICK WIRE ROPE RELEASE FITTING REMOVAL/INSTALLATION

11.74.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.74.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

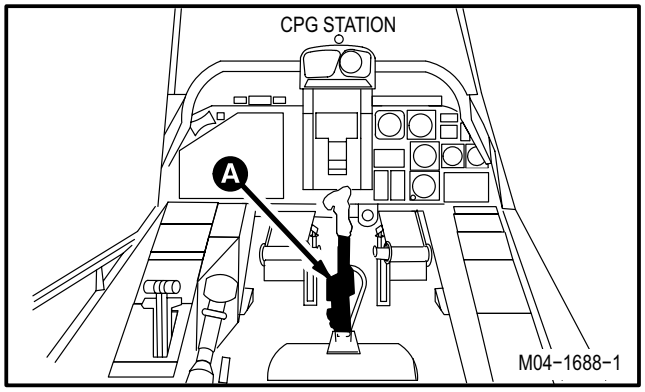
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

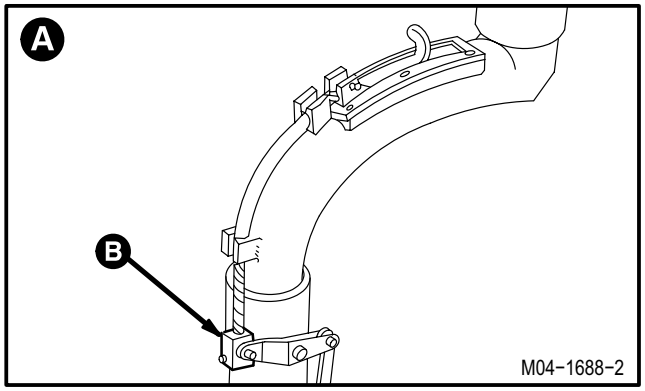
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

Materials/Parts:

Cotter pin (2)





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11.74. CPG CYCLIC STICK WIRE ROPE RELEASE FITTING REMOVAL/INSTALLATION – continued

11.74.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**

b. **Remove fitting (1) from lever (2).**

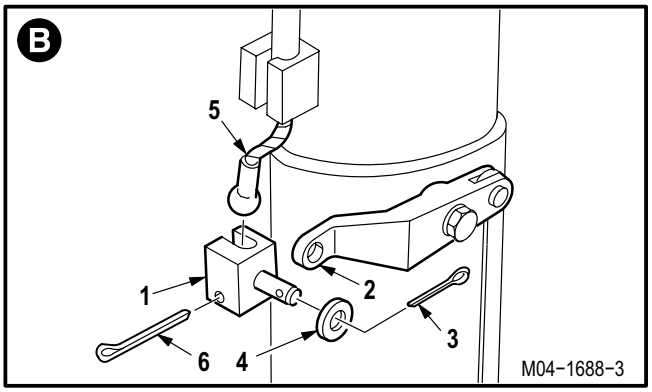
(1) Remove and discard cotter pin (3).

(2) Remove washer (4), fitting (1), and cable (5).

c. **Remove fitting (1) from cable (5).**

(1) Remove and discard cotter pin (6).

(2) Separate fitting (1) from cable (5).



11.74.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.74.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.74. CPG CYCLIC STICK WIRE ROPE RELEASE FITTING REMOVAL/INSTALLATION – continued

11.74.6. Installation

a. **Install fitting (1) on cable (5).**

(1) Install fitting (1) on end of cable (5).

(2) Install new cotter pin (6).

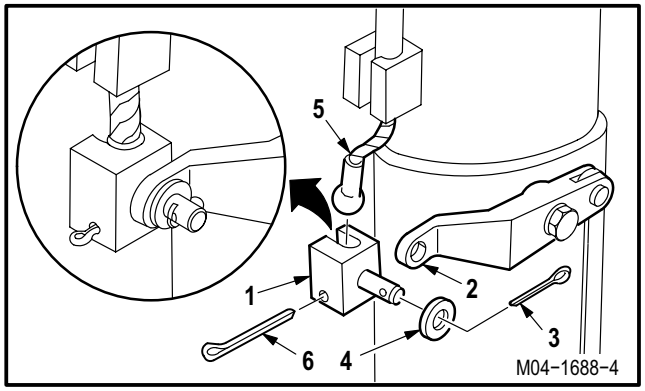
b. **Connect fitting (1) with cable (5) to lever (2).**

(1) Insert fitting (1) through lever (2).

(2) Install washer (4) on fitting (1).

(3) Install new cotter pin (3).

c. **Inspect (QA).**



END OF TASK

11.75. CPG CYCLIC STICK LEVER LOCK RELEASE RETAINER REMOVAL/INSTALLATION

11.75.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.75.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)

Personnel Required:

67R Attack Helicopter Repairer
One person to assist
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

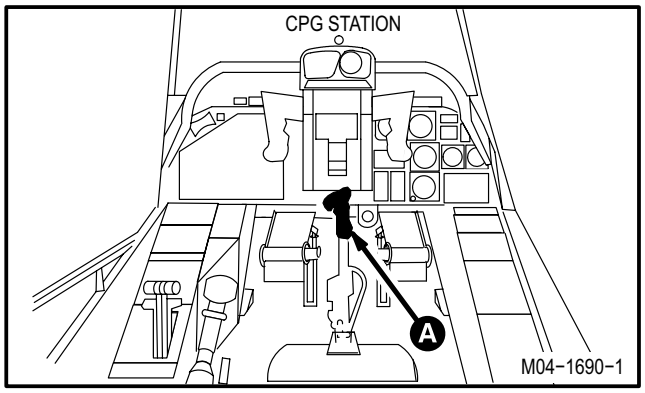
sealing compound (item 169, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

11.75.3. Removal

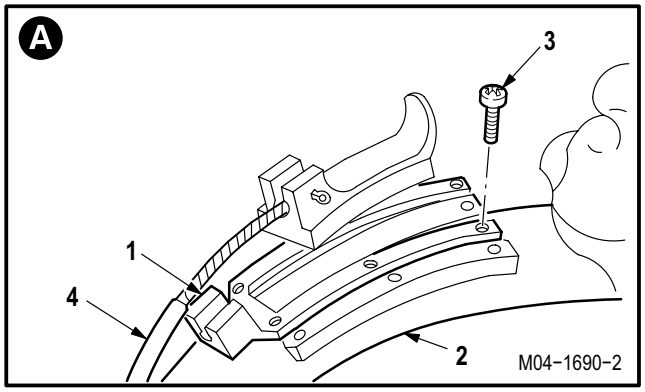
a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**



b. **Remove lever lock release retainer (1) from cyclic stick (2).**

(1) Remove six screws (3).

(2) Slide retainer (1) free of cable housing (4).



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11.75. CPG CYCLIC STICK LEVER LOCK RELEASE RETAINER REMOVAL/INSTALLATION – continued

11.75.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.75.5. Inspection

a. **Check cable for fraying.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.75.6. Installation

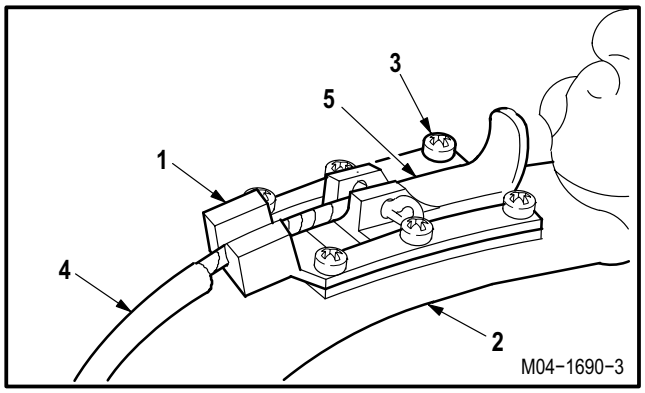
a. **Install lever lock release retainer (1) on cyclic stick (2).**

(1) Slide retainer (1) on cable housing (4).

(2) Position retainer (1) on stick (2) so that lever (5) is captured against stick (2).

(3) Apply sealing compound to threads of six screws (3). Use sealing compound (item 169, App F).

(4) Install six screws (3).



b. **Inspect (QA).**

END OF TASK

11.76. CPG CYCLIC STICK LOCK RELEASE WIRE ROPE REMOVAL/INSTALLATION

c

11.76.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.76.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

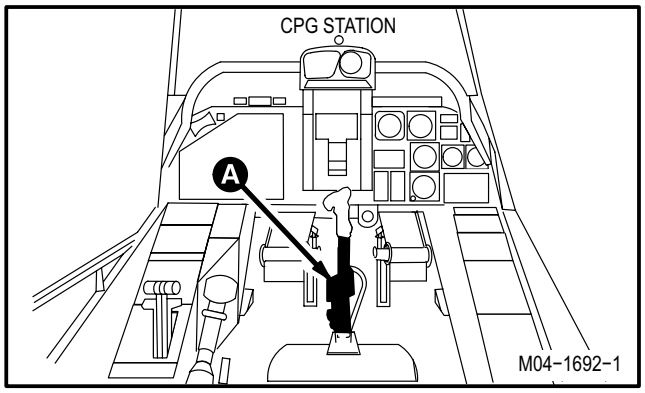
Ref	Condition
1.57	Helicopter safed

Materials/Parts:

Cotter pin

11.76.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**

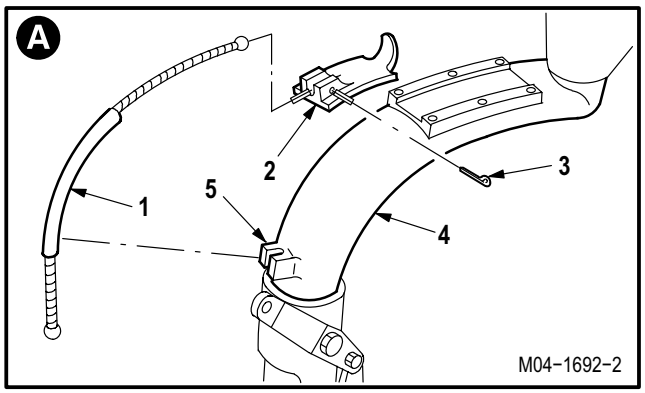


b. **Remove wire rope (1) from lever lock release retainer (2).**

(1) Remove and discard cotter pin (3).

(2) Slide lever (2) free of wire rope (1).

c. **Remove wire rope (1) from cyclic stick (4) by sliding it out of support (5).**



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11.76. CPG CYCLIC STICK LOCK RELEASE WIRE ROPE REMOVAL/INSTALLATION – continued

11.76.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.76.5. Inspection

a. **Check wire rope for fraying.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.76.6. Installation

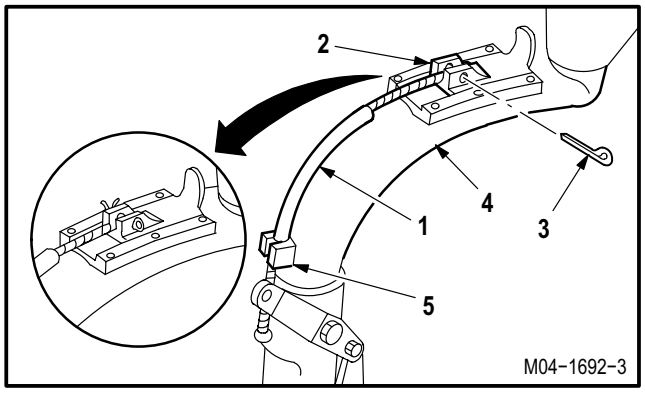
a. **Install wire rope (1) in support (5) on cyclic stick (4).**

b. **Install wire rope (1) on lever lock release retainer (2).**

(1) Slide lever (2) on end of wire rope (1).

(2) Install new cotter pin (3).

c. **Inspect (QA).**



END OF TASK

11.77. CPG CYCLIC STICK LOCK REMOVAL/INSTALLATION

11.77.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.77.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Plastic strap installation tool (item 182, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

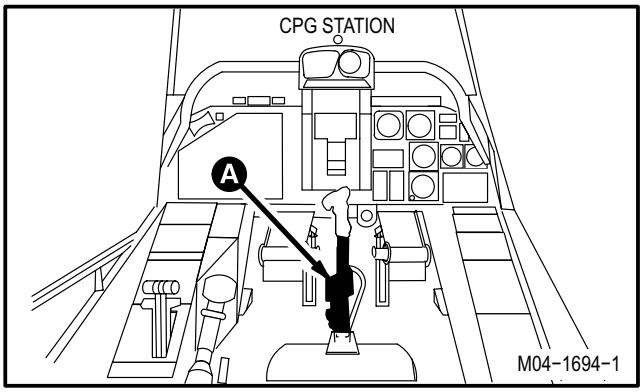
Ref	Condition
1.57	Helicopter safed
11.68	CPG adjustable cyclic stick link assembly removed
11.69	CPG cyclic stick forward link removed
11.71	CPG lock release lever removed

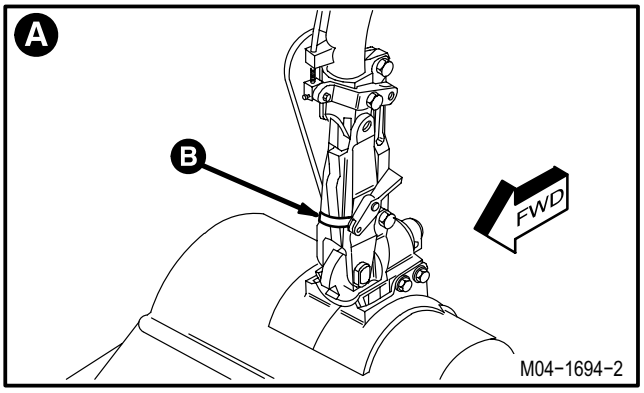
Materials/Parts:

Strap (item 192, App F)

11.77.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**





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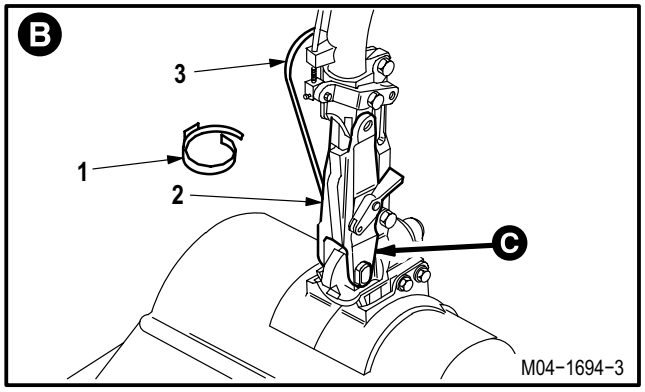
11.77. CPG CYCLIC STICK LOCK REMOVAL/INSTALLATION – continued

b. **Remove tiedown strap (1) from lock (2) and wire bundle (3).**

(1) Cut and discard strap (1).



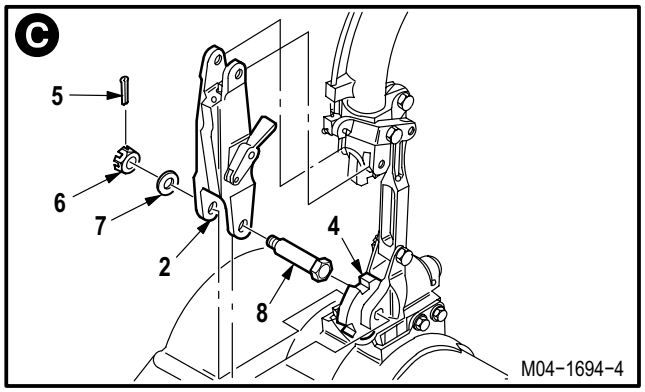
c. **Remove lock (2) from base (4).**

(1) Remove and discard cotter pin (5).

(2) Remove nut (6) and washer (7).

(3) Remove bolt (8).

(4) Remove lock (2).



11.77.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.77.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.77. CPG CYCLIC STICK LOCK REMOVAL/INSTALLATION – continued

11.77.6. Installation

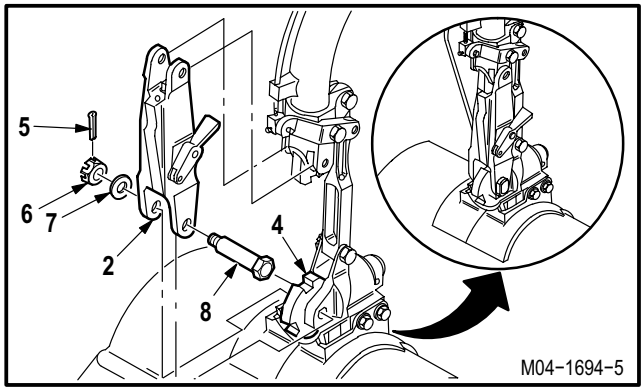
a. **Install lock (2) on base (4).**

(1) Aline lock (2) with base (4).

(2) Install bolt (8) through lock (2) and base (4).

(3) Install washer (7) and nut (6).

(4) Install new cotter pin (5).



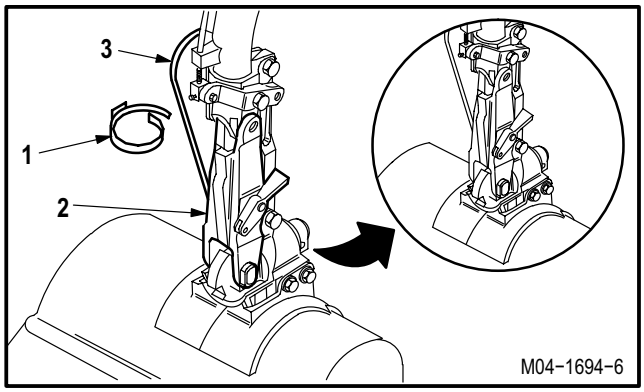
b. **Install CPG lock release lever** (para 11.71)**.**

c. **Install CPG cyclic stick forward link** (para 11.69)**.**

d. **Install CPG adjustable cyclic stick link** (para 11.68)**.**

e. **Install strap (1) around lock (2) and wire bundle (3).** Use strap (item 192, App F) and strap installation tool.

f. **Inspect (QA).**



END OF TASK

11.78. CPG CYCLIC STICK BASE ASSEMBLY REMOVAL/INSTALLATION

11.78.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.78.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
30 - 150 inch-pound 1/4-inch drive click type torque wrench (item 435, App H)
0 - 30 inch-pound 1/4-inch drive dial indicator torque wrench (item 445, App H)

Materials/Parts:

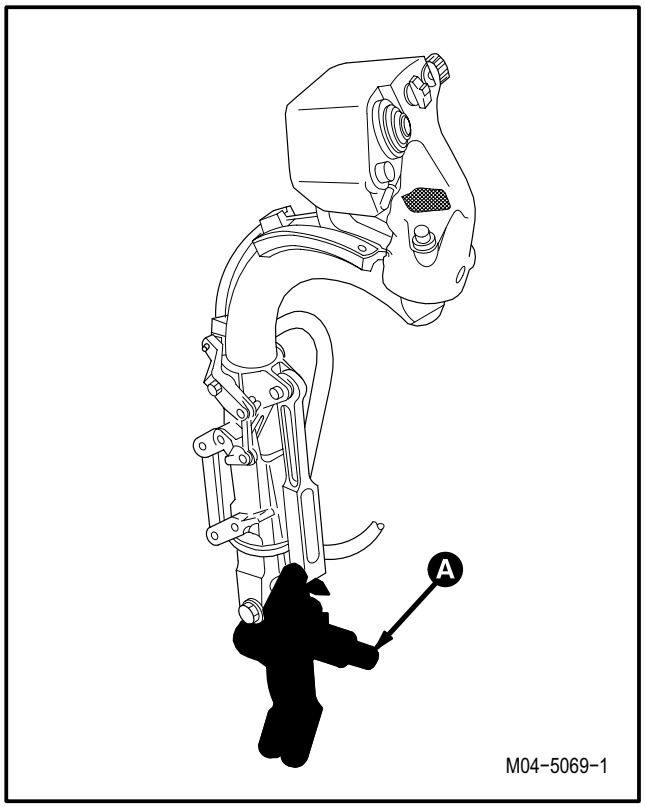
Cotter pin

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.66	CPG cyclic stick and lateral link removed



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11.78. CPG CYCLIC STICK BASE ASSEMBLY REMOVAL/INSTALLATION – continued

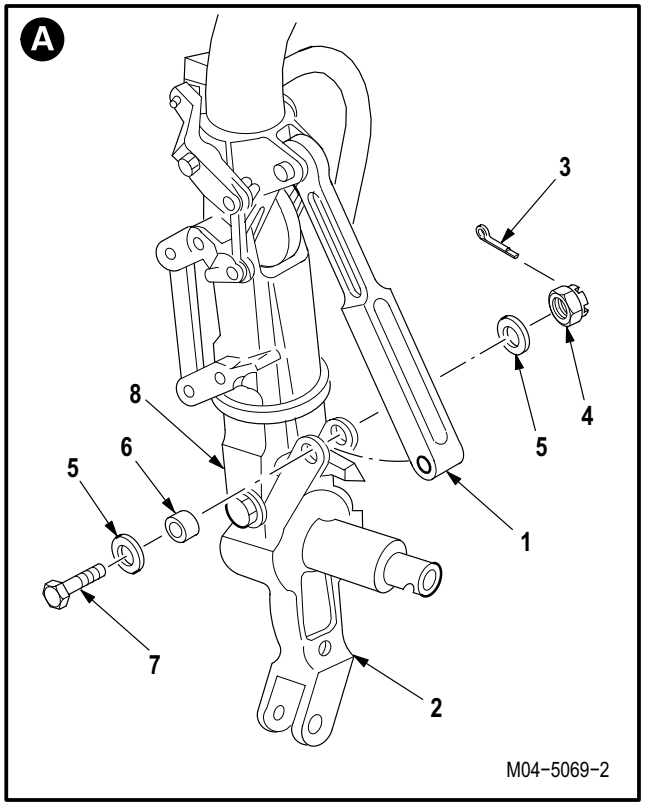
11.78.3. Removal

a. **Remove rig connecting link (1) from base assembly (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4), washer (5) and sleeve bushing (6).

(3) Remove bolt (7) and washer (5).



b. **Remove base assembly (2) from lock assembly (8).**

(1) Remove and discard cotter pin (9).

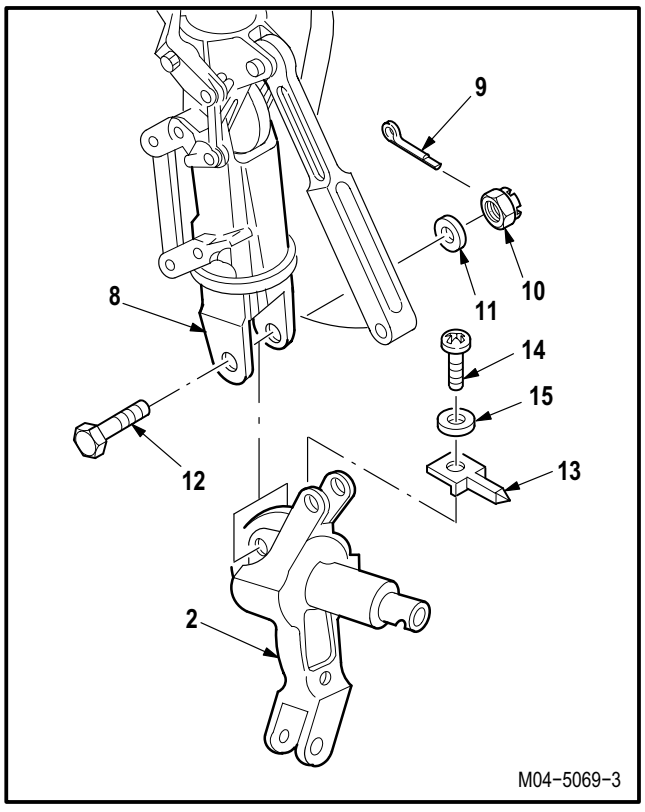
(2) Remove nut (10), washer (11).

(3) Remove bolt (12) and base (2).

c. **Remove position indicator (13) from base assembly (2).**

(1) Remove screw (14) and washer (15).

(2) Remove indicator (13).



11.78.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

GO TO NEXT PAGE

11.78. CPG CYCLIC STICK BASE ASSEMBLY REMOVAL/INSTALLATION – continued

11.78.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.78.6. Installation

a. **Install indicator (13) on base (2).** Torque screw (14) to **5 INCH-POUNDS**.

(1) Aline indicator (13) with base (2).

(2) Install screw (14) through washer (15) and base (2).

(3) Torque screw (14) to **5 INCH-POUNDS**. Use torque wrench.

b. **Install base (2) on lock (8).** Torque nut (10) **45 to 85 INCH-POUNDS**.

(1) Aline base (2) with lock (8).

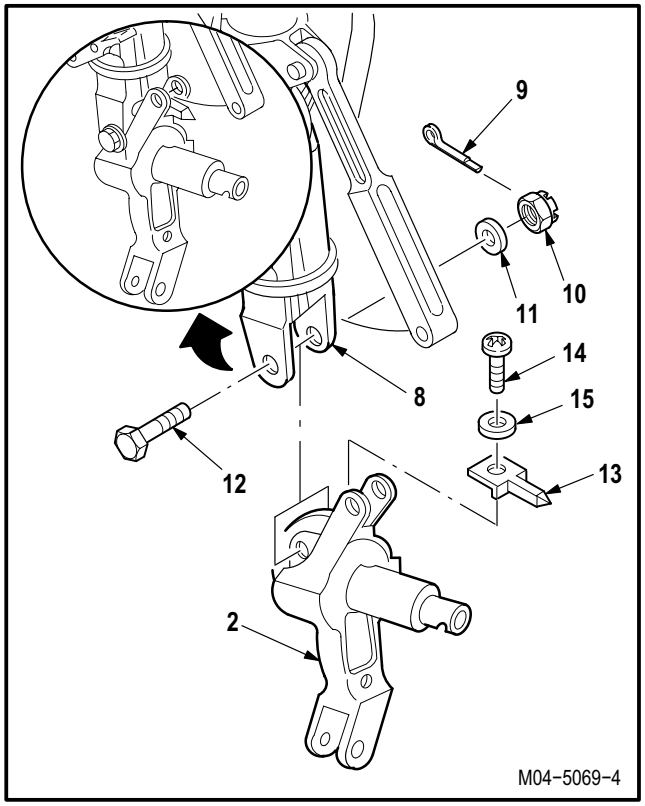
(2) Install bolt (12) through lock (8) and base (2).

(3) Install washer (11) and nut (10).

(4) Torque nut (10) to **45 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **85 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.78. CPG CYCLIC STICK BASE ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Install lower end of link (1) to base (2).** Torque nut (4) **12 to 25 INCH-POUNDS**.

(1) Aline link (1) with base (2).

(2) Install bushing (6) through base (2) and link (1).

(3) Insert bolt (7) through washer (5), bushing (6), base (2), and link (1).

(4) Install washer (5) and nut (4).

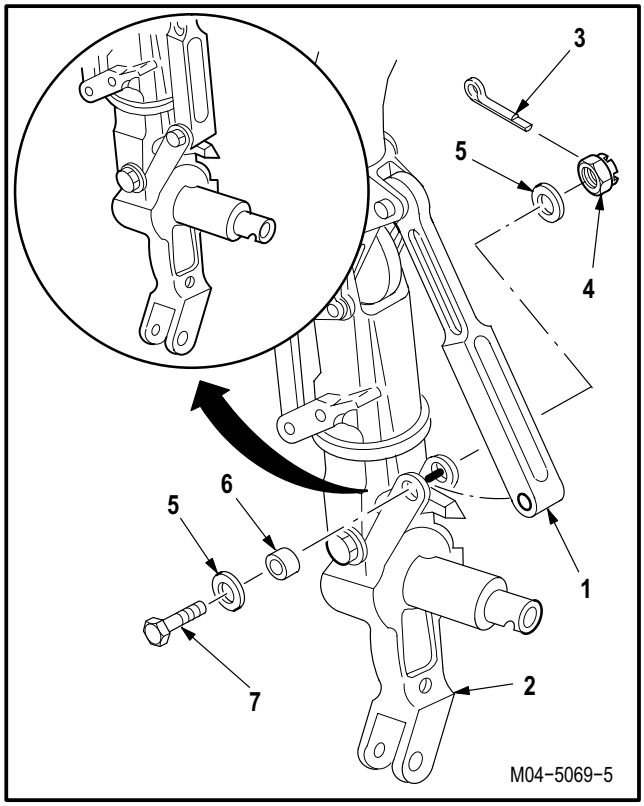
(5) Torque nut (4) to **12 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **25 INCH-POUNDS**.

(7) Install new cotter pin (3).

d. **Inspect (QA).**

e. **Install CPG cyclic stick and lateral link** (para 11.67)**.**



END OF TASK

11.79. CPG CYCLIC STICK ADJUSTABLE LOCK ASSEMBLY DISASSEMBLY/ASSEMBLY

11.79.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.79.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)

Personnel Required:

67R Attack Helicopter Repairer
68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1500-204-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.77	CPG cyclic stick lock removed

Materials/Parts:

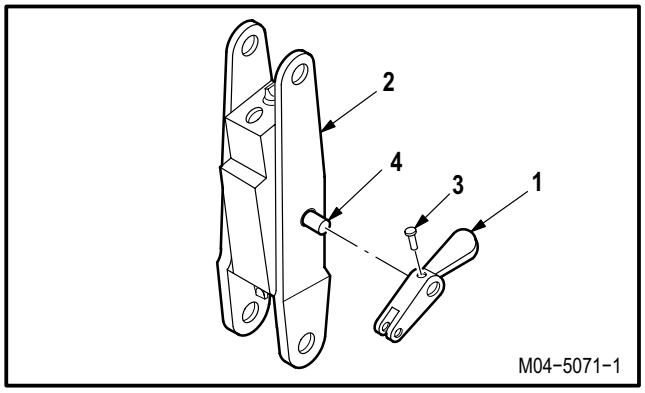
Washer
Lubricant (item 113, App F)

11.79.3. Disassembly

a. **Remove lock release handle (1) from adjustable lock assembly (2).**

(1) Remove and discard rivet (3) (TM 1-1500-204-23).

(2) Pull handle (1) free of flight control shaft (4).



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11.79. CPG CYCLIC STICK ADJUSTABLE LOCK ASSEMBLY DISASSEMBLY/ASSEMBLY – continued

NOTE

With shaft removed, pins and springs are free to slide out of lock assembly. Use care to avoid accidently dropping the pins and springs.

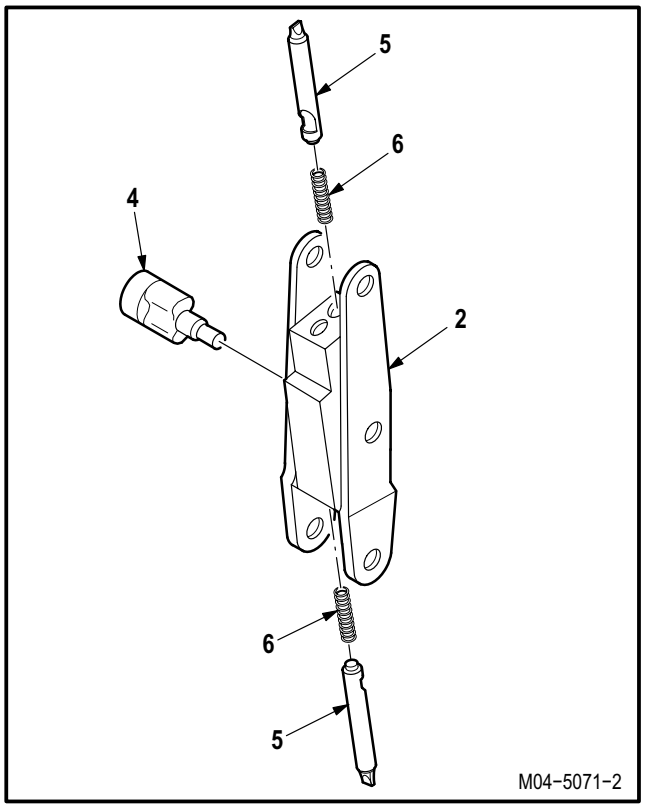
b. **Remove flight control shaft (4) from lock assembly (2).**

(1) Compress two cyclic adjustable pins (5) towards helical springs (6).

(2) Remove shaft (4) from lock (2).

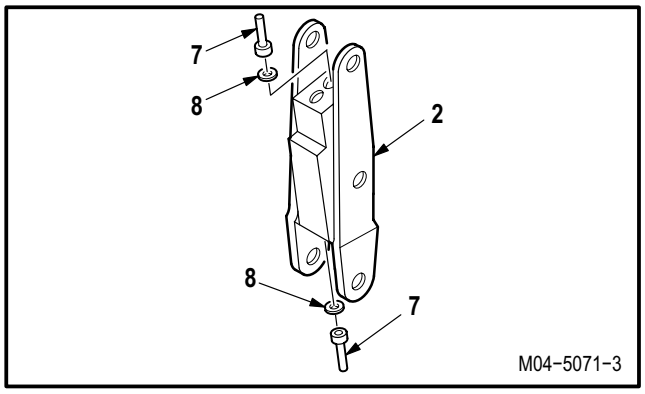
(3) Slowly release compression on the pins (5) and springs (6).

(4) Remove pins (5) and springs (6) from lock (2).



c. **Remove flight control stops (7) from lock (2).**

(1) Remove two stops (7) and washers (8).



11.79.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

GO TO NEXT PAGE

11.79. CPG CYCLIC STICK ADJUSTABLE LOCK ASSEMBLY DISASSEMBLY/ASSEMBLY – continued

11.79.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.79.6. Assembly

a. **Install stops (7) in lock (2).**

(1) Install two washers (8) and stops (7) in lock (2).

b. **Install shaft (4) on lock (2).**

(1) Lubricate pins (5). Use lubricant (item 113, App F).

(2) Allow pins (5) to air dry for **30 MINUTES**.

(3) Install springs (6) on stops (7).

(4) Position pins (5) in lock (2) with flat faces of pins (5) forward and AFT.

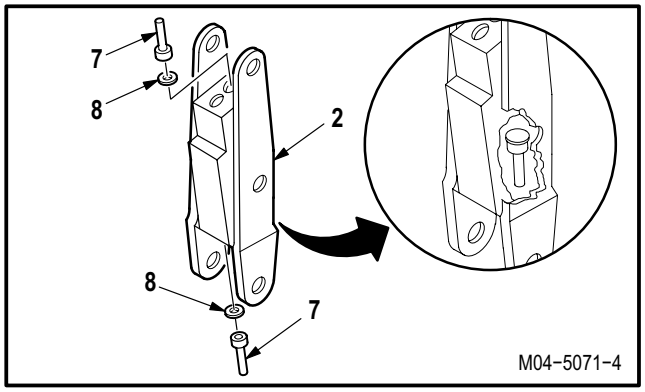
(5) Compress two pins (5) towards helical springs (6).

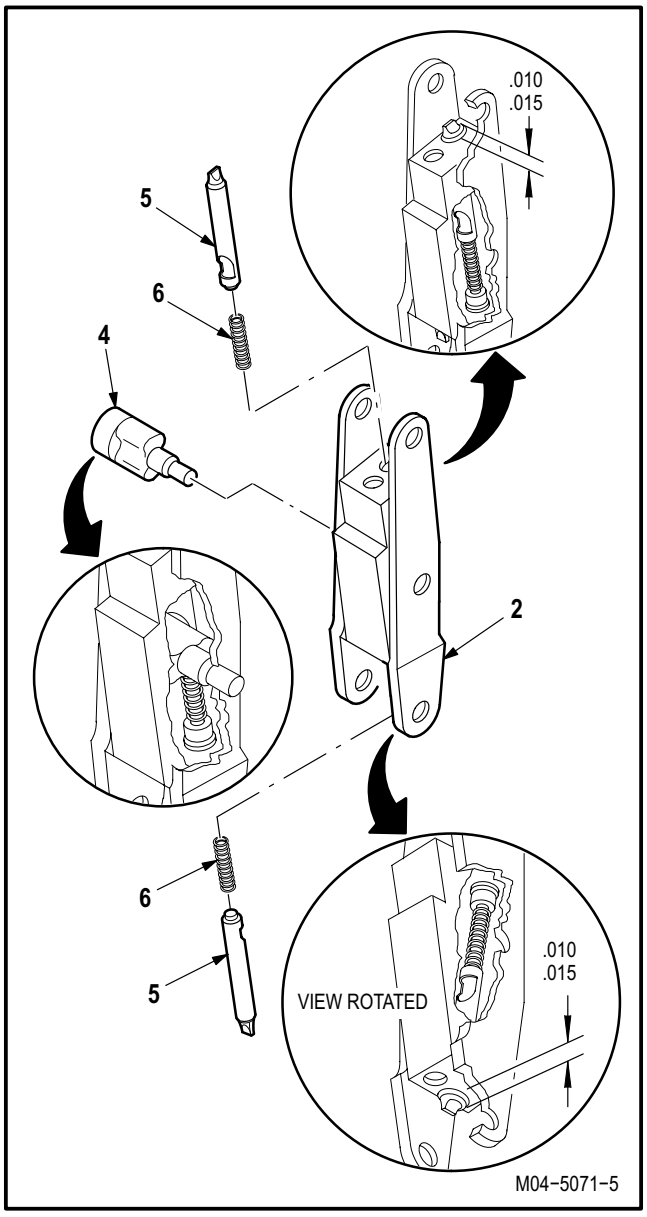
(6) Install shaft (4) on lock (2).

(7) Slowly release compression on pins (5) and springs (6).

c. **Check clearance of pins (5).**

(1) With pins (5) against stop, clearance from cam radius of **0.990 to 1.00 INCH** shall be **0.010 to 0.015 INCH**. Add washers (8) as required.





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11.79. CPG CYCLIC STICK ADJUSTABLE LOCK ASSEMBLY DISASSEMBLY/ASSEMBLY – continued

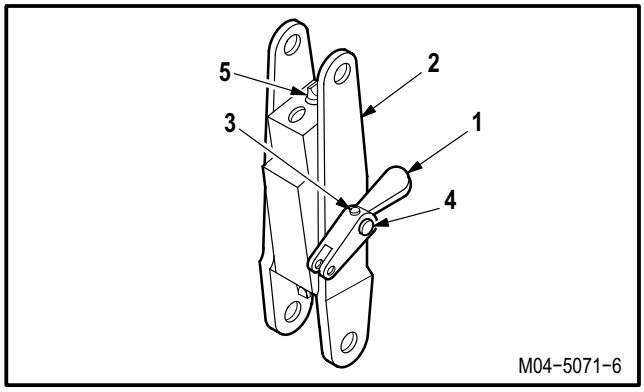
d. **Install lock release handle (1) on lock (2).**

(1) Position handle (1) on shaft (4).

(2) Aline rivet hole in handle (1) with rivet hole in shaft (4).

(3) Install rivet (3) through handle (1) and shaft (4) (TM 1-1500-204-23).

(4) Check handle function by comparing handle (1) and pin (5) positions.



e. **Inspect (QA).**

f. **Install CPG cyclic stick lock** (para 11.77)**.**

END OF TASK

11.80. CPG CYCLIC STICK TRIM AND FORCE FEEL RELEASE SWITCH REPLACEMENT

11.80.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.80.2. Initial Setup

Tools:

Electrical tool kit (item 378, App H)
Light duty laboratory apron (item 27, App H)
Heat protective gloves (item 155, App H)
Adjustable air filtering respirator (item 262, App H)
5-watt electric soldering iron (item 333, App H)

Personnel Required:

68X Armament/Electrical System Repairer
68X3F Armament/Electrical System Repairer/ Technical Inspector

References:

TM 1-1520-238-T
TM 55-1500-323-24

Materials/Parts:

Adhesive (item 14, App F)
Solder (item 189, App F)
Tape (item 202, App F)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

11.80.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**

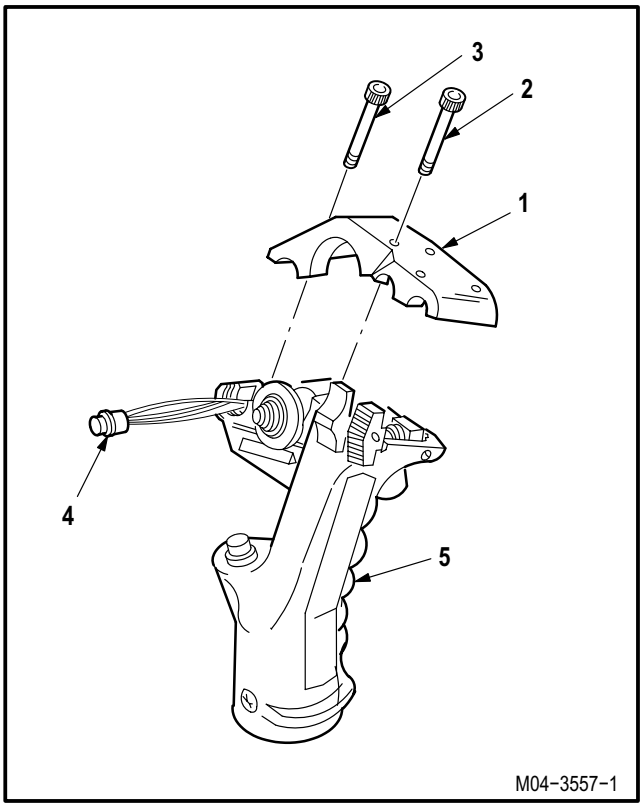
b. **Remove grip cap (1).**

(1) Remove sealant from heads of five screws (2) and screw (3) (para 1.47).

(2) Remove five screws (2) and screw (3).

(3) Remove cap (1).

c. **Debond and remove switch (4) from control grip (5).**



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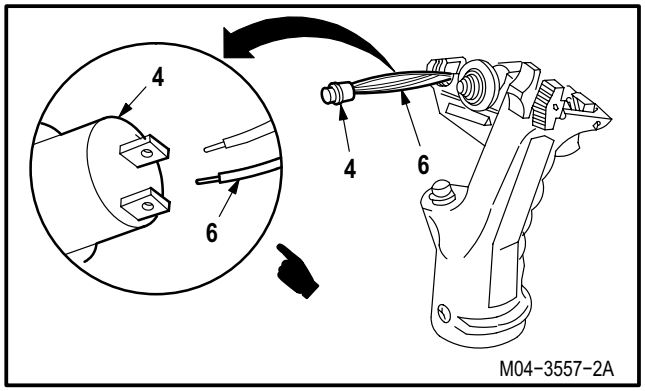
11.80. CPG CYCLIC STICK TRIM AND FORCE FEEL RELEASE SWITCH REPLACEMENT – continued

WARNING

Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.

d. **Desolder wires (6) from switch (4).**

(1) Identify and desolder wires (6) from switch (4). Use soldering iron (TM 55-1500-323-24).



11.80.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.80.5. Inspection

a. **Check for cracked and broken wires.** None allowed.

b. **Check removed and attaching parts for cracks.** None allowed.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.80. CPG CYCLIC STICK TRIM AND FORCE FEEL RELEASE SWITCH REPLACEMENT – continued

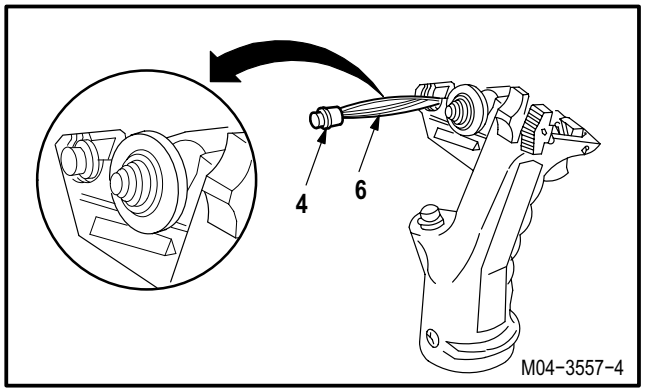
11.80.6. Installation

WARNING

- **Soldering iron can cause severe burns to personnel and start fires. Observe all safety precautions when using soldering iron. If injury occurs, seek medical aid.**
- **Ensure wiring inside the cyclic grip is properly restrained with lacing tape prior to reassembly. Failure to comply may cause uncommanded firing of a weapon system.**

a. **Solder wires (6) to switch (4).**

(1) Solder identified wires (6) to switch (4). Use soldering iron and solder (item 189, App F) (TM 55-1500-323-24).



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11.80. CPG CYCLIC STICK TRIM AND FORCE FEEL RELEASE SWITCH REPLACEMENT – continued

WARNING

Ensure wiring inside the cyclic grip is properly restrained with lacing tape prior to reassembly. Failure to comply may cause uncommanded firing of a weapon system.

b. **Install switch (4) in control grip (5).**

(1) Apply a small bead of adhesive (item 14, App F) to mating surface of switch mounting shoulder (7).

(2) Install switch (4) in mounting slot.

(3) Restrain wires (6). Use tape (item 202, App F) (TM 55-1500-323-24).

c. **Inspect (QA).**

d. **Install cap (1).**

(1) Position cap (1) on grip (5).

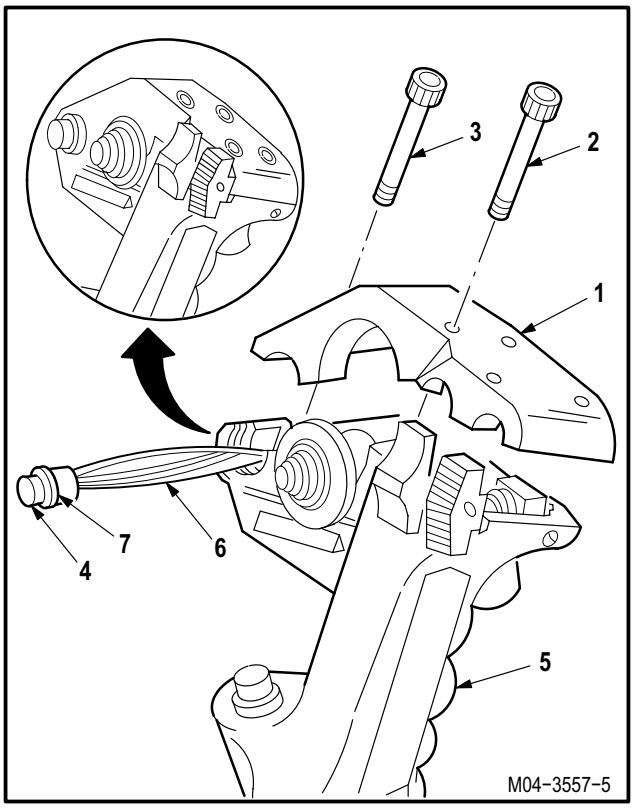
(2) Install five screws (2) and screw (3).

(3) Apply a light coat of adhesive (item 14, App F) over heads of screws (2) and (3) heads.

e. **Clean excess sealant from control grip (5)** (para 1.47)**.**

f. **Inspect (QA).**

g. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.81. CPG CYCLIC STICK HOUSING REMOVAL/INSTALLATION

11.81.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.81.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

References:

TM 1-1520-238-T

Equipment Conditions:

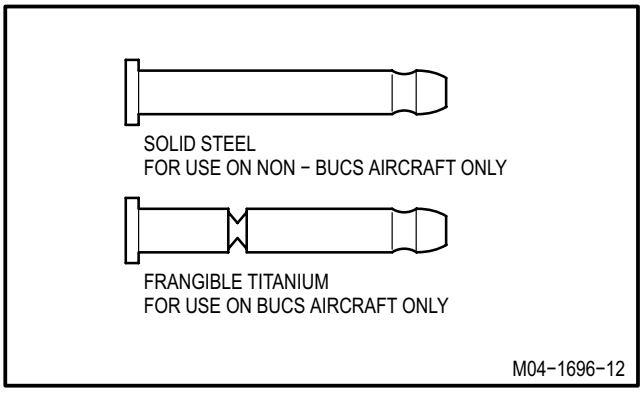
Ref	Condition
1.57	Helicopter safed
2.2	Access door B60 opened
11.65	CPG cyclic stick cover removed
11.66	CPG cyclic stick and lateral link removed

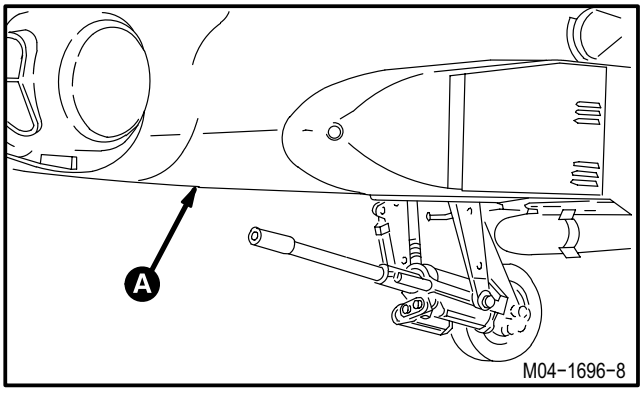
Personnel Required:

67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.





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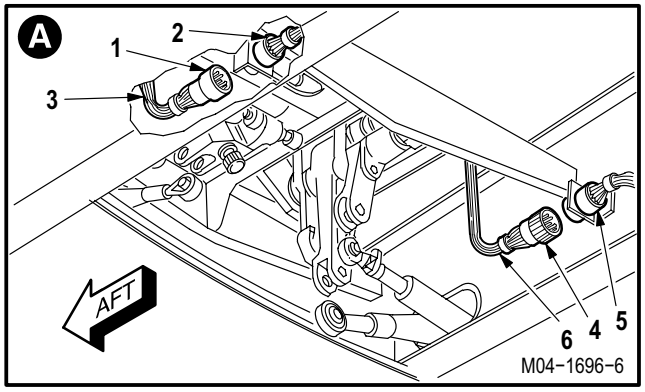
11.81. CPG CYCLIC STICK HOUSING REMOVAL/INSTALLATION – continued

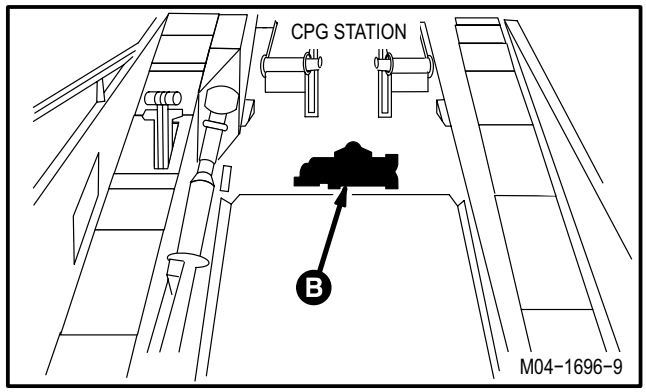
11.81.3. Removal

a. **Detach connector (A334)P1 (1) from receptacle J267 (2).** Identify cyclic longitudinal cable (3).

b. **Detach connector (A334)P1 (4) from receptacle J266 (5).** Identify cyclic lateral cable (6).

c. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**



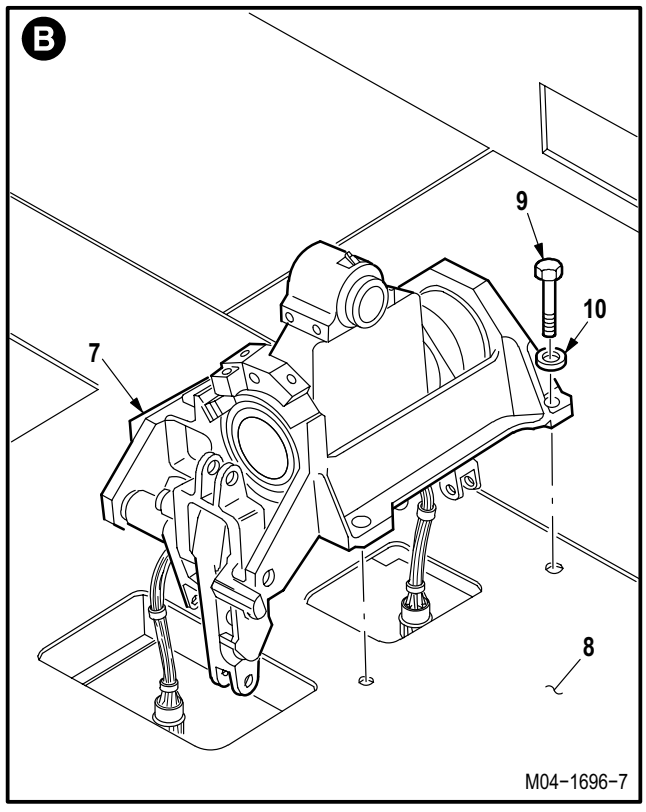


d. **Remove housing (7) from floor (8).**

(1) Remove four bolts (9) and washers (10).

(2) Lift housing (7) straight up from floor (8).

(3) Remove longitudinal cable (3) and lateral cable (6) with housing (7).



11.81.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.81.5. Inspection

a. **Check removed and attaching parts for cracks** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.81. CPG CYCLIC STICK HOUSING REMOVAL/INSTALLATION – continued

11.81.6. Installation

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**

b. **Install housing (7) on floor (8).**

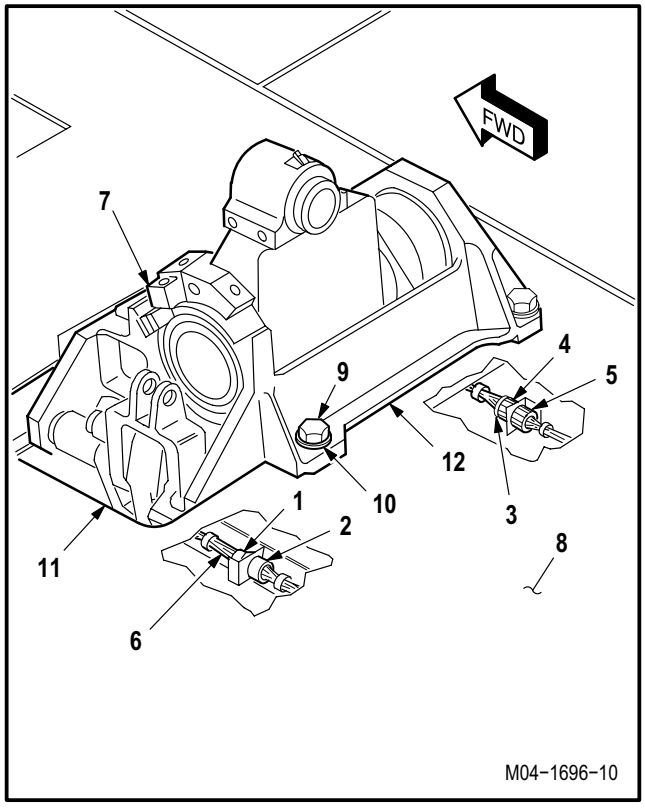
(1) Place lateral cable (6) through left opening (11) in floor (8).

(2) Place longitudinal cable (3) through right opening (12) in floor (8).

(3) Position housing (7) on floor (8).

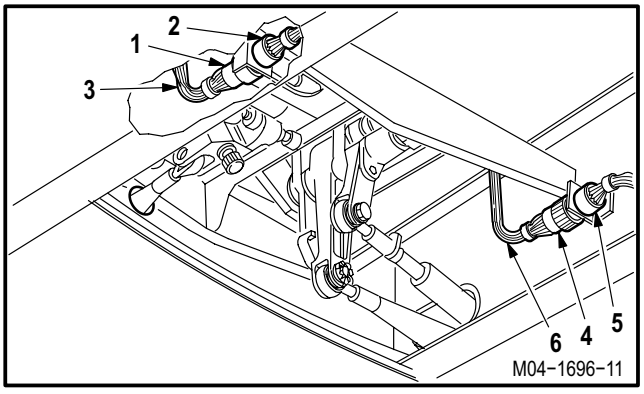
(4) Aline mounting holes.

(5) Install four bolts (9) and washers (10).



c. **Attach connector (A334)P1 (1) of longitudinal cable (3) to receptacle J267 (2).**

d. **Attach connector (A334)P1 (4) of lateral cable (6) to receptacle J266 (5).**



e. **Inspect (QA).**

f. **Install CPG cyclic stick and lateral link** (para 11.67)**.**

g. **Perform longitudinal (cyclic) flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

h. **Perform lateral (cyclic) flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

i. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

j. **Install CPG cyclic stick cover** (para 11.65)**.**

k. **Secure access door B60** (para 2.2)**.**

END OF TASK

11.82. CPG CYCLIC STICK HOUSING LONGITUDINAL SHEAR PIN REPLACEMENT

11.82.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.82.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

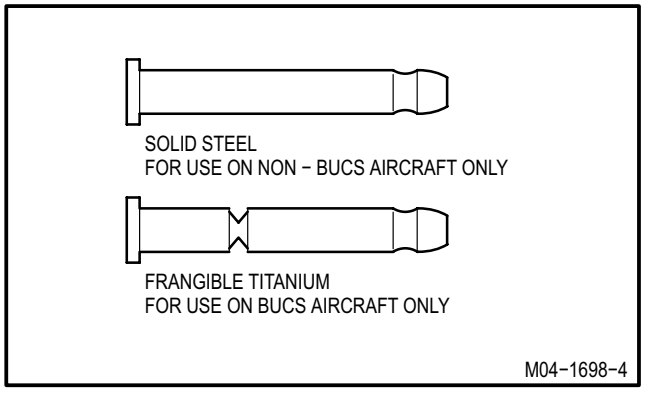
Ref	Condition
1.57	Helicopter safed
2.2	Access door B60 removed

Materials/Parts:

Petrolatum (item 138, App F)
Wire (item 220, App F)

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible type shear pin in an aircraft not equipped with BUCS may result in loss off flight controls and possible loss of aircraft.



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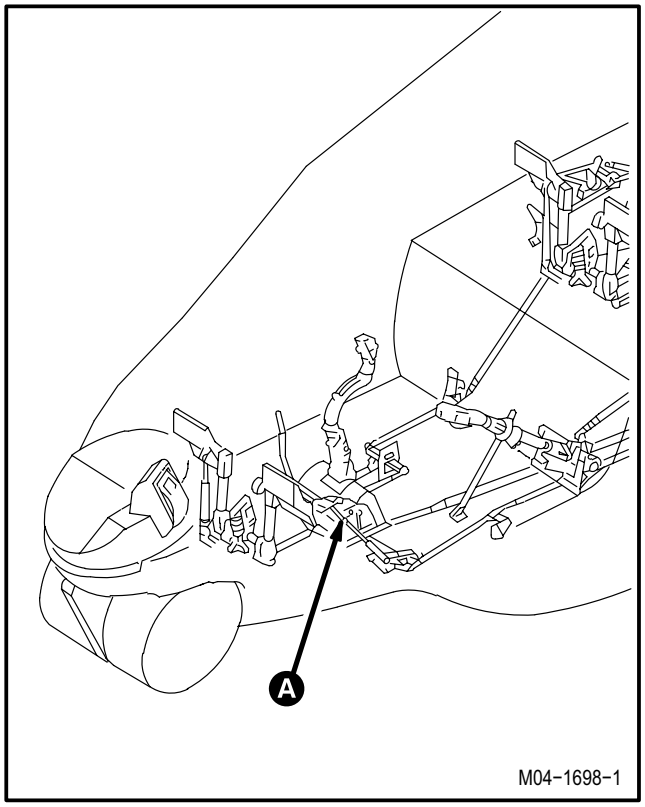
11.82. CPG CYCLIC STICK HOUSING LONGITUDINAL SHEAR PIN REPLACEMENT – continued



11.82.3. Removal

NOTE

If a shear pin(s) cannot be removed by conventional means, after repeated attempts from any of the SPAD assemblies (CPG or pilot), deliberately shearing the pin is permitted. Ensure the ends of the pins are removed.

a. **Remove shear pin retainer (1) from arm (2).**

(1) Remove lockwire.

(2) Unscrew retainer (1).

NOTE

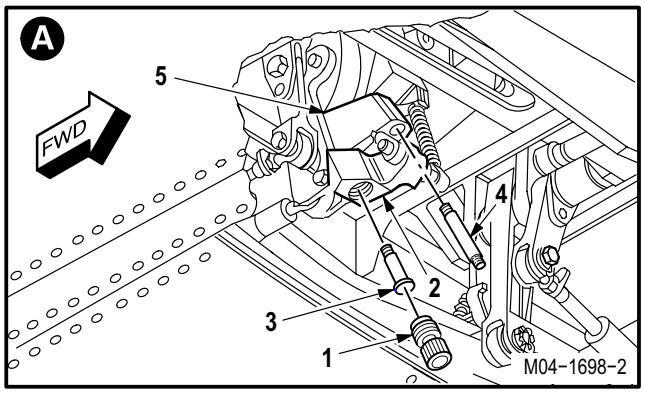
Shear pin must be removed in pieces if sheared.

b. **Remove shear pin half (3) from arm (2).**

c. **Remove shear pin half (4) from housing (5).**

(1) Move arm (2) to allow access to shear pin (4).

(2) Remove shear pin half (4) from housing (5).



11.82.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.82.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5).

GO TO NEXT PAGE

11.82. CPG CYCLIC STICK HOUSING LONGITUDINAL SHEAR PIN REPLACEMENT – continued

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check retainer for damaged threads.** None allowed.

11.82.6. Installation

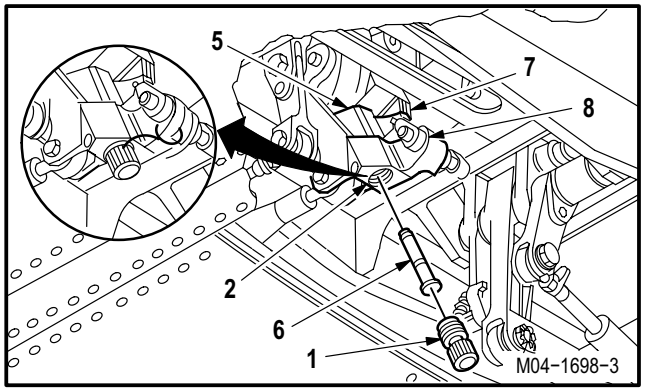
a. **Install new shear pin (6) in arm (2) and housing (5).**

(1) Apply petrolatum to tapered end of shear pin (6) before installation. Use petrolatum (item 138, App F).

(2) Aline arm (2) with housing (5).

(3) Ensure that switch detent (7) and switch position lever (8) are engaged.

(4) Insert shear pin (6) through arm (2) and housing (5).



NOTE

Install retainer finger tight.

b. **Install retainer (1) on arm (2).**

(1) Lockwire retainer (1) to arm (2). Use wire (item 220, App F).

c. **Inspect (QA).**

d. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

e. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install access door B60** (para 2.2)**.**

g. **Inspect (QA).**

END OF TASK

11.83. CPG CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT

11.83.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.83.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

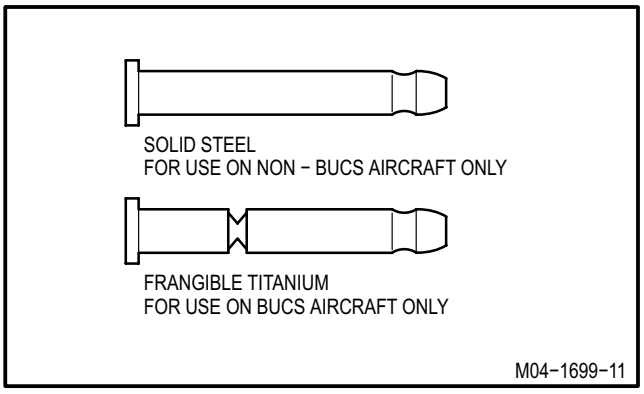
Ref	Condition
1.57	Helicopter safed
2.2	Access door B60 removed
11.65	CPG cyclic stick cover removed

Materials/Parts:

Cotter pin (2)
Petrolatum (item 138, App F)
Wire (item 220, App F)

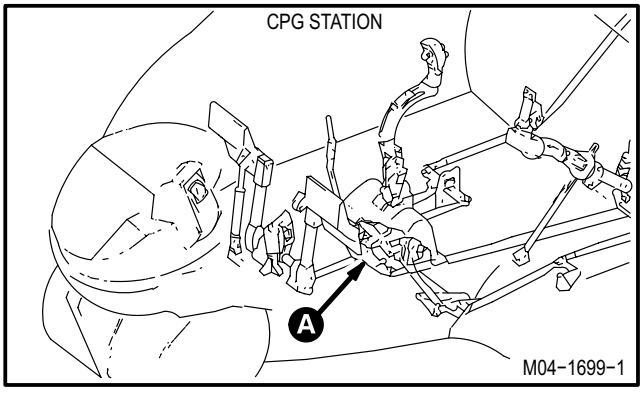
WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.



11.83.3. Removal

a. **Enter CPG station** (para 1.56)**. Observe all safety precautions.**



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11.83. CPG CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT – continued

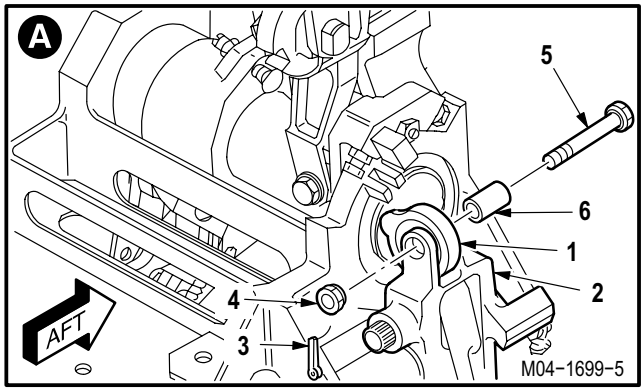
b. **Remove link (1) from arm (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5) and bushing (6).

(4) Remove link (1).



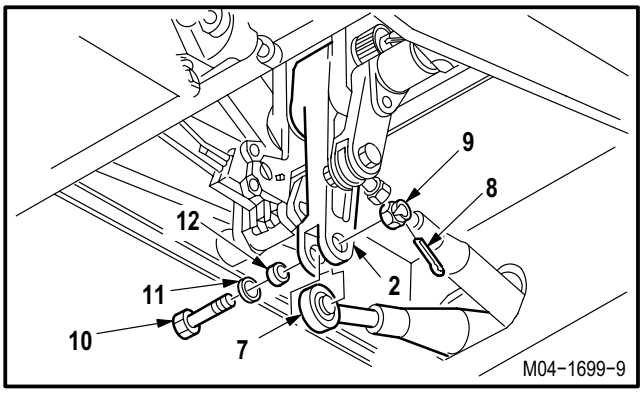
c. **Remove lateral push-pull rod (7) from arm (2).**

(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10), washer (11), and bushing (12).

(4) Remove rod (7).



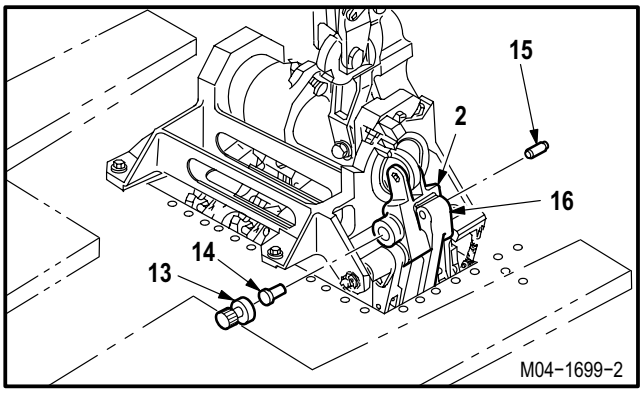
NOTE

If a shear pin(s) cannot be removed by conventional means, after repeated attempts from any of the SPAD assemblies (CPG or pilot), deliberately shearing the pin is permitted. Ensure the ends of the pins are removed.

d. **Remove shear pin retainer (13) from arm (2).**

(1) Remove lockwire.

(2) Remove retainer (13).



NOTE

Remove shear pin in pieces if sheared.

e. **Remove shear pin half (14) from arm (2).**

f. **Remove shear pin half (15) from lever (16).**

(1) Aline arm (2) with lever (16).

(2) Remove shear pin half (15) through arm (2).

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11.83. CPG CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT – continued

11.83.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.83.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check shear pin retainer for damaged threads.** None allowed.

d. **Check arm for damaged threads.** None allowed.

e. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

f. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.83. CPG CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT – continued

11.83.6. Installation

a. **Install new shear pin (17) in arm (2) and lever (16).**

(1) Apply petrolatum to tapered end of shear pin (17) before installation. Use petrolatum (item 138, App F).

(2) Aline arm (2) with lever (16).

(3) Ensure that switch detent (17) and switch position lever (18) are engaged.

(4) Install shear pin (17) through arm (2) and lever (16).

NOTE

Install retainer finger tight.

b. **Install retainer (14) on arm (2).**

(1) Lockwire retainer (14) to arm (2). Use wire (item 220, App F).

c. **Install lateral rod (7) on arm (2).** Torque nut (9) **30 to 40 INCH-POUNDS**.

(1) Aline rod (7) with arm (2).

(2) Install bushing (12) in arm (2).

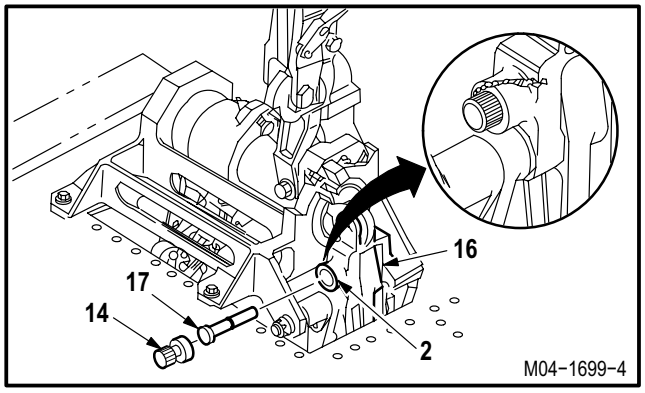
(3) Install bolt (10) through washer (11), bushing (12), arm (2), and rod (7).

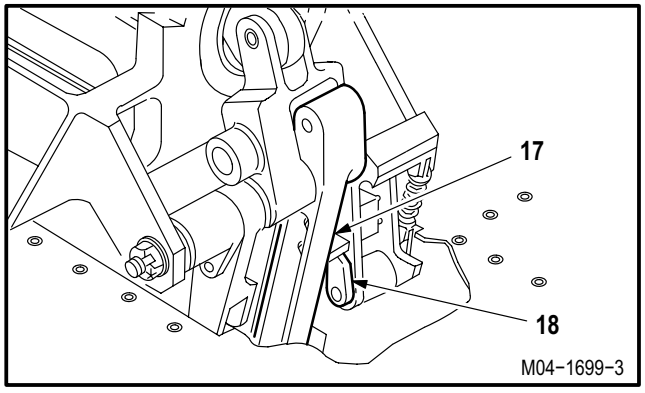
(4) Check fit of self-retaining bolt (10) (para 11.1).

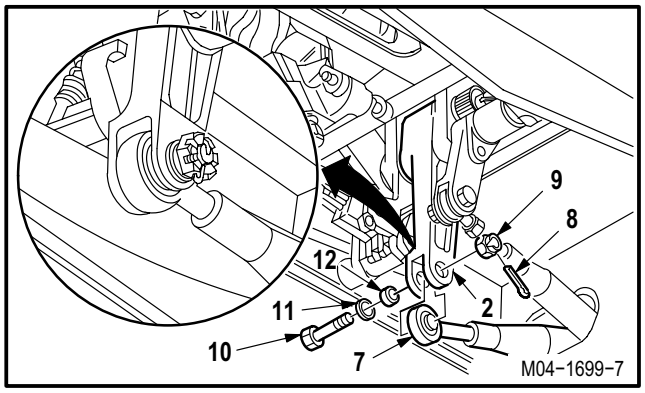
(5) Install nut (9). Torque nut (9) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (8).







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11.83. CPG CYCLIC STICK HOUSING LATERAL SHEAR PIN REPLACEMENT – continued

d. **Install link (1) on arm (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Install bushing (6) in arm (2).

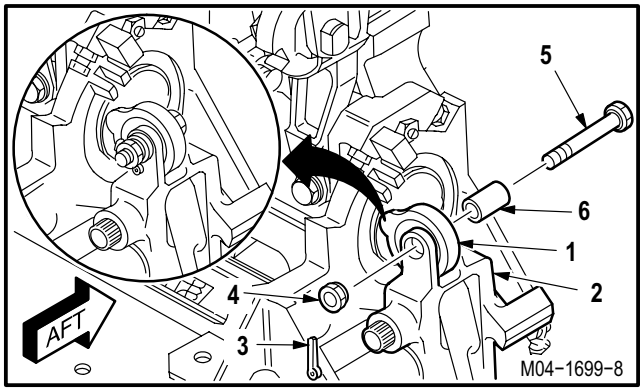
(2) Install bolt (5) through bushing (6), arm (2), and link (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



e. **Inspect (QA).**

f. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

g. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

h. **Install CPG cyclic stick cover** (para 11.65)**.**

i. **Install access door B60** (para 2.2)**.**

j. **Inspect (QA).**

END OF TASK

11.84. CPG CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.84.1. Description

This task covers: Disassembly. Cleaning. Inspection. Repair. Assembly.

11.84.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)
Light duty laboratory apron (item 27, App H)
2 3/4 x 3/8-inch drive open end socket wrench crowfoot attachment (item 96, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)
Heat protective gloves (item 155, App H)
Electric gun type heater (item 163, App H)
Adjustable air filtering respirator (item 262, App H)
1/2-inch drive 1 3/4 - 4-inch socket wrench spanner attachment set (item 335, App H)
150 - 750 inch-pound 3/8-inch drive click type torque wrench (item 442, App H)

Personnel Required:

67R	Attack Helicopter Repairer
68G	Aircraft Structural Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1500-204-23

Materials/Parts:

Cotter pin (2)
Packing
Antiseize compound (item 26, App F)
Petrolatum (item 138, App F)
Primer (item 145, App F)
Sealing compound (item 170, App F)
Wire (item 224, App F)

Equipment Conditions:

Ref	Condition
11.85	CPG cyclic stick flight control arm assembly removed
11.64	CPG cyclic longitudinal SPAD switch removed

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11.84. CPG CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.84.3. Disassembly

a. **Remove main rotor retainer (1) from cyclic support (2).**

(1) Remove lockwire from retainer (1).

(2) Remove retainer (1). Use crowfoot.

b. **Remove bearing retainer (3) from cyclic housing assembly (4).**

(1) Remove lockwire from retainer (3).

(2) Remove retainer (3). Use spanner attachment set.

c. **Remove input arm (5) from housing assembly (4).**

(1) Remove two nuts (6), washers (7), and bolts (8).

(2) Remove arm (5).

WARNING

Do not place heater near flammable material or allow heater to contact skin: severe burns can result. Wear protective equipment. If injury occurs, seek medical aid.

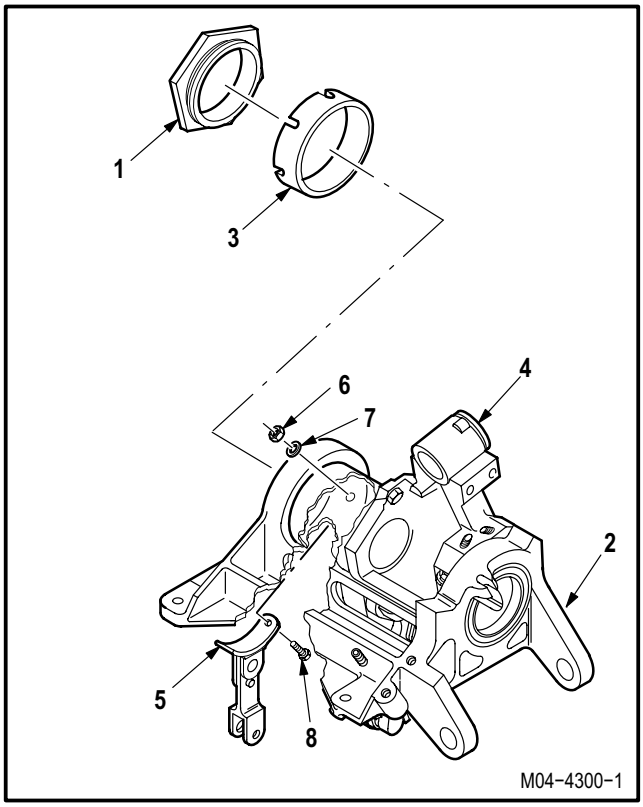
d. **Remove housing (4) from support (2).**

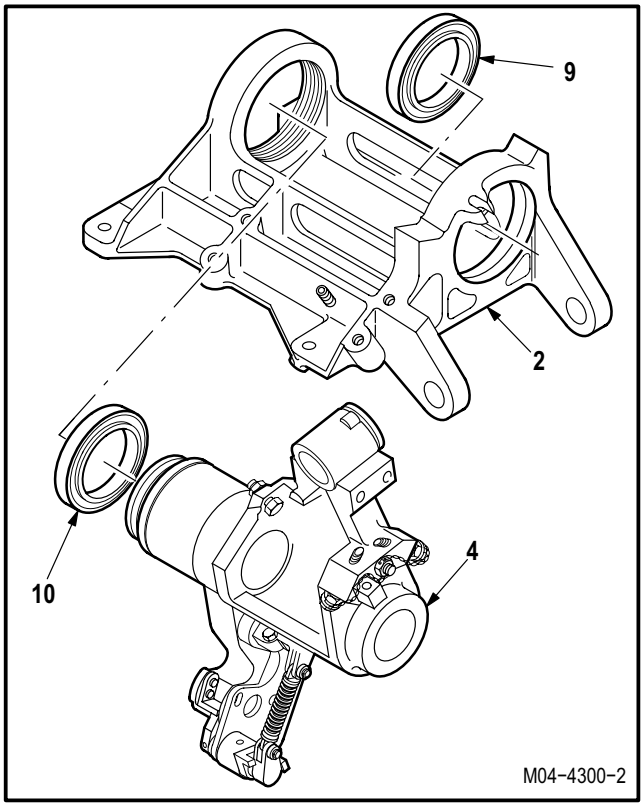
(1) Apply heat on bearing (9). Use protective gloves and heater.

(2) Hold support (2) and pull housing (4) in opposite direction of bearing (9) until housing (4) is free of support (2).

(3) Remove bearing (10).

(4) Remove housing (4) and bearing (9).





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11.84. CPG CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

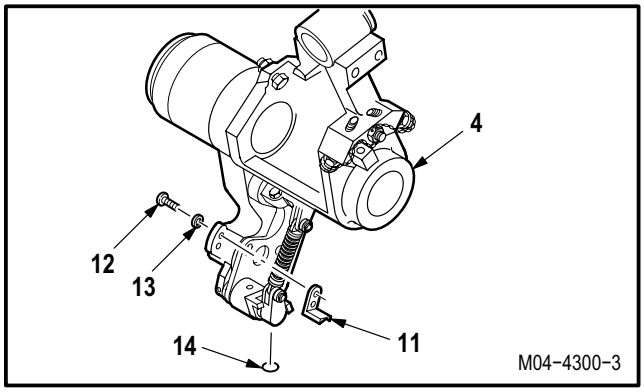
e. **Remove detent (11) from housing (4).**

(1) Remove lockwire from two screws (12).

(2) Remove two screws (12) and washers (13).

(3) Remove detent (11).

f. **Remove and discard packing (14) from housing (4).**



g. **Remove external spring guide (15) from yoke (16).**

(1) Remove cotter pin (17), washer (18), and pin (19).

(2) Discard cotter pin (17).

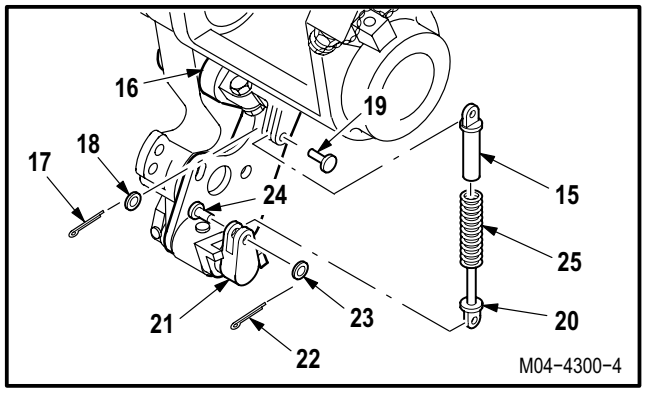
(3) Remove guide (15).

h. **Remove internal spring guide (20) from actuator switch shaft (21).**

(1) Remove cotter pin (22), washer (23), and pin (24).

(2) Discard cotter pin (22).

(3) Remove guide (20) and spring (25).



i. **Remove shaft (21) from yoke (16).**

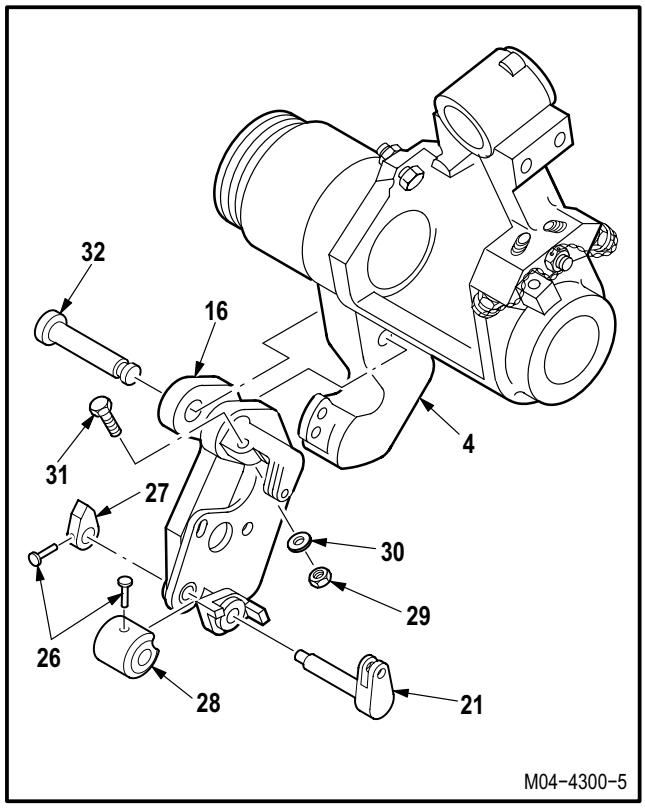
(1) Remove two rivets (26) from lever (27) and cam (28) (TM 1-1500-204-23).

(2) Remove lever (27), cam (28), and shaft (21).

j. **Remove yoke (16) from housing (4).**

(1) Remove nut (29), washer (30), and bolt (31).

(2) Remove shaft (32) and yoke (16).



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11.84. CPG CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

NOTE

Go to step k. if replacing housing; if not, go to paragraph 11.84.4.

k. **Remove two bolts (33) and nuts (34) from housing (4).**

(1) Measure and record dimensions A from housing (4) to tops of two bolts (33).

(2) Remove lockwire.

(3) Remove two bolts (33) and nuts (34).

l. **Remove bolt (35) and nut (36) from housing (4).**

(1) Measure and record dimension B from housing (4) to top of bolt (35).

(2) Remove lockwire.

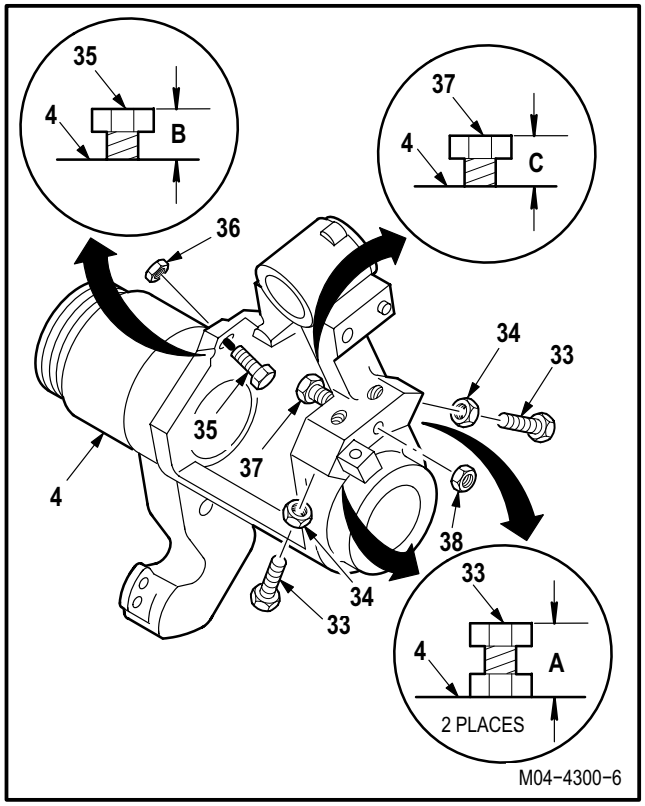
(3) Remove bolt (35) and nut (36).

m. **Remove bolt (37) and nut (38) from housing (4).**

(1) Measure and record dimension C from housing (4) to top of bolt (37).

(2) Remove lockwire.

(3) Remove bolt (37) and nut (38).



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11.84. CPG CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.84.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.84.5. Inspection

a. **Check support and housing threaded inserts for stripped or damaged threads.** None allowed.

b. **Check support, housing, and yoke for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

e. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

f. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.84.6. Repair

a. **Replace threaded inserts as necessary** (TM 1-1500-204-23)**.**

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11.84. CPG CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.85.7. Assembly

a. **If removed, install bolt (37) and nut (38) on housing (4).**

NOTE

Refer to dimension C recorded earlier.

(1) Hand tighten bolt (37) on housing (4) until dimension C is attained.

(2) Install nut (38).

b. **If removed, install bolt (35) and nut (36) on housing (4).**

NOTE

Refer to dimension B recorded earlier.

(1) Hand tighten bolt (35) on housing (4) until dimension B is attained.

(2) Install nut (36).

(3) Lockwire bolt (35) and nut (36) to housing (4). Use wire (item 224, App F).

c. **If removed, install two bolts (33) and nuts (34) on housing (4).**

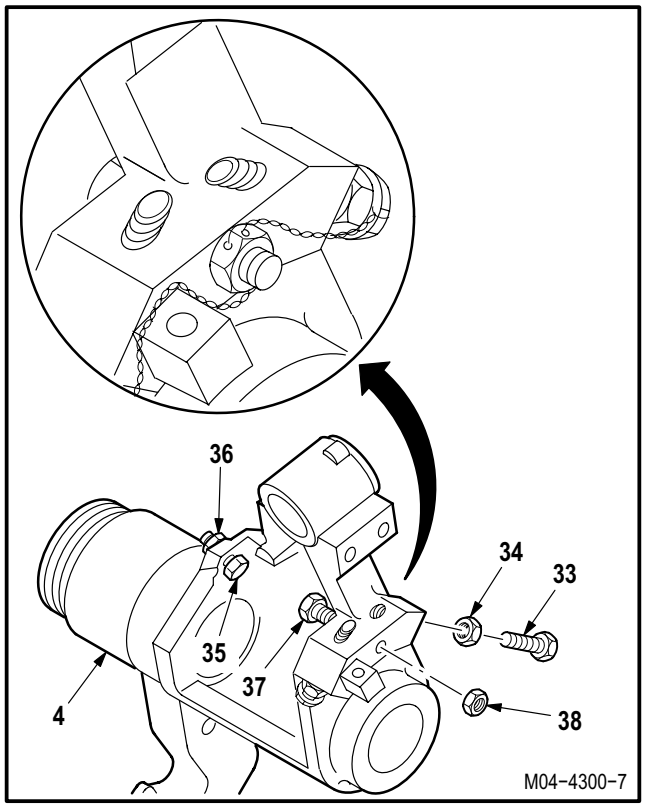
NOTE

Refer to dimensions A recorded earlier.

(1) Hand tighten two bolts (33) and nuts (34) on housing (4) until dimension A is attained.

(2) Tighten two nuts (34).

(3) Lockwire two bolts (33), nuts (34), bolt (37), and nut (38) together. Use wire (item 224, App F).



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11.84. CPG CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

d. **Install yoke (16) on housing (4).**

(1) Aline yoke (16) on housing (4).

(2) Install shaft (32) through yoke (16) and housing (4).

(3) Install bolt (31) through yoke (16).

(4) Install washer (30) and nut (29).

NOTE

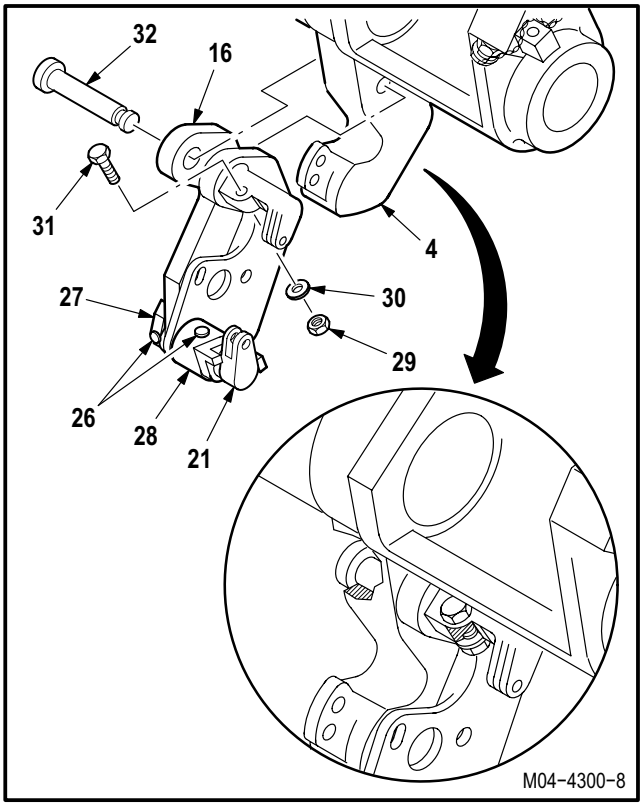
Ensure shaft arm, cam valley, and lever tip are facing same direction.

e. **Install shaft (21) on yoke (16).**

(1) Install shaft (21) through yoke (16), cam (28), and lever (27).

(2) Aline cam (28) and lever (27) with holes in shaft (21).

(3) Install two rivets (26) in cam (28) and lever (27) (TM 1-1500-204-23).



f. **Install guide (20) on shaft (21).**

(1) Install pin (24) through shaft (21), guide (20), and washer (23).

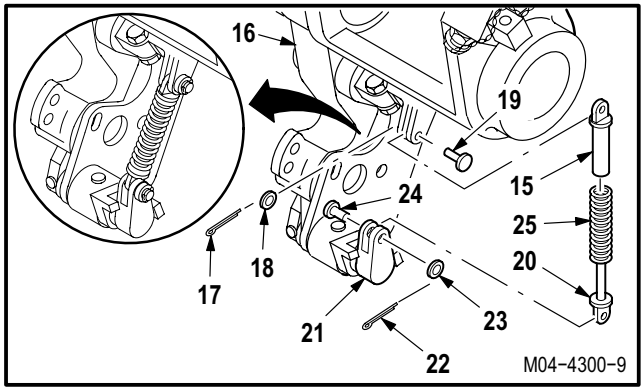
(2) Install new cotter pin (22).

g. **Install guide (15) on yoke (16).**

(1) Install spring (25) and guide (15) on guide (20).

(2) Install pin (19) through yoke (16), guide (15), and washer (18).

(3) Install new cotter pin (17).



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11.84. CPG CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

h. **Install new packing (14) in housing (4).**

(1) Lubricate new packing (14). Use petrolatum (item 138, App F).

(2) Install packing (14) in housing (4).

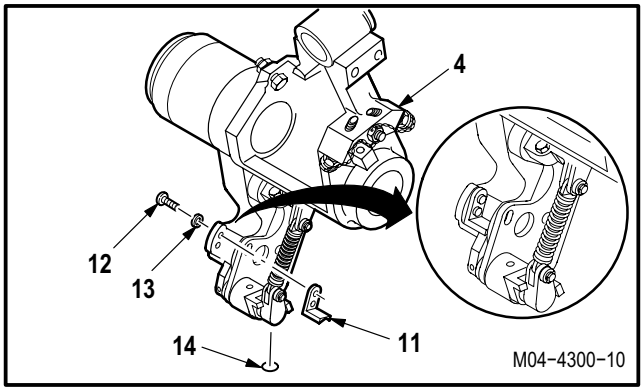
i. **Install detent (11) on housing (4).**

(1) Aline detent (11) on housing (4).

NOTE

Detent will be secured and adjusted when SPAD switch is installed.

(2) Install two screws (12) and washers (13).



j. **Install housing (4) on support (2).**

(1) Apply primer on bearing mount surface of support. Use primer (item 145, App F).

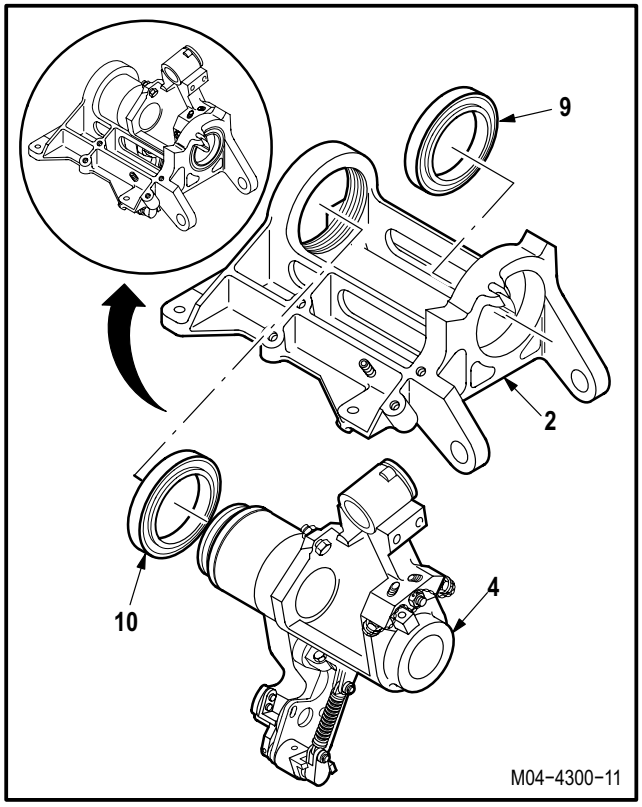
(2) Allow primer to air dry **30 MINUTES**.

(3) Apply sealing compound on bearing (9) mount surface of support (2). Use sealing compound (item 170, App F).

(4) Press bearing (9) on housing (4) (para 11.5).

(5) Install bearing (10) on housing (4) until properly seated in support (2).

(6) Install housing (4) on support (2). Ensure bearing (9) is properly seated in support (2).



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11.84. CPG CYCLIC STICK HOUSING ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

k. **Install arm (5) on housing (4).**

(1) Install two bolts (8) through arm and housing (4).

(2) Install two washers (7) and nuts (6).

l. **Install retainer (3) on housing (4).** Torque retainer (3) to **500 INCH-POUNDS**.

(1) Apply thin coat of antiseize compound on threads of retainer (3) and install. Use antiseize compound (item 26, App F).

(2) Torque retainer (3) to **500 INCH-POUNDS**. Use torque wrench and spanner attachment set.

(3) Lockwire retainer (1) to cyclic housing (4). Use wire (item 224, App F).

m. **Install retainer (1) on support (2).** Torque retainer (1) to **500 INCH-POUNDS**.

(1) Apply thin coat of antiseize compound on threads of retainer (1) and install. Use antiseize compound (item 26, App F).

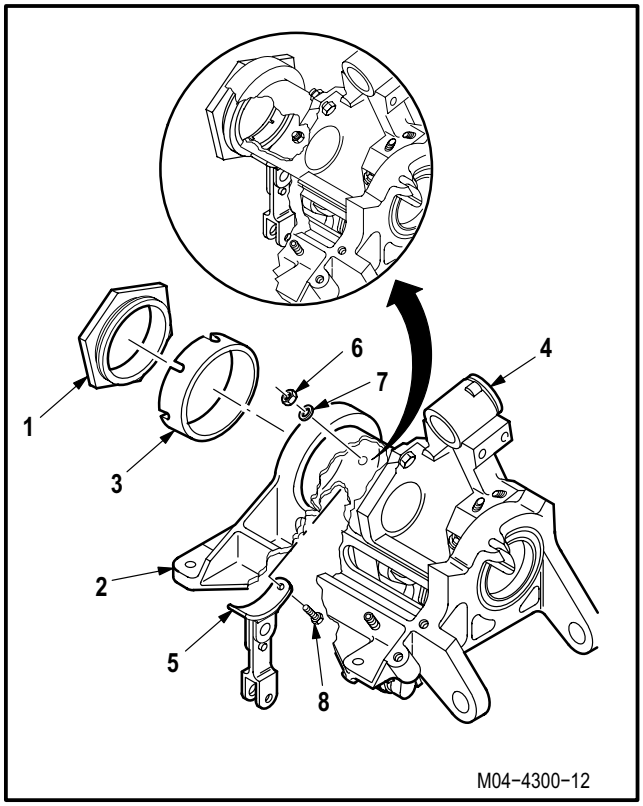
(2) Torque retainer (1) to **500 INCH-POUNDS**. Use torque wrench and crowfoot.

(3) Lockwire retainer (1) to support (2). Use wire (item 224, App F).

n. **Install CPG cyclic longitudinal SPAD switch** (para 11.64)**.**

o. **Install CPG cyclic stick flight control arm assembly** (para 11.85)**.**

p. **Inspect (QA).**



END OF TASK

11.85. CPG CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.85.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.85.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
30 - 150 inch-pound 1/4-inch drive click type torque wrench (item 435, App H)

Personnel Required:

67R Attack Helicopter Repairer
68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

Cotter pin (3)
Packing
Rivet MS20470AD3 (3)
Adhesive (item 3A, App F)
Damping fluid (item 69, App F)
Petrolatum (item 138, App F)

References:

TM 1-1500-204-23

11.85.3. Disassembly

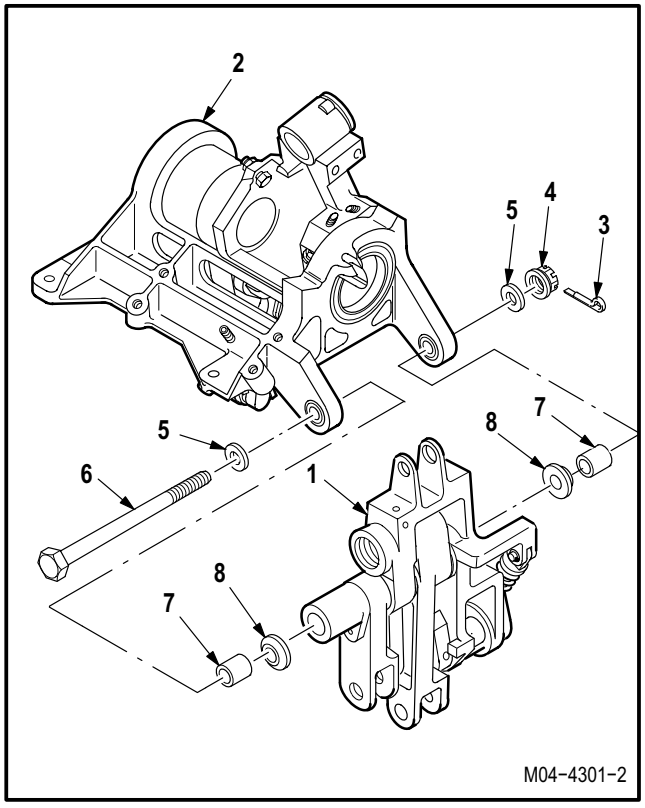
a. **Remove flight control arm assembly (1) from cyclic support (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4) and washer (5).

(3) Remove bolt (6) and washer (5).

(4) Remove two spacers (7), retainers (8), and arm (1).



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11.85. CPG CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

b. **Remove drive collar (9) from arm (1).**

(1) Remove and discard rivet (10) (TM 1-1500-204-23).

(2) Remove collar (9) from output arm shaft (11).

(3) Remove key (12).

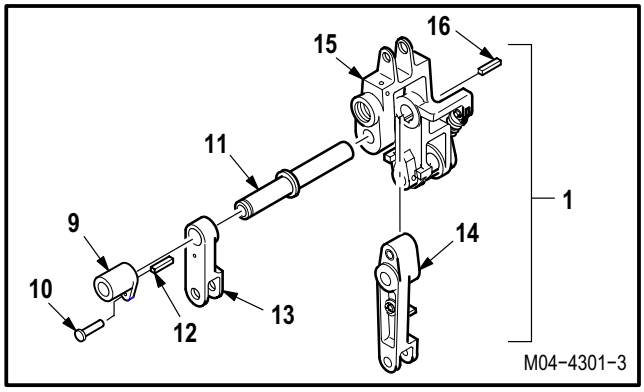
c. **Remove transducer input arm (13) from shaft (11).**

d. **Remove arm (14) from arm (15).**

(1) Remove shaft (11).

(2) Remove key (16).

(3) Remove arm (14) from arm (15).



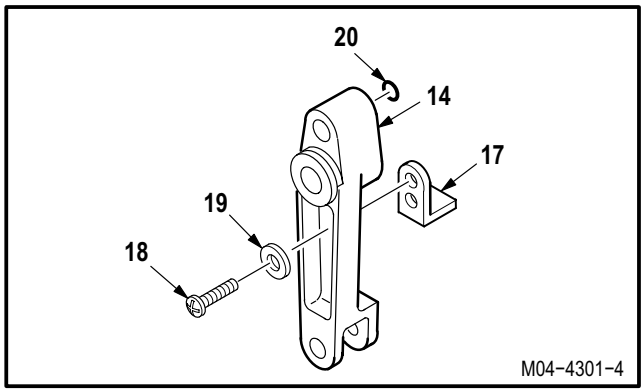
e. **Remove detent (17) from arm (14).**

(1) Remove lockwire from two screws (18).

(2) Remove two screws (18) and washers (19).

(3) Remove detent (17).

f. **Remove and discard packing (20) from arm (14).**



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11.85. CPG CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

g. **Remove internal spring guide (21) from actuator switch shaft (22).**

(1) Remove cotter pin (23), washer (24), and pin (25). Discard cotter pin.

(2) Remove guide (21) and spring (26).

h. **Remove external spring guide (27) from arm (15).**

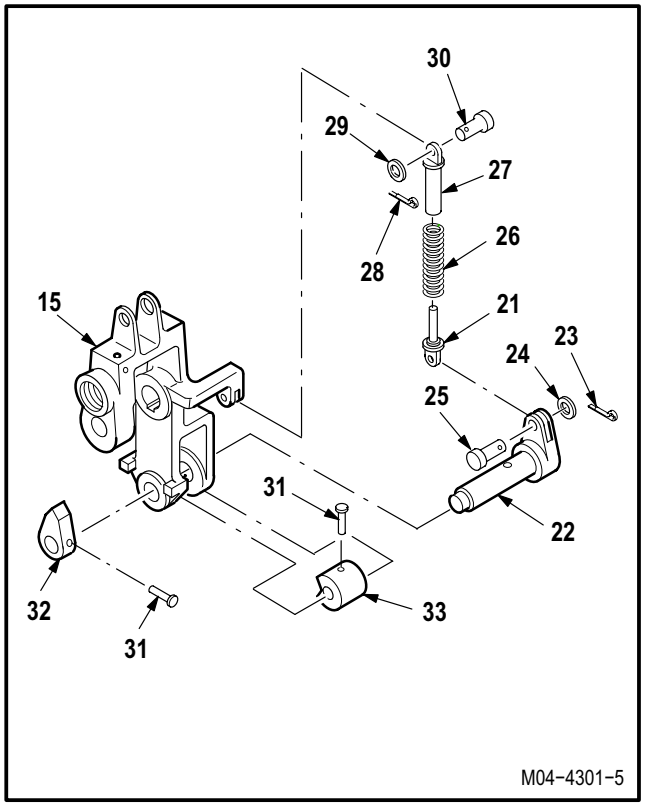
(1) Remove cotter pin (28), washer (29), and pin (30). Discard cotter pin.

(2) Remove guide (27).

i. **Remove shaft (22) from arm (15).**

(1) Remove two rivets (31) from lever (32) and cam (33) (TM 1-1500-204-23).

(2) Remove lever (32), cam (33), and shaft (22).



11.85.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.85.5. Inspection

a. **Check support and arms for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.85. CPG CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.85.6. Assembly

a. **Install shaft (22) on arm (15).**

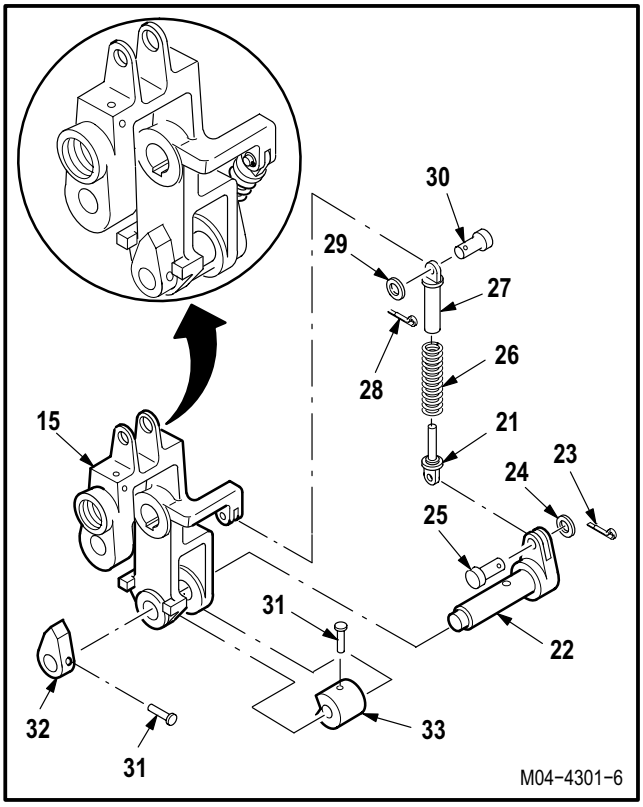
(1) Install shaft (22) through arm (15), cam (33), and lever (32).

NOTE

Ensure shaft arm, cam valley, and lever tip are facing same direction.

(2) Aline cam (33) and lever (32) on shaft (22).

(3) Install two new rivets (31) in cam (33) and lever (32) (TM 1-1500-204-23).



b. **Install guide (27) on arm (15).**

(1) Install pin (30) through guide (27), arm (15), and washer (29).

(2) Install new cotter pin (28).

c. **Install guide (21) on shaft (22).**

(1) Install spring (26) and guide (21).

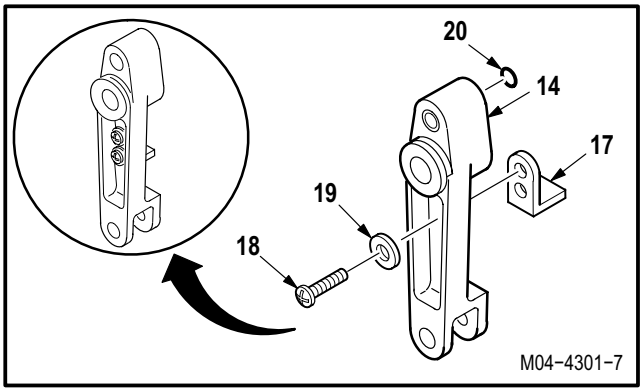
(2) Install pin (25) through shaft (22), guide (21), and washer (24).

(3) Install new cotter pin (23).

d. **Install new packing (20) in arm (14).**

(1) Lubricate new packing (20). Use petrolatum (item 138, App F).

(2) Install packing (20) on arm (14).



e. **Install detent (17) on arm (14).**

(1) Aline detent (17) on arm (14).

NOTE

Detent will be secured, adjusted, and lockwired when SPAD switch is installed.

(2) Install two screws (18) and washers (19).

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11.85. CPG CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

f. **Install arm (14) on arm (15).**

(1) Apply lubricant to faying surfaces of arm (14) and arm (15) that contact shaft (11). Use damping fluid (item 69, App F).

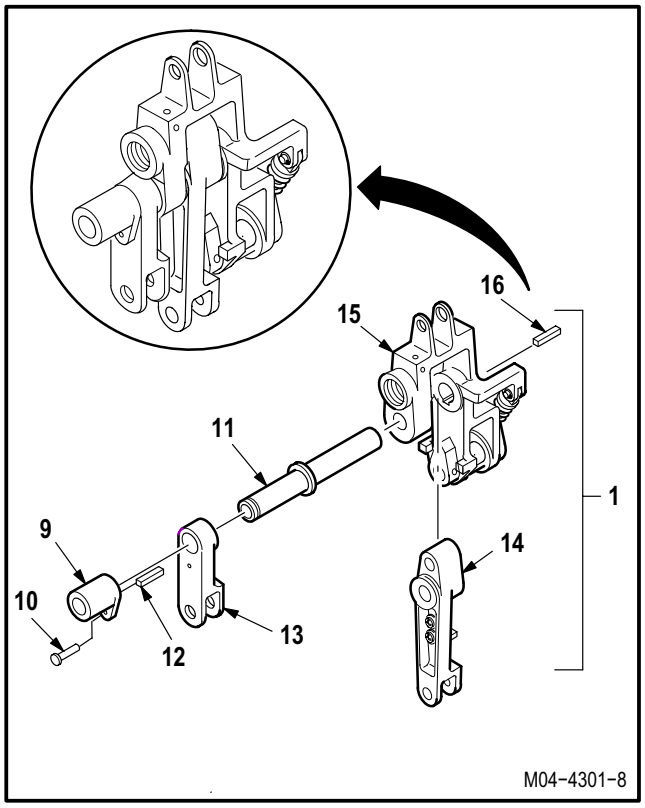
(2) Apply adhesive to shaft (11) key seat. Use adhesive (item 3A, App F).

(3) Install shaft (11) through arm (14) and arm (15).

(4) Apply adhesive to key (16). Coat all surfaces except end to be inserted first. Use adhesive (item 3A, App F).

(5) Aline arm (14) and arm (15).

(6) Install key (16). Wipe excess adhesive from key (16).



g. **Install arm (13) on shaft (11).**

(1) Apply lubricant to faying surfaces and bore of arm (13) that contact shaft (11). Use damping fluid (item 69, App F).

(2) Install arm (13) on shaft (11).

h. **Install collar (9) on shaft (11).**

(1) Apply lubricant to faying surfaces of collar (9) that contact shaft (11). Use damping fluid (item 69, App F).

(2) Apply adhesive to shaft (11) key seat. Use adhesive (item 3A, App F).

(3) Apply adhesive to key (12). Coat all surfaces except end to be inserted first. Use adhesive (item 3A, App F).

(4) Install key (12). Wipe excess adhesive from key (12).

(5) Aline and install collar (9) with key (12) and shaft (11).

(6) Install new rivet (10) dry (TM 1-1500-204-23).

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11.85. CPG CYCLIC STICK FLIGHT CONTROL ARM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

i. **Allow adhesive to cure 12 HOURS at ambient temperature or cure 1.5 HOURS at 135 °F (57 °C).**

j. **Install arm (1) on support (2).** Torque nut (4) **65 to 85 INCH-POUNDS**.

(1) Aline arm (1) with two retainers (8) and spacers (7).

(2) Install bolt (6) through washer (5), support (2), spacer (7), retainer (8), arm (1), retainer (8), spacer (7), and support (2).

(3) Check fit of self-retaining bolt (6) (para 11.1).

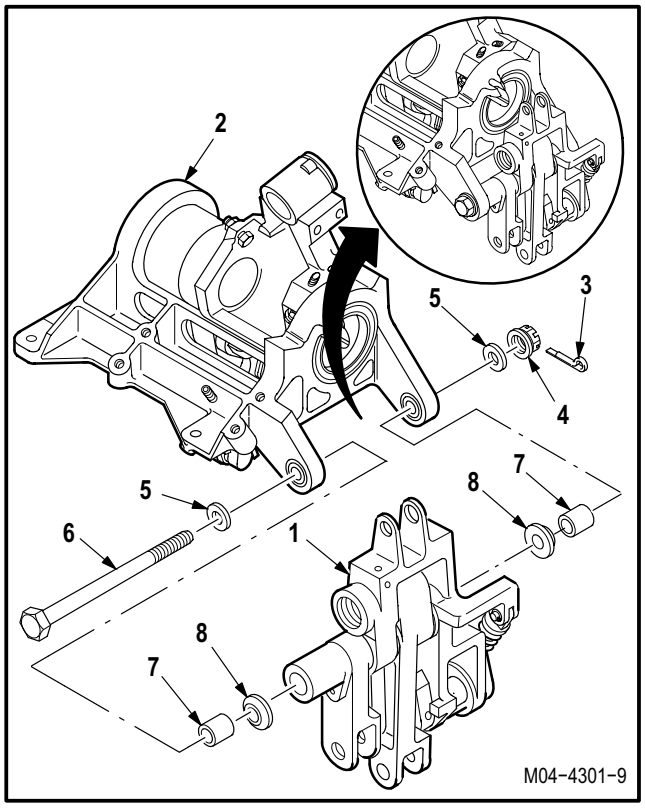
(4) Install washer (5) and nut (4).

(5) Torque nut (4) to **65 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **85 INCH-POUNDS**.

(7) Install new cotter pin (3).

k. **Inspect (QA).**



END OF TASK

11.86. CPG CYCLIC LATERAL PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.86.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.86.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

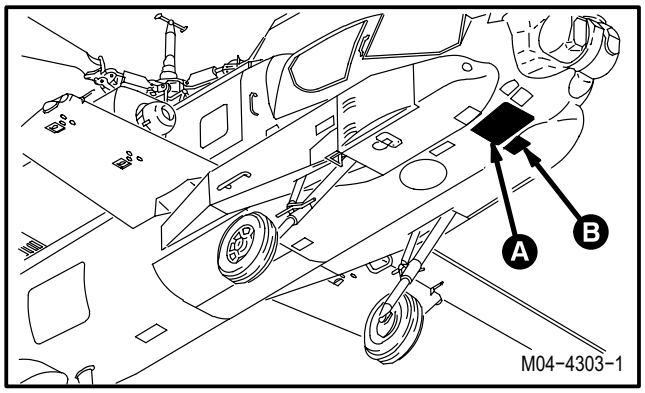
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access doors B60 and B65L removed; fairing L60 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



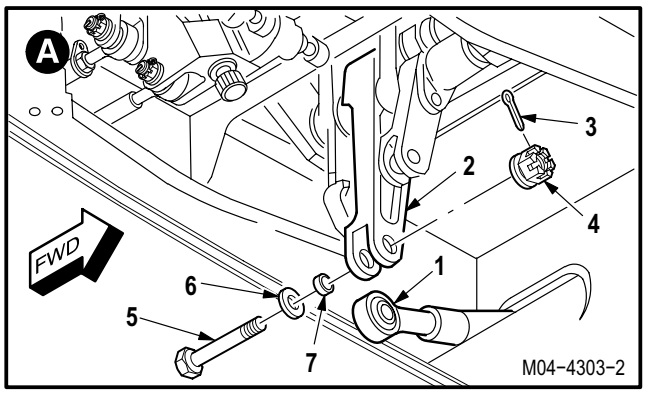
11.86.3. Removal

a. **Remove push-pull rod assembly (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).



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11.86. CPG CYCLIC LATERAL PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

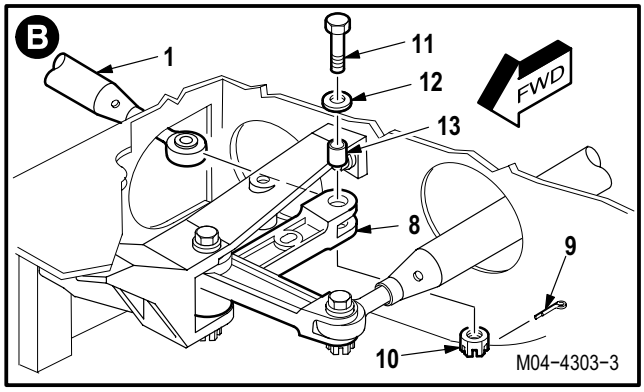
b. **Remove rod (1) from bellcrank (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (1).



11.86.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.86.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.86. CPG CYCLIC LATERAL PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.86.6. Installation

CAUTION

To prevent damage to flight control components, do not use force in alining push-pull rod with bellcranks.

a. **Install rod (1) on bellcrank (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

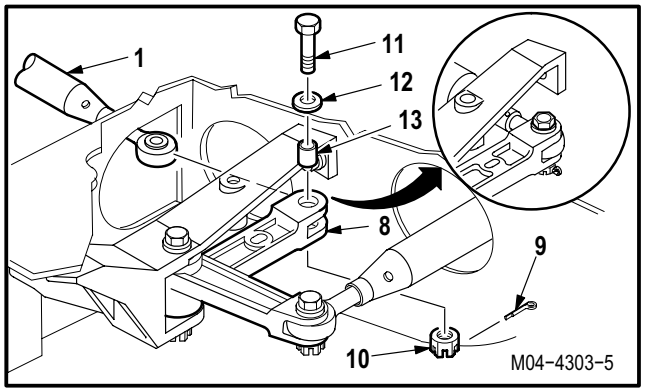
(1) Install bolt (11), washer (12), and bushing (13) through bellcrank (8) and rod (1).

(2) Check fit of self-retaining bolt (11) (para 11.1).

(3) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(4) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(5) Install new cotter pin (9).



b. **Install adjustable end of rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

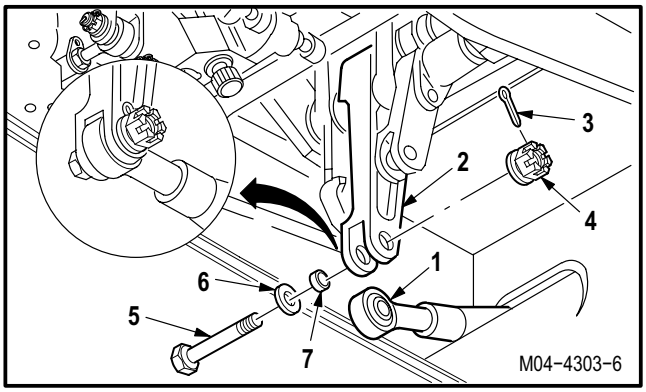
(1) Install bolt (5), washer (6), and bushing (7) through bellcrank (2) and rod (1).

(2) Check fit of self-retaining bolt (5) (para 11.1).

(3) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(4) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(5) Install new cotter pin (3).



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11.86. CPG CYCLIC LATERAL PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Inspect (QA).**

d. **Perform lateral flight control rigging maintenance operation check** (TM 1-1520-238-T)**.**

e. **Install access doors B60 and B65L; install fairing L60** (para 2.2)**.**

f. **Inspect (QA).**

END OF TASK

11.87. CPG TO PILOT LATERAL F.S. 65.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.87.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.87.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

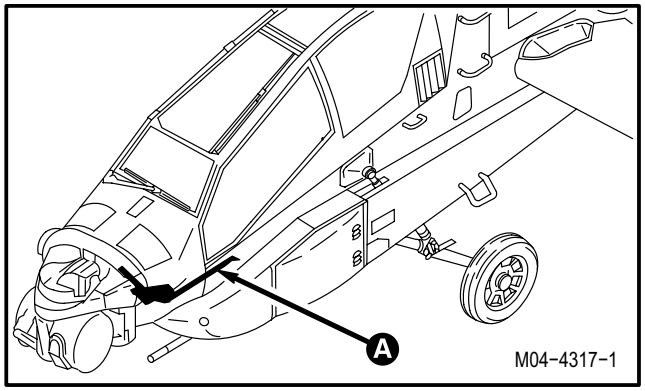
67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access door B65L removed; fairing L60 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.87. CPG TO PILOT LATERAL F.S. 65.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.87.3. Removal

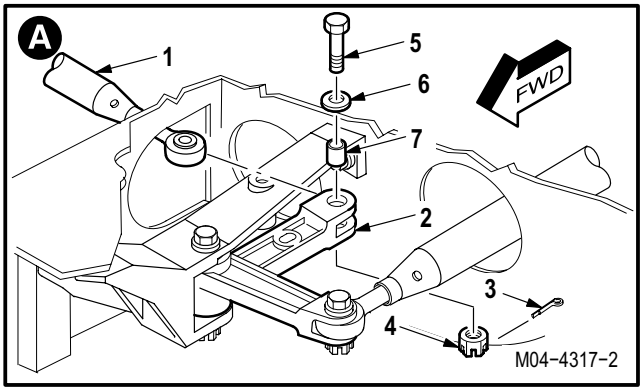
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



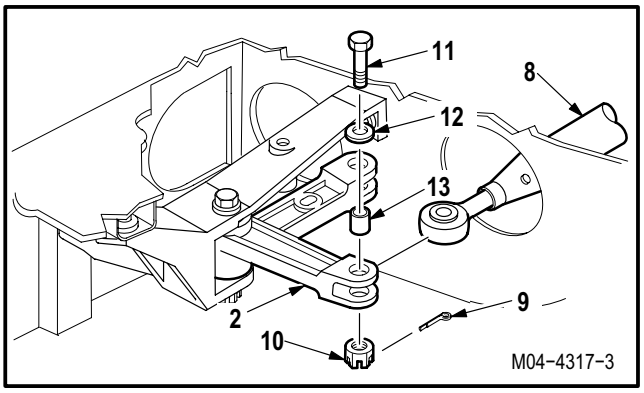
b. **Remove push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

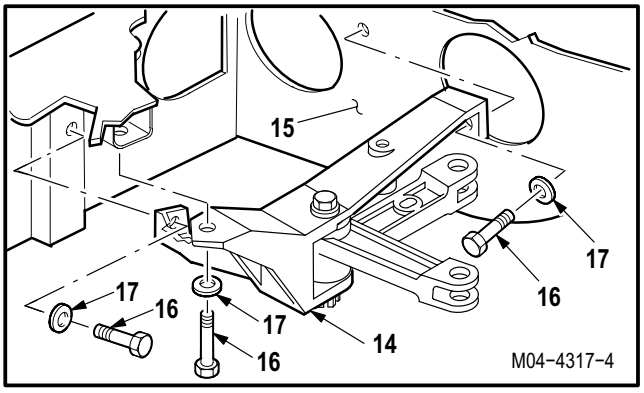
(4) Remove rod (8) from bellcrank (2).



c. **Remove bracket assembly (14) from airframe (15).**

(1) Remove three bolts (16) and washers (17).

(2) Remove bracket (14).



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11.87. CPG TO PILOT LATERAL F.S. 65.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

d. **Remove bellcrank (2) from bracket (14).**

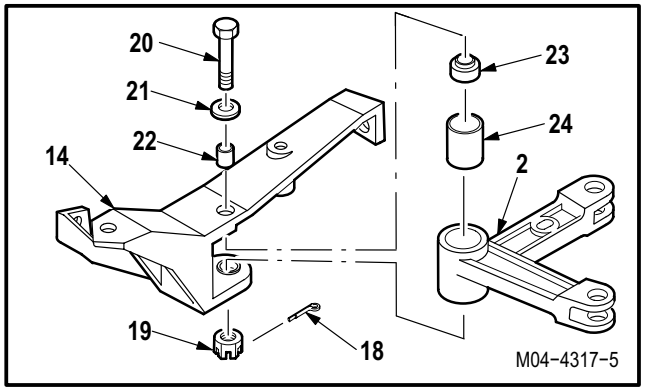
(1) Remove and discard cotter pin (18).

(2) Remove nut (19).

(3) Remove bolt (20), washer (21), and bushing (22).

(4) Remove bellcrank (2).

(5) Remove bearing (23) and spacer (24) from bellcrank (2).



11.87.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.87.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.87. CPG TO PILOT LATERAL F.S. 65.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.87.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bellcrank (2) on bracket (14).** Torque nut (19) **30 to 40 INCH-POUNDS**.

(1) Install spacer (24) and bearing (23) on bellcrank (2).

(2) Aline bellcrank (2) with bracket (14).

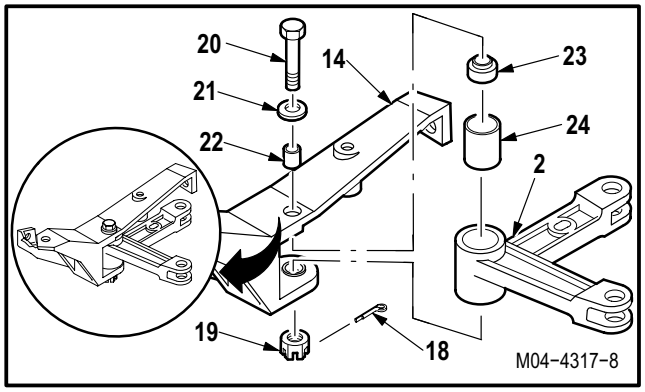
(3) Install bolt (20) through washer (21), bushing (22), bracket (14), and bellcrank (2).

(4) Check fit of self-retaining bolt (20) (para 11.1).

(5) Install nut (19). Torque nut (19) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

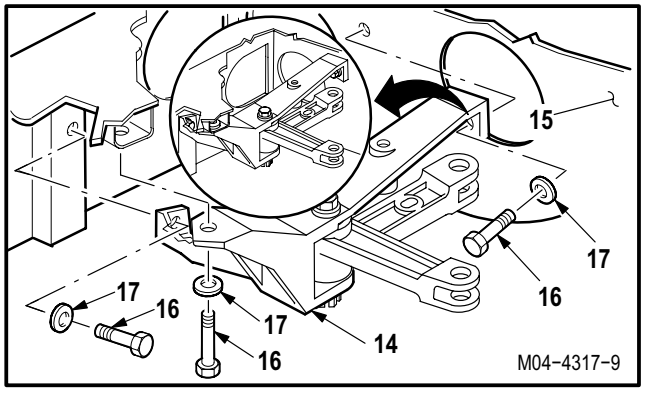
(7) Install new cotter pin (18).



b. **Install bracket (14) on airframe (15).**

(1) Aline bracket (14) on airframe (15).

(2) Install three bolts (16) through washers (17) and bracket (14) into airframe (15).



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11.87. CPG TO PILOT LATERAL F.S. 65.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

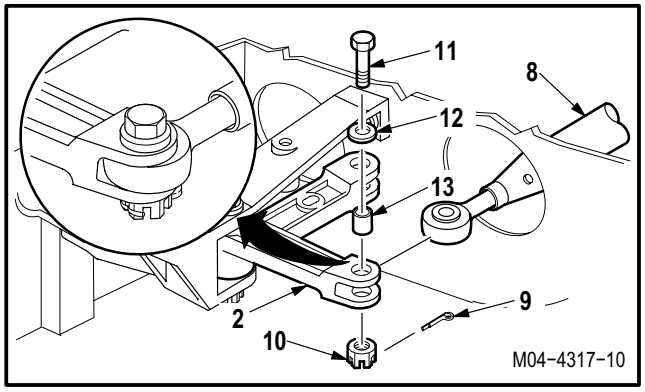
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



d. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

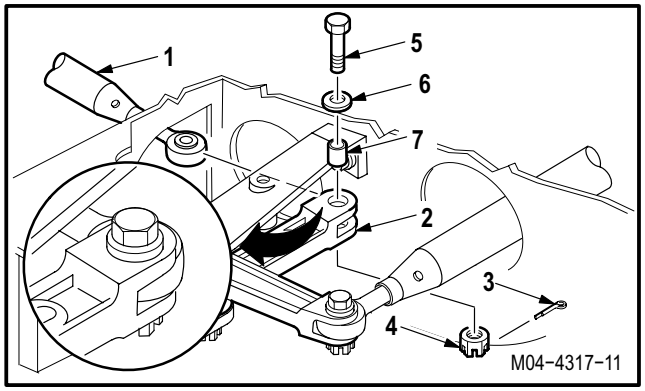
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



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11.87. CPG TO PILOT LATERAL F.S. 65.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

e. **Inspect (QA).**

f. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

g. **Install access door B65L; install fairing L60** (para 2.2)**.**

h. **Inspect (QA).**

END OF TASK

11.88. LATERAL F.S. 65.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.88.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.88.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

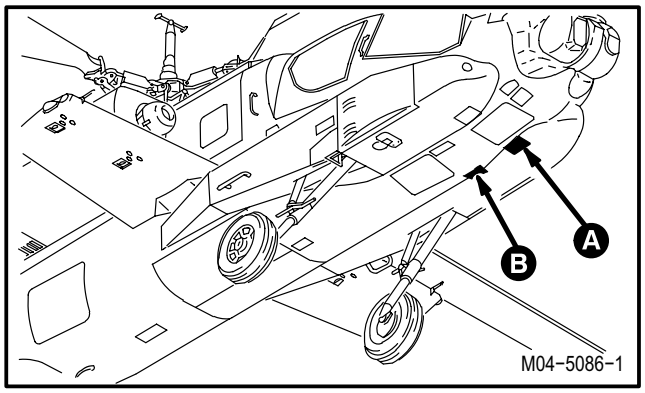
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Fairing L60 removed; covers B80R and B85R removed; door B65R removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.88. LATERAL F.S. 65.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.88.3. Removal

a. **Remove lateral push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7) from bellcrank (2) and rod (1).

(4) Remove rod (1) from bellcrank (2).

b. **Remove lateral push-pull rod (1) from bellcrank (8).**

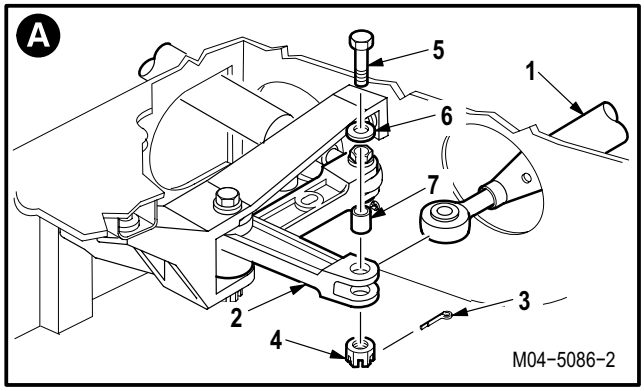
(1) Remove and discard cotter pin (9).

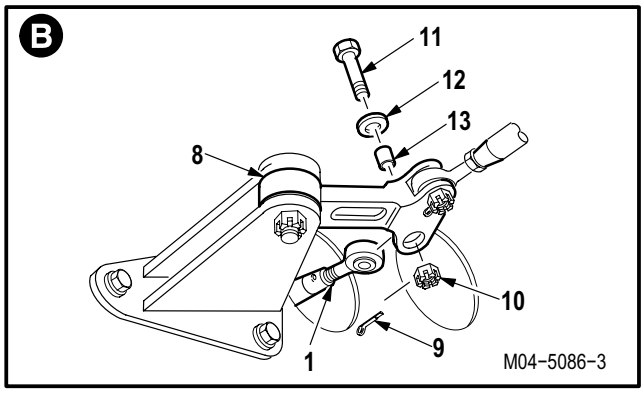
(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13) from bellcrank (8) and rod (1).

