

**DRAFT  
TECHNICAL MANUAL**

**OPERATOR'S AND ORGANIZATIONAL  
MAINTENANCE MANUAL  
INCLUDING  
REPAIR PARTS AND SPECIAL TOOLS LIST  
AND  
DEPOT MAINTENANCE REPAIR PARTS**

**GENERATOR SET, SMOKE, MECHANICAL:  
PULSE JET, M157  
W/120 GAL FOG OIL TANK  
(1040-01-206-0147) (EIC: 5CD)  
W/80 GAL FOG OIL TANK  
(1040-01-293-5496) (EIC: 5CE)**

EQUIPMENT  
DESCRIPTION

OPERATING  
INSTRUCTIONS

OPERATOR PREVENTIVE  
MAINTENANCE CHECKS  
AND SERVICES

OPERATION  
UNDER  
UNUSUAL  
CONDITIONS

OPERATOR  
TROUBLESHOOTING

ORGANIZATIONAL  
PREVENTIVE  
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ORGANIZATIONAL  
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PROCEDURES

MAINTENANCE  
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CHART

OPERATOR AND  
ORGANIZATIONAL  
REPAIR PARTS AND  
SPECIAL TOOLS LIST

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DEPARTMENT OF THE ARMY  
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Operator's and Organizational  
MAINTENANCE MANUAL  
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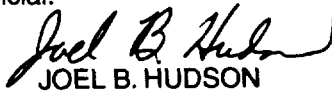
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**Operator's and Organizational  
Maintenance Manual  
Including  
Repair Parts and Special Tools List  
and  
Depot Maintenance Repair Parts**

**GENERATOR SET, SMOKE, MECHANICAL:  
PULSE JET, M157  
W/120 GAL FOG OIL TANK  
(1040-01-206-0147)  
W/80 GAL FOG OIL TANK  
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Operator's and Organizational  
MAINTENANCE MANUAL  
INCLUDING  
REPAIR PARTS AND SPECIAL TOOLS LIST

GENERATOR SET, SMOKE MECHANICAL:  
PULSE JET, M157  
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Change }  
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**Operator's and Organizational  
 MAINTENANCE MANUAL  
 INCLUDING  
 REPAIR PARTS AND SPECIAL TOOLS LIST**

**GENERATOR SET, SMOKE MECHANICAL:  
 PULSE JET, M157  
 (1040-01-206-0147)**

This change adds a procedure to prevent a potential safety hazard.

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Distribution:

To be distributed in accordance with DA Form 12-20 Operator and Unit requirements for Mechanical Smoke Generators.



## WARNINGS

### FIRE HAZARD

System contains combustible fluids. Keep flames, sparks, and ignition sources 100 feet away at all times. No smoking within 100 feet. Have fire extinguisher available at all times. Fires may result in personnel injury and loss of equipment system.

GASOLINE is very flammable. Do not allow open flames, sparks, or heated objects in the area during fueling operations. Always have a CO<sub>2</sub> or dry chemical fire extinguisher (at least 10 lb) available. Avoid spilling fuel.

FUEL SPRAY is very flammable. Do not allow open flames, sparks or heated objects in the area during procedure. Point nozzle assembly away from personnel and smoke generator.

Primer fuel spray is very flammable. Do not allow open flames, sparks or heated objects in the area during procedure.

Cold air entering a hot engine chamber may cause fire flashback and injury to personnel. Purge hot gases from engine before removing engine head from a hot generator. Immediately install spare engine head. Keep away from discharge nozzles for at least 24 hours after operation.

Failure to insert engine head blank may cause fire flashback and injury to personnel.

Fire detection system will only detect large fires at the engine head and will not warn personnel of small fire or flashbacks common to the system.

Do not operate generator with FUEL pressure switch on generator terminal bracket assembly in the ON position. If the fuel return line becomes damaged, fuel will be sprayed over vehicle creating a fire hazard.

### **HEAT HAZARD**

Engine and engine head may become very hot during operation. Do not touch engine or engine head with bare hand. Allow sufficient time for cooling after operation.

Control panel may become very hot when operating at temperatures above 95°F. Do not touch control panel with bare hands. Wear gloves.

### **TOXIC HAZARD**

Prolonged breathing of fog oil smoke may cause pneumonia. Stay out of smoke or wear your protective mask while operating your smoke generator.

### **NOISE HAZARD**

HIGH INTENSITY NOISE is present during operation. Wear authorized hearing protection within 25 feet while smoke generator is operating.

### **SLIPPERY SURFACES**

Surfaces covered with fog oil will become slippery and may cause personnel injury due to falls. Clean up all spillage or leakage of fog oil. Avoid spilling fog oil.

### **COMPRESSED AIR**

Air compressor tank is pressurized to 63 psig. Bleed air from tank before attempting maintenance or disconnecting hoses.

### **STOWAGE HAZARD**

Do not stow any vehicle BII/COEI between fog oil tank and fog oil tank retaining straps.

### **FIRST AID**

For first aid information, refer to FM 21-11.

Technical Manual  
No. 3-1040-279-12&P

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
Washington, DC 22 May 1987

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W/80 GAL FOG OIL TANK  
(1040-01-293-5496) (EIC: 5CE)**

Current as of 4 March 1998

**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 to: Director, Armament and Chemical Acquisition and Logistics Activity, ATTN: AMSTA-AC-NML, Rock Island, IL 61299-7630, FAX - (309) 782-0726, DSN - 793-0726, e-mail - AMSTA-AC-NML@ria-emh2.ARMY.MIL. A reply will be furnished to you.

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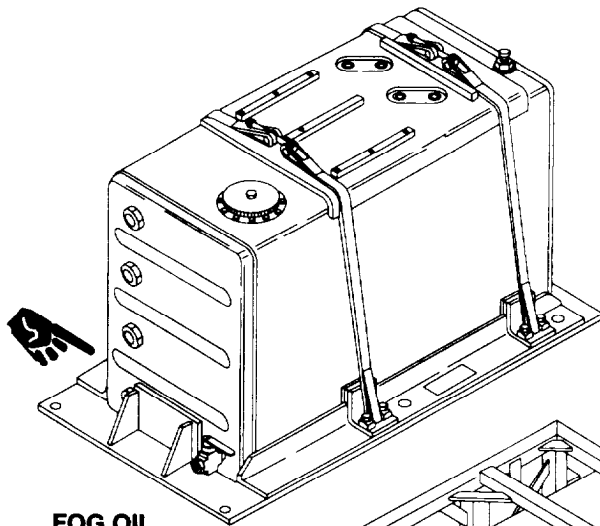
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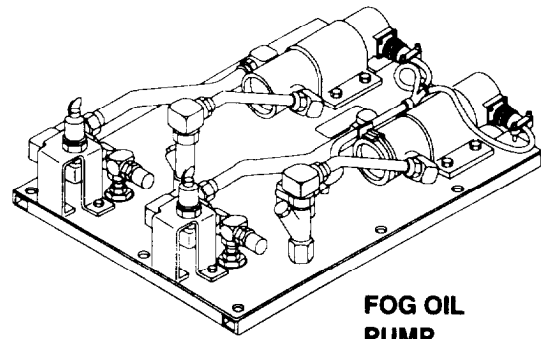
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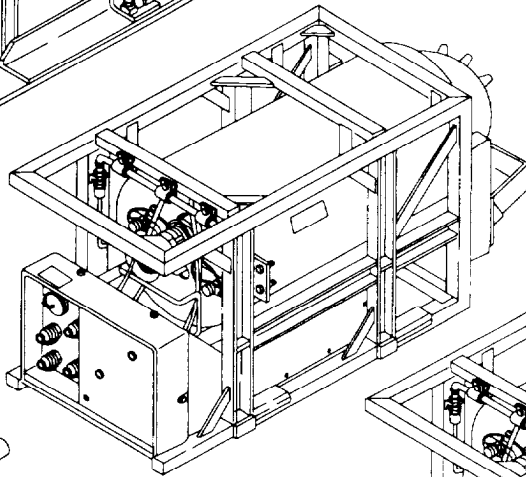
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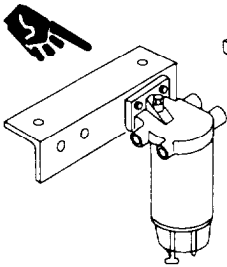
**FOG OIL  
TANK  
ASSEMBLY**



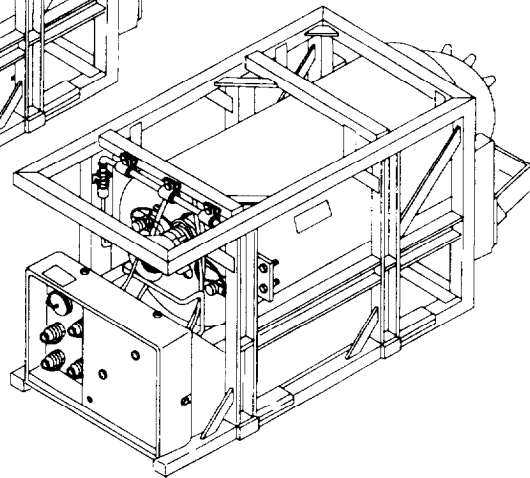
**FOG OIL  
PUMP  
ASSEMBLY**



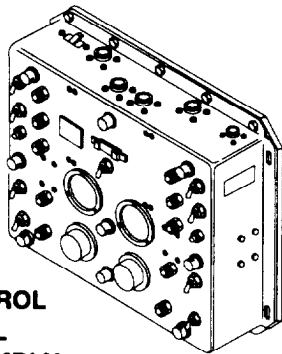
**M54 SMOKE  
GENERATORS**



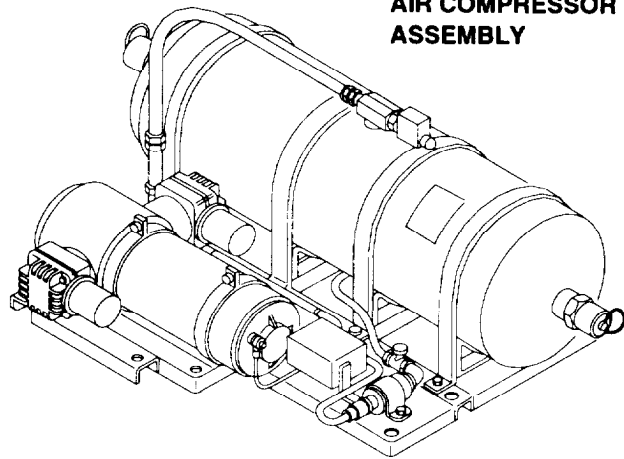
**FUEL FILTER/WATER  
SEPARATOR ASSEMBLY  
(MOTORIZED VERSION SHOWN)**



**AIR COMPRESSOR  
ASSEMBLY**



**CONTROL  
PANEL  
ASSEMBLY**



*External View of Generator Set*



# CHAPTER 1 INTRODUCTION

## Section I. GENERAL INFORMATION

### 1-1 SCOPE.

a. Type of Manual. Operator's and Organizational Maintenance with Repair Parts and Special Tools List.

b. Equipment Name. Generator Set, Smoke, Mechanical: Pulse Jet, M157 hereinafter called the smoke generator set.

c. Purpose of Equipment. Either on the move or in a static position the Smoke Generator Set is capable of producing large area smoke screens to support various tactical situations. The M157 smoke generator set mounted on the M1037/ M1097 HMMWV can be used to mask air fields, troop movements, artillery and other tactical missions. The M1059 mechanized system will be used to support mechanized infantry and armor unit missions.

### 1-2 MAINTENANCE FORMS, 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 (TAMMS), as contained in Maintenance Management Update.

### 1-3 DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE.

Destruction of the smoke generator set to prevent use by the enemy is covered in TM 43-0002-31.

### 1-4 PREPARATION FOR STORAGE OR SHIPMENT.

Refer to page 4-191 for storage or shipping procedures.

### 1-5 NOMENCLATURE CROSS REFERENCE LIST.

<u>COMMON NAME</u>	<u>OFFICIAL NOMENCLATURE</u>
Smoke Generator Set	Generator Set, Smoke, Mechanical: Pulse Jet, M157
Clamp	Coupling, V Retainer
Safety Wire	Wire, Non-electrical
Engine Head Wrench	Wrench, Spanner

#### COMMON NAME

Check Valve  
 Drain Valve  
 Fog Oil Tank Assembly  
  
 Control Panel Assembly  
 Wedge Block  
 Engine Head Blank

#### OFFICIAL NOMENCLATURE

Hot Gas Valve  
 Valve, Control  
 Tank Unit, Liquid Dispenser  
 Control-Indicator  
 Connecting Link  
 Tester, Ignition System, Engine, Pulse Jet

### 1-6 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your smoke generator set needs improvement, let us know. Send us an 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 SF 368 (Product Quality Deficiency Report). Mail it to: Commander, U.S. Army Armament Research, Development and Engineering Center, ATTN: AMSTA-AR-QAW-A (R)/Customer Feedback Center, Rock Island, IL 61299-7300.

#### 1-6.1 CORROSION PREVENTION AND CONTROL (CPC).

Corrosion Prevention and Control (CPC) of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

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.

If a corrosion problem is identified, it can be reported using Standard Form 368 (Product Quality Deficiency Report). Use of key words such as "corrosion," "rust," "deterioration," or "cracking" will ensure that the information is identified as a CPC problem. The form should be submitted to: Commander, U.S. Army Armament Research, Development and Engineering Center, ATTN: AMSTA-AR-QAW-A (R)/Customer Feedback Center, Rock Island, IL 61299-7300.

## Section II. EQUIPMENT DESCRIPTION

### 1-7 EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

#### a. Characteristics.

(1) Uses a pulse jet engine to vaporize and release fog oil into the air where it cools to form an oil vapor cloud.

(2) Easy to start and operate.

(3) Engine is started and operated from inside vehicle.

#### b. Capabilities and Features.

(1) Can be used on the move or in static locations.

(2) It can produce large area smoke screens.

(3) Able to operate in up to 40 mile-per-hour winds.

(4) System can operate at any angle up to 45 degrees.

### 1-8 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

Ⓐ **Control Panel Assembly.** Provides separate switches, controls, and indicators for operating and monitoring each smoke generator assembly, the fog oil pump, and the air compressor.

Ⓑ **M54 Smoke Generator Assembly.**

Gasoline-operated, pulse jet engine with an equipment container and cover assembly. Cover assembly contains the fuel pump and also serves as a system connecting point for cable and hoses.

Ⓒ **Fog Oil Tank.** Two sizes are provided A

120-gallon tank for the M1059 mechanized system and an 80-gallon tank for the M1037/M1097 HMMWV. Sight glasses on each tank allow the fluid level to be checked quickly and easily. The fog oil tank also serves as the mount for the fog oil pump assembly.

Ⓓ **Air Compressor Assembly.** Uses a

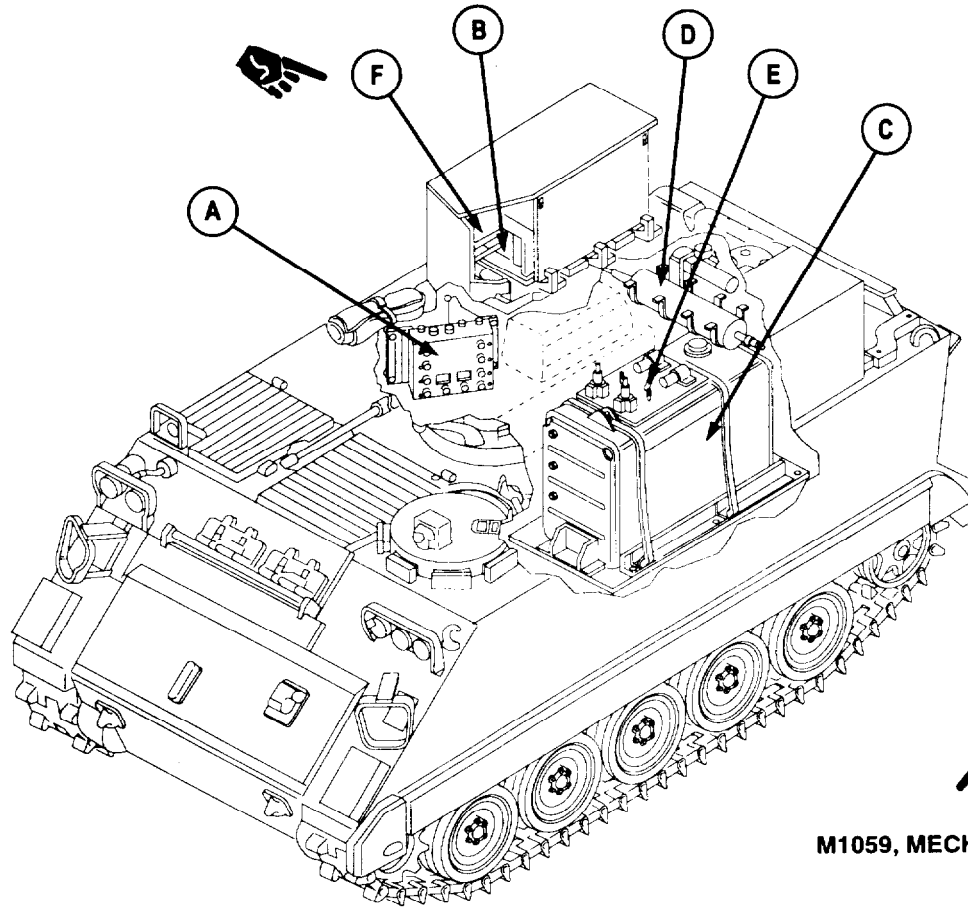
pressure tank to store the compressed air needed for starting and purging the pulse jet engine. A pressure switch mounted on the air compressor assembly monitors the pressure in the tank. When the required pressure is reached, the switch opens and removes power from the air compressor.

Ⓔ **Fog Oil Pump Assembly.** Contains two dc

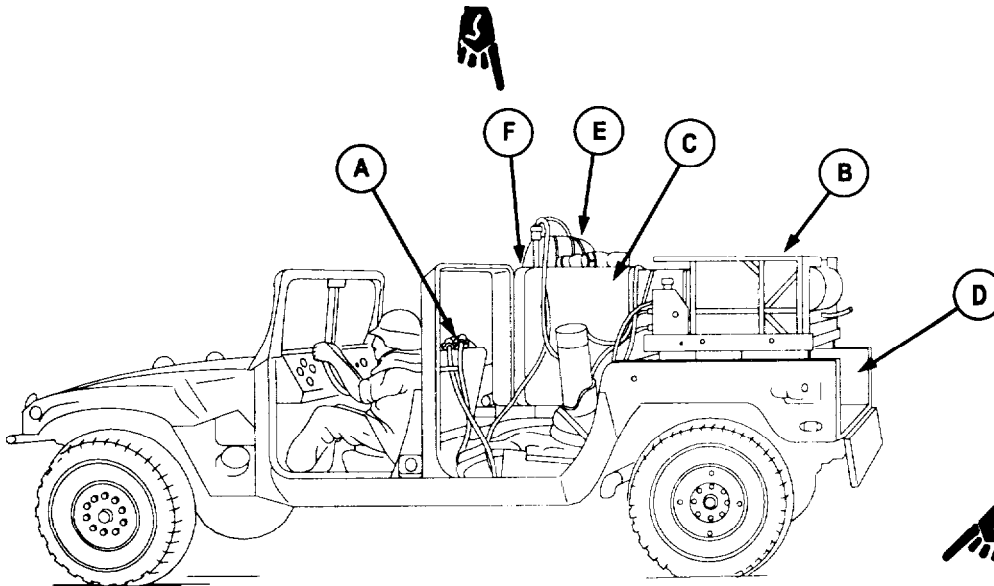
in-line fog oil pumps. Fog oil is drawn from the fog oil tank and flows through two strainers. Two pressure relief valves protect against excessive fog oil pressure by returning excess fog oil to the fog oil tank before it flows to smoke generator.

Ⓕ **Fuel Filter/Water Separator Assembly.** A

fuel filter/water separator assembly mounted on the fog oil tank or armor shield prevents the flow of contaminated fuel to the M54 smoke generator.



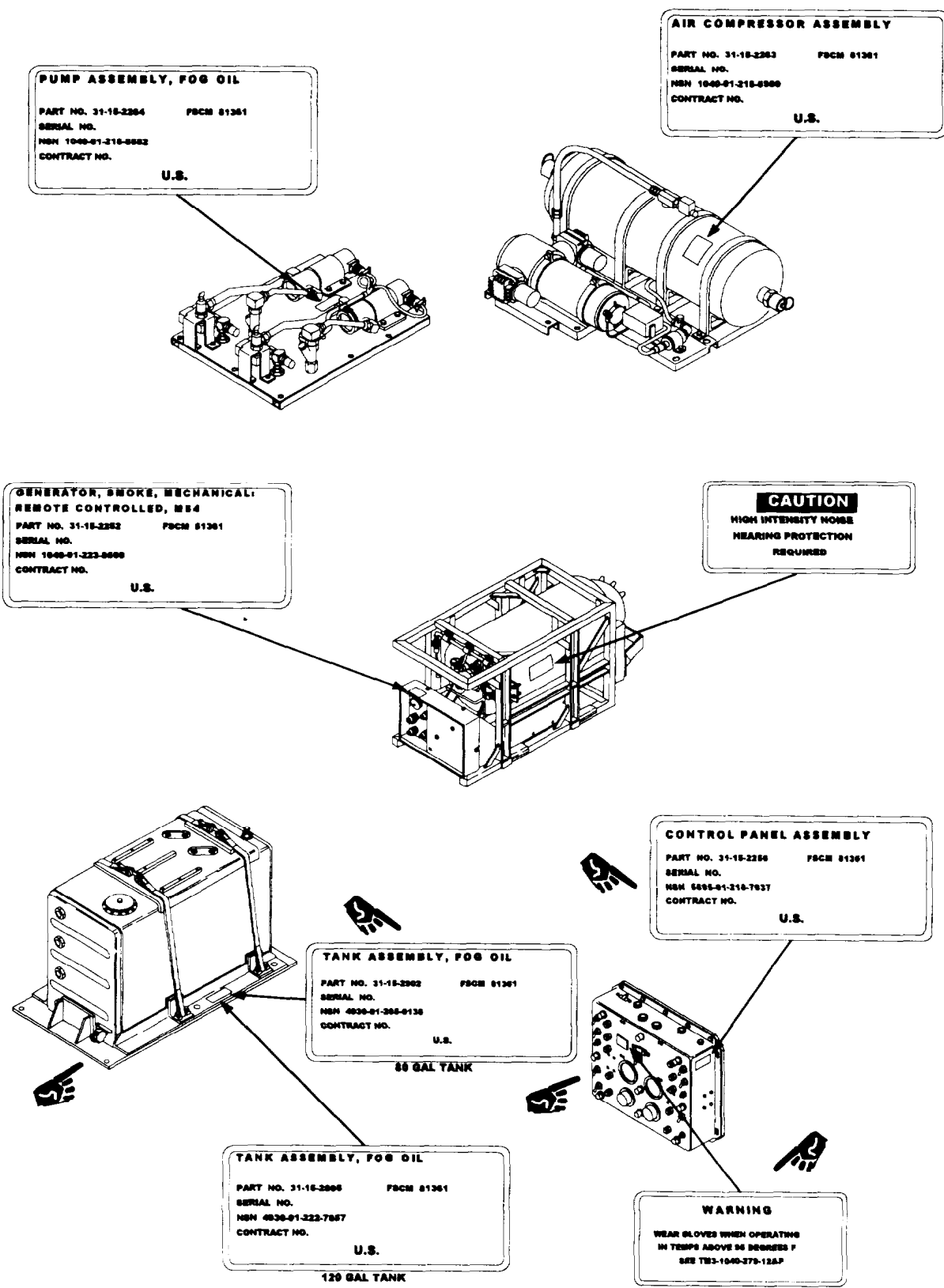
**M1059, MECHANIZED**



**M1037/M1097/M157, MOTORIZED**

**Major Components**

1-9 IDENTIFICATION AND INSTRUCTION PLATES.



**1-10 EQUIPMENT DATA.**

	<u>Weight</u>	<u>Length</u>	<u>Width</u>	<u>Height</u>
Smoke Generator, M54 .....	175 lb	40.5 in.	16.5 in.	20 in.
Control Panel Assembly .....	20.5 lb	20.5 in.	4.50 in.	17 in.
Fog Oil Pump Assembly .....	38.5 lb	16.75 in.	21.13 in.	7 in.
Air Compressor Assembly .....	80 lb	20.5 in.	33.5 in.	10.75 in.
120 Gallon Fog Oil Tank Assembly .....	207 lb	58.25 in.	30.0 in.	32.06 in.
80 Gallon Fog Oil Tank Assembly .....	182 lb	58.25 in.	30.0 in.	26.63 in.
Fuel Filter/Water Separator Assembly .....	4.0 lb	12.0 in.	3.25 in.	8.8 in.

Engine and Accessories

Type ..... Pulse jet, 50-60 explosions per second  
 Igniter Size ..... 18mm

Pressure Settings

Pressure Switch Bracket Assembly

Fuel pressure switch .....2.5 psig  
 Fog oil pressure switch .....2.5 psig  
 Air pressure switch .....53 psig

Air Compressor Assembly

Pressure switch ..... 63 ±5 psig

Fuel Pump ..... 100 ±5 psig

Fog Oil Pump Assembly

Pressure Relief Valve ..... 25 ±5 psig for operating temperatures of 90°F and above;  
 55 ±5 psig for operating temperatures below 90°F

Classification and Ratings

Fog Oil Consumption (Nominal) ..... 40 gal/h

Fog Oil Flow Variable ..... .30 gal/h to 55 gal/h

Fuel Consumption (Nominal) ..... .2.75 gal/h

Angle of Inclination in any Direction . . . . .45 degrees (maximum)

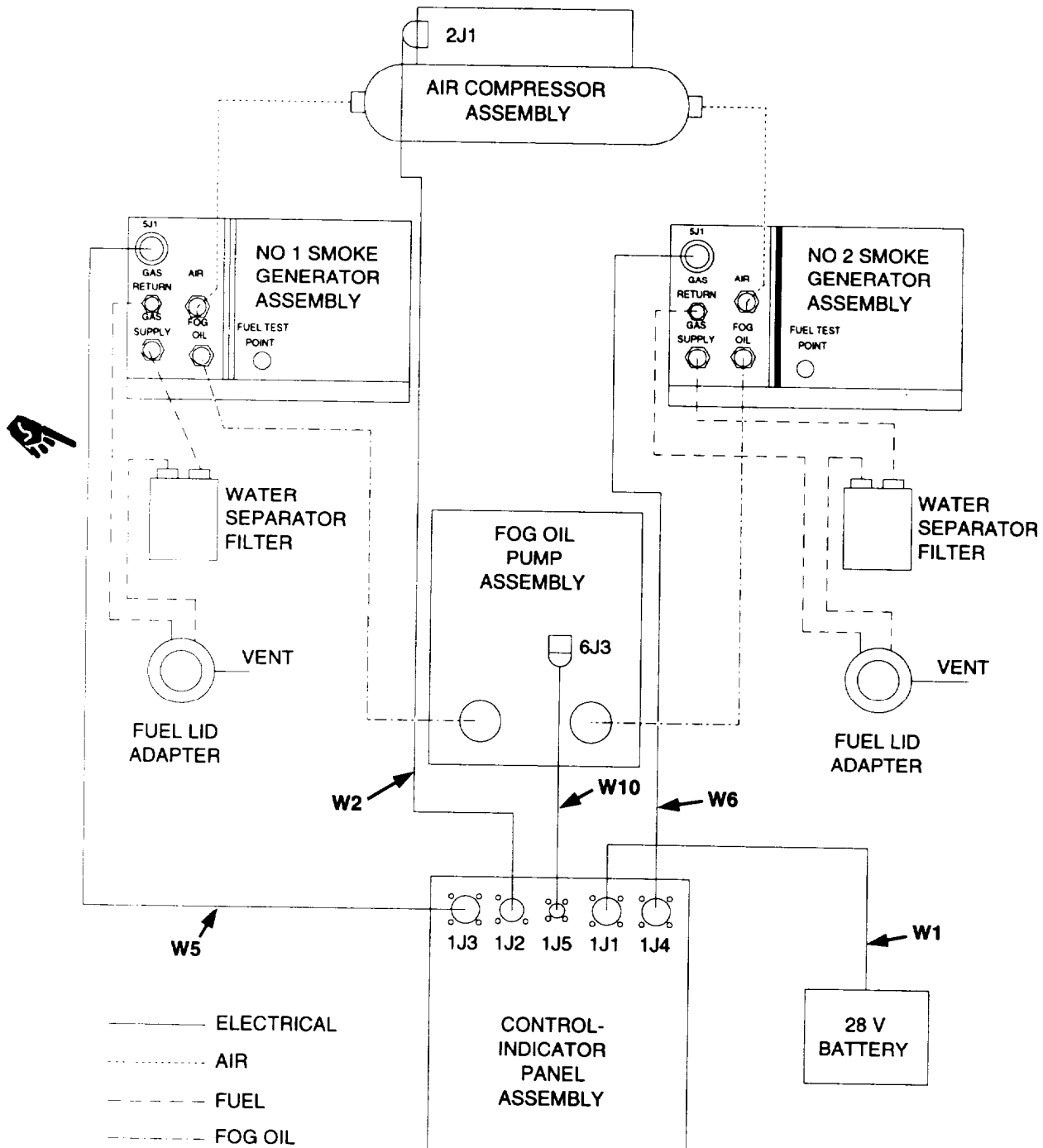
Temperature Range ..... -25 degrees F to 140 degrees F

Fog Oil SFG-2 Temperature Range.....32 degrees F to 140 degrees F

Fog Oil Diluted with Kerosene..... -25 degrees F to 32 degrees F

1-10 EQUIPMENT DATA. (CONT)

INTERCONNECTING DIAGRAM



Connect remaining cable and hose assemblies according to the interconnecting diagram. Route cable and hoses behind retaining straps of fog oil tank where possible.

**NOTE**

This diagram shows the M157 Smoke Generator Set with attached fuel can lid assemblies and fuel filter water separator. Your system may not have these installed.

## Section III. TECHNICAL PRINCIPLES OF OPERATION

**1-11 PULSE JET ENGINE.**

Initially a mixture of fuel and air is forced into the combustion chamber of the pulse jet engine by holding the ENGINE switch at the control panel assembly in the START position. A spark at the igniter causes the fuel/air mixture to explode. The positive pressure developed as this explosion occurs closes the engine valve and forces the burning gases through the engine tube. Reflection of the shock wave off the engine valve develops a negative pressure on the combustion chamber side of the engine valve. The negative pressure permits external air under atmospheric pressure to enter the combustion chamber. As the air passes over the nozzle assembly, fuel is forced into the air stream. Once again, the fuel/air mixture is forced through the engine valve and into the combustion chamber, where the mixture is exploded by the heat of the pulse jet engine.

The igniter is required for only the first explosion. After the ENGINE indicator lights, the ENGINE switch on the control panel assembly can be released to RUN and successive charges of fuel/air mixture will be exploded by contact with the hot gases and metal in the combustion chamber. The frequency of explosion in the pulse jet engine is approximately 60 times per second.

**1-12 FUEL AND AIR SYSTEMS.**

The fuel pump assemblies pump fuel from the 5-gallon (18.2-litre) fuel tanks to the nozzle assemblies mounted on the pulse jet engines head of each smoke generator assembly. At the same time, the air compressor assembly provides the start air to the same nozzle assemblies. The mixture of fuel and air pass through the nozzle assemblies and is injected into the pulse jet engines where the mixture is exploded.

**1-13 FOG OIL SYSTEM.**

The fog oil pump assembly draws fog oil from a storage tank and pumps it into the pulse jet engines once they are in operation. Vaporization occurs as the fog oil is mixed with the engine exhaust gases produced when the fuel/air mixture is exploded. The vaporized fog oil is forced out into the atmosphere where it cools and condenses into very small liquid droplets which make up the smoke.

The FOG OIL FLOW control knob, on the control panel, varies the flow of fog oil and operating temperature of the smoke generator. As the fog oil flow is increased, the operating temperature decreases. The nominal operating range is between 650° -950°F (343° -510°C), and can be read from the SMOKE TEMP indicator on the control panel.



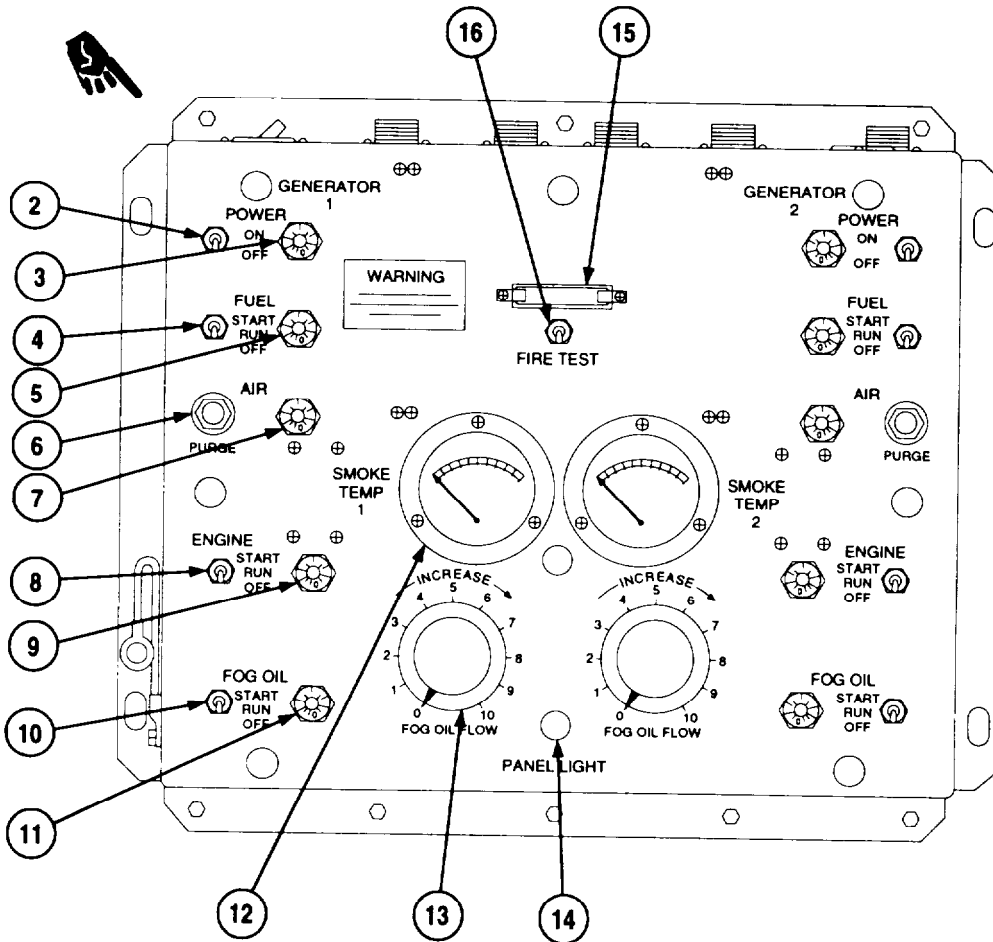
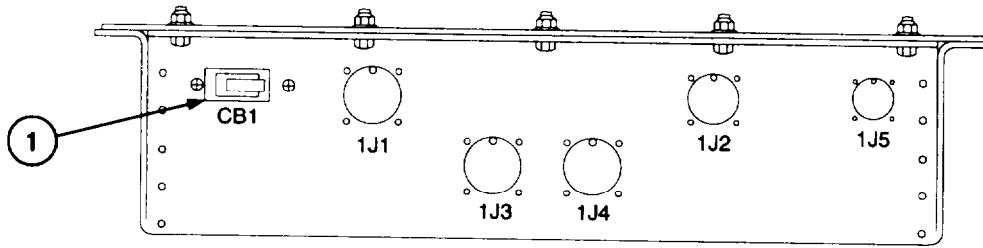


## CHAPTER 2 OPERATING INSTRUCTIONS

### Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

#### 2-1 FOG OIL TANK.

KEY	CONTROL OR INDICATOR	FUNCTION
1	Sight Glasses	Used to check fog oil level in fog oil tank.
2	Ball Valve and Drain Hose Assembly	Used to drain fog oil and water from fog oil tank.

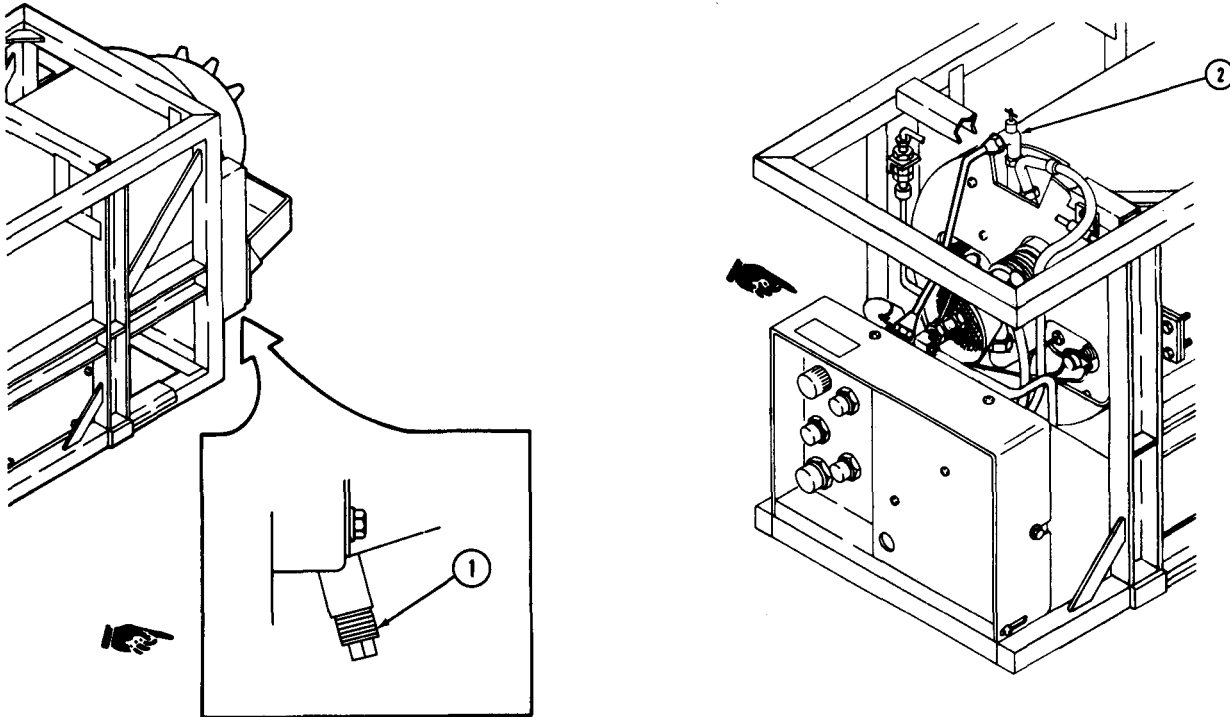


## 2-2 CONTROL PANEL ASSEMBLY

KEY	CONTROL OR INDICATOR	FUNCTION
1	Circuit Breaker (CB1)	Disconnects power source from system when an electrical malfunction occurs.
2	POWER On/Off Switch	Supplies power to the control circuits for the corresponding smoke generator.
3	POWER Indicator	Indicates that power is supplied to the system control circuits. Press to test function checks the lamp in the indicator.
4	FUEL Switch	Supplies power to the corresponding fuel pump to obtain operating pressure in the START position and the continuous operation in the RUN position.
5	FUEL Indicator	Indicates sufficient fuel pressure is available for operating the system. The press to test function checks the lamp in the indicator.
6	AIR PURGE Switch	Used to purge pulse jet engine.
7	AIR Indicator	Indicates when sufficient air pressure is present to start or purge the pulse jet engines. Press to test function checks the lamp in the indicator.
8	ENGINE Switch	Provides ignition, starting air, and fuel to the corresponding pulse jet engine in the START position then fuel for continuous operation in the RUN position.
9	ENGINE Indicator	Indicates when the pulse jet engine is capable of operating on its own. Press to test function checks the lamp in the indicator.
10	FOG OIL Switch	Supplies power to the corresponding fog oil pump to obtain operating pressure in START position and continuous operation in the RUN position.
11	FOG OIL Indicator	Indicates when sufficient fog oil pressure is obtained for operation. Press to test function checks the lamp in the indicator.
12	SMOKE TEMP Indicator	Monitors the temperature of the corresponding pulse jet engine.
13	FOG OIL FLOW Knob	Regulates the flow of fog oil supplied to the corresponding pulse jet engine.
14	PANEL LIGHT Control Knob	Varies the brightness of the panel lights.
15	Fire Warning Indicator	Indicates the presence of a fire in one or both of the smoke generators.
16	FIRE TEST Switch	Checks proper operation of the fire detection system. Both generators must be electrically connected for system to operate.

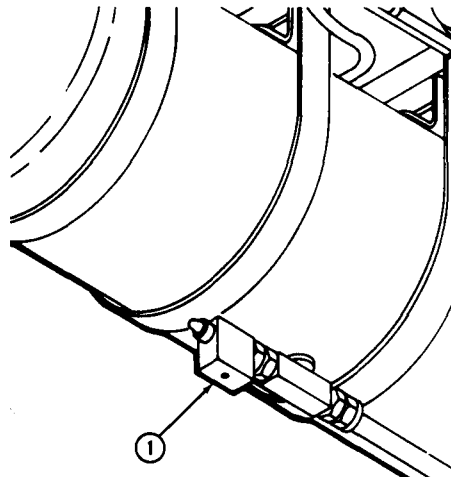
2-3 SMOKE GENERATOR.

KEY	CONTROL OR INDICATOR	FUNCTION
1	Pipe plug	Used to drain fog oil or water from drip pan assembly.
2	Check valve	Allows purge air to enter smoke generator.



2-4 AIR COMPRESSOR ASSEMBLY.

KEY	CONTROL OR INDICATOR	FUNCTION
1	Control Valve	Used to release condensation and compressed air from pressure tank.



## Section II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

### 2-5 GENERAL.

#### a. Introduction.

Your Preventive Maintenance Checks and Services table lists the inspection and care of your equipment required to keep it in good operating condition. The interval column of your PMCS table tells you when to do a certain check or service. The procedures column of the table tells you how to do the required task. Carefully follow these instructions. If your equipment does not perform as required, refer to Chapter 3 Troubleshooting Procedures.

- (1) Before You Operate. Always keep in mind the **CAUTIONS** and **WARNINGS**. Perform your **BEFORE** PMCS.
- (2) While You Operate. Always keep in mind the **CAUTIONS** and **WARNINGS**. Perform your **DURING** PMCS.
- (3) After You Operate. Be sure to perform your **AFTER** PMCS.
- (4) If Your Equipment Fails to Operate. If your equipment does not perform as required, refer to Chapter 3 under Troubleshooting for possible problems. Report any malfunctions or failures on DA Form 2404. Refer to DA PAM 738-750.

### 2-6 PMCS PROCEDURES.

- (1) Purpose of PMCS. Your Preventive Maintenance Checks and Services list the inspections and care of your equipment required to keep it in good operating condition.
- (2) Item No. Column. Checks and services are numbered in chronological order regardless of interval. This column is used as a source of item number for the "TM Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet in recording results of PMCS.
- (3) Interval Column. This column tells you when to do a certain check or service: BEFORE, DURING, or AFTER operation. When more than one check and/or service type is required, then you should do the check or service at each of those intervals.
- (4) Location. Item to Check/Service Column. This column lists the common name of the item to be inspected such as "Drive Belts". When appropriate, the location of the item within the equipment/end item shall be provided, underlined, and appear above the item name.
- (5) Procedures Column. This column tells you how to do the required checks or services. Carefully follow these instructions. If you do not have the tools, or if the procedures tell you to, have unit maintenance do the work.
- (6) Not Fully Mission Capable If: Column. This column tells you when and why your equipment cannot be used.

#### NOTE

The term mission capable refers to equipment that is on hand and is able to perform its combat mission. (See DA PAM 738-750).

Within designated interval, these checks are to be performed in the order listed.

### 2-7 SPECIAL INSTRUCTIONS.

a. Do not operate the M157 Smoke Generator Set if Class III Fog Oil leaks or Class II and III fuel leaks are present.

Class I. Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

2-7 SPECIAL INSTRUCTIONS. (cont)

**Class II.** Leakage of fluid great enough to form drops, but not enough to cause drops to drip from item being inspected.

**Class III.** Leakage great enough to form drops that fall from the item being inspected.

**b. Perform Before PMCS if:**

- (1) You are the assigned operator and have not operated the equipment since the last mission.
- (2) You are operating the equipment for the first time.

**c. Mission Capability.** The M157 Smoke Generator Set will be considered mission capable if at least one M54 Smoke Generator can produce smoke obscurant in the static or mobile mode of operation.

**Table 2-1. Operator Preventive Maintenance Checks and Services**

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/ Service		
1	BEFORE	On-Board Spares and Tools	Check for missing on-board spares and tools (App C). Replace missing spares or tools.	Spares or tools not available. (Only two spare indicator lamps per box need be available.)
2	BEFORE, AFTER	Fire Extinguisher	Check both fire extinguishers for availability, a full charge, and unbroken seals.	Fire extinguisher is missing, pressure gage indicates in discharge area, or seal is broken.
3	BEFORE, AFTER	Fuel Cans	<p style="text-align: center;"><b>CAUTION</b></p> <p>If new fuel can lid assemblies are secured to the new plastic fuel cans, leave attached. This will prevent damage to the plastic threads.</p> <p>If fuel cans have to be removed from the vehicle, remove hose lines at the lid assembly flare fitting ends only. Tape over hose flare fittings.</p> <p>a. Check that all hoses (1) (supply, return, and vent) are connected and tight to flare fittings (2) of both fuel can lid assemblies (3). Check that fuel can lid assemblies are connected to fuel cans.</p>	Class II or III fuel leaks are found.

Table 2-1. Operator Preventive Maintenance Checks and Services (cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
3 (cont)	BEFORE, AFTER	Fuel Cans (cont)	<p>b. Remove refueling cap (4) on both 5-gallon fuel cans (5) and check for water or dirt in fuel. Clean fuel can and fuel can lid assembly strainer screen, if contaminated.</p>	
	BEFORE, AFTER		<p>c. Fill fuel cans to bottom of fill hole in fuel can lid assemblies with clean fuel and secure refueling caps (4).</p>	
4	BEFORE, AFTER	M54 Smoke Generator	<p>a. Check for signs of leaks in all hoses, connectors, and lines.</p> <p>Check that hoses are not torn, cracked, twisted, or collapsed.</p>	<p>Class III fog oil leaks are present, or Class II and III fuel leaks are present.</p> <p>Hoses are torn, cracked, or collapsed.</p>
	BEFORE, AFTER		<p>b. Check that cable assemblies are correctly connected and tight.</p> <p>Check cable insulation for dry rot, cuts, or wear to bare wire.</p>	<p>Cable connectors are broken.</p> <p>Cable insulated is dry rotted, cut, or worn to bare wire.</p>

2-7 SPECIAL INSTRUCTIONS. (cont)

Table 2-1. Operator Preventive Maintenance Checks and Services (cont)

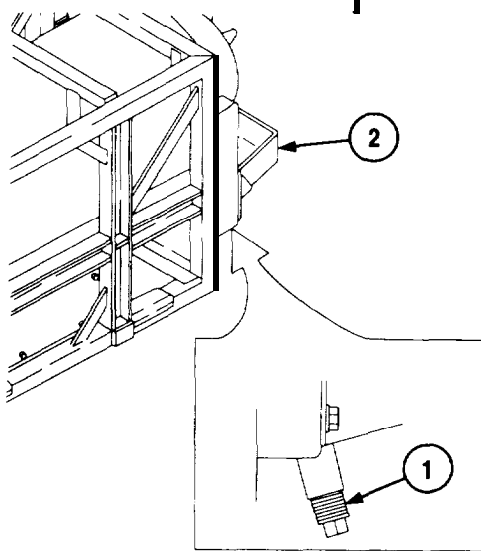
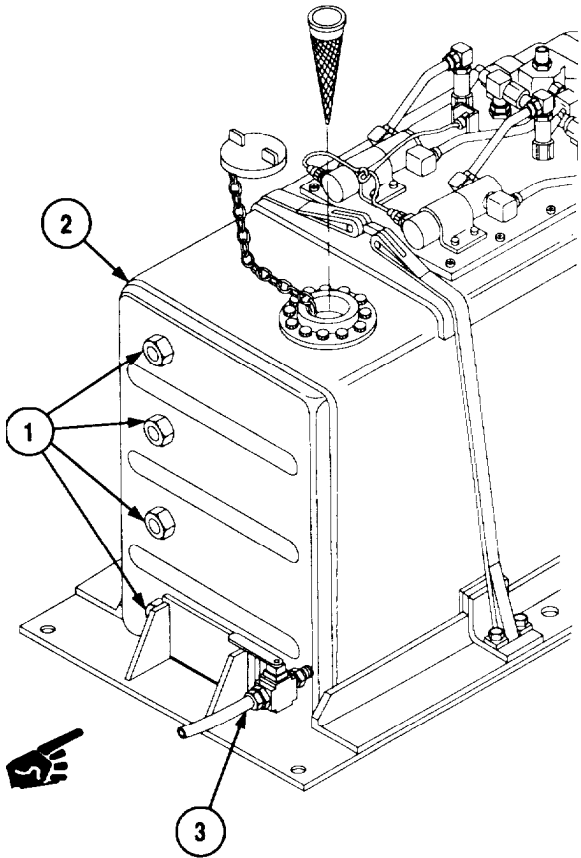
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
4 (cont)	BEFORE, AFTER	M54 Smoke Generator (cont)	<p>c. Remove pipe plug (1) and drain waste oil and water from drip pan (2) into a suitable container. Reinstall pipe plug.</p> <p><b>NOTE</b> Dispose of waste oil and water IAW local Unit SOP.</p> 	
5	WEEKLY	Fog Oil Tank Assembly	<p>d. Remove engine head assembly (P. 3-8) and inspect/repair (P.3-10).</p> <p><b>WARNING</b> Do not stow any vehicle Bll, COEI, etc. between fog oil tank and fog oil tank retaining straps.</p>	
	BEFORE, AFTER		<p>a. Using indicator sights (1) on fog oil tank (2), check fog oil level and replenish if not full.</p>	
	BEFORE, AFTER		<p>b. Check for leaks.</p>	Class III fog oil leaks are present.
	WEEKLY		<p>c. Check fill hole strainer element for any debris and clean if required.</p>	



Table 2-1. Operator Preventive Maintenance Checks and Services (cont)

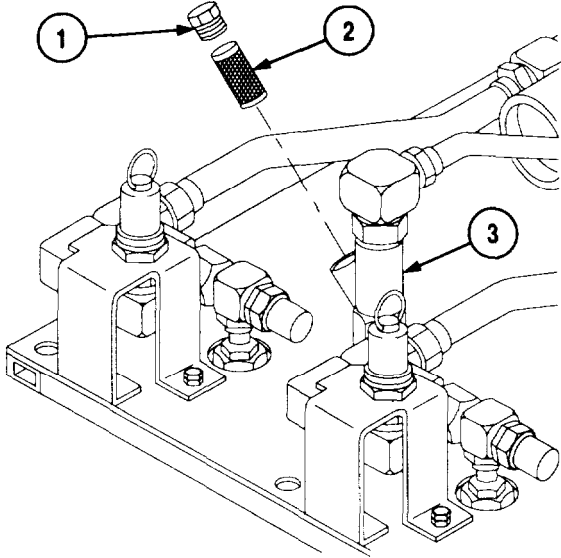
Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
5 (cont)		Fog Oil Tank Assembly (cont)	 <p><b>NOTE</b> If fog oil flows out, immediately close drain valve. If water or other contaminants flow out, keep ball valve open until only fog oil flows out.</p> <p>d. Open ball valve (3) and allow fog oil to flow out of the drain hose into a suitable container.</p> <p><b>NOTE</b> Dispose of waste fog oil and water IAW local Unit SOP.</p>	
6	BEFORE, AFTER	Fog Oil Pump Assembly	a. Check for signs of leaks in all hoses, connectors, and lines.	Class III Fog Oil leaks are present or Class II and III fuel leaks are present.

2-7 SPECIAL INSTRUCTIONS. (cont)

Table 2-1. Operator Preventive Maintenance Checks and Services (cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
6 (cont)	BEFORE, AFTER	Fog Oil Pump Assembly (cont)	(Cont)	
	BEFORE, AFTER		<p>Check that hoses are torn, cracked, twisted, or collapsed.</p> <p>Check that cable assemblies are correctly connected and tight.</p> <p>Check cable insulation for dry rot, cuts, or wear to bare wire.</p>	<p>Hoses are torn, cracked, or collapsed.</p> <p>Cable connectors are broken.</p> <p>Cable insulation is dry rotted, cut, or worn to bare wire.</p>
	BEFORE, AFTER		<p>Check fog oil strainer screens and clean as required:</p> <p>Remove cap screw (1), with preformed packing and strainer screen (2) from strainer assembly (3).</p> <p>Clean screen with dry cleaning solvent and rags (Items 4 and 11, App E).</p> <p>Check to ensure that preformed packing on cap screw is not cut or torn. Notify organizational maintenance if damaged.</p> <p>Install strainer screen (2) into strainer assembly (3) and secure with cap screw (1). Ensure preformed packing is in good condition. Replace if necessary. Do not over-tighten.</p>	

Table 2-1. Operator Preventive Maintenance Checks and Services (cont)

Item No.	Interval	Location Item to Checks Service	Procedure	Not Fully Mission Capable If:
6 (cont)		Fog Oil Pump Assembly (cont)		
7	BEFORE, AFTER	Air Compressor Assembly	<p>a. Check that cable assemblies are correctly connected and not damaged. Check that cable insulation is not dry rotted, cut, or worn to bare wire.</p> <p>b. Check that hoses are not torn, cracked, or collapsed.</p>	<p>Cable assembly connectors are broken or cable insulation is dry rotted, cut, or worn to bare wire.</p> <p>Hoses are torn, cracked, or collapsed.</p>

2-7 SPECIAL INSTRUCTIONS. (cont)

Table 2-1. Operator Preventive Maintenance Checks and Services (cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
7 (cont)	BEFORE, AFTER	Air Compressor Assembly (cont)	Check mechanical felt filter: turn filter cover (1) counterclockwise 1/4 turn and remove. Check filter and clean as required using compressed air only. Reinstall or replace filter assembly with on-board spares, if required.	
	AFTER		d. Release condensation from pressure tank through control valve (2).	
a	BEFORE		e. Check air compressor operation.	Air compressor does not operate.
	BEFORE, AFTER	Control Panel Assembly	a. Check that cable assemblies are correctly connected to the back of the control panel and are tight.  Check cable insulation for dry rot, cuts, or wear to bare wire.	Cable connectors are broken.  Cable insulation is dry rotted, cut, or worn to bare wire.

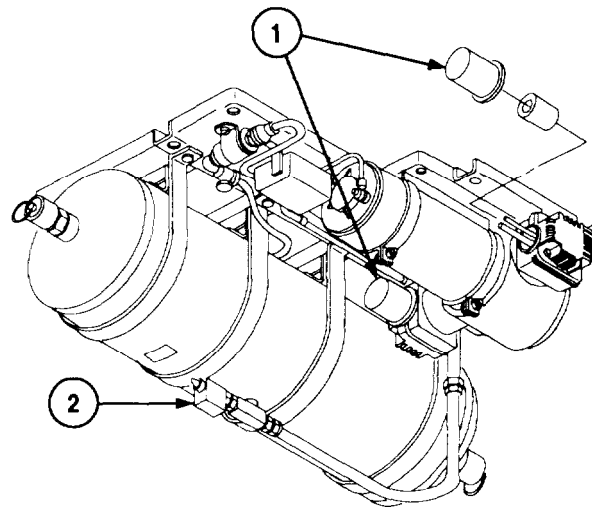


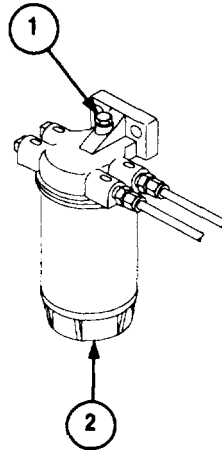
Table 2-1. Operator Preventive Maintenance Checks and Services (cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
8 (cont)	BEFORE, AFTER	Control Panel Assembly (cont)	b. Set circuit breaker CB 1 and POWER switches (P. 2-3) to ON and press all indicator lights to test. Replace indicator and panel lights if required. Notify organizational maintenance if indicator or panel lights do not light.  <b>NOTE</b> If panel lights do not light, check panel light control knob.  Ensure that both M54 Smoke Generators are hooked together electrically before performing the following check.	Indicators do not light.
	BEFORE, AFTER		c. Place and hold FIRE TEST switch to TEST position. Check that the fire warning light comes on within 2 seconds. Release switch when light comes on or after 2 seconds. Set circuit breaker CB 1 and POWER switch to OFF.	FIRE WARNING light does not come on.
	DURING		d. Monitor SMOKE TEMP indicator for overheating.	
	DURING		e. Monitor indicators for proper system operation.	
9		Fuel Filter/Water Separator Assembly	<b>WARNING</b> System contains combustible fluids. Keep flames, sparks, and ignition sources 100 feet away at all times. No smoking within 100 feet. Have fire extinguisher available at all times. Fires may result in personnel injury and loss of equipment/system.	

2-7 SPECIAL INSTRUCTIONS. (cont)

Table 2-1. Operator Preventive Maintenance Checks and Services (cont)

Item No.	Interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
9 (cont)	BEFORE, AFTER	Fuel Filter/Water Separator Assembly (cont)	<p>a. Check that all hoses are connected and tight to flare fittings of both fuel filter/water separators. Check for leaks.</p> <p>b. Check that hoses are not torn, cracked, or collapsed.</p> <p>c. Check for fuel contamination as follows: Loosen fuel vent plug (1) by turning counterclockwise 2 turns.</p>	<p>Class II or III fuel leaks are present.</p> <p>Hoses are tom, cracked, or collapsed.</p>
	BEFORE, AFTER BEFORE, AFTER			
	BEFORE, AFTER BEFORE, AFTER		<p>d. Close the drain valve (2).</p> <p>e. Tighten fuel vent plug (1) until finger tight. Do not over tighten vent plug.</p> <p><b>NOTE</b> If contamination is present, turn on fuel pump momentarily to refill fuel filter/water separator and repeat above procedure. If contamination is still present, notify organizational maintenance.</p> <p><b>NOTE</b> When separator is drained, fuel prime may be lost.</p>	<p>Contamination still exists after draining fuel filter/water separator twice.</p>



M1059 Vehicle

**Table 2-1. Operator Preventive Maintenance Checks and Services (cont)**

Item No.	interval	Location	Procedure	Not Fully Mission Capable If:
		Item to Check/Service		
10	BEFORE, AFTER	M157 Smoke Generator Set	a. Check for signs of leaks in all hoses, connectors, and lines.	Class III fog oil leaks are present, or Class II and III fuel leaks are present.
	BEFORE, AFTER		b. Check that hoses are not torn, cracked, or collapsed.	Hoses are torn, cracked, or collapsed.
	BEFORE, AFTER		c. Check cable assemblies for cracked or loose connectors, cut insulation.	Connectors are damaged, insulation is cut to bare wire.
	BEFORE, AFTER		d. Ensure all equipment container panels, smoke generator "wedge blocks", motor cover assemblies, etc., are securely mounted and fastened.	
	DURING		e. Check all fuel and fog oil hose assemblies for leaks.	Class III fog oil leaks are present, or Class II or III fuel leaks are present.
	DURING		f. Check for torn, cracked, or collapsed hoses.	Hoses are torn or collapsed.
	DURING		g. Monitor operation to ensure both M54 Smoke Generators are operating in correct temperature range.	
			<p style="text-align: center;">NOTE</p> <p>If one M54 Smoke Generator is operational, the M157 Smoke Generator Set is Fully Mission Capable.</p>	

## Section III. OPERATION UNDER USUAL CONDITIONS

### 2-8 INITIAL ADJUSTMENTS AND DAILY CHECKS.

Perform BEFORE PMCS (P. 2-5). Refer to symptom index (P. 3-1) for troubleshooting malfunctions.

### 2-9 OPERATING PROCEDURES.

The following procedures are for operating the Smoke Generator Set in usual conditions of temperatures between 32°F (0°C) and 90°F (32°C). Starting procedures are the same for both smoke generators.

#### WARNING

Prolonged breathing of fog oil smoke may cause pneumonia. Stay out of smoke or wear your protective mask as much of the time as possible while operating your smoke generator.

HIGH INTENSITY NOISE is present during operation. Wear authorized hearing protection within 25 feet while smoke generator is operating.

#### *a. Starting.*

#### CAUTION

Do not hold the FUEL, ENGINE, or FOG OIL switches in the START position for more than 30 seconds or equipment will be damaged.

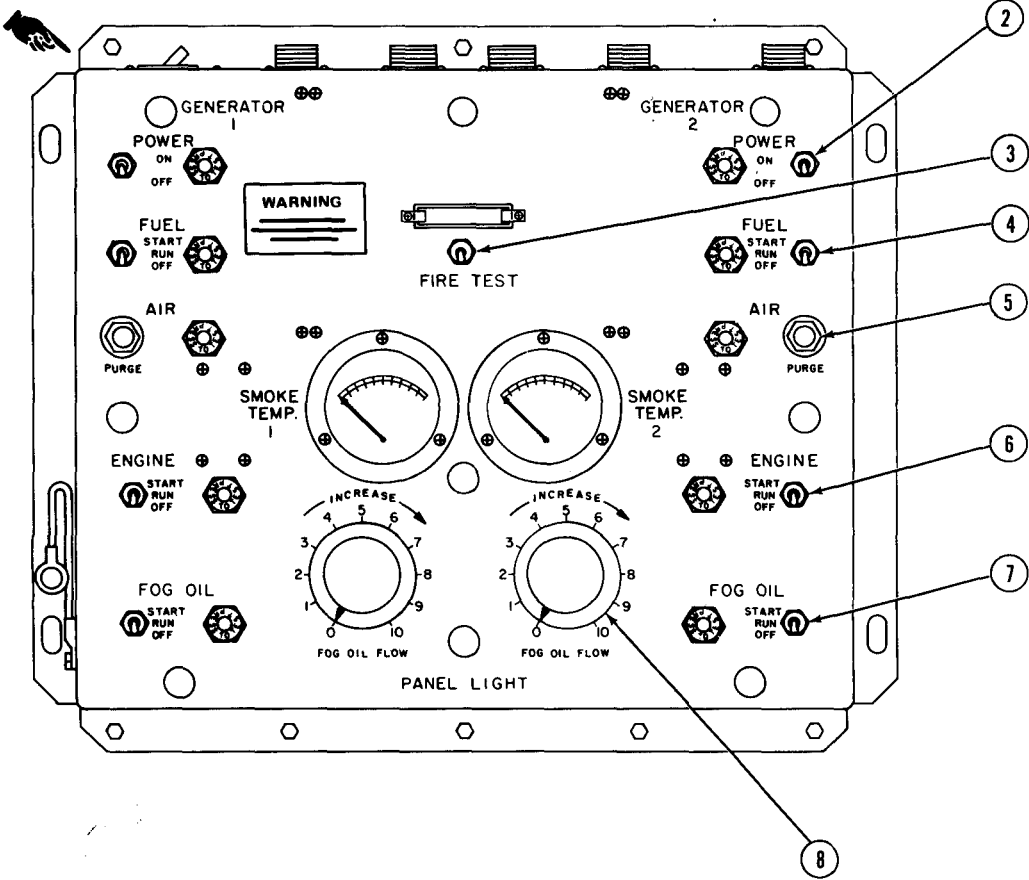
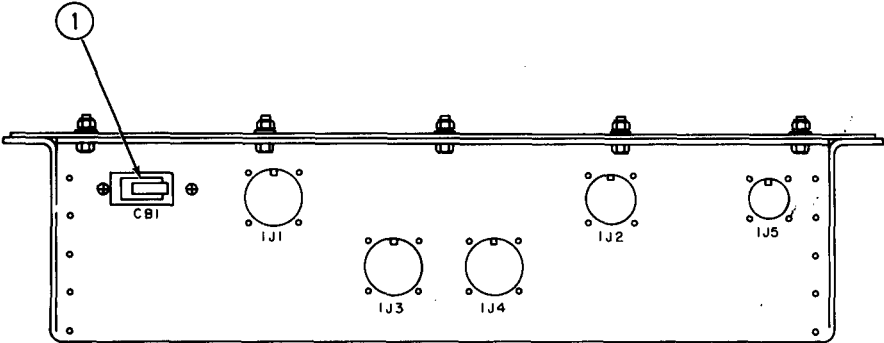
- (1) Start vehicle engine. See vehicle operators manual.
- (2) Set circuit breaker CB1(1) to ON.
- (3) Set POWER switch (2) to ON. POWER indicator lights and air compressor starts.
- (4) Hold FUEL switch (4) in START (up) position until FUEL indicator lights. After indicator lights, release FUEL switch and allow it to move to RUN (center) position.
- (5) Wait for AIR indicator to light. After AIR indicator lights, push PURGE pushbutton (5) for 3 seconds to purge pulse jet engine. Wait for AIR indicator to light again.



2-9 OPERATING PROCEDURES (CONT)

a. Starting (cont).

TOP VIEW



**WARNING**

Fire detection system will only detect large fires at the engine head and will not warn personnel of small fires or flashbacks common to the system.

- (6) Hold ENGINE switch (6) in START (up) position until ENGINE indicator lights. After indicator lights, release ENGINE switch and allow it to move to RUN (center) position.
- (7) Hold FOG OIL switch (7) in START (up) position until FOG OIL indicator

lights. After indicator lights, release FOG OIL switch and allow it to move to RUN (center) position.

**CAUTION**

Adjust FOG OIL FLOW control knob within 30 seconds after fog oil indicator lights to prevent overheating the pulse jet engine.

- (8) Adjust FOG OIL FLOW control knob (8) for normal engine temperature and optimum smoke production. (See table below.)

**OPERATING TEMPERATURES**

INDICATOR COLOR RANGE	TEMPERATURE	CONDITION
White	200-400°F (93-204°C)	Not operating
Yellow	400-650°F (204-343°C)	Excess fog oil flow
Green	650-950°F (343-510°C)	Normal operation
Red	950-1200°F (510-649°C)	Inadequate fog oil flow

**b. Stopping.** To shut down the smoke generator set, proceed as follows:

**CAUTION**

Procedures 1, 2, and 3 must be performed within 30 seconds to prevent smoke generator engine from overheating.

**NOTE**

If emergency shutdown is required, set circuit breaker CB1 (1) to OFF.

- (1) Turn the FOG OIL FLOW control

knob (8) on the control panel assembly fully counterclockwise.

- (2) Set FOG OIL switch (7) to OFF.
- (3) Let pulse jet engine run to burn excess fog oil, then set ENGINE switch (6) to OFF.
- (4) Set FUEL switch (4) to OFF.
- (5) Press PURGE switch for 3 to 5 seconds.
- (6) Set POWER switch to OFF.
- (7) Set circuit breaker CB1 to OFF
- (8) Perform after (A) operation PMCS procedures.

## Section IV. OPERATION UNDER UNUSUAL CONDITIONS

### 2-10 OPERATION IN EXTREME COLD.

**a. Effects of Freezing Weather.** At temperatures below 32°F (0°C), condensation may freeze in fuel, fog oil, and air lines. This freezing may occur on strainers or in elbows of lines, reducing or stopping flow of fuel, fog oil, or pressurized air. When this occurs, lines must be cleared. Use type 2 automotive combat gasoline in fuel system or add 16 ounces of isopropyl (item 7E, app E) to every 5 gallons of untreated gasoline. Use cold weather fog oil mixtures cited in para 2-10b to prevent frozen water crystals from forming in fog oil.

**b. Cold Weather Fog Oil Mixtures.** For operation in freezing weather, fog oil (item 6, app E) and kerosene (item 8, app E) or equivalent (diesel fuel) can be blended to form mixtures that flow easier. The following table lists percentages of fog oil-fuel mixtures recommended for operation in freezing weather. Add 16 ounces of diethylene glycol monomethyl ether (DGME) (item 7D, App E) to every 40 gallons of fog oil-fuel mixture to prevent ice from forming. Notify fuel supply personnel if your generator requires these mixtures. Fuel supply personnel are responsible for mixing and supplying these mixtures.

FOG OIL-FUEL MIXTURES

OPERATING TEMPERATURES		PERCENTAGE BY VOLUME	
Fahrenheit (F)	Celsius (C)	Fog Oil	Diesel Fuel or Equivalent
Above 32°F	Above 0°C	100	0
32 to -10°F	0 to - 23°C	75	25
-10 to - 25°F	-23 to - 32°C	60	40
-25 to - 40°F	-32 to - 40°C	50	50

**c. Starting in Freezing Weather.** These instructions are in addition to paragraph 2-9a.

- (1) In temperatures below 32°F (0°C) use type 2 automotive combat gasoline. Keep excess fuel supply in tightly capped containers to prevent contamination.
- (2) Keep fuel tanks as full as possible to prevent condensation from forming in fuel tanks.

#### WARNING

Primer fuel spray is very flammable. Do not allow open flames, sparks or heated objects in the area during procedure.

#### NOTE

Two people are needed to perform next step.

- (3) If type 2 automotive combat gasoline is not available, use engine primer fuel. Spray fuel into nozzle assembly and step back before placing ENGINE switch in START position.
- (4) If starting smoke generator in temperatures below 20°F (-7°C) follow steps (1) through (5) of STARTING PROCEDURES (P. 2-10.6) then proceed as follows:
  - (a) Rotate FOG OIL FLOW control knob fully clockwise.

### CAUTION

Do not hold ENGINE or FOG OIL switch in START position for more than 15 seconds.

- (b) Hold ENGINE switch in START position until ENGINE indicator lights.
- (c) After ENGINE indicator lights, hold FOG OIL switch in START position (keeping ENGINE switch in START position).
- (d) When FOG OIL indicator lights, move ENGINE and FOG OIL switches to RUN position.
- (e) After FOG OIL indicator lights, adjust FOG OIL FLOW control knob to obtain an operating temperature of 650° -950°F (343°-510%).

### CAUTION

Do not repeat steps (b) through (d) more than 3 times if engine fails to start.

- (f) If thermal switch stops pulse jet engine before FOG OIL indicator lights, move all switches to OFF, wait until SMOKE TEMP indicates 650°F, and then perform steps (a) through (d) again. If after 3 attempts FOG OIL indicator does not light, move all switches and CB1 to OFF position and notify organizational maintenance.

## 2-11 OPERATION IN EXTREME HEAT

The following procedures are for operating the M157 smoke generator set in temperatures above 90°F (32°C).

a. Adjustments. For missions where the average operating temperature is expected to be 90°F or above, request organizational maintenance to adjust the fog oil pump assembly pressure relief valve to 25 psig. Refer to page 4-145. If the operating temperature during a mission would unexpectedly drop below 90°F, it is not necessary to stop the mission. Proper adjustment should be made when time permits.

### WARNING

Control panel may become very hot when operating at temperatures above 95°F. Do not touch control panel with bare hands. Wear gloves (App E).

**b. Starting in Extreme Heat.** This procedure should also be used when restarting a hot generator (SMOKE TEMP indicator above 650° F).

- (1) Follow steps 2-9a (1 through 5) for starting under usual conditions (P. 2-10.6).
- (2) Preset FOG OIL FLOW control knob to a level that will deliver fog oil at a rate that will ensure normal operation. If unknown, set to 5.
- (3) Hold both ENGINE and FOG OIL switches to the START (up) position at the same time until their indicators light. When indicators are lit, release switches and allow them to move to the RUN (center) position.
- (4) Adjust FOG OIL FLOW control knob for normal engine temperature and optimum smoke production.

**NOTE**

Proper fog oil flow must be delivered to generator within 5 seconds after starting to ensure that high temperature thermal switch does not shut down pulse jet engine.

**c. Stopping.** To shut down smoke generator, proceed as follows:

- (1) Turn FOG OIL FLOW control knob fully clockwise to increase fog oil flow. Wait 3 seconds (approximately 500°F on SMOKE TEMP indicator).
- (2) Set FOG OIL switch to OFF and allow excess fog oil to burn off.
- (3) Set ENGINE switch to OFF.
- (4) Follow steps 2-9b (4 through 8) for stopping under usual conditions (P. 2-12).



## CHAPTER 3 OPERATOR MAINTENANCE INSTRUCTIONS

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### Section 1. LUBRICATION INSTRUCTIONS

(Not Applicable)

### Section II. OPERATOR TROUBLESHOOTING PROCEDURES

#### 3-2 SCOPE.

a. The troubleshooting table (P. 3-2) lists the common malfunctions you may find during the operation or maintenance of the M157 Smoke Generator or its components. Perform the tests/inspections and corrective actions in the order listed.

b. This manual cannot list all malfunctions

that may occur, nor all tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective actions, notify your supervisor.

c. Before you use the troubleshooting table, be sure you have performed all normal operating procedures, checks, and services.

d. Use the following symptom index to locate troubleshooting procedures.

#### *SYMPTOM INDEX*

	Troubleshooting Procedure Page
1. CIRCUIT BREAKER CB1 MOVES TO OFF POSITION.	3-2
2. CIRCUIT BREAKER CB1 MOVES TO OFF POSITION WHEN POWER SWITCH IS SET TO ON.	3-2
3. ENGINE WILL NOT START.	3-4
4. CIRCUIT BREAKER CB1 MOVES TO OFF POSITION WHEN FOG OIL SWITCH IS IN START POSITION.	3-6
5. ENGINE RUNS ERRATICALLY DURING OPERATION.	3-7
6. FLASHING FROM SMOKE GENERATOR COMBUSTION CHAMBER.	3-7
7. ENGINE OVERHEATS.	3-7

NOTES

Troubleshooting procedures given in this table are the same for both smoke generators and either side of the control panel assembly.

Some of the troubleshooting procedures require two people. Before performing these procedures, make sure the second person is available.

System uses vehicle battery for power. Do not operate system without vehicle engine running.

**TROUBLESHOOTING**

---

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

1. CIRCUIT BREAKER CB1 MOVES TO OFF POSITION.

*Step 1.* Check for short circuit in air compressor assembly.

Disconnect cable assembly from connector 2J1 at air compressor.

Set circuit breaker CB1 to ON.

If circuit breaker CB1 stays in the ON position, air compressor assembly has a short circuit. Notify organizational maintenance.

If circuit breaker CB1 trips to OFF position, reconnect cable and go to next step.

*Step 2.* Check for short circuit in vehicle air compressor cable.

Disconnect cable assembly from connector 1J2 control panel assembly.

Set circuit breaker CB1 to ON.

If circuit breaker CB1 stays in the ON position, vehicle cable has a short circuit. Notify organizational maintenance.

If circuit breaker CB1 trips to OFF position, control panel has a short circuit. Notify organizational maintenance.

2. CIRCUIT BREAKER CB1 MOVES TO OFF POSITION WHEN POWER SWITCH IS SET TO ON.

*Step 1.* Check for short circuit in air compressor assembly.

Disconnect cable assembly from connector 2J1 at air compressor.

Set circuit breaker CB1 and power switch to ON.

If circuit breaker CB1 stays in the ON position, air compressor assembly has a short circuit. Notify organizational maintenance.

If circuit breaker CB1 trips to OFF position, reconnect cable and go to next step.



## TROUBLESHOOTING (CONT)

## MALFUNCTION

## TEST OR INSPECTION

## CORRECTIVE ACTION

- 
- Step 2.* Check for short circuit in vehicle air compressor cable.
- Disconnect cable assembly from connector 1J2 at control panel assembly.
- Set circuit breaker CB1 and POWER switch to ON.
- If circuit breaker CB1 stays in the ON position, vehicle cable has a short circuit. Notify organizational maintenance.
- If circuit breaker CB1 trips to OFF position, reconnect cable and go to next step.
- Step 3.* Check for short circuit in smoke generator assembly.
- Disconnect cable assembly from connector 5J1 at cover assembly of smoke generator.
- Set circuit breaker CB1 and POWER switch to ON.
- If circuit breaker CB1 stays in the ON position, smoke generator has a short circuit. Notify organizational maintenance.
- If circuit breaker CB1 trips to OFF position, reconnect cable and go to step 4 for M1059 vehicles or skip to step 5 for other vehicle applications.
- Step 4.* Check for short circuit in smoke generator cable from vehicle adapter assembly (located under front of each smoke generator on MI 059).
- Disconnect cable assembly from connector at vehicle adapter assembly.
- Set circuit breaker CB1 and POWER switch to ON.
- If circuit breaker CB1 stays in the ON position, cable assembly from adapter to generator has a short circuit. Notify organization maintenance.
- If circuit breaker CB1 trips to OFF position, reconnect cable and go to next step.
- Step 5.* Check for short circuit in smoke generator cable assembly from control panel.
- Disconnect cable assembly from connector 1J3 for No. 1 generator or 1J4 for No. 2 generator at control panel.
- Set circuit breaker CB1 and POWER switch to ON.
- If circuit breaker CB1 stays in the ON position, smoke generator cable assembly has a short circuit. Notify organizational maintenance.
- If circuit breaker CB1 trips to OFF position, control panel has a short circuit. Notify organizational maintenance.

TROUBLESHOOTING (CONT)

---

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

---

3. ENGINE WILL NOT START.

**NOTE**

Two people are required to perform steps 1 through 3.

*Step 1.* Check igniter and igniter cable.

Set circuit breaker CB1 and POWER switch to ON.

Ensure FUEL switch is in OFF position,

Purge air from air compressor assembly.

Remove engine head assembly (P. 3-8) and insert clear engine head blank. Do not reattach nozzle assembly to blank engine head.

**WARNING**

Failure to insert engine head blank may cause fire flashback and injury to personnel.

**CAUTION**

Do not hold ENGINE switch in START position for more than 15 seconds.

Hold ENGINE switch in START position and observe spark from igniter in combustion chamber.

If spark is not present, set all switches to OFF. Disconnect igniter cable from igniter. Set POWER switch to ON.

Place or hold end of igniter cable ¼-inch from frame assembly.

Hold ENGINE switch in START position.

If spark is present, set all switches to OFF and notify organizational maintenance.

If no spark is present, set all switches to OFF and notify organizational maintenance.

## TROUBLESHOOTING (CONT)

---

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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## 3. ENGINE WILL NOT START. (CONT)

*Step 2.* Check for start air blast.

Set FUEL switch to OFF.

**CAUTION**

Do not hold ENGINE switch in START position for more than 30 seconds.

Hold ENGINE switch in the START position.

Listen for start air blast at nozzle assembly on engine head.

If start air blast is not present, set all switches and circuit breaker CB1 to OFF and notify organizational maintenance.

If start air blast is present, set all switches and circuit breaker CB1 to OFF and go to next step.



## TROUBLESHOOTING (CONT)

---

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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## Step 3. Check nozzle assembly for fuel flow.

Loosen nut on nozzle clamp and life catch. Remove clamp and nozzle assembly from engine head.

Place nozzle assembly in a container.

Bleed air from air compressor tank through control valve.

Disconnect the air supply hose from AIR coupling on cover assembly.

Set circuit breaker CB1 and POWER switch to ON position.

## CAUTION

Do not hold FUEL or ENGINE switch in START position for more than 30 seconds.

Hold FUEL switch in START position until FUEL indicator lights.

Release FUEL switch to RUN position.

## WARNING

FUEL SPRAY is very flammable. Do not allow open flames, sparks, or heated objects in the area during procedure. Point nozzle assembly away from personnel and smoke generator.

Hold ENGINE switch in START position.

Observe fuel flow at nozzle assembly.

If fuel flow is not present, set all switches and circuit breaker CB1 to OFF and notify organizational maintenance.

If fuel flow is present, set FUEL switch to OFF, reconnect air supply hose at cover assembly and go to next step.

*TROUBLESHOOTING (CONT)*

---

MALFUNCTION	
TEST OR INSPECTION	
CORRECTIVE ACTION	

---

*Step 4.* Inspect engine head.

WARNING

Cold air entering a hot engine chamber may cause fire flashback and injury to personnel. Purge hot gases from engine before removing engine head from a hot generator. Immediately install spare engine head.

Engine and engine head may become very hot during operation. Do not touch engine or engine head with bare hand.

Remove engine head assembly (P. 3-8). If generator is hot, immediately install spare engine head.

Wipe engine head clean.

Check if engine valve is broken, frayed, bent, sticking, or has carbon deposits.

If engine valve is damaged, replace engine head and repair (P. 3-10).

If engine valve is not faulty, reinstall engine head and nozzle assembly and notify organizational maintenance.

4. CIRCUIT BREAKER CB1 MOVES TO OFF POSITION WHEN FOG OIL SWITCH IS IN START POSITION.

*Step 1.* Check for short circuit in fog oil pump assembly.

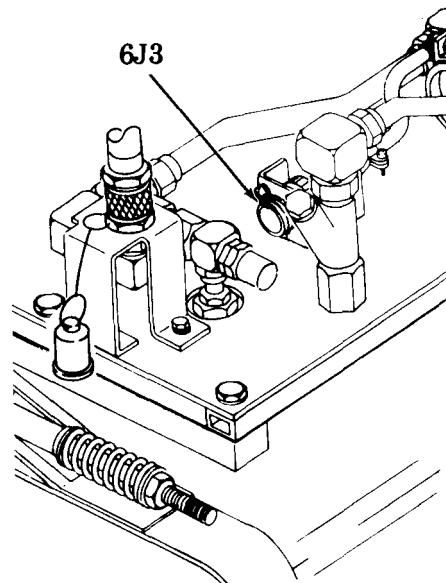
Disconnect cable assembly from connector 6J3 at fog oil pump assembly.

Set circuit breaker CB1 and POWER switch to ON.

Set FUEL and ENGINE switches to RUN. Hold FOG OIL switch to START.

If circuit breaker CB1 stays in the ON position, fog oil pump assembly has a short circuit. Notify organizational maintenance.

If circuit breaker CB1 trips to OFF position, set all switches to OFF, reconnect cable assembly and go to next step.



## TROUBLESHOOTING (CONT)

---

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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*Step 2.* Check for a short circuit in fog oil pump cable.

Disconnect cable assembly from connector 1J5 at control panel.

Set circuit breaker CB1 and POWER switch to ON.

Set FUEL and ENGINE switches to RUN. Hold FOG OIL switch to START.

If circuit breaker CB1 stays in the ON position, fog oil pump cable assembly has a short circuit. Set all switches to OFF. Notify organizational maintenance.

If circuit breaker CB1 trips to OFF position, reconnect cable and notify organizational maintenance.

5. ENGINE RUNS ERRATICALLY DURING OPERATION.

Perform step 4 of malfunction 3.

6. FLASHING FROM SMOKE GENERATOR COMBUSTION CHAMBER.

Perform step 4 of malfunction 3.

7. ENGINE OVERHEATS.

*Step 1.* Check fog oil supply in fog oil tank.

If fog oil supply is low, shutdown generator and fill fog oil tank with fog oil.

If fog oil supply is not low, shutdown generator and go to next step.

*Step 2.* Check fog oil strainer assembly for clogged strainer.

If fog oil strainer is clogged, clean strainer and reinstall.

Start generator and check for overheating.

If generator still overheats, shutdown generator and notify organizational maintenance.

Section III. OPERATORS MAINTENANCE PROCEDURES

3-3 REPLACING ENGINE HEAD.

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*a. Removal.*

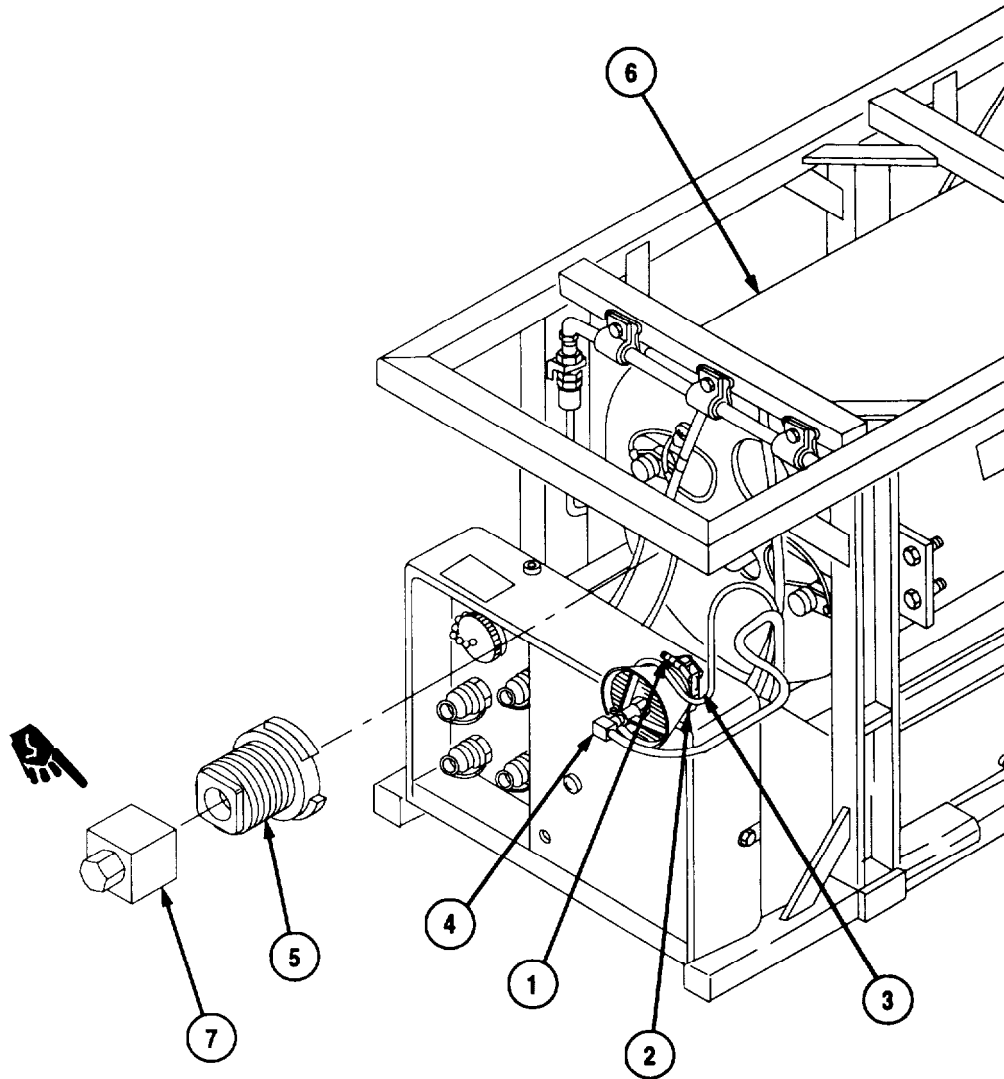
WARNING

Cold air entering a hot engine chamber may cause fire flashback and injury to personnel. Purge hot gases from engine before removing engine head from a hot generator. Immediately install spare engine head.

Engine and engine head may become very hot during operation. Do not touch engine or engine head with bare hand. Wear gloves (App D).

1. Loosen but do not remove clamp nut (1).
2. Open clamp (2) by lifting catch (3).
3. Remove clamp (2) from nozzle assembly (4).
4. Remove nozzle assembly (4) from engine head assembly (5).
5. Remove engine head assembly (5) from pulse jet engine (6) by turning engine head assembly (5) counterclockwise using engine head wrench (7).





**b. Installation.**

**CAUTION**

Do not overtighten engine head. Over-tightening can cause severe damage to head gasket, engine head and combustion chamber flanges.

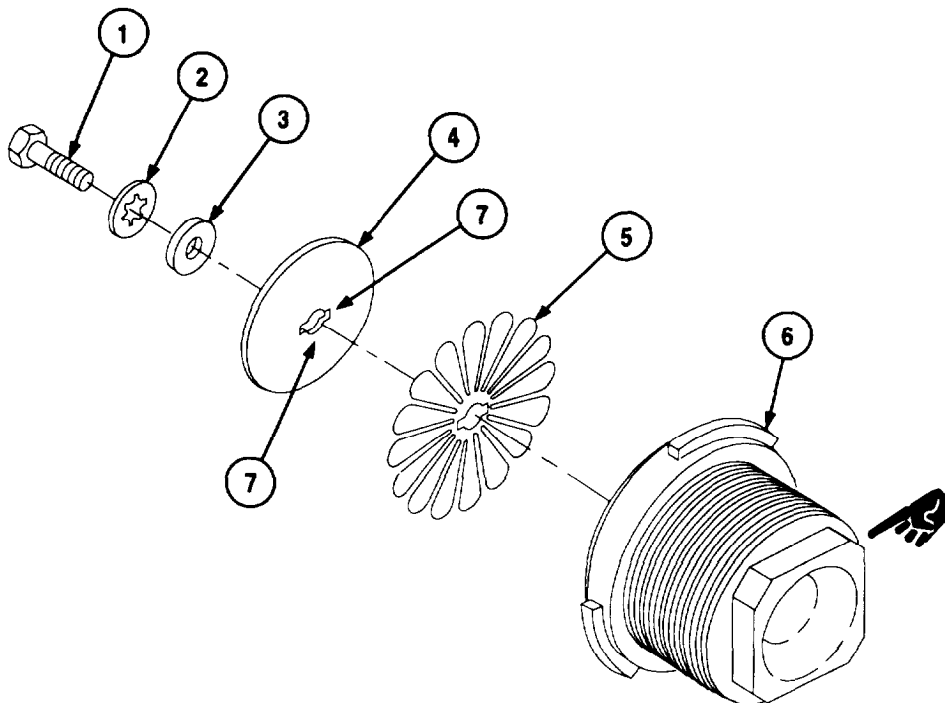
1. Position engine head assembly (5) in pulse jet engine (6) and secure by turning engine head assembly (5) clockwise using engine head wrench (7) (item 8, Section III. Basic Issue Items, App C)-
2. Position nozzle assembly (4) on engine head assembly (5) and secure with nozzle clamp (2).
3. Close catch (3) and tighten clamp nut (1).

### 3-4 REPAIRING ENGINE HEAD.

---

#### *a. Disassembly.*

1. Remove machine bolt (1), lockwasher (2), backstop washer (3), engine valve backstop (4) and engine valve (5) from engine head (6).



#### *b. Inspect/Repair.*

1. Inspect machine bolt (1) for stripped threads and backstop washer (3) for corrosion. Replace damaged parts.
2. Inspect engine valve backstop (4) for burred or worn index tabs (7) and for corrosion. Remove corrosion with rag and fog oil. If badly damaged, replace with spare and turn in to organizational maintenance.
3. Inspect engine valve (5) for broken, bent or burnt petals. Replace if petals are broken or bent.

**NOTE**

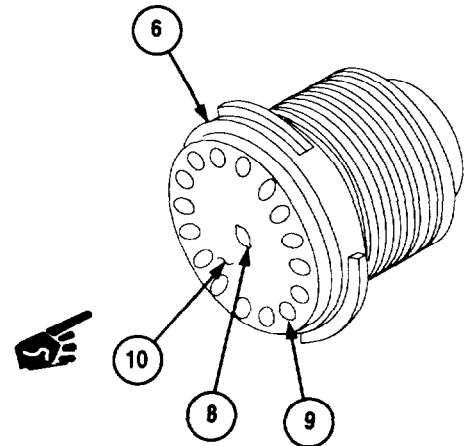
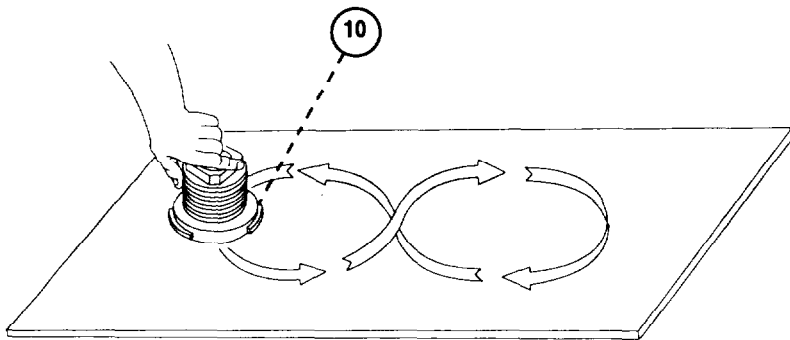
Engine head is still usable if chromate coating is removed. However, head must have sharp (not rounded or chamfered) seating face corner edge.

4. Inspect engine head (6) for wear, burrs on engine head index slot (8), clogged ports (9), and carbon deposits on valve seating face (10). If ports are clogged, wipe ports with twisted corner of rag soaked with dry cleaning solvent. Remove carbon deposits on valve seating face as described in step 5. If badly damaged, notify organizational maintenance.
5. Clean engine head:

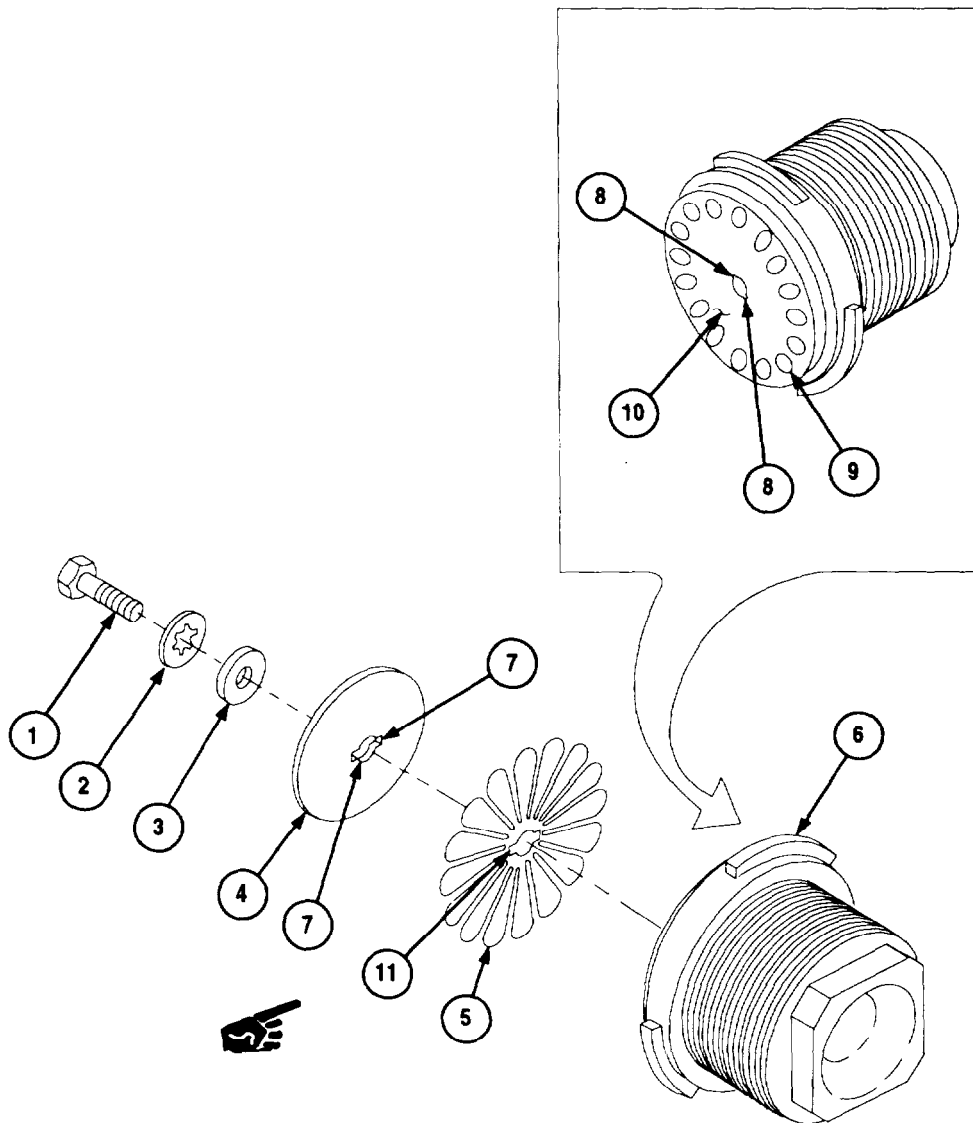
**CAUTION**

Do not attempt to remove carbon deposits on valve seating face of engine head with scraper or abrasive cloth.

- (a) Place lapping board on flat surface.
- (b) Place a few drops of fog oil on lapping board.
- (c) Rub valve seating face (10) of engine head on lapping board using a figure 8 motion. Ensure engine head seating surface stays flush on lapping board. Do not round edges.
- (d) Rotate engine head or engine valve so even pressure is applied to different parts until carbon deposits are removed. Wipe dry with rag.



3-4 REPAIRING ENGINE HEAD. (cont)



**c. Reassembly.**

1. Assemble lockwasher (2) on machine bolt (1).
2. Position engine valve (5) on engine head (6) so that engine head index slots (8) are aligned.
3. Position engine valve backstop (4) so index tabs (7) are aligned with engine valve index slots (11) and engine head index slots (8).
4. Install machine bolt (1) with backstop washer (3), align with index slots and engine head (6). Install washer, lockwasher, and machine screw.
5. Tighten machine bolt (1) without damaging threads in engine head (6) or moving petals of engine valve (5) on engine head ports (9).

## **CHAPTER 4**

### **ORGANIZATIONAL MAINTENANCE INSTRUCTIONS**

---

#### **Section I. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT TMDE; AND SUPPORT EQUIPMENT**

##### **4-1 COMMON TOOLS AND EQUIPMENT.**

For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit.

##### **4-2 SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.**

No special tools or equipment are required for organizational maintenance.

##### **4-3 REPAIR PARTS.**

Repair parts are listed in Appendix F of this manual.

#### **Section II. SERVICE UPON RECEIPT**

##### **4-4 CHECKING UNPACKED EQUIPMENT.**

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF Form 364, Report of Discrepancy.

b. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions in DA PAM 738-750.

c. Check if the equipment has been modified.

##### **4-5 INSTALLATION.**

Refer to TM 9-2350-261-20-1 for M1059 vehicle installation procedures or TM 3-1040-280-20&P for M1037/M1097 vehicle installation using M284 mounting kit.

##### **4-6 OPERATING CHECK.**

a. Perform operator PMCS (P. 2-5).

b. Adjust fuel pump pressure (P. 4-62).

c. Adjust fog oil pressure relief valves (P. 4-145).

d. Start and operate smoke generator (P. 2-10.6).

## Section III. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES

### 4-7 ORGANIZATIONAL PMCS.

**a. Purpose.** The purpose of organizational PMCS is to systematically and periodically inspect and service the M157 smoke generator set:

- (1) To ensure that the equipment is ready for operation at all times.
- (2) To perform those PMCS procedures that are beyond the capability of the operator/crew.
- (3) To discover and correct defects before they result in serious damage or failure requiring time-consuming repairs or replacement.

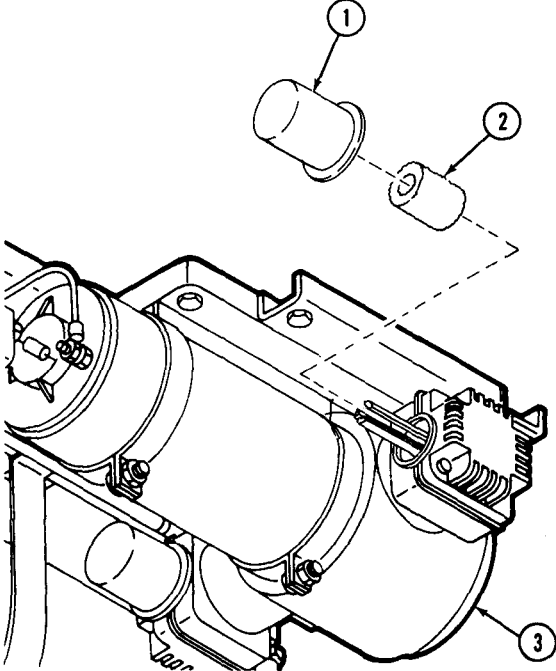
**b. Use.**

- (1) Schedule each of your unit's smoke generators for organizational PMCS every three months.
- (2) Use the quarterly schedule below as a check list each time you perform the PMCS to make sure that you perform all required procedures.
- (3) Report and record all deficiencies and short-comings, together with corrective actions taken, on DA Form 2404, Equipment Inspection and Maintenance Worksheet.

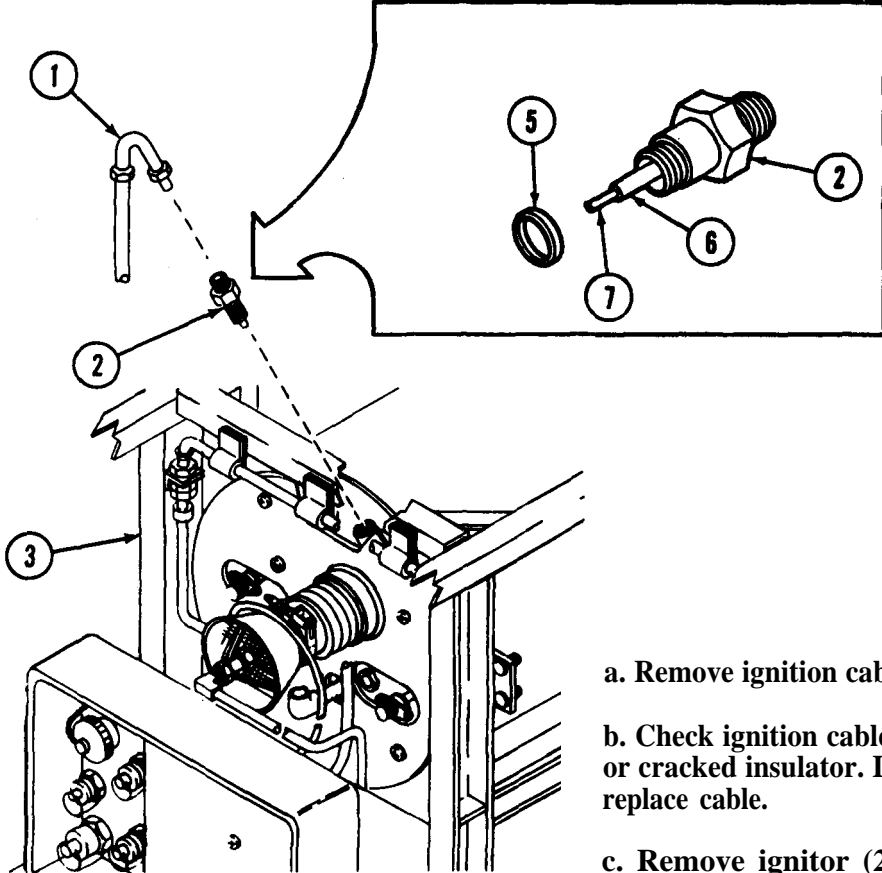
**c. Explanation of Columns on the PMCS Schedule.**

- (1) Item Number Column. Checks and services are numbered in order of performance. Use this column as a source of item numbers for the TM Number Column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.
- (2) Item To Be Inspected Column. The items listed in this column are divided into groups indicating the portion of the equipment of which they are part. The common name or official nomenclature as shown on the maintenance allocation chart (App B) is used for this purpose.
- (3) Procedures Column. This column briefly describes the procedure for performing the check or service. Whenever replacement or repair is recommended, reference is made to page number for the applicable maintenance instruction.

**ORGANIZATIONAL PREVENTIVE MAINTENANCE  
CHECKS AND SERVICES QUARTERLY SCHEDULE**

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURES
1	Fog Oil Pump Pressure Relief valve	Adjust pressure relieve valve (P. 4-145).
2	Air Compressor Assembly	<p>Clean mechanical felt (filter).</p> <p><b>NOTE</b></p> <p>There are two air filters on the compressor assembly. Procedures are the same for both filters.</p> <p>a. Turn air filter (1) ¼ turn counterclockwise.</p> <p>b. Remove mechanical felt (2) from air compressor (3).</p> <p>c. Clean mechanical felt (2) with dry cleaning solvent (Item 4, App E) or replace as required.</p> <p>d. Install air filter (1) on air compressor (3) and turn ¼ turn clockwise to secure.</p> 

**ORGANIZATIONAL PREVENTIVE MAINTENANCE  
CHECKS AND SERVICES QUARTERLY SCHEDULE (CONT)**

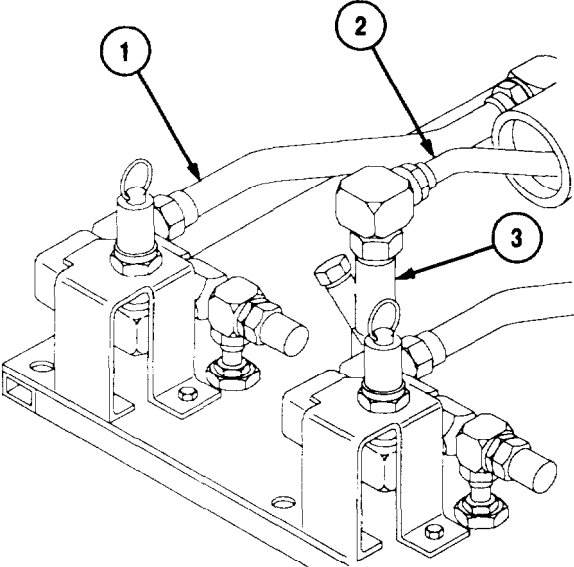
ITEM NO.	ITEM TO BE INSPECTED	PROCEDURES
3	Ignitor	<p>Clean and inspect.</p>  <ol style="list-style-type: none"> <li>a. Remove ignition cable (1) from igniter (2).</li> <li>b. Check ignition cable for broken, missing, or cracked insulator. If damaged or missing, replace cable.</li> <li>c. Remove ignitor (2) from pulse jet engine (3).</li> <li>d. Clean spark ignitor (2) with dry cleaning solvent (Item 4, App E) and rags (Item 11, App E). Inspect for cracked insulator (6), burned, loose or pitted center pole (7), and cut or missing gasket (5). If damaged, replace.</li> <li>e. Install igniter (2) in pulse jet engine (2).</li> <li>f. Install ignition cable (1) on ignitor (2).</li> </ol>
4	Fuel Pump Pressure	Adjust fuel pump pressure (P. 4-62).



**ORGANIZATIONAL PREVENTIVE MAINTENANCE  
CHECKS AND SERVICES QUARTERLY SCHEDULE (CONT)**

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURES
5	Hot Gas Valve	<p>a. Check for bent stem (1); missing pin (2), spring (3), or washer (4). Replace if parts are missing or damaged.</p> <p>b. Check that valve seats by pulling up stem. If stem moves, the spring is weak. Replace hot gas valve.</p> <p>c. Check for proper stem travel by pushing down on stem. If binding occurs, replace valve.</p> <div style="text-align: center;"> </div>
6	Engine Head Gasket	<p>Check for missing, cut, or torn gasket. Replace (P. 4-108) if missing or damaged.</p>
7	M1 57 Smoke Generator Set	<p>a. Inspect components for rust, corrosion, chipped paint or bare metal on painted surfaces. Repaint or touch up as necessary (P. 4-20).</p>

ORGANIZATIONAL PREVENTIVE MAINTENANCE  
CHECKS AND SERVICES QUARTERLY SCHEDULE (CONT)

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURES
7 (cont)	M157 Smoke Generator Set (cont)  	<p>b. Remove end of fog oil pump supply hose (1) to pressure relief valve and place in a container of light 10W grade lubricating oil (NSN 9150-00-189-6727).</p> <p>c. Remove fog oil hose end (2) from fog oil strainer (3) and place in same container of 10W grade lubricating oil.</p> <p style="text-align: center;"><b>NOTE</b></p> <p>M1059 Vehicle-Curbside M54 Smoke Generator has to be removed from mount to gain access to panel.</p> <p>d. Remove the right side panel (Para 4-16c) for the M54 Smoke Generator equipment container which matches to the fog oil pump being flushed with lubricating oil. Place fog oil By-pass switch in the ON (up) position.</p> <p>e. Power-up the Control-Indicator Panel and place the FOG OIL switch in the ON (middle) position. Run the fog oil pump for a minimum of two minutes to flush moisture out.</p> <p>f. Place Fog Oil switch in the OFF (down) position. Turn-off Control-Indicator Panel power.</p> <p>g. Place fog oil By-pass switch in the OFF (down) position. Install right side panel on M54 Smoke Generator equipment container (Para 4-16c).</p> <p>h. Connect end of fog oil pump supply hose (1) to pressure relief valve and connect fog oil hose end (2) to fog oil strainer (3).</p>

ORGANIZATIONAL PREVENTIVE MAINTENANCE  
CHECKS AND SERVICES QUARTERLY SCHEDULE (CONT)

ITEM NO.	ITEM TO BE INSPECTED	PROCEDURES
	<p>The diagram consists of two parts. The upper part shows a fuel filter/water separator assembly with a 'PUMP IN' label. A fuel supply hose end (4) is shown being disconnected from the assembly. The lower part shows a fuel can lid assembly (6) with a fuel return hose end (5) being disconnected from it.</p>	<p>i. Remove fuel supply hose end (4) from fuel filter/water separator assembly outlet and fuel return hose end (5) from fuel can lid assembly (6).</p> <p style="text-align: center;"><b>CAUTION</b></p> <p>Do not let end of hose come into contact with dirt or any other contaminants while performing this procedure. Foreign matter allowed to enter into the fuel system will damage internal fuel pump parts.</p> <p>j. Place both fuel hose ends in a container of light 10W grade lubricating oil (NSN 9150-00-189-6727).</p> <p>k. Power-up the Control-Indicator Panel and place the FUEL switch in the START (up) position until fuel indicator illuminates. With fuel indicator illuminated, move the FUEL switch to the ON (middle) position. Run the fuel pump for a minimum of two minutes to flush moisture out.</p> <p>l. Place FUEL switch in the OFF (down) position and turn-off Control-Indicator Panel power.</p> <p>m. Connect fuel supply hose end (4) and fuel return hose end (5) to fuel can lid assembly (6).</p>



Section IV. ORGANIZATIONAL TROUBLESHOOTING PROCEDURES

4-8 SCOPE.

a. The troubleshooting table lists common malfunctions you can find during inspection and/or maintenance of the smoke generator set. You should perform test or inspection and corrective action procedures in the order listed in the table. The smoke generator schematic (P. 4-181) should be used as a reference when performing electrical troubleshooting.

b. This manual cannot list all the malfunctions that can occur nor provide all the tests, inspections, and corrective actions. If a malfunction is not listed or is not corrected by the listed corrective actions, notify your supervisor.

c. Use the following symptom index to locate troubleshooting procedures.

*SYMPTOM INDEX*

	Troubleshooting Procedure Page
1. POWER INDICATOR DOES NOT LIGHT	4-6
2. FIRE INDICATOR DOES NOT LIGHT	4-7
3. AIR INDICATOR DOES NOT LIGHT	4-9
4. FUEL INDICATOR DOES NOT LIGHT	4-9
5. ENGINE INDICATOR DOES NOT LIGHT	4-11
6. FOG OIL INDICATOR DOES NOT LIGHT	4-12
7. PANEL LIGHTS DO NOT LIGHT	4-13
8. SMOKE TEMP INDICATOR DOES NOT WORK	4-14
9. AIR COMPRESSOR DOES NOT RUN	4-15
10. AIR COMPRESSOR RUNS CONTINUOUSLY	4-16
11. NO START AIR BLAST	4-16
12. NO FUEL FLOW	4-18
13. ENGINE WILL NOT START	4-19

NOTES

Troubleshooting procedures given in this table are the same for both smoke generators and either side of the control panel assembly.

Some of the troubleshooting procedures require two people. Before performing these procedures, make sure the second person is available.

System uses vehicle battery for power. Do not operate system without vehicle engine running. See vehicle operator manual.

On M1059 vehicles, the control panel has to be removed from mounting bracket and lowered to access electrical connector sockets for measurements.

28v will range from 24 to 28 volts.

**TROUBLESHOOTING**

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MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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1. POWER INDICATOR DOES NOT LIGHT.

*Step 1.* Check POWER indicator lamp.

