COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

SPOILER ACTUATION POWER CONTROL UNIT ASSEMBLY

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COMPONENT MAINTENANCE MANUAL

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To: All holders of SPOILER ACTUATION POWER CONTROL UNIT ASSEMBLY 27-60-42.

Attached is the current revision to this COMPONENT MAINTENANCE MANUAL

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Location of Change	Description of Change
27-60-42	
TESTING AND FAULT ISOLATION	Changed testing procedure.
SPECIAL TOOLS FIXTURES AND EQUIPMENT	Changed the data in the Tool Supplier Information table.
	Added the Commercial Tools table.
	Added the Special Tools table.
	Added the Tool Supplier Information table.
	Changed the data in the Special Tools table.

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TEMPORARY REVISION AND SERVICE BULLETIN RECORD

BOEING SERVICE BULLETIN	BOEING TEMPORARY REVISION	OTHER DIRECTIVE	DATE OF INCORPORATION INTO MANUAL
		PRR 38122	DEC 01/97
		PRR 38141	DEC 01/97

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Temporary Revision		Inserted		Removed	
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Temporary Revision		Inserted		Removed	
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INTRODUCTION

1. General

A. The instructions in this manual supply the data necessary to do the maintenance functions together with the test, fault isolation, repair, and replacement of the defective parts.

B. This manual is divided into different parts:

(1) Title Page

(2) Transmittal Letter

(3) Highlights

(4) List of Effective Pages

(5) Table of Contents

(6) Temporary Revision & Service Bulletin Record

(7) Record of Revisions

(8) Record of Temporary Revisions

(9) Introduction

(10) Procedures & IPL Sections

C. Components that can be repaired have a different repair number for each specified repair. To find the repair number location of a component, look in the Repair-General procedure at the beginning of the REPAIR section. The Repair-General procedure also has an explanation of the True Position Dimension symbols used.

D. All dimensions, measures, quantities and weights included are in English units. When metric equivalents are given they will be in the parentheses that follow the English units.

E. The introduction to the Illustrated Parts List (IPL) shows how the IPL data is used.

F. Design changes, optional parts, configuration differences and Service Bulletin modifications may cause different part numbers. These part numbers are identified in the IPL with an alphabetical letter which is added to the end of the basic item number. This new item number is referred to as an alpha-variant. Throughout the manual, IPL basic item number references also apply to alpha-variants unless shown differently.

G. The tool reference numbers found in the individual procedures and in the Special Tools, Fixtures, and Equipment section are used to identify if a tool is a standard tool (STD-XXXX), a commercial tool (COM-XXXX), or a Special Tool (SPL-XXXX). This reference number is also used to distinguish between tools with similar names in the same procedure. These reference numbers are for use in the documentation only. They are not to be used for ordering tools.

SPOILER ACTUATOR POWER CONTROL UNIT ASSEMBLY - DESCRIPTION AND OPERATION

1. Description

A. The spoiler actuator power control unit (PCU) assembly is used to set the position of each of the flight spoilers (Spoilers No. 2 thru 5 and 8 thru 11). The PCU includes an input assembly, a piston, and manifold, barrel, and rod end assemblies. The unit also has a control valve, a hold-down check and relief valve, overtravel pistons, and a filter.

B. The PCU is mounted on a trunnion bracket on the wing rear spar. The piston rod end is attached to the spoiler panel. Control inputs are transmitted through the input assembly linkage. Hydraulic power is supplied to the PCU through fittings in the mounting bracket.

2. Operation

A. The eight flight spoilers operate as speedbrakes, and also help the ailerons to supply lateral control. The spoilers are flush with the wing upper surface when they are retracted. They are raised to the necessary positions by the flight spoiler PCU assemblies.

B. The control command from the flight deck turns the spoiler control quadrant, which moves the input lever of the PCU. The input lever moves the control valve, which allows 3000 psi hydraulic fluid to be supplied to one side of the piston. The PCU turns as it puts the spoiler into position. This causes the control valve to go back to its neutral position. The hydraulic fluid flow stops when the spoiler is at the correct position.

C. The hold-down check valve prevents spoiler float when hydraulic pressure is removed or lost. A poppet in the check valve is held open by a plunger when hydraulic pressure is available. The poppet is closed by a spring when the hydraulic pressure is removed.

D. The check valve also operates as a relief valve to prevent damage when there is a large increase in the hydraulic fluid pressure in the actuator. The increase in the pressure can be caused by thermal expansion of trapped hydraulic fluid, or by spoiler-up loads when hydraulic power is on. As the internal pressure increases under these conditions, the plunger opens the poppet to decrease the pressure.

3. Leading Particulars (Approximate)

A. Length – 10 inches (retracted) 12 inches (extended)

B. Width – 13 inches

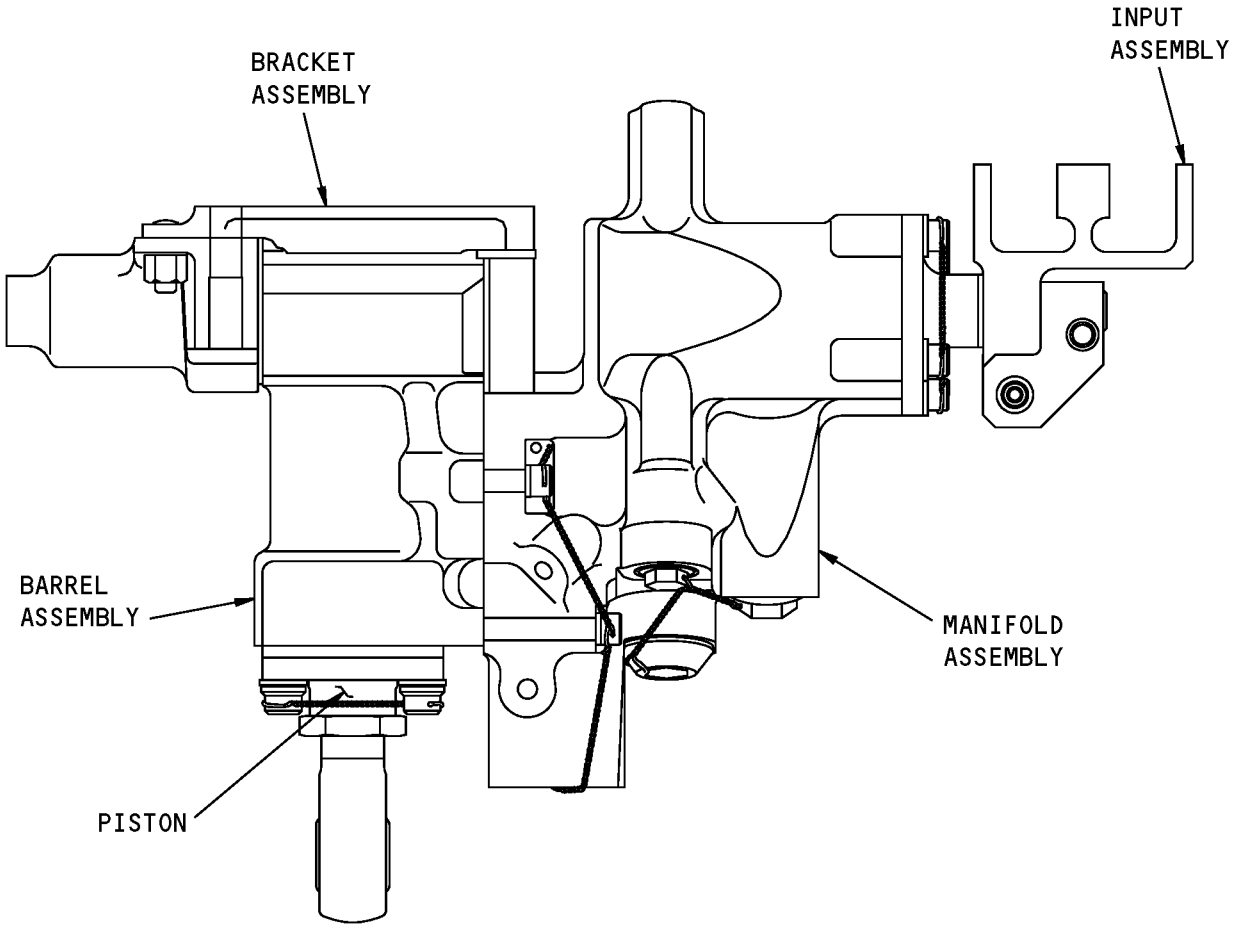
C. Height – 4 inches

D. Weight – 12.4 pounds

E. Stroke – 2.24 inches

F. Operating Fluid – BMS 3-11, Type 4 Hydraulic Fluid

G. Operating Pressure – 3000 psi



Spoiler Actuator Power Control Unit Assembly
Figure 1

TESTING AND FAULT ISOLATION

1. General

A. This procedure has the data necessary to do a test of the spoiler actuator power control unit (PCU) assembly (1B) after an overhaul, or for fault isolation.

B. Refer to the Standard Overhaul Practice Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 2 or IPL Figure 3 for item numbers.

D. Do the tests at room temperature. Fill the PCU assembly with BMS 3-11, type 4 hydraulic fluid, D00153. Bleed all air from the fluid.

E. Do not apply compressed air to the hydraulic ports.

2. Procedures

WARNING: REMOVE ALL AIR FROM THE COMPONENTS BEFORE YOU DO THESE TESTS. BLEED THE AIR FROM THE FLUID AND KEEP THE TEST UNIT FULL DURING ALL OF THE TESTS. DO NOT APPLY COMPRESSED AIR TO THE PORTS DURING THE TESTS.

A. Tools/Equipment

NOTE: Equivalent substitutes may be used.

Reference	Description
SPL-5346	Flow meter - 0-2 gpm (Part #: 410DME-3R, Supplier: 81205)
SPL-5349	X-Y Recorder/Plotter (Part #: 925E, Supplier: 60795)
SPL-5387	Adapter - Wrench, Flight Spoiler Actuator (Part #: C27061-1, Supplier: 81205)
SPL-5388	Test Block - Flight Spoiler Actuator Valve Cartridge (Part #: C27062-1, Supplier: 81205)
SPL-5435	Test Equipment - Flight Spoiler Power Control Unit (Part #: F80224-79, Supplier: 81205) (Opt Part #: F80224-60, Supplier: 81205)
SPL-5451	Position Transducer (LVDT) (Part #: DC750-050, Supplier: 0ZW31) (Part #: PR750-050, Supplier: 0ZW31)
SPL-5452	Position transducer (LVDT) (Part #: PR750-050, Supplier: 0ZW31)
SPL-5453	Pressure Transducer - 0-5000 psi (Part #: PX91, Supplier: 81205)
SPL-5459	Position Transducer (Part #: SS-101, Supplier: 00288)

B. Component Functional Test

NOTE: Use a hydraulic test stand which can supply BMS 3-11 hydraulic fluid at 0-5000 psi.

(1) Do the test of the hold-down check and relief valve (IPL Figure 2, 255).

(a) Use the C27061 wrench adapter, SPL-5387 to remove the relief valve from the PCU assembly, and install the valve in the C27062 test block, SPL-5388. Refer to TESTING AND FAULT ISOLATION, Figure 101.

(b) Do a check of the minimum operating pressure of the relief valve.

1) Connect the high pressure hydraulic source to the supply port. Attach a drain tube to the retract valve port. Apply 5 psi to the retract cylinder port.

2) With the return port open to atmosphere, increase the pressure at the supply port until flow occurs at the retract valve port. The flow must occur at a minimum supply pressure of 100 psi.

(c) Do a check of the relief pressure of the relief valve.

1) Connect the high pressure hydraulic source to the retract cylinder port. Apply 5 psi to the supply and return ports.

2) Increase the pressure at the retract cylinder port until a minimum flow of 5 drops/minute occurs at the retract valve port. The relief valve cracking pressure (at which the flow occurs) must be 3200-4000 psi.

3) Increase the pressure at the retract cylinder port until there is a continuous flow from the retract valve port. Decrease the pressure to 2800 psi. After 20 seconds, the flow must not be more than 5 drops/minute.

4) Repeat step (c) with 3000 psi applied to the supply port.

(d) Do a check of the relief flow through the relief valve.

1) Connect the retract valve port to a Flow meter, SPL-5346.

2) Apply 3000 psi to the retract cylinder port. Increase the pressure to increase the flow through the retract valve port to 1.2 gpm minimum. The pressure must not be more than 4900 psi at the 1.2 gpm minimum flow.

3) Decrease the pressure to 2100 psi. After 20 seconds, the flow must not be more than 5 drops/minute.

(e) Do a check of the cracking pressure of the check valve.

1) Install the pressure gage in the retract valve port. Connect the pressure source to the retract valve port.

2) Increase the pressure until there is flow from the retract cylinder port. The cracking pressure of the check valve, when flow starts, must be 2-5 psi. Decrease the pressure until the valve reseats and the flow stops.

(f) Do a check of the full flow through the check valve.

1) Install a differential pressure gage across the retract valve port and the retract cylinder port. Connect the pressure source to the retract valve port, and let the retract cylinder port drain through the Flow meter, SPL-5346.

2) Increase the pressure at the retract valve port until a flow of 2 gpm occurs. The pressure drop at 2 gpm must not be more than 30 psi (corrected for the tare loss through the test block, SPL-5388 and the hydraulic connections).

(g) Remove the hold-down check and relief valve (IPL Figure 2, 255) from the test block, SPL-5388. Install the valve in the PCU assembly. Refer to ASSEMBLY.

(2) Do the test of the flow control servovalve.

NOTE: The slide and sleeve assembly (IPL Figure 2, 230) in the PCU manifold is the flow control servovalve.

(a) Remove the manifold assembly (IPL Figure 2, 325) from the barrel assembly (IPL Figure 2, 440). Refer to DISASSEMBLY.

(b) Attach the PCU manifold assembly to the test manifold on the F80224-79 test equipment, SPL-5435 test equipment.

(c) Connect the cylinder extend (CE) and cylinder retract (CR) ports on the test manifold, with a shutoff (interconnect) valve installed between the ports. Also install pressure transducers pressure transducer, SPL-5453 at the CE and CR ports. Attach a Position Transducer, SPL-5452, position transducer, SPL-5451 or Position Transducer, SPL-5459 to measure the travel of the PCU input lever.

(d) Set the hydraulic neutral position of the valve.

1) Close the interconnect valve between the CE and CR ports. Apply 3000 psi to the pressure (P) port on the test manifold.

2) Adjust the PCU input lever so that the difference between the pressures at the cylinder ports is less than 50 psi.

3) Set the input lever Position Transducer, SPL-5452, position transducer, SPL-5451 or Position Transducer, SPL-5459 to zero. The cylinder port pressures must be 1000-2000 psi for a new valve, or 300-2700 psi for an in-service or overhauled valve.

(e) Do a check of the pressure gain at the valve neutral position.

1) Connect the output from the cylinder pressure transducers pressure transducer, SPL-5453 and the Position Transducer, SPL-5452, position transducer, SPL-5451 or Position Transducer, SPL-5459 to an X-Y recorder/plotter, SPL-5349.

2) Move the input lever slowly from 0.0024 inch (0.1 degree) in the retract direction to 0.0024 inch (0.1 degree) in the extend direction, then back to 0.0024 inch in the retract direction. For a change in differential pressure (CE minus CR) of -2000 psi to +2000 psi, the input lever travel must not be more than 0.0014 inch (0.057 degree). Refer to TESTING AND FAULT ISOLATION, Figure 102.

(f) Do a check of the valve flow gain.

NOTE: It is not necessary to do this check if you only replace the packings and the rings or retainers.

1) Install a flow transducer between the CE and CR ports. Connect the output from the flow transducer and the input lever Position Transducer, SPL-5452, position transducer, SPL-5451 or Position Transducer, SPL-5459 to the X-Y recorder/plotter, SPL-5349.

2) Open the interconnect valve. Apply 3000 psi to the P port with the return (R) port open.

3) Move the input lever through one complete cycle, and plot the flow versus the input lever travel on the X-Y recorder/plotter, SPL-5349. The curve must be inside the limits shown on TESTING AND FAULT ISOLATION, Figure 103.

(g) Do a check of the valve underlap.

NOTE: It is not necessary to do this check if you only replace the packings and the rings or retainers.

1) Expand the scale on the X-Y recorder/plotter, SPL-5349. Use the same test setup and conditions as in the step before this one.

2) Move the input lever slowly from 0.01 inch (0.4 degree) retract to 0.01 inch (0.4 degree) extend, then back to 0.01 inch retract. Make sure the valve null region is not less than 0.0008 inch (0.035 degree) wide, as shown in TESTING AND FAULT ISOLATION, Figure 104.

NOTE: The null region is the distance between the points where the left and right halves of the plot of flow- versus-input-lever-position go across the X-axis. The width of the null region is an indication of the valve underlap.

(h) Measure the internal leakage at the valve neutral position.

1) Install the flow transducer in the line from the R port.

2) Close the interconnect valve between the CE and CR ports. Apply 3000 psi to the pressure (P) port on the test manifold.

3) Adjust the PCU input lever so that the pressures at the cylinder ports are equal (valve neutral position). The neutral leakage must not be more than 380 cc/minute for a new valve (slide and sleeve assembly), or 2000 cc/minute for an in-service or an overhauled valve.

(i) Measure the internal leakage at the limits of the valve travel.

1) Move the input lever 20 degrees from neutral in the retract direction.

2) Increase the applied pressure at the P port until the differential pressure between the CE and CR ports is 3000 psi. The internal leakage from the R port must not be more the 30 cc/minute.

3) Move the input lever 20 degrees from neutral in the extend direction.

4) Increase the applied pressure at the P port until the differential pressure between the CE and CR ports is 3000 psi. The internal leakage from the R port must not be more than 30 cc/minute.

(j) Measure the valve breakout force.

1) Apply a force to the input lever, through the center of the clevis holes and perpendicular to the centerline of the lever.

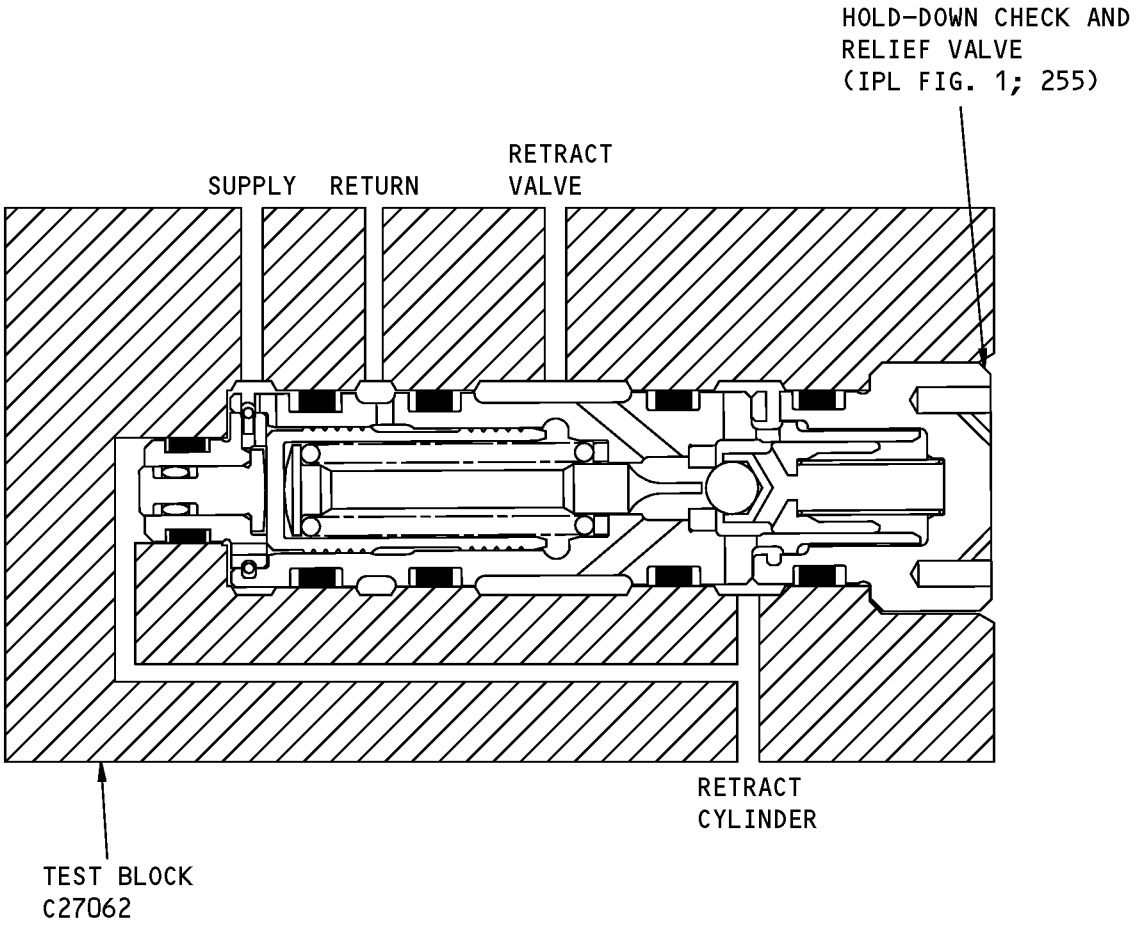
2) Increase the force until the valve slide (IPL Figure 2, 245) starts to move, as shown by an increase in the differential pressure between the CE and CR ports. The applied force must not be more than 3.65 pounds when the slide starts to move.

NOTE: The 3.65 pound force is applied to a moment arm of 1.375 inches, to give a maximum input torque of 5.0 pound-inches around the pivot of the lever.

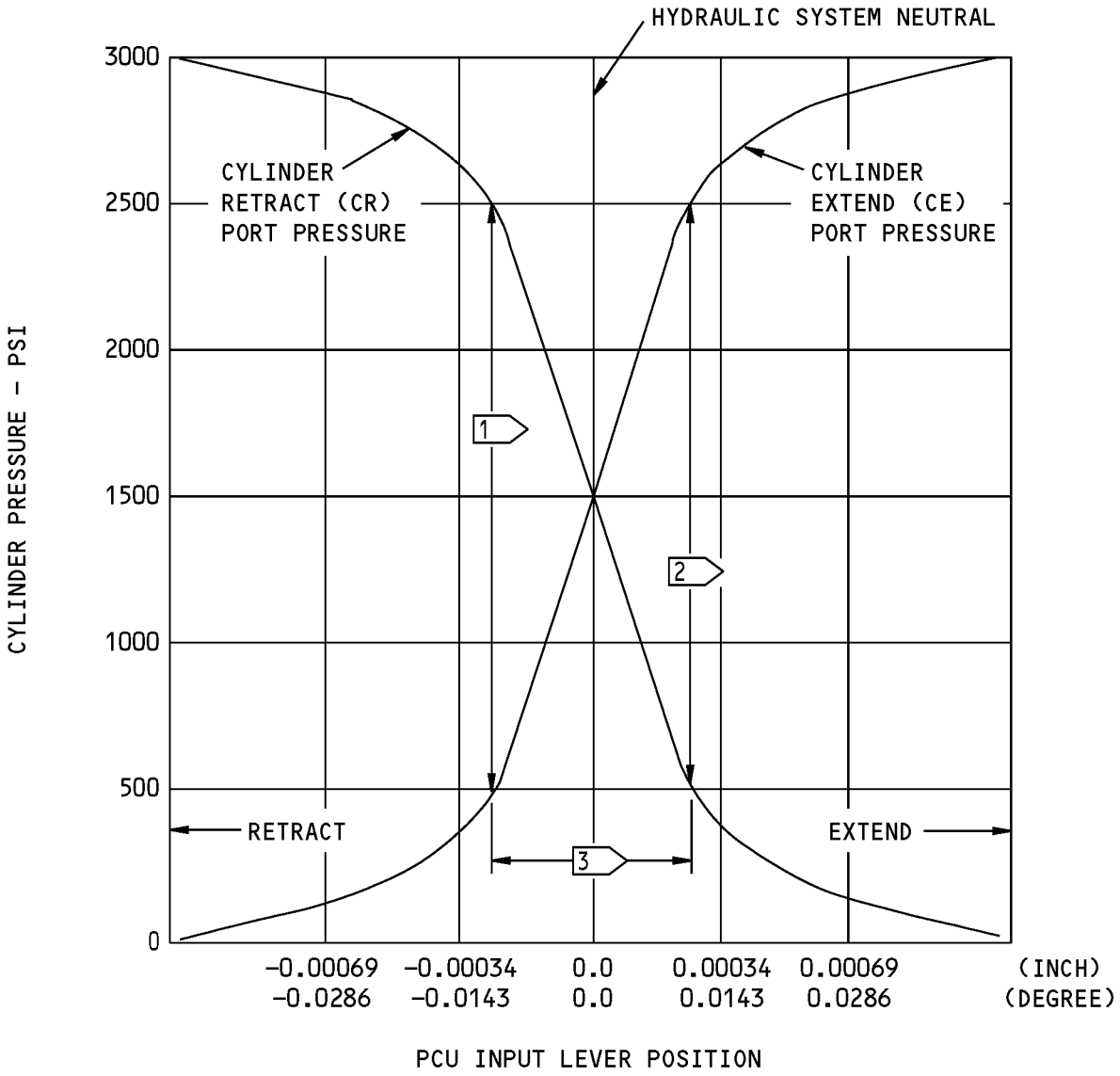
3) Remove the force and make sure that the input lever retracts.

(k) Remove the PCU manifold assembly from the F80224-79 test equipment, SPL-5435, and remove the test manifold from the PCU.

(l) Attach the PCU manifold assembly to the barrel assembly (440). Refer to ASSEMBLY.



Valve Installation In Test Block
Figure 101



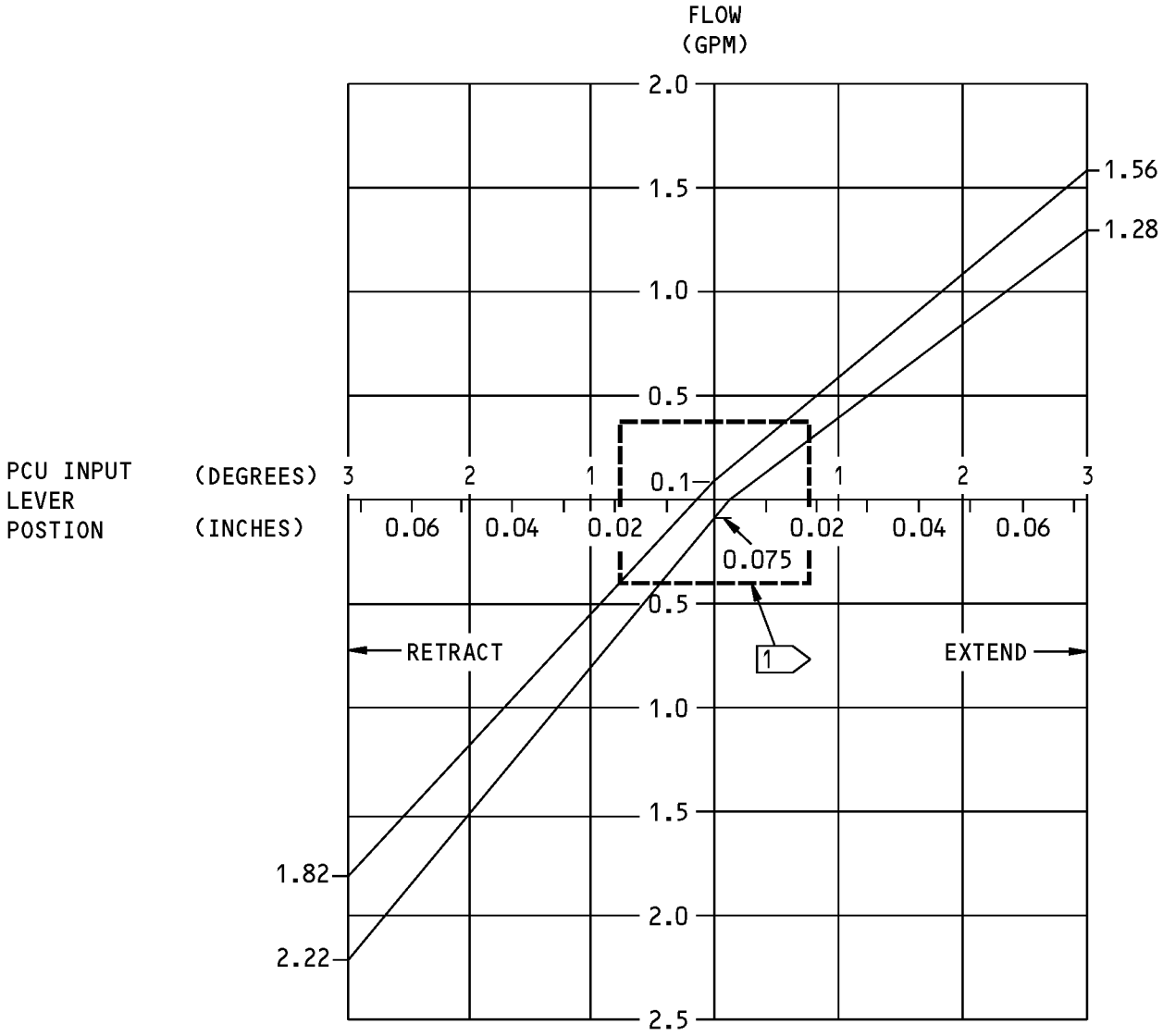
NOTE: TYPICAL CURVES ARE SHOWN FOR REFERENCE.

