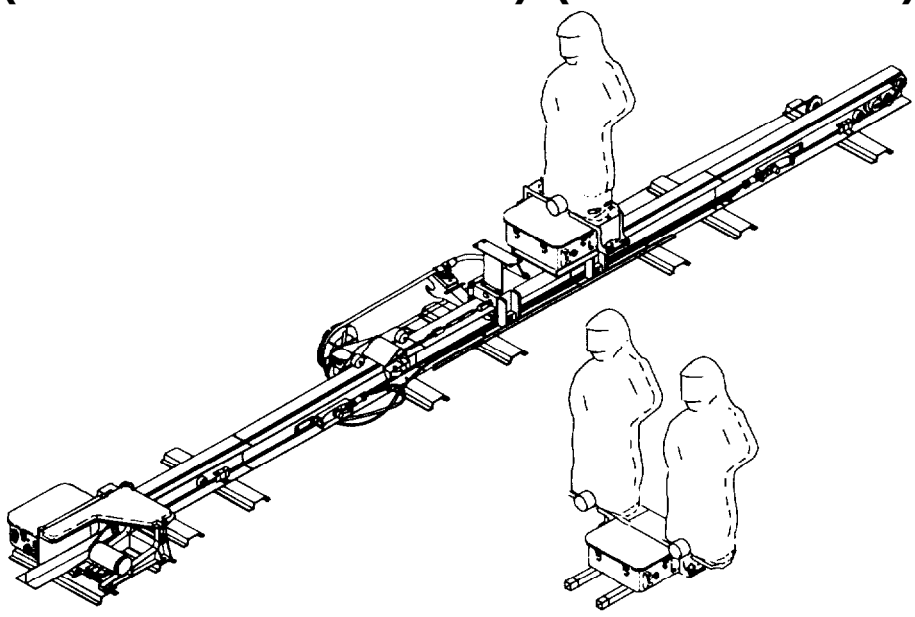
TM 9-6920-742-14-3

TECHNICAL MANUAL

OPERATOR, UNIT, DIRECT SUPPORT,
AND GENERAL SUPPORT MAINTENANCE MANUAL
FOR

ENHANCED REMOTED TARGET SYSTEM (ERETS)

TRACK SYSTEM, TARGET TRAINING SET - INFANTRY
(NSN 6920-01-147-8589) (PN 11829748)
AND
(SINGLE) TARGET HOLDING SET, TRAINING
(NSN 6920-01-142-2858) (PN 11829340-1)
(DOUBLE) TARGET HOLDING SET, TRAINING
(NSN 6920-01-373-7291) (PN 11829340-2)



HEADQUARTERS, DEPARTMENT OF THE ARMY

DECEMBER 1997

SAFETY SUMMARY

The following are general safety precautions that must be followed during operation and maintenance of the Target Training Set Track System - Infantry (IMTC) and Training Target Holding Set (ITM). Personnel should become familiar with these precautions and adhere to the requirements.

KEEP AWAY FROM LIVE CIRCUITS

Maintenance personnel must observe all safety precautions during maintenance and troubleshooting of the IMTC and ITM. Live circuits are exposed during some maintenance and troubleshooting procedures. Before working on the IMTC or the ITM, ensure that circuit breakers on interconnecting box (ICB), IMTC electronics assembly, and ITM have been set to OFF.

The personnel working with or near high voltages must be trained and certified in mouth-to-mouth and cardiopulmonary resuscitation. Installation medical activities shall provide certified instructors. Newly assigned maintenance personnel must be trained as soon as practical.

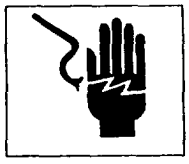
Make sure at least two persons are in the area at all times when work is being performed on exposed live circuits carrying 30 volts or more.

KEEP AWAY FROM MOVING PARTS

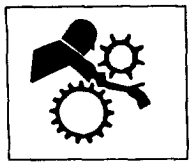
During operation and testing of the IMTC, stand clear of track to avoid injury. During operation and testing of ITM, stand clear of target to avoid being hit. Stand clear of moving parts when performing local tests of IMTC and ITM; equipment reacts immediately when test switch is tripped.

Refer to FM 21-11, First Aid for Soldiers.

WARNING



Before working on the IMTC or ITM, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Care must be taken to prevent wires from shorting out to ground. Failure to do so could result in electrical shock and death or serious injury.



When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped. When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 is tripped.

WARNING

Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles and gloves and use only in well ventilated area.

Compressed air used for cleaning purposes will not exceed 30 pounds per square inch (207 kilopascals). Use only with effective chip guarding and personal protective equipment or injury to personnel could result.

TECHNICAL MANUAL

NO. 9-6920-742-14-3

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington D.C., *18 December 1997*

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ENHANCED REMOTED TARGET SYSTEM (ERETS)
TRACK SYSTEM, TARGET TRAINING SET - INFANTRY
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REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Director, Armament and Chemical Acquisition and Logistics Activity, ATTN: AMSTA-AC-NML, Rock Island, IL 61299-7630.

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NOTE

This manual replaces TM 9-6920-742-14&P-5, dated July 1986, and TM 9-6920-742-14&P-6, dated July 1986, which have been rescinded.

CHAPTER 1

INTRODUCTION

SECTION I. GENERAL INFORMATION

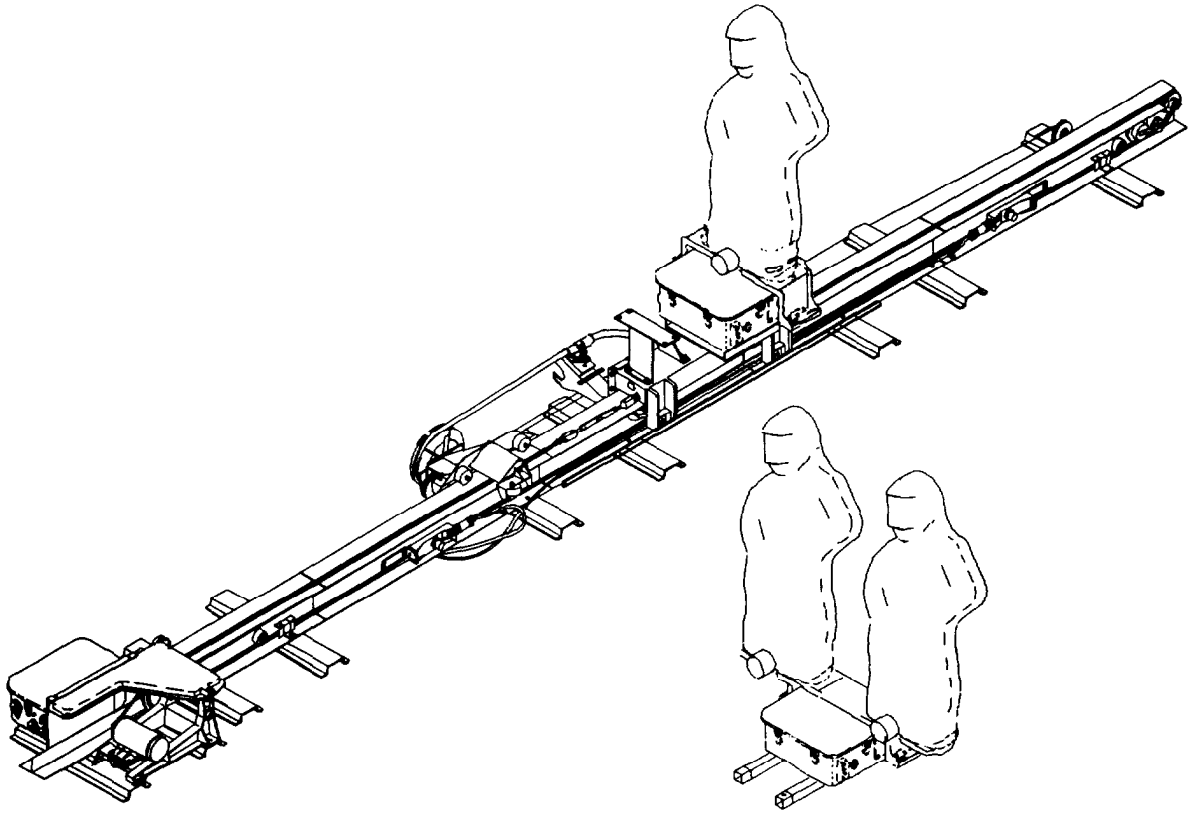


Figure 1-1. Target Training Set Track System - Infantry and Training Target Holding Set.

1-1 HOW TO USE THIS MANUAL.

This manual contains operating instructions and maintenance procedures for the Target Training Set Track System - Infantry (IMTC) and the Training Target Holding Set (ITM). The manual includes five chapters, four appendixes, and an index. Chapters in this manual are divided into sections, and the sections are divided into paragraphs. Maintenance tasks are arranged in top-down breakdown order and are grouped by chapter in accordance with maintenance levels authorized to perform the tasks.

The manual follows the same presentation outlined in the table of contents. Chapter 1 provides an introduction to the IMTC and ITM that includes equipment description and principles of operation. Chapter 2 contains operating instructions for the IMTC and the ITM, as well as operator Preventive Maintenance Checks and Services (PMCS). Chapter 3 contains operator maintenance instructions. Chapter 4 contains unit troubleshooting procedures and maintenance instructions. Chapter 5 contains direct support troubleshooting procedures and maintenance instructions.

Appendixes follow the chapters. Appendix A lists references contained in the manual. Appendix B contains the Maintenance Allocation Chart (MAC). Appendix C contains the Common Tools and Supplements and Special Tools/Fixtures List. Appendix D contains the Expendable and Durable Items List. Appendix E is a standard torque chart for common hardware. Appendix F contains the Manufactured and Fabricated Items Appendix. An index at the rear of the manual contains an alphabetical listing of subjects under every topic covered in the manual.

All chapter, section, paragraph, and appendix titles are listed in the table of contents. If you are looking for information on a specific subject or procedure, refer to the table of contents in the front of the manual. Find the subject or procedure in the table of contents and turn to the indicated page. If the subject or procedure is not listed in the table of contents, try looking in the Index at the rear of the manual.

1-2 SCOPE.

This manual presents all the information and procedures necessary to operate and maintain the IMTC and ITM at the operator, unit, and direct support levels. Since no maintenance tasks for the IMTC or the ITM are authorized at the general support level, the manual does not contain a chapter for general support maintenance instructions.

The IMTC is an electronically controlled mechanism that simulates a running man moving from one concealed position to another. The ITM is an electronically controlled unit that raises and lowers infantry targets in response to commands from the Target Training Set Console (RCS) - Enhanced Remoted Target System (ERETS). The ITM can be used in conjunction with the IMTC or operated as an independent unit.

Operation and maintenance procedures allocated to the operator, unit, and direct support levels are organized in accordance with the MAC contained in appendix B. Appendix C, Common Tools and Supplements and Special Tools/Fixtures List, lists the tools required to maintain the IMTC and the ITM. Appendix D provides a listing of expendable and durable items needed to operate and maintain the IMTC and ITM. Appendix E provides a torque limits table for common bolts and defines the difference between grades. Appendix E provides a list of materials and assembly instructions for manufactured and fabricated items.

1-3 MAINTENANCE FORMS, LOGBOOKS, RECORDS, AND REPORTS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, The Army Maintenance Management System. Accidents involving injury to personnel or damage to materiel will be reported on DA Form 285 (Accident Report) in accordance with AR 385-40.

1-4 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your IMTC or ITM needs improvement, let us know. Send us an equipment improvement recommendation (EIR). You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an, Product Quality Deficiency Report (QDR). Mail it to us at: Director, U.S. Army Research, Development and Engineering Center, ATTN: AMSTA-AC-QAW-A (R)/Customer Feedback Center, Rock Island, IL 61299-7300. We will send you a reply.

1-5 CORROSION PREVENTION AND CONTROL (CPC).

Corrosion prevention and control (CPC) for Army material is a continuing concern. It is important that any corrosion problems with the Target Training Set Track System - Infantry or Training Target Holding Set be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

a. What To Report. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

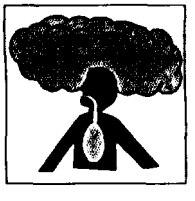
b. How To Report CPC. If a corrosion problem is identified, it can be reported using Standard Form 368, Quality Deficiency Report. Use of key words such as "corrosion," "rust," "deterioration," or "cracking," will assure that the information is identified as a CPC problem.

c. Where To Send the Report. This form should be submitted to: Director, U.S. Army Research, Development and Engineering Center, ATTN: AMSTA-AC-QAW-A (R)/Customer Feedback Center, Rock Island, IL 61299-7300.

d. Cleaning and Painting.

(1) Wire brush metal parts to remove rust and corrosion.

WARNING



Dry cleaning solvent (SD2) is toxic and flammable. Wear protective goggles, mask, and gloves and use only in well ventilated area.

(2) Clean metal parts with dry cleaning solvent (item 3, appendix D). Metal or fiber brushes may be used to apply cleaning solvent and to remove softened or dissolved material. Hand scraping with metal scrapers may be used to remove soft coatings or deposits.

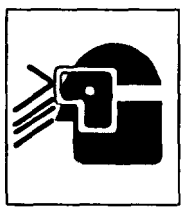
1-5 CORRODSION PREVENTION AND CONTROL (CPC)- Continued.

(3) Soak very oily or greasy metal parts in a tank containing dry cleaning solvent. The time parts must be in solvent varies with the type and amount of material to be removed.

(4) Do not use solvent to clean electrical insulation, wires, cables, or wiring harnesses. Clean these parts by wiping with a damp cloth. Use a mild soap solution if necessary. Dry immediately with clean, dry cloths. Clean contact points with flint abrasive paper (item 8, appendix D) and dust thoroughly after cleaning.

(5) Do not use dry cleaning solvent to clean rubber parts. Clean rubber parts by washing with a mild solution of soap and water.

WARNING



Compressed air used for cleaning purposes will not exceed 30 pounds per square inch (207 kilopascals). Use only with effective chip guarding and personal protective equipment or Injury to personnel could result.

(6) Dry parts by blowing with low-pressure compressed air or wiping with lint-free cloths.

(7) Paint metal surfaces after repair as required. Sand and paint damaged areas. Apply one coat of rust inhibitor primer (item 9, appendix D). Allow primer to dry for 30 minutes minimum before applying enamel (item 4, appendix D). Paint with enamel to match existing color.

1-6 DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE.

Destruction of the IMTC and ITM to prevent enemy use shall be carried out in accordance with the procedures contained in.

1-7 PREPARATION FOR STORAGE OR SHIPMENT.

Refer to AR 750-1 for requirements for administrative storage.

1-8 NOMENCLATURE CROSS-REFERENCE LIST.

Table 1-1. Nomenclature Cross-Reference List.

OFFICIAL NOMENCLATURE	COMMON NAME
Adapter, Power Supply	Range Control Station Adapter (RCS Adapter)
Console, Target Training Set - ERETS (ARMOR)	Range Control Station, Enhanced Remoted Target System, Armor (RCS/ERETS Armor)

OFFICIAL NOMENCLATURE	COMMON NAME
Console, Target Training Set - ERETS (INFANTRY)	Range Control Station, Enhanced Remoted Target System, Infantry (RCS/ERETS Infantry)
Interconnecting Box, High Power	Interconnecting Box (ICB)
Interconnecting Box, Low Power	Interconnecting Box (ICB)
Interconnecting Box, Target Interface	Target Interface Unit (TIU)
Simulator, Gunfire	Armor Target Kill Simulator (ATKS) Target Kill Simulator (TKS) Gunfire Simulator Device (GUFS)
Simulator, Muzzle Flash, Small Arms	Muzzle Flash Simulator (MFS)
Simulator, Sound, Small Arms (SASS)	Rifle Fire Simulator (RFS) Gunfire Simulator (GUFS)
Target Holding Mechanism, Tank Gunnery	Target Holding Mechanism, Tank Gunnery (THM/TG) Automatic Tank Target System (ATTS)
Target Holding Set, Training	Infantry Target Mechanism (ITM)
Track System, Target Training Set - Armor	Armor Moving Target Carrier (AMTC)
Track System, Target Training Set - Infantry	Infantry Moving Target Carrier (IMTC)

1-9 LIST OF ABBREVIATIONS.

The following list contains the acronyms and abbreviations used throughout the manual and in conjunction with the range system.

AMTC	Armor Moving Target Carrier
ATKS	Armor Target Kill Simulator
CCA	Circuit Card Assembly
cm Hg	centimeter(s) of mercury
ERETS	Enhanced Remoted Target System
fps	feet per second
GUFS	Gunfire Simulator
ICB	Interconnecting Box
ILTEM	Improved Lifting Target Elevating Mechanism
IMTC	Infantry Moving Target Carrier

1-9 LIST OF ABBREVIATIONS - Continued.

in Hg	Inch(es) of mercury
ITM	Infantry Target Mechanism
mps	meters per second
RCS	Range Control Station
RFS	Rifle Fire Simulator
SASS	Small Arms Sound Simulator
THM/TG	Target Holding Mechanism, Tank Gunnery
TIU	Target Interface Unit
TTA	Tank Target Assembly

SECTION II. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

1-10 COMMON TOOLS AND EQUIPMENT.

For authorized common tools and equipment, refer to the Table of Distribution and Allowances (TDA) applicable to your unit.

1-11 SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

Refer to appendix B, Maintenance Allocation Chart, and TM 9-6920-742-24P-3, Repair Parts and Special Tools List (RPSTL), for any special tools, TMDE, and support equipment required to maintain the IMTC and ITM.

1-12 REPAIR PARTS.

Repair parts are listed and illustrated in the repair parts and special tools list, TM 9-6920-742-24P-3.

SECTION III. EQUIPMENT DESCRIPTION

1-13 EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

The following subparagraphs describe the equipment characteristics, capabilities, and features of the IMTC and the ITM.

a. IMTC Equipment Characteristics, Capabilities, and Features.

(1) Characteristics. The IMTC is an electronically controlled mechanical mechanism that simulates a running man moving from one concealed position to another. A carriage assembly mounts an ITM and Muzzle Flash Simulator (MFS). The IMTC operates for a distance of 32.8 ft (10 m) along aluminum track positioned at a 45° angle from firing line. Operation is controlled by commands from the RCS.

(2) Capabilities and Features. The IMTC is capable of moving a target forward or backward in either the up or down position. It has three selectable speeds. Speed selection must be made at IMTC and cannot be selected remotely. The IMTC is used as part of a ERETS range.

b. ITM Equipment Characteristics, Capabilities, and Features.

(1) Characteristics. The ITM is an environmentally sealed unit that provides mechanical control of single or double infantry targets for small arms trainees. Operation is electronically controlled by commands from the RCS. Signals from the RCS raise and lower two-dimensional and three-dimensional polyethylene personnel targets. Target hits are detected by a hit sensor and target hit information is transmitted to the RCS.

(2) Capabilities and Features. The ITM can be used as a stationary target, or it can be installed on an IMTC for use as a moving target. Electric connectors on the ITM permit connection to and use with an IMTC. The electric connectors also allow the ITM to be operated in conjunction with an MFS, a Small Arms Sound Simulator (SASS), or both. The ITM is used as part of a ERETS range.

1-14 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

The following subparagraphs give brief descriptions of the major components of the IMTC and ITM.

a. Location and Description of Major Components on IMTC. Refer to figure 1-2.

(1) Drive Mechanism Assembly. Platform-mounted drive motor operates belt-driven pulleys. V-belt setting is used to select speed of carriage assembly. Pulleys operate drive belt that moves carnage assembly along track sections.

(2) Electronic Components Assembly. Distributes +24 vdc to electrical circuits and proximity switches. Receives and processes commands from ITM that are used to control operation of drive motor. Sends attack and retreat limit signals to ITM for status report to the RCS.

(3) Drive Belt Assembly. Connects to pulleys on drive mechanism and return end track sections, and moves carriage assembly forward or backward along track sections.

(4) Trolley Assembly. Wheel-mounted trolley chassis travels along track sections. Trolley chassis provides mounting for cable follower sheave and sheave assembly.

(5) Carriage Assembly. Wheel-mounted carriage travels along track sections. Carriage provides mounting for ITM and MFS.

(6) Track Assemblies. Track sections are mounted on crossmember assemblies and provide stationary surface for free movement of carnage and trolley assemblies. Proximity switches detect carriage movement and are located on drive end and return end track sections. Pulleys on drive end and return end track sections permit free movement of drive belt. Bumper assembly on return end track section prevents carriage assembly derailment.

(7) Cable Support Assembly. Attaches to carriage assembly. Provides secure mounting for cable assembly W103 during carriage movement.

1-14 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued.

(8) Cable Assembly W103. Transmits data between RCS, ITM, and IMTC electronic components assembly and supplies power to ITM.

(9) Trolley Cable. Guides movement of carriage and trolley assemblies along track sections.

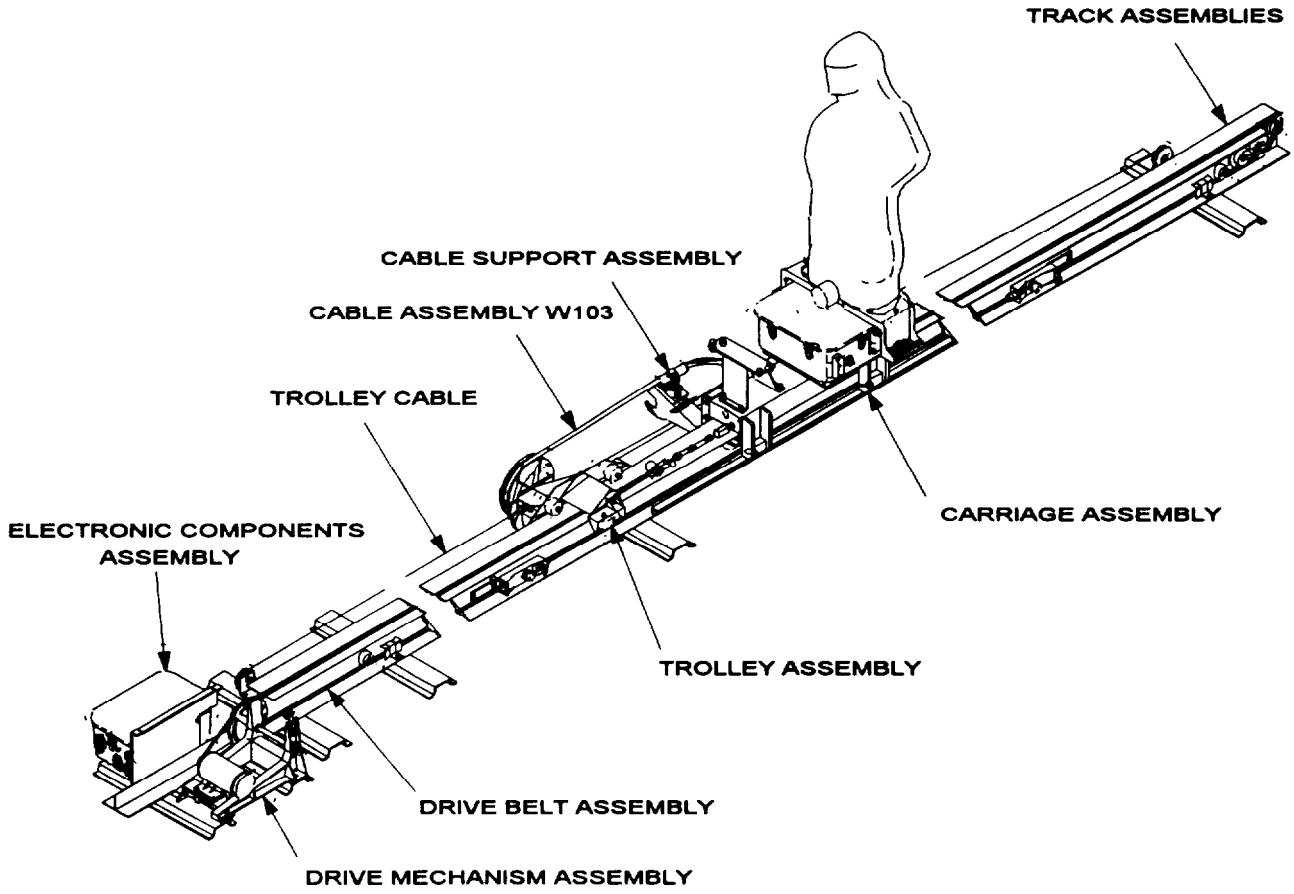


Figure 1-2. Major Components on IMTC.

b. Location and Description of Major Components on ITM. Refer to figure 1-3.

(1) Housing and Cover Assemblies. Provide environmentally sealed unit that protects drive motor and electronic components from natural elements.

(2) Drive Motor Assembly. Provides power to raise and lower target.

(3) Target Arm Assembly. Raises and lowers target in response to commands from RCS.

(4) Hit Sensor Assembly. Detects and transmits target hit information to RCS.

(5) Electric Connectors. Allow connection of power and data cables. Also allow connection to MFS and SASS for use in various simulation scenarios.

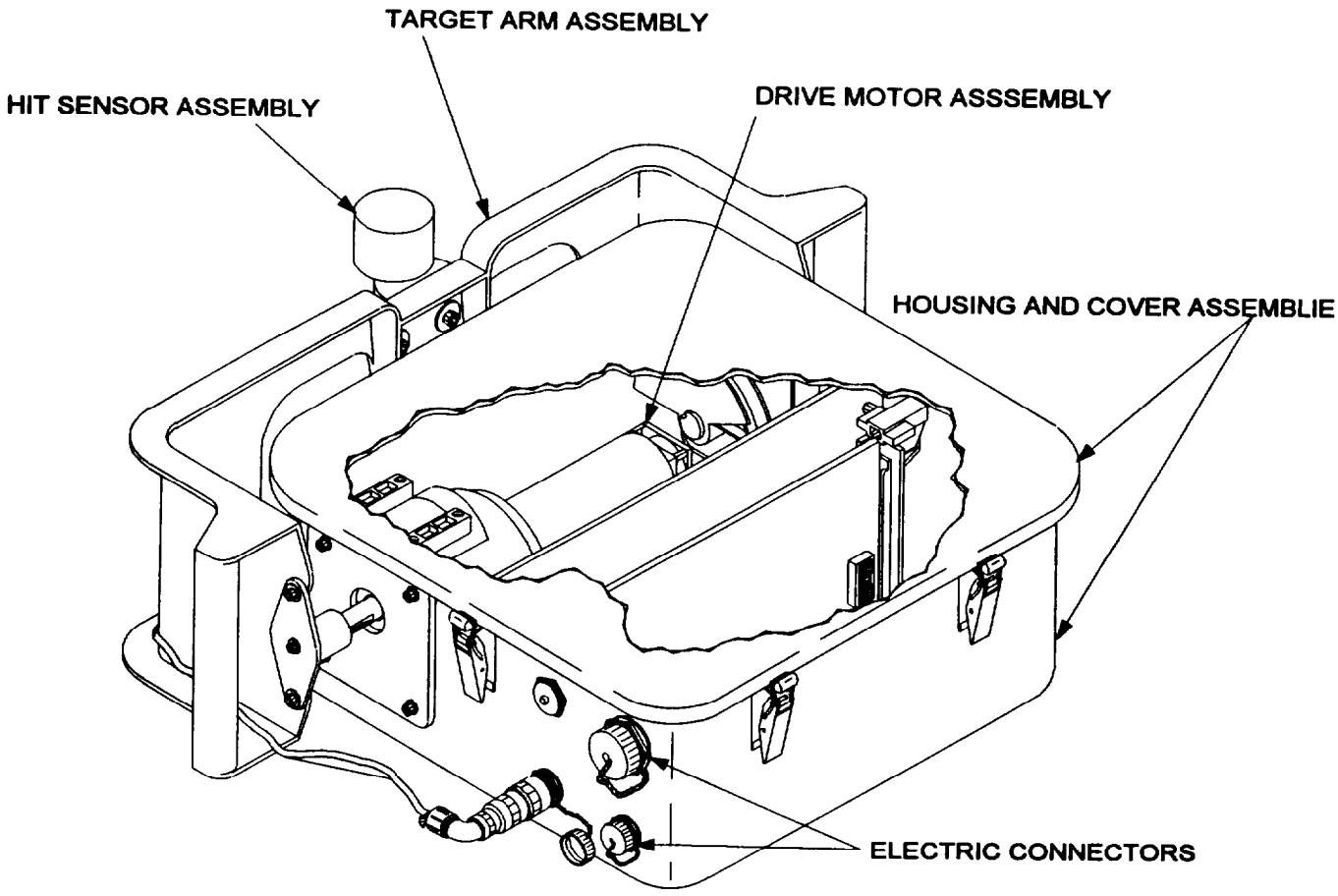


Figure 1-3. Major Components on the ITM.

1-15 EQUIPMENT DATA.

The following tables provide equipment data on the IMTC and the ITM. Refer to table 1-2 for equipment data on IMTC and to table 1-3 for equipment data on ITM.

Table 1-2. Equipment Data for IMTC.

PHYSICAL CHARACTERISTICS	
Weights	
Drive Mechanism Assembly	Approximately 30 lb. (13.62 kg)
Electronic Components Assembly	Approximately 20 lb. (9.08 kg)
Carriage Assembly	Approximately 20 lb. (9.08 kg)
Length	46.5 ft (14.18 m)
Width	32 in (81.28 cm)

1-15 EQUIPMENT DATA - Continued.

Table 1-2. Equipment Data for IMTC - Continued.

ENVIRONMENTAL STANDARDS	
Temperature	5 to 125 °F (-15 to 52 °C)
Relative Humidity	5 to 95 percent
Low Pressure Limit	16.9 in Hg/15,000 ft altitude (42.93 cm Hg/4,575 m altitude)
POWER REQUIREMENTS	24 ±3.6 vdc
Operation	30 amp/720 w
OPERATING CHARACTERISTICS	
Speeds	5.9 ±0.65 fps (1.8 ±0.2 mps) 8.85 ±0.65 fps (2.7 ±0.2 mps) 12.13 ±0.65 fps (3.7 ±0.2 mps)

Table 1-3. Equipment Data for ITM.

PHYSICAL CHARACTERISTICS	
Weight	Approximately 20 lb. (9.08 kg)
Length (with target arm)	17 in (43.18 cm)
Width (with target arm)	17 in (43.18 cm)
Height (with target arm)	8 in (20.32 cm)
ENVIRONMENTAL STANDARDS	
Temperature	5 to 125 °F (-15 to 52 °C)
Relative Humidity	5 to 95 percent
Low Pressure Limit	16.9 in Hg/15,000 ft altitude (42.93 cm Hg/4,575 m altitude)
POWER REQUIREMENTS	24 ±1.5 vdc
Operation	10 amp/240 w

1-16 EQUIPMENT CONFIGURATION.

All ERETS ranges are constructed differently. The equipment configuration will depend upon design, climate, terrain, and mission. This technical manual was developed to reflect the equipment configurations contained in the technical data packages for the IMTC and the ITM. Different configurations of the IMTC and the ITM exist in the field. The user/maintainer must consider the differences and make allowances between specific configurations of fielded equipment and the configurations described in this manual.

SECTION IV. PRINCIPLES OF OPERATION

1-17 FUNCTIONAL DESCRIPTION OF IMTC OPERATION.

a. General. IMTC operation is electronically controlled by commands from the RCS. Power is transferred via cable assembly from the high power interconnecting box (ICB) to the IMTC electronic components assembly; command data is transferred from the ITM via cable assembly W103. The control logic circuit card assembly (CCA) inside the IMTC electronic components assembly accepts attack and retreat commands from the ITM control logic CCA in the form of 1-second, +10 vdc positive pulses. The IMTC control logic CCA latches the command signals and then provides relay closure levels to the electronic relay plate assembly, activating the drive motor. When the drive motor is activated, the carnage assembly will move to the limit to which it is commanded.

The carriage assembly moves forward (attack drive) or in reverse (retreat drive) along the track sections by means of a drive mechanism assembly. The drive mechanism assembly employs a dc motor and drive belt arrangement. The ITM and MFS are mounted on the carriage frame. The carriage frame has wheels which allow it to ride on the track sections, and an electrical switch actuator bar mounted to the underside.

in attack drive, the actuator bar will engage the forward proximity switch as the carriage assembly reaches the end of travel. In retreat drive, the actuator bar will engage the reverse proximity switch as the carriage assembly reaches the end of travel. When the bar encounters a proximity switch, limit switch closure commands are transmitted via cable assembly to the IMTC control logic CCA, and motor drive is terminated. Status of the limit switches is routed to the ITM control logic CCA for status sampling by the processor assembly.

The carriage assembly will travel an overall distance of 10 meters (32.8 feet) from one limit to the other by a system consisting of a motor pulley and drive belt pulleys which can be adjusted for low, medium, and high speeds. In the event of limit switch failure, motor drive will be terminated automatically by a timer circuit after 10 seconds. A bumper assembly on the return end track section stops further carriage movement in the event of proximity switch failure.

A test switch allows operational testing of the individual IMTC. The carriage assembly responds to drive commands when the switch is toggled to the ATTACK or RETREAT position.

b. Circuit Description. The IMTC control logic CCA receives +24 vdc. This can be measured at test point 1 (TP 1) referenced to TP 3. The +24 vdc is regulated to +10 ±1.5 vdc by R1 and CR3. This power is supplied to the control logic CCA integrated circuits and can be measured at TP 2 referenced to TP 3. Additionally, 10 ±1.5 vdc is produced and supplied to the attack and retreat limit proximity switches.

1-17 FUNCTIONAL DESCRIPTION OF IMTC OPERATION - Continued.

While the electrical switch actuator bar is over the retreat limit proximity switch, retreat status is high. Transistor Q7 is off, and TP 7 referenced to TP 3 is low. The attack limit proximity switch output is high and may be measured on TP 4 referenced to TP 3.

When the attack command is received from the RCS through the ITM, TP 9 referenced to TP 3 will momentarily go low. The "attack" command is latched as U6 pin 11 goes high. This prevents a retreat command from being accepted. An "attack drive" command is generated as U1 pin 1 goes high. This signal may be monitored at TP 5 referenced to TP 3. This turns on or "gates" transistors Q1, Q2, and Q3, supplying +24 vdc to the electronic relay plate assembly. This voltage may be monitored at TP 10 referenced to TP 3.

On the electronic relay plate assembly, relay K1 coil A is activated. This connects drive motor terminal A1 to +24 vdc and drive motor terminal A2 to ground. The motor turns clockwise, advancing the target carnage.

As the carriage begins to move, the actuator bar moves away from the retreat limit proximity switch. Transistor Q7 is turned on and TP 7 referenced to TP 3 will go high. This high is supplied to U1 pin 10 and U6 pin 8, setting the conditions for acceptance of a retreat command. A "low retreat status" is supplied from U7 pin 3 to U6 pin 1, blocking attack signals. As the carriage continues to drive forward, the actuator bar encounters the attack limit proximity switch. Attack status is changed as U7 pin 4 goes high and Q10 is turned off. Conditions are now set for acceptance of the retreat command. The attack drive signal is terminated and transistors Q1, Q2, and Q3 are turned off. Power is removed from the drive motor, the brake is applied, and the carriage is stopped.

When a drive command is given, a 10-second counter is activated. Unless the counter is deactivated by the limit proximity switch, the drive command is terminated at 10 seconds. If the counter terminates the drive command, neither attack nor retreat commands will be accepted, and a malfunction signal will be sent to the RCS via the ITM.

1-18 FUNCTIONAL DESCRIPTION OF ITM OPERATION.

a. General. The ITM can be used either as a moving or a stationary mechanism that raises and lowers 2- or 3-dimensional targets in response to commands from the RCS. When used as a fixed target mechanism, power and command data are transferred to the ITM by direct cable connection to the low power interconnecting box (ICB). When used as a moving target mechanism, the ITM is mounted atop the IMTC carriage assembly. Power and command data are transferred by cable connections from the high power ICB to the IMTC electronic components assembly, and then fed directly to the ITM through cable assembly W103. The control logic CCA in the ITM controls direction of target travel by decoding and sending forward/reverse commands from the RCS to the IMTC electronic components assembly. An MFS can be connected to the ITM for use in either the stationary or moving target configuration; the SASS, however, can be used with the ITM only when it is installed as a stationary target mechanism. Hostile fire commands from the RCS are decoded and processed by the ITM control logic CCA, generating random single or burst pulses that are sent to the MFS and SASS.

b. Data Communication. The ITM receives and decodes command data from the RCS that is used to position the target on the ITM and drive the SASS, MFS, and IMTC. Target position status, IMTC position status, and hit information are encoded by the ITM and transmitted back to the RCS for computer manipulation.

Four pairs of wires, running through various cable connections between the RCS and the ITM, are used to create a communications scheme consisting of a clock train, a data signal, a status signal, and status power. Within this communications scheme, “words” are exchanged between the RCS and the ITM. Each word is composed of 32 bits of data that correspond to 32 clock pulses (clock train). A command word (or data signal) is sent by the RCS to the ITM, and the ITM responds by sending a status word (or status signal) back to the RCS.

The ITM responds to command data and sends status back to the RCS only if the address in the command word corresponds to the address code that is set on the ITM. The address code on the ITM is determined by the setting of the address switch, a nine-position pencil switch located on the control logic CCA.

When a command word with a corresponding address is received by the ITM, the control logic CCA processes the data contained in the command word. The ITM then responds to the commands, and the response data is processed and stored in a status register. Upon receipt of the next command word, the data stored in the status register is transmitted back to the RCS during the clock train.

c. Command Data. The data contained in the command word is presented in table 1-4. A more detailed explanation of the command data is provided in the subparagraphs that follow.

Table 1-4. Serial Command Data.

BIT NUMBER	DATA	EXPLANATION
0 - 4	Target Address	Contain first five bits of nine-bit target address.
5	Hit Counter Reset	Sets current hit count in target address to 0.
6	Unused	
7	Command	When set, target addressed responds to commands.
8	Hostile Fire Single/Burst	Set when RCS intends single shot hostile fire simulation; reset when burst fire is requested.
9	Hostile Fire Enable	Set to initiate hostile fire simulation at addressed target.
10	Hit Count Single/Burst	Controls mode of hit counter in addressed target. When reset, target is commanded to count a burst of automatic rifle fire as one hit.
11	IMTC Retreat	Initiates a retreat movement for addressed moving target.
12	IMTC Attack	Initiates an attack movement for addressed moving target.

1-18 FUNCTIONAL DESCRIPTION OF ITEM OPERATION - Continued.

Table 1-4. Serial Command Data - Continued.

BIT NUMBER	DATA	EXPLANATION
13	Target Bob	Commands addressed target to automatically raise its target arm after going down for a hit.
14	Target Hold	Commands addressed target to maintain a raised target when hit.
15	Target Up/Down	Set to command addressed target up; reset to command target down.
16-19	Target Address	Contains last four bits of nine-bit address code.
20-23	N Hit Kill	Bits are set to a binary number between 1 and 16 that establishes the number of hits to be counted by addressed target before lowering target arm.
24-25	Spares	
26	N Hit Kill Enable	Causes addressed target to accept information in bits 20 through 23.
27-31	AMTC Bits	Bits contain command data for AMTC; not used for IMTC/ITM operation.

(1) Target Address. Bits 0 through 4 and 16 through 19 of the command word are dedicated for selecting target addresses from 0 to 511. When the command word is received, the control logic CCA in the ITM conducts an address compare. If the address contained in the command word does not match the address code in the ITM, the command word is ignored. If the addresses do match, the control action contained in the data word is performed by the ITM, and data contained in the status register is transmitted back to the RCS.

(2) Hit Counter Reset. Whenever a hit counter reset command is transmitted to the ITM, the hit count information stored in the status register is transmitted to the RCS. The hit count information stored in the hit accumulator is transferred to the status register, and the hit accumulator is reset to zero. (In order to detect that reset has occurred, two additional commands must be sent to the ITM. On the second command, the ITM should return the zero value for the hit count.)

(3) HFS Single or Burst Command. When a hostile fire simulator (HFS) single command is received by the ITM, the ITM generates positive pulses at random intervals to the MFS and SASS. When an HFS burst command is received by the ITM, the ITM generates “bursts” of positive pulses to the MFS and SASS. Each burst contains random numbers of pulses which occur randomly with respect to the end of the last burst.

(4) Single or Burst Hit Count. When a hit count single command is received by the ITM, the ITM counts each and every hit it receives. However, when a hit count burst command is received by the ITM, the ITM counts a burst of hits as one single hit.

(5) IMTC Attack or Retreat Command. Upon receiving an IMTC attack command or an IMTC retreat command, the ITM transmits a positive pulse to the control logic CCA in the IMTC electronic components assembly, initiating carrier movement.

(6) Target Response to Hits.

(a) Fall. When the target receives a hit or receives enough hits to cause a kill, and the last command word transmitted to the ITM does not contain a bob-when-hit or hold-when-hit command, the target arm lowers to the down position.

(b) Bob. When the ITM receives a bob-when-hit command, the ITM lowers and then raises the target upon detection of a hit or enough hits to cause a kill.

(c) Hold. When the ITM receives a hold-when-hit command, the detection of hits causes the hit counts to be incremented, but the target is not lowered.

(7) Target UP or Down Command. When received by the ITM, the target arm either moves to the up position (in response to an up command) or to the down position (in response to a down command).

(8) Number of Hits to Kill (N-Hit/Kill). Bits 20 through 23 of the command word represent a binary number that is used to determine the total number of hits which must be detected before causing the target to be lowered. When all four bits are low (0000), a single hit will cause the target to be "killed." When all four bits are high (1111), 16 hits are required to kill the target. The ITM accepts the N-hit/kill command only if the N-hit/kill enable bit (bit 26) is high.

d. Serial Status. The status word transmitted by the ITM includes hit information, target arm position, and forward/reverse position of the IMTC. Every time a command word is received (and loaded), the ITM transmits a status word back to the RCS. The data contained in the status word is presented in table 1-5.

Table 1-5. Serial Status Data.

BIT NUMBER	DATA	EXPLANATION
0-15	Spares	
16-21	Hit Count	Bits contain binary representation of cumulative hit counts detected since receipt of last hit counter reset command.
22	Down Limit	High when target arm is down; low when target arm is up.
23	Up Limit	High when target arm is up; low when target arm is down.

1-18 FUNCTIONAL DESCRIPTION OF ITEM OPERATION - Continued.

Table 1-5. Serial Status Data - Continued.

BIT NUMBER	DATA	EXPLANATION
24	IMTC Forward Limit	High when IMTC is in forward limit; low when IMTC is in reverse limit.
25	IMTC Reverse Limit	High when IMTC is in reverse limit; low when IMTC is in forward limit.
26-31	Pad	Serve as pad to status word; bits 26 through 30 are set low at 0, while bit 31 is set high at 1.

e. Principles of Operation. A data signal (or command word) and clock train are sent by the RCS to the ITM. Upon receipt of the command word, the control logic CCA in the ITM compares the address bits in the data signal with the code set on the address switch. If the address matches, command data are loaded into the ITM circuits. Information being held in the status register on the ITM control logic CCA is transmitted back to the RCS. If a hit counter reset command has been transmitted, any hit count information being held in the hit accumulator is transferred to the status register, and the hit accumulator is reset to zero.

If an up command has been transmitted, the control logic CCA communicates both drive voltage and brake release signals to the motor drive CCA. The brake on the target drive motor is disengaged, and the motor raises the target arm that holds the infantry target. As the target arm reaches its limit of travel, an actuator on the idler shaft engages the optical switch assembly. The up limit signal goes low, and the down limit signal goes high. The limit signals are transmitted to the target drive and brake release circuits on the control logic CCA. Target drive circuits are latched to receive a down command, and the brake release signal is terminated. The brake in the drive motor engages and target movement (as a result of carriage movement or high winds) will be prevented.

If the ITM is being used as a moving target mechanism, a movement command will be signalled to the control logic CCA in the IMTC electronic components assembly, and IMTC carnage movement will be initiated. When the carriage reaches its limit of travel, an IMTC limit signal is sent back to the ITM control logic CCA and stored in the status register.

If any hostile fire commands were loaded, random pulses will be transmitted to the MFS and/or SASS, so that muzzle flashes and/or sounds can be simulated. Rate of simulated hostile fire (single or burst) will correspond to the HFS bits loaded from the command word.

A hit sensor detects and transmits target hit information to the control logic CCA, which processes and stores the data in the hit accumulator. ITM response to target hits will correspond to the hit count, the N-hits/kill, and the target response bits loaded from the command word. If a fall or a bob response has been loaded from the command word, a local down command signal will be transmitted to the target drive circuits. If a hold response has been loaded from the command word, a down command signal will have to be transmitted directly from the RCS to lower the target.

When a down command is transmitted, the sequence of actions is similar to those which occur when an up command is received and processed. The brake is disengaged, and the target drive motor towers the target arm until the actuator engages the optical switch assembly. The down limit signal goes low, and the up limit signal goes high. Target drive circuits are latched to receive an up command, and the brake in the drive motor engages, preventing target movement.

A test switch is used to perform local tests of the ITM. When the test switch is toggled, the target arm will raise momentarily and then lower if all circuits and parts are operational.

CHAPTER 2

OPERATING INSTRUCTIONS

SECTION I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1 CONTROLS AND INDICATORS.

This section shows the locations and describes the functions of the controls and indicators used on the Target Training Set Track System - Infantry (IMTC) and the Training Target Holding Set (ITM).

a. Controls and Indicators on the IMTC. Controls and indicators on the IMTC are located on the electronic components assembly. The controls and indicators are described in table 2-1 and illustrated in figure 2-1. Match the keys in table 2-1 with the callouts on figure 2-1 to determine the location of the controls or indicators.

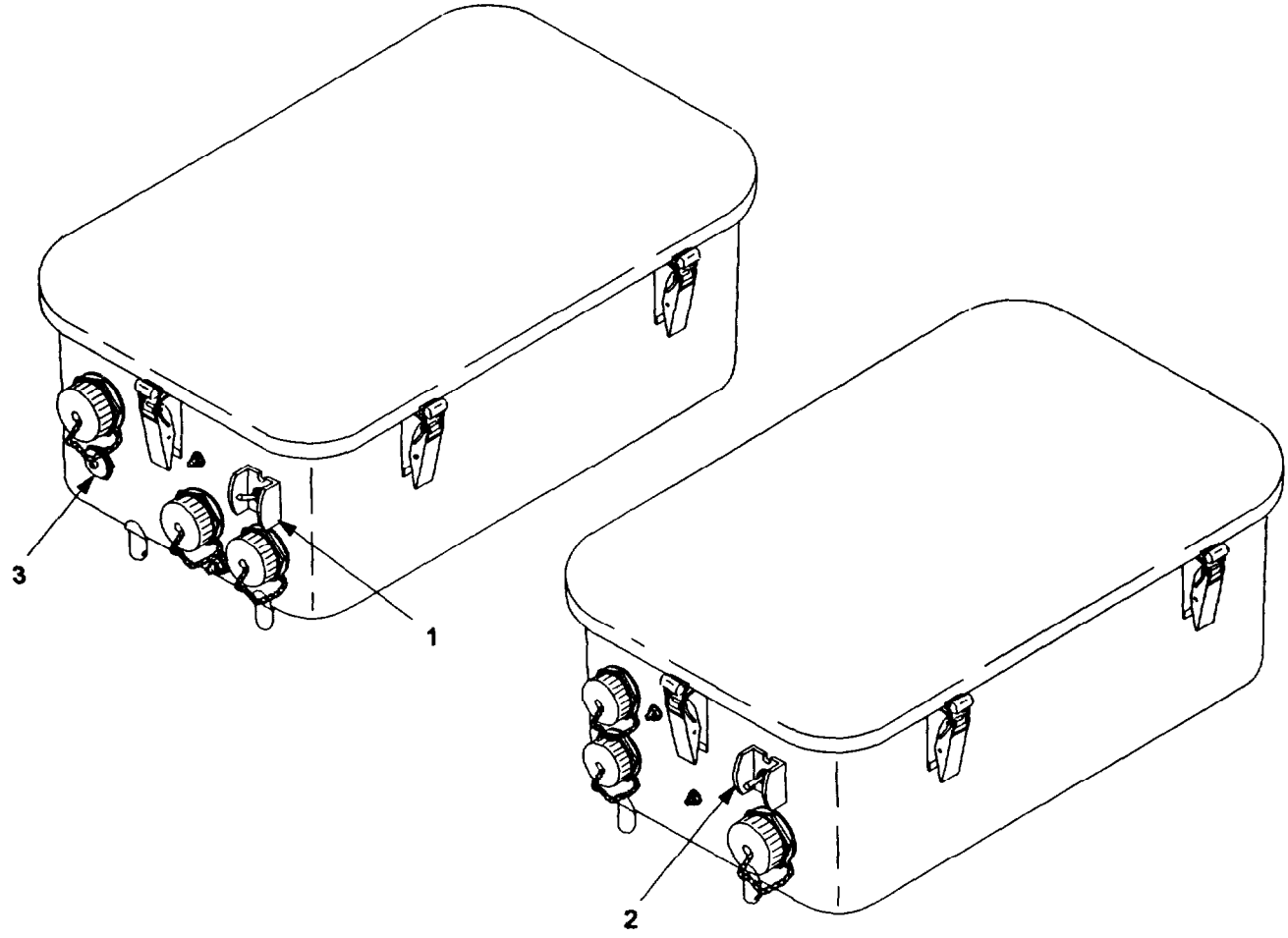


Figure 2-1. Controls and Indicators on IMTC Electronic Components Assembly.

Table 2-1. Controls and Indicators on IMTC Electronic Components Assembly.

KEY	CONTROL OR INDICATOR	FUNCTION
1	Circuit Breaker CB1	Removes all power to the IMTC when in the OFF position. In the ON position it applies 24 vdc power to the IMTC and provides overload protection.
2	Test Switch S1	Allows operational testing of the individual IMTC. Carriage assembly responds to ATTACK or RETREAT commands when switch is activated.
3	Pressure Relief Valve	When pressed, equalizes internal pressure in unit.

b. Controls and Indicators on the ITM. Controls and indicators on the ITM are described in table 2-2 and illustrated in figure 2-2. Match the keys in table 2-2 with the callouts on figure 2-2 to determine the location of the controls or indicators.

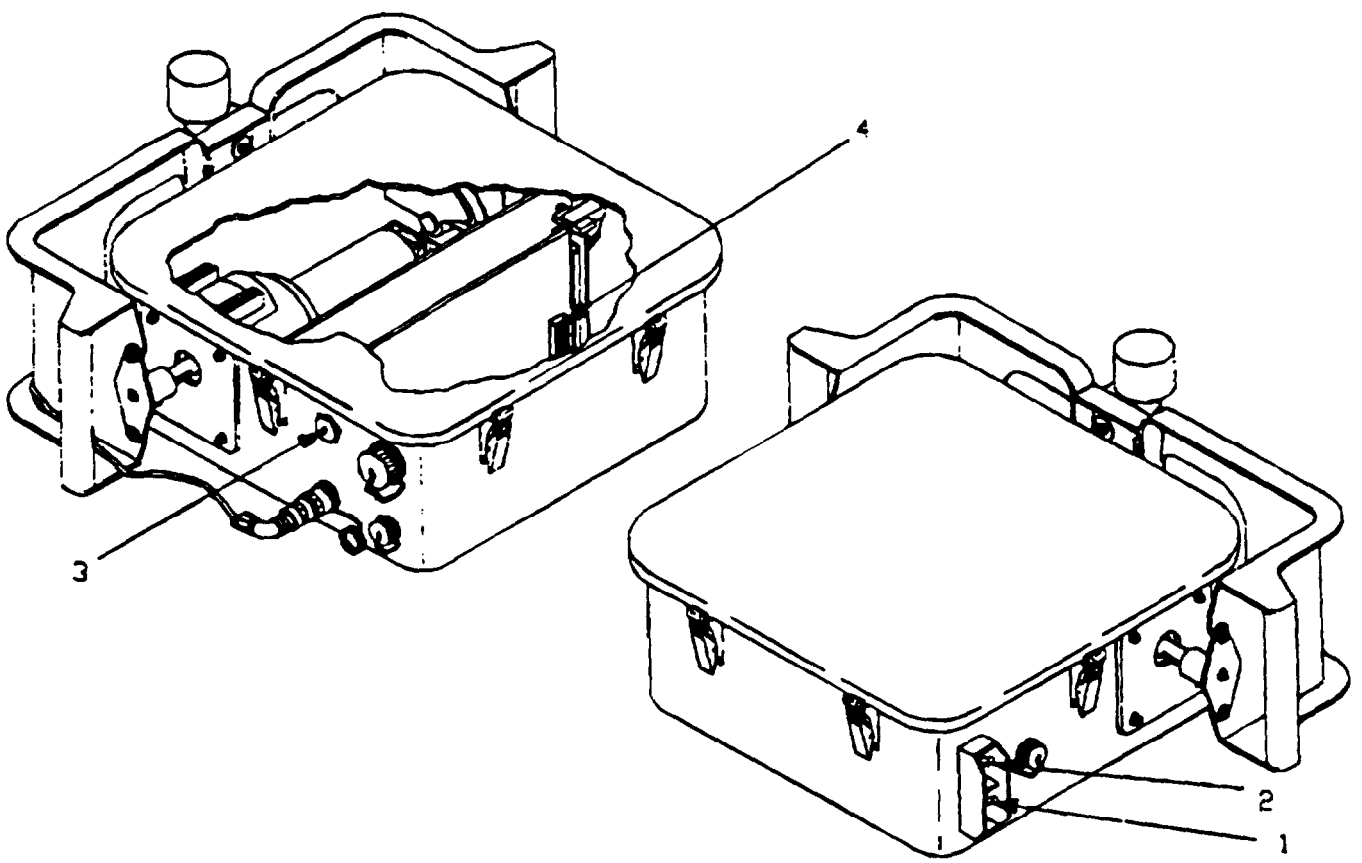


Figure 2-2. Controls and Indicators on ITM.

Table 2-2. Controls and Indicators on ITM.

KEY	CONTROL OR INDICATOR	FUNCTION
1	Circuit Breaker CB1	Removes all power to the ITM when in the POWER OFF position. In the POWER ON position it applies 24 vdc power to the ITM and provides overload protection.
2	Test/Operate Switch S-1	Permits ITM self-testing when held in the spring-loaded TARGET TEST position. Permits operation of target arm in AUTO position.
3	Pressure Relief Valve	When pressed, equalizes internal pressure in unit.
4	Address Switch	Establishes an address code for ITM. ITM only responds to commands from Target Training Set Console (RCS) - Enhanced Remoted Target System (ERETS) addressed with same code.

SECTION II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2 GENERAL.

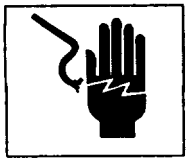
No PMCS is performed by the operator for the IMTC or the ITM. All PMCS procedures for the IMTC and the ITM are performed by unit level maintenance.

SECTION III. OPERATION UNDER USUAL CONDITIONS

2-3 ASSEMBLY AND PREPARATION FOR USE.

a. Assembly and Preparation of IMTC. To assemble and prepare the IMTC for operation, perform the following steps:

WARNING



Before working on the IMTC or the ITM, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or Injury to personnel.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

2-3 ASSEMBLY AND PREPARATION FOR USE - Continued.

(3) Set circuit breaker on ITM to POWER OFF.

NOTE

Perform steps (4) through (16) only if speed setting of IMTC needs to be changed for scenario.

(4) Refer to figure 2-3. Release flex draw latch (1) that secures cover to drive mechanism assembly (2).

(5) Remove two pan-head screws (3) and hex nuts (4), and remove drive mechanism cover (5) from cover bracket (6).

(6) Loosen adjustment bolts (7) on motor mount platform (8) and release tension on V-belt (9).

CAUTION

Combination of V-belt in red motor pulley and red output pulley creates speed which may cause equipment damage and may damage or cut V-belt.

NOTE

Motor pulleys and output pulleys are color-coded for speed adjustments.

(7) Refer to table 2-3. Position V-belt in applicable combination of pulleys for desired speed setting. If medium speed is selected, adjust position of drive motor assembly on motor mount platform to allow for alignment of output pulley (olive drab with yellow perimeter) with motor pulley (olive drab). Refer to paragraph 4-25.

Table 2-3. Pulley Speed Settings.

SPEED	MOTOR PULLEY	OUTPUT PULLEY
Low	Red	Olive drab with yellow perimeter
Medium	Olive drab	Olive drab with yellow perimeter
High	Olive drab	Olive drab with red perimeter

CAUTION

Before adjusting tension on V-belt, ensure that motor pulley and output pulley used in speed setting are in proper alignment. Installing belt in pulleys that are misaligned will lead to excessive wear on belt.

(8) Check position of output pulley (on V-belt driven pulley assembly) (10) to ensure proper alignment with motor pulley (11) to be used in speed setting.

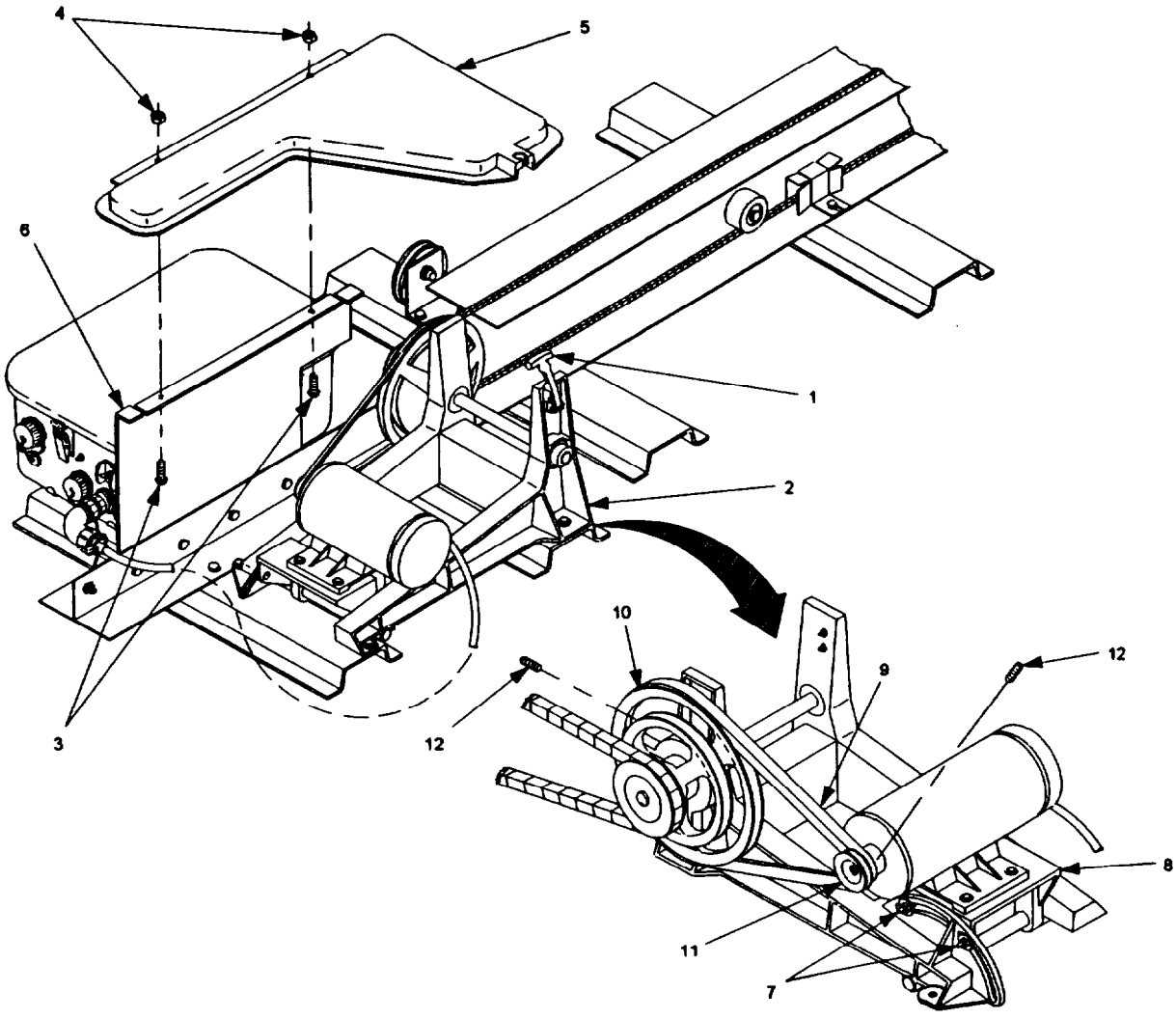


Figure 2-3. Setting Speed of IMTC.

NOTE

Perform steps (9) through (12) only If alignment of output pulley with motor pulley is required.

(9) Remove setscrew (12) from V-belt driven pulley assembly.

(10) Adjust position of V-belt driven pulley assembly on counter shaft so that output pulley is properly aligned with motor pulley.

(11) Apply sealing compound (item 12, appendix D) to setscrew.

2-3 ASSEMBLY AND PREPARATION FOR USE - Continued.

(12) Install setscrew and tighten until V-belt driven pulley assembly is firmly secured on counter shaft.

NOTE

Adjust V-belt tension to allow no more than 1/2 in (1.27 cm) slack in belt when pressed with thumb.

(13) Adjust tension on V-belt (9) and tighten adjustment bolts (7) on motor mount platform (8).

(14) Apply sealing compound (item 12, appendix D) to threads of pan-head screws (3).

(15) Position drive mechanism cover (5) on cover bracket (6) and install two pan-head screws and hex nuts (4).

(16) Fasten flex draw latch (1) and secure cover to drive mechanism assembly (2).

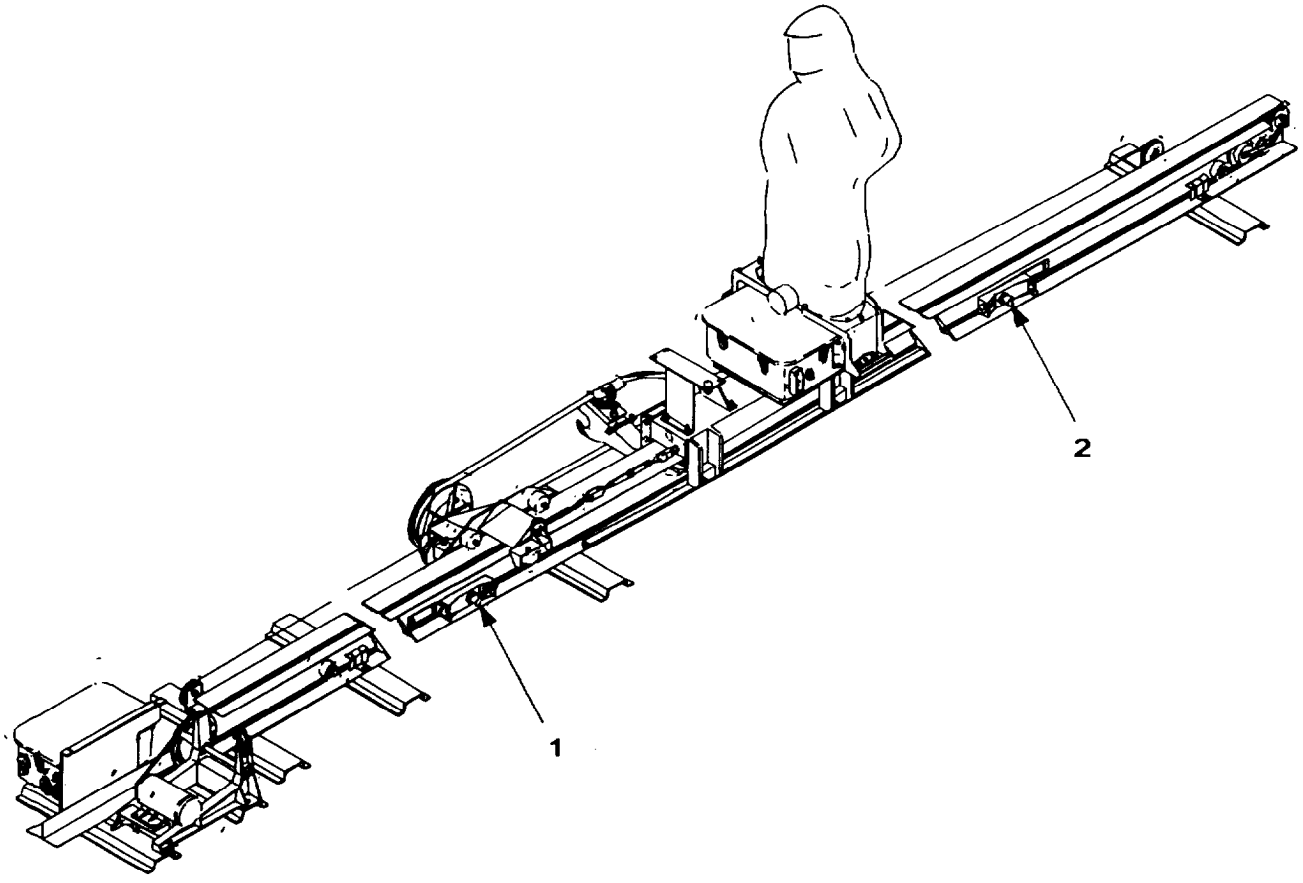


Figure 2-4. Forward and Reverse Proximity Switches.

CAUTION

If IMTC has been set to high speed, move proximity switches to the Innermost position on the track sections, or carriage assembly will fail to stop at the proper limit, resulting in collision and damage to the equipment.

(17) Refer to figure 2-4. Check positions of forward proximity switch (1) and reverse proximity switch (2) on track assemblies. If IMTC has been set to operate at high speed, move both limit switches to the innermost position on the drive end track section and return end track section. Refer to paragraphs 4-17 and 4-33.

(18) Refer to figure 2-5. Position ITM (1) on target mechanism assembly plate (2).

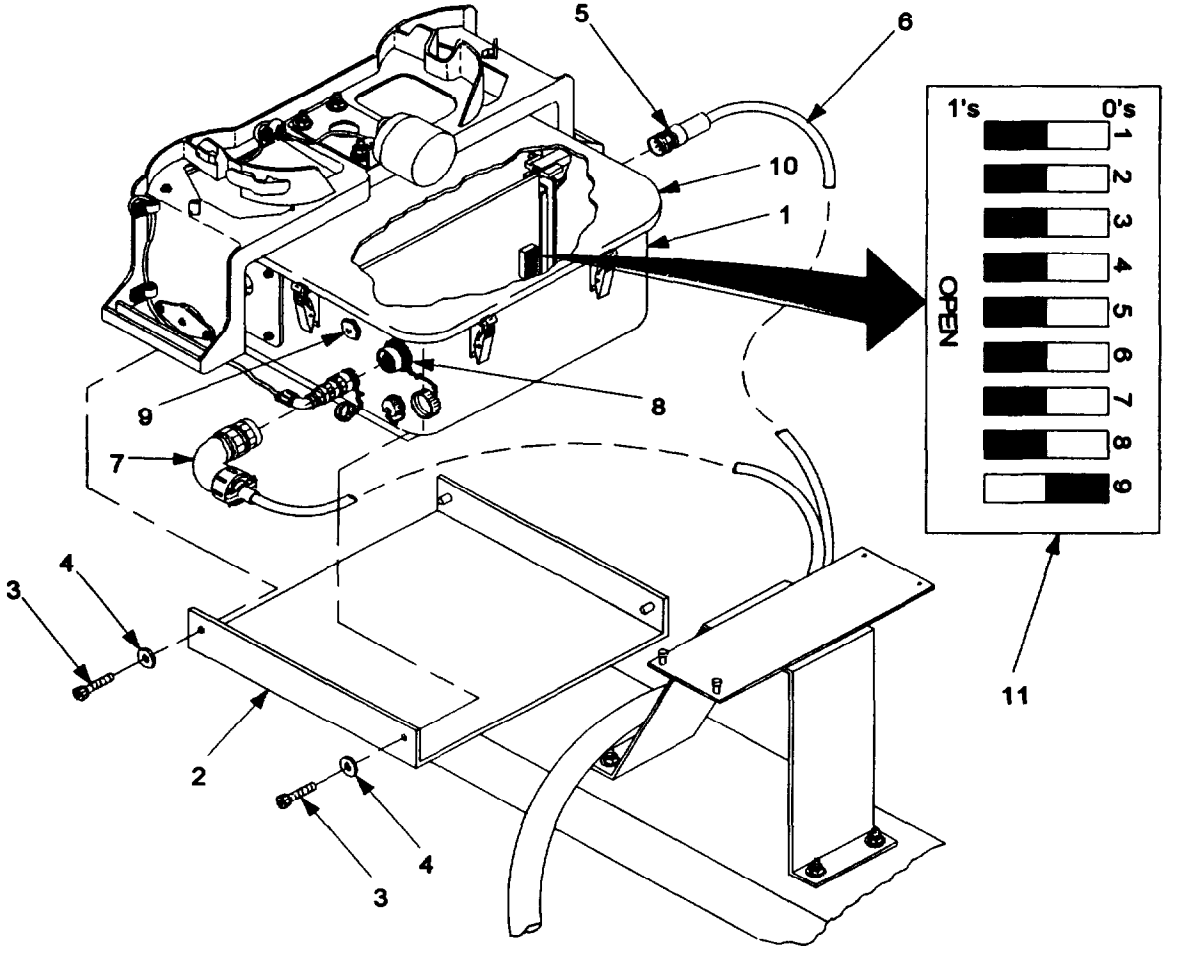


Figure 2-5. Installation of ITM on IMTC.

2-3 ASSEMBLY AND PREPARATION FOR USE - Continued.

(19) Install two hex-head screws (3) and flatwashers (4), and secure ITM on target mechanism assembly plate.

(20) Connect connector P2 (5) on cable assembly W103 (6) to connector J1 on ITM.

(21) Connect connector P3 (7) on cable assembly W103 to connector J3 (8) on ITM.

(22) Press pressure relief valve (9) on ITM to equalize pressure inside housing unit,

NOTE

Target arm must be in the down position before cover assembly on the ITM can be removed.

(23) Release latches and remove cover assembly (10) from ITM.

(24) Using a nonconductible pointed tool, set code on address switch (11) in the "0" and "1" sequence assigned that component (refer to paragraph 2-3c).

(25) Apply grease (item 5, appendix D) to entire surface of gasket on ITM housing, reinstall cover assembly on ITM, and fasten latches.

NOTE

The ITM has single- and double-target-arm configurations. Procedures for installing targets on the double target arm are the same as those for installing a target on the single target arm.

(26) Refer to figure 2-6. Remove hit sensor shield (1) from hit sensor assembly (2) on ITM.

(27) Loosen capscrew (part of hit sensor clamp assembly) and remove hit sensor clamp assembly (3) and spacer (4) from hit sensor assembly.

NOTE

Target arm must be in the down position for target installation.

(28) Position target (5) on target arm.

(29) Standing at rear of target, latch right side of target to mounting hooks (6) on right side of target arm.

(30) Latch left side of target to mounting hooks on left side of target arm.

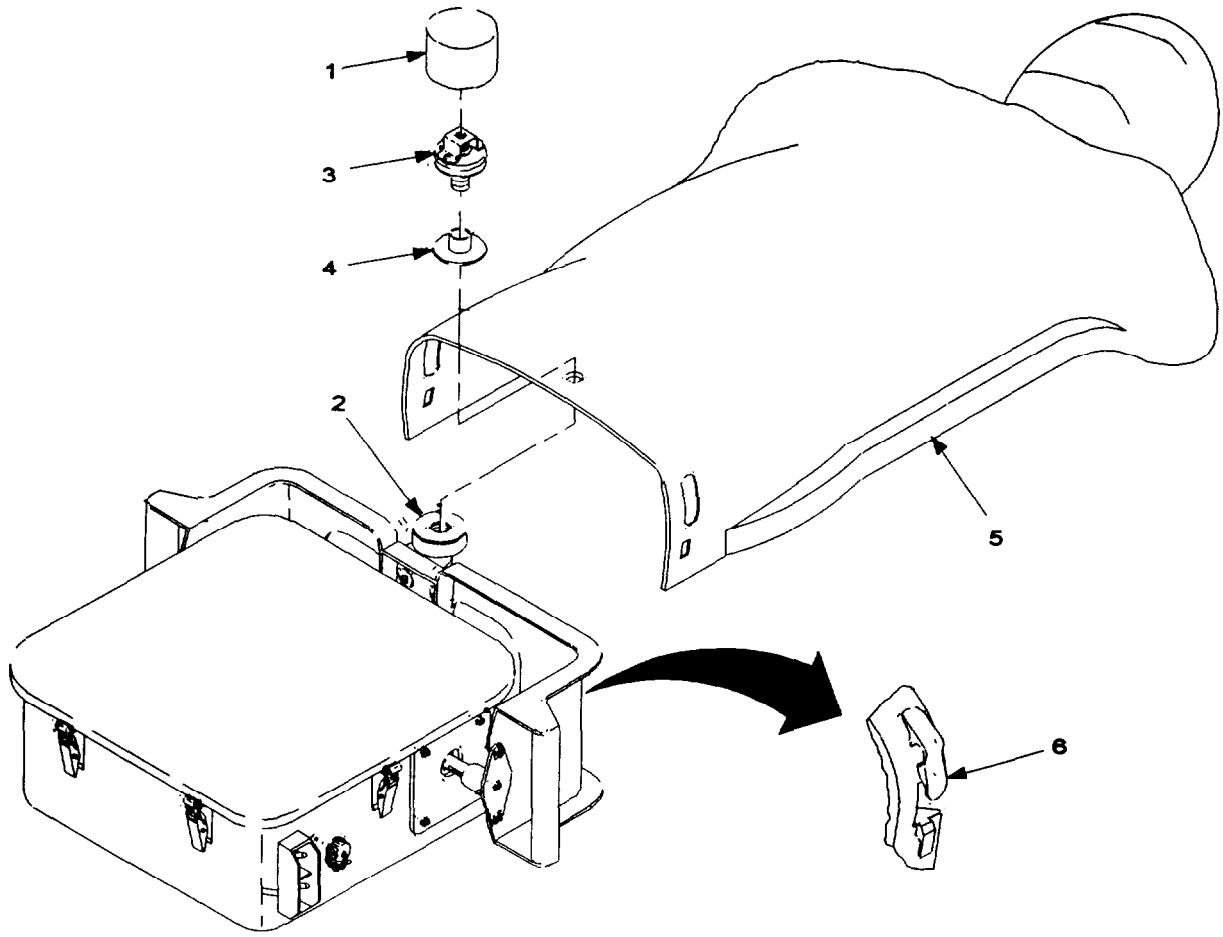


Figure 2-6. Installation of Target on ITM.

CAUTION

Do not overtighten capscrew on hit sensor clamp assembly. Overtightening capscrew can deform clamp and lead to false hit counts during range operation.

NOTE

To increase sensitivity of hit sensor to target hits, position spacer with nipple facing inward, toward hit sensor. For less sensitive recording of hits, position spacer with nipple facing outward, away from hit sensor.

(31) Position spacer and hit sensor clamp assembly on target and hit sensor assembly. Hand-tighten capscrew until snug; then tighten one-half additional turn.

2-3 ASSEMBLY AND PREPARATION FOR USE - Continued.

(32) Install hit sensor shield on hit sensor assembly.

NOTE

Perform steps (33) through (35) only if a Muzzle Flash Simulator (MFS) Is used in scenario.

(33) Refer to figure 2-7. Position MFS (1) on MFS support assembly (2).

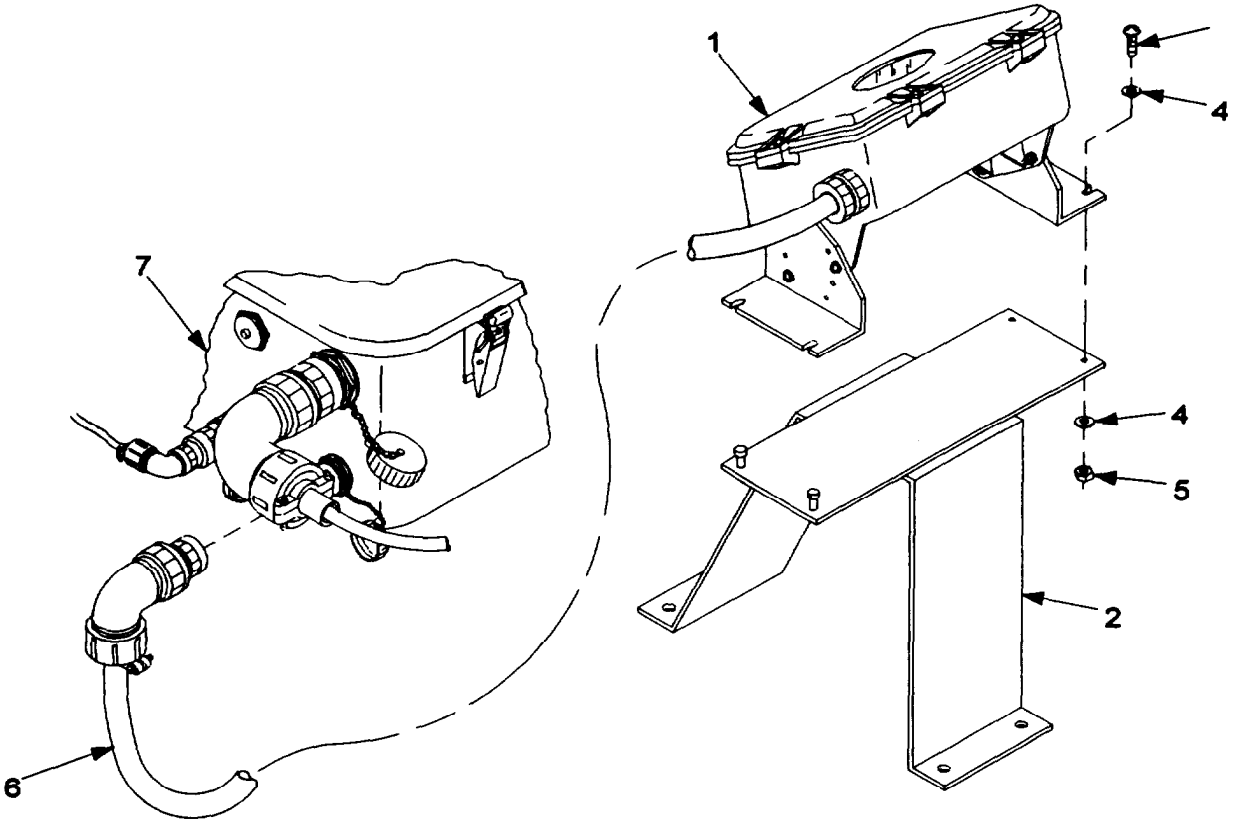


Figure 2-7. Installation of MFS on IMTC.

(34) Install two pan-head screws (3), four flatwashers (4), and two self-locking nuts (5), and secure MFS on MFS support assembly.

(35) Connect connector P1 on MFS cable assembly (6) to connector J4 on ITM (7).

(36) Check tension on drive belt assembly kit and adjust as required (reference paragraph 4-10).

(37) Set circuit breaker CB1 on ITM to POWER ON.

(38) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(39) Set circuit breaker on ICB to ON.

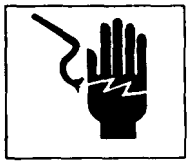
(40) Perform IMTC self-test (reference paragraph 2-4a).

(41) Perform ITM self-test (reference paragraph 2-4b).

(42) Contact RCS - ERETS and run test of IMTC. Observe operation of IMTC and ITM. Report any malfunctions to unit maintenance.

b. Assembly and Preparation of ITM. If ITM is used as a moving target mechanism, refer to subparagraph a above for instructions on assembly and preparation for use. If ITM is used as stationary target mechanism, perform the following steps to assemble and prepare the ITM for operation:

WARNING



Before working on the ITM, set circuit breakers on ICB and ITM to OFF. Failure to do so could result in electrical shock and death or Injury to personnel.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on ITM to POWER OFF.

(3) Check code setting on address switch (reference paragraph 2-3a) and reset if not correct (reference paragraph 2-3c).

(4) Install target on target arm assembly (reference paragraph 2-3a).

NOTE

Perform step (5) only if an MFS is used in scenario.

(5) Refer to figure 2-8. Connect connector P1 (1) on MFS cable assembly to connector J4 (2) on ITM (3).

(6) Set circuit breaker CB1 on ITM to POWER ON.

(7) Set circuit breaker on ICB to ON.

(8) Perform ITM self-test (reference paragraph 2-4b).

(9) Contact RCS - ERETS to run test of ITM. Observe operation of ITM and report any malfunctions to unit maintenance.

2-3 ASSEMBLY AND PREPARATION FOR USE - Continued.

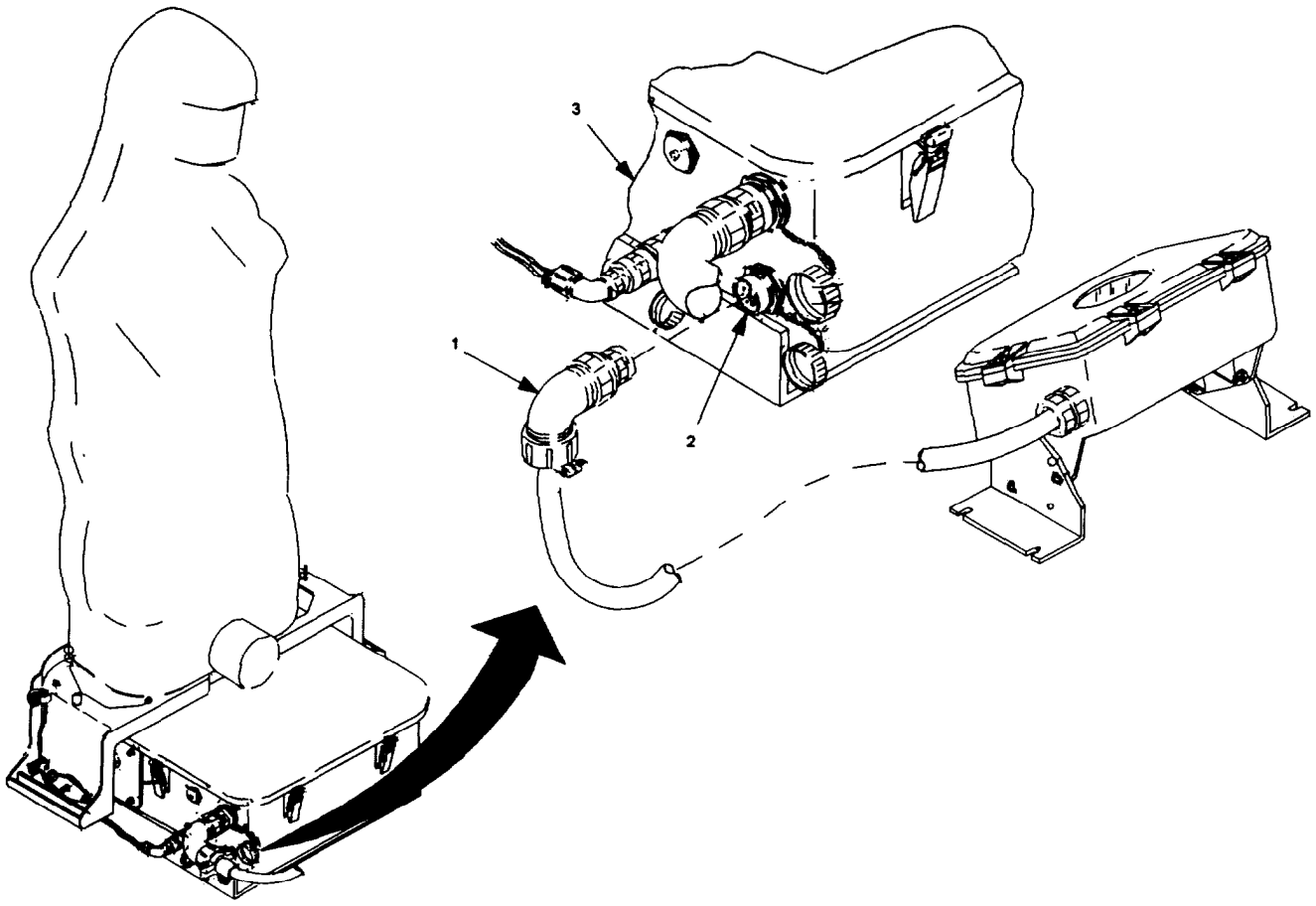


Figure 2-8. Connection of MFS to ITM.

c. Setting the Binary Code on the ITM Address Switch. Each individual ITM on a ERETS range is assigned a specific number or target address (reference paragraph 1-18c (1)). The address of the individual ITM is determined by the setting on the address switch, located on the control logic CCA (refer to figure 2-9). The target address assigned to the ITM is based on a binary numbering system. A total of nine switches on the address switch can be positioned in "0" and "1" combinations that represent a binary code. The binary code is a combination of binary numbers that are used to identify target numbers 1 through 511.

Binary numbers are obtained from a method of counting that compounds the value of each successive numeral. Table 2-4 shows the binary number that is represented by each one of the nine switches and the real number to which it is equal.

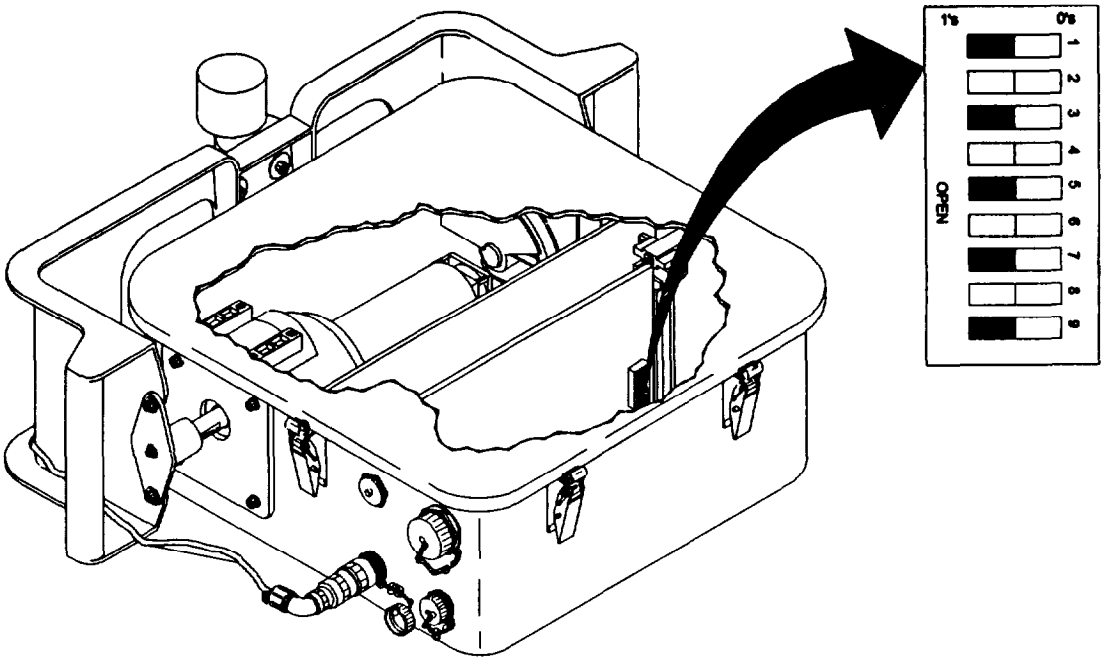


Figure 2-9. Setting Address Code on ITM.

Table 2-4. Binary Numbers on Address Switch.

BINARY NUMBER (ADDRESS SWITCH NUMBER)	EQUALS REAL NUMBER
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128
9	256

Address code settings are determined by selecting the correct combination of binary numbers whose real number equivalents, when added together, will equal the target number. For each binary number that is selected, the corresponding switch on the address switch must be set to the "1" or OPEN position. The remaining switches must be left in the "0" or closed position. To position one of the nine switches to a setting of "1," use a non-conductible pointed tool and set switch toward the side of the address switch labeled “OPEN.” To position one of the nine switches to a setting of "0," use a non-conductible pointed tool and set switch toward the side of the address switch marked with numbers "1" through "9."

2-3 ASSEMBLY AND PREPARATION FOR USE - Continued.

To arrive at the combination of binary numbers that will equal the target number, first select the largest of the nine binary numbers whose equivalent real number can be subtracted from the target number (refer to table 24). Subtract the real number (that is equivalent to the binary number) from the target number. Then continue to subtract the largest possible binary number from each remaining real number, until zero is reached. For each binary number selected, the corresponding address switch is then set to the OPEN position. The remaining switches are left in the closed position.

For example, if the target number is 341, the binary code setting on the address switch would be determined as follows:

```
 341  (target number)
-256  (real number value of binary number 9)
  85
 -64  (real number value of binary number 7)
  21
 -16  (real number value of binary number 5)
   5
  -4  (real number value of binary number 3)
   1
  -1  (real number value of binary number 1)
   0
```

When the real number equivalents of binary numbers 1, 3, 5, 7, and 9 are added together, the result is 341, the same number as the target. Address switches 1, 3, 5, 7, and 9 would then be set to OPEN. The remaining switches would left in the closed position.

A complete list of code settings on address switch for target numbers 1 through 511 is provided in TM 9-6920-742-14-1.

2-4 INITIAL ADJUSTMENTS, DAILY CHECKS, AND SELF-TEST.

a. IMTC Self-Test. Perform the following test procedures to determine whether the IMTC is operating correctly. Refer to figure 2-10.

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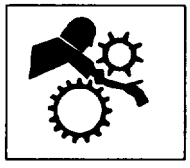


When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped.

(1) Position carriage assembly (1) over reverse (retreat limit) proximity switch (2) on return end track section.

(2) Set test switch S-1 (3) on IMTC electronic components assembly (4) to ATTACK and observe carriage assembly. Carriage assembly should travel to drive end track section and stop.

(3) Position carriage assembly over forward (attack limit) proximity switch (5) on drive end track section.

(4) Set test switch S-1 on IMTC electronic components assembly to RETREAT and observe carriage assembly. Carriage assembly should travel to return end track section and stop.

(5) If carriage assembly will not perform either test function satisfactorily, report malfunction to unit maintenance.

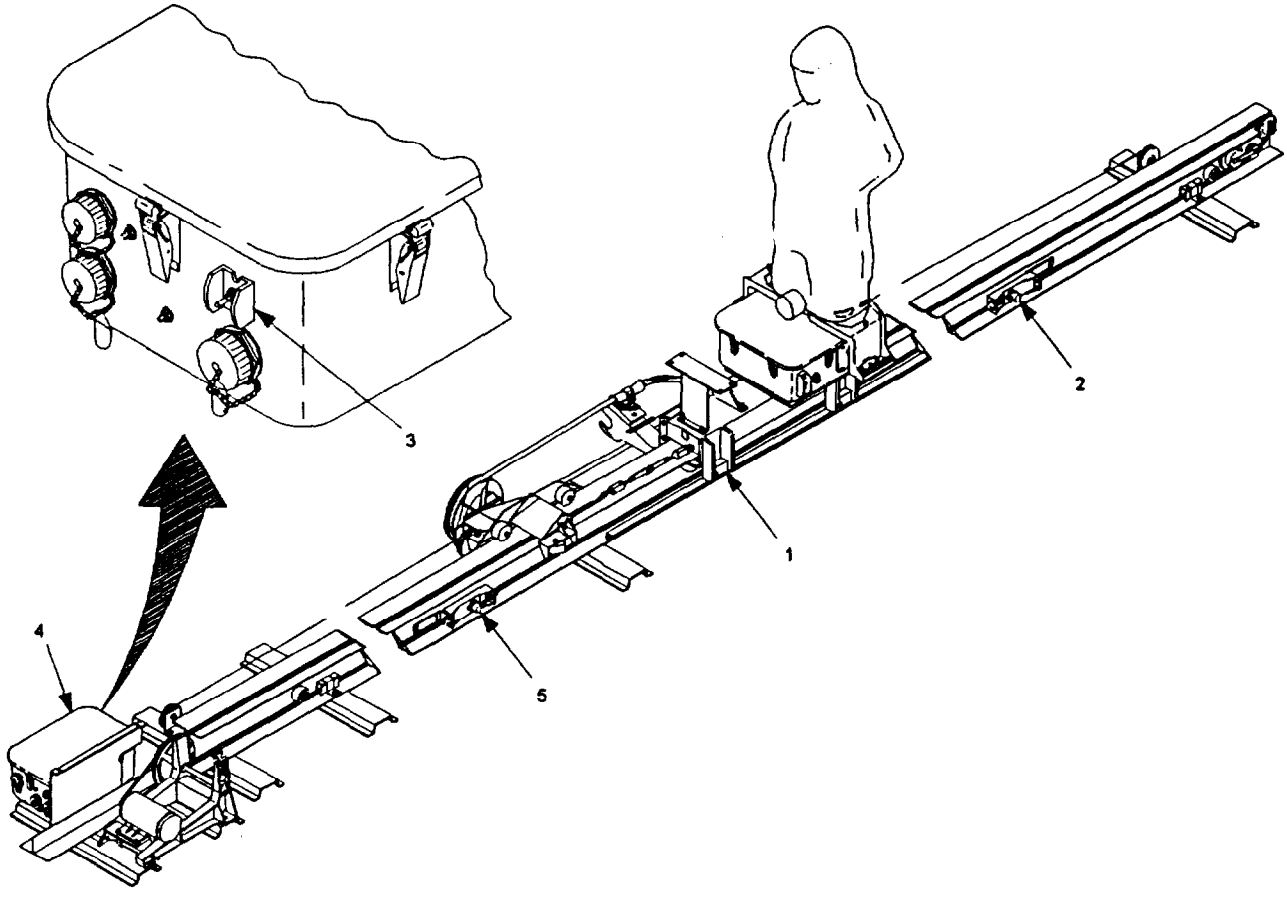
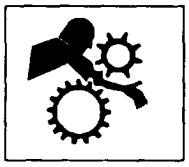


Figure 2-10. IMTC Self-Test.

b. ITM Self-Test. Perform the following test procedures to determine whether the ITM is operating correctly. Refer to figure 2-11.

2-4 INITIAL ADJUSTMENTS, DAILY CHECKS, AND SELF-TEST - Continued.

WARNING



When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 is tripped.

(1) Set test/operate switch S-1 (1) to TARGET TEST and observe target arm (2). Target arm should move to the up position, then return to the down position each time the switch is set to TARGET TEST.

(2) If ITM does not perform test function satisfactorily, report malfunction to unit maintenance.

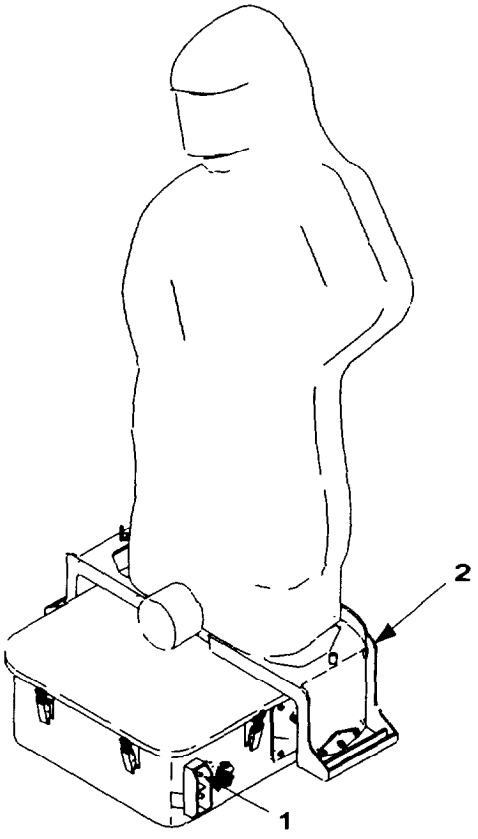


Figure 2-11. ITM Self-Test.

2-5 OPERATING PROCEDURES.

Operation of the IMTC and the ITM is controlled by commands from the RCS - ERETS. Refer to TM 9-6920-742-14-1.

2-6 DECALS AND INSTRUCTION PLATES.

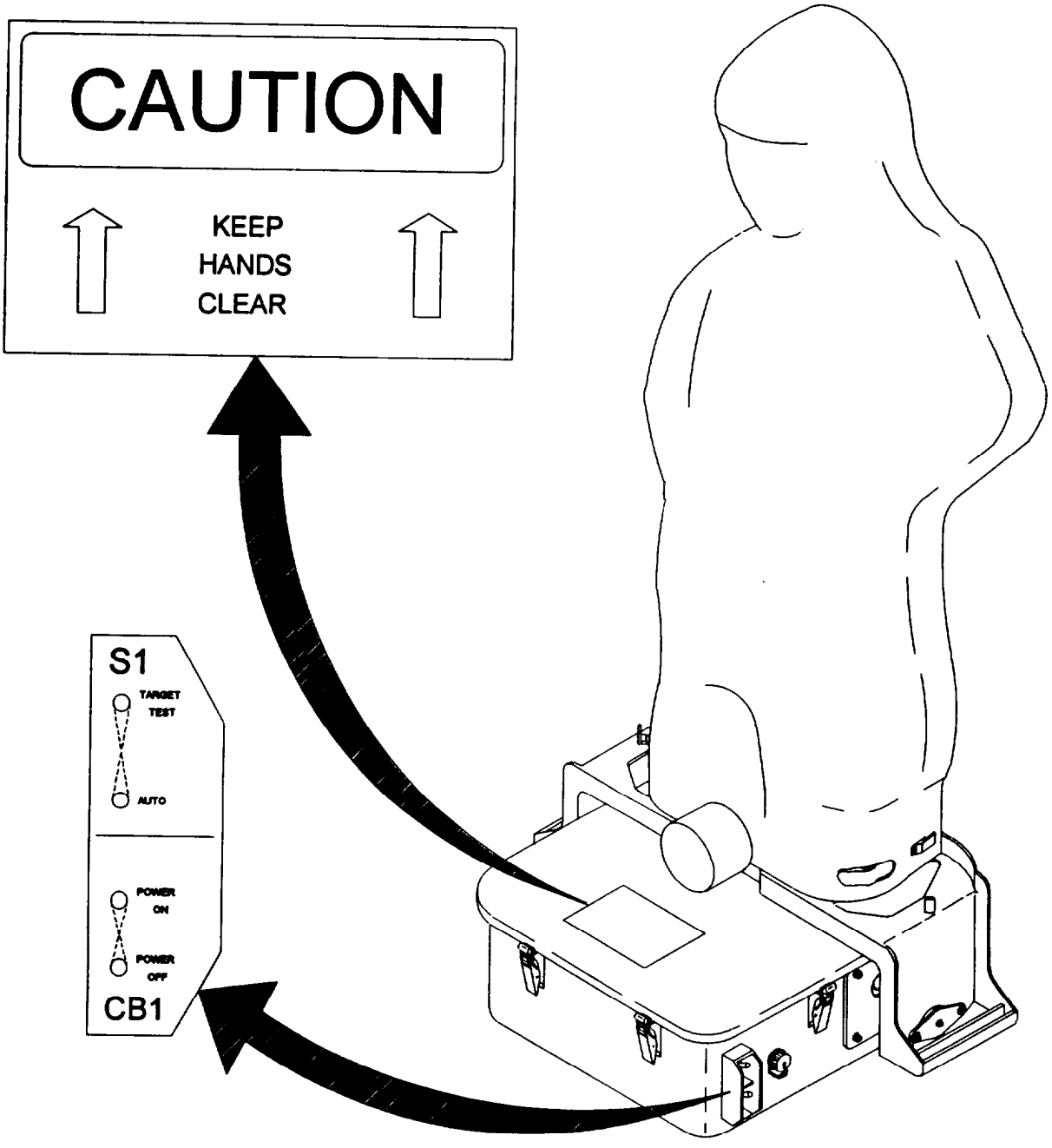


Figure 2-12. Decals and Instruction Plates on ITM.

2-6 DECALS AND INSTRUCTION PLATES - Continued.

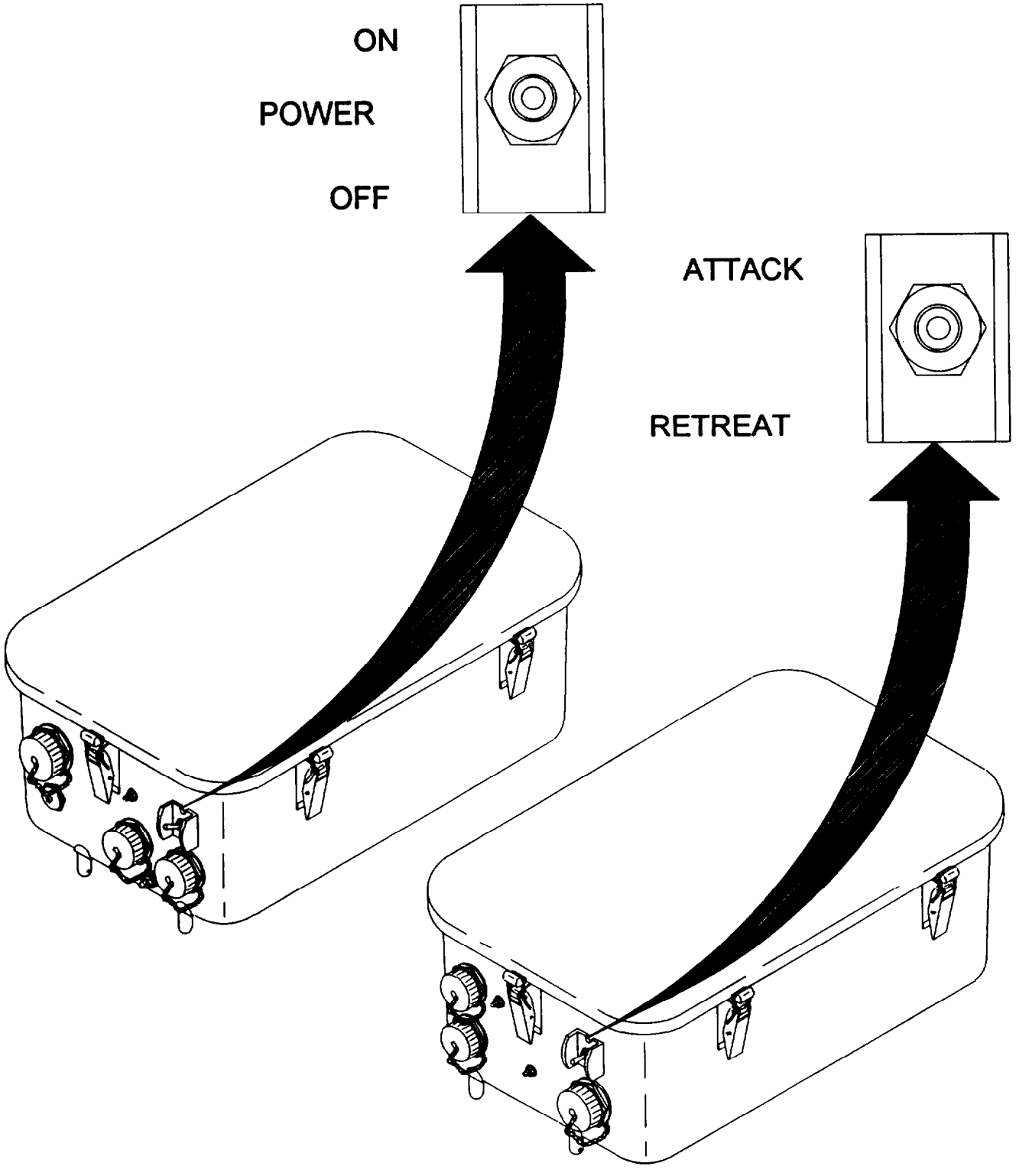


Figure 2-13. Decals and Instruction Plates on IMTC (Sheet 1 of 2).

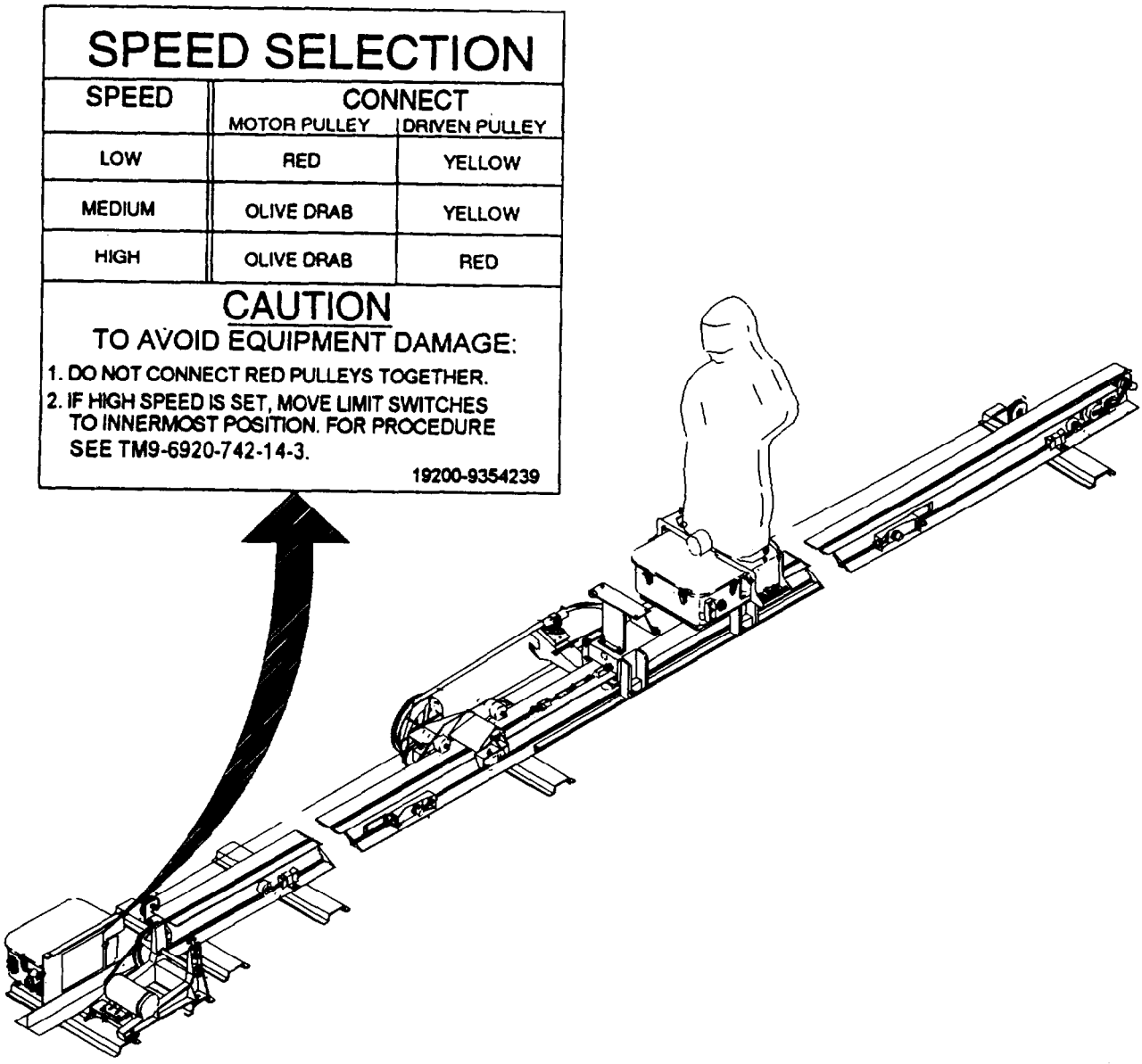


Figure 2-13. Decals and Instruction Plates on IMTC (Sheet 2 of 2).

SECTION IV. OPERATION UNDER UNUSUAL CONDITIONS

2-7 COLD WEATHER OPERATION.

When operating the IMTC or ITM during cold weather, care must be taken to keep the targets free of ice and snow buildup. The hubs on the ITM can be broken when raising a target that is covered with ice or snow, or when the target is frozen to the ground. Before beginning range operations under cold weather conditions, remove any snow or ice buildup from the targets. Ensure that all targets can move freely and are not frozen to the ground. Chip away ice as required to free target where it contacts the ground surface.

CHAPTER 3

OPERATOR MAINTENANCE INSTRUCTIONS

SECTION I. LUBRICATION INSTRUCTIONS

3-1 LUBRICATION.

No scheduled lubrication of the Target Training Set Track System - Infantry (IMTC) or the Training Target Holding Set (ITM) by the operator is required.

SECTION II. OPERATOR TROUBLESHOOTING PROCEDURES

3-2 GENERAL.

No troubleshooting procedures for the IMTC or the ITM apply to the operator.

SECTION III. OPERATOR MAINTENANCE PROCEDURES

3-3 GENERAL.

No maintenance procedures for the IMTC or the ITM are tasked at the operator level of maintenance.

CHAPTER 4

UNIT MAINTENANCE INSTRUCTIONS

SECTION I. SERVICE UPON RECEIPT

4-1 GENERAL.

Unpacking, installation, and preliminary servicing and adjustment of the Target Training Set Track System - Infantry (IMTC) and the Training Target Holding Set (ITM) are performed by Armament and Chemical Acquisition and Logistics Activity (TACOM-ACALA) and the Corps of Engineers. Other than inspection of replacement parts, no service upon receipt is required by unit level maintenance.

SECTION II. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-2 GENERAL.

a. Corrosion. Refer to paragraph 1-5.

b. Monthlv Touchup/Spot Painting. Painting is limited to touchup/spot painting.

c. Daily. Always keep in mind the WARNINGS and CAUTIONS. Perform your daily (D) PMCS prior to the IMTC or ITM performing its intended mission.

d. Weekly. Always keep in mind the WARNINGS and CAUTIONS while you perform your weekly (W) PMCS.

e. Monthly. Always keep in mind the WARNINGS and CAUTIONS while you perform your monthly (M) PMCS.

f. If Your Equipment Fails to Operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms. See DA PAM 738-750.

4-3 PMCS PROCEDURES.

a. Preventive Maintenance Checks and Services Table. Lists the inspections and care of your equipment required to keep it in good operating condition.

b. Item Number Column. The item number column is used for reference. When completing DA Form 2404, Equipment Inspection and Maintenance worksheet, include the item number for the check/service indicating a fault. Item numbers also appear in the order that you must do checks and services for intervals listed.

c. Interval Column. The interval column tells you when to do a certain check or service.

4-2. GENERAL - Continued.

d. Perform Weekly as Well as Before Operations PMCS if.

(1) You are assigned operator and have not operated the IMTC or ITM since the last weekly.

(2) You are operating the IMTC or ITM for the first time.

e. While You Perform PMCS. Have Tools with You and Keep an Eye Out for the Following.

(1) Loose Bolts. A loose bolt can be difficult to spot without using a wrench. However, you can often identify loose bolts by observing loose or chipped paint around bolt head and bare metal or rust at its base. Tighten loose bolt and spot paint as required.

(2) Damaged Welds. Damaged welds may be detected by observing rust or chipped paint where cracks occur.

(3) Frayed Electrical Wires and Loose Connectors. Check electrical wiring for cracks due to aging and exposed wires that could cause an electrical short. Tighten loose clamps and connectors.

(4) Corrosion. Check for signs of deterioration, rust, unusual cracking, softening, swelling, or breaking.

f. Leakage Definitions for PMCS Shall Be Classified as Follows.

CAUTION

Equipment operation is allowable with minor leakages (Class I or II). Of course, you must consider the fluid capacity in the item/system being checked or inspected. When in doubt, notify your supervisor. When operating with Class I or Class II leaks, continue to check fluid levels as required in your PMCS.

(1) Class I leakage is seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

(2) Class II leakage is leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.

(3) Class Ill leakage is leakage of fluid great enough to form drops that fall from item being checked/inspected. Class III leaks should be reported to your supervisor or direct support maintenance.

g. Damage Definitions Are as Follows.

(1) Burr. A raised portion, restricting the entrance of a part, component, or assembly.

(2) Crack. A narrow break or separation in material.

(3) Gouge. A groove or cavity in a sealing surface that cannot be repaired.

(4) Nick. An indention caused by object(s) striking the material.

h. The Item to be Checked or Serviced Column. indicates the item to be serviced.

i. The Procedures Column. Tells you how to do the required checks and services. Carefully follow these instructions. if you do not have the tools, or if the procedure tells you to, notify unit maintenance.

j. If Your Equipment Does Not Perform as Required. Refer to the troubleshooting table for possible problems. Report any malfunctions or failures on DA Form 2404, or refer to DA Pam 738-750.

Table 4-1. Unit Preventive Maintenance Checks and Services.

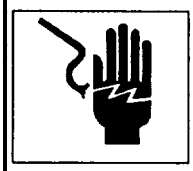
ITEM NO	INTERVAL D	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED 0R ADJUSTED AS NECESSARY	EQUIPMENT NOT READY/ AVAILABLE IF:
					WARNING	
					**Before performing PMCS, ensure that circuit breakers on interconnecting box (ICB), IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or injury to personnel.**	
					IMTC	
1			•	Electronic Components Assembly	Ensure that cables are firmly attached to electric connectors on housing. Tighten any loose cable connections.	
					Check for loose, corroded, or damaged electric connectors. install covers on any electric connectors not in use.	Electric connectors are loose, corroded, or damaged.
					Ensure that cover is firmly latched and provides proper seal for housing. Fasten any loose latches. if seal is bad, replace housing gasket (reference paragraph 4-34).	Cover does not provide proper seal for housing.
					Check for loose, damaged, or missing attaching hardware.	
					Ensure that lockpins are properly installed in housing legs.	

Table 4-1. Unit Preventive Maintenance Checks and Services - Continued.

ITEM NO	INTERVAL D	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OF ADJUSTED AS NECESSARY	EQUIPMENT NOT READY/ AVAILABLE IF:
2			•	Drive Mechanism Assembly	Check for loose, damaged, or missing mounting hardware.	**Mounting hardware does not adequately secure assembly.**
					Check for any visible **damage to** mounting platforms, pulleys, or drive motor. Ensure that motor and output pulleys are properly aligned.	**Pulleys are damaged or not aligned.**
					Ensure that adjustment bolts on motor mount platform are tight. Tighten **any** loose adjustment bolts (reference paragraph 4-24).	
					Check V-belt for fraying and other signs of wear or damage. Check tension on V-belt. Belt should deflect no more than 1/2 inch (in) (1.27 centimeters {cm}) when depressed with thumb. If belt has more than 1/2 in (1.27 cm) play, adjust belt tension (reference paragraph 4-24). Replace belt if frayed or worn (reference paragraph 4-24).	**V-belt is worn or loose.**
					Ensure that cable on drive motor has not been damaged or severed. Ensure that connector on cable is firmly secured to electronic components assembly.	**Drive motor cable is damaged.**
3			•	Drive Belt Assembly	Check for loose, damaged, or missing attaching hardware.	**Attaching hardware is loose, damaged, or missing.**
					Check belt for broken teeth, fraying, or other visible signs of wear or damage. Check for damage caused by ITM target hitting belt. Replace belt if damaged (reference paragraph 4-11). Check for any signs that belt tension is not properly adjusted. Adjust belt kit tension if required (reference paragraph 4-10).	**Belt is worn or damaged.Belt tension is not properly adjusted.**

Table 4-1. Unit Preventive Maintenance Checks and Services - Continued.

ITEM NO	INTERVAL D	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OF ADJUSTED AS NECESSARY	EQUIPMENT NOT READY/ AVAILABLE IF:
4			•	Trolley Assembly	Check for loose, damaged, or missing mounting hardware.	Mounting hardware does not adequately secure parts.
					Check for any visible damage to trolley frame, cable sheaves, or mounting supports.	
					Check for binding or frozen wheels by manually moving trolley assembly on tracks to ensure free movement.	Trolley assembly does not move freely on tracks.
					NOTE **When conducting PMCS on IMTC, perform checks and services on ITM while inspecting the carriage assembly. Refer to item numbers 9 through 11 in this table.**	
5			•	Carriage Assembly	Check for loose, damaged, or missing mounting hardware.	Hardware does not adequately secure parts.
					Check for loose or damaged cable clamps. Ensure that cables are properly secured by clamps.	Cables are not property secured by clamps.
					Check for any visible damage to carriage frame, mounting platforms, pulleys, sheaves, or cable support assembly.	
					Check for binding or frozen wheels by manually moving carriage assembly on tracks to ensure free movement.	Carriage assembly does not move freely on tracks.

Table 4-1. Unit Preventive Maintenance Checks and Services - Continued.

ITEM NO	INTERVAL D	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OF ADJUSTED AS NECESSARY	EQUIPMENT NOT READY/ AVAILABLE IF:
6			•	Track Assemblies	Check for loose, damaged, or missing attaching hardware.	
					Ensure that track sections are firmly secured to crossmembers. Ensure that splice connections between tracks are firmly secured.	Tracks are not properly spliced or connected to crossmembers.
					Check for loose, damaged, or missing bonding wires.	Bonding wires are damaged or missing.
					Check for any visible damage to pulleys, cable sheaves, or cable tensioner.	Pulleys, sheaves, or cable tensioner are loose or damaged.
					Check for damaged or missing cable clamps and belt guards.	
					Check for and remove any debris from track sections. Clean dirt, dust, mud, and other foreign material from track sections.	Track surfaces are not clean and free of debris.
7			•	Trolley Cable	Check for loose, damaged, or missing attaching hardware.	Attaching hardware is loose, damaged, or missing.
					Check for fraying or other visible signs of wear or damage. Check for any signs that cable is loose or not correctly aligned.	Cable is worn, loose, or not aligned.
					Ensure that clamp attached to cable support on carriage assembly does not bind cable.	
					Ensure that cable is properly seated in all pulleys.	Cable is not property seated in pulleys.

Table 4-1. Unit Preventive Maintenance Checks and Services - Continued.

ITEM NO	INTERVAL D	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT NOT READY/ AVAILABLE IF:
8			•	Cable Assembly W103	Ensure that cable is firmly attached to electric connectors on ITM and IMTC electronic components assembly.	
					Ensure that cable is properly seated in cable sheaves on trolley assembly and crossmember.	Cable assembly is not properly seated in sheaves.
					Ensure that all cable clamps are in place and properly secure cable.	Cable assembly is not properly secured by clamps.
					Ensure that cable has not been cut or severed by weapons fire. Visually inspect cable for damage due to abrasive contact with ground surface. Ensure that cable insulation is intact and no wires are exposed.	Cable assembly is cut or wiring is exposed.
					ITM	
9			•	Housing and Cover	Ensure that cables are firmly attached to electric connectors on housing. Tighten any loose cable connections.	
					Check for loose, corroded, or damaged connectors. Install covers on any connectors not in use.	Connectors are loose, corroded, or damaged.
					Ensure that cover is firmly latched and provides proper seal for housing. Fasten any loose latches. If seal is bad, replace housing gasket (reference paragraph 4-43).	Cover does not provide proper seal for housing.
					Check for loose, damaged, or missing mounting hardware.	Mounting hardware does not adequately secure assembly.

Table 4-1. Unit Preventive Maintenance Checks and Services - Continued.

ITEM NO	INTERVAL D	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OF ADJUSTED AS NECESSARY	EQUIPMENT NOT READY/ AVAILABLE IF:
10			•	Target Arm and Target	Check for loose, damaged, or missing attaching hardware. Check screw that secures target hub to drive shaft. Tighten and torque screw if loose (reference paragraph 4-47 or 4-50).	Attaching hardware does not adequately secure target arm.
					Check target to ensure it is adequately secured to target arm.	Target is not adequately secured to target arm.
					Check for any visible damage to target arm.	
					If operating range in winter conditions, ensure that target is not frozen to ground. Remove ice or snow as required to allow for free movement of target.	Target will not move freely.
11			•	Hit Sensor Assembly	Check for damaged or missing hit sensor shield.	Hit sensor is not adequately protected by shield.
					Ensure that cable is firmly attached to electric connector on housing. Tighten cable connection, if loose.	
					Ensure that cable has not been cut or severed by weapons fire. Ensure that cable insulation is intact and no wires are exposed.	Cable is cut or wiring is exposed.
					Ensure that target is firmly secured by clamp. Tighten clamp if loose.	

SECTION III. TROUBLESHOOTING

4-4 TROUBLESHOOTING PROCEDURES.

Table 4-2 lists the common malfunctions that you may find during operation or maintenance of the IMTC and ITM. You should perform the tests/inspections and corrective actions in the order listed. Before you begin troubleshooting the IMTC or ITM, ensure that unit PMCS has been performed. The following procedures are based on the premise that unit PMCS has been completed. If in doubt, perform PMCS in accordance with the procedures described in table . This manual cannot list all the malfunctions that may occur nor all the tests or inspections and corrective actions. Notify your supervisor if a malfunction persists and cannot be corrected by prescribed action.

WARNING

Personnel working with or near high voltages must be trained and certified in mouth-to-mouth and cardiopulmonary resuscitation. Installation medical activities shall provide certified instructors. Newly assigned maintenance personnel must be trained as soon as practical. Make sure at least two persons are in the area at all times when work is being performed on exposed live circuits carrying 30 volts or more.

Malfunction Index

Table 4-2. Unit Troubleshooting Procedures.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. IMTC fails to operate on command.

Step 1. Ensure that circuit breakers on interconnecting box (ICB), IMTC electronic components assembly, and ITM are set to the on position.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

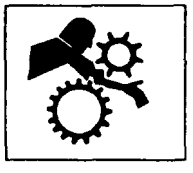
If all circuit breakers are on and holding, proceed to step 2.

If circuit breaker on ICB trips, reference TM 9-6920-742-14-4.

If circuit breaker on IMTC electronic components assembly trips, reference malfunction 5.

If circuit breaker on ITM trips, reference malfunction 12.

WARNING



When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-l is tripped.

Step 2. Perform ITM self-test (reference paragraph 2-4b).

If ITM responds to self-test satisfactorily, proceed to step 3.

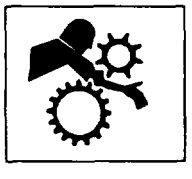
If ITM does not respond to self-test satisfactorily, perform steps 5 and 6, and proceed to step 7.

Step 3. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position. Remove cover from ITM (reference paragraph 4-44) and check code on address switch.

If the code is set correctly on the address switch, reinstall cover on the ITM (reference paragraph 4-44). Set circuit breakers on ITM, IMTC electronic components assembly, and ICB to the on position. Proceed to step 4.

If the wrong code has been set on the address switch, set the correct code (reference paragraph 2-3c) reinstall cover on the ITM (reference paragraph 4-44). Set circuit breakers on ITM, IMTC electronic components assembly, and ICB to the on position. Retest unit from RCS.

WARNING



When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 4. Perform IMTC self-test (reference paragraph 2-4a).

If IMTC responds to self-test satisfactorily, perform steps 5 and 6, and proceed to step 8.

If IMTC does not respond to self-test satisfactorily, perform steps 5 and 6, and proceed to step 7.

Step 5. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position.

Step 6. Disconnect connector P1 on cable assembly W103 from connector J4 on IMTC electronic components assembly. Connect connector P1 on cable assembly W103 to connector J29 on the IMTC breakout box. Connect connector P1 on IMTC breakout box cable to connector J4 on the IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position.

Step 7. Set multimeter to dc volts. Connect positive lead on multimeter to +24 VDC test jack (J3) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on IMTC breakout box. Multimeter should read +30 ±I0 vdc.

Connect positive lead on multimeter to +24 VDC test jack (J4) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on IMTC breakout box. Multimeter should read +30 ±10 vdc.

If both multimeter readings indicate correct voltage, perform step 24 and proceed to step 25.

If either multimeter reading does not indicate correct voltage, notify next higher level of maintenance.

Step 8. Ensure that multimeter is set to dc volts. Connect positive lead on multimeter to MTC RTRT STATS OUT test jack (J10) on IMTC breakout box. Connect negative lead on multimeter to GRD test jack (J1) on IMTC breakout box. Proceed to step 9.

Step 9. Perform the following checks: Using test switch S-1 to move the carriage assembly, position electrical switch actuator bar over reverse proximity switch; multimeter should read +I0 ±1.5 vdc. Using test switch S-1 to move the carriage assembly, move electrical switch actuator bar off reverse proximity switch; multimeter should read less than 1 vdc.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If multimeter readings indicate correct voltage, proceed to step 10.

If multimeter readings do not indicate correct voltage, perform step 24 and proceed to step 33.

Step 10. Ensure multimeter is set to dc volts. Connect positive lead on multimeter to MTC ATTCK STATS OUT test jack (J11) on IMTC breakout box. Connect negative lead on multimeter to GRD test jack (J1) on IMTC breakout box. Proceed to step 11.

Step 11. Perform the following checks: Using test switch S-1 to move the carriage assembly, position electrical switch actuator bar over forward proximity switch; multimeter should read +10 ±1.5 vdc. Using test switch S-1 to move the carriage assembly, move electrical switch actuator bar off forward proximity switch; multimeter should read less than 1 vdc.

If multimeter readings indicate correct voltage, proceed to step 12.

If multimeter readings do not indicate correct voltage, perform step 24 and proceed to step 27.

NOTE

Ensure that electrical switch actuator bar is positioned over reverse proximity switch before performing steps 12 through 20.

Step 12. Set multimeter to ac volts. Connect positive lead on multimeter to DATA + OUTPUT test jack (J12) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on IMTC breakout box. Proceed to step 13.

Step 13. Direct RCS personnel to issue an ATTACK command to the IMTC. Observe multimeter during transmittal of command for the following indications: Before and after command, multimeter should read approximately 4 ±1 vac; during command, multimeter should indicate 10 ±5 vac.

If multimeter readings indicate correct voltage, proceed to step 14.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher level of maintenance.

Step 14. Ensure that multimeter is set to ac volts. Connect positive lead on multimeter to CLOCK + OUTPUT test jack (J15) on IMTC breakout box. Connect negative lead on multimeter to CLOCK - OUTPUT test jack (J16) on IMTC breakout box. Proceed to step 15.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 15. Direct RCS personnel to send an ATTACK command to the IMTC. Observe multimeter during transmittal of command for following indications: Before and after command, multimeter should read 0 vac; during command, multimeter should indicate varying ac up to 1 v.

If multimeter readings indicate correct voltage, proceed to step 16.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher level of maintenance.

Step 16. Set multimeter to dc volts. Connect positive lead on multimeter to STATUS PWR test jack (J21) on IMTC breakout box. Connect negative lead on multimeter to STATUS PWR RTRN test jack (J22) on the IMTC breakout box. Multimeter should indicate +12 ±1.5 vdc.

If multimeter readings indicate correct voltage, proceed to step 17.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher level of maintenance.

Step 17. Set multimeter to ac volts. Connect positive lead on multimeter to STATUS + INPUT test jack (J19) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on the IMTC breakout box. Proceed to step 18.

Step 18. Direct RCS personnel to issue an ATTACK command to the IMTC. Observe multimeter during transmittal of command for the following indications: Before and after command, multimeter should read approximately 4 ±1 vac; during command, multimeter should indicate 10 ±5 vac.

If multimeter readings indicate correct voltage, proceed to step 19.

If multimeter readings do not indicate correct voltage, perform step 24 and proceed to step 25.

Step 19. Set multimeter to dc volts. Connect positive lead on multimeter to MTC ATTACK INPUT test jack (J7) on IMTC breakout box. Connect negative lead on multimeter to MTC ATT/RET test jack (J8) on IMTC breakout box. Proceed to step 20.

Step 20. Ensure that electrical switch actuator bar is over reverse proximity switch, and direct RCS personnel to issue an ATTACK command to the IMTC. Observe multimeter during transmittal of command: Multimeter should indicate a momentary rise to +5.5 ±5 vdc when ATTACK command is transmitted.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If multimeter reading indicates correct voltage, proceed to step 21.

If multimeter reading does not indicate correct voltage, perform step 24 and proceed to step 25.

Step 21. Position carriage assembly over forward proximity switch. Proceed to step 22.

Step 22. Ensure that multimeter is set to dc volts. Connect positive lead on multimeter to MTC RTRT INPUT test jack (J9) on IMTC breakout box. Connect negative lead on multimeter to MTC ATT/RET test jack (J8) on IMTC breakout box. Proceed to step 23.

Step 23. Ensure that electrical switch actuator bar is over foward proximity switch, and direct RCS personnel to issue a RETREAT command to the IMTC. Observe multimeter during transmittal of command: Multimeter should indicate a momentary rise to +5.5 ±5 vdc when RETREAT command is transmitted.

if multimeter reading indicates correct voltage, perform step 24 and notify next higher level of maintenance.

If multimeter reading does not indicate correct voltage, perform step 24 and proceed to step 25.

Step 24. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position. Disconnect connector P1 on cable assembly W103 from connector J29 on the IMTC breakout box. Disconnect connector P1 on IMTC breakout box cable from connector J4 on the IMTC electronic components assembly. (If next step does not call for removal of cable assembly W103, connect connector P1 on cable assembly W103 to connector J4 on the IMTC electronic components assembly.)

Step 25. Remove cable assembly W103 (reference paragraph 4-39). Set multimeter to ohms and perform continuity check.

If continuity exists, replace ITM (reference paragraph 4-41), reinstall original cable assembly W103 (reference paragraph 4-39), and proceed to step 26.

if continuity does not exist, replace cable assembly W103 (reference paragraph 4-39) and proceed to step 26.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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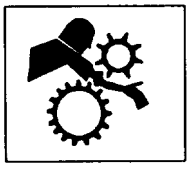

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 is tripped.

Step 26. Set circuit breakers on ITM, IMTC electronic components assembly, and ICB to the on position. Repeat tests in steps 19 through 23.

If unit tests satisfactorily, part(s) replaced were defective and unit is now operational.

If unit does not test satisfactorily, notify next higher maintenance level.

Step 27. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Disconnect connector P1 on cable assembly W104 from connector J5 on IMTC electronic components assembly. Connect connector P1 on cable assembly W104 to connector J30 on the IMTC breakout box. Connect connector P2 on IMTC breakout box cable to connector J5 on IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 28.

Step 28. Set multimeter to dc volts. Connect positive lead on multimeter to +I2 V (LIMIT) test jack (J26) on the IMTC breakout box. Connect negative lead on multimeter to GND test jack (J27) on IMTC breakout box. Multimeter should read +12 ±1.5 vdc.

If reading on multimeter indicates correct voltage, proceed to step 29.

If reading on multimeter does not indicate correct voltage, perform step 31 and notify next higher maintenance level.

Step 29. Connect positive lead on multimeter to LIMIT SIGNAL test jack (J28) on **IMTC** breakout box. Connect negative lead on multimeter to GND test jack (J27) on breakout box. Proceed to step 30.

NOTE

Two persons are required to perform the checks in step 30.

Step 30. Perform the following checks: Position electrical switch actuator bar over forward proximity switch; multimeter should read less than 1 vdc. Move electrical switch actuator bar off forward proximity switch; multimeter should read 10 ±1.5 vdc.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If readings on multimeter indicate correct voltage, perform step 31 and proceed to step 33.

If readings on multimeter do not indicate correct voltage, perform step 31 and proceed to step 32.

Step 31. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Disconnect connector P2 on IMTC breakout box cable from connector J5 on IMTC electronic components assembly. Disconnect connector P1 on cable assembly W104 from connector J30 on IMTC breakout box. (If next step does not call for removal of cable assembly W104, connect connector P1 on cable assembly W104 to connector J5 on the IMTC electronic components assembly.)

Step 32. Remove cable assembly W104 (reference paragraph 4-8). Set multimeter to ohms and perform continuity check on cable assembly.

If continuity exists, replace forward proximity switch (reference paragraph 4-18), reinstall cable assembly W104 (reference paragraph 4-8) and proceed to step 39.

If continuity does not exist, replace cable assembly W104 (reference paragraph 4-8) and proceed to step 39.

Step 33. Disconnect connector P1 on cable assembly W105 from connector J6 on IMTC electronic components assembly. Connect connector P1 on cable assembly W105 to connector J30 on the IMTC breakout box. Connect connector P2 on IMTC breakout box cable to connector J6 on IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 34.

Step 34. Set multimeter to dc volts. Connect positive lead on multimeter to +12 V (LIMIT) test jack (J26) on the IMTC breakout box. Connect negative lead on multimeter to GND test jack (J27) on IMTC breakout box. Multimeter should read +12 ±1.5 vdc.

If reading on multimeter indicates correct voltage, proceed to step 35.

If reading on multimeter does not indicate correct voltage, perform step 37 and notify next higher maintenance level.

Step 35. Connect positive lead on multimeter to LIMIT SIGNAL test jack (J28) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J27) on breakout box. Proceed to step 36.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOTE

Two persons are required to perform the checks in step 36.

Step 36. Perform the following checks: Position electrical switch actuator bar over reverse proximity switch; multimeter should read less than 1 vdc. Move electrical switch actuator bar off reverse proximity switch; multimeter should read 10±1.5 vdc.

If readings on multimeter indicate correct voltage, perform step 37 and proceed to step 40.

If readings on multimeter do not indicate correct voltage, perform step 37 and proceed to step 38.

Step 37. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Disconnect connector P2 on IMTC breakout box cable from connector J6 on IMTC electronic components assembly. Disconnect connector P1 on cable assembly W105 from connector J30 on IMTC breakout box. (If next step does not call for removal of cable assembly W105, connect connector P1 on cable assembly W105 to connector J6 on the IMTC electronic components assembly.)

Step 38. Remove cable assembly W105 (reference paragraph 4-9). Set multimeter to ohms and perform continuity check on cable assembly.

If continuity exists, replace reverse proximity switch (reference paragraph 4-33), reinstall cable assembly W105 (reference paragraph 4-9) and proceed to step 39.

If continuity does not exist, replace cable assembly W105 (reference paragraph 4-9) and proceed to step 39.

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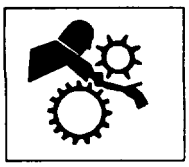

When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped.

Step 39. Perform IMTC self-test (reference paragraph 2-4a).

If IMTC performs self-test satisfactorily, contact RCS to verify that unit is operational.

If IMTC does not perform self-test satisfactorily, notify next higher level of maintenance.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 40. Position electrical switch actuator bar over reverse proximity switch. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position. Disconnect connector P1 on cable assembly W115 from connector J3 on IMTC electronic components assembly. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 41.

NOTE

Two persons are required to perform the checks in steps 41 through 44.

Step 41. Set multimeter to dc volts. Connect negative lead on multimeter to ground. Connect positive lead on multimeter to pin H on connector J3.

Set test switch S-1 to ATTACK and observe multimeter. Before command, multimeter should read approximately 0 vdc; after command is sent, multimeter should indicate +30 ±10 vdc.

Set circuit breaker on IMTC electronic components assembly to the off position and then back to the on position.

If readings on multimeter indicate correct voltage, proceed to step 42.

If readings on multimeter do not indicate correct voltage, notify next higher maintenance level.

Step 42. Ensure multimeter is set to dc volts. Connect negative lead on multimeter to ground. Connect positive lead on multimeter to pin J on connector J3.

Set test switch S-1 to ATTACK and observe multimeter. Before command, multimeter should read approximately 0 vdc; after command is sent, multimeter should indicate +30 ±10 vdc.

Set circuit breaker on IMTC electronic components assembly to the off position and then back to the on position.

If readings on multimeter indicate correct voltage, proceed to step 43.

If readings on multimeter do not indicate correct voltage, notify next higher maintenance level.

Step 43. Position electrical switch actuator bar over foward proximity switch. Ensure multimeter is set to dc volts. Connect negative lead on multimeter to ground. Connect positive lead on multimeter to pin F on connector J3.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Set test switch S-1 to RETREAT and observe multimeter. Before command, multimeter should read approximately 0 vdc; after command is sent, multimeter should indicate +30 ±10 vdc.

Set circuit breaker on IMTC electronic components assembly to the off position and then back to the on position.

If readings on multimeter indicate correct voltage, proceed to step 44.

If readings on multimeter do not indicate correct voltage, notify next higher maintenance level.

Step 44. Ensure multimeter is set to dc volts. Connect negative lead on multimeter to ground. Connect positive lead on multimeter to pin G on connector J3.

Set test switch S-1 to RETREAT and observe multimeter. Before command, multimeter should read approximately 0 vdc; after command is sent, multimeter should indicate +30 ±10 vdc.

Set circuit breaker on IMTC electronic components assembly to the off position and then back to the on position.

If readings on multimeter indicate correct voltage, proceed to step 45.

If readings on multimeter do not indicate correct voltage, notify next higher maintenance level.

Step 45. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position. Remove cable assembly W115 from dc motor (reference paragraph 4-27). Set multimeter to ohms. Refer to FO-2 and perform continuity check on cable assembly.

If continuity exists, replace dc motor (reference paragraph 4-26). install cable assembly WI 15 on replacement motor (reference paragraph 4-27). Perform step 46 and proceed to step 47.

If continuity does not exist, replace cable assembly W115 (reference paragraph 4-27). Perform step 46 and proceed to step 47.

Step 46. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position. Connect connector P1 on cable assembly W115 to connector J3 on IMTC electronic components assembly. Set circuit breakers *on* ICB, IMTC electronic components assembly, and ITM to the on position.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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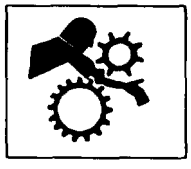

When testing or operating the IMTC, stand clear of the target and track to avoid Injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped.

Step 47. Perform IMTC self-test (reference paragraph 2-4a).

if IMTC performs self-test satisfactorily, contact RCS to verify that unit is operational.

If IMTC does not perform self-test satisfactorily, notify next higher level of maintenance.

2. IMTC operates on command, but fails to report correct status to RCS.

Step 1. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Proceed to step 2.

Step 2. Disconnect connector P1 on cable assembly W103 from connector J4 on IMTC electronic components assembly. Connect connector P1 on cable assembly W103 to connector J29 on the IMTC breakout box. Connect connector P1 on IMTC breakout box cable to connector J4 on the IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 3.