Set circuit breaker CB1 and POWER switch to ON.

Press lens of POWER indicator.

If lamp does not light, replace lamp (P. 4-110).

If lamp still does not light, go to next step.

*Step 2.* Check for 28v at power supply cable assembly.

Disconnect power supply cable from control panel connector 1J1.

Check for 28v input at disconnected end of power supply cable with voltmeter referenced to ground.

If 28v input is present, connect power supply cable to control panel connector 1J1 and go to next step.

If 28v input is not present, connect power supply cable to control panel connector 1J1 and notify your supervisor.

*Step 3.* Check for 28v output from circuit breaker CB1.

Disconnect cable assembly from control panel connector 1J2.

Set circuit breaker CB1 to ON.

Check for 28v between sockets B (+) and C (-) of 1J2.

If 28v is obtained, go to next step.

If 28v is not obtained, replace CB1 (P. 4-110).

## TROUBLESHOOTING (CONT)

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MALFUNCTION	
TEST OR INSPECTION	
CORRECTIVE ACTION	

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*Step 4.* Check for 28v output from POWER switch.

Set POWER switch to ON.

Check for 28v between sockets A (+) and C (-) of 1J2.

If 28v is obtained, troubleshoot wiring (P. 4-127) in control panel between POWER switch and indicator. Repair wiring or replace indicator (P. 4-110) as required.

If 28v is not obtained, replace POWER switch (P. 4-110).

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## 2. FIRE INDICATOR DOES NOT LIGHT.

*Step 1.* Check FIRE indicator lamps.

Replace lamps in FIRE indicator (P. 4-110).

Set circuit breaker CB1 and power switch to ON and retest.

If circuit breaker CB1 trips to OFF, go to next step.

If lamps do not light in 2 seconds, go to step 3.

*Step 2.* Check for short in fire detector control unit.

Disconnect cable assembly CU-1 from fire detector control unit in control panel. Refer to P. 4-123 for location.

Set circuit breaker CB1 and power switch to ON position.

If circuit breaker CB1 stays in ON position, fire detector control unit is faulty, replace control unit (P. 4-110).

If circuit breaker CB1 goes to OFF position, check power wiring (P. 4-127) to control unit for short circuit and repair.

*Step 3.* Check for open circuit in control panel.

Disconnect cable assemblies from connectors 1J3 and 1J4 at control panel.

Check continuity between socket J of 1J3 and J of 1J4 then socket K of 1J3 and K of 1J4.

If continuity was obtained, reconnect cable assemblies and retest lamp.

If lamp does not light, check control panel wiring (P. 4-127) for an open circuit in the cable assembly CU-1 (P. 4-110), or FIRE/TEST switch (P. 4-110) as required.

If lamp still does not light, disconnect cables and install a jumper wire in sockets J and K of 1J3 and sockets J and K of 1J4. Retest lamp.

If lamp lights, remove jumpers, reconnect cables and go to step 4.

If lamp does not light, replace control unit (P. 4-110).

**TROUBLESHOOTING (CONT)**

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MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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*Step 4.* Check for open circuit in smoke generator.

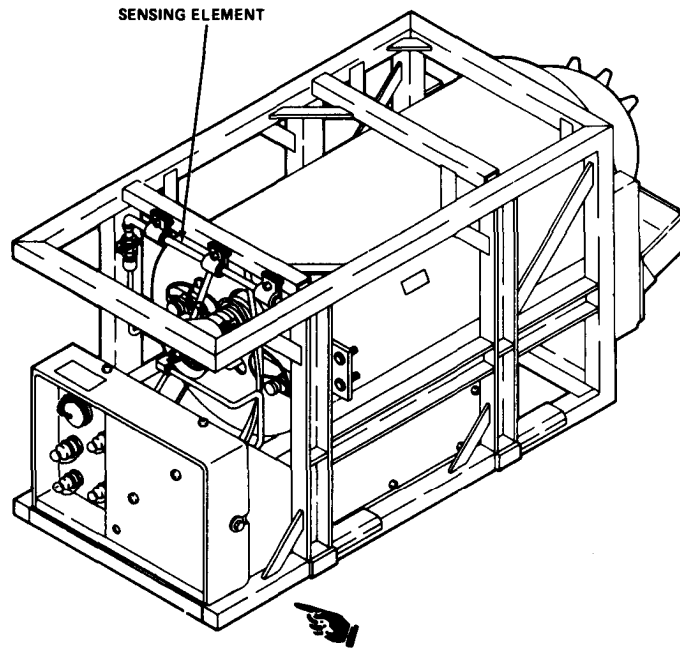
Disconnect cable assembly from connector 5J1 at each smoke generator.

Check continuity between pins J and K of connector 5J1 at each smoke generator.

If continuity was obtained, one of the vehicle cable assemblies is defective. Notify your supervisor.

If continuity was not obtained, go to next step.

*Step 5.* Check sensing elements of both smoke generators.



Disconnect cable assembly from sensing elements.

Check continuity between center pins of sensing elements. Do not short center pin to connector shell.

If continuity was obtained, check smoke generator wiring (P. 4-34) for an open circuit. Repair wiring or replace cable assembly W12 (P. 4-22) as required.

If continuity was not obtained, replace sensing element (P. 4-22).

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## TROUBLESHOOTING (CONT)

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MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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## 3. AIR INDICATOR DOES NOT LIGHT.

*Step 1.* Check that air compressor started when circuit breaker CB1 and POWER switch were set to ON.

If air compressor started, go to next step.

If air compressor did not start, go to malfunction 9.

*Step 2.* Check AIR indicator lamp after air compressor stops.

Press lens of indicator.

If lamp does not light, replace lamp (P. 4-110).

If lamp lights, go to next step.

*Step 3.* Check for 28v output from control panel.

Disconnect cable assembly from connector 1J3 or 1J4 (No. 1 or No. 2 generator) at control panel.

Check for 28v between sockets A (+) and N (-) of 1J3 or 1J4 (No. 1 or No. 2 generator).

If 28v is obtained, reconnect cable assembly and go to next step.

If 28v is not obtained, check control panel wiring (P. 4-125) for an open circuit.

*Step 4.* Check pressure switch S106.

Disconnect cable assembly from connector 5J1 at smoke generator.

Check continuity between pins A and E of connector 5J1.

If continuity is obtained, vehicle cable assembly is defective. Notify your supervisor.

If continuity is obtained, vehicle cable assembly is defective. Refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.

If continuity is not obtained, replace pressure switch S106 (P. 4-98).

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## 4. FUEL INDICATOR DOES NOT LIGHT.

*Step 1.* Check FUEL indicator lamp.

Set circuit breaker CB1 and POWER switch to ON.

Press lens of FUEL indicator.

If lamp does not light, replace lamp (P. 4-110).

If lamp lights, go to next step.

TROUBLESHOOTING (CONT)

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MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
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*Step 2.* Check fuel pump operation.

**CAUTION**

Do not hold FUEL switch in START position for more than 30 seconds.

Hold FUEL switch in START position and listen for pump operation at smoke generator.

If fuel pump is operating, set FUEL and POWER switches to OFF and replace fuel pressure switch S108 (P. 4-98).

If fuel pump is not operating, set FUEL switch to RUN and go to next step.

*Step 3.* Check control panel circuit.

Disconnect cable assembly from connector 5J1 at smoke generator.

Check for continuity between pins C and F at cable connector.

If continuity is obtained, reconnect cable assembly and go to next step.

If continuity is not obtained, reconnect cable assembly and go to step 6.

*Step 4.* Check smoke generator circuit.

Disconnect cable assembly from connector 5J2 at smoke generator. Refer to P. 4-79 for location.

Check for continuity between pins C and D of connector 5J2.

If continuity is obtained, reconnect cable assembly and go to next step.

If continuity is not obtained, replace high temp thermal switch TS101 (P. 4-105) or cable assembly 5J2 (P. 4-65).

*Step 5.* Check relay K101 in container assembly. Refer to P. 4-78 for location.

Check for 28v between terminal A2 (+) of relay and terminal 16 of terminal board TB12 with FUEL switch in START position.

If 28v is obtained, set all switches to OFF and replace pump motor assembly (P. 4-36).

If 28v is not obtained, set all switches to OFF and replace relay K101 (P. 4-67).

## TROUBLESHOOTING (CONT)

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MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

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*Step 6.* Check vehicle cable.

Disconnect cable assembly from 1J3 or 1J4 (No. 1 or No. 2 generator) at control panel.

Check continuity between sockets C and F of connector 1J3 or 1J4.

If continuity is obtained, vehicle cable assembly is defective. Refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.

If continuity is not obtained, repair control panel wiring (P. 4-127) or replace fuel switch (P. 4-110) as required.

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#### 5. ENGINE INDICATOR DOES NOT LIGHT.

*Step 7.* Check ENGINE indicator lamp.

Set circuit breaker CB1 and POWER switch to ON.

Press lens of ENGINE indicator.

If lamp does not light, replace lamp (P. 4-110).

If lamp lights, go to next step.

*Step 2.* Follow starting procedure and check that engine starts.

If engine does not start, set ENGINE, FUEL, and POWER switches to OFF and go to malfunction 13.

If engine starts and ENGINE indicator does not light, set FUEL and POWER switches to OFF and go to next step.

*Step 3.* Check engine run thermal switch S104 circuit.

Set ENGINE switch to RUN.

Disconnect cable assembly from 5J1 at smoke generator.

Check continuity between sockets D and G of cable assembly.

If continuity was obtained, replace engine run thermal switch S104 (P. 4-106) or cable assembly 5J2 (P. 4-67).

If continuity was not obtained, go to next step.

*Step 4.* Check vehicle cable assembly.

Disconnect cable assembly from connector 1J3 or 1J4 (No. 1 or No. 2 generator) at control panel.

Check continuity between sockets D and G of 1J3 or 1J4.

TROUBLESHOOTING (CONT)

---

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

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If continuity is obtained, vehicle cable assembly is defective. Refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.

If continuity was not obtained, repair control panel wiring (P. 4-127) or replace ENGINE switch (P. 4-110) as required.

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6. FOG OIL INDICATOR DOES NOT LIGHT.

*Step 1.* Check FOG OIL indicator lamp.

Set circuit breaker CB1 and POWER switch to ON.

Press lens of FOG OIL indicator.

If lamp does not light, replace lamp (P. 4-110).

If lamp lights, set POWER switch to OFF and go to next step.

*Step 2.* Check fog oil pressure switch S103.

Remove eight screws and washers securing left equipment container panel and remove panel.

Set OIL switch S113 to ON.

Disconnect cable assembly from 1J5 on control panel.

Set POWER switch ON.

If FOG OIL indicator lights, go to next step:

If FOG OIL indicator does not light, set POWER switch to OFF and go to step 6.

*Step 3.* Check control panel output voltage.

Set FOG OIL switch to RUN.

Check for 28v between sockets A (+) and B (-) of 1J5 for No. 1 generator or sockets C (+) and D (-) for No. 2 generator.

If 28v is obtained, set FOG OIL switch to OFF, reconnect cable assembly to 1J5, and go to next step.

If 28v is not obtained, set FOG OIL and POWER switches to OFF, and check control panel wiring (P. 4-127). Repair wiring or replace POWER switch, relay K103/203, or FOG OIL FLOW rheostat (P. 4-110) as required.

## TROUBLESHOOTING (CONT)

## MALFUNCTION

## TEST OR INSPECTION

## CORRECTIVE ACTION

- 
- Step 4.* Check vehicle cable.
- Disconnect cable assembly from connector 6J3 on fog oil pump assembly.
- Set FOG OIL switch to RUN.
- Check for 28v between sockets A (+) and B (-) of cable connector for No. 1 generator on sockets C (+) and D (-) for No. 2 generator.
- If 28v is obtained, set FOG OIL switch to OFF, reconnect cable assembly to 6 J3, and go to next step.
- If 28v is not obtained, vehicle cable assembly is defective. Set all switches to OFF. Refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.
- Step 5.* Check fog oil pump pressure (P. 4-145).
- If correct pressure is obtained, replace fog oil pressure switch S103 (P. 4-98).
- If correct pressure is not obtained, check pump gears for free movement, pitting, or corrosion (P. 4-148).
- Recheck pump pressure to ensure pump is running.
- If no pump pressure is obtained, replace fog oil pump (P. 4-134).
- Step 6.* Check smoke generator wiring.
- Disconnect cable assembly from connector 5J1 at smoke generator.
- Check continuity between pins A and B of connector 5J1.
- If continuity was obtained, set OIL switch S113 in equipment container to OFF and go to next step.
- If continuity was not obtained, repair smoke generator wiring (P. 4-34).
- Step 7.* Check control panel wiring.
- Disconnect cable assembly from connector 1J3 or 1J4 (No. 1 or No. 2 smoke generator).
- Connect a jumper wire between sockets A and B of connector 1J3 or 1J4.
- Set POWER switch to ON and check that FOG OIL indicator lights.
- If FOG OIL indicator lights, vehicle cable assembly is defective. Set POWER switch to OFF, remove jumper. Refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.
- If FOG OIL indicator does not light, set POWER switch to OFF, remove jumper and repair control panel wiring (P. 4-127).
-

TROUBLESHOOTING (CONT)

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MALFUNCTION	
TEST OR INSPECTION	
CORRECTIVE ACTION	

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7. PANEL LIGHTS DO NOT LIGHT.

*Step 1.* Check panel lights.

Set POWER switch to ON.

Rotate PANEL LIGHT rheostat fully clockwise.

If panel lamps do not light, go to next step.

If some panel lamps do not light, replace defective lamps (P. 4-108).

*Step 2.* Check for power to POWER switch.

Check for 28v between pin 8 of POWER switch, and chassis ground.

If 28v is present, go to next step.

If 28v is not present, check control panel wiring (P. 4-127) for open or shorted condition.

*Step 3.* Check POWER switch.

Check for 28v between pin 9 of POWER switch and chassis ground.

If 28v is present, check control panel wiring (P. 4-127) for open or shorted condition.

If 28v is not present, replace POWER switch (P. 4-110).

---

8. SMOKE TEMPERATURE INDICATOR DOES NOT WORK.

*Step 1.* Check thermalcouple continuity.

Disconnect cable assembly from connector 5J2 on equipment container.

Check continuity between pins A and B of cable assembly.

If continuity is present, reconnect cable assembly and go to next step.

If continuity is not present, replace cable assembly W12 (P. 4-22).

*Step 2.* Check smoke generator circuit.

Disconnect cable assembly from connector 5J1 at smoke generator.

Check continuity between pins L and M of connector 5J1.

If continuity was obtained, reconnect cable assembly and go to next step.

If continuity was not obtained, check smoke generator wiring (P. 4-34) for an open circuit,

## TROUBLESHOOTING (CONT)

## MALFUNCTION

## TEST OR INSPECTION

## CORRECTIVE ACTION

*Step 3.* Check vehicle cable assembly.

Disconnect cable assembly from connector 1J3 or 1J4 (No. 1 or No. 2 generator) at control panel.

Check continuity between pins L and M or cable assembly.

If continuity is not present, vehicle cable assembly is defective. Refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.

If continuity is present, check control panel wiring (P. 4-127) of an open circuit. Repair wiring or replace SMOKE TEMP indicator (P. 4-110).

## 9. AIR COMPRESSOR DOES NOT RUN.

*Step 1.* Check output power from control panel.

Disconnect cable assembly from connector 1J2.

Set circuit breaker CB1 and POWER switch to ON.

Check for 28v between sockets B (+) and C (-) and sockets A (+) and C (-) of connector 1 J2.

If 28v is present, set POWER switch to OFF and reconnect cable assembly. Go to next step.

If 28v is not present, check control panel wiring (P. 4-127) for open or shorted condition.

*Step 2.* Check cable assembly.

Disconnect cable assembly from connector 2J1 on air compressor assembly.

Set POWER switch to ON.

Check for 28v between sockets B (+) and C (-) and sockets A (+) and C (-) of cable assembly.

If 28v is present, set POWER switch to OFF. Go to next step.

If 28v is not present, set POWER switch to OFF. Refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.

TROUBLESHOOTING (CONT)

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MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

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Step 3. Check continuity of cable assembly 2J1 on air compressor.

Check for continuity between pins A, B, and C of connector 2J1 and terminals 1, 2, and 3 of terminal board TB14. See wiring diagram (P. 4-165).

If continuity is not present in all cases, replace cable assembly 2J1 (P. 4-151).

If continuity is present in all cases, reconnect cable assembly and go to next step.

Step 4. Check air pressure switch S114.

Bleed air from air compressor tank through control valve.

Check for continuity between terminal 1 of terminal board TB14 and terminal X2 of relay K104.

If continuity is present, go to next step.

If continuity is not present, replace pressure switch S114 (P. 4-151).

Step 5. Check relay K104.

Check for continuity between terminals X1 and X2 of relay K104.

If continuity is present, go to next step.

If continuity is not present, replace relay K104 (P. 4-151).

Step 6. Check air compressor.

Set POWER switch to ON.

Check for 28v between terminals X1 and A1 of relay K104.

If 28v is present, replace air compressor (P. 4-151).

If 28v is not present, replace relay K104 (P. 4-151).

---

10. AIR COMPRESSOR RUNS CONTINUOUSLY.

Step 1. Check air compressor hoses for leaks.

If leaks are found, refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.

If no leaks are found, go to next step.



## TROUBLESHOOTING (CONT)

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MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

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Step 2. Check air compressor pressure switch S114.

Follow procedures (P. 4-167) for checking pressure switch.

If pressure reading is less than 63  $\pm$ 3 psig, replace air compressor (P. 4-151).

If pressure reading is more than 63  $\pm$ 3 psig, replace pressure switch (P. 4-151).

---

## 11. NO START AIR BLAST.

Step 1. Check output power from control panel.

Disconnect cable assembly from connector 1J3 or 1J4 (No. 1 or No. 2 generator) on control panel.

Set circuit breaker CB1 and POWER switch to ON.

Hold ENGINE switch to START.

Check for 28v between sockets H (+) and N (-) of connector 1J3 or 1J4.

If 28v is present, set POWER and ENGINE switches to OFF, reconnect cable assembly and go to next step.

If 28v is not present, set POWER and ENGINE switches to OFF, and check control panel wiring (P. 4-127) for open or shorted condition.

Step 2. Check vehicle cable assembly.

Disconnect cable assembly from connector 5J1 at smoke generator.

Set POWER switch to ON.

Hold ENGINE switch to START.

Check for 28v between sockets H (+) and N (-) of cable assembly.

If 28v is present, set POWER and ENGINE switches to OFF and go to next step.

If 28v is not present, vehicle cable assembly is defective. Set POWER and ENGINE switches to OFF. Refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.

TROUBLESHOOTING (CONT)

MALFUNCTION

TEST OR INSPECTION

CORRECTIVE ACTION

- 
- Step 3. Check wiring at equipment container terminal board TB12.
- Remove eight screws and washers securing left equipment container panel and remove panel.
- Check continuity between pin H of 5J1 and terminal 8 of terminal board TB12 and pin N of 5J1 and terminal 18 of TB12.
- If continuity was obtained, reconnect cable assembly to connector 5J1 and go to next step.
- If continuity was not obtained, repair wiring (P. 4-34).
- Step 4. Check start air hose. Refer to P. 4-88 for location.
- Check that air hose is not cut, collapsed, or pinched.
- If air hose is damaged, replace damaged hose.
- If air hose is not damaged, replace solenoid assembly (P. 4-70).
- 

12. NO FUEL FLOW.

- Step 1. Check fuel can lid assembly check valve/orifice cap.
- Remove fuel can lid assembly from fuel can and check that the check valve is not damaged, clogged, or that orifice cap hole in new version is not blocked.
- Clean check valve, ensuring that spring plunger/ball moves freely and does not bind or carefully clean out orifice hole in cap.
- Reconnect fuel can lid assembly to the fuel can. Ensure that the fuel supply, return hoses are not damaged, leaking, torn, or collapsed. Replace/repair hoses as required (TM 3-1040-284-20&P or TM 9-2350-261-24P).
- Step 2. Check fuel filter.
- Remove fuel filter from cover assembly (P. 4-36).
- Wipe filter clean and blow air through filter with low pressure (10 psi) compressed air.
- If air flow is good, reinstall filter and go to next step.
- If air flow is restricted, replace fuel filter.
- Step 3. Check control panel circuit.
- Disconnect cable assembly from 1J3 or 1J4 (No. 1 or No. 2 generator) on control panel.
- Set POWER switch to ON.
- Hold ENGINE switch to START.
- Check for 28v between sockets G (+) and N (-) of connector 1J3 or 1J4.
- If 28v is obtained, set switches to OFF, reconnect cable assembly and go to next step.
- If 28v is not obtained, set switches to OFF, and repair control panel wiring (P. 4-127) or replace ENGINE switch (P. 4-110).

TROUBLESHOOTING (CONT)

---

MALFUNCTION	
TEST OR INSPECTION	
CORRECTIVE ACTION	

---

*Step 4.* Check vehicle cable.

Disconnect cable assembly from 5J1 at smoke generator.

Set POWER switch to ON.

Hold ENGINE switch to START.

Check for 28v between sockets G (+) and N (-) of cable assembly.

If 28v is obtained, set switches to OFF, repair smoke generator wiring (P. 4-34) or replace solenoid valve (P. 4-36).

If 28v is not obtained, vehicle cable assembly is defective. Refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.

---

13. ENGINE WILL NOT START.

**NOTE**

Two people are required to perform this task.

*Step 1.* Check igniter and igniter cable.

Set circuit breaker CB1 and POWER switch to ON.

Ensure FUEL switch is in OFF position.

Purge air from air compressor assembly.

Remove engine head assembly (Para 3-8) and insert clear engine head blank (item 2, Section III. Basic Issue Items, App. C).

**WARNING**

Failure to insert engine head blank may cause fire flashback and injury to personnel.

**CAUTION**

Do not hold ENGINE switch in START position for longer than 15 seconds.

Hold ENGINE switch in START position, and observe spark from igniter in combustion chamber.

If spark is present set all switches to OFF, reinstall head assembly and continue troubleshooting for adequate fuel/air.

If no spark is present, set all switches to OFF and disconnect ignition cable from igniter. Set POWER switch to ON. Place or hold end of ignition cable ¼ inch from frame assembly. Hold ENGINE switch to START.

If spark is present, set all switches to OFF, replace igniter and repeat troubleshooting.

If no spark is present, set all switches and circuit breaker CB1 to OFF, replace the ignition coil (P. 4-67) and continue troubleshooting.

---

## Section V. ORGANIZATIONAL MAINTENANCE PROCEDURES

### 4-9 M157 SMOKE GENERATOR SET.

---

This task covers painting of smoke generator set and replacement of:

- a. Control Panel Assembly*
  - b. Air Compressor Assembly*
  - c. M54 Smoke Generator*
  - d. Fog Oil Tank Assembly*
  - e. Fog Oil Pump Assembly (P. 4-21)*
- 

#### INITIAL SETUP

##### Tools

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

##### References

TM 3-1040-280-20&P  
TM 9-2350-261-20-1  
TM 43-0139

##### Materials

Paint Brush (Item 2, App E)  
Abrasive Cloth (Item 3, App E)  
Polyurethane Coating (Item 9, App E)  
Primer Coating (Item 10, App E)

---

#### PAINTING

##### CAUTION

Do not paint engine head assembly, outlet nozzle assembly, nozzle assembly, air compressor motor, fog oil pumps, fire detection element, cable assemblies, fuel hoses, fog oil houses, or air pressure hoses.

1. Remove burrs, corrosion, and chipped paint.
  2. Touch up outside surfaces of smoke generator set with primer coating and polyurethane coating. See TM 43-0139.
- 

- a. Control Panel Assembly.*
  - b. Air Compressor Assembly.*
  - c. M54 Smoke Generator.*
  - d. Fog Oil Tank Assembly.*
- 

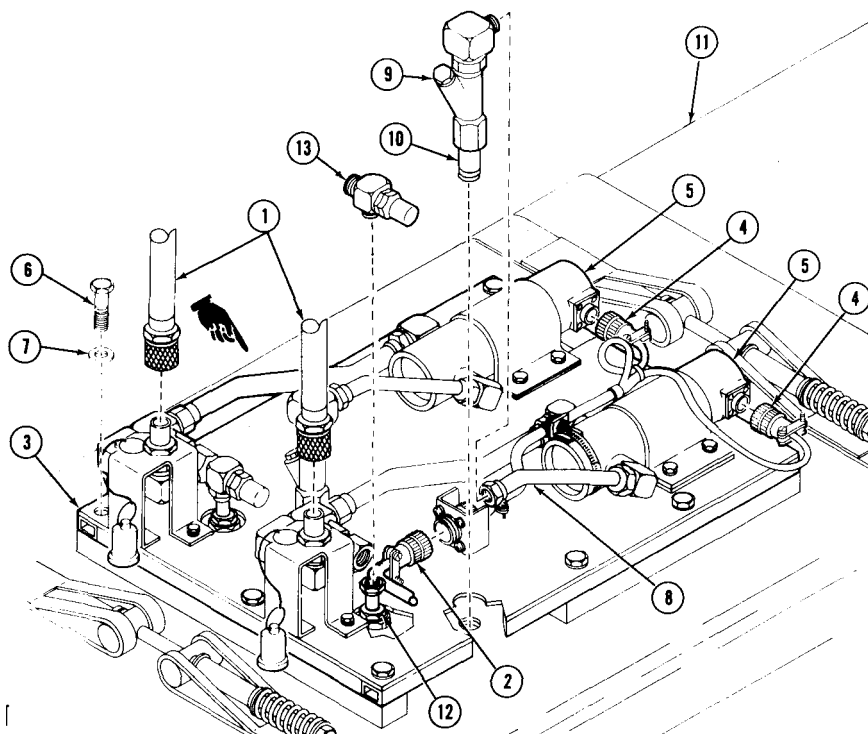
#### REMOVAL/INSTALLATION

Refer to TM 9-2350-261-20-1 for equipment mounted on M1059 vehicles or TM 3-1040-280-20&P for equipment mounted on M1037/M1097 vehicles.

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**e. Fog Oil Pump Assembly.****REMOVAL**

1. Disconnect fog oil hoses (1) and cable assembly (2) from fog oil pump assembly (3).
2. Tag and disconnect cable assembly (4) from fog oil pumps (5).
3. Remove 12 screws (6) and washers (7).
4. Disconnect two hose assemblies (8) from two strainer assemblies (9).
5. Remove two strainer assemblies (9) from nipples (10) from fog oil tank (11).
6. Remove two flare nuts (12) from two pressure relief valves (13).
7. Remove fog oil pump assembly (3) from fog oil tank (11).

**INSTALLATION**

1. Position fog oil pump assembly (3) on top of fog oil tank (11).
2. Install two flare nuts (12) on relief pressure valve (13).
3. Install two strainer assemblies (9) with nipples (10) in fog oil tank (11).
4. Install two hose assemblies (8) on two strainer assemblies (9).
5. Install 12 screws (6) with washers (7) and secure fog oil pump assembly (3).
6. Connect cable assembly (4) to fog oil pumps (5) as tagged.
7. Connect fog oil hoses (1) and cable assembly (2) to fog oil pump assembly (3).

## 4-10 M54 SMOKE GENERATOR.

---

This task covers replacement of:

- a. **Nozzle Assembly (P. 4-22).**
  - b. **Fog Oil Tube Assembly (P. 4-24).**
  - c. **Purge Air Tube Assembly (P. 4-25).**
  - d. **Check Valve (P. 4-26).**
  - e. **Drip Pan Assembly (P. 4-27).**
  - f. **Cable Assembly W12 (P. 4-28).**
  - g. **Pipe plug (P. 4-30).**
  - h. **Sensing Element (P. 4-31).**
  - i. **Element Clamp (P. 4-33).**
- 

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26  
Socket wrench (BIIL)

#### *Materials*

Safety Wire (Item 17, App E)  
Sealing Compound (Item 12, App E)

#### *General Safety Instructions*

Fog oil is slippery, cleanup all spills immediately to prevent injury.

Before performing any maintenance procedure, be sure circuit breaker CB1 is in the OFF position.

Pulse jet engine is hot during operation. Allow sufficient cooling before handling engine.

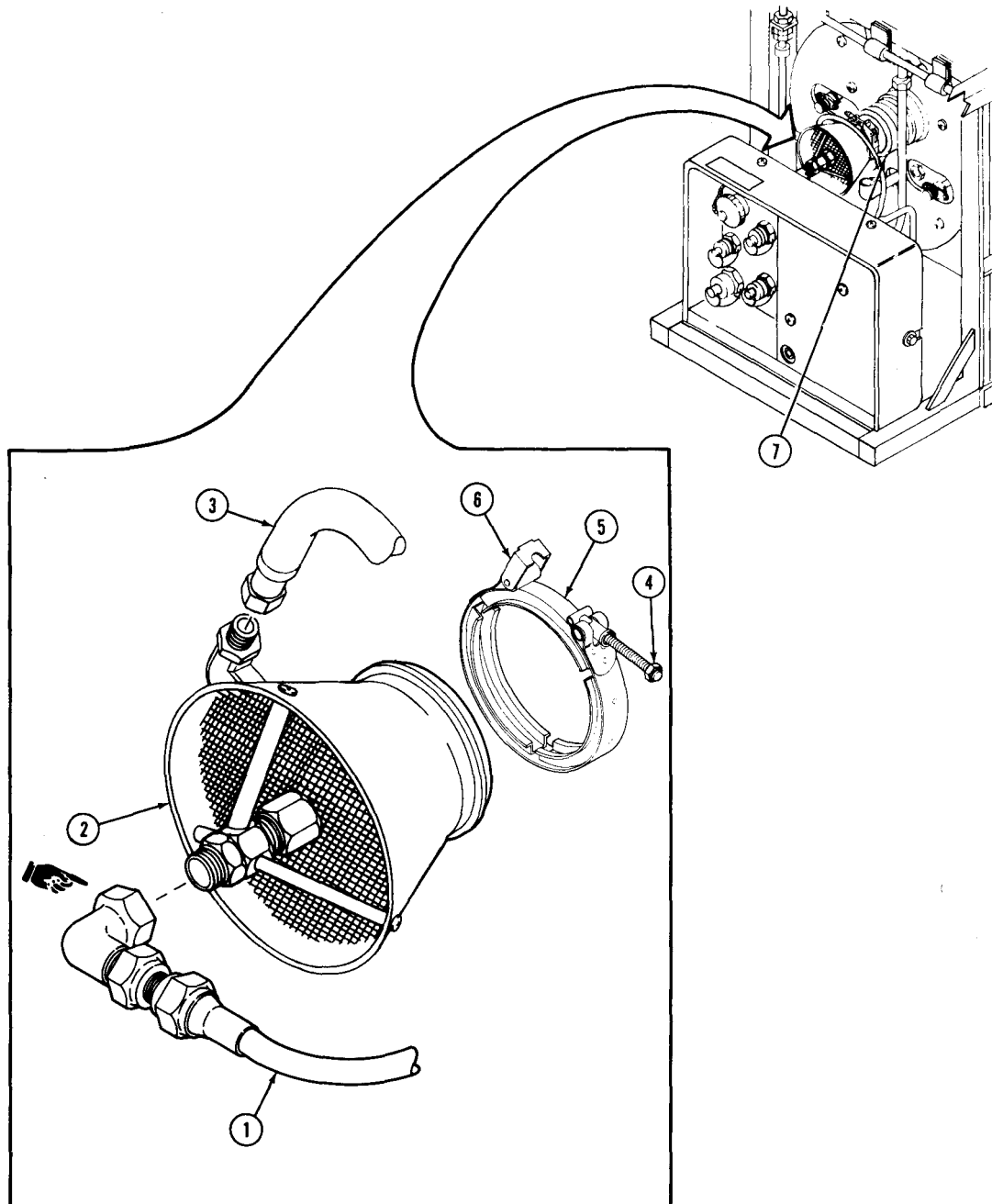
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#### **a. Nozzle Assembly.**

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### REMOVAL

1. Disconnect start air hose (3) from nozzle assembly (2).
2. Loosen clamp nut (4) on nozzle clamp (5).
3. Lift catch (6) on clamp (5) and remove clamp.
4. Remove nozzle assembly (2) from engine head (7).
5. Hold elbow of fuel hose (1) with a wrench and remove nozzle assembly (2) from fuel hose.



## INSTALLATION

1. Apply sealing compound (Item 12, App E) to threads of fuel hose fitting on nozzle assembly.
2. Connect fuel hose (1) to nozzle assembly (2).
3. Install nozzle assembly (2) on engine head (7) as illustrated.
4. Position nozzle clamp (5) on nozzle assembly (2) and engine head (7) and close catch (6), and tighten clamp nut (4).
5. Connect start air hose (3) to nozzle assembly (2).

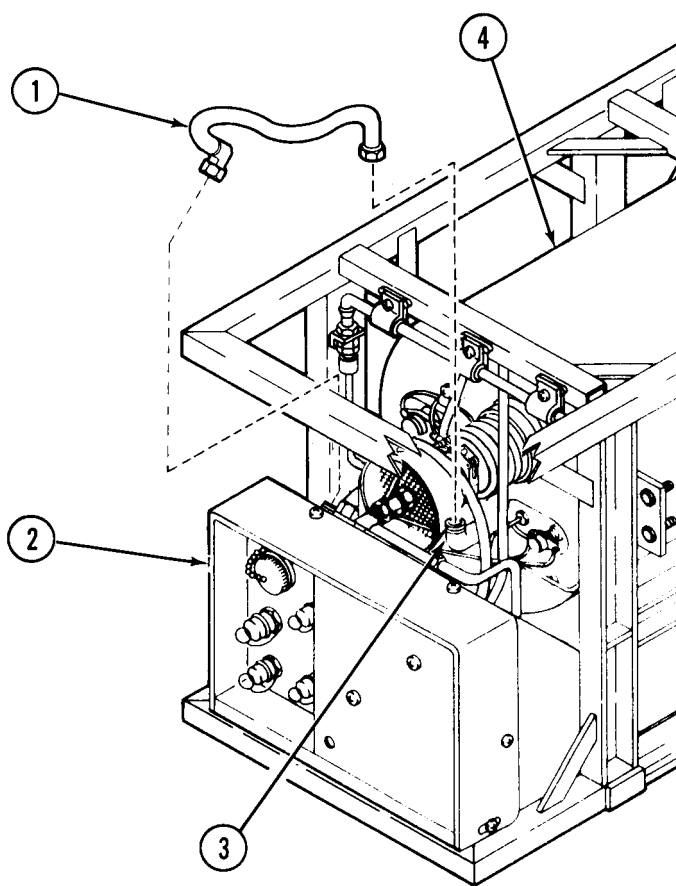
## 4-10 M54 SMOKE GENERATOR (CONT).

### *b. Fog Oil Tube Assembly.*

---

#### REMOVAL

1. Disconnect fog oil tube (1) assembly from equipment container (2).
2. Disconnect fog oil tube (1) from elbow (3) on pulse jet engine (4), and remove fog oil tube (1).



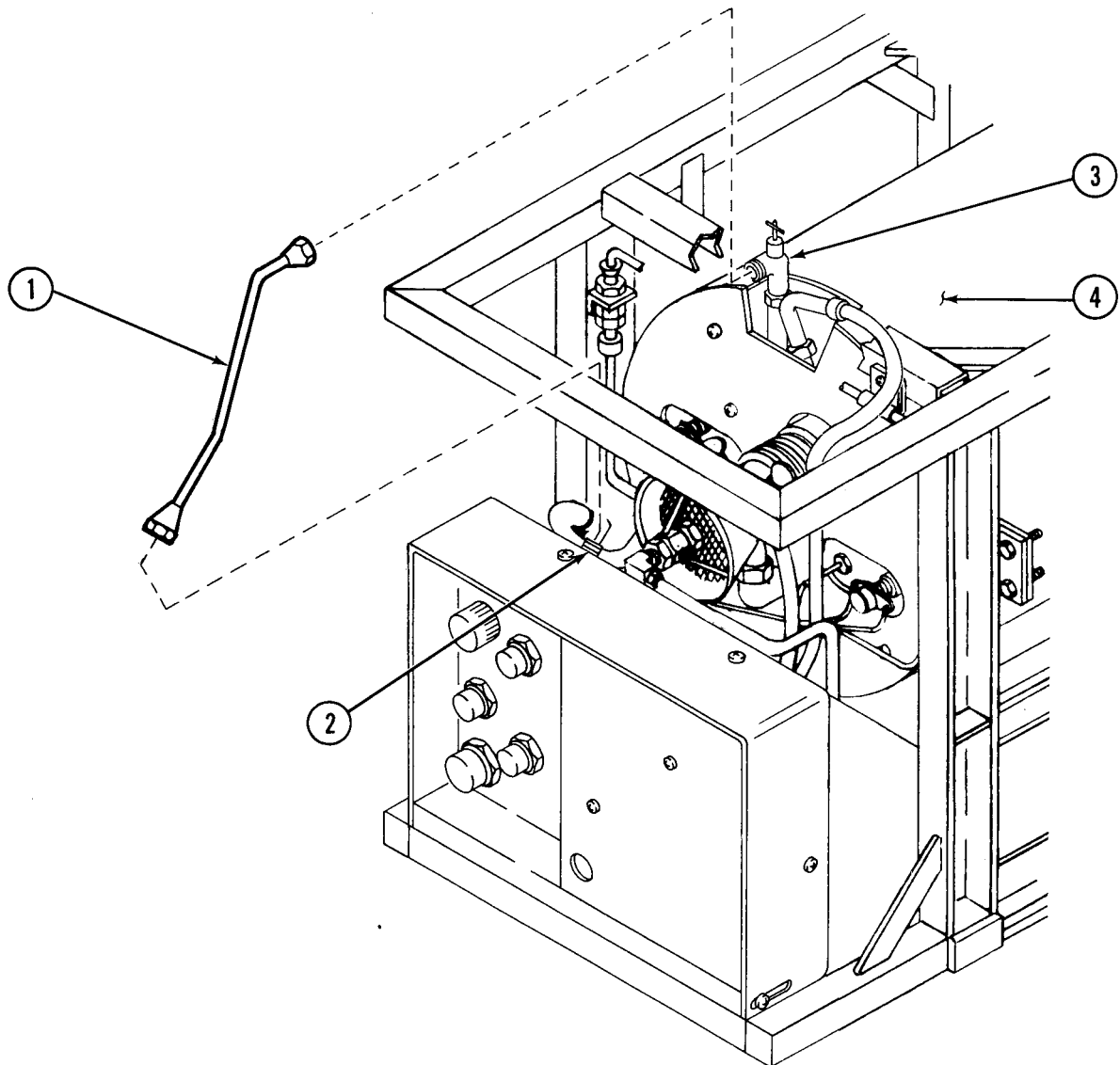
#### INSTALLATION

1. Connect fog oil tube (1) to elbow (3) on pulse jet engine (4).
  2. Connect fog oil tube (1) to equipment container (2).
-



*c. Purge Air Tube Assembly.***REMOVAL**

1. Disconnect purge air tube assembly (1) from equipment container (2).
2. Disconnect purge air tube (1) from hot gas valve (3) on pulse jet engine (4).

**INSTALLATION**

1. Connect purge air tube (1) to equipment container (2).
2. Connect purge air tube (1) to hot gas valve (3) on pulse jet engine (4).

## 4-10 M54 SMOKE GENERATOR (CONT).

### d. Check Valve

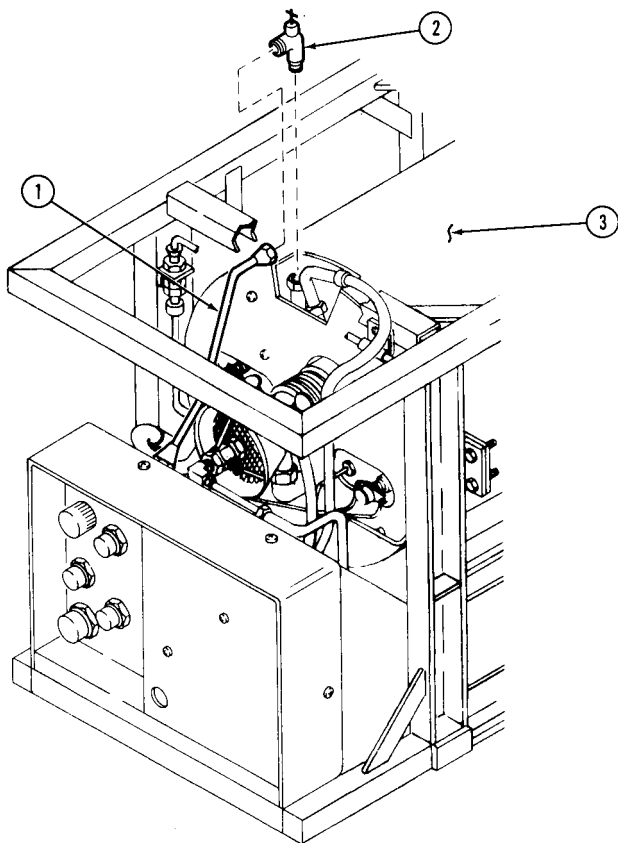
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#### REMOVAL

#### NOTE

On M1059 vehicles, lower inboard armor shield and remove smoke generator from vehicle mount for access (TM 9-2350-261-20-1).

1. Disconnect purge air tube (1) from check valve (2) on pulse jet engine (3).
2. Loosen connection at other end of purge air tube.
3. Remove check valve (2) from pulse jet engine (3).

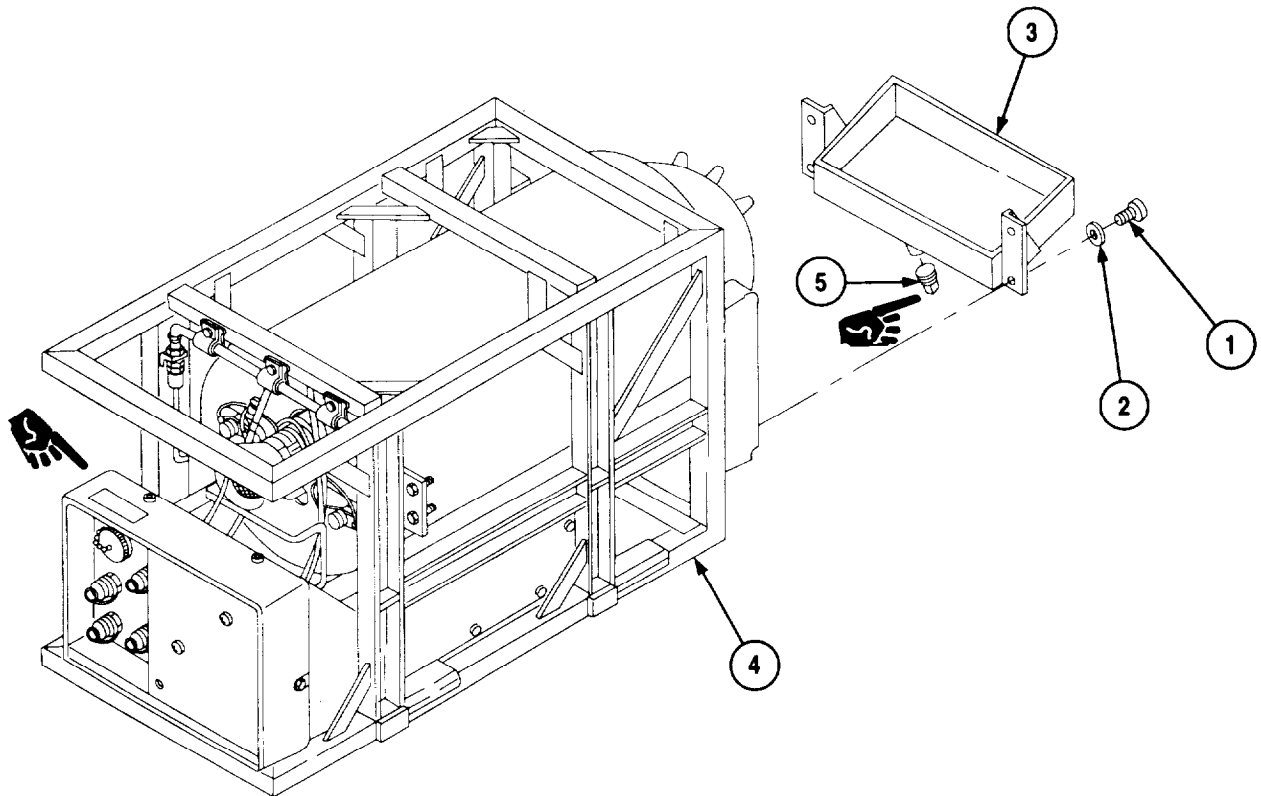


#### INSTALLATION

1. Connect check valve (2) to pulse jet engine (3).
  2. Connect purge air tube (1) to check valve (2) and tighten connections.
-

**e. Drip Pan Assembly.****REMOVAL**

1. Remove four screws (1) and washers (2) securing drip pan (3).
2. Remove drip pan (3) from frame (4).
3. Remove pipe plug (5) from drip pan (3).

**INSTALLATION**

1. Install pipe plug (5) on drip pan (3)
2. Position drip pan (3) on frame (4).
3. Secure drip pan (3) using four screws (1) and washers (2).

## 4-10 M54 SMOKE GENERATOR (CONT).

### *f. Cable Assembly W12.*

---

#### REMOVAL

1. Remove equipment container (P. 4-68).
2. Disconnect cable assembly (1) from sensing element (2).
3. Unscrew thermocouple lock nut (3) and remove thermocouple (4) from pulse jet engine (5).
4. Disconnect cable assembly (1) from engine run thermal switch (6), and engine overtemperature thermal switch (7).
5. Remove three screws (8), washers (9) and clamps (10) securing cable assembly (1) to cooling baffle (11) and remove cable assembly.

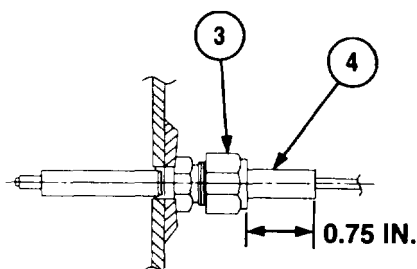
#### INSTALLATION

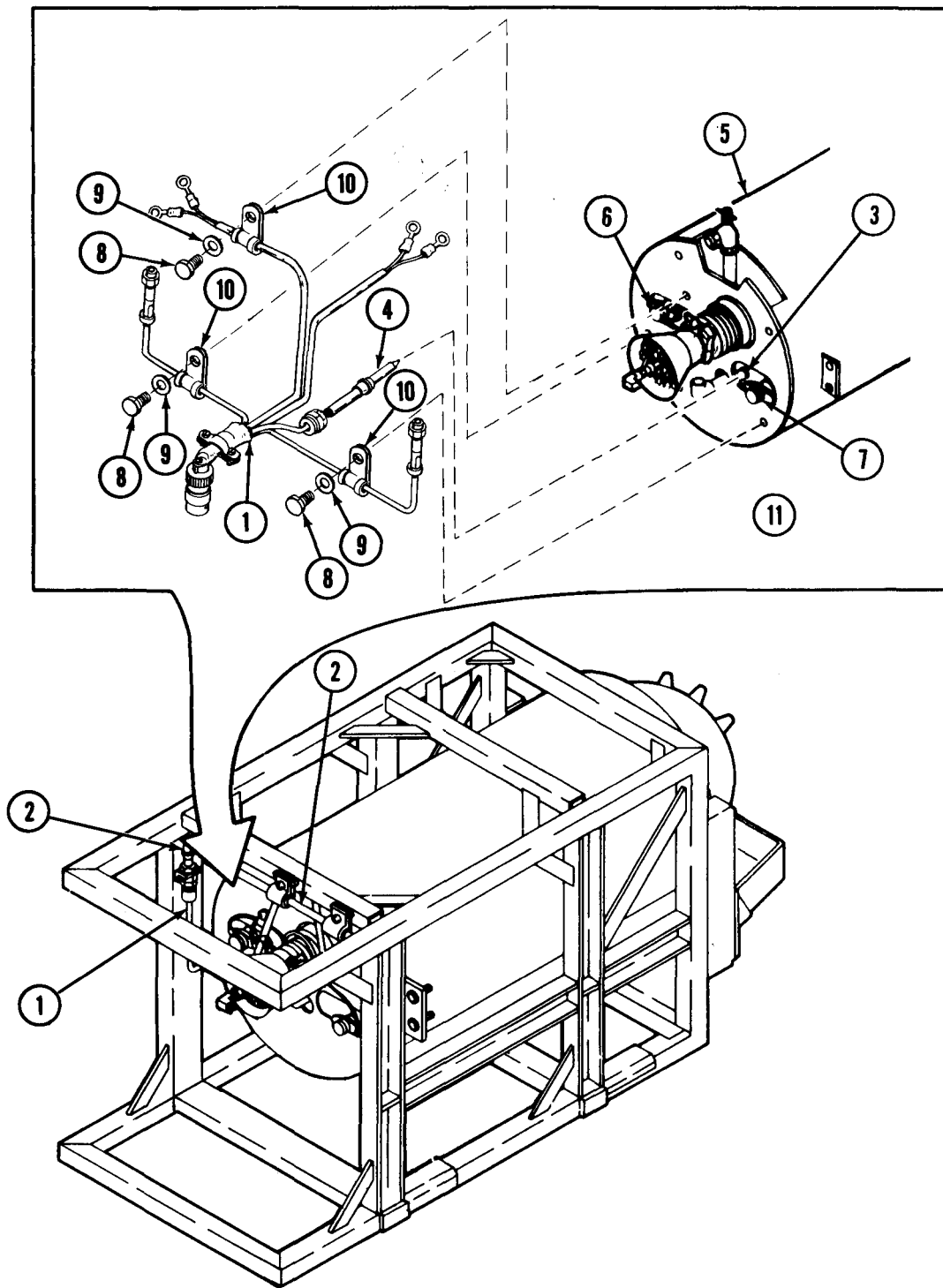
1. Secure cable assembly (1) to cooling baffle (11) using three screws (8), washers (9) and clamps (10).
2. Connect cable assembly (1) to engine run thermal switch (6), and engine over-temperature thermal switch (7).

#### CAUTION

Handle thermocouple with care. Rough handling will cause internal damage.

3. Apply antiseize compound (item 1 A, App E) to threads of locknut and install thermocouple (4) in pulse jet engine (5) as shown and tighten lock nut (3).
4. Connect cable assembly (1) to sensing element (2). Secure with safety wire (Item 16, App E).
5. Install equipment container (P. 4-68).





4-10 M54 SMOKE GENERATOR (CONT).

**g. Pipe Plug**

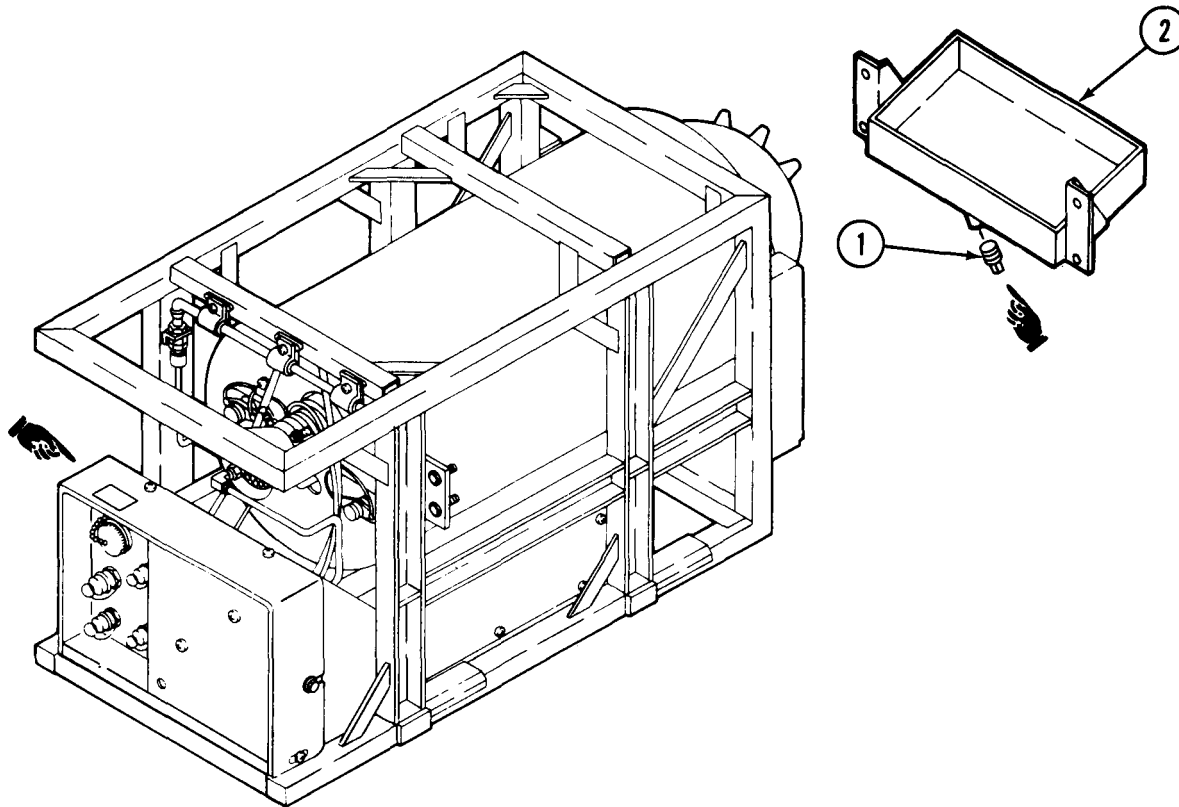
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REMOVAL

NOTE

Drip pan removed from smoke generator for clarity.

1. Remove pipe plug (1) from drip pan (2).



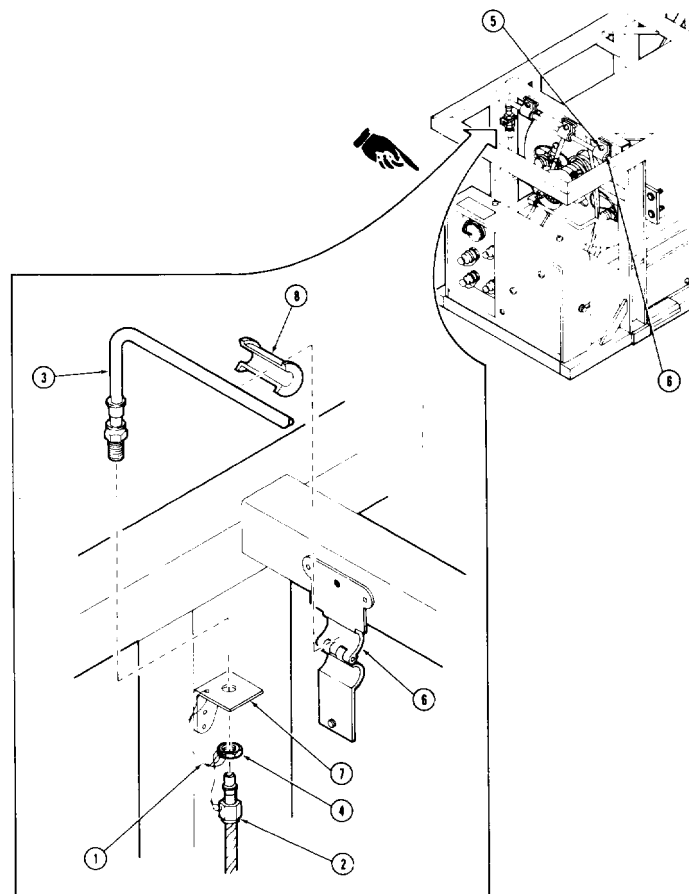
INSTALLATION

1. Install new pipe plug (1) on drip pan (2).
-

***h. Sensing Element.*****REMOVAL****NOTE**

On M1059 vehicles, lower inboard armor shield and remove smoke generator from vehicle mount for access (TM 9-2350-261-20-1).

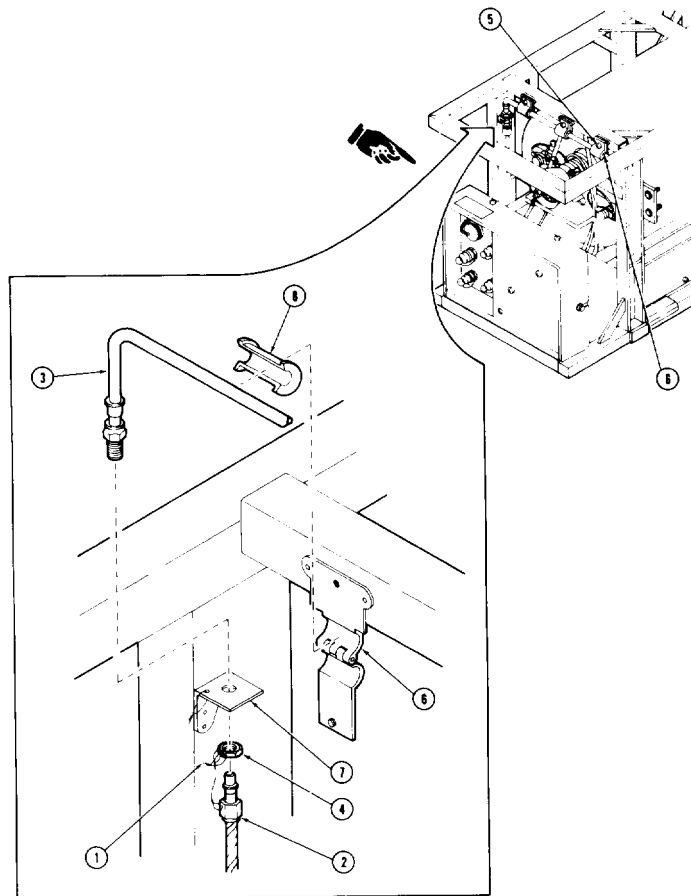
1. Remove safety wire (1).
2. Disconnect cable assembly (2) from sensing element (3).
3. Remove element nut (4) from element (3).
4. Turn three screws (5) on three element clamps (6) and remove sensing element (3) from element clamps (6), and brackets (7).
5. Remove grommets (8) from sensing element (3). Replace grommets as required.



## 4-10 M54 SMOKE GENERATOR (CONT).

### INSTALLATION

1. Install grommets (8) on sensing element (3).
2. Position sensing element (3) in three element clamps (6) and two brackets (7).
3. Secure sensing element (3) by closing three element clamps (6) and turning three screws (5).
4. Secure sensing element (3) to two brackets (7) by installing element nuts (4) on element (3).
5. Connect cable assembly (2) to sensing element (3).
6. Secure element nuts (4), sensing element (3), and cable assembly (2) with safety wire (1) (Item 16, App E).





*i. Element Clamp.*

---

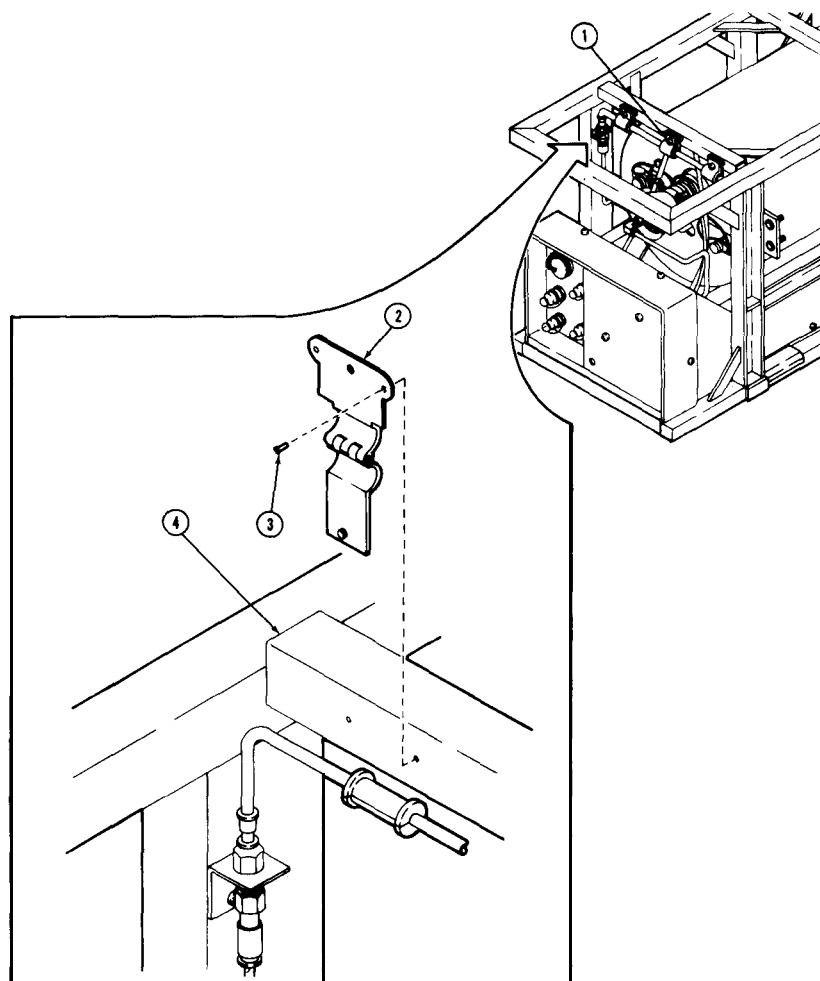
## REMOVAL

## NOTES

On M1059 vehicles, lower inboard armor shield and remove smoke generator from vehicle mount for access (TM 9-2350-261-20-1).

Removal of sensing element maybe required to replace element clamp (Refer to P. 4-31).

1. Turn screw (1) on element clamp (2) and open element clamp.
2. Remove rivets (3) from element clamp (2) and remove element clamp from frame assembly (4).



## INSTALLATION

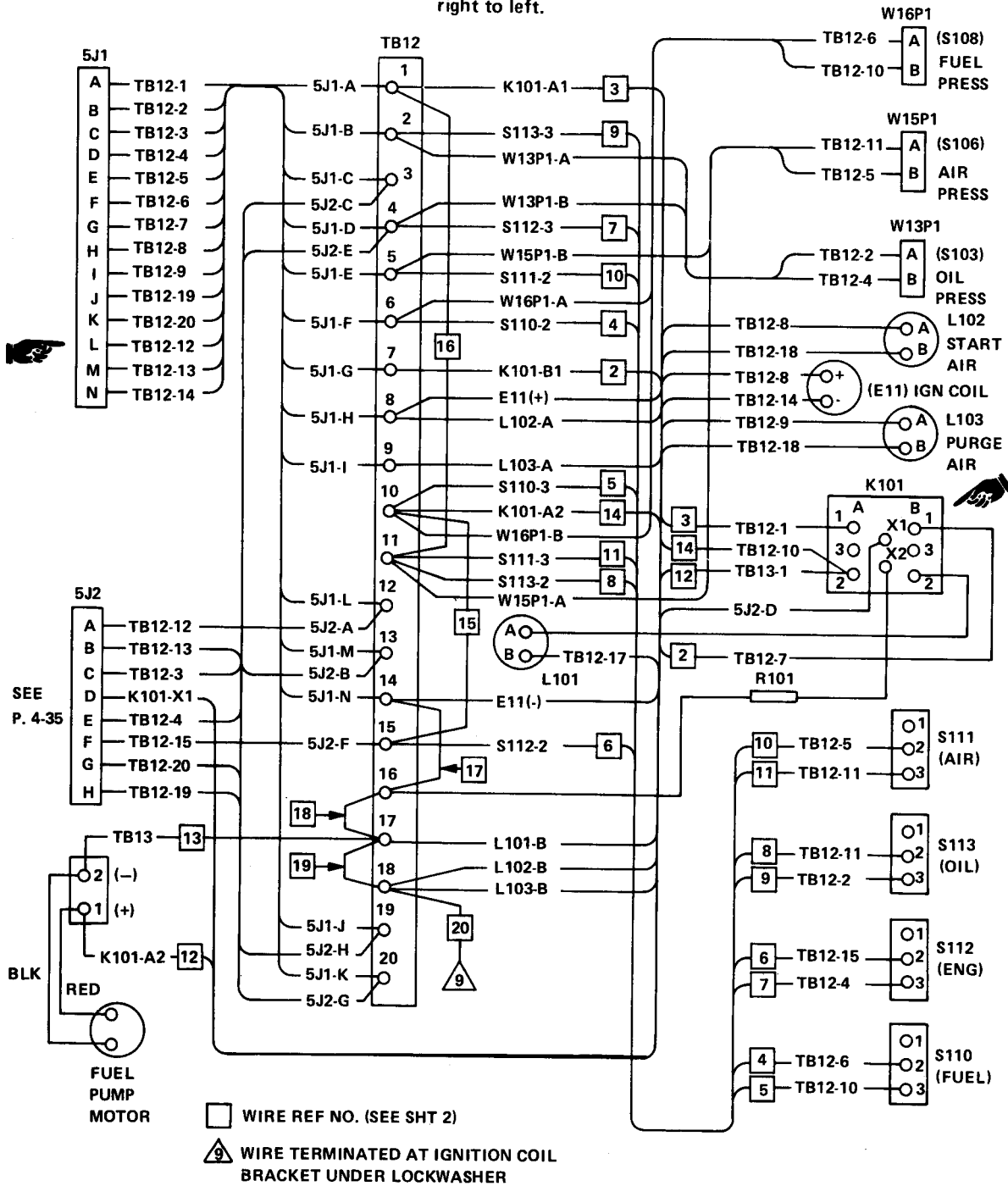
1. Position element clamp (2) on frame assembly (4), and secure with two rivets (3).
  2. Close element clamp (2) and secure by turning screw (1).
-

4-10 M54 SMOKE GENERATOR (CONT).

SMOKE GENERATOR WIRING

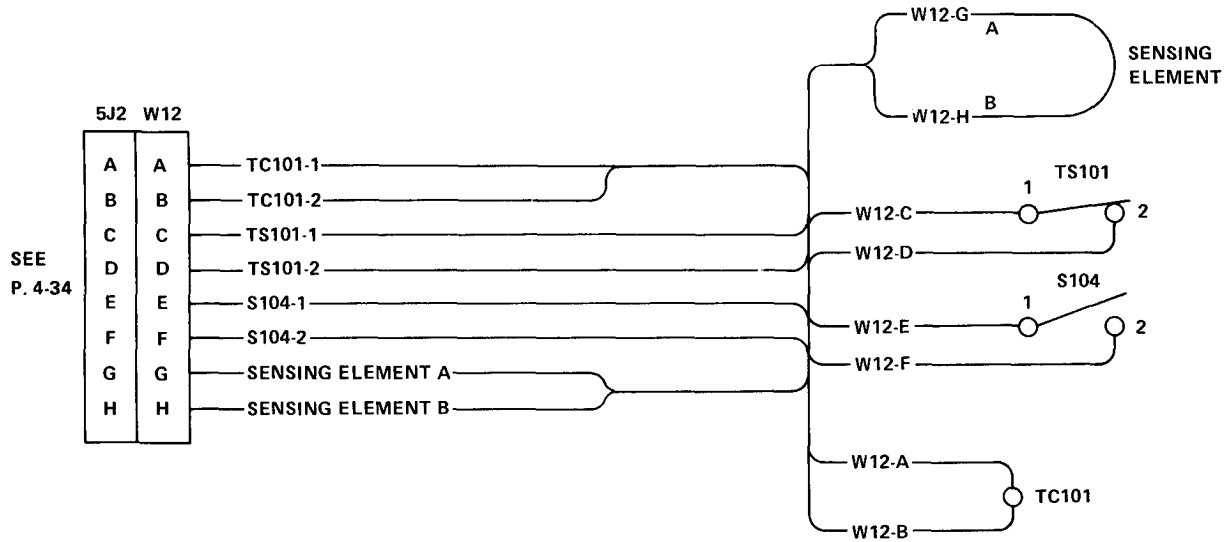
NOTE

TB12 terminals are numbered right to left.



SMOKE GENERATOR WIRING (CONT).

EQUIPMENT CONTAINER WIRING (CONT)



WIRE REF NO.	WIRE LENGTH INCHES	TERMINATION		TERMINATION		* WIRE ITEM NO.
		FROM	ITEM NO. *	TO	ITEM NO. *	
1						
2	8.5	K101-B1	12	TB12-7	12	22
3	8.0	K101-A1	12	TB12-1	12	22
4	11.0	S110-2	12	TB12-6	12	22
5	8.5	S110-3	12	TB12-10	12	22
6	6.0	S112-2	12	TB12-15	12	22
7	2.5	S112-3	12	TB12-4	12	22
8	9.5	S113-2	12	TB12-4	12	22
9	10.0	S113-3	12	TB12-2	12	22
10	8.0	S111-2	12	TB12-5	12	22
11	5.0	S111-3	12	TB12-11	12	22
12	29.0	K101-A2	12	TB13-1	12	22
13	32.0	TB13-2	12	TB12-17	12	22
14	4.0	TB12-10	12	K101-A2	12	22
15	4.0	TB12-10	12	TB12-15	12	22
16	7.0	TB12-1	12	TB12-11	12	22
17	3.0	TB12-14	12	TB12-16	12	22
18	2.0	TB12-16	12	TB12-17	12	22
19	2.0	TB12-17	12	TB12-18	12	22
20	14.5	TB12-18	12		17	22

\* Refers to bulk item no. in app F

## 4-11 COVER ASSEMBLY.

---

This task covers disassembly and reassembly of cover assembly and replacement of:

- a. **Solenoid Valve L101 (P. 4-38)**
  - b. **Fuel Filter (P. 4-42)**
  - c. **Fuel Hose Assembly (P. 4-43)**
  - d. **Cable Assembly 5J1 (P. 4-44)**
  - e. **Pump Return Tube Assembly (P. 4-46)**
  - f. **Gas Return Fuel Tube Assembly (P. 4-47)**
  - g. **Pump Pressure Tube Assembly (P. 4-48)**
  - h. **Gas Supply Fuel Tube Assembly (P. 4-49)**
  - i. **Terminal Board (P. 4-50)**
  - j. **Solenoid Inlet Tube Assembly (P. 4-52)**
  - k. **Disconnect Coupling (AIR) (P. 4-53)**
  - l. **Disconnect Coupling (FOG OIL) (P. 4-54)**
  - m. **Disconnect Coupling (GAS RETURN) (P. 4-55)**
  - n. **Fuel Pressure Hose Assembly (P. 4-56)**
  - o. **Quick Disconnect Coupling (GAS SUPPLY) (P. 4-58)**
  - p. **Pump Motor Assembly (P. 4-60)**
- 

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Materials*

Sealing Compound (Item 12, App E)  
Sealing Compound (Item 11A, App E)

#### *General Safety Instructions*

Before performing any maintenance procedures be sure circuit breaker CB1 is in OFF position.

Before performing any maintenance procedures on air lines remove pressure from lines by opening drain valve on compressor.

Before disconnecting hose or tube assemblies, have a container available to collect fuel left in lines.

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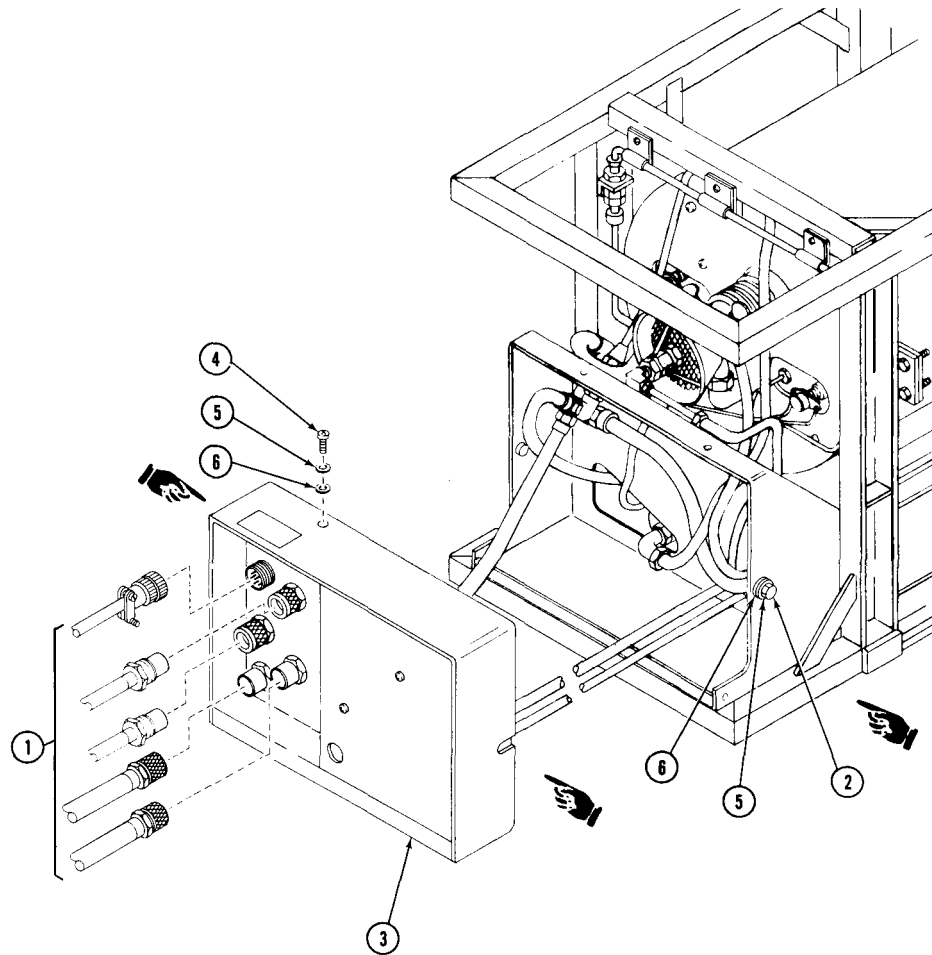
### DISASSEMBLY

#### **NOTE**

On M1059 vehicles, lower inboard armor shield and remove smoke generator from vehicle mount for access (TM 9-2350-261-20-1).

1. Disconnect cable and hose assemblies (1) from front of cover assembly.

2. Loosen two screws (2) securing sides of cover assembly (3). Remove two screws (4), lockwashers (5), and washers (6) securing top of cover assembly and open cover assembly.



### REASSEMBLY

1. Connect cable and hose assemblies (1) to front of cover assembly.
2. Check for leaks:
  - (a) Set circuit breaker CB1 and POWER switch to ON.
  - (b) Hold FUEL switch in START until FUEL indicator lights, then release to RUN.
  - (c) Check hose and tube assembly connections for leaks. Tighten or repair connections.
  - (d) Set all switches to OFF.
3. Slowly close cover assembly (3). Position hoses in equipment container while closing cover so that hoses do not become kinked or pinched. Secure cover assembly with screws (2 and 4), lockwashers (5), and washers (6).

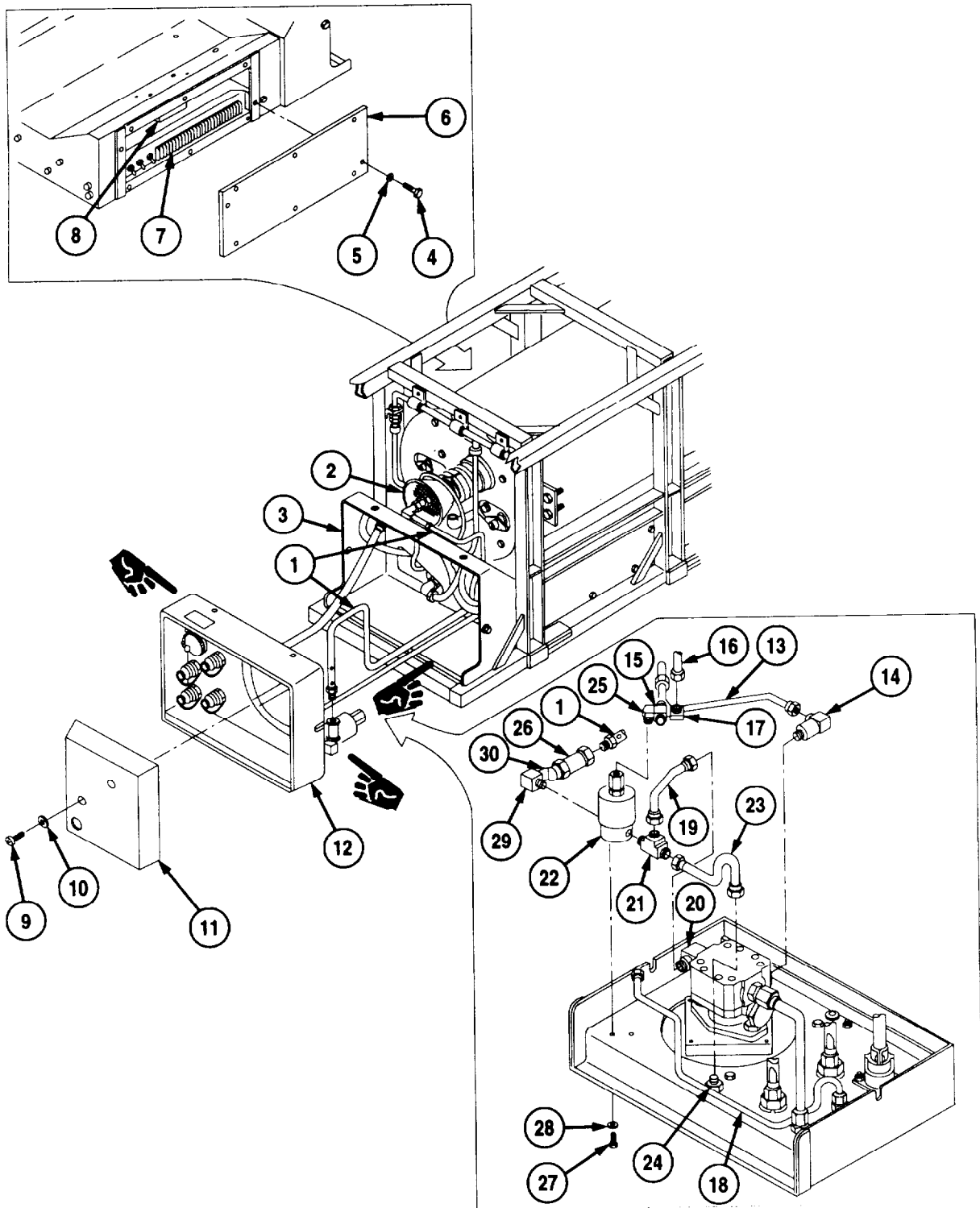
## 4-11 COVER ASSEMBLY (CONT).

### *a. Solenoid Valve L101.*

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#### REMOVAL

1. Disassemble cover assembly (P. 4-36).
2. Deleted.
3. Remove eight screws (4) and washers (5), and remove equipment container panel (6).
4. Remove wire leads of solenoid valve L101 from terminal board TB12 (7) and relay K101 (8). See smoke generator wiring (P. 4-34),
5. Remove two screws (9), washers (10), and motor cover (11) from cover assembly (12).
6. Disconnect and remove pump return tube assembly (13) from elbow (14) and cross (15) connection.
7. Disconnect fuel pressure hose assembly (16) from elbow (17).
8. Disconnect fuel return tube assembly (18) from cross (15) connection.
9. Disconnect and remove solenoid inlet tube assembly (19) from elbow (20) and tee (21).
10. Disconnect and remove pump pressure tube assembly (23) from fuel test adapter (24) and tee (21).
11. Hold fitting on solenoid with wrench and remove elbow (25) as an assembly from solenoid valve (22).
12. Disconnect fuel hose assembly (1) from fuel filter (26).
13. Remove two screws (27), washers (28), and solenoid valve (22) from cover assembly (12).
14. Remove fuel filter (26) from elbows (30).
15. Remove elbow (29) with elbows (30) as an assembly from solenoid valve (22).
16. Remove tee (21) from solenoid valve (22).



## INSTALLATION

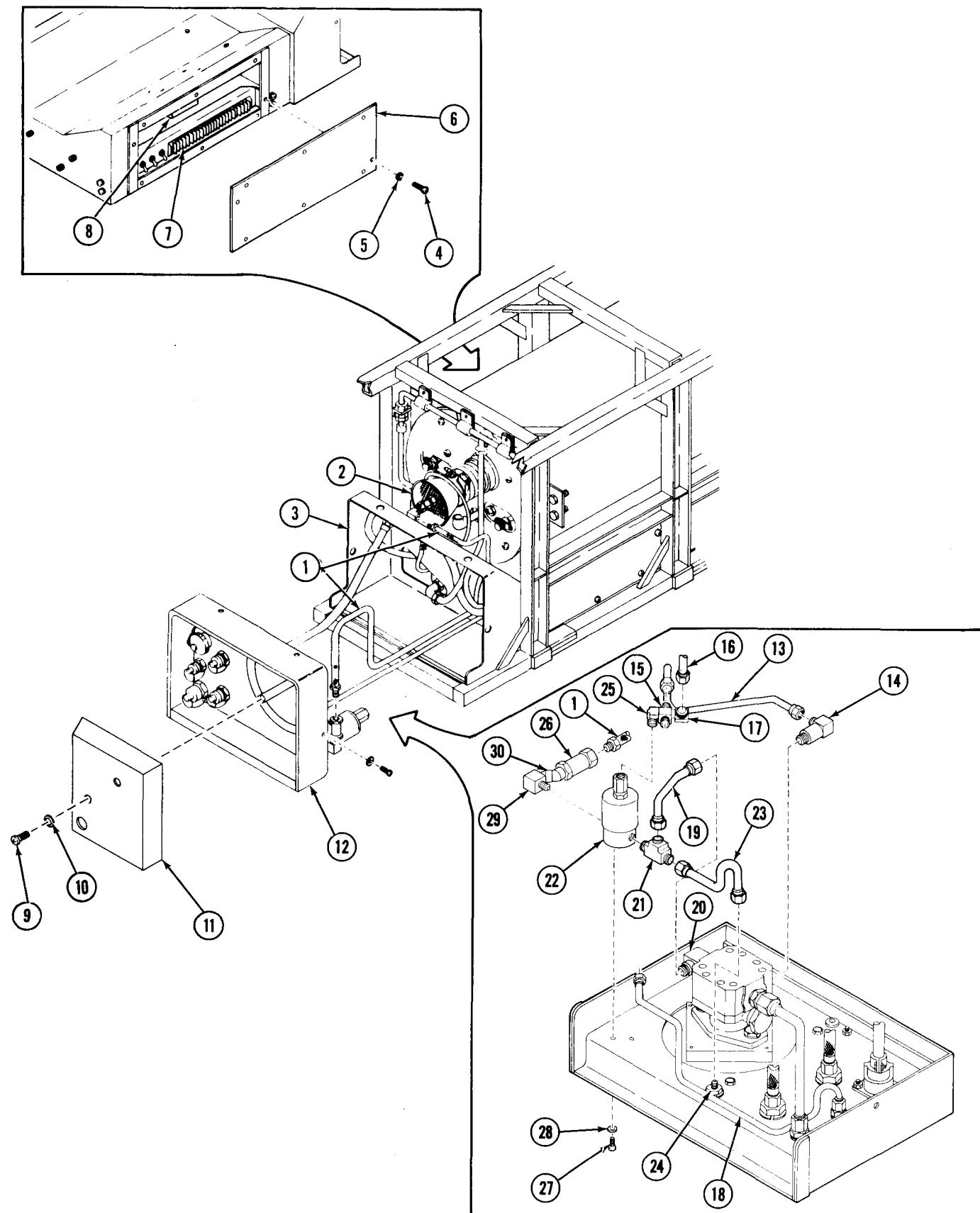
### NOTE

Apply sealing compound (Item 12, App E) to threads of male pipe fittings before installing.

The following procedure is performed to determine which is the inlet/outlet port. The solenoid is in the non-energized mode.

1. Blow air into one of the side ports to determine if this is the fuel supply port. It is the fuel supply port if air blows out the END port. Install tee (21) of solenoid valve to this port.
2. Install elbow (29) with elbows (30) as one assembly to other side port.
3. Install fuel filter (26) on elbows (30).
4. Install solenoid valve (22) on cover assembly (12) with two screws (27) and washers (28).
5. Connect fuel hose assembly (1) to fuel filter (26).
6. Install elbow assembly (25) to END port of solenoid valve (22).
7. Connect pump pressure tube assembly (23) between fuel test adapter (24) and tee (21).
8. Connect solenoid inlet tube assembly (19) between elbow (20) and tee (21).
9. Connect fuel return tube assembly (18) to cross (15).
10. Connect fuel pressure hose assembly (16) to elbow (17).
11. Connect pump return tube assembly (13) between elbow (14) and cross (15).
12. Install motor cover (11) on cover assembly (12) with two screws (9) and washers (10).
13. Feed wire leads of solenoid valve through equipment container (3) and connect leads to terminal board TB12 (7) and relay K101 (8). See smoke generator wiring (P. 4-34). Coat terminal board screw threads with sealing compound (Item 11 A, App E) before securing wire leads.
14. Install equipment container panel (6) with eight screws (4), and washers (5).
15. Reassemble cover assembly (P. 4-37).



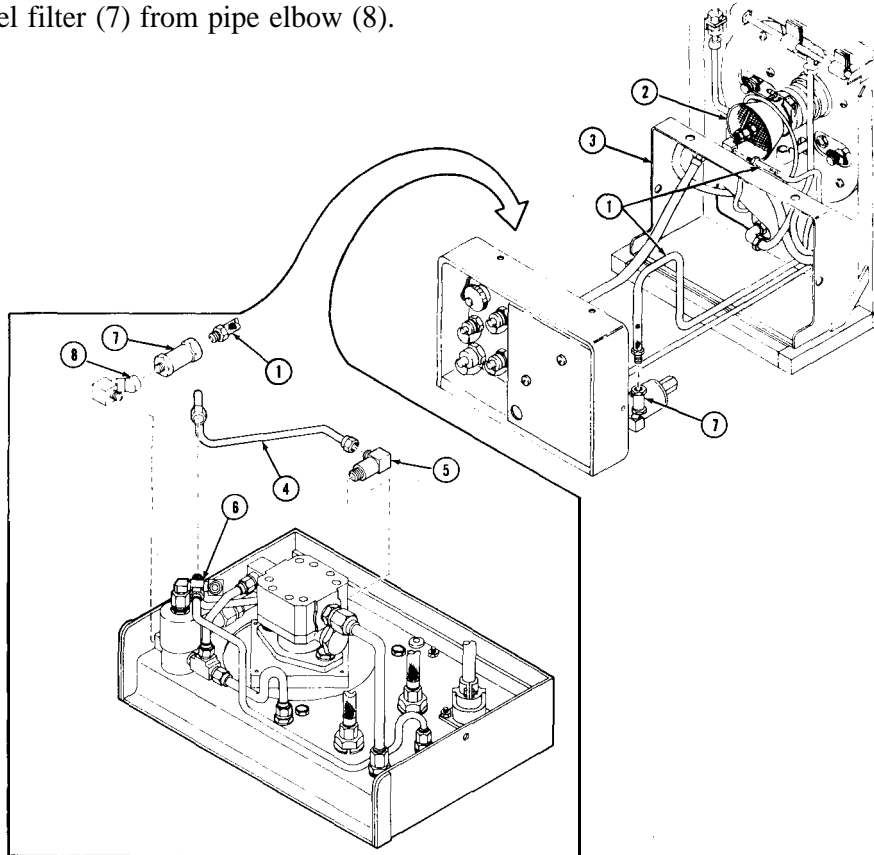


## 4-11 COVER ASSEMBLY (CONT).

**b. Fuel Filter.**

## REMOVAL

1. Disassemble cover assembly (P. 4-37).
2. Disconnect fuel hose assembly (1) from nozzle assembly (2) and remove from equipment container (3).
3. Disconnect and remove pump return tube assembly (4) from elbow (5) and cross (6).
4. Disconnect fuel hose assembly (1) from fuel filter (7).
5. Remove fuel filter (7) from pipe elbow (8).

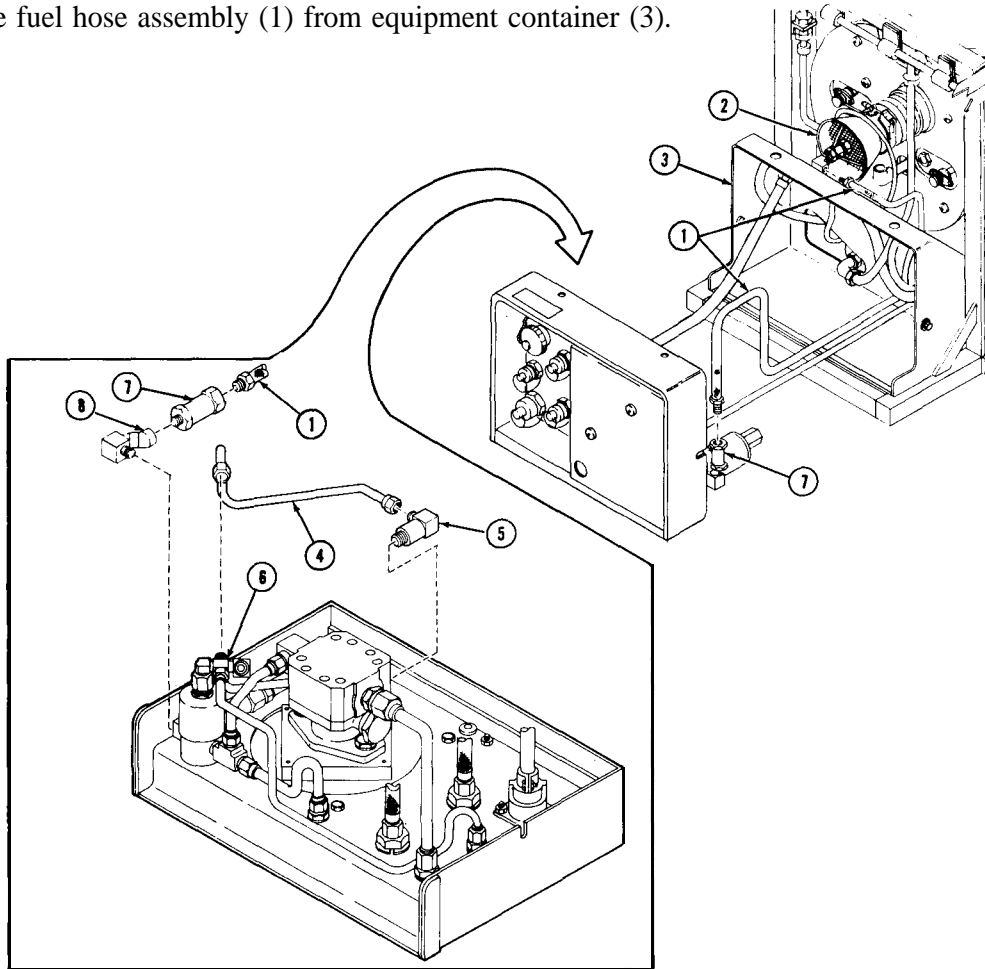


## INSTALLATION

1. Connect fuel filter (7) to pipe elbow (8).
2. Connect fuel hose assembly (1) to fuel filter (7).
3. Connect pump return tube assembly (4) between elbow (5) and cross (6).
4. Install fuel hose assembly (1) in equipment container (3), and connect fuel hose assembly (1) to nozzle assembly (2).
5. Reassemble cover assembly (P. 4-37).

**c. Fuel Hose Assembly.****REMOVAL**

1. Remove nozzle assembly (P. 4-22).
2. Disassemble cover assembly (P. 4-36).
3. Disconnect and remove pump return tube assembly (4) from elbow (5) and cross (6).
4. Disconnect fuel hose assembly (1) from fuel filter (7).
5. Remove fuel hose assembly (1) from equipment container (3).

**INSTALLATION**

1. Install fuel hose assembly (1) in equipment container (3).
2. Connect fuel hose assembly (1) to fuel filter (7).
3. Connect pump return tube assembly (4) between elbow (5) and cross (6).
4. Install nozzle assembly (P. 4-23).
5. Reassemble cover assembly (P. 4-37).

## 4-11 COVER ASSEMBLY (CONT).

### *d. Cable Assembly 5J1.*

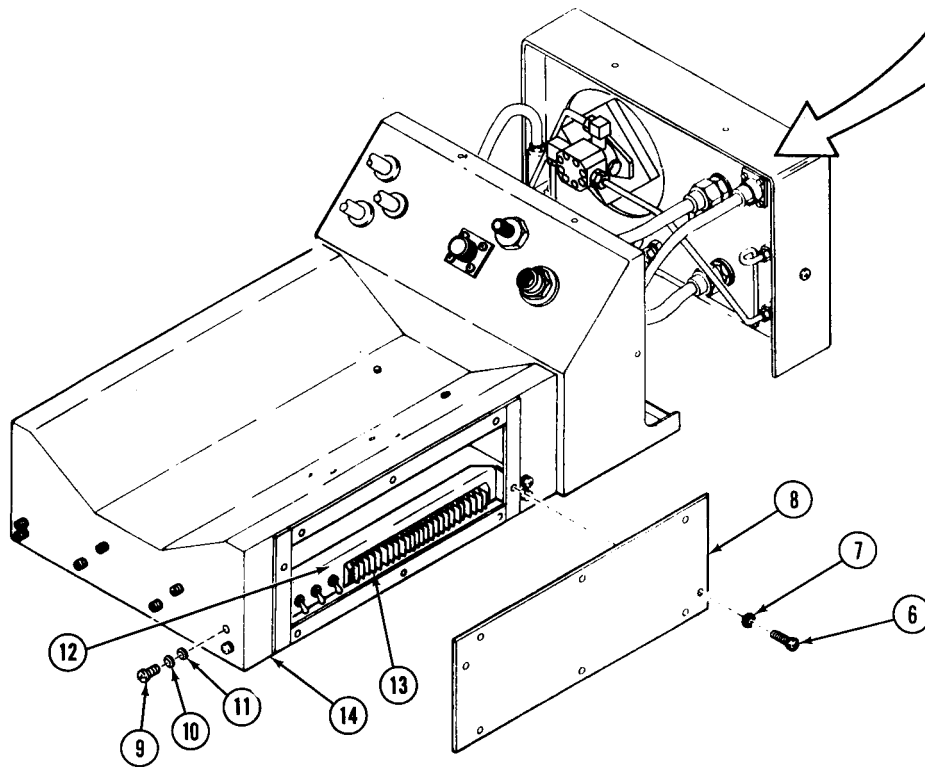
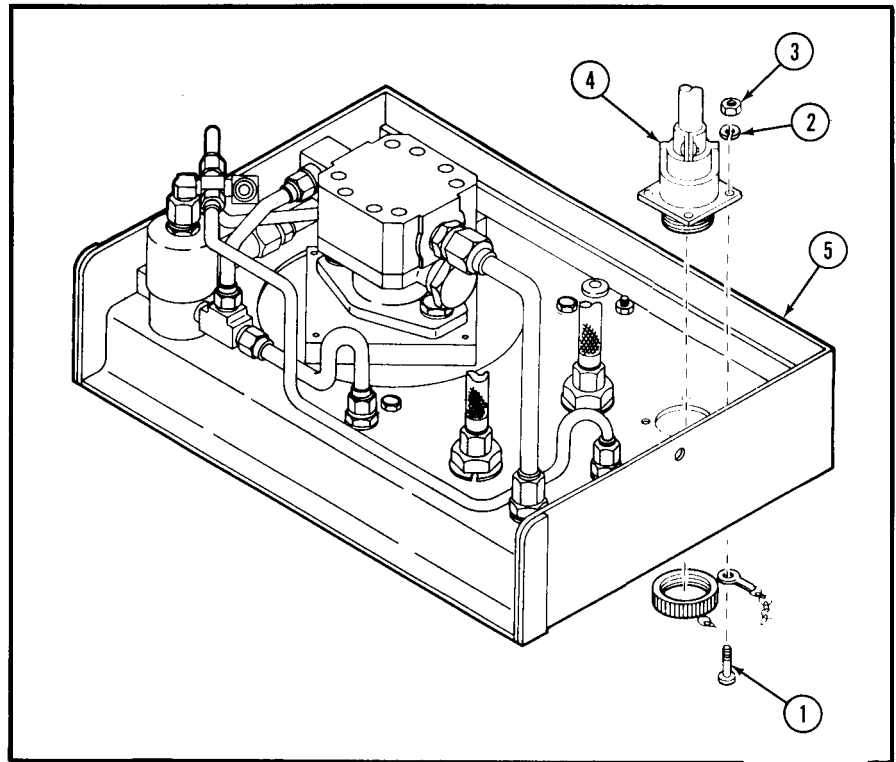
---

#### REMOVAL

1. Remove equipment container (P. 4-68).
2. Disassemble cover assembly (P. 4-36).
3. Remove four screws (1), washers (2) and nuts (3) and remove cable assembly (4) from cover assembly (5).
4. Remove eight screws (6) and washers (7) and remove equipment container panel (8).
5. Remove four screws (9), washers (10), and lockwashers (11) securing terminal bracket assembly (12) to gain access to terminal bracket assembly.
6. Remove electrical connections of 5J1 from top terminals of terminal board (13). See smoke generator wiring (P. 4-34).
7. Remove cable assembly (4) from equipment container (14).

#### INSTALLATION

1. Install cable assembly (4) in equipment container (14) and attach electrical connections. See smoke generator wiring (P. 4-34). Coat terminal board screw threads with sealing compound (Item 11A, App E) before securing connections.
2. Position terminal bracket assembly (12) in equipment container (14) and secure terminal bracket assembly (12) with four screws (9), washers (10) and lockwashers (11).
3. Secure cable assembly (4) to cover assembly (5) with four screws (1), washers (2) and nuts (3).
4. Make sure switches on terminal bracket are in OFF (down) position.
5. Position equipment container panel (8) on equipment container (14) and secure with eight screws (6) and washers (7).
6. Reassemble cover assembly (P. 4-37).
7. Install equipment container (P. 4-69).



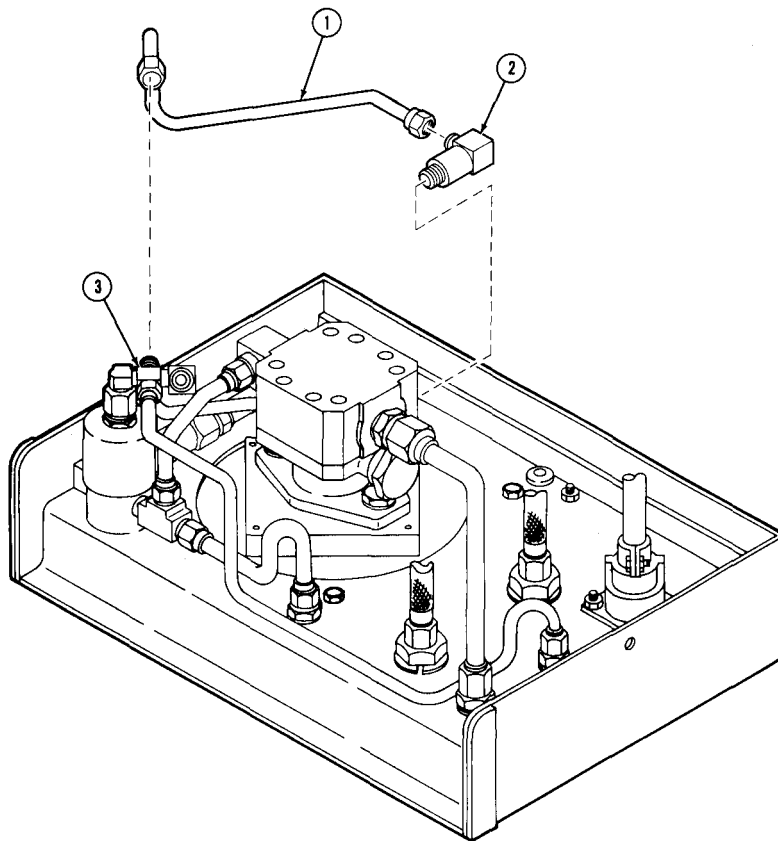
## 4-11 COVER ASSEMBLY (CONT).

### *e. Pump Return Tube Assembly.*

---

#### REMOVAL

1. Disassemble cover assembly (P. 4-37).
2. Disconnect and remove pump return tube assembly (1) from elbow (2) and cross (3).



#### INSTALLATION

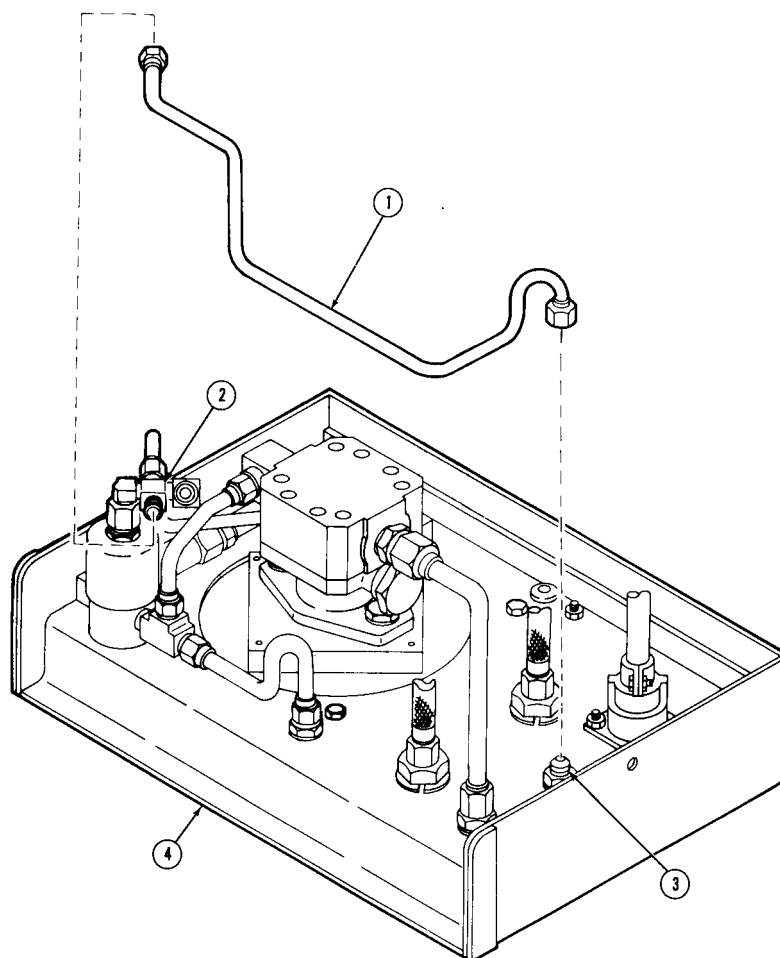
1. Connect pump return tube assembly (1) between elbow (2) and cross (3).
  2. Reassemble cover assembly (P. 4-37).
-

**f. Gas Return Fuel Tube Assembly.**

---

**REMOVAL**

1. Disassemble cover assembly (P. 4-37).
2. Disconnect fuel tube assembly (1) from cross (2).
3. Disconnect fuel tube assembly (1) from disconnect coupling (3).
4. Remove fuel tube assembly (1) from cover assembly (4).

**INSTALLATION**

1. Position fuel tube assembly (1) in cover assembly (4).
  2. Connect fuel tube assembly (1) to disconnect coupling (3).
  3. Connect fuel tube assembly (1) to cross (2).
  4. Reassemble cover assembly (P. 4-37).
-

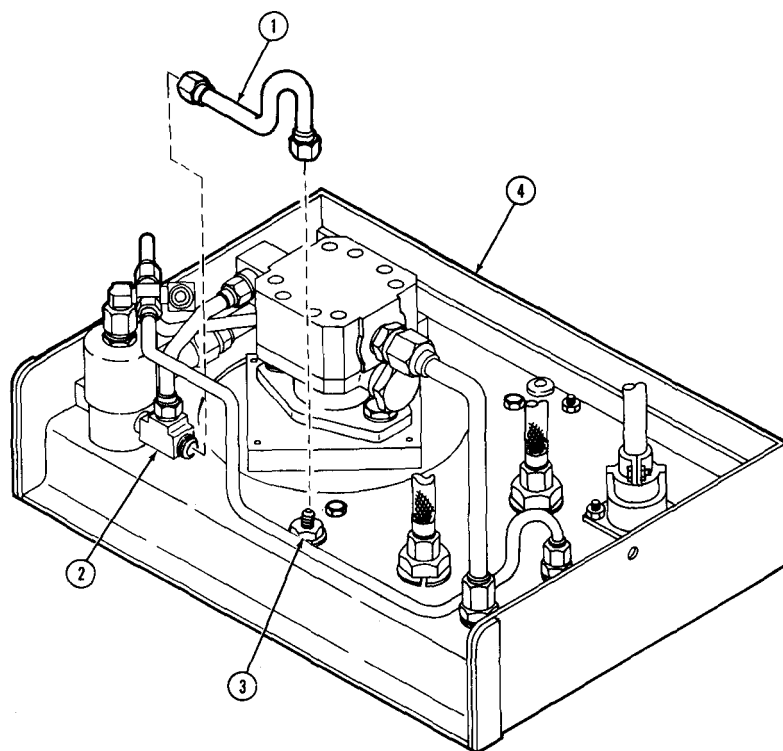
4-11 COVER ASSEMBLY (CONT).

*g. Pump Pressure Tube Assembly.*

---

REMOVAL

1. Disassemble cover assembly (P. 4-37).
2. Disconnect pump pressure tube assembly (1) from tee (2).
3. Disconnect pump pressure tube assembly (1) from fuel test adapter (3).
4. Remove pump pressure tube assembly (1) from cover assembly (4).



INSTALLATION

1. Position pump pressure tube assembly (1) in cover assembly (4).
  2. Connect pump pressure tube assembly (1) to fuel test adapter (3).
  3. Connect pump pressure tube assembly (1) to tee (2).
  4. Reassemble cover assembly (P. 4-37).
-

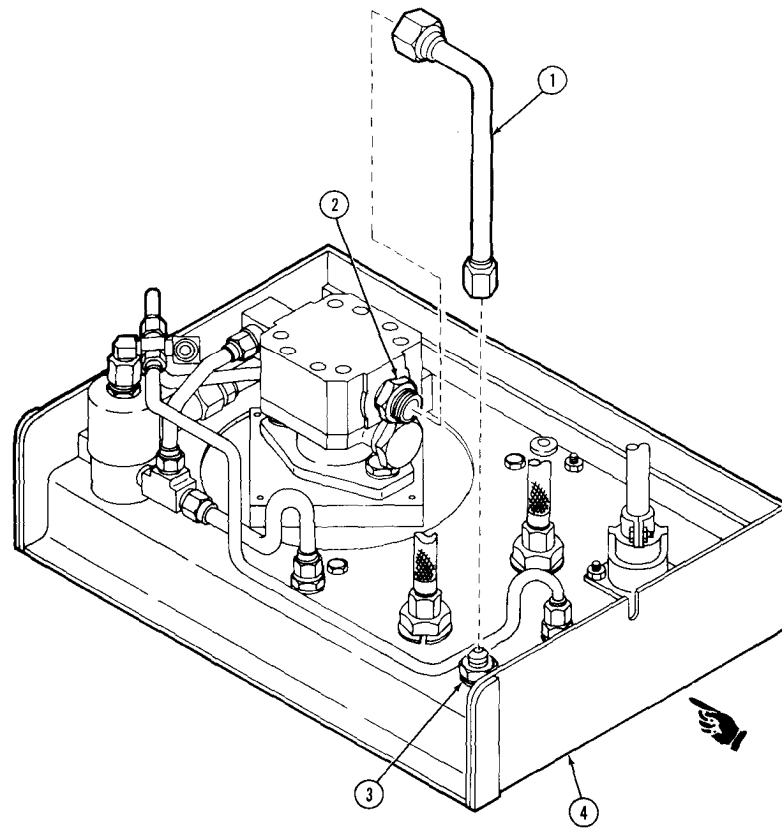


### *h. Gas Supply Fuel Tube Assembly.*

---

#### REMOVAL

1. Disassemble cover assembly (P. 4-36).
2. Disconnect gas supply fuel tube assembly (1) from fuel inlet adapter (2).
3. Disconnect fuel tube assembly (1) from GAS SUPPLY quick disconnect coupling (3).
4. Remove fuel tube assembly (1) from cover assembly (4).



#### INSTALLATION

1. Position fuel tube assembly (1) in cover assembly (4).
  2. Connect gas supply fuel tube assembly (1) to GAS SUPPLY quick disconnect coupling (3).
  3. Connect fuel tube assembly (1) to fuel inlet adapter (2).
  4. Reassemble cover assembly (P. 4-37).
-

## 4-11 COVER ASSEMBLY (CONT).

### *i. Terminal Board.*

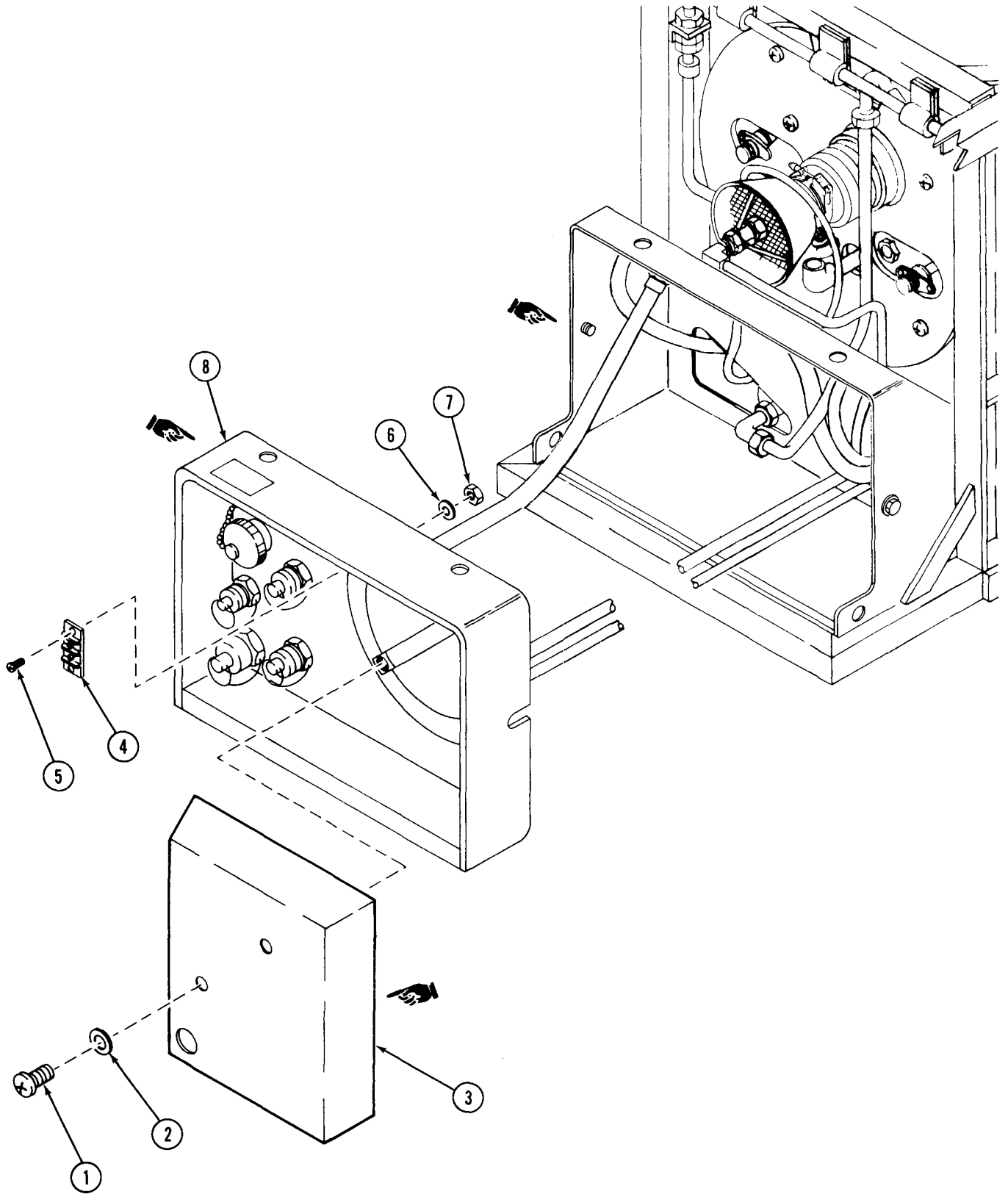
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#### REMOVAL

1. Disassemble cover assembly (P. 4-36).
2. Remove two screws (1) and washers (2) and remove motor cover (3).
3. Tag and remove electrical connections from terminal board (4).
4. Remove two screws (5), washers (6), and nuts (7) and remove terminal board (4).