1 DIFFERENTIAL PRESSURE (CE - CR) = -2000 PSI

2 DIFFERENTIAL PRESSURE (CE - CR) = +2000 PSI

3 INPUT LEVER TRAVEL < 0.0014 INCH (0.057 DEGREE)

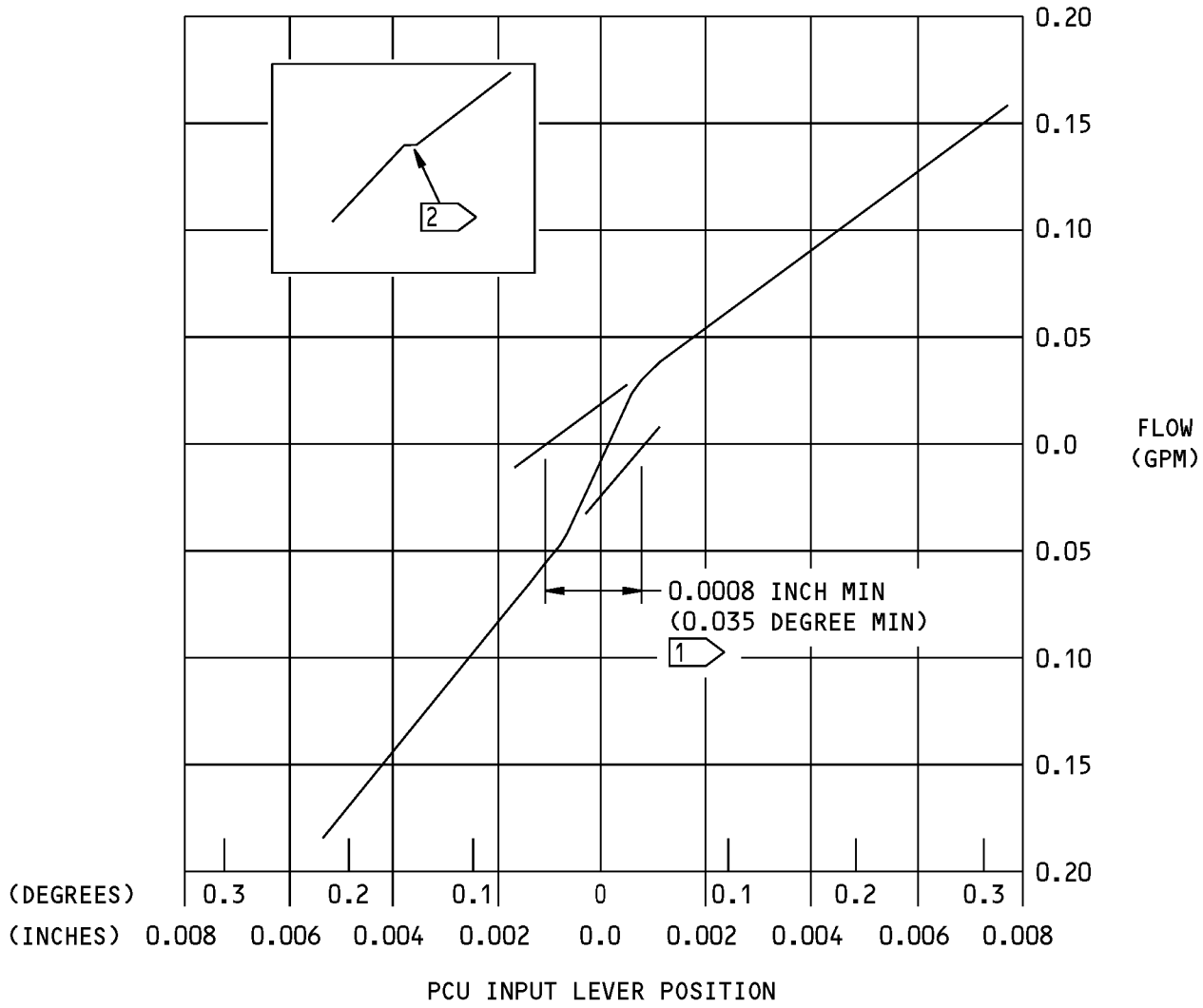
Pressure Gain at the Valve Neutral Position
Figure 102



NOTE: FLOW CURVE MUST BE INSIDE LIMITS SHOWN.

1 SEE FIG. 104 FOR DETAILS

Valve Flow Gain
Figure 103



1 NULL REGION (DISTANCE BETWEEN POINTS WHERE THE CURVE EXTENSIONS CROSS THE X-AXIS).

2 FLAT SPOT IN THE NULL REGION SHOWS VALVE OVERLAP, AND IS NOT PERMITTED.

Valve Underlap
Figure 104

C. PCU Assembly Functional Test

(1) Before you install the unit in the F80224-79 test equipment, SPL-5435, turn the input lever by hand through one full cycle with no hydraulic pressure. Do not turn the input lever more than 60 degrees on each side of the neutral position. Make sure that the lever moves freely.

WARNING: REMOVE ALL AIR FROM THE PCU ASSEMBLY BEFORE YOU DO THESE TESTS OR PERSONNEL CAN BE INJURED. BLEED THE AIR FROM THE FLUID AND KEEP THE TEST UNIT FULL DURING ALL OF THE TESTS. DO NOT APPLY COMPRESSED AIR TO THE PORTS DURING THE TESTS.

CAUTION: MAKE SURE THAT THE PISTON IS FREE TO MOVE DURING ALL PROOF PRESSURE TESTS, OR THE UNIT OR TEST EQUIPMENT CAN BE DAMAGED.

(2) Do the proof pressure tests.

NOTE: The proof pressure tests are not necessary if the unit was not disassembled.

(a) Do a proof pressure test of the supply side of the PCU.

1) Apply 3000 psi to the pressure port and open the return port to a drain.

2) Move the input lever so the piston is fully retracted.

3) Slowly increase the supply pressure to 4500 psi and hold the pressure for one minute. Make sure that there is no external leakage, permanent deformation, or other damage to the unit. Decrease the pressure to zero.

4) Increase the pressure to 3000 psi, then move the input lever so the piston is fully extended.

5) Slowly increase the supply pressure to 4500 psi and hold the pressure for one minute. make sure that there is no external leakage, permanent deformation or other damage to the unit. Decrease the pressure to zero.

6) Increase the pressure to 3000 psi, then move the input lever so the piston is fully retracted. Decrease the pressure to zero.

(b) Do a proof pressure test of the return side of the PCU.

1) Put a plug in the pressure port.

2) Apply 3000 psi to the return port and hold the pressure for one minute. Make sure that there is no external leakage, permanent deformation, or other damage to the unit.

3) Decrease the return pressure to zero.

4) Remove the plug and apply 3000 psi to the pressure port. Move the input lever so the piston is fully extended. Put the plug in the pressure port.

5) Apply 3000 psi to the return port and hold the pressure for one minute. Make sure that there is no external leakage, permanent deformation, or other damage to the unit.

6) Decrease the return pressure to zero. Remove the plug from the pressure port.

(c) Do a proof pressure test at low pressure.

1) Apply 5 psi to the pressure and return ports at the same time, and hold the pressures for one minute. Decrease the pressures to zero.

2) Increase the pressures to 5 psi again, and hold the pressure for one minute. Make sure that there is no external leakage.

3) Decrease the pressures to zero.

(3) Do a test for internal leakage.

(a) Install the unit in the F80224-79 test equipment, SPL-5435. Hold the piston rod end in a fixed position, with the input lever in the free or neutral position.

(b) Apply 3000 psi to the pressure port with the return port open. Measure the leakage out of the return port during a 3 minute test.

(c) Release the piston rod end. Turn the input lever 20 degrees from the neutral position to fully retract the piston. Measure the leakage out of the return port during a 3 minute test.

(d) Turn the input lever 20 degrees from the neutral position to fully extend the piston. Measure the leakage out of the return port during a 3 minute test.

(e) For an in-service unit, the leakage must not be more than 2060 cc/minute with the input lever at the neutral position. The leakage must not be more than 150 cc/minute with the piston fully retracted or fully extended.

(f) For a new unit, or an overhauled unit with a new control valve, the leakage must not be more than 430 cc/minute with the input lever at the neutral position. For an overhauled unit with an overhauled control valve, the in-service limit of 2060 cc/ minute is applicable. The leakage, with the piston fully retracted or fully extended, must not be more than 85 cc/ minute for a new or overhauled unit.

(4) Measure the piston stroke.

(a) Install the unit in the F80224-79 test equipment, SPL-5435.

(b) Apply 3000 psi to the pressure port.

(c) Loosen the jam nut (IPL Figure 2, 370) and adjust the rod assembly (IPL Figure 2, 380) to get the retracted rig length of 6.375-6.875 inches. Measure this dimension between the rod bearing center and the centerline of the input shaft (IPL Figure 2, 130) and (IPL Figure 3, 120) with the piston fully retracted.

(d) Turn the input lever to extend and retract the piston. Make sure that the piston stroke is 2.224-2.264 inches as measured from the fully retracted position to the fully extended position. The piston stroke must also be 2.224-2.264 inches when measured in the opposite direction.

(5) Measure the output resolution.

(a) Install the unit in the F80224-79 test equipment, SPL-5435, or in an equivalent fixture which can apply external loads to the unit, and configure the test equipment for the output resolution test.

NOTE: The F80224-79 test equipment, SPL-5435 has a simulated spoiler panel so that the unit can be set to equivalent spoiler positions.

(b) Apply 3000 psi to the pressure port. Turn the input lever so that the piston is fully retracted.

CAUTION: MOVE THE INPUT LEVER IN ONLY ONE DIRECTION BETWEEN THE CHECK POSITIONS. IF THE PISTON CHANGES DIRECTION DURING ITS TRAVEL TO A CHECK POSITION, THE TEST RESULTS WILL NOT BE CORRECT.

(c) Turn the input lever to a position equivalent to 2 degrees of spoiler extension. Adjust the piston dial indicator so it reads zero at this position.

(d) Slowly turn the input lever to a position approximately equivalent to 5 degrees of spoiler extension, then turn the input lever back to the 2 degree position. Record the piston position from the piston dial indicator.

(e) Turn the input lever so that the piston is fully retracted, then turn the input lever to a position equivalent to 12 degrees of spoiler extension. Adjust dial indicator so it reads zero at this position.

(f) Slowly turn the input lever to a position approximately equivalent to 15 degrees of spoiler extension, then turn the input lever back to the 12 degree position. Record the piston position from the piston dial indicator.

(g) The output resolution at the 2 degree spoiler position, and at the 12 degree spoiler position, must not be more than the following:

1) 0.006 inch – New unit, or an overhauled unit with a new control valve

2) 0.029 inch – In-service unit, or a unit with an overhauled control valve

(6) Do a test of the leakage of the hold-down check valve.

CAUTION: APPLY THE TENSION LOADS TO THE UNIT ONLY FROM THE RETRACTED POSITION TO THE EXTENDED POSITION, OR DAMAGE TO THE MOUNTING BRACKET (IPL FIG. 2, 515) CAN OCCUR.

(a) With the unit still in the F80224-79 test equipment, SPL-5435, or equivalent, apply 3000 psi to the pressure port with the return port open. Turn the input lever so that the piston is fully retracted. Decrease the pressure to zero.

(b) Apply a 4400 pound tension load to the piston, and hold the load for 5 minutes. The initial movement of the piston must not be more than 0.05 inch. Make sure that the piston does not move more than an additional 0.05 inch during the next 5 minutes.

(c) Decrease the tension load to 2400 pounds. Apply 3000 psi to the pressure port with the return port open. Move the piston to 0.5-1.5 inch extension.

(d) Decrease the pressure to zero at a constant rate of approximately 500 psi/second. The initial movement of the piston must not be more than a 0.05 inch extension. Make sure that the piston does not move more than an additional 0.02 inch during the next 2 minutes.

(7) Do a hold-down check of the unit.

(a) Apply 3000 psi to the pressure port with the return port open. Turn the input lever so that the piston is fully retracted.

(b) Apply a tension load of not less than 4800 pounds to the piston.

(c) Decrease the pressure to zero. Gradually decrease the applied load to 500 pounds in 6-8 seconds, and hold that load. The initial movement of the piston must not be more than a 0.05 inch extension. Make sure that the piston does not move more than an additional 0.02 inch during the next 2 minutes.

(d) Decrease the tension load to zero.

(8) Do a test for external leakage.

(a) Apply 3000 psi to the pressure port.

(b) For a new or overhauled unit, operate the unit through 100 cycles of extension and retraction. For an in-service unit, operate the unit through 25 cycles of extension and retraction.

(c) Make sure that there is no chatter or instability during the operation of the unit, or external leakage at any static seal.

(d) For a new or overhauled unit, the leakage at the piston rod seal (IPL Figure 2, 410) must not be more than 1 drop for each 25 cycles. The leakage at the rotary seals must not be more than 1 drop for each 100 cycles.

(e) For an in-service unit, the leakage at the piston rod seal (IPL Figure 2, 410) must not be more than 1 drop for each 5 cycles. The leakage at the rotary seals must not be more than 1 drop for each 25 cycles.

(9) Measure the valve breakout force.

(a) Put the piston rod in the retracted position.

(b) Apply 3000 psi to the pressure port and 50 psi to the return port. Hold the pressures for 5 minutes.

(c) Apply a force to the input lever, through the center of the clevis holes and perpendicular to the center line of the lever. Make sure that the piston rod starts to extend with an applied force of less than 3.65 pounds.

NOTE: The 3.65 pound force is applied to a moment arm of 1.375 inches to give a maximum input torque of 5.0 lb-in around the pivot of the lever.

(d) Remove the force from the input lever and make sure that the piston rod retracts.

(10) Measure the input lever travel and torque.

(a) Apply 3000 psi to the pressure port and 50 psi to the return port.

CAUTION: MAKE SURE THAT THE PISTON IS FREE TO MOVE DURING THIS TEST, OR THE UNIT OR THE F80224-79 TEST EQUIPMENT CAN BE DAMAGED.

(b) From the neutral position, turn the input lever clockwise against the spring load until it stops and the piston is fully extended. Turn the input lever clockwise into the overtravel range until it bottoms.

(c) Make sure that the overtravel rotation is not less than 40 degrees (60 degrees total rotation from neutral).

(d) Make sure that the input torque is not more than 275 lb-in.

(e) Return the input lever to its spring loaded stop, and make sure the piston is fully retracted. Turn the input lever counter clockwise into the overtravel range until it bottoms.

(f) Make sure that the overtravel rotation is not less than 40 degrees (60 degrees total rotation from neutral).

(g) Make sure that the input torque is not more than 275 lb-in.

(h) Decrease the pressures at the pressure port and return port to zero.

(i) Turn the input lever counter clockwise into the overtravel range until it bottoms.

(j) Make sure that the input torque is not more than 20 lb-in.

(k) Turn the input lever clockwise against the spring load until it stops. Turn the input lever counter clockwise into the overtravel range until it bottoms.

(l) Make sure that the input torque is not more than 20 lb-in.

(11) Remove the PCU assembly from the F80224-79 test equipment, SPL-5435.

D. Fault Isolation Procedures

(1) Refer to TESTING AND FAULT ISOLATION, Table 101 to do fault isolation with the test results.

Table 101: Trouble Shooting Chart

TROUBLE	PROBABLE CAUSE	CORRECTIONS
Incorrect operation of hold-down check and relief valve (IPL Figure 2, 255)	Defective valve	Replace the valve
Incorrect pressure setting, pressure gain, or flow gain at the flow control valve neutral position	Defective packings (IPL Figure 2, 220)	Replace the packings
	Defective slide and sleeve assembly (IPL Figure 2, 230)	Replace the slide and sleeve assembly as a matched set
Incorrect valve underlap	Defective slide and sleeve assembly (IPL Figure 2, 230)	Replace the slide and sleeve assembly as a matched set
Too much internal leakage at the valve neutral position and at the travel limits (with the test manifold attached)	Defective slide and sleeve assembly (IPL Figure 2, 230) Defective piston rings (IPL Figure 2, 180, 190)	Replace the slide and sleeve assembly as a matched set Replace the piston rings
	Defective packings (IPL Figure 2, 220, 265)	Replace the packings
High valve breakout force	Defective slide and sleeve assembly (IPL Figure 2, 230)	Replace the slide and sleeve assembly as a matched set
	Friction in the input assembly (IPL Figure 2, 15, 17)	Replace the bearings (IPL Figure 2, 85), (IPL Figure 3, 75) or the spring (IPL Figure 2, 90), (IPL Figure 3, 80) in the input assembly
Too much internal leakage in the PCU assembly	Defective plus seal (IPL Figure 2, 435)	Replace the plus seal
Output resolution is not in limits	Worn or defective parts in the input assembly (IPL Figure 2, 15, 17)	Repair or replace the input assembly
Piston (IPL Figure 2, 430) moves when a tension load is applied	Defective hold-down check and relief valve	Replace the valve
	Defective plus seal (IPL Figure 2, 435)	Replace the plus seal
External leakage	Defective packings (IPL Figure 2, 80, 140, 170, 200, 265, 300, 320, 405, 425) or (IPL Figure 3, 65)	Replace the packings
	Defective seals (IPL Figure 2, 410, 470)	Replace the seals

Table 101: Trouble Shooting Chart (Continued)

TROUBLE	PROBABLE CAUSE	CORRECTIONS
	Defective packing cap ring (IPL Figure 2, 75) or (IPL Figure 3, 60)	Replace the packing cap ring
High input torque	Friction in the input assembly (IPL Figure 2, 15, 17)	Replace the bearings (IPL Figure 2, 85), (IPL Figure 3, 75) or the spring (IPL Figure 2, 90), (IPL Figure 3, 80) in the input assembly

E. Post-test Procedures

(1) Examine all of the ports of the PCU assembly for damage.

(2) If necessary, apply corrosion protection to the unit. Refer to ASSEMBLY.

(3) If necessary, install lockwire on the unit. Refer to ASSEMBLY.

DISASSEMBLY

1. General

A. This procedure has the data necessary to disassemble the spoiler actuator power control unit (PCU) assembly (1B).

B. Disassemble this component sufficiently to isolate the defects, do the necessary repairs, and put the component back to a serviceable condition.

C. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

D. Refer to IPL Figure 1, IPL Figure 2 or IPL Figure 3 for item numbers.

E. Cut and remove all lockwire from the PCU assembly.

F. Remove the corrosion protection sealant from the caps (IPL Figure 2, 160, 195) and from the hold-down check and relief valve (IPL Figure 2, 255).

G. Drain the hydraulic fluid from the unit.

2. Disassembly

A. Parts Replacement

NOTE: The parts which follow are recommended for replacement. Unless a procedure tells you to replace a part, replacement is optional.

(1) Packings (IPL Figure 1, 15, 20)

(2) Packings (IPL Figure 2, 80, 140, 150, 170, 200, 220, 265, 275, 300, 320 405, 425) and (IPL Figure 3, 65)

(3) Backup rings (IPL Figure 2, 135, 165, 215, 260A, 270, 295A, 315, 420)

(4) Seals (IPL Figure 2 410, 435, 470)

(5) Piston rings (IPL Figure 2, 180, 190)

(6) Filter (IPL Figure 2, 155A)

B. Procedure

CAUTION: DO NOT PUT THE UNIT IN A CLAMPING DEVICE. IT CAN BE DAMAGED.

(1) Remove the reducer (IPL Figure 1, 5) and union (IPL Figure 1, 10) from the hydraulic ports in the journal (IPL Figure 2, 500). Remove the packings (IPL Figure 1, 15, 20) from the reducer and the union.

(2) Remove the manifold assembly (IPL Figure 2, 325) from the barrel assembly (IPL Figure 2, 440).

CAUTION: BE CAREFUL THAT THE TRANSFER TUBES (IPL FIG. 2; 305, 310) DO NOT FALL OUT WHEN THE MANIFOLD ASSEMBLY IS REMOVED FROM THE BARREL ASSEMBLY.

(a) Remove the screws (IPL Figure 2, 280, 285) and washers (IPL Figure 2, 290), then remove the manifold assembly (IPL Figure 2, 325) from the barrel assembly (IPL Figure 2, 440).

(b) Remove the transfer tubes (IPL Figure 2, 305, 310) from the manifold assembly or the barrel assembly. Remove the packings (IPL Figure 2, 300, 320) and backup rings (IPL Figure 2, 295A, 315) from the transfer tubes.

(3) Remove the screws (IPL Figure 2, 5) and washers (IPL Figure 2, 10), then pull the input assembly (IPL Figure 2, 15, 17) out of the manifold assembly (IPL Figure 2, 325).

NOTE: Do not disassemble the input assembly (IPL Figure 2, 15, 17) unless repair or replacement of parts is necessary.

(4) Remove the remaining parts from the manifold assembly.

NOTE: Do not remove the pins (IPL Figure 2, 335, 345, 355) and plugs (IPL Figure 2, 330, 340, 350) which seal the drilled passages in the manifold, unless they leak and must be replaced. Do not remove the inserts (IPL Figure 2, 360) from the manifold unless replacement is necessary.

CAUTION: THE SLIDE AND SLEEVE ASSEMBLY (IL FIG. 2; 230) IS A PRECISION PART. THE SLIDE AND THE SLEEVE ARE A MATCHED SET. TO PREVENT DAMAGE, DO NOT TOUCH THE ASSEMBLY MORE THAN IS NECESSARY.

(a) Remove the cap (IPL Figure 2, 195), packing (IPL Figure 2, 200), and spring washer (IPL Figure 2, 205), then remove the slide and sleeve assembly (IPL Figure 2, 230) from the manifold. Remove the collar (IPL Figure 2, 210) from the slide and sleeve assembly.

(b) Remove the spring (IPL Figure 2, 225) from the slide and sleeve assembly. Assemble the slide (IPL Figure 2, 245) and the sleeve (IPL Figure 2, 250) and put the parts together in a sealed bag. Write the serial number of the parts on a tag and put the tag on the bag to identify the assembly as a matched set.

NOTE: Do not remove the swaged locking ring (IPL Figure 2, 235) and collar (IPL Figure 2, 240) from the sleeve unless the collar is loose or damaged, and replacement is necessary.

(c) Remove the cap (IPL Figure 2, 160), packing (IPL Figure 2, 170), and backup ring (IPL Figure 2, 165), then remove the step piston (IPL Figure 2, 175) from the manifold. Remove the piston ring (IPL Figure 2, 180) from the piston.

(d) Remove the piston (IPL Figure 2, 185) from the manifold. Remove the piston ring (IPL Figure 2, 190) from the piston.

(e) Remove the cap (IPL Figure 2, 145), packing (IPL Figure 2, 150), and filter (IPL Figure 2, 155A) from the manifold.

CAUTION: THE HOLD-DOWN CHECK AND RELIEF VALVE (IPL FIG. 2; 255) IS A PRECISION PART. TO PREVENT DAMAGE, DO NOT TOUCH THE ASSEMBLY MORE THAN IS NECESSARY.

(f) Remove the hold-down check and relief valve (IPL Figure 2, 255) from the manifold. Remove the packings (IPL Figure 2, 265, 275) and backup rings (IPL Figure 2, 260A, 270) from the valve.

NOTE: Do not disassemble the hold-down check and relief valve. If there is a malfunction of the valve, replace the part as a unit.

(5) Remove the bracket assembly (IPL Figure 2, 475).

CAUTION: THE JOURNAL (IPL FIG. 2; 500) AND BRACKET (IPL FIG. 2; 515) ARE A MATCHED SET. KEEP THE PARTS TOGETHER TO MAKE SURE THAT THE PCU CAN BE ASSEMBLED CORRECTLY. TO PREVENT DAMAGE, DO NOT TOUCH THE ASSEMBLY MORE THAN IS NECESSARY.

(a) Remove the cotter pins (IPL Figure 2, 480), nuts (IPL Figure 2, 495), washers (IPL Figure 2, 490), and tapered pins (IPL Figure 2, 485).

(b) Remove the journal (IPL Figure 2, 500) and bracket (IPL Figure 2, 515) from the barrel assembly (IPL Figure 2, 440). Remove the seals (IPL Figure 2, 470) from the inside of the journal.

(c) Assemble the journal and the bracket, and put the parts together in a sealed bag. Write the serial number of the parts on a tag, and put the tag on the bag to identify the assembly as a matched set.

NOTE: Do not remove the bearings (IPL Figure 2, 505) from the journal and bracket unless replacement is necessary. Do not remove the shim (IPL Figure 2, 510) from the bracket unless replacement is necessary.

(6) Remove parts from the barrel assembly (IPL Figure 2, 440).

NOTE: Do not remove the pins (IPL Figure 2, 450, 460) and plugs (IPL Figure 2, 445, 455) which seal the drilled passages in the barrel unless replacement is necessary.

(a) Loosen the jam nut (IPL Figure 2, 370) and remove the key (IPL Figure 2, 375).

(b) Remove the rod assembly (IPL Figure 2, 380) from the piston (IPL Figure 2, 430), then remove the jam nut from the rod assembly.

(c) Remove the bolts (IPL Figure 2, 385) and washers (IPL Figure 2, 390), then remove parts (IPL Figure 2, 395 thru 425) from the barrel assembly. Remove the seal (IPL Figure 2, 410) and the packing (IPL Figure 2, 405) from the end bearing (IPL Figure 2, 415). Remove the scraper (IPL Figure 2, 395) from the seal retainer (IPL Figure 2, 400).

(d) Remove the piston (IPL Figure 2, 430) from the barrel. Remove the seal (IPL Figure 2, 435) from the piston.

CLEANING

1. General

A. This procedure has the data necessary to clean the spoiler actuator power control unit (PCU) assembly (1B).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 2 or IPL Figure 3 for item numbers.

2. Cleaning

A. References

Reference	Title
SOPM 20-30-01	CLEANING AND RELUBRICATING BEARINGS
SOPM 20-30-03	GENERAL CLEANING PROCEDURES

B. Procedure

(1) Clean the bearings (IPL Figure 2, 85) or (IPL Figure 3, 75) as specified in SOPM 20-30-01.

NOTE: Do not apply grease to the bearings (IPL Figure 2, 85) or (IPL Figure 3, 75) after cleaning.

(2) Use standard industry procedures and refer to SOPM 20-30-03 to clean other parts.

CHECK

1. General

A. This procedure has the data necessary to find defects in the material of the specified parts.

B. Refer to FITS AND CLEARANCES for the design dimensions and wear limits.

C. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

D. Refer to IPL Figure 2 or IPL Figure 3 for item numbers.

2. Check

A. References

Reference	Title
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION
SOPM 20-20-02	PENETRANT METHODS OF INSPECTION

B. Procedure

(1) Use standard industry procedures to do a visual check of all the parts for defects. Do the penetrant or magnetic particle check if the visual check shows possible damage or if you suspect possible damage on the parts listed below:

(2) Do a magnetic particle check (SOPM 20-20-01) of these parts:

(a) Adjusting screw (IPL Figure 2, 25, 27) and (IPL Figure 3, 15)

(b) Bushing (IPL Figure 2, 30) and (IPL Figure 3, 25)

(c) Spacer (IPL Figure 2, 35)

(d) Fork (IPL Figure 2, 55) and (IPL Figure 3, 45)

(e) Input lever (IPL Figure 2, 60) and (IPL Figure 3, 50, 50A)

(f) Torsion spring (IPL Figure 2, 90) and (IPL Figure 3, 80)

(g) Roller pin (IPL Figure 2, 105) and (IPL Figure 3, 95)

(h) Roller (IPL Figure 2, 110) and (IPL Figure 3, 100)

(i) Pin (IPL Figure 2, 115) and (IPL Figure 3, 110)

(j) Lever (IPL Figure 2, 125) and (IPL Figure 3, 115)

(k) Shaft (IPL Figure 2, 130) and (IPL Figure 3, 120)

(l) Cap (IPL Figure 2, 145)

(m) Step piston (IPL Figure 2, 175), piston (IPL Figure 2, 185)

(n) Barrel (IPL Figure 2, 465)

(3) Do a penetrant check (SOPM 20-20-02) of these parts:

(a) Cover (IPL Figure 2, 70) and (IPL Figure 3, 70)

(b) Journal (IPL Figure 2, 500)

(c) Bracket (IPL Figure 2, 515)

(4) Do a check of the spring (IPL Figure 2, 225) as follows:

(a) Free length: 1.27-1.29 inches

(b) Minimum check load: 0.45-0.55 pounds at 0.781 inch

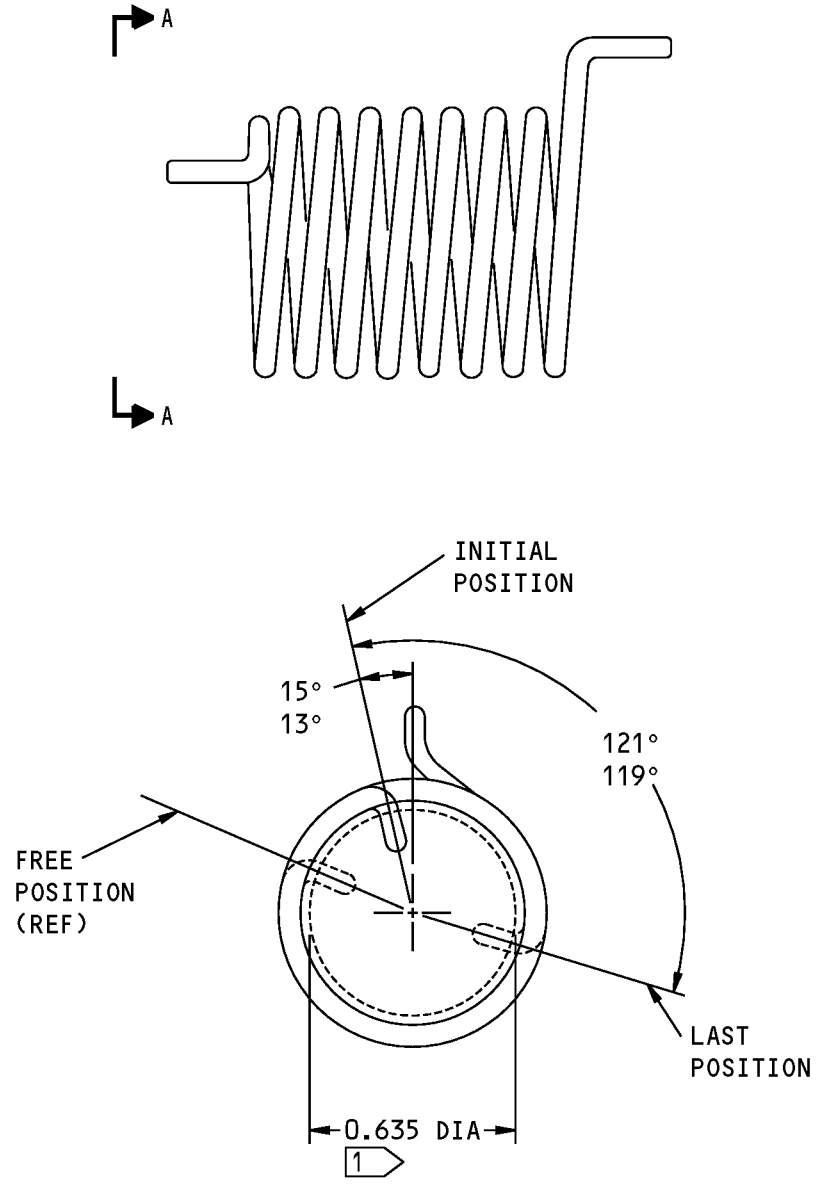
(c) Maximum check load: 0.72-0.88 pounds at 0.426 inch

(5) Do a check of the torsion spring (IPL Figure 2, 90) and (IPL Figure 3, 80). Refer to CHECK, Figure 501.

(a) Minimum check torque: 0.9-1.1 pound-inches at the initial position

(b) Maximum check torque: 3.2-3.8 pound-inches at the last position

(c) Minimum working diameter: 0.635 inch (I.D. at the last position)



1 SPRING MUST WORK ON THIS MAXIMUM DIAMETER (MINIMUM SPRING ID AT LAST POSITION).

ALL DIMENSIONS ARE IN INCHES

Torsion Spring Check
Figure 501

REPAIR

1. General

A. Instructions for repair, refinish, and replacement of the specified subassembly parts are included in each REPAIR when applicable:

Table 601:

PART NUMBER	NAME	REPAIR
—	REFINISH OF OTHER PARTS	1-1
BAC27DHY369	NAMEPLATE	2-1
251A1246 69-35638	INPUT ASSEMBLY	3-1
251A1264	PISTON	4-1
251A1265	BRACKET ASSEMBLY	5-1
65-44562	BARREL	6-1
66-22743	SLIDE AND SLEEVE ASSEMBLY	7-1
66-22775	INPUT SHAFT ASSEMBLY	8-1, 8-2
69-35549	END BEARING	9-1
251A1243 69-35592	PISTON	10-1

2. Dimensioning Symbols

A. Standard True Position Dimensioning Symbols used in the applicable repair procedures are shown in REPAIR-GENERAL, Figure 601.

