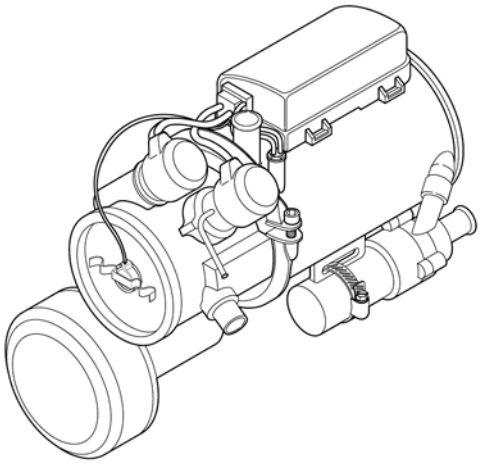
TB 9-6115-643-13

TECHNICAL BULLETIN

OPERATOR, UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL FOR



WINTERIZATION KIT (NSN: 6115-01-477-0566) (EIC: N/A)

INSTALLED ON GENERATOR SET, SKID MOUNTED, TACTICAL QUIET, 15kW, 50/60 and 400 Hz MEP-804A (50/60Hz) (6115-01-274-7388) MEP-814A (400Hz) (6115-01-274-7393)

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HEADQUARTERS, DEPARTMENT OF THE ARMY

1 March 2002

WARNING SUMMARY

NOTE

The warnings in the generator set technical manuals must also be considered.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to observe this warning could result in severe injury or death.

WARNING

Generator cooling system operates at high temperatures. Personal injury or death from burns or scalding can result from contact with high-pressure steam and/or liquid.

WARNING

Do not attempt any tasks inside generator housing with generator set running. Failure to observe this warning could result in severe personal injury or death.

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Failure to observe this warning could result in severe personal injury or death.

WARNING

Before disconnecting any coolant lines, let generator cool from operation, then relieve pressure by opening radiator cap carefully. Coolant is hot and under pressure and may cause severe burns.

WARNING

Catch fuel in suitable container. Keep spilled fuel away from hot engine and all fires, and wash with warm water after getting any on skin. Fuel is highly flammable and is irritating to skin.

WARNING

Muffler and flex hoses get hot. Allow them to cool before touching them to avoid burn injury.

WARNING

The coolant in the system shall contain the proper mixture of water and antifreeze to prevent coolant from freezing or slushing. Failure could cause engine damage and/or personal injury.

Refer to FM 21-11 for first aid.

LIST OF EFFECTIVE PAGES

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No. 9-6115-643-13

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 1 March 2002

OPERATOR, UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL
for
WINTERIZATION KIT
(NSN: 6115-01-477-0566) (EIC: N/A)
INSTALLED ON
GENERATOR SET, SKID MOUNTED, TACTICAL QUIET
15kW, 50/60 AND 400 Hz
MEP-804A (50/60 Hz) 6115-01-274-7388
MEP-814A (400 Hz) 6115-01-274-7393

REPORTING 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 directly to: Commander, U.S. Army Communications and Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LEO-D-CS-CFO, Fort Monmouth, New Jersey 07703-5006. The fax number is 732-532-1413, DSN: 992-1413. You may also e-mail your recommendations to AMSEL-LC-LEO-PUBS-CHG@mail1.monmouth.army.mil.

In any case, we will send you a reply.

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CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1 SCOPE.

This technical bulletin is for your use in operating and maintaining the Winterization Kit installed on the 15kW Tactical Quiet Generator Sets. The manual covers operator, unit maintenance, and direct support installation instructions for the kit.

1-2 MAINTENANCE FORMS AND RECORDS.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750 (The Army Maintenance System (TAMMS) Maintenance Management UPDATE).

1-3 CORROSION PREVENTION AND CONTROL.

Corrosion Prevention and Control (CPC) of Army material 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 the future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other material, such as rubber or 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 (PQDR). Use of keywords such as “corrosion”, “rust”, “deterioration”, or “cracking” will ensure that the information is identified as a CPC problem.

1-4 DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE.

Destruction of Army material to prevent enemy use shall be in accordance with TM 750-244-3.

1-5 PREPARATION FOR STORAGE AND SHIPMENT.

No procedure required. Refer to Generator TM 9-6115-643-24.

1-6 EQUIPMENT IMPROVEMENT RECOMMENDATION (EIR).

If the equipment in any of your kits 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 SF 368 Product Quality Deficiency Report (PQDR). Mail it to us at Commander, U.S. Army Communications and Electronics Command, ATTN: AMSEL-LC-LEO-D-CS-CFO, Fort Monmouth, New Jersey 07703-5006. We will send you a reply.

1-7 LIST OF ABBREVIATIONS.

Hz	Hertz
kW	Kilowatts
RTV	Room Temperature Vulcanizing

1-8 LEVELS OF MAINTENANCE.

Army users shall refer to the Maintenance Allocation Chart (MAC) for tasks and levels of maintenance to be performed.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-9 GENERAL.

The winterization kit is designed to be mounted in generator sets where extreme cold temperatures are anticipated. The kit consists of a coolant heater, which allows the generator set to operate to -50°F (-45.6°C). The coolant heater circulates the coolant from the generator set through the heater pump and heats the coolant by the heater and returns it back through the radiator of the generator. Then, continues the cycle until the temperature reaches 176°F. The heater then goes into low heat. If the coolant temperature drops to 158°F, then the heater will switch to high heat mode.

1-10 EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES.

1-10.1 Characteristics. The Winterization Kit consists of a coolant heater, which allows the generator set to operate to -50°F (-45.6°C).

1-10.1.2 Capabilities and Features. The heater burns fuel from the generator fuel tank to heat the coolant, which is pumped through the engine block. The kit consists of a heater and coolant pump, a control unit, an ON-OFF switch, a fuel pump and line, coolant circulating lines, a wiring harness and mounting hardware to ensure operation to -50°F (-45.6°C).

1-11 LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.

Figure 1-1 illustrates the major components of the kit and shows their locations on the 15kW Tactical Quiet Generator Set. (Refer to table 1-1 for item names).

Table 1-1. Description of Major Components.

Item No.	Item Name	Description
	Winterization Kit	A fuel-burning heater, pre-heats engine coolant permitting generator operation to -50°F (-45.6°C).
1	Control Unit	Controls heater operations.
2	Heater	Circulates coolant.
3	Fuel Pump	Provides fuel for heater.
4	Fuel Lines	Provides a means of transporting fuel to heater.
5	Coolant Pump	Pumps coolant from generator to heater.
6	Coolant Lines	Provides a means of transporting coolant for circulation.
7	Switch/Lamp	Turns on/off heater and lamp indicates operations.
8	Wire Harness	Provides a flow of electricity to different components to operate.

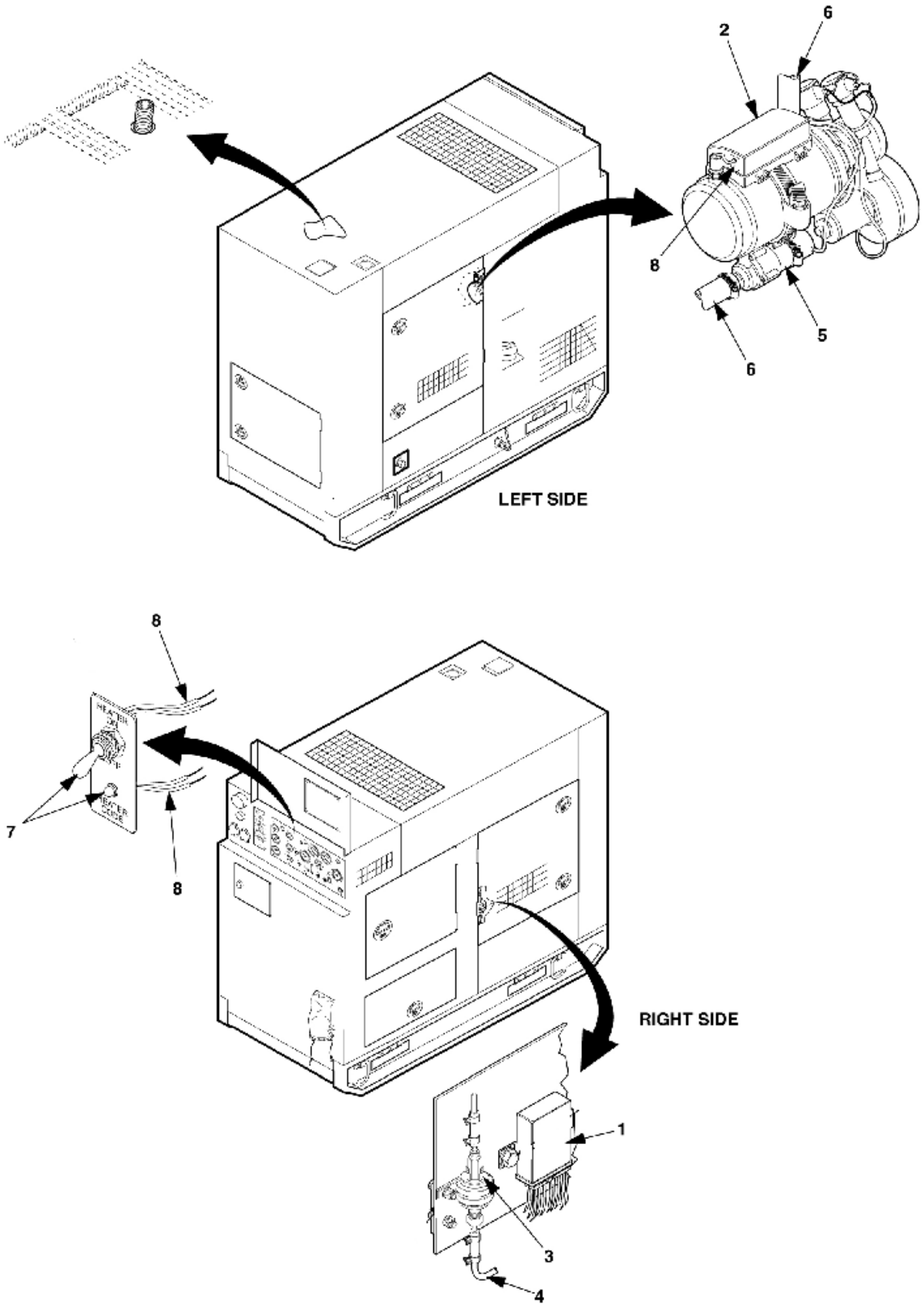

Figure 1-1. Location of Major Components for 15kW (MEP-804A, MEP-814A).

1-12 TABULATED/ILLUSTRATED DATA.

1-12.1 Tabulated Data for the heater is located in Table 1-2.

Table 1-2. Heater Operating Data.

Item Name	Data
1. Winterization Kit	
a. National Stock Number	6115-01-477-0566
b. Overall Length	10.787 inches
c. Overall Width	5.984 inches
d. Overall Height	7.815 inches
e. Weight	15 lbs
2. Heater:	
a. Manufacturer	Active Gear
b. Model	D5W
3. Heating Capacity	Water Coolant High: 17,000 BTU/Hr. Low: 4250 BTU/Hr.
4. Rated Voltage	24 Vdc
a. Operating Voltage Range	20 to 28 Vdc
b. Current at 24 Vdc	Start: 20 Amps/Hr. Running High: 1.8 Amps/Hr. Running Low: 1.2 Amps/Hr.
5. Fuel Consumption	Diesel High: 0.06 Gal/Hr. Low: 0.04 Gal/Hr.
6. Coolant Pump Flow	250 Gal/Hr.

Section III. PRINCIPLES OF OPERATION

1-13 GENERAL.

This section contains functional description of the winterization kit.

1-13.1 Functional Description. When the heater is switched on, the indicator lamp comes on, the combustion air fan comes on high, then low, and the start cycle begins. The water-circulating pump begins to run and after a short time, the fuel pump begins to operate. The fuel is ignited by the ignition element and a flame detector turns off the ignition element when combustion is established. When the coolant temperature has reached the operating point, the temperature sensor sends a signal to the control unit to reduce the heat output. If the temperature remains at the upper limit, the heater turns off, but the coolant pump continues to run. The heater will automatically restart once the system's temperature has dropped to the lower temperature switch point of the sensor. The heater continues in this mode until the ON/OFF switch is placed in the OFF position. At this point the indicator lamp will go off, but the combustion air blower and the circulating pump will continue running for several minutes and then shut off.

NOTE

Heater warms generator engine block sufficiently to start.

(1) The circulation pump, ceramic igniter/glow plug, and combustion air fan start operation after the heater is turned on.

(2) After approximately 50 seconds, the fuel pump starts, combustion starts, and the ceramic igniter/glow plug is turned off.

(3) When the coolant temperature reaches 176°F (80°C), the heater switches to low heat mode.

(4) If coolant temperature drops to 158°F (70°C), the heater switches to high heat mode.

(5) If coolant temperature rises to 185°F (85°C), the heater will switch off (coolant pump continues to run).

(6) The heater continues to run as described above until the ON/OFF switch is placed in the OFF position.

(7) When switched off, the fuel pump stops and the flame is extinguished. The combustion air fan and coolant circulation pump continues to run for a cool down period of several minutes.

CHAPTER 2

OPERATING INSTRUCTIONS

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

2-1 GENERAL: This section describes and illustrates winterization kit controls and indicators to ensure proper operations.

2-1.1 Controls and Indicators. There are three controls. The Heater indicator light, a control unit, and an on-off switch.

2-1.1.1 Heater Indicator Light. A light at the heater ON-OFF switch (item 7, figure 1-1) lights when the heater is operating. The light also serves as a troubleshooting code light (See paragraph 3-1.1).

2-1.1.2 Control Unit. The control unit is a sealed unit, mounted on the generator wall that controls heater operation.

2-1.1.3 ON-OFF Switch. The ON-OFF switch is a single-pole, single-throw toggle switch. Placed in the ON position, the switch closes the 24Vdc circuit to the control unit.

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

2-2 GENERAL.

Table 2-1 (Operator PMCS table) has been provided so you can keep your equipment in good operating condition and ready for its primary mission.

2-2.1 Warnings, Cautions, and Notes. Always observe the ***WARNINGS, CAUTIONS,*** and ***NOTES*** appearing in your PMCS table. Warnings and Cautions appear before applicable procedures. You must observe ***WARNINGS*** to prevent serious injury to yourself and to others. You must observe ***CAUTIONS*** to prevent your equipment from being damaged. You must observe ***NOTES*** to ensure procedures are performed properly.

2-2.2 Explanation of Table Entries.

2-2.2.1 Item No. Column. Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), or DD Form 5988E, include the item number for the checks/service indicating a fault. Item numbers also appear in the order that you must do checks and services for the intervals listed.

2-2.2.2 Interval Column. This column tells you when you must do the procedure in the procedure column. "BEFORE" procedures must be done before you operate the generator with modification kit installed for its intended mission. "DURING" procedures must be done during the time you are operating the generator for its intended mission. "AFTER" procedures must be done immediately after shutting down the generator. Perform "WEEKLY" procedures at the listed interval.

2-2.2.3 Location, Item to Check/Service Column. This column lists the location and the item to be checked or serviced. The item location is underlined.

2-2.2.4 Procedure Column. This column gives the procedure for checking or servicing the item listed in the location, item to check/service column. You must perform the procedure to know if the generator is ready or available for its intended mission or operation. You must do the procedure at the time stated in the interval column.

2-2.2.5 Not Fully Mission Capable if: Column. Information in this column tells you what faults will keep your modified generator from being capable of performing its primary mission. If you make checks or services that show faults listed in this column, do not operate the generator.

2-2.2.6 Reporting and Correcting Deficiencies. If Winterization Kit does not perform as required, refer to Chapter 3, Operator Maintenance, Section I. Troubleshooting.

2-2.3 Other Table Entries. Be sure to observe all special information and notes that appear in your table.

2-2.4 Special Instructions. Preventive maintenance is not limited to performing the checks and services listed in the PMCS table. Covering unused receptacles, stowing unused accessories, and other routine procedures such as equipment inventory, cleaning components, and touch up painting are not listed in the table. These are things you should do any time you see that they need to be done. If a routine check is listed in the PMCS table, it is because experience has shown that problems may occur with this item. Take along tools and cleaning cloths needed to perform the required checks and services. Use the following information to help identify potential problems before and during checks and services. Use the information in the following paragraphs to help you identify problems at any time.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to observe this warning could result in severe injury or death.

CAUTION

Keep cleaning solvents, gasoline and lubricants away from rubber or soft plastic parts. They will deteriorate material.

a. Keep it clean. Dirt, grease, and oil get in the way and may cover up a serious problem. Use dry cleaning solvent to clean metal surfaces.

b. Use soap and water to clean rubber or plastic parts and material.

c. Check all bolts, nuts, and screws to make sure they are not loose, missing, bent, or broken. Do not try to check them all with a tool, but look for chipped paint, bare metal, or rust around bolt heads. If you find one loose, tighten it or report it to unit level of maintenance.

d. Inspect welds. Look for loose or chipped paint, rust, or gaps where parts are welded together. If a broken weld is found, report it to unit level of maintenance.

e. Inspect electrical wires, connectors, terminals, and receptacles. Look for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure wires are in good condition. Examine terminals and receptacles for serviceability. If deficiencies are found, report them to unit level of maintenance.

f. Inspect hoses and fluid lines. Look for wear, damage, and leaks. Make sure that clamps and fittings are tight. Wet spots and stains around a fitting or connector can mean a leak. If a leak comes from a loose connector, or if something is broken or worn out, report it to unit level of maintenance.

2-2.5 Leakage Definitions. You must know how fluid leakage affects the status of your equipment. The following are definitions of the types/classes of leakage you need to know to be able to determine the status of your equipment. Learn and be familiar with them. When in doubt, *notify your supervisor.*

Leakage Class	Leakage Definition
Class I	Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.
Class II	Leakage of fluid great enough to form drops, but not enough to cause drops to drip from the item being checked/inspected.
Class III	Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

2-2.6 Order in Which PMCS will be done. Figure 2-1 shows the order in which you are to perform your PMCS. The figure shows a generator to which a kit has been added. The number call outs on Figure 2-1 corresponds to the numbers in the Item No. column of Table 2-1, for BEFORE/DURING PMCS.

NOTE

Be sure Generator PMCS is completed first in accordance with TM 9-6115-643-10.

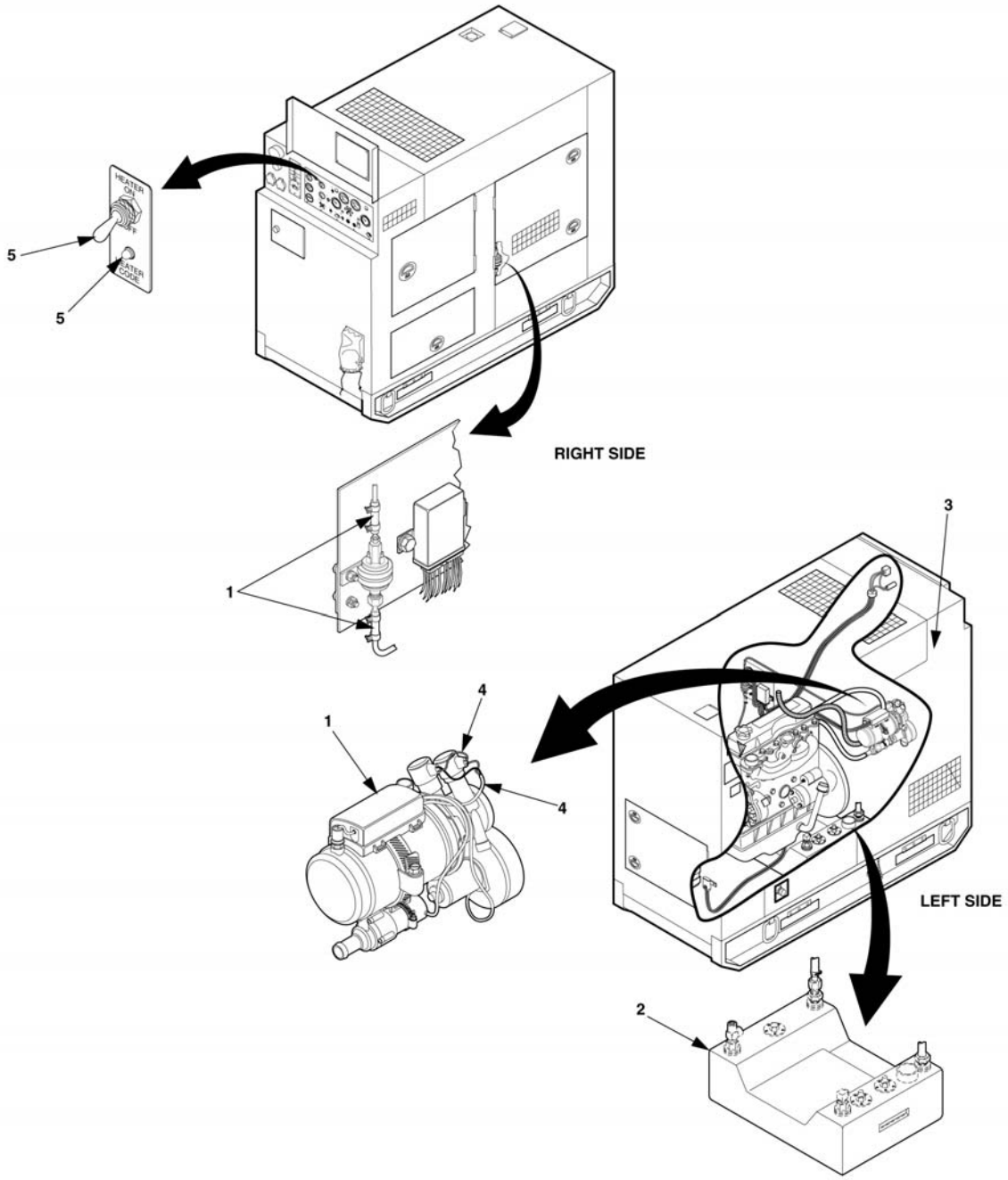

Figure 2-1. Operator PMCS Routing Diagram.

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

Item No.	Interval	Location Item to Check/Service	Procedure	Not Fully Mission Capable if:
			NOTE Refer Generator TM 9-6115-643-24.	
1	Before	VISUAL INSPECTION		
		• Heater assembly	a. Check for damage.	Damage that renders equipment unsafe.
		• Heater control unit • Fuel and coolant lines	b. Check on, around and under equipment for fuel, oil or coolant leaks.	Class III coolant or any class fuel leak is detected.
2	Before	GENERATOR FUEL TANK	Check for sufficient fuel supply.	Generator is low on fuel.
3	Before	GENERATOR COOLING SYSTEM	**WARNING** Generator cooling system operates at high temperatures. Personal injury or death from burns or scalding can result from contact with high-pressure steam and/or liquid.	Generator is low on coolant.
		RADIATOR	Inspect for loose, damaged or missing parts.	Class III leaks or missing radiator cap.
		HOSES	Inspect for leaks, cracks or missing parts.	Class III leaks or missing clamps or hoses.
4	Before	HEATER WIRING CONNECTIONS	Inspect wiring for burned or frayed insulation or loose terminals.	Wiring is loose or burned.
5	During	HEATER CONTROL SWITCH AND LIGHT	Check that indicator light is on when heater is operating. Check Heater Function Code Plate.	
6	After	ITEMS 1 - 5	Repeat procedures for items 1 - 5.	

Section III. OPERATION UNDER USUAL CONDITIONS

2-3 ASSEMBLY AND PREPARATION FOR USE.

The kit is installed on the generator. No assembly or preparation for use is required. For operation of the generator, refer to TM 9-6115-643-10.

2-4 OPERATING INSTRUCTIONS.

2-4.1 Winterization Kit. Usual conditions for operating the heater imply extremely cold temperatures. The heater allows the generator set to operate to -50°F (-45.6°C). Heater operation is automatic after the ON/OFF switch is placed in the ON position.

NOTE

Depending on temperature, heater could take up to 1 hour to activate heater control circuits.

a. At least 30 minutes, before generator is to be started, put the heater power switch on generator control panel in the ON position to activate heater control circuits.

b. When the coolant temperature reaches 176°F (80°C), the heater switches to low heat mode. Check temperature gauge if you have a reading of 176°F.

c. When generator is started, place the heater ON-OFF power switch in OFF position. The indicator light should go off.

2-5 PREPARATION FOR MOVEMENT.

The kit is installed on the generator. No preparation for movement is required beyond that for moving the generator.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-6. UNUSUAL CONDITIONS.

Same operation under unusual conditions applies to the generator with the winterization kit. Refer to TM 9-6115-643-10.

CHAPTER 3

OPERATOR MAINTENANCE

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Section II Maintenance Procedures 3-4

3-2 Operator Maintenance 3-4

Section I. TROUBLESHOOTING

3-1 GENERAL.

Refer to TM 9-6115-643-10 for generator troubleshooting instructions. This section lists common malfunctions you may find during operation of the generator with the Winterization Kit installed and the generator set is running. You should perform the tests/inspections and corrective actions in the order listed. Each malfunction listed on Figure 3-1 includes a reference to the troubleshooting figure that contains a glow chart to help determine probable causes and corrective actions to take. The troubleshooting symptom index cannot list all faults that may occur, nor all the tests or inspections and corrective actions. If a malfunction is not listed or cannot be corrected by listed corrective actions, notify your supervisor.

3-1.1 Code Light Troubleshooting. The indicator light near the heater switch is designed to blink on codes sequences to signal malfunctions in the system. (Refer to paragraph 3-1.1.1.)

3-1.1.1 Code Light Pulses. The indicator light near the heater ON-OFF switch will blink in different sequences of long and short to indicate malfunctions. A plate (Figure 3-1) mounted on the generator control panel access door (Figure 4-30) lists the malfunctions and shows each sequence of pulses. If you see any of these series of pulses, notify next higher level of maintenance.

NOTE

For Location of Troubleshooting Procedures (Figures), see page 4-8.

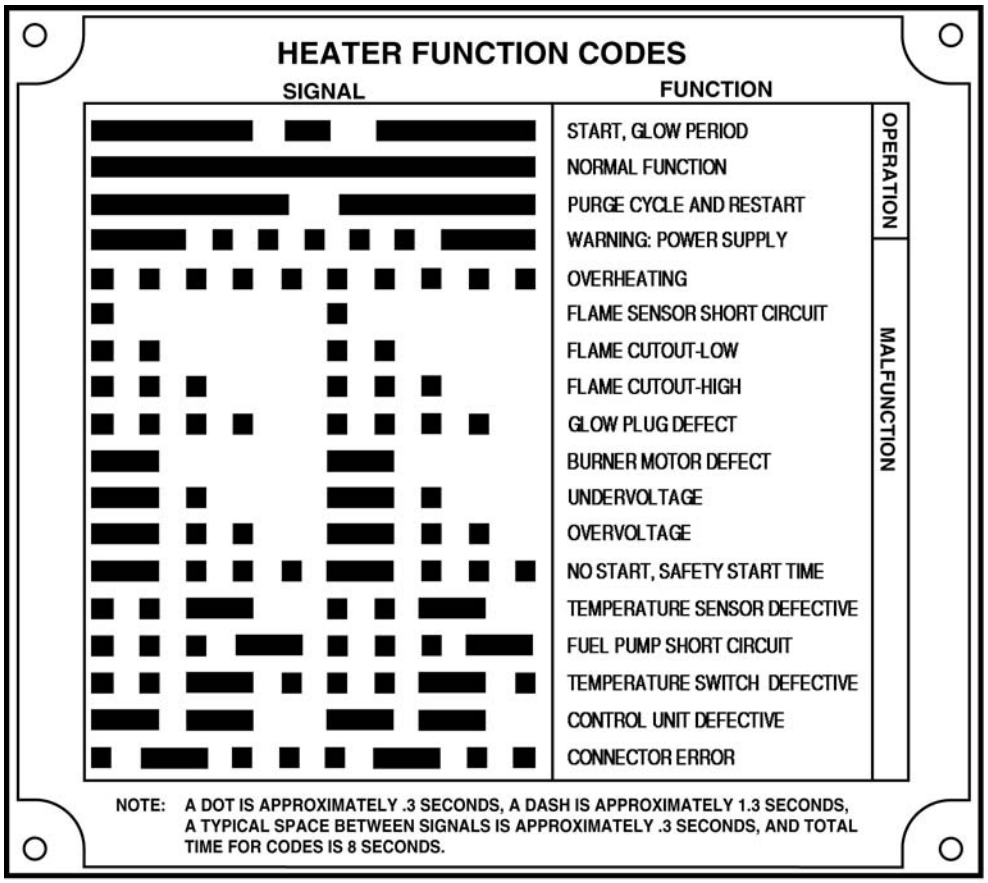

Figure 3-1. Heater Function Codes Plate.

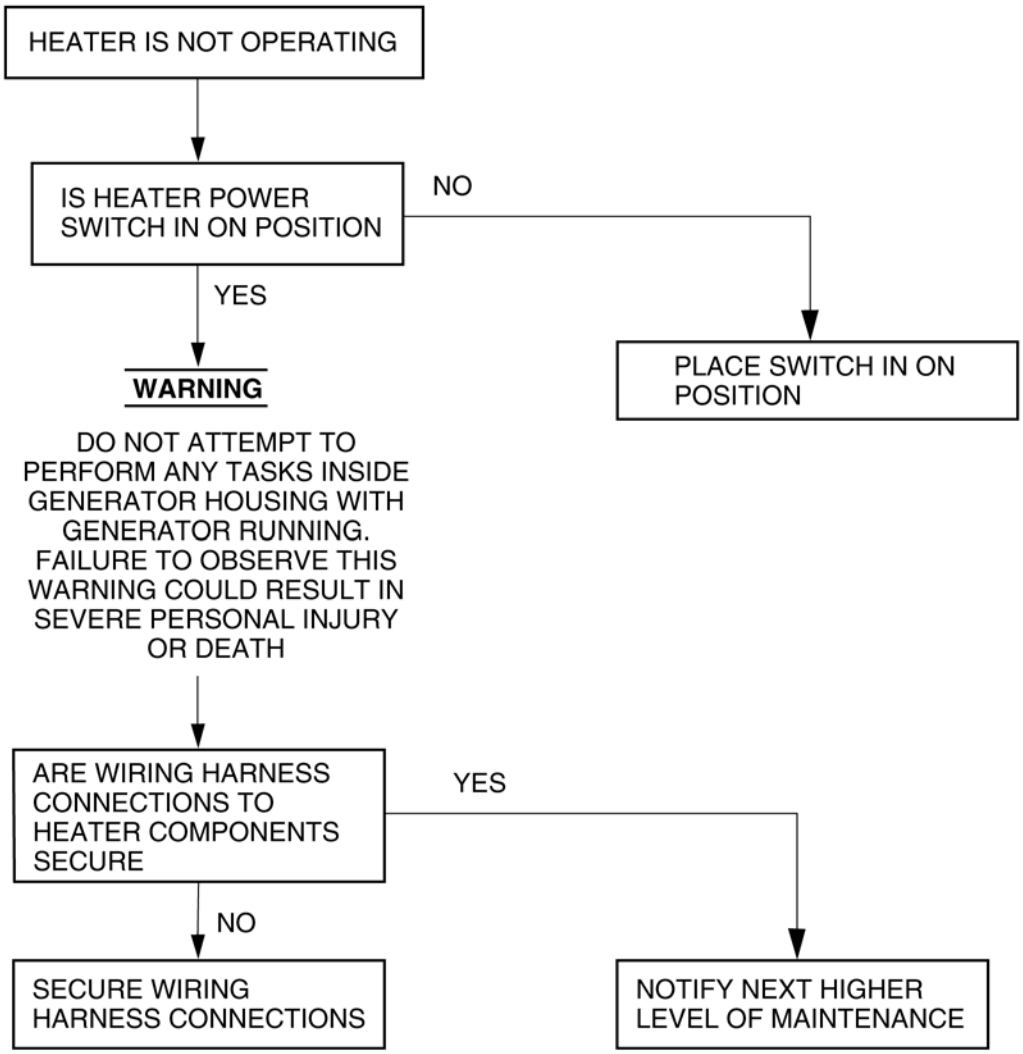

Figure 3-2. Heater Is Not Operating.