Step 3. Set multimeter to dc volts. Connect positive lead on multimeter to MTC RTRT STATS OUT test jack (J10) on IMTC breakout box. Connect negative lead on multimeter to GRD test jack (J1) on IMTC breakout box. Proceed to step 4.

Step 4. Perform the following checks: Using test switch S-1 to move the carnage assembly, position electrical switch actuator bar over reverse proximity switch; multimeter should read +10±1.5 vdc. Using test switch S-1 to move the carriage assembly, move electrical switch actuator bar off reverse proximity switch; multimeter should read less than 1 vdc.

If multimeter readings indicate correct voltage, proceed to step 5.

If multimeter readings do not indicate correct voltage, perform step 14 and notify next higher level of maintenance.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 5. Ensure multimeter is set to dc volts. Connect positive lead on multimeter to MTC ATTCK STATS OUT test jack (J11) on IMTC breakout box. Connect negative lead on multimeter to GRD test jack (J1) on IMTC breakout box. Proceed to step 6.

Step 6. Perform the following checks: Using test switch S-1 to move the carriage assembly, position electrical switch actuator bar over forward proximity switch; multimeter should read +10 ±1.5 vdc. Using test switch S-1 to move the carriage assembly, move electrical switch actuator bar off forward proximity switch; multimeter should read less than 1 vdc.

If multimeter readings indicate correct voltage, proceed to step 7.

If multimeter readings do not indicate correct voltage, perform step 14 and notify next higher maintenance level.

Step 7. Set multimeter to ac volts. Connect positive lead on multimeter to DATA + OUTPUT test jack (J12) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on IMTC breakout box. Proceed to step 8.

NOTE

Ensure that electrical switch actuator bar is positioned over reverse proximity switch before performing steps 8 through 13.

Step 8. Direct RCS personnel to issue an ATTACK command to the IMTC. Observe multimeter during transmittal of command for the following indications: Before and after command, multimeter should read approximately 4 ±1 vac; during command, multimeter should indicate 10 ±5 vat.

If multimeter readings indicate correct voltage, proceed to step 9.

If multimeter readings do not indicate correct voltage, perform step 14 and notify next higher level of maintenance.

Step 9. Ensure that multimeter is set to ac volts. Connect positive lead on multimeter to CLOCK + OUTPUT test jack (J15) on IMTC breakout box. Connect negative lead on multimeter to CLOCK - OUTPUT test jack (J16) on IMTC breakout box. Proceed to step 10.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 10. Direct RCS personnel to send an ATTACK command to the IMTC. Observe multimeter during transmittal of command for following indications: Before and after command, multimeter should read 0 vac; during command, multimeter should indicate varying ac up to 1 v.

If multimeter readings indicate correct voltage, proceed to step 11.

If multimeter readings do not indicate correct voltage, perform step 14 and notify next higher level of maintenance.

Step 11. Set multimeter to dc volts. Connect positive lead on multimeter to STATUS PWR test jack (J21) on IMTC breakout box. Connect negative lead on multimeter to STATUS PWR RTRN test jack (5-22) on the IMTC breakout box. Multimeter should indicate +12±1.5 vdc.

If multimeter readings indicate correct voltage, proceed to step 12.

If multimeter readings do not indicate correct voltage, perform step 14 and notify next higher level of maintenance.

Step 12. Set multimeter to ac volts. Connect positive lead on multimeter to STATUS + INPUT test jack (J19) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on the IMTC breakout box. Proceed to step 13.

Step 13. Direct RCS personnel to issue an ATTACK command to the IMTC. Observe multimeter during transmittal of command for the following indications: Before and after command, multimeter should read approximately 4 ±1 vac; during command, multimeter should indicate 10 ±5 vac.

If multimeter readings indicate correct voltage, replace ITM (reference paragraph 4-41) and proceed to step 16.

If multimeter readings do not indicate correct voltage, perform step 14 and proceed to step 15.

Step 14. Set circuit breaker CBI on IMTC electronic components assembly to the off position. Disconnect connector P1 on cable assembly W103 from connector J29 on the IMTC breakout box. Disconnect connector P1 on IMTC breakout box cable from connector J4 on the IMTC electronic components assembly. (If next step does not call for removal of cable assembly W103, connect connector P1 on cable assembly W103 to connector J4 on the IMTC electronic components assembly.)

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 15. Remove cable assembly W103 (reference paragraph 4-39). Set multimeter to ohms and perform continuity check.

If continuity exists, replace ITM (reference paragraph 4-41) reinstall original cable assembly W103 (reference paragraph 4-39) and proceed to step 16.

If continuity does not exist, replace cable assembly W103 (reference paragraph 4-39) and proceed to step 16.

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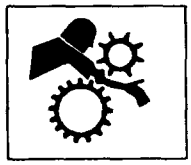

When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped.

Step 16. Contact RCS to run test of IMTC.

If unit tests satisfactorily, data communication problem has been corrected.

If unit does not test satisfactorily, reinstall any original part that was replaced for test, and notify next higher maintenance level.

3. Carriage assembly travels to retreat limit, but will not respond to attack command.

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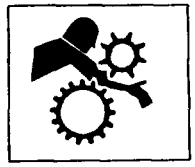

When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOTE

If IMTC is displaying a limit switch malfunction, the circuit breaker on the IMTC electronic components assembly must be turned off and then on before the IMTC is tested. This action resets the timer circuit on the control logic circuit card assembly and eliminates an artificial limit pulse that is generated when the IMTC fails to reach the commanded limit within 5 seconds. If an artificial pulse is sent, the unit will not respond to either ATTACK or RETREAT commands until the timer circuit is reset.

Step 1. Set circuit breaker on IMTC electronic components assembly to the off position and then to the on position. Perform IMTC self-test (reference paragraph 2-4a).

If IMTC performs self-test satisfactorily, proceed to step 10.

If IMTC does not perform self-test satisfactorily, proceed to step 2.

Step 2. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Proceed to step 3.

Step 3. Disconnect connector P1 on cable assembly W104 from connector J5 on IMTC electronic components assembly. Connect connector P1 on cable assembly W104 to connector J30 on the IMTC breakout box. Connect connector P2 on IMTC breakout box cable to connector J5 on IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 4.

Step 4. Set multimeter to dc volts. Connect positive lead on multimeter to +12 V (LIMIT) test jack (J26) on the IMTC breakout box. Connect negative lead on multimeter to GND test jack (J27) on IMTC breakout box. Multimeter should read +12 ±1.5 vdc.

If reading on multimeter indicates correct voltage, proceed to step 5.

If reading on multimeter does not indicate correct voltage, perform step 7 and notify next higher maintenance level.

Step 5. Connect positive lead on multimeter to LIMIT SIGNAL test jack (J28) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J27) on breakout box. Proceed to step 6.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOTE

Two persons are required to perform the checks in step 6.

Step 6. Perform the following checks: Position electrical switch actuator bar over forward proximity switch; multimeter should read less than 1 vdc. Move electrical switch actuator bar off proximity switch; multimeter should read less 10 ±1.5 vdc.

If readings on multimeter indicate correct voltage, perform step 7 and proceed to step 10.

If readings on multimeter do not indicate correct voltage, perform step 7 and proceed to step 8.

Step 7. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Disconnect connector P2 on IMTC breakout box cable from connector J5 on IMTC electronic components assembly. Disconnect connector P1 on cable assembly W104 from connector J30 on IMTC breakout box. (If next step does not call for removal of cable assembly W104, connect connector P1 on cable assembly W104 to connector J5 on the IMTC electronic components assembly.)

Step 8. Remove cable assembly W104 (reference paragraph 4-8). Set multimeter to ohms and perform continuity check on cable assembly.

if continuity exists, replace forward proximity switch (reference paragraph 4-18), reinstall cable assembly W104 (reference paragraph 4-8), and proceed to step 9.

If continuity does not exist, replace cable assembly W104 (reference paragraph 4-8) and proceed to step 9.

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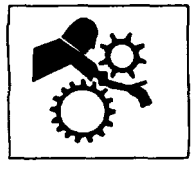

When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped.

Step 9. Perform IMTC self-test (reference paragraph 2-4a).

If IMTC performs self-test satisfactorily, contact RCS to verify that unit is operational.

if IMTC does not perform self-test satisfactorily, notify next higher level of maintenance.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 10. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Proceed to step 11.

Step 11. Disconnect connector P1 on cable assembly W103 from connector J4 on IMTC electronic components assembly. Connect connector P1 on cable assembly W103 to connector J29 on the IMTC breakout box. Connect connector P1 on IMTC breakout box cable to connector J4 on the IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 12.

NOTE

Ensure that electrical switch actuator bar is positioned over forward proximity switch before performing steps 12 through 23.

Step 12. Set multimeter to dc volts. Connect positive lead on multimeter to MTC ATTCK STATS OUT test jack (J11) on IMTC breakout box. Connect negative lead on multimeter to GRD test jack (J1) on IMTC breakout box. Proceed to step 13.

NOTE

Two persons are required to perform the following checks.

Step 13. Perform the following checks: Position electrical switch actuator bar over forward proximity switch; multimeter should read +10±1.5 vdc. Move electrical switch actuator bar off forward proximity switch; multimeter should read less than 1 vdc.

If multimeter readings indicate correct voltage, proceed to step 14.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher maintenance level.

Step 14. Set multimeter to ac volts. Connect positive lead on multimeter to DATA + OUTPUT test jack (J12) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on IMTC breakout box. Proceed to step 15.

Step 15. Direct RCS personnel to issue a RETREAT command to the IMTC. Observe multimeter during transmittal of command for the following indications: Before and after command, multimeter should read approximately 4 ± vac; during command, multimeter should indicate 10 ±5 vac.

If multimeter readings indicate correct voltage, proceed to step 16.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher level of maintenance.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 16. Ensure that multimeter is set to ac volts. Connect positive lead on multimeter to CLOCK + OUTPUT test jack (J15) on IMTC breakout box. Connect negative lead on multimeter to CLOCK - OUTPUT test jack (J16) on IMTC breakout box. Proceed to step 17.

Step 17. Direct RCS personnel to send a RETREAT command to the IMTC. Observe multimeter during transmittal of command for following indications: Before and after command, multimeter should read 0 vac; during command, multimeter should indicate varying ac up to 1 v.

If multimeter readings indicate correct voltage, proceed to step 18.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher level of maintenance.

Step 18. Set multimeter to dc volts. Connect positive lead on multimeter to STATUS PWR test jack (J21) on IMTC breakout box. Connect negative lead on multimeter to STATUS PWR RTRN test jack (J22) on the IMTC breakout box. Multimeter should indicate +12±1.5 vdc.

If multimeter readings indicate correct voltage, proceed to step 19.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher level of maintenance.

Step 19. Set multimeter to ac volts. Connect positive lead on multimeter to STATUS + INPUT test jack (J19) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on the IMTC breakout box. Proceed to step 20.

Step 20. Direct RCS personnel to issue a RETREAT command to the IMTC. Observe multimeter during transmittal of command for the following indications: Before and after command, multimeter should read approximately 2 vac; during command, multimeter should indicate 8 vac.

If multimeter readings indicate correct voltage, proceed to step 21.

If multimeter readings do not indicate correct voltage, perform step 24 and proceed to step 25.

Step 21. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Manually position carriage assembly over forward proximity switch. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 22.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 22. Set multimeter to dc volts. Connect positive lead on multimeter to MTC RTRT INPUT test jack (J9) on IMTC breakout box. Connect negative lead on multimeter to MTC ATT/RET test jack (J8) on IMTC breakout box. Proceed to step 23.

Step 23. Ensure that electrical switch actuator bar is over forward proximity switch, and direct RCS personnel to issue a RETREAT command to the IMTC. Observe multimeter during transmittal of command: Multimeter should indicate a momentary rise to +5.5 ±5 vdc when RETREAT command is transmitted.

If multimeter readings indicate correct voltage, perform step 24 and notify next higher level of maintenance.

If multimeter readings do not indicate correct voltage, perform step 24 and proceed to step 25.

Step 24. Set circuit breaker CBl on IMTC electronic components assembly to the off position. Disconnect connector P1 on cable assembly W103 from connector J29 on the IMTC breakout box. Disconnect connector P1 on IMTC breakout box cable from connector J4 on the IMTC electronic components assembly. (If next step does not call for removal of cable assembly W103, connect connector P1 on cable assembly W103 to connector J4 on the IMTC electronic components assembly.)

Step 25. Remove cable assembly W103 (reference paragraph 4-39). Set multimeter to ohms and perform continuity check.

If continuity exists, replace ITM (reference paragraph 4-41) reinstall original cable assembly W103 (reference paragraph 4-39) and proceed to step 26.

If continuity does not exist, replace cable assembly W103 (reference paragraph 4-39) and proceed to step 26.

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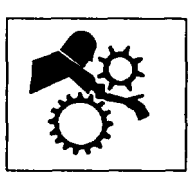

When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 26. Set circuit breaker on IMTC electronic components assembly to the off position and then to the on position. Perform IMTC self-test (reference paragraph 2-4a).

If IMTC performs self-test satisfactorily, contact RCS to verify that unit is operational.

If IMTC does not perform self-test satisfactorily, reinstall any original parts that were replaced to perform the test, and notify next higher level of maintenance.

4. Carriage assembly travels to attack limit, but will not respond to retreat command.

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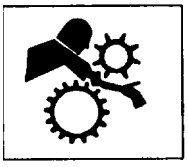

When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped.

NOTE

If IMTC is displaying a limit switch malfunction, the circuit breaker on the IMTC electronic components assembly must be turned off and then on before the IMTC is tested. This action resets the timer circuit on the control logic circuit card assembly and eliminates an artificial limit pulse that is generated when the IMTC fails to reach the commanded limit within 5 seconds. If an artificial pulse is sent, the unit will not respond to either ATTACK or RETREAT commands until the timer circuit is reset.

Step 1. Set circuit breakers on IMTC electronic components assembly to the off position and then to the on position. Perform IMTC self-test (reference paragraph 2-4a).

If IMTC performs self-test satisfactorily, proceed to step 10.

If IMTC does not perform self-test satisfactorily, proceed to step 2.

Step 2. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Proceed to step 3.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 3. Disconnect connector P1 on cable assembly W105 from connector J6 on IMTC electronic components assembly. Connect connector P1 on cable assembly W105 to connector J30 on the IMTC breakout box. Connect connector P2 on IMTC breakout box cable to connector J6 on IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 4.

Step 4. Set multimeter to dc volts. Connect positive lead on multimeter to +12 V (LIMIT) test jack (J26) on the IMTC breakout box. Connect negative lead on multimeter to GND test jack (J27) on IMTC breakout box. Multimeter should read +12 ±1.5 vdc.

If reading on multimeter indicates correct voltage, proceed to step 5.

If reading on multimeter does not indicate correct voltage, perform step 7 and notify next higher maintenance level.

Step 5. Connect positive lead on multimeter to LIMIT SIGNAL test jack (J28) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J27) on breakout box. Proceed to step 6.

NOTE

Two persons are required to perform the checks in step 6.

Step 6. Perform the following checks: Position electrical switch actuator bar over reverse proximity switch; multimeter should read less than 1 vdc. Move electrical switch actuator bar off proximity switch; multimeter should read 10 ±1.5 vdc.

If readings on multimeter indicate correct voltage, perform step 7 and proceed to step 10.

If readings on multimeter do not indicate correct voltage, perform step 7 and proceed to step 8.

Step 7. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Disconnect connector P2 on IMTC breakout box cable from connector J6 on IMTC electronic components assembly. Disconnect connector P1 on cable assembly W105 from connector J30 on IMTC breakout box. (If next step does not call for removal of cable assembly W105, connect connector P1 on cable assembly W105 to connector J6 on the IMTC electronic components assembly.)

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 8. Remove cable assembly W105 (reference paragraph 4-9). Set multimeter to ohms and perform continuity check on cable assembly.

If continuity exists, replace reverse proximity switch (reference paragraph 4-33), reinstall cable assembly W105 (reference paragraph 4-9) and proceed to step 9.

If continuity does not exist, replace cable assembly W105 (reference paragraph 4-9) and proceed to step 9.

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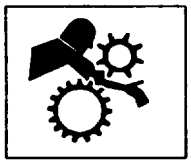

When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts Immediately when test switch S-1 is tripped.

Step 9. Perform IMTC self-test (reference paragraph 2-4a).

If IMTC performs self-test satisfactorily, contact RCS to verify that unit is operational.

If IMTC does not perform self-test satisfactorily, notify next higher level of maintenance.

Step 10. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Proceed to step 11.

Step 11. Disconnect connector P1 on cable assembly W103 from connector J4 on IMTC electronic components assembly. Connect connector P1 on cable assembly W103 to connector J29 on the IMTC breakout box. Connect connector P1 on IMTC breakout box cable to connector J4 on the IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 12.

NOTE

Ensure that electrical switch actuator bar is positioned over reverse proximity switch before performing steps 12 through 23.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 12. Set multimeter to dc volts. Connect positive lead on multimeter to MTC RTRT STATS OUT test jack (J10) on IMTC breakout box. Connect negative lead on multimeter to GRD test jack (J1) on IMTC breakout box. Proceed to step 13.

NOTE

Two persons are required to perform the checks in step 13.

Step 13. Perform the following checks: Position steel plate over reverse proximity switch; multimeter should read +10±1.5 vdc. Take steel plate off forward proximity switch; multimeter should read less than 1 vdc.

If multimeter readings indicate correct voltage, proceed to step 14.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher maintenance level.

Step 14. Set multimeter to ac volts. Connect positive lead on multimeter to DATA + OUTPUT test jack (J12) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on IMTC breakout box. Proceed to step 15.

Step 15. Direct RCS personnel to issue an ATTACK command to the IMTC. Observe multimeter during transmittal of command for the following indications: Before and after command, multimeter should read approximately 4 ±1 vac; during command, multimeter should indicate 10 ±5 vac.

If multimeter readings indicate correct voltage, proceed to step 16.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher level of maintenance.

Step 16. Ensure that multimeter is set to ac volts. Connect positive lead on multimeter to CLOCK + OUTPUT test jack (J15) on IMTC breakout box. Connect negative lead on multimeter to CLOCK - OUTPUT test jack (J16) on IMTC breakout box. Proceed to step 17.

Step 17. Direct RCS personnel to send an ATTACK command to the IMTC. Observe multimeter during transmittal of command for following indications: Before and after command, multimeter should read 0 vac; during command, multimeter should indicate varying ac up to 1 v.

If multimeter readings indicate correct voltage, proceed to step 18.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher level of maintenance.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 18. Set multimeter to dc volts. Connect positive lead on multimeter to STATUS PWR test jack (J21) on IMTC breakout box. Connect negative lead on multimeter to STATUS PWR RTRN test jack (J22) on the IMTC breakout box. Multimeter should indicate +12 ±1.5 vdc.

If multimeter readings indicate correct voltage, proceed to step 19.

If multimeter readings do not indicate correct voltage, perform step 24 and notify next higher level of maintenance.

Step 19. Set multimeter to ac volts. Connect positive lead on multimeter to STATUS + INPUT test jack (J19) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on the IMTC breakout box. Proceed to step 20.

Step 20. Direct RCS personnel to issue an ATTACK command to the IMTC. Observe multimeter during transmittal of command for the following indications: Before and after command, multimeter should read approximately 4 ±1 vac; during command, multimeter should indicate 10 ±5 vac.

If multimeter readings indicate correct voltage, proceed to step 21.

If multimeter readings do not indicate correct voltage, perform step 24 and proceed to step 25.

Step 21. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Manually position carriage assembly over forward proximity switch. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 22.

Step 22. Ensure that multimeter is set to dc volts. Connect positive lead on multimeter to MTC ATTCK INPUT test jack (J7) on IMTC breakout box. Connect negative lead on multimeter to MTC ATT/RET test jack (J8) on IMTC breakout box. Proceed to step 23.

Step 23. Ensure that electrical switch actuator bar is over forward proximity switch, and direct RCS personnel to issue an ATTACK command to the IMTC. Observe multimeter during transmittal of command: Multimeter should indicate a momentary rise to +5.5 ±5 vdc when ATTACK command is transmitted.

If multimeter readings indicate correct voltage, perform step 24 and notify next higher level of maintenance.

If multimeter readings do not indicate correct voltage, perform step 24 and proceed to step 25.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 24. Set circuit breaker CBl on IMTC electronic components assembly to the off position. Disconnect connector P1 on cable assembly W103 from connector J29 on the lMTC breakout box. Disconnect connector P1 on IMTC breakout box cable from connector J4 on the IMTC electronic components assembly. (If next step does not call for removal of cable assembly W103, connect connector P1 on cable assembly WI03 to connector J4 on the IMTC electronic components assembly.)

Step 25. Remove cable assembly W103 (reference paragraph 4-39). Set multimeter to ohms and perform continuity check.

If continuity exists, replace ITM (reference paragraph 4-41) reinstall original cable assembly W103 (reference paragraph 4-39) and proceed to step 26.

If continuity does not exist, replace cable assembly W103 (reference paragraph 4-39) and proceed to step 26.

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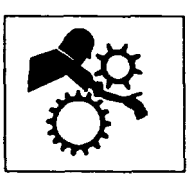

When testing or operating the IMTC, stand clear of the target and track to avoid injury to personnel. The carriage assembly reacts immediately when test switch S-1 is tripped.

Step 26. Set circuit breaker on IMTC electronic components assembly to the off position and then to the on position. Perform IMTC self-test (reference paragraph 2-4a).

If IMTC performs self-test satisfactorily, contact RCS to verify that unit is operational.

If IMTC does not perform self-test satisfactorily, reinstall any original parts that were replaced to perform the test, and notify next higher level of maintenance.

5. Circuit breaker on IMTC electronic components assembly trips.

Step 1. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position.

Systematically disconnect cable assemblies, one at a time, from each electrical connector on IMTC electronic components assembly. Check each connector on cable assembly and electrical connector on IMTC electronic components assembly for damage and wetness.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If connectors on all cable assemblies and IMTC electronic components assembly are dry and have no apparent damage, reconnect all cable assemblies, and proceed to step 3.

If connector on cable assembly or IMTC electronic components assembly is wet, proceed to step 2.

If electrical connector on IMTC electronic components assembly is damaged, notify next higher level of maintenance.

Step 2. Dry connector using clean cloth. Reconnect cable assembly to IMTC electronic components assembly. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position.

If circuit breaker on IMTC electronic components assembly holds, wet connector was causing short and problem is now corrected.

If circuit breaker trips, continue performing checks and tests in accordance with step 1, or proceed to step 3 if all connections on the IMTC electronic components assembly have been inspected and cleaned.

Step 3. Ensure circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the off position. Remove cover from IMTC electronic components assembly. Inspect inside of housing for wetness, loose wiring connections, or any indications that wiring or circuit card assembly (CCA) is damaged or burned.

If inside of housing is dry, no wiring appears loose, and there is no indication of damaged or burned wiring or CCA, reinstall cover on IMTC electronic components assembly and proceed to step 4.

If inside of housing is wet, wiring is loose, or there is any indication that wiring is damaged or burned, reinstall cover on IMTC electronic components assembly and notify next higher level of maintenance.

Step 4. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the off position.

Systematically disconnect cable assemblies, one at a time, from each electrical connector on ITM. Check each connector on cable assembly and electrical connector on ITM for damage and wetness.

If connectors on all cable assemblies and ITM are dry and have no apparent damage, reconnect all cable assemblies, and proceed to step 6.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If connector on cable assembly or ITM is wet, proceed to step 5.

If electrical connector on ITM is damaged, notify next higher level of maintenance.

Step 5. Dry connector using clean cloth. Reconnect cable assembly to ITM. Set circuit breakers on ICB and ITM to the on position.

If circuit breaker on ITM holds, wet connector was causing short and problem is now corrected.

If circuit breaker trips, continue performing checks and tests in accordance with step 4, or proceed to step 6 if all connections on the ITM have been inspected and cleaned.

Step 6. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the off position. Remove cover from ITM (reference paragraph 4-44). Inspect inside of housing for wetness, loose wiring connections, or any indications that wiring or CCAs are damaged or burned.

If inside of housing is dry, no wiring appears loose, and there is no indication of damaged or burned wiring or CCAs, reinstall cover on ITM (reference paragraph 4-44) and proceed to step 7.

If inside of housing is wet, wiring is loose, or there is any indication that wiring is damaged or burned, replace ITM (reference paragraph 4-41) and retest.

Step 7. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the OFF position, Disconnect connector P1 on cable assembly W103 from connector J4 on IMTC electronic components assembly. Proceed to step 8.

Step 8. Set circuit breakers on ICB and IMTC electronic components assembly to the on position.

If circuit breaker on IMTC electronic components assembly holds, set circuit breakers on ICB and IMTC electronic components assembly to the off position and proceed to step 9.

If circuit breaker on IMTC electronic components assembly trips, proceed to step 11.

Step 9. Reconnect connector P1 on cable assembly W103 to connector J4 on IMTC electronic components assembly. Disconnect connector P2 on cable assembly W103 from connector J1 on ITM. Disconnect connector P3 on cable assembly W103 from connector J3 on ITM. Proceed to step 10.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 10. Set circuit breakers on ICB and IMTC electronic components assembly to the on position.

If circuit breaker on IMTC electronic components assembly holds, replace ITM (reference paragraph 4-41) and retest.

If circuit breaker on IMTC electronic components assembly trips, replace cable assembly W103 (reference paragraph 4-39) and retest.

Step 11. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the off position. Disconnect connector P1 on cable assembly W104 from connector J5 on IMTC electronic components assembly. Proceed to step 12.

Step 12. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position.

If circuit breaker on IMTC electronic components assembly holds, set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position and proceed to step 13.

If circuit breaker on IMTC electronic components assembly trips, proceed to step 15.

Step 13. Reconnect connector P1 on cable assembly W104 to connector J5 on IMTC electronic components assembly. Disconnect connector P2 on cable assembly W104 from connector J1 on forward proximity switch. Proceed to step 14.

Step 14. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position.

If circuit breaker on IMTC electronic components assembly holds, replace forward proximity switch (reference paragraph 4-18) and retest.

If circuit breaker on IMTC electronic components assembly trips, replace cable assembly W104 (reference paragraph 4-8) and retest.

Step 15. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the off position. Disconnect connector P1 on cable assembly W105 from connector J6 on IMTC electronic components assembly. Proceed to step 16.

Step 16. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If circuit breaker on IMTC electronic components assembly holds, set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position and proceed to step 17.

If circuit breaker on IMTC electronic components assembly trips, proceed to step 19.

Step 17. Reconnect connector P1 on cable assembly W105 to connector J6 on IMTC electronic components assembly. Disconnect connector P2 on cable assembly W105 from connector J1 on reverse proximity switch. Proceed to step 18.

Step 18. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position.

If circuit breaker on IMTC electronic components assembly holds, replace reverse proximity switch (reference paragraph 4-33) and retest.

If circuit breaker on IMTC electronic components assembly trips, replace cable assembly W105 (reference paragraph 4-9) and retest.

Step 19. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the off position. Disconnect connector P1 on cable assembly W115 from connector J3 on IMTC electronic components assembly. Proceed to step 20.

Step 20. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position.

If circuit breaker on IMTC electronic components assembly holds, set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position and proceed to step 21.

If circuit breaker on IMTC electronic components assembly trips, reconnect connector P1 on cable assembly W115 to connector J3 on IMTC electronic components assembly, and notify next higher maintenance level.

Step 21. Remove cable assembly W115 from drive motor (reference paragraph 4-27). Set multimeter to ohms. Perform both pin-to-pin and pin-to-ground checks on connector P1 of the cable assembly.

If continuity is found on all of the checks, replace dc motor (reference paragraph 4-26). Install cable assembly W115 on replacement motor (reference paragraph 4-27) and retest.

If continuity cannot be found on any of the checks, replace cable assembly W115 (reference paragraph 4-27) and retest.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

6. Target on moving ITM does not respond to up or down commands.

Step 1. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM are set to the on position.

If all circuit breakers are on and holding, proceed to step 2.

If circuit breaker on ICB trips, reference TM 9-6920-742-14-4.

If circuit breaker on IMTC electronic components assembly trips, reference malfunction 5.

If circuit breaker on ITM trips, reference malfunction 12.

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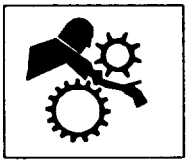

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 is tripped.

Step 2. Perform ITM self-test (reference paragraph 2-4b).

If ITM responds to self-test satisfactorily, proceed to step 3.

If ITM does not respond to self-test satisfactorily, perform steps 4 and 5, and proceed to step 6.

Step 3. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM are set to the off position. Remove cover from ITM (reference paragraph 4-44) and check code on address switch.

If the code is set correctly on the address switch, reinstall cover on the ITM (reference paragraph 4-44) perform to steps 4 and 5 and proceed to step 7.

If the wrong code has been set on the address switch, set the correct code (reference paragraph 2-3c) reinstall cover on the ITM (reference paragraph 4-44). Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position. Retest unit from RCS.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 4. Ensure that circuit breakers on the ICB, IMTC electronic components assembly, and ITM have been set to the off position.

Step 5. Disconnect connector P1 on cable assembly W103 from connector J4 on IMTC electronic components assembly. Connect connector P1 on cable assembly W103 to connector J29 on the IMTC breakout box. Connect connector P1 on IMTC breakout box cable to connector J4 on the IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position.

Step 6. Set multimeter to dc volts. Connect positive lead on multimeter to +24 VDC test jack (J3) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on IMTC breakout box. Multimeter should read +30 ±10 vdc.

Connect positive lead on multimeter to +24 VDC test jack (J4) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on IMTC breakout box. Multimeter should read +30±10 vdc.

If both multimeter readings indicate correct voltage, proceed to step 7.

If either multimeter reading does not indicate correct voltage, perform step 10 and notify next higher level of maintenance.

Step 7. Set multimeter to ac volts. Connect positive lead on multimeter to DATA + OUTPUT test jack (J12) on IMTC breakout box. Connect negative lead on multimeter to GND test jack (J1) on IMTC breakout box. Proceed to step 8.

Step 8. Direct RCS personnel to issue a TARGET UP command to the ITM. Observe multimeter during transmittal of command for the following indications: Before and after command, multimeter should read approximately 3 vac; during command, multimeter should indicate 5.5 vac.

If multimeter readings indicate correct voltage, proceed to step 9.

If multimeter readings do not indicate correct voltage, perform step 10 and notify next higher level of maintenance.

Step 9. Set multimeter to dc volts. Connect positive lead on multimeter to STATUS PWR test jack (J21) on IMTC breakout box. Connect negative lead on multimeter to STATUS PWR RTRN test jack (J22) on the IMTC breakout box. Multimeter should indicate +12±1.5 vdc.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If multimeter readings indicate correct voltage, perform step 10 and proceed to step 11.

If multimeter readings do not indicate correct voltage, perform step 10 and notify next higher level of maintenance.

Step 10. Set circuit breaker CBl on IMTC electronic components assembly to the off position. Disconnect connector P1 on cable assembly W103 from connector J29 on the IMTC breakout box. Disconnect connector P1 on IMTC breakout box cable from connector J4 on the IMTC electronic components assembly. (If next step does not call for removal of cable assembly W103, connect connector P1 on cable assembly W103 to connector J4 on the IMTC electronic components assembly.)

Step 11. Remove cable assembly W103 (reference paragraph 4-39). Set multimeter to ohms and perform continuity check.

If continuity exists, replace ITM (reference paragraph 4-41) reinstall original cable assembly W103 (reference paragraph 4-39) and proceed to step 12.

If continuity does not exist, replace cable assembly W103 (reference paragraph 4-39) and proceed to step 12.

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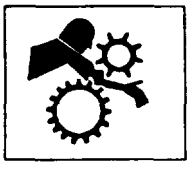

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 is tripped.

Step 12. Perform ITM self-test (reference paragraph 2-4b).

If unit tests satisfactorily, contact RCS to verify that unit is operational.

If unit does not test satisfactorily, notify next higher maintenance level.

7. Target on stationary ITM does not respond to up or down commands.

Step 1. Ensure that circuit breakers on ICB and ITM are set to the on position.

If all circuit breakers are on and holding, proceed to step 2.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If circuit breaker on ICB trips, reference .

If circuit breaker on ITM trips, reference malfunction 12.

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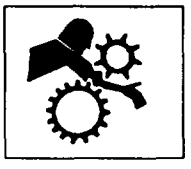

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 is tripped.

Step 2. Perform ITM self-test (reference paragraph 2-4b).

If ITM responds to self-test satisfactorily, proceed to step 3.

If ITM does not respond to self-test satisfactorily, replace ITM (reference paragraph 4-41) and proceed to step 4.

Step 3. Remove cover from ITM (reference paragraph 4-44) and check code on address switch.

If the code is set correctly on the address switch, replace ITM (reference paragraph 4-41) and retest. If unit does not retest satisfactorily, reinstall original ITM and perform troubleshooting procedures on ICB (reference TM 9-6920-742-14-4).

If the wrong code has been set on the address switch, set the correct code (reference paragraph 2-3c) reinstall cover on the ITM (reference paragraph 4-44) and retest unit from RCS.

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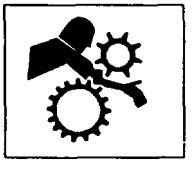

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 is tripped.

Step 4. Perform ITM self-test (reference paragraph 2-4b).

If ITM performs self-test satisfactorily, contact RCS to verify that unit is operational.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If ITM does not perform self-test satisfactorily, reinstall any original parts that were replaced to perform the test, and notify next higher level of maintenance.

8. Target on moving ITM does not bob or go down when hit.

Step 1. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM are set to the on position.

If all circuit breakers are on and holding, proceed to step 2.

If circuit breaker on ICB trips, reference TM 9-6920-742-14-4.

If circuit breaker on IMTC electronic components assembly trips, reference malfunction 5.

If circuit breaker on ITM trips, reference malfunction 12.

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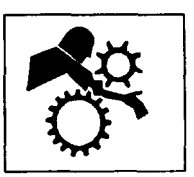
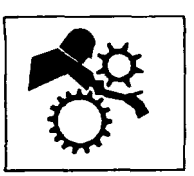


When testing **or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 Is tripped.**

Step 2. Perform ITM self-test (reference paragraph 2-4b).

If ITM responds to self-test satisfactorily, proceed to step 3.

If ITM does not respond to self-test satisfactorily, reference malfunction 6.



When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when hit sensor is tapped.

Step 3. Remove hit sensor shield from hit sensor clamp assembly. Set and hold test switch SW1 to TARGET TEST position and tap hit sensor lightly with metal object.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If target arm goes down, reinstall hit sensor shield on hit sensor clamp assembly, and proceed to step 9.

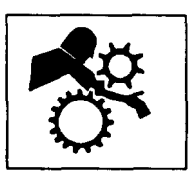
If target arm does not go down, proceed to step 4.

Step 4. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position. Remove hit sensor clamp assembly and spacer from hit sensor assembly (reference paragraph 4-48). Inspect spacer.

If surface of spacer appears to be evenly flat, reinstall spacer and hit sensor clamp assembly on hit sensor assembly (reference paragraph 4-48). Proceed to step 5.

If spacer appears to be bent or excessively concave, replace spacer (reference paragraph 4-48) and proceed to step 5.

WARNING



When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when hit sensor is tapped.

Step 5. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position. Repeat test in step 3.

If target arm goes down, reinstall hit sensor shield on hit sensor clamp assembly. Unit is now operational.

If target arm does not go down, reinstall hit sensor shield on hit sensor clamp assembly and proceed to step 6.

Step 6. Inspect target and ensure that target is property installed on target arm.

If target is properly installed on target arm, proceed to step 7.

If target is not property installed on target arm, reinstall or replace target (reference paragraph 4-42) and repeat test in step 3.

Step 7. Disconnect connector on hit sensor cable from connector J2 on ITM. Inspect connector on hit sensor cable and connector J2 on ITM for damage and wetness.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If connectors on hit sensor cable and ITM are dry and not damaged, reconnect connector on hit sensor cable to connector J2 on ITM and proceed to step 8.

If connector on hit sensor cable and/or ITM is wet remove power and dry connector(s) using clean cloth. Reconnect connector on hit sensor cable to connector J2 on ITM, return power, and repeat test in step 3.

If connector on hit sensor cable is damaged, replace target arm assembly (reference paragraph 4-47 or 4-50) and repeat test in step 3.

If connector J2 on ITM is damaged, notify next higher level of maintenance.

Step 8. Inspect hit sensor cable for damage. Ensure that clamps on target arm have not cut into cable.

If hit sensor cable is not damaged, proceed to step 9.

If hit sensor cable is cut or damaged, replace target arm assembly (reference paragraph 4-47 or 4-50) and repeat test in step 3.

Step 9. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Proceed to step 10.

Step 10. Disconnect connector P1 on cable assembly W103 from connector J4 on IMTC electronic components assembly. Connect connector P1 on cable assembly W103 to connector J29 on the IMTC breakout box. Connect connector P1 on IMTC breakout box cable to connector J4 on the IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 11,

Step 11. Set multimeter to dc volts. Connect positive lead on multimeter to STATUS PWR test jack (J21) on IMTC breakout box. Connect negative lead on multimeter to STATUS PWR RTRN test jack (5-22) on the IMTC breakout box. Multimeter should indicate +12±1.5 vdc.

If multimeter readings indicate correct voltage, perform step 12 and proceed to step 13.

If multimeter readings do not indicate correct voltage, perform step 12 and notify next higher level of maintenance.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 12. Set circuit breaker CBl on IMTC electronic components assembly to the off position. Disconnect connector P1 on cable assembly W103 from connector J29 on the IMTC breakout box. Disconnect connector P1 on IMTC breakout box cable from connector J4 on the IMTC electronic components assembly. (If next step does not call for removal of cable assembly W103, connect connector P1 on cable assembly W103 to connector J4 on the IMTC electronic components assembly.)

Step 13. Remove cable assembly W103 (reference paragraph 4-39). Set multimeter to ohms and perform continuity check.

If continuity exists, replace ITM (reference paragraph 4-41) reinstall original cable assembly W103 (reference paragraph 4-39) and proceed to step 14.

If continuity does not exist, replace cable assembly W103 (reference paragraph 4-39) and proceed to step 14.

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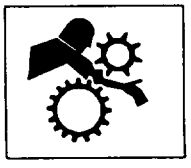

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when hit sensor is tapped.

Step 14. Remove hit sensor shield from hit sensor clamp assembly. Set and hold test switch SW1 to TARGET TEST position and tap hit sensor lightly with metal object.

If unit tests satisfactorily, reinstall hit sensor shield on hit sensor clamp assembly, and contact RCS to verify that unit is operational.

If unit does not test satisfactorily, reinstall any original parts that were replaced to perform the test, reinstall hit sensor shield on hit sensor clamp assembly, and notify next higher maintenance level.

9. Target on stationary ITM does not bob or go down when hit.

Step 1. Ensure that circuit breakers on ICB and ITM are set to the on position.

If circuit breakers on ICB and ITM are on and holding, proceed to step 2.

If circuit breaker on ICB trips, reference TM 9-6920-742-14-4.

If circuit breaker on ITM trips, reference malfunction 12.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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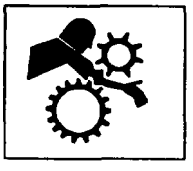

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 is tripped.

Step 2. Perform ITM self-test (reference paragraph 2-4b).

If ITM responds to self-test satisfactorily, proceed to step 3.

If ITM does not respond to self-test satisfactorily, reference malfunction 7.

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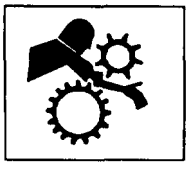

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when hit sensor is tapped.

Step 3. Remove hit sensor shield from hit sensor clamp assembly. Set and hold test switch SW1 to TARGET TEST position and tap hit sensor lightly with metal object.

If target arm goes down, reinstall hit sensor shield on hit sensor clamp assembly, and perform troubleshooting procedures on ICB (reference TM 98-8920-742-14-4).

If target arm does not go down, proceed to step 4.

Step 4. Set circuit breakers on ICB and ITM to the off position. Remove hit sensor hit sensor clamp assembly and spacer from hit sensor assembly (reference paragraph 4-48). Inspect spacer.

If surface of spacer appears to be evenly flat, reinstall spacer and hit sensor clamp assembly on hit sensor assembly (reference paragraph 4-48). Proceed to step 5.

If spacer appears to be bent or excessively concave, replace spacer (reference paragraph 4-48) and proceed to step 5.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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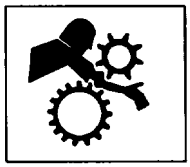

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when hit sensor is tapped.

Step 5. Set circuit breakers on ICB and ITM to the on position. Repeat test in step 3.

If target arm goes down, reinstall hit sensor shield on hit sensor clamp assembly. Unit is now operational.

If target arm does not go down, reinstall hit sensor shield on hit sensor clamp assembly and proceed to step 6.

Step 6. Inspect target and ensure that target is property installed on target arm.

If target is property installed on target arm, proceed to step 7.

If target is not properly installed on target arm, reinstall or replace target (reference paragraph 4-42) and repeat test in step 3.

Step 7. Disconnect connector on hit sensor cable from connector J2 on ITM. Inspect connector on hit sensor cable and connector J2 on ITM for damage and wetness.

If connectors on hit sensor cable and ITM are dry and not damaged, reconnect connector on hit sensor cable to connector J2 on ITM and proceed to step 8.

If connector on hit sensor cable and/or ITM is wet, dry connector(s) using clean cloth. Reconnect connector on hit sensor cable to connector J2 on ITM and repeat test in step 3.

If connector on hit sensor cable is damaged, replace target arm assembly (reference paragraph 4-47 or 4-50) and repeat test in step 3.

If connector J2 on ITM is damaged, notify next higher level of maintenance.

Step 8. Inspect hit sensor cable for damage. Ensure that clamp on target arm have not cut into cable.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If hit sensor cable is not damaged, replace ITM (reference paragraph 4-41) and repeat test in step 3. If unit does not respond to retest satisfactorily, reinstall any original parts that were replaced to perform the test, and notify next higher level of maintenance.

If hit sensor cable is cut or damaged, replace target arm assembly (reference paragraph 4-47 or 4-50) and repeat test in step 3.

10. Target on moving ITM responds to hits, but ITM fails to report correct hit status to RCS.

Step 1. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM are set to the on position.

If all circuit breakers are on and holding, proceed to step 2.

If circuit breaker on ICB trips, reference TM 9-6926-742-14-4.

If circuit breaker on IMTC electronic components assembly trips, reference malfunction 5.

If circuit breaker on ITM trips, reference malfunction 12.

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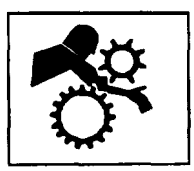


When testlng or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-l Is tripped.

Step 2. Perform ITM self-test (reference paragraph 2-4b).

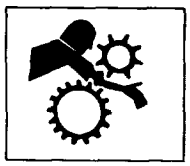
If ITM responds to self-test satisfactorily, proceed to step 3.

If ITM does not respond to self-test satisfactorily, reference malfunction 6.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

WARNING



When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts Immediately when hit sensor is tapped.

Step 3. Remove hit sensor shield from hit sensor clamp assembly. Set and hold test switch SW1 to TARGET TEST position and tap hit sensor lightly with metal object.

If target arm goes down, reinstall hit sensor shield on hit sensor clamp assembly, and proceed to step 4.

If target arm does not go down, reference malfunction 8.

Step 4. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the off position. Proceed to step 5.

Step 5. Disconnect connector P1 on cable assembly W103 from connector J4 on IMTC electronic components assembly. Connect connector P1 on cable assembly W103 to connector J29 on the IMTC breakout box. Connect connector P1 on IMTC breakout box cable to connector J4 on the IMTC electronic components assembly. Set circuit breakers on the ICB, IMTC electronic components assembly, and ITM to the on position. Proceed to step 6.

Step 6. Set multimeter to dc volts. Connect positive lead on multimeter to STATUS PWR test jack (J21) on IMTC breakout box. Connect negative lead on multimeter to STATUS PWR RTRN test jack (J22) on the IMTC breakout box. Multimeter should indicate +12 ±1.5 vdc.

If multimeter readings indicate correct voltage, perform step 7 and proceed to step 8.

If multimeter readings do not indicate correct voltage, perform step 7 and notify next higher level of maintenance.

Step 7. Set circuit breaker CB1 on IMTC electronic components assembly to the off position. Disconnect connector P1 on cable assembly W103 from connector J29 on the IMTC breakout box. Disconnect connector P1 on IMTC breakout box cable from connector J4 on the IMTC electronic components assembly. (If next step does not call for removal of cable assembly W103, connect connector P1 on cable assembly W103 to connector J4 on the IMTC electronic components assembly.)

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 8. Remove cable assembly W103 (reference paragraph 4-39) and perform continuity check.

If continuity exists, replace ITM (reference paragraph 4-41) reinstall original cable assembly W103 (reference paragraph 4-39), and proceed to step 9.

If continuity does not exist, replace cable assembly W103 (reference paragraph 4-39) and proceed to step 9.

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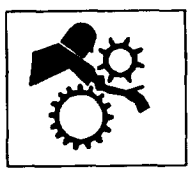

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-l is tripped.

Step 9. Perform ITM self-test (reference paragraph 2-4b).

If unit tests satisfactorily, contact RCS to verify that unit is operational.

If unit does not test satisfactorily, notify next higher maintenance level.

11. Target on stationary ITM responds to hits, but ITM fails to report correct hit status to RCS.

Step 1. Ensure that circuit breakers on ICB and ITM are set to the on position.

If circuit breakers on ICB and ITM are on and holding, proceed to step 2.

If circuit breaker on ICB trips, reference TM 9-6920-742-14-4.

If circuit breaker on ITM trips, reference malfunction 12.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

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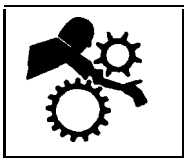


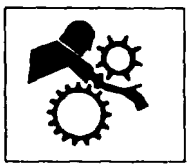
When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 Is tripped.

Step 2. Perform ITM self-test (reference paragraph 2-4b).

If ITM responds to self-test satisfactorily, proceed to step 3.

If ITM does not respond to self-test satisfactorily, reference malfunction 7.

WARNING



When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts Immediately when hit sensor is tapped.

Step 3. Remove hit sensor shield from hit sensor clamp assembly. Set and hold test switch SW1 to TARGET TEST position and tap hit sensor lightly with metal object.

If target arm goes down, replace ITM (reference paragraph 4-41), reinstall hit sensor shield on hit sensor clamp assembly, and proceed to step 4.

If target arm does not go down, reference malfunction 9.

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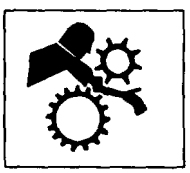

When testing or operating the ITM, stand clear of target to avoid being hit. The target arm assembly reacts immediately when test/operate switch S-1 is tripped

Step 4. Contact RCS to run test on unit.

If unit tests satisfactorily, original ITM was defective and unit is now operational.

Table 42. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If unit does not test satisfactorily, reinstall any original parts that were replaced to perform the test, reinstall hit sensor shield on hit sensor clamp assembly, and notify next higher level of maintenance.

12. Circuit breaker on ITM trips.

Step 1. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position.

Systematically disconnect cable assemblies, one at a time, from each electrical connector on ITM. Check each connector on cable assembly and electrical connector on ITM for damage and wetness.

If connectors on all cable assemblies and ITM are dry and have no apparent damage, reconnect all cable assemblies, and proceed to step 3.If connector on cable assembly or ITM is wet, proceed to step 2.

If electrical connector on ITM is damaged, notify next higher level of maintenance.

Step 2. Dry connector using clean cloth. Reconnect cable assembly to ITM. Set circuit breakers on ICB and ITM to the on position.

If circuit breaker on ITM holds, wet connector was causing short and problem is now corrected.

If circuit breaker on ITM trips, continue performing checks and tests in accordance with step 1, or proceed to step 3 if all connections on the ITM have been inspected and cleaned.

Step 3. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the off position. Remove cover from ITM (reference paragraph 4-44). Inspect inside of housing for wetness, loose wiring connections, or any indications that wiring or CCAs are damaged or burned.

If inside of housing is dry, no wiring appears loose, and there is no indication of damaged or burned wiring or CCAs, reinstall cover on ITM (reference paragraph 4-44) and proceed to step 4.

If inside of housing is wet, wiring is loose, or there is any indication that wiring is damaged or burned, replace ITM (reference paragraph 4-41) and retest.

Step 4. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the OFF position. Disconnect connector PI on hit sensor cable from connector J2 on ITM. Proceed to step 5.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 5. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position.

If circuit breaker holds, replace target arm assembly (reference paragraph 4-47 or 4-50) and retest.

If circuit breaker on ITM trips, reconnect connector PI on hit sensor cable to connector J2 on ITM. Proceed to step 6 if troubleshooting stationary ITM. Proceed to step 10 if troubleshooting moving ITM.

NOTE

Steps 6 through 9 are performed only on stationary ITM.

Step 6. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the OFF position. Disconnect connector P1 on cable assembly W106 from connector J1 on muzzle flash simulator (MFS). Proceed to step 7.

Step 7. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position.

If circuit breaker on ITM holds, set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the off position and proceed to step 8.

If circuit breaker on ITM trips, proceed to step 10.

Step 8. Reconnect connector P1 on cable assembly W106 to connector J1 on MFS. Disconnect connector P2 on cable assembly W106 from connector J1 on small arms sound simulator (SASS). Proceed to step 9.

Step 9. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position.

If circuit breaker on ITM holds, replace SASS (reference TM 9-6920-742-14-2), and retest.

If circuit breaker on ITM trips, replace cable assembly W106 (reference TM 9-6920-742-14-2) and retest.

Step 10. Ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to the OFF position. Disconnect connector P1 on MFS cable assembly from connector J4 on ITM. Proceed to step 11.

Table 4-2. Unit Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
Step 11. Set circuit breakers on ICB, IMTC electronic components assembly, and ITM to the on position. If circuit breaker holds, replace MFS (reference TM 9-6920-742-14-2) and retest. If circuit breaker on ITM trips, replace ITM (reference paragraph 4-41) and retest.

SECTION IV. MAINTENANCE PROCEDURES FOR IMTC

4-5 GENERAL.

This section contains the instructions for adjustment, removal, repair, and installation of components of the IMTC. The instructions consist of an initial setup to prepare for the task and step-by-step procedures to perform the task. Observe all warnings, cautions, and notes during the performance of these tasks.

The units of measurement found in the maintenance procedures are abbreviated as follows: centimeter (cm), inch (in), kilogram (kg), pound (lb), and inch-pound (in-lb).

4-6 ELECTRICAL SWTCH ACTUATOR BAR ADJUSTMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Spacing flatwashers (MS15795-813)

Personnel Required:
2 persons (for safety purposes)

References:
Add/remove spacing flatwashers (reference paragraph 4-7).
Adjust proximity switch on bracket (reference paragraph 4-18).
Perform IMTC self-test (reference paragraph 2-4a).

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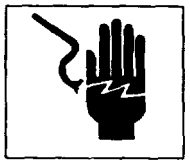


Before working on the IMTC, ensure that circuit breakers on interconnecting box (ICB), IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

a. Adjustment.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Position carriage assembly (1) on track so that electrical switch actuator bar (2) is over proximity switch (3).

NOTE

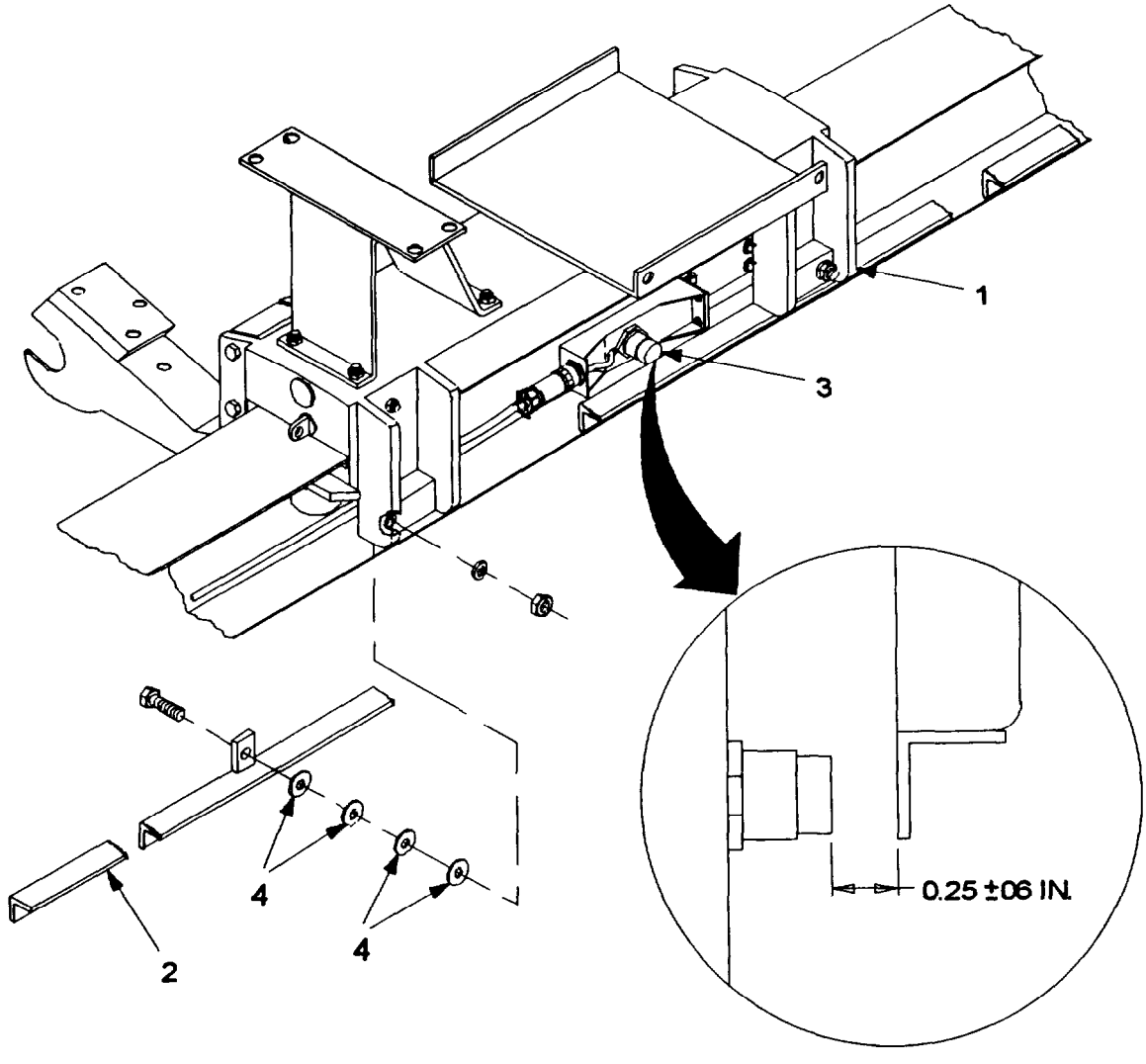
Before adjusting position of electrical switch actuator bar, check carriage assembly for excessive play on track. Wheels on carriage assembly can wear and cause carriage to slant toward one side, resulting in misalignment between electrical switch actuator bar and proximity switches.

(5) Check carriage assembly for excessive play on track. If wheels on carriage assembly require replacement, notify next higher level of maintenance.

NOTE

To obtain proper tolerance, distance between electrical switch actuator bar and both proximity switches must checked and adjusted.

(6) Using machinist's rule, check distance between electrical switch actuator bar and proximity switches: Distance between electrical switch actuator bar and proximity switch should be 0.25 0.06 in (0.64 ±0.15 cm).



(7) Add or remove spacing flatwashers (4) as required until space between electrical switch actuator bar and proximity switches is within specified dimensions (reference paragraph 4-7). If tolerance cannot be obtained by adding or removing spacing flatwashers, adjust position of proximity switch on bracket (reference paragraph 4-18).

(8) Set circuit breaker on ITM to POWER ON.

(9) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(10) Set circuit breaker on ICB to ON.

(11) Perform IMTC self-test (reference paragraph 2-4a).

4-7 ELECTRICAL SWITCH ACTUATOR BAR REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

Materials/Parts:
Self-locking nut (MS21083C6)
Electrical switch actuator bar (9353983)
Sealing compound (item 13, appendix D)

References:
Adjust electrical switch actuator bar (reference paragraph 4-8).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.

WARNING

Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove two self-locking nuts (1), hex-head bolts (2), and flatwashers (3), and eight spacing flatwashers (4) that secure electrical switch actuator bar (5) to carnage assembly (6).

(5) Remove electrical switch actuator bar from carriage assembly.

b. Installation.

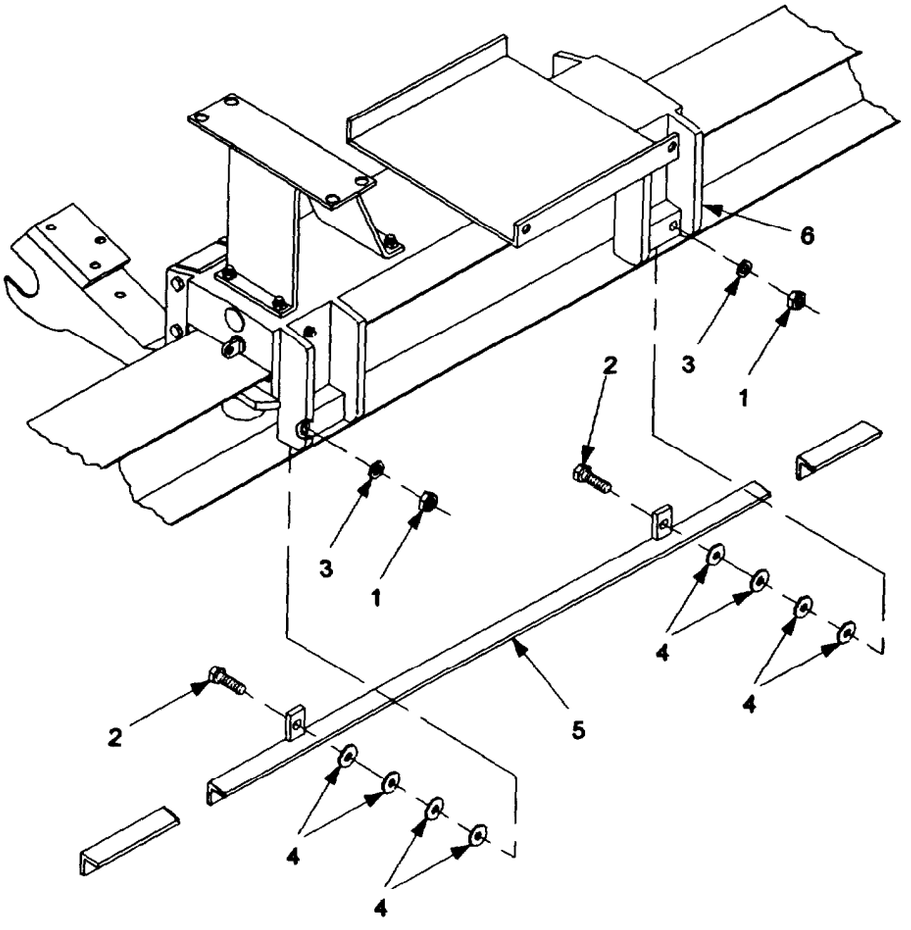
(1) Position electrical switch actuator bar (5) on carriage assembly (6).

CAUTION

To allow clearance between wheel and bolt heads, install nuts on the outside of electrical switch actuator bar, or damage could result to equipment.

NOTE

Do not completely tighten hex-head bolts until electrical switch actuator bar has been adjusted.



(2) Install two flatwashers (3), hex-head bolts (2), self-locking nuts (1) and appropriate quantity of spacing flatwashers (4) to allow for correct spacing between the electrical switch actuator bar and proximity switch (reference paragraph 4-6).

(3) Once the proper amount of spacing flatwashers has been determined, remove two hex-head bolts.

(4) Apply sealing compound to threads of two hex-head bolts.

NOTE

Only tighten bolts until engagement with nuts is approximately 1/4 in (0.64 cm).

(5) Install and tighten two hex-head bolts.

(6) Set circuit breaker on ITM to POWER ON.

(7) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(8) Set circuit breaker on ICB to ON.

(9) Perform IMTC self-test (reference paragraph 2-4a).

4-8 CABLE ASSEMBLY W104 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

Materials/Parts:
Self-locking nut (MS21083C4)
Cable assembly (9354097-1)

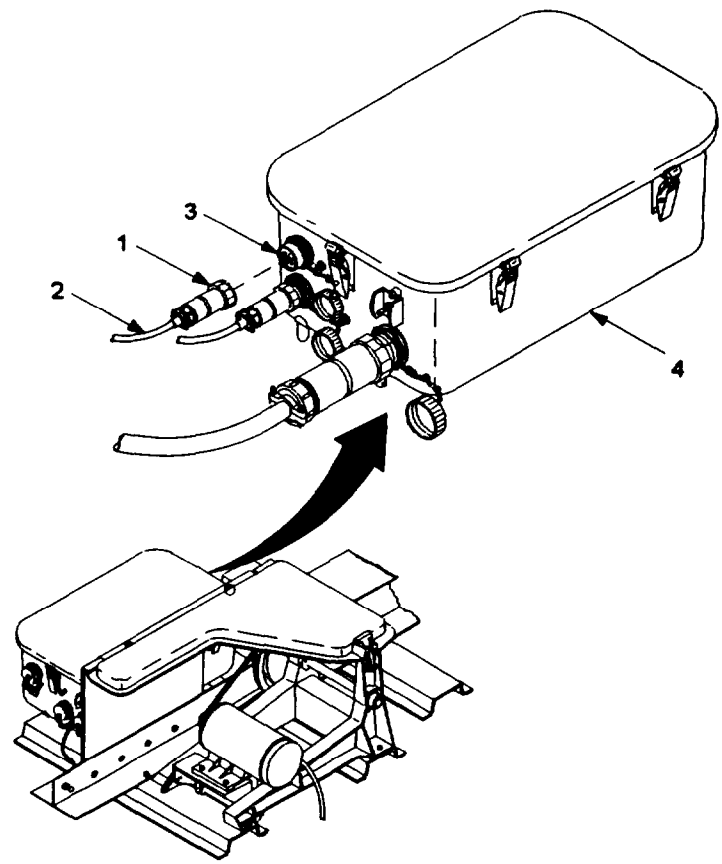
References:
Perform IMTC self-test
(reference paragraph **2-4a).**

---

a. Removal.

WARNING

Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.



(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

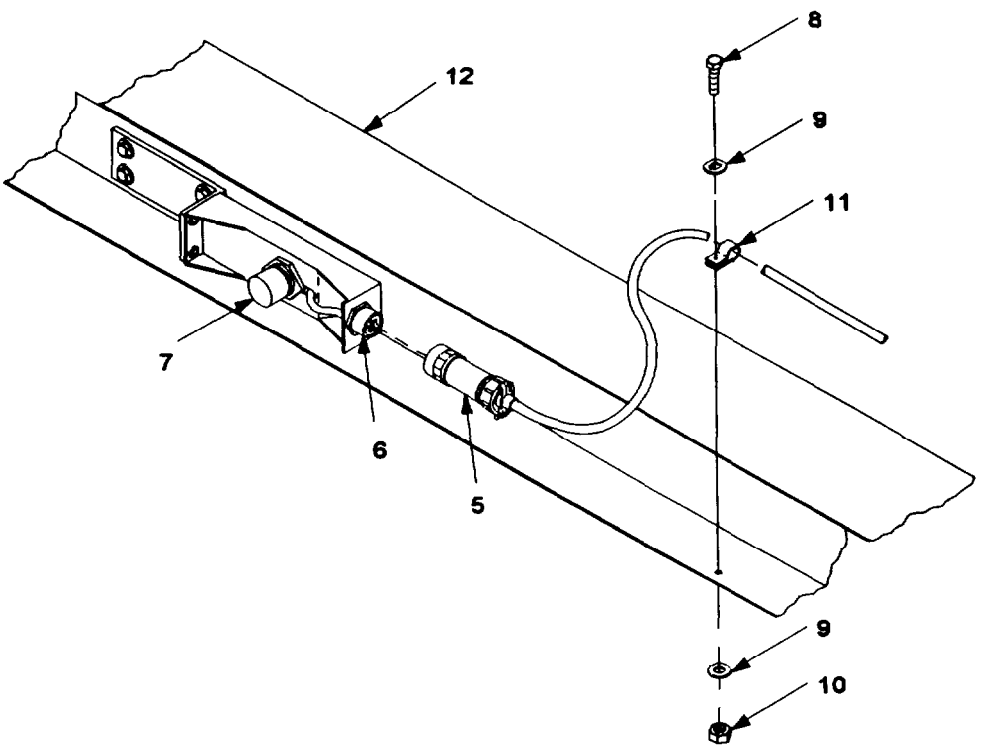
(4) Disconnect connector P1 (1) on cable assembly W104 (2) from connector J5 (3) on IMTC electronic components assembly (4).

(5) Disconnect connector P2 (5) on cable assembly W104 from connector J1 (6) on forward proximity switch (7).

(6) Remove screw (8), two flatwashers (9), and self-locking nut (10) that secure cable clamp (11) to drive end track section (12).

(7) Remove cable clamp from cable assembly W104.

(8) Remove cable assembly W104 from IMTC.



b. Installation.

(1) Position cable assembly W104 (2) on IMTC.

(2) Connect connector P2 (5) on cable assembly W104 to connector J1 (6) on forward proximity switch (7).

(3) Connect connector PI (1) on cable assembly W104 to connector J5 (3) on IMTC electronic components assembly (4).

4-8 CABLE ASSEMBLY W104 REPLACEMENT - Continued.

(4) Install cable clamp (11) on cable assembly W104 and position cable clamp on drive end track section (12).

(5) Install screw(8), two flatwashers (9), and self-locking nut (1O) and secure cable clamp to track section (12).

(6) Set circuit breaker on ITM to POWER ON.

(7) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(8) Set circuit breaker on ICB to ON.

(9) Perform IMTC self-test (reference paragraph 2-4a).

4-9 CABLE ASSEMBLY W105 REPLACEMENT.

INITAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Self-locking nut (MS21083C4)
Cable assembly (9354097-2)

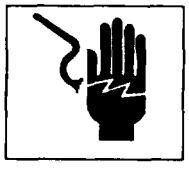
Personnel Required:
2 persons (for safety purposes)

References:
Perform IMTC self-test
(reference paragraph 2-4a).

---

a. Removal.

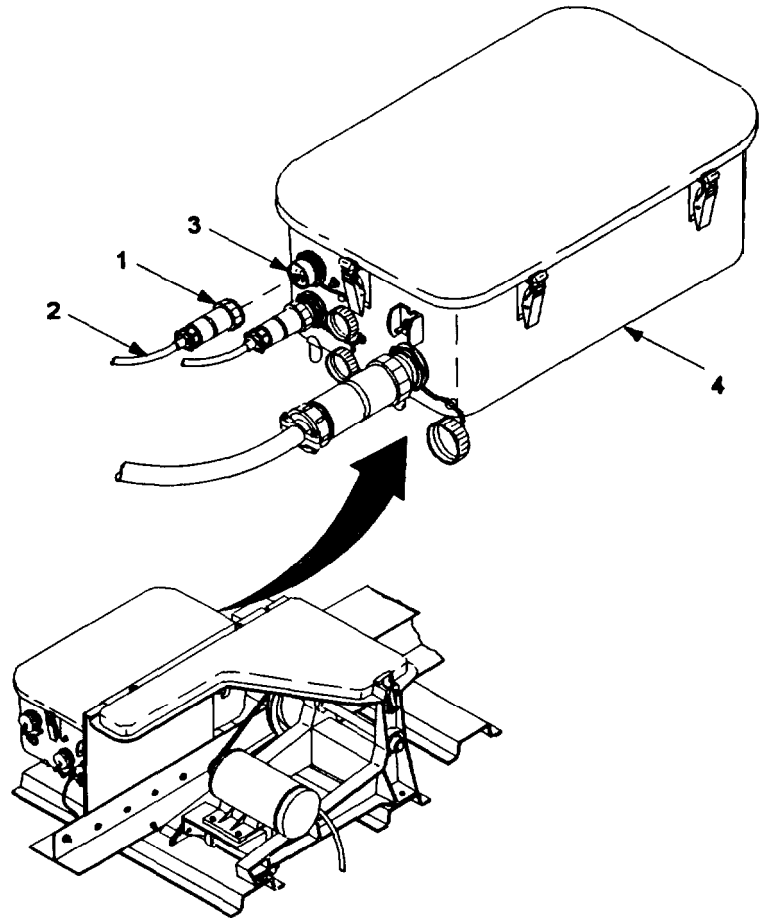
WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.



(3) Set circuit breaker on ITM to POWER OFF.

(4) Disconnect connector P1 (1) on cable assembly W105 (2) from connector J6 (3) on IMTC electronic components assembly (4).

(5) Disconnect connector P2 (5) on cable assembly W105 from connector J2 (6) on reverse proximity switch (7).

(6) Remove screw (8), two flatwashers (9), and self-locking nut (10) that secure each of four cable clamps (11) to track sections (12).

(7) Remove four cable clamps from cable assembly W105.

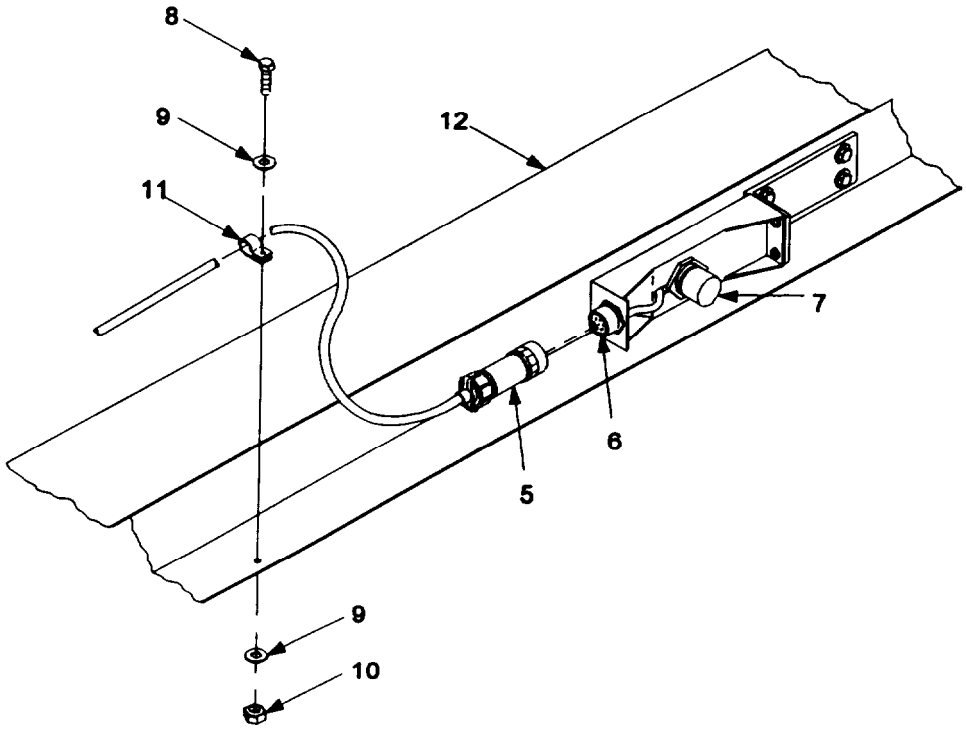
(8) Remove cable assembly W105 from IMTC.

b. Installation.

(1) Position cable assembly W105 (2) on IMTC.

(2) Connect connector P2 (5) on cable assembly W105 to connector J2 (6) on reverse proximity switch(7)

4-9 CABLE ASSEMBLY W105 REPLACEMENT - Continued.



(3) Connect connector P1 (1) on cable assembly W105 to connector J6 (3) on IMTC electronic components assembly (4).

(4) Install four cable clamps (11) on cable assembly W105 and position cable clamps on track sections (12).

(5) Install screw (8), two flatwashers (9), and self-locking nut (10) on each cable clamp and secure cable clamps to track sections.

(6) Set circuit breaker on ITM to POWER ON.

(7) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(8) Set circuit breaker on ICB to ON.

(9) Perform IMTC self-test (reference paragraph 2-4a).

4-10 DRIVE BELT ASSEMBLY KIT ADJUSTMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Weighing scale

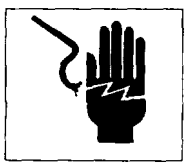
Materials/Parts:
Locking clip (MS21256-2)

Personnel Required:
2 persons (for safety purposes)

References:
Remove target from ITM (reference paragraph 4-42).
Install target on ITM (reference paragraph 4-42).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Adjustment.



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove target from ITM (reference paragraph 4-42).

NOTE

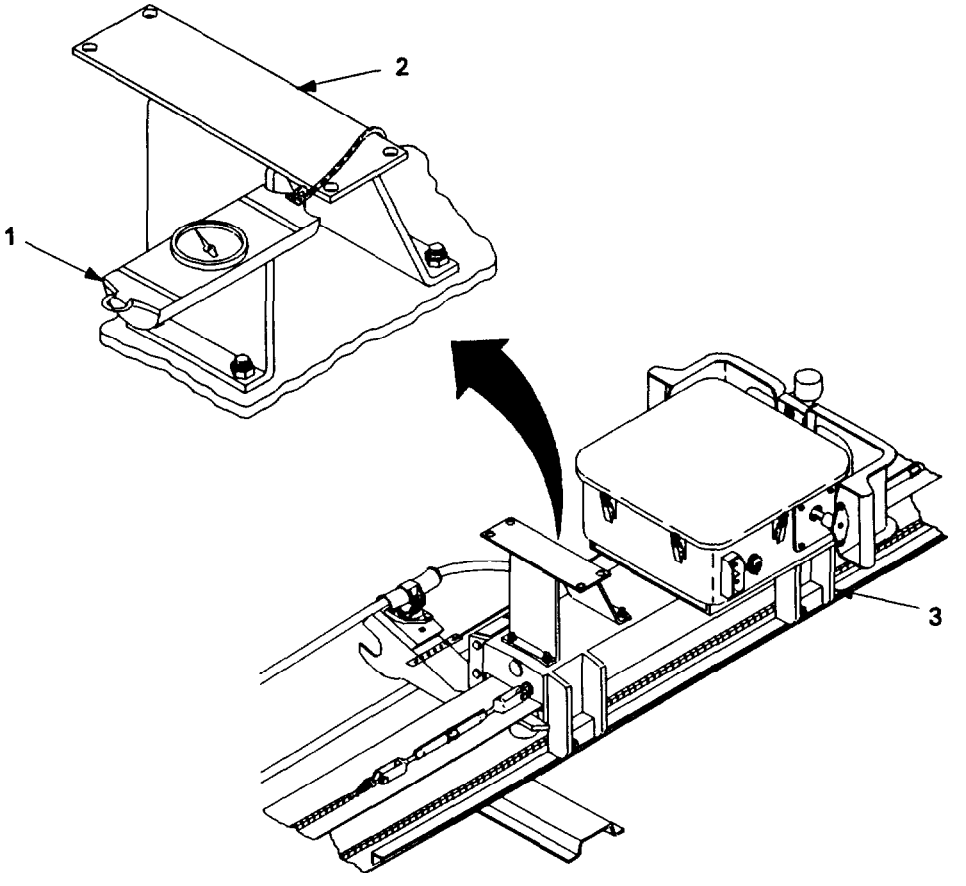
Attach weighing scale on carriage assembly so scale can be pulled parallel to track and in direction of point where drive belt is secured.

(5) Attach weighing scale (1) to muzzle flash simulator (MFS) support assembly (2) on carriage assembly (3).

(6) Using foot, clamp drive end of drive belt assembly (4) against track surface.

(7) Pull on weighing scale until tension between drive belt assembly and shackle (5) is relieved. Scale should read 40 ±5 lb (18 ±2 kg).

(8) Remove two locking clips (6) from each of two tumbuckle assemblies (7).



(9) Adjust turnbuckle assemblies as required until scale reading is within specified tolerance.

(10) Remove weighing scale from MFS support assembly.

NOTE

Groove in threaded portion of clevises on turnbuckle assembly must be facing up to allow installation of locking clips.

(11) Install two new locking clips in each of two turnbuckle assemblies:

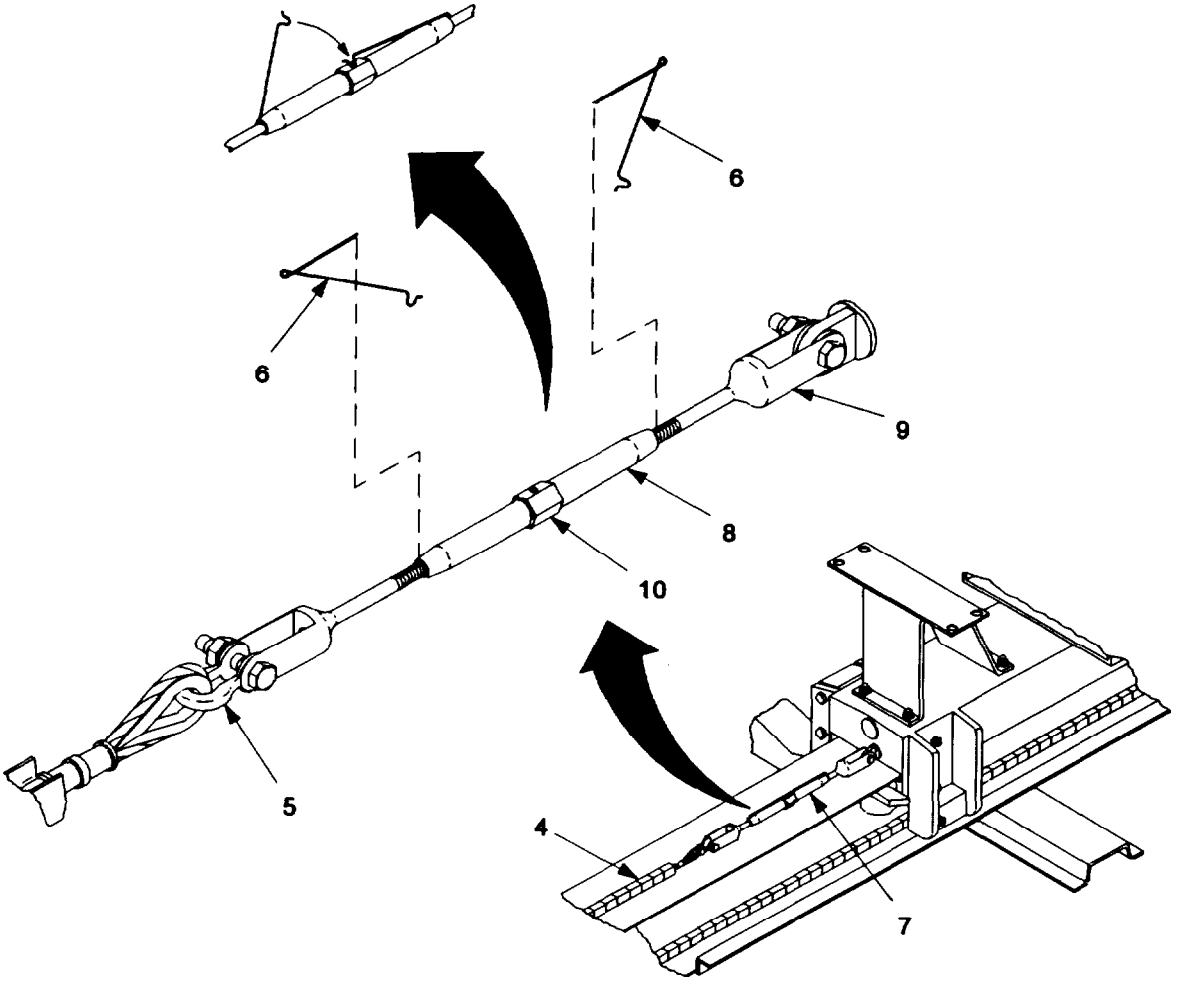
(a) Install straight portion of locking clip between turnbuckle body (8) and clevis (9).

(b) Push hooked portion of locking clip into hole in nut (10) on tumbuckle body.

(12) Install target on ITM (reference paragraph 4-42).

(13) Set circuit breaker on ITM to POWER ON.

4-10 DRIVE BELT ASSEMBLY KIT ADJUSTMENT - Continued.



(14) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(15) Set circuit breaker on ICB to ON.

(16) Perform IMTC self-test (reference paragraph 2-4a).

4-11 DRIVE BELT ASSEMBLY KIT REPLACEMENT AND ASSEMBLY.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts (Replacement):
Drive belt assembly kit (9353961)

Materials/Parts (Assembly):
Reference table 4-3, paragraph 4-11 b.

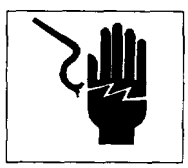
Personnel Required:
2 persons (for safety purposes)

References:
Remove target from ITM (reference paragraph 4-42).
Adjust drive belt assembly kit (reference paragraph 4-10).
Install target on ITM (reference paragraph 4-42).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove two locking clips (1) from each of two turnbuckle assemblies (2).

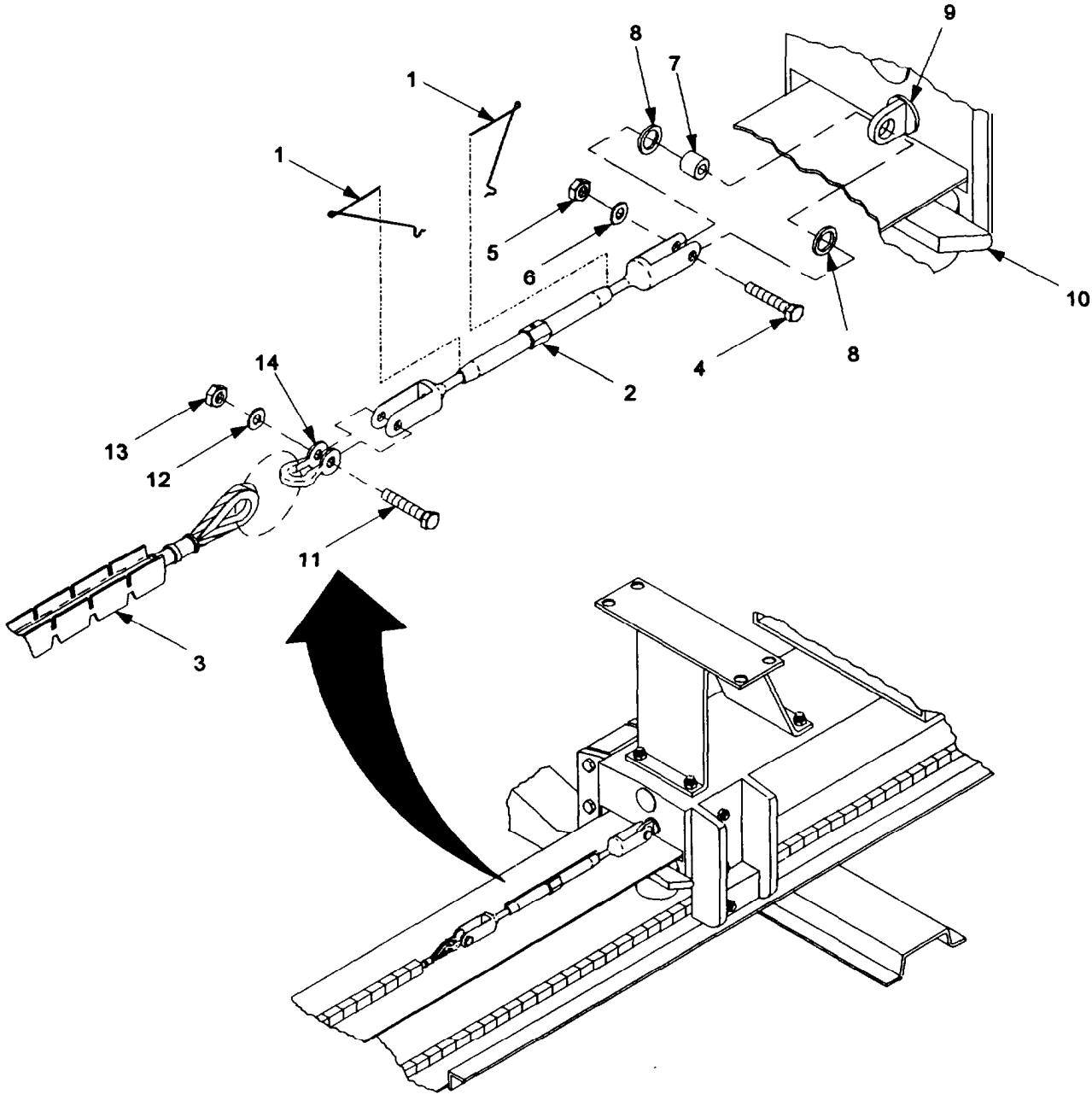
(5) Loosen drive end turnbuckle assembly and release tension on drive belt assembly (3).

(6) Remove bolt (4), self-locking nut (5), flatwasher (6), 1/2-in screw spacer (7), two l/4-in screw spacers (8), and turnbuckle assembly from eyebolt (9) on drive end of carriage assembly (10).

(7) Remove bolt (11), flatwasher (12), self-locking nut (13), shackle (14), and turnbuckle assembly from drive end of drive belt assembly.

(8) Repeat steps (6) and (7) for return end of drive belt assembly.

(9) Remove drive belt assembly from output pulley (15) on drive mechanism assembly (16).



(10) Remove drive belt assembly from return end pulley assembly (17) and tensioner assembly (18) on return end track section (19).

(11) Carefully pull drive belt assembly through belt guards (20) and remove from track.

b. Assembly. The drive belt assembly kit contains the necessary hardware for installation of the drive belt assembly on the IMTC. (Reference the parts list in table 4-3.) However, all attaching hardware must be removed from the drive belt assembly to allow for installation. Assembly of the drive belt assembly kit occurs during installation (reference subparagraph c below).

4-11 DRIVE BELT ASSEMBLY KIT REPLACEMENT AND ASSEMBLY - Continued.

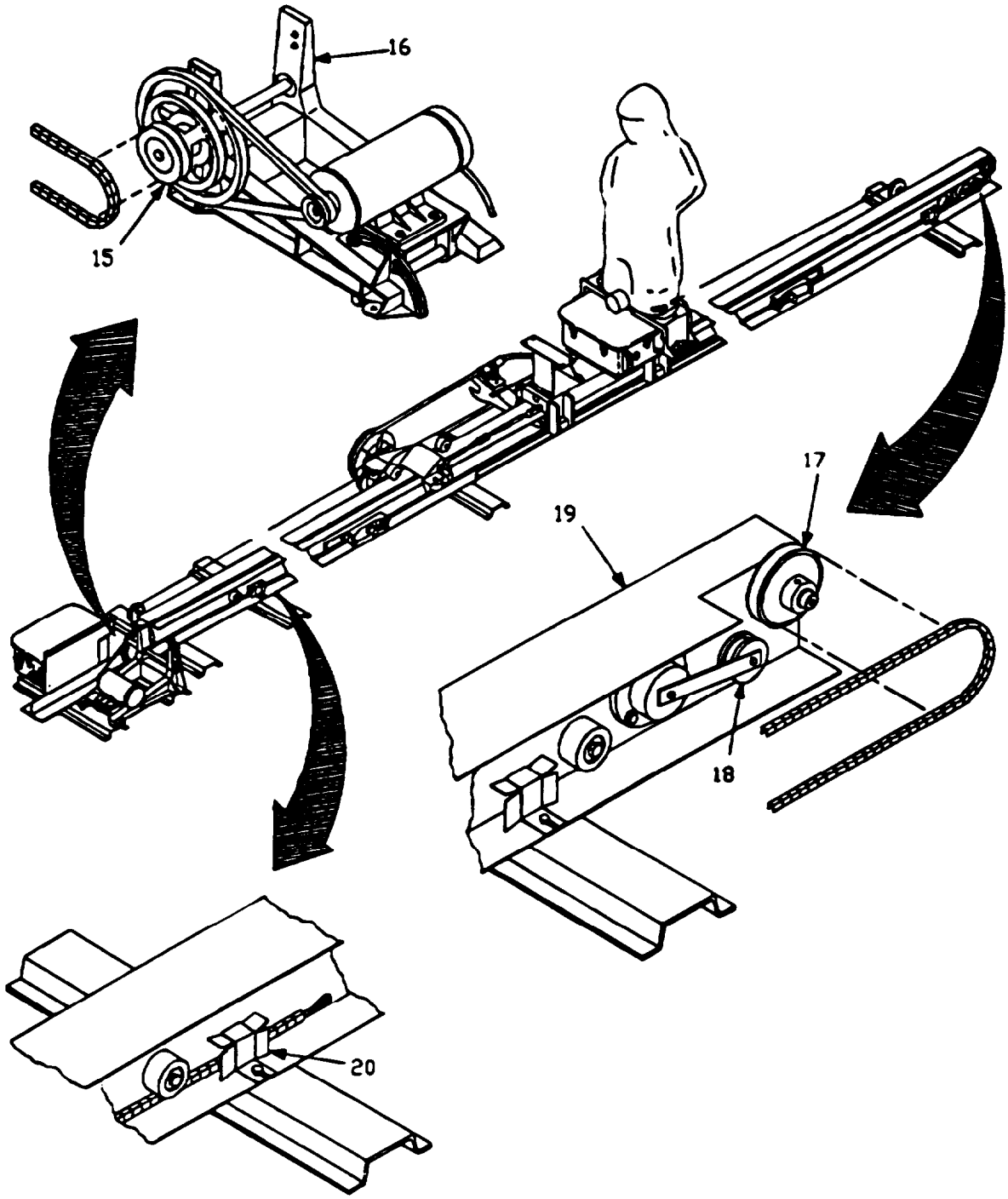


Table 4-3. Parts List for Drive Belt Assembly Kit.

NOMENCLATURE	PART NUMBER	QUANTITY
Bolt	AN4C11A	4
Drive belt assembly	9362984	1
Flatwasher	AN960C416	4
Locking clip	MS21256-2	4
Self-locking nut	MS21083C4	4
Screw spacer (l/4 in)	NAS43HT-31	2
Screw spacer (l/2 in)	NAS43DD7-8	2
Shackle	MS20115-5	2
Turnbuckle assembly	9363225	2

c. Installation.

(1) Remove target from ITM (reference paragraph 4-40).

(2) Pull drive belt assembly (3) through belt guards (20) and position on track.

(3) Position drive belt assembly in tensioner assembly (18) and return end pulley assembly (17) on return end track section (19).

(4) Position drive belt assembly in output pulley (15) on drive mechanism assembly (16).

(5) Position drive belt assembly on top flanges of track.

NOTE

Groove in threaded portion of clevises on turnbuckle assembly must be facing up to allow installation of locking clips.

(6) Position shackle (14) and turnbuckle assembly (2) on return end of drive belt assembly, and install bolt (11), flatwasher (12), and self-locking nut (13).

(7) Position turnbuckle assembly over eyebolt (9) on return end of carriage assembly (10), and install bolt (4), flatwasher (6), two1/4-in screw spacers (8),1/2-in screw spacer (7), and self-locking nut (5).

(8) Repeat steps (6) and (7) on drive end of drive belt assembly.

(9) Adjust tension on drive belt assembly kit (reference paragraph 4-10).

(10) Install target on ITM (reference paragraph 4-42).

(11) Set circuit breaker on ITM to POWER ON.

(12) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(13) Set circuit breaker on ICB to ON.

(14) Perform IMTC self-test (reference paragraph 2-4a).

4-12 CABLE SUPPORT ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

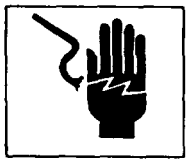
Materials/Parts:
Self-locking nut (MS21083C4)
Self-locking nut (MS21083C6)
Cable support assembly (9363177)
Sealing compound (item 13, appendix D)

References:
Adjust position of cable assembly W103 (reference paragraph 4-39c).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove two screws (1) and nuts (2), and remove upper half of cable clip (3) on cable support assembly (4).

(5) Remove cable assembly W103 (5) from cable support assembly.

(6) Position upper half on lower half of cable clip (6) and install two screws and nuts.

(7) Remove hex-head screw (7), two flatwashers (8), and self-locking nut (9), and remove cable straps (10) from cable support assembly.

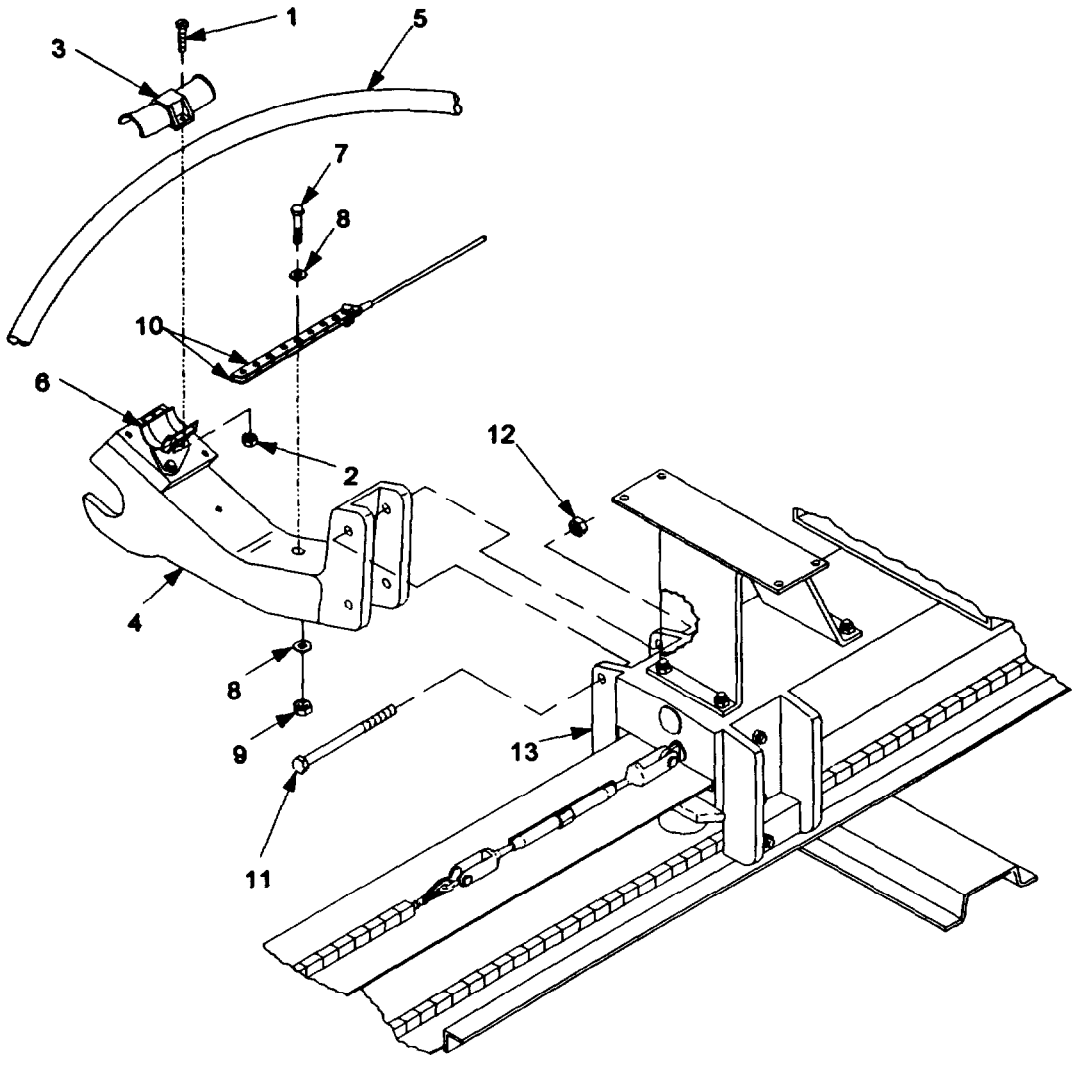
(8) Remove two bolts (11) and nuts (12) and remove cable support assembly from carriage assembly (13).

b. Installation.

(1) Apply sealing compound to threads of bolts (11).

(2) Position cable support assembly (4) on carriage assembly (13) and install two bolts and nuts (12).

(3) Position cable straps (10) on cable support assembly and install hex-head screw (7), two flatwashers (8), and new self-locking nut (9).



(4) Remove two screws (1) and nuts (2), and remove upper half of cable clip (3) on cable support assembly.

(5) Position cable assembly W103 in lower half of cable clip (6).

(6) Position upper half on lower half of cable clip and install two screws and nuts.

(7) Adjust position of cable assembly W103 (reference paragraph 4-39c).

(8) Set circuit breaker on ITM to POWER ON.

(9) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(10) Set circuit breaker on ICB to ON.

(11) Perform IMTC self-test (reference paragraph 2-4a).

4-13 CABLE SUPPORT ASSEMBLY REPAIR.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Cable clip (9353969)
Connecting plate (9363065)
Adapter plate (9383058)
Cable support (11829287)

References:
Install cable support assembly (reference paragraph 4-12).

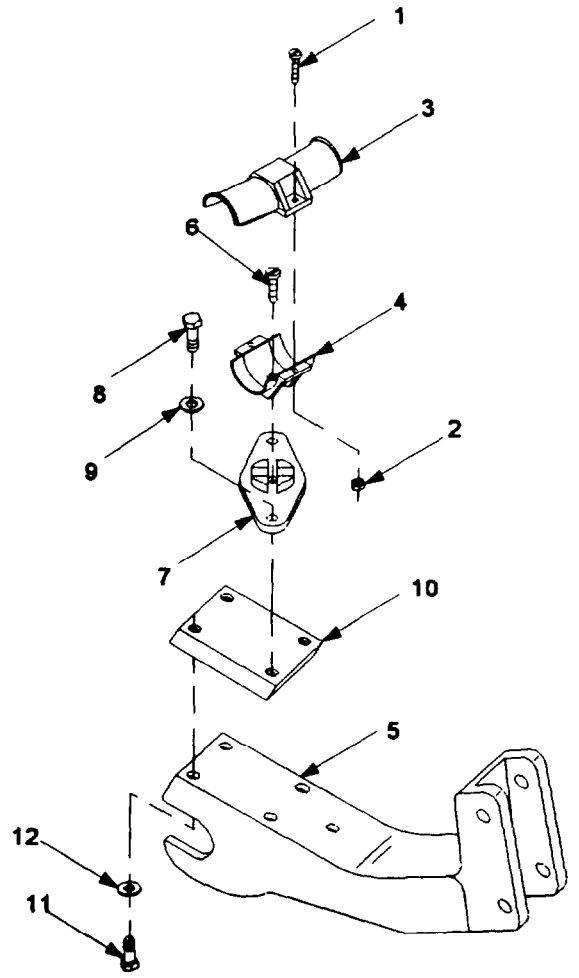
Equipment Conditions:
Cable support assembly removed (reference paragraph 4-12).

---

a. Disassembly.

(1) Remove two screws (1) and nuts (2), and remove upper half of cable clip (3) from bottom half of cable clip (4) on cable support (5).

(2) Remove screw (6), and remove bottom half of cable clip from connecting plate (7).



(3) Remove two screws (8) and washers (9) and remove connecting plate from adapter plate (10)

(4) Remove two screws (11) and washers (12), and remove adapter plate from cable support.

b. Assembly.

(1) Position adapter plate (10) on cable support (5).

(2) install two washers (12) and screws (11) and secure adapter plate to cable support.

(3) Position connecting plate (7) on adapter plate.

(4) Install two screws (8) and washers (9) and secure connecting plate to adapter plate.

(5) Position bottom half of cable clip (4) on connecting plate and install screw (6).

(6) Position upper half of cable clip (3) on lower half of cable clip and install two screws (1) and nuts (2).

(7) install cable support assembly (reference paragraph 4-12).

4-14 BELT GUARD REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

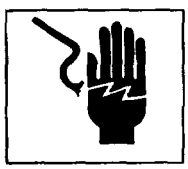
Materials/Parts:
Belt guard (9353989)

References:
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.

WARNING



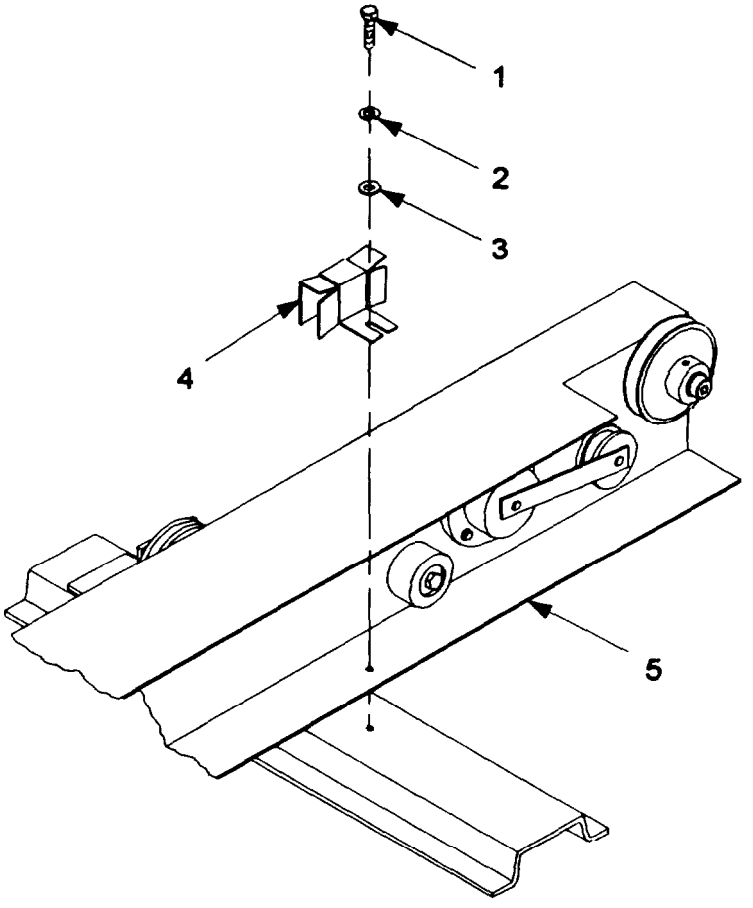
Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

4-14 BELT GUARD REPLACEMENT - Continued.



(4) Remove hex-head bolt (1), lockwasher (2), and flatwasher (3).

(5) Remove belt guard (4) from track section (5).

b. Installation.

(1) Position belt guard (4) over drive belt on track section (5).

(2) Install flatwasher (3), new lockwasher (2), and hex-head bolt (1) and secure belt guard to track section.

(3) Set circuit breaker on ITM to POWER ON.

(4) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(5) Set circuit breaker on ICB to ON.

(6) Perform IMTC self-test (reference paragraph 2-4a).

4-15 SPLICE BARS REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

Materials/Parts:
Lockwasher (MS35338-141)
Heavy splice bar (11829259)
Light splice bar (11829260)

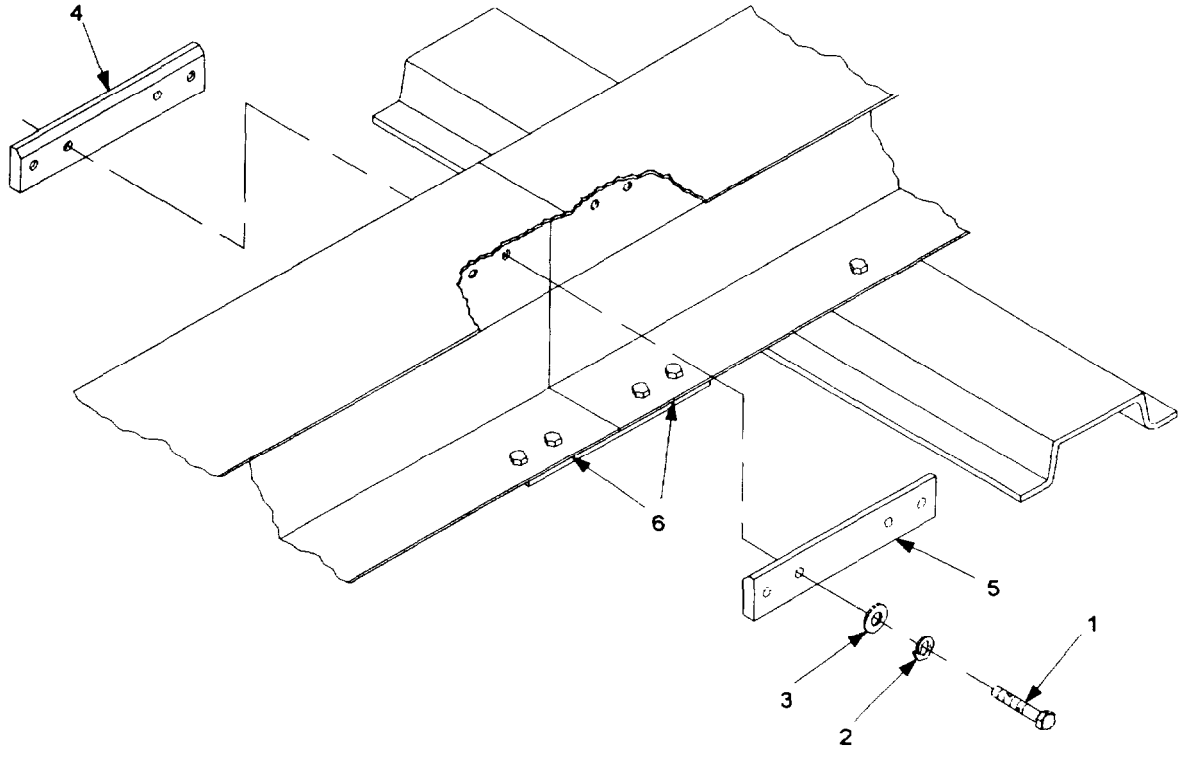
References:
Perform IMTC self-test (reference paragraph a).

---

a. Removal.

Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.



(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove four hex-head bolts (1), lockwashers (2), and flatwashers (3), and remove heavy splice bar (4) and light splice bar (5) from track sections (6).

b. installation.

(1) Chamfered edge of splice bars face up and to the inside of the track sections.

NOTE

Position heavy splice bar (4) and light splice bar (5) between track sections (6), and install four hex-head bolts (1), new lockwashers (2), and flatwashers (3).

(2) Set circuit breaker on ITM to POWER ON.

(3) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(4) Set circuit breaker on ICB to ON.

(5) Perform IMTC self-test (reference paragraph 2-4a).

4-16 BONDING WIRES REPLACEMENT AND ASSEMBLY.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Hand terminal crimping tool (1006)
(assembly procedure only)

Personnel Required:
2 persons for removal or installation
(for safety purposes)

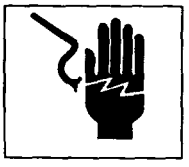
Materials/Parts (Replacement):
Bonding wire (9353984)
Lockwasher (MS35338-139)
Self-locking nut (MS21083C4) (Self-locking nut is required for replacement of bonding wire on end of drive mechanism track section only.)

Materials/Parts (Assembly):
Terminal lug (MS25036-157)
10 AWG green insulated wire (M16878/4BMG5)

---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in **electrical shock and death or serious injury.**

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove two hex-head bolts (I), lo&washers (2), flatwashers (3), and coated flatwashers **(4).**

(5) Remove bonding wire (5) from track sections (6).

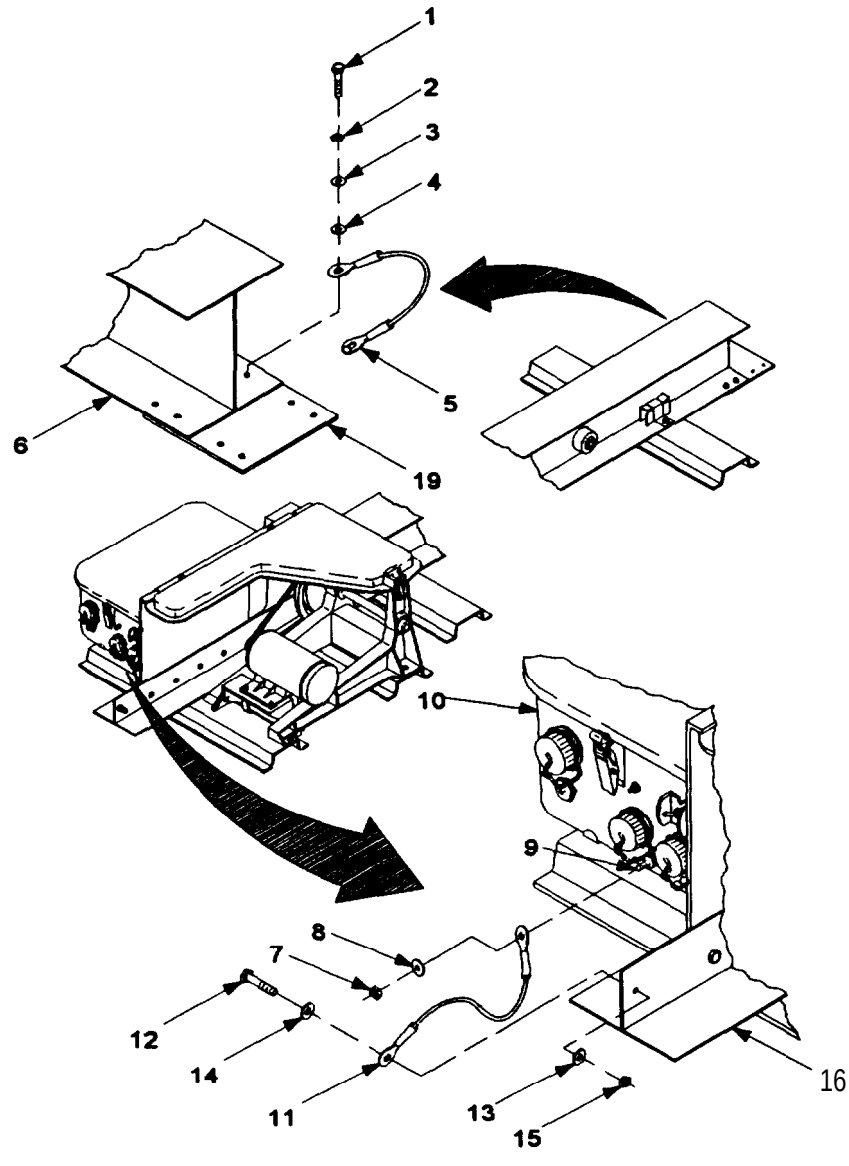
NOTE

Steps (6) through (9) apply to removal of bonding wire from end of drive mechanism track section only.

(6) Remove self-locking nut (7) and flatwasher (8) from bolt (9) at E4 on IMTC electronic components assembly (10).

(7) Disconnect bonding wire (11) from bolt at E4.

(8) Install flatwasher and self-locking nut on bolt at E4.



(9) Remove hex-head screw (12), flat-washer (13), coated flatwasher (14), self-locking nut (15), and bonding wire from drive mechanism track section (16).

b. Assembly.

(1) Cut 8-in (20.32 cm) length of 10 AWG green insulated wire (17).

(2) Strip insulation on wire 1/4 in (0.64 cm) from each end.

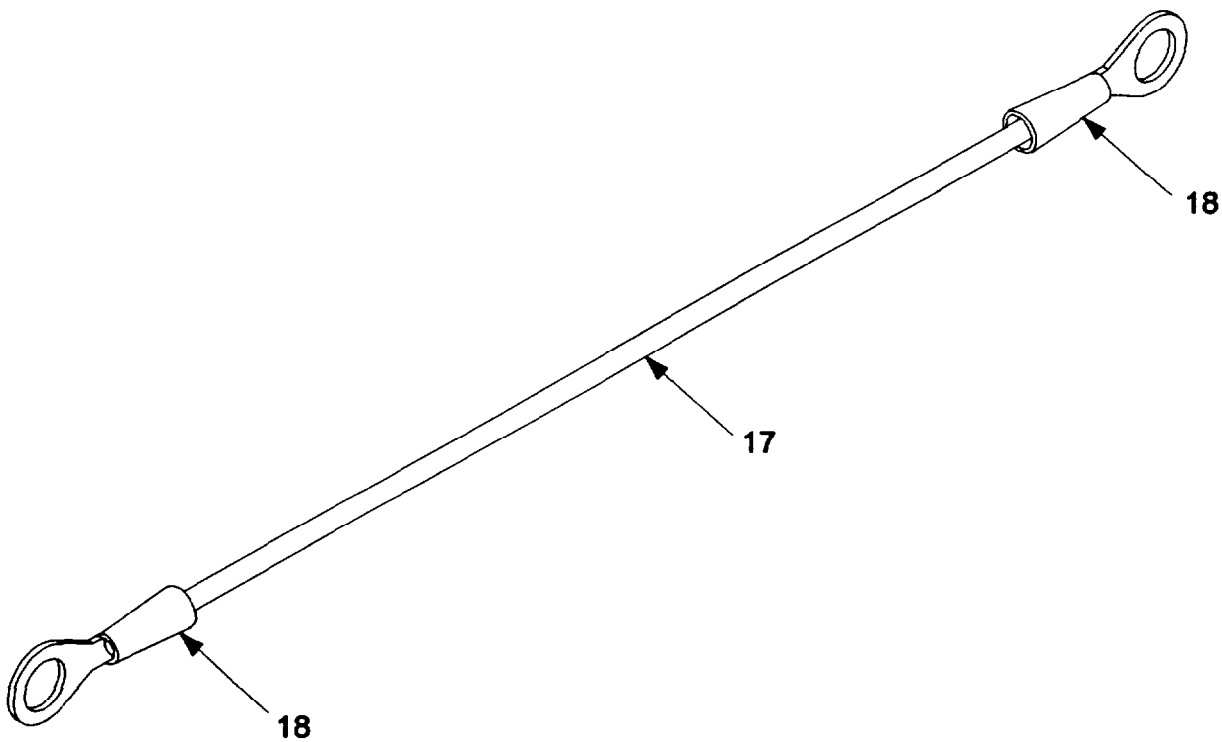
(3) Insert end of wire into terminal lug (18) and crimp tight. Repeat for other end of wire.

c. Installation.

(1) Position bonding wire (5) above splice plate (19) between track sections (6).

4-16 BONDING WIRES REPLACEMENT AND ASSEMBLY - Continued.

(2) Install two coated flatwashers (4), flatwashers (3), new lockwashers (2), and hex-head bolts (1) and secure bonding wire to track sections.



NOTE

Steps (3) through (6) apply to installation of bonding wire on end of drive mechanism track section only.

(3) Position bonding wire (11) on drive mechanism track section (16) and install hex-head screw (12), flatwasher (13), coated flatwasher (14), and new self-locking nut (15).

(4) Remove self-locking nut (7) and flatwasher (8) from bolt (9) at E4 on IMTC electronic components assembly (10).

(5) Connect bonding wire to bolt at E4.

(6) Install flatwasher and new self-locking nut on bolt at E4.

(7) Set circuit breaker on ITM to POWER ON.

(8) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(9) Set circuit breaker on ICB to ON.

4-17 DRIVE END SWITCH AND CONNECTOR BRACKET ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

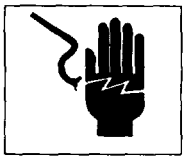
Materials/Parts:
Switch and connector bracket assembly (9353990)
Self-locking nut (MS21083C4)

References:
Adjust electrical switch actuator bar (reference paragraph 4-6).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

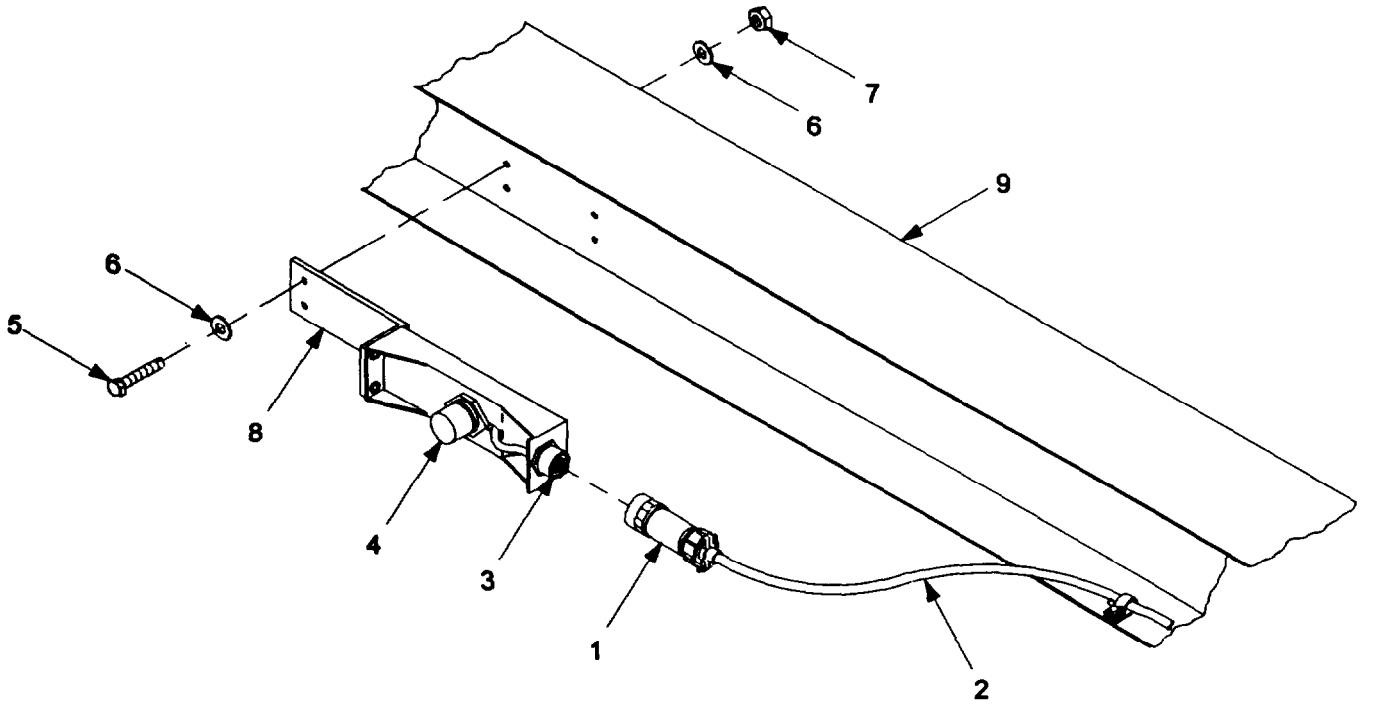
(4) Disconnect connector P2 (1) on cable assembly W104 (2) from connector J1 (3) on forward proximity switch (4).

(5) Remove four hex-head bolts (5), eight flatwashers (6), and four self-locking nuts (7), and remove switch and connector bracket assembly (8) from drive end track section (9).

b. Installation.

CAUTION

When installing switch and connector bracket assembly, bracket must be positioned toward drive end of track. If IMTC has been set to high speed, switch and connector bracket assembly must be installed at innermost position on drive end track section. If the switch and connector bracket assembly is not installed or positioned correctly, carriage assembly will fail to stop at the proper limit, resulting in collision and damage to the equipment.



(1) Position switch and connector bracket assembly (8) on drive end track section (9), and install four hex-head bolts (5), eight flatwashers (6), and four new self-locking nuts (7).

(2) Connect connector P2 (1) on cable assembly W104 (2) to connector J1 (3) on forward proximity switch (4).

(3) Check distance between electrical switch actuator bar and proximity switch. Adjust position of electrical switch actuator bar as required to meet specified dimensions (reference paragraph 4-6).

(4) Set circuit breaker on ITM of POWER ON.

(5) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(6) Set circuit breaker on ICB to ON.

(7) Perform IMTC self-test (reference paragraph 2-4a).

4-18 SWITCH AND CONNECTOR ASSEMBLY REPLACEMENT.

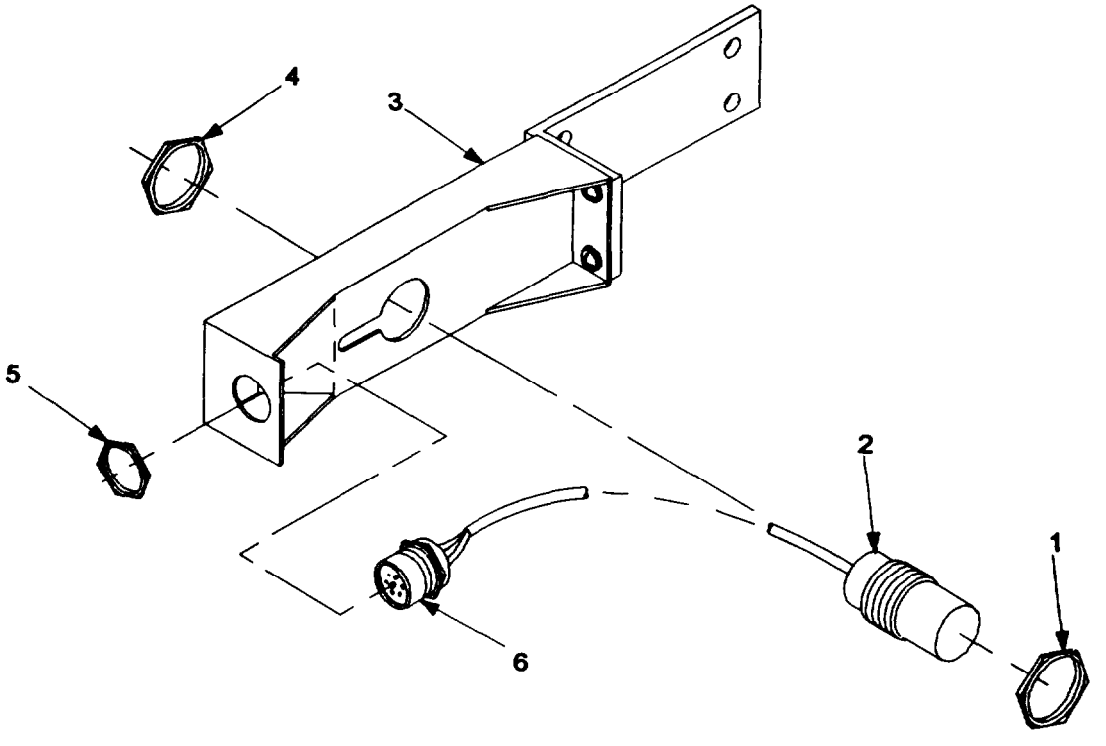
INITIAL SETUP

Materials/Parts:
Switch and connector assembly (9354033)
Sealing compound (item 12, appendix D)

Equipment Conditions:
Drive end switch and connector bracket assembly removed (reference paragraph 4-17).

Tools and Special Tools:
General mechanic's automotive tool kit

References:
Install drive end switch and connector bracket assembly (reference paragraph 4-17).



a. Removal.

(1) Remove front jamnut (1) from proximity switch (2).

(2) Pull proximity switch through rear of switch and connector bracket (3).

(3) Remove rear jamnut (4) from proximity switch.

(4) Remove proximity switch through front of switch and connector bracket.

(5) Remove jamnut (5) from connector (6).

(6) Remove connector from switch and connector bracket.

b. Installation.

(1) Remove jamnut (5) from connector (6).

(2) Apply sealing compound to threads of connector.

(3) Position connector on switch and connector bracket (3).

(4) Install jamnut on connector and secure connector to switch and connector bracket.

(5) Remove front and rear jamnuts from proximity switch (2).

(6) Pull proximity switch through front of switch and connector bracket.

(7) Apply sealing compound to threads of proximity switch.

(8) Install rear jamnut (4) on proximity switch.

(9) Position proximity switch on switch and connector bracket.

(10) Install front jamnut (1) on proximity switch and secure proximity switch to switch and connector bracket.

(11) Install drive end switch and connector bracket assembly (reference paragraph 4-17).

4-19 DRIVE END WHEEL ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

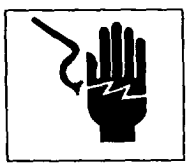
Materials/Parts:
Self-locking nut (MS21083C5)
wheel assembly (9354110)

References:
Perform IMTC self-test
(reference paragraph 2-4a).

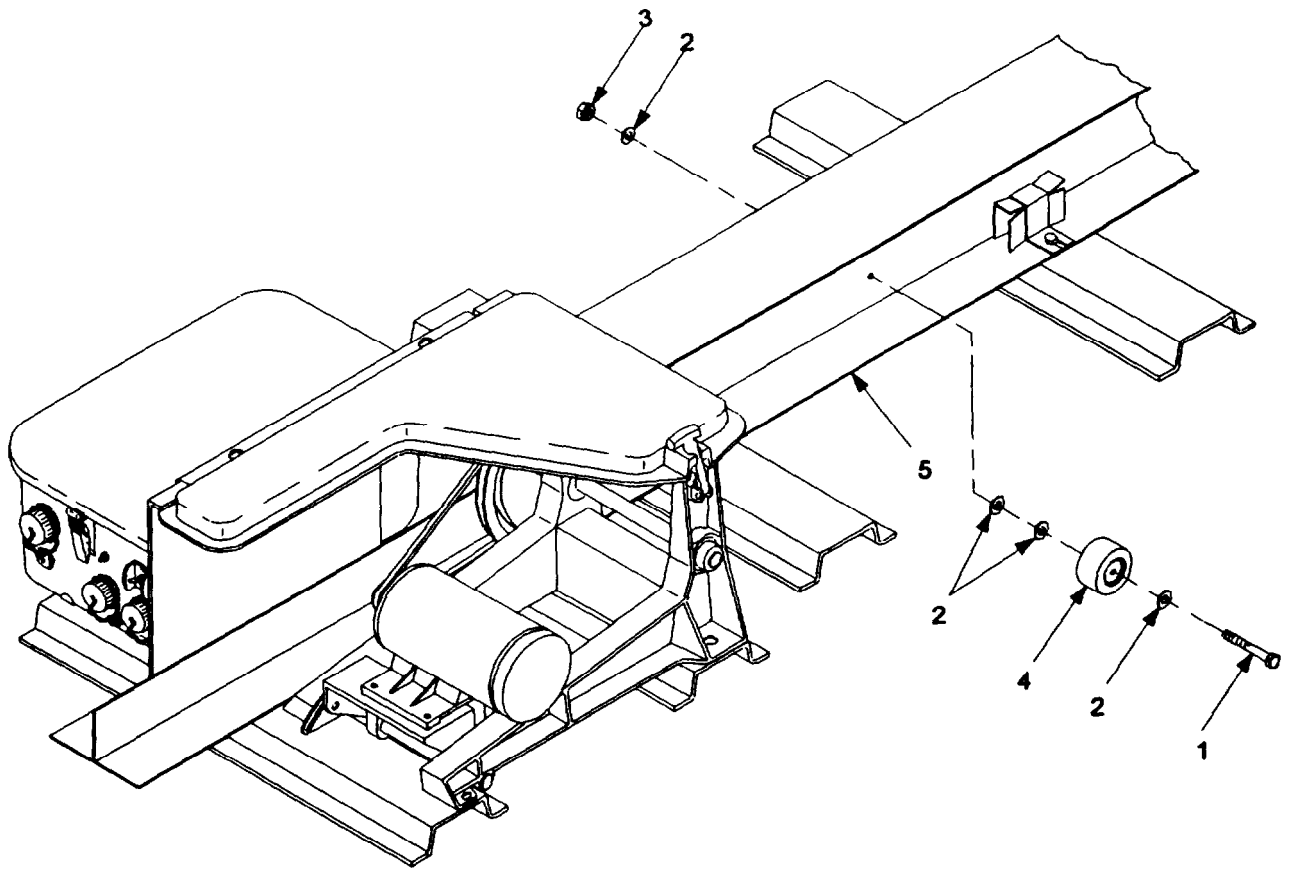
---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.



(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove hex bolt (1), four flatwashers (2), and self-locking nut (3) that secure wheel assembly (4) to drive mechanism track section (5).

(5) Remove wheel assembly from drive mechanism track section.

b. Installation.

NOTE

Position wheel assembly so that grease seal faces away from track section.

(1) Position wheel assembly (4) on drive mechanism track section (5).

(2) Install hex bolt (1), four flatwashers (2), and new self-locking nut (3), and secure wheel assembly to drive mechanism track section.

(3) Set circuit breaker on ITM to POWER ON.

(4) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(5) Set circuit breaker on ICB to ON.

(6) Perform IMTC self-test (reference paragraph 2-4a).

4-20 DRIVE END CABLE SHEAVE ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

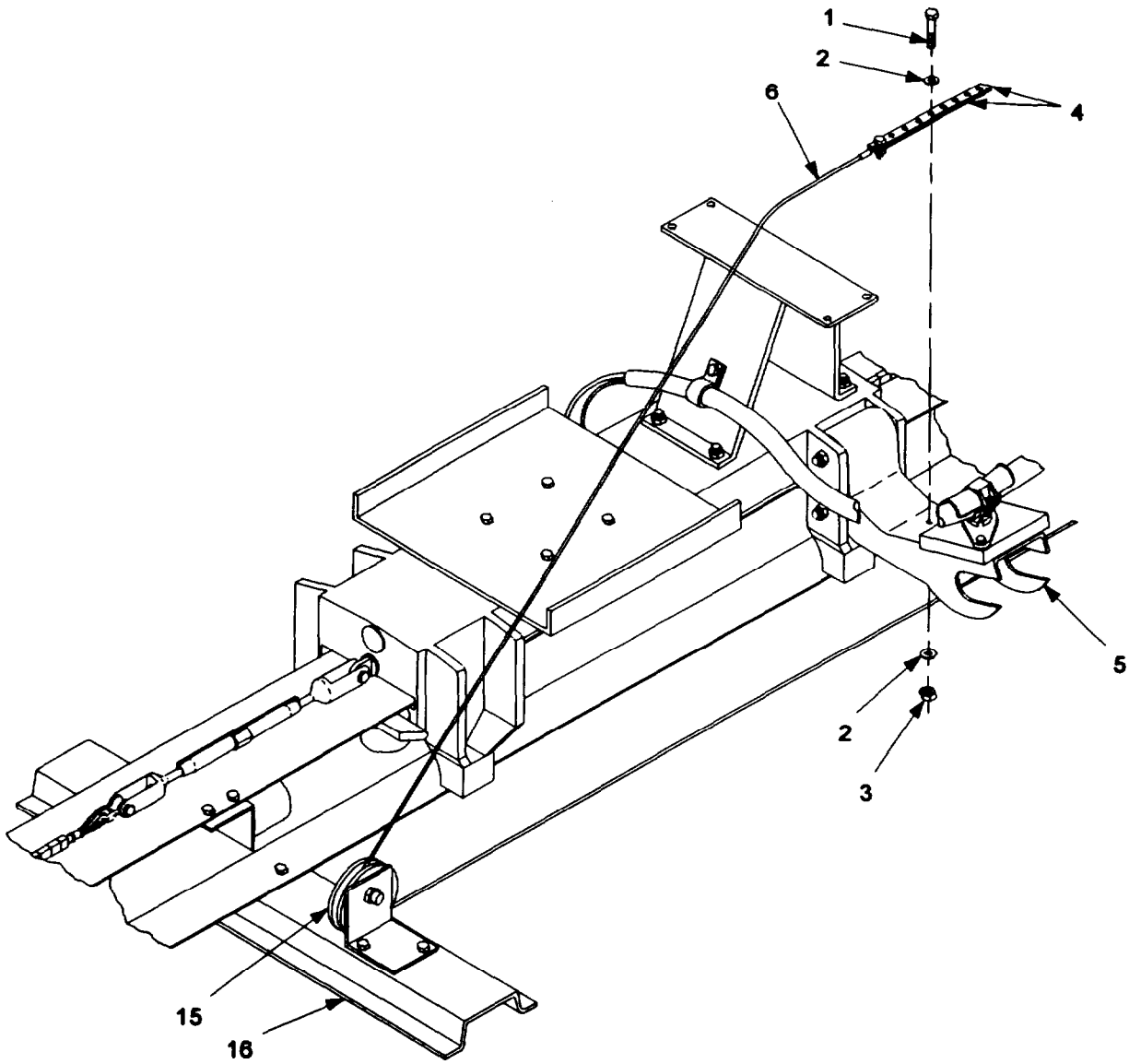
Personnel Required:
2 persons (for safety purposes)

MaterialsParts:
Cable sheave assembly (9387199)
Self-locking nut (MS21083C4)
Self-locking nut (MS21083C5)

References:
Perform IMTC self-test
(reference paragraph 2-4a).

---

a. Removal.



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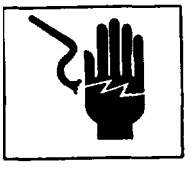


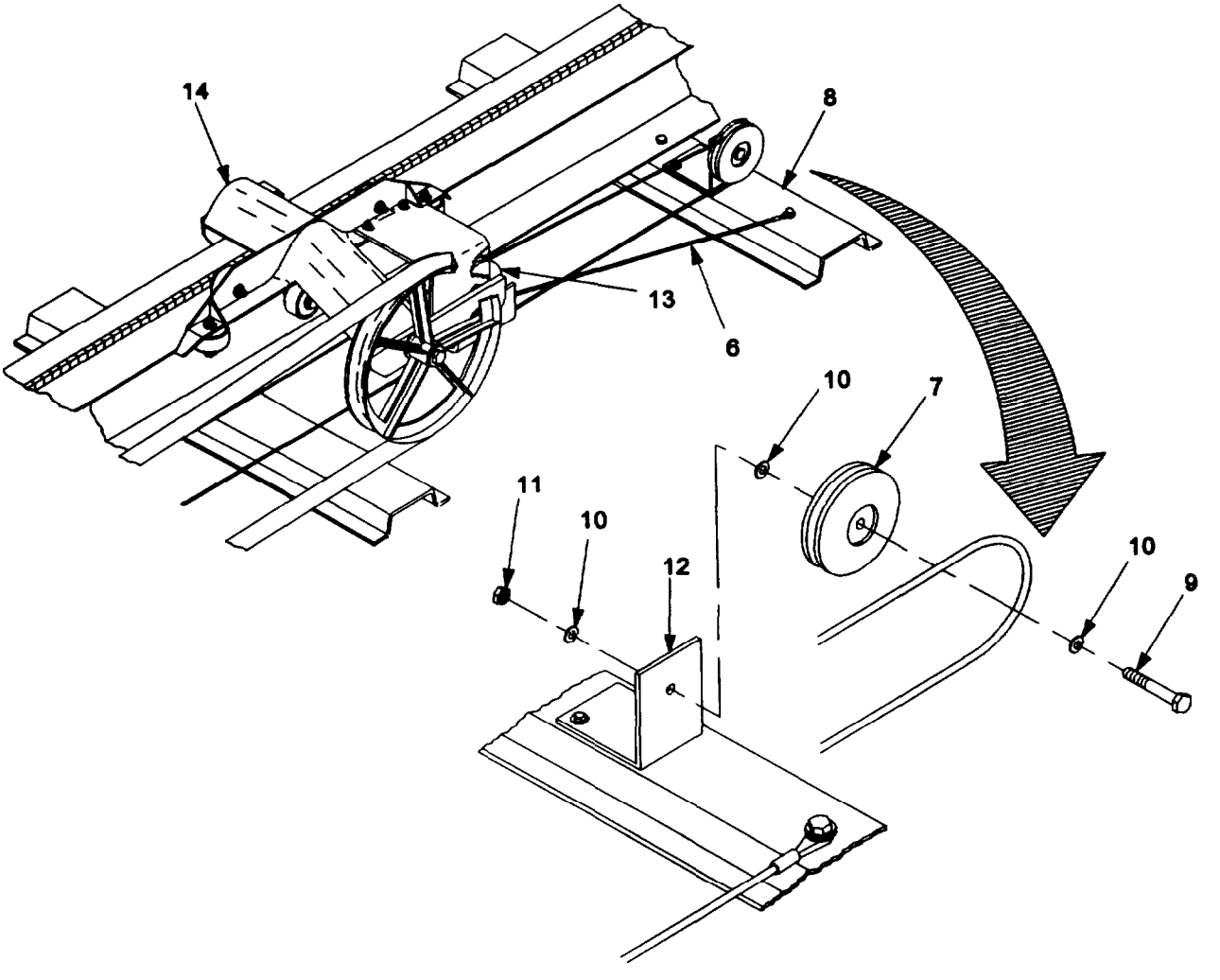
Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove hex-head screw (1), two flatwashers (2), and self-locking nut (3), and remove cable straps (4) from cable support assembly (5).



4-20 DRIVE END CABLE SHEAVE ASSEMBLY REPLACEMENT - Continued.

(5) Remove trolley cable (6) from cable sheave assembly (7) on crossmember assembly (8) at drive end of track.

(6) Remove hex bolt (9), flatwashers (10), and self-locking nut (11) that secure cable sheave assembly to anchor bracket (12) on crossmember assembly at drive end of track.

(7) Remove cable sheave assembly from anchor bracket.

b. Installation.

NOTE

Position cable sheave assembly so that grease seal faces away from anchor bracket.

(1) Position cable sheave assembly (7) on anchor bracket (12) attached to crossmember assembly (8) at drive end of track.

NOTE

Install enough flatwashers between anchor bracket and cable sheave assembly to ensure free rotation of cable sheave assembly.

(2) Install hex bolt (9), flatwashers (10) (as required), and new self-locking nut (11) and secure cable sheave assembly to anchor bracket.

NOTE

Trolley cable is installed under and over cable sheave assembly on trolley assembly.

(14) (Ensure that trolley cable (6) is installed in cable sheave assembly (13) on trolley assembly (14)

NOTE

Trolley cable is installed over and under cable sheave assembly on crossmember assembly at drive end of track.

(4) Install trolley cable in cable sheave assembly on crossmember assembly at drive end of track.

NOTE

Trolley cable is installed under and over cable sheave assembly on crossmember assembly at return end of track.

(5) Ensure that trolley cable is installed in cable sheave assembly (15) on crossmember assembly (16) at return end of track.