(4) Remove rod (1) from bellcrank (8).

(5) Remove rod (1).





11.88.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.88.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.88. LATERAL F.S. 65.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.88.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install rod (1) on bellcrank (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (1) with bellcrank (8).

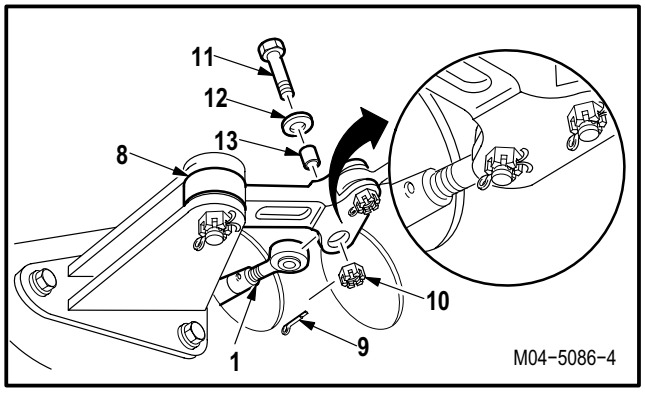
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (8), and rod end (1).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



b. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (1) with bellcrank (2).

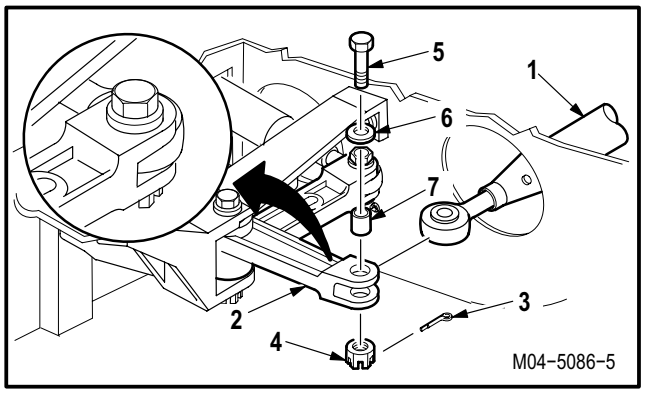
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod end (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



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11.88. LATERAL F.S. 65.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Inspect (QA).**

d. **Install access door B65, covers B80R and B85R and fairing L60** (para 2.2)**.**

e. **Inspect (QA).**

f. **Perform applicable flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.89. CPG TO PILOT CONTROL LATERAL F.S. 83.45 IDLER BELLCRANK REMOVAL/INSTALLATION

11.89.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.89.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

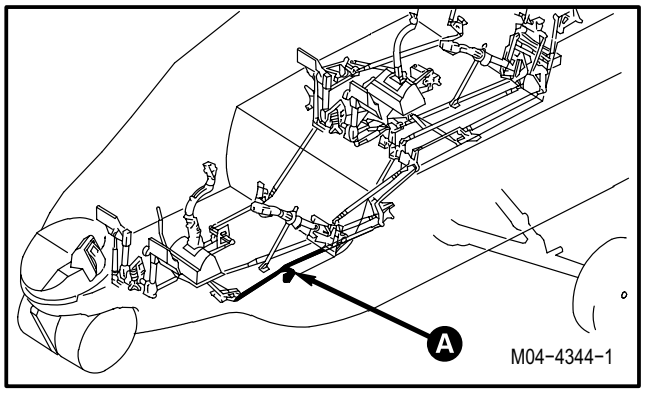
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access covers B80L and B85L removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.89.3. Removal

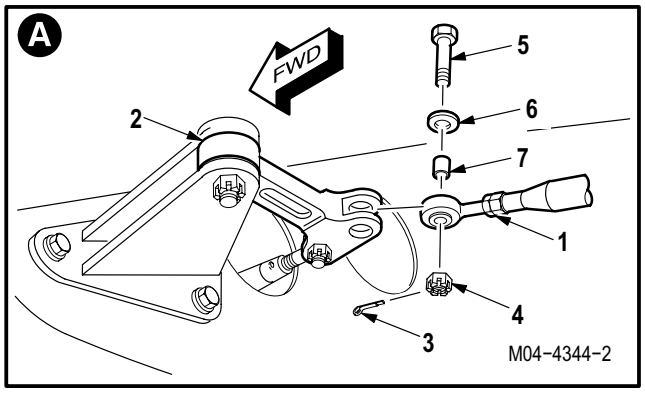
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1) from bellcrank (2).



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11.89. CPG TO PILOT CONTROL LATERAL F.S. 83.45 IDLER BELLCRANK REMOVAL/INSTALLATION – continued

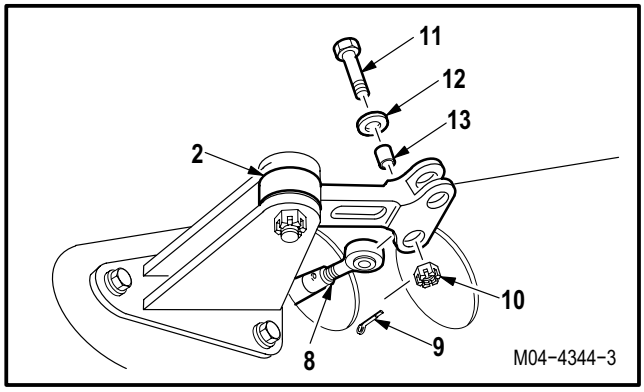
b. **Remove push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (8) from bellcrank (2).



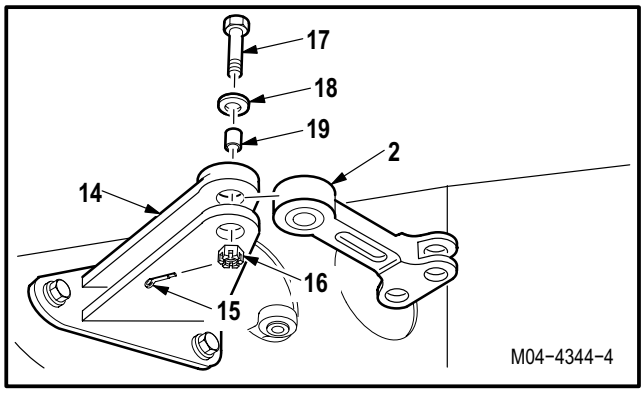
c. **Remove bellcrank (2) from bracket (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove bellcrank (2).



11.89.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.89.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.89. CPG TO PILOT CONTROL LATERAL F.S. 83.45 IDLER BELLCRANK REMOVAL/INSTALLATION – continued

11.89.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (14).

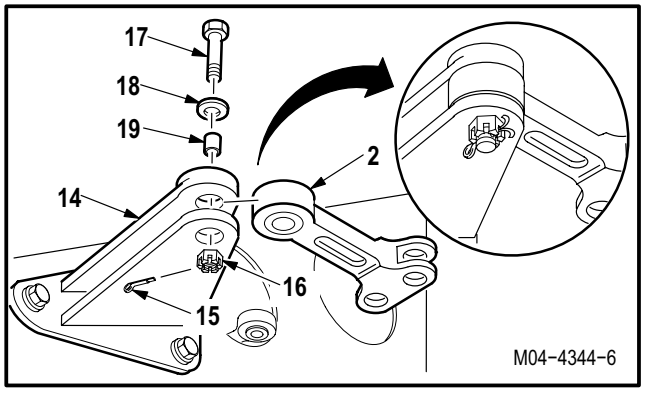
(2) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

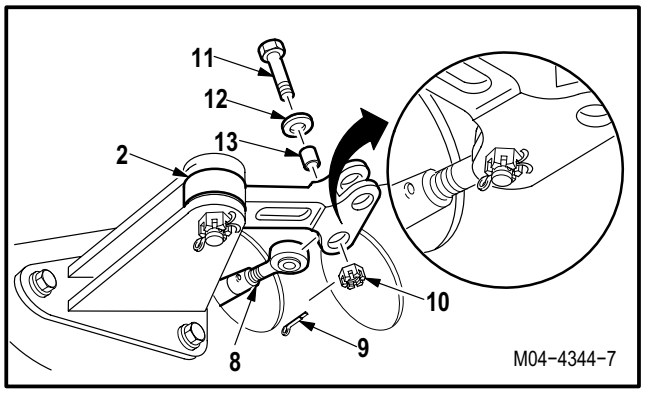
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.89. CPG TO PILOT CONTROL LATERAL F.S. 83.45 IDLER BELLCRANK REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

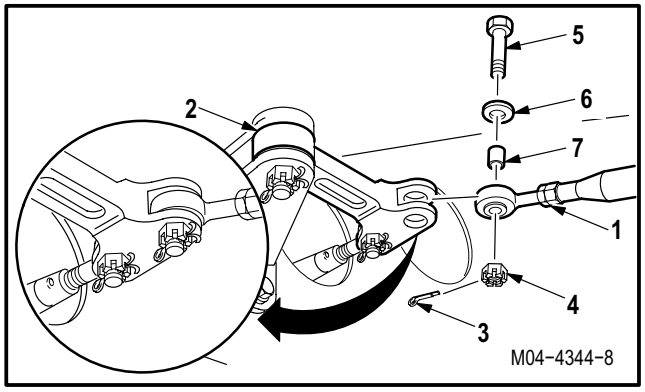
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install access covers B80L and B85L** (para 2.2)**.**

END OF TASK

11.90. LATERAL F.S. 83.45 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.90.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.90.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

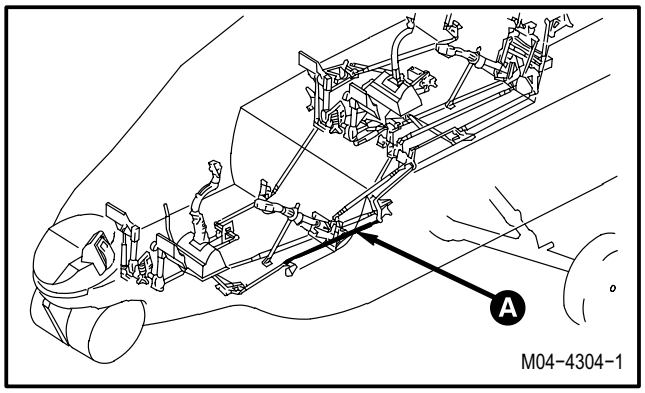
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access covers B80L and B85L removed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.90.3. Removal

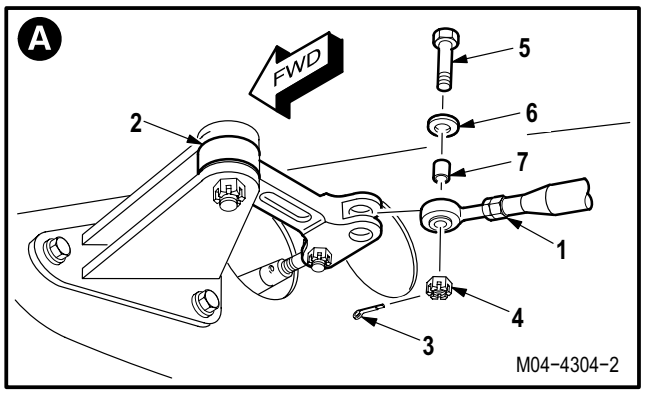
a. **Remove push-pull rod assembly (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1) from bellcrank (2).



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11.90. LATERAL F.S. 83.45 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

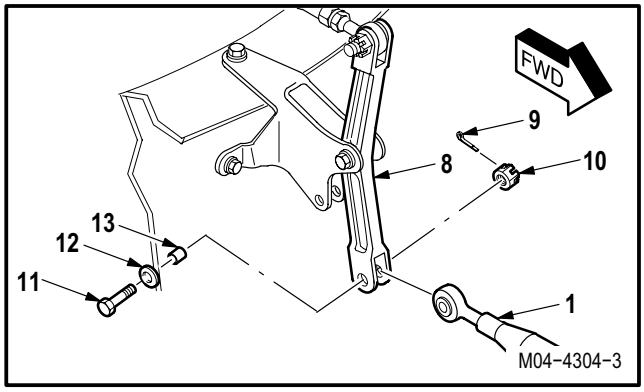
b. **Remove rod (1) from bellcrank (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (1).



11.90.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.90.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.90. LATERAL F.S. 83.45 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.90.6. Installation

CAUTION

To prevent damage to flight control components, do not use force in alining rod with bellcrank.

a. **Install rod (1) on bellcrank (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (8).

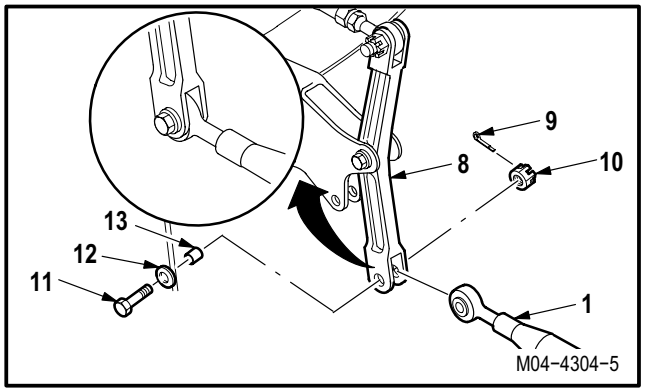
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (8), and rod (1).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.90. LATERAL F.S. 83.45 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install adjustable end of rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

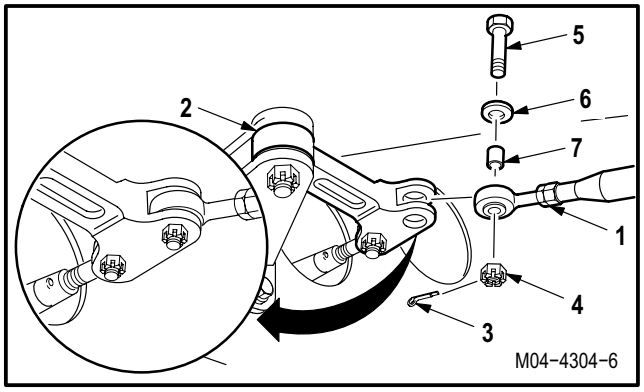
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install access covers B80L and B85L** (para 2.2)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.91. CPG TO PILOT LATERAL CONTROL F.S. 83.45 SUPPORT BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.91.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.91.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin

Personnel Required:

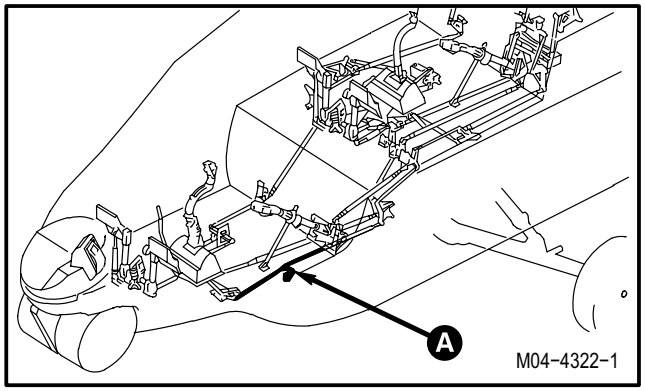
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access covers B80L and B85L removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.91. CPG TO PILOT LATERAL CONTROL F.S. 83.45 SUPPORT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.91.3. Removal

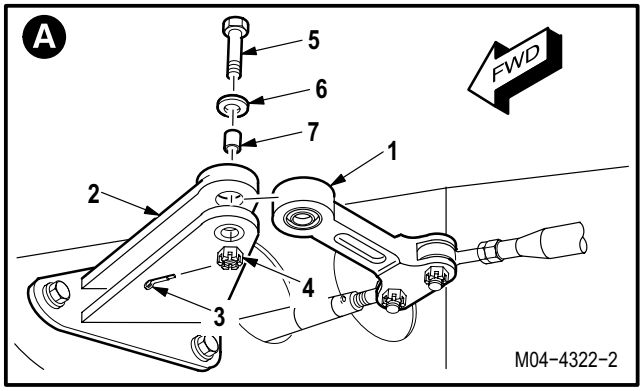
a. **Remove bellcrank (1) from bracket assembly (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7) from bracket (2) and bellcrank (1).

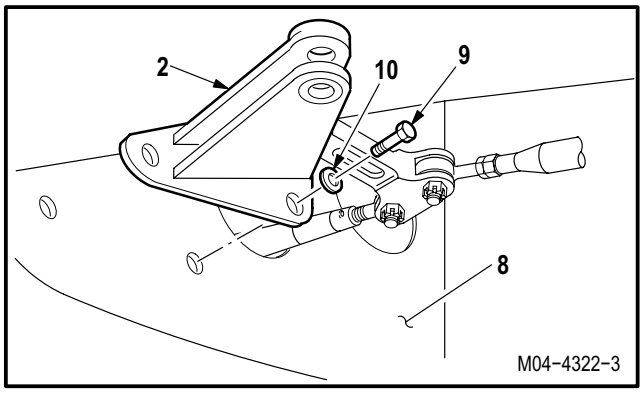
(4) Remove bellcrank (1) from bracket (2).



b. **Remove bracket (2) from airframe (8).**

(1) Remove three bolts (9) and washers (10).

(2) Remove bracket (2).



11.91.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.91.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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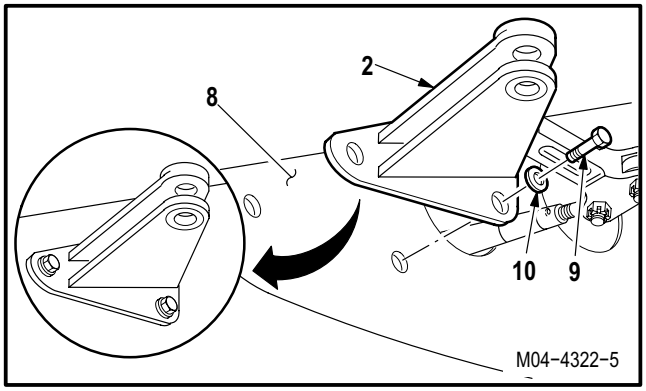
11.91. CPG TO PILOT LATERAL CONTROL F.S. 83.45 SUPPORT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.91.6. Installation

a. **Install bracket (2) on airframe (8).**

(1) Aline three holes in bracket (2) with holes in airframe (8).

(2) Install three bolts (9) through washers (10), bracket (2), and airframe (8).



CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

b. **Install bellcrank (1) on bracket (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (1) with bracket (2).

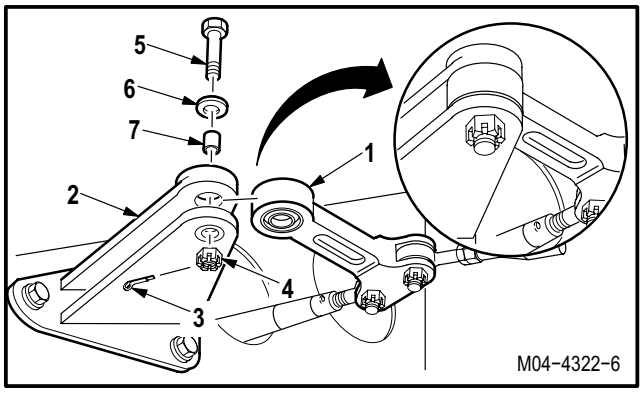
(2) Install bolt (5) through washer (6), bushing (7), bracket (2), and bellcrank (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install access covers B80L and B85L** (para 2.2)**.**

END OF TASK

11.92. CPG TO PILOT CONTROL LATERAL F.S. 111.50 BELLCRANK REMOVAL/INSTALLATION

11.92.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.92.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (3)

Personnel Required:

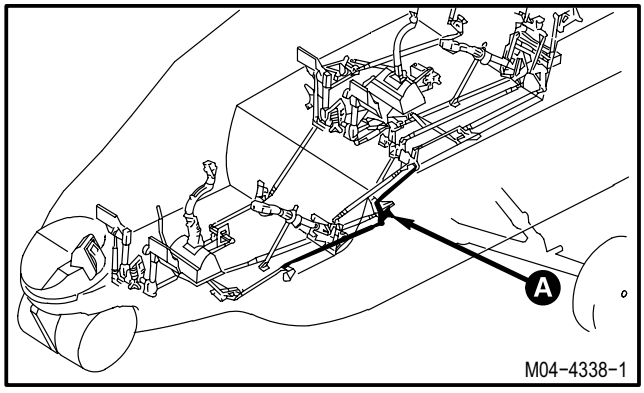
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.92.3. Removal

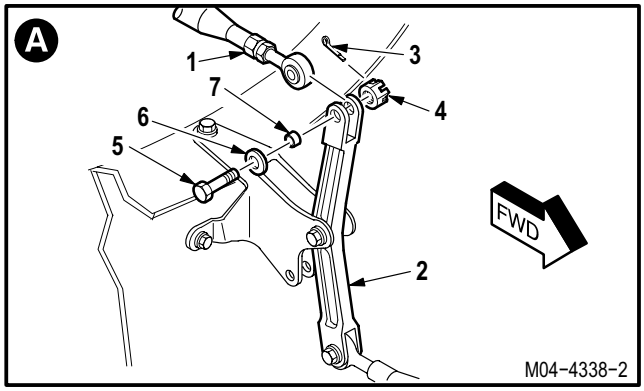
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1) from bellcrank (2).



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11.92. CPG TO PILOT CONTROL LATERAL F.S. 111.50 BELLCRANK REMOVAL/INSTALLATION – continued

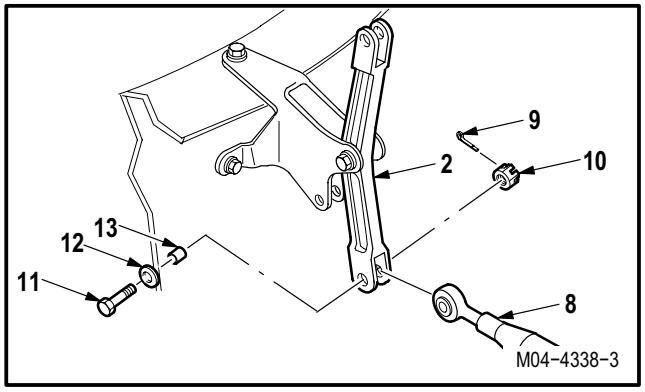
b. **Remove push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (8) from bellcrank (2).



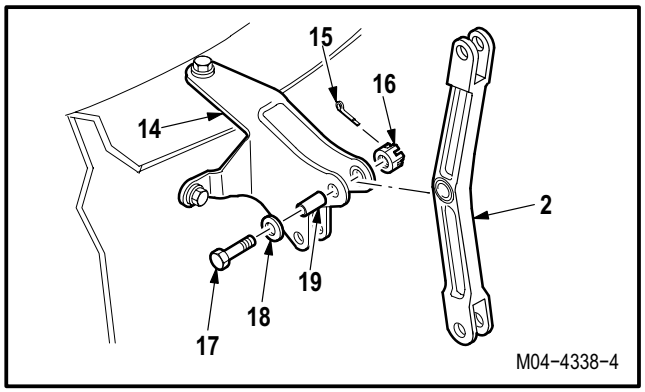
c. **Remove bellcrank (2) from bracket (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17) and washer (18), and bushing (19).

(4) Remove bellcrank (2).



11.92.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.92.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.92. CPG TO PILOT CONTROL LATERAL F.S. 111.50 BELLCRANK REMOVAL/INSTALLATION – continued

11.92.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (14).

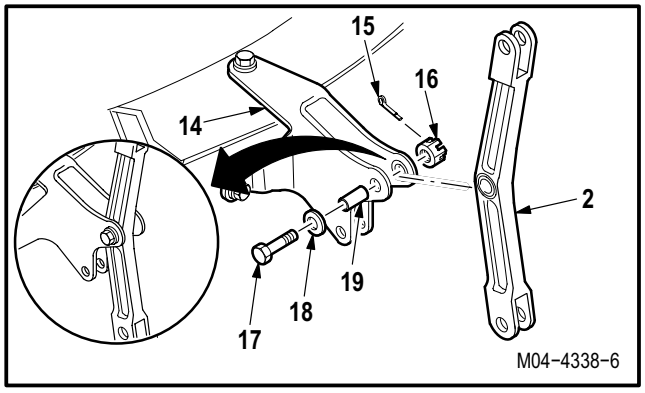
(2) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

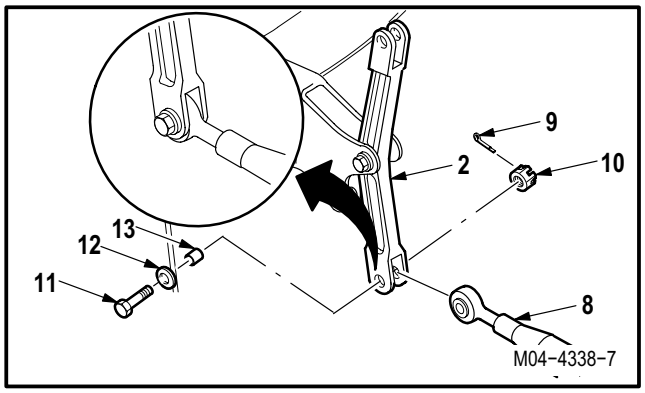
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.92. CPG TO PILOT CONTROL LATERAL F.S. 111.50 BELLCRANK REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

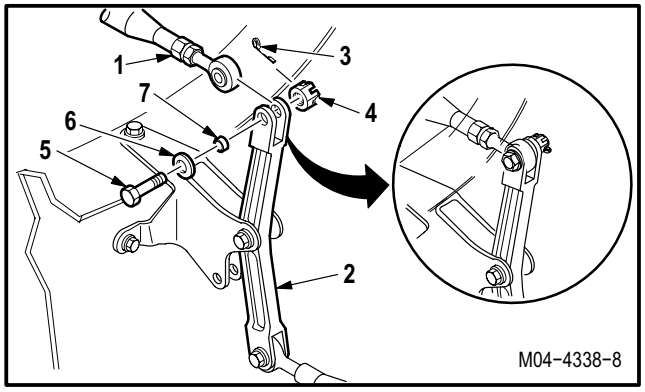
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4).Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.93. LATERAL F.S. 111.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.93.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.93.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

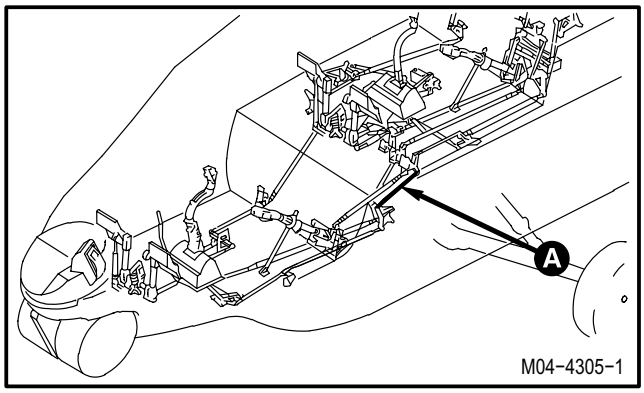
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.93.3. Removal

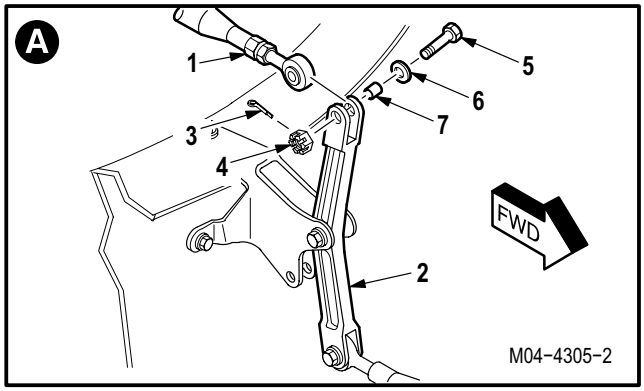
a. **Remove push-pull rod assembly (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1) from bellcrank (2).



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11.93. LATERAL F.S. 111.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

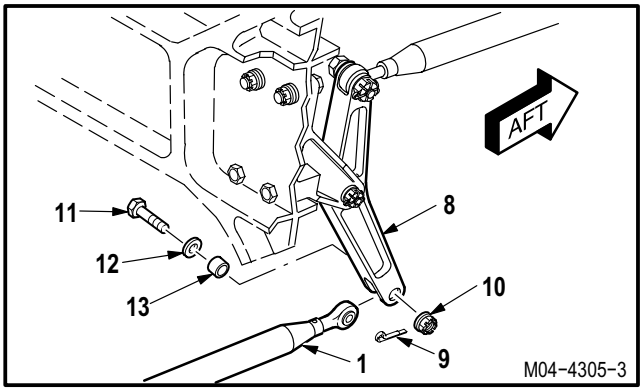
b. **Remove rod (1) from bellcrank (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (1).



11.93.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.93.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.93. LATERAL F.S. 111.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.93.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install rod (1) on bellcrank (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (8).

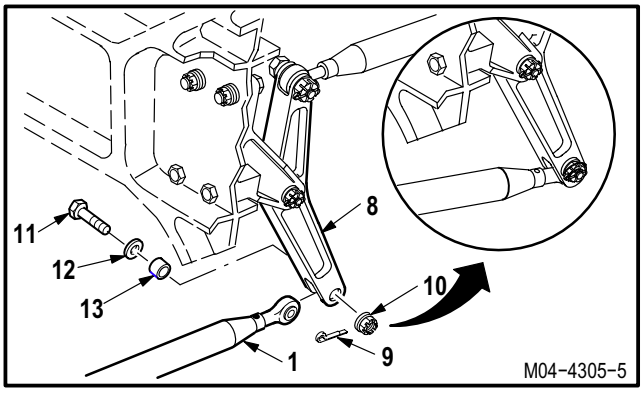
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (8), and rod (1).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.93. LATERAL F.S. 111.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install adjustable end of rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

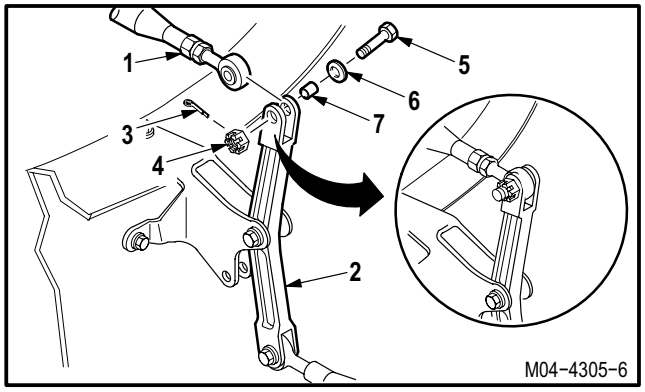
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.94. CPG TO PILOT LATERAL F.S. 111.50 BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.94.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.94.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

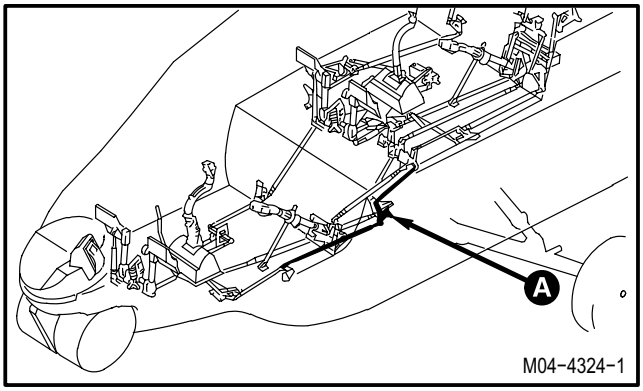
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.94.3. Removal

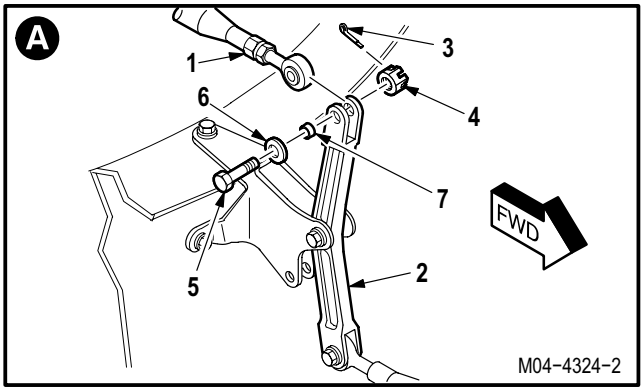
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.94. CPG TO PILOT LATERAL F.S. 111.50 BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

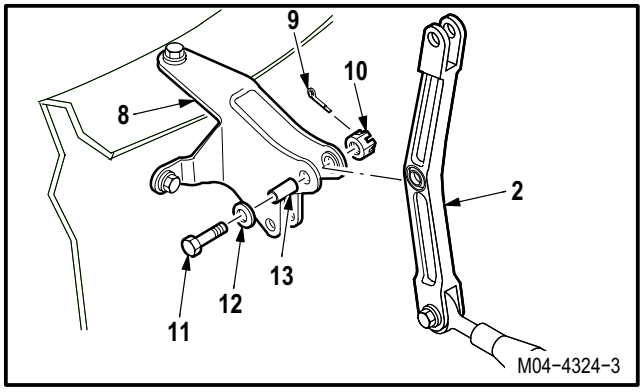
b. **Remove bellcrank (2) from bracket assembly (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13) from bracket (8) and bellcrank (2).

(4) Remove bellcrank (2) from bracket (8).

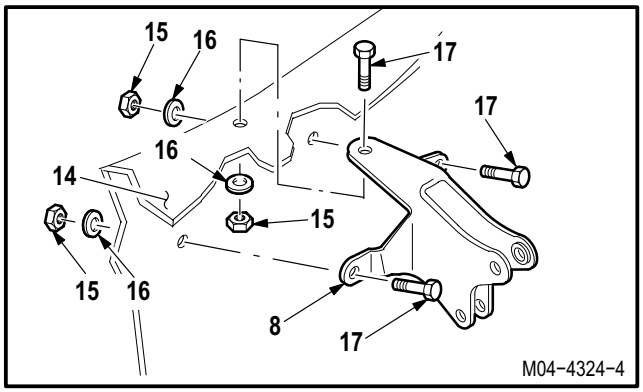


c. **Remove bracket (8) from airframe (14).**

(1) Remove three nuts (15) and washers (16).

(2) Remove three bolts (17).

(3) Remove bracket (8).



11.94.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.94.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.94. CPG TO PILOT LATERAL F.S. 111.50 BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

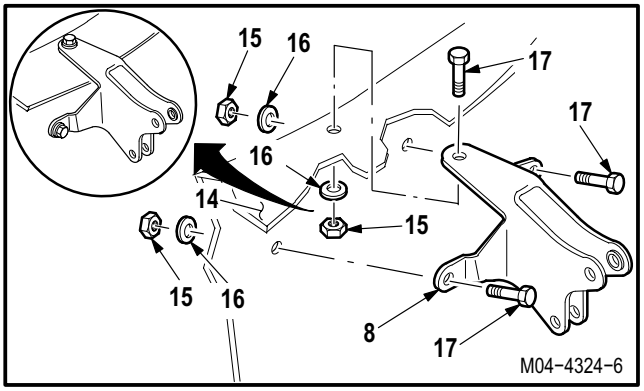
11.94.6. Installation

a. **Install bracket (8) on airframe (14).**

(1) Aline bracket (8) with airframe (14).

(2) Install three bolts (17) through bracket (8) and airframe (14).

(3) Install three washers (16) and nuts (15).



CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bellcrank (2) on bracket (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (8).

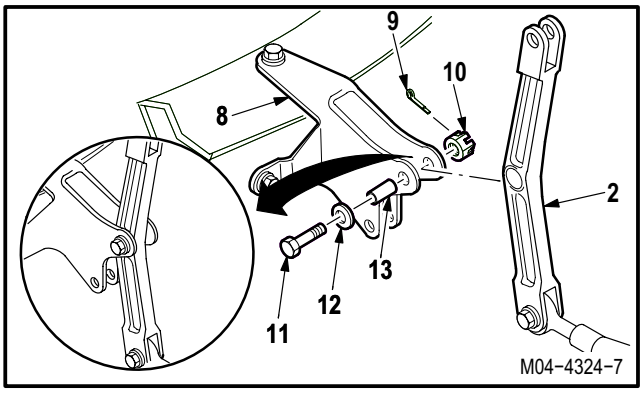
(2) Install bolt (11) through washer (12), bushing (13), bracket (8), and bellcrank (2).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.94. CPG TO PILOT LATERAL F.S. 111.50 BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

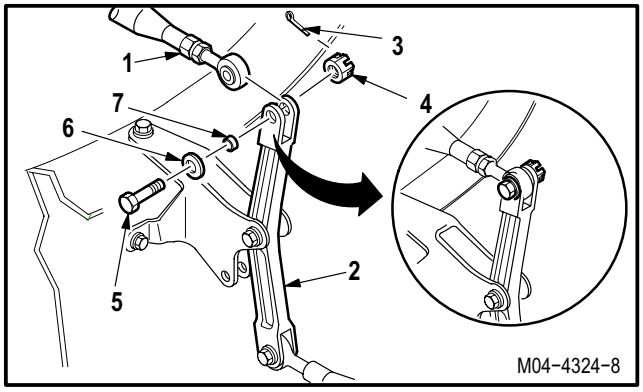
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.95. CPG TO PILOT CONTROL LATERAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION

11.95.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.95.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (3)

Personnel Required:

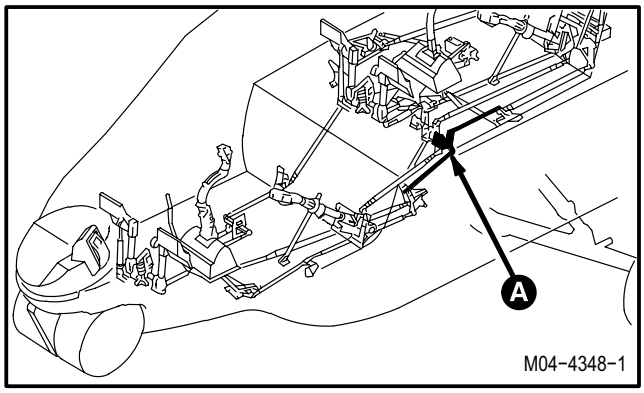
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.95.3. Removal

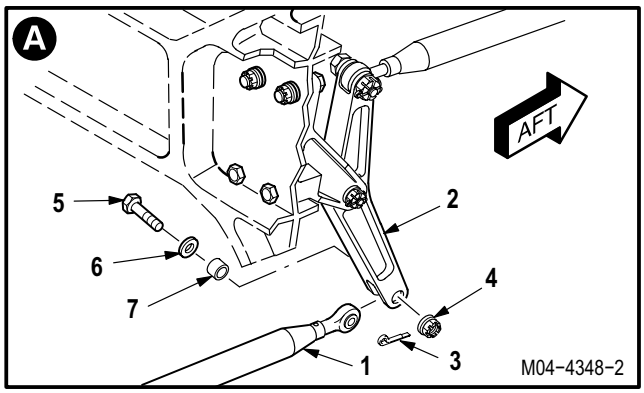
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.95. CPG TO PILOT CONTROL LATERAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

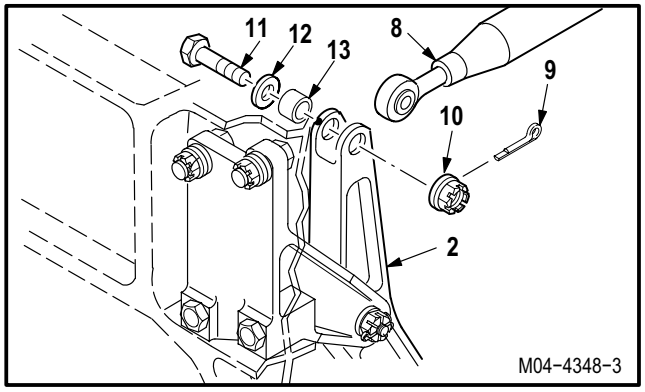
b. **Remove push pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (8).



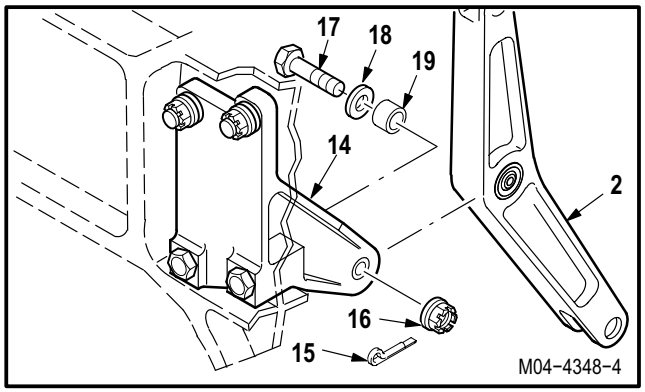
c. **Remove bellcrank (2) from bracket (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove bellcrank (2).



11.95.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.95.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.95. CPG TO PILOT CONTROL LATERAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

11.95.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (14).

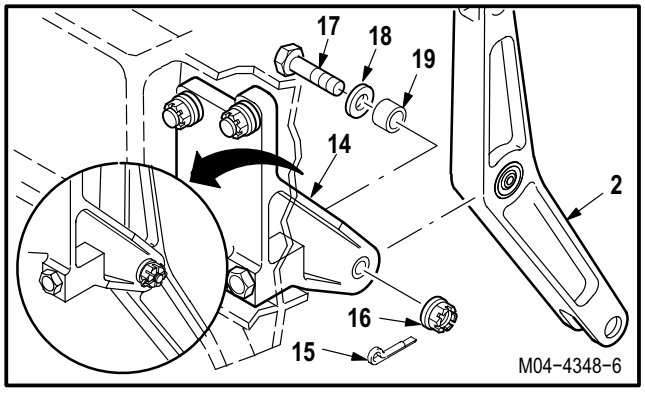
(2) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



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11.95. CPG TO PILOT CONTROL LATERAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

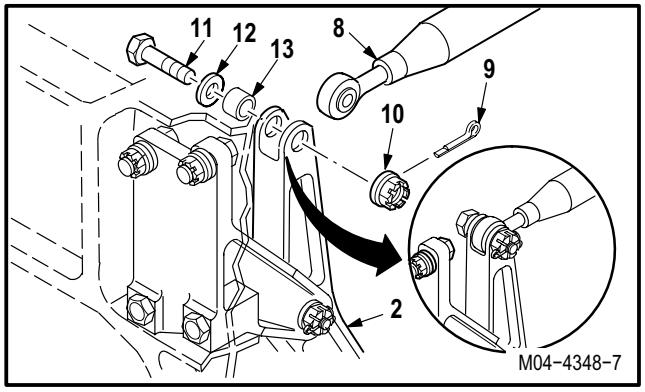
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

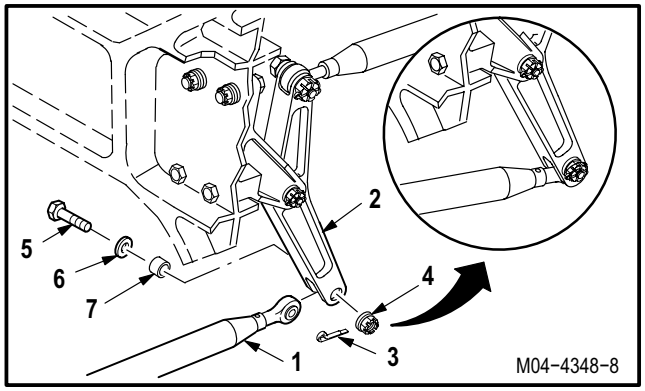
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.96. LATERAL F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.96.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.96.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (2)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

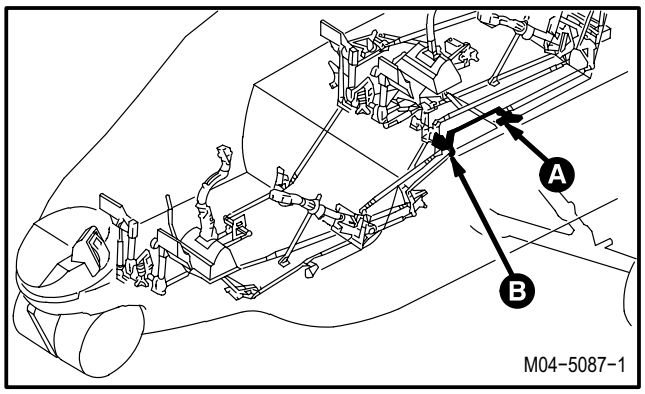
TM 1-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access fairing L140 removed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed, ammunition conveyor forward of left main landing gear leg disconnected

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

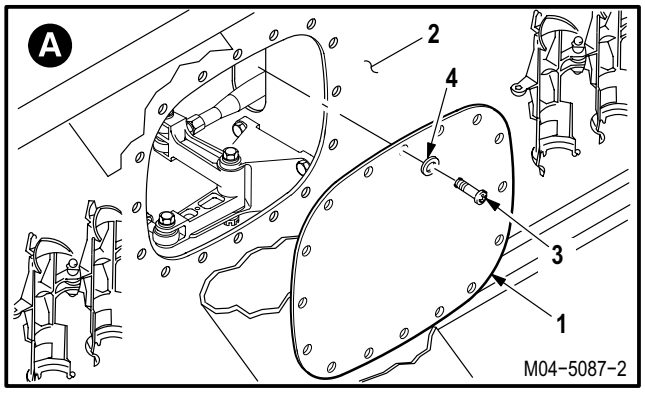


11.96.3. Removal

a. **Remove lateral decoupler access cover (1) from airframe (2).**

(1) Remove 15 screws (3) and washers (4).

(2) Remove cover (1).



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11.96. LATERAL F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

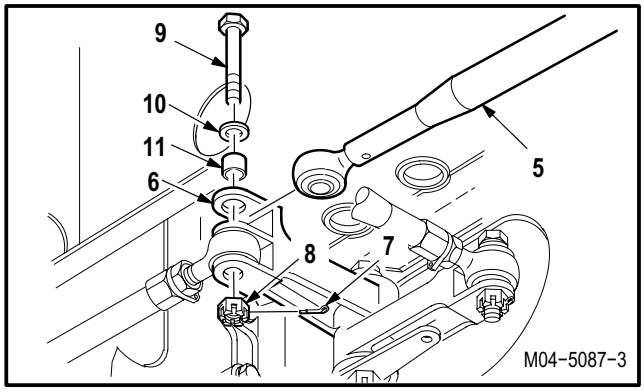
b. **Remove lateral push-pull rod (5) from bellcrank (6).**

(1) Remove and discard cotter pin (7).

(2) Remove nut (8).

(3) Remove bolt (9), washer (10), and bushing (11).

(4) Remove rod (5) from bellcrank (6).



c. **Remove lateral push-pull rod (5) from bellcrank (12).**

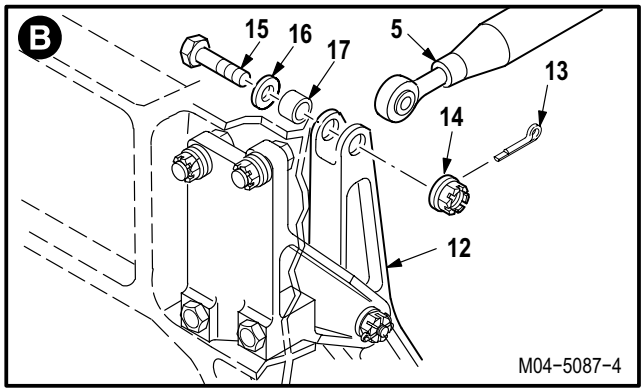
(1) Remove and discard cotter pin (13).

(2) Remove nut (14).

(3) Remove bolt (15), washer (16), and bushing (17) from bellcrank (12) and rod (5).

(4) Remove rod (5) from bellcrank (12).

(5) Remove rod (5).



11.96.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.96.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.96. LATERAL F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.96.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install rod (5) on bellcrank (12).** Torque nut (14) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (5) with bellcrank (12).

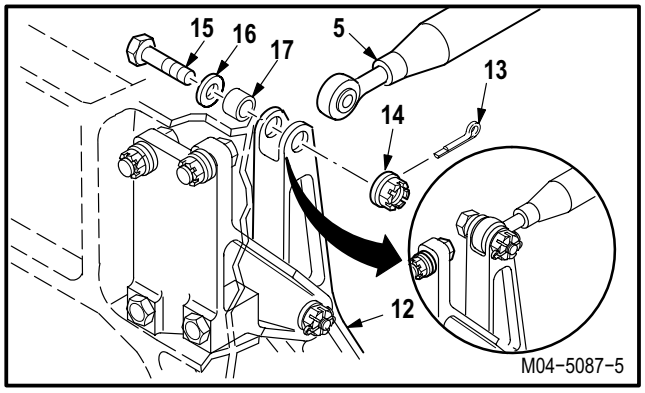
(2) Install bolt (15) through washer (16), bushing (17), bellcrank (12), and rod end (5).

(3) Check fit of self-retaining bolt (15) (para 11.1).

(4) Install nut (14). Torque nut (14) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (13).



b. **Install rod (5) on bellcrank (6).** Torque nut (8) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (5) with bellcrank (6).

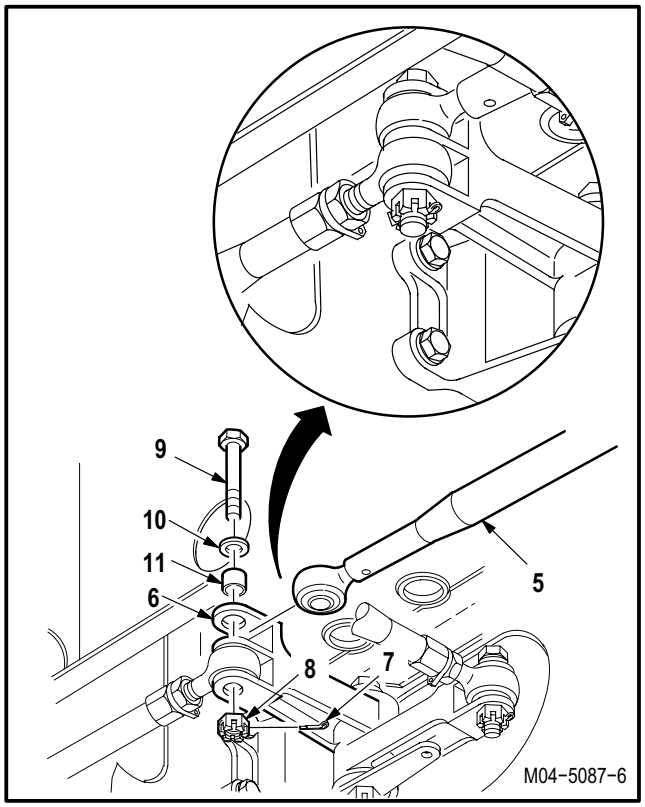
(2) Install bolt (9) through washer (10), bushing (11), bellcrank (6), and rod end (5).

(3) Check fit of self-retaining bolt (9) if required (para 11.1).

(4) Install nut (8). Torque nut (8) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (7).



c. **Inspect (QA).**

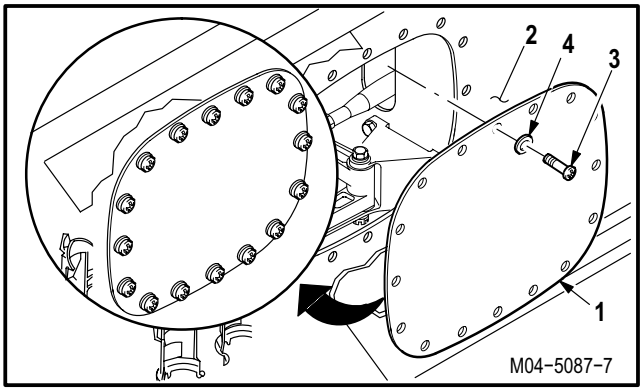
GO TO NEXT PAGE

11.96. LATERAL F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

d. **Install cover (1) on airframe (2).**

(1) Aline holes in cover (1) with holes in airframe (2).

(2) Install 15 screws (3) and washers (4).



e. **Inspect (QA).**

f. **Install flex chute on area weapon** (TM 9-1090-208-23)**.**

g. **Reconnect ammunition conveyor** (TM 9-1090-208-23)**.**

h. **Install turret** (TM 9-1090-208-23)**.**

i. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

j. **Install access fairing L140** (para 2.2)**.**

END OF TASK

11.97. CPG TO PILOT LATERAL F.S. 118.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.97.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.97.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

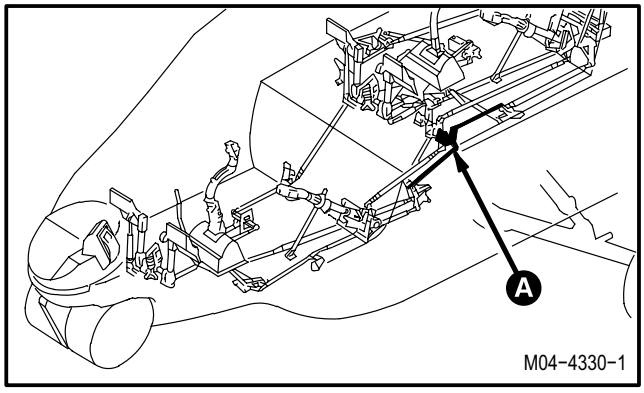
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.97.3. Removal

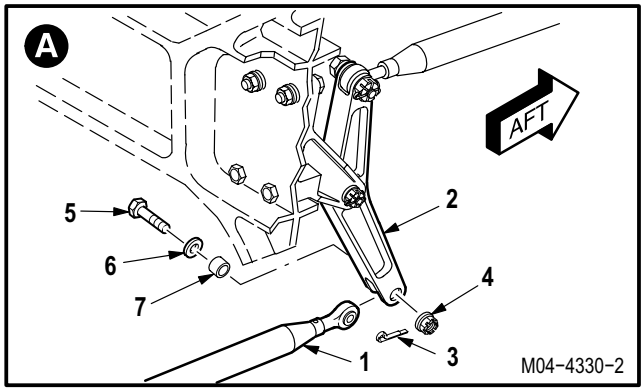
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.97. CPG TO PILOT LATERAL F.S. 118.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

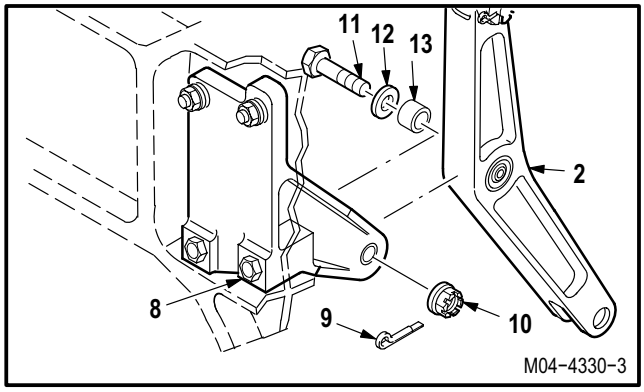
b. **Remove bellcrank (2) from bracket assembly (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13) from bracket (8) and bellcrank (2).

(4) Remove bellcrank (2).



NOTE

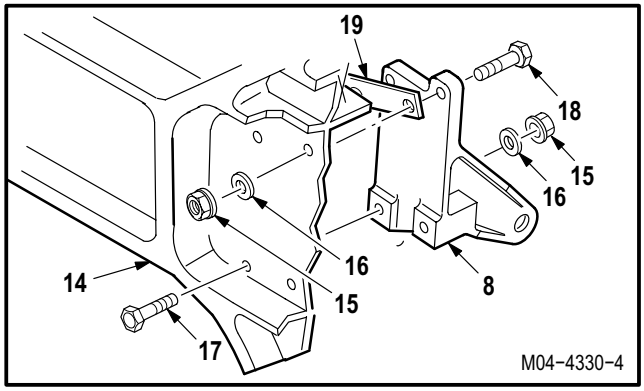
A laminated spacer is installed between the bracket and the airframe. Use care when removing the bracket to prevent the spacer from delaminating.

c. **Remove bracket (8) from airframe (14).**

(1) Remove four nuts (15) and washers (16).

(2) Remove two bolts (17) and two bolts (18).

(3) Remove bracket (8) and spacer (19).



11.97.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.97.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.97. CPG TO PILOT LATERAL F.S. 118.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.97.6. Installation

NOTE

Install the laminated spacer between the bracket and the airframe. Adjust thickness of the laminated spacer to obtain minimum **0.010 INCH** clearance from any structure.

a. **Install bracket (8) on airframe (14).**

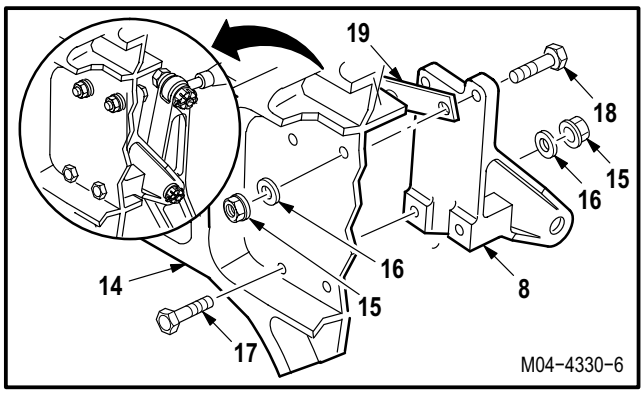
(1) Aline bracket (8) with airframe (14).

(2) Install two bolts (18) through bracket (8), spacer (19), and airframe (14).

(3) Install two bolts (17) through airframe (14) and bracket (8).

(4) Install four washers (16) and nuts (15).

(5) Verify minimum clearance of **0.010 INCH** is maintained between bracket (8) and any structure.



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11.97. CPG TO PILOT LATERAL F.S. 118.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bellcrank (2) on bracket (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (8).

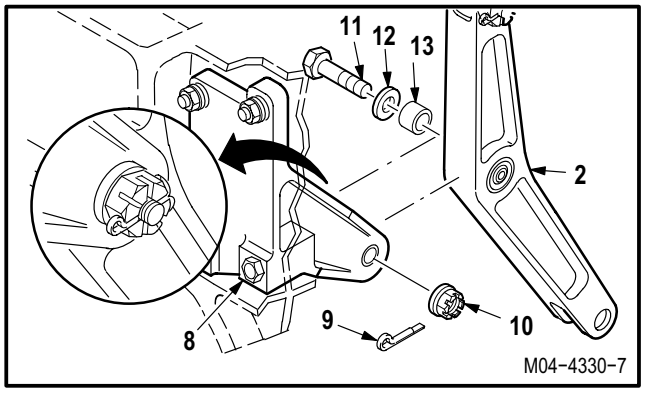
(2) Install bolt (11) through washer (12), bushing (13), bracket (8), and bellcrank (2).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.97. CPG TO PILOT LATERAL F.S. 118.50 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

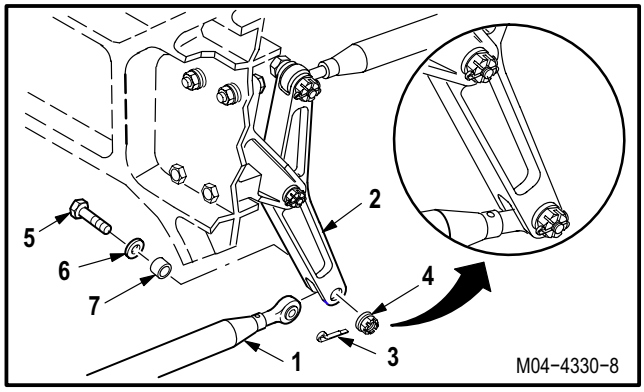
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4).Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.98. PILOT CYCLIC LATERAL PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.98.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.98.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (2)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

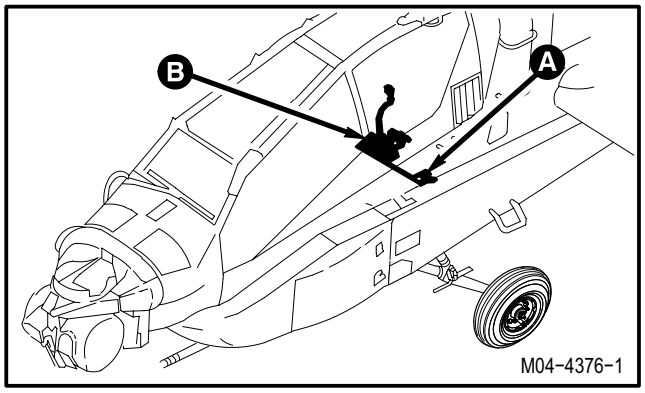
TM 9-1090-208-23
TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.46	Pilot cyclic stick cover removed
2.2	Access fairing L140 removed
TM 9-1090-208-23	Flex chute disconnected from area weapon
TM 9-1090-208-23	Ammunition conveyor forward of left main landing gear leg disconnected

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

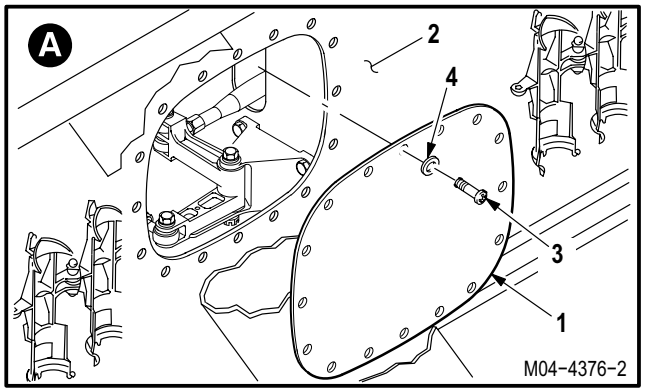


11.98.3. Removal

a. **Remove lateral decoupler access cover (1) from airframe (2).**

(1) Remove 15 screws (3) and washers (4).

(2) Remove cover (1).



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11.98. PILOT CYCLIC LATERAL PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

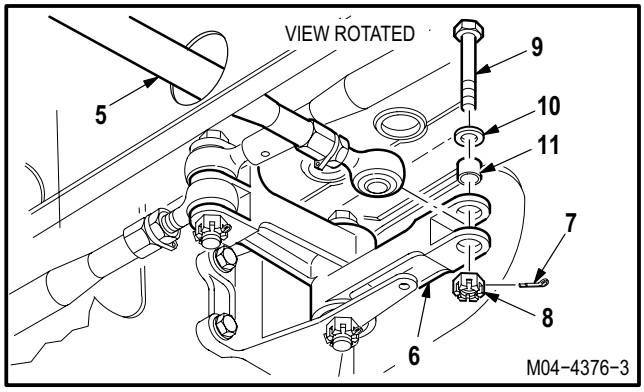
b. **Remove push-pull rod assembly (5) from bellcrank (6).**

(1) Remove and discard cotter pin (7).

(2) Remove nut (8).

(3) Remove bolt (9), washer (10), and bushing (11).

(4) Remove rod (5).



c. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

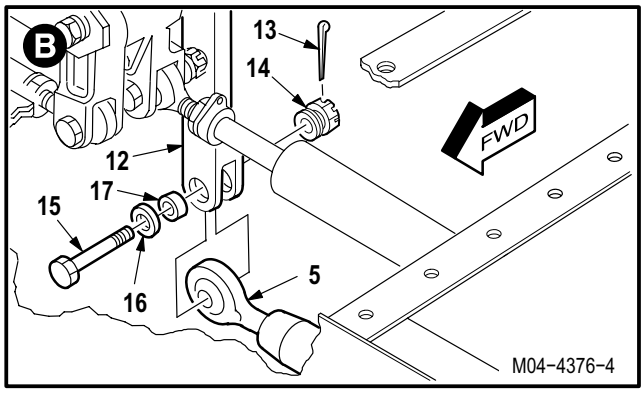
d. **Remove rod (5) from cyclic stick arm (12).**

(1) Remove and discard cotter pin (13).

(2) Remove nut (14).

(3) Remove bolt (15), washer (16), and bushing (17).

(4) Remove rod (5).



11.98.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.98.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.98. PILOT CYCLIC LATERAL PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.98.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install non-adjustable end of rod (5) on arm (12).** Torque nut (14) **30 to 40 INCH-POUNDS**.

(1) Aline rod (5) with arm (12).

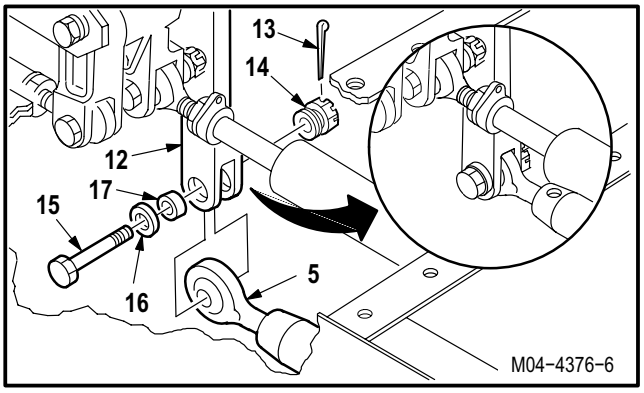
(2) Install bolt (15) through washer (16), bushing (17), arm (12), and rod (5).

(3) Check fit of self-retaining bolt (15) (para 11.1).

(4) Install nut (14). Torque nut (14) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (13).



b. **Install adjustable end of rod (5) on bellcrank (6).** Torque nut (8) **30 to 40 INCH-POUNDS**.

(1) Aline rod (5) with bellcrank (6).

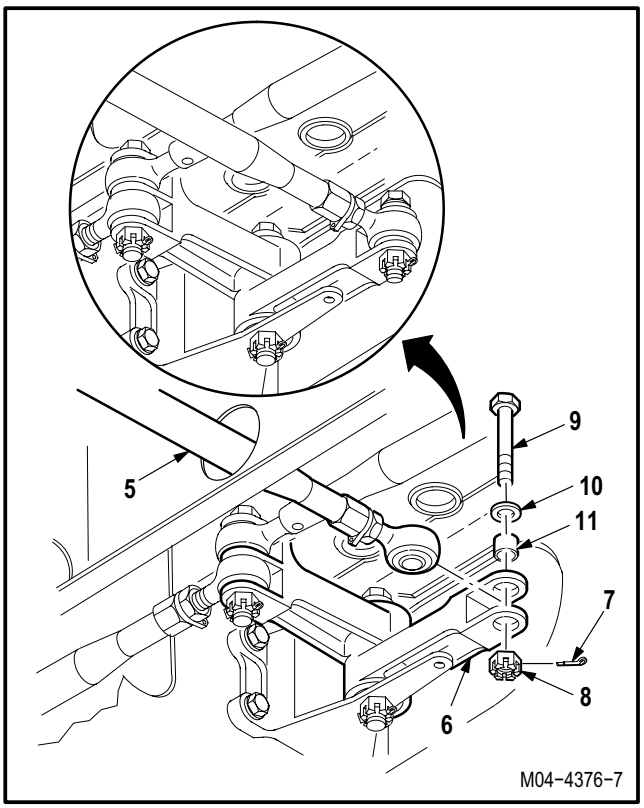
(2) Install bolt (9) through washer (10), bushing (11), bellcrank (6), and rod (5).

(3) Check fit of self-retaining bolt (9) (para 11.1).

(4) Install nut (8). Torque nut (8) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (7).



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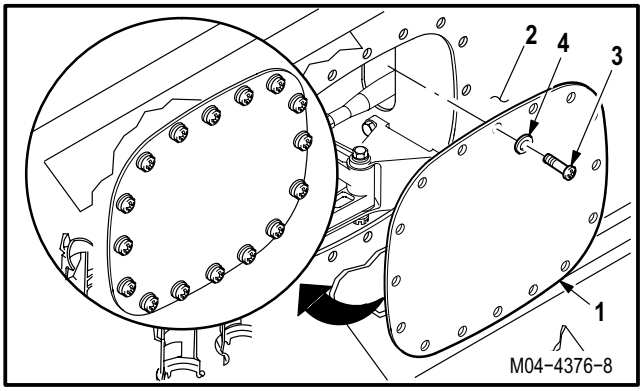
11.98. PILOT CYCLIC LATERAL PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Inspect (QA).**

d. **Install cover (1) on airframe (2).**

(1) Aline holes in cover (1) with holes in airframe (2).

(2) Install 15 screws (3) and washers (4).



e. **Connect ammunition conveyor** (TM 9-1090-208-23)**.**

f. **Connect flex chute on area weapon** (TM 9-1090-208-23)**.**

g. **Perform lateral flight control rigging maintenance operation check** (TM 1-1520-238-T)**.**

h. **Install access fairing L140** (para 2.2)**.**

i. **Install pilot cyclic stick cover** (para 11.46)**.**

END OF TASK

11.99. LATERAL F.S. 132.84 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.99.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.99.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

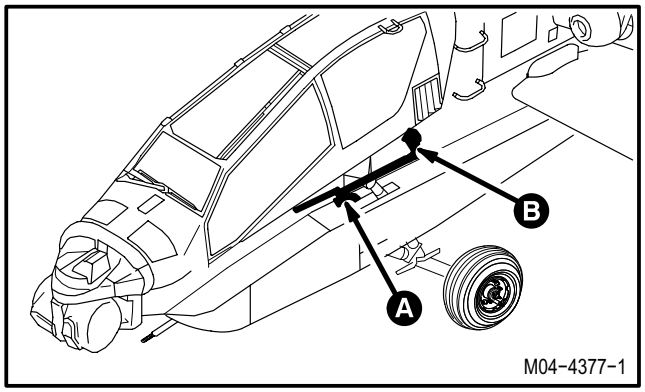
Cotter pin (2)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
10.52A	Forward fuel cell retainer panel removed (if installed)
1.72	External primary hydraulic power applied
11.46	Pilot cyclic stick cover removed



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11.99. LATERAL F.S. 132.84 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

11.99.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

CAUTION

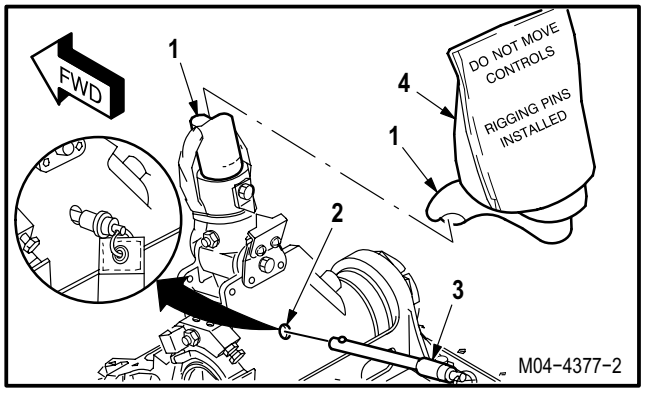
- To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.
- To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

b. **Slowly move pilot cyclic stick (1) to aline lateral rig pin hole (2) in cyclic stick support.**

(1) Install -5 rig pin (3) in hole (2).

c. **Remove external primary hydraulic power** (para 1.72)**.**

d. **Install cyclic stick warning cover (4).**



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11.99. LATERAL F.S. 132.84 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

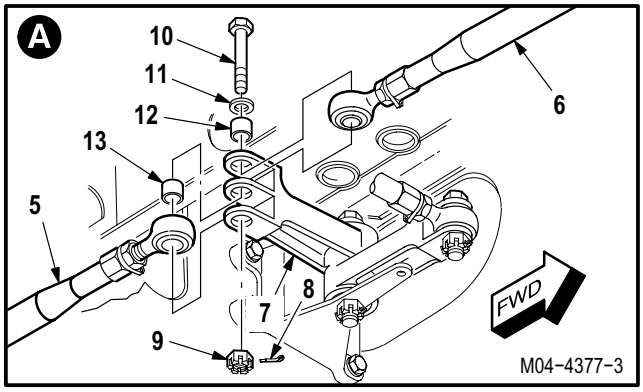
e. **Remove push-pull rod assembly (5) and (6) from bellcrank (7).**

(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10), washer (11), and bushings (12) and (13).

(4) Remove rods (5) and (6) from bellcrank (7).



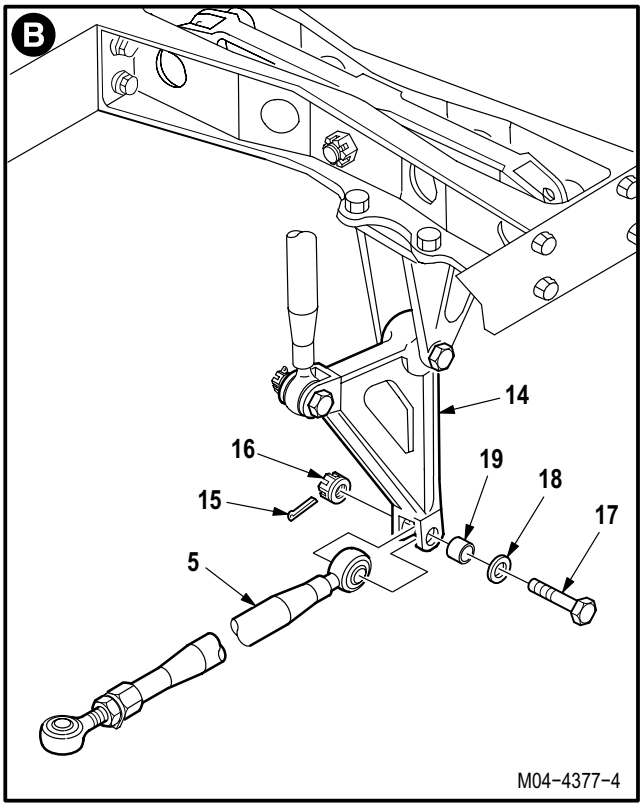
f. **Remove rod (5) from bellcrank (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushings (19).

(4) Remove rod (5).



11.99.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.99.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.99. LATERAL F.S. 132.84 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.99.6. Installation

CAUTION

- To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.
- To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install rod (5) on bellcrank (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

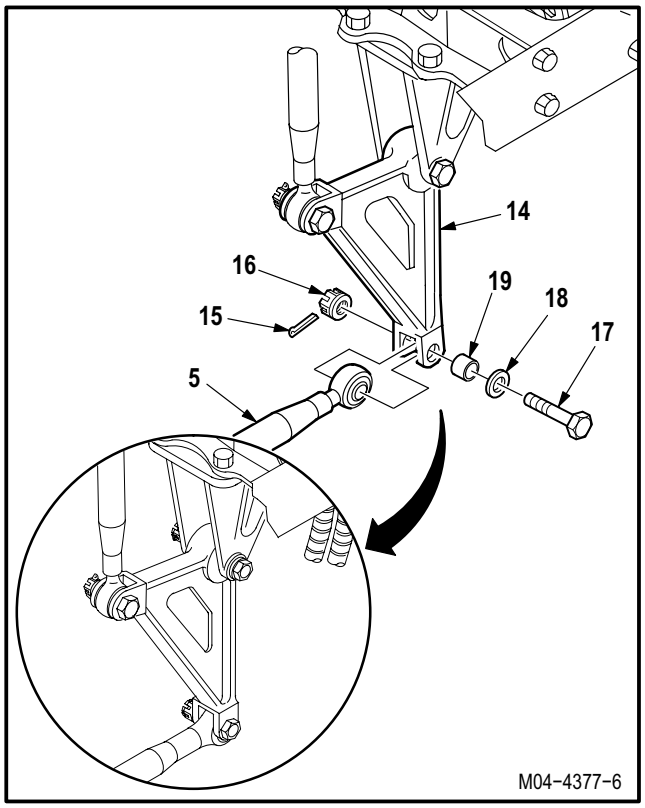
(1) Install bolt (17) through washer (18), bushing (19), bellcrank (14), and rod (5).

(2) Check fit of self-retaining bolt (17) (para 11.1).

(3) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(4) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(5) Install new cotter pin (15).



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11.99. LATERAL F.S. 132.84 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install adjustable end of rod (5) and (6) on bellcrank (7).** Torque nut (9) **30 to 40 INCH-POUNDS**.

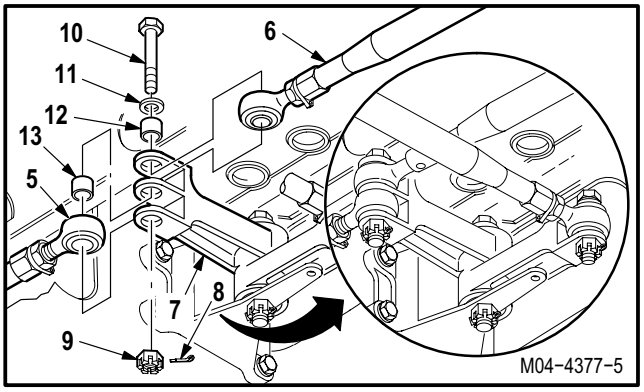
(1) Install bolt (10) through washer (11), bushing (12), bellcrank (7), rod (6), bushing (13), and rod (5).

(2) Check fit of self-retaining bolt (10) (para 11.1).

(3) Install nut (9). Torque nut (9) to **30 INCH-POUNDS**. Use torque wrench.

(4) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(5) Install new cotter pin (8).



c. **Inspect (QA).**

d. **Remove -5 rig pin (3) from hole (2).**

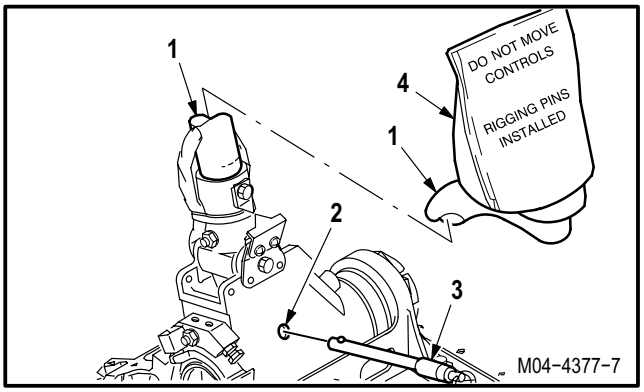
e. **Remove cover (4) from stick (1).**

f. **Inspect (QA).**

g. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

h. **Perform lateral flight control rigging maintenance operation check** (TM 1-1520-238-T)**.**

i. **Install pilot cyclic stick cover** (para 11.46)**.**



END OF TASK

11.100. LATERAL F.S. 132.84 BELLCRANK REMOVAL/INSTALLATION

11.100.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.100.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (3)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

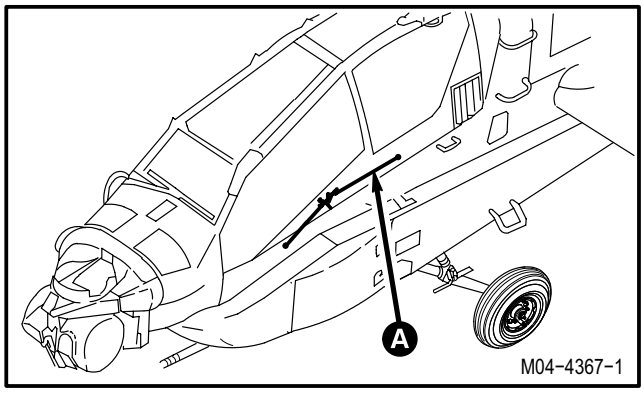
TM 1-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access fairing L140 removed
TM 9-1090-208-23	Flex chute disconnected from area weapon
TM 9-1090-208-23	Ammunition conveyor forward of left main landing gear leg disconnected

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

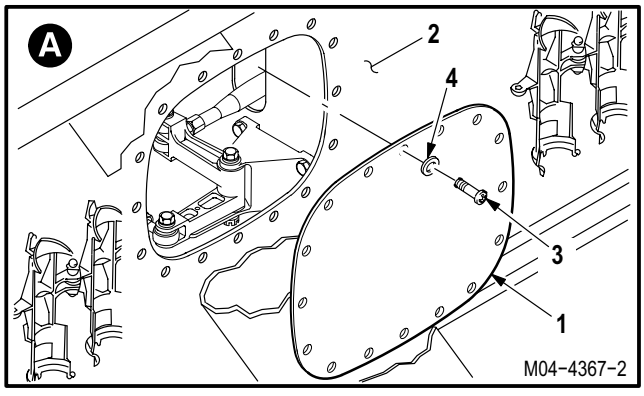


11.100.3. Removal

a. **Remove lateral decoupler access cover (1) from airframe (2).**

(1) Remove 15 screws (3) and washers (4).

(2) Remove cover (1).



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11.100. LATERAL F.S. 132.84 BELLCRANK REMOVAL/INSTALLATION – continued

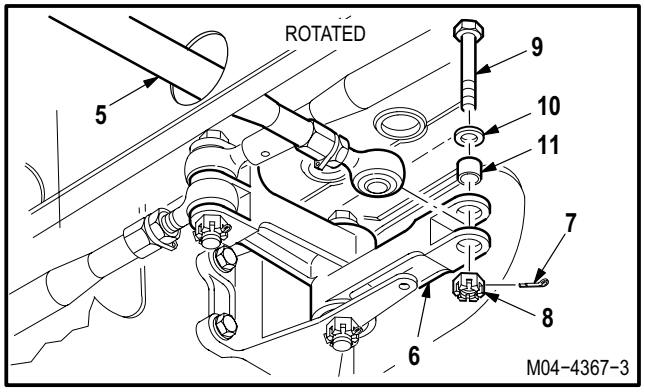
b. **Remove push-pull rod (5) from bellcrank (6).**

(1) Remove and discard cotter pin (7).

(2) Remove nut (8).

(3) Remove bolt (9), washer (10), and bushing (11).

(4) Remove rod (5) from bellcrank (6).



c. **Remove push-pull rods (12) and (13) from bellcrank (6).**

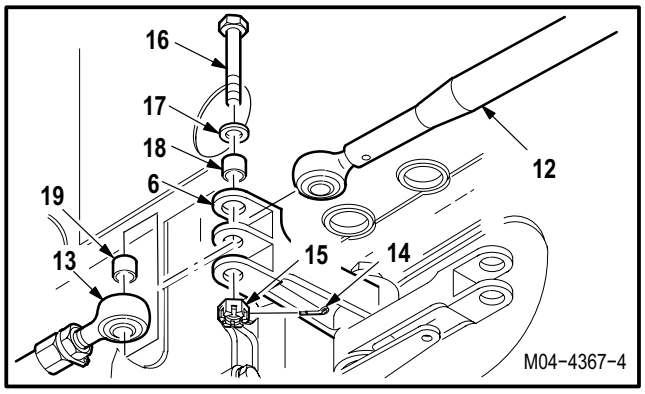
(1) Remove and discard cotter pin (14).

(2) Remove nut (15).

(3) Remove bolt (16), washer (17), and bushing (18).

(4) Remove rod (12) from bellcrank (6).

(5) Remove bushing (19) and rod (13) from bellcrank (6).



d. **Remove bellcrank (6) from bracket (20).**

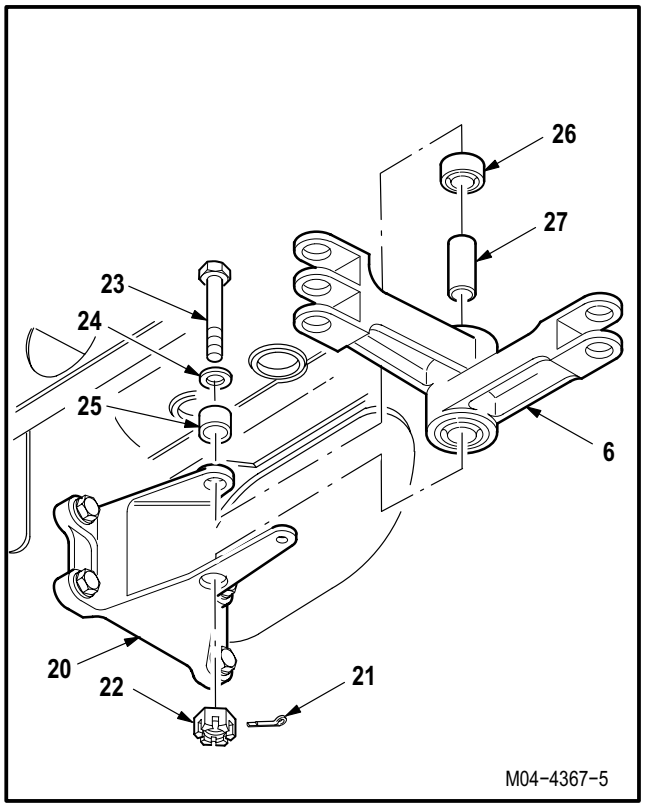
(1) Remove and discard cotter pin (21).

(2) Remove nut (22).

(3) Remove bolt (23), washer (24), and bushing (25).

(4) Remove bellcrank (6).

(5) Remove bearing (26) and bushing (27) from bellcrank (6).



11.100.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

GO TO NEXT PAGE

11.100. LATERAL F.S. 132.84 BELLCRANK REMOVAL/INSTALLATION – continued

11.100.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.100.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install bellcrank (6) on bracket (20).** Torque nut (22) **30 to 40 INCH-POUNDS**.

(1) Install bushing (27) and bearing (26) in bellcrank (6).

(2) Aline bellcrank (6) with bracket (20).

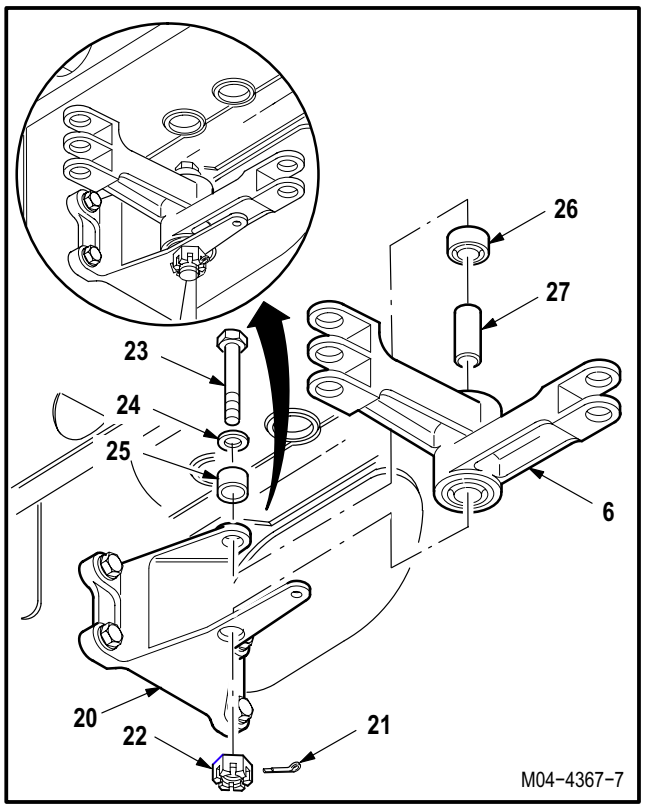
(3) Install bolt (23) through washer (24), bushing (25), bracket (20), and bellcrank (6).

(4) Check fit of self-retaining bolt (23) (para 11.1).

(5) Install nut (22). Torque nut (22) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (21).



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11.100. LATERAL F.S. 132.84 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install rods (13) and (12) on bellcrank (6).** Torque nut (15) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (6).

(2) Install bushing (19).

(3) Aline rod (12) with bellcrank (6).

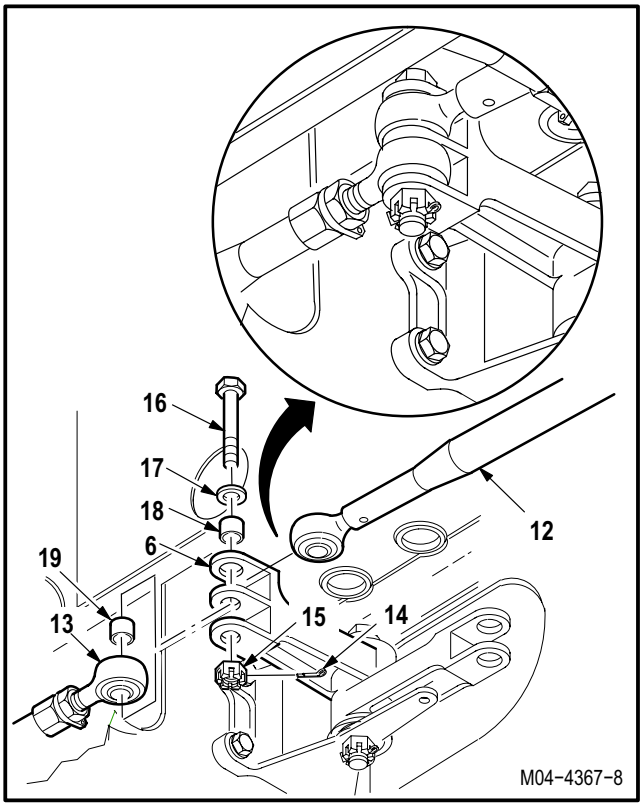
(4) Install bolt (16) through washer (17), bushing (18), bellcrank (6), rod (12), bushing (19), and rod (13).

(5) Check fit of self-retaining bolt (16) (para 11.1).

(6) Install nut (15). Torque nut (15) to **30 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(8) Install new cotter pin (14).



c. **Install rod (5) on bellcrank (6).** Torque nut (8) **30 to 40 INCH-POUNDS**.

(1) Aline rod (5) with bellcrank (6).

(2) Install bolt (9) through washer (10), bushing (11), bellcrank (6), and rod (5).

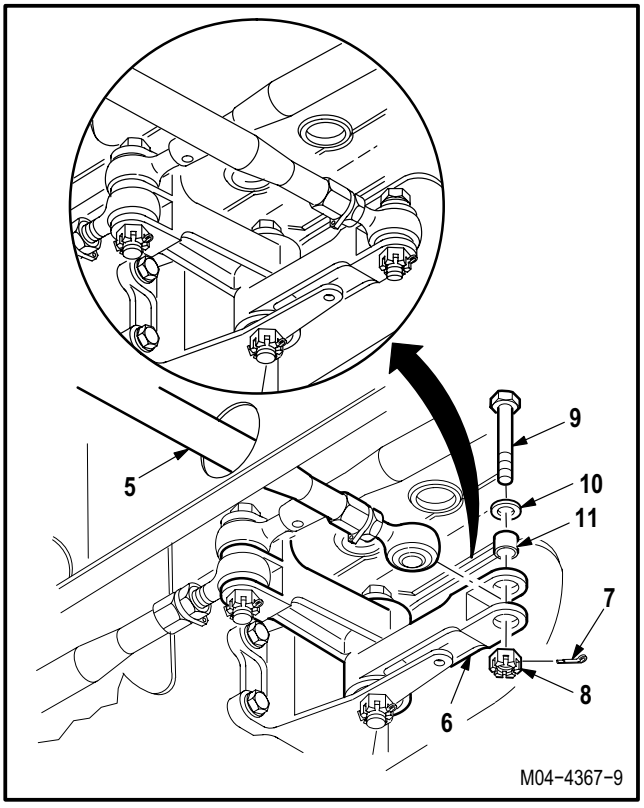
(3) Check fit of self-retaining bolt (9) (para 11.1).

(4) Install nut (8). Torque nut (8) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (7).

d. **Inspect (QA).**



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11.100. LATERAL F.S. 132.84 BELLCRANK REMOVAL/INSTALLATION – continued

e. **Install cover (1) on airframe (2).**

(1) Aline holes in cover (1) with holes in airframe (2).

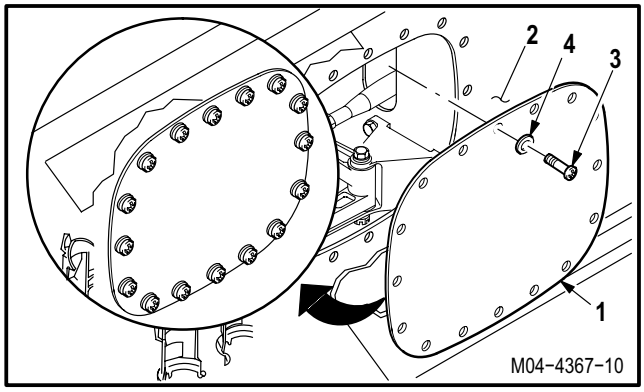
(2) Install 15 screws (3) and washers (4).

f. **Connect ammunition conveyor** (TM 9-1090-208-23)**.**

g. **Connect flex chute on area weapon** (TM 9-1090-208-23)**.**

h. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

i. **Install access fairing L140** (para 2.2)**.**



END OF TASK

11.101. LATERAL F.S. 132.84 FLIGHT BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.101.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.101.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (2)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

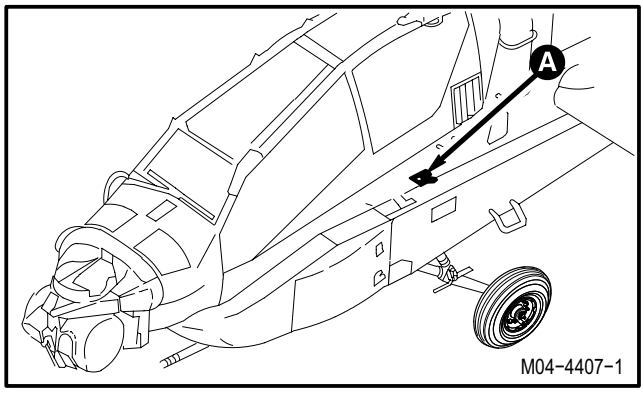
TM 1-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access fairing L140 removed
10.52A	Forward fuel cell retainer panel removed (if installed)
TM 9-1090-208-23	Flex chute disconnected from area weapon
TM 9-1090-208-23	Ammunition conveyor forward of left main landing gear leg disconnected

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

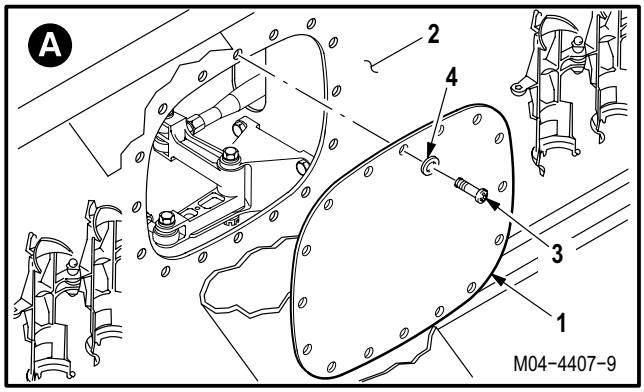


11.101.3. Removal

a. **Remove lateral decoupler access cover (1) from airframe (2).**

(1) Remove 15 screws (3) and washers (4).

(2) Remove cover (1).



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11.101. LATERAL F.S. 132.84 FLIGHT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

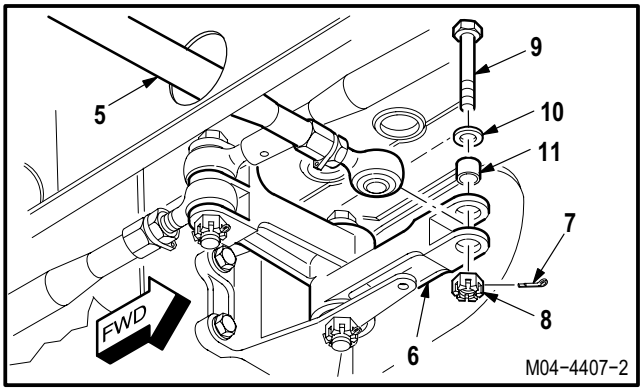
b. **Remove push-pull rod (5) from bellcrank (6).**

(1) Remove and discard cotter pin (7).

(2) Remove nut (8).

(3) Remove bolt (9), washer (10), and bushing (11).

(4) Remove rod (5).



c. **Remove bellcrank (6) from bracket assembly (12).**

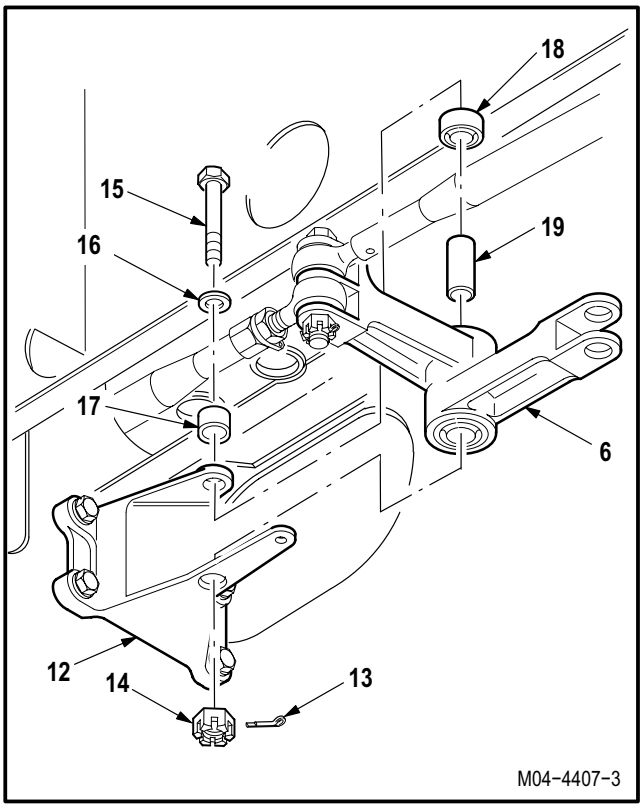
(1) Remove and discard cotter pin (13).

(2) Remove nut (14).

(3) Remove bolt (15), washer (16), and bushing (17) from bracket (12) and bellcrank (6).

(4) Remove bellcrank (6).

(5) Remove bearing (18) and bushing (19) from bellcrank (6).

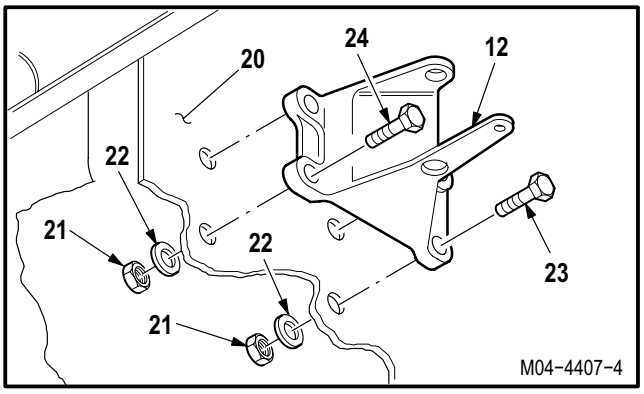


d. **Remove bracket (12) from airframe (20).**

(1) Remove four nuts (21) and washers (22).

(2) Remove bolts (23) and (24).

(3) Remove bracket (12).



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11.101. LATERAL F.S. 132.84 FLIGHT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.101.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.101.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

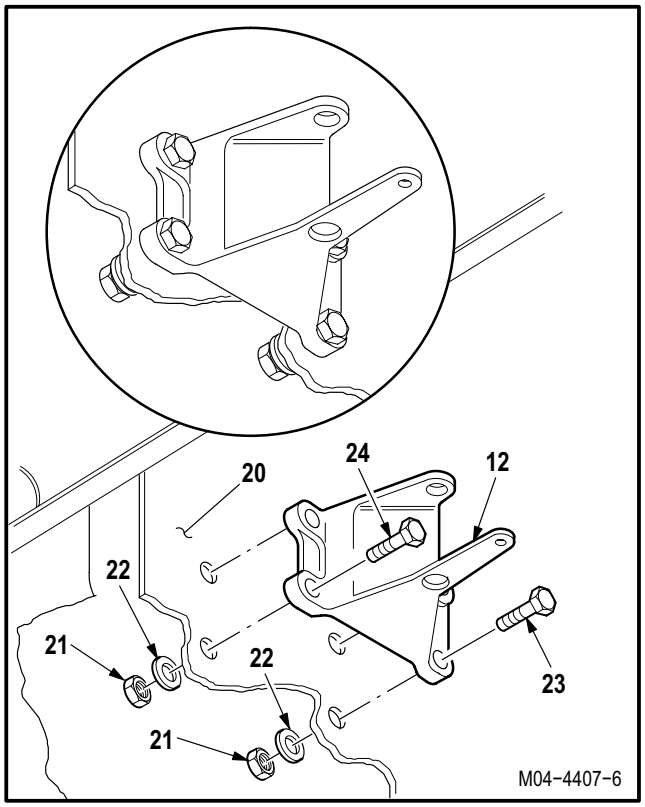
11.101.6. Installation

a. **Install bracket (12) on airframe (20).**

(1) Aline four holes in bracket (12) with holes in airframe (20).

(2) Install bolts (23) and (24) through bracket (12) and airframe (20).

(3) Install four washers (22) and nuts (21).



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11.101. LATERAL F.S. 132.84 FLIGHT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bellcrank (6) on bracket (12).** Torque nut (14) **30 to 40 INCH-POUNDS**.

(1) Install bushing (19) and bearing (18) on bellcrank (6).

(2) Aline bellcrank (6) with bracket (12).

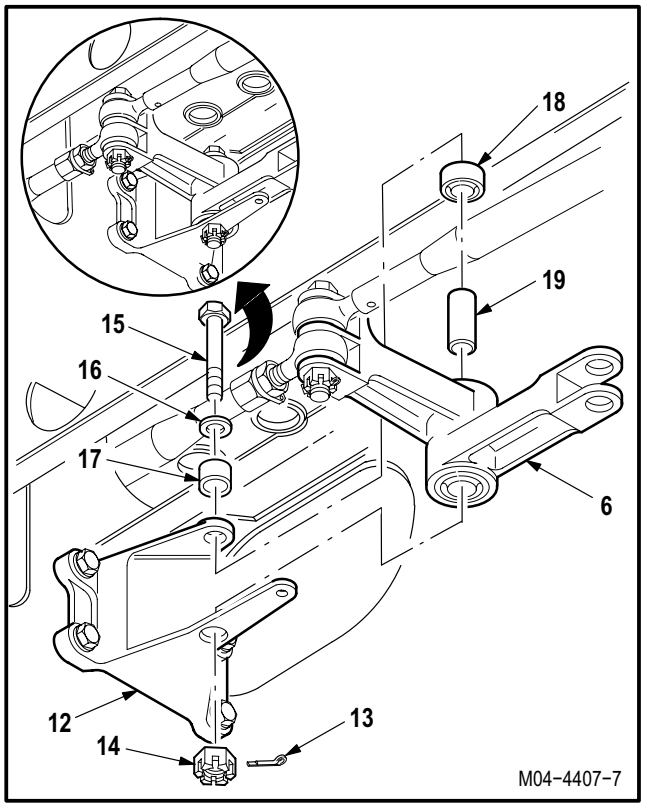
(3) Install bolt (15) through washer (16), bushing (17), bracket (12), and bellcrank (6).

(4) Check fit of self-retaining bolt (15) (para 11.1).

(5) Install nut (14). Torque nut (14) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (13).



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11.101. LATERAL F.S. 132.84 FLIGHT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Install rod (5) on bellcrank (6).** Torque nut (8) **30 to 40 INCH-POUNDS**.

(1) Aline rod (5) with bellcrank (6).

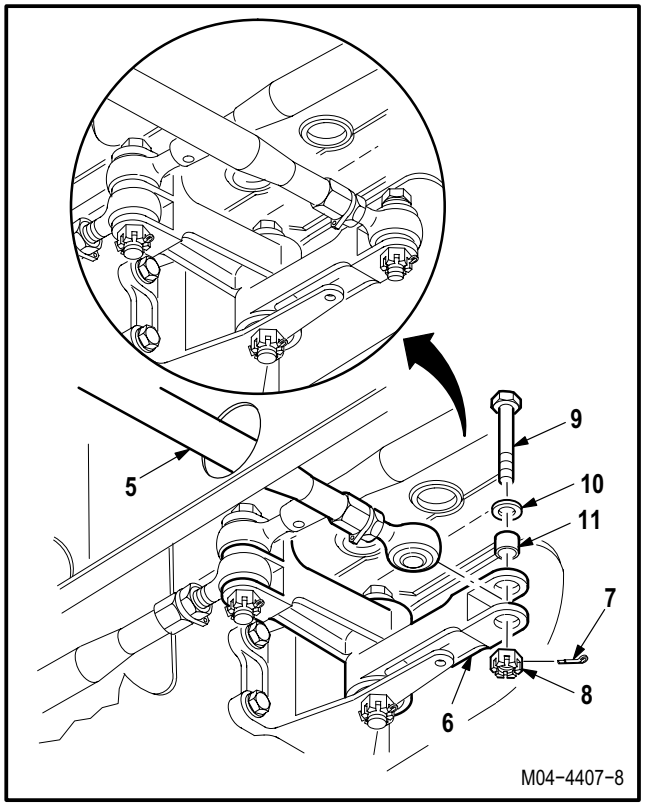
(2) Install bolt (9) through washer (10), bushing (11), bellcrank (6), and rod (5).

(3) Check fit of self-retaining bolt (9) (para 11.1).

(4) Install nut (8). Torque nut (8) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

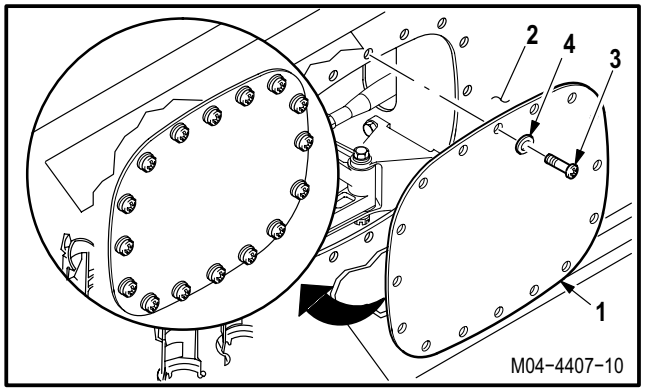
(6) Install new cotter pin (7).



d. **Install cover (1) on airframe (2).**

(1) Aline holes in cover (1) with holes in airframe (2).

(2) Install 15 screws (3) and washers (4).



e. **Inspect (QA).**

f. **Connect ammunition conveyor** (TM 9-1090-208-23)**.**

g. **Install flex chute on area weapon** (TM 9-1090-208-23)**.**

h. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

i. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

j. **Install access fairing L140** (para 2.2)**.**

END OF TASK

11.102. LATERAL F.S. 159.13 BELLCRANK REMOVAL/INSTALLATION

11.102.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.102.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

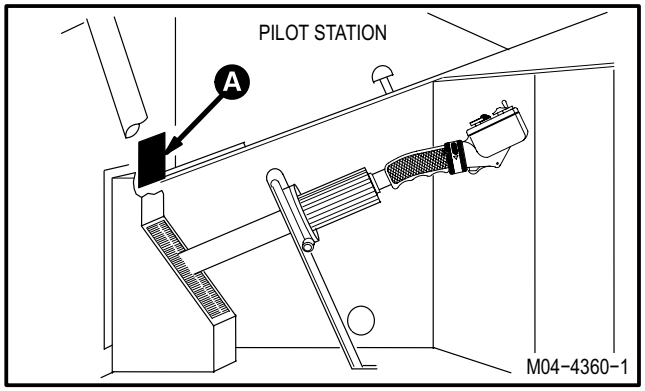
67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed
13.27	Air duct No. 11 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.102. LATERAL F.S. 159.13 BELLCRANK REMOVAL/INSTALLATION – continued

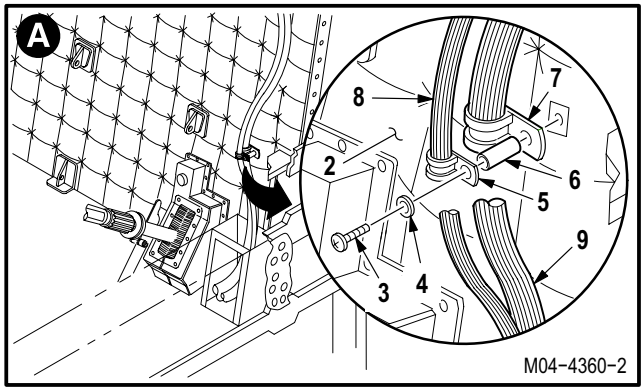
11.102.3. Removal

a. **Remove access cover (1) from pilot cockpit aft bulkhead (2).**

(1) Remove screw (3), washer (4), clamp (5), spacer (6), and clamp (7) from bulkhead (2).

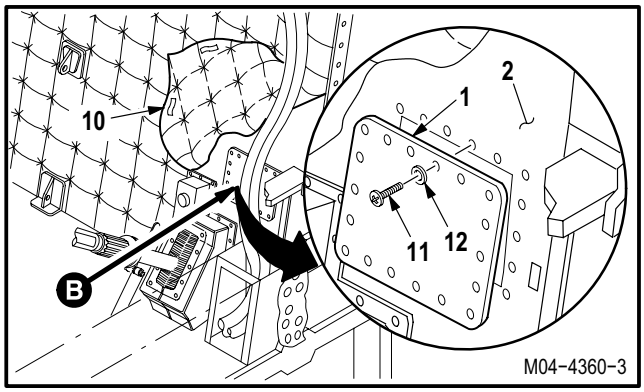
(2) Move wire harnesses (8) and (9) away from bulkhead (2).

(3) Move thermal insulation (10) away from bulkhead (2), to expose cover (1).



(4) Remove 19 screws (11) and washers (12).

(5) Remove cover (1).



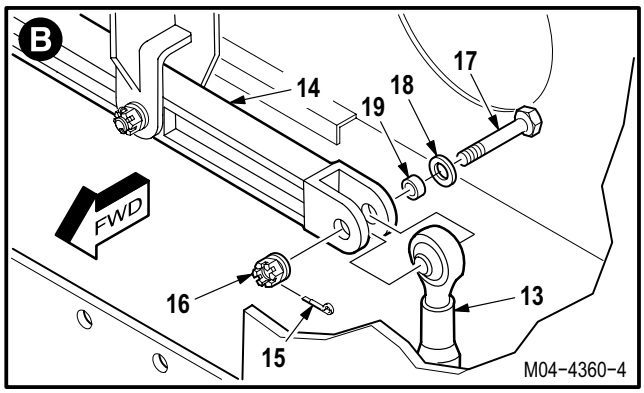
b. **Remove push-pull rod (13) from bellcrank (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove rod (13).



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11.102. LATERAL F.S. 159.13 BELLCRANK REMOVAL/INSTALLATION – continued

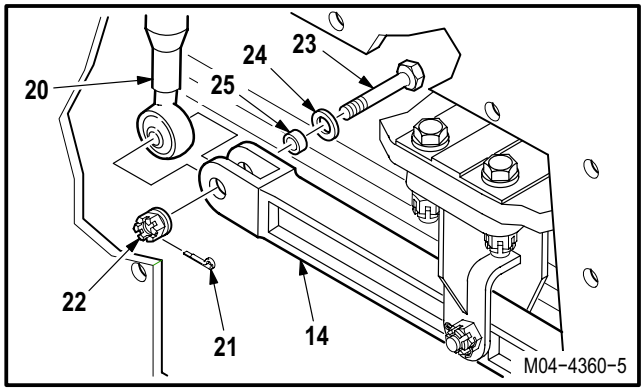
c. **Remove push-pull rod (20) from bellcrank (14).**

(1) Remove and discard cotter pin (21).

(2) Remove nut (22).

(3) Remove bolt (23), washer (24), and bushing (25).

(4) Remove rod (20).



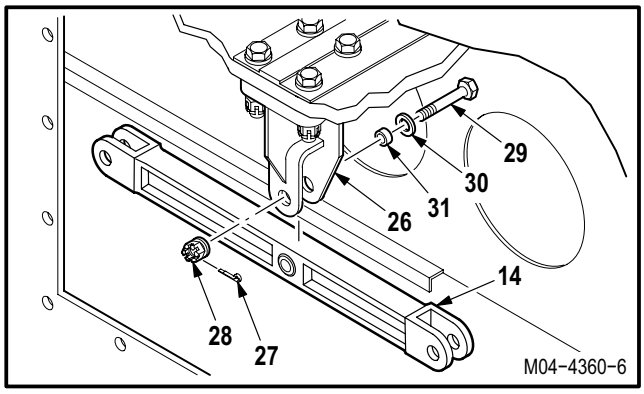
d. **Remove bellcrank (14) from bracket (26).**

(1) Remove and discard cotter pin (27).

(2) Remove nut (28).

(3) Remove bolt (29), washer (30), and bushing (31).

(4) Remove bellcrank (14).



11.102.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.102.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.102. LATERAL F.S. 159.13 BELLCRANK REMOVAL/INSTALLATION – continued

11.102.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install bellcrank (14) on bracket (26).** Torque nut (28) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (14) with bracket (26).

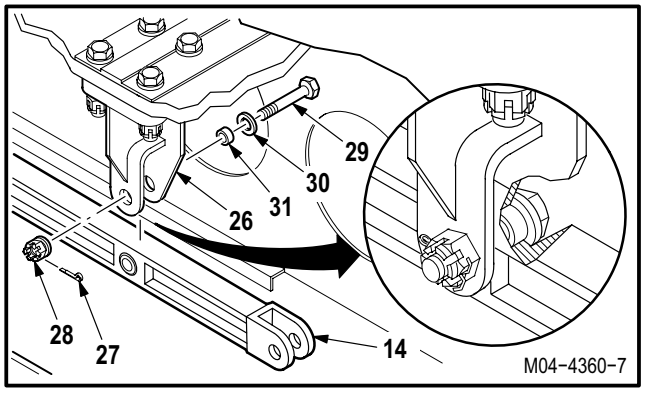
(2) Install bolt (29) through washer (30), bushing (31), bracket (26), and bellcrank (14).

(3) Check fit of self-retaining bolt (29) (para 11.1).

(4) Install nut (28). Torque nut (28) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (27).



b. **Install rod (20) on bellcrank (14).** Torque nut (22) **30 to 40 INCH-POUNDS**.

(1) Aline rod (20) with bellcrank (14).

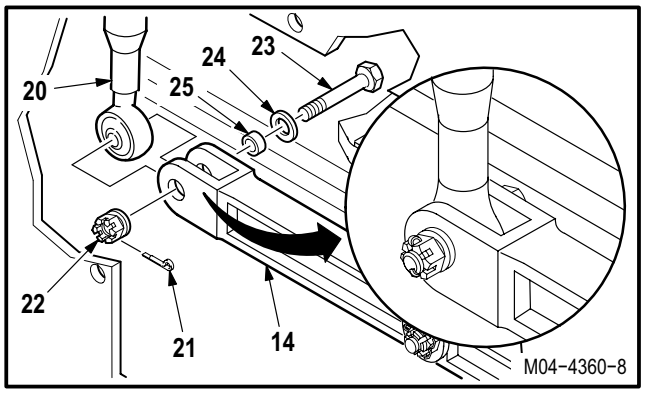
(2) Install bolt (23) through washer (24), bushing (25), bellcrank (14), and rod (20).

(3) Check fit of self-retaining bolt (23) (para 11.1).

(4) Install nut (22). Torque nut (22) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (21).



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11.102. LATERAL F.S. 159.13 BELLCRANK REMOVAL/INSTALLATION – continued

c. **Install rod (13) on bellcrank (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (14).

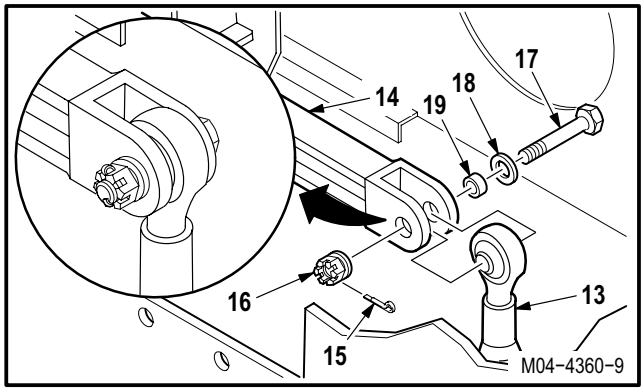
(2) Install bolt (17) through washer (18), bushing (19), bellcrank (14), and rod (13).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



d. **Inspect (QA).**

e. **Install cover (1) on bulkhead (2).**

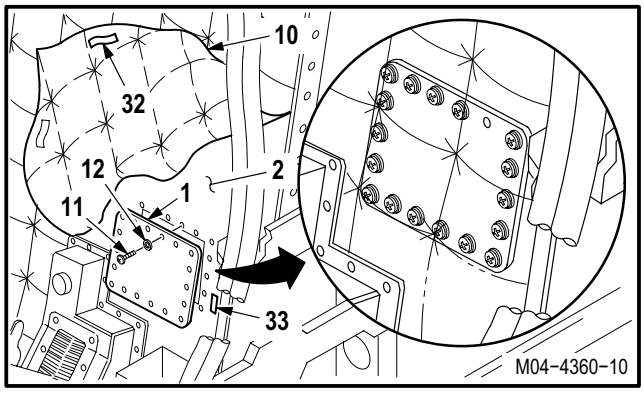
(1) Aline holes in cover (1) with holes in bulkhead (2).

(2) Install 18 screws (11) and washers (12).

(3) Secure insulation (10) on bulkhead (2) by fastening pile tape (32) on hook tape (33).

(4) Install two clamps (5) and (7) on wire harnesses (8) and (9).

(5) Install screw (3) through washer (4), clamp (5), spacer (6), clamp (7), and bulkhead (2).

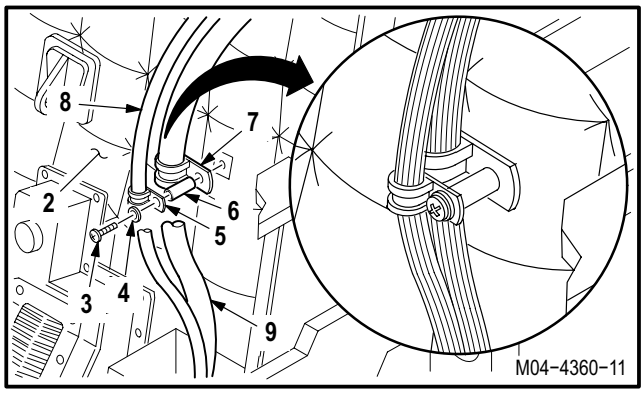


f. **Inspect (QA).**

g. **Install Air duct No. 11** (para 13.27)**.**

h. **Install pilot seat** (para 2.161)**.**

i. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.103. LATERAL F.S. 159.13 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.103.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.103.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Equipment Conditions:

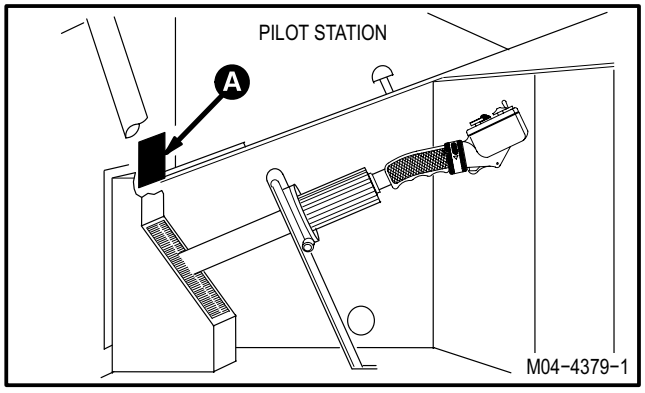
Ref	Condition
1.57	Helicopter safed
2.2	Access panel L200 removed
2.161	Pilot seat removed
13.27	Air duct No. 11 removed

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

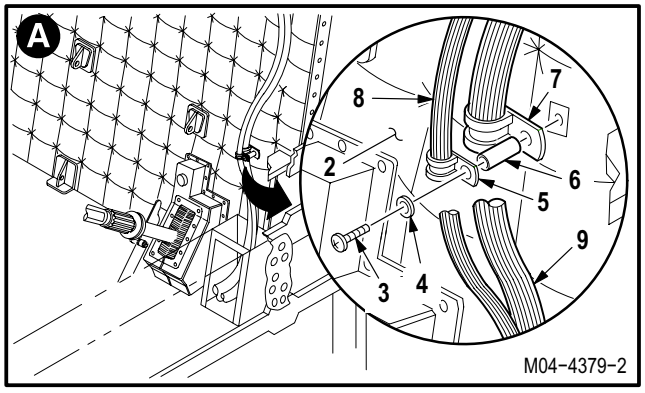


11.103.3. Removal

a. **Remove access panel (1) from pilot cockpit aft bulkhead (2).**

(1) Remove screw (3), washer (4), clamp (5), spacer (6), and clamp (7) from bulkhead (2).

(2) Move wire harnesses (8) and (9) away from bulkhead (2).



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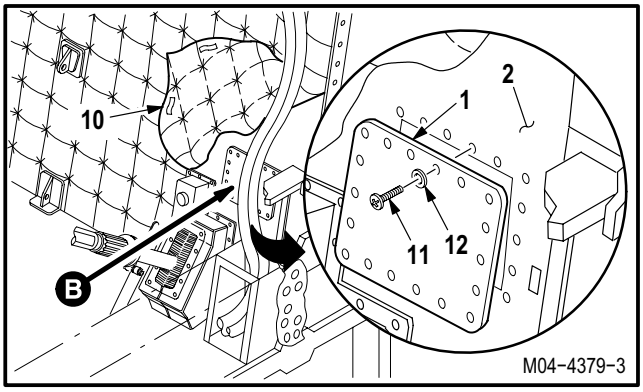
11.103. LATERAL F.S. 159.13 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

(3) Move thermal insulation (10) away from bulkhead (2) to expose cover (1).

(4) Remove 19 screws (11) and washers (12).

(5) Remove cover (1).



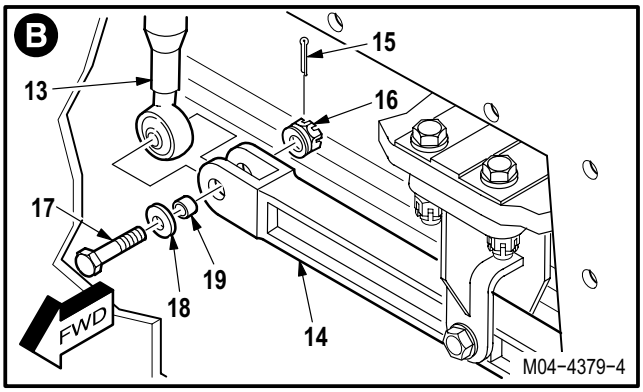
b. **Remove push-pull rod assembly (13) from bellcrank (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove rod (13) from bellcrank (14).



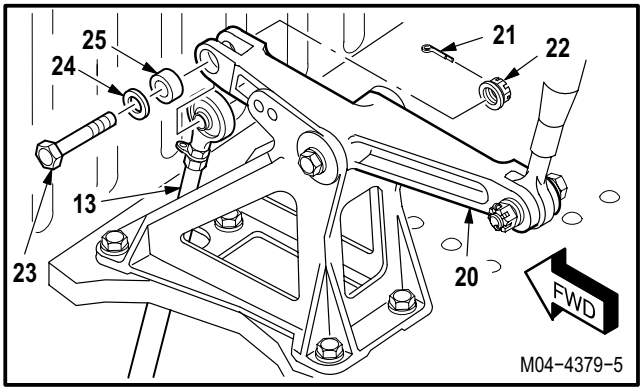
c. **Remove rod (13) from bellcrank (20).**

(1) Remove and discard cotter pin (21).

(2) Remove nut (22).

(3) Remove bolt (23), washer (24), and bushing (25).

(4) Remove rod (13).



11.103.4. Cleaning

a. **Wipe removed and attaching parts with a cle an rag.**

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11.103. LATERAL F.S. 159.13 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.103.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.103.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install adjustable end of rod (13) on bellcrank (20).** Torque nut (22) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (20).

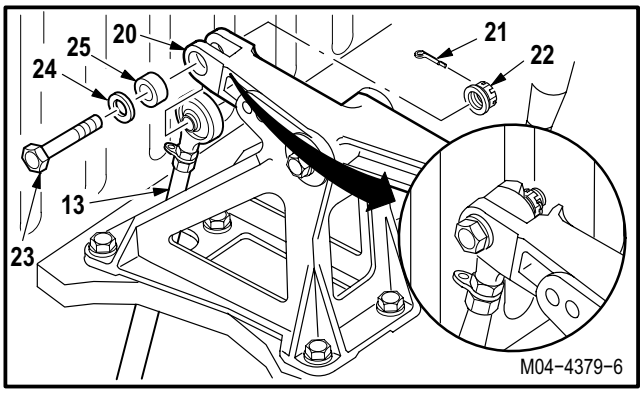
(2) Install bolt (23) through washer (24), bushing (25), bellcrank (20), and rod (13).

(3) Check fit of self-retaining bolt (23) (para 11.1).

(4) Install nut (22). Torque nut (22) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (21).



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11.103. LATERAL F.S. 159.13 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod (13) on bellcrank (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (14).

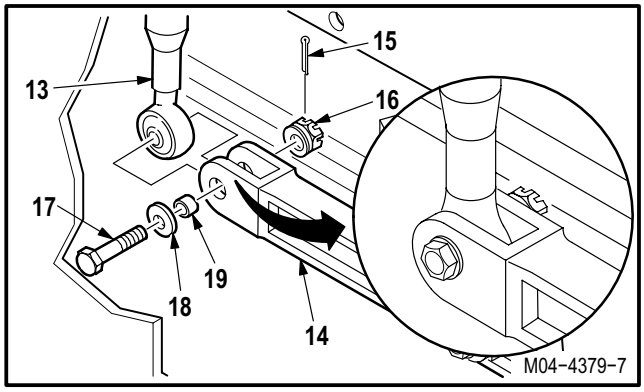
(2) Install bolt (17) through washer (18), bushing (19), bellcrank (14), and rod (13).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



c. **Inspect (QA).**

d. **Install cover (1) on bulkhead (2).**

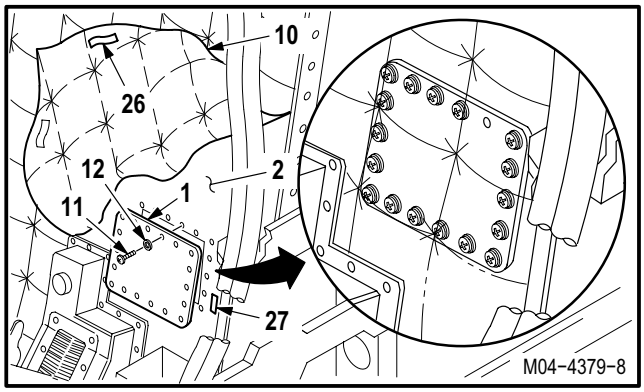
(1) Aline holes in cover (1) with holes in bulkhead (2).

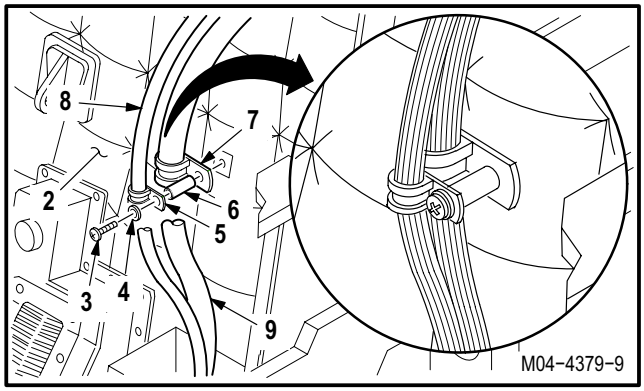
(2) Install 19 screws (11) and washers (12).

(3) Secure insulation (10) on bulkhead (2) by fastening pile tape (26) on hook tape (27).

(4) Install two clamps (5) and (7) on wire harnesses (8) and (9).

(5) Install screw (3) through washer (4), clamp (5), spacer (6), clamp (7), and bulkhead (2).





e. **Inspect (QA).**

f. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

g. **Install air duct No. 11** (para 13.27)**.**

h. **Install pilot seat** (para 2.161)**.**

i. **Install access panel L200** (para 2.2)**.**

END OF TASK

11.104. LATERAL F.S. 159.13 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.104.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.104.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (2)

Personnel Required:

67R Attack Helicopter Repairer
One person to assist
67R3F Attack Helicopter Repairer/Technical Inspector

References:

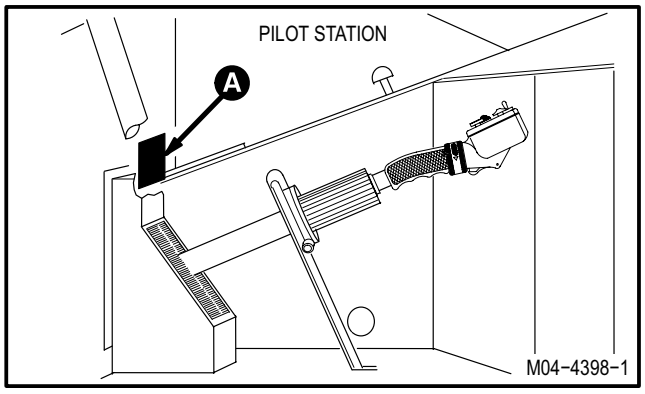
TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access panel L200 removed
2.161	Pilot seat removed
13.27	Air duct No. 11 removed
9.30	Transformer-rectifier No. 1 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.104. LATERAL F.S. 159.13 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.104.3. Removal

a. **Remove access cover (1) from pilot cockpit aft bulkhead (2).**

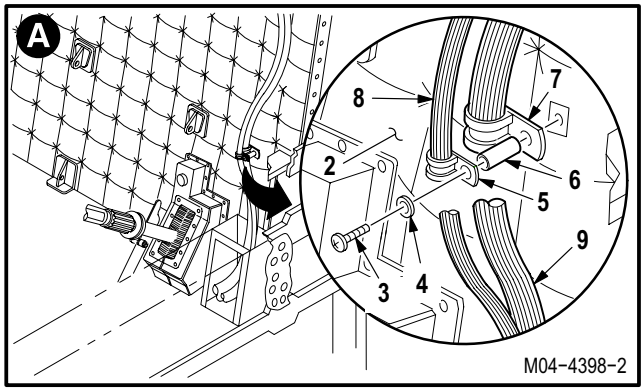
(1) Remove screw (3), washer (4), clamp (5) spacer (6), and clamp (7) from bulkhead (2).

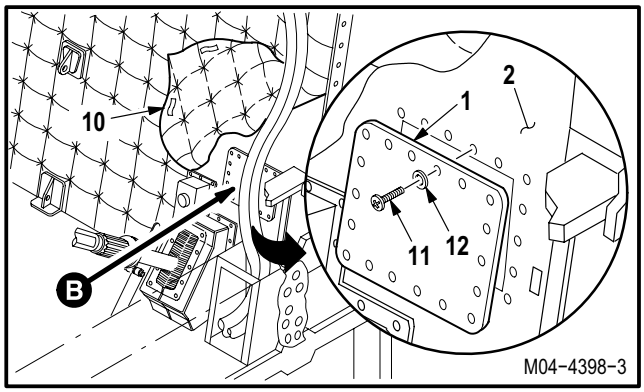
(2) Move wire harnesses (8) and (9) away from bulkhead (2).