Section II. MAINTENANCE PROCEDURES

3-2 OPERATOR MAINTENANCE.

Refer to TM 9-6115-643-10 for generator maintenance instructions. Operator maintenance functions for the kit is limited to those authorized in the MAC and described in Table 2-1, Operator Preventive Maintenance Checks and Services.

CHAPTER 4

UNIT MAINTENANCE

Subject	Index	Page
Section I	Repair Parts; Special Tools; Test, Measurement, and Diagnostic Equipment (TMDE); and Support Equipment	4-2
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4-2	Special Tools, TMDE, and Support Equipment	4-2
4-3	Repair Parts	4-2
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4-4	Service Upon Receipt of Materiel	4-3
4-5	Removal Instructions	4-3
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4-14	Coolant Hose Maintenance	4-28
4-15	Air Inlet and Exhaust Hose Maintenance	4-30
4-16	Wiring Harness Maintenance	4-32
4-17	Igniter/Glow Plug and Resistor Maintenance	4-34
4-18	Fuel Line Maintenance	4-36
4-19	Function Codes Plate Maintenance	4-38
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4-21	Instructions to Unit Maintenance for Removal of Winterization Kit on the 15kW Tactical Quiet Generator Set	4-42

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 equipment.

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

No special tools or support equipment are required for maintenance of the modification kit.

4-3. REPAIR PARTS.

Repair parts for the modification kit are listed and illustrated in Appendix C.

Section II. SERVICE UPON RECEIPT

4-4 SERVICE UPON RECEIPT OF MATERIEL.

If winterization kit is already installed on the generator, the normal service on receipt of the generator is sufficient, and no separate service on receipt is required by unit for the winterization kit. If the kit is not installed, refer to Chapter 5, Section II of this TB.

4-5 REMOVAL INSTRUCTIONS.

Refer to Chapter 4, Section VII of this TB.

Section III. UNIT LUBRICATION

4-6 LUBRICATION (NOT APPLICABLE TO MODIFICATION KITS).

No lubrication is required on the winterization kit.

Section IV. UNIT PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-7 GENERAL.

Table 4-1 (Unit PMCS table) has been provided so you can keep your equipment in good operating condition and ready for its primary mission.

4-7.1 Warning, Cautions, and Notes. Always observe the ***WARNINGS, CAUTIONS,*** and ***NOTES*** appearing in your PMCS table. Warnings and Cautions appear before applicable procedures. You must observe ***WARNINGS*** to prevent serious injury to yourself and others. You must observe ***CAUTIONS*** to prevent your equipment from being damaged. You must observe ***NOTES*** to ensure procedures are performed properly.
Explanation of Table Entries.

4-7.2.1 Item No. Column. Numbers in this column are for reference. When completing DA Form 2404 (Equipment Inspection and Maintenance Worksheet), or DD Form 5988E (Equipment Inspection and Maintenance Worksheet), include the item number for the checks/service indicating a fault. Item numbers also appear in the order that you must do checks and services for the intervals listed.

4-7.2.2 Interval Column. This column tells you when you must do the procedure in the Procedure column. Perform procedures such as Monthly or Quarterly at the listed calendar interval. Perform procedures designated by number of hours when the equipment has been operated for that many hours.

4-7.2.3 Item to be Checked or Serviced Column. This column lists the item to be checked or serviced.

4-7.2.4 Procedure Column. This column gives the procedure for checking or servicing the item listed in the location, item to check/service column. You must perform the procedure to know if the generator is ready or available for its intended mission or operation. You must do the procedure at the time stated in the interval column.

4-7.2.5 Not Fully Mission Capable if: Column. Information in this column tells you what faults will keep your equipment from being capable of performing its primary mission. If you make checks or services that show faults listed in this column, do not operate the equipment.

4-7.2.6 Reporting and Correcting Deficiencies. If Winterization Kit does not perform as required, refer to Chapter 4, Section V. Troubleshooting.

4-7.3 Other Table Entries. Be sure to observe all special information and notes that appear in your table.

4-7.4 Special Instructions. Preventive maintenance is not limited to performing the checks and services listed in the PMCS table. See Figure 4-1 for PMCS routing. Covering unused receptacles, stowing unused accessories, and other routine procedures such as equipment inventory, cleaning components, and touch up painting are not listed in the table. If a routine check is listed in the PMCS table, it is because experience has shown that problems may occur with this item. Take along tools and cleaning cloths needed to perform the required checks and services.

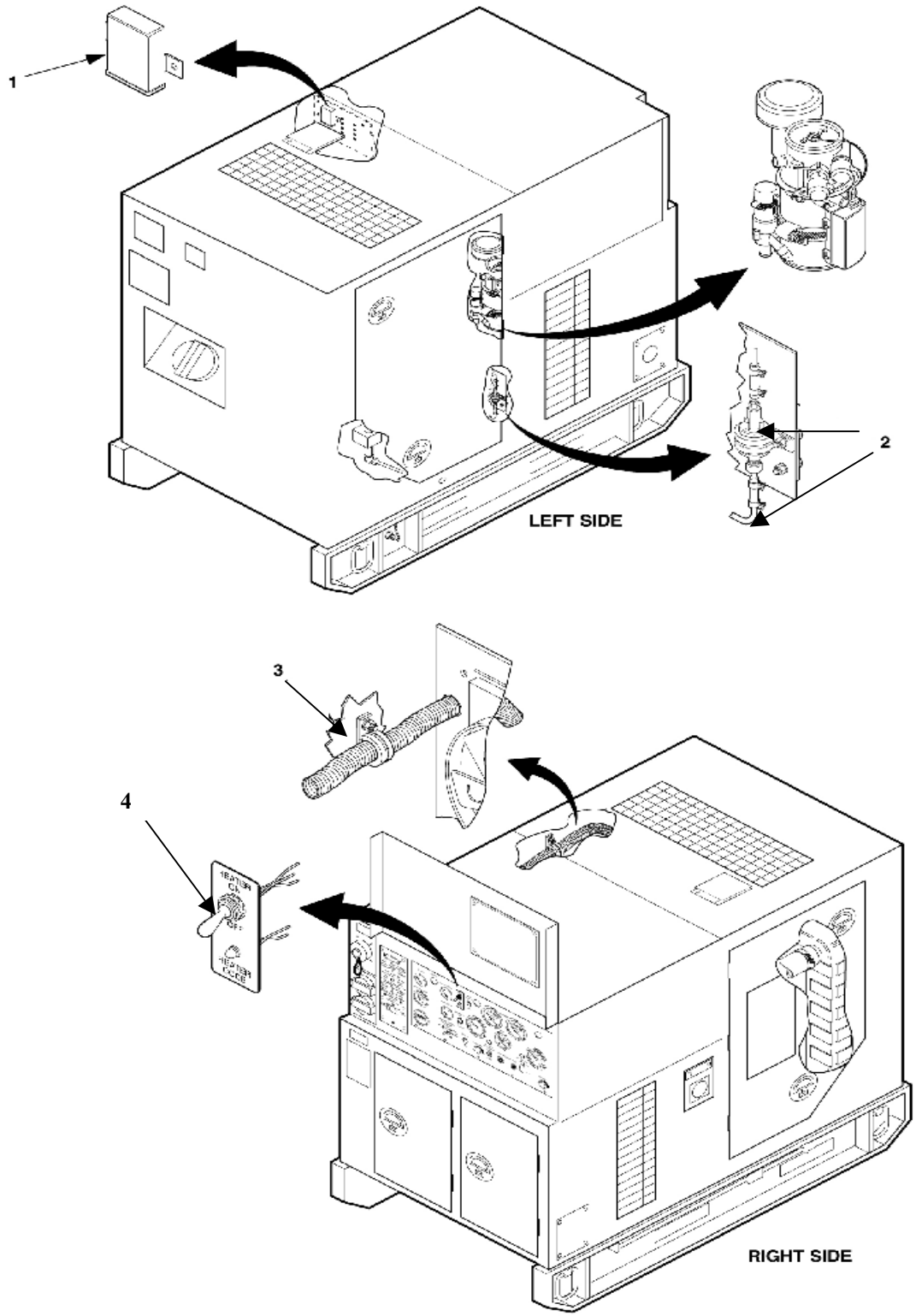

Figure 4-1. Unit PMCS Routing Diagram.

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

Item No.	Interval	Item to be Checked or Serviced	Procedure	Not Fully Mission Capable if:
		WINTERIZATION KIT		
1	Before	HEATER CONTROL UNIT	Check electrical connections for damage or loose connections.	Loose or damaged electrical connections.
2	Before	FUEL PUMP AND LINES	Check pump connections for leaks and/or loose connections.	Fuel leaks or loose connections.
3	Before	EXHAUST SYSTEM	Check for loose connections and/or leaks.	Exhaust leaks or loose connections.
4	Before	HEATER ON/OFF SWITCH	Check operations of heater on/off switch.	Doesn't turn heater on.

Section V. TROUBLESHOOTING

4-8 GENERAL.

Refer to TM 9-6115-643-24 for generator troubleshooting procedures and to TM 9-2815-254-24 for engine troubleshooting procedures. In this section a symptom index for the kit lists faults associated with kit operation. The kit has an indicator light, which flashes in a sequence to indicate faults. These pulses are shown visually on the Function Codes plate mounted inside the generator control panel cover. Refer to Figure 3-1 and 4-2 for the Function Codes plate. Figure 4-3 through 4-19 show the same information for the kit. Each malfunction listed on the Symptom Index includes a reference to the troubleshooting figure that contains a chart that will help you determine probable causes and corrective actions to take. The symptom index cannot list all faults that may occur, nor all the test or inspections and corrective actions. If a malfunction is not listed or cannot be corrected by listed corrective actions, notify next higher level of maintenance for assistance.

SYMPTOM INDEX, WINTERIZATION KIT

NOTE

When the heater is switched on, the light will perform one of the sequences of light pulses shown visually on the Function Codes Plate mounted inside the generator control panel cover (Figure 4-30). Before each symptom, this index lists in parentheses the light sequence associated with it.

Troubleshooting Symptom	Procedure (Page)
No Indication of Heater Operation When Switch Is In ON Position	4-10
(dash, dash) Heater Restart Attempted During Purge Cycle	4-11
(dash, 5 dots, dash) Warning: Power Supply	4-11
(10 dots) Overheating	4-12
(dot, dot) Flame Sensor Short-Circuit	4-12
(2 dots, 2 dots) Flame Cutout-LOW	4-13
(3 dots, 3 dots) Flame Cutout-HIGH	4-13
(4 dots, 4 dots) Glow Plug Defect	4-14
(dash, dash) Burner Motor Defect	4-14
(dash, dot, dash, dot) Under Voltage	4-14
(dash, 2 dots, dash, 2 dots) Over Voltage	4-15
(dash, 3 dots, dash, 3 dots) Non-Start	4-15
(2 dots, dash, 2 dots, dash) Temperature Sensor Defective	4-16
(3 dots, dash, 3 dots, dash) Fuel Pump Short Circuit	4-16
(2 dots, dash, 3 dots, dash, dot) Temperature Switch Defective	4-17
(4 dashes) Control Unit Defective	4-17
(dot, dash, 3 dots, dash, 2 dots) Connection Error	4-17

NOTE

Before performing troubleshooting procedures, turn off heater and attempt restart.

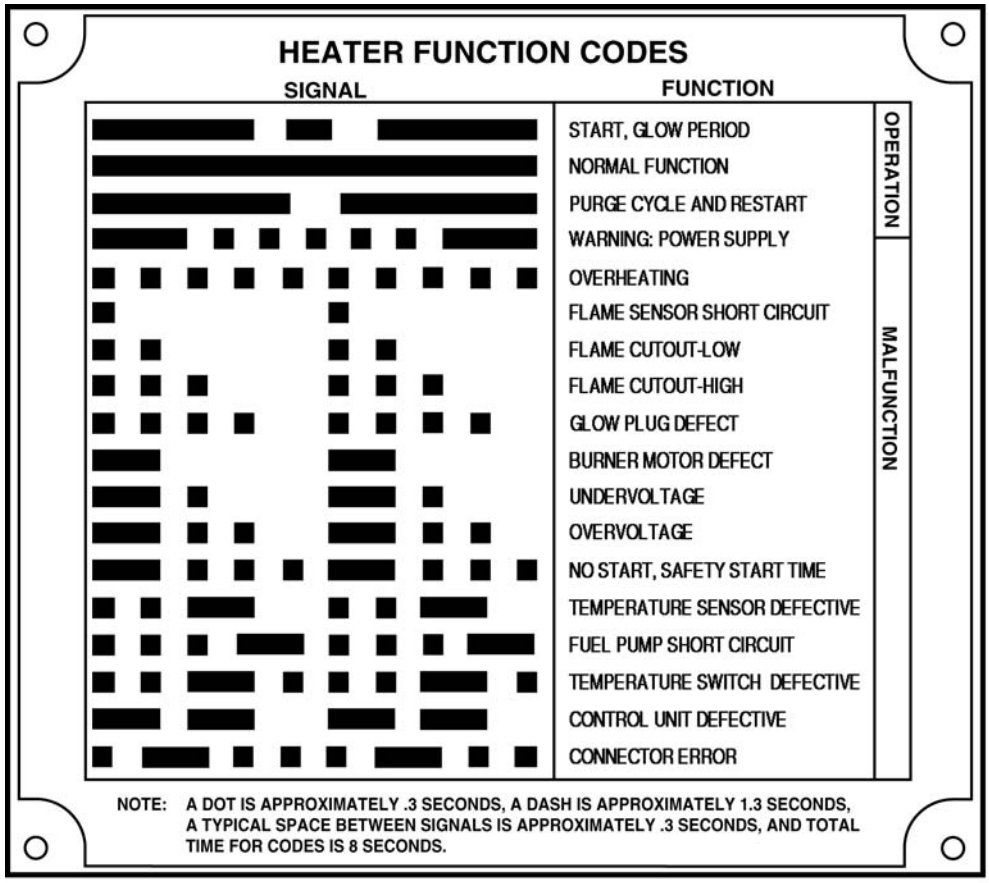

Figure 4-2. Heater Function Codes Plate.

WARNING

DO NOT ATTEMPT ANY TASKS INSIDE GENERATOR HOUSING WITH GENERATOR SET RUNNING. FAILURE TO OBSERVE THIS WARNING COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH.

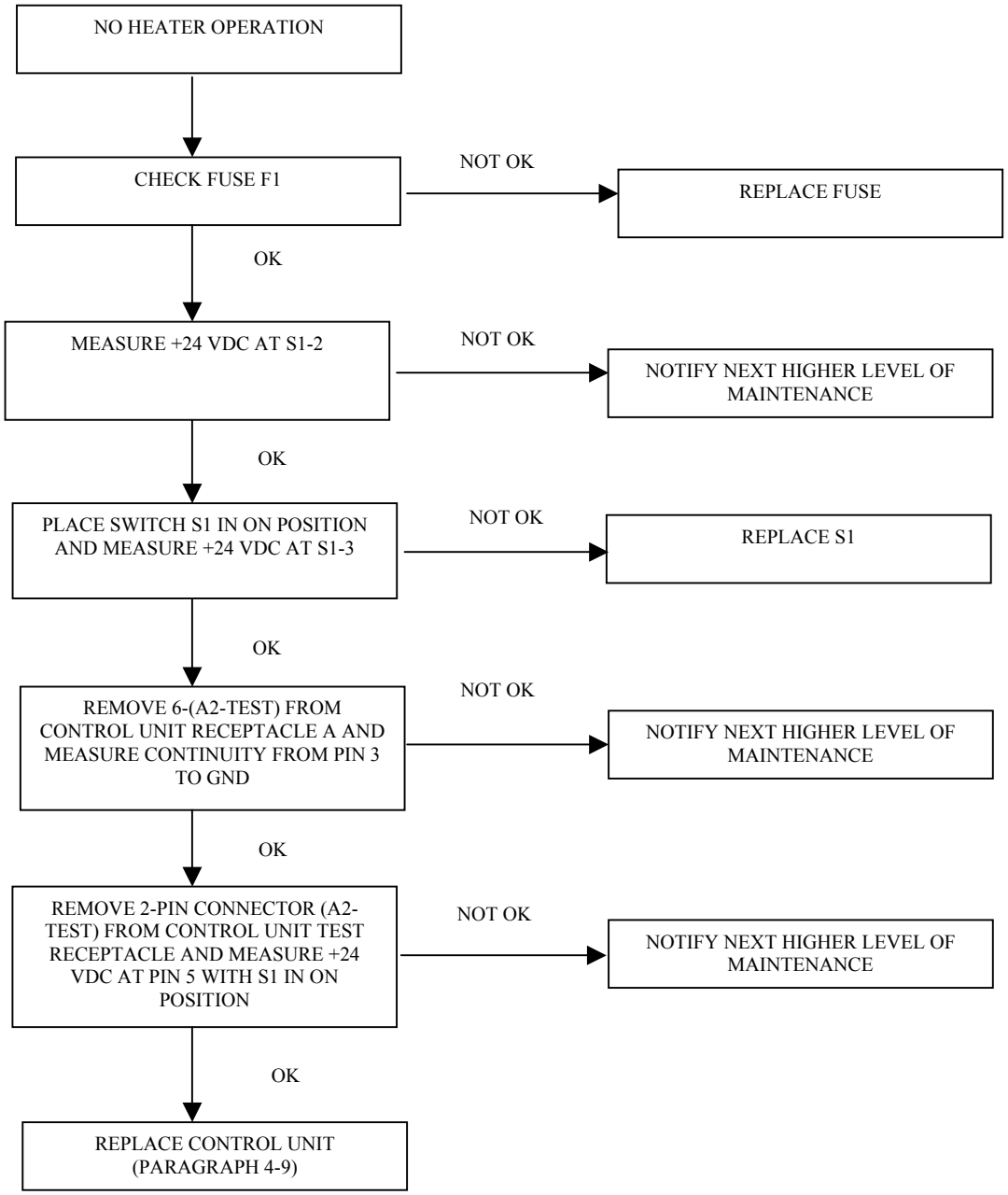

Figure 4-3. No Indication of Heater Operation When Switch Is In ON Position.

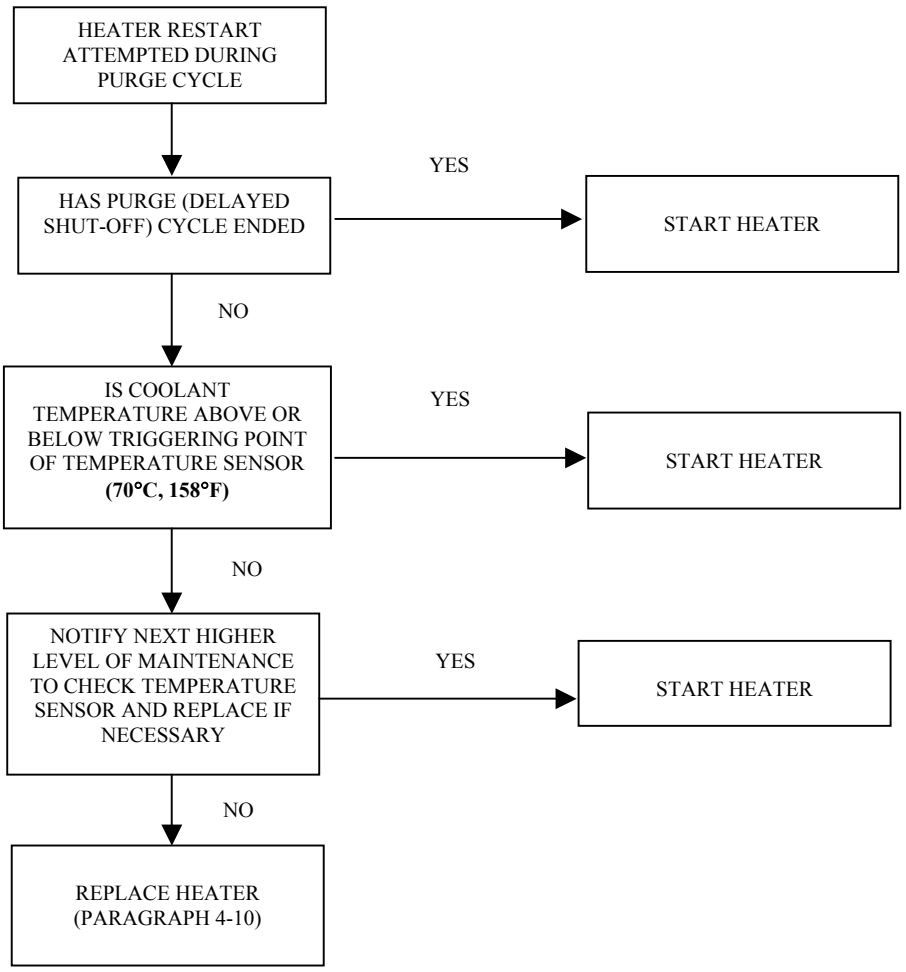

Figure 4-4. (dash, dash) Heater Restart Attempted During Purge Cycle.

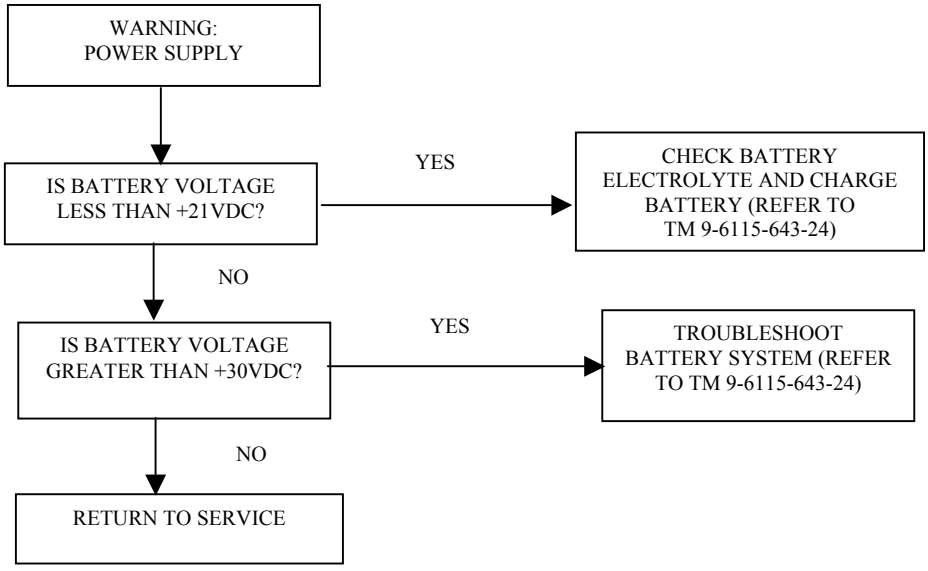

Figure 4-5. (dash, 5 dots, dash) Warning: Power Supply.

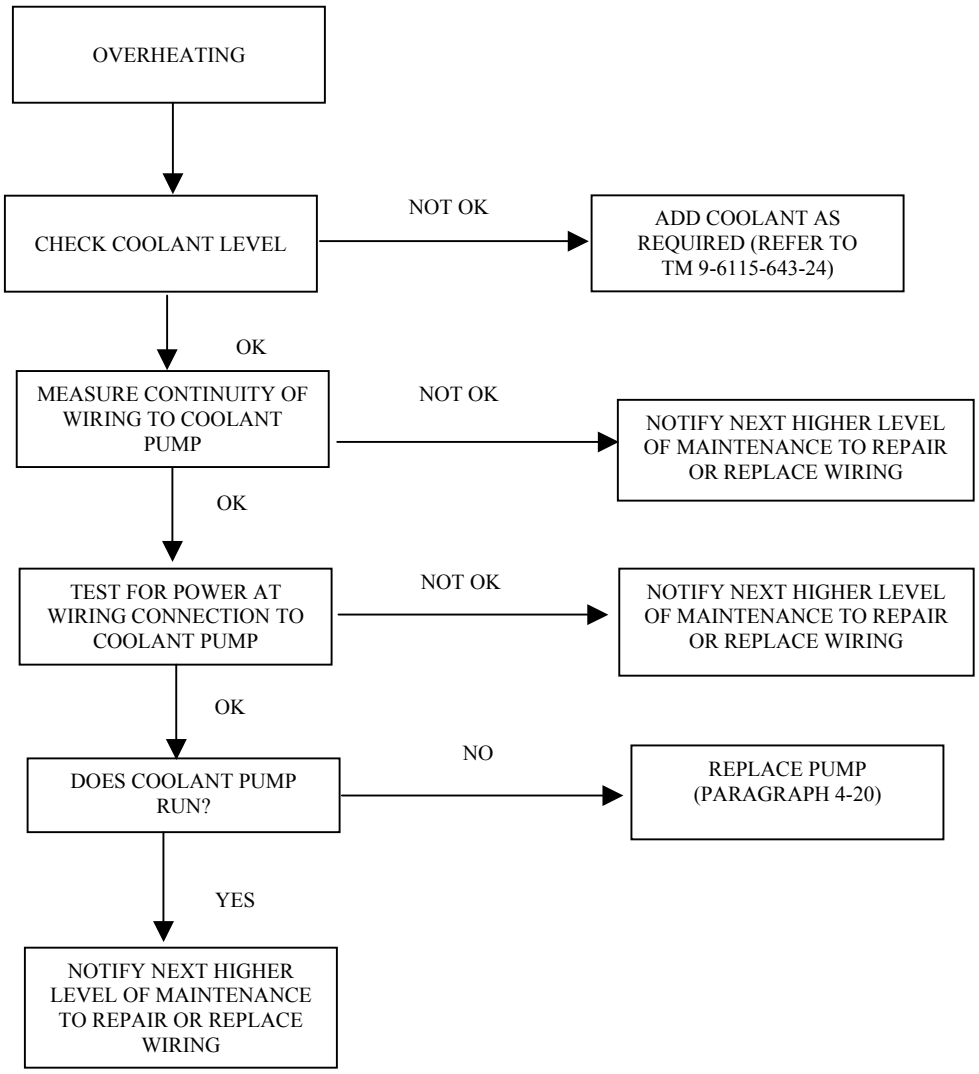

Figure 4-6. (10 dots) Overheating.

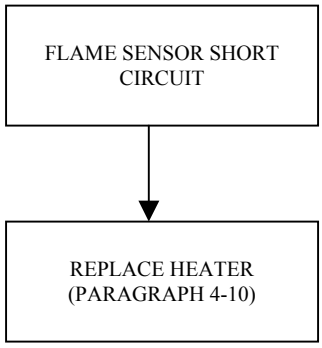

Figure 4-7 (dot, dot) Flame Sensor Short-Circuit.

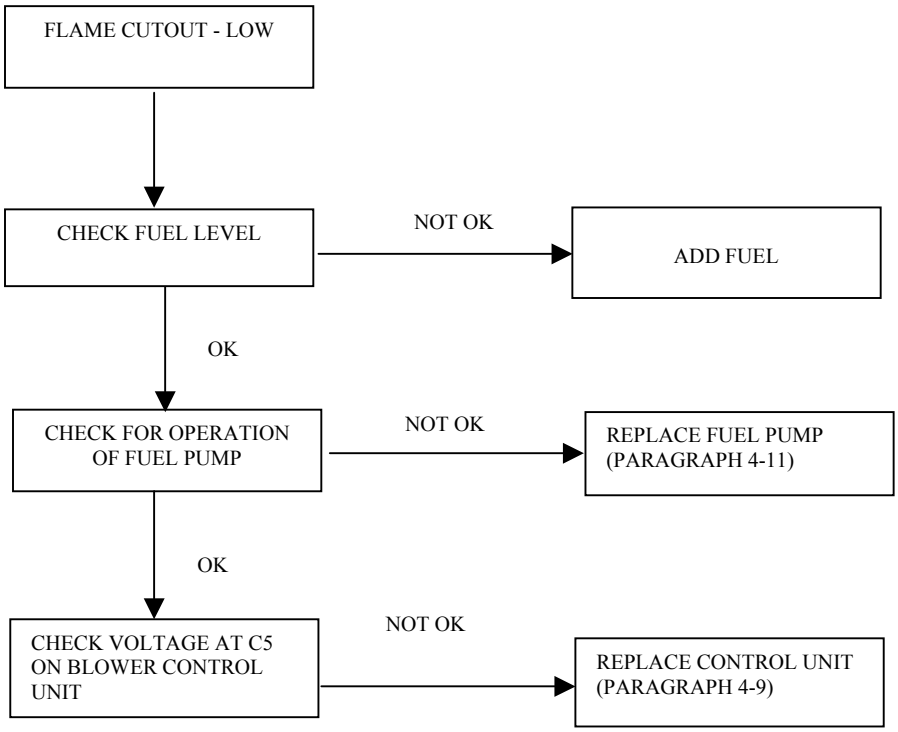

Figure 4-8. (2 dots, 2 dots) Flame Cutout - Low.