(6) Position cable straps (4) on cable support assembly (5) and install hex-head screw (1), two flatwashers (2), and new self-locking nut (3).

(7) Move carriage assembly against track bumper assembly on return end track section, and check trolley cable tension. Adjust position of trolley cable on cable straps as required.

(8) Set circuit breaker on ITM to POWER ON.

(9) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(10) Set circuit breaker on ICB to ON.

(11) Perform IMTC self-test (reference paragraph 2-4a).

4-21 DRIVE MECHANISM ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Self-locking nut (MS21083C4)
Lockwasher (MS35338-139)
Drive mechanism assembly (9340977)
Sealing compound (item 12, appendix D)

Personnel Required:
2 persons (for safety purposes)

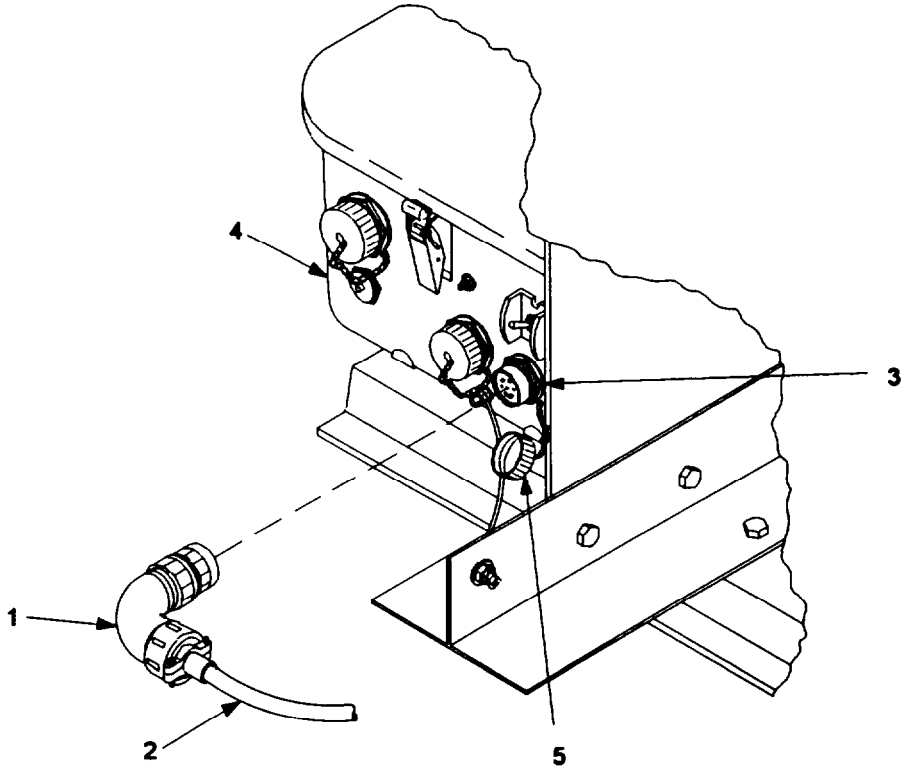
References:
Adjust position of output pulley #5 on countershaft (reference paragraph 4-22).
Adjust drive belt assembly kit (reference paragraph 4-10).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.

WARNING

Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result In electrical shock and death or serious Injury.



(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

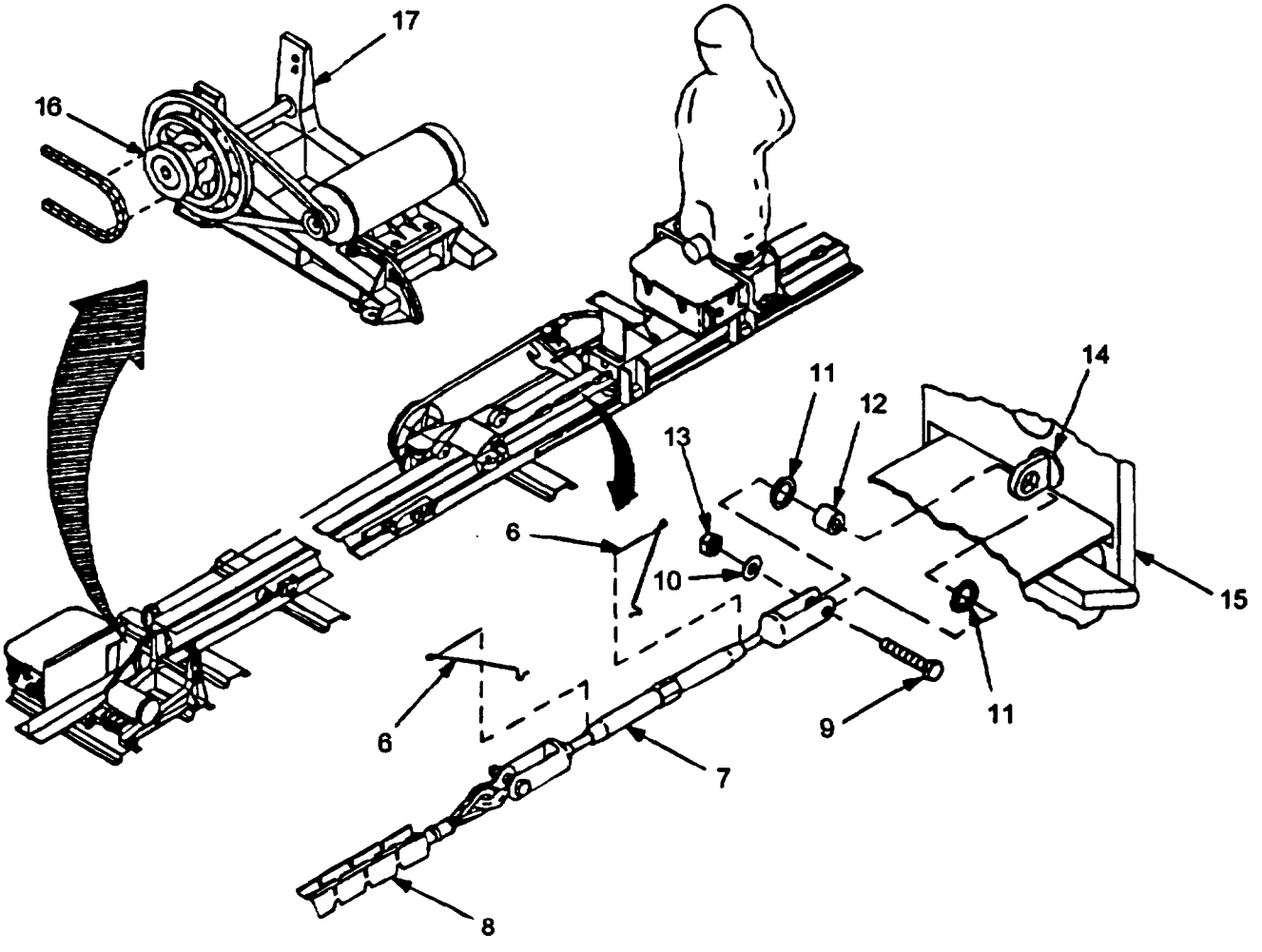
(4) Disconnect connector P1 (1) on cable assembly W115 (2) from connector J3 (3) on IMTC electronic components assembly (4).

(5) Install connector cover (5) on connector J3.

(6) Remove two locking clips (6) from each of two turnbuckle assemblies (7).

(7) Loosen drive end turnbuckle assembly and release tension on drive belt assembly (8).

(8) Remove bolt (9), flatwasher (10), two 1/4-in screw spacers (11), ½-in screw spacer (12), self-locking nut (13), and turnbuckle assembly from eyebolt (14) on drive end of carriage assembly (15).



4-21 DRIVE MECHANISM ASSEMBLY REPLACEMENT - Continued.

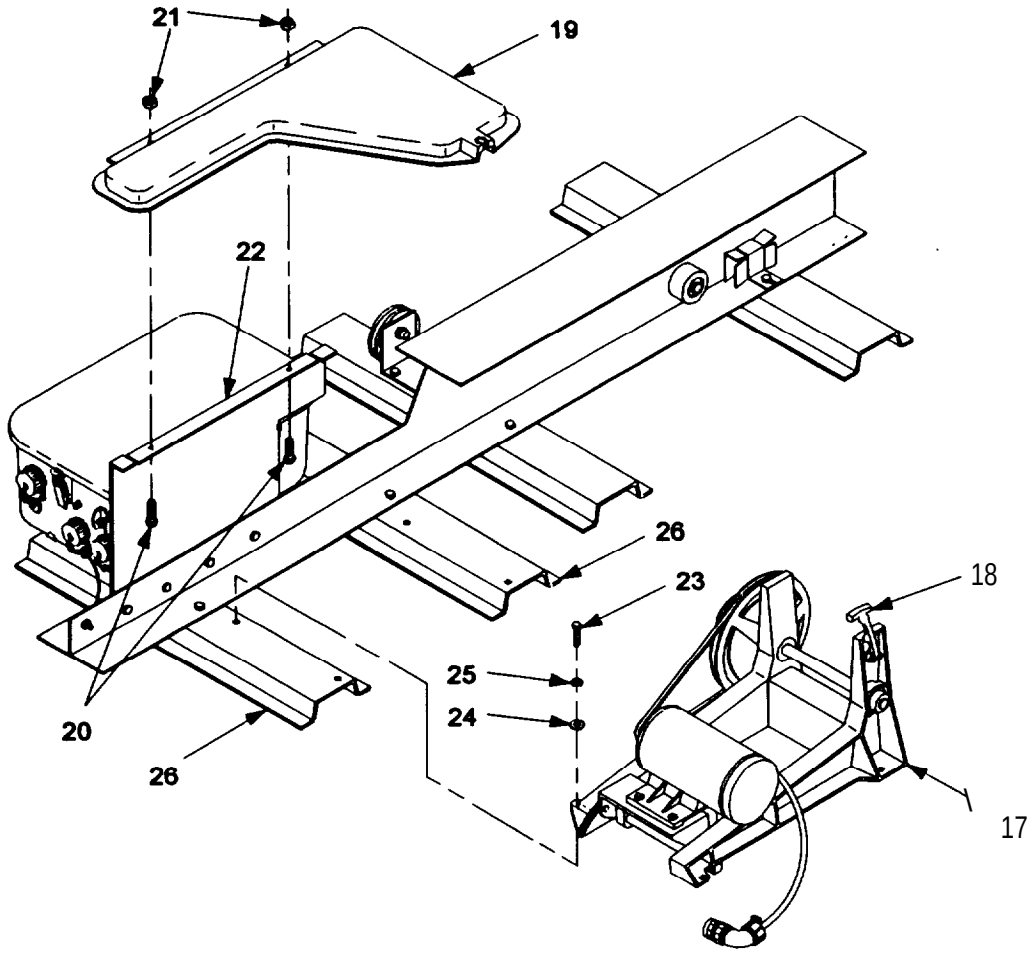
(9) Remove drive belt assembly from output pulley (16) on drive mechanism assembly (17).

(10) Release flex draw latch (18) that secures cover (19) to drive mechanism assembly.

(11) Remove two pan-head screws (20) and hex-nuts (21), and remove drive mechanism cover from cover bracket (22).

(12) Remove four hex-head screws (23), flatwashers (24), and lockwashers (25) that secure drive mechanism assembly to motor crossmember assemblies (26).

(13) Lift and remove drive mechanism assembly from motor crossmember assemblies.

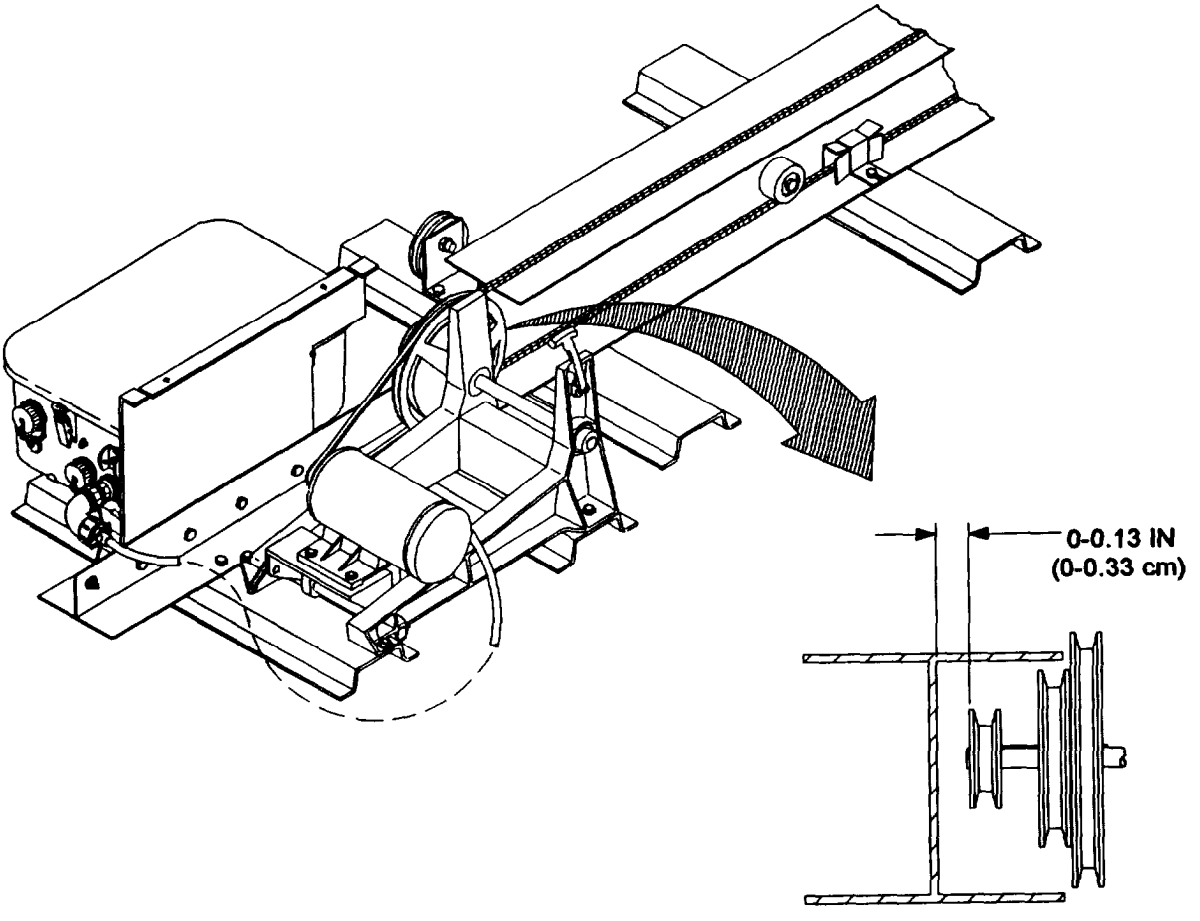


b. Installation.

(1) Position drive mechanism assembly (17) on motor crossmember assemblies (26).

(2) Install four hex-head screws (23), flatwashers (24), and new lockwashers (25) that secure drive mechanism assembly to motor crossmember assemblies.

(3) Check gap between output pulley and vertical surface of track section. Gap between output pulley and track section should be between 0 and 0.13 in (0 and 0.33 cm). Adjust position of output pulley #5 on counter shaft (reference paragraph 4-22) as required to obtain the proper tolerance.



(4) Loosen adjustment bolts (27) on motor mount platform (28).

NOTE

Adjust V-belt tension to allow no more than 1/2-in (1.27 cm) slack in belt when pressed with thumb.

(5) Adjust tension on V-belt (29) and tighten adjustment bolts.

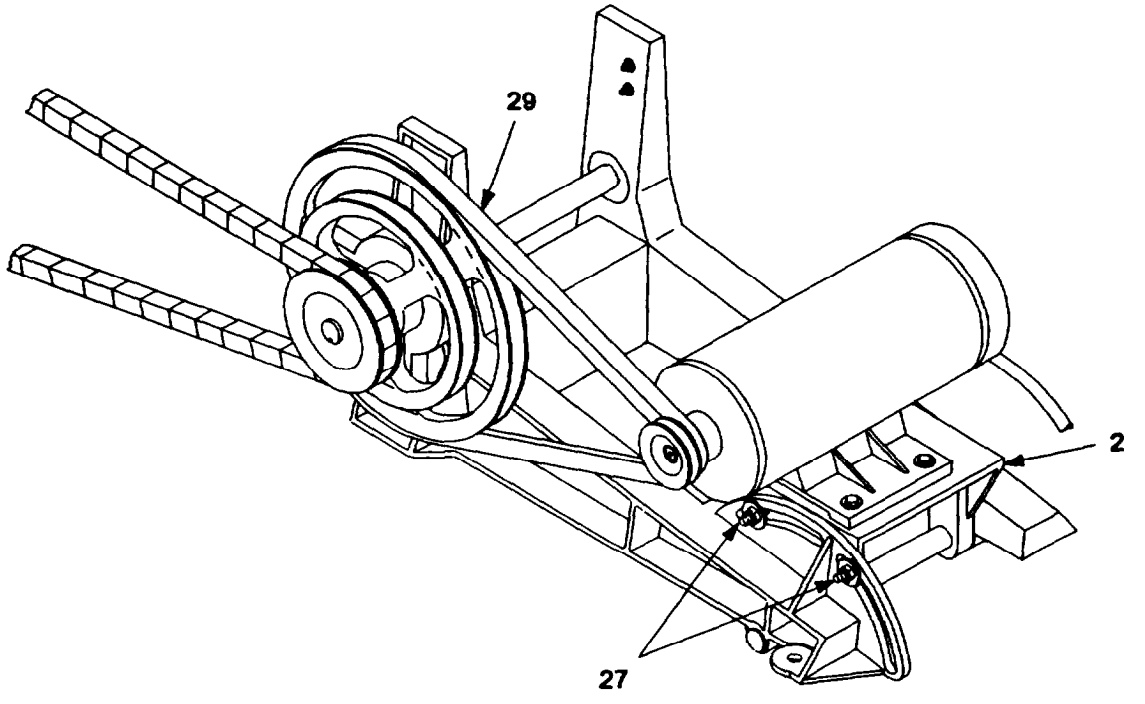
(6) Apply sealing compound to threads of pan-head screws (20).

(7) Position drive mechanism cover (19) on cover bracket (22), and install two pan-head screws and hex-nuts (21).

(8) Fasten flex draw latch (18) and secure cover to drive mechanism assembly.

(9) Position drive belt assembly (8) in output pulley (16) on drive mechanism assembly.

4-21 DRIVE MECHANISM ASSEMBLY REPLACEMENT - Continued.



(10) Position drive belt assembly on top flanges of track.

(11) Install tumbuckle assembly (7), bolt (9), flatwasher (10), two 1/4-in screw spacers (11), 1/2-in screw spacer (12) and new self-locking nut (13) in eyebolt (14) on drive end of carriage assembly (15).

(12) Adjust tension on drive belt assembly kit (reference paragraph 4-10).

(13) Remove connector cover (5) from connector J3 (3).

(14) Connect connector P1 (1) on cable assembly W115 (2) to connector J3 on IMTC electronic components assembly (4).

(15) Set circuit breaker on ITM to POWER ON.

(16) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(17) Set circuit breaker on ICB to ON.

(18) Perform IMTC self-test (reference paragraph 2-4a).

4-22 OUTPUT #5 PULLEY, V-BELT DRIVEN PULLEY ASSEMBLY AND SQUARE KEY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Output #5 pulley (9354013)
V-belt driven pulley assembly (9354008)
Square key (9354018-4)
Sealing compound (item 12, appendix D)

References:
Install drive mechanism assembly (reference paragraph 4-21).

Equipment Conditions:
Drive mechanism assembly removed (Reference paragraph 4-21).

a. Removal.

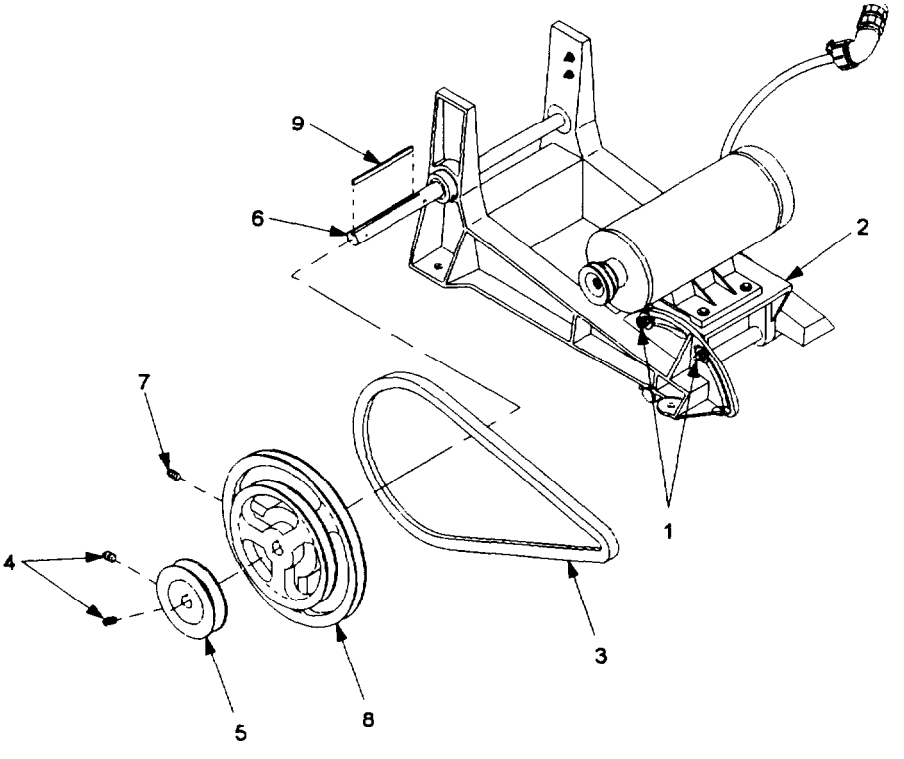
(1) Loosen adjustment bolts (1) on motor mount platform (2) and release tension on V-belt (3).

(2) Remove V-belt from pulleys.

(3) Loosen two setscrews (4) and remove output #5 pulley (5) from counter shaft (6).

(4) Loosen setscrew (7) and remove V-belt driven pulley assembly (8) from counter shaft.

(5) Remove square key (9) from counter shaft.



b. Installation.

NOTE

When installing square key on counter shaft, depression on key is placed at outer end of shaft.

(1) Install square key (9) on counter shaft (6).

(2) Remove two setscrews (4) from output #5 pulley (5). Remove setscrew (7) from V-belt driven pulley assembly (8).

(3) Apply sealing compound to setscrews and install setscrews in output #5 pulley and V-belt driven pulley assembly.

NOTE

Do not tighten setscrew on V-belt driven pulley assembly until pulley assembly has been aligned with motor pulleys.

(4) Align keyway with key and install V-belt driven pulley assembly on counter shaft.

(5) Align V-belt driven pulley assembly on counter shaft with motor pulleys on drive motor shaft. Tighten setscrew on V-belt driven pulley assembly.

(6) Align keyway with key and install output #5 pulley on counter shaft. Tighten two setscrews on output #5 pulley.

(7) Loosen adjustment bolts (1) on motor mount platform (2). Install V-belt (3) on pulleys and tighten adjustment bolts.

(8) Install drive mechanism assembly. Reference paragraph 4-21.

4-23 Motor #2 Pulley Replacement.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Motor #1 pulley (9354031)
Motor #2 pulley (9354002)
Sealing compound (item 12, appendix D)

References:
Install drive mechanism assembly (reference paragraph 4-23).

Equipment Conditions:
Drive mechanism assembly removed (reference paragraph 4-23.

---

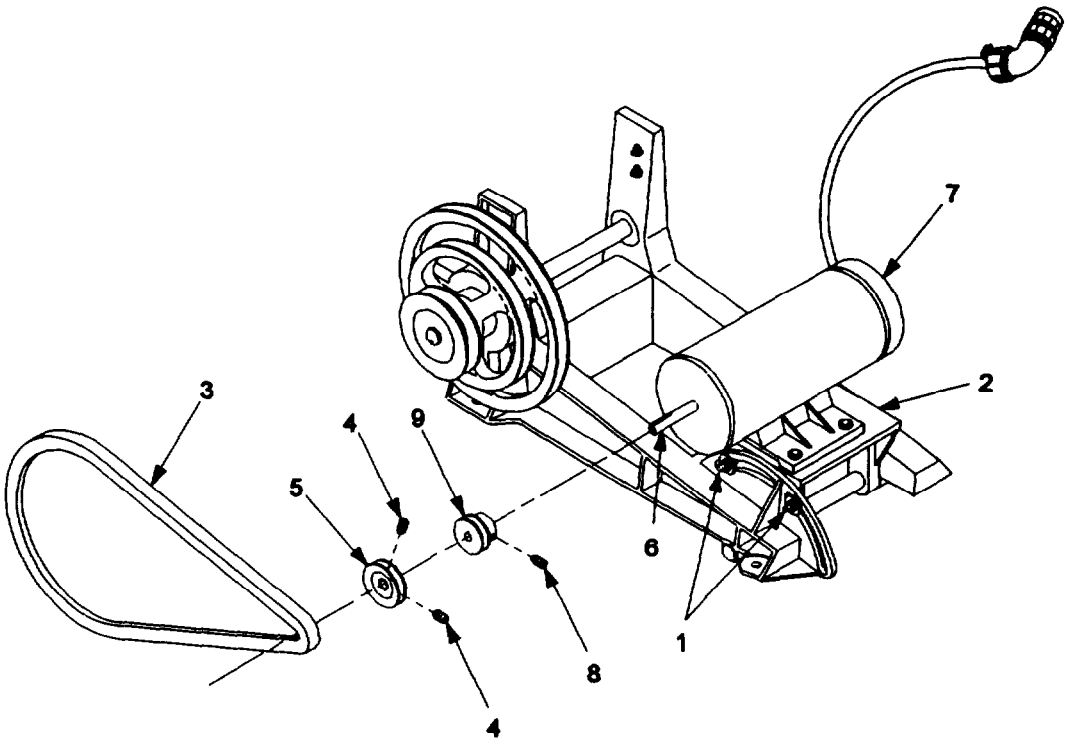
a. Removal.

(1) Loosen adjustment bolts (1) on motor mount platform (2) and release tension on V-belt (3).

(2) Remove V-belt from motor pulley.

(3) Loosen two setscrews (4) and remove motor #2 pulley (5) from shaft (6) on drive motor assembly (7).

(4) Loosen setscrew (8) and remove motor #1 pulley (9) from shaft on drive motor assembly.



b. Installation.

(1) Remove setscrew (8) from motor #1 pulley (9). Remove two setscrews (4) from motor #2 pulley (5).

(2) Apply sealing compound to setscrews and install setscrews in motor #1 and motor #2 pulleys.

(3) Align keyway with key and install motor #1 pulley on shaft (6) on drive motor assembly (7). Tighten setscrew.

(4) Align keyway with key and install motor #2 pulley on shaft on drive motor assembly. Tighten setscrews.

(5) Loosen adjustment bolts (1) on motor mount platform (2). Install V-belt (3) on pulleys and tighten adjustment bolts.

(6) Install drive mechanism assembly (reference paragraph 4-21).

4-24 V-BELT REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

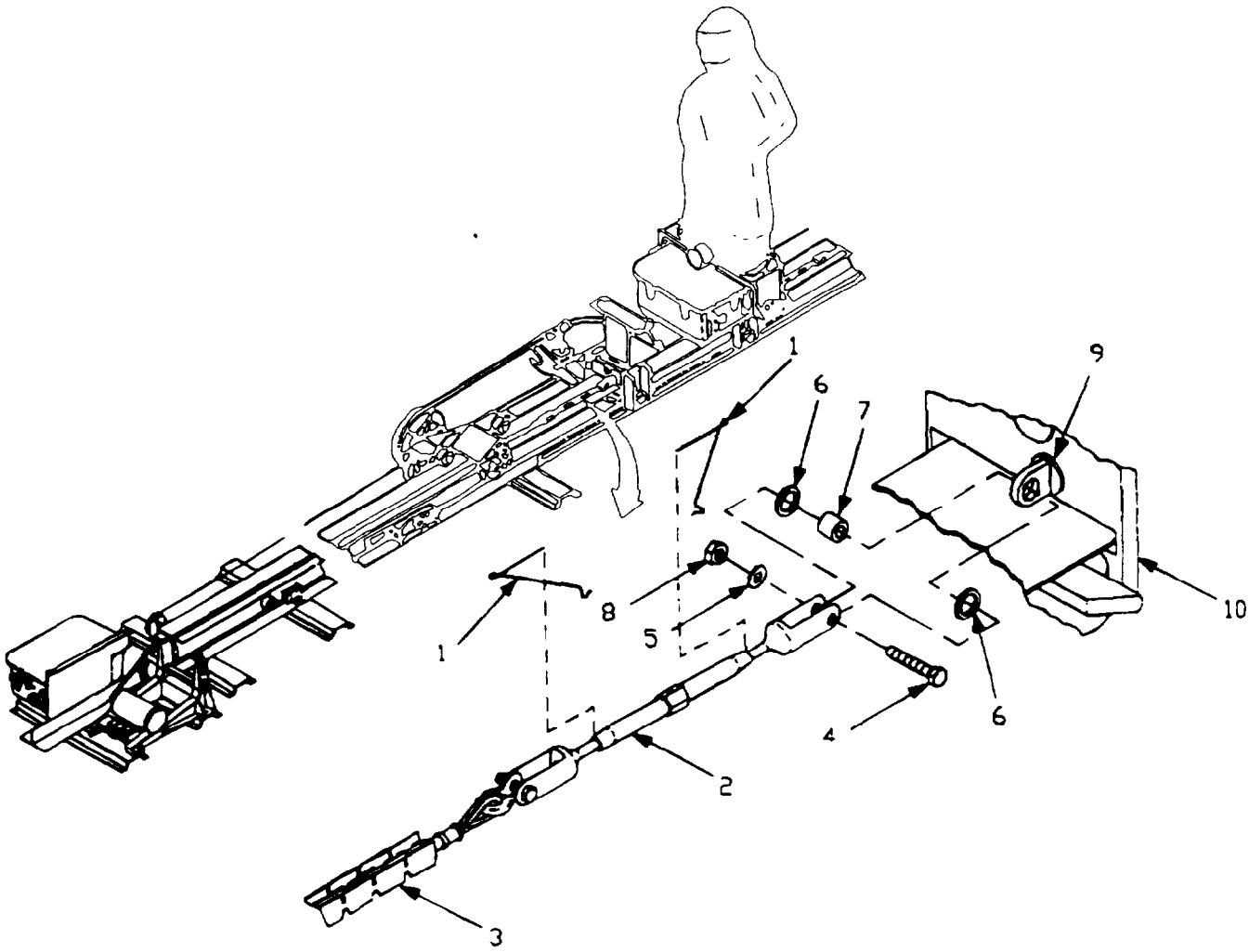
Materials/Part:
V-belt (9354003)
Sealing compound (item 12, appendix D)
Self-locking nut (MS21083C4)

Personnel Required:
2 persons (for safety purposes)

References:
Positioning V-belt in pulleys for desired speed setting (reference paragraph 2-3).
Adjust drive belt assembly kit (reference paragraph 4-10).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.



WARNING

Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious Injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove two locking clips (1) from each of two turnbuckle assemblies (2).

(5) Loosen drive end turnbuckle assembly and release tension on drive belt assembly (3).

(6) Remove bolt (4) flatwasher (5) two 1/4-in screw spacers (6), 1/2-in screw spacer (7), self-locking nut (8), and turnbuckle assembly from eyebolt (9) on drive end of carnage assembly (10).

(7) Remove drive belt assembly from output pulley #5 (11) on drive mechanism assembly (12).

(8) Release flex draw latch (13) that secures cover (14) to drive mechanism assembly.

(9) Remove two pan-head screws (15) and hex nuts (16), and remove drive mechanism cover from cover bracket (17).

(10) Loosen adjustment bolts (18) on motor mount platform (19) and release tension on V-belt (20).

(11) Remove V-belt from pulleys (21).

b. Installation.

(1) Loosen adjustment bolts (18) on motor mount platform (19). Install V-belt (20) on pulleys (21) in accordance with desired speed setting (reference paragraph 2-3).

NOTE

Adjust V-belt tension to allow no more than 1/2-in (1.27 cm) slack In belt when pressed with thumb.

(2) Adjust tension on V-belt and tighten adjustment bolts.

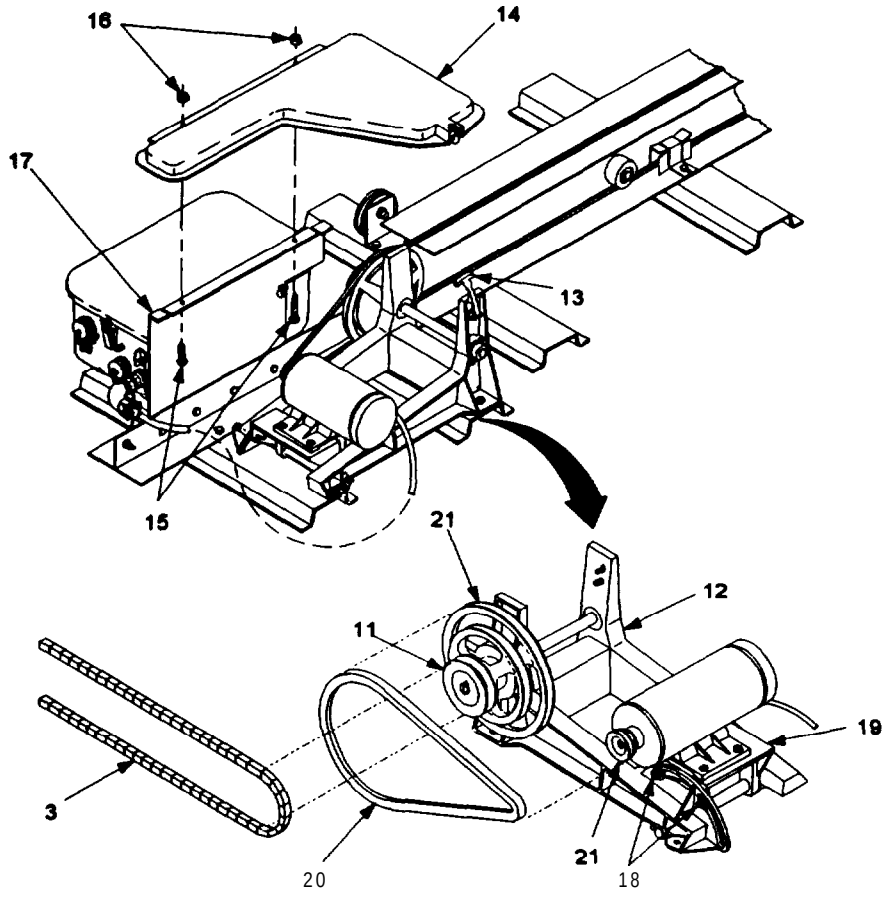
(3) Apply sealing compound to threads of pan-head screws (15).

(4) Position drive mechanism cover (14) on cover bracket (17), and install two pan-head screws and hex nuts (16).

(5) Fasten flex draw latch (13) and secure cover to drive mechanism assembly (12).

(6) Position drive belt assembly (3) in output pulley #5 (11) on drive mechanism assembly (12).

4-24 V-BELT REPLACEMENT - Continued.



(7) Position drive belt assembly on top flanges of track.

NOTE

Groove In threaded portion of clevises on turnbuckle assembly must be facing up to allow installation of locking clips.

(8) Position turnbuckle assembly (2) over eyebolt (9) on drive end of carriage assembly (10) and install bolt (4) flatwasher (5), two 1/4-in *screw* spacers (6), 1/2-in screw spacer (7) and new self-locking nut (8).

(9) Adjust tension on drive belt assembly kit (reference paragraph 4-10).

(10) Set circuit breaker on ITM to POWER ON.

(11) Set circuit breaker CB1 on lMTC electronic components assembly to ON.

(12) Set circuit breaker on ICB to ON.

(13) Perform IMTC self-test (reference paragraph 2-4a).

4-25 DRIVE MOTOR ASSEMBLY REPLACEMENT.

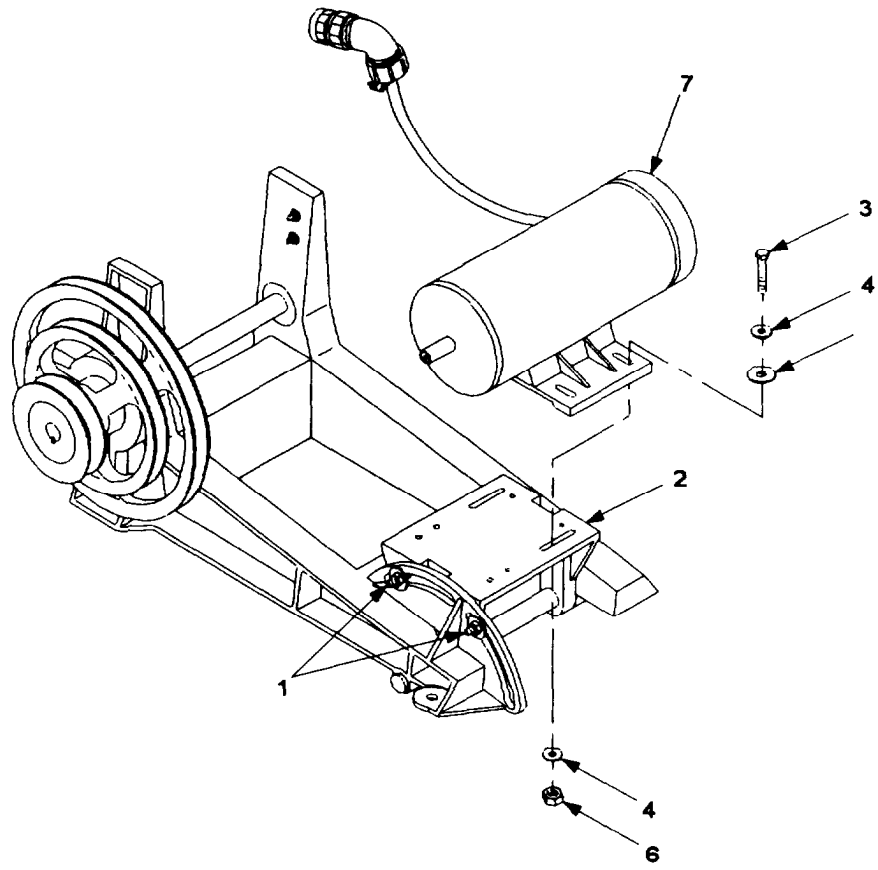
INITIAL **SETUP**

Tools and Special Tools:
General mechanic's automotive tool kit

Equipment Conditions:
Drive mechanism assembly removed (reference paragraph 4-21).
Motor #1 and #2 pulleys removed (reference paragraph 4-23).

Materials/Parts:
Self-locking nut (MS21083C4)
Drive motor assembly (9354017)

References:
Install motor #1 and #2 pulleys (reference paragraph 4-23).
Install drive mechanism assembly (reference paragraph 4-21).
Perform IMTC self-test (reference paragraph 2-4a).



Replacement.

a. Remove four hex-head capscrews (3), eight 1/4-in flatwashers (4), four 3/8-in flatwashers (5), and four self-locking nuts (6), and remove drive motor assembly (7) from motor mount platform.

b. Position replacement drive motor assembly (7) on motor mount platform (2), and install four hex-head capscrews (3), eight 1/4-in flatwashers (4), four 3/8-in flatwashers (5), and four new self-locking nuts (6).

c. Install motor #1 and #2 pulleys (reference paragraph 4-23).

d. Install drive mechanism assembly (reference paragraph 4-21).

e. Perform IMTC self-test (reference paragraph 2-4a).

4-26 DC MOTOR REPLACEMENT.

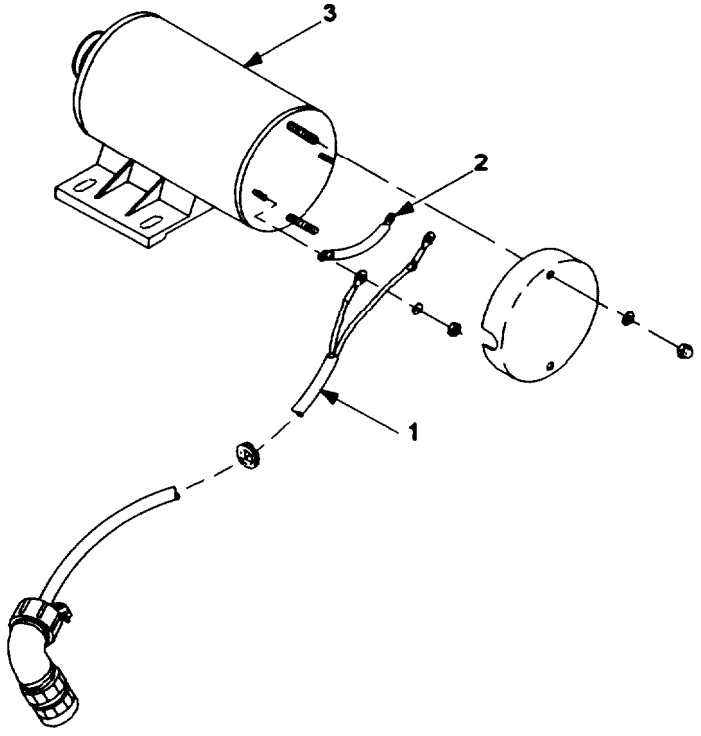
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
DC motor (9354000)

References:
Remove drive motor assembly (reference paragraph 4-25).

References - Continued.
Remove cable assembly W115 and suppressor assembly (reference paragraph 4-27).
Install cable assembly W115 and suppressor assembly (reference paragraph 4-27).
Install drive motor assembly (reference paragraph 4-25).
Perform IMTC self-test (reference paragraph 2-4a).



Replacement.

a. Remove drive motor assembly (reference paragraph 4-25).

b. Remove cable assembly W115 (1) and suppressor assembly (2) from dc motor (3) (reference paragraph 4-27).

c. Install cable assembly W115 (1) and suppressor assembly (2) on replacement dc motor (3) (reference paragraph 4-27).

d. Install drive motor assembly (reference paragraph 4-25).

e. Perform IMTC self-test (reference paragraph 2-4a).

4-27 CABLE ASSEMBLY W115 AND SUPPRESSOR ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

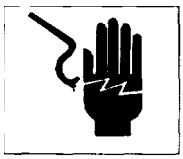
Materials/Parts:
Cable assembly (9354019)
Suppressor assembly (9387289)

References:
Perform IMTC self-test
(reference paragraph 2-4).

---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Disconnect connector PI (1) on cable assembly W115 (2) from connector J3 (3) on IMTC electronic components assembly (4).

(5) Install connector cover on connector J3.

(6) Remove two nuts (5) and washers (6) and remove safety cover (7) from rear of dc motor (8).

(7) Remove two nuts (9) and washers (10), and remove cable assembly W115 and suppressor assembly (11) from terminals (12) on dc motor.

(8) Remove cable assembly W115 and grommet (13) from safety cover.

(9) Remove grommet from cable assembly W115.

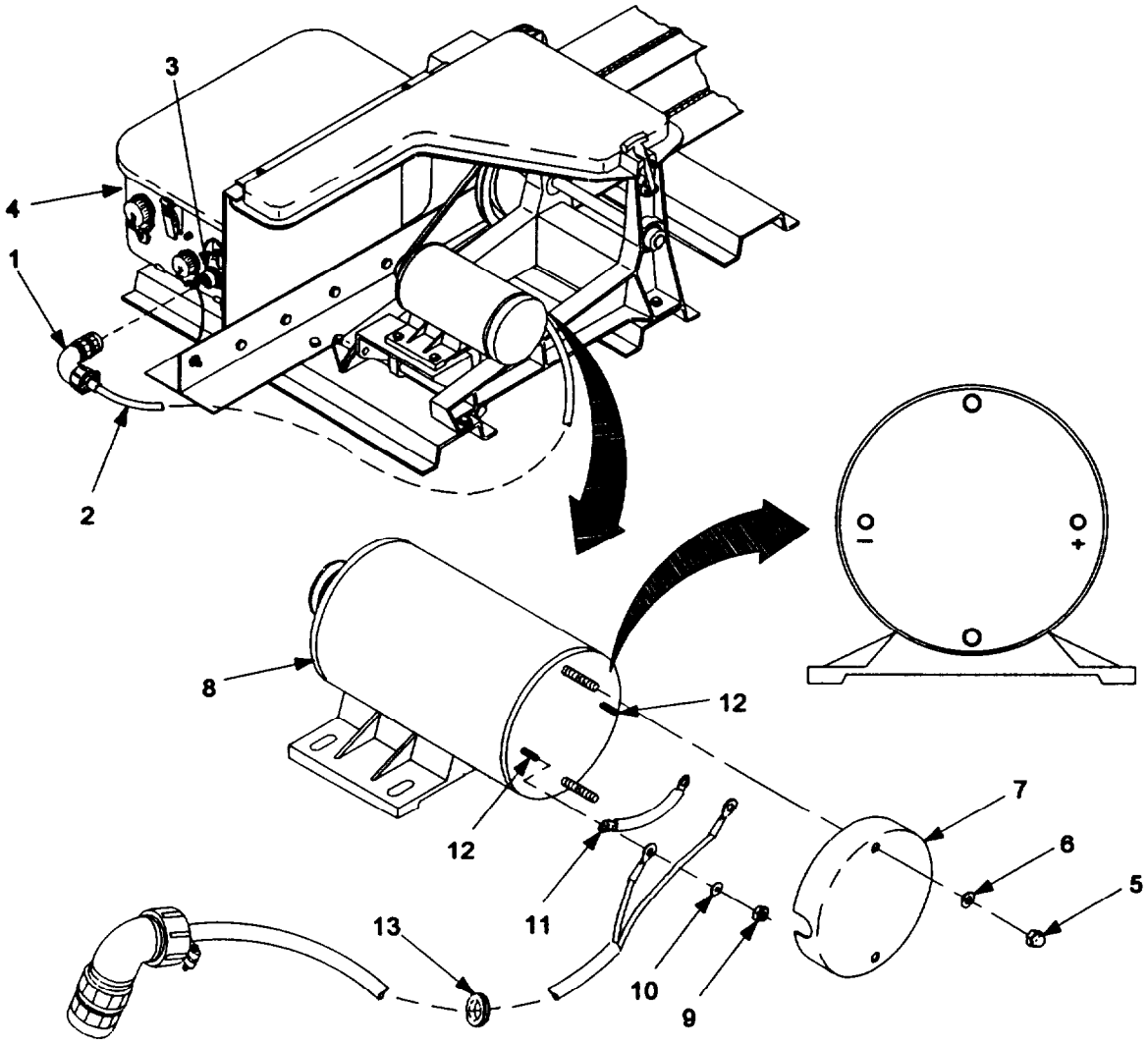
b. Installation.

(1) Install grommet (13) on cable assembly W115 (2).

(2) Install suppressor assembly (11) on terminals (12) on dc motor (8).

(3) Connect cable assembly W115 positive lead to terminal Al on dc motor.

(4) Connect cable assembly W115 negative lead to terminal A2 on dc motor.



(5) Install washer (10) and nut (9) on each terminal.

(6) Position safety cover (7) on rear of dc motor, and install grommet on safety cover. Install two nuts (5) and washers (6).

(7) Remove connector cover from connector J3 (3).

(8) Connect connector P1 (1) on cable assembly W115 to connector J3 on IMTC electronic components assembly (4).

(9) Set circuit breaker on ITM to POWER ON.

(10) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(11) Set circuit breaker on ICB to ON.

(12) Perform IMTC self-test (reference paragraph 2-4a).

4-28 RETURN END WHEEL ASSEMBLY REPLACEMENT.

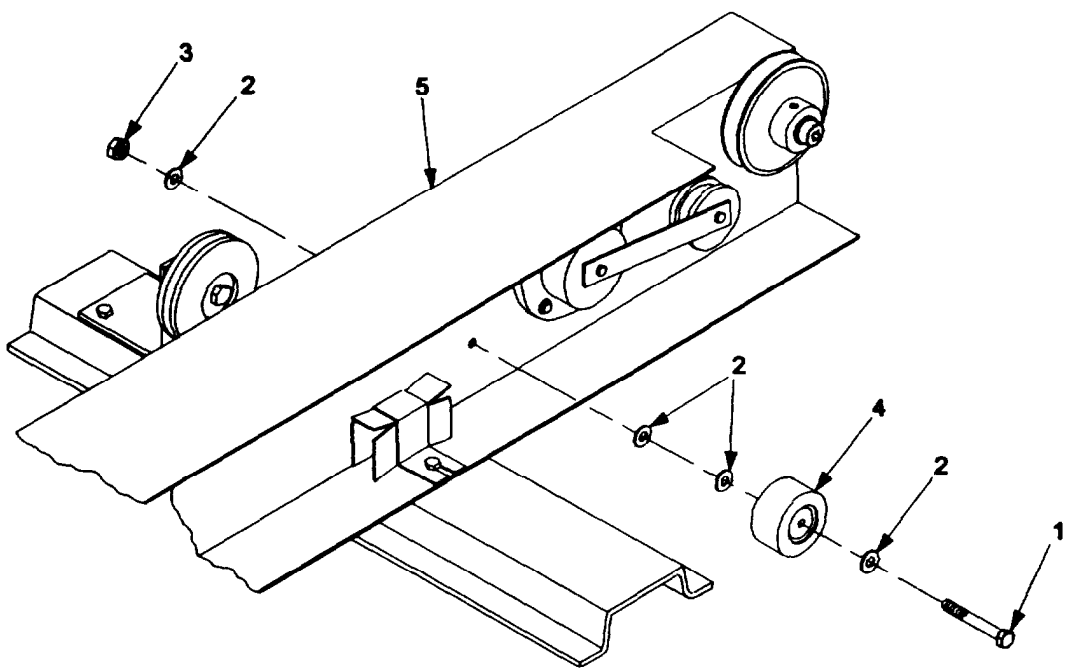
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

Materials/Parts:
Wheel assembly (9354110)
Self-locking nut (MS21083C4)

References:
Perform IMTC self-test
(reference paragraph 2-4a).



a. Removal.

WARNING

Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove hex bolt (1), four flatwashers (2), and self-locking nut (3) that secure wheel assembly (4) to return end track section (5).

(5) Remove wheel assembly from return end track section.

b. Installation.

NOTE

Position wheel assembly so that grease seal faces away from track section.

(1) Position wheel assembly (4) on return end track section (5).

(2) Install hex bolt (1), four flatwashers (2), and new self-locking nut (3), and secure wheel to return end track section.

(3) Set circuit breaker on ITM to POWER ON.

(4) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(5) Set circuit breaker on ICB to ON.

(6) Perform IMTC self-test (reference paragraph 2-4a).

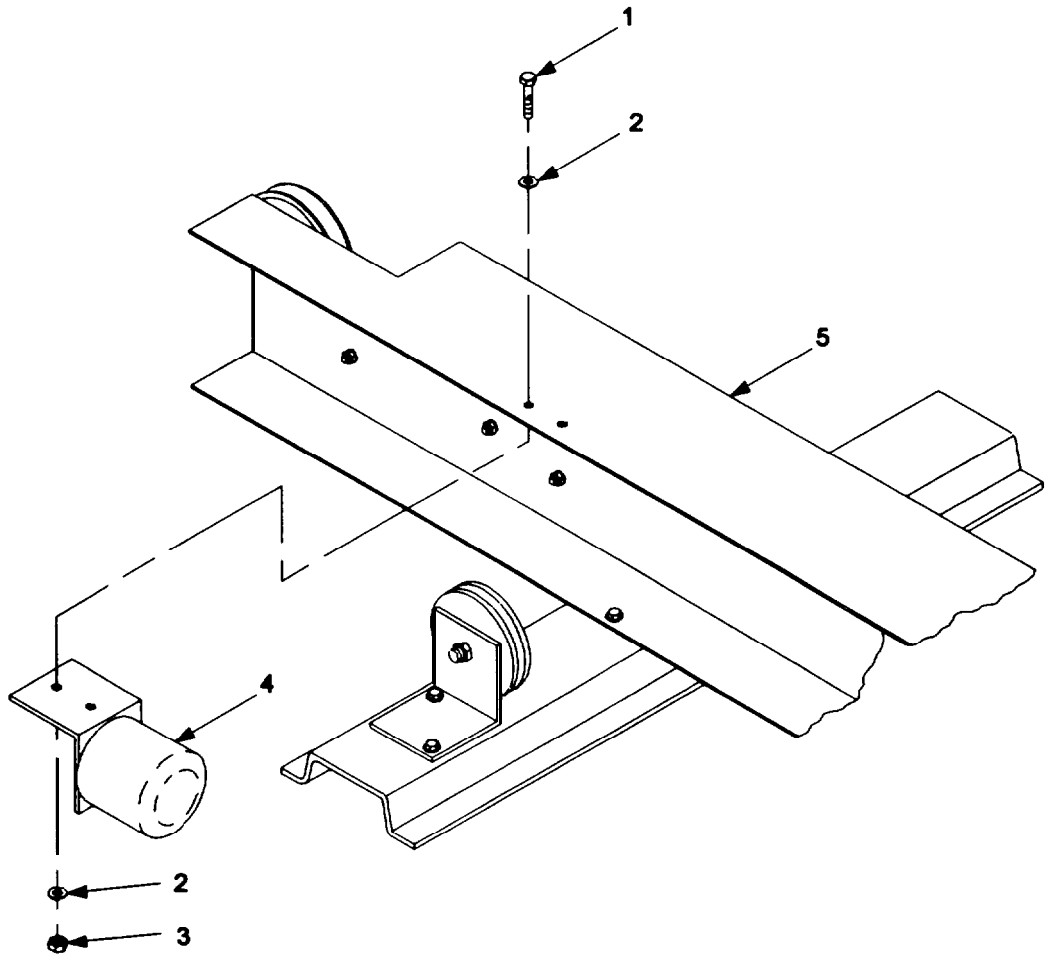
4-29 TRACK BUMPER ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

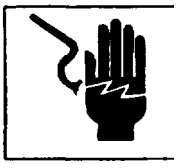
Personnel Required:
2 persons (for safety purposes)

Materials/Parts:
Track bumper assembly (9353993)
Self-locking nut (MS21083-C6)



a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove two hex-head screws (1), four flatwashers (2), two self-locking nuts (3) that secure track bumper assembly (4) to return end track section (5).

(5) Remove track bumper assembly from return end track section.

b. Installation.

(1) Position track bumper assembly (4) on return end track section (5).

(2) install two hex-head screws (1), four flatwashers (2), and two new self-locking nuts (3) and secure track bumper assembly on return end track section.

(3) Set circuit breaker on ITM to POWER ON.

(4) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(5) Set circuit breaker on ICB to ON.

4-30 RETURN END CABLE SHEAVE ASSEMBLY REPLACEMENT.

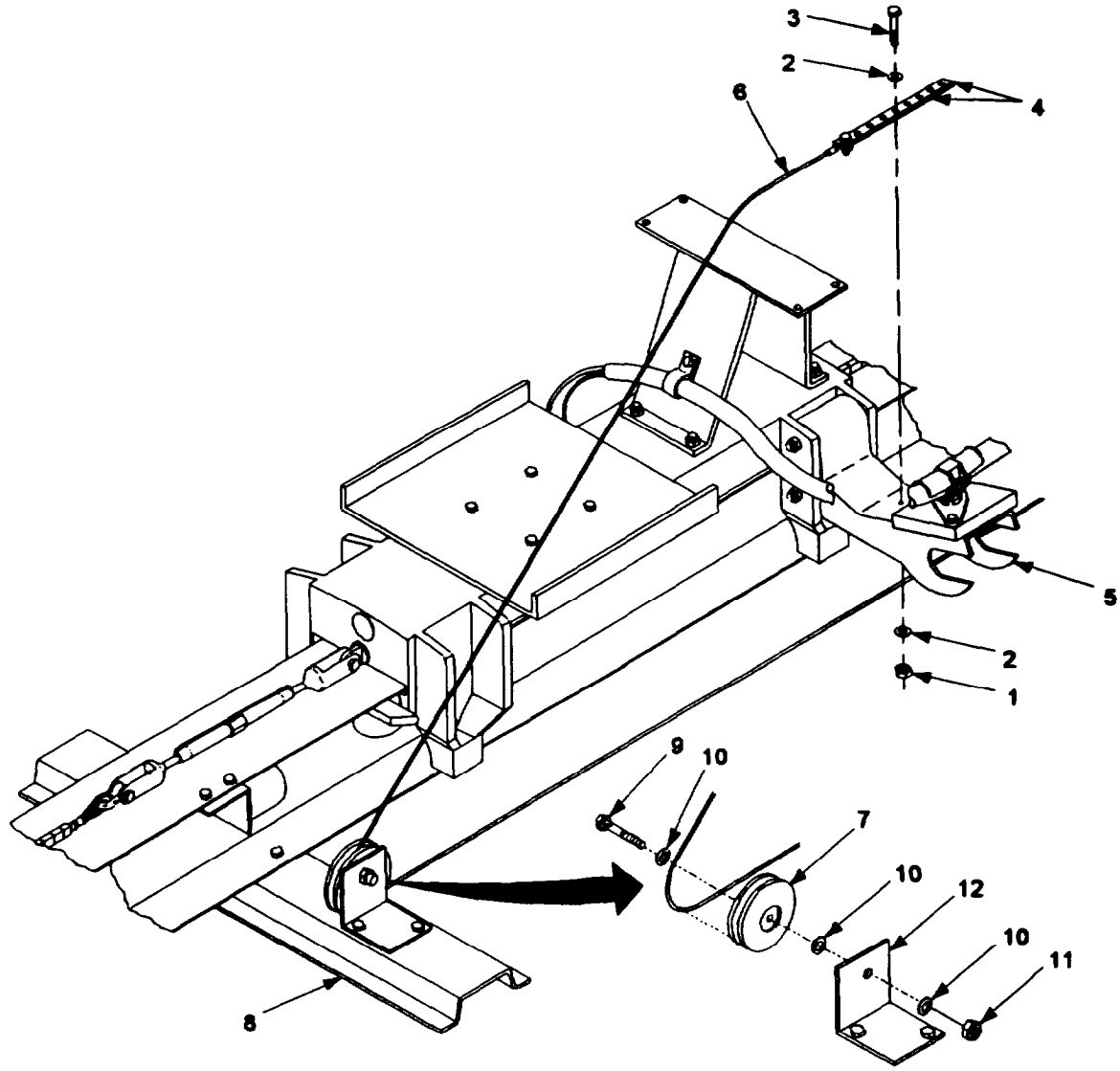
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Matetials/Parts:
Self-locking nut (MS21083C4)
Self-locking nut (MS21083C5)
Cable sheave assembly (9387199)

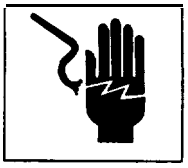
Personnel Required:
2 persons (for safety purposes)

References:
Trolley cable adjustment (reference paragraph 4-39c).
Perform IMTC self-test (reference paragraph 2-4a).



a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove self-locking nut (1), two flatwashers (2), and hex-head screw (3), and remove cable straps (4) from support asssembly (5)

(5) Remove trolley cable (6) from cable sheave assembly (7) on crossmember assembly (8) at return end of track.

(6) Remove hex bolt (9) flatwashers (10), and self-locking nut (11) that secure cable sheave assembly to anchor bracket (12) on crossmember assembly at return end of track.

(7) Remove cable sheave assembly from anchor bracket.

b. Installation.

NOTE

Position cable sheave assembly so that grease seal faces away from anchor bracket.

(1) Position cable sheave assembly (7) on anchor bracket (12) attached to crossmember assembly (8) at return end of track.

NOTE

Install flatwashers between anchor bracket and cable sheave assembly as required to ensure free rotation of cable sheave assembly.

(2) install hex bolt (9), flatwashers (10) (as required), and new self-locking nut (11), and secure cable sheave assembly to anchor bracket.

NOTE

Before installing trolley cable In cable sheave assembly on crossmember assembly at return end of track, ensure that trolley cable is installed In cable sheave assemblies on trolley assembly and crossmember assembly at drive end of track.

4-30 RETURN END CABLE SHEAVE REPLACEMENT - Continued.

NOTE

Trolley cable is installed under and over cable sheave assembly on crossmember assembly at return end of track.

(3) install trolley cable (6) in cable sheave assembly on crossmember assembly at return end of track.

(4) Position cable straps (4) on cable support assembly (5), and install hex-head screw (3), two flatwashers (2), and self-locking nut (1).

(5) Move carriage assembly against track bumper assembly on return end track section, and check trolley cable tension. Adjust position of trolley cable on cable straps as required. (Reference paragraph 4-39c).

(6) Set circuit breaker on ITM to POWER ON.

(7) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(8) Set circuit breaker on ICB to ON.

(9) Perform IMTC self-test (reference paragraph 2-4a).

4-31 RETURN END PULLEY ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Self-locking nut (MS21083C4)
Return end pulley (9353996)
Sealing compound (item 13, appendix D)

Personnel Required:
2 persons (for safety purposes)

References:
Adjust drive belt assembly kit (reference to paragraph 4-10).
Install target (reference paragraph 4-42).
Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
Target removed (reference paragraph 4-42).

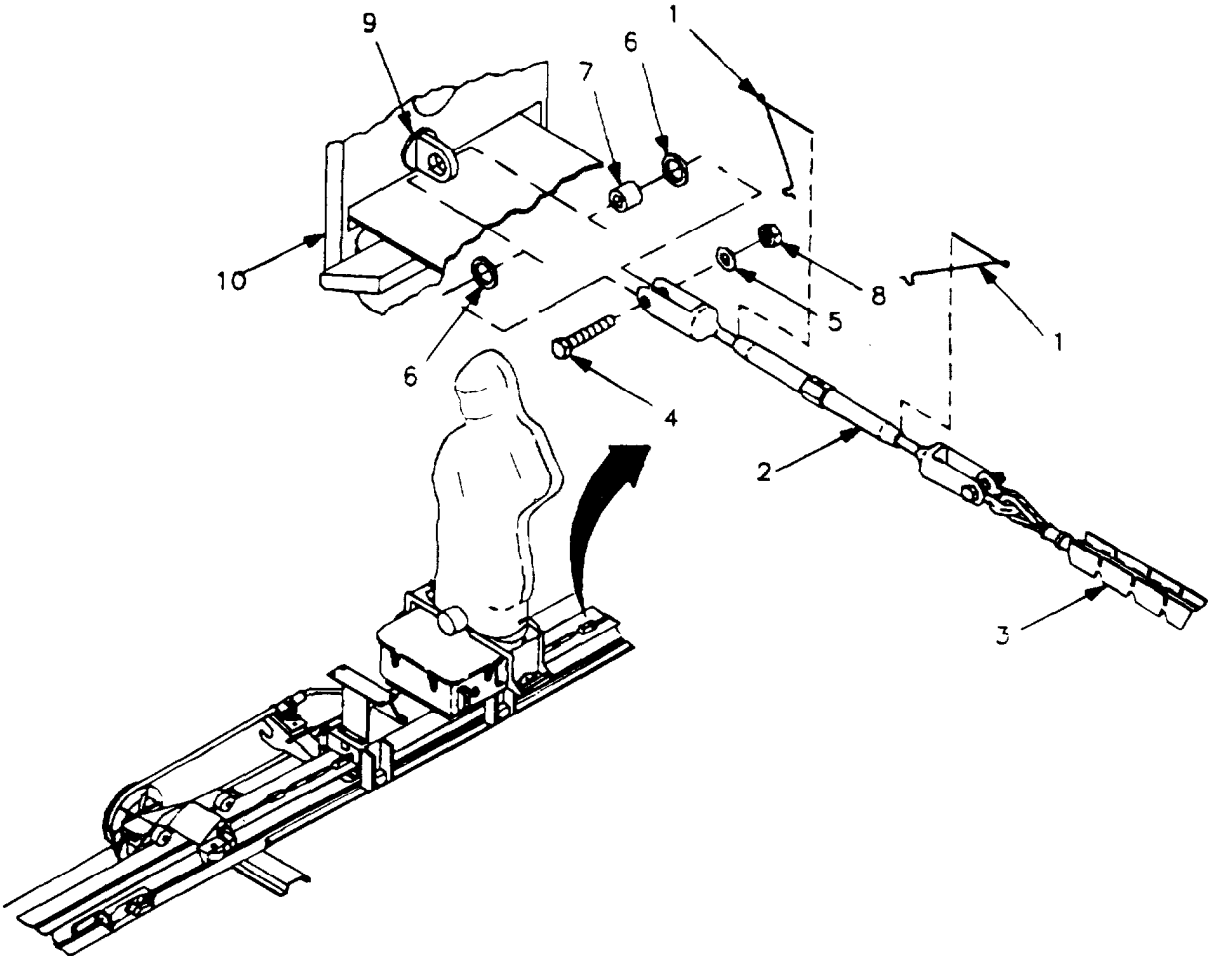
---

a. Removal.

(1) Remove two locking clips (1) from each of two turnbuckle assemblies (2).

(2) Loosen return end turnbuckle assembly and release tension on drive belt assembly (3).

(3) Remove bolt (4), flatwasher (5), two 1/4-in screw spacers (6), 1/2-in screw spacer (7), seif-locking nut (8), and turnbuckle assembly from eyebolt (9) on return end of carriage assembly (10).



(4) Remove drive belt assembly from return end pulley assembly (11).

(5) Remove shoulder screw (12), two flatwashers (13), spacing flatwasher (14), plain nut (15), and return end pulley assembly from return end track section (16).

b. Installation.

(1) Apply sealing compound to threads of plain nut (15).

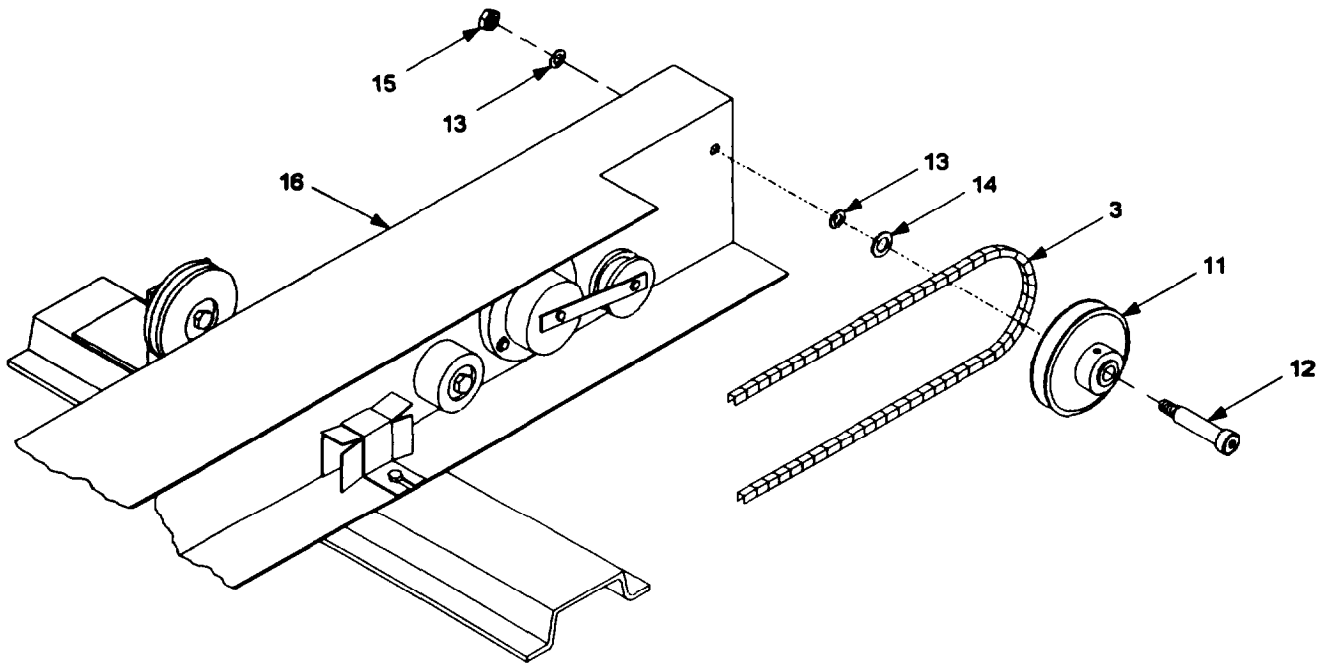
NOTE

Use spacing flatwasher as required to keep end play between return end pulley assembly and shoulder screw to a minimum, but allowing return end pulley assembly to roll free.

(2) Position return end pulley assembly (11) on return end track section (16) and install shoulder screw (12), two flatwashers (13), spacing flatwasher (14), and plain nut.

(3) Position drive belt (3) in return end pulley assembly.

4-31 RETURN END PULLEY ASSEMBLY REPLACEMENT - Continued.



NOTE

Groove in threaded portion of clevises on turnbuckle assembly must be facing up to allow installation of locking clips.

(4) Position turnbuckle assembly (2) over eyebolt (9) on return end of carriage assembly (10), and install bolt (4), flatwasher (5), two 1/4-in screw spacers (6), 1/2-in screw spacer (7), and new self-locking nut (8).

(5) Adjust tension on drive belt assembly kit (reference paragraph 4-10).

(6) install target (reference paragraph 4-42).

(7) Set circuit breaker on ITM to POWER ON.

(8) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(9) Set circuit breaker on ICB to ON.

(10) Perform IMTC self-test (reference paragraph 2-4a).

4-32 TENSIONER ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Self-locking nut (MS21083C4)
Tensioner assembly (9363102)

Personnel Required:
2 persons (for safety purposes)

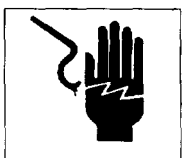
References:
Adjust drive belt assembly kit (reference paragraph 4-10).
Install target (reference paragraph 4-42).
Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
Target removed (reference paragraph 4-42).

---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

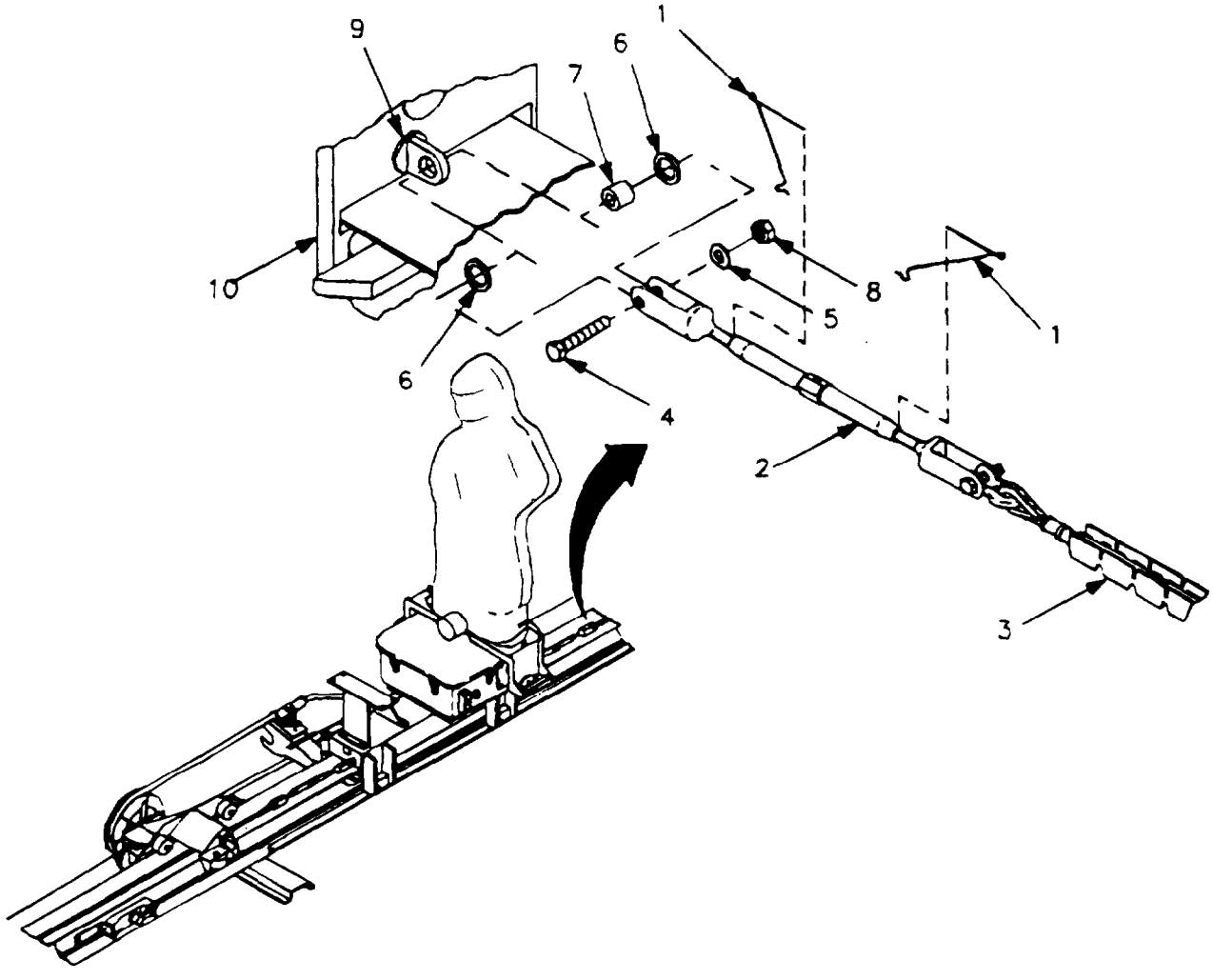
(4) Remove two locking clips (1) from each of two turnbuckle assemblies (2).

(5) Loosen return end turnbuckle assembly and release tension on drive belt assembly (3).

(6) Remove bolt (4), flatwasher (5), two 1/4-in screw spacers (6), 1/2-in screw spacer (7), self-locking nut (8), and turnbuckle assembly from eyebolt (9) on return end of carriage assembly (10).

(7) Remove drive belt assembly from return end pulley assembly (11) and tensioner assembly (12) on return end track section (13).

(8) Remove four hex-head screws (14), eight flatwashers (15), four self-locking nuts (16), tensioner spacer (17), and tensioner assembly from return end track section.



b. Installation.

NOTE

When positioning tensioner assembly on return end track section, ensure sheave on tensioner assembly rests on bottom flange of track section.

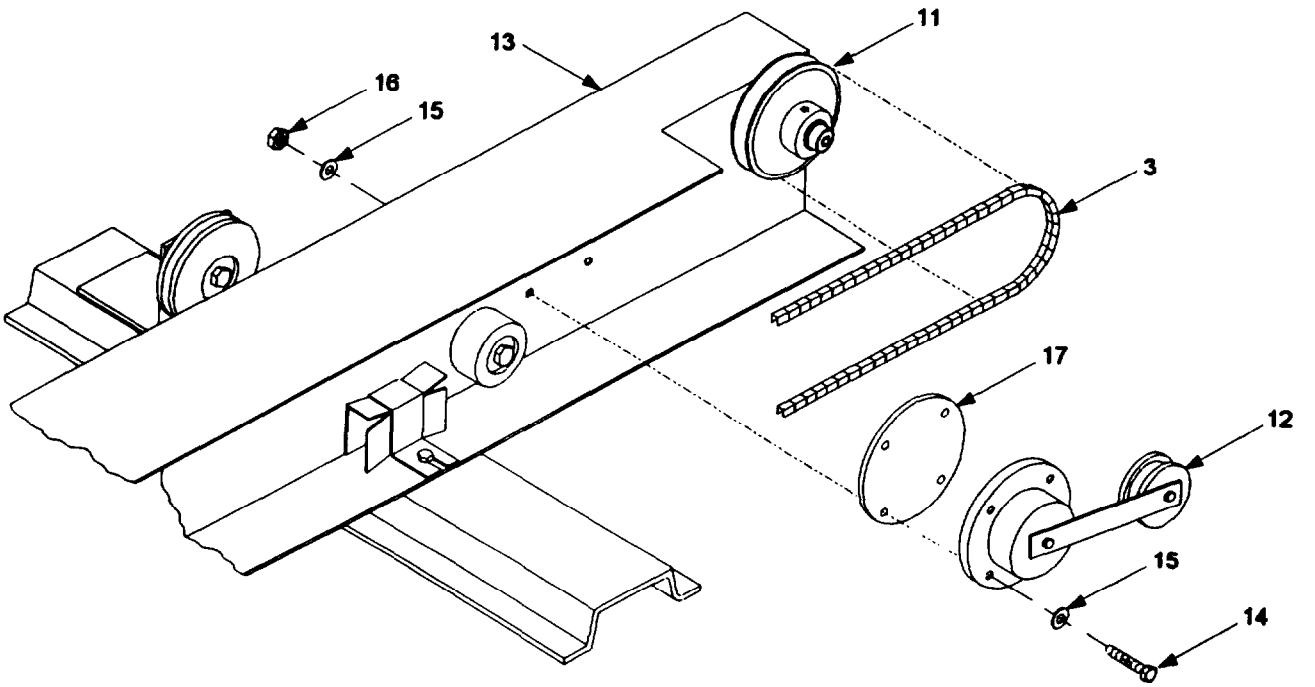
(1) Position tensioner spacer (17) and tensioner assembly (12) on return end track section (13) and install four hex-head screws (14), eight flatwashers (15), and four new self-locking nuts (16).

(2) Position drive belt (3) in tensioner assembly and return end pulley assembly (11).

NOTE

Groove in threaded portion of clevises on turnbuckle assembly must be facing up to allow installation of locking clips.

4-32 TENSIONER ASSEMBLY REPLACEMENT - Continued.



(3) Position turnbuckle assembly over eyebolt (9) on return end of carriage assembly (10) and install bolt (4), flatwasher (5), two l/4-in screw spacers (6), 1/2in screw spacer (7), and new self-locking nut (8).

(4) Adjust tension on drive belt assembly kit (reference paragraph 4-10).

(5) Install target (reference paragraph 4-42).

(6) Set circuit breaker on ITM to POWER ON.

(7) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(8) Set circuit breaker on ICB to ON.

(9) Perform IMTC self-test (reference paragraph 2-4a).

4-33 RETURN END SWITCH AND CONNECTOR BRACKET ASSEMBLY REPLACEMENT AND REPAIR.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Self-locking nut (MS21083C4)
Switch and connector bracket assembly (9353990)

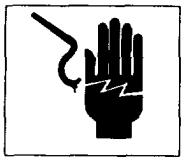
Personnel Required:
2 persons (for safety purposes)

References:
Switch and connector assembly replacement (reference paragraph 4-18).
Adjust electrical switch actuator bar (reference paragraph 4-6).
Perform IMTC self-test (reference paragraph 2-4a).

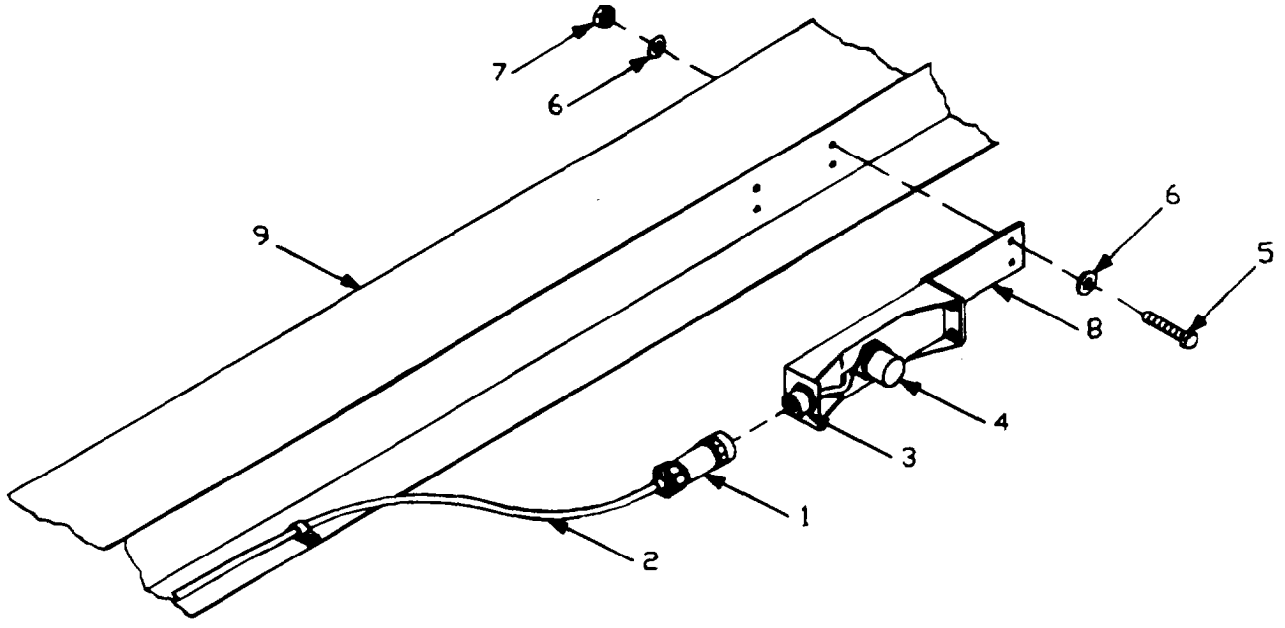
---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.



(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Disconnect connector P2 (1) on cable assembly W105 (2) from connector J2 (3) on reverse proximity switch (4).

(5) Remove four hex-head bolts (5), eight flatwashers (6), and four self-locking nuts (7), and remove switch and connector bracket assembly (8) from return end track section (9).

b. Repair. Repair of the switch and connector bracket assembly consists of replacing the switch and connector assembly. Reference paragraph 4-18 for replacement procedures for the switch and connector assembly.

c. Installation.

CAUTION

When installing switch and connector bracket assembly, bracket must be positioned toward return end of track. If IMTC has been set to high speed, switch and connector bracket assembly must be installed at innermost position on return end track section. If the switch and connector bracket assembly is not installed or positioned correctly, carriage assembly will fail to stop at the proper limit, resulting in collision and damage to the equipment.

(1) Position switch and connector bracket assembly (8) on return end track section (9), and install four hex-head bolts (5), eight flatwashers (6), and four new self-locking nuts (7).

(2) Connect connector P2 (1) on cable assembly W105 (2) to connector J2 (3) on reverse proximity switch (4).

(3) Check distance between electrical switch actuator bar and proximity switch. Adjust position of electrical switch actuator bar as required to meet specified dimensions (reference paragraph 4-6).

(4) Set circuit breaker on ITM to POWER ON.

(5) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(6) Set circuit breaker on ICB to ON.

(7) Perform IMTC self-test (reference paragraph 2-4a).

4-34 ELECTRONIC COMPONENTS ASSEMBLY HOUSING GASKET REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

Materials/Parts:
Gasket (9387226)
Adhesive (item 1, appendix D)
Grease (item 6, appendix D)

---

a. Removal.

WARNING

Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result In electrical shock and death or serious Injury.

(1) Set circuit breaker on ICB to OFF,

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2).

(5) Unfasten latches (3) and remove cover assembly (4) from IMTC electronic components assembly housing.

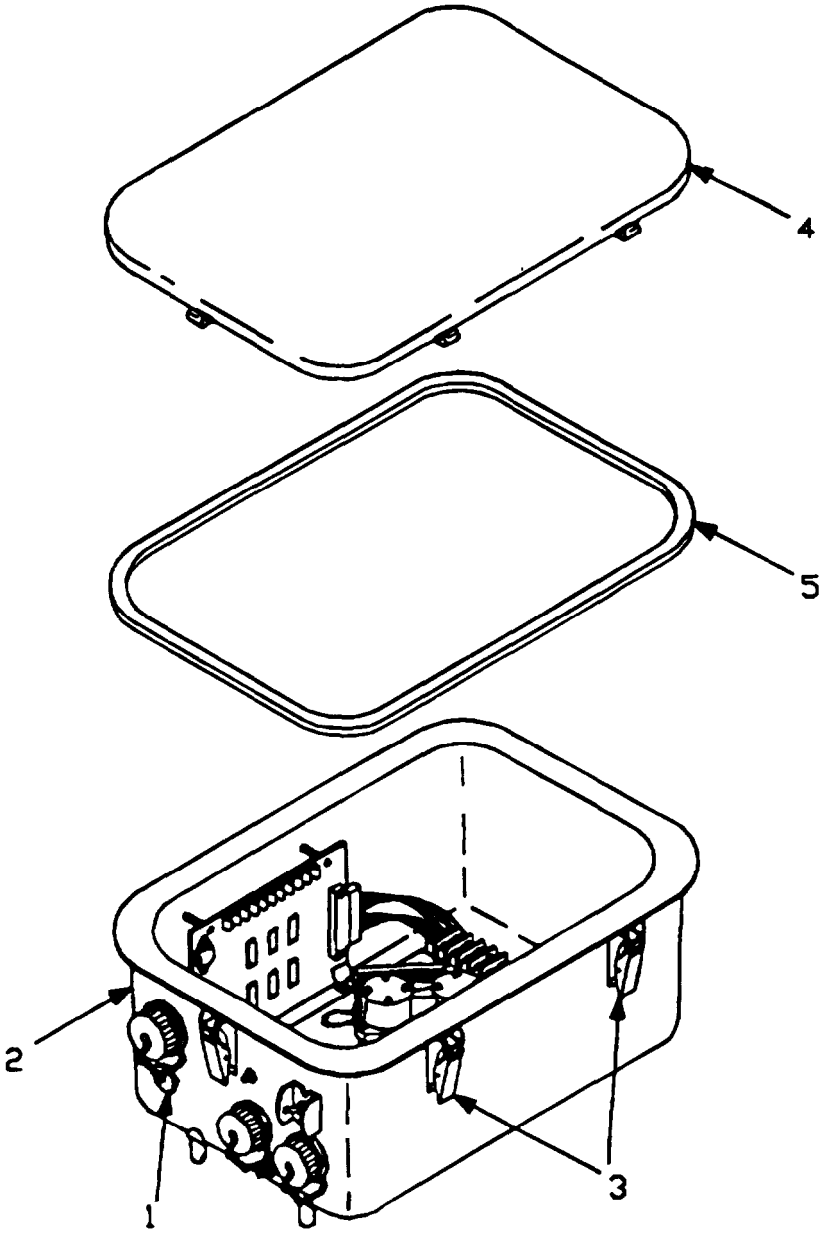
(6) Scrape old gasket (5) from mounting surfaces of IMTC electronic components assembly

(7) Remove all old adhesive from mounting surfaces of IMTC electronic components assembly

b. Installation.

(1) Apply thin even coat of adhesive to new gasket (5).

(2) Bond gasket to mounting surface of IMTC electronic components assembly housing (2).



(3) Apply thin coating of grease to entire gasket surface.

(4) Install cover assembly (4) *on* IMTC electronic components assembly housing and fasten latches (3).

(5) Set circuit breaker on ITM to POWER ON.

(6) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(7) Set circuit breaker on ICB to ON.

4-35 CIRCUIT BREAKER ASSEMBLY CB1 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque screwdriver set
Torque wrench

Materials/Parts:
Lockwasher (MS353381-37)
Circuit breaker assembly (9353925)
Grease, (item 6, appendix D)

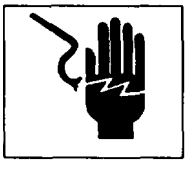
Personnel required:
2 persons (for safety purposes)

References:
Perform IMTC self-test
(reference paragraph 2-4a).

---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2).

(5) Unfasten latches and remove cover assembly from IMTC electronic components assembly housing.

(6) Remove screws (3) and lockwashers (4) from terminals 1 and 4 on terminal strip TB2 (5). Discard lockwashers.

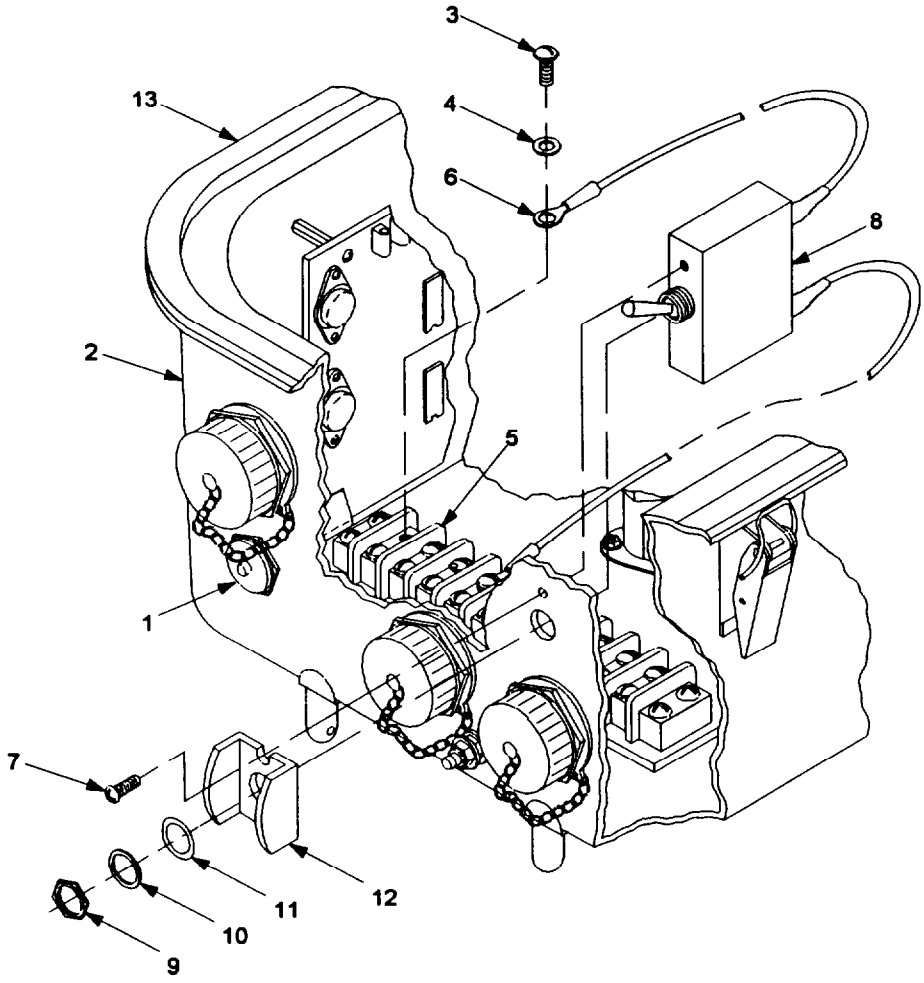
(7) Disconnect terminal lugs on circuit breaker assembly wires (6) from terminals 1 and 4 on terminal strip TB2.

(8) Install screws on terminals 1 and 4 on terminal strip TB2.

(9) Remove mounting screw (7) from front of circuit breaker (8).

(10) Remove hex-nut (9), lockwasher (10), and rubber O-ring (11) from front of circuit breaker.

(11) Remove switch guard (12) and circuit breaker assembly from IMTC electronic components assembly housing.



b. Installation.

(1) Position circuit breaker assembly (8) and switch guard (12) on IMTC electronic components assembly housing (2).

(2) Install rubber O-ring (11), lockwasher (10), and hex-nut (9), and secure circuit breaker to IMTC electronic components assembly housing.

(3) Torque hex-nut to 23 ±3 in lbs (2.6 ±0.3 Newton-meters).

(4) Install mounting screw (7) on front of circuit breaker.

(5) Torque mounting screw to 12 2 in lbs (1.4 ±0.2 Newton-meters).

(6) Remove screws (3) from terminals 1 and 4 on terminal strip TB2 (5).

(7) Using wire markers as guide, connect terminal lugs on circuit breaker assembly wires (6) to terminals 1 and 4 on terminal strip TB2.

4-35 CIRCUIT BREAKER ASSEMBLY CB1 REPLACEMENT - Continued.

(8) Install screws and new lockwashers (4) on terminals 1 and 4 on terminal strip TB2.

(9) Apply thin coating of grease to entire gasket surface (13) on IMTC electronic components assembly housing.

(10) Install cover assembly on IMTC electronic components assembly housing and fasten latches.

(11) Set circuit breaker on ITM to POWER ON.

(12) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(13) Set circuit breaker on ICB to ON.

(14) Perform IMTC self-test (reference paragraph 2-4a).

4-36 TROLLEY ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque wrench

Materials/Parts:
Self-locking nut (MS21083C4)
Trolley assembly (11829747)
Sealing compound (item 13, appendix D)

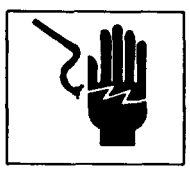
Personnel Required:
2 persons (for safety purposes)

References:
Adjust position of cable assembly W103 (reference paragraph 4-39c).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.

WARNING

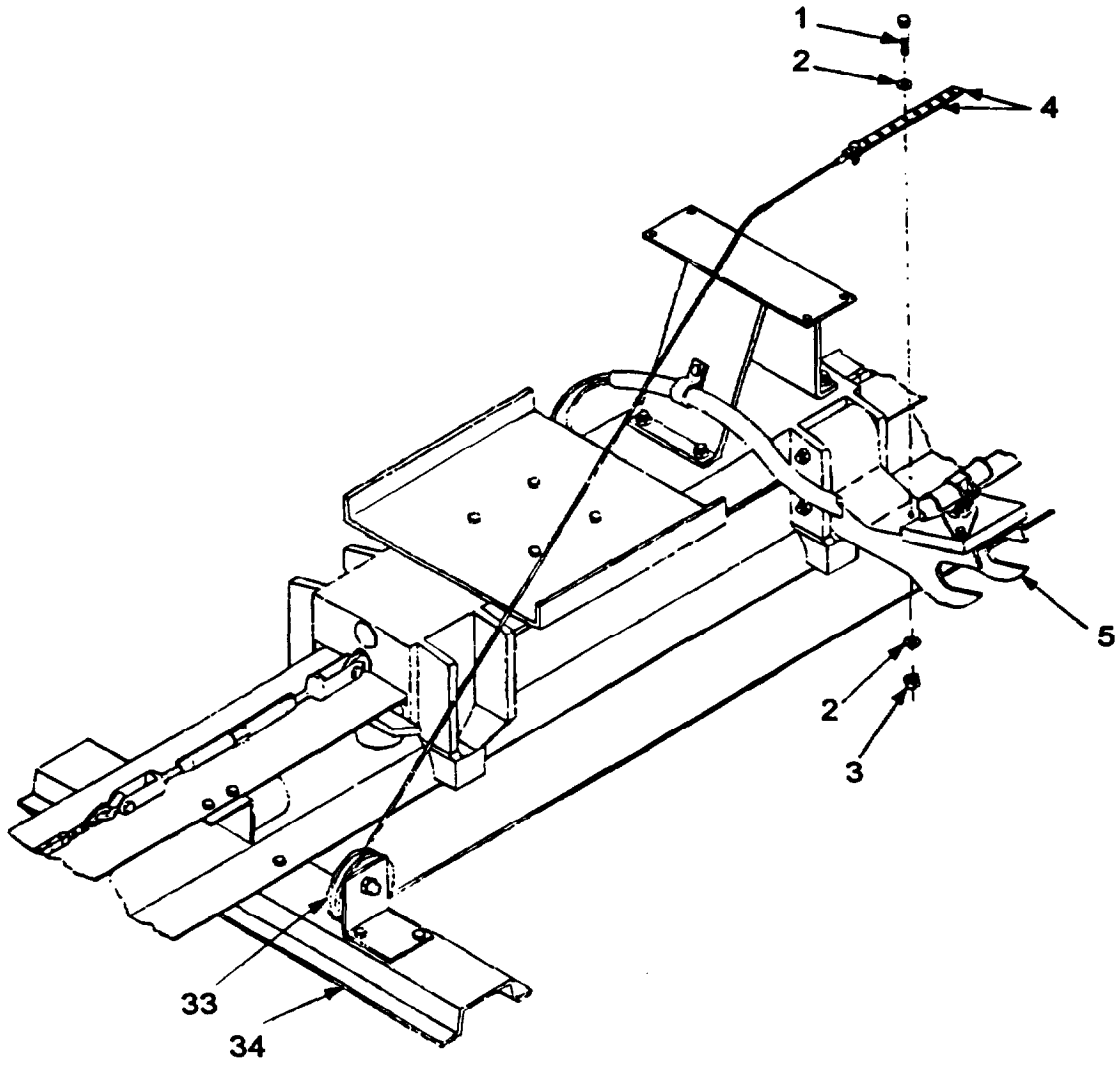


Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious Injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.



(4) Remove hex-head screw (1), two fiatwashers (2), and self-locking nut (3), and remove cable straps (4) from cable support assembly (5).

(5) Disconnect connector P2 (6) on cable assembly W103 (7) from connector Jl on ITM (8).

(6) Disconnect connector P3 (9) on cable assembly W103 from connector J3 (10) on ITM.

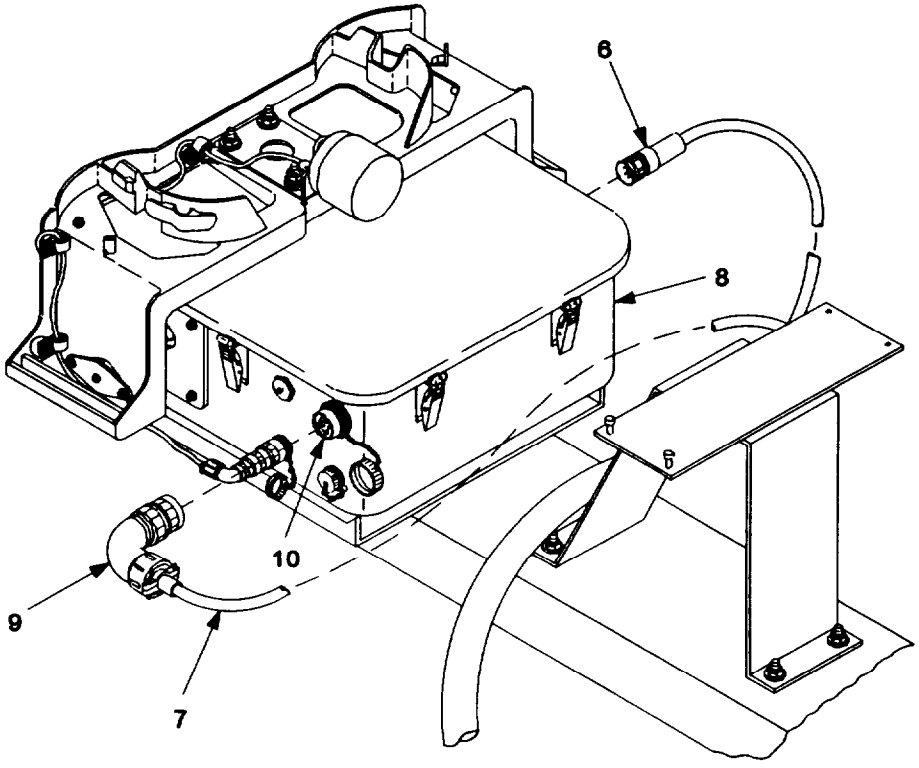
(7) Remove hex-head screw (11), two flatwashers (12), self-locking nut (13), and cable clamp (14) from MFS support assembly (15).

(6) Remove cable clamp from cable assembly W103.

(9) Remove two screws (16) and nuts (17), and remove upper half of cable clip (18) on cable support assembly (19).

(10) Remove cable assembly W103 from cable support assembly.

4-36 TROLLEY ASSEMBLY REPLACEMENT - Continued,



(11) Position upper half on lower half of cable clip (20) and install two screws and nuts.

(12) Remove cable assembly W103 from cable follower sheave (21) on trolley assembly (22).

(13) Remove trolley cable (23) from cable sheave assembly (24) on crossmember assembly (25) at drive end of track.

(14) Remove trolley cable from sheave assembly (26) on trolley assembly.

(15) Remove two bolts (27), eight flatwashers (28), and two self-locking nuts (29), and remove two wheel assemblies (30) from trolley chassis (31).

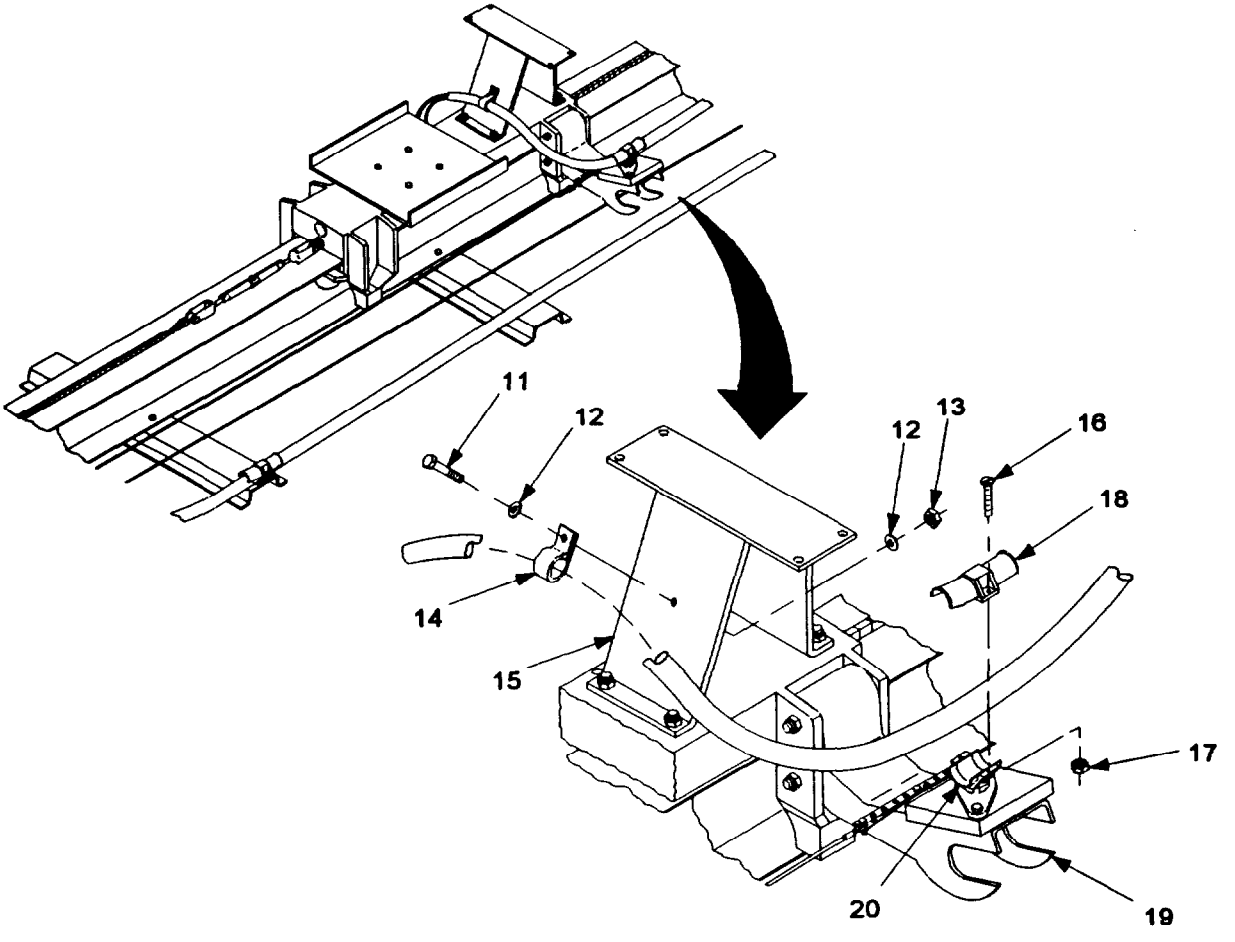
(16) Remove trolley assembly from track section (32).

b. Installation.

(1) Position trolley assembly (22) on track section (32).

(2) Position two wheel assemblies (30) on trolley chassis (31), and install bolt (27), four flatwashers (28), and new self-locking nut (29) in each wheel assembly.

(3) Using torque wrench, torque self-locking nuts 30 ±5 in-lb (3.4 ±0.57 Newton-meters).



NOTE

Trolley cable is Installed under and over cable sheave assembly on trolley assembly.

(4) Install trolley cable (23) in cable sheave assembly (26) on trolley assembly.

NOTE

Trolley cable is installed over and under cable sheave assembly on crossmember assembly at drive end of track.

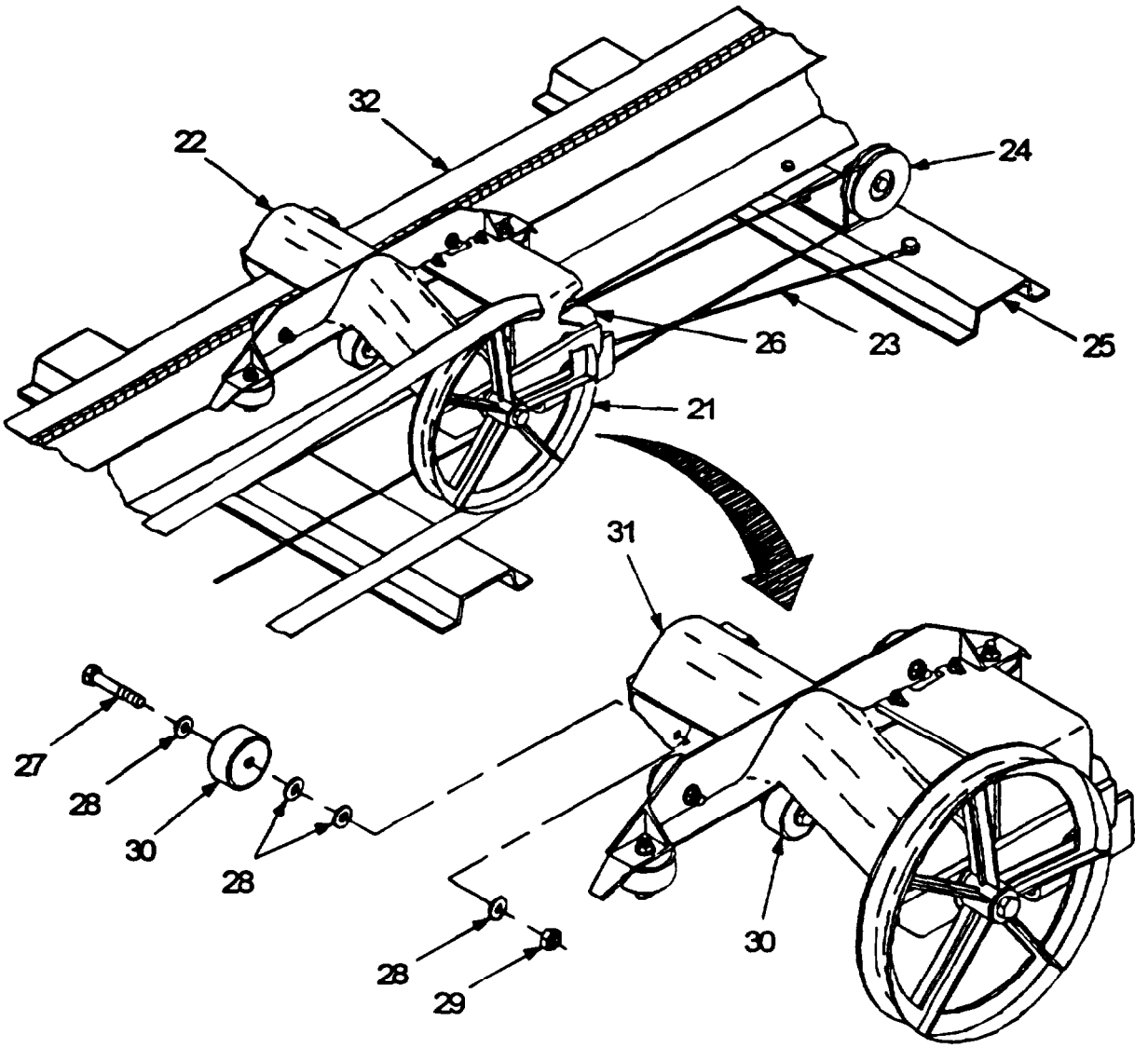
(5) Install trolley cable in cable sheave assembly on crossmember assembly at drive end of track.

(6) Position cable assembly W103 (7) in cable follower sheave (21) on trolley assembly.

(7) Connect connector P2 (6) on cable assembly W103 to connector J1 on ITM (8).

(6) Connect connector P3 (9) on cable assembly W103 to connector J3 (10) on ITM.

4-36 TROLLEY ASSEMBLY REPLACEMENT - Continued.



(9) Remove two screws (16) and nuts (17), and remove upper half of cable clip (18) on cable support assembly (19).

(10) Position cable assembly W103 in lower half of cable clip (20) on cable support assembly.

(11) Position upper half on lower half of cable clip and install two screws and nuts.

(12) Position cable clamp (14) on cable assembly W103.

(13) Apply sealing compound to threads of hex-head screw (11).

NOTE

Only tighten hex-head screw until engagement is approximately 1/2 in (0.64 cm).

(14) Position cable clamp on MFS support assembly (15), and install hex-head screw, two flatwashers (12), and new self-locking nut (13).

NOTE

Trolley cable is installed under and over cable sheave assembly on crossmember assembly at return end of track.

(15) Ensure that trolley cable is installed in cable sheave assembly (33) on crossmember assembly (34) at return end of track.

(16) Position cable straps (4) on cable support assembly (5) and install hex-head screw (1), two flatwashers (2), and new self-locking nut (3).

(17) Adjust position of cable assembly W103 (reference paragraph 4-39c).

(18) Set circuit breaker on ITM to POWER ON.

(19) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(20) Set circuit breaker on ICB to ON.

(21) Perform IMTC self-test (reference paragraph 2-4a).

4-37 TROLLEY ASSEMBLY REPAIR

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque wrench

Materials/Parts:
Self-locking nut (MS21083C4)
Self-locking nut (MS21083C5)
Self-locking nut (MS51922-38)
Wheel assembly (9354110)
Cable follower sheave (11829253)
Sheave assembly (9387199)
Trolley chassis (11829264)

References:
Install trolley assembly
(reference paragraph 4-36).

Equipment Conditions:
Trolley assembly removed
(reference paragraph 4-36).

---

a. Disassembly.

(1) Remove bolt (1), flatwashers (2), and self-locking nut (3) from each of six remaining wheel assemblies (4), and remove wheel assemblies from trolley chassis (5).

(2) Remove bolt (6), flatwashers (7), and self-locking nut (8), and remove sheave assembly (9) from trolley wheel mounting bracket (10).

(3) Remove hex-head bolt (11), bearing thrust washer (12), sheave spacer (13), two flatwashers (14), and self-locking nut (15), and remove cable follower sheave (16) from trolley chassis.

(4) Remove two flat-head screws (17), flatwashers (18), and self-locking nuts (19) that secure trolley wheel mounting bracket to trolley chassis.

(5) Remove two hex-head screws (20), four flatwashers (21), and two self-locking nuts (22), and remove trolley wheel mounting bracket from trolley chassis.

b. Assembly.

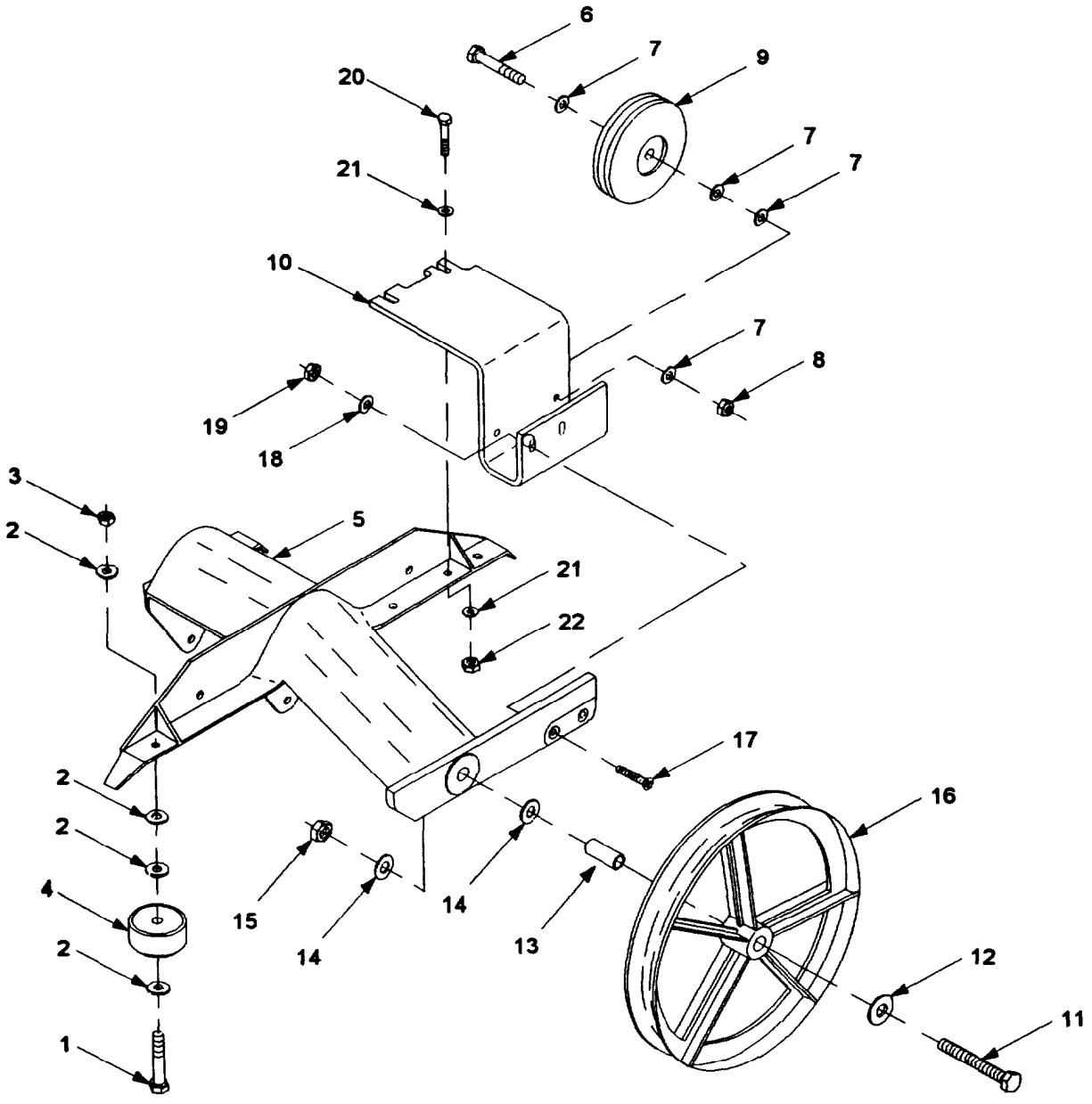
(1) Position trolley wheel mounting bracket (10) in trolley chassis (5), and install two hex-head screws (20), four flatwashers (21), and two new self-locking nuts (22).

(2) Install two flat-head screws (17), flatwashers (18), and new self-locking nuts (19), and secure trolley wheel mounting bracket to trolley chassis.

(3) Position cable follower sheave (16) on trolley chassis, and install hex-head bolt (11), bearing thrust washer (12), sheave spacer (13), two flatwashers (14), and new self-locking nut (15).

NOTE

Add flatwashers as required between trolley wheel mounting bracket and sheave assembly to ensure free rotation of sheave assembly.



(4) Position sheave assembly (9) on trolley wheel mounting assembly and install bolt (6), flatwashers (7), and new self-locking nut (8).

(5) Using torque wrench, torque self-locking nut to 30 ±5 in-lb (3.4 ±0.57 Newton-meters).

(6) Position six wheel assemblies (4) on trolley chassis, and install bolt (1), four flatwashers (2), and new self-locking nut (3) in each wheel assembly.

(7) Using torque wrench, torque self-locking nuts 30 ±5 in-lb (3.4 ±0.57 Newton-meters).

(8) Install trolley assembly (reference paragraph 4-36).

4-38 TROLLEY CABLE KIT REPLACEMENT AND ASSEMBLY.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts (Replacement):
Trolley cable kit (9363669)
(reference table 4-4, paragraph 4-37b).

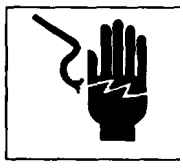
Personnel Required:
2 persons (during removal and installation for safety purposes)

References:
Trolley cable adjustment
(reference paragraph 4-39c).
Perform IMTC self-test
(reference paragraph 2-4a).

---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Remove self-locking nut (1), two flatwashers (2), and hex-head screw (3), and remove cable straps (4) from cable support assembly (5).

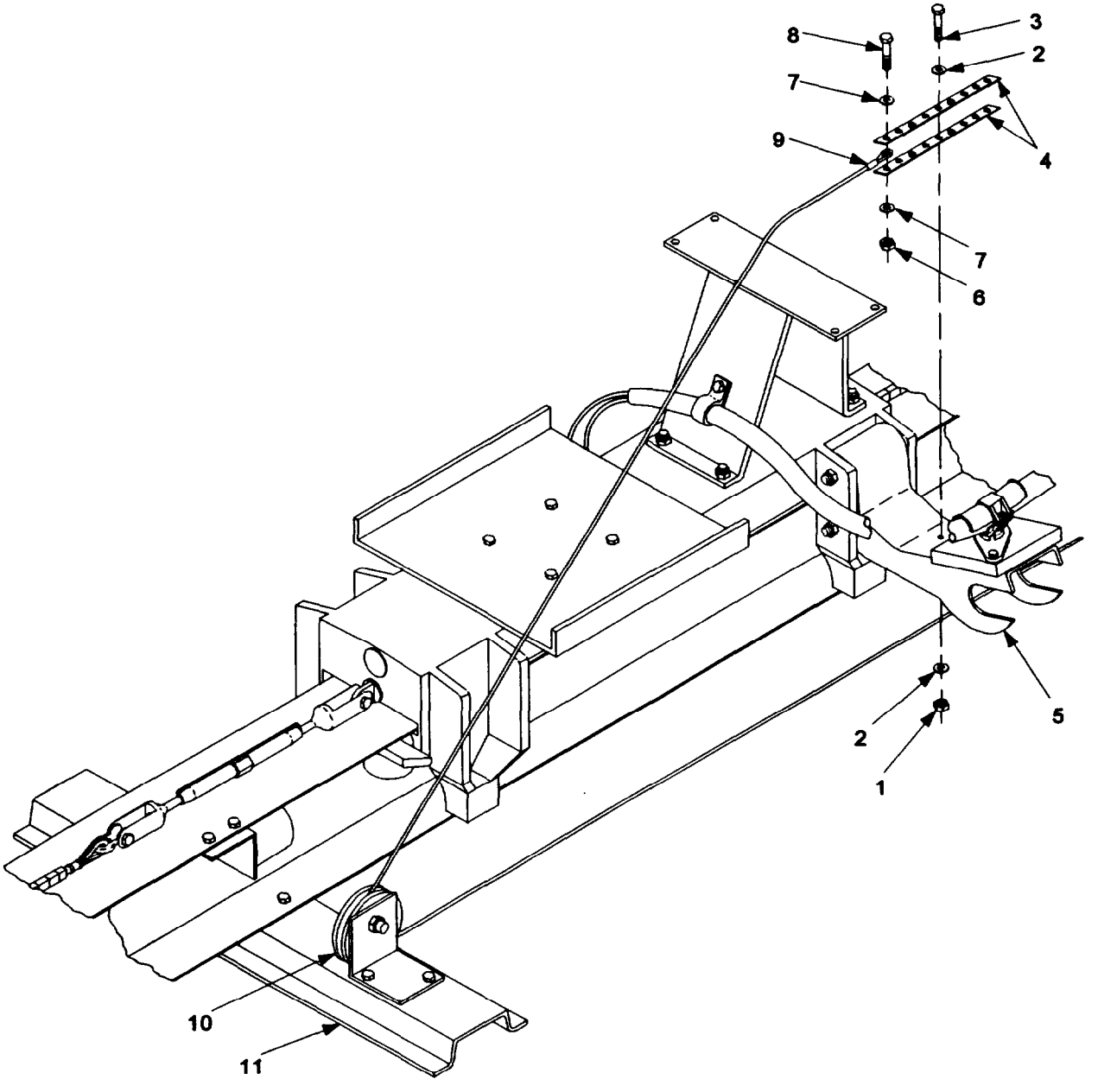
(5) Remove self-locking nut (6), two flatwashers (7), and hex-head screw (8), and remove trolley cable (9) from cable straps attached to cable support assembly.

(6) Remove trolley cable from cable sheave assembly (10) attached to crossmember assembly (11) at return end of track.

(7) Remove self-locking nut (12), two flatwashers (13), and hex-head screw (14), and remove trolley cable from crossmember assembly (15) at drive end of track.

(8) Remove trolley cable from sheave assembly (16) on trolley assembly (17).

(9) Remove trolley cable from cable sheave assembly (18) attached to crossmember assembly at drive end of track.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3
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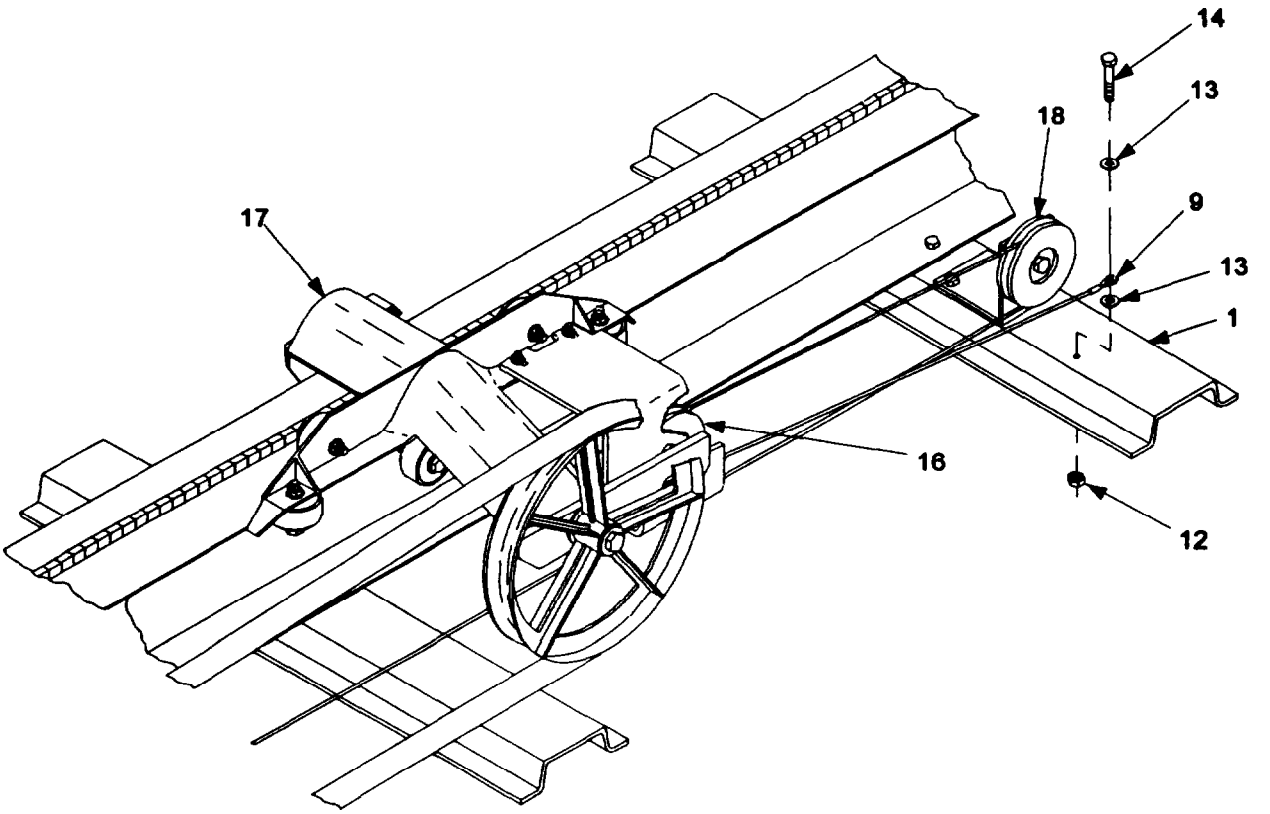
11

4-38 TROLLEY CABLE KIT REPLACEMENT AND ASSEMBLY - Continued.



b. Assembly. The trolley cable kit contains the necessary hardware for assembly and installation of the trolley cable on the IMTC. (Reference the parts list in table 4-4.)

Table 4-4. Parts List for Trolley Cable Kit.

NOMENCLATURE	PART NUMBER	QUANTITY
Cable, plastic-coated	9387208	AR
Cable strap	9363064	2
Self-locking nut	MS21083C4	3
Screw, hex-head	MS35308-306	3
Flatwasher	AN960C416	6

c. Installation.

(1) Position trolley cable (9) on crossmember assembly (15) at drive end of track, and install hex-head screw (14), two flatwashers (13), and self-locking nut (12).

NOTE

Trolley cable is installed under and over cable sheave assembly on trolley assembly.

(2) Install trolley cable in sheave assembly (16) on trolley assembly (17).

NOTE

Trolley cable is installed over and under cable sheave assembly on crossmember assembly at drive end of track.

(3) Install trolley cable in cable sheave assembly (18) on crossmember assembly at drive end of track.

NOTE

Trolley cable is installed under and over cable sheave assembly on crossmember assembly at return end of track.

(4) Install trolley cable in cable sheave assembly (10) on crossmember assembly (11) at return end of track.

CAUTION

Do not overtighten attaching hardware. Thimble in trolley cable must be free to move and must not be clamped. If thimble is clamped, equipment may not operate properly and damage could result.

(5) Position trolley cable in cable straps (4), and install hex-head screw (8), two flatwashers (7), and self-locking nut (6).

(6) Position cable straps on cable support assembly (5), and install hex-head screw (3), two flatwashers (2), and self-locking nut (1).

(7) Move carriage assembly against track bumper assembly on return end track section, and check trolley cable tension. Adjust position of trolley cable on cable straps as required. (Reference paragraph c).

(8) Set circuit breaker on ITM to POWER ON.

(9) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(10) Set circuit breaker on ICB to ON.

(11) Perform IMTC self-test (reference paragraph 2-4a).

4-39 CABLE ASSEMBLY W103 REPLACEMENT AND ADJUSTMENT.

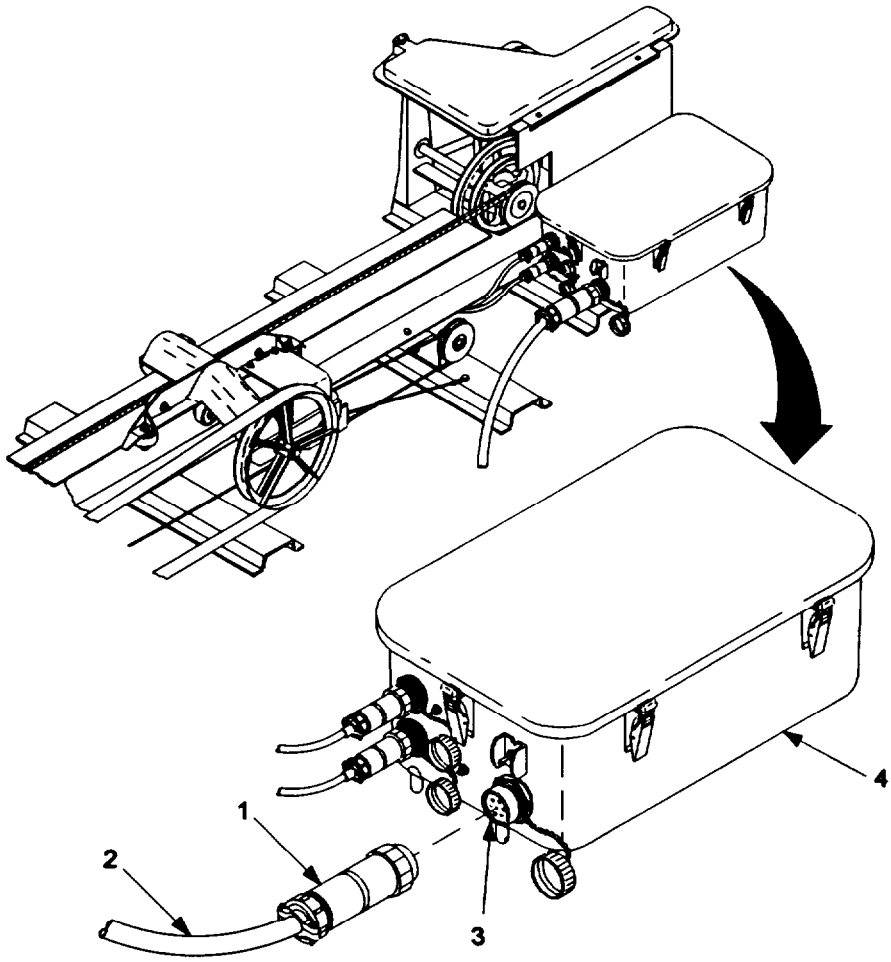
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel required:
2 persons (for safety purposes)

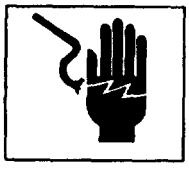
Materials/Parts:
Cable assembly (9354099)
Sealing compound (item 13, appendix D)

References:
Perform IMTC self-test
(reference paragraph 2-4a).



a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

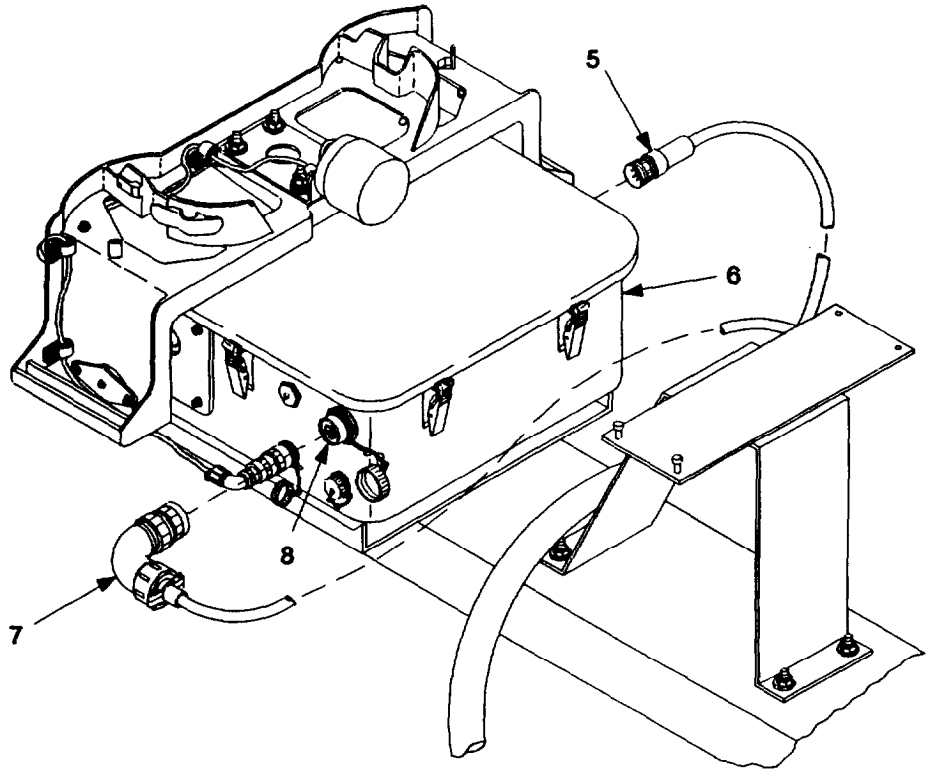
(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Disconnect electric connector P1 (1) on cable assembly W103 (2) from connector J4 (3) on IMTC electronic components assembly (4).

(5) Disconnect electric connector P2 (5) on cable assembly W103 from connector J1 on ITM (6).

(6) Disconnect electric connector P3 (7) on cable assembly W103 from connector J3 (8) on ITM.



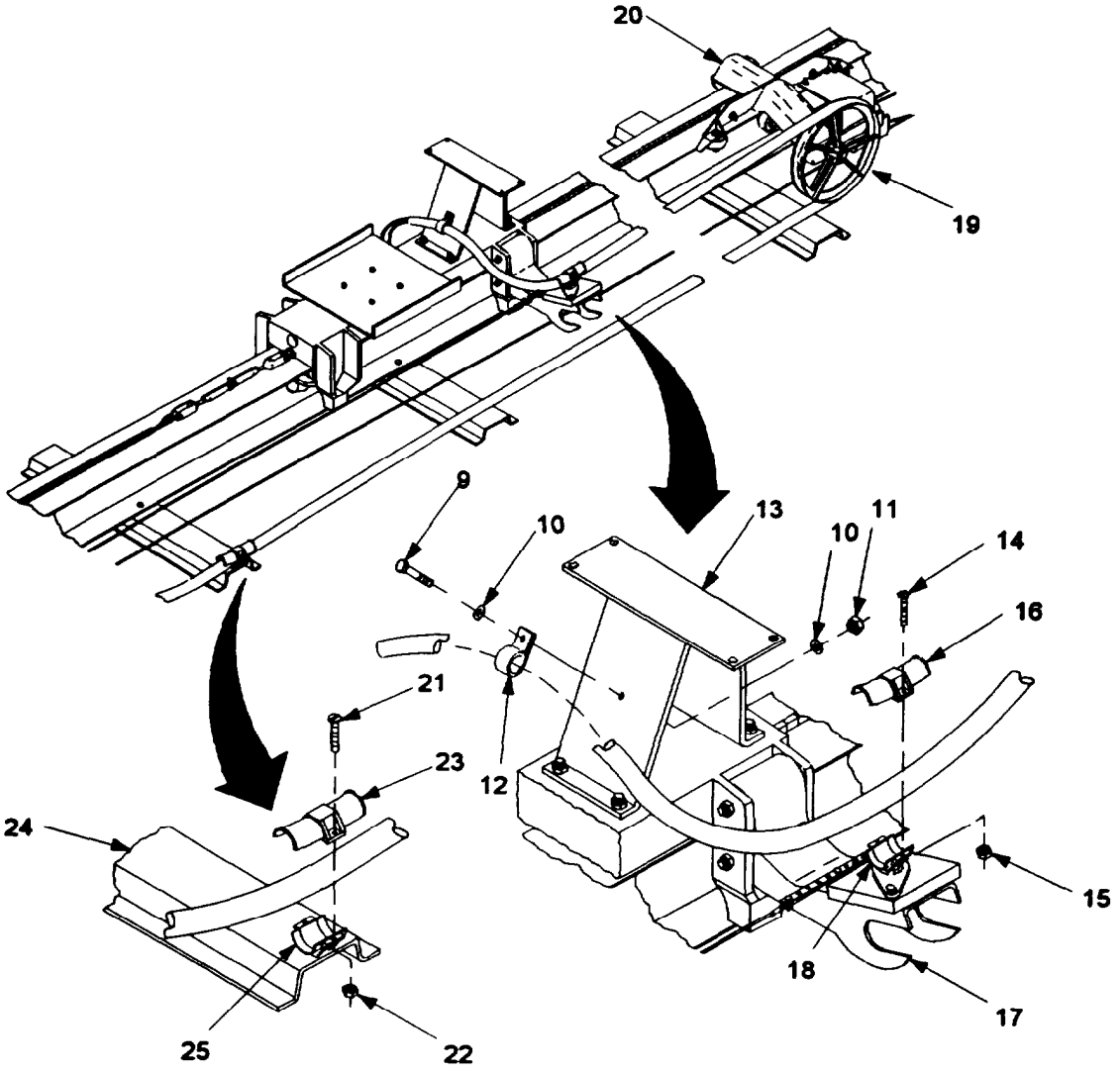
4-39 CABLE ASSEMBLY W103 REPLACEMENT AND ADJUSTMENT - Continued.

(7) Remove hex-head screw (9), two flatwashers (10), self-locking nut (11), and cable clamp (12) from MFS support assembly (13).

(8) Remove cable clamp from cable assembly W103.

(9) Remove two screws (14) and nuts (15) and remove upper half of cable clip (16) on cable support assembly (17).

(10) Remove cable assembly W103 from cable support assembly.



(11) Position upper half on lower half of cable clip (18) and install two screws and nuts.

(12) Remove cable assembly W103 from cable sheave assembly (19) on trolley assembly (20).

(13) Remove two screws (21) and nuts (22) and remove upper half of cable clip (23) on crossmember assembly (24) at center of track.

(14) Remove cable assembly W103 from crossmember assembly and move away from track.

(15) Position upper half on lower half of cable clip (25) and install two screws and nuts.

(16) Remove cable assembly W103 from track.

b. Installation.

(1) Position cable assembly W103 (2) on track.

(2) Remove two screws (21) and nuts (22) and remove upper half of cable clip (23) on crossmember assembly (24) at center of track.

(3) Position cable assembly W103 in lower half of cable clip.

(4) Position upper half on lower half of cable clip (25) and install two screws and nuts.

(5) Install cable assembly W103 in cable sheave assembly (19) on trolley assembly (20).

(6) Connect electric connector P3 (7) on cable assembly W103 to connector J3 (8) on ITM (6).

(7) Connect electric connector P2 (5) on cable assembly W103 to connector J1 on ITM.

(8) Position cable clamp (12) on cable assembly W103.

(9) Apply sealing compound to threads of hex-head screw (9).

(10) Position cable clamp on MFS support assembly (13) and install hex-head screw, two flatwashers (IO), and new self-locking nut (11).

(11) Remove two screws (14) and nuts (15) and remove upper half of cable clip (16) on cable support assembly (17).

(12) Position cable assembly W103 in lower half of cable clip (18).

(13) Position upper half on lower half of cable clip and install two screws and nuts.

(14) Connect electric connector PI (1) on cable assembly W103 to connector J4 (3) on IMTC electronic components assembly (4).