(3) Move thermal insulation (10) away from bulkhead (2) to expose cover (1).

(4) Remove 18 screws (11) and washers (12).

(5) Remove cover (1).





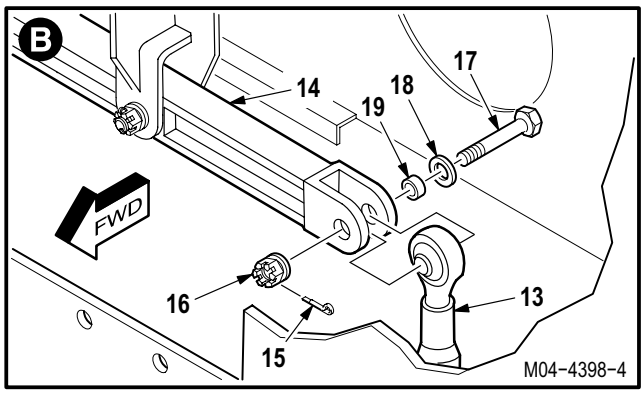
b. **Remove push-pull rod (13) from bellcrank bracket assembly (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove rod (13).



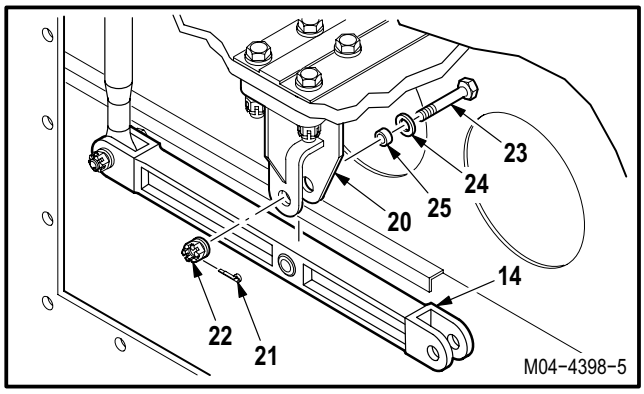
c. **Remove bellcrank (14) from bracket (20).**

(1) Remove and discard cotter pin (21).

(2) Remove nut (22).

(3) Remove bolt (23), washer (24), and bushing (25) from bracket (20) and bellcrank (14).

(4) Remove bellcrank (14).



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11.104. LATERAL F.S. 159.13 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

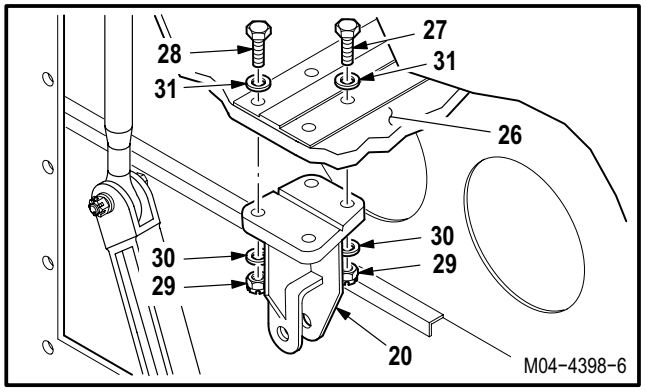
d. **Remove bracket (20) from airframe (26).**

(1) With one person holding bolts (27) and (28), remove four nuts (29) and washers (30).

(2) Remove two bolts (27) and washers (31).

(3) Remove two bolts (28) and washers (31).

(4) Remove bracket (20).



11.104.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.104.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.104. LATERAL F.S. 159.13 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.104.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

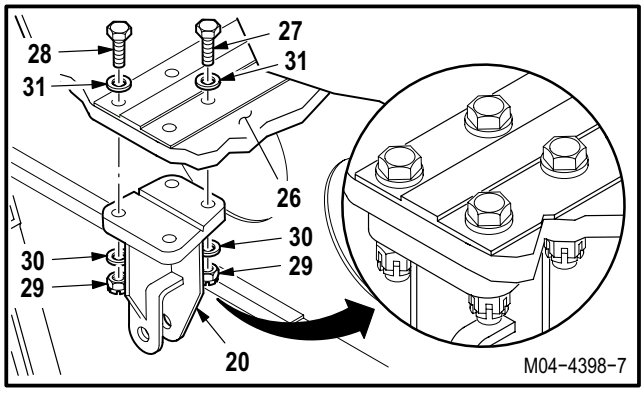
a. **Install bracket (20) on airframe (26).**

(1) Aline bracket (20) with airframe (26).

(2) With one person holding bracket, install two bolts (28) through washers (31), airframe (26), and bracket (20).

(3) With one person holding bracket, install two bolts (27) through washers (31), airframe (26), and bracket (20).

(4) With one person holding bolts (27) and (28), install four washers (30) and nuts (29).



b. **Install bellcrank (14) on bracket (20).** Torque nut (22) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (14) with bracket (20).

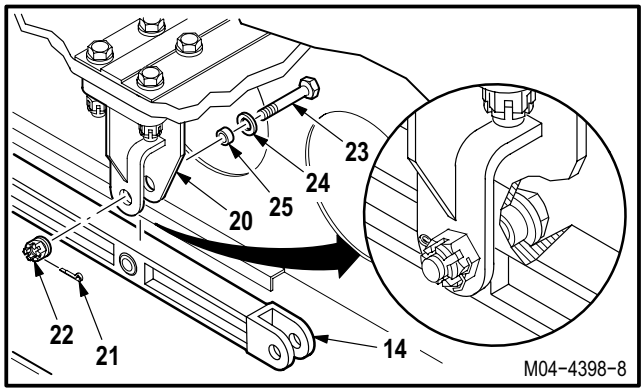
(2) Install bolt (23) through washer (24), bushing (25), bracket (20), and bellcrank (14).

(3) Check fit of self-retaining bolt (23) (para 11.1).

(4) Install nut (22). Torque nut (22) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (21).



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11.104. LATERAL F.S. 159.13 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Install rod (13) on bellcrank (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (14).

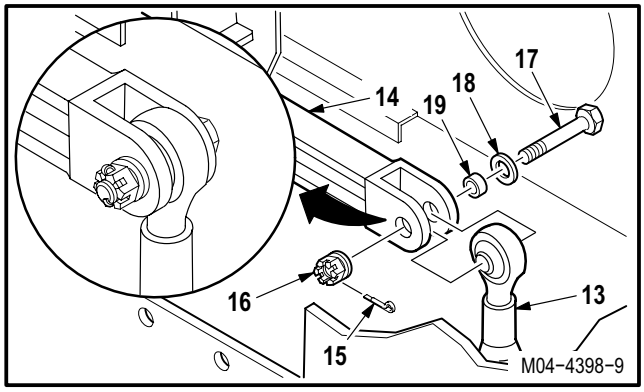
(2) Install bolt (17) through washer (18), bushing (19), bellcrank (14), and rod (13).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



d. **Inspect (QA).**

e. **Install cover (1) on bulkhead (2).**

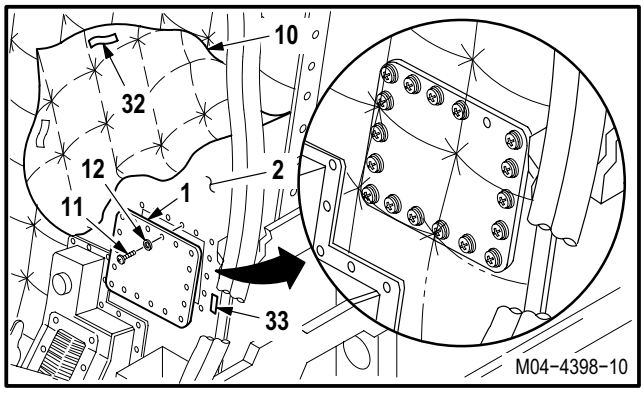
(1) Aline holes in cover (1) with holes in bulkhead (2).

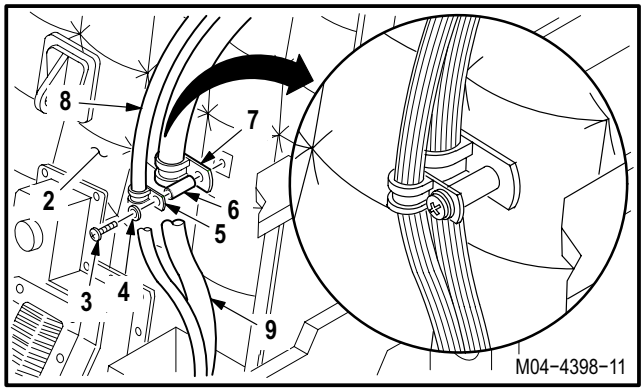
(2) Install 19 screws (11) and washers (12).

(3) Install insulation (10) on bulkhead (2) by fastening pile tape (32) on hook tape (33).

(4) Install two clamps (5) and (7) on wire harnesses (8) and (9).

(5) Install screw (3) through washer (4), clamp (5) spacer (6), clamp (7), and bulkhead (2).





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11.104. LATERAL F.S. 159.13 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

f. **Inspect (QA).**

g. **Install transformer-rectifier No. 1** (para 9.30)**.**

h. **Install air duct No. 11** (para 13.27)**.**

i. **Install pilot seat** (para 2.161)**.**

j. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

k. **Install access panel L200** (para 2.2)**.**

END OF TASK

11.105. LATERAL F.S. 160.56 BELLCRANK REMOVAL/INSTALLATION

11.105.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.105.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

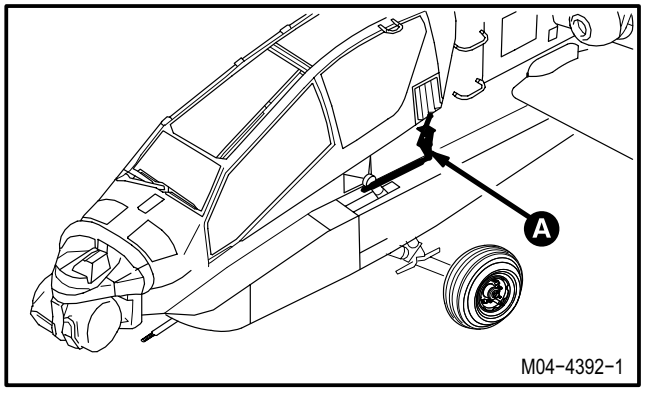
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access cover L160 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.105.3. Removal

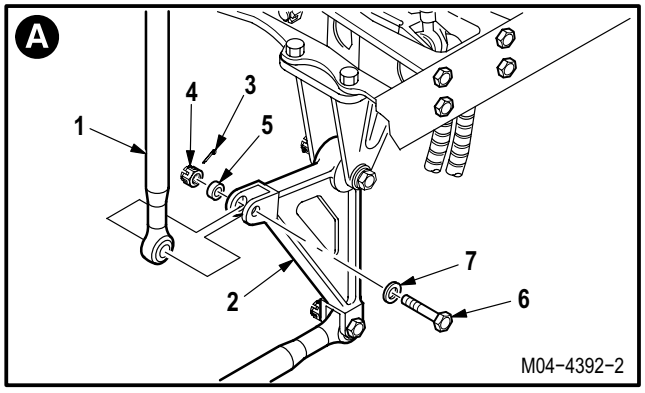
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4) and bushing (5).

(3) Remove bolt (6) and washer (7).

(4) Remove rod (1).



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11.105. LATERAL F.S. 160.56 BELLCRANK REMOVAL/INSTALLATION – continued

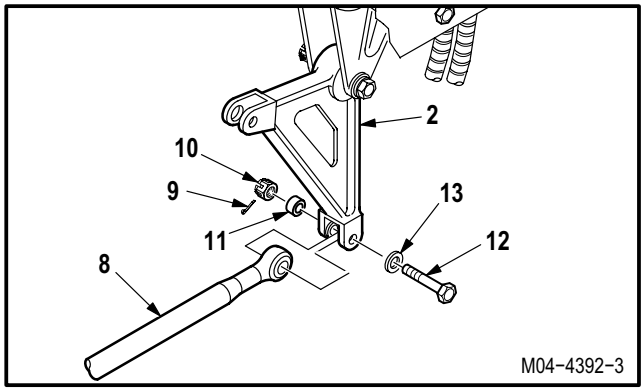
b. **Remove push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10) and bushing (11).

(3) Remove bolt (12) and washer (13).

(4) Remove rod (8).



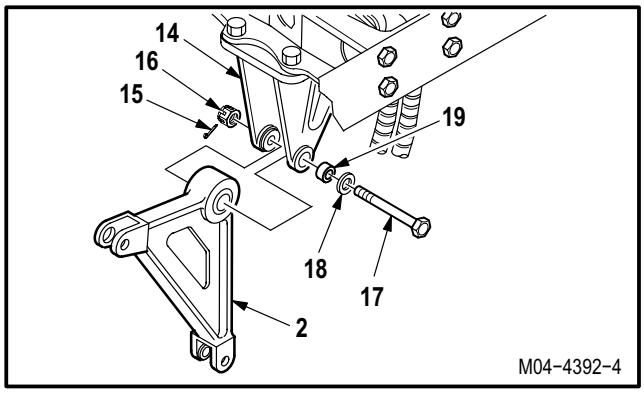
c. **Remove bellcrank (2) from bracket (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove bellcrank (2).



11.105.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.105.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.105. LATERAL F.S. 160.56 BELLCRANK REMOVAL/INSTALLATION – continued

11.105.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (14).

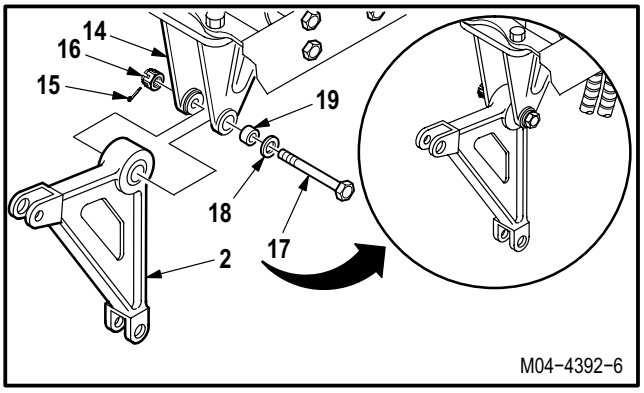
(2) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

(2) Install bolt (12) through washer (13), bellcrank (2), and rod (8).

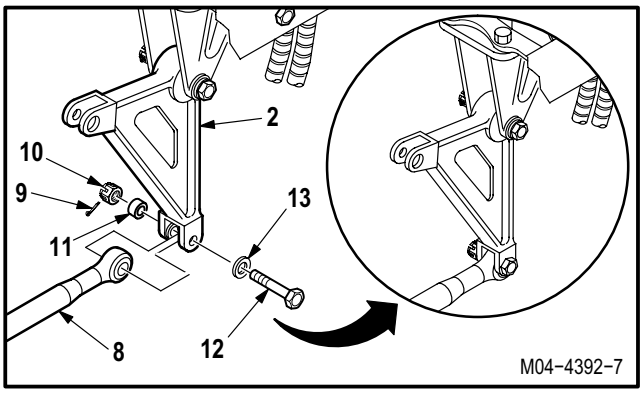
(3) Check fit of self-retaining bolt (12) (para 11.1).

(4) Install nut (10) and bushing (11).

(5) Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (9).



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11.105. LATERAL F.S. 160.56 BELLCRANK REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

(2) Install bolt (6) through washer (7), bellcrank (2), and rod (1).

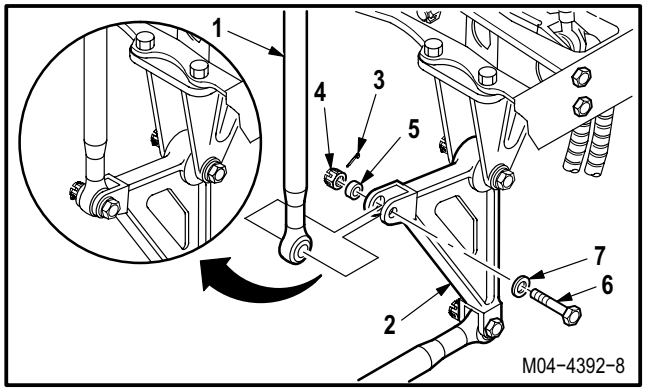
(3) Check fit of self-retaining bolt (6) (para 11.1).

(4) Install nut (4) and bushing (5).

(5) Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install access cover L160** (para 2.2)**.**

END OF TASK

11.106. LATERAL F.S. 160.56 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.106.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.106.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

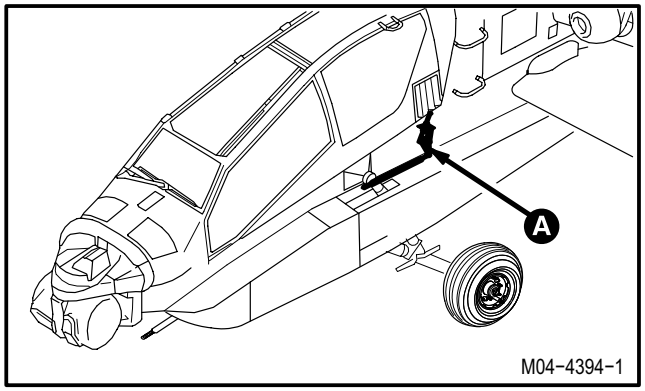
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access cover L160 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.106.3. Removal

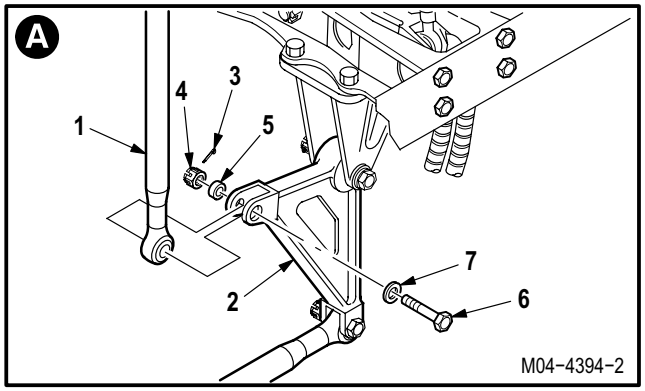
a. **Remove push-pull rod assembly (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4) and bushing (5).

(3) Remove bolt (6), and washer (7).

(4) Remove rod (1).



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11.106. LATERAL F.S. 160.56 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

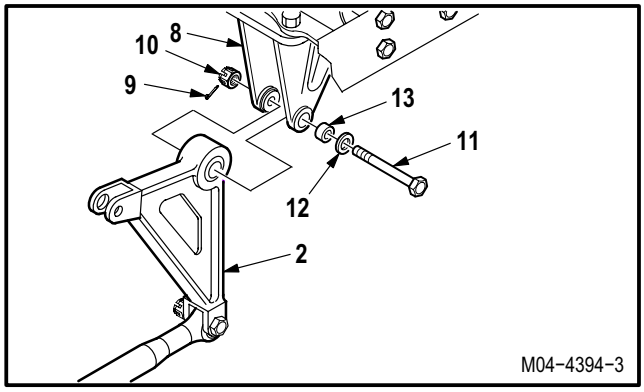
b. **Remove bellcrank (2) from bracket (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13) from bracket (8) and bellcrank (2).

(4) Remove bellcrank (2).

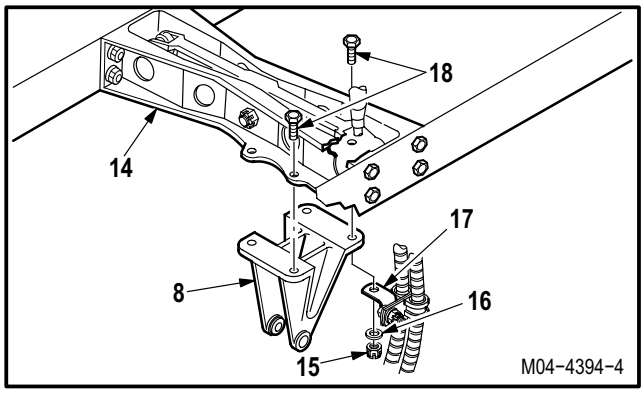


c. **Remove bracket (8) from bracket (14).**

(1) Remove four nuts (15), washers (16), and clamp bracket (17).

(2) Remove four bolts (18).

(3) Remove bracket (8).



11.106.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.106.5. Inspection

a. **Check removed parts for damage** (para 11.5)**.**

b. **Check removed parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.106. LATERAL F.S. 160.56 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.106.6. Installation

CAUTION

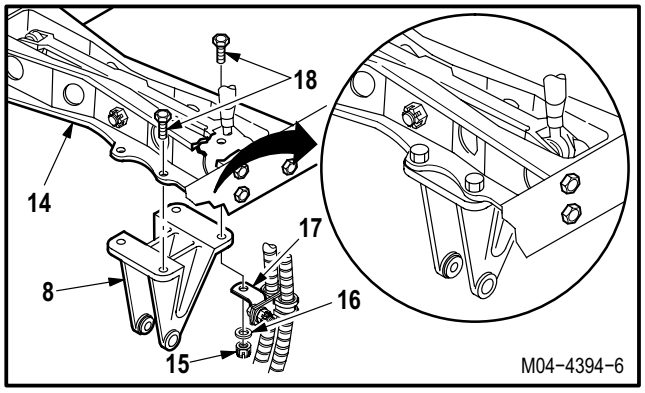
To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install bracket (8) on bracket (14).**

(1) Aline four holes in bracket (8) with holes in bracket (14).

(2) Install four bolts (18) through bracket (14) and bracket (8).

(3) Install clamp bracket (17), four washers (16), and nuts (15).



b. **Install bellcrank (2) on bracket (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (8).

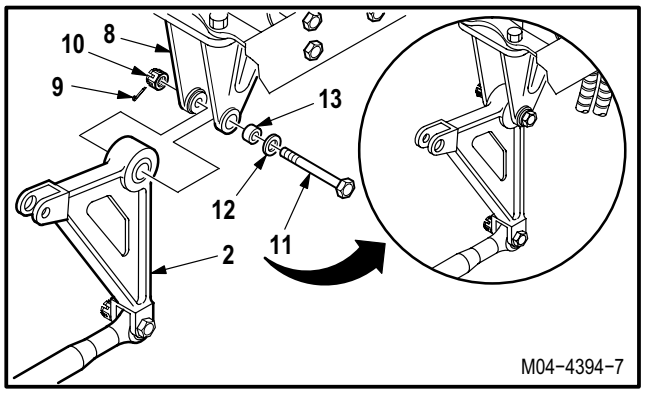
(2) Install bolt (11) through washer (12), bushing (13), bracket (8), and bellcrank (2).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.106. LATERAL F.S. 160.56 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

(2) Install bolt (6) through washer (7), bellcrank (2), and rod (1).

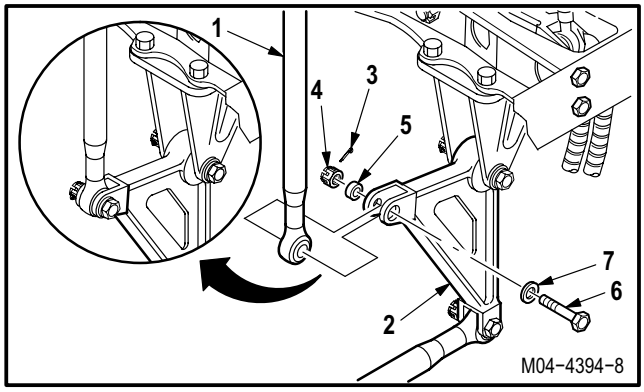
(3) Check fit of self-retaining bolt (6) (para 11.1).

(4) Install bushing (5) and nut (4).

(5) Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install access cover L160** (para 2.2)**.**

END OF TASK

11.107. LATERAL F.S. 164.95 BELLCRANK REMOVAL/INSTALLATION

11.107.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.107.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

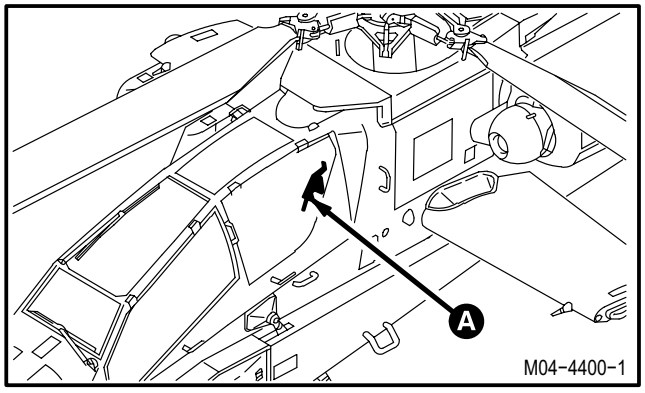
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access panel L200 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.107.3. Removal

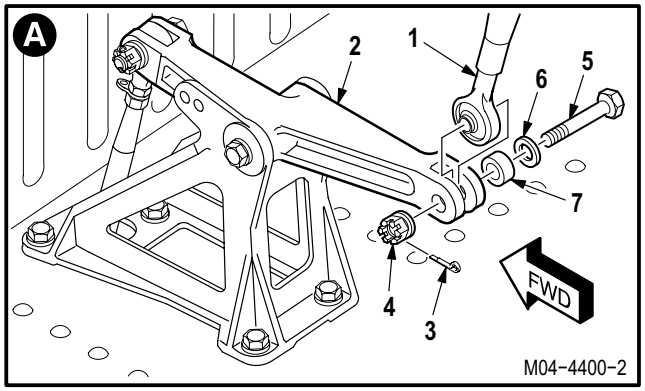
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.107. LATERAL F.S. 164.95 BELLCRANK REMOVAL/INSTALLATION – continued

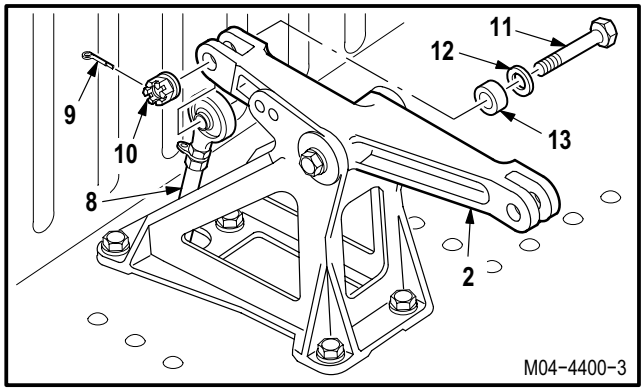
b. **Remove push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (8).



c. **Remove bellcrank (2) from bracket (14).**

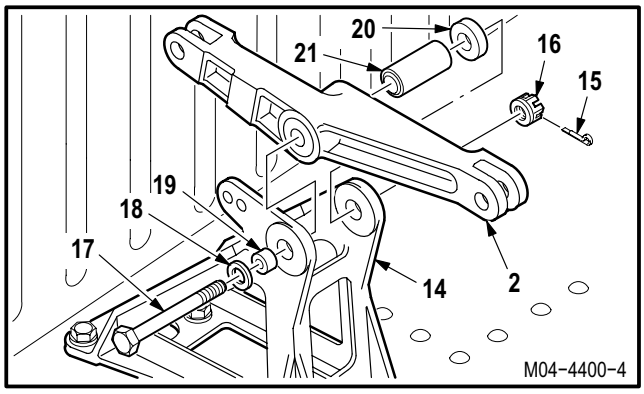
(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove bellcrank (2).

(5) Remove bearing (20) and bushing (21) from bellcrank (2).



11.107.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.107.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.107. LATERAL F.S. 164.95 BELLCRANK REMOVAL/INSTALLATION – continued

11.107.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Install bushing (21) and bearing (20) on bellcrank (2).

(2) Aline bellcrank (2) with bracket (14).

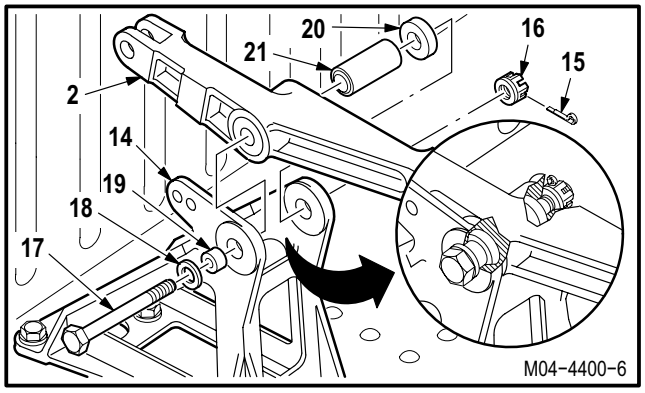
(3) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(4) Check fit of self-retaining bolt (17) (para 11.1).

(5) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (15).



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11.107. LATERAL F.S. 164.95 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

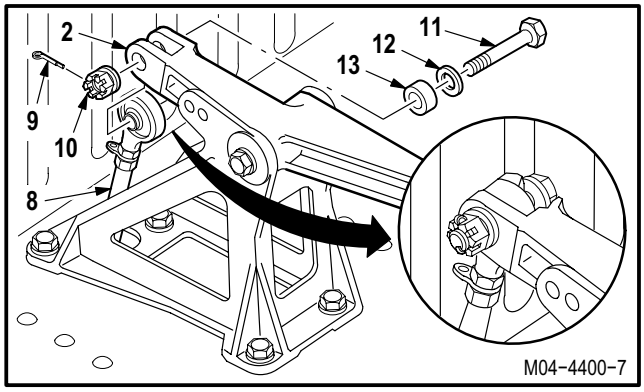
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

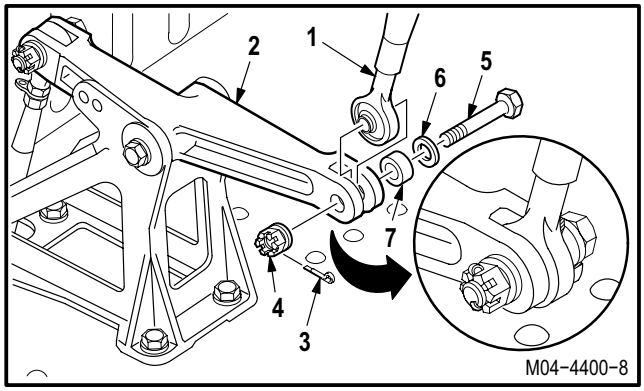
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install access panel L200** (para 2.2)**.**

END OF TASK

11.108. LATERAL F.S. 164.95 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.108.1. Description

This task covers: Removal. Cleaning. Inspection. Repair. Installation.

11.108.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

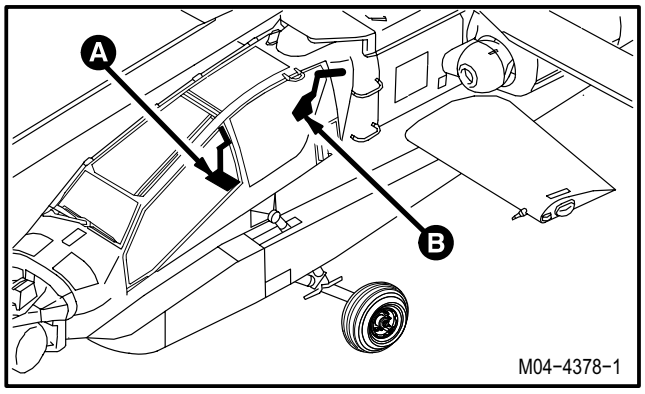
Ref	Condition
1.57	Helicopter safed
2.2	Access panel L200 removed
1.72	External primary hydraulic power applied

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

CAUTION

- To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.
- To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.



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11.108. LATERAL F.S. 164.95 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.108.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

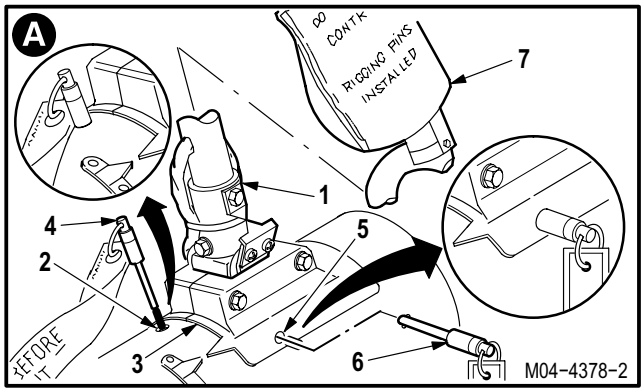
b. **Secure pilot cyclic stick (1) in ZERO LONG position and ZERO LAT position.**

(1) Slowly move stick (1) to aline longitudinal rig pin hole (2) on housing (3).

(2) Install -5 rig pin (4).

(3) Slowly move stick (1) to aline lateral rig pin hole (5) on housing (3).

(4) Install -9 rig pin (6).



c. **Install cover (7) on stick (1).**

d. **Remove external hydraulic power** (para 1.72)**.**

e. **Remove push-pull rod assembly (8) from lateral bellcrank (9).**

(1) Remove and discard cotter pin (10).

(2) Remove nut (11).

(3) Remove bolt (12), washer (13), and bushing (14).

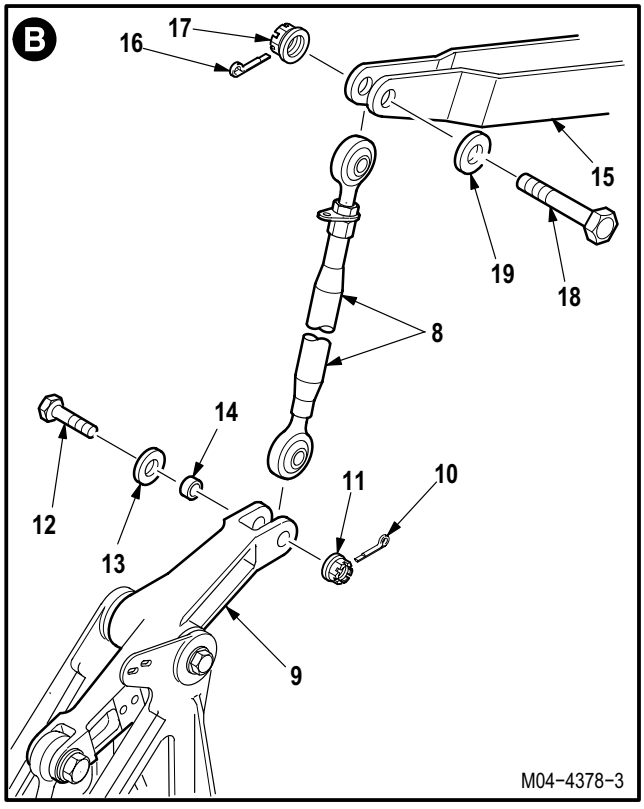
f. **Remove rod (8) from servocylinder clevis (15).**

(1) Remove and discard cotter pin (16).

(2) Remove nut (17).

(3) Remove bolt (18) and washer (19) from clevis (15).

(4) Remove rod (8).



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11.108. LATERAL F.S. 164.95 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.108.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.108.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.108.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install adjustable end of rod (8) on clevis (15).** Torque nut (17) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with clevis (15).

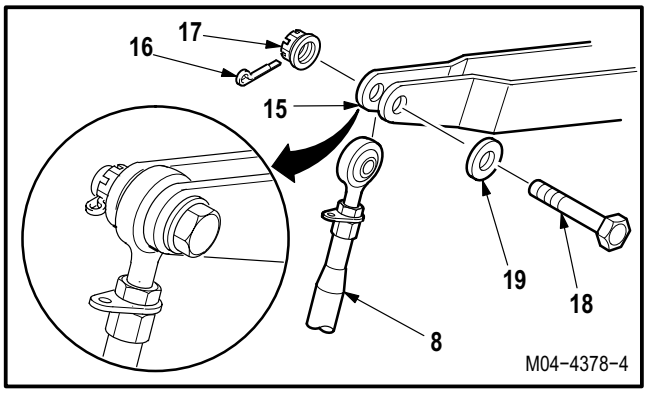
(2) Install bolt (18) through washer (19), clevis (15), and rod (8).

(3) Check fit of self-retaining bolt (18) (para 11.1).

(4) Install nut (17). Torque nut (17) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (16).



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11.108. LATERAL F.S. 164.95 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod (8) on bellcrank (9).** Torque nut (11) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (9).

(2) Install bolt (12) through washer (13), bushing (14), bellcrank (9), and rod (8).

(3) Check fit of self-retaining bolt (12) (para 11.1).

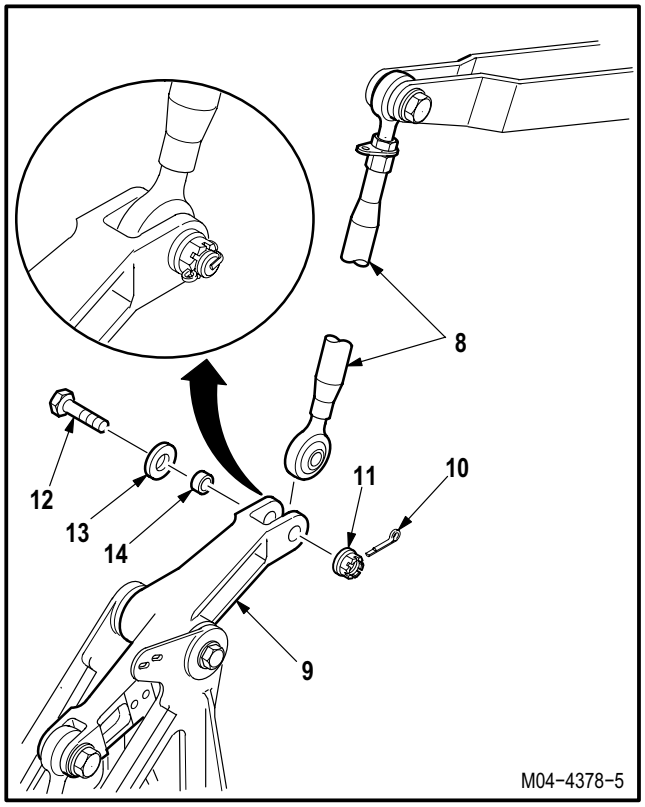
(4) Install nut (11).

(5) Torque nut (11) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (10).

c. **Inspect (QA).**

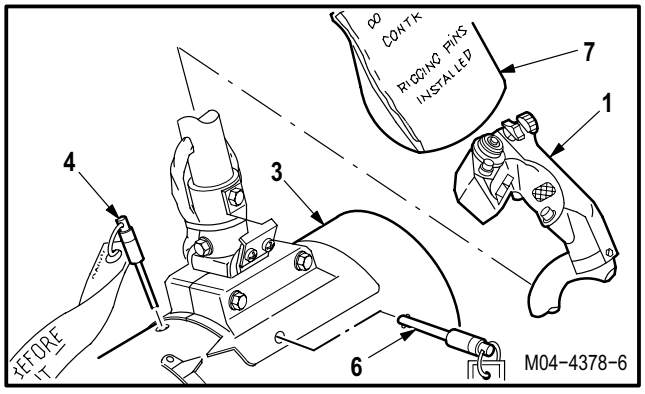


d. **Remove -5 rig pin (4) and -9 rig pin (6) from housing (3).**

e. **Remove cover (7) from stick (1).**

f. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

g. **Install access panel L200** (para 2.2)**.**



END OF TASK

11.109. LATERAL F.S. 164.95 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.109.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.109.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)
Sealing compound (item 174, App F)

Personnel Required:

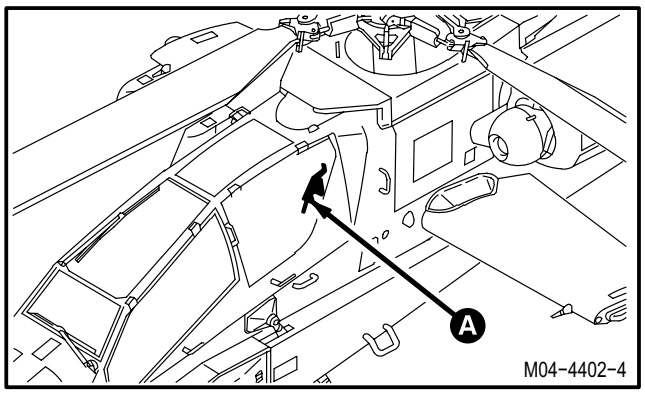
67R Attack Helicopter Repairer
One person to assist
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access panel L200 removed
9.30	Transformer-rectifier No. 1 removed
10.52A	Forward fuel cell retainer panel removed (if installed)

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.109. LATERAL F.S. 164.95 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.109.3. Removal

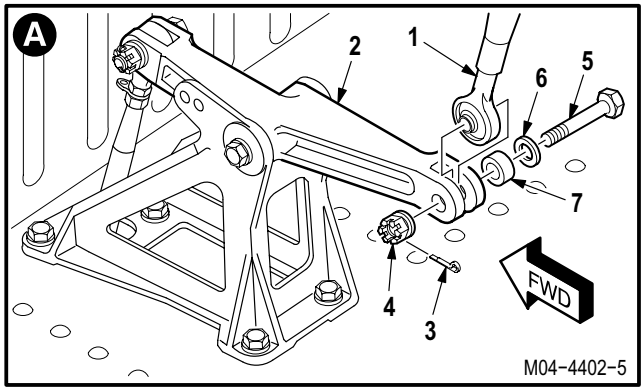
a. **Remove push-pull rod (1) from bellcrank bracket assembly (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1) from bellcrank (2).



b. **Remove bellcrank (2) from bracket (8).**

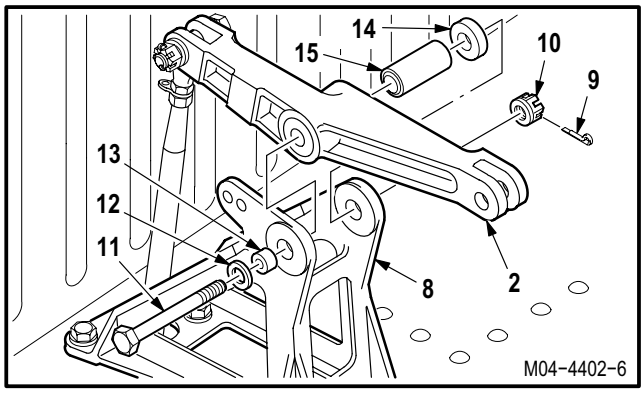
(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13) from bracket (8) and bellcrank (2).

(4) Remove bellcrank (2) from bracket (8).

(5) Remove bearing (14) and bushing (15).



c. **Remove sealing compound from faying surface of bracket (8).**

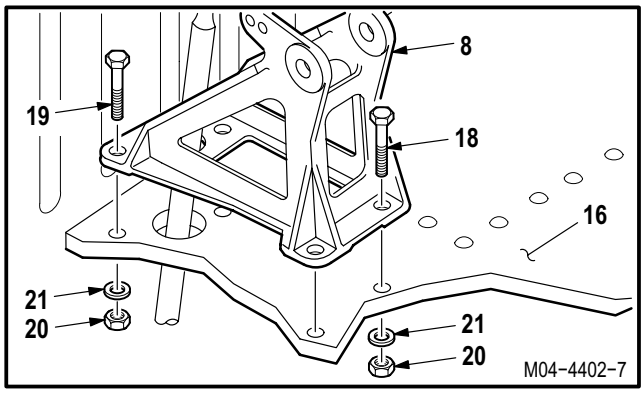
d. **Remove bracket (8) from airframe (16).**

(1) With one person holding bolts (18) and (19), remove four nuts (20) and washers (21).

(2) Remove two aft bolts (19).

(3) Remove two forward bolts (18).

(4) Remove bracket (8).



11.109.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

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11.109. LATERAL F.S. 164.95 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.109.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.109.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install bracket (8) on airframe (16).**

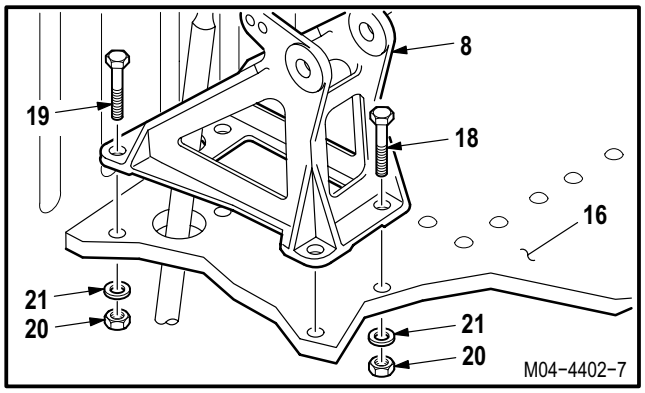
(1) Aline four holes in bracket (8) with holes in airframe (16).

(2) Install two aft bolts (19) through bracket (8), and airframe (16).

(3) Install two forward bolts (18) through bracket (8), and airframe (16).

(4) With one person holding bolts (18) and (19), install four washers (21) and nuts (20).

(5) Apply sealing compound to faying surface of bracket (8). Use sealing compound (item 174, App F).



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11.109. LATERAL F.S. 164.95 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install bellcrank (2) on bracket (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Install bushing (15) and bearing (14) on bellcrank (2).

(2) Aline bellcrank (2) with bracket (8).

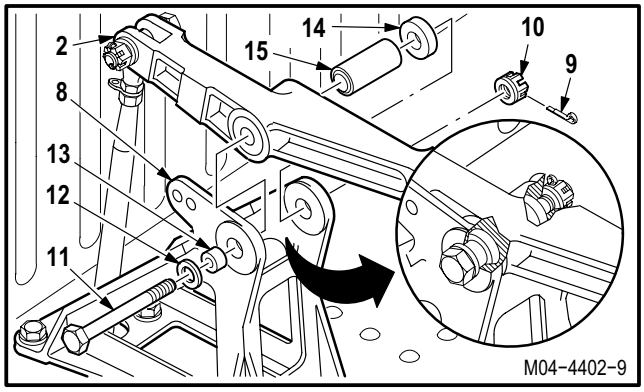
(3) Install bolt (11) through washer (12), bushing (13), bracket (8), and bellcrank (2).

(4) Check fit of self-retaining bolt (11) (para 11.1).

(5) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (9).



c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

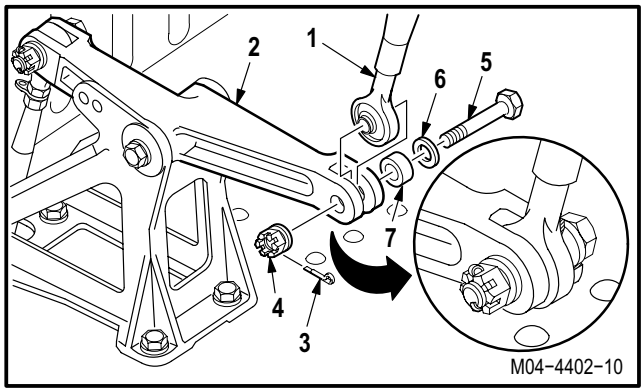
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



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11.109. LATERAL F.S. 164.95 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

d. **Inspect (QA).**

e. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install access panel L200** (para 2.2)**.**

g. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

h. **Install transformer-rectifier No. 1** (para 9.30)**.**

END OF TASK

11.110. LATERAL F.S. 176.00 SERVOCYLINDER MOUNT BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.110.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.110.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
150 - 750 inch-pound 3/8-inch drive click type torque wrench (item 442, App H)

References:

TM 1-1500-204-23

Materials/Parts:

Sealing compound (item 174, App F)

Personnel Required:

67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
7.44	Lateral servocylinder removed

WARNING

FLIGHT SAFETY PART

- **The lateral servocylinder mount bracket and/or components of the mount bracket are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.**
- **Heat-treated condition of the lateral servocylinder mount bracket is critical to its serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. This part must be protected from unscheduled heating and external impact during inspection and handling procedures.**

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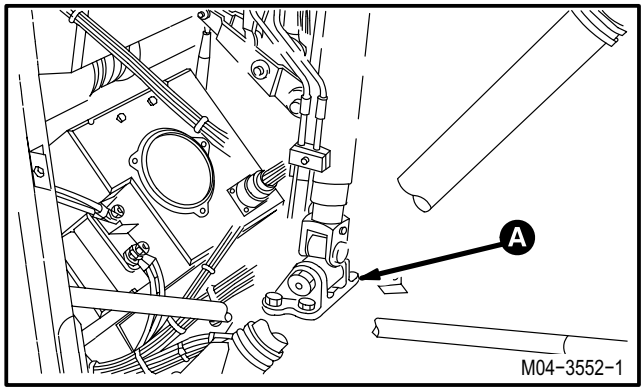
11.110. LATERAL F.S. 176.00 SERVOCYLINDER MOUNT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued



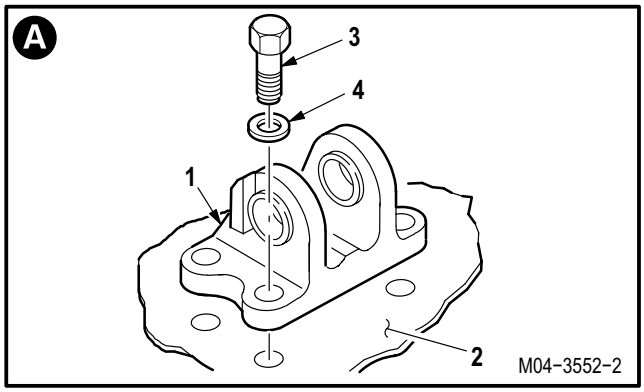
11.110.3. Removal

a. **Remove sealing compound from faying surface of bracket (1).**

b. **Remove mount bracket assembly (1) from deck (2).**

(1) Remove four bolts (3) and washers (4).

(2) Remove bracket (1).



11.110.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.110.5. Inspection

a. **Check nutplates for stripped or damaged threads** (TM 1-1500-204-23)**.**

b. **Check bracket for nicks, scratches, and gouges.** Not to exceed **0.015 INCH**.

c. **Check removed and attaching parts for damage** (para 11.5)**.**

d. **Check removed and attaching parts for corrosion** (para 1.49)**.**

e. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

f. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.110. LATERAL F.S. 176.00 SERVOCYLINDER MOUNT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.110.6. Installation

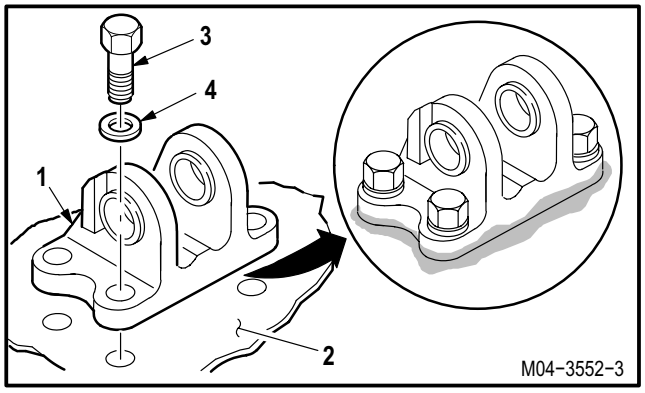
a. **Install bracket (1) on deck (2).** Torque four bolts (3) to **340 INCH-POUNDS**.

(1) Position bracket (1) on deck (2).

(2) Install four bolts (3) through washers (4) and bracket (1) into deck (2).

(3) Torque four bolts (3) to **340 INCH-POUNDS**. Use torque wrench.

(4) Apply sealing compound to faying surface of bracket (1). Use sealing compound (item 174, App F).



b. **Inspect (QA).**

c. **Install lateral servocylinder** (para 7.45)**.**

END OF TASK

11.111. PILOT CYCLIC LONGITUDINAL PUSH–PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.111.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.111.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

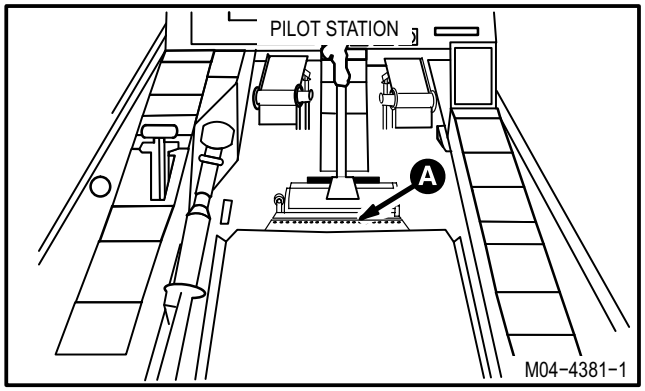
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed
2.189	Pilot foot guard removed
11.46	Pilot cyclic stick cover removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.111. PILOT CYCLIC LONGITUDINAL PUSH–PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

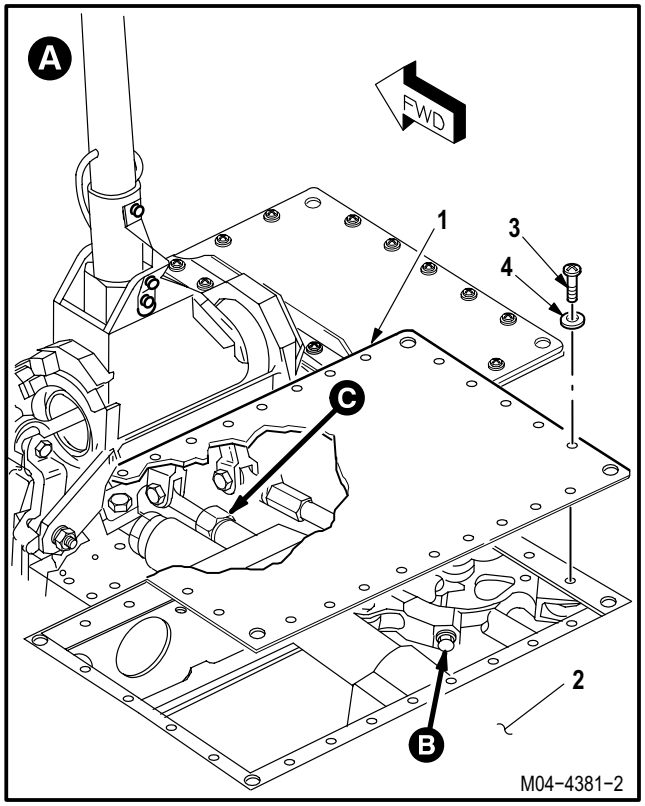
11.111.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **Remove access cover (1) from pilot floor (2).**

(1) Remove 28 screws (3) and washers (4).

(2) Remove cover (1).



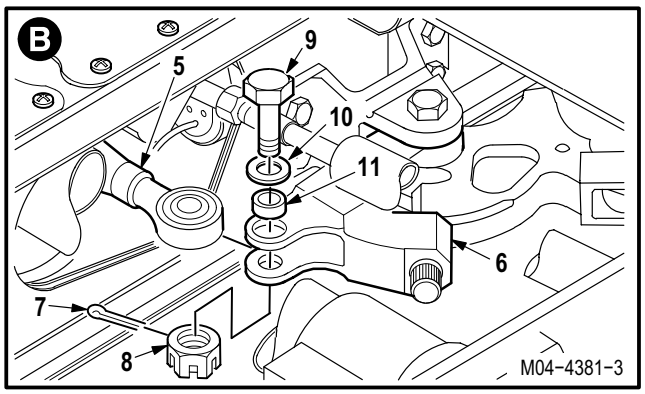
c. **Remove push-pull rod (5) from SPAD (6).**

(1) Remove and discard cotter pin (7).

(2) Remove nut (8).

(3) Remove bolt (9), washer (10), and bushing (11).

(4) Remove rod (5).



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11.111. PILOT CYCLIC LONGITUDINAL PUSH–PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

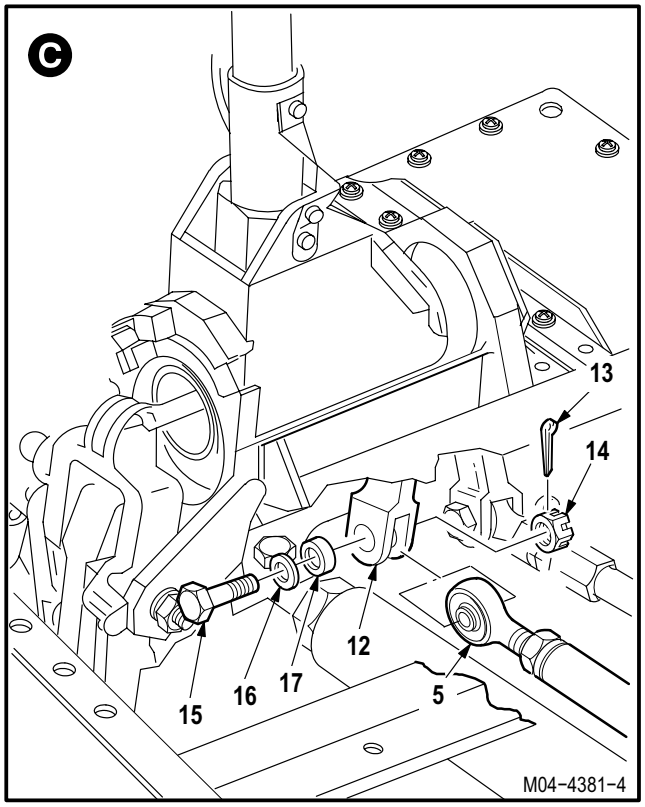
d. **Remove rod (5) from cyclic stick arm (12).**

(1) Remove and discard cotter pin (13).

(2) Remove nut (14).

(3) Remove bolt (15), washer (16), and bushing (17).

(4) Remove rod (5).



11.111.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.111.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.111. PILOT CYCLIC LONGITUDINAL PUSH–PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.111.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install adjustable end of rod (5) on arm (12).** Torque nut (14) **30 to 40 INCH-POUNDS**.

(1) Aline rod (5) with arm (12).

(2) Install bolt (15) through washer (16), bushing (17), arm (12), and rod (5).

(3) Check fit of self-retaining bolt (15) (para 11.1).

(4) Install nut (14). Torque nut (14) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (13).

b. **Install rod (5) on SPAD (6).** Torque nut (8) **30 to 40 INCH-POUNDS**.

(1) Aline rod (5) with SPAD (6).

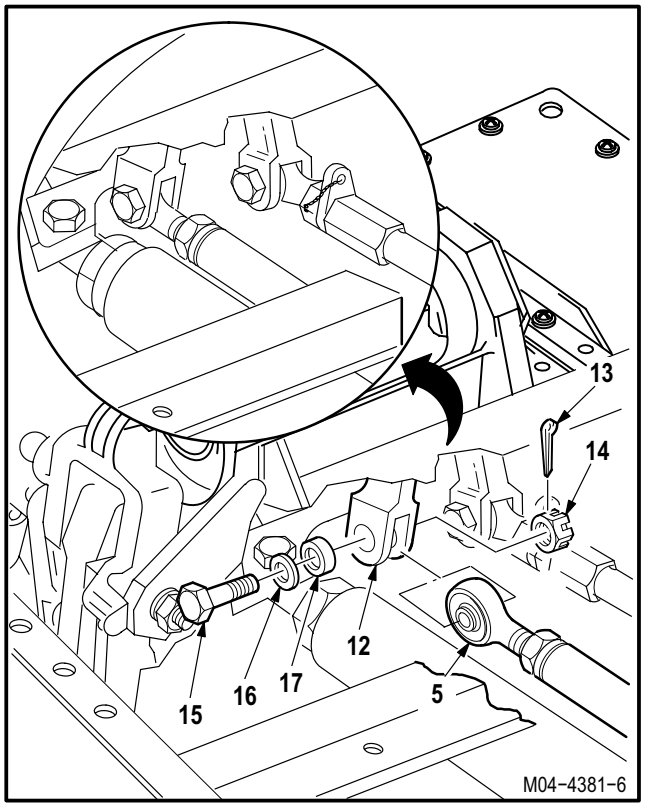
(2) Install bolt (9) through washer (10), bushing (11), SPAD (6), and rod (5).

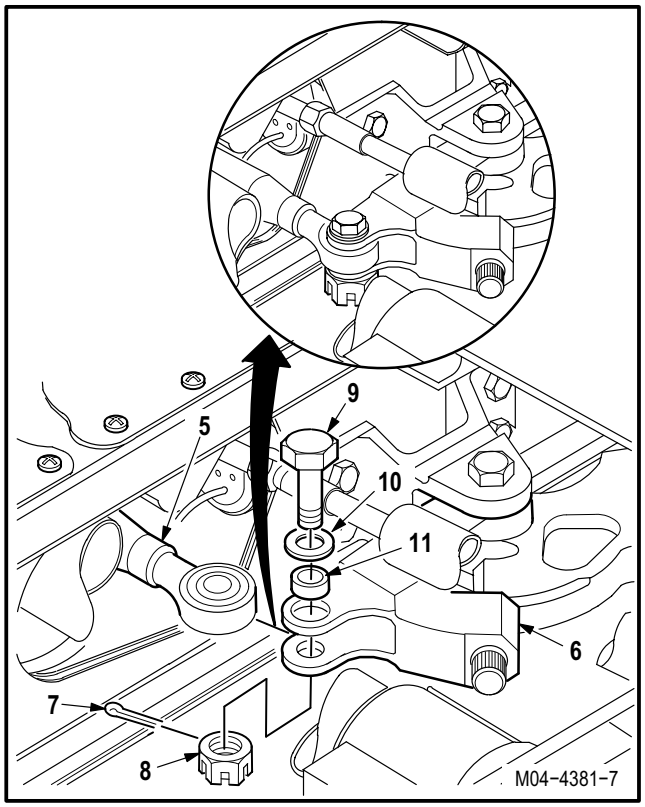
(3) Check fit of self-retaining bolt (9) (para 11.1).

(4) Install nut (8). Torque nut (8) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (7).





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11.111. PILOT CYCLIC LONGITUDINAL PUSH–PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Inspect (QA).**

d. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install cover (1) on floor (2).**

(1) Aline holes in cover (1) with holes in floor (2).

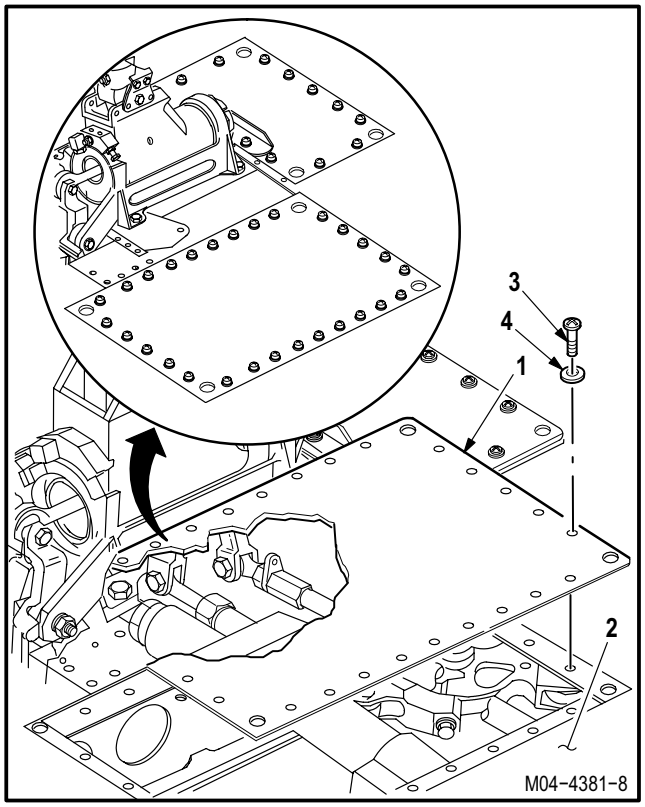
(2) Install 28 screws (3) and washers (4).

f. **Inspect (QA).**

g. **Install pilot cyclic stick cover** (para 11.46)**.**

h. **Install pilot foot guard** (para 2.189)**.**

i. **Install pilot seat** (para 2.161)**.**



END OF TASK

11.112. CPG TO PILOT CONTROL LONGITUDINAL F.S. 82.80 BELLCRANK REMOVAL/INSTALLATION

11.112.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.112.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

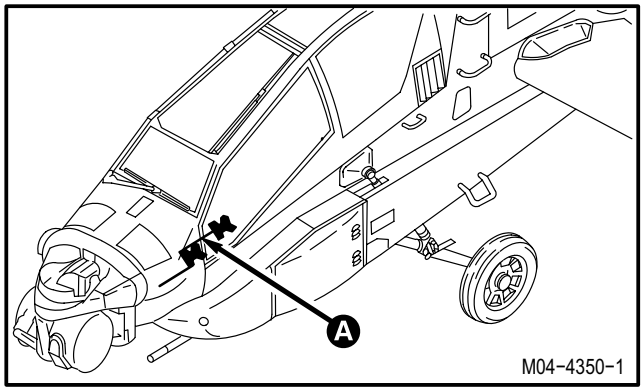
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access door B75R removed; covers B80R and B85R removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.112.3. Removal

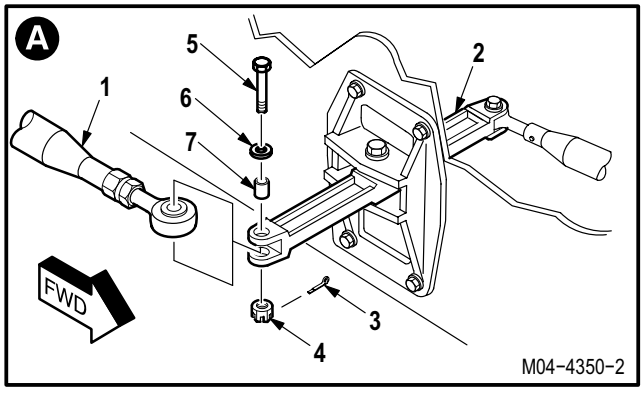
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1) from bellcrank (2).



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11.112. CPG TO PILOT CONTROL LONGITUDINAL F.S. 82.80 BELLCRANK REMOVAL/INSTALLATION – continued

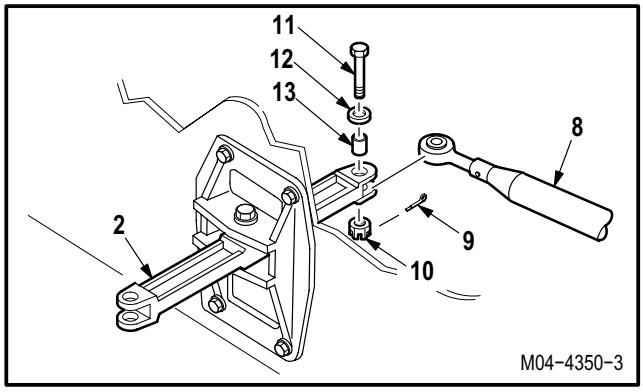
b. **Remove push–pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (8).



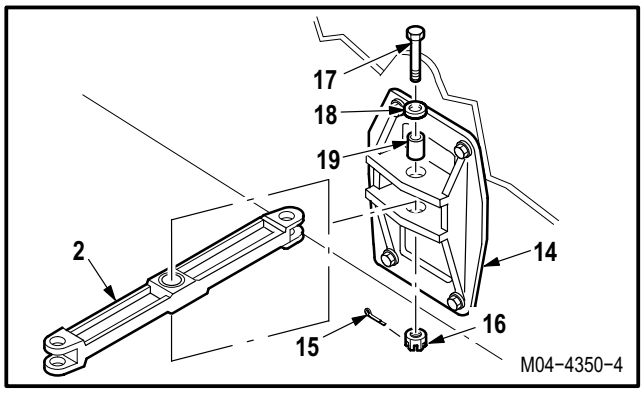
c. **Remove bellcrank (2) from bracket (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove bellcrank (2).



11.112.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.112.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.112. CPG TO PILOT CONTROL LONGITUDINAL F.S. 82.80 BELLCRANK REMOVAL/INSTALLATION – continued

11.112.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (14).

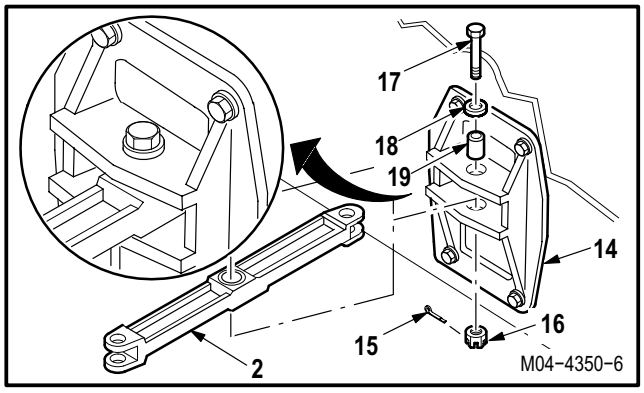
(2) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

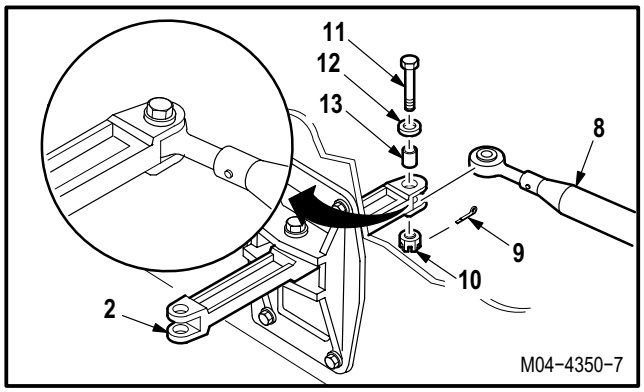
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.112. CPG TO PILOT CONTROL LONGITUDINAL F.S. 82.80 BELLCRANK REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

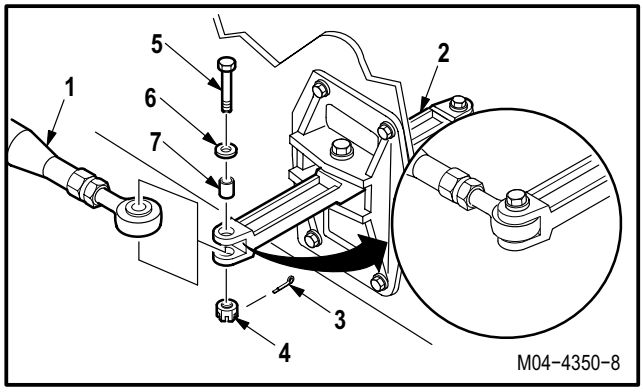
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install access door B75R; install covers B80R and B85R** (para 2.2)**.**

g. **Inspect (QA).**

END OF TASK

11.113. LONGITUDINAL F.S. 82.80 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.113.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.113.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Equipment Conditions:

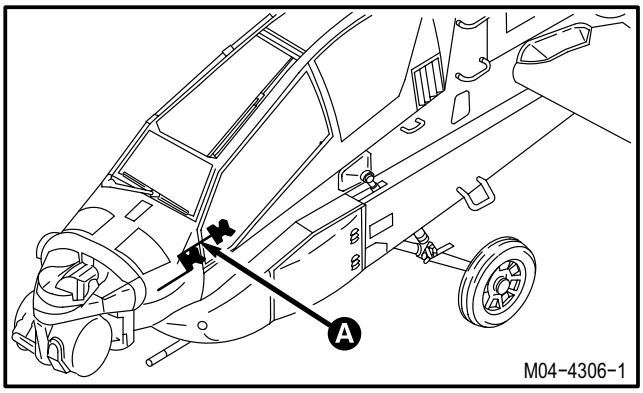
Ref	Condition
1.57	Helicopter safed
2.2	Access covers B80R and B85R removed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.113.3. Removal

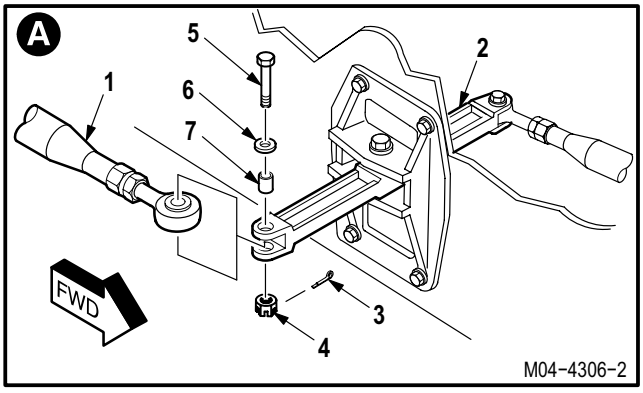
a. **Remove push-pull rod assembly (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.113. LONGITUDINAL F.S. 82.80 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

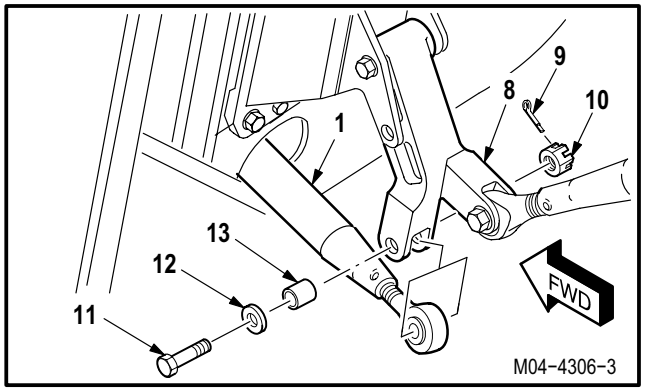
b. **Remove rod (1) from bellcrank (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (1).



11.113.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.113.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.113. LONGITUDINAL F.S. 82.80 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.113.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install rod (1) on bellcrank (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (8).

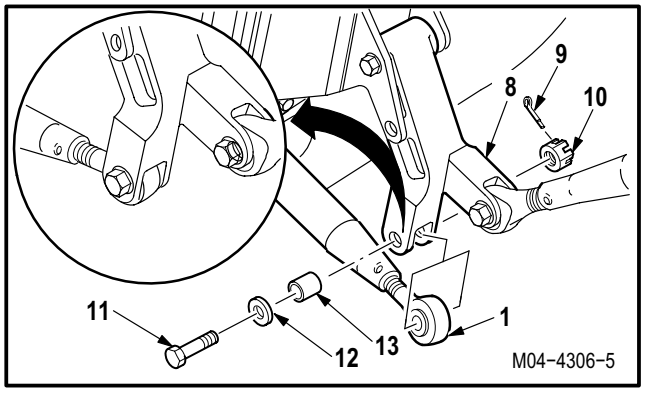
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (8), and rod (1).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.113. LONGITUDINAL F.S. 82.80 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install adjustable end of rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

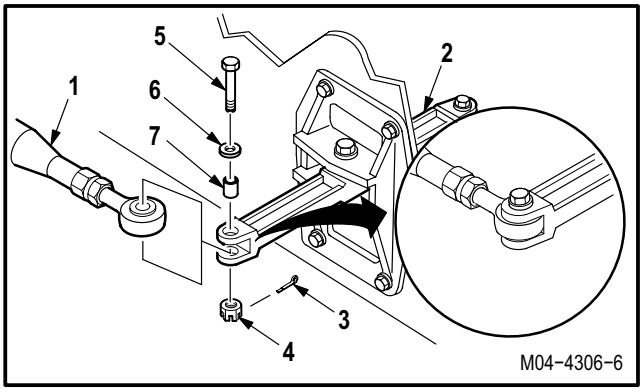
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install access covers B80R and B85R** (para 2.2)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.114. CPG TO PILOT LONGITUDINAL F.S. 82.80 CONTROL BRACKET REMOVAL/INSTALLATION

11.114.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.114.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

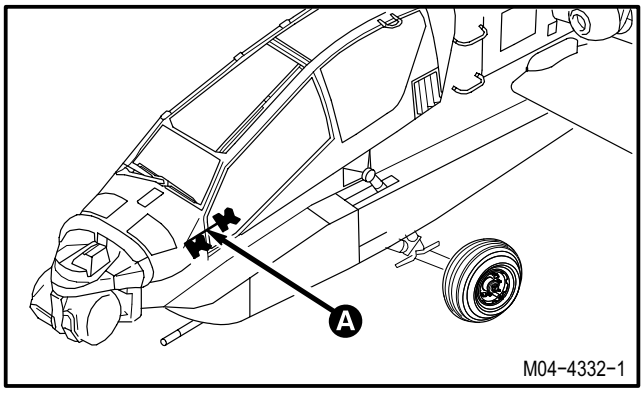
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access covers B80R and B85R removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.114.3. Removal

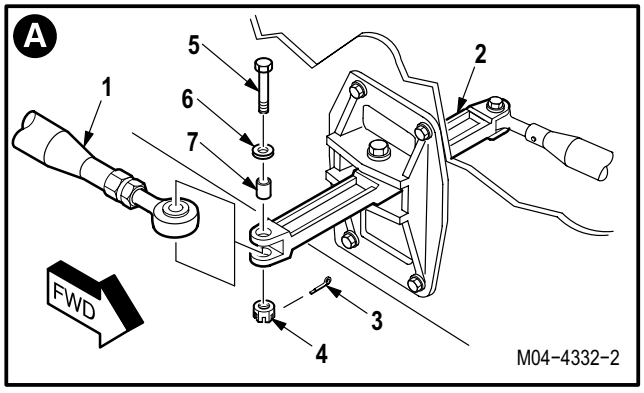
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1) from bellcrank (2).



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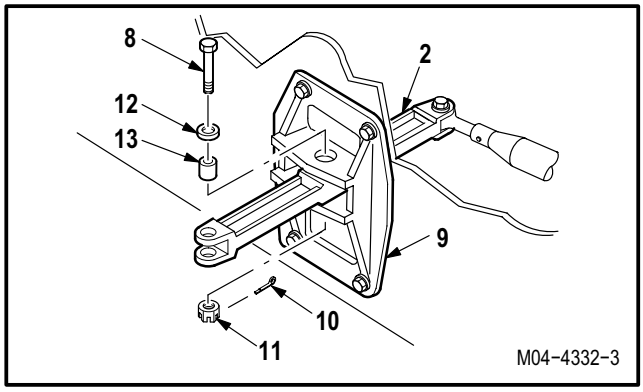
11.114. CPG TO PILOT LONGITUDINAL F.S. 82.80 CONTROL BRACKET REMOVAL/INSTALLATION – continued

b. **Remove bolt (8) from bracket (9) and bellcrank (2).**

(1) Remove and discard cotter pin (10).

(2) Remove nut (11).

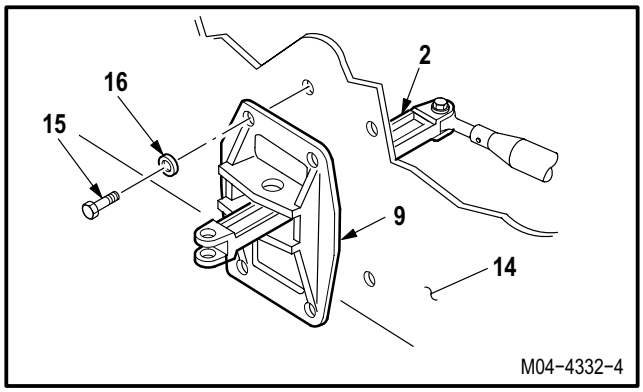
(3) Remove bolt (8), washer (12), and bushing (13) from bracket (9) and bellcrank (2).



c. **Remove bracket (9) from airframe (14).**

(1) Remove four bolts (15) and washers (16).

(2) Remove bracket (9) from airframe (14).



11.114.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.114.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.114. CPG TO PILOT LONGITUDINAL F.S. 82.80 CONTROL BRACKET REMOVAL/INSTALLATION – continued

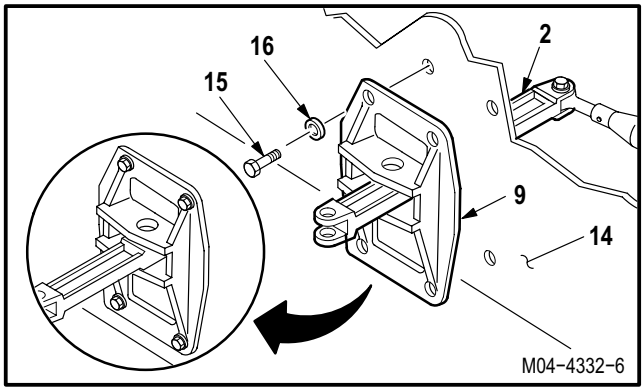
11.114.6. Installation

a. **Install bracket (9) on airframe (14).**

(1) Position bracket (9) over bellcrank (2).

(2) Aline four holes in bracket (9) with holes in airframe (14).

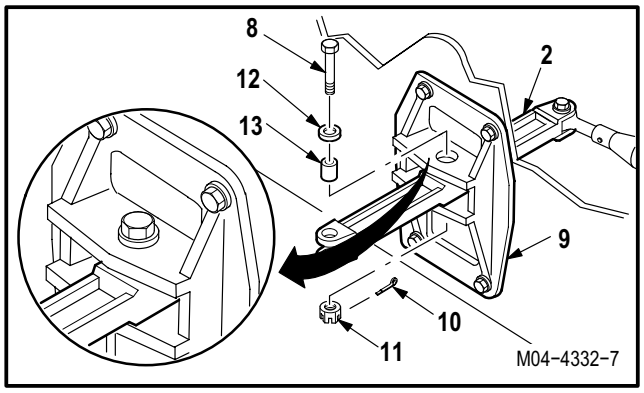
(3) Install four bolts (15) through washers (16) and bracket (9), into airframe (14).



CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bolt (8) through bracket (9) and bellcrank (2).** Torque nut (11) **30 to 40 INCH-POUNDS**.



(1) Aline bellcrank (2) with bracket (9).

(2) Install bolt (8) through washer (12), bushing (13), bracket (9), and bellcrank (2).

(3) Check fit of self-retaining bolt (8) (para 11.1).

(4) Install nut (11). Torque nut (11) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (10).

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11.114. CPG TO PILOT LONGITUDINAL F.S. 82.80 CONTROL BRACKET REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

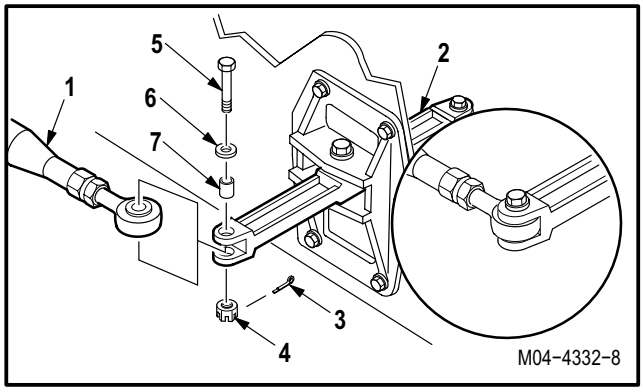
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4).Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install access covers B80R and B85R** (para 2.2)**.**

END OF TASK

11.115. CPG TO PILOT CONTROL LONGITUDINAL F.S. 96.59 BELLCRANK REMOVAL/INSTALLATION

11.115.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.115.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (3)

Personnel Required:

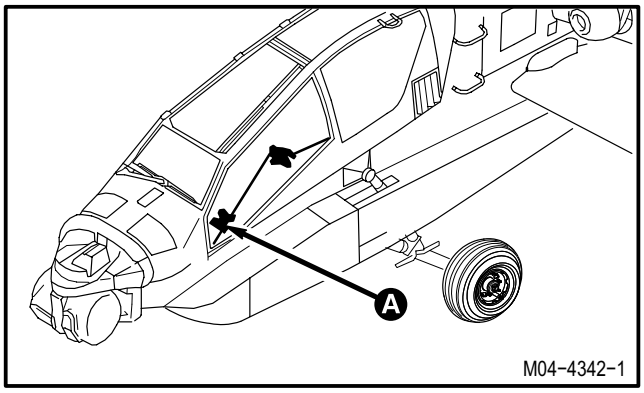
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.115.3. Removal

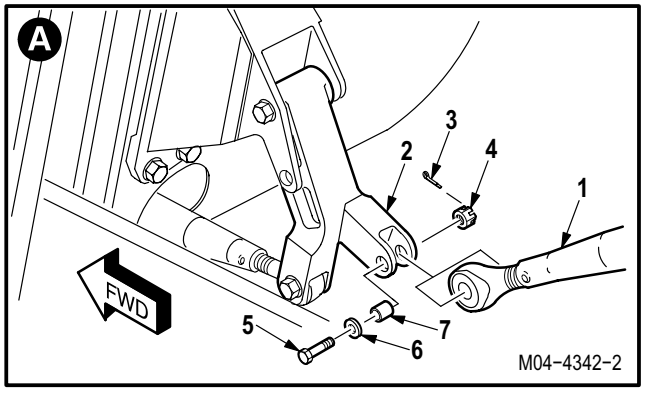
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1) from bellcrank (2).



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11.115. CPG TO PILOT CONTROL LONGITUDINAL F.S. 96.59 BELLCRANK REMOVAL/INSTALLATION – continued

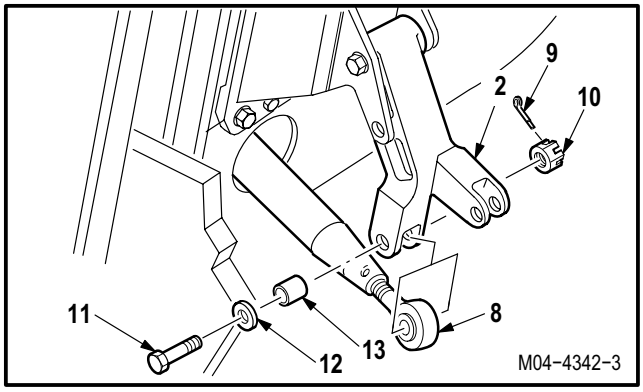
b. **Remove push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (8) from bellcrank (2).



c. **Remove bellcrank (2) from bracket (14).**

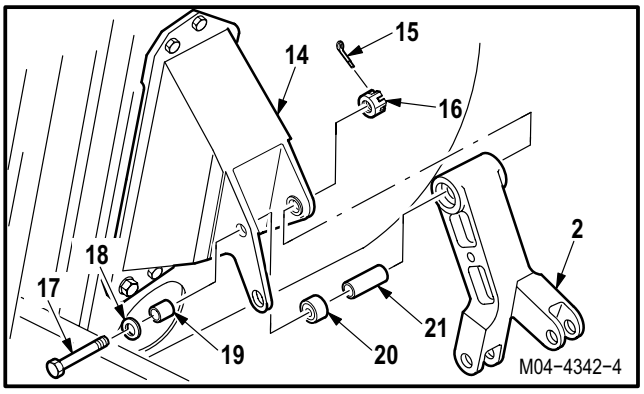
(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove bellcrank (2).

(5) Remove bearing (20) and bushing (21).



11.115.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.115.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.115. CPG TO PILOT CONTROL LONGITUDINAL F.S. 96.59 BELLCRANK REMOVAL/INSTALLATION – continued

11.115.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Install bushing (21) and bearing (20) on bellcrank (2).

(2) Aline bellcrank (2) with bracket (14).

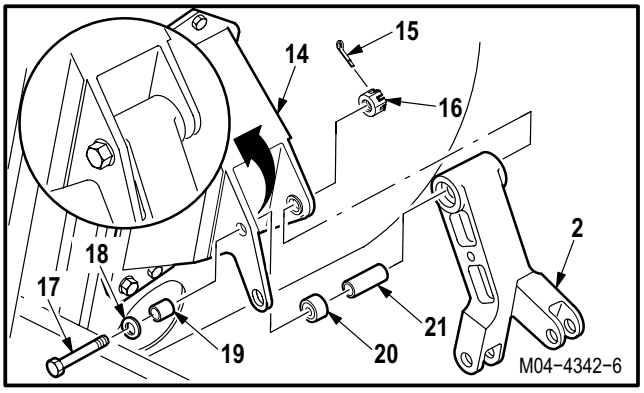
(3) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(4) Check fit of self-retaining bolt (17) (para 11.1).

(5) Install nut (16).Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (15).



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11.115. CPG TO PILOT CONTROL LONGITUDINAL F.S. 96.59 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

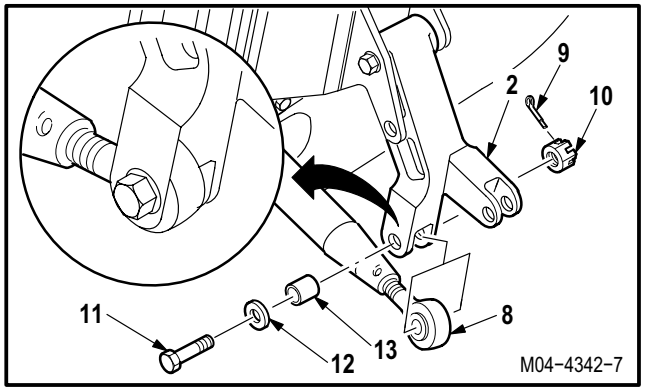
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10).Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

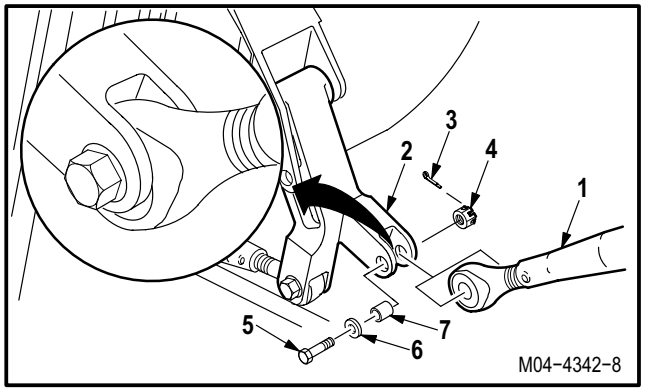
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4).Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.116. LONGITUDINAL F.S. 96.59 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.116.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.116.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

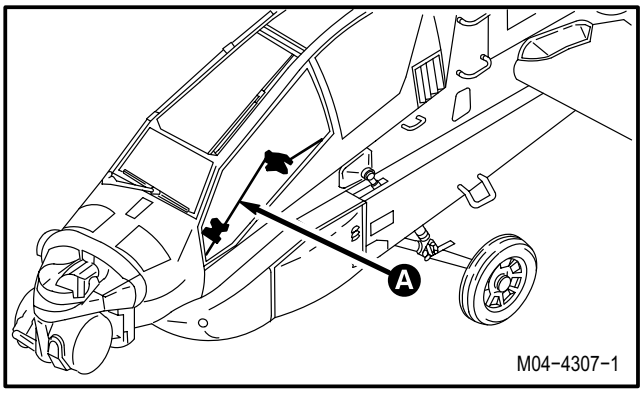
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.116.3. Removal

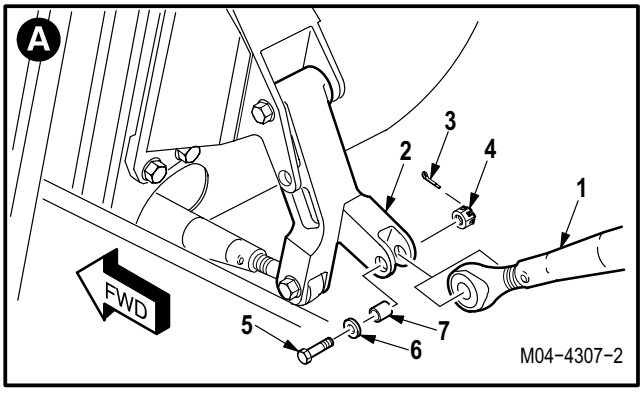
a. **Remove push-pull rod assembly (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.116. LONGITUDINAL F.S. 96.59 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

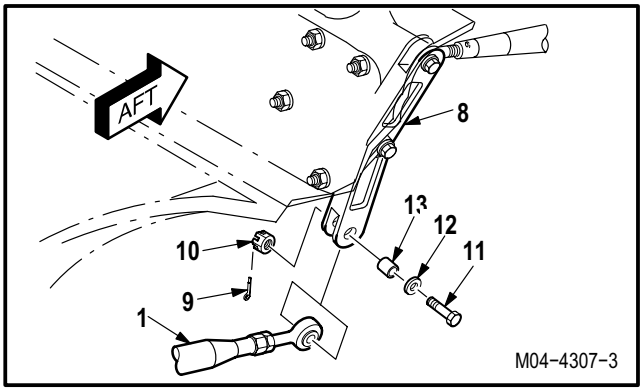
b. **Remove rod (1) from bellcrank (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (1).



11.116.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.116.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.116. LONGITUDINAL F.S. 96.59 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.116.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install adjustable end of rod (1) on bellcrank (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (8).

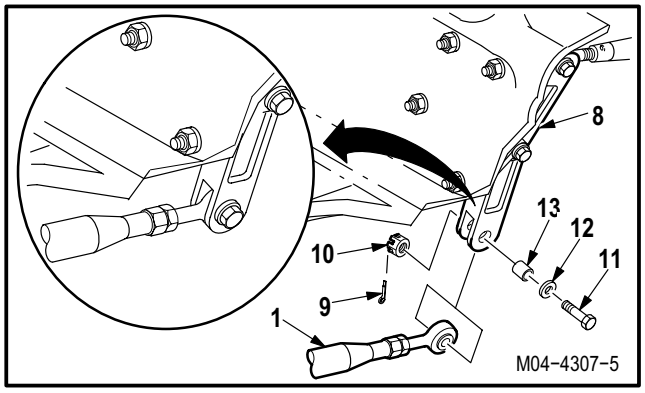
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (8), and rod (1).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.116. LONGITUDINAL F.S. 96.59 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

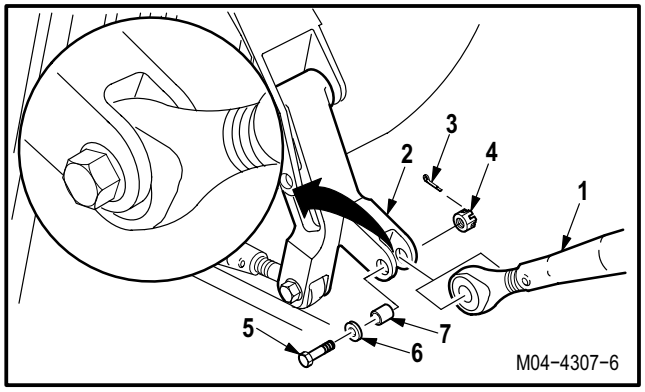
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**.Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.117. CPG TO PILOT LONGITUDINAL F.S. 96.59 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.117.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.117.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

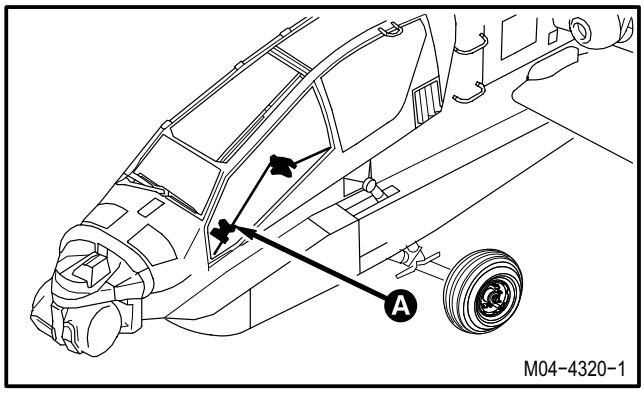
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.117.3. Removal

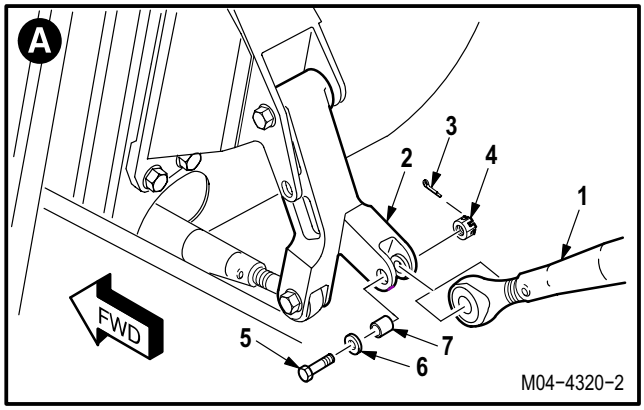
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.117. CPG TO PILOT LONGITUDINAL F.S. 96.59 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Remove bellcrank (2) from bracket assembly (8).**

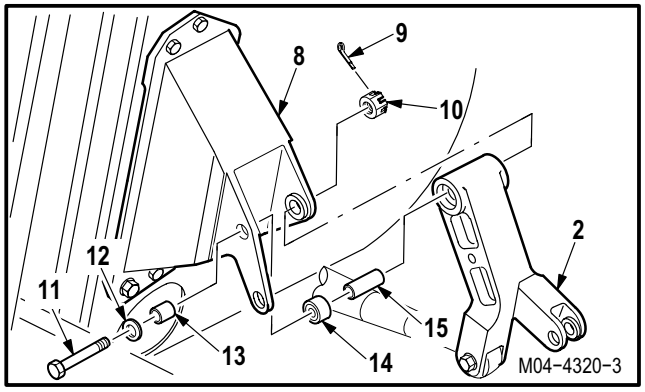
(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13) from bracket (8) and bellcrank (2).

(4) Remove bellcrank (2) from bracket (8).

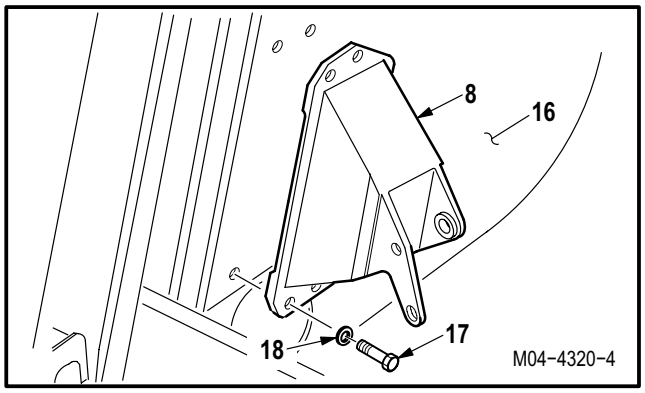
(5) Remove bearing (14) and bushing (15) from bellcrank (2).



c. **Remove bracket (8) from airframe (16).**

(1) Remove four bolts (17) and washers (18).

(2) Remove bracket (8).



11.117.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.117.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.117. CPG TO PILOT LONGITUDINAL F.S. 96.59 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.117.6. Installation

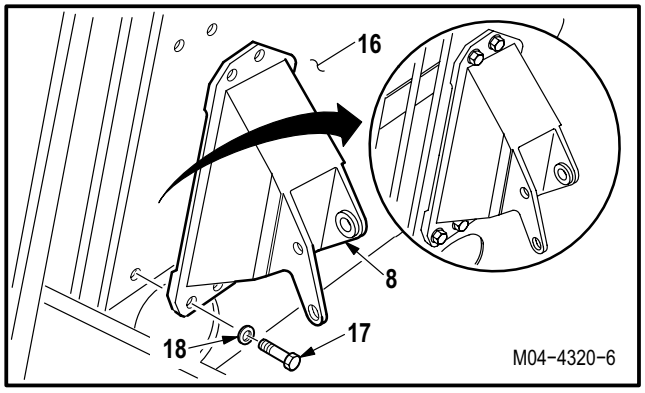
CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bracket (8) on airframe (16).**

(1) Aline bracket (8) on airframe (16).

(2) Install four bolts (17) through washers (18) and bracket (8) into airframe (16).



b. **Install bellcrank (2) on bracket (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Install bushing (15) and bearing (14) on bellcrank (2).

(2) Aline bellcrank (2) with bracket (8).

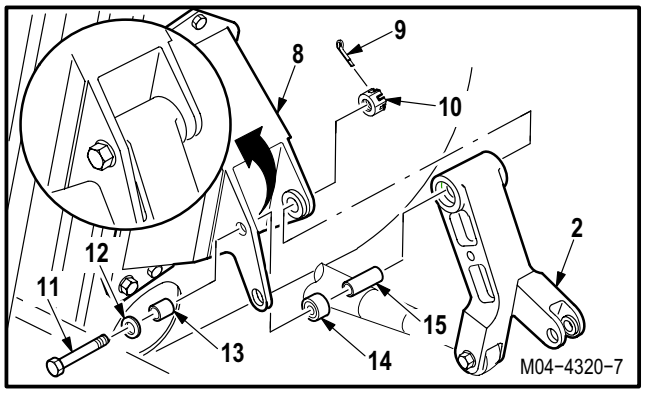
(3) Install bolt (11) through washer (12), bushing (13), bracket (8), and bellcrank (2).

(4) Check fit of self-retaining bolt (11) (para 11.1).

(5) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (9).



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11.117. CPG TO PILOT LONGITUDINAL F.S. 96.59 CONTROL BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

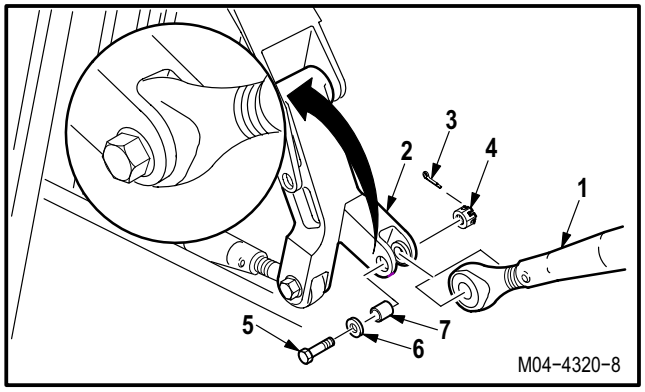
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.118. CPG TO PILOT CONTROL LONGITUDINAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION

11.118.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.118.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (3)

Personnel Required:

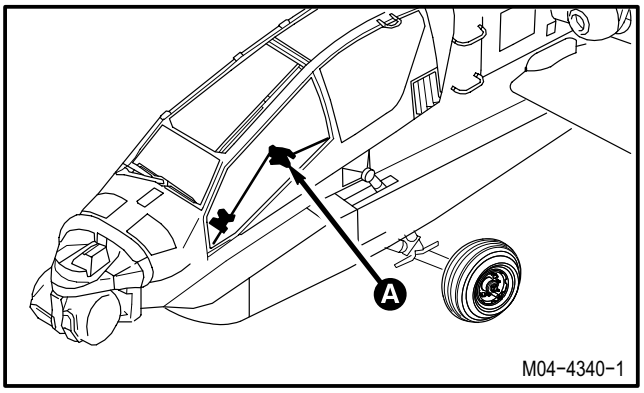
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.118.3. Removal

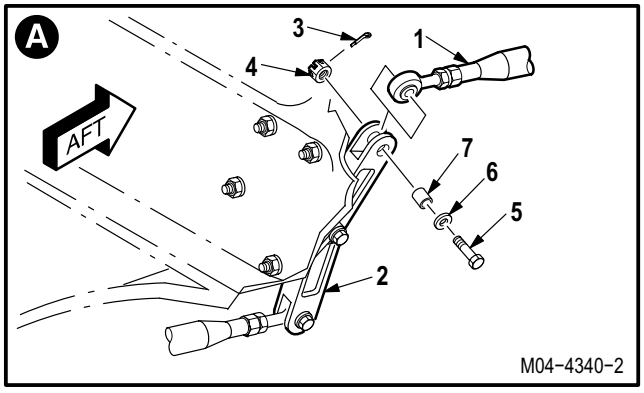
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.118. CPG TO PILOT CONTROL LONGITUDINAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

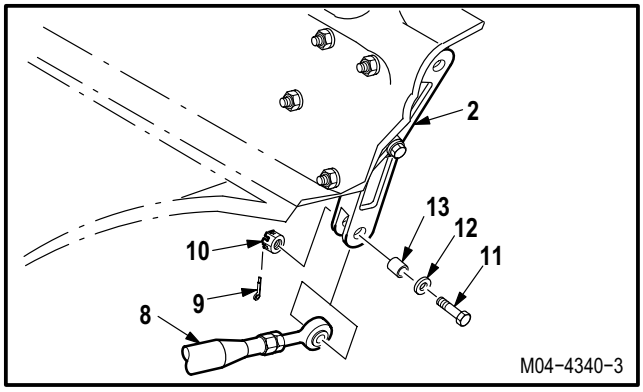
b. **Remove push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (8).



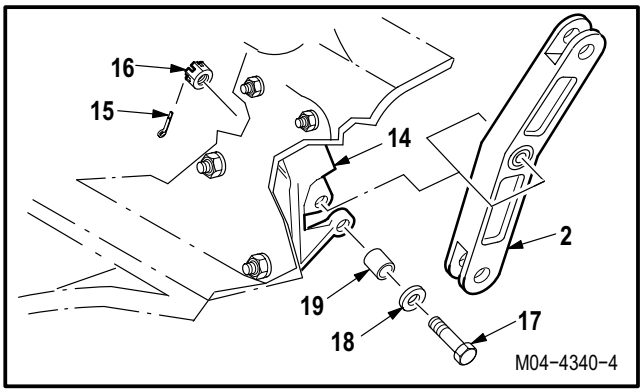
c. **Remove bellcrank (2) from bracket (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove bellcrank (2).



11.118.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.118.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.118. CPG TO PILOT CONTROL LONGITUDINAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

11.118.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) to **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (14).

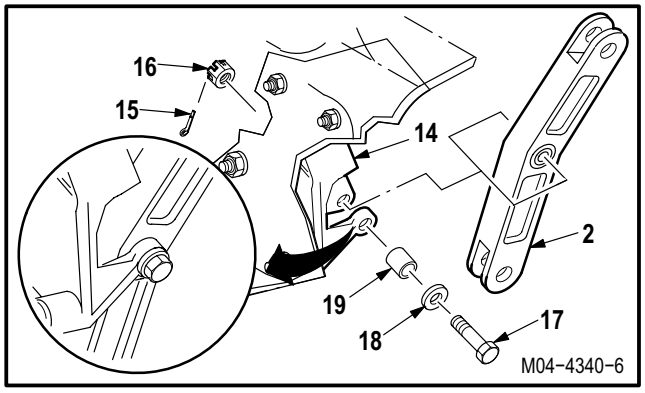
(2) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

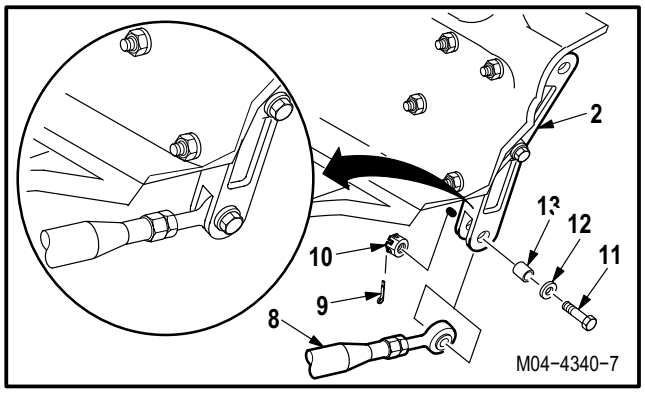
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.118. CPG TO PILOT CONTROL LONGITUDINAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

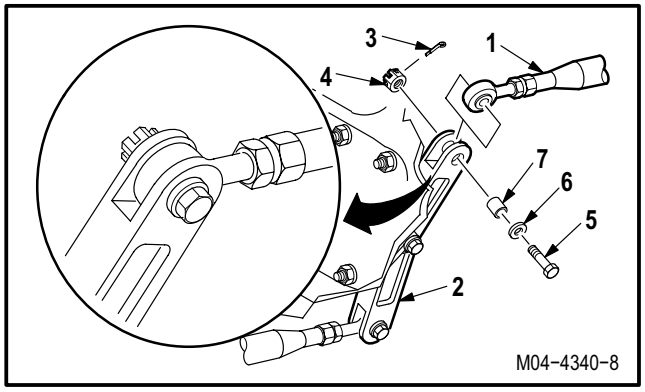
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.119. LONGITUDINAL F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.119.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.119.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

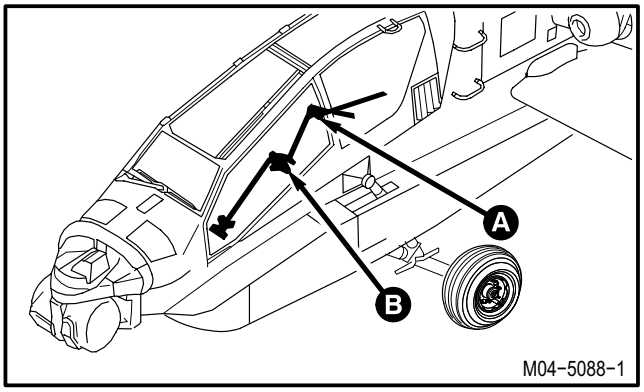
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed
10.52A	Forward fuel cell retainer panel removed (if installed)

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.119. LONGITUDINAL F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.119.3. Removal

a. **Remove longitudinal push-pull rods (1) and (2) from bellcrank (3).**

(1) Remove and discard cotter pin (4).

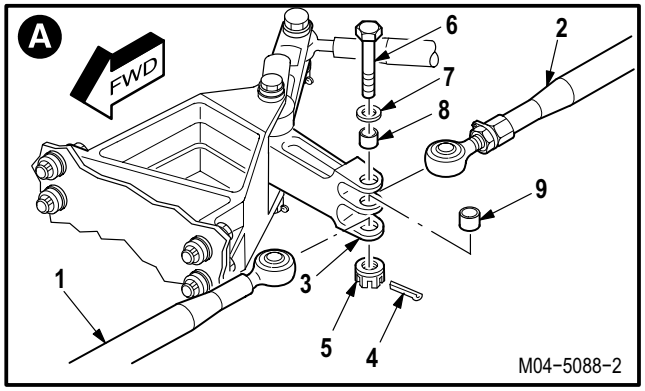
(2) Remove nut (5).

(3) Remove bolt (6), washer (7), and bushing (8).

(4) Remove rod (1).

(5) Remove bushing (9).

(6) Remove rod (2).



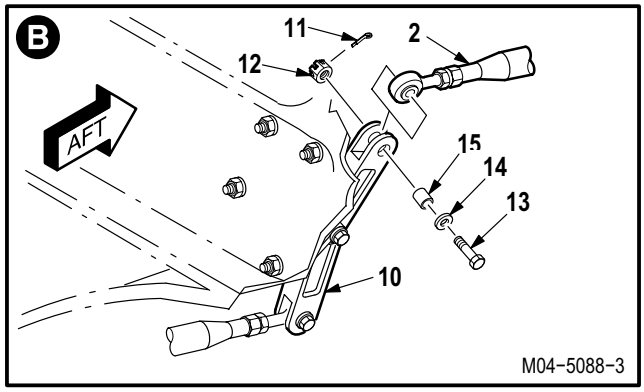
b. **Remove longitudinal push-pull rod (2) from bellcrank (10).**

(1) Remove and discard cotter pin (11).

(2) Remove nut (12).

(3) Remove bolt (13), washer (14), and bushing (15).

(4) Remove rod (2).



11.119.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

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11.119. LONGITUDINAL F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.119.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.119.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install rod (1) on bellcrank (10).** Torque nut (12) **30 to 40 INCH-POUNDS**.

(1) Aline rod (2) with bellcrank (10).

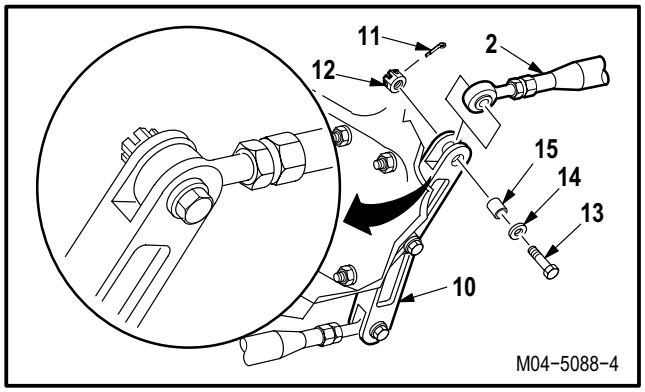
(2) Install bolt (13) through washer (14), bushing (15), bellcrank (10), and rod (2).

(3) Check fit of self-retaining bolt (13) (para 11.1).

(4) Install nut (12). Torque nut (12) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (11).



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11.119. LONGITUDINAL F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rods (2) and (1) on bellcrank (3).** Torque nut (5) **30 to 40 INCH-POUNDS**.

(1) Aline rod (2) with bellcrank (3).

(2) Install bushing (9).

(3) Aline rod (1) with bellcrank (3).

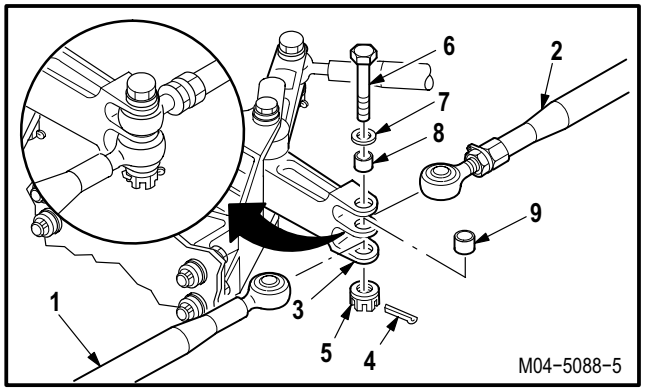
(4) Install bolt (6) through washer (7), bushing (8), bellcrank (3), rod (1), and rod (2).

(5) Check fit of self-retaining bolt (7) (para 11.1).

(6) Install nut (5). Torque nut (5) to **30 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(8) Install new cotter pin (4).



c. **Inspect (QA).**

d. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

f. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

END OF TASK

11.120. CPG TO PILOT LONGITUDINAL F.S. 118.50 CONTROL FLIGHT BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.120.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.120.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

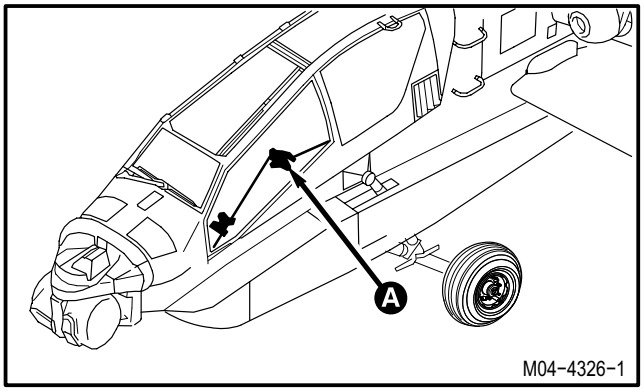
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.120.3. Removal

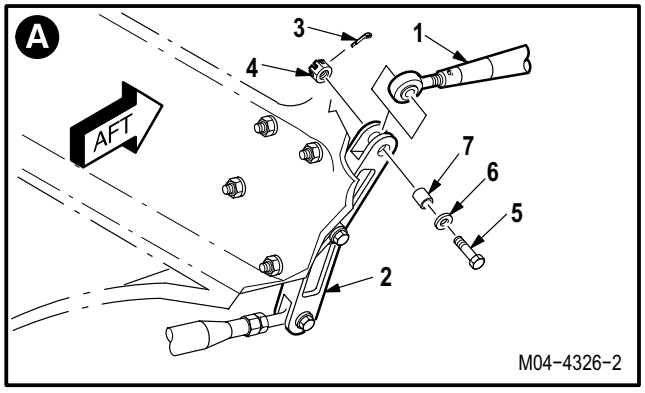
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.120. CPG TO PILOT LONGITUDINAL F.S. 118.50 CONTROL FLIGHT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

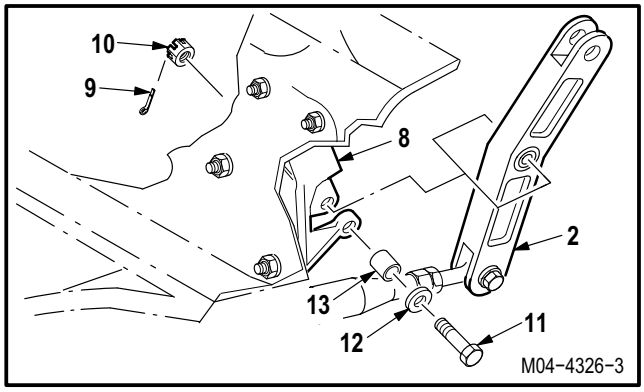
b. **Remove bellcrank (2) from bracket assembly (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13) from bracket (8) and bellcrank (2).

(4) Remove bellcrank (2).



NOTE

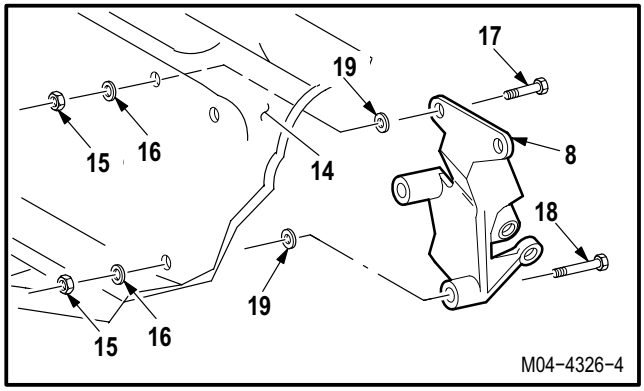
Laminated spacers are installed between the bracket and the airframe. Use care when removing the bracket to prevent the spacers from delaminating.

c. **Remove bracket (8) from airframe (14).**

(1) Remove four nuts (15) and washers (16).

(2) Remove two bolts (17), two bolts (18), and four spacers (19).

(3) Remove bracket (8).



11.120.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.120.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.120. CPG TO PILOT LONGITUDINAL F.S. 118.50 CONTROL FLIGHT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.120.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

NOTE

Install laminated spacers between the bracket and the airframe. Adjust thickness of the laminated spacer to obtain minimum **0.010 INCH** clearance from any structure.

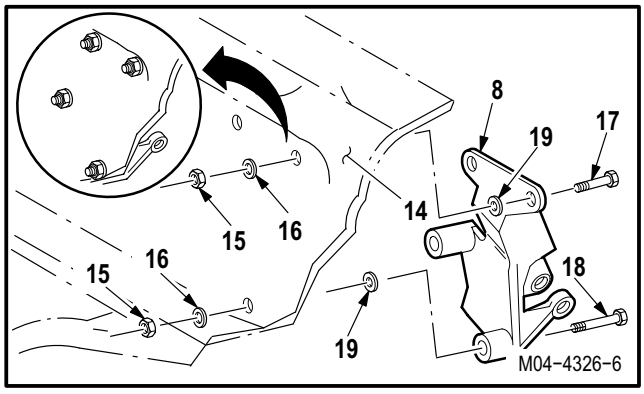
a. **Install bracket (8) on airframe (14).**

(1) Position bracket (8) on airframe (14).

(2) Install two bolts (17) and two bolts (18) through bracket (8) and four spacers (19) into airframe (14).

(3) Install four washers (16) and nuts (15).

(4) Verify minimum clearance of **0.010 INCH** is maintained between bracket (8) and any structure.



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11.120. CPG TO PILOT LONGITUDINAL F.S. 118.50 CONTROL FLIGHT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install bellcrank (2) on bracket (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (8).

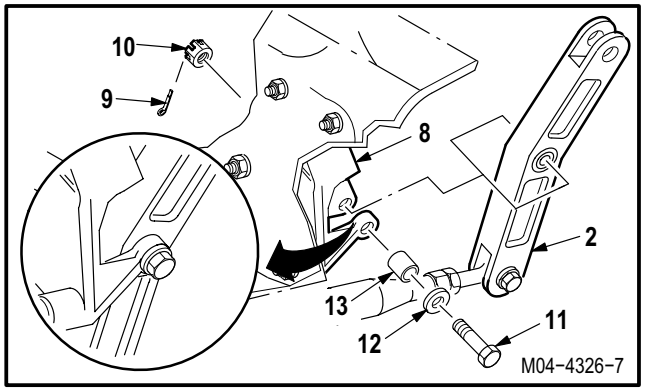
(2) Install bolt (11) through washer (12), bushing (13), bracket (8), and bellcrank (2).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

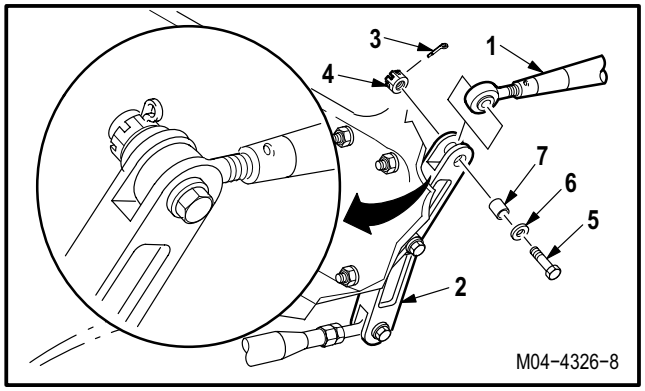
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.121. LONGITUDINAL F.S. 129.25 BELLCRANK REMOVAL/INSTALLATION

11.121.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.121.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

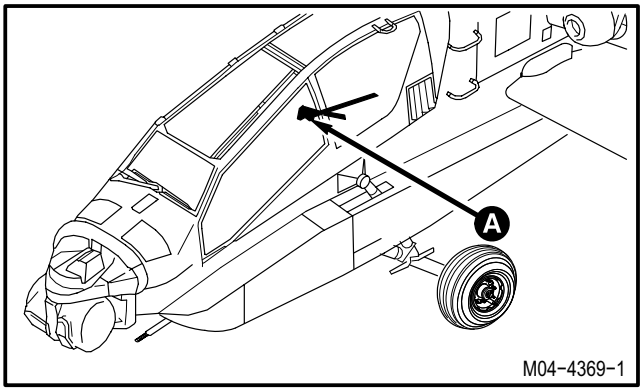
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
10.52A	Forward fuel cell retainer panel removed (if installed)

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.121.3. Removal

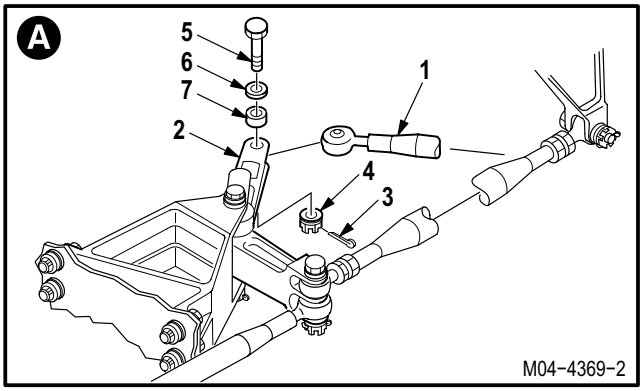
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.121. LONGITUDINAL F.S. 129.25 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Remove push-pull rods (8) and (9) from bellcrank (2).**

(1) Remove and discard cotter pin (10).

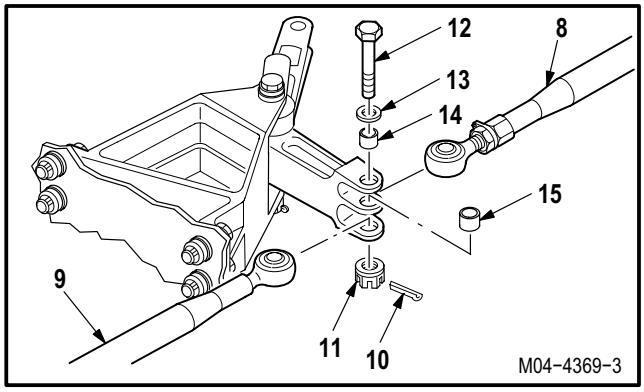
(2) Remove nut (11).

(3) Remove bolt (12), washer (13), and bushing (14).

(4) Remove rod (8) from bellcrank (2).

(5) Remove bushing (15).

(6) Remove rod (9).



c. **Remove bellcrank (2) from bracket (16).**

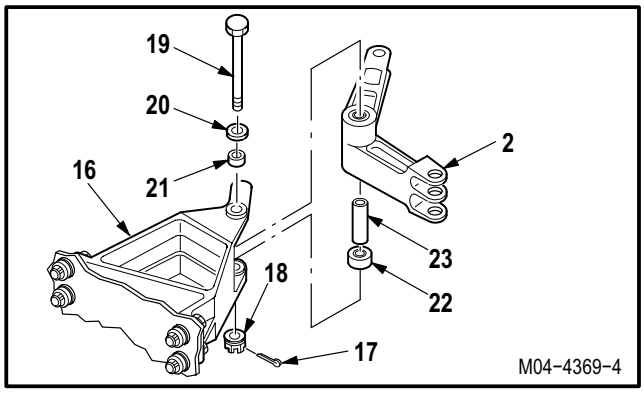
(1) Remove and discard cotter pin (17).

(2) Remove nut (18).

(3) Remove bolt (19), washer (20), and bushing (21).

(4) Remove bellcrank (2).

(5) Remove bearing (22) and bushing (23) from bellcrank (2).



11.121.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.121.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.121. LONGITUDINAL F.S. 129.25 BELLCRANK REMOVAL/INSTALLATION – continued

11.121.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bellcrank (2) on bracket (16).** Torque nut (18) **30 to 40 INCH-POUNDS**.

(1) Install bushing (23) and bearing (22) on bellcrank (2).

(2) Aline bellcrank (2) with bracket (16).

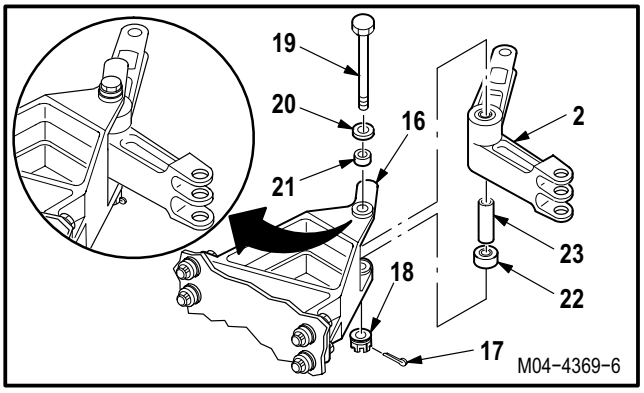
(3) Install bolt (19) through washer (20), bushing (21), bracket (16), and bellcrank (2).

(4) Check fit of self-retaining bolt (19) (para 11.1).

(5) Install nut (18). Torque nut (18) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (17).



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11.121. LONGITUDINAL F.S. 129.25 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install rods (9) and (8) on bellcrank (2).** Torque nut (11) **30 to 40 INCH-POUNDS**.

(1) Aline rod (9) with bellcrank (2).

(2) Install bushing (15).

(3) Aline rod (8) with bellcrank (2).

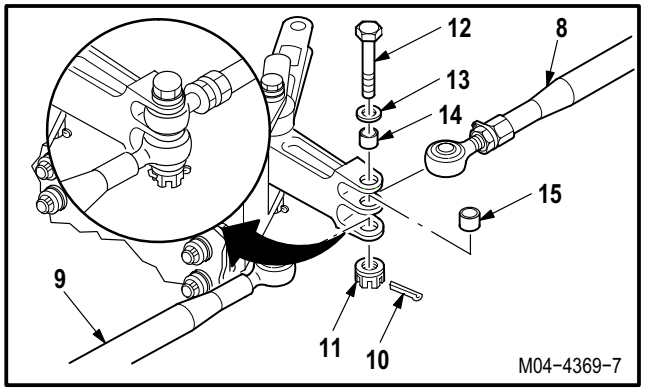
(4) Install bolt (12) through washer (13), bushing (14), bellcrank (2), rod (8), and rod (9).

(5) Check fit of self-retaining bolt (12) (para 11.1).

(6) Install nut (11). Torque nut (11) to **30 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(8) Install new cotter pin (10).



c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

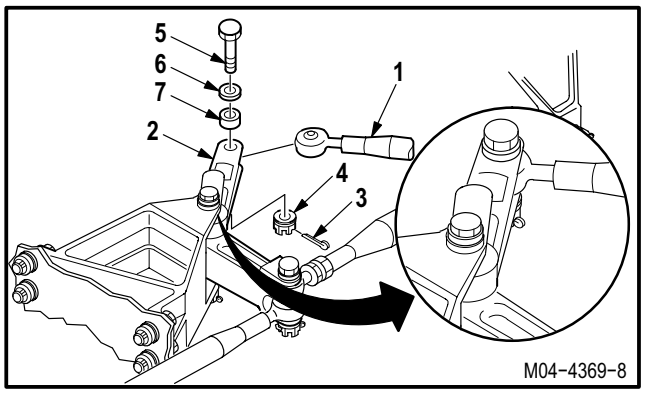
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

END OF TASK

11.122. LONGITUDINAL F.S. 129.25 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.122.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.122.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

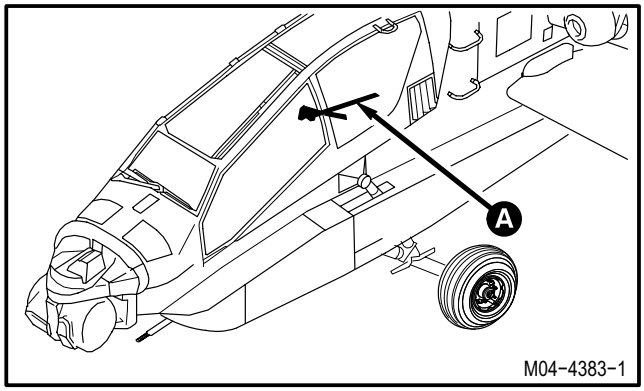
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
10.52A	Forward fuel cell retainer panel removed (if installed)

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.122.3. Removal

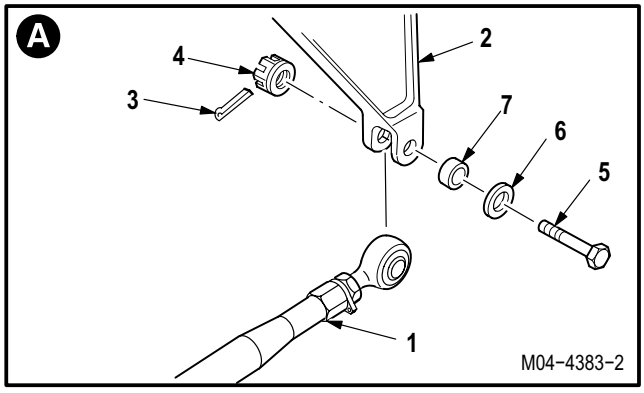
a. **Remove push-pull rod assembly (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.122. LONGITUDINAL F.S. 129.25 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Remove push-pull rods (1) and (8) from bellcrank (9).**

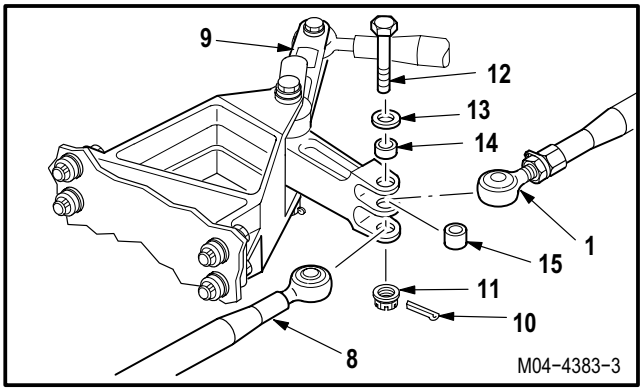
(1) Remove and discard cotter pin (10).