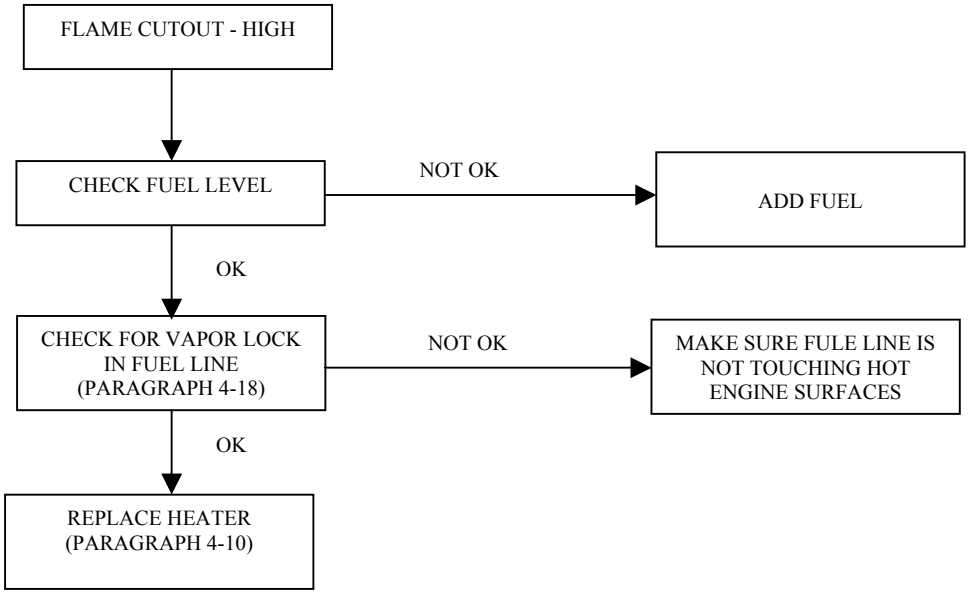

Figure 4-9. (3 dots, 3 dots) Flame Cutout - High.

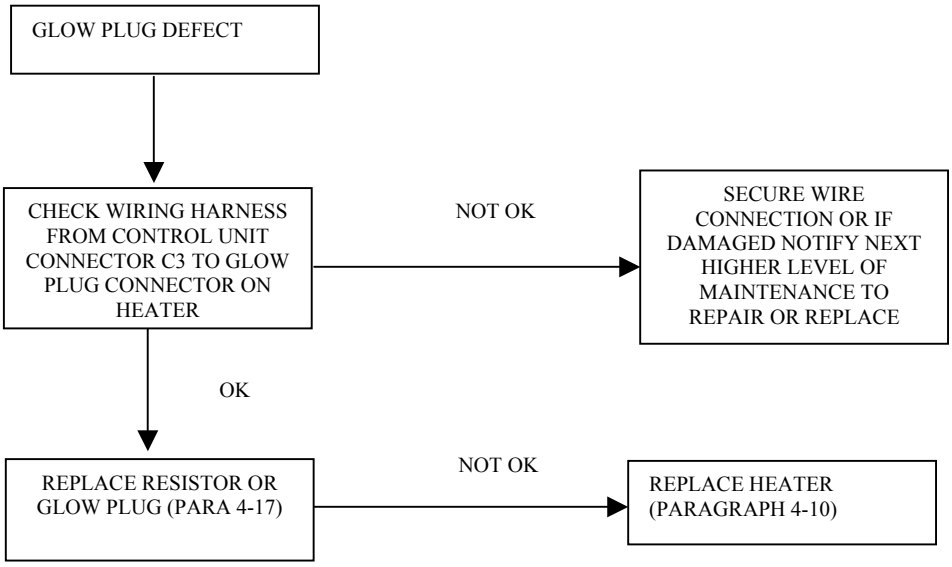

Figure 4-10 (4 dots, 4 dots) Glow Plug Defect.

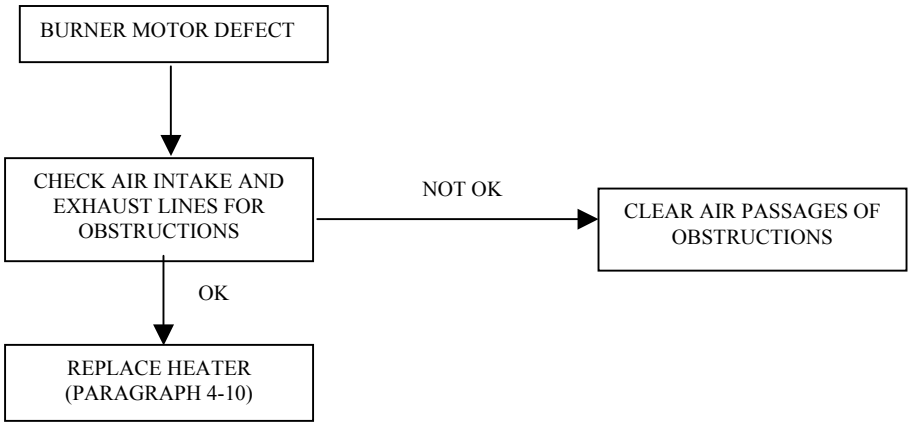

Figure 4-11 (dash, dash) Burner Motor Defect.

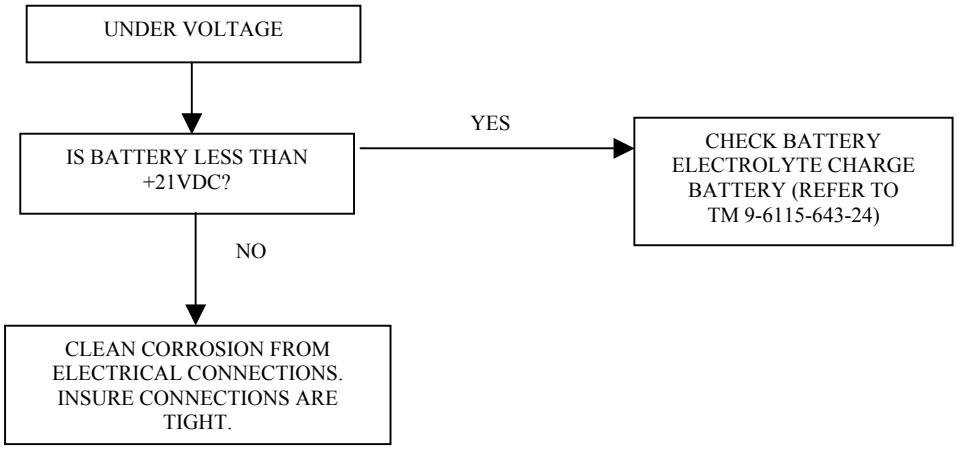

Figure 4-12 (dash, dot, dash, dot) Under Voltage.

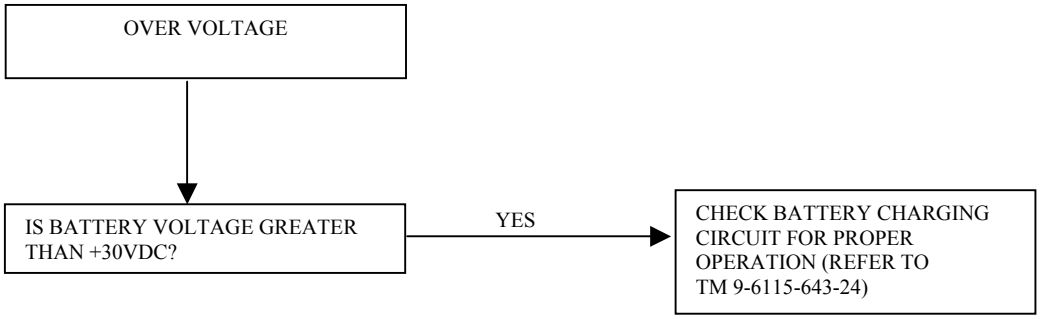

Figure 4-13 (dash, 2 dots, dash, 2 dots) Over Voltage.

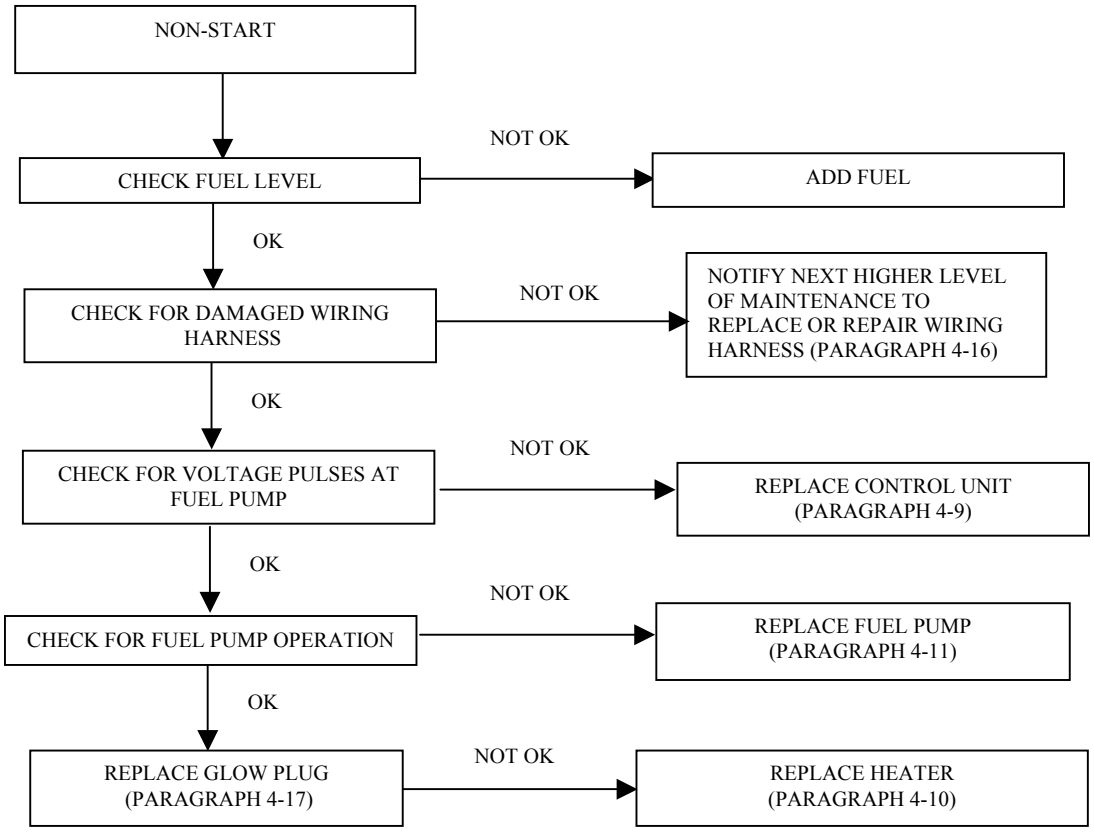

Figure 4-14 (dash, 3 dots, dash, 3 dots) Non-Start.

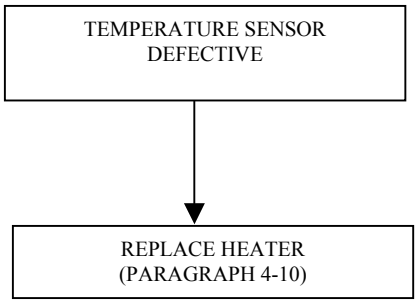

Figure 4-15 (2 dots, dash, 2 dots, dash) Temperature Sensor Defective.

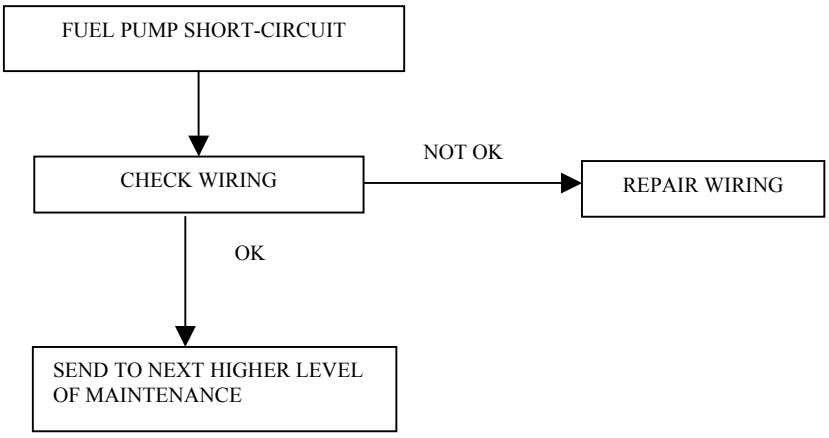

Figure 4-16 (3 dots, dash, 3 dots, dash) Fuel Pump Short-Circuit.

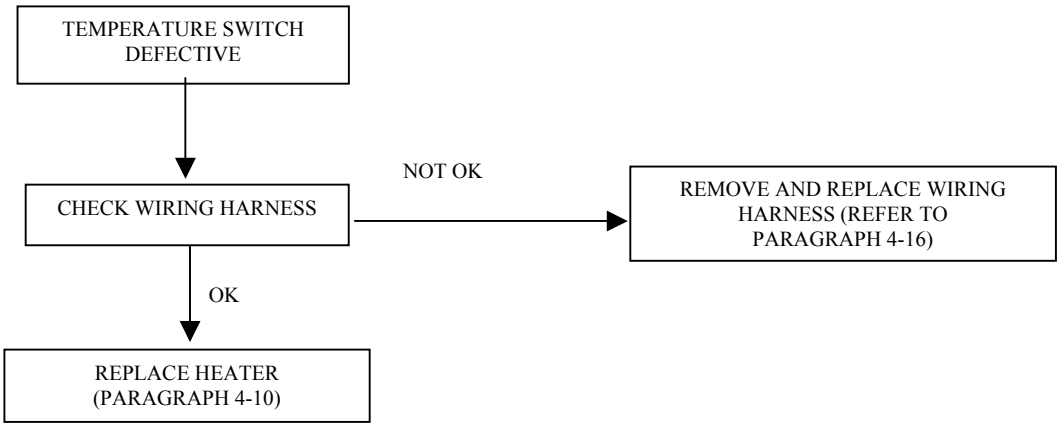

Figure 4-17 (2 dots, dash, 3 dots, dash, dot) Temperature Switch Defective.

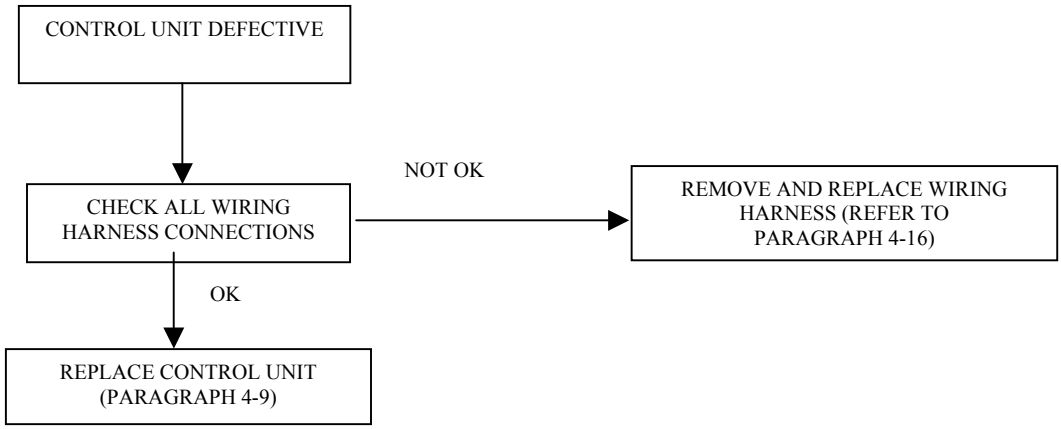

Figure 4-18 (4 dashes) Control Unit Defective.

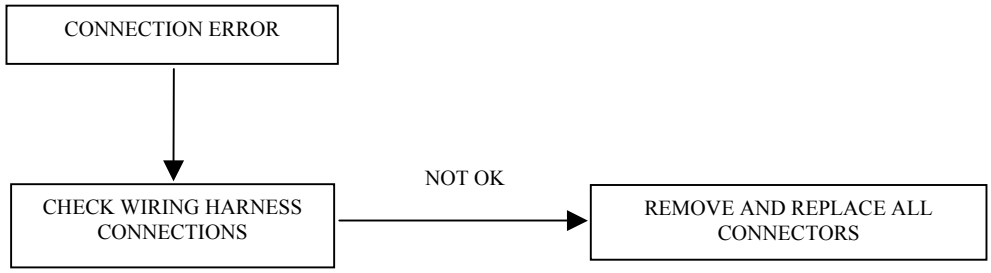

Figure 4-19 (dot, dash, 3 dots, dash, 2 dots) Connection Error.

Section VI. UNIT MAINTENANCE PROCEDURES.

WARNING

Do not attempt to perform any maintenance tasks on the kit while the generator is operating. Serious electrical shock or death by electrocution may result from failure to observe this warning.

4-9 CONTROL UNIT MAINTENANCE.

This task covers:
a. Test
b. Remove
c. Replace
d. Install

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 1, appendix B)

Materials/Parts

Equipment Conditions

Reference

Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2
Heater shut off, Paragraph 2-4.1c

TEST

Refer to troubleshooting procedures, Figures 4-3, 4-8, and 4-14.

REMOVAL

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Failure to observe this warning could result in severe personal injury or death.

WARNING

Before disconnecting any coolant lines, let generator cool from operation, then relieve pressure by opening radiator cap carefully. Coolant is hot and under pressure and may cause severe burns.

1. Disconnect negative battery cable.
2. Disconnect electrical connectors.
3. Remove two screws (2), Figure 4-20, lock washers (3), flat washers (4) and control unit (1).

REPLACEMENT

1. Perform steps 1 thru 3 of removal.
2. Perform steps 1 thru 3 of installation, substituting new control unit for the defective one.

INSTALLATION

1. Install control unit (1), securing with screws (2), lock washers (3), and flat washers (4).
2. Reconnect wiring harness to control unit.
3. Reconnect negative battery cable.

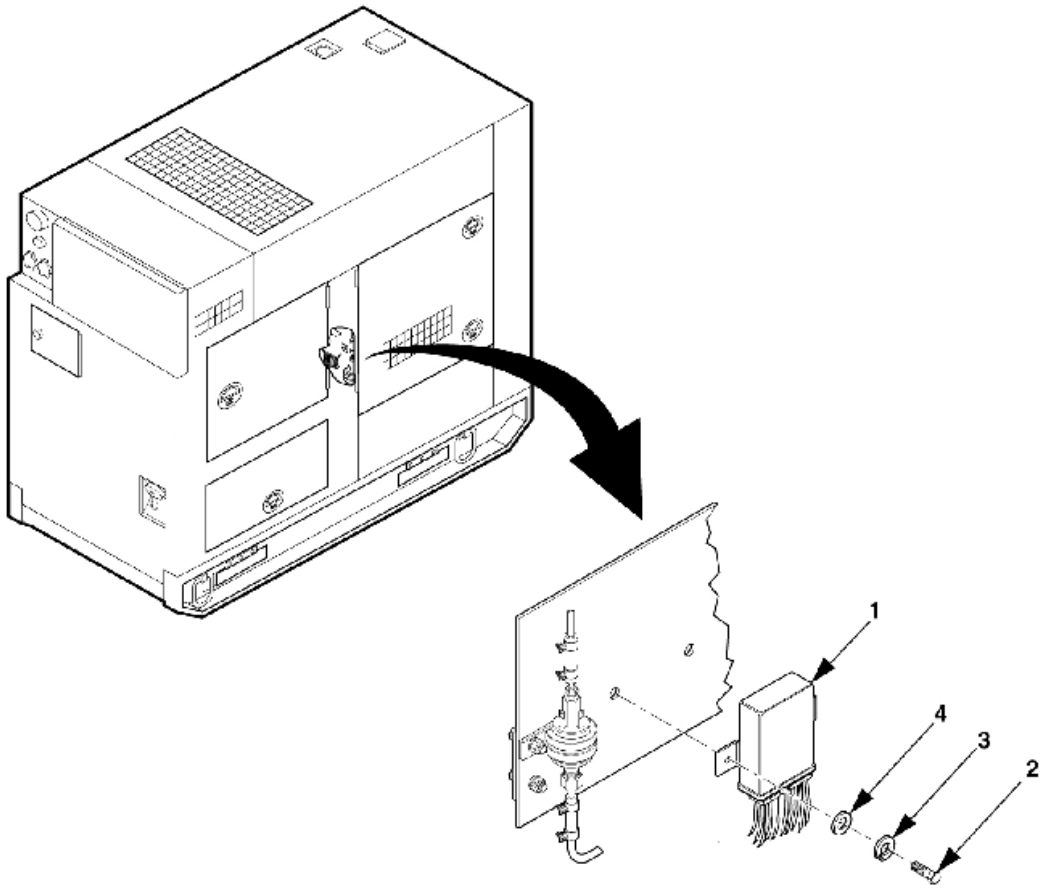

Figure 4-20. Control Unit Maintenance.

4-10. HEATER ASSEMBLY MAINTENANCE.

This task covers:
a. Inspect
b. Test
c. Remove
d. Repair
e. Replace
f. Install

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 1, appendix B)

Materials/Parts

Equipment Conditions

Reference

Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2
Heater shut off, Paragraph 2-4.1c

INSPECTION

Inspection is limited to visual inspection of components. Check for damaged and frayed wiring.

TEST

Refer to troubleshooting procedures, Figures 4-4, 4-7, 4-9, 4-10, 4-11, 4-14, 4-15, and 4-17.

REMOVAL

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Failure to observe this warning could result in severe personal injury or death.

WARNING

Before disconnecting any coolant lines, let generator cool from operation, then relieve pressure by opening radiator cap carefully. Coolant is hot and under pressure and may cause severe burns.

1. Disconnect negative battery cable.
2. Drain coolant system.
3. Disconnect fuel clamp (1), Figure 4-21, and fuel line (2) from heater and drain any fuel from hose into a suitable container.
4. Disconnect wiring harness connector (17) from heater.
5. Remove screw clamp (15) and remove elbow (16) and exhaust hose (6) from heater (3).
6. Position a suitable container under heater to catch coolant from hoses, and loosen screw clamps (7) to disconnect coolant inlet hose (8) and outlet hose (9) from heater (3).
7. Remove four screws (14), lock washers (11), flat washers (12), nuts (10), and heater (3) with mounting plate (13) from bulkhead housing.

REPAIR

1. Repair of the Heater Assembly is limited to the replacement of the igniter/glow plug assembly, resistor, and the coolant pump.

REPLACEMENT

1. Perform steps 1 thru 7 of removal.

2. Perform steps 1 thru 7 of installation, substituting new heater assembly for the defective one.

INSTALLATION

1. Install heater (3) with attached mounting plate (13) on bulkhead housing. Secure with flat washers (12), lock washers (11), screws (14), and nuts (10).

2. Connect coolant inlet hose (8) and outlet hose (9) to heater (3), using screw clamps (7). Top off radiator to replace any coolant lost in removing hoses.

3. Attach elbow (16) to heater unit (3) and exhaust flex hose (6) to elbow using screw clamp (15).

4. Connect wiring harness connector (17) to the heater (3).

5. Connect fuel line (2) to heater assembly (3) using clamp (1).

6. Top off coolant system.

7. Reconnect negative battery cable.

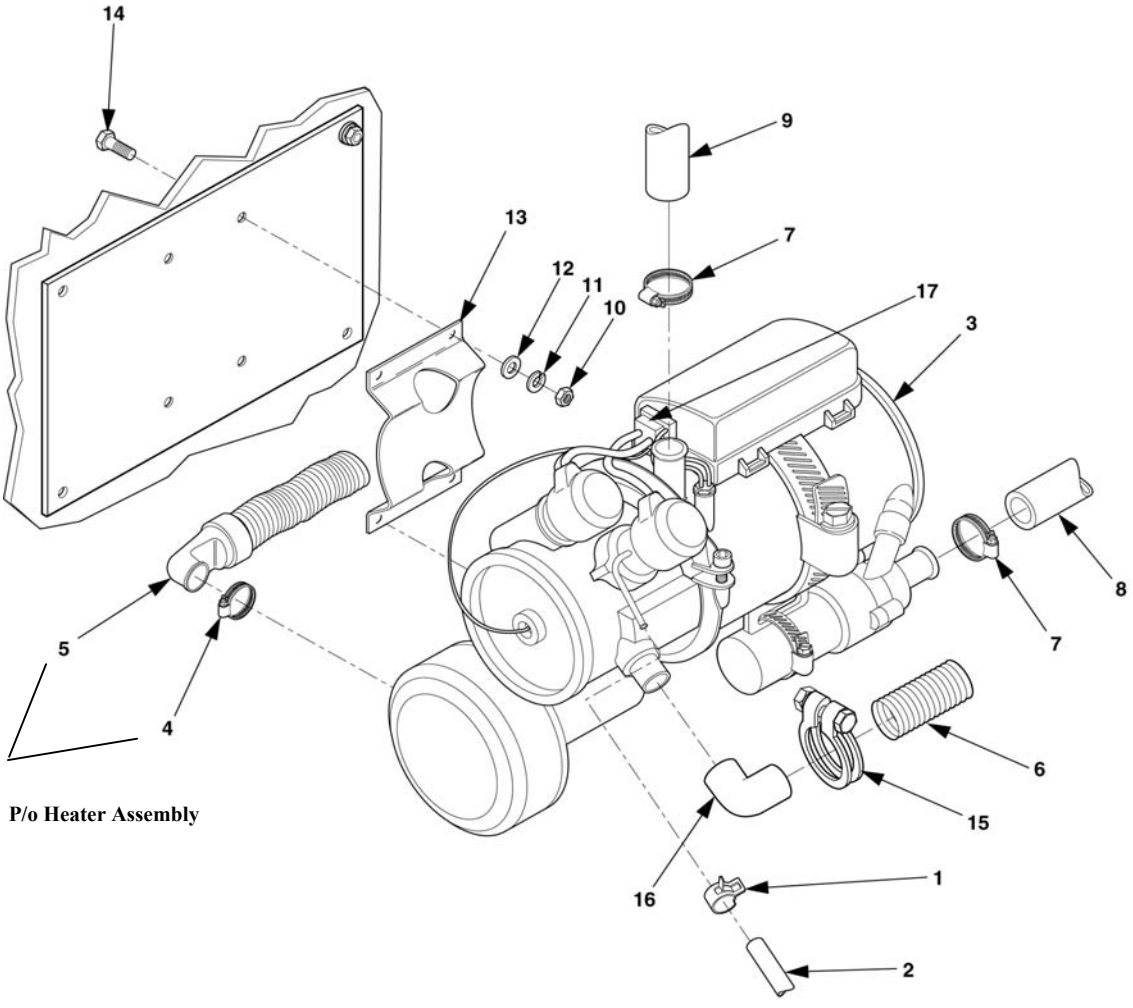

Figure 4-21. Heater Assembly Maintenance

4-11 FUEL PUMP MAINTENANCE.

This task covers: a. Test b. Remove c. Replace d. Install

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 1, appendix B)

Materials/Parts

Equipment Conditions

Reference

Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2
Heater shut off, Paragraph 2-4.1c

TEST

1. Disconnect fuel line at heater assembly.
2. Place fuel line into container suitable for catching fuel.
3. Apply 24 VDC to electrical input of pump. Pump should hum. Fuel will then start flowing into the container.

REMOVAL

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Failure to observe this warning could result in severe personal injury or death.

WARNING

Before disconnecting any coolant lines, let generator cool from operation, then relieve pressure by opening radiator cap carefully. Coolant is hot and under pressure and may cause severe burns.

WARNING

Catch fuel in a suitable container. Keep spilled fuel away from hot engine and all fires, and wash with warm water after getting any on skin. Fuel is highly flammable and is irritating to skin.

1. Disconnect negative battery cable.
2. Disconnect electrical leads (12) from connector (11), Figure 4-22, on fuel pump (2).
3. Loosen screw clamps (3) to disconnect fuel line and butt splice (4) from input end of fuel pump (2). Drain any fuel from line into a suitable container.
4. Loosen screw clamp (3) to disconnect butt splice (5) and fuel line (6) from output end of fuel pump (2). Drain any fuel from line into a suitable container.
5. Remove nut (10), lock washer (9), flat washer (8) from bolt (7). Then, remove bolt.
6. Remove fuel pump (2) from clamp (3).

REPLACEMENT

1. Perform steps 1 thru 6 and reverse order of removal.

2. Perform steps 1 thru 5 of installation, substituting new fuel pump for the defective one.

INSTALLATION

1. Install new fuel pump (2) in clamp (13) and secure to housing with bolt (7), flat washer (8), lock washer (9), and nut (10).

2. Install butt splice (5) and fuel line (6) on outlet end of fuel pump (2) and secure with screw clamps (3).

3. Install fuel line (6) and butt splice (4) on inlet end of fuel pump (2) and secure with screw clamps (3).

4. Plug in electrical leads (12) at connector (11) on fuel pump (2).

5. Reconnect negative battery cable.

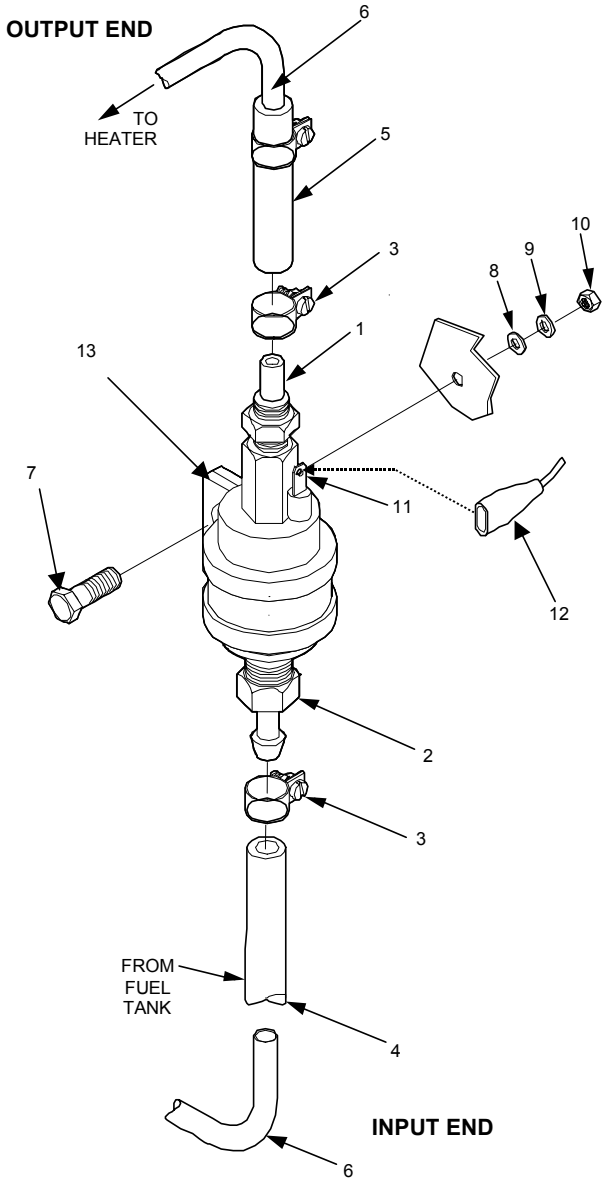

Figure 4-22. Fuel Pump Maintenance.