—	STRAIGHTNESS
▱	FLATNESS
⊥	PERPENDICULARITY (OR SQUARENESS)
//	PARALLELISM
○	ROUNDNESS
⌭	CYLINDRICITY
⌒	PROFILE OF A LINE
⌓	PROFILE OF A SURFACE
◎	CONCENTRICITY
⌯	SYMMETRY
∠	ANGULARITY
↗	RUNOUT
↗↗	TOTAL RUNOUT
⌴	COUNTERBORE OR SPOTFACE
∨	COUNTERSINK
⌖	THEORETICAL EXACT POSITION OF A FEATURE (TRUE POSITION)
∅	DIAMETER
S ∅	SPHERICAL DIAMETER
R	RADIUS
SR	SPHERICAL RADIUS
()	REFERENCE
BASIC (BSC) OR [DIM]	A THEORETICALLY EXACT DIMENSION USED TO DESCRIBE SIZE, SHAPE OR LOCATION OF A FEATURE. FROM THIS FEATURE PERMISSIBLE VARIATIONS ARE ESTABLISHED BY TOLERANCES ON OTHER DIMENSIONS OR NOTES.
[-A-]	DATUM
Ⓜ	MAXIMUM MATERIAL CONDITION (MMC)
Ⓛ	LEAST MATERIAL CONDITION (LMC)
Ⓢ	REGARDLESS OF FEATURE SIZE (RFS)
Ⓟ	PROJECTED TOLERANCE ZONE
FIM	FULL INDICATOR MOVEMENT

EXAMPLES

— | 0.002	STRAIGHT WITHIN 0.002
⊥ | 0.002 | B	PERPENDICULAR TO DATUM B WITHIN 0.002
// | 0.002 | A	PARALLEL TO DATUM A WITHIN 0.002
○ | 0.002	ROUND WITHIN 0.002
⌭ | 0.010	CYLINDRICAL SURFACE MUST LIE BETWEEN TWO CONCENTRIC CYLINDERS, ONE OF WHICH HAS A RADIUS 0.010 INCH GREATER THAN THE OTHER
⌒ | 0.006 | A	EACH LINE ELEMENT OF THE SURFACE AT ANY CROSS SECTION MUST LIE BETWEEN TWO PROFILE BOUNDARIES 0.006 INCH APART RELATIVE TO DATUM A
⌓ | 0.020 | A	SURFACES MUST LIE WITHIN PARALLEL BOUNDARIES 0.020 INCH APART AND EQUALLY DISPOSED ABOUT TRUE PROFILE
◎ | ∅ 0.0005 | C	CONCENTRIC TO DATUM C WITHIN 0.0005 DIAMETER
⌯ | 0.010 | A	SYMMETRICAL WITH DATUM A WITHIN 0.010
∠ | 0.005 | A	ANGULAR TOLERANCE 0.005 WITH DATUM A
⌖ | ∅ 0.002 Ⓢ | B	LOCATED AT TRUE POSITION WITHIN 0.002 DIA RELATIVE TO DATUM B, REGARDLESS OF FEATURE SIZE
⊥ | ∅ 0.010 Ⓜ | A 0.510 Ⓟ	AXIS IS TOTALLY WITHIN A CYLINDER OF 0.010 INCH DIAMETER, PERPENDICULAR TO DATUM A, AND EXTENDING 0.510 INCH ABOVE DATUM A, MAXIMUM MATERIAL CONDITION
[2.000] OR 2.000 BSC	THEORETICALLY EXACT DIMENSION IS 2.000

True Position Dimensioning Symbols
Figure 601

REFINISH OF OTHER PARTS - REPAIR 1-1

1. General

A. This procedure has the data necessary to refinish the parts which are not given in the specified repairs.

B. Refer to the Standard Overhaul Practice Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 2 for item numbers.

2. Refinish of Other Parts

A. References

Reference	Title
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. General

(1) Instructions for the repair of the parts listed in REPAIR 1-1, Table 601 are for repair of the initial finish.

C. Procedure

NOTE: For general cleaning procedures, refer to SOPM 20-30-03. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Refer to REPAIR 1-1, Table 601 for the refinish of other parts.

Table 601: Refinish Details

IPL FIG. & ITEM	MATERIAL	FINISH
Cap (145)	CRES	Passivate (F-17.25)
Cap (160), manifold (365)	Aluminum alloy	Boric acid-sulfuric acid anodize, or chromic acid anodize (F-17.35)
Cap (195)	Aluminum alloy	Chromic acid anodize (F-2.26)
Washer (290)	4340 Steel 125-150 ksi	Cadmium plate (F-1.32)
Transfer tube (305, 310), seal retainer (400)	Aluminum alloy	Chromic acid anodize (F-17.02)
Key (375, 375B)	4340 Steel (4130 optional) 180-200 ksi	Cadmium plate (F-1.32)

NAMEPLATE - REPAIR 2-1

BAC27DHY369

1. General

A. This procedure has the data necessary to replace the nameplate (520).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 2 for item numbers.

2. Nameplate Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00551	Sealant - Fuel Tank	BAC5010, Type 44 (BMS5-44, BMS5-45)

B. References

Reference	Title
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-50-10	APPLICATION OF STENCILS, INSIGNIA, SILK SCREEN, PART NUMBERING AND IDENTIFICATION MARKINGS
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

NOTE: For miscellaneous materials, refer to SOPM 20-60-04.

(1) Remove the nameplate (520).

(2) Clean the surface of the barrel assembly (SOPM 20-30-03).

(3) Steel stamp the assembly dash number and serial number on the new nameplate (SOPM 20-50-10).

(4) Bend the nameplate to the contour of the barrel.

(5) Apply sealant, A00551 to the back of the nameplate to get a 100 percent fay surface seal.

(6) Install the nameplate on the barrel assembly. Put the strap through the slot in the nameplate and bend back the strap to get a tight fit.

(7) Make sure that the sealant fills the slot in the nameplate.

INPUT ASSEMBLY - REPAIR 3-1

251A1246–1, 69-35638–7

1. General

A. This procedure has the data necessary to repair and refinish the input assembly (IPL Figure 2, 15, 17).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 for item numbers, unless an IPL Figure is specified.

2. Replacement of Parts

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS 5-95
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)
D50004	Compound - Antiseize	BMS3-28

B. References

Reference	Title
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-50-06	INSTALLATION OF O-RINGS AND TEFLON SEALS
SOPM 20-60-02	FINISHING MATERIALS
SOPM 20-60-03	LUBRICANTS
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01. For finishing materials, refer to SOPM 20-60-02. For lubricants, refer to SOPM 20-60-03. For miscellaneous materials, refer to SOPM 20-60-04.

(1) Remove the input assembly (IPL Figure 2, 15, 17).

(a) Remove the screws IPL Figure 2, (5) and washers (IPL Figure 2, 10), then pull the input assembly (IPL Figure 2, 15, 17) out of the manifold assembly (IPL Figure 2, 325).

(b) Remove the lock bolt (IPL Figure 2, 45) or (IPL Figure 3, 35) and collar (IPL Figure 2, 50) or (IPL Figure 3, 40), then remove the fork (IPL Figure 2, 55) or (IPL Figure 3, 45) and input lever (IPL Figure 2, 60) or (IPL Figure 3, 50) from the input shaft assembly (IPL Figure 2, 100) or (IPL Figure 3, 90).

(c) Remove the pin (IPL Figure 2, 37) or (IPL Figure 3, 10) and collar (IPL Figure 2, 40) or (IPL Figure 3, 20). Loosen the jam nut (IPL Figure 2, 20) or (IPL Figure 3, 5), and remove the adjusting screw (IPL Figure 2, 25) or (IPL Figure 3, 15), jam nut, bushings (IPL Figure 2, 30) or (IPL Figure 3, 25), input lever (60) or (IPL Figure 3, 50), and spacer (IPL Figure 2, 35) or (IPL Figure 3, 30) from the fork (IPL Figure 2, 55) or (IPL Figure 3, 45).

NOTE: Discard the adjusting screw (IPL Figure 2, 25) if it has two drilled holes for the collar pin (IPL Figure 2, 37). Discard the adjusting screw (IPL Figure 3, 15) if it has three drilled holes for the collar pin (IPL Figure 3, 10).

(d) Remove parts (IPL Figure 2, 65 thru 95) or (IPL Figure 3, 55 thru 85) from the input shaft assembly. Remove the packings (IPL Figure 2, 140, 80) or (IPL Figure 3, 65) and rings (IPL Figure 2, 75, 135; IPL Figure 3, 60) from the cover (IPL Figure 2, 70) or (IPL Figure 3, 70.

NOTE: Do not disassemble the input shaft assembly (IPL Figure 2, 100) or (IPL Figure 3, 90) unless repair or replacement of the parts is necessary. Refer to REPAIR 8-1.

(2) Assemble the input assembly (IPL Figure 2, 15, 17).

(a) Install one bearing (IPL Figure 2, 85) or (IPL Figure 3, 75), the spacer (IPL Figure 2, 95) or (IPL Figure 3, 85), and the spring (IPL Figure 2, 90) or (IPL Figure 3, 80) on the input shaft assembly (IPL Figure 2, 100) or (IPL Figure 3, 100). Make sure that the large diameter end of the spring goes over the bearing. Make sure that the other end of the spring engages the notch in the spacer and also the keyway in the input shaft.

NOTE: Bearing (IPL Figure 2, 85) or (IPL Figure 3, 75) is made from bearing P/N MKP8A by the removal of the seals and grease. Do not apply grease to the bearings during assembly.

(b) Lubricate the packing (IPL Figure 2, 80) or (IPL Figure 3, 65) and the cap ring (IPL Figure 2, 75) or (IPL Figure 3, 60) with hydraulic fluid, D00153 or assembly MCS 352B fluid, D00054, then install the packing, cap ring, and the other bearing (IPL Figure 2, 85) or (IPL Figure 3, 75) in the cover (IPL Figure 2, 70) or (IPL Figure 3, 70). Refer to SOPM 20-50-06.

(c) Install the cover on the input shaft assembly (IPL Figure 2, 100) or (IPL Figure 3, 90). Make sure that the large-diameter end of the spring engages the groove at the opening of the cover.

(d) Install the input lever (IPL Figure 2, 60) or (IPL Figure 3, 50) and the fork (IPL Figure 2, 55) or (IPL Figure 3, 45) on the input shaft. Make sure the bolt hole in the fork aligns with the groove in the splined end of the input shaft. Apply sealant, A00247 to the shank of the bolt (IPL Figure 2, 45) or (IPL Figure 3, 35) (F-19.48), then install the bolt into the fork. Install the collar (IPL Figure 2, 50) or (IPL Figure 3, 40) on the bolt.

CAUTION: REPLACE THE USED ADJUSTING SCREW (25) IF IT HAS TWO DRILLED HOLES FOR THE COLLAR PIN (37). REPLACE THE USED ADJUSTING SCREW (27) IF IT HAS THREE DRILLED HOLES FOR THE COLLAR PIN (38). THE SCREW MAY BREAK, OR THE ASSEMBLY MAY NOT OPERATE CORRECTLY, IF TOO MANY HOLES ARE DRILLED.

(e) Apply anti-seize compound, D50004 to the threads on the head end of the adjusting screw (IPL Figure 2, 25) or (IPL Figure 3, 15). Install the adjusting screw through one side of the fork. Hold the bushings (IPL Figure 2, 30) or (IPL Figure 3, 25) in position on each side of the input lever. Put the screw through the bushings and spacer (IPL Figure 2, 35) or (IPL Figure 3, 30) in the other side of the fork. Turn the screw until the input lever is approximately in the center of the slot in the fork.

(f) Install the collar (IPL Figure 2, 40) or (IPL Figure 3, 20). Tighten the collar until the adjusting screw turns with a torque of 15-35 pound-inches. Break off the shear section of the collar. Drill a hole through the collar. If the screw (IPL Figure 2, 25) or (IPL Figure 3, 15) was installed before, and has a hole from the collar which was removed, drill the new hole at approximately 90 degress to the first hole. Screw (IPL Figure 3, 15) may have a maximum of three holes drilled. Refer to REPAIR 3-1, Figure 601.

(g) Install the pin (IPL Figure 2, 37) or (IPL Figure 3, 10) in the hole in the collar. Make sure that the adjusting screw turns with a torque of 35 pound-inches or less.

(h) Install the jam nut (IPL Figure 2, 20) or (IPL Figure 3, 5) on the adjusting screw and tighten to 10-20 lb-in.

NOTE: The position of the adjusting screw is temporary. The screw will be adjusted during assembly of the PCU. Lockwire is installed on the jam nut (IPL Figure 2, 20) or (IPL Figure 3, 5) when the PCU assembly is installed on the airplane.

3. Refinish

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
C00259	Primer - Chemical And Solvent Resistant Finish, Epoxy Resin	BMS10-11, Type I
C00700	Coating - Exterior Protective Enamel, Gray Gloss Enamel	BMS10-60, Type I, BAC 707
D00113	Lubricant - Liquid Dispersed Solid Film Lubricant	BMS3-8, BAC 5811, TYPE VIII

B. References

Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES
SOPM 20-60-02	FINISHING MATERIALS
SOPM 20-60-03	LUBRICANTS

C. Procedures

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01. For finishing materials, refer to SOPM 20-60-02. For lubricants, refer to SOPM 20-60-03.

(1) Adjusting screw (IPL Figure 2, 25) and (IPL Figure 3, 15) – Passivate (F-17.25) and apply solid film lubricant, D00113 all over. Material: CRES, 170-190 ksi. (IPL Figure 2, 25); CRES, 160-180 ksi. (IPL Figure 3, 15)

(2) Bushing (IPL Figure 2, 30), input lever (IPL Figure 2, 60) – Passivate (F-17.25). Material: CRES, 180-200 ksi.

(3) Bushing (IPL Figure 3, 25) – Cadmium plate (F-1.32). Material: CRES, 180-200 ksi.

(4) Spacer (IPL Figure 2, 35) – Passivate (F-17.25) and apply solid film lubricant, D00113 (F-19.10) all over. Material: CRES, 150-170 ksi.

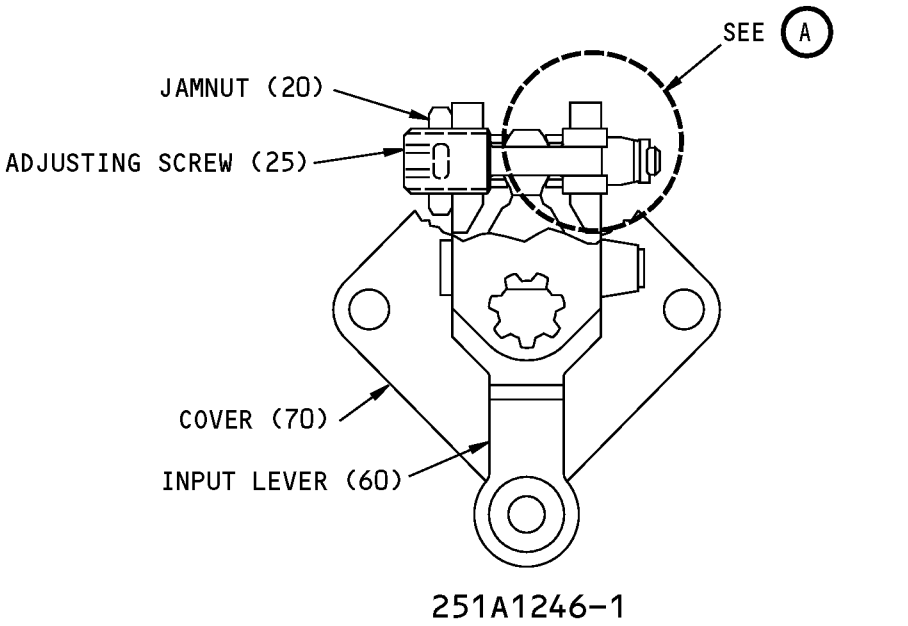
(5) Spacer (IPL Figure 3, 30) – Chromic acid anodize (F-17.02). Material: Aluminum alloy.

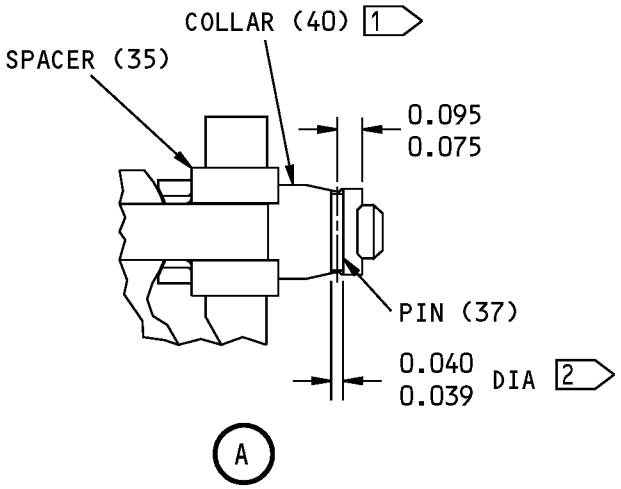
(6) Fork (IPL Figure 2, 55) – Passivate (F-17.25). Material: CRES, 150-170 ksi. Fork (IPL Figure 3, 45) – Cadmium plate (F-1.32) except no plating on splines.

(7) Cover (IPL Figure 2, 70) and (IPL Figure 3, 70) – Anodize and apply primer, C00259 (F-18.04). Apply coating, C00700. Obey the flagnotes shown on REPAIR 3-1, Figure 602. Material: Aluminum alloy.

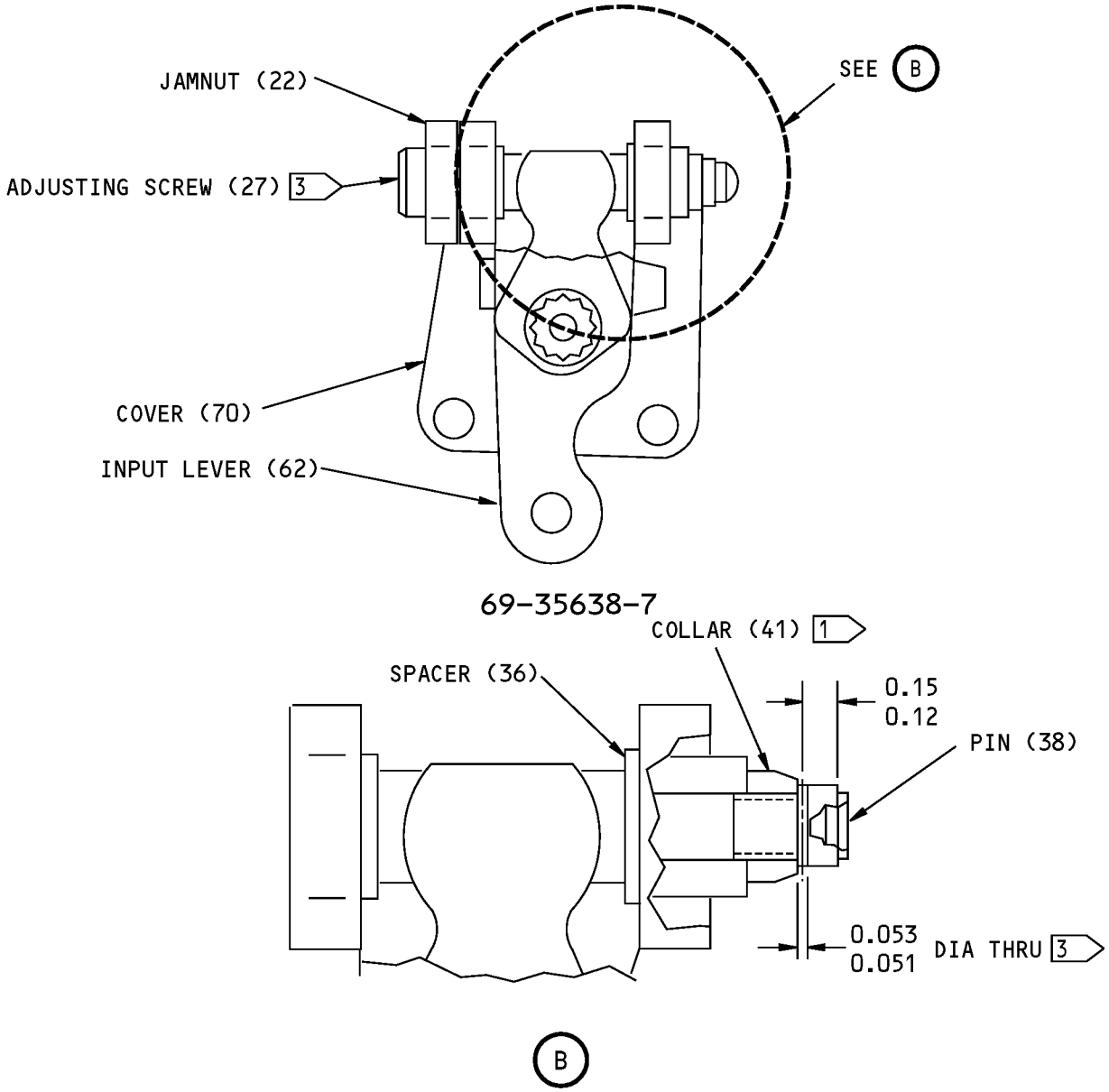
(8) Spacer (IPL Figure 2, 95) IPL Figure 3, 85) – Passivate (F-17.09). Material: CRES, Rc 58 minimum.

(9) Input lever (IPL Figure 2, 60) and (IPL Figure 3, 50, 50A) – See REPAIR 3-1, Figure 603.





251A1246-1 69-35638-7 Input Assembly - Adjusting Screw Installation
Figure 601 (Sheet 1 of 2)



1 TIGHTEN COLLAR UNTIL ADJUSTING SCREW TURNS WITH 15-35 POUNDS-INCHES TORQUE APPLIED

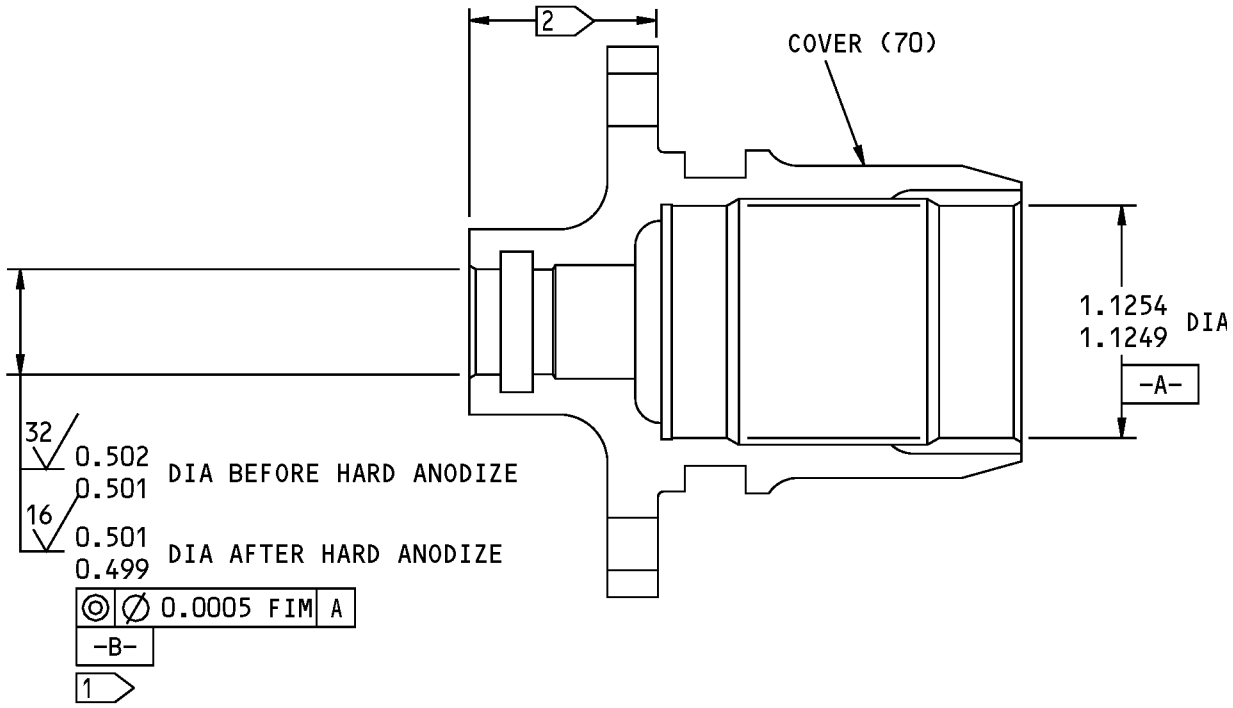
2 DRILL HOLE AT 90 DEGREES TO EXISTING HOLE

3 MAXIMUM OF THREE HOLES MAY BE DRILLED IN SCREW (27)

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

251A1246-1 69-35638-7 Input Assembly - Adjusting Screw Installation
Figure 601 (Sheet 2 of 2)



REFINISH

ANODIZE (F-17.02) ALL OVER, BUT NOT AREAS 1 AND 2.

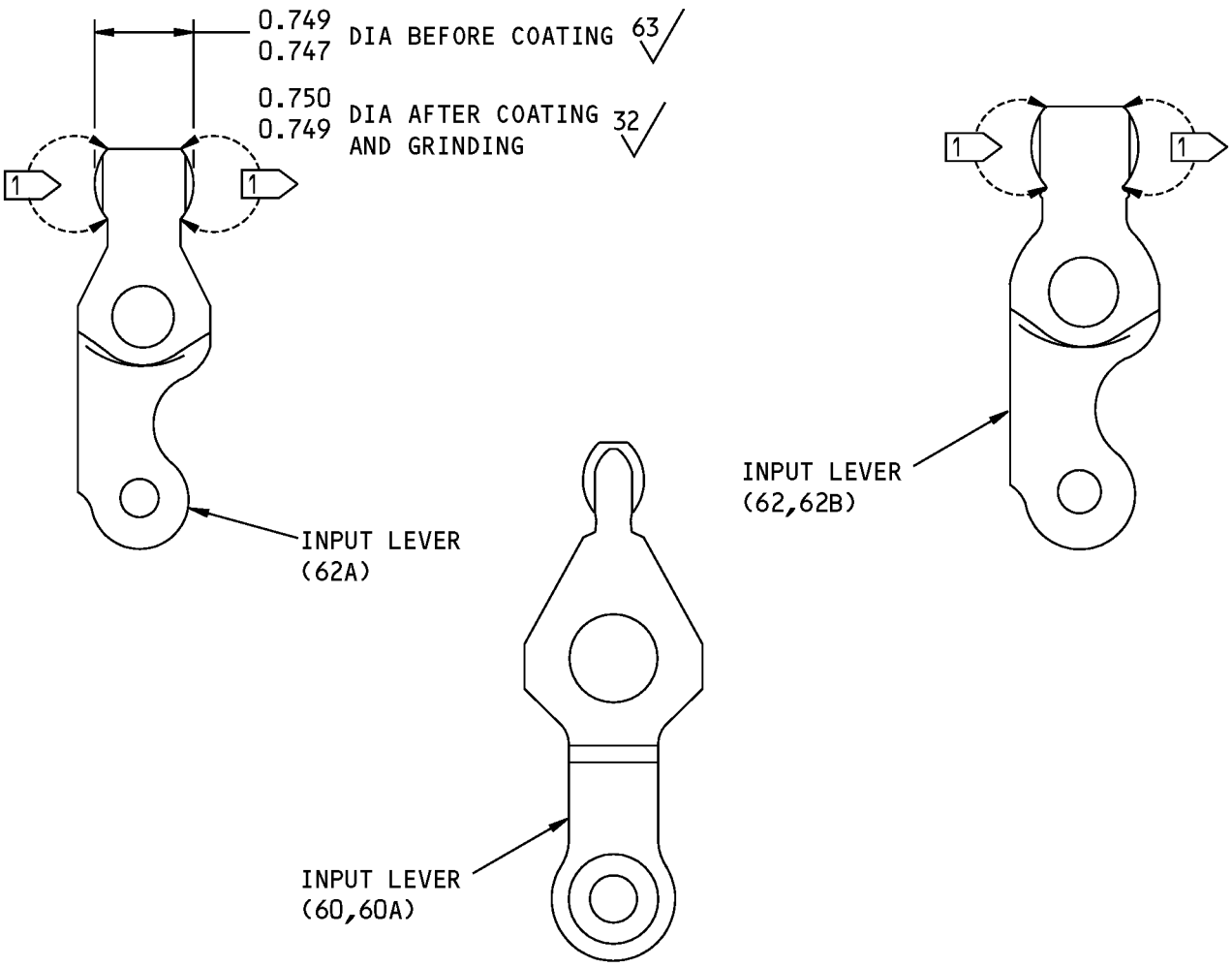
1 HARD ANODIZE ONLY (F-17.06)

2 ANODIZE AND APPLY ONE LAYER OF BMS 10-11, TYPE I PRIMER (F-18.04). APPLY ONE LAYER OF BMS 10-60 ENAMEL (SRF-14.9813)

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

69-35595-1,-2 Cover Refinish
Figure 602



REFINISH

PASSIVATE (F-17.25) 251A1251-2,-3, (60,60A), 65-44574-3 (62).

ANODIZE AND APPLY BMS 10-11, TYPE 1 PRIMER (F-18.04) AND APPLY BMS 10-60 ENAMEL (F-14.9813) EXCEPT AS NOTED BY FLAGNOT 1, 65-44573-3 (62B).

FLASH HARD ANODIZE 0.0002-0.0003 THICK SODIUM DICHROMATE SEAL PER MIL-A-8625 EXCEPT AS NOTED BY FLAGNOTE 1 65-44573-1, (62A).

1 HARD COAT PER (F-2.204). SINGLE COATING THICKNESS 0.002-0.003 INCH (62A,62B)

MATERIAL: INPUT LEVER (60)
CRES 180-200 KSI

INPUT LEVER (62,62B)
CRES 180-220 KSI

INPUT LEVER (62A)
ALUMINUM ALLOY

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

65-44573-1,-3; 65-44574-3; 251A1251-2,-3 Input Lever Refinish
Figure 603

PISTON - REPAIR 4-1

251A1264–1

1. General

A. This procedure has the data necessary to repair and refinish the piston (430).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 for item numbers.

E. General repair details:

(1) Material: CRES, 180-200 ksi

(2) Shot peen: Repaired surfaces as shown in REPAIR 4-1, Figure 601.

(a) Shot Size = 0.017 - 0.046

(b) Intensity = 0.010A

(c) Coverage = 2.0

2. Piston Repair

A. Procedure

NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Machine the piston (430) to the repair dimensions shown in REPAIR 4-1, Figure 601 to remove defects (SOPM 20-10-01).

(2) Break all sharp edges.

(3) Do a magnetic particle check of the piston (SOPM 20-20-01).

(4) Shot peen the machined area (SOPM 20-10-03).

(5) Apply chrome plate (F-15.34) to the machined area as shown in REPAIR 4-1, Figure 601.

(6) Grind the chrome plate to the design dimension shown in REPAIR 4-1, Figure 601 (SOPM 20-10-04). Make sure to keep the surface finish shown in REPAIR 4-1, Figure 601.