(2) Remove nut (11).

(3) Remove bolt (12), washer (13), and bushing (14).

(4) Remove rod (1).

(5) Remove bushing (15) and rod (8) from bellcrank (9).



11.122.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.122.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.122. LONGITUDINAL F.S. 129.25 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.122.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install rods (8) and (1) on bellcrank (9).** Torque nut (11) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (9).

(2) Install bushing (15).

(3) Aline rod (1) with bellcrank (9).

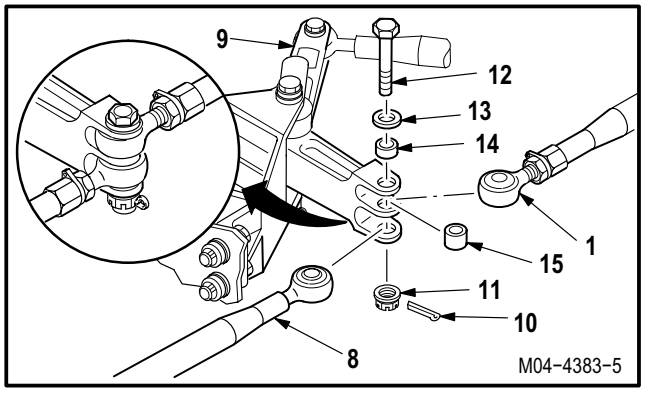
(4) Install bolt (12) through washer (13), bushing (14), bellcrank (9), rod (1), bushing (15), and rod (8).

(5) Check fit of self-retaining bolt (12) (para 11.1).

(6) Install nut (11). Torque nut (11) to **30 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(8) Install new cotter pin (10).



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11.122. LONGITUDINAL F.S. 129.25 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

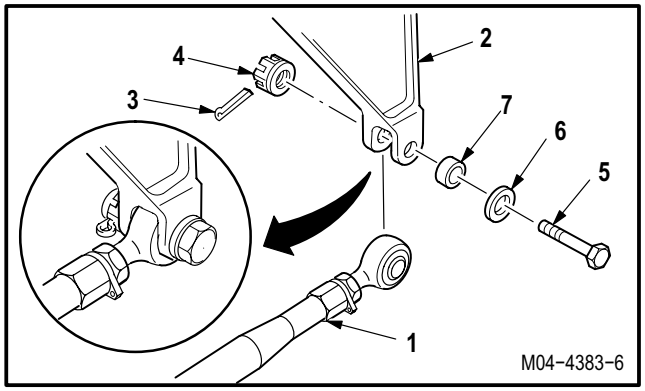
(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4).

(5) Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

END OF TASK

11.123. LONGITUDINAL F.S. 129.25 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.123.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.123.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (2)

Personnel Required:

67R Attack Helicopter Repairer
One person to assist
67R3F Attack Helicopter Repairer/Technical Inspector

References:

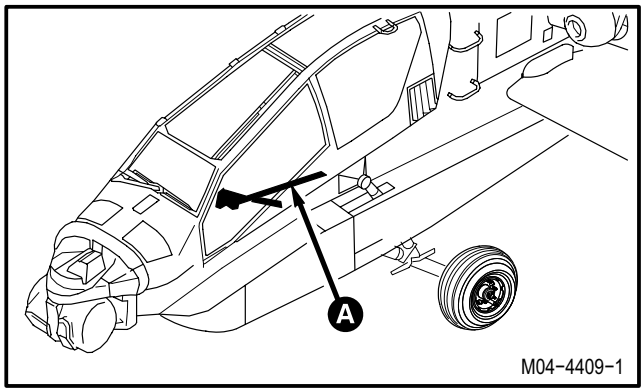
TM 1-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
10.52A	Forward fuel cell retainer panel removed (if installed)
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.123.3. Removal

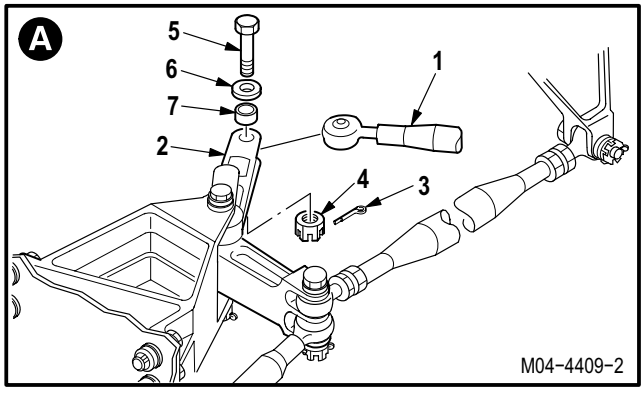
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.123. LONGITUDINAL F.S. 129.25 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Remove bellcrank (2) from bracket (8).**

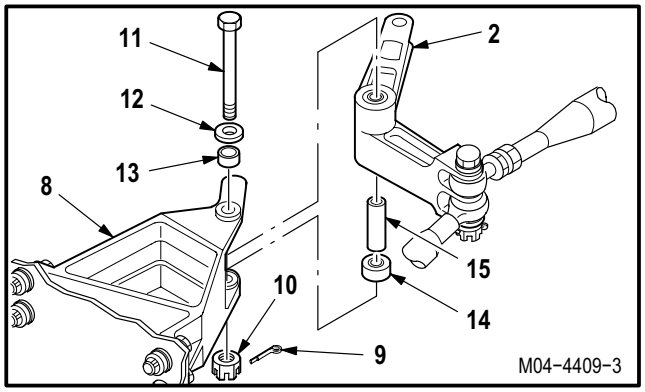
(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13) from bracket (8) and bellcrank (2).

(4) Remove bellcrank (2).

(5) Remove bearing (14) and bushing (15).

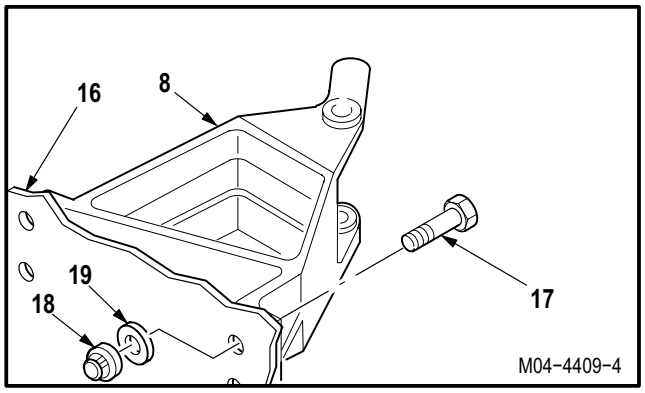


c. **Remove bracket (8) from airframe (16).**

(1) With one person holding bolts (17), remove four nuts (18) and washers (19).

(2) Remove four bolts (17).

(3) Remove bracket (8).



11.123.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.123.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.123. LONGITUDINAL F.S. 129.25 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.123.6. Installation

CAUTION

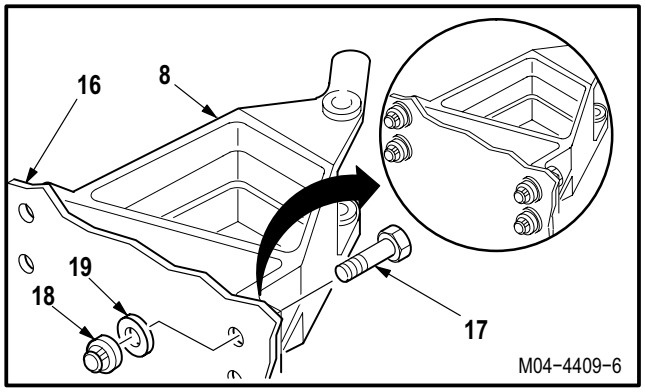
To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bracket (8) on airframe (16).**

(1) Aline four holes in bracket (8) with holes in airframe (16).

(2) Install four bolts (17) through bracket (8) and airframe (16).

(3) With one person holding bolts (17), install four washers (19) and nuts (18).



b. **Install bellcrank (2) on bracket (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Install bushing (15) and bearing (14) on bellcrank (2).

(2) Aline bellcrank (2) with bracket (8).

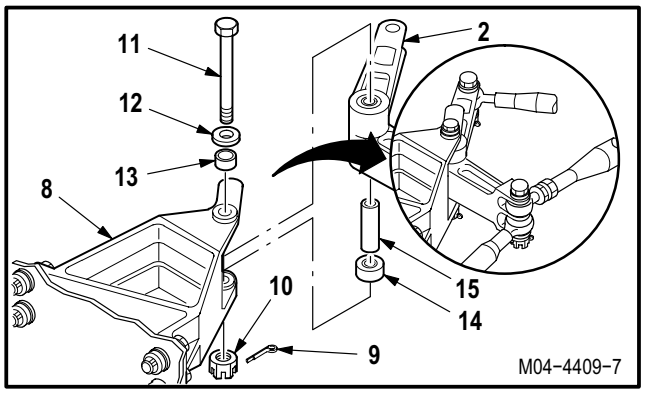
(3) Install bolt (11) through washer (12), bushing (13), bracket (8), and bellcrank (2).

(4) Check fit of self-retaining bolt (11) (para 11.1).

(5) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (9).



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11.123. LONGITUDINAL F.S. 129.25 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque (4) nut **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

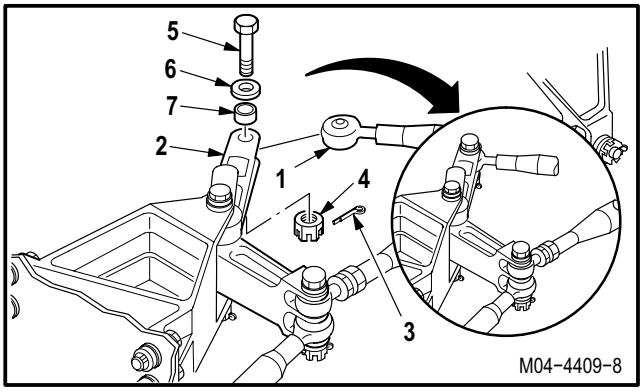
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque (4) nut to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

f. **Perform lateral flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

g. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

END OF TASK

11.124. LONGITUDINAL F.S. 159.62 BELLCRANK REMOVAL/INSTALLATION

11.124.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.124.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

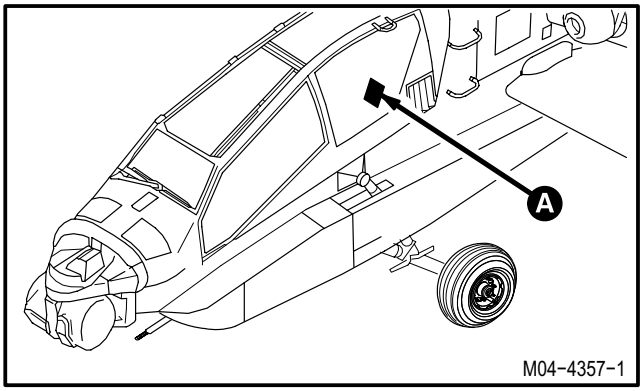
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



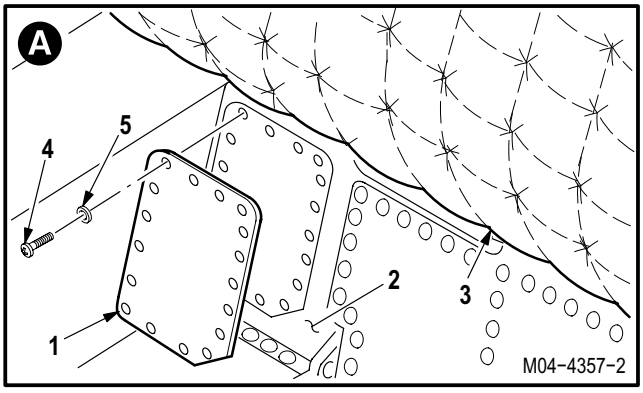
11.124.3. Removal

a. **Remove access cover (1) from pilot cockpit aft bulkhead (2).**

(1) Move thermal insulation (3) away from bulkhead (2) to expose cover (1).

(2) Remove 17 screws (4) and washers (5).

(3) Remove cover (1).



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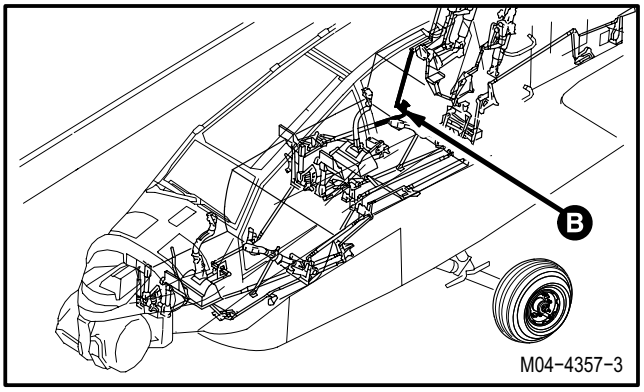
11.124. LONGITUDINAL F.S. 159.62 BELLCRANK REMOVAL/INSTALLATION – continued



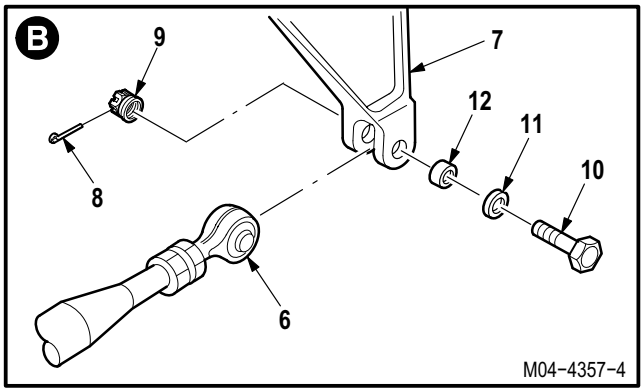
b. **Remove push-pull rod (6) from bellcrank (7).**

(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10), washer (11), and bushing (12).

(4) Remove rod (6).



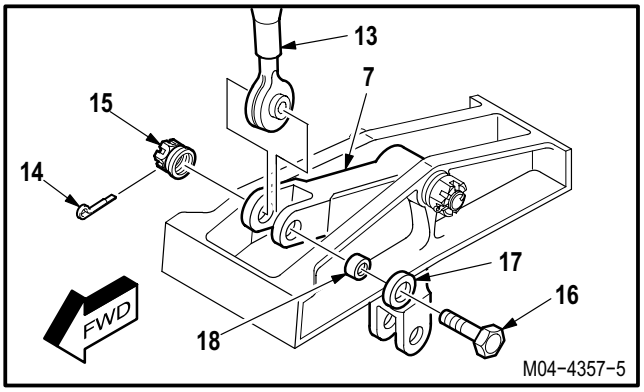
c. **Remove push-pull rod (13) from bellcrank (7).**

(1) Remove and discard cotter pin (14).

(2) Remove nut (15).

(3) Remove bolt (16), washer (17), and bushing (18).

(4) Remove rod (13).



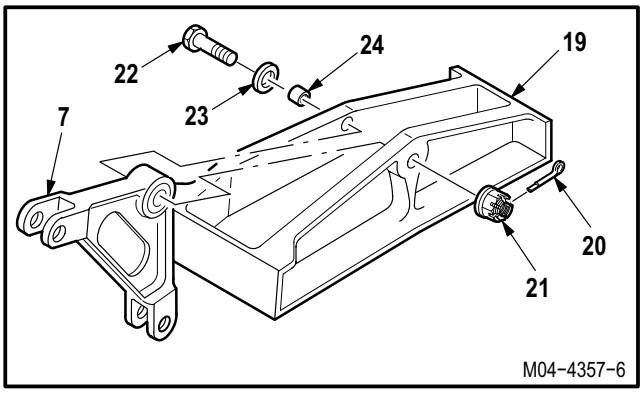
d. **Remove bellcrank (7) from bracket (19).**

(1) Remove and discard cotter pin (20).

(2) Remove nut (21).

(3) Remove bolt (22), washer (23), and bushing (24).

(4) Remove bellcrank (7).



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11.124. LONGITUDINAL F.S. 159.62 BELLCRANK REMOVAL/INSTALLATION – continued

11.124.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.124.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.124.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bellcrank (7) on bracket (19).** Torque nut (21) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (7) with bracket (19).

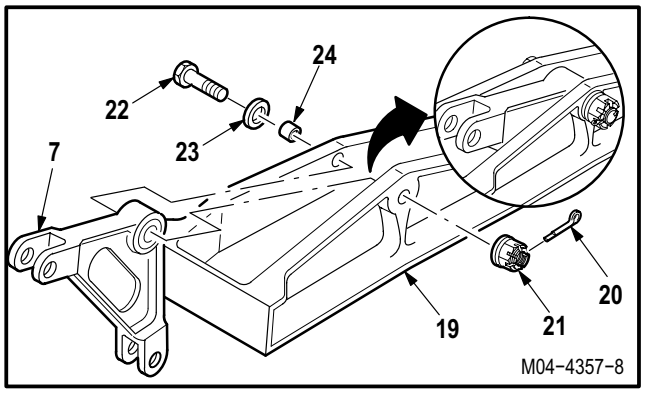
(2) Install bolt (22) through washer (23), bushing (24), bracket (19), and bellcrank (7).

(3) Check fit of self-retaining bolt (22) (para 11.1).

(4) Install nut (21). Torque nut (21) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (20).



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11.124. LONGITUDINAL F.S. 159.62 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install rod (13) on bellcrank (7).** Torque nut (15) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (7).

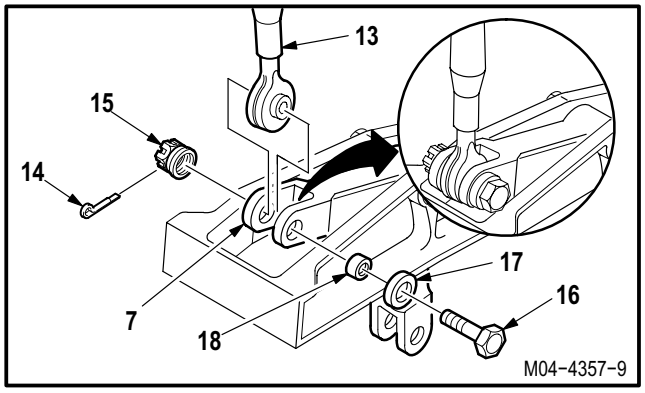
(2) Install bolt (16) through washer (17), bushing (18), bellcrank (7), and rod (13).

(3) Check fit of self-retaining bolt (16) (para 11.1).

(4) Install nut (15). Torque nut (15) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (14).



c. **Install rod (6) on bellcrank (7).** Torque nut (9) **30 to 40 INCH-POUNDS**.

(1) Aline rod (6) with bellcrank (7).

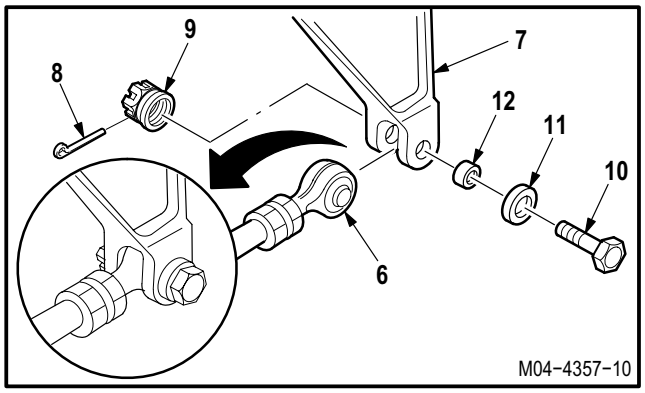
(2) Install bolt (10) through washer (11), bushing (12), bellcrank (7), and rod (6).

(3) Check fit of self-retaining bolt (10) (para 11.1).

(4) Install nut (9). Torque nut (9) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (8).



d. **Inspect (QA).**

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11.124. LONGITUDINAL F.S. 159.62 BELLCRANK REMOVAL/INSTALLATION – continued

e. **Install cover (1) on bulkhead (2).**

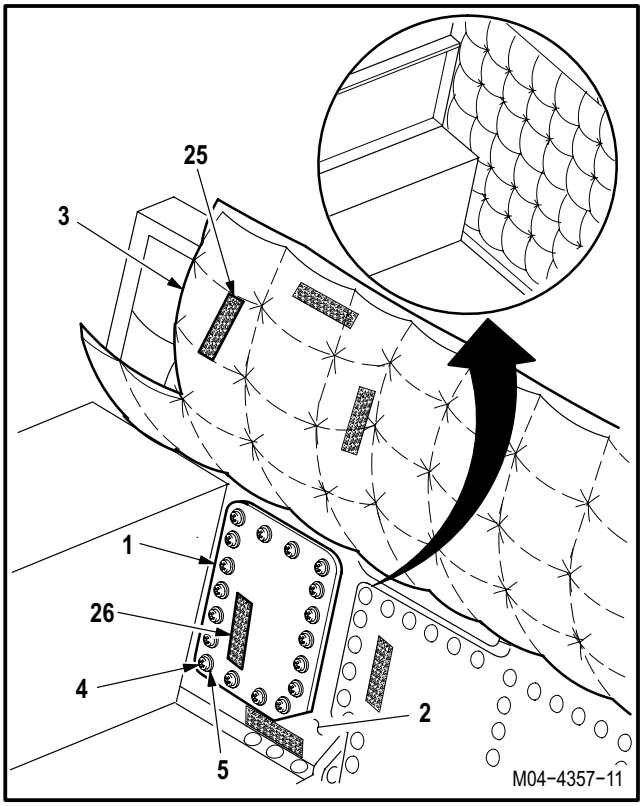
(1) Aline holes in cover (1) with holes in bulkhead (2).

(2) Install 17 screws (4) and washers (5).

(3) Secure insulation (3) on bulkhead (2) by fastening pile tape (25) on hook tape (26).

f. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

g. **Install pilot seat** (para 2.161)**.**



END OF TASK

11.125. LONGITUDINAL F.S. 159.62 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.125.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.125.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

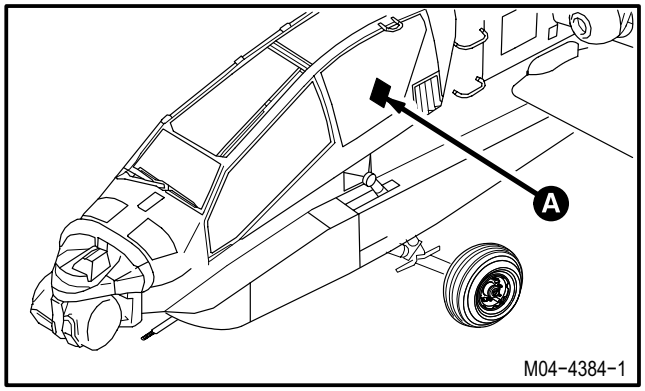
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access panel R200 removed
2.161	Pilot seat removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.125. LONGITUDINAL F.S. 159.62 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.125.3. Removal

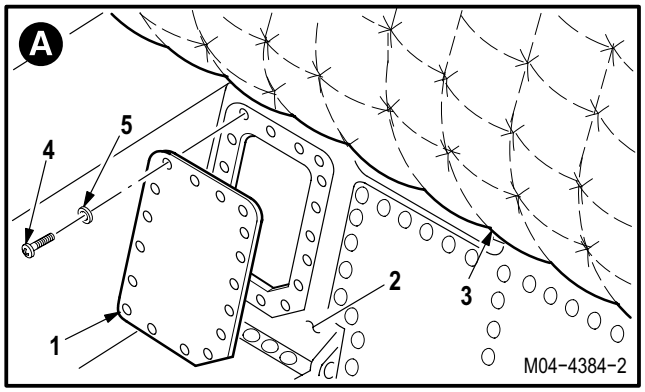
a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

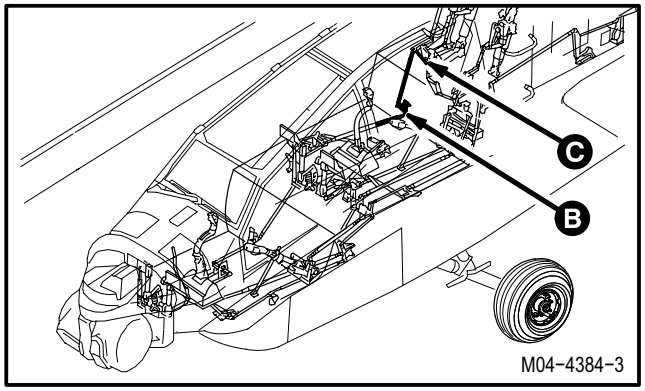
b. **Remove access cover (1) from pilot cockpit bulkhead (2).**

(1) Move thermal insulation (3) away from bulkhead (2) to expose cover (1).

(2) Remove 17 screws (4) and washers (5).

(3) Remove cover (1).





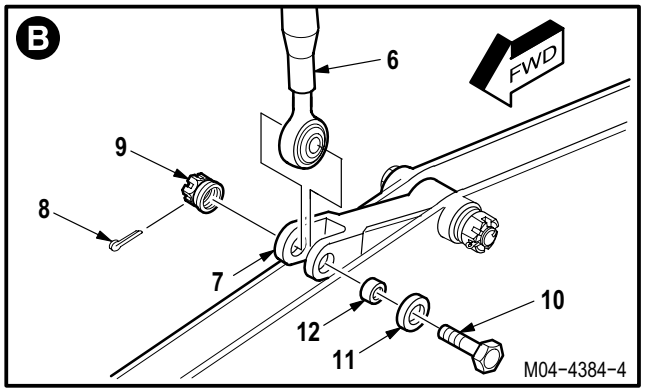
c. **Remove push-pull rod assembly (6) from bellcrank (7).**

(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10), washer (11), and bushing (12).

(4) Remove rod (6).



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11.125. LONGITUDINAL F.S. 159.62 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

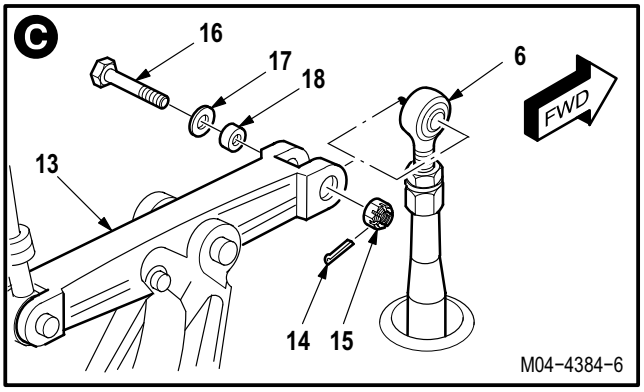
d. **Remove rod (6) from bellcrank (13).**

(1) Remove and discard cotter pin (14).

(2) Remove nut (15).

(3) Remove bolt (16), washer (17), and bushing (18).

(4) Remove rod (6).



11.125.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.125.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.125. LONGITUDINAL F.S. 159.62 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.125.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

a. **Install adjustable end of rod (6) on bellcrank (13).** Torque nut (15) **30 to 40 INCH-POUNDS**.

(1) Aline rod (6) with bellcrank (13).

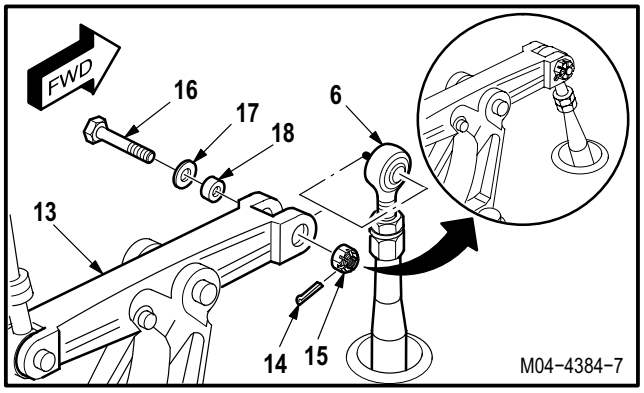
(2) Install bolt (16) through washer (17), bushing (18), bellcrank (13), and rod (6).

(3) Check fit of self-retaining bolt (16) (para 11.1).

(4) Install nut (15). Torque nut (15) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (14).



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11.125. LONGITUDINAL F.S. 159.62 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod (6) on bellcrank (7).** Torque nut (9) **30 to 40 INCH-POUNDS**.

(1) Aline rod (6) with bellcrank (7).

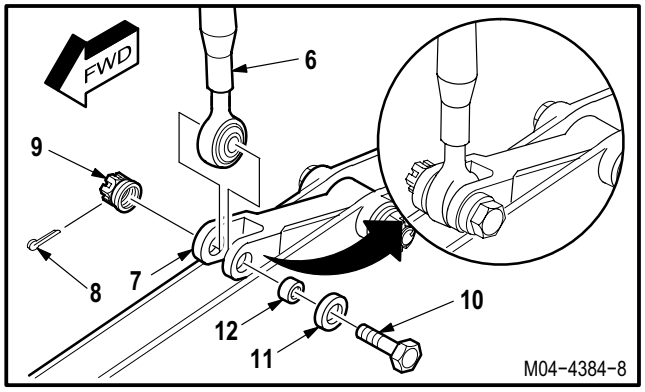
(2) Install bolt (10) through washer (11), bushing (12), bellcrank (7), and rod (6).

(3) Check fit of self-retaining bolt (10) (para 11.1).

(4) Install nut (9). Torque nut (9) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (8).



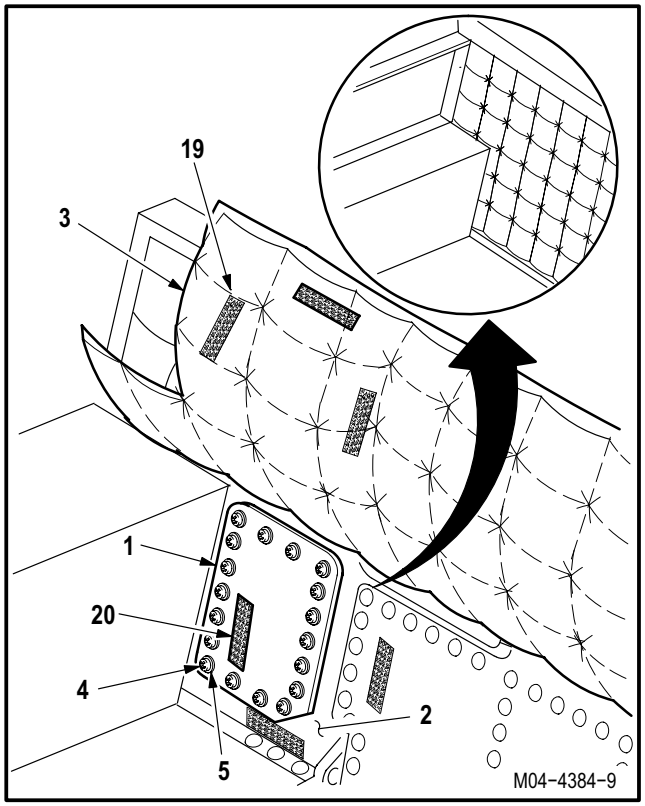
c. **Inspect (QA).**

d. **Install cover (1) on bulkhead (2).**

(1) Aline holes in cover (1) with holes in bulkhead (2).

(2) Install 17 screws (4) and washers (5).

(3) Secure insulation (3) on bulkhead (2) by fastening pile tape (19) on hook tape (20).



e. **Inspect (QA).**

f. **Install pilot seat** (para 2.161)**.**

g. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

h. **Install access panel R200** (para 2.2)**.**

END OF TASK

11.126. LONGITUDINAL F.S. 164.38 BELLCRANK REMOVAL/INSTALLATION

11.126.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.126.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

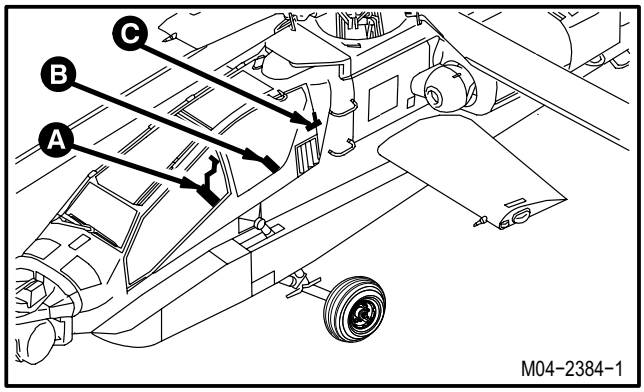
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
1.72	External primary hydraulic power applied
9.32	Transformer-rectifier No. 2 removed
11.44	Collective stick cover removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.126. LONGITUDINAL F.S. 164.38 BELLCRANK REMOVAL/INSTALLATION – continued

11.126.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

CAUTION

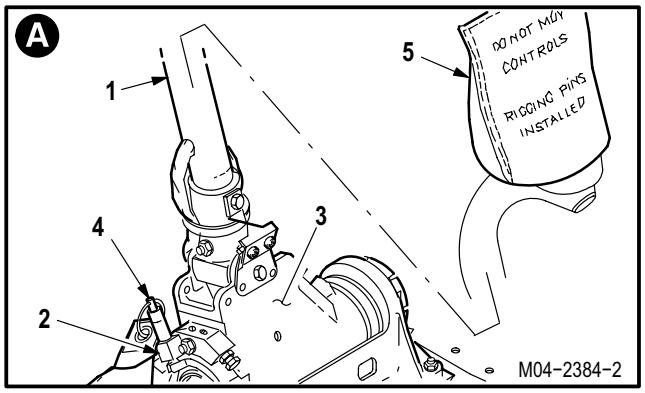
To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

b. **Secure pilot cyclic stick (1) in ZERO LONG position.**

(1) Slowly move cyclic stick (1) to aline longitudinal rig pin hole (2) on housing (3).

(2) Install -9 rig pin (4).

c. **Install cyclic stick cover (5).**



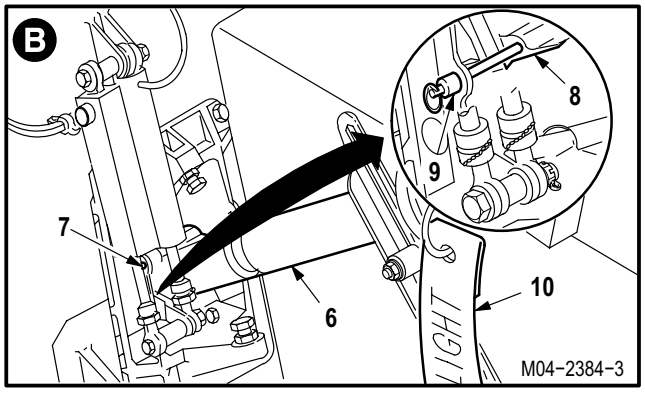
d. **Secure pilot collective stick (6) in neutral position.**

(1) Slowly position stick (6) to aline rig pin hole (7) in stick (6) and housing (8).

(2) Install -3 rig pin (9).

e. **Install collective stick warning flag (10) on stick (6).**

f. **Remove external primary hydraulic power** (para 1.72)**.**



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11.126. LONGITUDINAL F.S. 164.38 BELLCRANK REMOVAL/INSTALLATION – continued

g. **Remove longitudinal FS 164.38 push-pull rod (11) from bellcrank (12).**

(1) Remove and discard cotter pin (13).

(2) Remove nut (14), counterbalance weight (15), and bushing (16).

(3) Remove bolt (17), two washers (18), and counterbalance weight (19) from bellcrank (12).

(4) Secure rod (11) to prevent damage.

h. **Remove longitudinal FS 159.62 push-pull rod (20) from bellcrank (12).**

(1) Remove and discard cotter pin (21).

(2) Remove nut (22).

(3) Remove bolt (23), washer (24), and bushing (25).

(4) Secure rod (20) to prevent damage.

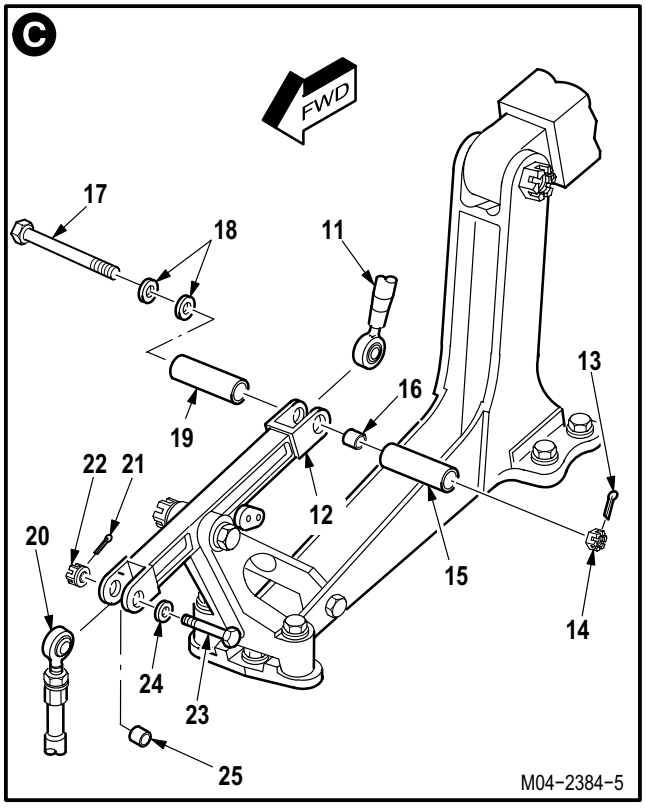
i. **Remove bellcrank (12) from bracket (26).**

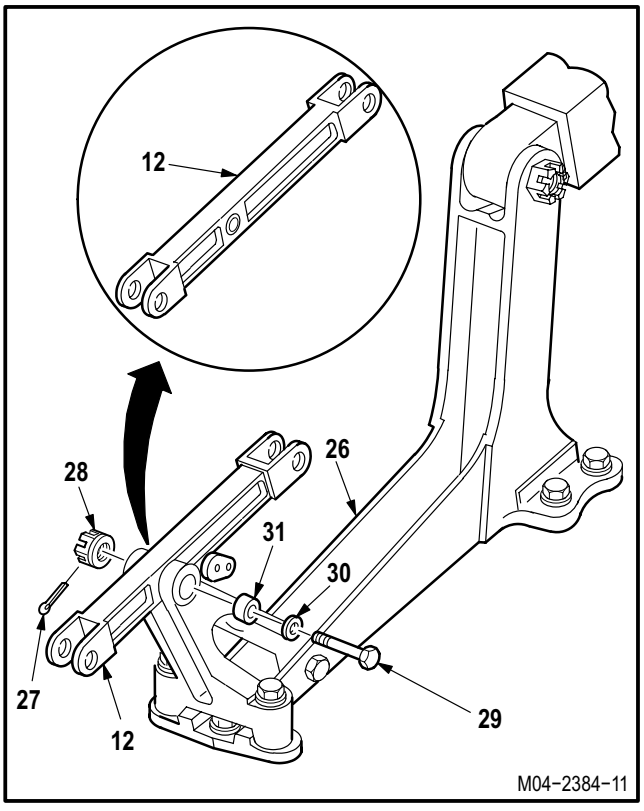
(1) Remove and discard cotter pin (27).

(2) Remove nut (28).

(3) Remove bolt (29), washer (30), and bushing (31).

(4) Remove bellcrank (12).





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11.126. LONGITUDINAL F.S. 164.38 BELLCRANK REMOVAL/INSTALLATION

11.126.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.126.5. Inspection

a. **Check counterbalance weight for cracks and elongated holes.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.126. LONGITUDINAL F.S. 164.38 BELLCRANK REMOVAL/INSTALLATION – continued

11.126.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bellcrank (12) on bracket (26).** Torque nut (28) **30 to 40 INCH-POUNDS**.

(1) Position bellcrank (12) on bracket (26) to aline pivot bolt holes.

(2) Install bushing (31) in bracket (26).

NOTE

The maximum thickness for washer stackup is **0.102 INCH** for this bellcrank pivot point.

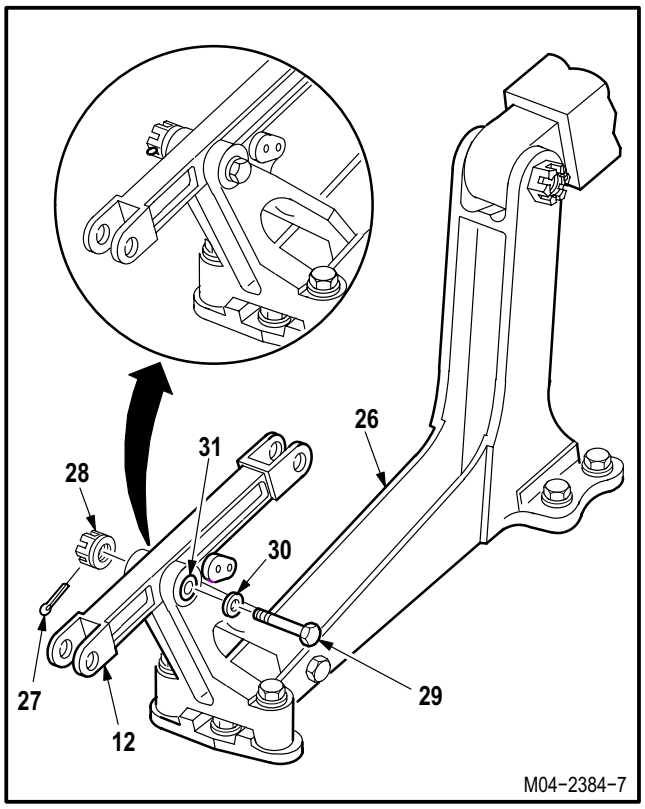
(3) Install bolt (29) through washer (30), bracket (26), bushing (31), and bellcrank (12).

(4) Check fit of self-retaining bolt (29) (para 11.1).

(5) Install nut (28). Torque nut (29) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (27).



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11.126. LONGITUDINAL F.S. 164.38 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install rod (20) on bellcrank (12).** Torque nut (22) **30 to 40 INCH-POUNDS**.

(1) Position rod (20) on bellcrank (12) to aline bolt holes and bushing (25) in bellcrank (12).

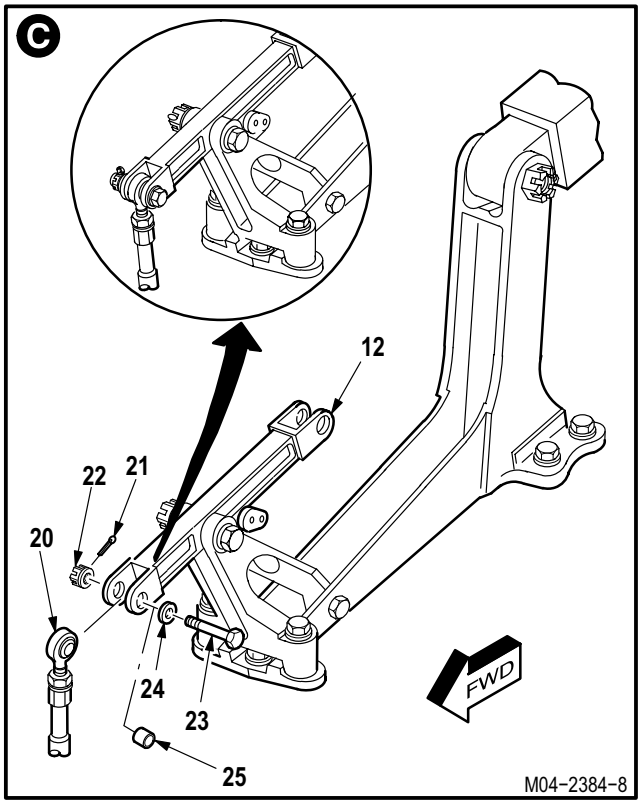
(2) Install bolt (23) through washer (24), bellcrank (12), bushing (25), and rod (20) (para 11.1).

(3) Check fit of self-retaining bolt (23) (para 11.1).

(4) Install nut (22). Torque nut (22) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (21).



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11.126. LONGITUDINAL F.S. 164.38 BELLCRANK REMOVAL/INSTALLATION – continued

c. **Install rod (11) on bellcrank (12).** Torque nut (14) **30 to 40 INCH-POUNDS**.

(1) Position rod (11) on bellcrank (12) to aline bolt holes and bushing (16) in bellcrank (12).

NOTE

The maximum thickness for washer stack up is **0.124 INCH** for this push-pull rod connection to bellcrank.

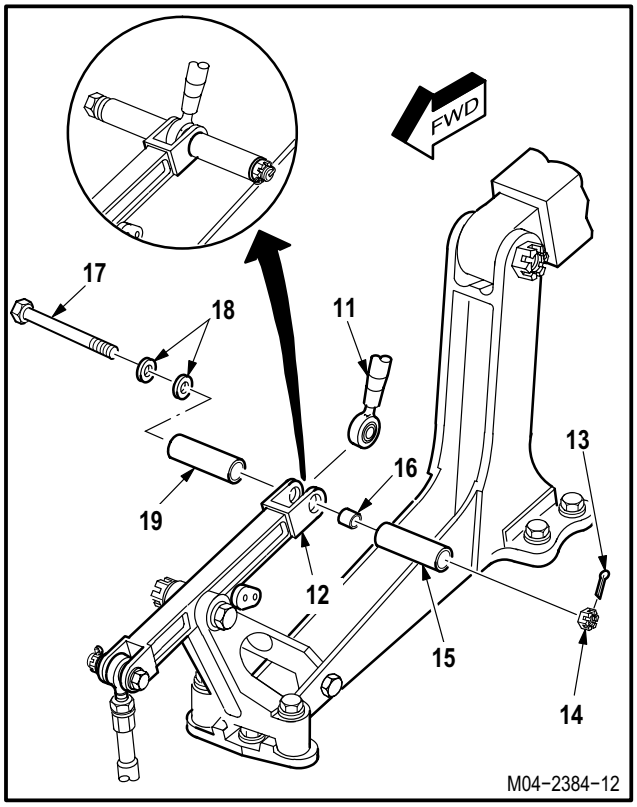
(2) Install bolt (17) through two washers (18), counterbalance weight (19), bellcrank (12), rod (11), bushing (16), and counterbalance weight (15).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (14). Torque nut (14) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

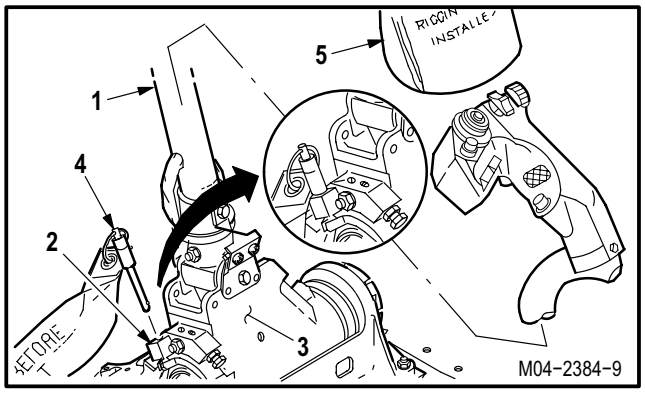
(6) Install new cotter pin (13).



d. **Inspect (QA).**

e. **Remove -9 rig pin (4) from pilot cyclic stick housing (3).**

f. **Remove cover (5) from cyclic stick (1).**



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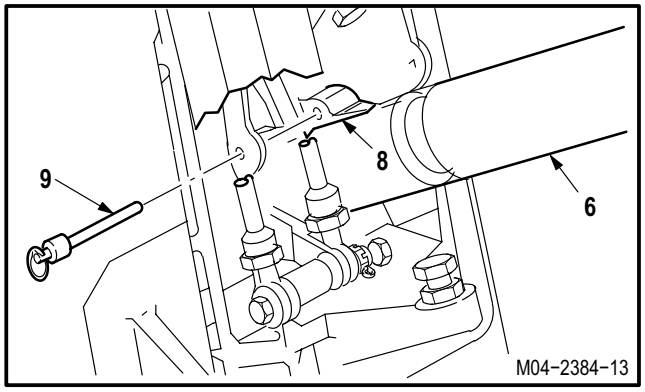
11.126. LONGITUDINAL F.S. 164.38 BELLCRANK REMOVAL/INSTALLATION – continued

g. **Remove -3 rig pin (9) from stick housing (8).**



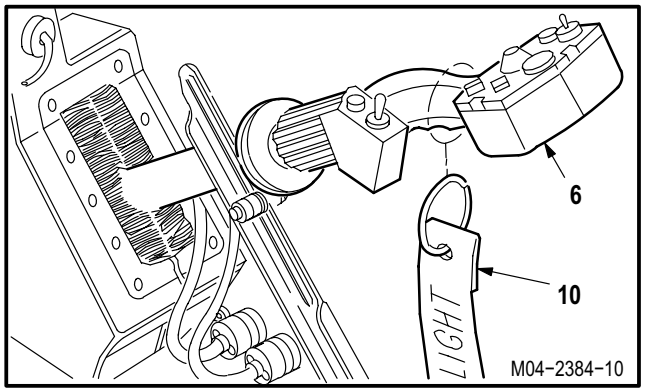
h. **Remove flag (10) from stick (6).**

i. **Inspect (QA).**

j. **Install collective stick cover** (para 11.44)**.**

k. **Install No. 2 transformer-rectifier** (para 9.32)**.**

l. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.127. LONGITUDINAL F.S. 164.38 PUSH-PULL ROD REMOVAL/INSTALLATION

11.127.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.127.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

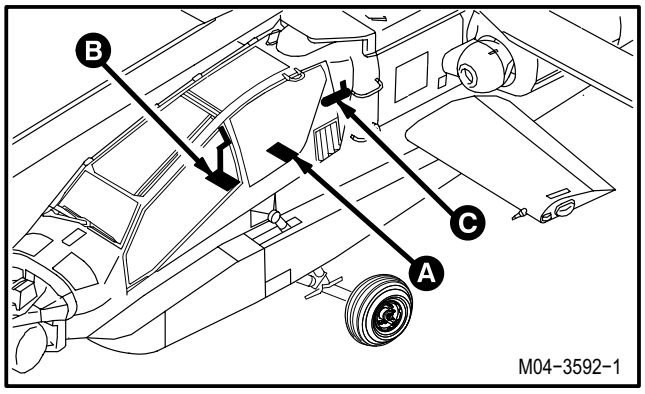
Ref	Condition
1.57	Helicopter safed
11.44	Collective stick cover removed
1.72	External primary hydraulic power applied
9.32	Transformer-rectifier No. 2 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.



11.127.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

GO TO NEXT PAGE

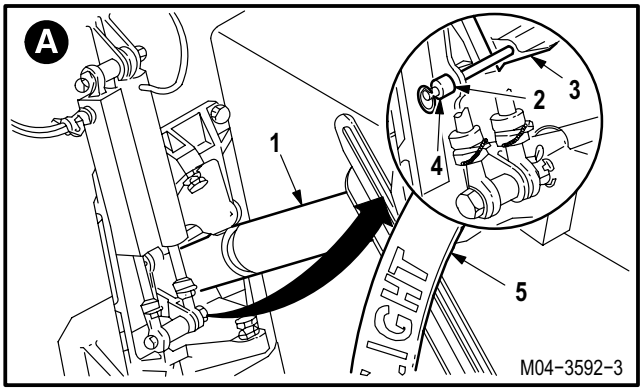
11.127. LONGITUDINAL F.S. 164.38 PUSH-PULL ROD REMOVAL/INSTALLATION – continued

b. **Secure pilot collective stick (1) in neutral position.**

(1) Slowly position stick (1) to aline rig pin holes (2) in stick (1) and housing (3).

(2) Install -3 rig pin (4).

c. **Install collective stick warning flag (5) on stick (1).**



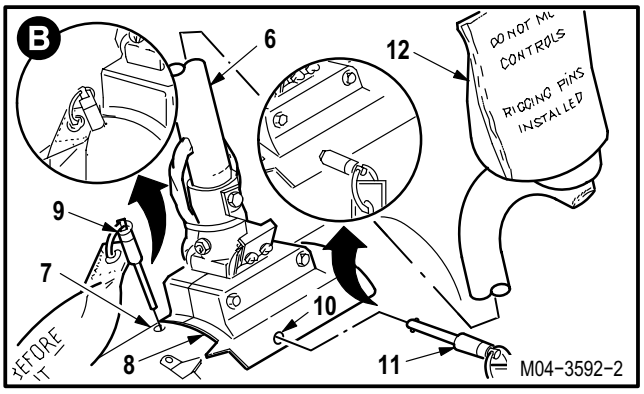
d. **Secure pilot cyclic stick (6) in ZERO LONG position and ZERO LAT position.**

(1) Slowly move stick (6) to aline longitudinal rig pin hole (7) on housing (8).

(2) Install -9 rig pin (9).

(3) Slowly move stick (6) to aline lateral rig pin hole (10) on housing (8).

(4) Install -5 rig pin (11).



e. **Install cyclic stick cover (12) on stick (6).**

f. **Remove external hydraulic power** (para 1.72)**.**

GO TO NEXT PAGE

11.127. LONGITUDINAL F.S. 164.38 PUSH-PULL ROD REMOVAL/INSTALLATION – continued

g. **Remove longitudinal F.S. 164.38 push-pull rod (13) from longitudinal F.S. 164.38 bellcrank (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16), weight (17), and bushing (18) from bolt (19).

(3) Remove bolt (19), two washers (20), and weight (21).

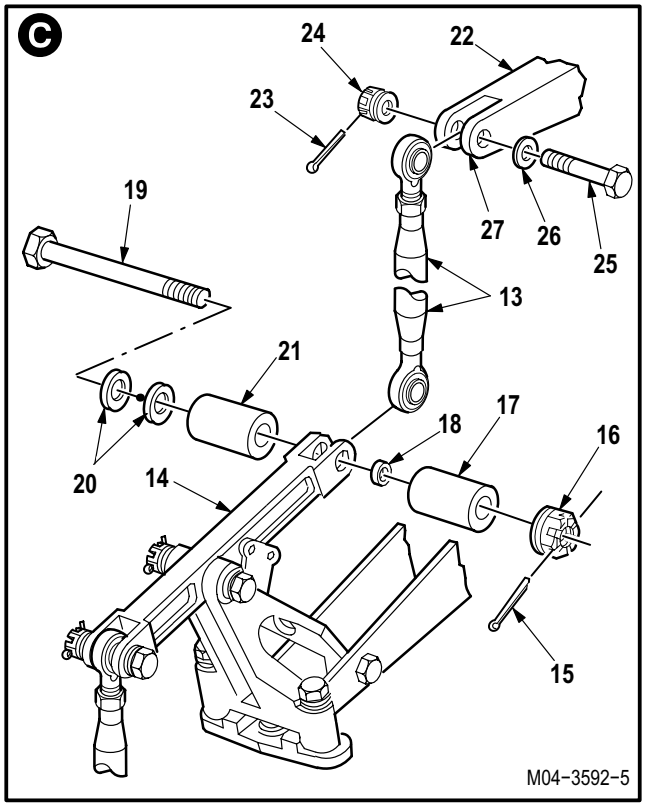
h. **Remove rod (13) from longitudinal F.S. 176 servocylinder (22).**

(1) Remove and discard cotter pin (23).

(2) Remove nut (24).

(3) Remove bolt (25) and washer (26) from servocylinder clevis (27).

(4) Remove rod (13).



11.127.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.127.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.127. LONGITUDINAL F.S. 164.38 PUSH-PULL ROD REMOVAL/INSTALLATION – continued

11.127.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install adjustable end of rod (13) on servocylinder (22).** Torque nut (24) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with clevis (27).

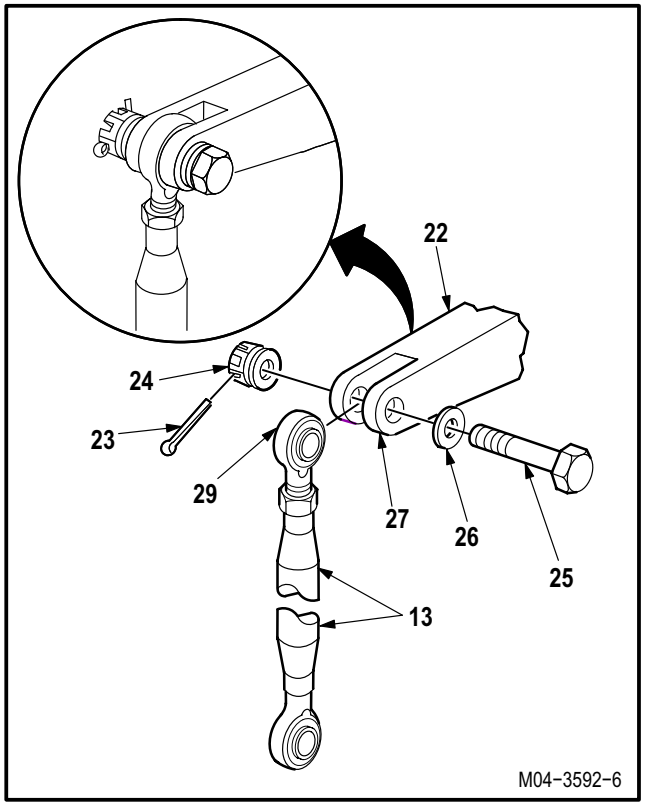
(2) Install bolt (25) through washer (26), clevis (27), and rod (13).

(3) Check fit of self-retaining bolt (25) (para 11.1).

(4) Install nut (24). Torque nut (24) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install cotter pin (23).



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11.127. LONGITUDINAL F.S. 164.38 PUSH-PULL ROD REMOVAL/INSTALLATION – continued

b. **Install rod (13) on bellcrank (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (14).

(2) Install bolt (19) through two washers (20), weight (21), bellcrank (14), and rod (13).

(3) Install bushing (18) and weight (17) on bolt (19).

NOTE

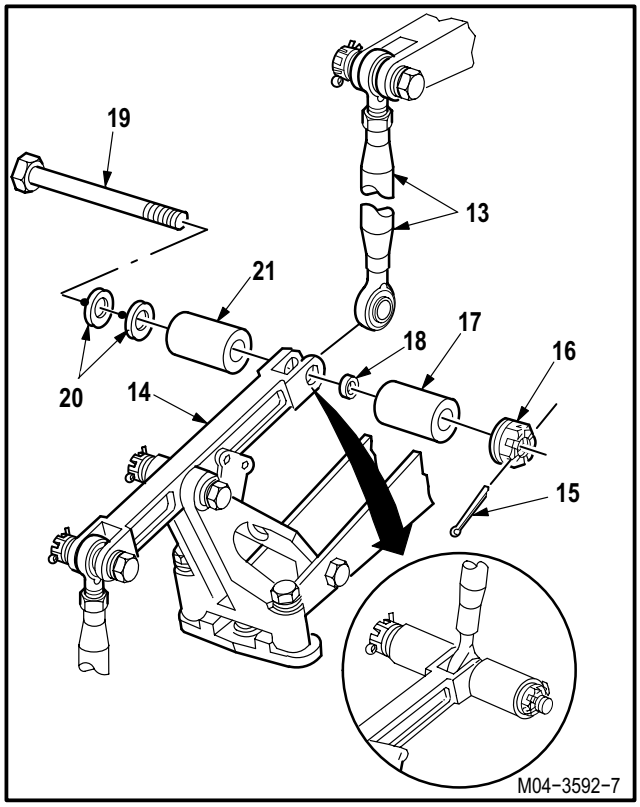
The maximum thickness for washer stack-up under the bolt head is **0.124 INCH**.

(4) Check fit of self-retaining bolt (19) (para 11.1).

(5) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

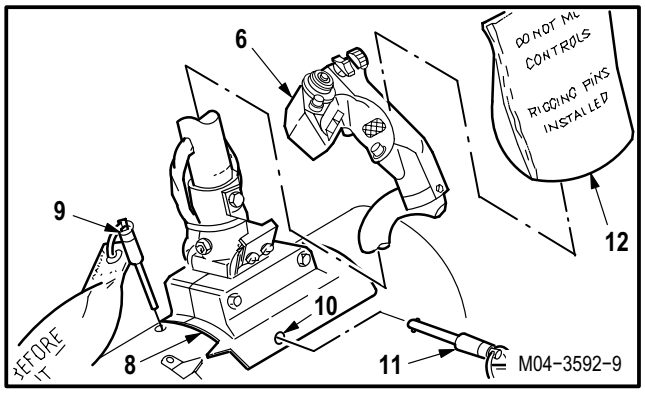
(7) Install new cotter pin (15).



c. **Inspect (QA).**

d. **Remove -9 rig pin (9) and -5 rig pin (11) from housing (8).**

e. **Remove cover (12) from stick (6).**



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11.127. LONGITUDINAL F.S. 164.38 PUSH-PULL ROD REMOVAL/INSTALLATION – continued

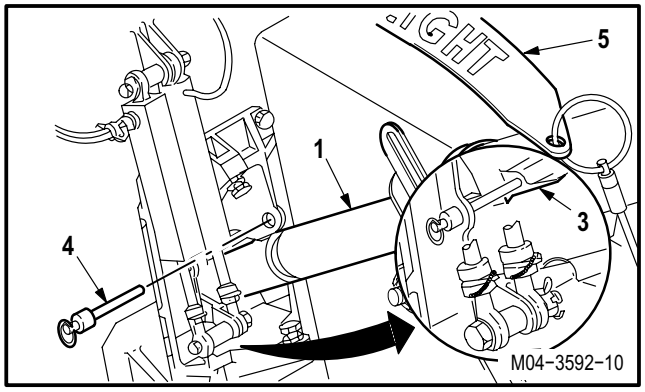
f. **Remove -3 rig pin (4) from stick (1).**

g. **Install collective stick cover** (para 11.44)**.**

h. **Remove flag (5) from collective stick (1).**

i. **Install transformer-rectifier No. 2** (para 9.32)**.**

j. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.128. LONGITUDINAL F.S. 176.00 SERVOCYLINDER MOUNT BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.128.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.128.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
30 - 150 inch-pound 1/4-inch drive click type torque wrench (item 435, App H)
150 - 750 inch-pound 3/8-inch drive click type torque wrench (item 442, App H)

Materials/Parts:

Sealing compound (item 174, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
7.47	Longitudinal servocylinder removed from mount bracket
11.126	Longitudinal F.S. 164.38 bellcrank removed
9.32	Transformer-rectifier No. 2 removed

WARNING

FLIGHT SAFETY PART

- **The longitudinal servocylinder mount bracket and/or components of the mount bracket are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.**
- **Heat-treated condition of the longitudinal servocylinder mount bracket is critical to its serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. This part must be protected from unscheduled heating and external impact during inspection and handling procedures.**
- **Shot-peened surface on mount bracket is critical. This part shall be replaced or have the peening restored if surface has had peening removed by wear or other cause. It also must be protected from unscheduled heating and external impact during inspection and any other handling procedures.**

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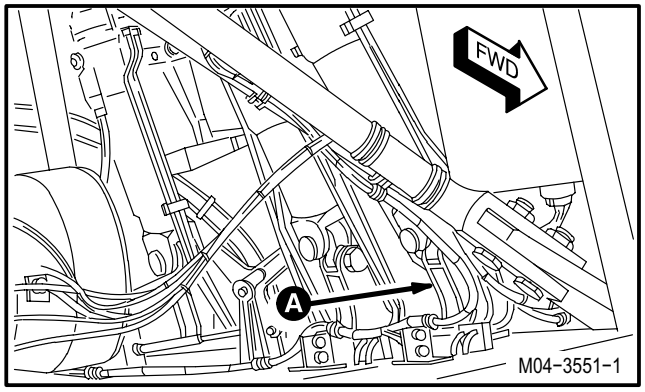
11.128. LONGITUDINAL F.S. 176.00 SERVOCYLINDER MOUNT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued



11.128.3. Removal

a. **Remove adhesive from faying surface of mount bracket (1).**

b. **Remove mount bracket (1) from deck (2).**

(1) Remove two bolts (3) and washers (4).

(2) Remove two bolts (5) and washers (6).

(3) Remove two bolts (7) and washers (8).

(4) Remove bolt (9) and washer (10).

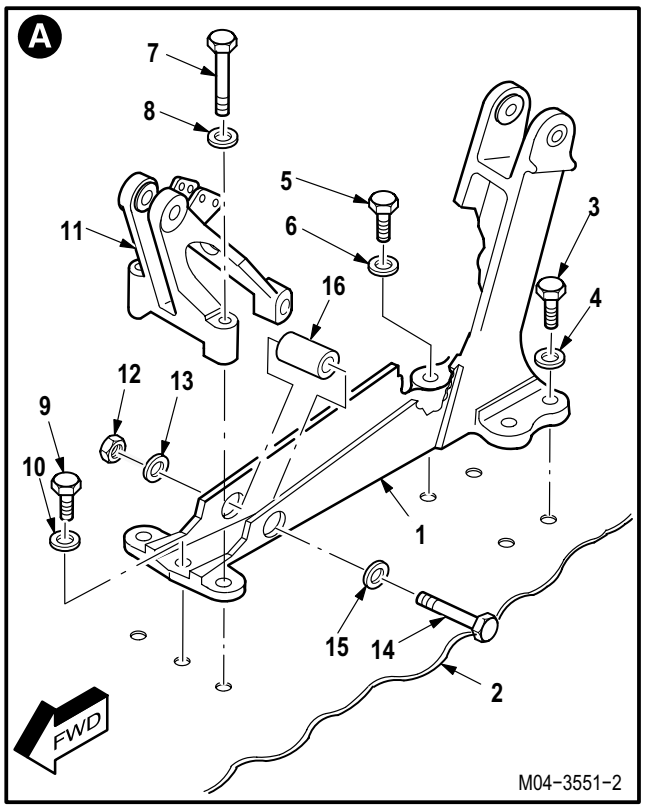
(5) Remove bracket (1).

c. **Remove bracket assembly (11) from bracket (1).**

(1) Remove nut (12) and washer (13) from bolt (14).

(2) Remove bolt (14) and washer (15) from bracket (1).

(3) Remove bracket (11) and bushing (16) from bracket (1).



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11.128. LONGITUDINAL F.S. 176.00 SERVOCYLINDER MOUNT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.128.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.128.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

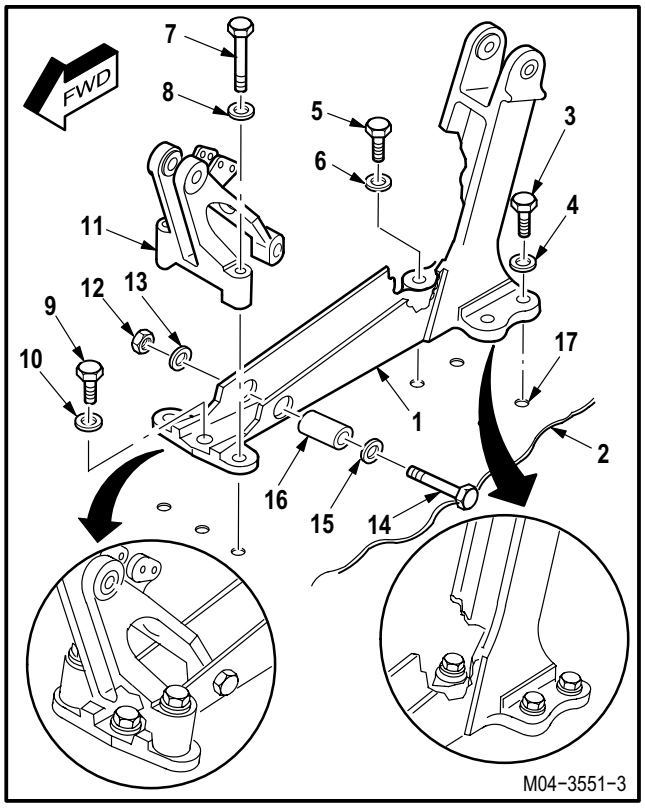
11.128.6. Installation

a. **Install bracket assembly (11) on bracket (1).**

(1) Install bushing (16) in bracket (11).

(2) Position bracket (11) in bracket (1) and install bolt (14) through washer (15), bushing (16), bracket (1), and bracket (11).

(3) Install washer (13) and nut (12) on bolt (14).



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11.128. LONGITUDINAL F.S. 176.00 SERVOCYLINDER MOUNT BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install bracket (1) on deck (2).** Torque bolts (7) and (9) to **80 INCH-POUNDS**. Torque bolts (3) and (5) to **340 INCH-POUNDS**.

(1) Position bracket (1) to aline seven mounting holes (17).

(2) Install two bolts (3) with washers (4).

(3) Install two bolts (5) with washers (6).

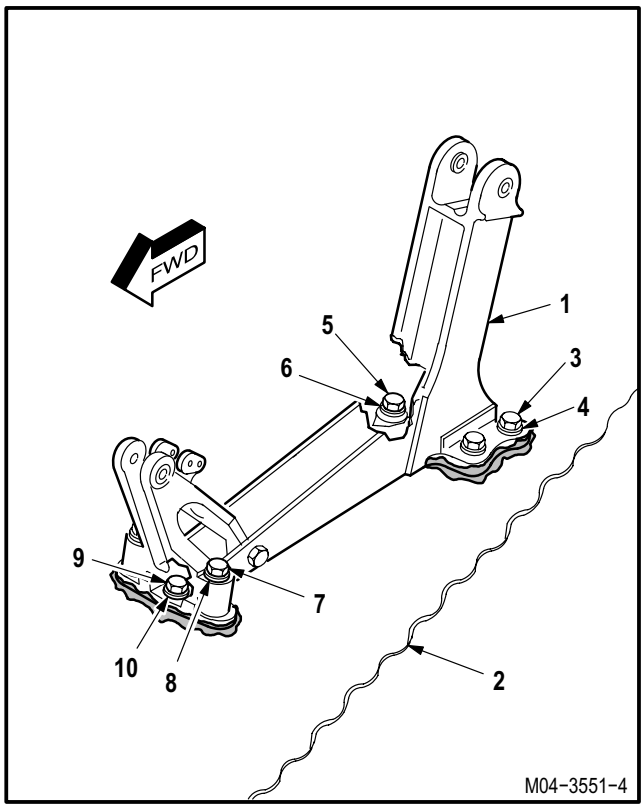
(4) Install two bolts (7) with washers (8).

(5) Install bolt (9) with washer (10).

(6) Torque bolts (7) and (9) to **80 INCH-POUNDS**. Use torque wrench.

(7) Torque bolts (3) and (5) to **340 INCH-POUNDS**. Use torque wrench.

(8) Apply sealing compound to faying surface of bracket (1). Use sealing compound (item 174, App F).



c. **Inspect (QA).**

d. **Install transformer-rectifier No. 2** (para 9.32)**.**

e. **Install longitudinal F.S. 164.38 bellcrank** (para 11.126)**.**

f. **Install longitudinal servocylinder on mount bracket** (para 7.48)**.**

END OF TASK

Pages 11-569 through 11-572 deleted

11.130. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION

11.130.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.130.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (3)

Personnel Required:

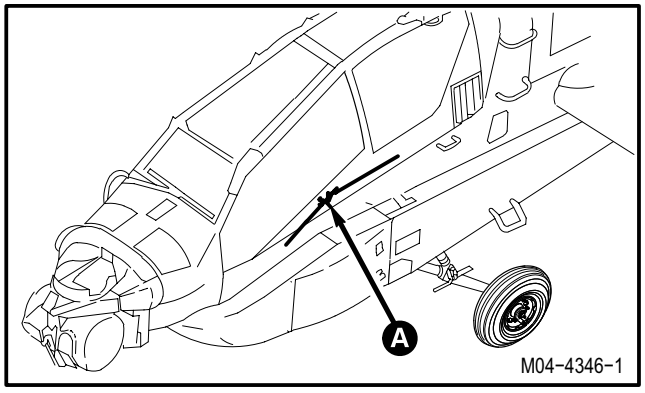
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.130. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

11.130.3. Removal

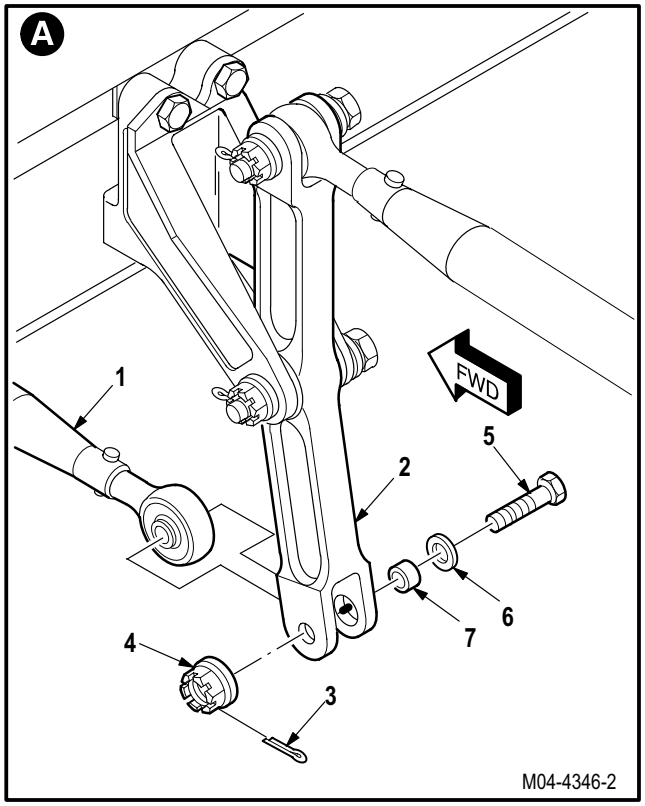
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



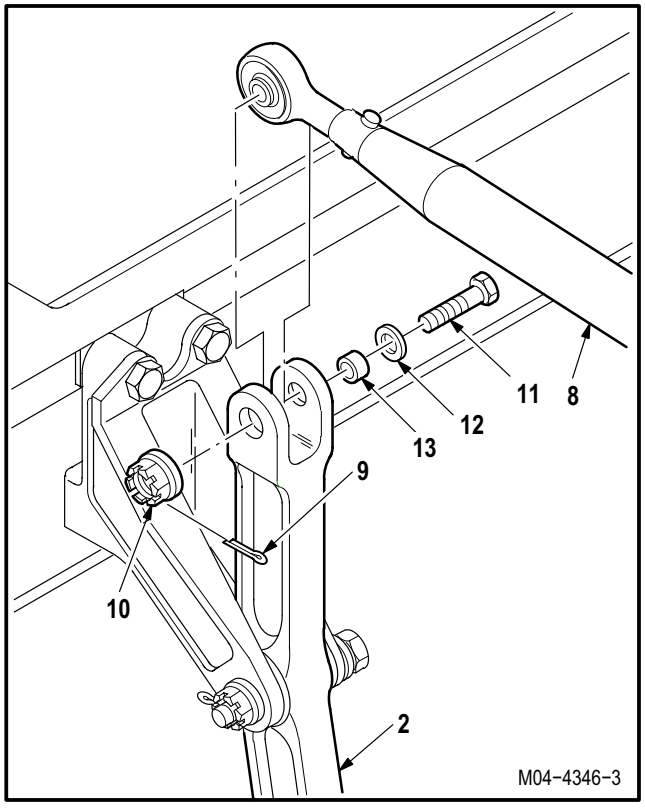
b. **Remove push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (8).



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11.130. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

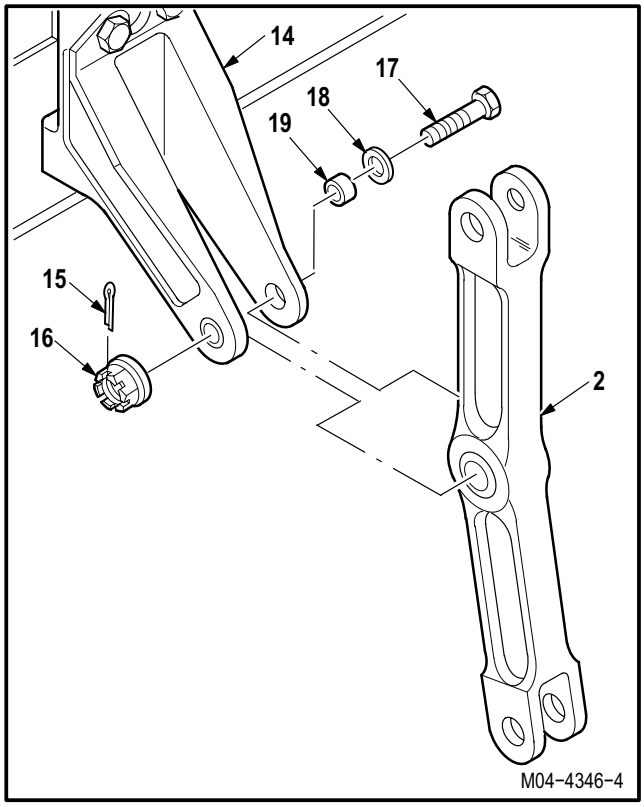
c. **Remove bellcrank (2) from bracket (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove bellcrank (2).



11.130.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.130.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.130. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

11.130.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (14).

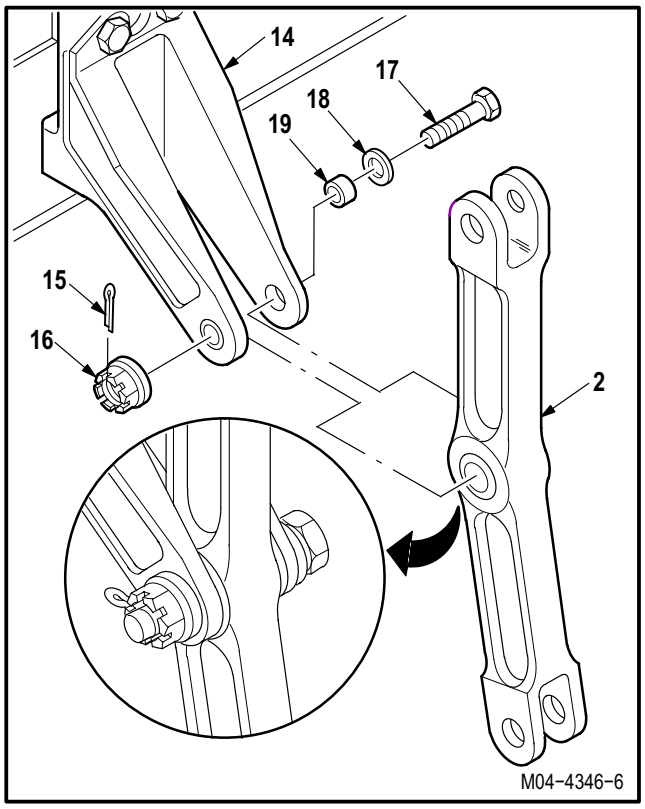
(2) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



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11.130. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

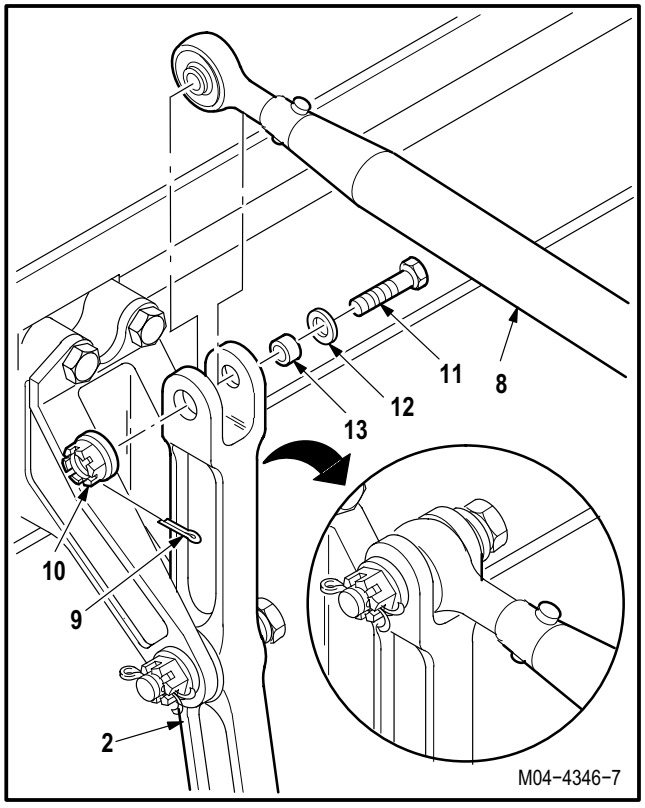
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

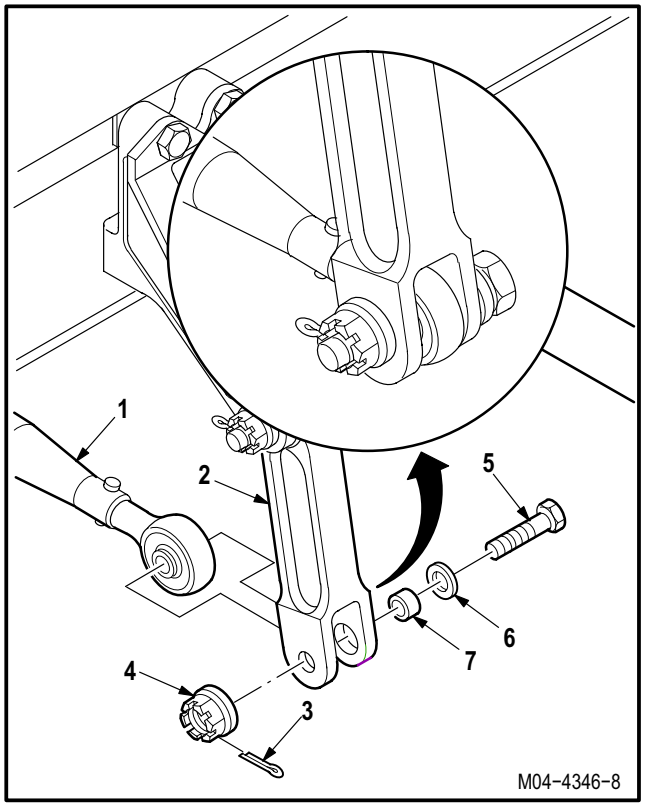
(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).

d. **Inspect (QA).**

e. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**



END OF TASK

11.131. CPG COLLECTIVE F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.131.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.131.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

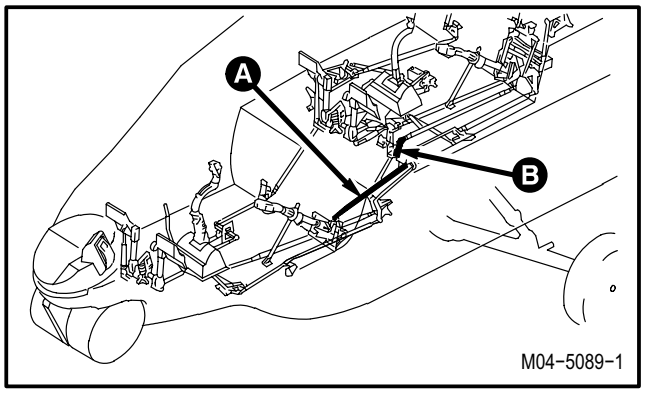
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.131. CPG COLLECTIVE F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.131.3. Removal

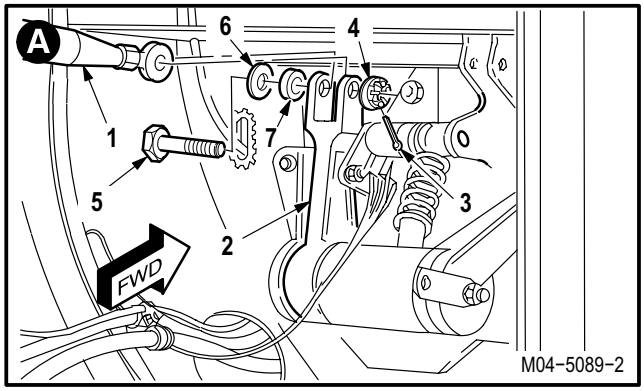
a. **Remove CPG collective push-pull rod (1) from collective support (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod end (1).



b. **Remove push-pull rod (1) from bellcrank (8).**

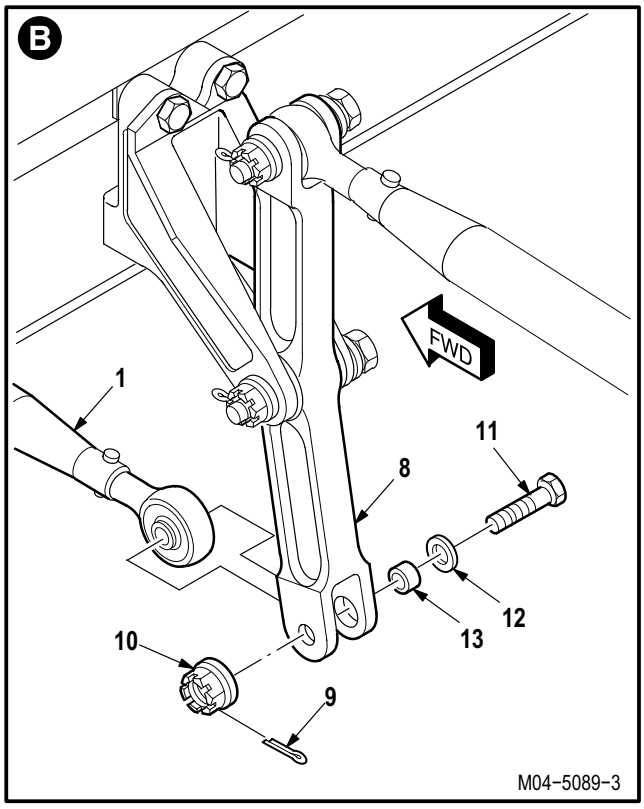
(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod end (1) from bellcrank (8).

(5) Remove rod (1).



11.131.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.131.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.131. CPG COLLECTIVE F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.131.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install rod (1) on bellcrank (8).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (8).

(2) Install bolt (11) through washer (12), bushing (13), bellcrank (8), and rod (1).

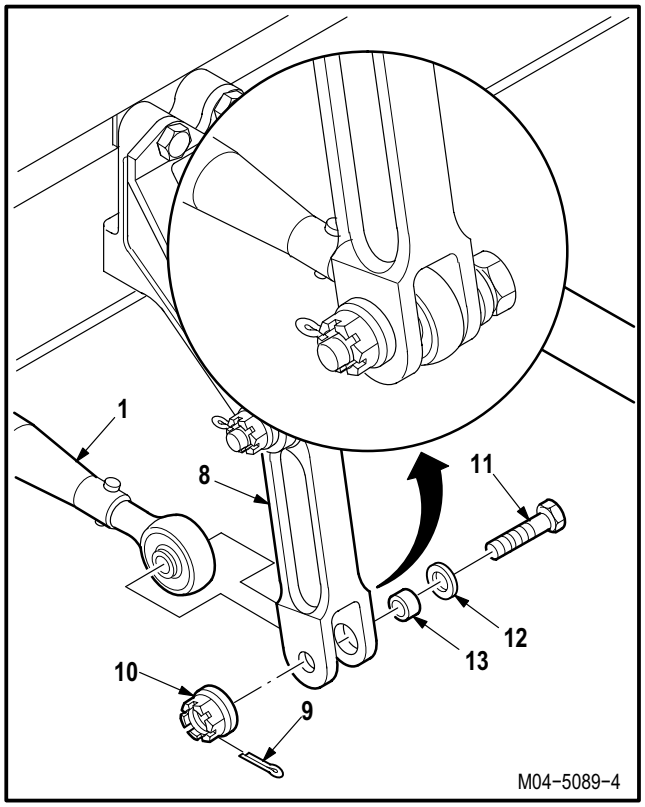
(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10).

(5) Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (9).



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11.131. CPG COLLECTIVE F.S. 118.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod end (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

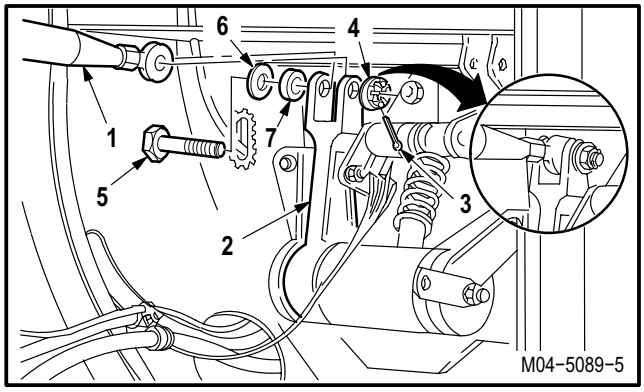
(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4).

(5) Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.132. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION

11.132.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.132.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

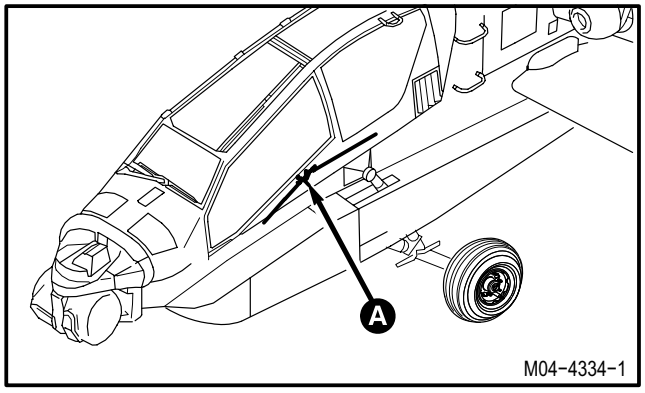
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.132. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION – continued

11.132.3. Removal

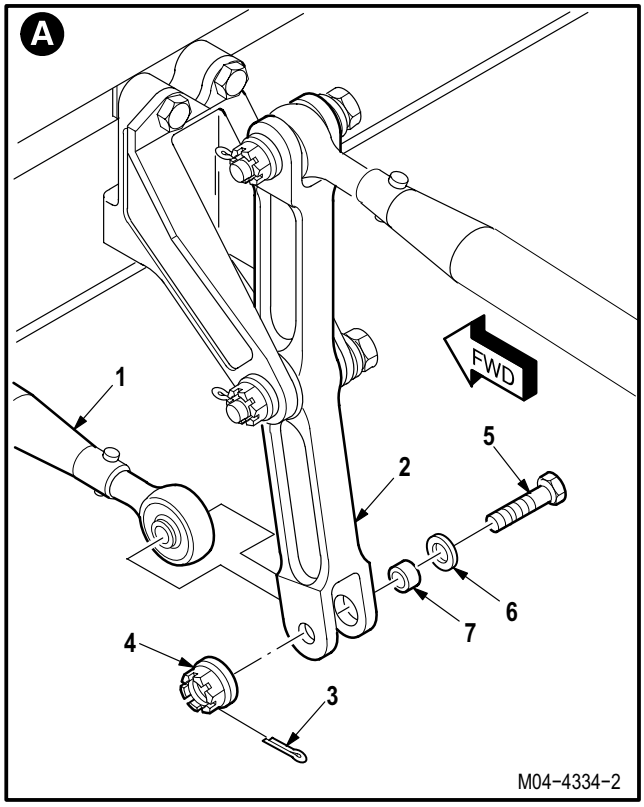
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



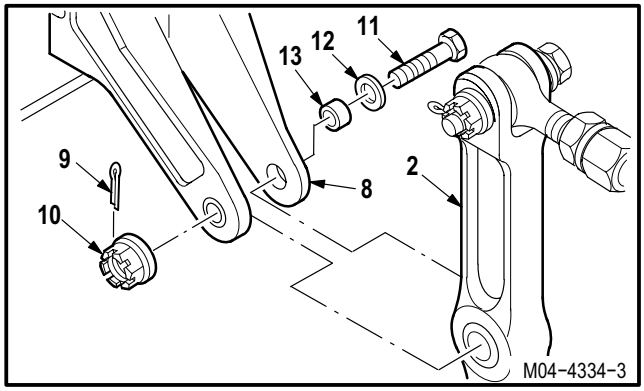
b. **Remove bellcrank (2) from bracket (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove bellcrank (2).



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11.132. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION – continued

NOTE

A laminated spacer is installed between the bracket and the airframe. Use care when removing the bracket to prevent the spacer from delaminating.

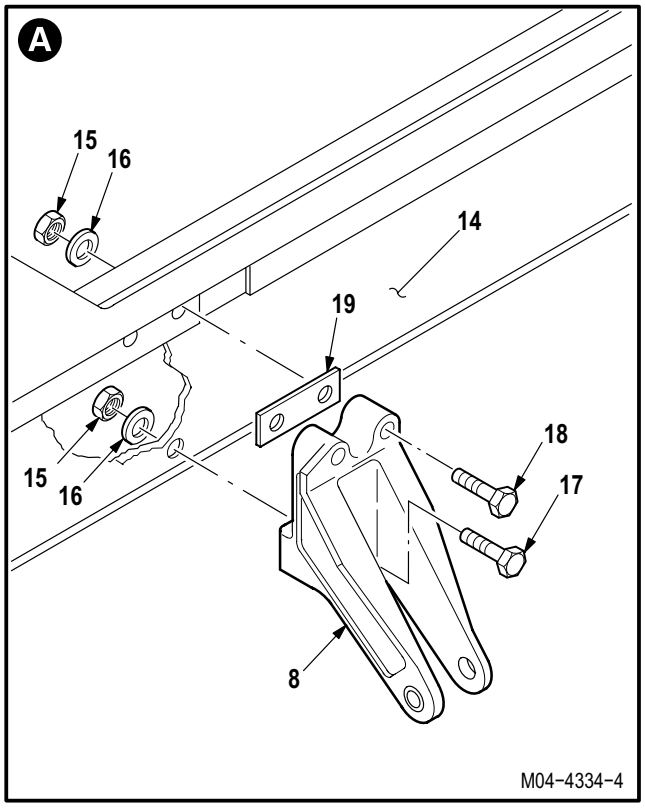
c. **Remove bracket (8) from airframe (14).**

(1) Remove three nuts (15) and washers (16).

(2) Remove bolt (17).

(3) Remove two bolts (18).

(4) Remove bracket (8) and spacer (19).



11.132.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.132.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.132. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION – continued

11.132.6. Installation

NOTE

Install the laminated spacer between the bracket and the airframe. Adjust thickness of the laminated spacer as required to allow for **0.008 INCH** clearance.

a. **Install bracket (8) on airframe (14).**

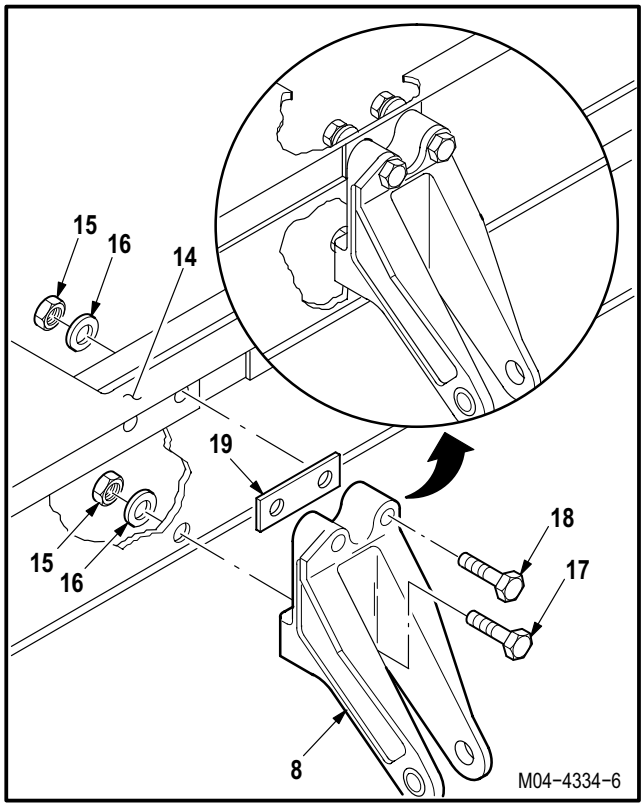
(1) Aline three holes in bracket (8) with holes in airframe (14).

(2) Install two bolts (18) through bracket (8), spacer (19), and airframe (14).

(3) Install bolt (17) through bracket (8) and airframe (14).

(4) Install three washers (16) and nuts (15).

(5) Verify minimum clearance of **0.008 INCH** is maintained between bracket (8) and any structure.



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11.132. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bellcrank (2) on bracket (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (8).

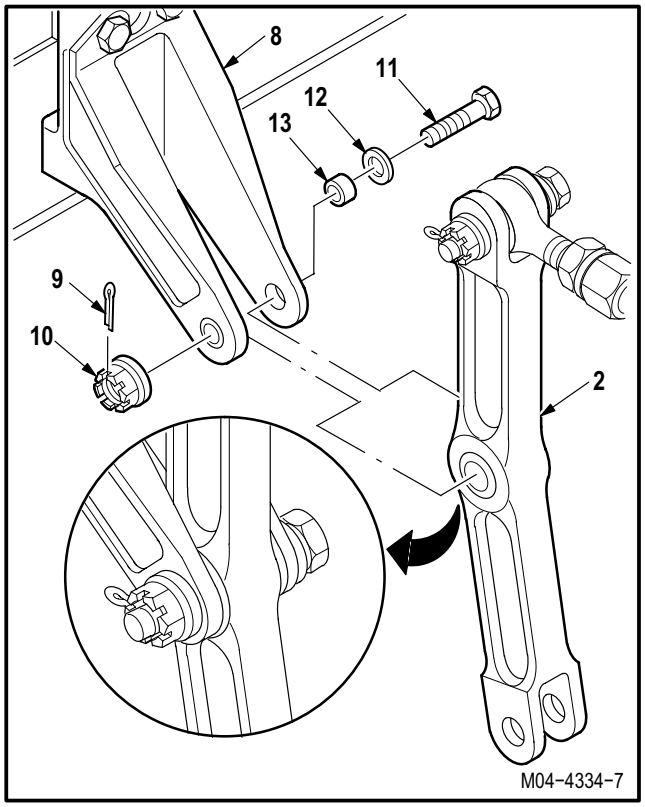
(2) Install bolt (11) through washer (12), bushing (13), bracket (14), and bellcrank (2).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

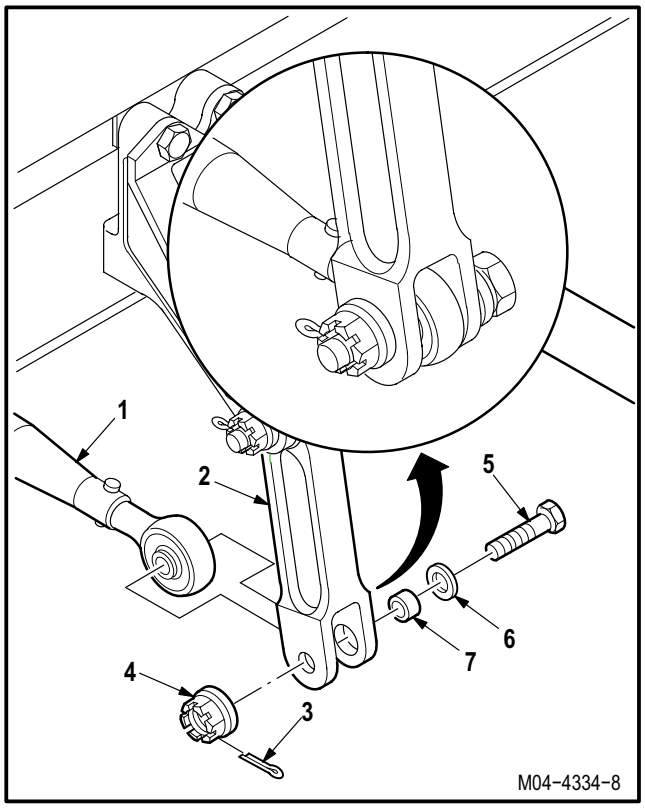
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



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11.132. CPG TO PILOT CONTROL COLLECTIVE F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION – continued

d. **Inspect (QA).**

e. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.133. PILOT COLLECTIVE PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.133.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.133.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

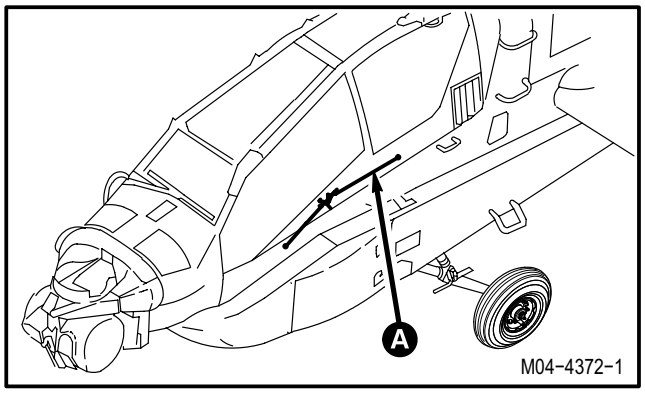
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed
10.52A	Forward fuel cell retainer panel removed (if installed)

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.133. PILOT COLLECTIVE PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.133.3. Removal

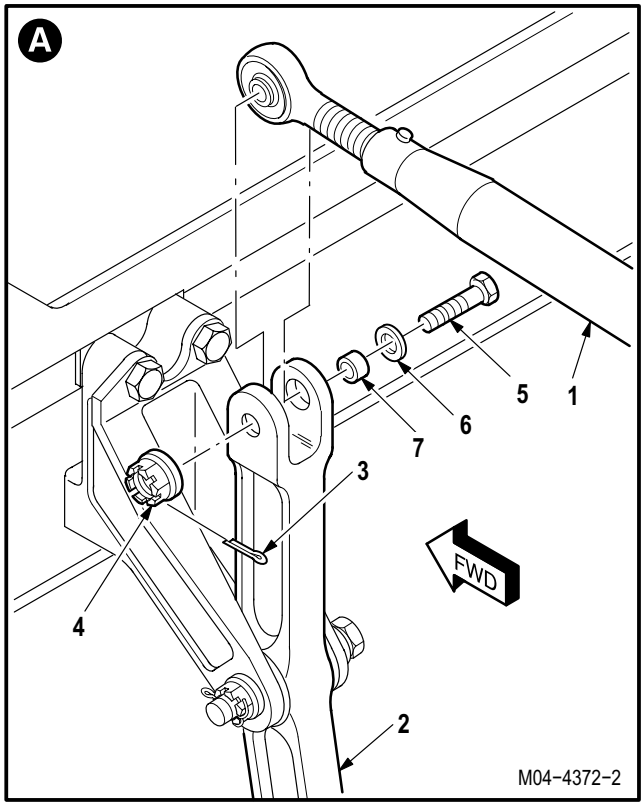
a. **Remove push-pull rod assembly (1) from bell-crank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



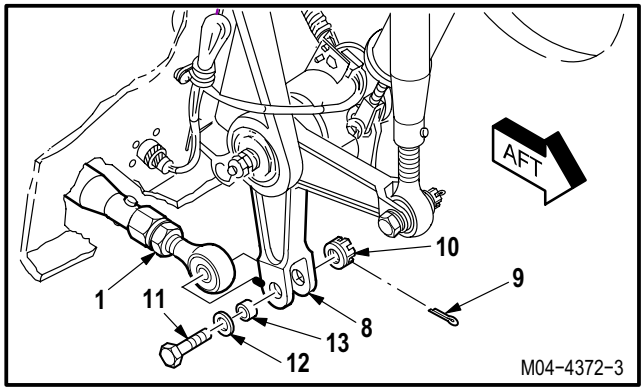
b. **Remove rod (1) from collective arm (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (1).



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11.133. PILOT COLLECTIVE PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.133.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.133.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.133.6. Installation

CAUTION

To prevent damage to flight control components, do not use force to aline bellcrank or to aline push-pull rod with bellcrank.

a. **Install adjustable end of rod (1) on arm (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with arm (8).

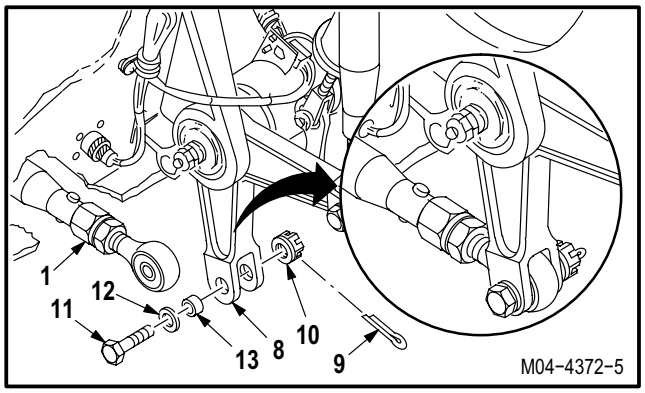
(2) Install bolt (11) through washer (12), bushing (13), arm (8), and rod (1).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.133. PILOT COLLECTIVE PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

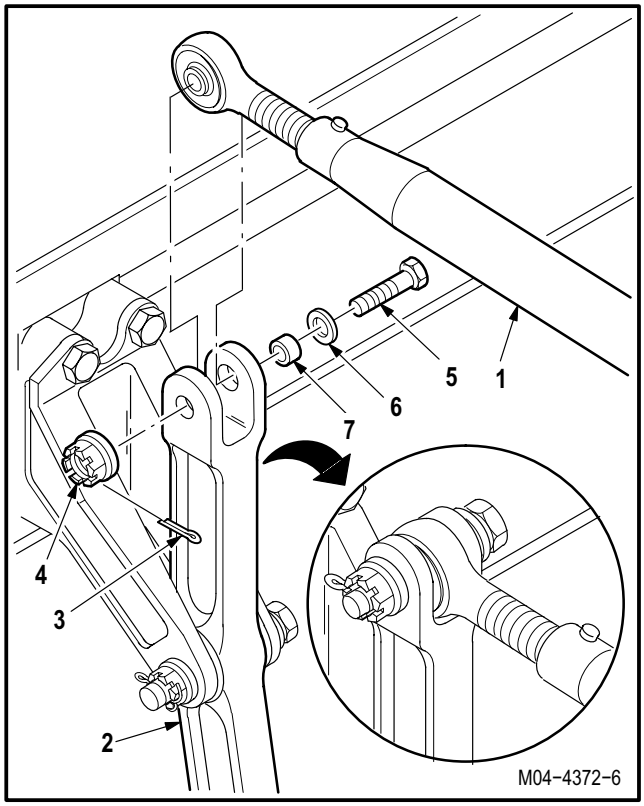
(6) Install new cotter pin (3).

c. **Inspect (QA).**

d. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

f. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**



END OF TASK

11.134. COLLECTIVE F.S. 161.54 BELLCRANK REMOVAL/INSTALLATION

11.134.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.134.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

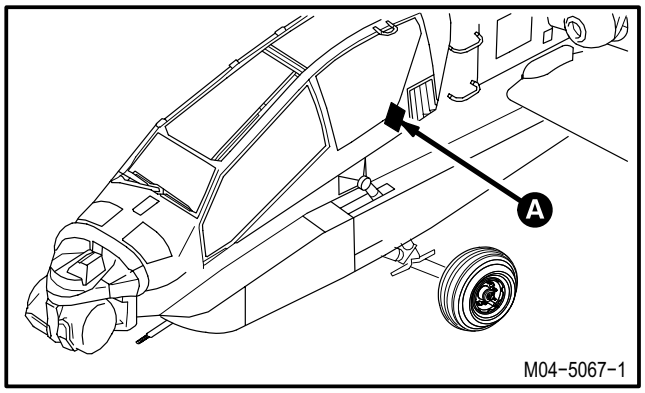
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.134. COLLECTIVE F.S. 161.54 BELLCRANK REMOVAL/INSTALLATION – continued

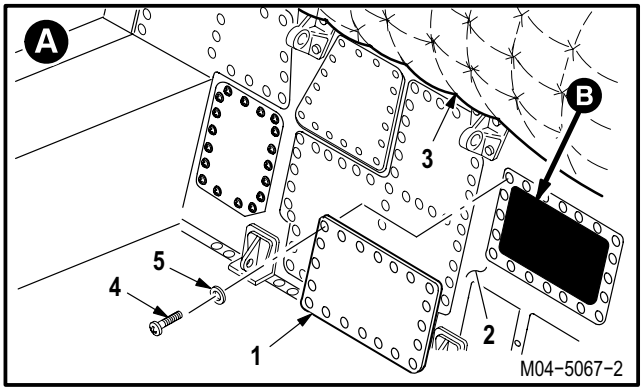
11.134.3. Removal

a. **Remove access cover (1) from pilot cockpit aft bulkhead (2).**

(1) Move thermal insulation (3) away from bulkhead (2) to expose cover (1).

(2) Remove 18 screws (4) and washers (5).

(3) Remove cover (1).



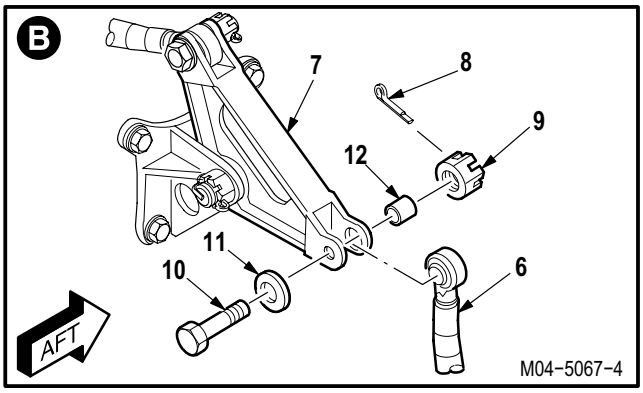
b. **Remove push-pull rod (6) from bellcrank (7).**

(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10), washer (11), and bushing (12).

(4) Remove rod (6) from bellcrank (7).



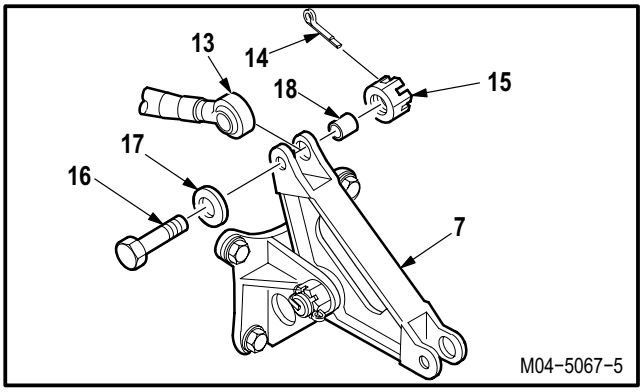
c. **Remove rod (13) from bellcrank (7).**

(1) Remove and discard cotter pin (14).

(2) Remove nut (15).

(3) Remove bolt (16), washer (17), and bushing (18).

(4) Remove rod (13) from bellcrank (7).



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11.134. COLLECTIVE F.S. 161.54 BELLCRANK REMOVAL/INSTALLATION – continued

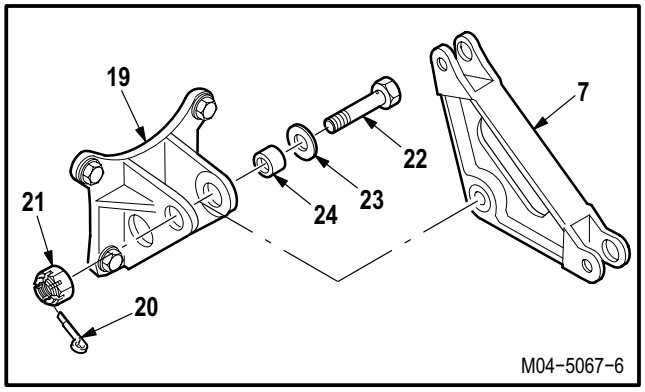
d. **Remove bellcrank (7) from bracket (19).**

(1) Remove and discard cotter pin (20).

(2) Remove nut (21).

(3) Remove bolt (22), washer (23), and bushing (24).

(4) Remove bellcrank (7).



11.134.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.134.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.134. COLLECTIVE F.S. 161.54 BELLCRANK REMOVAL/INSTALLATION – continued

11.134.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bellcrank (7) on bracket (19).** Torque nut (21) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (7) with bracket (19).

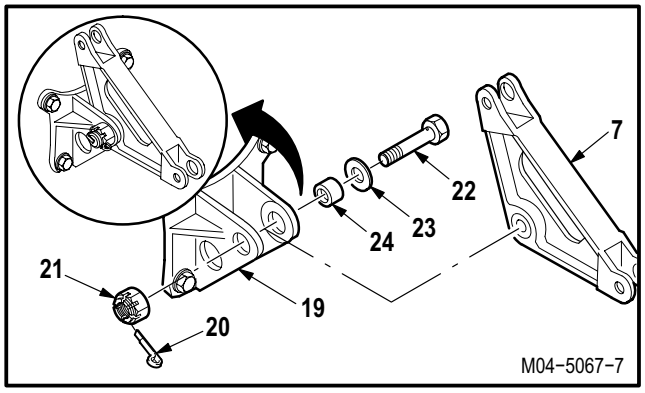
(2) Install bolt (22) through washer (23), bushing (24), bracket (19), and bellcrank (7).

(3) Check fit of self-retaining bolt (22) (para 11.1).

(4) Install nut (21). Torque nut (21) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (20).



b. **Install rod (13) on bellcrank (7).** Torque nut (15) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (7).

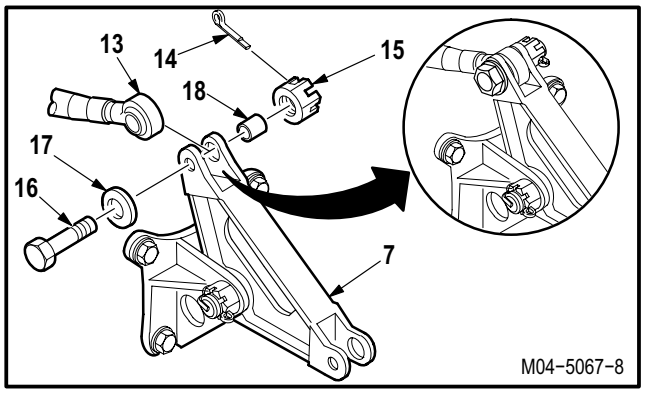
(2) Install bolt (16) through washer (17), bellcrank (7), rod (13), and bushing (18).

(3) Check fit of self-retaining bolt (16) (para 11.1).

(4) Install nut (15). Torque nut (15) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (14).



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11.134. COLLECTIVE F.S. 161.54 BELLCRANK REMOVAL/INSTALLATION – continued

c. **Install rod (6) on bellcrank (7).** Torque nut (9) **30 to 40 INCH-POUNDS**.

(1) Aline rod (6) with bellcrank (7).

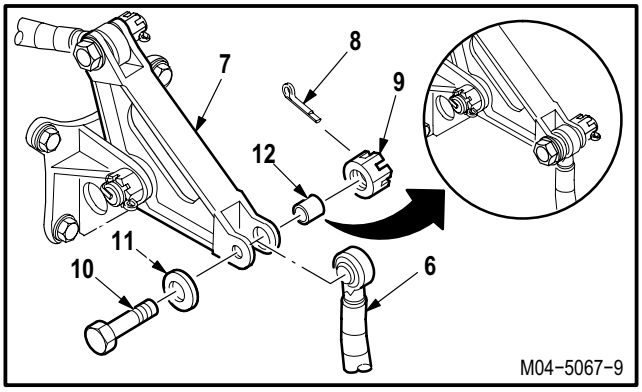
(2) Install bolt (10) through washer (11), bellcrank (7), rod (6), and bushing (12).

(3) Check fit of self-retaining bolt (10) (para 11.1).

(4) Install nut (9). Torque nut (9) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (8).



d. **Inspect (QA).**

e. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

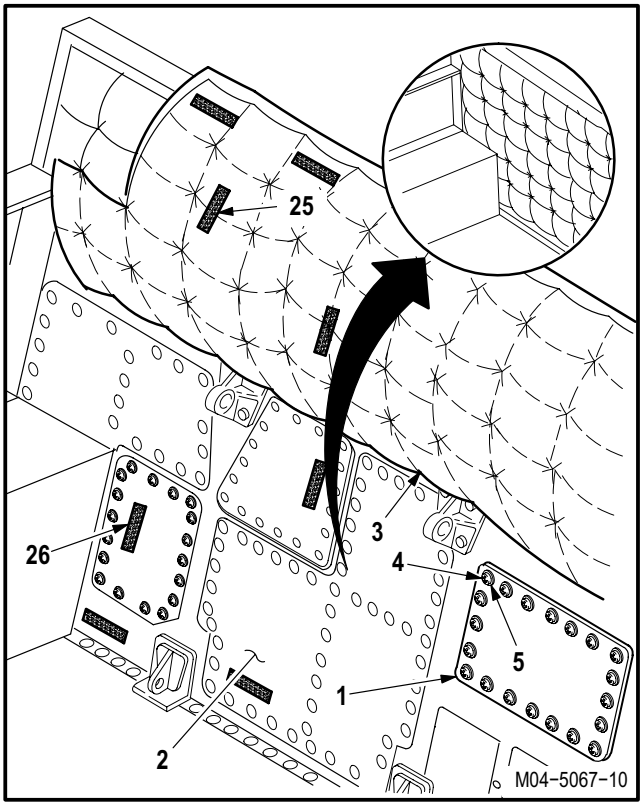
f. **Install cover (1) on bulkhead (2).**

(1) Aline holes in cover (1) with holes in bulkhead (2).

(2) Install 18 screws (4) and washers (5).

(3) Secure insulation (3) on bulkhead (2) by fastening pile tape (25) on hook tape (26).

g. **Install pilot seat** (para 2.161)**.**



END OF TASK

11.135. COLLECTIVE F.S. 161.54 BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.135.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.135.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter Pin (2)

Personnel Required:

67R	Attack Helicopter Repairer One person to assist
67R3F	Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

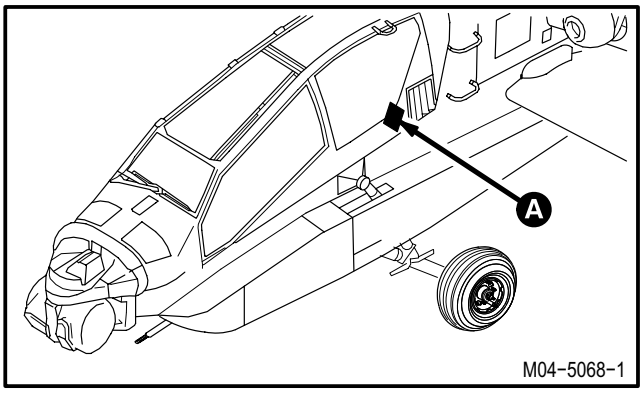
Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed
2.2	Access panel R200 removed
9.32	Transformer-rectifier No. 2 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

11.135.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**



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11.135. COLLECTIVE F.S. 161.54 BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Remove access covers (1) and (2) from pilot cockpit aft bulkhead (3).**

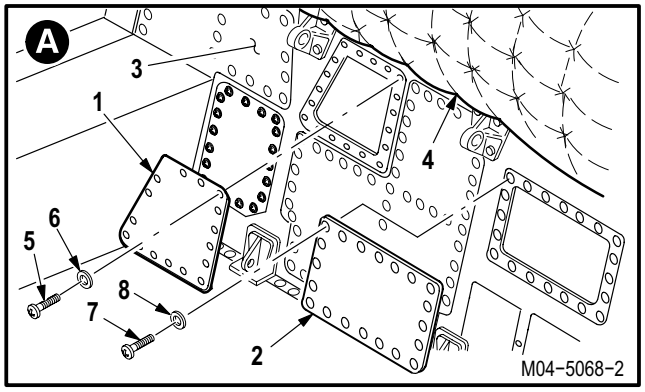
(1) Move thermal insulation (4) away from bulkhead (3) to expose covers (1) and (2).

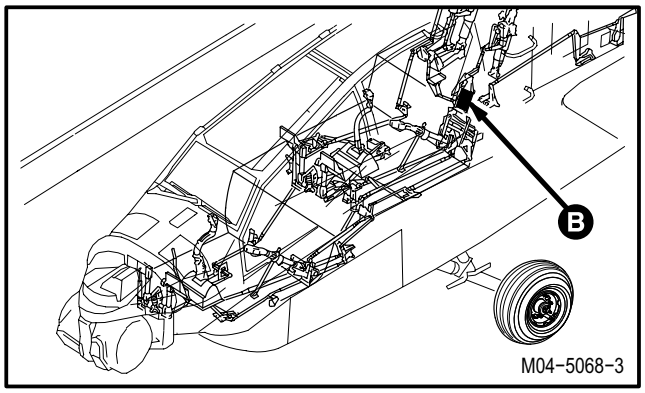
(2) Remove 18 screws (5) and washers (6) from cover (1).

(3) Remove cover (1).

(4) Remove 20 screws (7) and washers (8) from cover (2).

(5) Remove cover (2).





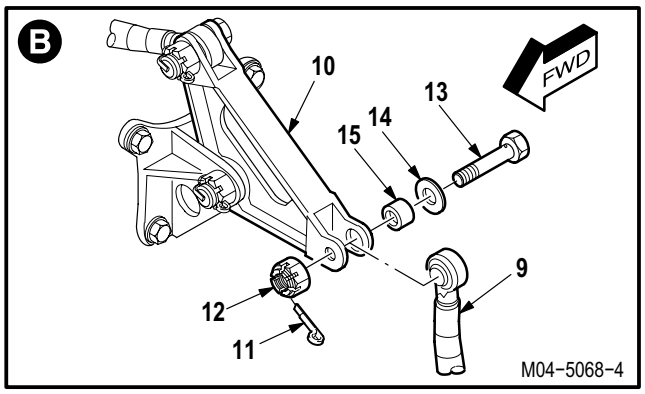
c. **Remove push-pull rod (9) from bellcrank bracket assembly (10).**

(1) Remove and discard cotter pin (11).

(2) Remove nut (12).

(3) Remove bolt (13), washer (14), and bushing (15).

(4) Remove rod (9).



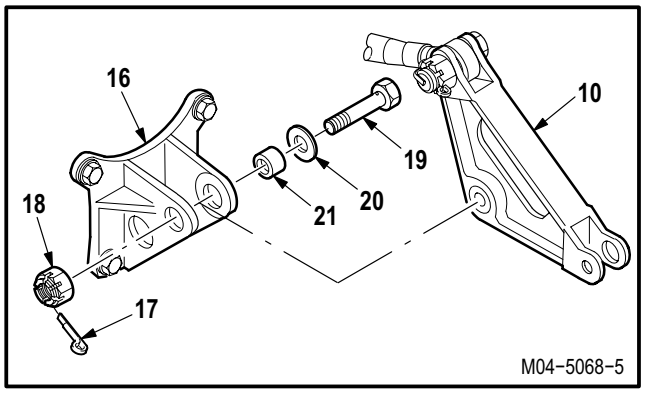
d. **Remove bellcrank (10) from bracket (16).**

(1) Remove and discard cotter pin (17).

(2) Remove nut (18).

(3) Remove bolt (19), washer (20), and bushing (21).

(4) Remove bellcrank (10).



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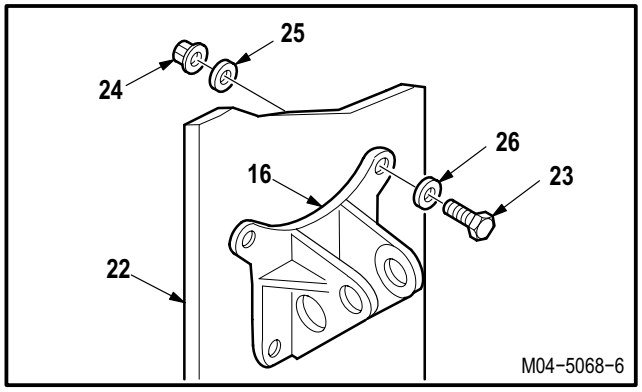
11.135. COLLECTIVE F.S. 161.54 BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

e. **Remove bracket (16) from airframe (22).**

(1) With one person holding bolts (23), remove four nuts (24) and washers (25).

(2) Remove four bolts (23) and washers (26).

(3) Remove bracket (16).



11.135.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.135.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

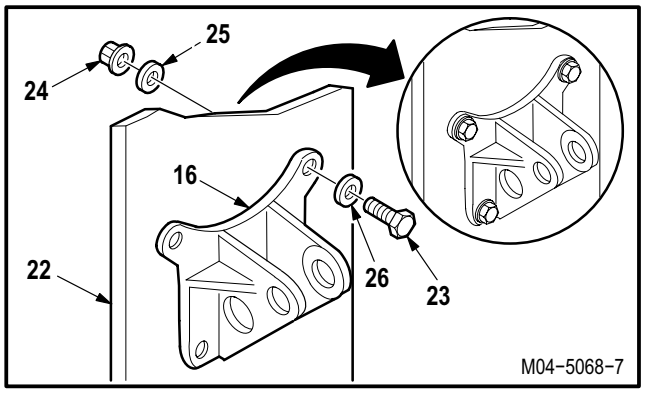
11.135.6. Installation

a. **Install bracket (16) on airframe (22).**

(1) Aline bracket (16) with airframe (22).

(2) With one person holding bracket (16), install four bolts (23) through washers (26), bracket (16), and airframe (22).

(3) With one person holding bolts (23), install four washers (25) and nuts (24).



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11.135. COLLECTIVE F.S. 161.54 BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bellcrank (10) on bracket (16).** Torque nut (18) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (10) with bracket (16).

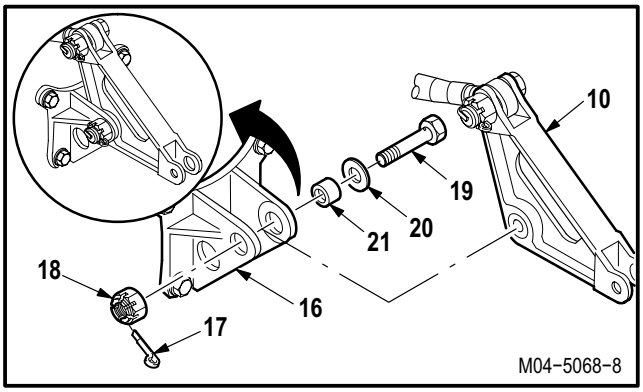
(2) Install bolt (19) through washer (20), bushing (21), bracket (16), and bellcrank (10).

(3) Check fit of self-retaining bolt (19) (para 11.1).

(4) Install nut (18). Torque nut (18) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (17).



c. **Install rod (9) on bellcrank (10).** Torque nut (12) **30 to 40 INCH-POUNDS**.

(1) Aline rod (9) with bellcrank (10).

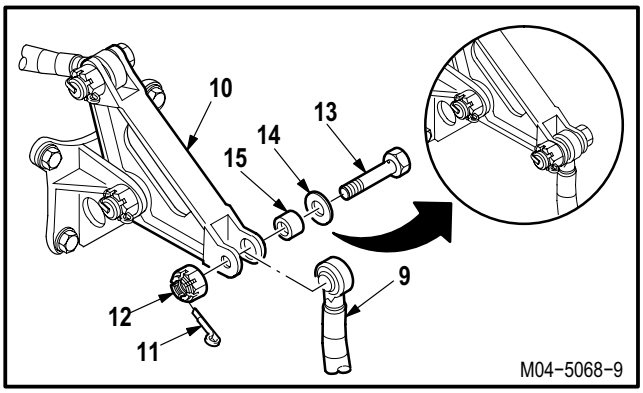
(2) Install bolt (13) through washer (14), bushing (15), bellcrank (10), and rod (9).

(3) Check fit of self-retaining bolt (13) (para 11.1).

(4) Install nut (12). Torque nut (12) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (11).



d. **Inspect (QA).**

GO TO NEXT PAGE

11.135. COLLECTIVE F.S. 161.54 BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

e. **Install covers (1) and (2) on bulkhead (3).**

(1) Aline holes in cover (1) with holes in bulkhead (3).

(2) Install 18 screws (5) and washers (6).

(3) Aline holes in cover (2) with holes in bulkhead (3).

(4) Install 20 screws (7) and washers (8).

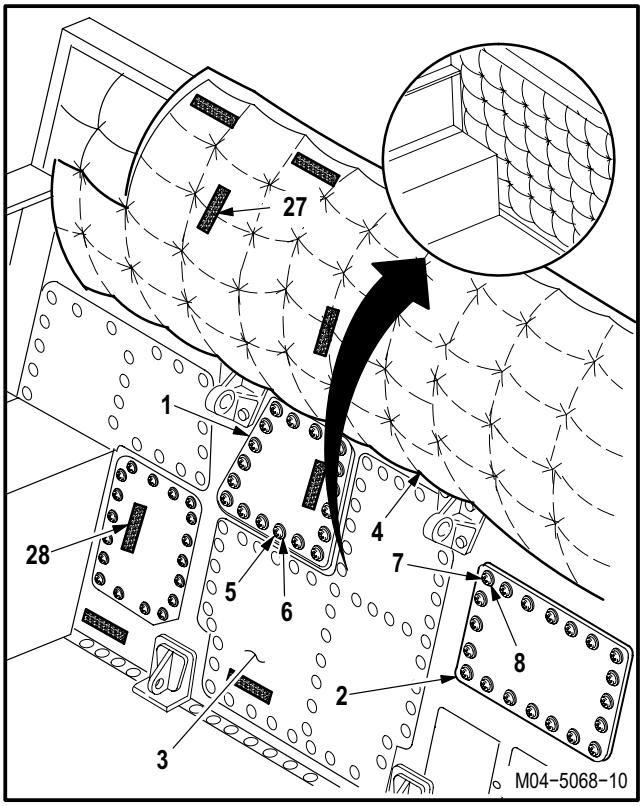
(5) Secure insulation (4) on bulkhead (3) by fastening pile tape (27) on hook tape (28).

f. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

g. **Install pilot seat** (para 2.161)**.**

h. **Install access panel R200** (para 2.2)**.**

i. **Install transformer-rectifier No. 2** (para 9.32)**.**



END OF TASK

11.136. COLLECTIVE F.S. 161.54 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.136.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.136.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

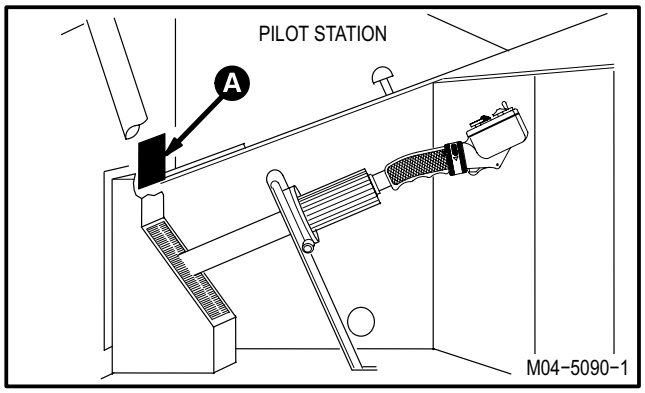
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed
13.27	Air duct No. 11 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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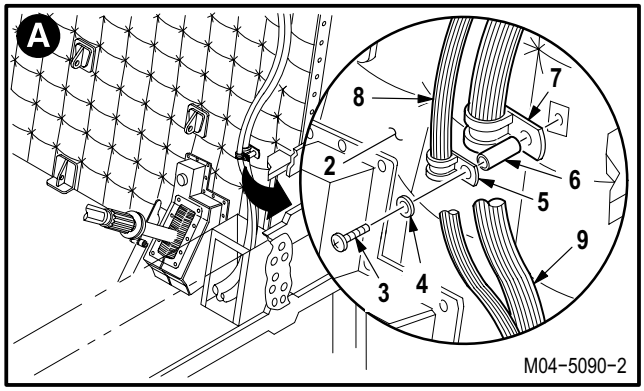
11.136. COLLECTIVE F.S. 161.54 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.136.3. Removal

a. **Remove access cover (1) from pilot cockpit aft bulkhead (2).**

(1) Remove screw (3), washer (4), clamp (5), spacer (6), and clamp (7) from bulkhead (2).