4-12 HEATER ATTACHMENT MAINTENANCE

This task covers: a. Replace

INITIAL SETUP

Tools	Equipment Conditions
Tool Kit, General Mechanic's (item 1, appendix B)	Reference
	Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2
Materials/Parts	Heater shut off, Paragraph 2-4.1c

REPLACE

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Failure to observe this warning could result in severe personal injury or death.

WARNING

Catch fuel in a suitable container. Keep spilled fuel away from hot engine and all fires, and wash with warm water after getting any on skin. Fuel is highly flammable and is irritating to skin.

1. Turn heater and generator off.
2. Open left and right access doors and disconnect negative battery cable from right battery and positive battery cable from the left battery.
3. Support heater. Remove screws (1, 3, 4), Figure 4-23, washers (2, 7, and 8), nut (11), lock washers (5, 6, and 9) and heater from heater-mounting brace (10), then heater-mounting brace (10) from wall-mounting bracket (12), and wall-mounting bracket (12) and screws (13) from generator housing (14).
4. Inspect all hardware (1-13) for damage and replace as required.
5. Install wall-mounting bracket (12) with screws (4, 13), lock washers (6) and washers (8) to generator housing (14).
6. Install heater to heater-mounting brace (10) with screws (1), washers (2), lock washers (9) and nut (11).
7. Install heater-mounting brace (10) to wall-mounting bracket (12) with screws (3), lock washers (5), and washers (7).
8. Reconnect batteries and close access doors.

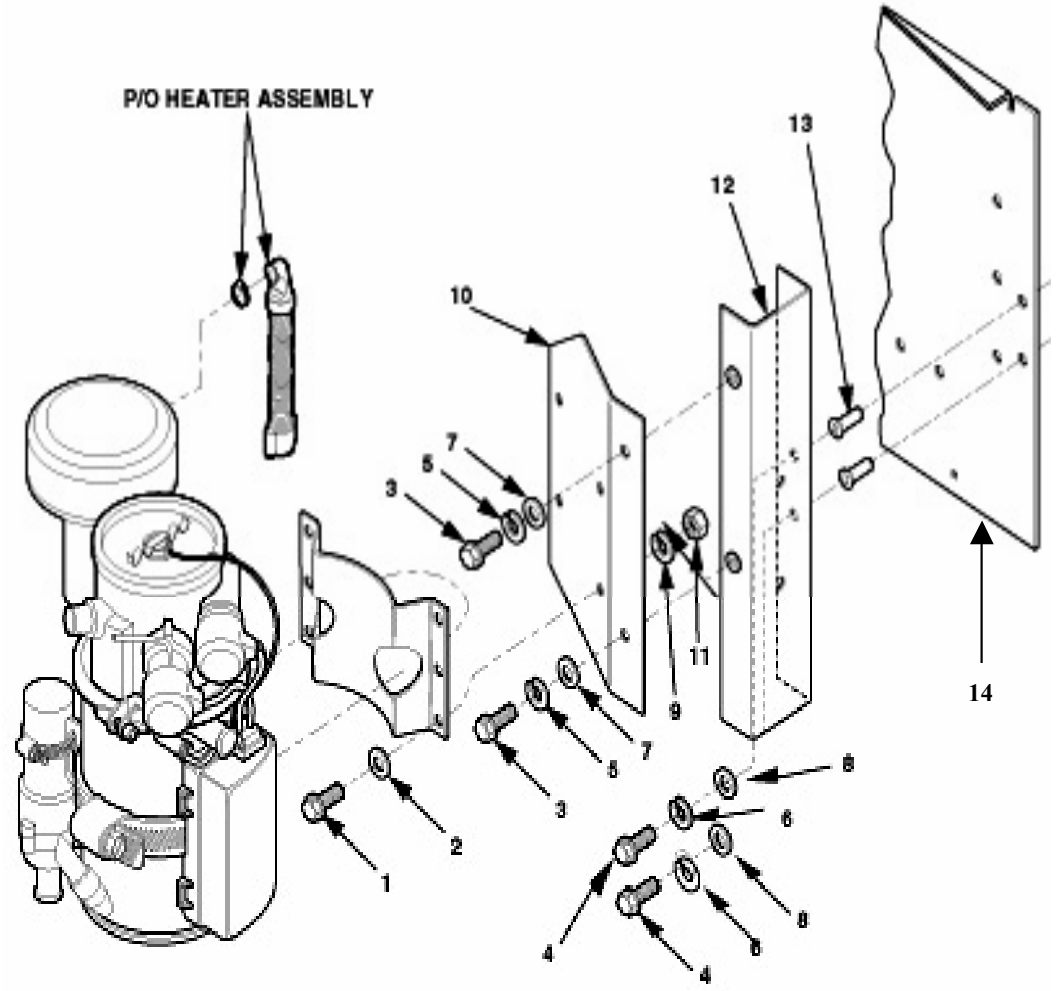

Figure 4-23. Heater Attachment Maintenance.

4-13 PLATE, OPERATION AND HEATER SWITCH MAINTENANCE

This task covers:
a. Inspect
b. Test
c. Remove
d. Replace
e. Install

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 1, appendix B)

Materials/Parts

Equipment Conditions

Reference

Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2
Heater shut off, Paragraph 2-4.1c

INSPECTION OF HEATER SWITCH

Inspection is limited to visual inspection of components. Check for damaged and frayed wiring.

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Failure to observe this warning could result in severe personal injury or death.

TEST OF HEATER SWITCH

1. Disconnect electrical lead from electrical switch terminal (2), Figure 4-24, and use multimeter to measure for continuity across switch terminals with switch in ON position. With switch in OFF position, there should be an open circuit.

2. If readings are not as above, replace switch.

REMOVAL OF HEATER SWITCH

1. Disconnect negative battery cable.

2. Release control panel by turning two fasteners and carefully lowering control panel.

3. At generator control panel (1), tag and disconnect all electrical leads to switch (2).

4. Remove knurled nut (5), and mounting nut (6) from control panel (1).

5. Tag and disconnect electrical leads from indicator light (3).

6. Remove indicator light (3) and push-on nut (7), along with heater switch plate (4).

REPLACEMENT OF HEATER SWITCH

1. Perform steps 1 thru 6 of removal.

2. Perform steps 1 thru 5 of installation, substituting new heater switch lable for the defective one.

INSTALLATION OF HEATER SWITCH

1. Install heater switch lable (4) and indicator light (3) with new push-on nut (7). Discard rectangular clip that comes with indicator lights.

2. Connect all electrical leads to indicator light (3).
3. Install switch (2), mounting nut (6), knurled nut (5), and reconnect electrical leads to switch (2).
4. Raise and secure control panel (1).
5. Reconnect negative battery cable.

INSPECTION OF OPERATING PLATE, FUNCTION CODE PLATE, AND ID PLATE

1. Inspect lable for illegible instructions, dents, cracks, etc.

REPLACEMENT OF OPERATING PLATE, FUNCTION CODE PLATE, AND ID PLATE

1. Open operation panel. Using electric drill with 1/8” drill bit, drill each of the rivets and punch out.
2. Template should be placed approximately 1” from top enclosure of the control panel door and approximately 4” from left edge of the control panel door.
3. Install plates using blind rivets.

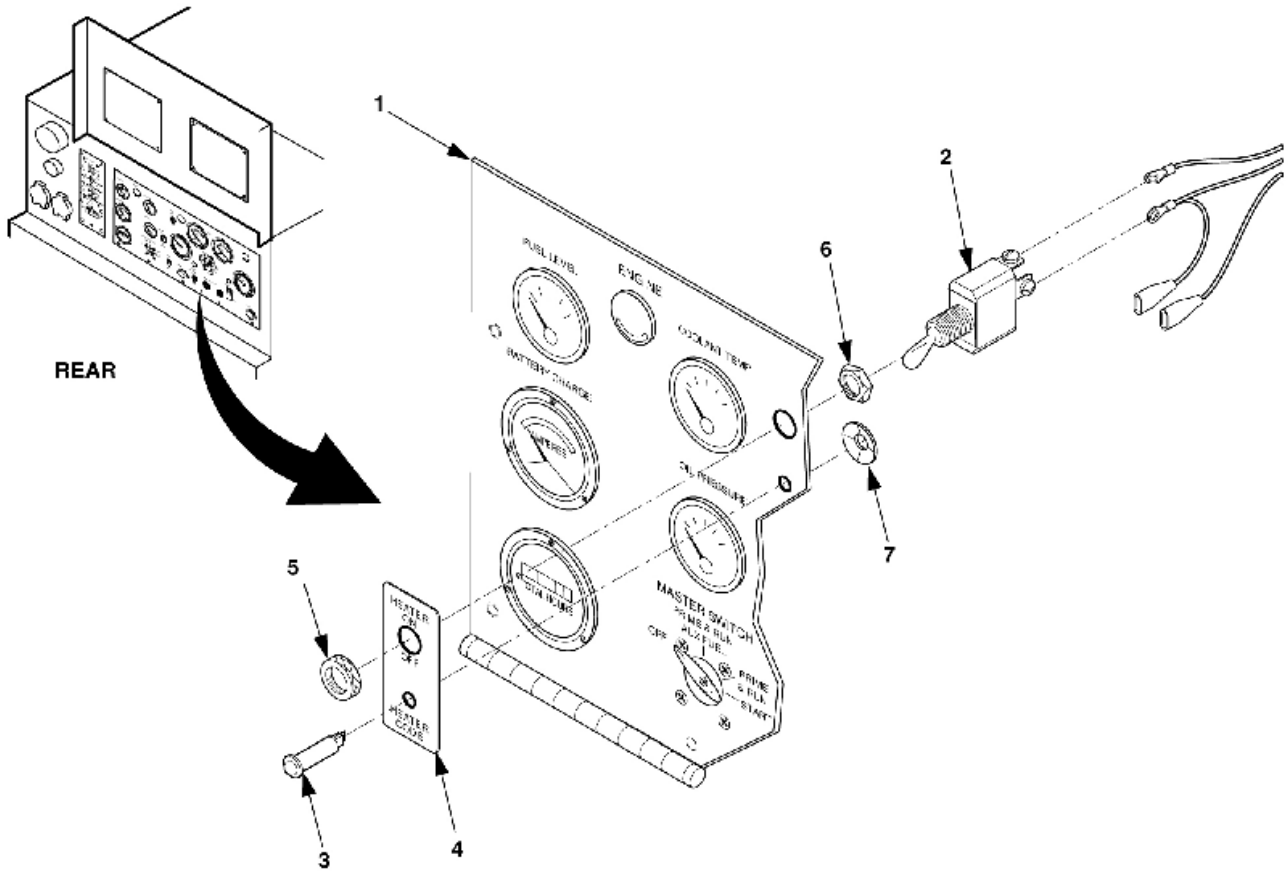

Figure 4-24. Plate, Operation and Heater Switch Maintenance.

4-14 COOLANT HOSE MAINTENANCE

This task covers:
a. Inspect
b. Remove
c. Replace
d. Install

INITIAL SETUP

Tools	Equipment Conditions
Tool Kit, General Mechanic's (item 1, appendix B)	Reference Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2 Heater shut off, Paragraph 2-4.1c

INSPECTION

Inspection is limited to visual inspection of components. Check for leaks and cuts.

REMOVAL

WARNING

Before disconnecting any coolant lines, let generator cool from operation, then relieve pressure by opening radiator cap carefully. Coolant is hot and under pressure and may cause severe burns.

1. Drain coolant.

2. Loosen screw clamps (1), Figure 4-25, to disconnect either or both coolant hoses, inlet (2) or outlet (3) from the heater. Drain any coolant from the hose into a suitable container.

3. Loosen screw clamp (1) to disconnect hose (2 and/or 3) to be replaced from motor block or water pump.

REPLACEMENT

1. Perform steps 1 thru 3 of removal.

2. Perform steps 1 thru 2 of installation, substituting new coolant hose for defective one.

INSTALLATION

1. Install new hose (2 and/or 3) securing with screw clamps (1).

2. Top off radiator coolant level to replace coolant lost in hose removal.

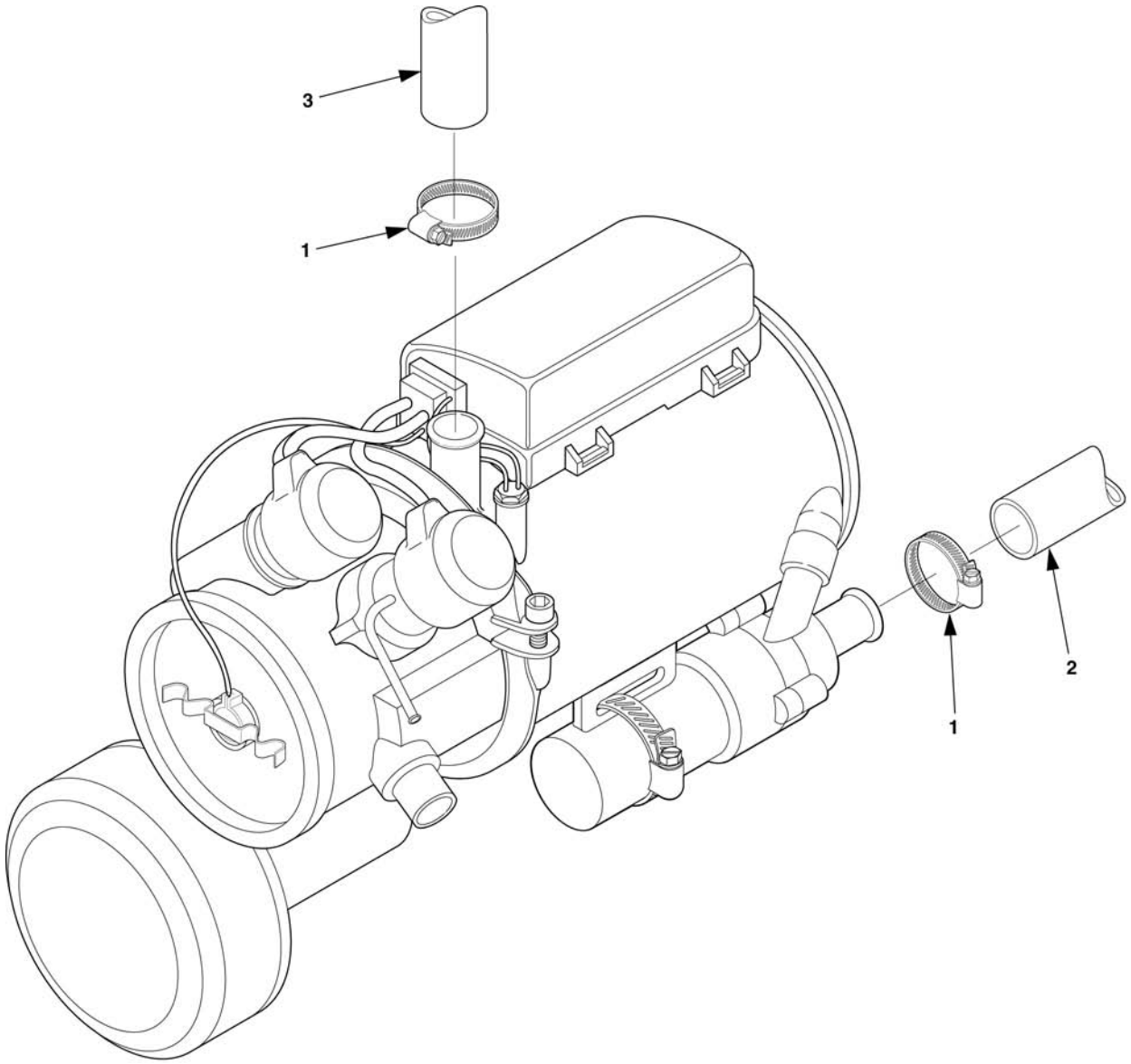

Figure 4-25 Coolant Hose Maintenance.

4-15 AIR INLET AND EXHAUST HOSE MAINTENANCE.

This task covers:
a. Inspect
b. Remove
c. Replace
d. Install

INITIAL SETUP

Tools

Tool Kit, General Mechanic's
(item 1, appendix B)

Materials/Parts
Sealant
(item 1, appendix F)

Equipment Conditions

Reference

Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2
Heater shut off, Paragraph 2-4.1c.

INSPECTION

Inspection is limited to visual inspection of components. Check for cuts, air leaks, and crushed hoses.

REMOVAL

WARNING

Muffler and flex hoses get hot. Allow them to cool before touching them to avoid burn injury.

1. Loosen screw clamp (7), Figure 4-26, to remove air inlet hose (1) from heater (6).
2. Loosen screw clamp (4) to remove air exhaust hose (3) and elbow (5) from heater (6).
3. Remove RTV and air exhaust hose (3) and clamp (2).

REPLACEMENT

1. Perform steps 1 thru 3 of removal.
2. Perform steps 1 thru 3 of installation, substituting new air inlet and exhaust hose for the defective one.

INSTALLATION

1. Attach elbow (5), using RTV, to heater exhaust port. Attach air exhaust hose (3) to elbow (5) with screw clamp (4).
2. Install exhaust hose (3) through clamp (2) and secure. Guide exhaust hose (3) through hole in bulkhead and secure with RTV.
3. Attach air inlet hose (1) to heater (6) with screw clamp (7).

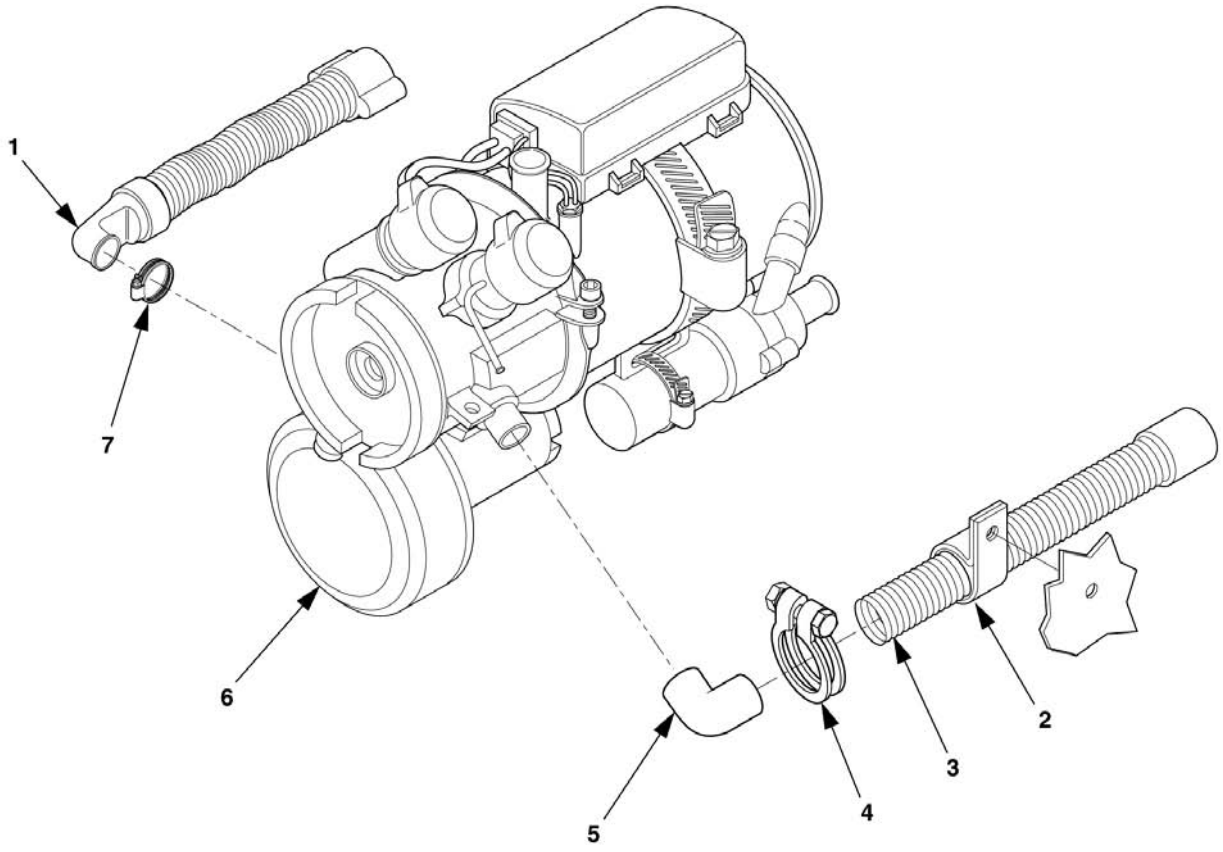

Figure 4-26. Air Inlet and Exhaust Hose Maintenance.

4-16 WIRING HARNESS MAINTENANCE.

This task covers:
a. Inspect
b. Test
c. Remove
d. Repair
e. Replace
f. Install

INITIAL SETUP

Tools

Tool Kit, General Mechanic's (item 1, appendix B)
Multimeter (item 5, appendix B)

Materials/Parts

None

Equipment Conditions

Reference

Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2
Heater shut off, Paragraph 2-4.1c

WARNING

Do not attempt any tasks inside generator housing with generator set running. Failure to observe this warning could result in severe personal injury or death.

INSPECTION

Inspection is limited to visual inspection of components. Check for damaged and frayed wiring.

TEST

Test wiring for continuity (refer to Figure 4-27). Replace any open or broken wires or connectors.

REMOVAL

1. Prior to removal, refer to Figure 4-27 and tag all leads on wiring harness.
2. Disconnect all leads and plugs. Remove wiring harness.

REPAIRMENT

Repair consists of replacing wires, connectors, and terminals. Follow standard shop practice when performing all repairs.

REPLACEMENT

1. Perform steps 1 thru 2 of removal.
2. Perform steps 1 thru 2 of installation, substituting new wiring harness for the defective one.

INSTALLATION

1. Position wiring harness in place.
2. Refer to Figure 4-27 and connect leads and plugs.

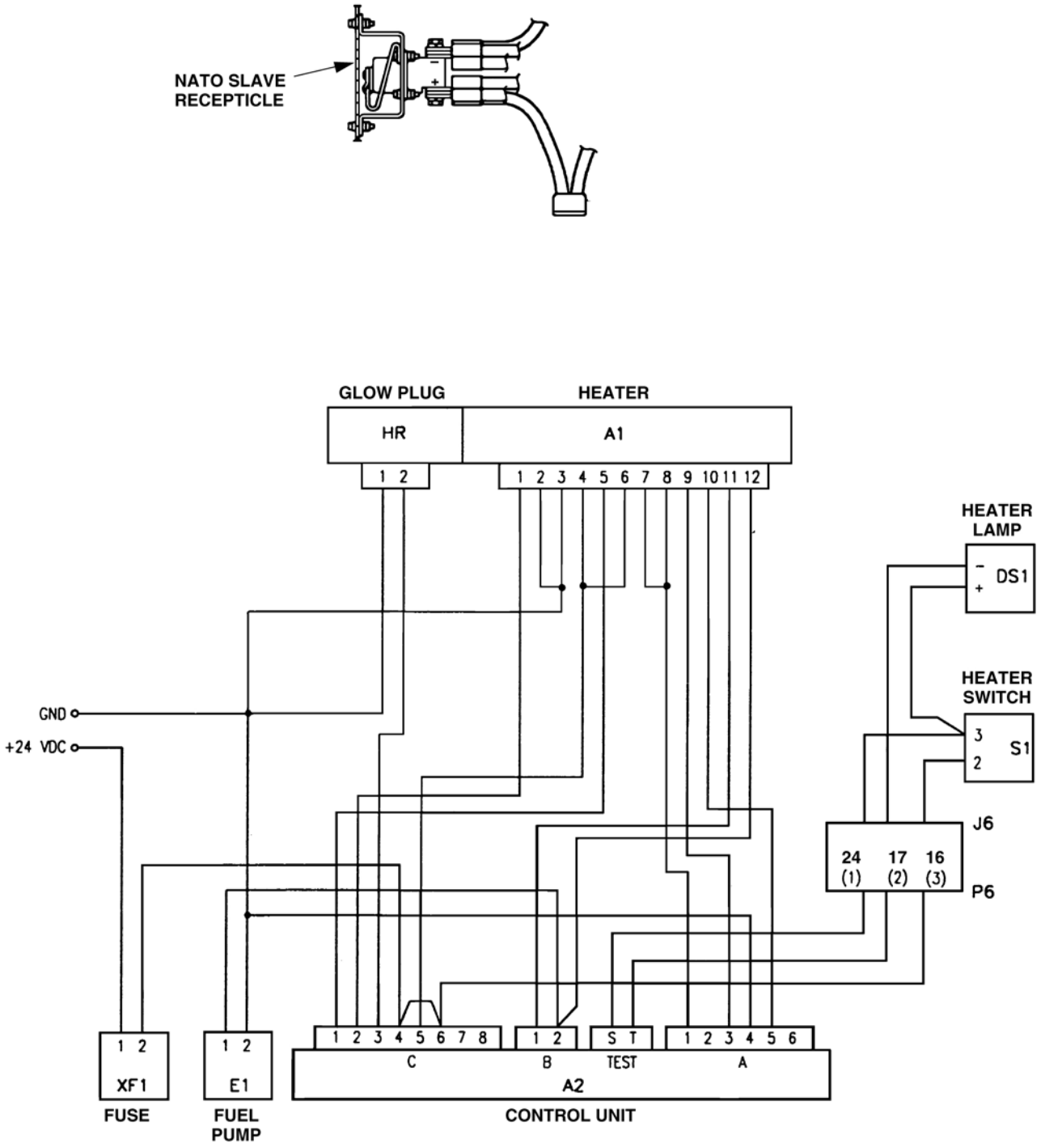

Figure 4-27. Wiring Harness Maintenance.

4-17 IGNITER/GLOW PLUG AND RESISTOR MAINTENANCE.

This tasks covers: a. Test b. Replace

INITIAL SETUP

Tools

Tool Kit, General Mechanic's
(item 1, appendix B)

Equipment Conditions

Reference

Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2
Heater shut off, paragraph 2-4.1c

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Failure to observe this warning could result in severe personal injury or death.

TEST

1. Disconnect negative battery terminal.
2. Remove caps (5), Figure 4-28, from igniter/glow plug and resistor.
3. Disconnect wires from igniter/glow plug and resistor.
4. Check continuity between igniter/glow plug and ground and the resistor and ground.

REPLACEMENT

1. Disconnect negative battery cable.
2. Remove caps (5) from igniter/glow plug (4) and/or resistor (1). Loosen hex nuts (2) on igniter/glow plug (4) and/or resistor (1). Remove cable (3).
3. Unscrew igniter/glow plug (4) and/or resistor (1), as required, and remove it. Use an angled hook to clean the igniter/glow plug hole.
4. Install igniter/glow plug (4) and/or resistor (1).
5. Install plug cable (3), hex nuts (2), and caps (5).
6. Reconnect negative battery cable.

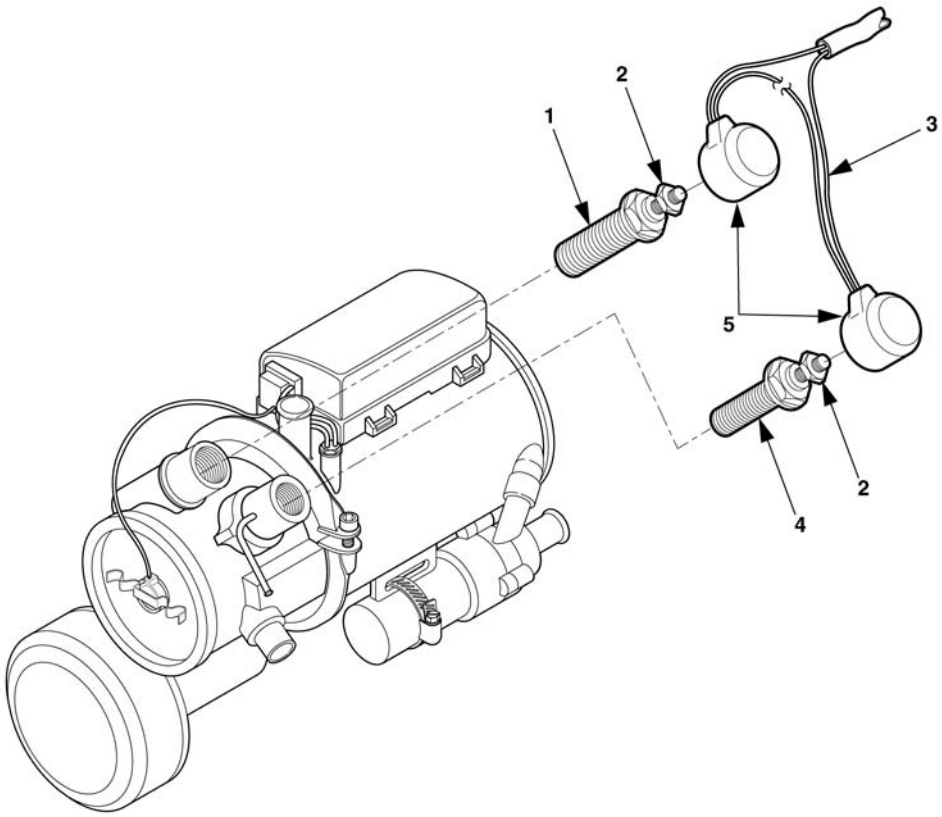

Figure 4-28. Igniter/Glow Plug And Resistor Maintenance.

4-18 FUEL LINE MAINTENANCE.

This task covers:
a. Inspect
b. Remove
c. Replace
d Install

INITIAL SETUP

Tools

Tool Kit, General Mechanic's
(item 1, appendix B)

Equipment Conditions

Reference

Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2
Heater shut off, Paragraph 2-4.1c

INSPECTION

Perform a visual inspection for deterioration leakage, dry rot, etc.

REMOVAL

WARNING

Catch fuel in a suitable container. Keep spilled fuel away from hot engine and all fires, and wash with warm water after getting any on skin. Fuel is highly flammable and is irritating to skin.

1. Loosen screw clamps (1), Figure 4-29, to remove butt splices (2) and fuel line (9) between primary fuel tank (3), and fuel pump (4). Drain any fuel from line into a suitable container.

2. Loosen screw clamps (5) to remove butt splices (6) and fuel line (7) between fuel pump (4) and heater (8).

REPLACEMENT

1. Perform steps 1 thru 2 of removal.

2. Perform steps 1 thru 2 of installation, substituting new fuel line for the defective one.

INSTALLATION

NOTE

Ensure that fuel line is routed away from the engine and heater exhaust.