3. Refinish

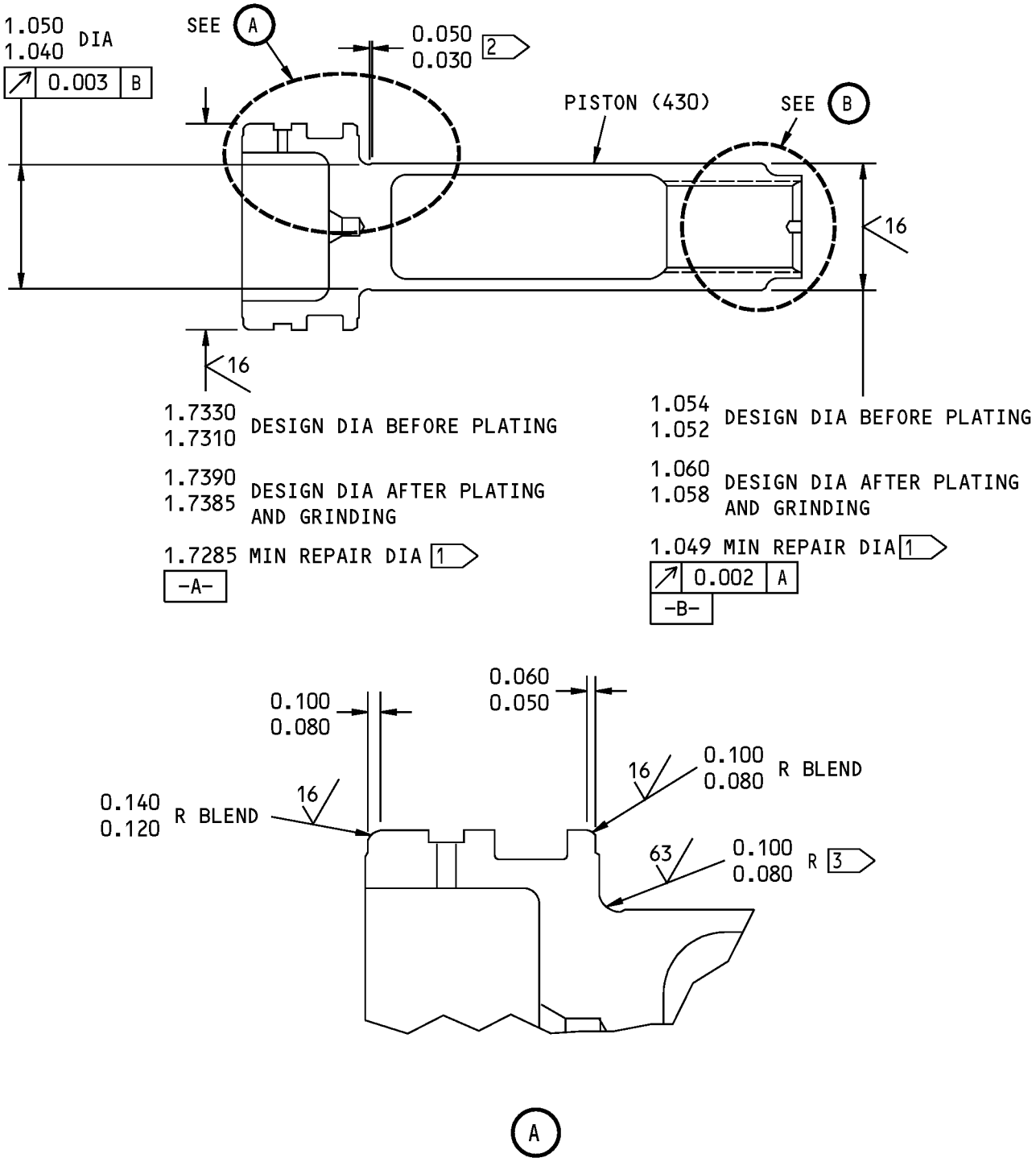
A. Procedure

NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

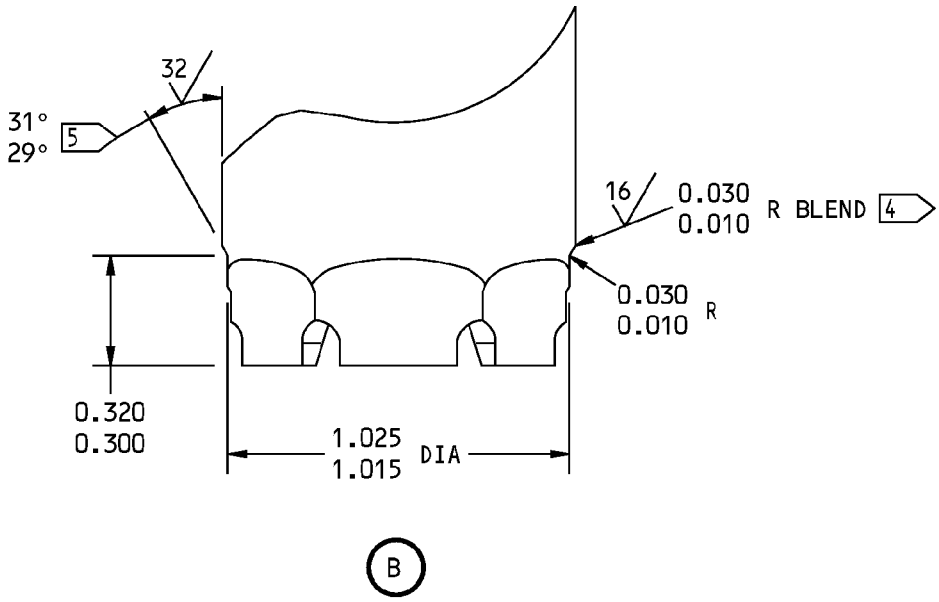
(1) Apply chrome plate (F-15.34) as shown in REPAIR 4-1, Figure 601.

(2) Grind the chrome plate to the design dimension shown in REPAIR 4-1, Figure 601 (SOPM 20-10-04). Make sure to keep the surface finish shown in REPAIR 4-1, Figure 601.

(3) Passivate (F-17.25) the surfaces which are not chrome plated.



251A1264-1 Piston Repair
Figure 601 (Sheet 1 of 2)



1 SHOT PEEN AND BUILD UP WITH CHROME PLATE (F-15.34) GRIND TO DESIGN DIMENSION AND FINISH SHOWN. 0.005 MAXIMUM THICKNESS OF CHROME PLATE AFTER GRINDING.

2 CHROME PLATE RUNOUT AREA BEFORE RELIEF RADIUS

3 NO CHROME PLATE ON RELIEF RADIUS

4 EDGE OF CHROME PLATE MUST BE SMOOTH

5 FINISH GRIND 30 DEGREE RAMP AFTER CHROME PLATE

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

251A1264-1 Piston Repair
Figure 601 (Sheet 2 of 2)

BRACKET ASSEMBLY - REPAIR 5-1

251A1265–1

1. General

A. This procedure has the data necessary to repair and refinish the bracket assembly (475).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 for item numbers.

2. Bearing (505) Replacement

A. References

Reference	Title
SOPM 20-50-03	BEARING AND BUSHING REPLACEMENT

B. Procedure

(1) Remove the tapered pins (485), washers (490), and the nuts (495). Disassemble the journal (500) and bracket (515).

(2) Remove the bearings (505).

(3) Install new bearings (SOPM 20-50-03).

(4) Assemble the journal and bracket, and install the tapered pins, washers, and nuts. Tighten the nuts to 10-20 lb-in.

3. Shim (510) Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
A00028	Adhesive - Modified Epoxy For Rigid PVC, Foam Cored Sandwiches	BAC5010, Type 70 (BMS5-92, Type 1)

B. References

Reference	Title
SOPM 20-30-03	GENERAL CLEANING PROCEDURES
SOPM 20-50-12	APPLICATION OF ADHESIVES
SOPM 20-60-04	MISCELLANEOUS MATERIALS

C. Procedure

NOTE: For miscellaneous materials, refer to SOPM 20-60-04.

(1) Remove the tapered pins (485), washers (490), and nuts (495). Disassemble the journal (500) and bracket (515).

(2) Remove the shim (510).

(3) If it is necessary, clean the area where the shim is to be bonded (SOPM 20-30-03). Chemical treat (F-17.10) the area if bare aluminum shows.

(4) Bond the new shim to the bracket (515) with adhesive, A00028 (SOPM 20-50-12). Make sure that the beveled edge of the shim is adjacent to the radiused surface.

4. Refinish

A. References

Reference	Title
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Procedure

NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Journal (500) – Hard anodize 0.0025-0.0030 thick on the 0.938-0.939 inch diameter lands (F-17.06). Chemical treat the surface which touches the bracket (515). Flash hard anodize or sulfuric acid anodize (F-17.30) the other surfaces. Material: Aluminum alloy.

(2) Bracket (515) – Boric acid-sulfuric acid anodize or chromic acid anodize (F-17.35). Material: Aluminum alloy.

BARREL - REPAIR 6-1

65-44562–2, –4

1. General

A. This procedure has the data necessary to repair and refinish the barrel (465).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 for item numbers.

E. General repair details:

(1) Material: CRES, 180-200 ksi

(2) Shot peen: Repaired surfaces as shown in REPAIR 6-1, Figure 601.

(a) Shot Size = 0.017 - 0.046

(b) Intensity = 0.010A

(c) Coverage = 2.0

2. Barrel Repair

A. References

Reference	Title
SOPM 20-10-01	REPAIR AND REFINISH OF HIGH STRENGTH STEEL PARTS
SOPM 20-10-03	SHOT PEENING
SOPM 20-10-04	GRINDING OF CHROME PLATED PARTS
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Procedure

NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Machine the barrel (465) to the repair dimension shown in REPAIR 6-1, Figure 601 to remove defects (SOPM 20-10-01).

(2) Break all sharp edges.

(3) Do a magnetic particle check of the barrel (SOPM 20-20-01).

(4) Shot peen the machined area (SOPM 20-10-03).

(5) Apply chrome plate (F-15.34) to the machined area as shown in REPAIR 6-1, Figure 601.

(6) Grind the chrome plate to the design dimension shown in REPAIR 6-1, Figure 601 (SOPM 20-10-04). Make sure to keep the surface finish shown in REPAIR 6-1, Figure 601.

3. Refinish

A. References

Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Procedure

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1)

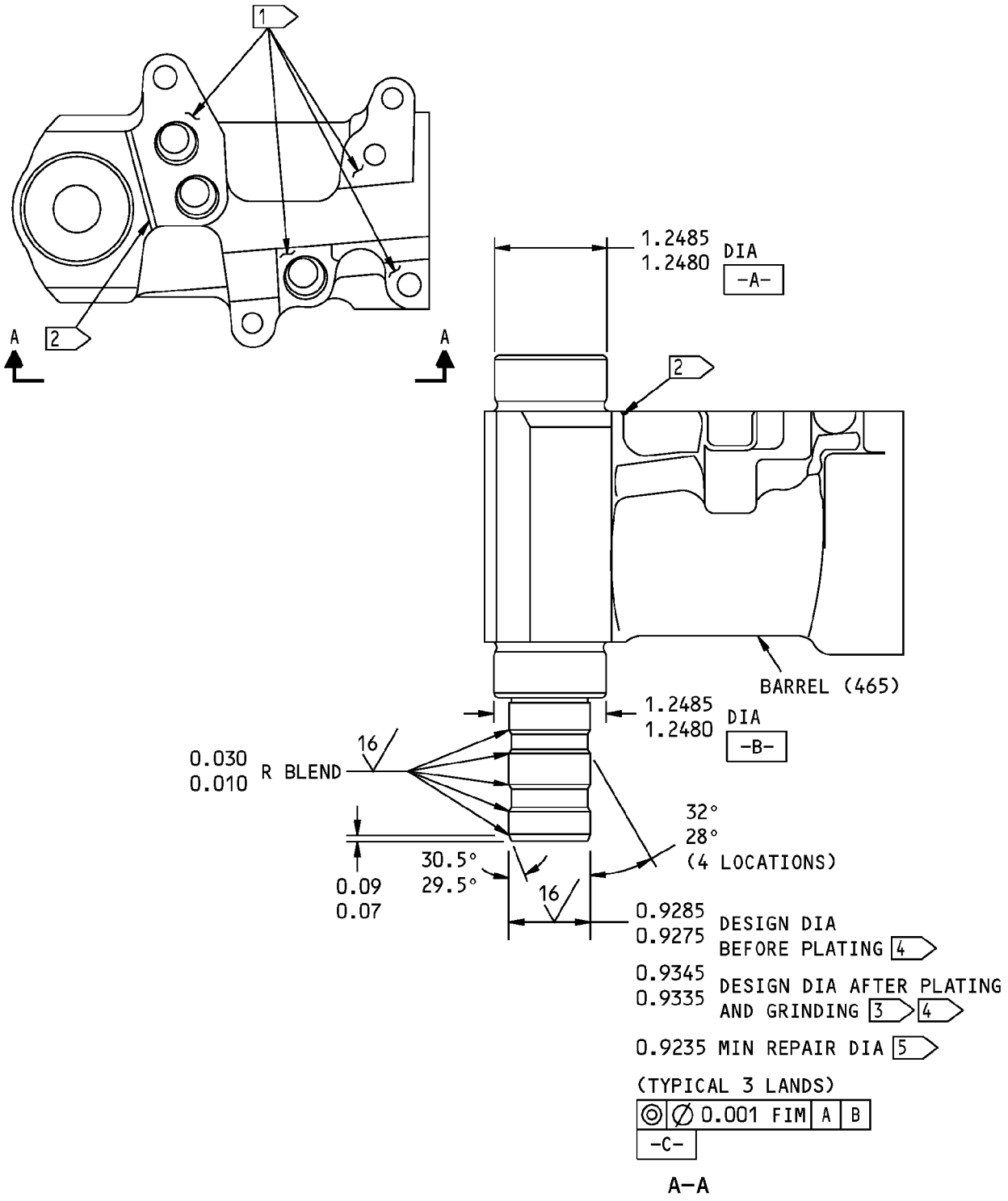
(2) Apply cadmium plate (F-1.1929) to the surfaces which touch the manifold assembly (325), as shown in REPAIR 6-1, Figure 601.

(3) Apply chrome plate (F-15.34), 0.003-0.005 inch single plate thickness, to the trunnion lands, as shown in REPAIR 6-1, Figure 601.

NOTE: Chrome plate on these surfaces was optional during manufacture. It is not necessary to apply chrome plate if the finished diameter of the base metal is 0.9335-0.9345 inch.

(4) Passivate (F-17.09) the surfaces which are not plated.

(5) Material: CRES, 180-200 ksi.



65-44562-2,-4 Barrel Repair
Figure 601 (Sheet 1 of 2)

1. CADMIUM PLATE (F-1.1929) ON THESE MACHINED SURFACES ONLY
2. CADMIUM PLATE RUNOUT PERMITTED IN GROOVE
3. CHROME PLATE (F-1.90), 0.003-0.005 SINGLE PLATE THICKNESS, ON THIS DIAMETER ONLY (OPTIONAL DURING MANUFACTURE)
4. CHROME PLATE NOT NECESSARY IF DIAMETER OF BASE MATERIAL IS 0.9335-0.9345
5. SHOT PEEN AND BUILD UP WITH CHROME PLATE (F-1.90). GRIND TO DESIGN DIMENSION AND FINISH SHOWN. 0.005 MAXIMUM THICKNESS OF CHROME PLATE AFTER GRINDING.

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

65-44562-2,-4 Barrel Repair
Figure 601 (Sheet 2 of 2)

SLIDE AND SLEEVE ASSEMBLY - REPAIR 7-1

66-22743–4

1. General

A. This procedure has the data necessary to repair the slide and sleeve assembly (230).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 for item numbers.

2. Collar Replacement

A. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜able & intermixable with Type V)

B. References

Reference	Title
SOPM 20-60-03	LUBRICANTS

C. Procedure

CAUTION: THE SLIDE AND SLEEVE ASSEMBLY IS A PRECISION PART. THE SLIDE AND THE SLEEVE ARE A MATCHED SET. TO PREVENT DAMAGE, DO NOT TOUCH THE ASSEMBLY MORE THAN IS NECESSARY.

NOTE: For lubricants, refer to SOPM 20-60-03.

(1) Remove the collar (240).

(a) Remove the slide (245) from the sleeve (250).

(b) Remove the locking ring (235), then remove the collar (240).

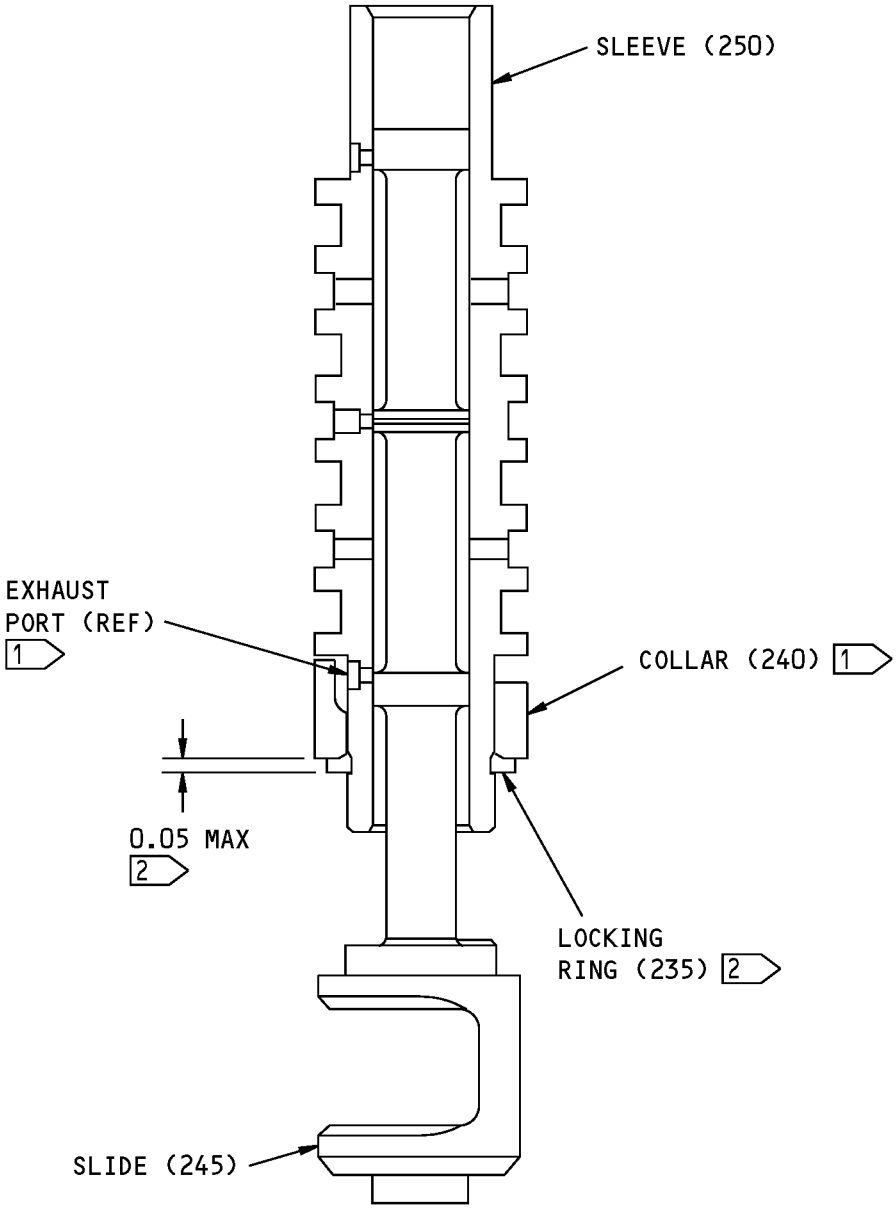
(2) Install the collar.

(a) Put the collar on the sleeve. Make sure that the deflector flange on the collar is over the exhaust port in the flat on the sleeve.

(b) Install the locking ring on the sleeve with the chamfered side adjacent to the collar. Swage the locking ring as shown in REPAIR 7-1, Figure 601. Make sure that the ring locks the collar tightly onto the sleeve. Remove burrs from the ring if necessary.

(c) Assemble the slide into the sleeve. Be careful not to damage the lapped surfaces of the slide and the sleeve.

(3) Put the assembly fully into hydraulic fluid, D00153, then drain the fluid. Put the parts into a bag, and seal the bag. Write the serial number of the parts on a tag and put the tag on the bag to identify the assembly as a matched set.



1 INSTALL COLLAR WITH DEFLECTOR FLANGE OVER EXHAUST PORT.

2 INSTALL LOCKING RING WITH CHAMFER ADJACENT TO COLLAR. SWAGE TO 0.05 MAXIMUM THICKNESS.

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

66-22743-4 Slide and Sleeve Assembly - Collar Replacement
Figure 601

INPUT SHAFT ASSEMBLY - REPAIR 8-1

66-22775–4

1. General

A. This procedure has the data necessary to disassemble and assemble the input shaft assembly (IPL Figure 2, 100) or (IPL Figure 3, 90), and to replace parts on the assembly.

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 or IPL Figure 3 for item numbers.

2. Replacement of Parts

A. Procedure

(1) Disassemble the input shaft assembly (IPL Figure 2, 100) or (IPL Figure 3, 90).

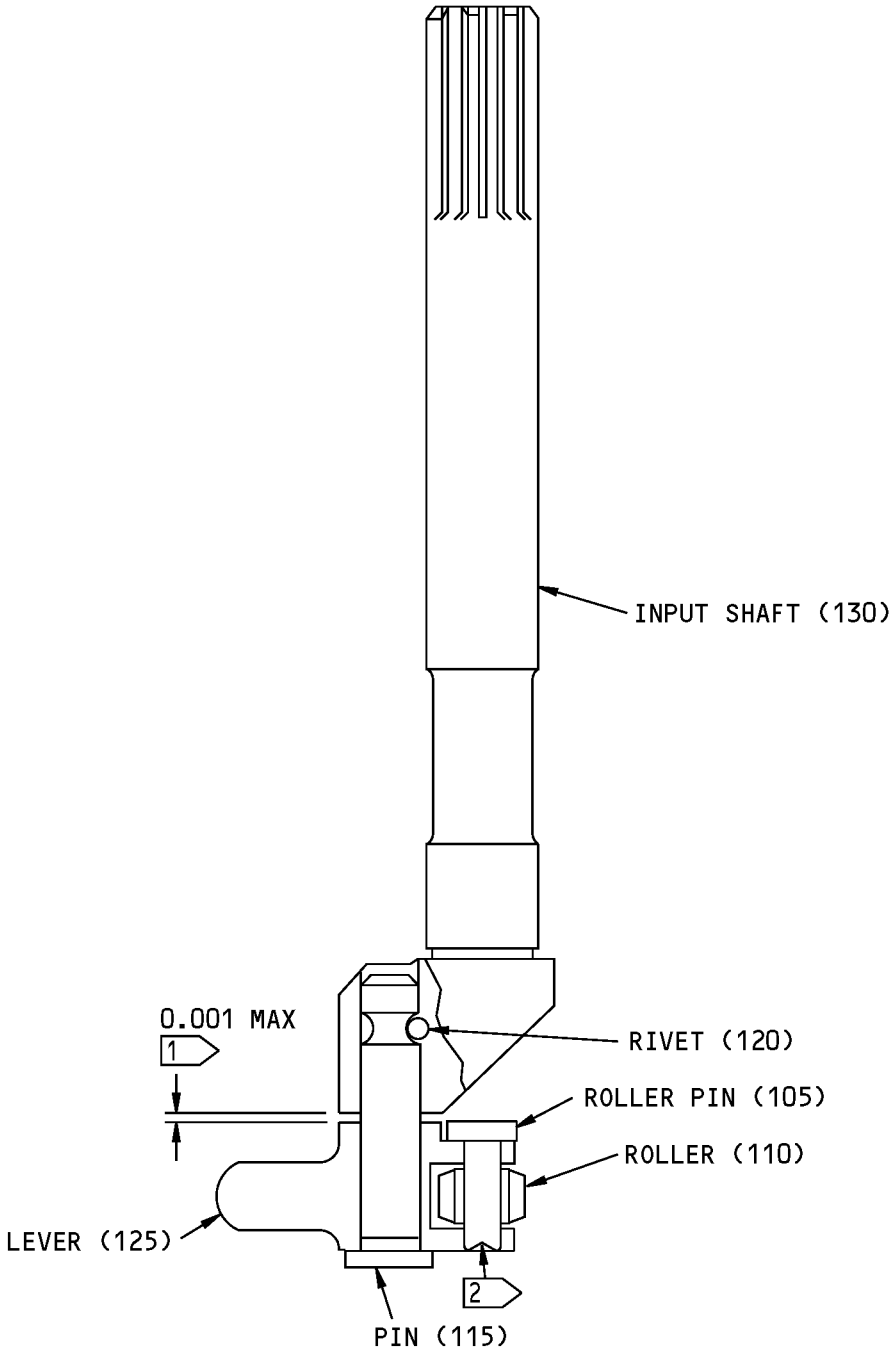
(a) Remove the rivet (IPL Figure 2, 120) or (IPL Figure 3, 105), then remove the pin (IPL Figure 2, 115) or (IPL Figure 3, 110) and the lever (IPL Figure 2, 125) or (IPL Figure 3, 115) from the input shaft (IPL Figure 2, 130) or (IPL Figure 3, 120).

(b) File or grind off the end of the roller pin (IPL Figure 2, 105) or (IPL Figure 3, 95), then remove the pin and the roller (IPL Figure 2, 110) or (IPL Figure 3, 100) from the lever.

(2) Assemble the input shaft assembly (IPL Figure 2, 100) or (IPL Figure 3, 90). Refer to REPAIR 8-1, Figure 601.

(a) Install the roller pin (IPL Figure 2, 105) or (IPL Figure 3, 95) and the roller (IPL Figure 2, 110) or (IPL Figure 3, 100) into the lever. Make the upset at the end of the pin until the pin is tight in the lever. Make sure that the roller can turn freely.

(b) Install the roller pin (IPL Figure 2, 115) or (IPL Figure 3, 110) through the lever and into the input shaft. Install the rivet (IPL Figure 2, 120) or (IPL Figure 3, 105) to hold the parts together. Make sure that the clearance between the lever and the input shaft is not more than 0.001 inch, and that the lever can turn freely.



1 MAXIMUM CLEARANCE BETWEEN INPUT SHAFT (130) AND LEVER (125)

2 MAKE UPSET ON THIS END OF ROLLER PIN (105)

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

66-22775-4 Input Shaft Assembly Details
Figure 601

BOEING®

COMPONENT MAINTENANCE MANUAL

INPUT SHAFT ASSEMBLY - REPAIR 8-2

66-22775–4

1. General

A. This procedure has the data necessary to repair and refinish the parts of the input shaft assembly (IPL Figure 2, 100; IPL Figure 3, 90).

B. Refer to the Standard Overhaul Practice Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 or IPL Figure 3 for item numbers.

E. General repair details:

(1) Material:

(a) Roller pin (IPL Figure 2 ,105) and (IPL Figure 3, 95) – CRES, 150-170 ksi

(b) Roller (IPL Figure 2, 110) and (IPL Figure 3, 100) – CRES, Rc 58-62

(c) Pin (IPL Figure 2, 115) and (IPL Figure 3, 110) – CRES, 180-200 ksi

(d) Shaft (IPL Figure 2, 130) and (IPL Figure 3, 120) – CRES, 180-200 ksi

(2) Shot peen: Repaired surfaces as shown in REPAIR 8-2, Figure 601 and REPAIR 8-2, Figure 602.

(a) Shot Size = 0.017 - 0.046

(b) Intensity = 0.010A

(c) Coverage = 2.0

2. Repair of Parts

A. References

Reference	Title
SOPM 20-10-01	REPAIR AND REFINISH OF HIGH STRENGTH STEEL PARTS
SOPM 20-10-03	SHOT PEENING
SOPM 20-10-04	GRINDING OF CHROME PLATED PARTS
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Procedure

NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Disassemble the input shaft assembly (IPL Figure 2, 100) or (IPL Figure 3, 90) as necessary. Refer to REPAIR 8-1.

(2) Machine the pin (IPL Figure 2, 115) or (IPL Figure 3, 110) and the shaft (IPL Figure 2, 130) or (IPL Figure 3, 120) to the repair dimensions shown in REPAIR 8-2, Figure 601 and REPAIR 8-2, Figure 602 to remove defects (SOPM 20-10-01).

(3) Break all sharp edges.

(4) Do a magnetic particle check of the parts (SOPM 20-20-01).

(5) Shot peen the machined areas on the parts (SOPM 20-10-03).

(6) Apply chrome plate (F-15.03 or F-15.04) 4) to the machined areas as shown in REPAIR 8-2, Figure 601 and REPAIR 8-2, Figure 602.

(7) Grind the chrome plate to the design dimensions shown in REPAIR 8-2, Figure 601 and REPAIR 8-2, Figure 602 (SOPM 20-10-04). Make sure to keep the surface finishes shown in the figures.

(8) Assemble the input shaft assembly (IPL Figure 2, 100) or (IPL Figure 3, 90). Refer to REPAIR 8-1.

3. Refinish

A. References

Reference	Title
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Procedures

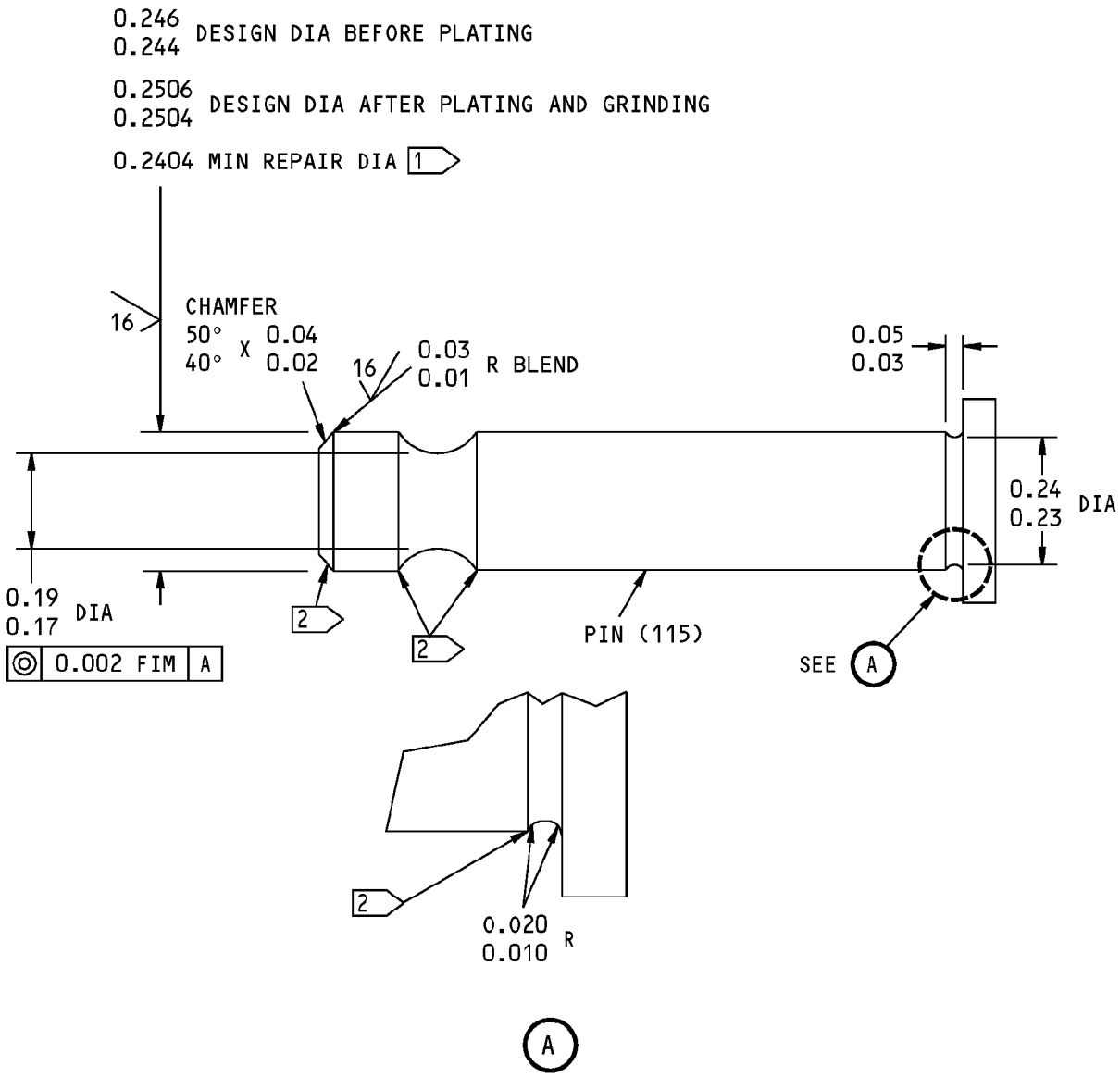
NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Roller pin (IPL Figure 2, 105) and (IPL Figure 3, 95) – Passivate (F-17.09).