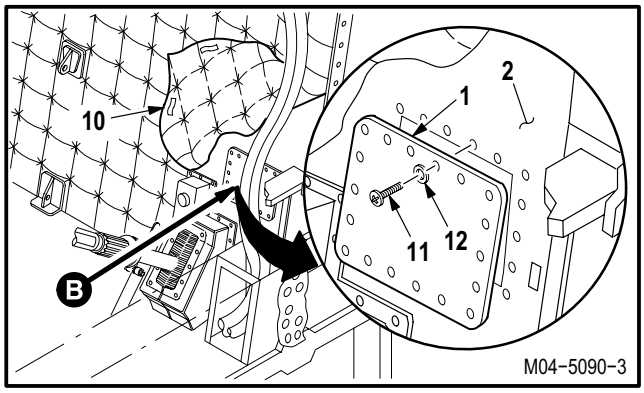
(2) Move wire harnesses (8) and (9) away from bulkhead (2).



(3) Move thermal insulation (10) away from bulkhead (2), to expose cover (1).

(4) Remove 19 screws (11) and washers (12).

(5) Remove cover (1).



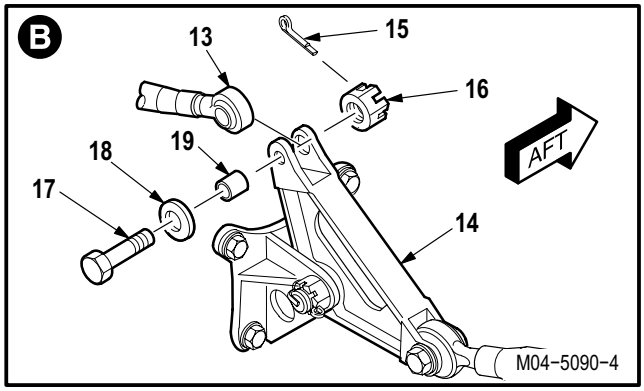
b. **Remove push-pull rod end (13) from bellcrank (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove rod (13) from bellcrank (14).



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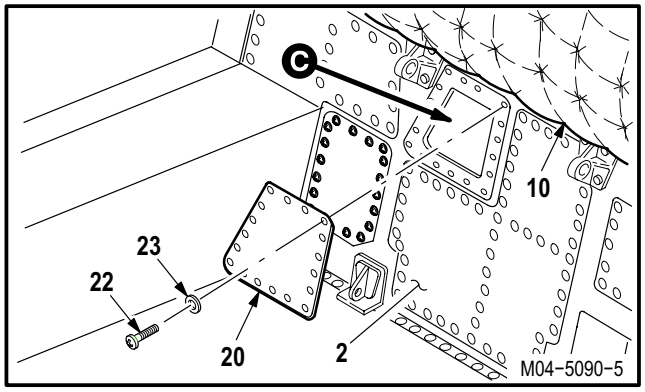
11.136. COLLECTIVE F.S. 161.54 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

c. **Remove access cover (20) from pilot cockpit aft bulkhead (2).**

(1) Move thermal insulation (10) away from bulkhead (2) to expose cover (21).

(2) Remove 18 screws (22) and washers (23).

(3) Remove cover (20).



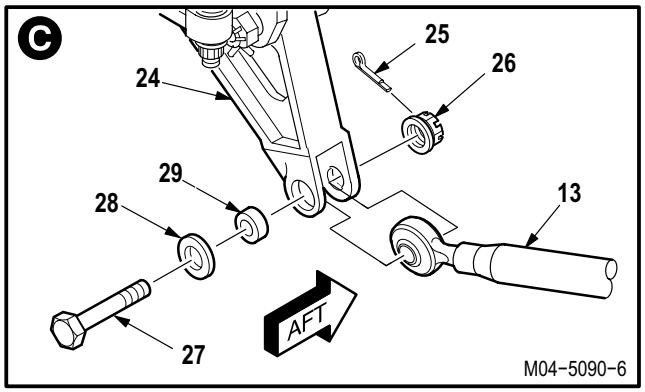
d. **Remove push-pull rod end (13) from bellcrank (24).**

(1) Remove and discard cotter pin (25).

(2) Remove nut (26).

(3) Remove bolt (27), washer (28), and bushing (29).

(4) Remove rod (13).



11.136.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.136.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.136. COLLECTIVE F.S. 161.54 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.136.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install rod (13) on bellcrank (24).** Torque nut (26) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (24).

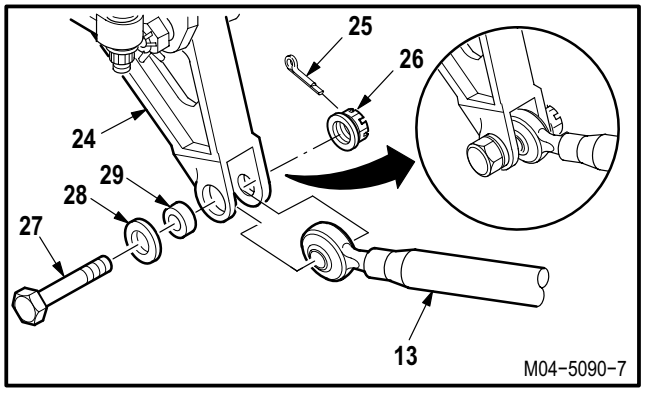
(2) Install bolt (27) through washer (28), bushing (29), bellcrank (24), and rod (13).

(3) Check fit of self-retaining bolt (27) (para 11.1).

(4) Install nut (26). Torque nut (26) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (25).



b. **Install rod (13) on bellcrank (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (14).

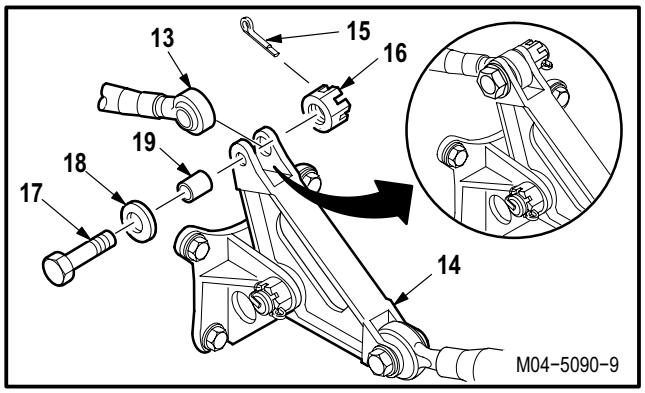
(2) Install bolt (17) through washer (18), bushing (19), bellcrank (14), and rod (13).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



c. **Inspect (QA).**

GO TO NEXT PAGE

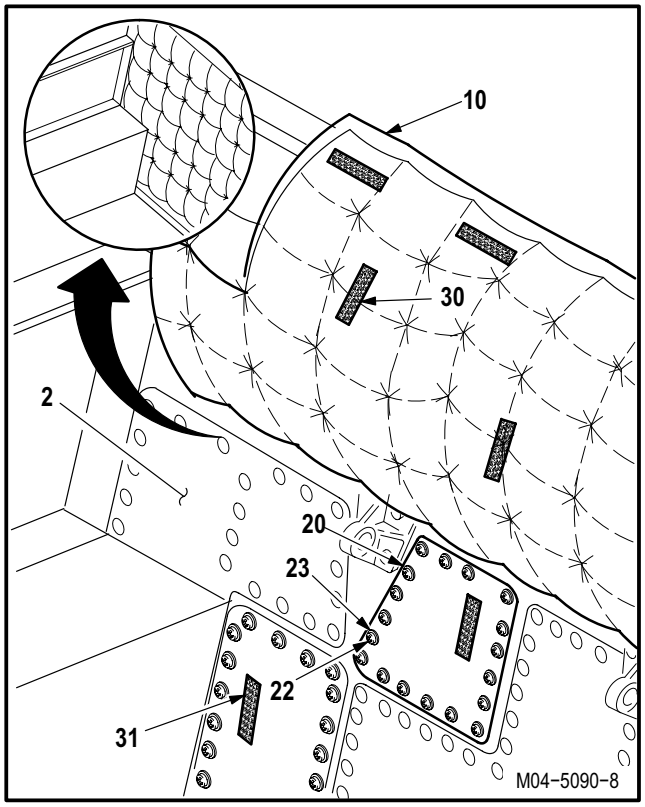
11.136. COLLECTIVE F.S. 161.54 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

d. **Install cover (20) on bulkhead (2).**

(1) Aline holes in cover (20) with holes in bulkhead (2).

(2) Install 18 screws (22) and washers (23).

(3) Secure insulation (10) on bulkhead (2) by fastening pile tape (30) on hook tape (31).

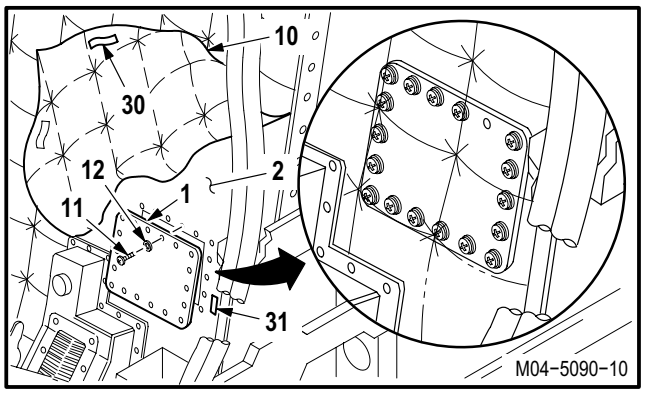


e. **Install cover (1) on bulkhead (2).**

(1) Aline holes in cover (1) with holes in bulkhead (2).

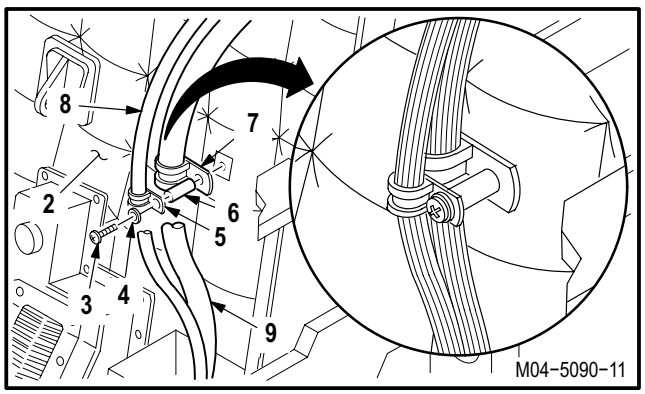
(2) Install 19 screws (11) and washers (12).

(3) Secure insulation (10) on bulkhead (2) by fastening pile tape (30) on hook tape (31).



(4) Install two clamps (5) and (7) on wire harnesses (8) and (9).

(5) Install screw (3) through washer (4), clamp (5), spacer (6), clamp (7), and bulkhead (2).



f. **Install air duct No. 11** (para 13.27)**.**

g. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

h. **Install pilot seat** (para 2.161)**.**

END OF TASK

11.137. COLLECTIVE F.S. 161.60 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.137.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.137.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

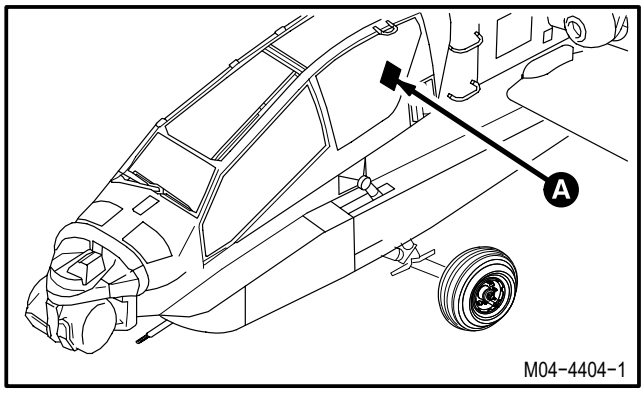
67R Attack Helicopter Repairer
One person to assist
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed
2.2	Access panel R200 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.137.3. Removal

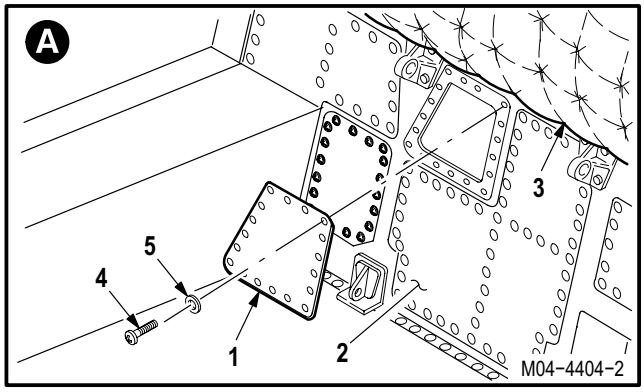
a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **Remove access cover (1) from pilot cockpit aft bulkhead (2).**

(1) Move thermal insulation (3) away from bulkhead (2) to expose cover (1).

(2) Remove 18 screws (4) and washers (5).

(3) Remove cover (1).



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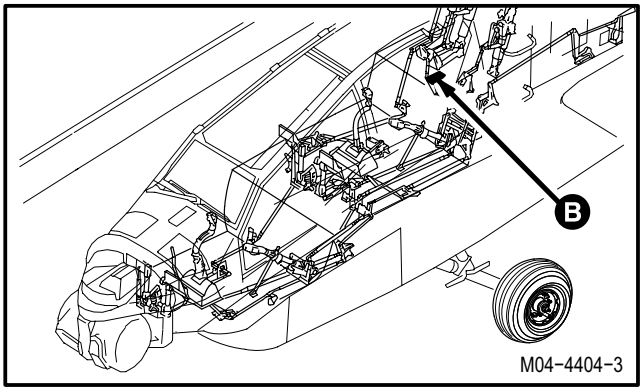
11.137. COLLECTIVE F.S. 161.60 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued



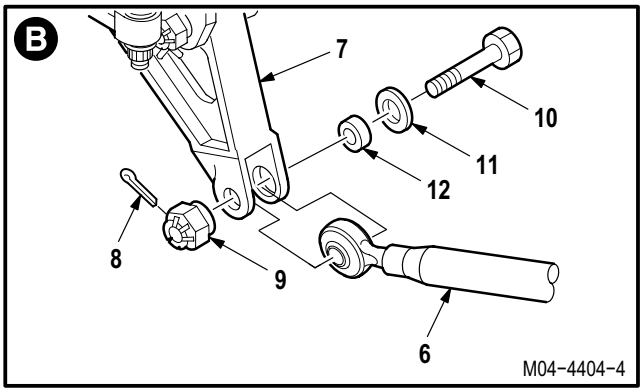
c. **Remove push-pull rod (6) from bellcrank bracket assembly (7).**

(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10), washer (11), and bushing (12).

(4) Remove rod (6).



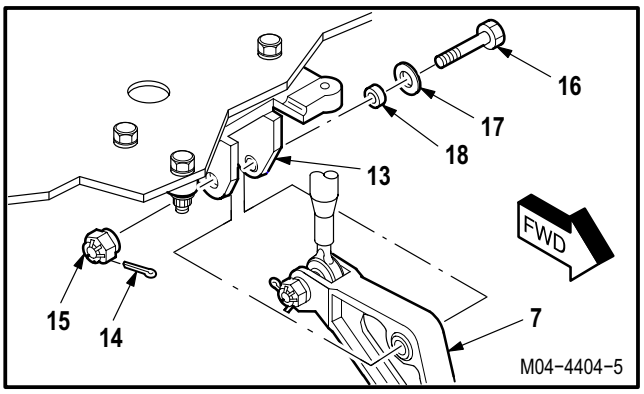
d. **Remove bellcrank (7) from bracket (13).**

(1) Remove and discard cotter pin (14).

(2) Remove nut (15).

(3) Remove bolt (16), washer (17), and bushing (18).

(4) Remove bellcrank (7).

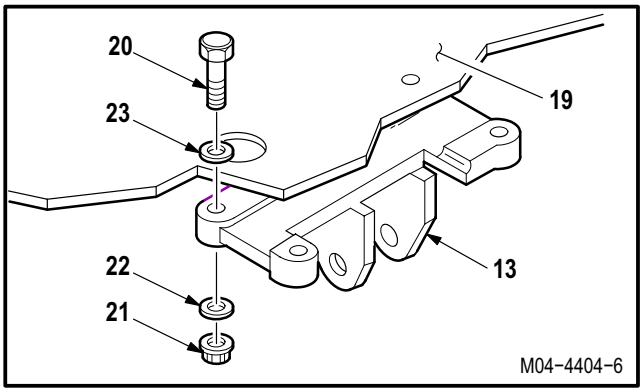


e. **Remove bracket (13) from airframe (19).**

(1) With one person holding bolts (20), remove four nuts (21) and washers (22).

(2) Remove four bolts (20) and washers (23).

(3) Remove bracket (13).



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11.137. COLLECTIVE F.S. 161.60 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.137.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.137.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

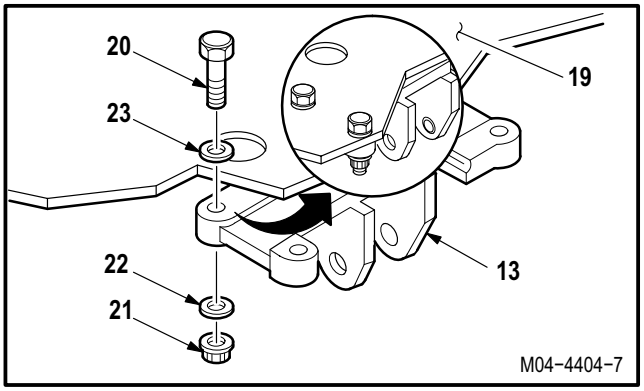
11.137.6. Installation

a. **Install bracket (13) on airframe (19).**

(1) Aline bracket (13) with airframe (19).

(2) With one person holding bracket (13), install four bolts (20) through washers (23), airframe (19), and bracket (13).

(3) With one person holding bolts (20), install four washers (22) and nuts (21).



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11.137. COLLECTIVE F.S. 161.60 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bellcrank (7) on bracket (13).** Torque nut (15) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (7) with bracket (13).

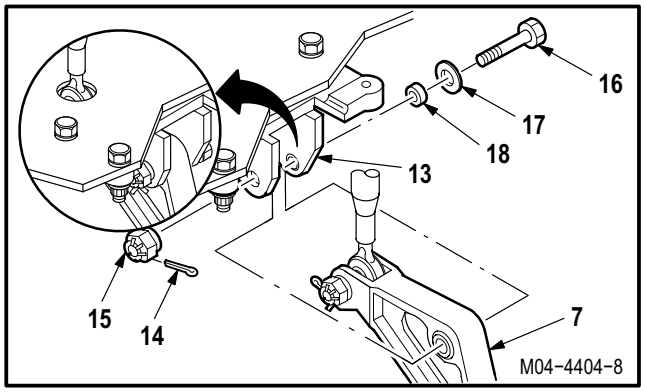
(2) Install bolt (16) through washer (17), bushing (18), bracket (13), and bellcrank (7).

(3) Check fit of self-retaining bolt (16) (para 11.1).

(4) Install nut (15). Torque nut (15) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (14).



c. **Install rod (6) on bellcrank (7).** Torque nut (9) **30 to 40 INCH-POUNDS**.

(1) Aline rod (6) with bellcrank (7).

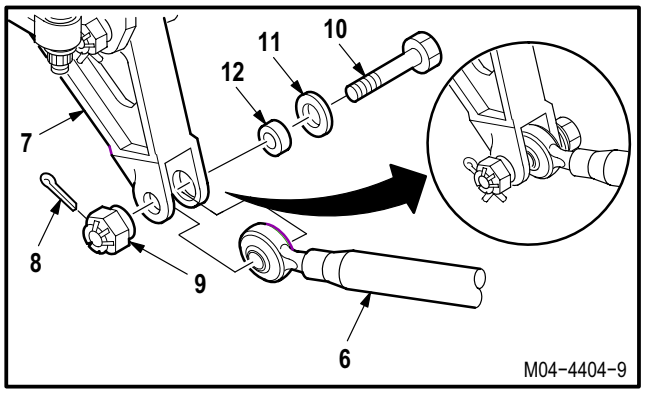
(2) Install bolt (10) through washer (11), bushing (12), bellcrank (7), and rod (6).

(3) Check fit of self-retaining bolt (10) (para 11.1).

(4) Install nut (9). Torque nut (9) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (8).



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11.137. COLLECTIVE F.S. 161.60 BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

d. **Inspect (QA).**

e. **Install cover (1) on bulkhead (2).**

(1) Aline holes in cover (1) with holes in bulkhead (2).

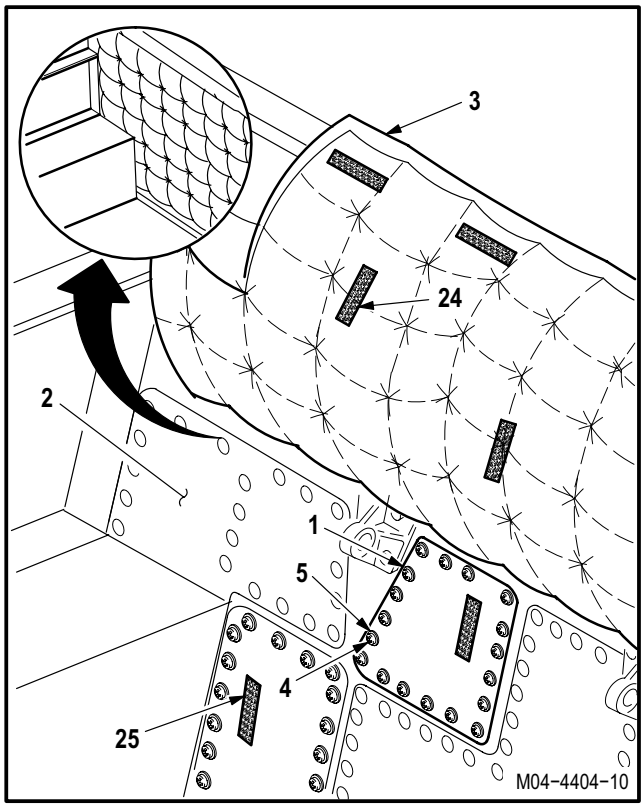
(2) Install 18 screws (4) and washers (5).

(3) Secure insulation (3) on bulkhead (2) by fastening pile tape (24) on hook tape (25).

f. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

g. **Install pilot seat** (para 2.161)**.**

h. **Install access panel R200** (para 2.2)**.**



END OF TASK

11.138. COLLECTIVE F.S. 161.60 BELLCRANK REMOVAL/INSTALLATION

11.138.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.138.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

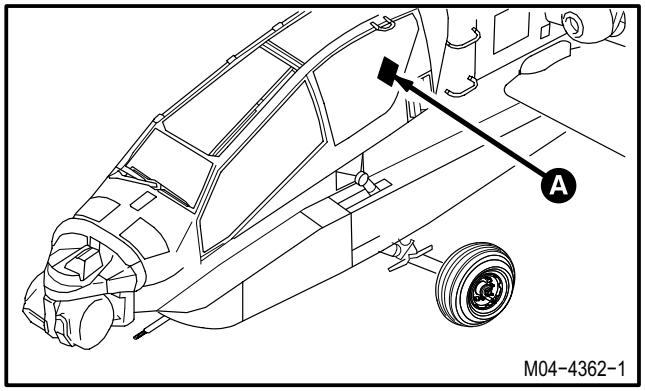
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.138. COLLECTIVE F.S. 161.60 BELLCRANK REMOVAL/INSTALLATION – continued

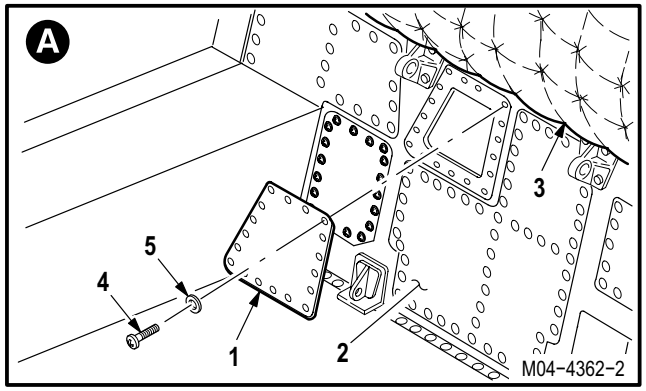
11.138.3. Removal

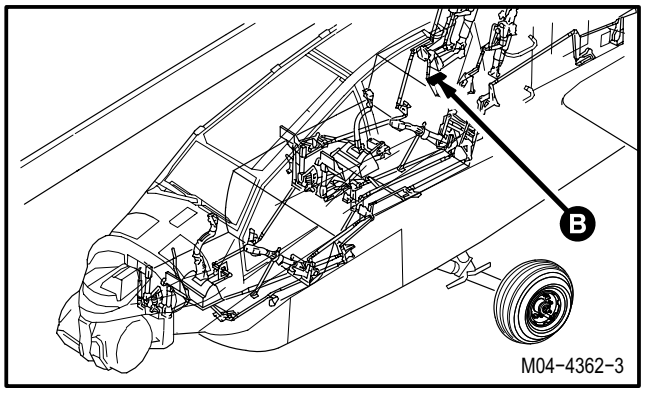
a. **Remove access cover (1) from pilot cockpit aft bulkhead (2).**

(1) Move thermal insulation (3) away from bulkhead (2) to expose cover (1).

(2) Remove 18 screws (4) and washers (5).

(3) Remove cover (1).





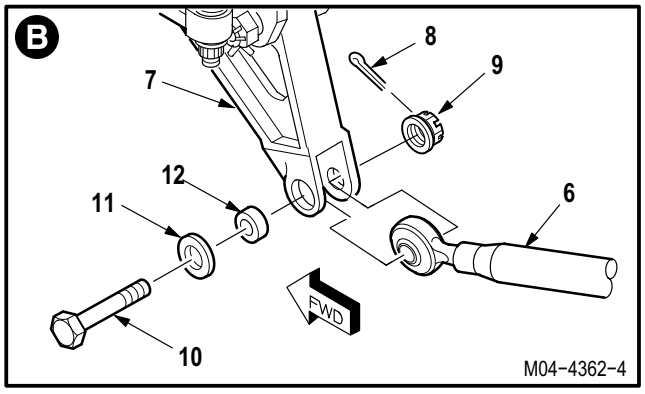
b. **Remove push-pull rod (6) from bellcrank (7).**

(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10), washer (11), and bushing (12).

(4) Remove rod (6) from bellcrank (7).



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11.138. COLLECTIVE F.S. 161.60 BELLCRANK REMOVAL/INSTALLATION – continued

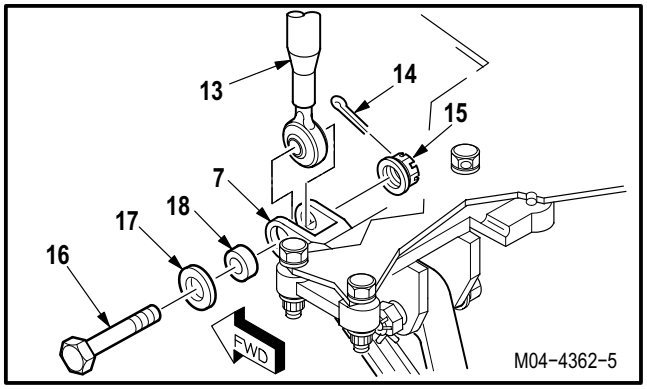
c. **Remove push-pull rod (13) from bellcrank (7).**

(1) Remove and discard cotter pin (14).

(2) Remove nut (15).

(3) Remove bolt (16), washer (17), and bushing (18).

(4) Remove rod (13) from bellcrank (7).



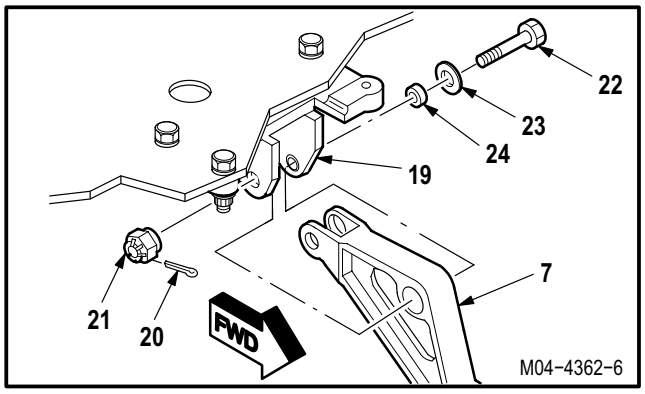
d. **Remove bellcrank (7) from bracket (19).**

(1) Remove and discard cotter pin (20).

(2) Remove nut (21).

(3) Remove bolt (22), washer (23), and bushing (24).

(4) Remove bellcrank (7).



11.138.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.138.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.138. COLLECTIVE F.S. 161.60 BELLCRANK REMOVAL/INSTALLATION – continued

11.138.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bellcrank (7) on bracket (19).** Torque nut (21) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (7) with bracket (19).

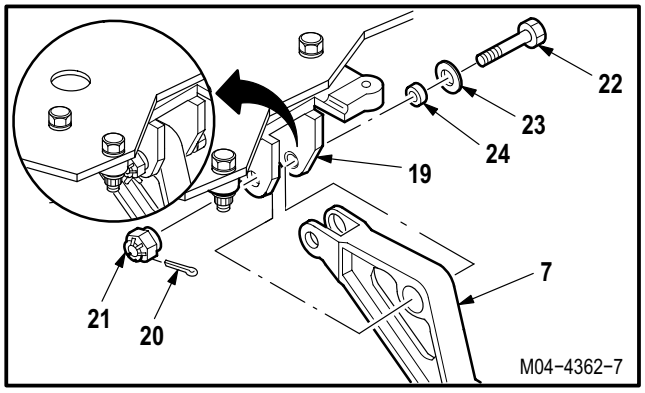
(2) Install bolt (22) through washer (23), bushing (24), bracket (19), and bellcrank (7).

(3) Check fit of self-retaining bolt (22) (para 11.1).

(4) Install nut (21). Torque nut (21) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (20).



b. **Install rod (13) on bellcrank (7).** Torque nut (15) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with bellcrank (7).

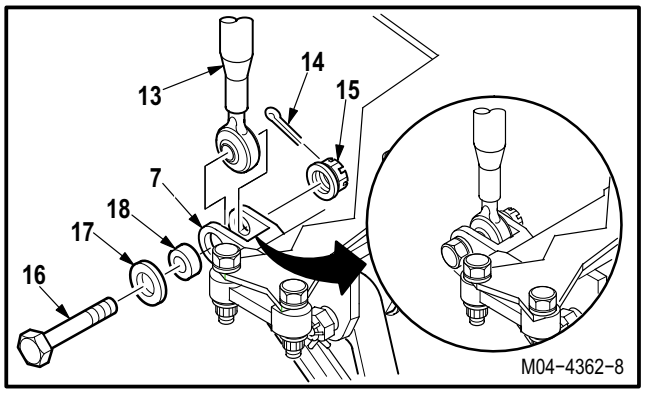
(2) Install bolt (16) through washer (17), bushing (18), bellcrank (7), and rod (13).

(3) Check fit of self-retaining bolt (16) (para 11.1).

(4) Install nut (15). Torque nut (15) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (14).



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11.138. COLLECTIVE F.S. 161.60 BELLCRANK REMOVAL/INSTALLATION – continued

c. **Install rod (6) on bellcrank (7).** Torque nut (9) **30 to 40 INCH-POUNDS**.

(1) Aline rod (6) with bellcrank (7).

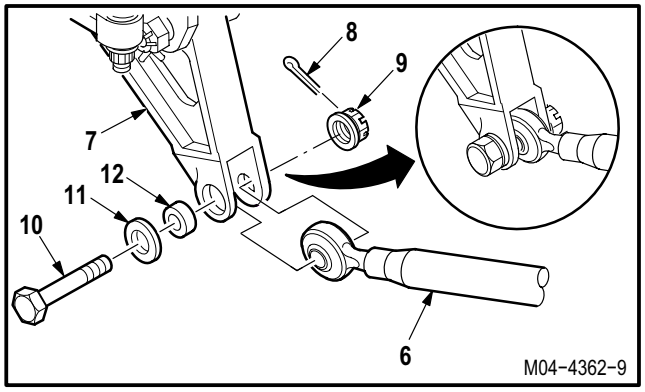
(2) Install bolt (10) through washer (11), bushing (12), bellcrank (7), and rod (6).

(3) Check fit of self-retaining bolt (10) (para 11.1).

(4) Install nut (9). Torque nut (9) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (8).



d. **Inspect (QA).**

e. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

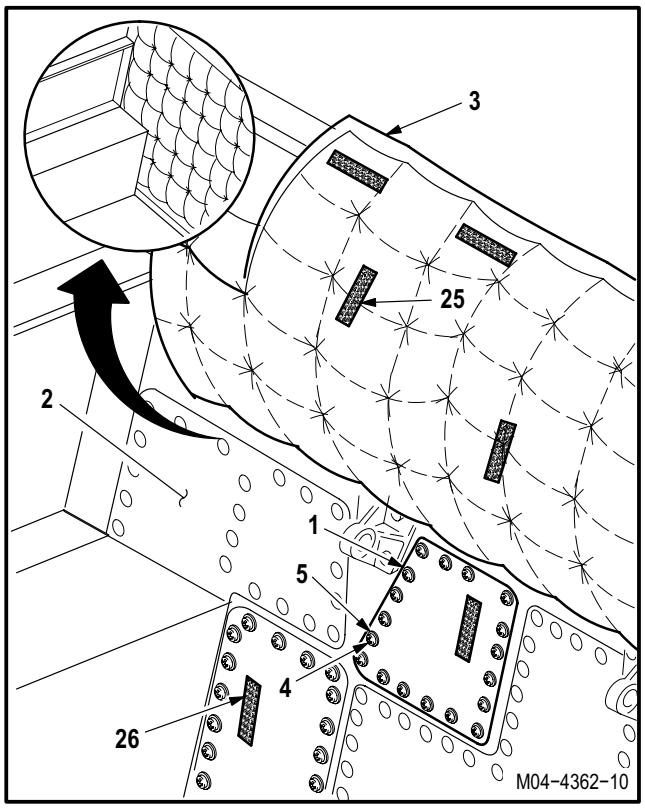
f. **Install cover (1) on bulkhead (2).**

(1) Aline holes in cover (1) with holes in bulkhead (2).

(2) Install 18 screws (4) and washers (5).

(3) Secure insulation (3) on bulkhead (2) by fastening pile tape (25) on hook tape (26).

g. **Install pilot seat** (para 2.161)**.**



END OF TASK

11.139. COLLECTIVE F.S. 161.60 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.139.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.139.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access panel R200 removed
9.32	Transformer-rectifier No. 2 removed
2.161	Pilot seat removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

11.139.3. Removal

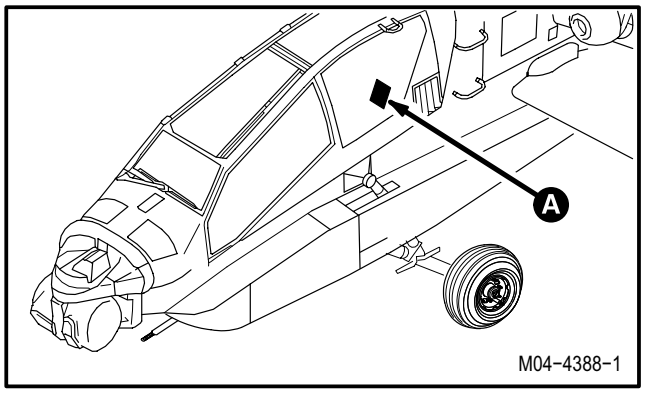
a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

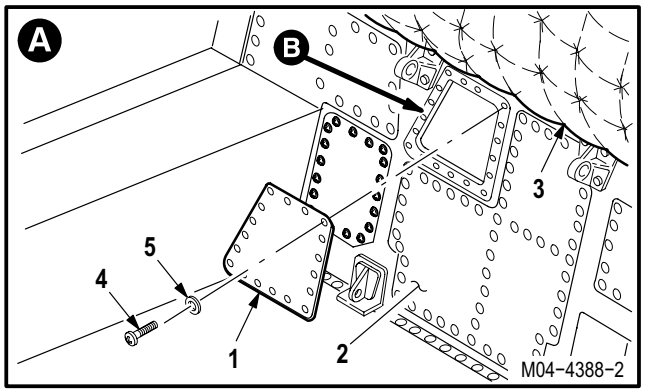
b. **Remove access cover (1) from pilot cockpit aft bulkhead (2).**

(1) Move thermal insulation (3) away from bulkhead (2) to expose cover (1).

(2) Remove 18 screws (4) and washers (5).

(3) Remove cover (1).





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11.139. COLLECTIVE F.S. 161.60 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

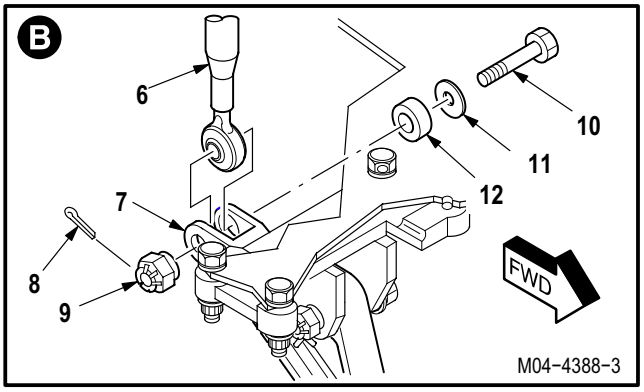
c. **Remove push-pull rod assembly (6) from bellcrank (7).**

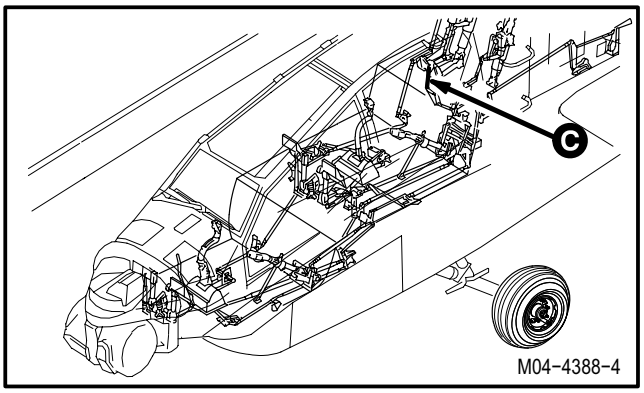
(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10), washer (11), and bushing (12).

(4) Remove rod (6).





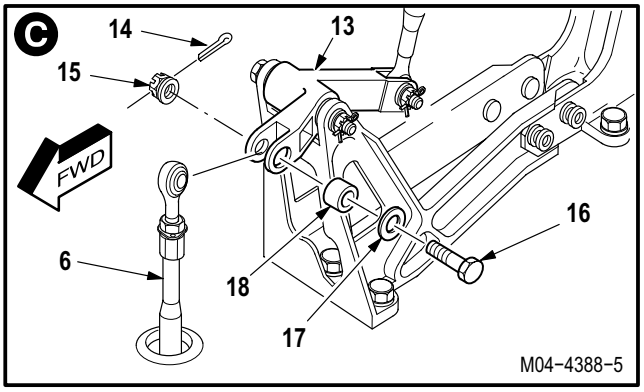
d. **Remove rod (6) from bellcrank (13).**

(1) Remove and discard cotter pin (14).

(2) Remove nut (15).

(3) Remove bolt (16), washer (17), and bushing (18).

(4) Remove rod (6) from bellcrank (13).



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11.139. COLLECTIVE F.S. 161.60 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.139.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.139.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.139.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install adjustable end of rod (6) on bellcrank (13).** Torque nut (15) **30 to 40 INCH-POUNDS**.

(1) Aline rod (6) with bellcrank (13).

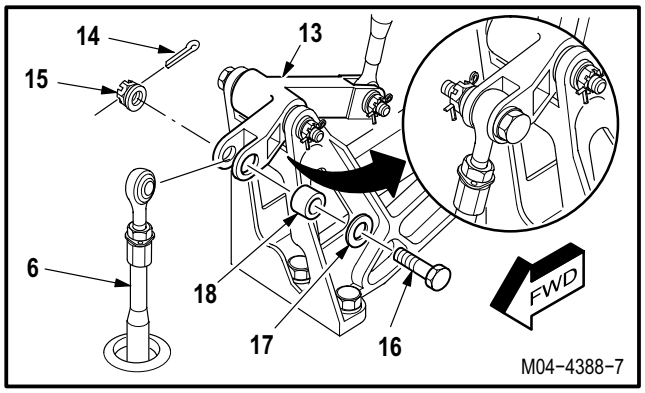
(2) Install bolt (16) through washer (17), bushing (18), bellcrank (13), and rod (6).

(3) Check fit of self-retaining bolt (16) (para 11.1).

(4) Install nut (15). Torque nut (15) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (14).



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11.139. COLLECTIVE F.S. 161.60 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod (6) on bellcrank (7).** Torque nut (9) **30 to 40 INCH-POUNDS**.

(1) Aline rod (6) with bellcrank (7).

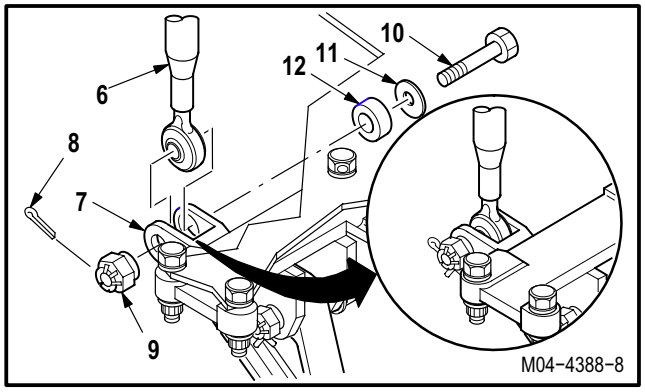
(2) Install bolt (10) through washer (11), bushing (12), bellcrank (7), and rod (6).

(3) Check fit of self-retaining bolt (10) (para 11.1).

(4) Install nut (9). Torque nut (9) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (8).



c. **Inspect (QA).**

d. **Install cover (1) on bulkhead (2).**

(1) Aline holes in cover (1) with holes in bulkhead (2).

(2) Install 18 screws (4) and washers (5).

(3) Secure insulation (3) on bulkhead (2) by fastening pile tape (19) on hook tape (20).

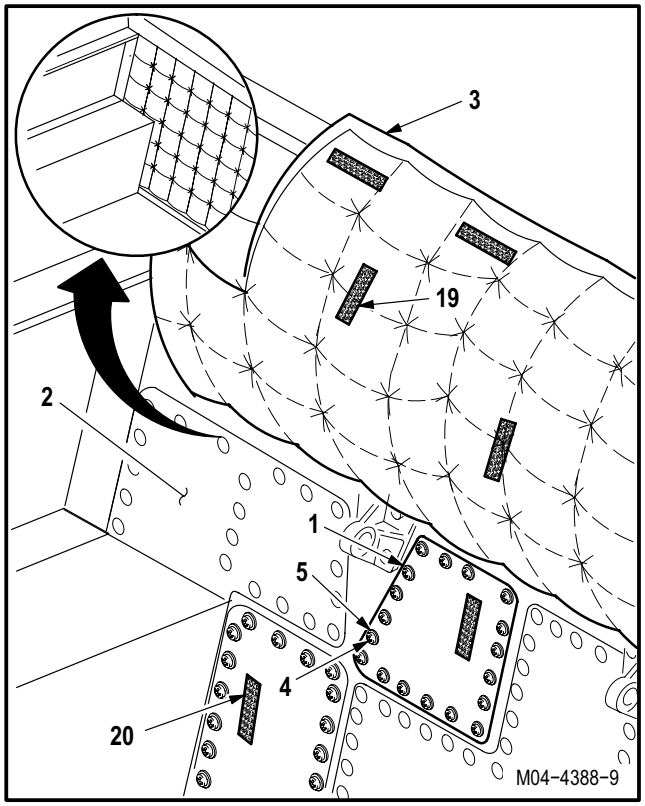
e. **Inspect (QA).**

f. **Install transformer-rectifier No. 2** (para 9.32)**.**

g. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

h. **Install pilot seat** (para 2.161)**.**

i. **Install access panel R200** (para 2.2)**.**



END OF TASK

11.140. COLLECTIVE F.S.164.95 BELLCRANK REMOVAL/INSTALLATION

11.140.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.140.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
1/4 x 1.92 dowel (item 110, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

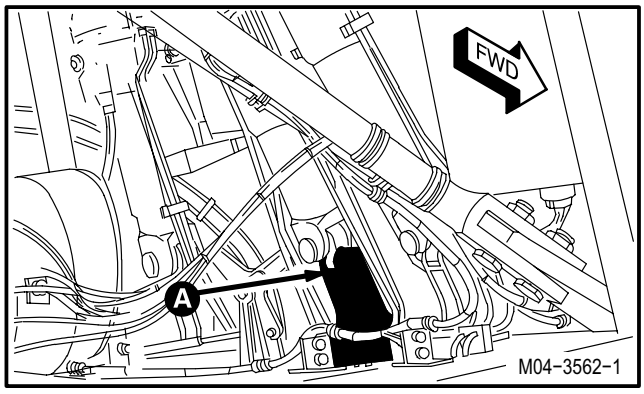
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
9.32	Transformer-rectifier No. 2 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.140. COLLECTIVE F.S.164.95 BELLCRANK REMOVAL/INSTALLATION – continued

11.140.3. Removal

a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).

b. **Remove push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (8).

NOTE

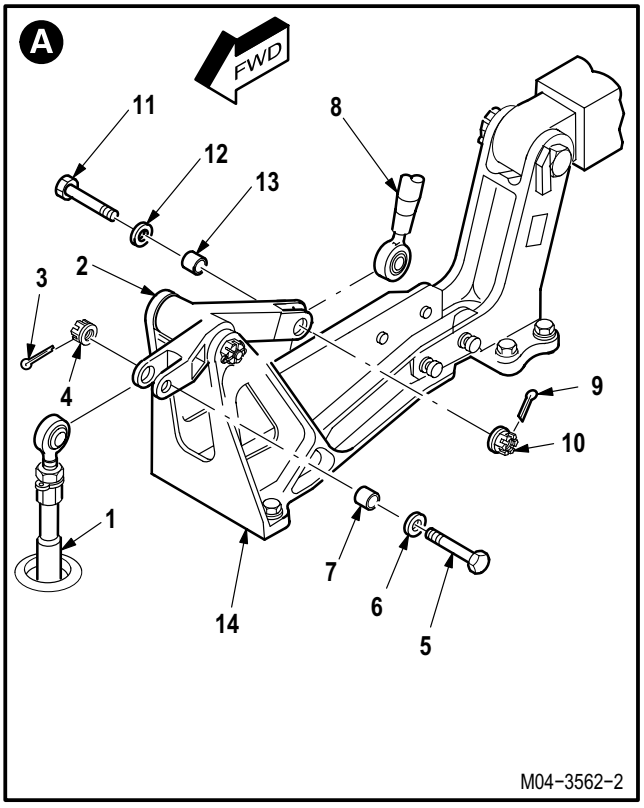
Dowel pin is used to secure bushing and bearing inside of bellcrank during removal.

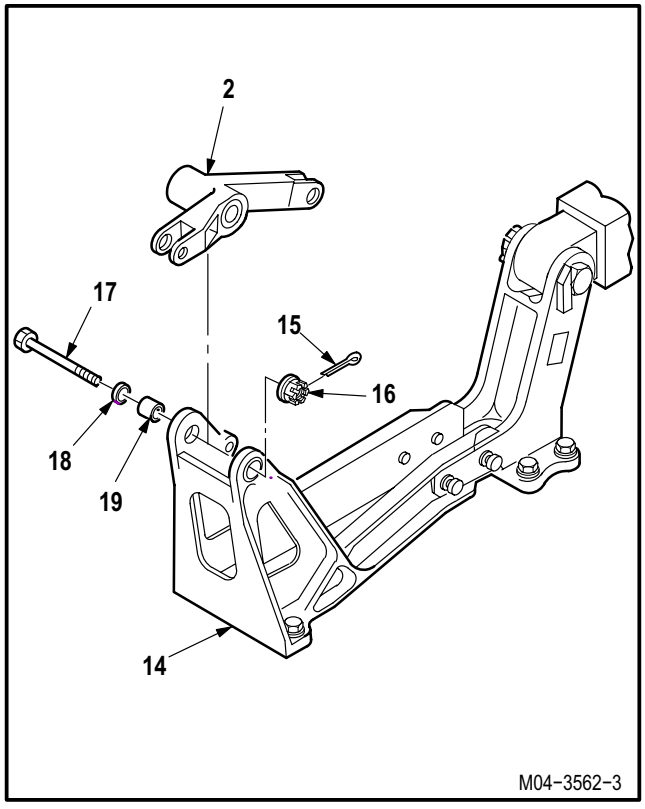
c. **Remove bellcrank (2) from bracket (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).





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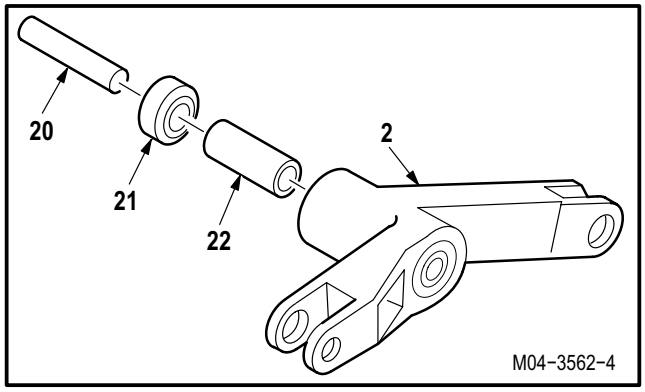
11.140. COLLECTIVE F.S.164.95 BELLCRANK REMOVAL/INSTALLATION – continued

(4) Install dowel pin (20) through bearing (21) and bushing (22). Use dowel.

(5) Remove bellcrank (2) with bearing (21), and bushing (22) secured by dowel pin (20).

(6) Remove dowel pin (20) from bearing (21), bushing (22), and bellcrank (2).

(7) Remove bearing (21) and bushing (22) from bellcrank (2).



11.140.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.140.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.140. COLLECTIVE F.S.164.95 BELLCRANK REMOVAL/INSTALLATION – continued

11.140.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

NOTE

Dowel pin is used to aline bushing and bearing inside of bellcrank during installation.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Position bushing (22) and bearing (21) in bellcrank (2).

(2) Insert dowel pin (20) through bearing (21), bushing (22), and bellcrank (2). Use dowel.

(3) Install bellcrank (2) on bracket (14).

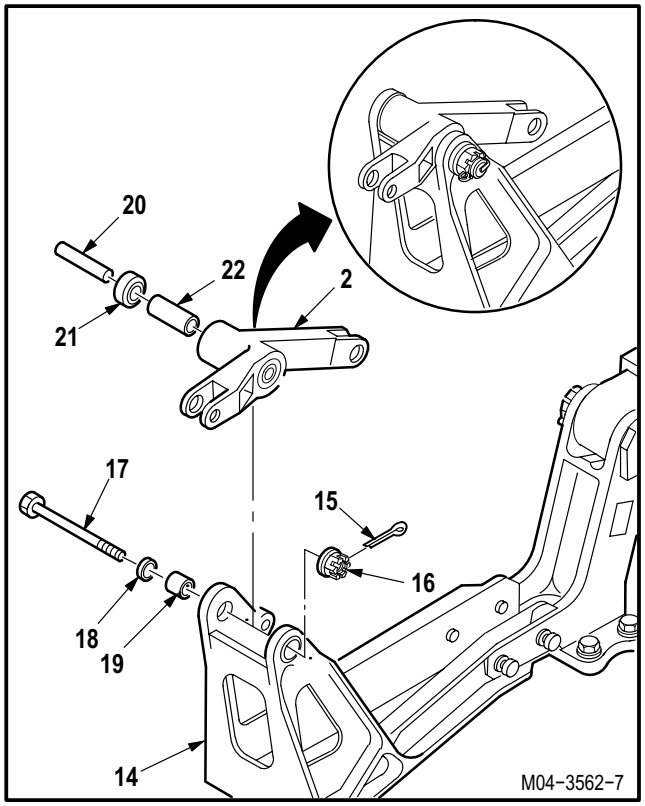
(4) Install bolt (17) through washer (18), bushing (19), bracket (14), bellcrank (2), bearing (21) and bushing (22) pushing dowel pin (20) out of bellcrank (2).

(5) Check fit of self-retaining bolt (17) (para 11.1).

(6) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(8) Install new cotter pin (15).



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11.140. COLLECTIVE F.S.164.95 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Position rod (8) on bellcrank (2) to aline bolt hole and bushing (13) in bellcrank (2).

(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Position rod (1) on bellcrank (2) to aline bolt hole and bushing (7) in bellcrank (2).

(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

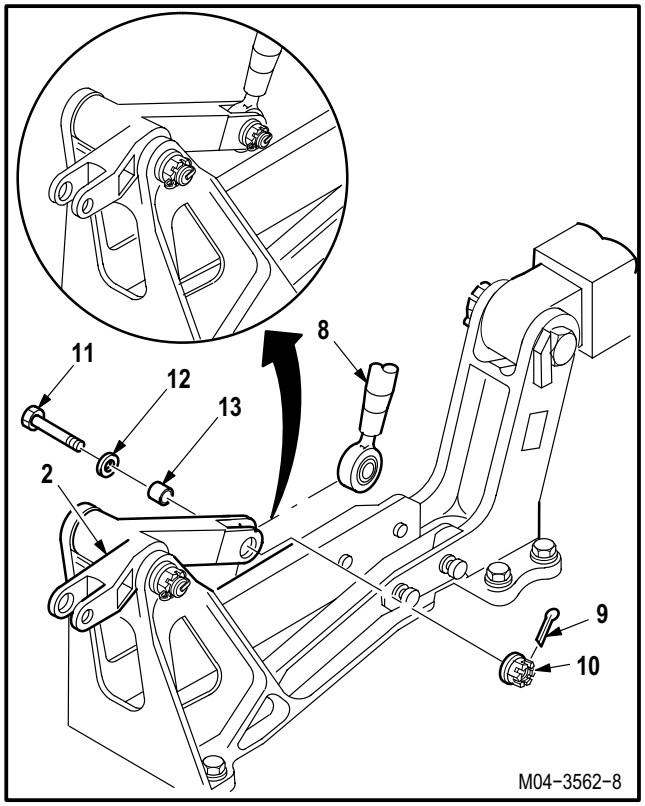
(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

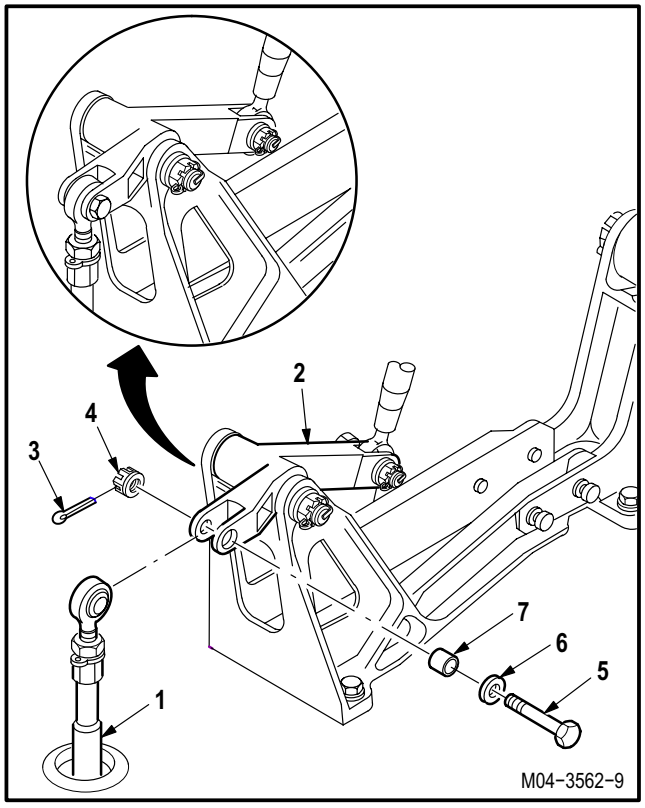
(6) Install new cotter pin (3).

d. **Inspect (QA).**

e. **Perform collective flight controls rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install transformer-rectifier No. 2** (para 9.32)**.**





END OF TASK

11.141. COLLECTIVE F.S. 164.95 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.141.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.141.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
9.32	Transformer-rectifier No. 2 removed
11.44	Collective stick cover removed
1.72	External primary hydraulic power applied

Personnel Required:

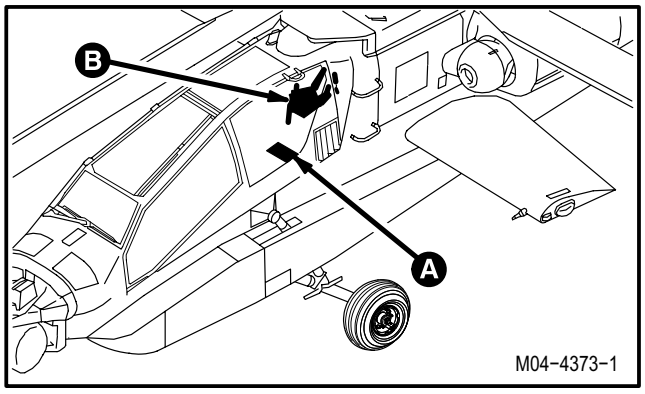
67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.



11.141.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

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11.141. COLLECTIVE F.S. 164.95 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Secure pilot collective stick (1) in neutral position.**

(1) Slowly move stick (1) to aline rig pin holes (2) in collective stick (1) and housing (3).

(2) Install -3 rig pin (4).

c. **Install collective stick warning flag (5) on stick (1).**

d. **Remove external hydraulic power** (para 1.72)**.**

e. **Remove collective push-pull rod (6) from collective bellcrank (7).**

(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10), washer (11), and bushing (12).

(4) Remove rod (6).

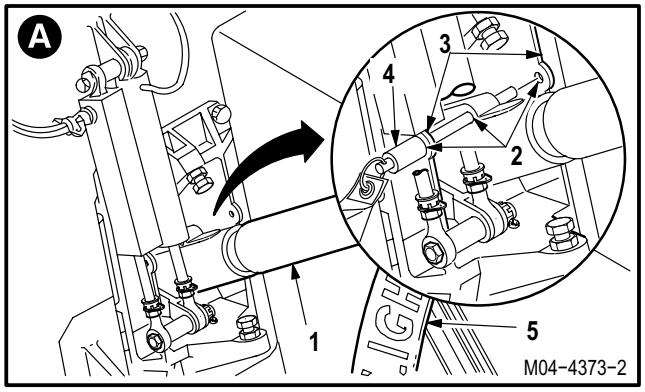
f. **Remove rod (6) from collective servocylinder clevis (13).**

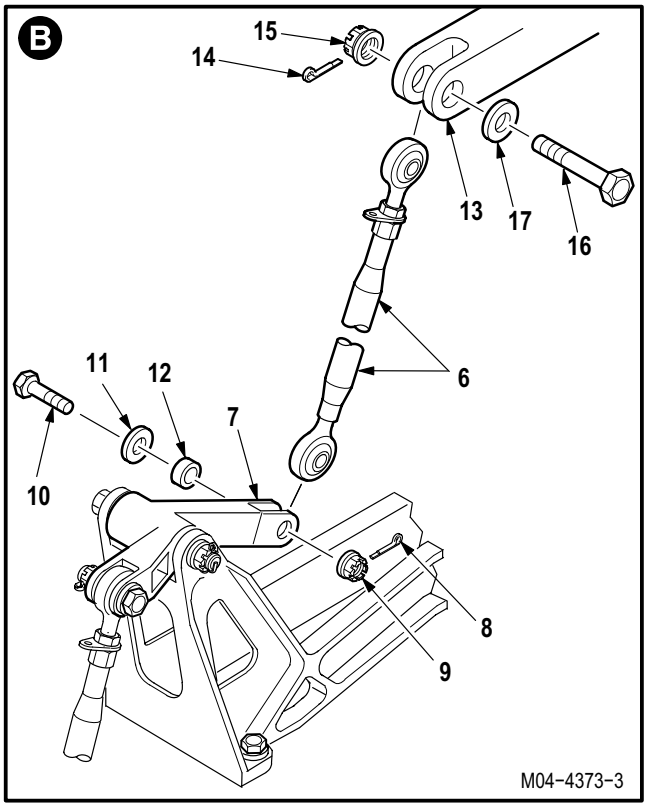
(1) Remove and discard cotter pin (14).

(2) Remove nut (15).

(3) Remove bolt (16) and washer (17) from clevis (13).

(4) Remove rod (6).





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11.141. COLLECTIVE F.S. 164.95 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.141.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.141.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.141.6. Installation

CAUTION

To prevent damage to flight control components, do not use force in alining push-pull rod with bellcrank and servocylinder clevis.

a. **Install adjustable end of rod (6) on clevis (13).** Torque nut (15) **30 to 40 INCH-POUNDS**.

(1) Aline rod (6) with clevis (13).

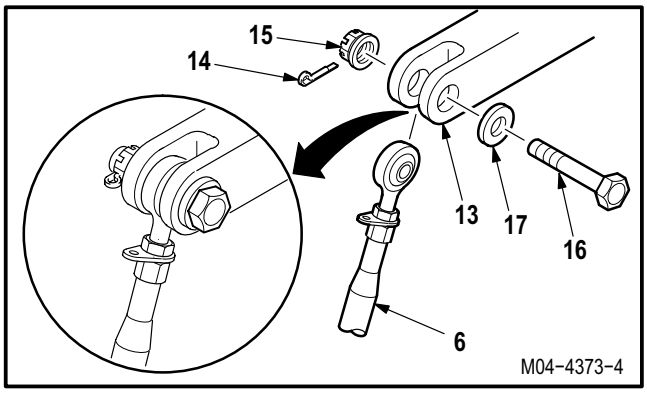
(2) Install bolt (16) through washer (17), clevis (13), and rod (6).

(3) Check fit of self-retaining bolt (16) (para 11.1).

(4) Install nut (15). Torque nut (15) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (14).



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11.141. COLLECTIVE F.S. 164.95 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod (6) on bellcrank (7).** Torque nut (9) **30 to 40 INCH-POUNDS**.

(1) Aline rod (6) with bellcrank (7).

(2) Install bolt (10) through washer (11), bushing (12), bellcrank (7), and rod (6).

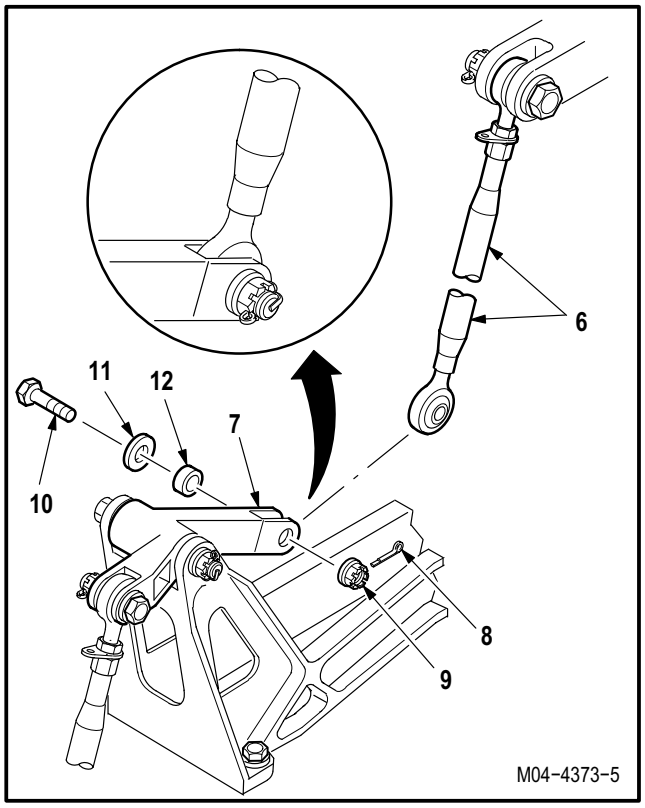
(3) Check fit of self-retaining bolt (10) (para 11.1).

(4) Install nut (9). Torque nut (9) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (8).

c. **Inspect (QA).**



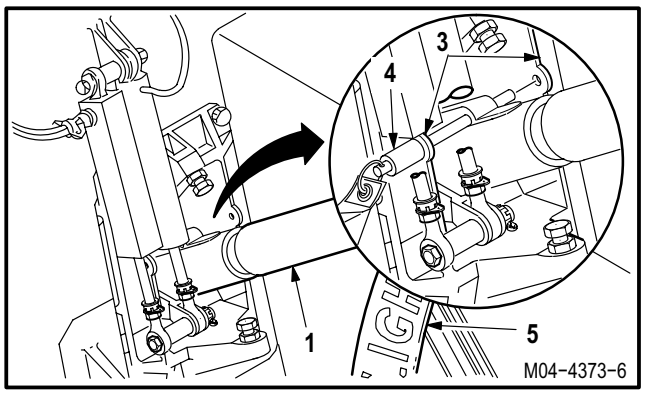
d. **Remove -3 rig pin (4) from pilot collective stick (1).**

e. **Remove flag (5) from stick (1).**

f. **Install transformer-rectifier No. 2** (para 9.32)**.**

g. **Perform collective flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

h. **Install collective stick cover** (para 2.2)**.**



END OF TASK

11.142. COLLECTIVE F.S. 176.00 SERVOCYLINDER MOUNT BRACKET REMOVAL/INSTALLATION

11.142.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.142.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
30 - 150 inch-pound 1/4-inch drive click type torque wrench (item 435, App H)
150 - 750 inch-pound 3/8-inch drive click type torque wrench (item 442, App H)

Materials/Parts:

Sealing compound (item 174, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
12.55	Blade de-ice controller removed
7.41	Collective servocylinder removed from mount bracket
11.140	Collective F.S. 164.95 bellcrank removed

WARNING

FLIGHT SAFETY PART

- **The collective servocylinder mount bracket and/or components of the mount bracket are flight safety parts. Failure to follow maintenance instructions may result in serious injury or death of crewmembers and/or serious damage to the helicopter.**
- **Heat-treated condition of the mount bracket is critical to its serviceability. Any indication of heat oxidizing (discoloration), where visually detectable, requires replacement of the part. This part must be protected from unscheduled heating and external impact during inspection and other handling procedures.**
- **Shot-peened surface on mount bracket is critical. This part shall be replaced or have the peening restored if surface has had peening removed by wear or other cause. It also must be protected from unscheduled heating and external impact during inspection and any other handling procedures.**

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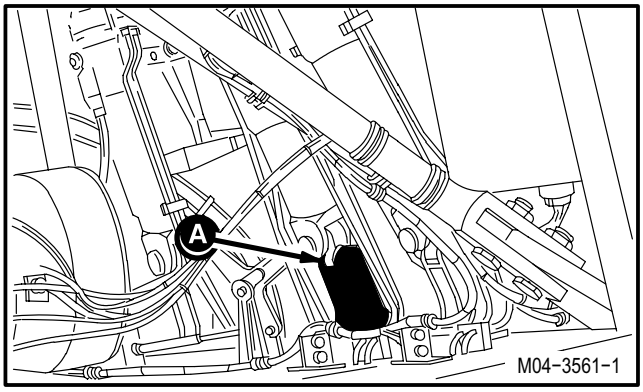
11.142. COLLECTIVE F.S. 176.00 SERVOCYLINDER MOUNT BRACKET REMOVAL/INSTALLATION – continued



11.142.3. Removal

a. **Remove sealing compound from faying surface of mount bracket (1).**

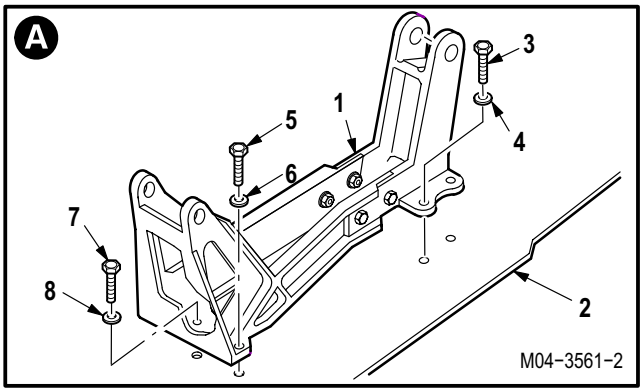
b. **Remove mount bracket (1) from deck (2).**

(1) Remove four bolts (3) and washers (4).

(2) Remove two bolts (5) and washers (6).

(3) Remove bolt (7) and washer (8).

(4) Remove bracket (1).



11.142.4. Cleaning

a. **Clean bracket mounting deck and attaching hardware** (para 1.47)**.**

11.142.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.142. COLLECTIVE F.S. 176.00 SERVOCYLINDER MOUNT BRACKET REMOVAL/INSTALLATION – continued

11.142.6. Installation

a. **Install bracket (1) on deck (2).** Torque two bolts (5) and bolt (7) to **80 INCH-POUNDS**. Torque four bolts (3) to **340 INCH-POUNDS**.

(1) Position bracket (1) to aline seven mounting holes (9).

(2) Install four bolts (3) with washers (4).

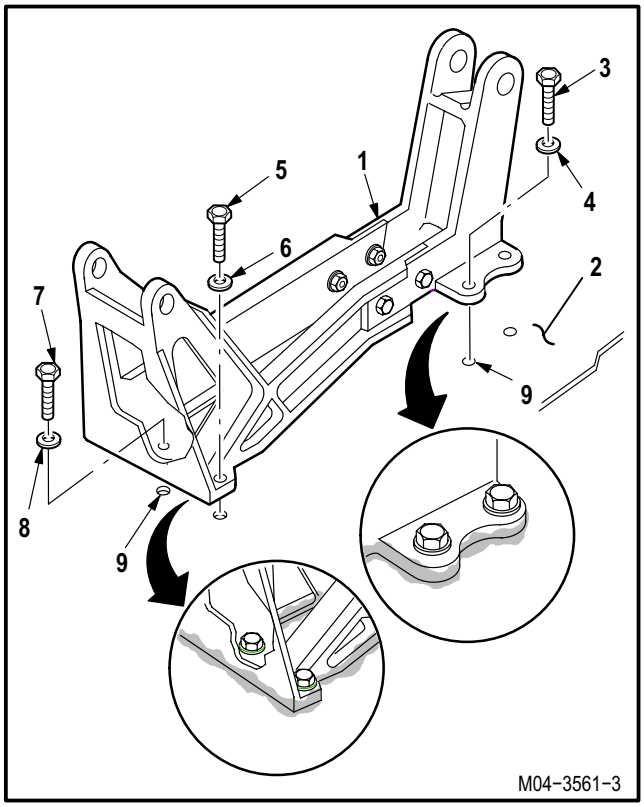
(3) Install two bolts (5) with washers (6).

(4) Install bolt (7) with washer (8).

(5) Torque two bolts (5) and bolt (7) to **80 INCH-POUNDS**. Use torque wrench.

(6) Torque four bolts (3) to **340 INCH-POUNDS**. Use torque wrench.

(7) Apply sealing compound to faying surface of bracket (1). Use sealing compound (item 174, App F).



b. **Inspect (QA).**

c. **Install collective F.S. 164.95 bellcrank** (para 11.140)**.**

d. **Install collective servocylinder to mount bracket** (para 7.42)**.**

e. **Install blade de-ice controller** (para 12.55)**.**

END OF TASK

11.143. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.143.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.143.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23
TM 9-1270-476-30

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access door B65L removed; access fairing L60 removed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed
TM 9-1270-476-30	TADS/PNVS assembly removed

Materials/Parts:

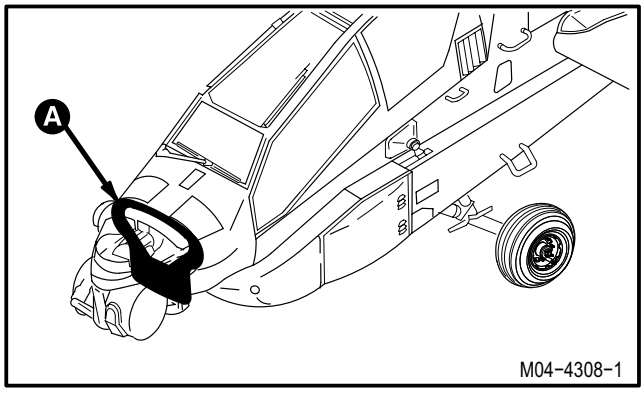
Cotter pin (2)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

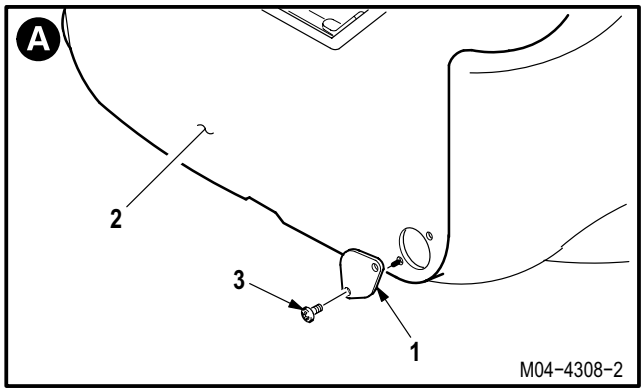


11.143.3. Removal

a. **Remove cover (1) from F.S. 35.5 bulkhead (2).**

(1) Remove two screws (3).

(2) Remove cover (1).



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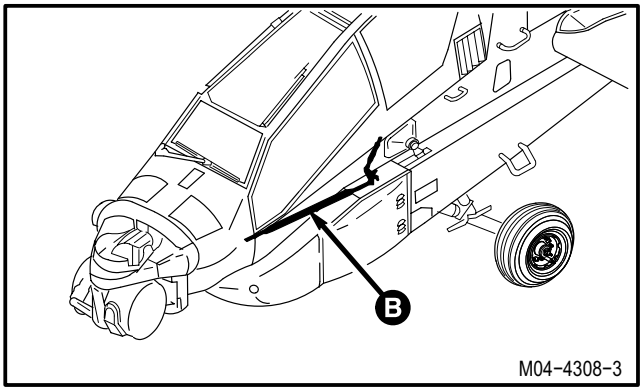
11.143. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued



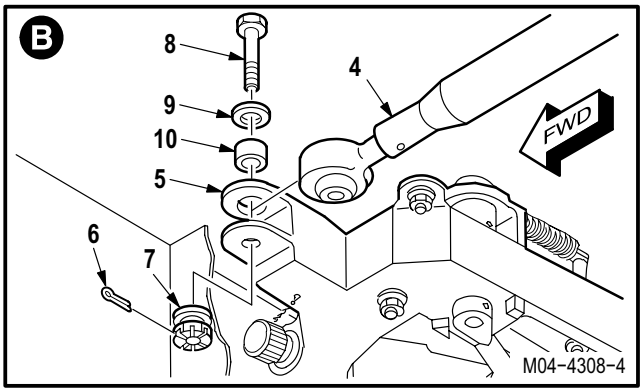
b. **Remove push-pull rod assembly (4) from SPAD (5).**

(1) Remove and discard cotter pin (6).

(2) Remove nut (7).

(3) Remove bolt (8), washer (9), and bushing (10).

(4) Remove rod (4).



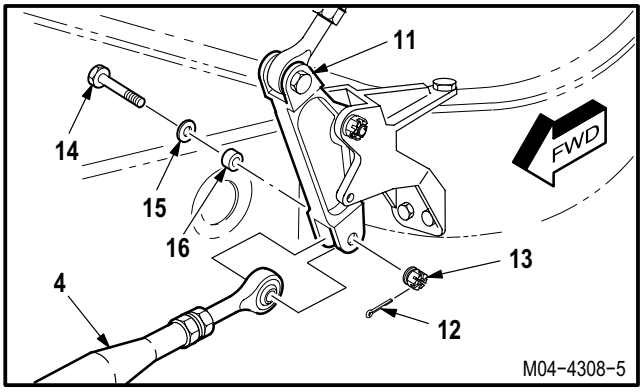
c. **Remove rod (4) from bellcrank (11).**

(1) Remove and discard cotter pin (12).

(2) Remove nut (13).

(3) Remove bolt (14), washer (15), and bushing (16).

(4) Remove rod (4) through F.S. 35.5 bulkhead.



11.143.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

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11.143. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.143.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.143.6. Installation

CAUTION

To prevent damage to flight control components, do not use force in alining rod with bellcranks.

a. **Install adjustable end of rod (4) on bellcrank (11).** Torque nut (13) **30 to 40 INCH-POUNDS**.

(1) Install rod (4) through F.S. 35.5 bulkhead.

(2) Aline rod (4) with bellcrank (11).

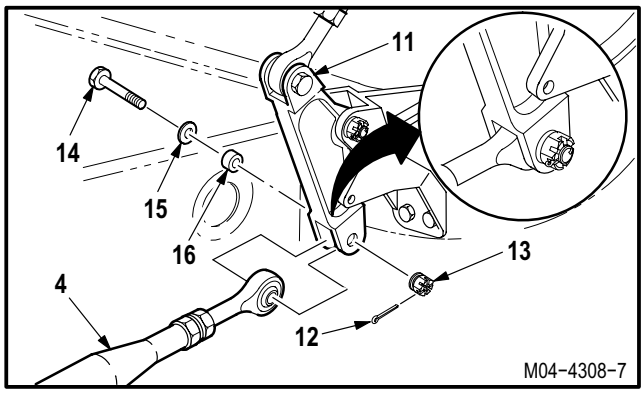
(3) Install bolt (14) through washer (15), bushing (16), bellcrank (11), and rod (4).

(4) Check fit of self-retaining bolt (14) (para 11.1).

(5) Install nut (13). Torque nut (13) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (12).



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11.143. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod (4) on SPAD (5).** Torque nut (7) **30 to 40 INCH-POUNDS**.

(1) Aline rod (4) with SPAD (5).

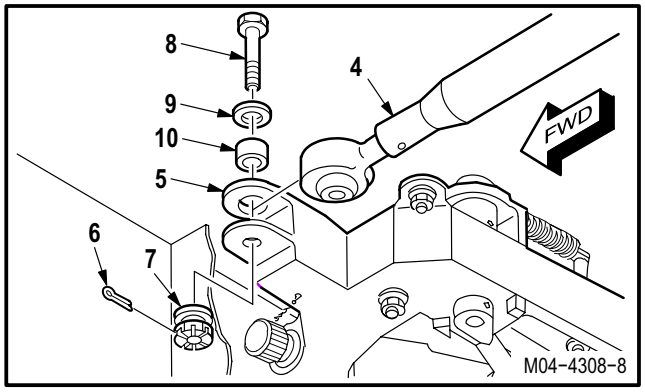
(2) Install bolt (8) through washer (9), bushing (10), bellcrank (5), and rod (4).

(3) Check fit of self-retaining bolt (8) (para 11.1).

(4) Install nut (7). Torque nut (7) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (6).



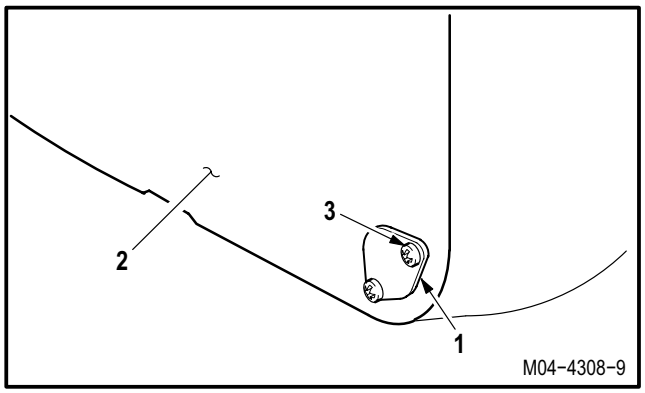
c. **Inspect (QA).**

d. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install cover (1) on bulkhead (2).**

(1) Aline cover (1) on bulkhead (2).

(2) Install two screws (3).



f. **Install access door B65L; install fairing L60** (para 2.2)**.**

g. **Inspect (QA).**

h. **Install TADS/PNVS assembly** (TM 9-1270-476-30)**.**

i. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.144. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL

11.144.1. Description

This task covers: Removal. Cleaning. Inspection.

11.144.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

Personnel Required:

67R Attack Helicopter Repairer

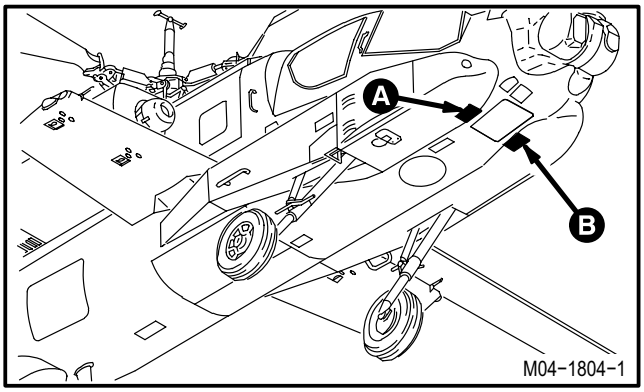
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access doors B60, B65L, and B65R removed; fairings L60 and R60 removed

11.144.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **On pilot center circuit breaker panel, open ASE AC, DC, and BUCS circuit breakers.**

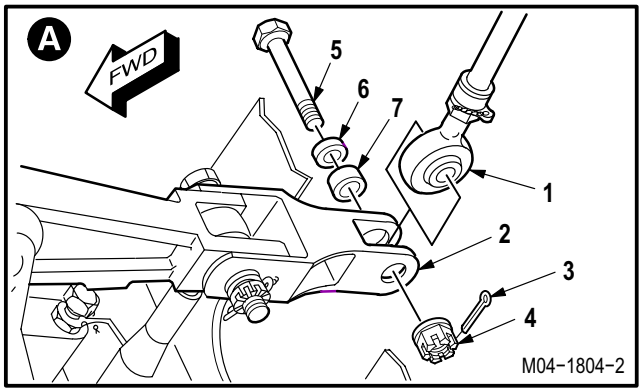


c. **Remove position transducer (1) from SPAD (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).



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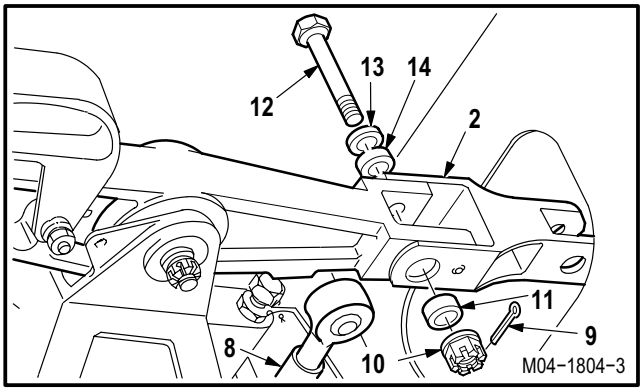
11.144. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL – continued

d. **Remove directional push-pull rod (8) from SPAD (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10) and bushing (11).

(3) Remove bolt (12), washer (13), and bushing (14).



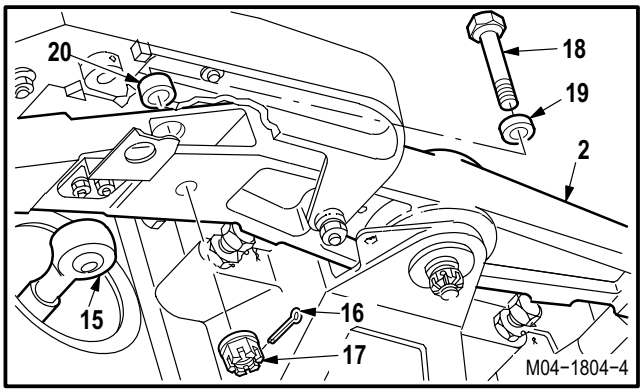
e. **Support SPAD (2) and remove directional push-pull rod (15) from SPAD (2).**

(1) Remove and discard cotter pin (16).

(2) Remove nut (17).

(3) Remove bolt (18), washer (19), and bushing (20).

(4) Remove rod (15) to rear of SPAD (2) and reinstall bolt (18).



f. **Detach connector A334P1 (21) from receptacle J273 (22).**

g. **Remove two wire clamps (23).**

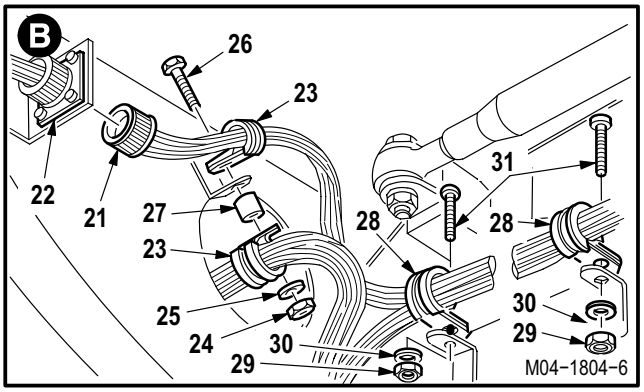
(1) Remove nut (24) and washer (25).

(2) Remove screw (26), top clamp (23), spacer (27), and bottom clamp (23).

h. **Remove two wire clamps (28).**

(1) Remove two nuts (29) and washers (30).

(2) Remove two screws (31) and clamps (28).



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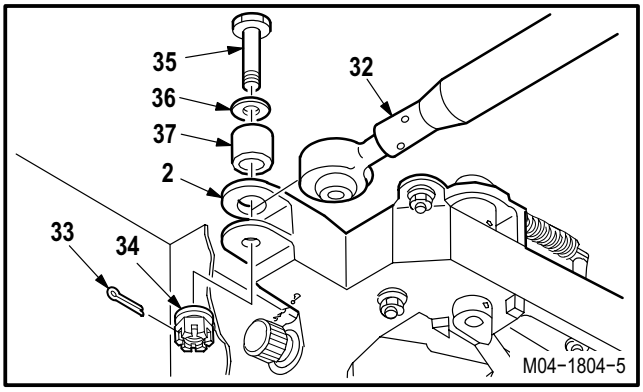
11.144. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL – continued

i. **Remove directional push-pull rod (32) from SPAD (2).**

(1) Remove and discard cotter pin (33).

(2) Remove nut (34).

(3) Remove bolt (35), washer (36), and bushing (37).



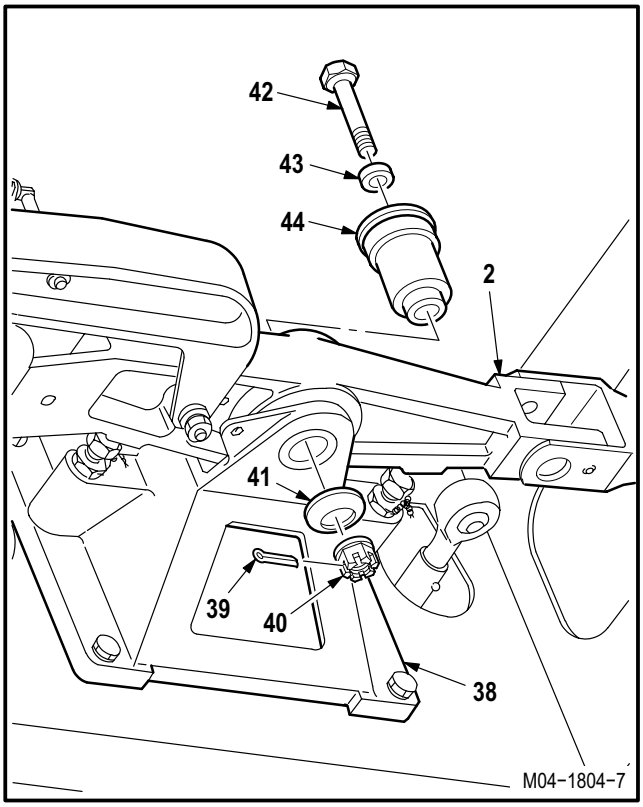
j. **Remove SPAD (2) from mounting bracket (38).**

(1) Remove and discard cotter pin (39).

(2) Remove nut (40) and retainer (41).

(3) Remove bolt (42), washer (43), and shaft (44).

(4) Remove SPAD (2) from bracket (38).



11.144.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.144.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

e. **Check retainer for damaged threads.** None allowed.

END OF TASK

11.145. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION

11.145.1. Description

This task covers: Installation.

11.145.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

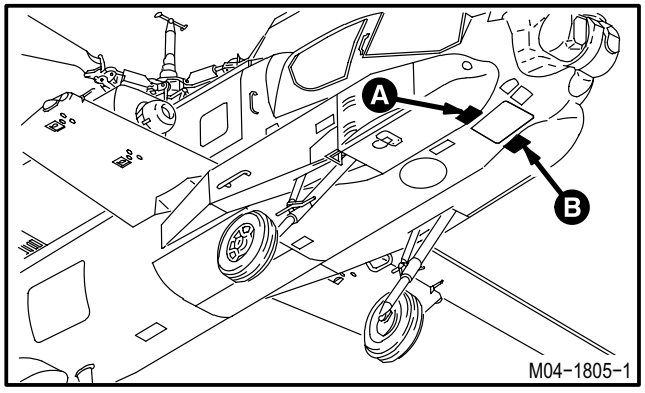
Cotter pin (5)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed



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11.145. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION – continued

11.145.3. Installation

a. **Install SPAD (1) on mounting bracket (2).** Torque nut (3) **30 to 40 INCH-POUNDS**.

(1) Position SPAD (1) on bracket (2) with swivel arm (4) to left.

(2) Install bolt (5) through washer (6) into shaft (7).

(3) Install shaft (7) with bolt (5) and washer (6) through bracket (2) and SPAD (1).

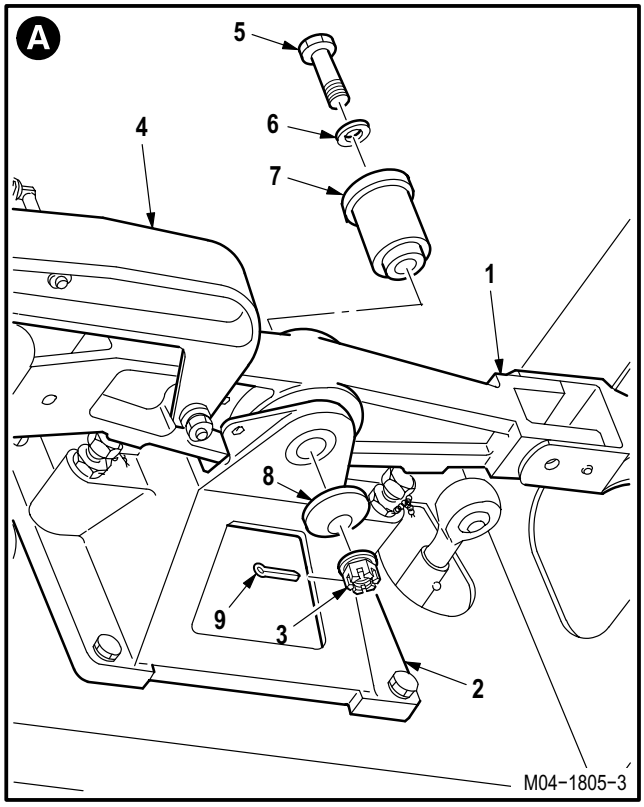
(4) Install retainer (8).

(5) Check fit of self-retaining bolt (5) (para 11.1).

(6) Install nut (3). Torque nut (3) to **30 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(8) Install new cotter pin (9).



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11.145. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline push-pull rod with SPAD.

b. **Install directional push-pull rod (10) on SPAD (1).** Torque nut (11) **30 to 40 INCH-POUNDS**.

(1) Install bushings (12) and (13) in SPAD (1).

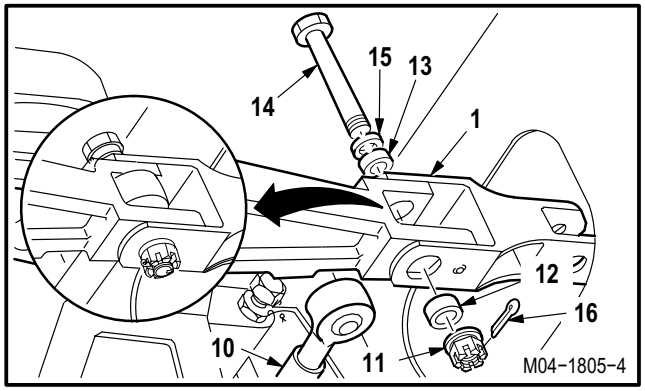
(2) Install bolt (14) through washer (15), bushing (13), SPAD (1), bushing (12), and rod (10).

(3) Check fit of self-retaining bolt (14) (para 11.1).

(4) Install nut (11). Torque nut (11) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (16).



c. **Install directional push-pull rod (17) on SPAD (1).** Torque nut (18) **30 to 40 INCH-POUNDS**.

(1) Install bushing (19) in SPAD (1).

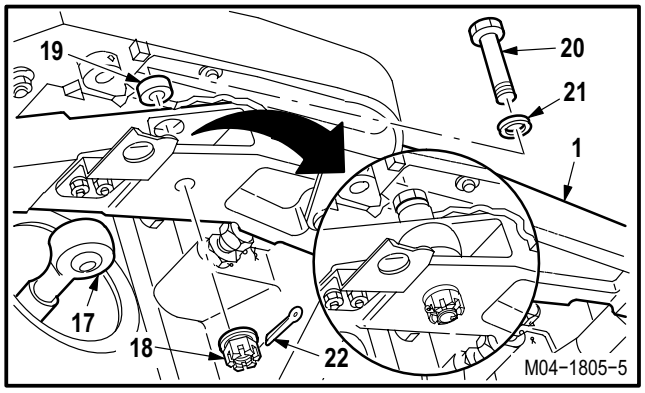
(2) Install bolt (20) through washer (21), bushing (19), SPAD (1), and rod (17).

(3) Check fit of self-retaining bolt (20) (para 11.1).

(4) Install nut (18). Torque nut (18) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (22).



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11.145. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION – continued

d. **Install position transducer (23) on SPAD (1).** Torque nut (24) **30 to 40 INCH-POUNDS**.

(1) Install bushing (25) in SPAD (1).

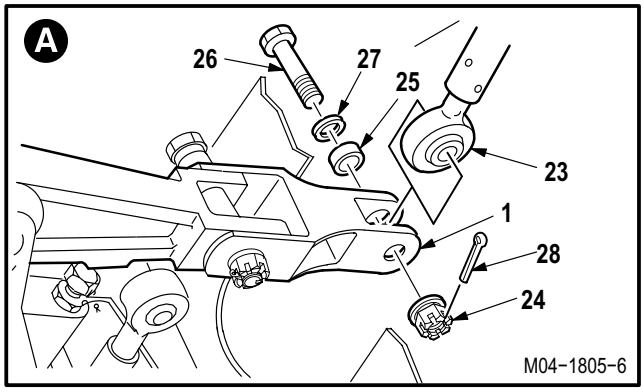
(2) Install bolt (26) through washer (27), bushing (25), SPAD (1), and transducer (23).

(3) Check fit of self-retaining bolt (26) (para 11.1).

(4) Install nut (24). Torque nut (24) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (28).



e. **Install directional push-pull rod (29) on SPAD (1).** Torque nut (30) **30 to 40 INCH-POUNDS**.

(1) Install bushing (31) in SPAD (1).

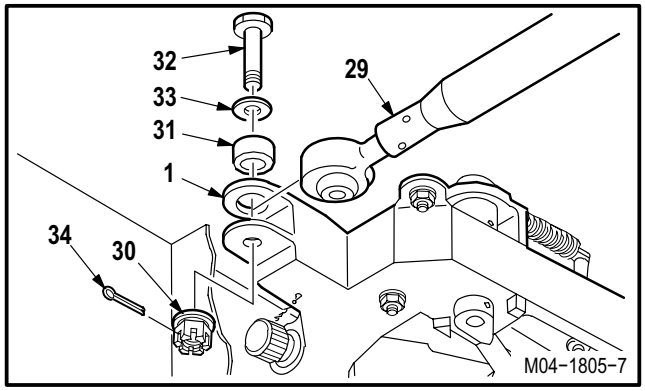
(2) Install bolt (32) through washer (33), bushing (31), SPAD (1), and rod (29).

(3) Check fit of self-retaining bolt (32) (para 11.1).

(4) Install nut (30). Torque nut (30) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (34).



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11.145. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION – continued

f. **Attach connector (A334)P1 (35) to receptacle J273 (36).**

g. **Install two wire clamps (37).**

(1) Install two screws (38) through clamps (37).

(2) Install two washers (39) and nuts (40) on screws (38).

h. **Install two wire clamps (41).**

(1) Install screw (43) through top clamp (41), spacer (42), and bottom clamp (41).

(2) Install washer (44) and nut (45).

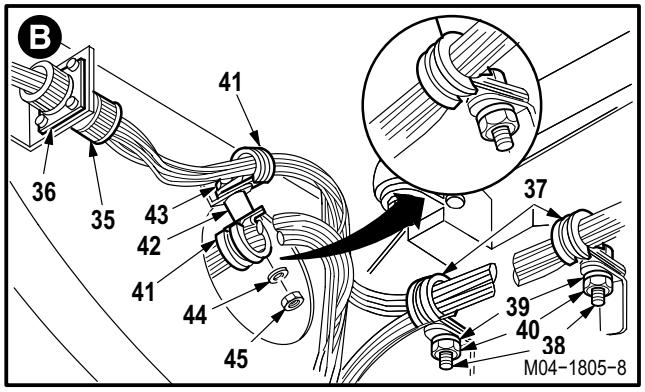
i. **Inspect (QA).**

j. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

k. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

l. **Install access doors B60, B65L, and B65R; install fairings L60 and R60** (para 2.2)**.**

m. **Inspect (QA).**



END OF TASK

11.146. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT

11.146.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.146.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

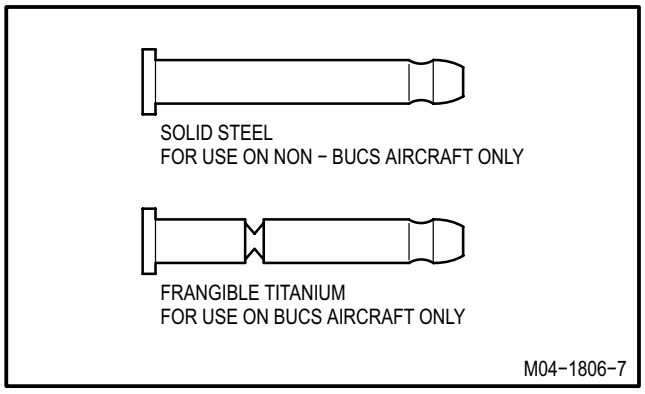
Ref	Condition
1.57	Helicopter safed
2.2	Access doors B60 and B65L removed; access fairing L60 removed

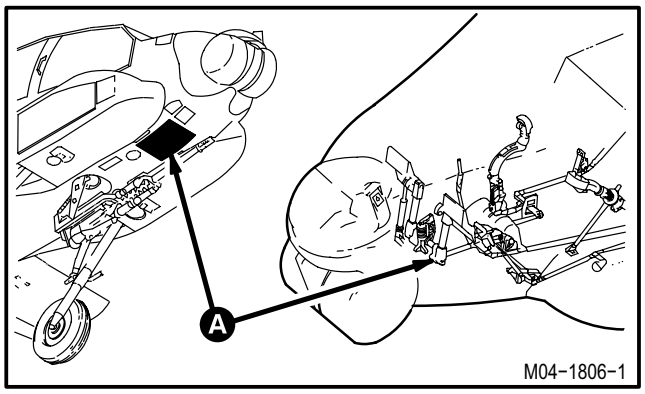
Materials/Parts:

Cotter pin
Petrolatum (item 138, App F)
Wire (item 220, App F)

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.





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11.146. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT – continued

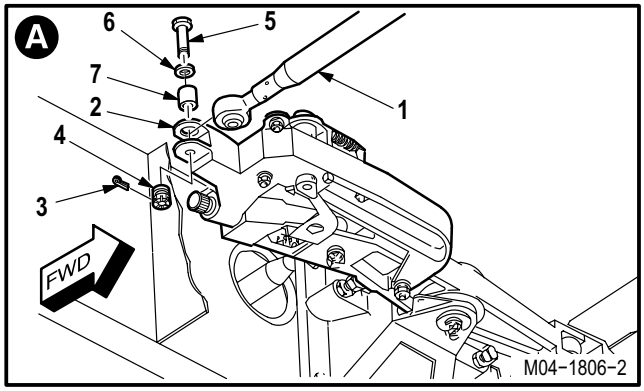
11.146.3. Removal

a. **Remove directional push-pull rod (1) from arm (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).



NOTE

If a shear pin(s) cannot be removed by conventional means, after repeated attempts from any of the SPAD assemblies (CPG or pilot), deliberately shearing the pin is permitted. Ensure the ends of the pins are removed.

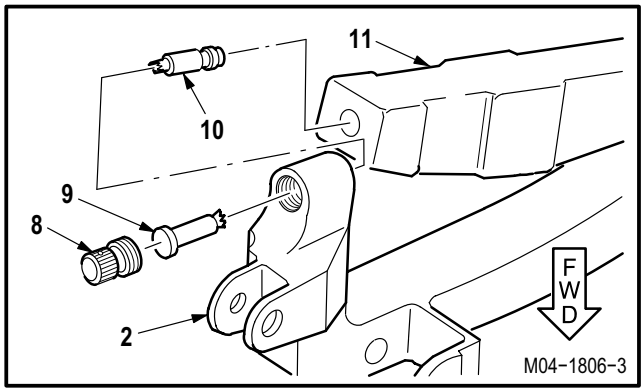
b. **Remove shear pin retainer (8) from arm (2).**

(1) Remove lockwire.

(2) Remove retainer (8).

NOTE

Shear pin must be removed in pieces if sheared.



c. **Remove shear pin half (9) from arm (2).**

d. **Remove shear pin half (10) from SPAD (11).**

(1) Move arm (2) for access to shear pin half (10).

(2) Remove shear pin half (10).

11.146.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.146.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

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11.146. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT – continued

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

e. **Check retainer for damaged threads.** None allowed.

11.146.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

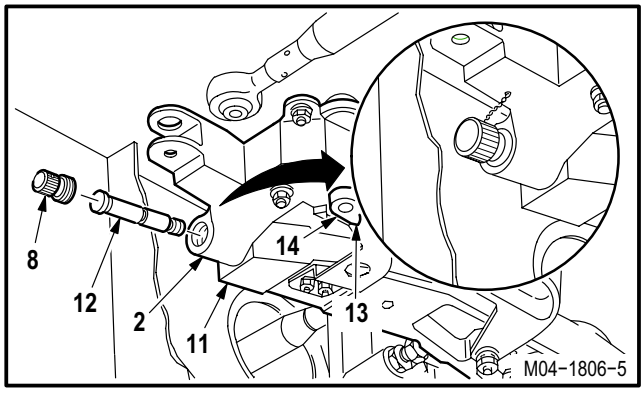
a. **Lubricate tapered end of shear pin (12).** Use petrolatum (item 138, App F).

b. **Install shear pin (12) in arm (2) and SPAD (11).**

(1) Aline arm (2) with SPAD (11).

(2) Ensure that switch detent (13) and switch position lever (14) are engaged.

(3) Install shear pin (12) through arm (2) in SPAD (11).



NOTE

Install retainer finger tight.

c. **Install retainer (8) on arm (2).**

(1) Lockwire retainer (8) to arm (2). Use wire (item 220, App F).

GO TO NEXT PAGE

11.146. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT – continued

d. **Install rod (1) on arm (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with arm (2).

(2) Install bushing (7) in arm (2).

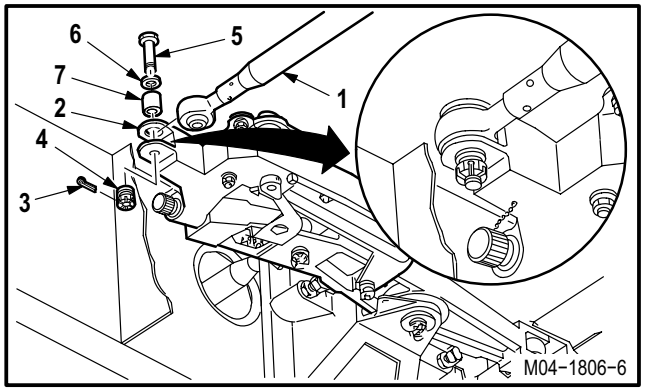
(3) Install bolt (5) through washer (6), bushing (7), arm (2), and rod (1).

(4) Check fit of self-retaining bolt (5) (para 11.1).

(5) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (3).



e. **Inspect (QA).**

f. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

g. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

h. **Install access doors B60 and B65L; install fairing L60** (para 2.2)**.**

i. **Inspect (QA).**

END OF TASK

11.147. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR RIVET REPLACEMENT (AVIM)

11.147.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.147.2. Initial Setup

Tools:

Airframe repairman's tool kit (item 377, App H)

References:

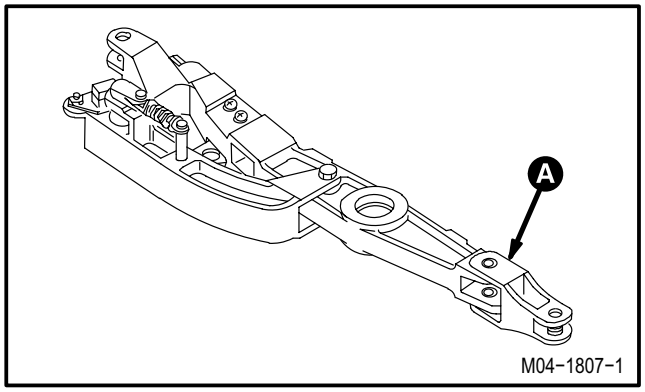
TM 1-1500-204-23

Personnel Required:

68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed



11.147.3. Removal

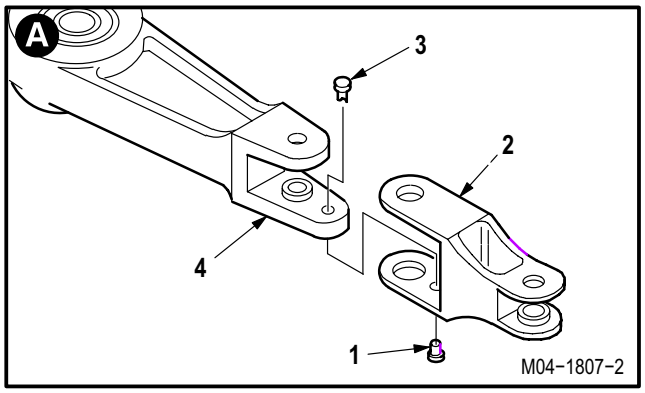
NOTE

If rivet is sheared go to step a. If rivet is not sheared, go to step c.

a. **Remove shear rivet half (1) from transducer arm (2).**

b. **Remove rivet half (3) from SPAD (4).**

c. **Remove rivet** (TM 1-1500-204-23)**.**



11.147.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

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11.147. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR RIVET REPLACEMENT (AVIM) – continued

11.147.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.147.6. Installation

NOTE

Existing bolt, bushings, and nut are used to aline transducer arm and SPAD for installation of rivet.

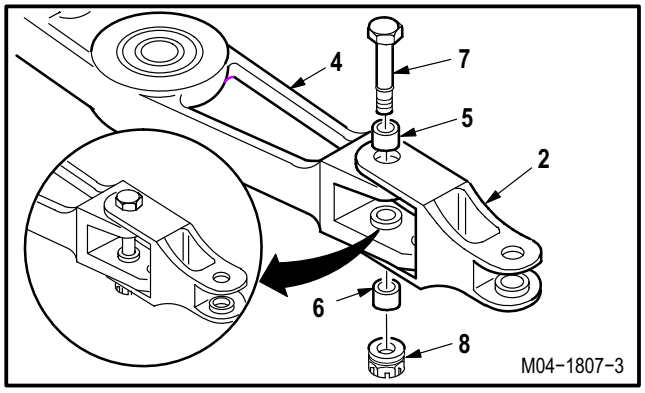
a. **Install arm (2) on SPAD (4).**

(1) Aline arm (2) with SPAD (4).

(2) Install bushings (5) and (6) in arm (2).

(3) Insert bolt (7) through arm (2) and SPAD (4).

(4) Hand tighten nut (8) to contact bushing (6).



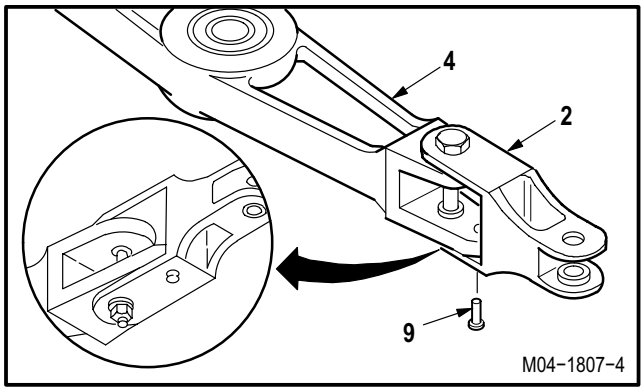
b. **Install arm (2) shear rivet (9).**

(1) Insert rivet (9) through arm (2) and SPAD (4).

NOTE

Maintain gap of **0.001** to **0.005 INCH** between SPAD and arm on rivet side.

(2) Install rivet (9) (TM 1-1500-204-23).



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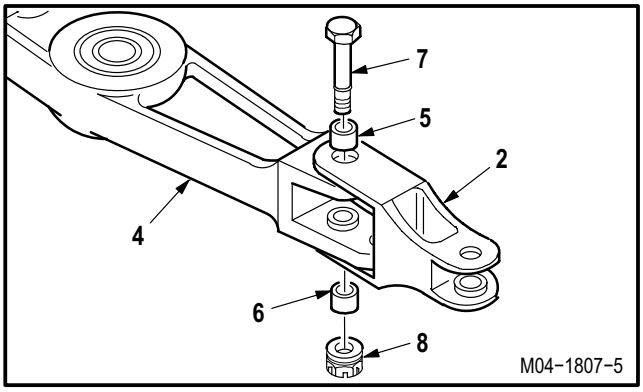
11.147. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR RIVET REPLACEMENT (AVIM) – continued

c. **Remove bolt (7) from SPAD (4) and arm (2).**

(1) Remove nut (8) and bushing (6).

(2) Remove bolt (7) and bushing (5).

d. **Inspect (QA).**



END OF TASK

11.148. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.148.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.148.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)

References:

TM 1-1500-204-23

Materials/Parts:

Cotter pin (2)
Rivet MS20470A3 (2)

Personnel Required:

67R Attack Helicopter Repairer
68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
11.64	CPG directional SPAD switch removed

NOTE

The SPAD arms are serialized matched sets. Do not intermix SPAD arms.

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11.148. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.148.3. Disassembly

a. **Remove external spring guide (1) from arm assembly (2).**

(1) Remove and discard cotter pin (3).

(2) Remove straight-headed pin (4), washer (5), and bushing (6).

(3) Remove guide (1) and spring (7).

b. **Remove internal spring guide (8) from switch actuator shaft (9).**

(1) Remove and discard cotter pin (10).

(2) Remove straight-headed pin (11) and two washers (12).

(3) Remove guide (8).

c. **Remove shaft (9) from arm (2).**

(1) Remove two rivets (13) from lever (14) and cam (15) (TM 1-1500-204-23).

(2) Remove shaft (9), lever (14), and cam (15).

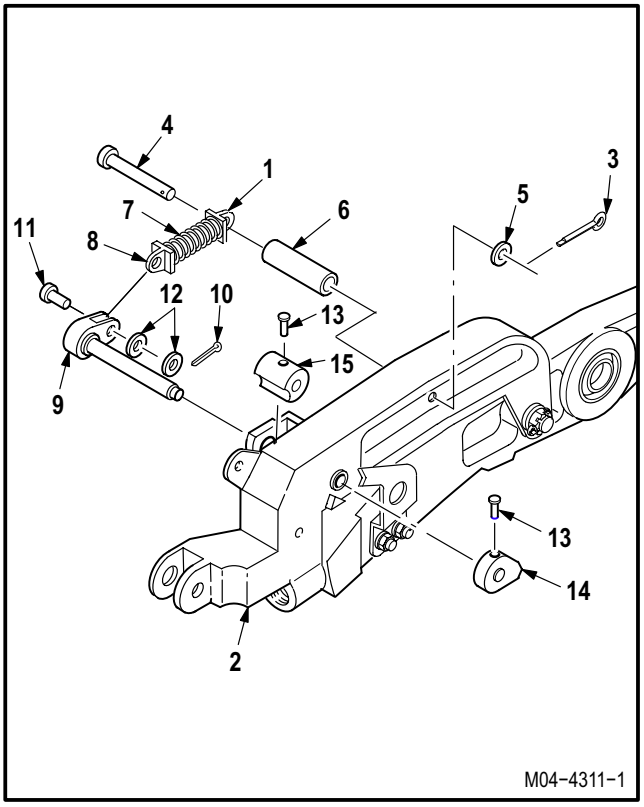
d. **Remove arm (2) from arm (16).**

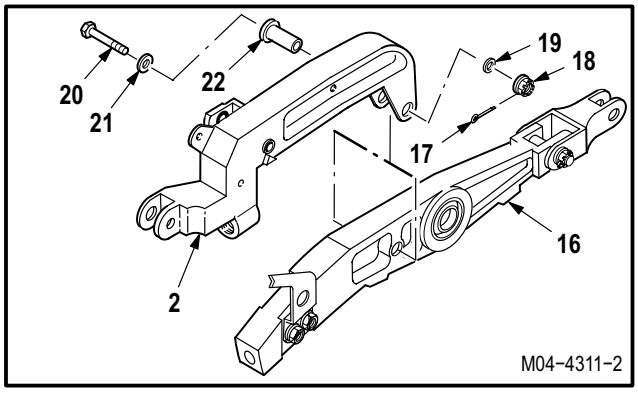
(1) Remove and discard cotter pin (17).

(2) Remove nut (18) and washer (19).

(3) Remove bolt (20), washer (21), and bushing (22).

(4) Remove arm (2).





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11.148. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

e. **Remove rig connecting link (23) from arm (16).**

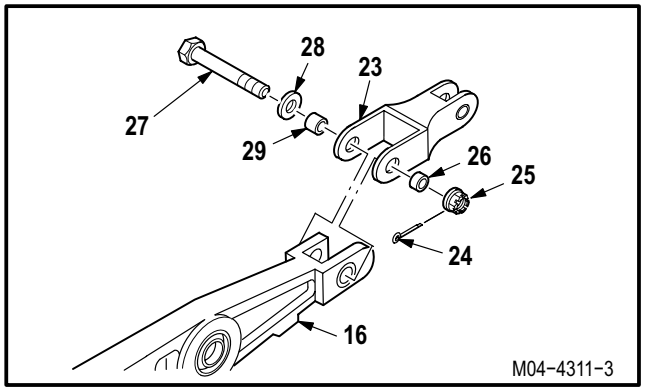
(1) Remove shear rivet (para 11.147).

(2) Remove and discard cotter pin (24).

(3) Remove nut (25) and bushing (26).

(4) Remove bolt (27), washer (28), and bushing (29).

(5) Remove link (23).

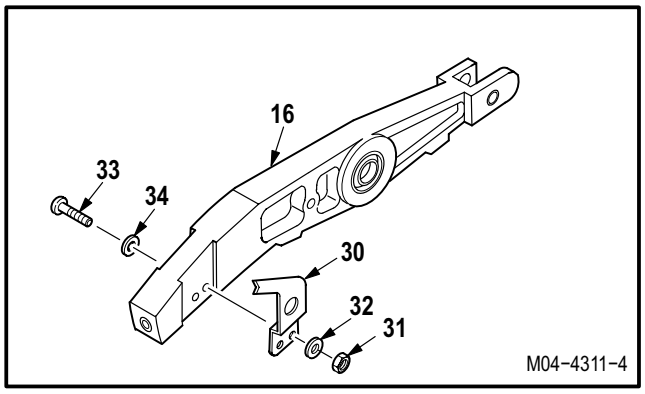


f. **Remove detent (30) from arm (16).**

(1) Remove two nuts (31) and washers (32).

(2) Remove two screws (33) and washers (34).

(3) Remove detent (30).



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11.148. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.148.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.148.5. Inspection

a. **Check arms and lever for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

b. **Check cam for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

c. **Check removed and attaching parts for elongated holes, stripped or damaged threads, or distortions** (para 11.5)**.**

d. **Check removed and attaching parts for cracks.** None allowed.

e. **Check removed and attaching parts for damage** (para 11.5)**.**

f. **Check removed and attaching parts for corrosion** (para 1.49)**.**

g. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

h. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.148. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.148.6. Assembly

NOTE

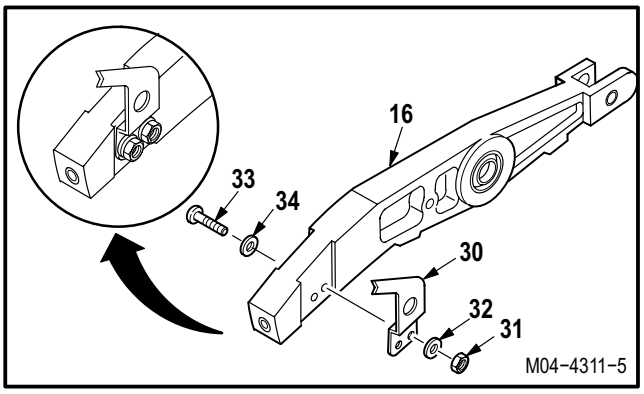
Detent will be secured and adjusted when SPAD switch is installed.

a. **Install detent (30) on arm (16).**

(1) Aline detent (30) with arm (16).

(2) Install two screws (33) through washers (34), detent (30), and arm (16).

(3) Install two washers (32) and nuts (31) on screws (33).



b. **Install rig connecting link (23) on arm (16).**

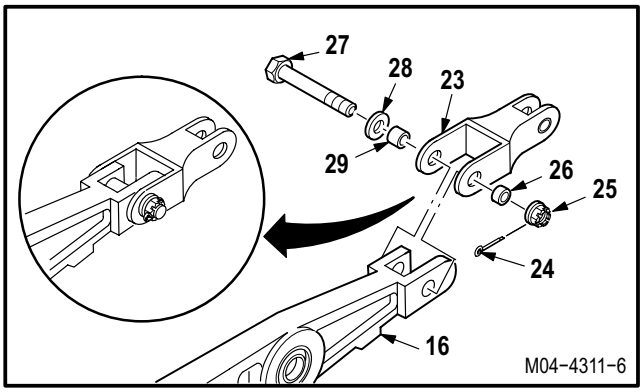
(1) Aline link (23) with arm (16).

(2) Install bolt (27) through washer (28), bushing (29), and arm (16).

(3) Install bushing (26) and nut (25) on bolt (27).

(4) Install shear rivet (11.147).

(5) Install new cotter pin (24).



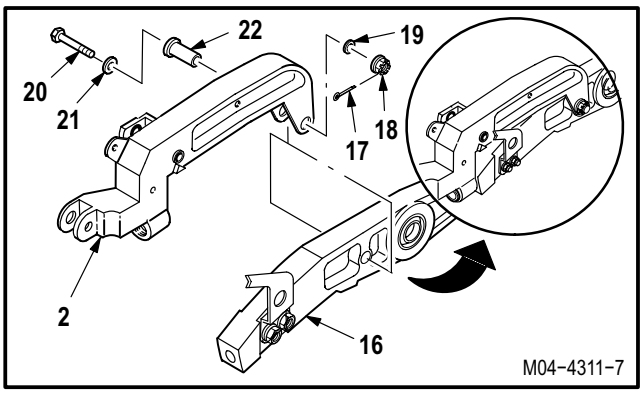
c. **Install arm (2) on arm (16).**

(1) Aline arm (2) with arm (16).

(2) Install bolt (20) through washer (21), bushing (22), arm (2), and arm (16).

(3) Install washer (19) and nut (18) on bolt (20).

(4) Install new cotter pin (17).



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11.148. CPG DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

d. **Install shaft (9) on arm (2).**

(1) Install shaft (9), cam (15), and lever (14).

NOTE

Ensure that shaft arm, cam valley, and lever tip are facing the same direction as when removed.

(2) Aline cam (15) and lever (14) with holes in arm (2).

(3) Install two new rivets (13) in cam (15) and lever (14) (TM 1-1500-204-23).

e. **Install guide (8) on shaft (9).**

(1) Install pin (11) through shaft (9), guide (8) and two washers (12).

(2) Install new cotter pin (10).

f. **Install guide (1) and spring (7) on arm (2).**

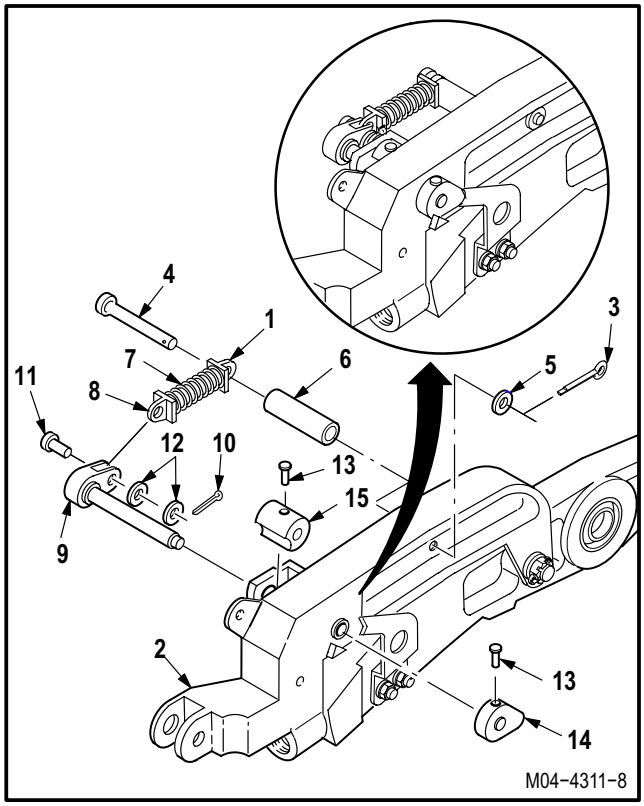
(1) Aline spring (7) between guides (8) and (1).

(2) Install pin (4) through guide (1), bushing (6), arm (2), and washer (5).

(3) Install new cotter pin (3).

g. **Inspect (QA).**

h. **Install CPG directional SPAD switch** (para 11.64)**.**



END OF TASK

11.149. CPG DIRECTIONAL F.S. 60.56 SHEAR PIN ACTIVATED DECOUPLER (SPAD) BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.149.1. Description

This task covers: Removal. Cleaning. Inspection. Repair. Installation.

11.149.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

References:

TM 1-1500-204-23

Materials/Parts:

Wire (item 224, App F)

Personnel Required:

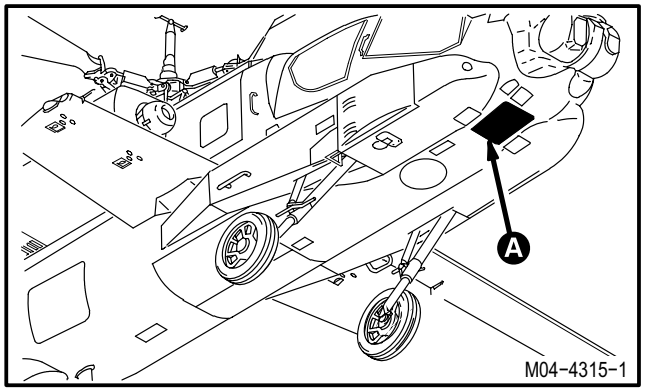
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.144	CPG directional SPAD removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



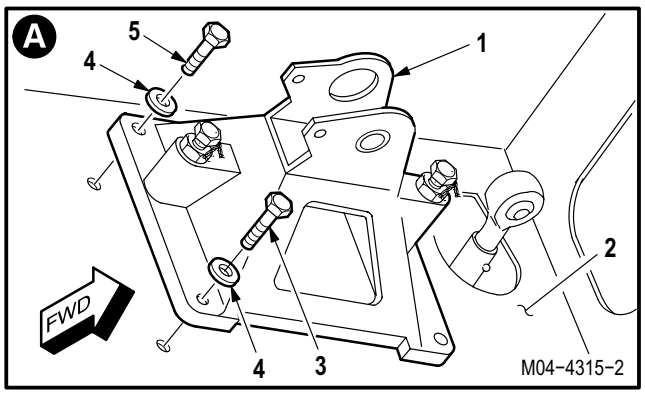
11.149.3. Removal

a. **Remove CPG SPAD bracket (1) from airframe (2).**

(1) Remove two bolts (3) and washers (4).

(2) Remove two bolts (5) and washers (4).

(3) Remove bracket (1).



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11.149. CPG DIRECTIONAL F.S. 60.56 SHEAR PIN ACTIVATED DECOUPLER (SPAD) BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

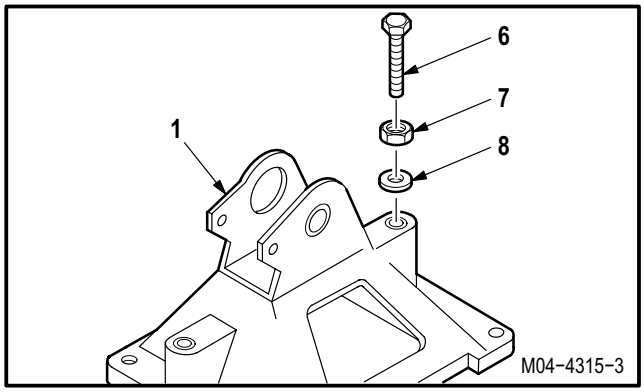
NOTE

If the SPAD bracket is to be replaced, perform step b.

b. **Remove two SPAD stop bolts (6), nuts (7), and washers (8) from bracket (1).**

(1) Remove lockwire from two bolts (6) and nuts (7).

(2) Remove two bolts (6), nuts (7), and washers (8) from bracket (1).



11.149.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.149.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

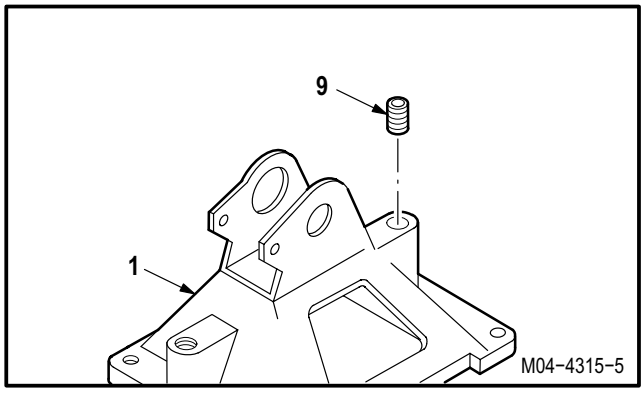
b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.149.6. Repair

a. **Repair bracket (1) by replacing screw thread inserts (9)** (TM 1-1500-204-23)**.**



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11.149. CPG DIRECTIONAL F.S. 60.56 SHEAR PIN ACTIVATED DECOUPLER (SPAD) BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.149.7. Installation

NOTE

If the SPAD bracket was replaced, perform step a.

a. **Install two bolts (6), nuts (7), and washers (8) on bracket (1).**

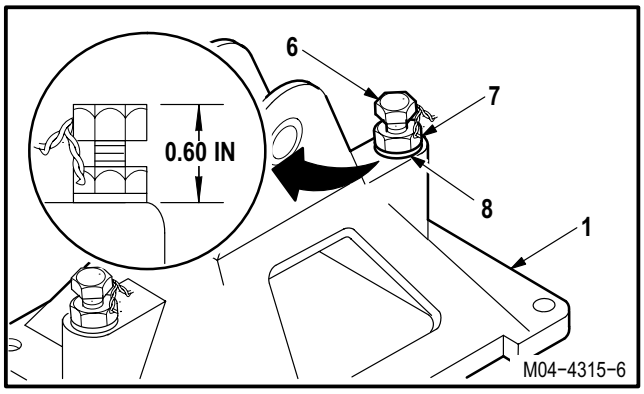
(1) Install two bolts (6), nuts (7), and washers (8) on bracket (1)

(2) Adjust two bolts (6) to obtain **0.60 INCH** from top of bolt (6) to bracket (1) body.

(3) Tighten nuts (7).

(4) Verify bolt (6) lengths are **0.60 INCH** from top of bolts (6) to bracket (1) body.

(5) Lockwire bolt (6) and nut (7) together (two places). Use wire (item 224, App F).