#### INSTALLATION

1. Position terminal board (4) in cover assembly (8) and secure with two screws (5), washers (6) and nuts (7).
2. Attach electrical connections to terminal board (4) as tagged. Coat terminal board screw threads with sealing compound (Item 11A, App E) before securing connections.
3. Position motor cover and secure with two screws (1) and washers (2).
4. Reassemble cover assembly (P. 4-37).



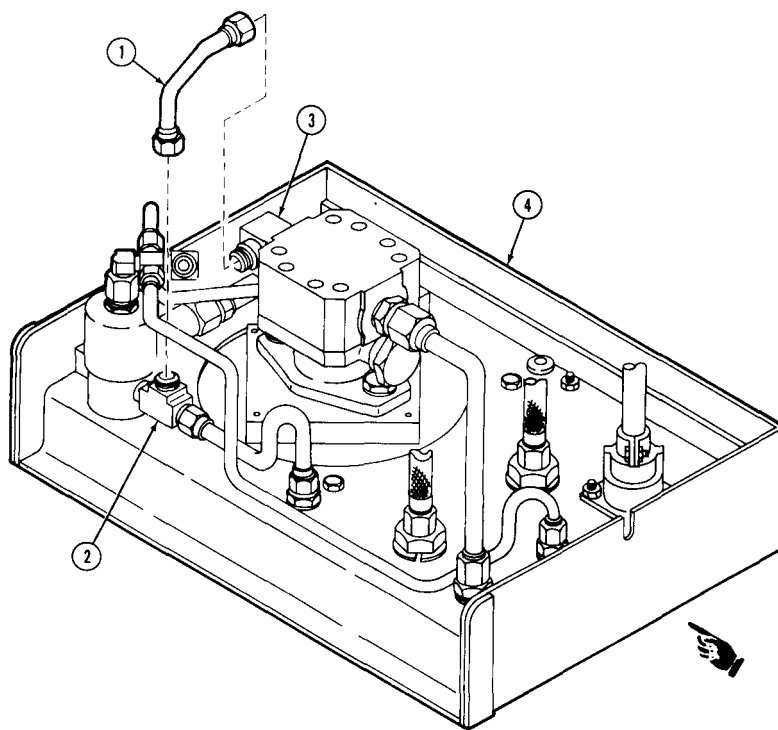
## 4-11 COVER ASSEMBLY (CONT).

### *j. Solenoid Inlet Tube Assembly.*

---

#### REMOVAL

1. Disassemble cover assembly (P. 4-36).
2. Disconnect solenoid inlet tube assembly (1) from tee (2).
3. Disconnect solenoid inlet tube assembly (1) from fuel outlet elbow (3).
4. Remove solenoid inlet tube assembly (1) from cover assembly (4).

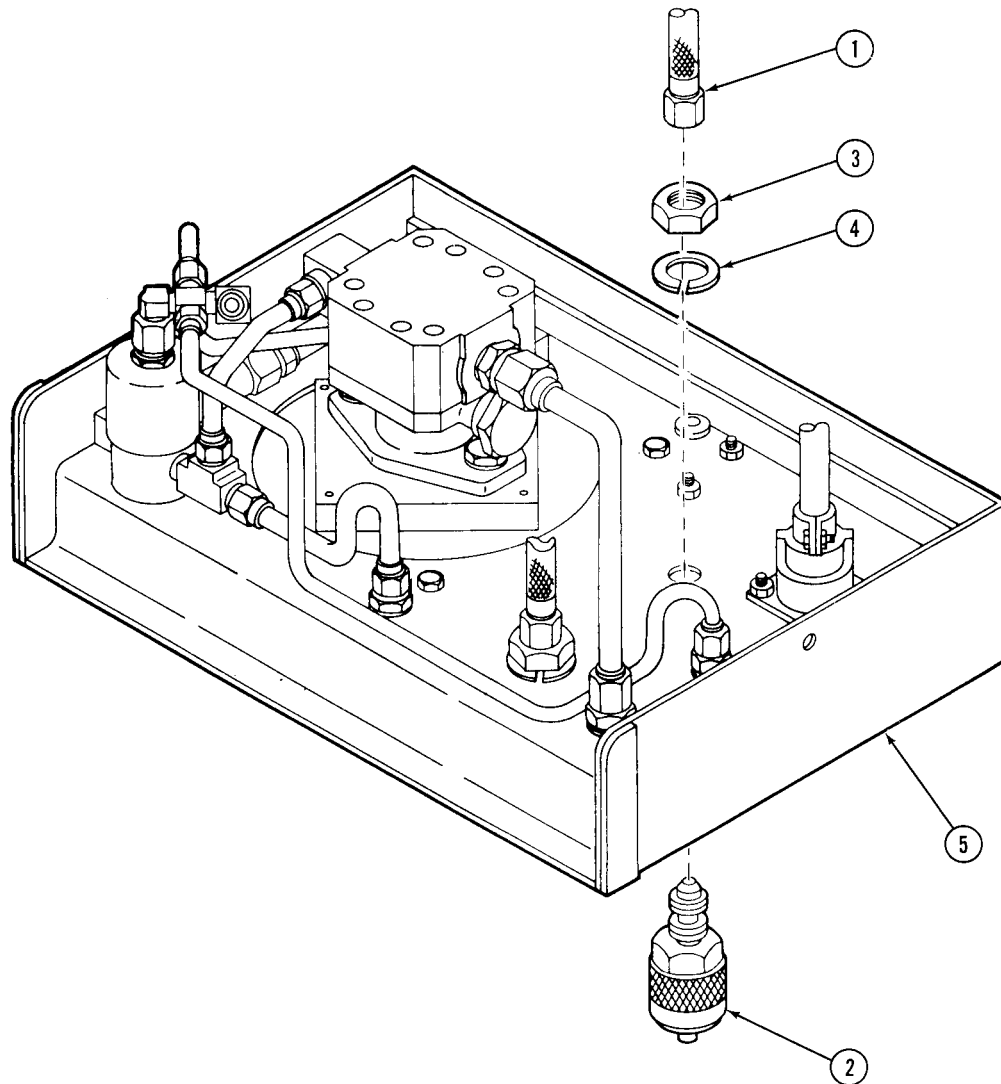


#### INSTALLATION

1. Position solenoid inlet tube assembly (1) in cover assembly (4).
  2. Connect solenoid inlet tube assembly (1) to fuel outlet elbow (3).
  3. Connect solenoid inlet tube assembly (1) to tee (2).
  4. Reassemble cover assembly (P. 4-37).
-

**k. Disconnect Coupling (AIR).****REMOVAL**

1. Disassemble cover assembly (P. 4-37).
2. Disconnect air hose assembly (1) from AIR disconnect coupling (2).
3. Remove nut (3) and washer (4) from disconnect coupling (2) and remove coupling from cover assembly (5).

**INSTALLATION**

1. Install disconnect coupling (2) in cover assembly (5) and secure with nut (3) and washer (4).
2. Connect air hose assembly (1) to AIR disconnect coupling.
3. Reassemble cover assembly (P. 4-37).

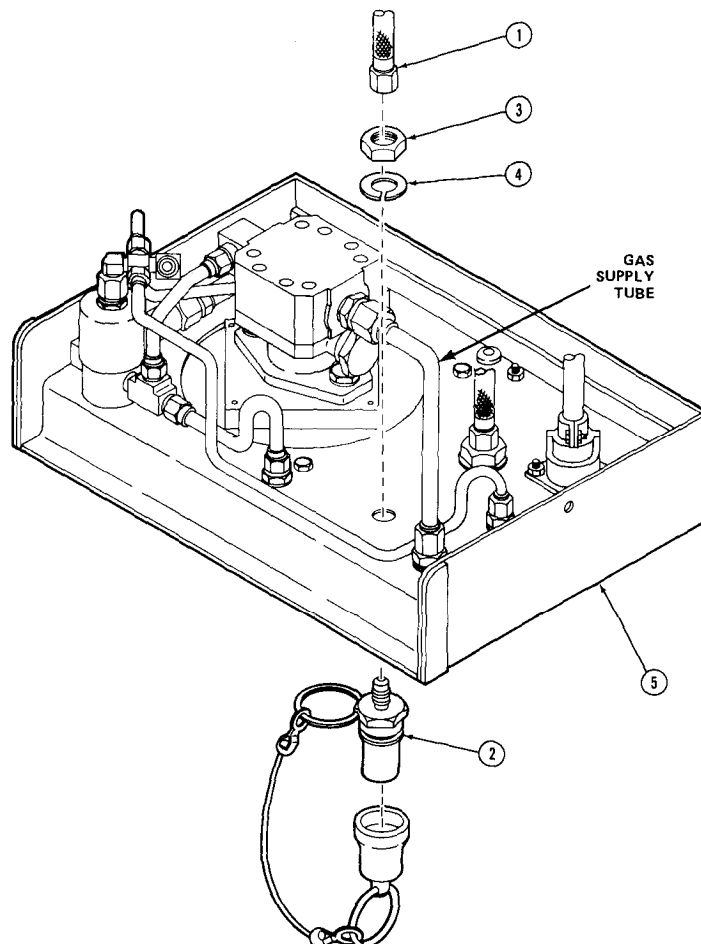
## 4-11 COVER ASSEMBLY (CONT).

### *1. Disconnect Coupling (FOG OIL).*

---

#### REMOVAL

1. Disassemble cover assembly (P. 4-37).
2. Disconnect fog oil hose assembly (1) from FOG OIL disconnect coupling (2).
3. Remove nut (3) and washer (4) from FOG OIL disconnect coupling (2) and remove coupling from cover assembly (5).

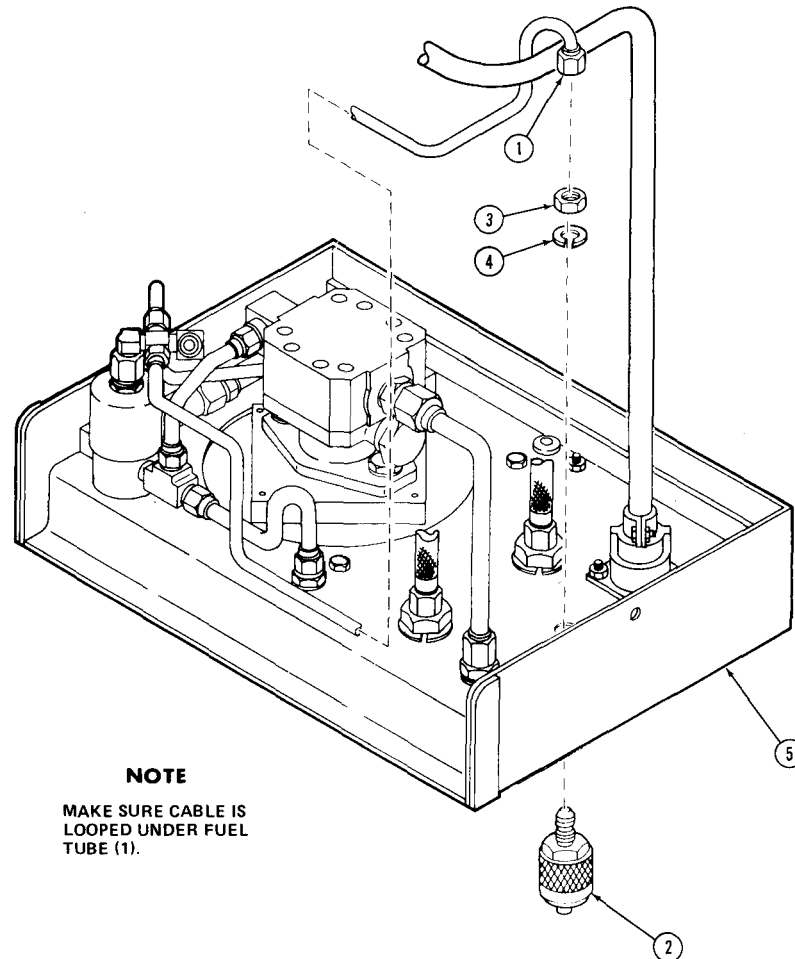


#### INSTALLATION

1. Install FOG OIL disconnect coupling (2) in cover assembly (5) and secure with nut (3) and washer (4).
  2. Loop fog oil hose assembly (1) around gas supply tube and connect hose assembly to FOG OIL disconnect coupling.
  3. Reassemble cover assembly (P. 4-37).
-

***m. Disconnect Coupling (GAS RETURN).*****REMOVAL**

1. Disassemble cover assembly (P. 4-37).
2. Disconnect fuel tube assembly (1) from GAS RETURN disconnect coupling (2).
3. Remove nut (3) and washer (4) from GAS RETURN disconnect coupling (2) and remove coupling from cover assembly (5).

**INSTALLATION**

1. Install GAS RETURN disconnect coupling (2) in cover assembly (5) and secure with nut (3) and washer (4).
2. Connect fuel tube assembly (1) to GAS RETURN disconnect coupling (2).
3. Reassemble cover assembly (P. 4-37).

## 4-11 COVER ASSEMBLY (CONT).

### *n. Fuel Pressure Hose Assembly.*

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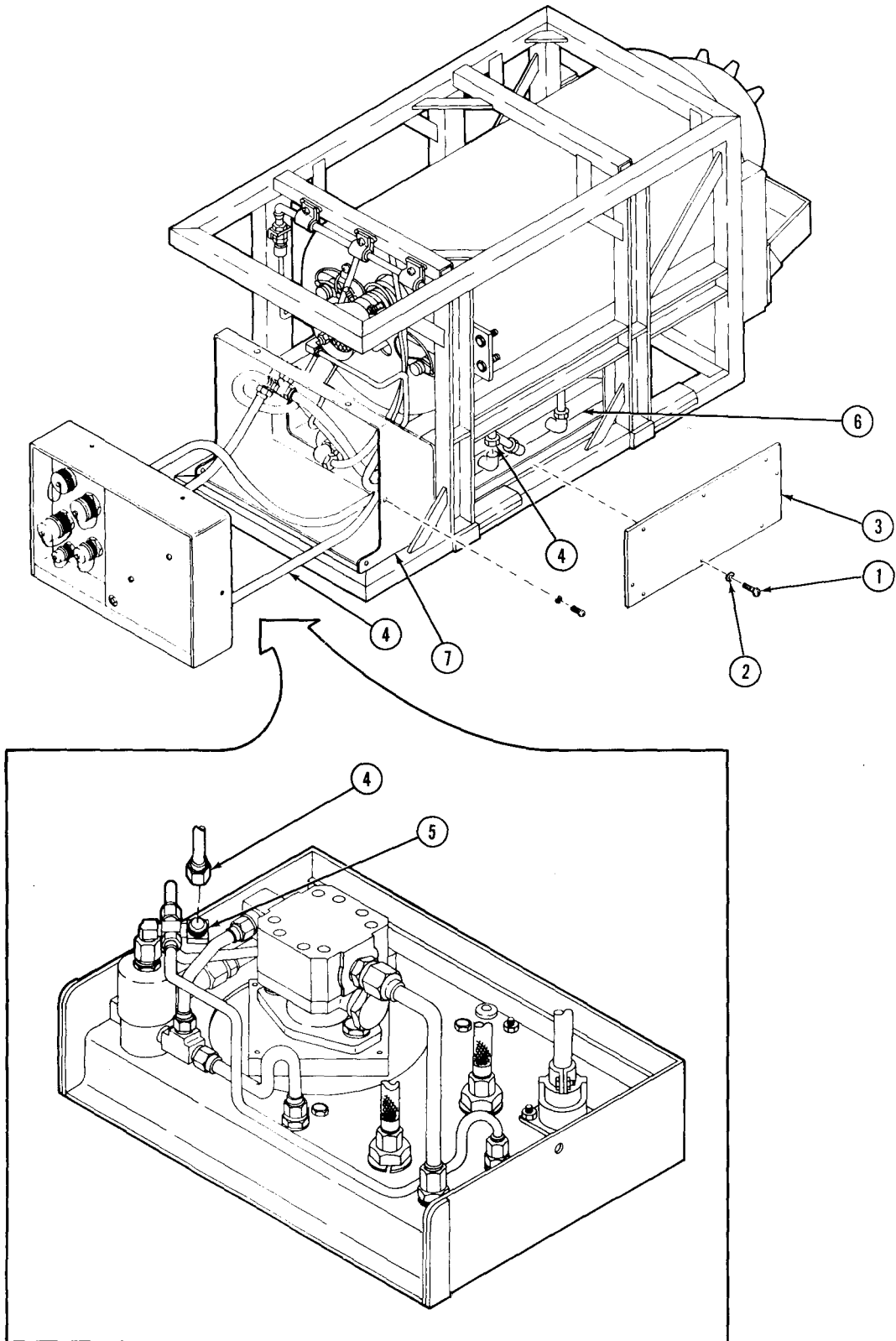
#### REMOVAL

1. Disassemble cover assembly (P. 4-37).
2. Remove eight screws (1) and washers (2) and remove equipment container panel (3).
3. Disconnect fuel pressure hose assembly (4) from elbow (5).
4. Disconnect pump hose assembly (4) from pressure switch bracket assembly (6).
5. Remove fuel pressure hose assembly (4) from equipment container (7).

#### INSTALLATION

1. Position pump hose assembly (4) in equipment container (7).
2. Connect pump hose assembly (4) to pressure switch bracket assembly (6).
3. Connect pump hose assembly (4) to elbow (5).
4. Position equipment container panel (3) on equipment container (7) and secure with eight screws (1) and washers (2).
5. Reassemble cover assembly (P. 4-37).





## **4-11 COVER ASSEMBLY (CONT).**

### ***o. Quick Disconnect Coupling (GAS SUPPLY).***

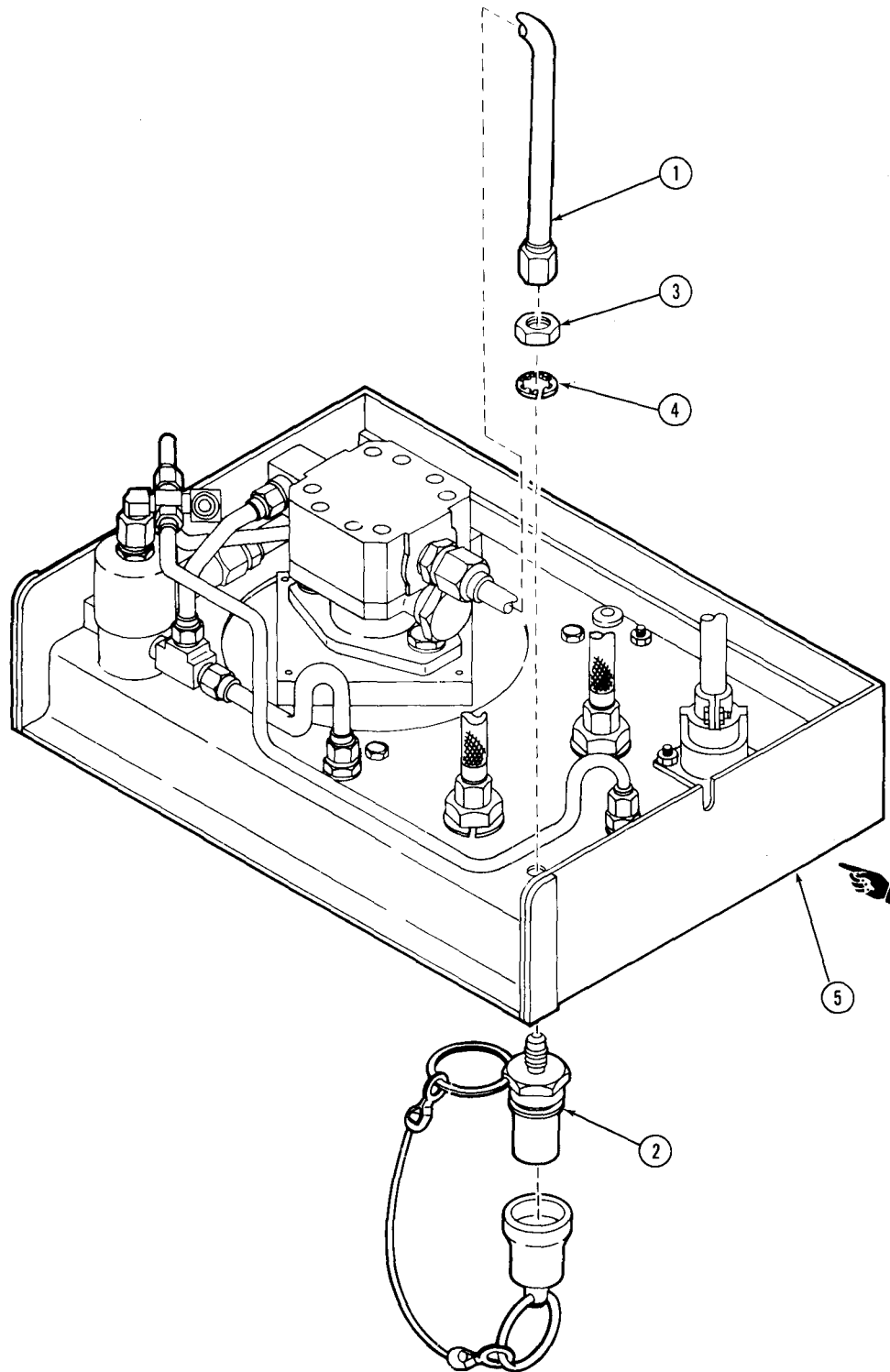
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#### **REMOVAL**

1. Disassemble cover assembly (P. 4-37).
2. Disconnect fuel tube assembly (1) from GAS SUPPLY quick disconnect coupling (2).
3. Remove nut (3) and washer (4) from GAS SUPPLY quick disconnect coupling (2).
4. Remove quick disconnect coupling (2) from cover assembly (5).

#### **INSTALLATION**

1. Position GAS SUPPLY quick disconnect coupling (2) in cover assembly (5) and secure with nut (3) and washer (4).
2. Connect fuel tube assembly (1) to GAS SUPPLY quick disconnect coupling (2).
3. Reassemble cover assembly (P. 4-37).



## 4-11 COVER ASSEMBLY (CONT).

*p. Pump Motor Assembly.*

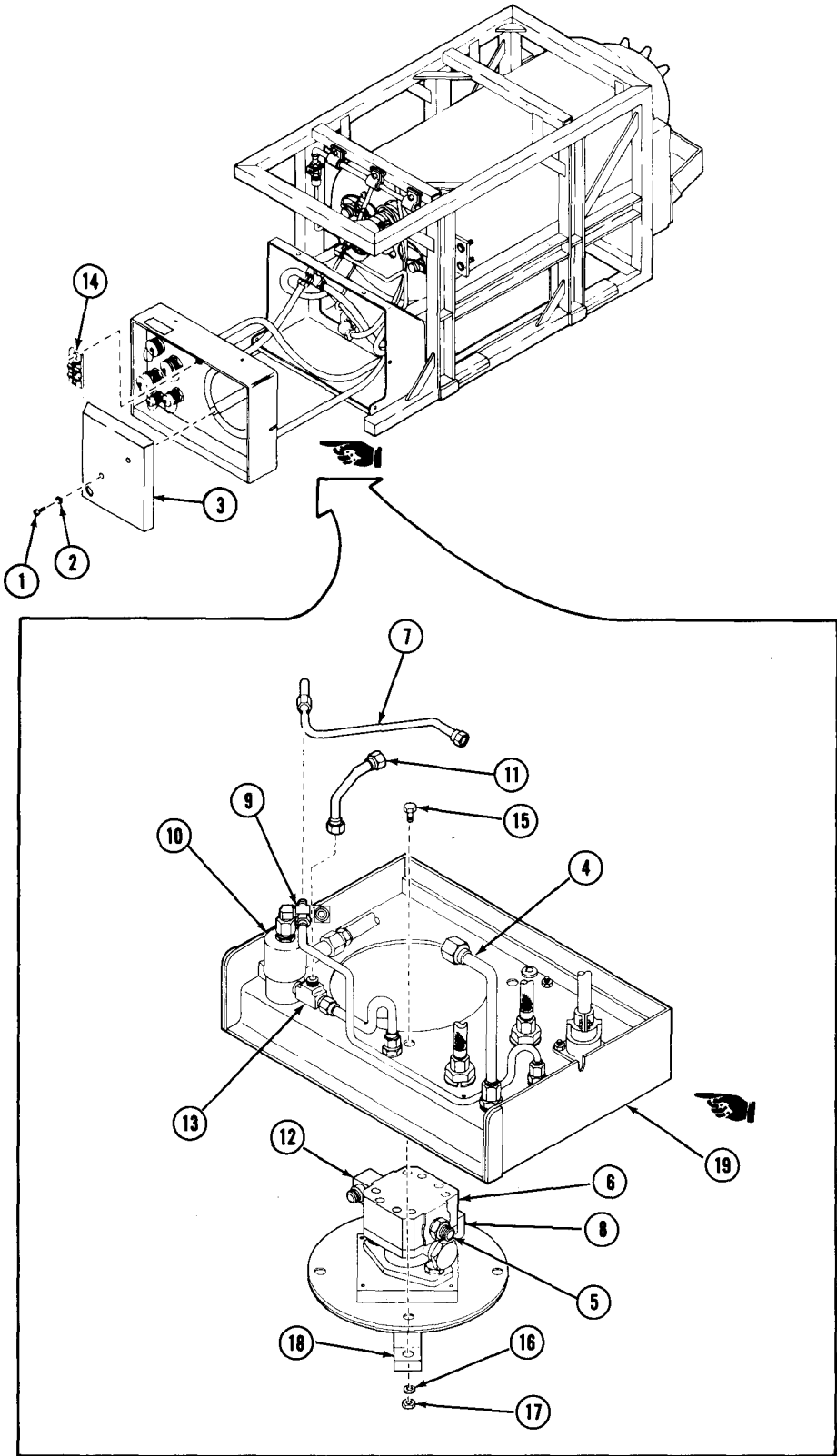
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### REMOVAL

1. Disassemble cover assembly (P. 4-36).
2. Remove two screws (1) and washers (2) and remove motor cover (3).
3. Disconnect fuel supply tube assembly (4) from fuel inlet adapter (5) on fuel pump assembly (6).
4. Disconnect and remove pump return tube assembly (7) from elbow (8) on fuel pump assembly (6) and cross (9) on solenoid valve (10).
5. Disconnect and remove solenoid inlet tube assembly (11) from elbow (12) on pump assembly (6) and tee (13) on solenoid valve (10).
6. Remove electrical connections of pump assembly (6) from terminal board (14).
7. Remove four screws (15), washers (16), nuts (17) and cover mounting bracket (18).
8. Remove pump assembly (6) from cover assembly (19).

### INSTALLATION

1. Position pump assembly (6) in cover assembly (19) and secure with four screws (15), washers (16), nuts (17), and cover mounting bracket (18).
2. Attach electrical connections from pump assembly (6) to terminal board (14). (See smoke generator wiring (P. 4-34). Coat terminal board screw threads with sealing compound (Item 11A, App E) before securing connections.
3. Connect solenoid inlet tube assembly (11) between elbow (12) on pump assembly (6) and tee (13) on solenoid valve (10).
4. Connect pump return tube assembly (7) between elbow (8) on fuel pump assembly (6) and cross (9) on solenoid valve (10).
5. Connect fuel supply tube assembly (4) to fuel inlet adapter (5) on fuel pump assembly (6).
6. Position motor cover (3) on cover assembly (19) and secure with two screws (1) and washers (2).
7. Adjust fuel pump pressure (P. 4-62).



## 4-12 FUEL PUMP PRESSURE ADJUSTMENT PROCEDURES.

This task covers adjustment of fuel pump.

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Test Equipment*

Fuel Test Gage (Fig. G-22, App G)

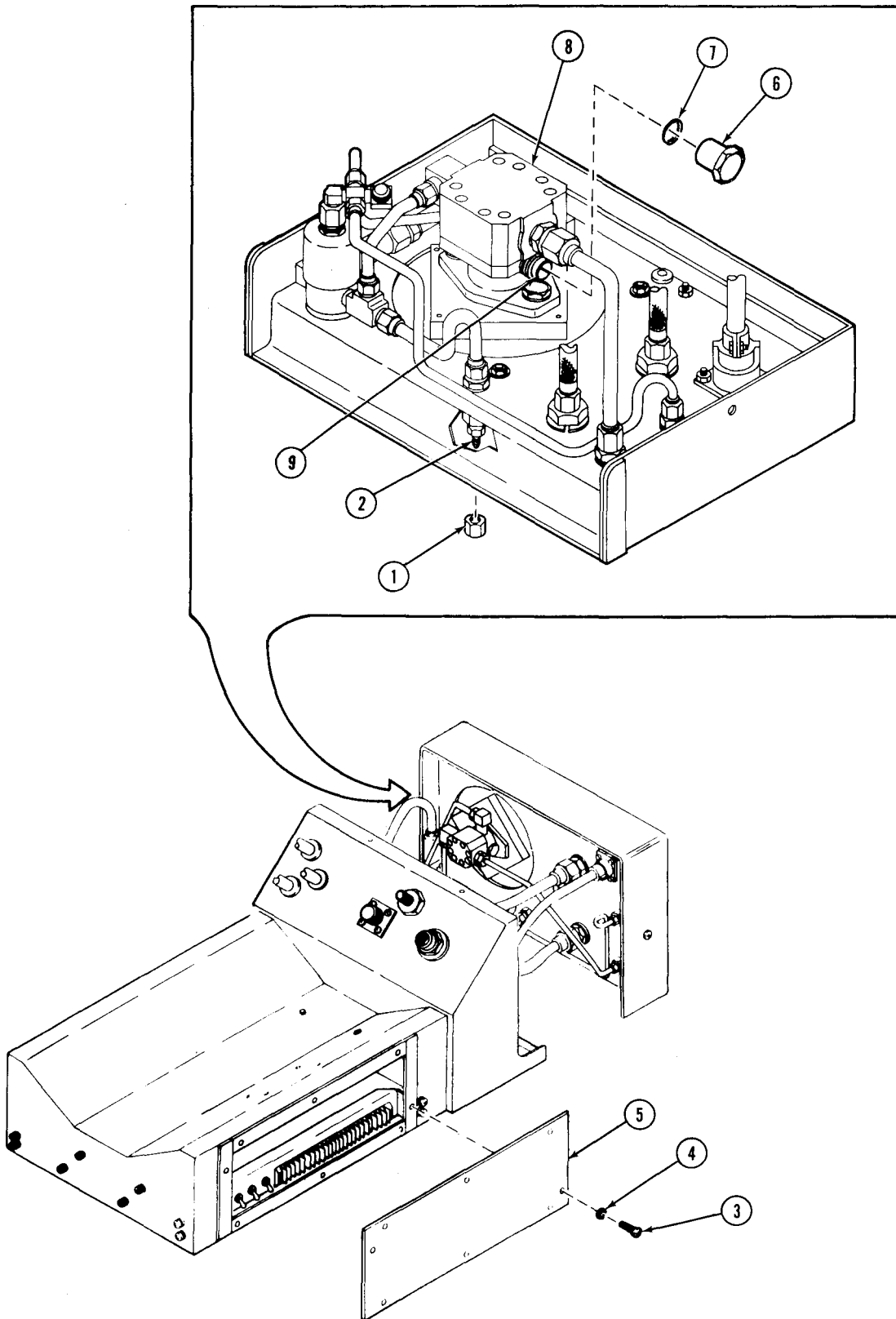
#### *Equipment Condition*

Vehicle Engine Running

### **WARNING**

FUEL SPRAY is very flammable. Do not allow open flames, sparks, or heated objects in the area during procedure. Point nozzle assembly away from personnel and smoke generator.

1. Disassemble cover assembly (P. 4-36).
2. Remove cap (1) from FUEL TEST POINT, and attach fuel test gage (Fig. G-22, App G), to fitting (2).
3. Remove eight screws (3) and washers (4) and remove equipment container panel (5).
4. Set ENGINE switch on terminal bracket assembly to ON.
5. Remove nozzle assembly from engine head.
6. Place nozzle assembly in suitable container to collect fuel.
7. Set circuit breaker CB1, and POWER switch to ON.
8. Hold FUEL switch on control panel to START position until FUEL indicator lights then release switch to RUN position.
9. Set ENGINE switch to RUN position. Check fuel test gage. Pressure should be  $100 \pm 5$  psig. If not:
  - a. Set control panel switches to OFF.
  - b. Remove cap nut (6) from fuel pump assembly (8).
  - c. Turn adjuster (9) clockwise to increase pressure, turn adjuster counterclockwise to reduce pressure (one turn equals 10 psi).
  - d. Replace cap nut and repeat steps 7, 8 and 9.
10. After setting pressure, set FUEL, ENGINE, and POWER switches on control panel to OFF.
11. Set circuit breaker CB1 POWER switch, on control panel and ENGINE switch on terminal bracket to OFF.
12. Remove fuel test gage and install cap.
13. Position equipment container panel (5) and secure with eight screws (3) and washers (4).
14. Reassemble cover assembly (P. 4-37).



## 4-13 FUEL PRESSURE HOSE ASSEMBLY - MAINTENANCE INSTRUCTIONS.

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This task covers repair of Hose Assembly.

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### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

Fog oil is slippery, clean up all spills immediately to prevent injury.

#### *Equipment Condition*

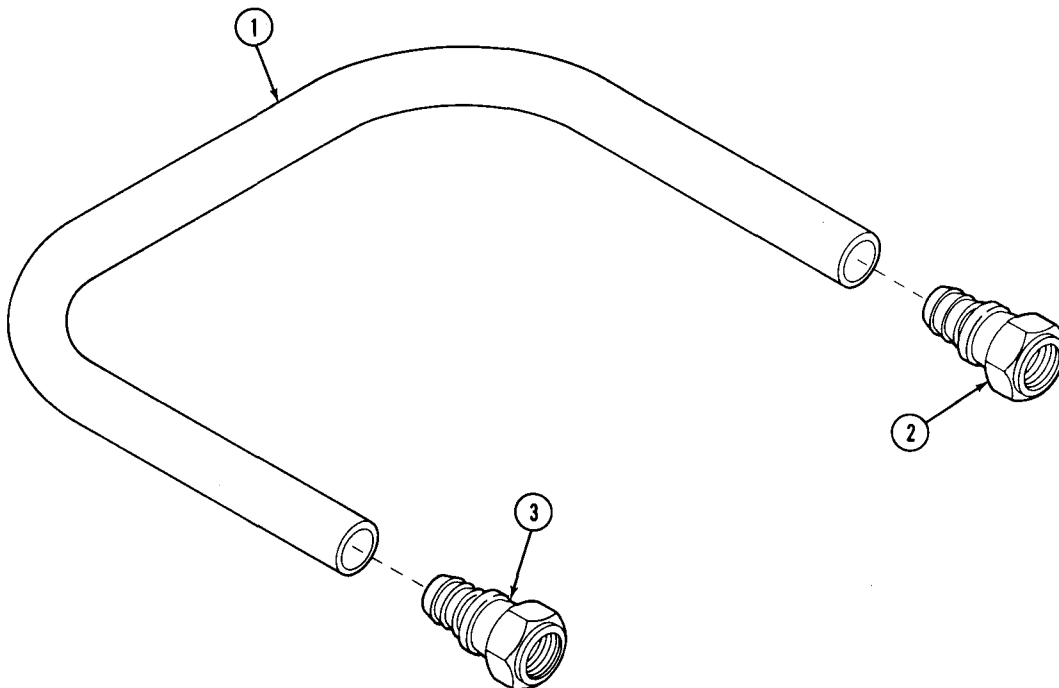
Fuel pressure hose assembly removed  
from cover assembly (P. 4-56).

Before performing any maintenance functions  
be sure circuit breaker CB1 is in the OFF  
position.

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Cut hydraulic hose (1) at straight adapter (3) and remove adapter.
3. Replace straight adapters (2) and (3) as required.
4. Fabricate new hose (Fig.G-1, App G).
5. Install straight adapters (2) and (3) in hydraulic hose (1).





4-14 Paragraph Deleted



## 4-15 DISCONNECT COUPLING (GAS RETURN).

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This task covers replacement of Preformed Packing.

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### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

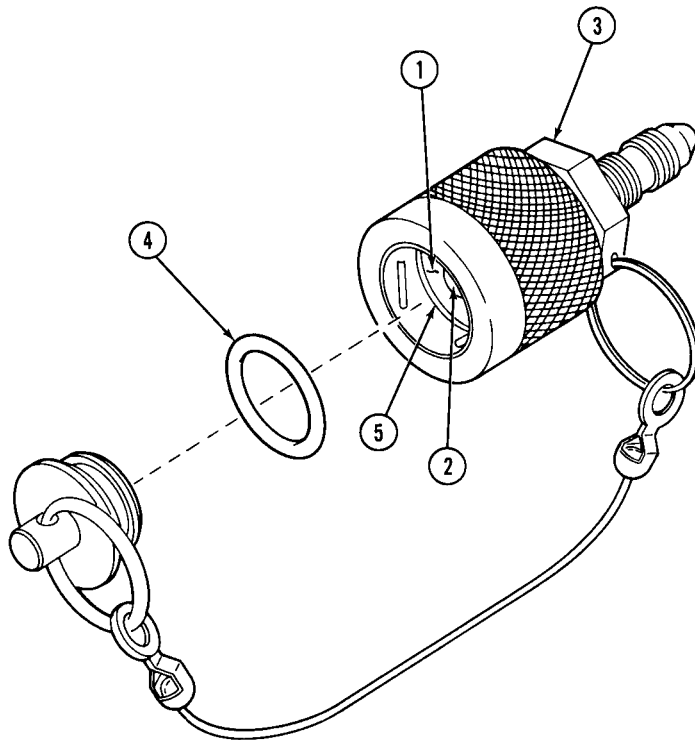
#### *Equipment Condition*

Disconnect coupling removed from cover  
assembly (P. 4-55).

---

### REMOVAL

1. Depress ring (1) around center (2) of disconnect coupling (3).
2. Remove preformed packing (4) from disconnect coupling (3).



### INSTALLATION

Install preformed packing (4) of disconnect coupling (3) in groove (5) around ring (1).

---

**4-16 EQUIPMENT CONTAINER ASSEMBLY.**

This task covers removal and installation of equipment container and replacement of:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>a. <b>Solenoid Assembly</b> (P. 4-70)</li> <li>b. <b>Pressure Switch Bracket Assembly</b><br/>(P. 4-72)</li> <li>c. <b>Terminal Bracket Assembly</b> (P. 4-74)</li> <li>d. <b>Ignition Coil</b> (P. 4-76)</li> <li>e. <b>Relay K101</b> (P. 4-78)</li> <li>f. <b>Cable Assembly 5 J2</b> (P. 4-79)</li> <li>g. <b>Ignition Cab/e Assembly</b> (P. 4-80)</li> </ul> | <ul style="list-style-type: none"> <li>h. <b>Fog Oil Supply Hose Assembly</b><br/>(P. 4-81)</li> <li>i. <b>Fog Oil Pressure Hose Assembly</b><br/>(P. 4-82)</li> <li>j. <b>Air Hose Assembly</b> (P. 4-83)</li> <li>k. <b>Purge Air Hose Assembly</b> (P. 4-84)</li> <li>l. <b>Air Supply Hose Assembly</b> (P. 4-86)</li> <li>m. <b>Start Air Hose Assembly</b> (P. 4-88)</li> </ul> |
|---|---|

**INITIAL SETUP**

*Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-CL-N26

*Automotive Shop Equipment*

SC 4910-95-CL-A74:  
Torque wrench

*Equipment Condition*

M1059 vehicles - Inboard armor shield lowered and smoke generator removed from vehicle mount (TM 9-2350-261-20-1).

*Materials*

Sealing compound (Item 11 A, App E)

*General Safety Instructions*

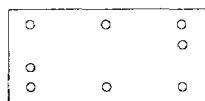
Before performing any maintenance procedures be sure circuit breaker CB1 is in the OFF position.

Before performing any maintenance procedures on air lines remove pressure from lines by opening drain valve on compressor.

Fog oil is very slippery, clean up all spills immediately to prevent injury to personnel.

**NOTE**

Alternate equipment container panel has three slots and requires only six screws and six lockwashers. If your equipment container assembly has alternate equipment container panel, removal and installation procedures are as follows:



**OLD STYLE**



**ALTERNATE STYLE**

**Alternate Equipment Container Panel.**

**REMOVAL**

1. Remove three top screws and lock washers and loosen three bottom screws and lock washers.
2. Remove panel from equipment container.

**INSTALLATION**

1. Position panel under three bottom lock washers and place on equipment container.
2. Secure with three top screws and lock washers and tighten three bottom screws.

## 4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

### Equipment Container.

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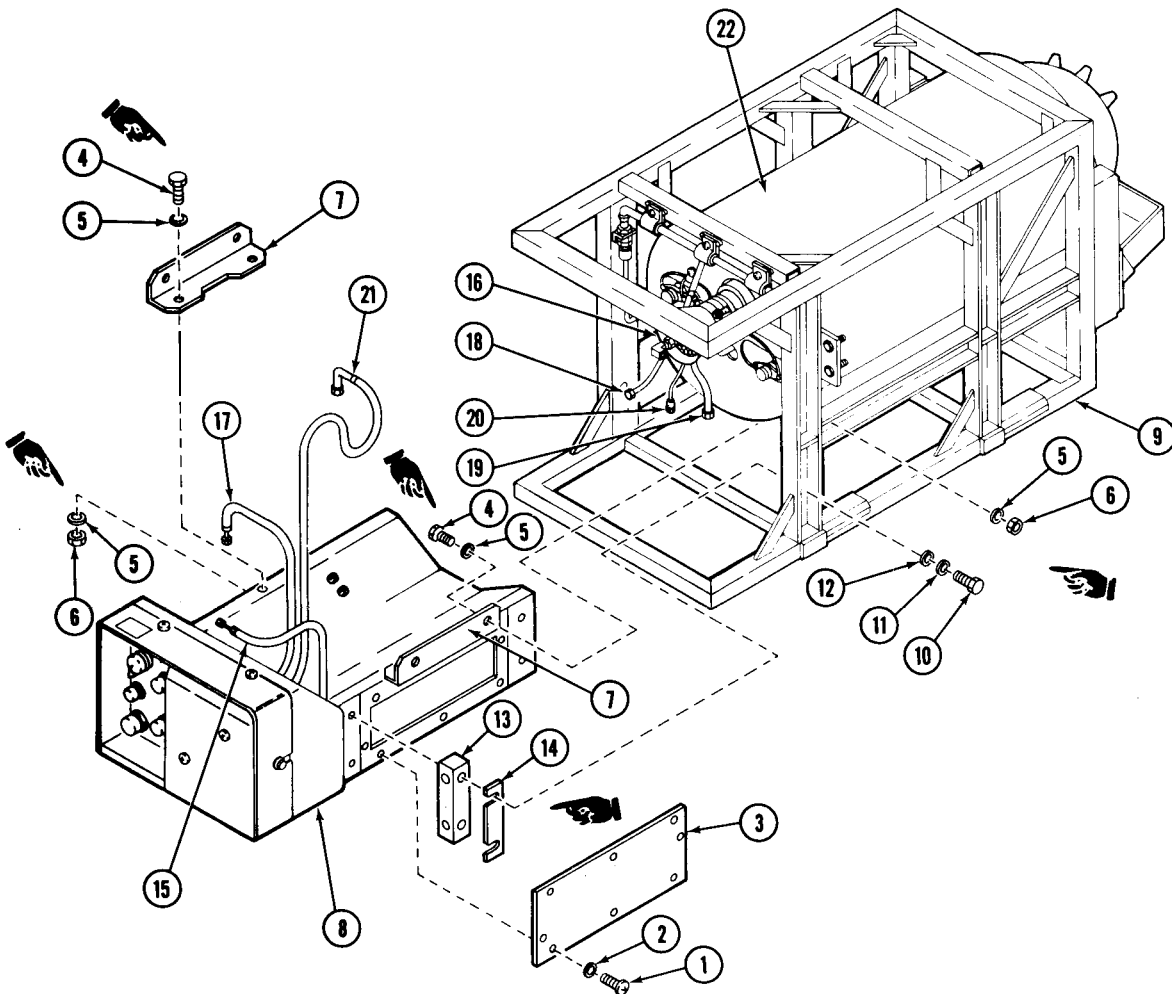
#### REMOVAL

1. Disconnect vehicle cable and hoses from smoke generator.
  - 1.1 Remove eight screws (1) and washers (2) from both equipment container side panels (3) and remove panels.
  - 1.2 Remove eight screws (4), sixteen washers (5), and eight nuts (6) securing angle brackets (7) to equipment container (8) and frame assembly (9). Remove brackets.
  - 1.3 Remove eight screws (10), eight lock washers (11), eight washers (12), four spacers (13), and shims (14) securing equipment container (8).
2. Disconnect fuel hose (15) from nozzle assembly (16).
3. Disconnect start air hose (17) from nozzle assembly (16).
4. Disconnect purge air hose (18) from equipment container (8).
5. Disconnect fog oil tube (19) from equipment container (8).
6. Disconnect cable assembly W12 (20) from connector 5 J2 on equipment container (8).
7. Disconnect ignition cable (21) from pulse jet engine (22).
8. Remove equipment container (8) from frame assembly (9).

#### INSTALLATION

1. Position equipment container (8) in frame assembly (9).
2. Connect ignition cable (21) to pulse jet engine (22).
3. Connect start air hose (17) to nozzle assembly (16).
4. Connect cable assembly (20) to equipment container (8).
5. Connect fog oil tube (19) to equipment container (8).
6. Connect purge air hose (18) to equipment container (8).
7. Connect fuel hose (15) to nozzle assembly (6).
8. Install angle brackets (7) to equipment container (8) and frame assembly (9) with eight screws (4), sixteen washers (5), and eight nuts (6). Do not fully tighten screws at this time.

9. Rotate spacers (13) to center equipment container in frame assembly and provide the smallest possible gap. Both spacers on any one side of the frame assembly must be positioned the same. Install but don not tighten eight screws (19), lock washers (11), washers (12), and four spacers (13).
10. Tighten screws (10) on one side of frame assembly. Insert shims (14) between frame and spacers on other side of frame assembly as required for a snug fit. An equal number of shims should be used for each spacer on each side of generator.
11. Torque screws (10) to 12 lb-ft.
12. Tighten eight screws (4) securing angle brackets (6) to equipment container (8) and frame assembly (9).
13. Install equipment container side panels (3) using eight screws (1) and washers (2).



## 4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

### *a. Solenoid Assembly.*

---

#### REMOVAL

1. Remove equipment container (P. 4-68).
2. Remove eight screws (1) and washers (2) from both left and right side equipment container panels (3) and remove two equipment container panels (3).
3. Remove air pressure hose (4) from pressure switch bracket assembly (5).
4. Remove four screws (6), flat washers (7), and lock washers (8), securing pressure switch bracket assembly (5) and disconnect purge air hose (9) from solenoid assembly (10).
5. Remove four screws (11), flat washers (12), and lock washers (13) securing solenoid assembly (10).
6. Tag and remove four solenoid wire leads from terminal board. See smoke generator wiring (P. 4-34).
7. Disconnect air supply hose (14) and start air hose (15) from solenoid assembly (10).
8. Remove solenoid assembly (10) from equipment container (16).
9. Disconnect air pressure hose (4) from solenoid assembly (10).

#### INSTALLATION

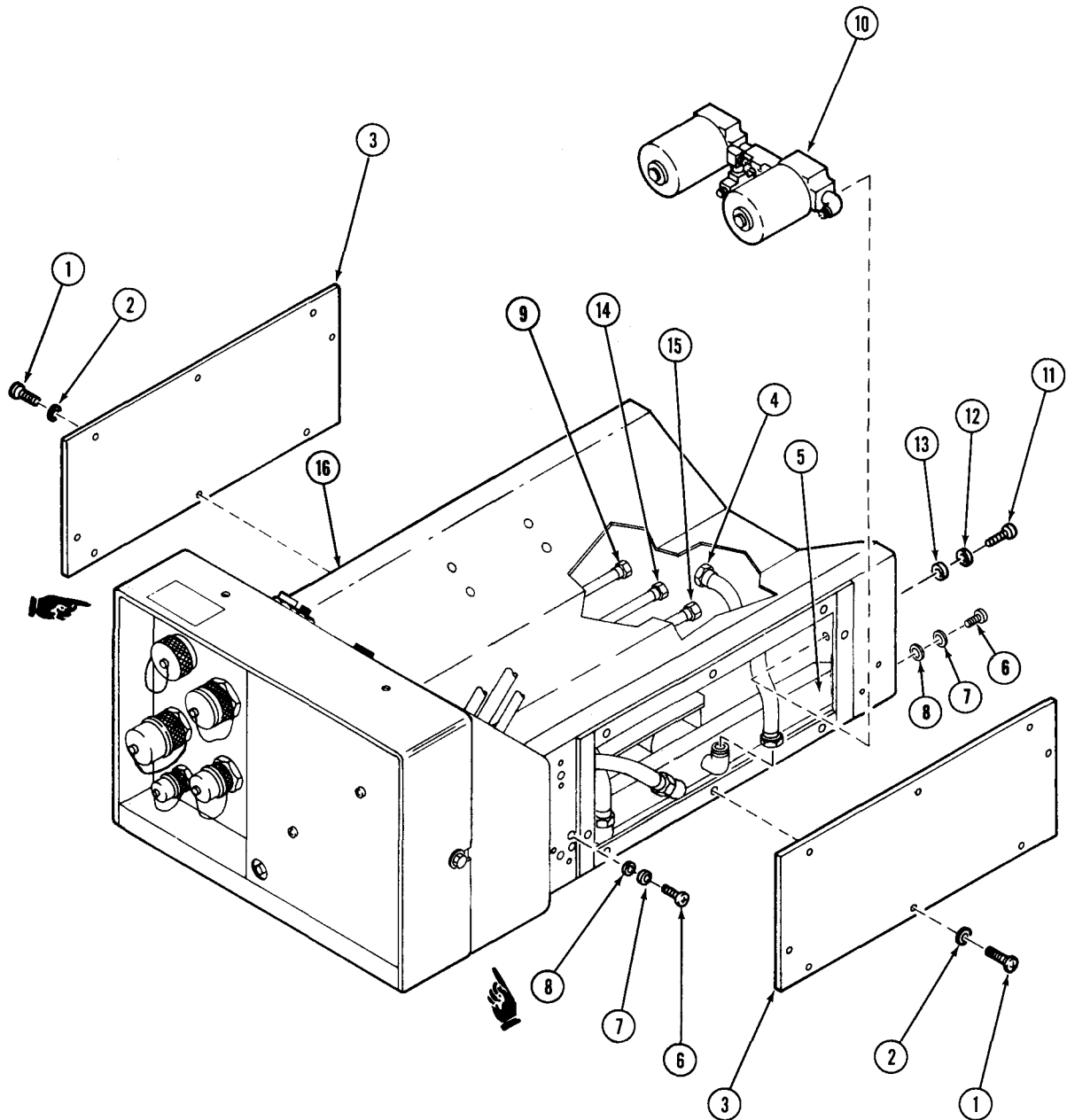
1. Attach air pressure hose (4) and purge air hose (9) to solenoid assembly (10).
2. Place solenoid assembly (10) in equipment container (16).
3. Install air supply hose (14) and start air hose (15) to solenoid assembly (10).
4. Run four solenoid wire leads under terminal bracket.
5. Attach one wire from each solenoid to position 18 on terminal board. Coat terminal board screw threads with sealing compound before securing wire leads.

#### **NOTE**

TB12 is wired from right to left.

6. Attach start air solenoid wire lead to position 8 on terminal board and purge air solenoid wire lead to position 9 on terminal board. Coat terminal board screw threads with sealing compound before securing wire leads.

7. Secure solenoid assembly (10) using four screws (11), flat washers (12) and lock washers (13).
8. Secure pressure switch bracket assembly (5) using four screws (6), flat washers (7) and lock washers (8).
9. Attach air pressure hose (4) to pressure switch bracket assembly (5).
10. Attach right and left equipment container panels (3) using eight screws (1) and flat washers (2).
11. Install equipment container (P. 4-68).



## 4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

### *b. Pressure Switch Bracket Assembly.*

---

#### REMOVAL

1. Remove equipment container from smoke generator (P. 4-68).
2. Remove eight screws (1) and washers (2) and remove equipment container panel (3).
3. Tag and remove fuel pressure hose (4), fog oil pressure hose (5), and air pressure hose (6) from pressure switch bracket assembly (7).
4. Remove four screws (8), flat washers (9), lock washers (10) securing pressure switch bracket assembly (7).
5. Tag and remove three cable assemblies (11) from pressure switch bracket assembly (7).
6. Remove pressure switch bracket assembly (7) from equipment container (12).

#### INSTALLATION

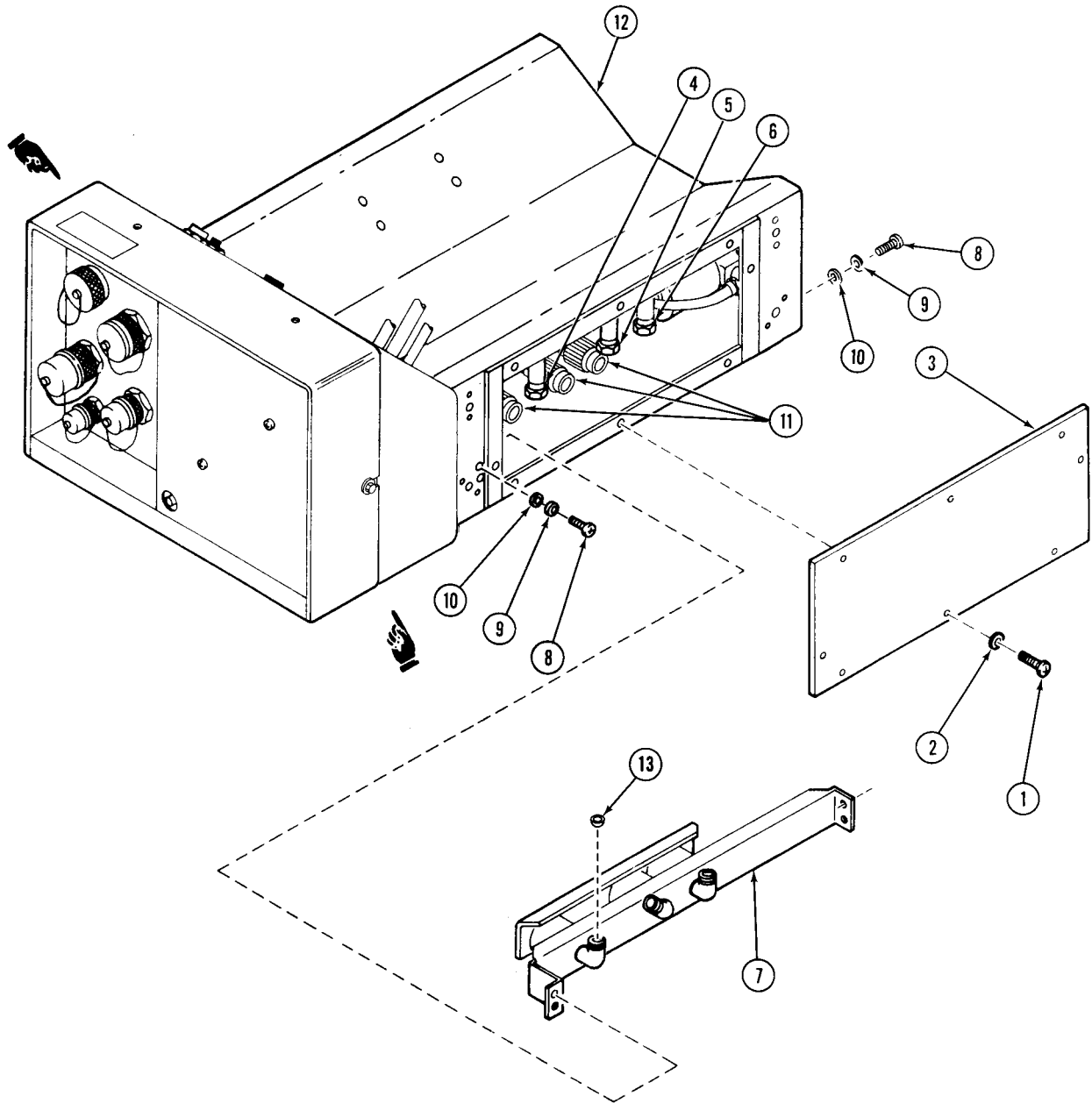
1. Install three cable assemblies (11) on pressure switch bracket assembly (7).
2. Secure pressure switch bracket assembly (7) with four screws (8), flat washers (9), and lock washers (10).

#### **NOTE**

Make sure tube seal bonnet (13) is in place before connecting fuel pressure hose (4).

3. Attach fuel pressure hose (4), fog oil pressure switch hose (5) and air pressure hose (6) to pressure switch bracket assembly (7).
4. Secure equipment container panel (3) using eight screws (1) and washers (2).
5. Install equipment container in smoke generator (P. 4-68).





## 4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

### *c. Terminal Bracket Assembly.*

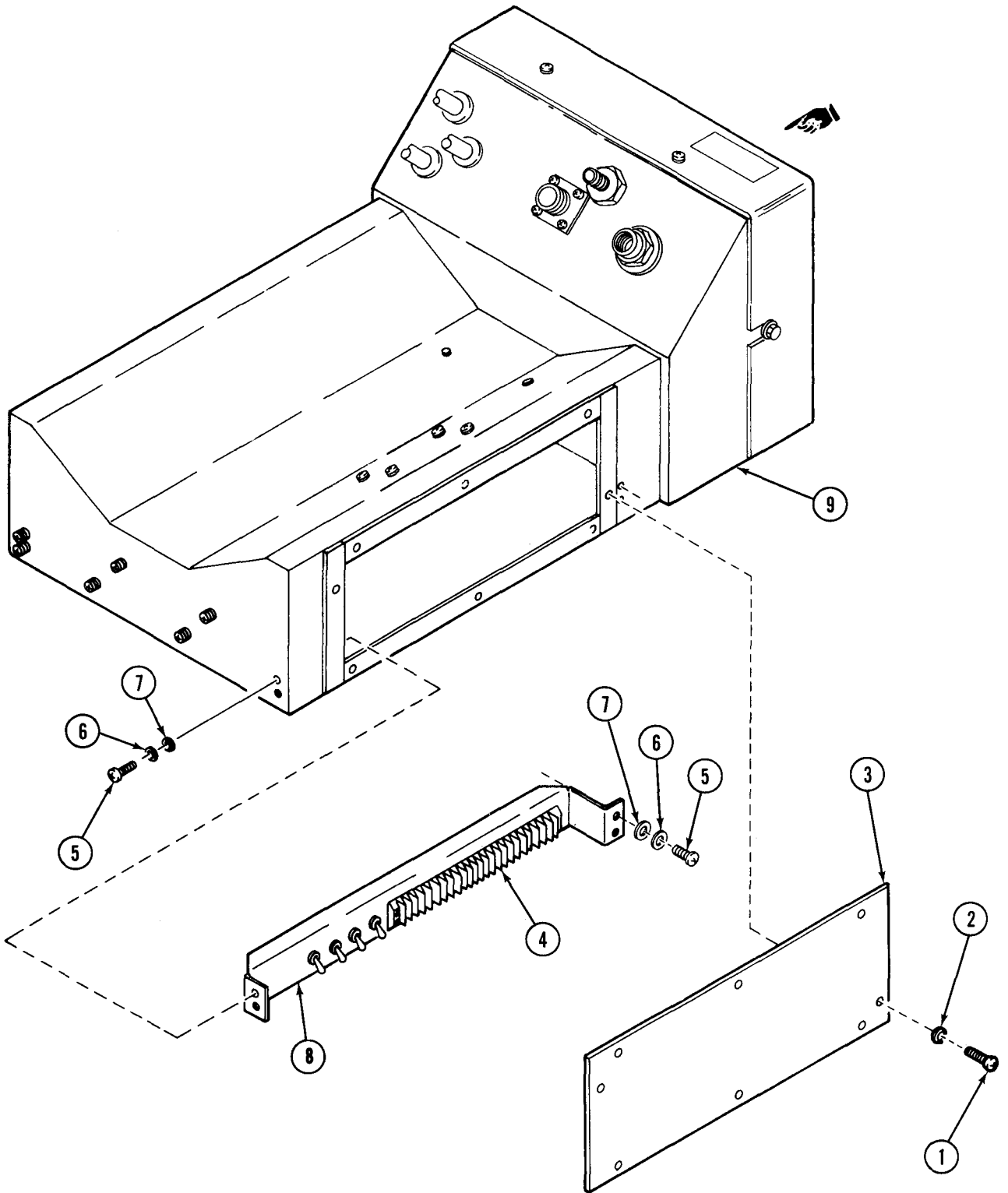
---

#### REMOVAL

1. Remove equipment container (P. 4-68).
2. Remove eight screws (1) and washers (2) and remove equipment container panel (3).
3. Remove four screws (5), flat washers (6) and lock washers (7), securing terminal bracket assembly (8), and remove bracket assembly.
4. Tag and remove all wire leads from terminal board (4). See smoke generator wiring (P. 4-34).

#### INSTALLATION

1. Attach all wire leads to terminal board (4), smoke generator wiring (P. 4-34). Coat terminal board screw thread with sealing compound before securing wire leads.
2. Position terminal bracket assembly (8), and secure with four screws (5), flat washers (6) and lock washers (7).
3. Position equipment container panel (3) on equipment container (9) and secure with eight screws (1), and flat washers (2).
4. Install equipment container (P. 4-68).



## 4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

### *d. Ignition Coil.*

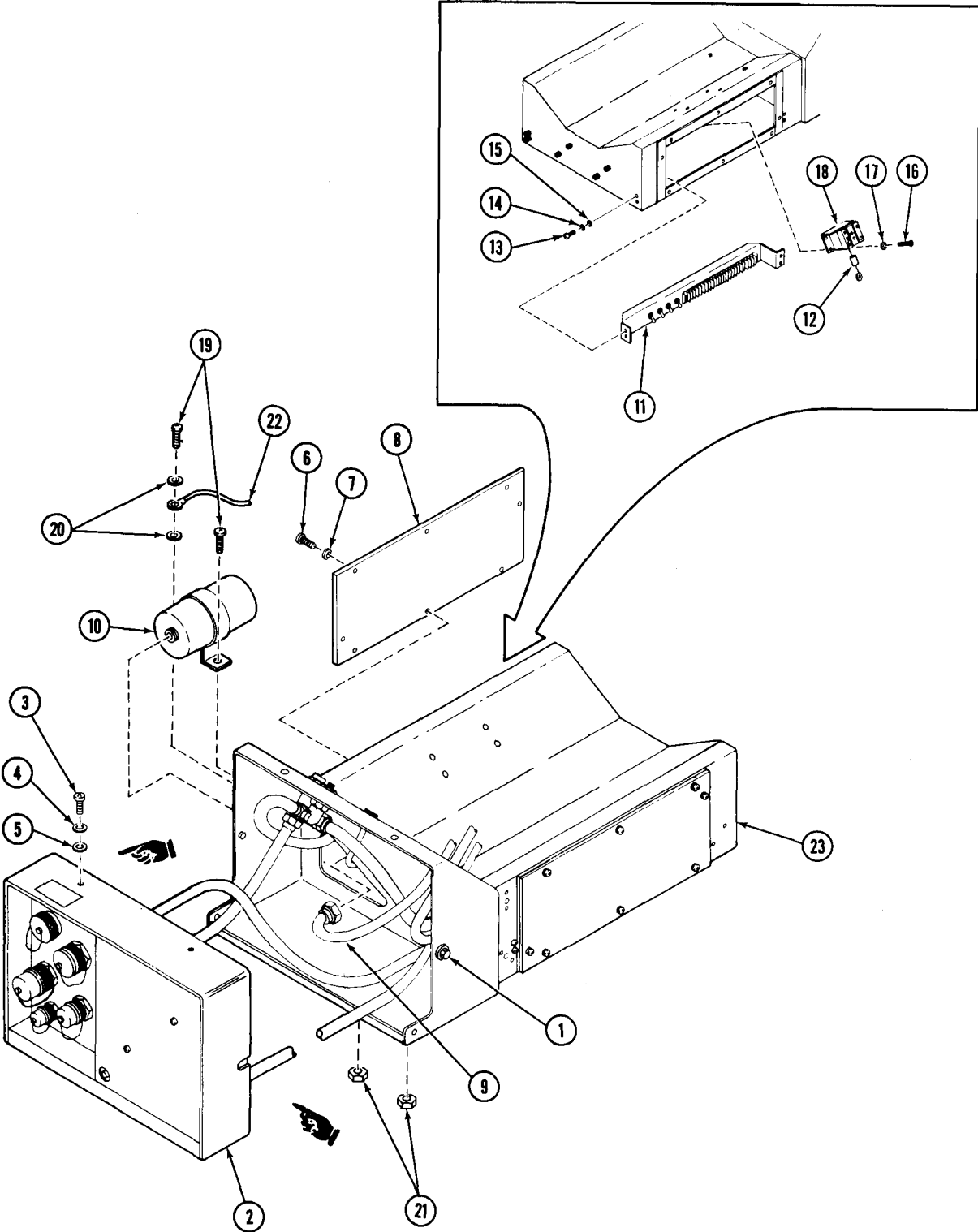
---

#### REMOVAL

1. Remove equipment container (P. 4-68).
2. Loosen two screws (1) securing sides of cover assembly (2). Remove two screws (3), Lock washers (4), and washers (5) securing top of cover assembly and open cover assembly.
3. Remove eight screws (6) and washers (7) from equipment container panel (8) and remove panel.
4. Remove ignition cable (9) from ignition coil (10).
5. Tag and remove two ignition coil (E11) wires from terminal bracket assembly (11). See smoke generator wiring (P. 4-34).
6. Tag and remove resistor assembly (12) lead from terminal bracket assembly (11).
7. Remove four screws (13) lock washers (14), and flat washers (15) securing terminal bracket assembly (11).
8. Remove four screws (16) and washers (17) securing relay (18). Move relay and terminal bracket aside.
9. Remove two screws (19), two washers (20), two nuts (21) and one electrical wire (22), and remove ignition coil (10) from equipment container (23).

#### INSTALLATION

1. Position ignition coil (10) in equipment container (23).
2. Install two screws (19), two washers (20), one electrical wire (22), and two nuts (21), and secure ignition coil (10) to equipment container (23).
3. Position relay (18) and secure with four screws (16) and washers (17).
4. Install two ignition coil wires on terminal bracket assembly (11) as tagged.
5. Install ignition cable (9) on ignition coil (10).
6. Position terminal bracket assembly (11) in equipment container (23) and secure with four screws (13), lock washers (14) and flat washers (15).
7. Attach resistor assembly (12) to terminal bracket assembly (11).
8. Position equipment container panel (8) and secure with eight screws (6) and washers (7).
9. Close cover assembly (2) and secure with four screws (1 and 3) and lock washers (4) and washers (5).
10. Install equipment container (P. 4-68).

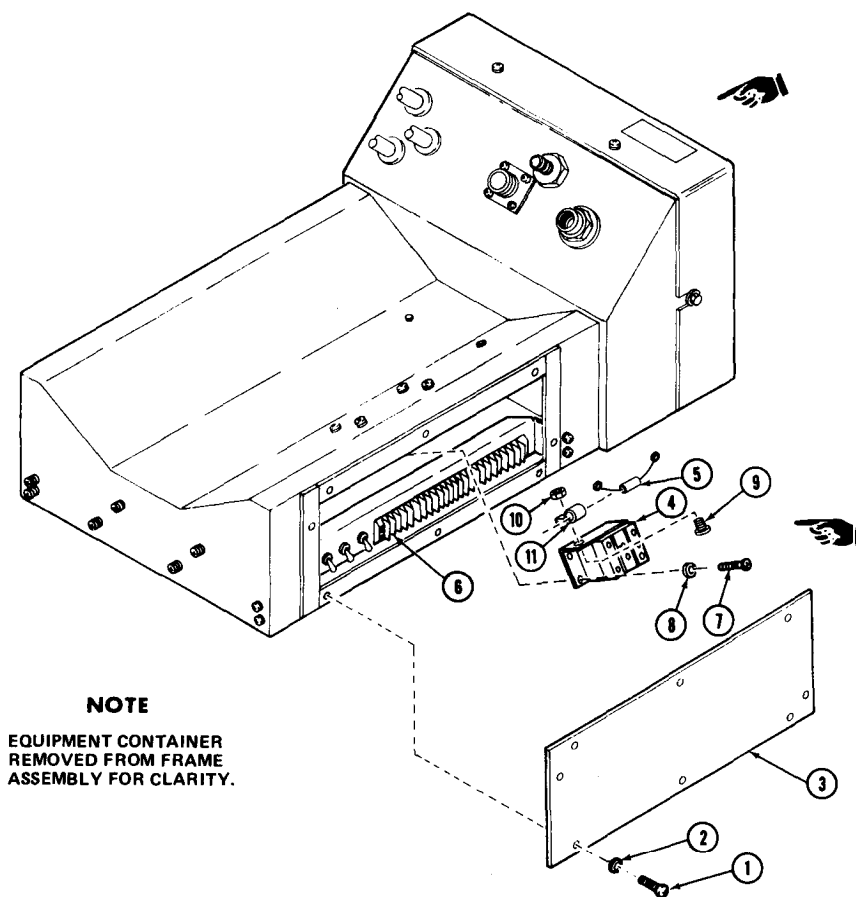


## 4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

### e. Relay K101.

#### REMOVAL

1. Remove eight screws (1) and washers (2) securing equipment container panel (3).
2. Tag and remove electrical connections from relay (4).
3. Disconnect resistor (5) lead from terminal board (6) and tag.
4. Remove four screws (7) and washers (8) securing relay (4) and remove relay.
5. Remove screw (9) and nut (10) securing resistor (5) and loop clamp (11) to relay (4).



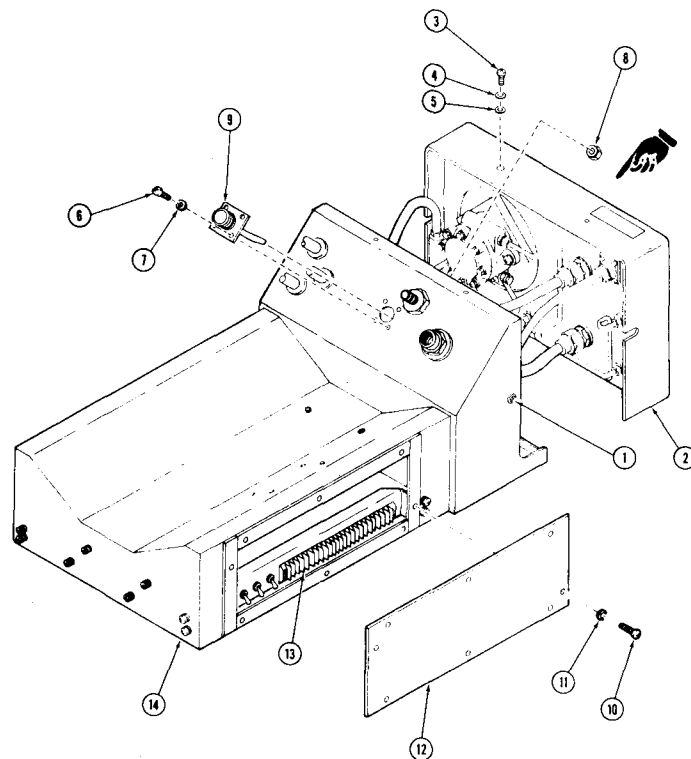
#### INSTALLATION

1. Secure resistor (5) and loop clamp (11) to relay (4) with screw (9) and nut (10).
2. Secure relay (4) in equipment container with four screws (7) and washers (8).
3. Attach electrical connections to relay as tagged. Connect resistor (5) lead to terminal board (6) as tagged. Coat terminal board screw thread with sealing compound (11A, App E) before securing.
4. Install equipment container panel (3) with eight screws (1) and washers (2).

*f. Cable Assembly 5J2.*

## REMOVAL

1. Remove equipment container (P. 4-68).
2. Loosen two screws (1) securing sides of cover assembly (2). Remove two screws (3), lockwashers (4), and washers (5) securing top of cover assembly and open cover assembly.
3. Remove four screws (6), washers (7), and nuts (8) from cable assembly (9).
4. Remove eight screws (10) and washers (11) securing equipment container panel (12).
5. Remove eight wire leads of cable assembly (9) from terminal bracket assembly (13). See smoke generator wiring (P. 4-34).
6. Remove electric cable assembly (9) from equipment container (14).



## INSTALLATION

1. Install electric cable assembly (9) in equipment container (14).
2. Install wire leads to TB12, see smoke generator wiring (P. 4-34). Coat terminal board screw threads with sealing compound before securing wire leads.
3. Position equipment container panel (12) and secure using eight screws (10), and washers (11).
4. Secure electric cable assembly (9) using four screws (6), washers (7) and nuts (8).
5. Slowly close cover assembly (2). Position hoses in equipment container while closing cover so that hoses do not become kinked or pinched. Secure cover assembly with screws (1 and 3), lockwashers (4), and washer (5).
6. Install equipment container (P. 4-68). Coat terminal board screw threads with sealing compound before securing wire leads.

4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

*g. Ignition Cable Assembly.*

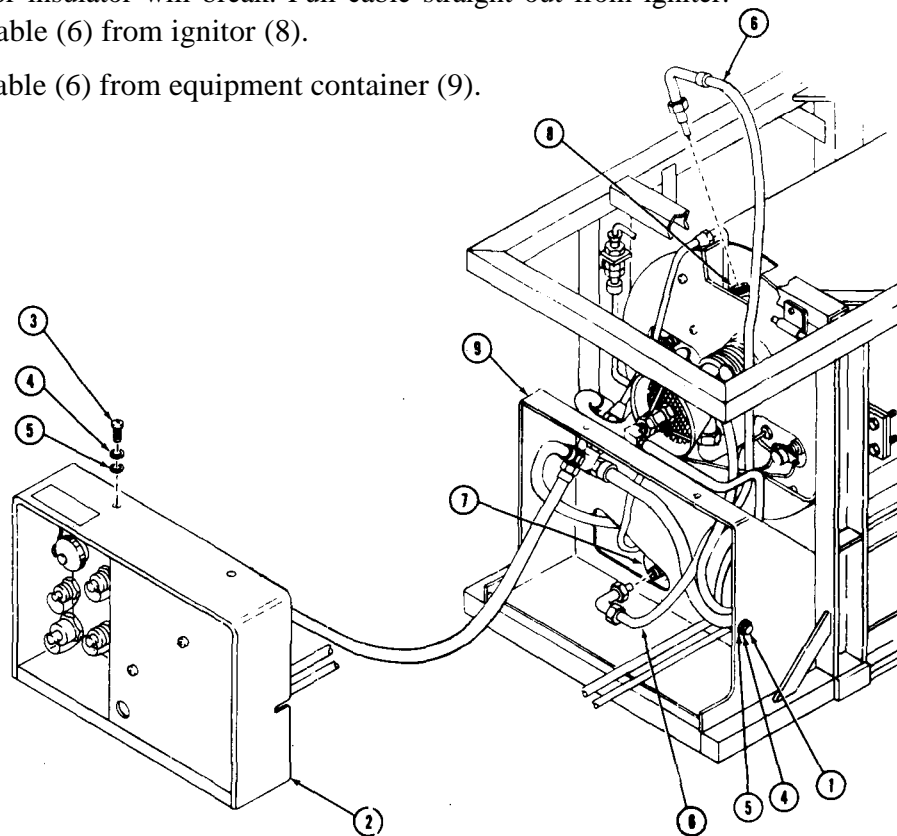
REMOVAL

1. Loosen two screws (1) securing sides of cover assembly (2). Remove two screws (3), lockwashers (4), and washers (5) securing top of cover assembly and open cover assembly.
2. Remove ignition cable (6) from ignition coil (7).

**CAUTION**

Ignition cable contains a ceramic insulator. Take care when removing cable from igniter or insulator will break. Pull cable straight out from igniter.

3. Remove ignition cable (6) from ignitor (8).
4. Remove ignition cable (6) from equipment container (9).



INSTALLATION

1. Install ignition cable (6) through equipment container (9).

**CAUTION**

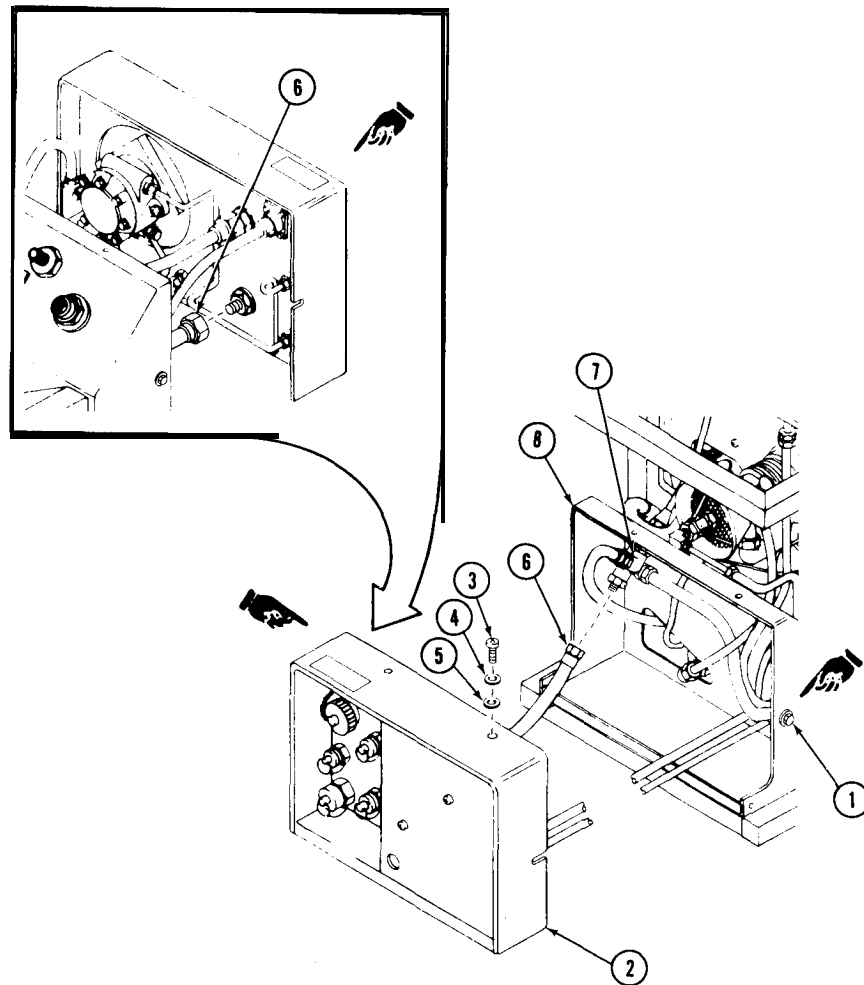
Ignition cable contains a ceramic insulator. Take care when installing cable on ignitor or insulator will break. Insert cable straight in on ignitor.

2. Install ignition cable (6) on ignitor (8).
3. Install ignition cable (6) on ignition coil (7).
4. Slowly close cover assembly (2). Position hoses in equipment container while closing cover so that hoses do not become kinked or pinched. Secure cover assembly with screws (1 and 3), lockwashers (4), and washers (5).



***h. Fog Oil Supply Hose Assembly.*****REMOVAL**

1. Loosen two screws (1) securing sides of cover assembly (2). Remove two screws (3), lockwashers (4), and washers (5) securing top of cover assembly and open cover assembly.
2. Disconnect fog oil hose assembly (6) from bulkhead tee (7), on equipment container (8).
3. Disconnect fog oil hose assembly (6) from cover assembly (2), and remove fog oil hose assembly (6).

**INSTALLATION**

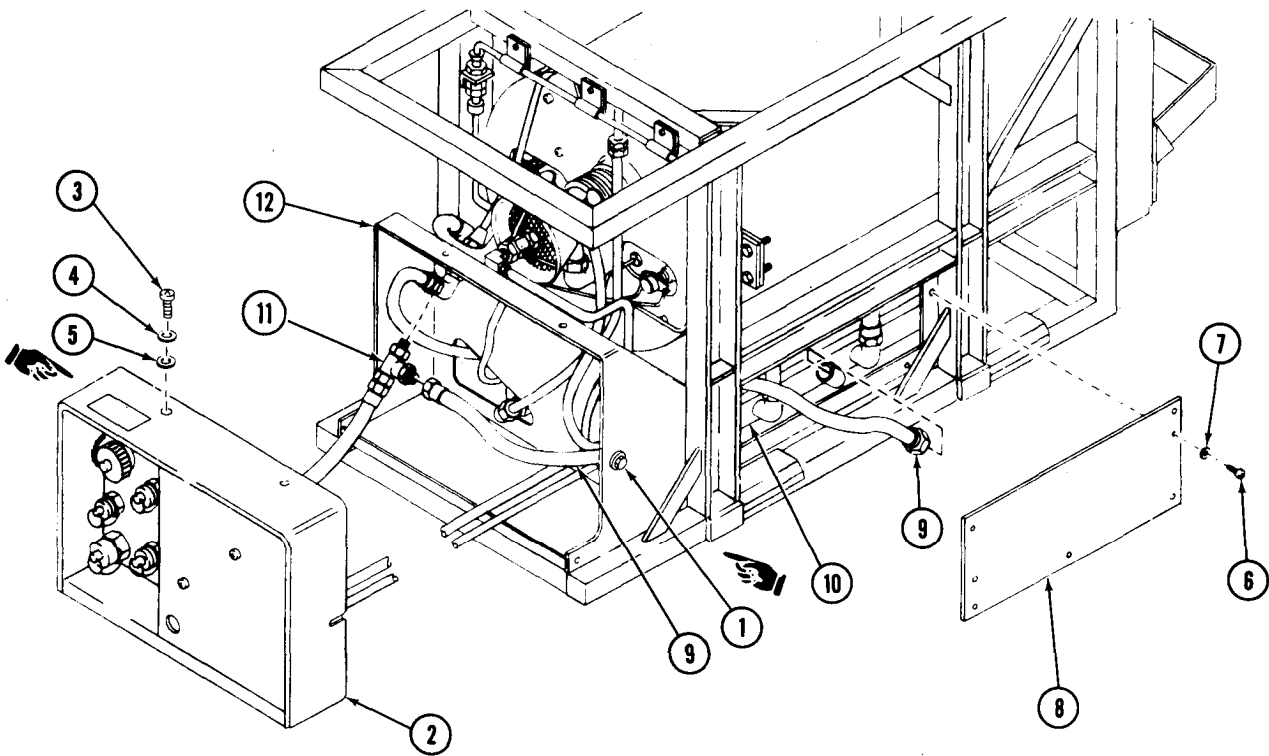
1. Connect fog oil hose assembly (6) to cover assembly (2).
2. Attach fog oil hose assembly (6) to bulkhead tee (7).
3. Slowly close cover assembly (2). Position hoses in equipment container while closing cover so that hoses do not become kinked or pinched. Secure cover assembly with screws (1 and 3), lockwashers (4), lockwashers (4), and washers (5).

## 4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

### *i. Fog Oil Pressure Hose Assembly.*

#### REMOVAL

1. Loosen two screws (1) securing sides of cover assembly (2). Remove two screws (3), lockwashers (4), and washers (5) securing top of cover assembly and open cover assembly.
2. Remove eight screws (6) and washers (7) securing equipment container panel (8).
3. Disconnect fog oil hose assembly (9) from pressure switch bracket (10).
4. Disconnect fog oil hose assembly (9) from bulkhead tee (11) on equipment container (12).
5. Remove fog oil hose assembly (9) from equipment container (12).



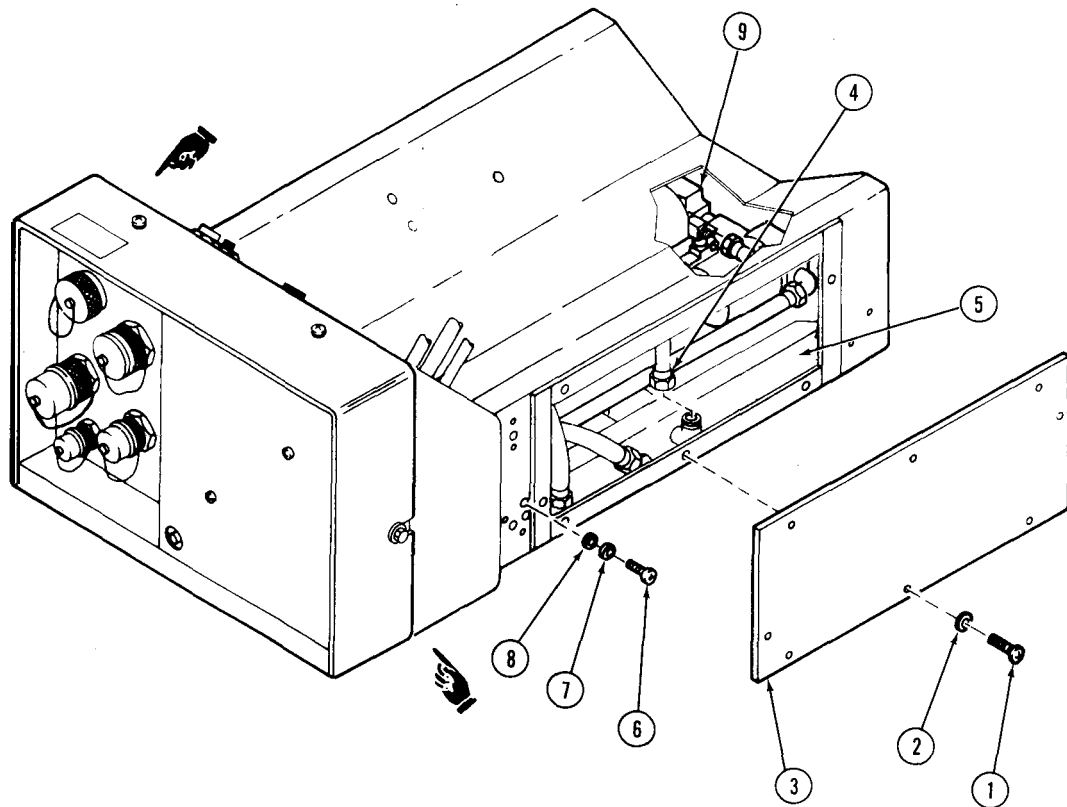
#### INSTALLATION

1. Install fog oil hose assembly (9) in equipment container (12).
2. Connect fog oil hose assembly (9) to pressure switch bracket (10).
3. Secure fog oil hose assembly (9) bulkhead tee (11) on equipment container (12).
4. Position equipment container panel (8) and secure with eight screws (6) and washers (7).
5. Slowly close cover assembly (2). Position hoses in equipment container while closing cover so that hoses do not become kinked or pinched. Secure cover assembly with screws (1 and 3), lockwashers (4), and washers (5).

*j. Air Hose Assembly.*

## REMOVAL

1. Remove equipment container (P. 4-68).
2. Remove eight screws (1) and washers (2) securing equipment container panel (3).
3. Disconnect air hose assembly (4) from pressure switch bracket (5).
4. Remove four screws (6), flat washers (7) and lock washers (8) securing pressure switch bracket assembly (5), and move bracket aside.
5. Remove air hose assembly (4) from solenoid assembly (9).



## INSTALLATION

1. Install air hose assembly (4) on solenoid assembly (9).
2. Position pressure switch bracket assembly (5) and secure with four screws (6), flat washers (7), and lock washers (8).
3. Install air hose assembly (4) on pressure switch bracket (5).
4. Position equipment container panel (3) and secure with eight screws (1) and washers (2).
5. Install equipment container (P. 4-68).

## 4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

### *k. Purge Air Hose Assembly.*

---

#### REMOVAL

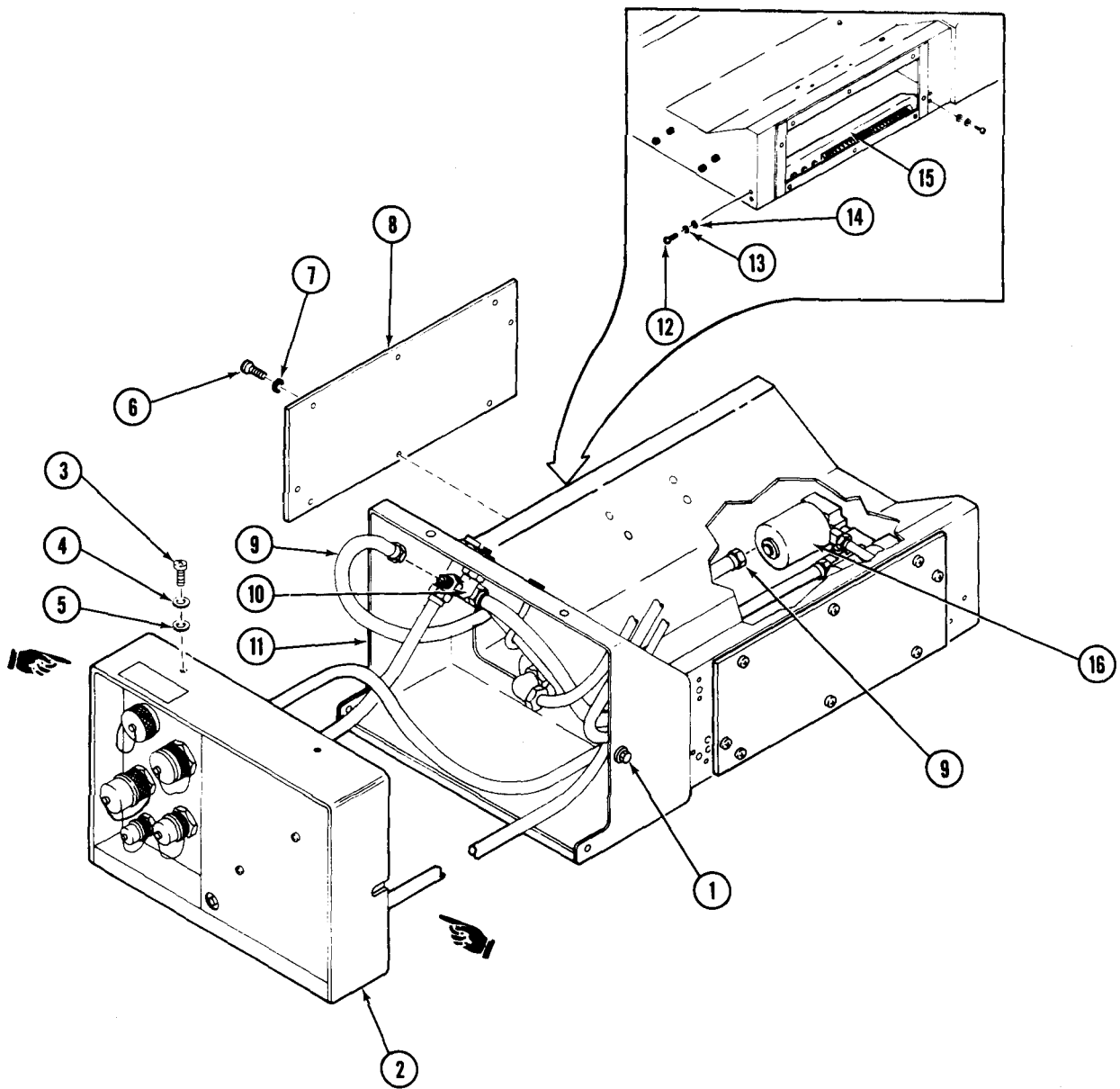
#### NOTE

Equipment container removed from smoke generator for clarity.

1. Loosen two screws (1) securing sides of cover assembly (2). Remove two screws (3), lockwashers (4), and washers (5) securing top of cover assembly and open cover assembly.
2. Remove eight screws (6) and washers (7), securing equipment container panel (8).
3. Disconnect purge air hose (9) from elbow (10) on equipment container (11).
4. Disconnect four screws (12), washers (13), and lock washers (14) securing terminal bracket assembly (15).
5. Remove purge air hose (9) from solenoid assembly (16).

#### INSTALLATION

1. Connect purge air hose (9) to solenoid assembly (16).
2. Position terminal bracket assembly (15) and secure with four screws (12), washers (13) and lock washers (14).
3. Connect air hose (9) to elbow (10) on equipment container (11).
4. Make sure switches on terminal bracket are in the OFF (down) position.
5. Position equipment container panel (8) and secure with eight screws (6) and washers (7).
6. Slowly close cover assembly (2). Position hoses in equipment container while closing cover so that hoses do not become kinked or pinched. Secure cover assembly with screws (1 and 3), lockwashers (4), and washers (5).



## 4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

### *1. Air Supply Hose Assembly.*

---

#### REMOVAL

1. Remove equipment container (P. 4-68).
2. Loosen two screws (1) securing sides of cover assembly (2). Remove two screws (3), lock washers (4), and washers (5) securing top of cover assembly and open cover assembly.
3. Remove eight screws (6) and washers (7) securing right equipment container panel (8).
4. Remove eight screws (9) and washers (10) securing left equipment container panel (11).
5. Remove four screws (12), flat washers (13), and lock washers (14) securing pressure switch bracket assembly (15).
6. Remove four screws (16), washers (17) and lock washers (18) securing terminal bracket assembly (19).
7. Disconnect air supply hose (20) from solenoid assembly (21).
8. Disconnect air supply hose (20) from quick disconnect coupling (22) on cover assembly (2).
9. Remove air supply hose (20) from equipment container (23).

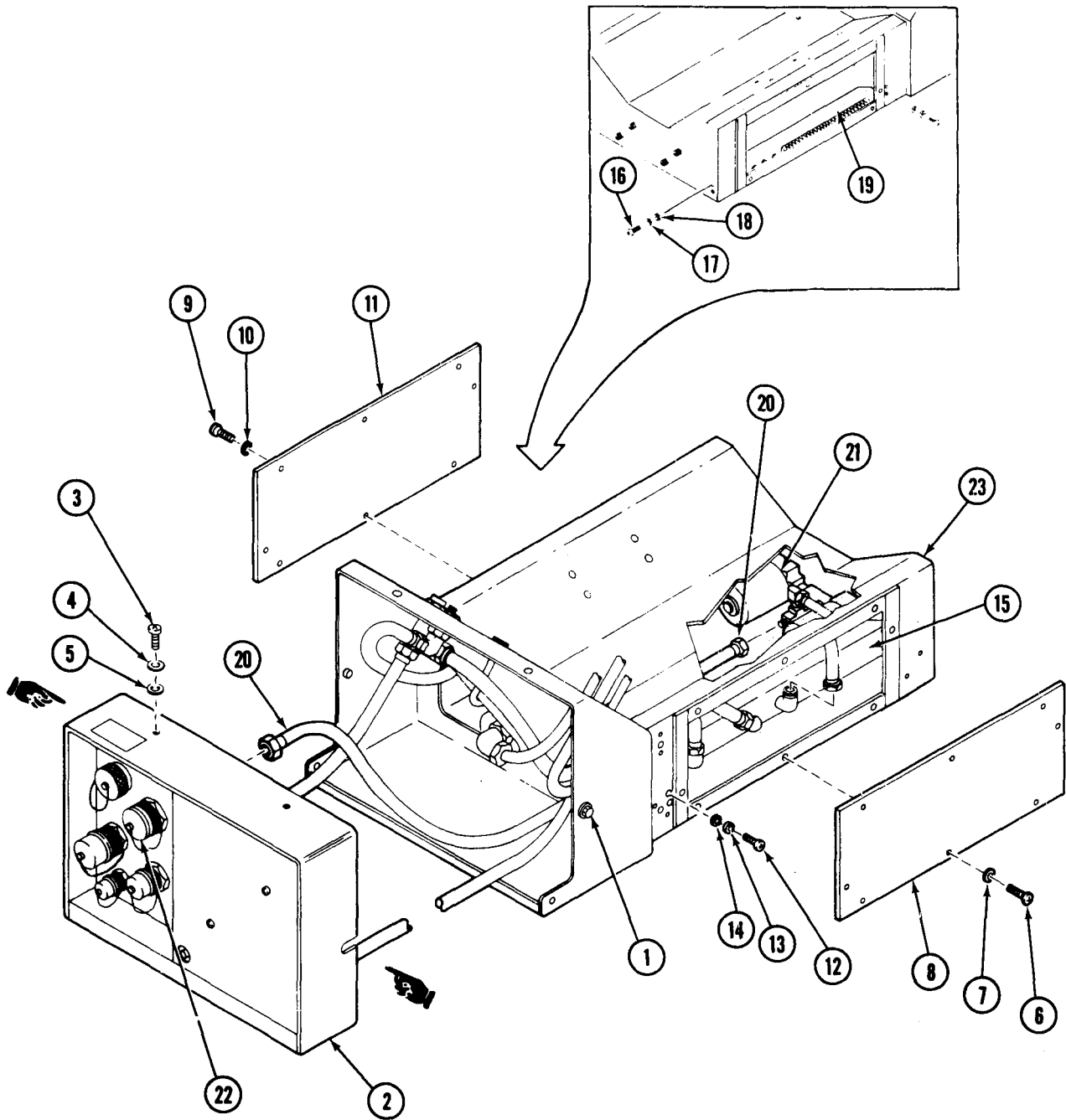
#### INSTALLATION

1. Connect air supply hose (20) to quick disconnect coupling (22) in cover assembly (2).
2. Run air supply hose (20) through equipment container (23) and connect air supply hose (20) to solenoid assembly (21).
3. Position pressure switch bracket assembly (15) and secure with four screws (12), flat washers (13) and lock washers (14).
4. Position equipment container panel (11) and secure with four screws (9) and washer (10).
5. Position terminal bracket assembly (19) and secure with eight screws (16), washers (17) and lock washers (18).
6. Position equipment container panel (8) and secure with four screws (6) and washers (7).

#### **NOTE**

Insure spring guard on air supply hose is positioned within 1 inch of hose fitting at cover assembly.

7. Slowly close cover assembly (2). Position hoses in equipment container while closing cover so that hoses do not become kinked or pinched. Secure cover assembly with screws (1 and 2), lock washers (4), and washers (5).
8. Install equipment container (P. 4-68).



## 4-16 EQUIPMENT CONTAINER ASSEMBLY (CONT).

### *m. Start Air Hose Assembly.*

---

#### REMOVAL

#### NOTE

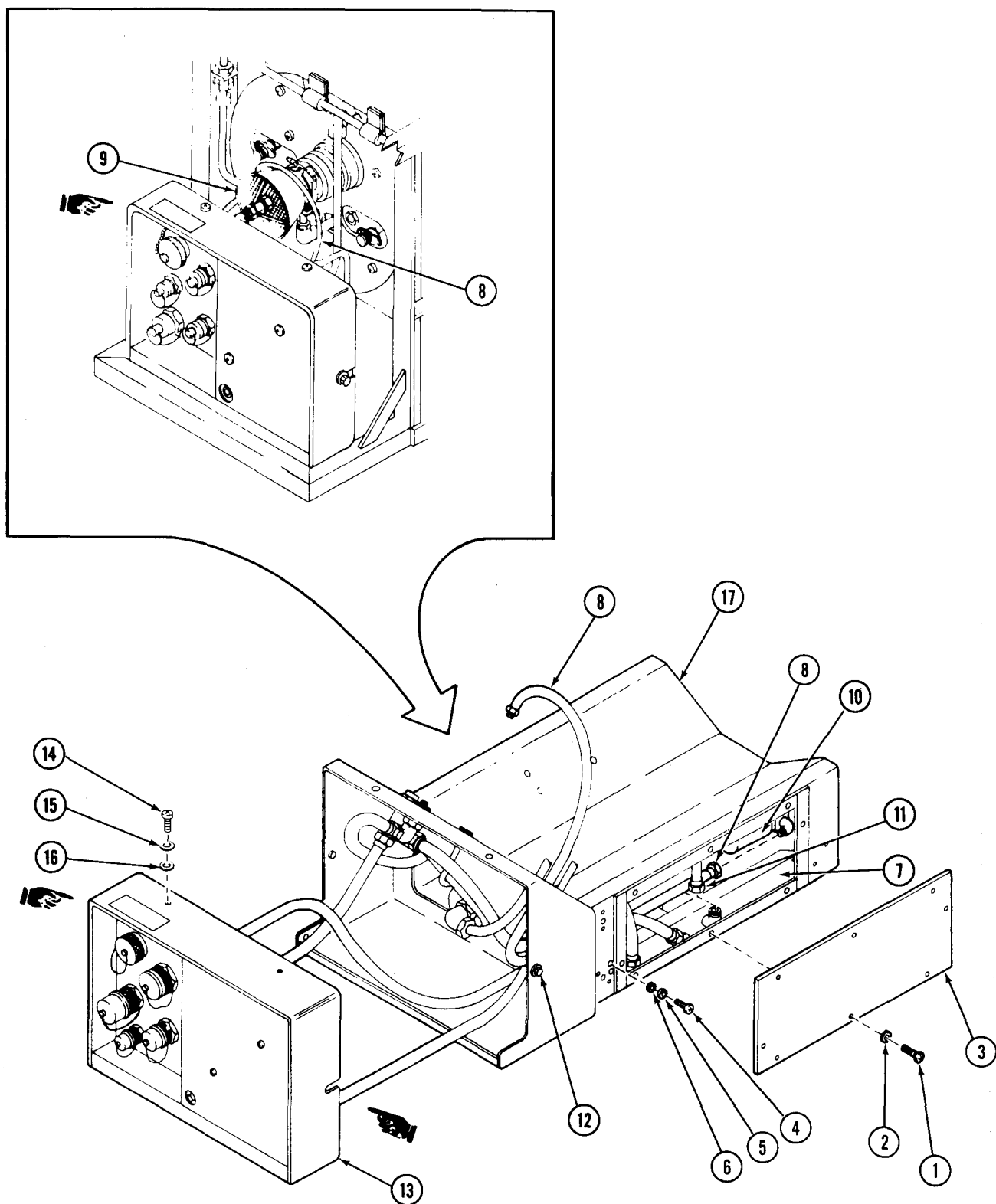
Equipment container removed from smoke generator for clarity.

1. Remove eight screws (1) and washers (2) securing equipment container panel (3).
2. Remove four screws (4), flat washers (5) and lock washers (6) securing pressure switch bracket assembly (7), and move bracket aside.
3. Disconnect start air hose (8) from nozzle assembly (9).
4. Disconnect start air hose (8) from solenoid assembly (10).
5. Disconnect air pressure hose (11) from pressure switch bracket assembly (7).
6. Loosen two screws (12) securing sides of cover assembly (13). Remove two screws (14), lock washers (15), and washers (16) securing top of cover assembly and open cover assembly.
7. Remove start air hose (8) from equipment container (17).

#### INSTALLATION

1. Position start air hose (8) in equipment container (17).
2. Connect start air hose (8) to nozzle assembly (9).
3. Connect start air hose (8) to solenoid assembly (10).
4. Slowly close cover assembly (13) and position hoses in equipment container while closing cover so that hoses do not become kinked or pinched. Secure cover assembly with screws (12 and 14), lock washers (15), and washers (16).
5. Position pressure switch bracket assembly (7), and secure with four screws (4), flat washers (5), and lock washers (6).
6. Connect air pressure hose (11) to pressure switch bracket assembly (7).
7. Position equipment container panel (3) and secure with eight screws (1) and washers (2).





## 4-17 AIR HOSE ASSEMBLY.

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This task covers repair of Air Hose Assembly.

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### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N-26

#### *Equipment Condition*

Air hose assembly removed from equipment container (P. 4-83).

#### *General Safety Instructions*

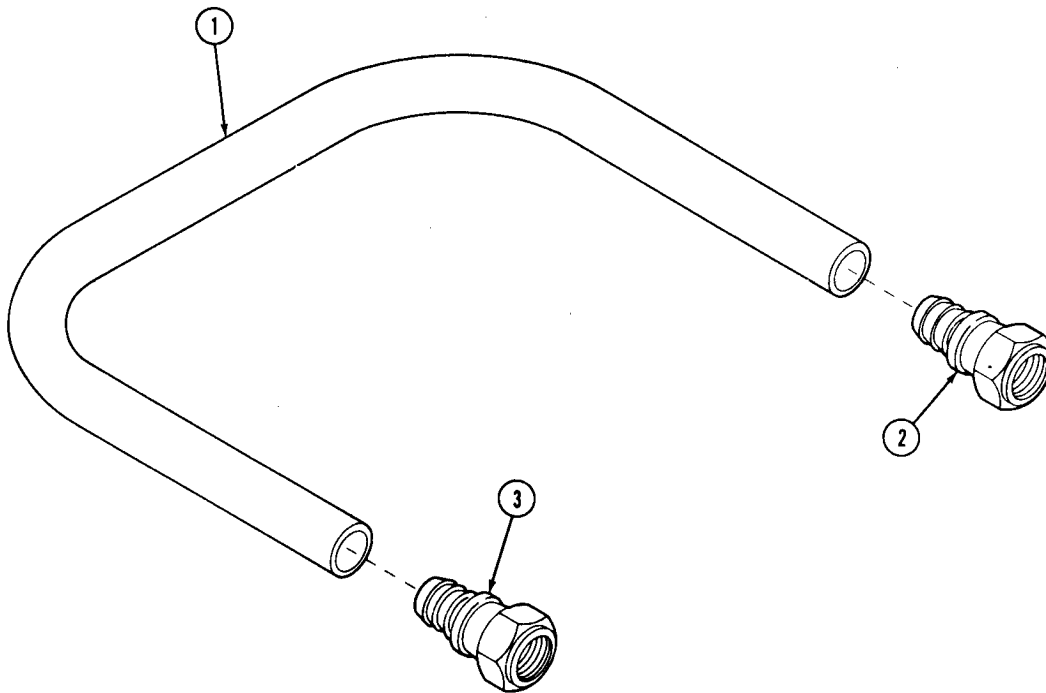
Before performing any maintenance procedures be sure circuit breaker CB1 is in OFF position.

Before performing any maintenance procedures on air lines be sure to relieve system of pressure by opening drain valve on compressor tank.

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Cut hydraulic hose (1) at straight adapter (3) and remove adapter.
3. Replace adapters as required.
4. Fabricate new hose (Fig. G-2, App G).
5. Install straight adapters (2) and (3) in hydraulic hose.



## 4-18 FOG OIL SUPPLY HOSE ASSEMBLY.

---

This task covers repair of Hose Assembly.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

Before performing any maintenance procedures be sure circuit breaker CB1 is in OFF position.

#### *Equipment Condition*

Hose removed from equipment container (P. 4-81).

Fog oil is slippery, wipe up all spills immediately to prevent injury to personnel.

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Cut hydraulic hose (1) at straight adapter (3) and remove adapter.
3. Replace straight adapters as required.
4. Fabricate new hose (Fig.G-3, App G).
5. Install straight adapters (2) and (3) in hydraulic hose (1).

## 4-19 AIR SUPPLY HOSE ASSEMBLY.

---

This task covers repair of Air Supply Hose Assembly.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Equipment Condition*

Air supply hose removed from equipment container (P. 4-86).

#### *General Safety Instructions*

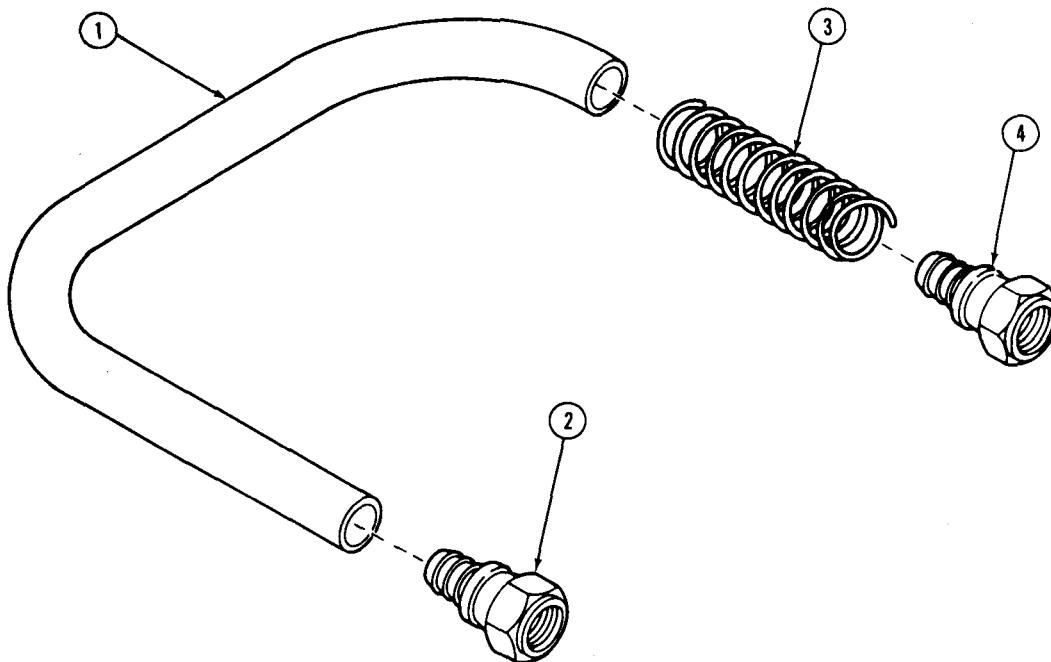
Before performing any maintenance procedures be sure circuit breaker CB1 is in OFF position.

Before performing any maintenance procedures on air lines be sure to relieve system of pressure by opening control valve on compressor tank.

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Slide spring guard (3) away from straight adapter (4) and cut hydraulic hose (1) at adapter, and remove adapter.
3. Remove spring guard (3) from hydraulic hose (1).
4. Replace straight adapters as required.
5. Fabricate new hose (Fig. G-4, App G).
6. Slide guard spring (3) on hydraulic hose.
7. Install straight adapters (2) and (3) in hydraulic hose.



## 4-20 START AIR HOSE ASSEMBLY.

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This task covers repair of Start Air Hose Assembly.

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### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Equipment Condition*

Start air hose assembly removed from equipment container (P. 4-88).

#### *General Safety Instructions*

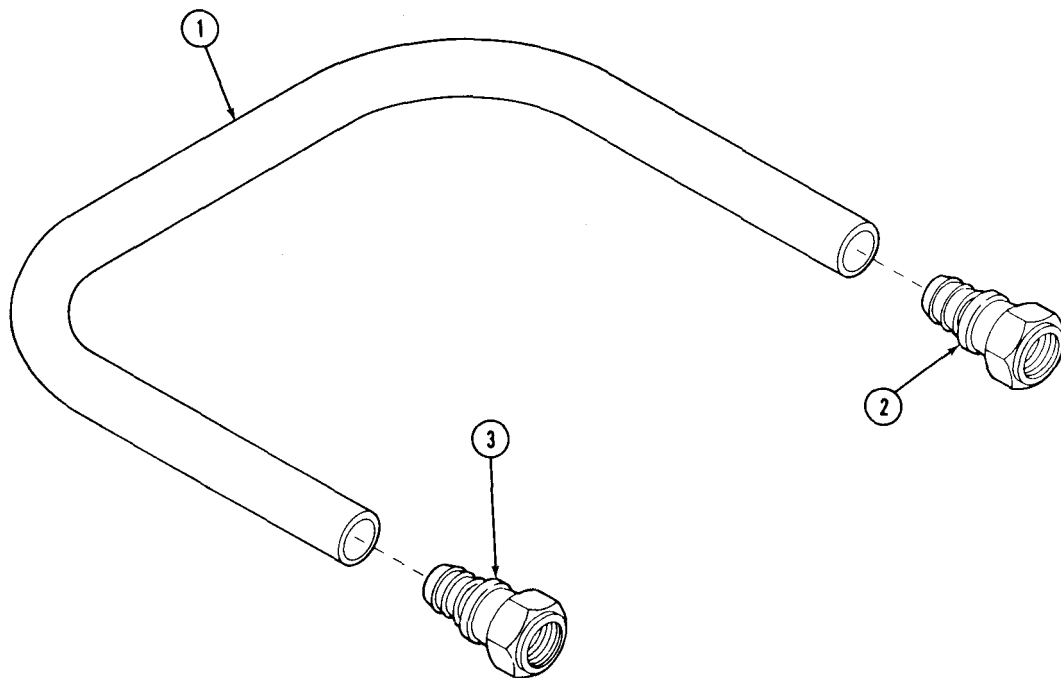
Before performing any maintenance instructions be sure circuit breaker CB1 is in OFF position.