1. Install a new fuel line (9) and butt splices (2) between primary fuel tank (3) and fuel pump (4), securing with screw clamps (1).

1. Install a new fuel line (7) and butt splices (6) between fuel pump (4) and heater (8), securing with screw clamps (5).

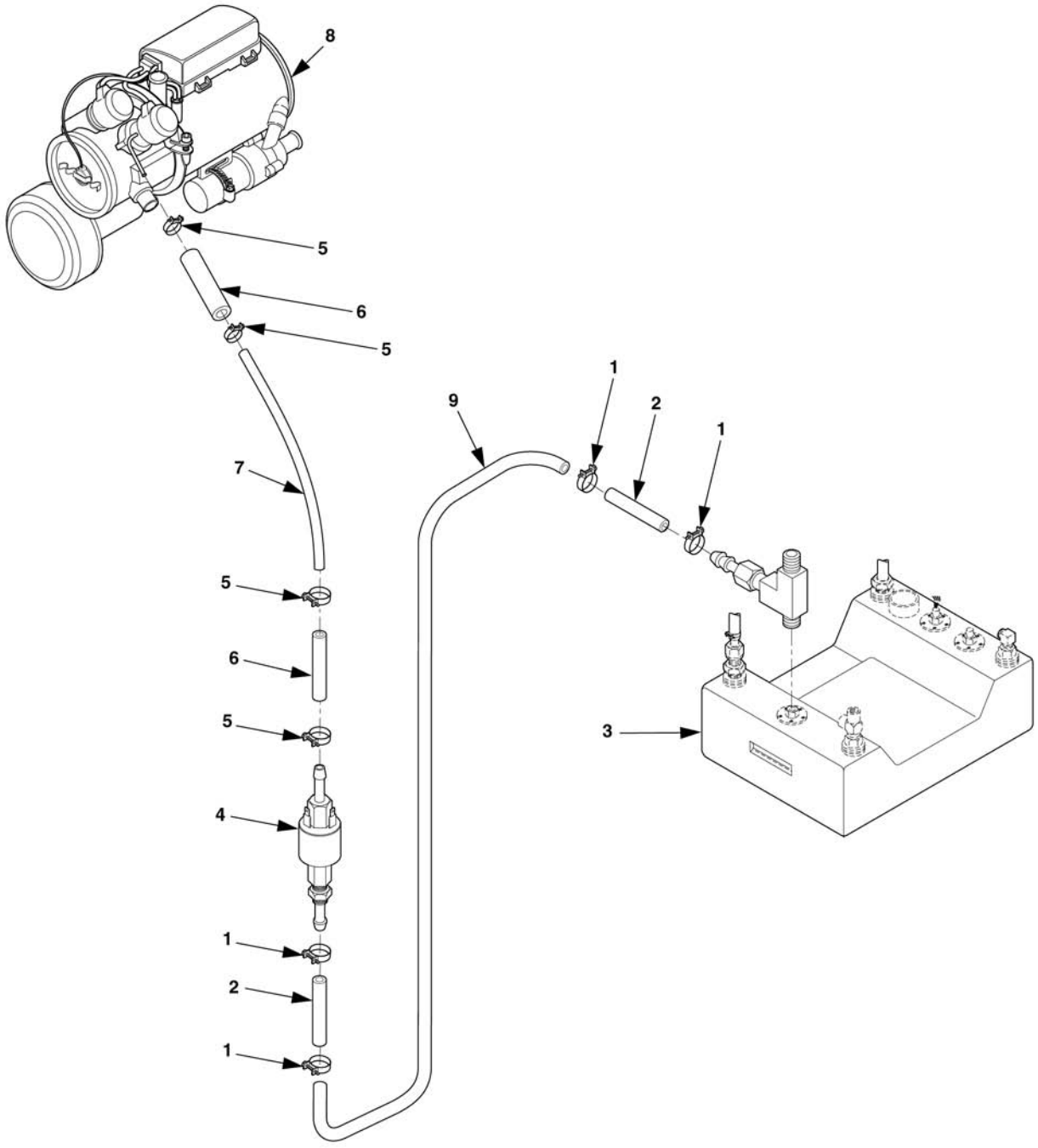

Figure 4-29. Fuel Line Maintenance.

4-19 FUNCTION CODES PLATE MAINTENANCE.

This task covers: a. Inspect b. Replace

INITIAL SETUP

Tools

Tool Kit, General Mechanic's
(item 1, appendix B)

Materials/Parts

Equipment Conditions

Reference

Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2
Heater shut off, paragraph 2-4.1c

INSPECTION

Inspect plate for illegible instructions, dents, cracks, etc.

REPLACEMENT

1. Lift generator control panel cover (1), Figure 4-30.
2. Remove four rivets (2) and plate (3).
3. Install new code plate (3) and four rivets (2).
4. Close control panel cover (1).

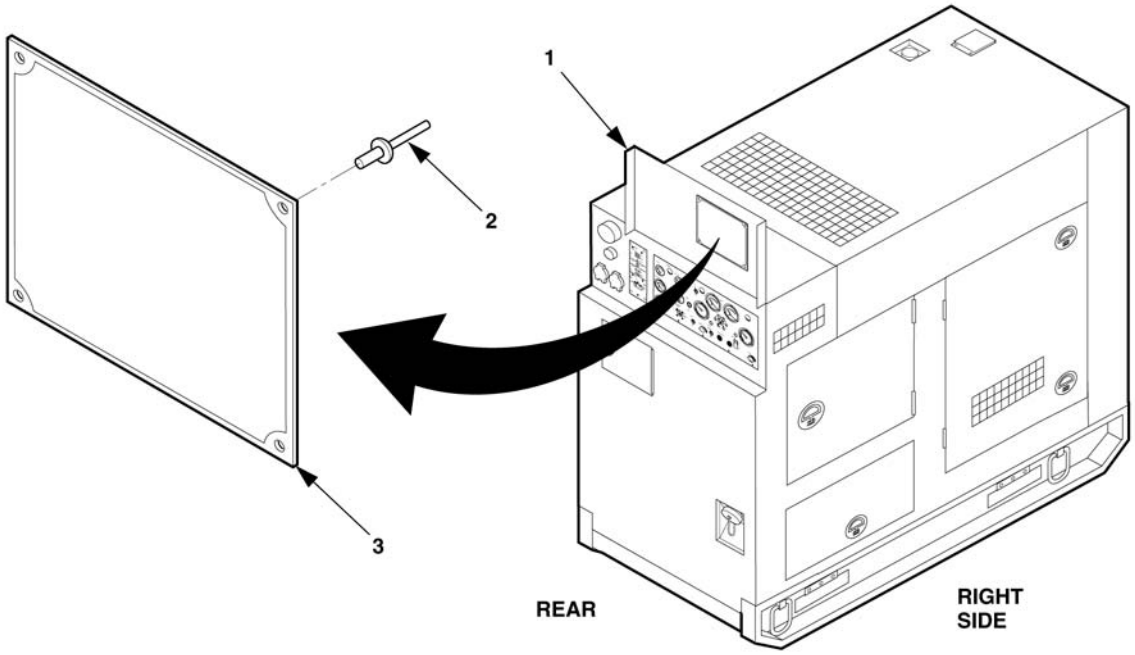

Figure 4-30. Function Codes Plate Maintenance.

4-20 COOLANT PUMP MAINTENANCE.

This task covers:
a. Test
b. Remove
c. Replace
d. Install

INITIAL SETUP

Tools	Equipment Conditions
Tool Kit, General Mechanic's (item 1, appendix B)	Reference
Sealant (item 1, appendix F)	Generator shut down, TM 9-6115-643-10, Paragraph 2-9.2 Heater shut off, Paragraph 2-4.1c

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Failure to observe this warning could result in severe personal injury or death.

TEST

Refer to troubleshooting procedure, Figure 4-6.

REMOVAL

1. Disconnect negative battery cable.
2. Remove electrical cover (1), Figure 4-31 and 12-pin connector (2).
3. Remove 12-pin connector (2) and push out pins (3) to coolant pump (6).
4. Remove clamp (7), attaching pump (6) to heater (8).
5. Loosen clamp (4) and remove outlet hose (5) from pump (6), using a container to catch coolant from hose.

REPLACEMENT

1. Perform steps 1 thru 5 of removal.
2. Perform steps 1 thru 6 of installation, substituting new coolant pump for the defective one.

INSTALLATION

1. Attach coolant pump (6) with clamp (7) to heater (8).
2. Apply sealant to outlet and attach hose (5) with clamp (4).
3. Push in 2 pins (3) with wire through 12-pin connector (2).

4. Replace 12-pin connector cover (2) and electrical cover (1).
5. Top off coolant if needed.
6. Reconnect negative battery cable.

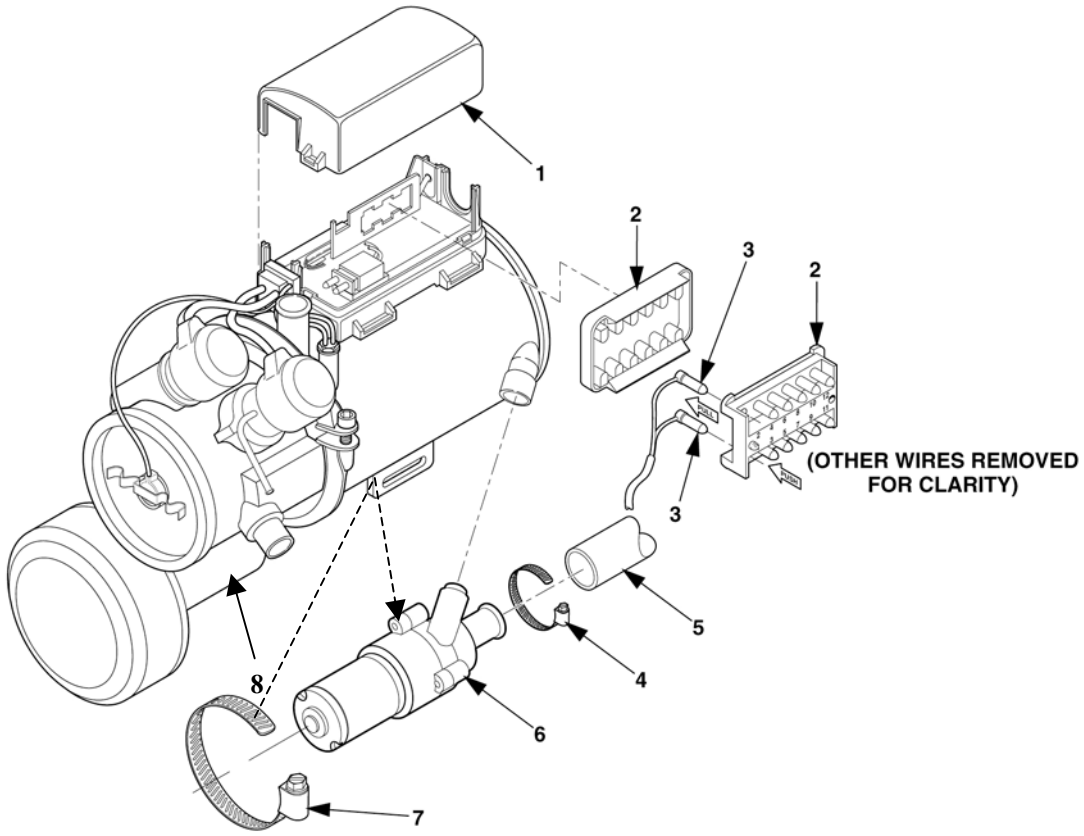

Figure 4-31. Coolant Pump Maintenance.

Section VII. REMOVAL INSTRUCTIONS

4-21 INSTRUCTIONS TO UNIT MAINTENANCE FOR REMOVAL OF WINTERIZATION KIT ON THE 15kW TACTICAL QUIET GENERATOR SET.

The following instructions have been provided so you can remove, Heater Kit, 15kW Generator Set NSN: 6115-01-477-0566 from your Generator Set.

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Failure to observe this warning could result in severe personal injury or death.

WARNING

Before disconnecting any coolant lines, let generator cool from operation, then relieve pressure by opening radiator cap carefully. Coolant is hot and under pressure and may cause burns.

WARNING

Catch fuel in suitable container. Keep spilled fuel away from hot engine and all fires. Wash with warm water after getting any on skin. Fuel is highly flammable and is irritating to skin.

4-21.1 Removal Procedures.

INITIAL SETUP

Tools	Equipment Conditions
Tool Kit, General Mechanic's Tool Kit, Automotive (Common No. I)	Reference Generator shut down TM 9-6115-643-10 TM 9-6115-643-24 TM 9-2815-254-24

REMOVAL

1. Turn heater and generator off.
2. Open left and right access doors and disconnect negative battery cable from right battery and the positive battery cable from the left battery.
3. Drain generator coolant system in accordance with TM 9-6115-643-24.
4. Open control panel access door (12), Figure 4-32.
5. Remove electrical leads from J6-16, 17, and 24, Figure 4-34.
6. Remove control unit (1), Figure 4-33 from output box (2). Replace existing hardware.

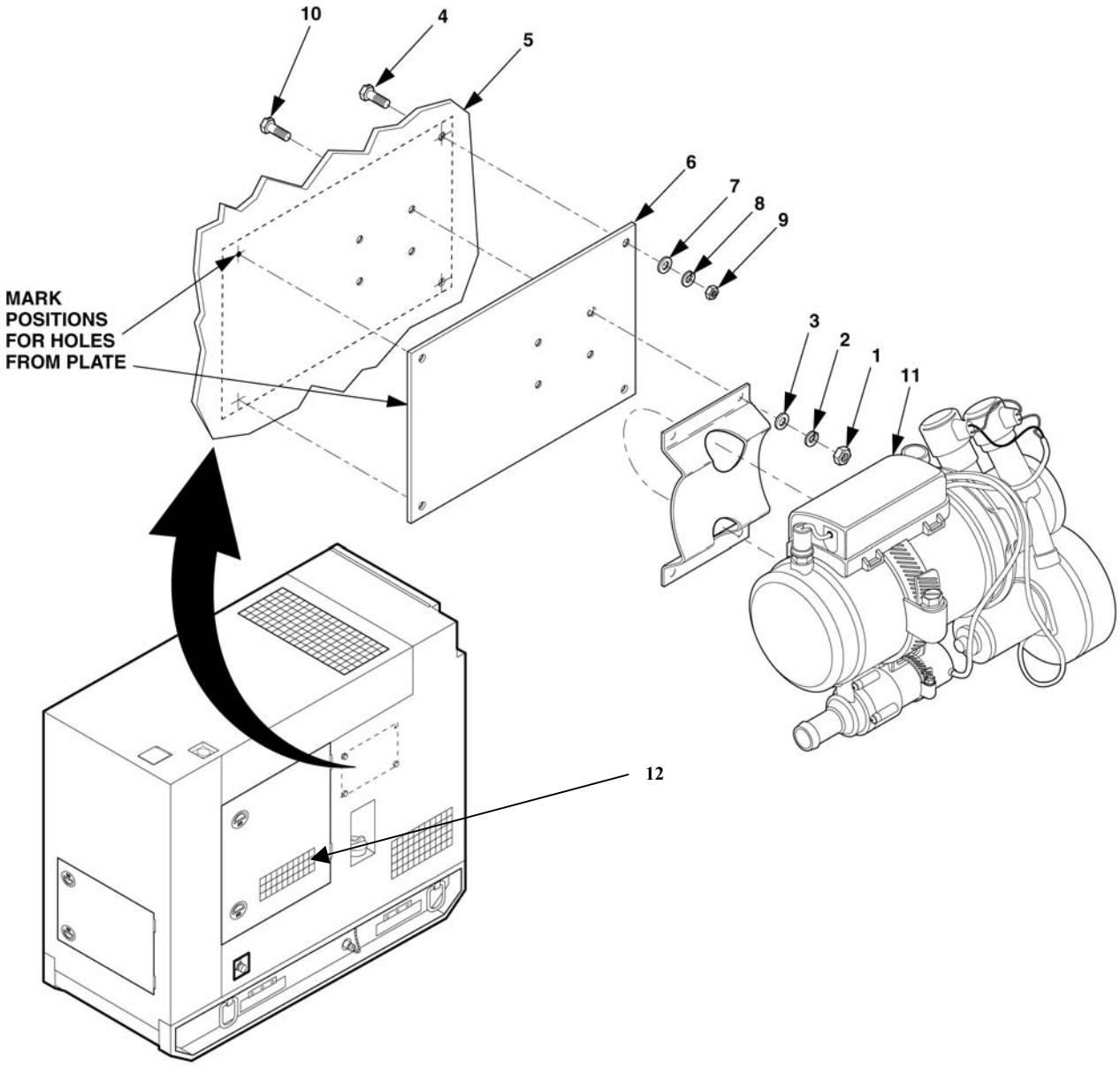

Figure 4-32. Heater Assembly

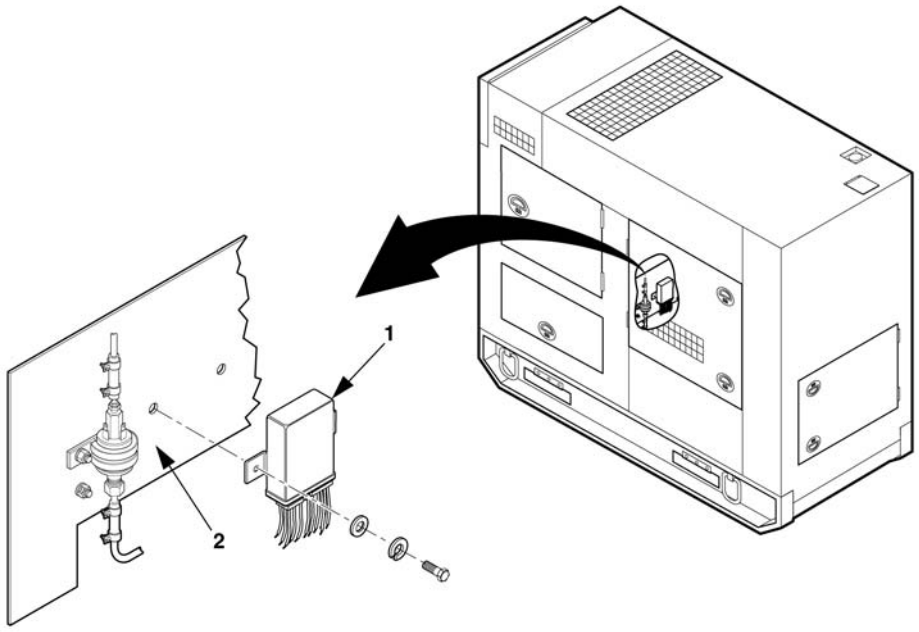

Figure 4-33. Control Unit Removal

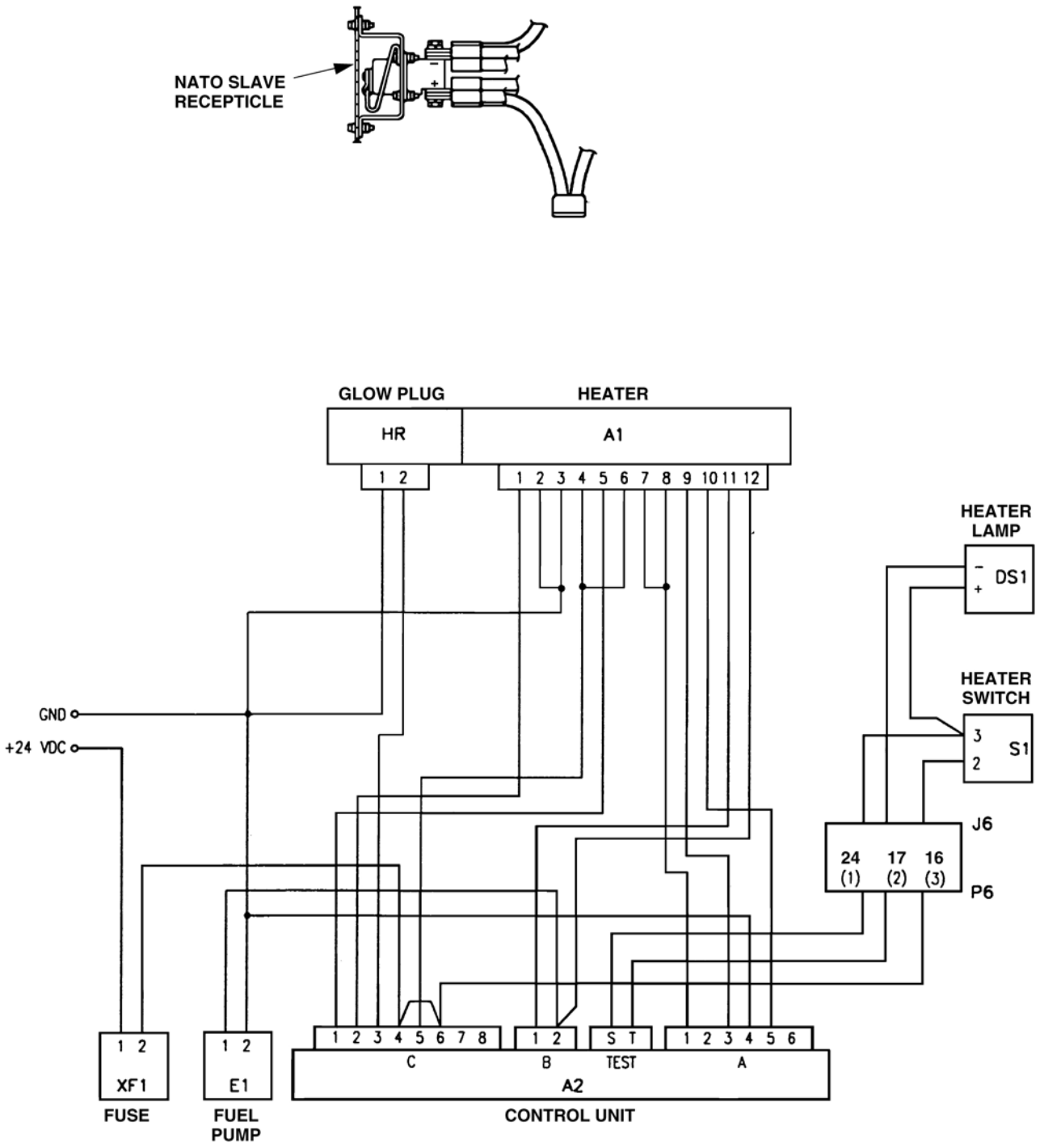

Figure 4-34. Wiring Harness Removal

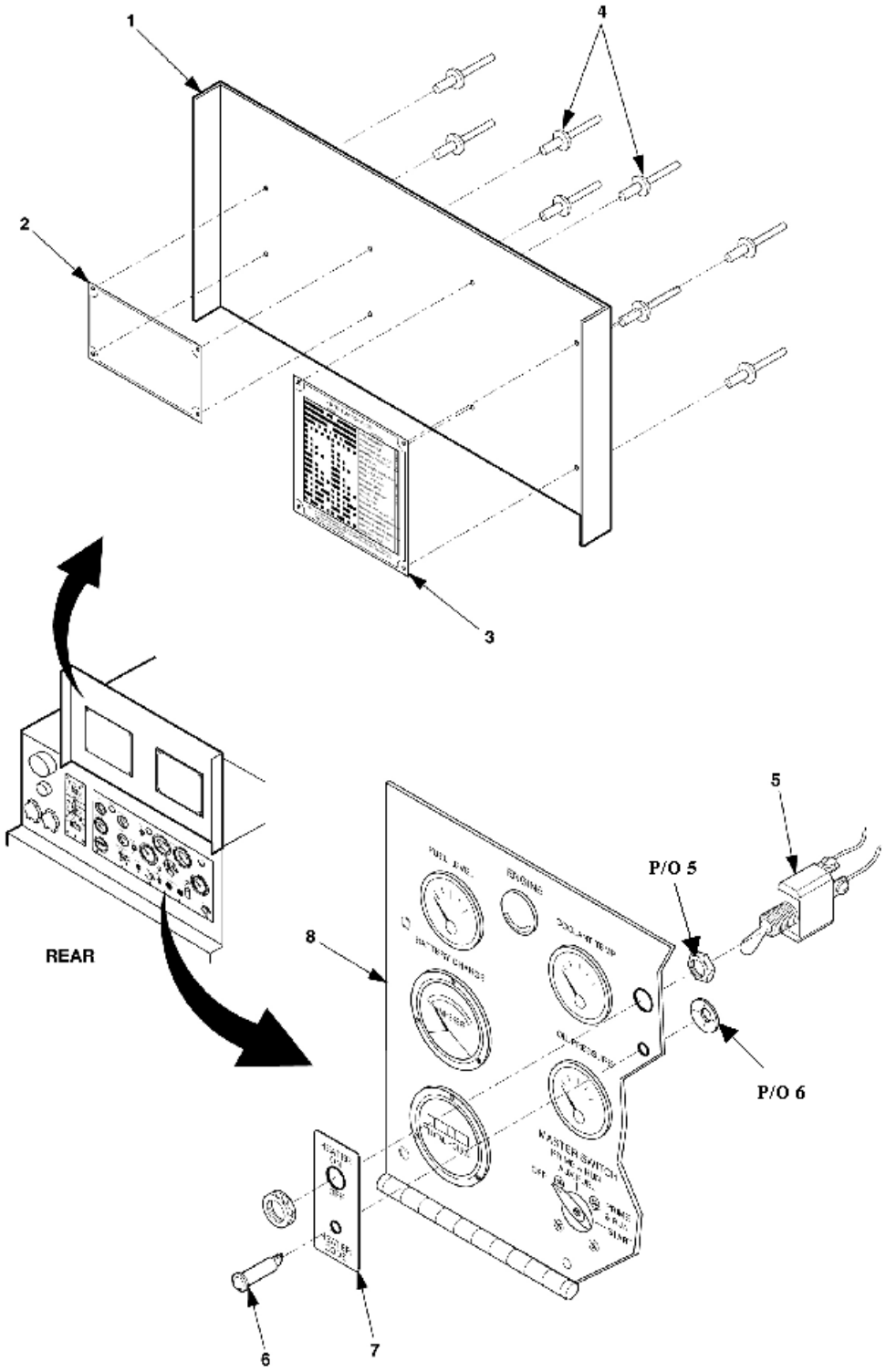

Figure 4-35. Cover And Instrument Panel

7. Remove toggle switch (5), Figure 4-35, indicator light (6), and heater switch lable(7) from instrument panel (8). Remove rivets (4) from operating plate (2) and function code plate (3). Remove operating and function code plate (2 and 3) from control panel door (1).

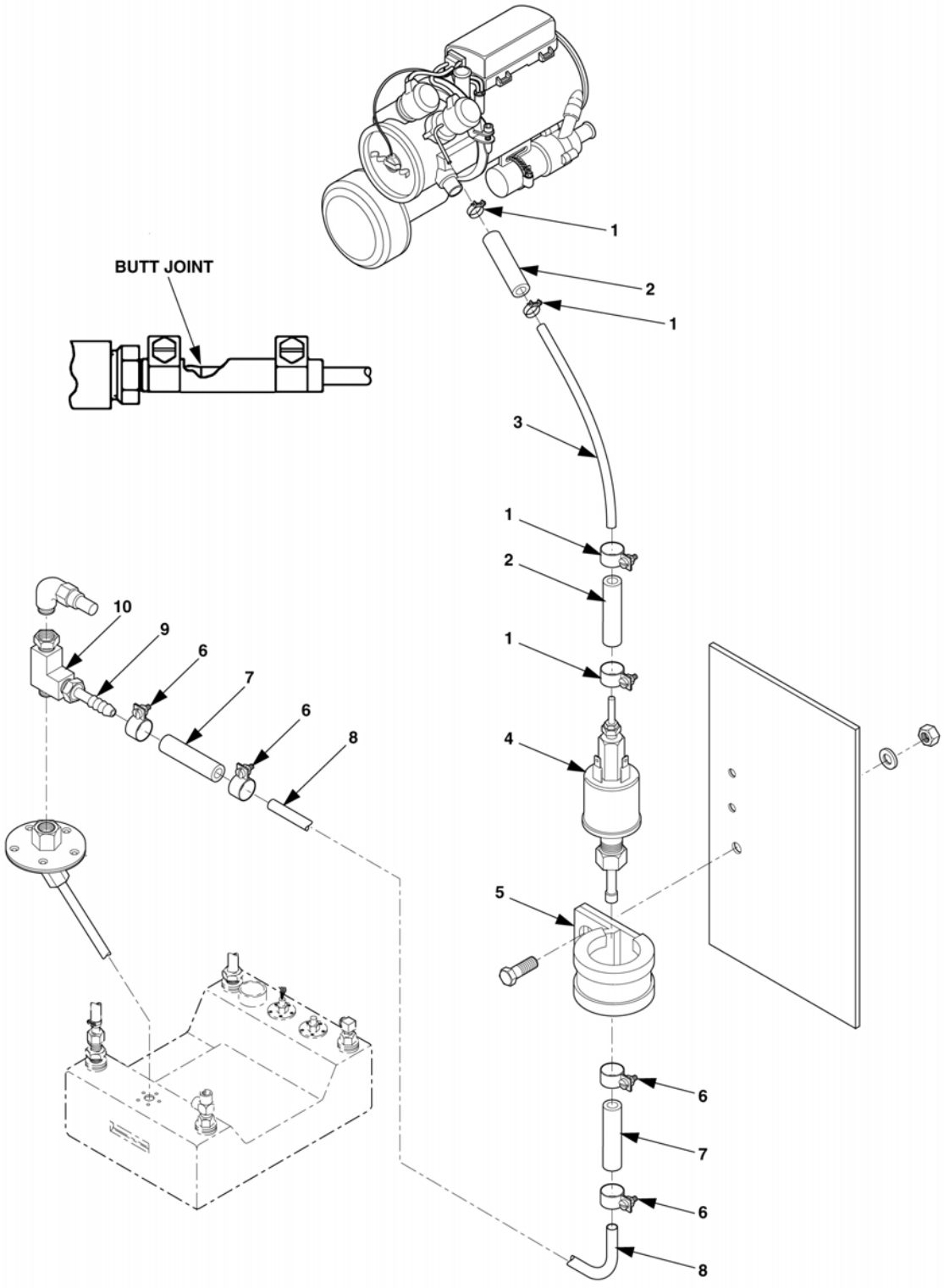

Figure 4-36. Fuel Pump and Lines Removal

8. Remove fuel pump, lines and hardware Figure 4-36, 1 thru 10 and replace fuel supply line. Be sure to use a suitable container to catch any fuel from lines.