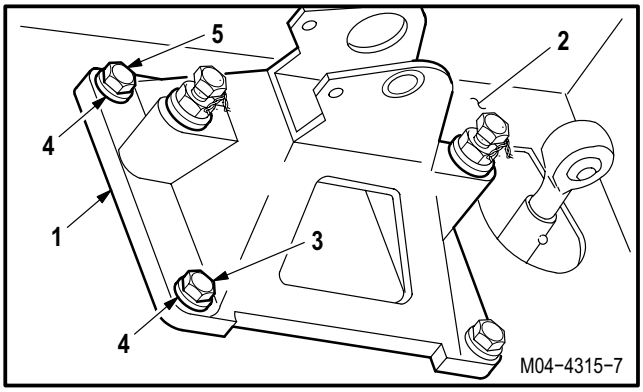


b. **Install bracket (1) on airframe (2).**

(1) Aline bracket (1) with airframe (2).

(2) Install two bolts (5) and washers (4).

(3) Install two bolts (3) and washers (4).



c. **Inspect (QA).**

d. **Install CPG directional SPAD** (para 11.145)**.**

END OF TASK

11.150. PILOT STATION DIRECTIONAL BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION

11.150.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.150.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)

References:

TM 1-1500-204-23

Materials/Parts:

Wire (item 224, App F)

Personnel Required:

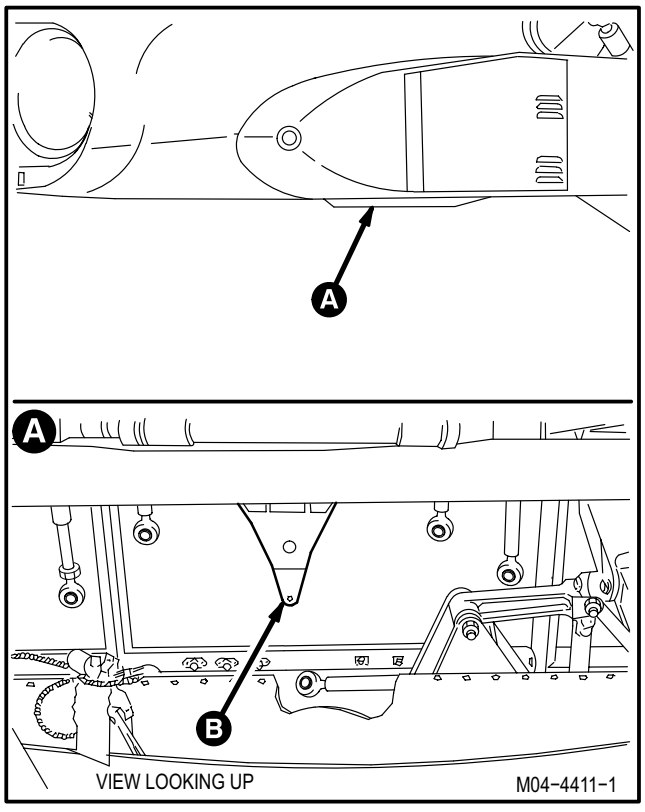
67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.152	Pilot directional SPAD removed
11.175	Pedal adjust handle support removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.150. PILOT STATION DIRECTIONAL BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.150.3. Removal

NOTE

A laminated spacer is installed between the bracket and the airframe. Use care when removing the bracket to prevent the spacer from delaminating.

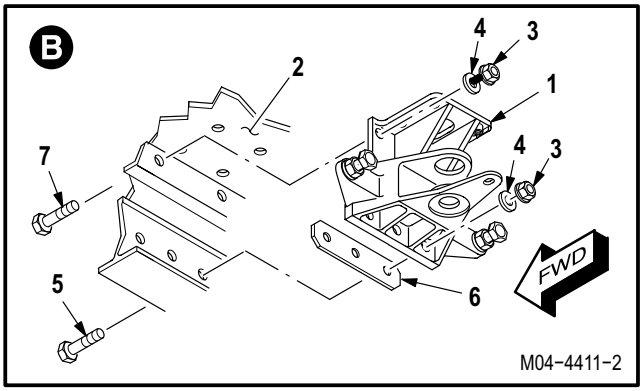
a. **Remove pilot directional bellcrank bracket assembly (1) from airframe (2).**

(1) Remove five nuts (3) and washers (4).

(2) Remove three bolts (5) and shim (6).

(3) Remove two bolts (7).

(4) Remove bracket (1).



NOTE

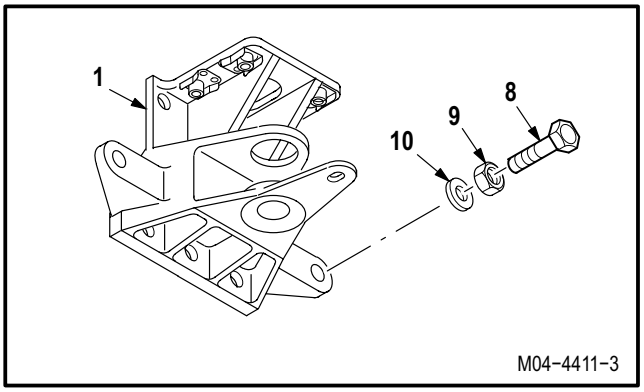
If the bracket is to be replaced, perform step b.

b. **Remove two stop bolts (8), nuts (9), and washers (10) from bracket (1).**

(1) Measure and record length from top of bolt (8) to bracket (1) body (two places).

(2) Remove lockwire from two bolts (8).

(3) Remove two bolts (8), nuts (9), and washers (10) from bracket (1).



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11.150. PILOT STATION DIRECTIONAL BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

11.150.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.150.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check nutplates and threaded inserts for stripped thread damage** (TM 1-1500-204-23)**.**

11.150.6. Installation

NOTE

If the bracket was replaced, perform step a.

a. **Install two bolts (8), nuts (9), and washers (10) on bracket (1).**

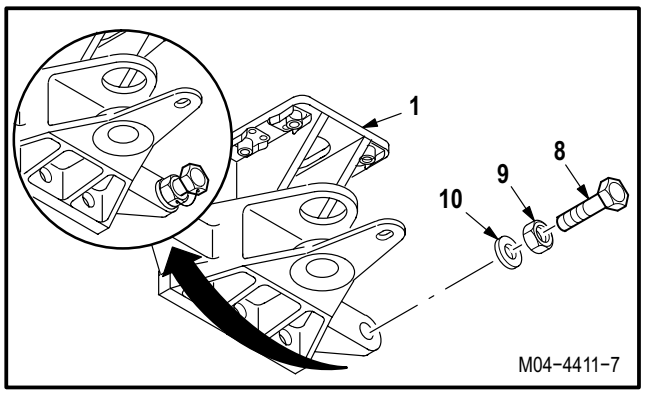
(1) Install two bolts (8), nuts (9), and washers (10) on bracket (1).

(2) Adjust two bolts (8) to obtain lengths recorded in paragraph 11.150.3, step b.

(3) Tighten two nuts (9).

(4) Verify bolts are at lengths recorded in paragraph 11.150.3, step b.

(5) Lockwire bolt (8) and nut (9) together (two places). Use wire (item 224, App F).



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11.150. PILOT STATION DIRECTIONAL BELLCRANK BRACKET ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install bracket (1) on airframe (2).**

(1) Aline bracket (1) with airframe (2).

(2) Install two bolts (7), washers (4), and nuts (3).

(3) Measure gap between bracket (1) and airframe (2).

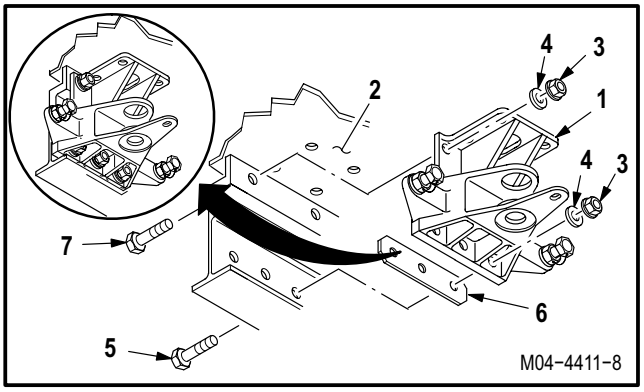
(4) Measure shim (6).

(5) Remove or add to shim (6) as required to fill space between bracket (1) and airframe (2) to within **0.006 INCH**.

(6) Loosen two bolts (7) and nuts (3).

(7) Install shim (6), three bolts (5), washers (4), and nuts (3).

(8) Tighten two bolts (7) and nuts (3).



c. **Inspect (QA).**

d. **Install pedal adjust handle support** (para 11.175)**.**

e. **Install pilot directional SPAD** (para 11.153)**.**

END OF TASK

11.151. DIRECTIONAL F.S. 121.40 BELLCRANK AND BRACKET REMOVAL/INSTALLATION

11.151.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.151.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (3)

Personnel Required:

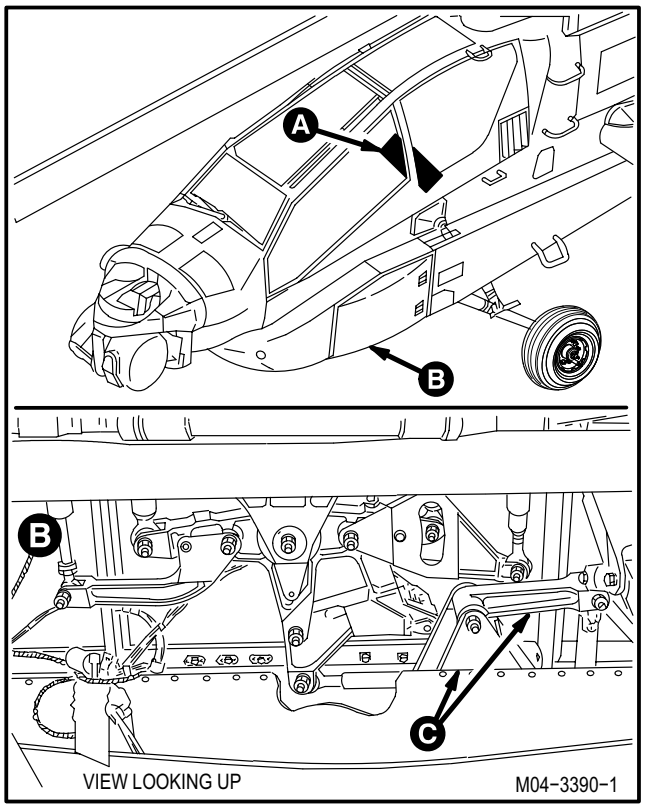
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed
2.182	Pilot scuff plate removed
10.28	Forward fuel cell removed
11.46	Pilot cyclic stick cover removed
11.165	Directional F.S. 156.07 lower rod end removed
TM 9-1090-208-23	Area weapon and turret removed



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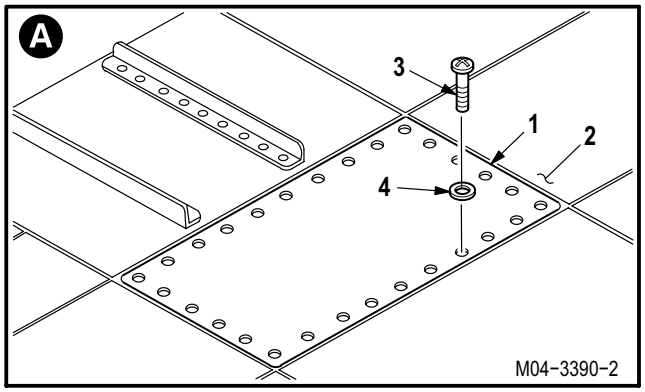
11.151. DIRECTIONAL F.S. 121.40 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

11.151.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **Remove pilot floor panel (1) from pilot floor (2).**

(1) Remove 28 screws (3) and washers (4).



c. **Remove rod end (5) from bellcrank (6).**

(1) Remove and discard cotter pin (7).

(2) Remove nut (8).

(3) Remove bolt (9), washer (10), and bushing (11) from rod end (5), and bellcrank (6).

d. **Remove rod end (12) and rig connecting link (13) from bellcrank (6).**

(1) Remove and discard cotter pin (14).

(2) Remove nut (15).

(3) Remove bolt (16) washer (17), and bushing (18) from bellcrank (6).

(4) Remove rod end (12), link (13), and bushing (19).

e. **Remove bellcrank (6) from bracket (20).**

(1) Remove and discard cotter pin (21).

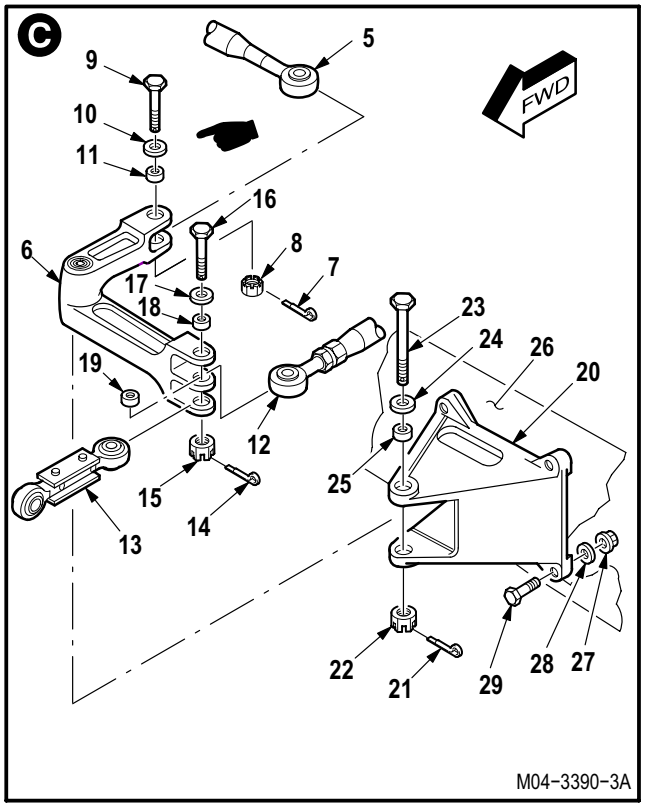
(2) Remove nut (22).

(3) Remove bolt (23), washer (24), and bushing (25), from bellcrank (6) and bracket (20).

f. **Remove bracket (20) from airframe (26).**

(1) Remove four nuts (27) and washers (28).

(2) Remove four bolts (29) from airframe (26).



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11.151. DIRECTIONAL F.S. 121.40 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

11.151.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.151.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

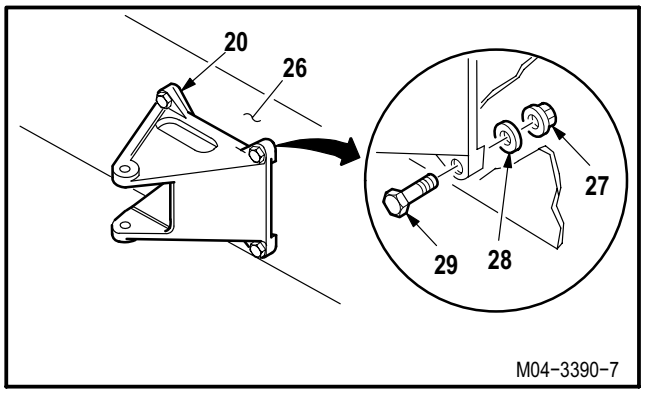
11.151.6. Installation

a. **Install bracket (20) on airframe (26).**

(1) Aline holes on bracket (20) with holes on airframe (26).

(2) Install four bolts (29) through bracket (20) and airframe (26).

(3) Install four washers (28) and nuts (27) on bolts (29).



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11.151. DIRECTIONAL F.S. 121.40 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bellcrank (6) on bracket (20).** Torque nut (22) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (6) with bracket (20).

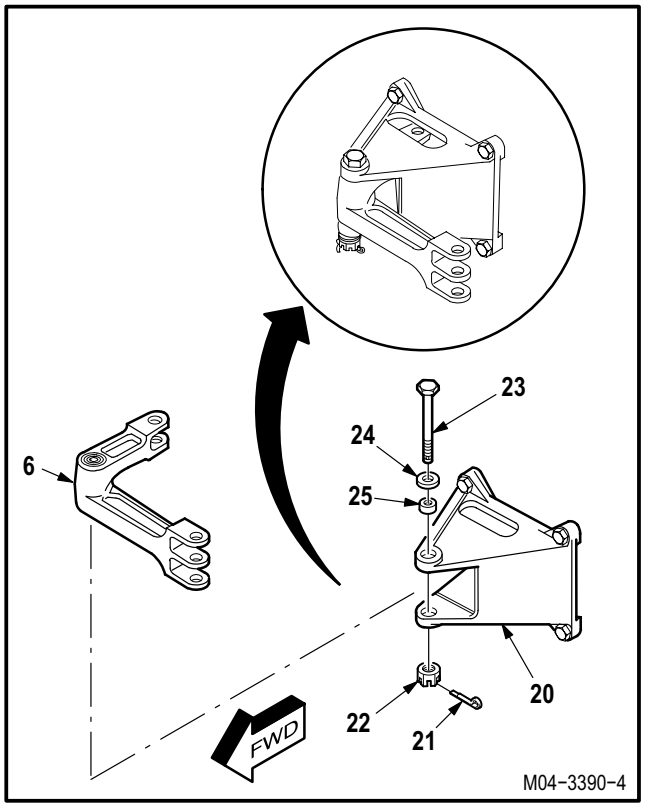
(2) Install bolt (23) through washer (24), bushing (25), bellcrank (6), and bracket (20).

(3) Check fit of self-retaining bolt (23) (para 11.1).

(4) Install nut (22). Torque nut (22) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (21).



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11.151. DIRECTIONAL F.S. 121.40 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

c. **Install rod end (5) on bellcrank (6).** Torque nut (8) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (5) with bellcrank (6).

(2) Install bolt (9) through washer (10), bushing (11), rod end (5), and bellcrank (6).

(3) Check fit of self-retaining bolt (9) (para 11.1).

(4) Install nut (8). Torque nut (8) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (7).

d. **Install rod end (12) and link (13) on bellcrank (6).** Torque nut (15) **30 to 40 INCH-POUNDS**.

(1) Install bushing (19) on bellcrank (6).

(2) Aline rod ends (12) and link (13) with bellcrank (6).

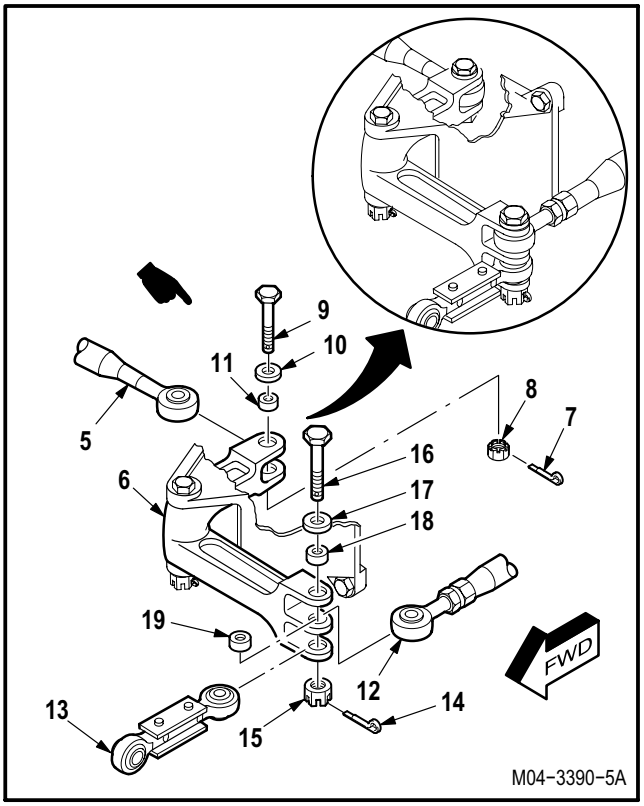
(3) Install bolt (16) through washer (17), bushing (18), rod end (12), bellcrank (6), link (13), and bushing (19).

(4) Check fit of self-retaining bolt (16) (para 11.1).

(5) Install nut (15). Torque nut (15) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (14).



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11.151. DIRECTIONAL F.S. 121.40 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

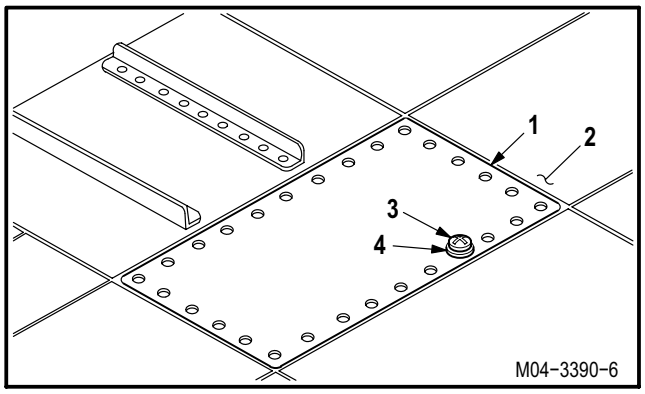
e. **Inspect (QA).**

f. **Install directional F.S. 156.07 lower rod end** (para 11.165)**.**

g. **Install forward fuel cell** (para 10.29)**.**

h. **Install panel (1) on floor (2).**

(1) Install 28 washers (4) and screws (3).



i. **Install pilot cyclic stick cover** (para 11.46)**.**

j. **Install pilot scuff plate** (para 2.182)**.**

k. **Install pilot seat** (para 2.161)**.**

l. **Install area weapon and turret** (TM 9-1090-208-23)**.**

m. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.152. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL

11.152.1. Description

This task covers: Removal Cleaning. Inspection.

11.152.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)

References:

TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access panels B60 and L200 removed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

Personnel Required:

67R Attack Helicopter Repairer

WARNING

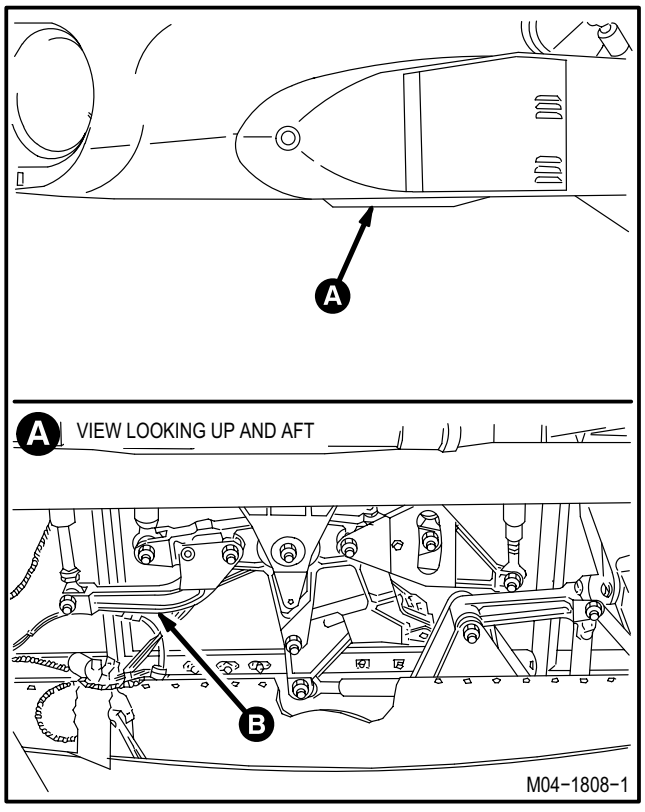
To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.

11.152.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **On pilot center circuit breaker panel, open ASE AC, DC, and BUCS circuit breakers.**

c. **Locate SPAD through gun turret bay.**



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11.152. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL – continued

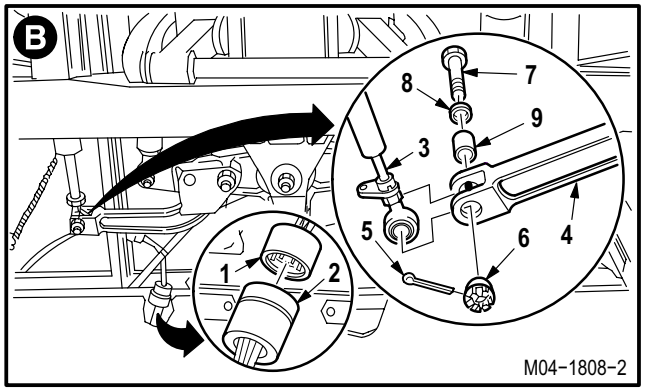
d. **Detach connector (A334)P1 (1) from receptacle J269 (2).**

e. **Remove position transducer (3) from SPAD (4).**

(1) Remove and discard cotter pin (5).

(2) Remove nut (6).

(3) Remove bolt (7), washer (8), and bushing (9).

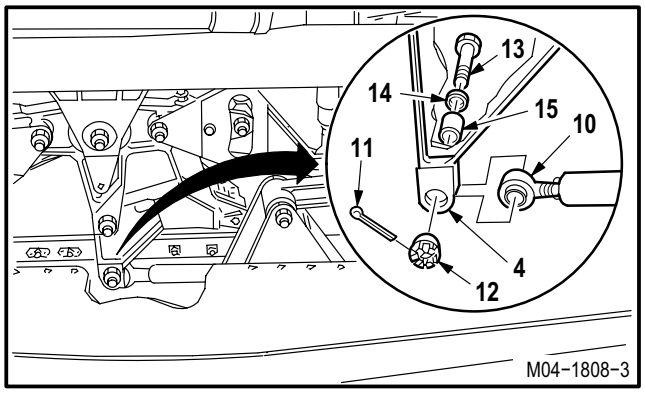


f. **Remove directional push-pull rod (10) from SPAD (4).**

(1) Remove and discard cotter pin (11).

(2) Remove nut (12).

(3) Remove bolt (13), washer (14), and bushing (15).

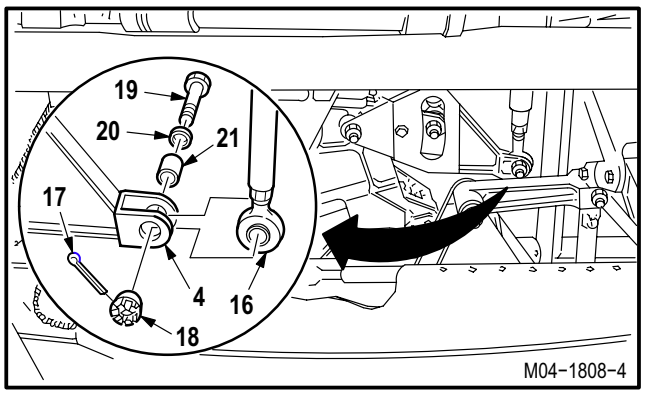


g. **Remove feel spring cartridge (16) from SPAD (4).**

(1) Remove and discard cotter pin (17).

(2) Remove nut (18).

(3) Remove bolt (19), washer (20), and bushing (21).

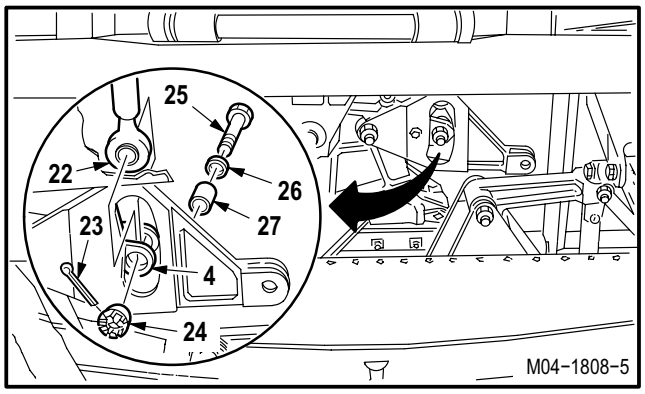


h. **Remove directional push-pull rod (22) from SPAD (4).**

(1) Remove and discard cotter pin (23).

(2) Remove nut (24).

(3) Remove bolt (25), washer (26), and bushing (27).



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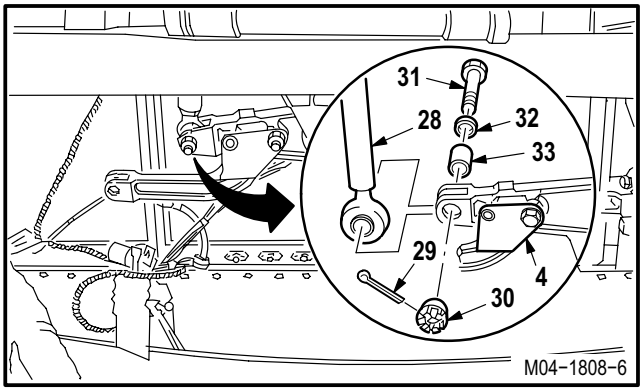
11.152. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL – continued

i. **Remove directional push-pull rod (28) from SPAD (4).**

(1) Remove and discard cotter pin (29).

(2) Remove nut (30).

(3) Remove bolt (31), washer (32), and bushing (33).



j. **Remove SPAD (4) from mounting bracket (34).**

(1) Remove and discard cotter pin (35).

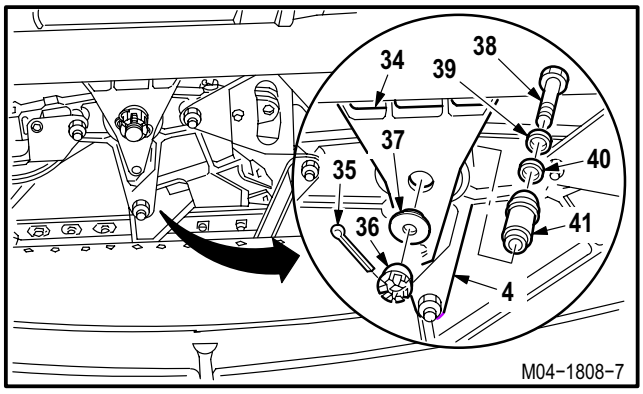
(2) Remove nut (36) and retainer (37).

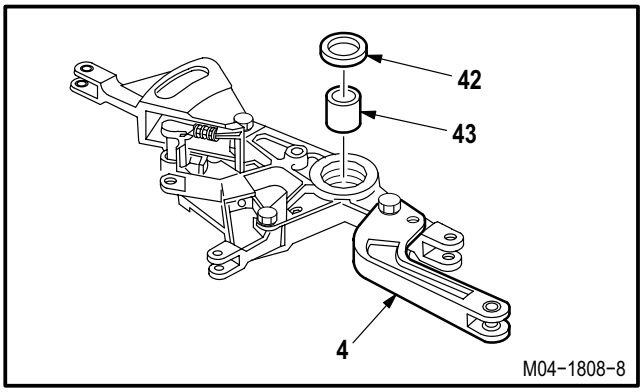
(3) Remove bolt (38), washer (39), and washer (40) from shaft (41).

(4) Remove shaft (41) from SPAD (4).

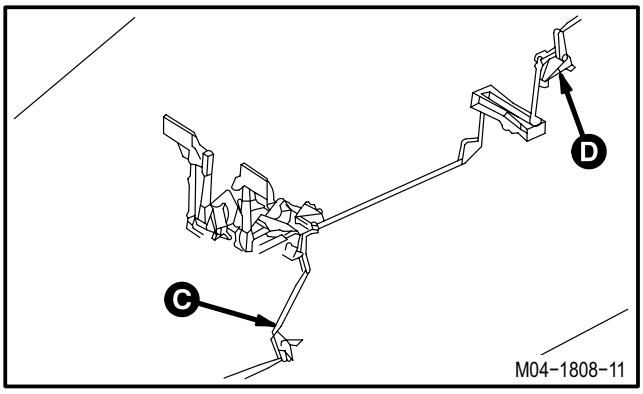
(5) Remove SPAD (4) from bracket (34).

(6) Remove bearing (42) and bushing (43) from SPAD (4).





k. **Place directional flight controls in neutral position.**



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11.152. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL – continued

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls.

l. **Install -9 rig pin (44) through bracket (45) and directional F.S. 110 bellcrank (46).**

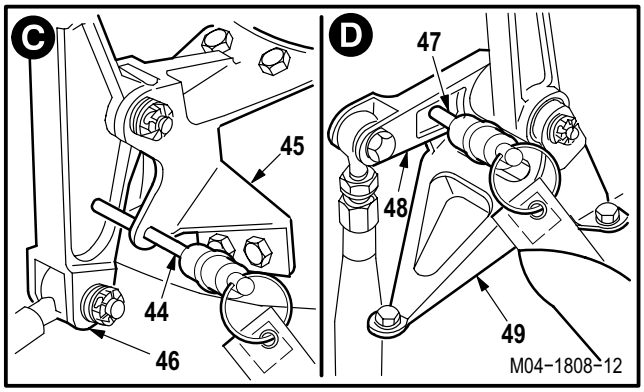
(1) Locate bracket (45) and bellcrank (46) in gun turret bay.

(2) Install -9 rig pin (44) through bracket (45) and bellcrank (46).

m. **Install -9 rig pin (47) through directional F.S. 164 bellcrank (48) and bracket (49).**

(1) Locate bellcrank (48) and bracket (49) on main deck.

(2) Install -9 rig pin (47) through bellcrank (48) and bracket (49).



11.152.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.152.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

END OF TASK

11.153. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION

11.153.1. Description

This task covers: Installation.

11.153.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)
0 - 30 inch-pound 1/4-inch drive dial indicator torque wrench (item 445, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

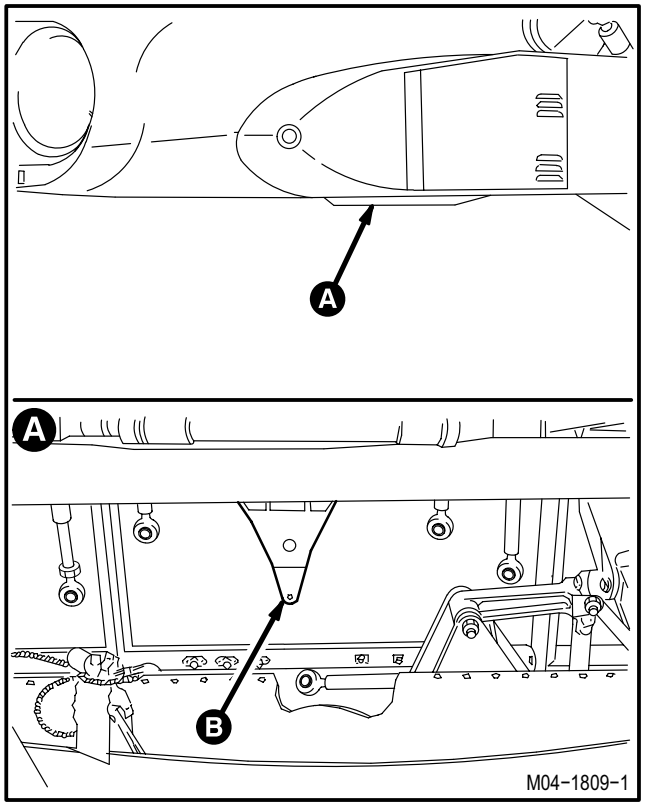
TM 1-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed

Materials/Parts:

Cotter pin (6)



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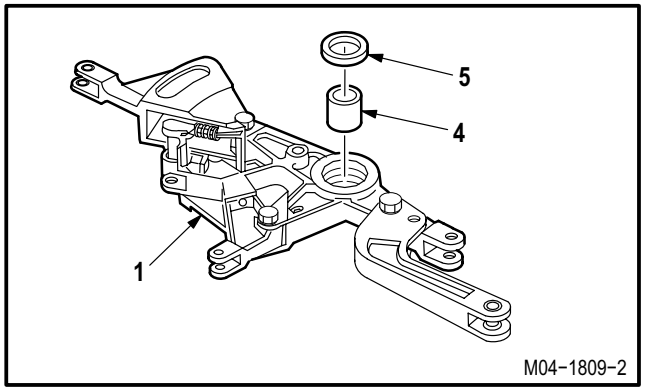
11.153. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION – continued

11.153.3. Installation

a. **Install SPAD (1) on mounting bracket (2).** Torque nut (3) **30 to 40 INCH-POUNDS**.

(1) Install bushing (4) and bearing (5) in SPAD (1).

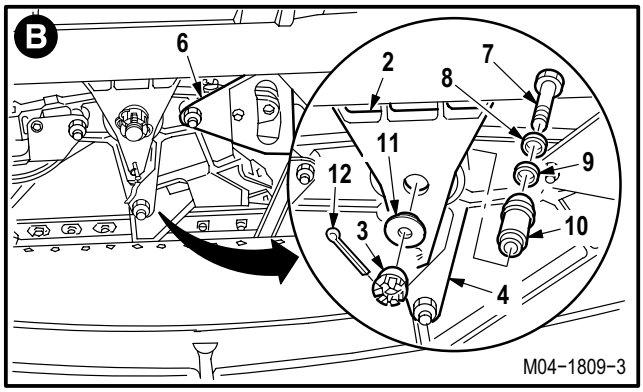


(2) Position SPAD (1) on bracket (2) with arm (6) to left side of aircraft.

(3) Install bolt (7) through washer (8) and washer (9) in shaft (10).

(4) Install shaft (10) with bolt (7), washer (8), and washer (9) through bracket (2) and SPAD (1).

(5) Check fit of self-retaining bolt (7) (para 11.1).



NOTE

Install retainer with large washer face toward mounting bracket.

(6) Install retainer (11) and nut (3).

(7) Torque nut (3) to **30 INCH-POUNDS**. Use torque wrench.

(8) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(9) Install new cotter pin (12).

NOTE

Go to step c if rig pins are installed in F.S. 110 and F.S. 164 directional bellcranks.

b. **Place directional flight controls in neutral position.**

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11.153. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION – continued

CAUTION

To prevent damage to flight control components, do not force bellcranks into alinement with brackets or push-pull rods with bellcranks.

c. **Install directional push-pull rod (13) on SPAD (1).** Torque nut (14) **30 to 40 INCH-POUNDS**.

(1) Aline rod (13) with SPAD (1).

(2) Install bushing (15) in SPAD (1).

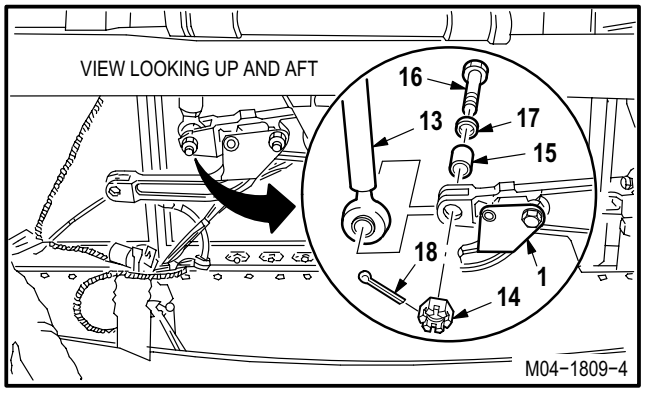
(3) Install bolt (16) through washer (17), bushing (15), SPAD (1), and rod (13).

(4) Check fit of self-retaining bolt (16) (para 11.1).

(5) Install nut (14). Torque nut (14) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (18).



d. **Install directional push-pull rod (19) on SPAD (1).** Torque nut (20) to **30 to 40 INCH-POUNDS**.

(1) Aline rod (19) with SPAD (1).

(2) Install bushing (21) in SPAD (1).

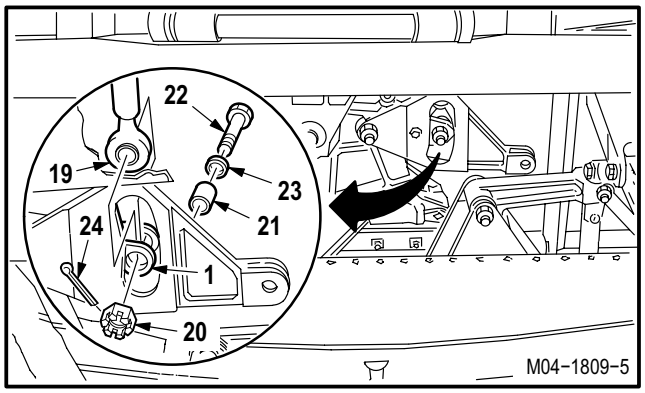
(3) Install bolt (22) through washer (23), bushing (21), SPAD (1), and rod (19).

(4) Check fit of self-retaining bolt (22) (para 11.1).

(5) Install nut (20). Torque nut (20) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (24).



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11.153. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION – continued

e. **Install feel spring cartridge (25) on SPAD (1).** Torque nut (26) **30 to 40 INCH-POUNDS**.

(1) Aline cartridge (25) with SPAD (1).

(2) Install bushing (27) in SPAD (1).

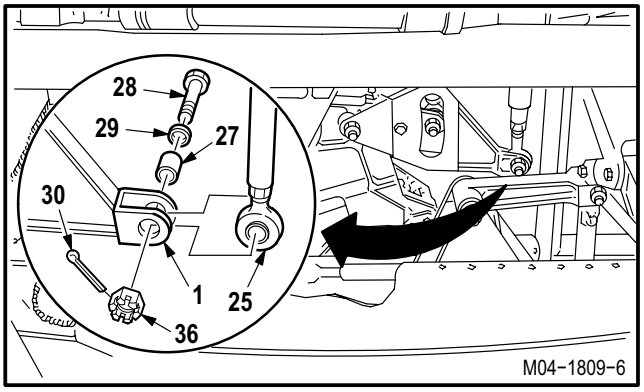
(3) Install bolt (28) through washer (29), bushing (27), SPAD (1), and cartridge (25).

(4) Check fit of self-retaining bolt (28) (para 11.1).

(5) Install nut (26). Torque nut (26) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (30).



f. **Install position transducer (31) on SPAD (1).** Torque nut (32) **14 to 18 INCH-POUNDS**.

(1) Aline transducer (31) with SPAD (1).

(2) Install bushing (33) in SPAD (1).

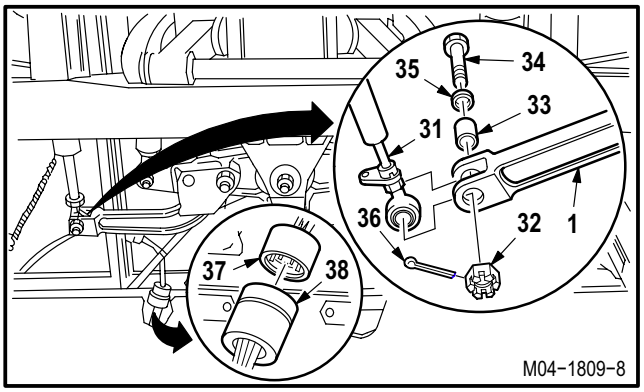
(3) Install bolt (34) through washer (35), bushing (33), SPAD (1), and transducer (31).

(4) Check fit of self-retaining bolt (34) (para 11.1).

(5) Install nut (32). Torque nut (32) to **14 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **18 INCH-POUNDS**.

(7) Install new cotter pin (36).



g. **Attach connector (A334)P1 (37) to receptacle J269 (38).**

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11.153. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) INSTALLATION – continued

h. **Install directional push-pull rod (39) on SPAD (1).** Torque nut (40) **30 to 40 INCH-POUNDS**.

(1) Aline rod (39) with SPAD (1).

(2) Install bushing (41) in SPAD (1).

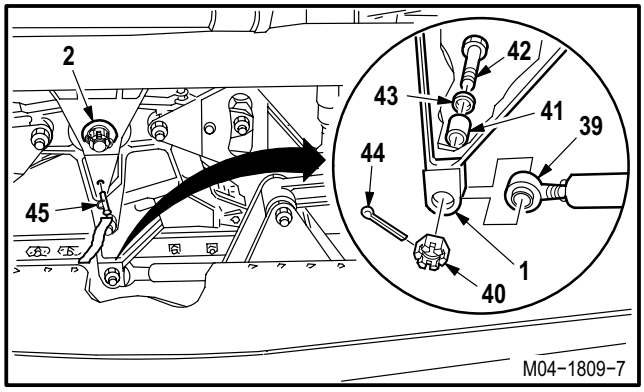
(3) Install bolt (42) through washer (43), bushing (41), SPAD (1), and rod (39).

(4) Check fit of self-retaining bolt (42) (para 11.1).

(5) Install nut (40). Torque nut (40) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (44).

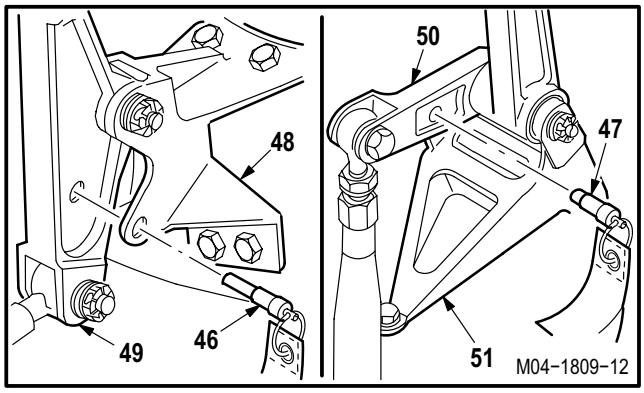


i. **Remove rig pins (45), (46), and (47).**

(1) Remove -9 rig pin (45) from SPAD (1) and bracket (2).

(2) Remove -9 rig pin (46) from F.S. 110 bracket (48) and bellcrank (49).

(3) Remove -9 rig pin (47) from F.S. 164 bellcrank (50) and bracket (51).



j. **Inspect (QA).**

k. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

l. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

m. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

n. **Install access panels B60 and L200** (para 2.2)**.**

o. **Inspect (QA).**

END OF TASK

11.154. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.154.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.154.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)

References:

TM 1-1500-204-23

Materials/Parts:

Cotter pin (4)
Rivet MS20470A3 (2)

Personnel Required:

67R Attack Helicopter Repairer
68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
11.64	Pilot directional SPAD switch removed

NOTE

The SPAD arms are serialized matched sets. Do not intermix SPAD arms.

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11.154. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.154.3. Disassembly

a. **Remove external spring guide (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove straight-headed pin (4) and washer (5).

(3) Remove guide (1) and spring (6).

b. **Remove internal spring guide (7) from switch actuator shaft (8).**

(1) Remove and discard cotter pin (9).

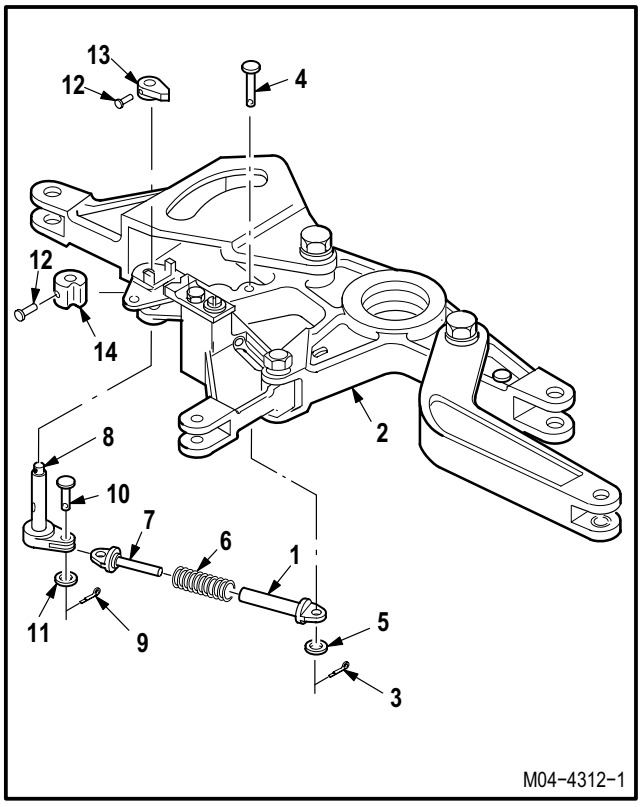
(2) Remove straight-headed pin (10) and washer (11).

(3) Remove guide (7).

c. **Remove shaft (8) from bellcrank (2).**

(1) Remove two rivets (12) from lever (13) and cam (14) (TM 1-1500-204-23).

(2) Remove shaft (8), lever (13), and cam (14).



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11.154. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

d. **Remove detent (15) from bellcrank (16).**

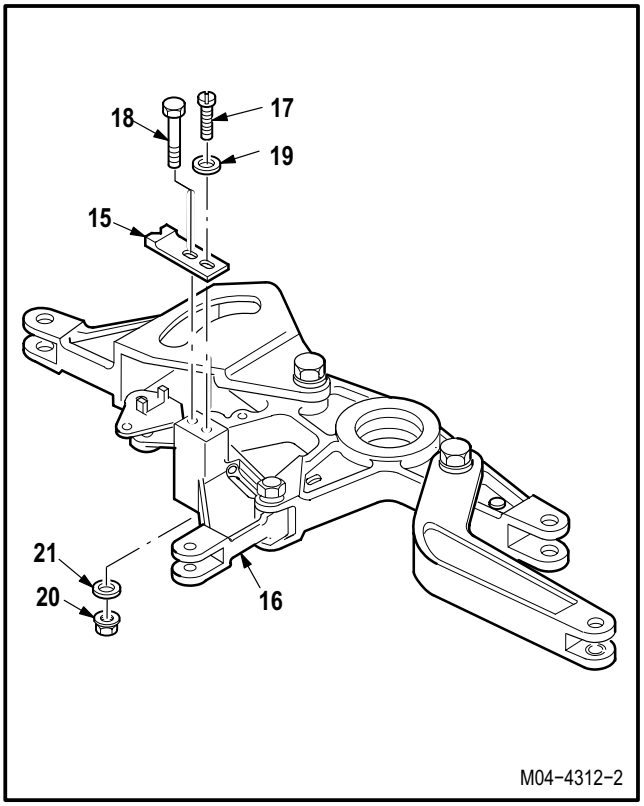
(1) Remove lockwire from screw (17) and bolt (18).

(2) Remove screw (17) and washer (19).

(3) Remove nut (20) and washer (21).

(4) Remove bolt (18).

(5) Remove detent (15).



e. **Remove transducer arm (22) from bellcrank (2).**

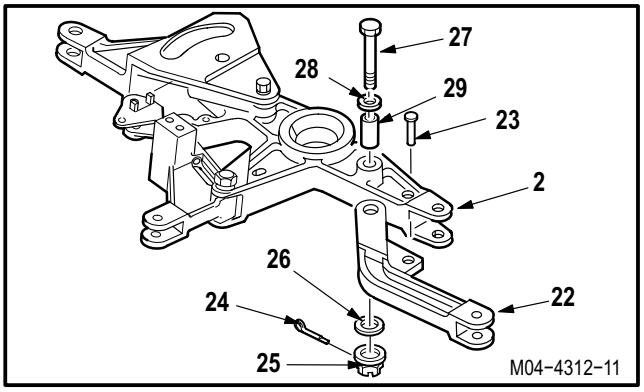
(1) Remove shear rivet (23) from arm (22) (TM 1-1500-204-23).

(2) Remove and discard cotter pin (24).

(3) Remove nut (25) and washer (26).

(4) Remove bolt (27), washer (28), and bushing (29).

(5) Remove arm (22).



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11.154. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

f. **Remove remote control lever (30) from bellcrank (2).**

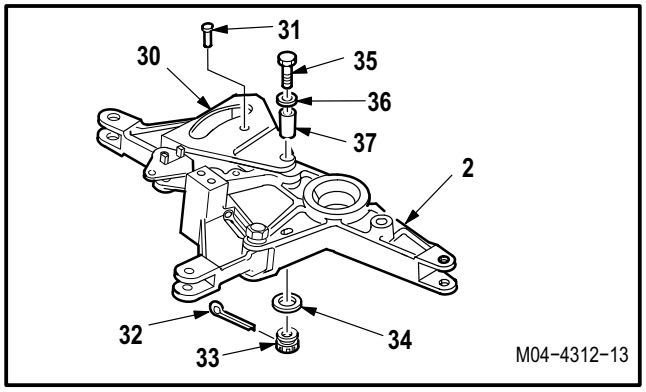
(1) Remove shear rivet (31) from lever (30) (TM 1-1500-204-23).

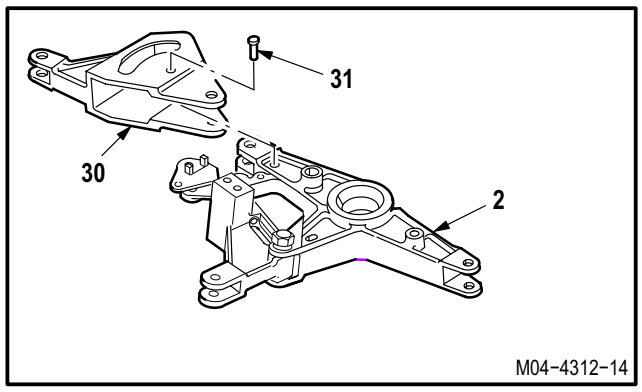
(2) Remove and discard cotter pin (32).

(3) Remove nut (33) and washer (34).

(4) Remove bolt (35), washer (36), and bushing (37).

(5) Remove lever (30).





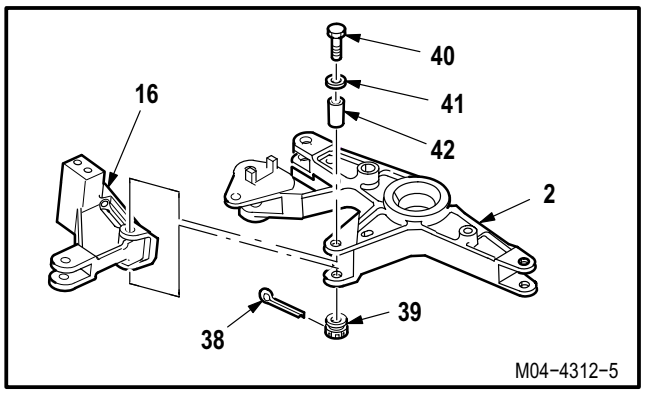
g. **Remove bellcrank (16) from bellcrank (2).**

(1) Remove and discard cotter pin (38).

(2) Remove nut (39).

(3) Remove bolt (40), washer (41), and bushing (42).

(4) Remove bellcrank (16).



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11.154. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.154.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.154.5. Inspection

a. **Check arms and lever for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

b. **Check cam for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

c. **Check removed and attaching parts for excessive wear, nicks, elongated holes, stripped or damaged threads, or distortions.** None allowed.

d. **Check removed and attaching parts for cracks.** None allowed.

e. **Check removed and attaching parts for damage** (para 11.5)**.**

f. **Check removed and attaching parts for corrosion** (para 1.49)**.**

g. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

h. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.154.6. iAssembly

a. **Install bellcrank (16) in bellcrank (2).**

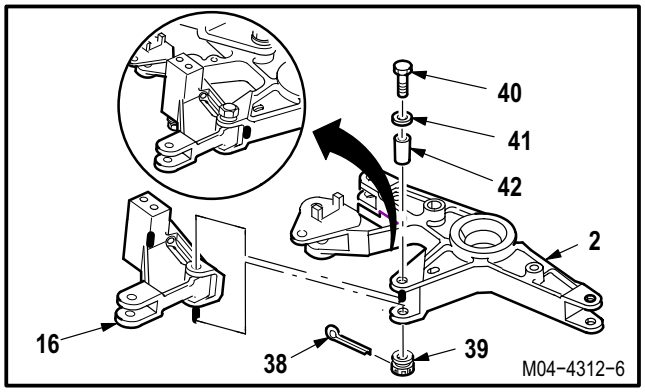
(1) Aline bellcrank (16) with bellcrank (2).

(2) Install bolt (40) through washer (41), bushing (42), bellcrank (16), and bellcrank (2).

(3) Check fit of self-retaining bolt (40) (para 11.1).

(4) Install nut (39) on bolt (40).

(5) Install new cotter pin (38).



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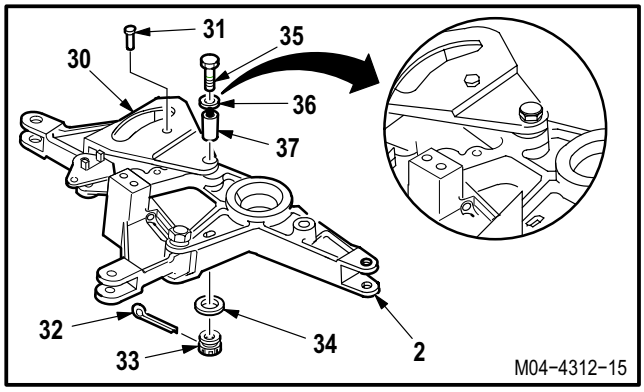
11.154. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

b. **Install lever (30) on bellcrank (2).**



(1) Aline lever (30) with bellcrank (2).

(2) Install bushing (37) in lever (30).

(3) Install bolt (35) through washer (36), bushing (37), lever (30), and bellcrank (2).

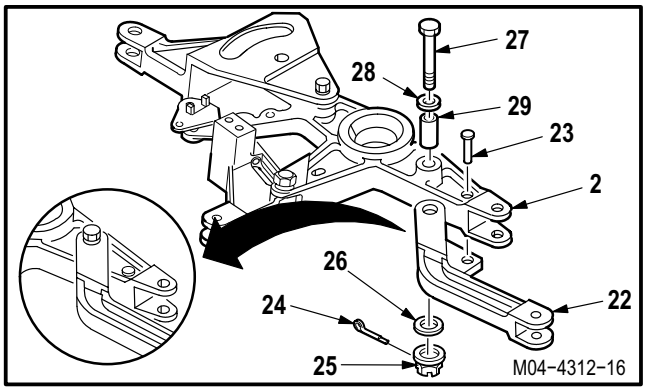
(4) Check fit of self-retaining bolt (35) (para 11.1).

(5) Install washer (34) and nut (33).

(6) Install new cotter pin (32).

(7) Install rivet (31) in lever (30) (TM 1-1500-204-23).

c. **Install arm (22) on bellcrank (2).**



(1) Aline arm (22) with bellcrank (2).

(2) Install bushing (29) in arm (22).

(3) Install bolt (27) through washer (28), bushing (29), arm (22), and bellcrank (2).

(4) Check fit of self-retaining bolt (27) (para 11.1).

(5) Install washer (26) and nut (25).

(6) Install new cotter pin (24).

(7) Install rivet (23) in arm (22) (TM 1-1500-204-23).

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11.154. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

NOTE

Detent will be secured and adjusted when SPAD switch is installed.

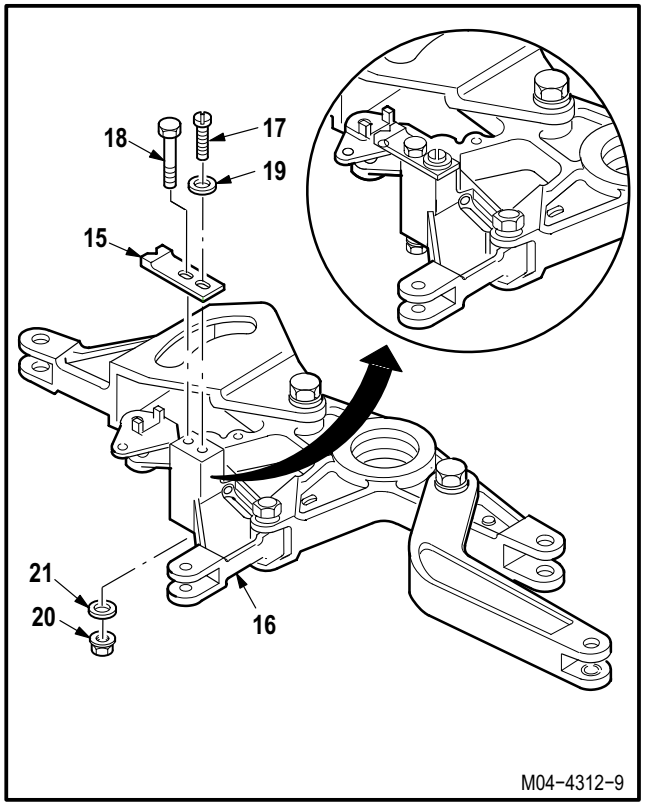
d. **Install detent (15) on bellcrank (16).**

(1) Aline detent (15) with bellcrank (16).

(2) Install screw (17) through washer (19), detent (15), and bellcrank (16).

(3) Install bolt (18) through detent (15) and bellcrank (16).

(4) Install washer (21) and nut (20) on bolt (18).



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11.154. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

e. **Install shaft (8) on bellcrank (2).**

(1) Install shaft (8) through bellcrank (2), cam (14), and lever (13).

NOTE

Ensure that shaft arm, cam valley, and lever tip are facing the same direction.

(2) Aline cam (14) and lever (13) with holes in shaft (8).

(3) Install two new rivets (12) in cam (14) and lever (13) (TM 1-1500-204-23).

f. **Install guide (7) on shaft (8).**

(1) Install pin (10) through guide (7) and washer (11).

(2) Install new cotter pin (9).

g. **Install guide (1) and spring (6) on bellcrank (2).**

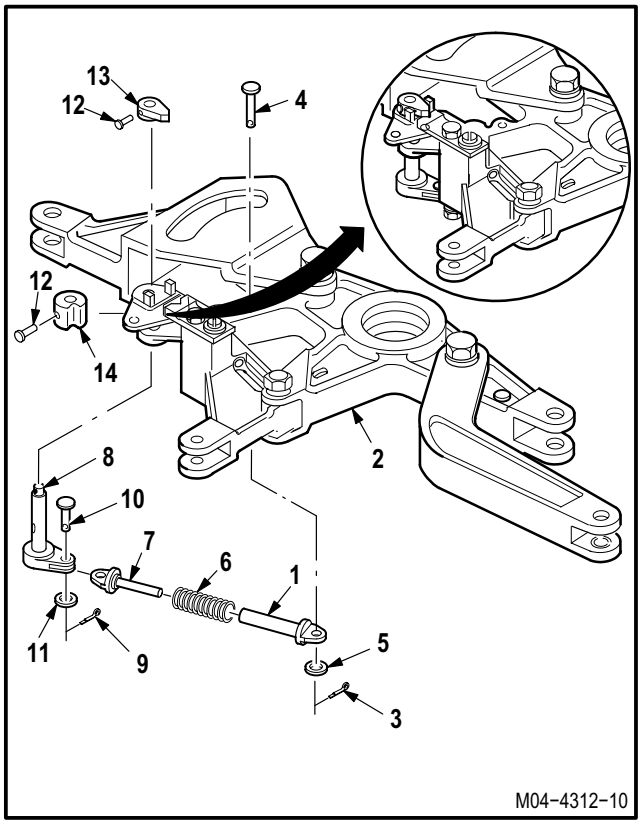
(1) Aline spring (6) between guides (7) and (1).

(2) Install pin (4) through bellcrank (2), guide (1), and washer (5).

(3) Install new cotter pin (3).

h. **Inspect (QA).**

i. **Install directional SPAD switch** (para 11.64)**.**



END OF TASK

11.155. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT

11.155.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.155.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

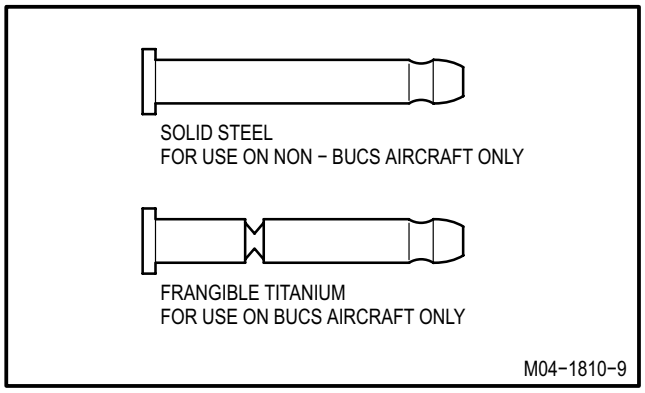
Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

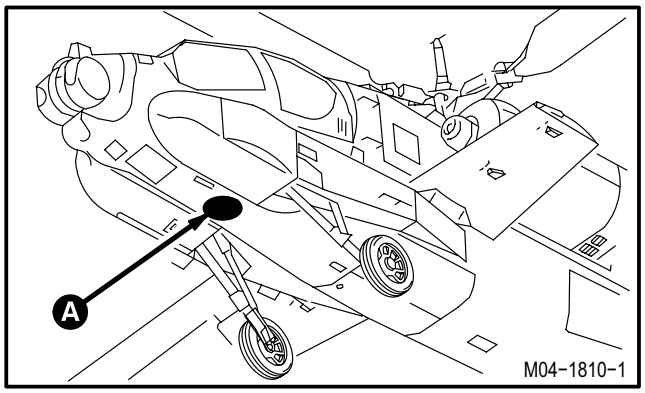
Materials/Parts:

Cotter pin
Petrolatum (item 138, App F)
Wire (item 220, App F)

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible–type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.





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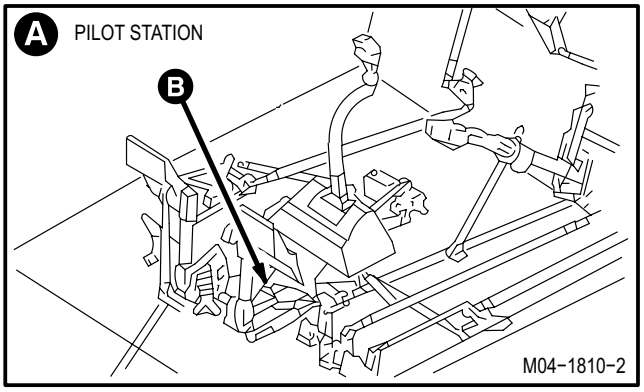
11.155. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT – continued



11.155.3. Removal

a. **Remove directional push-pull rod (1) from arm (2).**

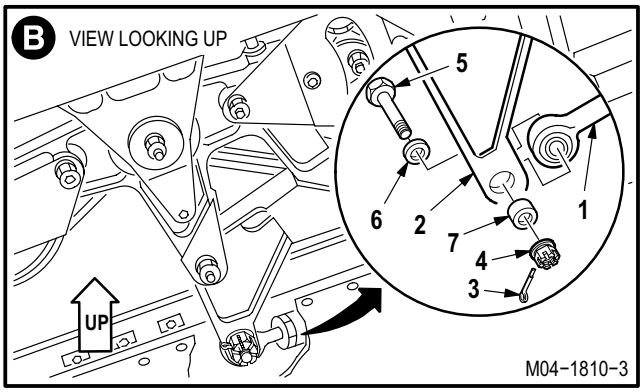
(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6) and bushing (7).

NOTE

If a shear pin(s) cannot be removed by conventional means, after repeated attempts from any of the SPAD assemblies (CPG or pilot), deliberately shearing the pin is permitted. Ensure the ends of the pins are removed.



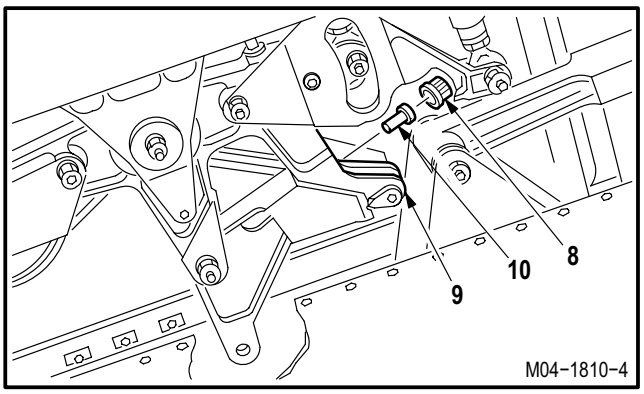
b. **Remove shear pin retainer (8) from SPAD (9).**

(1) Remove lockwire.

(2) Unscrew retainer (8).

NOTE

Shear pin will be removed in pieces if sheared.

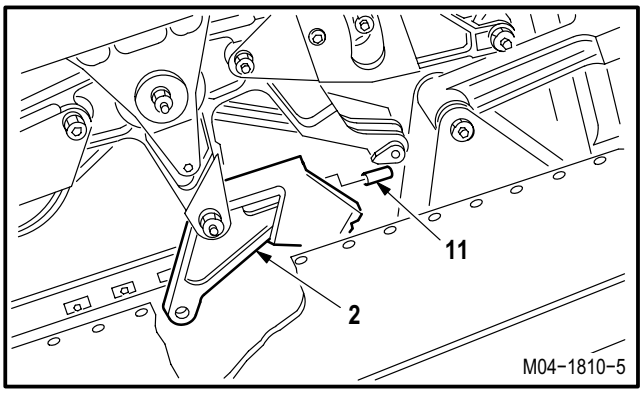


c. **Remove shear pin half (10) from SPAD (9).**

d. **Remove shear pin half (11) from arm (2).**

(1) Move arm (2) for access to shear pin half (11).

(2) Remove shear pin half (11) from arm (2).



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11.155. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT – continued

11.155.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.155.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.155.6. Installation

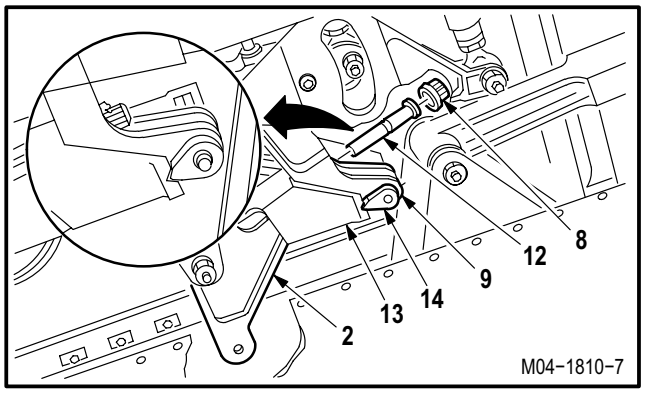
a. **Install shear pin (12) in SPAD (9) and arm (2).**

(1) Aline arm (2) with SPAD (9).

(2) Ensure that switch detent (13) and switch position lever (14) are engaged.

(3) Lubricate tapered end of shear pin (12). Use petrolatum (item 138, App F).

(4) Insert shear pin (12) through arm (2) and SPAD (9).



NOTE

Install retainer finger tight.

b. **Install retainer (8) on SPAD (9).**

c. **Lockwire retainer (8) to arm (2).** Use wire (item 220, App F).

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11.155. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline push-pull rod with arm.

d. **Install rod end (1) on arm (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with arm (2).

(2) Install bushing (7) in arm (2).

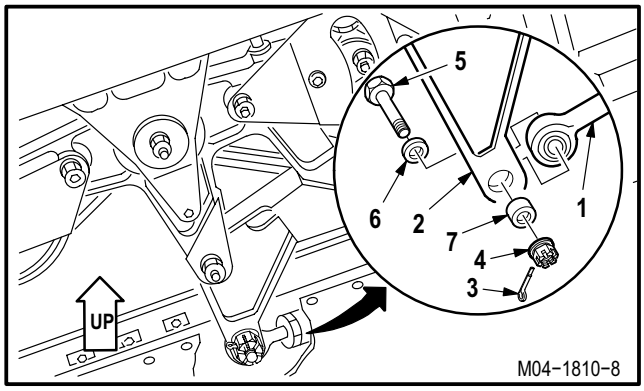
(3) Install bolt (5) through washer (6) (if required), arm (2), rod (1), and bushing (7).

(4) Install nut (4).

(5) Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (3).



e. **Inspect (QA).**

f. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

g. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

h. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.156. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) TRANSDUCER ARM SHEAR RIVET REPLACEMENT (AVIM)

11.156.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.156.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)

Personnel Required:

68G Aircraft Structural Repairer
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

Cotter pin

References:

TM 1-1500-204-23

11.156.3. Removal

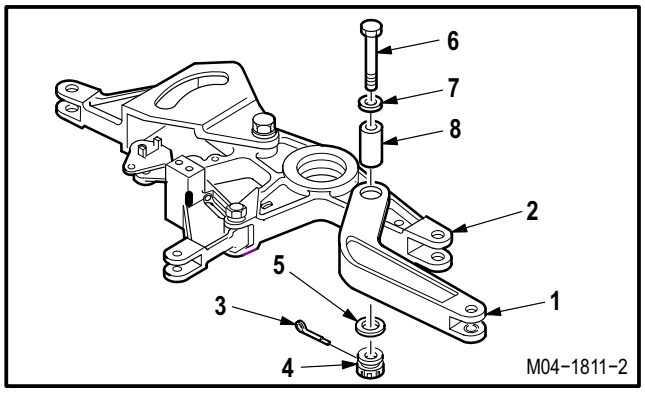
a. **Remove transducer arm (1) from SPAD (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4) and washer (5).

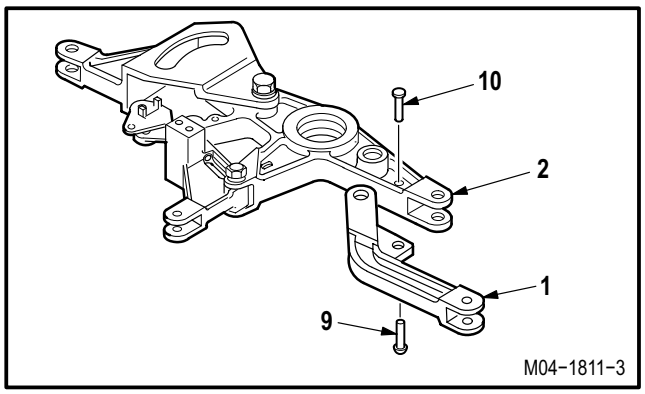
(3) Remove bolt (6), washer (7), and bushing (8).

(4) Remove arm (1).



b. **Remove rivet half (9) from arm (1).**

c. **Remove rivet half (10) from SPAD (2).**



11.156.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

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11.156. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) TRANSDUCER ARM SHEAR RIVET REPLACEMENT (AVIM) – continued

11.156.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.156.6. Installation

a. **Install arm (1) on SPAD (2).**

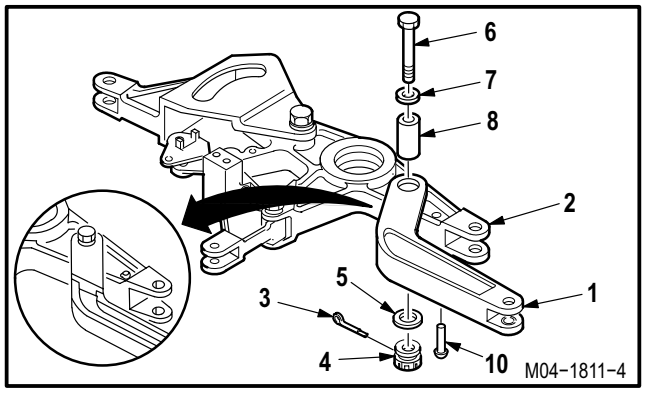
(1) Aline arm (1) with SPAD (2).

(2) Install bolt (6) through washer (7), bushing (8), arm (1), and SPAD (2).

(3) Check fit of self-retaining bolt (6) (para 11.1).

(4) Install washer (5) and nut (4).

(5) Install new cotter pin (3).

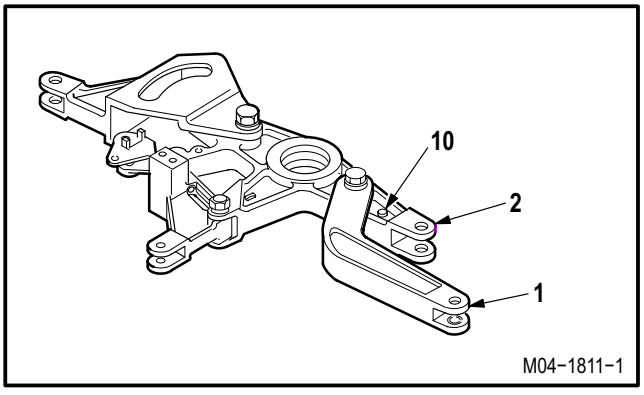


b. **Install new shear rivet (10) in SPAD (2) and arm (1).**

(1) Aline arm (1) with SPAD (2).

(2) Install rivet (10) (TM 1-1500-204-23).

c. **Inspect (QA).**



END OF TASK

11.157. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR RIVET REPLACEMENT (AVIM)

11.157.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.157.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)

Personnel Required:

68G Aircraft Structural Repairer
67R Attack Helicopter Repairer
One person to assist
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

Cotter pin

References:

TM 1-1500-204-23

11.157.3. Removal

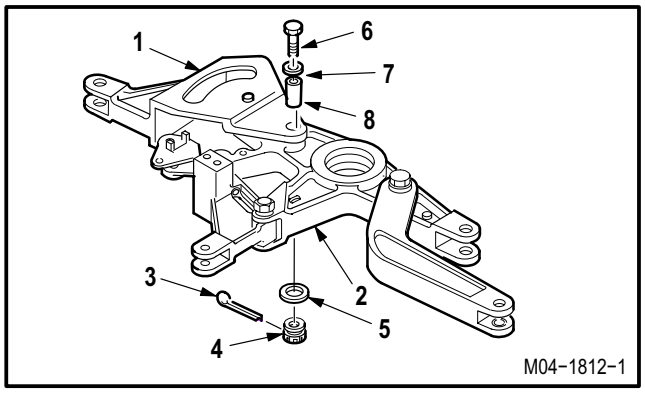
a. **Remove remote control lever (1) from SPAD (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4) and washer (5).

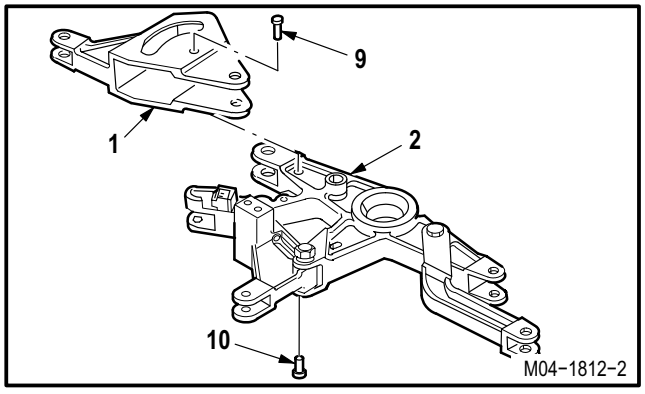
(3) Remove bolt (6), washer (7), and bushing (8).

(4) Remove lever (1).



b. **Remove shear rivet half (9) from lever (1).**

c. **Remove rivet half (10) from SPAD (2).**



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11.157. PILOT DIRECTIONAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR RIVET REPLACEMENT (AVIM) – continued

11.157.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.157.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.157.6. Installation

a. **Install lever (1) on SPAD (2).**

(1) Aline lever (1) with SPAD (2).

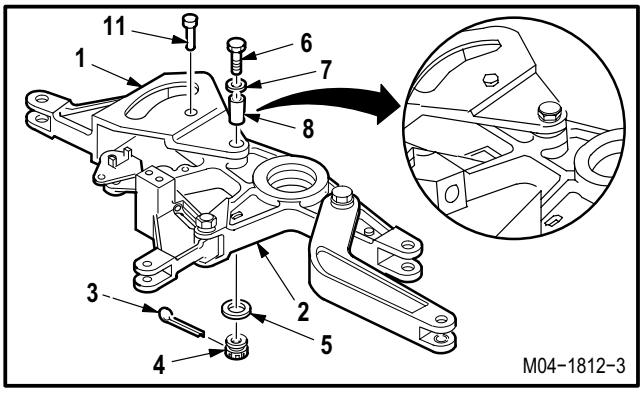
(2) Install bushing (8) in lever (1).

(3) Install bolt (6) through washer (7), lever (1), and SPAD (2).

(4) Check fit of self-retaining bolt (6) (para 11.1).

(5) Install nut (4) and washer (5).

(6) Install new cotter pin (3).



b. **Install shear rivet (11) in lever (1).**

(1) Aline arm (1) with SPAD (2).

(2) Install rivet (11) (TM 1-1500-204-23).

c. **Inspect (QA).**

END OF TASK

11.158. CPG TO PILOT CONTROL DIRECTIONAL F.S. 112.50 BELLCRANK REMOVAL/INSTALLATION

11.158.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.158.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (3)

Personnel Required:

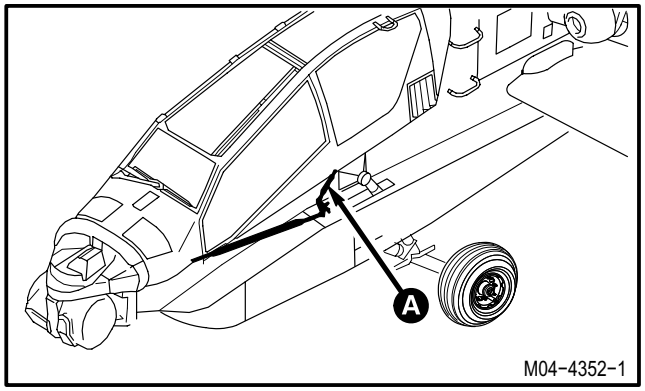
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.158. CPG TO PILOT CONTROL DIRECTIONAL F.S. 112.50 BELLCRANK REMOVAL/INSTALLATION – continued

11.158.3. Removal

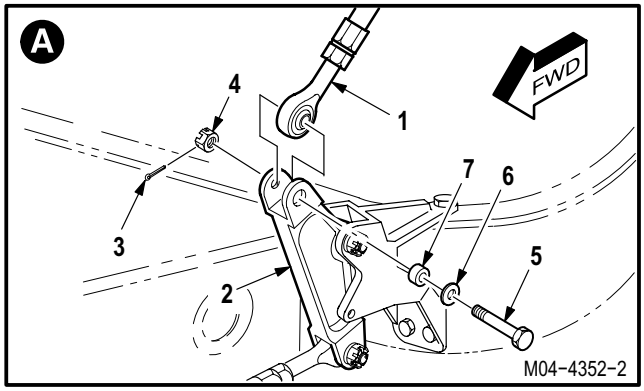
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



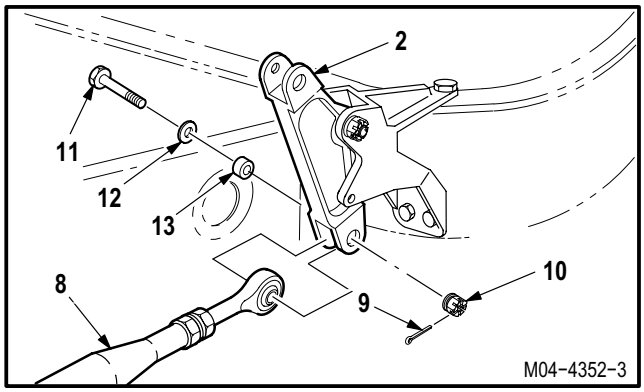
b. **Remove push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (8).



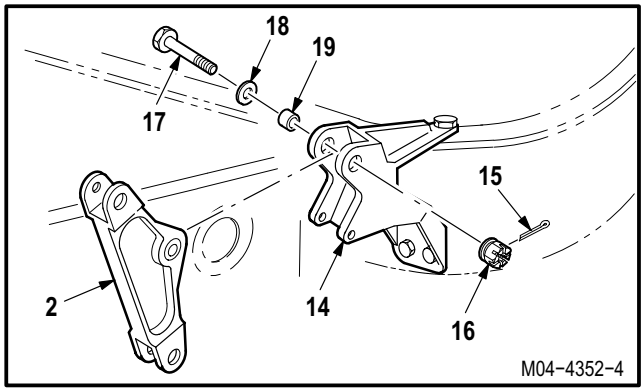
c. **Remove bellcrank (2) from bracket (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove bellcrank (2).



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11.158. CPG TO PILOT CONTROL DIRECTIONAL F.S. 112.50 BELLCRANK REMOVAL/INSTALLATION – continued

11.158.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.158.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.158.6. Installation

CAUTION

To prevent damage to flight control components, do not use force to aline bellcrank with bracket or to aline push–pull rods with bellcrank.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (14).

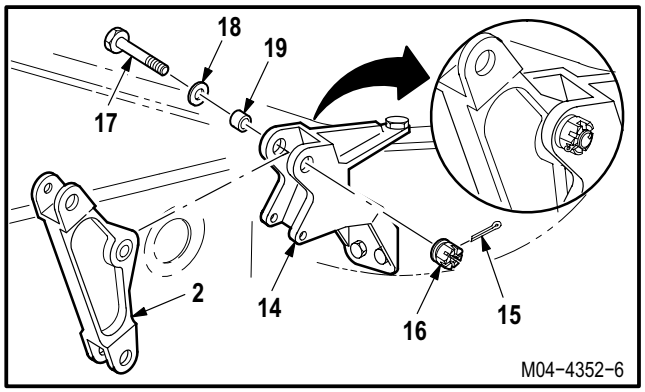
(2) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



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11.158. CPG TO PILOT CONTROL DIRECTIONAL F.S. 112.50 BELLCRANK REMOVAL/INSTALLATION – continued

b. **Install rod (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (8) with bellcrank (2).

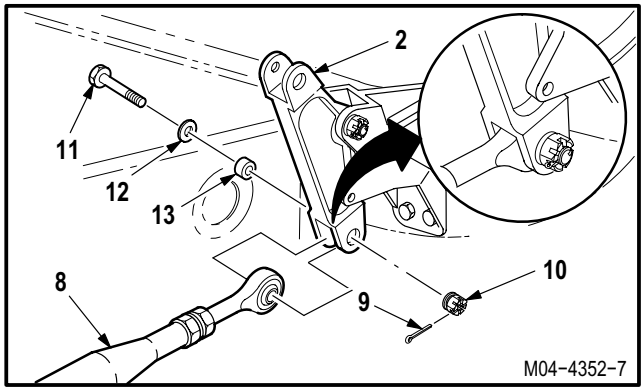
(2) Install bolt (11) through washer (12), bellcrank (2), rod (8), and bushing (13).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

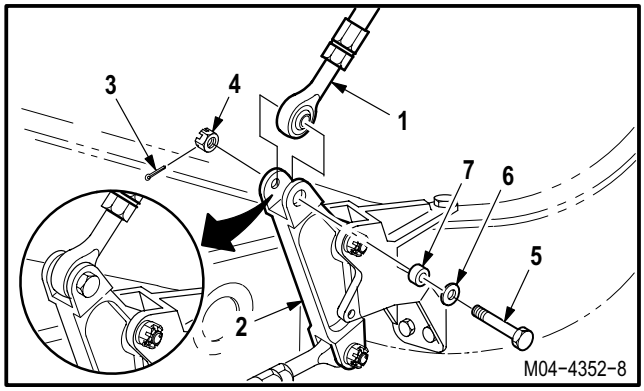
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.159. DIRECTIONAL F.S. 112.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.159.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.159.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

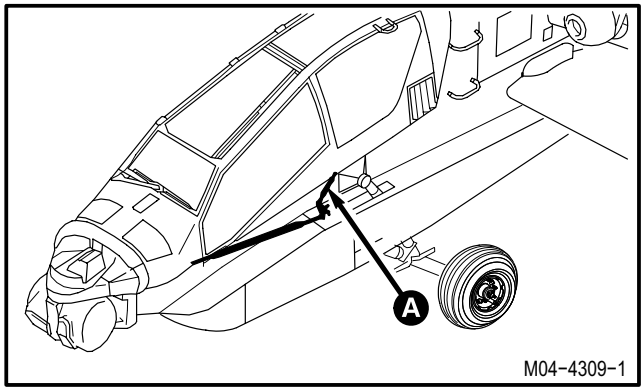
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.159.3. Removal

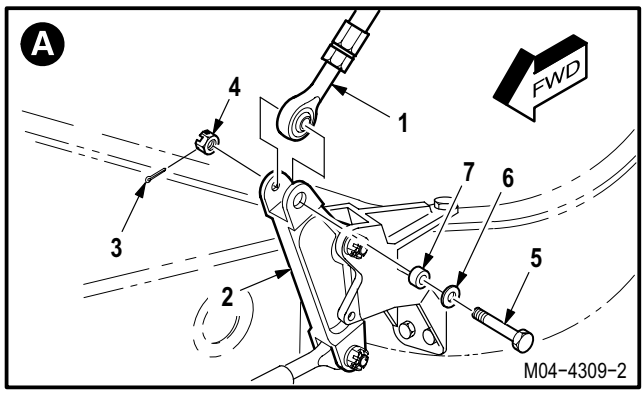
a. **Remove push-pull rod assembly (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.159. DIRECTIONAL F.S. 112.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

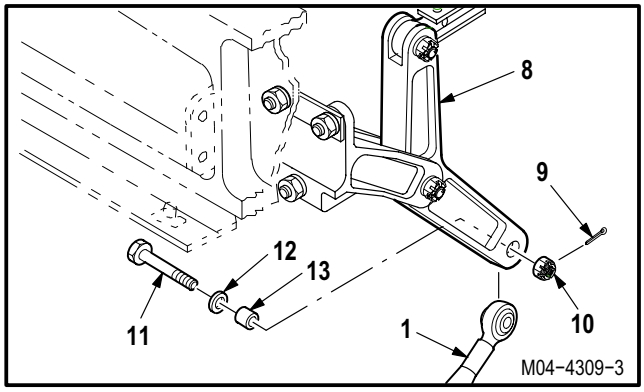
b. **Remove rod (1) from bellcrank (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (1).



11.159.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.159.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.159. DIRECTIONAL F.S. 112.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.159.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install rod (1) on bellcrank (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (8).

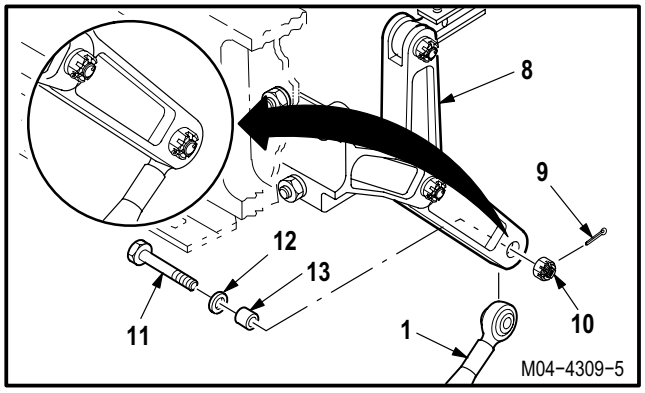
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (8), and rod (1).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.159. DIRECTIONAL F.S. 112.50 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install adjustable end of rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

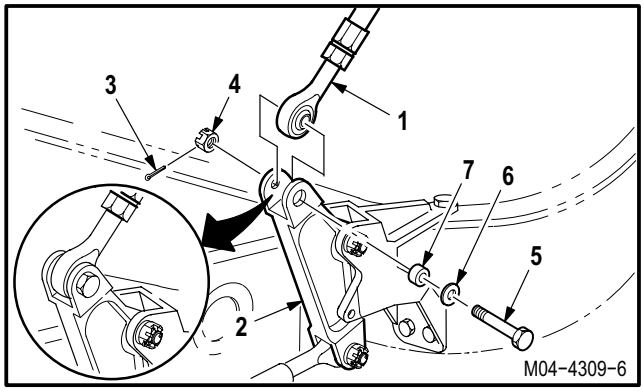
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.160. CPG TO PILOT DIRECTIONAL F.S. 112.50 CONTROL BRACKET REMOVAL/INSTALLATION

11.160.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.160.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

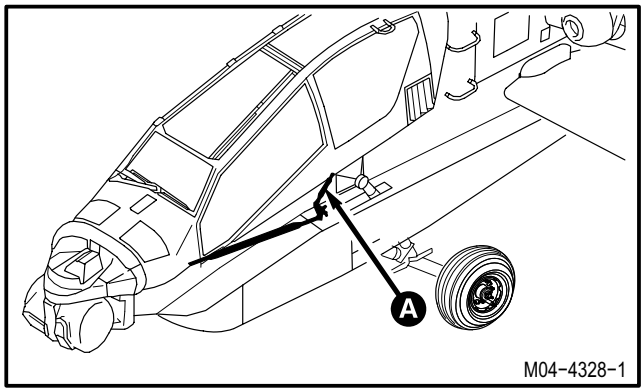
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.160.3. Removal

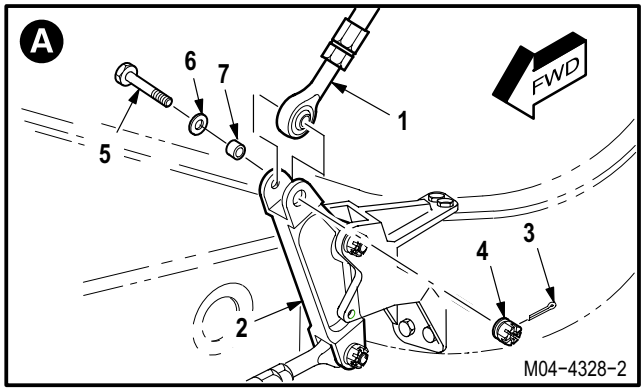
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.160. CPG TO PILOT DIRECTIONAL F.S. 112.50 CONTROL BRACKET REMOVAL/INSTALLATION – continued

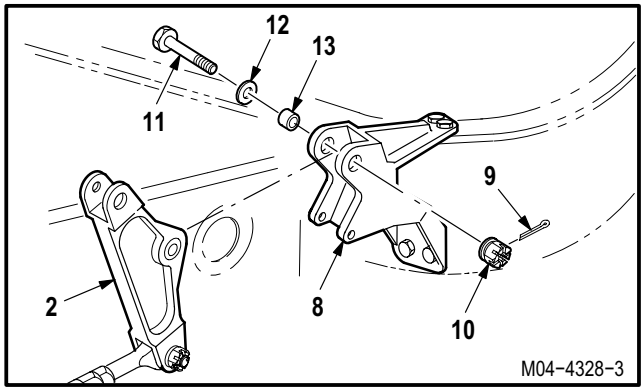
b. **Remove bellcrank (2) from bracket (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13) from bracket (8) and bellcrank (2).

(4) Remove bellcrank (2).



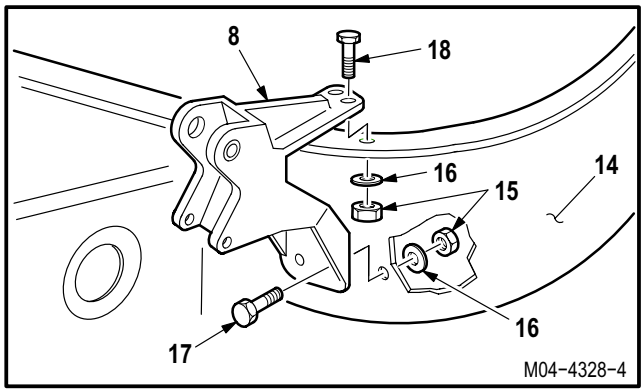
c. **Remove bracket (8) from airframe (14).**

(1) Remove four nuts (15) and washers (16).

(2) Remove two bolts (17).

(3) Remove two bolts (18).

(4) Remove bracket (8).



11.160.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.160.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.160. CPG TO PILOT DIRECTIONAL F.S. 112.50 CONTROL BRACKET REMOVAL/INSTALLATION – continued

11.160.6. Installation

NOTE

Install the longer bolts through the top two mounting holes.

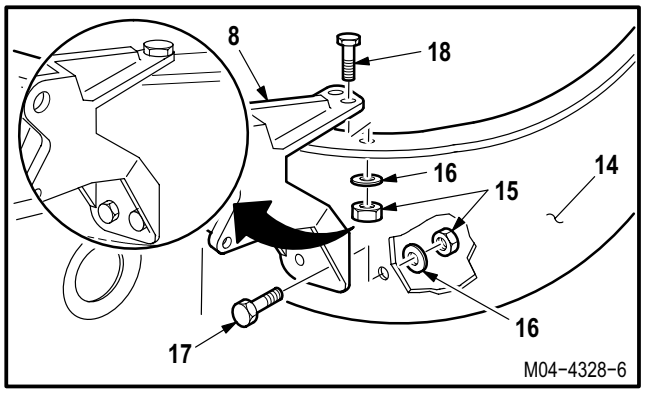
a. **Install bracket (8) on airframe (14).**

(1) Aline bracket (8) with holes on airframe (14).

(2) Install two bolts (18) through bracket (8) and airframe (14).

(3) Install two bolts (17) through bracket (8) and airframe (14).

(4) Install four washers (16) and nuts (15).



CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bellcrank (2) on bracket (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (8).

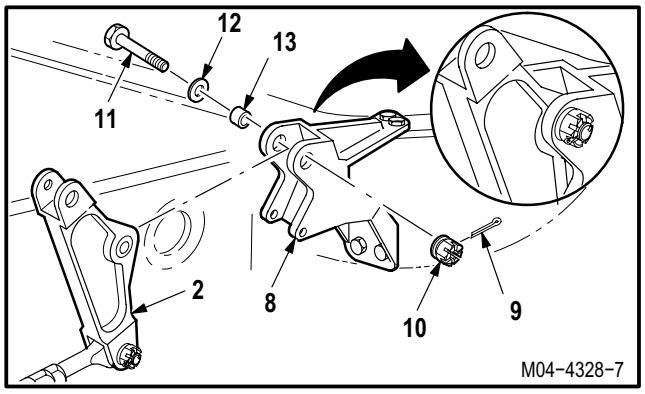
(2) Install bolt (11) through washer (12), bushing (13), bracket (8), and bellcrank (2).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.160. CPG TO PILOT DIRECTIONAL F.S. 112.50 CONTROL BRACKET REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

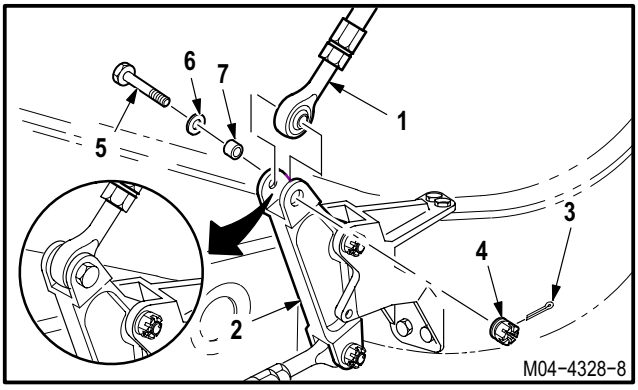
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.161. CPG TO PILOT CONTROL DIRECTIONAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION

11.161.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.161.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (3)

Personnel Required:

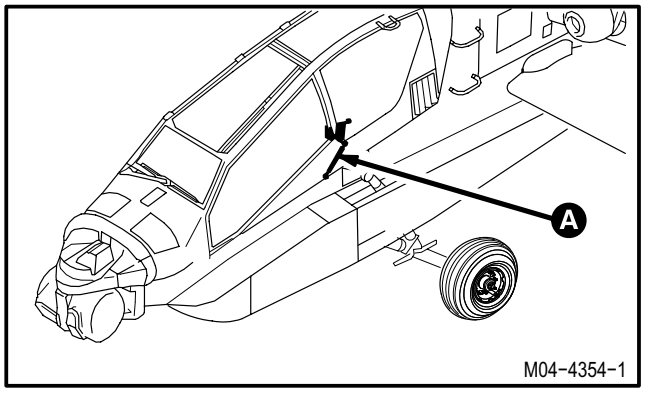
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.161.3. Removal

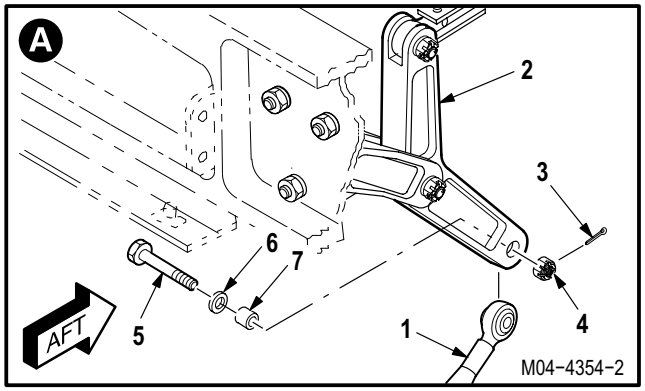
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



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11.161. CPG TO PILOT CONTROL DIRECTIONAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

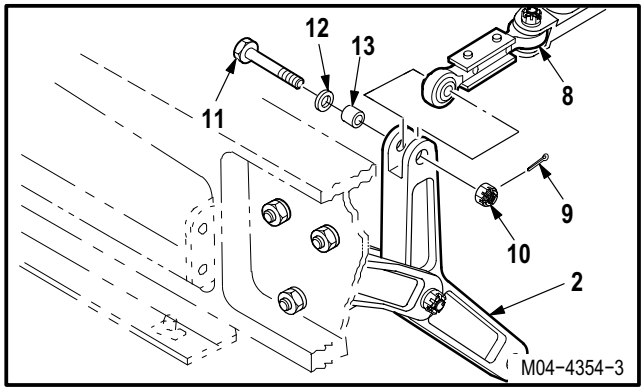
b. **Remove link (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove link (8) from bellcrank (2).



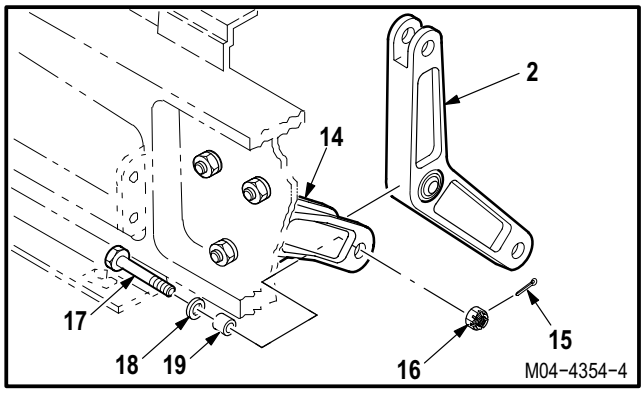
c. **Remove bellcrank (2) from bracket (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19).

(4) Remove bellcrank (2).



11.161.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.161.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.161. CPG TO PILOT CONTROL DIRECTIONAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

11.161.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

a. **Install bellcrank (2) on bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (14).

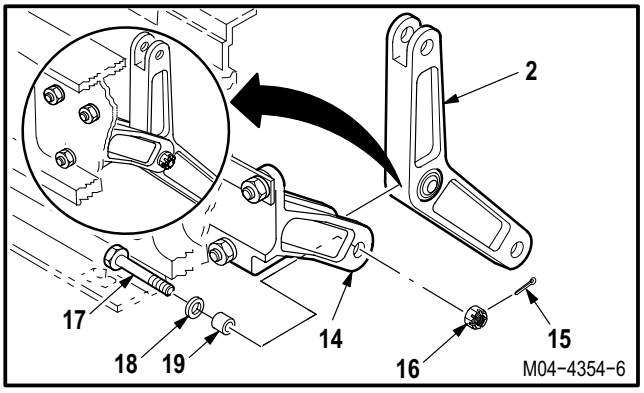
(2) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(3) Check fit of self-retaining bolt (17) (para 11.1).

(4) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (15).



b. **Install link (8) on bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline link (8) with bellcrank (2).

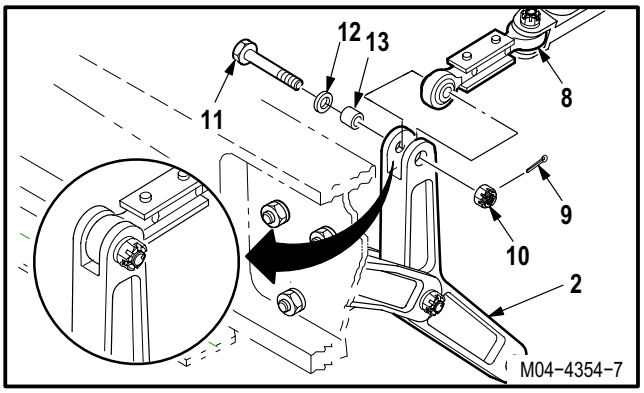
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.161. CPG TO PILOT CONTROL DIRECTIONAL F.S. 118.50 BELLCRANK REMOVAL/INSTALLATION – continued

c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

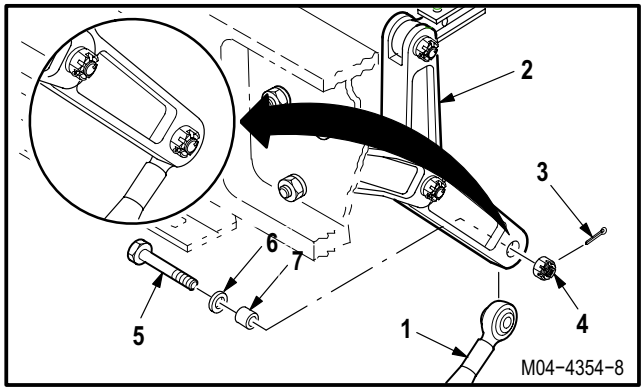
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



d. **Inspect (QA).**

e. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.162. CPG TO PILOT CONTROL DIRECTIONAL F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION

11.162.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.162.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

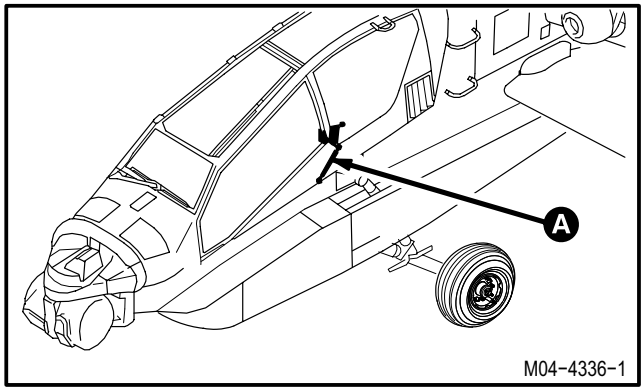
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.162.3. Removal

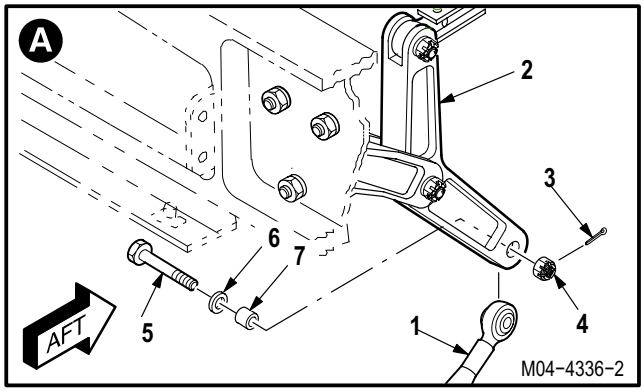
a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1) from bellcrank (2).



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11.162. CPG TO PILOT CONTROL DIRECTIONAL F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION – continued

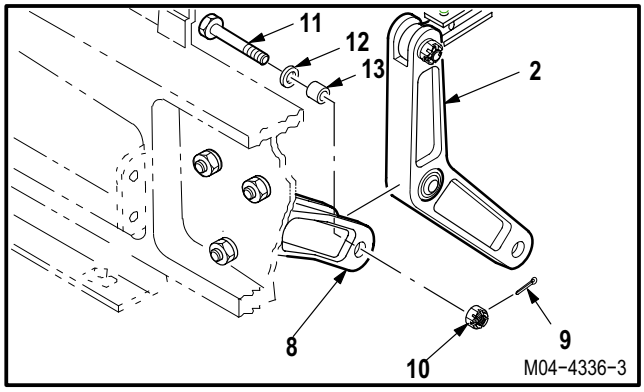
b. **Remove bellcrank (2) from bracket (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing from bracket (8) and bellcrank (2).

(4) Remove bellcrank (2) from bracket (8).



NOTE

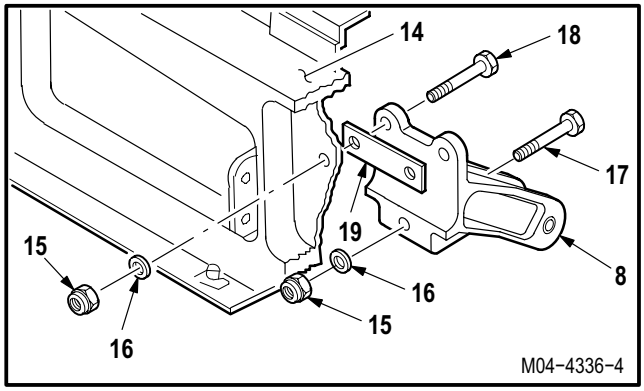
A laminated spacer is installed between the bracket and the airframe. Use care when removing the bracket to prevent the spacer from delaminating.

c. **Remove bracket (8) from airframe (14).**

(1) Remove three nuts (15) and washers (16).

(2) Remove bolt (17) and two bolts (18).

(3) Remove bracket (8) and spacer (19).



11.162.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.162.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.162. CPG TO PILOT CONTROL DIRECTIONAL F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION – continued

11.162.6. Installation

NOTE

Install the laminated spacer between the bracket and the airframe. Adjust thickness of the laminated spacer as required to allow for **0.008 INCH** clearance.

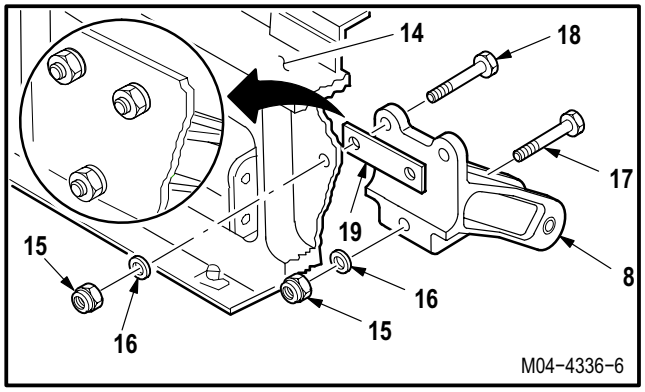
a. **Install bracket (8) on airframe (14).**

(1) Install two bolts (18) through bracket (8), spacer (19), and airframe (14).

(2) Install bolt (17) through bracket (8) and airframe (14).

(3) Install three washers (16) and nuts (15).

(4) Verify minimum clearance of **0.008 INCH** is maintained between bracket (8) and any structure.



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11.162. CPG TO PILOT CONTROL DIRECTIONAL F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bellcrank (2) on bracket (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with bracket (8).

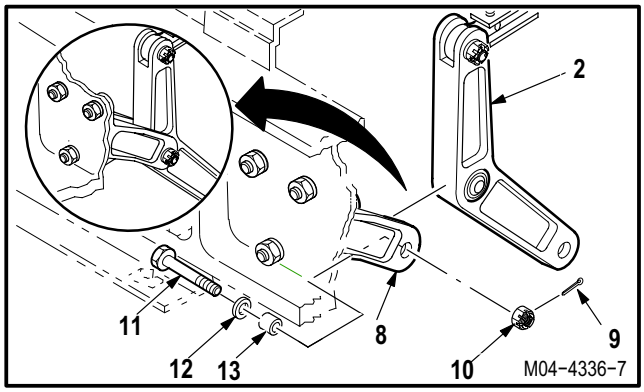
(2) Install bolt (11) through washer (12), bushing (13), bracket (8), and bellcrank (2).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



c. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

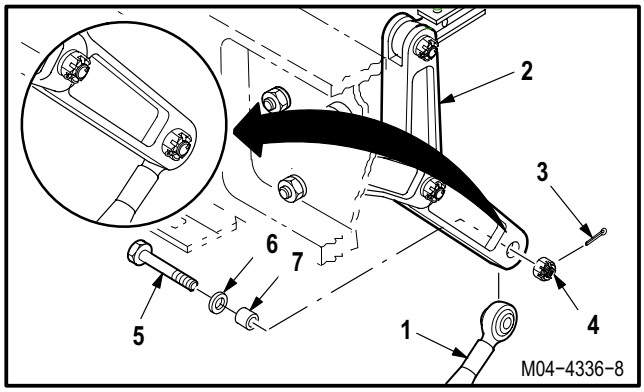
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install cotter pin (3).



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11.162. CPG TO PILOT CONTROL DIRECTIONAL F.S. 118.50 SUPPORT BRACKET REMOVAL/INSTALLATION – continued

d. **Inspect (QA).**

e. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.163. CPG TO PILOT CONTROL DIRECTIONAL F.S. 120.00 RIG CONNECTING LINK REMOVAL/INSTALLATION

11.163.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.163.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Cotter pin (2)

Personnel Required:

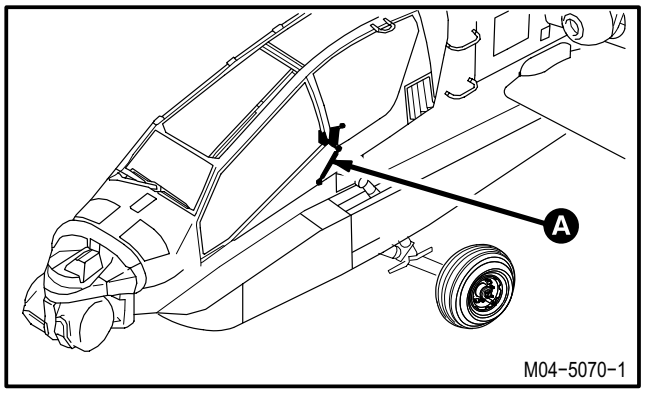
67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.163. CPG TO PILOT CONTROL DIRECTIONAL F.S. 120.00 RIG CONNECTING LINK REMOVAL/INSTALLATION – continued

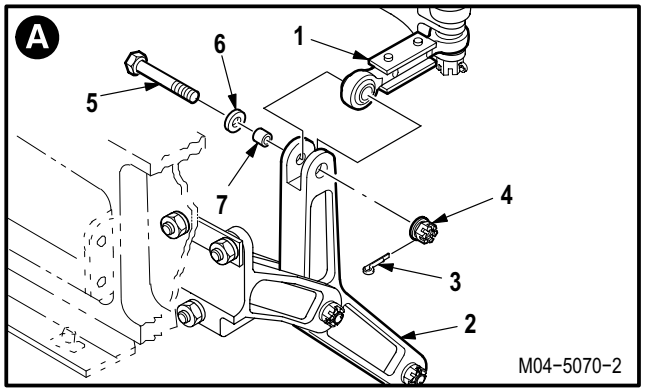
11.163.3. Removal

a. **Remove rig connecting link (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7) from bellcrank (2) and link (1).



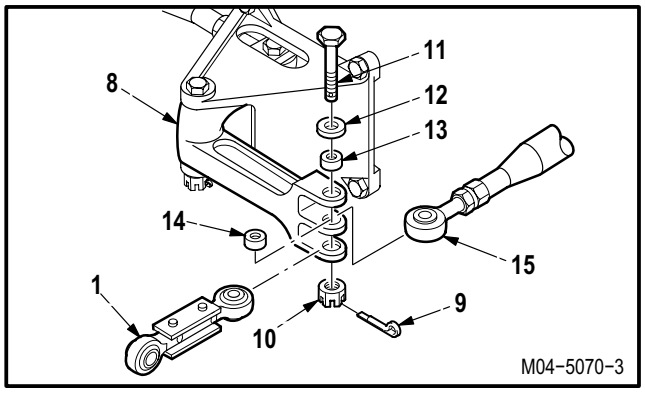
b. **Remove rig connecting link (1) from bellcrank (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), bushing (13), and bushing (14) from bellcrank (8), rod end (15), and link (1).

(4) Remove link (1).



11.163.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.163.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.163. CPG TO PILOT CONTROL DIRECTIONAL F.S. 120.00 RIG CONNECTING LINK REMOVAL/INSTALLATION – continued

11.163.6. Installation

CAUTION

To prevent damage to flight control components, do not use force to aline bellcrank with bracket or to aline push-pull rods with bellcrank.

a. **Install link (1) on bellcrank (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline link (1) to bellcrank (8).

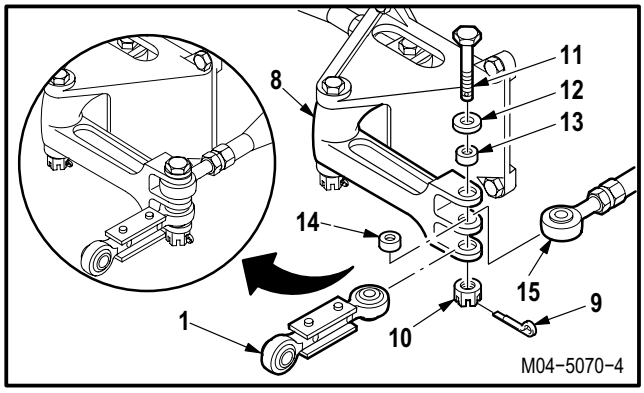
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (8), rod end (15), bushing (14), and link (1).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.163. CPG TO PILOT CONTROL DIRECTIONAL F.S. 120.00 RIG CONNECTING LINK REMOVAL/INSTALLATION – continued

b. **Install link (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline link (1) to bellcrank (2).

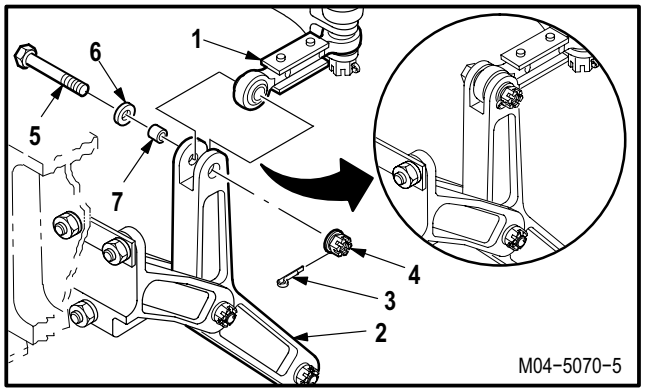
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and link (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.164. DIRECTIONAL F.S. 121.40 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.164.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.164.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

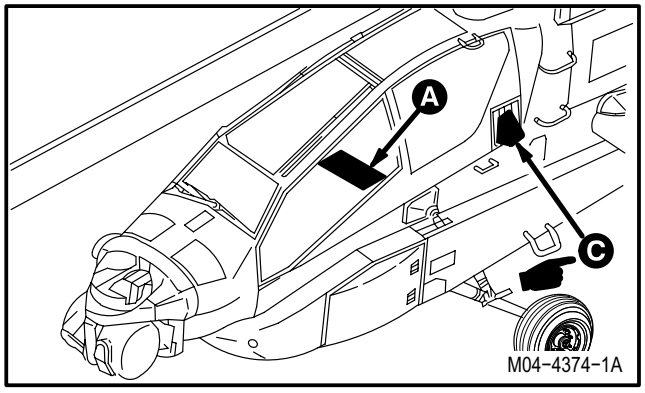
TM 1-1520-238-T
TM 9-1090-208-23

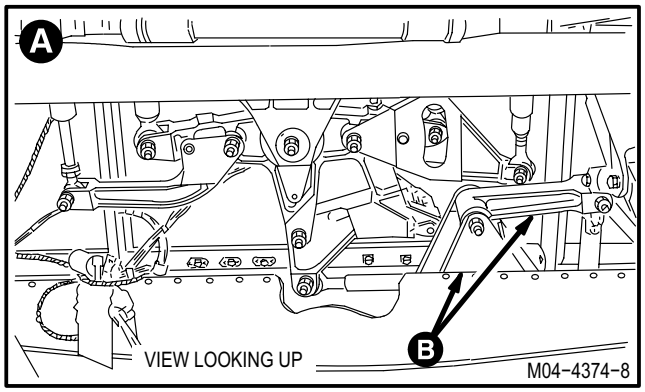
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
10.52A	Forward fuel cell retainer panel removed (if installed)
11.151	Directional F.S. 121.40 bellcrank removed
TM 9-1090-208-23	Area weapon and turret removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.





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11.164. DIRECTIONAL F.S. 121.40 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.164.3. Removal

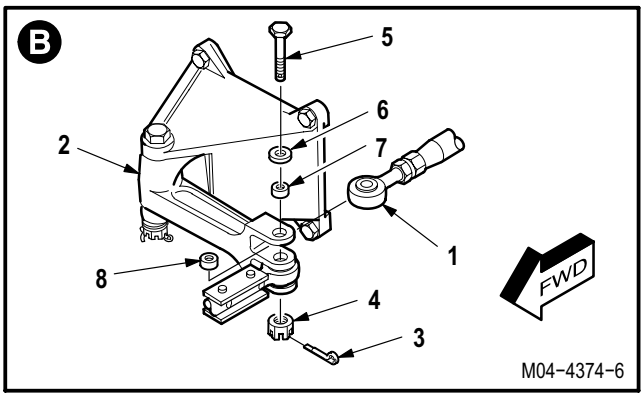
a. **Remove rod end (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7) from bellcrank (2).

(4) Remove rod end (1) and bushing (8).



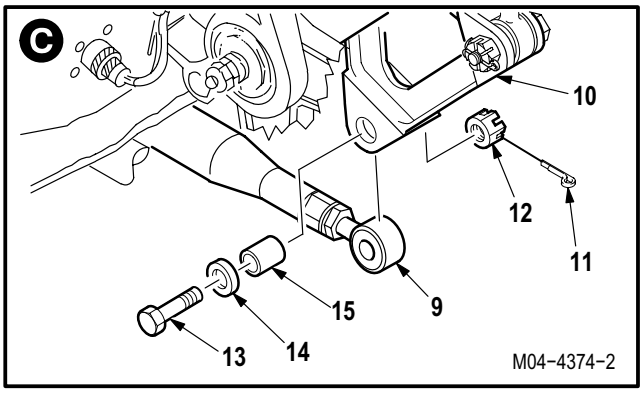
b. **Remove push-pull rod assembly (9) from bellcrank (10).**

(1) Remove and discard cotter pin (11).

(2) Remove nut (12).

(3) Remove bolt (13), washer (14), and bushing (15).

(4) Remove rod assembly (9).



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11.164. DIRECTIONAL F.S. 121.40 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.164.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.164.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.164.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline push-pull rod with bellcrank.

a. **Install rod (9) on bellcrank (10).** Torque nut (12) **30 to 40 INCH-POUNDS**.

(1) Aline rod (9) with bellcrank (10).

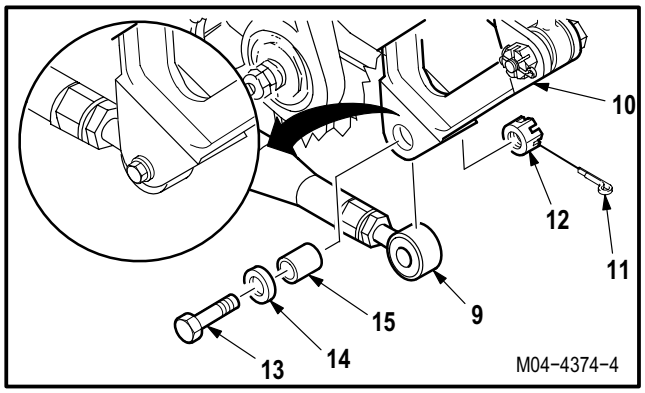
(2) Install bolt (13) through washer (14), bushing (15), bellcrank (10), and rod (9).

(3) Check fit of self-retaining bolt (13) (para 11.1).

(4) Install nut (12). Torque nut (12) to **30 INCH–POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (11).



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11.164. DIRECTIONAL F.S. 121.40 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod end (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Install bushing (8) in bellcrank (2).

(2) Aline rod end (1) with bellcrank (2).

(3) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod end (1).

(4) Check fit of self-retaining bolt (5) (para 11.1).

(5) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (3).

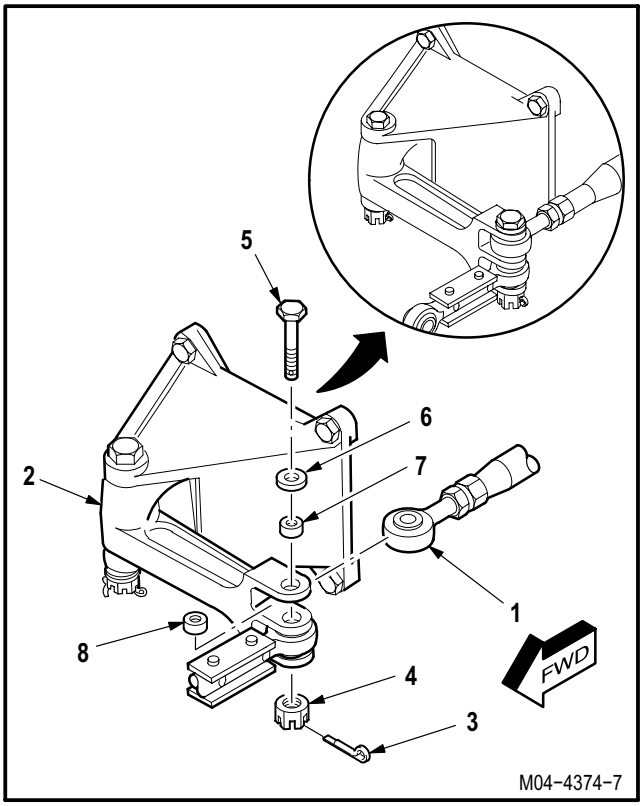
c. **Install directional F.S. 121.40 bellcrank** (para 11.151)**.**

d. **Inspect (QA).**

e. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install area weapon and turret** (TM 9-1090-208-23)**.**

g. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**



END OF TASK

11.165. DIRECTIONAL F.S. 156.07 BELLCRANK REMOVAL/INSTALLATION

11.165.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.165.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

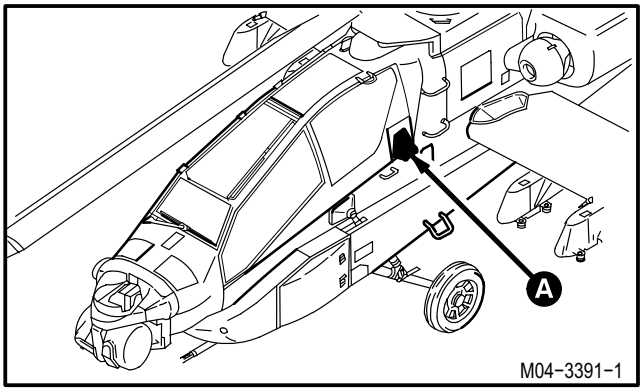
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
10.52A	Forward fuel cell retainer panel removed (if installed)

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.165. DIRECTIONAL F.S. 156.07 BELLCRANK REMOVAL/INSTALLATION – continued

11.165.3. Removal

a. **Remove rod ends (1) and (2) from bellcrank (3).**

(1) Remove and discard cotter pin (4).

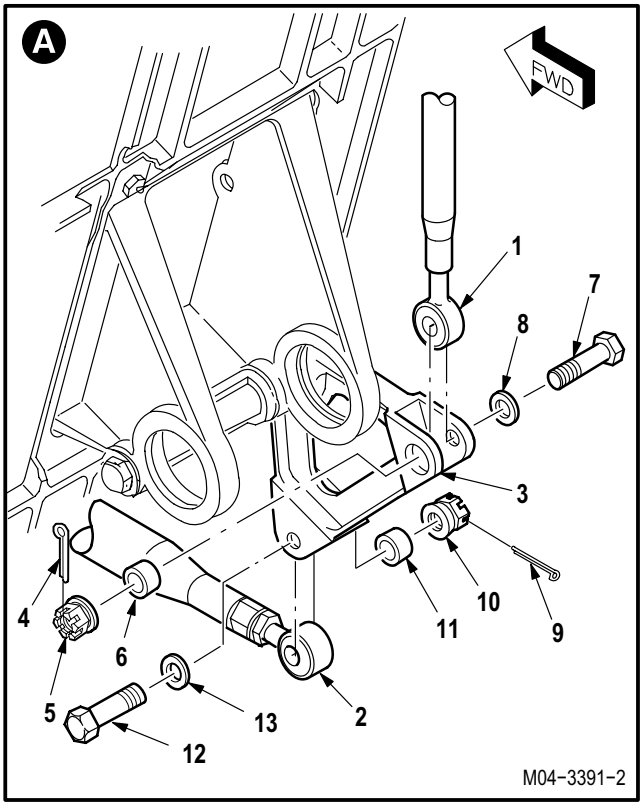
(2) Remove nut (5) and bushing (6).

(3) Remove bolt (7) and washer (8) from bellcrank (3) and rod end (1).

(4) Remove and discard cotter pin (9).

(5) Remove nut (10) and bushing (11).

(6) Remove bolt (12) and washer (13) from bellcrank (3) and rod end (2).

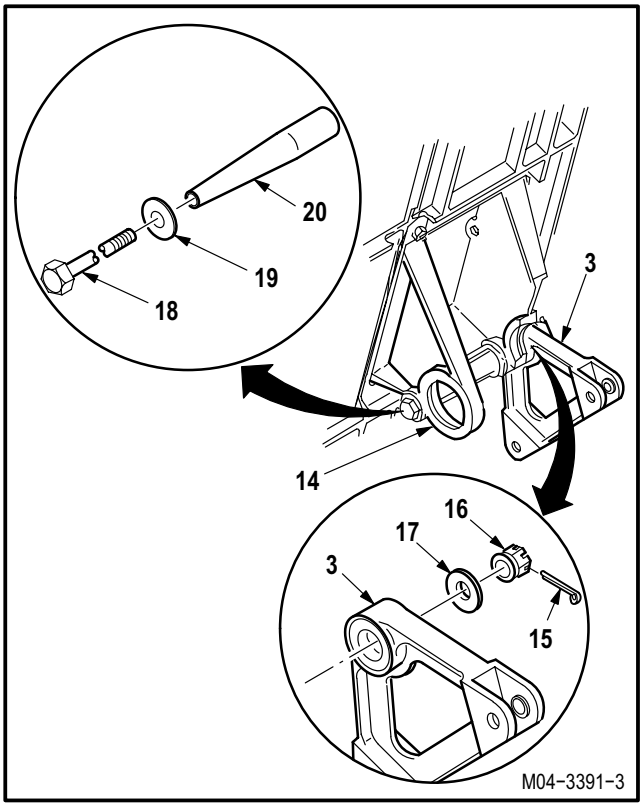


b. **Remove bellcrank (3) from pilot collective support (14).**

(1) Remove and discard cotter pin (15).

(2) Remove nut (16) and washer (17).

(3) Remove bolt (18), washer (19), bellcrank (3), and rotor control pivot (20).



11.165.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

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11.165. DIRECTIONAL F.S. 156.07 BELLCRANK REMOVAL/INSTALLATION – continued

11.165.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.165.6. Installation

a. **Install bellcrank (3) on support (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Install pivot (20) in support (14).

(2) Aline hole (21) with support (14).