Before performing any maintenance procedures on air lines be sure to relieve system of pressure by opening control valve on air compressor tank.

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Cut hydraulic hose (1) at straight adapter (3) and remove adapter.
3. Replace straight adapters as required.
4. Fabricate new hose (Fig. G-5, App G).
5. Install straight adapters (2) and (3) in hydraulic hose (1).



## 4-21 FOG OIL PRESSURE HOSE ASSEMBLY.

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This task covers repair of Fog Oil Hose Assembly.

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### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

Before performing any maintenance procedures be sure circuit breaker CB1 is in OFF position.

#### *Equipment Condition*

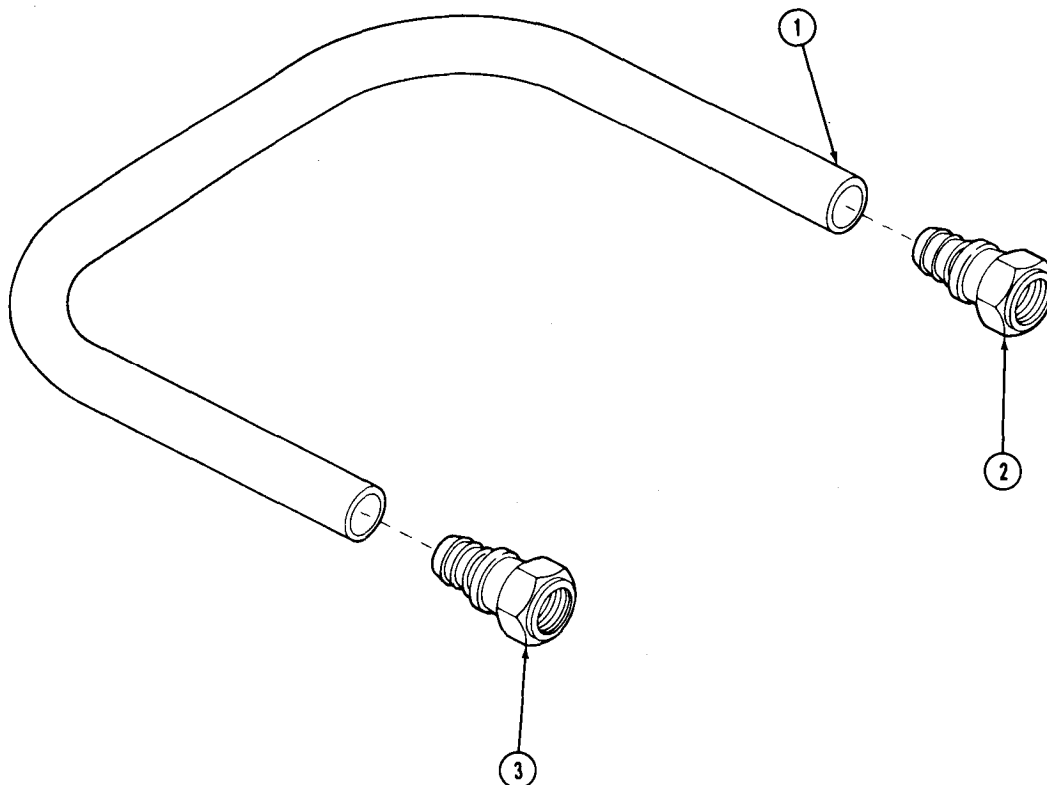
Fog oil hose assembly removed from equipment container (P. 4-82).

Fog oil is very slippery, cleanup all spills immediately to prevent injury to personnel.

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Cut hydraulic hose (1) at straight adapter (3) and remove adapter.
3. Replace straight adapters (2) and (3) as required.
4. Fabricate new hose (Fig. G-6, App G).
5. Install straight adapters (2) and (3) in hydraulic hose.



## 4-22 PURGE AIR HOSE ASSEMBLY.

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This task covers repair of Purge Air Hose Assembly.

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### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Equipment Condition*

Purge air hose assembly removed from equipment container (P. 4-84).

#### *General Safety Instructions*

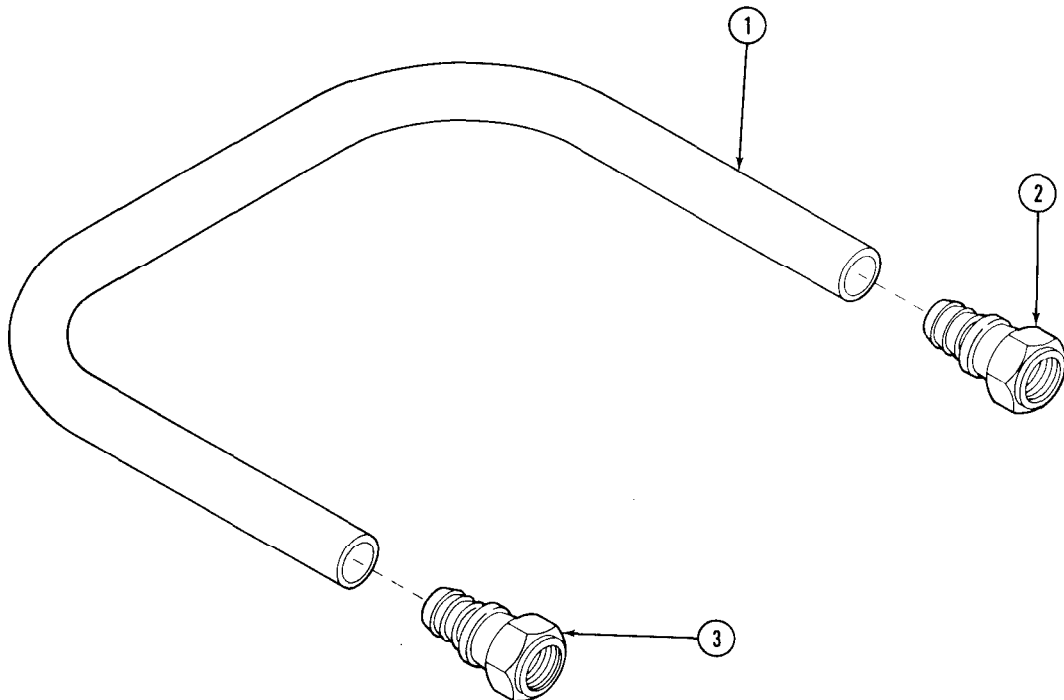
Before performing any maintenance procedures be sure circuit breaker CB1 is in OFF position.

Before performing any maintenance procedures on air lines be sure to relieve pressure in system through control valve on pressure tank.

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Cut hydraulic hose (1) at straight adapter (3) and remove adapter.
3. Replace straight adapters (2) and (3) as required.
4. Fabricate new hose (Fig. G-7, App G).
5. Install straight adapters (2) and (3) in hydraulic hose.



## 4-23 TERMINAL BRACKET ASSEMBLY.

This task covers replacement of:

**a. Terminal Board TB12 (P. 4-96)**

**b. FUEL, AIR, ENG, or OIL Switch (P. 4-97)**

### INITIAL SETUP

#### Tools

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### Materials

Sealing compound (Item 11A, App E)

#### General Safety Instructions

Before performing any maintenance procedures be sure circuit breaker CB1 is in OFF position.

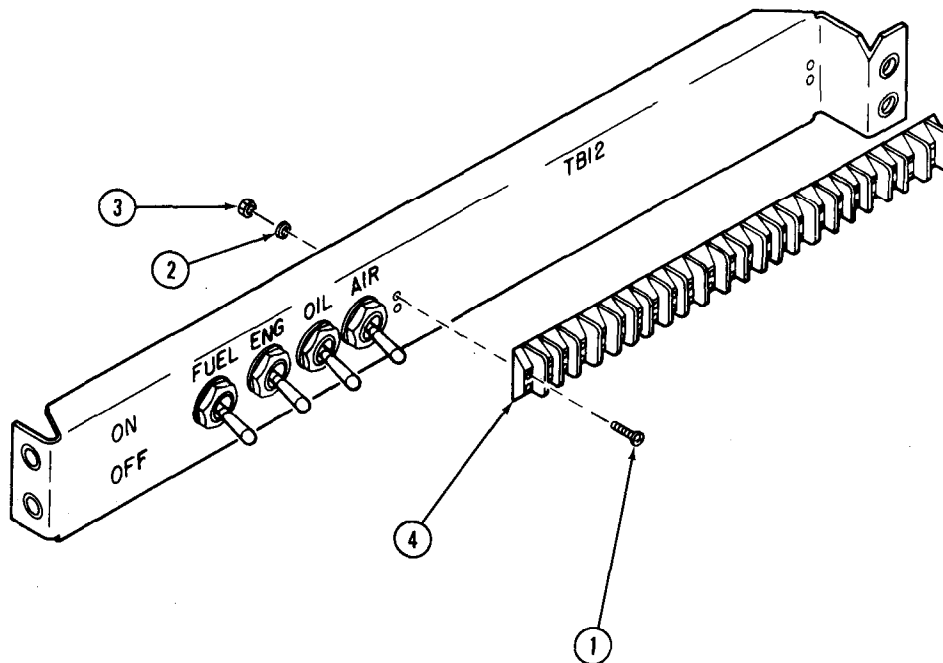
Before performing any maintenance procedures on air lines be sure to relieve system of pressure through control valve on pressure tank.

Fog oil is very slippery, wipe up all spills immediately to prevent injury to personnel.

### a. Terminal Board TB12

### REMOVAL

1. Remove terminal bracket assembly from equipment container (P. 4-74).
2. Remove four screws (1), washers (2), and nuts (3), and remove terminal board (4).



### INSTALLATION

1. Position terminal board (4) and secure using four screws (1), washers (2), and nuts (3).
2. Install terminal bracket assembly in equipment container (P. 4-74).

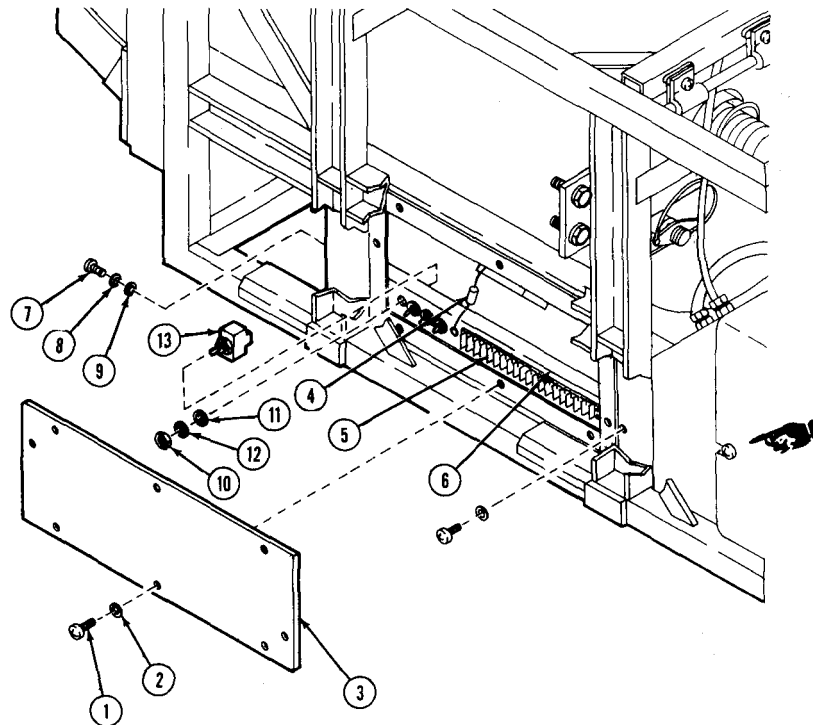


**b. FUEL, AIR, ENG, or OIL Switch.****NOTE**

Procedures for replacing AIR, FUEL, OIL, or ENG switches are the same.

**REMOVAL**

1. Remove eight screws (1), washers (2), and remove equipment container panel (3).
2. Tag and remove resistor assembly (4) from terminal board (5) on terminal bracket assembly (6).
3. Remove four screws (7), washers (8), and lock washers (9) securing terminal bracket assembly (6).
4. Remove nut (10), washer (11) and lock washers (12) and remove switch (13) from terminal bracket assembly (6).
5. Tag and remove electrical connections from switch (13).

**INSTALLATION**

1. Connect electrical connections to switch as tagged.
2. Position switch (13) in terminal bracket assembly (6) and secure with lock washers (12), washer (11), and nut (10).
3. Secure terminal bracket assembly (6) using four screws (7), washers (8), and lock washers (9).
4. Connect resistor assembly (4), as tagged, to terminal board (5) on terminal bracket assembly (6). Coat terminal board screw threads with sealing compound before securing connection.
5. Secure equipment container panel (3) using eight screws (1) and washers (2).

## 4-24 PRESSURE SWITCH BRACKET ASSEMBLY.

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This task covers replacement of:

**a. Cable Assemblies W13, W15, or W16 (P. 4-98).**

**b. Air Pressure Switch S106 (P. 4-100).**

**c. Oil Pressure Switch S103 (P. 4-100).**

**d. Fuel Pressure Switch S108 (P. 4-100).**

---

### INITIAL SETUP

#### *Materials*

Sealing Compound (Item 11A, App E)

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

Before performing any maintenance procedures be sure circuit breaker CB1 is in OFF position.

---

**a. Cable Assemblies W13, W15, or W16.**

---

### NOTE

Procedures for removal and installation of three cable assemblies are the same.

### REMOVAL

1. Remove equipment container from smoke generator (P. 4-68).
2. Remove eight screws (1) and washers (2) and remove right equipment container panel (3).
3. Remove eight screws (4) and washers (5) and remove left equipment container panel (6).
4. Disconnect air pressure hose (7) from pressure switch bracket assembly (8).
5. Remove four screws (9), washers (10), and flat washers (11) and remove pressure switch bracket assembly (8).
6. Disconnect cable assembly (12) from pressure switch (13).
7. Disconnect wire leads from terminal board (14) and remove cable assembly from equipment container (15).

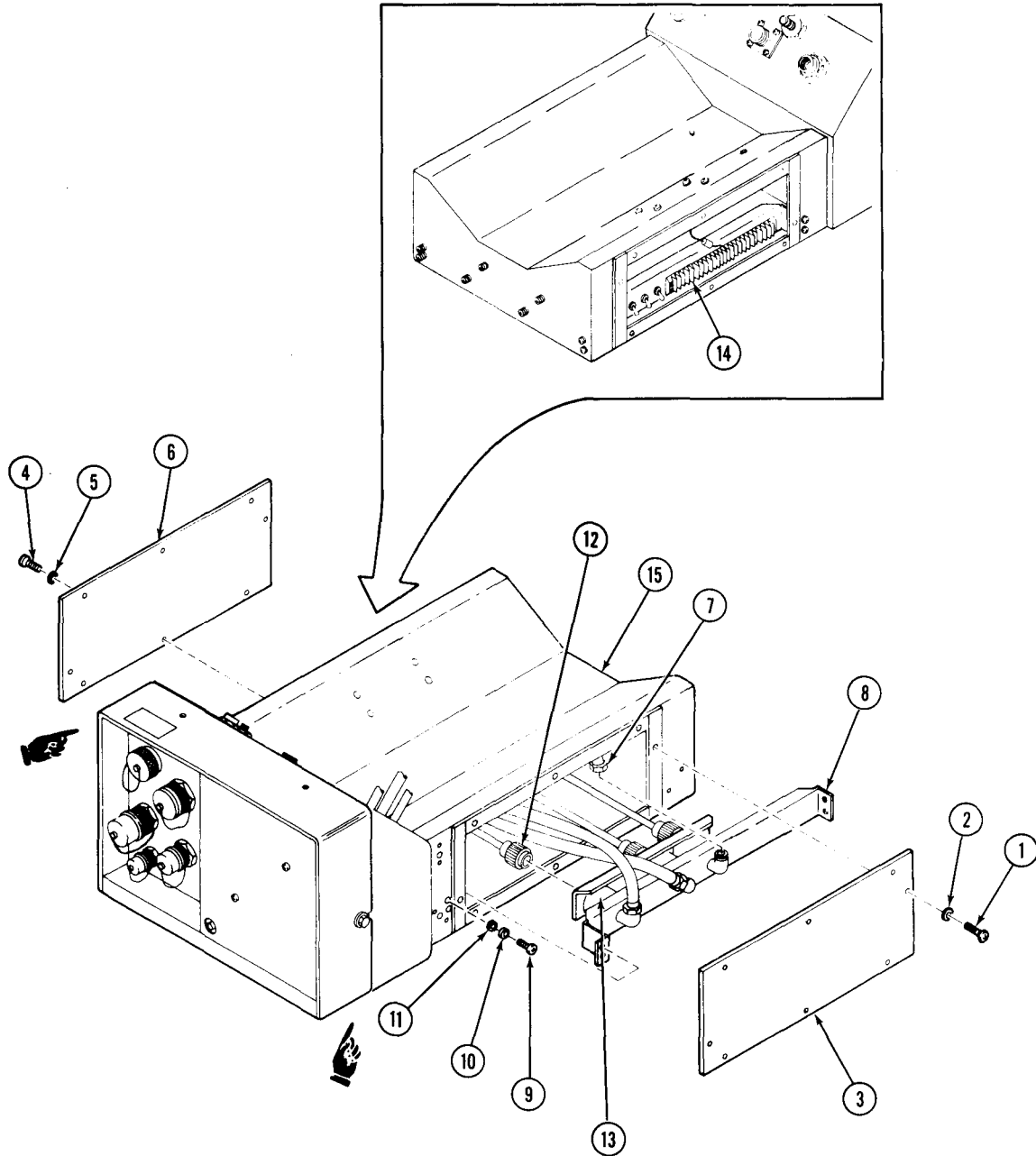
### INSTALLATION

### NOTE

TB 21 is wired right to left.

1. Connect cable assembly leads to terminal board TB12 (14). Coat terminal board screw threads with sealing compound before securing leads.
2. Connect cable assembly (12) to pressure switch (13).
3. Position pressure switch bracket assembly (8) and secure with four screws (9), lock washers (10) and flat washers (11).

4. Connect air pressure hose (7) to pressure switch bracket assembly (8).
5. Position right equipment panel (6), and secure with eight screws (4), and washers (5).
6. Position left equipment panel (3), and secure with eight screws (1), and washers (2).
7. Install equipment container (P. 4-68).



## 4-24 PRESSURE SWITCH BRACKET ASSEMBLY (CONT).

- b. *Air Pressure Switch S106.*
- c. *Oil Pressure Switch S103.*
- d. *Fuel Pressure Switch S108.*

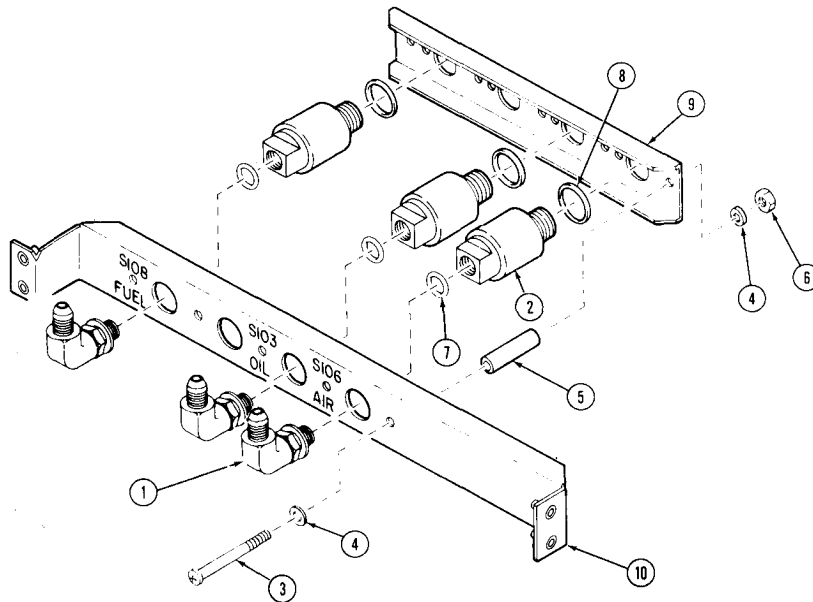
---

### NOTE

Removal and installation procedures are the same for all three switches.

### REMOVAL

1. Remove pressure switch bracket assembly from equipment container (P. 4-72).
2. Remove elbow (1) from pressure switch (2). Tag switches for identification.
3. Remove five screws (3), ten washers (4), five spacers (5), five nuts (6), preformed packings (7), and (8), and retainer channel (9).
4. Disassemble pressure switch bracket assembly and replace pressure switch.
5. Replace preformed packings (7) and (8) as required.



### INSTALLATION

1. Position pressure switch (2), in pressure switch bracket (10).
  2. Secure pressure switch bracket (10) using five screws (3), ten washers (4), five spacers (5), five nuts (6), preformed packings (7) and (8), and retainer channel (9).
  3. Install elbow (1) on pressure switch (2).
  4. Install pressure switch bracket assembly in equipment container (P. 4-72).
-

## 4-25 EQUIPMENT CONTAINER.

This task covers replacement of:

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>a. <b>Plain Blind Nut</b> (P. 4-101)</li> <li>b. <b>Plain Blind Nut</b> (P. 4-102)</li> </ul> | <ul style="list-style-type: none"> <li>c. <b>Plain Self-Locking Nut</b> (P. 4-103)</li> </ul> |
|--|---|

### INITIAL SETUP

#### Tools

General Mechanic's Automotive Tool Kit  
 SC 5180-90-CL-N26  
 Blind Rivet Tool Kit D-100-MIL-1

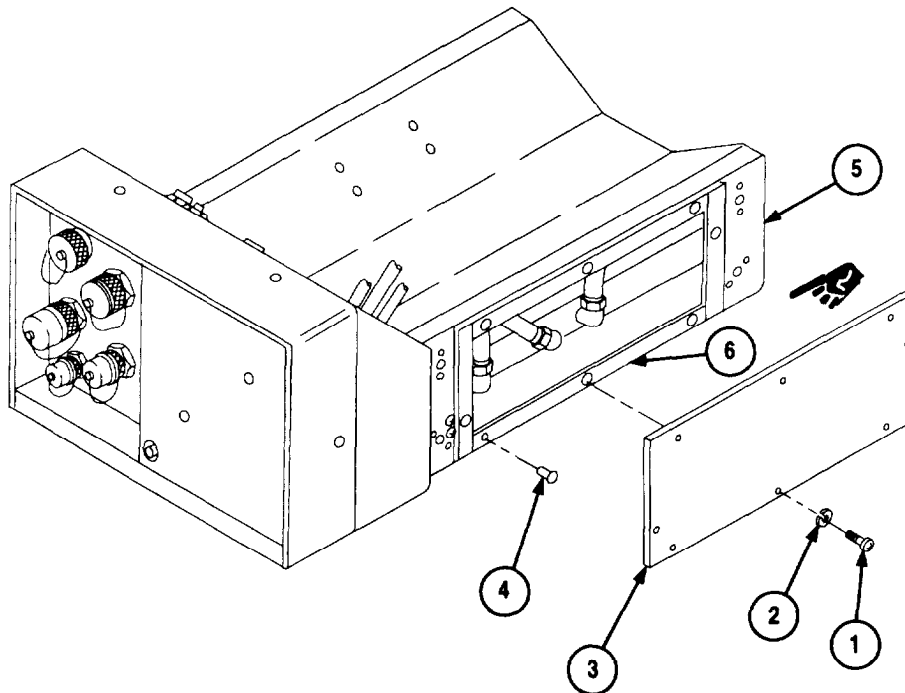
#### Equipment Condition

Equipment container removed from smoke generator (P. 4-68).

- a. **Plain Blind Nut.**

### REMOVAL

1. Remove eight screws (1) and washers (2) and remove equipment container panel (3).
2. Remove plain blind nuts (4) from equipment container (5) as required.
3. Replace gaskets (6) as required. Apply with adhesive (Item 1, App E).



### INSTALLATION

1. Press plain blind nuts (4) into equipment container (5).
2. Position equipment container panel (3) on equipment container (5) and secure with eight screws (1) and washers (2).

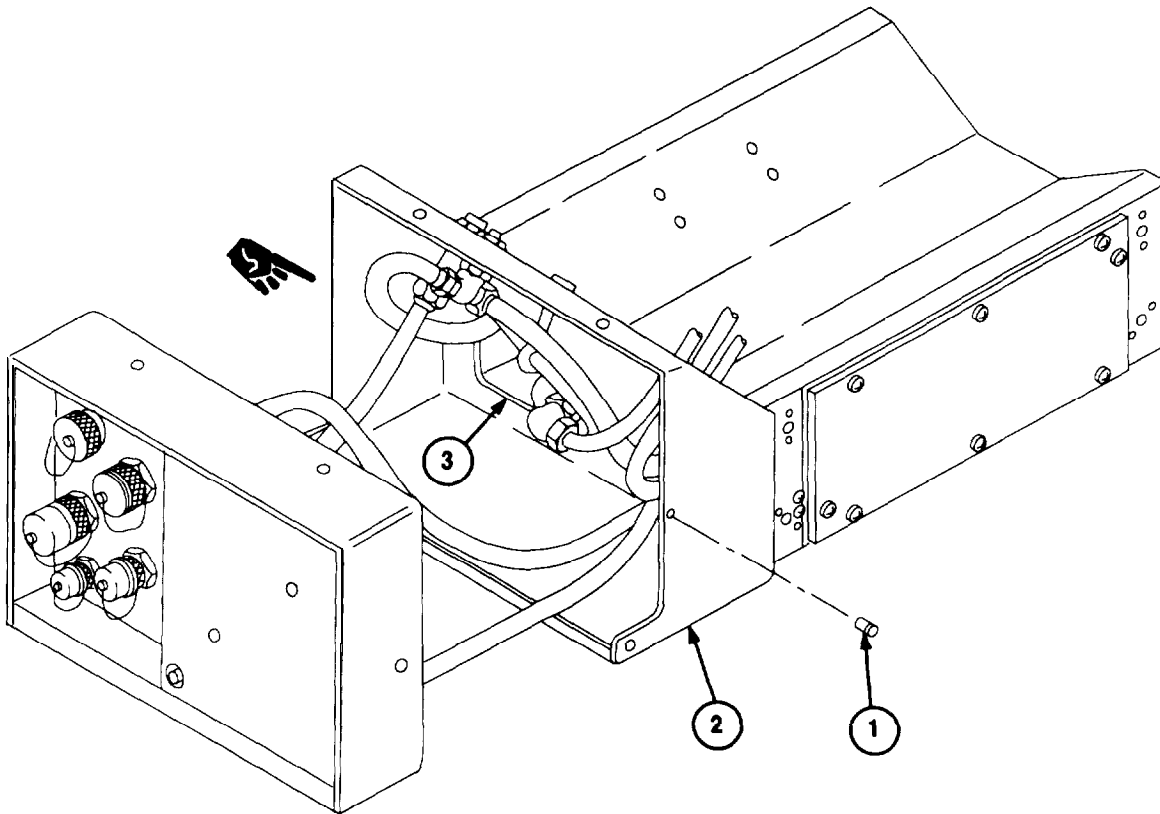
## 4-25 EQUIPMENT CONTAINER (CONT).

### b. Plain Blind Nut.

---

#### REMOVAL

1. Disassemble cover assembly (P. 4-37).
2. Remove plain blind nuts (1) from equipment container (2) as required.
3. Replace grommet (3) as required.

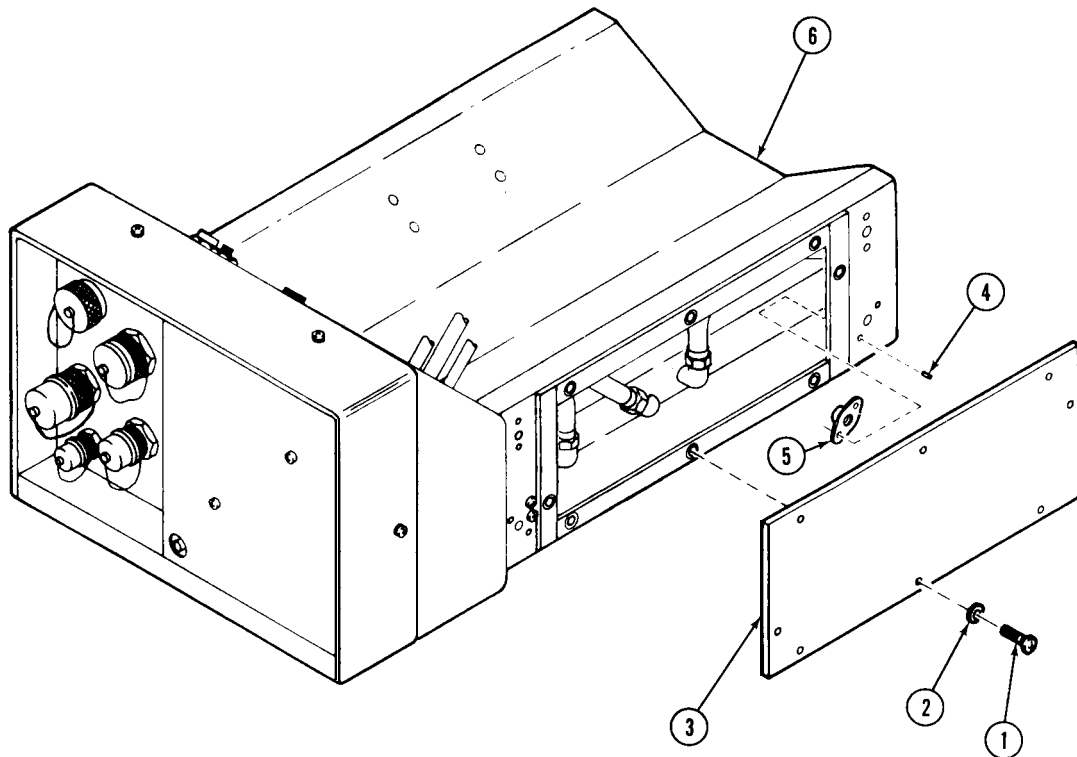


#### INSTALLATION

1. Press new plain blind nuts (1) into equipment container (2).
  2. Reassemble cover assembly (P. 4-37).
-

**c. Plain Self Locking Nut.****REMOVAL**

1. Remove eight screws (1) and washers (2) and remove equipment container panel (3).
2. Remove blind rivets (4) securing damaged plain self locking nut (5) and remove nut from equipment container (6).

**INSTALLATION**

1. Position plain self locking nut (5) in equipment container (6) and secure with two blind rivets (4).
2. Position equipment container panel (3) on equipment container (6) and secure with eight screws (1) and washers (2).

## 4-26 NOZZLE ASSEMBLY.

---

This task covers repair of Nozzle.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Equipment Condition*

Nozzle assembly removed from smoke generator (P. 4-22).

#### *General Safety Instructions*

Before performing any maintenance procedures be sure circuit breaker CB1 is in OFF position.

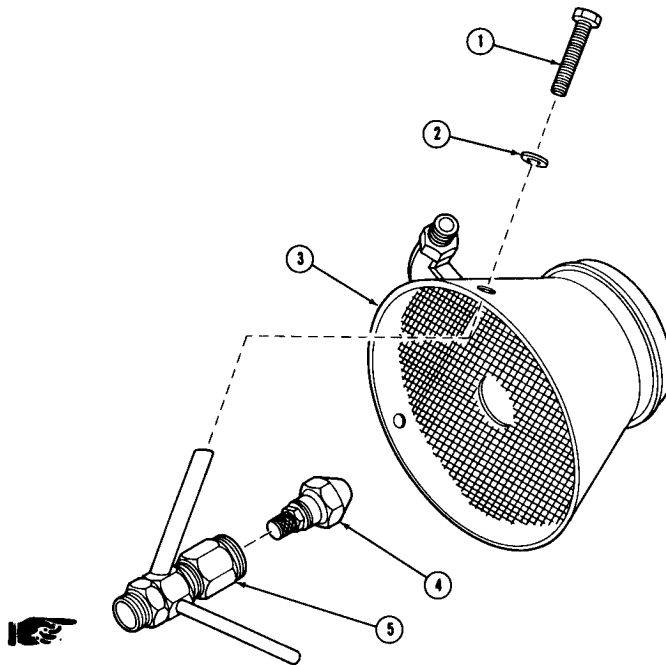
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### DISASSEMBLY

1. Remove three screws (1) and washers (2) and disassemble nozzle assembly (3).
2. Remove nozzle (4) from support assembly (5).

### REASSEMBLY

1. Install nozzle (4) on support assembly (5).
2. Reassemble nozzle assembly (3) with three screws (1) and washers (2).





---

## 4-27 PULSE JET ENGINE ASSEMBLY.

---

This task covers removal of pulse jet engine assembly and replacement of:

- |  |   |
|--|---|
| <b>a. Engine Run Thermal Switch S104</b><br>(P. 4-106) | <b>c. Engine Head Assembly</b> (P. 4-108) |
| <b>b. High Temp Thermal Switch TS101</b><br>(P. 4-106) | <b>d. Ignitor</b> (P. 4-109)              |
- 

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26  
Socket wrench (BIIL)

#### *Materials*

Antiseize Compound (Item 1A, App E)

#### *Equipment Condition*

M1059 vehicles - Inboard armor shield lowered  
and smoke generator removed from vehicle  
mount (TM 9-2350-261-20-1).

---

4-27 PULSE JET ENGINE ASSEMBLY (CONT).

- a. *Engine Run Thermal Switch S104.*
  - b. *High Temp Thermal Switch TS101.*
- 

REMOVAL

**NOTE**

Procedures for removing both thermal switches are the same.

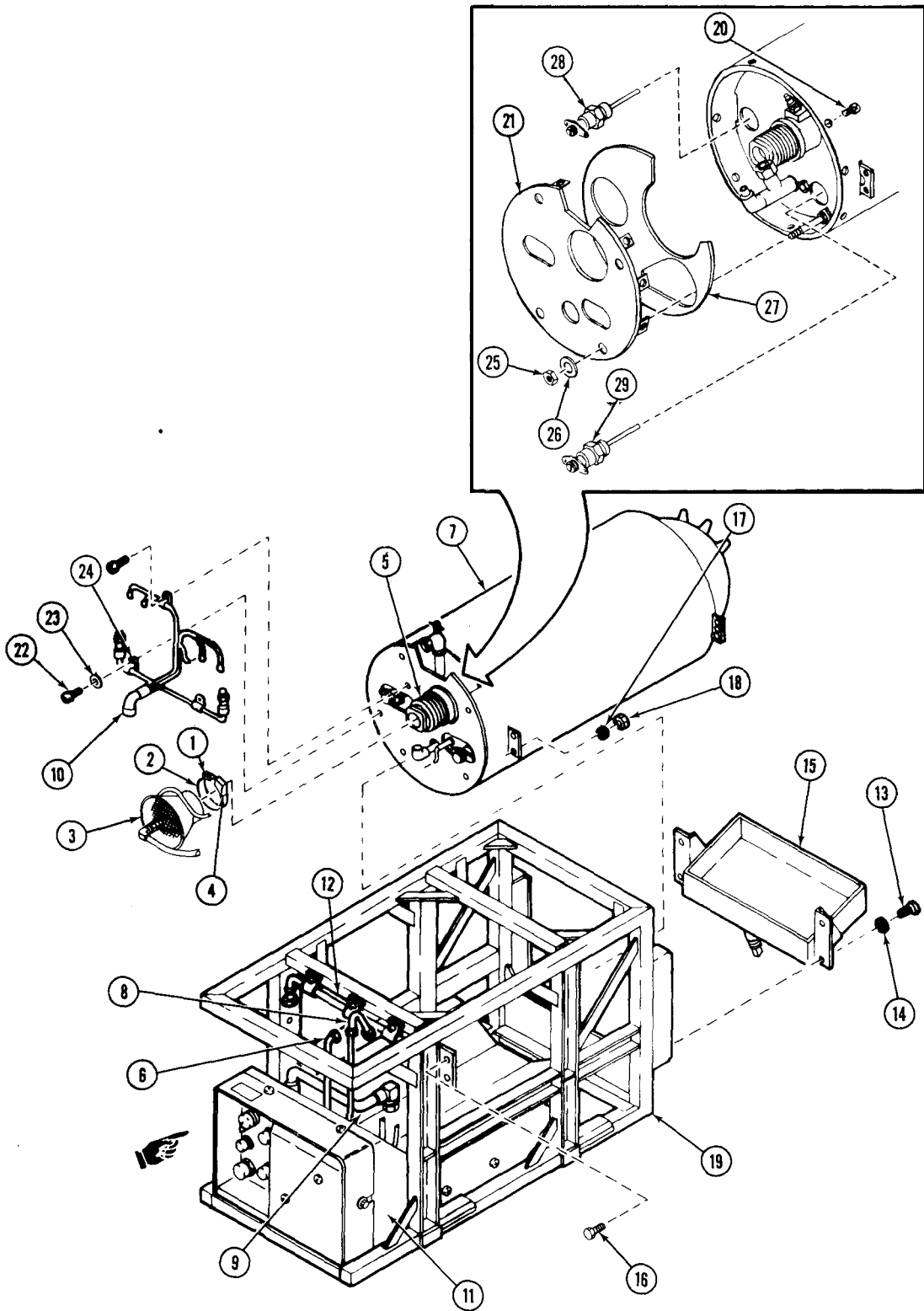
1. Loosen but do not remove clamp nut (1) on clamp (2) securing nozzle assembly (3).
2. Open clamp (2) by lifting catch (4), and remove nozzle assembly (3) from engine head (5).
3. Disconnect purge air line (6) from pulse jet engine (7).
4. Disconnect ignition cable (8) from pulse jet engine (7).
5. Disconnect fog oil hose (9) from pulse jet engine (7).
6. Disconnect cable assembly (10) from equipment container (11), and sensing element (12).
7. Remove four screws (13) and washers (14) securing drip pan (15) and remove drip pan.
8. Remove eight screws (16), twelve washers (17), and four nuts (18) securing pulse jet engine (7).
9. Remove pulse jet engine (7) from rear of frame assembly (19).
10. Remove ten screws (20) securing cooling baffle (21),
11. Remove three screws (22) washers (23), and clamps (24) securing cable assembly (10) to cooling baffle (21).
12. Remove four nuts (25) and washers (26) and remove cooling baffle (21), and insulating pad (27).
13. Tag and remove cable assembly from appropriate thermal switch (either engine run thermal switch (28) or high temperature thermal switch (29)).
14. Remove thermal switch from pulse jet engine (7).

INSTALLATION

**CAUTION**

Handle thermal switches with care. Rough handling or dropping of switches will cause internal damage or break terminal ears.

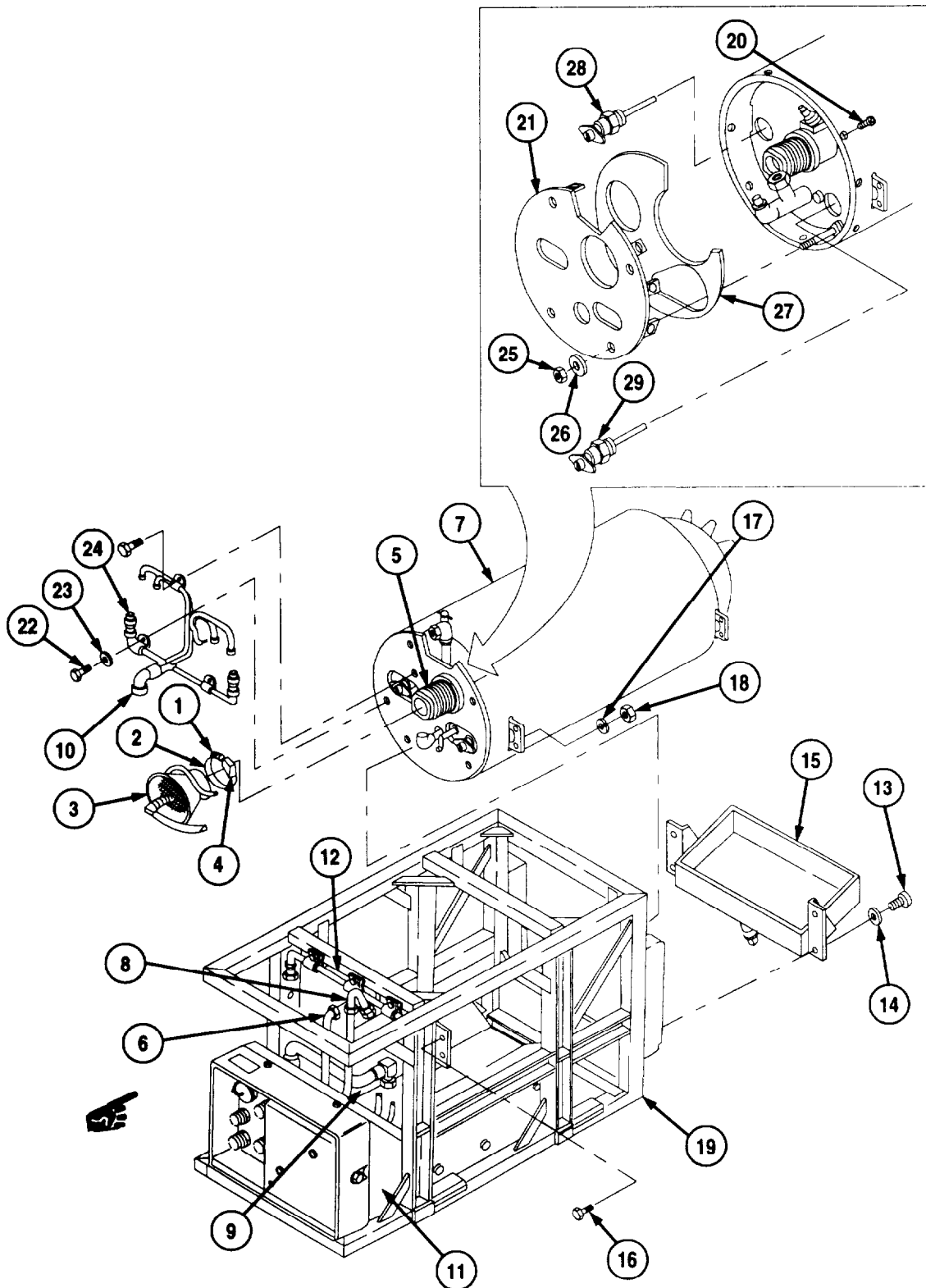
1. Apply antiseize compound (Item 1A, App E) to threads of thermal switches and install switch in pulse jet engine (7). Take care not to bend or break terminal ears during installation.
2. Position insulating pad (27), and cooling baffle (21) on pulse jet engine (7) and secure with four nuts (25) and washers (26).



4-27 PULSE JET ENGINE ASSEMBLY (CONT).

INSTALLATION (CONT).

3. Attach wire leads as tagged to thermal switch.
4. Secure cooling baffle (21) with ten screws (20).
5. Position cable assembly (10) on cooling baffle (21) and secure with three screws (22), washers (23) and clamps (24).
6. Install pulse jet engine (7) in frame assembly (19).
7. Secure pulse jet engine using eight screws (16), twelve washers (17), and four nuts (18).
8. Position drip pan assembly (15) and secure with four screws (13) and washers (14).
9. Connect cable assembly (10) to equipment container (11), and sensing element (12).
10. Connect fog oil hose (9) to pulse jet engine (7).
11. Connect ignition cable (8) to pulse jet engine (7).
12. Connect purge air line (6) to pulse jet engine (7).
13. Position nozzle assembly (3) on engine head (5) and secure with clamp (2).
14. Close catch (4) on clamp (2) and finger tighten clamp nut (1).



## 4-27 PULSE JET ENGINE ASSEMBLY (CONT).

### c. Engine Head Assembly.

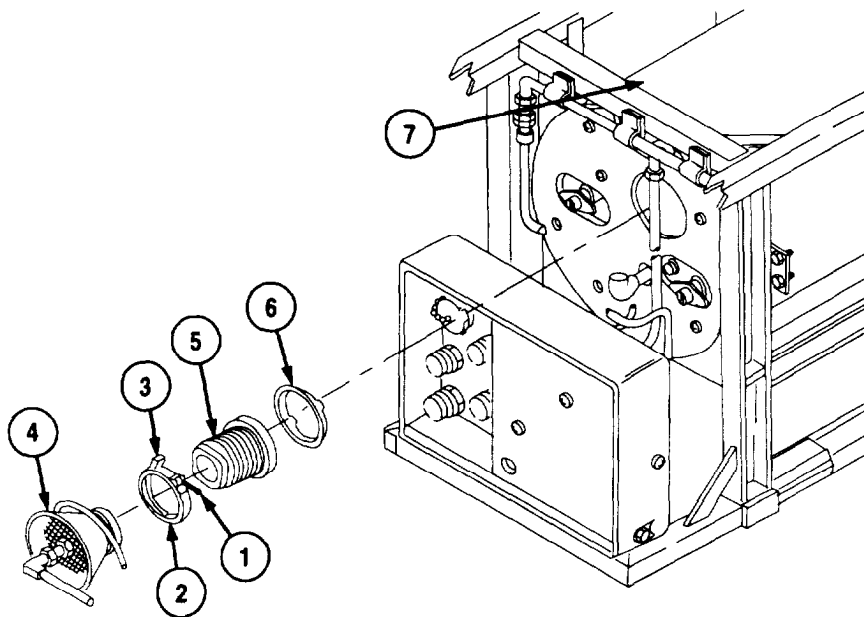
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#### WARNING

Engine and engine head may become very hot during operation. Do not touch engine or engine head with bare hand. Allow sufficient time for cooling after operation.

#### REMOVAL

1. Loosen but do not remove clamp nut (1) on clamp (2).
2. Open clamp (2) by lifting catch (3) and remove clamp (2).
3. Remove nozzle assembly (4) from engine head (5).
4. Rotate engine head (5) counterclockwise and remove.
5. Replace gasket (6) as required.



#### INSTALLATION

#### CAUTION

Do not overtighten engine head. Over-tightening can cause severe damage to head gasket, engine head and combustion chamber flanges.

1. Install engine head (5) with gasket (6) in pulse jet engine (7).
  2. Rotate engine head clockwise until secure.
  3. Position nozzle assembly (4) on engine head (5).
  4. Install clamp (2) on nozzle assembly (4) and engine head (5).
  5. Close catch (3) and secure with clamp nut (1).
-

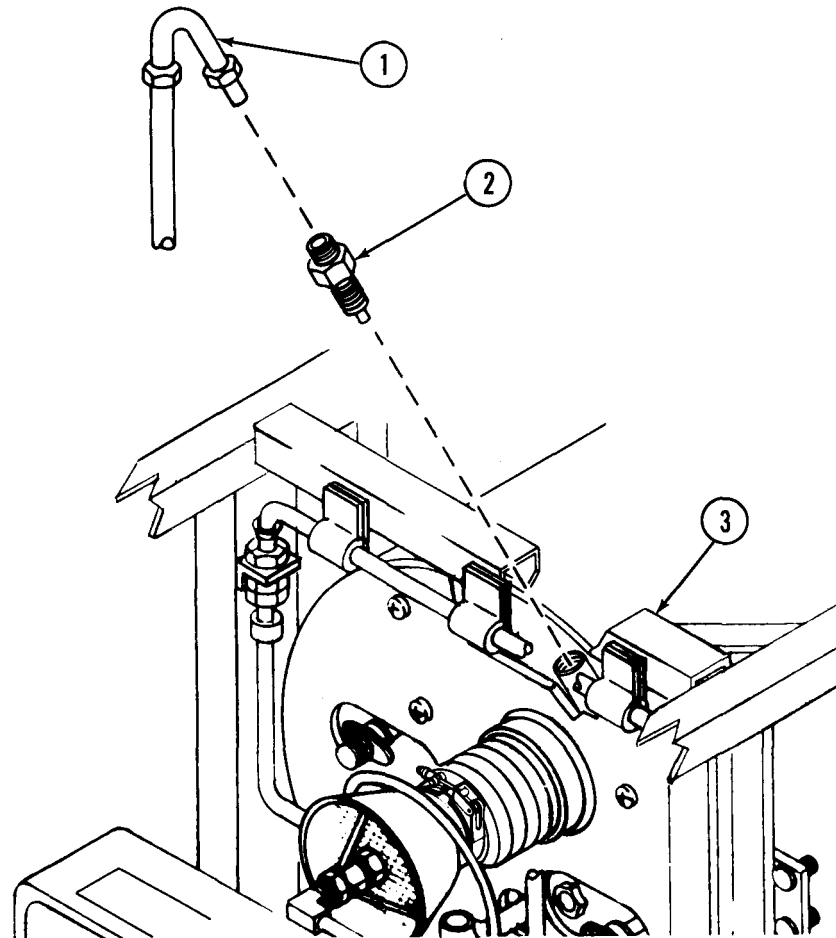
*d. ignitor.*

## REMOVAL

## CAUTION

Ignition cable contains a ceramic insulator. Take care when removing cable from ignitor or insulator will break. Pull cable straight out from ignitor.

1. Remove ignition cable (1) from ignitor (2) on pulse jet engine (3).
2. Remove ignitor (2) from pulse jet engine (3).



## INSTALLATION

## CAUTION

Ignition cable contains a ceramic insulator. Take care when installing cable on ignitor or insulator will break. Insert cable straight in on ignitor.

1. Install ignitor (2) in pulse jet engine (3).
2. Install ignition cable (1) on ignitor (2).





## 4-27.1 FRAME ASSEMBLY.

---

This task covers replacement of angle bracket.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Equipment Condition*

Sensing element removed (P. 4-31)

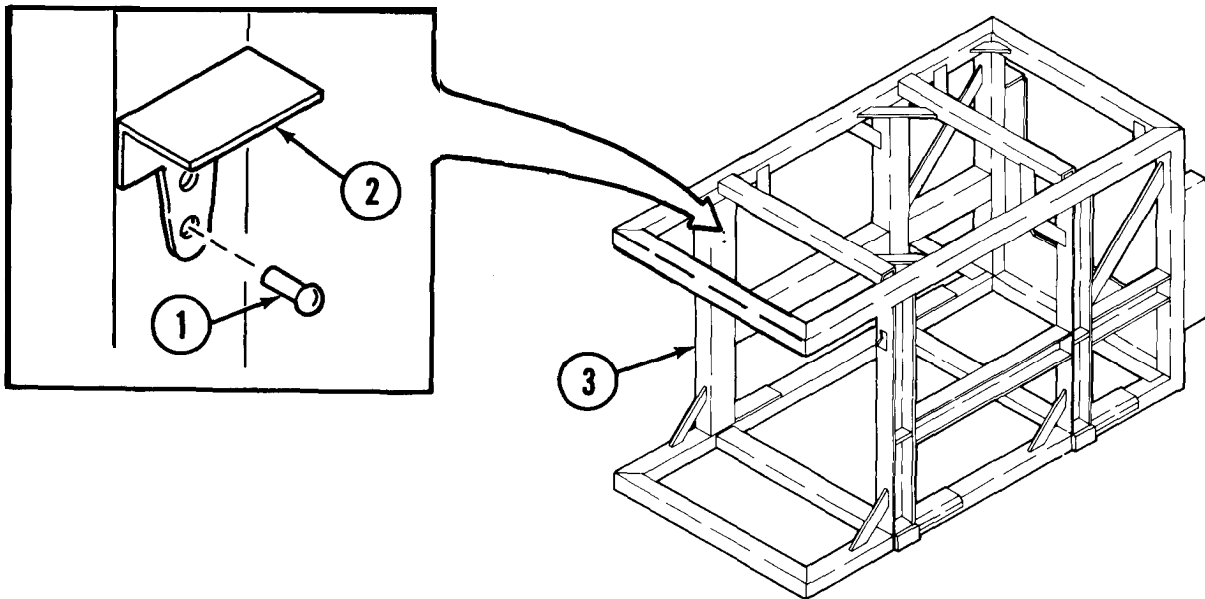
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### REMOVAL

#### NOTE

There are two angle brackets on frame assembly. Procedures are the same for both angle brackets.

1. Remove two solid rivets (1) on angle bracket (2).
2. Remove angle bracket (2) from frame assembly (3).



### INSTALLATION

1. Position angle bracket (2) on frame assembly (3).
  2. Install angle bracket (2) using two solid rivets (1).
  3. Touch up paint as necessary (P. 4-20).
-

## 4-28 CONTROL PANEL ASSEMBLY

This task covers removal and installation of panel cover and replacement of:

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>a. <i>Relay K103 or K203</i> (P. 4-111)</li> <li>b. <i>Toggle Switches (FOG OIL, FUEL, POWER, FIRE/TEST or ENGINE)</i> (P. 4-112)</li> <li>c. <i>Circuit Breaker CB1</i> (P. 4-113)</li> <li>d. <i>Indicator Lights</i> (P. 4-114)</li> <li>e. <i>PURGE Switch</i> (P. 4-115)</li> <li>f. <i>Cable Assembly</i> (P. 4-116)</li> <li>g. <i>SMOKE TEMP Indicator</i> (P. 4-117)</li> </ul> | <ul style="list-style-type: none"> <li>h. <i>Panel Light</i> (P. 4-118)</li> <li>i. <i>FOG OIL FLOW Rheostat</i> (P. 4-119)</li> <li>j. <i>Terminal Board TB11 or TB21</i> (P. 4-120)</li> <li>k. <i>Panel Light Rheostat</i> (P. 4-121)</li> <li>l. <i>Fire Detection Control Unit</i> (P. 4-122)</li> <li>m. <i>Lamps</i> (P. 4-124)</li> <li>n. <i>FIRE Warning Indicator</i> (P. 4-125)</li> <li>o. <i>Cable Assembly CU-1</i> (P. 4-126)</li> </ul> |
|---|--|

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

**Soldering gun** (shop equip-common No. 1)  
**Screwdriver A116-3**

#### *Equipment Condition*

Control panel removed from vehicle (P. 4-20).

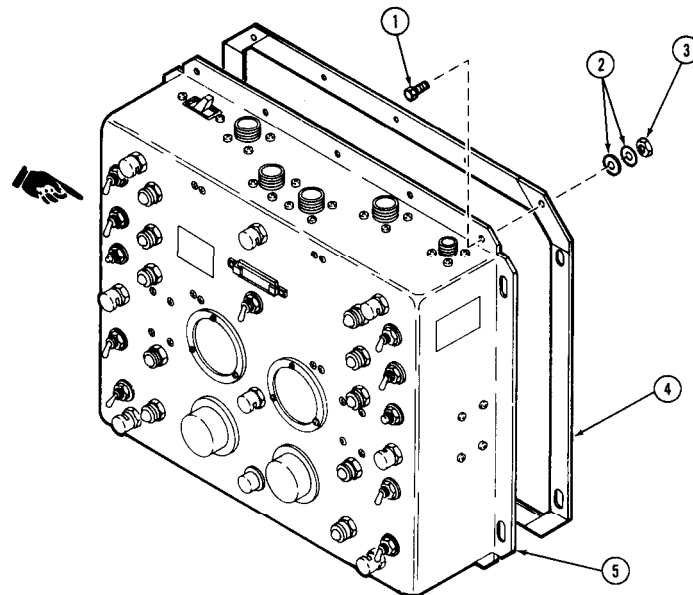
#### *Materials*

**Solder** (Item 12A, App E)  
**Tie down straps** (Item 13, App E)  
**Sealing compound** (Item 11A, App E)  
**Insulation sleeving** (Item 7C, App E)

### *Panel Cover*

### REMOVAL

1. Remove ten screws (1), 20 washers (2), and ten nuts (3).
2. Remove panel cover (4) from instrument panel (5).



### INSTALLATION

Position panel cover (4) on instrument panel (5) and secure with ten screws (1), 20 washers (2) and ten nuts (3).

**a. Relay K103 or K203.**

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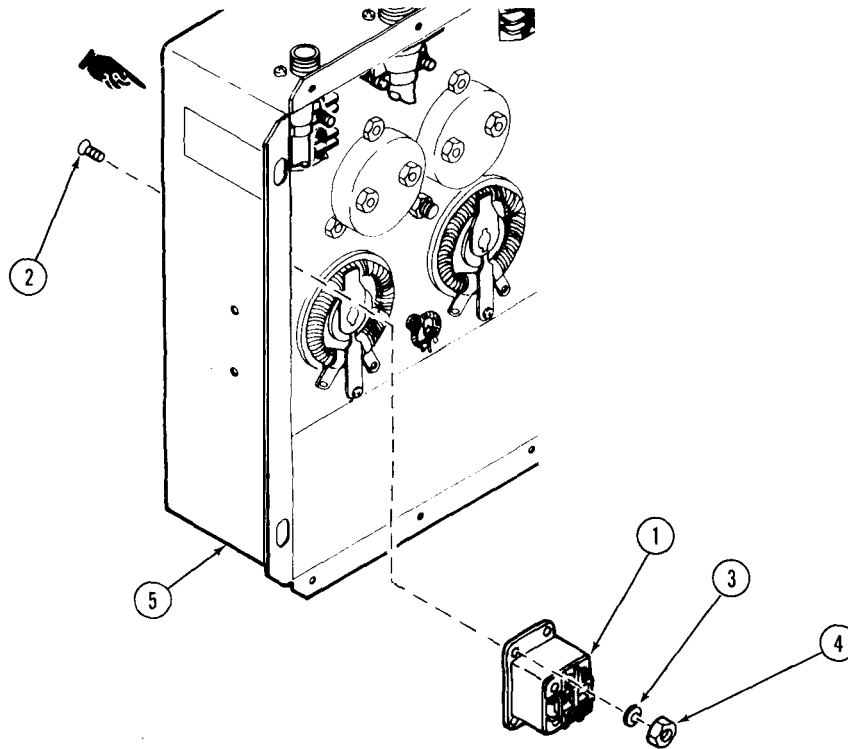
## REMOVAL

1. Remove panel cover (P. 4-110).

## NOTE

Removal and installation procedures are the same for both relays.

2. Tag and remove electrical connections from relay K103 (1).
3. Remove four screws (2), washers (3), and nuts (4).



## INSTALLATION

1. Position electromagnetic relay (1) in instrument panel (5), and secure with four screws (2), washers (3), and nuts (4).
  2. Attach electrical connections as tagged. See control panel wiring (P. 4-127).
  3. Install panel cover (P. 4-110).
-

## 4-28 CONTROL PANEL ASSEMBLY (CONT).

### *b. Toggle Switches (FOG OIL, FUEL, POWER, or ENGINE).*

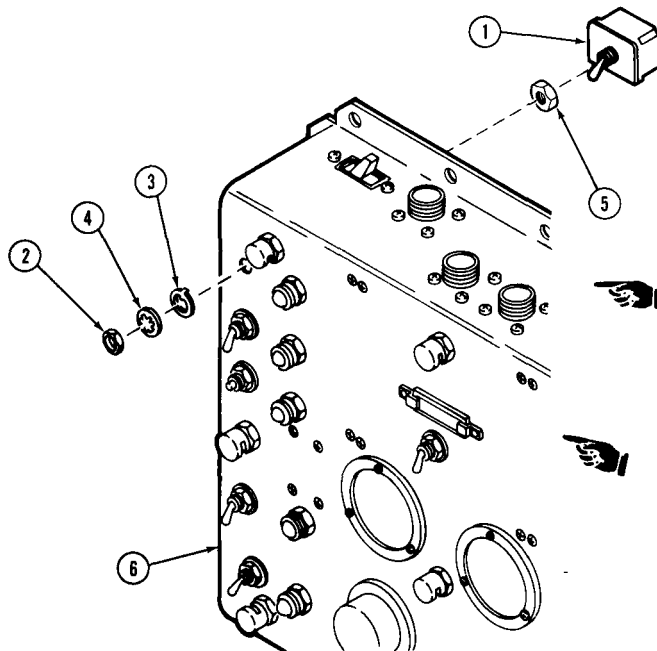
#### REMOVAL

1. Remove panel cover (P. 4-110).

#### NOTE

Removal and installation procedures are the same for all toggle switches. When removing left side POWER switch, circuit breaker CB1 must be removed first (P. 4-113). When removing right side ENGINE switch, fire detection control unit must be removed first (P. 4-122). All remaining procedures are the same.

2. Tag and remove electrical connections from toggle switch (1).
3. Remove nut (2), key washer (3), and lock washer (4) from toggle switch (1) and remove switch.

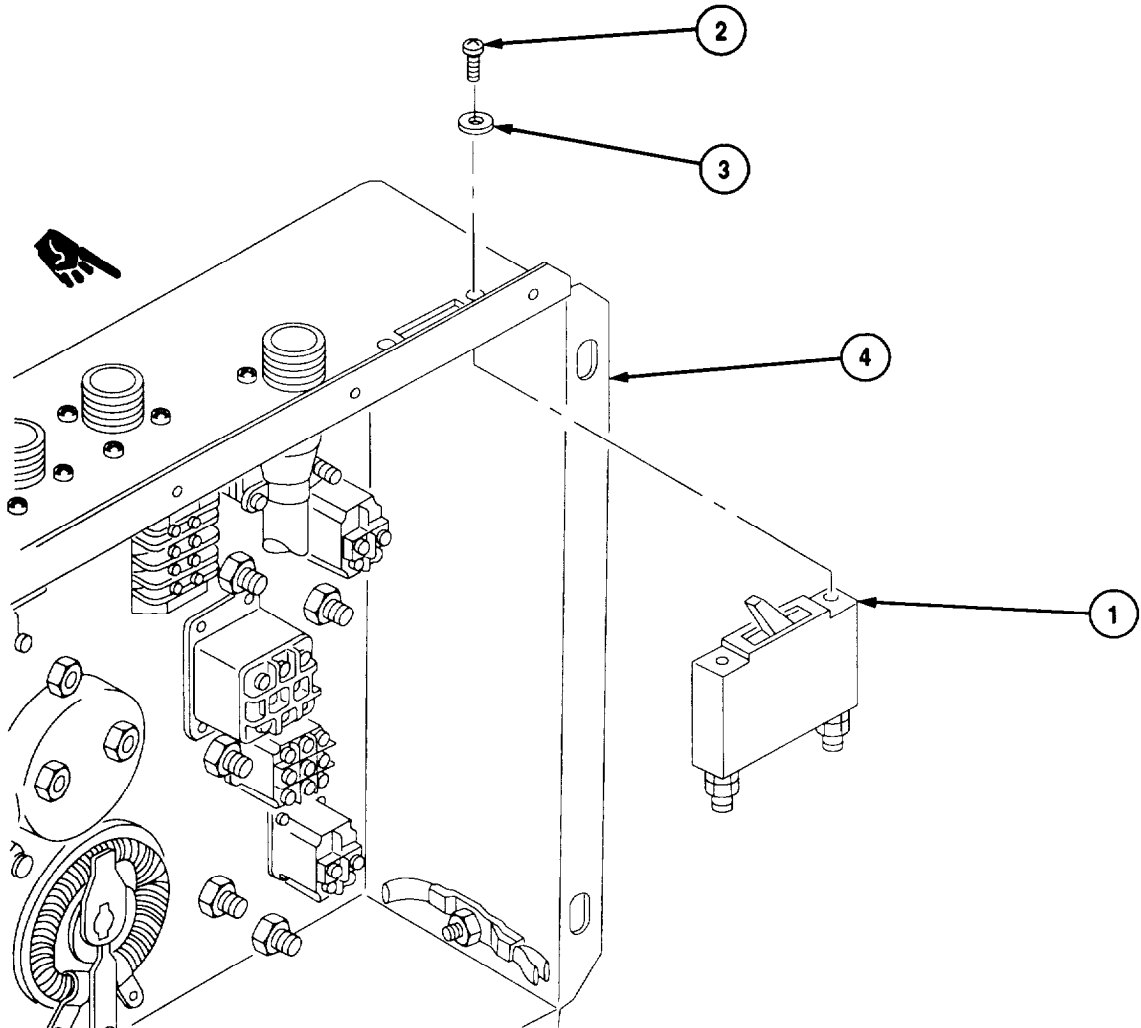


#### INSTALLATION

1. Screw nut (5) onto switch (1) to its maximum clockwise seated position.
2. Install toggle switch (1) in instrument panel (6) and secure with nut (2), key washer (3), and lock washer (4).
3. Connect electric connections as tagged. See control panel wiring (P. 4-34).
4. Install panel cover (P. 4-110).

**c. Circuit Breaker CB1.****REMOVAL**

1. Remove panel cover (P. 4-110).
2. Tag and remove electrical connections from circuit breaker CB1 (1).
3. Remove two screws (2) and washers (3), and remove CB1.

**INSTALLATION**

1. Position CB1 (1) in instrument panel (4) and secure with two screws (1) and washers (2).
2. Install electrical connections on CB1 as tagged.
3. Install panel cover (P. 4-110).

## 4-28 CONTROL PANEL ASSEMBLY (CONT).

### d. Indicator Lights.

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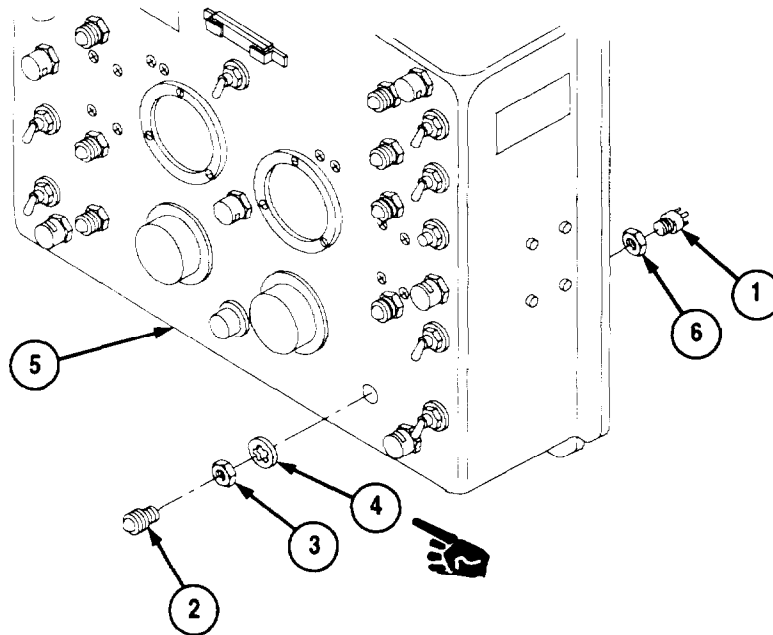
#### REMOVAL

1. Remove panel cover (P. 4-110).

#### NOTE

Removal and installation procedures are the same for all indicator lights. When replacing left side POWER and FUEL indicator lights, circuit breaker CB1 must be removed first (P. 4-113).

2. Tag and unsolder electrical connections from indicator socket (1).
3. Unscrew indicator lens (2) from indicator socket (1).
4. Remove nut (3) and lock washer (4) from indicator socket (1) and remove indicator socket from instrument panel (5). Remove nut (6) from indicator socket (1).



#### INSTALLATION

1. Screw on nut (6) approximately  $\frac{1}{4}$  in. (6mm) onto indicator socket (1).
  2. Install indicator socket (1) in instrument panel (5) and secure with nut (3), and lock washer (4).
  3. Solder electrical connections to indicator as tagged. For two wire connections, place insulation sleeving (Item 7C, App E) over both leads. Solder one lead to indicator pin. Solder second lead to first lead 0.125 to 0.250 inches from indicator pin. Pull insulation sleeving over soldered connection and heat shrink.
  4. Screw indicator lens (2) onto indicator socket (1).
  5. Install panel cover (P. 4-110).
-

e. *PURGE Switch.*

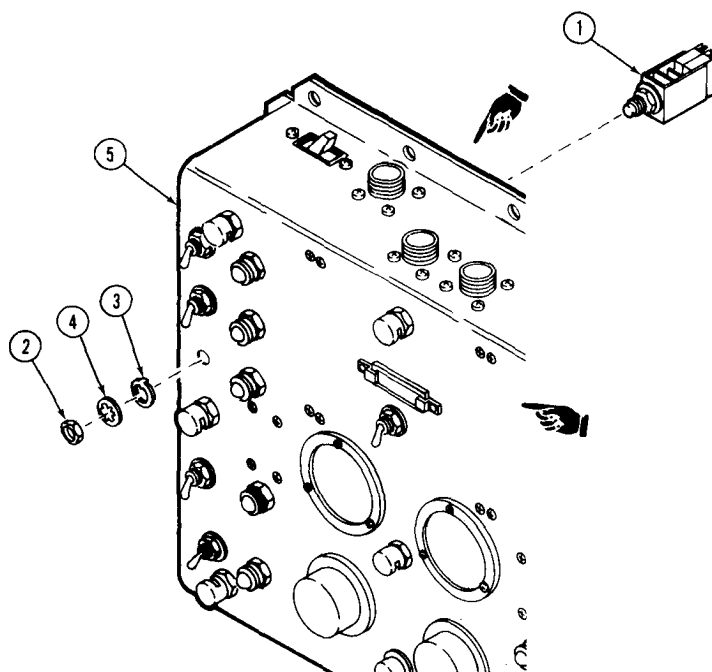
## REMOVAL

1. Remove panel cover (P. 4-110).

**NOTE**

Removal and installation procedures are the same for both PURGE switches. When removing right PURGE switch, disconnect cable assembly CU-1 from fire detection unit.

2. Tag and unsolder electrical connections from PURGE switch (1).
3. Remove nut (2), washer (3) and key washer (4) and remove PURGE switch (1) from instrument panel (5).



## INSTALLATION

1. Install PURGE switch (1) in instrument panel (5) and secure with nut (2).
2. Solder electrical connections as tagged to switch (1).

**NOTE**

If cable assembly CU-1 was disconnected, reconnect cable CU-1 to fire detection control unit.

3. Install panel cover (P. 4-110).

## 4-28 CONTROL PANEL ASSEMBLY (CONT).

### f. Cable Assembly.

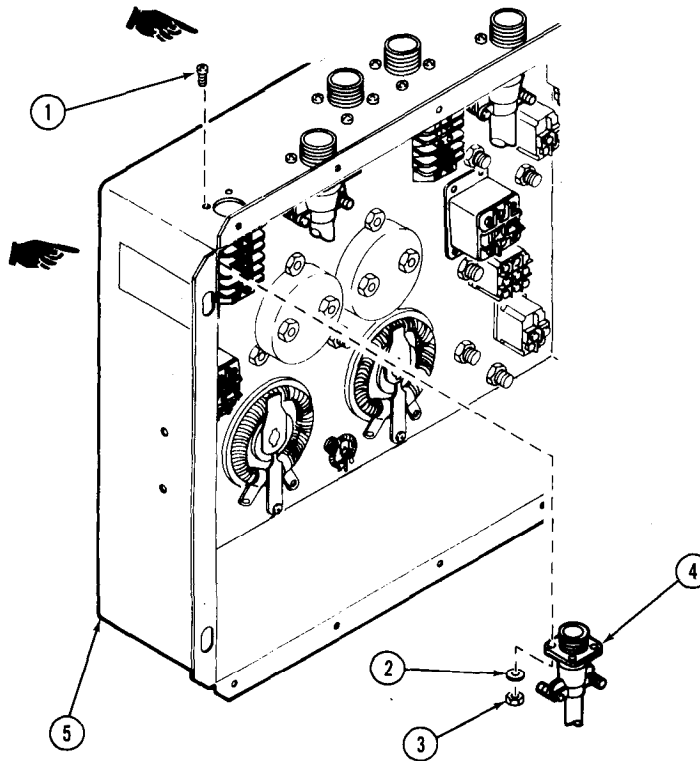
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#### NOTE

The removal and installation procedures are the same for all cable assemblies 1J1 thru 1J5 in control panel.

#### REMOVAL

1. Remove panel cover (P. 4-110).
2. Remove electrical connections from instrument panel electrical components. See control panel wiring (P. 4-127).
3. Remove cable tie down straps.
4. Remove four screws (1), washers (2), nuts (3) and remove cable assembly (4) from instrument panel (5).



#### INSTALLATION

1. Install cable assembly (4) in instrument panel (5) and secure with four screws (1), washers (2) and nuts (3).
  2. Attach electrical connections. See control panel wiring (P. 4-127). Coat terminal board screw threads with sealing compound before securing connections.
  3. Install cable tie down straps,
  4. Install panel cover (P. 4-110).
-



## 9. SMOKE TEMP Indicator.

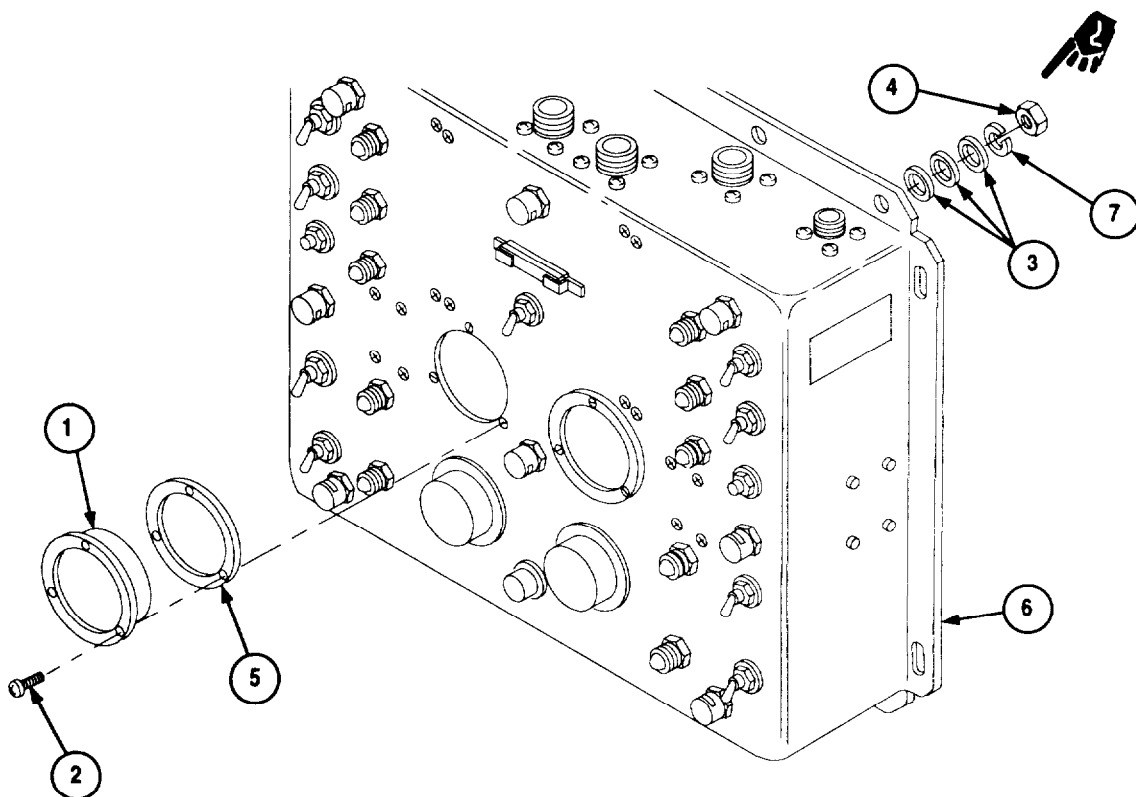
### REMOVAL

1. Remove panel cover (P. 4-110).

#### NOTE

Removal and installation procedures are the same for SMOKE TEMP indicator.

2. Tag and remove electrical connections from SMOKE TEMP indicator (1).
3. Remove three screws (2), washers (3) and nuts (4) and remove SMOKE TEMP indicator (1) with gasket (5).



### INSTALLATION

1. Position SMOKE TEMP indicator (1) with gasket (5) in instrument panel (6) and secure with three screws (2), washers (3) and nuts (4).
2. Attach electrical connections as tagged to SMOKE TEMP indicator (1). Place lock washer (7) under nut, and place terminal lug between the two flat washers (3).
3. Install panel cover (P. 4-110).

## 4-28 CONTROL PANEL ASSEMBLY (CONT).

### *h. Panel Light.*

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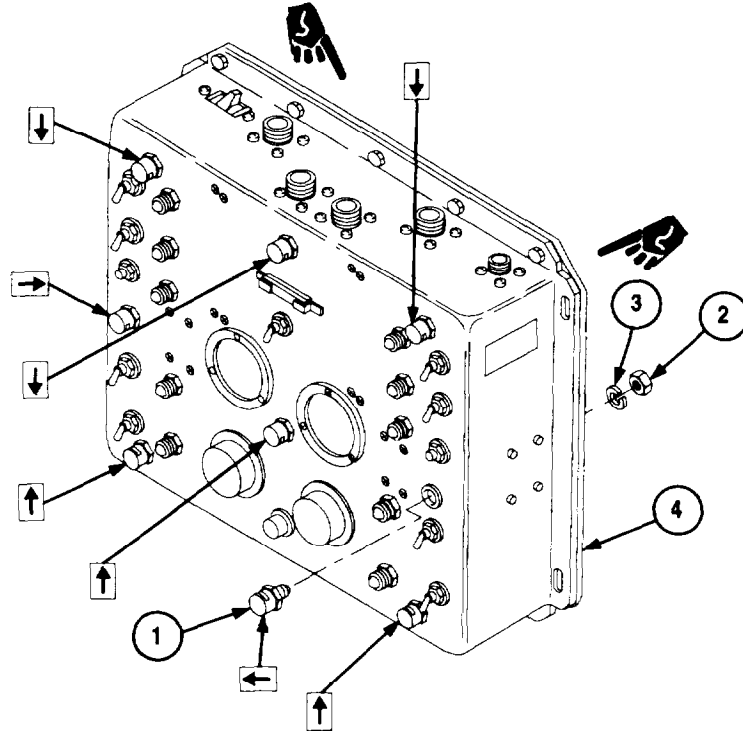
#### REMOVAL

1. Remove panel cover (P. 4-110).

#### NOTE

Removal and installation procedures are the same for all panel lights. When replacing right side center panel light, fire detection control unit must be removed first (P. 4-122).

2. Tag and unsolder electrical connections from panel light socket (1).
3. Remove nut (2) and washer (3) from panel light socket (1) and remove socket from control panel (4).



#### INSTALLATION

1. Position panel light socket (1) in control panel (4) with lens opening facing in direction shown by arrow. Secure panel light socket in control panel with nut (2) and washer (3).
2. Solder electrical connections as tagged to panel light socket (1).
3. Install lamp if required (P. 4-124).
4. Install panel cover (P. 4-110).

*i. FOG OIL FLOW Rheostat.*

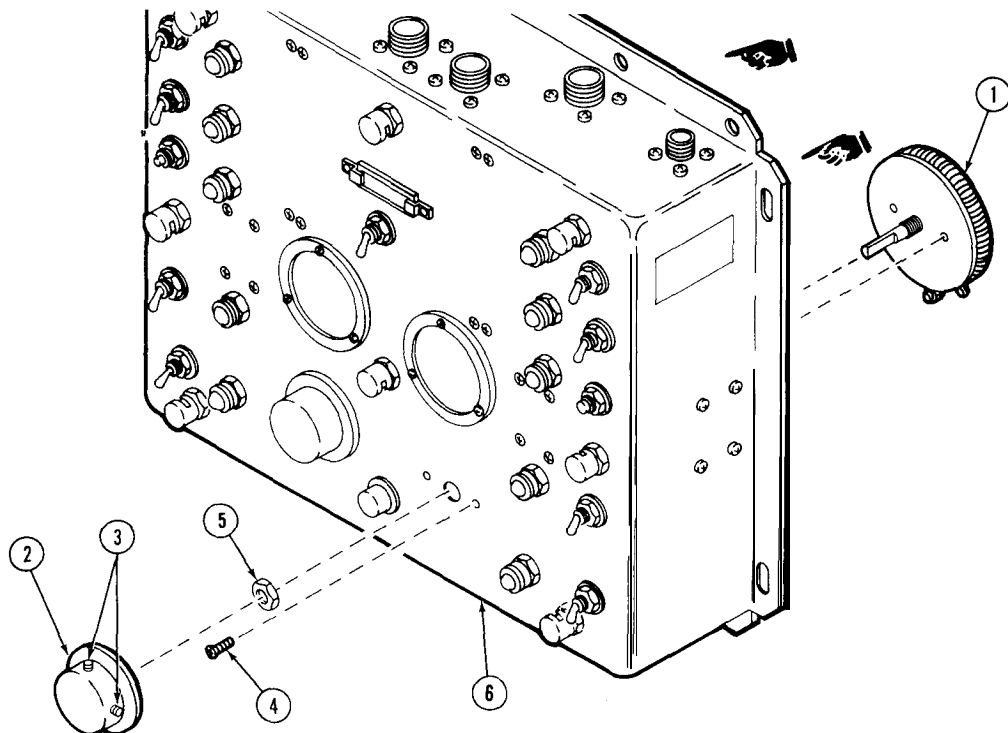
## REMOVAL

1. Remove panel cover (P. 4-110).

## NOTE

Removal and installation procedures are the same for both rheostats.

2. Tag and remove electrical connections from rheostat (1).
3. Remove fog oil flow control knob (2) from front of rheostat (1) by loosening two set screws (3).
4. Remove two set screws (4), nut (5) and remove rheostat from instrument panel (6).



## INSTALLATION

1. Position rheostat (1) in instrument panel (6) and secure with two screws (4) and nut (5).
2. Remove set screws (3) from fog oil flow control knob (2) and coat set screw threads with sealing compound (Item 11A, App E). Reinstall set screws but do not tighten.
3. Turn rheostat fully counterclockwise and install fog oil flow control knob (2) with the arrow pointing at 0 and secure with two set screws (3). Prior to final tightening, insure that knob indicates 0 in full counterclockwise position and 10 in full clockwise position.
4. Attach electrical connections as tagged. Make sure that no wires are in contact with rheostat.
5. Install panel cover (P. 4-110).

## 4-28 CONTROL PANEL ASSEMBLY (CONT).

### *j. Terminal Board TB11 or TB21.*

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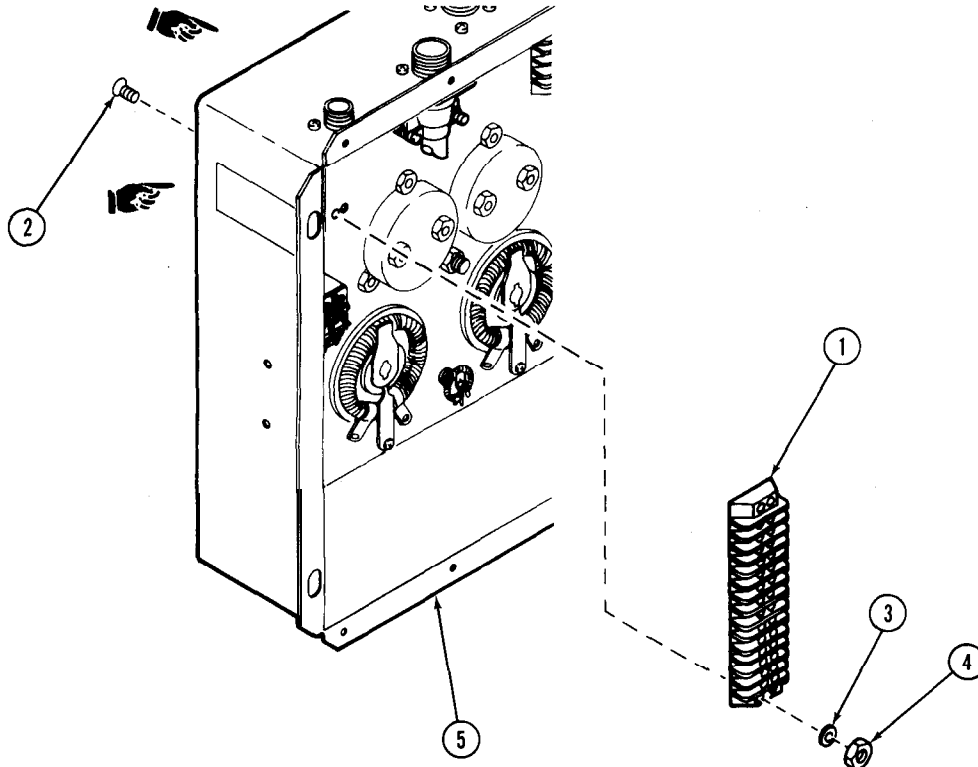
#### REMOVAL

1. Remove panel cover (P. 4-110).

#### NOTE

Removal and installation procedures are the same for both terminal boards TB11 or TB21.

2. Tag and remove electrical connections from terminal board (1). See control panel wiring (P. 4-127).
3. Remove four screws (2), washers (3) and nuts (4) and remove terminal board (1) from panel (5).

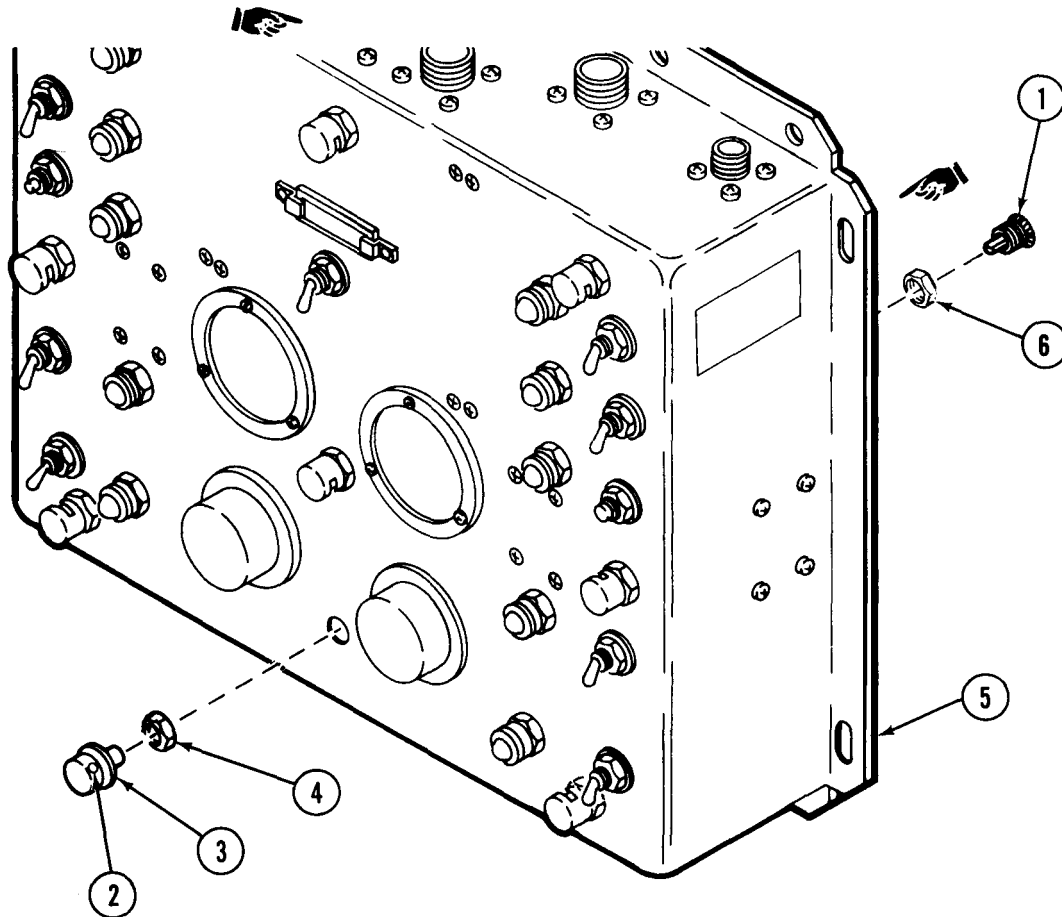


#### INSTALLATION

1. Position terminal board (1) in instrument panel (5) and secure with four screws (2), washers (3) and nuts (4).
  2. Attach electrical connections to terminal board (1) as tagged. Coat terminal, board screw threads with sealing compound before securing connections.
  3. Install panel cover (P. 4-110).
-

**k. Panel Light Rheostat.****REMOVAL**

1. Remove panel cover (P. 4-110).
2. Unsolder and tag electrical connections from rheostat (1).
3. Loosen set screw (2) and remove panel light control knob (3).
4. Remove nut (4) and remove rheostat from instrument panel (5).

**INSTALLATION**

1. Screw nut (6) to its full clockwise seated position.
2. Position rheostat (1) in instrument panel (5) and secure with nut (4).
3. Install panel control knob (3) on rheostat (1) and tighten set screw (2).
4. Solder electrical connections as tagged to rheostat.
5. Install panel cover (P. 4-110).

## 4-28 CONTROL PANEL ASSEMBLY (CONT).

### *1. Fire Defection Control Unit.*

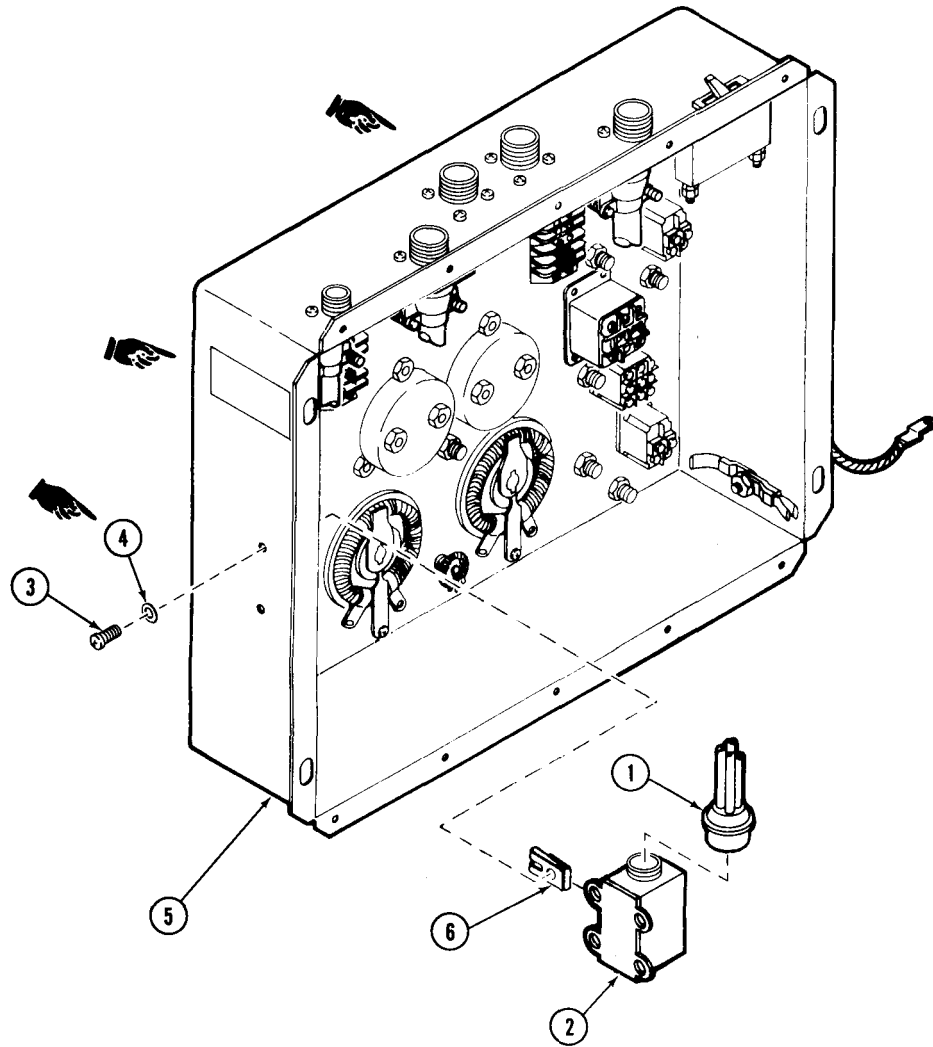
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#### REMOVAL

1. Remove panel cover (P. 4-110).
2. Disconnect fire detection cable assembly CU-1 (1) from control unit (2).
3. Remove four screws (3) and lockwashers (4) from side of instrument panel (5), and remove control unit (2) from instrument panel (5).
4. Remove clip nut (6) from control unit (2).

#### INSTALLATION

1. Install clip nuts (6) on control unit (2).
2. Position control unit (2) in instrument panel (5) and secure with four screws (3) and lockwashers (4).
3. Install fire detection cable assembly CU-1 (1) on control unit (2).
4. Install panel cover (P. 4-110).



## 4-28 CONTROL PANEL ASSEMBLY (CONT).

### *m. Lamps.*

---

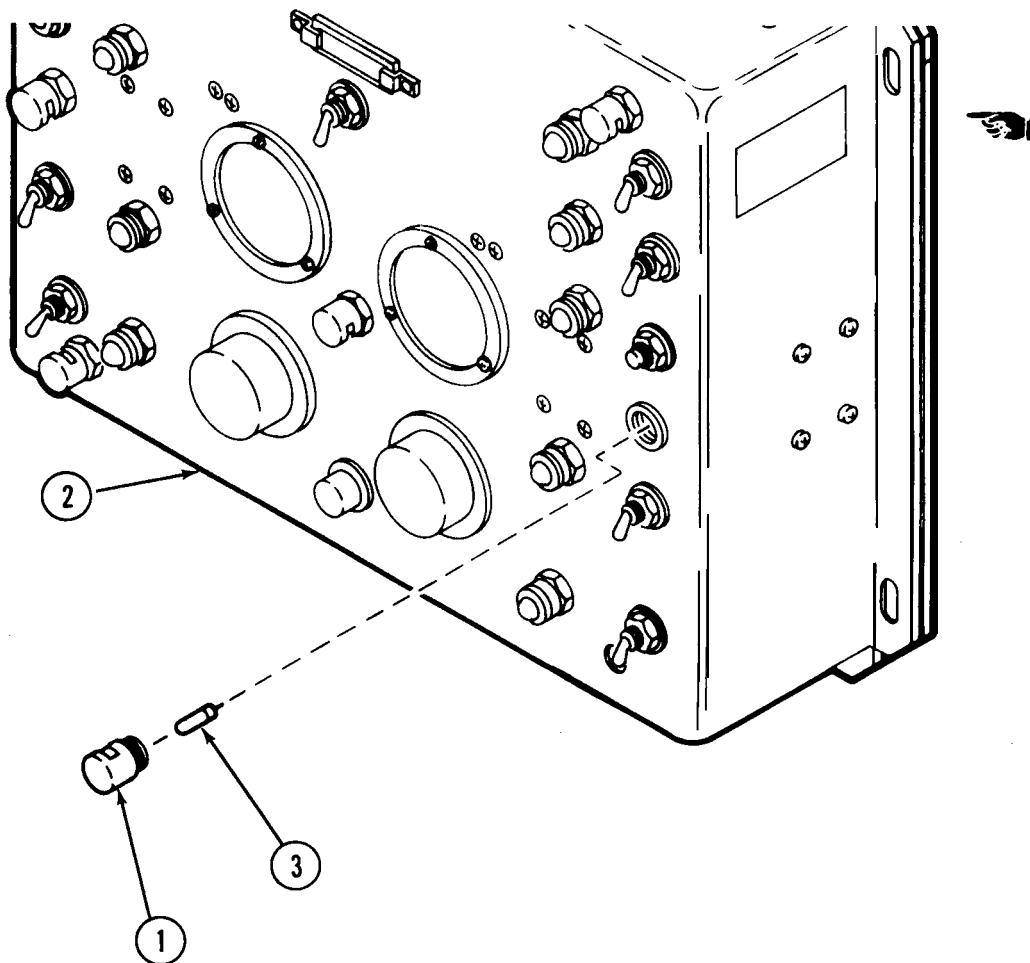
#### REMOVAL

1. Unscrew panel light lens (1) from control panel (2).

#### NOTE

Procedures for changing lamps are the same for all indicators and panel lights.

2. Remove lamp (3) from panel light (1).



#### INSTALLATION

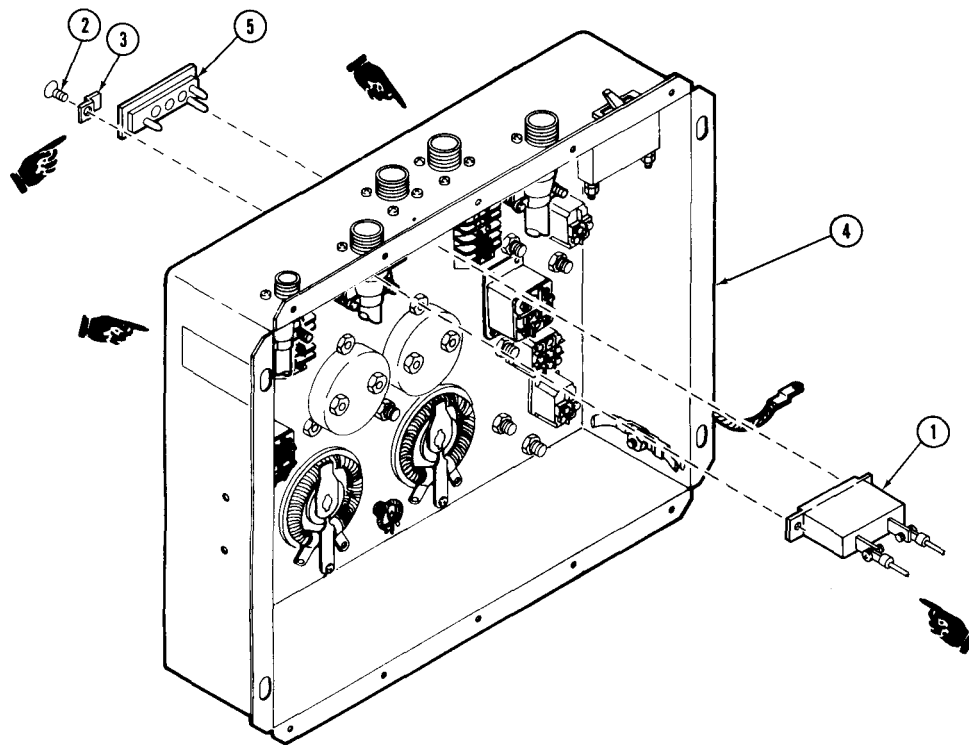
1. Install lamp (3) in panel light (1).
  2. Screw panel light (1) onto control panel (2).
-



*n. FIRE Warning Indicator.*

## REMOVAL

1. Remove panel cover (P. 4-110).
2. Tag and remove electrical connections from FIRE warning indicator (1).
3. Remove two screws (2) and clips (3) securing FIRE warning indicator (1) in control panel (4).
4. Pull lens (5) from FIRE warning indicator (1) and remove indicator from control panel.



## INSTALLATION

1. Position FIRE warning indicator (1) in control panel (4) and push lens (5) into indicator.
2. Secure FIRE warning indicator (1) in control panel (4) with two clips (3) and screws (2).
3. Attach electrical connections to indicator as tagged.
4. Install panel cover (P. 4-110).

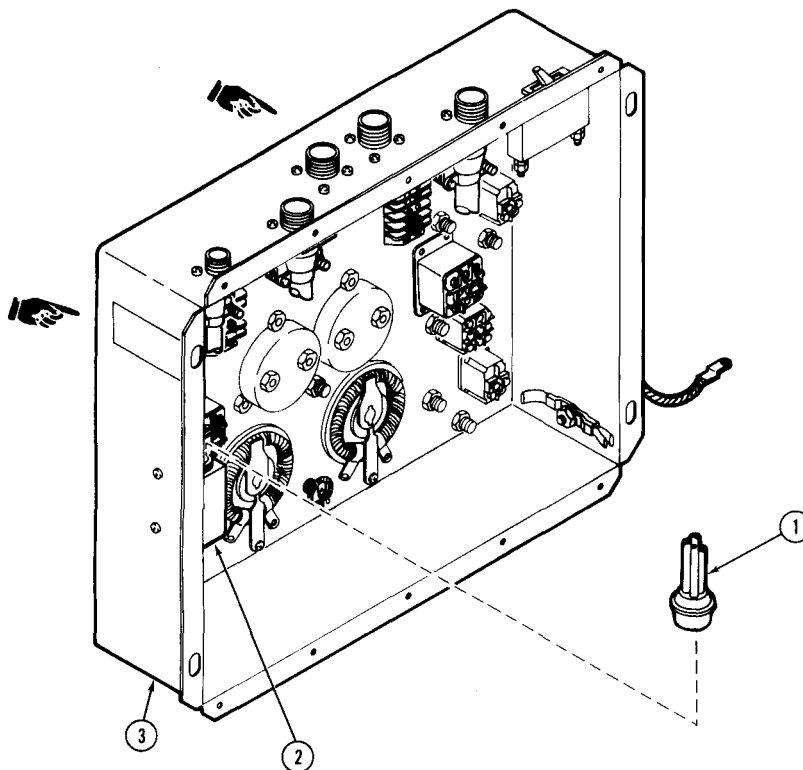
## 4-28 CONTROL PANEL ASSEMBLY (CONT).

### *o. FIRE Detection Control Unit Cable Assembly CU-1.*

---

#### REMOVAL

1. Remove panel cover (P. 4-110).
2. Disconnect cable assembly (1) from control unit (2).
3. Remove electrical connections of cable assembly from control panel components. See control panel wiring (P. 4-127).
4. Note location and remove cable tie down strap.
5. Remove cable assembly (1) from control panel (3).



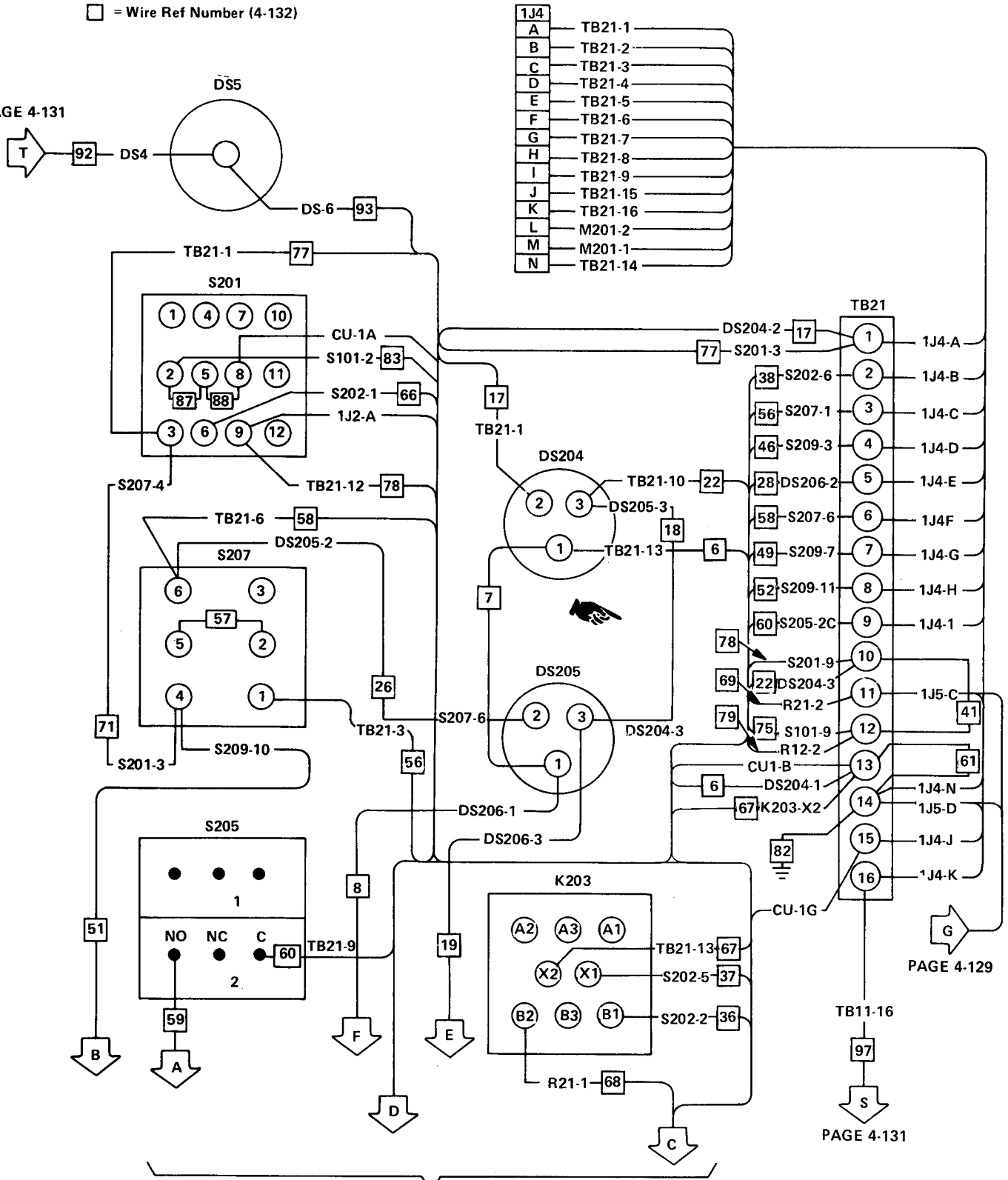
#### INSTALLATION

1. Attach electrical connections of cable assembly (1) to control panel components. See control panel wiring (P. 4-127). Coat terminal board screw threads with sealing compound before securing connections.
  2. Attach cable assembly (1) to control unit (2).
  3. Install cable tie down strap.
  4. Install panel cover (P. 4-110).
-

# CONTROL PANEL WIRING

☐ = Wire Ref Number (4-132)

PAGE 4-131

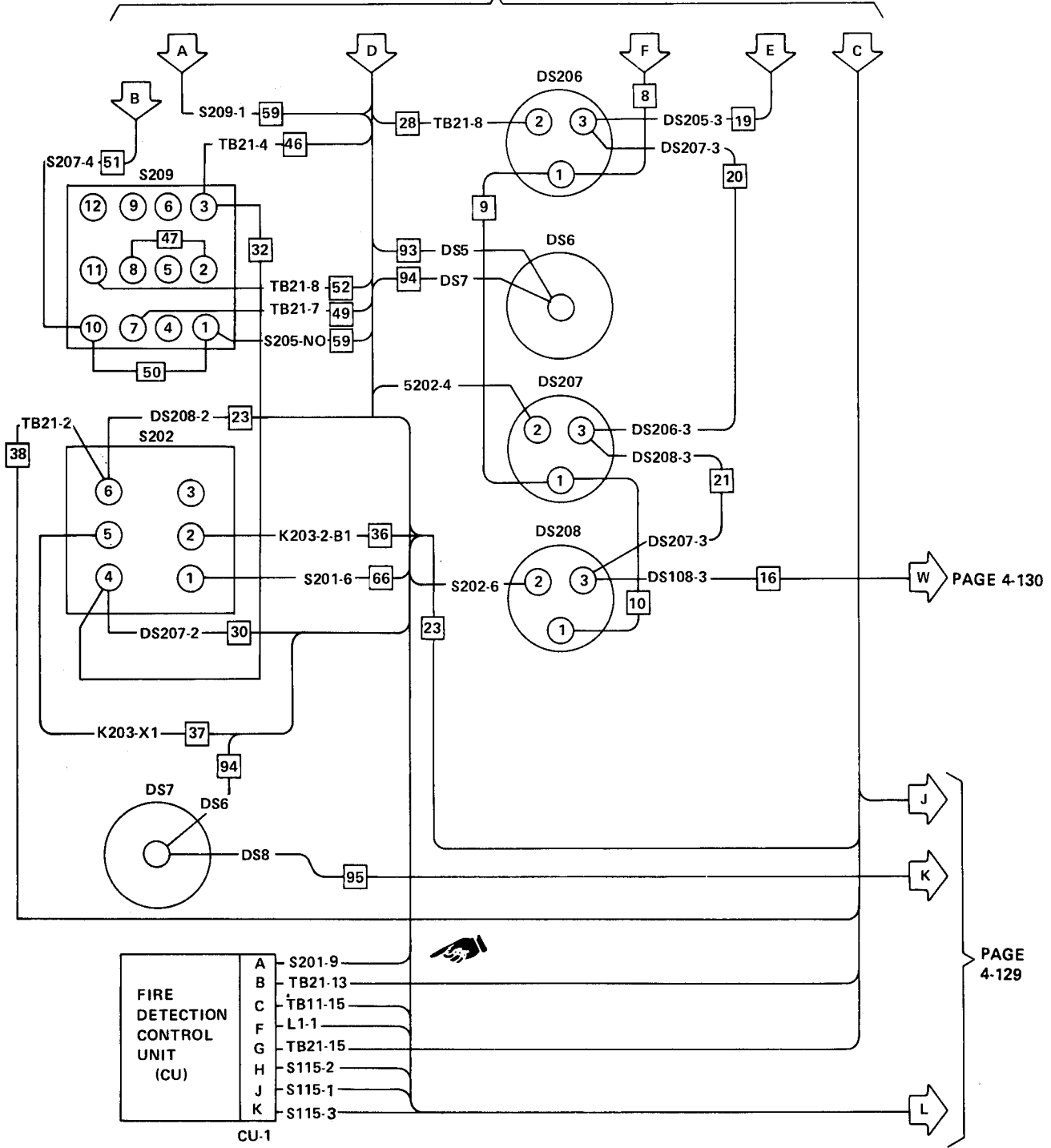


PAGE 4-128

PAGE 4-129

PAGE 4-131

CONTROL PANEL WIRING (CONT).