(2) Roller (IPL Figure 2, 110) and (IPL Figure 3100) – Passivate (F-17.09).

(3) Pin (IPL Figure 2, 115) and (IPL Figure 3, 110) – Apply chrome plate (F-15.03) as shown in REPAIR 8-2, Figure 601. Passivate (F-17.09) all other surfaces.

(4) Shaft (IPL Figure 2, 130) and (IPL Figure 3, 120) – Passivate (F-17.09).



1 SHOT PEEN AND BUILD UP WITH CHROME PLATE (F-15.03). GRIND TO DESIGN DIMENSION AND FINISH SHOWN. 0.005 MAXIMUM THICKNESS OF CHROME PLATE AFTER GRINDING.

2 CHROME PLATE RUNOUT PERMITTED IN THIS AREA

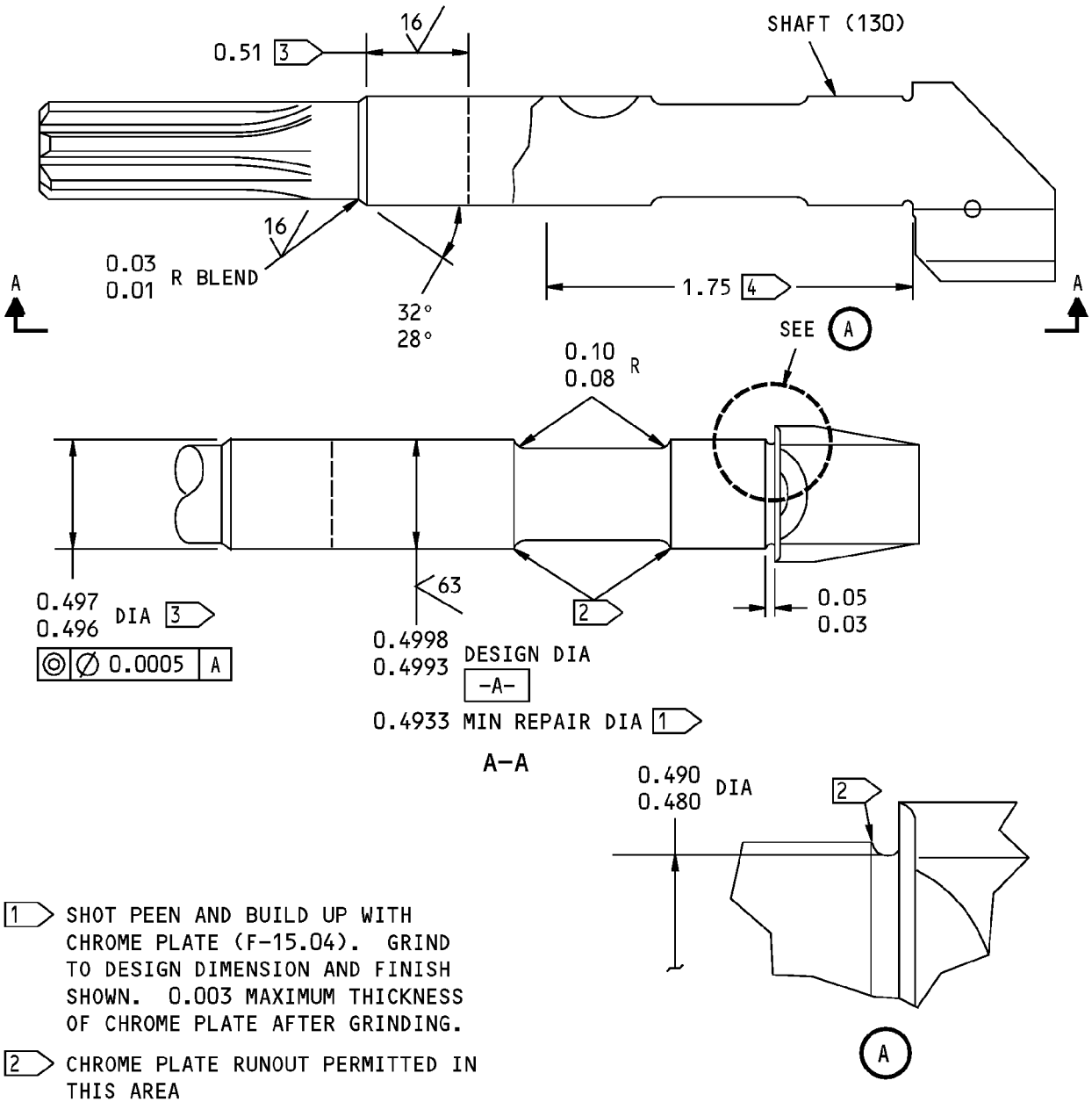
125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

66-22745-1 Pin Repair
Figure 601



1 SHOT PEEN AND BUILD UP WITH CHROME PLATE (F-15.04). GRIND TO DESIGN DIMENSION AND FINISH SHOWN. 0.003 MAXIMUM THICKNESS OF CHROME PLATE AFTER GRINDING.

2 CHROME PLATE RUNOUT PERMITTED IN THIS AREA

3 0.496-0.497 DIAMETER AND 16 MICROINCHES SURFACE FINISH APPLY OVER THIS LENGTH (MINIMUM)

4 0.4993-0.4998 DIAMETER AND 63 MICROINCHES SURFACE FINISH APPLY OVER THIS LENGTH (MINIMUM)

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

69-35593-1 Shaft Repair
Figure 602

END BEARING - REPAIR 9-1

69-35549–2

1. General

A. This procedure has the data necessary to refinish the end bearing (415).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 for item numbers.

E. General repair details:

(1) Material: Al-Ni-Bronze (AMS 4640)

2. Refinish

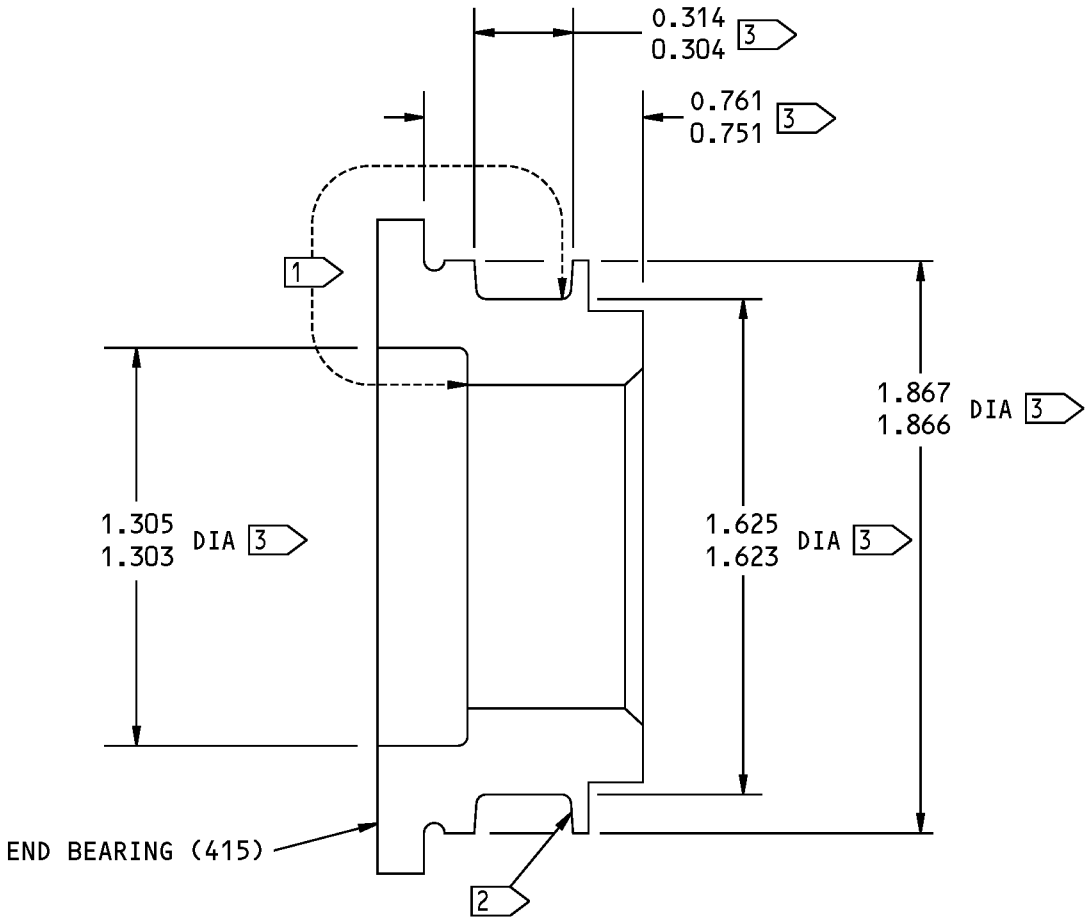
A. References

Reference	Title
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Procedure

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Apply cadmium plate (F-15.06) to the surfaces shown in REPAIR 9-1, Figure 601.



1 CADMIUM PLATE (F-15.06) ON THESE SURFACES ONLY

2 CADMIUM PLATE RUNOUT PERMITTED ON THIS SURFACE

3 DIMENSIONS APPLY TO PLATED SURFACES

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

69-35549-2 End Bearing Refinish
Figure 601

PISTON - REPAIR 10-1

251A1243–1, 69-35592–2

1. General

A. This procedure has the data necessary to repair and refinish the step piston (175) and the piston (185).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to REPAIR-GENERAL, Figure 601 for the Standard True Position Dimensioning Symbols shown in the repair.

D. Refer to IPL Figure 2 for item numbers.

E. General repair details:

(1) Material: Step piston (175), piston (185) – CRES, Rc 58-62

(2) Shot Peen: Repaired surfaces as shown in REPAIR 10-1, Figure 601.

(a) Shot Size = 0.017 - 0.046

(b) Intensity = 0.010A

(c) Coverage = 2.0

2. Piston Repair

A. References

Reference	Title
SOPM 20-10-01	REPAIR AND REFINISH OF HIGH STRENGTH STEEL PARTS
SOPM 20-10-03	SHOT PEENING
SOPM 20-10-04	GRINDING OF CHROME PLATED PARTS
SOPM 20-20-01	MAGNETIC PARTICLE INSPECTION
SOPM 20-30-02	STRIPPING OF PROTECTIVE FINISHES
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Procedure

NOTE: For stripping of protective finishes, refer to SOPM 20-30-02. For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Machine the step piston (175) to the repair dimension shown in REPAIR 10-1, Figure 601 to remove defects (SOPM 20-10-01).

(2) Machine the piston (185) to the repair dimension shown in REPAIR 10-1, Figure 602 to remove defects (SOPM 20-10-01).

(3) Break all sharp edges.

(4) Do a magnetic particle check of the piston (SOPM 20-20-01).

(5) Shot peen the machined area (SOPM 20-10-03).

(6) Apply chrome plate (F-15.04) to the areas shown in REPAIR 10-1, Figure 601 or REPAIR 10-1, Figure 602.

(7) Grind the chrome plate to the design dimension shown in REPAIR 10-1, Figure 601 or REPAIR 10-1, Figure 602 (SOPM 20-10-04). Make sure to keep the surface finish shown in REPAIR 10-1, Figure 601 or REPAIR 10-1, Figure 602.

3. Refinish

A. References

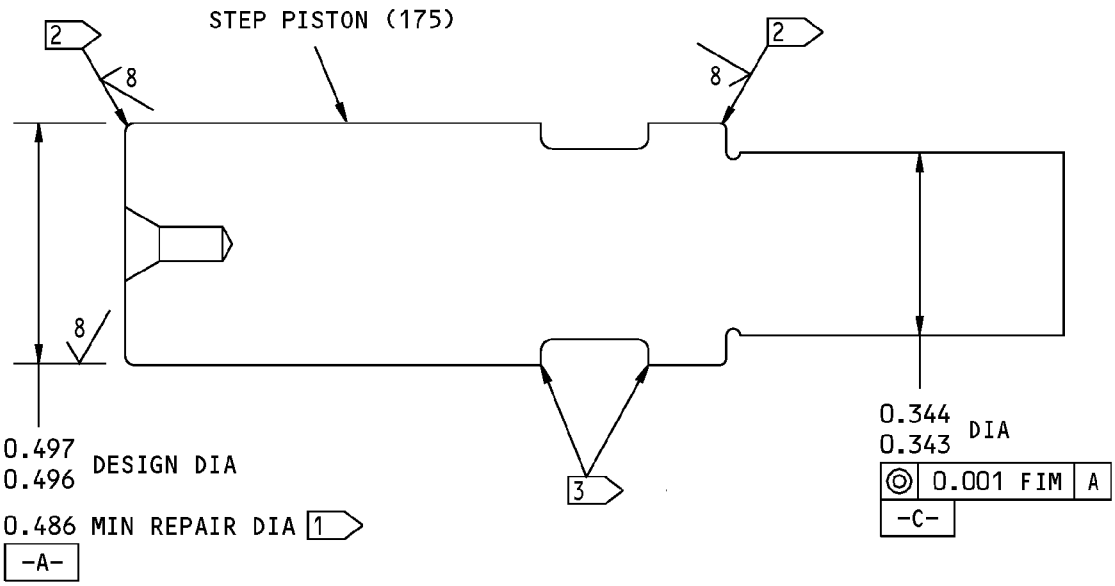
Reference	Title
SOPM 20-41-01	DECODING TABLE FOR BOEING FINISH CODES

B. Procedures

NOTE: For the decoding table for Boeing finish codes, refer to SOPM 20-41-01.

(1) Step piston (175) – Passivate (F-17.09).

(2) Piston (185) – Passivate (F-17.25).



1 SHOT PEEN AND BUILD UP WITH CHROME PLATE (F-15.04). GRIND TO DESIGN DIMENSION AND FINISH SHOWN. 0.005 MAXIMUM THICKNESS OF CHROME PLATE AFTER GRINDING.

2 BREAK SHARP EDGES 0.005-0.015 RADIUS

3 BREAK SHARP EDGES 0.000-0.010

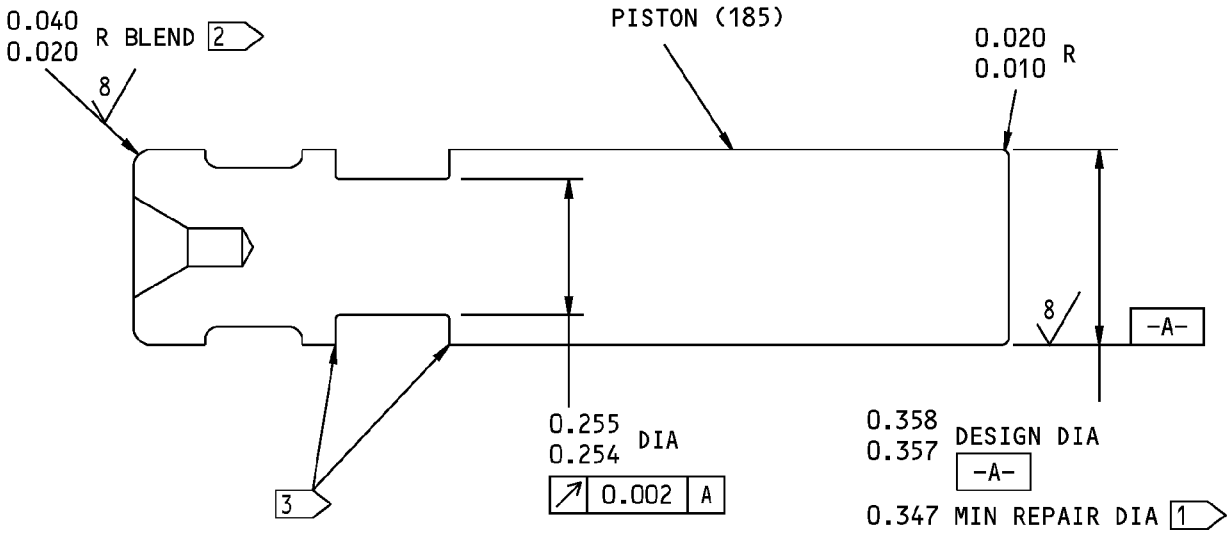
125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

69-35592-2 Step Piston Repair
Figure 601



1 SHOT PEEN AND BUILD UP WITH CHROME PLATE (F-15.04). GRIND TO DESIGN DIMENSION AND FINISH SHOWN. 0.005 MAXIMUM THICKNESS OF CHROME PLATE AFTER GRINDING.

2 EDGE OF CHROME PLATE MUST BE SMOOTH

3 BREAK SHARP EDGES 0.005-0.010

125 ALL MACHINED SURFACES UNLESS SHOWN DIFFERENTLY

BREAK ALL SHARP EDGES

ITEM NUMBERS REFER TO IPL FIG. 2

ALL DIMENSIONS ARE IN INCHES

251A1243-1 Piston Repair
Figure 602

ASSEMBLY

1. General

A. This procedure has the data necessary to assemble the spoiler actuator power control unit (PCU) assembly (1B).

B. Refer to the Standard Overhaul Practices Manual (SOPM) for the SOPM subjects identified in this procedure.

C. Refer to IPL Figure 1, IPL Figure 2 or IPL Figure 3 for item numbers.

2. Assembly

A. Tools/Equipment

NOTE: Equivalent substitutes may be used.

Reference	Description
SPL-5387	Adapter - Wrench, Flight Spoiler Actuator (Part #: C27061-1, Supplier: 81205)

B. Consumable Materials

NOTE: Equivalent substitutes may be used.

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS 3-27
D00054	Fluid - Hydraulic Assembly Lubricant - MCS 352B (Formerly Monsanto MCS 352B)	
D00153	Fluid - Hydraulic, Erosion Arresting, Fire Resistant	BMS3-11 Type IV (interchange˜ able & intermixable with Type V)
D00571	Grease - Polyalkylene Glycol, Lithium - Batco X8401-2	
G01912	Lockwire - Monel (0.032 In. Dia.)	NASM20995N˜ C32 (QQ-N-281)

C. References

Reference	Title
SOPM 20-50-01	BOLT AND NUT INSTALLATION
SOPM 20-50-02	INSTALLATION OF SAFETYING DEVICES
SOPM 20-50-06	INSTALLATION OF O-RINGS AND TEFLON SEALS
SOPM 20-50-17	CORROSION PROTECTION PROCEDURES FOR HYDRAULIC COMPONENTS
SOPM 20-60-02	FINISHING MATERIALS
SOPM 20-60-03	LUBRICANTS

Reference	Title
SOPM 20-60-04	MISCELLANEOUS MATERIALS

D. Procedure

NOTE: For finishing materials, refer to SOPM 20-60-02. For lubricants, refer to SOPM 20-60-03. For miscellaneous materials, refer to SOPM 20-60-04.

(1) Lubricate the packings, backup rings, and seals with hydraulic fluid, D00153 or assembly lube MCS 352B fluid, D00054 before you install the parts.

CAUTION: DO NOT PUT THE UNIT IN A CLAMPING DEVICE. IT CAN BE DAMAGED.

(2) Install the parts in the barrel assembly (IPL Figure 2, 440).

(a) Install the seal (IPL Figure 2, 435) on the piston (IPL Figure 2, 430), then install the piston in the barrel assembly (SOPM 20-50-06).

(b) Install the packing (IPL Figure 2, 405) and the seal (IPL Figure 2, 410) in the end bearing (IPL Figure 2, 415). Install the packing (IPL Figure 2, 425) and the backup rings (IPL Figure 2, 420) on the outside of the end bearing (SOPM 20-50-06).

(c) Install the end bearing over the end of the piston and into the barrel assembly.

(d) Install the scraper (IPL Figure 2, 395) in the seal retainer (IPL Figure 2, 400).

(e) Install the seal retainer on the piston. Make sure that the beveled surface of the retainer faces the end bearing.

(f) Install the bolts (IPL Figure 2, 385) and washers (IPL Figure 2, 390) to attach the seal retainer to the barrel assembly (SOPM 20-50-01). Tighten the bolts to 180-250 lb-in.

(g) Install the jam nut (IPL Figure 2, 370) fully onto the rod end assembly (IPL Figure 2, 380).

(h) Install the key (IPL Figure 2, 375) into the keyway in the rod assembly. Apply Batco X8401-2 grease, D00571 to the shank of the rod assembly (IPL Figure 2, 380) (SOPM 20-50-17, Type 1 procedure), then install the rod assembly into the piston. Adjust the rod assembly to get a distance of 6.375-6.875 inches between the rod bearing center and the centerline of the trunnion of the barrel assembly (IPL Figure 2, 440) with the piston fully retracted.

(i) Turn the rod assembly in the piston, with the piston fully retracted in the barrel assembly (IPL Figure 2, 440). Adjust the rod assembly to get a distance of 6.375-6.875 inches between the rod bearing center and the centerline of the trunnion of the barrel.

(j) Align the keyway with one of the slots in the end of the piston, then move the key down and into the slot. Move the jam nut down onto the end of the piston and tighten the jam nut to 200-250 lb-in.

(3) Install the bracket assembly (IPL Figure 2, 475) on the barrel assembly.

CAUTION: THE JOURNAL (IPL FIG. 2, 500) AND BRACKET (IPL FIG. 2, 515) ARE A MATCHED SET. MAKE SURE THAT THE SERIAL NUMBERS OF THE TWO PARTS ARE THE SAME, OR THE PART MAY NOT OPERATE CORRECTLY. TO PREVENT DAMAGE, DO NOT TOUCH THE BRACKET ASSEMBLY MORE THAN IS NECESSARY.

(a) Install the seals (IPL Figure 2, 470) in the journal (IPL Figure 2, 500) (SOPM 20-50-06).

(b) Make sure that the shim (IPL Figure 2, 510) is satisfactorily bonded to the bracket, then install the journal and the bracket on the barrel assembly (IPL Figure 2, 440).

(c) Install the tapered pins (IPL Figure 2, 485), washers (IPL Figure 2, 490), and nuts (IPL Figure 2, 495) to attach the journal to the bracket. Tighten the nuts to 10-20 lb-in. and install the cotter pins (IPL Figure 2, 480) (SOPM 20-50-01).

(4) Install parts in the manifold assembly (IPL Figure 2, 325).

CAUTION: THE HOLD-DOWN CHECK AND RELIEF VALVE (IPL FIG. 2; 255) IS A PRECISION PART. TO PREVENT DAMAGE, DO NOT TOUCH THE ASSEMBLY MORE THAN IS NECESSARY.

(a) Install the packings (IPL Figure 2, 265, 275) and backup rings (IPL Figure 2, 260A, 270) on the hold-down check and relief valve (IPL Figure 2, 255) (SOPM 20-50-06). Apply Batco X8401-2 grease, D00571 to the threads of the valve (SOPM 20-50-17, Type 1 procedure), then install the valve in the manifold assembly (IPL Figure 2, 325). Use the C27061 wrench adapter, SPL-5387 to tighten the valve to 200-250 lb-in.

(b) Install the packing (IPL Figure 2, 150) on the filter cap (IPL Figure 2, 145) (SOPM 20-50-06). Apply Batco X8401-2 grease, D00571 to the threads of the cap (SOPM 20-50-17, Type 4 procedure), then install the filter (IPL Figure 2, 155A) and the cap. Tighten the cap to 80-100 lb-in.

CAUTION: THE SLIDE AND SLEEVE ASSEMBLY (IL FIG. 2, 230) IS A PRECISION PART. THE SLIDE AND THE SLEEVE ARE A MATCHED SET. TO PREVENT DAMAGE, DO NOT TOUCH THE ASSEMBLY MORE THAN IS NECESSARY.

(c) Remove the slide (IPL Figure 2, 245) from the sleeve (IPL Figure 2, 250). Install the spring (IPL Figure 2, 225) onto the slide, then install the slide into the sleeve. Be careful not to damage the lapped surfaces of the slide and the sleeve.

(d) Install one packing (IPL Figure 2, 220) and one backup ring (IPL Figure 2, 215) in each of the four seal grooves on the outside of the sleeve (SOPM 20-50-06). Make sure that the backup rings are installed on the correct side of the packings, as shown in IPL Figure 2.

(e) Install the collar (IPL Figure 2, 210) and the spring washer (IPL Figure 2, 205) on the slide and sleeve assembly. Make sure that the deflector flange on the collar is over the exhaust port in the flat on the sleeve.

(f) Install the slide and sleeve assembly and related parts in the manifold assembly. Make sure that the open section of the clevis on the slide points to the opening of the hole for the input shaft.

(g) Install the packing (IPL Figure 2, 200) on the cap (IPL Figure 2, 195) (SOPM 20-50-06). Apply Batco X8401-2 grease, D00571 to the threads of the cap (SOPM 20-50-17, Type 4 procedure), then install the cap in the manifold. Tighten the cap to 200-250 lb-in.

(h) Thermally set the piston rings (IPL Figure 2, 180, 190) at a maximum of 400°F to get a 0.000-0.001 inch interference fit with the sealing surfaces. Install the piston ring (IPL Figure 2, 190) on the piston (IPL Figure 2, 185), then install the piston fully into the manifold. Install the piston ring (IPL Figure 2, 180) on the step piston (IPL Figure 2, 175), then install the step piston into the manifold sufficiently far so that the cap (IPL Figure 2, 160) can be installed.

(i) Install the packing (IPL Figure 2, 170) and backup rings (IPL Figure 2, 165) on the cap (IPL Figure 2, 160) (SOPM 20-50-06). Apply Batco X8401-2 grease, D00571 to the threads of the cap (SOPM 20-50-17, Type 1 procedure), then install the cap in the manifold. Tighten the cap to 80-100 lb-in.

(j) Install the packing (IPL Figure 2, 140) and backup rings (IPL Figure 2, 135) on the cover (IPL Figure 2, 70; IPL Figure 3, 70) of the input assembly (IPL Figure 2, 15, 17) (SOPM 20-50-06). Install the input assembly in the manifold assembly.

NOTE: The roller (IPL Figure 2, 110) or (IPL Figure 3, 100) on the input lever (IPL Figure 2, 125) or (IPL Figure 3, 115) must go between the piston (IPL Figure 2, 185) and the step piston (IPL Figure 2, 175). The stub shaft on the opposite end of the input lever must go into the slide clevis on the slide and sleeve assembly (IPL Figure 2, 230).

WARNING: BMS 3-27 CORROSION INHIBITING COMPOUND CONTAINS SOLVENTS, CHROMATES, AND A SMALL AMOUNT OF BOUND ASBESTOS. CONSULT THE APPLICABLE SAFETY STANDARDS FOR APPROVED HANDLING PROCEDURES.

CAUTION: BMS 3-27 COMPOUND IS USED ONLY IN STATIC JOINTS WHERE GREASE CANNOT BE APPLIED. BMS 3-27 COMPOUND IN DYNAMIC JOINTS WILL NOT LET THEM MOVE FREELY.

(k) Turn the cover counterclockwise to align the screw holes in the cover (IPL Figure 2, 70; IPL Figure 3, 70) with the holes in the manifold assembly. Apply corrosion inhibiting compound, C00913 to the threads and shanks of the screws (IPL Figure 2, 5), and to the bottoms of the screw heads. Install the screws with washers (IPL Figure 2, 10) to attach the input assembly to the manifold. Tighten the screws to 50-60 lb-in (SOPM 20-50-01).

NOTE: Three of the screw holes in the cover are on two axes which go through the input shaft centerline at 90 degrees to each other. The other hole is offset, and is not on one axis or the other.

(5) Attach the barrel assembly to the manifold assembly.

NOTE: As an alternative, you can do the test of the flow control servovalve (TESTING AND FAULT ISOLATION, Paragraph 2.B.(2)) before you attach the barrel assembly to the manifold assembly.

(a) Install the packings (IPL Figure 2, 300, 320) and the backup rings (IPL Figure 2, 295, 315) on the transfer tubes (IPL Figure 2, 305, 310) (SOPM 20-50-06).

(b) Install the transfer tubes in the holes in the barrel assembly.

NOTE: One end of one transfer tube (IPL Figure 2, 310) has a smaller diameter that the other ends of the transfer tubes (IPL Figure 2, 305, 310). That end must be installed in the correct hole in the barrel assembly.

WARNING: BMS 3-27 CORROSION INHIBITING COMPOUND CONTAINS SOLVENTS, CHROMATES, AND A SMALL AMOUNT OF BOUND ASBESTOS. CONSULT THE APPLICABLE SAFETY STANDARDS FOR APPROVED HANDLING PROCEDURES.

CAUTION: BMS 3-27 COMPOUND IS USED ONLY IN STATIC JOINTS WHERE GREASE CANNOT BE APPLIED. BMS 3-27 COMPOUND IN DYNAMIC JOINTS WILL NOT LET THEM MOVE FREELY.

(c) Apply corrosion inhibiting compound, C00913 to the threads and shanks of the screws (IPL Figure 2, 280, 285), and to the bottoms of the screw heads. Install the screws with washers (IPL Figure 2, 290) to attach the input assembly to the manifold. Tighten the screws to 50-60 lb-in (SOPM 20-50-01).

(6) Install the packings (IPL Figure 1, 15, 20) on the reducer (IPL Figure 1, 5) and the union (IPL Figure 1, 10), then install the parts in the hydraulic ports in the journal (IPL Figure 2, 500).

(7) Do the functional test of the actuator assembly TESTING AND FAULT ISOLATION.

(8) Apply corrosion protection as shown in ASSEMBLY, Figure 701 (SOPM 20-50-17).

(9) Install the lockwire, G01912 as shown in ASSEMBLY, Figure 702. Use the double-twist procedure (SOPM 20-50-02).

NOTE: Lockwire is installed on the jam nut (IPL Figure 2, 370) when the PCU assembly is installed in the airplane.