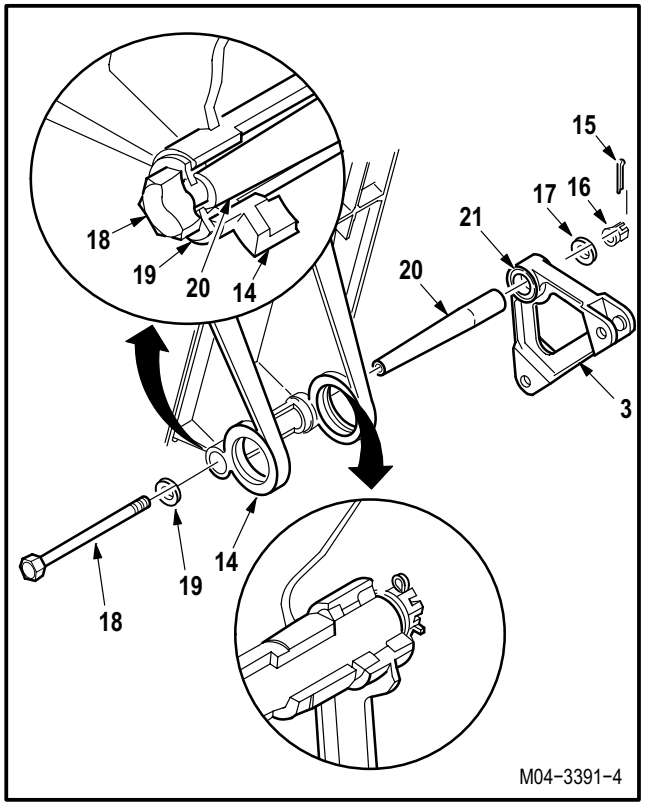
(3) Install bolt (18) through washer (19), pivot (20), support (14), and bellcrank (3).

(4) Install washer (17) and nut (16).

(5) Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (15).



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11.165. DIRECTIONAL F.S. 156.07 BELLCRANK REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline push-pull rod with bellcrank.

b. **Install rod ends (1) and (2) on bellcrank (3).** Torque nuts (5) and (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (2) with hole (22) in bellcrank (3).

(2) Install bolt (12) through washer (13), bellcrank (3), and rod end (2).

(3) Install bushing (11) and nut (10) on bolt (12).

(4) Aline rod end (1) with hole (21) in bellcrank (3).

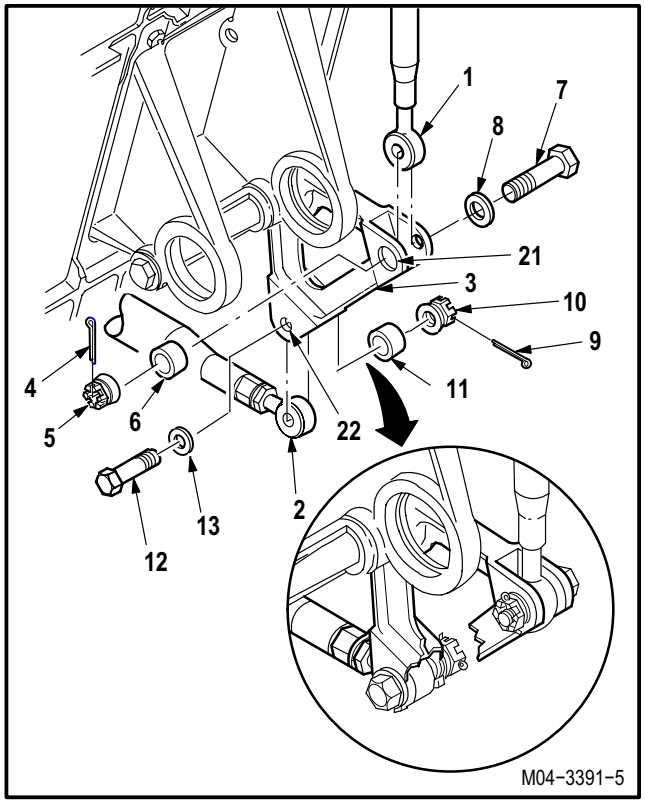
(5) Install bolt (7) through washer (8), bellcrank (3), and rod end (1).

(6) Install bushing (6) and nut (5) on bolt (7).

(7) Torque nuts (5) and (10) to **30 INCH-POUNDS**. Use torque wrench.

(8) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(9) Install new cotter pins (4) and (9).



c. **Inspect (QA).**

d. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

END OF TASK

11.166. DIRECTIONAL F.S. 156.07 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.166.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.166.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

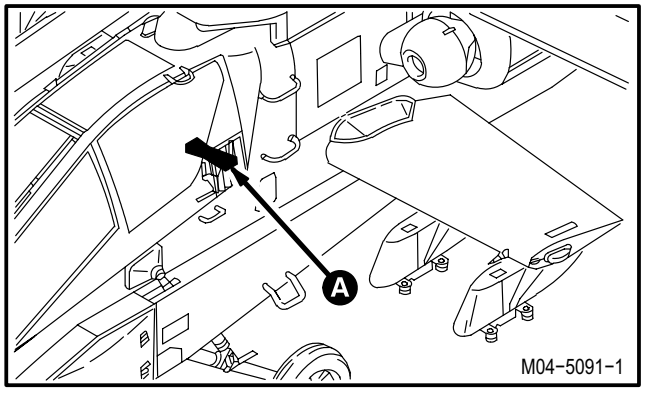
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access cover L160 removed
10.52A	Forward fuel cell retainer panel removed (if installed)

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.166. DIRECTIONAL F.S. 156.07 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.166.3. Removal

a. **Remove push-pull rod (1) from bellcrank (2).**

(1) Aline bolt (3) with hole (4) in bracket (5).

(2) Remove and discard cotter pin (6).

(3) Remove nut (7).

(4) Remove bolt (3), washer (8), and bushing (9).

(5) Remove rod (1) from bellcrank (2).

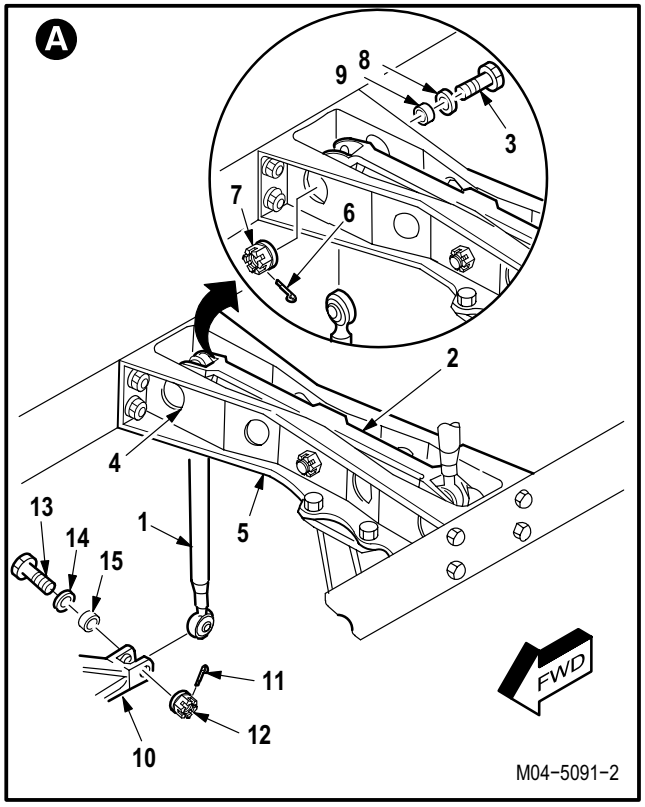
b. **Remove push-pull rod end (1) from bellcrank (10).**

(1) Remove and discard cotter pin (11).

(2) Remove nut (12).

(3) Remove bolt (13), washer (14), and bushing (15).

(4) Remove rod (1).



11.166.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.166.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.166. DIRECTIONAL F.S. 156.07 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.166.6. Installation

a. **Install rod (1) on bellcrank (10).** Torque nut (12) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (10).

(2) Install bolt (13) through washer (14), bushing (15), bellcrank (10), and rod (1).

(3) Check fit of self-retaining bolt (13) (para 11.1).

(4) Install nut (12). Torque nut (12) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (11).

b. **Install rod (1) on bellcrank (2).** Torque nut (7) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

(2) Install bolt (3) through washer (8), bushing (9), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (3) (para 11.1).

(4) Install nut (7). Torque nut (7) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

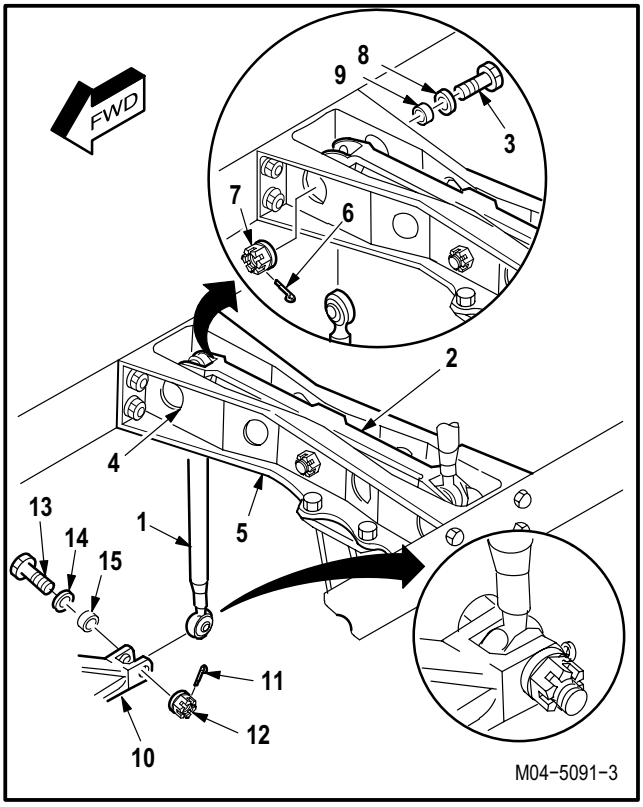
(6) Install new cotter pin (6).

c. **Inspect (QA).**

d. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

e. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

f. **Install access cover L160** (para 2.2)**.**



END OF TASK

11.167. DIRECTIONAL F.S. 159.98 BELLCRANK AND BRACKET REMOVAL/INSTALLATION

11.167.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.167.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (9)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

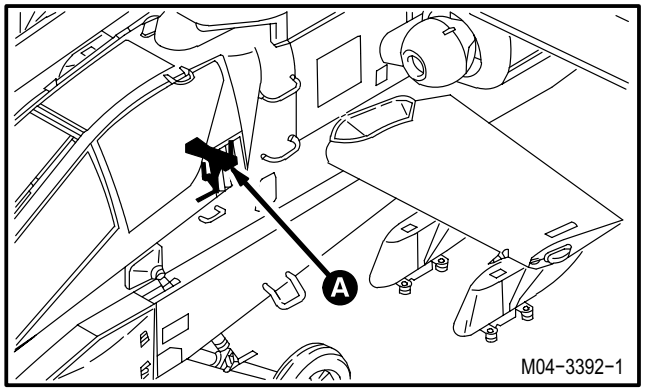
TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access cover L160 removed
10.52A	Forward fuel cell retainer panel removed (if installed)

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.167. DIRECTIONAL F.S. 159.98 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

11.167.3. Removal

a. **Remove rod ends (1) and (2) from bellcranks (3) and (4).**

(1) Remove and discard cotter pins (5) and (6).

(2) Remove nut (7).

(3) Remove bolt (8), washer (9), and bushing (10) from bellcrank (3) and rod end (1).

(4) Aline bolt (11) with hole (12) in bracket (13).

(5) Remove nut (14).

(6) Remove bolt (11), washer (15), and bushing (16) from bellcrank (4) and rod end (2).

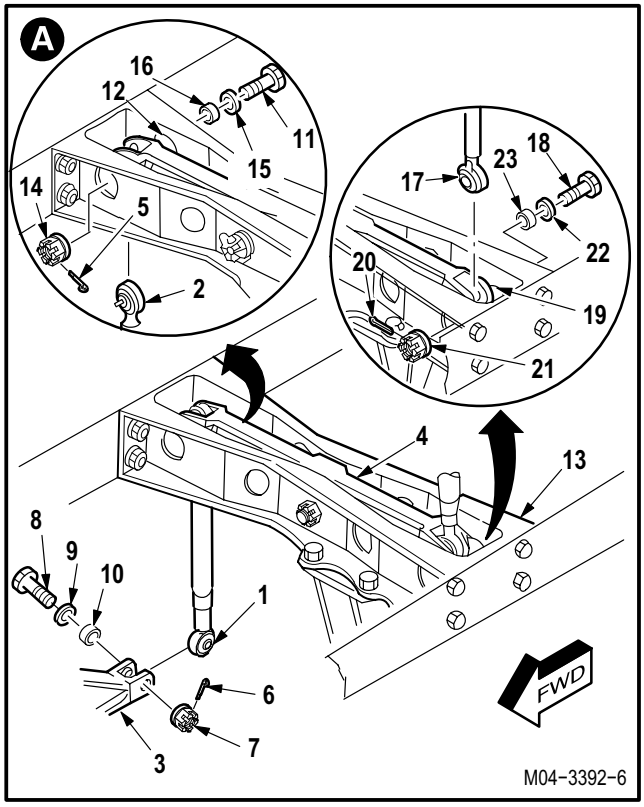
b. **Remove rod end (17) from bellcrank (4).**

(1) Aline bolt (18) with hole (19) in bracket (13).

(2) Remove and discard cotter pin (20).

(3) Remove nut (21).

(4) Remove bolt (18), washer (22), and bushing (23) from bellcrank (4) and rod end (17).



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11.167. DIRECTIONAL F.S. 159.98 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

c. **Remove bracket (24) and bellcrank (25) from bracket (13).**

(1) Remove and discard two cotter pins (26).

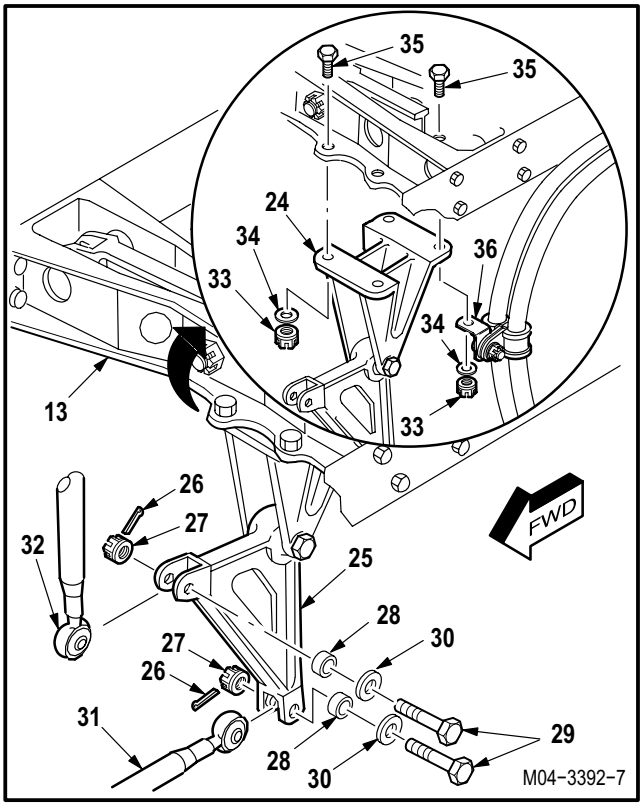
(2) Remove two nuts (27).

(3) Remove two bolts (29), washers (30), and bushings (28 from bellcrank (25) and rod ends (31) and (32).

(4) Remove four nuts (33) and washers (34).

(5) Remove four bolts (35).

(6) Remove bracket (24), bracket (36), and bellcrank (25) from bracket (13).



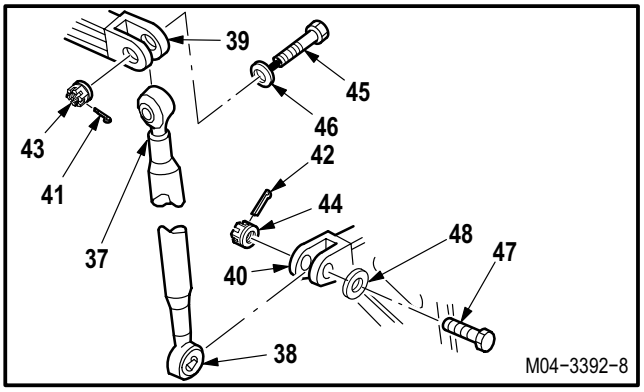
d. **Remove rod ends (37) and (38) from bellcranks (39) and (40).**

(1) Remove and discard cotter pins (41) and (42).

(2) Remove nuts (43) and (44).

(3) Remove bolt (45) and washer (46) from rod end (37) and bellcrank (39).

(4) Remove bolt (47) and washer (48) from rod end (38) and bellcrank (40).



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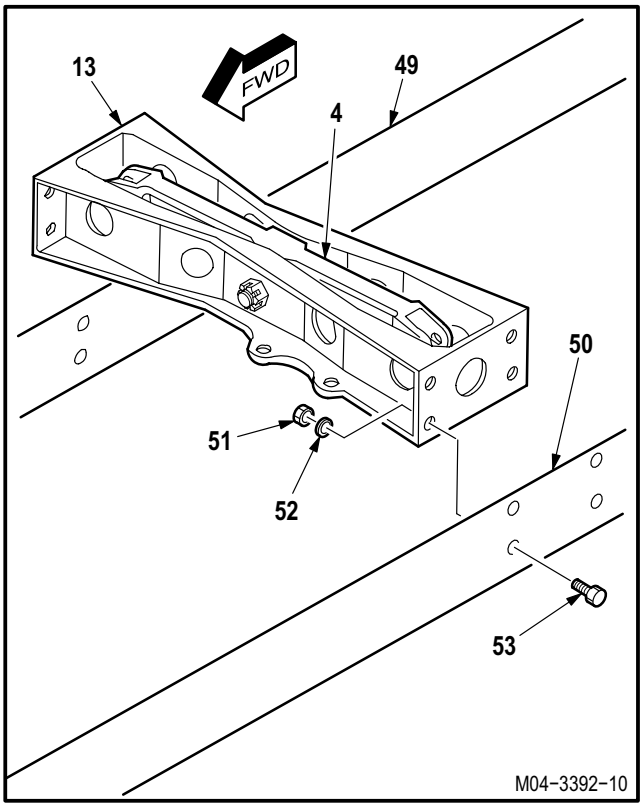
11.167. DIRECTIONAL F.S. 159.98 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

e. **Remove bracket (13) and bellcrank (4) from airframe (49) and (50).**

(1) Remove seven nuts (51) and washers (52).

(2) Remove seven bolts (53) from airframe (49) and (50) and bracket (13).

(3) Remove bracket (13) from airframe (49) and (50).



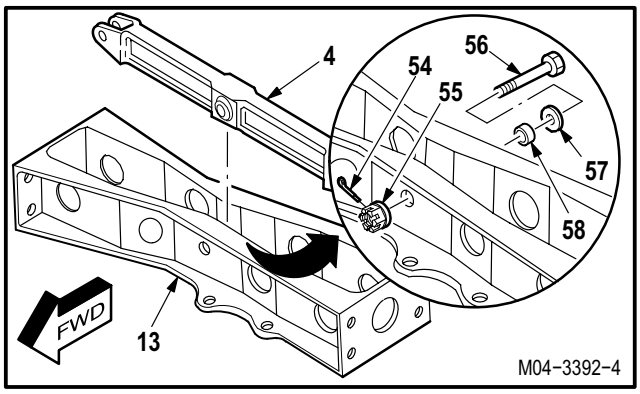
f. **Remove bellcrank (4) from bracket (13).**

(1) Remove and discard cotter pin (54).

(2) Remove nut (55).

(3) Remove bolt (56), washer (57), and bushing (58) from bracket (13) and bellcrank (4).

(4) Remove bellcrank (4) from bracket (13).



11.167.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.167.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

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11.167. DIRECTIONAL F.S. 159.98 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.167.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push–pull rod with bellcrank.

NOTE

When installing bellcrank in bracket, bushings and head of bolt must be facing aft.

a. **Install bellcrank (4) in bracket (13).** Torque nut (55) **30 to 40 INCH-POUNDS**.

(1) Aline center hole of bellcrank (4) with center hole in bracket (13).

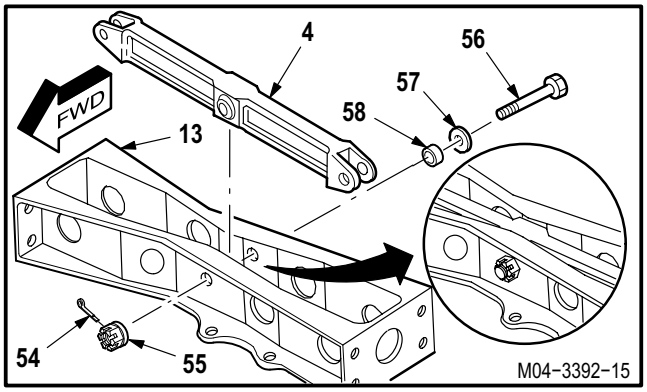
(2) Install bolt (56) through washer (57), bushing (58), center hole of bracket (13), and bellcrank (4).

(3) Check fit of self-retaining bolt (56) (para 11.1).

(4) Install nut (55). Torque nut (55) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (54).



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11.167. DIRECTIONAL F.S. 159.98 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

b. **Install bracket (13) and bellcrank (4) on airframe (49) and (50).**

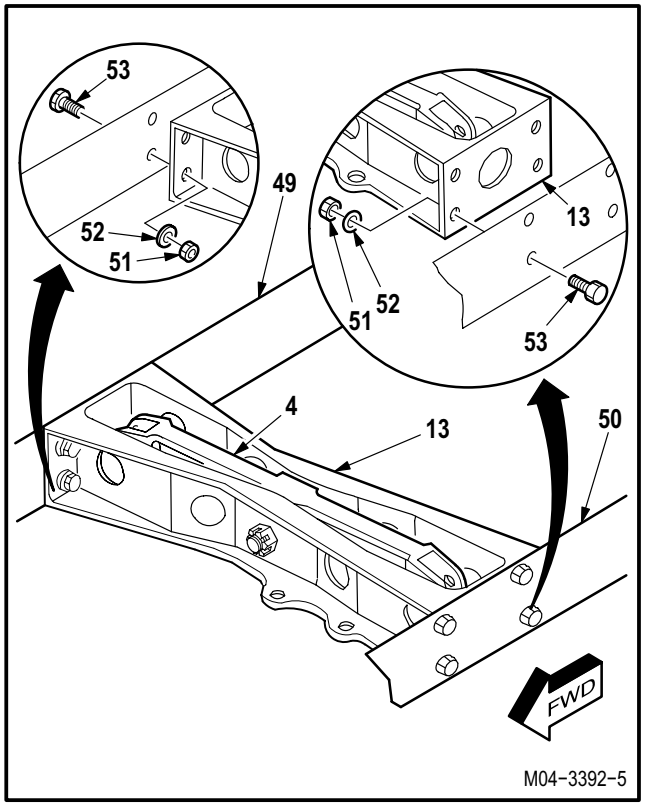
(1) Aline bracket (13) with airframe (50).

(2) Install four bolts (53) through airframe (50) and bracket (13).

(3) Install four washers (52) and nuts (51) on bolts (53).

(4) Install three bolts (53) through airframe (49) and bracket (13).

(5) Install three washers (52) and nuts (51) on bolts (53).



c. **Install rod ends (37) and (38) on bellcranks (39) and (40).** Torque nuts (43) and (44) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (37) with bellcrank (39).

(2) Install bolt (45) through washer (46), bellcrank (39), and rod end (37).

(3) Aline rod end (38) with bellcrank (40).

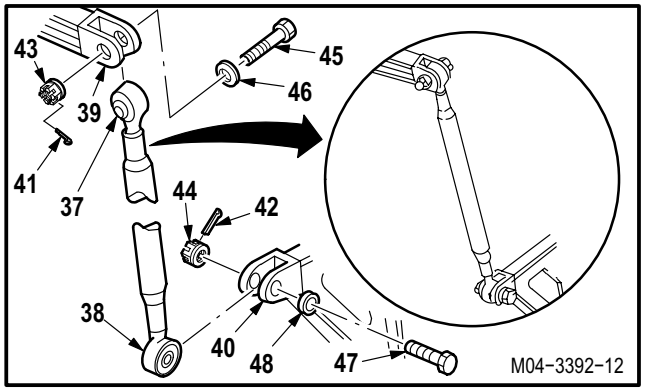
(4) Install bolt (47) through washer (48), bellcrank (40), and rod end (38).

(5) Check fit of self-retaining bolts (45) and (47) (para 11.1).

(6) Install nuts (43) and (44). Torque nuts (43) and (44) to **30 INCH-POUNDS**. Use torque wrench

(7) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(8) Install new cotter pins (41) and (42).



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11.167. DIRECTIONAL F.S. 159.98 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

d. **Install bracket (24) and bellcrank (25) on bracket (13).** Torque two nuts (27) **30 to 40 INCH-POUNDS**.

(1) Aline holes in bracket (24) with holes in bracket (13).

(2) Install four bolts (35) through bracket (13), bracket (24), and bracket (36).

(3) Install four washers (34) and nuts (33) on bolts (35).

(4) Aline rod ends (31) and (32) with bellcrank (25).

(5) Install bolt (29) through washer (30), bushing (28), bellcrank (25), and rod end (31).

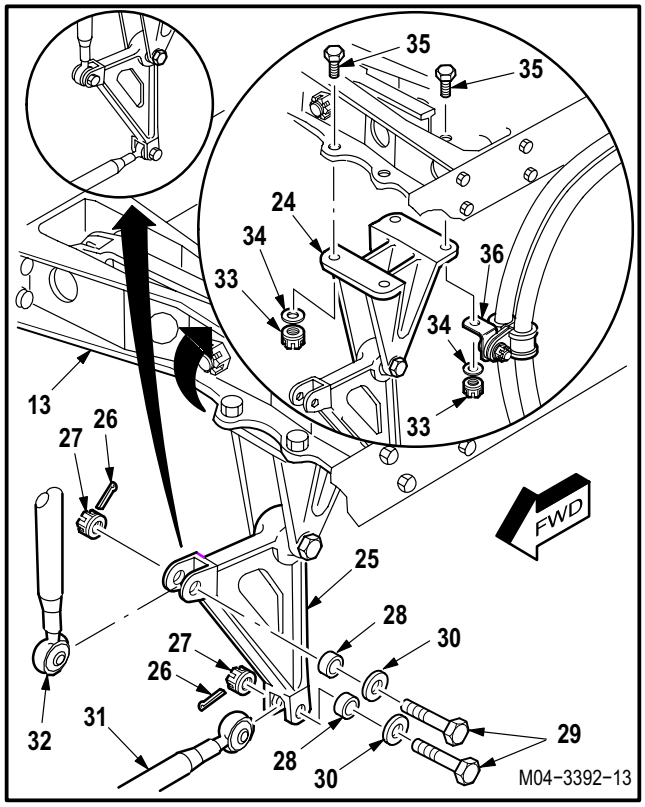
(6) Install bolt (29) through washer (30), bushing (28), bellcrank (25) and rod end (32).

(7) Check fit of two self-retaining bolts (29) (para 11.1).

(8) Install two nuts (27). Torque two nuts (27) to **30 INCH-POUNDS**. Use torque wrench.

(9) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(10) Install two new cotter pins (26).



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11.167. DIRECTIONAL F.S. 159.98 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

e. **Install rod end (17) on bellcrank (4).** Torque nut (21) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (17) with bellcrank (4) and hole (19) in bracket (13).

(2) Install bolt (18) through washer (22), bushing (23), hole (19), bellcrank (4), and rod end (17).

(3) Install nut (21). Torque nut (21) to **30 INCH-POUNDS**. Use torque wrench.

(4) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(5) Install new cotter pin (20).

f. **Install rod ends (1) and (2) on bellcranks (3) and (4).** Torque nuts (7) and (14) **30 to 40 INCH-POUNDS**.

(1) Aline rod end (2) with bellcrank (4) and hole (12) in bracket (13).

(2) Install bolt (11) through washer (15), bushing (16), hole (12), bellcrank (4), and rod end (2).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Aline rod end (1) with bellcrank (3).

(5) Install bolt (8) through washer (9), bushing (10), bellcrank (3), and rod end (1).

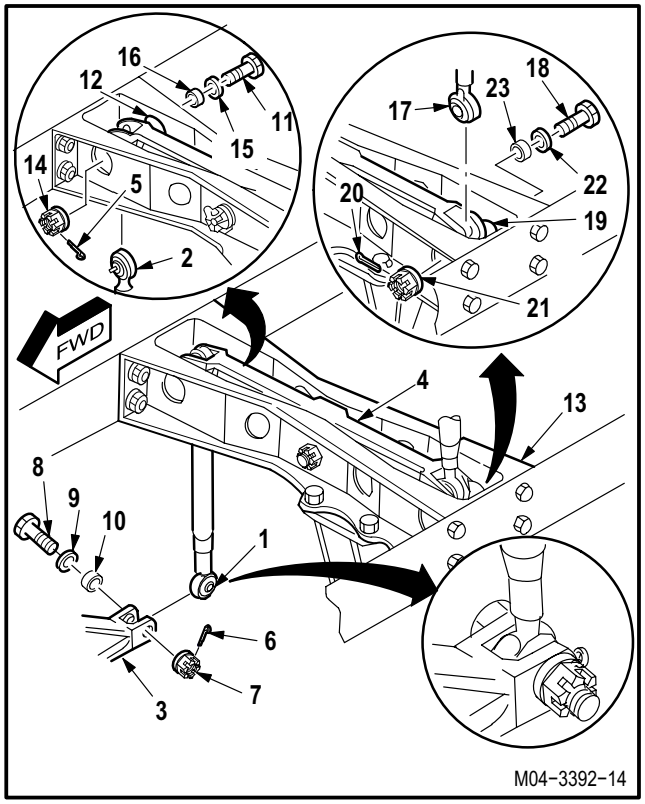
(6) Install nut (7) on bolt (8).

(7) Install nut (14) on bolt (11).

(8) Torque nuts (7) and (14) to **30 INCH-POUNDS**. Use torque wrench.

(9) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(10) Install two new cotter pins (5) and (6).



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11.167. DIRECTIONAL F.S. 159.98 BELLCRANK AND BRACKET REMOVAL/INSTALLATION – continued

g. **Inspect (QA).**

h. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

i. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

j. **Install access cover L160** (para 2.2)**.**

END OF TASK

11.168. DIRECTIONAL F.S. 159.98 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION

11.168.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.168.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

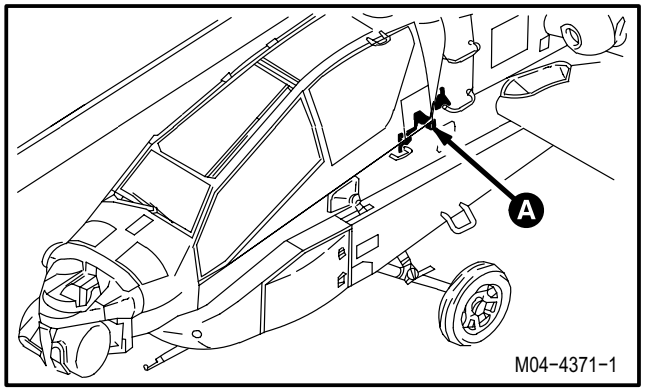
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
9.30	Transformer-rectifier No. 1 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.168. DIRECTIONAL F.S. 159.98 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.168.3. Removal

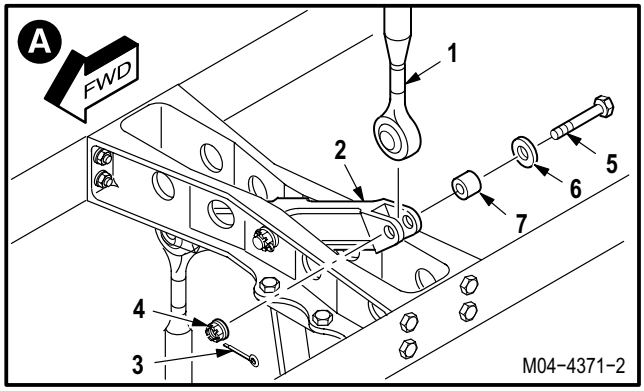
a. **Remove push-pull rod assembly (1) from bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), and bushing (7).

(4) Remove rod (1).



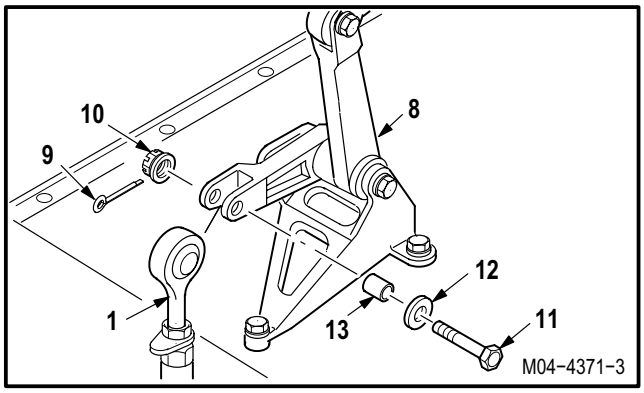
b. **Remove rod (1) from bellcrank (8).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), and bushing (13).

(4) Remove rod (1).



11.168.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.168.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.168. DIRECTIONAL F.S. 159.98 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

11.168.6. Installation

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.

a. **Install rod (1) on bellcrank (8).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (8).

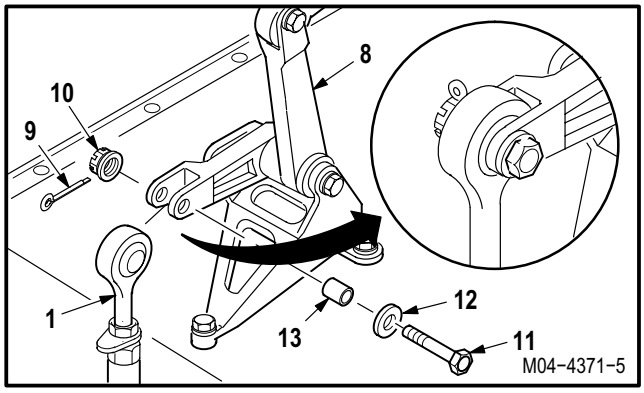
(2) Install bolt (11) through washer (12), bushing (13), bellcrank (8), and rod (1).

(3) Check fit of self-retaining bolt (11) (para 11.1).

(4) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (9).



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11.168. DIRECTIONAL F.S. 159.98 PUSH-PULL ROD ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install rod (1) on bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

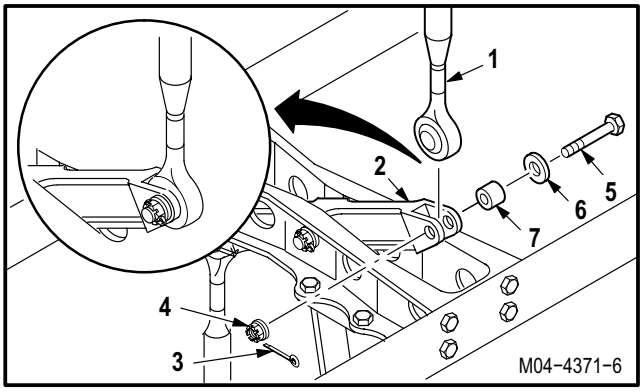
(2) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



c. **Inspect (QA).**

d. **Install transformer-rectifier No. 1** (para 9.30)**.**

e. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.169. DIRECTIONAL F.S. 164.33 PUSH-PULL ROD REMOVAL/INSTALLATION

11.169.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.169.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (2)

Personnel Required:

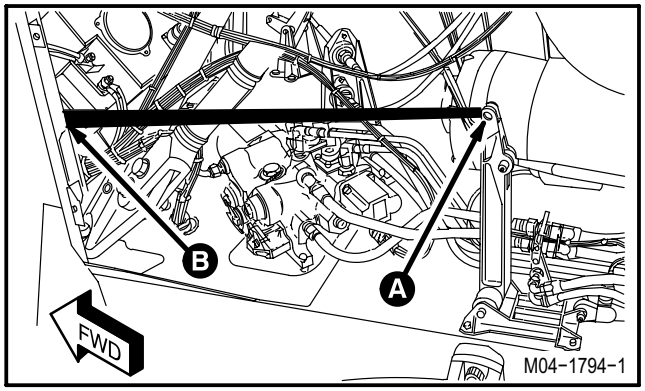
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access panel L200 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



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11.169. DIRECTIONAL F.S. 164.33 PUSH-PULL ROD REMOVAL/INSTALLATION – continued

11.169.3. Removal

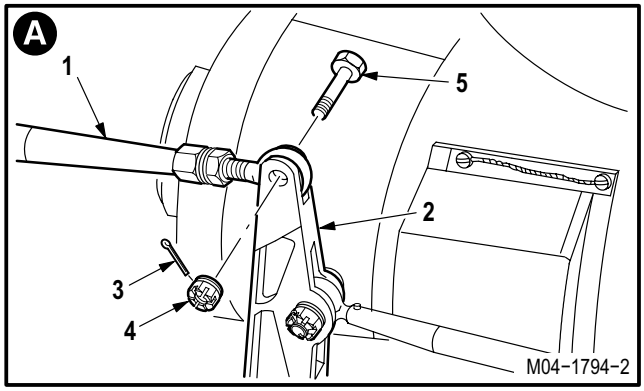
a. **Remove adjustable end of directional control push-pull rod (1) from aft bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5).

(4) Remove rod (1).



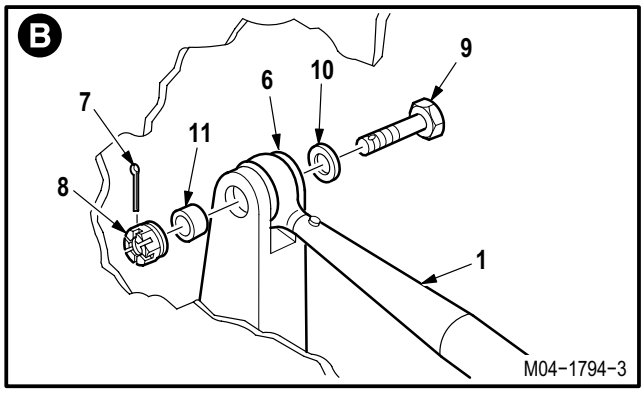
b. **Remove non-adjustable end of rod (1) from forward bellcrank (6).**

(1) Remove and discard cotter pin (7).

(2) Remove nut (8).

(3) Remove bolt (9), washer (10), and bushing (11).

(4) Remove rod (1).



11.169.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.169.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.169. DIRECTIONAL F.S. 164.33 PUSH-PULL ROD REMOVAL/INSTALLATION – continued

11.169.6. Installation

a. **Install non-adjustable end of rod (1) on aft bellcrank (6).** Torque nut (8) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (6).

(2) Install bolt (9) through washer (10), bellcrank (6), and rod (1).

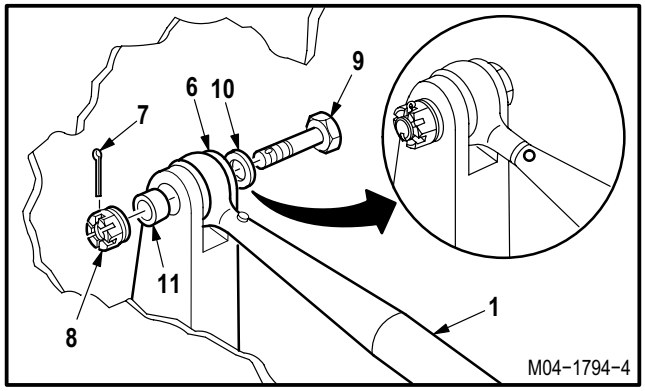
(3) Install bushing (11) in bellcrank (6).

(4) Check fit of self-retaining bolt (9) (para 11.1).

(5) Install nut (8). Torque nut (8) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (7).



b. **Install adjustable end of rod (1) on aft bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Aline rod (1) with bellcrank (2).

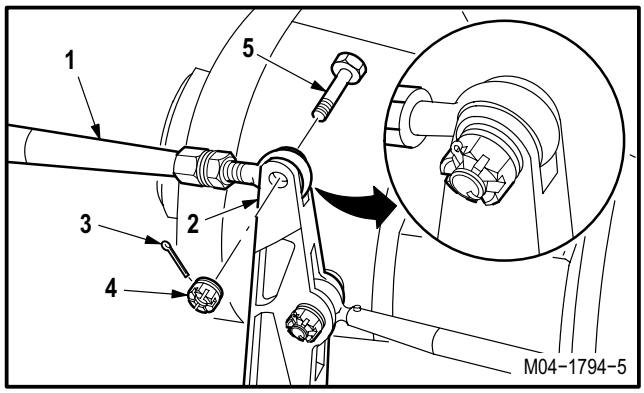
(2) Install bolt (5) through, bellcrank (2), and rod (1).

(3) Check fit of self-retaining bolt (5) (para 11.1).

(4) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (3).



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11.169. DIRECTIONAL F.S. 164.33 PUSH-PULL ROD REMOVAL/INSTALLATION – continued

c. **Inspect (QA).**

d. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

e. **Install access panel L200** (para 2.2)**.**

END OF TASK

11.170. DIRECTIONAL F.S. 164.33 BELLCRANK REMOVAL/INSTALLATION

11.170.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.170.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Cotter pin (3)

Personnel Required:

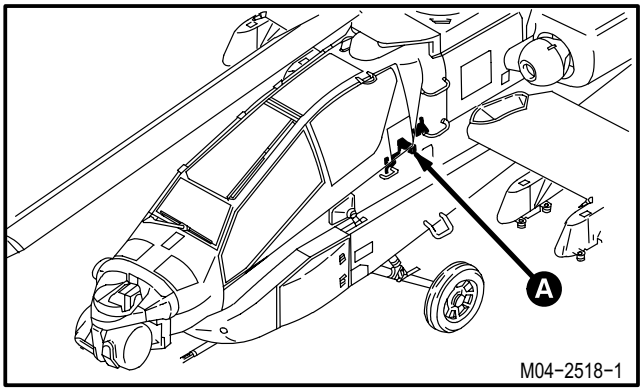
67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

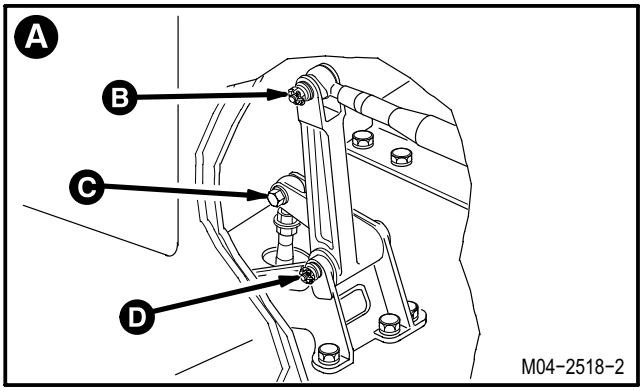
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access panel L200 removed
9.30	Transformer-rectifier No. 1 removed

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.





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11.170. DIRECTIONAL F.S. 164.33 BELLCRANK REMOVAL/INSTALLATION – continued

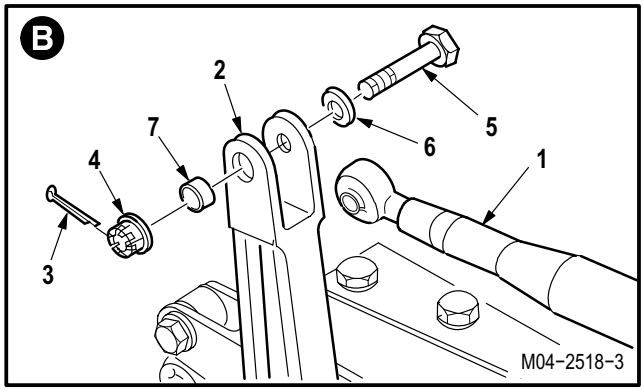
11.170.3. Removal

a. **Remove push-pull rod (1) from directional bellcrank (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4).

(3) Remove bolt (5), washer (6), bushing (7), and rod (1) from bellcrank (2).

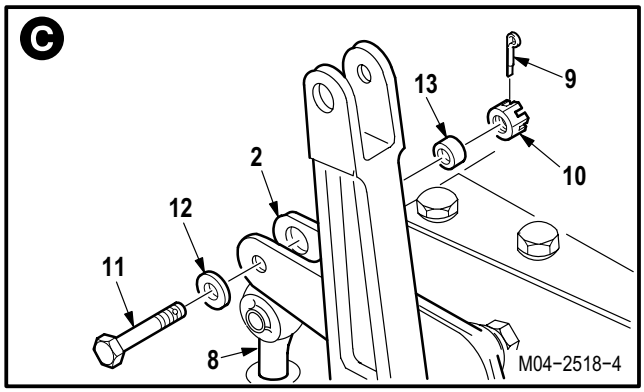


b. **Remove directional push-pull rod (8) from bellcrank (2).**

(1) Remove and discard cotter pin (9).

(2) Remove nut (10).

(3) Remove bolt (11), washer (12), bushing (13), and rod (8) from bellcrank (2).



c. **Secure rod (8) to prevent interference with bellcrank (2) during movement of controls.**

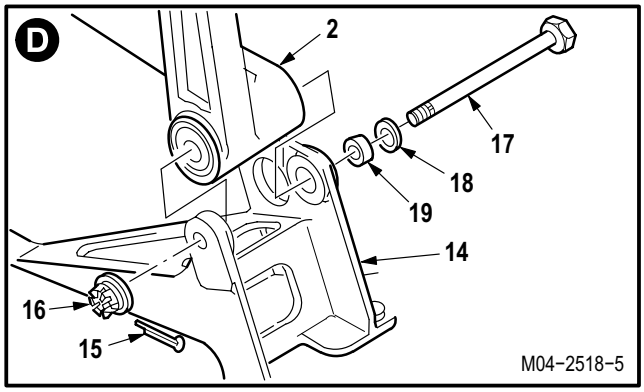
d. **Remove bellcrank (2) from directional bracket (14).**

(1) Remove and discard cotter pin (15).

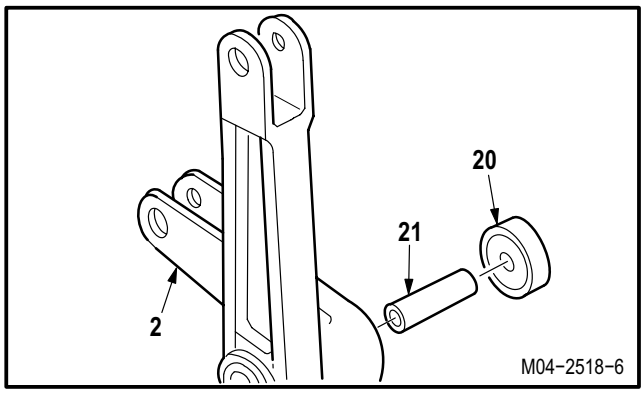
(2) Remove nut (16).

(3) Remove bolt (17), washer (18), and bushing (19) from bellcrank (2) and bracket (14).

(4) Remove bellcrank (2).



e. **Remove bearing (20) and bushing (21).**



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11.170. DIRECTIONAL F.S. 164.33 BELLCRANK REMOVAL/INSTALLATION – continued

11.170.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.170.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

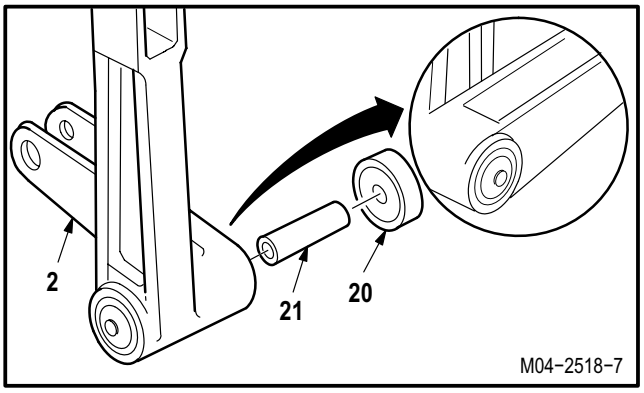
b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.170.6. Installation

a. **Install bushing (21) and bearing (20) in directional bellcrank (2).**



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11.170. DIRECTIONAL F.S. 164.33 BELLCRANK REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control system components, do not use force to aline bellcrank with bracket or to aline push-pull rod with bellcrank.

b. **Install bellcrank (2) in bracket (14).** Torque nut (16) **30 to 40 INCH-POUNDS**.

(1) Position bellcrank (2) in bracket (14).

(2) Aline bolt holes.

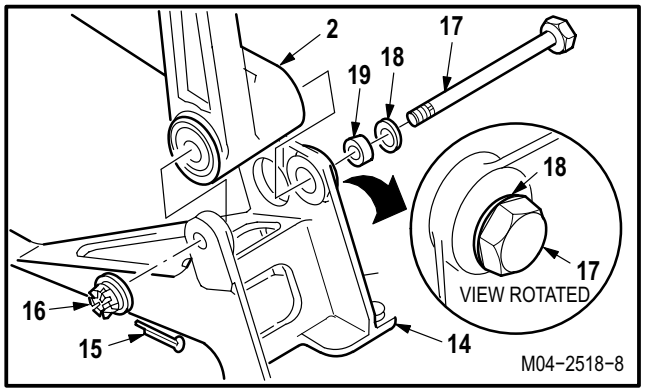
(3) Install bolt (17) through washer (18), bushing (19), bracket (14), and bellcrank (2).

(4) Check fit of self-retaining bolt (17) (para 11.1).

(5) Install nut (16). Torque nut (16) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (15).



c. **Install rod (8) in bellcrank (2).** Torque nut (10) **30 to 40 INCH-POUNDS**.

(1) Position rod (8) in bellcrank (2).

(2) Aline bolt holes.

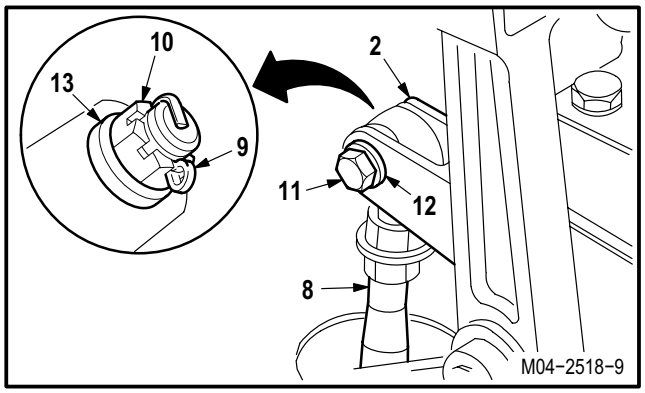
(3) Install bolt (11) through washer (12), bushing (13), bellcrank (2), and rod (8).

(4) Check fit of self-retaining bolt (11) (para 11.1).

(5) Install nut (10). Torque nut (10) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (9).



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11.170. DIRECTIONAL F.S. 164.33 BELLCRANK REMOVAL/INSTALLATION – continued

d. **Install rod (1) in bellcrank (2).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Position rod (1) in bellcrank (2).

(2) Aline bolt holes.

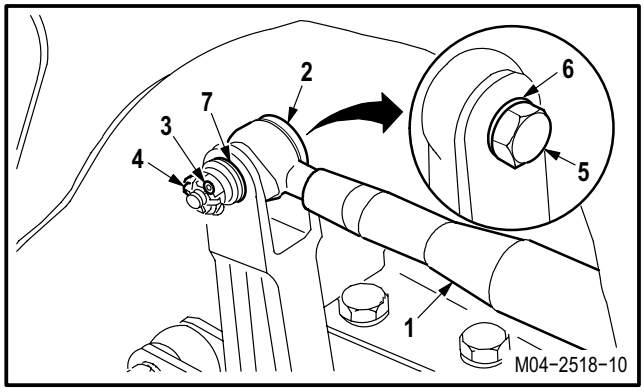
(3) Install bolt (5) through washer (6), bushing (7), bellcrank (2), and rod (1).

(4) Check fit of self-retaining bolt (5) (para 11.1).

(5) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (3).



e. **Inspect (QA).**

f. **Install transformer-rectifier No. 1** (para 9.30)**.**

g. **Install access panel L200** (para 2.2)**.**

h. **Perform directional flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.171. DIRECTIONAL F.S. 164.33 BELLCRANK BRACKET REMOVAL/INSTALLATION

11.171.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.171.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)

References:

TM 1-1520-238-T

Materials/Parts:

Sealing compound (item 174, App F)

Equipment Conditions:

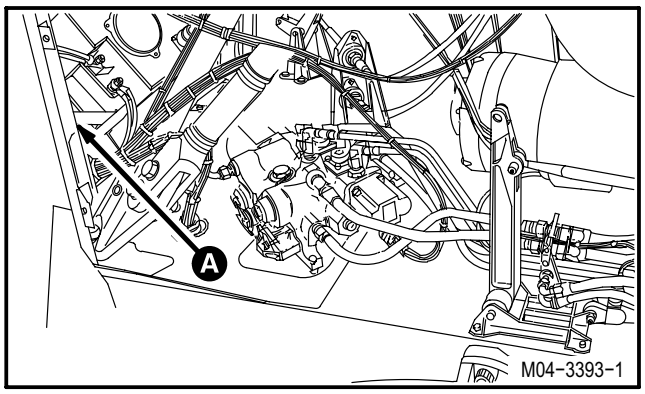
Ref	Condition
1.57	Helicopter safed
11.169	Directional F.S.164.33 push-pull rod removed
11.170	Directional F.S. 164.33 bellcrank removed
10.52A	Forward fuel cell retainer panel removed (if installed)

Personnel Required:

67R	Attack Helicopter Repairer One person to assist
67R3F	Attack Helicopter Repairer/Technical Inspector

WARNING

To prevent injury, maintenance personnel shall be warned before moving controls. If injury occurs, seek medical aid.



11.171.3. Removal

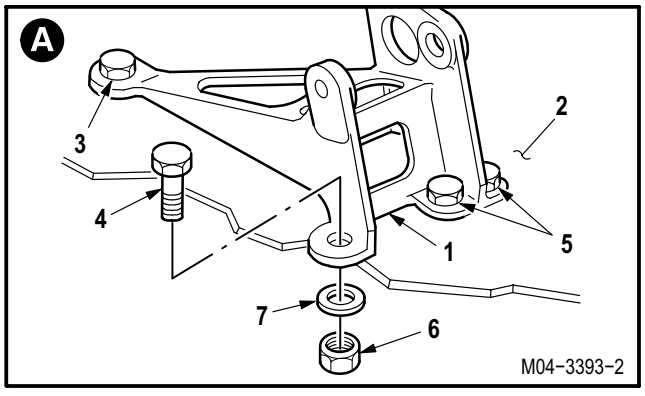
a. **Remove sealing compound from faying surface of bracket (1).**

b. **Remove bracket (1) from deck (2).**

(1) With one person holding bolts (3) and (4), and two bolts (5), remove four nuts (6) and washers (7).

(2) Remove bolts (3), (4), and (5).

(3) Remove bracket (1) from deck (2).



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11.171. DIRECTIONAL F.S. 164.33 BELLCRANK BRACKET REMOVAL/INSTALLATION – continued

11.171.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.171.5. Inspection

a. **Check bracket and deck for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.171.6. Installation

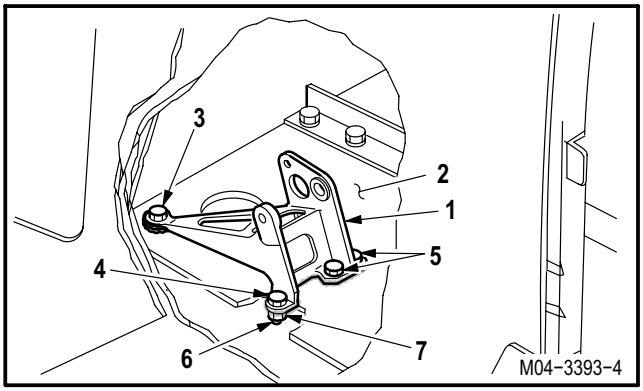
a. **Install bracket (1) on deck (2).**

(1) Aline bracket (1) on deck (2).

(2) Install bolts (3), (4), and two bolts (5) through bracket (1) and deck (2).

(3) With one person holding bolts (3), (4), and (5), install four washers (7) and nuts (6).

(4) Apply sealing compound to faying surface of bracket (16). Use sealing compound (item 174, App F).



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11.171. DIRECTIONAL F.S. 164.33 BELLCRANK BRACKET REMOVAL/INSTALLATION – continued

b. **Inspect (QA).**

c. **If removed install forward fuel cell retainer panel** (para 10.52A)**.**

d. **Install directional F.S. 164.33 bellcrank** (para 11.170)**.**

e. **Install directional F.S. 164.33 push-pull rod** (para 11.169)**.**

f. **Perform directional flight control rigging operational check** (TM 1-1520-238-T)**.**

END OF TASK

11.172. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION

11.172.1. Description

This task covers: Removal Cleaning. Inspection. Installation.

11.172.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Materials/Parts:

Cotter pin (2)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

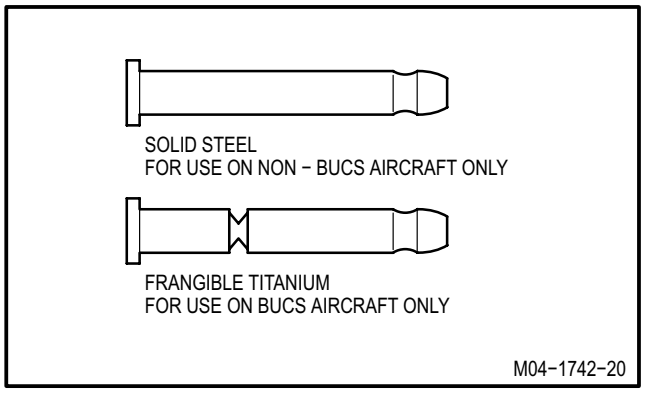
Ref	Condition
1.57	Helicopter safed
2.2	Access panel R200 removed
11.46	Pilot cyclic stick cover removed
1.72	External primary hydraulic power applied
2.161	Pilot seat removed
13.28	Air duct No. 21 removed

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible-type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.

CAUTION

To prevent damage to flight control system components, do not use force if binding or roughness occurs while moving controls with hydraulic power.



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11.172. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION – continued

11.172.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

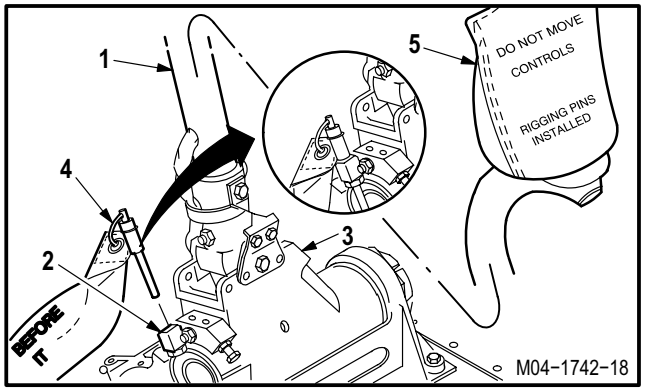
b. **Slowly position stick (1) to aline longitudinal rig pin hole (2) in cyclic stick base (3).**

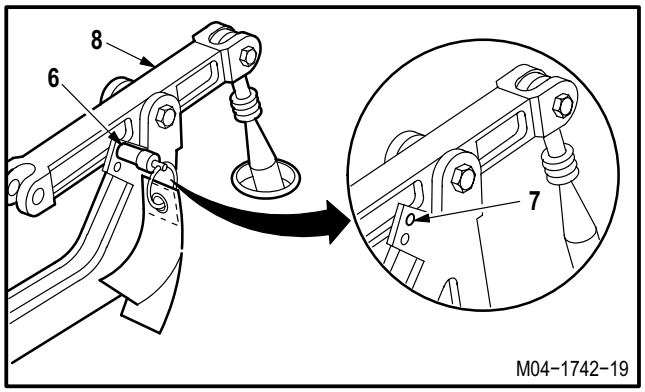
c. **Install -9 rig pin (4) into rig pin hole (2) in cyclic stick base (3).**

d. **Install cyclic stick warning cover (5).**

e. **Install -9 rig pin (6) in midstroke rig pin hole (7) in longitudinal FS165 bellcrank (8).**

f. **Remove external primary hydraulic power** (para 1.72)**.**





g. **Remove access door (9) from pilot floor (10).**

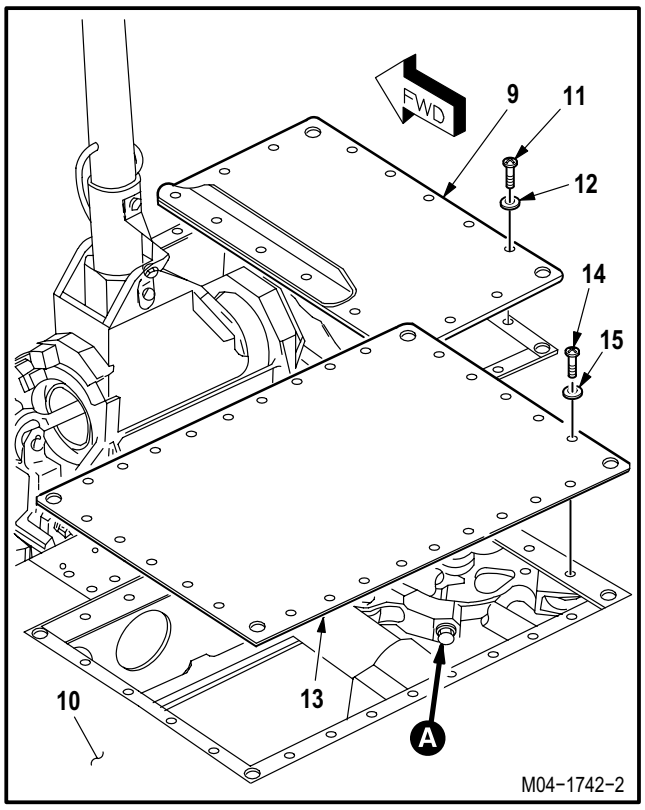
(1) Remove 16 screws (11) and washers (12) from floor (10).

(2) Remove door (9).

h. **Remove access door (13) from floor (10).**

(1) Remove 28 screws (14) and washers (15).

(2) Remove door (13).



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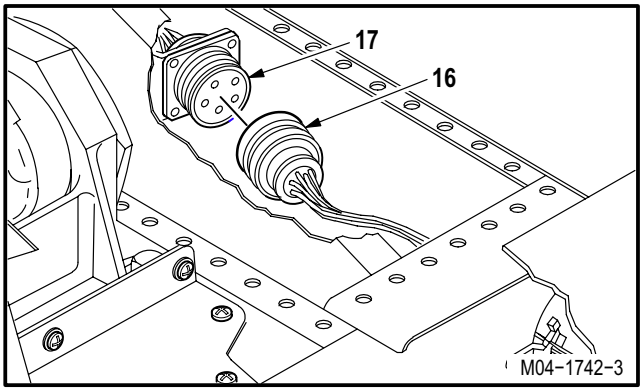
11.172. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION – continued

i. **Detach connector (A334)P1 (16) from receptacle J271 (17).**

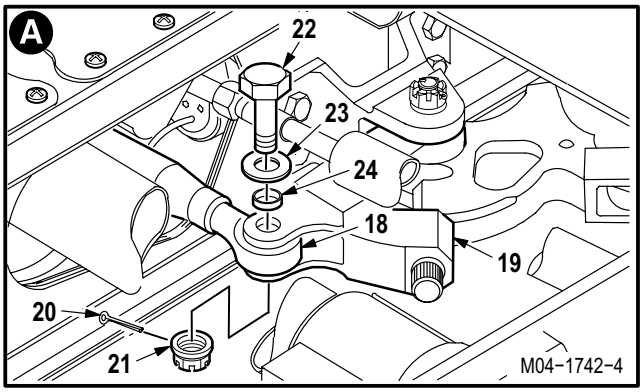


j. **Remove longitudinal F.S. 130 push-pull rod (18) from SPAD (19).**

(1) Remove cotter pin (20).

(2) Remove nut (21).

(3) Remove bolt (22), washer (23), bushing (24), and rod (18) from SPAD (19).

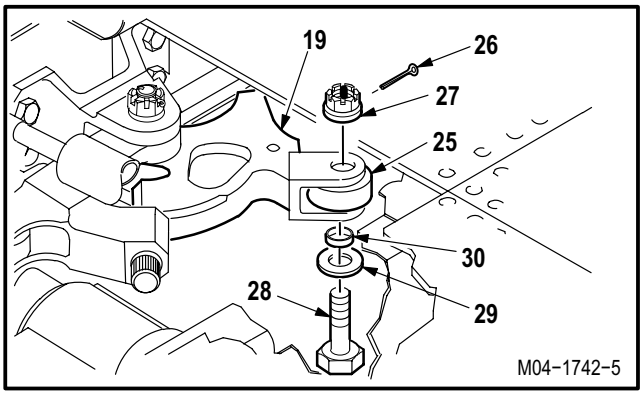


k. **Remove longitudinal F.S. 137 push-pull rod (25) from SPAD (19).**

(1) Remove and discard cotter pin (26).

(2) Remove nut (27).

(3) Remove bolt (28), washer (29), bushing (30), and rod (25) from SPAD (19).



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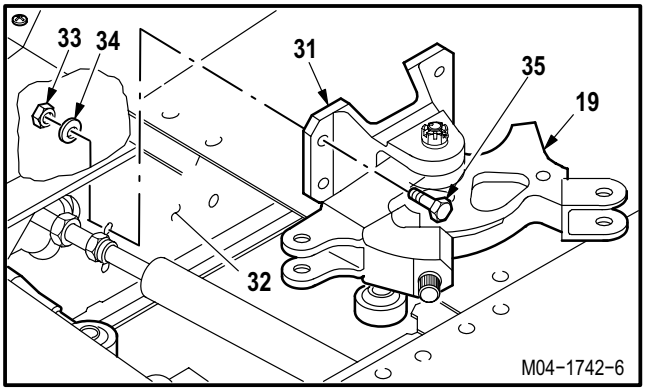
11.172. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION – continued

l. **Remove SPAD (19) and bracket (31) from structure (32).**

(1) Remove four nuts (33) and washers (34).

(2) Support SPAD (19) and remove four bolts (35) from bracket (31).

(3) Remove SPAD (19) and bracket (31).



11.172.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.172.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

e. **Check bracket for damage and wear.**

(1) Damage within 1-1/2 times bolt mounting holes bore diameter is not to exceed 10 percent of the material thickness or **0.040 INCH**, whichever is less.

(2) Damage in bulkhead of deck attachment area is not to exceed 25 percent of the item area and no more than 20 percent of material thickness after repair.

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11.172. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION – continued

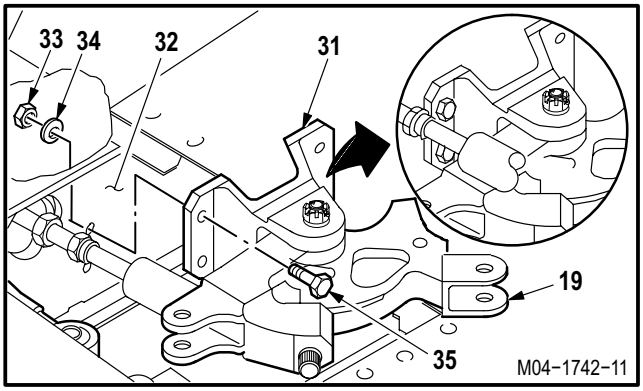
11.172.6. Installation

a. **Install SPAD (19) and bracket (31) on structure (32).**

(1) Aline bracket (31) on structure (32).

(2) Install four bolts (35) through bracket (31) and structure (32).

(3) Install four washers (34) and nuts (33).



b. **Install rod (25) on SPAD (19).** Torque nut (27) **30 to 40 INCH-POUNDS**.

(1) Aline rod (25) with SPAD (19).

(2) Install bushing (30).

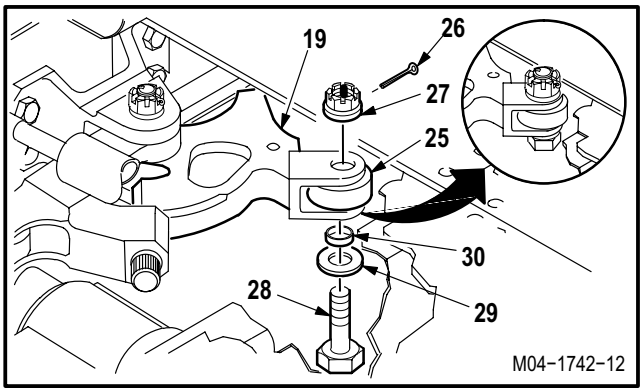
(3) Install bolt (28) through washer (29), bushing (30), SPAD (19), and rod (25).

(4) Check fit of self-retaining bolt (28) (para 11.5).

(5) Install nut (27). Torque nut (27) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (26).



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11.172. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) REMOVAL/INSTALLATION – continued

c. **Install rod (18) on SPAD (19).** Torque nut (21) **30 to 40 INCH-POUNDS**.

(1) Aline rod (18) with SPAD (19).

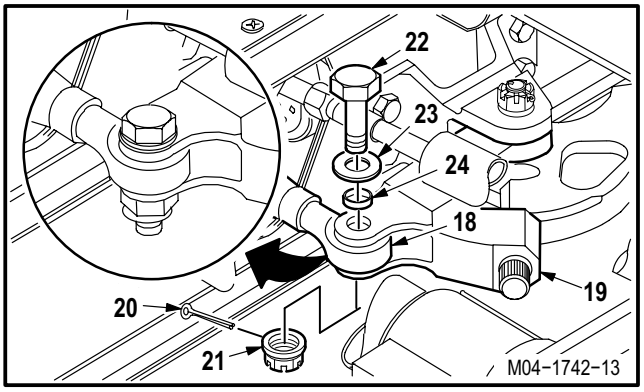
(2) Install bolt (22) through washer (23), bushing (24), SPAD (19), and rod (18).

(3) Check fit of self-retaining bolt (22) (para 11.5).

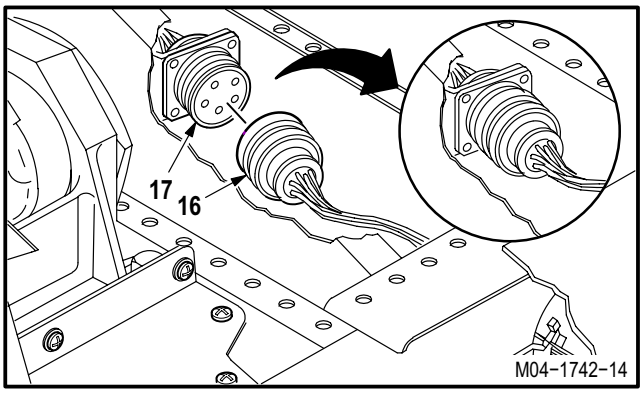
(4) Install nut (21). Torque nut (21) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (20).



d. **Attach connector (A334)P1 (16) to receptacle J271 (17).**



e. **Inspect (QA).**

f. **Perform longitudinal flight control rigging maintenance operational check** (TM 1-1520-238-T)**.**

g. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

h. **Install door (13) on floor (10).**

(1) Install 28 screws (14) and washers (15).

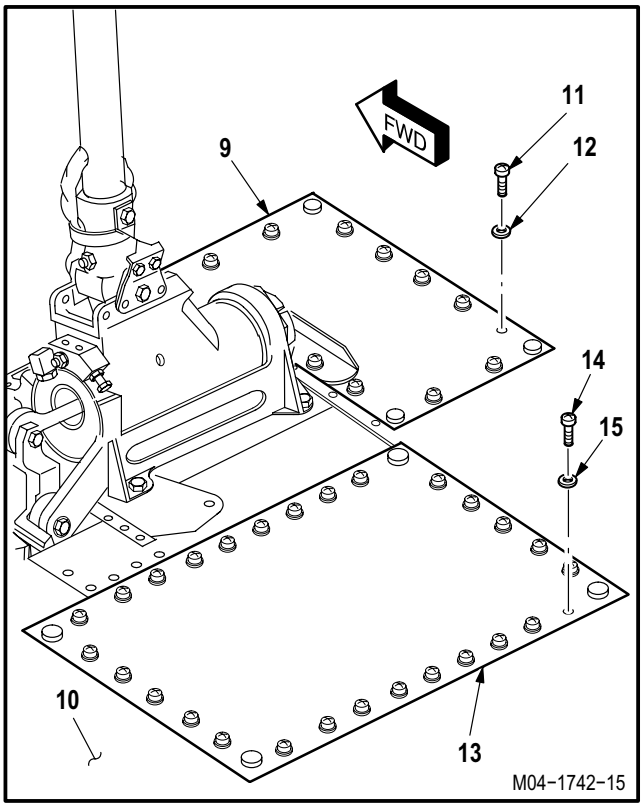
i. **Install door (9) on floor (10).**

(1) Install 16 screws (11) and washers (12).

j. **Install air duct No. 21** (para 13.28)**.**

k. **Install pilot seat** (para 2.161)**.**

l. **Install access panel R200** (para 2.2)**.**



END OF TASK

11.173. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT

11.173.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.173.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

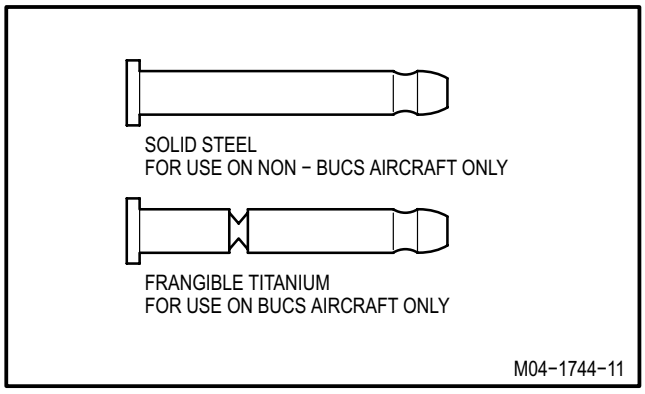
Ref	Condition
1.57	Helicopter safed
11.46	Pilot cyclic stick cover removed
2.161	Pilot seat removed

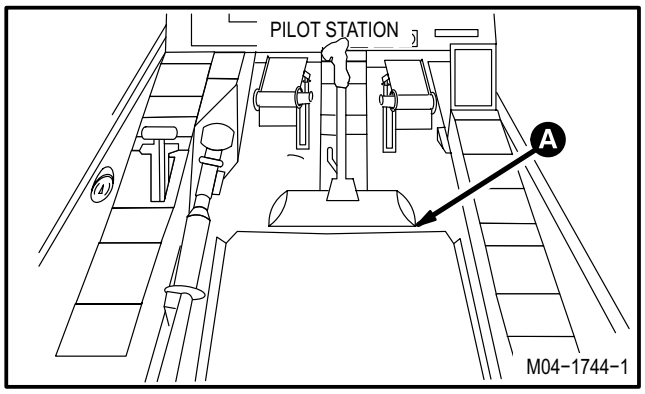
Materials/Parts:

Cotter pin
Petrolatum (item 138, App F)
Wire (item 220, App F)

WARNING

Installation of a solid steel shear pin in a BUCS-equipped aircraft will render the BUCS system inoperative. Installation of a frangible-type shear pin in an aircraft not equipped with BUCS may result in loss of flight controls and possible loss of aircraft.





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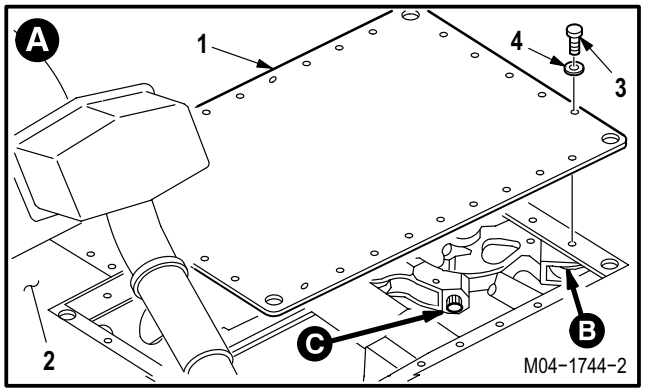
11.173. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT – continued

11.173.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **Remove access door (1) from pilot floor (2).**

(1) Remove 28 screws (3) and washers (4).

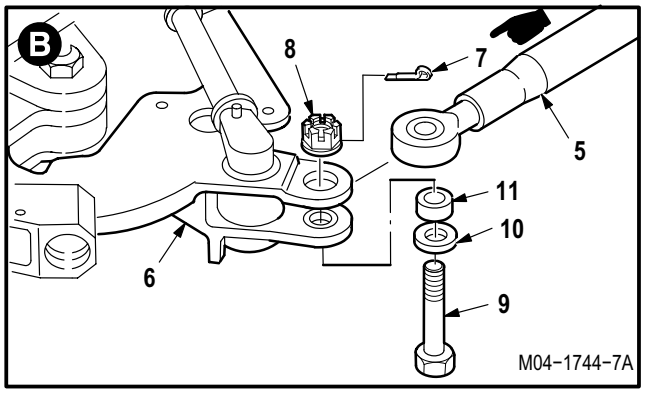


c. **Remove longitudinal F.S. 137.20 push-pull rod (5) from SPAD (6).**

(1) Remove and discard cotter pin (7).

(2) Remove nut (8).

(3) Remove bolt (9), washer (10), bushing (11), and rod (5) from SPAD (6).



NOTE

If a shear pin(s) cannot be removed by conventional means, after repeated attempts from any of the SPAD assemblies (CPG or pilot), deliberately shearing the pin is permitted. Ensure the ends of the pins are removed.

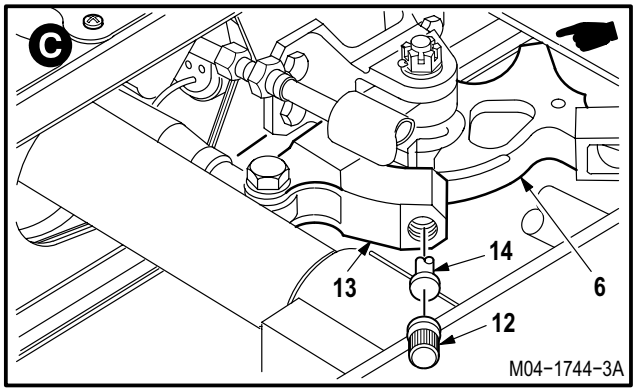
d. **Remove retainer (12) from lever (13).**

(1) Remove lockwire.

(2) Remove retainer (12).

NOTE

Shear pin must be removed in pieces if sheared.



e. **Remove shear pin half (14) from lever (13).**

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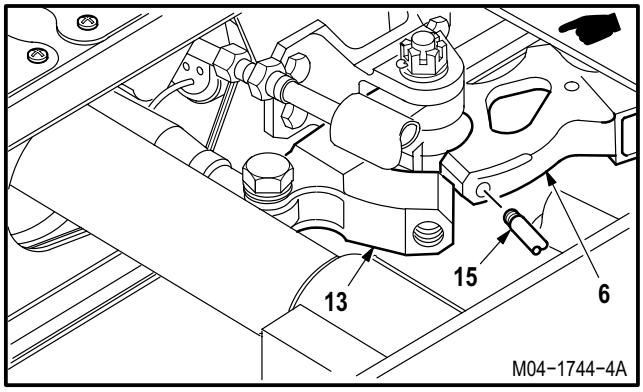
11.173. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT – continued

f. **Remove shear pin half (15) from SPAD (6).**

(1) Move lever (13) to allow access to shear pin half (15).

(2) Remove shear pin half (15) from SPAD (6).



11.173.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.173.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

e. **Check retainer for damaged threads.** None allowed.

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11.173. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT – continued

11.173.6. Installation

a. **Lubricate tapered end of shear pin (16).** Use petrolatum (item 138, App F).

b. **Install new shear pin (16) through lever (13) and SPAD (6).**

(1) Aline SPAD (6) with lever (13).

(2) Ensure that detent (17) and positioning lever (18) are engaged.

(3) Insert shear pin (16) through lever (13) and SPAD (6).

NOTE

Install retainer finger-tight.

c. **Install retainer (12) on lever (13).**

(1) Lockwire retainer (12) to lever (13). Use wire (item 220, App F).

d. **Install rod (5) on SPAD (6).** Torque nut (8) **30 to 40 INCH-POUNDS**.

(1) Aline rod (5) with SPAD (6).

(2) Install bushing (11).

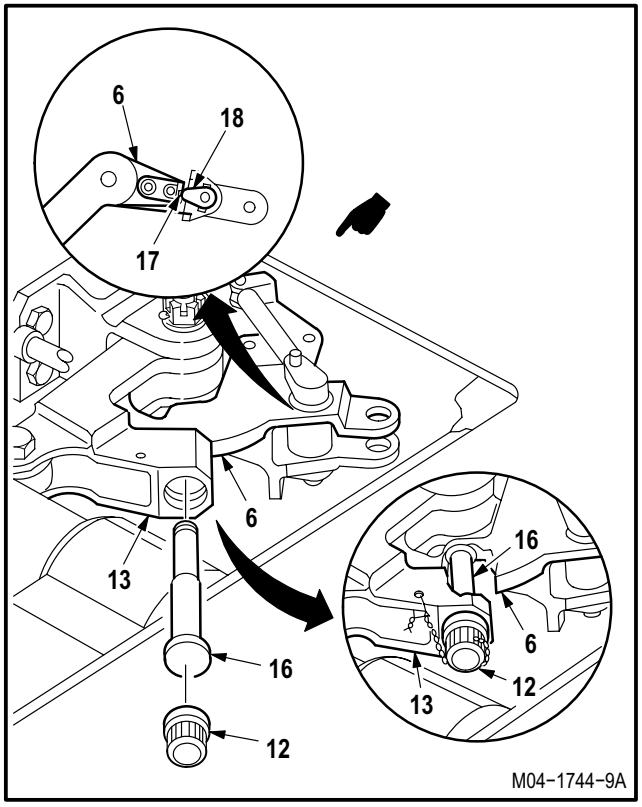
(3) Install bolt (9) through washer (10), bushing (11), SPAD (6), and rod (5).

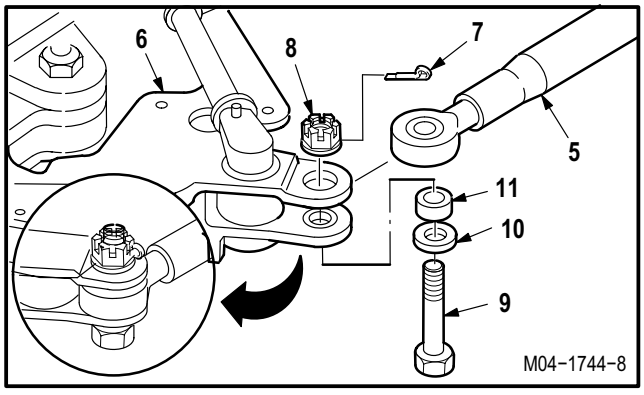
(4) Check fit of self-retaining bolt (9) (para 11.1).

(5) Install nut (8). Torque nut (8) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (7).





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11.173. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) SHEAR PIN REPLACEMENT – continued

e. **Inspect (QA).**

f. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

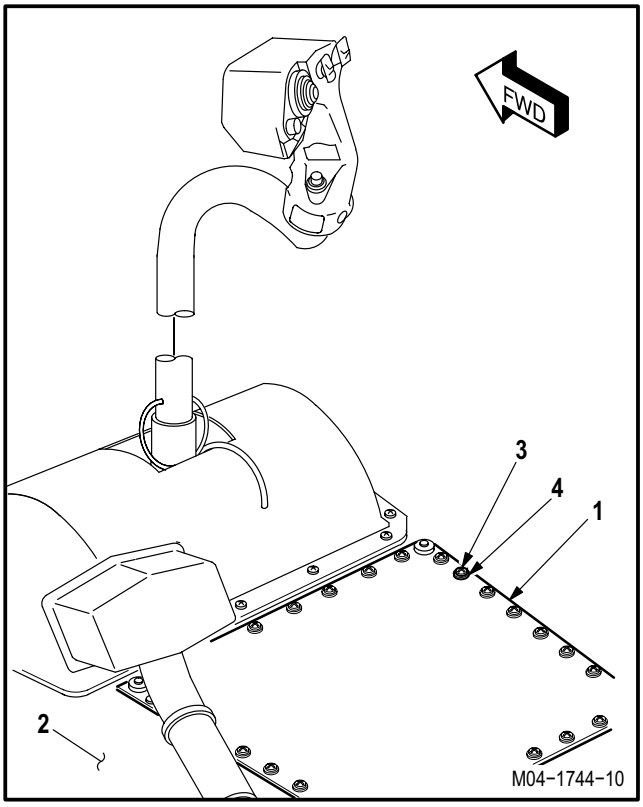
g. **Perform DASE maintenance operational check** (TM 1-1520-238-T)**.**

h. **Install access door (1) on pilot floor (2).**

(1) Install 28 screws (3) and washers (4).

i. **Install pilot cyclic stick cover** (para 11.46)**.**

j. **Install pilot seat** (para 2.161)**.**



END OF TASK

11.174. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.174.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.174.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Airframe repairman's tool kit (item 377, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
30 - 150 inch-pound 3/8-inch drive click type torque wrench (item 441, App H)

Materials/Parts:

Cotter pin (3)
Shear rivet MS20470AD3 (2)
Adhesive (item 19, App F)
Brush (item 34, App F)
Cloth (item 52, App F)
Naphtha (item 127, App F)
Wire (item 224, App F)

Personnel Required:

67R Attack Helicopter Repairer
68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1500-204-23

Equipment Conditions:

Ref	Condition
11.64	Pilot longitudinal SPAD switch removed
11.173	Pilot longitudinal SPAD shear pin removed

11.174.3. Disassembly

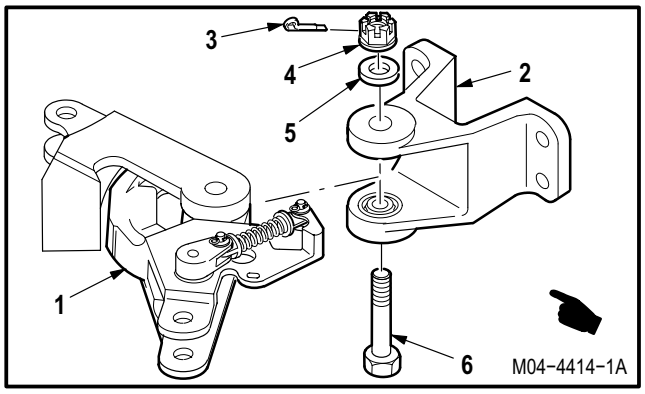
a. **Remove SPAD (1) from bracket (2).**

(1) Remove and discard cotter pin (3).

(2) Remove nut (4) and washer (5).

(3) Remove bolt (6).

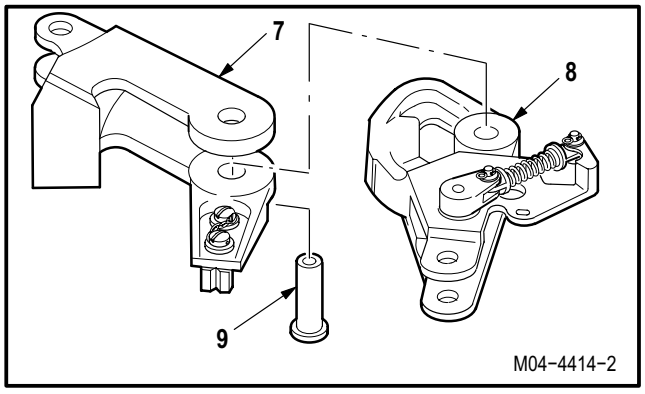
(4) Remove spad (1).



b. **Remove outer lever (7) from inner lever (8).**

(1) Remove bushing (9) from lever (7) and (8).

(2) Remove lever (7).



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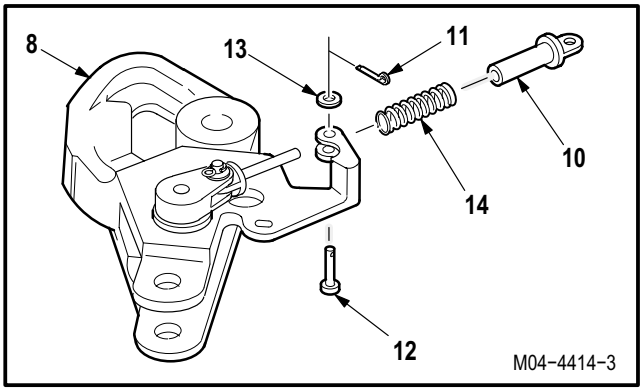
11.174. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

c. **Remove external spring guide (10) from lever (8).**

(1) Remove and discard cotter pin (11).

(2) Remove pin (12) and washer (13).

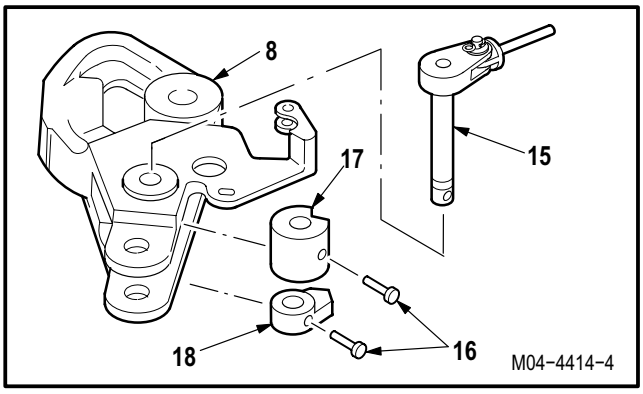
(3) Remove guide (10) and spring (14).



d. **Remove actuator switch shaft (15) from lever (8).**

(1) Remove two rivets (16) from cam (17) and lever (18) (TM 1-1500-204-23).

(2) Remove lever (18), cam (17), and shaft (15).

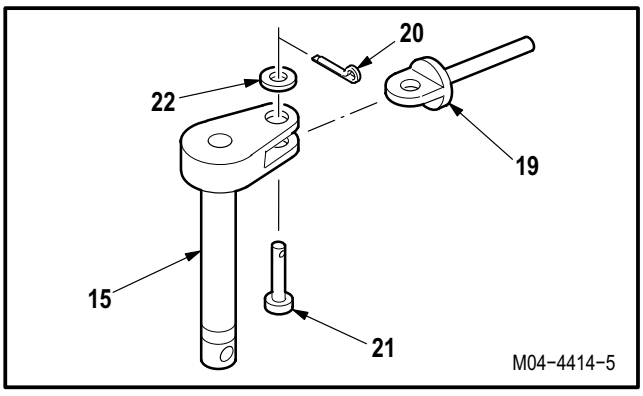


e. **Remove internal spring guide (19) from shaft (15).**

(1) Remove and discard cotter pin (20).

(2) Remove pin (21) and washer (22).

(3) Remove guide (19).



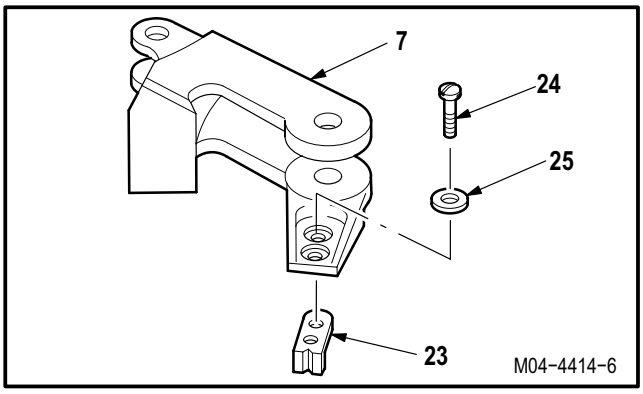
f. **Remove adhesive from faying surfaces of detent (23) and lever (7).**

g. **Remove detent (23) from lever (7).**

(1) Remove lockwire.

(2) Remove two screws (24) and washers (25) from lever (7) and detent (23).

(3) Remove detent (23).



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11.174. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.174.4. Cleaning

a. **Clean removed and attaching parts or surfaces** (para 1.47)**.**

11.174.5. Inspection

a. **Check arms and lever for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

b. **Check cam for gouges.**

(1) Maximum gouge depth is **0.025 INCH** and is acceptable if no material is raised above surrounding surface.

c. **Check removed and attaching parts for cracks.** None allowed.

d. **Check removed and attaching parts for damage** (para 11.5)**.**

e. **Check removed and attaching parts for corrosion** (para 1.49)**.**

f. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

g. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

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11.174. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.174.6. Assembly

NOTE

Detent will be secured and adjusted when SPAD switch is installed.

a. **Install detent (23) on lever (7).**

(1) Clean faying surfaces of detent (23) and lever (7) until free of contamination. Use naphtha (item 127, App F) and cloth (item 52, App F).

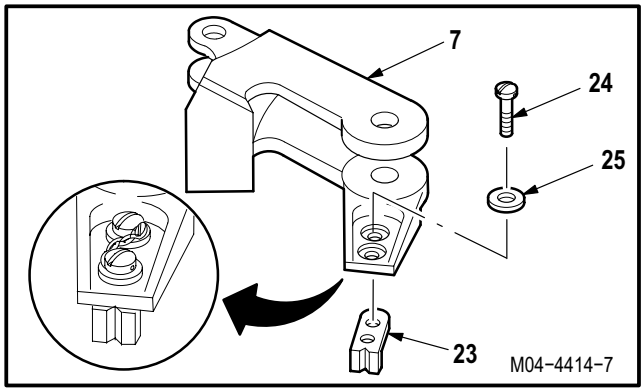
(2) Apply a thin uniform coat of adhesive to faying surfaces of detent (23) and lever (7). Use adhesive (item 19, App F) and brush (item 34, App F).

(3) Position detent (23) on lever (7) mating surface and press firmly together.

(4) Allow adhesive to air dry **36 HOURS** minimum before handling and **72 HOURS** minimum before applying load.

(5) Install two screws (24) through washers (25), and lever (7) into detent (23).

(6) Lockwire two screws (24) together. Use wire (item 224, App F).



CAUTION

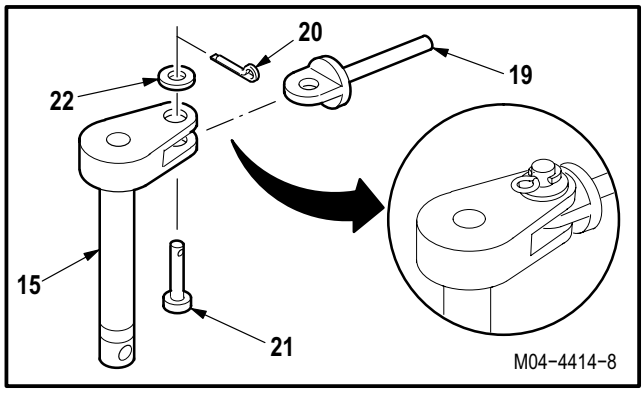
Ensure that pin is no longer than **0.453 INCH**. A longer pin may interfere with SPAD assembly function.

b. **Install guide (19) on shaft (15).**

(1) Position guide (19) on shaft (15).

(2) Install pin (21) through shaft (15), guide (19), and washer (22).

(3) Install new cotter pin (20).



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11.174. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

c. **Install shaft (15) on lever (8).**

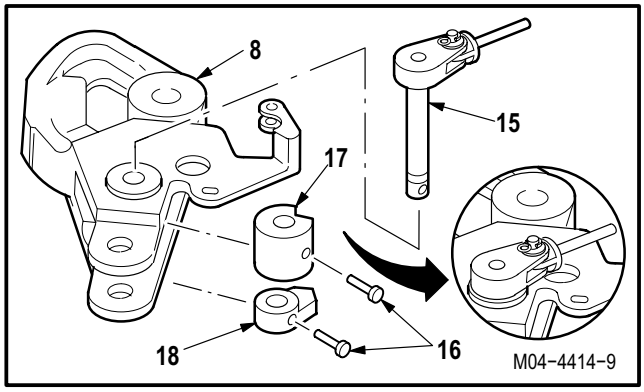
(1) Install shaft (15) through lever (8), cam (17), and lever (18).

NOTE

Ensure shaft arm, cam valley, and lever tip are facing same direction.

(2) Aline cam (17) and lever (18) with holes in shaft (15).

(3) Install two new rivets (16) on cam (17) and lever (18) (TM 1-1500-204-23).



CAUTION

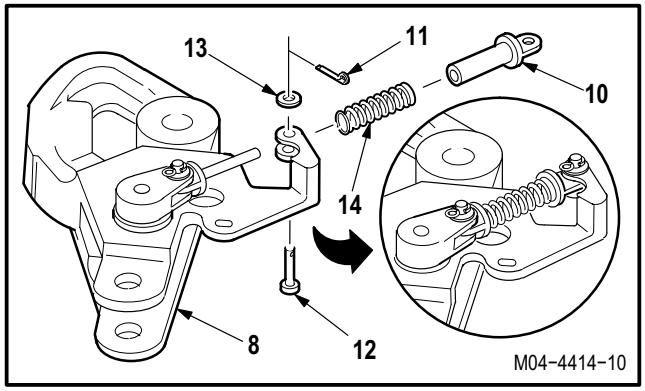
Ensure that pin is no longer than **0.453 INCH**. A longer pin may interfere with SPAD assembly function.

d. **Install guide (10) on lever (8).**

(1) Install spring (14) and guide (10) on lever (8).

(2) Install pin (12) through lever (8), guide (10), and washer (13).

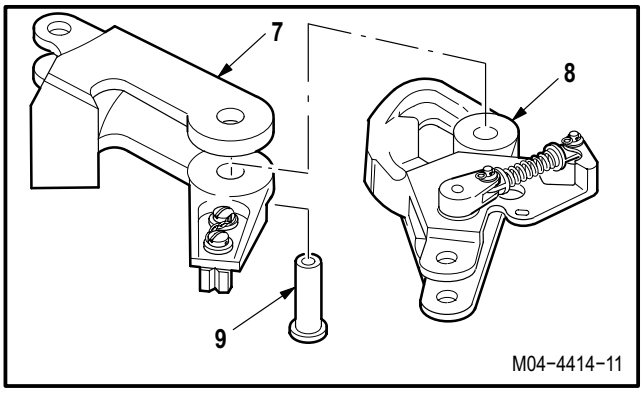
(3) Install new cotter pin (11).



e. **Install lever (7) on lever (8).**

(1) Position lever (7) on lever (8).

(2) Install bushing (9) through levers (7) and (8).



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11.174. PILOT LONGITUDINAL SHEAR PIN ACTIVATED DECOUPLER (SPAD) ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

f. **Install bracket (2) on SPAD (1).** Torque nut (4) **30 to 40 INCH-POUNDS**.

(1) Position bracket (2) on SPAD (1).

(2) Install bolt (6) through bracket (2), washer (5).

(3) Install nut (4). Torque nut (4) to **30 INCH-POUNDS**. Use torque wrench.

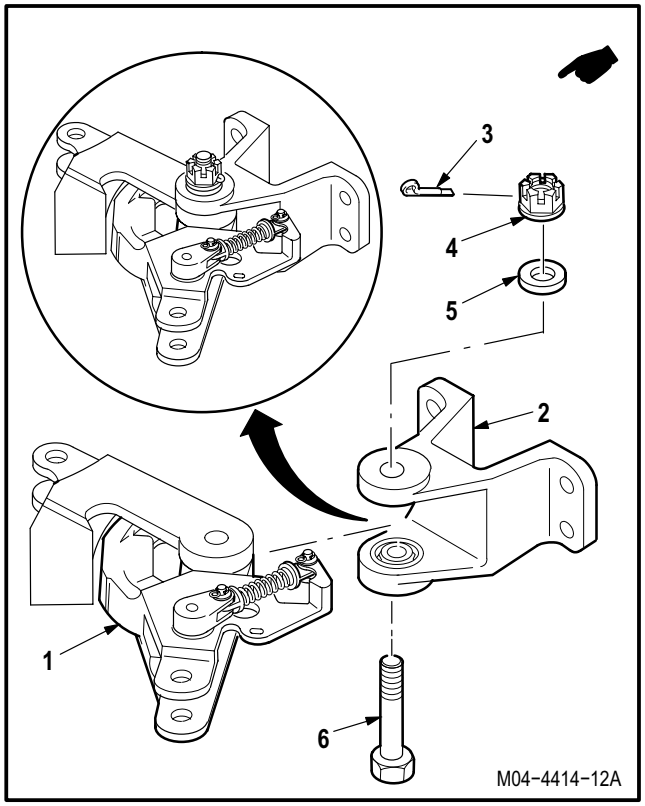
(4) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(5) Install new cotter pin (3).

g. **Inspect (QA).**

h. **Install pilot longitudinal SPAD switch** (para 11.64)**.**

i. **Install pilot longitudinal SPAD shear pin** (para 11.173)**.**



END OF TASK

11.175. PILOT PEDAL ADJUST HANDLE SUPPORT ASSEMBLY REMOVAL/INSTALLATION

11.175.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.175.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

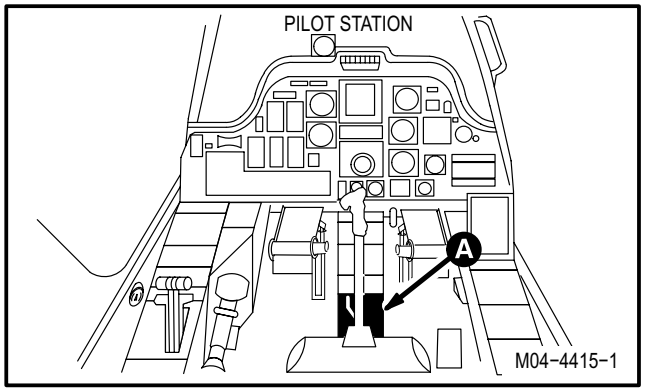
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

Cotter pin

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed



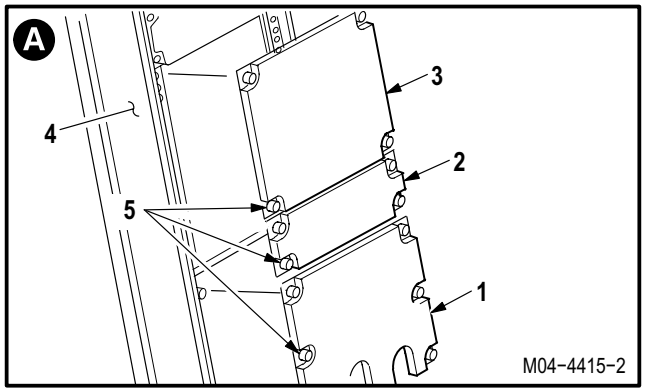
11.175.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **Remove cover plates (1), (2), and (3) from center console (4).**

(1) Release 12 fasteners (5).

(2) Remove plates (1), (2), and (3) from console (4).



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11.175. PILOT PEDAL ADJUST HANDLE SUPPORT ASSEMBLY REMOVAL/INSTALLATION – continued

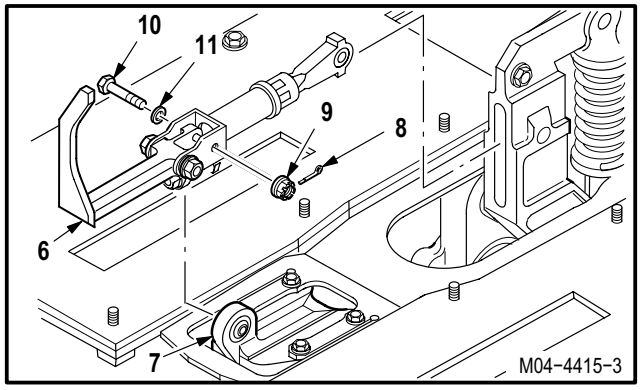
c. **Remove pedal adjust handle (6) from support assembly (7).**

(1) Remove and discard cotter pin (8).

(2) Remove nut (9).

(3) Remove bolt (10) and washer (11) from handle (6) and support (7).

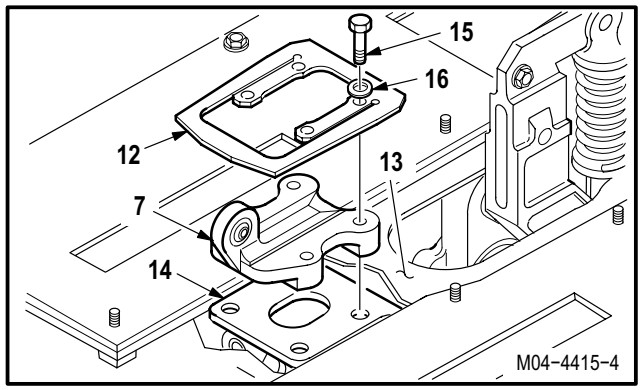
(4) Remove handle (6).



d. **Remove pedal engagement spring (12) and support (7) from floor (13) and directional SPAD bracket (14).**

(1) Remove four bolts (15) and washers (16).

(2) Remove spring (12) and support (7).



11.175.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.175.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.232)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.232)**.**

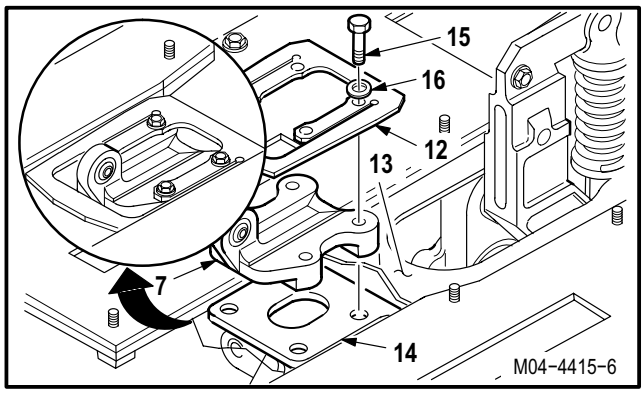
d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.232)**.**

11.175.6. Installation

a. **Install support (7) and spring (12) on bracket (14).**

(1) Aline support (7) and spring (12) with bracket (14) and floor (13).

(2) Install four bolts (15) through washers (16), spring (12), support (7), floor (13), and bracket (14).



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11.175. PILOT PEDAL ADJUST HANDLE SUPPORT ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install pedal adjust handle (6) on support (7).** Torque nut (9) to **30 to 40 INCH-POUNDS**.

(1) Aline handle (6) on support (7).

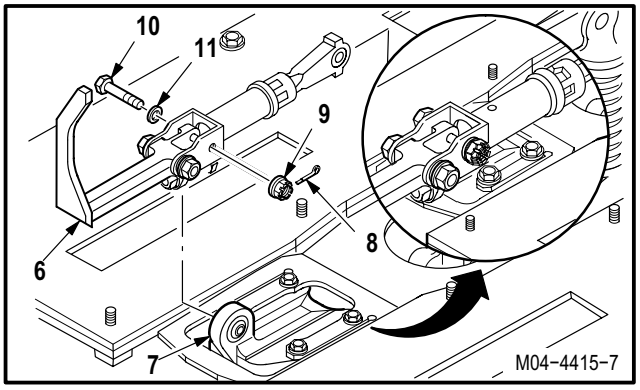
(2) Install bolt (10) through washer (11), handle (6), and support (7).

(3) Check fit of self-retaining bolt (10) (para 11.1).

(4) Install nut (9). Torque nut (9) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (8).

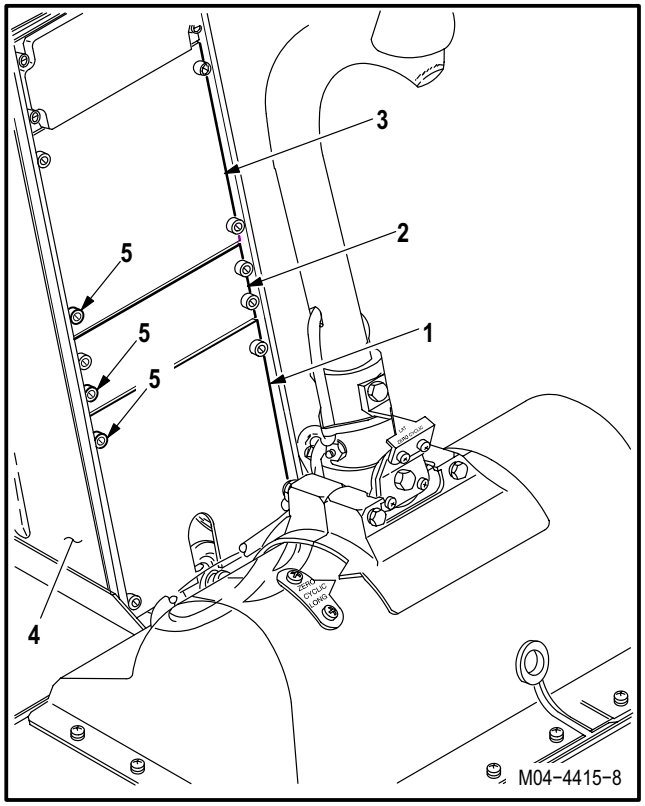


c. **Install cover plates (1), (2), and (3) on center console (4).**

(1) Aline plates (1), (2), and (3) on console (4).

(2) Secure 12 fasteners (5).

d. **Inspect (QA).**



END OF TASK

11.176. DIRECTIONAL MAGNETIC BRAKE REMOVAL/INSTALLATION

11.176.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.176.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
Industrial faceshield (item 129, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
Flight control rigging kit (item 267, App H)

References:

TM 1-1520-238-T
TM 9-1090-208-23

Materials/Parts:

Sealing compound (item 176, App F)

Personnel Required:

67R Attack Helicopter Repairer
Two persons to assist
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Gun turret removed
	Roller chute and sprocket chute removed

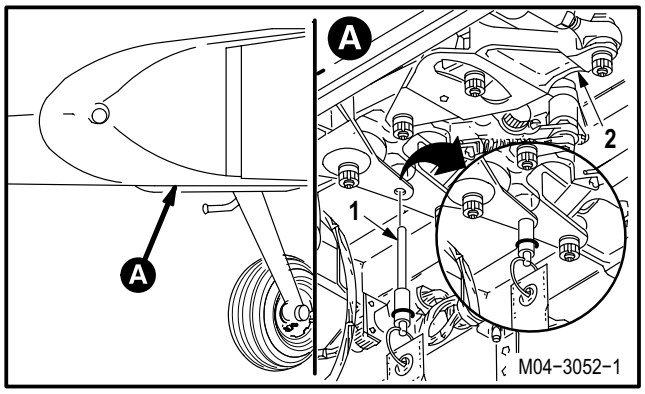
11.176.3. Removal

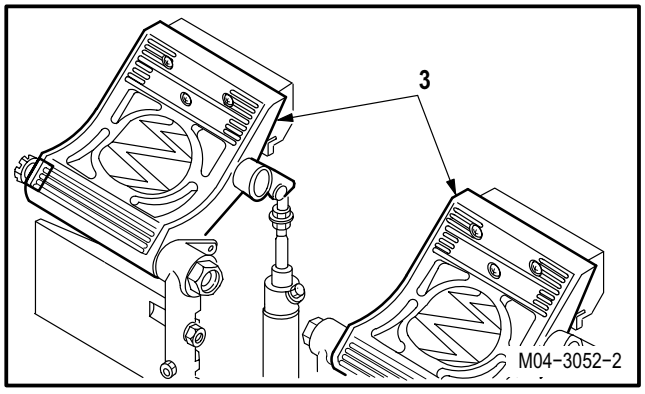
a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **Install -9 rig pin (1) in pilot directional SPAD (2).** Use flight control rigging kit.

(1) Slowly move pilot directional pedals (3) to aline rig pin holes in SPAD (2).

(2) Install rig pin (1) in SPAD (2).





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11.176. DIRECTIONAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

c. **Remove covers (4) and (5).**

(1) Remove sealant from faying surface of covers (4) and (5).

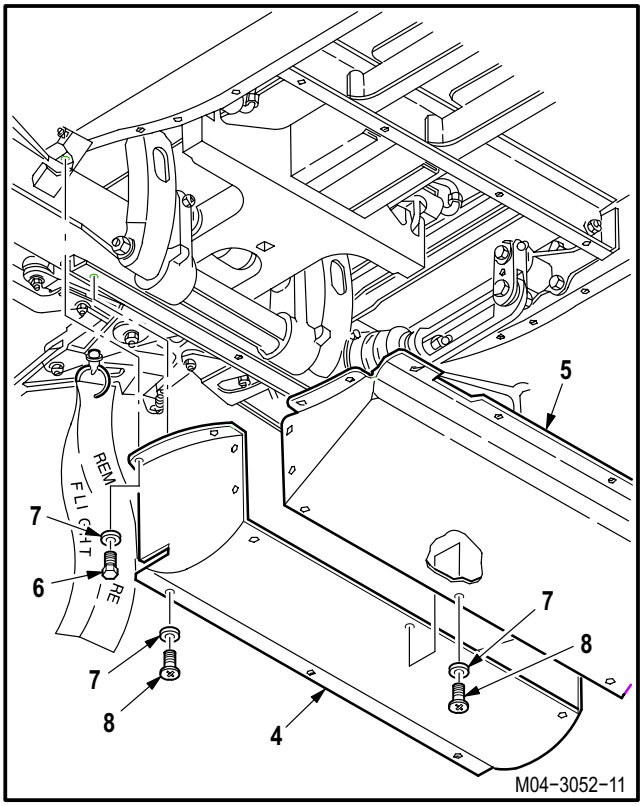
(2) Remove bolt (6) and washer (7).

(3) Remove 15 screws (8) and washers (7).

(4) Remove cover (5).

(5) Remove nine screws (8) and washers (7).

(6) Remove cover (4).

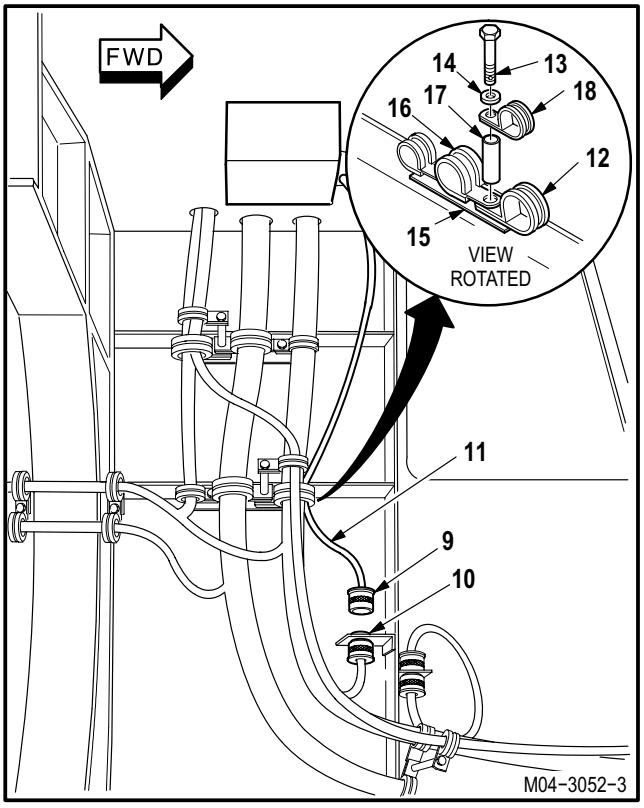


d. **Detach connector L21 (9) from receptacle J1048 (10).**

e. **Remove harness (11) from clamp (12).**

(1) Remove screw (13) and washer (14) from bracket (15), clamp (16), clamp (12), spacer (17) and clamp (18).

(2) Remove harness (11) from clamp (12).



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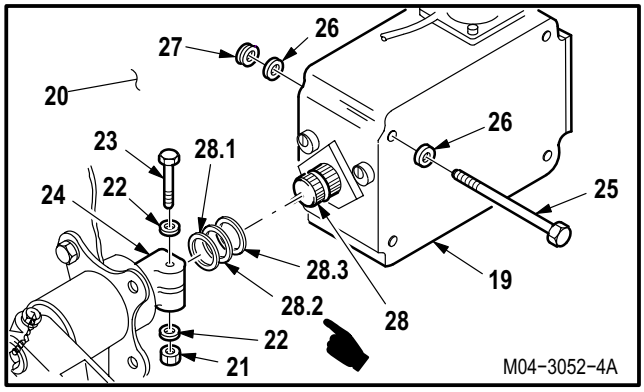
11.176. DIRECTIONAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

f. **Remove magnetic brake (19) from pilots floor (20).**



NOTE

Identify position of laminated washers for proper placement during installation.

(1) Remove nut (21) and washers (22) from bolt (23).

(2) Remove bolt (23) and washers (22) from bell-crank shaft (24).

(3) Remove four bolts (25), outside washers (26), inside washers (26), and laminated washers (27).

(4) Slide brake shaft (28) out of shaft (24).

(5) Remove brake (19).

NOTE

Identify position of shim and spacer rings for proper placement during installation.

(6) Remove shim (28.1), spacer rings (28.2) and (28.3) from shaft (28).

11.176.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.176.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.176. DIRECTIONAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

11.176.6. Installation

a. **Establish midpoint (29) of shaft (28) travel.**

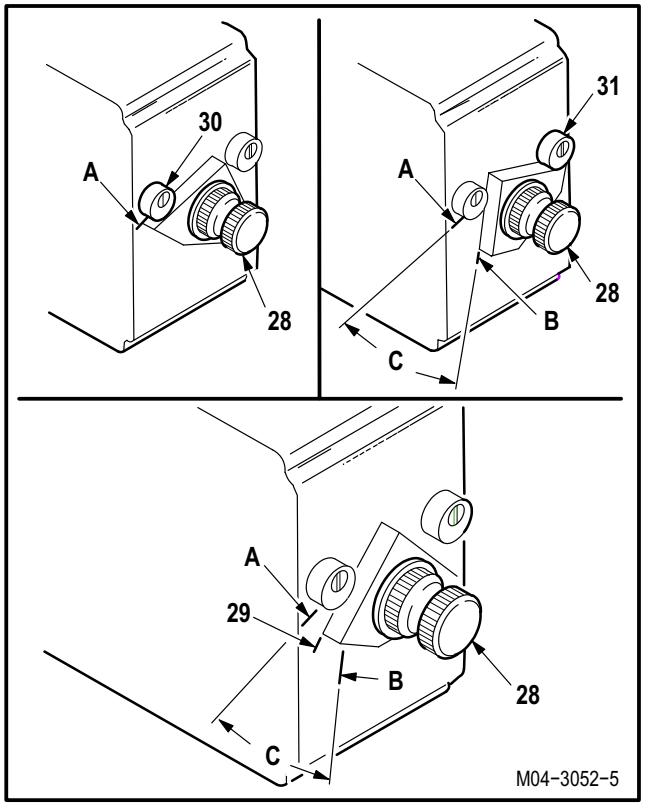
(1) Rotate brake shaft (28) to full left stop (30) and mark A.

(2) Rotate brake shaft (28) to full right stop (31) and mark B.

(3) Measure and bisect dimension C.

(4) Mark midpoint (29) of shaft (28) travel.

b. **Install -27 rig pin (32) in rig pin hole (33) in bellcrank (34), and support (35).** Use flight control rigging kit.



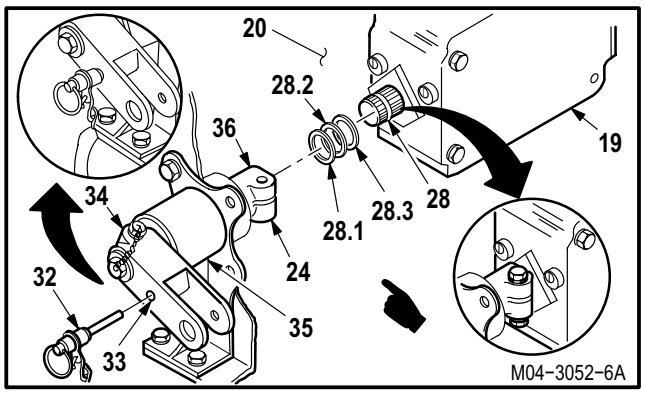
c. **Install magnetic brake (19) on floor (20).**

(1) Install spacer rings (28.3), (28.2) and shim (28.1) on shaft (28).

(2) Hold brake shaft (28) at midpoint (29).

(3) Position magnetic brake (19).

(4) Carefully insert brake shaft (28) in serrated bore (36) of shaft (24).



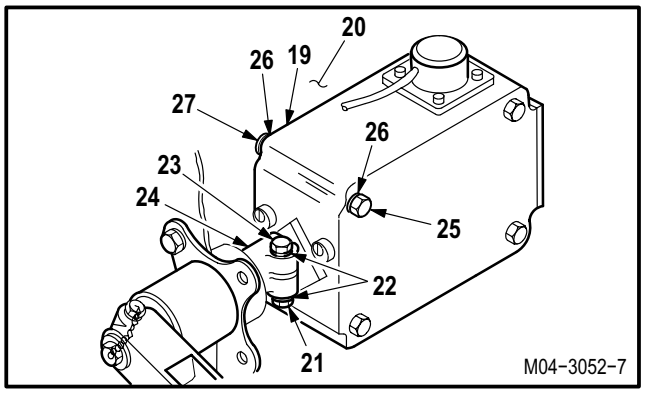
NOTE

Install laminated washers in same position as removed.

(4) Install bolt (23) through washer (22) and shaft (24).

(5) Install washer (22) and nut (21).

(6) Install four bolts (25) through outside washers (26), magnetic brake (19), inside washers (26), laminated washers (27), and floor (20).



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11.176. DIRECTIONAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

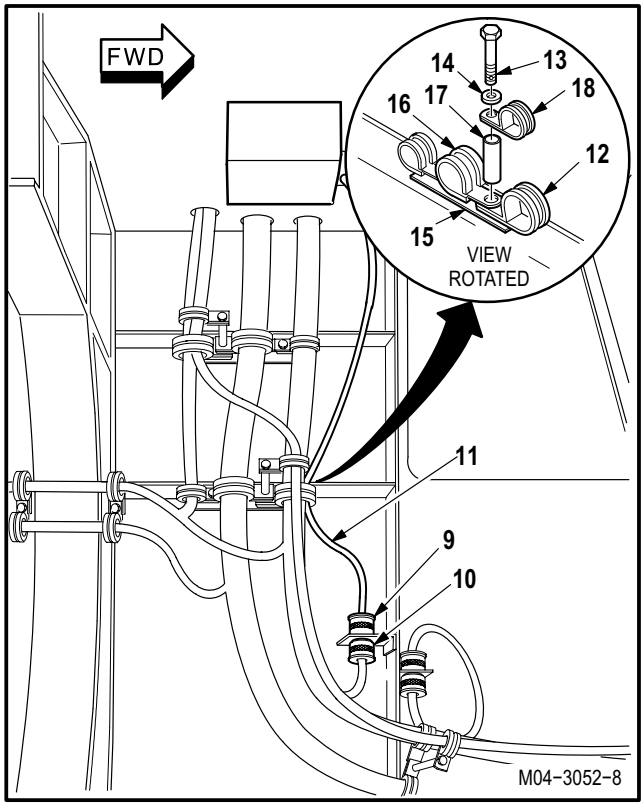
d. **Attach connector L21 (9) to receptacle J1048 (10).**

e. **Inspect (QA).**

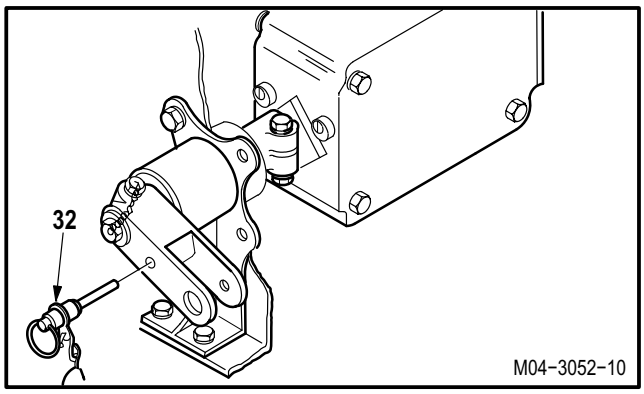
f. **Install harness (11) in clamp (12).**

(1) Position harness (11) in clamp 12).

(2) Install screw (13) through washer (14), clamp (18), spacer (17), clamp (16) and clamp (12) in bracket (15).



g. **Remove -27 rig pin (32).**



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11.176. DIRECTIONAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

h. **Remove -9 rig pin (1).**

i. **Install covers (4) and (5).**

(1) Aline cover (4) on frame (37).

(2) Install nine screws (8) and washers (7).

(3) Install bolt (6) and washer (7).

(4) Aline cover (5) on cover (4) and frame (37).

(5) Install 15 screws (8) and washers (7).

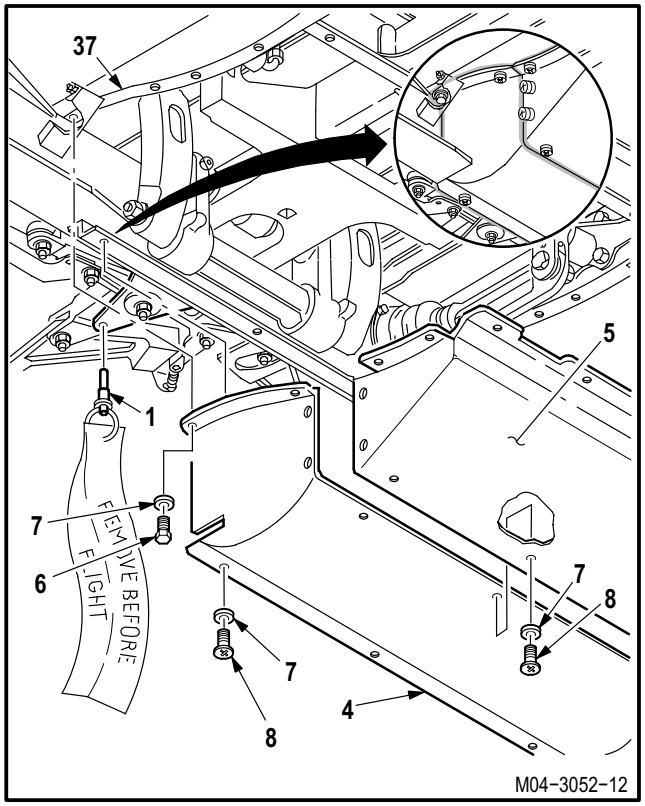
(6) Apply sealing compound to faying surface of covers (4) and (5). Use sealing compound (item 176, App F).

j. **Inspect (QA).**

k. **Install roller chute and sprocket chute** (TM 9-1090-208-23)**.**

l. **Install gun turret assembly** (TM 9-1090-208-23)**.**

m. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.177. DIRECTIONAL FEEL SPRING CARTRIDGE REMOVAL

11.177.1. Description

This task covers: Removal. Cleaning. Inspection. Repair.

11.177.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)

References:

TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
TM 9-1090-208-23	Area weapon, turret, and flex chute removed

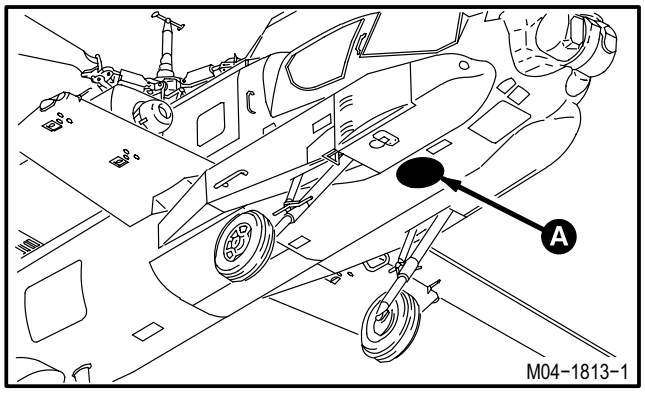
Personnel Required:

67R Attack Helicopter Repairer

11.177.3. Removal

a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**

b. **On pilot center circuit breaker panel, open ASE AC, DC, and BUCS circuit breakers.**



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11.177. DIRECTIONAL FEEL SPRING CARTRIDGE REMOVAL – continued

c. **Install -9 rig pin (1) in SPAD rig pin hole (2).** Use flight control rigging kit.

d. **Remove covers (3) and (4).**

(1) Remove adhesive.

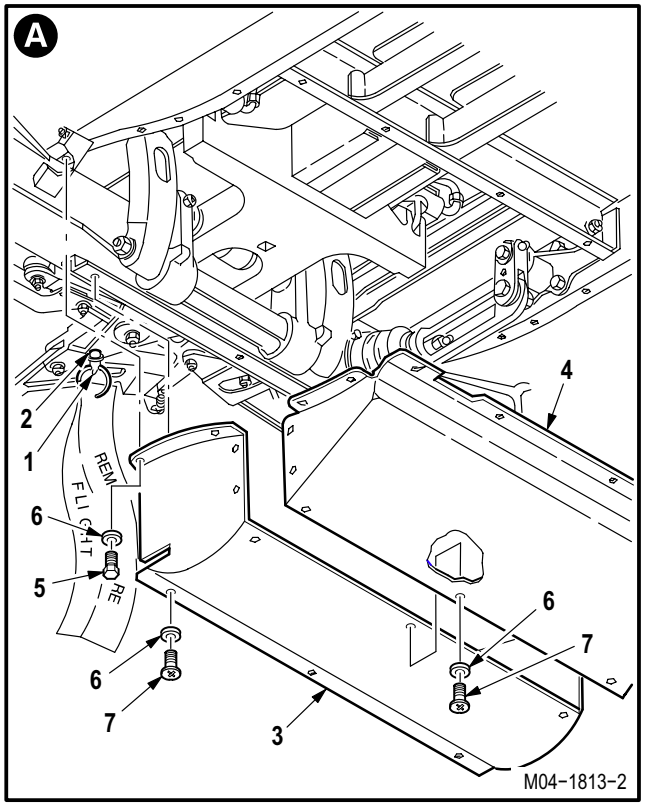
(2) Remove 15 screws (7) and washers (6).

(3) Remove cover (4).

(4) Remove bolt (5) and washer (6).

(5) Remove nine screws (7) and washers (6).

(6) Remove cover (3).