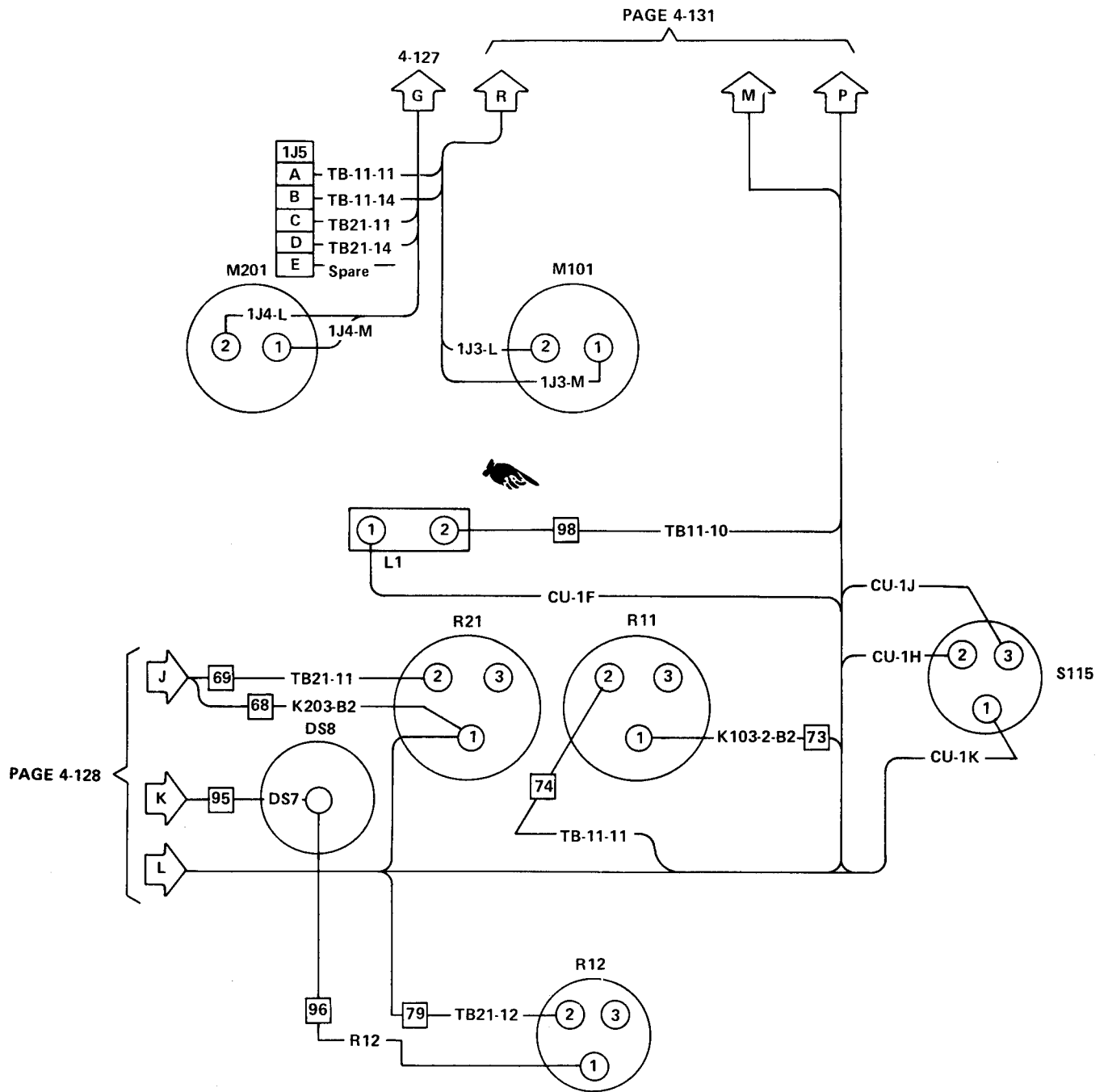


PAGE 4-130

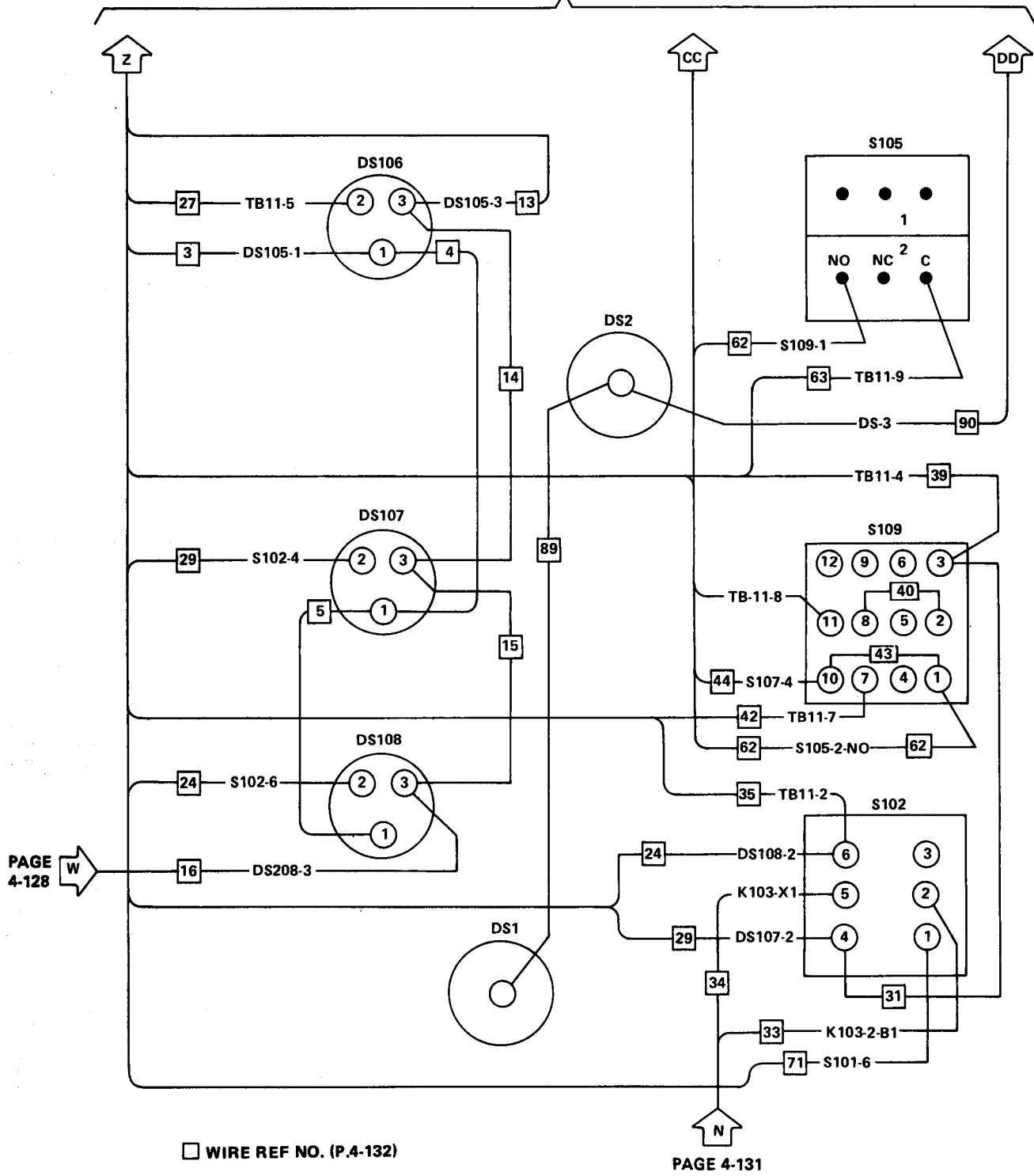
PAGE 4-129

□ WIRE REF NO. (P.4-132).

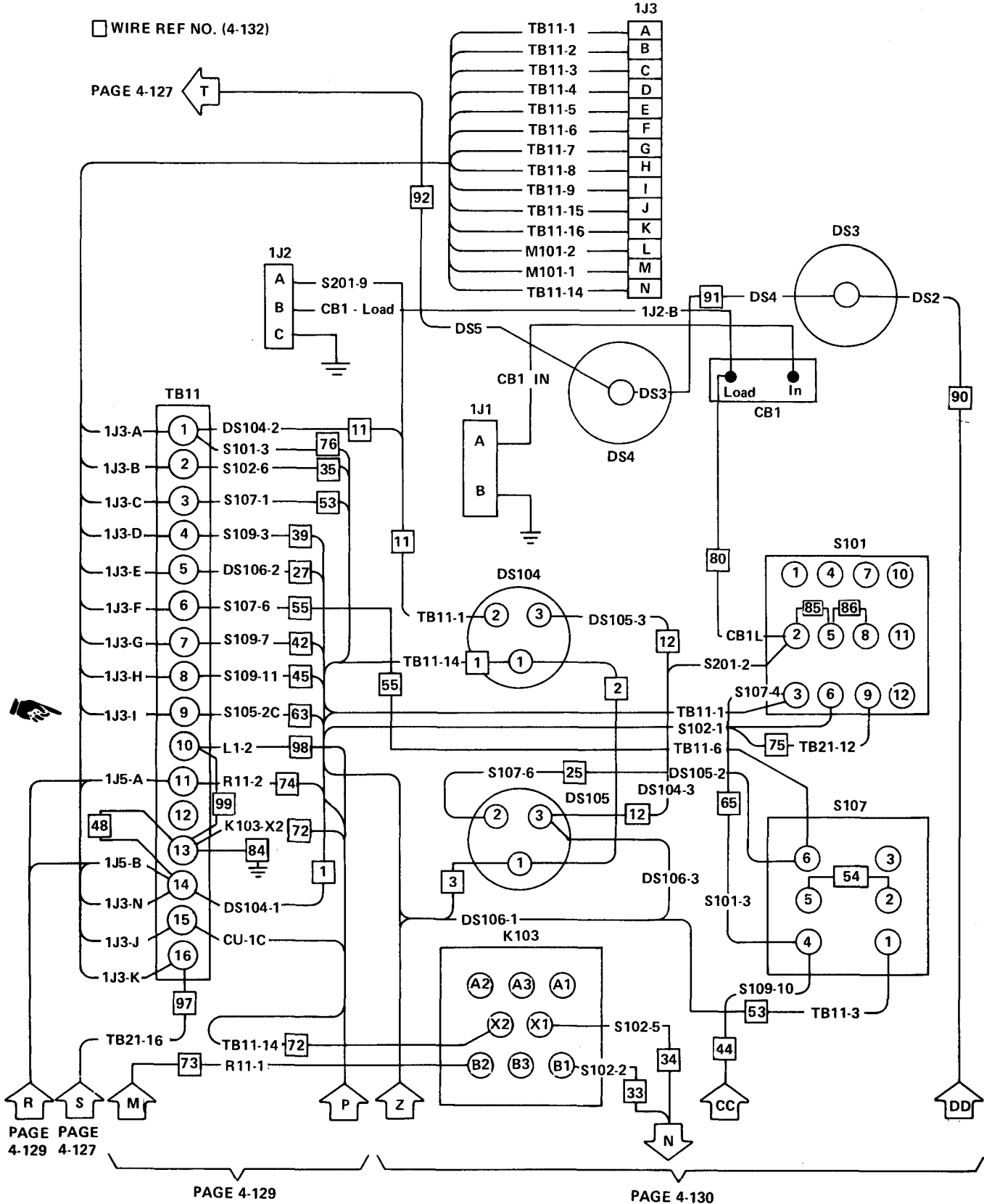
# CONTROL PANEL WIRING (CONT).



CONTROL PANEL WIRING (CONT).



CONTROL PANEL WIRING (CONT.)



CONTROL PANEL WIRING (CONT).

WIRE REF NO.	WIRE LENGTH INCHES	TERMINATION		TERMINATION		* WIRE ITEM NO.
		FROM	ITEM NO. *	TO	ITEM NO. *	
1	7.5	TB11-14	12	DS104-1	-	21
2	5.0	DS104-1	-	DS105-1	-	21
3	5.0	DS105-1	-	DS106-1	-	21
4	6.0	DS106-1	-	DS107-1	-	21
5	5.5	DS107-1	-	DS108-1	-	21
6	7.5	TB21-13	12	DS204-1	-	21
7	5.0	DS204-1	-	DS205-1	-	21
8	5.0	DS205-1	-	DS206-1	-	21
9	6.0	DS206-1	-	DS207-1	-	21
10	5.5	DS207-1	-	DS208-1	-	21
11	5.0	DS104-2	-	TB11-1	12	21
12	5.0	DS104-3	-	DS105-3	-	21
13	5.0	DS105-3	-	DS106-3	-	21
14	6.5	DS106-3	-	DS107-3	-	21
15	5.5	DD107-3	-	DS108-3	-	21
16	14.0	DS108-3	-	DS208-3	-	21
17	5.0	DS204-2	-	TB21-10	12	21
18	5.0	DS204-3	-	DS205-3	-	21
19	5.0	DS205-3	-	DS206-3	-	21
20	6.5	DS206-3	-	DS207-3	-	21
21	5.5	DS207-3	-	DS208-3	-	21
22	5.0	DS204-3	-	TB21-10	12	21
23	5.0	DS208-2	-	S202-6	12	21
24	4.0	S102-6	12	DS108-2	-	21
25	4.0	DS105-2	-	S107-6	12	21
26	5.0	DS205-2	-	S207-6	12	21
27	9.0	DS106-2	-	TB11-5	12	21
28	9.0	DS206-2	-	TB21-5	12	21
29	7.0	DS107-2	-	S102-4	12	21
30	8.0	DS207-2	-	S202-4	12	21
31	7.0	S102-4	12	S109-3	12	21
32	7.5	S202-4	12	S209-3	12	21
33	9.0	S102-2	12	K103-2-B1	12	21
34	10.0	S102-5	12	K103-X1	12	21
35	16.0	S102-6	12	TB11-2	12	21
36	9.0	S202-2	12	K203-2-B1	12	21
37	9.5	S202-5	12	K203-X1	12	21
38	16.0	S202-6	12	TB21-2	12	21
39	11.5	S109-3	12	TB11-4	12	21
40	2.0	S109-2	12	S109-8	12	21
41	3.0	TB21-10	12	TB21-12	12	21
42	13.0	S109-7	12	TB11-7	12	21
43	2.0	S109-10	12	S109-1	12	21
44	9.0	S109-10	12	S107-4	12	21
45	11.5	S109-11	12	TB11-8	12	21
46	11.5	S209-3	12	TB21-4	12	21
47	2.0	S209-2	12	S209-8	12	21
48	3.0	TB11-14	12	TB11-13	12	21
49	14.5	S209-7	12	TB21-7	12	21
50	2.0	S209-10	12	S209-1	12	21
51	9.0	S209-10	12	S207-4	12	21

WIRE REF NO.	WIRE LENGTH INCHES	TERMINATION		TERMINATION		* WIRE ITEM NO.
		FROM	ITEM NO. *	TO	ITEM NO. *	
52	12.5	S209-11	12	TB21-8	12	21
53	8.0	S107-1	12	TB11-3	12	21
54	2.0	S107-2	12	S107-5	12	21
55	5.0	S107-6	12	TB11-6	12	21
56	6.5	S207-1	12	TB21-3	12	21
57	2.0	S207-2	12	S207-5	12	21
58	5.0	S207-6	12	TB21-6	12	21
59	7.0	S209-1	12	S205-2 N.O.	12	21
60	7.0	S205-2C	-	TB21-9	12	21
61	4.0	TB21-13	12	TB21-14	12	21
62	9.5	S109-1	12	S105-2 N.O.	12	21
63	8.0	S105-2C	-	TB11-9	12	21
64						
65	5.0	S107-4	12	S101-3	12	21
66	14.0	S202-1	12	S201-6	12	21
67	8.0	K203-X2	12	TB21-13	12	21
68	12.0	K203-B2	12	R21	14	21
69	14.0	R21	16	TB21-11	12	21
70	5.0	S207-4	12	S201-3	12	21
71	15.0	S102-1	12	S101-6	12	21
72	8.0	K103-X2	12	TB11-13	12	21
73	12.0	K103-2-B2	12	R11	14	21
74	17.0	R11	16	TB11-11	12	21
75	24.0	S101-9	12	TB21-12	12	21
76	4.5	S101-3	12	TB11-1	12	21
77	8.0	S201-3	12	TB21-1	12	21
78	7.0	S201-9	12	TB21-10	12	21
79	21.0	R12	-	TB21-12	12	21
80	5.0	S101-2	20	CB1-LOAD	15	22
81	7.0	GRD	10	GRD	11	1
82	27.0	TB21-14	12	GRD	17	21
83	19.5	S101-2	20	S201-2	20	22
84	15.0	TB11-13	12	GRD	17	21
85	2.0	S101-2	20	S101-5	20	22
86	2.0	S101-5	20	S101-8	20	22
87	2.0	S201-2	20	S201-5	20	22
88	2.0	S201-5	20	S201-8	20	22
89	9.0	DS1(+)	-	DS2(+)	-	21
90	9.0	DS2(+)	-	DS3(+)	-	21
91	8.0	DS3(+)	-	DS4(+)	-	21
92	8.0	DS4(+)	-	DS5(+)	-	21
93	9.0	DS5(+)	-	DS6(+)	-	21
94	9.0	DS6(+)	-	DS7(+)	-	21
95	19.0	DS7(+)	-	DS8(+)	-	21
96	8.0	DS8(+)	-	R12	-	21
97	8.0	TB11-16	12	TB21-16	12	21
98	4.5	L1-2	12	TB11-10	12	21
99	4.0	TB11-10	12	TB11-13	12	21

\*Refers to bulk item no. in app F



## 4-29 PANEL COVER.

---

This task covers replacement of Gaskets.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Materials*

Adhesive (Item 1, App E)

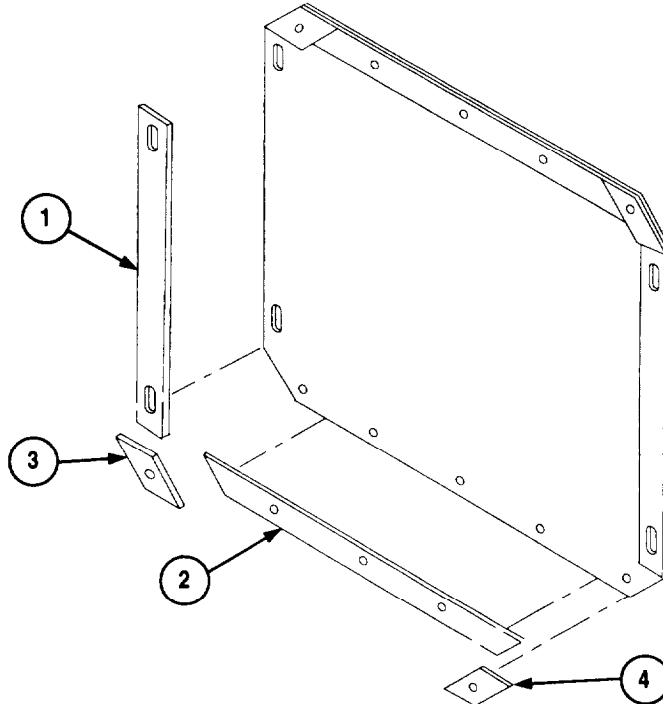
#### *Equipment Condition*

Control panel removed from vehicle. See vehicle TM manual. Panel cover removed (P. 4-110).

---

### REPLACEMENT

1. Fabricate new gaskets (Fig. G-17 thru G-20, App G).
2. Lift edge of gasket (1) with sharp tool.
3. Pull gasket completely off panel cover.
4. Thoroughly clean panel cover mounting surface with rags (Item 11, App E), and dry cleaning solvent (Item 4, App E).
5. Panel must be free of oil, grease, dirt, or any foreign matter.
6. Apply adhesive (Item 1, App E) to back of gaskets and mount on panel cover.



## 4-30 FOG OIL PUMP ASSEMBLY.

---

This task covers replacement of:

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- |  |  |
|--|--|
| <b>a. Strainer Assembly</b> (P. 4-134)     | <b>e. Quick Disconnect Coupling</b> (P. 4-139) |
| <b>b. Pressure Relief Valve</b> (P. 4-136) | <b>f. Cable Assembly 6J3</b> (P. 4-140)        |
| <b>c. Hose Assembly</b> (P. 4-137)         | <b>g. Fog Oil Pump</b> (P. 4-142)              |
| <b>d. Hose Assembly</b> (P. 4-138)         |  |
- 

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

Before performing any maintenance instructions be sure circuit breaker CB1 is in OFF position. Fog oil is very slippery. Clean up all spills immediately to prevent injury to personnel.

---

- a. Strainer Assembly.**
- 

### REMOVAL

#### NOTE

Removal and installation procedures are the same for both strainer assemblies.

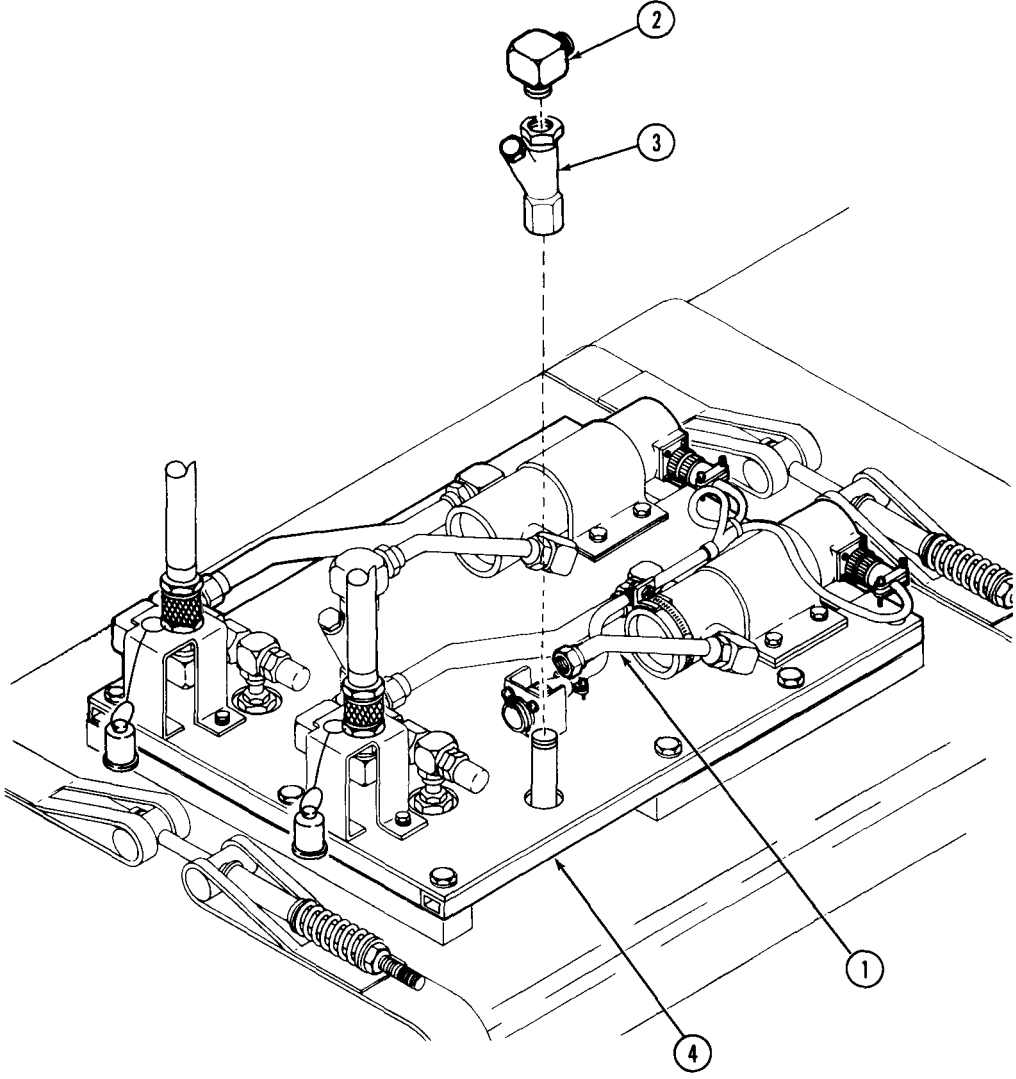
1. Disconnect fog oil hose (1) from elbow (2).
2. Remove elbow (2) from strainer assembly (3).
3. Remove strainer assembly (3) from fog oil pump assembly (4).

#### NOTE

If pipe nipple is removed with strainer assembly, remove nipple and install on new strainer assembly.

### INSTALLATION

1. Install strainer assembly (3) on fog oil pump assembly (4).
2. Install elbow (2) on strainer assembly (3).
3. Install fog oil hose (1) on elbow (2).



## 4-30 FOG OIL PUMP ASSEMBLY (CONT).

### *b. Pressure Relief Valve.*

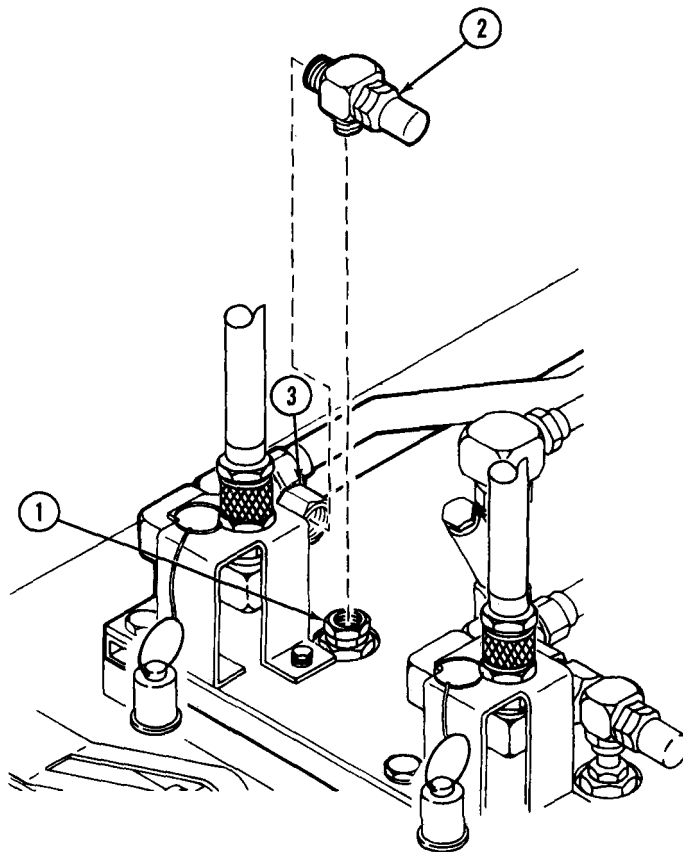
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#### REMOVAL

#### NOTE

Removal and installation instructions are the same for both pressure relief valves.

1. Disconnect flare nut (1) from pressure relief valve (2).
2. Disconnect swivel adapter (3) from pressure relief valve (2), and remove pressure relief valve.



#### INSTALLATION

1. Connect swivel adapter (3) to pressure relief valve (2) and tighten.
  2. Connect flare nut (1) to pressure relief valve (2) and tighten.
  3. Perform adjustment procedures (P. 4-145).
-

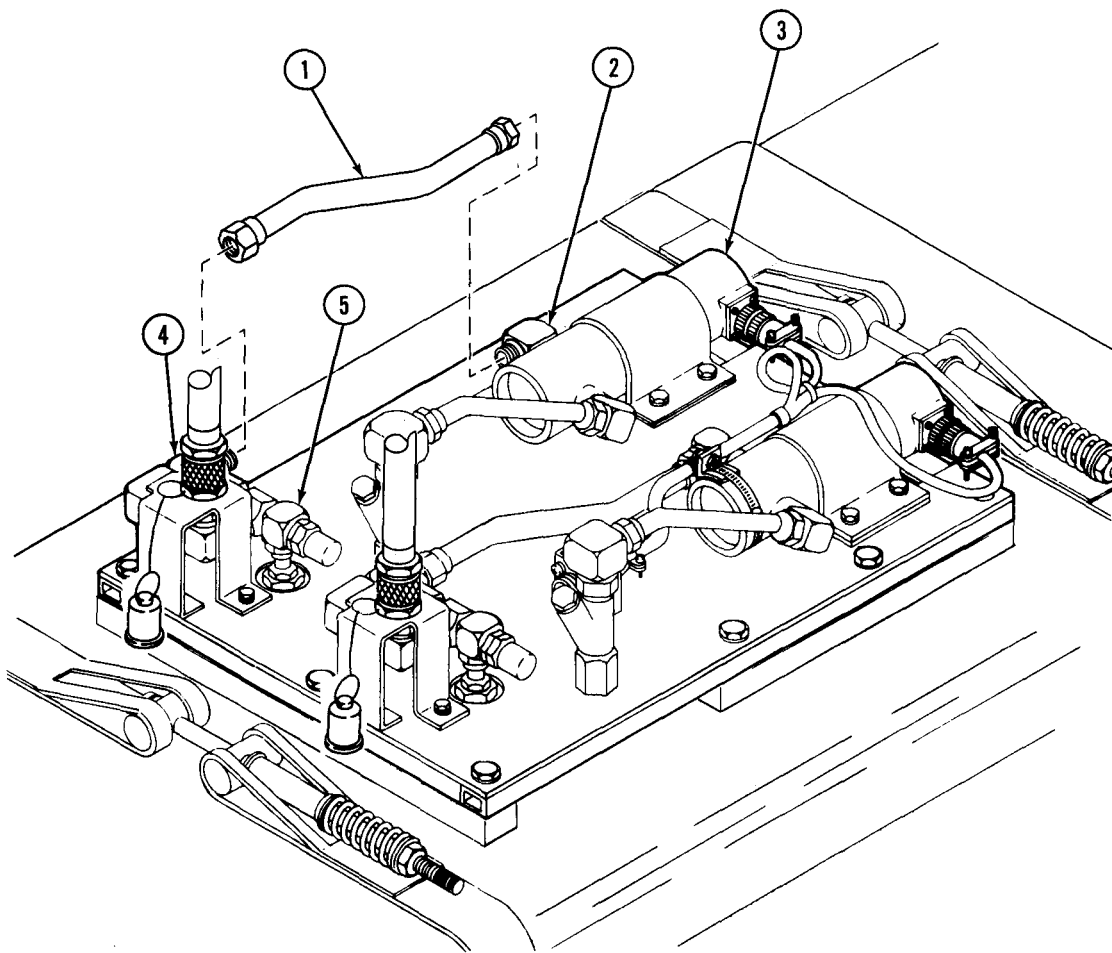
*c. Hose Assembly.*

## REMOVAL

## NOTE

Removal and installation procedures are the same for both hose assemblies.

1. Remove hose (1) from elbow (2) on fog oil pump (3).
2. Remove hose (1) from tee (4) on pressure relief valve (5).



## INSTALLATION

1. Attach hose (1) to tee (4) on pressure relief valve (5) and secure.
2. Attach hose (1) to elbow (2) on fog oil pump (3) and secure.

4-30 FOG OIL PUMP ASSEMBLY (CONT).

*d. Hose Assembly.*

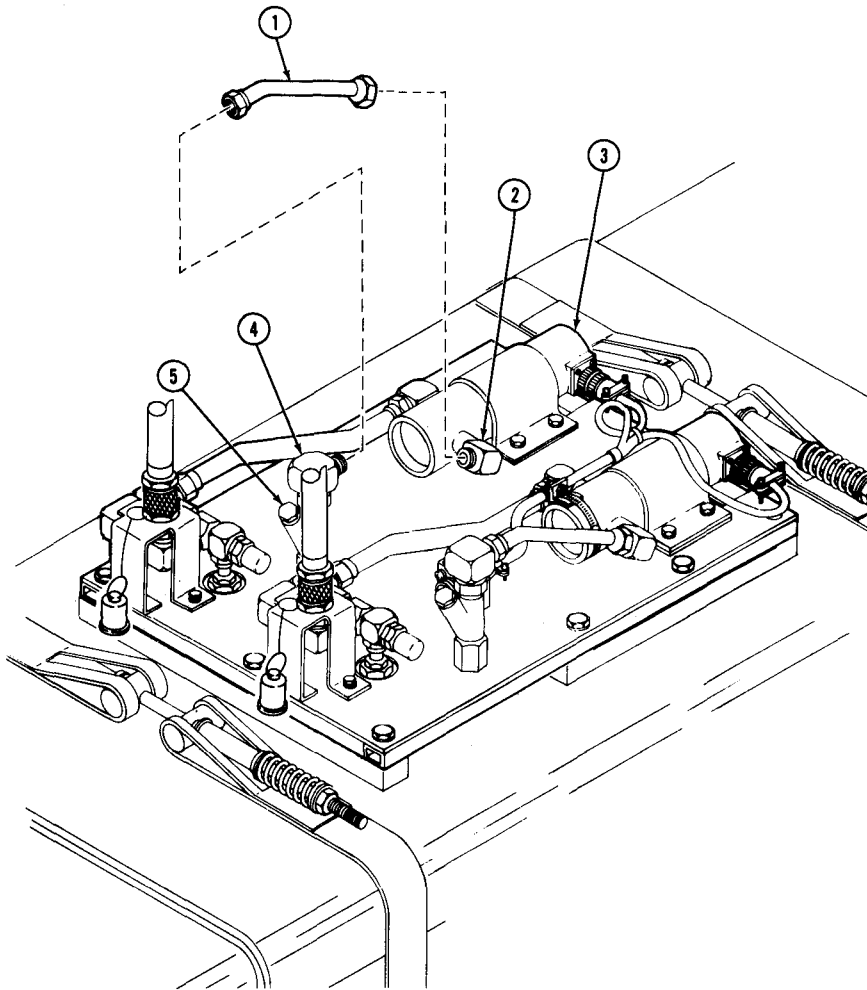
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REMOVAL

NOTE

Removal and installation procedures are the same for both hose assemblies.

1. Disconnect hose (1) from elbow (2) on pump (3).
2. Disconnect hose (1) from elbow (4) on strainer assembly (5).



INSTALLATION

1. Connect hose (1) to elbow (4) on strainer assembly (5) and secure.
  2. Connect hose (1) to elbow (2) on fog oil pump (3) and secure.
-

**e. Quick Disconnect Coupling.**

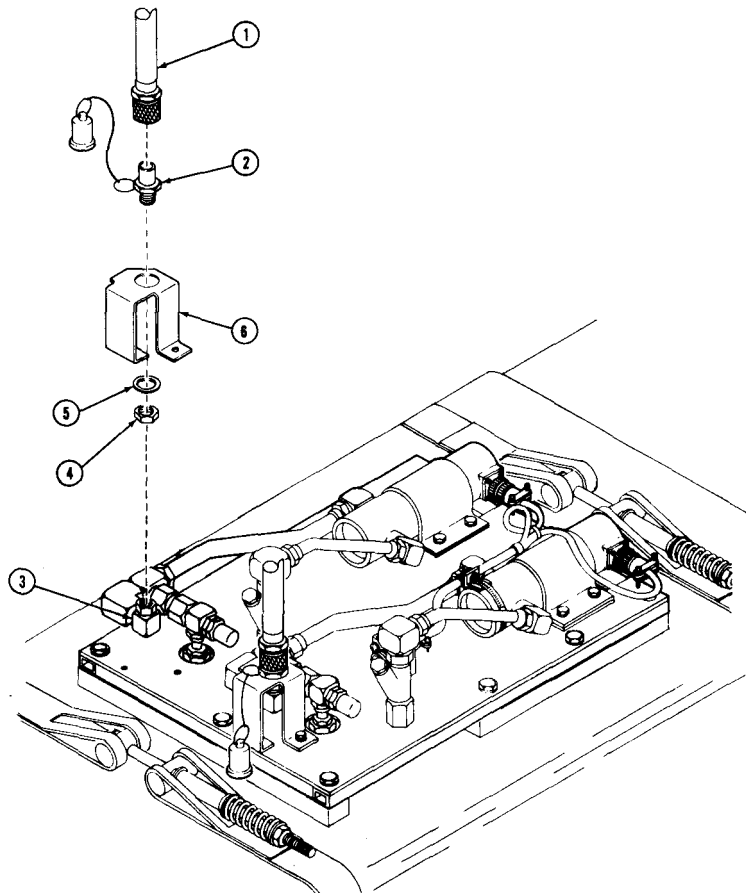
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## REMOVAL

## NOTE

Removal and installation procedures are the same for both disconnects. Disconnect bracket shown removed for clarity.

1. Disconnect hose (1) from disconnect coupling (2).
2. Disconnect swivel adapter (3) from disconnect coupling (2).
3. Disconnect nut (4) and washer (5) and remove disconnect coupling (2) from disconnect bracket (6).



## INSTALLATION

1. Position disconnect coupling (2) in disconnect bracket (6) and secure with nut (4) and washer (5).
  2. Connect swivel adapter (3) to disconnect coupling (2).
  3. Connect hose (1) to disconnect coupling (2).
-

## 4-30 FOG OIL PUMP ASSEMBLY (CONT).

### *f. Cable Assembly 6J3.*

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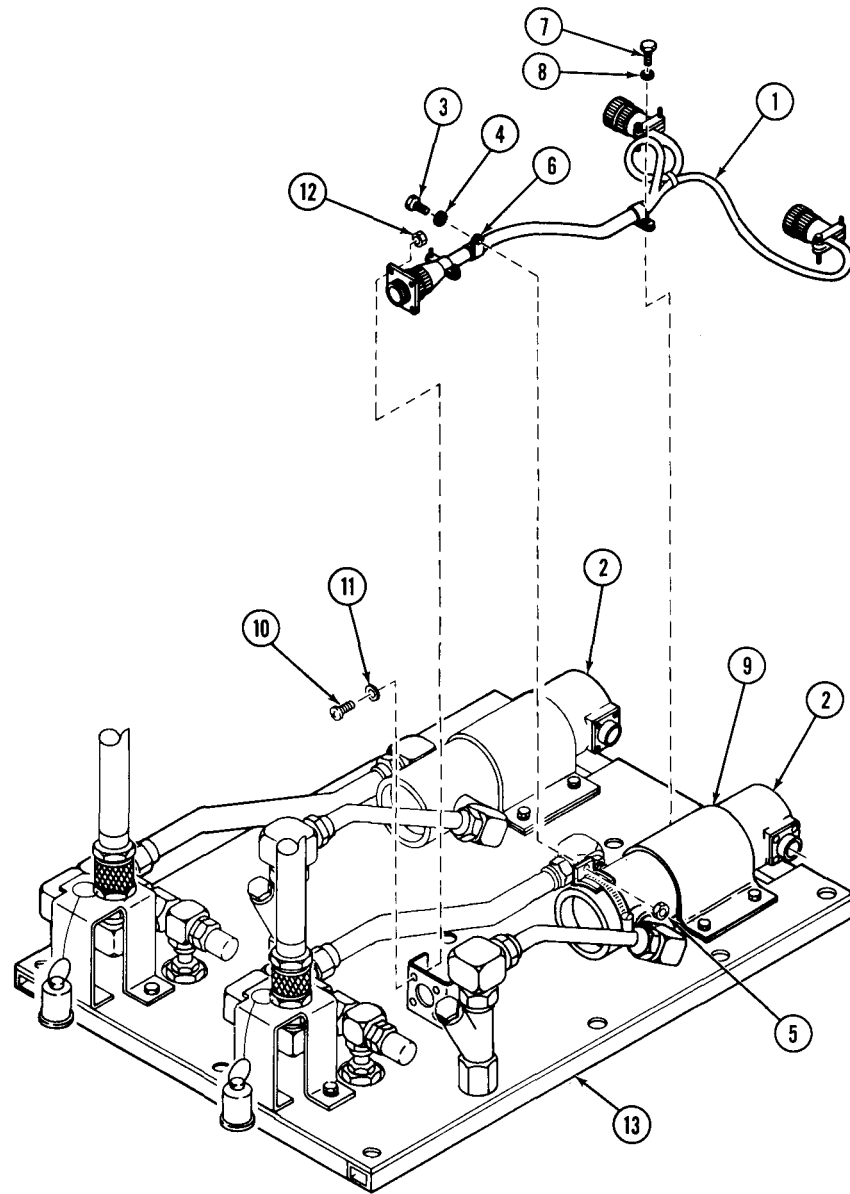
#### REMOVAL

1. Disconnect cable assembly (1) from both fog oil pumps (2) at connectors.
2. Remove screw (3), washer (4), and nut (5) from loop clamp (6) and remove cable assembly (1) and loop clamp (6).
3. Remove screw (7), washer (8), and loop clamp (9) and remove cable assembly (1).
4. Remove four screws (10), washers (11), and nuts (12) and remove cable assembly (1) from fog oil pump assembly (13).

#### INSTALLATION

1. Position cable assembly (1) on fog oil pump assembly (13) and secure with four screws (10), washers (11), and nuts (12).
2. Attach cable assembly (1) to loop clamp (6) with screw (3), washer (4), and nut (5).
3. Attach cable assembly (1) to loop clamp (9) and secure with screw (7) and washer (8) to fog oil pump assembly (13).
4. Attach cable assembly (1) to fog oil pumps (2).





## 4-30 FOG OIL PUMP ASSEMBLY (CONT).

### *g, Fog Oil Pump.*

---

#### REMOVAL

##### NOTE

Removal and installation procedures are the same for both fog oil pumps.

1. Disconnect fog oil hose (1) from elbow (2) on fog oil pump (3).
2. Disconnect fog oil hose (4) from elbow (5) on fog oil pump (3).
3. Disconnect cable assembly (6) from fog oil pump (3).

##### NOTE

If removing right fog oil pump, remove cable assembly from strap bracket, and remove hose clamp from fog oil pump.

4. Remove four screws (7) and washers (8) and remove strap bracket (9).
5. Remove fog oil pump (3) from fog oil pump assembly (10).
6. Remove elbows (2) and (5) from fog oil pump (3).

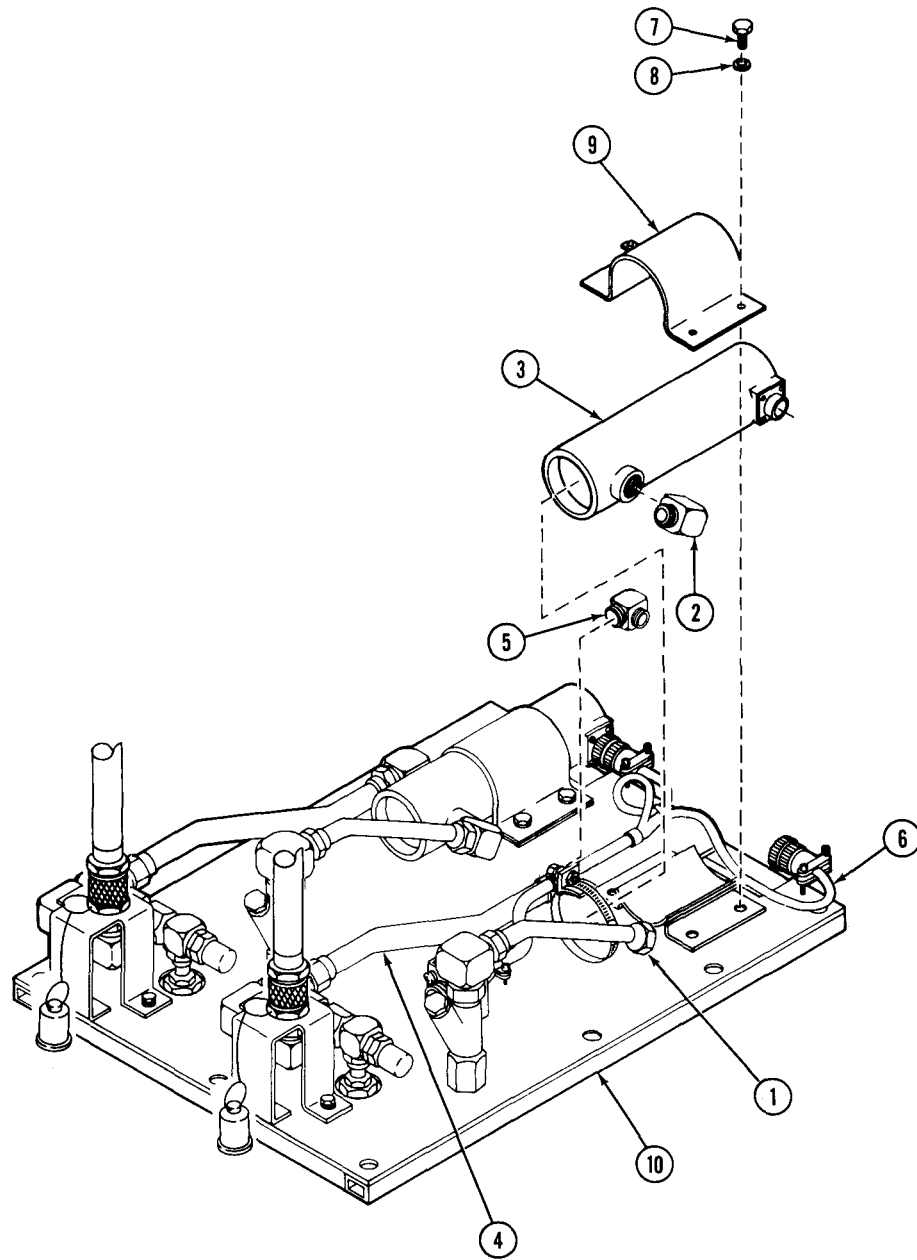
#### INSTALLATION

1. Install elbows (2) and (5) on fog oil pump (3).
2. Position fog oil pump (3) on fog oil pump assembly (10) and secure with strap bracket (9), four bolts (7), and washers (8).

##### NOTE

If right fog oil pump was removed then install hose clamp on fog oil pump and secure cable assembly in strap bracket.

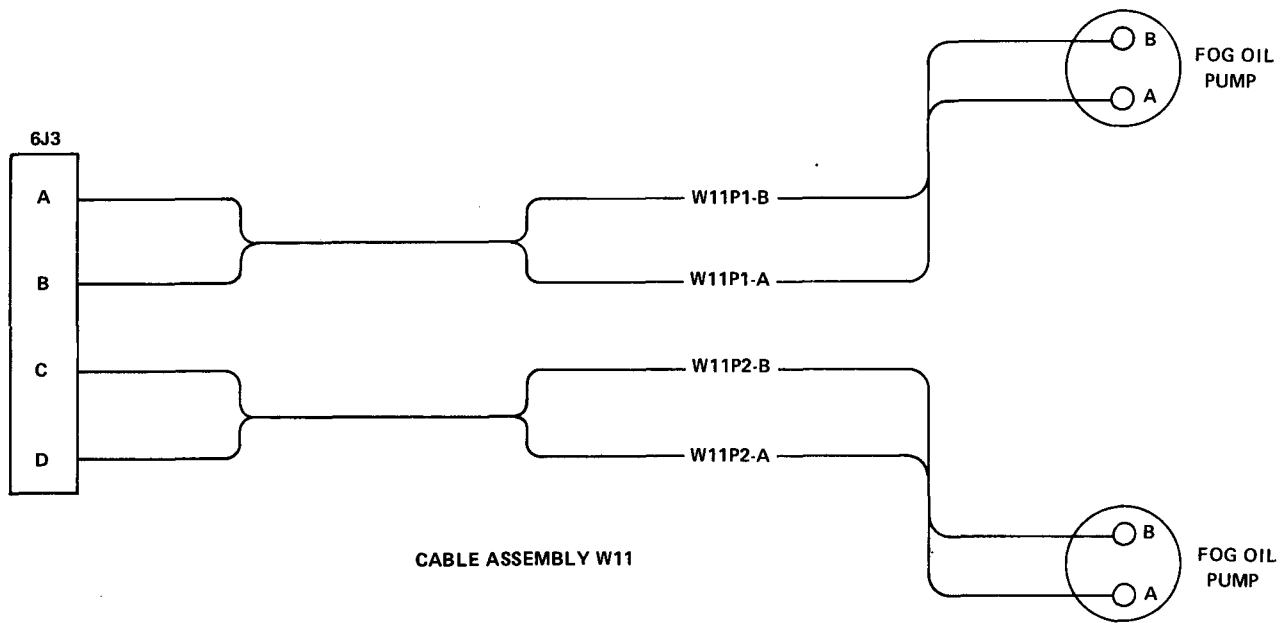
3. Install cable assembly (6) on fog oil pump (3).
4. Connect fog oil hose (4) to elbow (5) on fog oil pump (3).
5. Connect fog oil hose (1) to elbow (2) on fog oil pump (3).
6. Perform adjustment procedures (P. 4-145).



4-30 FOG OIL PUMP ASSEMBLY (CONT).

FOG OIL PUMP ASSEMBLY WIRING

---



## 4-31 FOG OIL PUMP ASSEMBLY PRESSURE RELIEF VALVE ADJUSTMENT.

---

This task covers adjustment of Fog Oil Pump Assembly Pressure Relief Valve.

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### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

Fog oil is very slippery. Clean up all spills immediately to prevent injury to personnel.

#### *Equipment Condition*

Vehicle engine running.

#### *Test Equipment*

Fog oil test gage (Fig. G-21, App G)

---

### ADJUSTMENT

#### **NOTE**

There are two pressure relief valves. The procedures are the same for both pressure relief valves.

1. Remove fog oil hose from fog oil disconnect (1).
2. Remove pipe plug from tee (4) and install test gage (Fig G-21, App G). Make sure valve on gage is closed (lever to the side).
3. Set OIL switch on terminal bracket assembly to ON. See P. 4-96 for location. On M1059 vehicles, it may be necessary to lower inboard armor shield and remove smoke generator.
4. Set circuit breaker CB1 and POWER switch to ON. Ensure vehicle engine is running. Turn FOG OIL FLOW control knob fully clockwise.

#### **NOTE**

Have a container available to collect fog oil or drain fog oil back into tank during next step.

5. Set FOG OIL switch to RUN position and observe reading on test gage. Fog oil pressure should be 25 psig for operating temperatures of 90°F and above or 55 psig for temperatures below 90°F. If not, bleed air from pump and hoses by opening valve on test gage assembly until fog oil runs out. Close valve and observe gage. If correct pressure is still not obtained, adjust pressure relief valve as follows.
  6. Loosen locknut (2) securing adjuster (3) of fog oil pressure relief valve.
  7. Turn adjuster clockwise to increase pressure, turn adjuster counterclockwise to reduce pressure.
  8. When correct pressure is obtained, tighten locknut (2) to secure adjuster (3).
  9. Set FOG OIL switch, POWER switch, and circuit breaker CB1 to OFF, and turn FOG OIL FLOW control knob fully counterclockwise.
  10. Set OIL switch on terminal bracket assembly to OFF.
  11. Disconnect test gage and reinstall pipe plug in tee (4) and fog oil hose on fog oil disconnect (1).
-

## 4-32 STRAINER ASSEMBLY.

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This task covers replacement of Strainer Element.

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### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

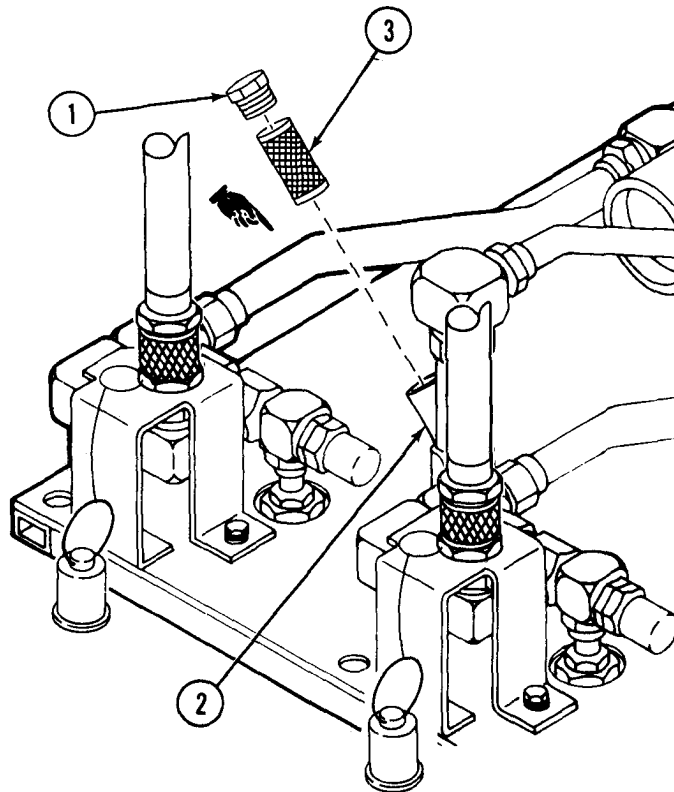
Before performing any maintenance instructions be sure circuit breaker CB1 is in OFF position.

Fog oil is very slippery. Clean up all spills immediately to prevent injury to personnel.

---

### REMOVAL

1. Remove cap screw (1) from strainer assembly (2).
2. Remove strainer element (3) from strainer assembly (2).



### INSTALLATION

1. Install strainer element (3) in strainer assembly (2).
  2. Install cap screw (1) on strainer assembly (2).
-

## 4-33 HOSE ASSEMBLY.

---

This task covers repair of Hose Assembly.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

Fog oil is very slippery. Clean up all spills immediately to prevent injury to personnel.

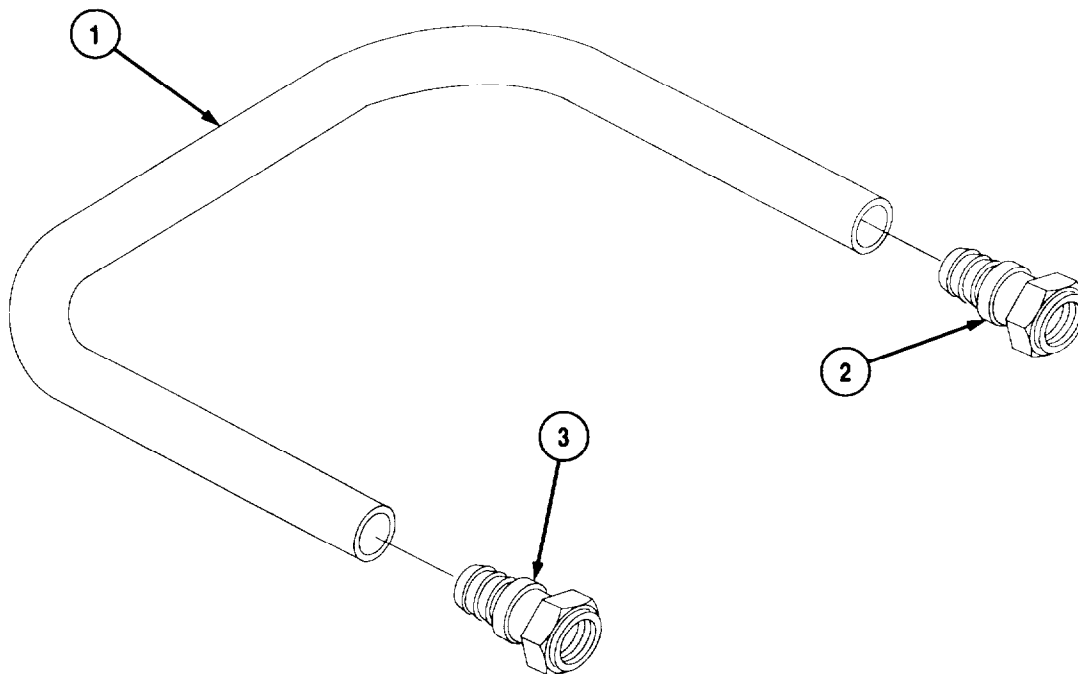
#### *Equipment Condition*

Hose assembly removed from fog oil pump assembly (P. 4-137).

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Cut hydraulic hose (1) at straight adapter (3) and remove adapter.
3. Fabricate new hose (Fig. G-8, App G).
4. Replace adapters (2) and (3) as required.
5. Install straight adapters (2) and (3) in hydraulic hose (1).



## 4-34 FOG OIL PUMP.

---

This task covers replacement of Gear Rotor Set.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

Fog oil is very slippery. Clean up all spills immediately to prevent injury to personnel.

#### *Equipment Condition*

Fog oil pump removed from fog oil pump assembly (P. 4-142).

---

### REMOVAL

#### NOTE

Scribe mark on mechanical housing and inside wall of pump motor housing before removal.

1. Remove four screws (1) securing mechanical housing (2).
2. Carefully tap mechanical housing end of pump (3) on a block of wood and remove mechanical housing (2).
3. Remove gear rotor set (4) from pump (3).
4. Remove woodruff key (5) from motor shaft (6), if being replaced.
5. Inspect gear rotor set (4) for free movement, pitting, and corrosion. Clean/replace gear rotor set as required. Do not use file or abrasive cleaners.
6. Clean pump motor housing (7).
7. Inspect preformed packing (8) and replace as required.

### INSTALLATION

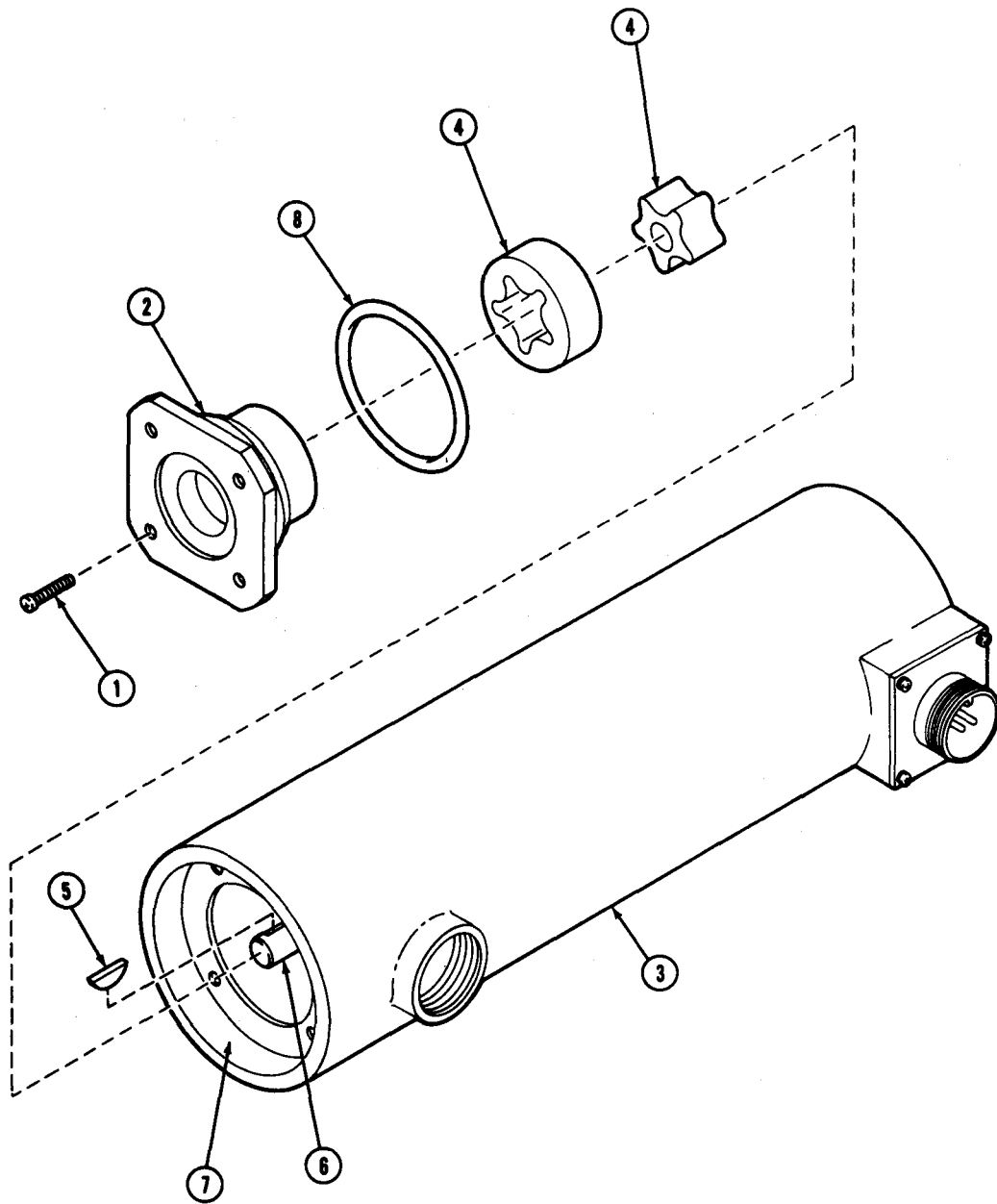
1. Install woodruff key (5) in motor shaft (6), if removed.
2. Lightly oil gear rotor set and install gear rotor set (4) on motor shaft (6) using square slot on rotor.

#### NOTE

Align scribe marks on mechanical housing and inside wall of pump motor housing.

3. Install mechanical housing (2) and secure with four screws (1).





## 4-35 FOG OIL HOSE ASSEMBLY.

---

This task covers repair of Hose Assembly.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

Fog oil is very slippery. Cleanup all spills immediately to prevent injury to personnel.

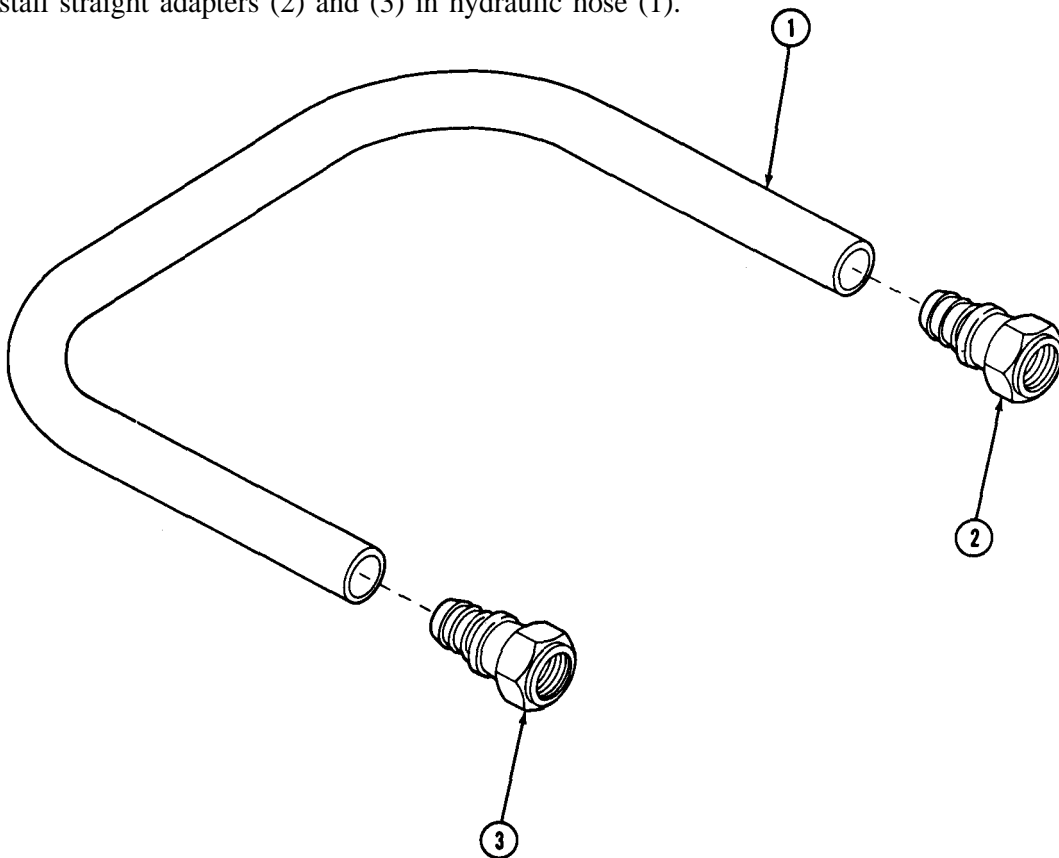
#### *Equipment Condition*

Fog oil hose assembly removed from fog oil pump assembly (P. 4-138).

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Cut hydraulic hose (1) at straight adapter (3) and remove adapter.
3. Replace straight adapters (2) and (3) as required.
4. Fabricate new hose (Fig. G-9, App G).
5. Install straight adapters (2) and (3) in hydraulic hose (1).



## 4-36 AIR COMPRESSOR ASSEMBLY.

---

This task covers replacement of:

- a. Pressure Tan&** (P. 4-152)
- b. Air Compressor** (P. 4-154)
- c. Relay K104** (P. 4-156)
- d. Pressure Switch S114** (P. 4-157)
- e. Terminal Block** (P. 4-158)
- f. Control Valve** (P. 4-159)
- g. Capacitor Assembly** (P. 4-159)
- h. Disconnect Coupling (AIR)** (P. 4-160)
- i. Cable Assembly 2J1** (P. 4-161)
- j. Air Hose Assembly** (P. 4-162)
- k. Cable Assembly** (P. 4-163)

- l. Air Hose Assembly** (P. 4-164)
  - m. Check Valve** (P. 4-165)
- 

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Equipment Condition*

Air compressor assembly removed from  
vehicle (P. 4-20).

#### *Materials*

Sealing compound (Item 12, App E)  
Sealing compound (Item 11 A, App E)

---

#### *General Safety Instructions*

Before performing any maintenance instructions be sure circuit breaker is in OFF position.

Before performing any maintenance procedures on air compressor assembly be sure to relieve pressure through control valve on pressure tank.

## 4-36 AIR COMPRESSOR ASSEMBLY (CONT).

### *a. Pressure Tank.*

---

#### REMOVAL

1. Disconnect air hose assembly (1) from straight adapter (2).
2. Remove control valve (3) with reducer (4) from pipe tee (5).
3. Remove pipe tee (5) with straight adapter (2).
4. Disconnect air hose assembly (6) from elbow (7) on pressure tank (8).
5. Remove two pipe bushings (9) with disconnect coupling (10) from pressure tank (8).
6. Remove cable loop clamp (11) for access.
7. Remove eight screws (12), washers (13), and four retaining straps (14) and remove pressure tank (8) from frame assembly (15).
8. Remove elbow (7) from pressure tank (8).

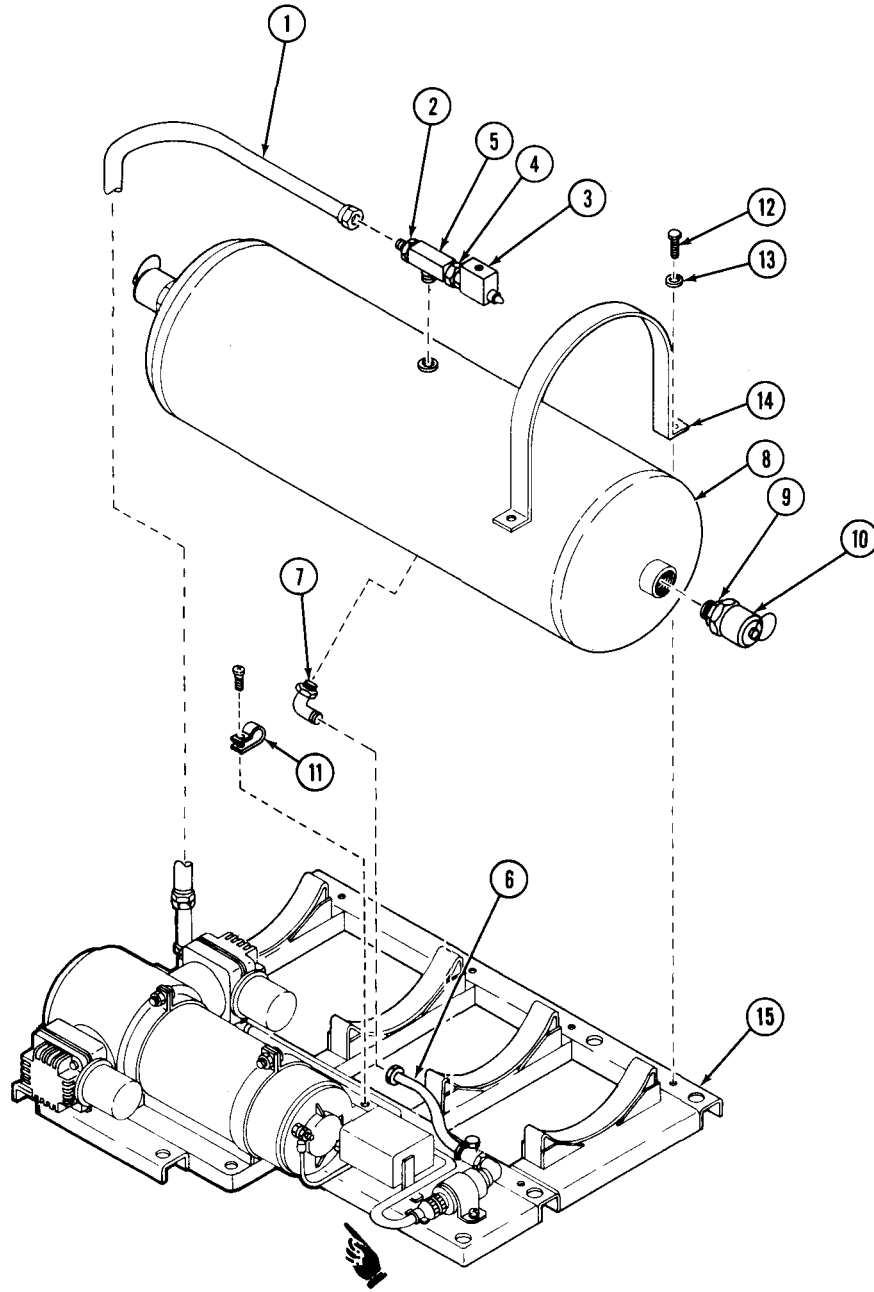
#### INSTALLATION

#### NOTES

Apply sealing compound (Item 12, App E) to threads of male pipe fittings before installing.

If required, replace insulation tape (Fig. G-16) on frame assembly's pressure tank mounting brackets, as required.

1. Install elbow (7) on pressure tank (8).
2. Position pressure tank (8) on compressor frame assembly (15) and secure with four retaining straps (14), eight screws (12) and washers (13). Do not over-tighten screws (12). A gap between retaining strap (14) and frame assembly (15) is permissible.
3. Install cable loop clamp (11).
4. Install two pipe bushings (9) with disconnect couplings (10) on pressure tank (2).
5. Connect air hose assembly (6) to elbow (7).
6. Install pipe tee (5) with straight adapter (2) on pressure tank (2).
7. install reducer (4) and control valve (3) on pipe tee (5).
8. Connect air hose assembly (1) to pressure tank (8).



**4-36 AIR COMPRESSOR ASSEMBLY (CONT).**

***b. Air Compressor.***

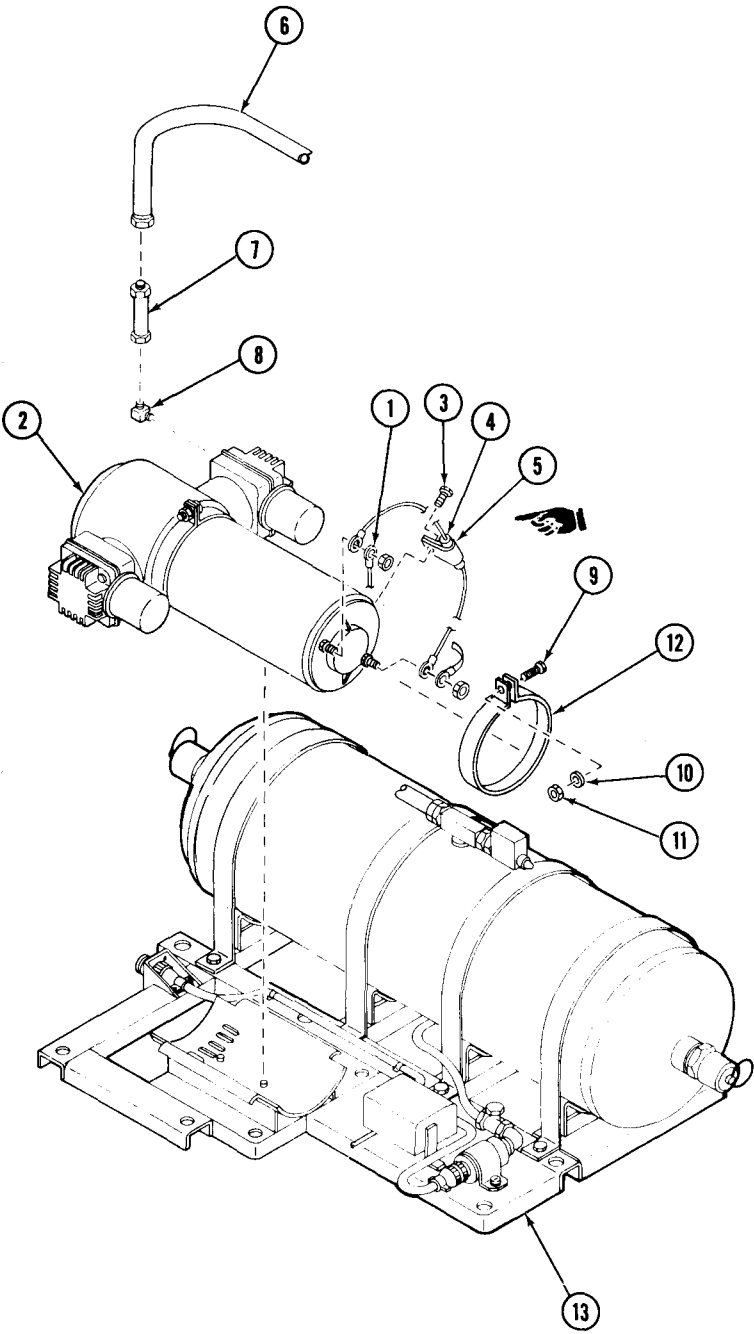
---

**REMOVAL**

1. Remove electrical connections (1) from POS and NEG terminals on air compressor (2).
2. Remove motor cover screw (3) securing capacitor assembly (4) and loop clamp (5) to air compressor (2).
3. Disconnect air hose assembly (6) from check valve (7), remove check valve (7) from elbow (8) and remove elbow (8) from air compressor (2).
4. Remove two screws (9), washers (10) and nuts (11), and remove two loop clamps (12).
5. Remove air compressor (2) from frame assembly (13).

**INSTALLATION**

1. Position air compressor (2) on frame assembly (13) and secure with two loop clamps (12), two screws (9), washers (10) and nuts (11).
2. Install elbow (8), check valve (7), and air hose assembly (6) on air compressor (2).
3. Install capacitor assembly (4) and loop clamp (5) on air compressor with motor cover screw (3).
4. Install electrical connections (1) on POS and NEG terminals of air compressor (2).



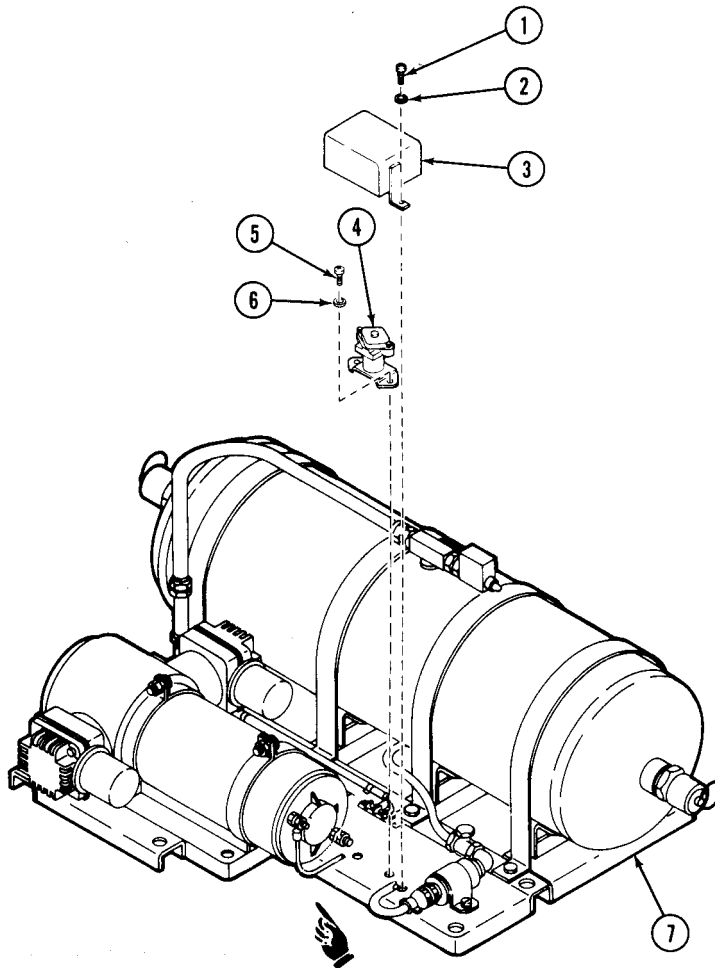
## 4-36 AIR COMPRESSOR ASSEMBLY (CONT).

### c. Relay K 104.

---

#### REMOVAL

1. Remove two screws (1) and washers (2) securing relay cover assembly (3).
2. Tag and remove four electrical connections from relay K104 (4).
3. Remove two screws (5) and washers (6) securing electromagnetic relay (4) and remove relay from frame assembly (7).



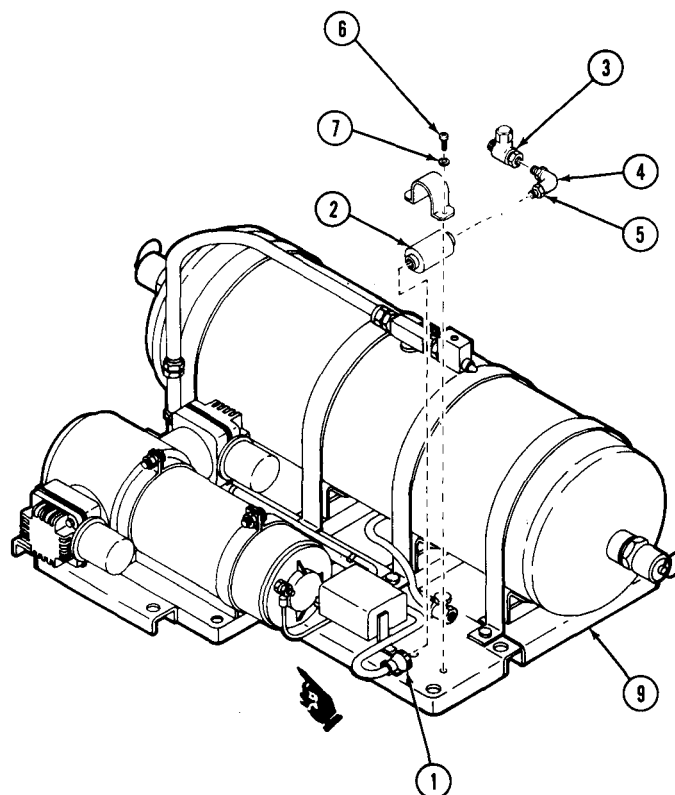
#### INSTALLATION

1. Position relay (4) on frame assembly (7) and secure with two screws (5) and washers (6).
  2. Install four electrical connections as tagged to electromagnetic relay (4).
  3. Position relay cover assembly (3) and secure with two screws (1) and washers (2).
-



*d. Pressure Switch S114.***REMOVAL**

1. Remove cable assembly (1) from pressure switch (2).
2. Remove swivel tee nut (3) from elbow (4) on pressure switch (2).
3. Loosen lock nut (5) on elbow (4).
4. Remove two screws (6) and washers (7) from pressure switch bracket (8) and remove pressure switch (2).
5. Remove elbow (4) from pressure switch (2).

**INSTALLATION**

1. Install elbow (4) on pressure switch (2).
2. Position pressure switch (2) on frame assembly (9) and secure with pressure switch bracket (8) and two screws (6), and washers (7).
3. Tighten lock nut (5).
4. Install swivel tee nut (3) on elbow (4) on pressure switch (2).
5. Connect cable assembly (1) to pressure switch (2).
6. Perform checks procedure for pressure switch (P. 4-167).

## 4-36 AIR COMPRESSOR ASSEMBLY (CONT).

### e. Terminal Block.

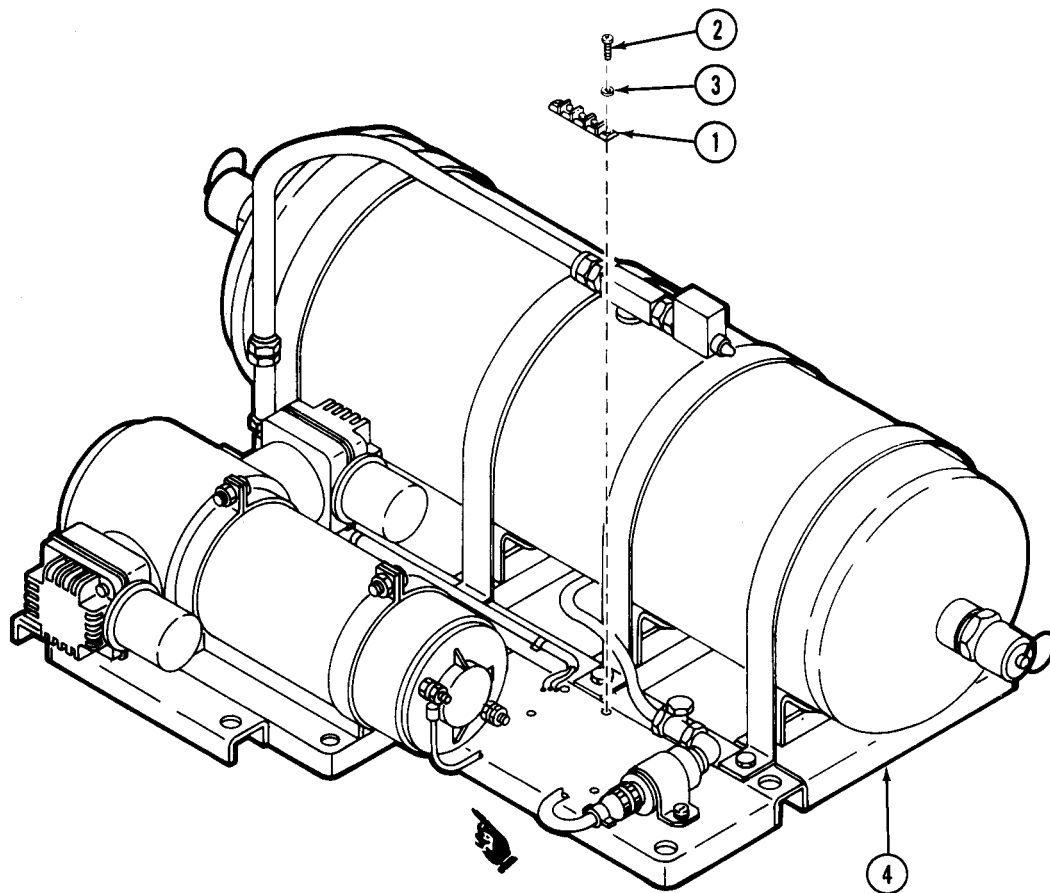
---

#### REMOVAL

1. Tag and remove electrical connections from terminal block (1).
2. Remove two screws (2) and washers (3) and remove terminal block (1) from frame assembly (4).

#### NOTE

Relay K104 removed for clarity.

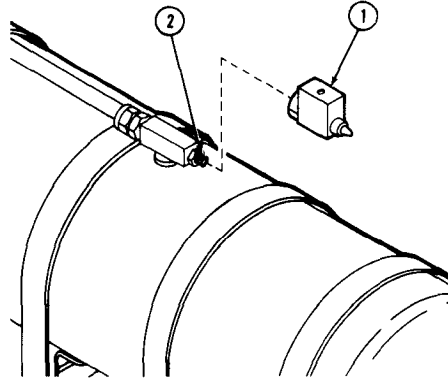


#### INSTALLATION

1. Position terminal block (1) on frame assembly (4) and secure with two screws (2) and washers (3).
  2. Install electrical connections on terminal block (1) as tagged. Coat terminal board screw threads with sealing compound (Item 11A, App E) before securing connections.
-

**f. Control Valve.****REMOVAL**

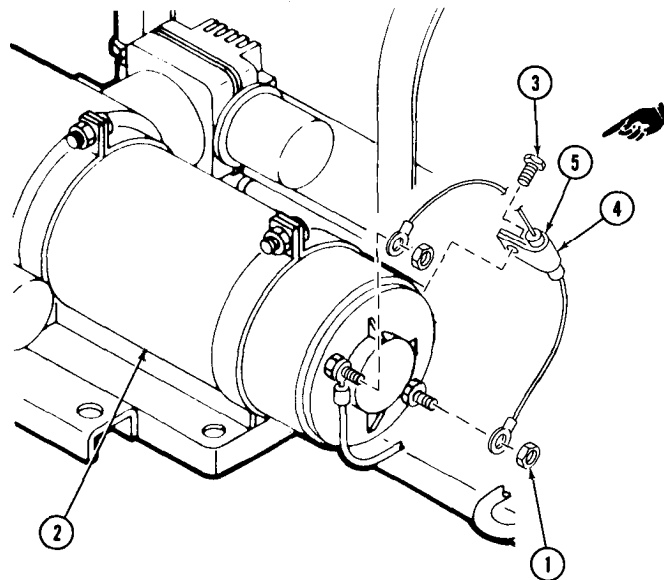
Remove control valve (1) from straight adapter (2).



1. Apply sealing compound to threads of straight adapter (2).
2. Install control valve (1) on straight adapter (2).

**g. Capacitor Assembly.****REMOVAL**

1. Remove two nuts (1) and tag and remove electrical connections from air compressor (2).
2. Remove motor cover screw (3) securing capacitor assembly (4) and loop clamp (5) to air compressor (2).

**INSTALLATION**

1. Install capacitor assembly (4) and loop clamp (5) to air compressor (2) using motor cover screw (3).
2. Connect electrical connections (1) as tagged to air compressor (2).

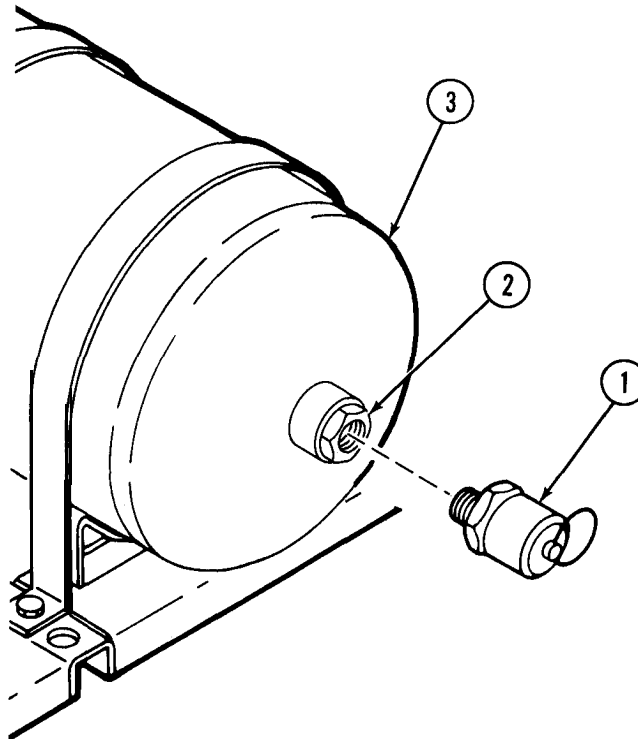
## 4-36 AIR COMPRESSOR ASSEMBLY (CONT).

### *h. Disconnect Coupling (AIR).*

---

#### REMOVAL

Remove disconnect coupling (1) from pipe bushing (2) on pressure tank (3).



#### INSTALLATION

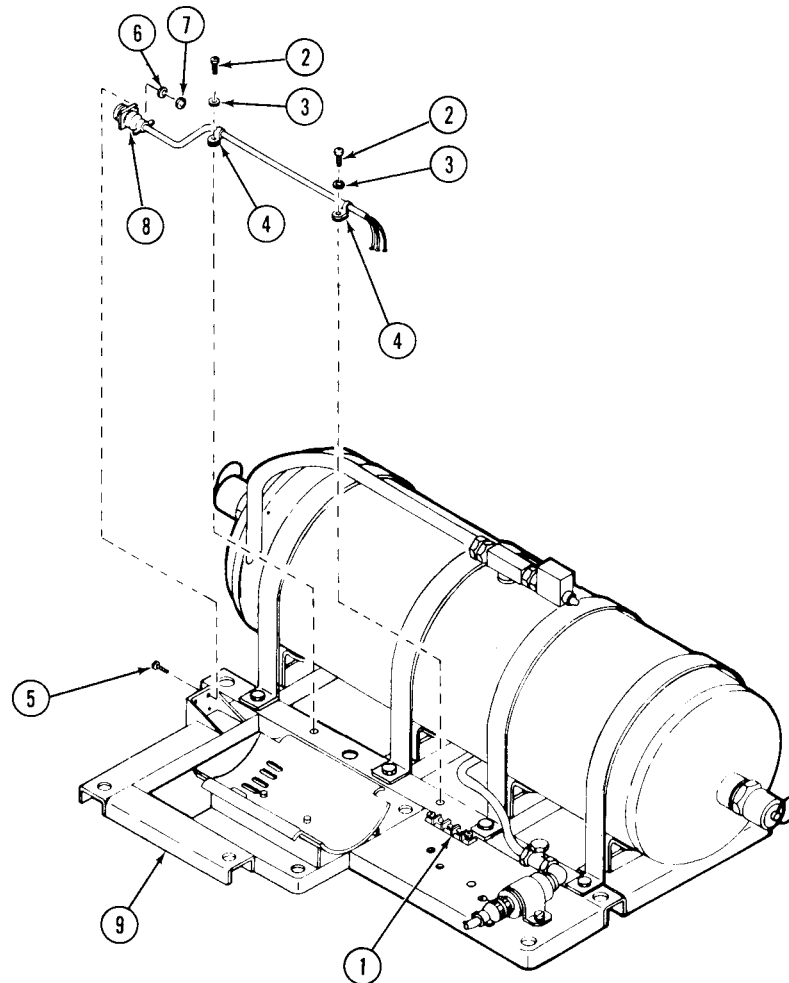
1. Apply sealing compound to threads of disconnect coupling (1).
  2. Install disconnect coupling (1) in pipe bushing (2) on pressure tank (3).
-

***i. Cable Assembly 2J1.*****REMOVAL**

1. Remove electrical connections from terminal block (1).
2. Remove two screws (2) and washers (3) and remove two loop clamps (4).
3. Remove four screws (5), washers (6), and nuts (7) and remove cable assembly (8) from frame assembly (9).

**NOTE**

Air compressor and relay removed for clarity.

**INSTALLATION**

1. Position cable assembly (8) on frame assembly (9) and secure with four screws (5), washers (6), and nuts (7).
2. Secure cable assembly (8) to frame assembly (9) with two loop clamps (4), screws (2) and washers (3).
3. Attach electrical connections to terminal board (1), see air compressor assembly wiring (P. 4-166), Coat terminal board screw threads with sealing compound (Item 11A, App E) before securing connections.

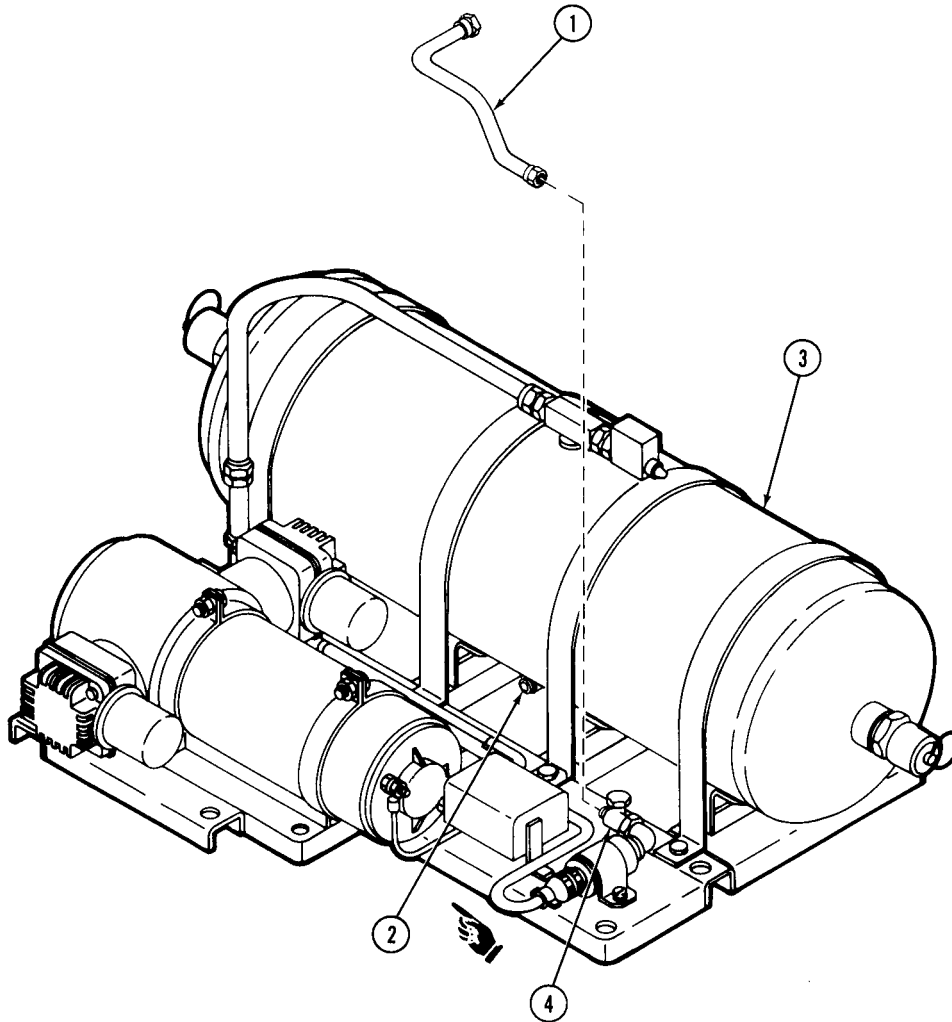
## 4-36 AIR COMPRESSOR ASSEMBLY (CONT).

### *j. Air Hose Assembly.*

---

#### REMOVAL

1. Disconnect air hose assembly (1) from elbow (2) on pressure tank (3).
2. Disconnect air hose assembly (1) from swivel tee nut (4), and remove air hose assembly (1).

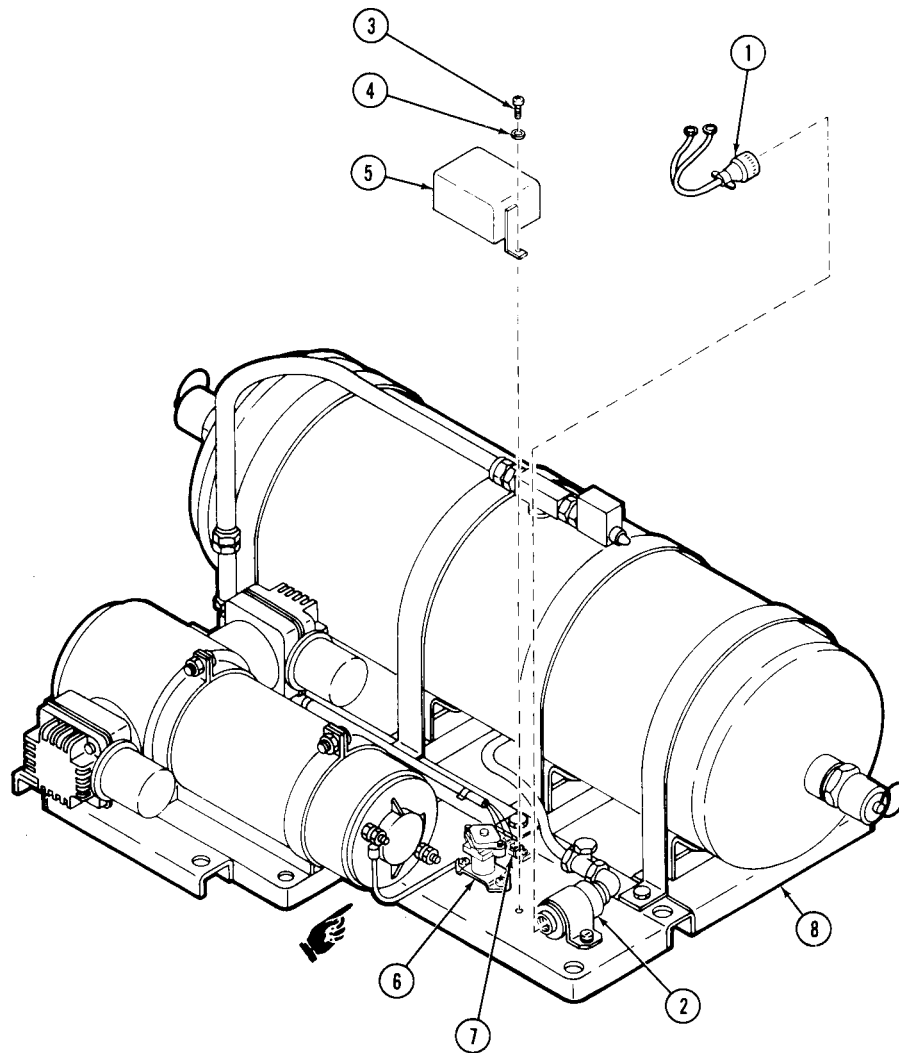


#### INSTALLATION

1. Connect air hose assembly (1) on swivel tee nut (4).
  2. Connect air hose assembly (1) on elbow (2) on pressure tank (3).
-

**k. Cable Assembly.****REMOVAL**

1. Remove cable assembly (1) from pressure switch (2).
2. Remove two screws (3) and washers (4) securing relay cover assembly (5) and remove cover assembly.
3. Remove cable assembly electrical connections from relay K104 (6) and terminal block (7), and remove cable assembly (1) from frame assembly (8).

**INSTALLATION**

1. Attach cable assembly electrical connections to electromagnetic relay (6) and terminal block (7), see air compressor assembly wiring (P. 4-166). Coat terminal board screw threads with sealing compound (Item 11A, App E) before securing connections.
2. Position relay cover assembly (5) on frame assembly (8) and secure with two screws (3) and washers (4).
3. Attach cable assembly (1) to pressure switch (2).

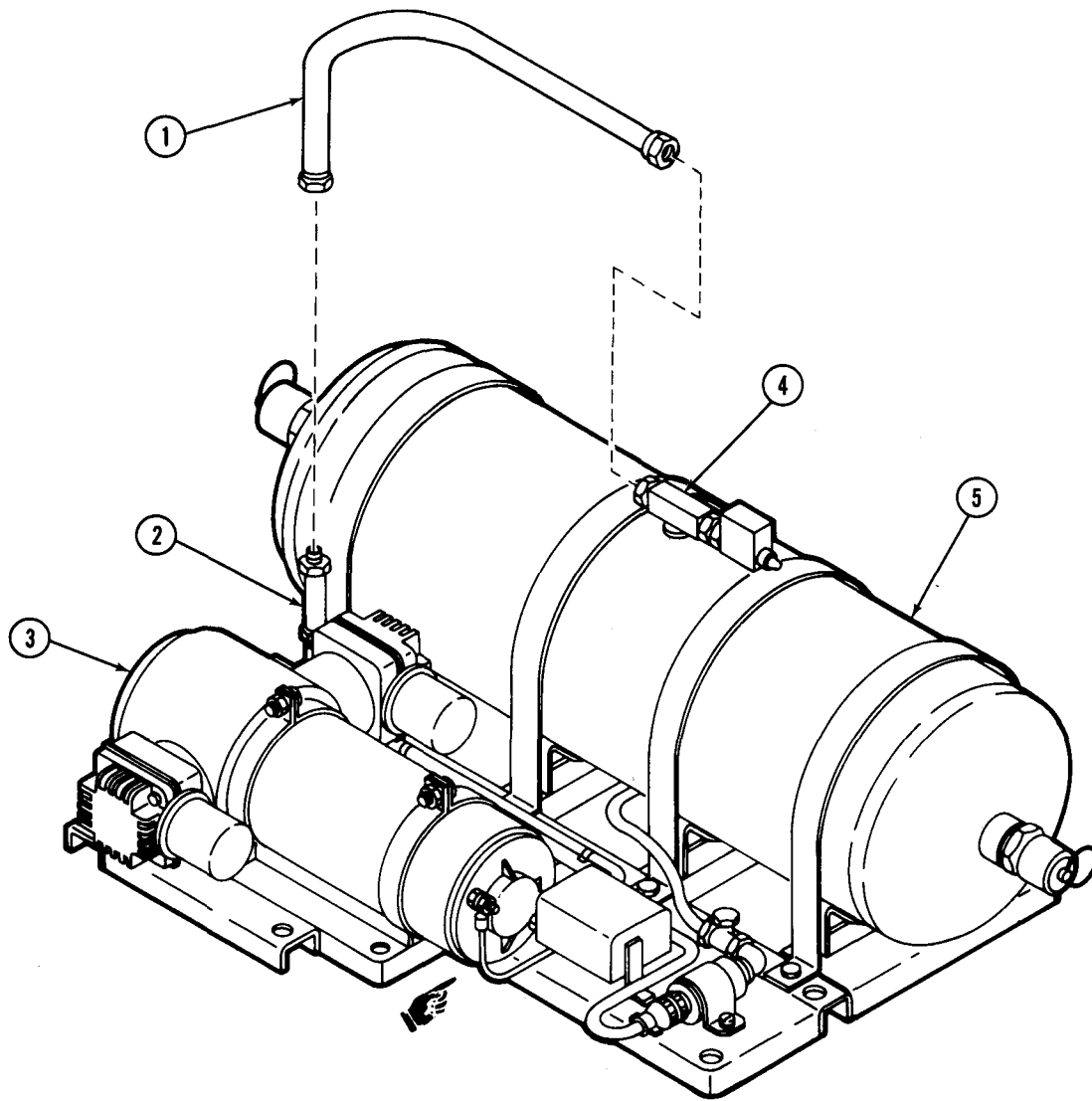
## 4-36 AIR COMPRESSOR ASSEMBLY (CONT).

### I. Air Hose Assembly.

---

#### REMOVAL

1. Disconnect air hose assembly (1) from check valve (2) on air compressor (3).
2. Disconnect air hose assembly (1) from straight adapter (4) on pressure tank (5).



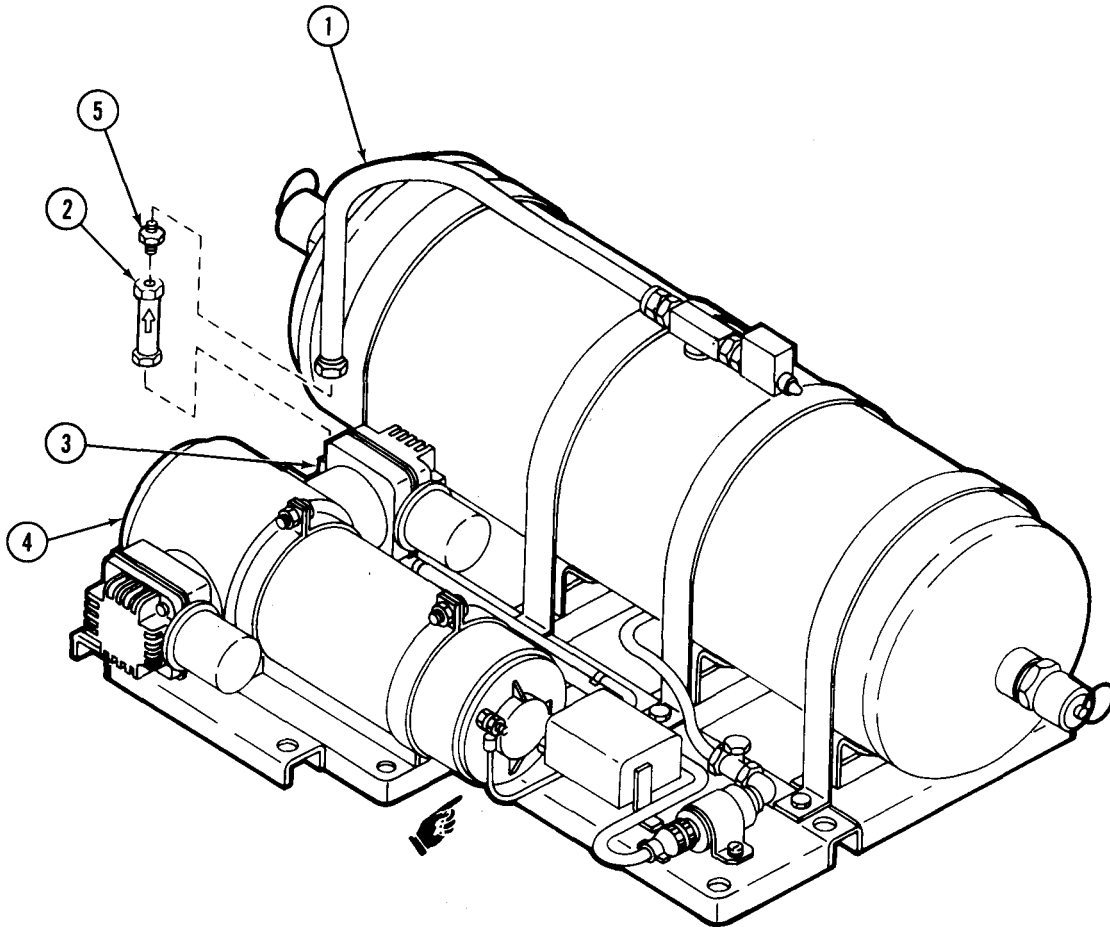
#### INSTALLATION

1. Connect air hose assembly (1) on straight adapter (4) on pressure tank (5).
  2. Connect air hose assembly (1) on check valve (2) on air compressor (3).
-



**m. Check Valve.****REMOVAL**

1. Remove air hose assembly (1) from check valve (2).
2. Remove check valve (2) from elbow (3) on air compressor (4).
3. Remove adapter (5) from check valve (2).

**INSTALLATION****NOTE**

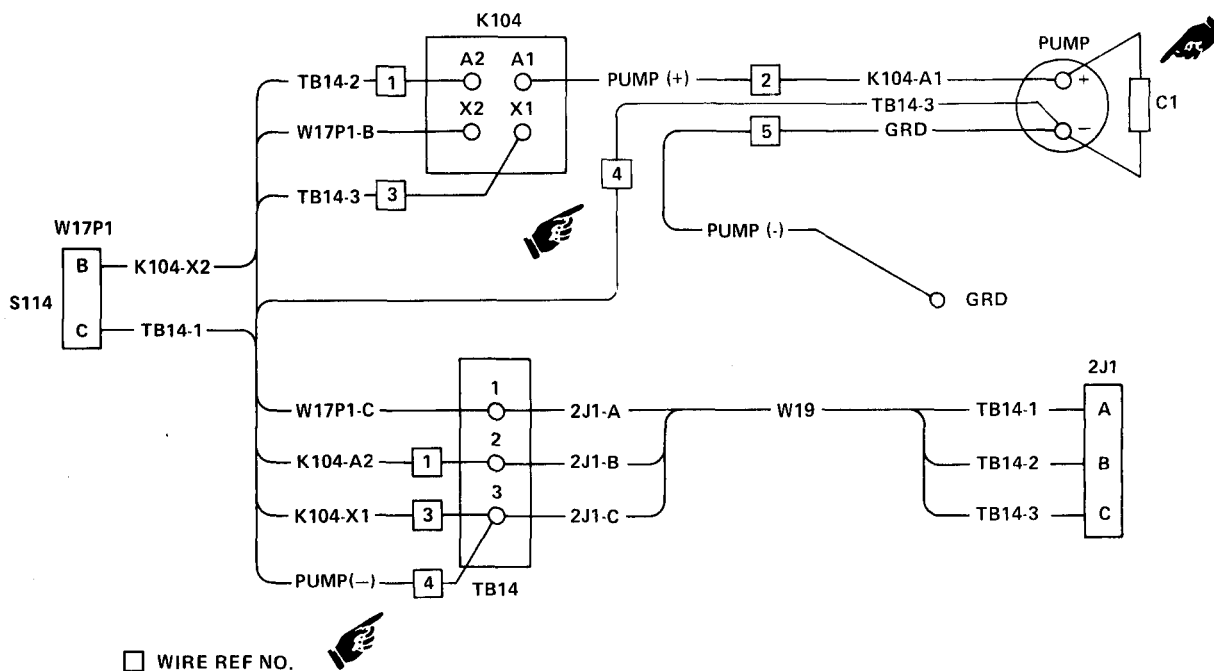
Apply sealing compound to threads of male pipe fittings before installing.

Position check valve with arrow pointing up.

1. Connect adapter (5) to check valve (2).
2. Connect check valve (2) to elbow (3).
3. Connect air hose assembly (1) to check valve (2).

4-36 AIR COMPRESSOR ASSEMBLY (CONT).

AIR COMPRESSOR ASSEMBLY WIRING



WIRE REF NO.	WIRE LENGTH INCHES	TERMINATION		TERMINATION		* WIRE ITEM NO.
		FROM	ITEM NO. *	TO	ITEM NO. *	
1	5.25	TB14-2	18	K104-A2	14	22
2	6.00	PUMP (+)	19	K104-A1	14	22
3	3.25	TB14-3	16	K104-X1	12	21
4	4.00	TB14-3	18	PUMP(-)	20A	1A
5	9.00	PUMP (-)	10	GRD	11	1

\* Refers to bulk item no. in app F

## 4-37 CHECK AIR COMPRESSOR PRESSURE SWITCH.

---

This task covers measuring air pressure in pressure tank.

---

### INITIAL SETUP

#### *Tools*

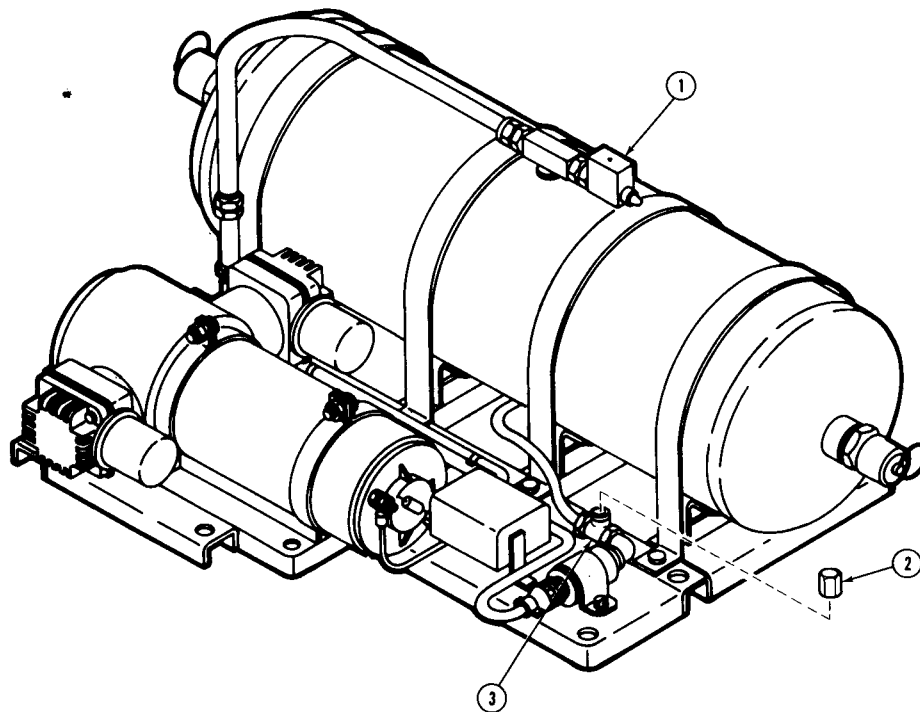
General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Test Equipment*

Air pressure test gage (Fig. G-22, App G)

---

1. Drain air out of pressure tank through control valve (1).
2. Remove cap (2) on tee (3).
3. Attach pressure gage (Fig. G-22, App G) to tee.
4. Set circuit breaker CB1 to ON.
5. Set POWER switch to ON.
6. Allow air compressor to run.
7. Pressure gage should indicate  $63 \pm 3$  psig when air compressor stops running. If the reading is not  $63 \pm 3$  psig, replace pressure switch.
8. Set POWER switch to OFF.
9. Set circuit breaker CB1 to OFF.
10. Drain air from pressure tank through control valve (1).
11. Remove pressure gage from tee (3) and install cap (2) on tee (3).



## 4-38 AIR COMPRESSOR - MAINTENANCE INSTRUCTIONS.

---

This task covers replacement of Mechanical Felt.

---

### INITIAL SETUP

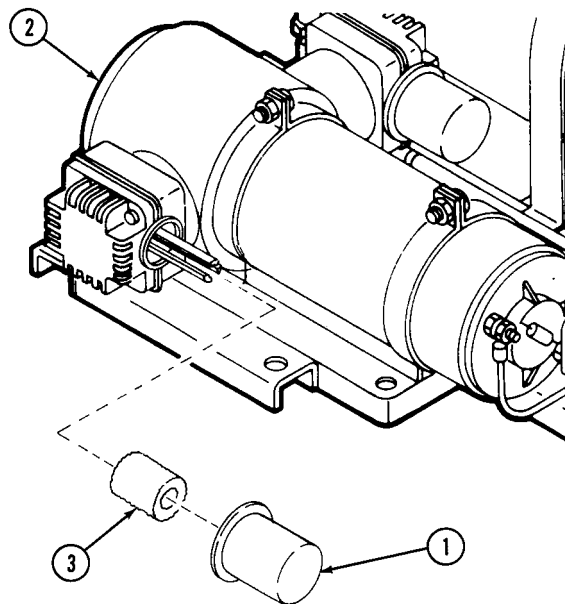
#### *General Safety Instructions*

Before performing any maintenance instructions  
be sure circuit breaker CB1 is in OFF position.

---

### REMOVAL

1. Turn air filter (1) counterclockwise and remove filter from air compressor (2).
2. Remove mechanical felt (3) from air compressor (2).



### INSTALLATION

1. Install mechanical felt (3) on air compressor (2).
  2. Install air filter (1) on air compressor (2).
-

## 4-39 AIR HOSE ASSEMBLY.

---

This task covers repair of Hose Assembly.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *General Safety Instructions*

Before performing any maintenance instructions be sure circuit breaker CB1 is in OFF position.