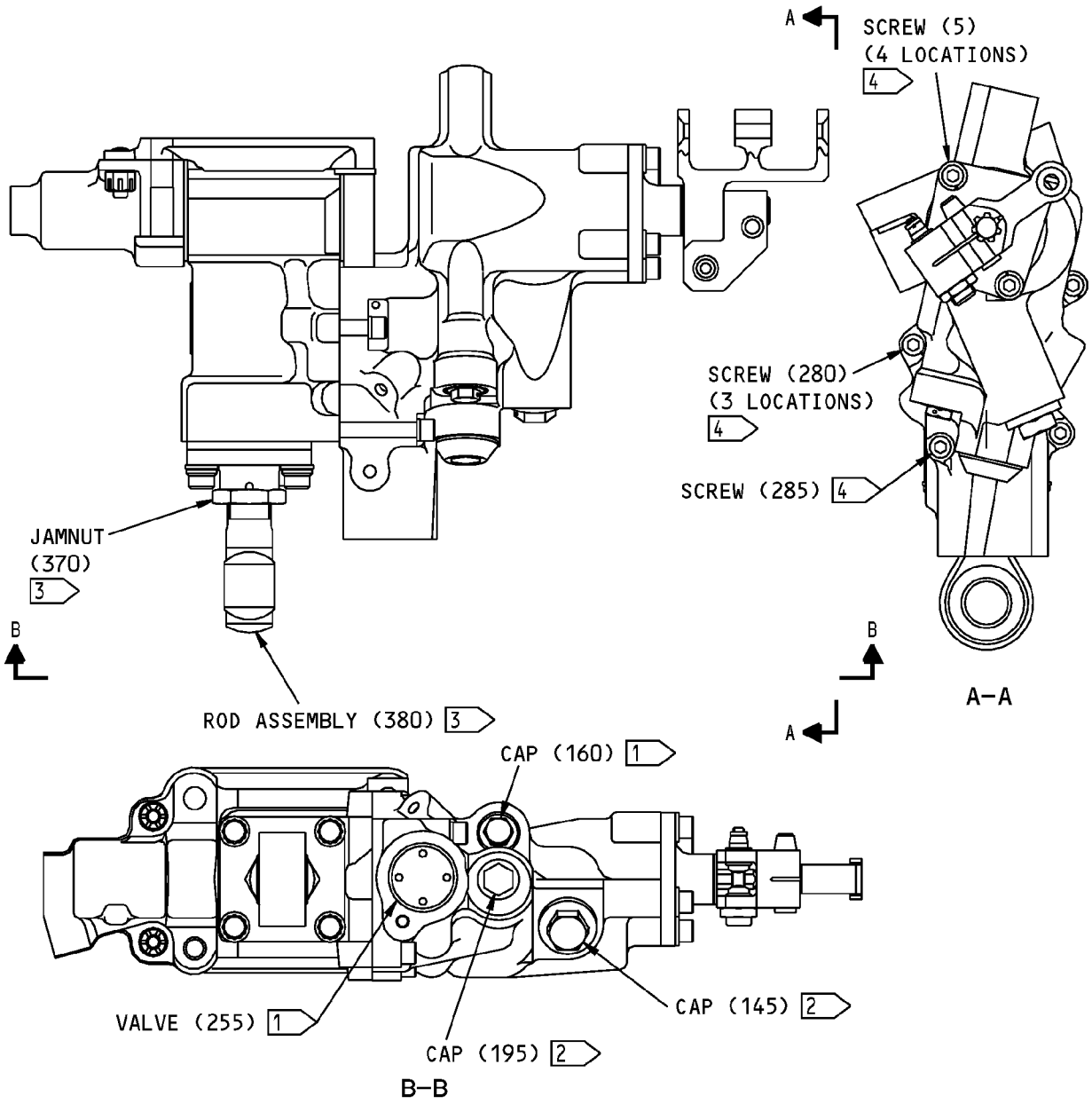
3. Storage

A. References

Reference	Title
SOPM 20-44-02	TEMPORARY PROTECTIVE COATINGS

B. Procedure

(1) Use standard industry procedures to store this component. Refer to SOPM 20-44-02 for more data.



NOTE: REFER TO SOPM 20-50-17 FOR DETAILS OF APPLICATION OF CORROSION PROTECTION.

1 APPLY TYPE 1 CORROSION PROTECTION

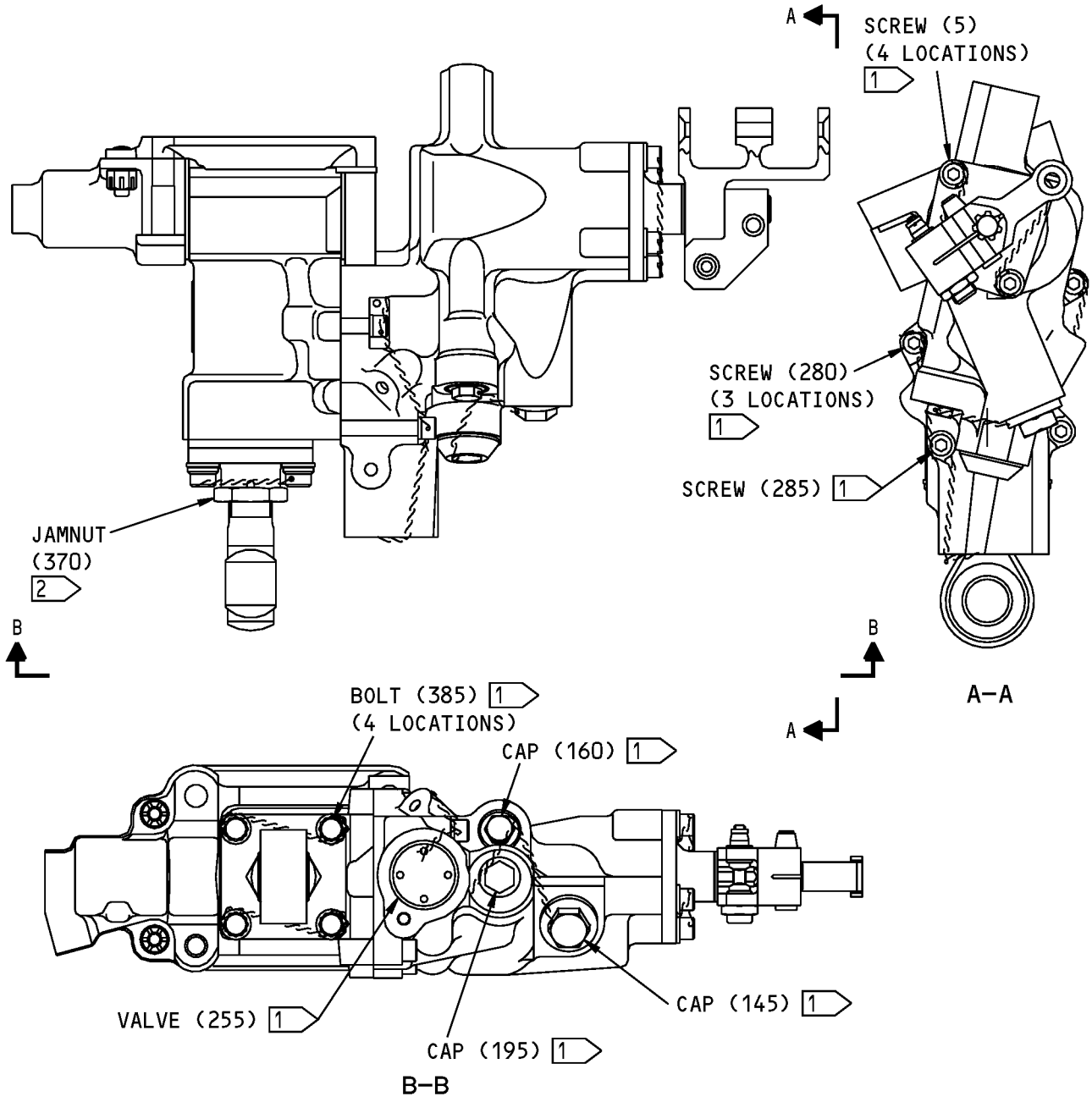
2 APPLY TYPE 4 CORROSION PROTECTION

3 APPLY TYPE 1 CORROSION PROTECTION GREASE, BUT DO NOT APPLY THE SEALANT

4 INSTALL WITH BMS 3-27 CORROSION INHIBITING COMPOUND

ITEM NUMBERS REFER TO IPL FIG. 2

Application of Corrosion Protection
Figure 701



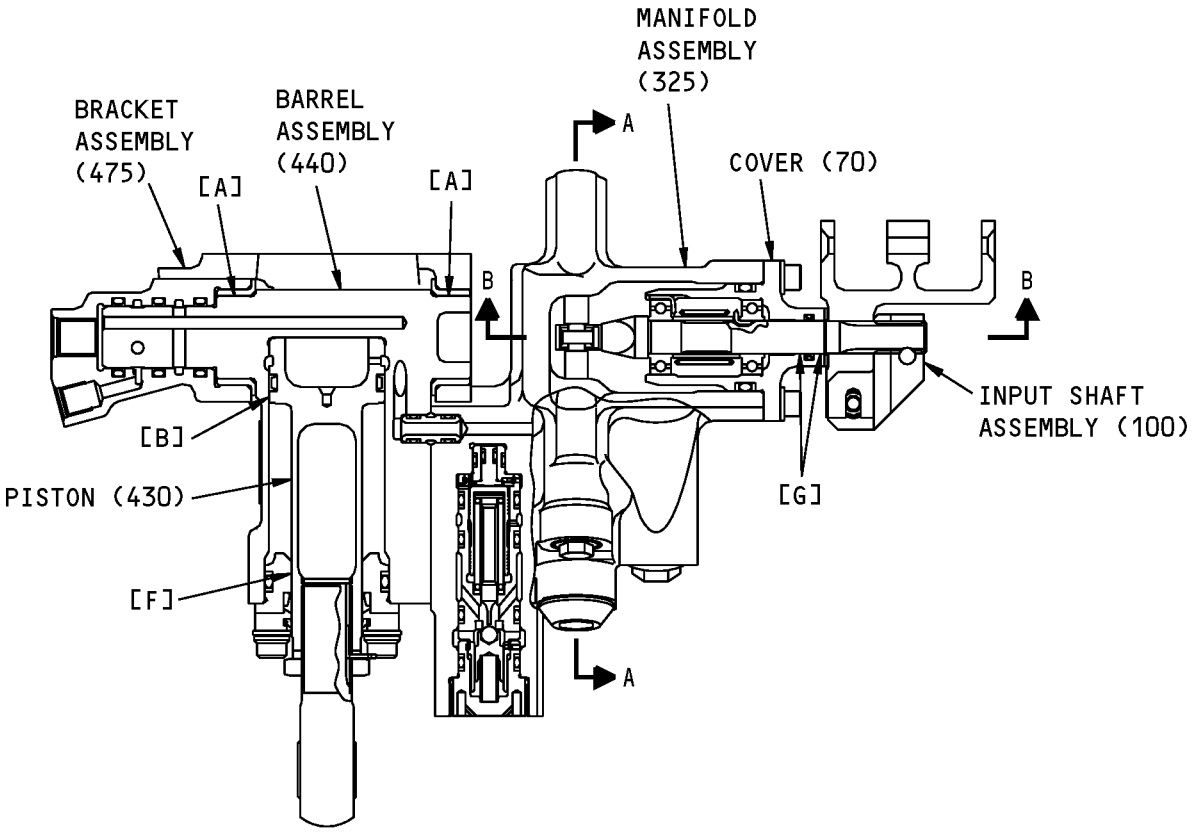
NOTE: REFER TO SOPM 20-50-02 FOR LOCKWIRE INSTALLATION DETAILS.

1 INSTALL MS20995NC32 LOCKWIRE (MS20995N32 OPTIONAL). USE DOUBLE-TWIST METHOD

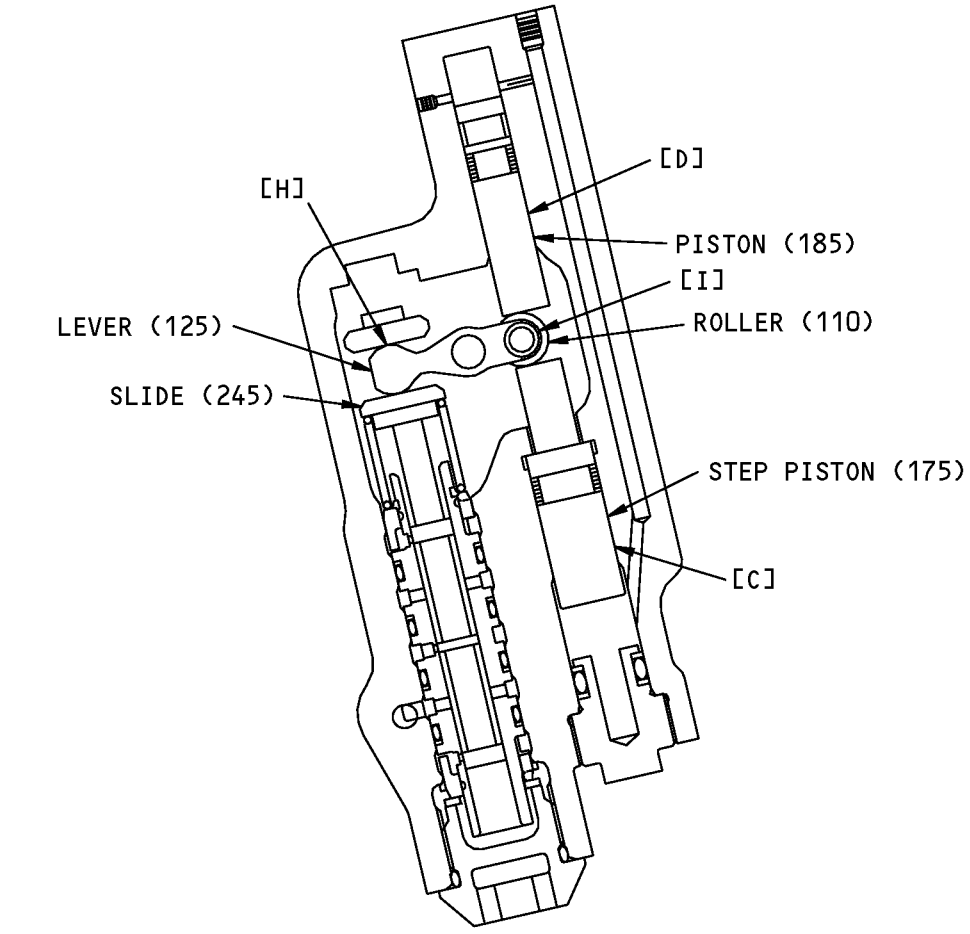
2 LOCKWIRE WILL BE INSTALLED DURING PCU INSTALLATION ON AIRPLANE

ITEM NUMBERS REFER TO IPL FIG. 2

Lockwire Diagram
Figure 702



Fits and Clearances
Figure 801 (Sheet 1 of 3)



ITEM NUMBERS REFER TO IPL FIG. 2

Fits and Clearances
Figure 801 (Sheet 2 of 3)

REF LETTER	REF IPL FIG. 2, MATING ITEM NO.	DESIGN DIMENSION*				SERVICE WEAR LIMIT*		
		DIMENSION		ASSEMBLY CLEARANCE 1		DIMENSION		MAXIMUM CLEARANCE
		MIN	MAX	MIN	MAX	MIN	MAX	
[A]	ID 505	1.2490	1.2500	0.0005	0.0020		1.2510	0.0025
	OD 440	1.2480	1.2485			1.2465		
[B]	ID 440	1.7400	1.7415	0.0010	0.0030		1.7470	0.0060
	OD 430	1.7385	1.7390			1.7320		
[C]	ID 325	0.499	0.501	0.002	0.005		0.504	0.007
	OD 175	0.496	0.497			0.492		
[D]	ID 325	0.360	0.361	0.002	0.004		0.364	0.006
	OD 185	0.357	0.358			0.354		
[E]	ID 125	0.2507	0.2510	0.0001	0.0006		0.2516	0.0010
	OD 115	0.2504	0.2506			0.2497		
[F]	ID 415	1.061	1.064	0.001	0.006		1.070	0.010
	OD 430	1.058	1.060			1.051		
[G]	ID 1 70	0.4990	0.5010	-0.0008	0.0017		0.5028	0.0030
	OD 130	0.4993	0.4998			0.4960		
[H]	2 245	0.3750	0.3754	0.0001	0.0008		0.3763	0.0015
	OD 3 125	0.3746	0.3749			0.3737		
[I]	ID 110	0.1877	0.1883	0.0002	0.0011		---	0.0015
	OD 105	0.1872	0.1875			---		

* ALL DIMENSIONS ARE IN INCHES

1 NEGATIVE VALUES INDICATE INTEFERENCE FIT

2 DIMENSION BETWEEN CLEVIS FACES

3 SPHERICAL DIAMETER OVER A 75 DEGREES INCLUDED CONICAL ANGLE

Fits and Clearances
Figure 801 (Sheet 3 of 3)

REF IPL		NAME	TORQUE*	
FIG. NO.	ITEM NO.		POUND-INCHES	POUND-FEET
2	5,280,285	Screw	50-60	
2	145,160	Cap	80-100	
2	195	Cap	200-250	
2	255	Valve	200-250	
2	370	Jamnut	200-250	
2	385	Bolt	180-250	
2	495	Nut	10-20	

* REFER TO SOPM 20-50-01 FOR TORQUE VALUES OF STANDARD FASTENERS.

Torque Table
Figure 802

SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

1. General

A. This section lists the special tools, fixtures, and equipment necessary for maintenance.

NOTE: Equivalent substitutes may be used.

Special Tools

Reference	Description	Part Number	Supplier
SPL-5346	Flow meter - 0-2 gpm	410DME-3R	81205
SPL-5349	X-Y Recorder/Plotter	925E	60795
SPL-5387	Adapter - Wrench, Flight Spoiler Actuator	C27061-1	81205
SPL-5388	Test Block - Flight Spoiler Actuator Valve Cartridge	C27062-1	81205
SPL-5435	Test Equipment - Flight Spoiler Power Control Unit	F80224-79 Opt: F80224-60	81205 81205
SPL-5451	Position Transducer (LVDT)	DC750-050 PR750-050	0ZW31 0ZW31
SPL-5452	Position transducer (LVDT)	PR750-050	0ZW31
SPL-5453	Pressure Transducer - 0-5000 psi	PX91	81205
SPL-5459	Position Transducer	SS-101	00288

Tool Supplier Information

CAGE Code	Supplier Name	Supplier Address
00288	COLLINS, G. L. CORP.	5875 OBISPO AVE. LONG BEACH, CA 90805-3715 Telephone: (213) 531-6500
0ZW31	MEASUREMENT SPECIALTIES GLOBAL HQ (FORMERLY SCHAEVITZ ENGINEERING)	1000 LUCAS WAY P. O. BOX 505 HAMPTON, VA 23666-1573 Telephone: 757-766-1500 Facsimile: 757-766-4297 www.meas-spec.com
60795	ALLEN DATAGRAPH INC.	2 INDUSTRIAL WAY SALEM, NH 03079-2837 Telephone: (603) 893-1983 Facsimile: (603) 893-9042

Tool Supplier Information (Continued)

CAGE Code	Supplier Name	Supplier Address
81205	THE BOEING COMPANY	17930 INTERNATIONAL BLVD. SOUTH SEATAC, WA 98188-4321 Telephone: 206-662-6650 Facsimile: 206-662-7145

ILLUSTRATED PARTS LIST

1. Introduction

A. The Illustrated Parts List (IPL) contains an illustration and a list of component parts you can repair or replace. The Illustrated Parts Catalog (IPC) shows how to use the Boeing part number system.

B. This shows how parts are related: The relation of each item to its next higher assembly (NHA) is shown in the NOMENCLATURE column. Use the indenture system that follows:

1 2 3 4 5 6 7

. Assembly

. Attaching parts for assembly

. . Detail parts for assembly

. . Subassembly

. . Attaching parts for subassembly

. . . Detail parts for subassembly

. . . Sub-subassembly

. . . Attaching parts for subassembly

. . . . . Details parts for sub-subassembly

Detail Installation Parts (Included only if installation parts may be sent to the shop as part of assembly)

C. Each top assembly is given one use code letter (A, B, C, etc.) in the USAGE CODE column. All subsequent component parts in the list can have one or more of the use code letters to show effectivity to top assemblies. A component part without a use code applies to all top assemblies.

D. An alphabetical letter is added after the item number for optional parts, parts changed by a Service Bulletin, configuration differences (except left-handed and right-handed parts), last engineering releases, and parts added between item numbers in a sequence. The alphabetical letter will not be shown on the illustration for equivalent parts of the same part number.

E. Color-coded parts are identified with a single digit alpha following the dash number or with ''SP'' suffix. If the ''SP'' suffix is used, it represents consolidation of all color codes applicable for a given usage which are not separately listed. Orders for color-coded parts should include the registry number of the airplane for which the parts are ordered.

F. If a part number is 15 characters long but will not fit in the part number column, the part number will be displayed with a ''~'' at the end of the line and will be continued on the next line. The ''~'' denotes that the part number continues on the next line.

G. Parts changed by a Service Bulletin are shown by PRE SB XXXX and POST SB XXXX added to the NOMENCLATURE column.

(1) When a new top assembly is added by a Service Bulletin, PRE SB XXXX and POST SB XXXX will be added at the top assembly level only. The configuration differences at the detail part level are shown by use code letters.

(2) When the top assembly part number is not changed by the Service Bulletin, PRE SB XXXX and POST SB XXXX will be added at the detail level.

H. Interchangeable Parts

Optional (OPT)	The part is optional to and interchangeable with other parts that have the same item number.
Replaces, Replaced by and not interchangeable with (REPLACES, REPLACED BY AND NOT INTCHG/W)	The part replaces and is not interchangeable with the initial part.
Replaces, Replaced by (REPLACES, REPLACED BY)	The part replaces and is interchangeable with, or is an alternative to, the initial part.

VENDOR CODES

Code	Name
02107	FLOUROCARBON CO OHIO DIV DOVER, OHIO 44622 CANCELLED NO REPLACEMENT FORMERLY SPARTA MANUFACTURING CO
02886	DODGE-WASMUND MFG CO INC 9607 BEVERLY ROAD PICO RIVERA, CALIFORNIA 90660-2136
05CK7	WINTEC LLC 1681 MCGAW AVE IRVINE, CALIFORNIA 92614-5631 FORMERLY V21550 BRUNSWICK CORP WINTER TECHNECTICS DIV
07128	TETRAFLUOR INC 2051 EAST MAPLE AVENUE EL SEGUNDO, CALIFORNIA 90245-5009 FORMERLY ROYAL IND TETRAFLUOR DIV V0667B ENGLEWOOD CALIF
09257	BUSAK AND SHAMBAN INC SEALS DIV 2531 BREMER DR PO BOX 176 FORT WAYNE, INDIANA 46801 FORMERLY SHAMBAN, W S AND CO
09455	RBC TRANSPORT DYNAMICS CORP 3131 W SEGERSTROM AVE SANTA ANA, CALIFORNIA 92704-5872 FORMERLY TRANSPORT DYNAMICS AEROSPACE DIV; FABROID DIV TRANSPORT DYNAMICS V17571 & LEAR SEIGLER INC TRANSPORT DIV V98076; FORMERLY BFM TRANSPORT DYNAMICS

Code	Name
11815	CHERRY AEROSPACE FASTENERS DIV OF TEXTRON 1224 EAST WARNER AVENUE PO BOX 2157 SANTA ANA, CALIFORNIA 92707-0157 FORMERLY IN LOS ANGELES, CALIF , FORMERLY CHERRY FASTENERS TOWNSEND DIV OF TEXTRON INC V71087
15860	NEW HAMPSHIRE BALL BEARINGS, INC ASTRO DIVISION 155 LEXINGTON AVENUE LACONIA, NEW HAMPSHIRE 03246-2937 FORMERLY ASTRO BEARING CORP, LOS ANGELES, CALIF.
17446	HUCK INTL INC AEROSPACE FASTENER DIV 900 WATSON CENTER ROAD CARSON, CALIFORNIA 90745-4201 FORMERLY V32134 REXNORD INC; FORMERLY V97928 HUCK INTL
18350	PALL AEROPOWER CORP 5775 RIO VISTA DR CLEARWATER, FLORIDA 33760-3114 FORMERLY V01414; FORMERLY AIRCRAFT POROUS MEDIA INC FORMERLY IN PINELLAS PARK, FL; FORMERLY V60047; FORMERLY MECTRON IND V10989
21335	TIMKEN US CORPORATION DIV FAFNIR 336 MECHANIC STREET LEBANON, NH 03766-0267 FORMERLY FAFNIR BRG AND TEXTRON INC FAFNIR DIV IN NEW BRITAIN, CONNECTICUT ; FORMERLY TORRINGTON CO THE SPECIAL PRODUCTS DIV SUB OF THE INGERSOLL-RAND CO V8D210 FORMERLY TORRINGTON CO FAFNIR BEARING DIV IN TORRINGTON, CT
26303	GREENE TWEED IND INC ADVANTEC DIV 7101 PATTERSON DRIVE PO BOX 5037 GARDEN GROVE, CALIFORNIA 92645-5037 FORMERLY OHIO AIRCRAFT SUPPLIES INC IN INGLEWOOD, CALIFORNIA FORMERLY ADVANTEC DIV OF IFP INC, LOS ANGELES, CA V5P801
26879	CORONADO MFG INC 11069 PENROSE AVENUE SUN VALLEY, CALIFORNIA 90352-2722 FORMERLY CORONADO PLASTICS INC IN BURBANK, CALIFORNIA

Code	Name
29666	HUCK MANUFACTURING CO SUB OF FEDERAL-MOGUL CORP 6 THOMAS IRVINE, CALIFORNIA 92714 FORMERLY HUCK MFG CO VB0016 IN DETROIT, MICHIGAN
56878	SPS TECHNOLOGIES INC AEROSPACE AND INDUSTRIAL PRODUCTS DIV 301 HIGHLAND AVE JENKINTOWN, PENNSYLVANIA 19046 FORMERLY STANDARD PRESSED STEEL FORMERLY IN SALT LAKE, UTAH
57606	REXNORD CORP PSI BEARINGS DIV 2175 UNION PL SIMI VALLEY, CALIFORNIA 93065-1661 FORMERLY PSI BEARINGS
5M902	ALCOA GLOBAL FASTENERS INC, DIV OF VOI-SHAN PRODUCTS 3000 W LOMITA BLVD TORRANCE, CALIFORNIA 90505-5103 FORMERLY FAIRCHILD INC INC FAIRCHILD AEROSPACE FASTENERS DIV
60029	SMITHS AEROSPACE ACTUATION SYSTEMS-LOS ANGELES 1700 BUSINESS CENTER DR DUARTE, CALIFORNIA 91010-2859 FORMERLY VB0067;V94641;HYDRAULIC UNITS INC SUB OF BOEING CO
73134	ROLLER BEARING COMPANYOF AMER DBA HEIM BEARINGS DIV 60 ROUND HILL RD FAIRFIELD, CONNECTICUT 06430-0000 FORMERLY INCOM INTL HEIM DIV; HEIM UNIVERSAL CORP INCOM; FORMERLY HEIM DIV INCOM INTL; IMO IND HEIM BEARINGS DIV
73197	HI-SHEAR TECHNOLOGY CORP 2600 SKYPARK DRIVE TORRANCE, CALIFORNIA 90509
77896	REXNORD INC BEARING OPERATION 2400 CURTIS STREET DOWNERS GROVE, ILLINOIS 60515-4005 FORMERLY SHAEFER BEARING DIV REX CHAINBELT FORMERLY REX CHAINBELT INC BEARING DIV.