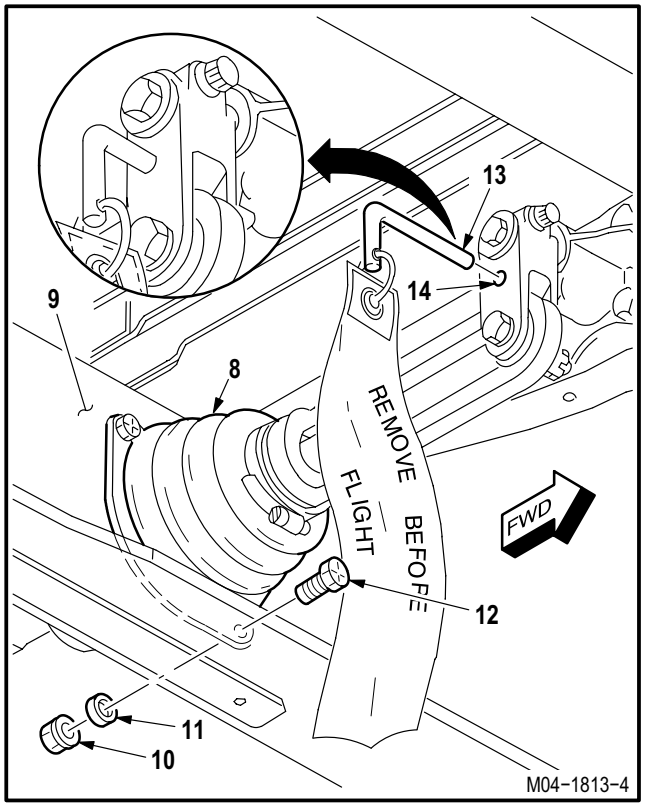


e. **Remove boot (8) from frame (9).**

(1) Remove two nuts (10) and washers (11).

(2) Remove two bolts (12).

f. **Install -27 rig pin (13) in rig pin hole (14).** Use flight control rigging kit.



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11.177. DIRECTIONAL FEEL SPRING CARTRIDGE REMOVAL – continued

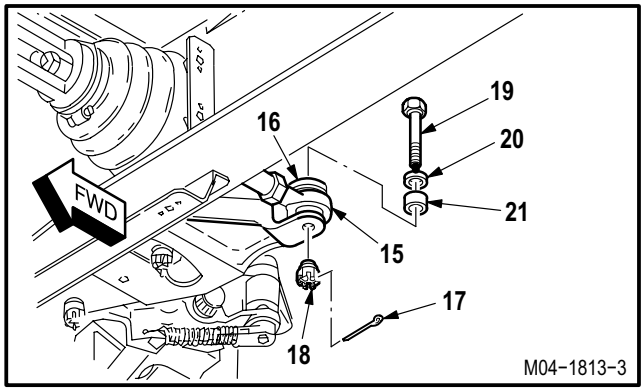
g. **Remove rod end (15) from bellcrank (16).**

(1) Remove and discard cotter pin (17).

(2) Remove nut (18).

(3) Remove bolt (19), washer (20), and bushing (21).

(4) Remove rod end (15).

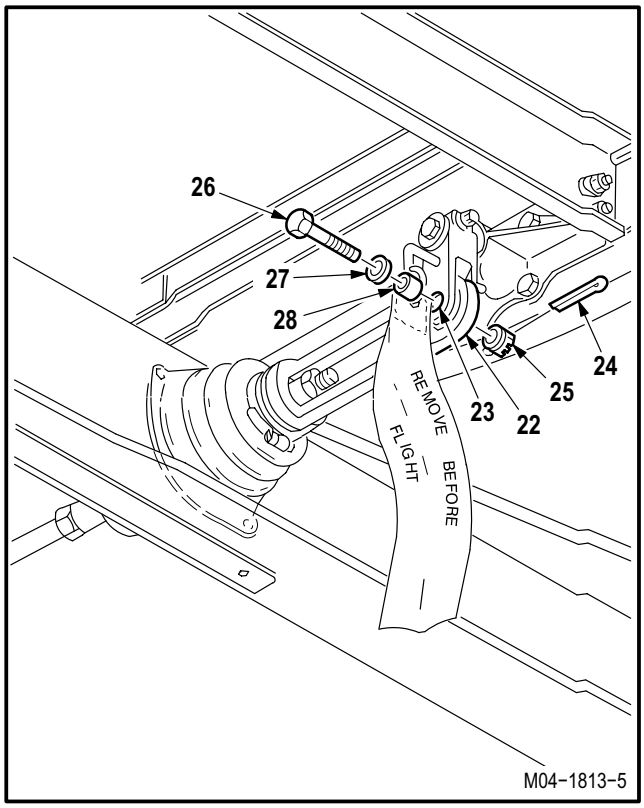


h. **Remove feel spring cartridge (22) from magnetic brake arm (23).**

(1) Remove and discard cotter pin (24).

(2) Remove nut (25).

(3) Remove bolt (26), washer (27), bushing (28), and cartridge (22).



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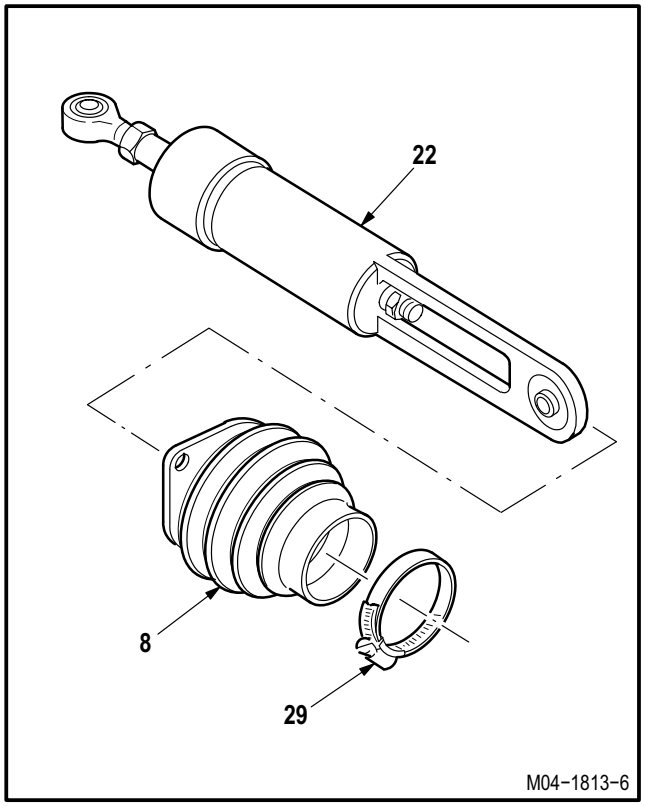
11.177. DIRECTIONAL FEEL SPRING CARTRIDGE REMOVAL – continued

i. **Remove boot (8) from cartridge (22).**

(1) Loosen clamp (29)

(2) Remove boot (8).



11.177.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.177.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.177.6. Repair

a. **Repair feel spring cartridge by replacing worn parts** (para 11.179)**.**

END OF TASK

11.178. DIRECTIONAL FEEL SPRING CARTRIDGE INSTALLATION

11.178.1. Description

This task covers: Installation.

11.178.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
9/16 x 1/4-inch drive open end box socket wrench crowfoot attachment (item 85, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)
30 - 150 inch-pound 1/4-inch drive click type torque wrench (item 435, App H)

Materials/Parts:

Cotter pin (2)
Sealing compound (item 176, App F)
Wire (item 223, App F)

Personnel Required:

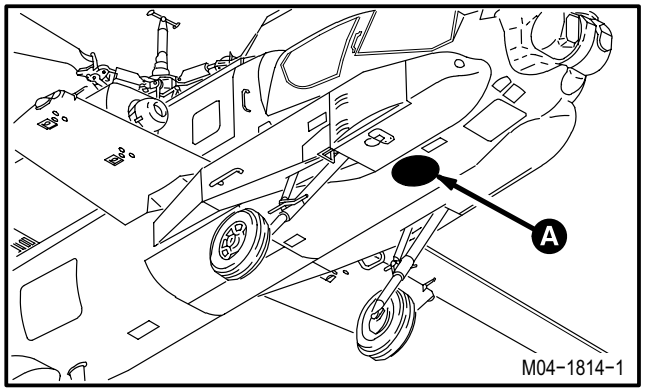
67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T
TM 9-1090-208-23

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed



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11.178. DIRECTIONAL FEEL SPRING CARTRIDGE INSTALLATION – continued

11.178.3. Installation

a. **Install feel spring feel cartridge (1) on magnetic brake arm (2).** Torque nut (3) **30 to 40 INCH-POUNDS**.

(1) Position boot (4) on cartridge (1) by sliding boot (4) over cartridge (1) so that large opening is on same side as rod end.

(2) Aline cartridge (1) with arm (2).

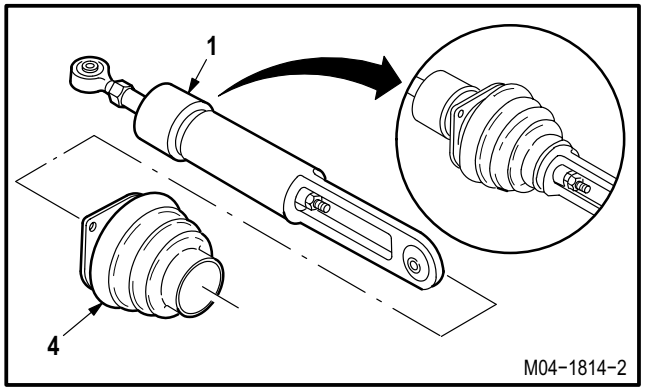
(3) Install bolt (5) through washer (6), bushing (7), arm (2), and cartridge (1).

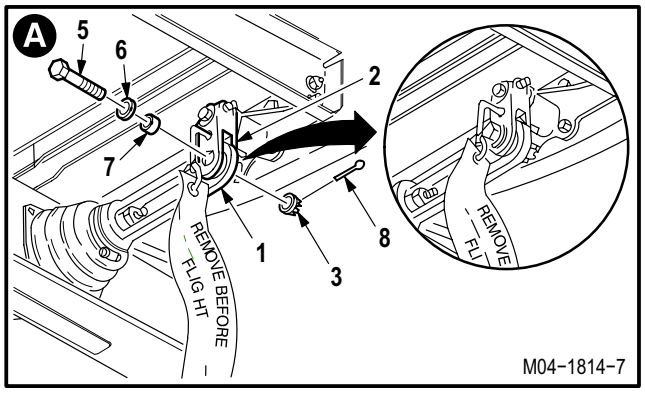
(4) Check fit of self-retaining bolt (5) (para 11.1).

(5) Install nut (3). Torque nut (3) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (8).





CAUTION

To prevent operational failure of feel spring cartridge, rod end shall not be stretched to aline rod end with SPAD.

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11.178. DIRECTIONAL FEEL SPRING CARTRIDGE INSTALLATION – continued

b. **Install rod end (9) on bellcrank (10).** Torque nut (11) to **30 to 40 INCH-POUNDS**.

(1) Install bolt (12) through washers (13), bushing (14), bellcrank (10), and rod end (9) to aline rod end (9) with bellcrank (10).

(2) If rod end (9) alines with bellcrank (10), go to step b. (11).

(3) If rod end (9) does not aline with bellcrank (10), go to step b. (4).

(4) Remove and discard lockwire from rod end (9).

(5) Loosen nut (15) until lock (16) is free of shaft (17).

(6) Adjust rod end (9) to aline with bellcrank (10).

(7) Hold rod end (9). Tighten nut (15) until lock (16) engages shaft (17).

(8) Hold rod end (9) Torque nut (15) to **105 INCH-POUNDS**. Use torque wrench and crowfoot.

(9) Install lockwire through nut (15) and lock (16). Use wire (item 223, App F).

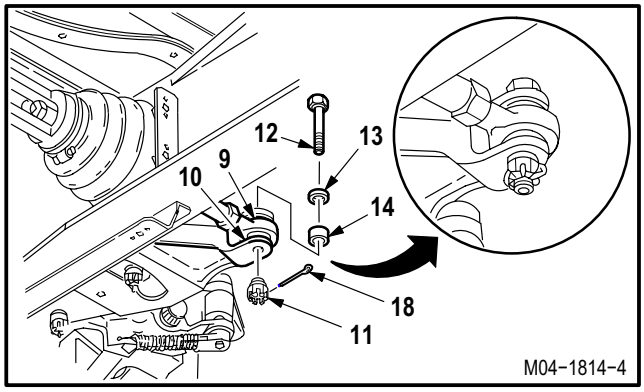
(10) Go to step b.(1).

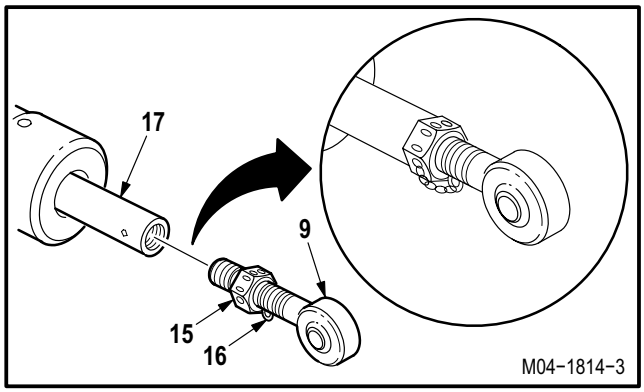
(11) Check fit of self-retaining bolt (12) (para 11.1).

(12) Install nut (11). Torque nut (11) to **30 INCH-POUNDS**. Use torque wrench.

(13) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(14) Install new cotter pin (18).





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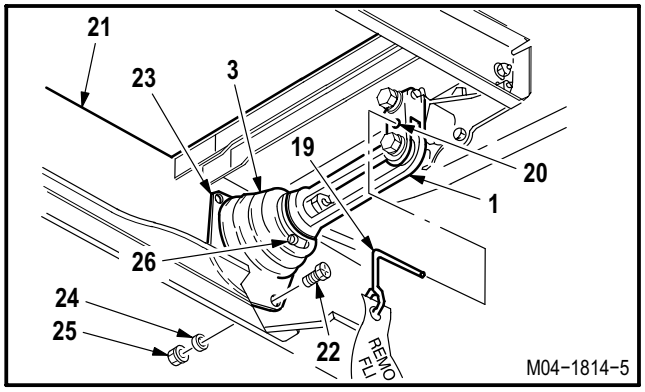
11.178. DIRECTIONAL FEEL SPRING CARTRIDGE INSTALLATION – continued

c. **Remove -27 rig pin (19) from rig pin hole (20).**



d. **Install boot (3) on frame (21).**

(1) Position boot (3) on frame (21).

(2) Install two bolts (22) through boot mounting plate (23).

(3) Install two washers (24) and nuts (25).

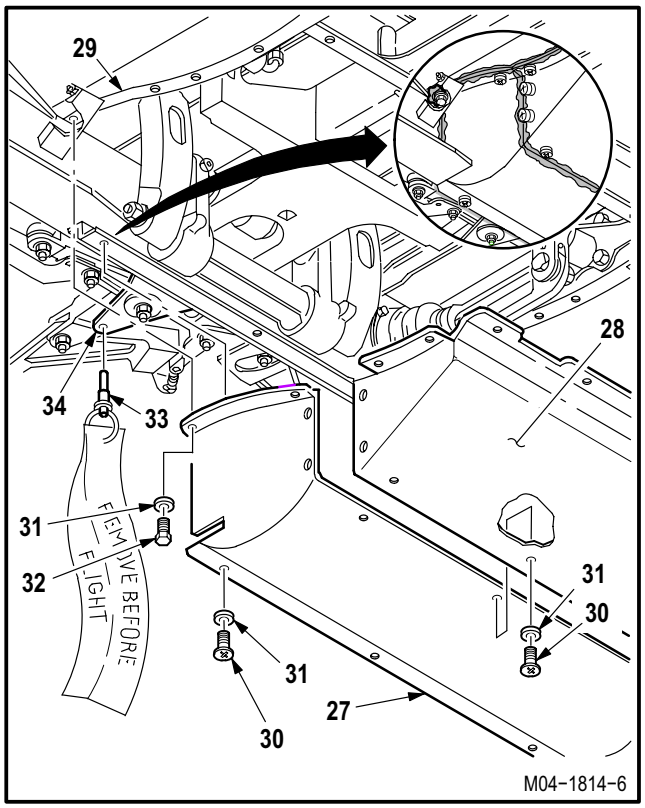
e. **Install boot (3) on cartridge (1).**

(1) Compress boot (3) until top of boot is **2.75 INCHES** from frame (21).

(2) Tighten clamp (26).

f. **Inspect (QA).**

g. **Install covers (27) and (28).**



(1) Aline cover (27) on frame (29).

(2) Install nine screws (30) and washers (31).

(3) Install bolt (32) and washer (31).

(4) Aline cover (28) on cover (27) and frame (29).

(5) Install 15 screws (30) and washers (31).

(6) Apply sealing compound to faying surface of covers (27) and (28). Use sealing compound (item 176, App F).

h. **Remove -9 rig pin (33) from rig pin hole (34).**

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11.178. DIRECTIONAL FEEL SPRING CARTRIDGE INSTALLATION – continued

i. **Inspect (QA).**

j. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

k. **Install flex chute, turret, and area weapon** (TM 9-1090-208-23)**.**

END OF TASK

11.179. FEEL SPRING CARTRIDGE DISASSEMBLY/ASSEMBLY (AVIM)

11.179.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.179.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Light duty laboratory apron (item 27, App H)
4-inch vise jaw caps (item 59, App H)
Chemical protective gloves (item 154, App H)
1/4-inch drive screwdriver bit holder (item 175, App H)
Adjustable air filtering respirator (item 262, App H)
0.0 - 50.0-pound weighing scale (item 273, App H)
Screwdriver bit set and handle (item 275, App H)
12-inch strap pipe wrench (item 425, App H)
1 - 100 inch-ounce 1/4-inch hexagon drive click type torque wrench (item 437, App H)

Materials/Parts:

Brush (item 34, App F)
Sealing compound primer (item 146, App F)
Sealing compound (item 168, App F)
Wire (item 224, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

NOTE

This task is typical for all feel spring cartridges except as noted for directional feel spring cartridge PN 7-311518009-7.

11.179.3. Disassembly

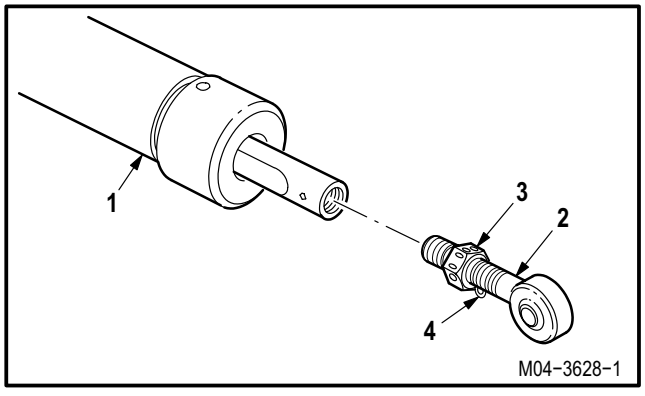
a. **Secure feel spring housing (1) in a suitable vise.** Use vise jaw caps.

b. **Remove rod end (2) from cartridge housing (1).**

(1) Remove and discard lockwire from rod end (2).

(2) Loosen nut (3).

(3) Remove rod end (2) with nut (3) and lock (4) installed.



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11.179. FEEL SPRING CARTRIDGE DISASSEMBLY/ASSEMBLY (AVIM) – continued

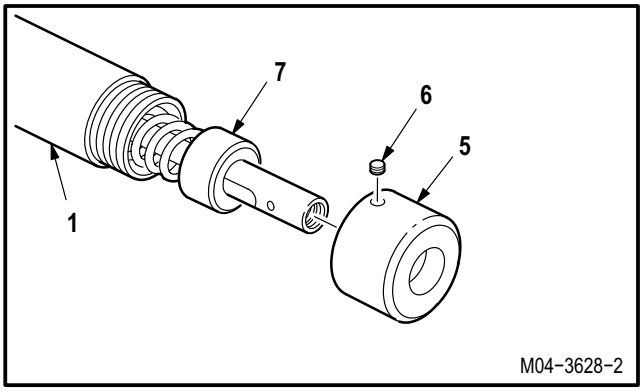
c. **Remove cap (5) from housing (1).**

(1) Remove set screw (6) from cap (5).

(2) Remove cap (5) from housing (1). Use strap wrench.

d. **Remove spring assembly (7) from housing (1).**

e. **Remove housing (1) from vise.**



NOTE

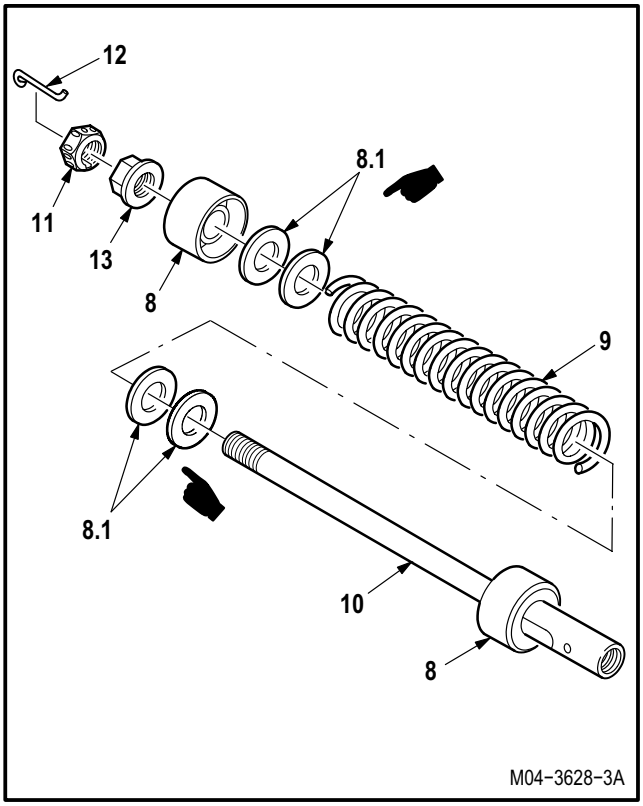
Washers (8.1) are only installed on directional feel spring cartridge, PN 7-311518009-7.

f. **Remove two cups (8), four washers (8.1) (if installed), and spring (9) from rod (10).**

(1) Remove and discard lockwire from nut (11).

(2) Remove nut (11), lock (12), and stop (13) from rod (10).

(3) Remove cup (8), two washers (8.1) (if installed), spring (9), two washers (8.1) (if installed), and cup (8) from rod (10).



11.179.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.179.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bearing(s) and/or bushing(s) for excessive wear** (para 11.5)**.**

d. **Check all removed bearing(s) and/or bushing(s) for excessive wear** (para 11.4)**.**

GO TO NEXT PAGE

11.179. FEEL SPRING CARTRIDGE DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.179.6. Assembly

NOTE

Install washers (8.1) only on directional feel spring cartridge, PN 7-311518009-7.

a. **Install two cups (8), four washers (8.1) (if required), and spring (9) on rod (10).**

(1) Install cup (8), two washers (8.1) (if required), spring (9), two washers (8.1) (if required), and cup (8) on rod (10).

(2) Install stop (13) on end of rod (10) until stop (13) contacts cup (8).

(3) Adjust spring (9) to sit securely in cups (8).

(4) Tighten stop (13) until dimension from the back of both cups (8) is **4.725 INCH**.

(5) Install lock (12).

(6) Install nut (11) finger tight.

b. **Perform spring assembly (7) functional check.**

(1) Temporarily install rod end (2).

(2) Tighten nut (3) finger tight.

NOTE

Cup surface must be equally supported on both sides of rod.

(3) Position cap (8) against vise jaws with rod end (2) between jaws.

(a) Do not tighten vise on rod end (2).

(4) Attach scale to rod end (2).

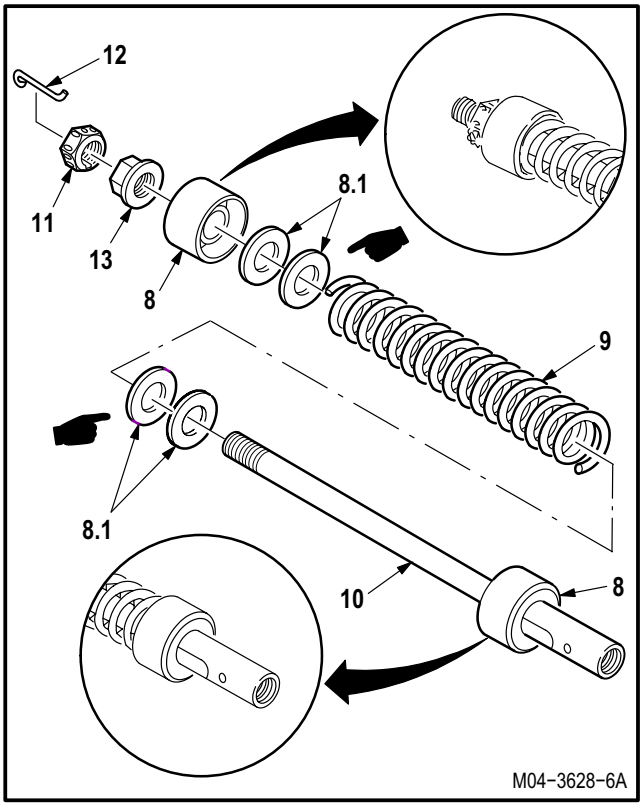
(5) Apply tension to rod end to deflect assembly (7) **0.010 to 0.030 INCH**. Use scale.

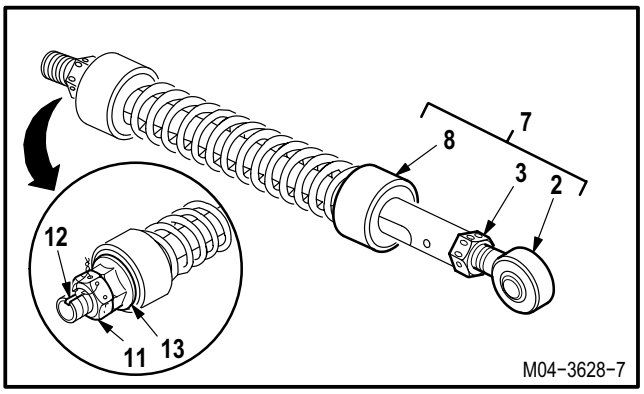
(a) Note indication on scale.

(6) Increase tension to deflect assembly (7) **0.990 to 1.010 INCH**. Use scale.

(a) Note indication on scale.

(7) Release tension on assembly (7) and compare indications to Table 1 for the appropriate feel spring cartridge.





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11.179. FEEL SPRING CARTRIDGE DISASSEMBLY/ASSEMBLY (AVIM) – continued

(8) If indications are within the tolerances listed in Table 1, go to step (11).

(9) If indications are out of tolerance, go to step (10).

(10) Adjust stop (13).

(a) Tighten to increase tension and loosen to decrease tension. Go to step (4).

(11) Tighten nut (11).

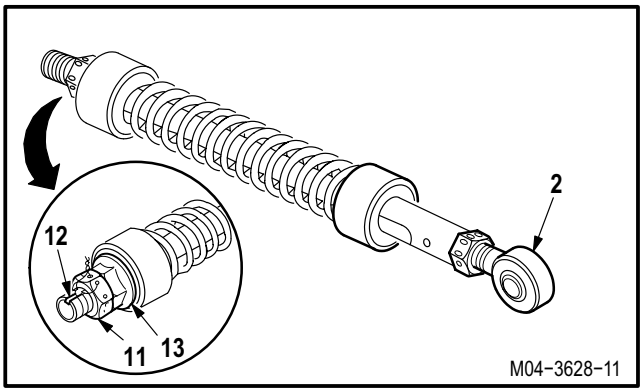
(12) Install lockwire through nut (11) and lock (12). Use wire (item 224, App F).

(13) Remove rod end (2).

TABLE 1

CARTRIDGE	LOAD AT DEFLECTION−LBS	
	.010−.030	.990−1.010
(LAT)	4.0−7.5	22.0−31.7
(LONG)	12.0−15.5	63.0−73.0
(DIR)	12.0 − 15.5	30.0 − 39.7
(-7 DIR)	17.0 − 19.5	35.0 − 45.0

M04−3628−10A



M04−3628−11

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11.179. FEEL SPRING CARTRIDGE DISASSEMBLY/ASSEMBLY (AVIM) – continued

CAUTION

To maintain the operational characteristics of the feel spring cartridge, do not continue to tighten cap once the cap contacts the spring assembly.

c. **Install spring assembly (7) in housing (1).** Torque set screw (6) to **64 INCH-OUNCES**.

(1) Slide assembly (7) in housing (1).

(2) Install cap (5) on housing (1) finger tight until cap (5) contacts spring assembly (7).

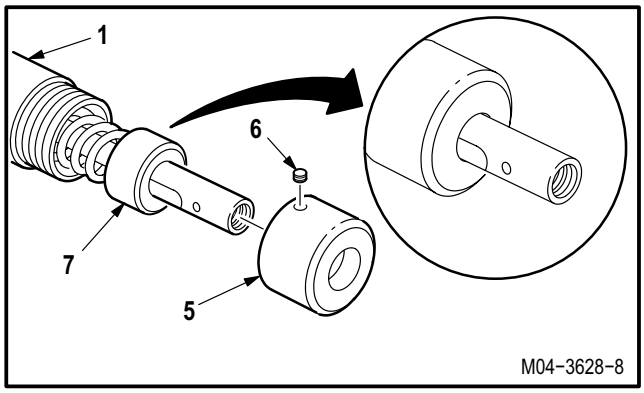
(3) Apply a thin coat of sealing compound to threads of set screw (6). Use brush (item 34, App F) and sealing compound primer (item 146, App F).

(4) Allow sealing compound primer to air dry **30 MINUTES**.

(5) Apply a thin coat of sealing compound to threads of set screw (6). Use brush (item 34, App F) and sealing compound (item 168, App F).

(6) Install set screw (6) until it contacts housing (1).

(7) Torque set screw (6) to **64 INCH-OUNCES**. Use bit set and handle, screwdriver bit holder, and torque wrench.



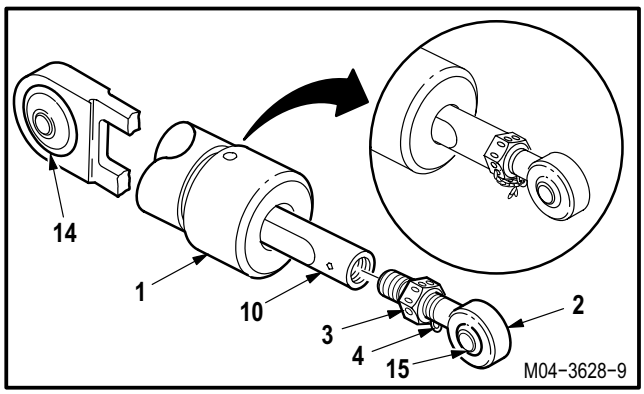
d. **Install rod end (2) in housing (1).**

(1) Install rod end (2) with nut (3) and lock (4) on rod (10).

(2) Adjust rod end (2) until the dimension between bearing (14) and rod end bearing (15) is **11.5 INCH**.

(3) Tighten nut (3).

(4) Install lockwire through nut (3) and lock (4). Use wire (item 224, App F).



e. **Inspect (QA).**

END OF TASK

11.180. LATERAL MAGNETIC BRAKE REMOVAL/INSTALLATION

11.180.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.180.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

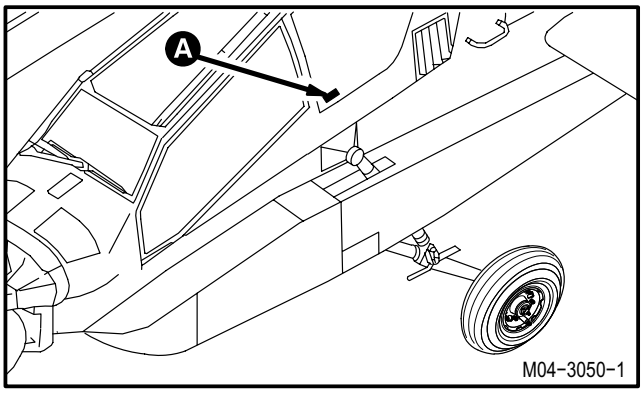
TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.46	Pilot cyclic stick cover removed
13.28	Air duct No. 21 removed

11.180.3. Removal

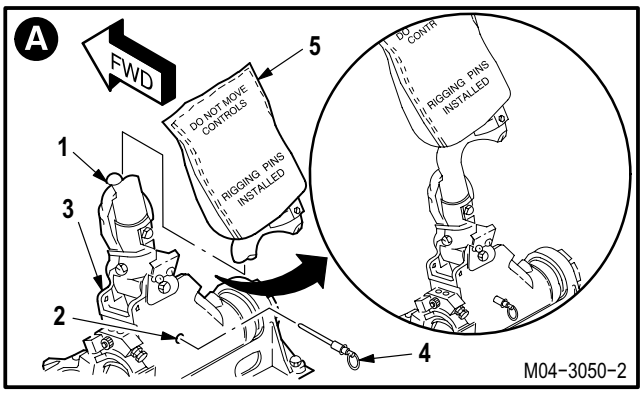
a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**



b. **Slowly move pilot cyclic stick (1) to aline lateral rig pin holes (2) in cyclic stick support (3).**

c. **Install -5 rig pin (4) in rig pin hole (2).** Use flight control rigging kit.

d. **Install cyclic stick warning cover (5) on stick (1).**



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11.180. LATERAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

e. **Remove access door (6) from pilot floor (7).**

(1) Remove 16 screws (8) and washers (9) from floor (7).

(2) Remove door (6).

f. **Detach connector L22 (10) from receptacle J1047 (11).**

g. **Remove arm (12) from brake shaft (13).**

(1) Remove nut (14) and washer (15).

(2) Remove bolt (16) and washer (15).

h. **Remove magnetic brake (17).**

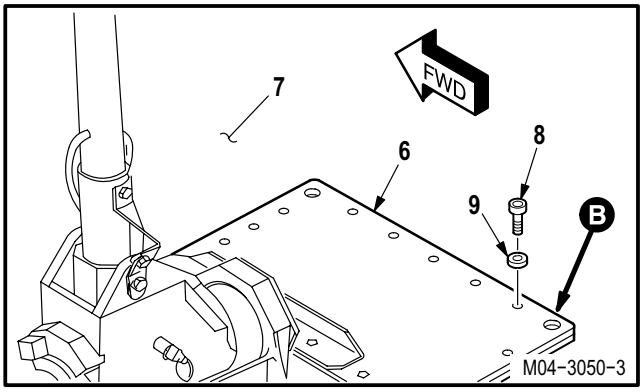
(1) Remove four bolts (18) and washers (19).

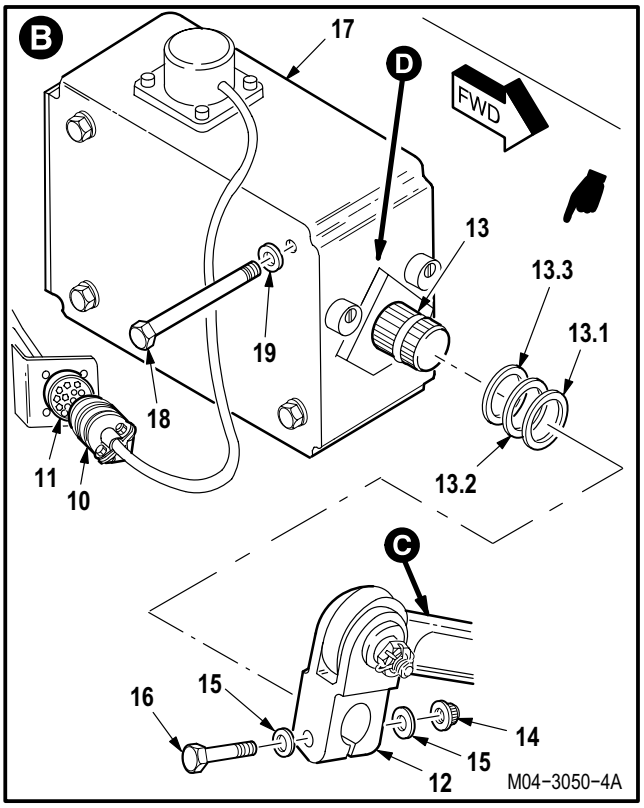
(2) Slide shaft (13) out of arm (12) and remove magnetic brake (17).

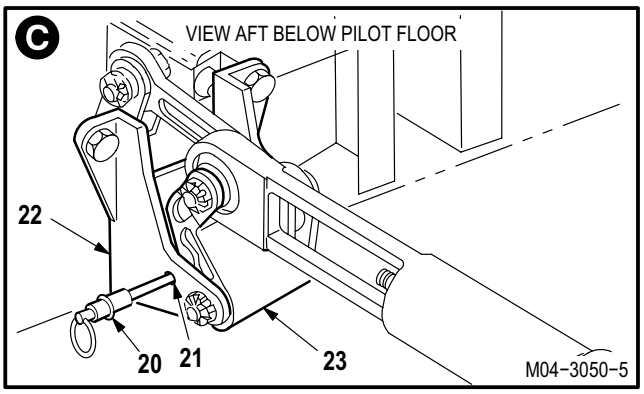
NOTE

Identify position of shim and spacer rings for proper placement during installation.

(3) Remove shim (13.1) spacer rings (13.2) and (13.3) from shaft (13).







11.180.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.180.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.180.6. Installation

a. **Install -5 rig pin (20) through rig pin hole (21), bracket (22), and bellcrank (23).** Use flight control rigging kit.

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11.180. LATERAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

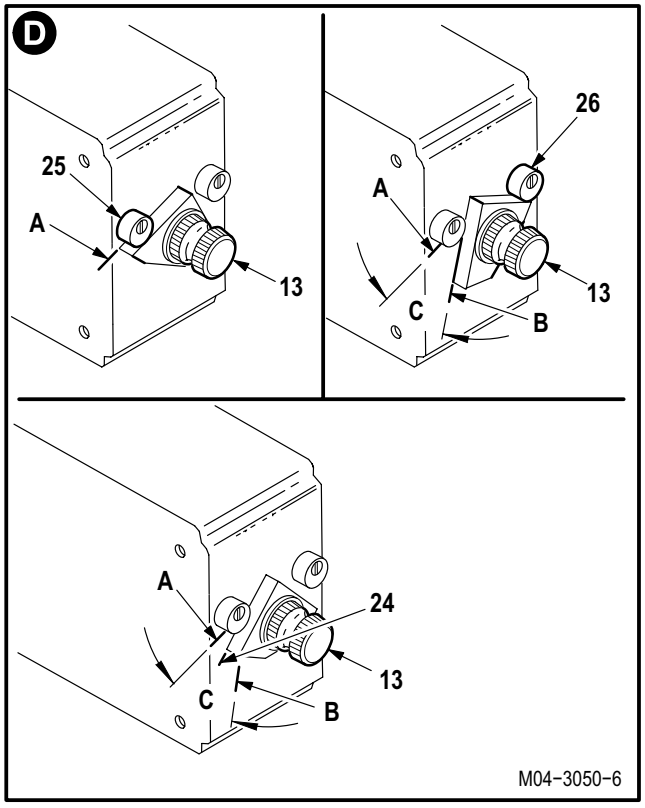
b. **Establish midpoint (24) of magnetic brake shaft (13) travel.**

(1) Rotate shaft (13) to full left stop (25) and mark A.

(2) Rotate shaft (13) to full right stop (26) and mark B.

(3) Measure and bisect dimension C.

(4) Mark midpoint (24) of shaft (13) travel.

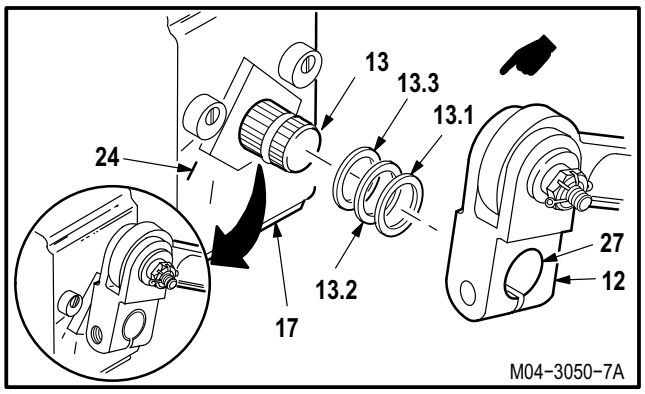


c. **Install brake (17).**

(1) Install spacers (13.3), (13.2), and shim (13.1) on shaft (13).

(2) Hold shaft (13) at midpoint (24) and position brake (17).

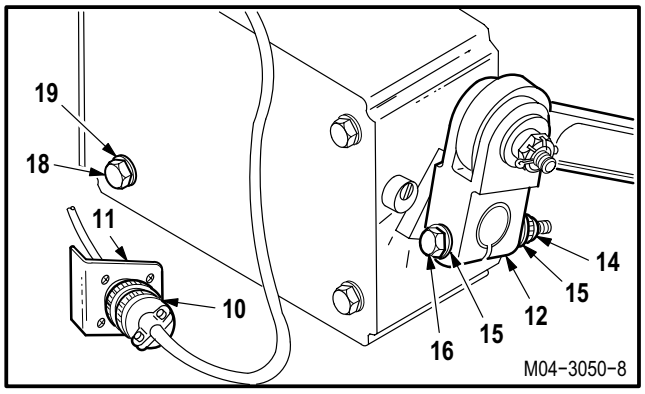
(3) Carefully insert shaft (13) into serrated bore (27) of arm (12).



(4) Install four washers (19) and bolts (18).

(5) Install bolt (16) through washer (15) and arm (12).

(6) Install washer (15) and nut (14) on bolt (16).



d. **Attach connector L22 (10) to receptacle J1047 (11).**

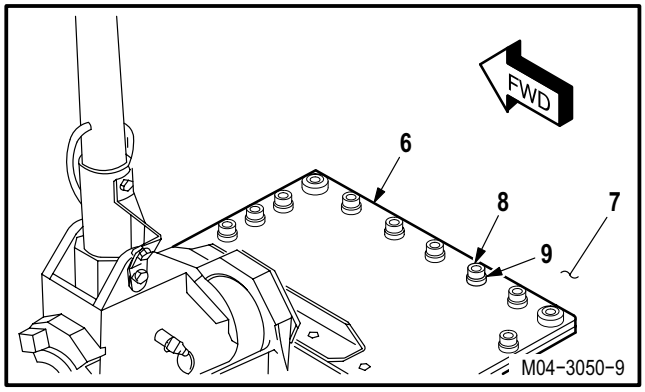
e. **Inspect (QA).**

GO TO NEXT PAGE

11.180. LATERAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

f. **Install door (6) on floor (7).**

(1) Install 16 screws (8) and washers (9).



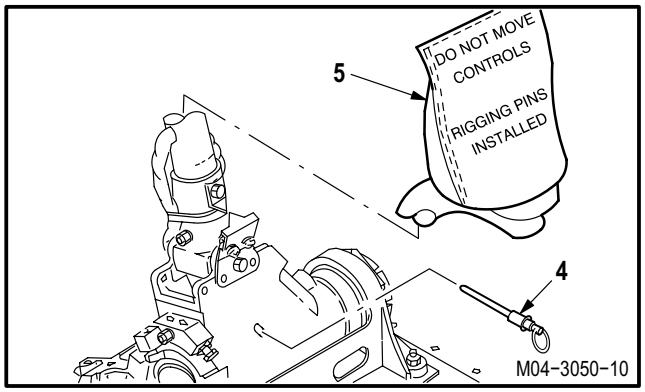
g. **Remove -5 rig pins (4) and (20).**

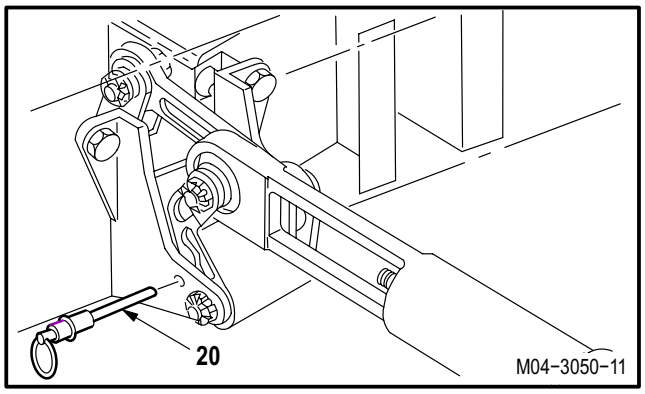
h. **Remove cover (5).**

i. **Install pilot cyclic stick cover** (para 11.46)**.**

j. **Install air duct No. 21** (para 13.28)**.**

k. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**





END OF TASK

11.181. LONGITUDINAL MAGNETIC BRAKE REMOVAL/INSTALLATION

11.181.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.181.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

References:

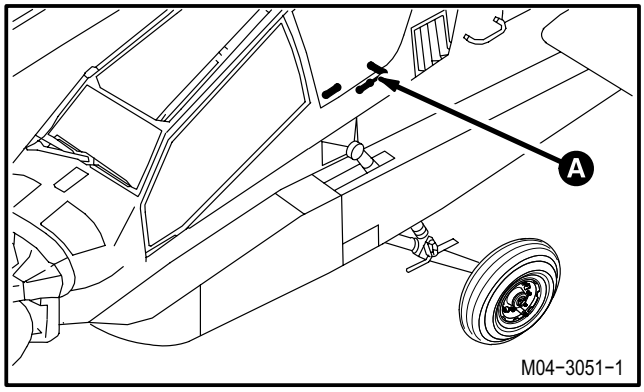
TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.46	Pilot cyclic stick cover removed
2.161	Pilot seat removed
7.47	Remove F.S. 165 push-pull rod from longitudinal servocylinder input lever

11.181.3. Removal

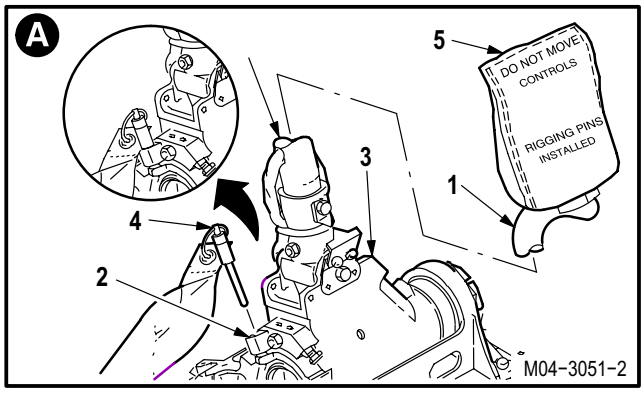
a. **Enter pilot station** (para 1.56)**. Observe all safety precautions.**



b. **Slowly move pilot cyclic stick (1) to aline longitudinal rig pin holes (2) in cyclic stick support base (3).**

c. **Install -9 rig pin (4) through rig pin hole (2) in base (3).** Use flight control rigging kit.

d. **Install cyclic stick warning cover (5).**



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11.181. LONGITUDINAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

e. **Remove access door (6) from pilot floor (7).**

(1) Remove 16 screws (8) and washers (9) from floor (7).

(2) Remove door (6).

f. **Remove access door (10) from pilot floor (7).**

(1) Remove 28 screws (11) and washers (12) from floor (7).

(2) Remove door (10).

g. **Detach connector P23 (13) from receptacle J1049 (14).**

h. **Remove shouldered shaft (15) from magnetic brake shaft (16).**

(1) Remove nut (17) and washer (18).

(2) Remove bolt (19) and washer (18).

i. **Remove magnetic brake (20).**

(1) Remove four bolts (21), outside washers (22), inside washers (22), and washers (23).

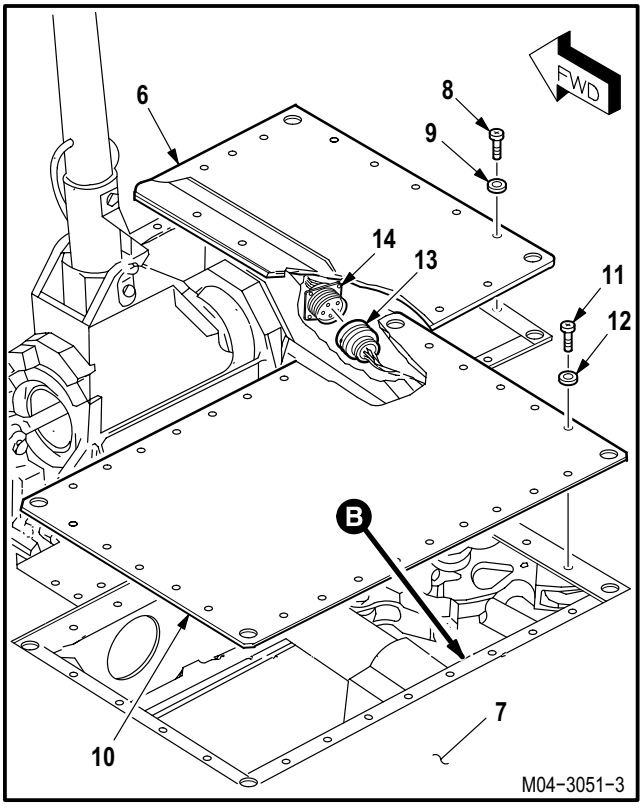
(2) Slide brake shaft (16) out of shaft (15).

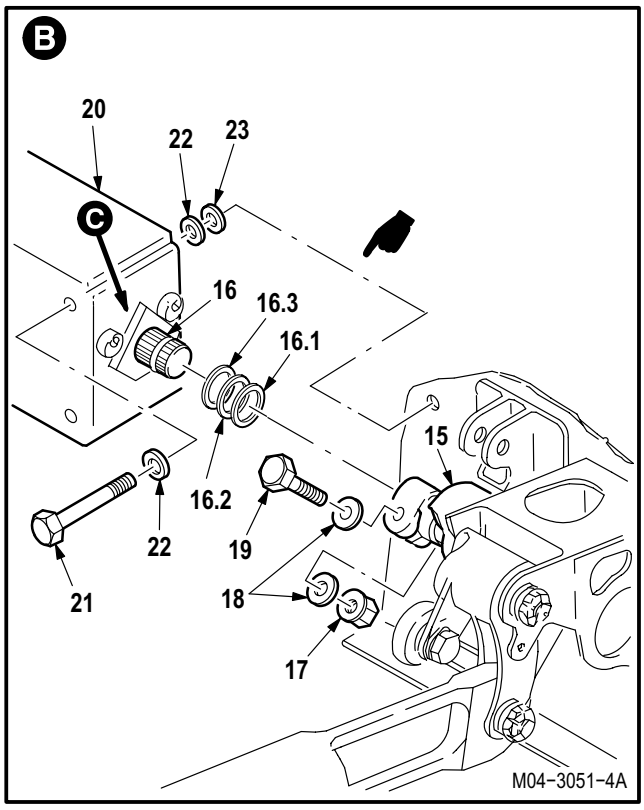
(3) Remove magnetic brake (20).

NOTE

Identify position of shim and spacer rings for proper placement during installation.

(4) Remove shim (16.1) spacer rings (16.2) and (16.3) from shaft (16).





11.181.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.181.5. Inspection

a. **Check removed and attaching parts for damage or wear** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

GO TO NEXT PAGE

11.181. LONGITUDINAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

11.181.6. Installation

a. **Establish midpoint (24) of magnetic brake shaft (16) travel.**

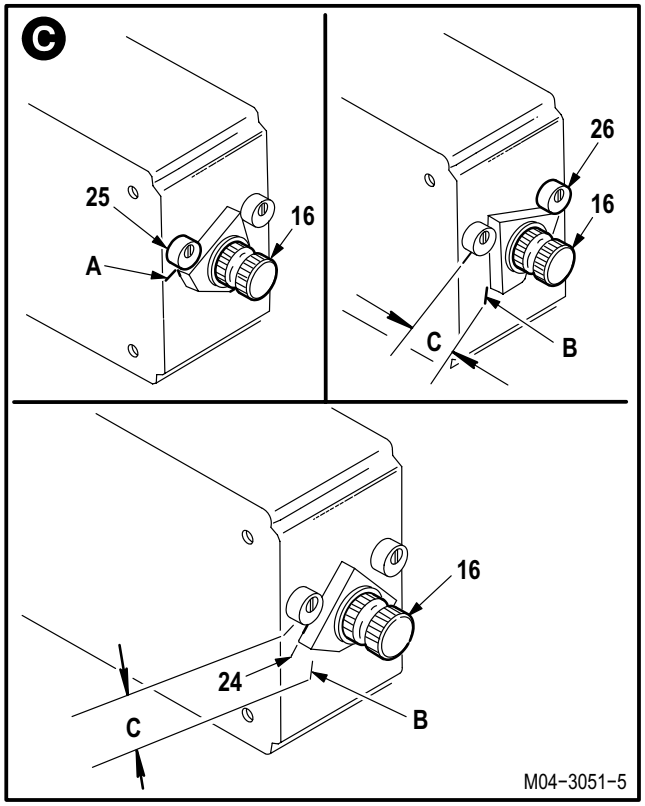
(1)

(2) Rotate shaft (16) to full left stop (25) and mark A.

(3) Rotate shaft (16) to full right stop (26) and mark B.

(4) Measure and bisect dimension C.

(5) Mark midpoint (24) of shaft (16) travel.



b. **Install -5 rig pin (27) through rig pin hole (28), bracket (29), and bellcrank (30).** Use flight control rigging kit.

c. **Install brake (20).**

(1) Install spacers (16.3), (16.2), and shim (16.1) on shaft (16).

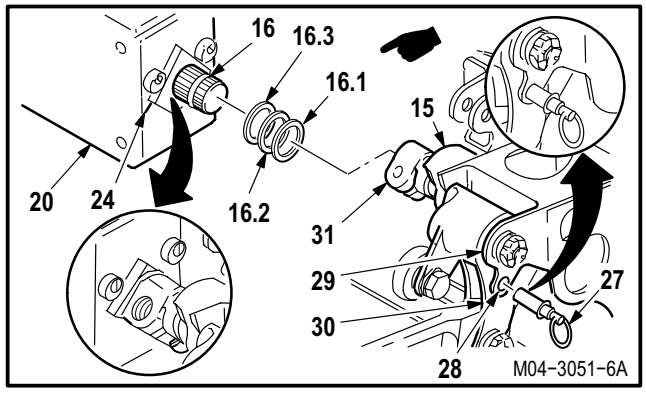
(2) Hold shaft (16) at midpoint (24) and position brake (20).

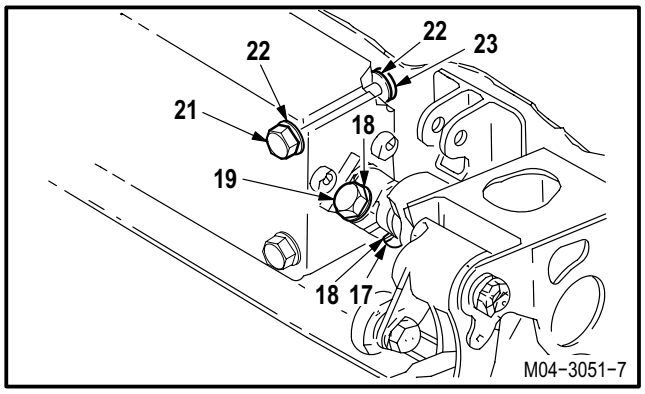
(3) Carefully insert shaft (16) in serrated bore (31) of shaft (15).

(4) Install four bolts (21) through washers (22) brake (20), washers (22), and washers (23).

(5) Install bolt (19) and washer (18).

(6) Install washer (18) and nut (17).





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11.181. LONGITUDINAL MAGNETIC BRAKE REMOVAL/INSTALLATION – continued

d. **Attach connector P23 (13) to receptacle J1049 (14).**

e. **Inspect (QA).**

f. **Install door (6) on floor (7).**

(1) Install 16 screws (8) and washers (9).

g. **Remove rig pins (4) and (28).**

h. **Remove cover (5).**

i. **Install door (10) on floor (7).**

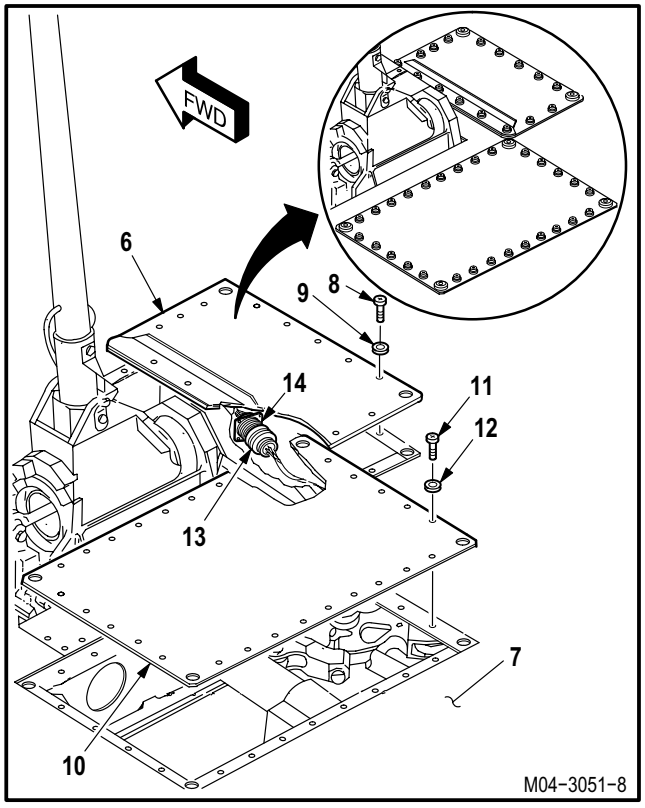
(1) Install 28 screws (11) and washers (12).

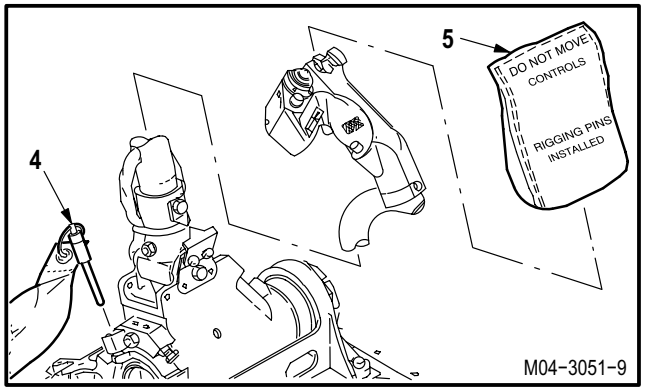
j. **Install pilot cyclic stick cover** (para 11.46)**.**

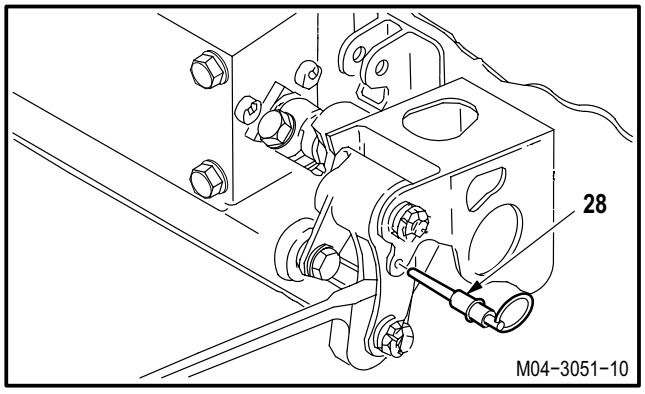
k. **Install pilot seat** (para 2.161)**.**

l. **Install F.S. 165 push-pull rod to longitudinal servocylinder input lever** (para 7.47)**.**

m. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**







END OF TASK

11.182. MOTIONAL TRANSDUCER REMOVAL/INSTALLATION

11.182.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.182.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
13/16 x 3/8-inch drive open end box socket wrench crowfoot attachment (item 76, App H)
30 - 150 inch-pound 1/4-inch drive click type torque wrench (item 435, App H)

References:

TM 1-1520-238-T
TM 55-1500-323-24

Materials/Parts:

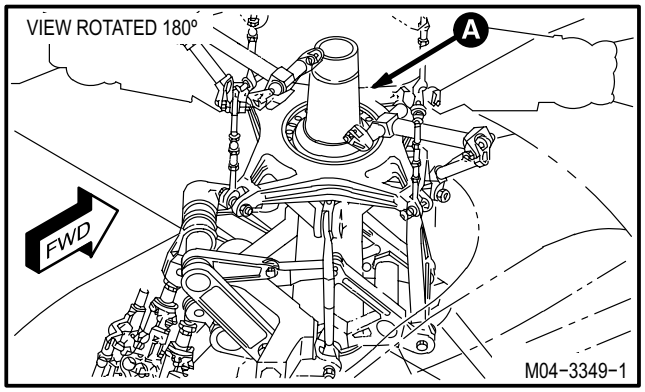
Wire (item 224, App F)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access doors T250L, T250R, T290L, T290R, and L325 opened

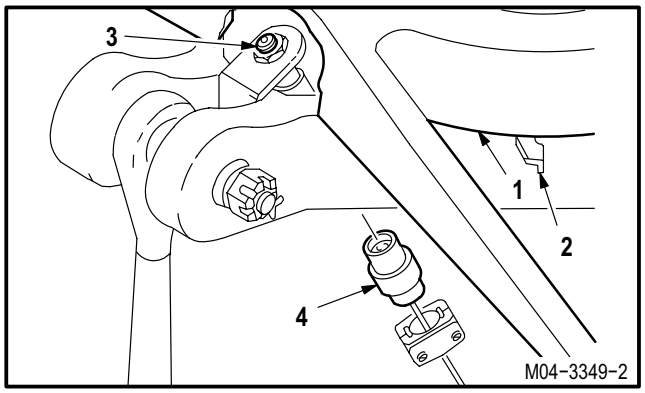


11.182.3. Removal

a. **Turn rotating swashplate (1) so that one interrupter (2) is positioned approximately 45 degrees on each side of transducer (3).**

b. **Remove lockwire from transducer (3).**

c. **Detach connector P57 (4) from transducer MT32 (3).**



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11.182. MOTIONAL TRANSDUCER REMOVAL/INSTALLATION – continued

d. **Remove transducer (3) from bracket (5).**

(1) Hold lower locknut (6).

(2) Remove upper locknut (7).

11.182.4. Cleaning

a. **Wipe transducer and mounting bracket with a clean rag.**

11.182.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

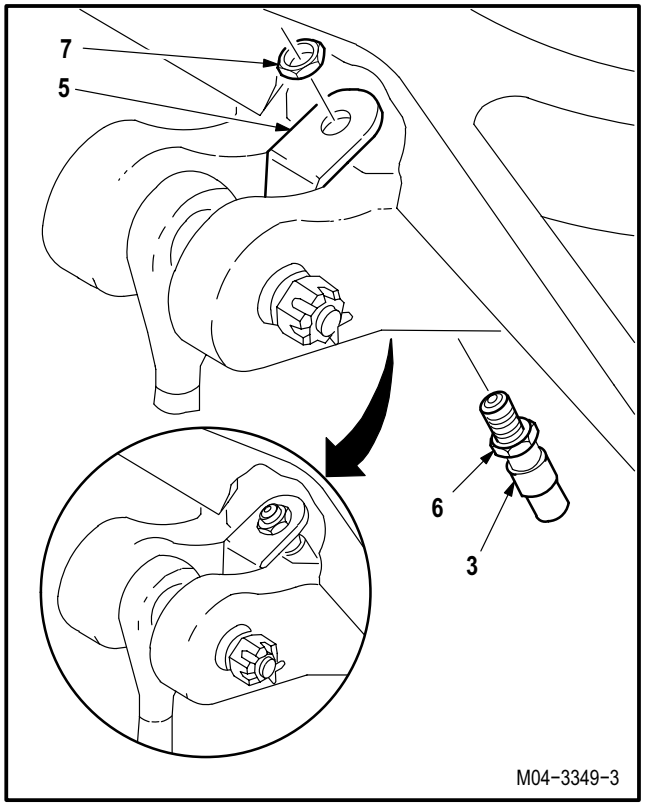
c. **Check connector for cuts or loose wires** (TM 55-1500-323-24)**.**

11.182.6. Installation

a. **Thread lower locknut (6) on transducer (3) approximately 3/8 INCH.**

b. **Install transducer (3) through bracket (5) with electrical connection pointing down.**

c. **Install locknut (7) on transducer (3).**



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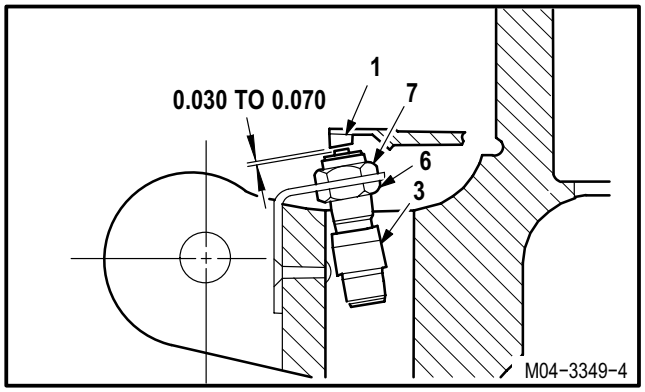
11.182. MOTIONAL TRANSDUCER REMOVAL/INSTALLATION – continued

CAUTION

Exercise care when rotating swashplate to ensure that the transducer does not strike the interrupters. If transducer contacts interrupters, equipment damage will occur.

d. **Adjust transducer (3) so that gap of 0.030 to 0.070 INCH exists between transducer (3) and four interrupters (1).**

e. **Torque locknut (7) to 110 INCH-POUNDS.** Use crowfoot and torque wrench.



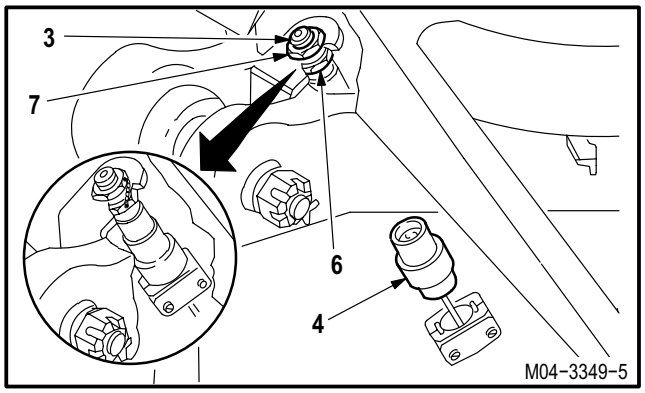
f. **Attach connector P57 (4) to transducer MT32 (3).**

g. **Lockwire locknut (6) to locknut (7) and connector P57 (4).** Use wire (item 224, App F).

h. **Inspect (QA).**

i. **Secure access doors T250L, T250R, T290L, T290R, and L325** (para 2.2)**.**

j. **Perform main rotor track and balance maintenance operational check** (TM 1-1520-238-T)**.**



END OF TASK

11.183. MOTIONAL TRANSDUCER SUPPORT BRACKET REPLACEMENT

11.183.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.183.2. Initial Setup

Tools:

Airframe repairman's tool kit (item 377, App H)
Light duty laboratory apron (item 27, App H)
Chemical protective gloves (item 154, App H)
Adjustable air filtering respirator (item 262, App H)

References:

TM 1-1500-204-23

Materials/Parts:

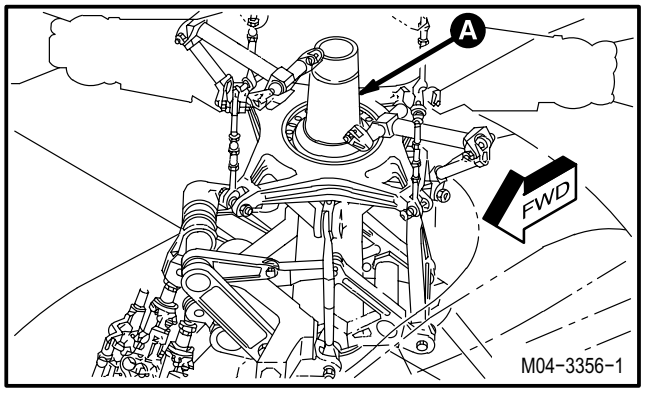
Adhesive (item 3, App F)

Personnel Required:

68G Aircraft Structural Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

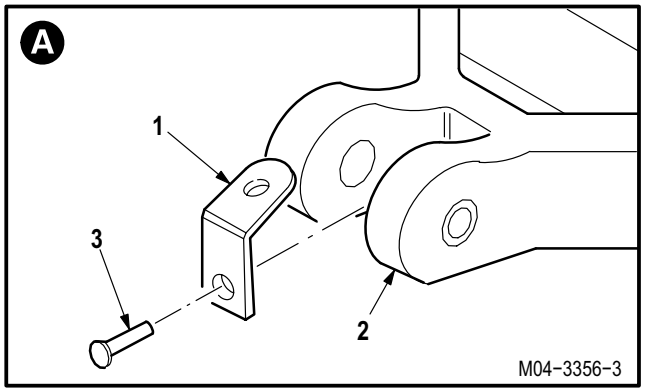
Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
11.182	Motional transducer removed
11.10	Detach upper end of lateral link



11.183.3. Removal

a. **Remove rivet (3) attaching bracket (1) to swashplate (2)** (TM 1-1500-204-23)**.**



11.183.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

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11.183. MOTIONAL TRANSDUCER SUPPORT BRACKET REPLACEMENT – continued

11.183.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check swashplate for elongated rivet hole.** None allowed.

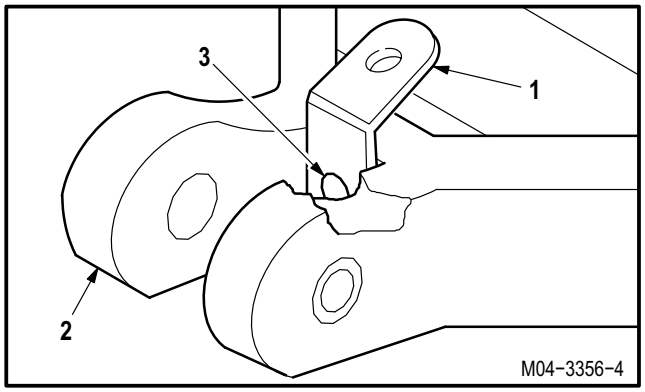
11.183.6. Installation

a. **Install bracket (1) on swashplate (2).**

(1) Apply a thin layer of adhesive to mating surfaces of bracket (1) and swashplate (2). Use adhesive (item 3, App F).

(2) Aline hole in bracket (1) with hole in swashplate (2).

(3) Install rivet (3) through bracket (1) and swashplate (2) (TM 1-1500-204-23).



b. **Inspect (QA).**

c. **Attach upper end of lateral link** (para 11.11)**.**

d. **Install motional transducer** (para 11.182)**.**

END OF TASK

11.184. DIRECTIONAL MAGNETIC BRAKE SUPPORT REMOVAL/INSTALLATION

11.184.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.184.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

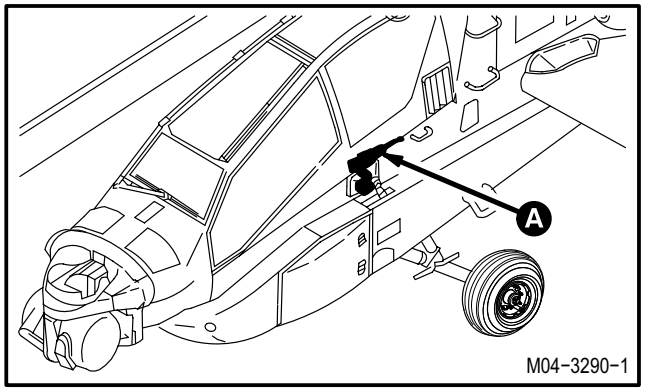
67R Attack Helicopter Repairer
One person to assist
67R3F Attack Helicopter Repairer/Technical Inspector

References:

TM 1-1520-238-T

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.2	Access fairings L194 and R194 removed
11.177	Directional feel spring cartridge removed
11.176	Bolts connecting magnetic brake shaft to brake support assembly shaft loosened



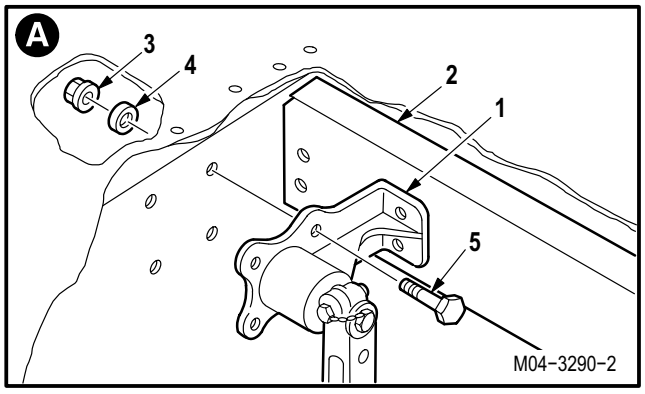
11.184.3. Removal

a. **Remove directional magnetic brake support (1) from airframe (2).**

(1) Remove six nuts (3) and washers (4).

(2) Remove six bolts (5).

(3) Remove support (1).



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11.184. DIRECTIONAL MAGNETIC BRAKE SUPPORT REMOVAL/INSTALLATION – continued

11.184.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.184.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

11.184.6. Installation

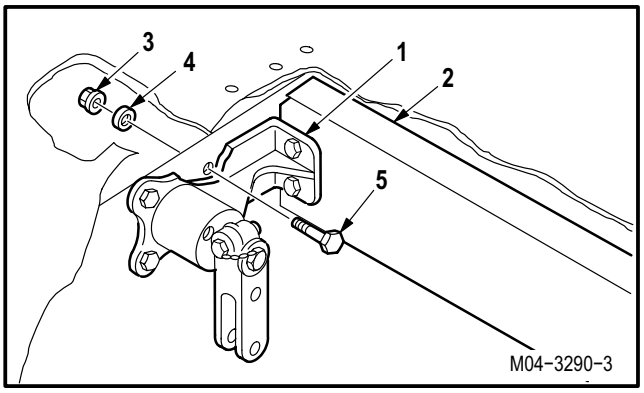
a. **Install support (1) on airframe (2).** Torque six nuts (3) to **41 INCH-POUNDS**.

(1) Position support (1) on airframe (2).

(2) Install six bolts (5) through support (1) and airframe (2).

(3) Install six washers (4) and nuts (3).

(4) Torque six nuts (3) to **41 INCH-POUNDS**. Use torque wrench.



b. **Inspect (QA).**

c. **Install pilot directional feel spring cartridge** (para 11.178)**.**

d. **Tighten bolts connecting magnetic brake shaft to brake support shaft** (para 11.176)**.**

e. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

f. **Install access fairings L194 and R194** (para 2.2)**.**

END OF TASK

11.185. DIRECTIONAL MAGNETIC BRAKE SUPPORT DISASSEMBLY/ASSEMBLY (AVIM)

11.185.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.185.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

Wire (item 226, App F)

11.185.3. Disassembly

a. **Remove pilot directional bellcrank (1) from pilot directional magnetic brake support (2).**

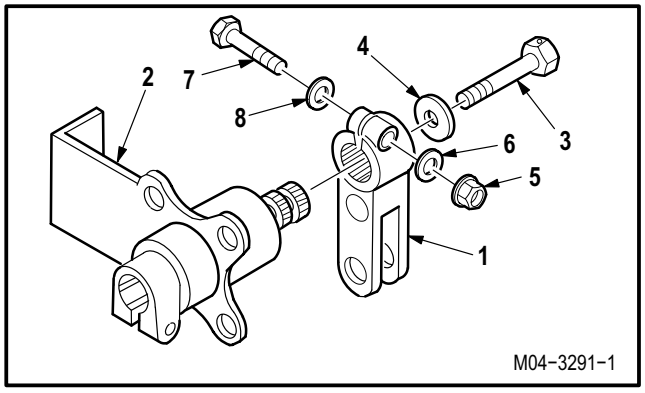
(1) Remove lockwire.

(2) Remove bolt (3) and washer (4).

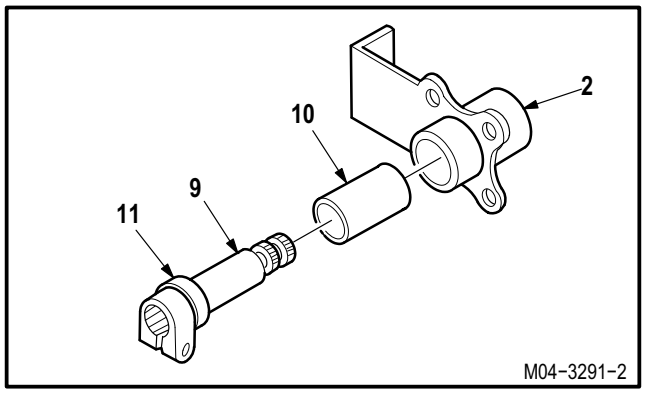
(3) Remove self-locking nut (5) and washer (6).

(4) Remove bolt (7) and recessed washer (8).

(5) Remove bellcrank (1).



b. **Remove shaft (9), spacer (10), and bearing (11) from support (2).**



11.185.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

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11.185. DIRECTIONAL MAGNETIC BRAKE SUPPORT DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.185.5. Inspection

a. **Check removed and attaching parts for cracks.** None allowed.

b. **Check removed and attaching parts for damage** (para 11.5)**.**

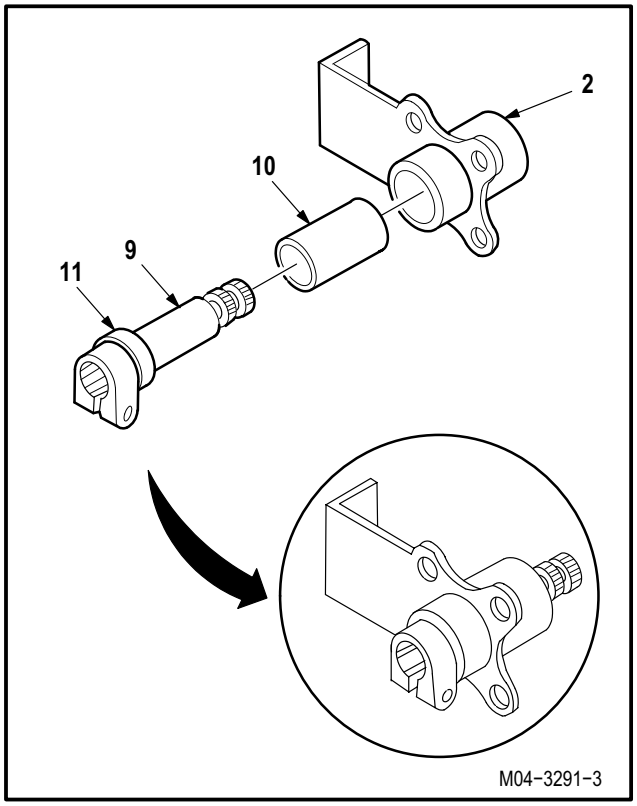
c. **Check removed and attaching parts for corrosion** (para 1.49)**.**

d. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

e. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.185.6. Assembly

a. **Install shaft (9) through bearing (11) and spacer (10) into support (2).**



b. **Install bellcrank (1) on support (2).** Torque bolt (3) and nut (5) to **40 INCH-POUNDS**.

(1) Position bellcrank (1) on support (2).

(2) Install washer (8) and bolt (7) through bellcrank (1).

(3) Install washer (6) and nut (5) on bolt (7).

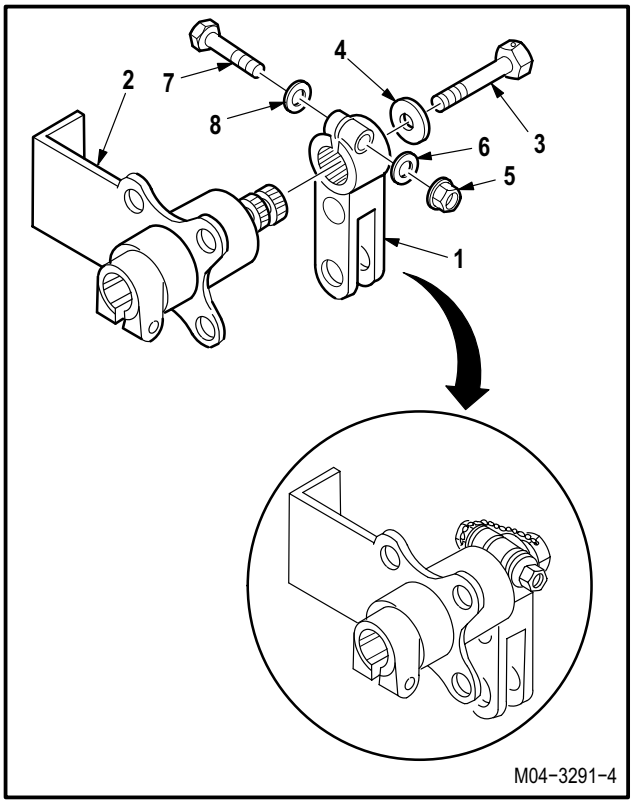
(4) Install washer (4) and bolt (3).

(5) Torque bolt (3) to **40 INCH-POUNDS**. Use torque wrench.

(6) Torque nut (5) to **40 INCH-POUNDS**. Use torque wrench.

(7) Lockwire bolt (3) to bolt (7). Use wire (item 226, App F).

c. **Inspect (QA).**



END OF TASK

11.186. LATERAL MAGNETIC BRAKE MECHANISM ASSEMBLY REMOVAL/INSTALLATION

11.186.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.186.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

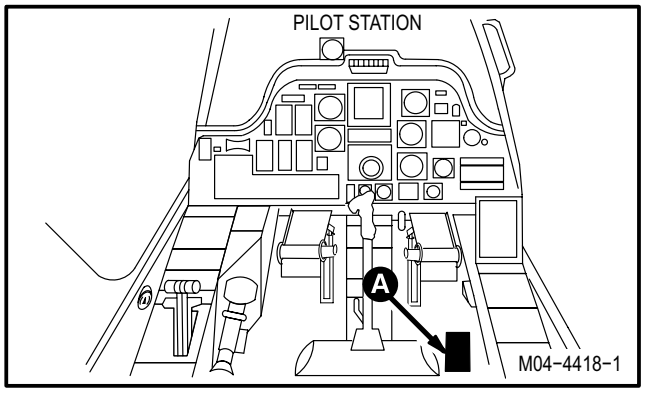
Cotter pin

Personnel Required:

67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed
2.185	Pilot HDU holster removed
11.46	Pilot cyclic stick cover removed

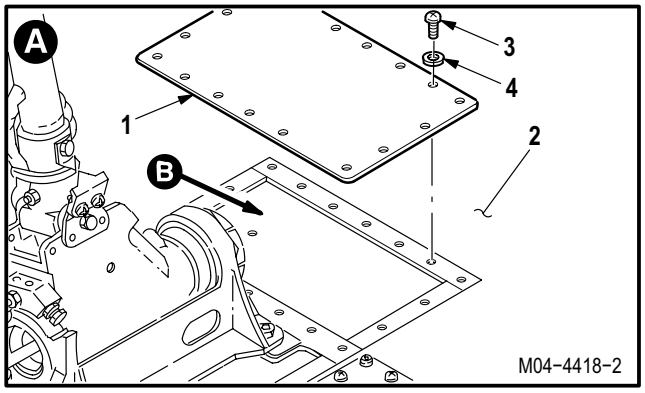


11.186.3. Removal

a. **Remove access door (1) from pilot floor (2).**

(1) Remove 16 screws (3) and washers (4) from door (1).

(2) Remove door (1).



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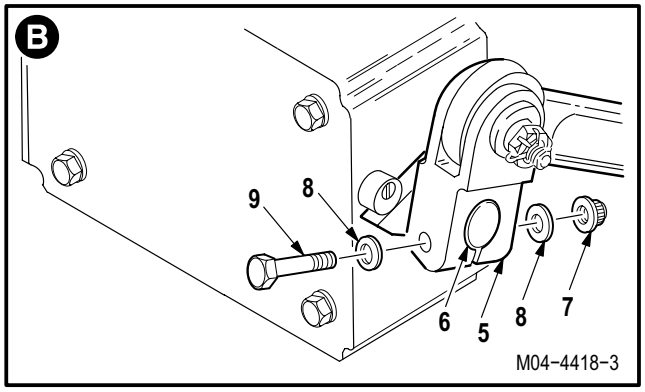
11.186. LATERAL MAGNETIC BRAKE MECHANISM ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Remove brake mechanism assembly (5) from magnetic brake shaft (6).**

(1) Remove nut (7) and washer (8).

(2) Remove bolt (9) and washer (8).



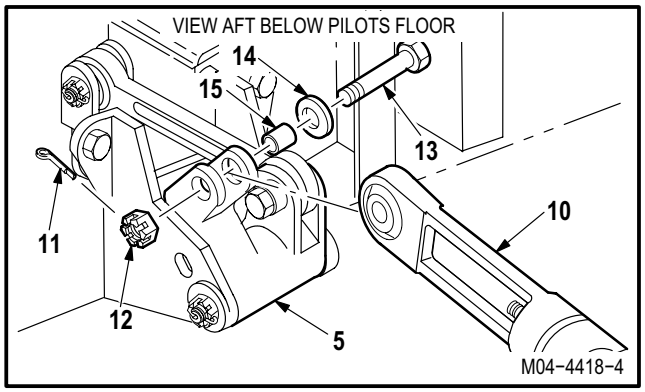
c. **Remove feel spring cartridge (10) from brake mechanism (5).**

(1) Remove and discard cotter pin (11).

(2) Remove nut (12).

(3) Remove bolt (13), washer (14), and bushing (15).

(4) Remove cartridge (10).



d. **Remove brake mechanism (5) from airframe (16).**

(1) Remove four nuts (17) and washers (18).

(2) Remove four bolts (19).

(3) Slide brake mechanism (5) off shaft (6).

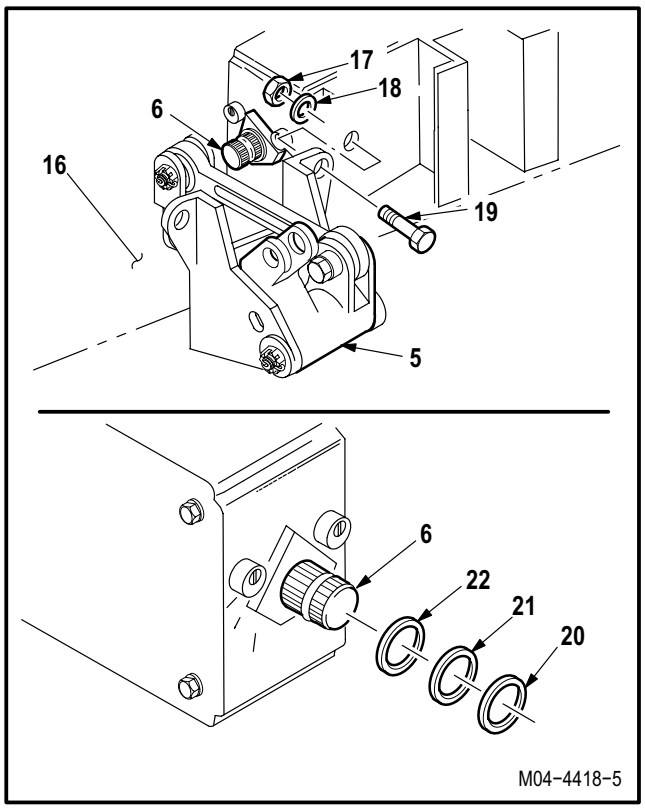
(4) Remove brake mechanism (5).

NOTE

Identify position of shim and spacer rings for proper placement during installation.

(5) Remove shim (20), spacers (21) and (22) from shaft (6).

(6) Retain shim (20) and spacers (21) and (22) for installation.



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11.186. LATERAL MAGNETIC BRAKE MECHANISM ASSEMBLY REMOVAL/INSTALLATION – continued

11.186.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.186.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.186.6. Installation

a. **Establish midpoint (23) of shaft (6) travel.**

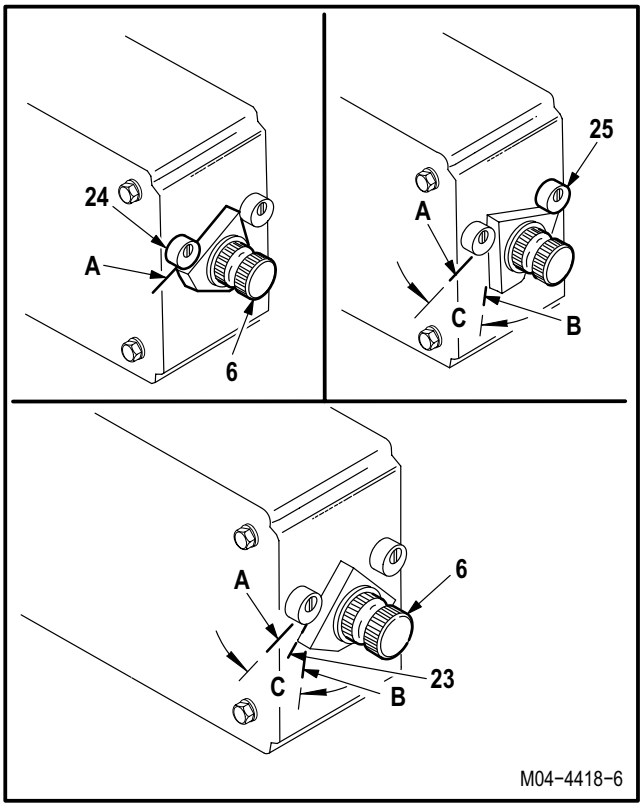
(1) Rotate shaft (6) to full left stop (24) and mark A.

(2) Rotate shaft (6) to full right stop (25) and mark B.

(3) Measure and bisect dimension C.

(4) Mark midpoint (23) of shaft (6) travel.

(5) Set shaft (6) at midpoint of travel (23).



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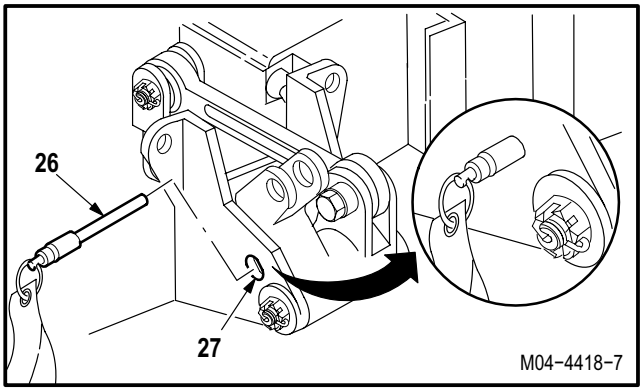
11.186. LATERAL MAGNETIC BRAKE MECHANISM ASSEMBLY REMOVAL/INSTALLATION – continued

b. **Install -5 rig pin (26) in rig pin hole (27).**



c. **Install brake mechanism (5) on airframe (16).**

(1) Maintain shaft (6) at midpoint of travel (23).

(2) Install spacers (22) and (21) and shim (20) on shaft (6).

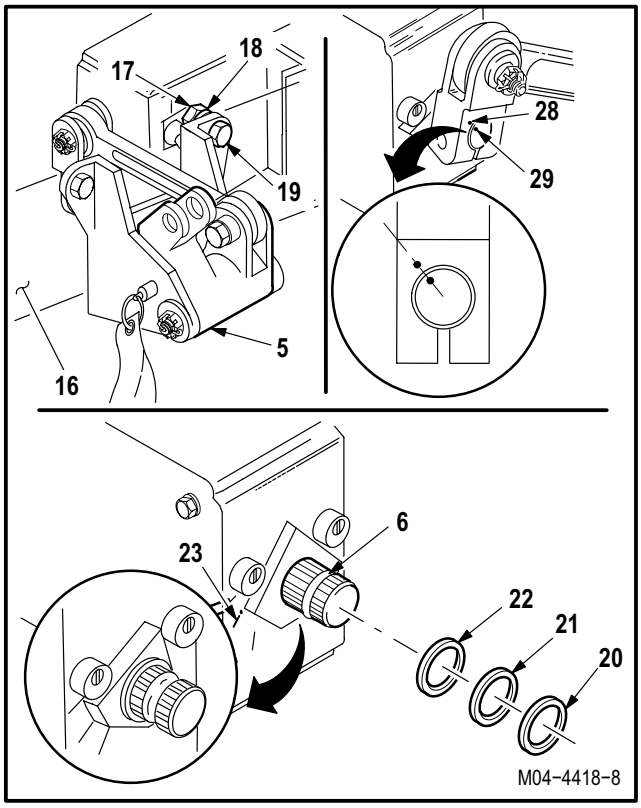
(3) Aline the arm index mark (28) with the magnetic brake shaft index mark (29).

(4) Slide brake mechanism (5) on shaft (6).

(5) Aline holes in brake mechanism (5) with holes in airframe (16).

(6) Install four bolts (19).

(7) Install four washers (18) and nuts (17).



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11.186. LATERAL MAGNETIC BRAKE MECHANISM ASSEMBLY REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control components, do not use force to aline cartridge with bellcrank.

d. **Install feel spring cartridge (10) on brake mechanism (5).** Torque nut (12) **30 to 40 INCH-POUNDS**.

(1) Aline cartridge (10) with brake mechanism (5).

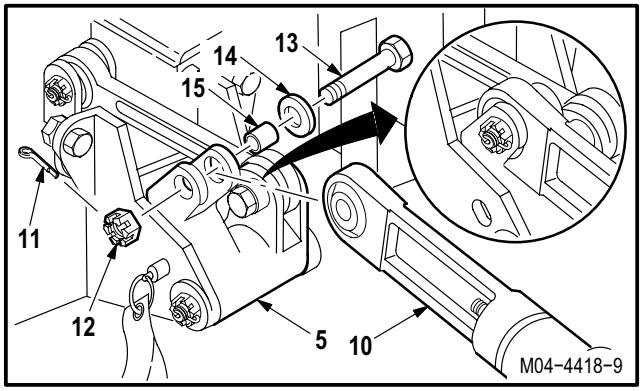
(2) Install bolt (13) through washer (14), bushing (15), brake mechanism (5), and cartridge (10).

(3) Check fit of self-retaining bolt (13) (para 11.1).

(4) Install nut (12). Torque nut (12) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

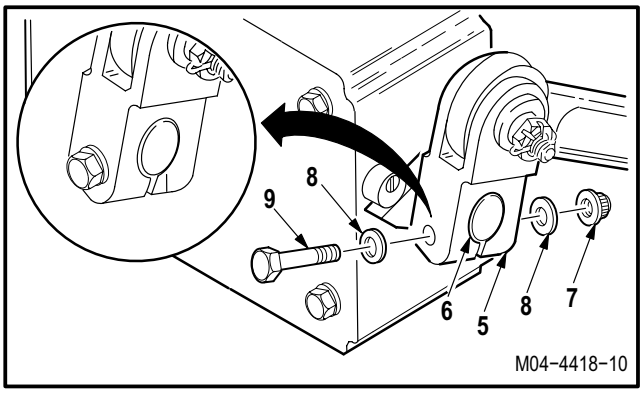
(6) Install new cotter pin (11).



e. **Install brake mechanism (5) on shaft (6).**

(1) Install bolt (9) through washer (8) and brake mechanism (5).

(2) Install nut (7) and washer (8).



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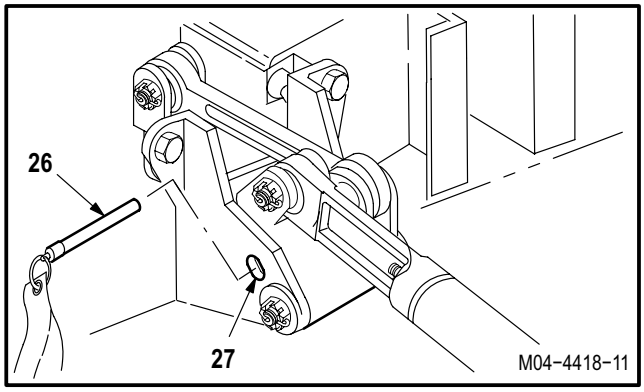
11.186. LATERAL MAGNETIC BRAKE MECHANISM ASSEMBLY REMOVAL/INSTALLATION – continued

f. **Remove -5 rig pin (26) from rig pin hole (27).**

g. **Inspect (QA).**

h. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**



i. **Install door (1) on floor (2).**

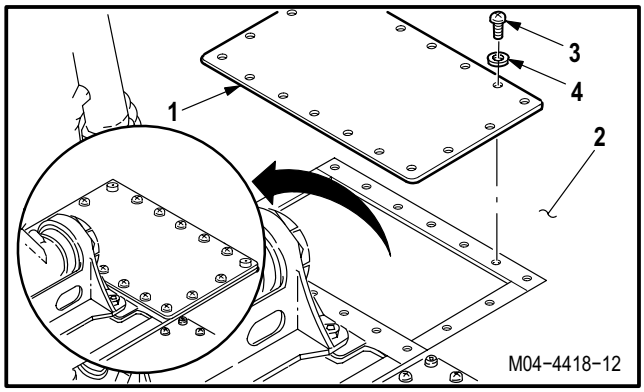
(1) Aline holes in door (1) with holes in floor (2).

(2) Install 16 screws (3) and washers (4) on door (1).

j. **Install HDU holster** (para 2.185)**.**

k. **Install pilot seat** (para 2.161)**.**

l. **Install pilot cyclic stick cover** (para 11.46)**.**



END OF TASK

11.187. LATERAL MAGNETIC BRAKE MECHANISM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM)

11.187.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.187.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

Cotter pin (3)

11.187.3. Disassembly

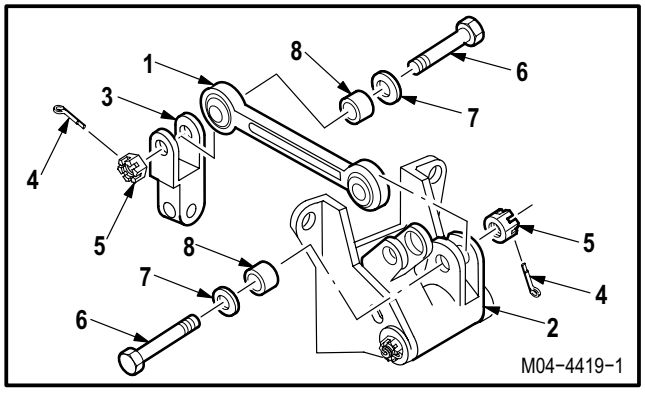
a. **Remove connecting link (1) from magnetic brake mechanism assembly bellcrank (2) and arm (3).**

(1) Remove and discard two cotter pins (4).

(2) Remove two nuts (5).

(3) Remove two bolts (6), washers (7), and bushings (8).

(4) Remove link (1) and arm (3).



b. **Remove bellcrank (2) from brake mechanism housing (9).**

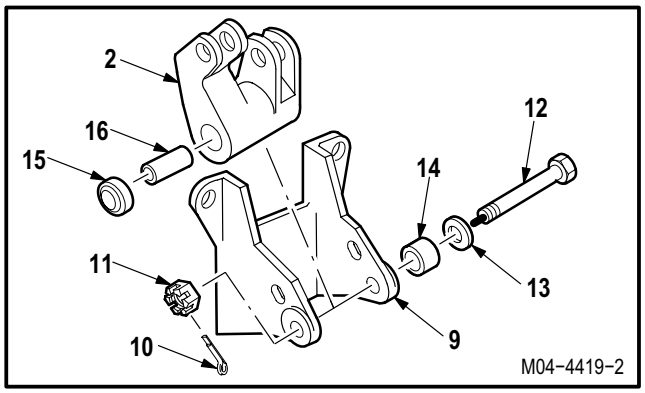
(1) Remove and discard cotter pin (10).

(2) Remove nut (11).

(3) Remove bolt (12), washer (13), and bushing (14).

(4) Remove bellcrank (2).

(5) Remove bearing (15) and spacer (16).



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11.187. LATERAL MAGNETIC BRAKE MECHANISM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.187.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.187.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.187.6. Assembly

a. **Install bellcrank (2) on housing (9).** Torque nut (11) **30 to 40 INCH-POUNDS**.

(1) Install spacer (16) and bearing (15) on bellcrank (2).

(2) Aline bellcrank (2) with housing (9).

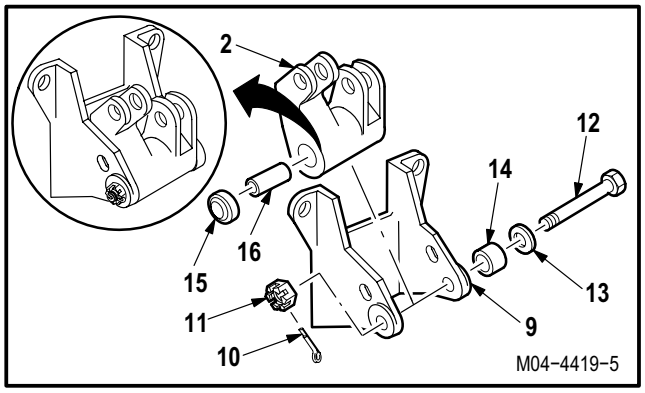
(3) Install bolt (12) through washer (13), bushing (14), housing (9), and bellcrank (2).

(4) Check fit of self-retaining bolt (12) (para 11.1).

(5) Install nut (11). Torque nut (11) to **30 INCH-POUNDS**. Use torque wrench.

(6) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(7) Install new cotter pin (10).



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11.187. LATERAL MAGNETIC BRAKE MECHANISM ASSEMBLY DISASSEMBLY/ASSEMBLY (AVIM) – continued

b. **Install link (1) on bellcrank (2) and arm (3).** Torque two nuts (5) **30 to 40 INCH-POUNDS**.

(1) Aline link (1) with bellcrank (2).

(2) Install bolt (6), washer (7), and bushing (8).

(3) Aline arm (3) with link (1).

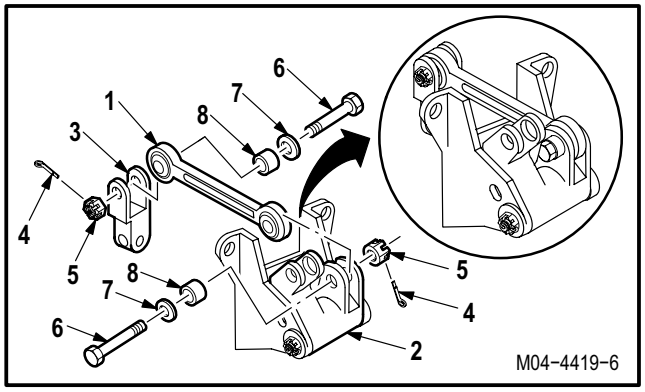
(4) Install bolt (6), washer (7), and bushing (8).

(5) Check fit of self-retaining bolts (6) (para 11.1).

(6) Install two nuts (5). Torque two nuts (5) to **30 INCH-POUNDS**. Use torque wrench.

(7) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(8) Install two new cotter pins (4).



c. **Inspect (QA).**

END OF TASK

11.188. LONGITUDINAL MAGNETIC BRAKE SPRING MECHANISM REMOVAL/INSTALLATION

11.188.1. Description

This task covers: Removal. Cleaning. Inspection. Installation.

11.188.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
Flight control rigging kit (item 267, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)

References:

TM 1-1520-238-T

Materials/Parts:

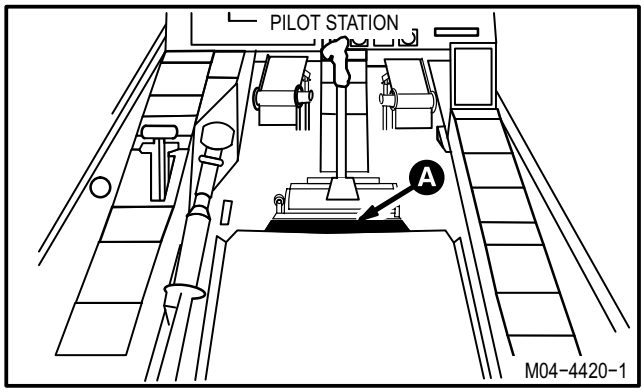
Cotter pin

Personnel Required:

67R	Attack Helicopter Repairer
67R3F	Attack Helicopter Repairer/Technical Inspector

Equipment Conditions:

Ref	Condition
1.57	Helicopter safed
2.161	Pilot seat removed

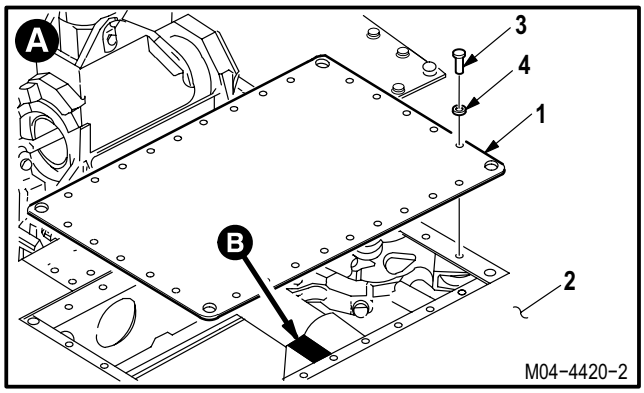


11.188.3. Removal

a. **Remove access door (1) from pilot floor (2).**

(1) Remove 28 screws (3) and washers (4) from door (1).

(2) Remove door (1).



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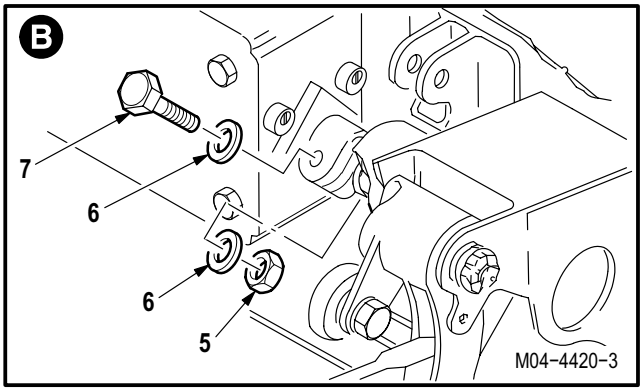
11.188. LONGITUDINAL MAGNETIC BRAKE SPRING MECHANISM REMOVAL/INSTALLATION – continued

b. **Remove nut (5) and washer (6).**

c. **Remove bolt (7) and washer (6).**



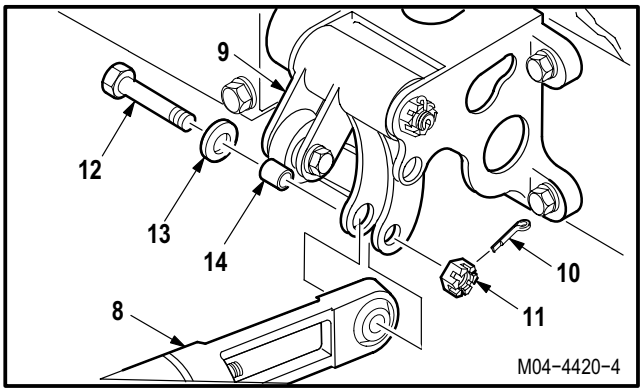
d. **Remove feel spring cartridge (8) from spring mechanism (9).**

(1) Remove and discard cotter pin (10).

(2) Remove nut (11).

(3) Remove bolt (12), washer (13), and bushing (14).

(4) Remove cartridge (8).



e. **Remove spring mechanism (9) from airframe (15).**

(1) Remove four bolts (16) and washers (17).

(2) Slide spring mechanism (9) off magnetic brake shaft (18).

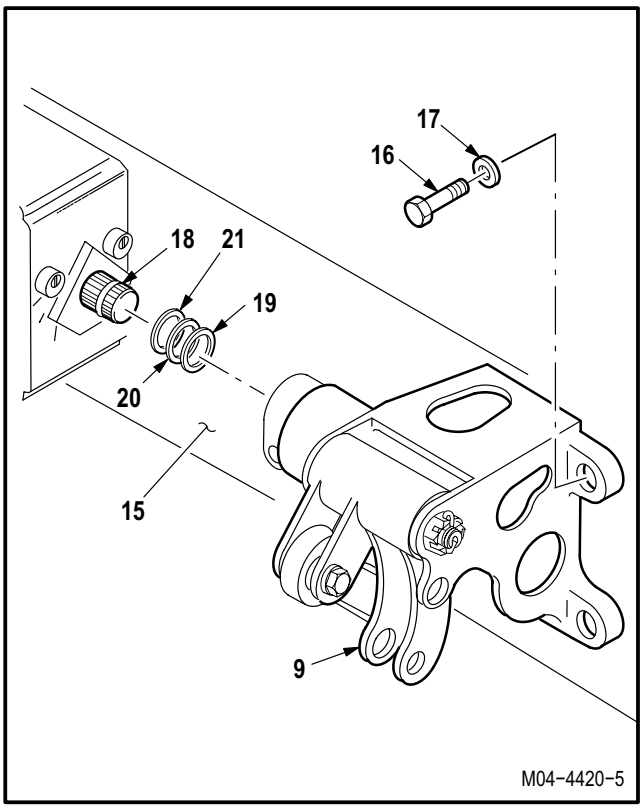
(3) Remove spring mechanism (9).

NOTE

Identify position of shim and spacer rings for proper placement during installation.

(4) Remove shim (19), spacers (20) and (21) from shaft (18).

(5) Retain shim (19) and spacers (20) and (21) for installation.



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11.188. LONGITUDINAL MAGNETIC BRAKE SPRING MECHANISM REMOVAL/INSTALLATION – continued

11.188.4. Cleaning

a. **Wipe removed and attaching parts with a clean rag.**

11.188.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

11.188.6. Installation

a. **Establish midpoint (22) of magnetic brake shaft (18) travel.**

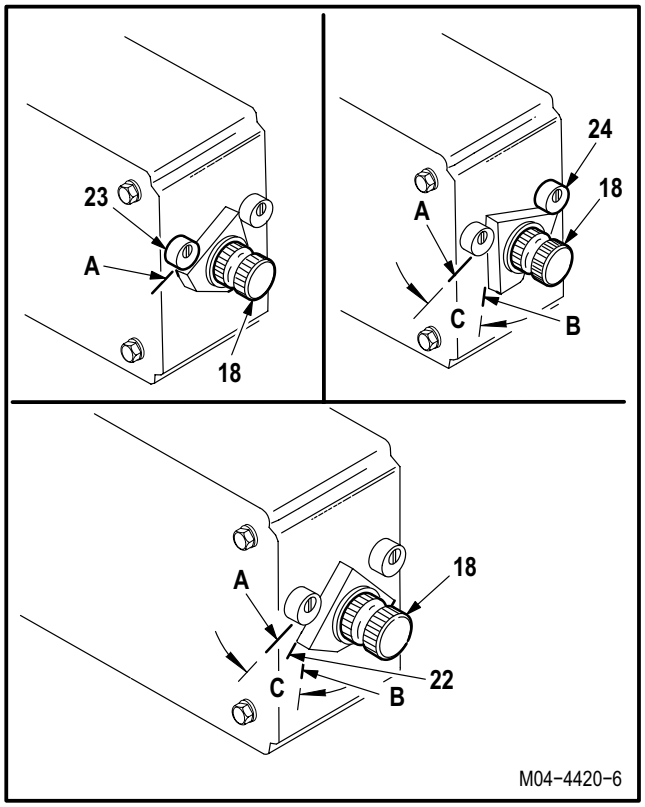
(1) Rotate shaft (18) to full left stop (23) and mark A.

(2) Rotate shaft (18) to full right stop (24) and mark B.

(3) Measure and bisect dimension C.

(4) Mark midpoint (22) of shaft (18) travel.

(5) Set shaft (18) at midpoint of travel (22).



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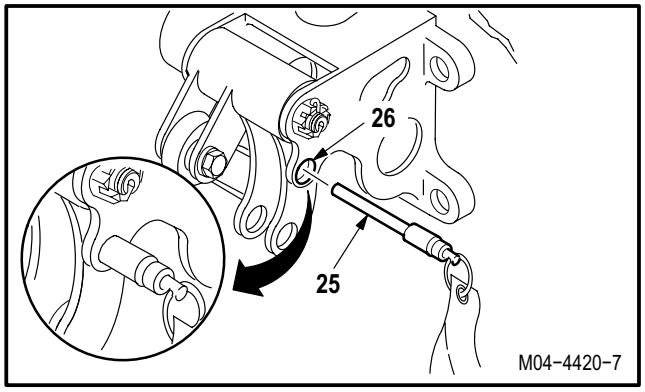
11.188. LONGITUDINAL MAGNETIC BRAKE SPRING MECHANISM REMOVAL/INSTALLATION – continued

b. **Install -5 rig pin (25) in rig pin hole (26).**



c. **Install spring mechanism (9) on airframe (15).**

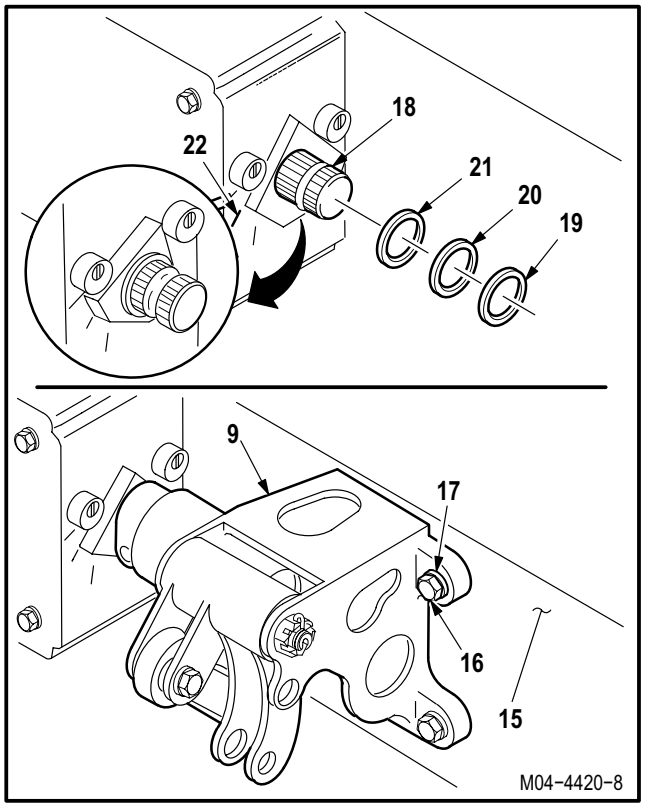
(1) Maintain shaft (18) at midpoint of travel (22).

(2) Install spacers (21) and (20) and shim (19) on shaft (18).

(3) Slide spring mechanism (9) on shaft (18).

(4) Aline mounting holes in spring mechanism (9) with holes in airframe (15).

(5) Install four bolts (16) and washers (17).



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11.188. LONGITUDINAL MAGNETIC BRAKE SPRING MECHANISM REMOVAL/INSTALLATION – continued

CAUTION

To prevent damage to flight control components, do not use force to aline cartridge with bellcrank.

d. **Install feel spring cartridge (8) on spring mechanism (9).** Torque nut (11) **30 to 40 INCH-POUNDS**.

(1) Aline cartridge (8) with spring mechanism (9).

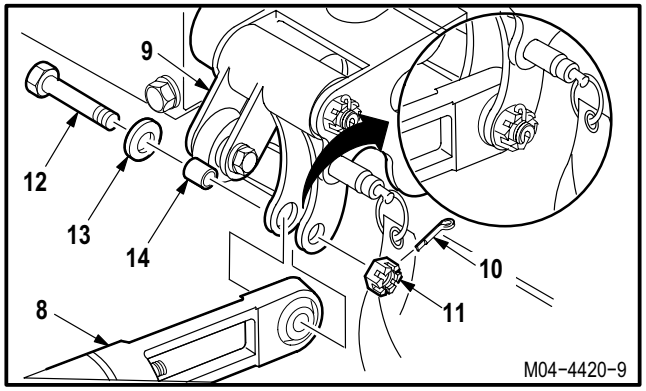
(2) Install bolt (12) through washer (13), bushing (14), spring mechanism (9), and cartridge (8).

(3) Check fit of self-retaining bolt (12) (para 11.1).

(4) Install nut (11). Torque nut (11) to **30 INCH-POUNDS**. Use torque wrench.

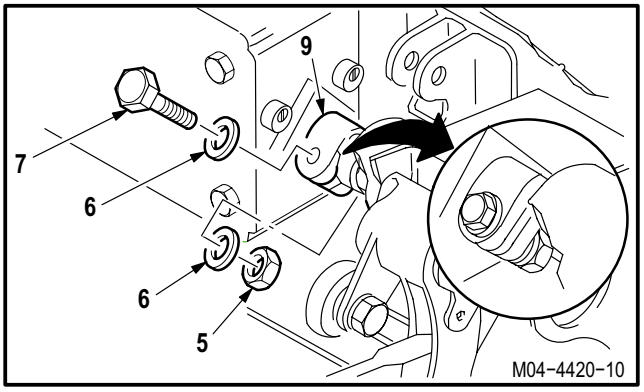
(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (10).



e. **Install bolt (7) through washer (6) and spring mechanism (9).**

f. **Install washer (6) and nut (5).**



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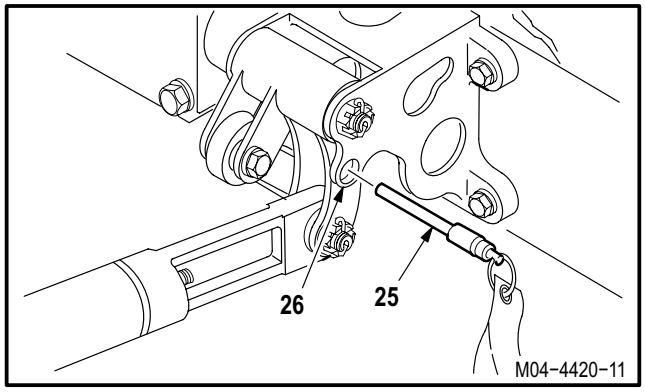
11.188. LONGITUDINAL MAGNETIC BRAKE SPRING MECHANISM REMOVAL/INSTALLATION – continued

g. **Remove -5 rig pin (25) from rig pin hole (26).**



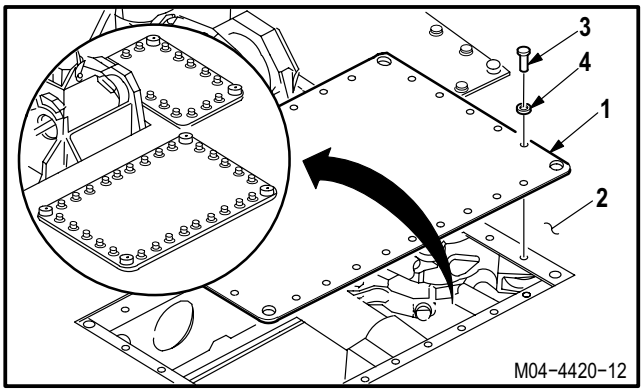
h. **Inspect (QA).**

i. **Perform flight control system maintenance operational check** (TM 1-1520-238-T)**.**

j. **Install door (1).**

(1) Aline holes in door (1) with holes in floor (2).

(2) Install 28 screws (3) and washers (4) on door (1).



k. **Install pilot seat** (para 2.161)**.**

END OF TASK

11.189. LONGITUDINAL MAGNETIC BRAKE SPRING MECHANISM DISASSEMBLY/ASSEMBLY (AVIM)

11.189.1. Description

This task covers: Disassembly. Cleaning. Inspection. Assembly.

11.189.2. Initial Setup

Tools:

Aircraft mechanic's tool kit (item 376, App H)
10 - 50 inch-pound 1/4-inch drive click type torque wrench (item 434, App H)
0 - 30 inch-pound 1/4-inch drive dial indicator torque wrench (item 445, App H)

Personnel Required:

67R Attack Helicopter Repairer
67R3F Attack Helicopter Repairer/Technical Inspector

Materials/Parts:

Cotter pin (3)
Wire (item 226, App F)

11.189.3. Disassembly

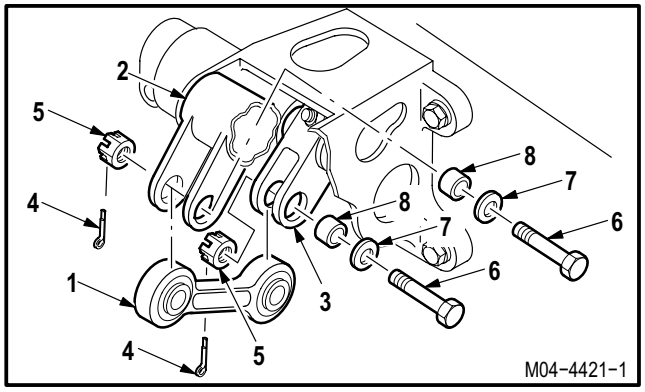
a. **Remove connecting link (1) from magnetic brake spring mechanism bellcrank (2) and lever (3).**

(1) Remove and discard two cotter pins (4).

(2) Remove two nuts (5).

(3) Remove two bolts (6), washers (7), and bushings (8).

(4) Remove link (1).



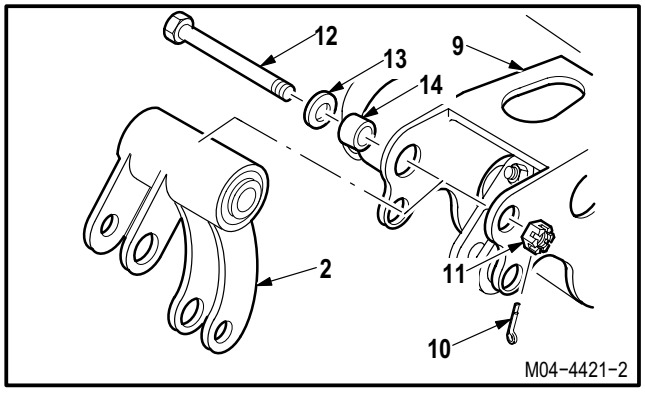
b. **Remove bellcrank (2) from spring mechanism housing (9).**

(1) Remove and discard cotter pin (10).

(2) Remove nut (11).

(3) Remove bolt (12), washer (13), and bushing (14).

(4) Remove bellcrank (2).



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11.189. LONGITUDINAL MAGNETIC BRAKE SPRING MECHANISM DISASSEMBLY/ASSEMBLY (AVIM) – continued

c. **Remove shaft (15) from housing (9).**

(1) Remove lockwire from bolt (16) and bolt (17).

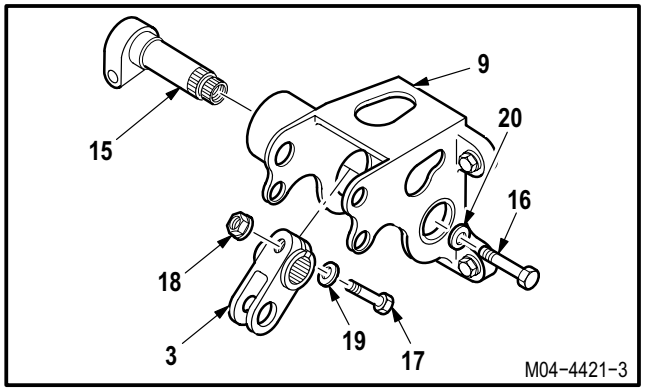
(2) Remove nut (18).

(3) Remove bolt (17) and washer (19).

(4) Remove bolt (16) and washer (20).

(5) Remove lever (3) from shaft (15).

(6) Remove shaft (15) from housing (9).



11.189.4. Cleaning

a. **Clean removed and attaching parts** (para 1.47)**.**

11.189.5. Inspection

a. **Check removed and attaching parts for damage** (para 11.5)**.**

b. **Check removed and attaching parts for corrosion** (para 1.49)**.**

c. **Check all installed bushing(s) and/or bearing(s) for wear** (para 11.5)**.**

d. **Check all removed bushing(s) and/or bearing(s) for wear** (para 11.4)**.**

GO TO NEXT PAGE

11.189. LONGITUDINAL MAGNETIC BRAKE SPRING MECHANISM DISASSEMBLY/ASSEMBLY (AVIM) – continued

11.189.6. Assembly

a. **Install shaft (15) on housing (9).** Torque bolt (16) to **15 INCH-POUNDS**. Torque nut (18) to **40 INCH-POUNDS**.

(1) Install shaft (15) on housing (9).

(2) Aline the lever index mark (21) with the shaft index mark (22).

(3) Install lever (3) on shaft (15).

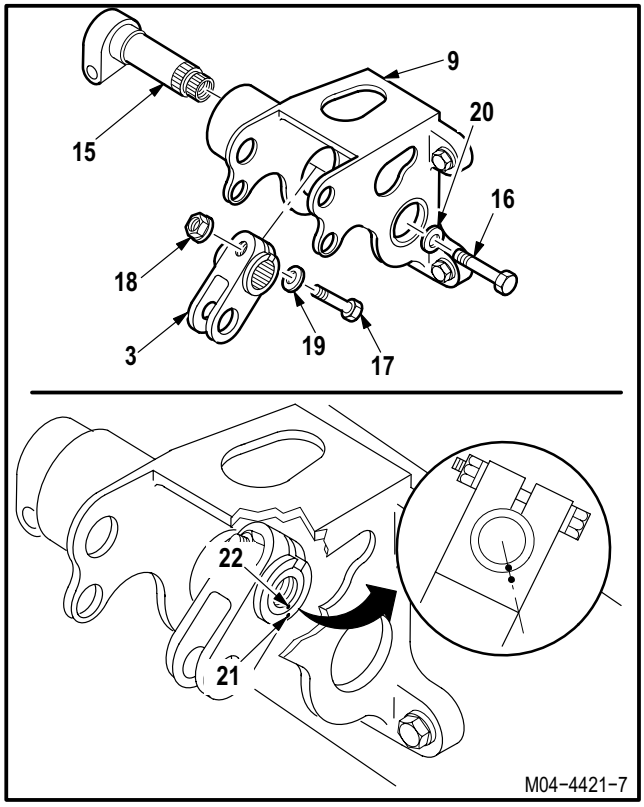
(4) Install bolt (16) and washer (20).

(5) Torque bolt (16) to **15 INCH-POUNDS**. Use torque wrench.

(6) Install bolt (17) and washer (19).

(7) Install nut (18). Torque nut (18) to **40 INCH-POUNDS**. Use torque wrench.

(8) Lockwire bolt (16) to bolt (17). Use wire (item 226, App F).



GO TO NEXT PAGE

11.189. LONGITUDINAL MAGNETIC BRAKE SPRING MECHANISM DISASSEMBLY/ASSEMBLY (AVIM) – continued

b. **Install bellcrank (2) on housing (9).** Torque nut (11) **30 to 40 INCH-POUNDS**.

(1) Aline bellcrank (2) with housing (9).

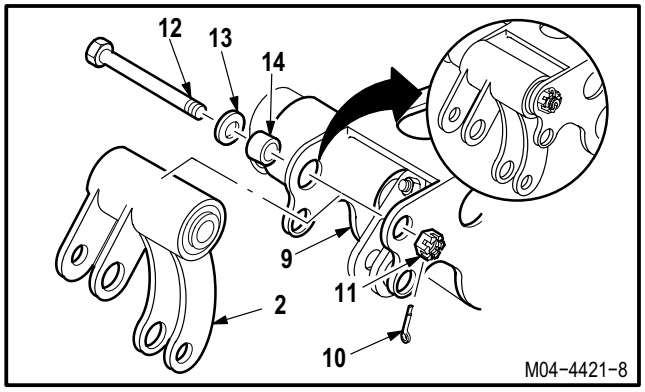
(2) Install bolt (12) through washer (13), bushing (14), housing (9), and bellcrank (2).

(3) Check fit of self-retaining bolt (12) (para 11.1).

(4) Install nut (11). Torque nut (11) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install new cotter pin (10).



c. **Install link (1) on bellcrank (2) and lever (3).** Torque two nuts (5) **30 to 40 INCH-POUNDS**.

(1) Aline link (1) with bellcrank (2) and lever (3).

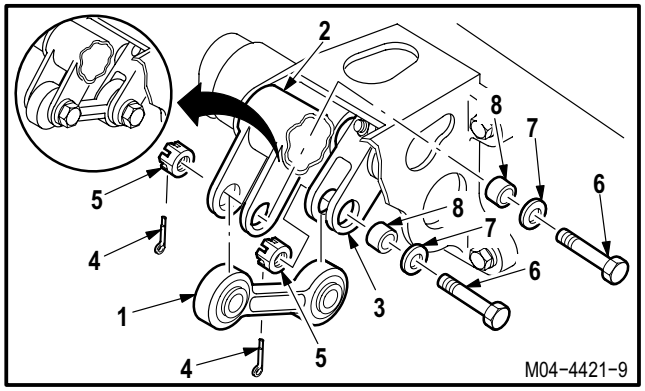
(2) Install two bolts (6), washers (7), and bushings (8).

(3) Check fit of self-retaining bolts (6) (para 11.1).

(4) Install two nuts (5). Torque two nuts (5) to **30 INCH-POUNDS**. Use torque wrench.

(5) Increase torque to aline cotter pin hole, but do not exceed **40 INCH-POUNDS**.

(6) Install two new cotter pins (4).



d. **Inspect (QA).**

END OF TASK

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
069533

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The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however, only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" whomever@avma27.army.mil
To: 2028@redstone.army.mil
Subject DA Form 2028

1. ***From:*** Joe Smith
2. *Unit:* home
3. ***Address:*** 4300 Park
4. ***City:*** Hometown
5. ***St:*** MO
6. ***Zip:*** 77777
7. ***Date Sent:*** 19-OCT-93
8. ***Pub no:*** 55-2840-229-23
9. ***Pub Title:*** TM
10. ***Publication Date:*** 04-JUL-85
11. *Change Number:* 7
12. *Submitter Rank:* MSG
13. ***Submitter FName:*** Joe
14. *Submitter MName:* T
15. ***Submitter LName:*** Smith
16. ***Submitter Phone:*** 123-123-1234
17. ***Problem:*** **1**
18. *Page:* 2
19. *Paragraph:* 3
20. *Line:* 4
21. *NSN:* 5
22. *Reference:* 6
23. *Figure:* 7
24. *Table:* 8
25. *Item:* 9
26. *Total:* 123
27. ***Text:***

This is the text for the problem below line 27.

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THEN . .JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)
PFC John DOE
CO A 3rd Engineer Bn
Ft. Leonardwood, MO 63108

DATE SENT
10 January 1999

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 1–1520–238-23-7-1	30 December 1998	AVUM/AVIM Manual for AH64 Helicopter

BE EXACT PIN–POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
6	2-1 a		
B1		4-3	

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2–1a the manual states the engine has 6 cylinders. The engine on my set only has 4 cylinders. Change the manual to show 4 cylinders.

Callout 16 on figure 4–3 is pointed at a bolt. In key to figure 4–3, item 16 is calle a shim. Please correct one or the other

EXAMPLE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER
JOHN DOE, PFC (268) 317–7111

SIGN HERE
JOHN DOE John Doe

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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounces
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce–inches	newton–meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.452	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound–feet	newton–meters	1.356	metric tons	short tons	1.102
pound–inches	newton–meters	.11296			

Temperature (Exact)

° F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	° C

PIN: 072832-007