#### *Equipment Condition*

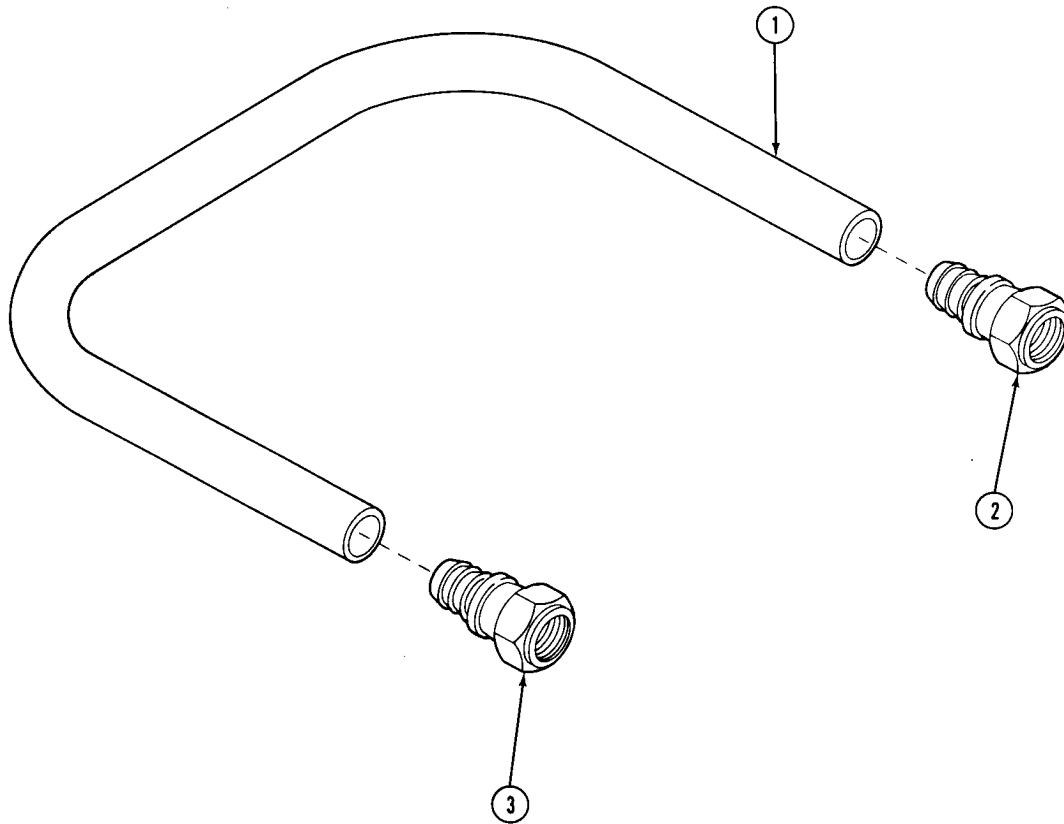
Air hose removed from air compressor assembly  
(P. 4-162).

Before performing any maintenance procedures on air hoses be sure to relieve system of pressure through control valve on pressure tank.

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Cut hydraulic hose (1) at straight adapter (3) and remove adapter.
3. Replace straight adapters (2) and (3) as required.
4. Fabricate new hose (Fig. G-10, App G).
5. Install straight adapters (2) and (3) in hydraulic hose (1).



## 4-40 AIR HOSE ASSEMBLY.

---

This task covers repair of Hose Assembly.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Equipment Condition*

Air hose removed from air compressor assembly  
(P. 4-164).

#### *General Safety Instructions*

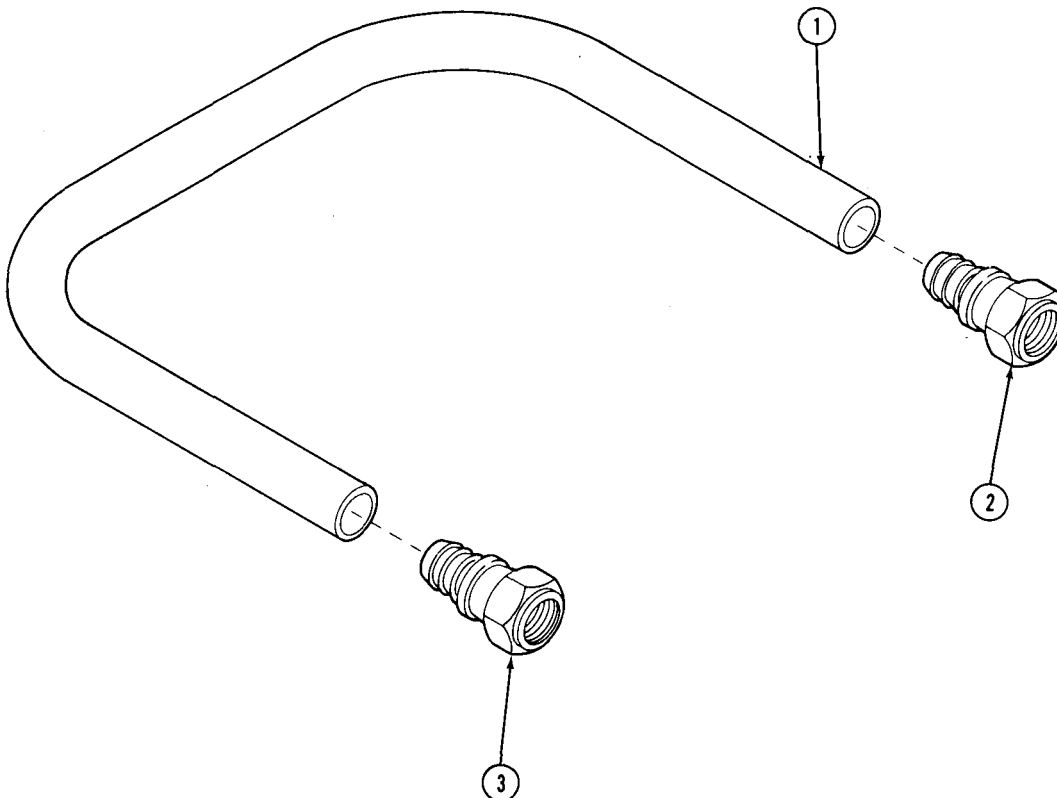
Before performing any maintenance instructions be sure circuit breaker CB1 is in OFF position.

Before performing any maintenance procedures on air hoses be sure to relieve system of pressure through control valve on pressure tank.

---

### REPAIR

1. Cut hydraulic hose (1) at straight adapter (2) and remove adapter.
2. Cut hydraulic hose (1) at straight adapter (3) and remove adapter.
3. Replace straight adapters (2) and (3) as required.
4. Fabricate new hose (Fig. G-11, App G).
5. Install straight adapters (2) and (3) in hydraulic hose (1).



4-41 Paragraph Deleted

## 4-42 FOG OIL TANK ASSEMBLY.

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This task covers replacement of:

- a. *Fog Oil Tank and Insulating Pads* (P. 4-172)
  - b. *Retaining Straps and Anchor Straps* (P. 4-174)
- 

### INITIAL SETUP

#### Tools

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### Materials

Dry Cleaning Solvent (item 4, App E)  
Rags (item 11, App E)  
Adhesive (Item 1, App E)

---

### a. *Fog Oil Tank and Insulating Pads.*

---

#### NOTE

The following procedure applies to one insulating pad. All pads are removed/installed the same way.

### REMOVAL

1. Remove fog oil pump assembly (P. 4-21).
2. Use appropriate container and drain fog oil tank (1) thru ball valve (2).
3. Loosen and remove nut (3), washer (4) and spring (5) on both retainer straps (6).
4. Loosen but do not remove two screws (7) securing forward restraint (8), and move restraint away from fog oil tank (1).
5. Remove fog oil tank (1) from baseplate (9)

### INSPECTION/REPAIR

1. Inspect baseplate pad (10), forward restraint pad (11), side restraint pads (12), top restraint pad (13) and rear restraint pad (14).
2. Replace pads if torn or otherwise damaged (Fig. 11 thru 14, App G).
3. Lift edge of pad (11) with sharp tool.
4. Remove pad completely from restraint (8).
5. Clean restraint mounting surface with dry cleaning solvent (Item 4, App E) and rags (Item 11, App E).
6. Apply thin coat of adhesive (Item 1, App E) to pad (11) and restraint (8). Allow to dry for 10 to 20 minutes, then press surfaces together.

### INSTALLATION

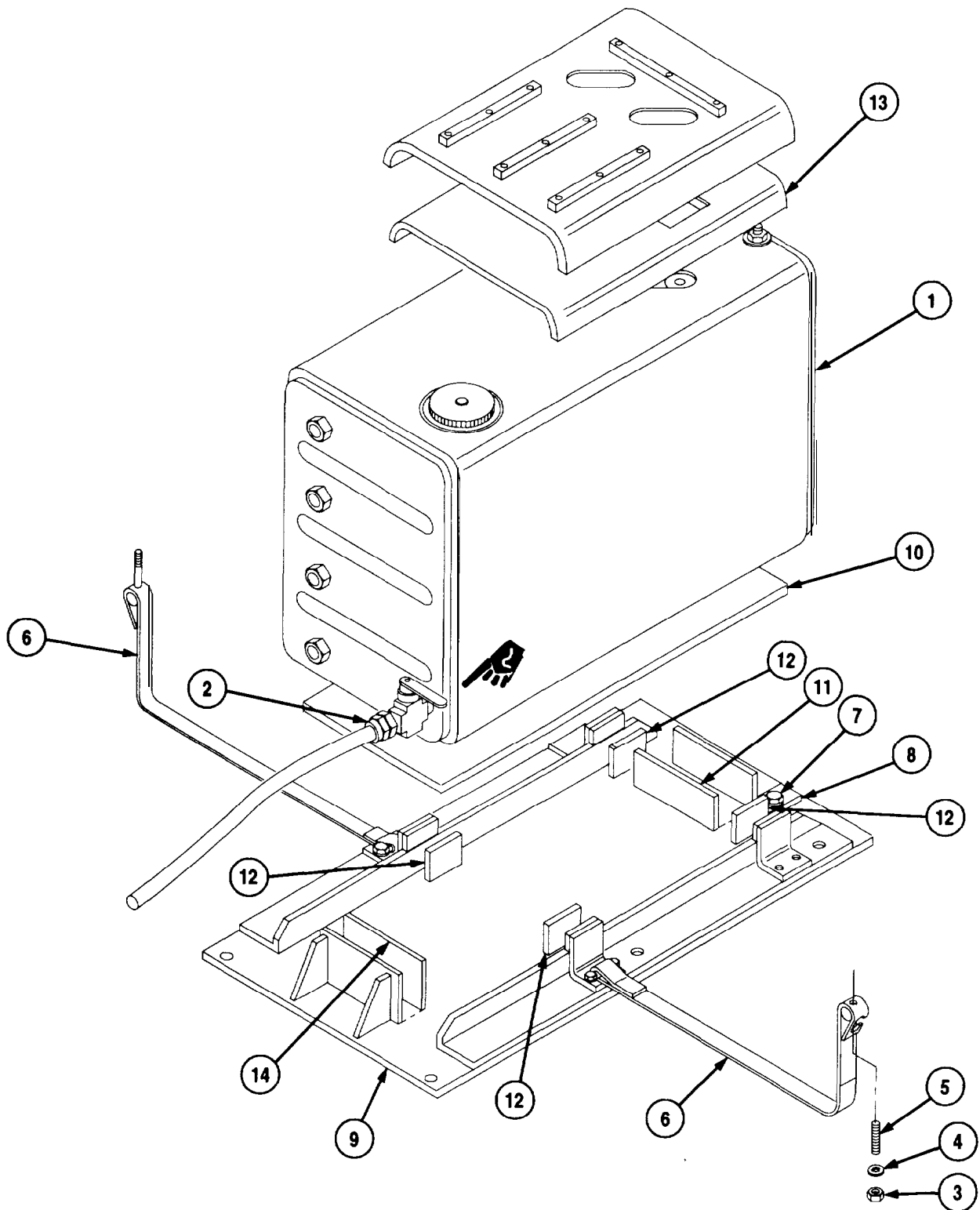
#### NOTE

For installation it may be necessary to remove one of the side restraints (P. 4-174).

1. Position fog oil tank (1) in baseplate (9).



2. Position forward restraint (8) against fog oil tank (1) and secure with two screws (7).
3. Close retainer straps (6) and secure with two washers (4), one spring (5) and two nuts (3).
4. Install fog oil pump assembly (P. 4-21).



## 4-42 FOG OIL TANK ASSEMBLY (CONT).

### *b. Retaining Straps and Anchor Straps.*

---

#### REMOVAL

#### NOTE

Removal and installation procedures are the same for all four retaining straps.

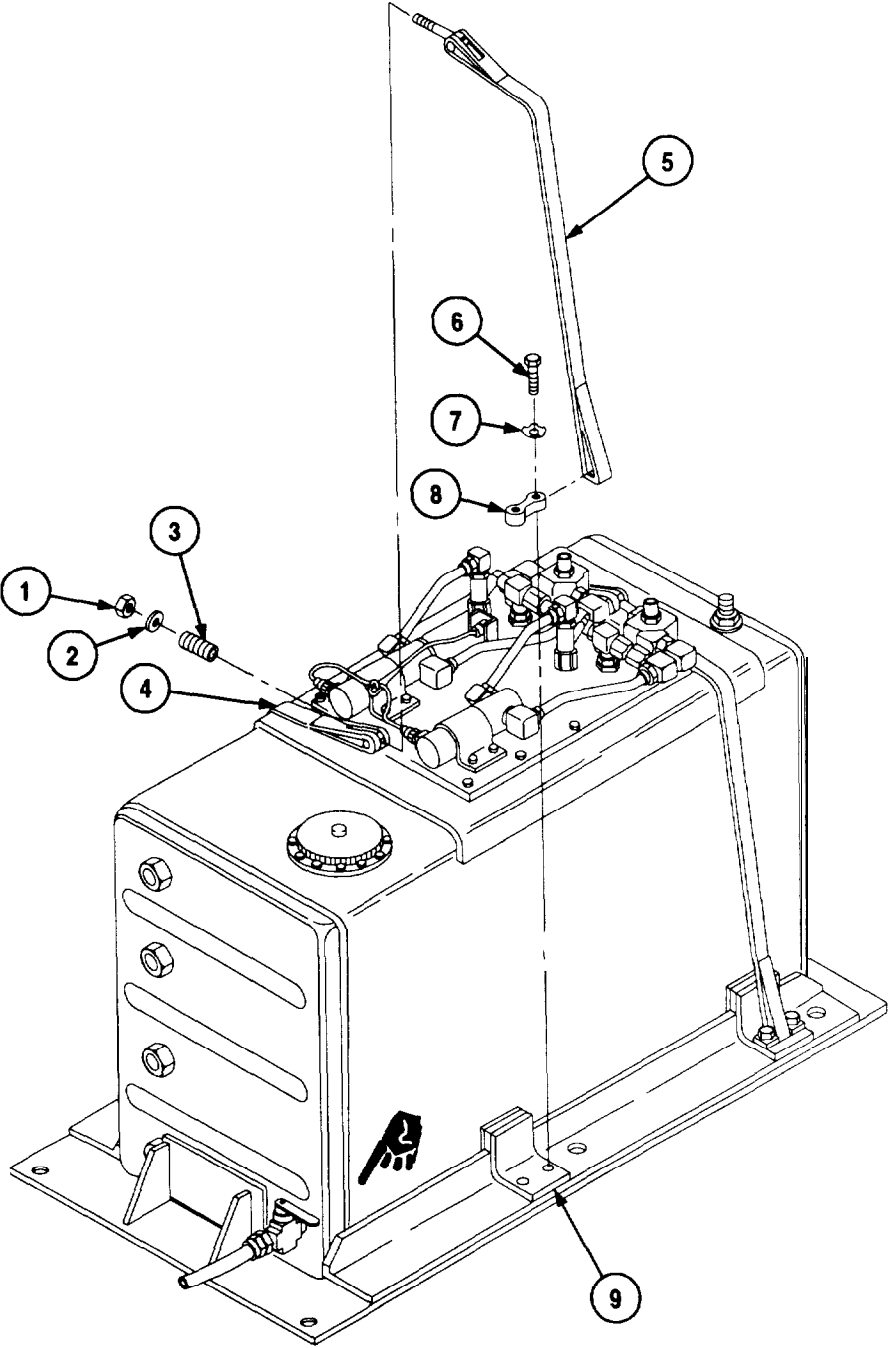
1. Loosen and remove nut (1), washer (2) and spring (3) securing retaining straps (4) and (5).
2. Remove two screws (6) and washers (7) securing anchor strap (8) and remove retaining strap (5) from fog oil tank assembly (9).

#### INSPECTION

Inspect for cracks, deformities, or damage due to thinning metal.

#### INSTALLATION

1. Position anchor strap (8) in retaining strap (5).
2. Position retaining strap (5) with anchor strap (8) on fog oil tank assembly (9) and secure with two screws (6) and washers (7).
3. Install two washers (2), one spring (3), and nut (1) and tighten nut (1) until retaining strap is secure.



## 4-43 FOG OIL TANK.

---

This task covers replacement of:

- a. **Strainer Element** (P. 4-176)
  - b. **Sight Indicator** (P. 4-178)
  - c. **Ball Valve** (P. 4-178)
  - d. **Dust and Moisture Boot** (P. 4-179)
- 

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

#### *Materials*

Safety wire (item 16, App E)  
Sealing compound (Item 12, App E)

---

#### **a. Strainer Element:**

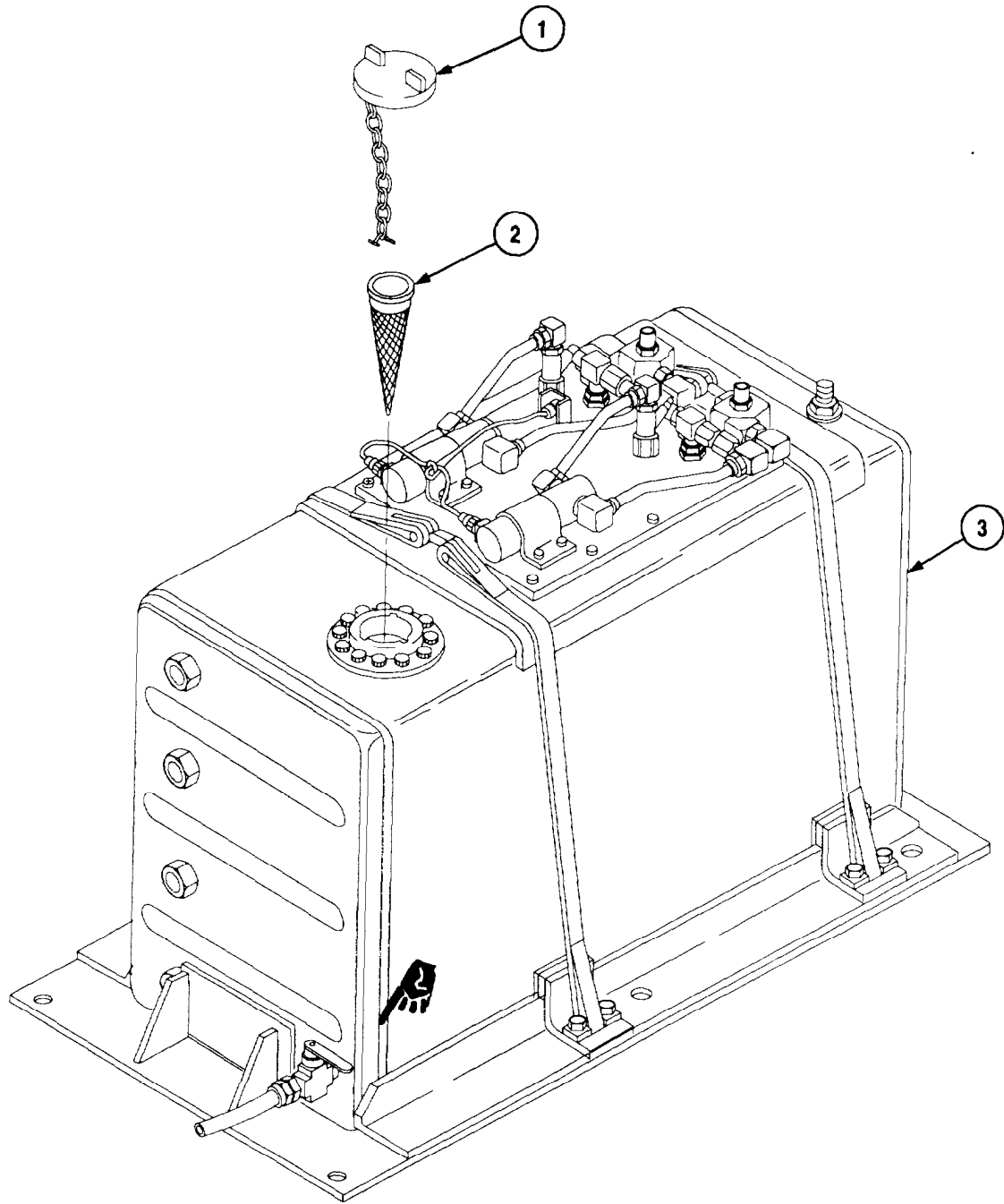
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### REMOVAL

1. Unscrew filler opening cap (1).
2. Remove strainer element (2) from tank (3).
3. Clean or replace strainer (2) as required.

### INSTALLATION

1. Install strainer (2) in tank (3).
2. Screw filler opening cap (1) onto tank (3).



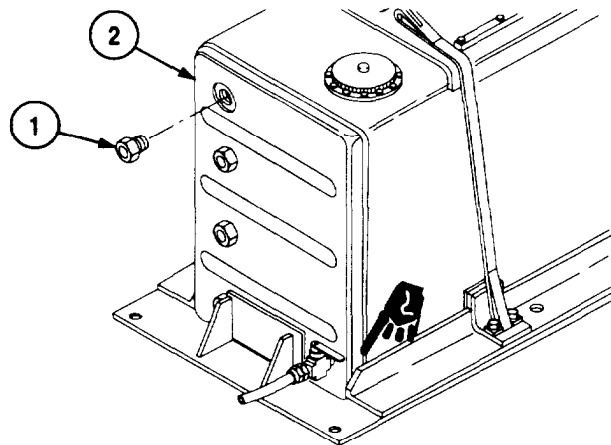
4-43 FOG OIL TANK (CONT).

*b. Sight Indicator*

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**REMOVAL**

Remove sight indicator (1) from fog oil tank (2).



**INSTALLATION**

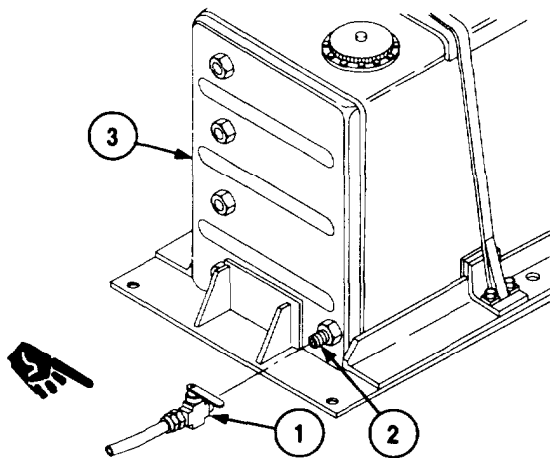
1. Apply sealing compound to threads of sight indicator (1).
  2. Install sight indicator (1) in fog oil tank (2) and secure.
- 

*c. Ball Valve.*

---

**REMOVAL**

Remove ball valve (1) from nipple (2) on fog oil tank (3).

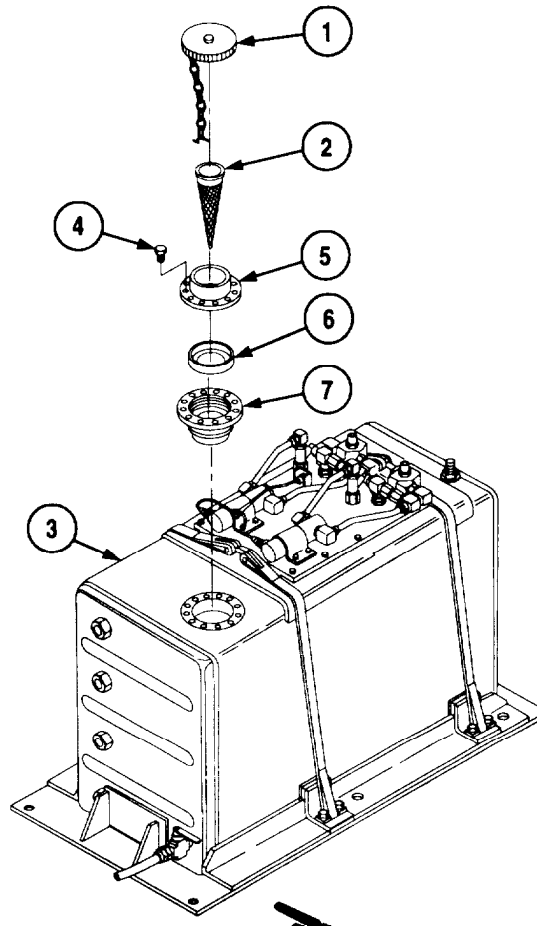


**INSTALLATION**

1. Apply sealing compound to threads of nipple (2).
  2. Install ball valve (1) on nipple (2) on fog oil tank (3).
-

**d. Dust and Moisture Boot.****REMOVAL**

1. Unscrew filler opening cap (1).
2. Remove strainer screen (2) from fog oil tank (3).
3. Remove safety wire from twelve screws (4) securing filler opening neck (5) and remove neck.
4. Remove strainer retainer (6) if corroded or otherwise damaged.
5. Remove dust and moisture boot (7), and replace if ripped or otherwise damaged.

**INSTALLATION**

1. Install dust and moisture boot (7) in fog oil tank (3).
2. Install strainer retainer (6) in dust and moisture boot (7).
3. Position filler opening neck (5) on tank (3) and secure with twelve screws (4) and safety wire (Item 16, App E).
4. Install strainer screen (2) in fog oil tank (3).
5. Screw filler opening cap (1) onto fog oil tank (3).

## 4-44 FUEL FILTER/WATER SEPARATOR ASSEMBLY.

This task covers replacement of Fuel Filter/Water Separator.

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-N26

#### *General Safety Instructions*

Before performing any maintenance procedure, be sure circuit breaker CB1 is in the OFF position.

#### *Materials*

Sealing Compound (Item 12, App E)  
Lock washers  
Self-locking nuts

Ensure carrier is blocked (M1059 version).  
Read and understand all WARNINGS for fuel.  
Ensure a fully charged fire extinguisher is on hand for possible use.

### REMOVAL

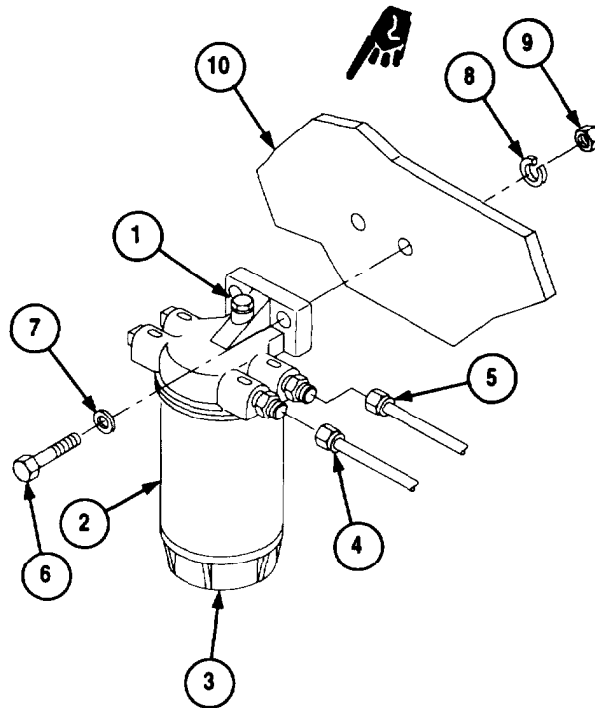
#### NOTES

The following procedures apply to one fuel filter/water separator assembly. Both are removed and installed the same way. Retain any thread adapters/elbows, etc. required for your system.

Plug fuel hoses after removing to prevent fuel spills. Dispose of waste fuel IAW Unit SOP. For the M1059 version, remove and install fuel filter/water separators mounted on the armor shields.

1. Loosen fuel vent plug (1) on fuel filter/water separator (2) by turning counterclockwise two turns.
2. Place suitable container under the drain valve (3). Drain the entire contents of the fuel filter/water separator. Close drain valve and tighten vent.
3. Remove fuel hose (4) from inlet tube adapter/elbow on fuel filter/water separator (2).
4. Remove fuel hose (5) from outlet tube adapter/elbow on fuel filter/water separator (2).
5. Remove two screws (6), flat washers (7), lock washers (8) and self-locking nuts (9) and fuel filter/water separator (2) from fog oil tank assembly mounting bracket (10). Discard lock washers and self-locking nuts. See TM 3-1040-248-20&P for motorized assembly, and TM 9-2350-261-24P for mechanized assembly.





## INSTALLATION

### NOTE

If required for your configuration, connect port plugs, thread adapters, 90 degree elbows, etc. to the separator housing and seal male pipe threads with sealing compound.

1. Position and install fuel filter/water separator (2) on fog oil tank mounting bracket (10) and secure with two screws (6), flat washers (7), new lock washers (8), and new self-locking nuts (9).
2. Connect fuel hose (5) to outlet tube adapter/elbow on fuel filter/water separator (2).
3. Connect fuel hose (4) to inlet tube adapter/elbow on fuel filter/water (2).

### CAUTION

Ensure fuel filter and filter bowl is filled with clean fuel before starting the M54 Smoke Generator.

## 4-45 FUEL FILTER/WATER SEPARATOR FILTER ELEMENT

---

This task covers replacement of Fuel Filter/Water Separator Filter Element.

---

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-N26

#### *Materials*

Dry Cleaning Solvent (Item 4, App E)  
Rags (Item 11, App E)

#### *Equipment Condition*

Fuel is drained from fuel/filter water separator  
(P. 4-180).

#### *General Safety Instructions*

Before performing any maintenance procedure, be sure circuit breaker CB1 is in the OFF position.

Ensure carrier is blocked (M1059 version).  
Read and understand all WARNINGS for fuel.  
Ensure a fully charged fire extinguisher is on-hand for possible use.

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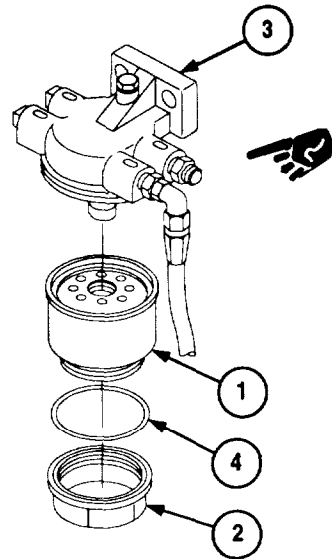
### REMOVAL

#### NOTES

Following procedures apply to one fuel filter/water separator filter element. Both are removed and installed the same way.

M1059 version fuel filter/water separators are mounted on the armor shields.

1. Remove fuel element (1) and attached bowl assembly (2) from fuel filter/water separator (3). Ensure the gasket crimped on fuel element top surface is attached to fuel element.
2. Remove bowl assembly (2) and gasket (4) from filter element (1). Retain gasket (4) and bowl assembly (2) for later reuse. Clean bowl assembly with clean rags and dry cleaning solvent (Items 4 and 11, App E).
3. Discard used filter element (1). Dispose of fuel filter element IAW Unit SOP.



## INSTALLATION

1. Install retained gasket (4) into bowl assembly (2). Apply a coating of clean fuel to gasket and screw on bowl assembly (2) with gasket onto new fuel element (1).
2. Apply a coating of clean fuel to filter element gasket and ensure filter element (1) and bowl assembly (2) are filled with clean fuel before proceeding.

### CAUTION

DO NOT use tools to tighten filter element to fuel filter/water separator assembly.

3. Screw on new fuel element (1) with attached bowl assembly (2) to fuel filter/water separator (3) snugly, by hand only.

### CAUTION

Ensure fuel filter and filter bowl is filled with clean fuel before starting the M54 smoke generator.

## 4-46 WATER MANIFOLD ASSEMBLY.

This task covers installation and use of Water Manifold Assembly.

### INITIAL SETUP

#### *Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-N26

#### *Materials*

Rags (Item 11, App E)

#### *Equipment Condition*

Vehicle engine running and M157 system is fully mission capable.

#### *General Safety Instructions*

Ensure a fully charged fire extinguisher is on hand for possible use.

If used indoors, ensure vehicle exhaust and M54 Smoke Generator exhaust is vented to the outside.

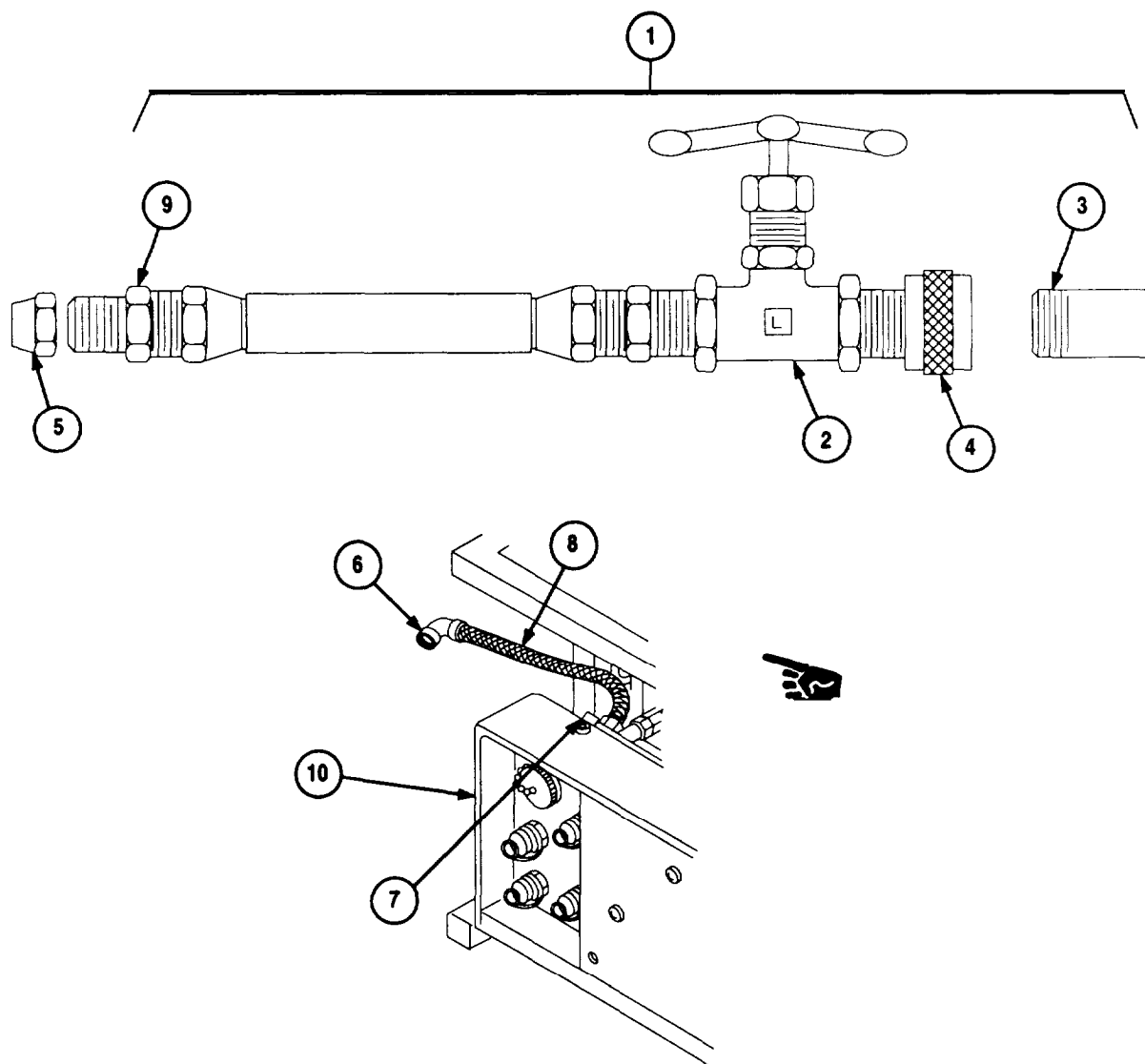
Ensure that proper hearing protection is worn.

### INSTALLATION

#### NOTE

Water manifold assembly can be used to test the proper operation of the M157 Smoke Generator System's M54 Smoke Generator without the use of fog oil. This is done by supplying water into the M54 Smoke Generator combustion chamber. Water from a commercial/industrial water pressurized source via a garden hose or equivalent is used for the following procedure.

1. Ensure water manifold assembly (Fig. F-29) (1) adapters and connectors are securely connected and fastened together, ensure fluid valve (2) is completely closed.
2. Connect water delivery hose with an attached garden hose male thread adapter (3) to the water manifold assembly bushing adapter (4). Connect other end of water delivery hose to the water source. Length of the water delivery hose can vary depending on site layout, facilities, motor pool area, etc.
3. Remove cap nut (5) from water manifold assembly and retain for later use.
4. Remove fog oil tube assembly elbow (6) from the tested M54 Smoke Generators (10) cover assembly fog oil tube nipple (7). Position fog oil tube assembly (8) so that water manifold male thread tube reducer (9) can attach to the female thread elbow (6) and connect the two together.
5. Connect retained cap nut (5) to the cover assembly's fog oil tube nipple (7) and tighten to prevent any fog oil from escaping. This will ensure that when FOG OIL switch on control panel is placed in the START, RUN position that the FOG OIL indicator light will come on.
6. Start up the M157 Smoke Generator System for normal operation (P. 2-10.6), start the M54 Smoke Generator (10) being tested and when the control panel SMOKE TEMP indicator reads in the GREEN temperature range, turn on the water supply source and slowly open fluid valve (2).
7. Regulate opening/closing of fluid valve (2) so that the tested M54 Smoke Generator (10) operating temperature stays in the GREEN range.



8. Once the required temperature range is obtained, the testing of the M54 Smoke Generator can last as long as required. Ensure that fuel supply will last during the testing period.
9. Perform the normal M157 Smoke Generator System operating shut down procedures (P. 2-12), close fluid valve (2) and turn off the water source.
10. Ensure M54 Smoke Generator engine head area is cool and disconnect the water manifold assembly (1) from the fog oil tube assembly (8). Remove cap nut (5) from cover assembly fog Oil tube nipple (7) and replace cap nut on water manifold assembly.
11. Reconnect fog oil tube assembly elbow (6) to the cover assembly fog oil tube nipple (7) and tighten.
12. At this time the other M54 Smoke Generator can be tested using the water manifold assembly, if required. Repeat the above steps for installation and use.
13. Drain water from supply hose(s) and water manifold assembly. Store for future use as required.

## 4-47 INSTRUCTION AND IDENTIFICATION PLATES.

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This task covers replacement of instruction and identification plates.

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### INITIAL SETUP

*Tools*

General Mechanic's Automotive Tool Kit  
SC 5180-90-CL-N26

*Materials*

Rags (Item 11, App E)  
Dry cleaning solvent (Item 4, App E)

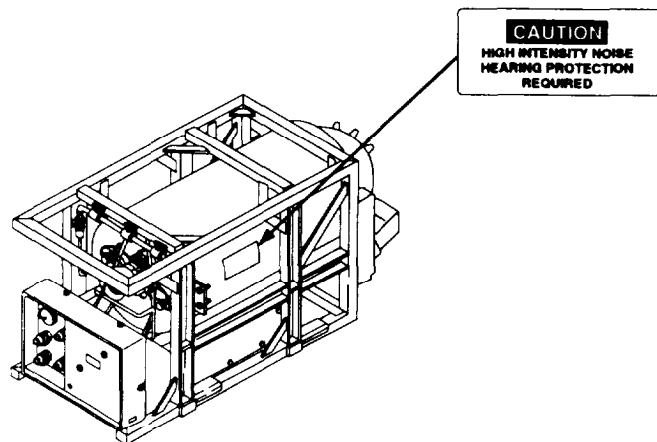
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### REMOVAL

#### NOTE

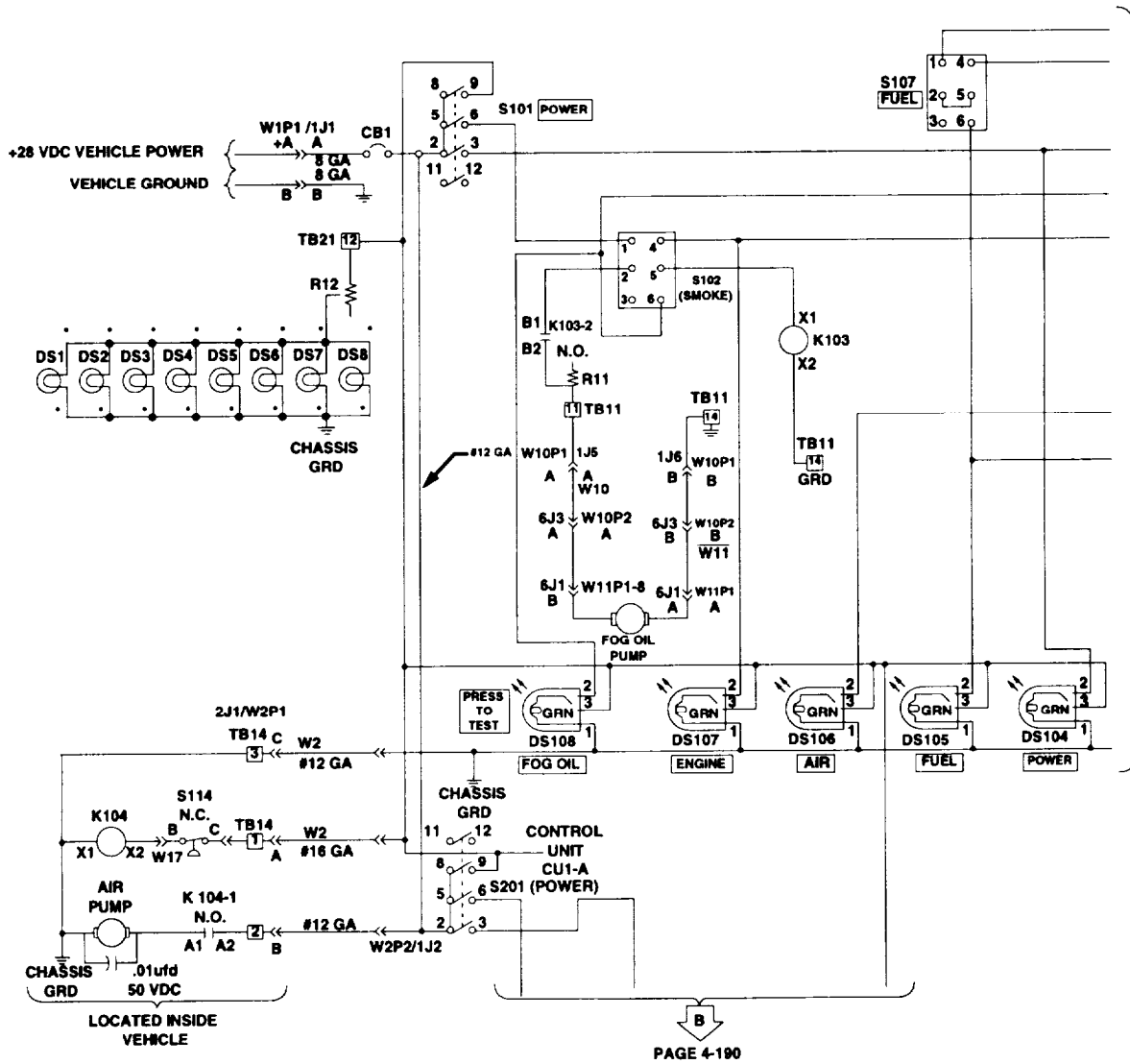
The procedures for replacing the instruction and identification plates are the same on all components of the Smoke Generator Set.

1. Lift edge of plate (1) with sharp tool.
2. Pull plate (1) completely off mounting surface.



3. Thoroughly clean mounting surface with rags (Item 11, App E) and dry cleaning solvent (Item 4, App E). Surface must be free of oil, grease, dirt, or any foreign matter.
  4. Peel paper from adhesive back of plate.
  5. Mount plate and apply pressure to plate surface.
-

4-48 SMOKE GENERATOR SCHEMATIC.

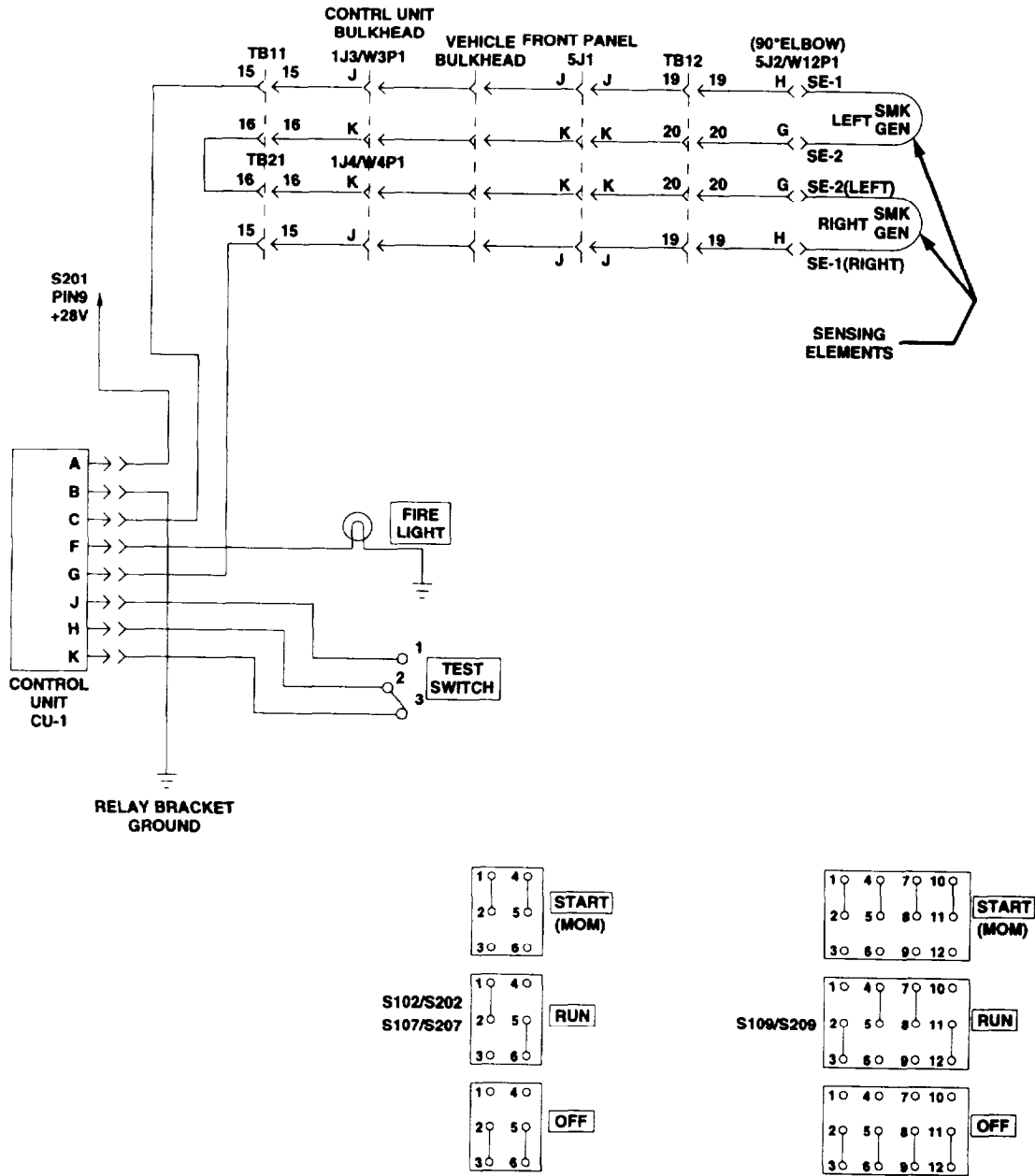


A  
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B  
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LOCATED INSIDE VEHICLE

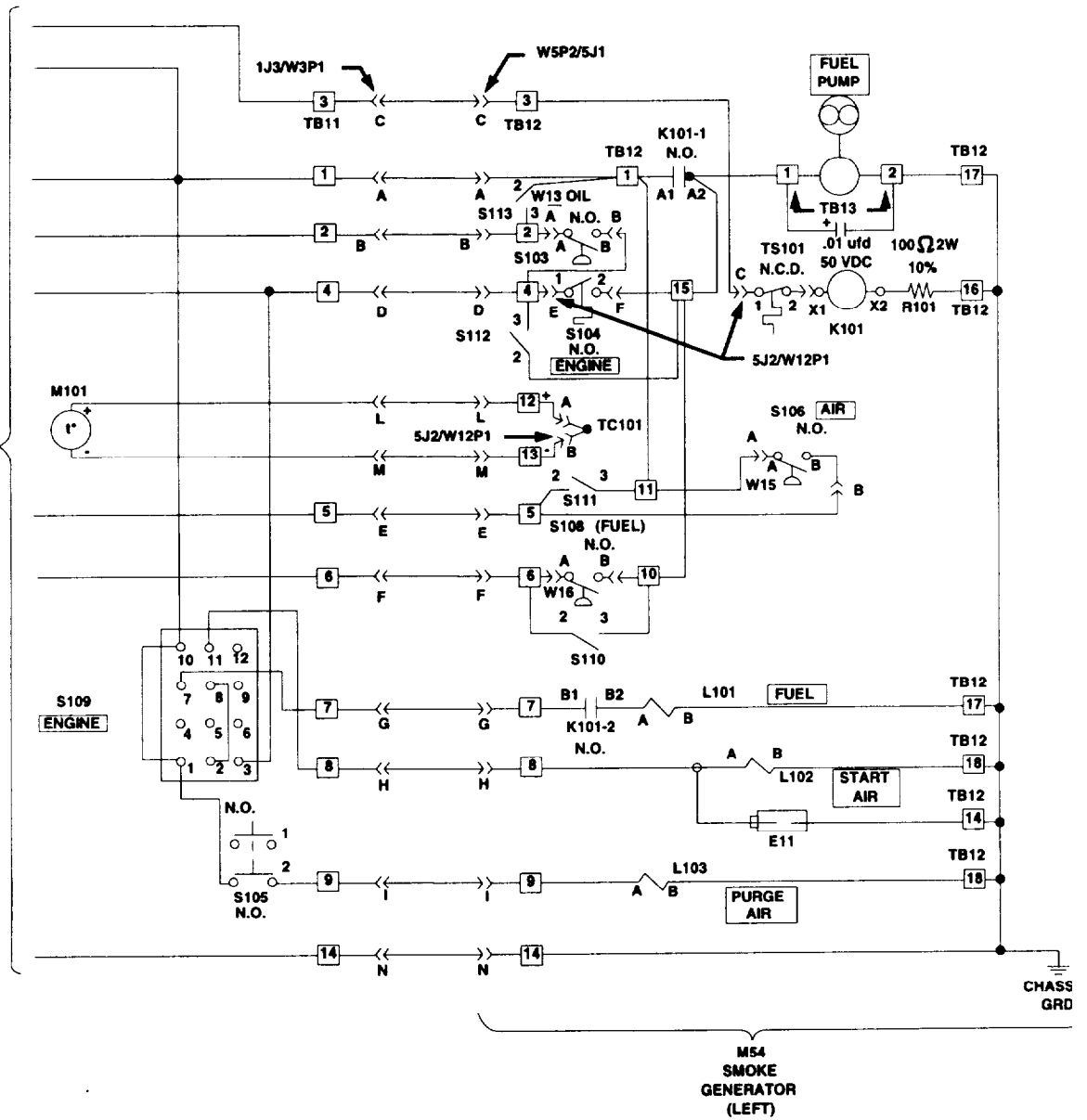
4-48 SMOKE GENERATOR SCHEMATIC (CONT).



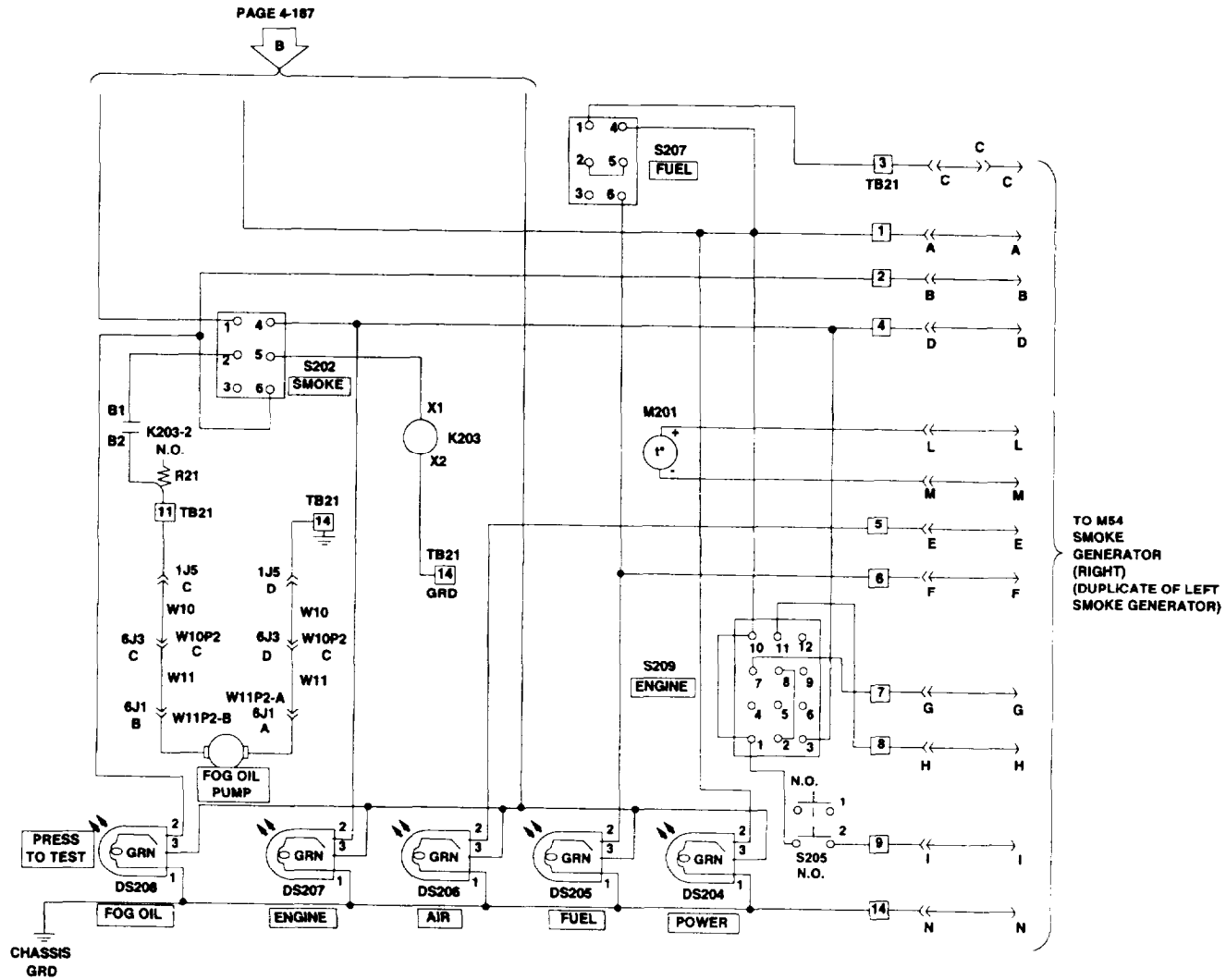


4-48 SMOKE GENERATOR SCHEMATIC (CONT).

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4-48 SMOKE GENERATOR SCHEMATIC (CONT).



## Section VI. PREPARATION FOR STORAGE OR SHIPMENT

### 4-49 SCOPE.

This section provides guidance and instructions for administrative storage of the M157 Smoke Generator Set (SGS) equipment.

### 4-50 PREPARATION FOR STORAGE.

- a. Store M157 SGS components with vehicle on which it is mounted. Refer to vehicle technical manuals (TM's) for proper preparation and serviceability of the host vehicle.
- b. Perform next scheduled preventive maintenance checks and services (PMCS) (P. 2-5). Correct all shortcomings and deficiencies. Check that all modification work orders (MWO's) have been applied.
- c. Ensure moisture is flushed from each M54 Smoke Generator fuel pump and both fog oil pumps by running light 10W grade lubricating oil through them (P. 4-4.1).
- d. Drain fog oil from the 80 or 120 gallon fog oil tank on the vehicle.
- e. If 5-gallon fuel cans are to be locked in a secure area to prevent theft, disconnect the three fuel can lid assembly hoses (supply, return, vent) from the fuel can lid assembly flare fitting elbows and leave the fuel can lid assembly attached to the 5-gallon fuel can. Remove the fuel from cans if required. Tape over hose ends to keep out dirt and water.
- f. Store fuel cans in area approved by local fire regulations.
- g. Remove fire extinguishers and store in a secure area to prevent theft.

### 4-51 STORAGE.

- a. Perform monthly walk-around visual inspection of the M157 Smoke Generator Set. Inspect for corrosion or other deterioration and missing or damaged parts.
- b. Record and report maintenance actions in accordance with DA PAM 738-750.

### 4-52 REMOVAL FROM STORAGE.

- a. Install fire extinguishers and 5-gallon fuel cans with attached fuel can lid assemblies into mounting brackets. Reconnect all hoses (supply, return, vent) to the fuel can lid assemblies. Fill fuel cans, if required.
- b. Perform any vehicle maintenance, deprocessing, etc., as required by the vehicle technical manuals
- c. Perform BEFORE preventive maintenance checks and services (PMCS) (P. 2-5).



## APPENDIX A REFERENCES

### A-1 TECHNICAL MANUALS.

TM 3-1040-280-20&P .....	Unit Maintenance Manual (Including Repair Parts and Special Tools List) Mounting Kit, Smoke Generator: M284 (1040-01-249-0272)
TM 3-1040-284-20&P .....	Unit Maintenance Manual (Including Repair Parts and Special Tools List) Mounting Kit, Smoke Generator: M284A1 (1040-01-379-8595)
TM 9-2320-280-20 .....	Organizational Maintenance, Truck, Utility, 1-1/4 Ton, 4 x 4
TM 9-2350-261-20-1 .....	Unit Maintenance Manual, Carrier, Smoke Generator: M1059 (2350-01-203-0188)
TM 9-2350-261-24P .....	Unit, Direct Support and General Support Maintenance Repair Parts and Special Tools List (including Depot Maintenance Repair Parts and Special Tools List), Carrier, Smoke Generator, Full Tracked, M1059 (2350-01-203-0188)
TM 43-1039 .....	Painting Instructions for Field Use
TM 43-0002-31 .....	Destruction of Chemical Weapons and Defense Equipment to Prevent Enemy Use

### A-2 PAMPHLETS.

DA-PAM 25-30 .....	Consolidated Index of Army Publications and Blank Forms
DA-PAM 738-750 .....	The Army Maintenance Management System (TAMMS)

### A-3 SUPPLY CATALOGS.

SC 5180-90-N26 .....	Sets, Kits, and Outfits for Tool Kit, General Mechanic's: Automotive (NSN 5180-00-177-7033)
SC 4910-95-A74.....	Sets, Kits, and Outfits Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No. 1 (NSN 4910-00-754-0654)

### A-4 COMMON TABLE OF ALLOWANCES.

CTA 8-100 .....	Army Medical Department Expendable/Durable Items
CTA 50-970 .....	Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)

**A-5 BLANK FORMS.**

DA Form 2028 .....	Recommended Changes to Publications and Blank Forms
DA Form 2028-2.. ..	Recommended Changes to Equipment Technical Publications
DA Form 2404 .....	Equipment Inspection and Maintenance Worksheet
SF 364 .....	Report of Discrepancy (ROD)
SF 368.....	Product Quality Deficiency Report (Category II)

**A-6 FIELD MANUALS.**

FM 21-11 .....	First Aid for Soldiers
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## APPENDIX B

### MAINTENANCE ALLOCATION CHART

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#### Section I. INTRODUCTION

##### B-1 GENERAL.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with the capacities and capabilities of the designated maintenance categories.

c. Section III 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.

**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 diagnostics equipment 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.

**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 MAC and is shown as the 3rd position code of the SMR code.

**i. Repair.** The application of maintenance services including fault location/troubleshooting, 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 (i.e., DMWR). 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 material 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-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 (include 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.

**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).

*d. Column 4, Maintenance Category.* Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category 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 category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time figures will be shown for each category. 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 categories are as follows:

- C . . . . . Operator or crew
- O . . . . . Organizational Maintenance
- F . . . . . Direct Support Maintenance

- H . . . . . General Support Maintenance
- L . . . . . Specialized-Repair Activity (SRA)
- D . . . . . Depot 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 REQUIREMENTS, SECTION III.**

*a. Column 7, 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 Category.* The lowest category 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 FOR M157 SMOKE GENERATOR SET

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
00	M157 Smoke Generator Set	Inspect Install Repair Overhaul		.2 1.0 .6				20.0	
01	M54 Smoke Generator	Inspect Replace Repair Test	.2	.4 .3 .7 .5				8 8 5	C
0101	Cover Assembly	Adjust Repair		.4 .6				8,3 8	A
010101	Fuel Pressure Hose Assembly	Replace Repair		.1 .2				8 8	
010102	Disconnect Coupling	Replace Repair		.2 .1				8	
0102	Equipment Container Assembly	Repair		.6				8,6	
010201	Air Supply Hose Assembly	Replace Repair		.6 .1				8	
010202	Fog Oil Hose Assembly	Replace Repair		.6 .1				8	
010203	Air Supply Hose Assembly	Replace Repair		.6 .1				8	
010204	Starting Air Hose Assembly	Replace Repair		.6 .1				8	
010205	Fog Oil Hose Assembly	Replace Repair		.6 .1				8	
010206	Purge Hose Assembly	Replace Repair		.2 .1				8	

### Section II. MAINTENANCE ALLOCATION CHART (CONT)

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
010207	Terminal Bracket Assembly	Repair		.6				8	
010208	Pressure Switch Bracket Assembly	Repair		.8				8	
010209	Equipment Container	Repair		.6				8,5	
0103	Nozzle Assembly	Replace Repair		.4 .4				8 8	
0104	Pulse Jet Engine Assembly	Service Repair		.4 .6				8 8	
010401	Engine Head Assembly	Inspect Replace Repair	.1 .1 .1	.1				1,2 1,2 8	
0105	Frame Assembly	Repair		.3					
02	Control Panel Assembly	Inspect Replace Repair	.1	.3 .7				8 6, 7, 8, 9	
0201	Panel Cover	Repair		.7				8	
03	Fog Oil Pump Assembly	Adjust Replace Repair		.4 .5 1.0				8,3 8 8	A
0301	Strainer Assembly	Inspect Service Repair	.1 .2	.2				8 8	
0302	Hose Assembly	Replace Repair		.1 .2				8 8	
0303	Fog Oil Hose Assembly	Replace Repair		.1 .2				8 8	
0304	Pump, Fog Oil	Repair		1.2				8	

**Section II. MAINTENANCE ALLOCATION CHART (CONT)**

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
04	Air Compressor Assembly	Service	.1	.2				8 8	
		Replace		.3					
		Repair		.8					
0401	Air Compressor	Replace		.8				8 8	B
		Repair				1.0			
040101	Compressor Pump Assembly	Repair		.1			.8	8	
04010101	Inlet Filter Assembly	Service	.1	.2					
		Replace		.1					
		Repair		.2					
0402	Air Hose Assembly	Replace		.2				8 8	
		Repair		.2					
0403	Air Hose Assembly	Replace		.2				8 8	
		Repair		.2					
05	Fog Oil Tank Assembly	Inspect	.1						
		Service	.2						
		Replace		.8					
		Repair		.4					
0501	Fog Oil Tank	Replace		.8				8 8	
		Repair		.2					
06	Fuel Filter/Water Separator Assembly	Inspect	.1	.1				8 8	
		Service	.2						
		Repair		.6					
0601	Fuel Filter/Water Separator	Replace		.5				8 8	
		Repair		.3					
07	Water Manifold	Replace		.3				8 8	
		Repair		.3					

**Section III. TOOLS AND TEST EQUIPMENT REQUIREMENTS**

TOOL REF NO.	MAINT. CAT.	NOMENCLATURE	NSN	TOOL NUMBER
<b>Special Tool Sets</b>				
1	C	Wrench, Spanner	5120-01-440-7469	31-15-2992
2	C	Wrench, Adjustable, 12"	5120-00-264-3796	
3	O	Test Gage, Fog Oil	6685-00-265-0905	
	O	Test Gage, Air & Fuel	6685-01-011-7284	
4	O	Water Manifold Assembly	(No NSN Assigned)	31-15-3401
<b>Tool Kits</b>				
5	O	Tool Kit, Blind Rivet	5180-01-201-4978	D-100-MIL-I
6	O	Shop Equipment, Automotive Maintenance and Repair, Common No. 1	4910-00-754-0654	
7	O	Screwdriver, Flat Tip	5120-00-720-4969	A116-3
8	O	Tool Kit, General Mechanic's Automotive	5780-00-177-7033	
9	O	Multimeter	6625-01-139-2512	AN/PSM-45A

**Section IV. REMARKS**

REFERENCE CODE	REMARKS
A	Test assembly is made by joining the gage and work aide (Fig. G-21 or G-22, App G).
B	Using commercial repair kits and instructions to perform Depot maintenance.
C	Water manifold assembly is made by joining the components (Fig. F-29 and Fig. G-24) together.

## APPENDIX C COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

### Section I. INTRODUCTION

#### C-1 SCOPE.

This appendix lists components of end item and basic issue items for the M157 Smoke Generator Set to help you inventory items required for safe and efficient operation.

#### C-2 GENERAL.

The Components of End Item (including on-board spares) and Basic Issue Items Lists are divided into the following sections:

##### a. Section II. Components of End Item.

- (1) Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.
- (2) On-board spares. On-board spares are extra items identified as essential to be available at all times for operator/crew support of the end item. This list is for authorization of these items. Illustrations are furnished to assist you in identifying the items.

**b. Section III, Basic Issue Items.** These are the minimum essential items required to place the M157 Smoke Generator Set in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the M157 Smoke Generator Set during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replace BII, based on TOE/MTOE authorization of the end item.

#### C-3 EXPLANATION OF COLUMNS.

The following provides an explanation of columns found in the tabular listings:

**a. Column (7) - Illustration Number (Illus Number).** This column indicates the number of the illustration in which the item is shown.

**b. Column (2) - National Stock Number.** Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

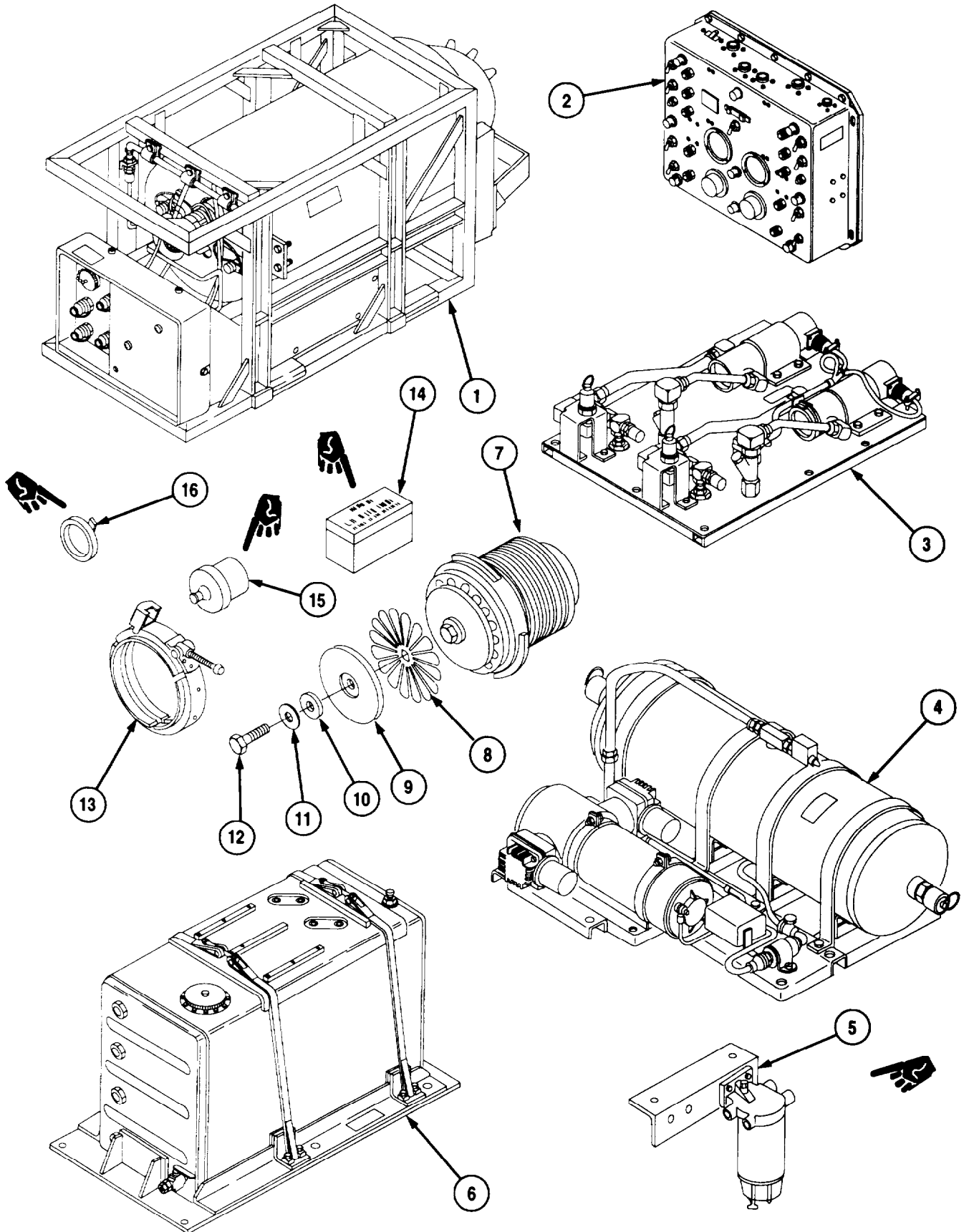
**c. Column (3) - Description.** Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number. If item needed differs for different models of this equipment, the model is shown under the "Usable On" heading of this column. These codes are identified as:

Code	Used On
Y16	M157 W/120 GAL FOG OIL TANK
16Y	M157 W/80 GAL FOG OIL TANK

**d. Column (4) - Unit of Measure (U/M).** Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr).

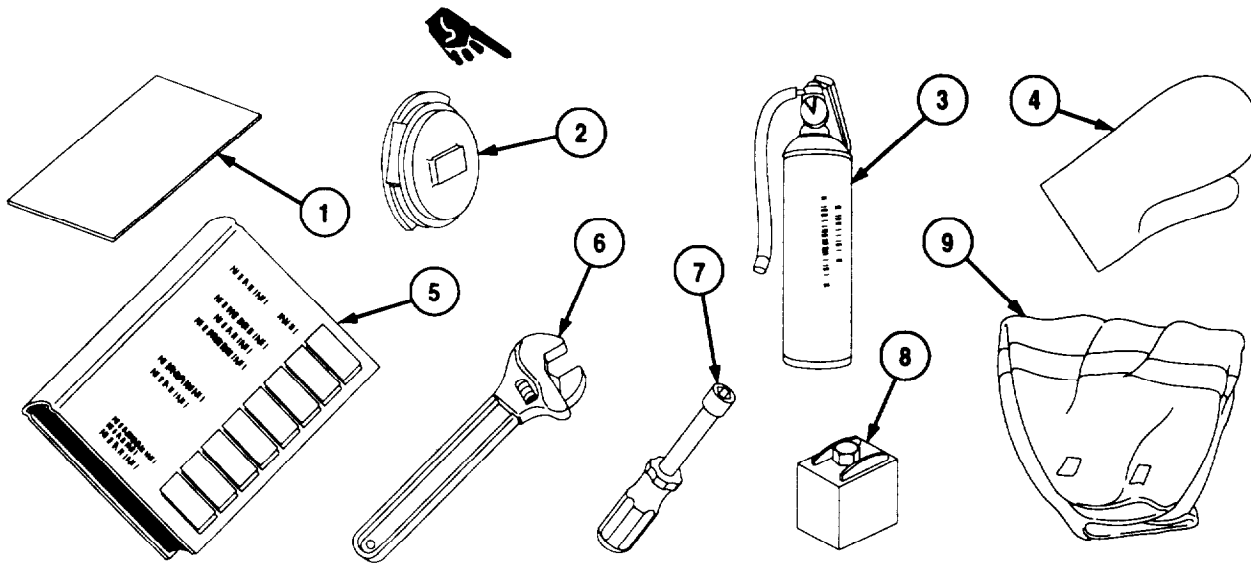
**e. Column (5) - Quantity Required (QTY RQR).** Indicates the quantity of the item authorized to be used with/on the equipment.

## Section II. COMPONENTS OF END ITEMS



(1) ILLUSTRATION NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) USABLE ON CODE U/M	(5) QTY RQR
1	1040-01-223-9660	M54 Smoke Generator (81361) 31-15-2252	EA	2
2	5895-01-218-7037	Control Indicator Panel Assembly (81361) 31-15-2915	EA	1
3	1040-01-218-8582	Fog Oil Pump Assembly (81361) 31-15-6980	EA	1
4	1040-01-218-6980	Compressor Assembly (81361) 31-15-2953	EA	1
5		Fuel Fitter/Water Separator Assembly (81361) 31-15-2967-10 and (81361) 31-15-2967-20	EA	2
6	4930-01-222-7857	Tank Unit, Liquid, Fog Oil (81361) 31-15-2805 or	EA	1
	4930-01-285-0138	Tank Unit, Liquid, Fog Oil (81361) 31-15-2715	EA	1
		<u>On-Board Spares</u> (Integral Components of End Item)		
7	2805-01-279-7822	Engine Head Assembly (81361) 31-15-2945	EA	2
8	1040-00-554-0458	Engine Valve (81361) B31-15-1036	EA	20
9	1040-00-699-9805	Back-Stop, Engine Valve (81361) B31-15-1035	EA	1
10	5310-00-513-9955	Washer, Recessed (81361) B31-15-1095	EA	1
11	5310-00-178-8631	Washer, Lock (96906) MS35333-75	EA	1
12	5306-01-246-6470	Bolt, Machine (96906) MS35307-336	EA	1
13	5340-01-246-6470	Coupling, Clamp, Grooved (14242) 3132H300Z	EA	1
14	6240-00-155-7836	Lamp, Incandescent (96906) MS25237-327	EA	BX
15	4330-01-106-4291	Filter, Fluid (24123) B300A	EA	2
16	5330-00-507-4900	Gasket, Engine Head (81361) B31-15-989	EA	2

### Section III. BASIC ISSUE ITEMS



(1) ILLUSTRATION NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY RQR
1	1040-00-568-9677	Board, Lapping (81361) C31-15-1083		EA	1
2	4910-01-449-5335	Tester, Ignition System, Engine, Pulse Jet (81361) 31-15-3350		EA	1
3	4120-00-775-0127	Extinguisher, Fire (01317) CS4210- 009AEG		EA	2
4	8415-01-092-0039	Mittens MIL-M-11199		EA	1
5	N/A	Technical Manual (TM 3-1040-279- 12&P)		EA	1
6	5120-00-264-3796	Wrench, Adjustable (58536) A-A-2344		EA	1
7	5120-00-596-1263	Wrench, Socket (58536) A-A-2382		EA	1
8	5120-01-440-7469	Wrench, Spanner (81361) 31-15-2992		EA	1
9	5140-00-473-6256	Tool Bag, Canvas (96906) MIL-B- 43663, TY1	16Y	EA	1



## APPENDIX D ADDITIONAL AUTHORIZATION LIST

### Section I. INTRODUCTION

**D-1 SCOPE.**

This appendix lists additional items you are authorized for the support of the M157 Smoke Generator Set.

**D-2 GENERAL.**

This list identifies items that do not have to accompany the M157 Smoke Generator Set and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

**D-3 EXPLANATION OF LISTING.**

National Stock Numbers, descriptions, and quantities are provided to help you identify and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, JTA) which authorized the item(s) to you. If the item you require differs between serial numbers of the same model, effective serial numbers are shown in the last line of the description. If item required differs for different models of this equipment, the model is shown under the "Usable On" heading in the description column. These codes are identified as:

<u>Code</u>	<u>Used On</u>
Y16	M157 w/ 120 GAL FOG OIL TANK
16Y	M157 w/ 80 GAL FOG OIL TANK

### Section II. ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM AND PART NUMBER	(3) USABLE ON CODE	U/M	(4) QTY AUTH.
	<b>MTO &amp; E Authorized Items</b>			
1040-01-249-0272	Mount for High Mobility Multi Purpose Wheeled Vehicle (HMMWV) M284 (81361) 31-15-2680	16Y	EA	1
	<b>CTA Authorized Items</b>			
4230-00-720-1618	Decontaminating Apparatus Portable 1-1/2 Quart, ABC-M11 (81361) D5-51-269		EA	1
4240-00-022-2946	Aural Protector (71483) E310		EA	1

**Section II. ADDITIONAL AUTHORIZATION LIST (CONT)**

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM AND PART NUMBER	(3) USABLE ON CODE  U/M	(4) QTY AUTH.
8415-00-269-5700	Glove, Shell, Cattlehide, Size 3 (81349) MIL-G-822	PR	1
8415-00-269-5701	Glove, Shell, Cattlehide, Size 4 (81349) MIL-G-822	PR	1
8415-00-269-5702	Glove, Shell, Cattlehide, Size 5 (81349) MIL-G-822	PR	1
8415-01-092-3910	Glove, Heat Protection (81349) MIL-G-44013, Type II	PR	1

# APPENDIX E EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

## Section I. INTRODUCTION

### E-1 SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain the Smoke Generator Set. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

### E-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 material (e.g., "Detergent, General Purpose, Item, App E").

**b. Column (2) - Level.** This column identifies the lowest level of maintenance that requires the listed item.

- C ..... Operator/Crew
- O ..... Organizational Maintenance

**c. Column (3) - National Stock Number.** This is the National Stock number assigned to the item; use it to request or requisition the item.

**d. Column (4) - Description.** Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

**e. Column (5) - Unit of Measure (U/M).** Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

## Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	O	8040-00-290-4301	Adhesive (02769) 2010832-1	QT
1A	C	8030-00-251-3980	Antiseize Compound: CN OR TU (05972) 76764	LB
1B	O	4730-01-178-0293	Adapter, Straight (00624) 2022-4-4S	EA
1C	O	4730-00-555-1152	Adapter, Straight (93568) 264-0310	EA
2	O	8020-00-721-9650	Brush, Paint: 1½ in. (80244) H-B-451 TY2SZ1-1/2	EA

**Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST  
(CONT)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
3	O	4350-00-174-1001	Cloth, Abrasive: 25/BD (58536) A-A-1200	EA
4	C	6850-00-264-9038	Dry Cleaning Solvent: 1 GL CN (81348) P-D-680	GL
5	C	6515-00-137-6345	Ear Plugs (89875) 4-375	EA
6	C	9150-00-261-7895	Fog Oil: 55 GL DR (81349) MILF12070TYPESGF-2	GL
6A	C	6850-00-823-7861	Engine Primer, Fuel Diethyl Ether, Type II (81348) O-F-1044	EA
6B	O	6685-00-265-0905	Gage, Pressure Dial (72100) G14635	EA
6C	O	6685-01-011-7284	Gage, Pressure Dial (38508) J4652	EA
7	C	9130-00-240-8201	Gasoline, Automotive: 55 GL DR (81349) MILG3056	GL
7A	O	4720-00-684-4033	Hose, Nonmetallic (79470) H10104	FT
7B			Deleted	
7C	O	5970-01-129-5603	Insulation Sleeving (96906) M23053/5-308-0	V
7D	C	6850-01-377-5075	Inhibitor, Icing Fuel System, DGME (81348) MIL-I-85470	GL
7E	C	6810-00-983-8551	Isopropyl Alcohol, Technical (81348) TT-I-735	QT
8	C	9140-00-242-6751	Kerosene: 55 GL DR (81348) VVK211	GL
9	O	8010-01-160-6741	Polyurethane Coating: 1 QT GREEN 383 (81399) MIL-C-46168	EA

**Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST  
(CONT)**

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
10	O	8010-01-193-0516	Primer Coating, Epoxy Kit (81349) MIL-P-53022	EA
11	C	7920-00-205-1711	Rag, Wiping: 50/B (58536) A-A-2522	LB
11A	O	8030-01-055-6126	Sealing Compound: TYPE II GRADE M (80244) MIL-S-46163	BT
12	O	8030-00-220-6973	Sealing Compound (81349) MIL-S-45180	DZ
12A	O	3439-00-555-4629	Solder (81348) SN60WRP2 0.032 1 LB	LB
13	O	5975-00-074-2072	Strap, Tie Down, Elec (96906) MS3367-1-9	EA
13A	O	4730-00-247-9105	Tee, Pipe (97403) 13207E3410FN145	EA
14			DELETED	
15	O	9330-01-097-2179	Tubing (06229) SP1/8TF	V
15A	O	4820-01-193-1951	Valve, Shutoff (81361) 31-15-1436	EA
16	O	9505-00-293-4208	Wire, Nonelectrical (96906) MS20995C32	V
17	O	9505-00-603-4117	Wire, Nonelectrical (96906) MS20995C20	V



# APPENDIX F

## OPERATOR AND ORGANIZATIONAL MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

### Section I. INTRODUCTION

#### F-1 SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement and diagnostic equipment (TMDE); and other special support equipment required for performance of operator and organizational maintenance of the M157 Smoke Generator Set. It authorizes the requisitioning, issue and disposition of spares, repair parts and special tools as indicated by the Source, Maintenance, and Recoverability (SMR) codes.

#### F-2 GENERAL

This Repair Parts and Special Tools list is divided into the following sections:

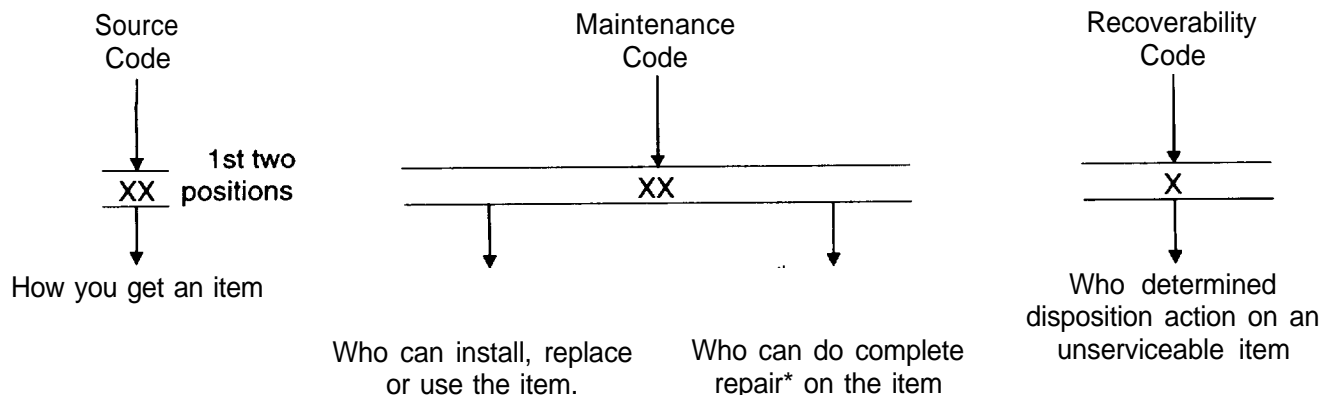
**a. Section II. Repair Parts List.** A list of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Bulk materials are listed by item name in FIG. BULK at the end of the section.

**b. Section III. Special Tools List.** A list of special tools, special TMDE, and other special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in DESCRIPTION AND USABLE ON CODE (UOC) column) for the performance of maintenance.

**c. Section IV. National Stock Number and Part Number Index.** A list in National Item Identification Number (NIIN) sequence, of all National Stock Numbers (NSN) appearing in the listings followed by a list in alphanumeric sequence of all part numbers appearing in the listings. National Stock Numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

#### F-3 EXPLANATION OF COLUMNS (SECTION II)

- a. ITEM NO. (Column (1)).** Indicates the number used to identify items called out in the illustration.
- b. SMR CODE (Column (2)).** The Source, Maintenance, and Recoverability (SMR) code is a 5-position code containing supply/requisitioning information, maintenance category authorization criteria, and dispositions instruction, as shown in the following breakout:



\*Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the "Repair" function in a

use/user environment in order to restore serviceability to a failed item.

(1) Source Code. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanation of source codes follow:

CODE	EXPLANATION
PA PB PC** PD PE PF PG	Stocked items; use the application NSN to request/requisition items with these source codes. They are authorized to the category indicated by the code entered in the 3 <sup>rd</sup> position of the SMR code.  "NOTE: Items coded PC are subject to deterioration.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance category indicated in the 3 <sup>rd</sup> position of the SMR code. The complete kit must be requisitioned and applied.
MO-(Made at org/AVUM level) MF-(Made at DS/AVIM Level) MH-(Made at GS Level) ML-(Made at Specialized Repair Act (SRA)) MD-(Made at Depot)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the Bulk Material group of the repair parts list in the RPSTL. If the item is authorized to you by the 3 <sup>rd</sup> position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.
AO-(Assembled by org/AVUM Level) AF-(Assembled by DS/AVIM Level) AH-(Assembled by GS Level) AL-(Assembled by SRA) AD-(Assembled by Depot)	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the 3 <sup>rd</sup> position code of the SMR code authorized you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.

- X A - Do not requisition an "XA"-coded item. Order its next higher assembly (also refer to the NOTE below).
- XB - If an "XB" item is not available from salvage, order it using the FSCM and part number given.
- XC - Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
- XD - Item is not stocked. Order an "XD"-coded item through normal supply channels using the FSCM and part number given, if no NSN is available.

NOTE: Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA".

(2) Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the SMR Code as follows:

(a) The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to one of the following levels of maintenance.

Code	Application/Explanation
C -	Crew or operator maintenance done within organizational or aviation unit maintenance.
O -	Organizational or aviation unit category can remove, replace, and use the item.
F -	Direct support or aviation intermediate level can remove, replace, and use the item.
H -	General support level can remove, replace, and use the item.
L -	Specialized repair activity can remove, replace, and use the item.
D -	Depot level can remove, replace, and use the item.



(b) The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (i.e., perform all authorized repair functions). (NOTE: Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.) This position will contain one of the following maintenance codes.

Code	Application/Explanation
O -	Organizational or aviation unit is the lowest level that can do complete repair on the item.
F -	Direct support or aviation intermediate is the lowest level that can do complete repair of the item.
H -	General support is the lowest level that can do complete repair of the item.
L -	Specialized repair activity is the lowest level that can do complete repair of the item.
D -	Depot is the lowest level that can do complete repair of the item.
Z -	Nonrepairable. No repair is authorized.
B -	No repair is authorized. (No parts or special tools are authorized for the maintenance of a "B"-coded item.) However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

(3) Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the SMR Code as follows:

Recoverability Codes	Definition
Z	Nonrepairable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the 3rd position of SMR Code.

O -	Repairable item. When uneconomically repairable, condemn and dispose of the item at organizational or aviation unit level.
F -	Repairable item. When uneconomically repairable, condemn and dispose of the item at the direct support or aviation intermediate level.
H -	Repairable item. When uneconomically repairable, condemn and dispose of the item at the general support level.
D -	Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L -	Repairable item. Condemnation and disposal not authorized below specialized repair activity.
A -	Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

**c. FSCM (Column (3)).** The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code which is used to identify the manufacturer, distributor or Government agency, etc., that supplies the item.

**d. Part Number (Column (4)).** 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.

**NOTE**

When you use an NSN to requisition an item, the item you receive may have a different part number from the part ordered.

**e. Description and Usable On Code (Column 5).** This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) Part numbers for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated.

(3) The statement "END OF FIGURE" appears just below the last item description in Column 5 for a given figure.

**f. QTY (Column 6).** The QTY (quantity per figure column) indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of quantity indicates that the quantity is variable and the quantity may vary from application to application.

**F-4 EXPLANATION OF COLUMNS**

**a. National Stock Number (NSN) Index.**

(1) *Stock Number Column.* This column lists the NSN by National Item Identification Number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN (i.e.,

NSN  
5305-01-674-1467). When using this column to

locate an item, ignore the first 4 digits of the NSN. However, the complete NSN should be used when ordering items by stock number.

(2) *FIG. Column.* This column lists the number of the figure where the item is identified/located. The figures are in numerical order in section II.

(3) *ITEM Column.* The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

**b. Part Number Index.** Part numbers in this index are listed by part number in ascending alphanumeric sequence (i.e., vertical arrangement of letter and number combination which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

(1) *FSCM Column.* The Federal Supply Code for Manufacturer (FSCM) is a 5-digit numeric code used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

(2) *Part Number Column.* Indicates the primary number used by the manufacturer (individual, 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.

(3) *Stock Number Column.* This column lists the NSN for the associated part number and manufacturer identified in the PART NUMBER and FSCM columns to the left.

(4) *Fig. Column.* This column lists the number of the figure where the item is identified/located in section II.

(5) *Item Column.* The item number is the number assigned to the item as it appears in the figure referenced in adjacent figure number column.

**F-5 SPECIAL INFORMATION**

**a. Usable on Code.** The usable on code appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC: . . . . ." in the Description Column on the first line applicable item description/nomenclature. Uncoded items are applicable to all models. Identification of the usable on codes used in the RPSTL are:

Code	Used On
Y16	M157 W/120 GAL FOG OIL TANK
16Y	M157 W/80 GAL FOG OIL TANK

**b. Fabrication Instructions.** Bulk materials required to manufacture items are listed in the Bulk Material Functional Group of this RPSTL. Part numbers for bulk materials are also referenced in the description column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in TM 3-1040-279-12&P, Appendix G.

**c. Assembly Instruction.** Detailed assembly instructions for items source coded to be assembled from component spare/repair parts are found in TM 3-1040-279-12&P. Items that make up the assembly are listed immediately following the assembly item entry or reference is made to an applicable figure.

**d. Index Numbers.** Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the National Stock Number/Part Number index and the Bulk Material List in section II.

## F-6 HOW TO LOCATE REPAIR PARTS

### a. When National Stock Number or Part Number is Not Known.

- (1) First. Using the table of contents, determine the assembly group or subassembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and listings are divided into the same groups.
- (2) Second. Find the figure covering the assembly group or subassembly group to which the item belongs.
- (3) Third. Identify the item on the figure and note the item number.
- (4) Fourth. Refer to the Repair Parts List for the figure to find the part number for the item number noted on the figure.
- (5) Fifth. Refer to the Part Number index to find the NSN, if assigned.

### b. When National Stock Number or Part Number is Known:

- (1) First. Using the Index of National Stock Numbers and Part Numbers, find the pertinent national stock number or part number. The NSN index is in national item identification number (NIIN) sequence. The part numbers in the Part Number Index are listed in ascending alphanumeric sequence. Both indexes cross-reference you to the illustration figure and item number of the item you are looking for.
- (2) Second. After finding the figure and item number, verify that the item is the one you're looking for, then locate the item number in the repair parts list for the figure.

## F-7 ABBREVIATIONS

Abbreviations	Explanation
NPN	No Part Number

## Section II. REPAIR PARTS LIST

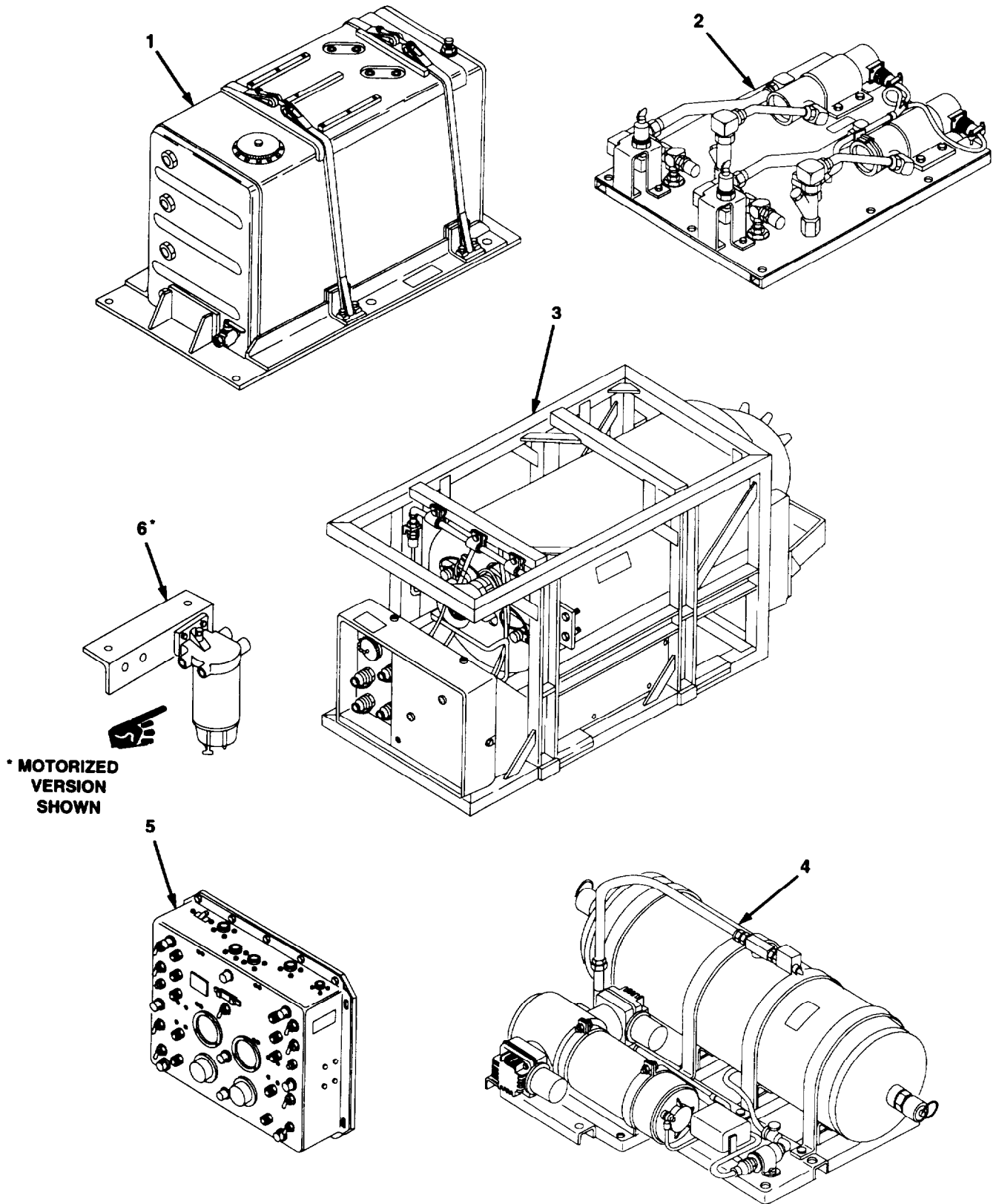


Figure F-1. M157 Pulse Jet Mechanical Smoke Generator Set

## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 00 GENERATOR SET, SMOKE, MECHANICAL: PULSE JET, M157	
					FIG. F-1 M157 PULSE JET MECHANICAL SMOKE GENERATOR SET	
					31-15-2255	
*1	PBOOO	4930012227857	81361	31-15-2805	TANK UNIT,LIQUID DI (SEE FIG. F-25 FOR BREAKDOWN) UOC:Y16	1
*1	PROOO	4930012850138	81361	31-15-2902	TANK UNIT,LIQUID DI (SEE FIG. F-25 FOR BREAKDOWN) UOC:16Y	1
*2	XBOOO		81361	31-15-2284	PUMP ASSEMBLY,FOG O (SEE FIG. F-17 FOR BREAKDOWN)	1
*3	PAOOA	1040012239660	81361	31-15-2252	GENERATOR,SMOKE,MEC (SEE FIG. F-2 FOR BREAKDOWN)	1
*4	PAODD	4310014150602	81361	31-15-3310	COMPRESSOR,RECIPROC (SEE FIG. F-21 FOR BREAKDOWN)	1
*5	PAOOO	5895012187037	81361	31-15-2256	CONTROL-INDICATOR (SEE FIG. F-16 FOR BREAKDOWN)	1
*6	AOOOO		81361	31-15-2967-10	FUEL FILTER-WATER S	1
*6	AOOOO		81361	31-15-2967-20	FUEL FILTER-WATER S (SEE FIG F-27 FOR BREAKDOWN)	1
*6	AOOOO		81361	31-15-2967-30	FUEL FILTER-WATER S (SEE FIG F-27 FOR BREAKDOWN)	1
					END OF FIGURE	



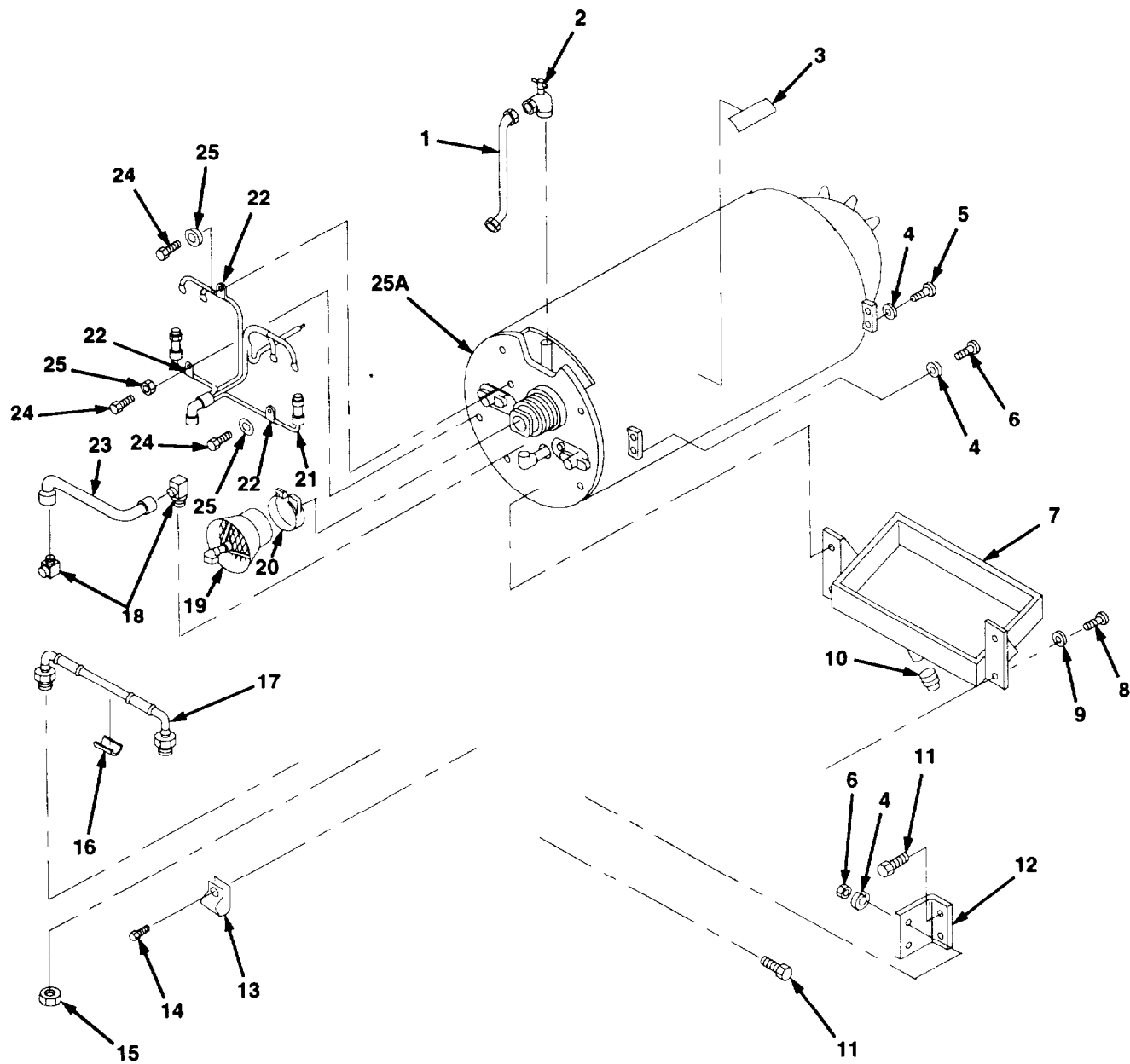


Figure F-2. M54 Smoke Generator (Sheet 1 of 2)

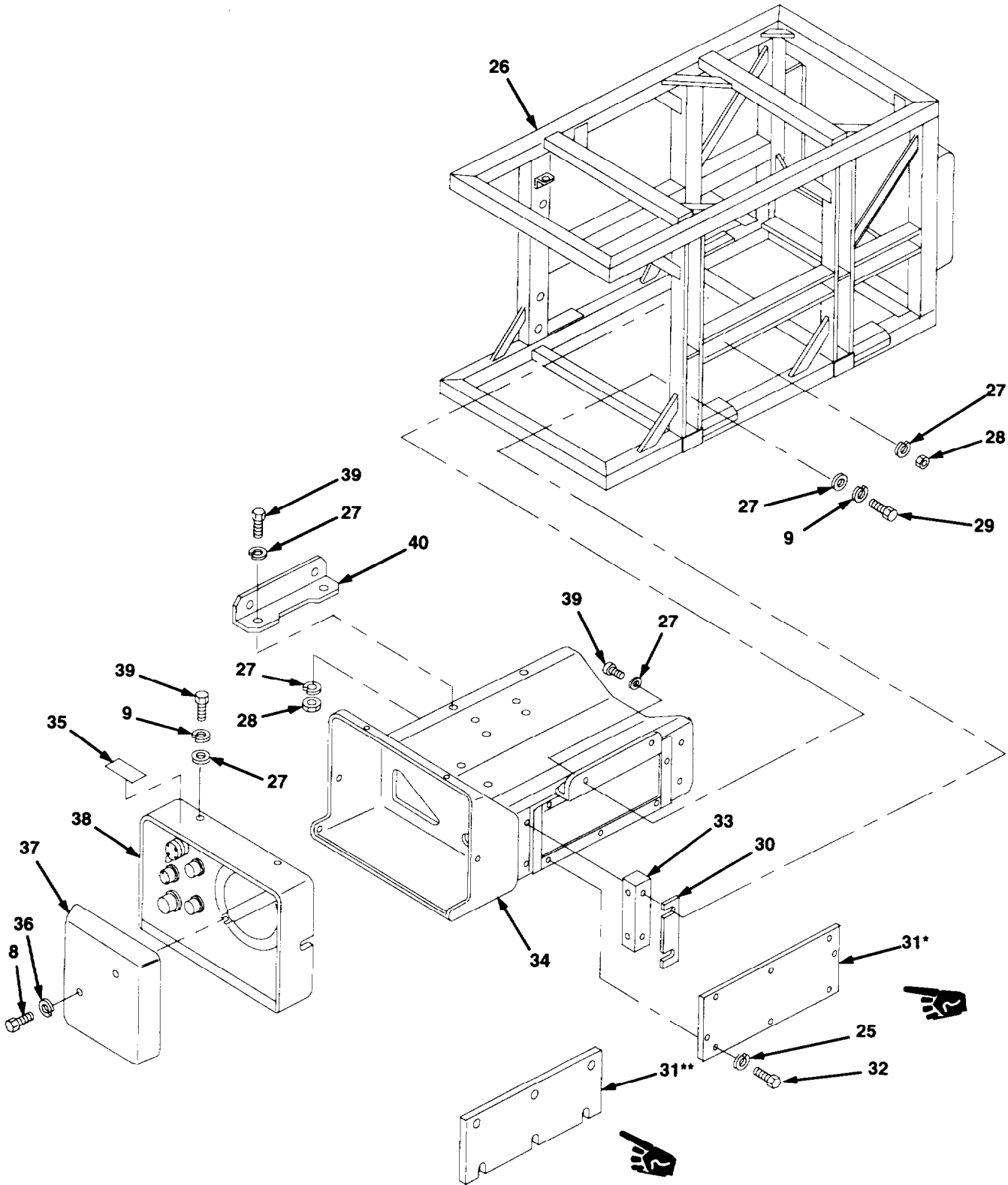


Figure F-2. M54 Smoke Generator (Sheet 2 of 2)



SECTION II

TM3-1040-279-12&P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 01 GENERATOR, SMOKE, M54						
FIG. F-2 M54 SMOKE GENERATOR						
31-15-2252						
1	PAOZZ	4710012165999	81361	31-15-2288	TUBE ASSEMBLY,METAL	1
2	PAOZZ	4820012164504	81361	31-15-2355	VALVE,LIFT-CHECK	1
*3	XDOZZ		19207	12253115	DECAL	2
4	PAOZZ	5310000814219	96906	MS27183-12	WASHER,FLAT	20
*5	PAOZZ	5306002264825	80204	B1821BH031C075 N	BOLT,MACHINE	4
6	PAOZZ	5310000880553	96906	MS21044N5	NUT,SELF-LOCKING,HE	8
7	XDOZZ		81361	31-15-2367	DRIP PAN ASSEMBLY..	1
*8	PAOZZ	5305000680500	96906	MS90725-3	SCREW,CAP,HEXAGON H	10
9	PAOZZ	5310005825965	96906	MS35338-44	WASHER,LOCK	4
*10	XDOZZ		96906	MS20913-3S	PLUG,PIPE	1
11	PAOZZ	5305000514076	96906	MS90727-34	SCREW,CAP,HEXAGON H	8
12	XDOZZ		81361	31-15-2277	BRACKET,SUPPORT	2
13	PAOZZ	1680005224953	61423	208236	CLAMP,DETECTOR,FIRE	3
14	PAOZZ	5320005340862	81349	M24243/1-F403	RIVET,BLIND	6
*15	PAOZZ	5310008277023	0KDP7	207865	NUT,PLAIN,HEXAGON	2
*16	PAOZZ	5640009695869	61423	262121	INSULATION SLEEVEING	3
17	PAOZZ	6350012351522	61423	899286	SENSING ELEMENT,FIR	1
18	PAOZZ	4730010457431	01276	2250-4-6S	ELBOW,PIPE TO TUBE	2
*19	PAOOO	4530014263533	81361	31-15-3307	NOZZLE,OIL BURNER,P	1
20	PAOZA	5342012466470	14242	3132H300Z	COUPLING,CLAMP,GROO	1
21	PAOZZ	6150012169422	81361	31-15-2443	CABLE ASSEMBLY,SPEC	1
22	PAOZZ	5340000783615	96906	MS21322-33	CLAMP,LOOP	1
23	PAOZZ	4720012762431	81361	31-15-2286	HOSE ASSEMBLY,METAL	1
24	PAOZZ	5305009906444	96906	MS35207-261	SCREW,MACHINE	1
25	PAOZZ	5310005765752	96906	MS35333-39	WASHER,LOCK	16
25A	XAOOO		81361	31-15-2342	ENGINE ASSEMBLY,PUL	1
26	XAOZZ		81361	31-15-2258	FRAME ASSEMBLY	1
27	PAOZZ	5310008094058	96906	MS27183-10	WASHER,FLAT	28
28	PAOZZ	5310000881251	96906	MS51922-1	NUT,SELF-LOCKING,HE	4
29	PAOZZ	5305002678956	96906	MS90727-12	SCREW,CAP,HEXAGON H	4
30	PAOZZ	5365012786886	81361	31-15-2898	SPACER,PLATE	10
31	XDOZZ		81361	31-15-2312	PANEL,EQUIPMENT CONTAINER	2
32	PAOZZ	5305009897434	96906	MS35207-263	SCREW,MACHINE	16
*33	XDOZZ		81361	31-15-2315	SPACER,STRAIGHT	4
34	XAOOO		81361	31-15-2253	EQUIPMENT CONTAINER..	1
35	XDOZZ		81361	31-15-2865-1	PLATE,IDENTIFICATI	1
36	PAOZZ	5310005501130	96906	MS35333-40	WASHER,LOCK	14
*37	XBOZZ		81361	31-15-2321	COVER,MOTOR	1
38	XAOOO		81361	31-15-2254	COVER,ASSEMBLY	1
*39	PAOZZ	5305000712505	80204	B1821BH025C088 N	SCREW,CAP,HEXAGON H	12
40	XDOZZ		81361	31-15-2899	ANGLE,MOUNTING	2
END OF FIGURE						



Section II. REPAIR PARTS LIST

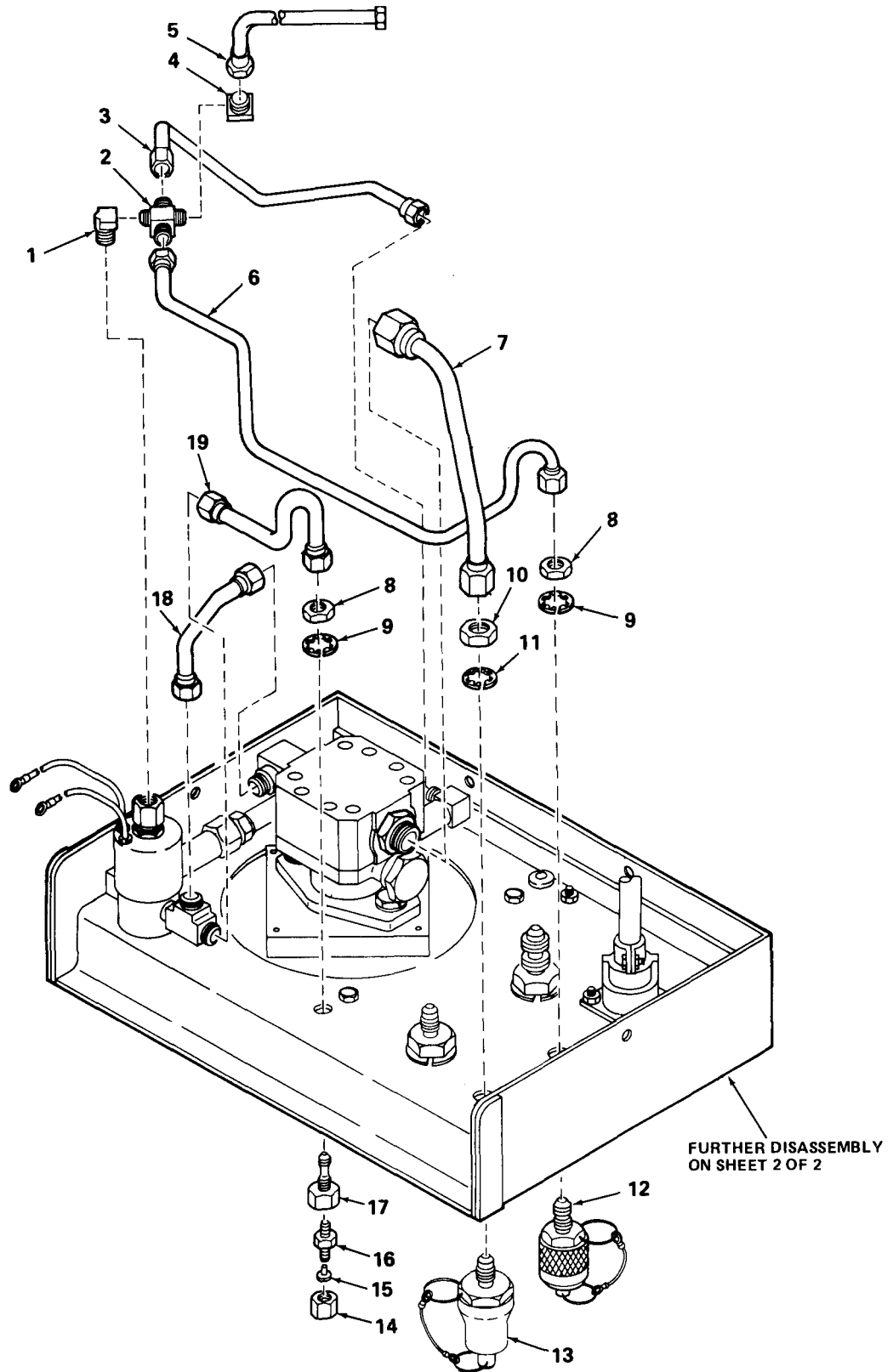


Figure F-3. Cover Assembly (Sheet 1 of 2)