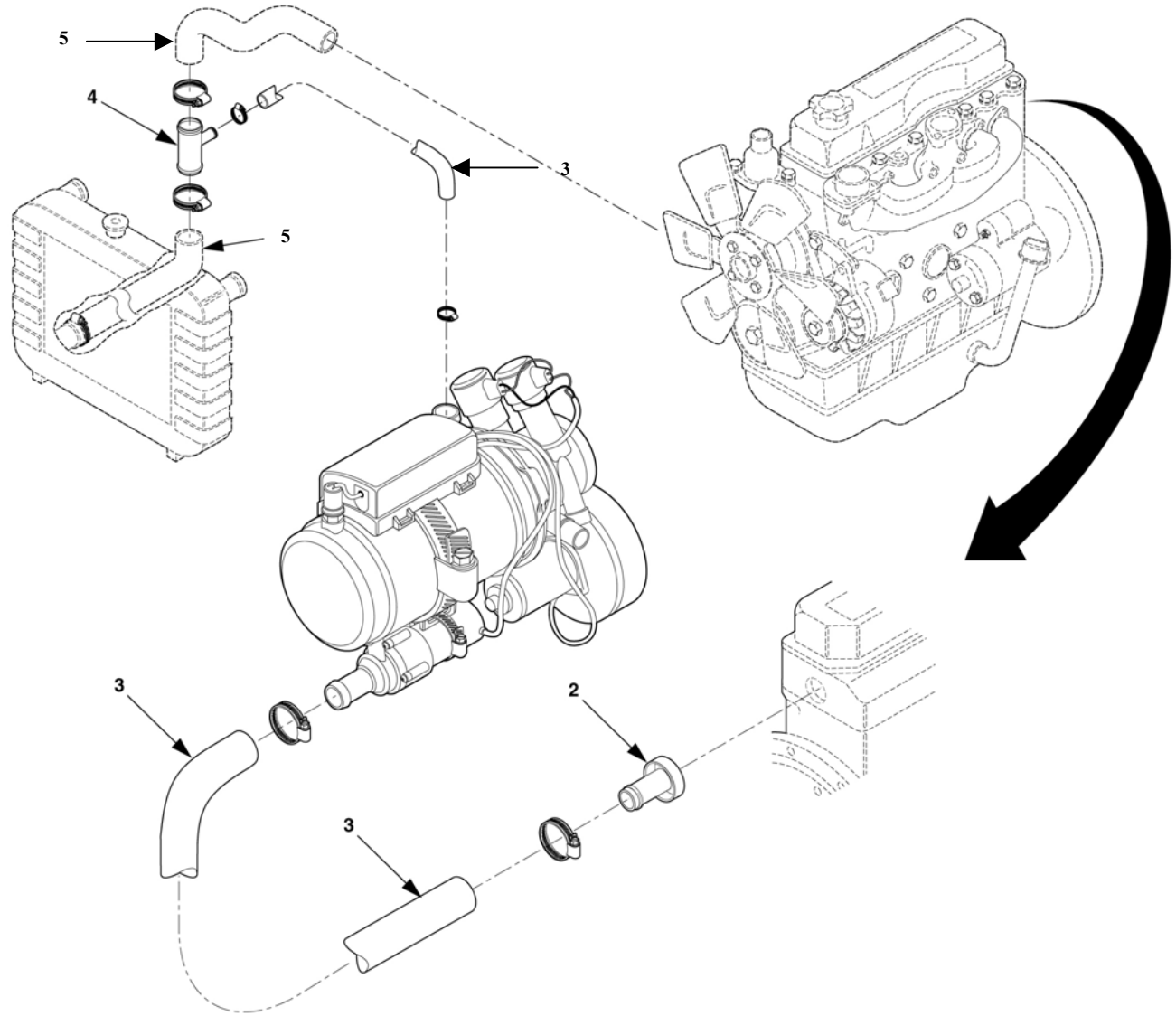

Figure 4-37. Coolant Hoses and Expansion Plug

9. Loosen clamps (1), Figure 4-37 and remove coolant hoses (3) from tee fitting (4) and expansion plug (2). Be sure to use a suitable container to catch coolant from hoses. Remove expansion plug (2) from rear of engine block and replace with new one. Refer to engine TM 9-6115-254-24. Remove coolant hose tee fitting (4) from lower radiator hose (5) and replace with new radiator hose.

10. Remove wiring harness from generator. Refer to figure 4-34.

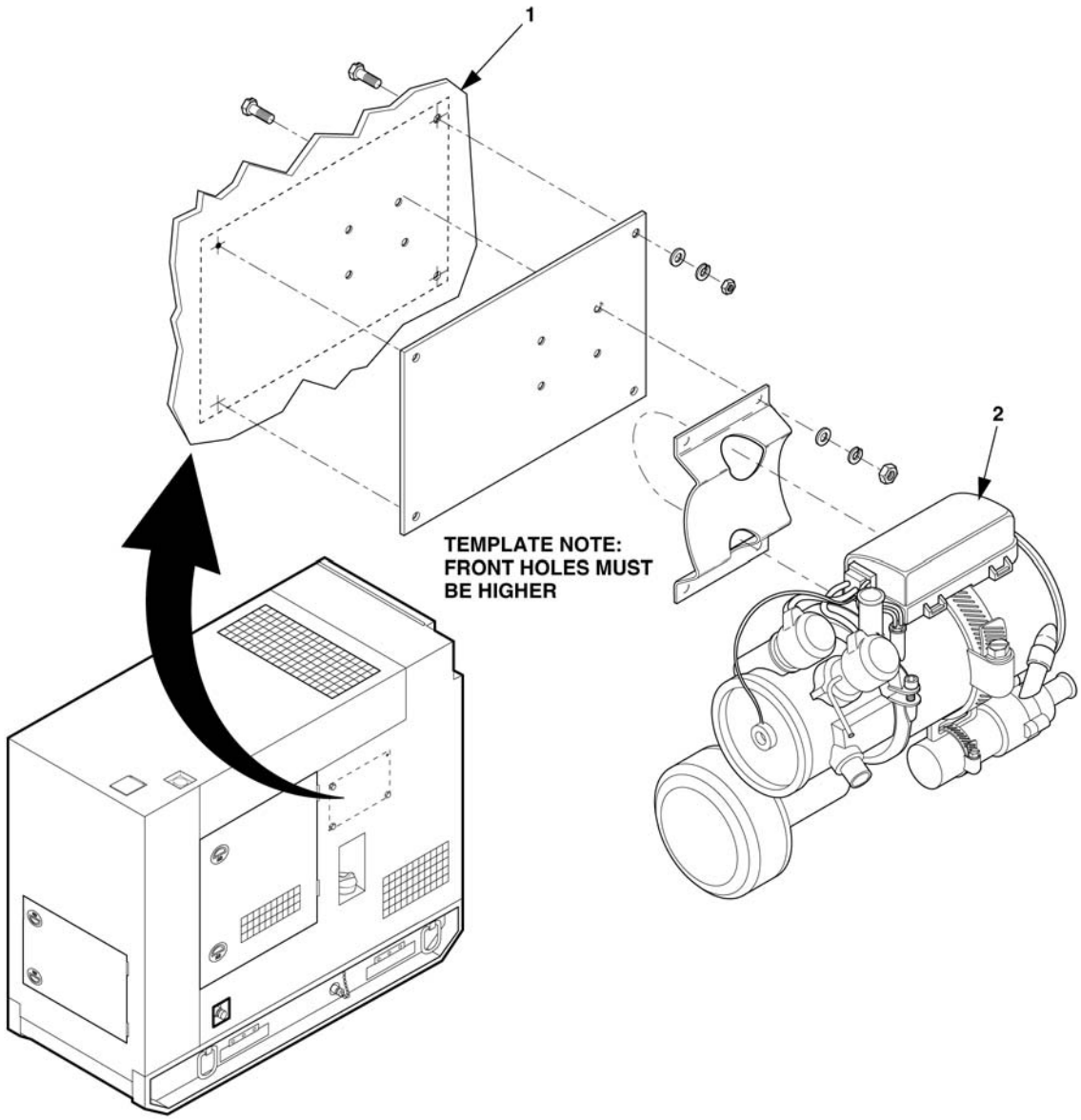

Figure 4-38. Heater Assembly Removal

11. Remove heater assembly (2), Figure 4-38 from bulkhead (1) along with all hardware (bolts and nuts).

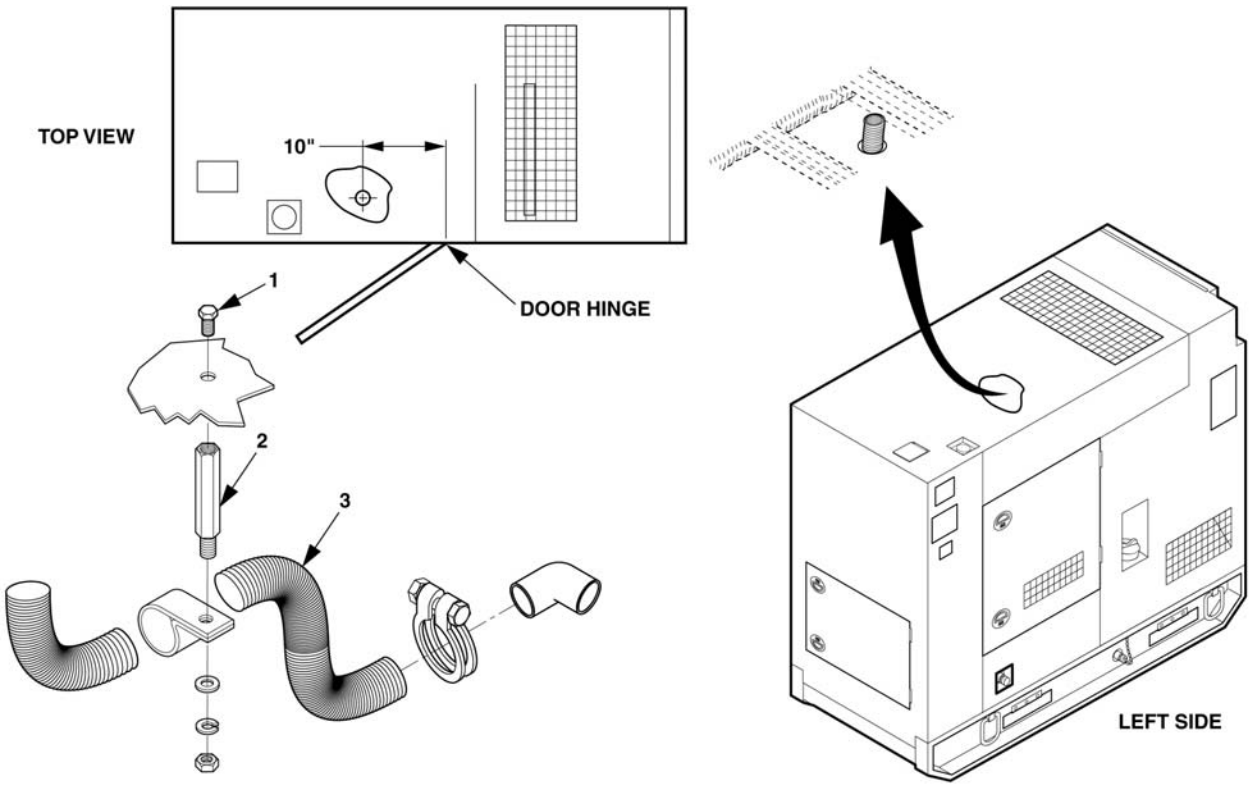

Figure 4-39. Exhaust Hose Removal

12. Remove exhaust hose (3), Figure 4-39 and hardware; be sure to replace screw (1) in existing screw hole after removing stud (2).

CHAPTER 5

DIRECT SUPPORT MAINTENANCE

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5-2 Special Tools, TMDE, and Support Equipment 5-2
5-3 Repair Parts 5-2

Section II Installation Instructions 5-3

5-4 Instructions to Direct Support Maintenance for installation of the Winterization Kit on the 15kW Tactical Quiet Generator Set 5-3

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

5-1 COMMON TOOLS AND EQUIPMENT.

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

5-2 SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

No special tools or support equipment are required for maintenance of the Winterization Kit. Refer to TM 9-6115-643-24P for the generator and to TM 9-2815-254-24P for the engine.

5-3 REPAIR PARTS.

Refer to TM 9-6115-643-24P for the generator set parts and to TM 9-2815-254-24P for the engine parts. Winterization kit repair parts are listed in Appendix C.

Section II. INSTALLATION INSTRUCTIONS

5-4 INSTRUCTIONS TO DIRECT SUPPORT MAINTENANCE FOR INSTALLATION OF WINTERIZATION KIT ON THE 15 kW TACTICAL QUIET GENERATOR SET.

The following instructions have been provided so you can install, Heater Kit, 15kW Generator Set NSN: 6115-01-477-0566 on your Generator Set.

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Failure to observe this warning could result in severe personal injury or death.

WARNING

Before disconnecting any coolant lines, let generator cool from operation, then relieve pressure by opening radiator cap carefully. Coolant is hot and under pressure and may cause burns.

WARNING

Catch fuel in suitable container. Keep spilled fuel away from hot engine and all fires. Wash with warm water after getting any on skin. Fuel is highly flammable and is irritating to skin.

5-4.1 Installation Procedures.

INITIAL SETUP

Tools	Equipment Conditions
Tool Kit, General Mechanic's	Reference
Tool Kit, Automotive (Common No. I)	Generator shut down TM 9-6115-643-10 TM 9-6115-643-24 TM 9-2815-254-24

INSTALLATION

NOTE

Use packing list provided with kit.

1. Open battery access door and disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures.

2. Drill holes outside of left side panel using heater mounting plate (6), Figure 5-1, as a template. Before drilling holes, look inside housing to verify proper position and clearance of mounting plate. To install the heater mounting plate, perform the following steps: using the plate as a template, place it 1.75" from the top left access door flange and 2" across from the door hinge flange to locate the edge of the plate.

NOTE

When mounting the heater (11), to the heater mounting plate, the burner end of the heater shall be higher than the coolant intake end.

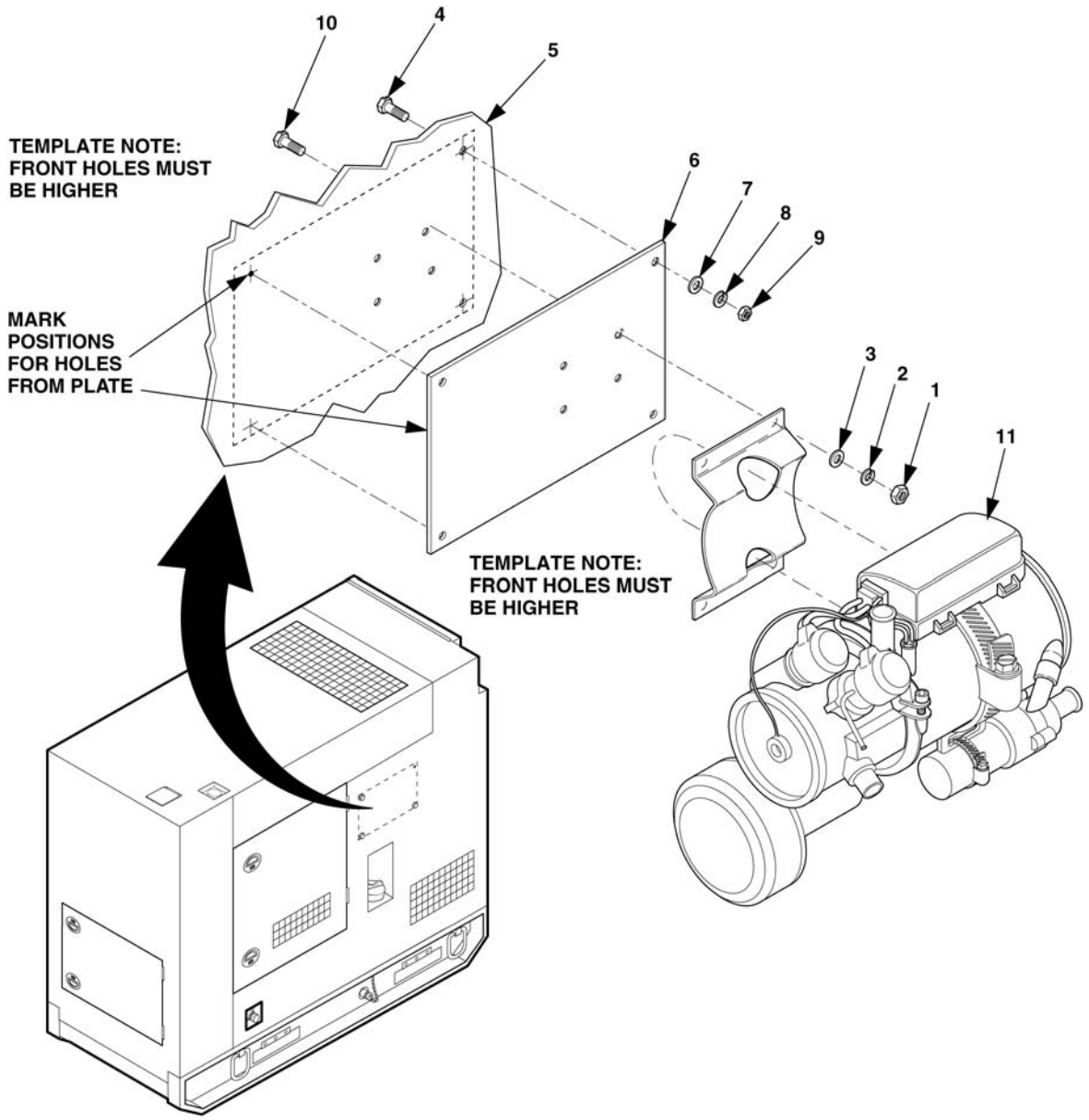


Figure 5-1. Heater Assembly

3. Open left side rear door and install heater mounting plate (6), then heater (11), attach using screws (10), flat washers (3), lock washers (2), and nuts (1). Then mount plate to bulkhead (5), using screws (4), flat washers (7), lock washers (8) and nuts (9).

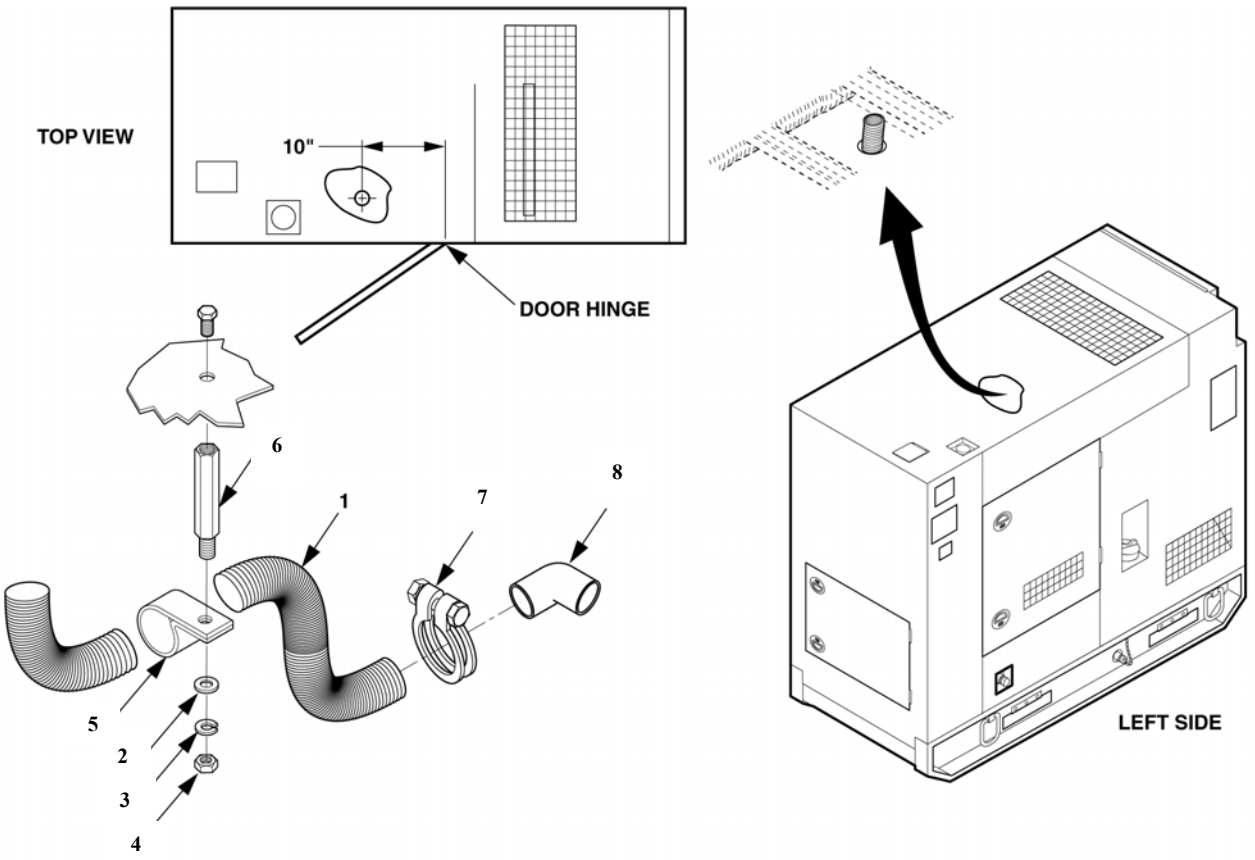


Figure 5-2. Exhaust Hose Assembly

4. Approximately 10” from inside of left door hinge, Figure 5-2, drill 1 7/16" diameter hole in top left side of bulkhead housing.

5. Remove rear panel from Generator Set in accordance with TM 9-6115-643-24.

6. Attach one end of exhaust hose (1), to exhaust elbow (8) with clamp (7). Attach it to exhaust port on heater. Apply 2 thick beads of RTV around exhaust port of heater and attach exhaust elbow to heater. Move elbow in a position that doesn’t interfere with anything in the route to the hole drilled in step 4.

7. Route hose through hole drilled in step 4. Install clamp (5) and use sealant provided in kit around hose. Open to prevent movement. Attach at middle of exhaust hose (1), to the top of the bulkhead at first screw closest to the heater. Secure using spacer (6), nut (4), lock washer (3), and washer (2).

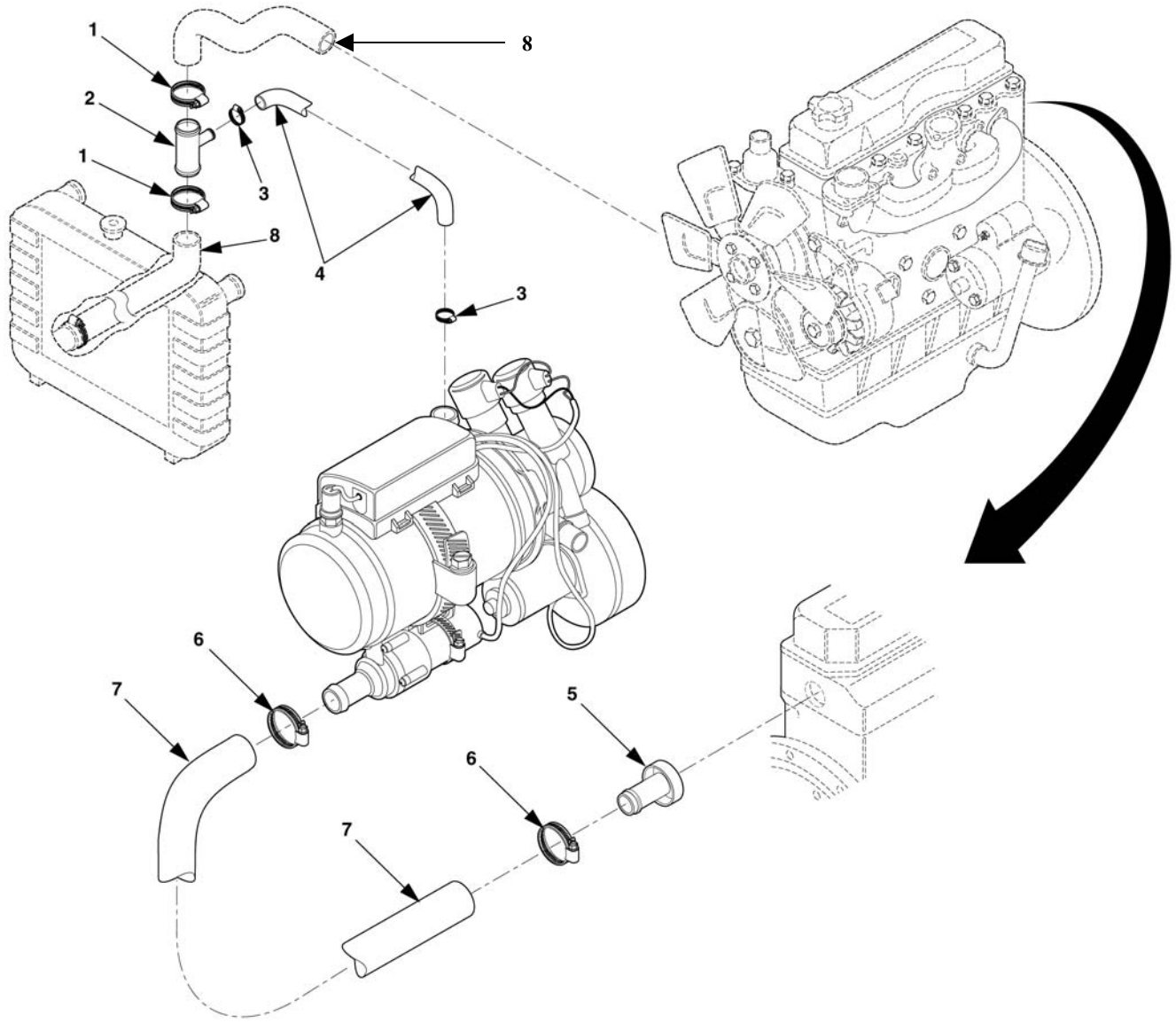


Figure 5-3. Coolant Hoses

8. Drain coolant system in accordance with TM 9-6115-643-24.

9. Remove expansion plug from rear of engine head (refer to engine TM 9-6115-254-24). Apply retaining compound to the mating surface of new expansion plug (5), Figure 5-3. Install expansion plug, then flush with engine block using a brass drift on outer edge only.

10. Install coolant hose (7) from expansion plug (5) to heater coolant intake using clamps (6).

11. Cut lower coolant hose (8) and install tee (pointing towards back of generator set) (2). Secure with clamp (1).

12. Install coolant hose (4) from tee to heater coolant using clamp (3).

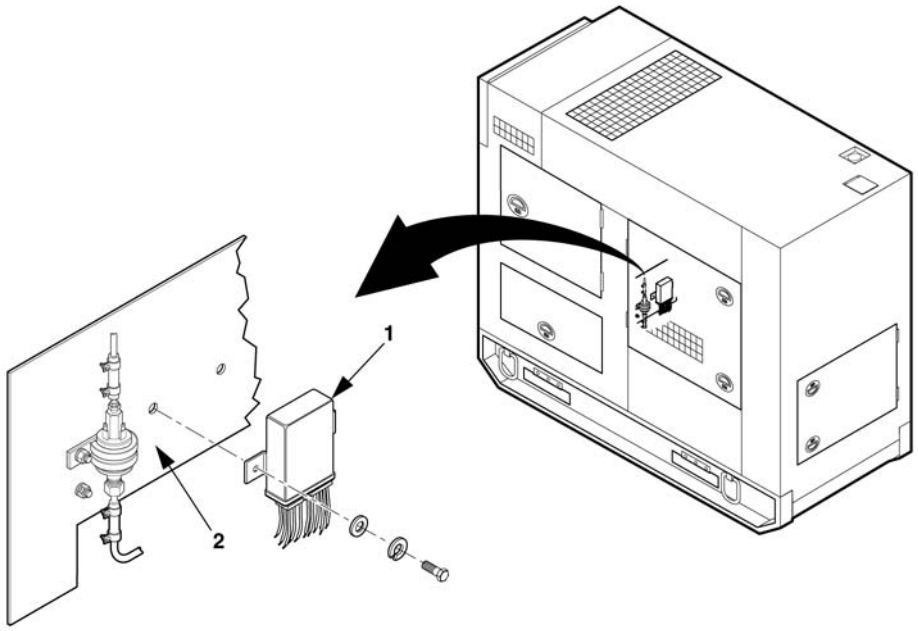


Figure 5-4. Control Unit Assembly

13. Install control unit (1), Figure 5-4, with existing hardware mounted to the output box (2).

14. Disconnect generator fuel supply line (11), Figure 5-5, from fuel pickup tube assembly (12). Attach tee (10) to fuel pickup tube assembly (12) and attach generator fuel supply line (11) to top of tee.

NOTE

The proper connection of fuel lines using a hose is a butt joint.
(See Figure 5-5).

15. Install adapter (9) to tee fitting (10) along with butt splice (7), fuel tubing (8), securing with clamps (6). Install fuel pump (4) with clamp (5), using existing hardware mounted to the output box.

16. Install butt splice (7) with fuel tubing (8) to inlet of pump (4), securing with clamp (6). Attach butt splices (2) and tubing (3) to outlet from pump (4) and to heater inlet tube using clamp (1).

NOTE

Seal all pipe threads with sealing compound contained in kit.