(15) Adjust position of cable assembly W103 (reference subparagraph c).

(16) Set circuit breaker on ITM to POWER ON.

4-39 CABLE ASSEMBLY W103 REPLACEMENT AND ADJUSTMENT - Continued.

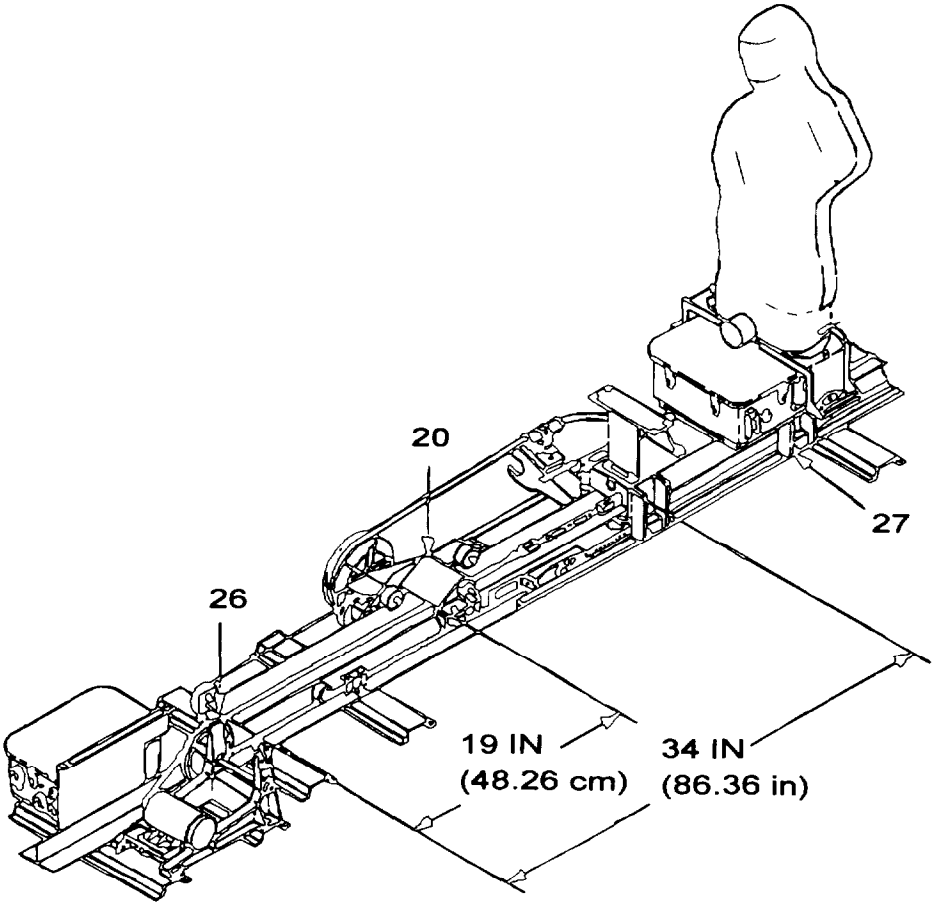
(17) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(18) Set circuit breaker on ICB to ON.

(19) Perform IMTC self-test (reference paragraph 2-4a).

c. Adjustment.

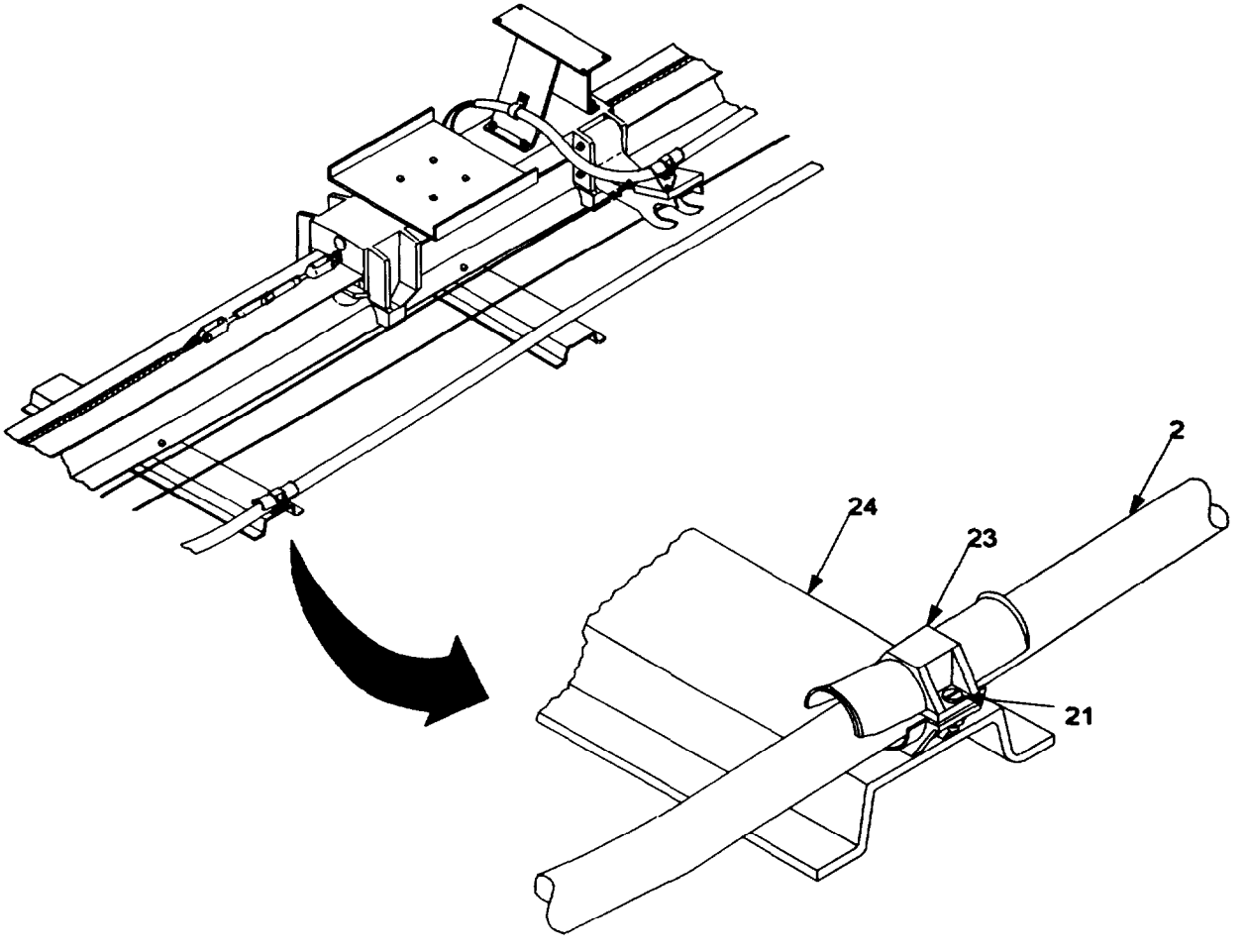
(1) Position trolley assembly (20) at drive end of track so that front of trolley assembly is approximately 19 in (48.26 cm) from end of top flange on drive mechanism track section (26).



(2) Secure trolley assembly in position to prevent movement.

(3) Check distance between carriage assembly (27) and end of top flange on drive mechanism track section. Front of carriage assembly should be approximately 34 in (86.36 cm) from end of top flange on drive mechanism track section.

(4) Loosen two screws (21) on cable clamp (23) on crossmember assembly (24) at center of track. Adjust position of carriage assembly and cable assembly W103 (2) as required to obtain proper distance.



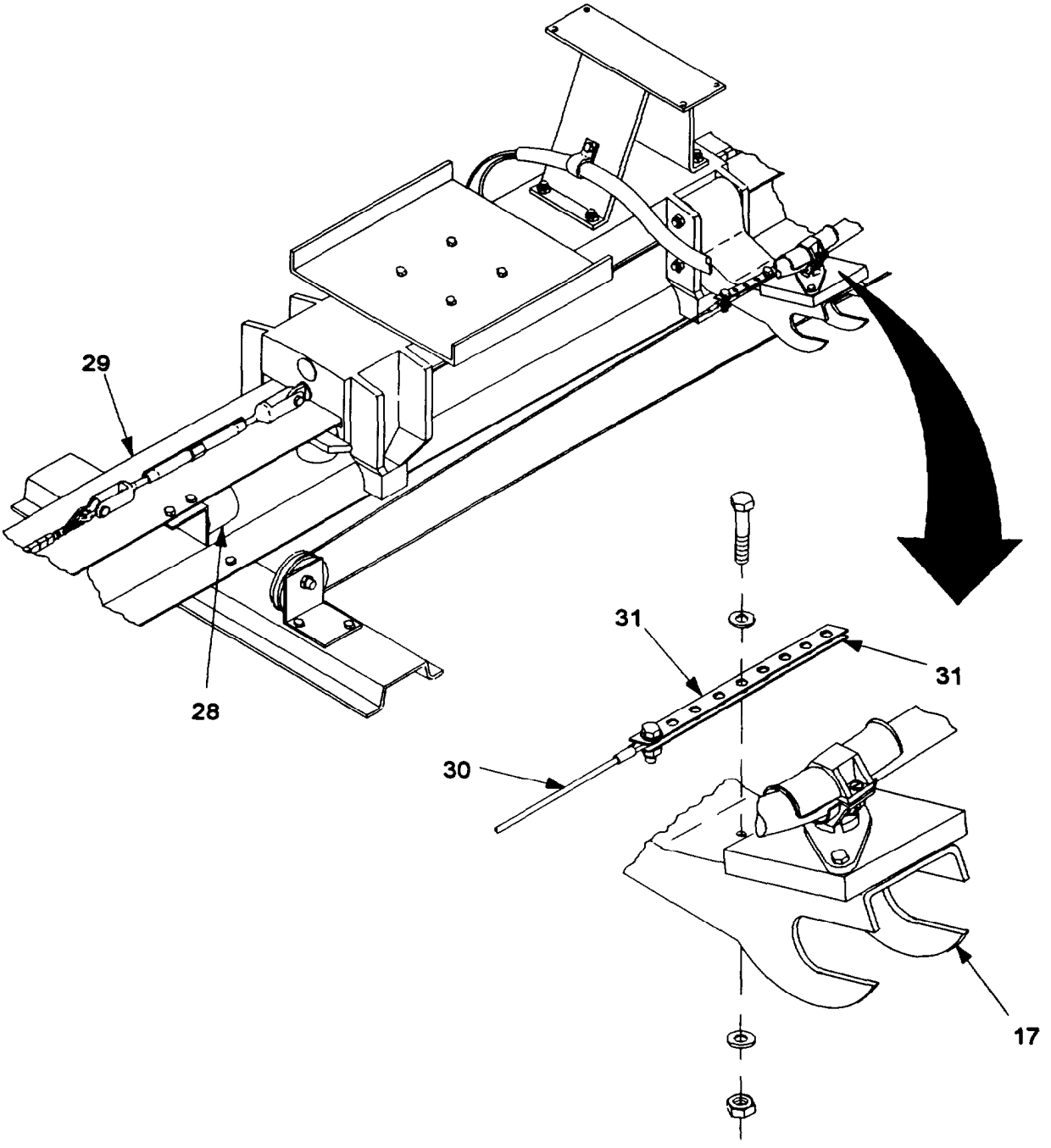
(5) Secure carriage assembly in position to prevent movement.

(6) Remove slack in cable assembly W103 between cable sheave on trolley assembly and cable clamp on crossmember assembly at center of track. Tighten two screws on cable clamp on crossmember assembly.

(7) Remove restraints from trolley assembly and carriage assembly.

4-39 CABLE ASSEMBLY W103 REPLACEMENT AND ADJUSTMENT - Continued.

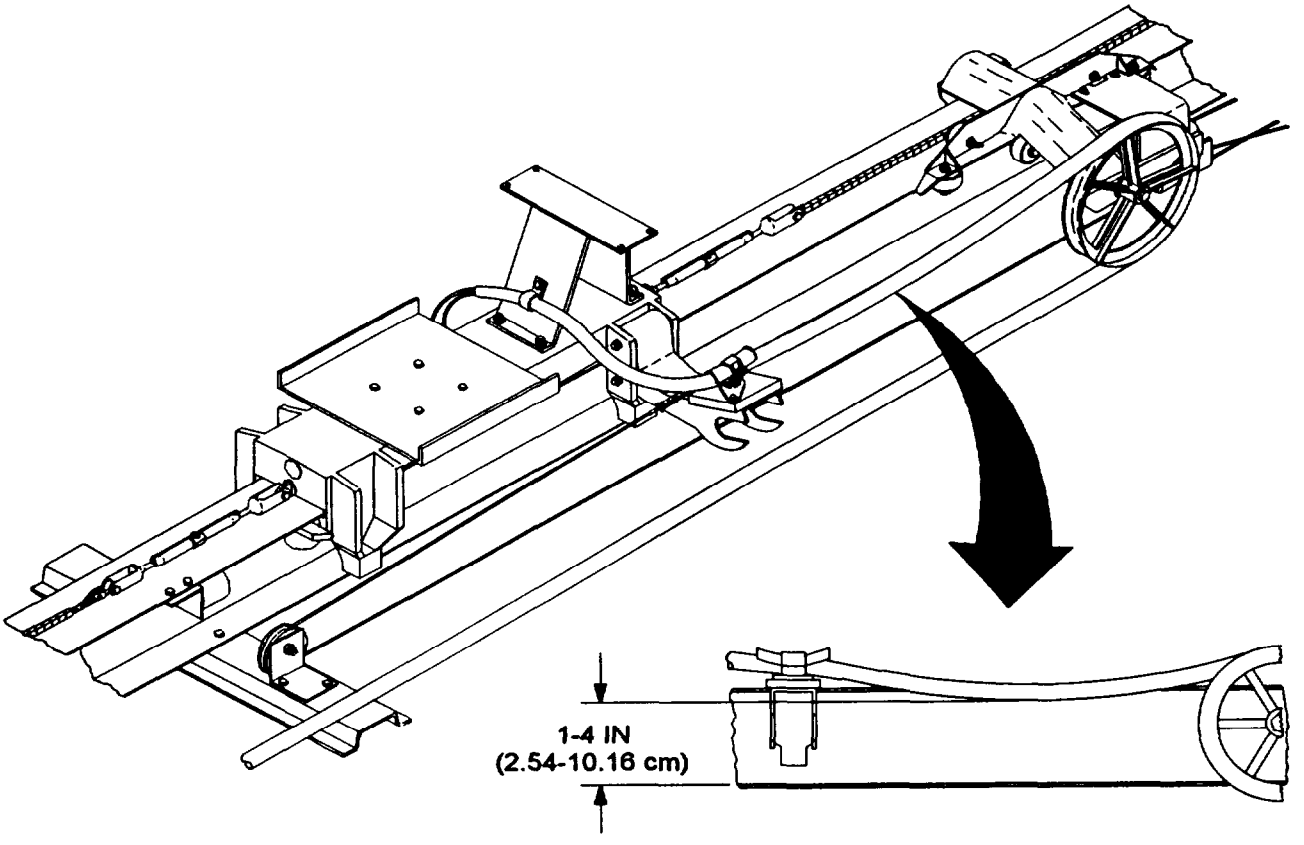
(8) Move carriage assembly against track bumper assembly (28) on return end track section (29), and check tension on trolley cable (30). Adjust position of cable straps (31) on cable support assembly (17) as required.



(9) Check bottom of arc formed by cable assembly W103 between trolley assembly and carriage assembly. Arc should be 1 to 4 in (2.54 to 10.16 cm) above bottom flange on return end track section.

(10) Loosen two screws on cable clamp on crossmember assembly at center of track, and adjust cable assembly W103 to meet specified limits.

(11) Tighten two screws on cable clamp on crossmember assembly.



Section V. MAINTENANCE PROCEDURES FOR ITM

4-40 GENERAL.

This section contains the instructions for removal, repair, and installation of components of the ITM. The instructions consist of an initial setup to prepare for the task and step-by-step procedures to perform the task. Observe all warnings, cautions, and notes during the performance of these tasks.

4-41 TRAINING TARGET HOLDING SET (ITM) REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Training target holding set (11829340)
Sealing compound (item 13, appendix D)

References:
Remove target (reference paragraph 4-42).
Remove cover assembly (reference paragraph 4-44).
Setting binary code on address switch (reference paragraph 2-3c).
Install cover assembly (reference paragraph 4-44).
Install target (reference paragraph 4-42).
Perform ITM self-test (reference paragraph 2-4b).

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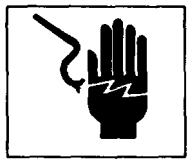
a. Removal.

WARNING



Before working on the ITM, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker CB1 on ITM to POWER OFF.

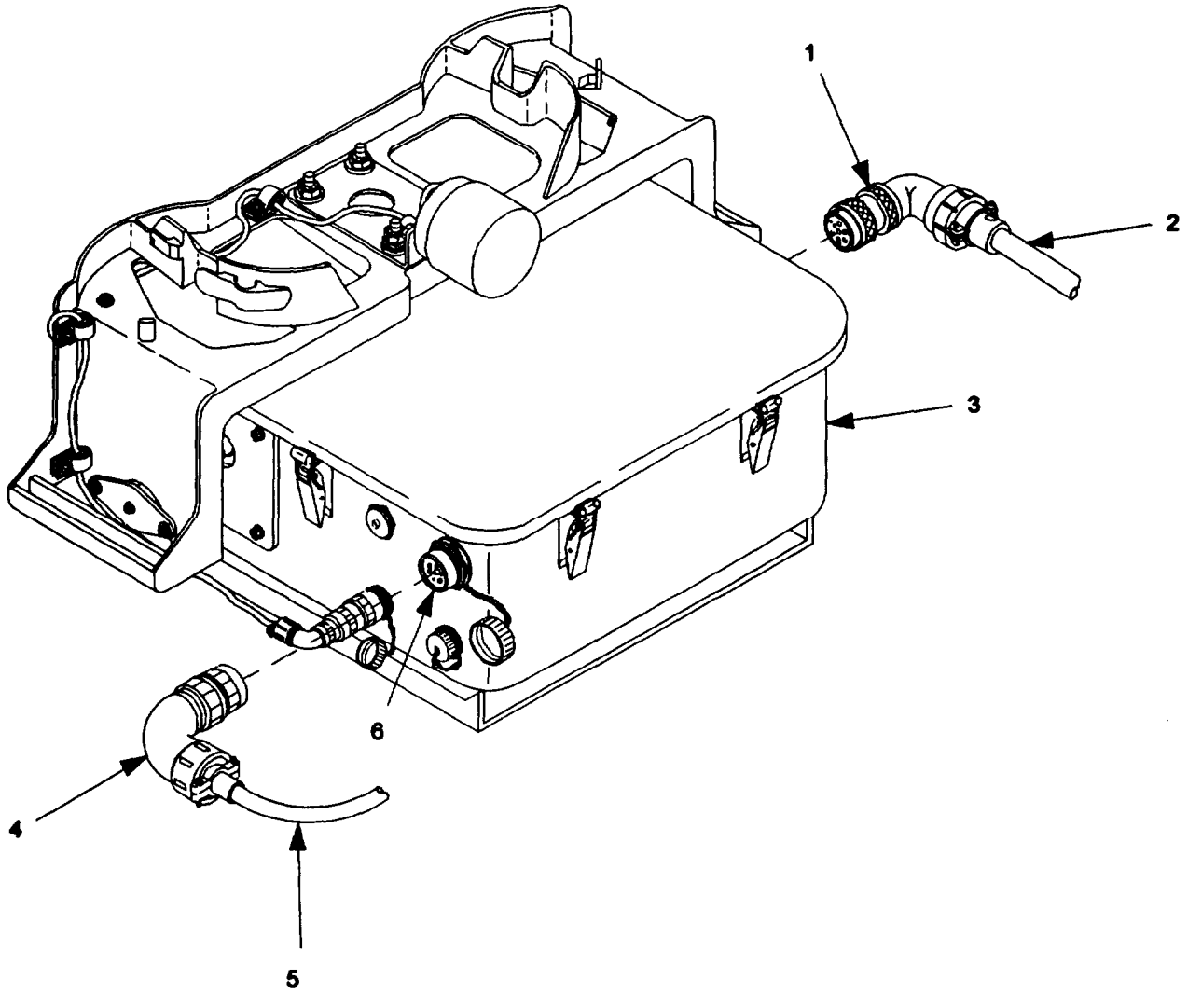
(4) Remove target from target arm assembly (reference paragraph 4-42).

NOTE

Perform steps (5) and (6) only if ITM is used as stationary target mechanism.

(5) Disconnect connector P2 (1) on cable assembly W102-1 (2) from connector J1 on ITM (3).

(6) Disconnect connector P2 (4) on cable assembly W101-1 (5) from connector J3 (6) on ITM.



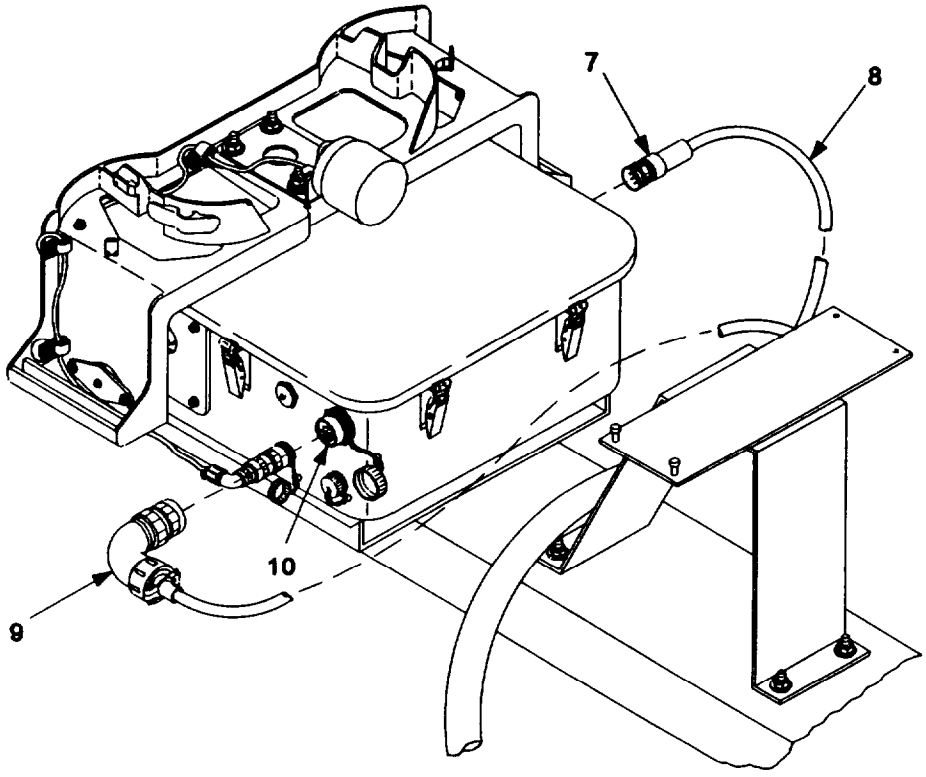
NOTE

Perform steps (7) and (8) only if ITM is used as moving target mechanism.

(7) Disconnect connector P2 (7) on cable assembly W103 (8) from connector J1 on ITM.

(8) Disconnect connector P3 (9) on cable assembly W103 from connector J3 (10) on ITM.

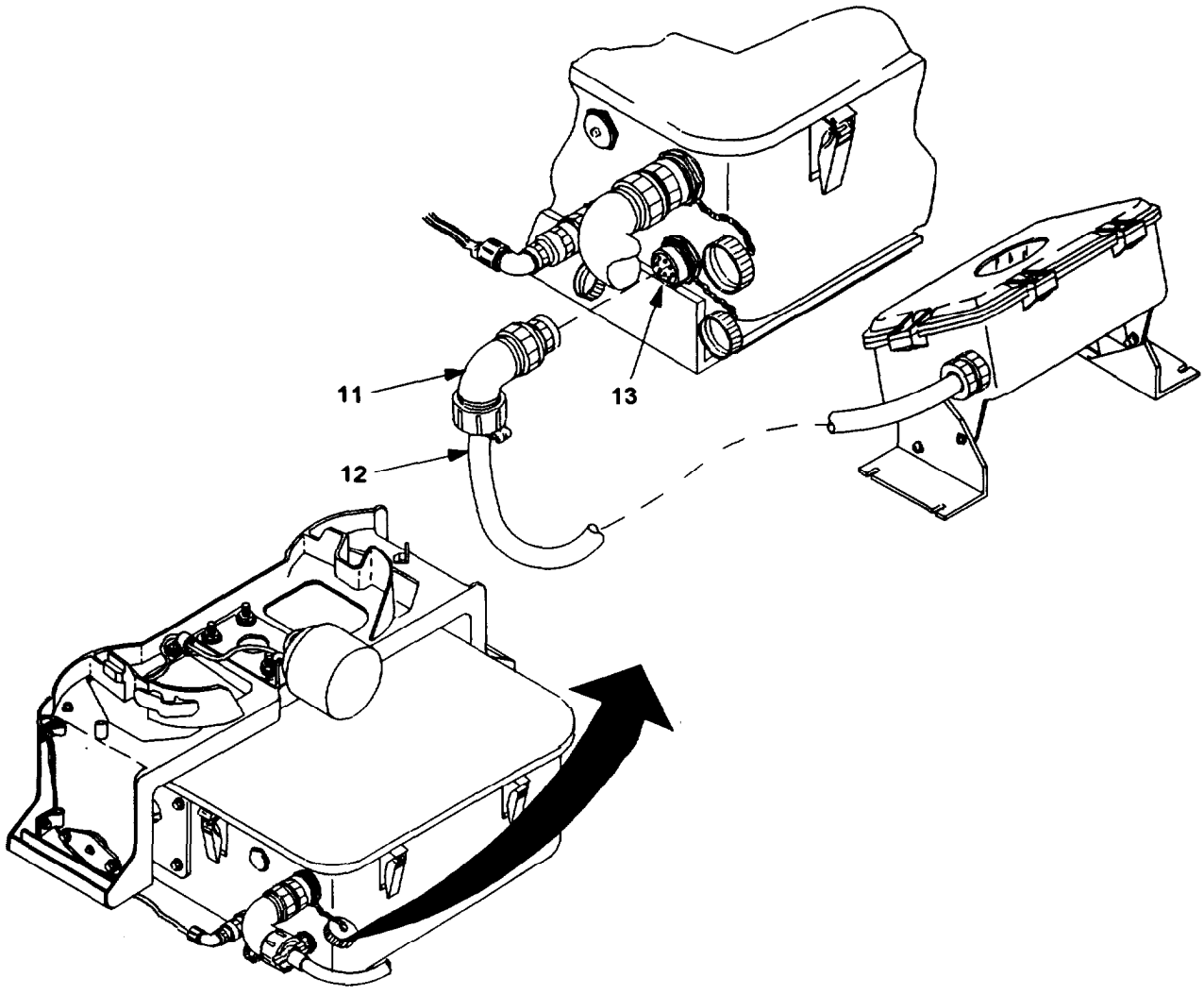
4-41 TRAINING TARGET HOLDING SET (ITM) REPLACEMENT - Continued.



NOTE

Perform step (9) only if MFS is connected to ITM.

(9) Disconnect connector PI (11) on MFS cable assembly (12) from connector J4 (13) on ITM.

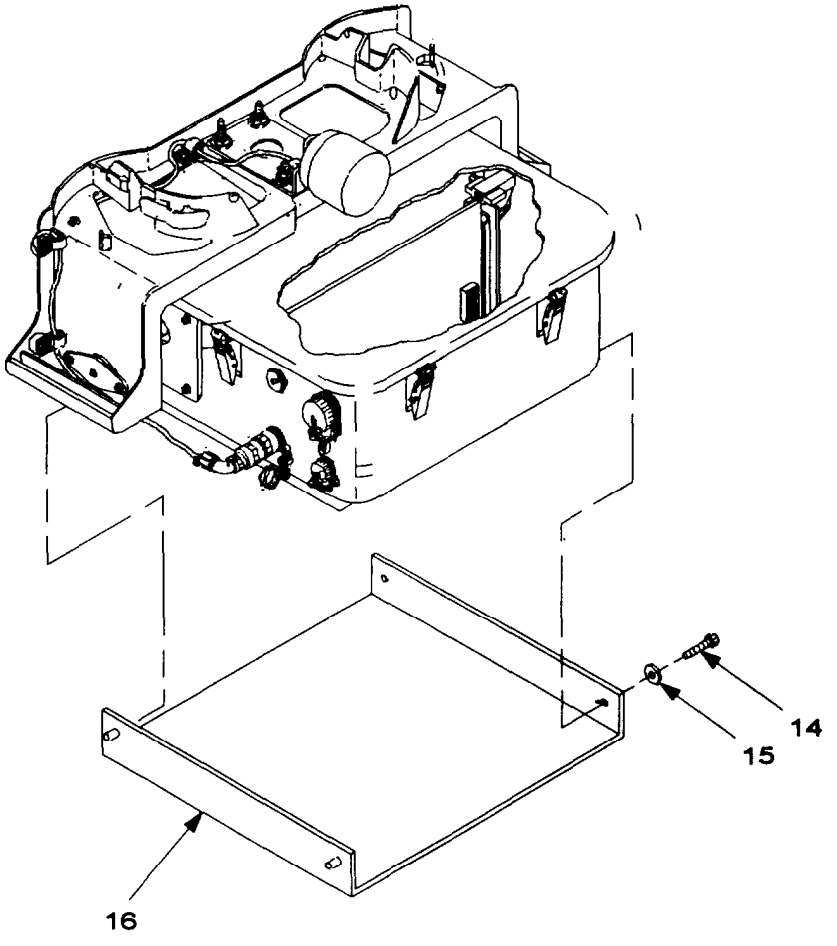


NOTE

If mounted on IMTC, two hex-head screws and flatwashers are used to secure ITM to target mechanism assembly plate.

(10) Remove two screws (14) and flatwashers (15) and remove ITM from mounting (16).

4-41 TRAINING TARGET HOLDING SET (ITM) REPLACEMENT - Continued.



b. Installation.

NOTE

If mounted on IMTC, two hex-head screws and flatwashers are used to secure ITM to target mechanism assembly plate.

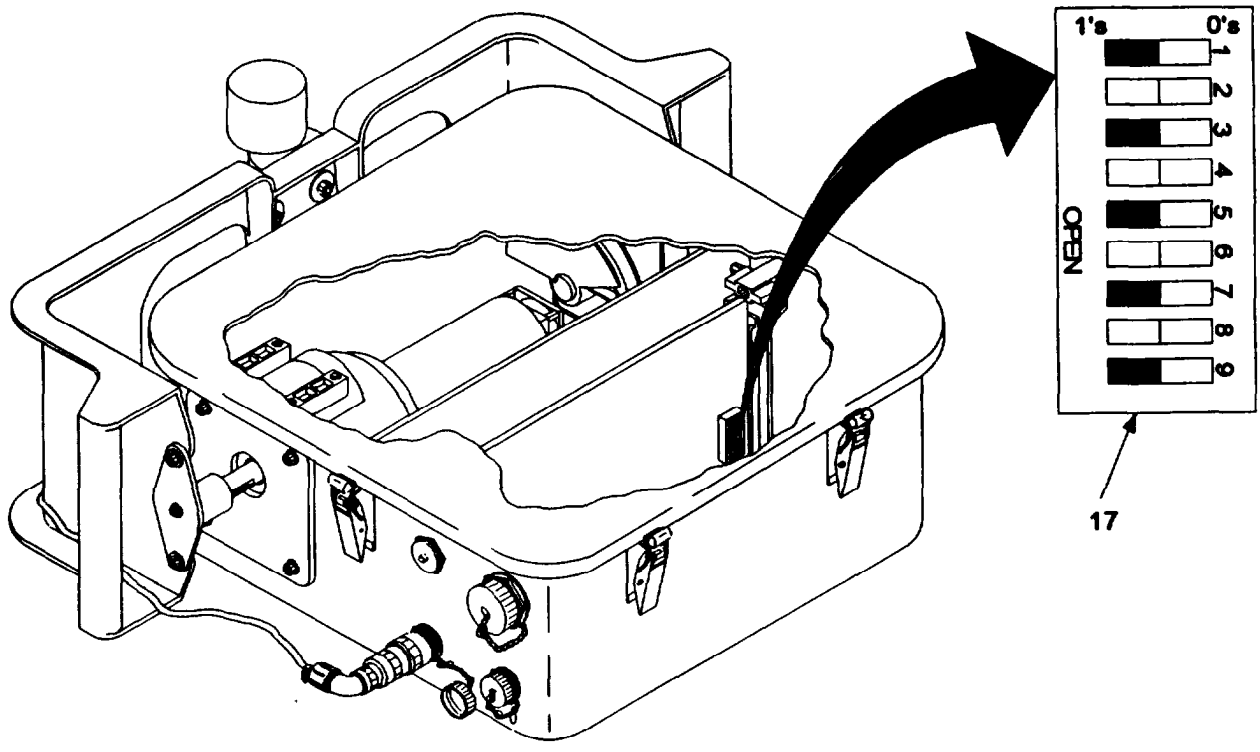
(1) Apply sealing compound to threads of two screws (14).

(2) Place ITM (3) on mounting (16) and secure with two screws (14) and flatwashers (15).

(3) Remove cover assembly (reference paragraph 4-44).

(4) Using a nonconductible pointed tool, set code on address switch (17) in the “0” and “1” sequence assigned that component (reference paragraph 2-4c).

(5) Install cover assembly (reference paragraph 4-44).



(8) Install target (reference paragraph 4-42).

NOTE

Perform step (7) only if MFS is connected to ITM.

(7) Connect connector PI (11) on MFS cable assembly (12) to connector J4 (13) on ITM.

NOTE

Perform steps (8) and (9) only if ITM is used as stationary target mechanism.

(8) Connect connector P2 (1) on cable assembly W102-1 (2) to connector J1 on ITM.

(9) Connect connector P2 (4) on cable assembly W101-1 (5) to connector J3 (6) on ITM.

4-41 TRAINING TARGET HOLDING SET (ITM) REPLACEMENT - Continued.

NOTE

Perform steps (10) and (11) only If ITM Is used as moving target mechanism.

(10) Connect connector P2 (7) on cable assembly W103 (8) to connector J1 on ITM.

(11) Connect connector P3 (9) on cable assembly W103 to connector J3 (10) on ITM.

(12) Set circuit breaker CB1 on ITM to POWER ON.

(13) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to ON.

(14) Set circuit breaker on ICB to ON.

(15) Perform ITM self-test (reference paragraph 2-4b).

4-42 TARGET REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
2 persons (for safety purposes)

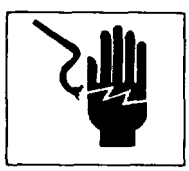
Materials/Parts:
Target (11829332)

References:
Perform ITM self-test (reference paragraph 2-4b).

---

a. Removal.

WARNING

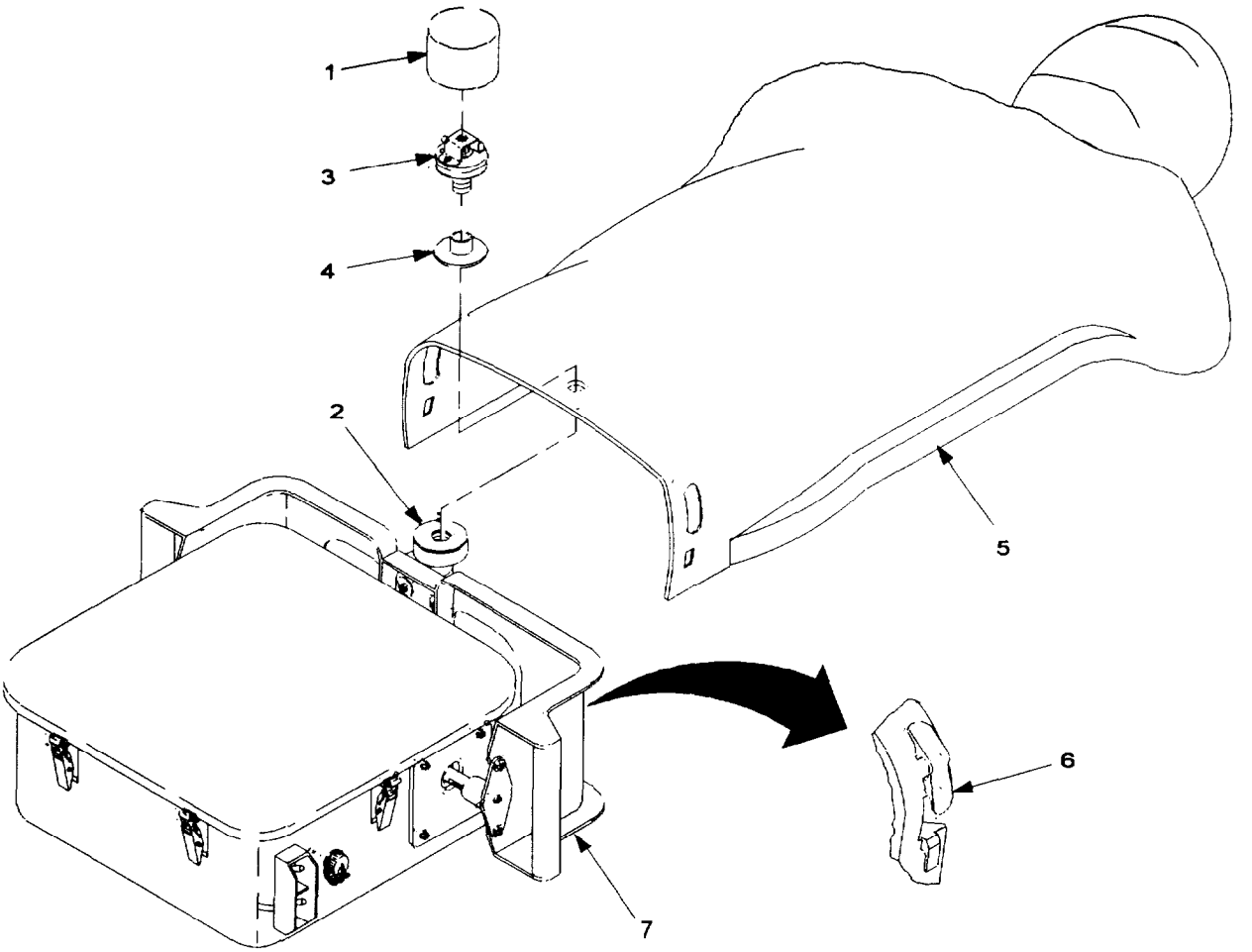


Before working on the ITM, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker CB1 on ITM to POWER OFF.



NOTE

The ITM has single- and double-target-arm configurations. Procedures for installing targets on the double target arm are the same as those for installing a target on a single target arm.

(4) Remove hit sensor shield (1) from hit sensor assembly (2).

(5) Loosen capscrew (part of hit sensor clamp assembly) and remove hit sensor clamp assembly (3) and spacer (4) from hit sensor assembly.

(6) Standing at rear of target (5) slide target to the right and unlatch right side of target from mounting hooks (6) on target arm (7).

(7) Slide target to the left and unlatch left side of target from mounting hooks on target arm.

(8) Remove target from target arm assembly.

4-42 TARGET REPLACEMENT - Continued.

(9) Reinstall spacer and hit sensor clamp assembly on hit sensor assembly and tighten capscrew.

(10) Install hit sensor shield on hit sensor assembly.

b. Installation.

(1) Remove hit sensor shield (1) from hit sensor assembly (2).

(2) Loosen capscrew (part of hit sensor clamp assembly) and remove hit sensor clamp assembly (3) and spacer (4) from hit sensor assembly.

NOTE

Target arm should be in the down position to aid in target installation.

(3) Position target (5) on target arm (7).

(4) Standing at rear of target, latch right side of target to mounting hooks (6) on right side of target arm.

(5) Latch left side of target to the mounting hooks on left side of target arm.

CAUTION

Do not overtighten capscrew on hit sensor clamp assembly. Overtightening capscrew can deform clamp and lead to false hit counts during range operation.

NOTE

To Increase sensitivity of hit sensor to target hits, position spacer with nipple facing inward, toward hit sensor. For less sensitive recording of hits, position spacer with nipple facing outward, away from hit sensor.

(6) Position spacer and hit sensor clamp assembly on target and hit sensor assembly. Hand-tighten capscrew until snug; then tighten one-half additional turn.

(7) Install hit sensor shield on hit sensor assembly.

(6) Set circuit breaker CB1 on ITM to POWER ON.

(9) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to ON.

(10) Set circuit breaker on ICB to ON.

(11) Perform ITM self-test (reference paragraph 2-4b).

(12) Remove hit sensor shield from hit sensor clamp assembly.

(13) Set and hold test switch SW1 to TARGET TEST position and tap hit sensor lightly with metal object. If target arm goes down, reinstall hit sensor shield on hit sensor clamp assembly. If target arm does not go down, perform troubleshooting procedures outlined in malfunction 8 or 9 in table 4-2.

4-43 ITM HOUSING GASKET REPLACEMENT.

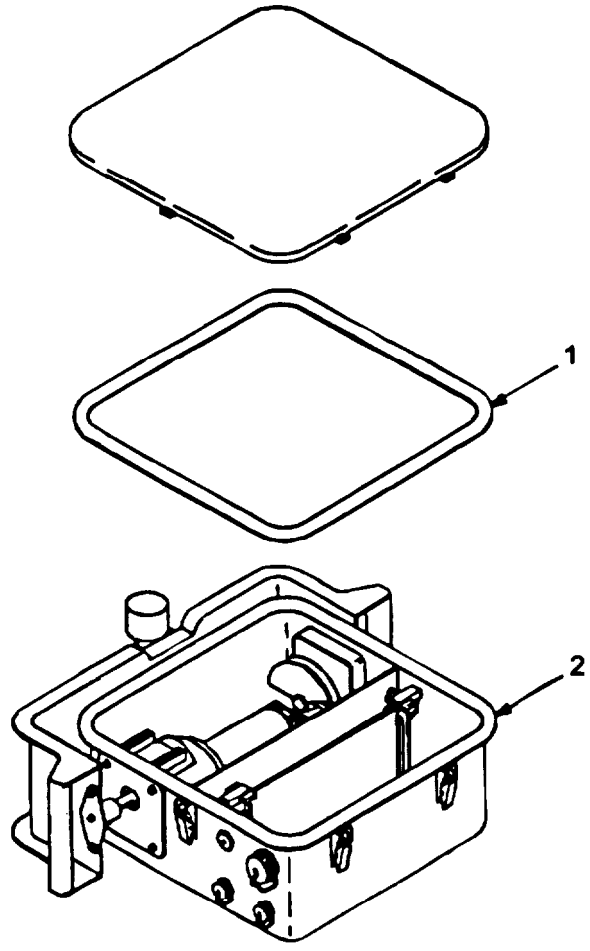
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Gasket (9387225)
Adhesive (item 1, appendix D)

References:
Install cover assembly (reference paragraph 4-44).

Equipment conditions:
Cover assembly removed (reference paragraph 4-44).



4-43 ITM HOUSING GASKET REPLACEMENT - CONTINUED.

Replacement.

a. Scrape old gasket (1) from mounting surfaces of housing assembly (2).

b. Remove all old adhesive from mounting surfaces of housing assembly.

c. Apply continuous coat of adhesive to one side of new gasket.

d. Bond gasket to mounting surface of housing assembly.

e. Install cover assembly (reference paragraph 4-44).

4-44 COVER ASSEMBLY REPLACEMENT.

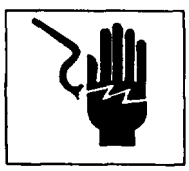
INITIAL SETUP

Materials/Parts:
Cover assembly (11829343-1)
Grease, (item 6, appendix D)

---

a. Removal.

WARNING



Before working on the ITM, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to OFF.

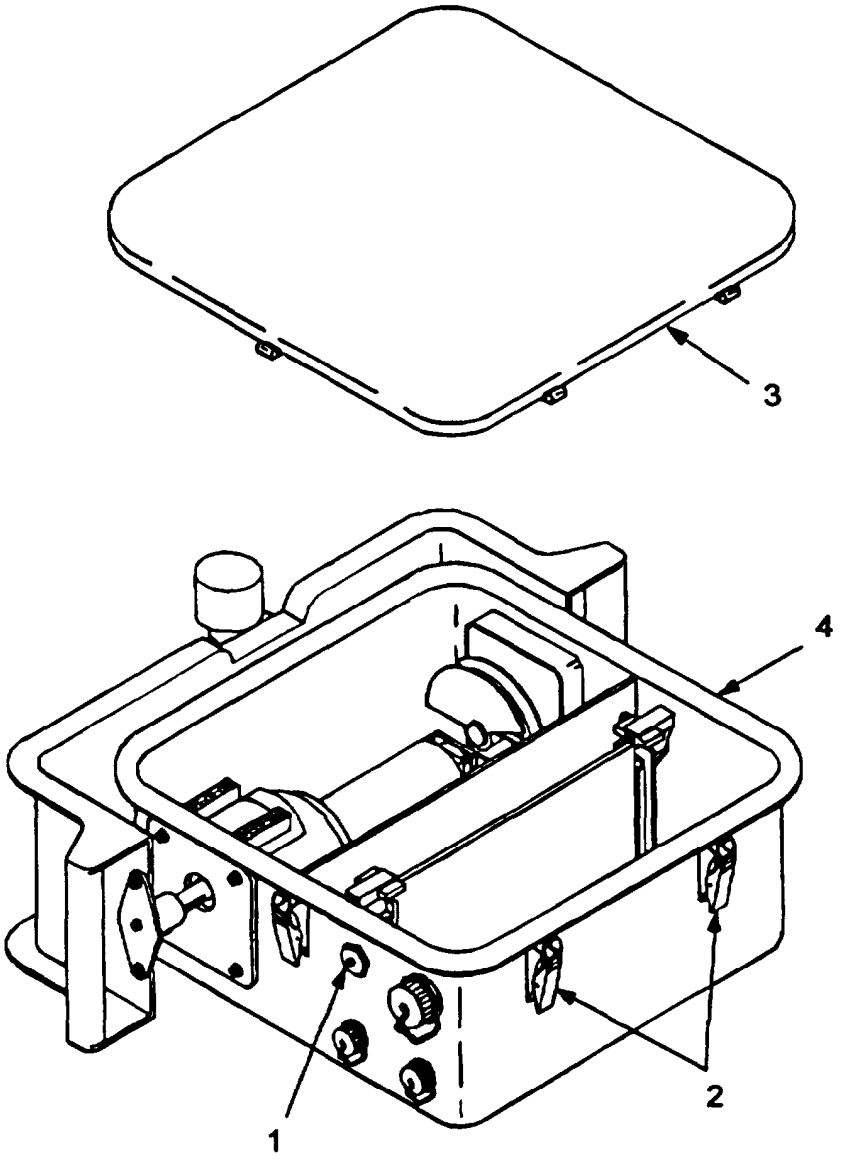
(3) Set circuit breaker CB1 on ITM to POWER OFF.

(4) Press pressure relief valve (1) to equalize pressure inside housing unit.

NOTE

Target arm must be in down position before cover assembly can be removed.

(5) Release latches (2) and remove cover assembly (3).



b. Installation.

(1) Apply a thin uniform coating of grease to entire gasket surface (4).

(2) Install cover assembly (3) and fasten latches (2).

(3) Set circuit breaker CB1 on ITM to POWER ON.

(4) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to ON.

(5) Set circuit breaker on ICB to ON.

4-45 PAD REPLACEMENT.

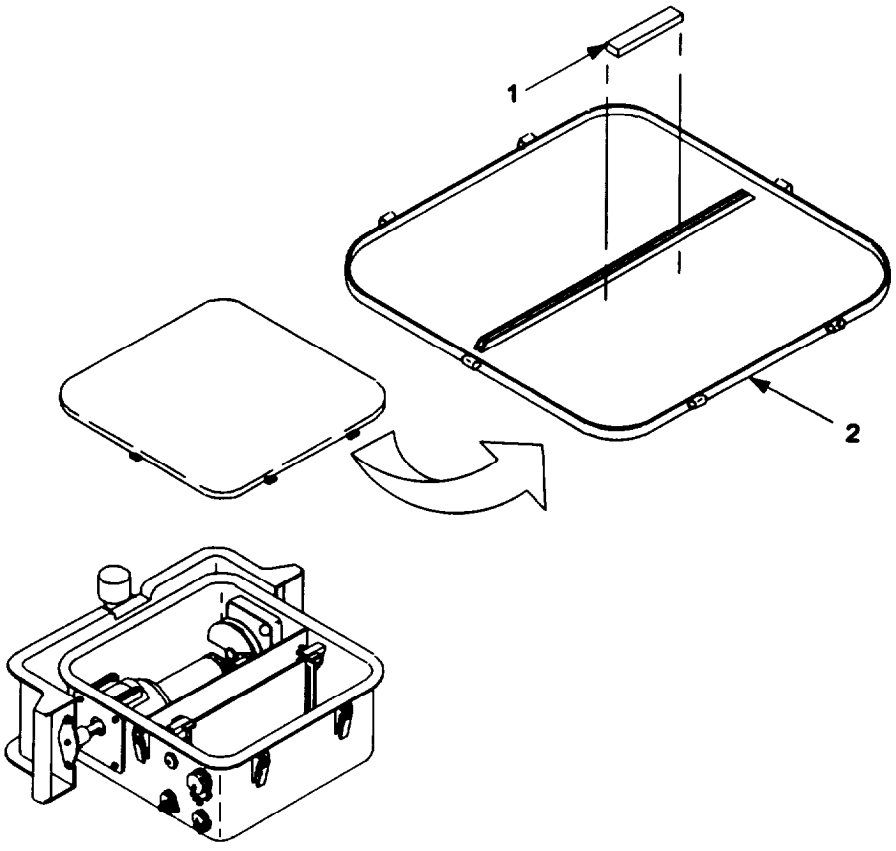
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Pad (11829387)
Adhesive
(item 7, appendix D)

References:
Install cover assembly
(reference paragraph 4-44).

Equipment conditions:
Cover assembly removed
(reference paragraph 4-44).



Replacement.

a. Scrape old pad (1) from inside of cover assembly (2).

b. Remove all old adhesive from pad mounting surface.

c. Apply continuous coat of adhesive to one side of new pad.

d. Bond pad to inside of cover assembly.

e. Install cover assembly (reference paragraph 4-44).

4-46 RADIO FREQUENCY INTERFERENCE (RFI) GASKET REPLACEMENT.

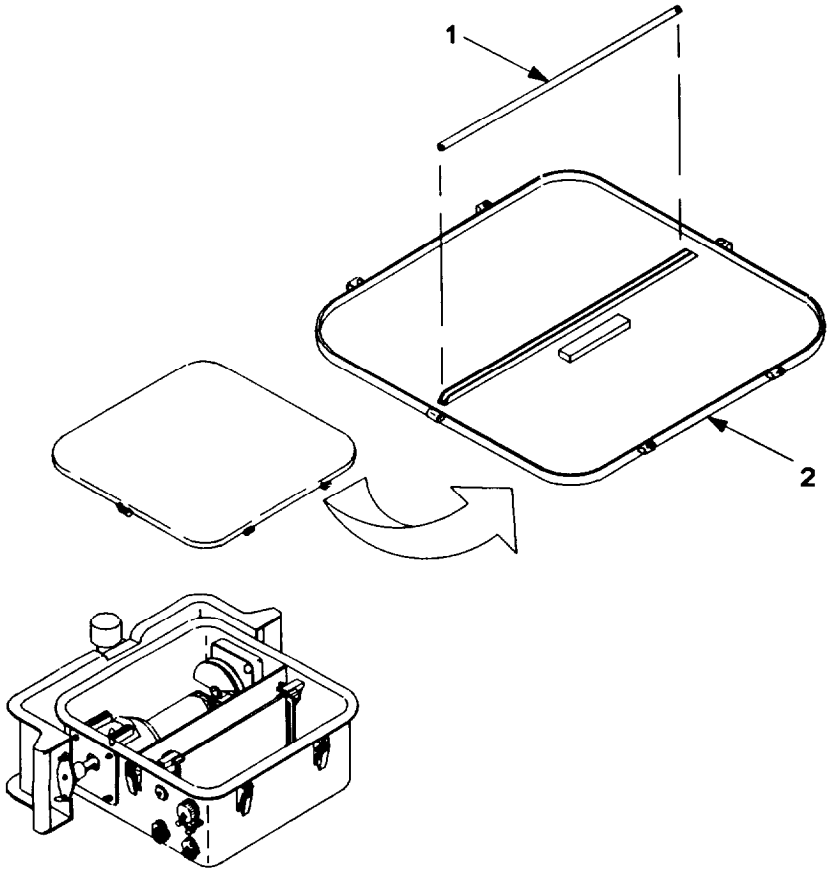
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Gasket, RFI (11829403)
Adhesive (item 1, appendix D)

References:
Install cover assembly (reference paragraph 4-44).

Equipment Conditions:
Cover assembly removed (reference paragraph 4-44).



Replacement.

a. Remove old RFI gasket (1) from cover assembly (2).

b. Remove all old adhesive from mounting surfaces of cover assembly.

c. Apply continuous bead of adhesive to new RFI gasket.

d. Bond gasket to mounting surface of cover assembly.

e. Install cover assembly (reference paragraph 4-44).

4-47 TARGET ARM ASSEMBLY REPLACEMENT.

INITIAL SETUP

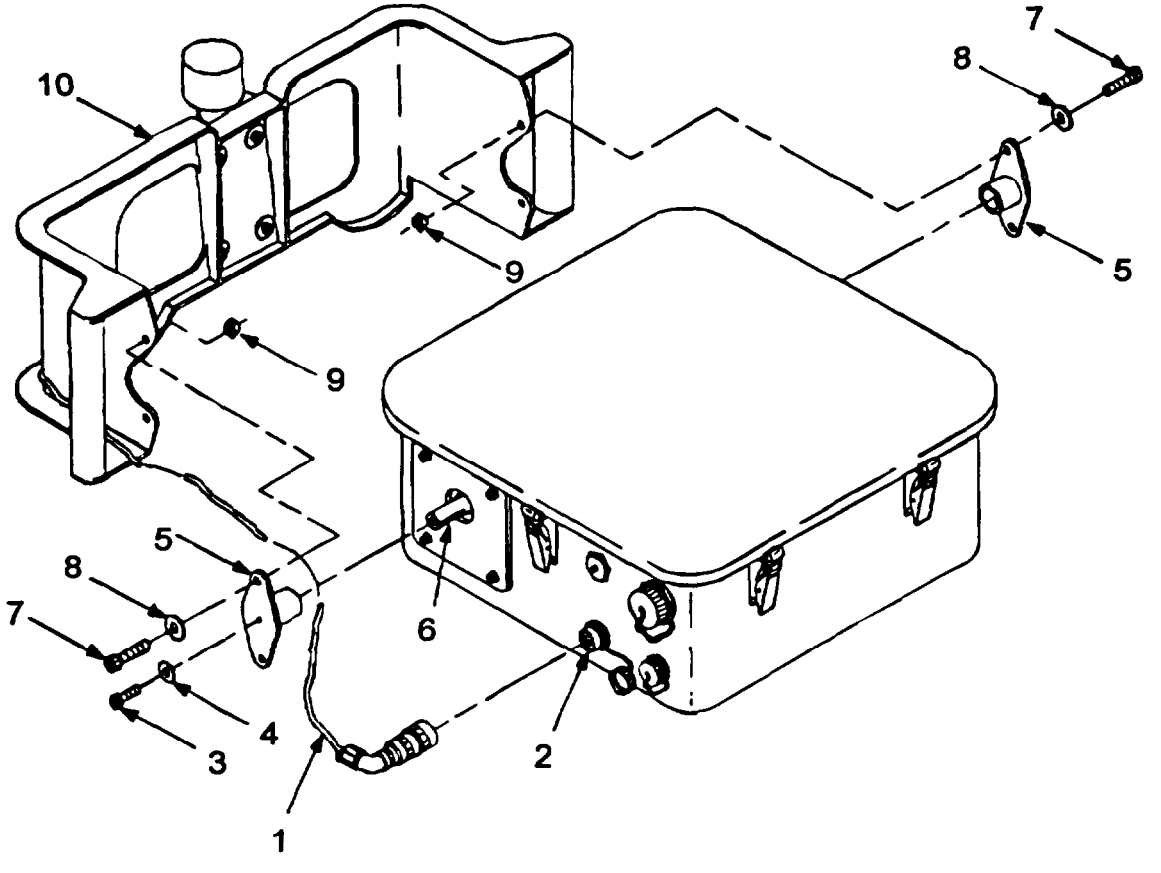
Tools and Special Tools:
General mechanic's automotive tool kit
Torque screwdriver set

Materials/Parts:
Self-locking nut (MS21083C4)
Target am assembly (11829342)
Sealing compound (item 11, appendix D)
Sealing compound, alternate
(item 15, appendix D)

Personnel Required:
2 persons (for safety purposes)

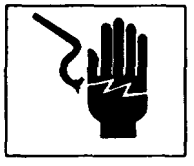
References:
Remove cover assembly
(reference paragraph 4-44).
Install cover assembly
(reference paragraph 4-44).
Install target
(reference paragraph 4-42).
Perform ITM self-test
(reference paragraph 2-4b).

Equipment Conditions:
Target removed
(reference paragraph 4-42).



a. Removal.

WARNING



Before working on the ITM, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result In electrical shock and death or serious Injury.

(1) Set circuit breaker on ICB to OFF.

(2) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker CB1 on ITM to POWER OFF.

(4) Disconnect connector on hit sensor electronics cable (1) from connector J2 (2).

(5) Remove screw (3) and flatwasher (4) securing target hub (5) to drive shaft (6).

(6) Remove four screws (7), flatwashers (8), and self-locking nuts (9) securing target arm assembly (10) to target hubs.

(7) Remove target arm assembly from target hubs.

(8) Remove target hubs from shafts.

b. Installation.

(1) Remove cover assembly (reference paragraph 4-44).

(2) Rotate idler shaft until actuator is inside optical switch assembly.

(3) Install target hubs (5) on shafts.

(4) Apply sealing compound to screw (3).

(5) Install screw and flatwasher (4) and secure target hub to drive shaft (6).

CAUTION

Torque screw that secures target hub to drive shaft or target hub will come loose during operation and damage to drive shaft will result.

(6) Using torque screwdriver set, torque screw 40 to 44 in-lb (4.55 to 5 Newton-meters).

(7) Position target arm assembly (10) on target hubs and install four screws (7), flatwashers (8), and new self-locking nuts (9).

4-47 TARGET ARM ASSEMBLY REPLACEMENT - Continued.

(8) Connect connector on hit sensor electronics cable (1) to connector J2 (2).

(9) Install cover assembly (reference paragraph 4-44) and install target (reference paragraph 4-11).

(10) Set circuit breaker CB1 on ITM to POWER ON.

(11) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to ON.

(12) Set circuit breaker on ICB to ON.

(13) Perform ITM self-test (reference paragraph 2-4b).

4-48 SPACER REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

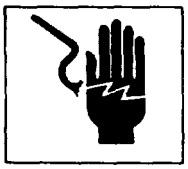
References:
Perform troubleshooting procedures (reference table 4-2).

Materials/Parts:
Spacer (9363051)

---

a. Removal.

WARNING



Before working on the ITM, ensure that circuit breaker on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

NOTE

This procedure applies to replacement of spacers on both the single and double hit sensor electronics.

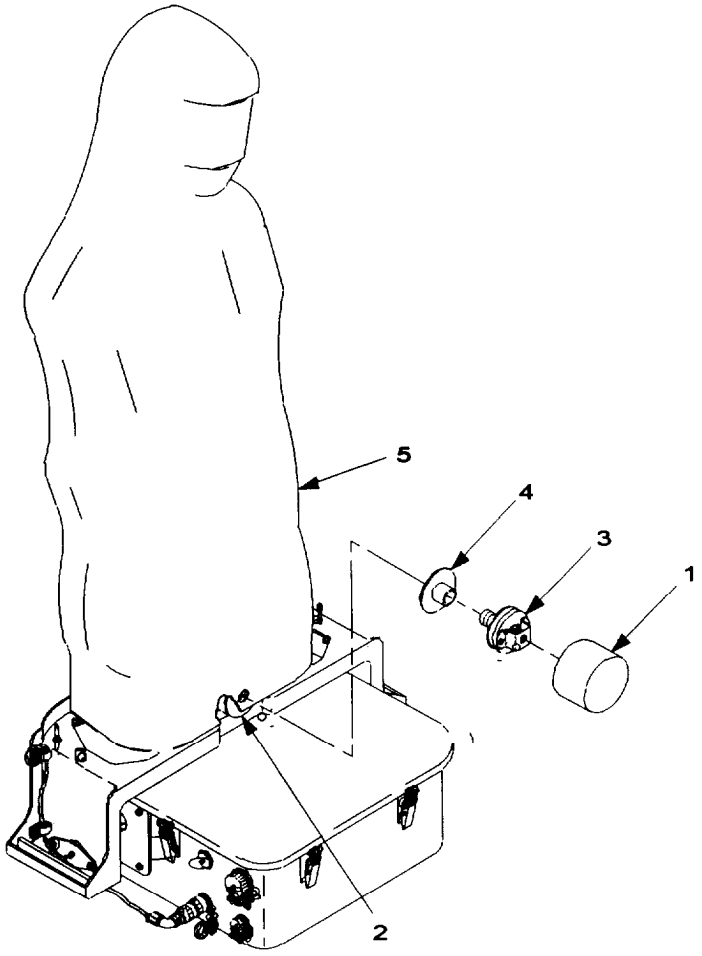
(1) Set circuit breaker on ICB to OFF.

(2) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker CB1 on ITM to POWER OFF.

(4) Remove hit sensor shield (1) from hit sensor assembly (2).

(5) Loosen capscrew (part of hit sensor clamp assembly) and remove hit sensor clamp assembly (3) and spacer (4) from target (5) and hit sensor assembly.



b. Installation.

CAUTION

Do not overtighten capscrew on hit sensor clamp assembly. Overtightening capscrew can deform clamp and lead to false hit counts during range operation.

NOTE

To increase sensitivity of hit sensor to target hits, position spacer with nipple facing inward, toward hit sensor. For less sensitive recording of hits, position spacer with nipple facing outward, away from hit sensor.

(1) Position spacer (4) and hit sensor clamp assembly (3) on target (5) and hit sensor assembly (2). Hand-tighten capscrew until snug; then tighten one-half additional turn.

(2) Install hit sensor shield (1) on hit sensor assembly.

4-49 SPACER REPLACEMENT - Continued.

(3) Set circuit breaker CB1 on ITM to POWER ON.

(4) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to ON.

(5) Set circuit breaker on ICB to ON.

(6) Set and hold test switch SW1 to TARGET TEST position and tap hit sensor lightly with metal object If target arm goes down, reinstall hit sensor shield on hit sensor clamp assembly. If target arm does not go down, perform troubleshooting procedures outlined in malfunction 8 or 9 in table .

4-49 IDLER SHAFT ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Idler shaft assembly (11829372)
Adhesive
(item 7, appendix D)
Sealing compound (item 11, appendix D)

References:
Install target arm assembly
(reference paragraph 4-45 or 4-48).
Install cover assembly
(reference paragraph 4-44).

References - Continued:
Install ITM (reference paragraph 4-41).
Perform ITM self-test
(reference paragraph 2-4b).

Equipment Conditions:
ITM removed (reference paragraph 4-41).
Target arm assembly removed
(reference paragraph 4-45 or 4-48).
Cover assembly removed
(reference paragraph 4-44).

---

a. Removal.

(1) Remove four mounting screws (1) and flatwashers (2) that secure idler shaft plate (3) and idler shaft assembly (4) to housing assembly (5).

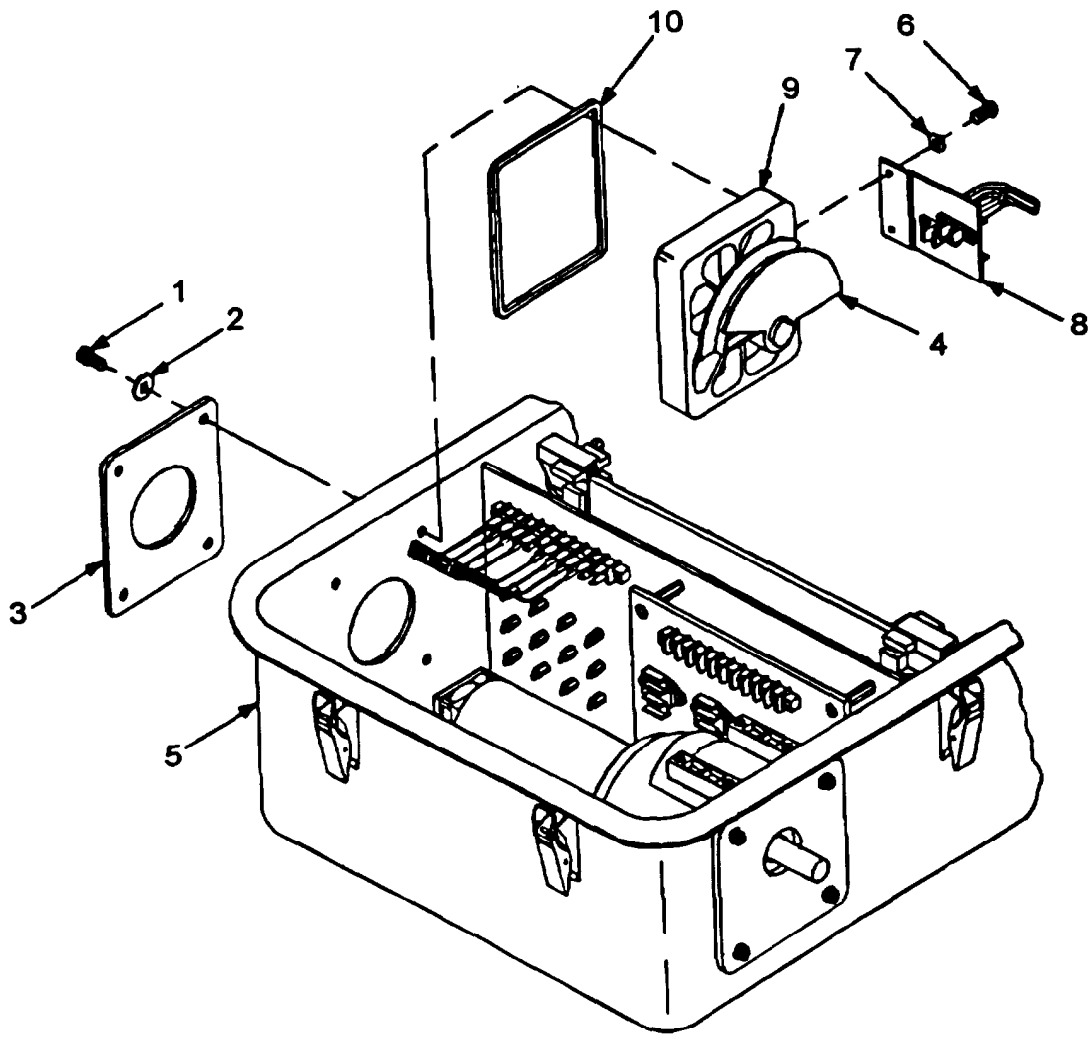
(2) Remove idler shaft plate and pull idler shaft assembly away from housing assembly.

(3) Remove two screws (6) and flatwashers (7) and remove optical switch assembly (8) from bearing housing (9).

(4) Remove idler shaft assembly from housing assembly.

(5) Remove O-ring (10) from bearing housing.

(6) Clean O-ring mounting surfaces on bearing housing and housing assembly.



b. Installation.

(1) Apply adhesive to both surfaces of O-ring (10).

(2) Install O-ring on bearing housing (9).

(3) Position optical switch assembly (8) on bearing housing.

(4) Apply sealing compound to two screws (6).

(5) Install two screws and flatwashers (7) and secure optical switch assembly to bearing housing.

(6) Position idler shaft assembly (4) on inside of housing assembly (5) and idler shaft plate (3) on outside of housing assembly.

(7) Install four mounting screws (1) and flatwashers (2) and secure idler shaft plate (3) and idler shaft assembly to housing assembly.

4-49 IDLER SHAFT ASSEMBLY REPLACEMENT - Continued.

(6) Install target arm assembly (reference paragraph 4-45 or 4-48).

(9) Install cover assembly (reference paragraph 4-44).

(10) Install ITM (reference paragraph 4-41).

(11) Perform ITM self-test (reference paragraph 2-4b).

4-50 DOUBLE TARGET ARM ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque screwdriver set

Materials/Parts:
Self-locking nut (MS21083C4)
Self-locking screw (MS21295-29)
Target arm assembly (9341015)
Sealing compound (item 11, appendix D)
Sealing compound, alternate (item 15, appendix D)

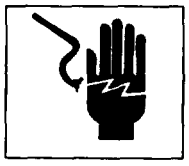
Personnel Required:
2 persons (for safety purposes)

References:
Remove cover assembly (reference paragraph 4-44).
Install cover assembly (reference paragraph 4-44).
Install target (reference paragraph 4-42).
Perform ITM self-test (reference paragraph 2-4b).

Equipment Conditions:
Target removed (reference paragraph 4-42).

a. Removal.

WARNING



Before working on the ITM, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker CB1 on ITM to POWER OFF.

(4) Disconnect connector on double hit sensor electronics cable (1) from connector J2 (2) on

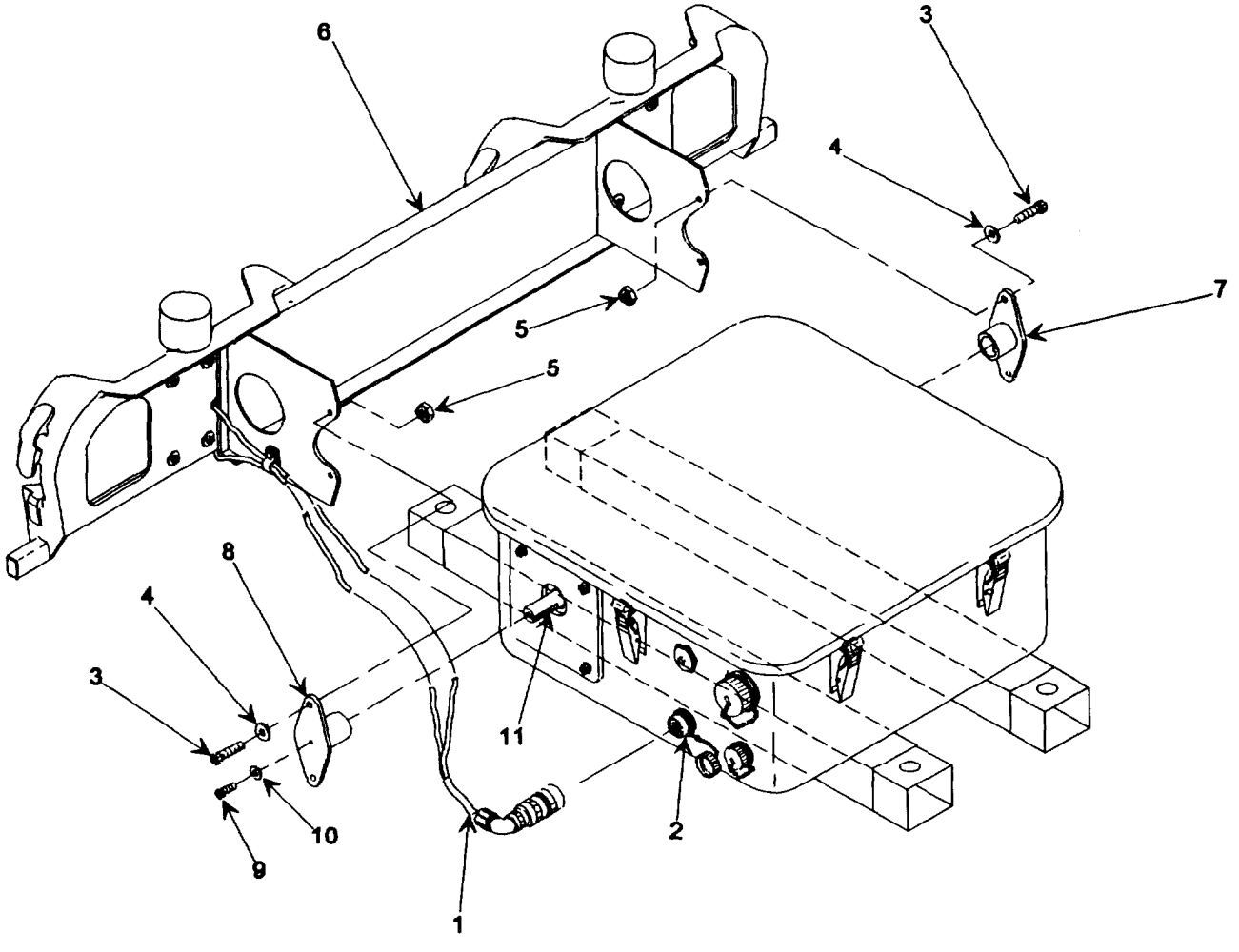
(5) Remove four screws (3) flatwashers (4) and self-locking nuts (5) that secure double target arm assembly (6) to target hub (7) and hub assembly (8).

(6) Remove double target arm assembly from target hub and hub assembly.

(7) Remove self-locking screw (9) and flatwasher (10) that secure hub assembly to shaft on drive motor assembly (11).

(8) Remove hub assembly from shaft on drive motor assembly.

(9) Remove target hub from idler shaft.



4-50 DOUBLE TARGET ARM ASSEMBLY REPLACEMENT - Continued.

b. Installation.

(1) Remove cover assembly (reference paragraph 4-44).

(2) Rotate idler shaft until actuator is positioned inside optical switch assembly.

(3) Install target hub (7) on idler shaft

(4) Install hub assembly (8) on drive motor shaft (11).

(5) Apply sealing compound to threads of new self-locking screw (9).

(6) Install self-locking screw and flatwasher (10) and secure hub assembly to drive motor shaft.

CAUTION

Torque screw that secures target hub to drive shaft or target hub will come loose during operation and damage to drive shaft will result.

(7) Using torque screwdriver set, torque self-locking screw 40 to 44 in-lb (4.55 to 5 Newton-meters).

(8) Position double target arm assembly (6) on target hub (7) and hub assembly.

(9) Install four screws (3), flatwashers (4), and new self-locking nuts (5), and secure double target arm assembly to target hub and hub assembly.

(10) Connect connector on double hit sensor electronics cable (1) to connector J2 (2) on ITM.

(11) Install cover assembly (reference paragraph 4-44).

(12) Install target (reference paragraph 4-42).

(13) Set circuit breaker CB1 on ITM to POWER ON.

(14) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to ON.

(15) Set circuit breaker on ICB to ON.

(16) Perform ITM self-test (reference paragraph 2-4b).

SECTION VI. PREPARATION FOR STORAGE OR SHIPMENT

4-51 GENERAL

No supplemental procedures are required to prepare the IMTC or ITM for shipment or

CHAPTER 5

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

SECTION I. TROUBLESHOOTING

5-1 TROUBLESHOOTING PROCEDURES.

Table 5-1 lists the common malfunctions that you may find during operation or maintenance of the Target Training Set Track System - Infantry (IMTC) and Training Target Holding Set (ITM). You should perform the tests/inspections and corrective actions in the order listed. Before you begin troubleshooting the IMTC or ITM, ensure that operator PMCS and unit troubleshooting procedures have been performed. The following procedures are based on the premise that operator preventive maintenance checks and services (PMCS) and unit troubleshooting procedures have been completed. If in doubt, perform PMCS in accordance with the procedures described in table 2-3 and perform unit troubleshooting procedures in accordance with table 4-1. This manual cannot list all the malfunctions that may occur nor all the tests or inspections and corrective actions. Notify your supervisor if a malfunction persists and cannot be corrected by prescribed action.

WARNING

Personnel working with or near high voltages must be trained and certified in mouth-to-mouth and cardiopulmonary resuscitation. Installation medical activities shall provide certified instructors. Newly assigned maintenance personnel must be trained as soon as practical. Make sure at least two persons are in the area at ail times when work is being performed on exposed live circuits carrying 30 volts or more.

Malfunction index

Table 5-1. Direct Support Troubleshooting Procedures.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. IMTC is inoperable.

Step 1. Perform steps to position controls on the RCS Adapter prior to application of power (refer to TM 9-6920-742-14-1).

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 2. Perform internal test of the Range Control Station (RCS) Adapter (refer to TM 9-6920-742-14-1).

Step 3. Connect test cable 9387314 as follows:

Connector P1 on test cable to RCS Adapter connector J1

Connector P2 on test cable to IMTC electronic components assembly connector J4

Connector P3 on test cable to IMTC electronic components assembly connector J6<

Connector P4 on test cable to IMTC electronic components assembly connector J5

Connector P5 on test cable to IMTC electronic components assembly connector J3.

Step 4. Connect test power cable 9387315 as follows:

Connector P1 on test power cable to connector J3 on RCS Adapter

Connector P2 on test power cable to connector J1 on IMTC electronic components assembly.

Step 5. Set the RCS Adapter Mode Controls POWER switch to the on position,

Step 6. Set the RCS Adapter UUT POWER switch to the on position.

Step 7. Set the IMTC electronic components assembly circuit breaker CB1 to on.

Step 8. Set multimeter to dc volts. Place negative lead on multimeter in RTN jack located at LIMIT SWITCH POWER section of RCS Adapter. Place positive lead on multimeter in REV jack. Multimeter should read +10.6 ±5 vdc.

if reading on multimeter indicates correct voltage, proceed to step 9.

if reading on multimeter does not indicate correct voltage, proceed to step 10.

Step 9. Ensure that multimeter is set to dc volts. Place negative lead on multimeter in RTN jack located at LIMIT SWITCH POWER section of RCS Adapter. Place positive lead on multimeter in FWD jack. Multimeter should read +10.6 ±5 vdc.

If reading on multimeter indicates correct voltage, proceed to step 17.

if reading on multimeter does not indicate correct voltage, proceed to step 10.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 10. Set circuit breaker on IMTC electronic components assembly to the off position. Unfasten latches and remove cover from IMTC electronic components assembly. Set circuit breakers on IMTC electronic components assembly to the on position. Proceed to step 11.

Step 11. Set multimeter to dc volts. Connect negative lead on multimeter to TP-3 (black) on control logic circuit card assembly (CCA). Connect positive lead on multimeter to TP-1 (red) on control logic CCA. Multimeter should read +30 ±10 vdc.

Connect negative lead on multimeter to TB2-8. Connect positive lead on multimeter to TB2-8. Multimeter should read +30 ±10 vdc.

If +30 ±10 vdc is present at TP1 and at TB2-8, proceed to step 13.

If +30 ±10 vdc is present at TB2-6 but not at TP1, proceed to step 12.

If +30 ±10 vdc is not present at TP1 or at TB2-6, proceed to step 14.

Step 12. Set multimeter to ohms. Remove wiring harness (refer to paragraph 5-25) and perform continuity check at the following points:

Pin 8 on terminal board TB2 to pin 19 on connector P1

Pin 9 on terminal board TB2 to pin 1 on connector P1

If continuity exists across all of the referenced points, reinstall wiring harness (refer to paragraph 5-25) replace IMTC control logic CCA (refer to paragraph 5-17), and retest.

If continuity does not exist across all of the referenced points, replace or repair wiring harness (refer to paragraph 5-25) and retest.

Step 13. Set multimeter to ohms. Remove wiring harness (refer to paragraph 5-25) and perform continuity check at the following points:

Pin C on connector J5 to pin 8 on connector P1

Pin D on connector J5 to pin 9 on connector P1

Pin C on connector J8 to pin 12 on connector P1

Pin D on connector J8 to pin 18 on connector P1

If continuity exists across all of the referenced points, reinstall wiring harness (refer to paragraph 5-25) replace IMTC control logic CCA (refer to paragraph 5-17), and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If continuity does not exist across all of the referenced points, replace or repair wiring harness (refer to paragraph 5-25) and retest.

Step 14. Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB2-8. Connect positive lead on multimeter to TB2-7. Multimeter should read +30 ±10 vdc.

Connect negative lead on multimeter to TB2-8. Connect positive lead on multimeter to TB2-5. Multimeter should read +30 ±10 vdc.

If multimeter indicates correct voltage at TB2-5 but not at TB2-7, replace resistor R2 (refer to paragraph 5-22) and retest.

If multimeter does not indicate correct voltage reading at TB2-5, proceed to step 15.

Step 15. Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB2-8. Connect positive lead on multimeter to TB2-4. Multimeter should read +30 ±10 vdc.

Connect negative lead on multimeter to TB2-8. Connect positive lead on multimeter to TB2-1. Multimeter should read +30 ±10 vdc.

Connect negative lead on multimeter to TB2-8. Connect positive lead on multimeter to TB2-2. Multimeter should read +30 ±10 vdc.

If +30 ±10 vdc is present at TB2-1 and TB2-2 but not at TB2-4, remove circuit breaker assembly CB1 (refer to paragraph), assemble and install new circuit breaker assembly (refer to paragraphs 5-24 and 4-35) and retest.

If +30 ±10 vdc is not present at TB2-1 or at TB2-2, proceed to step 16.

Step 18. Remove power cable assembly (refer to paragraph 5-30). Set multimeter to ohms and perform continuity check.

If continuity exists, reinstall power cable assembly (refer to paragraph 5-30). Power is not being supplied to the unit.

If continuity does not exist, assemble and install new power cable assembly (refer to paragraphs 5-31 and 5-30).

Step 17. Set LIMIT SIMULATORS switch on RCS Adapter to the OFF position. FWD and REV limit lamps on the TM OR TIU RESPONSE MONITORS should not be illuminated. Set the MOVER CONTROLS switch to the OFF position. FWD and REV lamps on MOTOR RESPONSE section of MTC RESPONSE MONITORS should not be illuminated.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If the above four lamps are not illuminated, proceed to step 18.

If any of the above four lamps are illuminated, check test cable 9387314 for correct connections. If the cable connections are correct, troubleshoot the RCS Adapter (refer to TM 9-6920-742-14-1).

Step 18. Set the FWD/REV LIMIT SIMULATORS switch on the RCS Adapter to the REV LIMIT position. The REV limit lamp on the TM OR TIU RESPONSE MONITORS should illuminate.

If REV limit lamp on TM OR TIU RESPONSE MONITORS illuminates, proceed to step 23.

If REV limit lamp on TM OR TIU RESPONSE MONITORS does not illuminate, proceed to step 19.

Step 19. Set circuit breaker ON IMTC electronic components assembly to the off position. Unfasten latches and remove cover from IMTC electronic components assembly. Set circuit breaker on IMTC electronic components assembly to the on position. Proceed to step 20.

Step 20. Ensure that multimeter is set to dc volts. Connect positive lead on multimeter to TP-7 (white) on control logic CCA. Connect negative lead on multimeter to TP-3 (black) on control logic CCA.

Set FWD/REV LIMIT SIMULATORS switch to OFF. Multimeter should read +I2 ±5 vdc. Set FWD/REV LIMIT SIMULATORS switch to REV LIMIT. The multimeter reading should drop to 0 vdc.

If multimeter indicates correct voltage readings at TP-7 on control logic CCA, proceed to step 22.

If multimeter does not indicate correct voltage readings at TP-7 on control logic CCA, proceed to step 21.

Step 21. Set multimeter to ohms.‘ Remove wiring harness (refer to procedure 5-27) and perform continuity check at the following point:

Pin E on connector J6 to pin 8 on connector P1

If continuity exists, reinstall wiring harness (refer to paragraph 5-25) replace IMTC control logic CCA (refer to paragraph 5-17) and retest.

If continuity does not exist, replace or repair wiring harness (refer to paragraph 5-25) as required and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 22. Set multimeter to ohms. Remove wiring harness (refer to paragraph 5-25) and perform continuity check at the following point:

Pin F on connector J4 to pin 28 on connector P1

If continuity exists, reinstall wiring harness (refer to paragraph 5-25) replace IMTC control logic CCA (refer to paragraph 5-17) and retest.

If continuity does not exist, replace or repair wiring harness (refer to paragraph 5-25) as required and retest.

Step 23. Set the FWD/REV LIMIT SIMULATORS switch on the RCS Adapter to the FWD LIMIT position. The FWD limit lamp on the TM OR TIU RESPONSE MONITORS should illuminate.

If FWD limit lamp on TM OR TIU RESPONSE MONITORS illuminates, proceed to step 28.

If FWD limit lamp on TM OR TIU RESPONSE MONITORS does not illuminate, proceed to step 24.

Step 24. Set circuit breaker on IMTC electronic components assembly to the off position. Unfasten latches and remove cover from IMTC electronic components assembly. Set circuit breaker on IMTC electronic components assembly to the on position. Proceed to step 25.

Step 25. Ensure that multimeter is set to dc volts. Connect positive lead on multimeter to TP-4 (white) on control logic CCA. Connect negative lead on multimeter to TP-3 (black) on control logic CCA.

Set FWD/REV LIMIT SIMULATORS switch to OFF. Multimeter should read +12 ±5 vdc. Set the FWD/REV LIMIT SIMULATORS switch to FWD LIMIT. The multimeter reading should drop to 0 vdc.

If multimeter indicates correct voltage readings at TP-4 on control logic CCA, proceed to step 27.

If multimeter does not indicate correct voltage readings at TP4 on control logic CCA, proceed to step 26.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 28. Set multimeter to ohms. Remove wiring harness (refer to paragraph 5-25) and perform continuity check at the following point:

Pin E on connector J5 to pin 7 on connector P1

If continuity exists, reinstall wiring harness (refer to paragraph 5-25), replace IMTC control logic CCA (refer to paragraph 5-17) and retest.

If continuity does not exist, replace or repair wiring harness (refer to paragraph 5-25) as required and retest.

Step 27. Set multimeter to ohms. Remove wiring harness (refer to procedure 5-15) and perform continuity check at the following point:

Pin G on connector J4 to pin 27 on connector P1

If continuity exists, reinstall wiring harness (refer to paragraph 5-25) replace IMTC control logic CCA (refer to paragraph 5-17) and retest.

If continuity does not exist, replace or repair wiring harness (refer to paragraph 5-25) as required and retest.

Step 28. Set FWD/REV LIMIT SIMULATORS switch on the RCS Adapter to the REV LIMIT position. Set the MOVER CONTROLS to the FORWARD position. The following should occur:

The REV limit lamp on the TM OR TIU RESPONSE MONITORS illuminates. The relay in the IMTC electronic components assembly energizes, as will be noted by an audible click. The FWD lamp on the MTC RESPONSE MONITORS illuminates.

After 10 ±1.5 seconds, the relay in the IMTC electronic components assembly de-energizes, as will be noted by an audible click. The FWD lamp on the MTC RESPONSE MONITORS extinguishes, while the REV limit lamp on the TM OR TIU RESPONSE MONITORS remains illuminated.

If all indications are correct, proceed to step 38.

If the relay does not energize as noted by an audible click, go to step 29.

If FWD lamp on the MTC RESPONSE MONITORS does not illuminate, go to step 44.

If, after 10 ±1.5 seconds, the relay does not de-energize, replace the IMTC control logic CCA (refer to paragraph 5-17) and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 29. Set circuit breaker IMTC electronic components assembly to the off position. Unfasten latches and remove cover from IMTC electronic components assembly. Set circuit breaker on IMTC electronic components assembly to the on position, Proceed to step 30.

Step 30. Set FWD/REV LIMIT SIMULATORS switch to the REV LIMIT position. Ensure that multimeter is set to dc volts. Connect positive lead on multimeter to TP-10 (white) on control logic CCA. Connect negative lead on multimeter to TP-3 (black) on control logic CCA. Multimeter should read 0 vdc.

Momentarily set MOVER CONTROLS switch to OFF, then to FORWARD. Multimeter should read +30 ±10 vdc.

Momentarily set FWD/REV LIMIT SIMULATORS switch to OFF. Connect positive lead on multimeter to TP-9 (white) on control logic CCA. Connect negative lead on multimeter to TP-3 (black) on control logic CCA. Set FWD/REV LIMIT SIMULATORS switch to the REV LIMIT position. Multimeter should read 10 ±1.5 vdc.

Momentarily set MOVER CONTROLS switch to OFF, then to FORWARD. Multimeter should momentarily drop to 0 vdc.

If multimeter indicates correct voltage reading at both TP-9 and at TP-10, proceed to step 32.

If multimeter indicates correct voltage reading at TP-9 on control logic CCA, but not at TP-10, replace IMTC control logic CCA (refer to paragraph 5-17) and retest.

if multimeter does not indicate correct voltage reading at TP-9 or at TP-10 on control logic CCA, proceed to step 31.

Step 31. Set multimeter to ohms. Remove wiring harness (refer to paragraph 5-25) and perform continuity check at the following points:

Pin A on connector J4 to pin 14 on connector P1

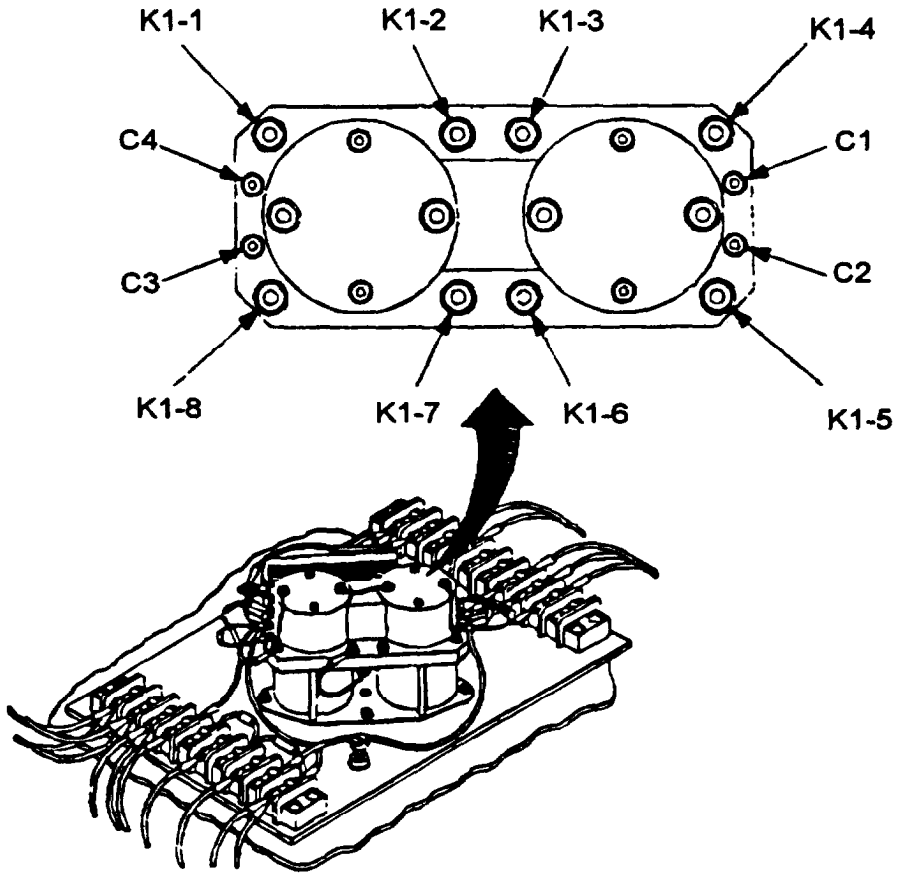
Pin B on connector J4 to pin 15 on connector P1

If continuity exists across ail of the referenced points, reinstall wiring harness (refer to paragraph 5-25) replace IMTC control logic CCA (refer to paragraph 5-17) and retest.

If continuity does not exist across all of the referenced points, replace or repair wiring harness (refer to paragraph 5-25) as required and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION



Step 32. Set multimeter to dc volts. Connect positive lead on the multimeter to C3 on the relay. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to FORWARD. Multimeter should read 0 vdc.

If multimeter indicates correct voltage reading at C3 on relay, proceed to step 33.

If multimeter does not indicate correct voltage reading at C3 on relay, replace diode assembly jumper (reference paragraph 5-20) and retest.

Step 33. Set multimeter to dc volts. Connect positive lead on the multimeter to C4 on the relay. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to FORWARD. Multimeter should read +30 ±10 vdc.

If multimeter indicates correct voltage reading at C4 on relay, proceed to step 34.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

NOTE

Check relay contacts for signs of burning or corrosion and clean as necessary prior to removal/replacement.

If multimeter does not indicate correct voltage reading at C4 and relay does not energize, replace relay (reference paragraph 5-19) and retest.

Step 34. Set multimeter to dc volts. Connect positive lead on the multimeter to TB1-8. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to FORWARD. Multimeter should read +30 ±10 vdc.

If multimeter indicates correct voltage reading at TB1-8, proceed to step 35.

If multimeter does not indicate correct voltage reading at TB1-8 on relay, replace wire that connects TB1-8 to C4 on relay and retest.

Step 35. Set multimeter to ohms. Remove wiring harness (refer to paragraph 5-25) and perform continuity check at the following point:

Pin 8 on terminal board TB1 to pin 5 on connector P1

If continuity exists, reinstall wiring harness (refer to paragraph 5-25), replace IMTC control logic CCA (refer to paragraph 5-17), and retest.

If continuity does not exist, replace or repair wiring harness (refer to paragraph 5-27) as required and retest.

Step 36. Set FWD/REV LIMIT SIMULATORS switch on the RCS Adapter to the FWD LIMIT position. Set the MOVER CONTROLS to the REVERSE position. The following should occur.

The FWD limit lamp on the TM OR TIU RESPONSE MONITORS illuminates. The relay in the IMTC electronic components assembly energizes, as will be noted by an audible click. The REV lamp on the MTC RESPONSE MONITORS illuminates.

After 10 ±1.5 seconds, the relay in the IMTC electronic components assembly de-energizes, as will be noted by an audible click. The REV lamp on the MTC RESPONSE MONITORS extinguishes, while the FWD limit lamp on the TM OR TIU RESPONSE MONITORS remains illuminated.

If all indications are correct, unit is operational.

If the relay does not energize as noted by an audible click, go to step 37.

If REV lamp on the MTC RESPONSE MONITORS does not illuminate, go to step 44.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If, after 10 ±1.5 seconds, the relay does not de-energize, replace the IMTC control logic CCA (refer to paragraph 5-17) and retest.

Step 37. Set circuit breaker on IMTC electronic components assembly to the off position. Unfasten latches and remove cover from IMTC electronic components assembly. Set circuit breaker on IMTC electronic components assembly to the on position. Proceed to step 38.

Step 38. Set FWD/REV LIMIT SIMULATORS switch to the FWD LIMIT position. Ensure that multimeter is set to dc volts. Connect positive lead on multimeter to TP-11 (white) on control logic CCA. Connect negative lead on multimeter to TP-3 (black) on control logic CCA. Multimeter should read 0 vdc.

Momentarily set MOVER CONTROLS switch to OFF, then to REVERSE. Multimeter should read +30 ±10 vdc.

Set FWD/REV LIMIT SIMULATORS switch to OFF. Connect positive lead on multimeter to TP-8 (white) on control logic CCA. Connect negative lead on multimeter to TP-3 (black) on control logic CCA. Set FWD/REV LIMIT SIMULATORS switch to the FWD LIMIT position. Multimeter should read 10 ±1.5 vdc.

Momentarily set MOVER CONTROLS switch to OFF, then to REVERSE. Multimeter should momentarily drop to 0 vdc.

If multimeter indicates correct voltage reading at both TP-8 and at TP-11, proceed to step 40.

If multimeter indicates correct voltage reading at TP-8 on control logic CCA, but not at TP-11, replace IMTC control logic CCA (refer to paragraph 5-17), and retest.

If multimeter does not indicate correct voltage reading at TP-8 or at TP-11 on control logic CCA, proceed to step 39.

Step 39. Set multimeter to ohms. Remove wiring harness (refer to paragraph 5-25) and perform continuity check at the following points:

Pin C on connector J4 to pin 13 on connector P1

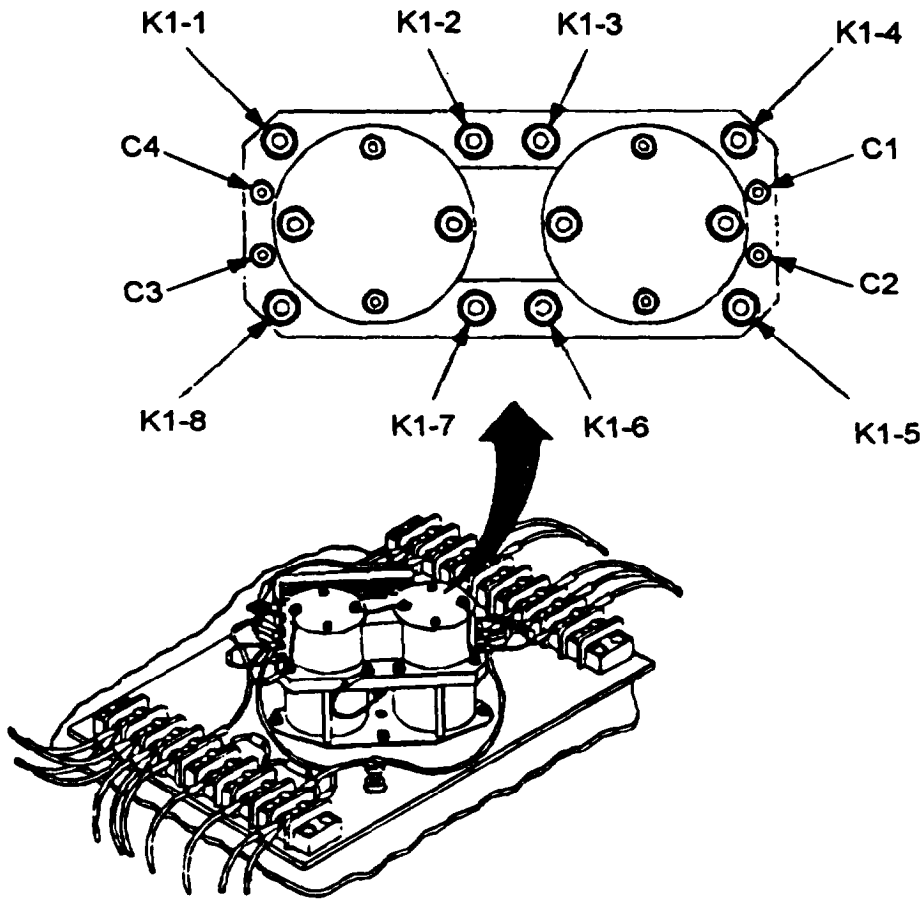
Pin 6 on connector J4 to pin 15 on connector P1

If continuity exists across all of the referenced points, reinstall wiring harness (refer to paragraph 5-25), replace IMTC control logic CCA (refer to paragraph 5-17), and retest.

If continuity does not exist across all of the referenced points, replace or repair wiring harness (refer to paragraph 5-25) as required and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION



Step 40. Set multimeter to dc volts. Connect positive lead on the multimeter to C2 on the relay. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to REVERSE. Multimeter should read 0 vdc.

If multimeter indicates correct voltage reading at C2 on relay and relay does not energize, proceed to step 41.

If multimeter does not indicate correct voltage reading at C2 on relay, replace diode assembly jumper (reference paragraph 5-21) and retest.

Step 41. Ensure that multimeter is set to dc volts. Connect positive lead on the multimeter to Cl on the relay. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to REVERSE. Multimeter should read +30 ±10 vdc.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If multimeter indicates correct voltage reading at Cl on relay, proceed to step 42.

If multimeter does not indicate correct voltage reading at C2 on relay and relay does not energize, replace relay (reference paragraph 5-19) and retest.

Step 42. Ensure multimeter is set to dc volts. Connect positive lead on the multimeter to TB1-9. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to REVERSE. Multimeter should read +30 ±10 vdc.

If multimeter indicates correct voltage reading at TB1-9, proceed to step 43.

If multimeter does not indicate correct voltage reading at TB1-9 on relay, replace wire that connects TB1-9 to C1 on relay and retest.

Step 43. Set multimeter to ohms. Remove wiring harness (refer to paragraph 5-25) and perform continuity check at the following points:

Pin 9 on terminal board TB1 to pin 17 on connector P1

If continuity exists, reinstall wiring harness (refer to paragraph 5-25), replace IMTC control logic CCA (refer to paragraph 5-17), and retest.

If continuity does not exist, replace or repair wiring harness (refer to paragraph 5-25) as required and retest.

Step 44. Ensure that multimeter is set to dc volts. Set FWD/REV LIMIT SIMULATORS switch on the RCS Adapter to REV LIMIT position. Connect positive lead on the multimeter to TB1-3. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to FORWARD. Multimeter should read +30 ±10 vdc.

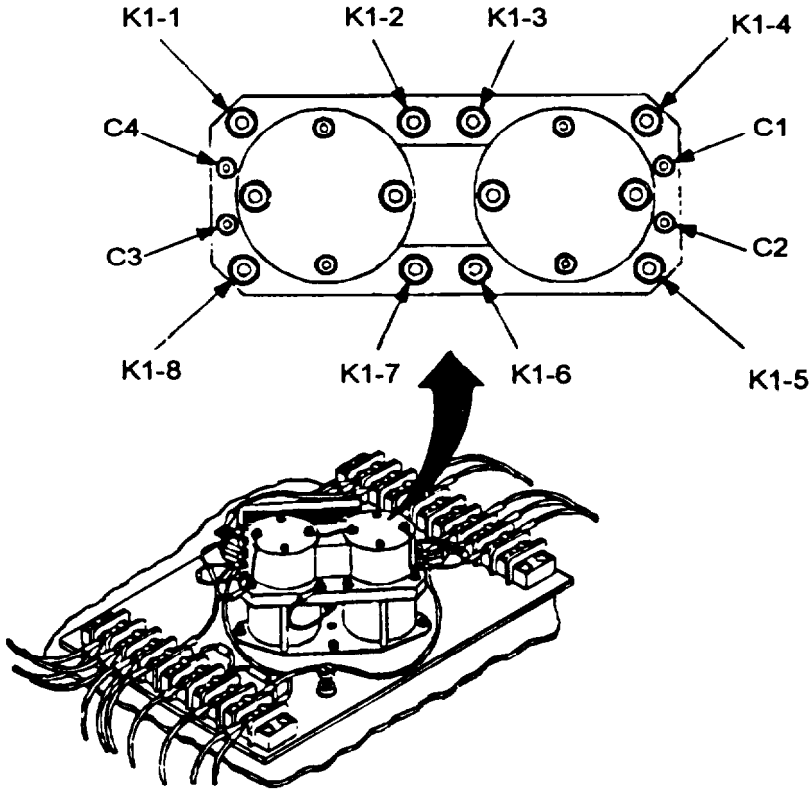
Set FWD/REV LIMIT SIMULATORS switch on the RCS Adapter to FWD LIMIT position. Connect positive lead on the multimeter to TB1-4. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to REVERSE. Multimeter should read +30 ±10 vdc.

If multimeter indicates correct voltage readings at TB1-3 and at TB1-4 when FORWARD and REVERSE commands are sent, proceed to step 49.

If multimeter does not indicate correct voltage reading at TB1-3 when FORWARD command is sent, or at TB1-4 when REVERSE command is sent, proceed to step 45.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION



Step 45. Ensure that multimeter is set to dc volts. Connect positive lead on multimeter to K1-1 on relay. Connect negative lead on multimeter to TB2-10. Multimeter should read +30 ±10 vdc.

If multimeter indicates correct voltage reading at K1-1 on relay, proceed to step 47.

If multimeter does not indicate correct voltage reading at K1-1 on relay, proceed to step 46.

Step 46. Set circuit breaker on the IMTC electronic components assembly to the off position. Set multimeter to ohms. Check for continuity at the following points:

Pin 4 on terminal board TB2 to terminal 1 on relay K1

Pin 9 on terminal board TB2 to terminal 2 on relay K1

If continuity exists across all the referenced points, perform troubleshooting procedures outlined in steps 15 and 16.

If continuity does not exist across all of the referenced points, replace or repair wires as required and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 47. Set circuit breaker on the IMTC electronic components assembly to the on position. Set multimeter to dc volts.

Set FWD/REV LIMIT SIMULATORS switch on the RCS Adapter to REV LIMIT position. Connect positive lead on the multimeter to K1-8 on relay. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to FORWARD. Multimeter should read +30 ±10 vdc.

Set FWD/REV LIMIT SIMULATORS switch on the RCS Adapter to FWD LIMIT position. Connect positive lead on the multimeter to K1-7 on relay. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to REVERSE. Multimeter should read +30 ±10 vdc.

If multimeter indicates correct voltage readings at K1-7 when REVERSE command is sent and at K1-8 on relay when FORWARD command is sent, proceed to step 48.

If multimeter does not indicate correct voltage reading at K1-7 on relay when reverse command is sent or at K1-8 on relay when FORWARD command is sent, replace relay (refer to paragraph 5-19) and retest.

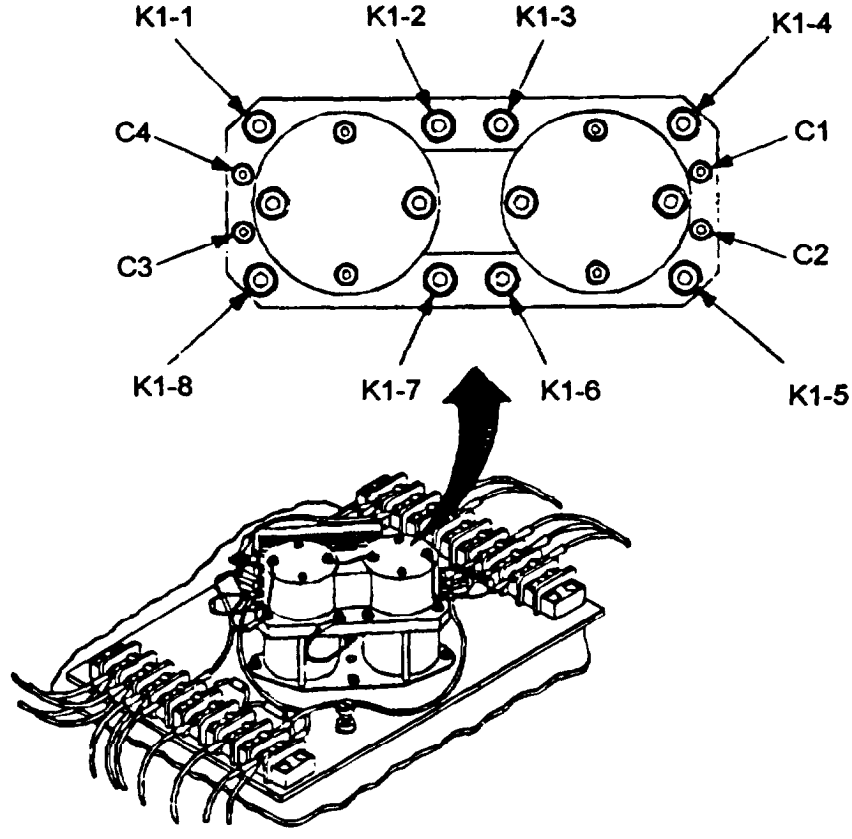


Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 48. Set circuit breaker on the IMTC electronic components assembly to the off position. Set multimeter to ohms. Check for continuity across the following points on the relay: K1-1 to K1-4, K1-2 to K1-3, K1-5 to K1-7, and K1-6 to K1-8.

If continuity exists across all of the referenced points, proceed to step 49.

If continuity does not exist across all of the referenced points, replace relay (refer to paragraph 5-19) and retest.

Step 49. Ensure that circuit breaker on IMTC electronic components assembly is set to the off position. Ensure that multimeter is set to ohms. Connect leads on multimeter to BRAKE RESISTANCE jacks on RCS Adapter. Multimeter should read less than 1 ohm.

If multimeter reads less than 1 ohm, proceed to step 53.

If multimeter reads 1 ohm or more, proceed to step 50.

Step 50. Perform continuity check on the cable assembly at the following points:

Pin H on connector J3 to pin 3 on terminal board TB1

Pin J on connector J3 to pin 3 on terminal board TB1

Pin F on connector J3 to pin 4 on terminal board TB1

Pin G on connector J3 to pin 4 on terminal board TB1

If continuity exists across all the referenced points, proceed to step 51.

If continuity does not exist across all of the referenced points, assemble and install new cable assembly (refer to paragraphs 5-33 and 5-32) and retest.

Step 51. Set multimeter to ohms. Perform continuity checks on wires at the following points:

K1-7 on relay to pin 4 on terminal board TB1

K1-8 on relay to pin 1 on terminal board TB1

R1-1 on resistor to pin 1 on terminal board TB1

R1-2 on resistor to pin 2 on terminal board TB1

Pin 2 terminal board TB1 to pin 3 on terminal board TB1

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If continuity exists all of the referenced points, proceed to step 52.

If continuity does not exist across all of the referenced points, replace or repair wire(s), and retest.

Step 52. Set circuit breaker on the IMTC electronic components assembly to the on position. Set multimeter to dc volts.

Set FWD/REV LIMIT SIMULATORS switch on the RCS Adapter to REV LIMIT position. Connect positive lead on the multimeter to TB1-1. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to FORWARD. Multimeter should read +30 ±10 vdc.

Connect positive lead on the multimeter to TB1-2. Connect negative lead on multimeter to TB2-10. Momentarily set MOVER CONTROLS switch to OFF, then to FORWARD. Multimeter should read +30 ±10 vdc.

If multimeter reading indicates correct voltage at both TB1-1 and at TB1-2, proceed to step 53.

If multimeter reading indicates correct voltage at TB1-1 but not at TB1-2, replace resistor R1 and retest.

Step 53. Set multimeter to ohms, Perform continuity checks on wiring harness at the following points:

Pin 1 on terminal board TB2 to pin a on connector J4

Pin 2 on terminal board TB2 to pin c on connector J4

Pin 3 on terminal board TB2 to pin J on connector J4

Pin 6 on terminal board TB1 to pin e on connector J4

Perform continuity check on following wire:

Pin 8 on terminal board TB2 to pin 7 on terminal board TB1

If continuity exists across all of the referenced points, proceed to step 54.

If continuity does not exist across all of the referenced points, replace or repair wiring harness (refer to paragraph 5-25), replace or repair wire, and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 54. Set multimeter to ohms. Perform continuity checks on wiring harness at the following points:

Pin c on connector J2 to pin L on connector J4

Pin d on connector J2 to pin M on connector J4

Pin e on connector J2 to pin R on connector J4

Pin f on connector J2 to pin S on connector J4

Pin g on connector J2 to pin V on connector J4

Pin h on connector J2 to pin W on connector J4

Pin i on connector J2 to pin D on connector J4

Pin j on connector J2 to pin E on connector J4

If continuity exists across all of the referenced points, relay and wiring are good. Proceed to step 55.

If continuity does not exist across all of the referenced points, replace or repair wiring harness (refer to paragraph 5-25) and retest.

Step 55. Set the IMTC electronic components assembly circuit breaker CB1 to off.

Step 56. Set the RCS Adapter UUT POWER switch to the off position.

Step 57. Set the RCS Adapter Mode Controls POWER switch to the off position.

Step 58. Disconnect test power cable 9387315 as follows:

Disconnect connector P1 on test power cable from connector J3 on RCS Adapter

Disconnect connector P2 on test power cable from connector J1 on IMTC electronic components assembly.

Step 59. Disconnect test cable <PARTN0>9387314</PARTNO> as follows:

Disconnect connector P1 on test cable from RCS Adapter connector J1

Disconnect connector P2 on test cable from IMTC electronic components assembly connector J4

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Disconnect connector P3 on test cable from IMTC electronic components assembly connector J6

Disconnect connector P4 on test cable from IMTC electronic components assembly connector J5

Disconnect connector P5 on test cable from IMTC electronic components assembly connector J3.

2. Target arm on ITM does not respond to up or down command.

Step 1. Perform steps to position controls on the RCS adapter prior to application of power (refer to TM 9-6920-742-14-1).

Step 2. Perform internal test of the RCS Adapter (refer to TM 9-6920-742-14-1).

Step 3. Connect test cable 9387318 as follows:

Connector P1 on test cable to RCS Adapter connector J1

Connector P2 on test cable to ITM connector J3

Connector P3 on test cable to ITM connector J1

Connector P4 on test cable to ITM connector J4

Connector P5 on test cable to ITM connector J2.

Step 4. Remove cover assembly from ITM and observe the position of the address switch on the control logic CCA in the ITM.

NOTE

Setting of address switch on the RCS Adapter must match setting of address switch on ITM throughout performance of troubleshooting procedures.

Step 5. Set the address switch on the RCS Adapter to match the setting of the address switch on the ITM (refer to TM 9-6920-742-14-1).

Step 6. Remove control logic CCA (refer to paragraph 5-40).

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 7. Set multimeter to diode check function. Place positive lead on TB1-6 on center plate assembly. Place negative lead on TB1-2 on center plate assembly. Multimeter should read 550 ±100 ohms.

Place negative lead on TB1-6 on center plate assembly. Place positive lead on TB1-2 on center plate assembly. Multimeter should read "open."

If both multimeter readings are correct, proceed to step 8.

If either multimeter reading is not correct, replace transient suppressor assembly CR1 and retest.

Step 8. Ensure multimeter is set to diode check function. Place positive lead on TB1-7 on center plate assembly. Place negative lead on TB2-7 on center plate assembly. Multimeter should read 550 ±100 ohms.

Place negative lead on TB2-7 on center plate assembly. Place positive lead on TB1-7 on center plate assembly. Multimeter should read "open."

If both multimeter readings are correct, proceed to step 9.

If either multimeter reading is not correct, replace transient suppressor assembly CR2 and retest.

Step 9. Install control logic CCA (refer to paragraph 5-40).

Step 10. Set the RCS Adapter Mode Controls POWER switch to the on position.

Step 11. Set the RCS Adapter UUT POWER switch to the on position.

Step 12. Set the ITM circuit breaker CB1 to the on position.

Step 13. Press SINGLE CYCLE button on RCS Adapter.

The START, PREAMBLE, and TRAILING ONES lamps on the SERIAL STATUS DISPLAY should illuminate.

If all lamps are illuminated, proceed to step 16.

If lamps are not illuminated, proceed to step 14.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 14. Check test cabling and all fittings for correct location and tightness. Correct location of test cabling as necessary and tighten any loose fittings. Press SINGLE CYCLE button on RCS Adapter.

If lamps illuminate, proceed to step 16.

If lamps are still not illuminated, proceed to step 15.

Step 15. Set the RCS Adapter Mode Controls POWER switch, RCS Adapter UUT POWER switch, and ITM circuit breaker to the off position. Replace control logic CCA (refer to paragraph 5-40). Set the RCS Adapter Mode Controls POWER switch, RCS Adapter UUT POWER switch, and ITM circuit breaker to the on position. Press SINGLE CYCLE button on RCS Adapter.

If lamps illuminate, original control logic CCA was defective. Proceed to step 16.

If lamps are not illuminated, reinstall original control logic CCA (refer to paragraph 5-40) and perform troubleshooting procedures for the RCS Adapter (refer to TM 9-6920-742-14-1).

Step 16. Set RUN/PAUSE switch to the RUN position. Press and release SINGLE CYCLE button one time. Set TARGET CONTROLS COMMAND switch to the COMMAND position. Set the HOLD/BOB switch to HOLD. Move the UP/DOWN switch to UP and then DOWN two times.

The target arm on the ITM should move to the same position toggled on the UP/DOWN switch, and the appropriate UP or DOWN lamp should illuminate on the SERIAL STATUS DISPLAY.

If all indications are correct, unit is operational. Range-related operating problems are outside of the ITM.

If the target arm on the ITM fails to respond to the UP or DOWN command, proceed to step 17.

Step 17. Perform ITM self-test (refer to paragraph 2-4b).

The target am on the ITM should move to the up position, then down, and the appropriate UP or DOWN lamp should illuminate on the SERIAL STATUS DISPLAY.

If ITM responds satisfactorily, re-check setting of address switch on RCS Adapter and proceed to step 18.

If target arm does not respond satisfactorily, proceed to step 20.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 18. Replace control logic CCA (refer to paragraph 5-40) and retest.

If ITM responds to retest satisfactorily, original control logic CCA was defective, and unit is now operational.

If ITM does not respond to retest satisfactorily, reinstall original control logic CCA (refer to paragraph 5-40), and proceed to step 19.

Step 19. Set circuit breaker on ITM to the off position. Set multimeter to ohms. Remove wiring harness W1 (refer to paragraph 5-43) and perform continuity check between following points:

Connector J3 - pin c to connector XA1 - pin 70

Connector J3 - pin d to connector XA1 - pin 69

Connector J3 - pin e to connector XA1 - pin 35

Connector J3 - pin f to connector XA1 - pin 68

Connector J3 - pin g to connector XA1 - pin 34

Connector J3 - pin h to connector XA1 - pin 33

Connector J3 - pin i to connector XA1 - pin 18

Connector J3 - pin j to connector XA1 - pin 19

If ITM continuity exists across all the referenced points, problems relating to communication of serial data and status signals are outside the ITM.

If continuity does not exist across all of the referenced points, replace or repair wiring harness (refer to paragraph 5-43) as necessary and retest.

Step 20. Set circuit breaker on ITM to the off position and remove control logic CCA (refer to paragraph 5-40). Set circuit breaker on the ITM to the on position and proceed to step 21.

Step 21. Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-7 on center plate electronic assembly. Connect positive lead on multimeter to TB1-1 on center plate electronic assembly. Multimeter should read +37 $\pm$ 10 vdc.

Connect negative lead on multimeter to TB1-7 on center plate electronic assembly. Connect positive lead on multimeter to TB1-2 on center plate electronic assembly. Multimeter should read +37 $\pm$ 10 vdc.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If multimeter indicates correct voltage readings at both TB1-1 and at TB1-2, perform step 22 and proceed to step 25.

If multimeter does not indicate correct voltage reading at TB1-1 or at TB1-2, perform step 22 and proceed to step 23.

Step 22. Set circuit breaker on ITM to the off position and install control logic CCA (refer to paragraph 5-40). Set circuit breaker on the ITM to the on position.

Step 23. Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to line side of circuit breaker CB1. Multimeter should read +37 $\pm$ 10 vdc.

Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to load side of circuit breaker CB1. Multimeter should read +37 $\pm$ 10 vdc.

If multimeter indicates correct voltage readings on both line and load sides of circuit breaker, replace or repair wiring harness W1 (refer to paragraph 5-43) between load terminals on circuit breaker and pin 1 on terminal board TB1 (center plate assembly) and retest.

If multimeter indicates correct voltage reading on line side of circuit breaker, but not on load side, replace circuit breaker CB1 (refer to paragraph 5-46) and retest.

If multimeter does not indicate correct voltage reading on line and load sides of circuit breaker, proceed to step 24.

Step 24. Set circuit breaker on ITM to the off position. Set multimeter to ohms and perform continuity check on wiring harness between the following points:

Connector J1 - pin D to line terminal - circuit breaker CB1

Connector J1 - pin E to line terminal - circuit breaker CB1

If continuity exists across all the referenced points, power is not being supplied to the ITM.

If continuity does not exist across all of the referenced points, replace or repair wiring harness W1 (refer to paragraph 5-43) as necessary and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 25. Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB1-8 on motor drive CCA. Multimeter should read +37 ± 10 vdc.

If multimeter indicates correct voltage reading at TB1-8 on motor drive CCA, proceed to step 28.

If multimeter does not indicate correct voltage reading at TB1-8, proceed to step 26.

Step 26. Set circuit breaker on ITM to the off position and remove control logic CCA (refer to paragraph 5-40). Set circuit breaker on the ITM to the on position and proceed to step 27.

Step 27. Ensure multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to motor side of EMI filter FL3. Multimeter should read +37 10 vdc.

Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to logic card side of EMI filter FL3. Multimeter should read +37 ± 10 vdc.

If multimeter indicates correct voltage readings on logic card and motor sides of EMI filter FL3, replace or repair wiring harness A1W2 (refer to paragraph 5-54) reinstall control logic CCA (refer to paragraph 5-40) and retest.

If multimeter indicates correct voltage reading on logic card side of EMI filter FL3 but not on motor side, replace EMI filter FL3, reinstall control logic CCA (refer to paragraph 5-40), and retest.

If multimeter does not indicate correct voltage reading on logic card and motor sides of EMI filter FL3, replace or repair wiring harness A1W1 (refer to paragraph 5-55) reinstall control logic CCA (refer to paragraph 5-40) and retest.

Step 28. Visually inspect optical switches.

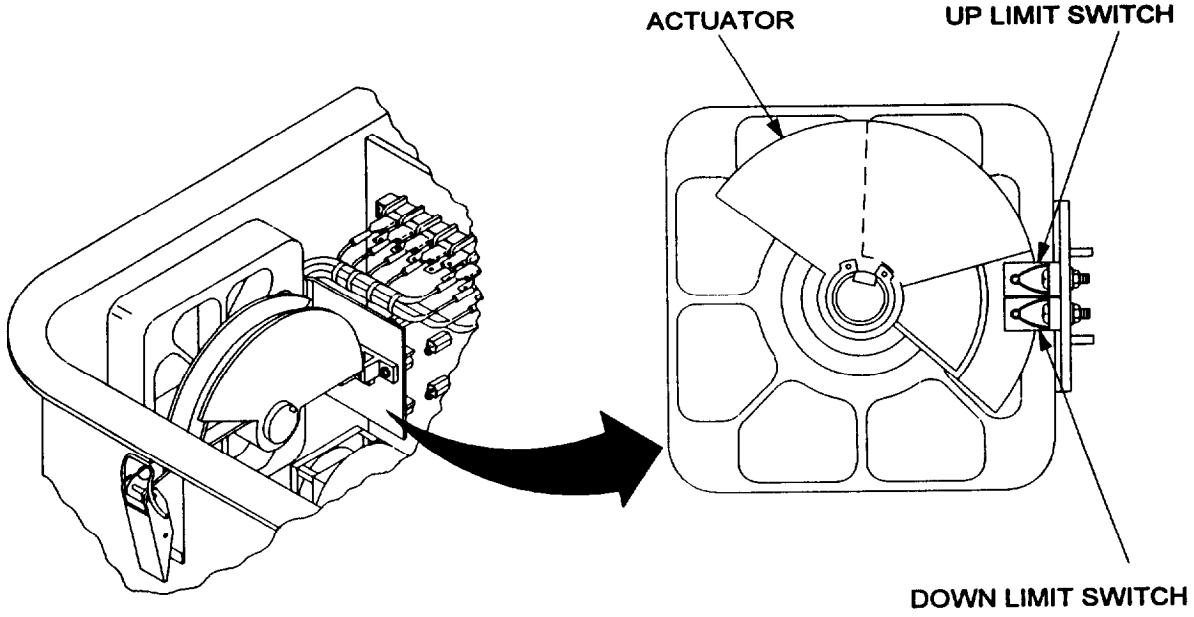
If optical switches appear to be clean, proceed to step 29.

If dirty, use denatured alcohol to clean optical switches and perform retest procedure in step 16 above. If ITM does not respond to retest satisfactorily, proceed to step 29.

Step 29. Set circuit breaker on ITM to the off position. Set UUT POWER switch on RCS Adapter to the off position. Remove target arm assembly from ITM (refer to paragraph 4-47 or 4-50). Install test arm on drive motor shaft and idler shaft on ITM (refer to item 2, appendix F). Set UUT POWER switch on RCS Adapter to the on position. Set circuit breaker on ITM to the on position. Proceed to step 30.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION



Step 30. Turn test arm until actuator engages the up limit switch and is out of the down limit switch.

Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB3-8 on center plate electronic assembly. Multimeter should read +10 ± 1.5 vdc.

Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB3-3 on center plate electronic assembly. Multimeter should read +2 ± 1.5 vdc.

If multimeter indicates correct voltage readings at both TB3-3 and TB3-8 on center plate electronic assembly, proceed to step 31.

If multimeter does not indicate correct voltage reading at TB3-3 or TB3-8 on center plate electronic assembly, proceed to step 32.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 31. Turn test arm until actuator engages the down limit switch and is out of the up limit switch.

Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB3-3 on center plate electronic assembly. Multimeter should read +10 ± 1.5 vdc.

Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB3-8 on center plate electronic assembly. Multimeter should read +2 ± 1.5 vdc.

If multimeter indicates correct voltage readings at both TB3-3 and TB3-8 on center plate electronic assembly, proceed to step 33.

If multimeter does not indicate correct voltage reading at TB3-3 or TB3-8 on center plate electronic assembly, proceed to step 32.

Step 32. Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB3-1 on center plate electronic assembly. Multimeter should read +37 ± 10 vdc.

Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB3-6 on center plate electronic assembly. Multimeter should read +37 ± 10 vdc.

If multimeter indicates correct voltage readings at both TB3-1 and TB3-6 on center plate electronic assembly, replace optical switch assembly (refer to paragraph 5-38) and retest.

If multimeter does not indicate correct voltage reading at TB3-1 or TB3-6 on center plate electronic assembly, proceed to step 33.

Step 33. Set circuit breaker on ITM to the off position and replace control logic CCA (refer to paragraph 5-40). Set circuit breaker on the ITM to the on position and retest.

If ITM responds to retest satisfactorily, original control logic CCA was defective, and unit is now operational.

If ITM does not respond to retest satisfactorily, remove replacement control logic CCA (refer to paragraph 5-40) and proceed to step 34.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 34. Ensure that circuit breaker on ITM is set to the off position. Set multimeter to ohms. Perform continuity checks on wiring harness A1W3 at following points:

Feed-thru cap Cl to terminal board TB3 - pin 3

Feed-thru cap C2 to terminal board TB3 - pin 1

Feed-thru cap C3 to terminal board TB3 - pin 2

Feed-thru cap C3 to terminal board TB3 - pin 7

Feed-thru cap C5 to terminal board TB3 - pin 6

Feed-thru cap C6 to terminal board TB3 - pin 8

Feed-thru cap C9 to terminal board TB3 - pin 4

Feed-thru cap C9 to terminal board TB3 - pin 9

If continuity exists across all of the referenced points, proceed to step 35.

If continuity does not exist across all of the referenced points, replace or repair wiring harness A1W3 (refer to paragraph 5-53) as necessary and retest.

Step 35. Ensure that circuit breaker on ITM is set to the off position. Set multimeter to ohms. Perform continuity checks on feed-thru caps C1, C2, C3, C5, C6, and C9.

Set multimeter to diode function. Perform resistance checks (feed-thru cap referenced to ground) on feed-thru caps C1, C2, C3, C5, C6, and C9.

If continuity exists across all feed-thru caps and no caps are grounded, proceed to step 36.

If continuity does not exist across all feed-thru caps or any caps are grounded, replace feed-thru cap(s) and retest.

Step 36. Set multimeter to ohms. Perform continuity checks on wiring harness A1W1 at following points:

Feed-thru cap C1 to terminal board TB2 - pin 5

Feed-thru cap C2 to terminal board TB2 - pin 4

Feed-thru cap C3 to terminal board TB2 - pin 3

Feed-thru cap C5 to terminal board TB2 - pin 2

Feed-thru cap C6 to terminal board TB2 - pin 1

Feed-thru cap C9 to terminal board TB1 - pin 9

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If continuity exists across all the referenced points, proceed to step 37.

If continuity does not exist across all of the referenced points, replace or repair wiring harness A1W1 (refer to paragraph 5-55) as necessary and retest.

Step 37. Set multimeter to ohms. Remove wiring harness W1 (refer to paragraph 5-43) and perform continuity check at following points:

Connector XA1 - pin 38 to terminal board TB2 - pin 1

Connector XA1 - pin 61 to terminal board TB2 - pin 2

Connector XA1 - pin 24 to terminal board TB2 - pin 3

Connector XA1 - pin 62 to terminal board TB2 - pin 4

Connector XA1 - pin 39 to terminal board TB2 - pin 5

Connector XA1 - pin 31 to terminal board TB1 - pin 2

Connector XA1 - pin 65 to terminal board TB1 - pin 10

Connector J1 - pin G to terminal board TB1 - pin 7

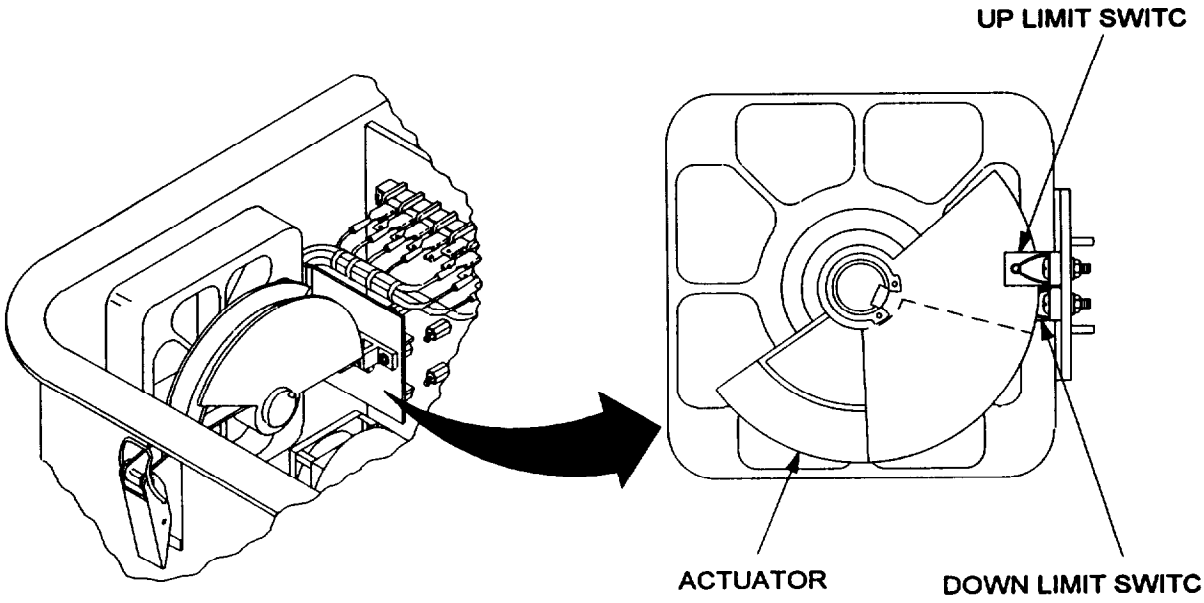
Connector J1 - pin H to terminal board TB1 - pin 10

If continuity exists across all of the referenced points, reinstall control logic CCA (reference paragraph 5-40) and proceed to step 38.

If continuity does not exist across all of the referenced points, replace or repair wiring harness W1 (refer to paragraph 5-43) as necessary and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION



CAUTION

When testing drive motor response to up/down commands, do not allow the drive motor to operate for more than three seconds, or transistors on motor drive CCA will become overheated and damage to the motor drive CCA will result.

NOTE

Always maintain actuator in the proper up or down sequence. If the actuator is out of sequence (out of up and down limit switches at the same time), set circuit breaker on ITM to the off position and set UUT POWER switch on the RCS adapter to the off position. Turn test arm until actuator is positioned in the proper sequence (the up or the down limit). Reapply power. Press and release SINGLE CYCLE button one time. Continue testing unit.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 38. Turn test arm until actuator engages the down limit switch and is out of the up limit switch.

Move the UP/DOWN switch on the RCS Adapter to DOWN. Ensure that RUN/PAUSE switch is set to the RUN position. Press and release SINGLE CYCLE button one time. Set TARGET CONTROLS COMMAND switch to the COMMAND position. Set the HOLD/BOB switch to HOLD.

Set multimeter to dc volts. Connect negative lead on multimeter to TB1-8 on motor drive CCA. Connect positive lead on multimeter to TB1-9 on motor drive CCA. Multimeter should read +37 ± 10 vdc.

Move the UP/DOWN switch on the RCS Adapter to UP. Voltage reading on multimeter should drop to less than 3 vdc. Turn test arm until actuator engages the up limit switch and motor stops.

If voltage reading drops to less than 3 vdc, proceed to step 39.

If the voltage reading remains greater than 3 vdc, proceed to step 42.

CAUTION

When testing drive motor response to up/down commands, do not allow the drive motor to operate for more than three seconds, or transistors on motor drive CCA will become overheated and damage to the motor drive CCA will result.

NOTE

Always maintain actuator in the proper up or down sequence. If the actuator is out of sequence (out of up and down limit switches at the same time), set circuit breaker on ITM to the off position and set UUT POWER switch on the RCS adapter to the off position. Turn test arm until actuator is positioned in the proper sequence (the up or the down limit). Reapply power. Press and release SINGLE CYCLE button one time. Continue testing unit.

Step 39. Turn test arm until actuator engages the up limit switch and is out of the down limit switch.

Ensure that RUN/PAUSE switch is set to the RUN position. Press and release SINGLE CYCLE button one time. Set TARGET CONTROLS COMMAND switch to the COMMAND position. Set the HOLD/BOB switch to HOLD.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Set multimeter to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB1-1 on motor drive CCA. Multimeter should read +37 ± 10 vdc.

Move the UP/DOWN switch on the RCS Adapter to DOWN. Voltage reading on multimeter should drop to less than 3 vdc. Turn test arm until actuator engages the down limit switch and motor stops.

If voltage reading drops to less than 3 vdc, proceed to step 40.

If the voltage reading remains greater than 3 vdc, proceed to step 43.

Step 40. Turn test arm until actuator engages the down limit switch and is out of the up limit switch.

Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB1-4 on motor drive CCA. Multimeter should read 1 vdc.

Move the UP/DOWN switch on the RCS Adapter to UP. Multimeter should read +30 ± 10 vdc. Turn test arm until actuator engages the up limit switch and motor stops.

If multimeter reading indicates +30 ± 10 vdc, proceed to step 41.

If multimeter reading does not indicate +30 ± 10 vdc, replace motor drive CCA (refer to paragraph 5-39) and retest.

Step 41. Turn test arm until actuator engages the up limit switch and is out of the down limit switch.

Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB1-10 on motor drive CCA. Multimeter should read 1 vdc.

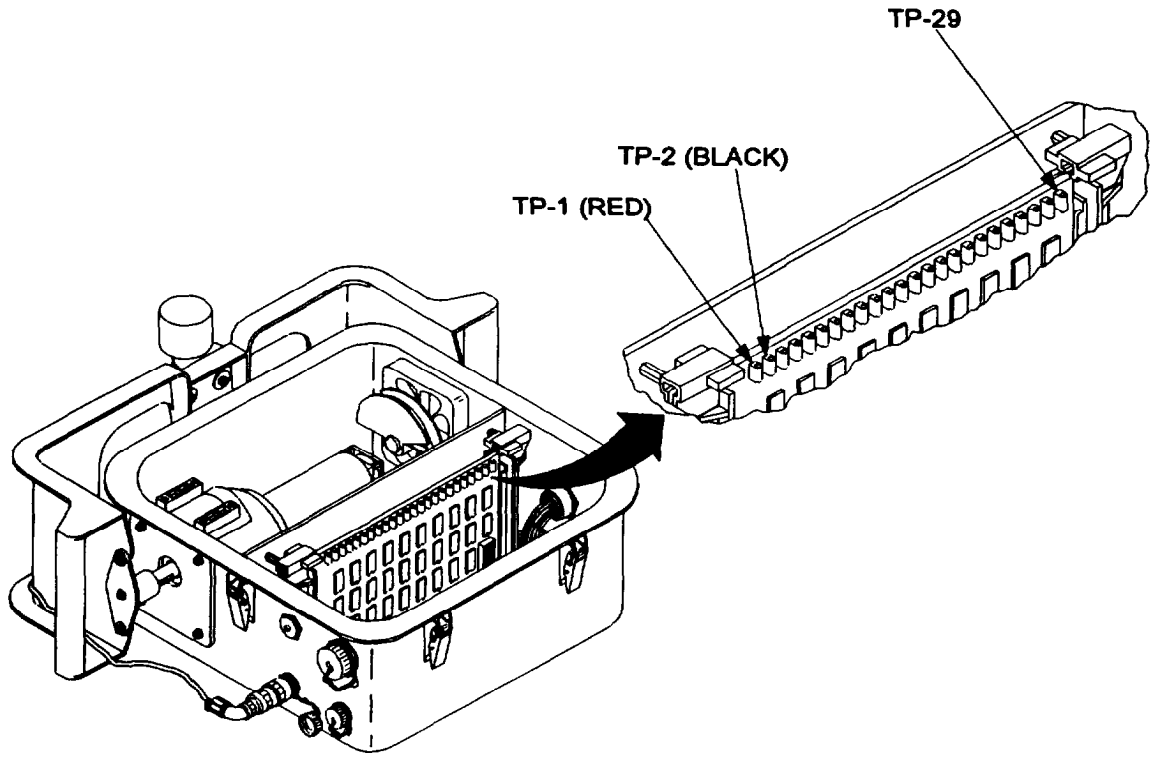
Move the UP/DOWN switch on the RCS Adapter to DOWN. Multimeter should read +30 ± 10 vdc. Turn test arm until actuator engages the down limit switch and motor stops.

If multimeter reading indicates +30 ± 10 vdc, proceed to step 49.

If multimeter reading does not indicate +30 ± 10 vdc, replace motor drive CCA (refer to paragraph 5-39) and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION



Step 42. Turn test arm until actuator engages the down limit switch and is out of the up limit switch.

Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TP-2 on control logic CCA. Connect positive lead on multimeter to TP-7 on control logic CCA.

Move the UP/DOWN switch on the RCS Adapter to UP. Multimeter should indicate pulse of +9 ± 1.5 vdc. Turn test arm until actuator engages the up limit switch and motor stops.

If multimeter indicates pulse of +9 ± 1.5 vdc, proceed to step 43.

If multimeter does not indicate pulse of +9 ± 1.5 vdc, proceed to step 44.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 43. Turn test arm until actuator engages the up limit switch and is out of the down limit switch.

Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TP-2 on control logic CCA. Connect positive lead on multimeter to TP-12 on control logic CCA.

Move the UP/DOWN switch on the RCS Adapter to DOWN. Multimeter should indicate pulse of +9 $\pm$ 1.5 vdc. Turn test arm until actuator engages the down limit switch and motor stops.

If multimeter indicates pulse of +9 $\pm$ 1.5 vdc, proceed to step 45.

If multimeter does not indicate pulse of +9 $\pm$ 1.5 vdc, proceed to step 44.

Step 44. Set circuit breaker on ITM to the off position and replace control logic CCA (refer to paragraph 5-40). Set circuit breaker on the ITM to the on position and retest unit for response to UP and DOWN commands.

If ITM responds to retest satisfactorily, original control logic CCA was defective, and unit is now operational.

If ITM does not respond to retest satisfactorily, reinstall original control logic CCA (refer to paragraph 5-40), and proceed to step 45.

Step 45. Set circuit breaker on ITM to the off position. Set multimeter to ohms. Perform continuity checks on wiring harness A1W3 at following points between motor drive CCA and center plate assembly:

Feed-thru cap C4 to terminal board TB1 - pin 5

Feed-thru cap C7 to terminal board TB1 - pin 9

Feed-thru cap C8 to terminal board TB1 - pin 1

EMI filter FL1 to terminal board TB1 - pin 7

EMI filter FL2 to terminal board TB1 - pin 6

EMI filter FL3 to terminal board TB1 - pin 8

If continuity exists across all of the referenced points, proceed to step 46.

If continuity does not exist across all of the referenced points, replace or repair wiring harness A1W3 (refer to paragraph 5-53) as necessary and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 46. Set multimeter to ohms. Perform continuity checks on feed-thru caps C4, C7, and C8, and EMI filters FL1, FL2, and FL3.

Set multimeter to diode function. Perform resistance checks (feed-thru cap referenced to ground and EMI filter referenced to ground) on feed-thru caps C4, C7, and C8 and EMI filters FL1, FL2, and FL3.

If continuity exists across all feed-thru caps and no feed-thru caps or EMI filters are grounded, proceed to step 47.

If continuity does not exist across all feed-thru caps or feed-thru caps or EMI filters are grounded, replace feed-thru cap(s) and/or EMI filter(s) and retest.

Step 47. Set multimeter to ohms. Perform continuity checks on wiring harness A1W1 at following points on canter plate assembly:

Feed-thru cap C4 to terminal board TB2 - pin 8

Feed-thru cap C7 to terminal board TB2 - pin 6

Feed-thru cap C8 to terminal board TB2 - pin 9

EMI filter FL1 to terminal board TB2 - pin 7

EMI filter FL2 to terminal board TB1 - pin 8

EMI filter FL3 to terminal board TB1 - pin 1

If continuity exists across all of the referenced points, proceed to step 48.

If continuity does not exist across all of the referenced points, replace or repair wiring harness A1W1 (refer to paragraph 5-55) as necessary and retest.

Step 48. Set multimeter to ohms. Remove wiring harness W1 (refer to paragraph 5-43) and perform continuity check at following points:

Connector XA1 - pin 64 to terminal board TB2 - pin 6

Connector XA1 - pin 58 to terminal board TB2 - pin 7

Connector XA1 - pin 21 to terminal board TB2 - pin 8

Connector XA1 - pin 63 to terminal board TB2 - pin 9

Connector J1 - pin G to terminal board TB1 - pin 7

Connector J1 - pin H to terminal board TB1 - pin 10

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If continuity exists across all of the referenced points, proceed to step 49.

If continuity does not exist across all of the referenced points, replace or repair wiring harness W1 (refer to paragraph 5-55) as necessary and retest.

Step 49. Set multimeter to dc volts. Connect negative lead on multimeter to TP-2 on control logic CCA. Connect positive lead on multimeter to TP-10 on control logic CCA. Multimeter should read +10 ± 1.5 vdc.

If multimeter reading is +10 ± 1.5 vdc or more, all circuits in ITM are operational. Proceed to step 50.

If multimeter reading is less than +10 ± 1.5 vdc, proceed to step 51.

Step 50. Set circuit breaker on ITM to the off position. Set UUT POWER switch on the RCS adapter to the off position. Remove test arm from drive motor shaft and idler shaft. Install target arm assembly on ITM (refer to paragraph 4-47 or 4-50). Perform test in step 16 and proceed to step 62.

CAUTION

When testing drive motor response to up/down commands, do not allow the drive motor to operate for more than three seconds, or transistors on motor drive CCA will become overheated and damage to the motor drive CCA will result.

NOTE

Always maintain actuator in the proper up or down sequence. If the actuator is out of sequence (out of up and down limit switches at the same time), set circuit breaker on ITM to the off position and set UUT POWER switch on the RCS adapter to the off position. Turn test arm until actuator is positioned in the proper sequence (the up or the down limit). Reapply power. Press and release SINGLE CYCLE button one time. Continue testing unit.

Step 51. Turn test arm until actuator engages the down limit switch and is out of the up limit switch.

Set circuit breaker on ITM to the on position. Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TP-2 on control logic CCA. Connect positive lead on multimeter to TP-9 on control logic CCA.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Move the UP/DOWN switch on the RCS Adapter to UP. Multimeter should indicate pulse of +10 ± 1.5 vdc. Turn test arm until actuator engages the up limit switch and motor stops.

If multimeter indicates pulse of +10 ± 1.5 vdc, proceed to step 52.

If multimeter does not indicate pulse of +10 ± 1.5 vdc, proceed to step 56.

Step 52. Turn test arm until actuator engages the up limit switch and is out of the down limit switch.

Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TP-2 on control logic CCA. Connect positive lead on multimeter to TP-9 on control logic CCA.

Move the UP/DOWN switch on the RCS Adapter to DOWN. Multimeter should indicate pulse of +10 ± 1.5 vdc. Turn test arm until actuator engages the down limit switch and motor stops.

If multimeter indicates pulse of +10 ± 1.5 vdc, proceed to step 53.

If multimeter does not indicate pulse of +10 ± 1.5 vdc, proceed to step 56.

Step 53. Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB1-7 on motor drive CCA. Multimeter should read +37 ± 10 vdc.

If multimeter indicates correct voltage readings at TB1-7 on motor drive CCA, proceed to step 54.

If multimeter does not indicate correct voltage reading at TB1-7 on motor drive CCA, proceed to step 56.

Step 54. Turn test arm until actuator engages the down limit switch and is out of the up limit switch.

Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB1-7 on motor drive CCA. Multimeter should read +37 ± 10 vdc.

Move the UP/DOWN switch on the RCS Adapter to UP. Multimeter should indicate pulse of +1 ± 1 vdc. Turn test arm until actuator engages the up limit switch and motor stops.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If multimeter indicates pulse of +1 ± 1 vdc, proceed to step 55.

If multimeter does not indicate pulse of +1 + 1 vdc, proceed to step 56.

Step 55. Turn test arm until actuator engages the up limit switch and is out of the down limit switch.

Ensure that multimeter is set to dc volts. Connect negative lead on multimeter to TB1-6 on motor drive CCA. Connect positive lead on multimeter to TB1-7 on motor drive CCA. Multimeter should read +37 ± 10 vdc.

Move the UP/DOWN switch on the RCS Adapter to DOWN. Multimeter should indicate pulse of +1 ± 1 vdc. Turn test arm until actuator engages the down limit switch and motor stops.

If multimeter indicates pulse of +1 ± 1 vdc, proceed to step 61.

If multimeter does not indicate pulse of +1 ± 1 vdc, proceed to step 56.

Step 56. Replace control logic CCA (refer to paragraph 5-40) and retest.

If ITM responds to retest satisfactorily, original control logic CCA was defective, and unit is now operational.

If ITM does not respond to retest satisfactorily, reinstall original control logic CCA (refer to paragraph 5-40), and proceed to step 57.

Step 57. Set circuit breaker on ITM to the off position. Set multimeter to ohms. Perform continuity check on wiring harness A1W3 between EMI filter FL1 on center plate assembly and terminal board TB1- pin 7 on motor drive CCA.

If continuity exists, proceed to step 58.

If continuity does not exist, replace or repair wiring harness A1W3 (refer to paragraph 5-53) as necessary and retest.

Step 58. Set multimeter to ohms. Perform continuity check on EMI filter FLI.

If continuity exists, proceed to step 59.

If continuity does not exist, replace filter and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 59. Set multimeter to ohms. Perform continuity checks on wiring harness A1W1 between EMI filter FL1 and terminal board TB2 - pin 7.

If continuity exists, proceed to step 60.

If continuity does not exist, replace or repair wiring harness A1W1 (refer to paragraph 5-55) as necessary and retest.

Step 60. Set multimeter to ohms. Remove wiring harness W1 (refer to paragraph 5-43) and perform continuity check between connector XA1 - pin 58 and terminal board TB2 - pin 7.

If continuity exists, reinstall wiring harness (refer to paragraph 5-43). If steps 56 through 60 have not identified problem, perform troubleshooting procedures on up/down limits signal circuit (steps 28 through 37).

If continuity does not exist, replace or repair wiring harness W1 (refer to paragraph 5-43) as necessary and retest.

Step 61. Replace motor drive CCA (refer to paragraph 5-39) and retest.

If ITM responds to retest satisfactorily, original motor drive CCA was defective, and unit is now operational.

If ITM does not respond to retest satisfactorily, reinstall original motor drive CCA (refer to paragraph 5-39), replace drive motor assembly (refer to paragraph 5-49), and retest.

Step 62. Set the ITM circuit breaker CB1 to the off position.

Step 63. Set the RCS Adapter UUT POWER switch to the off position.

Step 64. Set the RCS Adapter Mode Controls POWER switch to the off position,

Step 65. Disconnect test cable 9387318 as follows:

Disconnect connector P1 on test cable from RCS Adapter connector J1

Disconnect connector P2 on test cable from ITM connector J3

Disconnect connector P3 on test cable from ITM connector J1

Disconnect connector P4 on test cable from ITM connector J4

Disconnect connector P5 on test cable from ITM connector J2.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

3. ITM displays hit response or hit recording malfunction.

Step 1. Perform steps 1 through 13 (or through 15, if necessary) in malfunction 2.

Step 2. Set HOLD/BOB switch on TARGET CONTROLS to HOLD. Set RUN/PAUSE on MODE/CONTROLS switch to RUN. Press SINGLE CYCLE button on MODE CONTROLS one time. Set COMMAND switch to COMMAND. Set UP/DOWN switch on TARGET CONTROLS to DOWN, then to UP.

The ITM target arm should move smoothly up and stay up. The UP lamp on the SERIAL STATUS DISPLAY should illuminate.

If all indications are correct, proceed to step 3.

If either indication is wrong, refer to malfunction 2.

NOTE

The UP/DOWN switch on TARGET CONTROLS must be set to the UP position for hit count to increment.

Step 3. Ensure that UP/DOWN switch on TARGET CONTROLS is set to the UP position. Set HC SINGLE/BURST switch on TARGET CONTROLS to the SINGLE position. Set SINGLE/BURST switch on HIT GENERATOR section of TM OR TIU INPUT SIMULATORS to SINGLE. Set the Target Controls HC RESET/COUNT switch to RESET and then back to COUNT.

Press and release ACTIVATE button six times and watch for the following indications:

First time ACTIVATE button is pushed and released, HC1 lamp on SERIAL STATUS DISPLAY illuminates.

Second time ACTIVATE button is pushed and released, HC2 lamp on SERIAL STATUS DISPLAY illuminates.

Third time ACTIVATE button is pushed and released, HC1 and HC2 lamps on SERIAL STATUS DISPLAY illuminate.

Fourth time ACTIVATE button is pushed and released, HC4 lamp on SERIAL STATUS DISPLAY illuminates.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Fifth time ACTIVATE button is pushed and released, HC4 and HC1 lamps on SERIAL STATUS DISPLAY illuminate.

Sixth time ACTIVATE button is pushed and released, HC4 and HC2 lamps on SERIAL STATUS DISPLAY illuminate.

If indications are correct, proceed to step 4.

If any indication is not correct, proceed to step 11.

Step 4. Set SINGLE/BURST switch on HIT GENERATOR section of TM OR TIU INPUT SIMULATORS to BURST. HC1 through HC32 lamps on SERIAL STATUS DISPLAY should illuminate in a continuous counting mode.

If indications are correct, proceed to step 5.

If indications are not correct, proceed to step 11.

Step 5. Set SINGLE/BURST switch on HIT GENERATOR section of TM OR TIU INPUT SIMULATORS to SINGLE. Set the HC RESET/COUNT switch to RESET and then back to COUNT. Set the HOLD/BOB switch to the OFF position.

Press ACTIVATE button one time. The ITM target arm should move down. The HC1 and DWN lamps on the SERIAL STATUS DISPLAY should illuminate, and the UP lamp should extinguish.

If indications are correct, proceed to step 6.

If indications are not correct, proceed to step 11.

Step 6. Disconnect connector P5 on test cable from connector J2 on ITM. Connect hit sensor cable to connector J2 on ITM. Proceed to step 7.

Step 7. Set UP/DOWN switch on TARGET CONTROLS to DOWN and then to UP. (Locate N HIT KILL COMMAND section of TARGET CONTROLS.) Set NK1 and NK2 switches up. Set SET NHK switch up, then down. Set RESET/COUNT switch to RESET and then back to COUNT. Set HOLD/BOB switch to BOB.

Tap ITM hit sensor with a metal object 4 times and observe for the following indications:

On first tap, HC1 and UP lamps on SERIAL STATUS display illuminate, while target arm remains up.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

On second tap, HC2 and UP lamps on SERIAL STATUS display illuminate, while target arm remains up.

On third tap, HC1, HC2, and UP lamps on SERIAL STATUS display illuminate, while target arm remains up.

On fourth tap, HC4 lamp on SERIAL STATUS display illuminates. Target arm moves down, UP lamp extinguishes as arm moves, and DOWN lamp illuminates momentarily when target arm reaches limit of 'travel. Target arm then moves up again, DOWN lamp extinguishes as arm moves, and UP lamp illuminates when target arm reaches limit of travel.

If all indications are correct, proceed to step 8.

If indications are not correct, replace hit sensor assembly (refer to paragraph 5-41 or 5-58) and retest.

Step 8. Tap ITM hit sensor with a metal object. After each tap target arm should bob down and then back up, and HC lamps on SERIAL STATUS DISPLAY RCS should increment by one for each hit.

If all indications are correct, proceed to step 9.

If indications are not correct, replace hit sensor assembly (refer to paragraph 5-41 or 5-58) and retest.

Step 9. Disconnect hit sensor cable from connector J2 on ITM. Connect connector P5 on test cable to connector J2 on ITM. Proceed to step 10.

Step 10. Set NK1 and NK2 switches on N HIT KILL COMMAND section of TARGET CONTROLS to down position. Set SINGLE/BURST switch to BURST. Set HOLD/BOB switch to HOLD. Set SINGLE/BURST switch on HIT GENERATOR section of TM OR TIU INPUT SIMULATORS to BURST. Set UP/DOWN switch on TARGET CONTROLS to DOWN, then to UP. Set RESET/COUNT switch to RESET and then back to COUNT.

Press ACTIVATE button several times. Each time the ACTIVATE button is pressed, the binary count displayed by lamps HC1 through HC32 on SERIAL STATUS DISPLAY is incremented by 1.

If all indications are correct, ITM hit circuits are functional.

If indications are incorrect, replace hit sensor assembly (refer to paragraph 5-41 or 5-58) and retest.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 11. Set circuit breaker on ITM to the off position and remove control logic CCA (refer to paragraph 5-40). Set circuit breaker on ITM to the on position and proceed to step 12.

Step 12. Set multimeter to dc volts. Connect negative lead on multimeter to TB1-7 on center plate electronic assembly. Connect positive lead on multimeter to TB1-2 on center plate electronic assembly. Multimeter should read +37 $\pm$ 10 vdc.

If multimeter indicates correct voltage reading at TB1-2, proceed to step 13.

If multimeter does not indicate correct voltage reading at TB1-2, refer to malfunction 2.

Step 13. Replace control logic CCA (refer to paragraph 5-40) and retest.

If indications are now correct, original control logic CCA was defective and unit is now operational.

If indications are still not correct, reinstall original control logic CCA (refer to paragraph 5-40) and proceed to step 14.

Step 14. Set circuit breaker on ITM to the off position. Set multimeter to ohms. Remove control logic CCA (refer to paragraph 5-40) and perform continuity checks at the following points:

Terminal board TB1- pin 2 to connector J2 - pin P

Connector XA1 - pin 66 to connector J2 - pin A

Connector XA1 - pin 34 to connector J3 - pin g

Connector XA1 - pin 69 to connector J3 - pin d

Connector XA1 - pin 33 to connector J3 - pin h

Connector XA1 - pin 70 to connector J3 - pin c

Connector XA1 - pin 35 to connector J3 - pin e

Connector XA1 - pin 68 to connector J3 - pin f

Connector XA1 - pin 18 to connector J3 - pin i

Connector XA1 - pin 19 to connector J3 - pin j

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If continuity exists across all of the referenced points, malfunction is outside ITM. Proceed to step 15.

If continuity does not exist across all of the referenced points, replace or repair wiring harness W1 as required (refer to paragraph 5-43) and retest.

Step 15. Perform steps 63 through 65 in malfunction 2.

4. ITM displays IMTC attack/retreat command malfunction.

Step 1. Perform steps 1 through 13 (or through 15, if necessary) in malfunction 2.

Step 2. Set HOLD/BOB switch on target controls to HOLD. Set RUN/PAUSE switch on MODE CONTROLS to RUN. Press SINGLE CYCLE button one time. Set COMMAND switch on TARGET CONTROLS to COMMAND. Set the FWD LIMIT/REV LIMIT switch to the following positions and observe for the following indications.

FWD LIMIT/REV LIMIT is set to OFF; FWD and REV lamps on SERIAL STATUS DISPLAY illuminate,

FWD LIMIT/REV LIMIT is set to FWD LIMIT; FWD lamp on SERIAL STATUS DISPLAY Is extinguished, while REV lamp illuminates.

FWD LIMIT/REV LIMIT is set to REV LIMIT; REV lamp on SERIAL STATUS DISPLAY is extinguished, while FWD lamp illuminates.

If all indications are correct, proceed to step 3.

If indications are incorrect, proceed to step 4.

Step 3. Set the FORWARD/REVERSE switch on the MOVER CONTROLS to the following positions and observe for the following indications:

FORWARD/REVERSE switch is set to OFF; FWD and REV lamps on TM OR TIU RESPONSE MONITORS are extinguished.

FORWARD/REVERSE switch is set to FORWARD; FWD lamp on TM OR TIU RESPONSE MONITORS is illuminated 1 to 2 seconds, while REV lamp remains extinguished.

FORWARD/REVERSE switch is set to REVERSE; REV lamp on TM OR TIU RESPONSE MONITORS is illuminated 1 to 2 seconds, while FWD lamp remains extinguished.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

If all indications are correct, ITM ATTACK/RETREAT circuits are functional.

If indications are not correct, proceed to step 4.

Step 4. Replace control logic CCA (refer to paragraph 5-40) and retest.

If indications are correct, original control logic CCA was defective and unit is now operational.

If indications are not correct, reinstall original control logic CCA (refer to paragraph 5-40) and proceed to step 5.

Step 5. Set multimeter to ohms. Remove wiring harness W1 (refer to paragraph 5-43) and perform continuity checks on the following points:

Connector XA1 - pin 47 to connector J1 - pin C

Connector XA1 - pin 48 to connector J1 - pin L

Connector XA1 - pin 49 to connector J1 - pin B

Connector XA1 - pin 70 to connector J3 - pin c

Connector XA1 - pin 69 to connector J3 - pin d

Connector XA1 - pin 35 to connector J3 - pin e

Connector XA1 - pin 68 to connector J3 - pin f

Connector XA1 - pin 34 to connector J3 - pin g

Connector XA1 - pin 33 to connector J3 - pin h

Connector XA1 - pin 18 to connector J3 - pin i

Connector XA1 - pin 19 to connector J3 - pin j

Connector XA1 - pin 2 to connector J3 - pin n

Connector XA1 - pin 1 to connector J3 - pin g

If continuity exists across all of the referenced points, the malfunction is outside the ITM. Proceed to step 6.

If continuity does not exist across all of the referenced points, replace or repair wiring harness WI as required (refer to paragraph 5-43) and retest.

Step 6. Perform steps 63 through 65 in malfunction 2.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

5. ITM displays muzzle flash or small arms sound simulator malfunction.

Step 1. Perform steps 1 through 13 (or through 15, if necessary) in malfunction 2.

Step 2. Set RUN/PAUSE switch on MODE CONTROLS to RUN. Press SINGLE CYCLE button one time. Set COMMAND switch on TARGET CONTROLS to COMMAND. Set UP/DOWN switch to DOWN. Set HOLD/BOB switch to HOLD. Set HOSTILE FIRE CONTROLS to the following positions and observe for the following indications:

ENABLE switch on HOSTILE FIRE CONTROLS is set to down position, and SINGLE/BURST switch is set to SINGLE or BURST; both NMFS and HFS lamps on TM OR TIU RESPONSE MONITORS remain off.

ENABLE switch on HOSTILE FIRE CONTROLS is set to up position, and SINGLE/BURST switch is set to SINGLE; NMFS remains off and HFS lamps illuminate in random single flashes.

ENABLE switch on HOSTILE FIRE CONTROLS is set to up position, and SINGLE/BURST switch is set to BURST; NMFS remains off and HFS lamps illuminate in random burst flashes.

If all indications are correct, proceed to step 3.

If indications are not correct, proceed to step 4.

Step 3. Set UP/DOWN switch on TARGET CONTROLS to UP. Set HOSTILE FIRE CONTROLS to the following positions and observe for the following indications:

ENABLE switch on HOSTILE FIRE CONTROLS is set to down position, and SINGLE/BURST switch is set to SINGLE or BURST; both NMFS and HFS lamps remain off.

ENABLE switch on HOSTILE FIRE CONTROLS is set to up position, and SINGLE/BURST switch is set to SINGLE; NMFS and HFS lamps illuminate in random single flashes.

ENABLE switch on HOSTILE FIRE CONTROLS is set to up position, and SINGLE/BURST switch is set to BURST; NMFS and HFS lamps illuminate in random burst flashes.

If all indications are correct ITM, SASS, and MFS circuits are functional.

If indications are not correct, proceed to step 4.

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Step 4. Replace control logic CCA (refer to paragraph 5-40) and retest.

If ITM responds to retest satisfactorily, original control logic CCA was defective and unit is now operational.

if ITM does not respond to retest satisfactorily, reinstall original control logic CCA (refer to paragraph 5-40) and proceed to step 5.

Step 5. Set circuit breaker on ITM to the off position. Disconnect connector P4 on test cable from connector J4 on ITM. Set circuit breaker on ITM to the on position and proceed to step 6.

Step 6. Set multimeter to dc volts. Connect negative lead on multimeter to pin M on connector J4. Connect positive lead on multimeter to pin J on connector J4. Multimeter should read +37 $\pm$ 10 vdc.

Connect negative lead on multimeter to pin M on connector J4. Connect positive lead on multimeter to pin L on connector J4. Multimeter should read +37 $\pm$ 10 vdc.

If multimeter indicates correct voltage readings at pin J and pin L on connector J4, proceed to step 7.

If multimeter does not indicate correct voltage reading at pin J or pin L on connector J4, set multimeter to ohms and perform continuity checks listed in step 7. If continuity exists at all points, refer to malfunction 2.

Step 7. Set circuit breaker on ITM to the off position. Set multimeter to ohms. Remove wiring harness W1 (refer to paragraph 5-43) and perform continuity checks at the following points:

Terminal board TB1 - pin 2 to connector J4 - pin J

Terminal board TB1 - pin 9 to connector J4 - pin K

Terminal board TB1 - pin 1 to connector J4 - pin L

Terminal board TB1 - pin 9 to connector J4 - pin M

Connector XA1 - pin 40 to connector J4 - pin C

Connector XA1 - pin 7 to connector J4 - pin E

Connector XA1 - pin 69 to connector J3 - pin d

Table 5-1. Direct Support Troubleshooting Procedures - Continued.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

Connector XA1 - pin 33 to connector J3 - pin h

Connector XA1 - pin 34 to connector J3 - pin g

Connector XA1 - pin 70 to connector J3 - pin c

Connector XA1 - pin 35 to connector J3 - pin e

Connector XA1 - pin 68 to connector J3 - pin f

Connector XA1 - pin 18 to connector J3 - pin i

Connector XA1 - pin 19 to connector J3 - pin j

If continuity exists across all of the referenced points, malfunction is outside ITM. Proceed to step 8.

If continuity does not exist across all of the referenced points, replace or repair wiring harness W1 (refer to paragraph 5-43) as required and retest.

Step 8. Perform steps 63 through 65 in malfunction 2.

SECTION II. MAINTENANCE PROCEDURES FOR IMTC

5-2 GENERAL.

This section contains the instructions for removal, repair, and installation of major components of the Target Training Set Track System - Infantry (IMTC). The instructions consist of an initial setup to prepare for the task and step-by-step procedures to perform the task. Observe all warnings, cautions, and notes during the performance of these tasks.

The units of measurement found in the maintenance procedures are abbreviated as follows: centimeter (cm), inch (in), kilogram (kg), pound (lb), inch-pounds (in-lb).

5-3 CARRIAGE ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Self-locking nut (MS21083C4)
Carriage assembly (11829776)
Sealing compound (item 13, appendix D)

Personnel Required:
Two persons

Equipment Conditions:
Drive belt assembly kit removed (reference paragraph 4-11).
Electrical switch actuator bar removed (reference paragraph 4-7).
Target removed (reference paragraph 4-42).

References:
Remove cable support assembly (reference paragraph 4-12).

References - Continued:
Remove intermediate track assembly (reference paragraph 5-6 or 5-7).
Install intermediate track assembly (reference paragraph 5-6 or 5-7).
Install cable support assembly (reference paragraph 4-12).
Install electrical switch actuator bar (reference paragraph 4-7).
Adjust electrical switch actuator bar (reference paragraph 4-6).
Install drive belt assembly kit (reference paragraph 4-11).
Adjust drive belt assembly kit (reference paragraph 4-10).
Adjust cable assembly W103 (reference paragraph 4-39).
Install target (reference paragraph 4-42).
Perform IMTC self-test (reference paragraph 2-4a).

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a. Removal.

(1) Disconnect connector P2 (1) on cable assembly W103 (2) from connector J1 on ITM (3).

(2) Disconnect connector P3 (4) on cable assembly W103 from connector J3 (5) on ITM.

NOTE

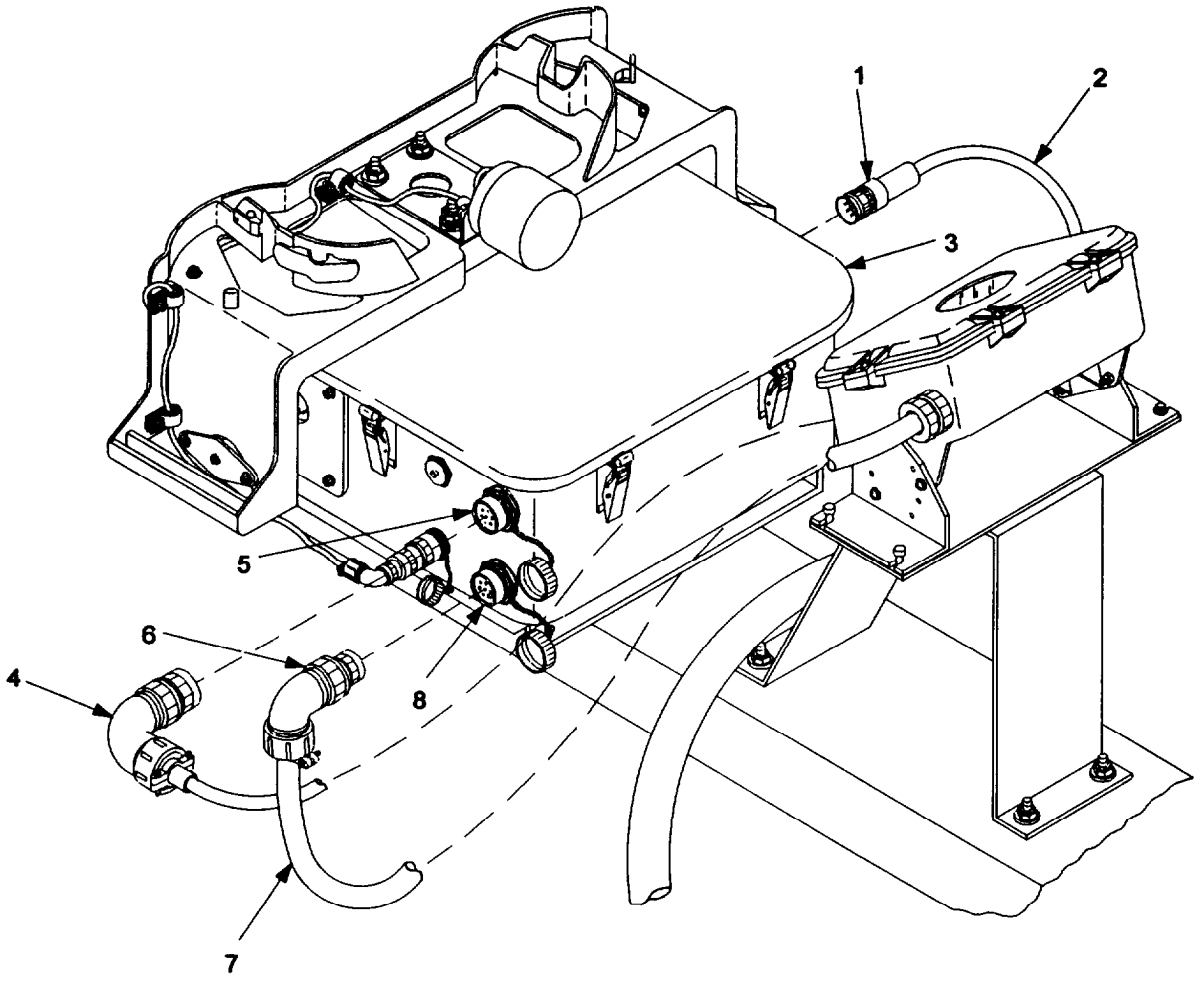
Perform step (3) only if muzzle flash simulator (MFS) is connected to ITM.

(3) Disconnect connector PI (6) on MFS cable assembly (7) from connector J4 (8) on ITM.

(4) Remove two screws (9) and flatwashers (10) and remove ITM from target mechanism assembly plate (11) on carriage assembly (12).

(5) Remove two pan-head screws (13), four flatwashers (14) and two self-locking nuts (15) that secure MFS (16) to MFS support assembly (17).

(6) Remove MFS from MFS support assembly.



(7) Remove hex-head screw (18) two flatwashers (19) self-locking nut (20) and cable clamp (21) from MFS support assembly.

(8) Remove cable clamp from cable assembly W103.

(9) Remove cable support assembly (reference paragraph 4-12).

(10) Remove intermediate track assembly (reference paragraph 5-6 or 5-7).

(11) Slide carriage assembly off open end of track section (22).

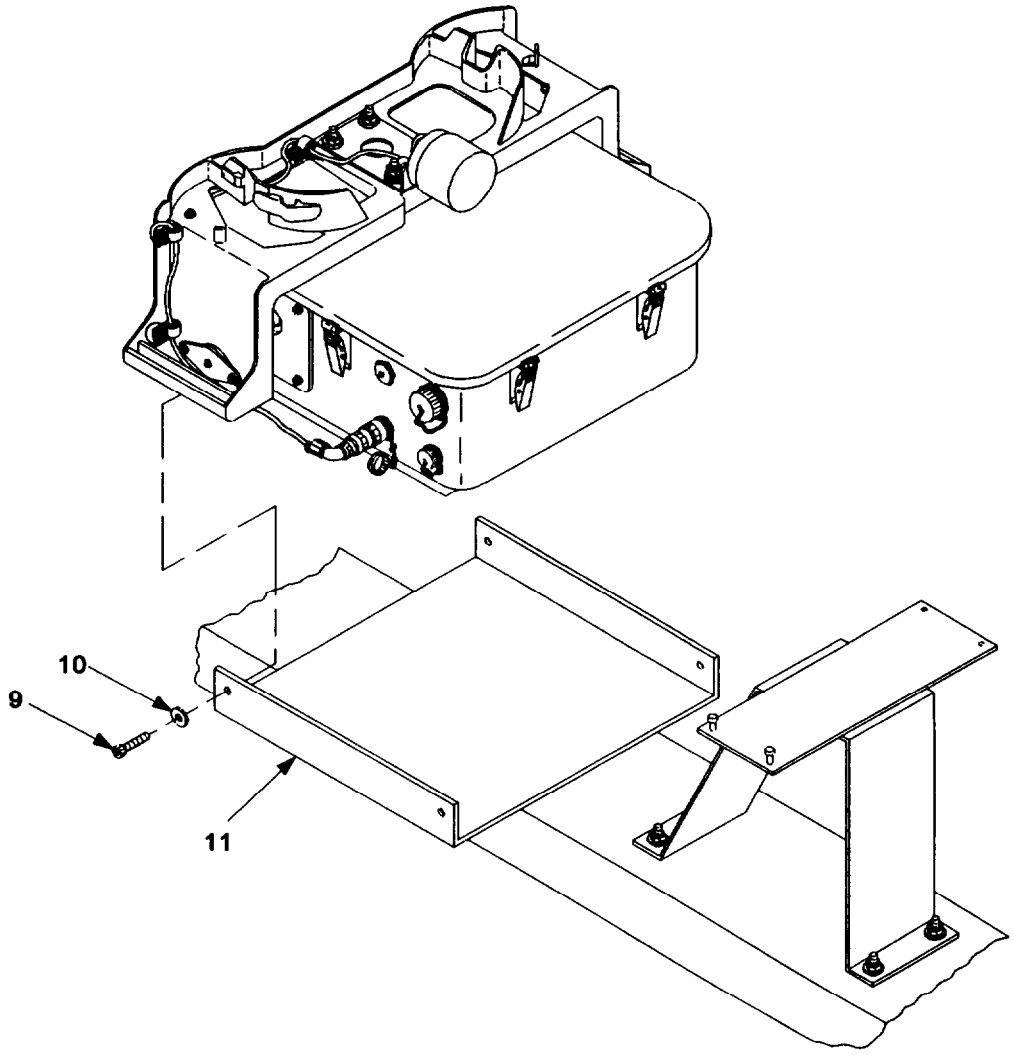
b. Installation.

NOTE

Ensure MFS support assembly faces drive end of track when carriage assembly is installed on track.

(1) Slide carriage assembly (12) onto track section (22).

5-3 CARRIAGE ASSEMBLY REPLACEMENT - Continued.



(2) Install intermediate track assembly (reference paragraph 5-6 or 5-7).

(3) Apply sealing compound to threads of two screws (9).

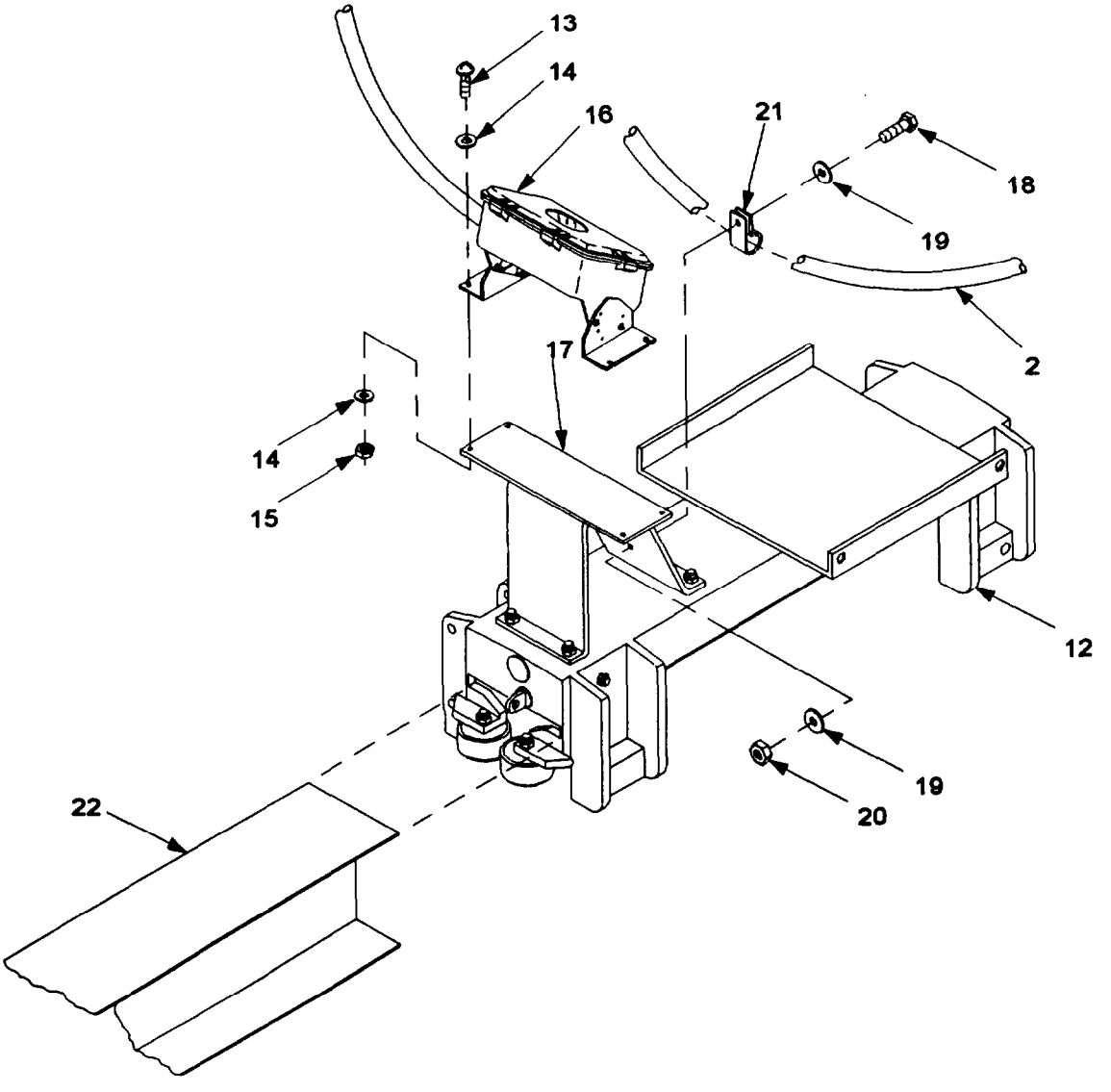
(4) Position ITM (3) on target mechanism assembly plate (11) and secure with two screws and flatwashers (10).

(5) Connect connector P2 (1) on cable assembly W103 (2) to connector J1 on ITM.

(6) Connect connector P3 (4) on cable assembly W103 to connector J3 (5) on ITM.

(7) Position MFS (16) on MFS support assembly (17).

(8) Apply sealing compound to threads of pan-head screws (13).



(9) Install two pan-head screws, four flatwashers (14) and two new self-locking nuts (15) and secure MFS to MFS support assembly.

(10) Connect connector P1 (6) on MFS cable assembly (7) to connector J4 (8) on ITM.

(11) Position cable clamp (21) on cable assembly W103.

(12) Apply sealing compound to threads of hex-head screw (18).

(13) Position cable clamp on MFS support assembly, and install hex-head screw, two flatwashers (19), and new self-locking nut (20).

(14) Install cable support assembly (reference paragraph 4-12).

5-3 CARRIAGE ASSEMBLY REPLACEMENT - Continued.

(15) Install electrical switch actuator bar (reference paragraph 4-7).

(16) Adjust electrical switch actuator bar (reference paragraph 4-6).

(17) Install drive belt assembly kit (reference paragraph 4-11).

(18) Adjust drive belt assembly kit (reference paragraph 4-10).

(19) Adjust cable assembly W103 (reference paragraph 4-39).

(20) Install target (reference paragraph 4-42).

(21) Set circuit breaker CB1 on ITM to POWER ON.

(22) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(23) Set circuit breaker on ICB to ON.

(24) Perform IMTC self-test (reference paragraph 2-4a).

5-4 WHEEL ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque wrench

Materials/Parts:
Self-locking nut (MS21083C5)
Wheel assembly (9354110)

References:
Install carriage assembly (reference paragraph 5-3).
Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
Carriage assembly removed (reference paragraph 5-3).

---

a. Removal.

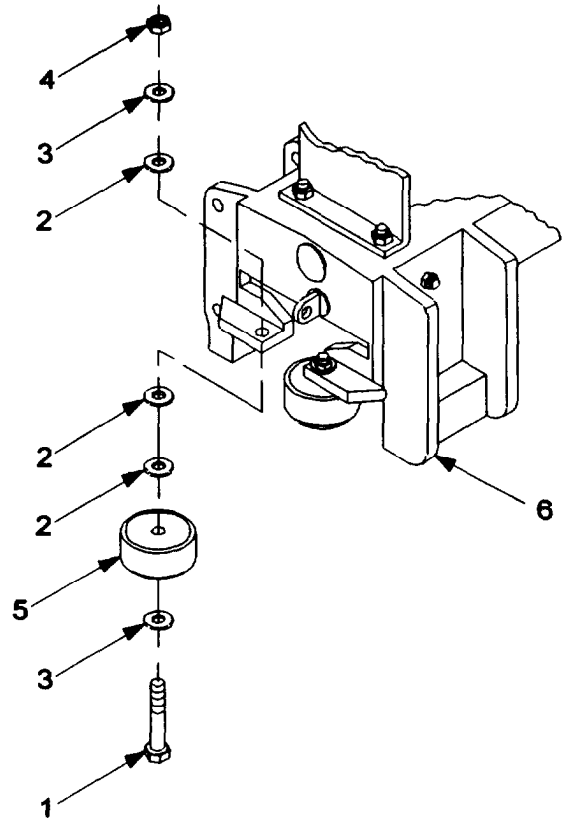
(1) Remove hex bolt (1) light flatwashers (2) flatwashers (3) and self-locking nut (4) that secure wheel assembly (5) to carriage (6).

(2) Remove wheel assembly from carriage.

b. Installation.

NOTE

Wheel assemblies must clear carriage casting. Add minimum number of light flatwashers and flatwashers as shims to ensure free wheel rotation.



(1) Position wheel assembly (5) on carriage (6) and install hex bolt (1), light flatwashers (2), flatwashers (3), and new self-locking nut (4).

(2) Using torque wrench, torque self-locking nut 30 ± 5 in-lb (3.4 ± 0.57 Newton-meters).

(3) Install carriage assembly (reference paragraph 5-3).

(4) Perform IMTC self-test (reference paragraph 2-4a).

5-5 CARRIAGE REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

References:
Install wheel assemblies (reference paragraph 5-4).
Install carriage assembly (reference paragraph 5-3).
Perform IMTC self-test (reference paragraph 2-4a).

Materials/Parts:
Self-locking nut (MS21083-C6)
Carnage (11829286)

Equipment Conditions:
Carnage assembly removed (reference paragraph 5-3).
Wheel assemblies removed (reference paragraph 5-4).

---

a. Removal.

(1) Remove two spring pins (1) from each of two eyebolts (2).

(2) Remove two self-locking nuts (3), flatwashers (4), and eyebolts from carnage (5).

(3) Remove four hex-head bolts (6), eight flatwashers (7), four spacers (8), and four self-locking nuts (9), and remove target mechanism assembly plate (10) from carriage.

(4) Remove four hex-head bolts (11), eight flatwashers (12), four spacers (13), and four self-locking nuts (14), and remove MFS support assembly (15) from carnage.

b. Installation.

NOTE

Install two mounting bolts, flatwashers, spacers and nuts on front of carriage with nuts on top in order to allow clearance between wheels and bolt heads.

(1) Position MFS support assembly (15) on carriage (5), and install four hex-head bolts (11), eight flatwashers (12), four spacers (13), and four new self-locking nuts (14).

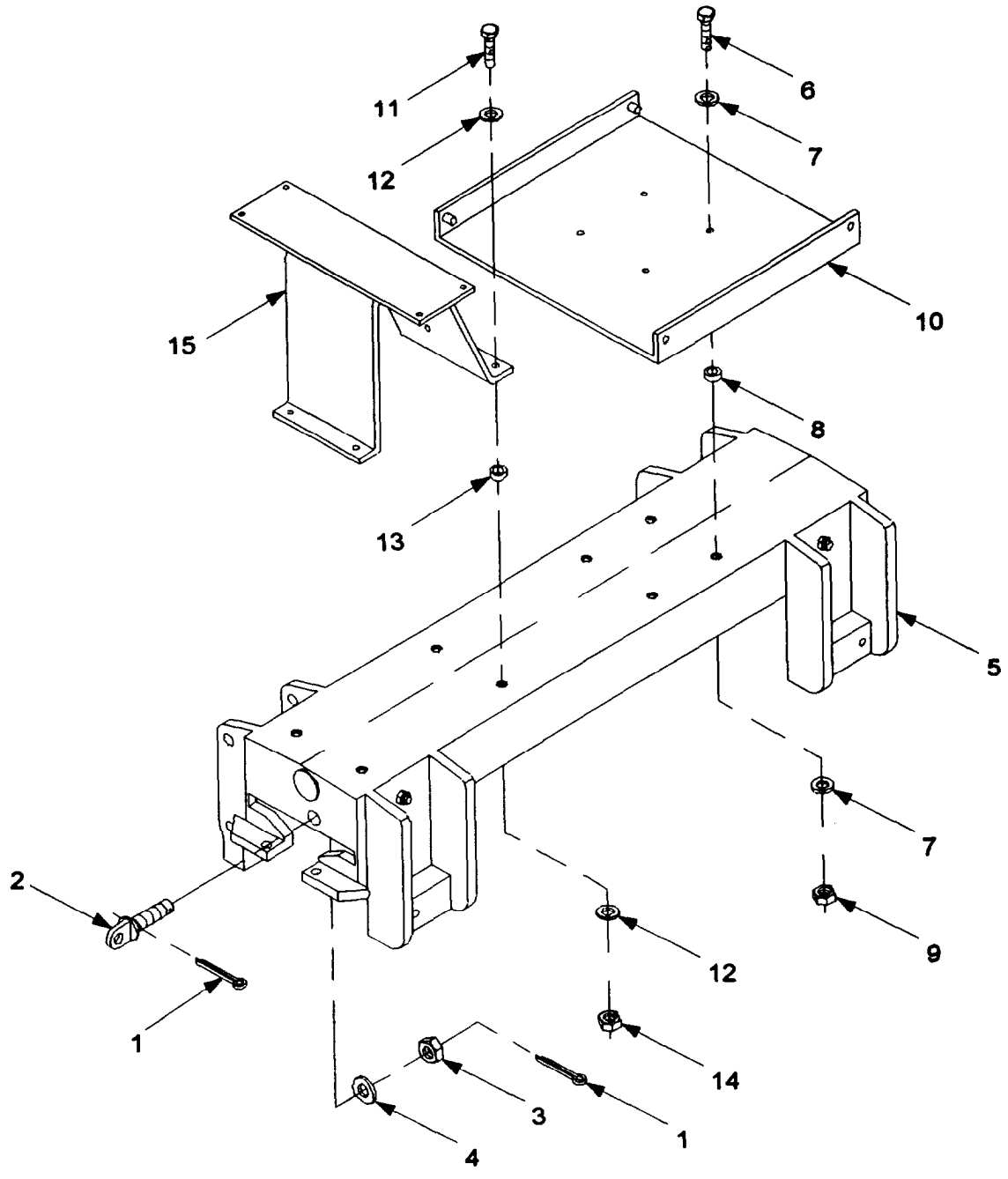
NOTE

Position target mechanism assembly plate (10) on carriage, and install four hex-head bolts (6), eight flatwashers (7), four spacers (8), and four new self-locking nuts (9).

(2) Install flatwashers to ensure tight fit between eyebolt and carriage.

(3) Install two eyebolts (2), flatwashers (4), and new self-locking nuts (3) on carnage.

(4) Install two spring pins (1) in each of two eyebolts.



(5) Install wheel assemblies (reference paragraph 5-4).

(6) Install carriage assembly (reference paragraph 5-3).

(7) Perform IMTC self-test (reference paragraph 2-4a).

5-6 INTERMEDIATE TRACK ASSEMBLY 9340980-1 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Track assembly (9340980-1)

Personnel Required:
Two persons

Equipment Conditions:
Drive belt assembly kit removed (reference paragraph 4-11).

References:
Remove splice bars (reference paragraph 4-15).
Remove bonding wires (reference paragraph 4-16).
Install bonding wires (reference paragraph 4-16).
Install splice bars (reference paragraph 4-15).
Install drive belt assembly kit (reference paragraph 4-11).
Adjust drive belt assembly kit (reference paragraph 4-10).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.

(1) Remove hex-head bolt (1), two flatwashers (2), self-locking nut (3), and cable clamp (4) from intermediate track section (5).

(2) Remove cable clamp from cable assembly W105 (6) and move cable assembly away from intermediate track section.

(3) Remove four hex-head bolts (7), flatwashers (8), and lockwashers (9), and belt guard (10) from intermediate track section.

(4) Remove light splice bars (11) and heavy splice bars (12) from both ends of intermediate track section (reference paragraph).

(5) Remove bonding wires (13) from both ends of intermediate track section (reference paragraph 4-16).

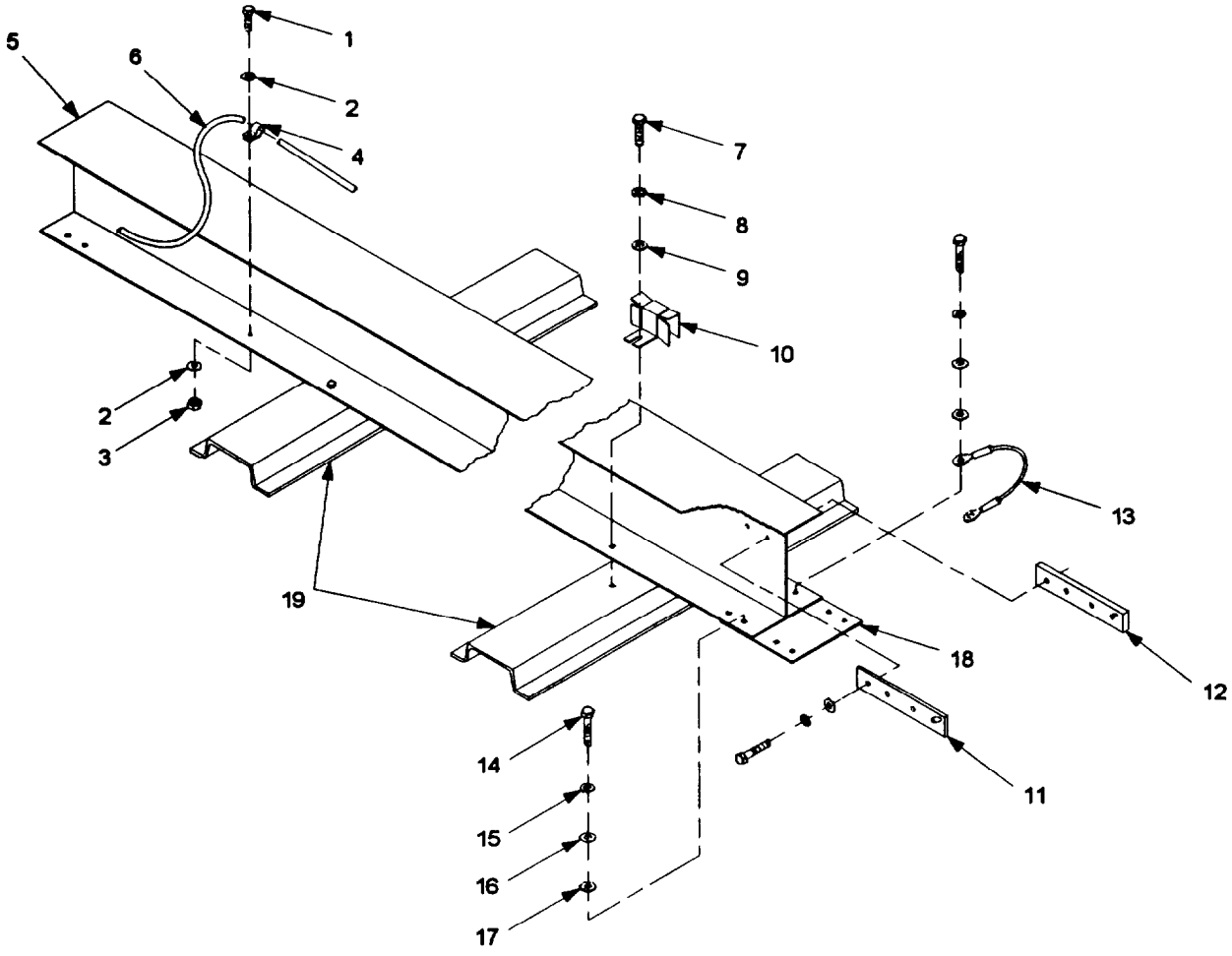
(6) Remove six hex-head bolts (14), lockwashers (15), flatwashers (16), and light flatwashers (17), and remove splice plate (18) from drive end of intermediate track section.

(7) Remove six hex-head bolts, lockwashers, flatwashers, and light flatwashers, and remove splice plate from return end of intermediate track section.

(8) Remove intermediate track section and two standard crossmember assemblies (19).

b. Installation.

(1) Position two standard crossmember assemblies (19) and intermediate track section (5) at proper location.



NOTE

Bolt thread engagement in splice plates should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(2) Position splice plate (18) at drive end of intermediate track section and install six hex-head bolts (14), new lockwashers (15), flatwashers (16), and light flatwashers (17).

(3) Position splice plate at return end of intermediate track section and install six hex-head bolts, new lockwashers, flatwashers, and light flatwashers.

(4) Install bonding wires (13) on both ends of intermediate track section (reference paragraph 4-16).

NOTE

Bolt thread engagement in splice bars should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

5-6 INTERMEDIATE TRACK ASSEMBLY 9340980-1 REPLACEMENT - Continued.

(5) Install light splice bars (11) and heavy splice bars (12) on both ends of intermediate track section (reference paragraph).

(6) Position belt guard (10) on intermediate track section.

(7) Install four hex-head bolts (7), flatwashers (8), and new lockwashers (9), and secure belt guard to intermediate track section and intermediate track section to crossmember assemblies.

(8) Install cable clamp (4) on cable assembly W105 (6).

NOTE

Bolt thread engagement in self-locking nut should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(9) Position cable clamp on intermediate track section and install hex-head bolt (1), two flatwashers (2), and new self-locking nut (3).

(10) Install drive belt assembly kit (reference paragraph 4-11).

(11) Adjust tension on drive belt assembly kit (reference paragraph 4-10).

(12) Set circuit breaker on ITM to POWER ON.

(13) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(14) Set circuit breaker on ICB to ON.

(15) Perform IMTC self-test (reference paragraph 2-4a).

5-7 INTERMEDIATE TRACK ASSEMBLY 9340980-2 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Track assembly (9340980-2)

Personnel Required:
Two persons

Equipment Conditions:
Drive belt assembly kit removed
(reference paragraph 4-11).

References:
Remove splice bars
(reference paragraph 4-15).

References - Continued.
Remove bonding wires
(reference paragraph 4-16).
Install bonding wires
(reference paragraph 4-16).
Install splice bars (reference paragraph 4-15).
Install drive belt assembly kit
(reference paragraph 4-11).
Adjust drive belt assembly kit
(reference paragraph 4-10).
Adjust cable assembly W103
(reference paragraph 4-39).
Perform IMTC self-test
(reference paragraph 2-4a).

---

a. Removal.

(1) Remove two screws (1) and nuts (2), and remove upper half of cable clip (3) on crossmember assembly (4).

(2) Remove cable assembly W103 (5) from crossmember assembly and move away from intermediate track section (6).

(3) Position upper half on lower half of cable clip (7) and install two screws and nuts.

(4) Remove hex-head bolt (8), two flatwashers (9), self-locking nut (10), and cable clamp (11) from intermediate track section.

(5) Remove cable clamp from cable assembly W105 (12) and move cable assembly away from intermediate track section.

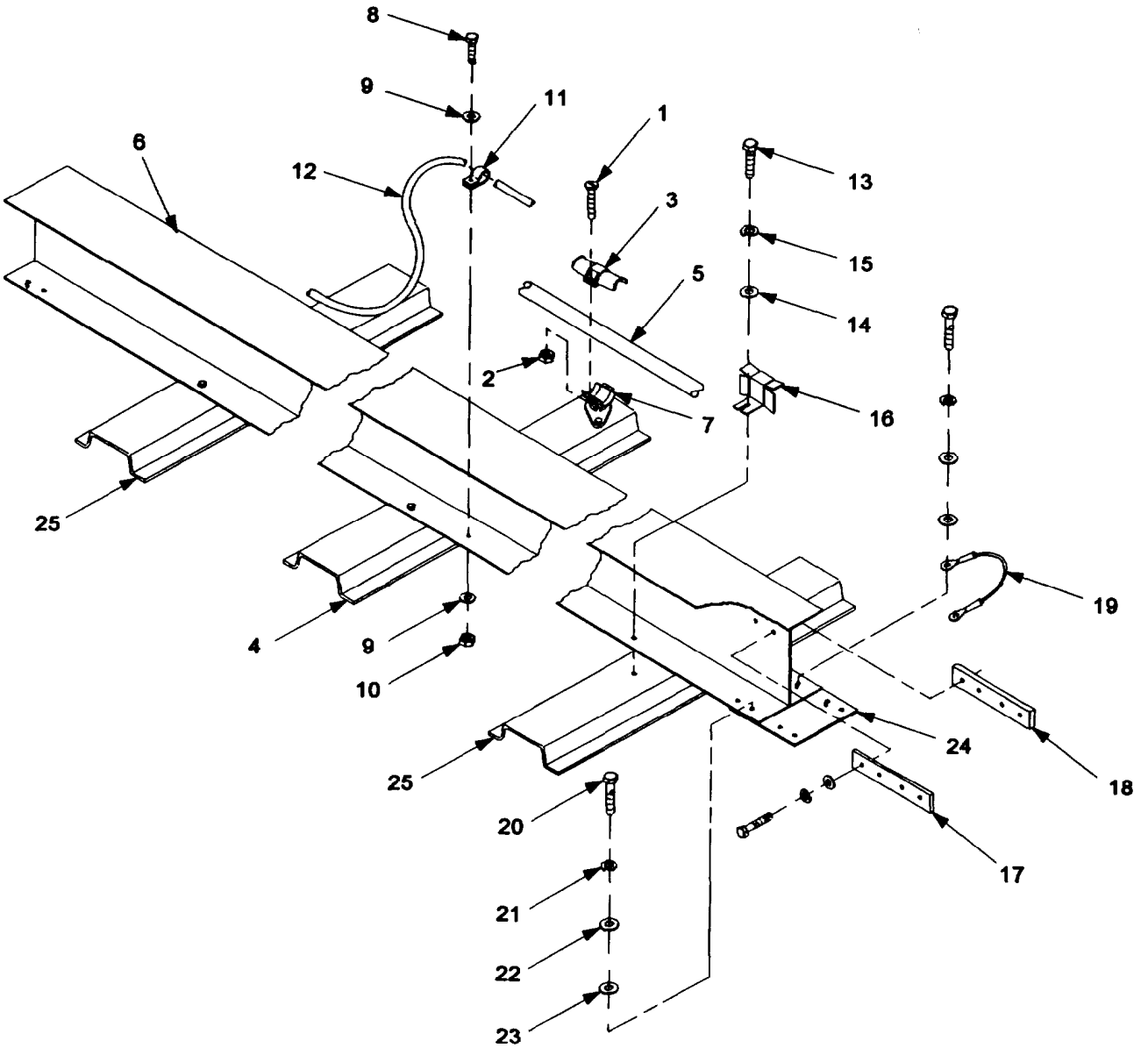
(6) Remove six hex-head bolts (13), flatwashers (14), and lockwashers (15), and belt guard (16) from intermediate track section.

(7) Remove light splice bars (17) and heavy splice bars (18) from both ends of intermediate track section (reference paragraph 4-15).

(8) Remove bonding wires (19) from both ends of intermediate track section (reference paragraph 4-16).

(9) Remove six hex-head bolts (20), lockwashers (21), flatwashers (22), and light flatwashers (23), and remove splice plate (24) from drive end of intermediate track section.

5-7 INTERMEDIATE TRACK ASSEMBLY 93409870-2 REPLACEMENT - Continued.



(10) Remove six hex-head bolts, lockwashers, flatwashers, and light flatwashers, and remove splice plate from return end of intermediate track section.

(11) Remove intermediate track section, crossmember assembly, and two standard crossmember assemblies (25).

b. Installation.

(1) Position crossmember assembly (4), two standard crossmember assemblies (25), and Intermediate track section (6) at proper location.

NOTE

Bolt thread engagement in splice plates should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(2) Position splice plate (24) at drive end of intermediate track section and install six hex-head bolts (20), new lockwashers (21), flatwashers (22), and light flatwashers (23).

(3) Position splice plate at return end of intermediate track section and install six hex-head bolts, new lockwashers, flatwashers, and light flatwashers.

(4) Install bonding wires (19) on both ends of intermediate track section (reference paragraph 4-16).

NOTE

Bolt thread engagement in splice bars should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(5) Install light splice bars (17) and heavy splice bars (18) on both ends of intermediate track section (reference paragraph 4-15).

(6) Position belt guard (16) on intermediate track section.

(7) Install six hex-head bolts (13), flatwashers (14), and new lockwashers (15), and secure belt guard to intermediate track section and intermediate track section to crossmember assemblies.

(8) Install cable clamp (11) on cable assembly W105 (12).

NOTE

Bolt thread engagement in self-locking nut should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(9) Position cable clamp on intermediate track section and install hex-head bolt (8), two flatwashers (9), and new self-locking nut (10).

(10) Remove two screws (1) and nuts (2), and remove upper half of cable clip (3) on crossmember assembly.

(11) Position cable assembly W103 (5) in lower half of cable clip (7).

(12) Position upper half on lower half of cable clip and install two screws and nuts.

(13) Install drive belt assembly kit (reference paragraph 4-11).

(14) Adjust tension on drive belt assembly kit (reference paragraph 4-10).

(15) Adjust cable assembly W103 (reference paragraph 4-39).

5-7 INTERMEDIATE TRACK ASSEMBLY 93409870-2 REPLACEMENT - Continued.

(16) Set circuit breaker on ITM to POWER ON.

(17) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(18) Set circuit breaker on ICB to ON.

(19) Perform IMTC self-test (reference paragraph 2-4a).

5-8 DRIVE END TRACK ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Track assembly (9340981)

Personnel Required:
Two persons

Equipment Conditions:
Drive belt assembly kit removed
(reference paragraph 4-11).

References:
Remove splice bars
(reference paragraph 4-15).
Remove bonding wires
(reference paragraph 4-16).
Install bonding wires
(reference paragraph 4-16).
Install splice bars (reference paragraph 4-15).
Install drive belt assembly kit
(reference paragraph 4-11).
Adjust drive belt assembly kit
(reference paragraph 4-10).
Perform IMTC self-test
(reference paragraph 2-4a).

---

a. Removal.

(1) Disconnect connector P2 (1) on cable assembly W104 (2) from connector J1 (3) on forward proximity switch (4).

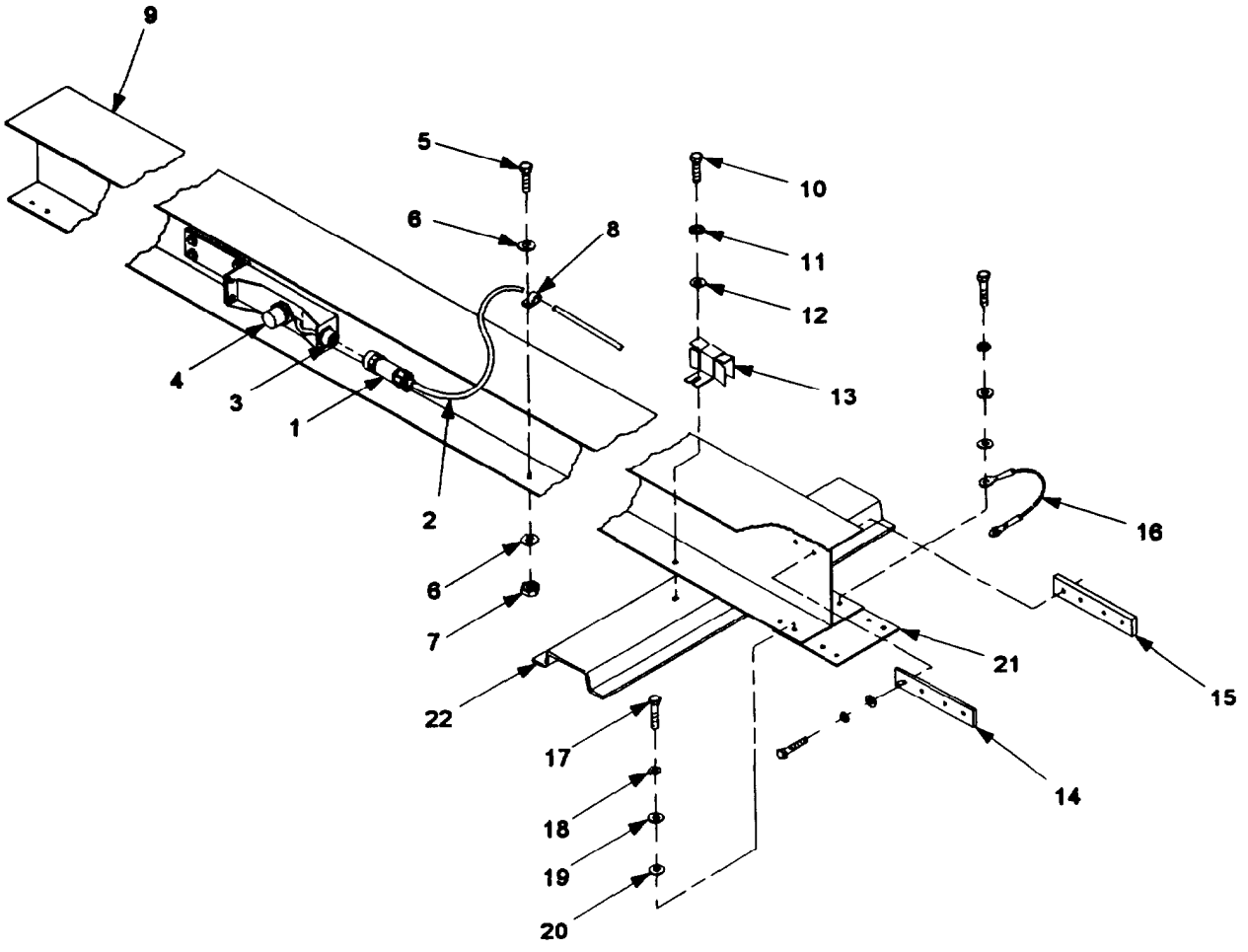
(2) Remove hex-head bolt (5), two flatwashers (6), self-locking nut (7), and cable clamp (8) from drive end track section (9).

(3) Remove cable clamp from cable assembly W104 and move cable assembly away from drive end track section.

(4) Remove two hex-head bolts (10), flatwashers (11), and lockwashers (12), and belt guard (13) from drive end track section.

(5) Remove light splice bars (14) and heavy splice bars (15) from both ends of drive end track section (reference paragraph 4-15).

(6) Remove bonding wires (16) from both ends of drive end track section (reference paragraph 4-16).



(7) Remove six hex-head bolts (17), lockwashers (18), flatwashers (19), and light flatwashers (20), and remove splice plate (21) from drive end of drive end track section.

(8) Remove six hex-head bolts, lockwashers, flatwashers, and light flatwashers, and remove splice plate from return end of drive end track section.

(9) Remove drive end track section and crossmember assembly (22).

b. Installation.

(1) Position crossmember assembly (22) and drive end track section (9) at proper location.

NOTE

Bolt thread engagement in splice plates should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(2) Position splice plate (21) at drive end of drive end track section and install six hex-head bolts (17), new lockwashers (18), flatwashers (19), and light flatwashers (20).

5-8 DRIVE END TRACK ASSEMBLY REPLACEMENT - Continued.

(3) Position splice plate at return end of drive end track section and install six hex-head bolts, new lockwashers, flatwashers, and light flatwashers.

(4) Install bonding wires (16) on both ends of drive end track section (reference paragraph 4-16).

NOTE

Bolt thread engagement in splice bars should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(5) Install light splice bars (14) and heavy splice bars (15) on both ends of drive end track section (reference paragraph 4-15).

(6) Position belt guard (13) on drive end track section.

(7) Install two hex-head bolts (10), flatwashers (11), and new lockwashers (12), and secure belt guard to drive end track section and drive end track section to crossmember assembly.

(8) Connect connector P2 (1) on cable assembly W104 to connector J1 (2) on forward proximity switch (4).

(9) Install cable clamp (8) on cable assembly W104 (2).

NOTE

Bolt thread engagement in self-locking nut should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(10) Position cable clamp on intermediate track section and install hex-head bolt (5), two flatwashers (6), and new self-locking nut (7).

(11) Install drive belt assembly kit (reference paragraph 4-11).

(12) Adjust tension on drive belt assembly kit (reference paragraph 4-10).

(13) Set circuit breaker CB1 on ITM to POWER ON.

(14) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(15) Set circuit breaker on ICB to ON.

(16) Perform IMTC self-test (reference paragraph 2-4a).

5-9 TRACK/DRIVE MECHANISM ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Personnel Required:
Two persons

Equipment Conditions:
Drive belt assembly kit removed (reference paragraph 4-11).
Trolley cable kit removed (reference paragraph 4-38).
Bonding wires removed (reference paragraph 4-16).
IMTC electronic components assembly removed (reference paragraph 5-16).
Drive mechanism assembly removed (reference paragraph 4-21).
Splice bars removed (reference paragraph 4-15).

Materials/Parts:
Self-locking nut (MS21083C4)
Track/drive mechanism assembly (9340982)
Sealing compound (item 11, appendix D)

References:
Install splice bars (reference paragraph 4-15).
Install drive mechanism assembly (reference paragraph 4-21).
Install IMTC electronic components assembly (reference paragraph 5-16).
Install bonding wires (reference paragraph 4-16).
Install drive belt assembly kit (reference paragraph 4-11).
Adjust drive belt assembly kit (reference paragraph 4-10).
Install trolley cable kit (reference paragraph 4-38).
Adjust trolley cable (reference paragraph 4-39).
Perform IMTC self-test (reference 2-4a).

---

a. Removal.

(1) Remove four hex-head screws (1), eight flatwashers (2), and four self-locking nuts (3), and remove cover bracket (4) from drive mechanism track section (5).

(2) Remove seven hex-head screws (6), flatwashers (7), and lockwashers (8), and belt guard (9) from drive mechanism track section.

NOTE

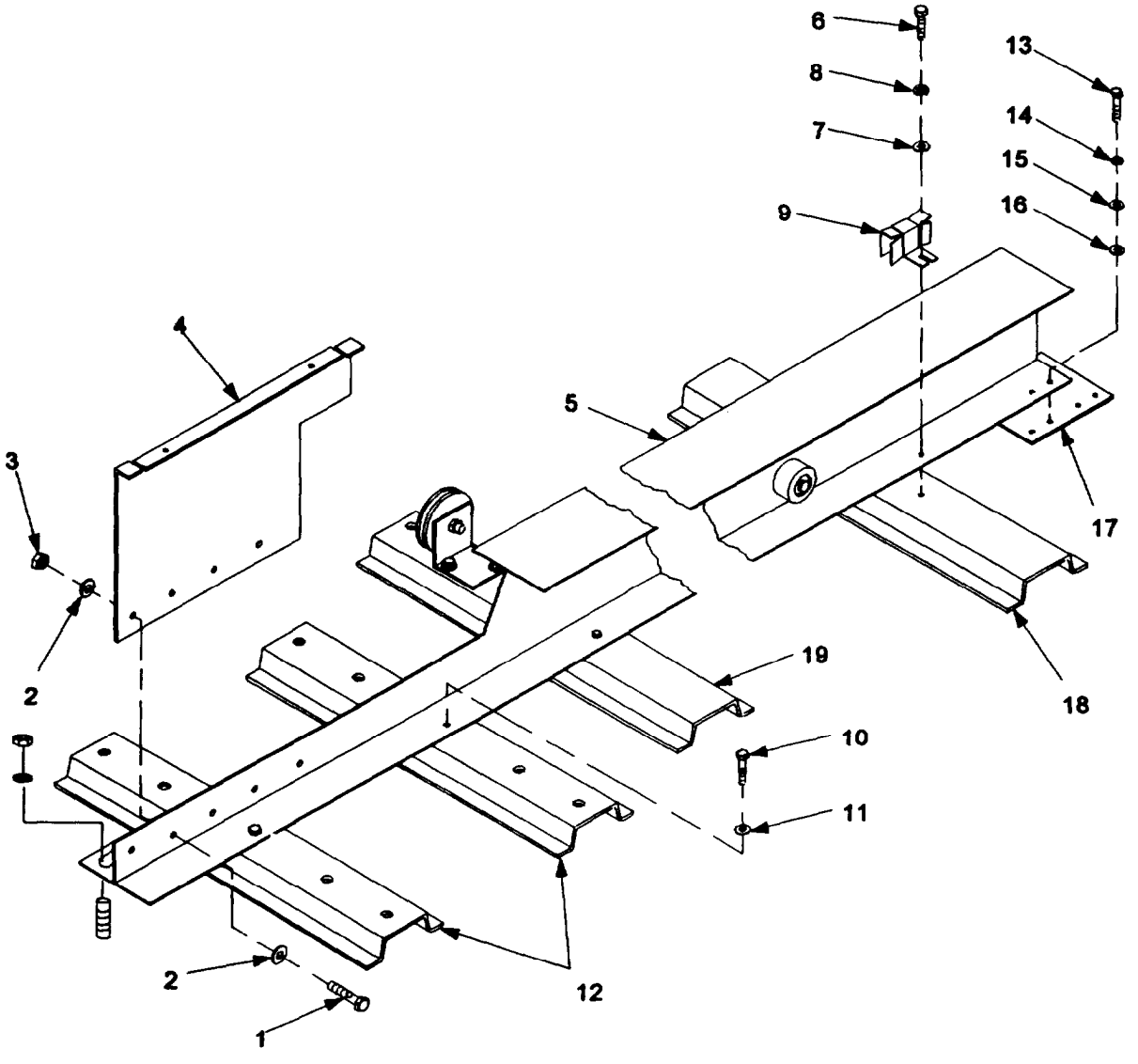
Note location of pan-head screw and flatwasher on motor crossmember assembly, so items will be installed in proper location.

(3) Remove pan-head screw (10) and flatwasher (11) from motor crossmember assembly (12).

(4) Remove six hex-head bolts (13), lockwashers (14), flatwashers (15), and light flatwashers (16), and remove splice plate (17) from return end of drive mechanism track section.

(5) Remove drive mechanism track section.

5-9 TRACK/DRIVE MECHANISM ASSEMBLY REPLACEMENT - Continued.



NOTE

Note location of crossmember assemblies, so each crossmember assembly will be installed in proper location.

(6) Remove standard crossmember assembly (18), crossmember assembly (19), and two motor crossmember assemblies.

b. Installation.

(1) Position standard crossmember assembly (18), crossmember assembly (19), and two motor crossmember assemblies (12) at proper locations.

(2) Position drive mechanism track section (5) on crossmember assemblies.

CAUTION

Do not tighten the nuts at either end of the IMTC track that secures the IMTC to the pad. Hand tightening is adequate to allow expansion/contraction of the track assembly.

NOTE

Bolt thread engagement in splice plate should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(3) Position splice plate (17) on return end of drive mechanism track section and install six hex-head bolts (13), new lockwashers (14), flatwashers (15), and light flatwashers (16).

NOTE

Bolt thread engagement in splice bars should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(4) Install splice bars on return end of drive mechanism track section (reference paragraph 4-15).

(5) Apply sealing compound to threads of pan-head screw (10).

NOTE

Install pan-head screw and flatwasher in proper location on motor crossmember assembly to allow installation of drive mechanism assembly.

(6) Install pan-head screw and flatwasher (11) on motor crossmember assembly.

(7) Position belt guard (9) on drive mechanism track section.

(8) Install seven hex-head screws (6), flatwashers (7), and new lockwashers (8), and secure belt guard to drive mechanism track section and drive mechanism track section to crossmember assemblies.

NOTE

Cover bracket is installed on same side of drive mechanism track section as IMTC electronic components assembly.

(9) Position cover bracket (4) on drive mechanism track section, and install four hex-head screws (1), eight flatwashers (2), and four self-locking nuts (3).

5-9 TRACK/DRIVE MECHANISM ASSEMBLY REPLACEMENT - Continued.

NOTE

Do not completely tighten attaching hardware before position of drive mechanism assembly has been adjusted.

NOTE

Adjust V-belt tension to allow no more than 1/2 in (1.27 in) slack in belt when pressed with thumb.

(10) Install drive mechanism assembly (reference paragraph 4-21).

(11) Install IMTC electronic components assembly (reference paragraph 5-16).

(12) Install bonding wires on drive end and return end of drive mechanism track section (reference paragraph 4-16).

(13) Install drive belt assembly kit (reference paragraph 4-11).

(14) Adjust tension on drive belt assembly kit (reference paragraph 4-10).

(15) Install trolley cable kit (reference paragraph 4-38).

(16) Move carnage assembly against track bumper assembly on return end track section, and check trolley cable tension. Adjust position of trolley cable on cable straps as required (reference paragraph 4-39).

(17) Set circuit breaker CB1 on ITM to POWER ON.

(18) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(19) Set circuit breaker on ICB to ON.

(20) Perform IMTC self-test (reference paragraph 2-4a).

5-10 COUNTER SHAFT AND LOCK COLLAR AND BEARING ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Lock collar and bearing assembly (9353964)
Tolerance ring (9354022)
Counter shaft (11829327)
Sealing compound (item 12, appendix D)

References:
Install square key, output pulley #5, and V-belt driven pulley assembly (reference paragraph 4-22).
Install drive mechanism assembly (reference paragraph 4-21).
Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
Drive mechanism assembly removed (reference paragraph 4-21).
Square key, output pulley #5, and V-belt driven pulley assembly removed (reference paragraph 4-22).

---

a. Removal.

(1) Loosen setscrew (1) in each of two lock collars (2).

CAUTION

Counter shaft and lock collar and bearing assemblies are manufactured with tolerance fits. Before removing counter shaft, ensure that surfaces of shaft are clean. Remove any rust and burrs from counter shaft to avoid damaging mating surfaces of lock collar and bearing assemblies.

(2) Remove counter shaft (3) from lock collars and bearings (4).

(3) Remove two lock collars, bearings, and tolerance rings (5) from motor mount base frame (6).

b. Installation.

NOTE

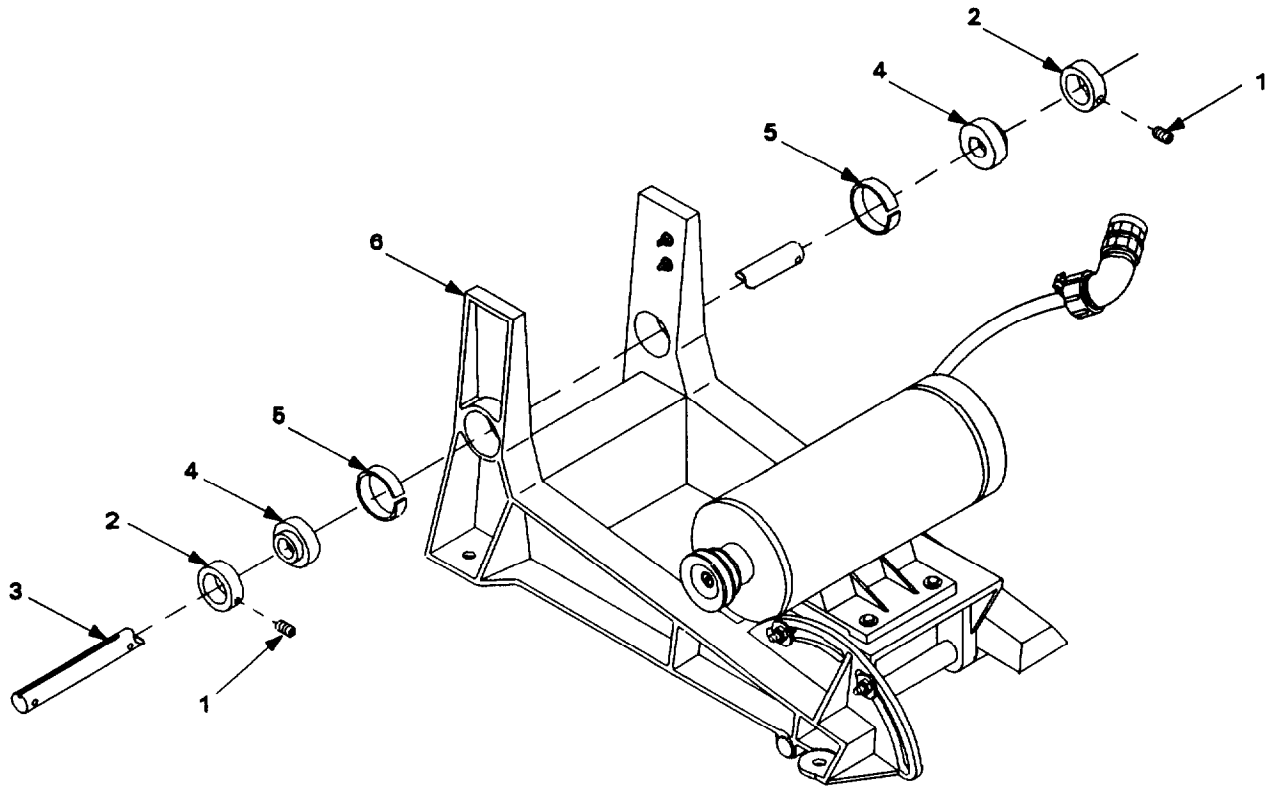
When replacing counter shaft or lock collar and bearing assembly, use new tolerance rings.

(1) Fit lock collars, bearings (4), and new tolerance rings (5) into ends of motor mount base frame (6). Using soft-faced hammer, tap lock collars and bearings into place.

(2) Position counter shaft (3) in lock collar and bearing assemblies.

(3) Remove setscrews (1) from lock collars (2).

(4) Coat threads of setscrews with sealing compound.



(5) Install setscrews in lock collars.

(6) Rotate lock collar on end of counter shaft until setscrew on collar is aligned with depression on shaft.

(7) Tighten setscrew and fasten lock collar in place.

(8) Repeat steps (6) and (7) for other end of shaft.

(9) Install square key, output pulley #5, and V-belt driven pulley assembly (reference paragraph 4-22).

(10) Install drive mechanism assembly (reference paragraph 4-21).

(11) Perform IMTC self-test (reference paragraph 2-4a).

5-11 HINGE SHAFT REPLACEMENT.

INITIAL SETUP

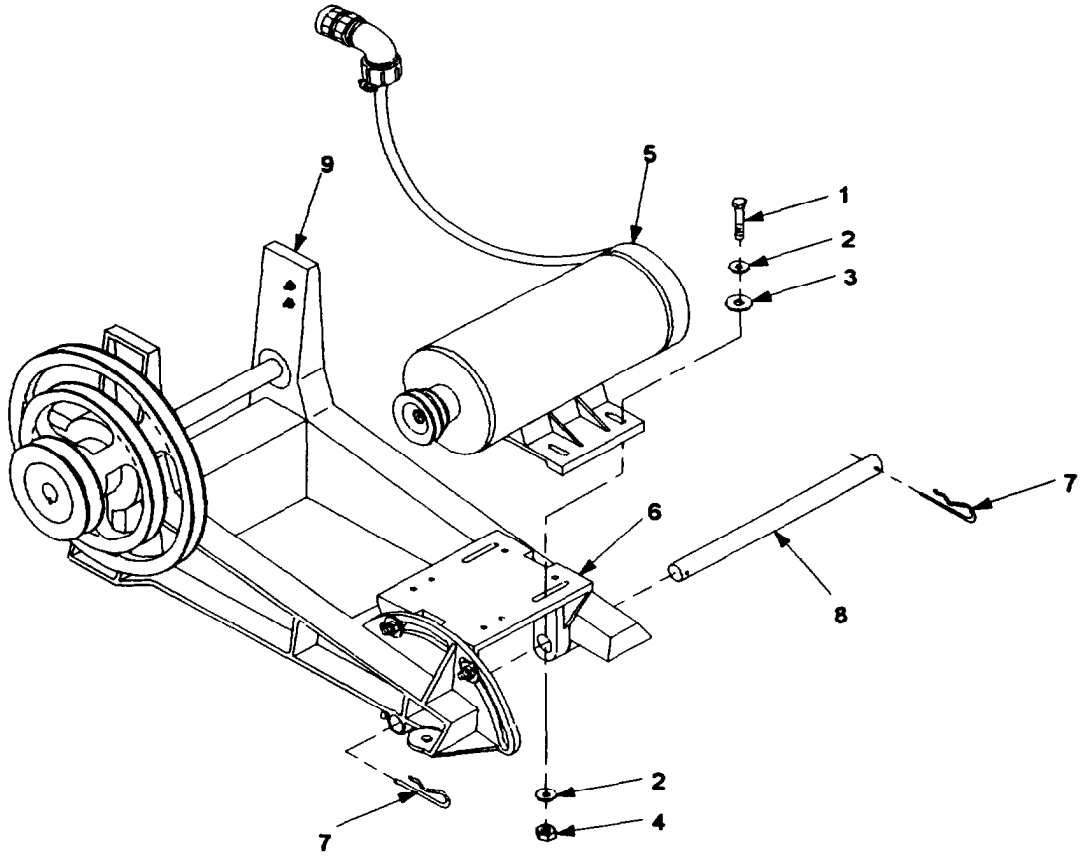
Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Self-locking nut (MS21083C4)
Hinge shaft (11829328)

References:
Install drive mechanism assembly (reference paragraph 4-21).

References - Continued.
Install V-belt (reference paragraph 4-24).
Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
V-belt removed (reference paragraph 4-24).
Drive mechanism assembly removed (reference paragraph 4-21).



a. Removal.

(1) Remove four hex-head capscrews (1), eight 1/4-in flatwashers (2), four 3/8-in flatwashers (3), and four self-locking nuts (4), and remove drive motor assembly (5) from motor mount platform (6).

(2) Remove two lock pins (7) from hinge shaft (8).

(3) Remove hinge shaft from motor mount platform and base frame motor mount (9).

b. Installation.

(1) Align motor mount platform (6) with base frame motor mount (9) to allow installation of hinge shaft (8).

(2) Install hinge shaft in motor mount platform and base frame motor mount.

(3) Install two lock pins (7) in hinge shaft.

(4) Position drive motor assembly (5) on motor mount platform, and install four hex-head capscrews (1) eight 1/4-in flatwashers (2), four 3/8-in flatwashers (3), and four new self-locking nuts (4).

(5) Install drive mechanism assembly (reference paragraph 4-21).

(6) Install V-belt (reference paragraph 4-24).

(7) Perform IMTC self-test (reference paragraph 2-4a).

5-12 REPLACEMENT OF ELECTRIC CONNECTOR P1 ON CABLE ASSEMBLY W115.

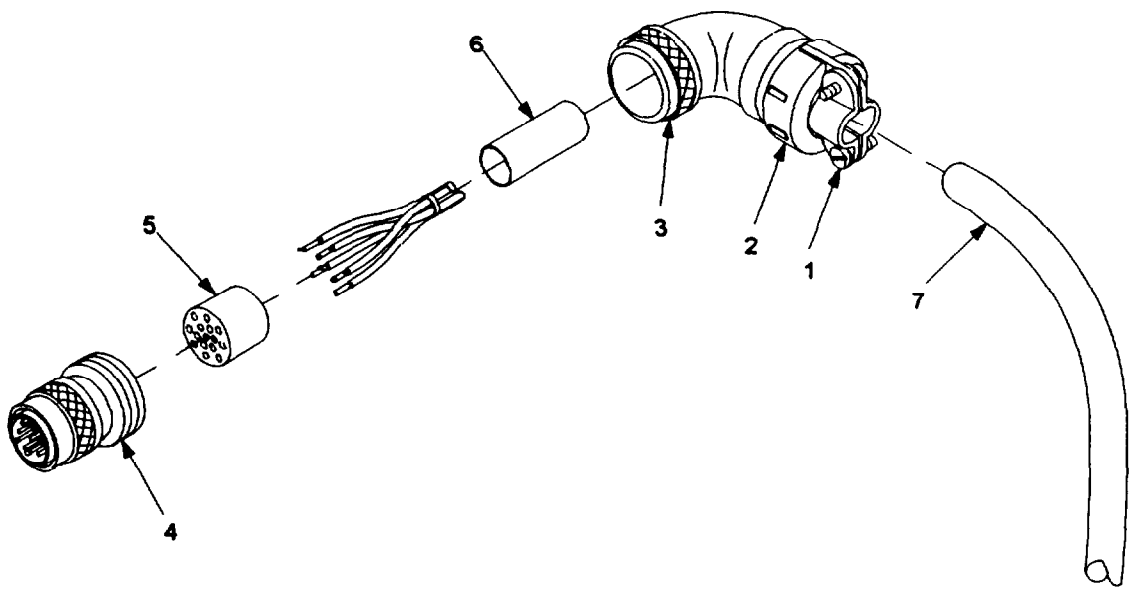
INITIAL SETUP

Materials/Parts:
- Electric connector (MS3126E18-11 P)
- 16 AWG white insulated wire (M16878/4BJE9)
- Shrink tubing (MS23053/5-305-O)
- Shrink tubing (MS23053/5-109-O)
- Solder (item 18, appendix D)
- Tape (item 19, appendix D)
- Sealing compound (item 13, appendix D)
- Sealing compound, alternate (item 15, appendix D)

Equipment Conditions:
- Cable assembly WI 15 removed (reference paragraph 4-27).

Tools and Special Tools:
- General mechanic's automotive tool kit
- Soldering and desoldering set
- Hand terminal crimping tool (11-3284-2) and turret
- Insertion/extraction tool (M81969/14-11)
- Electric gun-type heater

References:
- Instructions on using crimp tool and turret (reference paragraph 5-26).
- Instructions on using insertion/extraction tool (reference paragraph 5-26).
- Install cable assembly W115 (reference paragraph 4-27).
- Perform IMTC self-test (reference paragraph 2-4a).



a. Removal.

(1) Loosen two screws (1) on strain relief (2) attached to cable seal backshell (3) on electric connector P1 (4).

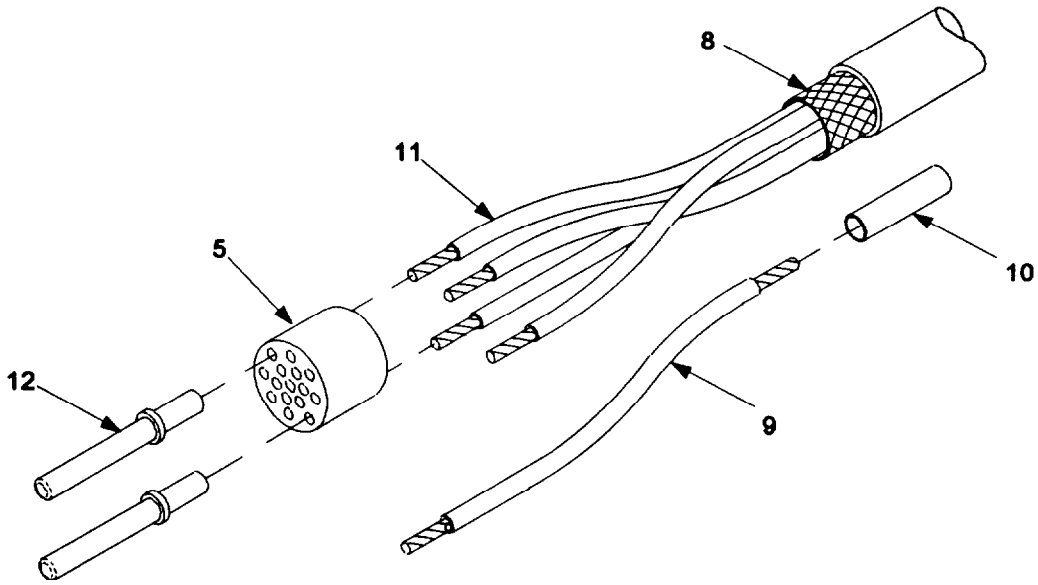
(2) Remove electric connector P1 from cable seal backshell.

(3) Slide cable seal backshell away from electric connector P1 and expose wiring.

(4) Cut wiring as close as possible to electric connector P1 and remove electric connector.

(5) Remove plastic grommet (5) from wiring.

(6) Remove shrink tubing (6) from cable (7).



b. Installation.

(1) Install 6- in (15.24 cm) length of shrink tubing (6) on cable (7) and slide along cable away

(2) Strip outer insulation on cable 6 in (15.24 cm) from end.

(3) Tape end of cable insulation.

(4) Fan shield (8) and twist together.

(5) Tin shield back to an approximate length of 0.5 in (1.27 cm).

(6) Solder 6-in (15.24 cm) length of 16 AWG white insulated wire (9) to tinned shield.

(7) Remove tape from end of cable insulation.

(8) Slide 1-in (2.54 cm) length of heat shrink tubing (10) over soldered connection.

(9) Apply heat and shrink tubing over connection.

(10) Install plastic grommet (5) on wires.

5-12 REPLACEMENT OF ELECTRIC CONNECTOR P1 ON CABLE ASSEMBLY W115 - Continued.

(11) Strip insulation on wires (11) 0.28 in (0.71 cm) from end.

(12) Using crimp tool and turret, install contacts (12) on wires and crimp connections. (For detailed instructions on using the crimp tool and turret, refer to paragraph 5-26.)

(13) Reference table 5-2. Using insertion/extraction tool, insert contacts (crimped to wires) in proper sockets at rear of electric connector P1 (4). (For detailed instructions on using the insertion/extraction tool, refer to paragraph 5-26.)

Table 5-2. Cable Assembly W115-to-Connector P1 Wiring Guide.

SOCKET	WIRE
G	White
F	Black
H	Red
J	Green
E	Shield (White)

(14) Slide 6-in (15.24 cm) length of shrink tubing over exposed wires.

(15) Apply heat and shrink tubing over wires.

(16) Position cable seal backshell (3) over shrink tubing.

(17) Apply sealing compound to threads of electric connector Pi.

(18) Install electric connector P1 on cable seal backshell.

(19) Tighten two screws (1) on strain relief (2) attached to cable seal backshell.

(20) Refer to FO-2. Using multimeter, perform continuity on cable assembly W115.

(21) Install cable assembly W115 (reference paragraph 4-27).

(22) Perform IMTC self-test (reference paragraph 2-4a).

5-13 REPLACEMENT OF TERMINAL LUGS ON CABLE ASSEMBLY W115.

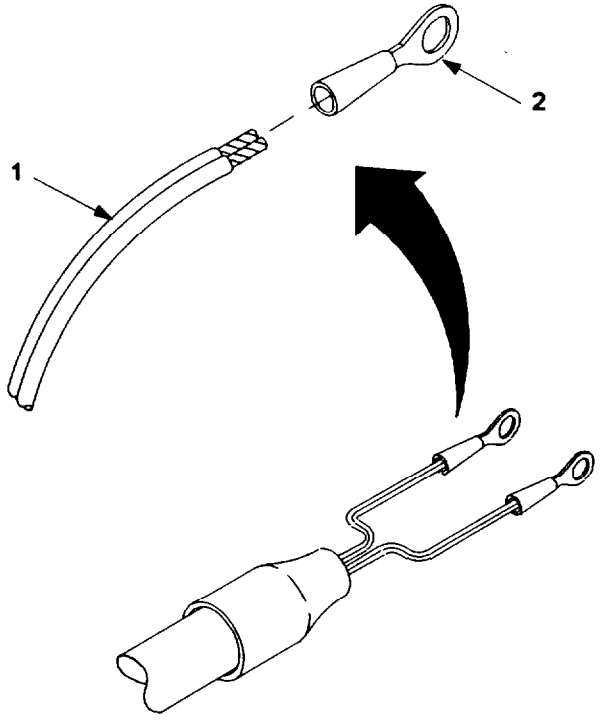
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Hand terminal crimping tool (1006)

Materials/Parts:
Terminal lug (MS25036-157)

References:
Install cable assembly W115 (reference paragraph 4-27).
Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
Cable assembly W115 removed (reference paragraph 4-27).



Replacement.

a. Cut cable assembly W115 wire (1) as close as possible to terminal lug (2).

b. Remove and discard terminal lug.

c. Strip insulation on cable assembly W115 wire (1) 1/4 in (0.64 cm) from end.

d. Install and crimp terminal lug (2) on end of wire.

e. Install cable assembly W115 (reference paragraph 4-27).

f . Perform IMTC self-test (reference paragraph 2-4a).

5-14 ASSEMBLY OF SUPPRESSOR ASSEMBLY.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Soldering and desoldering set
Electric gun-type heater

Materials/Parts:
Terminal lug (MS77074-7)
Diode (JAN1N5651A)
Shrink tubing (M23053/5-207-C)
Solder (item 17, appendix D)

References:
Install suppressor assembly (reference paragraph 4-27).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Assembly.

CAUTION

Ensure that arrows on diodes are pointed away from each other or damage to equipment could result when suppressor assembly is installed.

NOTE

The required overall length of the suppressor assembly is 4.25 ±0.25 in (10.79 ±0.64 cm) from center of terminal lug to center of terminal lug.

(1) Arrange diodes (1) so that arrows on diodes point away from each other and inner leads (2) of two diodes overlap by 0.25 in (0.64 cm).

(2) Solder inner leads of two diodes together.

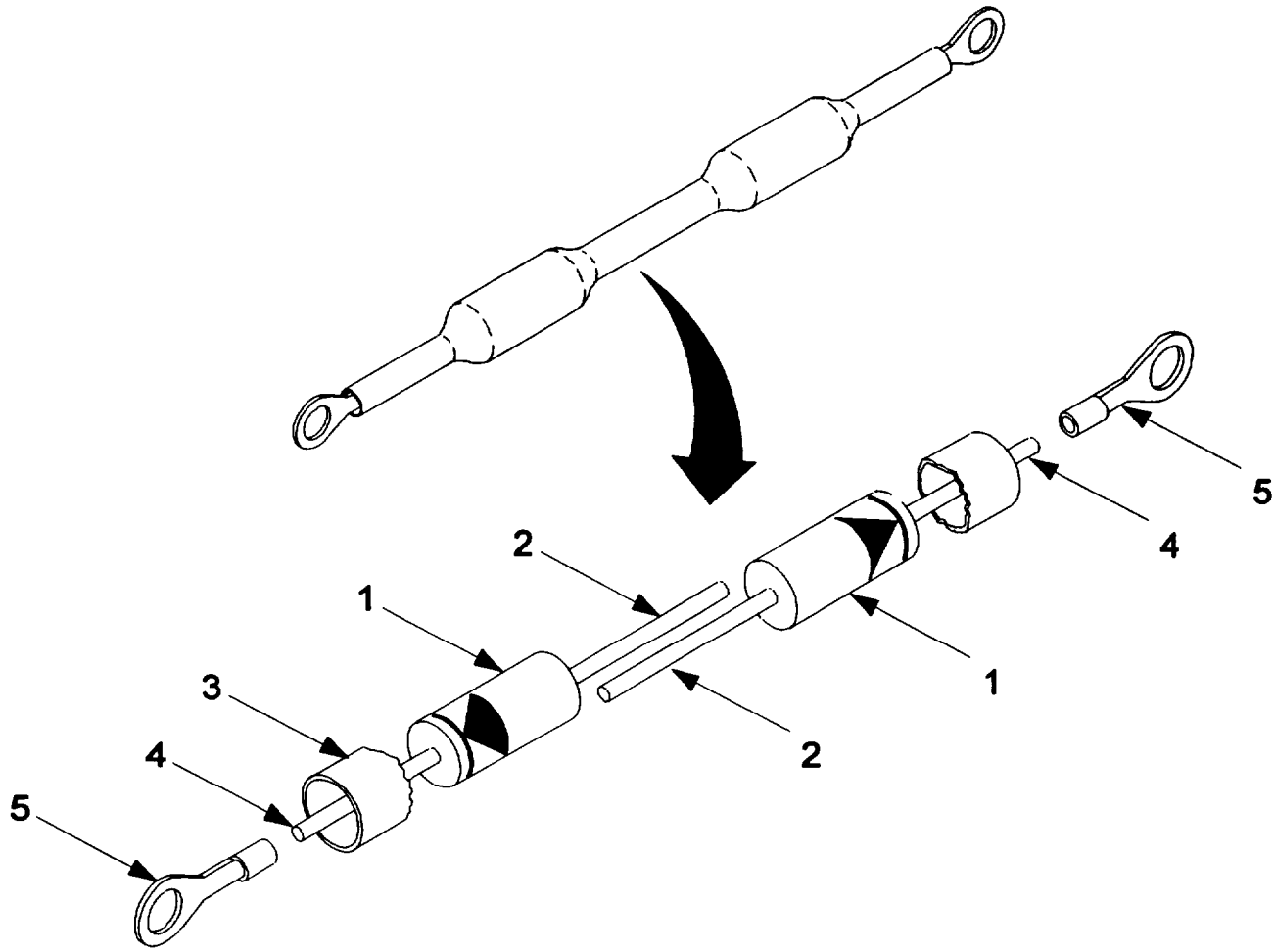
(3) Install 3-in (7.62 cm) length of shrink tubing (3) over diodes.

(4) Insert outer leads (4) from diodes into terminal lugs (5) and solder connections.

(5) Apply heat to shrink tubing.

(6) Install suppressor assembly (reference paragraph 4-27).

(7) Perform IMTC self-test (reference paragraph 2-4a).


5
4
2
1
1
3
4
5
2

5-15 RETURN END TRACK ASSEMBLY REPLACEMENT.

INITIAL SETUP

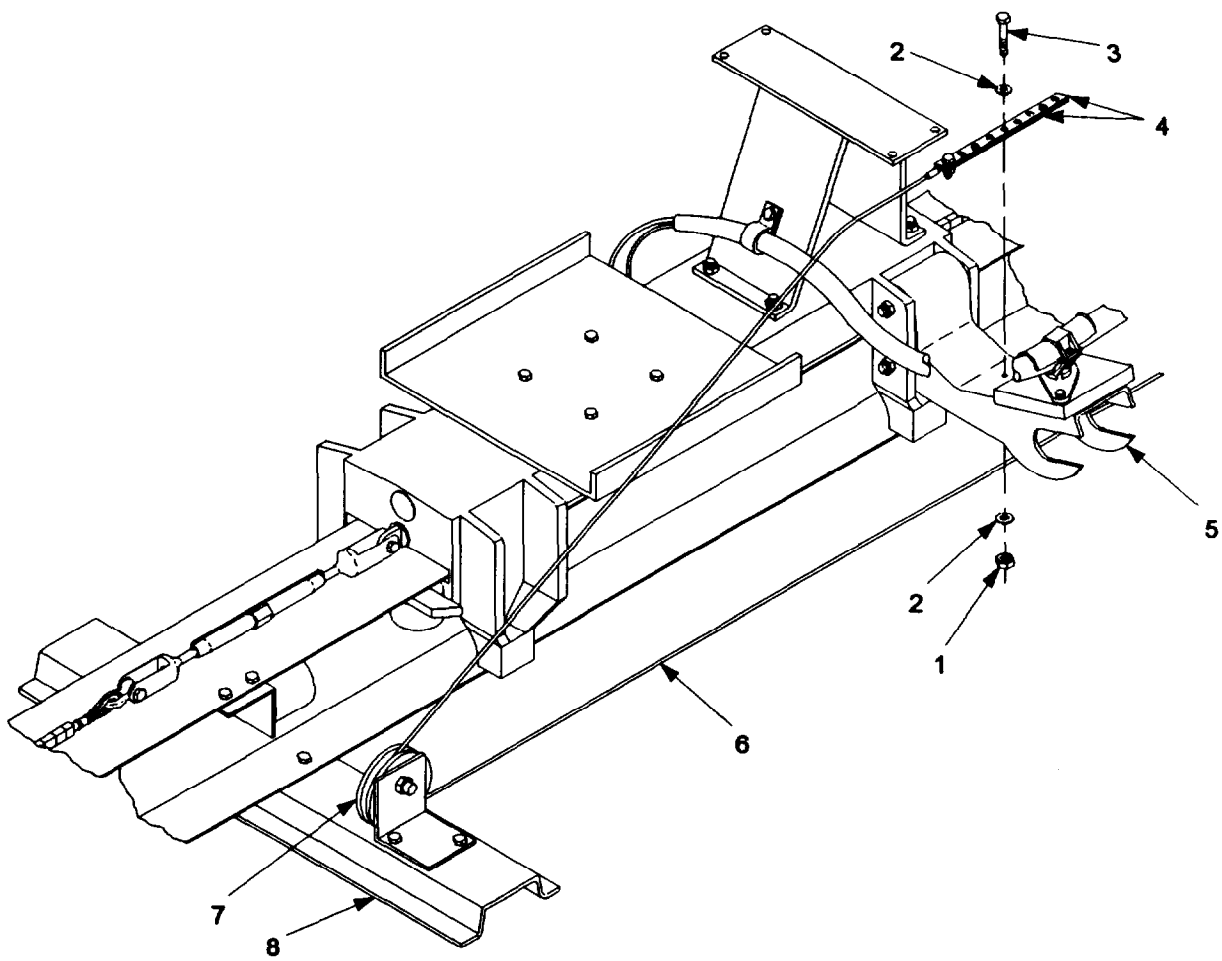
Tools and Special Tools:
General mechanic's automotive tool kit

Material/Parts:
Self-locking nut (MS21083C4)
Track assembly (9340978)

Equipment Conditions:
Drive belt assembly kit removed
(reference paragraph 4-11).
Splice bars removed
(reference paragraph 4-15).
Bonding wire removed
(reference paragraph 4-16).

Personnel Required:
Two persons

References:
Install bonding wire
(reference paragraph 4-16).
Install splice bars (reference paragraph 4-15).
Install drive belt assembly kit
(reference paragraph 4-11).
Adjust drive belt assembly kit
(reference paragraph 4-10).
Adjust trolley cable
(reference paragraph 4-39).
Perform IMTC self-test
(reference paragraph 2-4a).

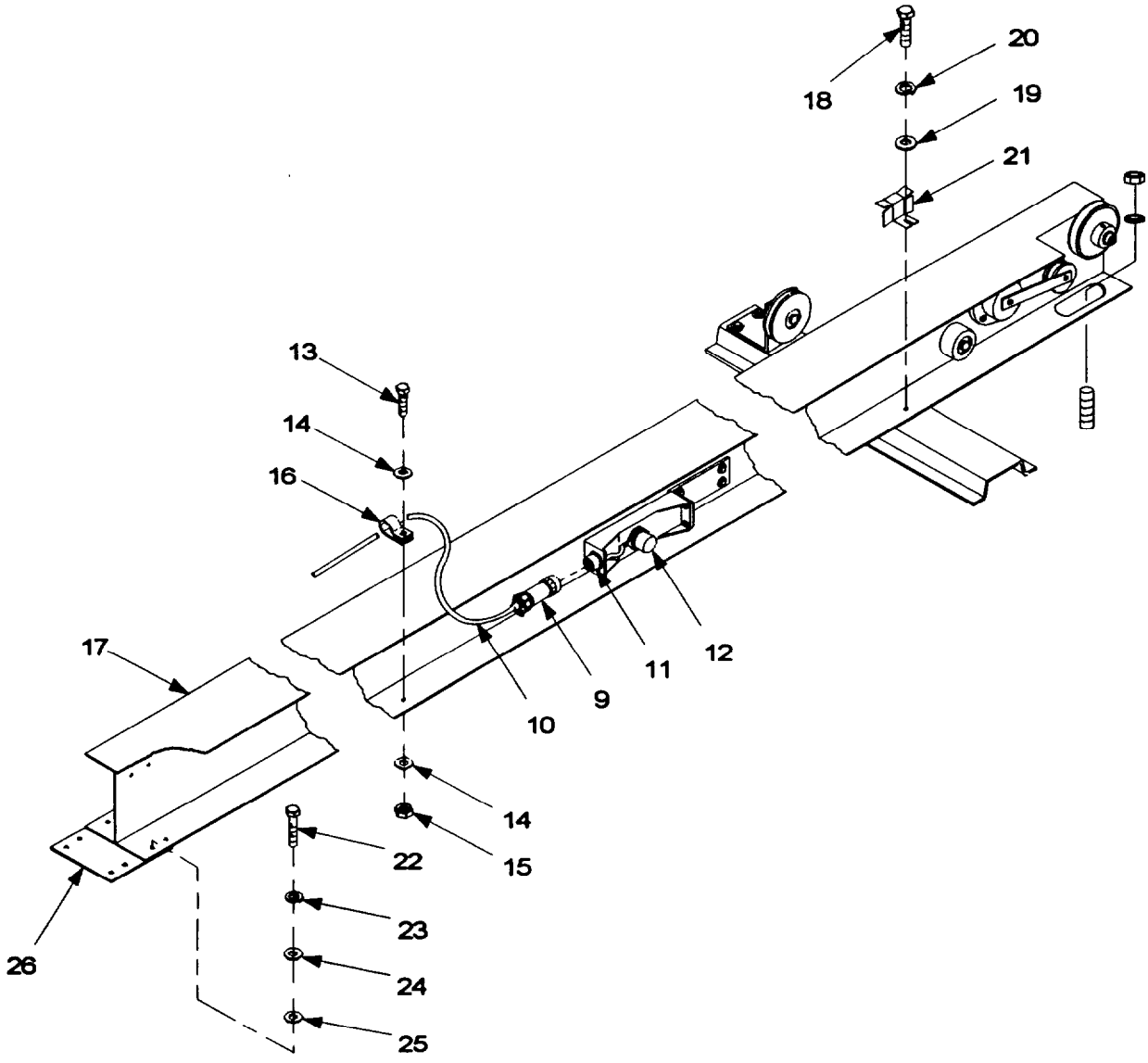


a. Removal.

(1) Remove self-locking nut (1) two flatwashers (2), and hex head screw (3), and remove cable straps (4) from cable support assembly (5).

(2) Remove trolley cable (6) from cable sheave assembly (7) attached to crossmember assembly (8) at return end of track.

(3) Disconnect connector P2 (9) on cable assembly W105 (10) from connector J2 (11) on reverse proximity switch (12).



(4) Remove hex-head screw (13), two flatwashers (14), self-locking nut (15), and cable clamp (16) from return end track section (17).

5-15 RETURN END TRACK ASSEMBLY REPLACEMENT - Continued.

(5) Remove cable clamp from cable assembly W105 and move cable assembly away from return end track section.

(6) Remove two hex-head screws (18), flatwashers (19), and lo&washers (20), and belt guard (21) from return end track section.

(7) Remove six hex-head bolts (22), lockwashers (23), flatwashers (24), and light flatwashers (25), and remove splice plate (26) from drive end of return end track section.

(8) Remove crossmember assembly and return end track section.

b. Installation.

(1) Position crossmember assembly (8) at proper location.

(2) Position return end track section (17) on crossmember assembly.

CAUTION

Do not tighten the nuts at either end of the IMTC track that secures the IMTC to the pad. Hand tightening is adequate to allow expansion/contraction of the track assembly.

NOTE

Bolt thread engagement In splice plate should be greater than 0.25 In (0.64 cm) but should not exceed 0.4 in (1 cm).

(3) Position splice plate (26) on drive end of return end track section, and install six hex-head bolts (22), new lochwashers (23), flatwashers (24), and light flatwashers (25).

(4) Install bonding wire on drive end of return end track section (reference paragraph 4-16).

NOTE

Bolt thread engagement in splice bars should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(5) Install heavy splice bar and light splice bar on drive end of return end track section (reference paragraph 4-15).

(6) Position belt guard (21) on return end track section.

(7) Install two hex-head screws (18), flatwashers (19), and new lockwashers (20), and secure belt guard to return end track section and return end track section to crossmember assembly.

(8) Connect connector P2 (9) on cable assembly W105 (10) to connector J2 (11) on reverse proximity switch (12).

(9) Install cable clamp (16) on cable assembly W105.

NOTE

Screw thread engagement in self-locking nut should be greater than 0.25 in (0.64 cm) but should not exceed 0.4 in (1 cm).

(10) Position cable clamp on return end track section and install hex-head screw (13), two flatwashers (14), and new self-locking nut (15).

(11) Install trolley cable (6) in cable sheave assembly (7) on crossmember assembly at return end of track.

(12) Position cable straps (4) on cable support assembly (5), and install hex head screw (1), two flatwashers (2), and self-locking nut (3).

(13) Install drive belt assembly kit (reference paragraph 4-11).

(14) Adjust tension on drive belt assembly kit (reference paragraph 4-10).

(15) Move carriage assembly against track bumper assembly on return end track section, and check trolley cable tension. Adjust position of trolley cable on cable straps as required (reference paragraph 4-39).

(16) Set circuit breaker CB1 on ITM to POWER ON.

(17) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(18) Set circuit breaker on ICB to ON.

(19) Perform IMTC self-test (reference paragraph 4-39a).

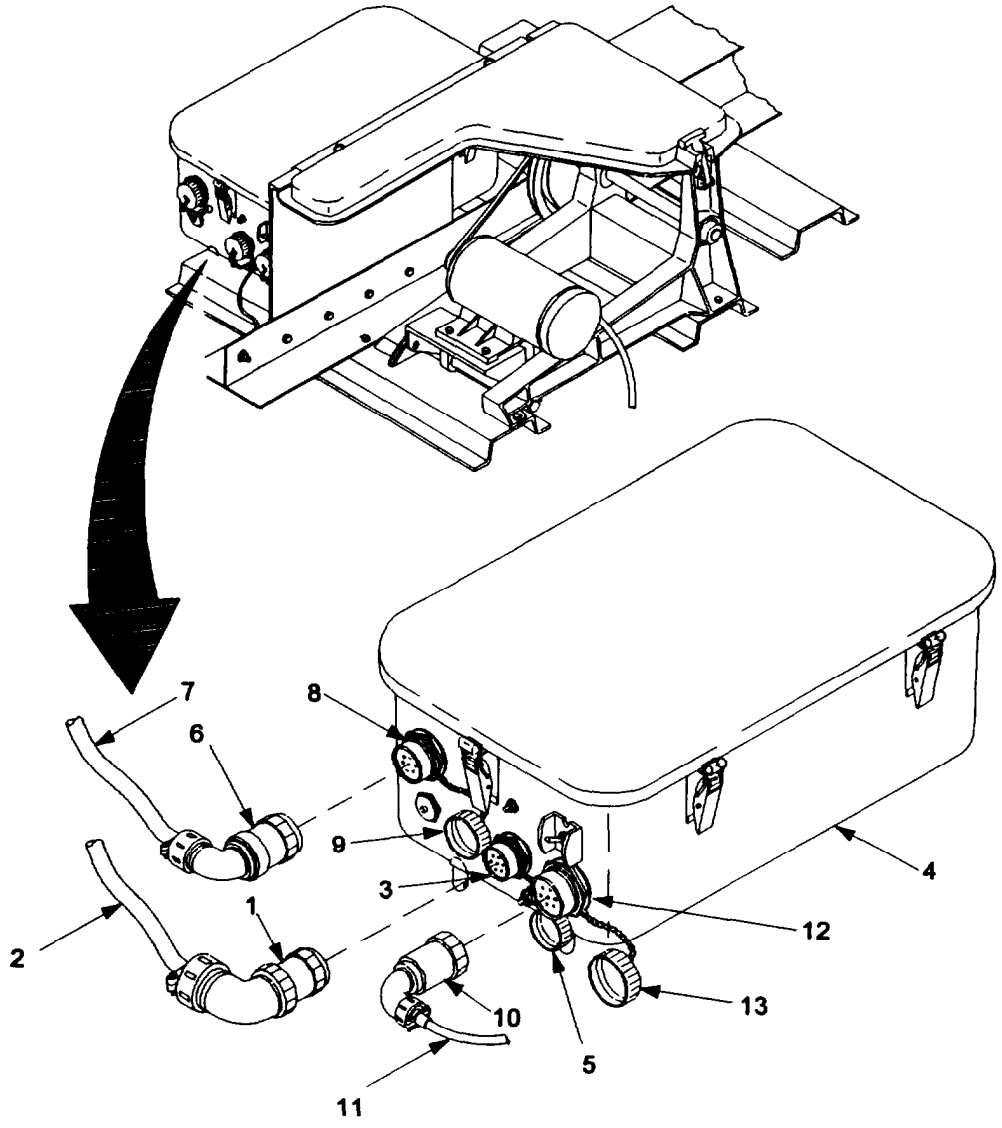
5-16 IMTC ELECTRONIC COMPONENTS ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

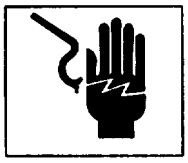
Materials/Parts:
IMTC electronic components assembly (11829457)

References:
Perform IMTC self-test (reference paragraph 2-4a).



a. Removal.

WARNING

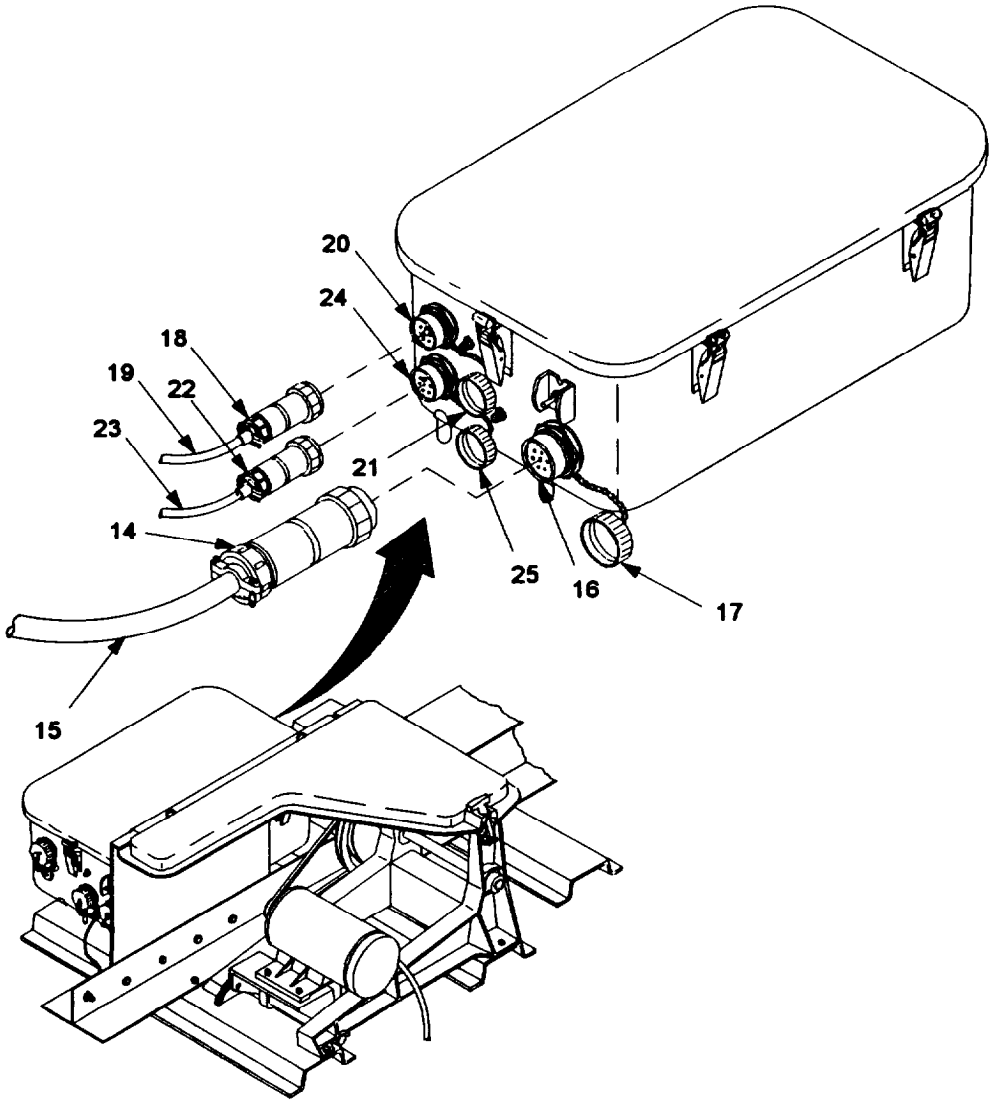


Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.



5-16 IMTC ELECTRONIC COMPONENTS ASSEMBLY REPLACEMENT - Continued.

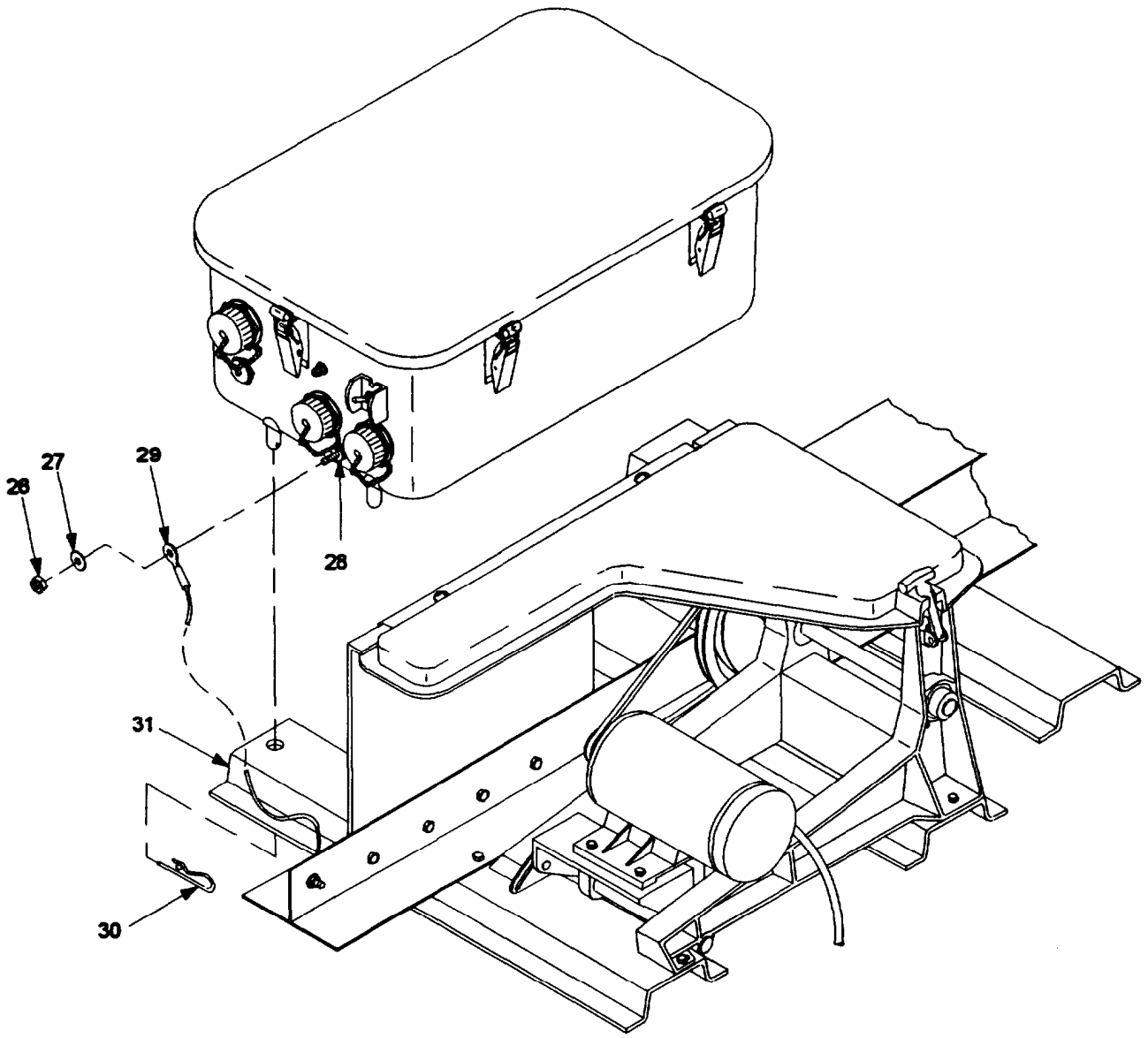
(4) Disconnect connector P1 (1) on cable assembly W102-2 (2) from connector J1 (3) on IMTC electronic components assembly (4).

(5) Install connector cover (5) on connector J1.

(6) Disconnect connector P1 (6) on cable assembly W101-2 (7) from connector J2 (8) on IMTC electronic components assembly.

(7) Install connector cover (9) on connector J2.

(8) Disconnect connector P1 (10) on cable assembly W115 (11) from connector J3 (12) on IMTC electronic components assembly.



(9) Install connector cover (13) on connector J3.

(10) Disconnect connector P1 (14) on cable assembly W103 (15) from connector J4 (16) on IMTC electronic components assembly.

(11) Install connector cover (17) on connector J4.

(12) Disconnect connector P1 (18) on cable assembly W104 (19) from connector J5 (20) on IMTC electronic components assembly.

(13) Install connector cover (21) on connector J5.

(14) Disconnect connector P1 (22) on cable assembly W105 (23) from connector J6 (24) on IMTC electronic components assembly.

(15) Install connector cover (25) on connector J6.

(16) Remove self-locking nut (26) and flatwasher (27) from bolt (28) at E4 on IMTC electronic components assembly.

(17) Disconnect bonding wire (29) from bolt at E4.

(18) Install flatwasher and self-locking nut on bolt at E4.

(19) Remove two lock pins (30) from legs on IMTC electronic components assembly.

(20) Lift and remove IMTC electronic components assembly from motor crossmember assemblies (31).

b. Installation.

(1) Position IMTC electronic components assembly (4) on motor crossmember assemblies (31).

(2) Install two lock pins (30) in legs on IMTC electronic components assembly.

(3) Remove self-locking nut (26) and flatwasher (27) from bolt (28) at E4 on IMTC electronic components assembly.

(4) Install bonding wire (29) on bolt at E4.

(5) Install flatwasher and new self-locking nut on bolt at E4.

(6) Remove connector cover (21) from connector J5 (20).

(7) Connect connector P1 (18) on cable assembly W104 (19) to connector J5 on IMTC electronic components assembly.

(8) Remove connector cover (25) from connector J6 (24).

(9) Connect connector P1 (22) on cable assembly W105 (23) to connector J6 on IMTC electronic components assembly.

5-16 IMTC ELECTRONIC COMPONENTS ASSEMBLY REPLACEMENT - Continued.

(10) Remove connector cover (17) from connector J4 (16).

(11) Connect connector P1 (14) on cable assembly W103 (15) to connector J4 on IMTC electronic components assembly.

(12) Remove connector cover (13) from connector J3 (12).

(13) Connect connector P1 (10) on cable assembly W115 (11) to connector J3 on IMTC electronic components assembly.

(14) Remove connector cover (9) from connector J2 (8).

(15) Connect connector P1 (6) on cable assembly W101-2 (7) to connector J2 on IMTC electronic components assembly.

(16) Remove connector cover (5) from connector J1 (3).

(17) Connect connector P1 (1) on cable assembly W102-2 (2) to connector J1 on IMTC electronic components assembly.

(18) Set circuit breaker on ITM to POWER ON.

(19) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(20) Set circuit breaker on ICB to ON.

(21) Perform IMTC self-test (reference paragraph 2-4a).

5-17 IMTC CONTROL LOGIC CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

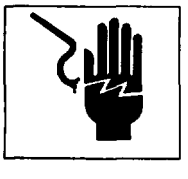
Materials/Parts:
Circuit card assembly (11829631)
Grease, aircraft and automotive (item 5, appendix D)

References:
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

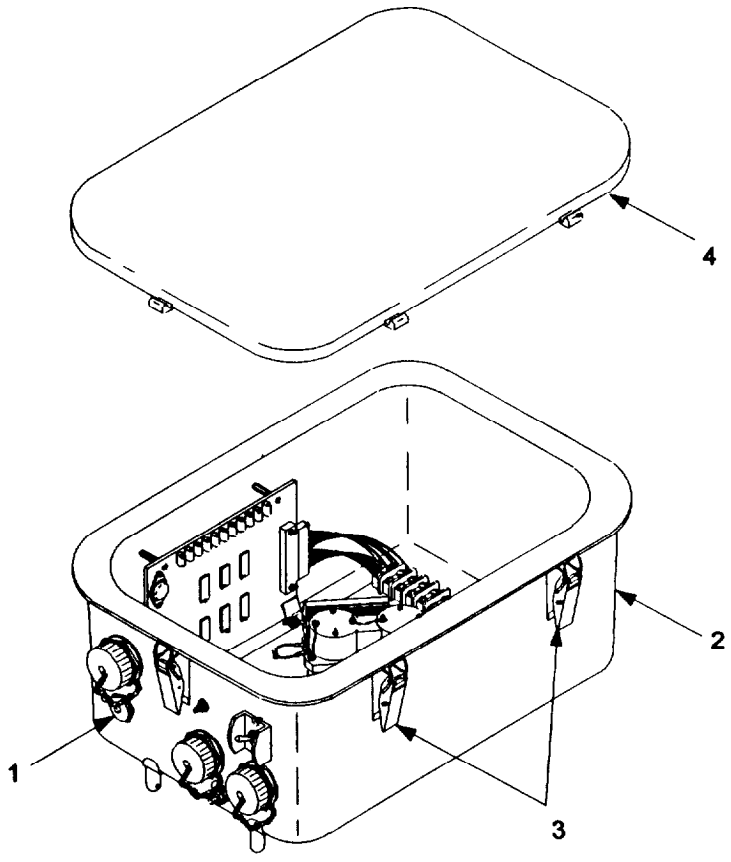
(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2).

(5) Unfasten latches (3) and remove cover assembly (4) from IMTC electronic components assembly housing.



CAUTION

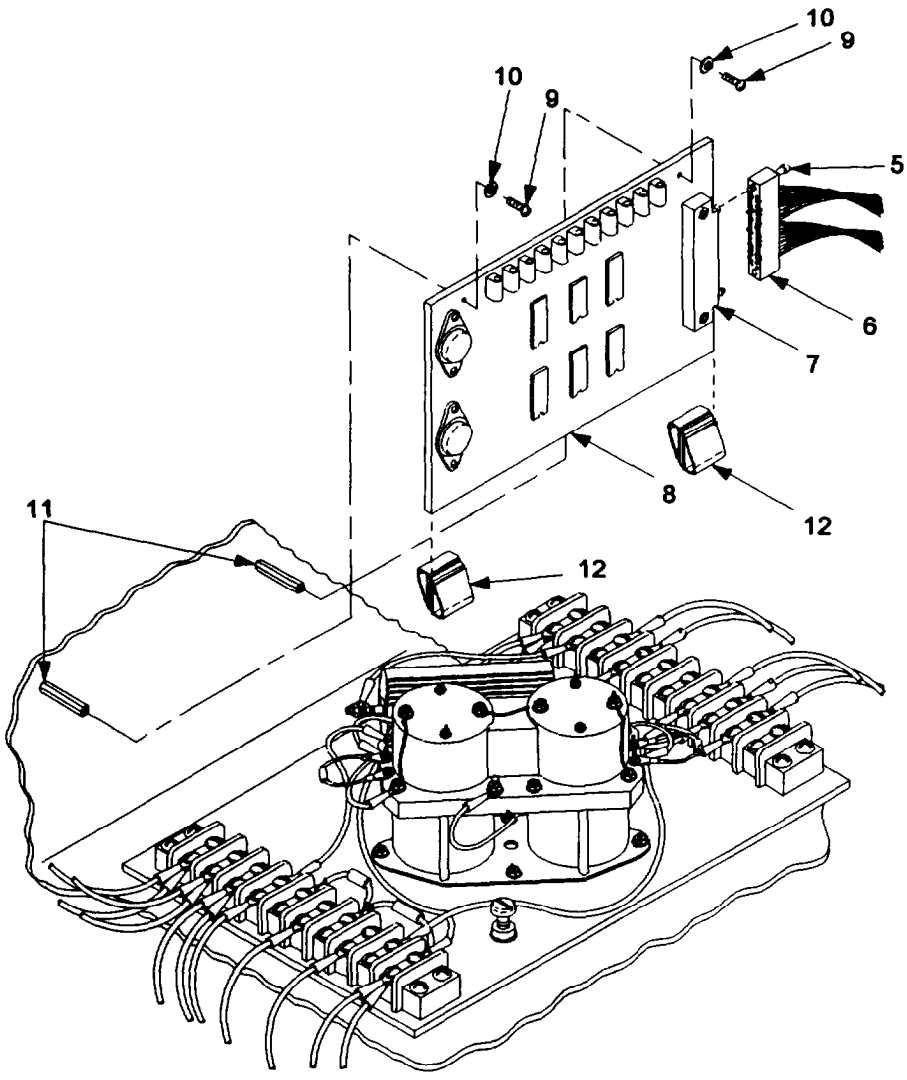
Ensure that mating surfaces of connector P1 on wiring harness and connector J1 on control logic CCA are evenly mated when connecting, tightening, or loosening lockscrews, or damage to contacts will result.

(6) Alternately loosen two lockscrews (5) on wiring harness connector P1 (6) and disconnect wiring harness connector P1 from connector J1 (7) on control logic CCA (8).

5-17 IMTC CONTROL LOGIC CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT - Continued.

(7) Remove two pan-head screws (9) and flatwashers (10) from standoffs (11) on side of IMTC electronic components assembly housing.

(8) Remove control logic CCA from clip assemblies (12) in bottom of IMTC electronic components assembly housing.



b. Installation.

(1) Install control logic CCA (8) in clip assemblies (12) on bottom of IMTC electronic components assembly housing (2).

(2) Install two flatwashers (10) and pan-head screws (9) in standoffs (11) on side of IMTC electronic components assembly housing.

CAUTION

Ensure that mating surfaces of connector P1 on wiring harness and connector J1 on control logic CCA are evenly mated when connecting, tightening, or loosening lockscrews, or damage to contacts will result.

(3) Connect wiring harness connector P1 (6) to connector J1 (7) on control logic CCA and alternately tighten two lockscrews (5).

(4) Apply thin coat of grease to entire gasket surface on IMTC electronic components assembly

(5) Position cover assembly (4) on IMTC electronic components assembly housing and fasten latches (3).

(6) Set circuit breaker on ITM to POWER ON.

(7) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(8) Set circuit breaker on ICB to ON.

(9) Perform IMTC self-test (reference paragraph 2-4a).

5-18 ELECTRIC RELAY PLATE ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Lockwasher (MS35338-137)
Electric relay plate (9353928)
Grease, aircraft and automotive (item 5, appendix D)

References:
Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).

References - Continued:
Install IMTC electronic components assembly (reference paragraph 5-16).
Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
IMTC electronic components assembly removed (reference paragraph 5-16).

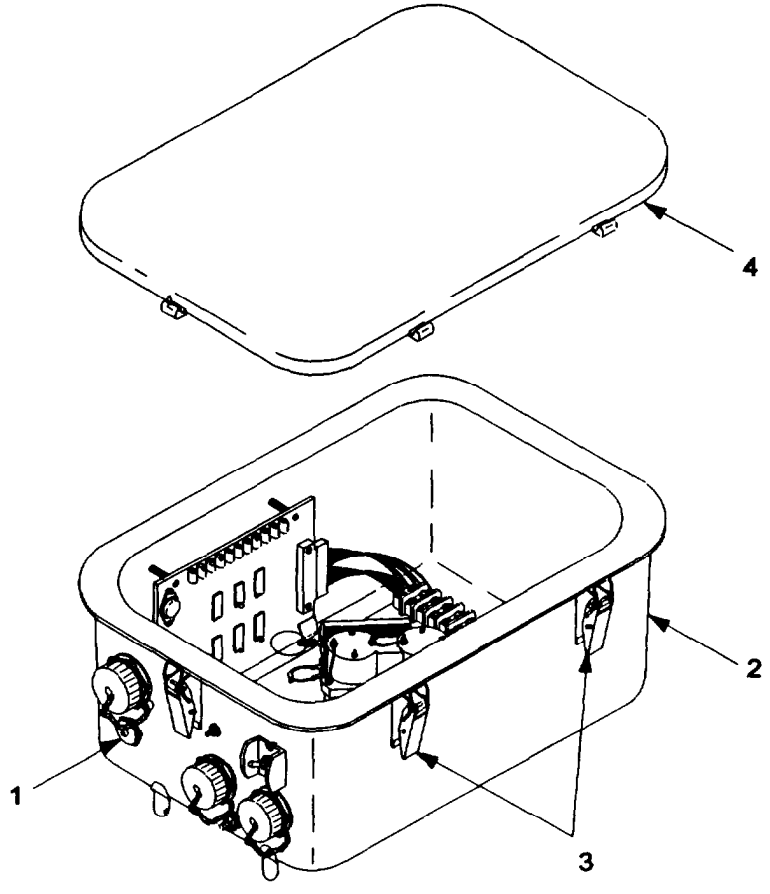
---

a. Removal.

(1) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2).

(2) Unfasten latches (3) and remove cover assembly (4) from IMTC electronic components assembly housing.

5-18 ELECTRIC RELAY PLATE ASSEMBLY REPLACEMENT - Continued.



NOTE

Tag wires before disconnecting from terminals to aid in installation.