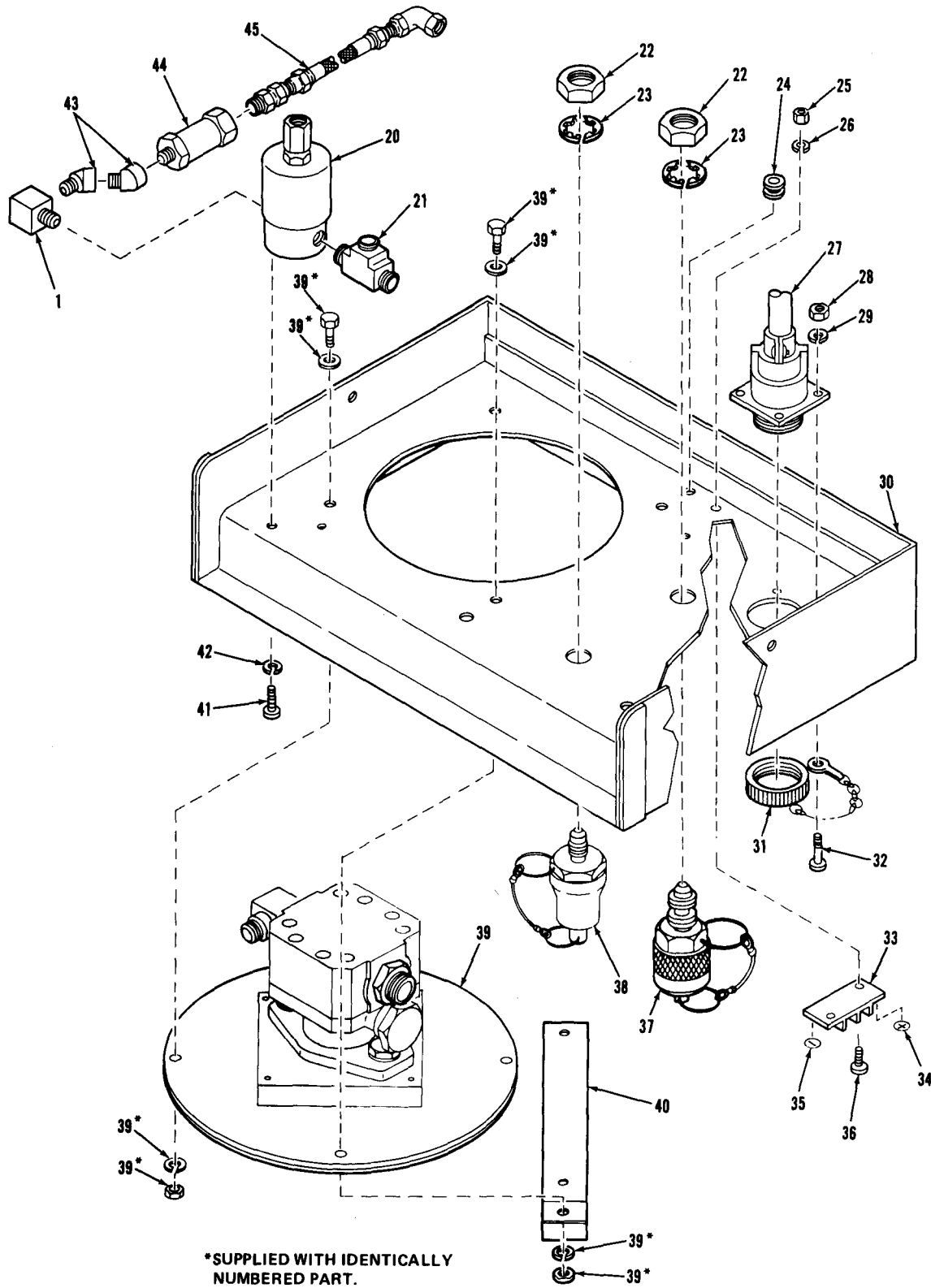


Figure F-3. Cover Assembly (Sheet 2 of 2)

## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 0101 COVER ASSEMBLY						
FIG. F-3 COVER ASSEMBLY						
31-15-2254						
*1	PAOZZ	4730006399730	81343	2-2 130239	ELBOW,PIPE	3
2	PAOZZ	4730012424508	01276	202009-2-4S	CROSS,PIPE TO TUBE	1
3	PAOZZ	4710012164579	81361	31-15-2325	TUBE ASSEMBLY,METAL	1
4	PAOZZ	4730008125298	96906	MS51506A4	ELBOW,PIPE TO TUBE	1
*5	AOOOO		81361	31-15-2302-80	HOSE ASSY,FUEL PRES (SEE FIG F-4 FOR BREAKDOWN).	1
6	PAOZZ	4710012242800	81361	31-15-2291	TUBE ASSEMBLY,METAL	1
7	PAOZZ	4710012316519	81361	31-15-2292	TUBE ASSEMBLY,METAL	1
*8	PAOZZ	4730000527673	79470	C5924X4	LOCKNUT,TUBE FITTIN	2
9	PAOZZ	5310006853228	96906	MS35333-43	WASHER,LOCK	2
10	PAOZZ	5310002827817	81352	AN924-6	NUT,PLAIN,HEXAGON	1
11	PAOZZ	5310002091510	96906	MS35333-45	WASHER,LOCK	1
*12	PAOOO	4730012331699	81833	200M3GE4	COUPLING HALF,QUICK (SEE FIG F-5 FOR BREAKDOWN).	1
13	PAOZZ	4730012314786	79326	205M3GE6	COUPLING HALFQUICK	1
14	PAOZZ	4730010440878	96906	MS51532B4	CAP,TUBE	1
15	PAOZZ	4730008777709	96906	MS35872-2B	SEAL BONNET,TUBE	1
*16	PAOZZ	4730009003296	72983	248X4	ADAPTER,STRAIGHT,PI	2
17	PAOZZ	4730004213849	79470	C5275X4	ADAPTER,STRAIGHT,PI	1
18	PAOZZ	4710012164581	81361	31-15-2324	TUBE ASSEMBLY,METAL	1
19	PAOZZ	4710012164580	81361	31-15-2326	TUBE ASSEMBLY,METAL	1
*20	PAOZZ	4810013971158	81978	71385SN1KVJ1N0 L111C2	VALVE,SOLENOID	1
21	PAOZZ	4730010643448	96906	MS51511A4	TEE,PIPE TO TUBE	1
22	PAOZZ	5310002085775	81352	AN924-8	NUT,PLAIN,HEXAGON	2
23	PAOZZ	5310005503714	96906	MS35333-47	WASHER,LOCK	2
24	PAOZZ	5325001850012	96906	MS35489-35	GROMMET,NONMETALLIC	1
25	PAOZZ	5310009349757	96906	MS35649-282	NUT,PLAIN,HEXAGON	2
26	PAOZZ	5310000454007	96906	MS35338-41	WASHER,LOCK	2
27	PAOZZ	6150012227850	81361	31-15-2287	CABLE ASSEMBLY,SPEC	1
28	PAOZZ	5310009349739	96906	MS35649-242	NUT,PLAIN,HEXAGON	4
29	PAOZZ	5310005432410	96906	MS35338-40	WASHER,LOCK	4
30	XAOZZ		81361	31-15-2285	COVER,EQUIPMENT CONTAINER	1
*31	PAOZZ	5935002218620	96906	MS25043-20DA	COVER,ELECTRICAL CO	1
32	PAOZZ	5305008892999	96906	MS35206-217	SCREW,MACHINE	4
33	XDOZZ		83330	37TBF-2-SS- CRES	TERMINAL BOARD	1
34	XDOZZ		81361	31-15-2370-1	MARKER,COMPONENT POS	1
35	XDOZZ		81361	31-15-2370-2	MARKER,COMPONENT NEG	1
36	PAOZZ	5305009844992	96906	MS35206-232	SCREW,MACHINE	2
37	PAOZZ	4730012355664	79326	200M4GE8	COUPLING HALF,QUICK	1
*38	XDOZZ		79326	205M4GE8	COUPLING HALF,QUICK	1
*39	PAODD	1040012247787	81361	31-15-2663	MOTOR ASSEMBLY,PUMP	1
40	XDOZZ		81361	31-15-2322	BRACKET,COVER MOUNT	1
41	PAOZZ	5305009906444	96906	MS35207-261	SCREW,MACHINE	2
42	PAOZZ	5310005765752	96906	MS35333-39	WASHER,LOCK	2
*43	PAOZZ	4730002775683	96906	MS514307-1	ELBOW,PIPE	2

**SECTION II****TM3-1040-279-12&P**

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
*44	PAOZZ	4330012255911	5H185	60046	FILTER,FLUID	1
*45	PAOZZ	4720013715770	81361	31-15-1502	HOSE ASSEMBLY,METAL	1
END OF FIGURE						

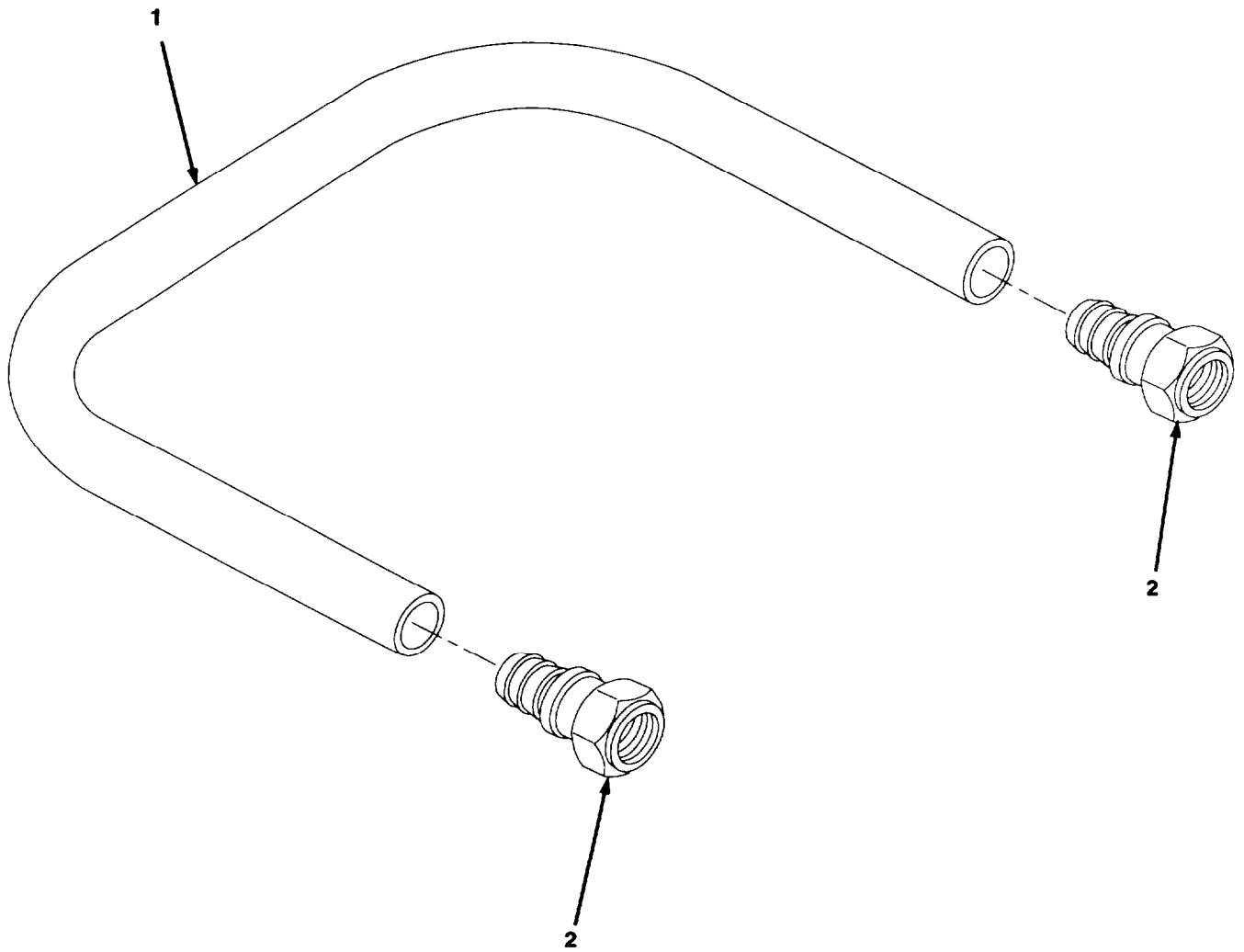


Figure F-4. Fuel Pressure Hose Assembly

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 010101 HOSE ASSEMBLY, FUEL PRESSURE	
					FIG. F-4 FUEL PRESSURE HOSE ASSEMBLY	
					31-15-2302-80	
*1	MOOZZ		81361	31-15-2302-2	HOSE, HYDRAULIC MAKE FROM HOSE P/N M24136/3-04/NSN 4720-01-121-0873	1
*2	PAOZZ	4730005551152	01276	4797-4B	ADAPTER, STRAIGHT, TU	1
					END OF FIGURE	

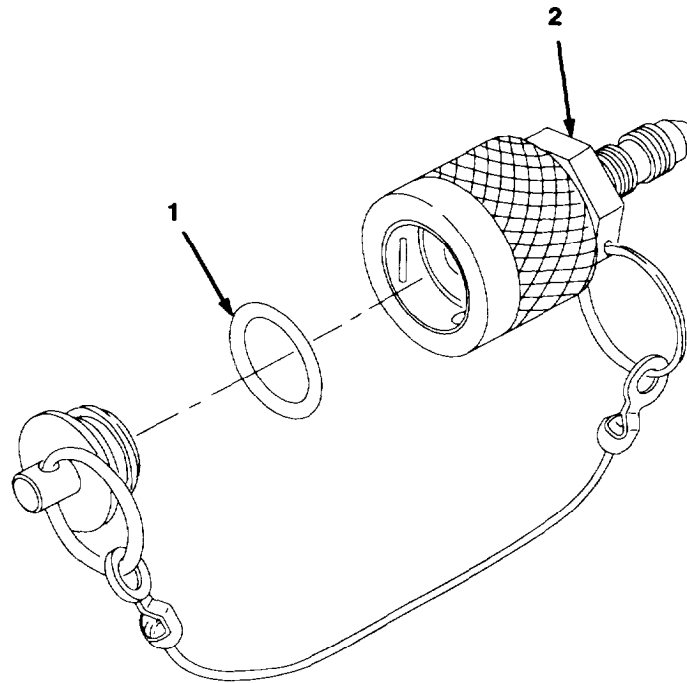
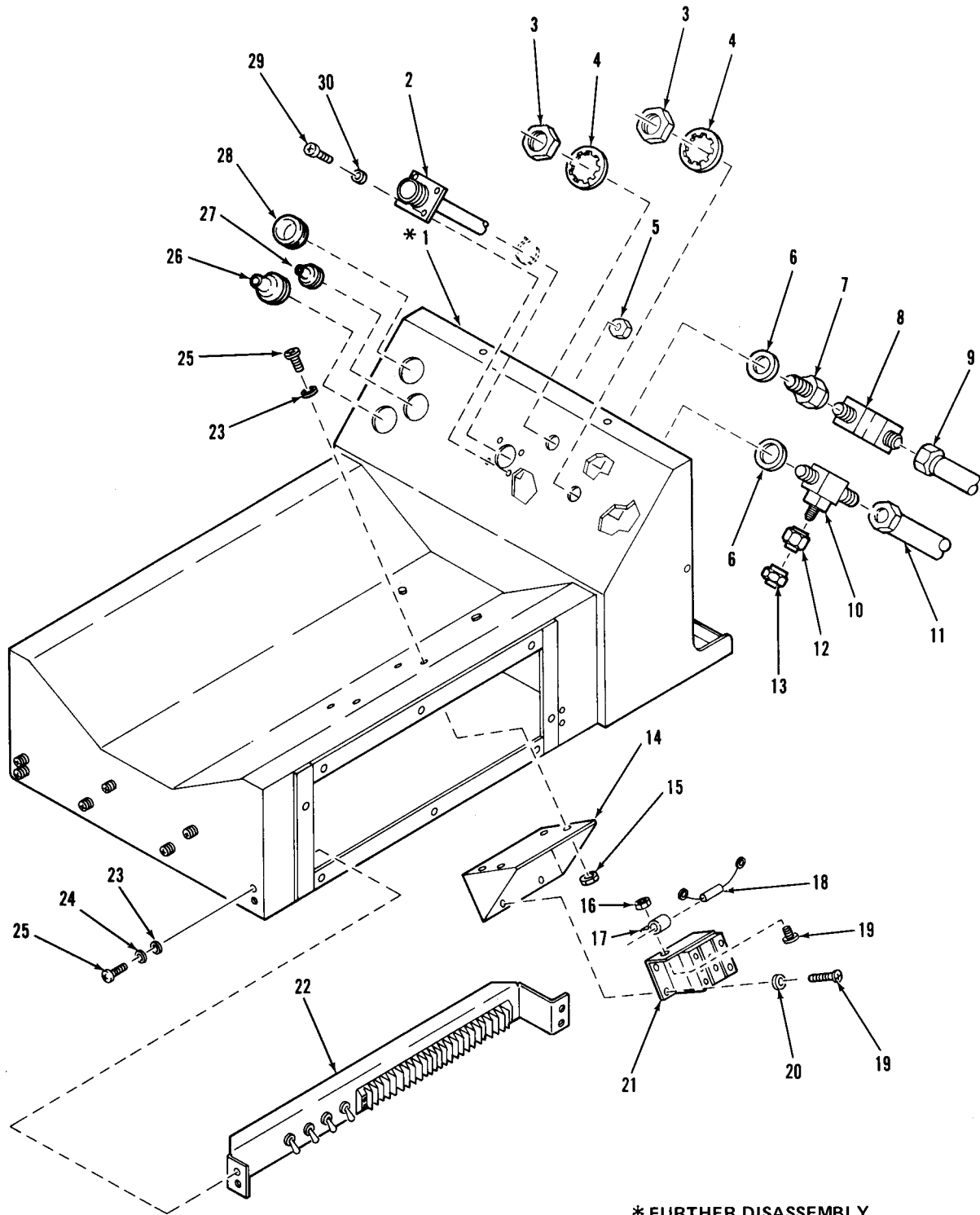


Figure F-5. Quick Disconnect Coupling Half

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 010102 COUPLING HALF, QUICK DISCONNECT	
					FIG. F-5 QUICK DISCONNECT COUPLING HALF	
					200M3GE4	
*1	PAOZZ	5331007592121	81349	M25988/1-017	O-RING	1
2	XAOZZ		81361	NPN 1	COUPLING HALF ASSEM	1
					END OF FIGURE	





\* FURTHER DISASSEMBLY  
ON SHEET 2 OF 2

Figure F-6. Equipment Container Assembly (Sheet 1 of 2)

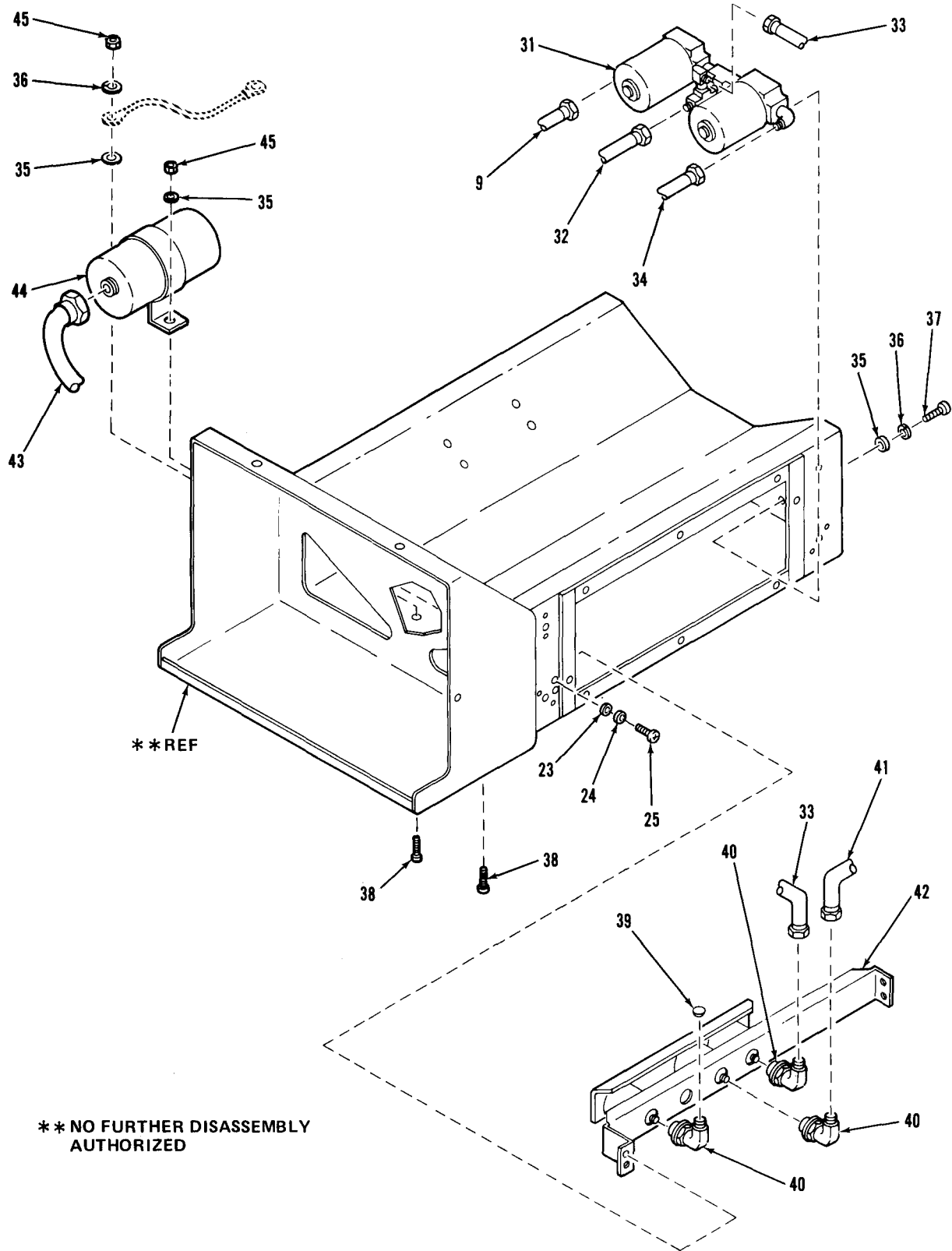


Figure F-6. Equipment Container Assembly (Sheet 2 of 2)

## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 0102 CONTAINER ASSY, EQUIPMENT	
					FIG. F-6 EQUIPMENT CONTAINER ASSEMBLY	
					31-15-2253	
1	XAOOO		81361	31-15-2389	CONTAINER,EQUIPMENT	1
2	PAOZZ	6150012227852	81361	31-15-2444	CABLE ASSEMBLY,ELEC	1
*3	XDOZZ		96906	MS51860-55	NUT,BULKHEAD	2
4	PAOZZ	5310002091510	96906	MS35333-45	WASHER,LOCK	2
5	PAOZZ	5310009349739	96906	MS35649-242	NUT,PLAIN,HEXAGON	4
*6	PAOZZ	5310008093079	96906	MS27183-19	WASHER,FLAT	2
*7	PAOZZ	4730006239137	96906	MS51520B6	ADAPTER,STRAIGHT,TU	1
8	PAOZZ	4730006185372	96906	MS51521A6	ELBOW,TUBE	1
9	AOOOO		81361	31-15-2302-120	HOSE ASSY,AIR PURGE (SEE FIG F-8 BKDN ASSY)	1
*10	XDOZZ		96906	MS51523-B6S	TEE,BULKHEAD	1
11	AOOOO		81361	31-15-2302-110	HOSE ASSY,FOG OIL (SEE FIG F-8 BKDN ASSY)	1
*12	PAOZZ	4730007068711	96906	MS51534A6-4	REDUCER BODY,TUBE	1
*13	PAOZZ	4730002033831	88044	AN818-6	NUT,TUBE COUPLING	1
14	XDOZZ		81361	31-15-2305	BRACKET,MOUTING,	1
15	PAOZZ	5310008775797	96906	MS21044N3	NUT,SELF-LOCKING,HE	4
16	PAOZZ	5310008575564	96906	MS21045-L08	NUT,SELF-LOCKING,HE	1
17	PAOZZ	5340002008560	96906	MS21919WDG5	CLAMP,LOOP	1
18	PAOZZ	5905012225832	81361	31-15-2676	RESISTOR,FIXED,WIRE	1
*19	PAOZZ	5305009846193	96906	MS35206-245	SCREW,MACHINE	4
*20	PAOZZ	5310005590070	96906	MS35333-38	WASHER,LOCK	4
21	PAOZZ	5945002258692	96906	MS24149-01	RELAY,ELECTROMAGNET	1
*22	XDOOO		81361	31-15-2316	BRACKET ASSEMBLY,TERMINAL (SEE FIG F-6 BKDN ASSY)	1
23	PAOZZ	5310008098546	96906	MS27183-8	WASHER,FLAT	12
24	PAOZZ	5310005765752	96906	MS35333-39	WASHER,LOCK	8
25	PAOZZ	5305009897435	12603	86G1010	SCREW,MACHINE	12
26	PAOZZ	5325009290052	14829	375	GROMMET,NONMETALLIC	1
27	PAOZZ	5325001749332	96906	MS35489-48	GROMMET,NONMETALLIC	1
*28	PAOZZ	5325012283341	96906	MS35489-47	GROMMET,NONMETALLIC	1
29	PAOZZ	5305008892999	96906	MS35206-217	SCREW,MACHINE	4
30	PAOZZ	5310005432410	96906	MS35338-40	WASHER,LOCK	4
31	PAOZZ	5945012187046	81361	31-15-2318	SOLENOID ASSEMBLY	1
32	AOOOO		81361	31-15-2302-90	HOSE ASSY,AIR SUPP (SEE FIG F-7 BKDN ASSY)	1
33	AOOOO		81361	31-15-2302-50	HOSE ASSEMBLY,AIR SUPP (SEE FIG F-7 BKDN ASSY)	1
34	AOOOO		81361	31-15-2302-100	HOSE ASSY,AIR START (SEE FIG F-8 BKDN ASSY)	1
*35	PAOZZ	5310008094058	96906	MS27183-10	WASHER,FLAT	6
*36	PAOZZ	5310005501130	96906	MS35333-40	WASHER,LOCK	5
*37	PAOZZ	5305009838084	96906	MS16997-60	SCREW,CAP,SOCKET HE	4
*38	PAOZZ	5305009881725	96906	MS35206-281	SCREW,MACHINE	6

## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
39	PAOZZ	4730012187042	81361	31-15-2796	SEAL BONNET,TUBE	1
*40	PAOZZ	4730010256805	96906	MS51527A4Z	ELBOW,TUBE TO BOSS	3
41	AOOOO		81361	31-15-2302-60	HOSE ASSY,FOG OIL (SEE FIG F-8 BKDN ASSY)	1
*42	XDOOO		81361	31-15-2317	BRACKET ASSEMBLY,PRESSURE SWITCH (SEE FIG F-10 BKDN ASSY)	1
*43	PAOZZ	6150012237267	81361	31-15-2682	LEAD AND CONDUCT AS	1
44	PAOZZ	2920012370447	82254	C-34192	COIL,IGNITION	1
*45	PAOZZ	5310000881251	96906	MS51922-1	NUT,SELF-LOCKING,HE	4
END OF FIGURE						

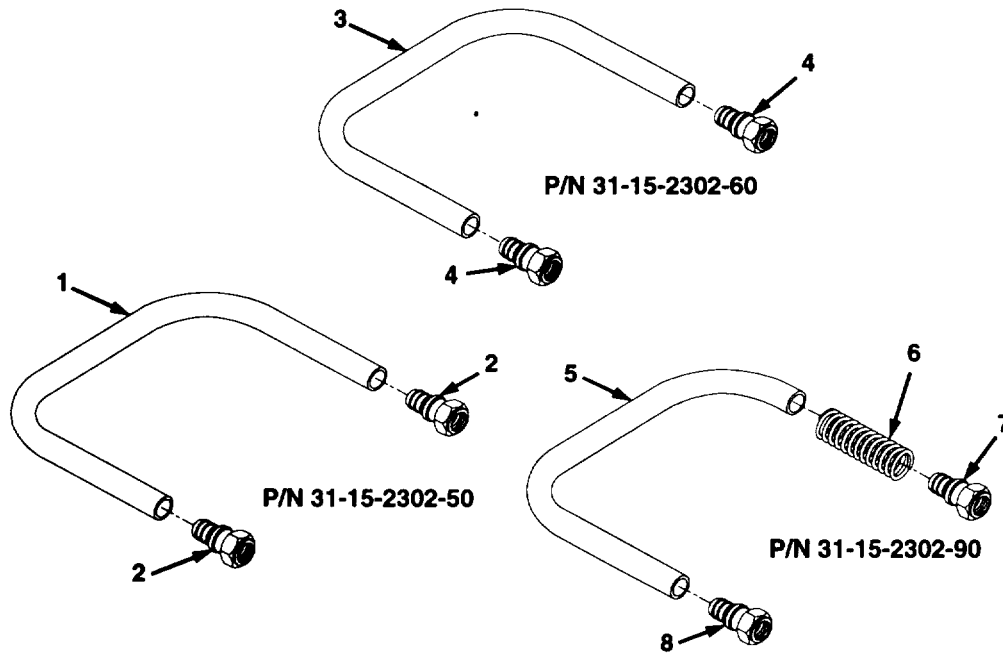


Figure F-7. Hose Assemblies

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC) GROUP: 010201 & 010202 & 010203 HOSE ASSEMBLIES, AIR SUPPLY AND FOG OIL	(7) QTY
FIG. F-7 AIR SUPPLY AND FOG OIL HOSE ASSEMBLIES						
31-15-2302-50, 31-15-2302-60, AND 31-15-2302-90						
*1	MOOZZ		81361	NPN-2	HOSE, HYDRAULIC MAKE FROM HOSE, P/N M24136/3-04/NSN 4720-01-121-0873	1
*2	PAOZZ	4730005551152	01276	4797-4B	ADAPTER, STRAIGHT, TU USED ON P/N 31-15 2302-50	2
*3	MOOZZ		81361	NPN 3	HOSE, HYDRAULIC MAKE FROM HOSE P/N M24136/3-04/NSN 4720-01-121-0873	1
*4	PAOZZ	4730005551152	01276	4797-4B	ADAPTER, STRAIGHT, TU USED O P/N 31-15 2302-60	2
*5	MOOZZ		81361	NPN 4	HOSE, HYDRAULIC MAKE FROM HOSE, P/N M24136/3-06/NSN 4720-00-187-4102	1
*6	XDOZZ		79470	A1903	GUARD, SPRING USED ON P/N 31-15-2302-90	1
*7	PAOZZ	4730009348027	01276	4797-8-6B	ADAPTER, STRAIGHT, TU USED ON P/N 31-15 2302-90	1
*8	PAOZZ	4730005882614	01276	4741-6B	ADAPTER, STRAIGHT, TU USED ON P/N 31-15 2302-90	1

END OF FIGURE

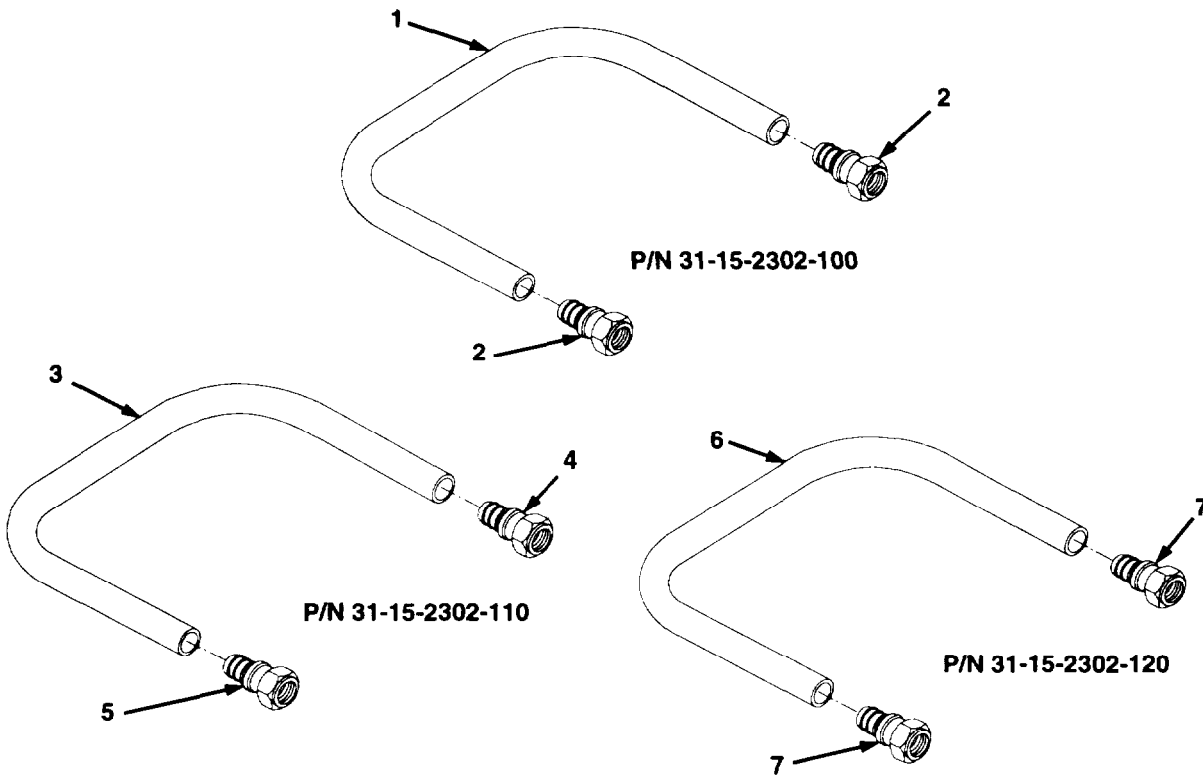
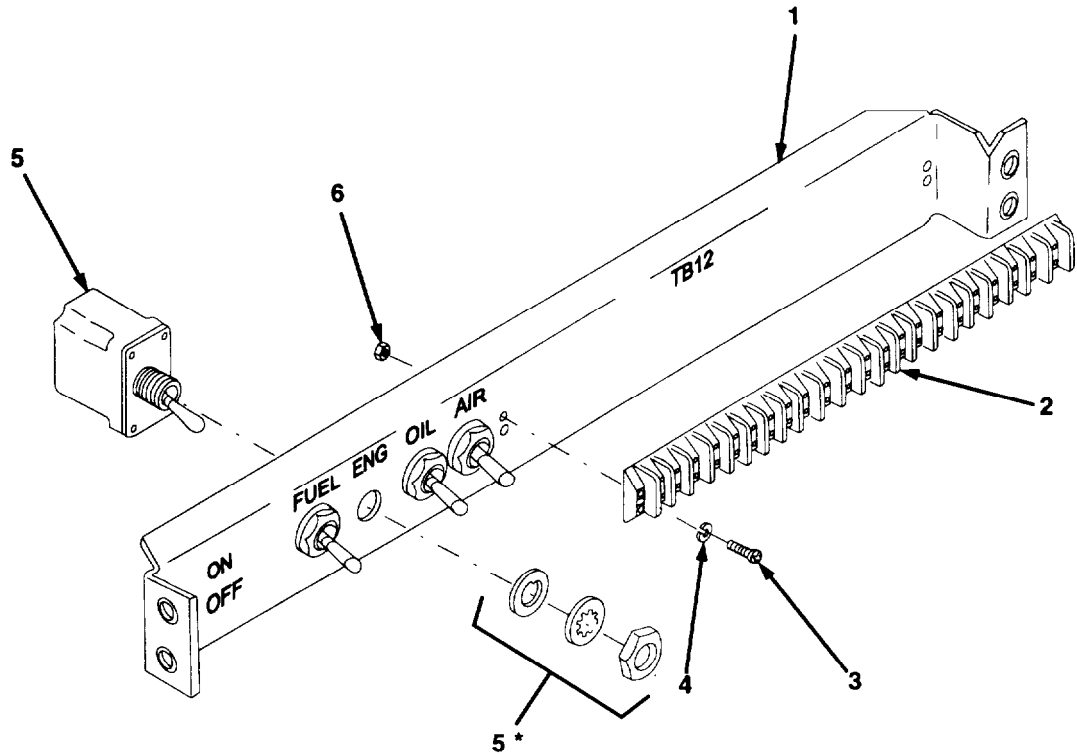


Figure F-8. Hose Assemblies

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 010204 & 010205 & 010206 HOSE ASSEMBLIES, STARTING AIR, FOG OIL, AND PURGE	
					FIG. F-8 STARTING AIR, FOG OIL, AND PURGE HOSE ASSEMBLIES	
					31-15-2302-100, 31-15-2302-110, AND 31-15-2302-120	
*1	MOOZZ		81361	NPN 5	HOSE, HYDRAULIC MAKE FROM HOSE, P/N M24136/3-06/NSN 4720-00-187-4102	1
*2	PAOZZ	4730005882614	01276	4741-6B	ADAPTER, STRAIGHT, TU USED ON P/N 31-15-2302-100	2
*3	MOOZZ		81361	NPN 6	HOSE, HYDRAULIC MAKE FROM HOSE, P/N M24136/3-06/NSN 4720-00-187-4102	1
*4	PAOZZ	4730005882614	01276	4741-6B	ADAPTER, STRAIGHT, TU USED ON P/N 31-15-2302-110	2
*5	PAOZZ	4730009348027	01276	4797-8-6B	ADAPTER, STRAIGHT, TU USED ON P/N 31-15-2302-110	1
*6	MOOZZ		81361	NPN 7	HOSE, HYDRAULIC MAKE FROM HOSE, P/N M24136/3-06/NSN 4720-00-187-4102	1
*7	PAOZZ	4730005882614	01276	4741-6B	ADAPTER, STRAIGHT, TU USED ON P/N 31-15-2302-120	2
END OF FIGURE						



\* SUPPLIED WITH IDENTICALLY NUMBERED PART

Figure F-9. Terminal Bracket Assembly

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 010207 BRACKET ASSEMBLY, TERMINAL						
FIG. F-9 TERMINAL BRACKET ASSEMBLY						
31-15-2316						
1	XAOZZ		81361	31-15-2311	BRACKET, MOUNTING	1
*2	XDOZZ		81349	37TB20	TERMINAL BOARD	1
*3	PAOZZ	5305008893001	96906	MS35206-231	SCREW, MACHINE	4
*4	PAOZZ	5310000454007	96906	MS35338-41	WASHER, LOCK	4
*5	PAOZZ	5930006831628	96906	MS24523-22	SWITCH, TOGGLE	4
6	PAOZZ	5310009349747	96906	MS35649-262	NUT, PLAIN, HEXAGON	4
END OF FIGURE						

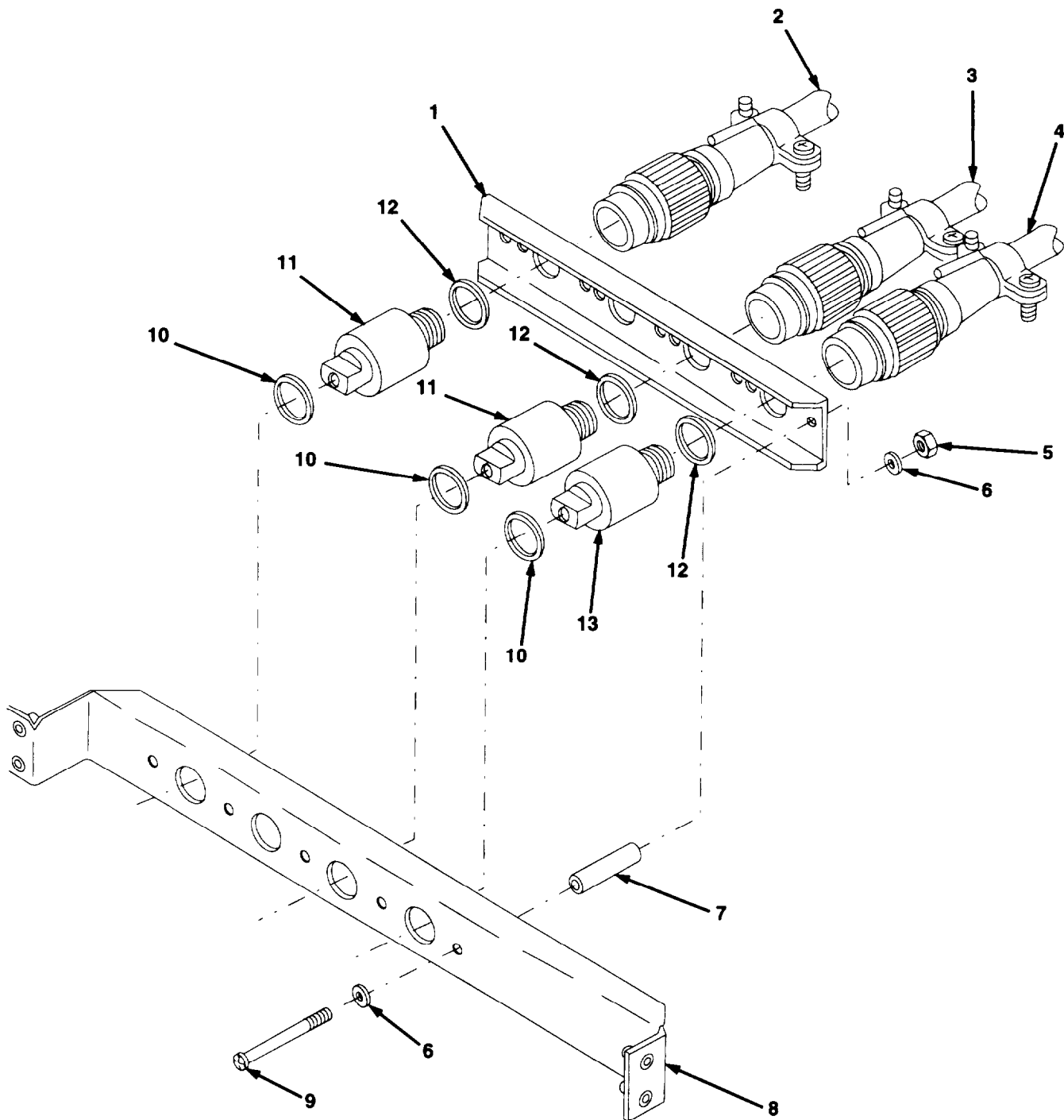


Figure F-10. Bracket Assembly



## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 010208 BRACKET ASSEMBLY, SWITCH PRESSURE	
					FIG. F-10 PRESSURE SWITCH BRACKET ASSEMBLY	
					31-15-2317	
1	XAOZZ		81361	31-15-2309	CHANNEL, RETAINER	1
*2	PAOZZ	6150012227853	81361	31-15-2373-40	CABLE ASSEMBLY, SPEC W 16 CABLE	1
*3	PAOZZ	6150012188611	81361	31-15-2373-10	CABLE ASSEMBLY, SPEC W 13 CABLE	1
*4	PAOZZ	6150012237253	81361	31-15-2373-30	CABLE ASSEMBLY, SPEC W 15 CABLE	1
5	PAOZZ	5310008775797	96906	MS21044N3	NUT, SELF-LOCKING, HE	5
*6	PAOZZ	5310000145850	96906	MS27183-42	WASHER, FLAT..	10
7	XDOZZ		81361	31-15-2323	SPACER	5
*8	XAOZZ		81361	31-15-2310	BRACKET, MOUNTING	1
9	PAOZZ	5305009580671	96906	MS35207-274	SCREW, MACHINE	5
*10	PAOZZ	5330002920570	96906	MS28775-210	O-RING..	3
11	PAOZZ	5930012341337	02750	6607-1-154	SWITCH, PRESSURE	2
*12	PAOZZ	5331011057263	96906	MS28775-208	O-RING..	3
13	PAOZZ	5930012340563	02750	6607-3-158	SWITCH, PRESSURE	1

END OF FIGURE

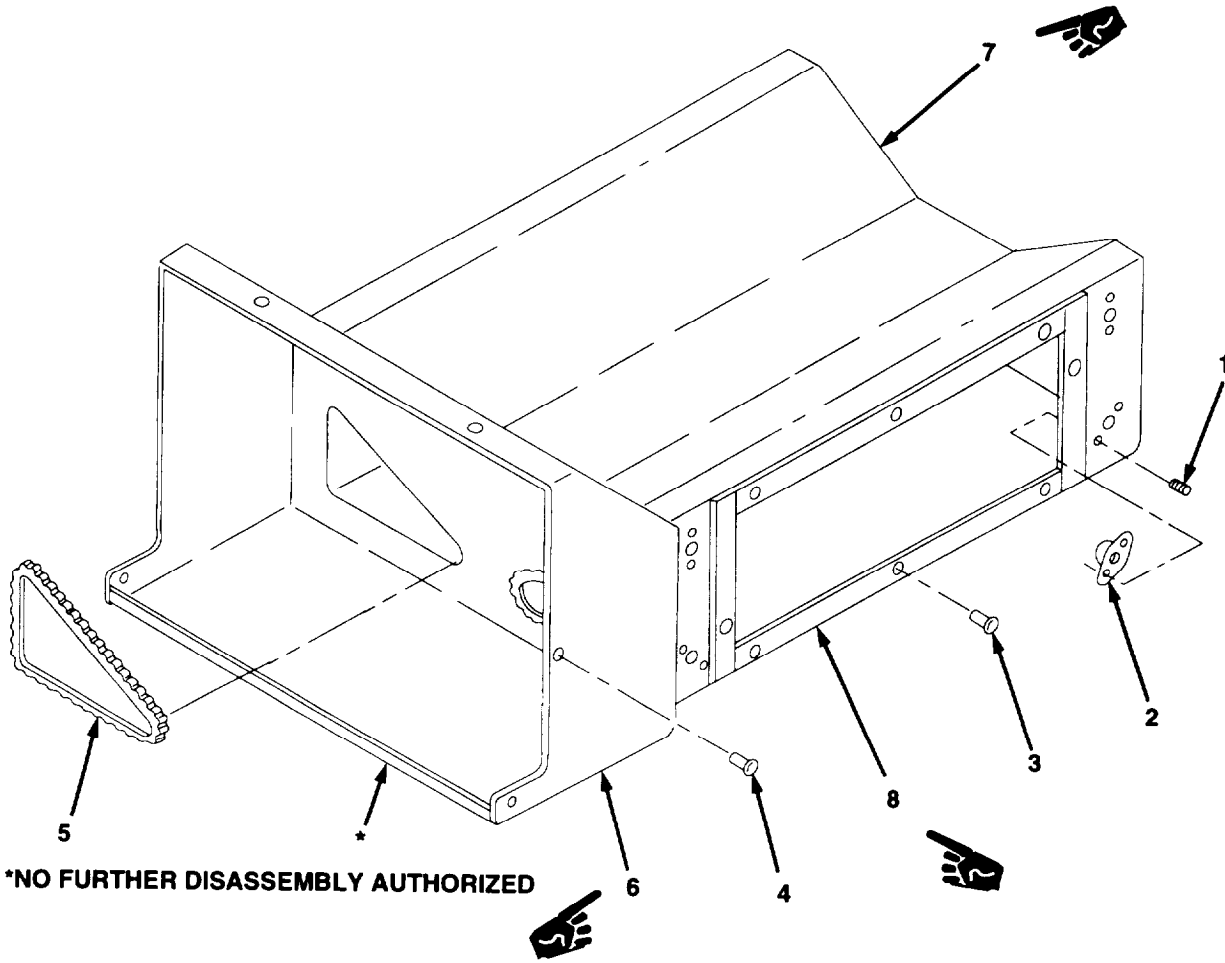


Figure F-11. Equipment Container

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) FSCM	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 010209 CONTAINER, EQUIPMENT						
FIG. F-11 EQUIPMENT CONTAINER						
31-15-2389						
*1	XDOZZ		96906	MS20605B3W4	RIVET,BLIND	16
*2	XDOZZ		96906	MS21059-L4	NUT,SELF-LOCKING,PL	8
*3	XDOZZ		96906	MS27130-S99K	NUT,PLAIN,BLIND RIV	16
*4	XDOZZ		96906	MS27130-S133	NUT,PLAIN,BLIND RIV	4
*5	MOOZZ		81361	NP1 12	GROMMET,EQUIPMENT,MAKE FROM P/N MS21266-3N/NSN 5325-01-025-4479	2
6	XAOZZ		81361	31-15-2356	ENCLOSURE,FRONT	1
7	XAOZZ		81361	31-15-2357	ENCLOSURE,REAR	1
*8	MOOZZ		81361	NPN 30	GASKET MAKE FROM P/N 81349MILR900/NSN 5330-00-057-4557	1
END OF FIGURE						

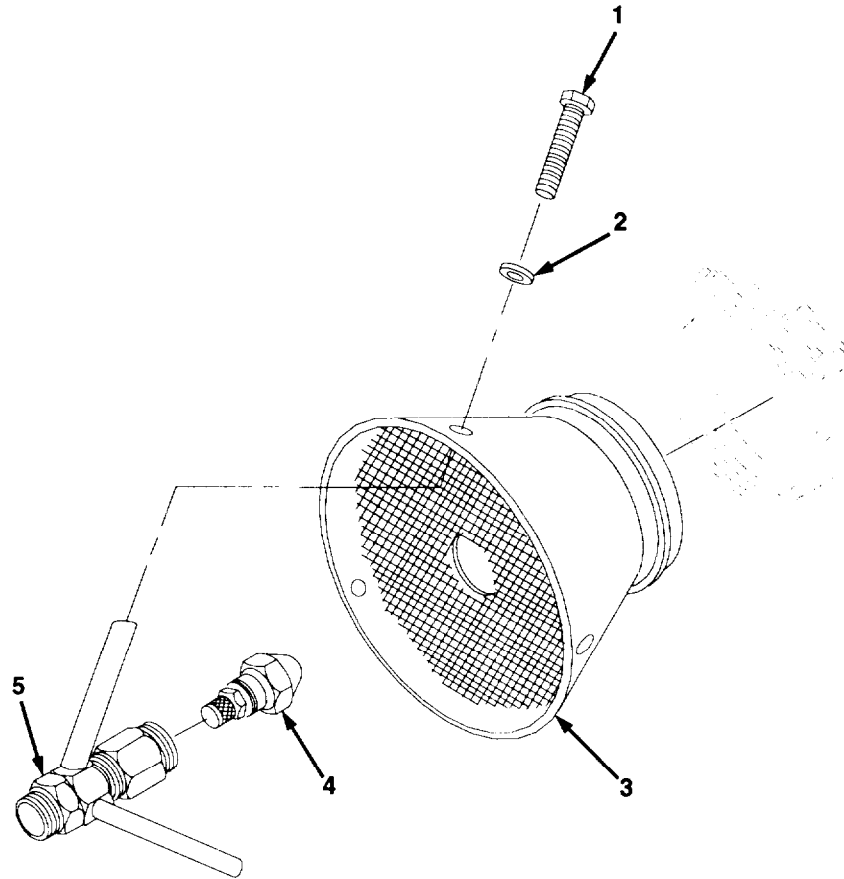


Figure F-12. Nozzle Assembly

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 0103 NOZZLE ASSEMBLY						
FIG. F-12 NOZZLE ASSEMBLY						
31-15-3307						
*1	PAOZZ	5305000521457	96906	MS35308-303	SCREW,CAP,HEXAGON,H	3
*2	PAOZZ	5310005432740	96906	MS35333-74	WASHER, LOCK	3
*3	XAOZZ		81361	31-15-2334	CONE ASSY,WELDMENT	1
*4	PBOZZ	2910014463219	81361	31-15-3306	NOZZLE ASSY,FUEL 01	1
*5	XAOZZ		81361	31-15-2336	SUPPORT ASSY,NOZZLE	1

END OF FIGURE

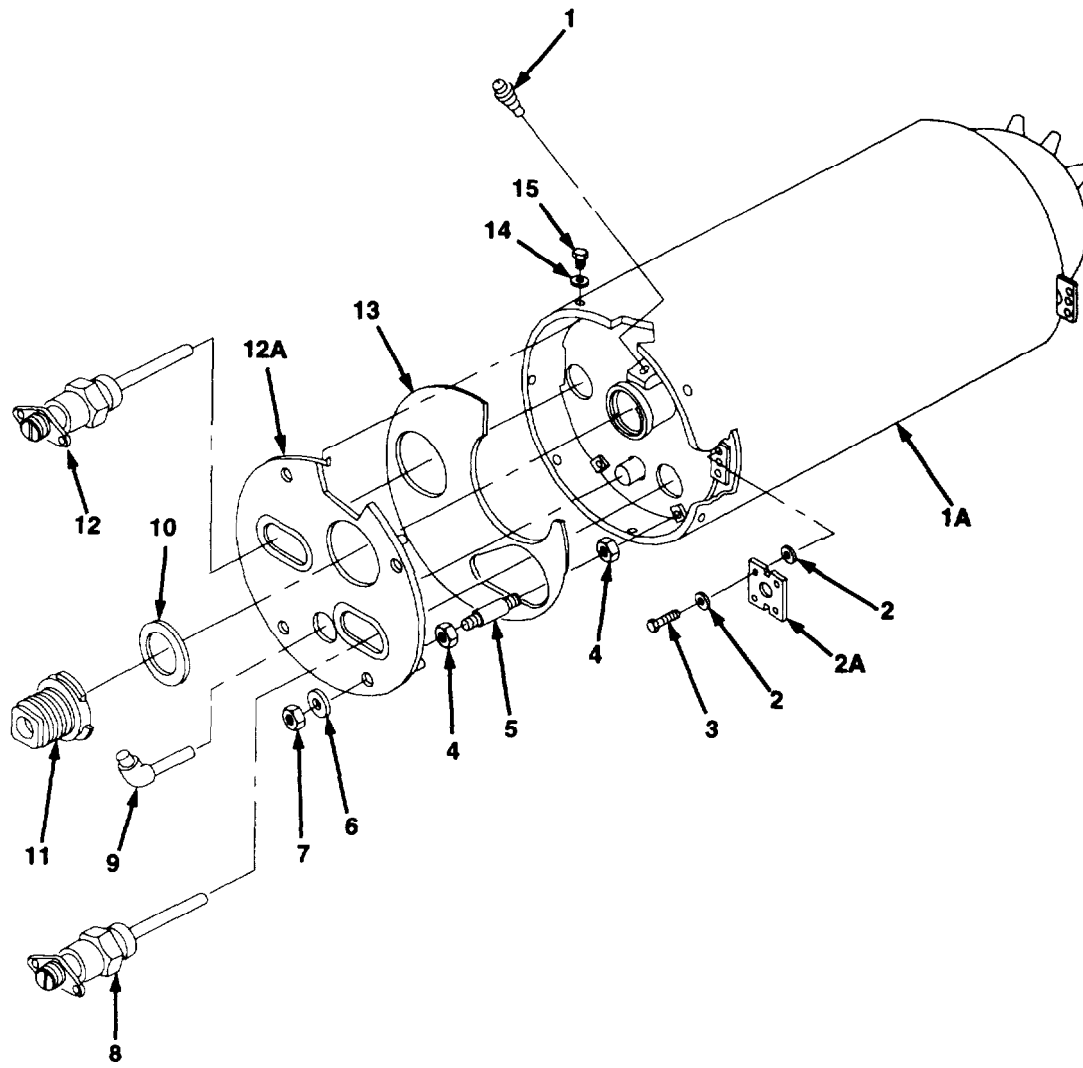


Figure F-13. Pulse Jet Engine Assembly 31- 15-2342

## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 0104 ENGINE ASSY, PULSE JET						
FIG. F-13 PULSE JET ENGINE ASSEMBLY						
31-15-2342						
*1	PAOZZ	2920012639720	70673	0271209	IGNITER,SPARK,GAS T	1
*1A	XAOZZ		81361	NPN 15	SHELL,OUTER	1
2	PAOZZ	5310001788631	96906	MS35333-75	WASHER,LOCK	12
2A	XDOZZ		81361	31-15-618	SUPPORT,SMOKE OUTLE	4
3	PAOZZ	5305002525101	96906	MS35308-329	SCREW,CAP,HEXAGON H	6
*4	PAOZZ	5310002686057	88044	AN316C5R	NUT,PLAIN,HEXAGON	4
5	PAOZZ	5307006384046	81361	B31-15-977	STUD,PLAIN	4
6	PAOZZ	5310008024701	96906	MS15795-813	WASHER,FLAT	4
7	PAOZZ	5310008238835	96906	MS21045-C5	NUT,SELF-LOCKING,HE	8
8	PAOZZ	5930012219466	81361	31-15-2294-10	SWITCH,THERMOSTATIC	1
*9	XDOZZ		81361	31-15-2296	ELBOW,OIL INJECTION	1
10	PAOZZ	5330005074900	81361	B31-15-989	GASKET	1
*11	PACOO	2805014259864	81361	31-15-2345	MANIFOLD,INTAKE	1
*12	PAOZZ	5930014425092	81381	31-15-2294-30	SWITCH,THERMOSTATIC	1
12A	XDOZZ		81361	31-15-2293	BAFFLE,COOLING	1
*13	PAOZZ	1560012573416	81361	31-15-2358	INSULATION,THERMAL	1
14	PAOZZ	5310008098544	96906	MS27183-7	WASHER,FLAT	11
15	PAOZZ	5305002118193	96906	MS51849-54	SCREW,MACHINE	11
END OF FIGURE						

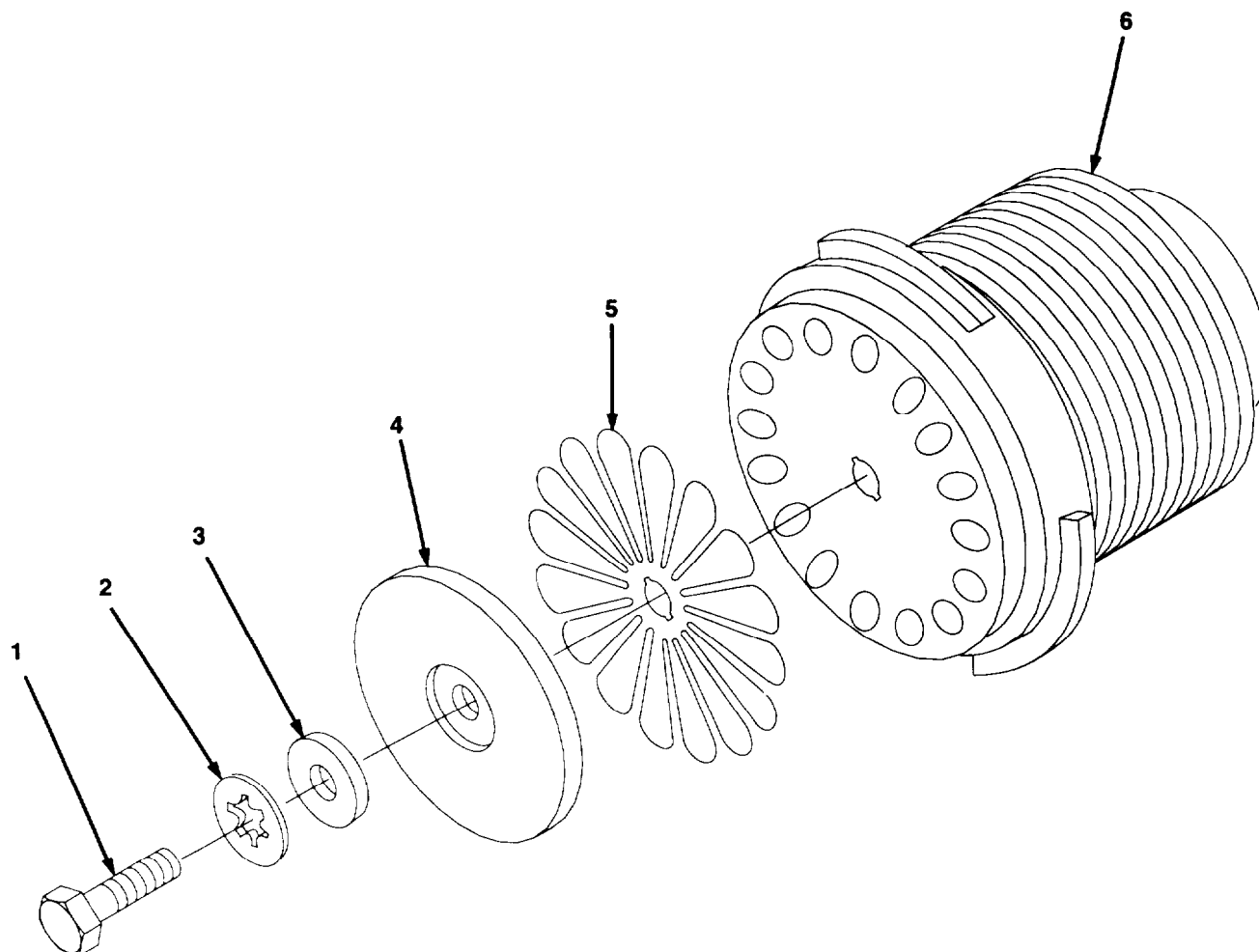


Figure F-14. Engine Head Assembly

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 010401 HEAD ASSEMBLY, ENGINE						
FIG. F-14 ENGINE HEAD ASSEMBLY						
31-15-2945						
1	PACZZ	5306006379674	96906	MS35307-336	BOLT,MACHINE	1
2	PACZZ	5310001788631	96906	MS35333-75	WASHER,LOCK	1
3	PACZZ	5310005139955	81361	831-15-1095	WASHER,RECESSED	1
4	PACZZ	1040006999805	81361	B31-15-1035	BACKSTOP,ENGINE VAL	1
*5	PACZZ	1040005540458	81361	B31-15-1036	VALVE,SMOKE GENERAT	1
*6	XAOZZ		81361	31-15-2946	ENGINE HEAD & ADAPT	1
END OF FIGURE						

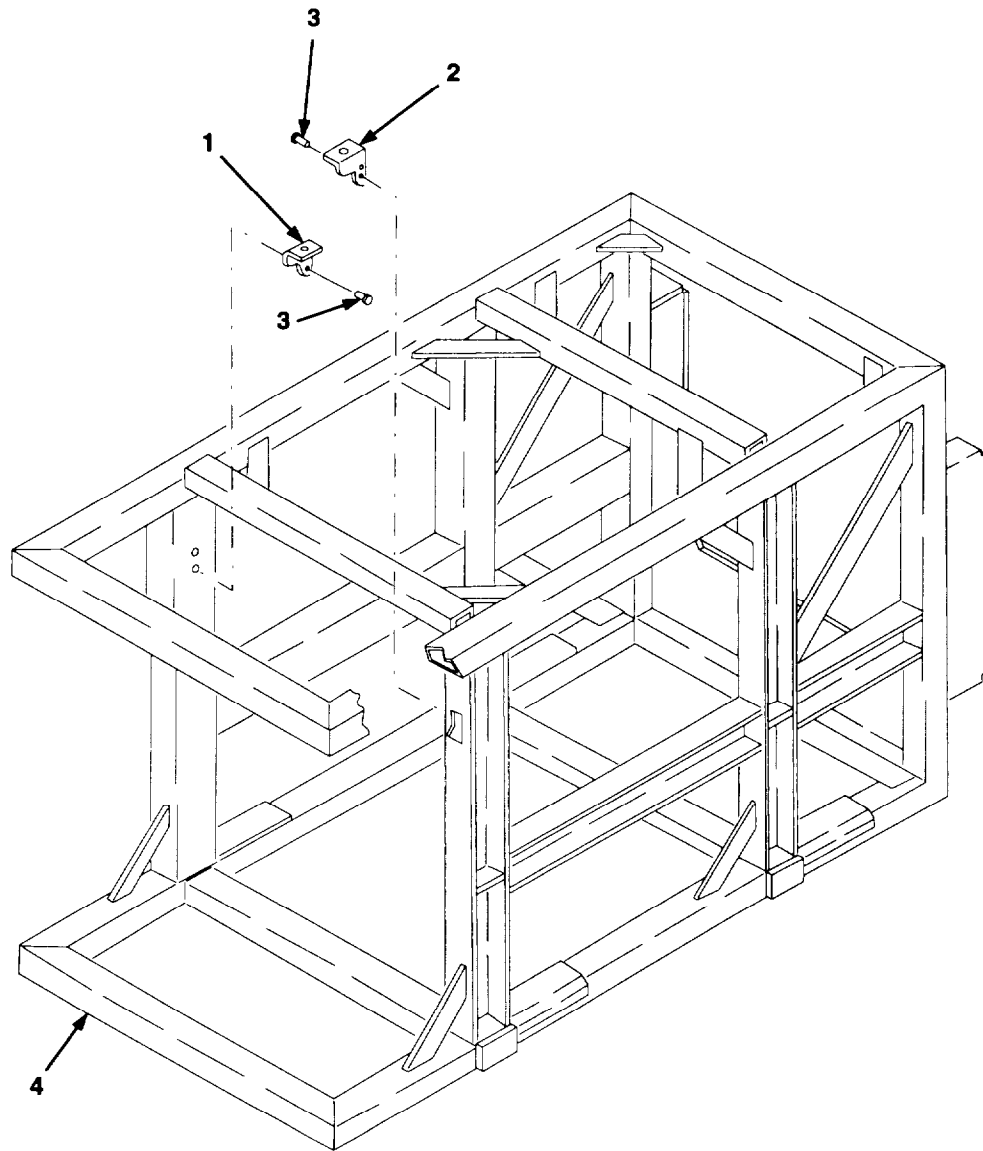
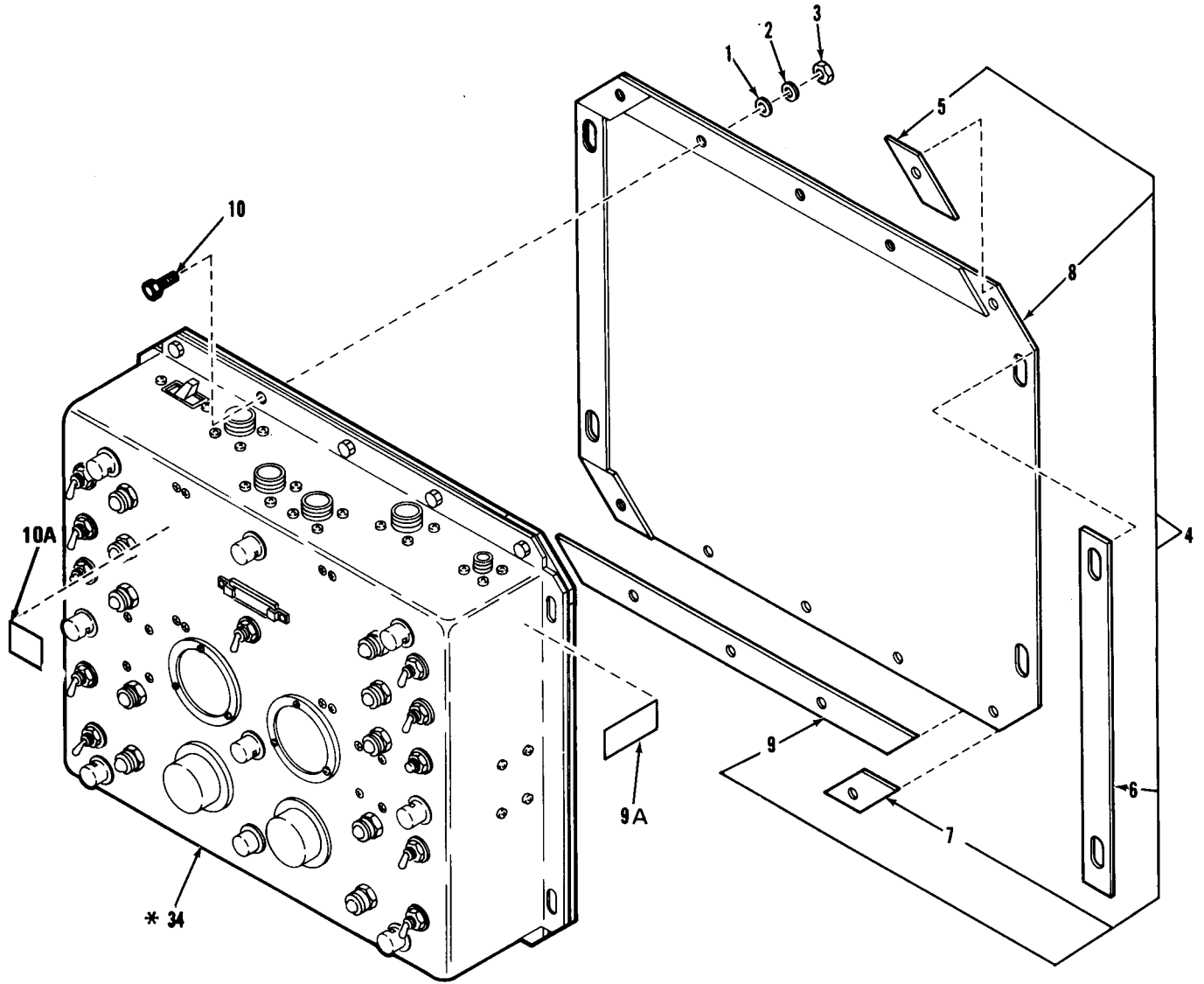


Figure F-15. Frame Assembly

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 0105 FRAME ASSEMBLY						
FIG. F-15 FRAME ASSEMBLY						
31-15-2258						
*1	XDOZZ		61423	841171	BRACKET,ANGLE (RIGHT)	1
*2	XDOZZ		61423	841170	BRACKET,ANGLE (LEFT)	1
*3	XDOZZ		96906	MS20613-4C6	RIVET,SOLID	1
*4	XAOZZ		81361	NPN 16	FRAME WELDMENT ASSY	1
END OF FIGURE						

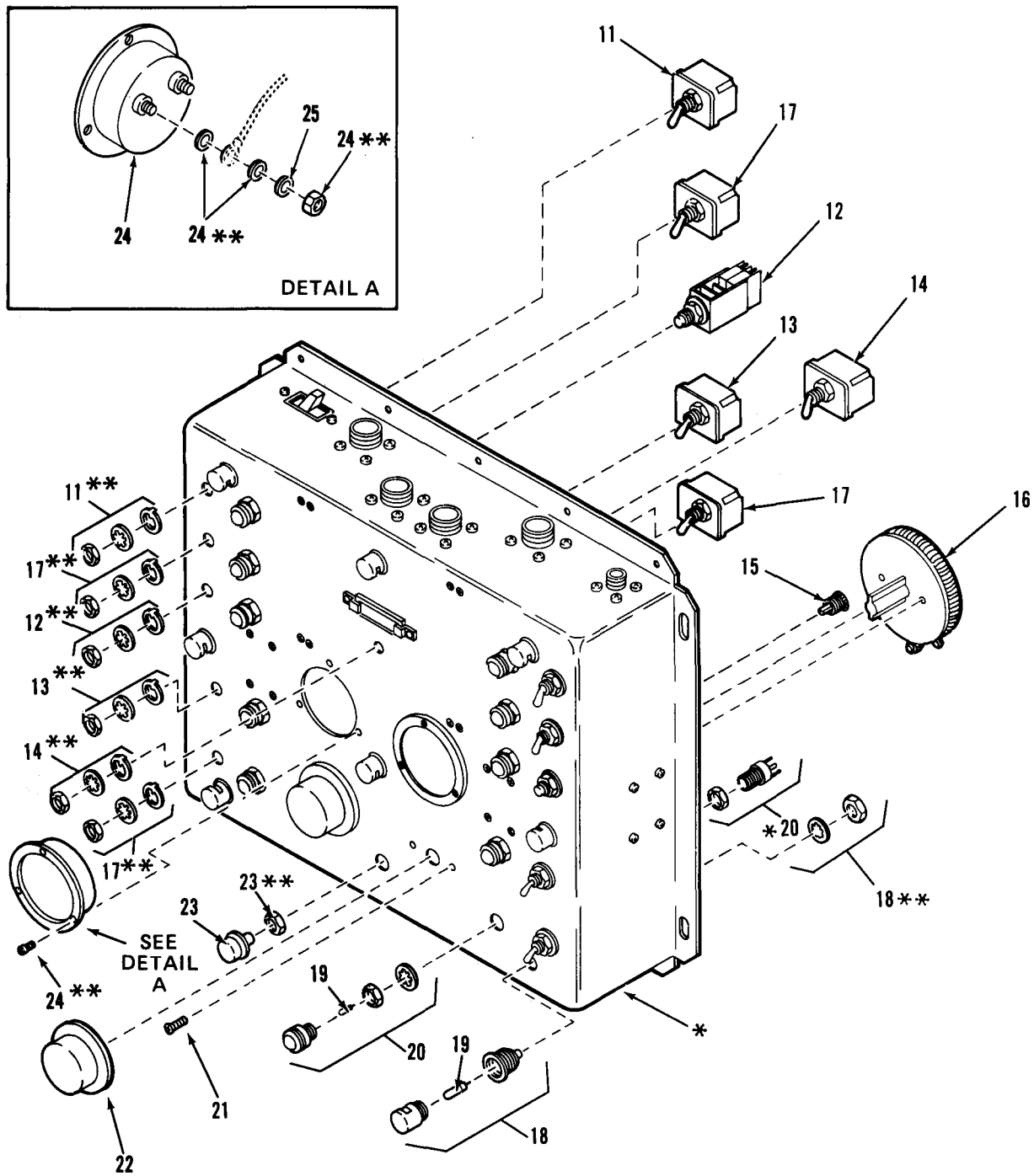






**\* FURTHER DISASSEMBLY  
ON SHEET 2 OF 4**

*Figure F-16. Control Panel Assembly Panel Cover (Sheet 1 of 4)*



\* FURTHER DISASSEMBLY  
ON SHEET 3 OF 4

\*\* SUPPLIED WITH IDENTICALLY  
NUMBERED PART

Figure F-16. Control Panel Assembly Panel Cover (Sheet 2 of 4)

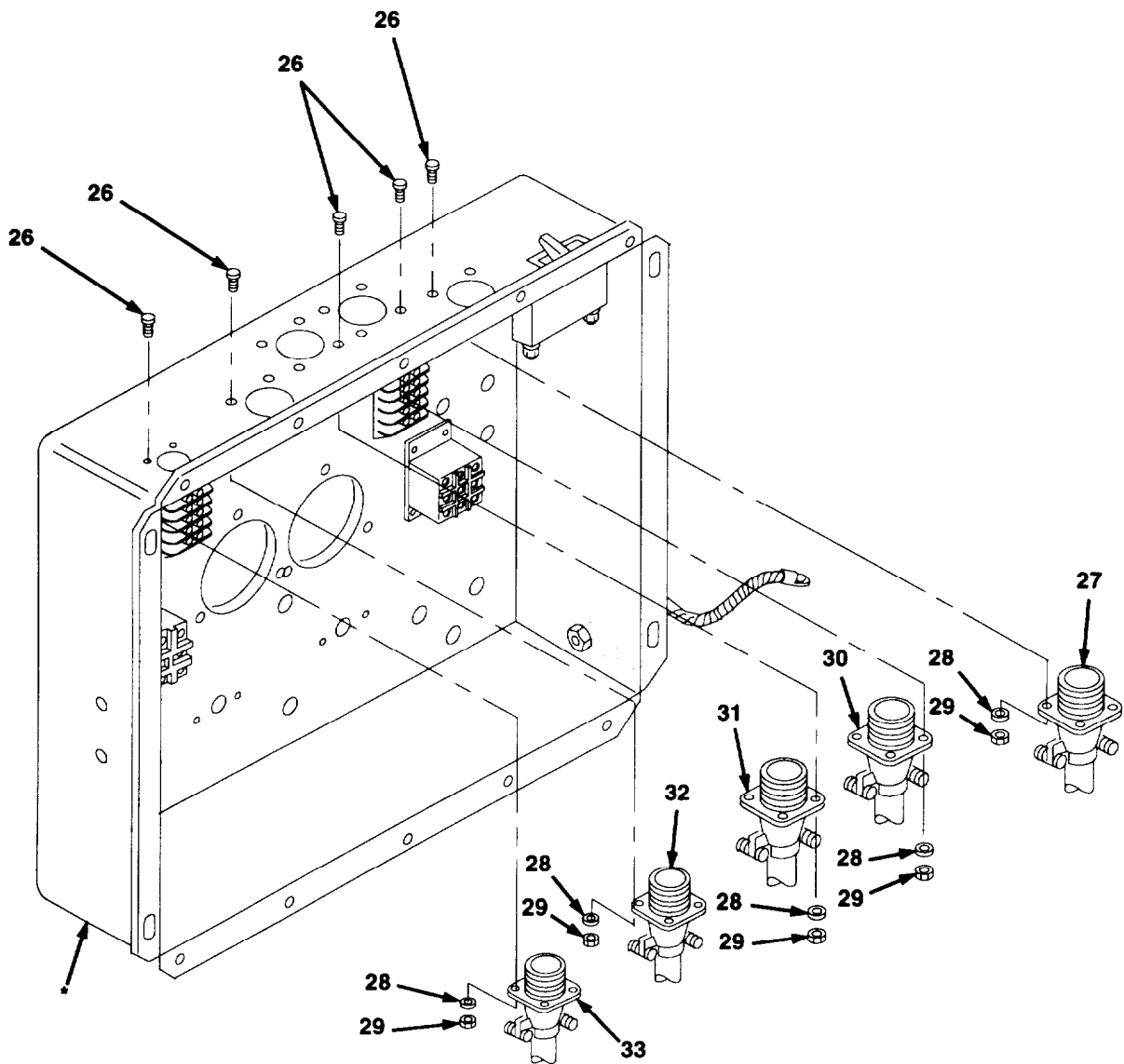


Figure F-16. Control Panel Assembly and Panel Cover (Sheet 3 of 4)

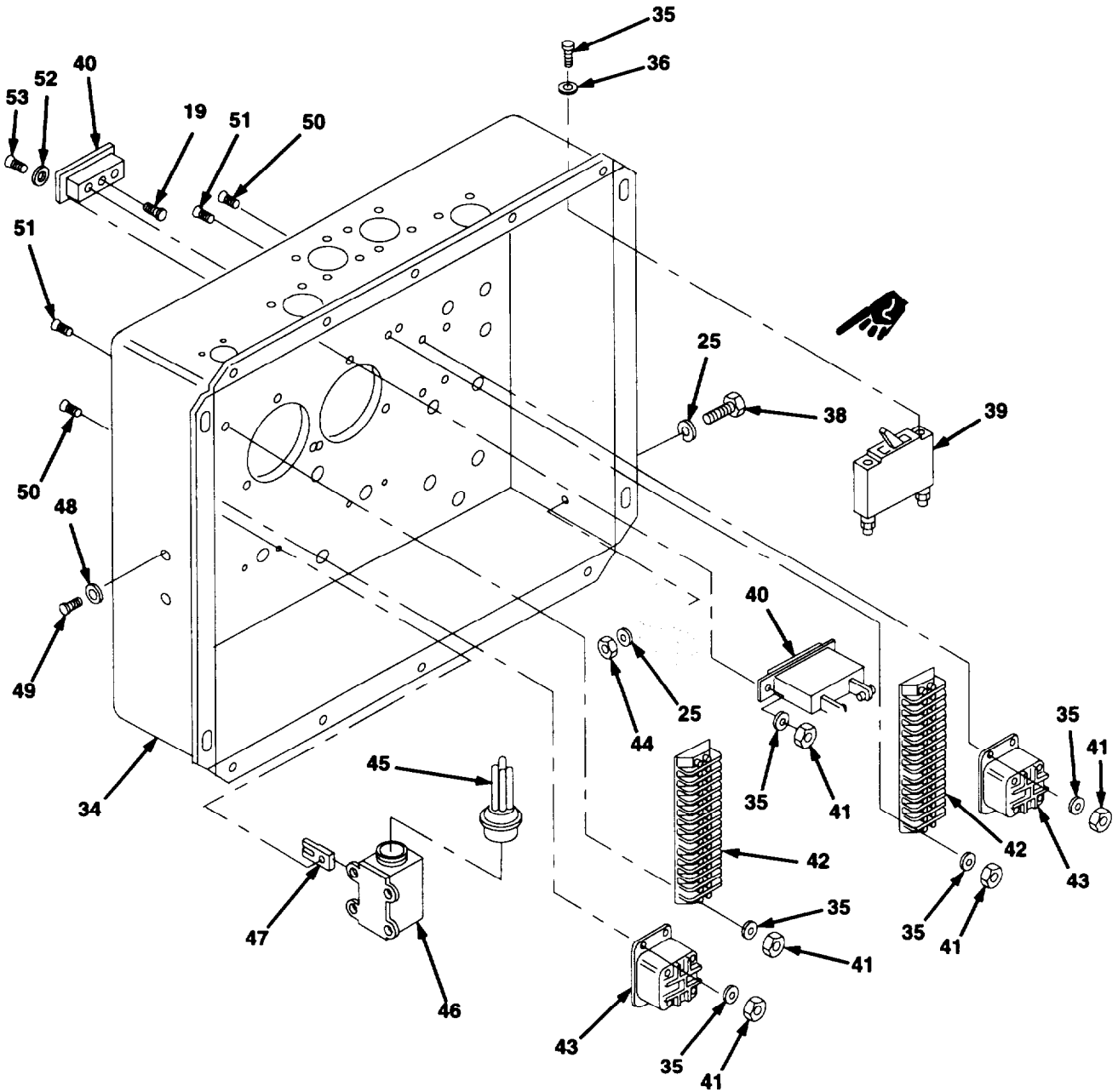


Figure F-16. Control Panel Assembly and Panel Cover (Sheet 4 of 4)

## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(3) CAGEC	(4) PART NUMBER	(5) DESCRIPTION AND USABLE ON CODES (UOC)	(6) QTY
					GROUP: 02 & 0201 CONTROL-INDICATOR AND PANEL COVER	
					FIG. F-16 CONTROL-INDICATOR, AND PANEL COVER	
					31-15-2256 AND 31-15-2441	
1	PAOZZ	5310005590070	96906	MS35333-38	WASHER,LOCK	14
*2	PAOZZ	5310007653197	96906	MS27183-41	WASHER,FLAT	10
3	PAOZZ	5310009349757	96906	MS35649-282	NUT,PLAIN,HEXAGON	14
4	XAOOO		81361	31-15-2441	COVER,PANEL	1
*5	MOOZZ		81361	31-15-2725	GASKET MAKE FROM SHEET,RUBBER,SOLID, PIN MILR900 NSN 5330-00-057-4557	2
*6	MOOZZ		81361	31-15-2724	GASKET MAKE FROM SHEET,RUBBER,SOLID, P/N MILR900 NSN 5330-00-057-4557	2
*7	MOOZZ		81361	31-15-2726	GASKET MAKE FROM SHEET,RUBBER,SOLID, P/N MILR900 NSN 5330-00-057-4557	2
*8	XAOZZ		81361	31-15-2728	PANEL..	1
*9	MOOZZ		81361	31-15-2727	GASKET MAKE FROM SHEET,RUBBER,SOLID, P/N MILR900 NSN 5330-00-057-4557	2
9A	XDOZZ		81361	31-15-2665-2	PLATE,IDENTIFICATIO	1
10	PAOZZ	5305009584359	96906	MS35207-246	SCREW,MACHINE	14
*10A	XDOZZ		81361	31-15-2906	PLATE,WARNING	1
11	PAOZZ	5930006603953	96906	MS24525-22	SWITCH,TOGGLE	2
12	PAOZZ	5930009994401	81349	M8805/23-001	SWITCH,PUSH	2
13	PAOZZ	5930007269508	96906	MS27406-2	SWITCH,TOGGLE	1
14	PAOZZ	5930006831632	96906	MS24523-26	SWITCH,TOGGLE	1
15	PAOZZ	5905009313808	81349	M22-01-00151SB	RESISTOR,VARIABLE,W	1
16	PAOZZ	5905008064199	81349	M22-09-00081SD	RESISTOR,VARIABLE,W	2
17	PAOZZ	5930000117872	96906	MS27407-5	SWITCH,TOGGLE	4
*18	PAOZZ	6210012321009	83330	113-1930-2934-201	LIGHT,PANEL	8
19	PAOZZ	6240009510608	08719	8327	LAMP,INCANDESCENT	8
20	PAOZZ	6210011296294	96906	MS25041-3-327	LIGHT,INDICATOR	10
21	PAOZZ	5305009847361	96906	MS35191-270	SCREW,MACHINE	4
22	PAOZZ	5355012586245	96906	MS91528-402B	KNOB..	2
23	PAOZZ	5355008171338	44655	5151	KNOB	1
*24	PAOZZ	6625012237263	15309	365-747	VOLTMETER	2
*25	PAOZZ	5310005501130	96906	MS35333-40	WASHER,LOCK	6
26	PAOZZ	5305008892999	96906	MS35206-217	SCREW,MACHINE	20
27	PAOZZ	6150012187090	81361	31-15-2362	CABLE ASSEMBLY,SPEC	1
28	PAOZZ	5310005432410	96906	MS35338-40	WASHER,LOCK	20
29	PAOZZ	5310009349739	96906	MS35649-242	NUT,PLAIN,HEXAGON	20
30	PAOZZ	6150012187035	81361	31-15-2383-10	CABLE ASSEMBLY,SPEC	1
31	PAOZZ	6150012237254	81361	31-15-2383-20	CABLE ASSEMBLY,SPEC	1
32	PAOZZ	6150012188612	81361	31-15-2422	CABLE ASSEMBLY,SPEC	1
33	PAOZZ	6150012187034	81361	31-15-2420	CABLE ASSEMBLY,SPEC	1
34	XAOZZ		81361	31-15-2268	PANEL,INSTRUMENT	1
35	PAOZZ	5305009644988	96906	MS35206-228	SCREW,MACHINE	2
36	PAOZZ	5310000454007	96906	MS35338-41	WASHER,LOCK	18
*37					DELETED	
38	PAOZZ	5305000680502	96906	MS90725-6	SCREW,CAP,HEXAGON H	1
39	PAOZZ	5925012334247	61541	UPL-1-1-52-603-M	CIRCUIT BREAKER	1
40	PAOZZ	6340007590710	72914	65-0136-7	INDICATOR,FIRE	1
41	PAOZZ	5310009349747	96906	MS35649-262	NUT,PLAIN,HEXAGON	16
42	XDOZZ		83330	37TBF-16SSCRES	TERMINAL BOARD	2

## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
43	PAOZZ	5945002258692	96906	MS24149-D1	RELAY,ELECTROMAGNET	2
44	PAOZZ	5310009971888	96906	MS35649-2252	NUT,PLAIN,HEXAGON	1
*45	PAOZZ	5995012305177	81361	31-15-2383-30	WIRING HARNESS,BRAN UOC:16Y	1
46	PAOZZ	1040012261667	61423	89909450	UNIT,CONTROL,FIRE	1
47	PAOZZ	5310009014326	60119	130061	NUT,CLIP-ON	4
48	PAOZZ	5310005765752	96906	MS35333-39	WASHER,LOCK	4
49	PAOZZ	5305009897435	96906	MS35207-264	SCREW,MACHINE	4
50	PAOZZ	5305000594553	96906	MS35190-238	SCREW,MACHINE	8
51	PAOZZ	5305009585450	96906	MS35190-240	SCREW,MACHINE	8
52	PAOZZ	5340012739500	81361	31-15-2897	BRACKET,DOUBLE ANGL	2
*53	PAOZZ	5305009844992	96906	MS35206-232	SCREW,MACHINE	2

END OF FIGURE

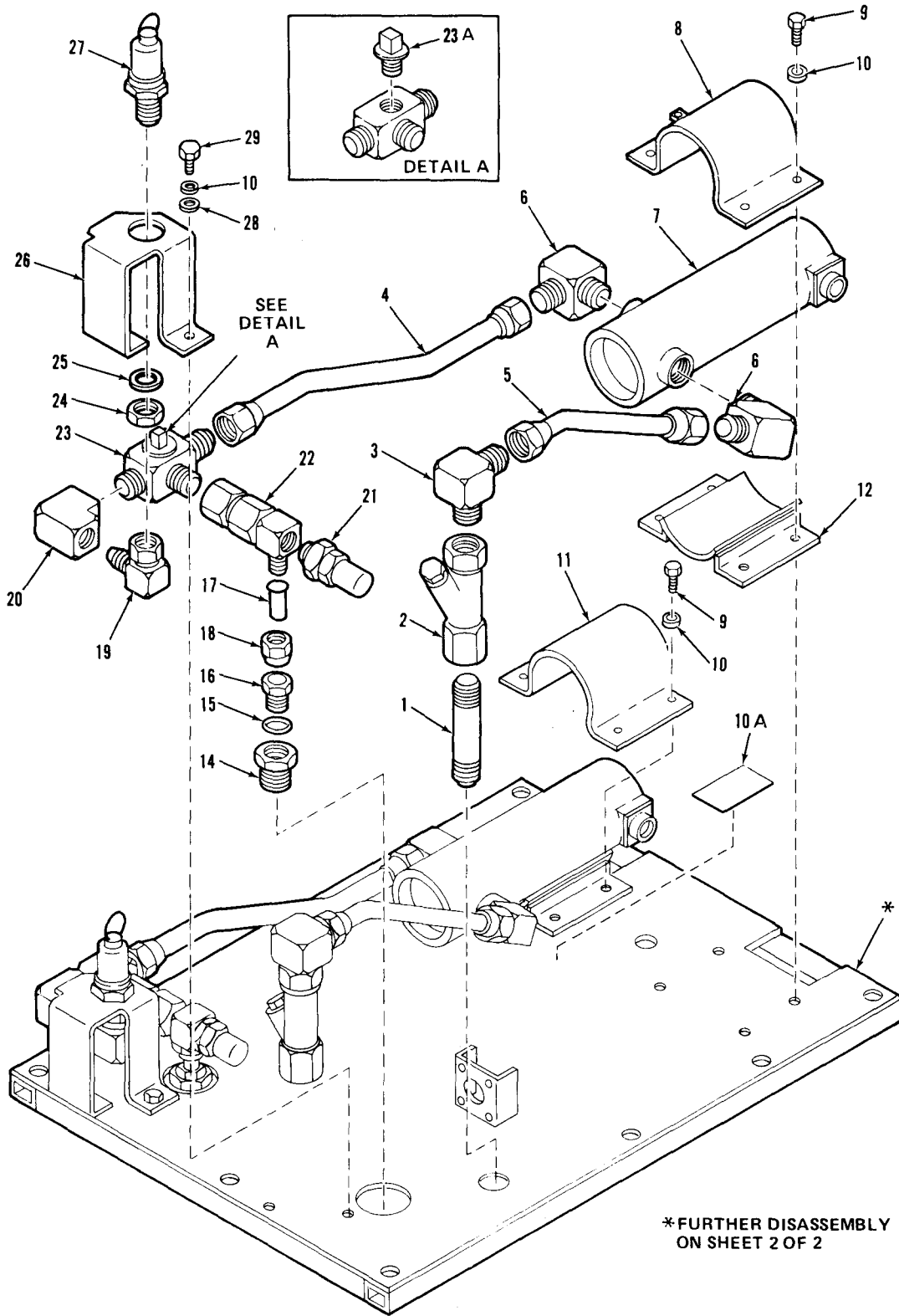
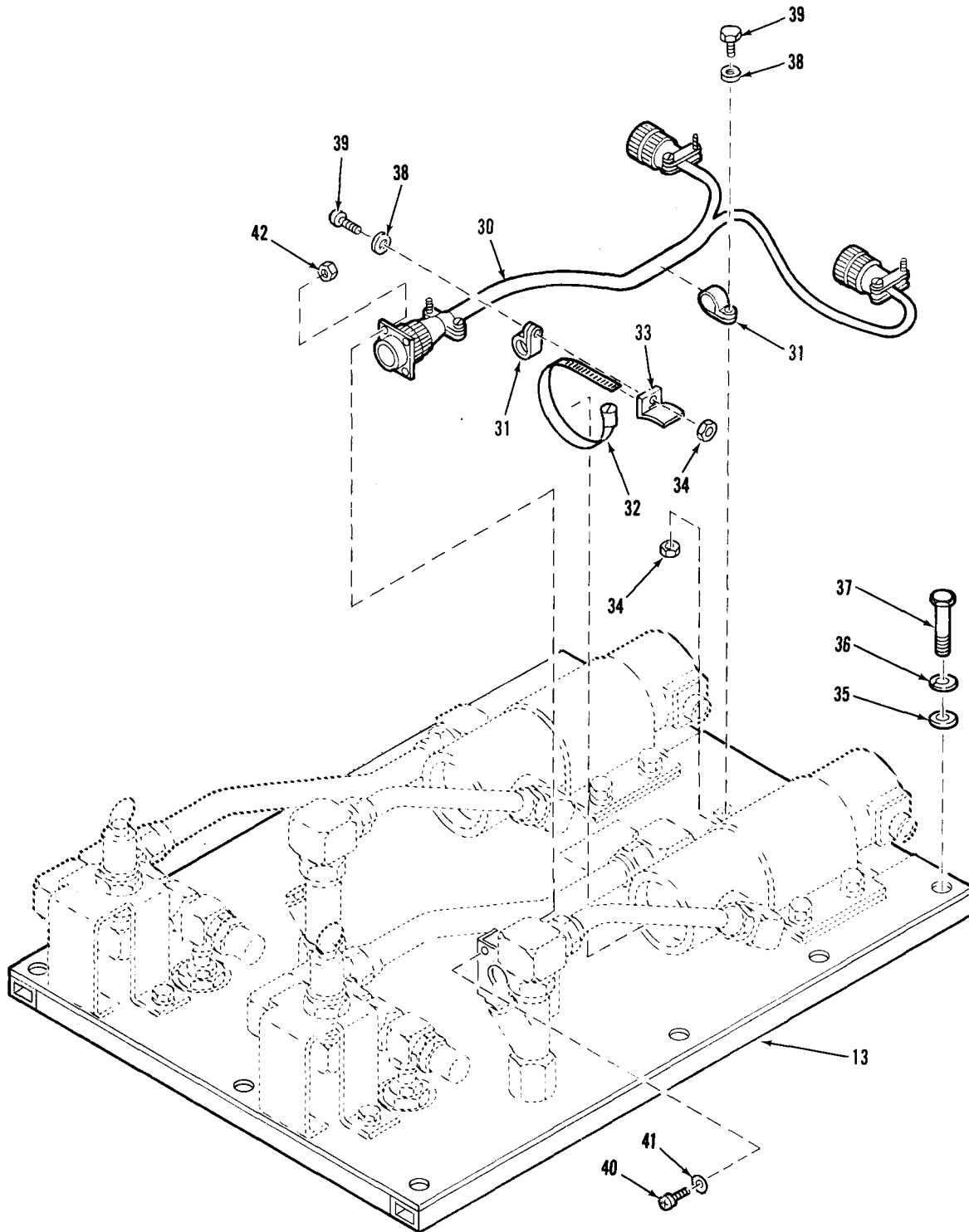


Figure F-17. Fog Oil Pump Assembly (Sheet 1 of 2)





## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 03 PUMP ASSEMBLY, FOG OIL						
FIG. F-17 FOG OIL PUMP ASSEMBLY						
31-15-2284						
1	PAOZZ	4730001961500	96906	MS51953-105	NIPPLE,PIPE	2
*2	XDOOO		41947	A-15178	STRAINER ASSEMBLY (SEE FIG F-18 FOR BREAKDOWN)	2
*3	PAOZZ	4730006188126	96906	MS51504A8-122	ELBOW,PIPE TO TUBE	2
4	AOOOO		81361	31-15-2366	HOSE,ASSEMBLY SEE FIG F-19 BKDN ASSY	2
5	AOOOO		81361	31-15-2302-30	HOSE ASSEMBLY, SEE FIG F-19 BKDN ASSY	2
*6	XDOZZ		96906	MS51527-B8	ELBOW,TUBE TO BOSS	4
*7	PAOOO	2910012545181	25140	164A246	PUMP,FUEL,ELECTRICA (SEE FIG F-20 FOR BREAKDOWN)	2
8	XDOZZ		81361	31-15-2394-20	STRAP	1
9	PAOZZ	5306002259088	96906	MS90726-33	BOLT,MACHINE	8
10	PAOZZ	5310000814219	96906	MS27183-12	WASHER,FLAT	12
10A	XDOZZ		81361	31-15-2865-4	PLATE,IDENTIFICATIO	1
11	XDOZZ		81361	31-15-2394-10	STRAP	1
12	XDOZZ		81361	31-15-2431	BRACKET,SUPPORT PUM	2
*13	XBOZZ		81361	31-15-2393	PANEL ASSEMBLY	1
*14	PAOZZ	4730009847175	01276	2081-12-8B	BUSHING,PIPE	2
*15	PAOZZ	5331002483840	96906	MS29513-014	O-RING	2
16	PAOZZ	4730012251404	81361	31-15-2447	ADAPTER,STRAIGHT,PI	2
17	PAOZZ	4730012203270	81361	31-15-2445	COUPLING,TUBE	2
*18	PAOZZ	4730002280826	96906	MS35872-4	NUT,TUBE COUPLING	2
19	PAOZZ	4730011155150	01276	2250-8-88	ELBOW,PIPE TO TUBE	2
*20	PAOZZ	4730002493885	96906	MS51845-4	ELBOW,PIPE	2
*21	PAOZZ	4820012261544	86768	634XB-3-82	VALVE,SAFETY RELIEF	2
*22	PAOZZ	4730011837167	01276	2242-8-8S	ADAPTER,STRAIGHT,PI	2
23	XDOZZ		81361	31-15-1500	TEE,MALE PLUG	2
23A	PAOZZ	4730002212136	96906	MS20913-1S	PLUG,PIPE	2
24	PAOZZ	5310002085775	88044	AN924-8	NUT,PLAIN,HEXAGON	2
25	PAOZZ	5310005503714	96906	MS35333-47	WASHER,LOCK	2
26	XDOZZ		81361	31-15-2404	BRACKET,QUICK DISCO	2
*27	XDOZZ		79326	205M4GE8	COUPLING HALF,QUICK	2
28	PAOZZ	5310004079566	96906	MS35338-45	WASHER,LOCK	4
*29	PAOZZ	5306002264825	80204	B1821BH031C075 N	BOLT,MACHINE	4
30	PAOZZ	6150012251227	81361	31-15-2417	CABLE ASSEMBLY,SPEC	1
31	PAOZZ	5340009972964	96906	MS21322-36	CLAMP,LOOP	2
32	PAOZZ	4730009086292	96906	MS35842-14	CLAMP,HOSE	1
33	XDOZZ		81361	31-15-2331	BRACKET,STRAP	1
34	PAOZZ	5310009349751	96906	MS35650-302	NUT,PLAIN,HEXAGON	2
*35	PAOZZ	5305007252317	80204	B1821BH038C150 N	SCREW,CAP,HEXAGON H	12
36	PAOZZ	5310006379541	96906	MS35338-46	WASHER,LOCK	12
37	PAOZZ	5310000806004	96906	MS27183-14	WASHER,FLAT	12
38	PAOZZ	5310000453296	96906	MS35338-43	WASHER,LOCK	2
39	PAOZZ	5305009897435	96906	MS35207-264	SCREW,MACHINE	2
40	PAOZZ	5305008892999	96906	MS35206-217	SCREW,MACHINE	4
41	PAOZZ	5310005432410	96906	MS35338-40	WASHER,LOCK	4
42	PAOZZ	5310009349739	96906	MS35649-242	NUT,PLAIN,HEXAGON	4
END OF FIGURE						

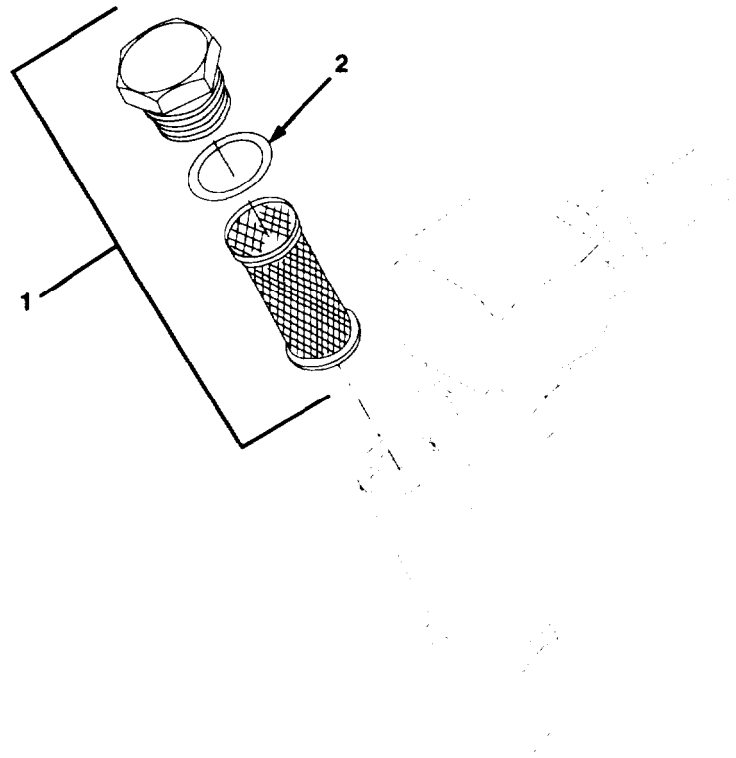


Figure F-18. Strainer Assembly

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 0301 STRAINER ASSEMBLY						
FIG. F-18 STRAINER ASSEMBLY						
A-15178						
1	PAOZZ	4730011788542	41947	A-15124	STRAINER ELEMENT,SE	2
*2	PAOZZ	5331008358974	96906	MS29561-119	O-RING	2
END OF FIGURE						

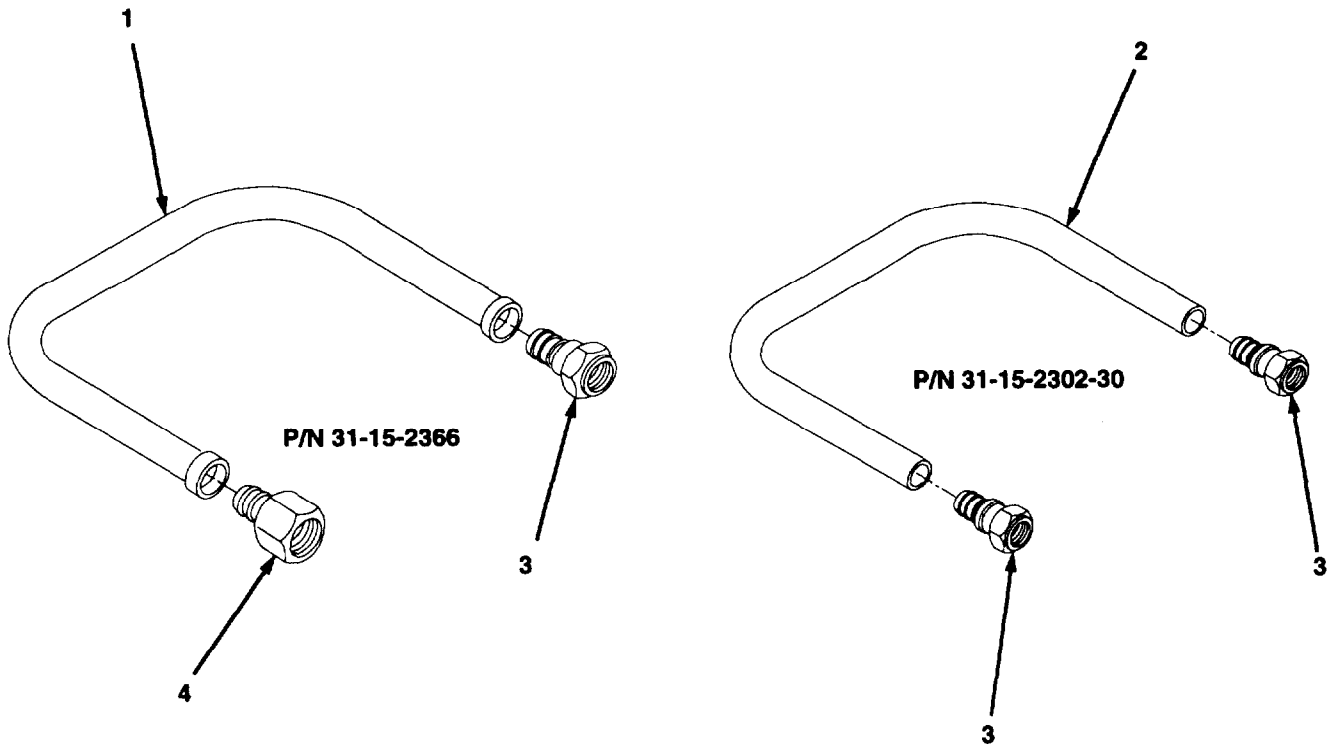
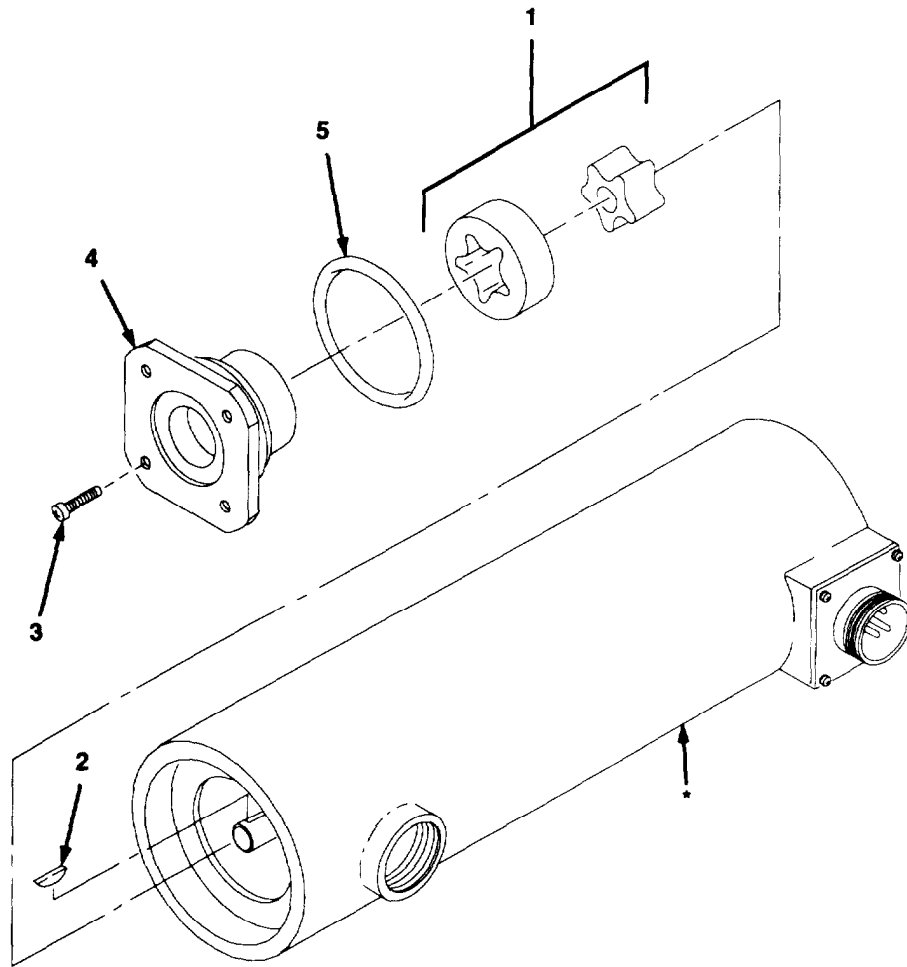


Figure F- 19. Hose Assembly

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 0302 & 0303 HOSE ASSEMBLY, AND HOSE ASSEMBLY, FOG OIL	
					FIG. F-19 HOSE ASSEMBLY, AND FOG OIL HOSE ASSEMBLY	
					31-15-2366 AND 31-15-2302-30	
*1	MOOZZ		81361	31-15-2366-1	HOSE,LOW PRESSURE MAKE FROM HOSE, P/N M24136/3-08/NSN 4720-00-167-4279	1
*2	MOOZZ		81361	31-15-2302-1	HOSE,HYDRAULIC MAKE FROM HOSE P/N M24136/3-08/NSN 4720-00-187-4279	1
3	PAOZZ	4730005422807	00624	4797-8B	ADAPTER,STRAIGHT,TU	2
*4	PAOZZ	4730012713700	01276	4753-8-8B	ADAPTER,STRAIGHT,PI	1
					END OF FIGURE	



**\*NO FURTHER DISASSEMBLY AUTHORIZED**

Figure F-20. Fog Oil Pump

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 0304 PUMP, FOG OIL						
FIG. F-20 FOG OIL PUMP						
(25140) 165A246						
1	PAOZZ	4320011367696	25140	27D1711	GEAR ROTOR SET,ROTA	1
2	PAOZZ	5315011555608	25140	20D863	KEY,WOODRUFF	1
3	PAOZZ	5305006140260	96906	MS35265-17	SCREW,MACHINE..	4
4	PAOZZ	3040011303694	25140	4D2902	HOUSING,MECHANICAL	1
*5	XDOZZ		25140	9D1906-2	PACKING,PREFORMED	1
END OF FIGURE						

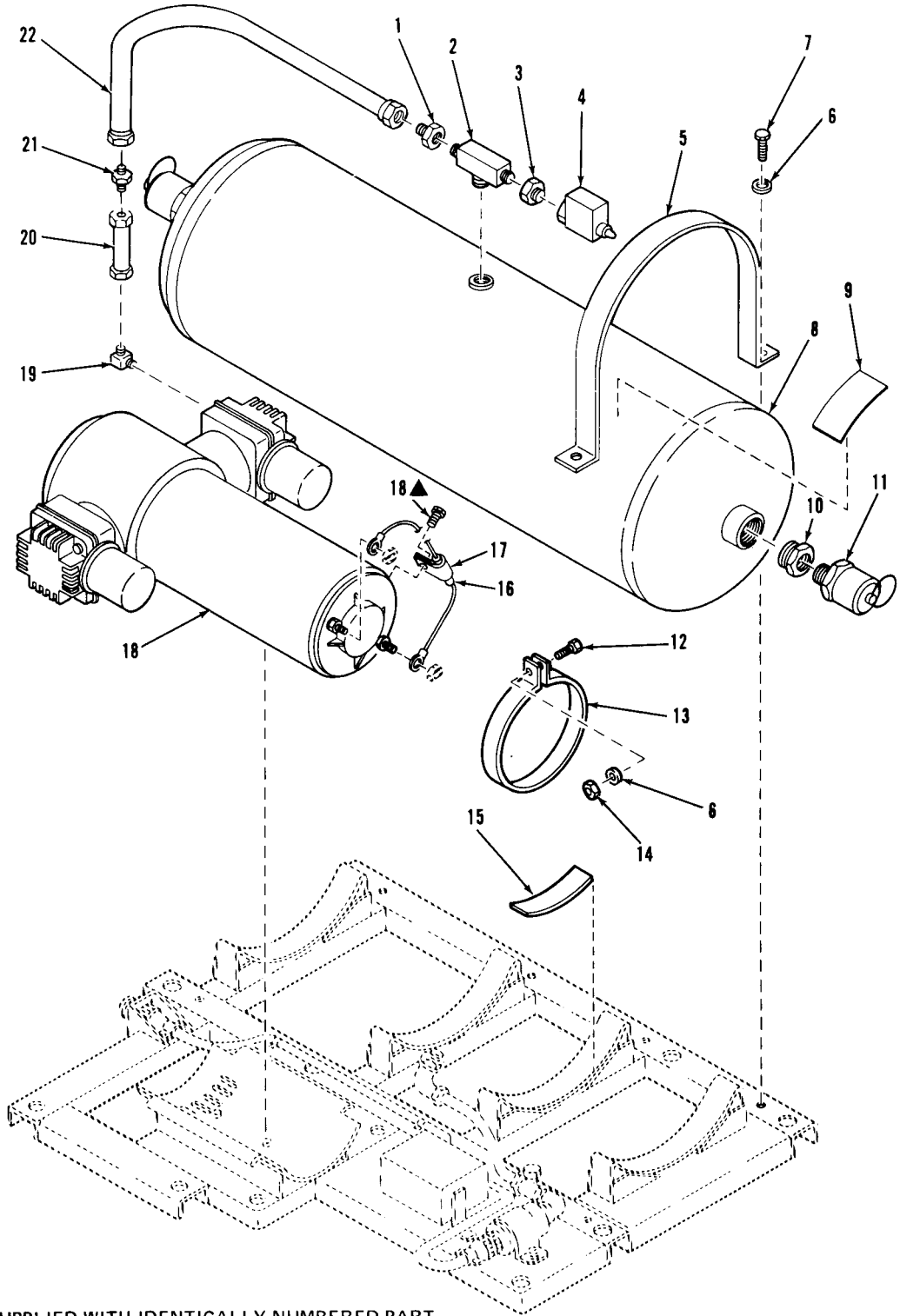


Figure F-21. Air Compressor Assembly (Sheet 1 of 2)