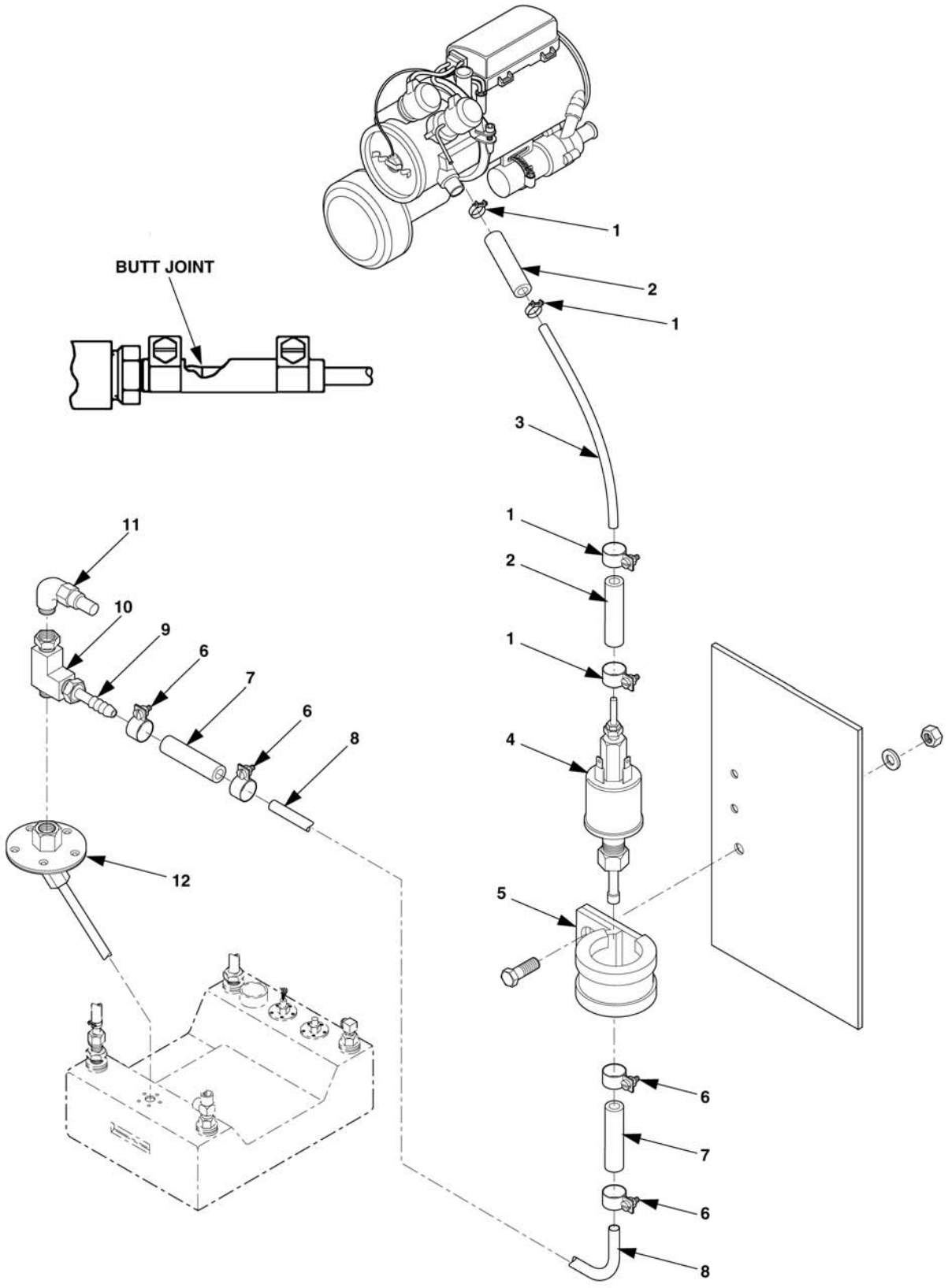


Figure 5-5. Fuel System Assembly

17. Open top right front panel door.

18. Remove and discard pins from P6-16, 17, and 24, Figure 5-6.

19. Install wiring harness in accordance with wiring diagram. Secure harness with straps contained in kit.

NOTE

Install fuse, (25 AMP, 32 V) if not already installed.

20. Connect (+) terminal wire of fuse holder (1) to the slave receptacle. Then install fuse XF1 into fuse holder (bottom left radiator housing).

21. Drill a 1/5" hole at lower left hand radiator side stiffener and mount fuse holder (1), using screw, washer, and nut provided in kit. Refer to generator TM 9-6115-643-24.

22. Open control panel access door (1), Figure 5-7.

23. Locate operating instruction plate (2) and heater function codes plate (3) and match drill 3/16" holes in control panel access door (1). Plates shall be readable when the door is open.

24. Install rivets (4). Rivet head shall be to the outside of the unit.

25. Locate heater switch label (7) and drill a 5/16" and a 1/2" hole in control panel (8).

26. Install heater switch label (7), indicator light (6), and toggle switch (5).

27. Remove and discard pins from J6-16, 17, and 24, Figure 5-6.

28. Install electrical leads in accordance with wiring diagram (refer to Figure 5-6). Secure leads with straps contained in kit.

WARNING

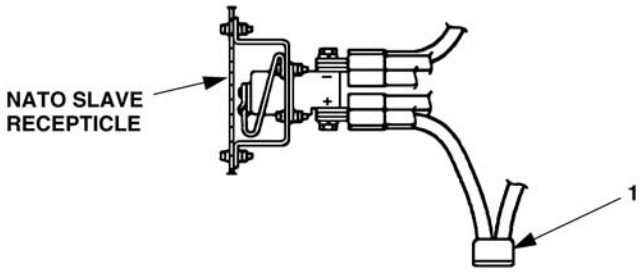
The coolant in the system shall contain the proper mixture of water and antifreeze to prevent coolant from freezing or slushing. Failure could cause engine damage and/or personal injury.

29. Add coolant to proper level.

30. Reinstall rear panel in accordance with TM 9-6115-643-24.

31. Connect positive and negative battery cables.

32. Start and run engine until the radiator thermostat has opened.



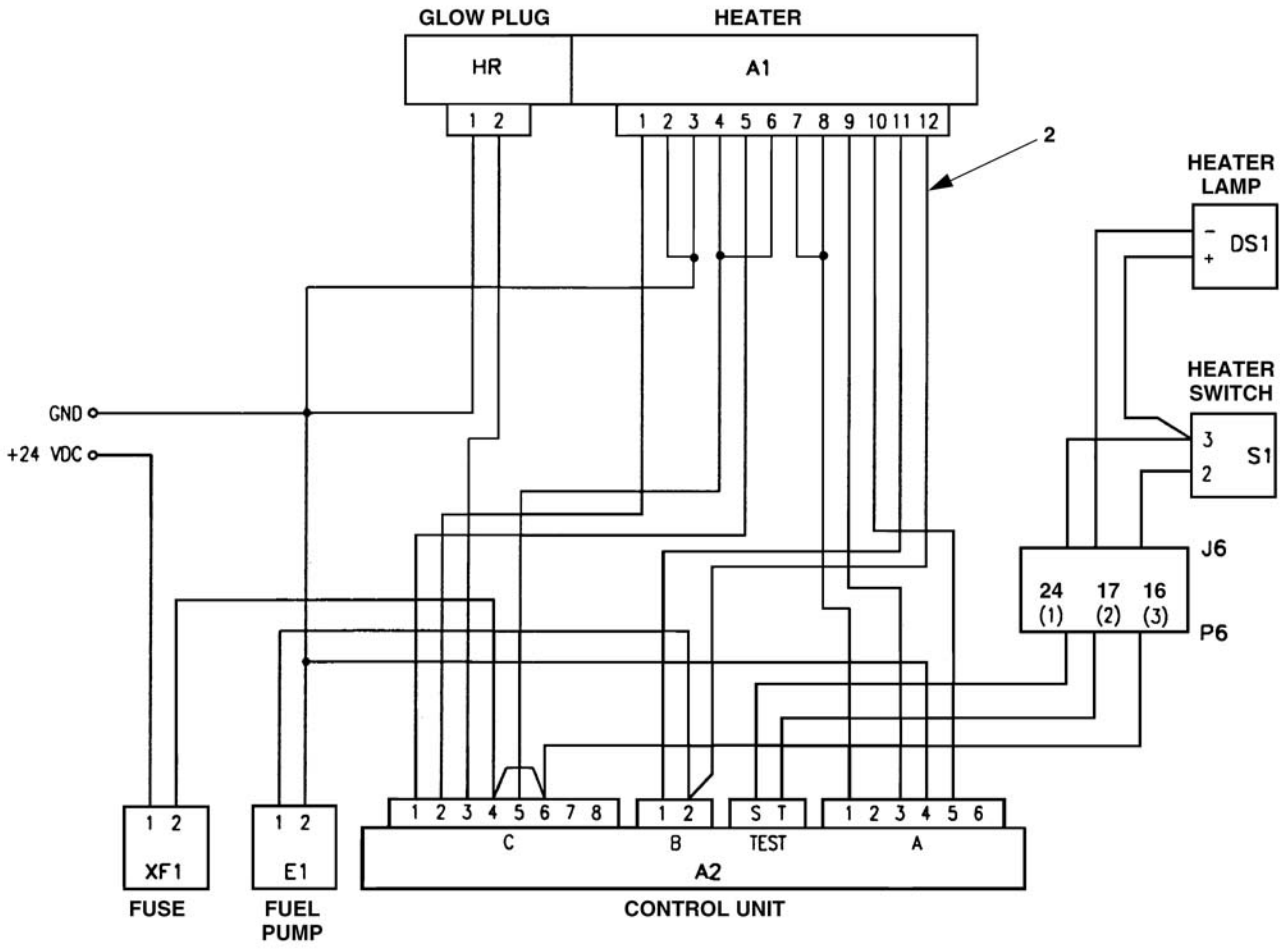


Figure 5-6. Fuse and Wiring Harness

33. Start the heater coolant pump by connecting a jumper from positive power to pin A6 of the A2 control unit. This will start the coolant pump only. Continue until pitch sound changes.

34. If necessary, top off coolant.

35. Disconnect jumper lead from pin A6 of the A2.

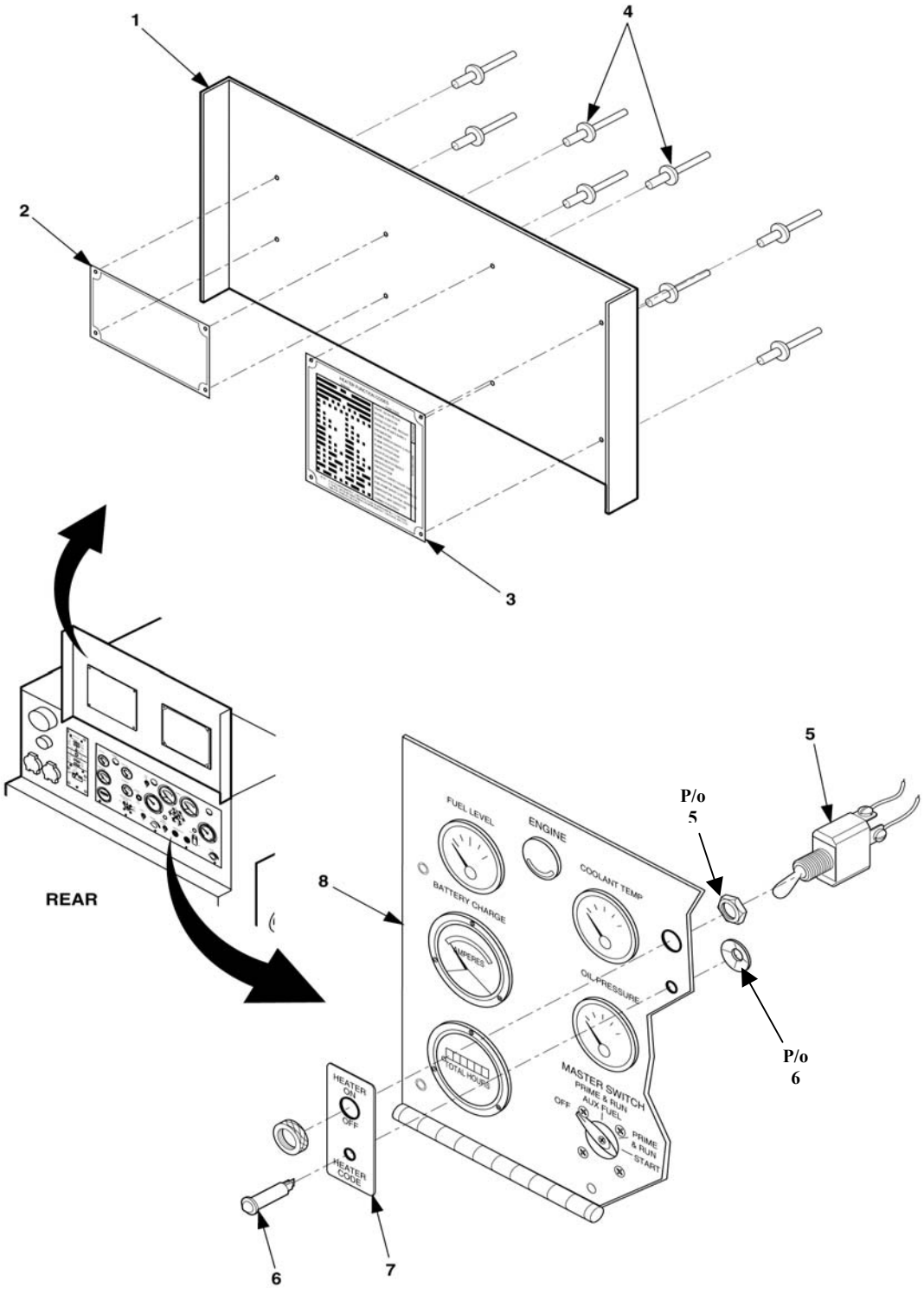


Figure 5-7. Cover and Instrument Panel

36. Double check all hose connections for leaks.

37. With engine running, start heater. Check the indicator light (6), per the heater function codes plate (3) for heater operation.

38. Turn off the engine and allow heater to run until the coolant reaches temperature, at which time the heater will cycle to low heat.

39. Switch heater off.

NOTE

The water pump and combustion air blower will continue to run for approximately 3 minutes.

40. Locate identification plate below existing plates on left side of housing. Match and drill 3/16” holes in housing. Install four rivets.

APPENDIX A

REFERENCES

A-1 SCOPE.

This appendix lists all forms, regulations, pamphlets, specifications, standards, technical manuals, lubrication orders, and field manuals referenced in this TB.

A-2 FORMS.

Recommended Changes to Publications and Blank Forms ..... DA Form 2028

Recommended Changes to Equipment Technical Publications ..... DA Form 2028-2

Depreservation Guide for Vehicles and Equipment…….. ..... DA Form 2258

Equipment Inspection and Maintenance Worksheet……. ..... DA Form 2404

Computerized (Equipment Inspection and Maintenance Worksheet) ..... DD Form 5988E

Packaging Improvement Report ..... DD Form 6

Product Quality Deficiency Report ..... SF 368

A-3 ARMY REGULATIONS.

Dictionary of United States Army Terms ..... AR 310-25

A-4 DEPARTMENT OF THE ARMY PAMPHLETS.

The Army Maintenance Management System (TAMMS) ..... DA PAM 738-750

A-5 TECHNICAL MANUALS.

Unit, Direct Support and General Support Maintenance Manual,
Diesel Engine Model No. C-240 FW-28, 4 Cylinder, 2.4 Liter ..... TM 9-2815-254-24

Unit, Direct Support and General Support Repair Parts and Special Tools List Maintenance Manual,
Diesel Engine Model No. C-240 FW-28, 4 Cylinder, 2.4 Liter ..... TM 9-2815-254-24P

Operator's Manual, Generator Set, Skid Mounted, Tactical, Quiet,
15kW, 50/60 and 400 Hz
MEP-804A (50/60 Hz) 6115-01-274-7388
MEP-814A (400 Hz) 6115-01-274-7393 ..... TM 9-6115-643-10

Unit, Direct Support and General Support Maintenance Manual, Generator Set,
Skid Mounted, Tactical, Quiet, 15kW, 50/60 and 400 Hz
MEP-804A (50/60 Hz) 6115-01-274-7388
MEP-814A (400 Hz) 6115-01-274-7393 ..... TM 9-6115-643-24

Unit, Direct Support and General Support Repair Parts and Special Tools List Maintenance Manual, Generator Set,
Skid Mounted, Tactical, Quiet, 15kW, 50/60 and 400 Hz
MEP-804A (50/60 Hz) 6115-01-274-7388
MEP-814A (400 Hz) 6115-01-274-7393 ..... TM 9-6115-643-24P

A-6 LUBRICATION ORDERS.

Lubrication Order: Generator Set, Skid Mounted, Tactical, Quiet,
15kW, 50/60 and 400 Hz
MEP-804A (50/60 Hz) 6115-01-274-7388
MEP-814A (400 Hz) 6115-01-274-7393 ..... LO 9-6115-643-12

A-7 FIELD MANUALS.

Electrical Power Generation in the Field ..... FM 20-31

First Aid ..... FM 21-11

APPENDIX B

MAINTENANCE ALLOCATION CHART (MAC)

Section l. INTRODUCTION

B-1 GENERAL

B-1.1 This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

B-1.2 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 levels.

B-1.3 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.

B-1.4 Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2 MAINTENANCE FUNCTIONS. Maintenance functions will be limited to and defined as below:

B-2.1 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-2.2 Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

B-2.3 Service. Operations required periodically keeping an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

B-2.4 Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.

B-2.5 Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

B-2.6 Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons to two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

B-2.7 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.

B-2.8 Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.

B-2.9 Repair. The application of maintenance services[1], including fault location/troubleshooting[2], removal/installation, and disassembly/assembly[3] procedures, and maintenance actions[4] 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.

B-2.10 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 publication. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

B-2.11 Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurement (e.g., hour/miles) considered in classifying Army equipment/components.

B-3 EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

B-3.1 Column (1), Functional Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

B-3.2 Column (2), Component/Assembly. Column (2) contains the names of components, assemblies, subassemblies, and modules for which a maintenance function is authorized.

B-3.3 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, refer to "Maintenance Functions" outlined in paragraph B-2).

B-3.4 Column (4), Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work item required (expressed as man-hours in whole hours or decimals in the appropriate sub column. This work-time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures will be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform

[1] *Services - inspect, test, service, adjust, align, calibrate, and/or replace.*

[2] *Fault location/troubleshooting - The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).*

[3] *Disassembly/assembly - The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component (i.e., assigned an SMR code) for the level of maintenance under consideration (i.e., identified as maintenance significant).*

[4] *Actions - Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.*

the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

C ..... Operator or crew maintenance

O ..... Unit maintenance

F ..... Direct support maintenance

L ..... Specialized Repair Activity (SRA)[5]

H ..... General support maintenance

D ..... Depot maintenance.

B-3.5 Column (5), Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

B-3.6 Column (6), Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

B-4 EXPLANATION OF COLUMNS IN TOOLS AND TEST EQUIPMENT REQUIREMENTS, SECTION III

B-4.1 Column (1), Tool or Test Equipment Reference Code. The tool and test equipment reference code correlates with a code used column (5), Section II of the MAC.

B-4.2 Column (2), Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

B-4.3 Column (3), Nomenclature. Name or identification of the tool or test equipment.

B-4.4 Column (4), National Stock Number. The National Stock Number (NSN) of the tool or test equipment.

B-4.5 Column (5), Tool Number. The manufacturers part number.

B-5 EXPLANATION OF COLUMNS IN REMARKS, SECTION IV

B-5.1 Column (1), Remarks Code. The code recorded in Column (6), Section II of the MAC.

B-5.2 Column (2), Remarks. This column lists information pertinent to the maintenance functions being performed as indicated in the MAC, Section II.

[5] *The "L" maintenance level is not included in Section II, column (4) of the MAC. Functions to this level of maintenance are identified by a work time figure in the "H" column of Section II, column (4), and an associated reference code is used in the REMARKS, column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.*

Section II. MAINTENANCE ALLOCATION CHART FOR WINTERIZATION KIT, 15kW GENERATOR

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
00	WINTERIZATION KIT	TEST		0.5				1,2,5	A
		REMOVE		2.0				1,2,	
		REPLACE		1.0				1,2, 3	D
		REPAIR		2.0				1,2	B
		INSTALL			4.0			1,2,3,4	
01	CONTROL UNIT	TEST		0.5				1,2,5	A
		REMOVE		0.5				1,2	
		REPLACE		0.5				1,2	D
		INSTALL		0.5				1,2	
02	OPERATION AND FUNCTION CODE PLATE	INSPECT	0.1	0.1					E
		REPLACE		0.5					
0201	FUNCTION CODE PLATE	INSPECT	0.1						E
		REPLACE		0.5				1,2,3	
020101	INDICATOR LIGHT	REMOVE		0.2				1,2	
		REPLACE		0.3				1,2	D
		INSTALL		0.2				1,2	
0202	OPERATING PLATE	INSPECT		0.1					E
		REPLACE		0.5				1,2,3	D
0203	HEATER SWITCH	INSPECT	0.1	0.1					E
		TEST		0.3				5	A
		REMOVE		0.5				1,2	
		REPLACE		0.5				1,2	D
		INSTALL		0.5				1,2	
03	FUEL SYSTEM AND ATTACHMENTS	INSTALL	0.1	0.1					
0301	FUEL PUMP	TEST		0.3				1,5	A
		REMOVE		0.5				1,2	
		REPLACE		0.5				1,2	D
		INSTALL		0.5				1,2	
0302	FUEL LINE	INSPECT		0.1				1,2	E
		REMOVE		0.2				1,2	
		REPLACE		0.4				1,2	D
		INSTALL		0.2				1,2	

MAINTENANCE ALLOCATION CHART
FOR
WINTERIZATION KIT, 15kW GENERATOR
(Continued)

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
04	HEATER ASSEMBLY	INSPECT	0.1	0.1					E
		TEST		0.5				1,2	A
		REMOVE		0.5				1,2	
		REPAIR		0.5				1,2	C
		REPLACE		0.5				1,2	D
		INSTALL		0.5				1,2	
0401	COOLANT PUMP	TEST		0,5				1,2	A
		REMOVE		0,5				1,2	
		REPLACE		0.5				1,2	D
		INSTALL		0.5				1,2	
0402	RESISTOR	TEST		0.3				1,5	A
		REPLACE		0.5				1,2	D
0403	IGNITOR/GLOW PLUG	TEST		0.3				1,5	A
		REPLACE		0.5				1,2	D
05	HEATER ATTACHMENTS	REPLACE		1.0				1,2	D
06	COOLANT HOSES AND ATTACHMENTS	INSPECT	0.1	0.1					E
		REMOVE		0.5				1,2	
		REPLACE		0.5				1,2	D
		INSTALL		0.5				1,2	
07	AIR INLET/EXHAUST HOSES	INSPECT	0.1	0.1					E
		REMOVE		0.5				1	
		REPLACE		0.5				1,2	D
		INSTALL		0.5				1,2	
08	WIRING HARNESS	INSPECT	0.1	0.1					E
		TEST		0.8				1,2,5	A
		REMOVE		0.5				1,2	
		REPAIR		1.0				1,2,4	B
		REPLACE		1.0				1,2,4	D
		INSTALL		0.4				1	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR WINTERIZATION KIT, 15kW GENERATOR

(1) TOOL OR TEST EQUIPMENT REF CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL/NATO STOCK NUMBER	(5) TOOL NUMBER
1	O	TOOL KIT, GENERAL MECHANIC'S	5180-00-177-7033	SC 5180-95-CL-N26
2	O,F	SHOP EQUIPMENT, AUTOMOTIVE MAINTENANCE AND REPAIR: ORGANIZATIONAL MAINTENANCE COMMON #1, LESS POWER	4910-00-754-0654	SC 4910-95-CL-A74
3	O,F	RIVETER, BLIND HEAD	5120-00-508-1588	GGG-R-00395
4	O,F	REMOVER, ELECTRICAL CONTACT	5120-00-020-5926	305183 (00779)
5	O, F	MULTIMETER	6625-01-265-6000	AN/PSM-45A

Section IV. REMARKS

(1) REMARKS CODE	(2) REMARKS
A	Testing of the Winterization Kit is limited to the control unit, heater switch, fuel pump, heater assembly, coolant pump, resistor, igniter/glow plug, and wiring harness (J1).
B	Repair of the Winterization Kit is limited to the replacement of control unit, operating and function code plates, indicator light, heater switch, fuel pump, fuel lines, heater assembly, coolant pump, heater attachments, air inlet/exhaust hoses, and the wiring harness (J1).
C	Repair of the Heater Assembly is limited to the replacement of the coolant pump, resistor, and the igniter/glow plug assembly.
D	Replace control unit, indicator light, operating plate, heater switch, fuel pump, fuel line, heater assembly, coolant pump, resistor, igniter/glow plug, heater attachments, coolant hoses, air inlet/exhaust hoses, and wiring maintenance.
E	Inspection is limited to visual inspection of components: operating and function code plates, heater switch, fuel line, heater assembly, coolant hoses and attachments, air inlet/exhaust hoses, and wiring harness (J1). Check for damage and frayed wiring. Check for illegible instructions, dents, cracks, etc.

APPENDIX C

UNIT AND DIRECT SUPPORT MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

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03	Fuel System and Attachments	C-12	Figure C-4
04	Heater Assembly	C-14	Figure C-5
05	Heater Assembly Attachments	C-16	Figure C-6
06	Coolant Hoses and Attachments	C-18	Figure C-7
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SECTION I. INTRODUCTION

C-1 SCOPE.

This Repair Parts and Special Tools (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 unit and direct support maintenance of the Winterization Kits for the MEP-804A/MEP-814A Tactical Quiet Generators (TQGs). It authorizes the requisitioning, issue, and disposition of spares, repair parts and special tools as indicated by the Source, Maintenance and Recoverability (SMR) codes.

C- 2. GENERAL.

In addition to Section I, Introduction, RPSTL 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 that 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 FIG BULK at the end of the section. Repair parts kits or sets are listed separately in their own functional group within Section II.

b. **Section III. Special Tools List**. There are no special tools for Generator's Winterization Kit.

c. **Section IV. National Stock Number and Part Number Indexes**. A list, in National Item Identification Number (NIIN) sequence, of all national stock numbered items appearing in the listings followed by a list in alphanumeric sequence of all part numbers appearing in the listing. National Stock Numbers (NSN) and part numbers are cross-referenced to each illustration figure and item number appearance.

C- 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 disposition instruction, as shown in the following breakout:

Source Code **XX**	Maintenance Code **XX**		Recoverability Code **X**
1st two positions	3rd position	4th position	5th position
How you get an item	Who can install, replace or use on the item.	Who can do complete repair* the item.	Who determines disposition action on an unserviceable item?

*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 you get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanations of source codes follow:

XB	Order by part number or obtain from salvage.

C-3 EXPLANATION OF COLUMNS (Section II) Con't

XC	Installation drawing, diagram, instruction sheet, field service drawing that is identified by manufacture's part number
PA	Stocked items; use the applicable NSN to request/requisition items with these codes. They are authorized to the category indicated by the code in the 3rd position of the SMR code.
MO - (Made at Unit Level) MF - (Made at DS Level)	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material, which is identified by the NSN or part number in the Bulk Material group of the repair parts list in this manual. If the item is authorized to you by the 3rd 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 at Unit Level) AF - Assembled at Direct Support)	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 3rd position code of the SMR code authorizes 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.

NOTE

Cannibalization when authorized may be used as a source of supply for items with the above source codes.

(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:

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	-Unit maintenance can remove, replace, and use the item.
F	-Direct support or aviation intermediate level can remove, replace, and use the item.

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	-Unit is the lowest level that can do complete repair of the item.
F	-Direct support or aviation intermediate is the lowest level that can do complete repair of the item.
Z	-Non-reparable. 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, adjusting, lubricating, etc., at the user level may recondition the item.

(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:

Code	Application/Explanation
Z	-Non-reparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3rd position of SMR code.
O	-Reparable item. When uneconomically reparable, condemn and dispose of the item at aviation unit level.
F	-Reparable item. When uneconomically reparable, condemn and dispose of the item at the direct support or aviation intermediate level.
A	-Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, costly item, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. NATIONAL STOCK NUMBER (COLUMN (3)). The National Stock Number is used to request/requisition items.

d. CAGE (Column (4)). The Commercial and Government Entity Code (CAGE) is used to identify the manufacturer, distributor, or Government agency, etc., that supplies the item.

e. PART NUMBER (Column (5)). 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.

f. DESCRIPTION (Column (6)). This column includes the following information:

(1) The Federal item name and, when required, a minimum description to identify the item.

(2) Items that are included in kits and sets are listed below the name of the kit or set.

(3) Spare/repair parts that make up an assembled item are listed immediately following the assembled item line entry.

(4) Part Numbers for bulk material are referenced in this column in the line entry for the item to be manufactured/fabricated.

(5) The statement END OF FIGURE appears just below the last item description in Column 6.

g. **QTY (Column (7))**. 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, sub-functional group, or assembly. A "V" appearing in this column in lieu of a quantity indicates that the specific quantity is variable and the quantity may vary from application to application.

C- 4. EXPLANATION OF COLUMNS (Sections III). **Special Tools List** - Not Applicable**.**

C- 5. EXPLANATION OF COLUMNS (Sections IV).

A. NATIONAL STOCK NUMBER (NSN) INDEX.

(1) STOCK NUMBER (Column (1). This column lists the NSN by National Item Identification Number (NIIN) sequence. The NIIN consists of the last nine digits of the NSN. An example is shown below.

NSN
(5305-01-674-1467).
NIIN

When using this column to locate an item, ignore the first four digits of the NSN. However, stock number should use the complete NSN when ordering items.

(2) FIG. (Column (2)). 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 (3)). 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.

(1) PART NUMBER (Column (1)). 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.

(2) FIG. (Column (2)). This column lists the number of the figure where the item is identified/located in Section II.

(3) ITEM (Column(3)). 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.

C- 6. SPECIAL INFORMATION.

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 the items source coded to be manufactured or fabricated are contained in Appendix G.

C- 7. HOW TO LOCATE REPAIR PARTS.

a. When National Stock Number or Part Number is Not Known:

First. Using the table of contents, determine the assembly 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.

Second. Find the figure covering the assembly group or subassembly group to which the item belongs.

Third. Identify the item on the figure and use the part number or NSN shown.

b. When National Stock Number or Part Number is Known:

First. Using National Stock Number or the Part Number Index, find the pertinent National Stock Number or Part Number. The NSN Index is in National Item Identification Number (NIIN) sequence (see C-4). 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.