(3) Refer to FO-1. Remove screws (5) and lockwashers (6) from appropriate terminals on terminal strip TB1 (7). Discard lockwashers.

(4) Disconnect appropriate wires (8) from terminals on terminal strip TB1.

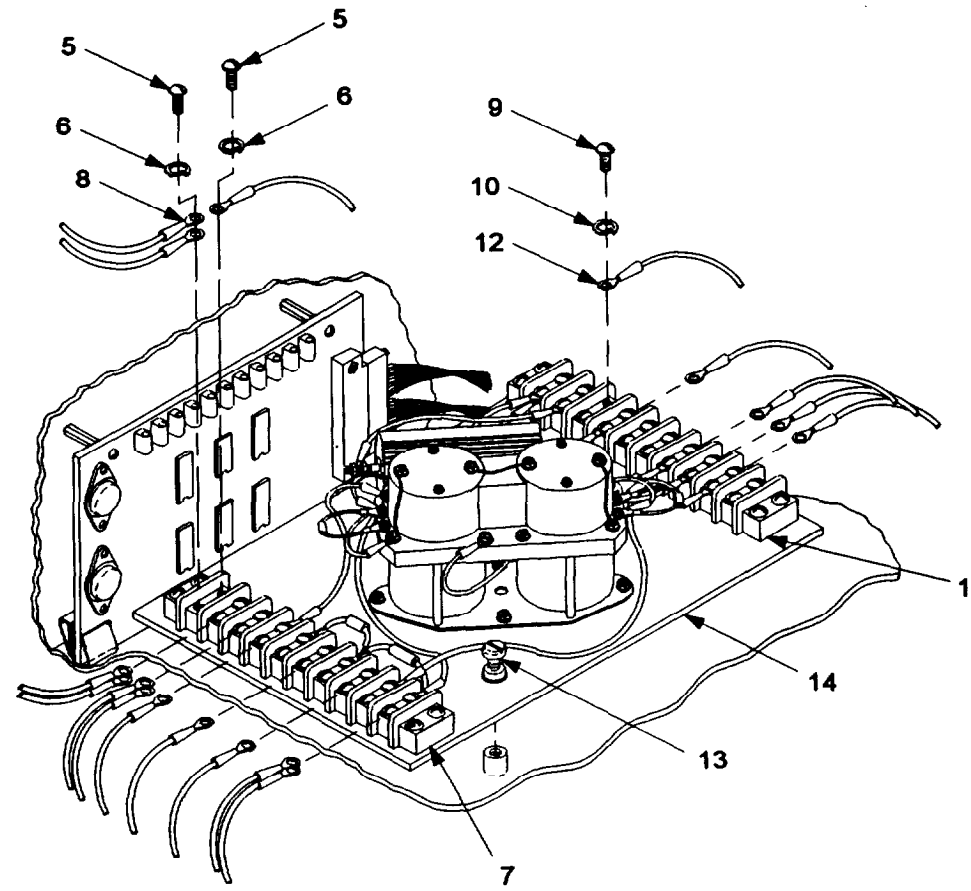
(5) Reinstall screws on appropriate terminals on terminal strip TB1.

(6) Remove screws (9) and lockwashers (10) from appropriate terminals on terminal strip TB2 (11). Discard lockwashers.

(7) Disconnect appropriate wires (12) from terminals on terminal strip TB2,

(8) Reinstall screws on appropriate terminals on terminal strip TB2.

(9) Loosen two captive screws (13) and remove electric relay plate assembly (14) from IMTC electronic components assembly housing.



b. Installation.

(1) Position electric relay plate assembly (14) in IMTC electronic components assembly housing (2) and tighten two captive screws (13).

(2) Remove screws (9) from appropriate terminals on terminal strip TB2 (11).

(3) Using tags as guide, connect wires (12) to appropriate terminals on terminal strip TB2. Remove tags from wires.

(4) Install screws and new lockwashers (10) on appropriate terminals on terminal strip TB2.

(5) Remove screws (5) from appropriate terminals on terminal strip TB1 (7).

(6) Using tags as guide, connect wires (8) to appropriate terminals on terminal strip TB1. Remove tags from wires.

(7) Install screws and new lockwashers (6) on appropriate terminals on terminal strip TB1.

(8) Apply thin coat of grease to entire gasket surface on IMTC electronic components assembly housing.

5-18 ELECTRIC RELAY PLATE ASSEMBLY REPLACEMENT - Continued.

(9) Position cover assembly (4) on IMTC electronic components assembly housing and fasten latches (3).

(10) Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).

(11) Install IMTC electronic components assembly (reference paragraph 5-16).

(12) Perform IMTC self-test (reference paragraph 2-4a).

5-19 RELAY K1 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Self-locking nut (MS21083C6)
Relay (9353777)

Equipment Conditions:
Electric relay plate assembly removed (reference paragraph 5-18).
Diode assembly jumper 9353927-1 removed (reference paragraph 5-20).
Diode assembly jumper 9353927-2 removed (reference paragraph 5-21).

References:
Install diode assembly jumper 9353927-2 (reference paragraph 5-21).
Install diode assembly jumper 9353927-1 (reference paragraph 5-20).
Install electric relay plate assembly (reference paragraph 5-22).
Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).
Install IMTC electronic components assembly (reference paragraph 5-16).
Perform IMTC self-test (reference paragraph 2-4a).

---

a. Removal.

NOTE

Check relay contacts for signs of burning or corrosion and clean as necessary prior to removal/replacement.

NOTE

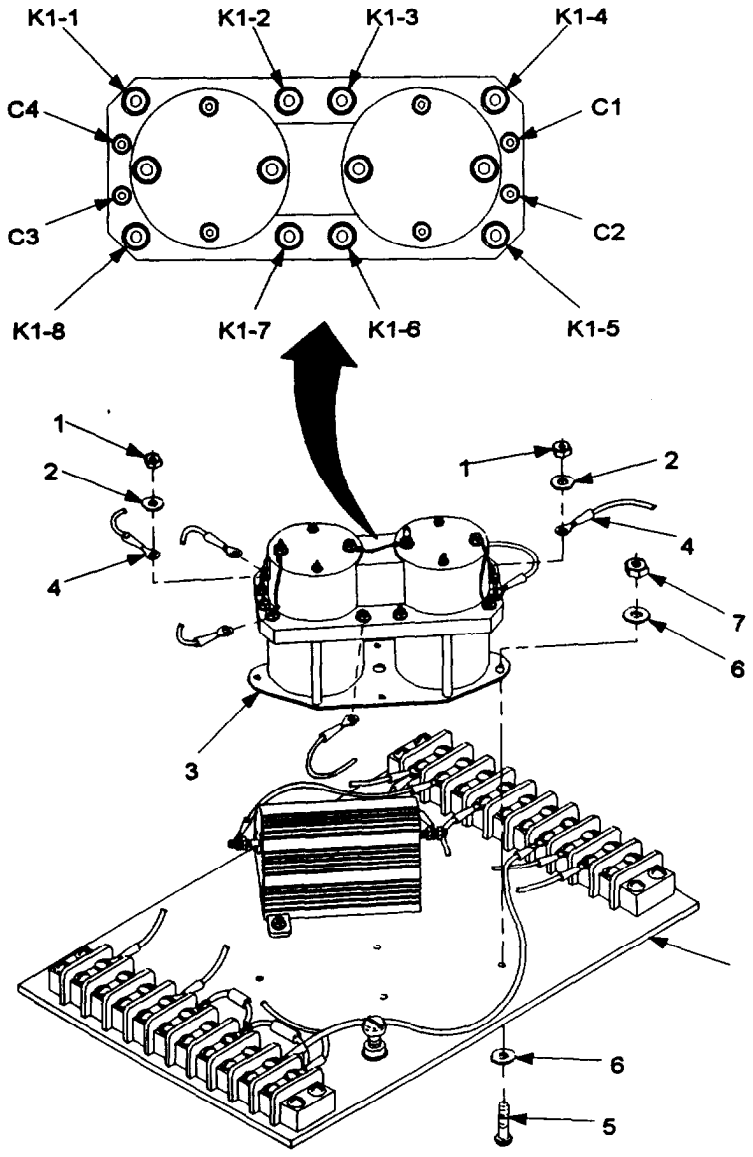
Tag wires before disconnecting from terminals to aid in installation.

(1) Refer to FO-1 and schematic of relay K1 that follows. Remove nuts (1) and washers (2) from appropriate terminals on relay K1 (3).

(2) Disconnect appropriate wires (4) from terminals on relay K1.

(3) Reinstall nuts and washers on appropriate terminals on relay K1.

(4) Remove four pan-head screws (5), eight flatwashers (6), and four self-locking nuts (7) and remove relay from electric relay plate assembly (8).



b. Installation.

(1) Position relay (3) on electric relay plate assembly (8) and install four pan-head screws (5), eight flatwashers (6), and four new self-locking nuts (7).

(2) Remove nuts (1) and washers (2) from appropriate terminals on relay K1.

(3) Using tags as guide, connect wires (4) to appropriate terminals on relay K1. Remove tags from wires.

(4) Install nuts and washers on appropriate terminals on relay K1.

5-19 RELAY K1 REPLACEMENT - Continued.

(5) Install diode assembly jumper 9353927-2 on relay (reference paragraph 5-21).

(6) Install diode assembly jumper 9353927-1 on relay (reference paragraph 5-20).

(7) Install electric relay plate assembly (reference paragraph 5-18).

(8) Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).

(9) Install IMTC electronic components assembly (reference paragraph 5-16).

(10) Perform IMTC self-test (reference paragraph 2-4a).

5-20 DIODE ASSEMBLY JUMPER (9353927-1) REPLACEMENT AND ASSEMBLY.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Hand terminal crimping tool (1008)
Soldering and desoldering set
Multimeter

Materials/Parts (Replacement):
Diode assembly jumper (9353927-1)
Grease, aircraft and automotive (item 5, appendix D)

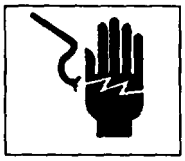
References:
Perform IMTC self-test (reference paragraph 2-4a).

Materials/Parts (Assembly):
Diode (JAN1N5417)
Terminal lug (MS77074-3)
Solder (item 17, appendix D)

---

a. Removal.

WARNING



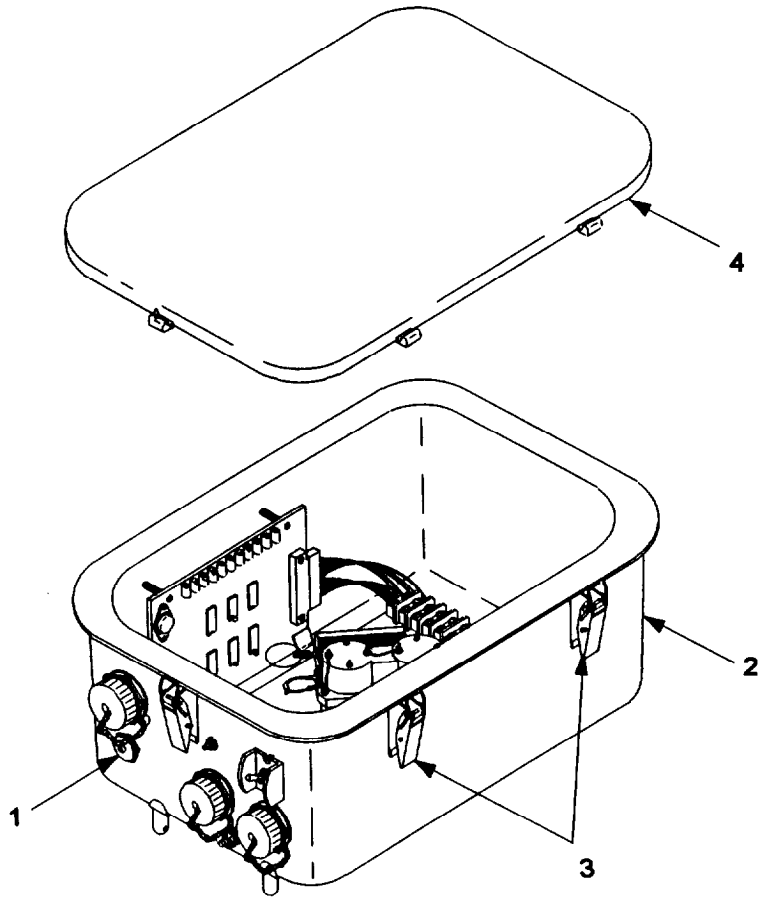
Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2)



(5) Unfasten latches (3) and remove cover assembly (4) from IMTC electronic components assembly housing.

(6) Remove two nuts (5) and washers (6) from terminals C3 (7) and C4 (8) on relay (9).

(7) Remove diode assembly jumper (10) from relay and discard.

b. Assembly.

NOTE

When assembled, diode assembly jumper should be 3 in. (7.6 cm) from eye to eye on terminal lugs.

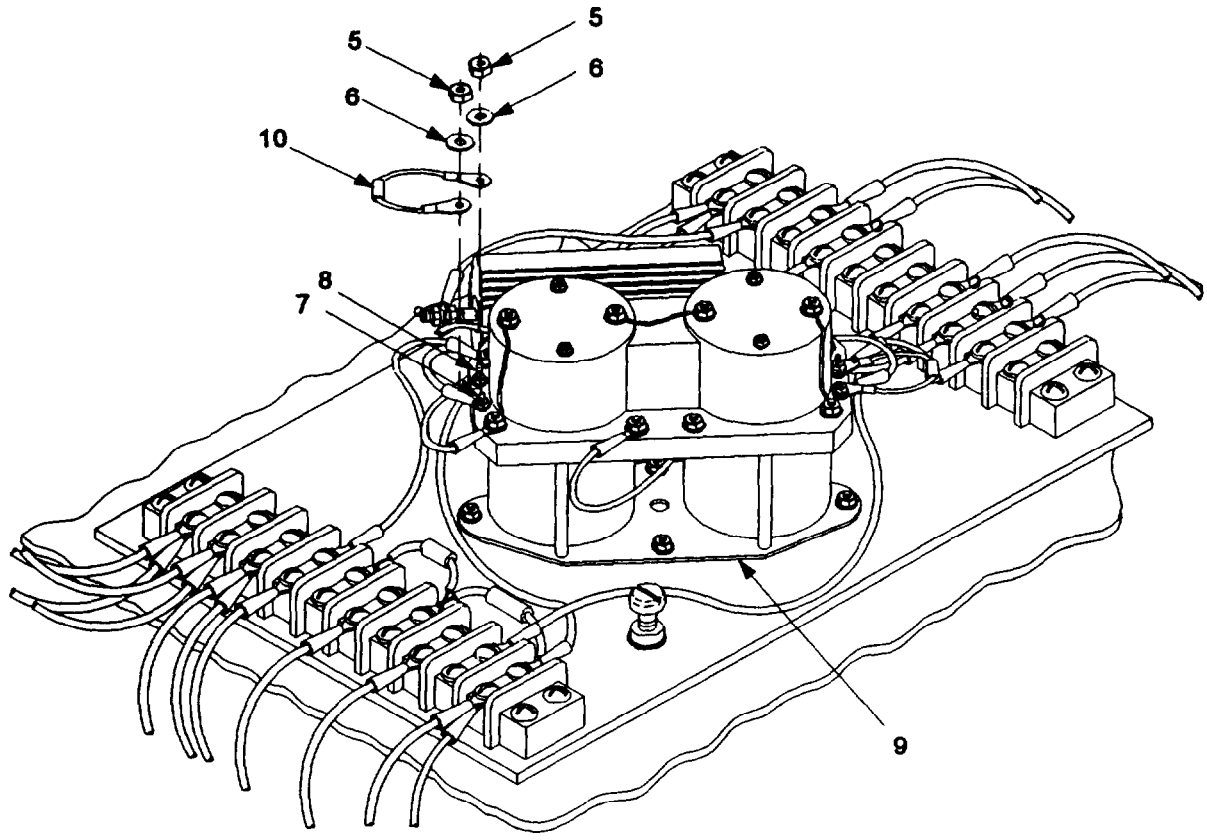
(1) Crimp terminal lugs (11) to both leads on diode (12).

(2) Solder exposed ends of diode leads to terminal lugs.

(3) Mark “K1C4” on end of diode assembly jumper that is closest to the symbol on the diode. Mark “K1C3” on remaining end of diode assembly jumper.

(4) Set multimeter to diode function and perform resistance check on diode assembly jumper.

5-20 DIODE ASSEMBLY JUMPER (9353927-1) REPLACEMENT AND ASSEMBLY - Continued.



c. Installation.

CAUTION

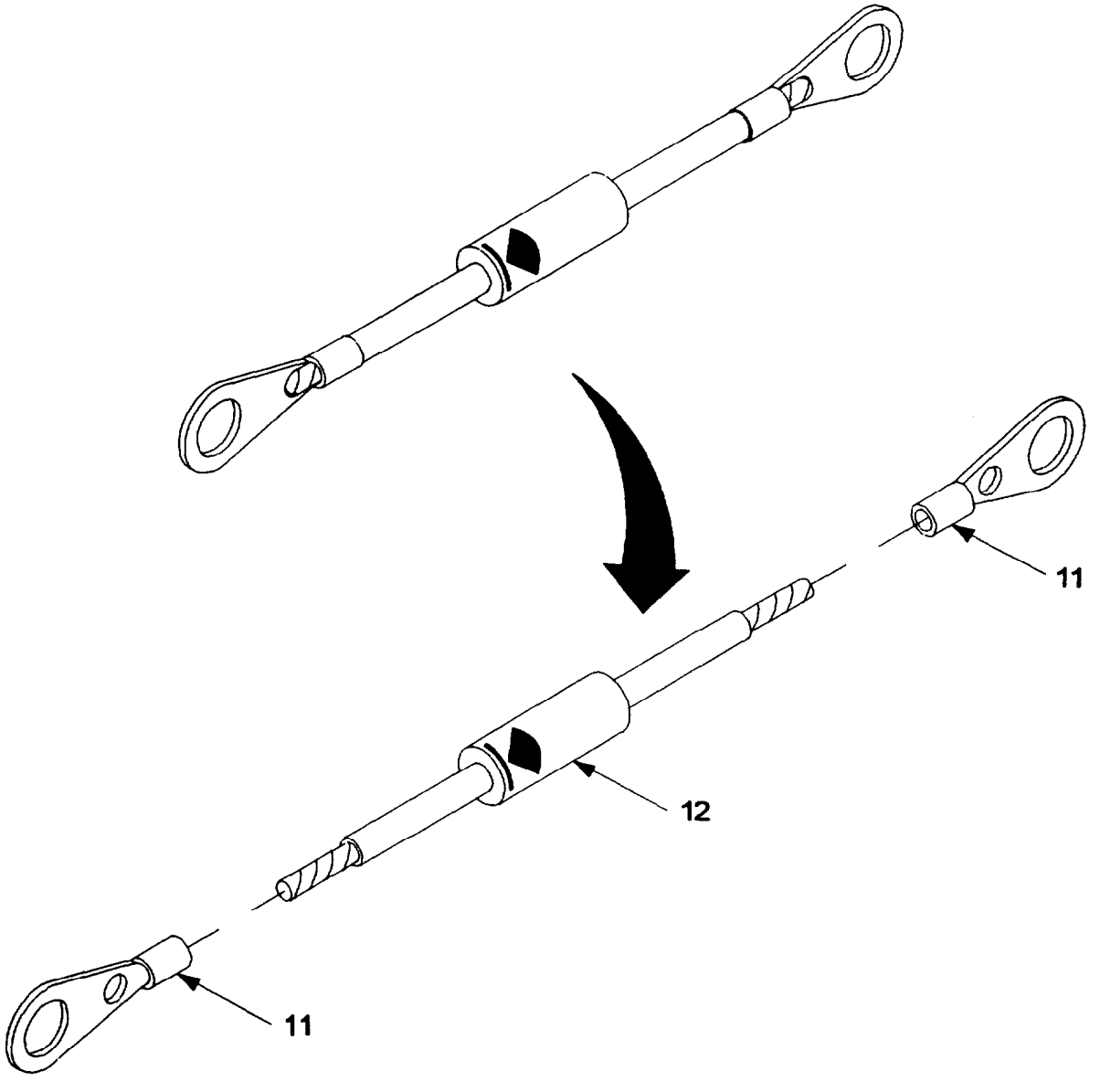
When installing diode assembly jumper on relay, ensure that the proper ends of the jumper are installed on the proper relay terminals, or damage to the relay could result during operation.

(1) Using markers on diode assembly jumper (10) as a guide, position diode assembly jumper on terminals C3 (7) and C4 (8) on relay (9).

(2) Install two nuts (5) and washers (6) on terminals C3 and C4.

(3) Apply thin coat of grease to entire gasket surface on IMTC electronic components assembly housing.

(4) Position cover assembly (4) on IMTC electronic components assembly housing (2) and fasten latches (3).



(5) Set circuit breaker on ITM to POWER ON.

(6) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(7) Set circuit breaker on ICB to ON.

(8) Perform IMTC self-test (reference paragraph 2-4a).

5-21 DIODE ASSEMBLY JUMPER (9353927-2) REPLACEMENT AND ASSEMBLY.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Hand terminal crimping tool (1006)
Soldering and desoldering set
Multimeter

Materials/Parts (Replacement):
Diode assembly jumper (9353927-2)
Grease, aircraft and automotive
(item 5, appendix D)

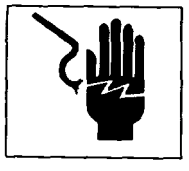
References:
Perform IMTC self-test
(reference paragraph 2-4a).

Materials/Parts (Assembly):
Diode (JAN1N5417h)
Terminal lug (MS77074-3)
Solder (item 17, appendix D)

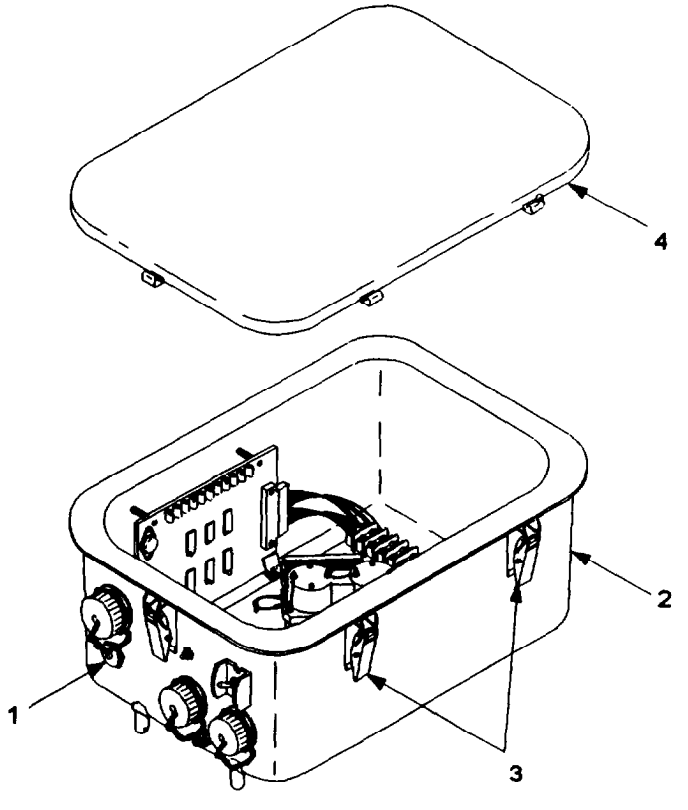
---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.



(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

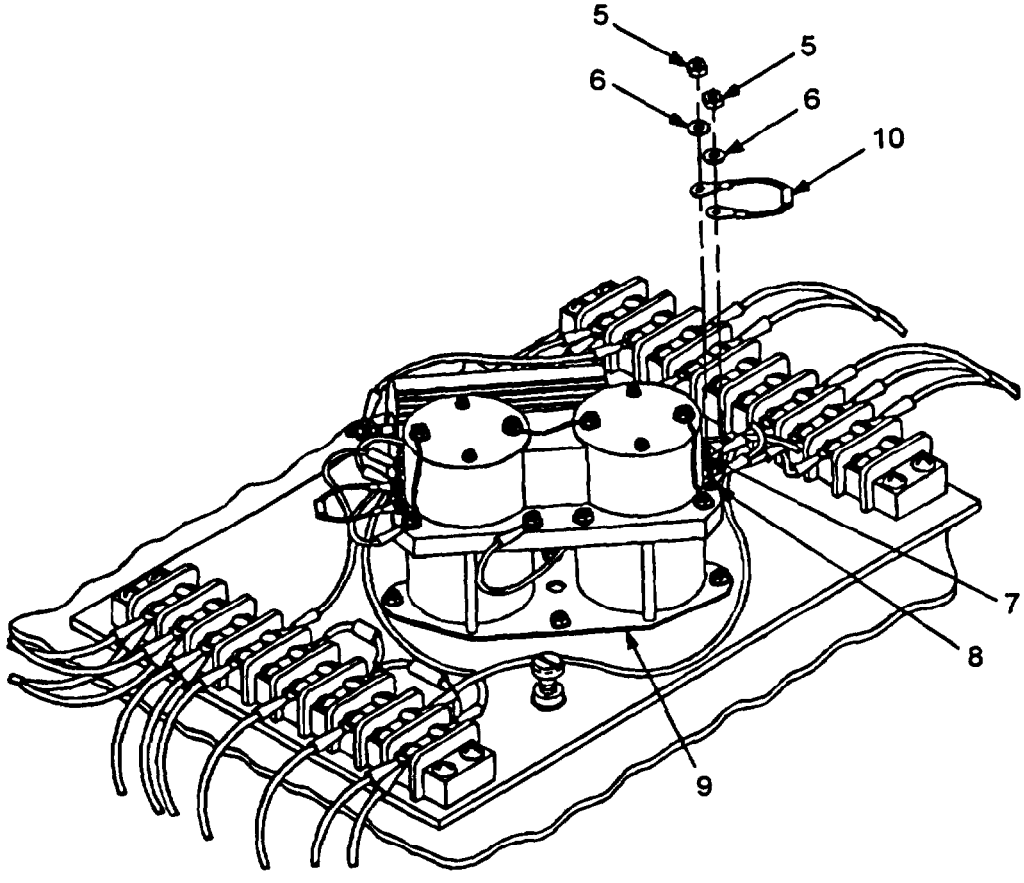
(3) Set circuit breaker on ITM to POWER OFF.

(4) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2).

(5) Unfasten latches (3) and remove cover assembly (4) from IMTC electronic components assembly housing.

(6) Remove two nuts (5) and washers (6) from terminals Cl (7) and C2 (8) on relay (9).

(7) Remove diode assembly jumper (10) from relay and discard.



b. Assembly.

NOTE

When assembled, diode assembly jumper should be 3 in. (7.6 cm) from eye to eye on terminal lugs.

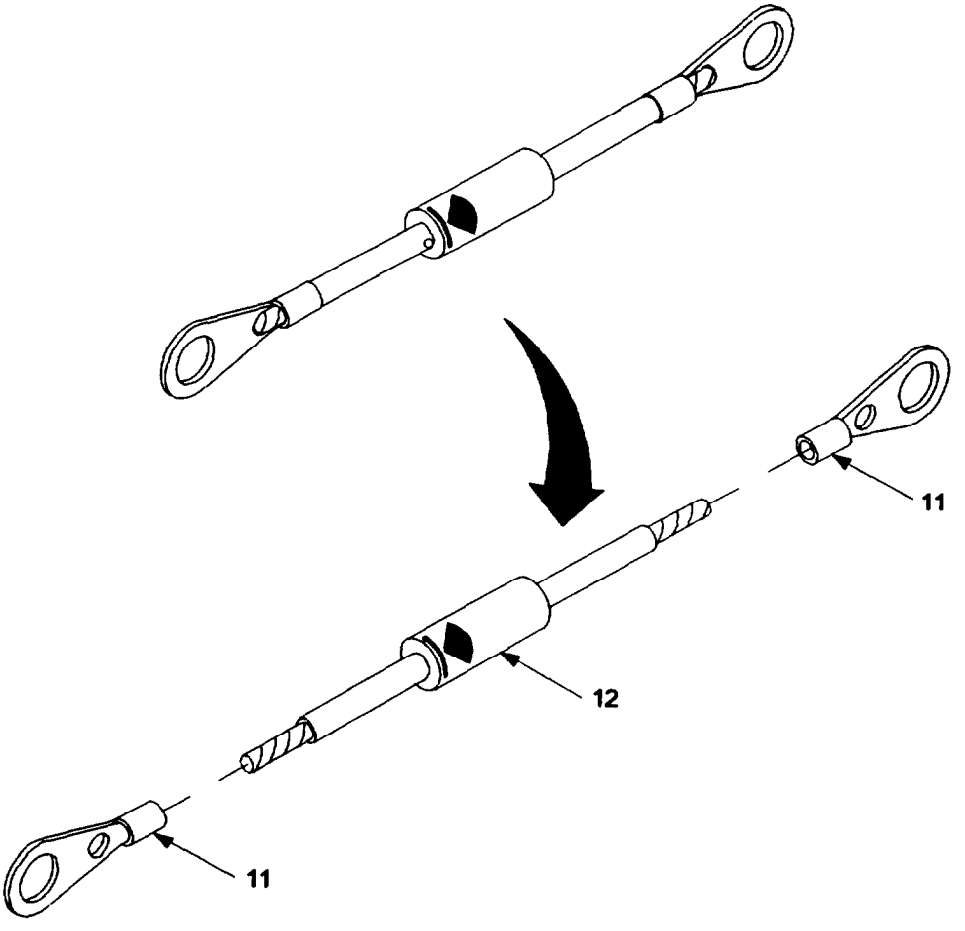
5-21 DIODE ASSEMBLY JUMPER (9353927-2) REPLACEMENT AND ASSEMBLY - Continued.

(1) Crimp terminal lugs (11) to both leads on diode (12).

(2) Solder exposed ends of diode leads to terminal lugs.

(3) Mark “K1C1” on end of diode assembly jumper that is closest to the symbol on the diode. Mark “K1C2” on remaining end of diode assembly jumper.

(4) Set multimeter to diode function and perform resistance check on diode assembly jumper.



c. Installation.

CAUTION

When installing diode assembly jumper on relay, ensure that the proper ends of the jumper are installed on the proper relay terminals, or damage to the relay could result during operation.

(1) Using markers on diode assembly jumper (10) as a guide, position diode assembly jumper on terminals C1 (7) and C2 (8) on relay (9).

(2) Install two nuts (5) and washers (6) on terminals C1 and C2.

(3) Apply thin coat of grease to entire gasket surface on IMTC electronic components assembly housing.

(4) Position cover assembly (4) on IMTC electronic components assembly housing (2) and fasten latches (3).

(5) Set circuit breaker on ITM to POWER ON.

(6) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(7) Set circuit breaker on ICB to ON.

(8) Perform IMTC self-test (reference paragraph 2-4).

5-22 RESISTOR ASSEMBLY (9354191) REPLACEMENT AND ASSEMBLY.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Soldering and desoldering set
Hand terminal crimping tool (1008)
Multimeter

Materials/Parts (Replacement):
Resistor assembly (9354191)

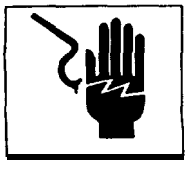
References:
Perform IMTC self-test (reference paragraph 2-4a).

Materials/Parts (Assembly):
Resistor (RWR-89-S10ROFR)
Terminal lug (MS77074-3)
Solder (item 17, appendix D)
Grease, aircraft and automotive (item 5, appendix D)

---

a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

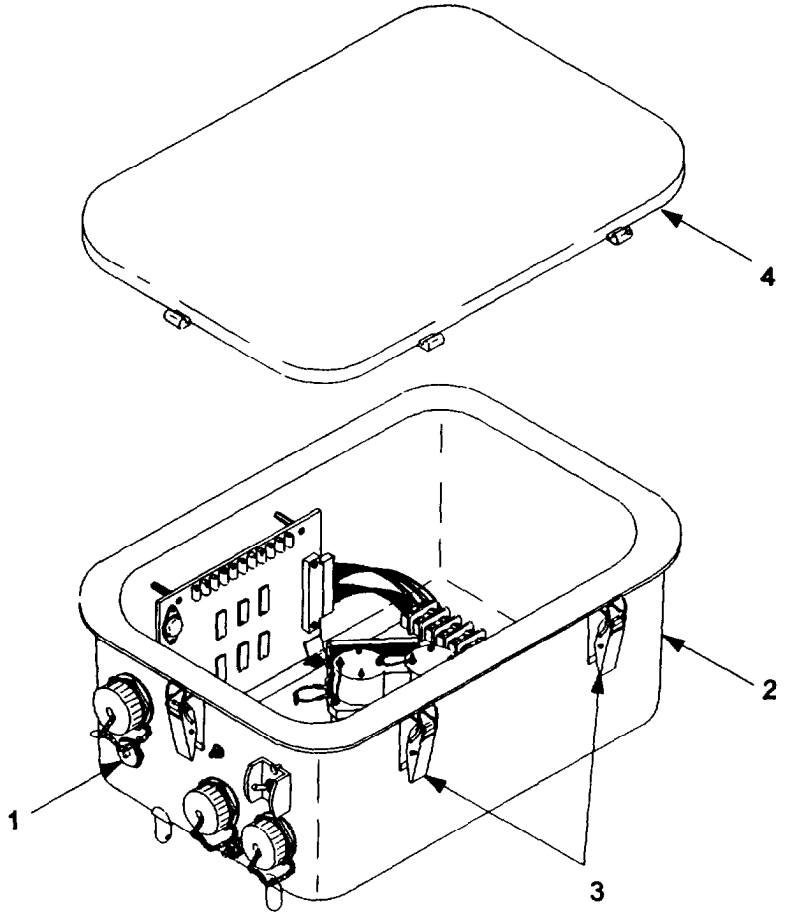
(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

5-22 RESISTOR ASSEMBLY (9354191) REPLACEMENT AND ASSEMBLY - Continued.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2).

(5) Unfasten latches (3) and remove cover assembly (4) from IMTC electronic components assembly housing.



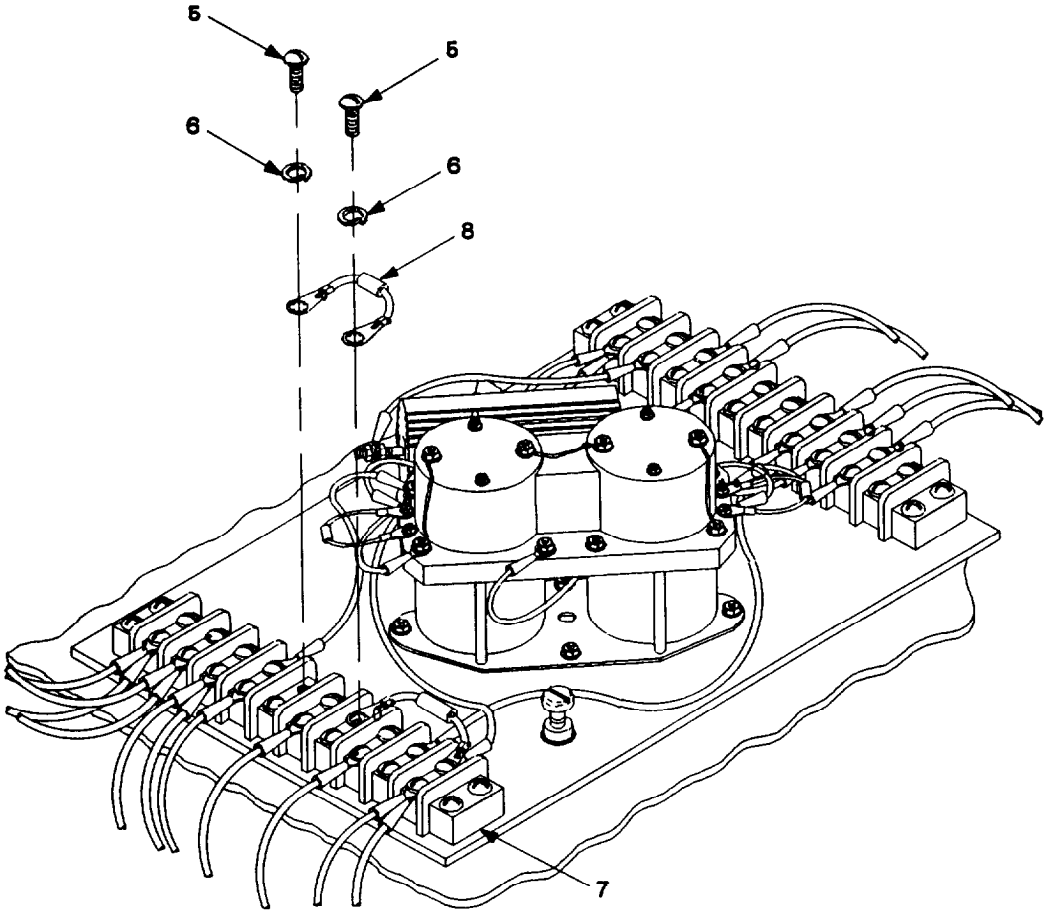
(6) Remove two screws (5) and lockwashers (6) from terminal board TB-2 (7).

(7) Remove resistor assembly (8) from terminal board TB-2.

b. Assembly.

NOTE

When assembled, leads on either side of the resistor should be 1.13 in. (2.87 cm).



(1) Crimp terminal lugs (9) to both leads on resistor (10).

(2) Solder exposed ends of resistor leads to terminal lugs.

(3) Mark "TB2-5" on one end of resistor assembly. Mark "TB2-7" on remaining end of resistor assembly.

(4) Set multimeter to ohms and perform continuity check on resistor assembly.

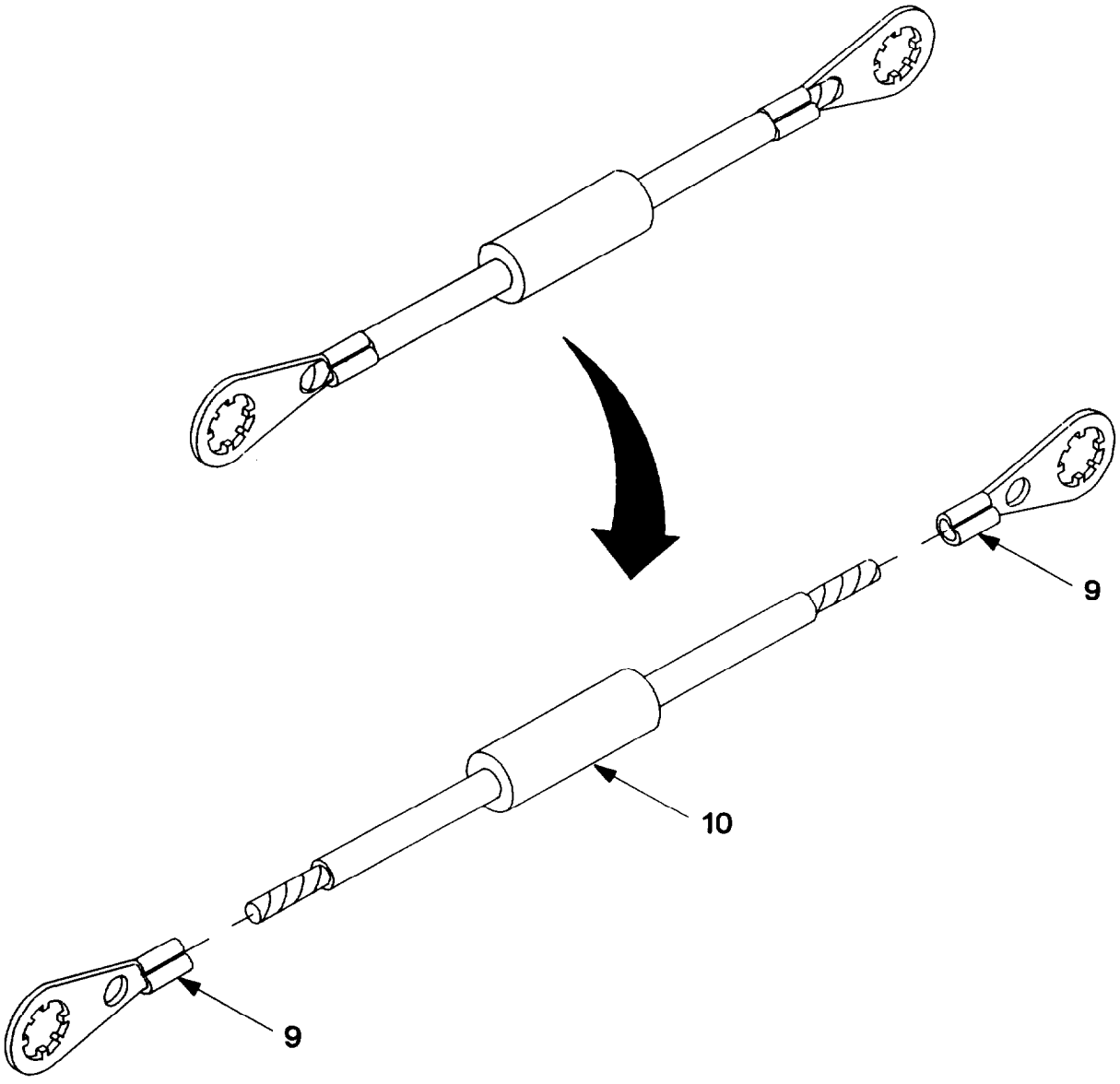
c. Installation.

(1) Using markers on resistor assembly (8) as a guide, position resistor assembly on terminal board TB-2 (7).

(2) Install two screws (5) and lockwashers (6) on terminal board TB-2.

(3) Apply thin coat of grease to entire gasket surface on IMTC electronic components assembly housing.

5-22 RESISTOR ASSEMBLY (99354191) REPLACEMENT AND ASSEMBLY - Continued.



(4) Position cover assembly (4) on IMTC electronic components assembly housing (2) and fasten latches (3).

(5) Set circuit breaker on ITM to POWER ON.

(6) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(7) Set circuit breaker on ICB to ON.

(8) Perform IMTC self-test (reference paragraph 2-4a).

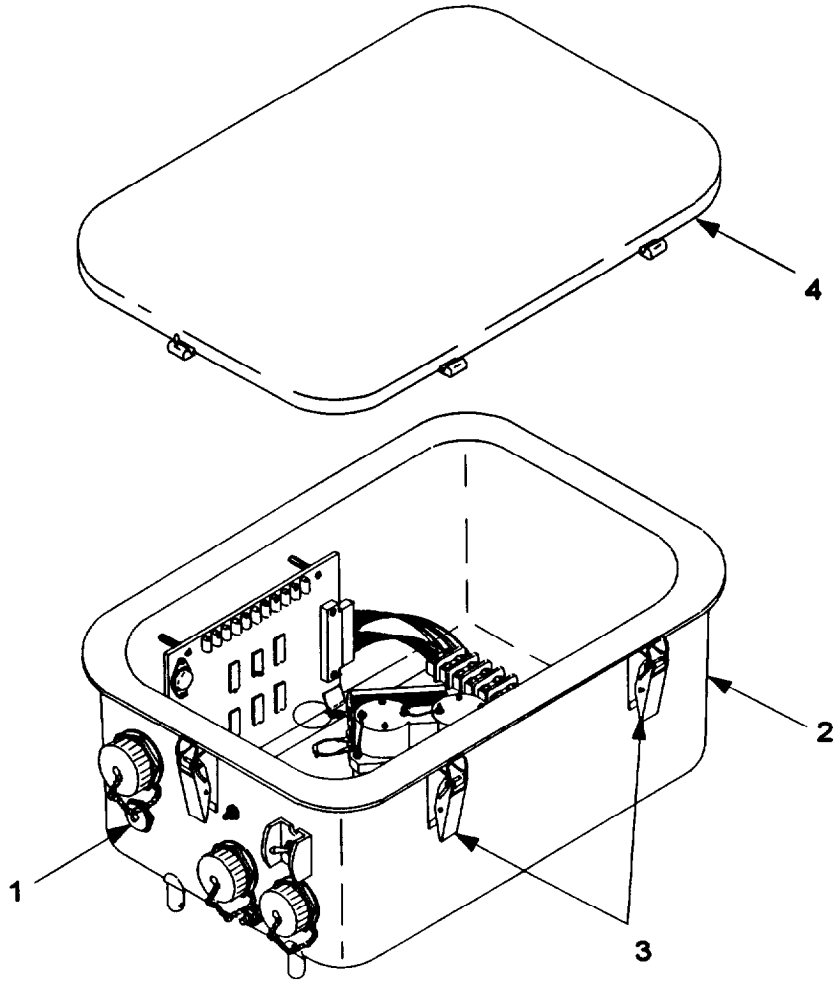
5-23 TRANSIENT SUPPRESSOR ASSEMBLY (93541864) REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Transient suppressor assembly (9354186-4)
Grease, aircraft and automotive
(item 3, appendix D)

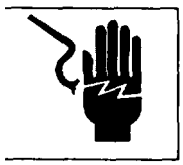
References:
Perform IMTC self-test
(reference paragraph 2-4a).



5-23 TRANSIENT SUPPRESSOR ASSEMBLY (9354186-4) REPLACEMENT - CONTINUED.

a. Removal.

WARNING



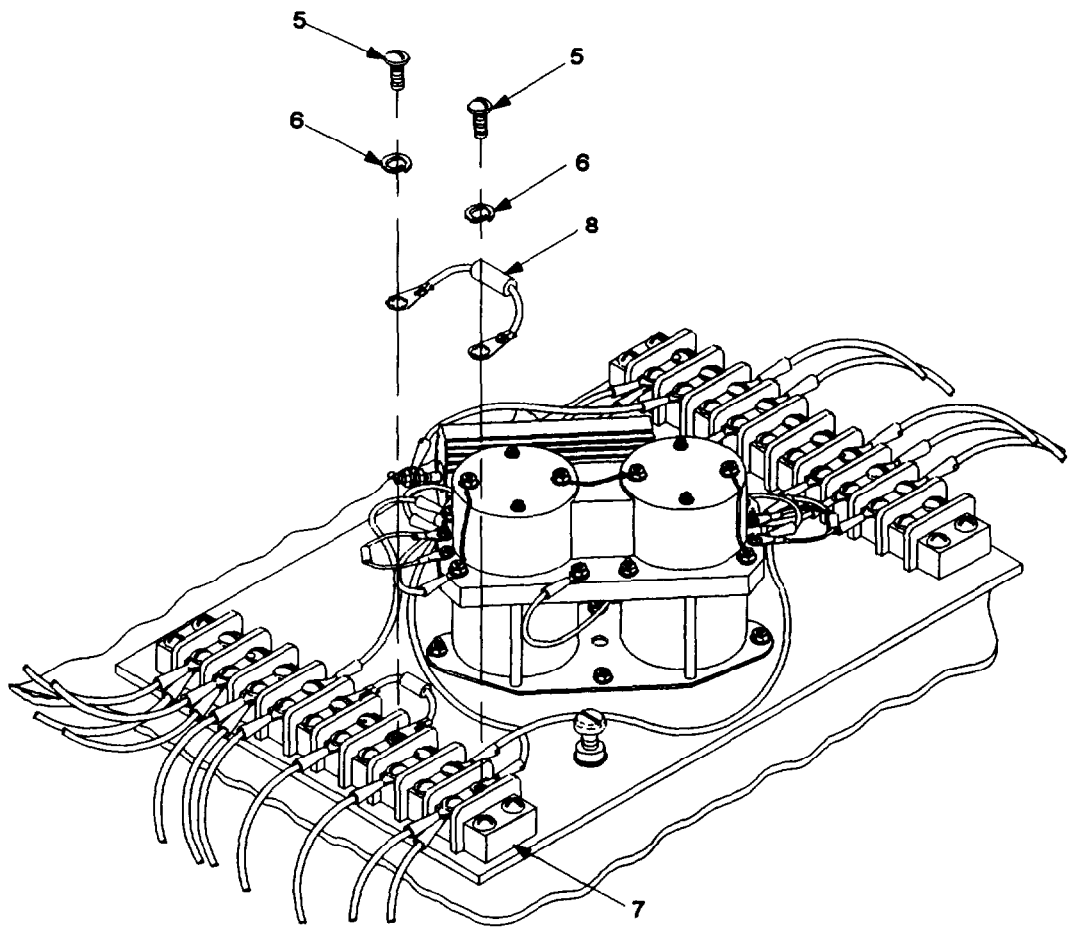
Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2).



(5) Unfasten latches (3) and remove cover assembly (4) from IMTC electronic components assembly housing.

(6) Remove two screws (5) and lockwashers (6) from terminal board TB-2 (7).

(7) Remove transient suppressor assembly (8) from terminal board TB-2.

b. Installation.

CAUTION

When installing transient suppressor assembly on terminal board TB-2, ensure that the proper ends of the assembly are installed on the proper terminals, or damage to the equipment could result during operation.

(1) Using markers on transient suppressor assembly (8) as a guide, position transient suppressor assembly on terminal board TB-2 (7).

(2) install two screws (5) and lockwashers (6) on terminal board TB-2.

(3) Apply thin coat of grease to entire gasket surface on IMTC electronic components assembly housing.

(4) Position cover assembly (4) on IMTC electronic components assembly housing (2) and fasten latches (3).

(5) Set circuit breaker on ITM to POWER ON.

(6) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(7) Set circuit breaker on ICB to ON.

(8) Perform IMTC self-test (reference paragraph 2-4a).

5-24 ASSEMBLY OF CIRCUIT BREAKER ASSEMBLY CB1.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Soldering and desoldering set
Electric gun-type heater
Hand terminal crimping tool (1006)
Multimeter

Materials/Parts:
Terminal lug (MS25036-153)
Circuit breaker assembly (9353924)
14 AWG red insulated wire (M16878/4BKE2)
Shrink tubing (M23053/5-106-0)
Solder (item 18, appendix D)

References:
Install circuit breaker assembly CB1 (reference paragraph D).

---

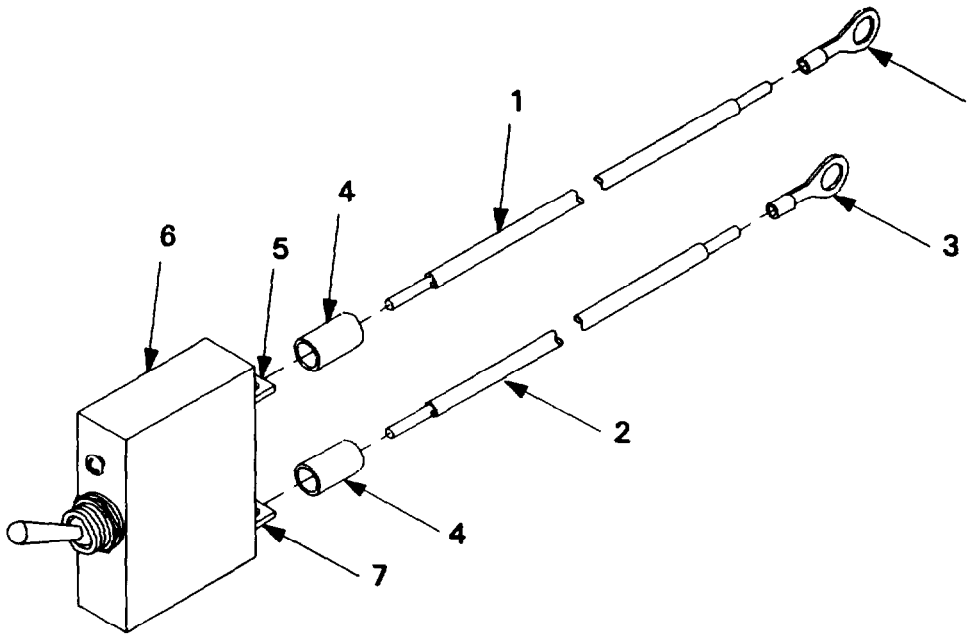
a. Assembly.

NOTE

The required overall length of the load lead Is 10.5 in (26.67 cm) when measured from the rear edge of the circuit breaker to the center of the eye on the terminal lug.

NOTE

The required overall length of the line lead Is 11.25 In (28.58 cm) when measured from the rear edge of the circuit breaker to the center of the eye on the termlnal lug.



(1) Cut 10-in (25.4 cm) length of 14 AWG red insulated wire (1) for load lead.

(2) Cut 10.75in (27.3 cm) length of 14 AWG red insulated wire (2) for line lead.

(3) Strip insulation on line and load leads 1/4 in (0.64 cm) from each end.

(4) Insert end of line lead into terminal lug (3) and crimp tight.

(5) Insert end of load lead into terminal lug and crimp tight.

(6) Install 1/2-in (1.27 cm) lengths of shrink tubing (4) on line and load leads.

NOTE

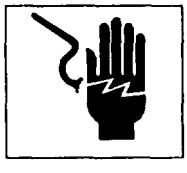
Load terminal on circuit breaker is located directly opposite mounting screw on front of circuit breaker.

(7) Connect load lead to load terminal (5) on circuit breaker (6) and solder connection in place.

(8) Connect line lead to line terminal (7) on circuit breaker and solder connection in place.

(9) Position shrink tubing over terminals and apply heat to activate tubing.

WARNING



When installing identification markers on leads, ensure that the correct identification marker is placed on the correct lead, or improper installation of circuit breaker assembly could occur, resulting in electrical shock and death or injury to personnel.

(10) Install identification marker that reads "TB2-1" on line lead.

(11) Install identification marker that reads “TB2-4” on load lead.

(12) Set multimeter to ohms and perform continuity check on circuit breaker assembly.

(13) Install circuit breaker assembly (reference paragraph 4-35).

5-25 WIRING HARNESS REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque wrench

References:
Install electric relay plate assembly (reference paragraph 5-18).
Install IMTC control logic CCA (reference paragraph 5-17).
Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).
Install IMTC electronic components assembly (reference paragraph 5-16).
Perform IMTC self-test (reference paragraph 2-4a).

Materials/Parts:
Lockwasher (MS35338-137)
Wiring harness (11829463)
Caulking compound (item 2, appendix D)
Sealing compound (item 12, appendix D)

Equipment Conditions:
IMTC electronic components assembly removed (reference paragraph 5-16).
IMTC control logic CCA removed (reference paragraph 5-17).
Electric relay plate assembly removed (reference paragraph 5-18).

---

a. Removal.

(1) Remove pan-head screw (1) and lockwasher (2) from standoff (3) at E3 on IMTC electronic components assembly housing (4). Discard lockwasher.

(2) Disconnect terminal lug on wiring harness ground wire (5) from standoff.

(3) Install pan-head screw on standoff at E3 on IMTC electronic components assembly housing.

(4) Remove connector cover (6) from connector J2 (7).

(5) Remove mounting bushing (8) and connector cover attaching ring (9) from connector J2.

(6) Pull connector J2 away from IMTC electronic components assembly housing.

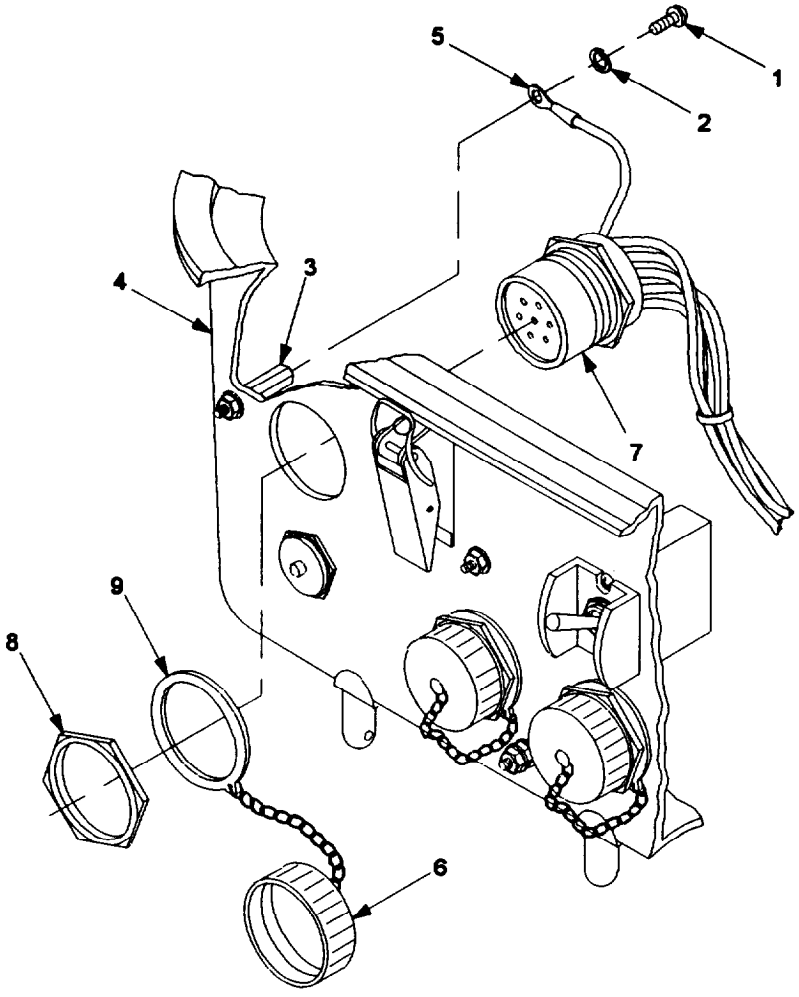
(7) Install mounting bushing on connector J2.

(8) Remove mounting bushing (10) from local switch SW1 (11).

(9) Remove switch guard (12) and pull local switch SW1 away from IMTC electronic components assembly housing.

(10) Install mounting bushing on local switch SW1.

(11) Remove pan-head screw (13) and lockwasher (14) from standoff (15) at E2 on IMTC electronic components assembly housing. Discard lockwasher.



(12) Disconnect terminal lug on wiring harness ground wire (16) from standoff.

(13) Install pan-head screw on standoff at E2 on IMTC electronic components assembly housing.

(14) Remove connector cover (17) from connector J4 (18).

(15) Remove mounting bushing (19) and connector cover attaching ring (20) from connector J4.

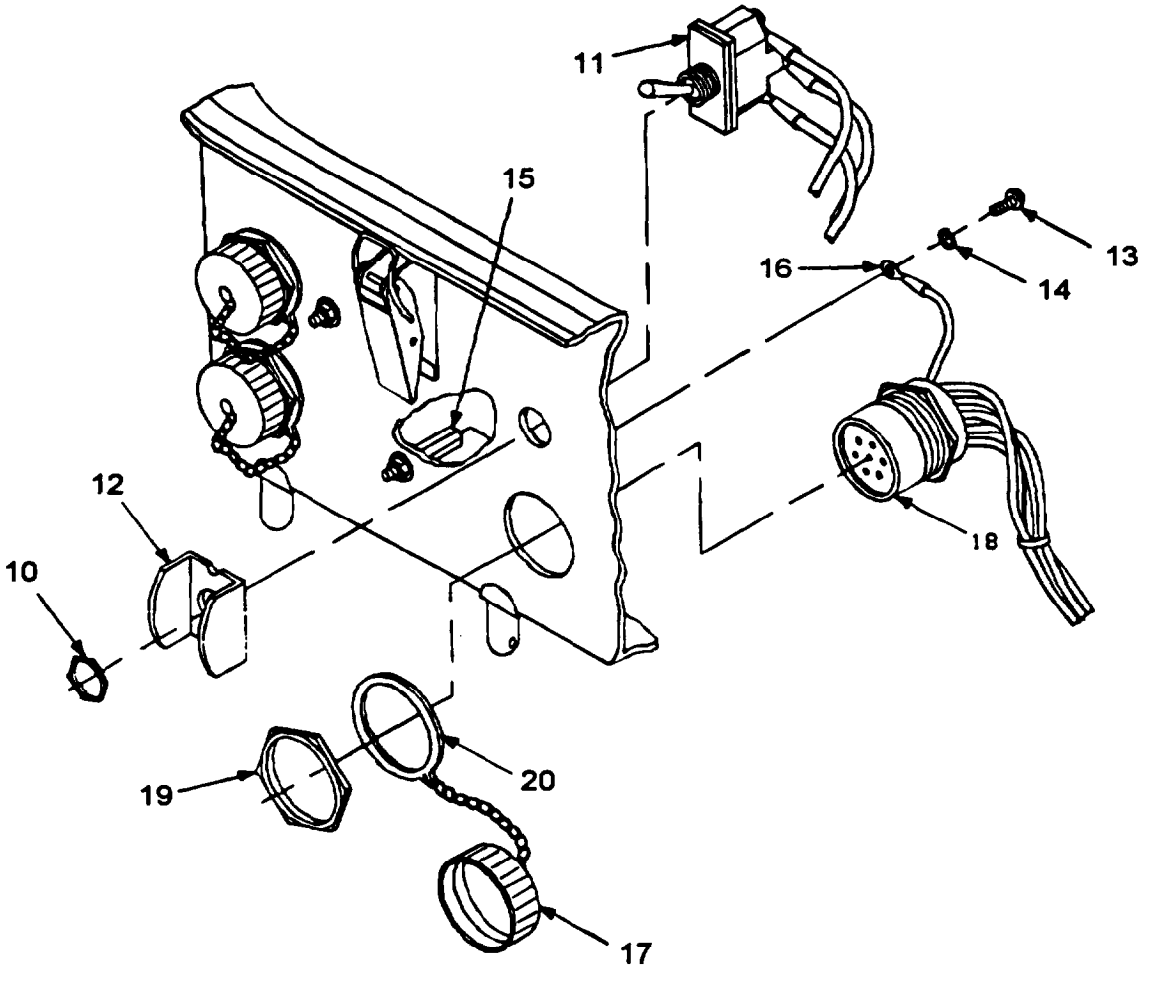
(16) Pull connector J4 away from IMTC electronic components assembly housing.

(17) Install mounting bushing on connector J4.

(18) Remove pan-head screw (21) and lockwasher (22) from standoff (23) at E1 on IMTC electronic components assembly housing. Discard lockwasher.

(19) Disconnect terminal lugs on wiring harness ground wires (24) from standoff.

5-25 WIRING HARNESS REPLACEMENT - Continued.



(20) Install pan-head screw on standoff at E1 on IMTC electronic components assembly housing.

(21) Remove connector cover (25) from connector J5 (26).

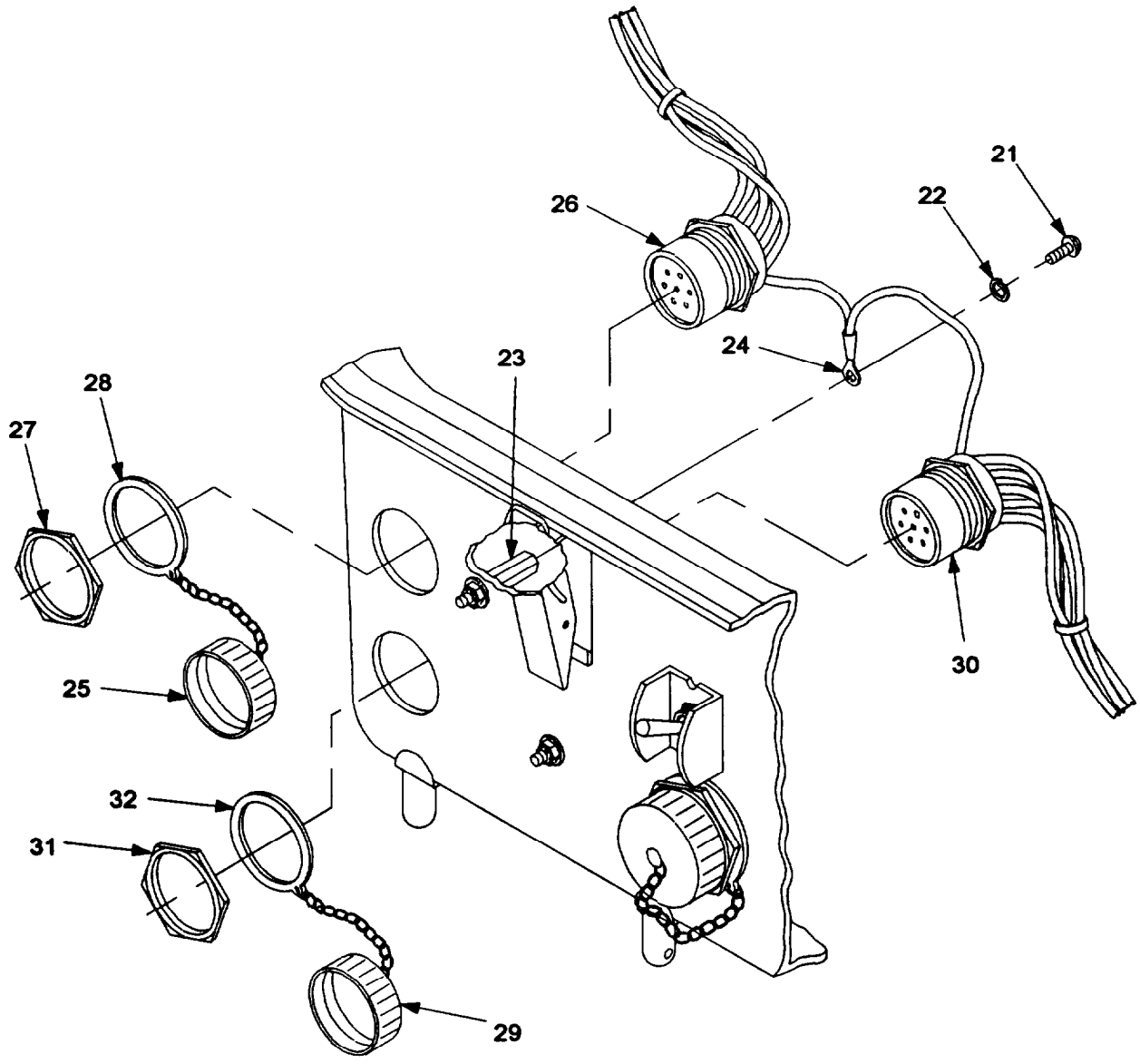
(22) Remove mounting bushing (27) and connector cover attaching ring (28) from connector J5.

(23) Pull connector J5 away from IMTC electronic components assembly housing.

(24) Install mounting bushing on connector J5.

(25) Remove connector cover (29) from connector J6 (30).

(26) Remove mounting bushing (31) and connector cover attaching ring (32) from connector J6.



(27) Pull connector J6 away from IMTC electronic components assembly housing.

(28) Install mounting bushing on connector J6.

(29) Remove wiring harness from IMTC electronic components assembly housing.

b. Installation.

(1) Position wiring harness in IMTC electronic components assembly housing (4).

(2) Remove mounting bushing (31) from connector J6(30).

5-25 WIRING HARNESS REPLACEMENT - Continued.

(3) Apply sealing compound to threads on connector J6.

(4) Position connector J6 in IMTC electronic components assembly housing.

(5) Install connector cover attaching ring (32) and mounting bushing on connector J6.

(6) Torque mounting bushing on connector J6 to 55-60 in-lbs (6.26-6.83 Newton-meters).

(7) Install connector cover (29) on connector J6.

(8) Remove mounting bushing (27) from connector J5 (26).

(9) Apply sealing compound to threads on connector J5.

(10) Position connector J5 in IMTC electronic components assembly housing.

(11) Install connector cover attaching ring (28) and mounting bushing on connector J5.

(12) Torque mounting bushing on connector J5 to 55-60 in-lbs (6.26-6.83 Newton-meters).

(13) Install connector cover (25) on connector J5.

(14) Remove pan-head screw (21) from standoff (23) at E1 on IMTC electronic components assembly housing.

(15) Connect terminal lug on wiring harness ground wires (24) to standoff.

(16) Install new lockwasher (22) and pan-head screw on standoff at E1 on IMTC electronic components assembly housing.

(17) Remove mounting bushing (1 9) from connector J4 (18).

(18) Apply sealing compound to threads on connector J4.

(19) Position connector J4 in IMTC electronic components assembly housing.

(20) Install connector cover attaching ring (20) and mounting bushing on connector J4.

(21) Torque mounting bushing on connector J4 to 100-110 in-lbs (11.38-12.51 Newton-meters).

(22) Install connector cover (17) on connector J4.

(23) Remove pan-head screw (13) from standoff (15) at E2 on IMTC electronic components assembly housing.

(24) Connect terminal lug on wiring harness ground wire (16) to standoff.

(25) Install new lockwasher (14) and pan-head screw on standoff at E2 on IMTC electronic components assembly housing.

(26) Remove mounting bushing (10) from local switch SW1 (11).

(27) Apply uniform thin coating of caulking compound to positioning washer and threads on local switch SW1.

(28) Position local switch SW1 in IMTC electronic components assembly housing.

(29) Position switch guard (12) on IMTC electronic components assembly housing and install mounting bushing on local switch SW1.

(30) Torque mounting bushing on local switch SW1 to 28-32 in-lbs (3.19-3.64 Newton-meters).

(31) Remove mounting bushing (8) from connector J2 (7).

(32) Apply sealing compound to threads on connector J2.

(33) Position connector J2 in IMTC electronic components assembly housing.

(34) Install connector cover attaching ring (9) and mounting bushing on connector J2.

(35) Torque mounting bushing on connector J2 to 90-95 in-lbs (10.24-10.81 Newton-meters).

(36) Install connector cover (8) on connector J2.

(37) Remove pan-head screw (1) from standoff (3) at E3 on IMTC electronic components assembly housing.

(38) Connect terminal lug on wiring harness ground wire (5) to standoff.

(39) Install new lockwasher (2) and pan-head screw on standoff at E3 on IMTC electronic components assembly housing.

(40) Install electric relay plate assembly (reference paragraph 5-18).

(41) Install IMTC control logic CCA (reference paragraph 5-17).

(42) Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).

(43) Install IMTC electronic components assembly (reference paragraph 5-16).

(44) Perform IMTC self-test (reference paragraph 2-4a).

5-26 ELECTRIC CONNECTOR REPLACEMENT.

INITIAL SETUP

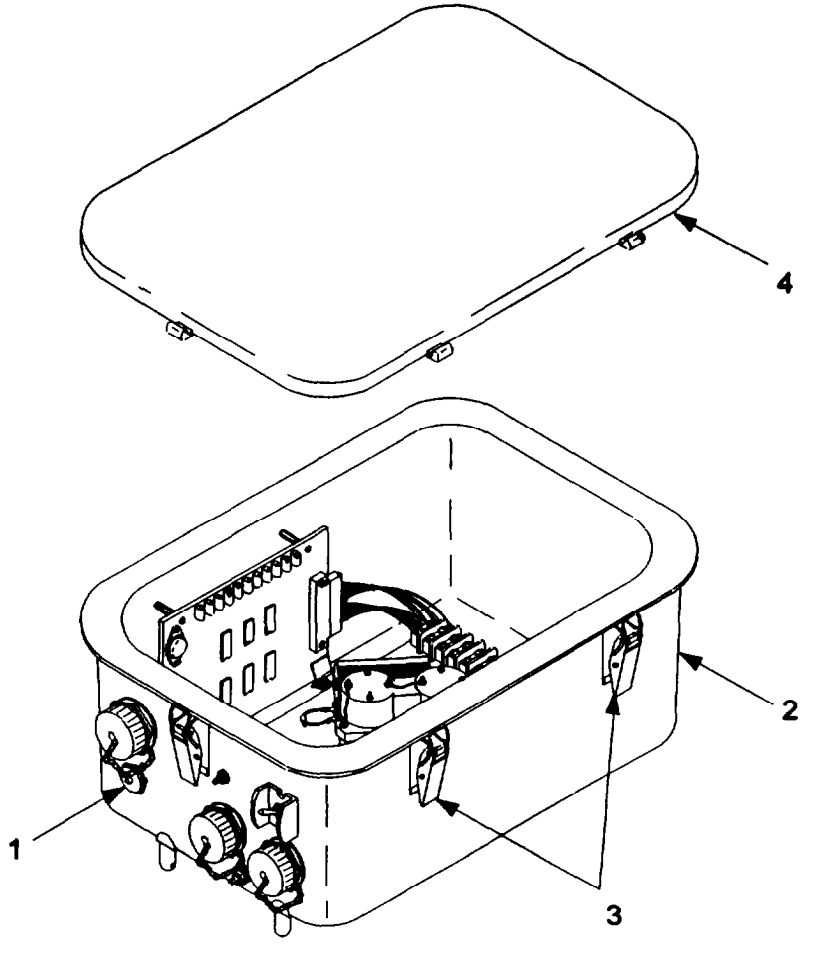
Tools and Special Tools:
- General mechanic's automotive tool kit
- Hand terminal crimping tool (11-3284-2) and turret
- Insertion/extraction tool (M81969/14-03)
- Insertion/extraction tool (M81969/14-04)
- Insertion/extraction tool (M81969/14-11)
- Torque wrench

Equipment Conditions:
- IMTC electronic components assembly removed (reference paragraph 5-16).

Materials/Parts:
- Lockwasher (MS35338-137)
- Connector J2 (MS3124E20-39S)

Materials/Parts - Continued.
- Connector J4 (MS3124E22-95S)
- Connector J5 or J6 (MS3124E1412S)
- Tie wraps (MS3367-4-9)
- Sealing compound (item 12, appendix D)
- Grease, aircraft and automotive (item 5, appendix D)

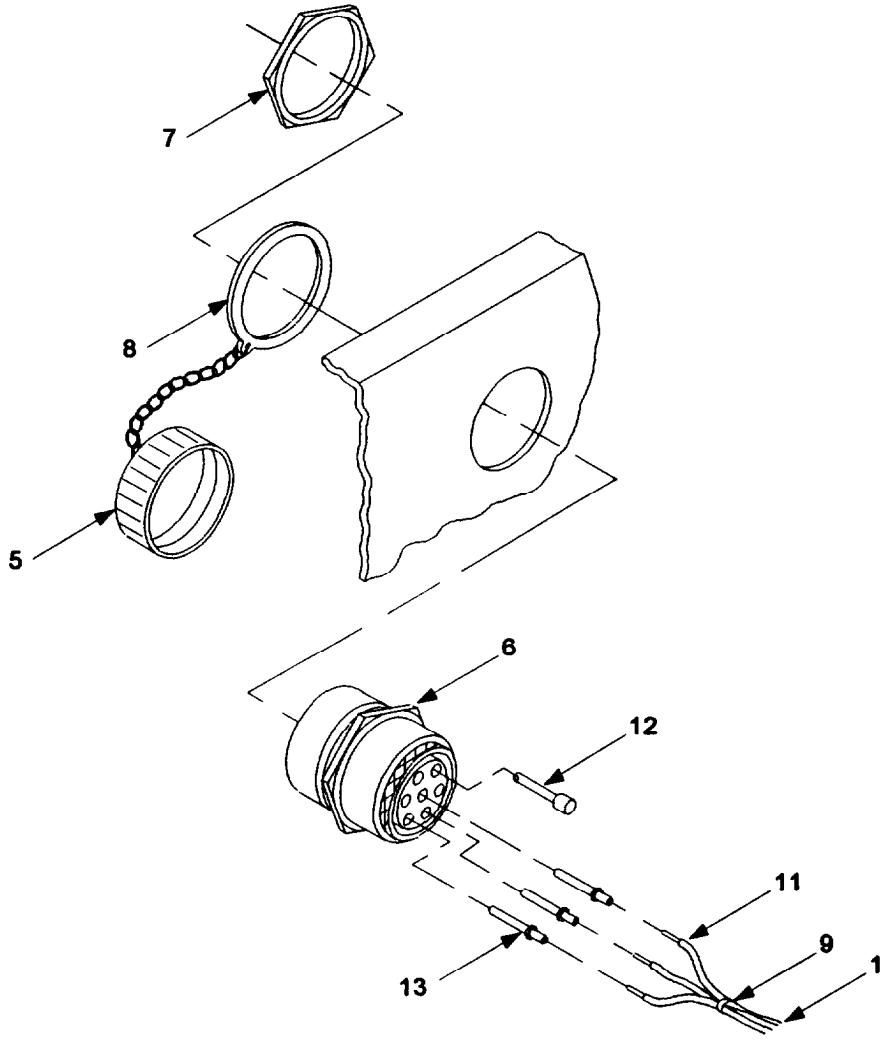
References:
- Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).
- Install IMTC electronic components assembly (reference paragraph 5-16).
- Perform IMTC self-test (reference paragraph 2-4a).



a. Removal.

NOTE

The following procedure applies to replacement of electric connectors J2, J4, J5, and J6 on the wiring harness.



(1) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2).

(2) Unfasten latches (3) and remove cover assembly (4) from IMTC electronic components assembly housing.

(3) Remove connector cover (5) from electric connector (6).

(4) Remove mounting bushing (7) and connector cover attaching ring (8) from electric connector.

5-26 ELECTRIC CONNECTOR REPLACEMENT - Continued.

(5) Pull electric connector away from IMTC electronic components assembly housing.

(6) Cut and discard sufficient number of tie wraps (9) from wiring harness (10) to allow enough slack in wires for replacement of electric connector.

(7) Tag wires (11) connected to electric connector.

(8) Cut wires as close as possible to electric connector, and remove electric connector.

(9) Remove sealing plugs (12) from electric connector.

b. Installation.

(1) Using tags on wires (11) as guide, match proper size contacts to wires. If replacing connector J2, refer to table 5-3. If replacing connector J4, refer to table 5-4. If replacing connector J5 or J6, refer to table 5-5. Each table lists contact sizes for sockets on the electric connector. If a socket has no entry under contact size in the table, then the socket is filled by a plug and no wire is connected to that socket.

Table 5-3. Contact/Plug Sizes for Connector J2.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
A	-	20
B	-	20
C	-	20
D	-	20
E	-	20
F	-	20
G	-	20
H	-	20
J	-	20
K	-	20
L	20	
M	-	20
N	-	20
P	-	20
R	-	20
S	-	20
T	-	20
U	-	20
V	-	20
W	-	20

Table 5-3. Contact/Plug Sizes for Connector J2 - Continued.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
X	20	-
Y	20	-
Z	20	-
a	-	20
b	20	-
c	20	-
d	20	-
e	20	-
f	20	-
g	20	-
h	20	-
i	20	-
j	20	-
k	-	20
m	-	16
n	-	20
p	-	20
q	-	20
r	-	16

Table 5-4. Contact/Plug Sizes for Connector J4.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
A	20	-
B	20	-
C	20	-
D	20	-
E	20	-
F	20	-
G	20	-
H	-	20
J	20	-
K	20	-
L	20	-
M	20	-

5-26 ELECTRIC CONNECTOR REPLACEMENT - Continued.

Table 5-4. Contact/Plug Sizes for Connector J4 - Continued.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
N	20	-
P	-	20
Q	20	-
R	20	-
S	20	-
T	20	-
U	-	20
V	20	-
W	20	-
X	20	-
Y	-	20
Z	20	-
a	12	-
b	-	20
c	12	-
d	-	20
e	12	-
f	-	20
g	12	-
h	20	-
i	-	20

Table 5-5. Contact/Plug Sizes for Connectors J5 and J6.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
A	-	20
B	20	-
C	20	-
D	20	-
E	20	-
F	-	20
G	-	20
H	-	20

Table 5-5. Contact/Plug Sizes for Connectors J5 and J6 - Continued.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
J	-	16
K	-	16
L	-	16
M	-	16

(2) Refer to table 5-6 and strip outer insulation on wires according to contact size.

Table 5-6. Contact/wire Installation Guide.

CONTACT SIZE	FITS ON AWG WIRE SIZES	STRIP OUTER INSULATION ON WIRE
#12	12 or 14	9/32 in (0.71 cm) from end
#16	18 or 20	9/32 in (0.71 cm) from end
#20	20, 22, or 24	3/16 in (0.48 cm) from end

(3) Insert wire into end of contact (13). When wire is inserted, wire insulation must butt against rear of contact, and wire must be visible through inspection hole.

(4) Match color of contact with color of locator on crimp tool and insert contact and wire into jaws on crimp tool.

(5) While maintaining slight insertion pressure on wire, squeeze handles on crimp tool firmly together until ratchet releases and allows handles to expand. (Otherwise, contact cannot be extracted from tool jaws.)

(6) Repeat steps (3) through (5) and install proper size contacts on remaining wires.

NOTE

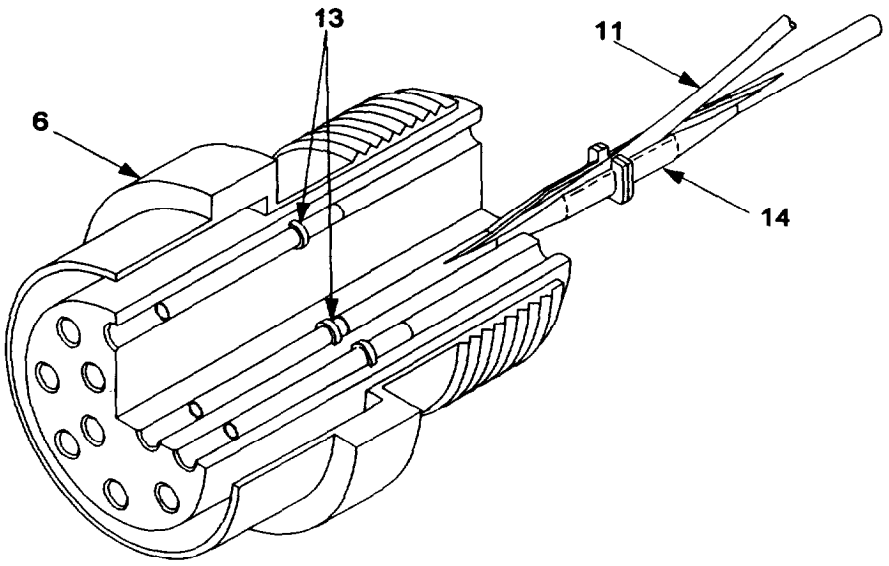
To aid in contact insertion, a 6-in (15.24 cm) minimum of free wire is recommended.

NOTE

when installing contact size #12, use insertion/extraction tool.
When installing contact size #16, use insertion/extraction tool.
when installing contact size #20, use insertion/extraction tool.

(7) Place wire (attached to contact being installed) into insertion/extraction tool (14) at large opening on colored end of tool.

5-26 ELECTRIC CONNECTOR REPLACEMENT - Continued.



(8) Slide back tool on wire while holding thumb against wire at opening. Wire will slip into tool.

CAUTION

When installing contact in socket on electric connector, do not use excessive pressure. Install contact with firm, even pressure to avoid damaging contact or socket on electric connector.

(9) With tool pressed against shoulder of contact, use tags as a guide and insert wired contact into proper socket at rear of electric connector. When contact bottoms, a slight crack can be heard as tines of metal retaining clip snaps into place behind contact shoulder.

(10) Withdraw tool from rear of electric connector. To be sure contact is locked, pull back lightly on wire. Then remove tool from wire.

(11) Repeat steps (7) through (10) and install contacts (crimped to wires) in rear of electric connector (6).

(12) Remove tags from wires.

NOTE

When installing sealing plugs in sockets, leave end of plug protruding to ease in removal.

(13) insert proper size sealing plugs (12) into unwired sockets in rear of electric connector. If replacing connector J2, refer to table 5-3. If replacing connector J4, refer to table 5-4. If replacing connector J5 or J6, refer to table 5-5. Each table lists plug sizes for sockets on the electric connector. If a socket has no entry under plug size in the table, then the socket is wired and no plug is required.

(14) Remove mounting bushing (7) from electric connector.

(15) Apply sealing compound to threads of mounting bushing.

(16) Position electric connector in IMTC electronic components assembly housing (2).

(17) Install connector cover attaching ring (8) and mounting bushing on electric connector.

(18) Torque mounting bushing on connector J2 to 90-95 in-lbs (10.24-10.81 Newton-meters). Torque mounting bushing on connector J4 to 100-110 in-lbs (11.38-12.51 Newton-meters). Torque mounting bushing on connector J5 or J6 to 55-60 in-lbs (6.26-6.83 Newton-meters).

(19) Install connector cover (5) on electric connector.

(20) Install tie wraps (9) on wiring harness (10).

(21) Apply thin coat of grease to entire gasket surface on IMTC electronic components assembly housing.

(22) Position cover assembly (4) on IMTC electronic components assembly housing and fasten latches (3).

(23) Perform test of IMTC electronic components assembly on RCS adapter (reference table).

(24) Install IMTC electronic components assembly (reference paragraph 5-16).

(25) Perform IMTC self-test (reference paragraph 2-4a).

5-27 LOCAL SWITCH SW1 REPLACEMENT.

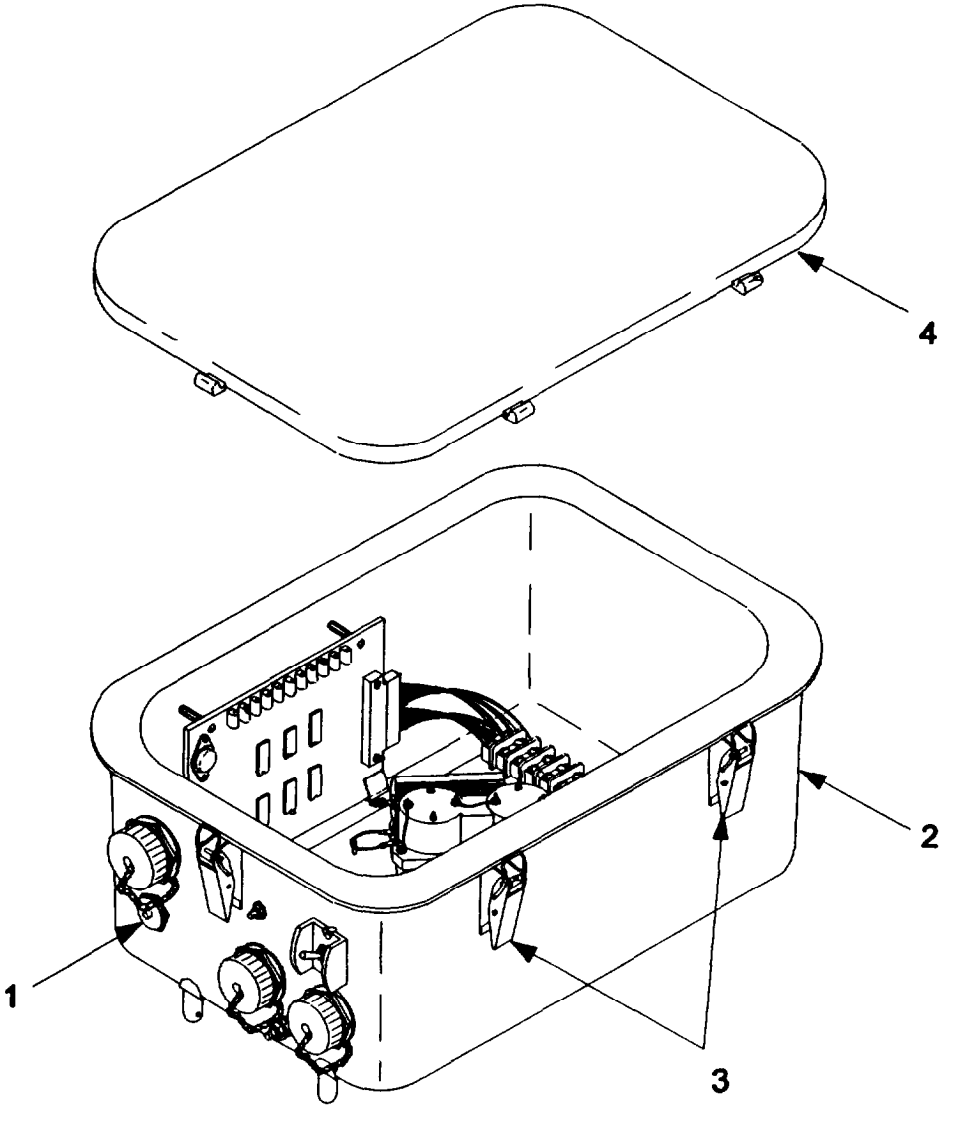
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque wrench

Materials/Parts:
Lockwasher (MS35338-137)
Local switch (MS24524-27)
Caulking compound (item 2, appendix D)

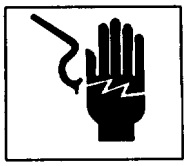
Materials/Parts - Continued:
Grease, aircraft and automotive (item 5, appendix D)

References:
Perform IMTC self-test (reference paragraph 2-4a).



a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

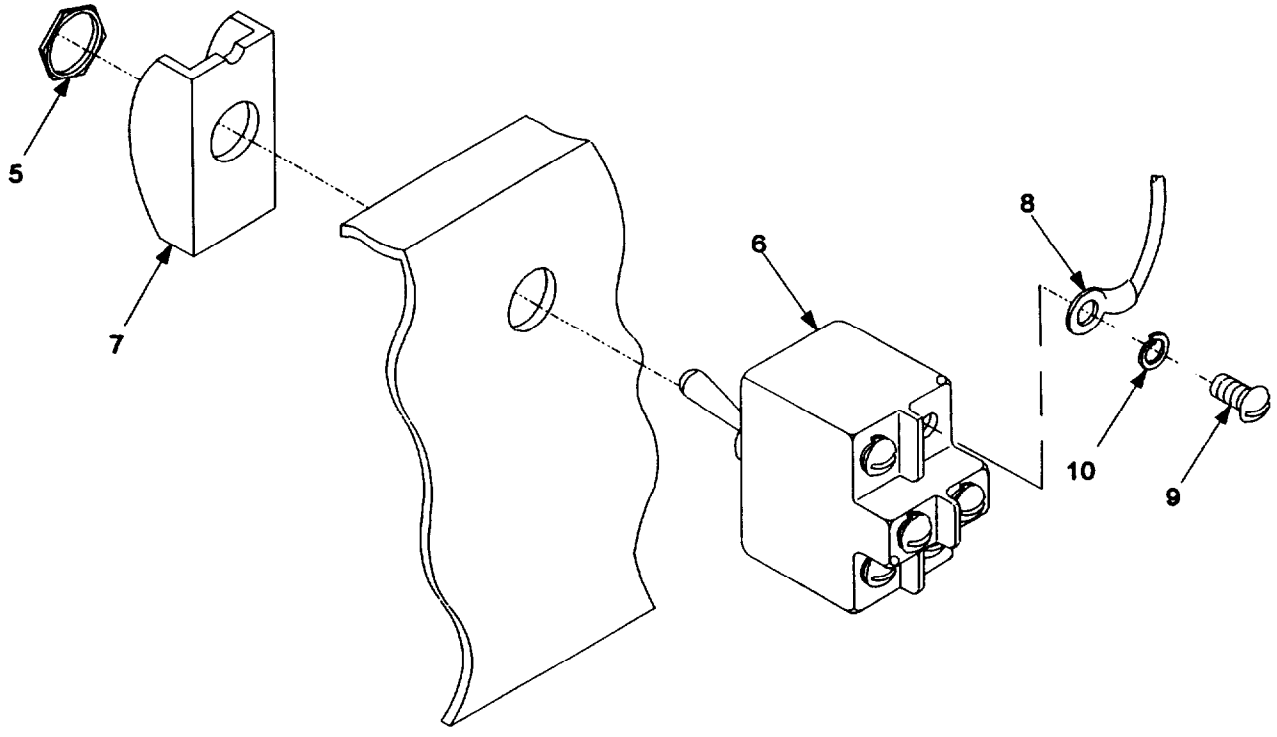
(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2).

(5) Unfasten latches (3) and remove cover assembly (4) from IMTC electronic components assembly housing.

(6) Remove mounting bushing (5) from local switch SW1 (6).



5-27 LOCAL SWITCH SW1 REPLACEMENT - Continued.

(7) Remove switch guard (7) and pull local switch SW1 away from IMTC electronic components assembly housing.

(8) Install mounting bushing on local switch SW1.

(9) Tag wires (8) connected to local switch SW1.

(10) Remove screws (9) and lockwashers (10) from appropriate terminals on local switch SW1.

(11) Disconnect wires from local switch SW1.

(12) Reinstall screws and lockwashers on appropriate terminals on local switch SW1.

b. Installation.

(1) Remove screws (9) and lockwashers (10) from appropriate terminals on local switch SW1 (6).

(2) Using tags as a guide, connect wires (8) to appropriate terminals on local switch SW1.

(3) Install screws and lockwashers on appropriate terminals on local switch SW1.

(4) Remove tags from wires.

(5) Remove mounting bushing (5) from local switch SW1.

(6) Apply uniform thin coating of caulking compound to positioning washer and threads on local switch SW1.

(7) Position local switch SW1 in IMTC electronic components assembly housing (2).

(8) Position switch guard (7) on IMTC electronic components assembly housing and install mounting bushing on local switch SW1.

(9) Torque mounting bushing on local switch SW1 to 28-32 in-lbs (3.19-3.64 Newton-meters).

(10) Apply thin coat of grease to entire gasket surface on IMTC electronic components assembly housing.

(11) Position cover assembly (4) on IMTC electronic components assembly housing (2) and fasten latches (3).

(12) Set circuit breaker on ITM to POWER ON.

(13) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(14) Set circuit breaker on ICB to ON.

(15) Perform IMTC self-test (reference paragraph 2-4a).

5-28 REPLACEMENT OF TERMINAL LUGS ON WIRING HARNESS.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Hand terminal crimping tool (1008)

Materials/Parts:
Lockwasher (MS35338-137)
Terminal lug, 14-16 AWG (MS25036-153)
Terminal lug, 18-22 AWG (MS25036-102)

Materials/Parts - Continued:
Terminal lug, 22-18 AWG (MS25036-149)
Grease, aircraft and automotive (item 5, appendix D)

References:
Perform IMTC self-test (reference paragraph 2-4a).

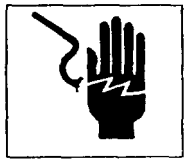
---

a. Removal.

NOTE

The following procedure applies to replacement of all 14-16 AWG, 18-22 AWG, and 22-18 AWG terminal lugs on the wiring harness.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Press pressure relief valve (1) to equalize pressure inside IMTC electronic components assembly housing (2).

(5) Unfasten latches (3) and remove cover assembly (4) from IMTC electronic components assembly housing.

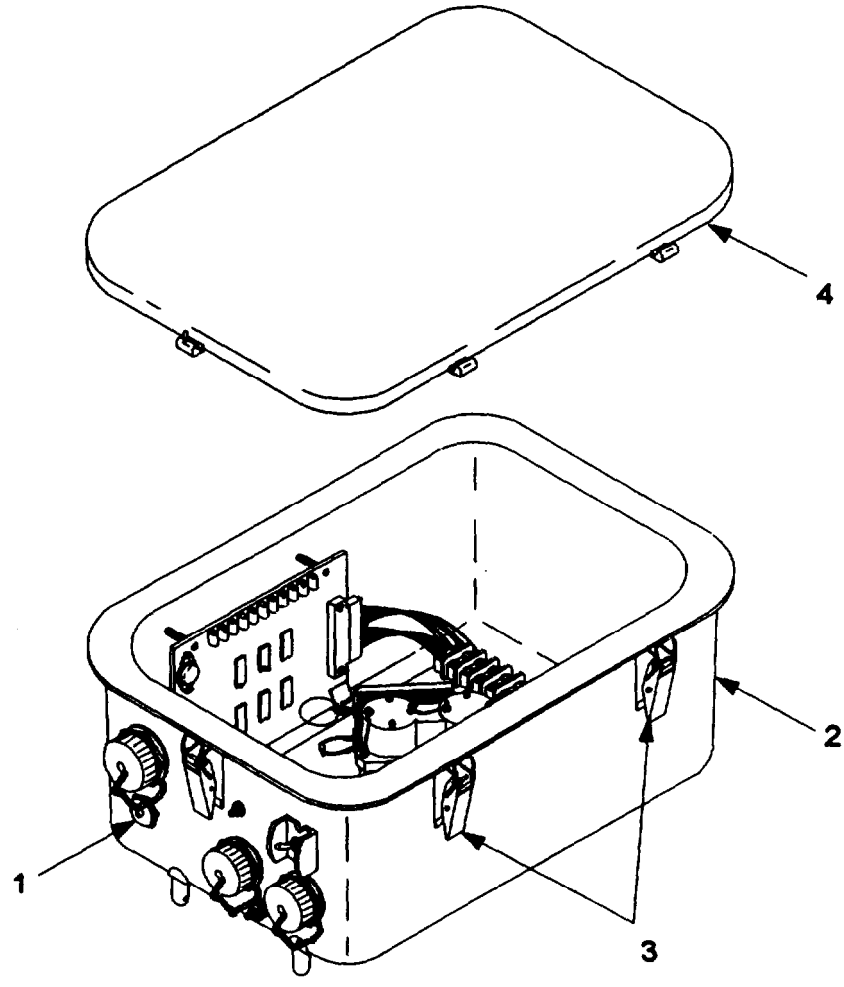
(6) Remove screw (5) and lockwasher (6) from appropriate terminal on terminal block (7).

(7) Disconnect wiring harness wire (8) from terminal on terminal block.

(8) Cut wiring harness wire as close as possible to terminal lug (9).

(9) Remove and discard terminal lug.

5-28 REPLACEMENT OF TERMINAL LUGS ON WIRING HARNESS - Continued.



b. Installation.

(1) Strip insulation on wiring harness wire (8) 1/4 in (0.64 cm) from end.

(2) Install and crimp terminal lug (9) on end of wire.

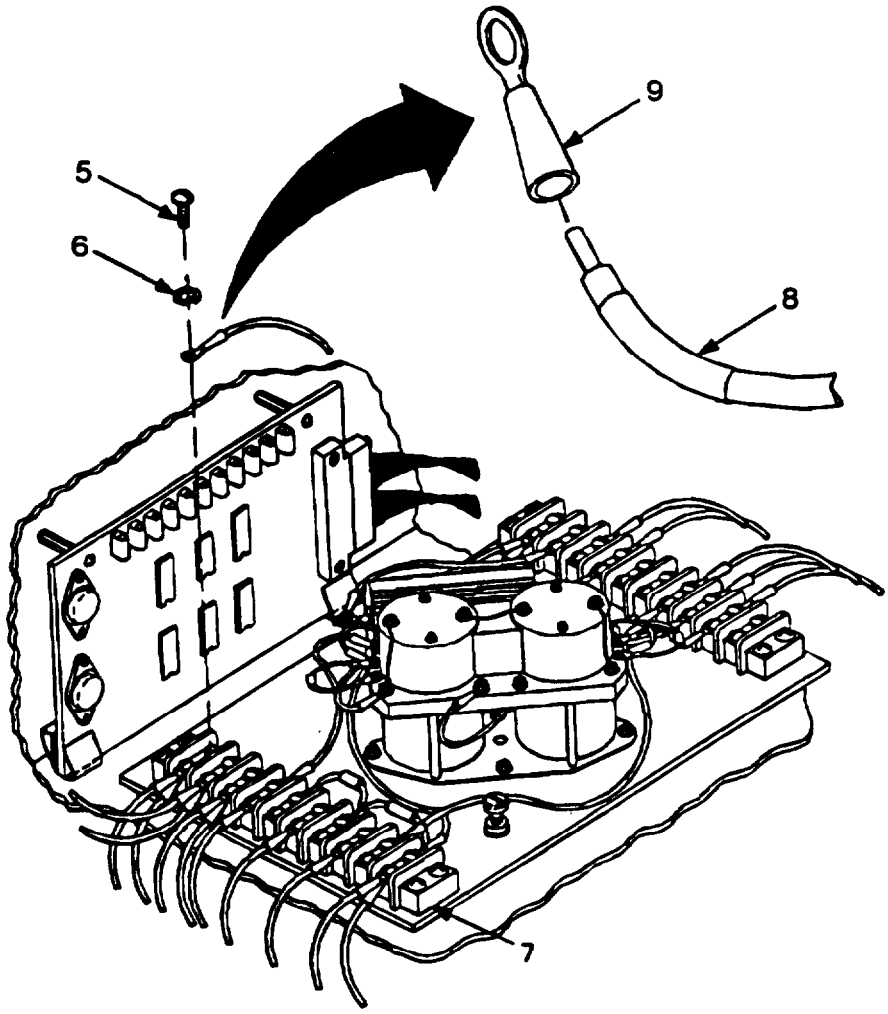
(3) Connect wiring harness wire to appropriate terminal on terminal block (7).

(4) Install screw (5) and lockwasher (6) on appropriate terminal on terminal block.

(5) Apply thin coat of grease to entire gasket surface on IMTC electronic components assembly housing.

(6) Position cover assembly (4) on IMTC electronic components assembly housing (2) and fasten latches (3).

(7) Set circuit breaker on ITM to POWER ON.



(8) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(9) Set circuit breaker on ICB to ON.

(10) Perform IMTC self-test (reference paragraph 2-4a).

5-29 REPLACEMENT OF CONNECTOR P1 ON WIRING HARNESS.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Soldering and desoldering set
Electric gun-type heater

Materials/Parts:
Connector P1 (M55302/62A40L)
Heat shrink tubing (M23053/5-102-O)
Heat shrink tubing (M23053/5-106-O)
Tie wraps (MS33674-9)
Solder (item 18, appendix D)

References:
Install wiring harness
(reference paragraph 5-25).
Perform test of IMTC electronic components assembly on RCS adapter
(reference table 5-1).
Install IMTC electronic components assembly
(reference paragraph 5-16).
Perform IMTC self-test
(reference paragraph 2-4a).

Equipment Conditions:
Wiring harness removed
(reference paragraph 5-25).

---

a. Removal.

(1) Cut and discard sufficient number of tie wraps (1) from wiring harness (2) to allow for removal of connector PI (3).

(2) Pull heat shrink tubing (4) away from all wiring connections on connector P1.

(3) Refer to FO-1. Tag all wires (5) connected to connector P1.

(4) Desolder and remove all wires from connector P1.

(5) Remove heat shrink tubing from all wires.

b. Installation.

(1) Install heat shrink tubing (4) on all wires (5) and slide tubing away from ends of wires.

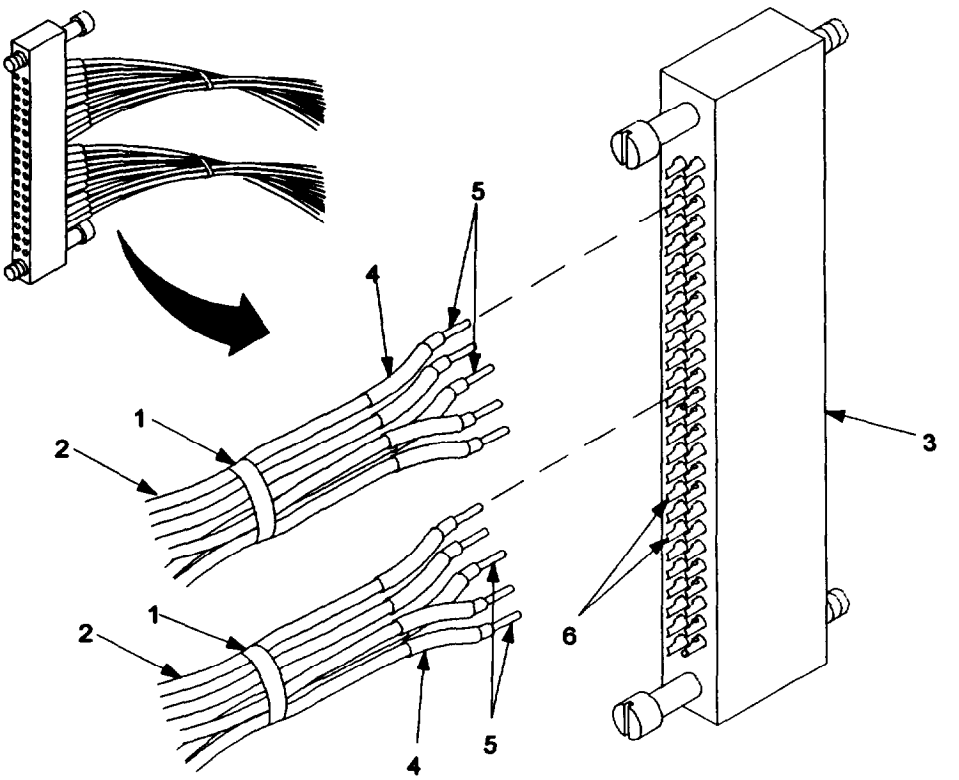
(2) Strip insulation on ends of wires 0.2 in (0.5 cm).

NOTE

When connecting and soldering wires to sockets on connector, work row by row across the connector.

(3) Using tags as guide, connect wires to sockets (6) on connector P1 (3) and solder connections in place.

(4) Position heat shrink tubing over all wiring connections and apply heat to activate tubing.



(5) Remove tags from wires.

(6) Install tie wraps (1) on wiring harness (2).

(7) Install wiring harness W1 (reference paragraph 5-25).

(8) Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).

(9) Install IMTC electronic components assembly (reference paragraph 5-16).

(10) Perform IMTC self-test (reference paragraph 2-4a).

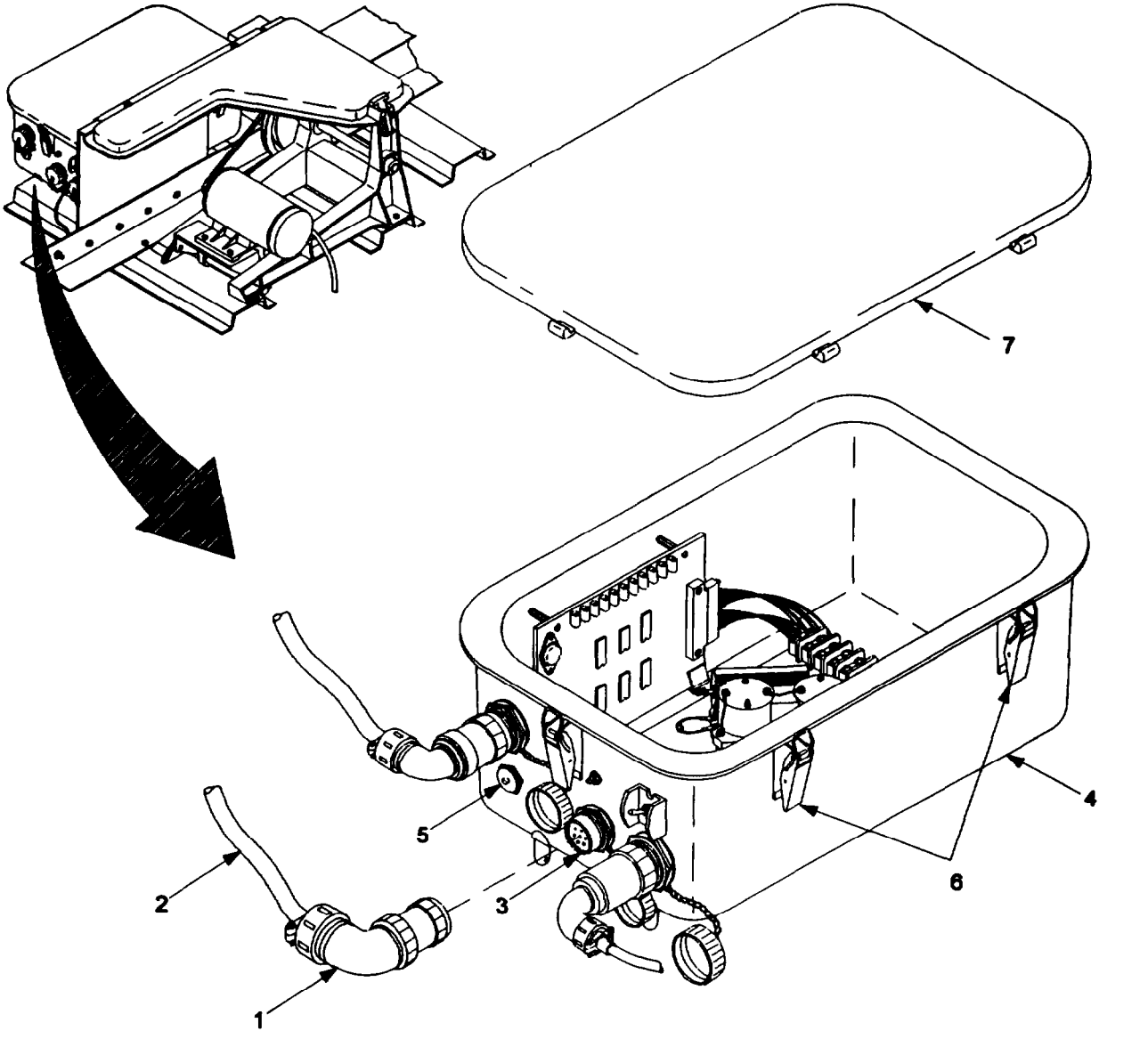
5-30 POWER CABLE REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque wrench

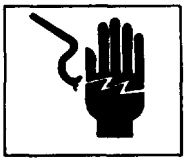
References:
Perform IMTC self-test
(reference paragraph 2-4a).

Materials/Parts:
Lockwasher (MS35338-137)
Power cable (9353950)
Grease, aircraft and automotive
(item 5, appendix D)
Sealing compound (item 12, appendix D)



a. Removal.

WARNING



Before working on the IMTC, ensure that circuit breakers on ICB, IMTC electronic components assembly, and ITM have been set to OFF. Failure to do so could result in electrical shock and death or serious Injury.

(1) Set circuit breaker on ICB to OFF.

(2) Set circuit breaker CB1 on IMTC electronic components assembly to OFF.

(3) Set circuit breaker on ITM to POWER OFF.

(4) Disconnect connector P1 (1) on cable assembly W102-2 (2) from connector J1 (3) on IMTC electronic components assembly (4).

(5) Press pressure relief valve (5) to equalize pressure inside IMTC electronic components assembly housing.

(6) Unfasten latches (6) and remove cover assembly (7) from IMTC electronic components assembly housing.

(7) Tag wires (8) connected to terminals TB2-6 and TB2-7.

(8) Remove screws (9) and lockwashers (10) from terminals TB2-6 and TB2-7.

(9) Disconnect wires from terminals TB2-6 and TB2-7.

(10) Reinstall screws and lockwashers on terminals TB2-6 and TB2-7.

(11) Remove mounting bushing (11) and connector cover attaching ring (12) from connector J1.

(12) Pull connector J1 away from IMTC electronic components assembly housing.

(13) Install mounting bushing on connector J1.

(14) Remove pan-head screw (13) and sealing washer (14) from standoff (15) at E5 on IMTC electronic components assembly housing.

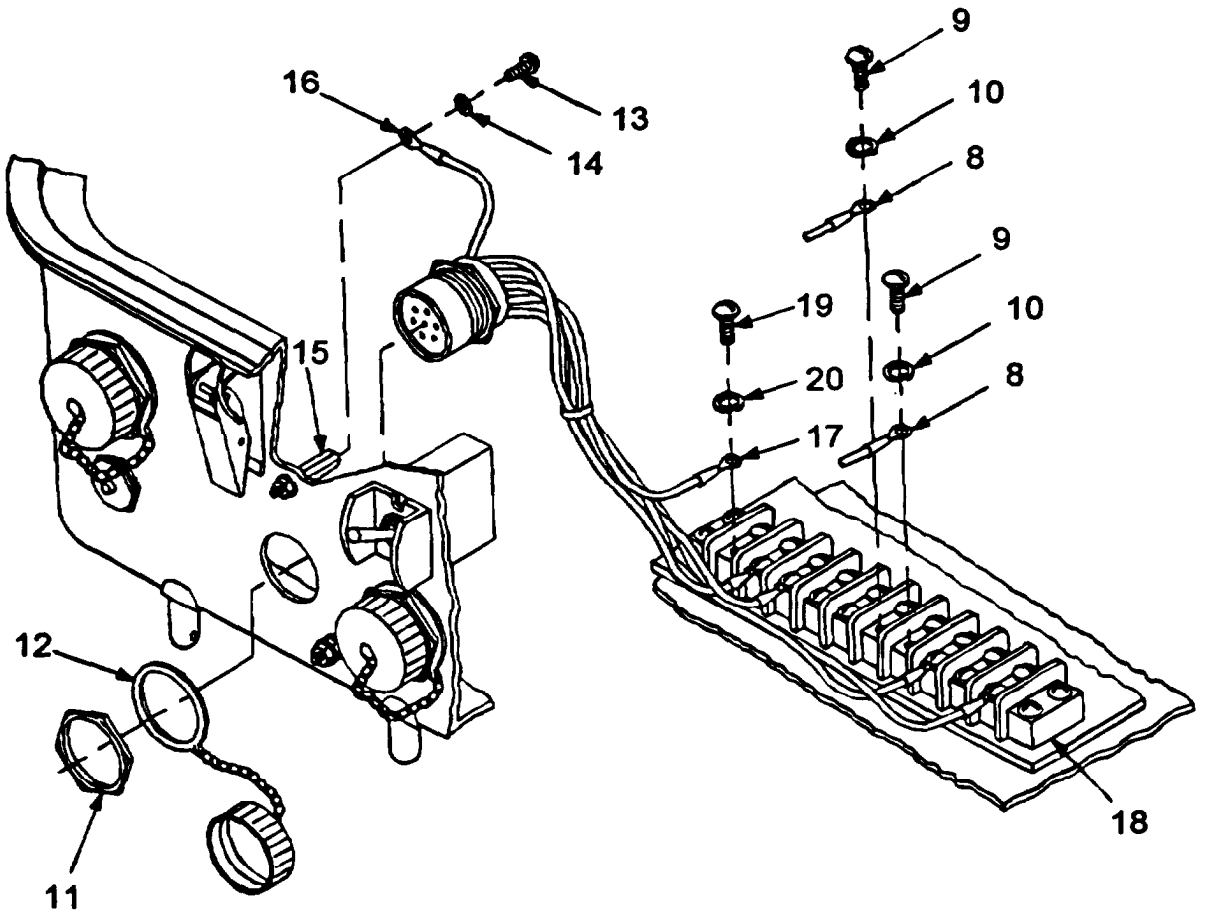
(15) Disconnect terminal lug on power cable ground wire (16) from standoff.

(16) Install sealing washer and pan-head screw on standoff at E5.

(17) Refer to FO-1. Tag power cable wires (17) connected to terminal strip TB2 (18).

(18) Remove screws (19) and lockwashers (20) from appropriate terminals on terminal strip TB2. Discard lockwashers.

5-30 POWER CABLE REPLACEMENT - Continued.



(19) Disconnect terminal lugs on power cable wires from appropriate terminals on terminal strip TB2.

(20) Install screws on appropriate terminals on terminal strip TB2.

(21) Remove power cable from IMTC electronic components assembly housing.

b. Installation.

(1) Position power cable in IMTC electronic components assembly housing (4).

(2) Remove mounting bushing (11) from connector J1 (3).

(3) Apply sealing compound to threads of connector J1.

(4) Position connector J1 in IMTC electronic components assembly housing.

(5) Install connector cover attaching ring (12) and mounting bushing on connector J1.

(6) Torque mounting bushing on connector J1 to 75-80 in-lbs (8.53-9.1 Newton-meters).

(7) Remove screws (19) from appropriate terminals on terminal strip TB2 (18).

(8) Using tags as a guide, connect terminal lugs on power cable wires (17) to appropriate terminals on terminal strip TB2.

(19) Install screws and new lockwashers (20) on appropriate terminals on terminal strip TB2. Remove tags from wires.

(10) Remove screws (9) and lockwashers (10) from terminals TB2-6 and TB2-7.

(11) Using tags as a guide, connect wires (8) to terminals TB2-6 and TB2-7.

(12) Reinstall screws and lockwashers on terminals TB2-6 and TB2-7. Remove tags from wires.

(13) Remove pan-head screw (13) and sealing washer (14) from standoff (15) at E5 on IMTC electronic components assembly housing.

(14) Position terminal lug on power cable ground wire (16) on standoff.

(15) Install sealing washer and pan-head screw on standoff at E5.

(16) Apply thin coat of grease to entire gasket surface on IMTC electronic components assembly housing.

(17) Position cover assembly (7) on IMTC electronic components assembly housing and fasten latches (6).

(18) Connect connector P1 (1) on cable assembly W102-2 (2) to connector J1 on IMTC electronic components assembly.

(19) Set circuit breaker on ITM to POWER ON.

(20) Set circuit breaker CB1 on IMTC electronic components assembly to ON.

(21) Set circuit breaker on ICB to ON.

(22) Perform IMTC self-test (reference paragraph 2-4a).

5-31 POWER CABLE ASSEMBLY.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Hand terminal crimping tool (11-3284-2) and turret
Insertion/extraction tool (M81969/ 14-04)
Insertion/extraction tool (M81969/ 14-11)
Digital multimeter
Hand terminal crimping tool (1006)

References:
Instructions on using crimp tool and turret (reference paragraph 5-26).
Instructions on using insertion/extraction tool (reference paragraph 5-26).
Install power cable (reference paragraph 5-30).
Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).

References - Continued:
Install IMTC electronic components assembly (reference paragraph 5-16).
Perform IMTC self-test (reference paragraph 2-4a).

Materials/Parts:
Connector J1 (MS3124E16-14P)
14 AWG red wire (M16878/4BKE2)
14 AWG black wire (M16878/4BKEO)
14 AWG green wire (M16878/4BFE5)
14 AWG white wire (M16878/4BFE9)
Terminal lug, 16-14 AWG (MS25036-153)
Terminal lug, 22-18 AWG (MS25036-102)
Terminal lug, 22-18 AWG (MS25036-149)
Sealing plug (MS27488-20)
Sealing plug (MS27488-20)

---

a. Assembly.

NOTE

The required overall length of the leads is measured from the rear of the electric connector to the center of the eye on the terminal lug (attached to the lead).

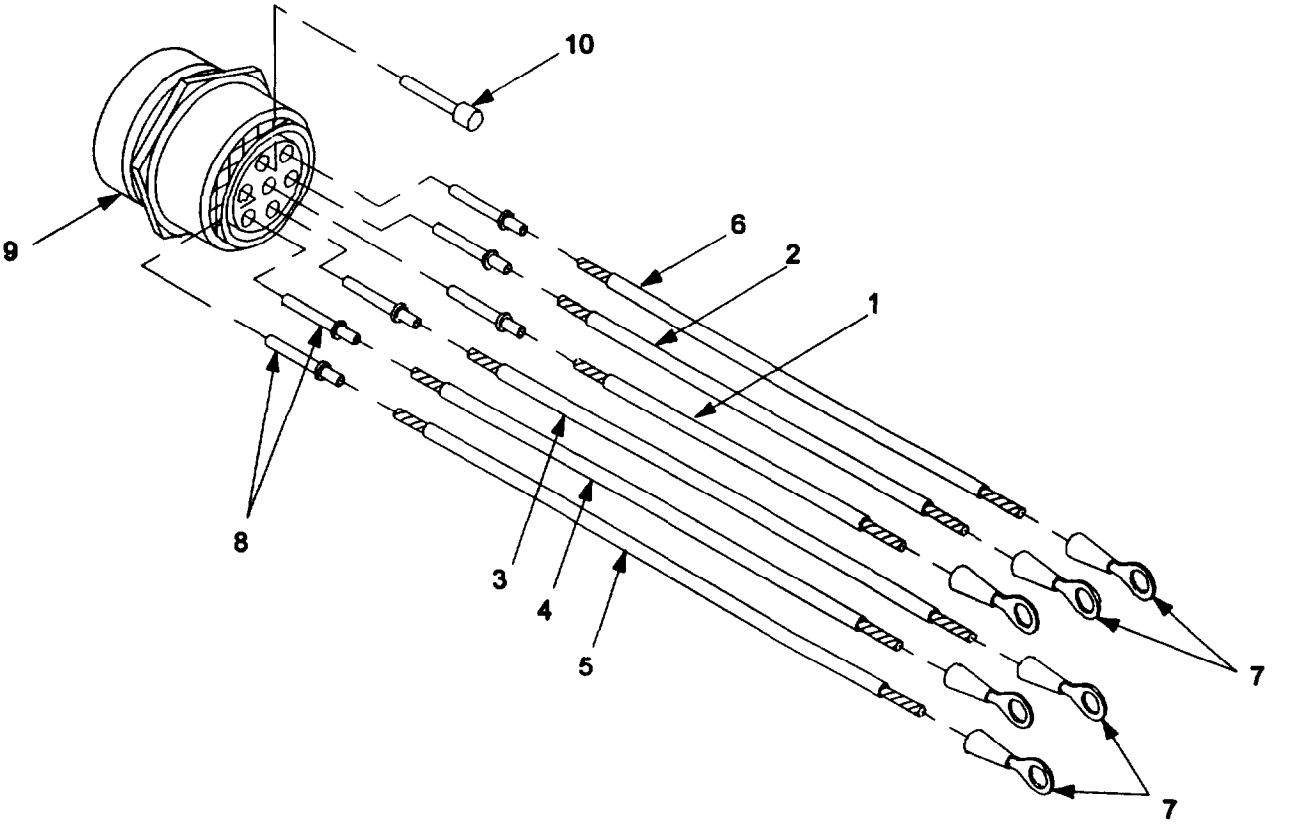
(1) Refer to table 5-7 and cut leads to specified lengths.

Table 5-7. Power Cable Lead Assembly.

LEAD NUMBER	WIRE SIZE/COLOR	LEAD LENGTH	TYPE TERMINAL LUG	IDENTIFICATION MARKER
1	22 AWG/Green	3.0 in (7.62 cm)	MS25036-102	E5
2	14 AWG/Black	3.5 in (8.89 cm)	MS25036-153	TB2-8
3	14 AWG/Black	4.06 in (10.31 cm)	MS25036-153	TB2-10
4	14 AWG/Red	4.18 in (10.62 cm)	MS25036-153	TB2-2

Table 5-7. Power Cable Lead Assembly - Continued.

NUMBER	WIRE SIZE/COLOR	LEAD LENGTH	TYPE TERMINAL LUG	IDENTIFICATION MARKER
5	14 AWG/Red	4.62 in (11.73 cm)	MS25036-153	TB2-1
6	22 AWG/White	4.62 in (11.73 cm)	MS25036-149	TB2-3



(2) Strip insulation on one end of all leads 1/4 in (0.64 cm) from end.

(3) Match specified terminal lugs (7) to leads.

(4) Insert stripped ends of leads into terminal lugs and crimp tight.

(5) Install specified identification markers on leads.

(6) Refer to table 5-8 and match specified contacts (8) to leads. If a socket has no entry under contact size in the table, then the socket is filled by a sealing plug, and no lead is connected to that socket.

5-31 POWER CABLE ASSEMBLY - Continued.

Table 58. Lead/Contact to Socket Connections on Power Cable.

LEAD MARKER MATCHES:	CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
-	A	-	12
-	B	-	20
-	C	-	20
TB2-1	D	12	-
TB2-2	E	12	-
E5	F	20	-
TB2-10	G	12	-
TB2-8	H	12	-
-	J	-	20
TB2-3	K	20	-
-	L	-	20
-	M	-	20
-	N	-	20
-	P	-	12

(7) Strip insulation on leads according to contact size: For leads with contact size 12, strip insulation 9/32 in (0.71 cm) from end. For leads with contact size 20, strip insulation 3/16 in (0.48 cm) from end.

(8) Using crimp tool and turret, install contacts on leads and crimp connections. (For detailed instructions on using the crimp tool and turret, refer to paragraph.)

NOTE

When installing contact size #12, use insertion/ extraction tool M81969/14-04. When installing contact size #20, use insertion/ extraction tool M81969/14-11.

(9) Refer to table 58 and use insertion/extraction tools to insert contacts (crimped to leads) in proper sockets at rear of electric connector J1 (9). (For detailed instructions on using insertion/ extraction tools, refer to paragraph 5-26.)

NOTE

When installing sealing plugs in sockets, leave end of plug protruding to ease in removal.

(10) Refer to table 5-8 and insert specified sealing plugs (10) into unwired sockets in rear of electric connector J1. If a socket has no entry under plug size in the table, then the socket is wired and no plug is required.

(11) Perform continuity checks to verify quality of cable.

(12) Install identification marker on power cable.

(13) Install power cable (reference paragraph 5-30).

(14) Perform test of IMTC electronic components assembly of RCS adapter (reference table).

(15) Install IMTC electronic components assembly (reference paragraph 5-16).

(16) Perform IMTC self-test (reference paragraph 2-4a).

5-32 CABLE ASSEMBLY (93539371 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque wrench

Materials/Parts:
Self-locking nut (MS21083C4)
Lockwasher (MS35338-137)
Cable assembly (9353937)
Sealing compound (item 12, appendix D)

References:
Install electric relay plate assembly (reference paragraph 5-18).
Install IMTC electronic components assembly (reference paragraph 5-16).
Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
IMTC electronic components assembly removed (reference paragraph 5-16).
Electric relay plate assembly removed (reference paragraph 5-18).

---

a. Removal.

NOTE

Cable assembly wiring connections to terminal strip TB2 are disconnected during removal of electric relay plate assembly (reference initial setup to this procedure).

(1) Remove bolt (1) sealing washer (2) three flatwashers (3), and two self-locking nuts (4) from E4 on IMTC electronic components assembly housing (5).

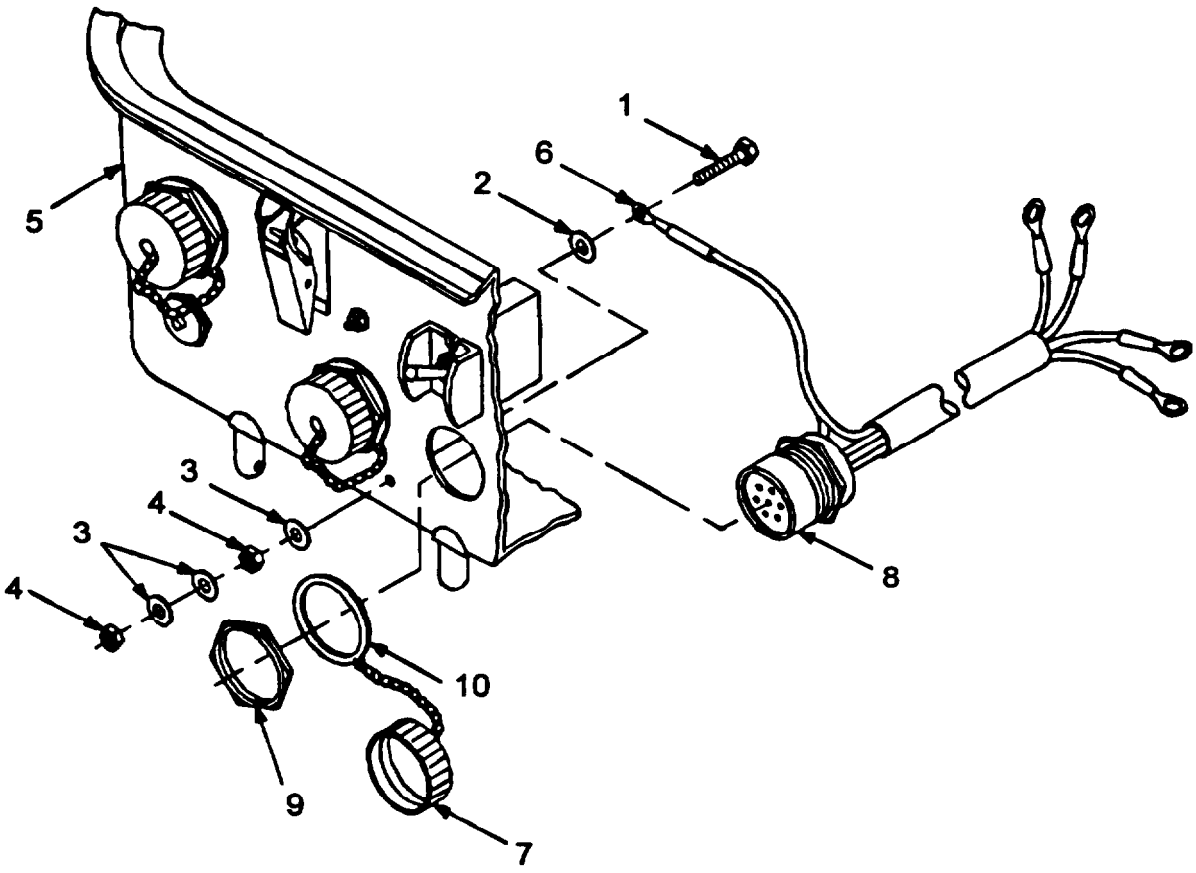
(2) Disconnect terminal lug on cable assembly ground wire (6) from bolt.

(3) Install bolt, sealing washer, three flatwashers, and two self-locking nuts at E4 on IMTC electronic components assembly housing.

(4) Remove connector cover (7) from connector J3 (8).

(5) Remove mounting bushing (9) and connector cover attaching ring (10) from connector J3.

5-32 CABLE ASSEMBLY (9353937) REPLACEMENT - Continued.



(6) Pull connector J3 away from IMTC electronic components assembly housing.

(7) Install mounting bushing on connector J3.

(8) Remove cable assembly from IMTC electronic components assembly housing.

b. Installation.

(1) Position cable assembly in IMTC electronic components assembly housing (5).

(2) Remove mounting bushing (9) from connector J3 (8).

(3) Apply sealing compound to threads of connector J3.

(4) Position connector J3 in IMTC electronic components assembly housing.

(5) Install connector cover attaching ring (10) and mounting bushing on connector J3.

(6) Torque mounting bushing on connector J3 to 80-85 in-lbs (9.1-9.67 Newton-meters).

(7) Install connector cover on connector J3.

(8) Remove bolt (1), sealing washer (2), three flatwashers (3), and two self-locking nuts (4) from E4 on IMTC electronic components assembly housing.

(9) Attach terminal lug on cable assembly ground wire (6) to bolt.

(10) Install bolt, sealing washer, three flatwashers, and two new self-locking nuts at E4 on IMTC electronic components assembly housing.

(11) Torque self-locking nut that is closest to IMTC electronic components assembly housing to 90-100 in-lbs (10.24-11.38 Newton-meters).

NOTE

Cable assembly wires are connected to terminal strip TB2 during Installation of electric relay plate assembly.

(12) Install electric relay plate assembly (reference paragraph 5-18).

(13) Install IMTC electronic components assembly (reference paragraph 5-16).

(14) Perform IMTC self-test (reference paragraph 2-4a).

5-33 ASSEMBLY OF CABLE ASSEMBLY (9353937).

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Hand terminal crimping tool (1006)
Hand terminal crimping tool (11-3284-2) and turret
Soldering and desoldering kit
Electric gun-type heater
Insertion/extraction tool (M81969/14-03)
Digital multimeter

References:
Instructions on using crimp tool and turret (reference paragraph 5-26).
Instructions on using insertion/extraction tool (reference paragraph 5-26).
Install cable assembly (reference paragraph 5-32).
Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).

References - Continued:
Install IMTC electronic components assembly (reference paragraph 5-16).
Perform IMTC self-test (reference paragraph 2-4a).

Materials/Parts:
Connector J3 (MS3124E18-11S)
Electrical cable (9363135-3)
22 AWG green wire (M16878/4BFE5)
16 AWG green wire (M16878/4BJE5)
Terminal lug, 14-16 AWG (MS25036-153)
Terminal lug, 14-16 AWG (MS25036-154)
Shrink tubing (M23053/5-305-0)
Shrink tubing (M23053/5-109-0)
Sealing plug (MS27488-16)
Solder (item 18, appendix D)
Tape (item 19, appendix D)

---

a. Assembly.

(1) Cut 18.5-in (46.99 cm) length of electrical cable.

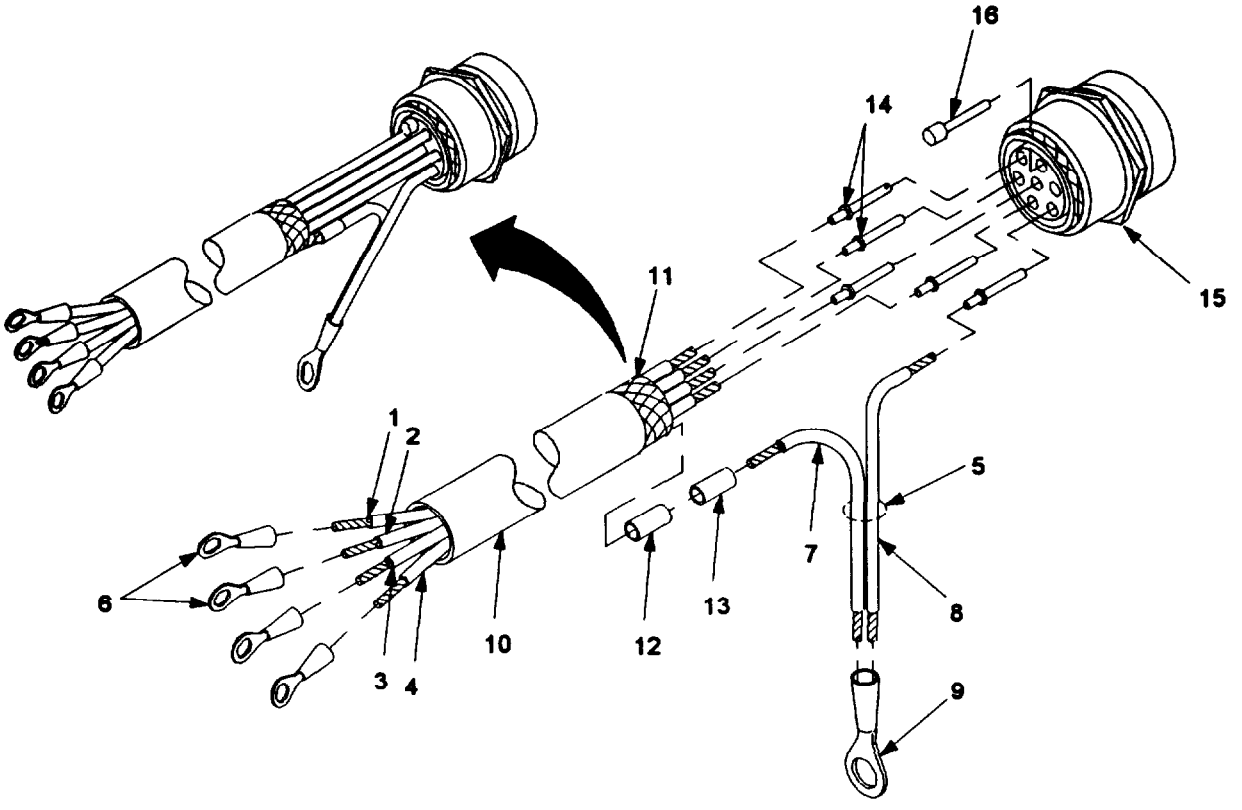
(2) Strip outer insulation on electrical cable 2 in (5.08 cm) from one end.

(3) Strip insulation on all exposed wires 1/4 in (0.64 cm) from ends.

(4) Refer to table 5-9 and install identification markers on wires.

Table 5-9. Wire-to-Socket Connections.

WIRE NUMBER	WIRE COLOR	IDENTIFICATION MARKER	CONNECTOR SOCKET
1	White	TB1-3	H
2	Red	TB1-4	F
3	Green	TB1-4	G
4	Black	TB1-3	J
5	Cable Shield(Green)	E4	E



(5) Insert stripped ends of wires into MS25036-153 terminal lugs (6) and crimp tight.

(6) Cut 4-in (10.16 cm) length of 22 AWG green wire (7).

(7) Cut 5-in (12.7 cm) length of 16 AWG green wire (8).

(8) Strip insulation on 16 AWG green wire 1/4 in (0.64 cm) from one end.

(9) Strip insulation on 22 AWG green wire 1/4 in (0.64 cm) from one end.

(10) Insert stripped ends of 22 AWG green wire and 16 AWG green wire into MS25036-154 terminal lug (9) and crimp tight.

(11) Refer to table 5-9 and install identification marker on both green wires (cable shield).

(12) Strip outer insulation 6 in (15.24 cm) from remaining end of electrical cable (10).

(13) Tape end of cable insulation.

(14) Fan shield (11) and twist together.

(15) Tin shield back to an approximate length of 1/2 in (1.27 cm).

5-33 ASSEMBLY OF CABLE ASSEMBLY (9353937) - Continued.

(16) Install l-in (2.54 cm) length of M23053/5-305-0 heat shrink tubing (12) and l-in (2.54 cm) length of M23053/5-109-0 heat shrink tubing (13) on 4-in (10.16 cm) length of 22 AWG green wire.

(17) Solder 4-in (10.16 cm) length of 22 AWG green wire to tinned shield.

(18) Remove tape from end of cable insulation.

(19) Slide 1-in (2.54-cm) lengths of heat shrink tubing over soldered connection.

(20) Apply heat and shrink tubing over connection.

(21) Strip insulation on 16 AWG cable shield wire and all exposed electrical cable wires 9/32 in (0.71 cm) from ends.

(22) Using crimp tool and turret, install contacts (14) on wires and crimp connections. (For detailed instructions on using the crimp tool and turret, refer to paragraph 5-26.)

(23) Refer to table 5-9 and use insertion/extraction tool to insert contacts (crimped to wires) in proper sockets at rear of electric connector J3 (15). (For detailed instructions on using the insertion/extraction tool, refer to paragraph 5-26.)

NOTE

When installing sealing plugs in sockets, leave end of plug protruding to ease in removal.

(24) Insert sealing plugs (16) in sockets A, B, C, D, K, and L in rear of electric connector J3.

(25) Perform continuity checks to verify quality of cable.

(26) Install identification marker on cable assembly.

(27) Install cable assembly (reference paragraph 5-32).

(28) Perform test of IMTC electronic components assembly on RCS adapter (reference table 5-1).

(29) Install IMTC electronic components assembly (reference paragraph 5-16).

(30) Perform IMTC self-test (reference paragraph 2-4a).

5-34 REPLACEMENT OF ELECTRIC CONNECTOR P1 ON CABLE ASSEMBLY W103.