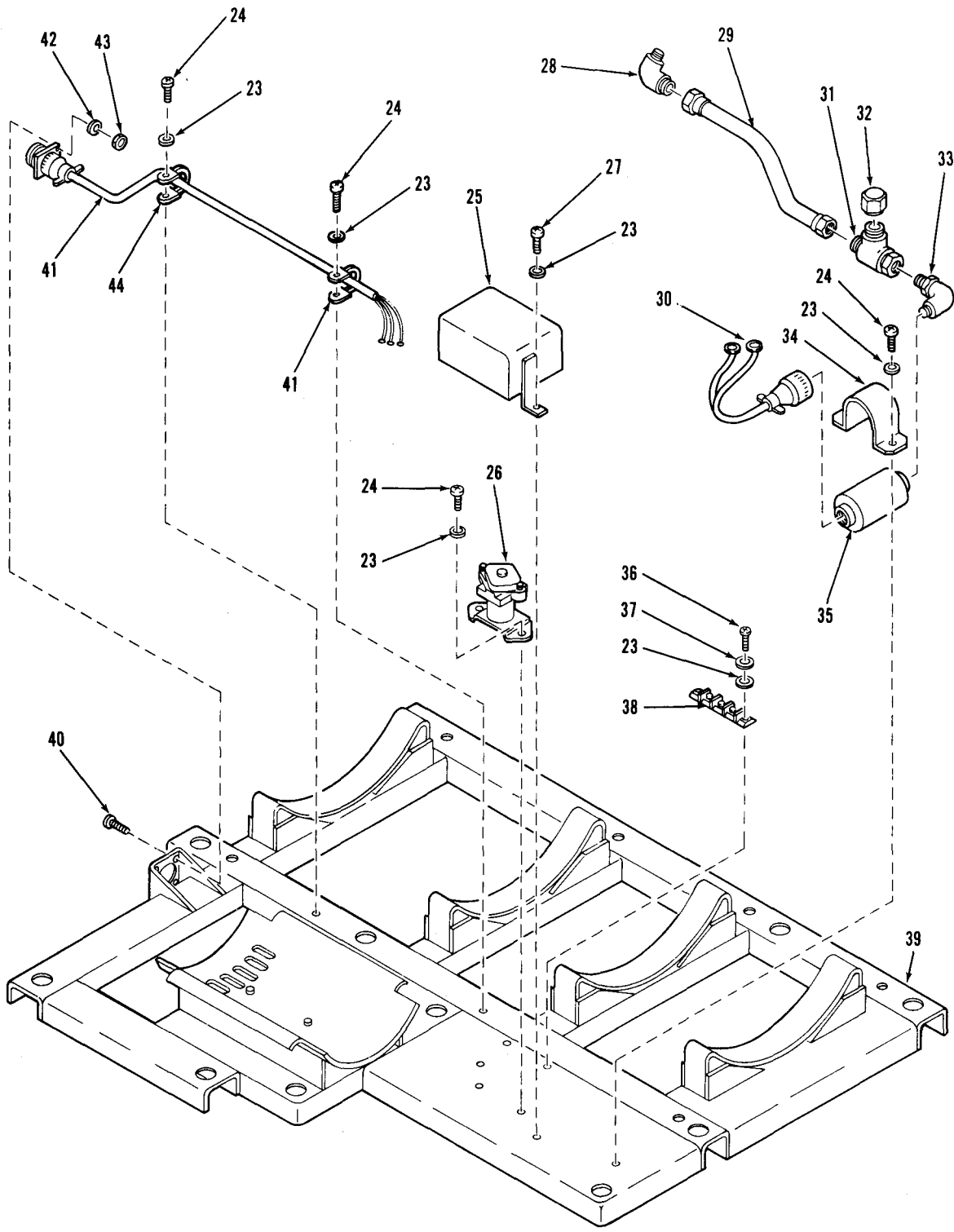
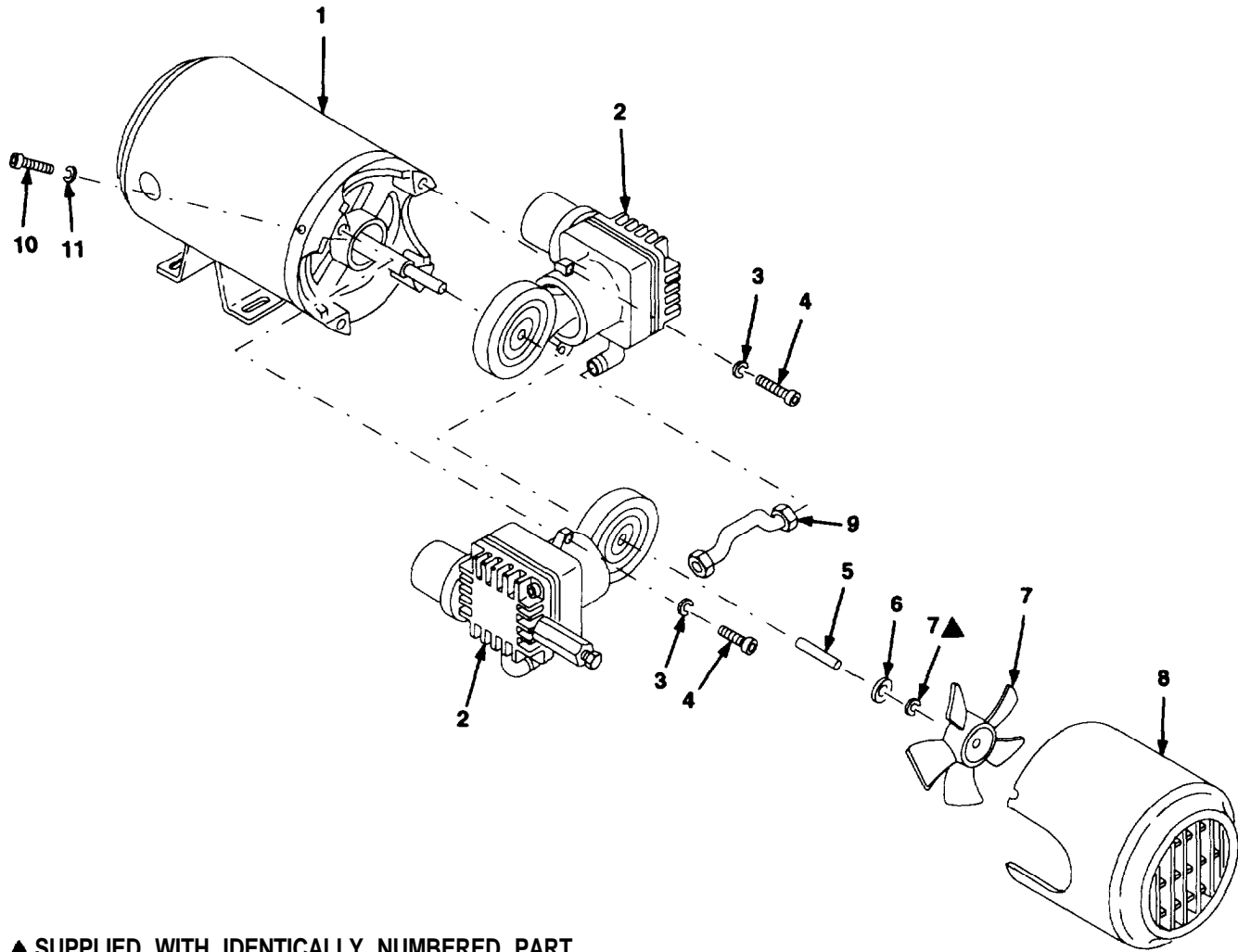


Figure F-21. Air Compressor Assembly (Sheet 2 of 2)

## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 04 AIR COMPRESSOR ASSEMBLY						
FIG. F-21 AIR COMPRESSOR ASSEMBLY						
31-15-3310						
*1	XDOZZ		96906	MS39158-20	ADAPTER,STRAIGHT	1
*2	PAOZZ	4730000888666	79470	C3609X4	TEE,PIPE	1
3	PAOZZ	4730006406330	79470	3325X4X2	REDUCER,PIPE	1
*4	PAOZZ	4820007529040	96906	MS35782-4	COCK,DRAIN	1
*4A	XDOZZ		81343	2-2130238B	ELBOW,PIPE	1
5	XDOZZ		81361	31-15-2412	STRAP,RETAINING	4
*6	PAOZZ	5310000806004	96906	MS27183-14	WASHER,FLAT	10
*7	XDOZZ		96906	MS90725-60	SCREW,CAP,HEXAGON H	8
8	PAOZZ	2530003778779	06853	217321	TANK,PRESSURE	1
9	XDOZZ		81361	31-15-2865-3	PLATE,IDENTIFICATIO	1
10	XDOZZ		79470	3121X12X8	BUSHING,PIPE	2
11	PAOZZ	4730012338048	79326	200M4GA8	COUPLING HALF,QUICK	2
12	PAOZZ	5305002693242	96906	MS90727-66	SCREW,CAP,HEXAGON H	2
13	XDOZZ		81361	31-15-2710	CLAMP,LOOP	2
*14	PAOZZ	5310009500039	96906	MS21044N6	NUT,SELF-LOCKING,HE	2
*15	MOOZZ		81361	31-15-2350-20	INSULATION MAKE FROM TAPE,P/N MIL-T-6841/NSN 9320-00-855-4009	4
*16	XDOZZ		81361	31-15-2448	CAPACITOR,FIXED,PLA	1
17	PAOZZ	5340002008560	96906	MS21919WDG5	CLAMP,LOOP	1
*18	XDODD		24123	3HBB-19-M323	COMPRESSOR,AIR SEE FIG F-22 BKDN ASSY	1
*19	PAOZZ	4730006022542	81343	4-4 140237C	ELBOW,PIPE	1
20	PAOZZ	4820008020132	91816	259B2PP	VALVE,CHECK	1
*21	PAOZZ	4730008377073	96906	MS51500A4-4S	ADAPTER,STRAIGHT,PI	1
*22	AOOOO		81361	31-15-2302-40	HOSE ASSEMBLY,AIR SEE FIG F-24 BKDN ASSY	1
23	PAOZZ	5310007653197	96906	MS27183-41	WASHER,FLAT	10
24	PAOZZ	5305009846210	96906	MS35206-263	SCREW,MACHINE	6
25	XDOZZ		81361	31-15-2792	COVER ASSEMBLY,RELA	1
*26	PAOZZ	5945006866877	96906	MS24166-D1	RELAY,ELECTROMAGNET	1
27	PAOZZ	5305009846193	96906	MS35206-245	SCREW,MACHINE	2
*28	XDOZZ		81343	4-6 010202B	ELBOW,MALE	1
*29	AOOOO		81361	31-15-2302-160	HOSE ASSEMBLY,AIR SEE FIG F-24 BKDN ASSY	1
30	PAOZZ	6150012227851	81361	31-15-2373-50	CABLE ASSEMBLY,SPEC	1
*31	XDOZZ		96906	MS51523-B4	TEE,NUT,SWIVEL	1
*32	PAOZZ	4730011273942	96906	MS51532B4S	CAP,TUBE	1
*33	PAOZZ	4730010256805	96906	MS51527A4Z	ELBOW,TUBE TO BOSS	1
34	XDOZZ		81361	31-15-2274	STRAP	1
35	PAOZZ	5930012381976	02750	6607-3-159	SWITCH,PRESSURE	1
36	PAOZZ	5305009846195	96906	MS35206-247	SCREW,MACHINE	2
37	PAOZZ	5310009338119	96906	MS35338-137	WASHER,LOCK	3
*38	PAOZZ	5940012444506	26405	812-GP-03-FP	TERMINAL BOARD	1
*39	XAOZZ		81361	31-15-2929	FRAME ASSEMBLY,COMP	1
40	PAOZZ	5305008892999	96906	MS35206-217	SCREW,MACHINE	4
41	PAOZZ	6150012237255	81361	31-15-2421	CABLE ASSEMBLY,SPEC	1
42	PAOZZ	5310005432410	96906	MS35338-40	WASHER,LOCK	4
43	PAOZZ	5310009349739	96906	MS35649-242	NUT,PLAIN,HEXAGON	4
44	PAOZZ	5340009972964	96906	MS21322-36	CLAMP,LOOP	2
END OF FIGURE						



▲ SUPPLIED WITH IDENTICALLY NUMBERED PART

Figure F-22. Air Compressor



## SECTION II

TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 0401 COMPRESSOR, AIR	
					FIG. F-22 AIR COMPRESSOR	
					3HHB-19-M323	
1	XADZZ		81361	NPN 21	ELECT MOTOR-MOUNT ASSY	1
*2	XADDD		81361	NPN 22	PUMP ASSY,AIR COMPR (SEE FIG F-23 FOR BKDN ASSY)	2
3	PADZZ	5310005825965	96906	MS35338-44	WASHER,LOCK	2
4	PADZZ	5305004102891	96906	MS24674-37	SCREW,CAP,SOCKET HE	2
5	PADZZ	5315011087336	24123	AF524	KEY,MACHINE	1
6	PADZZ	5325004193322	96906	MS90707-1050	RING,RETAINING	
7	PADZZ	4140011049279	24123	AF533	IMPELLER,FAN,AXIAL	1
8	XDDZZ		24123	AF535	SHROUD,COMPRESSOR P	1
9	XADZZ		81361	NPN 23	TUBE ASSEMBLY,METAL	1
10	PADZZ	5305009846193	96906	MS35206-245	SCREW,MACHINE	4
11	PADZZ	5310005967693	96906	MS35335-31	WASHER,LOCK	4
					END OF FIGURE	

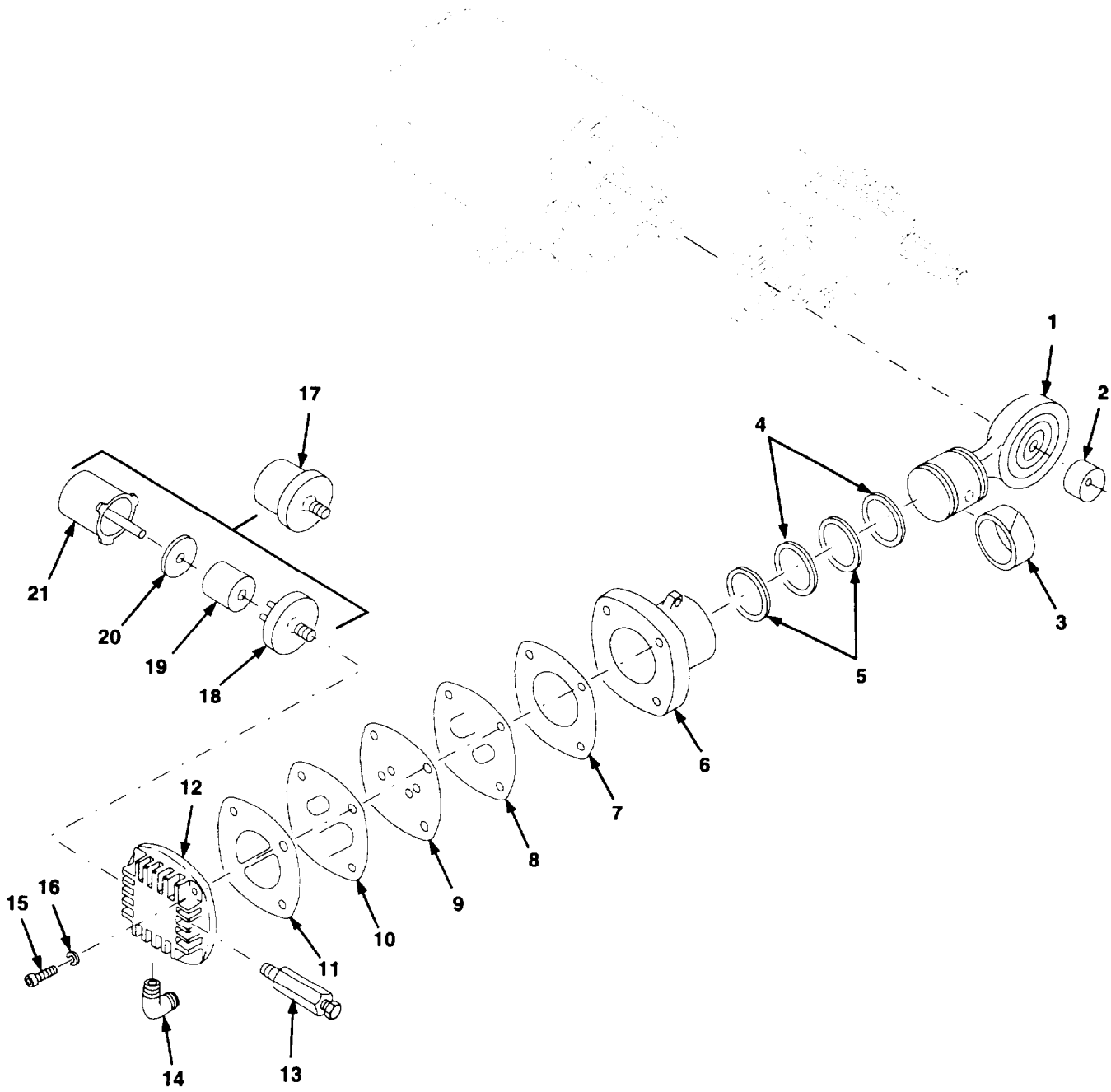


Figure F-23. Compressor Pump Assembly

## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 040101 & 04010101 COMPRESSOR PUMP ASSEMBLY	
					FIG. F-23 PUMP ASSEMBLY COMPRESSOR	
					NPN 22	
1	PADZZ	4310013005312	24123	AF560B	CONNECTING ROD,PIST	1
2	XADZZ		81361	NPN 24	ECCENTRIC LOBE	1
3	KDDZZ		24123	AF594	RIDER RING,AIR COMP PART OF KIT P/N K260	1
4	KDDZZ		24123	AF526	SEAL,PISTON PART OF KIT P/N K260	2
5	KDDZZ		24123	AF527	RING,PISTON PART OF KIT P/N K260	2
6	PADZZ	3040011051024	24123	AF510	CYLINDER,ACTUATING,	1
7	KDDZZ		24123	AF519	GASKET,CYLINDER PART OF KIT P/N K260	1
8	KDDZZ		24123	AF530	VALVE,FLAPPER,PUMP PART OF KIT P/N K260	1
9	PADZZ	4310011051567	24123	AF529	PLATE,VALVE	1
10	KDDZZ		24123	AF531	DIAPHRAGM,VALVE PART OF KIT P/N K260	1
11	KDDZZ		24123	AF518	GASKET PART OF KIT P/N K260	1
12	PADZZ	4310011054054	24123	AF508	CYLINDER HEAD,COMPR	1
*13	PAOZZ	4820004604007	24123	AF570S	VALVE,SAFETY RELIEF	1
14	XDDZZ		24123	AF567A	SLEEVE,MANIFOLD	1
15	PADZZ	5305004102891	96906	MS24674-37	SCREW,CAP,SOCKET HE	4
16	PADZZ	5310005825965	96906	MS35338-44	WASHER,LOCK	4
17	PAOOO	4330011064291	24123	B300A	FILTER,FLUID	1
*18	XAOZZ		81361	NPN 25	FILTER,BASE	1
19	PAOZZ	5330005991301	24123	B344A	FELT,MECHANICAL,PRE PART OF KIT P/N K260	1
*20	XAOZZ		81361	NPN 26	SEAL,FELT,MECHANICA	1
*21	XAOZZ		81361	NPN 27	HOUSING,FILTER,FLUI	1
	PADZZ	4310010493393	24123	K260	PARTS KIT,PISTON AS	1
					DIAPHRAGM,VALVE ( 1)F-23-10	
					FELT,MECHANICAL,PRE ( 1)F-23-19	
					GASKET ( 1)F-23-11	
					GASKET,CYLINDER ( 1)F-23-7	
					RIDER RING,AIR COMP ( 1)F-23-3	
					RING,PISTON ( 2)F-23-5	
					SEAL,PISTON ( 2)F-23-4	
					VALVE,FLAPPER,PUMP ( 1)F-23-8	

END OF FIGURE



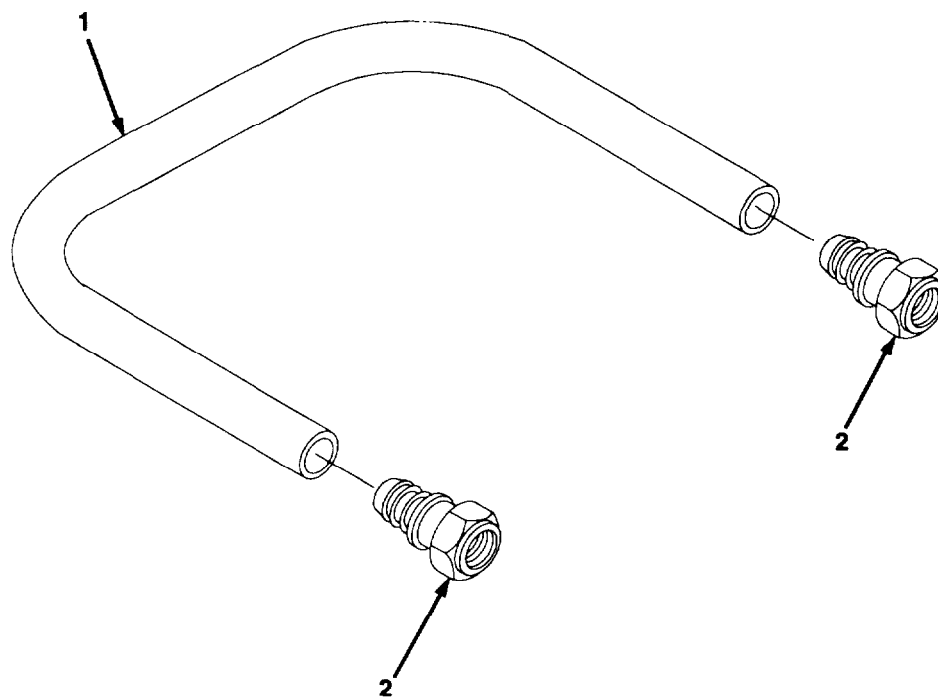


Figure F-24. Hose Assembly

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 0402 & 0403 HOSE ASSEMBLY, AND HOSE ASSEMBLY, AIR	
					FIG. F-24 HOSE ASSEMBLY, AND AIR HOSE ASSEMBLY	
					31-15-2302-160 AND 31-15-2302-40	
*1	MOOZZ		81361	NPN 20	HOSE, HYDRAULIC MAKE FROM HOSE, P/N M24136/3-04/NSN 4720-01-121-0873	1
2	PAOZZ	4730005551152	01276	4797-4B	ADAPTER, STRAIGHT, TU	2
					END OF FIGURE	

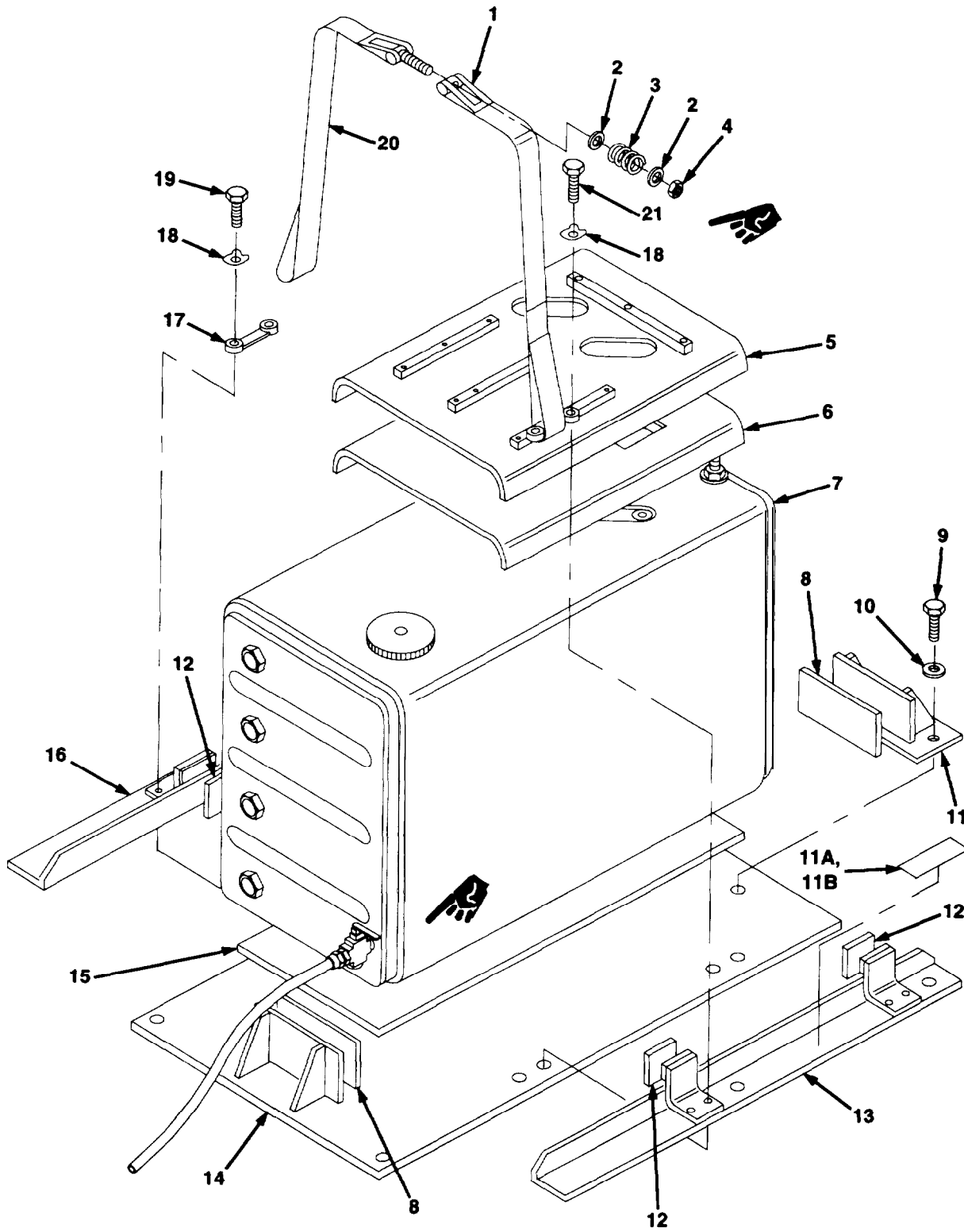


Figure F-25. Fog Oil Tank Assembly

## SECTION II

## TM3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
					GROUP: 05 TANK ASSEMBLY, FOG OIL	
					FIG. F-25 FOG OIL TANK ASSEMBLY	
					31-15-2805 AND 31-15-2902	
*1	PAOZZ	5340014438977	81361	31-15-2813	STRAP,RETAINING UOC:Y16	2
*1	PAOZZ	534001M264798	81361	31-15-2904	STRAP, RETAINING, 80 GALLON UOC: 16Y	2
2	PAOZZ	5310000877493	96906	MS27183-13	WASHER,FLAT	4
3	PAOZZ	5360004209082	19207	11633320	SPRING,HELICAL,COMP	2
4	PAOZZ	5310000880553	96906	MS21044N5	NUTSELF-LOCKING,HE	2
5	XAOZZ		81361	31-15-2812	RESTRAINT, TOP	1
*6	MOOZZ		81361	31-15-2809	PAD,RUBBER, MAKE FROM RUBBER SHEET,P/N 11678085-2/NSN 9320-00-009-0213	1
*7	XDOOO		81361	31-15-2806	TANK (SEE FIG F-26 FOR BKDN ASSY) UOC:Y16	1
*7	XDOOO		81361	31-15-2903	TANK UNIT,FOG OIL 80 GALLON (SEE FIG F- 26 FOR BKDN ASSY). UOC:16Y	1
*8	MOOZZ		81361	31-15-2808-2	PAD,RUBBER, MAKE FROM RUBBER SHEET, P/N 11678085-2/NSN 9320-00-009-0213	2
*9	PAOZZ	5305013258388	96906	MS90725-113	SCREW,CAP,HEXAGON H	2
10	PAOZZ	5310008095998	96906	MS27183-18	WASHER,FLAT	2
11	XAOZZ		81361	31-15-2811	RESTRAINT,FORWARD	1
*11A	XDOZZ		81361	31-15-2865-5	PLATE,IDENTIFICATIO UOC:Y16	1
*11B	XDOZZ		81361	31-15-2865-6	PLATE,IDENTIFICATIO UOC:16Y	1
*12	MOOZZ		81361	31-15-2808-3	PAD,RUBBER, MAKE FROM RUBBER SHEET,P/N 116780852/NSN 9320-00-009-0213	4
*13	XAOZZ		81361	31-15-2957-20	RESTRAINT,SIDE	1
*14	XAOZZ		81361	31-15-2943	BASEPLATE..	1
15	MOOZZ		81361	31-15-2808-1	PAD,RUBBER, MAKE FROM RUBBER SHEET,P/N 11678085-2/NSN 9320-00-009-0213	1
*16	XAOZZ		81361	31-15-2957-10	RESTRAINT,SIDE	1
17	PAOZZ	5342004357714	19207	11633316	ANCHOR STRAP	4
18	PAOZZ	5310006559668	19207	10863380	WASHERKEY	8
*19	PAOZZ	5305002693217	96906	MS90725-67	SCREW,CAP,HEXAGON H UOC:16Y	8
*19	PAOZZ	5305002693217	96906	MS90725-67	SCREW,CAP,HEXAGON H UOC:Y16	6
*20	PAOZZ	5340014501130	81361	31-15-2814	STRAP,RETAINING UOC:Y16	2
*20	PAOZZ	534001M266739	81361	31-15-2905	STRAP,RETAINING 80 GALLON UOC:16Y	1
*21	PAOZZ	5305008213869	80204	B1821BH038C175 N	SCREW,CAP HEX H UOC:Y16	2
					END OF FIGURE	

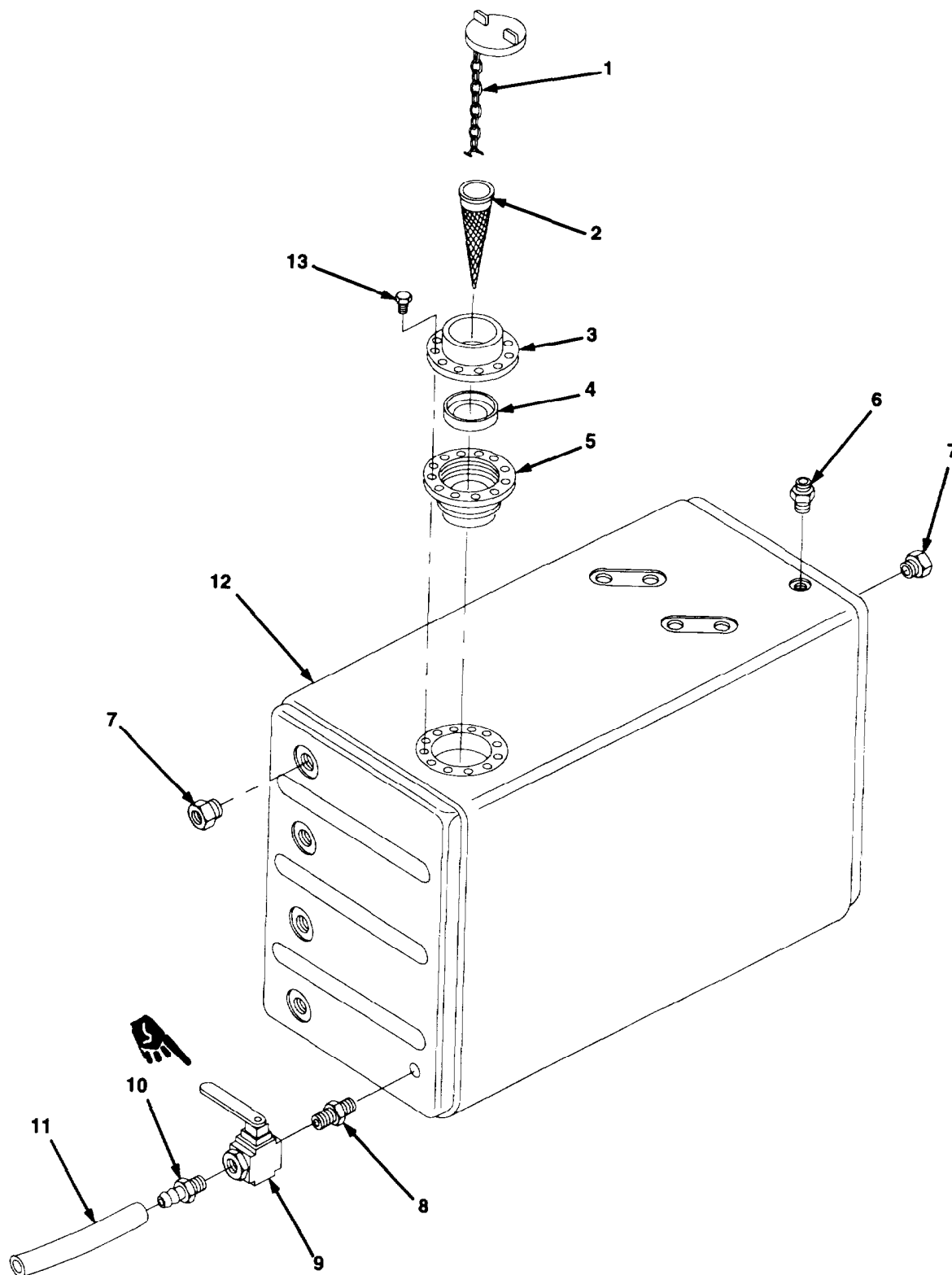


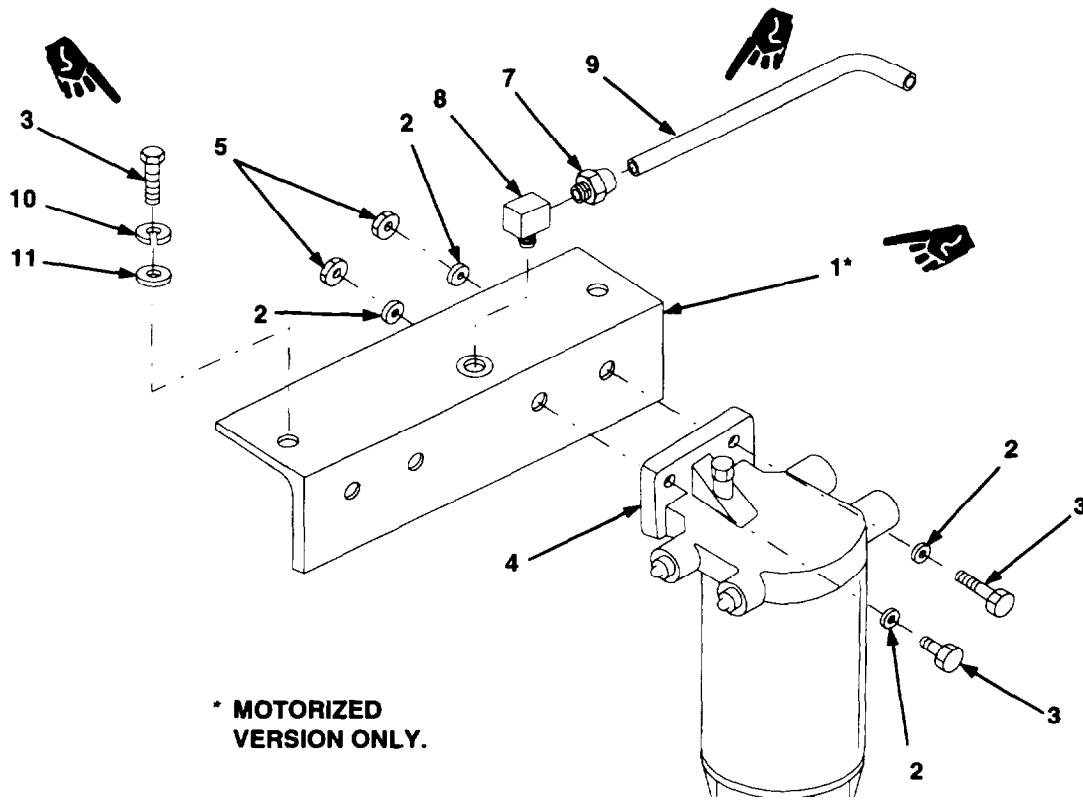
Figure F-26. Fog Oil Tank



SECTION II

TM3-1040-279-12&P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 0501 TANK, FOG OIL						
FIG. F-26 FOG OIL TANK						
31-15-2806 AND 31-15-2903						
1	PAOZZ	2590001165243	96906	MS53075-2	CAP,FILLER OPENING	1
2	XDOZZ		81361	31-15-2815	STRAINER ELEMENT,SE	1
*3	XDOZZ		19207	10861293	FILLER NECK	1
*4	PAOZZ	4730001241307	19207	11633313	STRAINER BODY,SEDIM	1
5	PAOZZ	2530001598936	19207	11633836	BOOT,VEHICULAR COM	1
6	PAOZZ	4730002890383	96906	MS51500A4	ADAPTER,STRAIGHT,PI	1
*7	PAOZZ	6680012672168	81361	31-15-2886	INDICATOR,SIGHT,LIQ	8
					UOC:Y16	
*7	PAOZZ	6680012672168	81361	31-15-2886	INDICATOR,SIGHT,LIQ	6
					UOC:16Y	
*8	PAOZZ	4730001932713	39428	4568K172	NIPPLE,PIPE	1
*9	PAOZZ	4820004171120	72219	32-103-01	VALVE, BALL	1
*10	PAOZZ	4730000804005	01276	4738-8-8B	ADAPTER,STRAIGHT,PI	1
*11	PCOZZ	4720001874102	81349	M24136/3-06	HOSE,NONMETALLIC	V
*12	XAOZZ		81361	31-15-2606/1-15	TANK,SHELL,120 GALL	1
					UOC:Y16	
*12	XAOZZ		81361	31-15-2903/1-15	TANK,SHELL,80 GALLO	1
					UOC:16Y	
*13	PAOZZ	5305009435928	96906	MS51095-306	SCREW,CAP,HEXAGON H	12
END OF FIGURE						



\* MOTORIZED VERSION ONLY.

Figure F-27. Fuel Filter/Water Separator Assembly

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 06 FUEL FILTER/WATER SEPARATOR ASSEMBLY						
FIG. F-27 FUEL FILTER/WATER SEPARATOR ASSEMBLY						
					31-15-2967-10 31-15-2967-20 31-15-2967-30	
*1	PAOZZ	5340014492022	81361	31-15-2923	BRACKET,ANGLE	1
*2	PAOZZ	5310000806004	96906	MS27183-14	WASHER,FLAT	4
*3	PAOZZ	5305008213869	80204	B1821BH038C175 N	SCREW,CAP,HEXAGON,H UOC:Y16	2
*3	PAOZZ	5305000680510	80204	B1821BH038C100 N	SCREW,CAP,HEXAGON H UOC: 16Y	2
*4	XDOZZ		81361	31-15-2958	FILTER,FLUID	1
*5	PAOZZ	5310000874652	96906	MS51922-17	NUT,SELF-LOCKING,HE	2
*6	PAOZZ	4820007529040	96906	MS35782-4	COCK,DRAIN	1
*7	PAOZZ	4730010519840	01276	2024-4-4S	ELBOW,PIPE TO TUBE	1
*8	PAOZZ	4730005551152	01276	4797-4B	ADAPTER,STRAIGHT,TU	1
*9	MOOZZ		01276	NPN 40	HOSE,NONMETALLIC MAKE FROM HOSE, PN 2580-4/NSN 4720-01-121-0873	1
*10	PAOZZ	5310006379541	96906	MS35338-46	WASHER,LOCK	2
*11	PAOZZ	5310000897493	96906	MS27183-13	WASHER,FLAT	2

END OF FIGURE

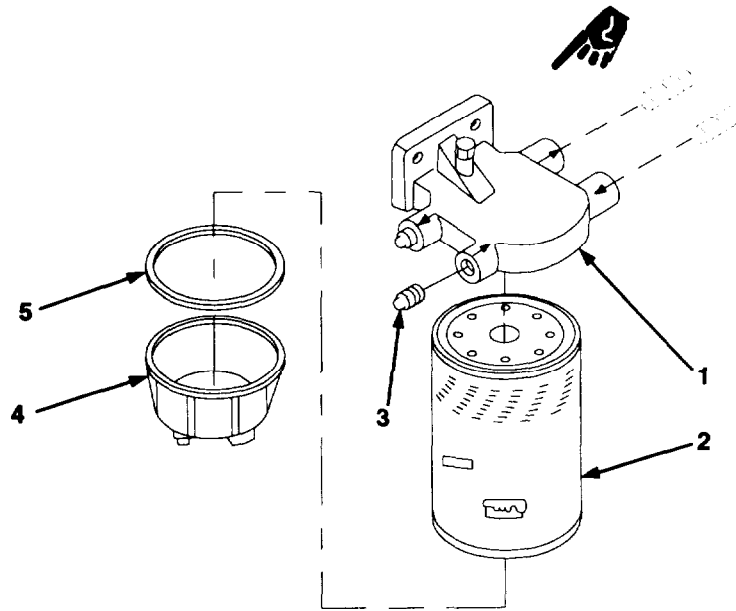


Figure F-28. Fuel Filter/Water Separator

(1) ITEM No	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 0601 FUEL FILTER/WATER SEPARATOR						
FIG. F-28 FUEL FILTER/WATER SEPARATOR						
31-15-2958						
*1	XAOZZ		55752	RK30852	HEAD,1/4-18NPT	1
*2	XDOZZ	4330013665667	55752	S3216S	FILTER ELEMENT,FLUI	1
*3	PAOZZ	4730014494533	55752	RK30817	COCK,DRAIN	2
*4	PAOZA	4330013728566	55752	RK10109	FILTER BODY,FLUID	1
*5	PAOZZ	5330013733649	55752	RK10012	GASKET	1
END OF FIGURE						

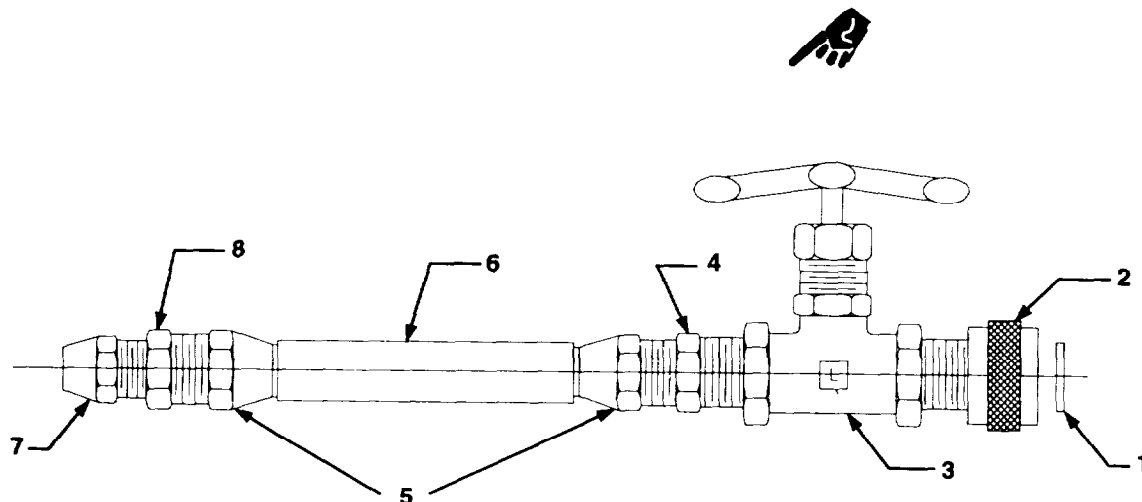
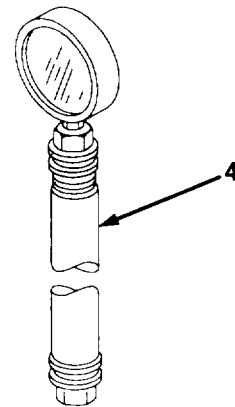
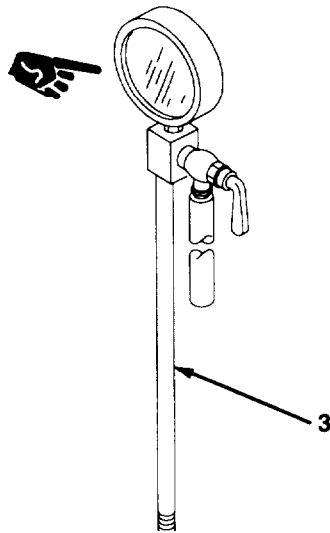
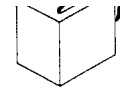
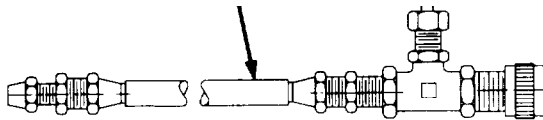


Figure F-29. Water Manifold Training and Test Assembly

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 07 WATER MANIFOLD TRAINING AND TEST ASSEMBLY						
FIG. F-29 WATER MANIFOLD TRAINING AND TEST ASSEMBLY						
31-15-3401						
*1	PAOZZ	5331014387493	39428	AS568A-211	O-RING	1
*2	PAOZZ	4730010635922	93061	82GH-12-8	ADAPTER,BUSHING	1
*3	PBOZZ	4820012485076	34880	A50983	STEM,FLUID VALVE	1
*4	PBOZA	4730013556542	01276	2021-8-8B	ADAPTER,STRAIGHT,PI	1
*5	PAOZZ	4730005422807	00624	4797-8B	ADAPTER,STRAIGHT,TU	2
*6	MOOZZ		81361	31-15-3401-6	HOSE,NONMETALLIC MAKE FROM P/N 2580-8/NSN 4720-00-187-4279	1
*7	PAOZZ	5310002576177	01276	210292-6S	NUT,PLAIN,CAP	1
*8	PAOZZ	4730011792472	81343	8-6070101CA	REDUCER,TUBE	1

END OF FIGURE

Section III. SPECIAL TOOLS LIST



(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 9500 SPECIAL TOOLS						
FIG. F-30						
*1	A0000		81361	31-15-3401	WATER MANIFOLD ASSY (FOR COMPONENT PARTS SEE FIG. F-29)	
					BOI:1 PER PLATOON	
*2	XBOZZ	5120014407469	81361	31-15-2992	WRENCH, SPANNER, BOI:1 AUTHORIZED PER VEHICLE.	
*3	A0000		81361	31-15-5505	GAGE, TEST, FOG OIL (FOR COMPONENT PARTS SEE APPX G)	
					BOI:1 PER PLATOON	
*4	A0000		81361	31-15-5504	GAGE, TEST, AIR AND FUEL (FOR COMPONENT PARTS SEE APPX G)	
					BOI:1 PER PLATOON.	
END OF FIGURE						

## SECTION III

TM 3-1040-279-12&amp;P

(1) ITEM NO	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODES (UOC)	(7) QTY
GROUP: 99 BULK ITEMS LIST						
FIG. BULK						
*1	PAOZZ	6145005482920	81348	QQB575R34T0500	BRAID,WIRE	V
*2	XDOZZ		96906	MS21266-3N	GROMMET,NONMETALLIC	V
*3	PCOZZ	4720011210873	81349	M24136/3-04	HOSE,NONMETALLIC	7
*4	PCOZZ	4720001874102	81349	M24136/3-06	HOSE,NONMETALLIC	10
*5	PCOZZ	4720001874279	81349	M24136/3-08	HOSE,NONMETALLIC	1
*6	PCOZZ	4720011210873	01276	2580-4	HOSE,NONMETALLIC	V
					UOC:16Y	
*7	PCOZZ	4720001874102	01276	2580-6	HOSE,NONMETALLIC	1
*8	PAOZZ	5330004144186	82942	R-416-H-125	RUBBER SHEET,CELLUL	6
*9	PAOZZ	5330011449473	82942	R-416-H-063	RUBBER SHEET,CELLUL	7
*10	PAOZZ	9320000090213	81349	MIL-C-3133	RUBBER SHEET,CELLUL	3
*11	PAOZZ	5330000574557	81349	MILR900	RUBBER SHEET,SOLID	1
*12	PAOZZ	9320008554009	81349	MILT6841	TAPE,ADHESIVE,RUBBE	3
*13	PAOZZ	5940001152678	96906	MS20659-111	TERMINAL,LUG	1
*14	PAOZZ	5940001154995	96906	MS20659-112	TERMINAL,LUG	2
*15	PAOZZ	5940002835280	96906	MS25036-106	TERMINAL,LUG	2
*16	PAOZZ	5940001434780	96906	MS25036-108	TERMINAL,LUG	V
*17	PAOZZ	5940001434794	96906	MS25036-112	TERMINAL,LUG	2
*18	PAOZZ	5940001138183	96906	MS25036-113	TERMINAL,LUG	1
*19	PAOZZ	5940001434774	96906	MS25036-153	TERMINAL,LUG	1
*20	PAOZZ	5940002300515	96906	MS25036-154	TERMINAL,LUG	1
*21	PAOZZ	5940001434775	96906	MS25036-156	TERMINAL,LUG	2
*22	PAOZZ	5940001434777	96906	MS25036-157	TERMINAL,LUG	20
*23	PAOZZ	5940012554193	14726	R4183F	TERMINAL,LUG	11
*24	PAOZZ	6145001611609	81349	M13486-1-3	WIRE,ELECTRICAL 16 AWG	V
*25	PAOZZ	6145007056678	81349	M13486/1-7	WIRE,ELECTRICAL 12 AWG	V

END OF FIGURE

## SECTION IV

## TM3-1040-279-12&amp;P

## CROSS-REFERENCE INDEXES

## NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
9320-00-009-0213	BULK	10	4730-00-193-2713	F-26	8
5930-00-011-7872	F-16	17	4730-00-196-1500	F-17	1
5310-00-014-5850	F-10	6	5340-00-200-8560	F-6	17
5310-00-145-3296	F-17	38		F-21	17
5310-00-045-4007	F-3	26	4730-00-203-3831	F-6	13
	F-9	4	5310-00-208-5775	F-3	22
	F-16	36		F-17	24
5305-00-051-4076	F-2	11	5310-00-209-1510	F-3	11
5305-00-052-1457	F-12	1		F-6	4
4730-00-052-7673	F-3	8	5305-00-211-8193	F-13	15
5330-00-057-4557	BULK	11	4730-00-221-2136	F-17	23A
5305-00-059-4553	F-16	50	5935-00-221-8620	F-3	31
5305-00-068-0500	F-2	8	5945-00-225-8692	F-6	21
5305-00-068-0502	F-16	38		F-16	43
5305-00-068-0510	F-27	3	5306-00-225-9088	F-17	9
5305-00-071-2505	F-2	39	5306-00-226-4825	F-2	5
5340-00-078-3615	F-2	22		F-17	29
4730-00-080-4005	F-26	10	4730-00-228-0826	F-17	18
5310-00-080-6004	F-17	37	5940-00-230-0515	BULK	20
	F-21	6	5331-00-248-3840	F-17	15
	F-27	2	4730-00-249-3885	F-17	20
5310-00-081-4219	F-2	4	5305-00-252-5101	F-13	3
	F-17	10	5310-00-257-6177	F-29	7
5311-00-087-4652	F-27	5	5305-00-267-8956	F-2	29
5310-00-087-7493	F-25	2	5310-00-268-6057	F-13	4
5310-00-088-0553	F-2	6	5305-00-269-3217	F-25	19
	F-25	4		F-25	19
5310-00-088-1251	F-2	28	5305-00-269-3242	F-21	12
	F-6	45	4730-00-277-5683	F-3	43
4730-00-088-8666	F-21	2	5310-00-282-7817	F-3	10
5940-00-113-8183	BULK	18	5940-00-283-5280	BULK	15
5940-00-115-2678	BULK	13	4730-00-289-0383	F-26	6
5940-00-115-4995	BULK	14	5330-00-292-0570	F-10	10
2590-00-116-5243	F-26	1	2530-00-377-8779	F-21	8
4730-00-124-1307	F-26	4	5310-00-407-9566	F-17	28
5940-00-143-4774	BULK	19	5305-00-410-2891	F-22	4
5940-00-143-4775	BULK	21		F-23	15
5940-00-143-4777	BULK	22	5330-00-414-4186	BULK	8
5940-00-143-4780	BULK	16	4820-00-417-1120	F-26	9
5940-00-143-4794	BULK	17	5325-00-419-3322	F-22	6
2530-00-159-8936	F-26	5	5360-00-420-9082	F-25	3
6145-00-161-1609	BULK	24	4730-00-421-3849	F-3	17
5325-00-174-9332	F-6	27	5342-00-435-7714	F-25	17
5310-00-178-8631	F-13	2	4820-00-460-4007	F-23	13
	F-14	2	5330-00-507-4900	F-13	10
5325-00-185-0012	F-3	24	5310-00-513-9955	F-14	3
4720-00-187-4102	BULK	4	1680-00-522-4953	F-2	13
	BULK	7	5320-00-534-0862	F-2	14
	F-26	11	4730-00-542-2807	F-29	5
4720-00-187-4279	BULK	5	4730-00-542-4034	F-29	2

## SECTION IV

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## CROSS-REFERENCE INDEXES

## NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
5310-00-543-2410	F-3	29	4730-00-706-8711	F-6	12
	F-6	30	5305-00-725-2317	F-17	35
	F-16	28	5930-00-726-9508	F-16	13
	F-17	41	4820-00-752-9040	F-21	4
	F-21	42		F-27	6
5310-00-543-2740	F-12	2	6340-00-759-0710	F-16	40
6145-00-548-2920	BULK	1	5331-00-759-2121	F-5	1
5310-00-550-1130	F-2	36	5310-00-765-3197	F-16	2
	F-6	36		F-21	23
	F-16	25	4820-00-802-0132	F-21	20
5310-00-550-3714	F-3	23	5310-00-802-4701	F-13	6
	F-17	25	5905-00-806-4199	F-16	16
1040-00-554-0458	F-14	5	5310-00-809-3079	F-6	6
4730-00-555-1152	F-4	2	5310-00-809-4058	F-2	27
	F-7	2		F-6	35
	F-7	4	5310-00-809-5998	F-25	10
	F-24	2	5310-00-809-8544	F-13	14
	F-27	8	5310-00-809-8546	F-6	23
5310-00-559-0070	F-6	20	4730-00-812-5298	F-3	4
	F-16	1	5355-00-817-1338	F-16	23
5310-00-576-5752	F-2	25	5305-00-821-3869	F-25	21
	F-3	42		F-27	3
	F-6	24	5310-00-823-8835	F-13	7
	F-16	48	5331-00-835-8974	F-18	2
5310-00-582-5965	F-2	9	4730-00-837-7073	F-21	21
	F-22	3	9320-00-855-4009	BULK	12
	F-23	16	5310-00-857-5564	F-6	16
4730-00-588-2614	F-7	8	5310-00-877-5797	F-6	15
	F-8	2		F-10	5
	F-8	4	4730-00-877-7709	F-3	15
	F-8	7	5305-00-889-2999	F-3	32
5310-00-596-7693	F-22	11		F-6	29
5330-00-599-1301	F-23	19		F-16	26
4730-00-602-2542	F-21	19		F-17	40
5305-00-614-0260	F-20	3		F-21	40
4730-00-618-5372	F-6	8	5305-00-889-3001	F-9	3
4730-00-618-8126	F-17	3	4730-00-900-3296	F-3	16
4730-00-623-9137	F-6	7	5310-00-901-4326	F-16	47
5310-00-637-9541	F-17	36	4730-00-908-6292	F-17	32
5306-00-637-9674	F-14	1	5325-00-929-0052	F-6	26
5307-00-638-4046	F-13	5	5905-00-931-3808	F-16	15
4730-00-640-6330	F-21	3	5310-00-933-8119	F-21	37
5310-00-655-9668	F-25	18	4730-00-934-8027	F-7	7
5930-00-660-3953	F-16	11		F-8	5
5930-00-683-1628	F-9	5	5310-00-934-9739	F-3	28
5930-00-683-1632	F-16	14		F-6	5
5310-00-685-3228	F-3	9		F-16	29
5945-00-686-6877	F-21	26		F-17	42
1040-00-699-9805	F-14	4		F-21	43
6145-00-705-6678	BULK	25	5310-00-934-9747	F-9	6



## SECTION IV

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## CROSS-REFERENCEINDEXES

## NATIONAL STOCK NUMBER INDEX

STOCKNUMBER	FIG.	ITEM	STOCKNUMBER	FIG.	ITEM
5310-00-934-9747	F-16	41	4730-01-127-3942	F-21	32
5310-00-934-9751	F-17	34	6210-01-129-6294	F-16	20
5310-00-934-9757	F-3	25	3040-01-130-3694	F-20	4
	F-16	3	4320-01-136-7696	F-20	1
5305-00-943-5928	F-26	13	5330-01-144-9473	BULK	9
5310-00-950-0039	F-21	14	5315-01-155-5608	F-20	2
6240-00-951-0608	F-16	19	4730-01-178-8542	F-18	1
5305-00-958-0671	F-10	9	4730-01-179-2472	F-29	8
5305-00-958-4359	F-16	10	4730-01-183-7167	F-17	22
5305-00-958-5450	F-16	51	4820-01-216-4504	F-2	2
5640-00-969-5869	F-2	16	4710-01-216-4579	F-3	3
5305-00-983-8084	F-6	37	4710-01-216-4580	F-3	19
5305-00-984-4988	F-16	35	4710-01-216-4581	F-3	18
5305-00-984-4992	F-3	36	4710-01-216-5999	F-2	1
	F-16	53	6150-01-216-9422	F-2	21
5305-00-984-6193	F-6	19	6150-01-218-7034	F-16	33
	F-21	27	6150-01-218-7035	F-16	30
	F-22	10	5895-01-218-7037	F-1	5
5305-00-984-6195	F-21	36	4730-01-218-7042	F-6	39
5305-00-984-6210	F-21	24	5945-01-218-7048	F-6	31
4730-00-984-7175	F-17	14	6150-01-218-7090	F-16	27
5305-00-984-7361	F-16	21	6150-01-218-8611	F-10	3
5305-00-988-1725	F-6	38	6150-01-218-8612	F-16	32
5305-00-989-7434	F-2	32	4730-01-220-3270	F-17	17
5305-00-989-7435	F-6	25	5930-01-221-9466	F-13	8
	F-16	49	5905-01-222-5832	F-6	18
	F-17	39	6150-01-222-7850	F-3	27
5305-00-990-6444	F-2	24	6150-01-222-7851	F-21	30
	F-3	41	6150-01-222-7852	F-6	2
5310-00-997-1888	F-16	44	6150-01-222-7853	F-10	2
5340-00-997-2964	F-17	31	4930-01-222-7857	F-1	1
	F-21	44	6150-01-223-7253	F-10	4
5930-00-999-4401	F-16	12	6150-01-223-7254	F-16	31
4730-01-025-6805	F-6	40	6150-01-223-7255	F-21	41
	F-21	33	6625-01-223-7263	F-16	24
4730-01-044-0878	F-3	14	6150-01-223-7267	F-6	43
4730-01-045-7431	F-2	18	1040-01-223-9660	F-1	3
4310-01-049-3393	F-23		4710-01-224-2800	F-3	6
4730-01-051-9840	F-27	7	1040-01-224-7787	F-3	39
4730-01-064-3448	F-3	21	6150-01-225-1227	F-17	30
4140-01-104-9279	F-22	7	4730-01-225-1404	F-17	16
3040-01-105-1024	F-23	6	4330-01-225-5911	F-3	44
4310-01-105-1567	F-23	9	4820-01-226-1544	F-17	21
4310-01-105-4054	F-23	12	1040-01-226-1667	F-16	46
5331-01-105-7263	F-10	12	5325-01-228-3341	F-6	28
4330-01-105-4291	F-23	17	5995-01-230-5177	F-16	45
5315-01-108-7336	F-22	5	4730-01-231-4786	F-3	13
4730-01-115-5150	F-17	19	4710-01-231-6519	F-3	7
4720-01-121-0873	BULK	3	4730-01-233-1699	F-3	12
	BULK	6	5925-01-233-4247	F-16	39

## SECTION IV

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## CROSS-REFERENCEINDEXES

## NATIONAL STOCK NUMBER INDEX

STOCKNUMBER	FIG.	ITEM	STOCKNUMBER	FIG.	ITEM
4730-01-233-8048	F-21	11			
5930-01-234-0563	F-10	13			
5930-01-234-1337	F-10	11			
6350-01-235-1522	F-2	17			
4730-01-235-5664	F-3	37			
2920-01-237-0447	F-6	44			
5930-01-238-1976	F-21	35			
4730-01-242-4508	F-3	2			
5940-01-244-4506	F-21	38			
5342-01-246-6470	F-2	20			
4820-01-248-5076	F-29	3			
2910-01-254-5181	F-17	7			
5940-01-255-4193	BULK	23			
1560-01-257-3416	F-13	13			
5355-01-258-6245	F-16	22			
2920-01-263-9720	F-13	1			
6680-01-267-2168	F-26	7			
	F-26	7			
4730-01-271-3700	F-19	4			
5340-01-273-9500	F-16	52			
4720-01-276-2431	F-2	23			
5365-01-278-6886	F-2	30			
4930-01-285-0138	F-1	1			
4310-01-300-5312	F-23	1			
5305-01-325-8388	F-25	9			
4730-01-355-6542	F-29	4			
4720-01-371-5770	F-3	45			
4330-01-372-8566	F-28	4			
5330-01-373-3649	F-28	5			
4810-01-397-1158	F-3	20			
4310-01-415-0602	F-1	4			
2805-01-425-9864	F-13	11			
4530-01-426-3533	F-2	19			
5331-01-438-7493	F-29	1			
5930-01-442-5092	F-13	12			
5340-01-443-8977	F-25	1			
2910-01-446-3219	F-12	4			
5340-01-449-2022	F-27	1			
5340-01-450-1130	F-25	20			

## SECTION IV

**TM3-1040-279-12&P**  
**CROSS-REFERENCE INDEXES**

PART NUMBER INDEX				
CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
41947	A-15124	4730-01-178-8542	F-18	1
41947	A-15178		F-17	2
24123	AF508	4310-01-105-4054	F-23	12
24123	AF510	3040-01-105-1024	F-23	6
24123	AF518		F-23	11
24123	AF519		F-23	7
24123	AF524	5315-01-108-7336	F-22	5
24123	AF526		F-23	4
24123	AF527		F-23	5
24123	AF529	4310-01-105-1567	F-23	9
24123	AF530		F-23	8
24123	AF531		F-23	10
24123	AF533	4140-01-104-9279	F-22	7
24123	AF535		F-22	8
24123	AF560B	4310-01-300-5312	F-23	1
24123	AF567A		F-23	14
24123	AF570S	4820-00-460-4007	F-23	13
24123	AF594		F-23	3
88044	AN316C5R	5310-00-268-6057	F-13	4
88044	AN818-6	4730-00-203-3831	F-6	13
81352	AN924-6	5310-00-282-7817	F-3	10
81352	AN924-8	5310-00-208-5775	F-3	22
			F-17	24
39428	AS568A-211	5331-01-438-7493	F-29	1
79470	A1903		F-7	6
34880	A50983	4820-01-248-5076	F-29	3
80204	B1821BH025C088N	5305-00-071-2505	F-2	39
80204	B1821BH031C075N	5306-00-226-4825	F-2	5
			F-17	29
80204	B1821BH038C100N	5305-00-068-0510	F-27	3
80204	B1821BH038C150N	5305-00-725-2317	F-17	35
80204	B1821BH038C175N	5305-00-821-3869	F-25	21
			F-27	3
24123	B300A	4330-01-106-4291	F-23	17
81361	B31-15-1035	1040-00-699-9805	F-14	4
81361	B31-15-1036	1040-00-554-0458	F-14	5
81361	B31-15-1095	5310-00-513-9955	F-14	3
81361	B31-15-977	5307-00-638-4046	F-13	5
81361	B31-15-989	5330-00-507-4900	F-13	10
24123	B344A	5330-00-599-1301	F-23	19
82254	C-34192	2920-01-237-0447	F-6	44
79470	C3609X4	4730-00-088-8666	F-21	2
79470	C5275X4	4730-00-421-3849	F-3	17
79470	C5924X4	4730-00-052-7673	F-3	8
24123	K260	4310-01-049-3393	F-23	
81349	MIL-C-3133	9320-00-009-0213	BULK	10
81349	MILR900	5330-00-057-4557	BULK	11
81349	MILT6841	9320-00-855-4009	BULK	12
96906	MS14307-1	4730-00-277-5683	F-3	43
96906	MS15795-813	5310-00-802-4701	F-13	6
96906	MS16997-60	5305-00-983-8084	F-6	37

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
96906	MS20605B3W4		F-11	1
96906	MS20613-4C6		F-15	3
96906	MS20659-111	5940-00-115-2678	BULK	13
96906	MS20659-112	5940-00-115-4995	BULK	14
96906	MS20913-1S	4730-00-221-2136	F-17	23A
96906	MS20913-3S		F-2	10
96906	MS21044N3	5310-00-877-5797	F-6	15
			F-10	5
96906	MS21044N5	5310-00-088-0553	F-2	6
			F-25	4
96906	MS21044N6	5310-00-950-0039	F-21	14
96906	MS21045-C5	5310-00-823-8835	F-13	7
96906	MS21045-L08	5310-00-857-5564	F-6	16
96906	MS21059-L4		F-11	2
96906	MS21266-3N		BULK	2
96906	MS21322-33	5340-00-078-3615	F-2	22
96906	MS21322-36	5340-00-997-2964	F-17	31
			F-21	44
96906	MS21919WDG5	5340-00-200-8560	F-6	17
			F-21	17
96906	MS24149-D1	5945-00-225-8692	F-6	21
			F-16	43
96906	MS24166-D1	5945-00-686-6877	F-21	26
96906	MS24523-22	5930-00-683-1628	F-9	5
96906	MS24523-26	5930-00-683-1632	F-16	14
96906	MS24525-22	5930-00-660-3953	F-16	11
96906	MS24674-37	5305-00-410-2891	F-22	4
			F-23	15
96906	MS25036-106	5940-00-283-5280	BULK	15
96906	MS25036-108	5940-00-143-4780	BULK	16
96906	MS25036-112	5940-00-143-4794	BULK	17
96906	MS25036-113	5940-00-113-8183	BULK	18
96906	MS25036-153	5940-00-143-4774	BULK	19
96906	MS25036-154	5940-00-230-0515	BULK	20
96906	MS25036-156	5940-00-143-4775	BULK	21
96906	MS25036-157	5940-00-143-4777	BULK	22
96906	MS25041-3-327	6210-01-129-6294	F-16	20
96906	MS25043-20DA	5935-00-221-8620	F-3	31
96906	MS27130-S133		F-11	4
96906	MS27130-S99K		F-11	3
96906	MS27183-10	5310-00-809-4058	F-2	27
			F-6	35
96906	MS27183-12	5310-00-081-4219	F-2	4
			F-17	10
96906	MS27183-13	5310-00-087-7493	F-25	2
96906	MS27183-14	5310-00-080-6004	F-17	37
			F-21	6
			F-27	2
96906	MS27183-18	5310-00-809-5998	F-25	10
96906	MS27183-19	5310-00-809-3079	F-6	6
96906	MS27183-41	5310-00-765-3197	F-16	2

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CAGEC	PART NUMBER	STOCK NUMBER	FIG	ITEM
96906	MS27183-41	5310-00-765-3197	F-21	23
96906	MS27183-42	5310-00-014-5850	F-10	6
96906	MS27183-7	5310-00-809-8544	F-13	14
96906	MS27183-8	5310-00-809-8546	F-6	23
96906	MS27406-2	5930-00-726-9508	F-16	13
96906	MS27407-5	5930-00-011-7872	F-16	17
96906	MS28775-208	5331-01-105-7263	F-10	12
96906	MS28775-210	5330-00-292-0570	F-10	10
96906	MS29513-014	5331-00-248-3840	F-17	15
96906	MS29561-119	5331-00-835-8974	F-18	2
96906	MS35190-238	5305-00-059-4553	F-16	50
96906	MS35190-240	5305-00-958-5450	F-16	51
96906	MS35191-270	5305-00-984-7361	F-16	21
96906	MS35206-217	5305-00-889-2999	F-3	32
			F-6	29
			F-16	26
			F-17	40
			F-21	40
96906	MS35206-228	5305-00-984-4988	F-16	35
96906	MS35206-231	5305-00-984-4988	F-9	3
96906	MS35206-232	5305-00-984-4992	F-3	36
			F-16	53
96906	MS35206-245	5305-00-984-6193	F-6	19
			F-21	27
			F-22	10
96906	MS35206-247	5305-00-984-6195	F-21	36
96906	MS35206-263	5305-00-984-6210	F-21	24
96906	MS35206-281	5305-00-988-1725	F-6	38
96906	MS35207-246	5305-00-958-4359	F-16	10
96906	MS35207-261	5305-00-990-6444	F-2	24
			F-3	41
96906	MS35207-263	5305-00-989-7434	F-2	32
96906	MS35207-264	5305-00-989-7435	F-16	49
			F-17	39
96906	MS35207-274	5305-00-958-0671	F-10	9
96906	MS35265-17	5305-00-614-0260	F-20	3
96906	MS35307-336	5306-00-637-9674	F-14	1
96906	MS35308-303	5305-00-052-1457	F-12	1
96906	MS35308-329	5305-00-252-5101	F-13	3
96906	MS35333-38	5310-00-559-0070	F-6	20
			F-16	1
96906	MS35333-39	5310-00-576-5752	F-2	25
			F-3	42
			F-6	24
			F-16	48
96906	MS35333-40	5310-00-550-1130	F-2	36
			F-6	36
			F-16	25
96906	MS35333-43	5310-00-685-3228	F-3	9
96906	MS35333-45	5310-00-209-1510	F-3	11
			F-6	4

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
96906	MS35333-47	5310-00-550-3714	F-3	23
			F-17	25
96906	MS35333-74	5310-00-543-2740	F-12	2
96906	MS35333-75	5310-00-178-8631	F-13	2
			F-14	2
96906	MS35335-31	5310-00-596-7693	F-22	11
96906	MS35338-137	5310-00-933-8119	F-21	37
96906	MS35338-40	5310-00-543-2410	F-3	29
			F-6	30
			F-16	28
			F-17	41
			F-21	42
96906	MS35338-41	5310-00-045-4007	F-3	26
			F-9	4
			F-16	36
96906	MS35338-43	5310-00-045-3296	F-17	38
96906	MS35338-44	5310-00-582-5965	F-2	9
			F-22	3
			F-23	16
96906	MS35338-45	5310-00-407-9566	F-17	28
96906	MS35338-46	5310-00-637-9541	F-17	36
96906	MS35489-35	5325-00-185-0012	F-3	24
96906	MS35489-47	5325-01-228-3341	F-6	28
96906	MS35489-48	5325-00-174-9332	F-6	27
96906	MS35649-2252	5310-00-997-1888	F-16	44
96906	MS35649-242	5310-00-934-9739	F-3	28
			F-6	5
			F-16	29
			F-17	42
			F-21	43
96906	MS35649-262	5310-00-934-9747	F-9	6
			F-16	41
96906	MS35649-282	5310-00-934-9757	F-3	25
			F-16	3
96906	MS35650-302	5310-00-934-9751	F-17	34
96906	MS35782-4	4820-00-752-9040	F-21	4
			F-27	6
96906	MS35842-14	4730-00-908-6292	F-17	32
96906	MS35872-2B	4730-00-877-7709	F-3	15
96906	MS35872-4	4730-00-228-0826	F-17	18
96906	MS39158-20		F-21	1
96906	MS51095-306	5305-00-943-5928	F-26	13
96906	MS51500A4	4730-00-289-0383	F-26	6
96906	MS51500A4-4S	4730-00-837-7073	F-21	21
96906	MS51504A8-12Z	4730-00-618-8126	F-17	3
96906	MS51506A4	4730-00-812-5298	F-3	4
96906	MS51511A4	4730-01-064-3448	F-3	21
96906	MS51520B6	4730-00-623-9137	F-6	7
96906	MS51521A6	4730-00-618-5372	F-6	8
96906	MS51523-B4		F-21	31
96906	MS51523-B6S		F-6	10

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
96906	MS51527-B8		F-17	6
96906	MS51527A4Z	4730-01-025-6805	F-6	40
			F-21	33
96906	MS51532B4	4730-01-044-0878	F-3	14
96906	MS51532B4S	4730-01-127-3942	F-21	32
96906	MS51534A6-4	4730-00-706-8711	F-6	12
96906	MS51845-4	4730-00-249-3885	F-17	20
96906	MS51849-54	5305-00-211-8193	F-13	15
96906	MS51860-55		F-6	3
96906	MS51922-1	5310-00-088-1251	F-2	28
			F-6	45
96906	MS51922-17	5310-00-087-4652	F-27	5
96906	MS51953-105	4730-00-196-1500	F-17	1
96906	MS53075-2	2590-00-116-5243	F-26	1
96906	MS90707-1050	5325-00-419-3322	F-22	6
96906	MS90725-113	5305-01-325-8388	F-25	9
96906	MS90725-3	5305-00-068-0500	F-2	8
96906	MS90725-6	5305-00-068-0502	F-16	38
96906	MS90725-60		F-21	7
96906	MS90725-67	5305-00-269-3217	F-25	19
			F-25	19
96906	MS90726-33	5306-00-225-9088	F-17	9
96906	MS90727-12	5305-00-267-8956	F-2	29
96906	MS90727-34	5305-00-051-4076	F-2	11
96906	MS90727-66	5305-00-269-3242	F-21	12
96906	MS91528-402B	5355-01-258-6245	F-16	22
81349	M13486-1-3	6145-00-161-1609	BULK	24
81349	M13486/1-7	6145-00-705-6678	BULK	25
81349	M22-01-00151SB	5905-00-931-3808	F-16	15
81349	M22-09-00081SD	5905-00-806-4199	F-16	16
81349	M24136/3-04	4720-01-121-0873	BULK	3
81349	M24136/3-06	4720-00-187-4102	BULK	4
			F-26	11
81349	M24136/3-08	4720-00-187-4279	BULK	5
81349	M24243/1-F403	5320-00-534-0862	F-2	14
81349	M25988/1-017	5331-00-759-2121	F-5	1
81349	M8805/23-001	5930-00-999-4401	F-16	12
81361	NPN 1		F-5	2
81361	NPN 15		F-13	1A
81361	NPN 16		F-15	4
81361	NPN 2		F-7	1
81361	NPN 20		F-24	1
81361	NPN 21		F-22	1
81361	NPN 22		F-22	2
81361	NPN 23		F-22	9
81361	NPN 24		F-23	2
81361	NPN 25		F-23	18
81361	NPN 26		F-23	20
81361	NPN 27		F-23	21
81361	NPN 3		F-7	3
81361	NPN 30		F-11	8

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CAGEC	PARTNUMBER	STOCKNUMBER	FIG.	ITEM
81361	NPN 4		F-7	5
81361	NPN 5		F-8	1
81361	NPN 6		F-8	3
81361	NPN 7		F-8	6
01276	NPN 40		F-27	9
81361	NP1 12		F-11	5
81348	QQB575R34T0500	6145-00-548-2920	BULK	1
82942	R-416-H-063	5330-01-144-9473	BULK	9
82942	R-416-H-125	5330-00-414-4186	BULK	8
55752	RF30817		F-28	3
55752	RK10012	5330-01-373-3649	F-28	5
55752	RK10109	4330-01-372-8566	F-28	4
55752	RK30852		F-28	
14726	R4183F	5940-01-255-4193	BULK	23
55752	S3216S		F-28	2
81541	UPL-1-1-52-603-M	5925-01-233-4247	F-16	39
70673	0271209	2920-01-263-9720	F-13	1
19207	10861293		F-26	3
19207	10863380	5310-00-655-9668	F-25	18
72619	113-1930-2934-201		F-16	18
19207	11633313	4730-00-124-1307	F-26	4
19207	11633316	5342-00-435-7714	F-25	17
19207	11633320	5360-00-420-9082	F-25	3
19207	11633836	2530-00-159-8936	F-26	5
19207	12253115		F-2	3
60119	130061	5310-00-901-4326	F-16	47
25140	164A246	2910-01-254-5181	F-17	7
77860	1857-2	4730-00-542-4034	F-29	2
81343	2-2 130238B		F-21	4A
81343	2-2130239		F-3	1
25140	20D863	5315-01-155-5608	F-20	2
81833	200M3GE4	4730-01-233-1699	F-3	12
79326	200M4GA8	4730-01-233-8048	F-21	11
79326	200M4GE8	4730-01-235-5664	F-3	37
01276	202009-2-4S	4730-01-242-4508	F-3	2
01276	2021-8-8B	4730-01-355-6542	F-29	4
01276	2024-4-4S	4730-01-051-9840	F-27	7
79326	205M3GE6	4730-01-231-4786	F-3	13
79326	205M4GE8		F-3	38
			F-17	27
62142	207865		F-2	15
01276	2081-12-8B	4730-00-984-7175	F-17	14
61423	208236	1680-00-522-4953	F-2	13
01276	210292-6S	5310-00-257-6177	F-29	7
06853	217321	2530-00-377-8779	F-21	8
01276	2242-8-8S	4730-01-183-7167	F-17	22
01276	2250-4-6S	4730-01-045-7431	F-2	18
01276	2250-8-8S	4730-01-115-5150	F-17	19
72983	248X4	4730-00-900-3296	F-3	16
01276	2580-4	4720-01-121-0873	BULK	6



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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
01276	2580-6	4720-00-187-4102	BULK	7
91816	259B2PP	4820-00-802-0132	F-21	20
61423	262121	5640-00-969-5869	F-2	16
25140	27D1711	4320-01-136-7696	F-20	1
24123	3HBB-19-M323		F-21	18
81361	31-15-1500		F-17	23
81361	31-15-1502	4720-01-371-5770	F-3	45
81361	31-15-2252	1040-01-223-9660	F-1	3
81361	31-15-2253		F-2	34
81361	31-15-2254		F-2	38
81361	31-15-2256	5895-01-218-7037	F-1	5
81361	31-15-2258		F-2	26
81361	31-15-2268		F-16	34
81361	31-15-2274		F-21	34
81361	31-15-2277		F-2	12
81361	31-15-2284		F-1	2
81361	31-15-2285		F-3	30
81361	31-15-2286	4720-01-276-2431	F-2	23
81361	31-15-2287	6150-01-222-7850	F-3	27
81361	31-15-2288	4710-01-216-5999	F-2	1
81361	31-15-2291	4710-01-224-2800	F-3	6
81361	31-15-2292	4710-01-231-6519	F-3	7
81361	31-15-2293		F-13	12A
81361	31-15-2294-10	5930-01-221-9466	F-13	8
81361	31-15-2294-30	5930-01-442-5092	F-13	12
81361	31-15-2302-1		F-19	2
81361	31-15-2302-100		F-6	34
81361	31-15-2302-110		F-6	11
81361	31-15-2302-120		F-6	9
81361	31-15-2302-160		F-21	29
81361	31-15-2302-2		F-4	1
81361	31-15-2302-30		F-17	5
81361	31-15-2302-40		F-21	22
81361	31-15-2302-50		F-6	33
81361	31-15-2302-60		F-6	41
81361	31-15-2302-80		F-3	5
81361	31-15-2302-90		F-6	32
81361	31-15-2305		F-6	14
81361	31-15-2309		F-10	1
81361	31-15-2310		F-10	8
81361	31-15-2311		F-9	1
81361	31-15-2312		F-2	31
81361	31-15-2315		F-2	33
81361	31-15-2316		F-6	22
81361	31-15-2317		F-6	42
81361	31-15-2318	5945-01-218-7048	F-6	31
81361	31-15-2321		F-2	37
81361	31-15-2322		F-3	40
81361	31-15-2323		F-10	7
81361	31-15-2324	4710-01-216-4581	F-3	18
81361	31-15-2325	4710-01-216-4579	F-3	3

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CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
81361	31-15-2326	4710-01-216-4580	F-3	19
81361	31-15-2331		F-17	33
81361	31-15-2334		F-12	3
81361	31-15-2336		F-12	5
81361	31-15-2342		F-2	25A
81361	31-15-2350-2		F-21	15
81361	31-15-2355	4820-01-216-4504	F-2	2
81361	31-15-2356		F-11	6
81361	31-15-2357		F-11	7
81361	31-15-2358	1560-01-257-3416	F-13	13
81361	31-15-2366		F-17	4
81361	31-15-2366-1		F-19	1
81361	31-15-2367		F-2	7
81361	31-15-2370-1		F-3	34
81361	31-15-2370-2		F-3	35
81361	31-15-2373-10	6150-01-218-8611	F-10	3
81361	31-15-2373-30	6150-01-223-7253	F-10	4
81361	31-15-2373-40	6150-01-222-7853	F-10	2
81361	31-15-2373-50	6150-01-222-7851	F-21	30
81361	31-15-2382	6150-01-218-7090	F-16	27
81361	31-15-2383-10	6150-01-218-7035	F-16	30
81361	31-15-2383-20	6150-01-223-7254	F-16	31
81361	31-15-2383-30	5995-01-230-5177	F-16	45
81361	31-15-2389		F-6	1
81361	31-15-2393		F-17	13
81361	31-15-2394-10		F-17	11
81361	31-15-2394-20		F-17	8
81361	31-15-2404		F-17	26
81361	31-15-2412		F-21	5
81361	31-15-2417	6150-01-225-1227	F-17	30
81361	31-15-2420	6150-01-218-7034	F-16	33
81361	31-15-2421	6150-01-223-7255	F-21	41
81361	31-15-2422	6150-01-218-8612	F-16	32
81361	31-15-2431		F-17	12
81361	31-15-2441		F-16	4
81361	31-15-2443	6150-01-216-9422	F-2	21
81361	31-15-2444	6150-01-222-7852	F-6	2
81361	31-15-2445	4730-01-220-3270	F-17	17
81361	31-15-2447	4730-01-225-1404	F-17	16
81361	31-15-2448		F-21	16
81361	31-15-2663	1040-01-224-7787	F-3	39
81361	31-15-2676	5905-01-222-5832	F-6	18
81361	31-15-2682	6150-01-223-7267	F-6	43
81361	31-15-2710		F-21	13
81361	31-15-2724		F-16	6
81361	31-15-2725		F-16	5
81361	31-15-2726		F-16	7
81361	31-15-2727		F-16	9
81361	31-15-2728		F-16	8
81361	31-15-2792		F-21	25
81361	31-15-2796	4730-01-218-7042	F-6	39

## SECTION IV

TM3-1040-279-12&P  
CROSS-REFERENCE INDEXES

PART NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
81361	31-15-2805	4930-01-222-7857	F-1	1
81361	31-15-2806		F-25	7
81361	31-15-2806/1-15		F-26	12
81361	31-15-2808-1		F-25	15
81361	31-15-2808-2		F-25	8
81361	31-15-2808-3		F-25	12
81361	31-15-2809		F-25	6
81361	31-15-2811		F-25	11
81361	31-15-2812		F-25	5
81361	31-15-2813	5340-01-443-8977	F-25	1
81361	31-15-2814	5340-01-450-1130	F-25	20
81361	31-15-2815		F-26	2
81361	31-15-2865-1		F-2	35
81361	31-15-2865-2		F-16	9A
81361	31-15-2865-3		F-21	9
81361	31-15-2865-4		F-17	10A
81361	31-15-2865-5		F-25	11A
81361	31-15-2865-6		F-25	11A
81361	31-15-2886	6680-01-267-2168	F-26	7
			F-26	7
81361	31-15-2897	5340-01-273-9500	F-16	52
81361	31-15-2898	5365-01-278-6886	F-2	30
81361	31-15-2899		F-2	40
81361	31-15-2902	4930-01-285-0138	F-1	1
81361	31-15-2903		F-25	7
81361	31-15-2903/1-15		F-26	12
81361	31-15-2904		F-25	1
81361	31-15-2905		F-25	20
81361	31-15-2906		F-16	10A
81361	31-15-2923	5340-01-449-2022	F-27	1
81361	31-15-2926		F-13	9
81361	31-15-2929		F-21	39
81361	31-15-2943		F-25	14
81361	31-15-2945	2805-01-425-9864	F-13	11
81361	31-15-2946		F-14	6
81361	31-15-2957-10		F-25	16
81361	31-15-2957-20		F-25	13
81361	31-15-2958		F-27	4
81361	31-15-2967-10		F-1	6
81361	31-15-2967-20		F-1	6
81361	31-15-2967-30		F-1	6
81361	31-15-2992		F-30	2
81361	31-15-3306	2910-01-446-3219	F-12	4
81361	31-15-3307	4530-01-426-3533	F-2	19
81361	31-15-3310	4310-01-415-0602	F-1	4
81361	31-15-3401		F-30	1
81361	31-15-3401-6		F-29	6
81361	31-15-5504		F-30	4
81361	31-15-5505		F-30	3
81361	31-15-618		F-13	2A
79470	3121X12X8		F-21	10

## SECTION IV

TM3-1040-279-12&P  
CROSS-REFERENCE INDEXES  
NATIONAL STOCK NUMBER INDEX

CAGEC	PART NUMBER	STOCK NUMBER	FIG.	ITEM
14242	3132H300Z	5342-01-246-6470	F-2	20
72219	32-103-01	4820-00-417-1120	F-26	9
79470	3325X4X2	4730-00-640-6330	F-21	3
15309	365-747	6625-01-223-7263	F-16	24
83330	37TBF-16-SS-CRES		F-16	42
83330	37TBF-2-SS-CRES		F-3	33
81349	37TB20		F-9	2
14829	375	5325-00-929-0052	F-6	26
81343	4-4 140237C	4730-00-602-2542	F-21	19
81343	4-6 010202B		F-21	28
25140	4D2902	3040-01-130-3694	F-20	4
39428	4568K172	4730-00-193-2713	F-26	8
01276	4738-8-8B	4730-00-080-4005	F-26	10
01276	4741-6B	4730-00-588-2614	F-7	8
			F-8	2
			F-8	4
			F-8	7
01276	4753-8-8B	4730-01-271-3700	F-19	4
01276	4797-4B	4730-00-555-1152	F-4	2
			F-7	2
			F-7	4
			F-24	2
			F-27	8
01276	4797-8-6B	4730-00-934-8027	F-7	7
			F-8	5
01276	4797-8B		F-19	3
		4730-00-542-2807	F-29	5
44655	5151	5355-00-817-1338	F-16	23
5H185	60046	4330-01-225-5911	F-3	44
86768	634XB-3-82	4820-01-226-1544	F-17	21
72914	65-0136-7	6340-00-759-0710	F-16	40
02750	6607-1-154	5930-01-234-1337	F-10	11
02750	6607-3-158	5930-01-234-0563	F-10	13
02750	6607-3-159	5930-01-238-1976	F-21	35
81978	71385SN1KVJ1N0L1 11C2	4810-01-397-1158	F-3	20
81343	8-6 070101CA	4730-01-179-2472	F-29	8
26405	812-GP-03-FP	5940-01-244-4506	F-21	38
08719	8327	6240-00-951-0608	F-16	19
61423	841170		F-15	2
61423	841171		F-15	1
12603	86G1010	5305-00-989-7435	F-6	25
61423	89909450	1040-01-226-1667	F-16	46
61423	899286	6350-01-235-1522	F-2	17
25140	9D1906-2		F-20	5

## APPENDIX G

### ILLUSTRATED LIST OF MANUFACTURED ITEMS

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#### Section I. INTRODUCTION

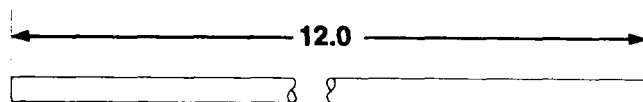
This appendix includes complete instructions for making each item authorized to be manufactured or fabricated at organizational maintenance (i.e., all MO source coded items) and test fixtures.

A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the figure which covers fabrication criteria.

All bulk materials needed for manufacture of the item will be listed by part number or specification number in a tabular list on the illustration.

#### INDEX

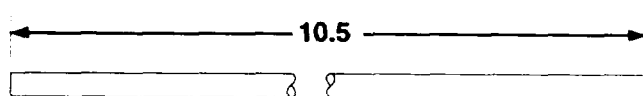
ITEM	FIGURE
31-15-2302-30 (Hose Assembly)	G-9
31-15-2302-40 (Hose Assembly)	G-11
31-15-2302-50 (Air Hose Assembly)	G-2
31-15-2302-60 (Fog Oil Hose Assembly)	G-3
31-15-2302-80 (Fuel Pressure Hose Assembly)	G-1
31-15-2302-90 (Air Supply Hose Assembly)	G-4
31-15-2302-100 (Air Start Hose Assembly)	G-5
31-15-2302-110 (Fog Oil Hose Assembly)	G-6
31-15-2302-120 (Purge Air Hose Assembly)	G-7
31-15-2302-160 (Air Hose Assembly)	G-10
31-15-2350 (Insulation)	G-16
31-15-2366 (Hose Assembly)	G-8
31-15-2724 (Gasket)	G-17
31-15-2725 (Gasket)	G-20
31-15-2726 (Gasket)	G-19
31-15-2727 (Gasket)	G-18
31-15-2808-1 (Rubber Pad)	G-12
31-15-2808-2 (Rubber Pad)	G-13
31-15-2808-3 (Rubber Pad)	G-14
31-15-2809 (Rubber Pad)	G-15
Drain Hose	G-23
Fog Oil Test Gage	G-21
Fuel and Air Test Gages	G-22
Hose (Water Manifold)	G-24



**NOTES**

- 1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-04).
- 2. DIMENSIONS ARE IN INCHES.

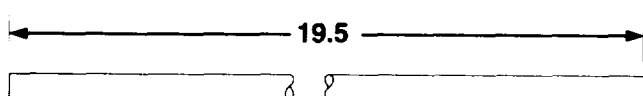
Figure G- 1. Fuel Pressure Hose Assembly (31-15-2302-80)



**NOTES**

- 1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-04).
- 2. DIMENSIONS ARE IN INCHES.

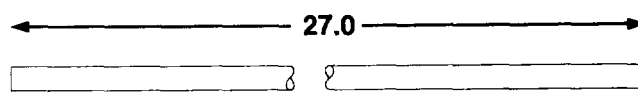
Figure G-2. Air Hose Assembly (31-15-2302-50)



**NOTES**

- 1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-04).
- 2. DIMENSIONS ARE IN INCHES.

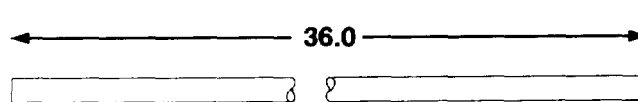
Figure G-3. Fog Oil Hose Assembly (37-15-2302-60)



**NOTES**

1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-06).
2. DIMENSIONS ARE IN INCHES.

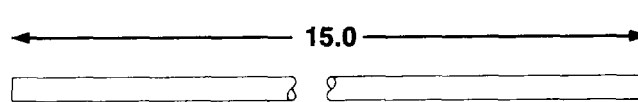
*Figure G-4. Air Supply Hose Assembly (31-15-2302-90)*



**NOTES**

1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-06).
2. DIMENSIONS ARE IN INCHES.

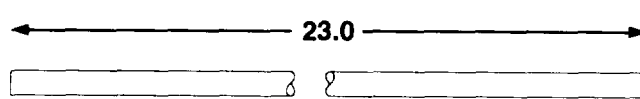
*Figure G-5. Air Start Hose Assembly (31-15-2302-100)*



**NOTES**

1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-06).
2. DIMENSIONS ARE IN INCHES.

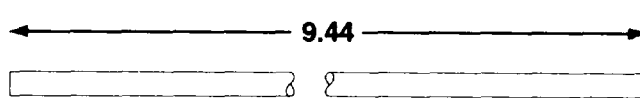
*Figure G-6. Fog Oil Hose Assembly (31-15-2302-110)*



**NOTES**

1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-06).
2. DIMENSIONS ARE IN INCHES.

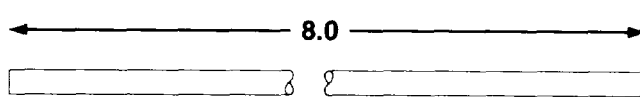
*Figure G-7. Purge Air Hose Assembly (31-15-2302-120)*



**NOTES**

1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-08).
2. DIMENSIONS ARE IN INCHES.

*Figure G-8. Hose Assembly (31-15-2366)*

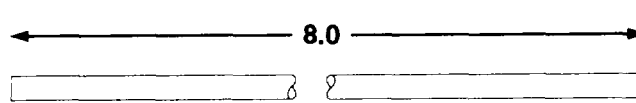


**NOTES**

1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-08).
2. DIMENSIONS ARE IN INCHES.

*Figure G-9. Hose Assembly (31-15-2302-30)*

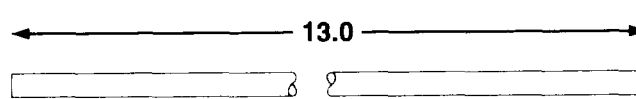




NOTES

1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-04).
2. DIMENSIONS ARE IN INCHES.

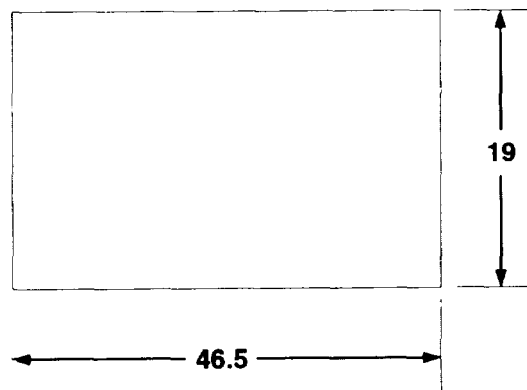
Figure G-10. Air Hose Assembly (31-15-2302-160)



NOTES

1. FABRICATE FROM NONMETALLIC HOSE (P/N M24136/3-04).
2. DIMENSIONS ARE IN INCHES.

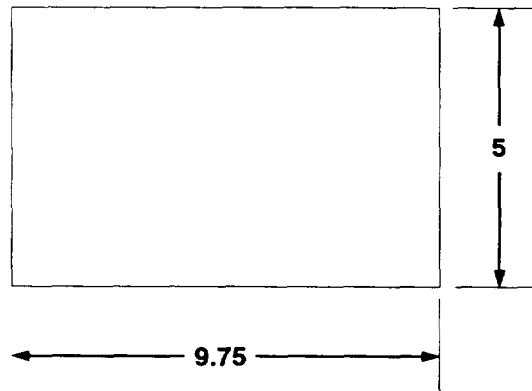
Figure G- 11. Hose Assembly (31-15-2302-40)



NOTES

1. FABRICATE FROM CELLULAR RUBBER (P/N 11678085-2).
2. DIMENSIONS ARE IN INCHES.

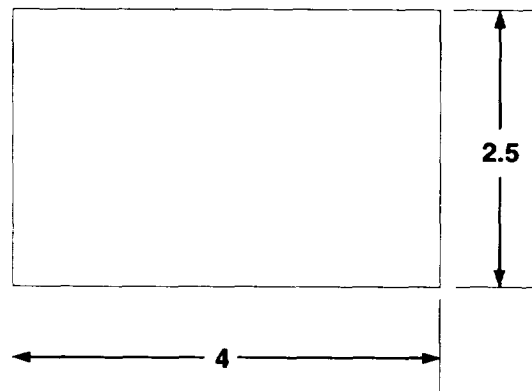
Figure G-12. Rubber Pad (31-15-2808- 1)



NOTES

1. FABRICATE FROM CELLULAR RUBBER (P/N 116780852).
2. DIMENSIONS ARE IN INCHES.

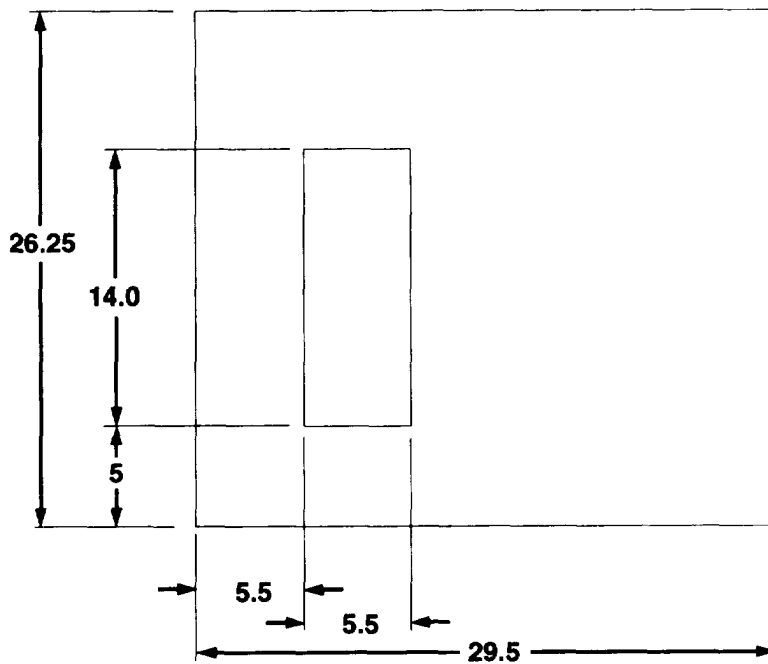
Figure G-13. Rubber Pad (31-15-2808-2)



NOTES

1. FABRICATE FROM CELLULAR RUBBER (P/N 116780852).
2. DIMENSIONS ARE IN INCHES.

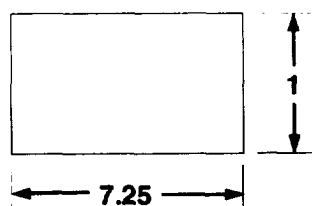
Figure G-14. Rubber Pad (31-15-2808-3)



NOTES

1. FABRICATE FROM CELLULAR RUBBER (P/N 11678085-2).
2. DIMENSIONS ARE IN INCHES.

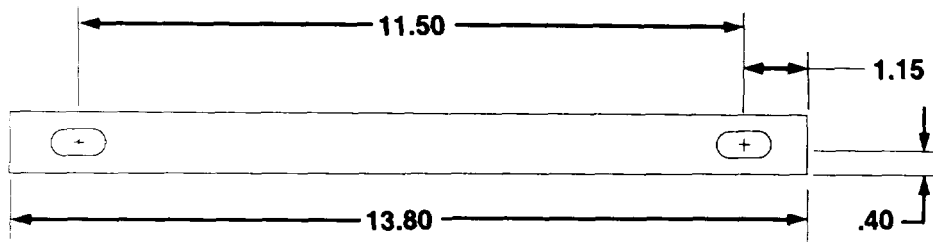
Figure G-15. Rubber Pad (31-15-2809)



NOTES

1. FABRICATE FROM THICK CORK-INSULATION (P/N DK153).
2. DIMENSIONS ARE IN INCHES.

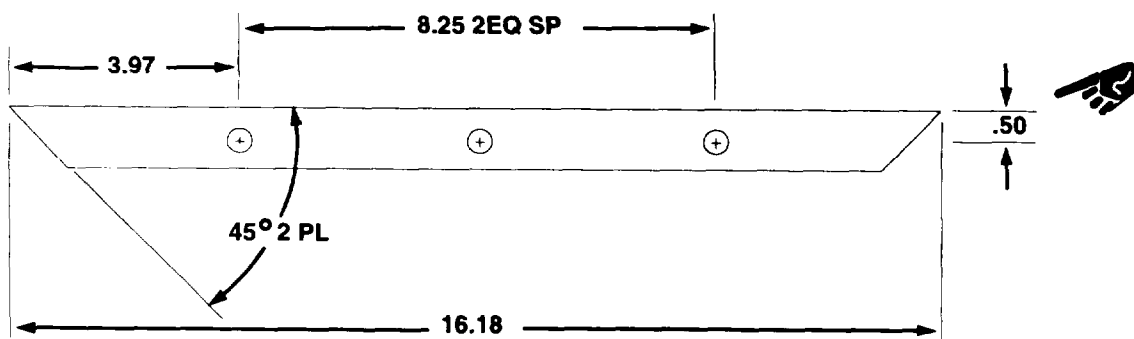
Figure G-16. Insulation (31-15-2350-20)



**NOTES**

1. FABRICATE FROM BLACK ADHESIVE NEOPRENE (P/N MILR900).
2. DIMENSIONS ARE IN INCHES.

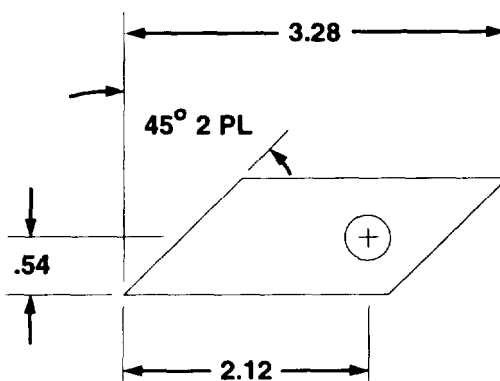
*Figure G-17. Gasket (37-15-2724)*



**NOTES**

1. FABRICATE FROM BLACK ADHESIVE NEOPRENE (P/N MILR900).
2. DIMENSIONS ARE IN INCHES.

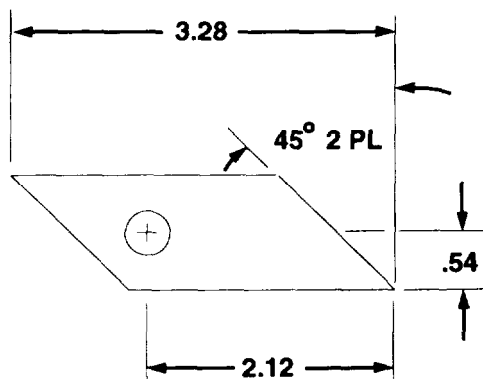
*Figure G-18. Gasket (31-75-2727)*



NOTES

1. FABRICATE FROM BLACK ADHESIVE NEOPRENE (P/N MILR900).
2. DIMENSIONS ARE IN INCHES.

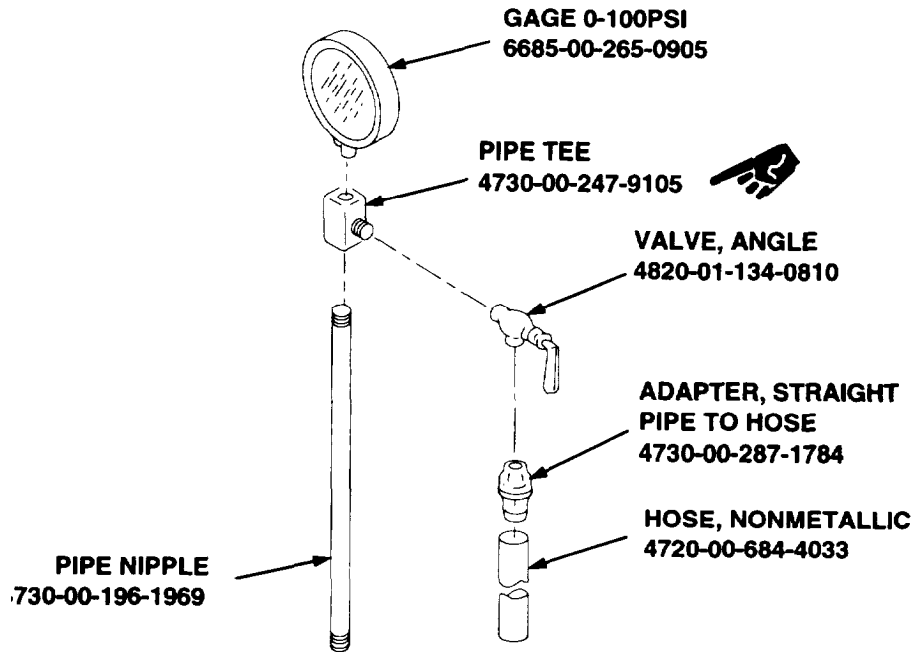
Figure G-19. Gasket (31-15-2726)



NOTES

1. FABRICATE FROM BLACK ADHESIVE NEOPRENE (P/N MILR900).
2. DIMENSIONS ARE IN INCHES.

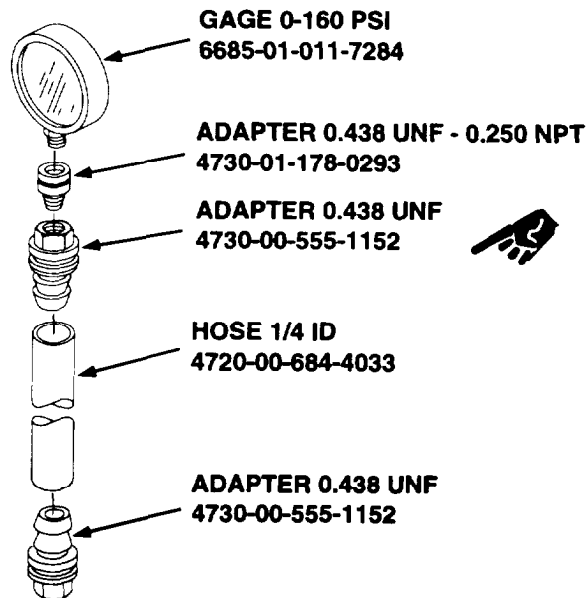
Figure G-20. Gasket (31-15-2725)



**NOTES:**

- 1. DIMENSIONS ARE IN INCHES
- 2. HOSE LENGTH AS REQUIRED

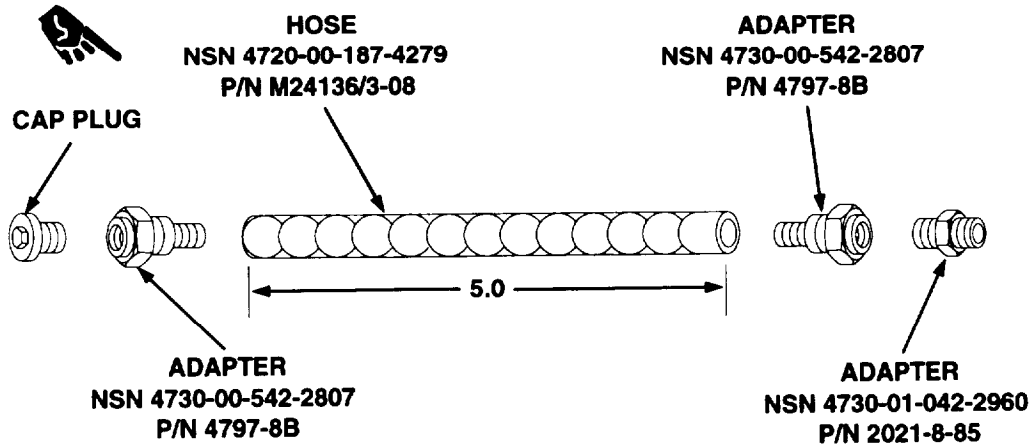
Figure G-21. Fog Oil Test Gage



**NOTES:**

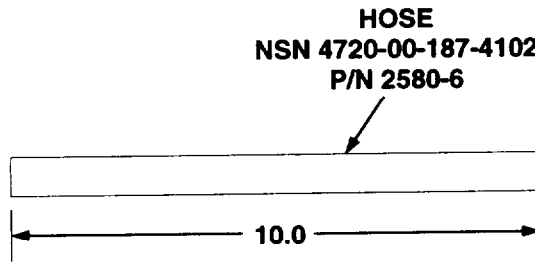
- 1. DIMENSIONS ARE IN INCHES
- 2. HOSE LENGTH AS REQUIRED

Figure G-22. Air and Fuel Test Gages



NOTE: DIMENSIONS ARE IN FEET

Figure G-23. Drain Hose



NOTE: DIMENSIONS ARE IN FEET

Figure G-24. Water Manifold Hose





**APPENDIX H**

**INITIAL MANDATORY PARTS LIST**

**Section I. INTRODUCTION**

**H-1 SCOPE.**

This appendix lists items which are designated as Initial Mandatory Parts List (IMPL) items required to support field maintenance for the M 157 Smoke Generator System.

**H-2 GENERAL.**

The IMPL is an authorized mandatory stockage for the M157 Smoke Generator Set as identified in the IMPL concept approved by HQDA (DALO-SMP-S). IMPL stockage consists only of essential items (essentiality code 1), stocked at the appropriate levels in support of field maintenance as required, to achieve a direct operational requirement.

**H-3 EXPLANATION OF COLUMNS**

**a. Column (1) - Level.** This column identifies the lowest level of maintenance that requires the listed item.

O . . . . . Organizational Maintenance

**b. Column (2) - National Stock Number.**

This is the National Stock Number assigned to the item; use it to request or requisition the item.

**c. Column (3) - Description.** Indicates the Federal item name and, if required, a to identify the item. The last line for each item indicates the Commercial and Government Entity (CAGE) Code in parenthesis followed by the part number.

**d. Column (4) - Unit of Measure (U/M).**

Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., EA, IN, PR). If a unit of measure differs from the unit of issue, then requisition the lowest unit of issue that will satisfy the requirement.

**e. Column (5) - Quantity Required (QTY RQR).**

Indicates the quantity of the item authorized to be used with/on the-equipment.

**Section II. INITIAL MANDATORY PARTS LIST**

(1) LEVEL	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) U / M	(5) QTY RQR
O	1040-01-216-9422	Cable Assembly, Spec (81361) 31-15-2443	EA	1
O	1040-00-554-0458	Valve, Engine (81361) B31-15-1036	EA	20
O	4320-01-136-7696	Gear Rotor Set, Rota (25140) 27D1711	EA	1

Section II. INITIAL MANDATORY PARTS LIST (CONT)

(1) LEVEL	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION	(4) U/M	(5) QTY RQR
O	6240-00-951-0608	Lamp, Incandescent (08719) 8327	EA	10
O	6150-01-223-7267	Lead and Conduit (00642) XH-8547	EA	1
O	6210-01-129-6294	Light, Indicator (96906) MS25041-3-327	EA	1
O	1040-01-224-7787	Motor Assembly, Pump (81361) 31-15-2663	EA	1
O	5945-00-225-8692	Relay, Electromagnetic (96906) MS24149-D1	EA	1
O	4730-01-218-7042	Seal, Bonnet, Tube (81361) 31-15-2796	EA	1
O	5930-01-234-1337	Switch, Pressure (02750) 6607-1-154	EA	1
O	5930-01-221-9466	Switch, Thermostatic (81361) 31-15-2294-10	EA	1
O	5930-01-221-9467	Switch, Thermostatic (81361) 31-15-2294-20	EA	1

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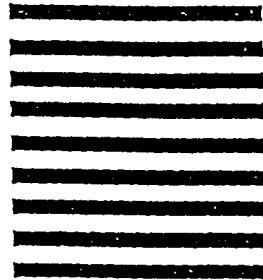
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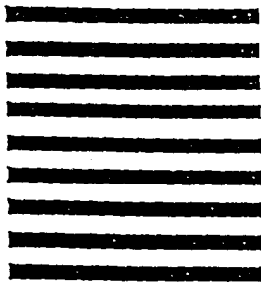
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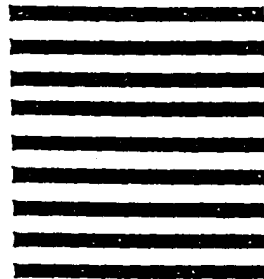
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