Code	Name
81376	SMITH ACQUISITION COMPANY 2240 BUENA VISTA BALDWIN PARK, CALIFORNIA 91706
90005	PUROLATOR-FACET FILTER 8439 TRIAD DR GREENSBORO, NORTH CAROLINA 27409-9621 FORMERLY BENDIX CORP FILTER DIV; FORMERLY FACET ENTERPRISES FILTER PRODUCTS DIV
92215	FAIRCHILD IND INC FAIRCHILD AEROSPACE FASTENER DIV 3010 W LOMITA BLVD TORRANCE, CALIFORNIA 90505-5102 FORMERLY VOI-SHAN IN CULVER CITY, CALIF
92555	LEE COMPANY 2 PETTIPAUG ROAD PO BOX 424 WESTBROOK, CONNECTICUT 06498-1543
94878	RAYBESTOS-MANHATTAN INC PACIFIC COAST DIV FULLERTON, CALIFORNIA 92631 BUSINESS DISCONTINUED
97613	SARGENT CONTROLS & AEROSPACE/KAHR BEARING DIV 5675 W BURLINGAME RD TUCSON, ARIZONA 85743 FORMERLY AETNA STEEL PROD KAHR BEARING DIV V96579 FORMERLY SARGENT IND KAHR BEARING DIV, BURBANK, CALIFORNIA
97820	BUSAK AND SHAMBAN INC BEARING DIV 711 MITCHELL ROAD PO BOX 665 NEWBURY PARK, CALIFORNIA 91320-2214 FORMERLY IN CULVER CITY, CALIF; FORMERLY SHAMBAN W S & CO
S0352	NIPPON MINIATURE BEARING CO LTD TOKYO, JAPAN

NUMERICAL INDEX

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
10-60516-244		2	505	2
10-60779-182		2	380	1
1151-103		2	205	1
1745030-03		2	155A	1
		2	155B	1
177275		2	380	1
2066-112NA		2	75	1
		3	60	1
2100-009		2	315	2
2100-011		2	295A	14
2100-012		2	270	2
2100-015		2	215	4
2100-110		2	165	2
2100-116		2	260A	8
2100-220		2	135	2
2100-223		2	420	2
2140-10A		2	395	1
251A1240-3		1	25A	1
		2	1B	RF
251A1240-4		1	25B	1
		2	1C	RF
251A1240-5		1	55C	1
		2	1D	RF
251A1241-1		2	325	1
251A1241-2		2	365	1
251A1242-2		2	145	1
251A1243-1		2	185	1
251A1244-1		2	160	1
251A1246-1		2	15	1
251A1247-1		2	35	1
251A1248-1		2	25	1
251A1248-2		2	25A	1
251A1249-1		2	55	1
251A1250-1		2	255	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
251A1251-2		2	60	1
251A1251-3		2	60A	1
251A1252-1		2	30	2
251A1252-2		2	30A	2
251A1264-1		2	430	1
251A1265-1		2	475	1
251A1265-2		2	515	1
251A1265-3		2	500	1
251A1270-2		1	1D	RF
251A1270-4		1	1C	RF
251A1270-5		1	1E	RF
25786		2	155A	1
		2	155B	1
3121-516		2	155A	1
		2	155B	1
65-44562-1		2	440	1
65-44562-2		2	465	1
65-44562-4		2	465A	1
65-44573-2		3	50A	1
65-44574-3		3	50	1
66-22710-1		2	510	1
66-22740-1		3	30	1
66-22741-1		2	65	1
		3	55	1
66-22742-3		2	110	1
		3	100	1
66-22743-4		2	230	1
66-22744-2		2	95	1
		3	85	1
66-22745-1		2	115	1
		3	110	1
66-22746-1		2	225	1
66-22748-1		3	25	2
66-22772-1		2	305	3
66-22775-4		2	100	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
		3	90	1
66-22781-1		2	290	4
66-22782-1		2	375	1
66-22783-1		2	105	1
		3	95	1
66014-6		2	40	1
66014-8		3	20	1
69-35526-1		3	45	1
69-35546-2		2	250	1
69-35547-2		2	245	1
69-35549-2		2	415	1
69-35558-1		2	400	1
69-35558-2		2	400A	1
69-35589-2		2	90	1
		3	80	1
69-35590-3		2	125	1
		3	115	1
69-35592-2		2	175	1
69-35593-1		2	130	1
		3	120	1
69-35595-1		2	70	1
		3	70	1
69-35595-2		2	70A	1
69-35595-3		3	70A	1
69-35638-3		2	85	2
		3	75	2
69-35638-7		2	17	1
		3	1A	RF
69-35696-1		2	485	2
69-35888-1		2	310	1
69-35904-1		3	15A	1
69-35904-3		3	20A	1
69-35939-1		2	195	1
69-35973-1		3	15	1
69-54659-1		2	240	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
69-54659-2		2	210	1
69-54660-2		2	235	1
90560		2	505	2
AJF20A109		2	505	2
ART12E104		2	380	1
BAC27DHY369		2	520	1
BACB30GW8-16		2	45	1
		3	35	1
BACB30US5K6H		2	385	4
BACC30M6		2	40	1
BACC30M8		3	20	1
BACN10JD4CD		2	495	2
BACN11U12CD2		2	370A	1
BACP18BC02A06P		2	480	2
BACP20AX06DA		2	330	1
BACP20AX06DAP		2	335	1
BACP20AX12D		2	340	4
BACP20AX12DP		2	345	4
BACP20AX18		2	445	2
		2	455	2
BACP20AX18A		2	455A	2
BACP20AX18AP		2	460A	2
BACP20AX18D		2	350	6
BACP20AX18DP		2	355	6
BACP20AX18P		2	450	2
		2	460	2
BACR12BD112NA		2	75	1
		3	60	1
BACR12BM009		2	315	2
BACR12BM011		2	295A	14
BACR12BM012		2	270	2
BACR12BM015		2	215	4
BACR12BM110		2	165	2
BACR12BM116		2	260A	8
BACR12BM220		2	135	2

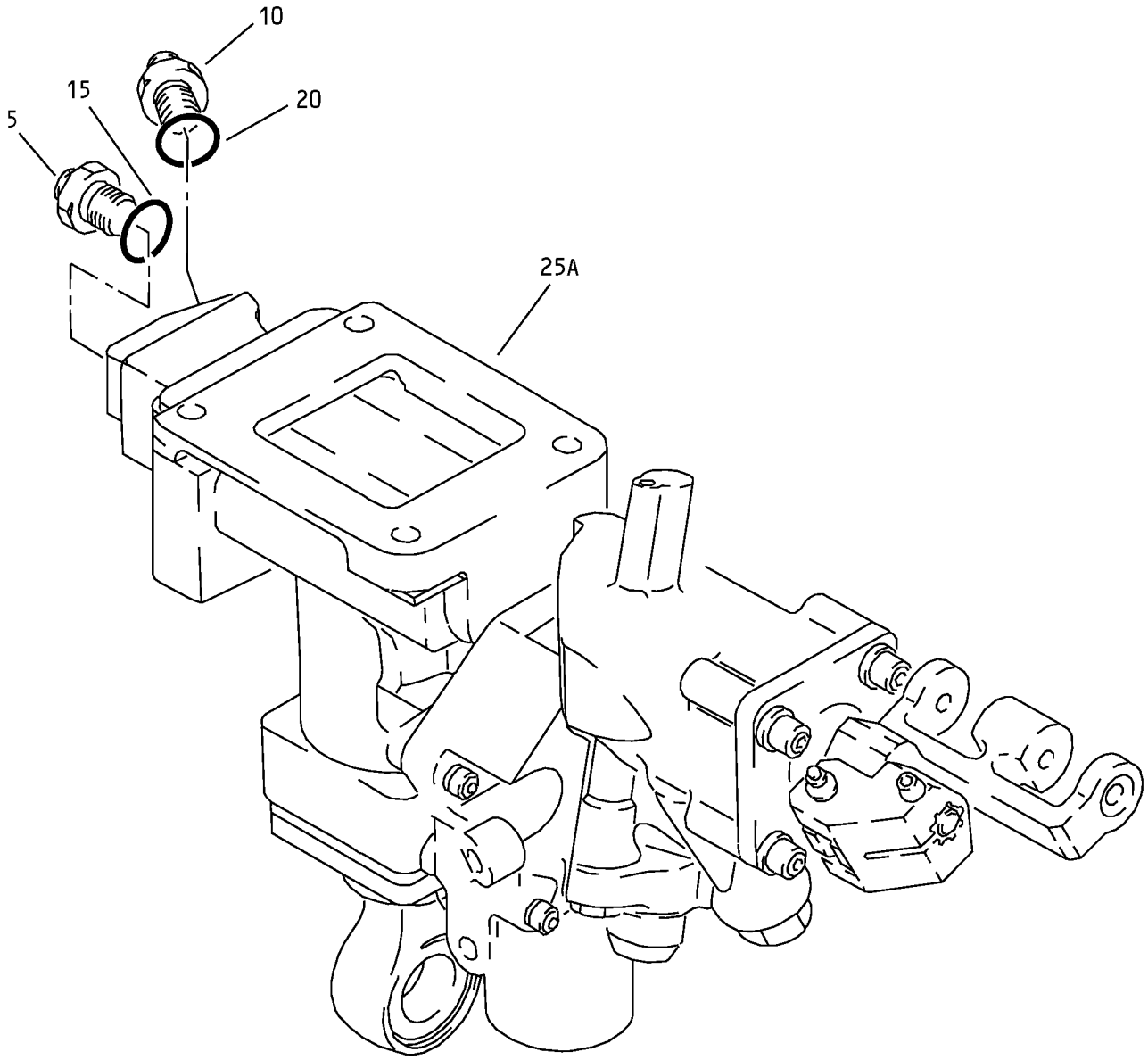
PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
BACR12BM223		2	420	2
BACS12HL4AH10		2	5A	4
BACS12HL4AH14		2	280A	3
BACS12HL4AH28		2	285A	1
BACS34A10A		2	395	1
BACW10BP5CD		2	390	4
C11236-009B		2	315	2
C11236-011B		2	295A	14
C11236-012B		2	270	2
C11236-015B		2	215	4
C11236-110B		2	165	2
C11236-116B		2	260A	8
C11236-220B		2	135	2
C11236-223B		2	420	2
C2120411-112NB		2	75	1
		3	60	1
CSI200-112NA		2	75	1
		3	60	1
CWR76-10B		2	395	1
DBAF20-077		2	505	2
DREM12-131		2	380	1
DW9680-10A		2	395	1
DW969517-112NA		2	75	1
		3	60	1
FBJW40TF46-17		2	505	2
FBR20A17BAC		2	505	2
FSHX0507600B		2	155A	1
		2	155B	1
HL79-6		2	40	1
		2	40	1
		2	40	1
		2	40	1
HL79-8		3	20	1
		3	20	1
		3	20	1

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
		3	20	1
KBDE12-16		2	380	1
KJN20-12		2	505	2
MS20613-2C8		2	120	1
		3	105	1
MS21209F4-15P		2	360	4
MS21902-4T		1	10	1
MS21916-6-4T		1	5	1
MS28774-015		2	215A	4
MS28782-14		2	260	8
MS28782-25		2	135A	2
MS28782-4		2	315A	2
MS28782-6		2	295	14
MS28782-7		2	270A	2
MS28782-8		2	165A	2
MS28783-1		2	420A	2
MS51923-177		2	37	1
MS51923-197		3	10	1
MSSKR1212-28BAD		2	380	1
NAS1080E8		2	50	1
		3	40	1
NAS1149D0463J		2	10	4
NAS1149E0463P		2	490	2
NAS1193K12C		2	375A	1
NAS1351N4H10P		2	5	4
NAS1351N4H14P		2	280	3
NAS1351N4H28P		2	285	1
NAS1423-12		2	370	1
		2	370B	1
NAS1423-7		2	20	1
NAS1423-8		3	5	1
NAS1611-009		2	320	1
NAS1611-009A		2	320A	1
NAS1611-011		2	300	7
NAS1611-011A		2	300A	7

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
NAS1611-012		2	275	1
NAS1611-012A		2	275A	1
NAS1611-015		2	220	4
NAS1611-015A		2	220A	4
NAS1611-110		2	170	1
NAS1611-110A		2	170A	1
NAS1611-112		2	80	1
		3	65	1
NAS1611-116		2	265	4
NAS1611-116A		2	265A	4
NAS1611-215		2	405	1
NAS1611-215A		2	405A	1
NAS1611-220		2	140	1
NAS1611-220A		2	140A	1
NAS1611-223		2	425	1
NAS1611-223A		2	425A	1
NAS1612-10		2	200	1
NAS1612-10A		2	200A	1
NAS1612-4		1	20	1
		1	20B	1
NAS1612-4A		1	20A	1
NAS1612-6		1	15	1
		1	15B	1
NAS1612-6A		1	15A	1
NAS1612-8		2	150	1
NAS1612-8A		2	150A	1
NHLF20-207A		2	505	2
NHNE12-205		2	380	1
P3A3050		2	380B	1
RMR12BD112NA		2	75	1
		3	60	1
RMR12BM009		2	315	2
RMR12BM011		2	295A	14
RMR12BM012		2	270	2
RMR12BM015		2	215	4

PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
RMR12BM110		2	165	2
RMR12BM116		2	260A	8
RMR12BM220		2	135	2
RMR12BM223		2	420	2
RMS34A10A		2	395	1
S12003-10-6		2	190	1
S12003-12-6		2	180	1
S12956-112N1		2	75	1
		3	60	1
S250N211-1		2	155A	1
		2	155B	1
S251A124-1		2	380B	1
S30294-009-1		2	315	2
S30294-011-1		2	295A	14
S30294-012-1		2	270	2
S30294-015-1		2	215	4
S30294-110-1		2	165	2
S30294-116-1		2	260A	8
S30294-220-1		2	135	2
S30294-223-1		2	420	2
S30775-213H5		2	470	3
S30855-213H5N		2	470A	3
		2	470B	3
S33121-215-99		2	410	1
S33865-510H99N		2	395B	1
		2	395C	1
S34722-222H5		2	435	1
S34722-222H5N		2	435A	1
SALPYT8-16		2	45	1
		2	45	1
		3	35	1
		3	35	1
STF800-009		2	315	2
STF800-011		2	295A	14
STF800-012		2	270	2

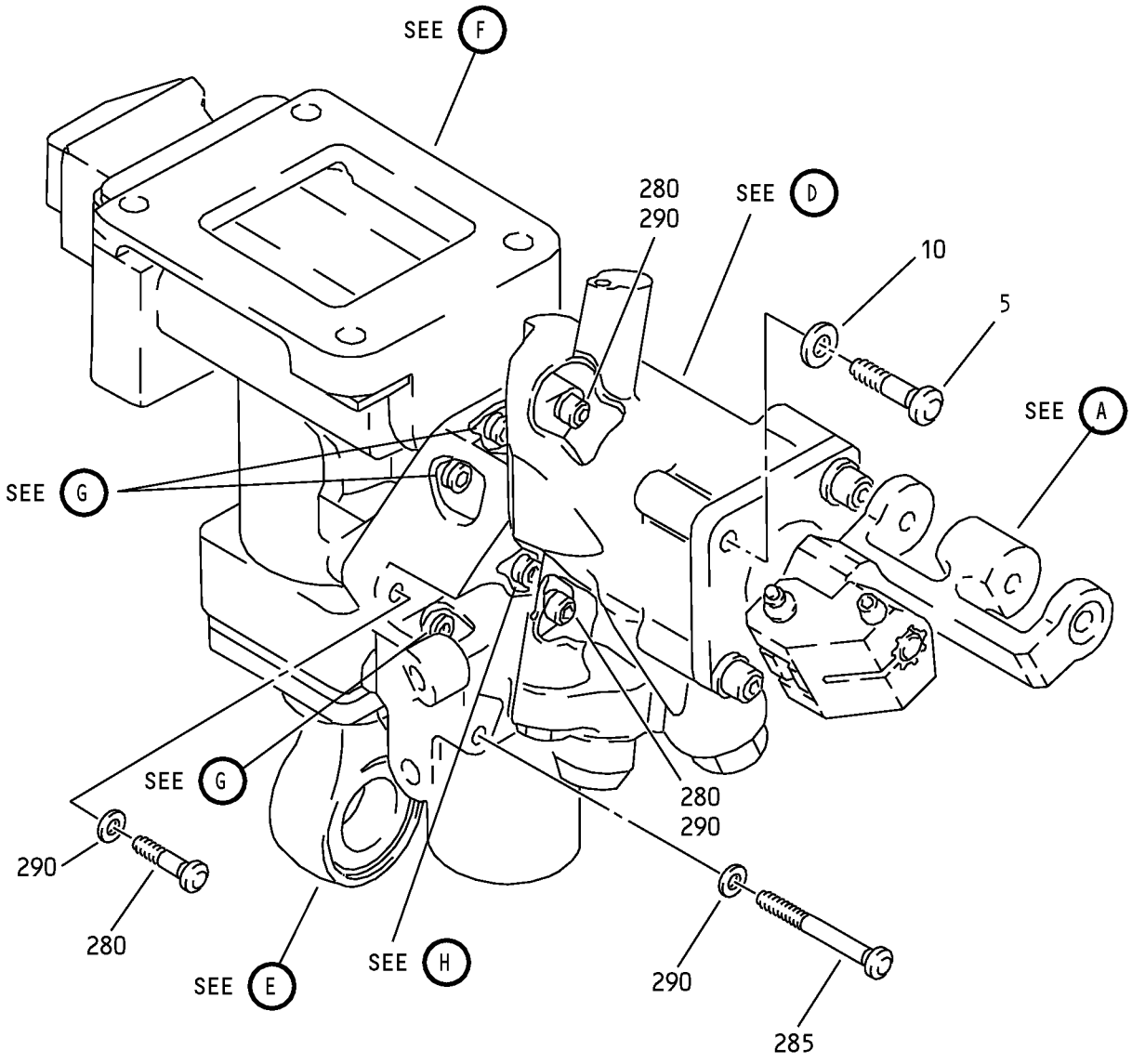
PART NUMBER	AIRLINE PART NUMBER	FIGURE	ITEM	UNITS PER ASSEMBLY
STF800-015		2	215	4
STF800-110		2	165	2
STF800-116		2	260A	8
STF800-220		2	135	2
STF800-223		2	420	2
TF005-10A		2	395	1
TF450-009A		2	315	2
TF450-011A		2	295A	14
TF450-012A		2	270	2
TF450-015A		2	215	4
TF450-110A		2	165	2
TF450-116A		2	260A	8
TF450-220A		2	135	2
TF450-223A		2	420	2
TF452-112NA		2	75	1
		3	60	1
YTM212		2	380	1
YTS570		2	505	2



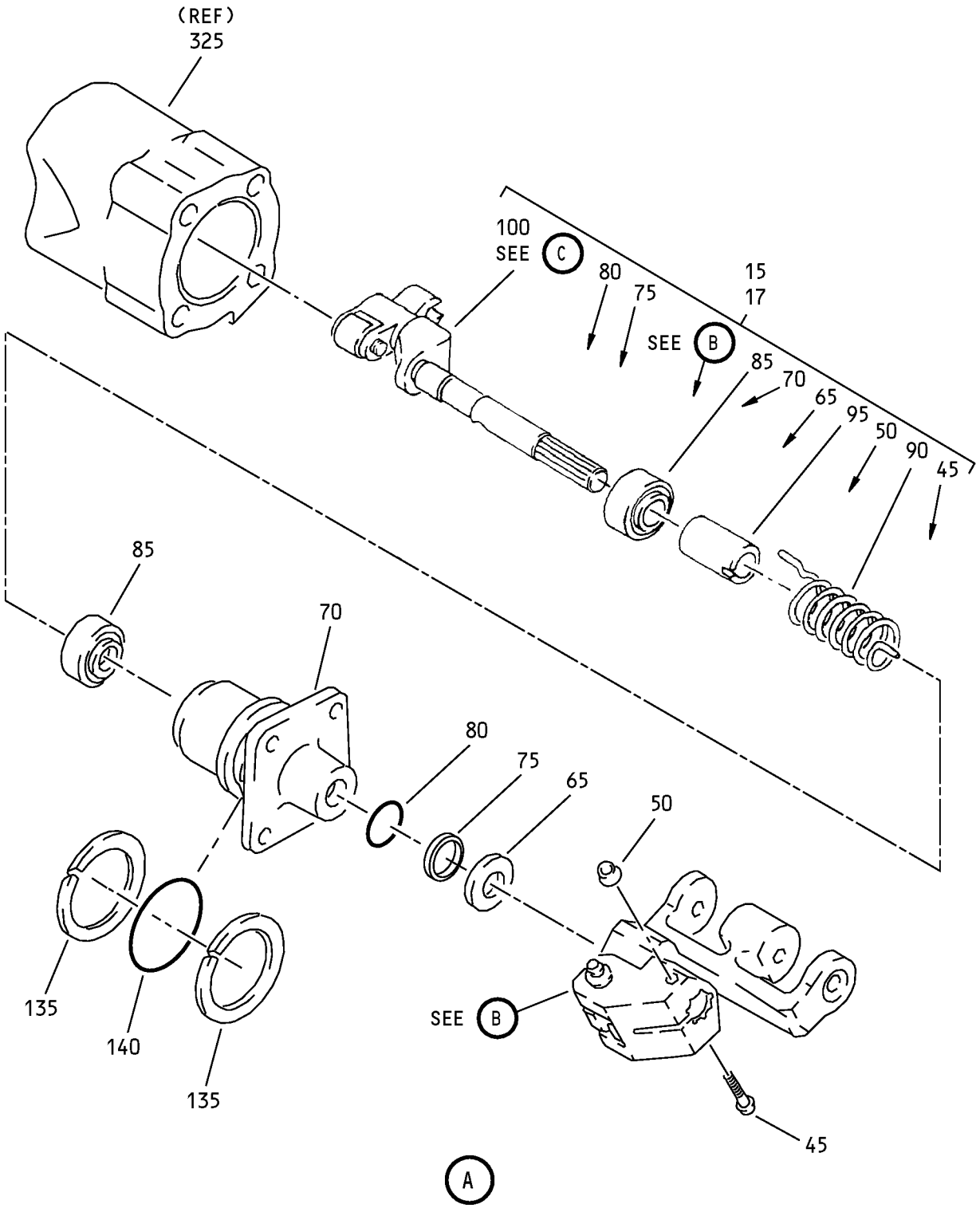
Spoiler Actuator Power Control Unit Assembly
IPL Figure 1

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
1–					
–1A	251A1270-3		DELETED		
–1C	251A1270-4		UNIT ASSY-PWR CONT SPOILER ACTR	B	RF
–1D	251A1270-2		UNIT ASSY-PWR CONT SPOILER ACTR	C	RF
–1E	251A1270-5		UNIT ASSY-PWR CONT SPOILER ACTR	D	RF
5	MS21916-6-4T		. REDUCER		1
10	MS21902-4T		. UNION		1
15	NAS1612-6		. PACKING	B, C	1
–15A	NAS1612-6A		. PACKING (OPT ITEM 15B)	D	1
–15B	NAS1612-6		. PACKING (OPT ITEM 15A)	D	1
20	NAS1612-4		. PACKING	B, C	1
–20A	NAS1612-4A		. PACKING (OPT ITEM 20B)	D	1
–20B	NAS1612-4		. PACKING (OPT ITEM 20A)	D	1
–25	251A1240-2		DELETED		
25A	251A1240-3		. UNIT ASSY (FOR DETAILS SEE FIG. 2)	B	1
–25B	251A1240-4		. UNIT ASSY (FOR DETAILS SEE FIG. 2)	C	1
–55C	251A1240-5		. UNIT ASSY (FOR DETAILS SEE FIG. 2)	D	1

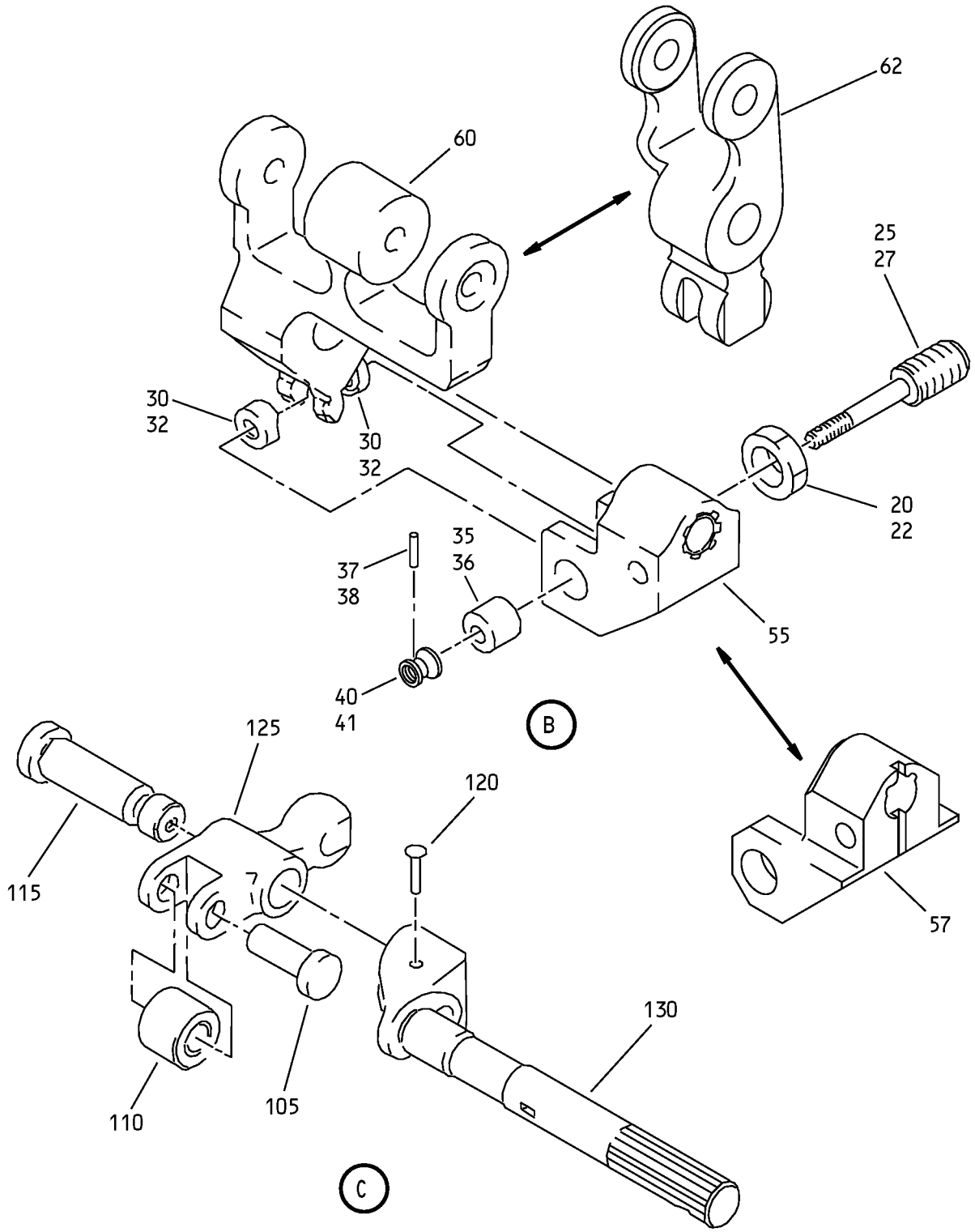
–Item not Illustrated



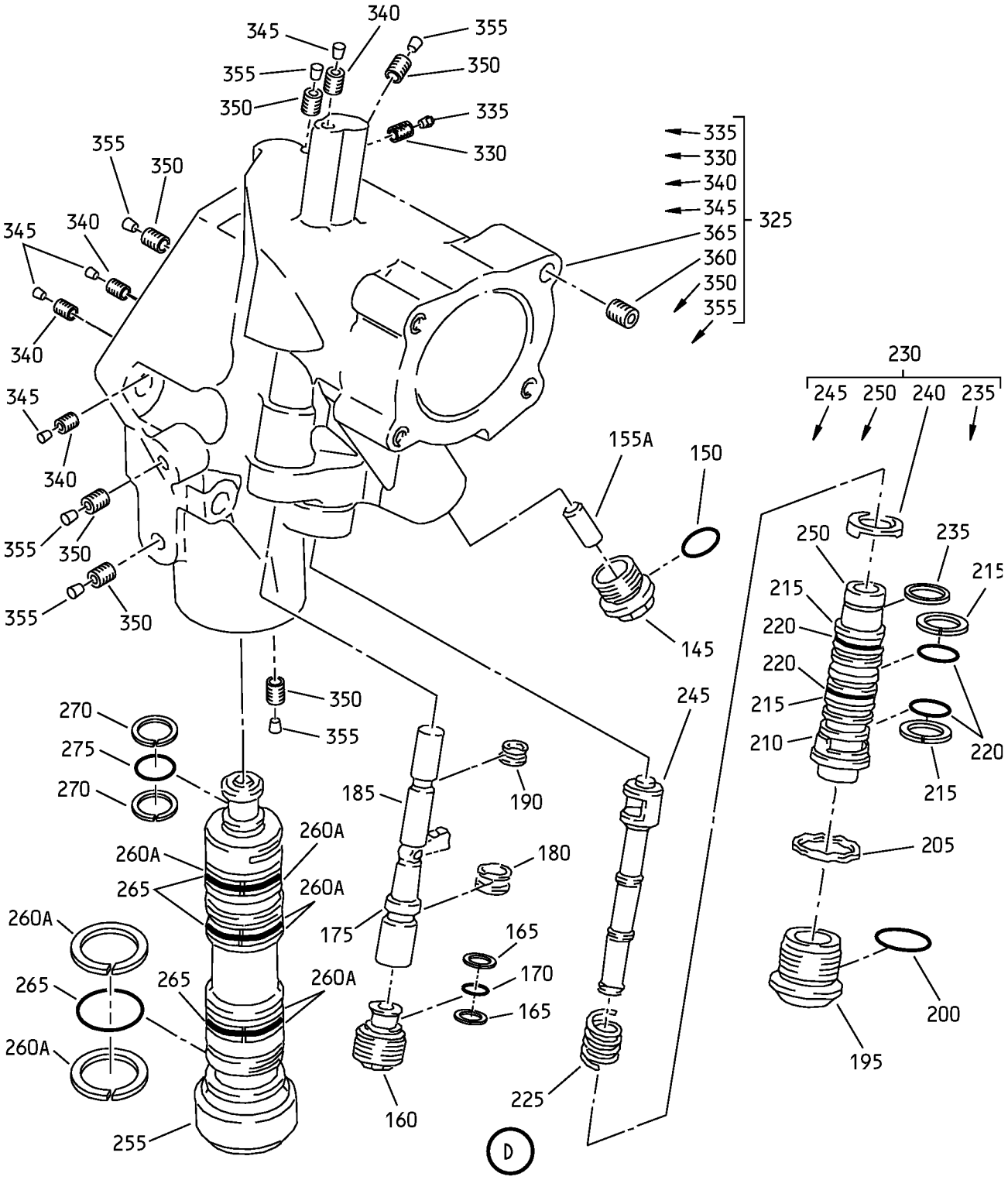
Spoiler Actuator Power Control Unit Assembly
IPL Figure 2 (Sheet 1 of 7)



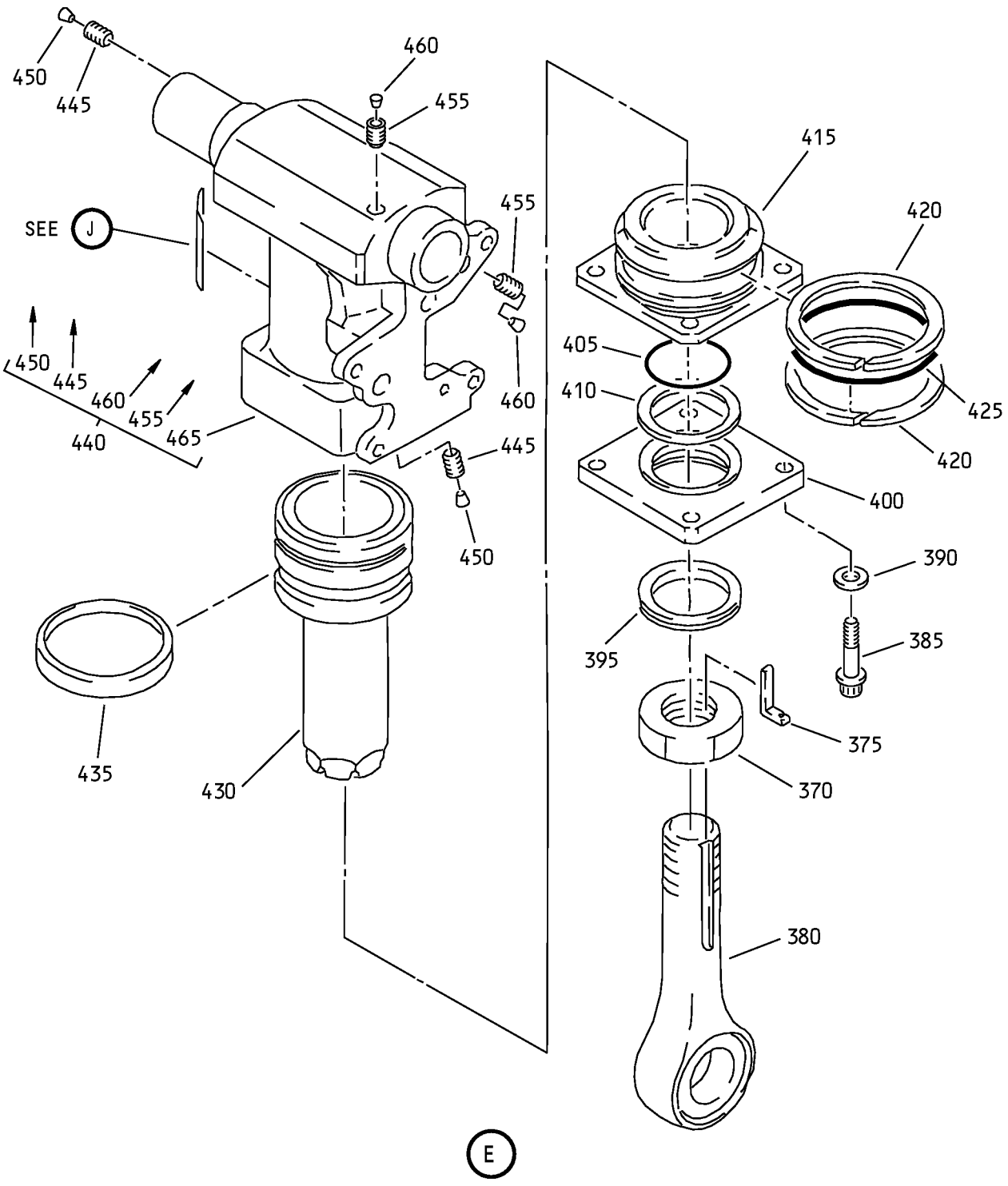
Spoiler Actuator Power Control Unit Assembly
IPL Figure 2 (Sheet 2 of 7)