INITIAL SETUP

Tools and Special Tools:
- General mechanic's automotive tool kit
- Soldering and desoldering set
- Hand terminal crimping tool (11-3284-2) and turret
- Insertion/extraction tool (M81969/14-04)
- Insertion/extraction tool (M81969/14-11)
- Electric gun-type heater
- Multimeter

Materials/Parts:
- Electric connector (MS3476W22-95S)
- Tape (item 13, appendix D)
- Insulated wire (M16878/4BGE9)
- Solder (item 12, appendix D)
- Shrink tubing (M23053/5-105-O)
- Crimp connector (9353932)
- Sealing compound (item 15, appendix D)

References:
- Instructions on using crimp tool and turret (reference paragraph 5-26).
- Instructions on using insertion/extraction tool (reference paragraph 5-26).
- Install cable assembly W103 (reference paragraph 4-39).
- Adjust cable assembly W103 (reference paragraph 4-39).
- Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
- Cable assembly W103 removed (reference paragraph 4-37).

---

a. Removal.

(1) Loosen two screws (1) on strain relief (2) attached to cable seal backshell (3) on electric connector P1 (4).

(2) Remove electric connector P1 from cable seal backshell.

(3) Slide cable seal backshell away from electric connector P1 and expose wiring.

(4) Cut wiring as close as possible to electric connector P1, and remove electric connector.

(5) Remove plastic grommet (5) from wiring.

b. Installation.

(1) Strip outer insulation on cable (6) 6 in (15.24 cm) from end.

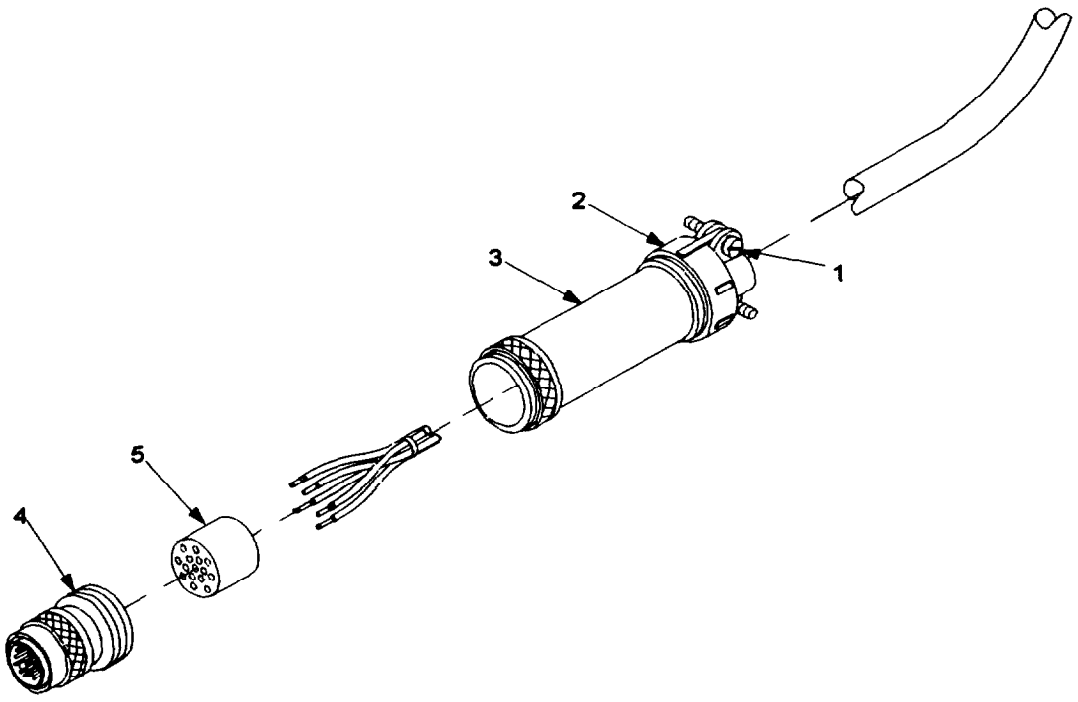
(2) Tape end of cable insulation.

(3) Fan shield (7) and twist together.

(4) Tin shield with approximate length of 1/2 in (1.27 cm).

(5) Solder 6-in (15.24 cm) length of 20 AWG wire (8) to tinned shield.

5-34 REPLACEMENT OF ELECTRIC CONNECTOR P1 ON CABLE ASSEMBLY W103 - Continued.



(6) Remove tape from end of cable insulation.

(7) Slide l-in (2.54 cm) length of heat shrink tubing (9) over soldered connection,

(8) Apply heat and shrink tubing over connection.

(9) Locate green wire and yellow wire jacketed pair (10).

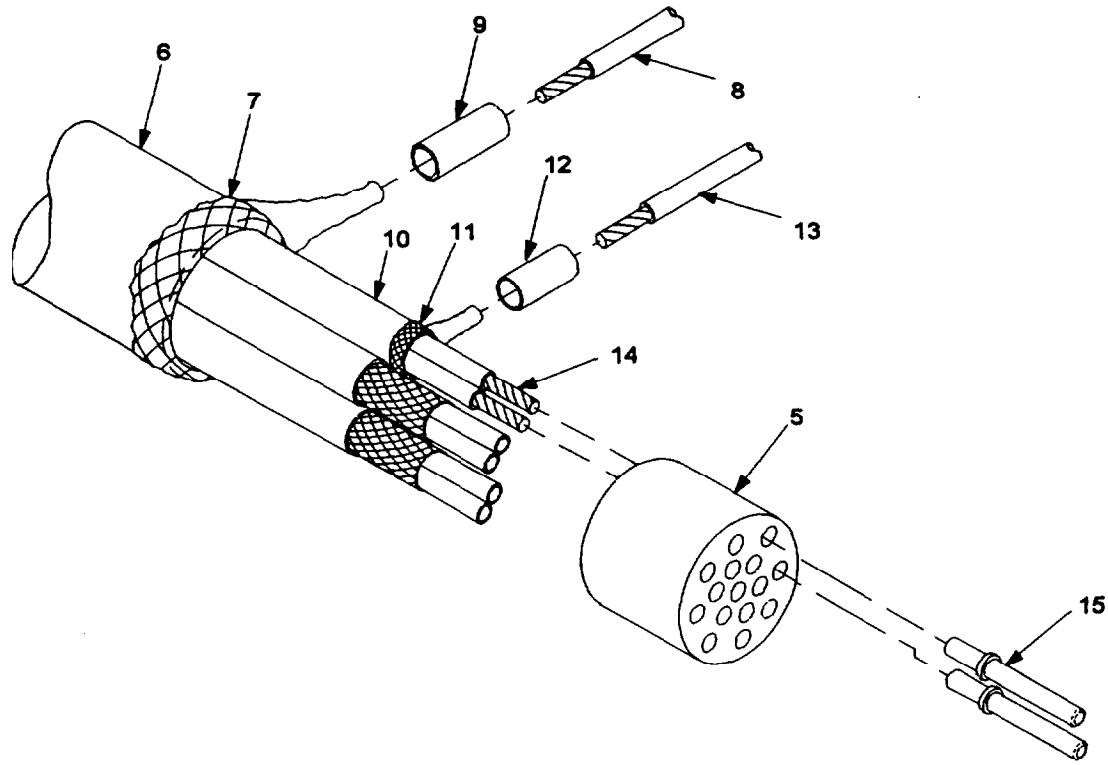
(10) Strip insulation on jacket 6 in (15.24 cm) from end.

(11) Fan shield (11) and twist together.

(12) Tin shield back to an approximate length of 1/2 in (1.27 cm).

(13) Using crimp connector (12) attach 6-in (15.24 cm) length of 20 AWG wire (13) to tinned shield on jacket.

(14) Repeat steps (10) through (13) above and attach shield wires to following jacketed pairs: blue wire and violet wire; white/blue wire and white/violet wire; and white/brown wire and white/red wire.



(15) Install plastic grommet (5) on wires (14).

(16) Refer to table 5-10 and match proper size contacts (15) to wires.

Table 5-10. Cable Assembly W103-to-Connector P1 Wiring Guide.

SOCKET	WIRE	CONTACT SIZE
A	White	20
B	Gray	20
C	White/Black	20
a	Red	12
e	Orange	12
c	Brown	12
g	Black	12
L	Green	20
M	Yellow	20
N	Shield (Green and Yellow)	20
R	White/Blue	20
S	White/Violet	20
T	Shield (White/Blue and White/Violet)	20
W	White/Brown	20

5-34 REPLACEMENT OF ELECTRIC CONNECTOR P1 ON CABLE ASSEMBLY W103 - Continued.

Table 5-10. Cable Assembly W103-to-Connector P1 Wiring Guide - Continued.

SOCKET	WIRE	CONTACT SIZE
V	White/Red	20
X	Shield (White/Brown and White/Red)	20
D	Blue	20
E	Violet	20
Z	Shield (Blue and Violet)	20
F	White/Orange	20
H	White/Green	20
G	White/Yellow	20
h	Shield (Cable)	20

(17) For wires that use contact size #12, strip insulation 9/32 in (0.71 cm) from the end.

(18) For wires that use contact size #20, strip insulation 3/16 in (0.48 cm) from the end.

(19) Using crimp tool and turret, install contacts on wires and crimp connections. (For detailed instructions on using the crimp tool and turret, refer to paragraph 5-26.)

NOTE

When Installing contact size #12, use insertion/extraction tool M81969/14-04. When Installing contact size #20, use Insertion/ extraction tool M81969/14-11.

(20) Refer to table 5-1. Using insertion/extraction tool, insert contacts (crimped to wires) in proper sockets at rear of electric connector P1 (4). (For detailed instructions on using the insertion/extraction tools, refer to paragraph 5-26.)

(21) Position cable seal backshell (3) over exposed wires.

(22) Apply sealing compound to threads of electric connector P1 and install electric connector P1 on cable seal backshell.

(23) Tighten two screws (1) on strain relief (2) attached to cable seal backshell.

(24) Refer to FO-2. Using multimeter, perform continuity check on cable assembly W103.

(25) Install cable assembly W103 (reference paragraph 4-39).

(26) Adjust cable assembly W103 (reference paragraph 4-39).

(27) Perform IMTC self-test (reference paragraph 2-4a).

5-35 REPLACEMENT OF ELECTRIC CONNECTOR P2 ON CABLE ASSEMBLY W103.

INITIAL SETUP

Tools and Special Tools:
- General mechanic's automotive tool kit
- Soldering and desoldering set
- Hand terminal crimping tool (11-3284-2) and turret
- Insertion/extraction tool (M81969/14-04)
- Insertion/extraction tool (M81969/14-11)
- Electric gun-type heater
- Multimeter

Materials/Parts:
- Electric connector (MS3126E16-14S)
- Tape (item 19, appendix D)
- Insulated wire (M16878/4BGE9)
- Solder (item 18, appendix D)
- Shrink tubing (M23053/5-105-O)

References:
- Instructions on using crimp tool and turret (reference paragraph 5-26).
- Instructions on using insertion/extraction tool (reference paragraph 5-26).
- Install cable assembly W103 (reference paragraph 4-39).
- Adjust cable assembly W103 (reference paragraph 4-39).
- Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
- Cable assembly W103 removed (reference paragraph 4-39).

---

a. Removal.

(1) Loosen two screws (1) on strain relief (2) attached to backshell (3) on electric connector P2 (4).

(2) Remove electric connector P2 from backshell.

(3) Slide backshell and strain relief away from electric connector P2 and expose wiring.

(4) Cut wiring as close as possible to electric connector P2, and remove electric connector.

(5) Remove plastic grommet (5) from wiring.

(6) Remove telescoping adapter bushing (6) from wiring.

b. Installation.

(1) Install telescoping adapter bushing (6) on cable (7) and slide along cable away from end.

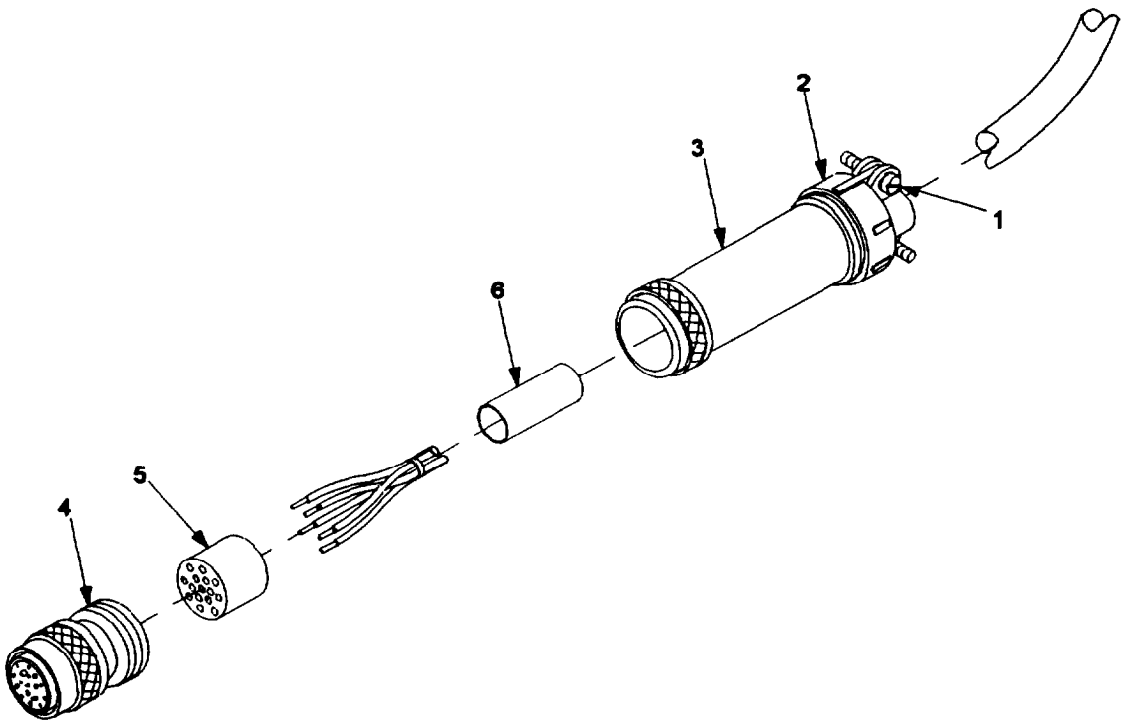
(2) Strip outer insulation on cable 6 in (15.24 cm) from end.

(3) Tape end of cable insulation.

(4) Fan shield (8) and twist together.

(5) Tin shield back to an approximate length of 1/2 in (1.27 cm).

5-35 REPLACEMENT OF ELECTRIC CONNECTOR P2 ON CABLE ASSEMBLY W103 - Continued.



(6) Solder 6-in (15.24-cm) length of 20 AWG wire (9) to tinned shield.

(7) Remove tape from end of cable insulation.

(8) Slide 1-in (2.54-cm) length of heat shrink tubing (10) over soldered connection.

(9) Apply heat and shrink tubing over connection.

(10) Locate white wire, gray wire, and white/black wire jacketed triplet (11).

(11) Strip insulation on jacket 6 in (15.24 cm) from end.

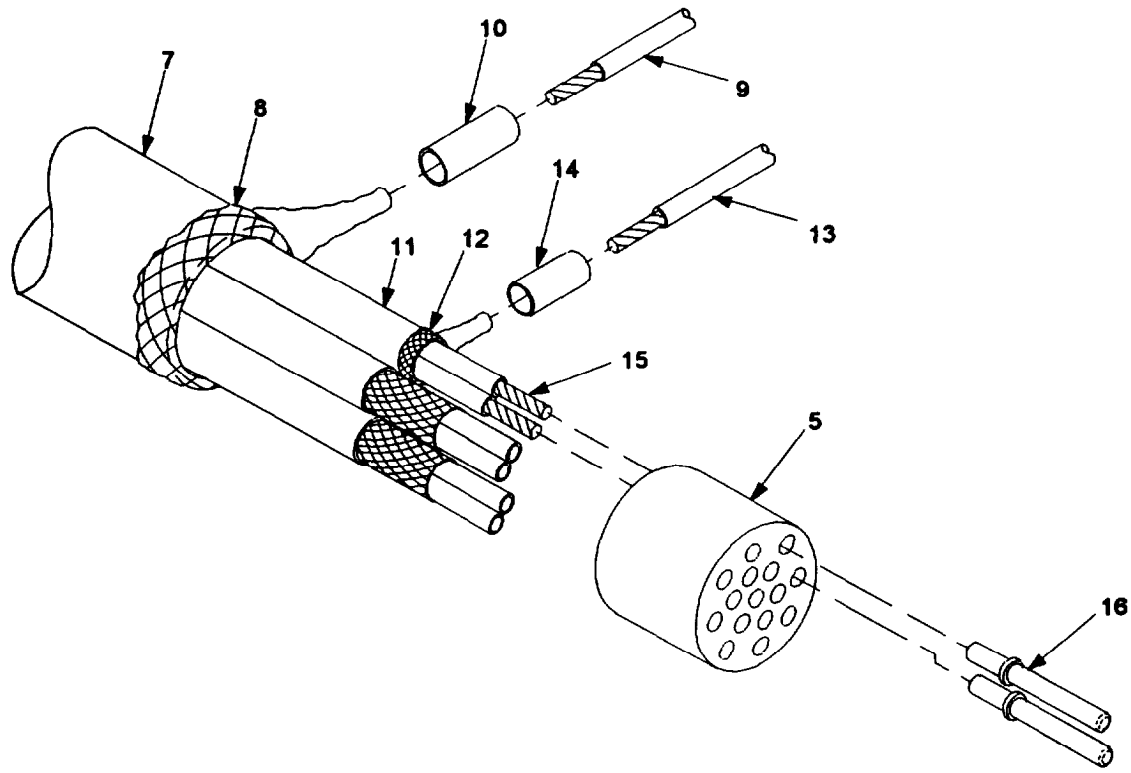
(12) Tape end of jacket insulation.

(13) Fan shield (12) and twist together.

(14) Tin shield with approximate length of 1/2 in (1.27 cm).

(15) Solder 6-in (15.24 cm) length of 20 AWG wire (13) to tinned shield.

(16) Remove tape from end of jacket insulation.



(17) Slide l-in (2.54 cm) length of heat shrink tubing (14) over soldered connection.

(18) Apply heat and shrink tubing over connection.

(19) Install plastic grommet (5) on wires (15).

(20) Refer to table 5-11 and match proper size contacts (16) to wires.

Table 5-11. Cable Assembly W103-to-Connector P2 Wiring Guide.

SOCKET	WIRE	CONTACT SIZE
B	White	20
L	Gray	20
C	White/Black	20
M	Shield (White, Gray, and White/Black)	20
D	Red	12
G	Orange	12
E	Brown	12
H	Black	12
F	Shield (Cable)	20

5-35 REPLACEMENT OF ELECTRIC CONNECTOR P2 ON CABLE ASSEMBLY W103 - Continued.

(21) For wires that use contact size #12, strip insulation 9/32 in (0.71 cm) from the end.

(22) For wires that use contact size #20, strip insulation 3/16 in (0.48 cm) from the end.

(23) Using crimp tool and turret, install contacts on wires and crimp connections. (For detailed Instructions on using the crimp tool and turret, refer to paragraph 5-26.)

NOTE

When Installing contact size #12, use insertion/extraction tool M81969/14-04. When installing contact size #20, use insertion/ extraction tool M81969/14-11.

(24) Refer to table 5-11. Using insertion/extraction tool, insert contacts (crimped to wires) in proper sockets at rear of electric connector P2 (4). (For detailed instructions on using the insertion/extraction tools, refer to paragraph 5-26.)

(25) Slide telescoping adapter bushing over exposed wires.

(26) Position backshell (3) over telescoping adapter bushing.

(27) Install electric connector P2 on backshell.

(28) Tighten two screws (1) on strain relief (2) attached to backshell.

(29) Refer to FO-2. Using multimeter, perform continuity check on cable assembly W103.

(30) Install cable assembly W103 (reference paragraph 4-39).

(31) Adjust cable assembly W103 (reference paragraph 4-39).

(32) Perform IMTC self-test (reference paragraph 2-4a).

5-36 REPLACEMENT OF ELECTRIC CONNECTOR P3 ON CABLE ASSEMBLY W103.

INITIAL SETUP

Tools and Special Tools:
- General mechanic's automotive tool kit
- Soldering and desoldering set
- Hand terminal crimping tool (11-3284-2) and turret
- Insertion/extraction tool (M81969/ 14-11)
- Electric gun-type heater
- Multimeter

Materials/Parts:
- Electric connector (MS3126E20-39P)
- Insulated wire (M16878/4BGE9)
- Solder (item 18, appendix D)
- Shrink tubing (M23053/5-105-O)
- Sealing compound (item 15, appendix D)
- Tape (item 19, appendix D)

References:
- Instructions on using crimp tool and turret (reference paragraph 5-26).
- Instructions on using insertion/ extraction tool (reference paragraph 5-26).
- Install cable assembly W103 (reference paragraph 4-39).
- Adjust cable assembly W103 (reference paragraph 4-39).
- Perform IMTC self-test (reference paragraph 2-4a).

Equipment Conditions:
- Cable assembly W103 removed (reference paragraph 4-39).

---

a. Removal.

(1) Loosen two screws (1) on strain relief (2) attached to backshell seal (3) on electric connector P3 (4).

(2) Remove electric connector P3 from backshell seal.

(3) Slide backshell seal away from electric connector P3 and expose wiring.

(4) Cut wiring as close as possible to electric connector P3, and remove electric connector.

(5) Remove plastic grommet (5) from wiring.

(6) Remove telescoping adapter bushing (6) from wiring.

b. Installation.

(1) Install telescoping adapter bushing (6) on cable (7) and slide along cable away from end.

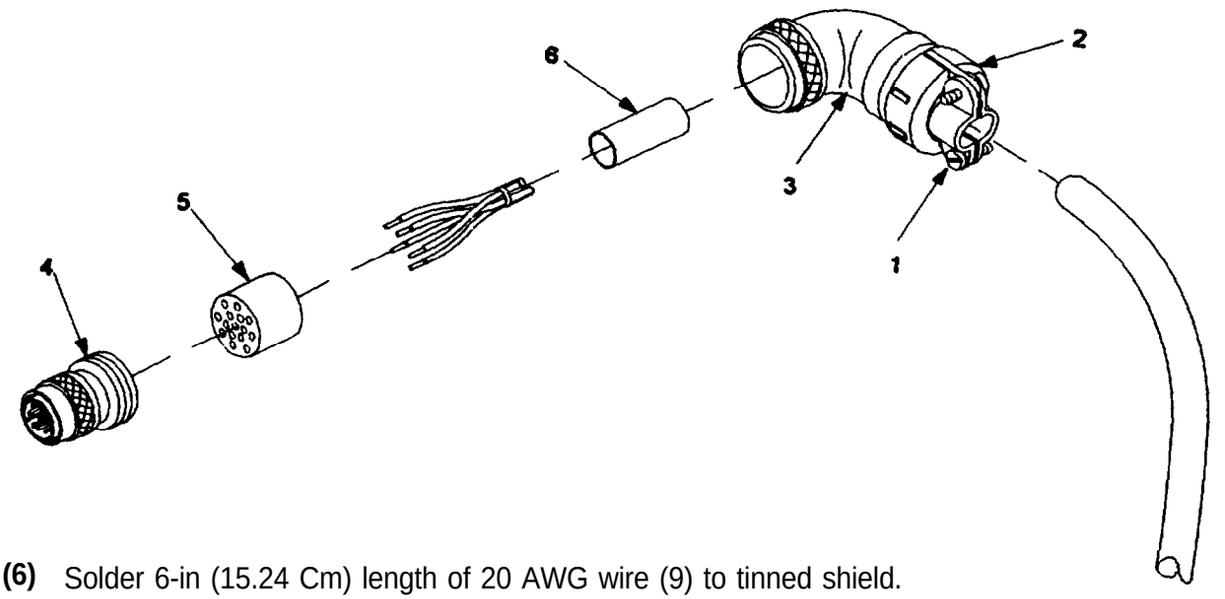
(2) Strip insulation on cable 6 in (15.24 cm) from end.

(3) Tape end of cable insulation.

(4) Fan shield (8) and twist together.

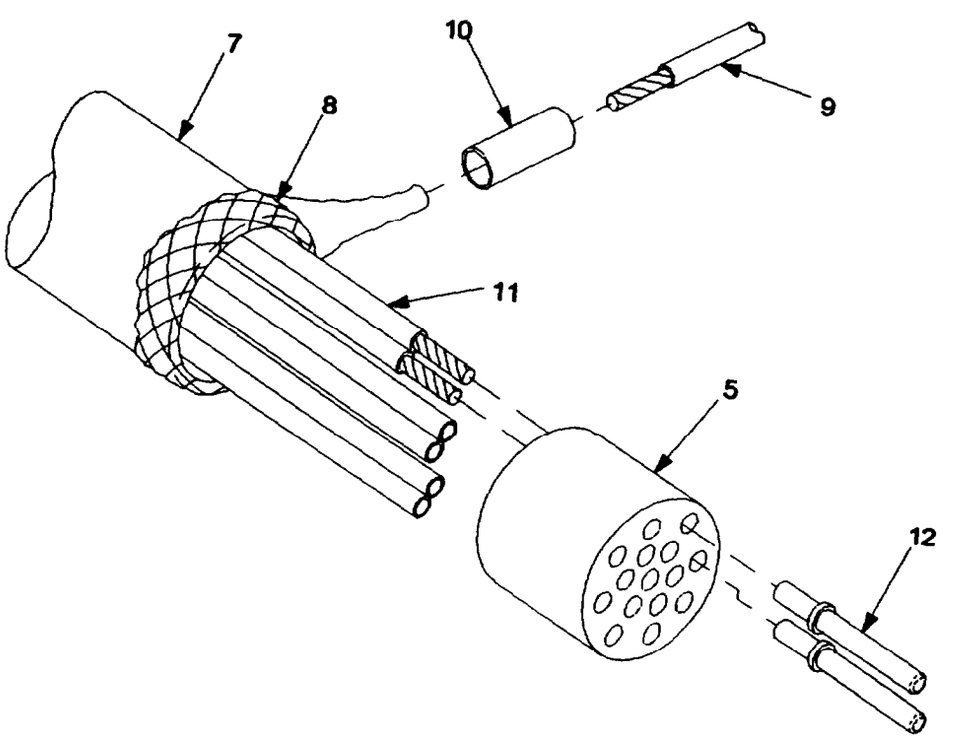
(5) Tin shield back to an approximate length of 1/2 in (1.27 cm).

5-36 REPLACEMENT OF ELECTRIC CONNECTOR P3 ON CABLE ASSEMBLY W103 - Continued.



(6) Solder 6-in (15.24 Cm) length of 20 AWG wire (9) to tinned shield.

(7) Remove tape from end of cable insulation.



(8) Slide 1-in (2.54 cm) length of shrink tubing (10) over soldered connection.

(9) Apply heat and shrink tubing over connection.

(10) install plastic grommet (5) on wires (11).

(11) Strip insulation on wires 3/16 in (0.48 cm) from the end.

(12) Using crimp tool and turret, install contacts (12) on wires and crimp connections. (For detailed instructions on using the crimp tool and turret, refer to paragraph 5-26.)

(13) Refer to table 5-12. Using insertion/extraction tool, insert contacts (crimped to wires) in proper sockets at rear of electric connector P3 (4). (For detailed instructions on using the insertion/extraction tools, refer to paragraph 5-26.)

Table 5-12. Cable Assembly W103-to-Connector P3 Wiring Guide.

SOCKET	WIRE	CONTACT SIZE
c	Green	20
d	Yellow	20
e	White/Blue	20
f	White/Violet	20
h	White/Brown	20
g	White/Red	20
i	Blue	20
j	Violet	20
q	White/Orange	20
a	White/Green	20
n	White/Yellow	20
L	Shield	20

(14) Slide telescoping adapter bushing over exposed wires.

(15) Position backshell seal (3) over telescoping adapter bushing.

(16) Apply sealing compound to threads of electric connector P3.

(17) Install electric connector P3 on backshell seal.

(18) Install and tighten two screws (1) in strain relief (2) on backshell seal.

(19) Refer to FO-2. Using multimeter, perform continuity check on cable assembly W103.

(20) Install cable assembly W103 (reference paragraph 4-39).

5-36 REPLACEMENT OF ELECTRIC CONNECTOR P3 ON CABLE ASSEMBLY W103 - Continued.

(21) Adjust cable assembly W103 (reference paragraph 4-39).

(22) Perform IMTC self-test (reference paragraph 2-4a).

SECTION III. MAINTENANCE PROCEDURES FOR ITM

5-37 GENERAL.

This section contains the instructions for removal, repair, and installation of major components of the ITM. The instructions consist of an initial setup to prepare for the task and step-by-step procedures to perform the task. Observe all warnings, cautions, and notes during the performance of these tasks.

5-38 OPTICAL SWITCH ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque screwdriver set

References:
Remove idler shaft assembly (reference paragraph 4-49).
Install idler shaft assembly (reference paragraph 4-49).
Perform test of ITM on RCS adapter (reference table 51).
Install cover assembly (reference paragraph 4-44).
Install target arm assembly (reference paragraph 4-47 or 4-50).
Install ITM (reference paragraph 4-41).

References - Continued:
Perform ITM self-test (reference paragraph 2-4b).

Materials/Parts:
Optical switch assembly (11829392)
Sealing compound (item 11, appendix D)
Sealing compound, alternate (item 16, appendix D)

Equipment Conditions:
ITM removed (reference paragraph 4-41).
Target arm assembly removed (reference paragraph 4-47 or 4-50).
Cover assembly removed (reference paragraph 4-44).

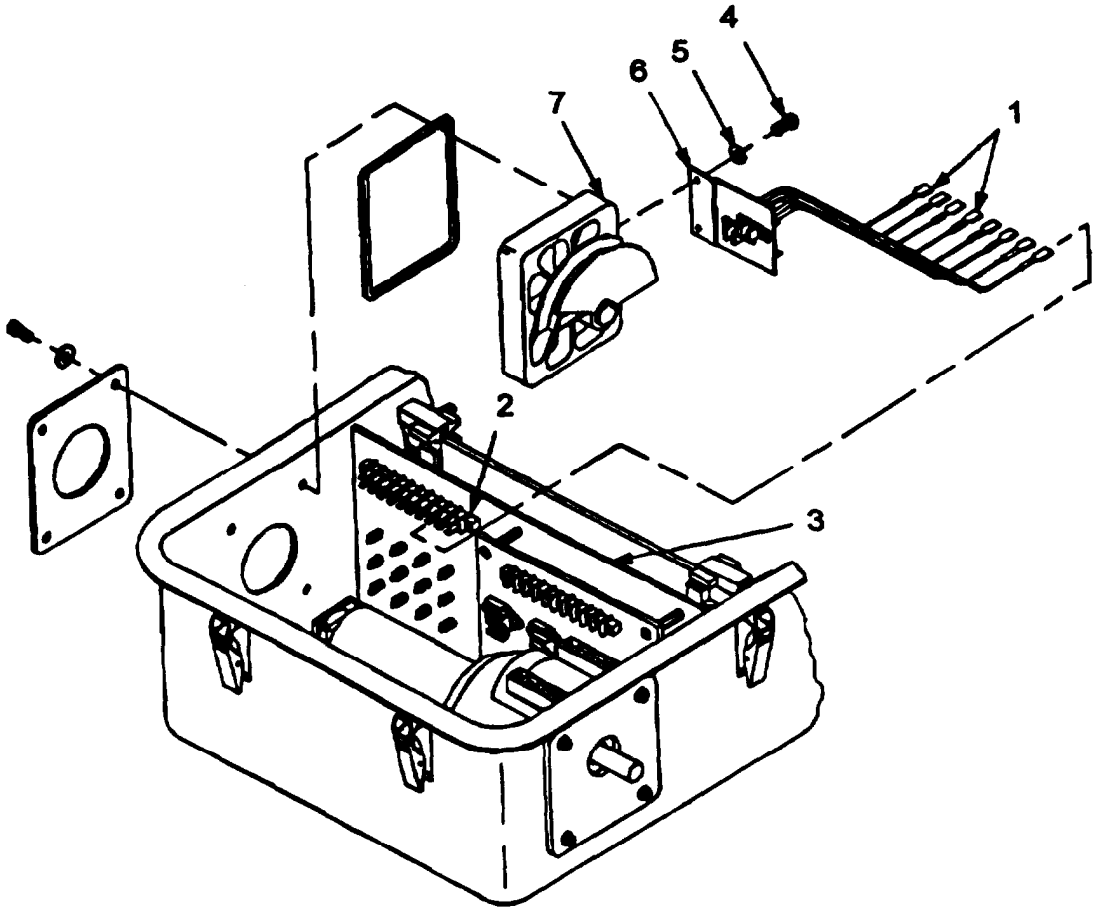
---

a. Removal.

(1) Tag and disconnect terminal lugs on eight optical switch assembly wires (1) from terminal board TB3 (2) on center plate electronic assembly (3).

(2) Remove idler shaft assembly (reference paragraph 4-49).

(3) Remove two screws (4) and flatwashers (5) and remove optical switch assembly (6) from bearing housing (7).



b. Installation.

(1) Position optical switch assembly (6) on bearing housing (7).

(2) Apply sealing compound to two screws (4).

(3) Install two screws and flatwashers (5) and secure optical switch assembly to bearing housing.

(4) Install idler shaft assembly (reference paragraph 4-49).

(5) Using tags or wire markers as guide, connect terminal lugs on eight optical switch assembly wires (I) to terminal board TB3 (2) on center plate electronics assembly (3). Remove tags from wires.

(6) Perform test of ITM on RCS adapter (reference table 5-1).

(7) Install target arm assembly (reference paragraph 4-47 or 4-50).

(8) Install cover assembly (reference paragraph 4-44).

5-38 OPTICAL SWITCH ASSEMBLY REPLACEMENT - Continued.

(9) Install ITM (reference paragraph 4-41).

(10) Set circuit breaker CB1 on ITM to POWER ON.

(11) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to ON.

(12) Set circuit breaker on ICB to ON.

(13) Perform ITM self-test (reference paragraph 2-4b).

5-39 MOTOR DRIVE CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Circuit card assembly (I 1829321)
Lockwasher (MS35338-136)
Sealing compound (item 11, appendix D)
Sealing compound, alternate (item 16, appendix D)

References:
Perform test of ITM on RCS adapter (reference table 5-1).
Install cover assembly (reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test (reference paragraph 2-4b).

Equipment Conditions:
ITM removed (reference paragraph 4-41).
Cover assembly removed (reference paragraph 4-44).

---

a. Removal.

(1) Tag leads from wiring harness A1W2 (1) and leads from drive motor assembly (2) that are connected to motor drive CCA (3).

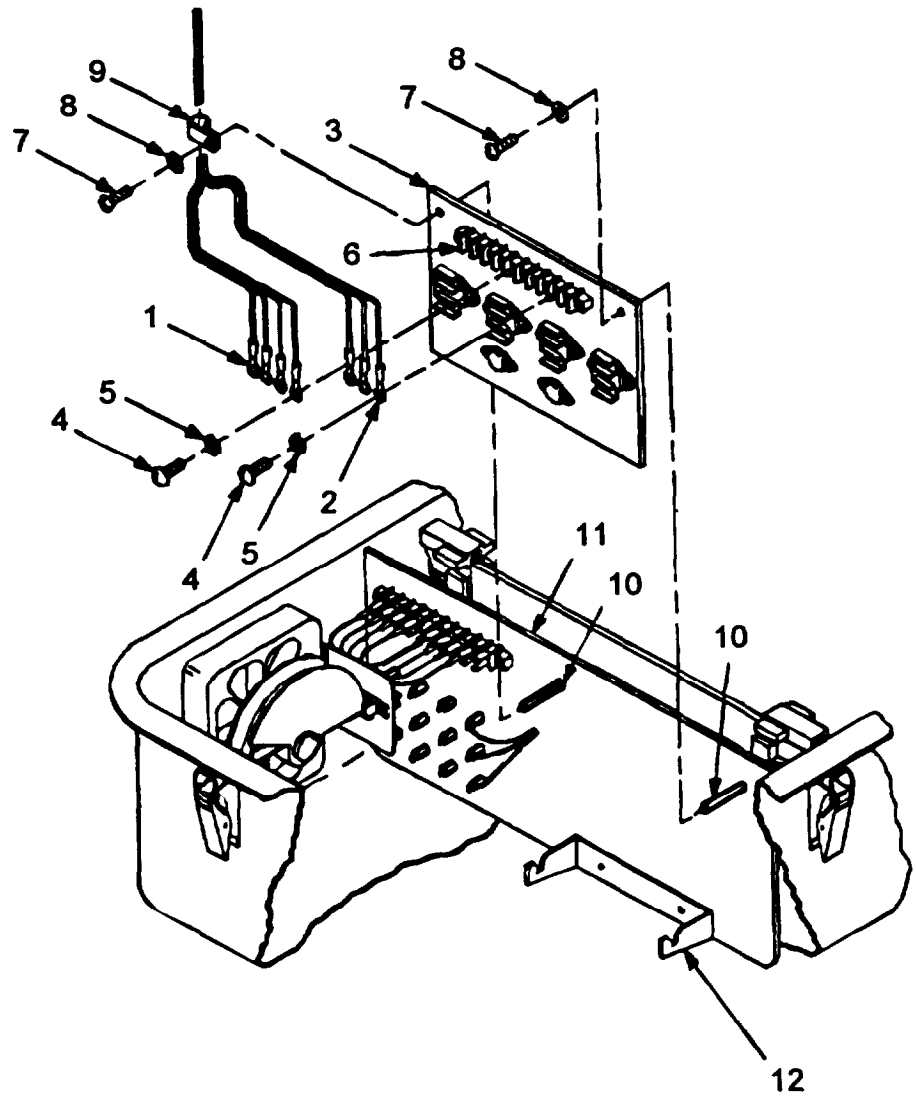
(2) Remove screws (4) and lockwashers (5) from appropriate terminals on terminal board TB1 (6) on motor drive CCA. Discard lockwashers.

(3) Remove tagged leads from terminals.

(4) Reinstall screws on appropriate terminals on terminal board TB1 on motor drive CCA.

(5) Remove two mounting screws (7) and flatwashers (8) that secure cable clamp (9) and motor drive CCA to electrical-mechanical posts (10) on center plate electronic assembly (11).

(6) Remove cable clamp and motor drive CCA from center plate electronic assembly.



b. Installation.

(1) Position motor drive CCA (3) on bracket (12) and electrical-mechanical posts (10) attached to center plate electronic assembly (11).

(2) Apply sealing compound to mounting screw (7).

(3) Install mounting screw and flatwasher (8) and secure motor drive CCA to electrical-mechanical post on center plate electronic assembly.

(4) Remove screws (4) from appropriate terminals on terminal board TB1 (6) on motor drive CCA.

(5) Using tags as guide, connect leads from wiring harness A1W2 and leads from drive motor assembly to terminals on terminal board TB1.

5-39 MOTOR DRIVE CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT - Continued.

(6) Install screws and new lockwashers (5) on appropriate terminals on terminal board TB1 on motor drive CCA.

(7) Remove tags from wires.

(8) Install cable clamp (9) on leads from wiring harness A1W2 (1) and leads from drive motor assembly (2).

(9) Position cable clamp on electrical-mechanical post.

(10) Apply sealing compound to mounting screw (7).

(11) Install mounting screw and flatwasher (8) and secure cable clamp to electrical-mechanical post on center plate electronic assembly.

(12) Perform test of ITM on RCS adapter (reference table 5-1).

(13) Install cover assembly (reference paragraph 4-44).

(14) Install ITM (reference paragraph 4-41).

(15) Perform ITM self-test (reference paragraph 2-4b).

5-40 CONTROL LOGIC CIRCUIT CARD ASSEMBLY (CCA) REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Circuit card assembly (9341125)

Equipment Conditions:
ITM removed (reference paragraph 4-41).
Cover assembly removed (reference paragraph 4-44).

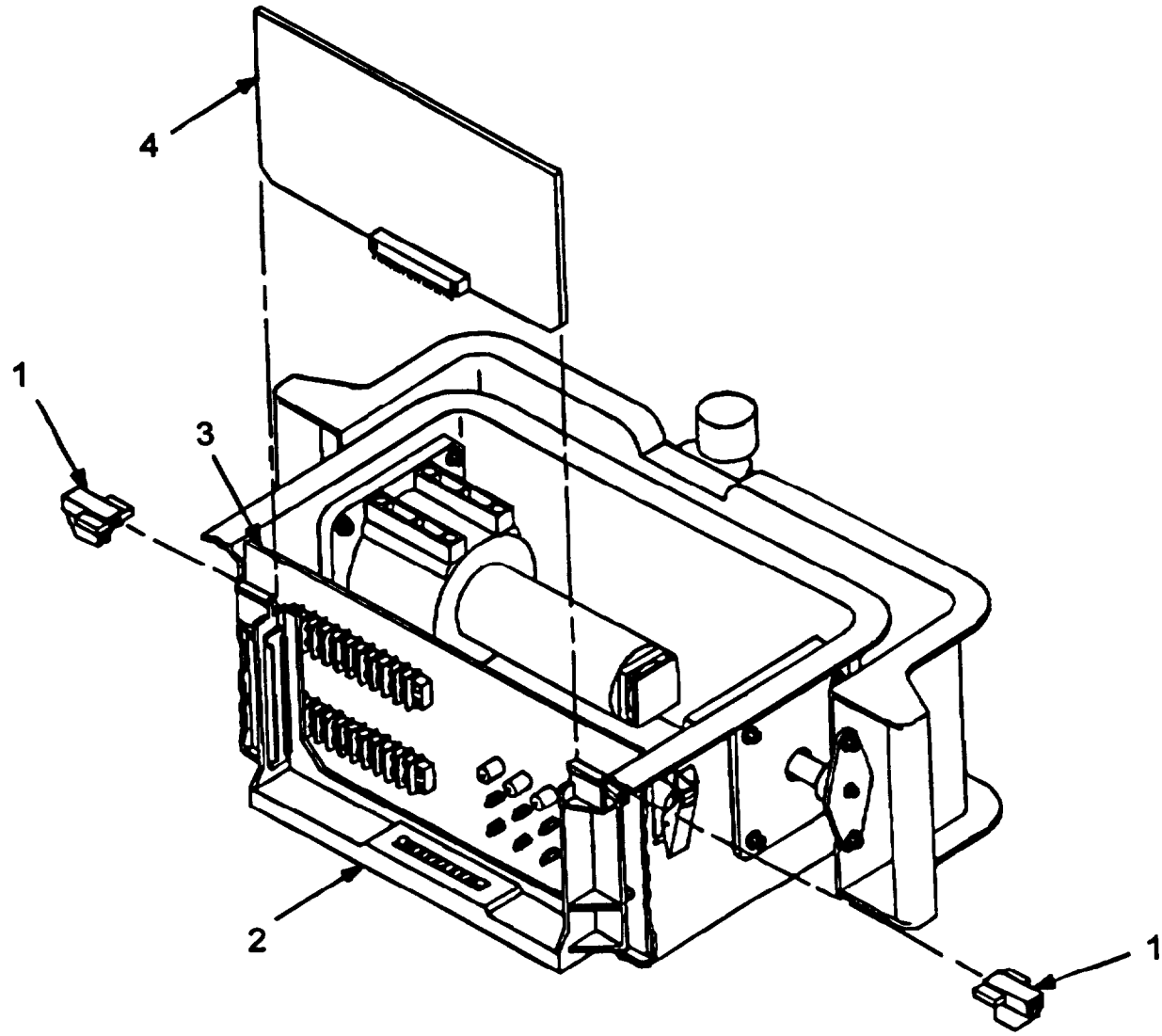
References:
Perform test of ITM on RCS adapter (reference table 5-1).
Install cover assembly (reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test (reference paragraph 2-4b).

---

a. Removal.

(1) Release keepers (1) on card guide frame (2) attached to center plate electronic assembly (3).

(2) Remove control logic CCA (4) from card guide frame.



b. Installation.

(1) Position control logic CCA (4) in card guide frame (2) attached to center plate electronic assembly (3) and fasten keepers (1).

(2) Perform test of ITM on RCS adapter (reference table 5-1).

(3) Install cover assembly (reference paragraph 4-44).

(4) Install ITM (reference paragraph 4-41).

(5) Perform ITM self-test (reference paragraph 2-4b).

5-41 TARGET ARM AND HIT SENSOR ASSEMBLY REPLACEMENT.

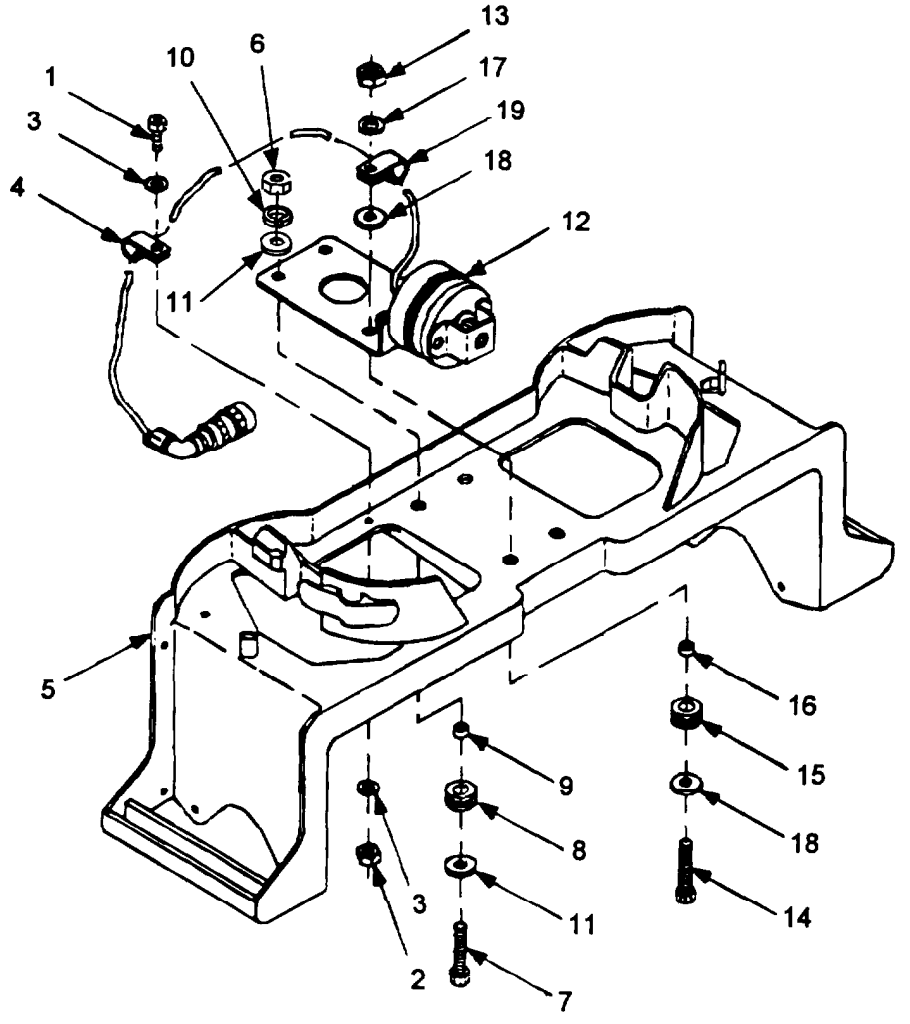
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Self-locking nut (MS21083C3)
Lockwasher (MS35338-139)
Target arm (11829279)
Hit sensor assembly (9363053)
Sealing compound (item 11, appendix D)
Sealing compound, alternate (item 16, appendix D)

References:
Install target arm assembly (reference paragraph 4-47).
Perform ITM self-test (reference paragraph 2-4b).

Equipment Conditions:
Target arm assembly removed (reference paragraph 4-47).



a. Removal.

(1) Remove three screws (I), three self-locking nuts (2) and six flatwashers (3) that secure cable clamps (4) to target arm (5).

(2) Remove three cable clamps from target arm.

(3) Remove three nuts (6) hex-head capscrews (7) grommets (8) spacers (9) lockwashers (10), and six flatwashers (11) that secure hit sensor assembly (12) to target arm.

(4) Remove nut (13), hex-head capscrew (14), grommet (15), spacer (16), lockwasher (17), and two flatwashers (18) that secure cable clamp (19) to target arm.

(5) Remove cable clamp and hit sensor assembly from target arm.

b. Installation.

(1) Position hit sensor assembly (12) on target arm (5).

(2) Install cable clamp (19) on hit sensor electronics cable and position cable clamp on target arm.

(3) Apply sealing compound to threads of hex-head capscrews (7) and (14).

NOTE

Longest capscrew is used with cable clamp.

(4) Install grommet (15), spacer (16), hex-head capscrew, new lockwasher (17), two flatwashers (18), and nut (13), and secure cable clamp to target arm (5).

(5) Install three grommets (8), spacers (9), hex-head capscrews, six flatwashers (11), three new lockwashers (10), and nuts (6), and secure hit sensor assembly to target arm.

(6) Install three cable clamps (4) on hit sensor electronics cable and position clamps on target arm.

(7) Install three screws (1), six flatwashers (3), and three new self-locking nuts (2), and secure cable clamps on target arm.

(8) install target arm assembly (reference paragraph 4-47).

(9) Perform ITM self-test (reference paragraph 2-4b).

5-42 HIT SENSOR ELECTRONICS REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Lockwasher (MS35338-139)
Hit sensor electronics (11829348)
Sealing compound (item 11, appendix D)
Sealing compound, alternate (item 16, appendix D)

References:
Install hit sensor assembly (reference paragraph 5-41).
Perform ITM self-test (reference paragraph 2-4b).

Equipment Conditions:
Hit sensor assembly removed (reference paragraph 5-41).

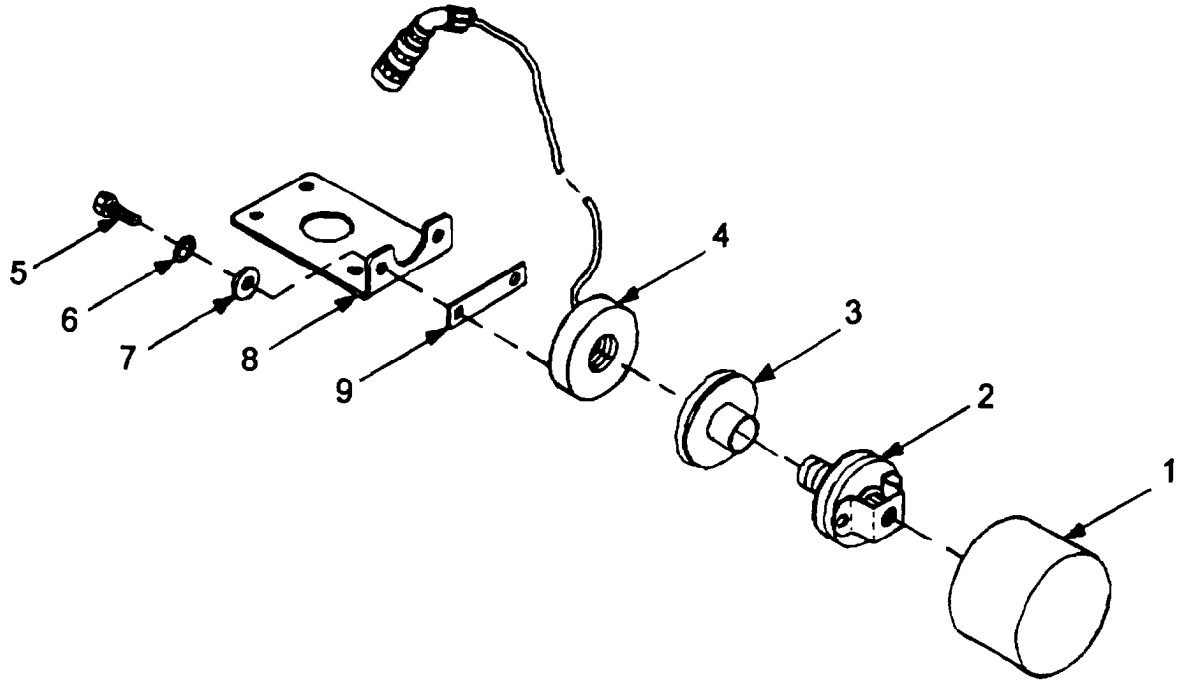
a. Removal.

(1) Remove hit sensor shield (I) from hit sensor assembly.

(2) Loosen capscrew (part of hit sensor clamp assembly) and remove hit sensor clamp assembly (2), spacer (3), from hit sensor electronics (4).

(3) Remove two screws (5), lockwashers (6), and flatwashers (7) that secure hit sensor electronics to base plate (8).

(4) Remove hit sensor electronics and isolation spacer (9) from base plate.



b. Installation.

(1) Position hit sensor electronics (4) and isolation spacer (9) on base plate (8).

(2) Apply one drop of sealing compound to each of two screws (5).

(3) Install two screws, new lockwashers (6), and flatwashers (7) and secure hit sensor electronics and insulation spacer to base plate.

(4) Position spacer (3) and hit sensor clamp assembly (2) on hit sensor electronics and tighten capscrew (part of hit sensor clamp assembly).

(5) Install hit sensor shield (1) on hit sensor assembly.

(6) Install hit sensor assembly (reference paragraph 5-41).

(7) Perform ITM self-test (reference paragraph 2-4b).

5-43 WIRING HARNESS W1 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque wrench

Materials/Parts:
Lockwasher (MS35338-136)
Tiedown straps (MS33674-9)
Self-locking nut (MS21083C6)
Wiring harness (11829394)
Sealing compound (item 11, appendix D)
Sealing compound, alternate
(item 16, appendix D)

References:
Install control logic CCA
(reference paragraph 5-40).
Perform test of ITM on RCS adapter
(reference table 5-1).
Install cover assembly
(reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test
(reference paragraph 2-4b).

Equipment Conditions:
ITM removed (reference paragraph 4-41).
Cover assembly removed
(reference paragraph 4-44).
Control logic CCA removed
(reference paragraph 5-40).

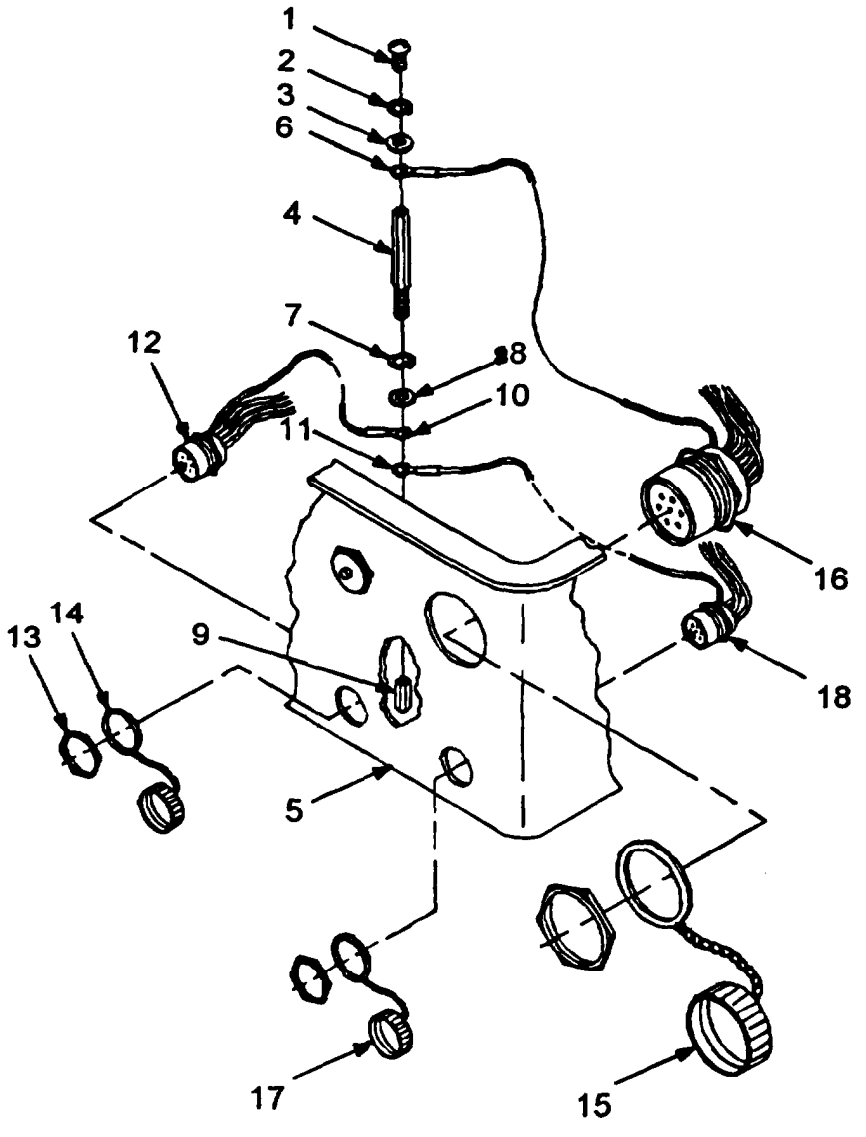
---

a. Removal.

(1) Remove pan-head screw (1), lockwasher (2), and flatwasher (3) from hex standoff (4) at E1 on housing assembly (5). Discard lockwasher.

(2) Disconnect terminal lug on connector J3 ground wire (6) from pan-head screw.

5-43 WIRING HARNESS W1 REPLACEMENT - Continued.



(3) Remove hex standoff, lockwasher (7), and flatwasher (8) from male-female standoff (9) at E1 on housing assembly. Discard lockwasher.

(4) Disconnect terminal lug on connector J2 ground wire (10) and terminal lug on connector J4 ground wire (11) from male-female standoff.

(5) Reinstall hex standoff and flatwasher on male-female standoff at E1 on housing assembly.

(6) Reinstall pan-head screw and flatwasher on hex standoff at E1 on housing assembly.

(7) Disconnect connector on hit sensor electronics cable from connector J2 (12).

(8) Remove mounting nut (13) and link chain attachment (14) from connector J2.

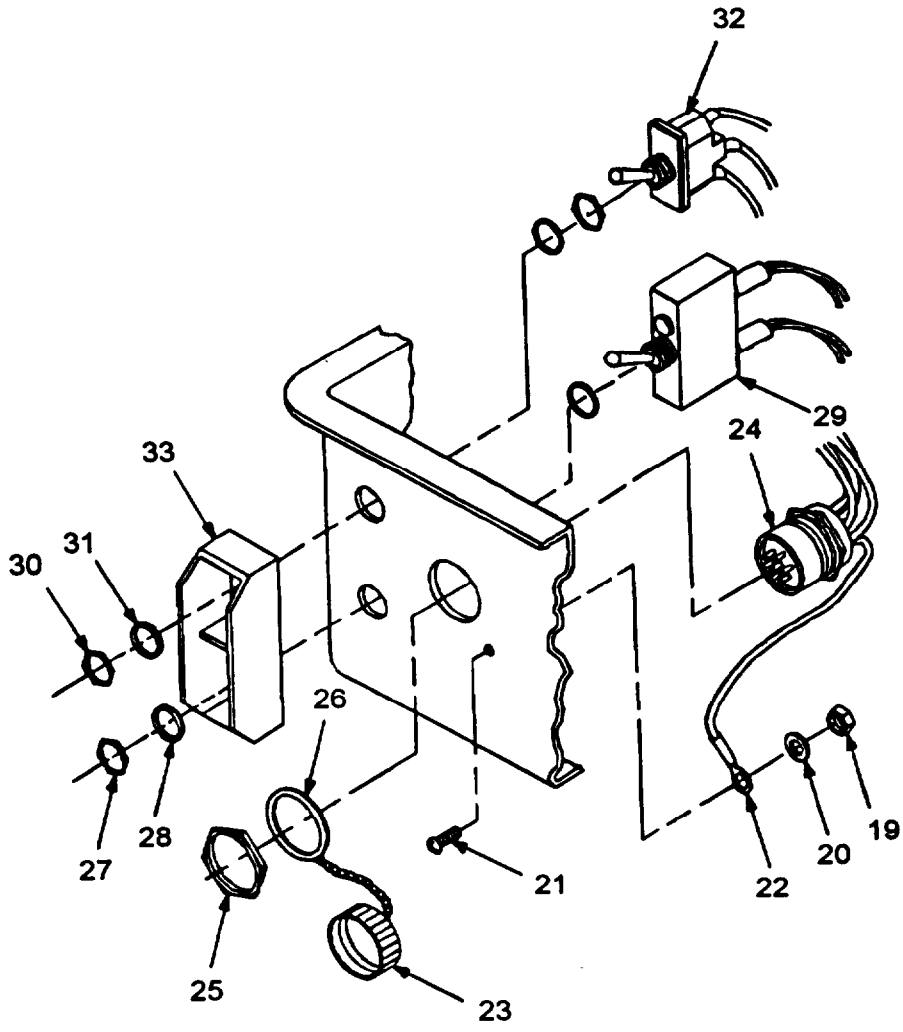
(9) Push connector J2 inside housing assembly.

(10) Reinstall mounting nut on connector J2.

(11) Remove protective cap (15) from connector J3 (16). Remove protective cap (17) from connector J4 (18).

(12) Repeat steps (8) through (10) for connectors J3 and J4.

(13) Remove self-locking nut (19) and flatwasher (20) from screw (21) at E3 on housing assembly.



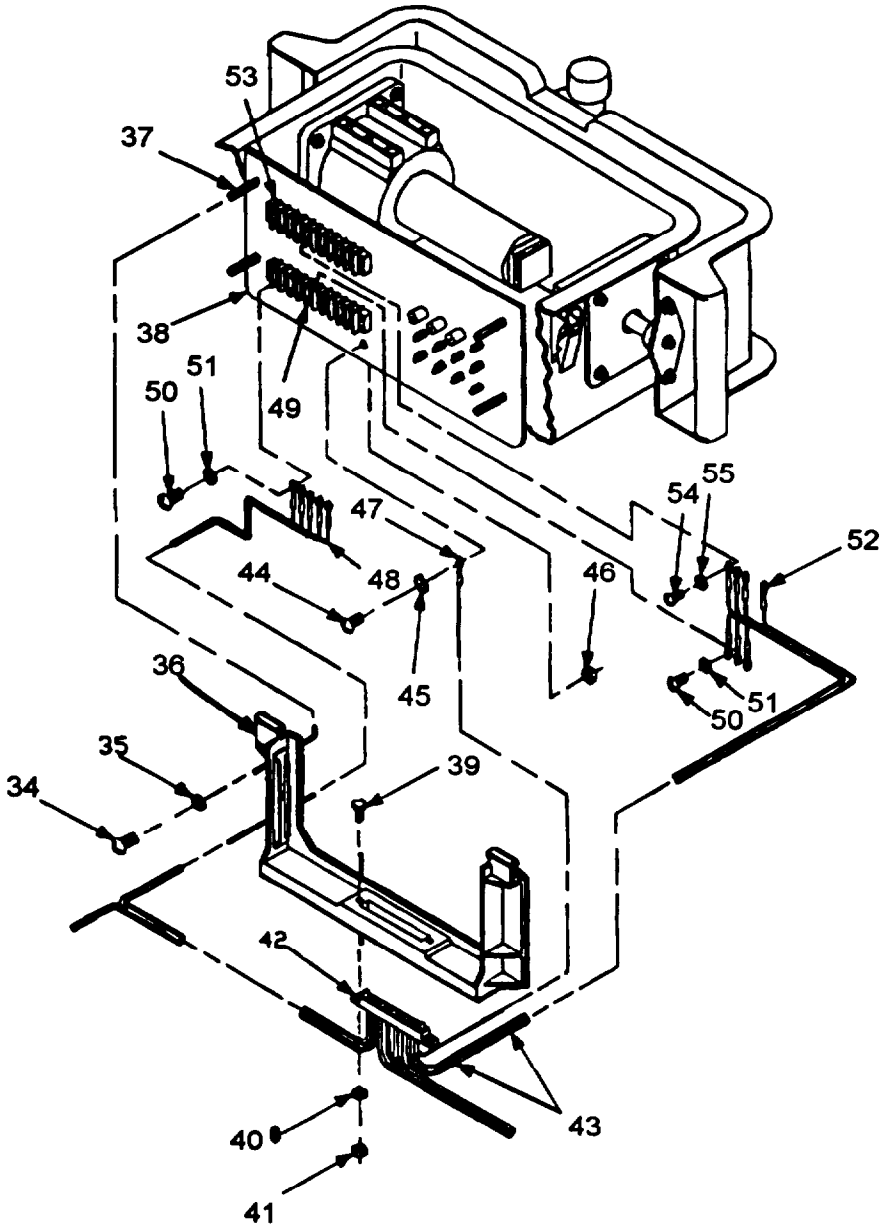
5-43 WIRING HARNESS W1 REPLACEMENT - Continued.

(14) Disconnect terminal lug on connector J1 ground wire (22) from screw at E3.

(15) Reinstall self-locking nut and flatwasher on screw at E3 on housing assembly.

(16) Remove protective cap (23) from connector J1 (24).

(17) Remove mounting nut (25) and link chain attachment (26) from connector J1.



(16) Push connector J1 inside housing assembly.

(19) Reinstall mounting nut on connector J1.

(20) Remove jamnut (27) and washer (28) from circuit breaker CB1 (29).

(21) Push circuit breaker CB1 inside housing assembly.

(22) Reinstall washer and jamnut on circuit breaker CB1.

(23) Remove jamnut (30) and washer (31) from test/operate switch S1 (32).

(24) Remove switch guard (33) and push test/operate switch S1 inside housing assembly.

(25) Reinstall washer and jamnut on test/operate switch S1.

(26) Remove four screws (34) and flatwashers (35) that secure card guide frame (36) to electrical-mechanical posts (37) on center plate electronic assembly (38).

(27) Remove two screws (39) washers (40) and nuts (41) that secure wiring harness connector XA1 (42) to card guide frame.

(28) Cut tiedown straps (43) as necessary and remove card guide frame.

(29) Remove pan-head screw (44), flatwasher (45) and locking hex-nut (46) at E1 on center plate electronic assembly,

(30) Disconnect terminal lug on connector XA1 ground wire (47) from pan-head screw.

(31) Reinstall pan-head screw, flatwasher, and locking hex-nut at El on center plate electronic assembly.

(32) Tag wiring harness W1 wires (48) attached to terminal board TB1 (49) on center plate electronic assembly.

(33) Remove screws (50) and lockwashers (51) from appropriate terminals on terminal board TB1. Discard lockwashers.

(34) Disconnect wiring harness WI wires from appropriate terminals on terminal board TB1.

(35) Reinstall screws on appropriate terminals on terminal board TB1.

(36) Tag wiring harness W1 wires (52) attached to terminal board TB2 (53) on center plate electronic assembly.

(37) Remove screws (54) and lockwashers (55) from appropriate terminals on terminal board TB2. Discard lockwashers.

(38) Disconnect wiring harness WI wires from appropriate terminals on terminal board TB2.

5-43 WIRING HARNESS W1 REPLACEMENT - Continued.

(39) Reinstall screws on appropriate terminals on terminal board TB2.

(40) Remove wiring harness W1 from housing assembly.

b. Installation.

(1) Position wiring harness WI in housing assembly (5).

(2) Remove screws (54) from appropriate terminals on terminal board TB2 (53).

(3) Using tags or wire markers as guide, connect wiring harness W1 wires (52) to appropriate terminals on terminal board TB2.

(4) Install screws and new lockwashers (55) on appropriate terminals on terminal board TB2.

(5) Remove screws (50) from appropriate terminals on terminal board TB1 (49).

(6) Using tags or wire markers as guide, connect wiring harness WI wires (48) to appropriate terminals on terminal board TB1.

(7) Install screws and new lockwashers (51) on appropriate terminals on terminal board TB1.

(8) Remove tags from wires.

(9) Remove pan-head screw (44) flatwasher (45) and locking hex-nut (46) at E1 on center plate electronic assembly (38).

(10) Connect terminal lug on connector XA1 ground wire (47) to pan-head screw.

(11) Install pan-head screw, flatwasher, and new locking hex-nut at E1 on center plate electronic assembly.

(12) Position wiring harness connector XA1 (42) on card guide frame (36) and install two screws (39), washers (40), and nuts (41).

(13) Position card guide frame on electrical-mechanical posts (37) attached to center plate electronic assembly and install four screws (34) and flatwashers (35).

(14) Install tiedown straps (43) as necessary to secure wiring harness W1 wires to card guide frame.

(15) Remove jamnut (27) and washer (28) from circuit breaker CB1 (29).

(16) Apply sealing compound to threads of circuit breaker CB1.

(17) Position switch guard (33) and circuit breaker CB1 on housing assembly,

(18) Install washer and jamnut on circuit breaker CB1 and secure circuit breaker to housing assembly.

(19) Remove jamnut (30) and washer (31) from test/operate switch S1 (32).

(20) Apply sealing compound to threads of test/operate switch S1.

(21) Position test switch S1 in housing assembly.

(22) Install washer and jamnut on test/operate switch S1 and secure switch guard and switch to housing assembly.

(23) Torque jamnuts on circuit breaker CB1 and test/operate switch S1 to 20-26 in-lbs (2.28-2.95 Newton-meters).

(24) Remove mounting nut (25) from connector J1 (24).

(25) Apply sealing compound to threads of connector J1.

(26) Position connector J1 in housing assembly.

(27) Install link chain attachment (26) and mounting nut on connector J1 and secure connector to housing assembly.

(28) Torque mounting nut on connector J1 to 70-75 in-lbs. (7.96-8.53 Newton-meters) and install protective cap (23) on connector J1.

(29) Remove self-locking nut (19) and flatwasher (20) from screw (21) at E3 on housing assembly.

(30) Connect terminal lug on connector J1 ground wire (22) to screw at E3.

(31) Install flatwasher and new self-locking nut on screw at E3 on housing assembly.

(32) Remove mounting nut (13) from connector J2 (12).

(33) Apply sealing compound to threads of connector J2.

(34) Position connector J2 in housing assembly.

(35) Install link chain attachment (14) and mounting nut on connector J2 and secure connector to housing assembly.

(36) Repeat steps (33) through (36) for connectors J3 (16) and J4 (18).

(37) Torque mounting nuts on connectors J2 and J4 to 55-60 in-lbs (6.25-6.83 Newton-meters) and install protective cap (17) on connector J4.

(38) Torque mounting nut on connector J3 to 90-95 in-lbs (10.24-10.8 Newton-meters) and install protective cap (15) on connector J3.

(39) Remove pan-head screw (1) and flatwasher (3), and hex standoff (4) and flatwasher (8) from male-female standoff (9) at E1 on housing assembly.

5-43 WIRING HARNESS W1 REPLACEMENT - Continued.

(40) Install flatwasher (8) and new lockwasher (7) on hex standoff.

(41) Connect terminal lug on connector J2 ground wire (10) and terminal lug on connector J4 ground wire (11) to hex standoff.

(42) Install hex standoff, new lockwasher, and flatwasher on male-female standoff at E1 on housing assembly.

(43) Install flatwasher and new lockwasher (2) on pan-head screw.

(44) Connect terminal lug on connector J3 ground wire (6) to pan-head screw.

(45) Install screw, new lockwasher, and flatwasher on hex standoff at E1 on housing assembly.

(46) Connect connector on hit sensor electronics cable to connector J2.

(47) Install control logic CCA (reference paragraph 5-40).

(48) Perform test of ITM on RCS adapter (reference table 5-1).

(49) Install cover assembly (reference paragraph 4-44).

(50) Install ITM (reference paragraph 4-41).

(51) Perform ITM self-test (reference paragraph 2-4b).

5-44 ELECTRIC CONNECTORS J1, J2, J3, AND J4 REPLACEMENT.

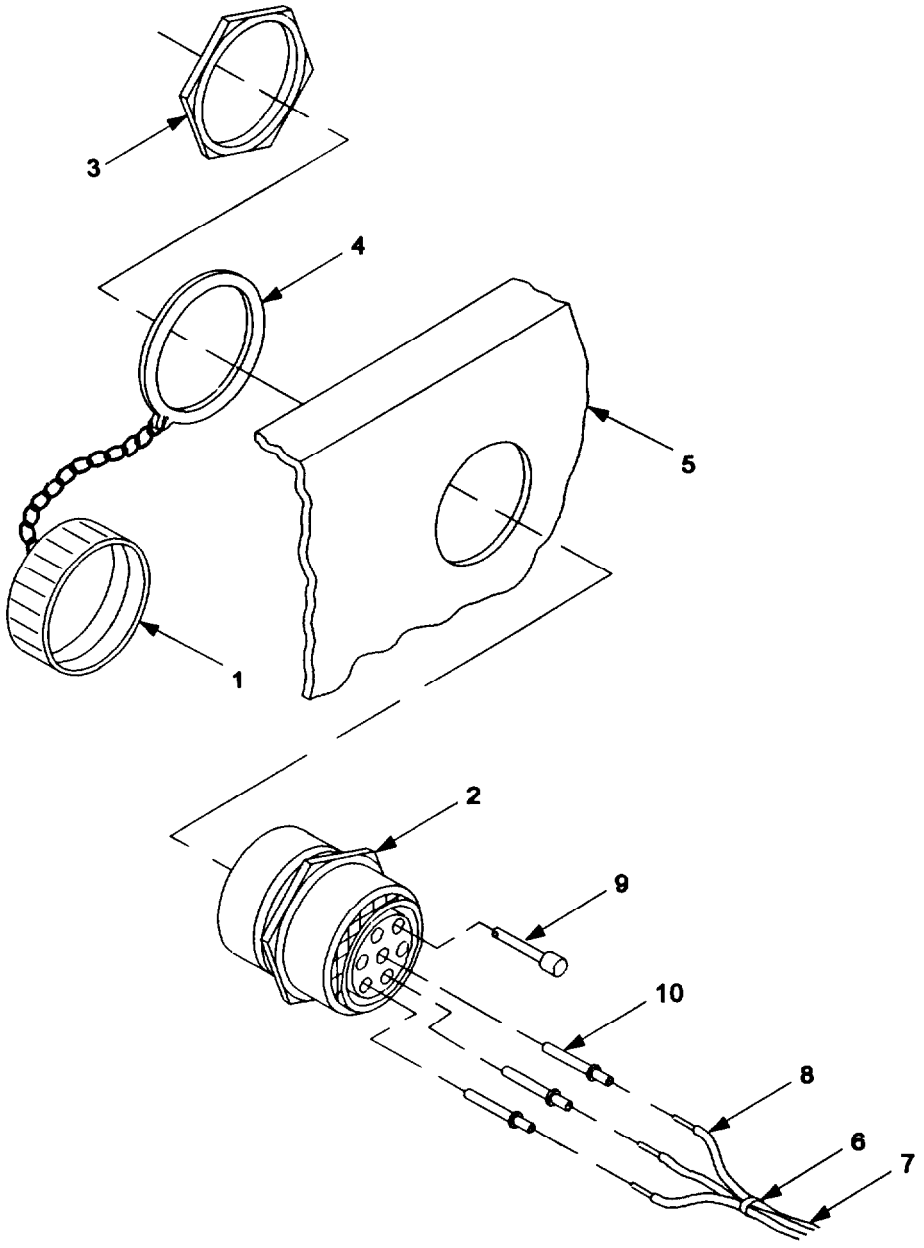
INITIAL SETUP

Tools and Special Tools:
- General mechanic's automotive tool kit
- Hand terminal crimping tool (11-3284-2) and turret
- Insertion/extraction tool (M81969/14-03)
- Insertion/extraction tool (M81969/14-04)
- Insertion/extraction tool (M81969/14-11)
- Torque wrench

Materials/Parts:
- Connector J1 (MS3124E16-14P)
- Connector J2 (MS3124E14-15S)
- Connector J3 (MS3124E20-39S)
- Connector J4 (MS3124E14-12S)
- Tiedown straps (MS3367-4-9)
- Sealing compound (item 11, appendix D)

References:
- Instructions on using crimp tool and turret (reference paragraph 5-26).
- Instructions on using insertion/extraction tool (reference paragraph 5-26).
- Perform test of ITM on RCS adapter (reference table 5-1).
- Install cover assembly (reference paragraph 4-44).
- Install ITM (reference paragraph 4-41).
- Perform ITM self-test (reference paragraph 2-4b).

Equipment Conditions:
- ITM removed (reference paragraph 4-41).
- Cover assembly removed (reference paragraph 4-44).



a. Removal.

(1) Remove protective cap (1) from electric connector (2).

(2) Remove mounting nut (3) and link chain attachment (4) from electric connector.

(3) Pull electric connector away from housing assembly (5).

(4) Reinstall mounting nut on electric connector.

5-44 ELECTRIC CONNECTORS J1, J2, J3, AND J4 REPLACEMENT - Continued.

(5) Cut and discard sufficient number of tiedown straps (6) from wiring harness (7) to allow enough slack in wires for replacement of electric connector.

(6) Tag wires (8) connected to electric connector.

(7) Cut wires as close as possible to electric connector, and remove electric connector.

(8) Remove sealing plugs (9) from electric connector.

b. Installation.

(1) Using tags on wires (8) as guide, match proper size contacts (10) to wires. If replacing connector J1, refer to table 5-13. If replacing connector J2, refer to table 5-14. If replacing connector J3, refer to table 5-15. If replacing connector J4, refer to table 5-16. Each table lists contact sizes for sockets on the electric connector. If a socket has no entry under contact size in the table, then the socket is filled by a plug and no wire is connected to that socket.

Table 5-13. Contact/Plug Sizes for Connector J1.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
A	-	12
B	20	-
C	20	-
D	12	-
E	12	-
F	20	-
G	12	-
H	12	-
J		20
K		20
L	20	-
M	20	-
N	20	-
P		12

Table 5-14. Contact/Plug Sizes for Connector J2.

CONNECTOR SOCKET)	CONTACT SIZE	PLUG SIZE
A	20	-
B	20	-
C	20	-

Table 5-14. Contact/Plug Sizes for Connector J2 - Continued.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
D	20	-
E	20	-
F	20	-
G	20	-
H	20	-
J		20
K	20	-
L	20	-
M	20	-
N	20	-
P	16	-
R		20

Table 5-15. Contact/Plug Sizes for Connector J3.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
A	20	
B	20	-
C	20	-
D	20	-
E	20	-
F	20	-
G	20	-
H	20	-
J	20	-
K	20	-
L	20	-
M	20	-
N	20	-
P	20	-
R	20	-
S	20	-
T	20	-
U	20	-
V	20	-
W	20	-

5-44 ELECTRIC CONNECTORS J1, J2, J3, AND J4 REPLACEMENT - Continued.

Table 5-15. Contact/Plug Sizes for Connector J3 - Continued.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
X	20	-
Y	20	-
Z	20	-
a	20	-
b		20
C	20	-
d	20	-
e	20	-
f	20	-
g	20	-
h	20	-
i	20	-
j	20	-
k	20	-
m	16	-
n	20	-
P	20	-
q	20	-
r	16	

Table 5-16. Contact/Plug Sizes for Connector J4.

CONNECTOR SOCKET	CONTACT SIZE	PLUG SIZE
A	20	-
B	20	-
C	20	-
D	20	-
E	20	-
F	20	-
G		20
H		20
J	16	-
K	16	-
L	16	-
M	16	

(2) Reference table 5-17 and strip outer insulation on wires according to contact size.

Table 5-17. Contact/wire Installation Guide.

CONTACT SIZE	FIT ON AWG WIRE SIZES	STRIP OUTER INSULATION ON WIRE
#12	12 or 14	9/32 in (0.71 cm) from end
#16	18 or 20	9/32 in (0.71 cm) from end
#20	20, 22, or 24	3/16 in (0.48 cm) from end

(3) Using crimp tool and turret, install contacts on wires and crimp connections. (For detailed instructions on using the crimp tool and turret, refer to paragraph 5-26.)

NOTE

When installing contact size #12, use insertion/extraction tool M81969/14-04. When installing contact size #16, use insertion/ extraction tool M81969/14-03. When installing contact size #20, use insertion/extraction tool M81969/14-11.

(4) Following tags on wires as guide and using insertion/extraction tools, insert contacts (crimped to wires) in proper sockets at rear of electric connector (2). (For detailed instructions on using the insertion/extraction tools, refer to paragraph 5-26.)

(5) Remove tags from wires.

NOTE

When Installing sealing plugs in sockets, leave end of plug protruding to ease in removal.

(6) Insert proper size sealing plugs (9) into unwired sockets at rear of electric connector. If replacing connector J1, refer to table 5-13. If replacing connector J2, refer to table 5-14. If replacing connector J3, refer to table 5-15. If replacing connector J4, refer to table 5-16. Each table lists plug sizes for sockets on the electric connector. If a socket has no entry under plug size in the table, then the socket is wired and no plug is required.

(7) Remove mounting nut (3) from electric connector.

(8) Apply sealing compound to threads of electric connector.

(9) Position electric connector in ITM housing (5).

(10) Install link chain attachment (4) and mounting nut on electric connector.

(11) Torque mounting nut on connector J1 to 70-75 in-lbs. (7.96-8.53 Newton-meters).

(12) Torque mounting nuts on connectors J2 and J4 to 55-60 in-lbs (6.26-6.83 Newton-meters).

5-44 ELECTRIC CONNECTORS J1, J2, J3, AND J4 REPLACEMENT - Continued.

(13) Torque mounting nut on connector J3 to 90-95 in-lbs (10.24-10.8 Newton-meters).

(14) Perform test of ITM on RCS adapter (reference table 5-1).

(15) install protective cap (1) on electric connector.

(16) Install tiedown straps (6) on wiring harness (7).

(17) Install cover assembly (reference paragraph 4-44).

(18) Install ITM (reference paragraph 4-41).

(19) Perform ITM self-test (reference paragraph 2-4b).

5-45 CONNECTOR XA1 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit
Soldering and desoldering set
Electric gun-type heater

Materials/Parts:
Connector (9353914)
Shrink tubing (M23053/5-102-O)
Solder (item 18, appendix D)
Tiedown straps (MS3367-4-9)

References:
Install wiring harness W1
(reference paragraph 5-43).
Perform test of ITM on RCS adapter
(reference table 5-1).
Install cover assembly
(reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test
(reference paragraph 2-4b).

Equipment Conditions:
Wiring harness WI removed
(reference paragraph 5-43).

---

a. Removal.

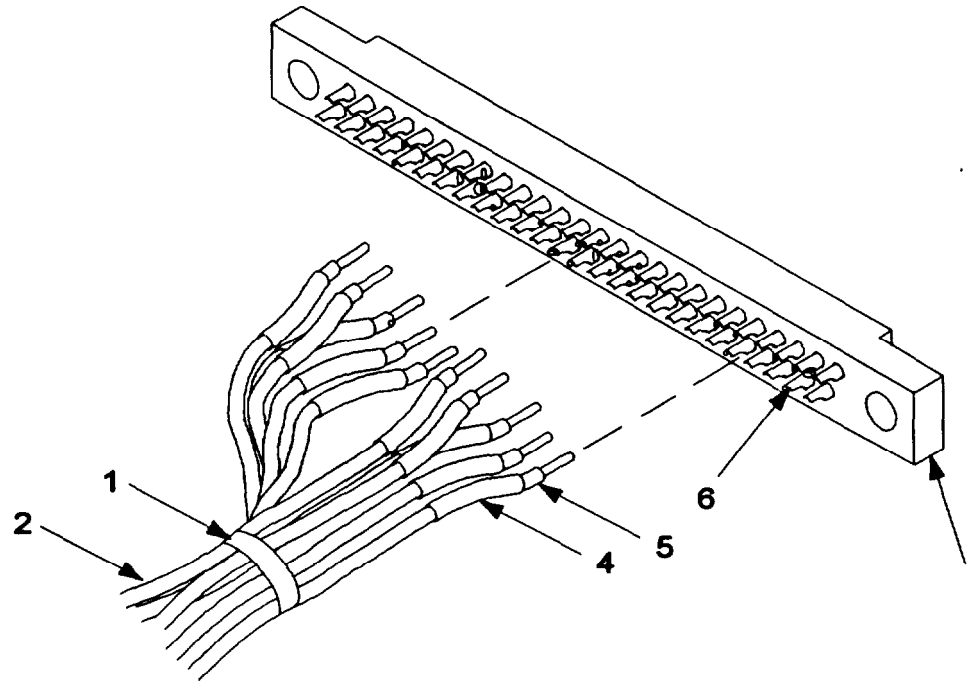
(1) Cut and discard sufficient number of tiedown straps (1) from wiring harness (2) to allow for removal of connector XAl (3).

(2) Pull shrink tubing (4) away from all wiring connections on connector XAI.

(3) Tag leads (5) connected to connector XAl.

(4) Desolder and remove all leads from connector XAl.

(5) Remove shrink tubing from all leads.



b. Installation.

(1) Install shrink tubing (4) on all leads (5).

NOTE

When connecting and soldering wires to sockets on connector, work row by row across the connector.

(2) Using tags as guide, connect leads to sockets (6) on connector XA1 (3) and solder connections in place.

(3) Position shrink tubing over all wiring connections and apply heat to activate tubing.

(4) Remove tags from leads.

(5) Install tiedown straps (1) on wiring harness (2).

(6) Install wiring harness W1 (reference paragraph 5-43).

(7) Perform test of ITM on RCS adapter (reference table 5-1).

(8) Install cover assembly (reference paragraph 4-44).

(9) Install ITM (reference paragraph 4-41).

(10) Perform ITM self-test (reference paragraph 2-4b).

5-46 CIRCUIT BREAKER CB1 REPLACEMENT.

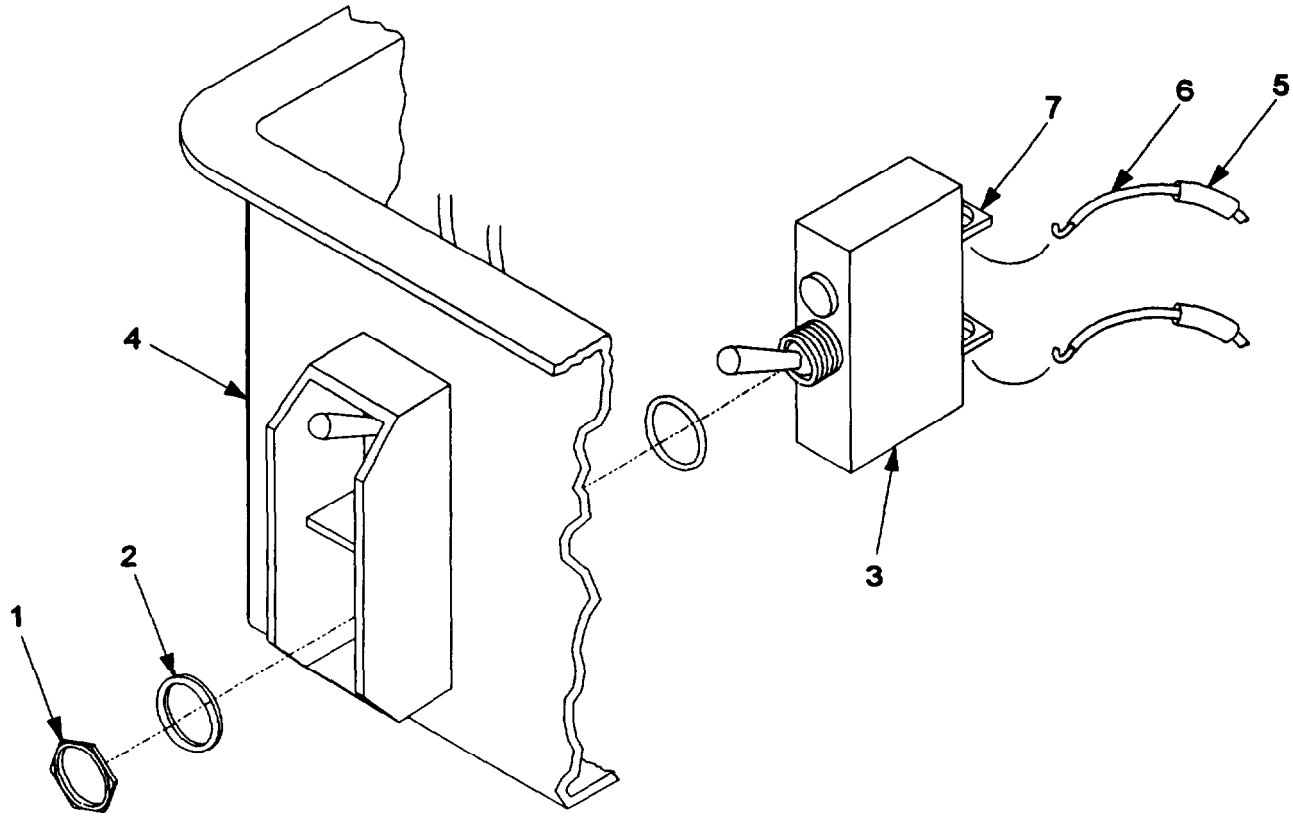
INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit
Soldering and desoldering set
Electric gun-type heater
Torque wrench

Materials/Parts:
Circuit breaker (11829397)
Shrink tubing (M23053/5-102-O)
Solder (item 17, appendix D)
Sealing compound (item 11, appendix D)
Sealing compound, alternate
(item 16, appendix D)

References:
Perform test of ITM on RCS adapter
(reference table 5-1).
Install cover assembly
(reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test
(reference paragraph 2-4b).

Equipment Conditions:
ITM removed (reference paragraph 4-41).
Cover assembly removed
(reference paragraph 4-44).



a. Removal.

(1) Remove jamnut (1) and washer (2) from circuit breaker CB1 (3).

(2) Push circuit breaker CB1 inside housing assembly (4).

(3) Reinstall washer and jamnut on circuit breaker CB1.

(4) Pull shrink tubing (5) away from wiring connections on circuit breaker CB1.

(5) Tag leads (6) connected to circuit breaker CB1.

(6) Desolder and remove four leads from terminals (7) on circuit breaker CB1.

(7) Remove shrink tubing from leads.

b. Installation.

(1) Install shrink tubing (5) on four leads (6).

(2) Using tags as guide, connect leads to terminals (7) on circuit breaker CB1 (3) and solder connections in place. Remove tags from leads.

(3) Position shrink tubing over terminals and apply heat to activate tubing.

(4) Remove jamnut (1) and washer (2) from circuit breaker CB1.

(5) Apply sealing compound to threads of circuit breaker CB1.

NOTE

Position circuit breaker CB1 with mounting screw on top.

(6) Position circuit breaker CB1 in housing assembly (4).

(7) Install washer and jamnut on circuit breaker CB1 and secure circuit breaker to housing assembly.

(8) Torque jamnut on circuit breaker CB4 to 20-28 in-lbs (2.28-2.95 Newton-meters).

(9) Perform test of ITM on RCS adapter (reference table 5-1).

(10) Install cover assembly (reference paragraph 4-44).

(11) Install ITM (reference paragraph 4-41).

(12) Perform ITM self-test (reference paragraph 2-4b).

5-47 TEST/OPERATE SWITCH S1 REPLACEMENT.

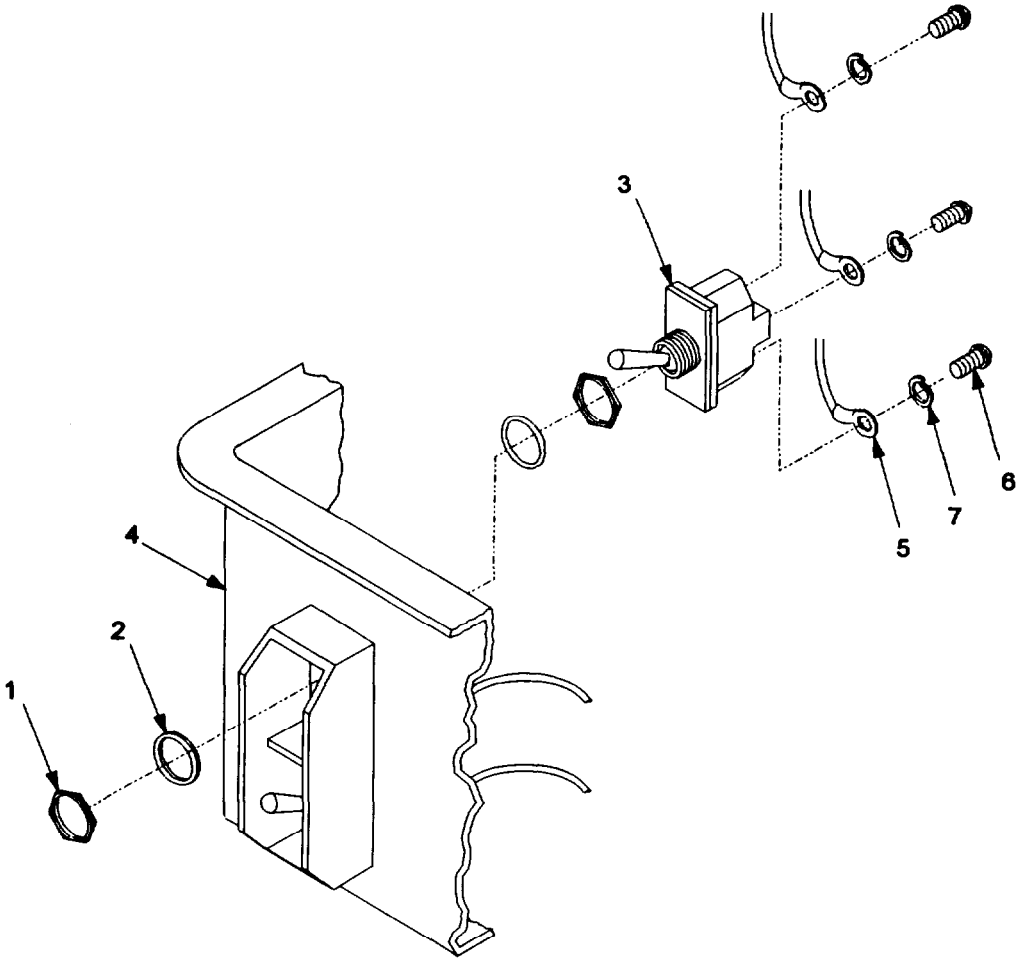
INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit
Torque wrench

Materials/Parts:
Switch S1 (MS24523-26)
Sealing compound (item 11, appendix D)
Sealing compound, alternate
(item 16, appendix D)

References:
Install cover assembly
(reference paragraph 4-44).
Perform ITM self-test
(reference paragraph 2-4b).

Equipment Conditions:
Cover assembly removed
(reference paragraph 4-44).



a. Removal.

(1) Remove jamnut (1) and washer (2) from test/operate switch S1 (3).

(2) Push test/operate switch S1 inside housing assembly (4).

(3) Reinstall washer and jamnut on test/operate switch S1.

(4) Tag leads (5) connected to test/operate switch S1.

(5) Remove three screws (6) and lo&washers (7) that secure three leads to terminals on test/operate switch S1.

(6) Disconnect terminal lugs on three leads from terminals on test/operate switch S1.

(7) Reinstall three screws and lockwashers on test/operate switch S1.

b. Installation.

(1) Remove three screws (6) and lockwashers (7) from terminals on test/operate switch S1 (3).

(2) Using tags as guide, connect terminal lugs on three leads (5) to terminals on test/operate switch S1.

(3) Reinstall three screws and lockwashers and secure leads to terminals on test/operate switch S1.

(4) Remove tags from leads.

(5) Remove jamnut (1) and washer (2) from test/operate switch S1.

(6) Apply sealing compound to threads of test/operate switch S1.

(7) Position test/operate switch S1 in housing assembly (4).

(8) Install washer and jamnut on test/operate switch S1 and secure switch to housing assembly.

(9) Torque jamnut on test/operate switch S1 to 20-26 in-lbs (2.28-2.95 Newton-meters).

(10) Install cover assembly (reference paragraph 4-44).

(11) Set circuit breaker CB1 on ITM to POWER ON.

(12) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to ON.

(13) Set circuit breaker on ICB to ON.

(14) Perform ITM self-test (reference paragraph 2-4b).

5-48 WIRING HARNESS TERMINAL LUGS REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit
Hand terminal crimping tool (1006)

Materials/Parts:
Lockwasher (MS35338-136)
Terminal lug (MS25036-102)
Terminal lug (MS25036-106)

References:
Install cover assembly (reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test (reference paragraph 2-4b).

Equipment Conditions:
ITM removed (reference paragraph 4-41).
Cover assembly removed (reference paragraph 4-44).

---

a. Removal.

NOTE

This procedure applies to replacement of all MS25036-102 and MS25036-106 terminal lugs on wiring harness W1.

(1) Release keepers (1) and remove control logic CCA (2) from card guide frame (3) attached to center plate electronic assembly (4).

(2) Tag wiring harness WI leads (5) to be removed from terminal board TB1 (6) or terminal board TB2 (7).

(3) Remove screws (8) and lockwashers (9) that secure tagged leads to terminals on terminal board. Discard lockwashers.

(4) Disconnect terminal lugs (10) on tagged leads from terminals.

(5) Reinstall screws on terminals.

(6) Slide identification markers (11) on disconnected leads 1/2 in (1.27 cm) away from terminal lugs.

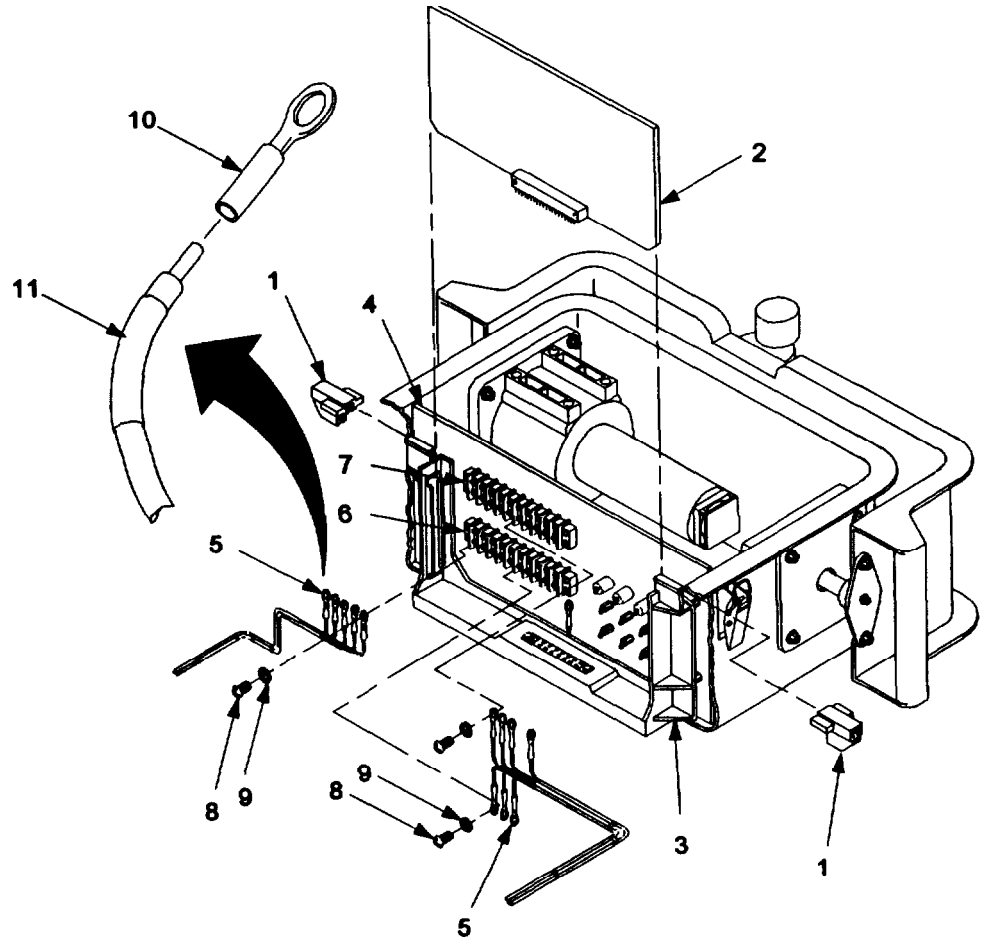
(7) Cut leads at terminal lugs and discard terminal lugs.

.b. Installation.

(1) Strip insulation on lead (5) 1/4 in (0.64 cm) from end.

(2) Insert end of lead into new terminal lug (IO) and crimp tight.

(3) Slide identification marker (11) over crimped connection.



(4) Repeat procedure for remaining leads as necessary.

(5) Remove screws (8) used to secure tagged leads to terminals on terminal board TB1 (8) or terminal board TB2 (7).

(6) Using tags as guide, position terminal lugs on wiring harness WI tagged leads to terminals.

(7) Install screws and new lockwashers (9) on terminals and secure tagged leads to terminal board.

(8) Remove tags from leads.

(9) Position control logic CCA (2) in card guide frame (3) attached to center plate electronic assembly (4) and fasten keepers (1).

(10) Install cover assembly (reference paragraph 4-44).

(11) Install ITM (reference paragraph 4-41).

(12) Perform ITM self-test (reference paragraph 2-4b).

5-49 DRIVE MOTOR ASSEMBLY REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit

Materials/Parts:
Lockwasher (MS35335-60)
Drive motor assembly (11829381)
Tiedown straps (MS3367-4-9)
Adhesive (item 7, appendix D)
Sealing compound (item II, appendix D)
Sealing compound, alternate (item 16, appendix D)

References:
Install target arm assembly (reference paragraph 4-47 or 4-50).

References - Continued:
Perform test of ITM on RCS adapter (reference table 5-1).
Install cover assembly (reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test (reference paragraph 2-4b).

Equipment Conditions:
ITM removed (reference paragraph 4-41).
Target arm assembly removed (reference paragraph 4-47 or 4-50).
Cover assembly removed (reference paragraph 4-44).

---

a. Removal.

(1) Tag leads (1) from drive motor assembly (2) that are connected to motor drive CCA (3).

(2) Remove screws (4) and lockwashers (5) from appropriate terminals on terminal board TB1 (6) on motor drive CCA. Discard lockwashers.

(3) Disconnect terminal lugs on drive motor assembly leads from terminals on terminal board TB1.

(4) Reinstall screws on appropriate terminals on terminal board TB1.

(5) Remove mounting screw (7) and flatwasher (8) that secure cable clamp (9) to electrical-mechanical post (10) on center plate electronic assembly (11).

(6) Remove cable clamp from drive motor assembly leads.

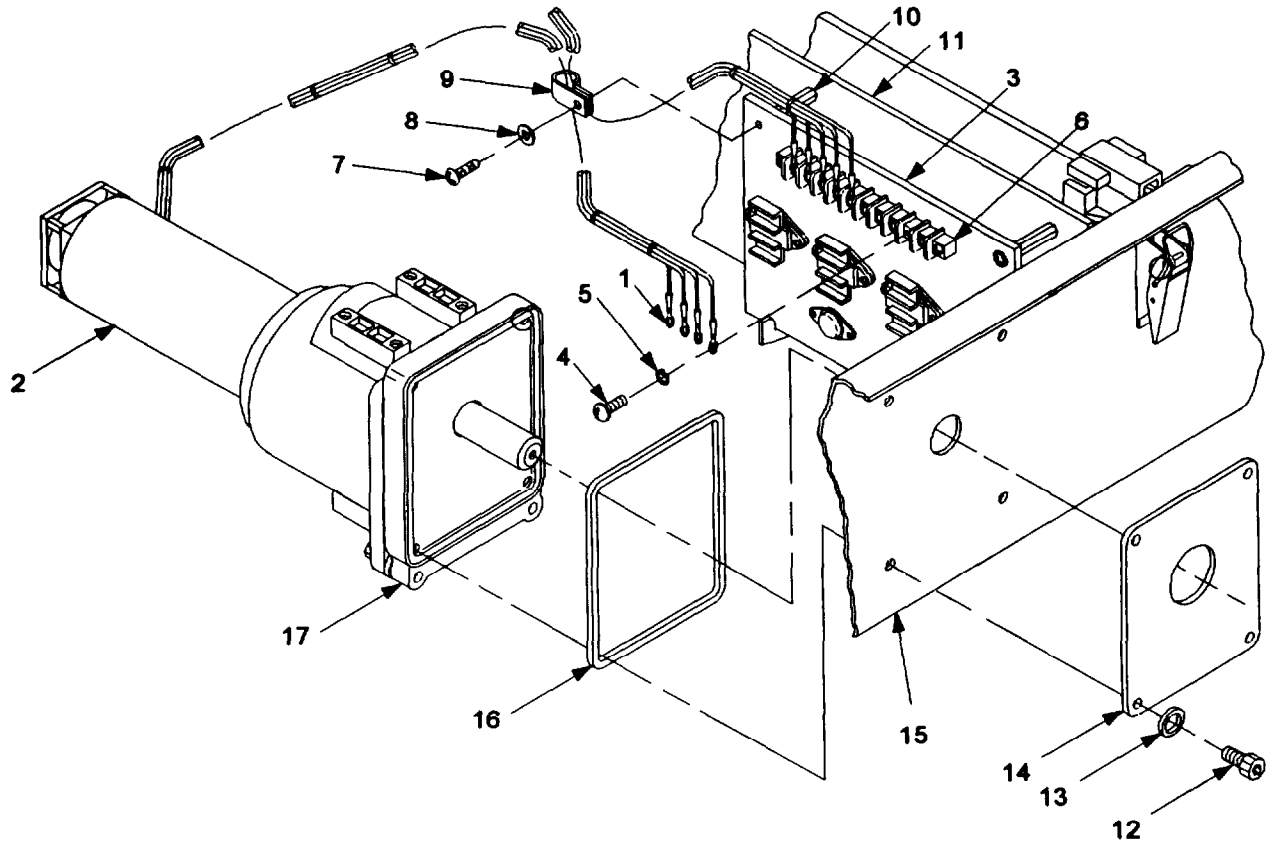
(7) Cut and discard tiedown straps as necessary.

(8) Support weight of drive motor assembly.

(9) Remove four screws (12) and flatwashers (13) and remove drive motor assembly and drive motor plate (14) from housing assembly (15).

(10) Remove O-ring (16) from mounting plate (17) on drive motor assembly.

(11) Clean O-ring mounting surfaces on mounting plate and housing assembly.



b. Installation.

(1) Apply adhesive to both surfaces of O-ring (16).

(2) Install O-ring on mounting plate (17).

(3) Position drive motor assembly (2) on inside of housing assembly (15) and drive motor plate (14) on outside of housing assembly.

(4) Apply sealing compound to four screws (12).

(5) Install four screws and flatwashers (13) and secure drive motor assembly and drive motor plate to housing assembly.

(6) Remove screws (4) from appropriate terminals on terminal board TB1 (6) on motor drive CCA (3).

(7) Using tags as guide, connect terminal lugs on drive motor assembly leads to terminals on terminal board TB1.

(8) Install screws and new lockwashers (5) on appropriate terminals on terminal board TB1.

5-49 DRIVE MOTOR ASSEMBLY REPLACEMENT - CONTINUED.

(9) Remove tags from leads.

(10) Install cable clamp (9) on drive motor assembly leads (1).

(11) Position cable clamp on electrical-mechanical post (10) attached to center plate electronic assembly (11) and install flatwasher (8) and mounting screw (7).

(12) Install tiedown straps on drive motor assembly leads.

(13) Install target arm assembly (reference paragraph 4-47 or 4-50).

(14) Perform test of ITM on RCS adapter (reference table 5-1).

(15) Install cover assembly (reference paragraph 4-44).

(16) Install ITM (reference paragraph D).

(17) Perform ITM self-test (reference paragraph 2-4b).

5-50 MOTOR AND BRAKE REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Torque wrench

Materials/Parts:
Motor and brake (11829380)
Grease, aircraft and automotive (item 5, appendix D)
Sealing compound (item 15, appendix D)

References:
Install drive motor assembly (reference paragraph 5-49).

References - Continued:
Perform test of ITM on RCS adapter (reference table 5-1).
Install cover assembly (reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test (reference paragraph 2-4b).

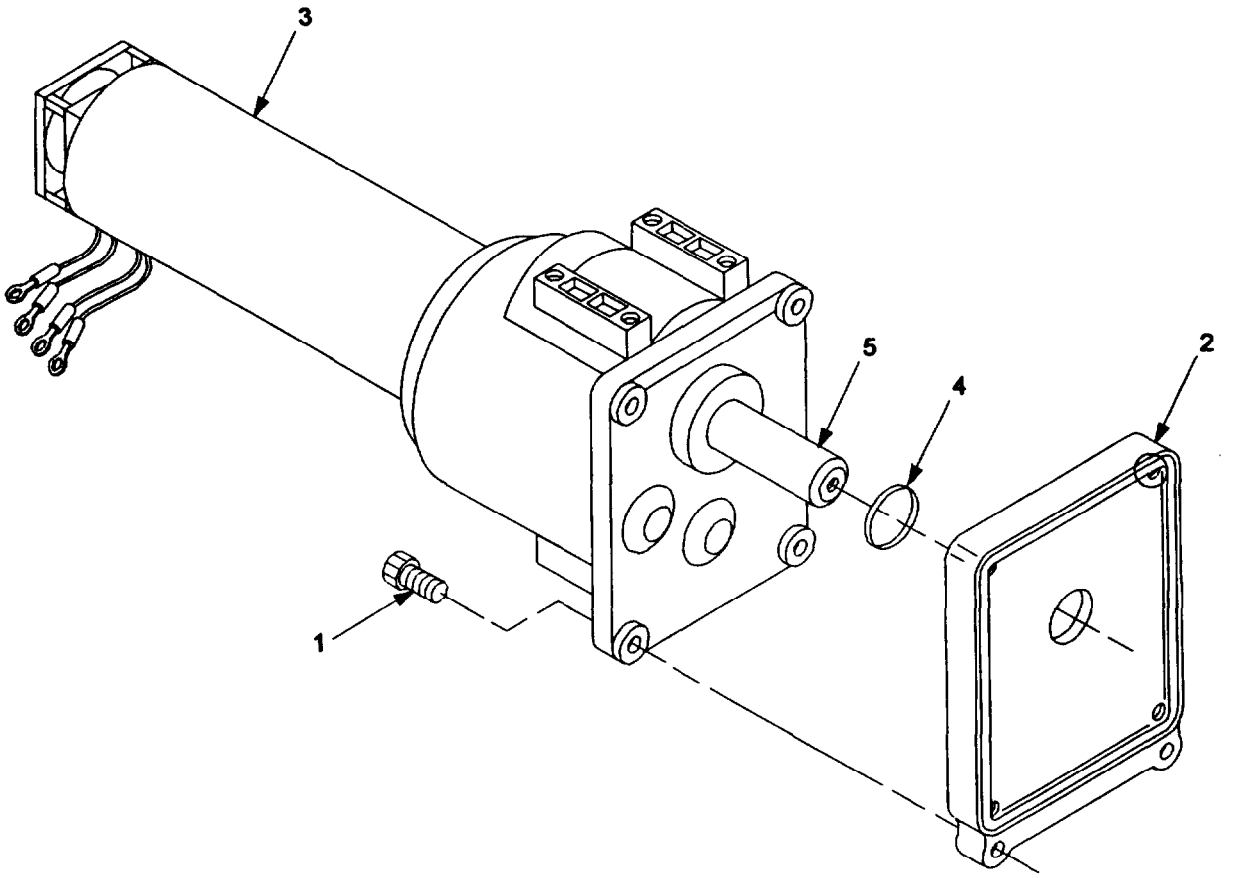
Equipment Conditions:
Drive motor assembly removed (reference paragraph 5-49).

---

a. Removal.

(1) Remove four socket-head capscrews (1) and remove mounting plate (2) from motor and brake (3).

(2) Remove motor seal (4) from motor shaft (5).



b. Installation.

(1) Apply light coating of grease to motor seal (4).

(2) Install motor seal on motor shaft (5).

(3) Position mounting plate (2) on motor and brake (3).

(4) Apply sealing compound to socket-head capscrews (1).

(5) Install four socket-head capscrews and torque to 120-137 in-lbs (13.66-15.60 Newton-meters) to secure mounting plate to motor and brake.

(6) Install drive motor assembly (reference paragraph 5-49).

(7) Perform test of ITM on RCS adapter (reference table 5-1).

(8) Install cover assembly (reference paragraph 4-44).

(9) Install ITM (reference paragraph 4-41).

(10) Perform ITM self-test (reference paragraph 2-4b).

5-51 DRIVE MOTOR TERMINAL LUGS REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit
Hand terminal crimping tool (1006)

Materials/Parts:
Terminal lug (MS25036-102)

References:
Install cover assembly
(reference paragraph 4-44).

References - Continued:
Install ITM (reference paragraph 4-41).
Perform ITM self-test
(reference paragraph 2-4b).

Equipment Conditions:
ITM removed (reference paragraph 4-41).
Cover assembly removed
(reference paragraph 4-44).

---

a. Removal.

(1) Tag leads (1) from drive motor assembly (2) that are connected to motor drive CCA (3).

(2) Remove screws (4) and lockwashers (5) from appropriate terminals on terminal board TB1 (6) on motor drive CCA. Discard lockwashers.

(3) Disconnect terminal lugs on drive motor assembly leads from terminals on terminal board TB1.

(4) Reinstall screws on appropriate teminals on terminal board TB1.

(5) Remove mounting screw (7) and flatwasher (8) that secure cable clamp (9) to electrical-mechanical post (10) on center plate electronic assembly (11).

(6) Remove cable clamp from drive motor assembly leads.

(7) Cut and discard tiedown straps as necessary.

(8) Slide identification markers (12) on leads 1/2 in (1.27 cm) away from terminal lugs (13).

(9) Cut leads at terminal lugs and discard terminal lugs.

b. Installation.

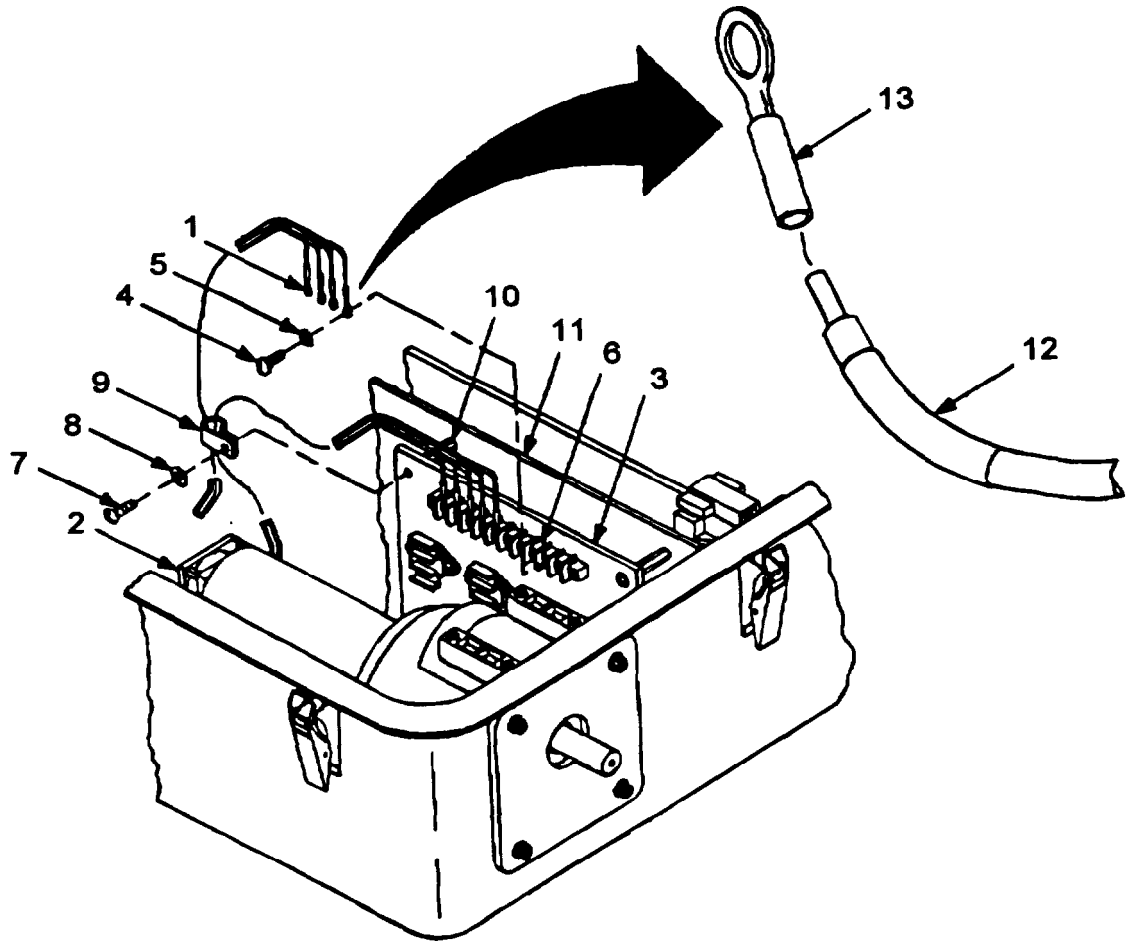
(1) Strip insulation on lead 1/4 in (0.64 cm) from end.

(2) Insert end of lead into new terminal lug (13) and crimp tight.

(3) Slide identification marker (12) over crimped connection.

(4) Repeat procedure for remaining leads as necessary.

(5) Remove screws (4) from appropriate terminals on terminal board TB1 (6) on motor drive CCA (3).



(6) Using tags as guide, connect terminal lugs on drive motor assembly leads to terminals on terminal board TB1.

(7) Install screws and new lockwashers (5) on appropriate terminals on terminal board TB1.

(8) Install cable clamp (9) on drive motor assembly leads (1).

(9) Position cable clamp on electrical-mechanical post (10) attached to center plate electronic assembly (11) and install flatwasher (8) and mounting screw (7).

(10) Remove tags from leads.

(11) Install tiedown straps on drive motor assembly leads.

(12) Install cover assembly (reference paragraph 4-44).

(13) Install ITM (reference paragraph 4-41).

(14) Perform ITM self-test (reference paragraph 2-4b).

5-52 CENTER PLATE ELECTRONIC ASSEMBLY REPLACEMENT.

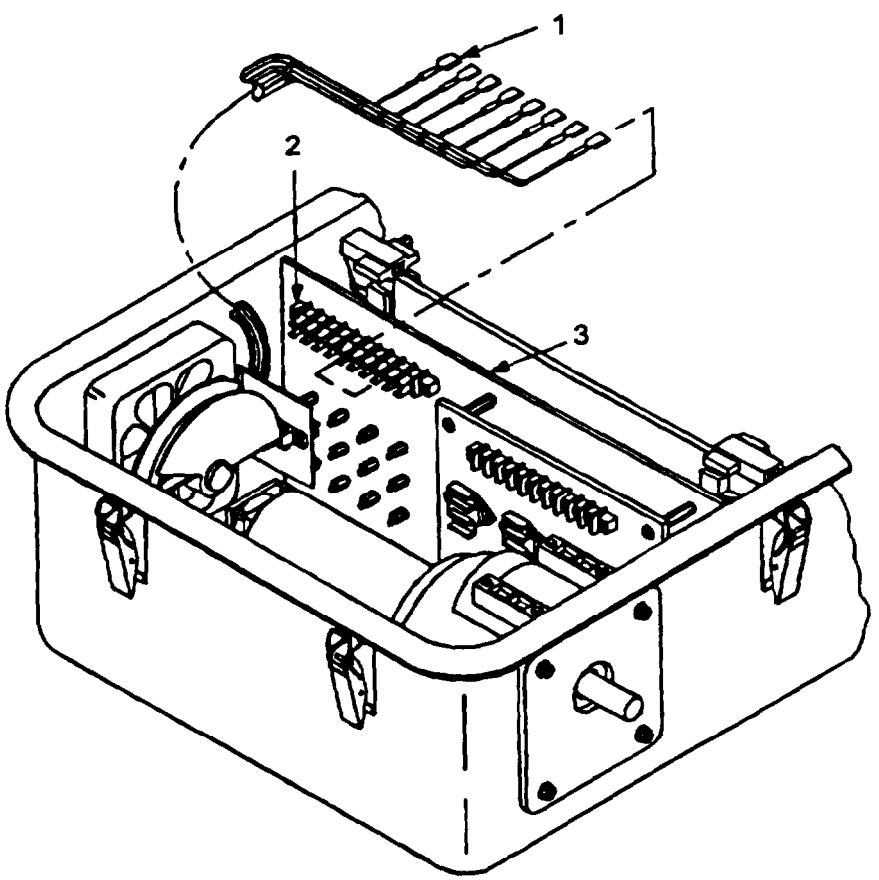
INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit

Materials/Parts:
Lockwasher (MS35338-136)
Locking hex-nut (MS21083C6)
Lockwasher (MS35335-60)
Center plate electronic assembly (11829367)
Tiedown straps (MS3367-4-9)

Equipment Conditions:
ITM removed (reference paragraph 4-41).
Cover assembly removed
(reference paragraph 4-44).

References:
Remove control logic CCA
(reference paragraph 5-40).
Remove motor drive CCA
(reference paragraph 5-39).
Install motor drive CCA
(reference paragraph 5-39).
Install control logic CCA
(reference paragraph 5-40).
Perform test of ITM on RCS adapter
(reference table 5-1).
Install cover assembly
(reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test
(reference paragraph 2-4b).



a. Removal.

(1) Tag and disconnect terminal lugs on eight optical switch assembly wires (1) from terminal board TB3 (2) on center plate electronic assembly (3).

(2) Remove control logic CCA (reference paragraph 5-40).

NOTE

After removing motor drive CCA, reinstall cable clamp, mounting screws, and flatwashers on electrical-mechanical posts attached to center plate electronic assembly.

(3) Remove motor drive CCA (reference paragraph 5-39).

(4) Remove four screws (4) and flatwashers (5) that secure card guide frame (6) to electrical-mechanical posts (7) on center plate electronic assembly.

(5) Remove two screws (8) washers (9) and nuts (10) that secure connector XA1 (11) on wiring harness WI to card guide frame.

(6) Cut tiedown straps as necessary and remove card guide frame.

(7) Remove locking hex-nut (12) flatwasher (13) and pan-head screw (14) at E1 on center plate electronic assembly.

(6) Disconnect terminal lug on connector XA1 ground wire (15) from pan-head screw.

(9) Tag wiring harness WI wires (16) attached to terminal board TB1 (17) on center plate electronic assembly.

(10) Remove screws (18) and lockwashers (19) from appropriate terminals on terminal board TB1. Discard lockwashers.

(11) Disconnect wiring harness W1 wires from appropriate terminals on terminal board TB1.

(12) Reinstall screws on appropriate terminals on terminal board TB1.

(13) Tag wiring harness W1 wires (20) attached to terminal board TB2 (21) on center plate electronic assembly.

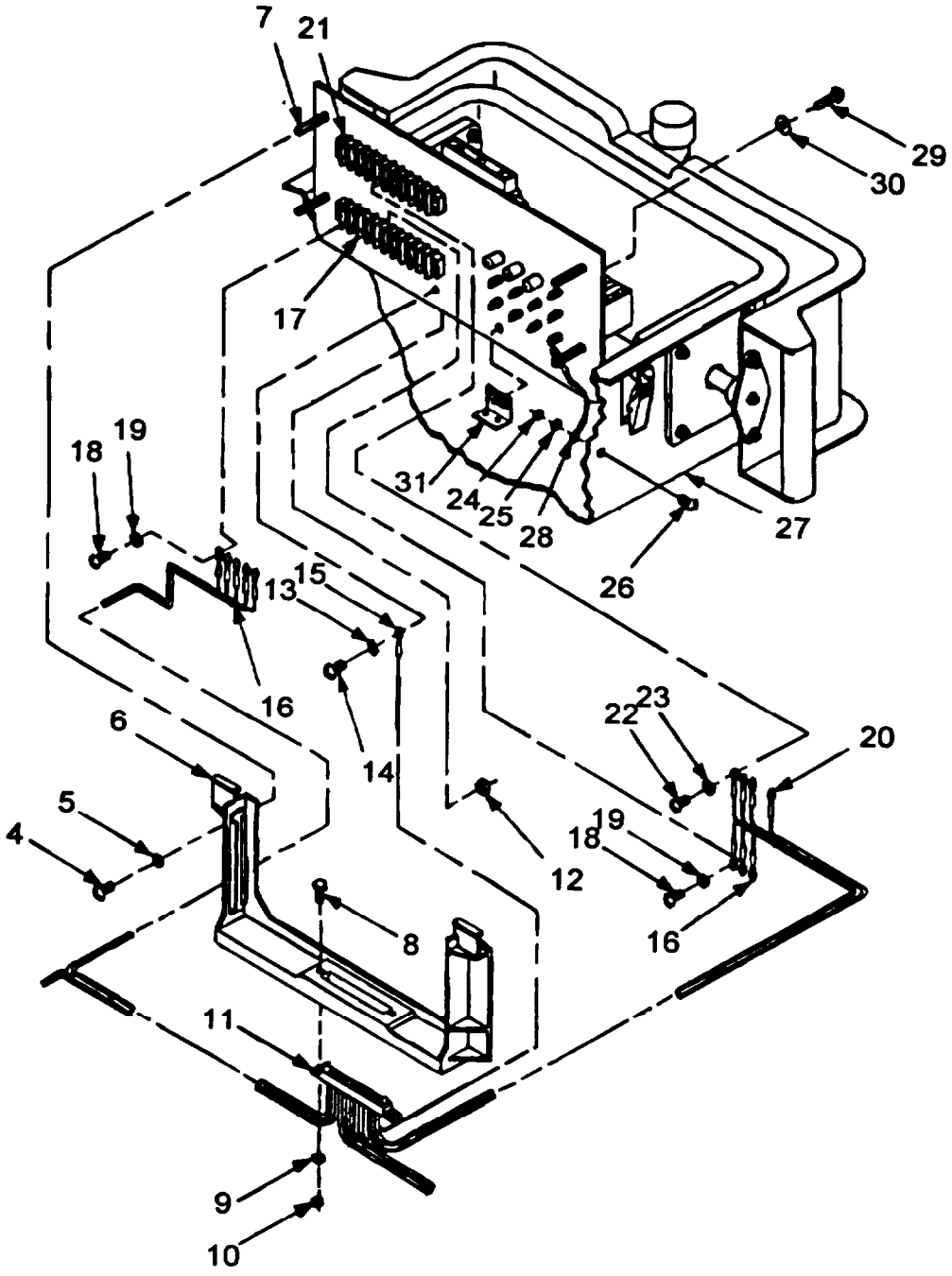
(14) Remove screws (22) and lockwashers (23) from appropriate terminals on terminal board TB2. Discard lockwashers.

(15) Disconnect wiring harness W1 wires from appropriate terminals on terminal board TB2.

(16) Reinstall screws on appropriate terminals on terminal board TB2.

(17) Remove locking hex-nut (24) and flatwasher (25) from pan-head screw (26) at E3 on housing assembly (27).

5-52 CENTER PLATE ELECTRONIC ASSEMBLY REPLACEMENT - Continued.



(18) Disconnect terminal lug on center plate electronic assembly bonding strap (28) from pan-head screw.

(19) Reinstall flatwasher and locking hex-nut on pan-head screw.

(20) Remove mounting screw (29) and lockwasher (30) that secure center plate electronic assembly to bracket assembly (31) in bottom of housing assembly.

(21) Remove center plate electronic assembly from housing assembly.

(22) Position card guide frame on electrical-mechanical posts attached to center plate electronic assembly, and install four flatwashers and screws.

b. Installation.

(1) Remove four screws (4) and flatwashers (5) that secure card guide frame (6) to electrical-mechanical posts (7) on center plate electronic assembly (3).

(2) Position center plate electronic assembly in housing assembly (27).

(3) Install mounting screw (29) and new lockwasher (30) and secure center plate electronic assembly to bracket assembly (31) in bottom of housing assembly.

(4) Remove locking hex-nut (24) and flatwasher (25) from pan-head screw (26) at E3 on housing assembly.

(5) Install terminal lug attached to center plate electronic assembly bonding strap (28) on pan-head screw.

(6) Install flatwasher and new locking hex-nut on pan-head screw at E3 on housing assembly.

(7) Remove screws (22) from appropriate terminals on terminal board TB2 (21).

(8) Using tags as guide, connect wiring harness W1 wires (20) to appropriate terminals on terminal board TB2.

(9) Install screws and new lockwashers (23) on appropriate terminals on terminal board TB2.

(10) Remove screws (18) from appropriate terminals on terminal board TB1 (17).

(11) Using tags as guide, connect wiring harness W1 wires (16) to appropriate terminals on terminal board TB1.

(12) Install screws and new lockwashers (19) on appropriate terminals on terminal board TB1.

(13) Install terminal lug attached to connector XA1 ground wire (15) on pan-head screw.

(14) Install flatwasher (13), new locking hex-nut (12) and pan-head screw (14) at E1 on center plate electronic assembly.

(15) Position connector XA1 (11) on card guide frame and install two screws (8) washers (9) and nuts (10).

5-52 CENTER PLATE ELECTRONIC ASSEMBLY REPLACEMENT - Continued.

(16) Position card guide frame on electrical-mechanical posts attached to center plate electronic assembly, and install four flatwashers and screws.

(17) Install tiedown straps on wiring harness leads.

(18) Remove two mounting screws and flatwashers, and remove cable clamp from electrical-mechanical posts attached to center plate electronic assembly (reference paragraph 5-39).

(19) Install motor drive CCA (reference paragraph 5-39).

(20) Using tags as guide, connect terminal lugs on eight optical switch assembly wires (1) to terminal board TB3 (2) on center plate electronic assembly.

(21) Remove tags from all wires.

(22) Install control logic CCA (reference paragraph 5-40).

(23) Perform test of ITM on RCS adapter (reference table 5-1).

(24) Install cover assembly (reference paragraph 4-44).

(25) Install ITM (reference paragraph 4-41).

(26) Perform ITM self-test (reference paragraph 2-4b).

5-53 WIRING HARNESS AIW3 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit
Soldering and desoldering set

Materials/Parts:
Wiring harness (9353918)
Solder (item 18, appendix D)

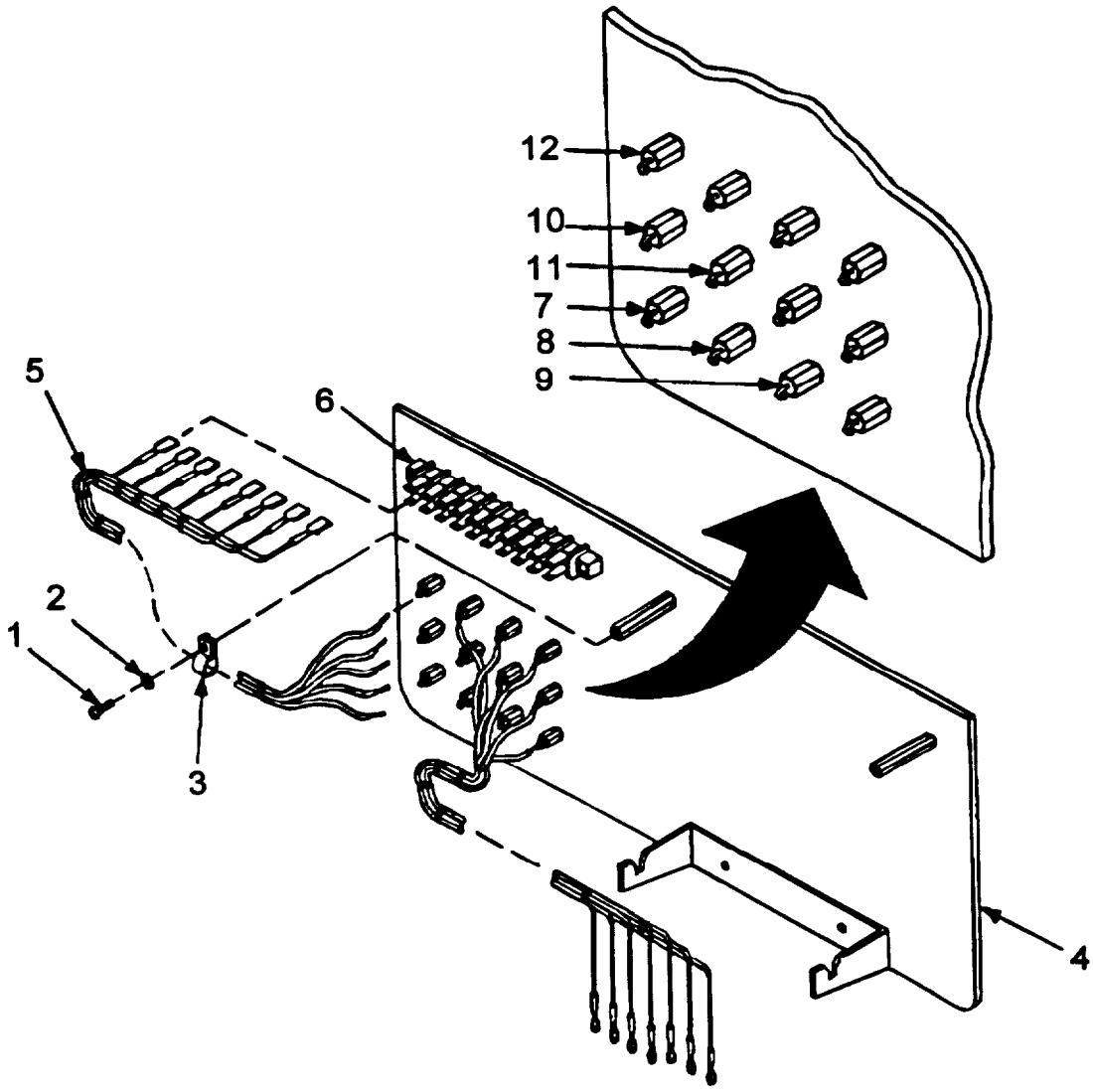
Equipment Conditions:
Center plate electronic assembly removed (reference paragraph 5-52).

References:
Install center plate electronic assembly (reference paragraph 5-52).
Perform test of ITM on RCS adapter (reference table 5-1).
Install cover assembly (reference paragraph 4--44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test (reference paragraph 2-4b).

---

a. Removal.

(1) Remove screw (1) and flatwasher (2) that secure cable clamp (3) to center plate electronic assembly (4).



(2) Refer to FO-5. Tag and disconnect leads on wiring harness A1W3 (5) that are connected to appropriate terminals on terminal board TB3 (6).

(3) Tag leads on wiring harness A1W3 connected to feed-thru caps on center plate electronic assembly.

(4) Desolder and remove leads on wiring harness A1W3 from feed-thru caps C1 (7), C2 (8), C3 (9), C5 (10), C6 (11), and C9 (12).

b. Installation.

(1) Using tags as guide, connect leads on wiring harness A1W3 (5) to feed-thru caps C1 (7), C2 (8), C3 (9), C5 (10), C6 (11), and C9 (12) on center plate electronic assembly (4) and solder leads in place.

5-53 WIRING HARNESS A1W3 REPLACEMENT - Continued.

(2) Using tags as guide, connect leads on wiring harness A1W3 to appropriate terminals on terminal board TB3 (6).

(3) Install cable clamp (3) on wiring harness A1W3.

(4) Position cable clamp on center plate electronic assembly and install screw (1) and flatwasher (2).

(5) Remove tags from leads.

(6) Install center plate electronic assembly (reference paragraph 5-52).

(7) Perform test of ITM on RCS adapter (reference table 5-1).

(8) Install cover assembly (reference paragraph 4-44).

(9) Install ITM (reference paragraph 4-41).

(10) Perform ITM self-test (reference paragraph 2-4b).

5-54 WIRING HARNESS A1W2 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit
Soldering and desoldering set

Materials/Parts:
Wiring harness (11829393)
Solder (item 18, appendix D)

Equipment Conditions:
Center plate electronic assembly removed (reference paragraph 5-52).

References:
Install center plate electronic assembly (reference paragraph 5-52).
Perform test of ITM on RCS adapter (reference table 5-1).
Install cover assembly (reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test (reference paragraph 2-4b).

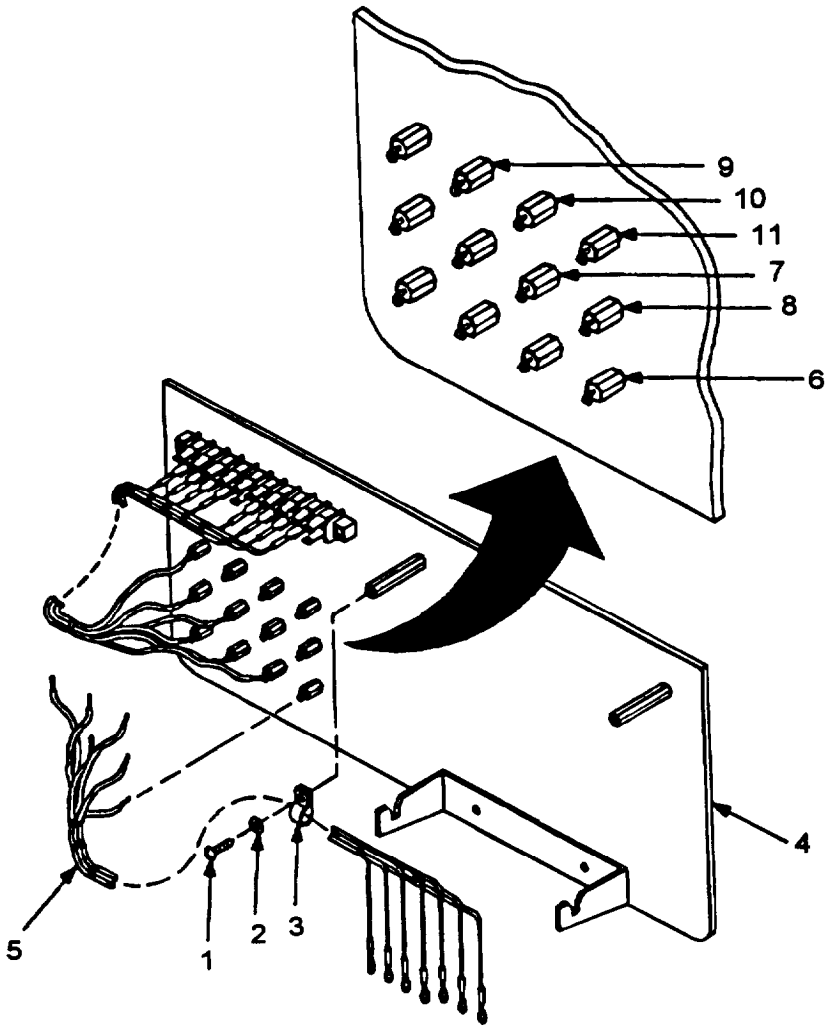
---

a. Removal.