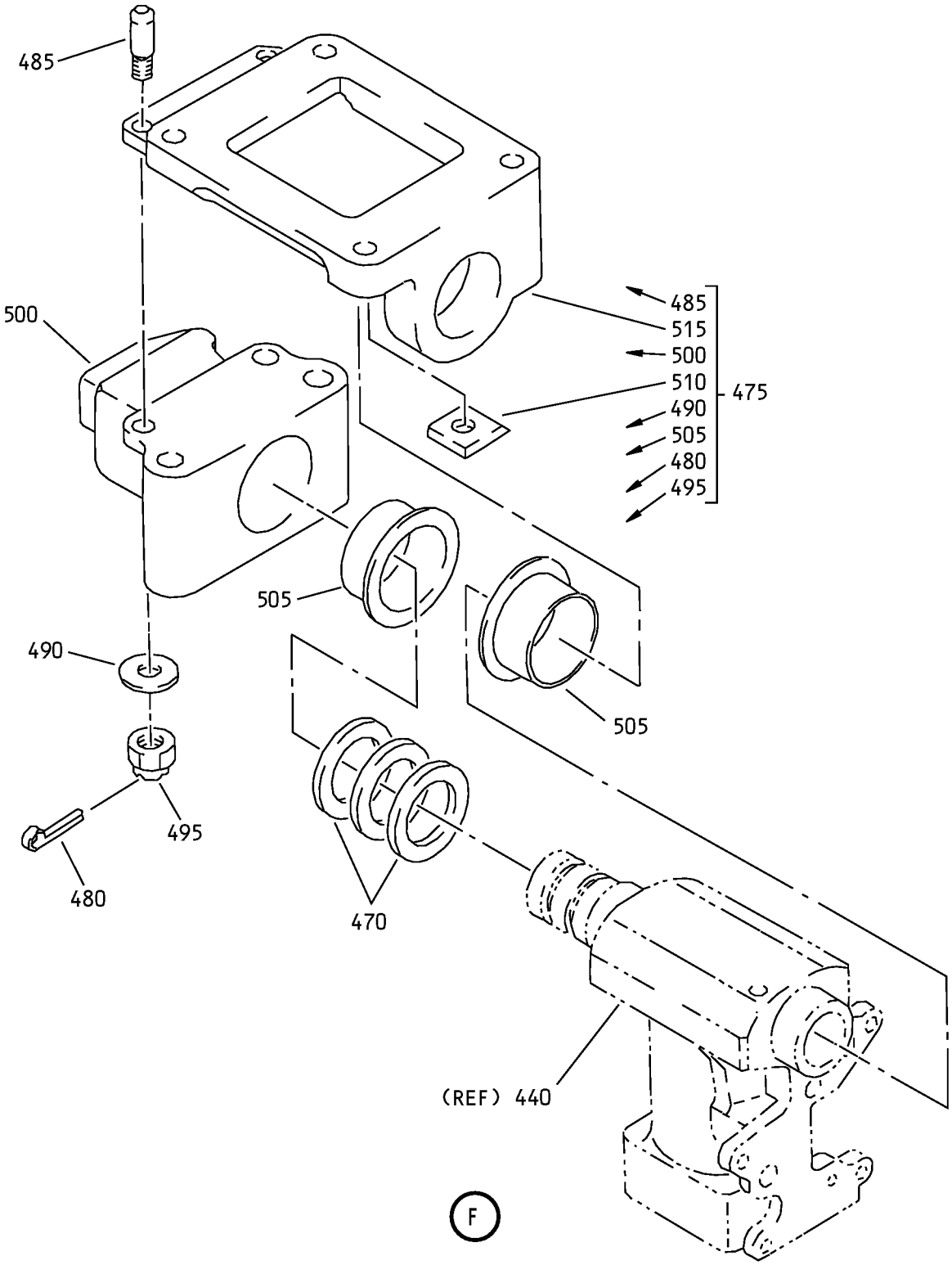
Spoiler Actuator Power Control Unit Assembly
IPL Figure 2 (Sheet 3 of 7)



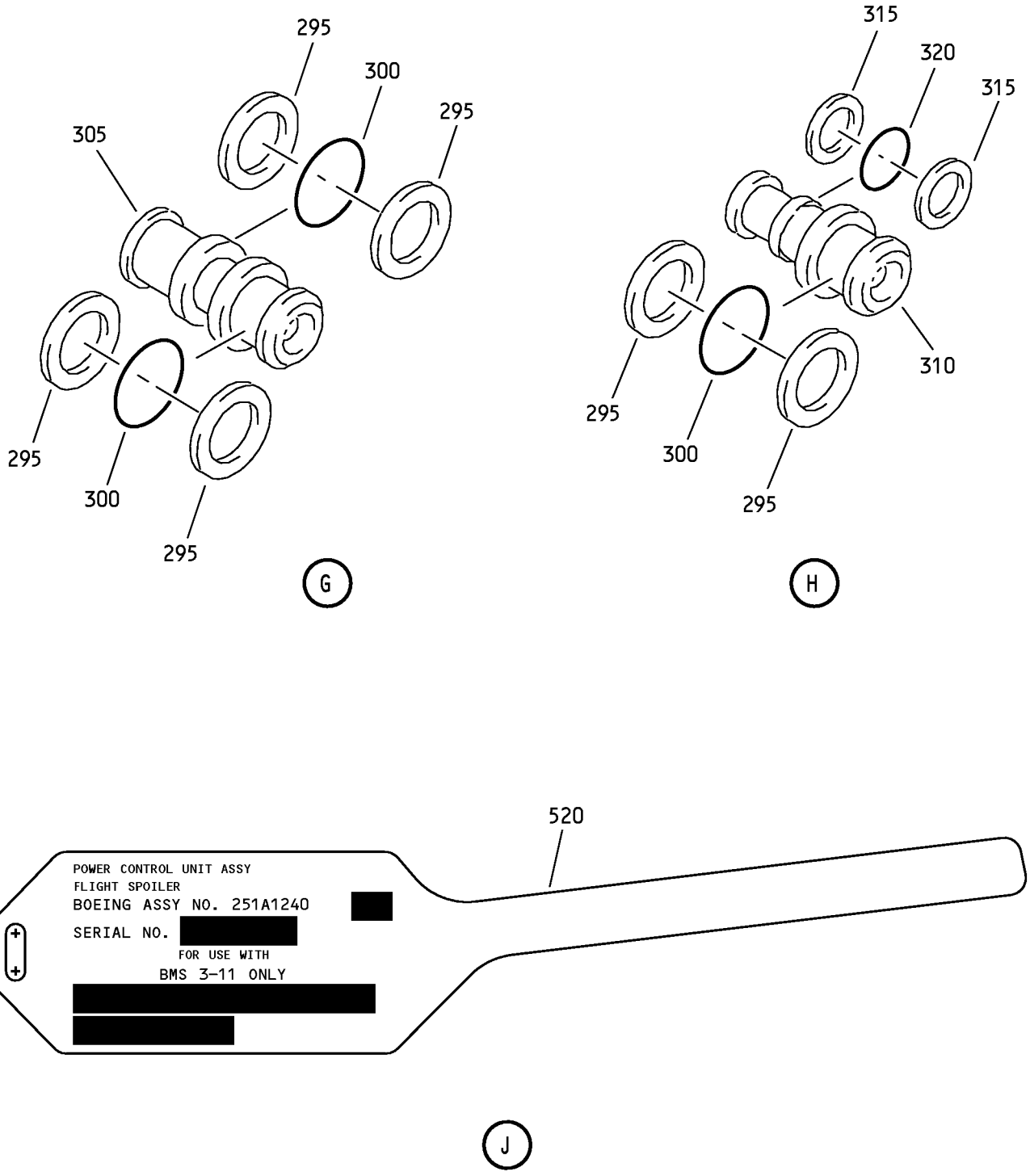
Spoiler Actuator Power Control Unit Assembly
IPL Figure 2 (Sheet 4 of 7)



Spoiler Actuator Power Control Unit Assembly
IPL Figure 2 (Sheet 5 of 7)



Spoiler Actuator Power Control Unit Assembly
IPL Figure 2 (Sheet 6 of 7)



G54165 S0004995060_V2

Spoiler Actuator Power Control Unit Assembly
IPL Figure 2 (Sheet 7 of 7)

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–1A	251A1240-2		DELETED		
–1B	251A1240-3		UNIT ASSY-PWR CONT SPOILER ACTR	B	RF
–1C	251A1240-4		UNIT ASSY-PWR CONT SPOILER ACTR	C	RF
–1D	251A1240-5		UNIT ASSY-PWR CONT SPOILER ACTR	D	RF
5	NAS1351N4H10P		. SCREW	B, C	4
–5A	BACS12HL4AH10		. SCREW	D	4
10	NAS1149D0463J		. WASHER		4
15	251A1246-1		. INPUT ASSY	B, D	1
17	69-35638-7		. INPUT ASSY (FOR DETAILS SEE FIG. 3)	C	1
20	NAS1423-7		. . NUT	B, D	1
–22	NAS1423-8		DELETED		
25	251A1248-1		. . SCREW-ADJUSTING (OPT ITEM 25A)	B, D	1
–25A	251A1248-2		. . SCREW-ADJUSTING (OPT ITEM 25)	B, D	1
–27	69-35973-1		DELETED		
–27A	69-35904-1		DELETED		
–28	69-35904-3		DELETED		
30	251A1252-1		. . BUSHING (OPT ITEM 30A)	B, D	2
–30A	251A1252-2		. . BUSHING (OPT ITEM 30)	B, D	2
–32	66-22748-1		DELETED		
35	251A1247-1		. . SPACER	B, D	1
–36	66-22740-1		DELETED		
37	MS51923-177		. . PIN	B, D	1
–38	MS51923-197		DELETED		

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
40	HL79-6		. . COLLAR (V5M902) (SPEC BACC30M6) (OPT HL79-6 (V73197)) (OPT HL79-6 (V92215)) (OPT 66014-6 (V56878)) (OPT HL79-6 (V56878))	B, D	1
45	SALPYT8-16		. . BOLT (V11815) (SPEC BACB30GW8-16) (OPT SALPYT8-16 (V29666))	B, D	1
50	NAS1080E8		. . COLLAR	B, D	1
55	251A1249-1		. . FORK	B, D	1
–57	69-35526-1		DELETED		
60	251A1251-2		. . LEVER-INPUT (OPT ITEM 60A)	B, D	1
–60A	251A1251-3		. . LEVER-INPUT (OPT ITEM 60)	B, D	1
–62	65-44574-3		DELETED		
–62A	65-44573-1		DELETED		
–62B	65-44573-3		DELETED		
65	66-22741-1		. . WASHER	B, D	1
70	69-35595-1		. . COVER (OPT ITEM 70A)	B, D	1
–70A	69-35595-2		. . COVER (OPT ITEM 70)	B, D	1
75	2066-112NA		. . RING (V26303) (SPEC BACR12BD112NA) (OPT TF452-112NA (V07128)) (OPT RMR12BD112NA (V94878)) (OPT DW969517-112NA (V02886)) (OPT C2120411-112NB (V26879)) (OPT CSI200-112NA (V02107)) (OPT S12956-112N1 (V09257))	B, D	1
80	NAS1611-112		. . PACKING	B, D	1
85	69-35638-3		. . BEARING	B, D	2
90	69-35589-2		. . SPRING	B, D	1
95	66-22744-2		. . SPACER-BRG	B, D	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
100	66-22775-4		. . SHAFT ASSY	B, D	1
105	66-22783-1		. . . PIN-ROLLER	B, D	1
110	66-22742-3		. . . ROLLER	B, D	1
115	66-22745-1		. . . PIN	B, D	1
120	MS20613-2C8		. . . RIVET	B, D	1
125	69-35590-3		. . . LEVER	B, D	1
130	69-35593-1		. . . SHAFT	B, D	1
135	C11236-220B		. RING (V26879) (SPEC BACR12BM220) (OPT RMR12BM220 (V94878)) (OPT STF800-220 (V02107)) (OPT S30294-220-1 (V97820)) (OPT TF450-220A (V07128)) (OPT 2100-220 (V26303)) (OPT ITEM 135A)		2
–135A	MS28782-25		. RING (OPT ITEM 135)		2
140	NAS1611-220		. PACKING	B, C	1
–140A	NAS1611-220A		. PACKING	D	1
145	251A1242-2		. CAP		1
150	NAS1612-8		. PACKING	B, C	1
–150A	NAS1612-8A		. PACKING	D	1
–155	25786		DELETED		
155A	FSHX0507600B		. FILTER (V92555) (SPEC S250N211-1) (OPT 3121-516 (V05CK7)) (OPT 1745030-03 (V90005)) (OPT 25786 (V18350))		1
–155B	1745030-03		. FILTER (V90005) (SPEC S250N211-1) (OPT 3121-516 (V05CK7)) (OPT FSHX0507600B (V90005)) (OPT 25786 (V18350))		1
160	251A1244-1		. CAP		1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
165	C11236-110B		. RING (V26879) (SPEC BACR12BM110) (OPT RMR12BM110 (V94878)) (OPT STF800-110 (V02107)) (OPT S30294-110-1 (V97820)) (OPT TF450-110A (V07128)) (OPT 2100-110 (V26303)) (OPT ITEM 165A)		2
–165A	MS28782-8		. RETAINER (OPT ITEM 165)		2
170	NAS1611-110		. PACKING	B, C	1
–170A	NAS1611-110A		. PACKING	D	1
175	69-35592-2		. PISTON-STEP		1
180	S12003-12-6		. RING-PISTON (V97820)		1
185	251A1243-1		. PISTON		1
190	S12003-10-6		. RING-PISTON (V97820)		1
195	69-35939-1		. CAP		1
200	NAS1612-10		. PACKING	B, C	1
–200A	NAS1612-10A		. PACKING	D	1
205	1151-103		. WASHER-SPR (V60029)		1
210	69-54659-2		. COLLAR		1
215	C11236-015B		. RING (V26879) (SPEC BACR12BM015) (OPT RMR12BM015 (V94878)) (OPT STF800-015 (V02107)) (OPT S30294-015-1 (V97820)) (OPT TF450-015A (V07128)) (OPT 2100-015 (V26303)) (OPT ITEM 215A)		4
–215A	MS28774-015		. RETAINER (OPT ITEM 215)		4
220	NAS1611-015		. PACKING	B, C	4
–220A	NAS1611-015A		. PACKING	D	4
225	66-22746-1		. SPRING		1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
230	66-22743-4		. SLIDE AND SLEEVE ASSY		1
235	69-54660-2		. . RING-LOCKING		1
240	69-54659-1		. . COLLAR		1
245	69-35547-2		. . SLIDE		1
250	69-35546-2		. . SLEEVE		1
255	251A1250-1		. HOLD DOWN CHECK-AND RELIEF VALVE		1
–260	MS28782-14		. RING (OPT ITEM 260A)		8
260A	C11236-116B		. RING (V26879) (SPEC BACR12BM116) (OPT RMR12BM116 (V94878)) (OPT STF800-116 (V02107)) (OPT S30294-116-1 (V97820)) (OPT TF450-116A (V07128)) (OPT 2100-116 (V26303)) (OPT ITEM 260)		8
265	NAS1611-116		. PACKING	B, C	4
–265A	NAS1611-116A		. PACKING	D	4
270	C11236-012B		. RING (V26879) (SPEC BACR12BM012) (OPT RMR12BM012 (V94878)) (OPT STF800-012 (V02107)) (OPT S30294-012-1 (V97820)) (OPT TF450-012A (V07128)) (OPT 2100-012 (V26303)) (OPT ITEM 270A)		2
–270A	MS28782-7		. RING (OPT ITEM 270)		2
275	NAS1611-012		. PACKING	B, C	1
–275A	NAS1611-012A		. PACKING	D	1
280	NAS1351N4H14P		. SCREW	B, C	3
–280A	BACS12HL4AH14		. SCREW	D	3
285	NAS1351N4H28P		. SCREW	B, C	1
–285A	BACS12HL4AH28		. SCREW	D	1
290	66-22781-1		. WASHER		4

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–295	MS28782-6		. RING (OPT ITEM 295A)		14
295A	C11236-011B		. RING (V26879) (SPEC BACR12BM011) (OPT RMR12BM011 (V94878)) (OPT STF800-011 (V02107)) (OPT S30294-011-1 (V97820)) (OPT TF450-011A (V07128)) (OPT 2100-011 (V26303)) (OPT ITEM 295)		14
300	NAS1611-011		. PACKING	B, C	7
–300A	NAS1611-011A		. PACKING	D	7
305	66-22772-1		. TUBE-TRANSFER		3
310	69-35888-1		. TUBE-TRANSFER		1
315	C11236-009B		. RING (V26879) (SPEC BACR12BM009) (OPT RMR12BM009 (V94878)) (OPT STF800-009 (V02107)) (OPT S30294-009-1 (V97820)) (OPT TF450-009A (V07128)) (OPT 2100-009 (V26303)) (OPT ITEM 315A)		2
–315A	MS28782-4		. RING (OPT ITEM 315)		2
320	NAS1611-009		. PACKING	B, C	1
–320A	NAS1611-009A		. PACKING	D	1
325	251A1241-1		. MANIFOLD ASSY		1
330	BACP20AX06DA		. . PLUG		1
335	BACP20AX06DAP		. . PIN		1
340	BACP20AX12D		. . PLUG		4
345	BACP20AX12DP		. . PIN		4
350	BACP20AX18D		. . PLUG		6
355	BACP20AX18DP		. . PIN		6
360	MS21209F4-15P		. . INSERT		4
365	251A1241-2		. . MANIFOLD		1
370	NAS1423-12		. NUT	B, C	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–370A	BACN11U12CD2		. NUT (OPT ITEM 370B)	D	1
–370B	NAS1423-12		. NUT (OPT ITEM 370A)	D	1
375	66-22782-1		. KEY-LOCKING	B, C	1
–375A	NAS1193K12C		. LOCKING DEVICE	D	1
–375B	66-22782-1		DELETED		
380	KBDE12-16		. ROD ASSY-END (V97613) (SPEC 10-60779-182) (OPT 177275 (V09455)) (OPT ART12E104 (VS0352)) (OPT DREM12-131 (V81376)) (OPT MSSKR1212-28BAD (V73134)) (OPT NHNE12-205 (V15860)) (OPT YTM212 (V77896))	C	1
–380A	S251A124-1		DELETED		
–380B	P3A3050		. ROD ASSY-END (V57606) (SPEC S251A124-1)	B, D	1
385	BACB30US5K6H		. BOLT		4
390	BACW10BP5CD		. WASHER		4
395	CWR76-10B		. SCRAPER (V26879) (SPEC BACS34A10A) (OPT TF005-10A (V07128)) (OPT 2140-10A (V26303)) (OPT RMS34A10A (V94878)) (OPT DW9680-10A (V02886)) (OPT ITEM 395B)	B, D	1
–395A	S33865-10H99N		DELETED		
–395B	S33865-510H99N		. SCRAPER (V97820) (OPT ITEM 395)	B, D	1
–395C	S33865-510H99N		. SCRAPER (V97820)	C	1
400	69-35558-1		. RETAINER-SEAL (OPT ITEM 400A)		1
–400A	69-35558-2		. RETAINER-SEAL (OPT ITEM 400)		1

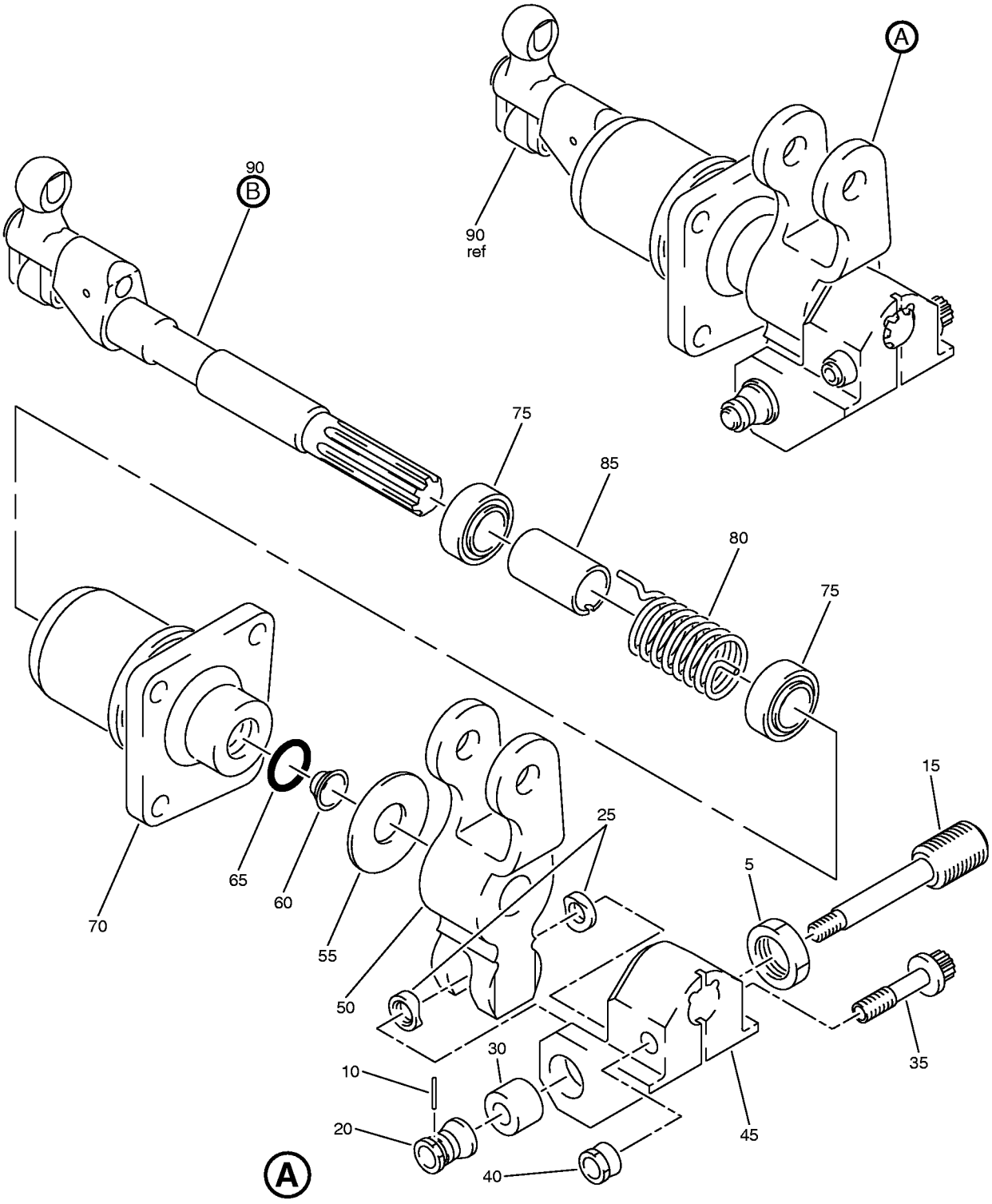
–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
405	NAS1611-215		. PACKING	B, C	1
–405A	NAS1611-215A		. PACKING	D	1
410	S33121-215-99		. SEAL-FOOT (V97820)		1
415	69-35549-2		. BEARING-END		1
420	C11236-223B		. RING-BACKUP (V26879) (SPEC BACR12BM223) (OPT RMR12BM223 (V94878)) (OPT STF800-223 (V02107)) (OPT S30294-223-1 (V97820)) (OPT TF450-223A (V07128)) (OPT 2100-223 (V26303)) (OPT ITEM 420A)		2
–420A	MS28783-1		. RING (OPT ITEM 420)		2
425	NAS1611-223		. PACKING	B, C	1
–425A	NAS1611-223A		. PACKING	D	1
430	251A1264-1		. PISTON		1
435	S34722-222H5		. SEAL-PLUS (V97820) (OPT ITEM 435A)		1
–435A	S34722-222H5N		. SEAL-PLUS (V97820) (OPT ITEM 435)		1
440	65-44562-1		. BARREL ASSY		1
445	BACP20AX18		. . PLUG		2
450	BACP20AX18P		. . PIN		2
455	BACP20AX18		. . PLUG (OPT ITEM 455A)		2
–455A	BACP20AX18A		. . PLUG (OPT ITEM 455)		2
460	BACP20AX18P		. . PIN (OPT ITEM 460A)		2
–460A	BACP20AX18AP		. . PLUG (OPT ITEM 460)		2
465	65-44562-2		. . BARREL (OPT ITEM 465A)		1

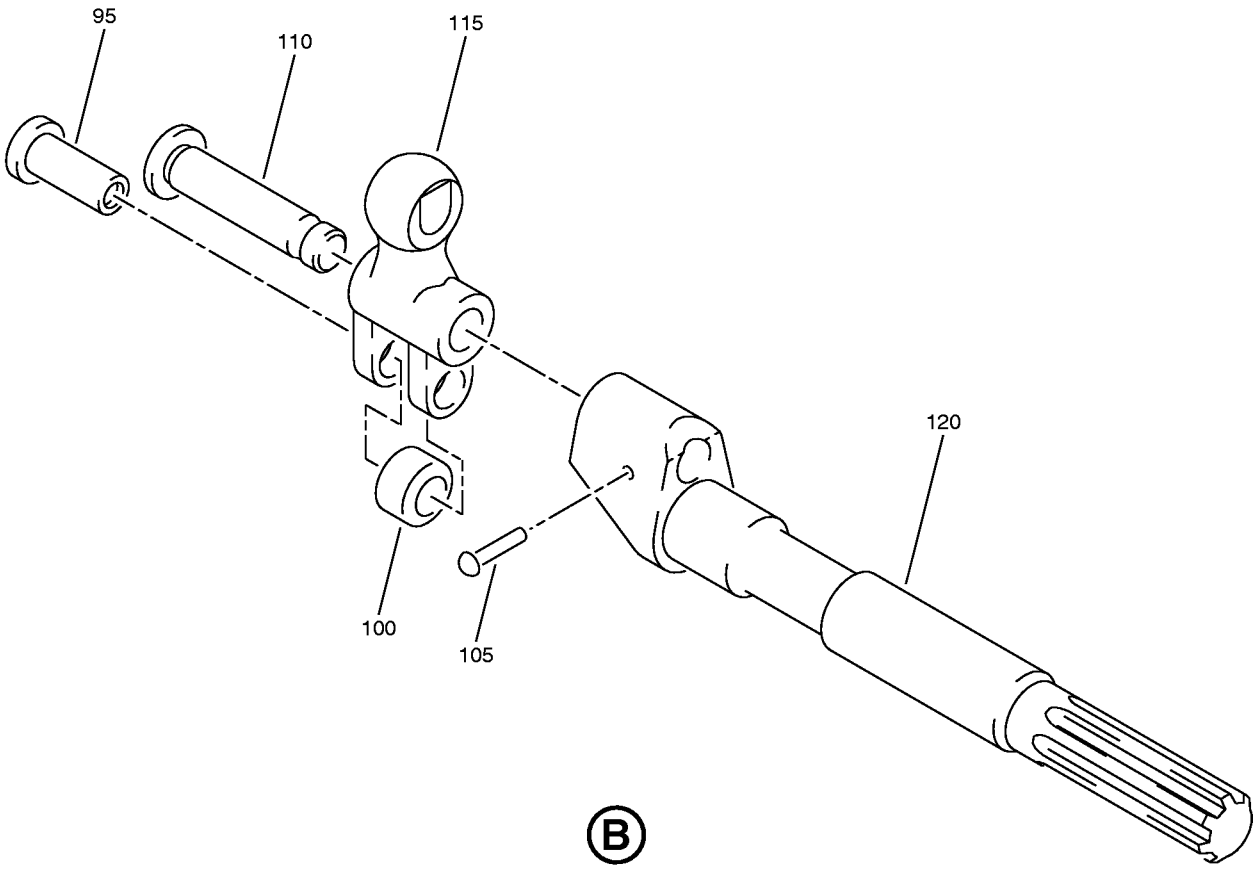
–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
2–					
–465A	65-44562-4		. . BARREL (OPT ITEM 465)		1
470	S30775-213H5		. SEAL-PLUS (V97820) (OPT ITEM 470A)	B, D	3
–470A	S30855-213H5N		. SEAL-PLUS (V09257) (OPT ITEM 470)	B, D	3
–470B	S30855-213H5N		. SEAL-PLUS (V09257)	C	3
475	251A1265-1		. BRACKET ASSY-MTG		1
480	BACP18BC02A06P		. . PIN-COTTER		2
485	69-35696-1		. . PIN-TAPERED		2
490	NAS1149E0463P		. . WASHER		2
495	BACN10JD4CD		. . NUT		2
500	251A1265-3		. . JOURNAL		1
505	AJF20A109		. . BEARING (VS0352) (SPEC 10-60516-244) (OPT 90560 (V09455)) (OPT DBAF20-077 (V81376)) (OPT FBJW40TF46-17 (V21335)) (OPT FBR20A17BAC (V73134)) (OPT KJN20-12 (V97613)) (OPT NHLF20-207A (V15860)) (OPT YTS570 (V77896))		2
510	66-22710-1		. . SHIM		1
515	251A1265-2		. . BRACKET		1
520	BAC27DHY369		. NAMEPLATE		1

–Item not Illustrated



Input Assembly
IPL Figure 3 (Sheet 1 of 2)



Input Assembly
IPL Figure 3 (Sheet 2 of 2)

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
3–					
–1A	69-35638-7		INPUT ASSY	C	RF
5	NAS1423-8		. NUT	C	1
10	MS51923-197		. PIN-COTTER (USED WITH ITEM 15)	C	1
15	69-35973-1		. SCREW (OPT ITEM 15A)	C	1
–15A	69-35904-1		. SCREW (OPT ITEM 15)	C	1
20	HL79-8		. COLLAR (V5M902) (SPEC BACC30M8) (OPT HL79-8 (V73197)) (OPT HL79-8 (V92215)) (OPT 66014-8 (V56878)) (OPT HL79-8 (V56878)) (USED WITH ITEM 15)	C	1
–20A	69-35904-3		. COLLAR (USED WITH ITEM 15A)	C	1
25	66-22748-1		. BUSHING	C	2
30	66-22740-1		. SPACER	C	1
35	SALPYT8-16		. BOLT (V11815) (SPEC BACB30GW8-16) (OPT SALPYT8-16 (V17446))	C	1
40	NAS1080E8		. COLLAR	C	1
45	69-35526-1		. FORK	C	1
50	65-44574-3		. LEVER (OPT ITEM 50A)	C	1
–50A	65-44573-2		. LEVER (OPT ITEM 50)	C	1
55	66-22741-1		. WASHER	C	1

–Item not Illustrated

FIG/ ITEM	PART NUMBER	AIRLINE PART NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNITS PER ASSY
3–					
60	S12956-112N1		. RING (V09257) (SPEC BACR12BD112NA) (OPT TF452-112NA (V07128)) (OPT RMR12BD112NA (V94878)) (OPT DW969517-112NA (V02886)) (OPT C2120411-112NB (V26879)) (OPT CSI200-112NA (V02107)) (OPT 2066-112NA (V26303))	C	1
65	NAS1611-112		. PACKING	C	1
70	69-35595-1		. COVER (OPT ITEM 70A)	C	1
–70A	69-35595-3		. COVER (OPT ITEM 70)	C	1
75	69-35638-3		. BEARING	C	2
80	69-35589-2		. SPRING	C	1
85	66-22744-2		. SPACER-BRG	C	1
90	66-22775-4		. SHAFT ASSY	C	1
95	66-22783-1		. . PIN-ROLLER	C	1
100	66-22742-3		. . ROLLER	C	1
105	MS20613-2C8		. . RIVET	C	1
110	66-22745-1		. . PIN	C	1
115	69-35590-3		. . LEVER	C	1
120	69-35593-1		. . SHAFT	C	1

–Item not Illustrated