(1) Remove screw (1) and flatwasher (2) that secure cable clamp (3) to center plate electronic assembly (4).

(2) Refer to FO-5. Tag leads on wiring harness A1W2 (5) connected to feed-thru caps and filters on center plate electronic assembly.

(3) Desolder and remove leads on wiring harness A1W2 from feed-thru caps C4 (6), C7 (7), and C8 (8), and filters FL1 (9), FL2 (10), and FL3 (11).



b. Installation.

(1) Using tags as guide, connect leads on wiring harness A1W2 (5) to feed-thru caps C4 (6), C7 (7), and C8 (8), and filters FL1 (9), FL2 (10), and FL3 (11) on center plate electronic assembly (4) and solder leads in place.

(2) Install cable clamp (3) on wiring harness A1W2.

(3) Position cable clamp on center plate electronic assembly and install screw (1) and flatwasher (2).

(4) Remove tags from leads.

(5) Install center plate electronic assembly (reference paragraph 5-52).

5-54 WIRING HARNESS A1W2 REPLACEMENT - Continued.

(6) Perform test of ITM on RCS adapter (reference table 5-1).

(7) Install cover assembly (reference paragraph 4-44).

(8) Install ITM (reference paragraph 4-41).

(9) Perform ITM self-test (reference paragraph 2-4b).

5-55 WIRING HARNESS A1W1 REPLACEMENT.

INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit
Soldering and desoldering set

Materials/Parts:
Wiring harness (9353920)
Solder (item 18, appendix D)
Lockwasher (MS35338-136)

Equipment Conditions:
Center plate electronic assembly removed (reference paragraph 5-52).

References:
Install center plate electronic assembly (reference paragraph 5-51).
Perform test of ITM on RCS adapter (reference table 5-1).
Install cover assembly (reference paragraph 4-44).
Install ITM (reference paragraph 4-41).
Perform ITM self-test (reference paragraph 2-4b).

---

a. Removal.

(1) Remove screw (1) and flatwasher (2) that secure cable clamp (3) to center plate electronic assembly (4).

(2) Refer to FO-5. Tag leads on wiring harness A1W1 (5) that are connected to terminal board TB1 (6).

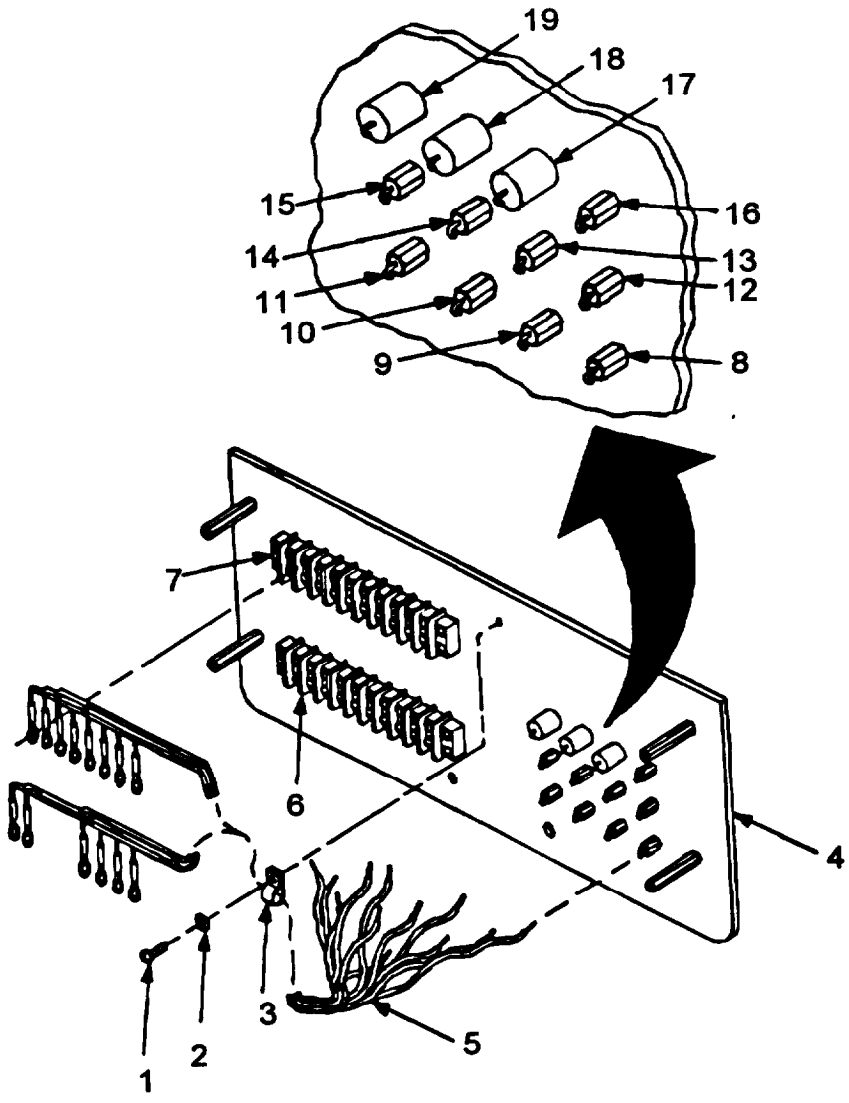
(3) Remove screws and lockwashers from appropriate terminals on terminal board TB1. Discard lockwashers.

(4) Disconnect leads on wiring harness A1W1 from appropriate terminals on terminal board TB1.

(5) Reinstall screws on appropriate terminals on terminal board TB1.

(6) Tag leads on wiring harness A1W1 that are connected to terminal board TB2 (7).

(7) Remove screws and lockwashers from appropriate terminals on terminal board TB2. Discard lockwashers.



(8) Disconnect leads on wiring harness A1W1 from appropriate terminals on terminal board TB2.

(9) Reinstall screws on appropriate terminals on terminal board TB2.

(10) Tag leads on wiring harness A1W1 connected to feed-thru caps and filters on center plate electronic assembly.

(11) Desolder and remove leads on wiring harness A1W1 from feed-thru caps C1 (8), C2 (9), C3 (10), C4 (11), C5 (12), C6 (13), C7 (14), C8 (15), and C9 (16), and filters FL1 (17), FL2 (18), and FL3 (19).

b. Installation.

(1) Using tags as guide, connect leads on wiring harness A1W1 (5) to feed-thru caps C1 (8), C2 (9), C3 (10), C4 (11), C5 (12), C6 (13), C7 (14), C8 (15), and C9 (16), and filters FL1 (17), FL2 (18), and FL3 (19) on center plate electronic assembly (4) and solder leads in place.

5-55 WIRING HARNESS A1W1 REPLACEMENT - Continued.

(2) Remove screws from appropriate terminals on terminal board TB2 (7).

(3) Using tags as guide, connect leads on wiring harness A1W1 to appropriate terminals on terminal board TB2.

(4) Install screws and new lockwashers on appropriate terminals on terminal board TB2.

(5) Remove screws from appropriate terminals on terminal board TB1 (6).

(6) Using tags as guide, connect leads on wiring harness A1W1 to appropriate terminals on terminal board TB1.

(7) Install screws and new lockwashers on appropriate terminals on terminal board TB1.

(8) Install cable clamp (3) on wiring harness A1W1.

(9) Position cable clamp on center plate electronic assembly and install screw (1) and flatwasher (2).

(10) Remove tags from leads.

(11) Install center plate electronic assembly (reference paragraph 5-52).

(12) Perform test of ITM on RCS adapter (reference table 5-1).

(13) Install cover assembly (reference paragraph 4-44).

(14) Install ITM (reference paragraph 4-41).

(15) Perform ITM self-test (reference paragraph 2-4b).

5-56 ACTUATOR SWITCH REPLACEMENT.

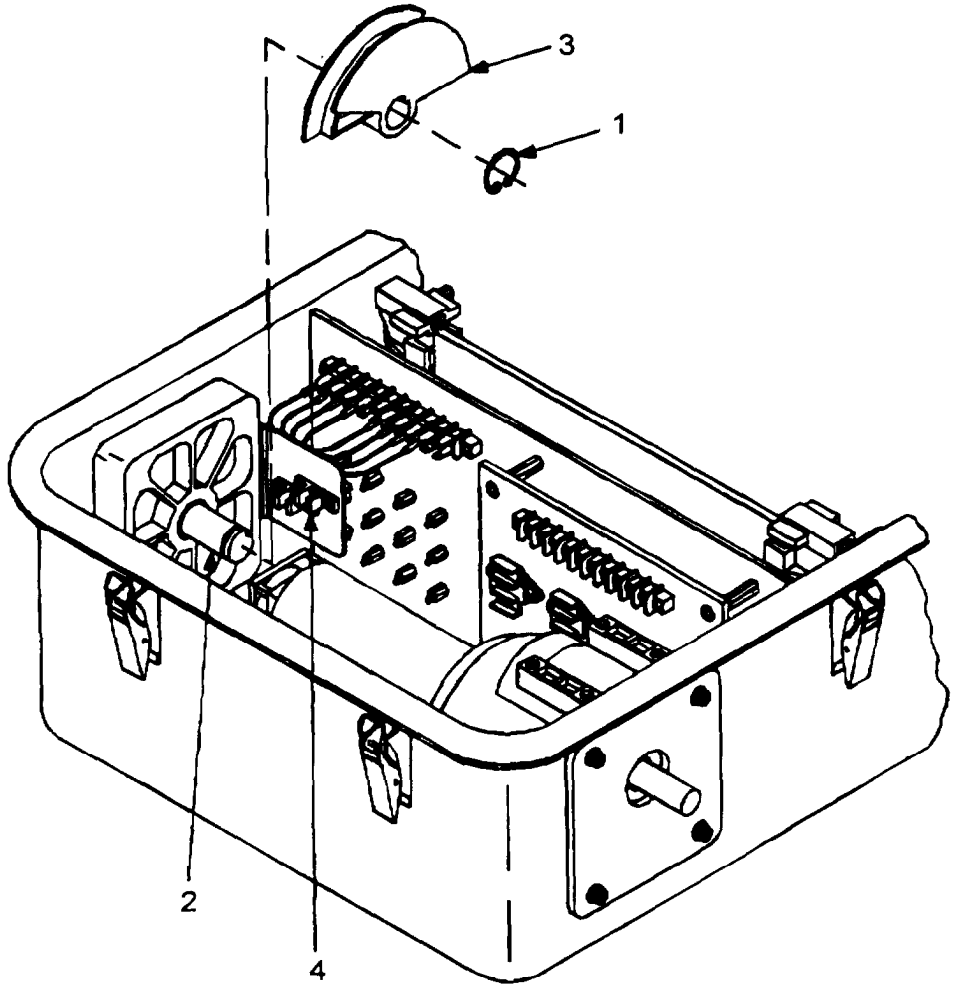
INITIAL SETUP

Tools and Special Tools:
General mechanic's automotive tool kit

Materials/Parts:
Actuator switch (11829386)

References:
Install target arm assembly
(reference paragraph 4-47 or 4-50).
Install cover assembly
(reference paragraph 4-44).
Perform ITM self-test
(reference paragraph 2-4b).

Equipment Conditions:
Target arm assembly removed
(reference paragraph 4-47 or 4-50).
Cover assembly removed
(reference paragraph 4-44).



a. Removal.

(1) Remove retainer ring (1) from idler shaft (2).

(2) Rotate actuator switch (3) to clear optical switch assembly (4).

(3) Remove actuator switch from idler shaft.

b. Installation.

(1) Orient actuator switch (3) with keyway and install on idler shaft (2).

(2) Install retainer ring (1) on idler shaft.

(3) Install target arm assembly (reference paragraph 4-47 or 4-50).

(4) Install cover assembly (reference paragraph 4-44).

(5) Set circuit breaker CB1 on ITM to POWER ON.

(6) If ITM is mounted on IMTC, set circuit breaker CB1 on IMTC electronic components assembly to ON.

(7) Set circuit breaker on ICB to ON.

(8) Perform ITM self-test (reference paragraph 2-4b).

5-57 BEARINGS REPLACEMENT.

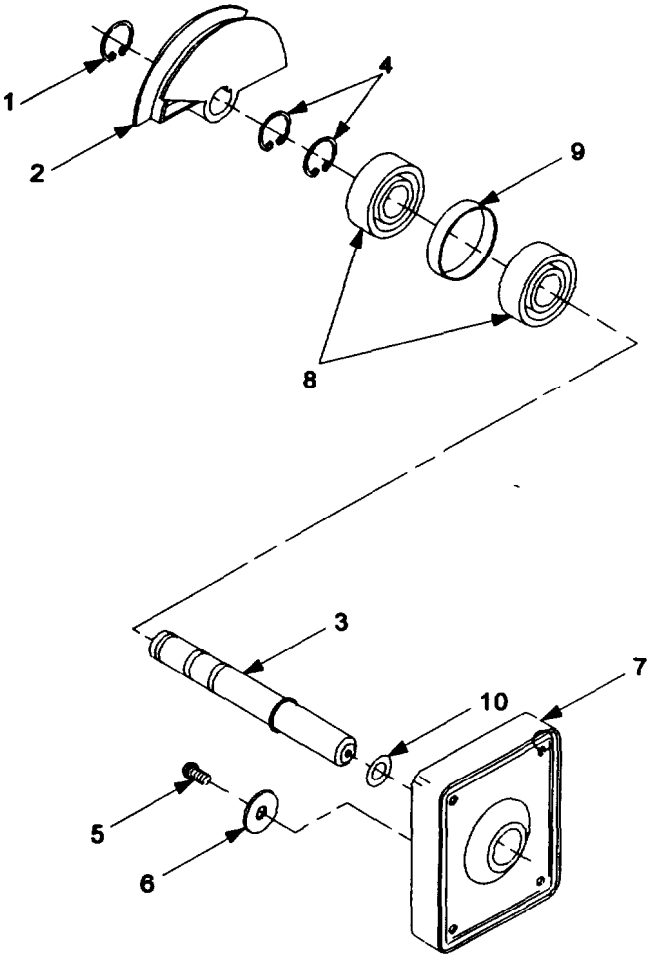
INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit

Materials/Parts:
Bearing (11829469)
Sealing compound (item 14, appendix D)
Grease, aircraft and automotive (item 5, appendix D)

References:
Install idler shaft assembly (reference paragraph 4-49).
Perform ITM self-test (reference paragraph 2-4b).

Equipment Conditions:
Idler shaft assembly removed (reference paragraph 4-49).



a. Disassembly.

(1) Remove retainer ring (1) and actuator switch (2) from shaft (3).

(2) Remove two retainer rings (4) from shaft.

(3) Remove four pan-head screws (5) and flatwashers (6) from bearing housing (7).

(4) Remove shaft, bearings (8) idler shaft spacer (9) and idler shaft seal (10) from bearing housing.

(5) Remove bearings, idler shaft spacer, and idler shaft seal from shaft.

b. Assembly.

(1) Lubricate idler shaft seal (10) with grease and install on shaft (3).

(2) install bearings (8) and idler shaft spacer (9) on shaft.

(3) install two retainer rings (4) on shaft.

(4) Position assembled shaft, bearings, idler shaft spacer, and idler shaft seal in bearing housing (7).

(5) Apply sealing compound to pan-head screws (5).

(6) Install four pan-head screws and flatwashers (6) in bearing housing and secure shaft and bearings in place.

(7) Install actuator switch (2) on shaft and secure with retainer ring (1).

(8) Install idler shaft assembly (reference paragraph 4-49).

(9) Perform ITM self-test (reference paragraph 2-4b).

5-58 DOUBLE TARGET ARM ASSEMBLY REPAIR.

INITIAL SETUP

Tools and Special Tools:
General mechanics automotive tool kit

References:
Install double target arm assembly (reference paragraph 4-50).
Perform ITM self-test (reference paragraph 2-4b).

Equipment Conditions:
Double target arm assembly removed (reference paragraph 4-50).

Materials/Parts:
Self-locking nut (MS21083C4)
Self-locking nut (MS21083C3)
Lockwasher (MS35338-139)
Double target arm (9341018)
Double hit sensor electronics (9341016)
Sealing compound (item 15, appendix D)

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a. Disassembly.

(1) Remove socket-head screw (1), flatwasher (2) and self-locking nut (3) that secure plastic loop clamp (4) to double target arm (5).

(2) Remove plastic loop clamp from double target arm and double hit sensor electronics cable (6).

(3) Remove four socket-head screws (7) flatwashers (8) and self-locking nuts (9) that secure four cushion loop clamps (10) to double target arm.

(4) Remove four cushion loop clamps from double target arm and double hit sensor electronics cable.

(5) Remove two 1-1/4-in socket-head screws (11), four 1/4-in ID flatwashers (12), two grommets (13), spacers (14), 1/4-in flatwashers (15), locknuts (16), and cushion loop clamps (17) from base plates (18) on double target arm.

(6) Remove two cushion loop clamps from double hit sensor electronics cable.

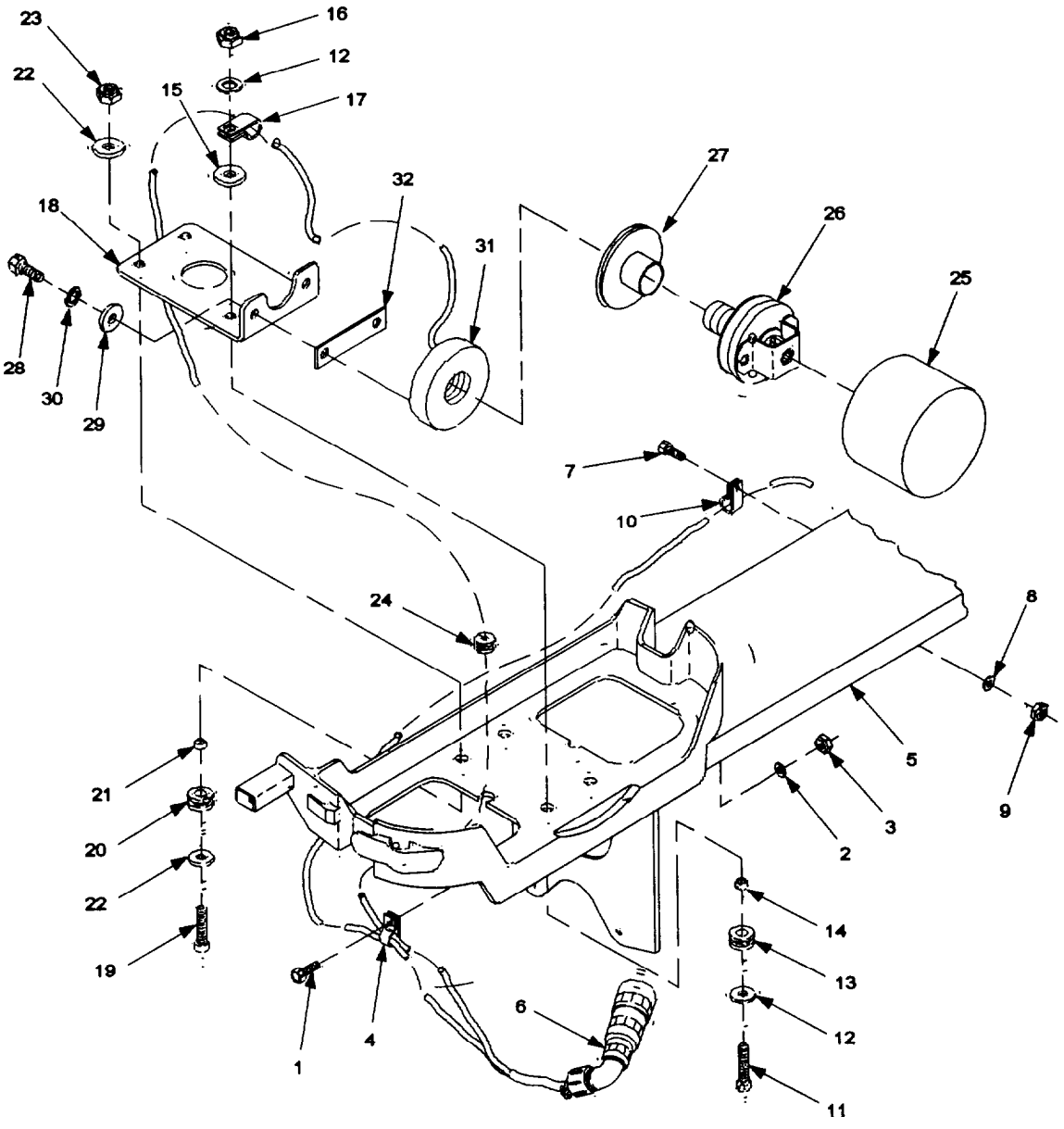
(7) Remove six 1-in socket-head screws (19), grommets (20), spacers (21), 1/4-in flatwashers (22), and self-locking nuts (23) that secure base plates to double target arm.

(8) Remove two grommets (24) from double target arm and double hit sensor electronics cable.

(9) Remove two base plates (with attached double hit sensor electronics) from double target arm.

(10) Remove hit sensor shield (25) from hit sensor assembly.

(11) Loosen capscrew (part of hit sensor clamp assembly) and remove hit sensor clamp assembly (26) and spacer (27) from hit sensor.



(12) Remove two socket-head screws (28), flatwashers (29), and lockwashers (30) that secure hit sensor (31) to base plate.

(13) Remove hit sensor and isolation spacer (32) from base plate.

(14) Repeat steps (10) through (13) to remove second hit sensor from base plate.

5-58 DOUBLE TARGET ARM ASSEMBLY REPAIR - Continued.

b. Assembly.

(1) Position hit sensor (31) and isolation spacer (32) on base plate (18).

(2) Apply sealing compound to threads of two socket-head screws (28).

(3) install two socket-head screws, flatwashers (29), and lockwashers (30) and secure hit sensor to base plate.

(4) Install spacer (27) and hit sensor clamp assembly (26) on hit sensor.

(5) lighten capscrew (part of hit sensor clamp assembly) and secure hit sensor clamp assembly to hit sensor.

(6) Install hit sensor shield (25) on hit sensor assembly.

(7) Repeat steps (1) through (6) to install second hit sensor on base plate.

NOTE

If **new grommets are being installed on double hit sensor electronics cable, the grommets must be cut before installation on cable.**

(8) Install two grommets (24) on double hit sensor electronics cable (6) and double target arm (5).

(9) Position two base plates (with attached double hit sensor electronics) on double target arm.

(10) Install six l-in socket-head screws (19), grommets (20), spacers (21), 1/4-in flatwashers (22), and self-locking nuts (23), and secure base plates to double target arm.

(11) Install two cushion loop clamps (17) on double hit sensor electronics cable.

(12) Install two 1-1/4-in socket-head screws (11), four 1/4-in ID flatwashers (12) two grommets (13), spacers (14), 1/4-in flatwashers (15), and locknuts (16), and secure cushion loop clamps on base plates.

(13) Install two cushion loop clamps (10) on double hit sensor electronics cable and position clamps on double target arm.

(14) install four socket-head screws (7), flatwashers (8), and self-locking nuts (9) and secure four cushion loop clamps to double target arm.

(15) Install plastic loop clamp (4) on double hit sensor electronics cable and position clamp on double target arm.

(16) Install socket-head screw (1), flatwasher (2), and self-locking nut (3) and secure plastic loop clamp to double target arm.

(17) Install double target arm assembly (reference paragraph 4-50).

(18) Perform ITM self-test (reference paragraph 2-4b).

APPENDIX A

REFERENCES

A-1 SCOPE.

This appendix lists all forms, technical manuals, and miscellaneous publications referenced in this manual.

A-2 PUBLICATION INDEXES.

The following publication index should be consulted frequently for latest changes or revisions of references given in this appendix and for new publications relating to material covered in this manual:

The Army Maintenance Management System (TAMMS) ..... DA PAM 738-750

A-3 TECHNICAL PUBLICATIONS.

Unit, Direct Support, and General Support Maintenance Repair Parts and Special Tool Lists/Illustrated Parts Breakdown (Including Depot Repair Parts and Special Tools), Remoted Target System (RETS) Target Training Set Track System - Infantry and Training Target Holding Set ..... TM 9-6920-742-24P-3

Operator, Unit, Direct Support, and General Support Maintenance Manual for Remoted Target System (RETS) Target Training Set Console - RETS, Target Training Set Console - ERETS (Armor), Target Training Set Console - ERETS (Infantry), and Power Supply Adapter ..... TM 9-6920-742-14-1

Destruction of Army Materiel to Prevent Enemy Use ..... TM 750-244-3

Accident Reporting and Records ..... AR 385-40
Safety Requirements for Maintenance of Electrical and Electronic Equipment ..... TB 385-4

A-4 FIELD MANUALS.

First Aid for Soldiers ..... FM 21-11

A-5 FORMS.

Product Quality Deficiency Report ..... SF 368

Accident Report ..... DA Form 285

Recommended Changes to Publications and Blank Forms ..... DA Form 2028

APPENDIX B

MAINTENANCE ALLOCATION CHART

SECTION I. INTRODUCTION

B-1 GENERAL.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The MAC in Section II designates overall authority and responsibility for the performance of maintenance functions on the Target Training Set Track System - Infantry (IMTC) and the Training Target Holding Set (ITM), The application of the maintenance functions to the IMTC and ITM will be consistent with the capacities and capabilities of the designated maintenance levels.

c. Section Ill lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2 MAINTENANCE FUNCTIONS.

Maintenance functions will be limited to and defined as follows:

a. **inspect.** To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. **Service.** Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids or gases.

d. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper or exact position or by setting the operating characteristics to specified parameters.

e. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.

f. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

B-2 MAINTENANCE FUNCTIONS - Continued.

g. **Remove/Install.** To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. **Replace.** To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3rd position code of the SMR code.

i. **Repair.** The application of maintenance services [1], including fault location/troubleshooting [2] removal/installation, and disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction or failure in a part, subassembly, module (component or assembly), end item or system.

j. **Overhaul.** That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

k. **Rebuild.** Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc) considered in classifying Army equipment/components.

B-3 EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. **Column 1. Group Number.** Column 1 lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00."

b. **Column 2, Component/Assembly.** Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. **Column 3. Maintenance Function.** Column 3 lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see paragraph B-2.)

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1 Services - inspect, test, service, adjust, align, calibrate, and/or replace.

2 Fault locate/troubleshoot - the process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or unit under test.

3 Disassemble/assemble - encompasses the step-by-step taking apart (or breakdown) of a spare/functional group coded item to the level of its least componency identified as maintenance significant (i.e., assigned an SMR code) for the level of maintenance under consideration.

4 Actions - welding, grinding, riveting, straightening, facing, remachining, and/or resurfacing.

d. **Column 4, Maintenance Level.** Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(the level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures will be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows:

C ..... Operator or crew

O ..... Unit maintenance

F ..... Direct support maintenance

H ..... General support maintenance

L..... Specialized repair activity (SRA)

D ..... Overhaul/depot level maintenance

e. **Column 5. Tools and Equipment.** Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. **Column 6, Remarks.** This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4 EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

a. **Column 1. Reference Code.** The tool and test equipment reference code correlates with a code used in the MAC, Section II, column 5.

b. **Column 2. Maintenance Level.** The lowest level of maintenance authorized to use the tool or test equipment.

c. **Column 3. Nomenclature.** Name or identification of the tool or test equipment.

d. **Column 4. National Stock Number.** The national stock number of the tool or test equipment.

e. **Column 5, Tool Number.** The manufacturer's part number.

B-5 EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

a. **Column 1, Reference Code.** The code recorded in column 6, Section II.

b. **Column 2, Remarks.** This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
00	TARGET TRACK SYSTEM - INFANTRY 11829748	INSPECT	.2						
		TEST		.1					
		ADJUST		.2				12	
		REPAIR		.1				12	
01	DRIVE BELT ASSEMBLY KIT 9353961	INSPECT	.1						
		ADJUST		.1				6, 12	
		REPLACE		.4				12	
		REPAIR		.2				1,12	
02	CARRIAGE ASSEMBLY 11829776	INSPECT	.1						
		REPLACE			1.9			12	
		REPAIR			1.1			12,14	
03	CABLE SUPPORT ASSEMBLY 9363177	REPLACE		.4				12	
		REPAIR		.2				12	
04	INTERMEDIATE TRACK ASSEMBLY 9340980-1	INSPECT	.1						
		REPLACE			1.2			12	
		REPAIR		.1				12	
0401	BONDING WIRE 9353984	REPLACE		.1				12	
		REPAIR		.1				3,12	
05	INTERMEDIATE TRACK ASSEMBLY 9340980-2	INSPECT	.1						
		REPLACE			1.5			12	
		REPAIR		.1				12	
0501	BONDING WIRE 9353984	REPLACE		.1				12	
		REPAIR		.1				3,12	
06	DRIVE END TRACK ASSEMBLY 9340981	INSPECT	.1						
		REPLACE			1.1			12	
		REPAIR		.1				12	
0601	SWITCH AND CONNECTOR BRACKET ASSEMBLY 9353990	REPLACE		.1				12	
		REPAIR		.2				12	
0602	BONDING WIRE 9353984	REPLACE		.1				12	
		REPAIR		.1				3,12	

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
07	TRACK/DRIVE MECHANISM ASSEMBLY 9340982	INSPECT	.1						
		REPLACE			1.6			12	
		REPAIR		.1				12	
0701	DRIVE MECHANISM ASSEMBLY 9340977	INSPECT	.1						
		REPLACE		.4				12	
		REPAIR		.8				12	
070101	DRIVE MOTOR ASSEMBLY 9354017	REPLACE		.3				12	
		REPAIR		.5				12	
07010101	CABLE ASSEMBLY 9354019	REPLACE		.1				12	
		REPAIR			.5			2,3,4,8,11, 12,13	
07010102	SUPPRESSOR ASSEMBLY 9387289	REPLACE		.1				12	
		REPAIR			.3			4,8,12	
0702	BONDING WIRE 9353984	REPLACE		.1				12	
		REPAIR		.1				3,12	
08	RETURN END TRACK ASSEMBLY 9340978	INSPECT	.1						
		REPLACE			1.1			12	
		REPAIR		.2				12	
0801	SWITCH AND CONNECTOR BRACKET ASSEMBLY 9353990	REPLACE		.1				12	
		REPAIR		.3				12	
09	IMTC ELECTRONIC COMPONENTS ASSEMBLY 11829457	INSPECT	.1						
		REPLACE			.1			12	
		REPAIR		.2				12	
0901	ELECTRIC RELAY ASSEMBLY 9353928	REPLACE			1.2			12	
		REPAIR			1.4			12	
090101	JUMPER DIODE ASSEMBLY 9353927-1	REPLACE			.2			12	
		REPAIR			.3			3,8,12	
090102	JUMPER DIODE ASSEMBLY 9353927-2	REPLACE			.2			12	
		REPAIR			.3			3,8,12	
090103	RESISTOR ASSEMBLY 9354191	REPLACE			.2			12	
		REPAIR			.3			3,8,12	

SECTION II. MAINTENANCE ALLOCATION CHART - Continued.

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
0902	CIRCUIT BREAKER ASSEMBLY 9353925	REPLACE		.3				7,12,14	
		REPAIR			.3			3,4,8,12	
0903	WIRING HARNESS ASSEMBLY 11829463	REPLACE			. 9			12,14	
		REPAIR			1.5			2,3,4,8,9,10, 11,12,13,14	
0904	POWER CABLE 9353937	REPLACE			.3			12,14	
		REPAIR			.5			2,3,5,10,11, 12,13	
0905	CABLE ASSEMBLY 9353950	REPLACE			.4			12,14	
		REPAIR			.5			2,3,4,5,8,9, 12,13	
10	TROLLEY ASSEMBLY 11829747	INSPECT	.1						
		REPLACE		.5				12,14	
		REPAIR		.5				12,14	
11	TROLLEY CABLE ASSEMBLY 9363069	INSPECT	.1						
		REPLACE		.2				12	
		REPAIR		.2				12,14	
12	CABLE ASSEMBLY W103 9354099	INSPECT	.1						
		ADJUST		.3				12	
		REPLACE		.5				12	
		REPAIR			1.2			2,4,8,10,11, 12,13	
13	TRAINING TARGET HOLDING SET 11829340-1, 11829340-2	INSPECT	.1						
		TEST		.1					
		REPLACE		.2				12	
		REPAIR		.2	.3			12,14	
1301	COVER ASSEMBLY 11829343-1	INSPECT	.1						
		REPLACE		.1				12	
		REPAIR		.2				12	

(1) Group Number	(2) Component/Assembly	(3) Maintenance Function	(4) Maintenance Category C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
1302	TARGET ARM ASSEMBLY 11829342	INSPECT	.1						
		REPLACE		.2				7,12	
		REPAIR			.3			12	
130201	HIT SENSOR ASSEMBLY 9363053	INSPECT	.1						
		REPLACE			.2			12	
		REPAIR		.1	.2			12	
1303	WIRING HARNESS 11829394	REPLACE			.8			12,14	
		REPAIR			1.0			2,3,4,8,9,10, 11,12,13,14	
1304	DRIVE MOTOR ASSEMBLY 11829361	REPLACE			.4			12	
		REPAIR			.4			3,12	
1305	CENTER PLATE ELECTRONIC ASSEMBLY 11829367	REPLACE			.7			12	
		REPAIR			1.1			8,12	
1306	IDLER SHAFT ASSEMBLY 11829372	REPLACE		.5				12	
		REPAIR			.4			12	
1307	DOUBLE TARGET ARM ASSEMBLY 9341015	INSPECT	.1						
		REPLACE		.2				7,12	
		REPAIR			.5			12	

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O	COMPRESSING TOOL, SPLICING SLEEVE	5120-01-048-5288	0051-G887
2	F	CRIMPING TOOL, TERMINAL, HAND	5120-00-165-3912	11-3284-2

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS - Continued.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
3	O	CRIMPING TOOL, TERMINAL, HAND	5120-00-170-7938	1006
4	F	HEATER, GUN-TYPE, ELECTRIC	4940-01-181-5876	1264T565
5	F	MULTIMETER, DIGITAL	6625-01-265-6000	AN/PSM=45A
6	O	SCALE, WEIGHING	6670-00-238-9777	270MD
7	O	SCREWDRIVER SET, TORQUE	5120-00-127-2525	KIT2
8	F	SET, SOLDERING AND DESOLDERING	3439-00-460-7198	W-TCP-K
9	F	TOOL, INSERTION/ EXTRACTION	5120-00-915-4588	M61969/14-03
10	F	TOOL, INSERTION/ EXTRACTION	5120-00-157-3136	M81969/14-04
11	F	TOOL, INSERTION/ EXTRACTION	5120-01-300-0095	M81969/14-11
12	O	TOOL KIT, GENERAL MECHANIC'S AUTO-MOTIVE	5180-00-177-7033	SC 5180-90-CL-N26
13	F	TURRET	5120-00-016-6362	M2250/1-02
14	O	WRENCH, TORQUE	5120-00-001-3733	28414

SECTION IV. REMARKS

(NOT APPLICABLE)

APPENDIX C

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES LIST

SECTION I. INTRODUCTION

C-1 SCOPE.

This appendix lists all common tools and supplements and special tools/fixtures needed to maintain the Target Training Set Track System - Infantry and Training Target Holding Set.

C-2 EXPLANATION OF COLUMNS.

a. Column 1 - Item Number. This number is assigned to the entry in the listing and is referenced in the initial setup to identify the item (e.g., "Crowbar (item 32, appx C)").

b. Column 2 - Item Name. This column lists the item by noun nomenclature and other descriptive features (e.g., "Gauge, belt tension").

c. Column 3 - National Stock Number. This is the national stock number (NSN) assigned to the item; use it to requisition the item.

d. Column 4 - Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

e. Column 5 - Reference. This column identifies the authorizing supply catalog or RPSTL/IPB for items listed in this appendix.

SECTION II. COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES LIST

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
1	Compressing tool, splicing sleeve	5120-01-048-5288	0051-G887	
2	Crimping tool, terminal, hand	5120-00-165-3912	11-3284-2	
3	Crimping tool, terminal, hand	5120-00-170-7938	1006	

SECTION II. COMMON TOOLS AND SUPPLEMENTS AND SPECIAL TOOLS/FIXTURES LIST - Continued.

(1) ITEM NUMBER	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) REFERENCE
4	Heater, gun-type, electric	4940-01-181-5876	1264T585	
5	Multimeter, digital	6625-01-265-6000	AN/PSM-45A	
6	Scale, weighing	6670-00-238-9777	270MD	
7	Screwdrive set, torque	5120-00-127-2525	KIT2	
8	Set, soldering and desoldering	3439-00-460-7198	W-TCP-K	
9	Tool, insertion/extraction	5120-00-915-4588	M81969/14-03	
10	Tool, insertion/extraction	5120-00-157-3138	M81969/14-04	
11	Tool, insertion/extraction	5120-01-300-0095	M81969/14-11	
12	Tool kit, general mechanic's automotive	5160-00-177-7033	SC 5180-90-CL-N26	
13	Turret	5120-00-016-6382	M22520/1-02	
14	Wrench, torque	5120-00-001-3733	28414	

APPENDIX D

EXPENDABLE AND DURABLE ITEMS LIST

SECTION I. INTRODUCTION

D-1 SCOPE.

This appendix lists expendable and durable items that you will need to operate and maintain the Target Training Set Track System - Infantry and Training Target Holding Set. This listing is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-790, Expendable/Durable Items.

D-2 EXPLANATION OF COLUMNS.

a. Column (1) - Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the item (e.g., "Use cleaning compound (item 5, Appendix D).").

b. Column (2)- Level. This column identifies the lowest level of maintenance that requires the item.

c. Column (3)- National Stock Number. This is the National stock number assigned to the item which you can use to requisition it.

d. Column (4) -Item. Description. Commercial and Government Entity Code (CAGEC). and Part Number. This provides the other information you need to identify the item.

e. Column (5) - Unit of Measure. This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

SECTION II. EXPENDABLE AND DURABLE ITEMS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, PART NUMBER	(5) U/M
1	O	8040-00-273-6717	Adhesive (81755)12A68BT1-51	OZ
2	F	8030-00-180-6339	Caulking compound (19200) 9362990	OZ
3	O	6850-00-110-4498	Dry Cleaning Solvent (61346) PD680	PT
4	O	8010-00-297-2124	Enamel (96906) MS35530-2	GL

SECTION II. EXPENDABLE AND DURABLE ITEMS LIST - Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, PART NUMBER	(5) U/M
5	O	9150-00-985-7245	Grease, aircraft and automotive (81349) MIL-G-23827	OZ
6	O	9150-00-965-2408	Grease, Ground Glass (19200) 9362987	OZ
7	O	8040-01-281-2729	Adhesive (81349) M46050-6-2-50	EA
8	O	5350-00-186-8858	Paper, Abrasive (58536) A-A-1049	EA
9	O	8010-00-899-8825	Primer, Coating (83421) 8010-00-899-8825	PT
10	C	7920-00-205-3570	Rag, Wiping (58536) A-A-2522	LB
11	O	8030-00-905-6818	Sealing compound (81349) MIL-S-22473	EA
12	O	8030-00-081-2333	Sealing compound (05972) 084-21	EA
13	O	8030-00-964-7537	Sealing compound (05972) 08441	OZ
14	F	8030-01-055-6126	Sealing compound (05972) 22241	OZ
15	O	8030-01-025-1692	Sealing compound (05972) 242-41	OZ
16	F	8030-01-142-3131	Sealing compound (05972) 26241	OZ
17	F	3439-01-046-1471	Solder, tin alloy (81348) SN60WRMAP3 0.020 1LB	OZ
18	F	3439-01-008-7578	Solder, tin alloy (81348) SN63WRMAP3 0.036 1LB	OZ
19	F	5970-00-686-9151	Tape, insulation, electric (20999) 27-1IN22HITE	YD

APPENDIX E

TORQUE LIMITS

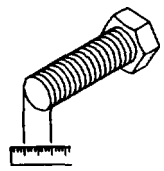
SECTION I. INTRODUCTION

E-1 GENERAL.

This appendix contains the torque standards for specific type and size of hardware. It defines the different types of bolts by grade.

SECTION II. TORQUE TABLE

HOW TO USE TORQUE TABLE:



a Measure the diameter of the screw. you are installing.

c. Under the SIZE, look down the left-hand column until you find the diameter f he screw you are installing. (There will usually be two lines beginning with the same size.)

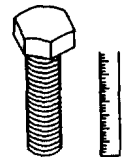
d. In the second column under SIZE find the number of threads per inch that matches the number of threads you counted in step 2. (Not required for metric screws.)

CAPSCREW HEAD MARKINGS

Manufacturer's marks may vary. These are all SAE Grade 5(3-line).

Metric screws are of three grades: 8.8, 10.9, and 12.9. Grades & Manufacturer's marks appear on the screw head.

STANDARD METRIC

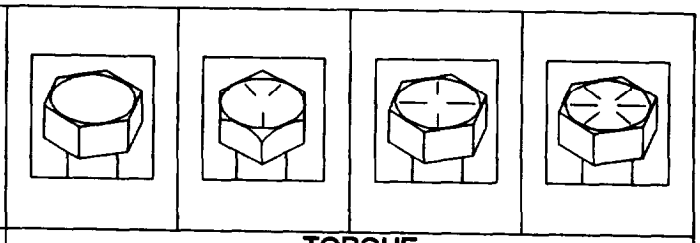


b. Count the number of threads. per inch or use a pitch gage.

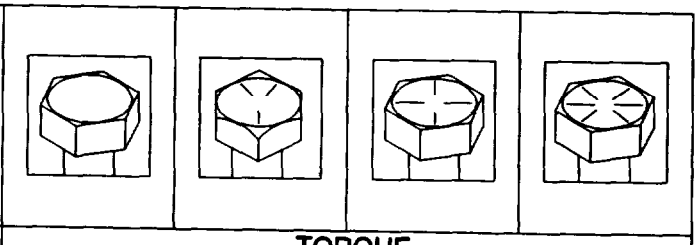
e. To find the grade screw you are installing, match the markings on the head to the correct picture of CAPSCREW HEAD MARKINGS on the torque table.

f. Look down the column under the picture you found in step 5 until you find the torque limit (LB-IN./FT or N.M) the diameter and threads per inch of the screw you are installing.

TORQUE LIMITS FOR DRY FASTENERS

CAPSCREW HEAD MARKINGS Manufacturer's marks may vary. These are all SAE Grade 5 (3-line).										
SIZE			TORQUE							
			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 OR 7		SAE GRADE NO. 8	
Dia. Inches	Threads Per Inch	Millimeters	Pound Feet	Newton-Meters	Pound Feet	Newton-Meters	Pound Feet	Newton-Meters	Pound Feet	Newton-Meters
1/4	20	6.35	5	7	7	8	10	14	12	16
1/4	28	6.35	6	9	9	10	12	16	14	19
5/16	18	7.94	11	15	15	17	21	28	25	34
5/16	24	7.94	12	16	16	19	24	22	25	34

TORQUE LIMITS FOR WET FASTENERS

CAPSCREW HEAD MARKINGS Manufacturer's marks may vary. These are all SAE Grade 5 (3-line).										
SIZE			TORQUE							
			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 OR 7		SAE GRADE NO. 8	
Dia. Inches	Threads Per Inch	Millimeters	Pound Feet	Newton-Meters	Pound Feet	Newton-Meters	Pound Feet	Newton-Meters	Pound Feet	Newton-Meters
1/4	20	6.35	4	6	6	8	8	11	9	12
1/4	28	6.35	5	7	7	9	9	12	10	14
5/16	18	7.94	8	11	3	18	16	22	18	24
5/16	24	7.94	9	12	14	19	18	24	20	27

TIGHTENING METAL FASTENERS

When torquing a fastener, select a wrench whose range fits the required torque value. A torque wrench is most accurate from 25% to 75% of its stated range. A wrench with a stated range of 0 to 100 will be most accurate from 25 to 75 Pound-Feet. The accuracy or readings will decrease as you approach 0 Pound-Feet or 100 Pound-Feet. The following ranges are based on this principle.

TORQUE RANGES

STATED RANGE	MOST EFFECTIVE RANGE
0-200 lb-ft	4-13 lb-ft
0-600 lb-ft	50-450 lb-ft
0-170 lb-ft	44-131 lb-ft
15-75 lb-ft	30-60 lb-ft

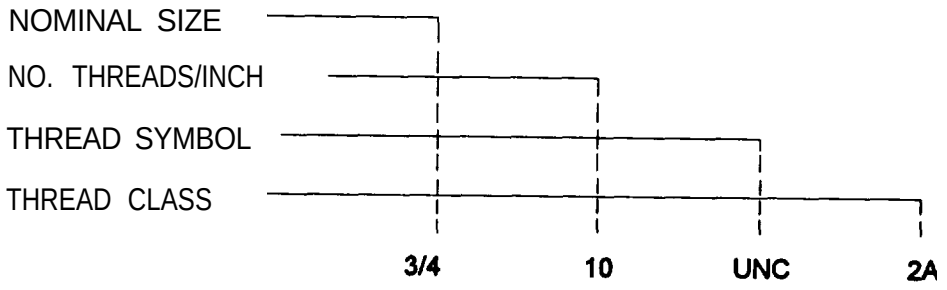
FASTENER SIZE AND THREAD PATTERN

Threaded fasteners are categorized according to diameter of the fastener shank. Thread styles are divided into broad groups, the two most common being coarse (United Coarse-UNC) and the fine (United Fine-UNF). These groups are defined by the number of threads per inch on the bolt shanks. In addition, threads are categorized by thread class, which is a measure of the degree of fit between the threads of the bolt or screw(external threads) and the threads of the bolt or screw (external threads). The most common thread class for bolts and screws is Class 2.

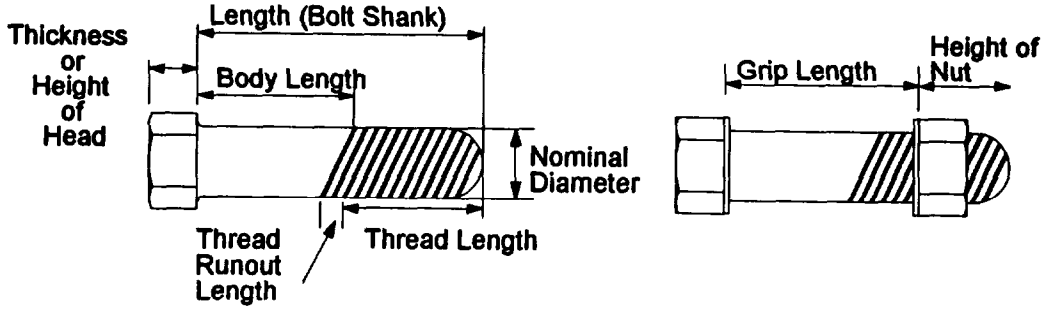
THREAD CLASSES AND DESCRIPTION

EXTERNAL	INTERNAL	FIT
1A	1B	LOOSE FIT
2A	2B	MEDIUM FIT
3A	3B	CLOSE FIT

Thread patterns are designated as follows:



NOTE: Unless followed with -LH (eg, 3/4-10UNC-2a-LH), threads are right-hand.



FASTENER GRADE

In addition to being classified by thread type, threaded fasteners are also classified by material. The most familiar fastener classification system is the SAE grading system.

SAE SCREW AND BOLT MARKINGS

SCREWS	BOLTS
SAE GRADE 2 NO MARKING	SAE GRADE 6 4 RADIAL DASHES 90° APART
SAE GRADE 3 2 RADIAL DASHES 180° APART	SAE GRADE 7 5 RADIAL DASHES 72° APART
SAE GRADE 5 3 RADIAL DASHES 120° APART	SAE GRADE 8 6 RADIAL DASHES 60° APART
	GRADE 8.2 6 RADIAL DASHES 30° APART

NOTE
Torque values for Grade 8.2 bolts are the same as for Grade B.

MARKINGS ON HEX LOCKNUTS

GRADE A - No Marks GRADE B - 3 Marks GRADE C - 8 Marks	GRADE A - No Mark GRADE B - Letter B GRADE C - Letter C
GRADE A - No Notches GRADE B - One Notch GRADE C - Two Notches	

TORQUE VALUE GUIDE

SCREW DIAMETER	TORQUE NO DASHES (SAE GRADE 2)	TORQUE 3 DASHES (SAE GRADE 5)	TORQUE 6 DASHES (SAE GRADE 8)	SOCKET SIZE
1/4-20 UNC	3-5 ft-lb (4-7 N.m)	6-8 ft-lb (8-11 N.m)	10-12 ft-lb (14-16 N.m)	7/16
1/4-28 UNF	4-6 ft-lb (5-8 N.m)	8-10 ft-lb (11-14 N.m)	9-14 ft-lb (12-19 N.m)	7/16
5/16-18 UNC	7-11 ft-lb (9-15 N.m)	13-17 ft-lb (18-23 N.m)	19-24 ft-lb (26-33 N.m)	1/2
5/16-24 UNF	7-11 ft-lb (9-15 N.m)	14-19 ft-lb (19-26 N.m)	23-28 ft-lb (31-38 N.m)	1/2
3/8-16 UNC	14-18 ft-lb (19-24 N.m)	26-31 ft-lb (35-32 N.m)	39-44 ft-lb (53-60 N.m)	9/16
3/8-24 UNF	15-19 ft-lb (20-26 N.m)	30-35 ft-lb (41-47 N.m)	46-51 ft-lb (62-69 N.m)	9/16
7/16-14 UNC	23-28 ft-lb (31-38 N.m)	44-49 ft-lb (60-66 N.m)	65-70 ft-lb (88-95 N.m)	5/8
7/16-20 UNF	23-28 ft-lb (31-38 N.m)	44-54 ft-lb (60-73 N.m)	69-79 ft-lb (94-107 N.m)	5/8
1/2-13 UNC	32-37 ft-lb (43-50 N.m)	65-75 ft-lb (88-102 N.m)	95-105 ft-lb (129-142 N.m)	3/4
1/2-20 UNF	34-41 ft-lb (46-56 N.m)	73-83 ft-lb (99-113 N.m)	113-123 ft-lb (153-167 N.m)	3/4
9/16-12 UNC	46-56 ft-lb (62-76 N.m)	100-110 ft-lb (136-149 N.m)	145-155 ft-lb (197-210 N.m)	13/16
9/16-18 UNF	47-57 ft-lb (64-77 N.m)	107-117 ft-lb (145-159 N.m)	165-175 ft-lb (224-237 N.m)	13/16
5/8-11 UNC	62-72 R-lb (84-98N.m)	140-150 ft-lb (190-203 N.m)	200-210 ft-lb (271-285 N.m)	15/16
5/8-18 UNF	67-77 ft-lb (91-104 N.m)	153-163 ft-lb (207-221 N.m)	235-245 ft-lb (319-332 N.m)	15/16
3/4-10 UNC	106-116 ft-lb (144-157 N.m)	260-270 ft-lb (353-366 N.m)	365-375 ft-lb (495-508 N.m)	1-1/4
3/4-16 UNF	115-125 ft-lb (156-169 N.m)	268-278 ft-lb (363-377 N.m)	417-427 ft-lb (565-579 N.m)	1-1/4
7/8-9 UNC	(156-169 N.m) (224-237 N.m)	385-395 ft-lb (522-536 N.m)	595-605 ft-lb (807-820 N.m)	1-5/16
7/8-14 UNF	178-188 ft-lb (241-255 N.m)	424-434 ft-lb (575-588 N.m)	663-673 ft-lb (899-912 N.m)	1-5/16
1-8 UNC	251-261 ft-lb (340-354 N.m)	580-590 ft-lb (786-800 N.m)	900-910 ft-lb (1220-1234 N.m)	1-1/2
1-14 UNF	255-265 R-lb (346-359 N.m)	585-634 ft-lb (793-860 N.m)	943-993 ft-lb (1279-1346 N.m)	1-1/2
1-1/4-7 UNC	451-461 ft-lb (611-625 N.m)	1070-1120 ft-lb (1451-1518 N.m)	1797-1817 ft-lb (2396-2463 N.m)	1-7/8
1-1/4-12 UNF	488-498 ft-lb (682-675 N.m)	1211-1261 ft-lb (1642-1710 N.m)	1963-2013 ft-lb (2661-2729 N.m)	1-7/8
1-1/2-6 UNC	727-737 ft-lb (986-999 N.m)	1899-1949 ft-lb (2575-2642 N.m)	3111-3161 ft-lb (4218-4286 N.m)	2-1/4
1-1/2-12 UNF	816-826 ft-lb (1106-1120 N.m)	2144-2194 ft-lb (2907-2975 N.m)	3506-3556 ft-lb (4753-4821 N.m)	2-1/4

APPENDIX F

MANUFACTURED AND FABRICATED ITEMS

SECTION I. INTRODUCTION

This appendix tells you how to make items authorized to be manufactured or fabricated at unit maintenance.

All bulk materials needed for manufacture of an item are listed. Part numbers or specification numbers are provided herein as applicable.

SECTION II. INDEX OF MANUFACTURED ITEMS

SECTION III. ILLUSTRATIONS OF MANUFACTURED ITEMS

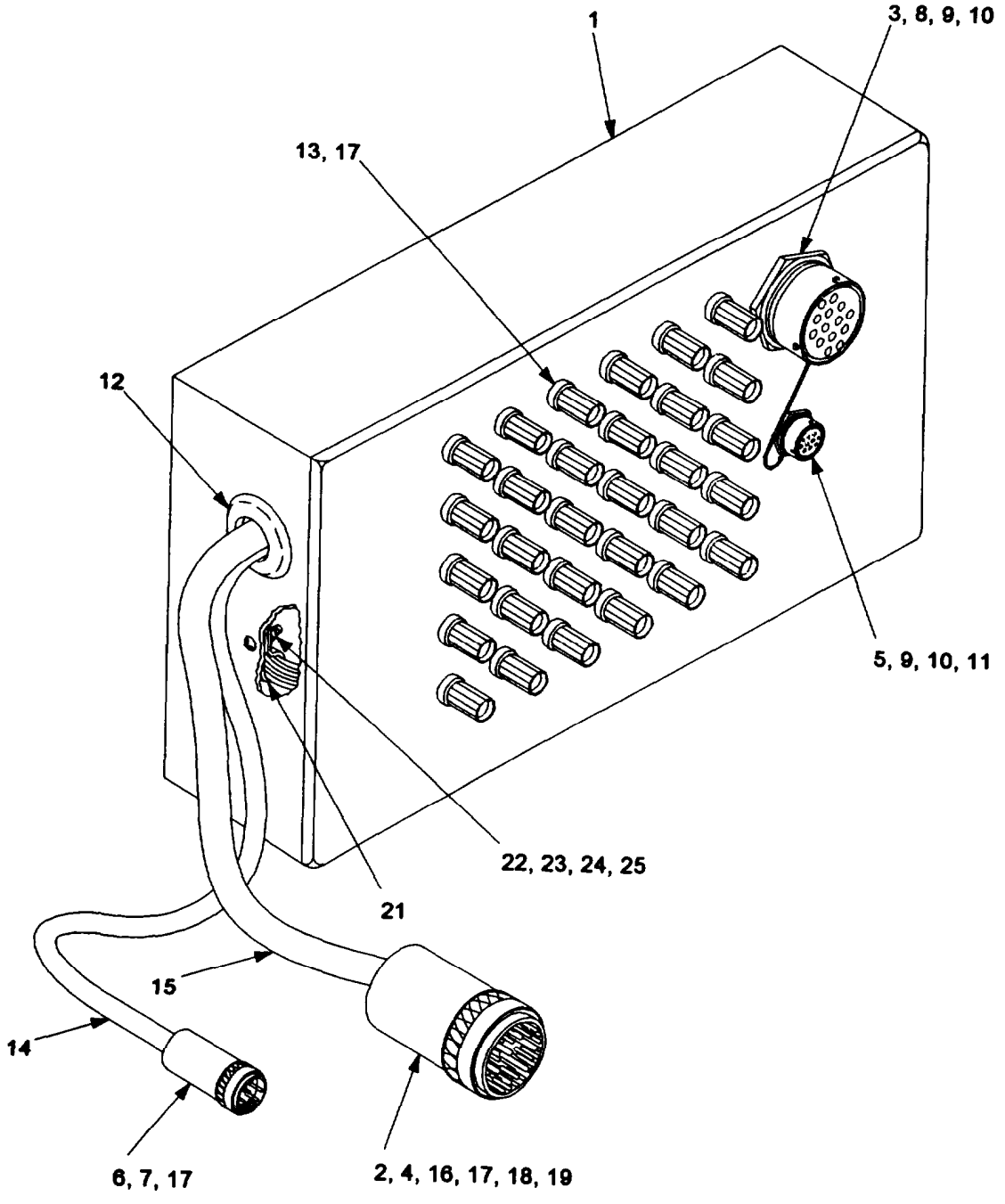


Figure F-1. IMTC Breakout Box.

Materials:

ITEM	NOMENCLATURE	PART NO.	NSN	U/I	QTY
1	Minibox	CU3011A	5999-00-971-8848	EA	1
2	Connector, electric	MS3126E22-95P		EA	1
3	Connector	MS3124E22-95S		EA	1
4	Insulation sleeving	M23053/1-110-0	5970-00-144-7432	FT	AR
5	Connector, electric	MS3474W14-12S	5935-01-149-9389	EA	1
6	Connector	MS3126E14-12P	5935-00-903-0038	EA	1
7	Insulation sleeving	M23053/1-108-0	5970-00-928-8812	FT	AR
8	Plug, electric connector	MS27488-12	5935-01-097-0399	EA	2
9	Plug, electric connector	MS27488-20	5935-00-496-7171	EA	38
10	Connector clips	19200-9341118	5940-00-041-3646	EA	10
11	Plug, electric connector	MS27488-16	5935-00-235-8970	EA	10
12	Grommet		5325-00-050-2857	EA	1
13	Standard binding post		5970-00-044-1583	EA	30
14	Sleeve, textile, 3/16	9443-16	5971-00-821-5018	FT	AR
15	Sleeve, textile, 3/8	9443-8	5970-00-308-0670	FT	AR
16	Wire, insulated, 20 AWG	M22759/11-20-9	6145-00-939-4964	FT	AR
17	Solder	SN63WRMAP3	3439-00-411-5097		AR
18	Tubing, shrink	M23053/5-105-0	5940-00-954-1622		AR
19	Connector, splice	9353932	5940-01-172-2948	EA	5
20	Strap, tiedown, electric	MS3367-4-9	5975-00-727-5153	EA	AR
21	Clamp	MS25281-F6	5340-00-915-2342	EA	1
22	Screw	MS35206-232	5305-00-984-4992	EA	1
23	Flatwasher	B75670	5310-00-685-3744	EA	1
24	Lo&washer	MS35333-41	5310-00-045-4007	EA	1
25	Nut	MS21083-NO6	5310-00-905-8451	EA	1

Notes:

1. Refer to fabricated panel drawing (FO-6) for hole location and size.

a. Use proper size drill bits to make holes in box (1).

b. Use a file to remove all sharp edges and burrs from box.

2. On cover

a. Refer to FO-5 and mark all connectors and terminals with metal stamps or stencil (not provided.)

b. Install connector J29 (item 3).

c. Install connector J30 (item 5).

d. Install standard binding posts 1 through 30 (item 13).

3. Wiring test box:

a. Using 20 AWG wire (item 16) connect terminals and standard binding posts (item 13) to J29 (item 3) and J30 (item 5) per wiring schematic (FO-7).

b. Solder (item 17) all connections as needed.

4. Final assembly of test box:

a. Install grommet (item 12) in hole in end of test box.

b. Cut 20 AWG wire (item 16) to 5-ft lengths. Install textile sleeve (item 15) over wire lengths. Refer to wiring schematic (FO-7) and connect wire lengths to connector PI (item 2) and standard binding posts (item 13). Solder (item 17) all connections as needed.

c. Cut 20 AWG wire (item 16) to 5-ft lengths. Install textile sleeve (item 14) over wire lengths. Refer to wiring schematic (FO-7) and connect wire lengths to connector P2 (item 6) and standard binding posts (item 13). Solder (item 17) all connections as needed.

d. Allowing approximately 1/2 in. Slack on cables inside box, install clamp (item 21) on inside of box using screw (item 22) flatwasher (item 23) lockwasher (item 24) and nut (item 25).

e. Install tiedown strap (item 20) (not shown) as needed to secure all the wires in a safe and neat manner.

f. Install cover on box.

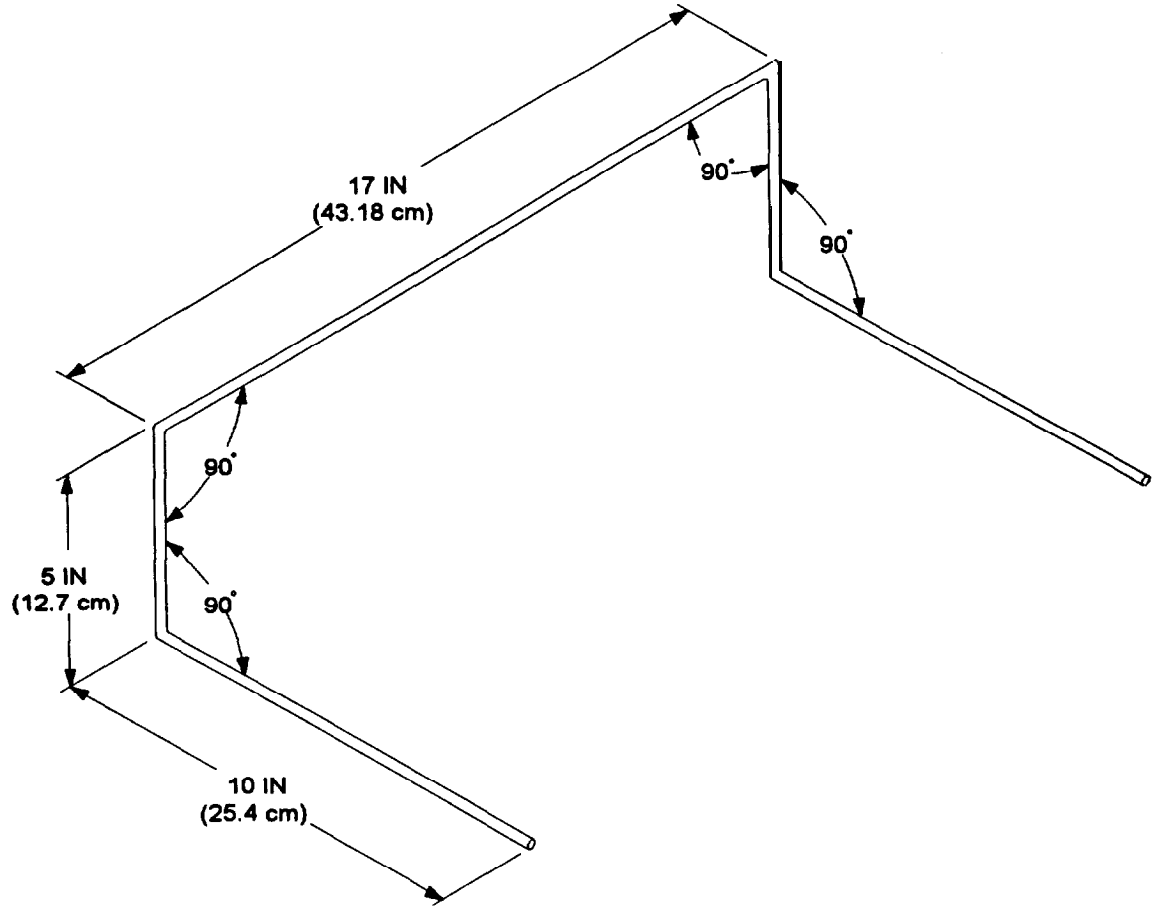


Figure F-2. ITM Test Arm.

Materials:

1. Steel wire, single-strand, 10-gage

Notes:

1. Fabrication of test arm (reference figure F-2):

a. Fabricate from 10-gage single-strand steel wire.

b. Cut 47-in length of wire.

c. Shape wire in accordance with dimensions and angles shown in figure F-2.

2. Installation of test an (reference figure F-3):

a. Remove target arm assembly from ITM (reference paragraph 4-47 or 4-50).

b. Remove cover assembly from ITM (reference paragraph 4-44).

c. Install target hubs on drive motor shaft and idler shaft.

d. Insert ends of the test arm through holes in target hub. Route ends of test arm from the inside of the target hub to the outside.

e . Bend ends of test arm along length of target hub and insert ends of test arm through holes in target hubs.

f. Loop ends of test arm back around target hubs and firmly secure test arm to target hubs.

g. Rework shape of wire as required to ensure free rotation of target arm during test procedures.

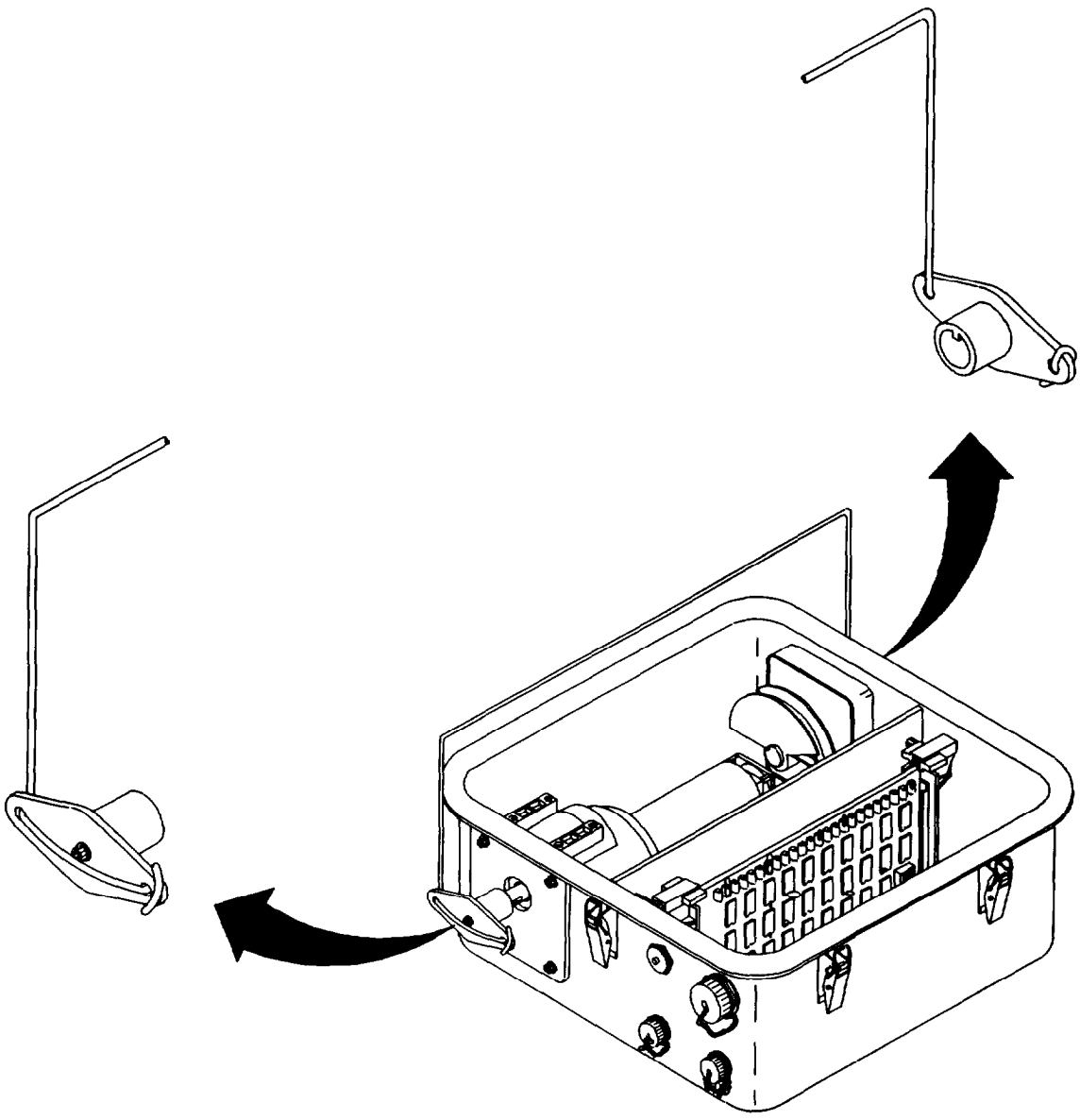


Figure F-3. Installation of Test Arm on ITM.

ALPHABETICAL INDEX

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By Order of the Secretary of the Army:

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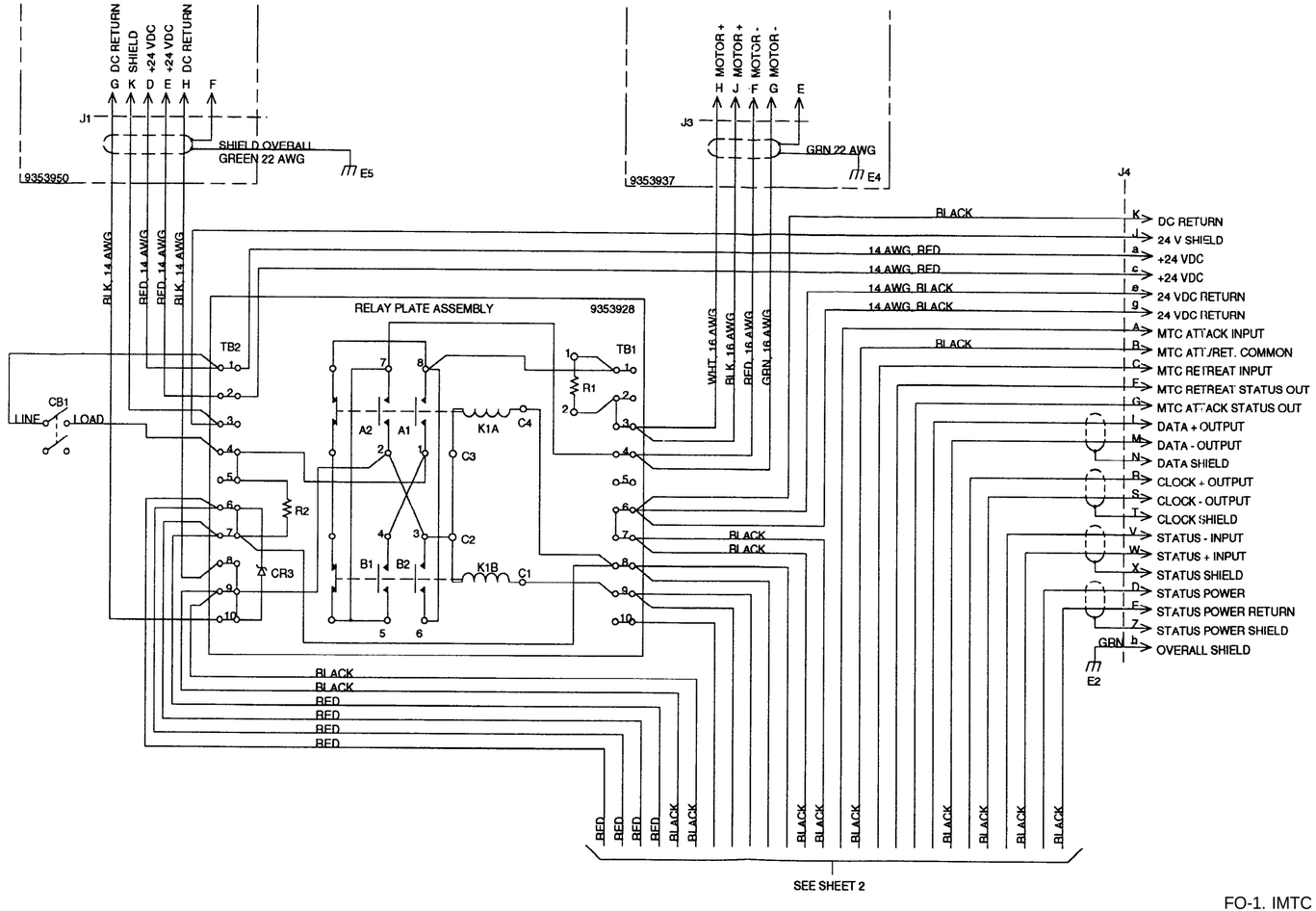
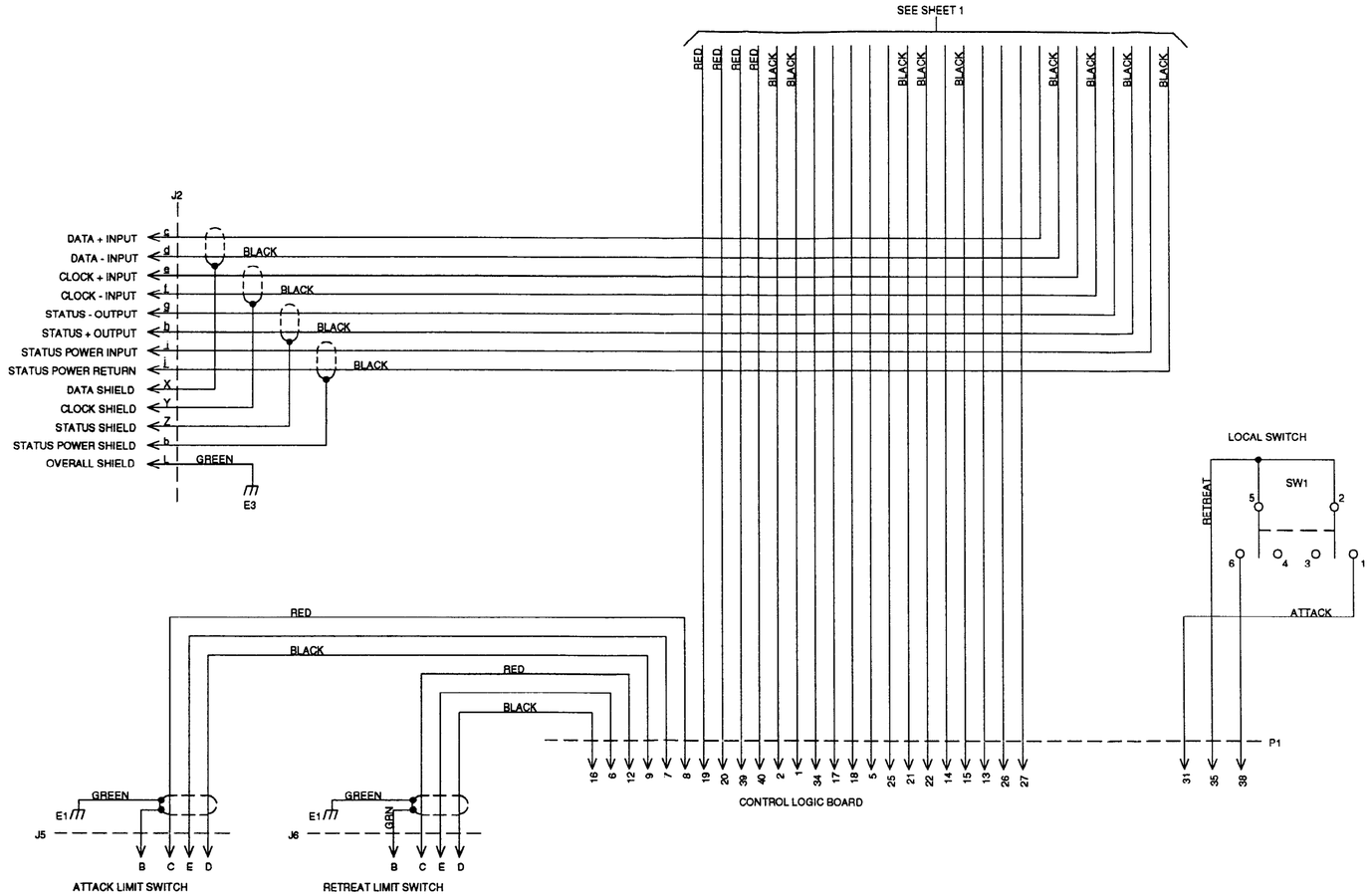
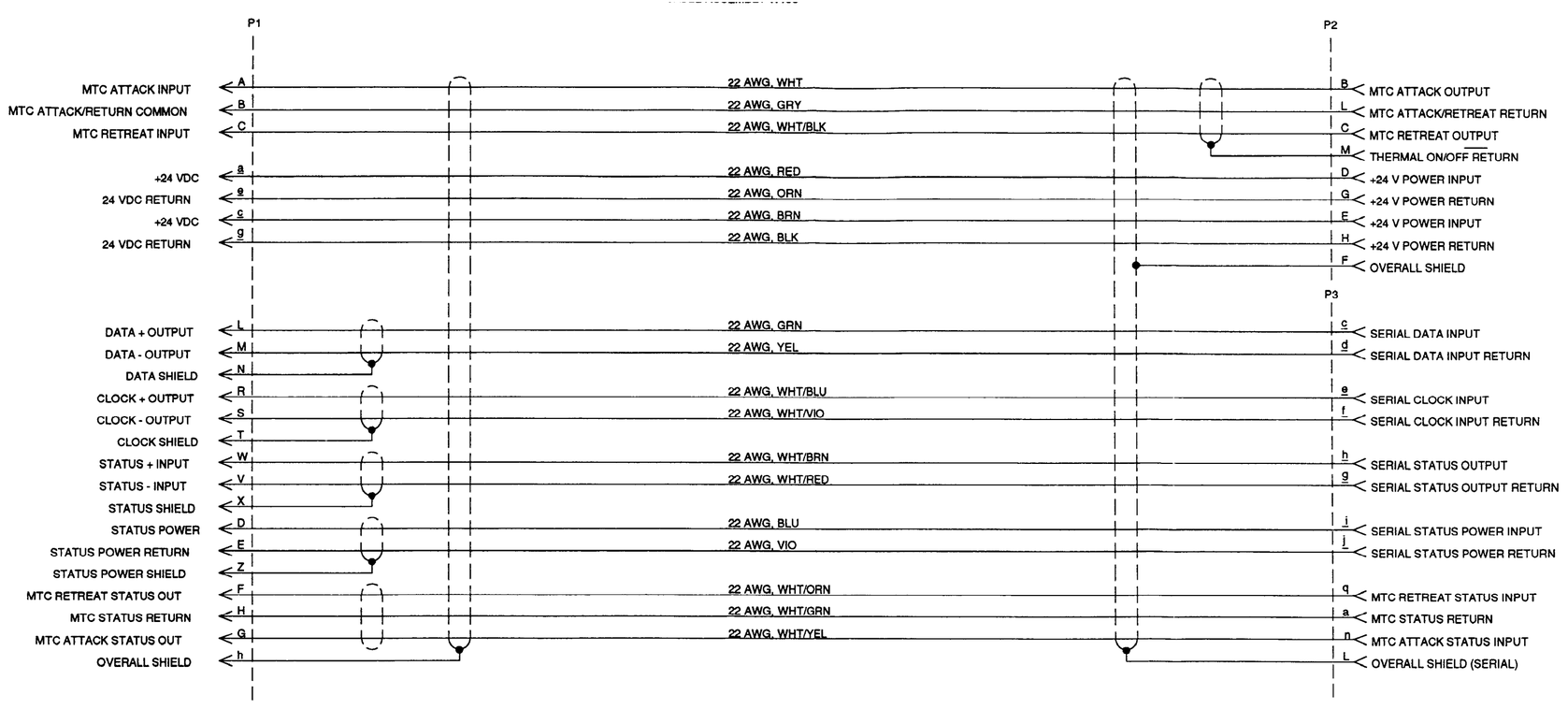


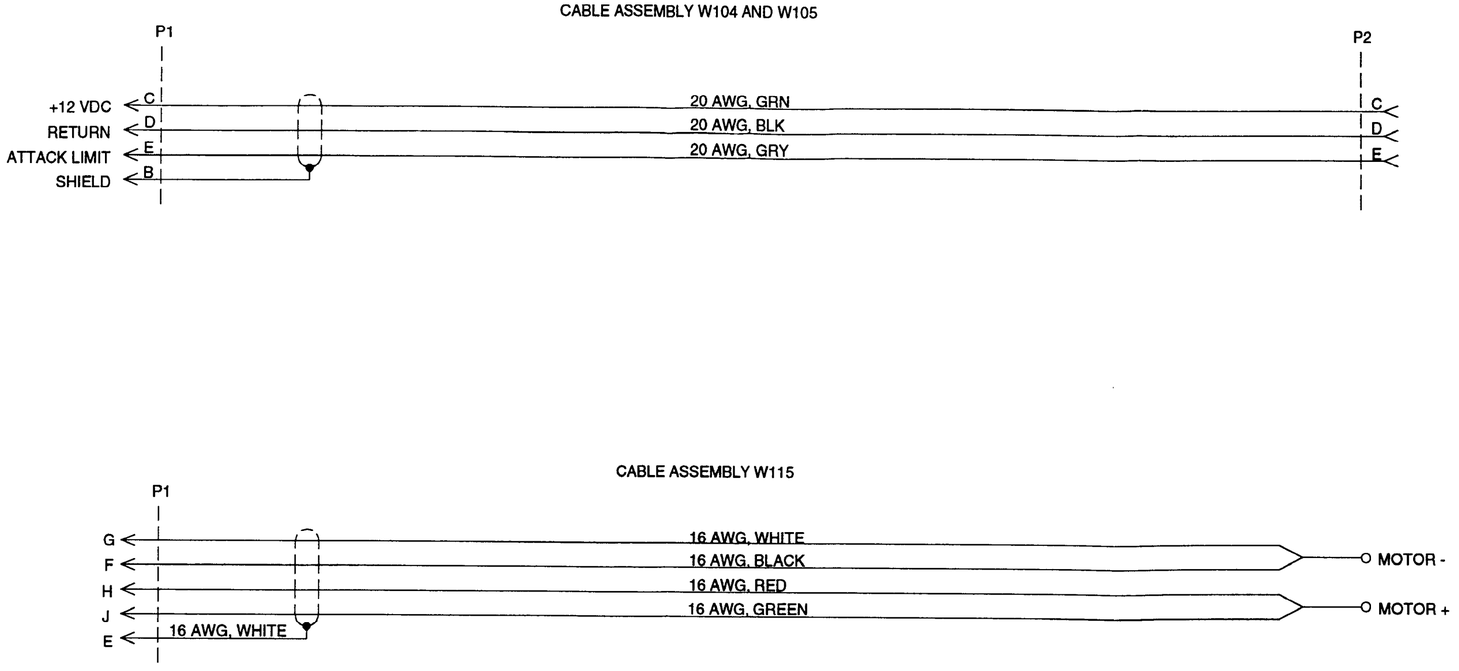
FO-1. IMTC Electronic Components Assembly Wiring Diagram (Sheet 1 of 2).



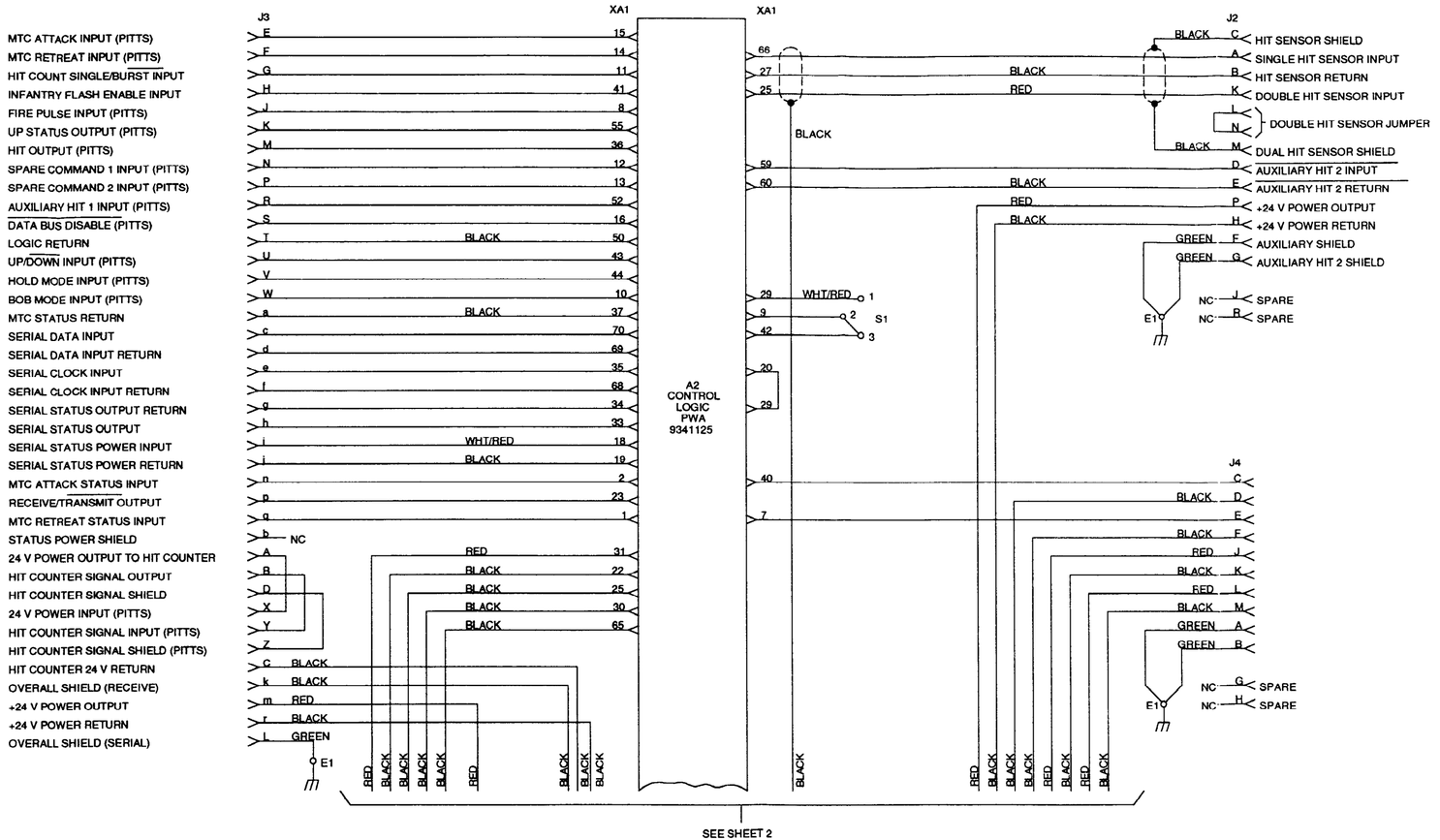
FO-1. IMTC Electronic Components Assembly Wiring Diagram (Sheet 2 of 2).



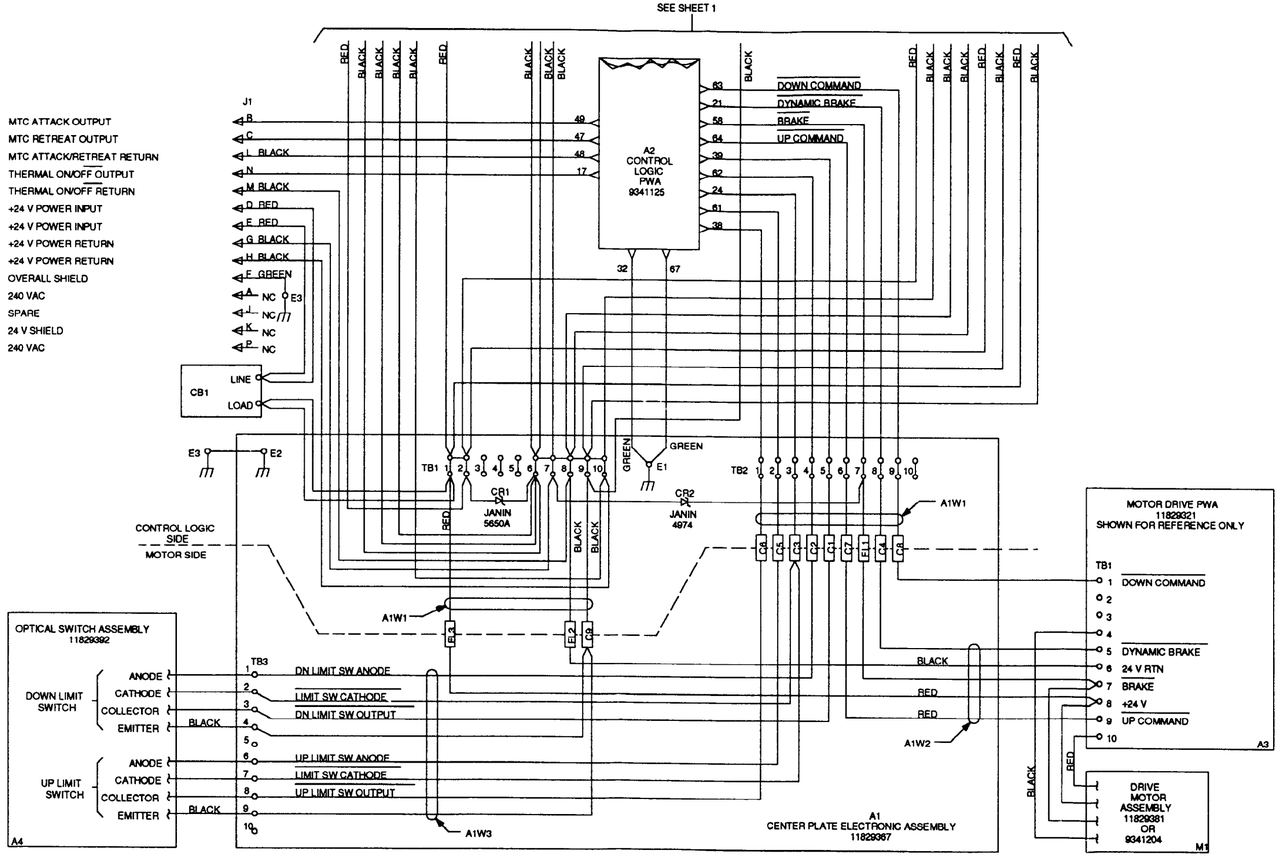
FO-2. Cable.Assemblies W103, W104, W105, and W115 Wiring Diagrams (Sheet 1 of 2).



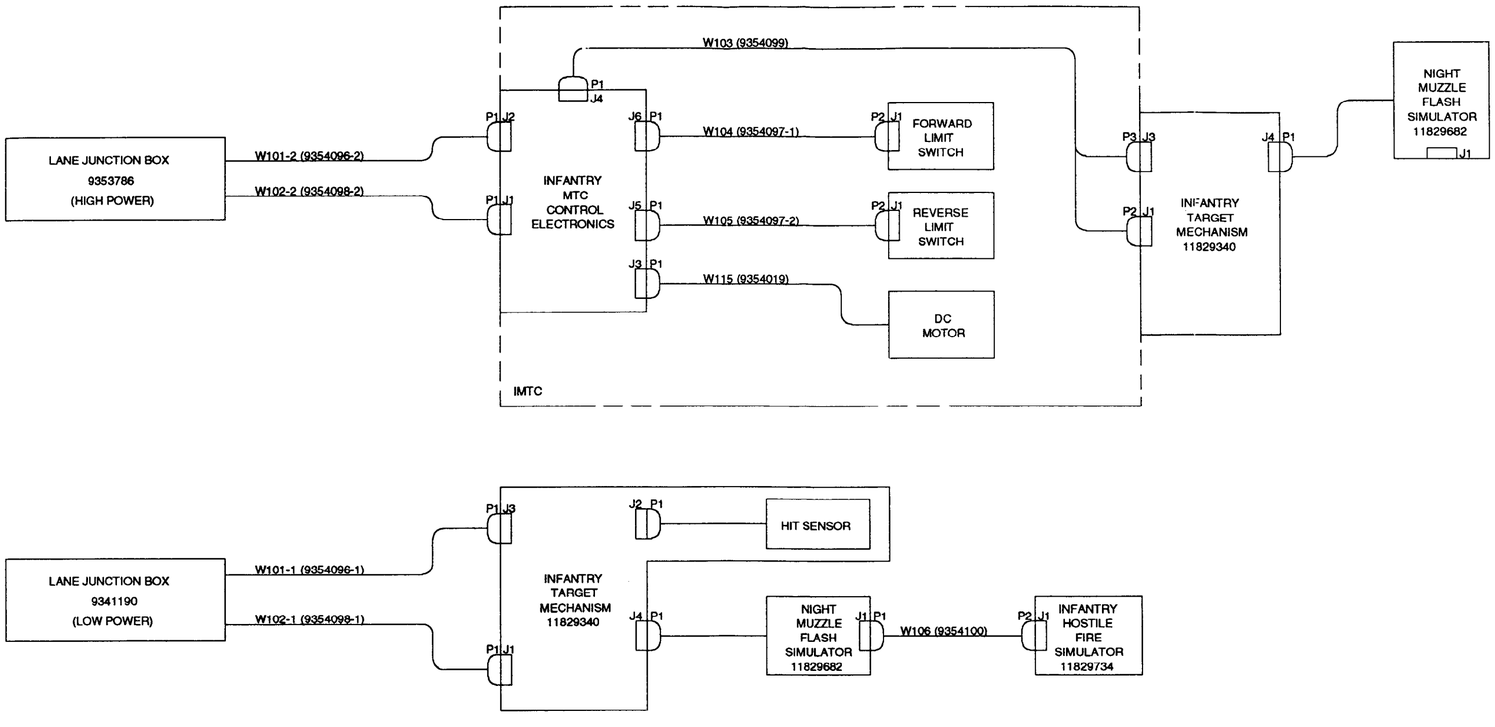
FO-2. Cable Assemblies W013, WO14, W105, and W115 Wiring Diagrams (sheet 2 of 2).



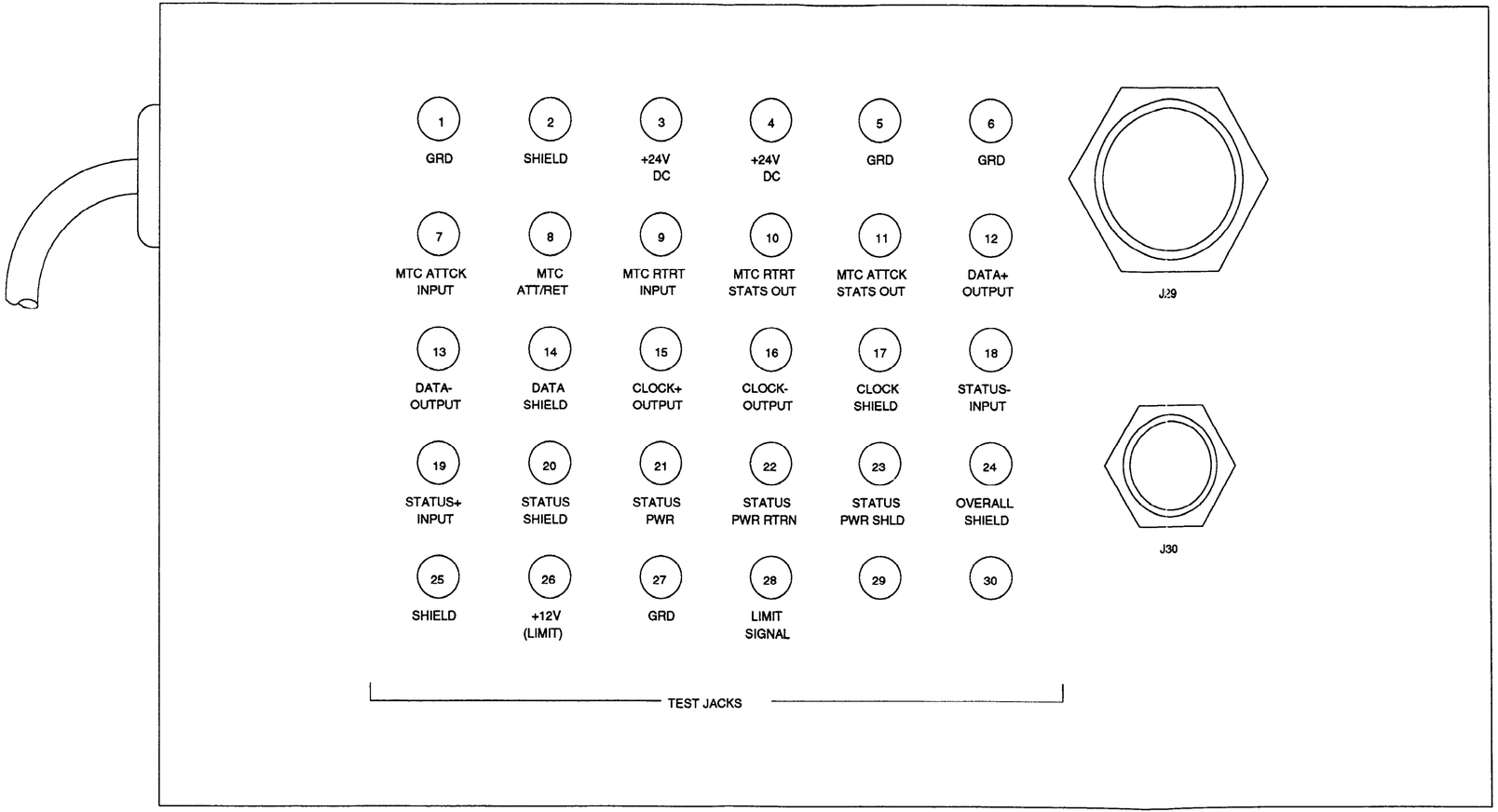
FO-3. ITM Wiring Diagram
(Sheet 1 of 2).



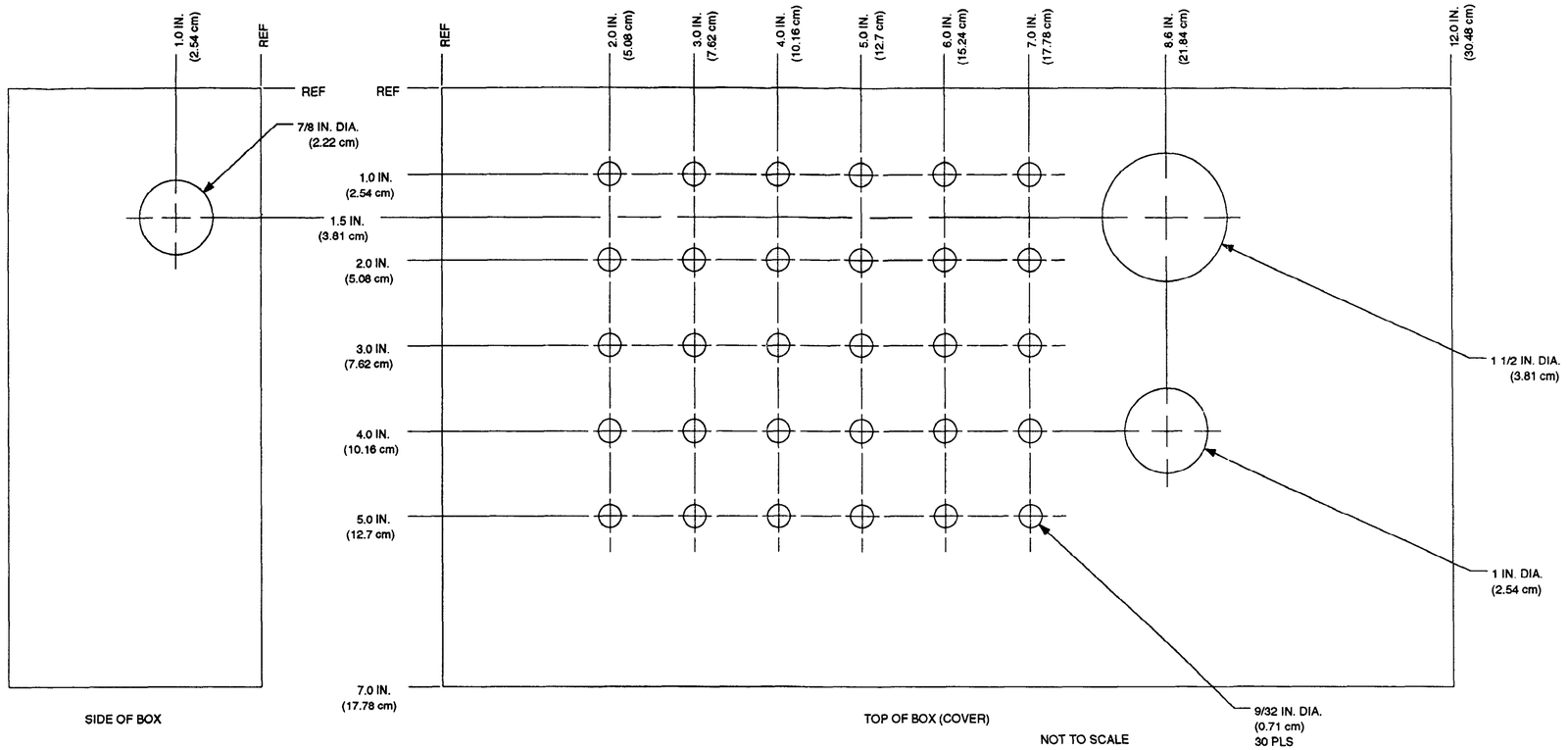
FO-3. ITM Wring Diagram
(Sheet 2 of 2).



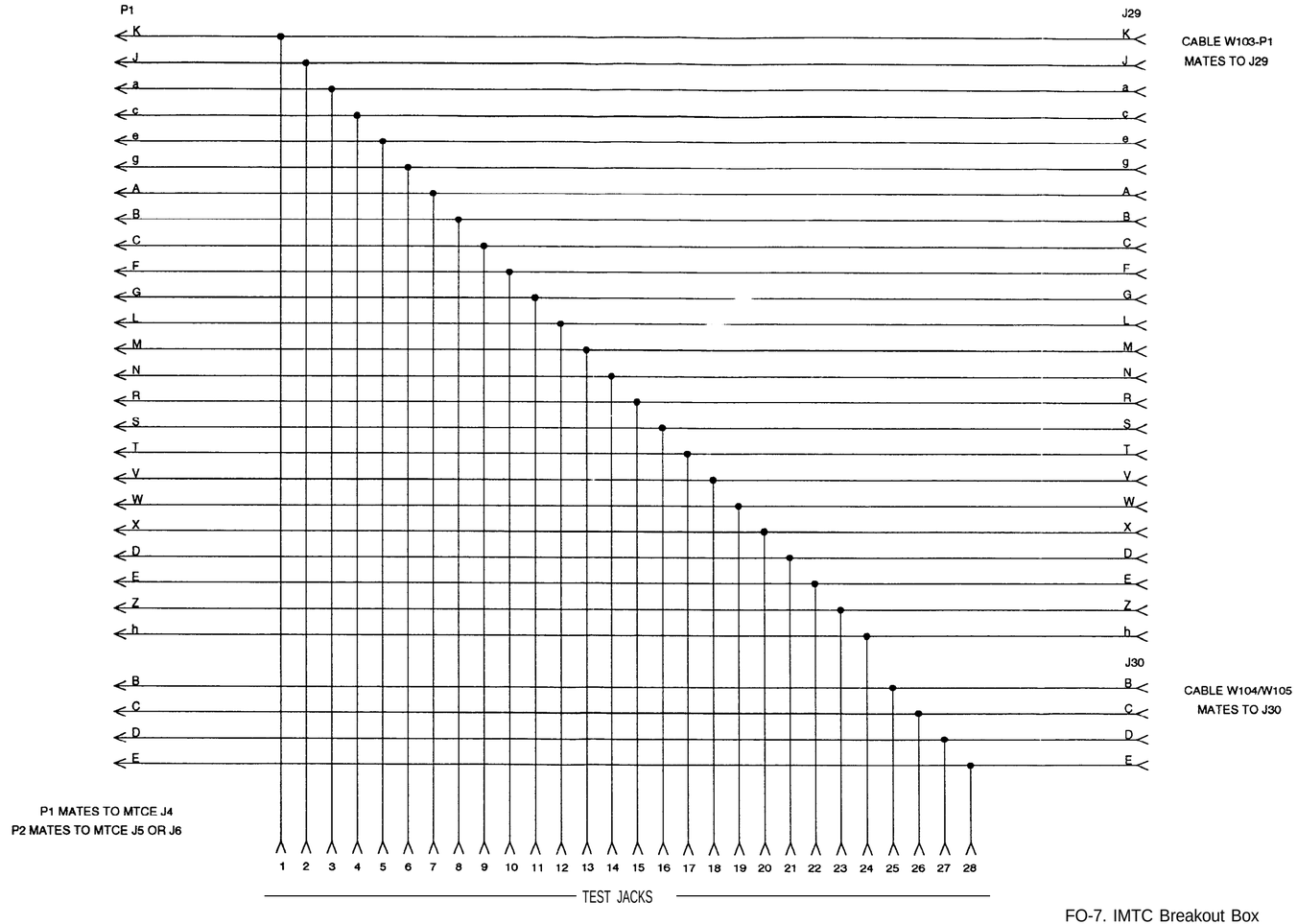
FO-4. IMTC and ITM Cable Connections Schematic. (Sheet 1 of 1).



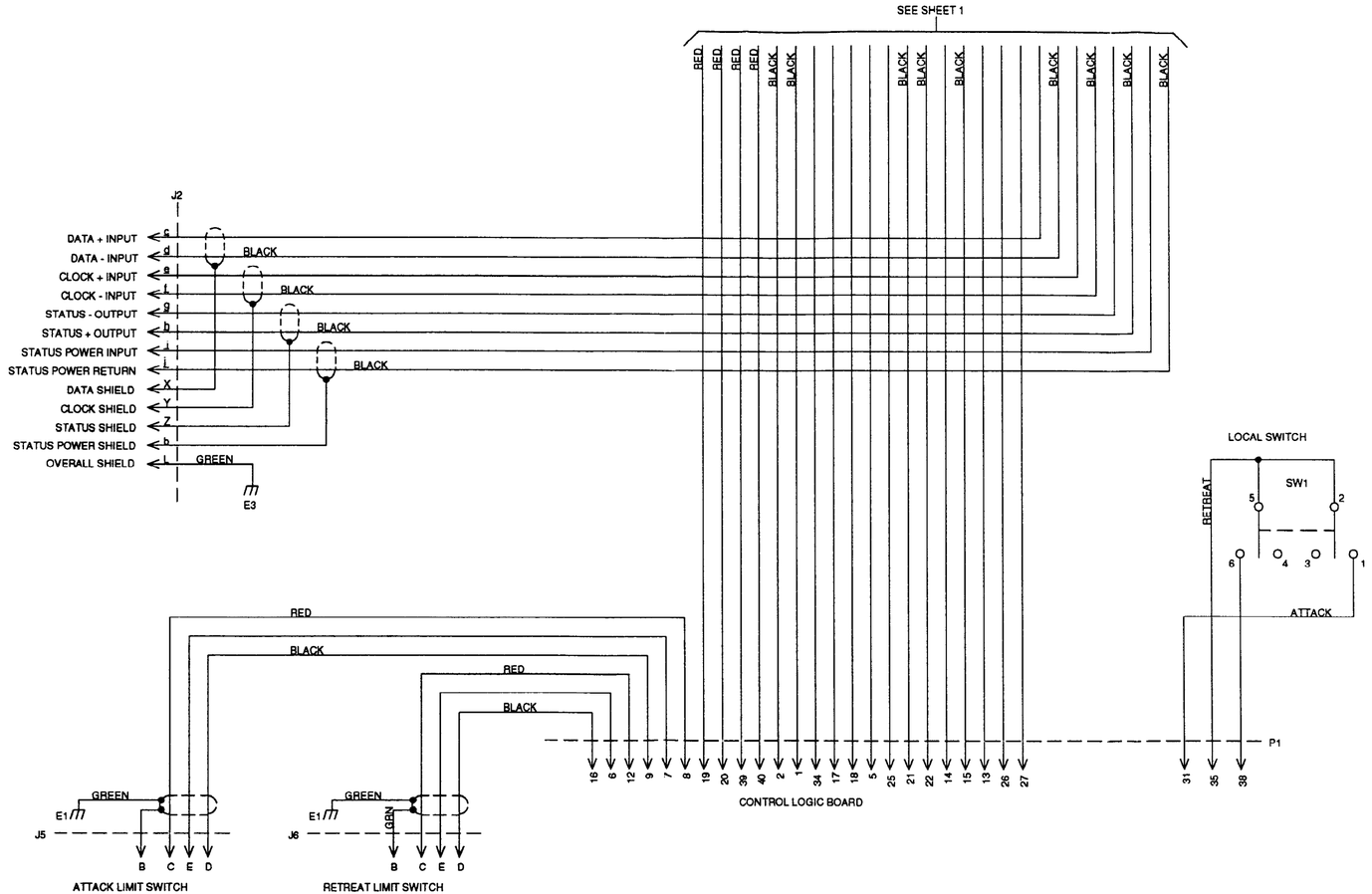
FO-5. IMTC Breakout Box Final Assembly.



FO-6. IMTC Breakout Box Panel.



FO-7. IMTC Breakout Box Wiring Schematic.



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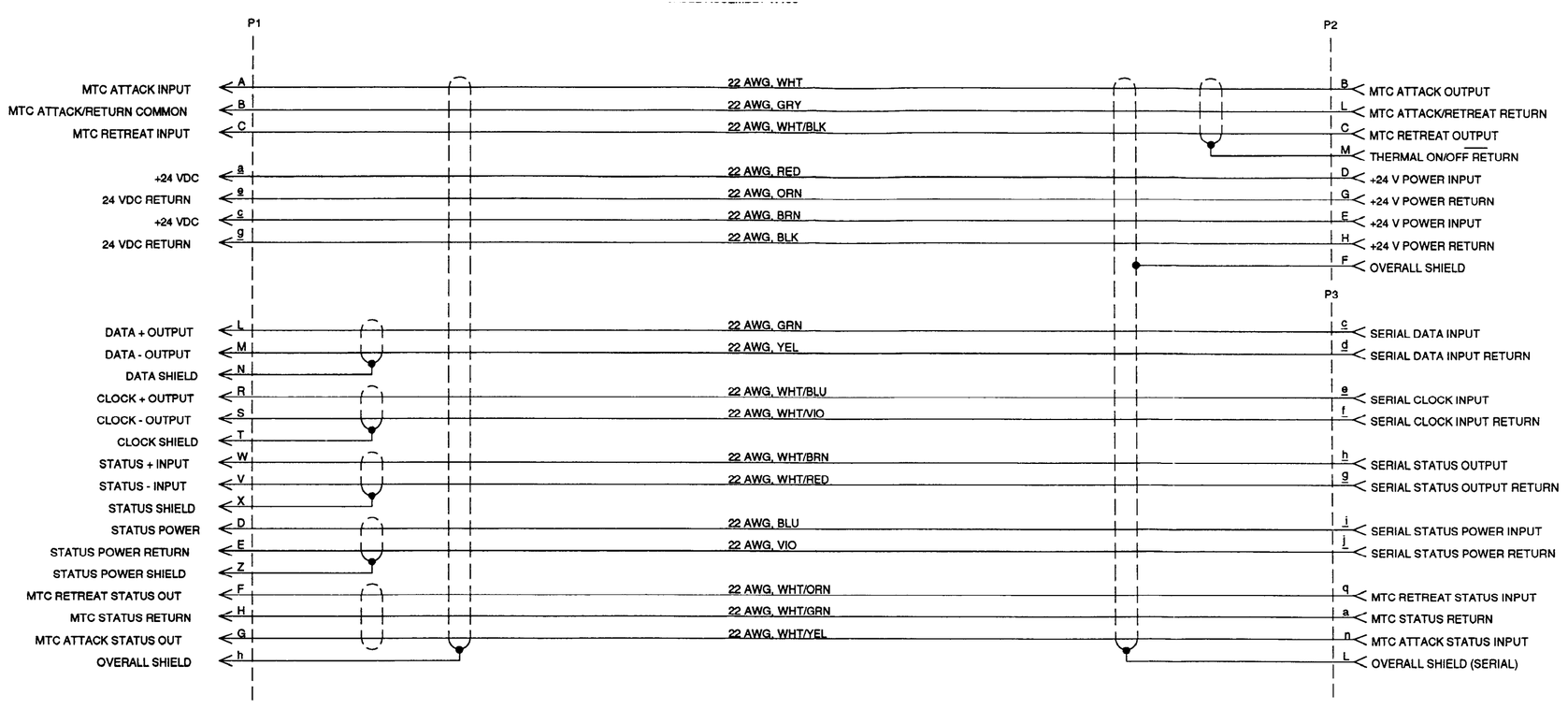

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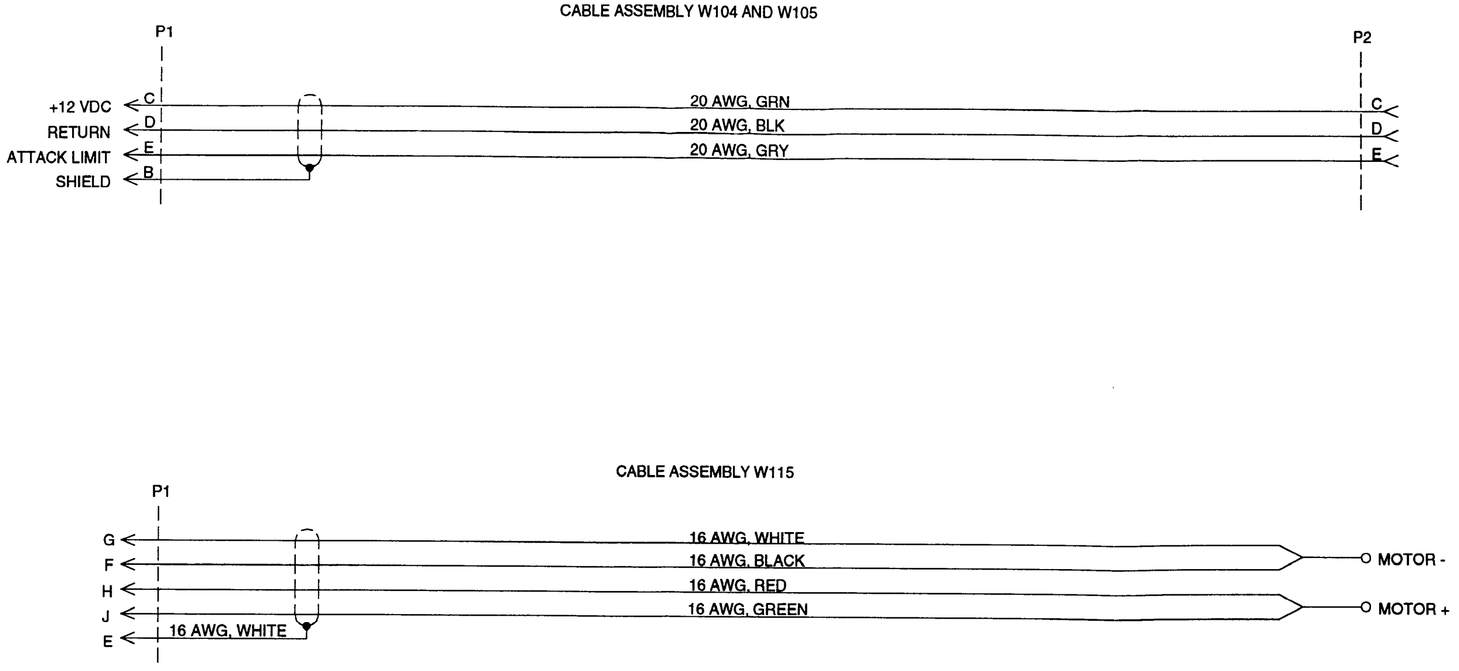

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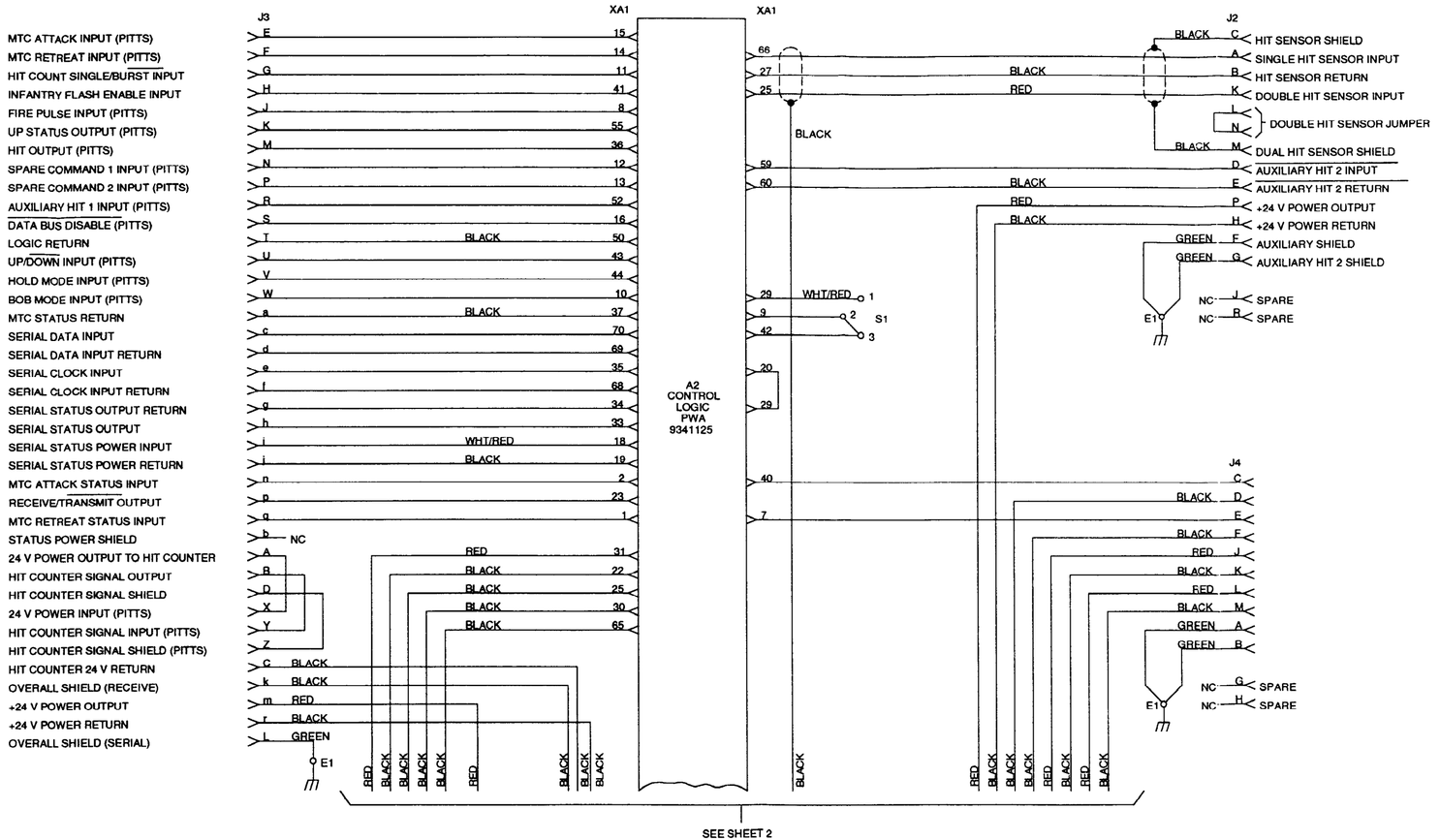

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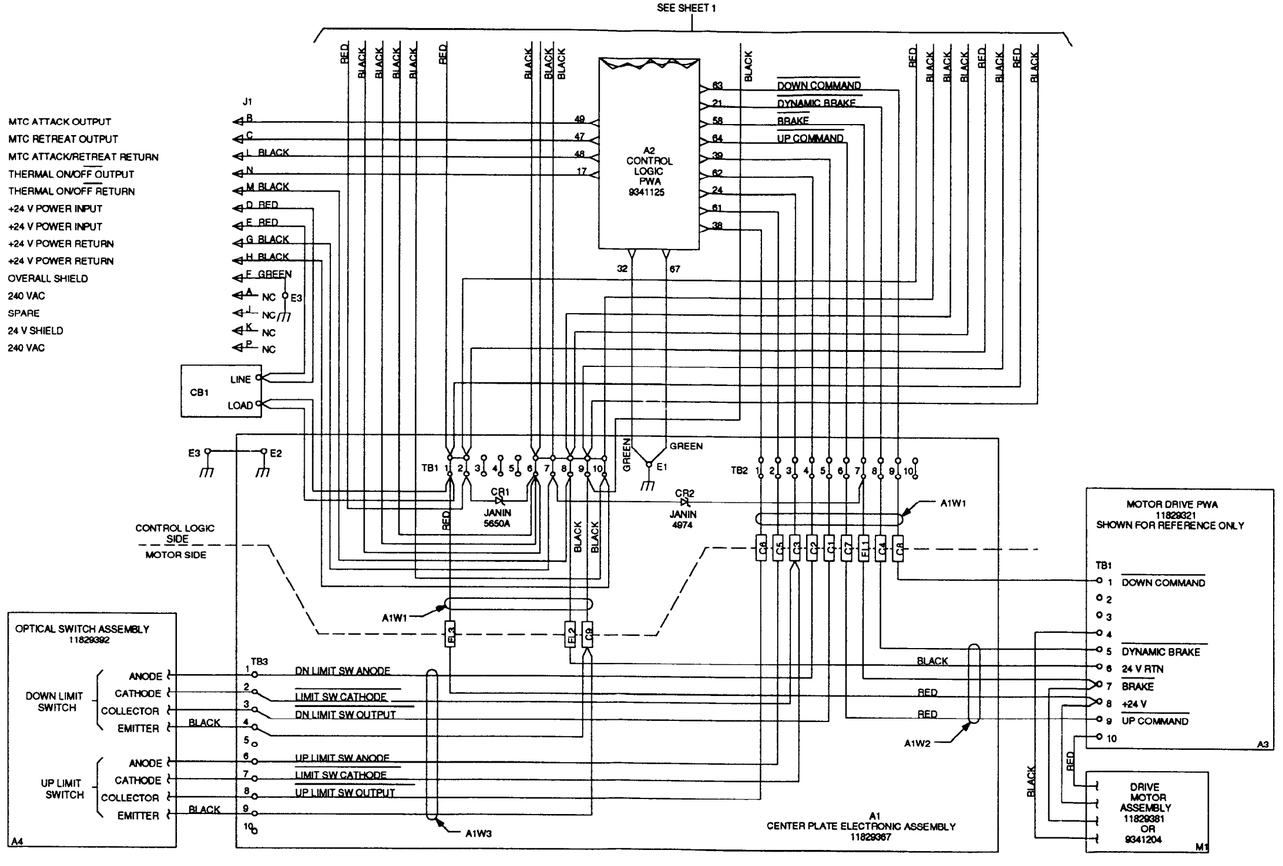
(Sheet 1 of 2).



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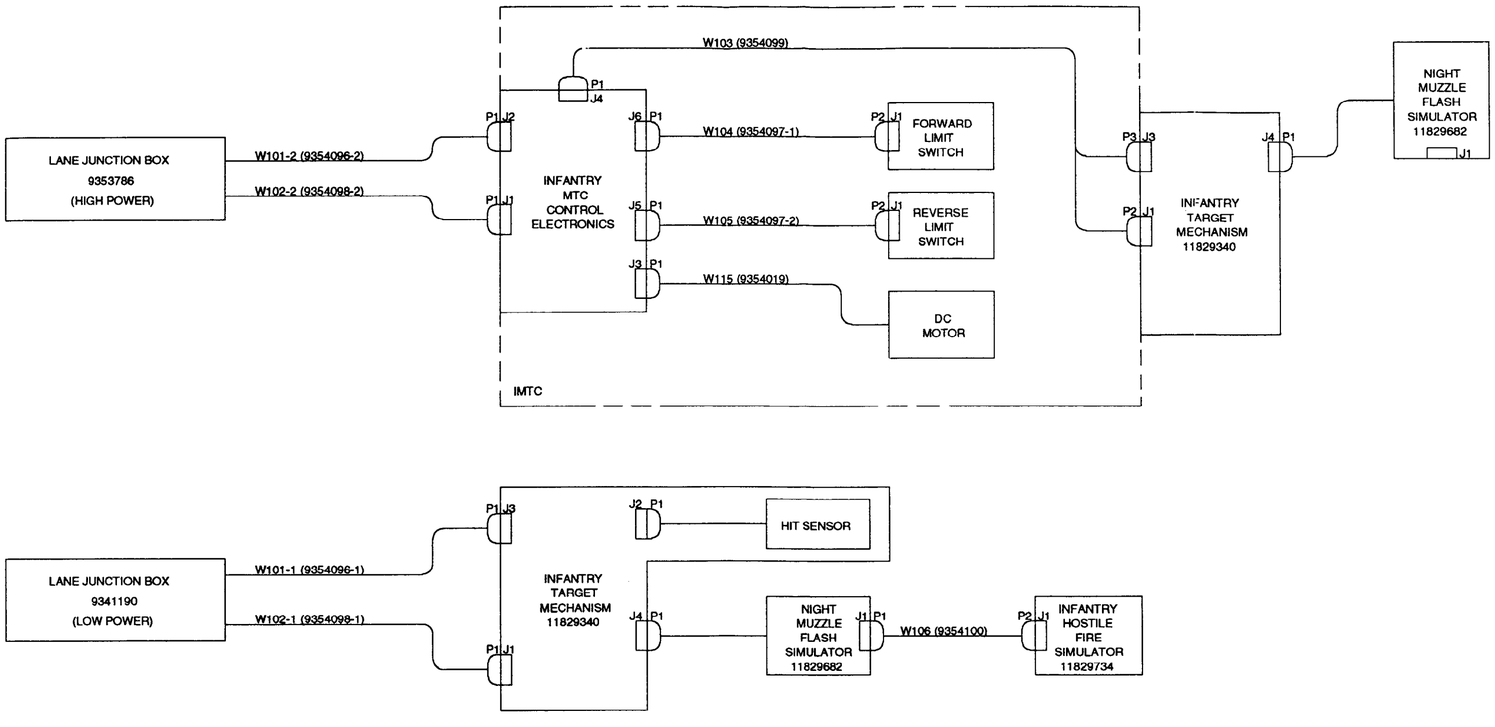
(Sheet 2 of 2).



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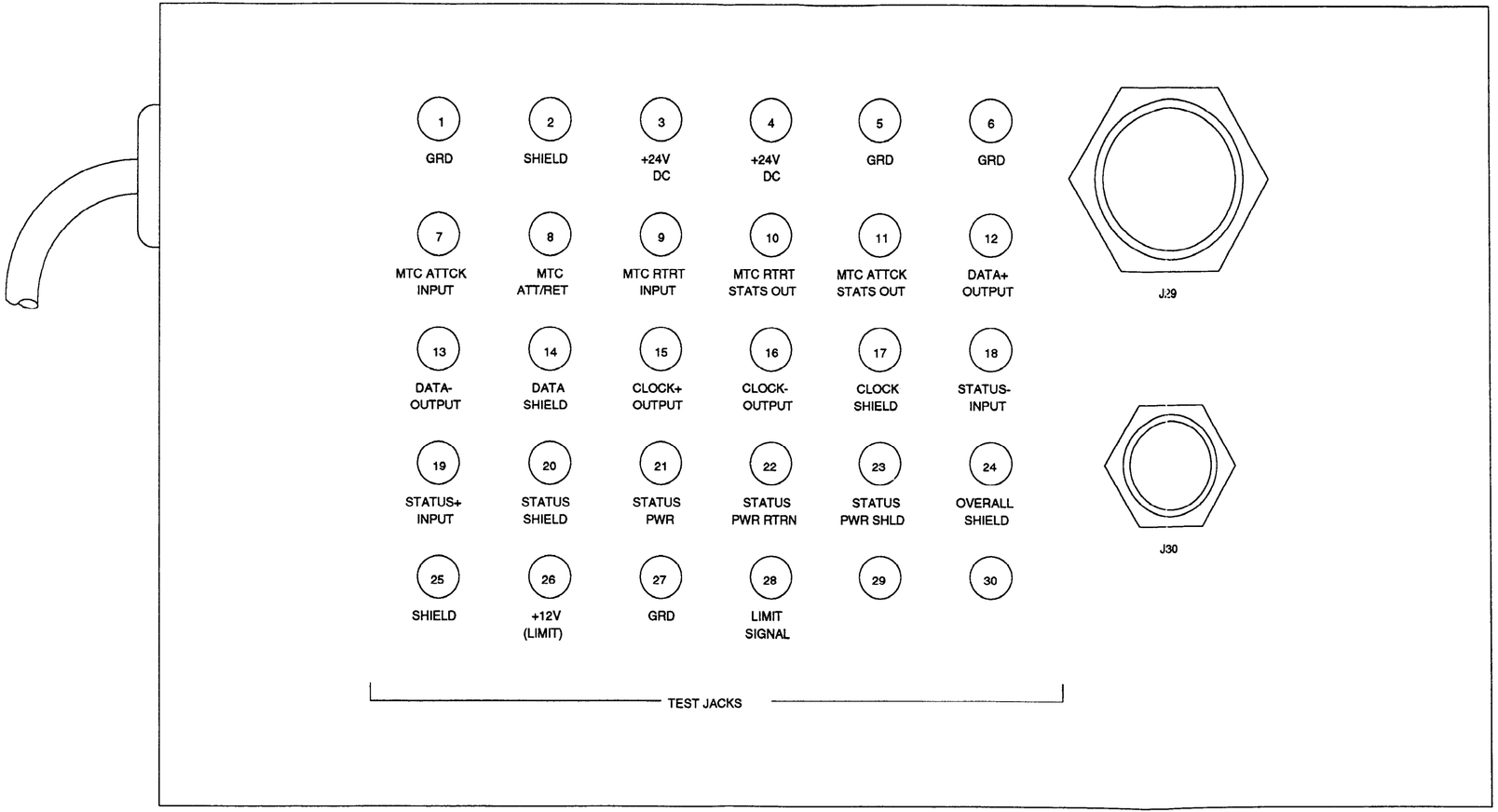

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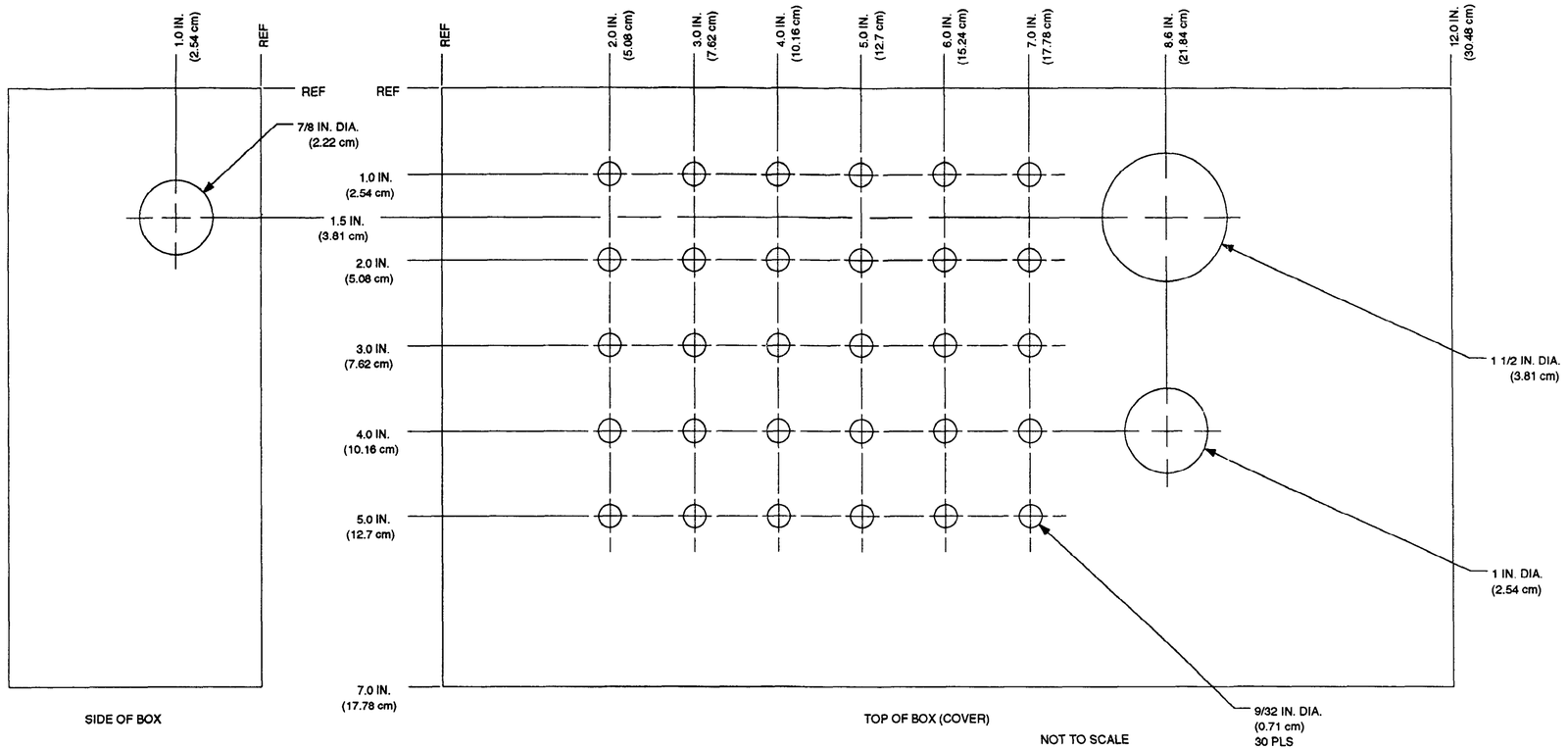

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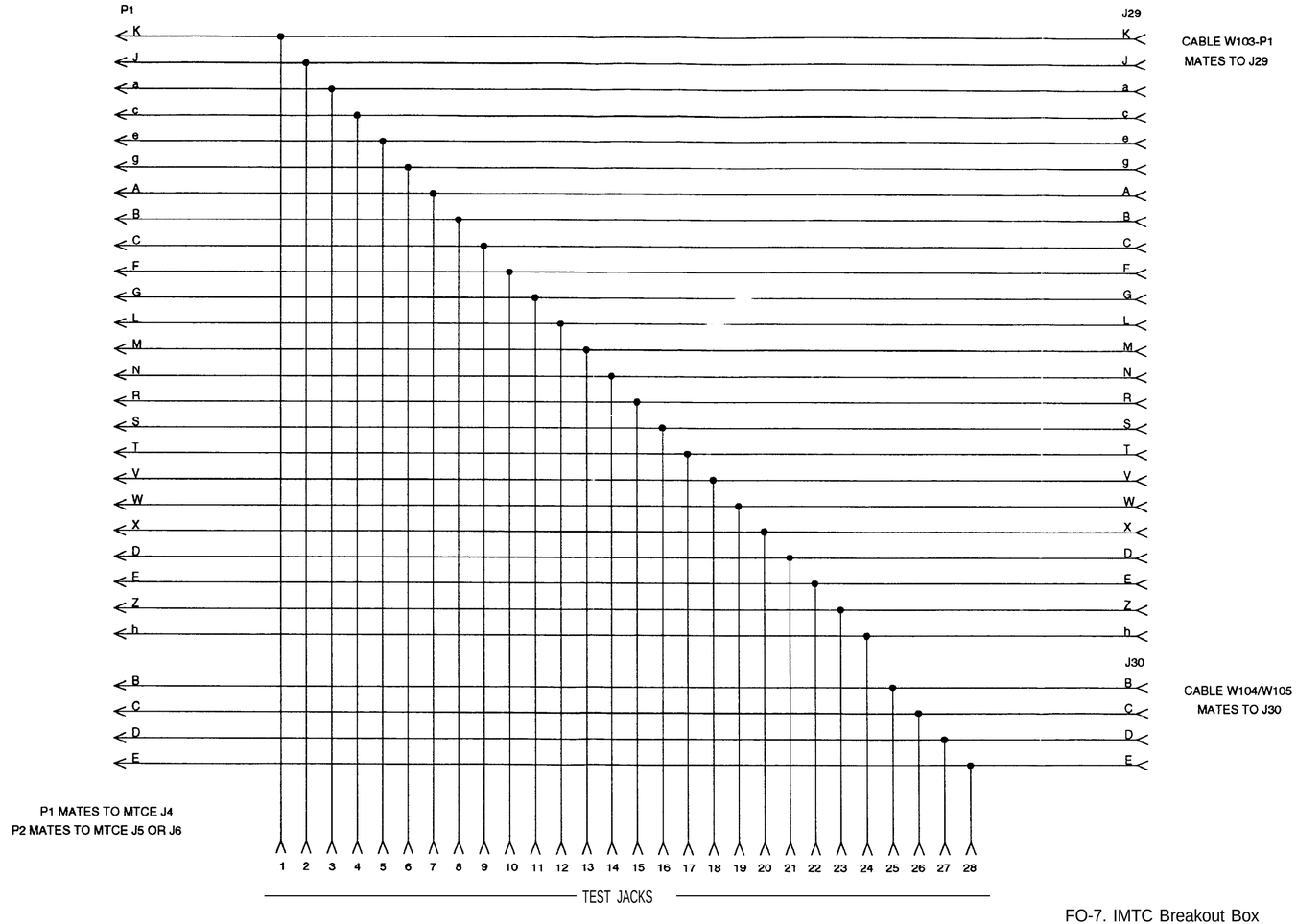

FO-7. IMTC Breakout Box Wiring Schematic.

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