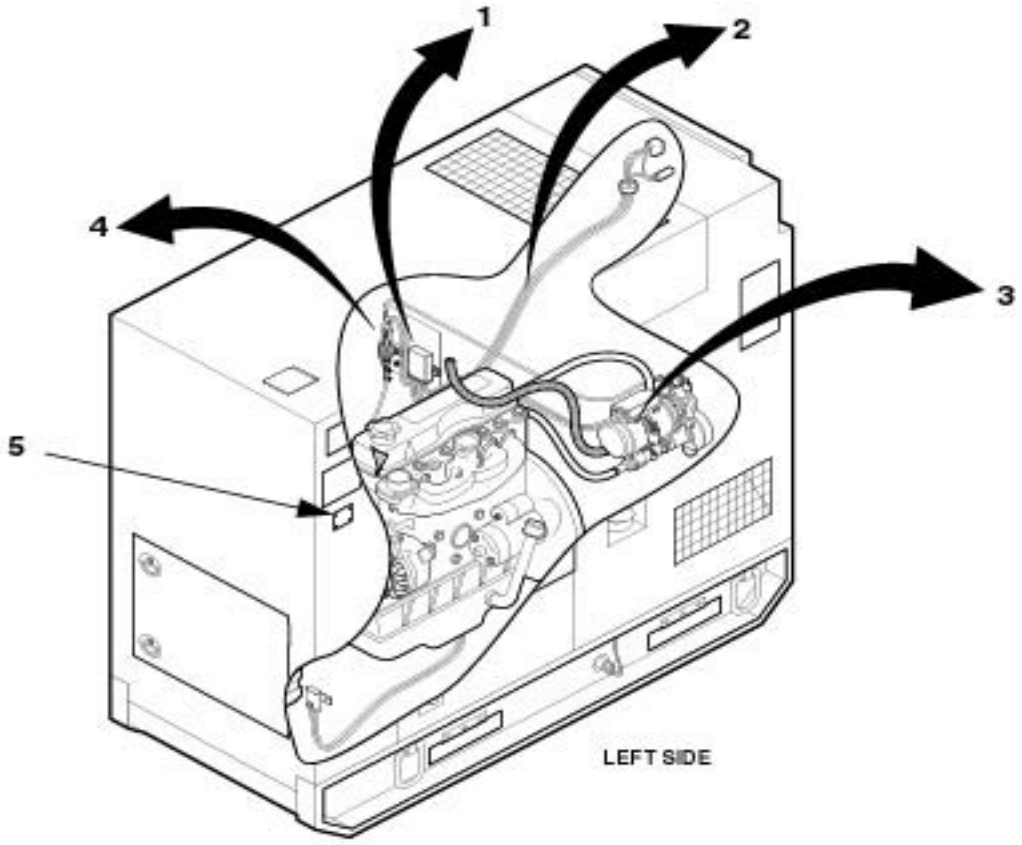


Figure C- 1. Winterization Kit 15kW, NSN 6115-01-477-0566, PN: 98-2015

Section II. Repair Parts List

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					Group 00 Figure C-1 Winterization Kit	
1	PAOZZ	2915-01-482-8924	30554	98-2014	CONTROL UNIT **See Figure C-2 for Parts**	1
2	PAOOO	--	38453	501-103-0035	WIRING HARNESS, J1 **See Figure C-9 for Parts**	1
3	PAOOO	2990-01-483-4051	30554	98-2000	HEATER ASSEMBLY **See Figure C-5 for Parts**	1
4	PAOZZ	2910-01-483-4069	30554	98-2013	FUEL SYSTEM & ATTACHMENTS **See Figure C-4 for Parts**	1
5	XBOZZ	--	30554	98-2053-3	PLATE IDENTIFICATION **End of Figure**	1

Section II. Repair Parts List-(Cont)

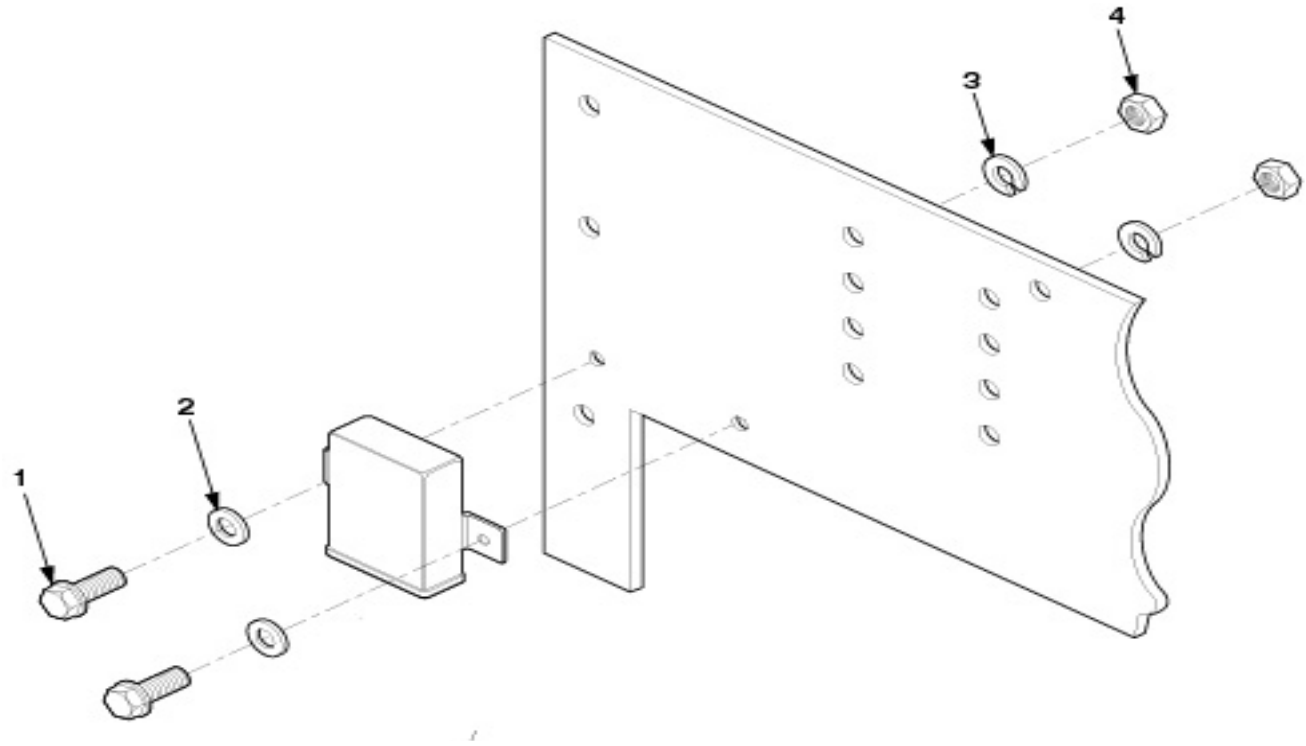


Figure C-2. Control Unit, PN: 98-2014

Section II. Repair Parts List-(Cont)

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					Group 01 Figure C-2. Control Unit	
1	XBOZZ	5306-01-156-7663	19207	12325869	SCREW, CAP HEXAGON	2
2	XBOZZ	5310-00-014-5850	96906	MS27183-42	WASHER FLAT	2
3	XBOZZ	5310-00-045-3296	30554	MS35338-43	WASHER, LOCK	2
4	XBOZZ	5310-00-533-2743	97403	13218E0320-49	NUT, PLAIN, HEXAGON	2
					End of Figure	

Section II. Repair Parts List-(Cont)

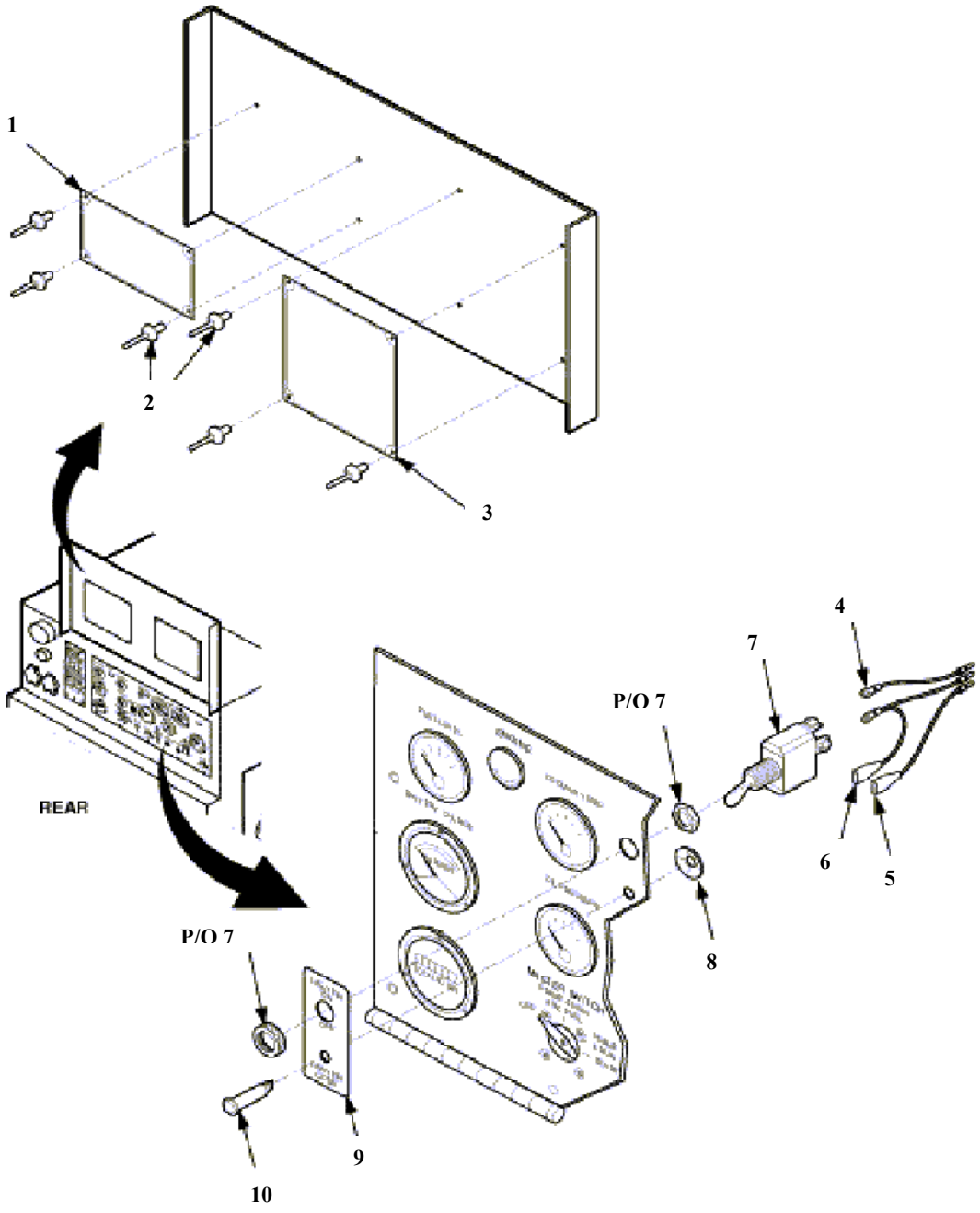


Figure C-3. Plate, Operation and Heater Switch

Section II. Repair Parts List-(Cont)

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					Group 02 Figure C-3. Operating Plates and Switch	
1	MOOZZ	—	30554	98-2041	PLATE, OPERATING INST	1
2	XBOZZ	5320-00-932-1972	97403	13214E3789-2	RIVET, BLIND	8
3	MOOZZ	—	30554	98-2001	PLATE, HEATER FUNCTION	1
4	MOOOO	—	30554	98-2049-4	LEAD, ELECTRICAL **See Figure C-10 for Parts**	1
5	MOOOO	—	30554	98-2049-3	LEAD, ELECTRICAL **See Figure C-10 for Parts**	1
6	MOOOO	—	30554	98-2050	LEAD, ELECTRICAL, **See Figure C-10 for Parts**	1
7	XBOZZ	5930-01-366-0048	81640	8906K4692	SWITCH, TOGGLE	1
8	XBOZZ	—	77122	PT312010PG	PUSH ON NUT	1
9	XBOZZ	—	30554	98-2021	LABEL, HEATER SWITCH	1
10	XBOZZ	—	91802	2191QU5-24V	LIGHT, INDICATOR	1
					End of Figure	

Section II. Repair Parts List-(Cont)

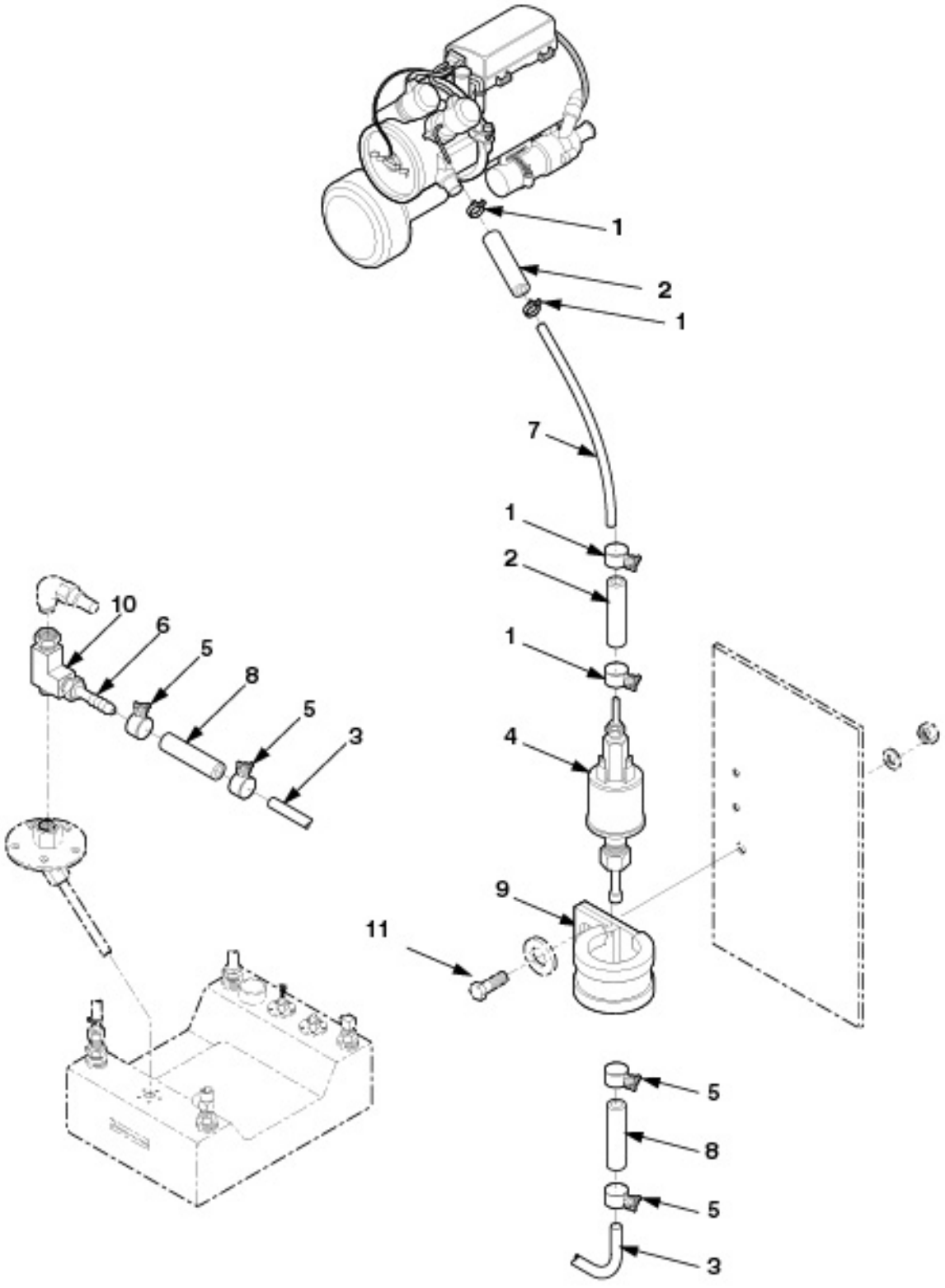


Figure C-4. Fuel System & Attachments

Section II. Repair Parts List-(Cont)

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					Group 03 Figure C-4. Fuel System & Attachments	
1	XBOZZ	—	81343	J1508-10 TYPE D	CLAMP, HOSE	4
2	XBOZZ	—	81343	J30R7-TYPE1-5/32ID	HOSE, NONMETALLIC	2
3	PAOZZ	—	1C645	090 31 125	TUBING, 6.2MM, BLACK, TUBING IS 60 IN. L	1
4	PAOZZ	2910-01-483-4069	30554	98-2013	PUMP FUEL	1
5	XBOZZ	—	81343	J1508-13 TYPE D	CLAMP, HOSE, TYPE D	4
6	XBOZZ	—	93061	125HB-3-4	ADAPTER, STRAIGHT, PI	1
7	PAOZZ	—	1C645	090 31 118	TUBING, 4X1.25 MM, NAT TUBING IS 16 IN. L	1
8	XBOZZ	4720-01-293-4415	81343	J30R7-TYPE1-3/16ID	HOSE NONMETALLIC HOSE IS 2 INCH LONG	2
9	XBOZZ	—	22175	55LC1WD21SN	CLAMP, LOOP, CUSHION	1
10	XBOZZ	4730-00-268-2403	81343	4-4-4-140424B	TEE, PIPE	4
11	XBOZZ	5305-01-381-9970	30554	88-20260-34	SCREW, CAP, HEXAGON,H	1
					End of Figure	

Section II. Repair Parts List-(Cont)

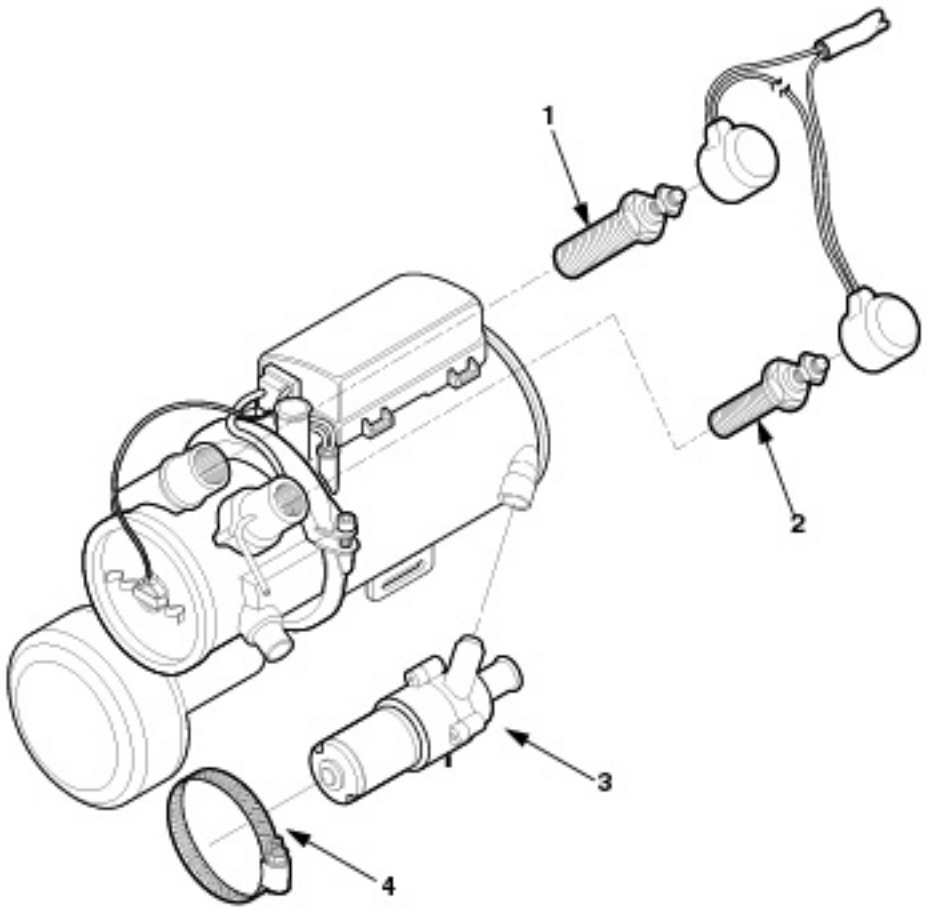


Figure C-5. Heater Assembly, PN: 98-2000

Section II. Repair Parts List-(Cont)

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					Group 04 Figure C-5. Heater Assembly	
1	PAOZZ	2920-12-187-7756	D2212	0102124405	GLOW PLUG	1
2	PAOZZ	5905-14-485-6282	F1425	25 1667 01 00 01	RESISTOR	1
3	PAOZZ	4320-12-326-9400	D8435	25 1671 25 01 00	WATER PUMP	1
4	XBOZZ	4730-12-167-2104	D8435	10 2064 03 20 50	CLAMP, COOLANT PUMP	1
					End of Figure	

Section II. Repair Parts List-(Cont)

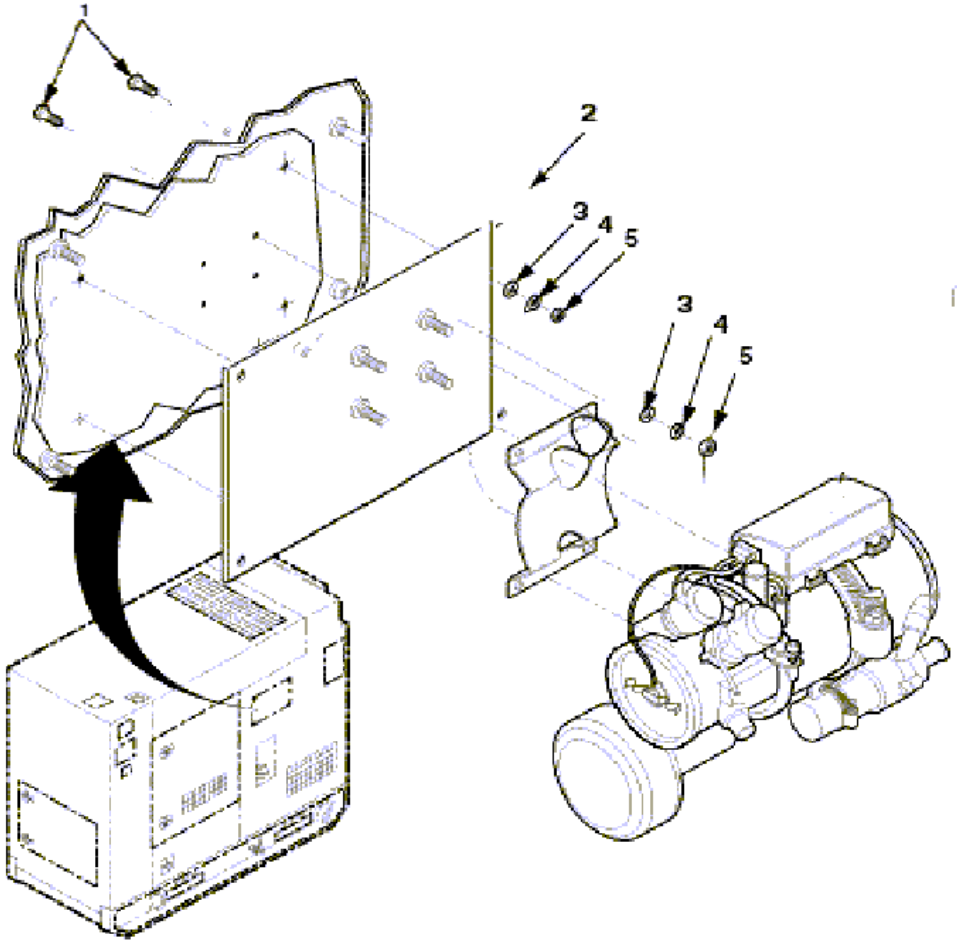


Figure C-6 Heater Assembly Attachments

Section II. Repair Parts List-(Cont)

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					Group 05 Figure C-6 Heater Assembly Attachments	
1	XBOZZ	5306-01-156-7663	19207	12325869	BOLT, MACHINE	4
2	XBOZZ	—	30554	98-2002	PLATE, MOUNTING, HEAT	1
3	XBOZZ	5310-00-014-5850	96906	MS27183-42	WASHER, FLAT	8
4	XBOZZ	5310-00-045-3296	96906	MS35338-43	WASHER, LOCK	8
5	XBOZZ	5310-00-533-2743	97403	13218E0320-49	NUT, PLAIN, HEXAGON	8
					End of Figure	

Section II. Repair Parts List-(Cont)

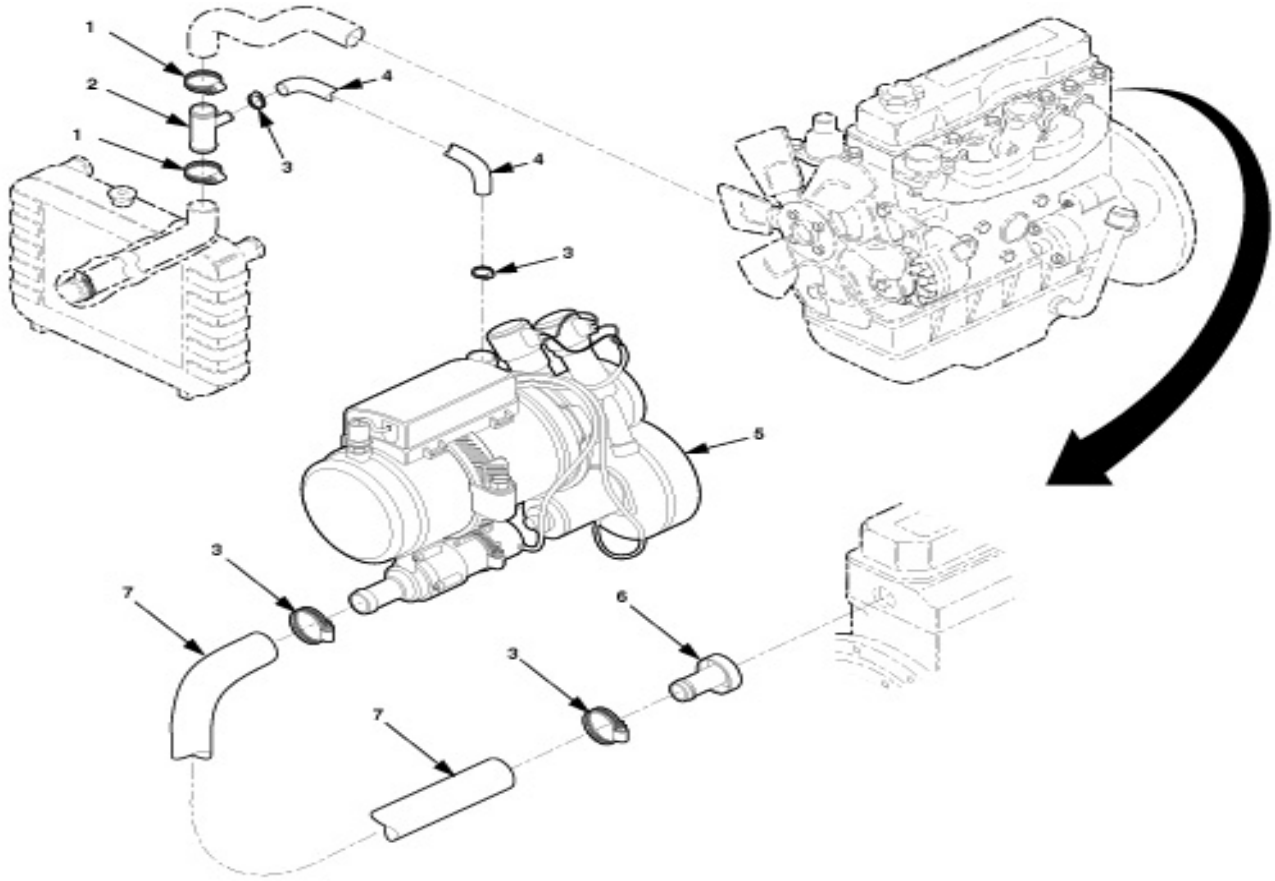


Figure C-7 Coolant Hoses and Attachments

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					Group 06 Figure C-7 Coolant Hoses and Attachments	
1	XBOZZ	4370-00-908-3193	56161	J1670-24	CLAMP, TYPE F, SIZE 24	1
2	XBOZZ	—	30554	98-2009	TEE	1
3	XBOZZ	—	81343	J1670-10	CLAMP, TYPE F, SIZE 10	4
4	PAOZZ	4720-01-484-6062	81300	80407	HOSE, PREFORMED, 90 D, 49 IN. L	1
5	PAOOO	2990-01-483-4051	30554	98-2000	HEATER, COOLANT, ENGINE	1
6	XBOZZ	-	30554	98-2022	PLUG, EXPANSION	1
7	PAOZZ	4720-01-484-6004	81300	80404	HOSE, PREFORMED, 90 D, 24 IN. L	1
					End of Figure	

Section II. Repair Parts List-(Cont)

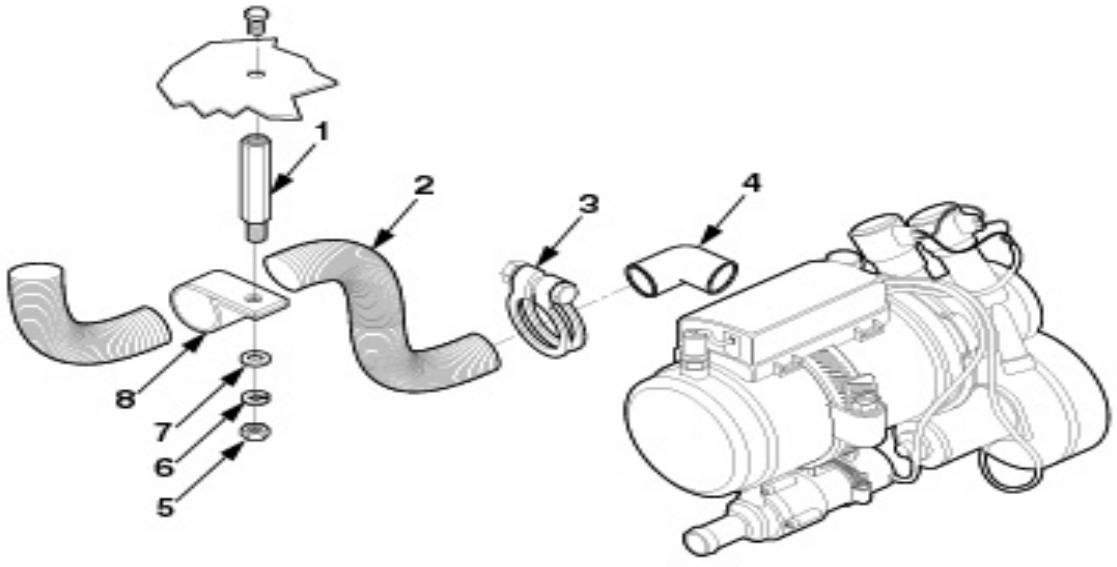


Figure C-8. Exhaust Hoses and Heater Brace

Section II. Repair Parts List-(Cont)

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					Group 07 **Figure C-8. Exhaust Hoses and Heater Brace**	
1	XBOZZ	5340-01-470-5184	61000	A7416-1032-0	STANDOFF, MALE-FEMALE	1
2	XBOZZ	—	OK1P5	1.25 ID HT4100S	HOSE METALLIC, 32 IN. L	1
3	XBOZZ	—	052C4	R36	CLAMP, LOOP	1
4	XBOZZ	4730-00-236-4066	96906	MS35928-9	ELBOW, 90 DEGREE	1
5	XBOZZ	5310-00-533-2743	97403	13218E0320-49	NUT, PLAIN, HEXAGON	1
6	XBOZZ	5310-00-045-3296	96906	MS35338-43	WASHER, LOCK	1
7	XBOZZ	5310-00-014-5850	96906	MS27183-42	WASHER, FLAT	1
8	XBOZZ	5340-00-550-5943	18076	MS122920	CLAMP, LOOP	1
					End of Figure	

Section II. Repair Parts List-(Cont)

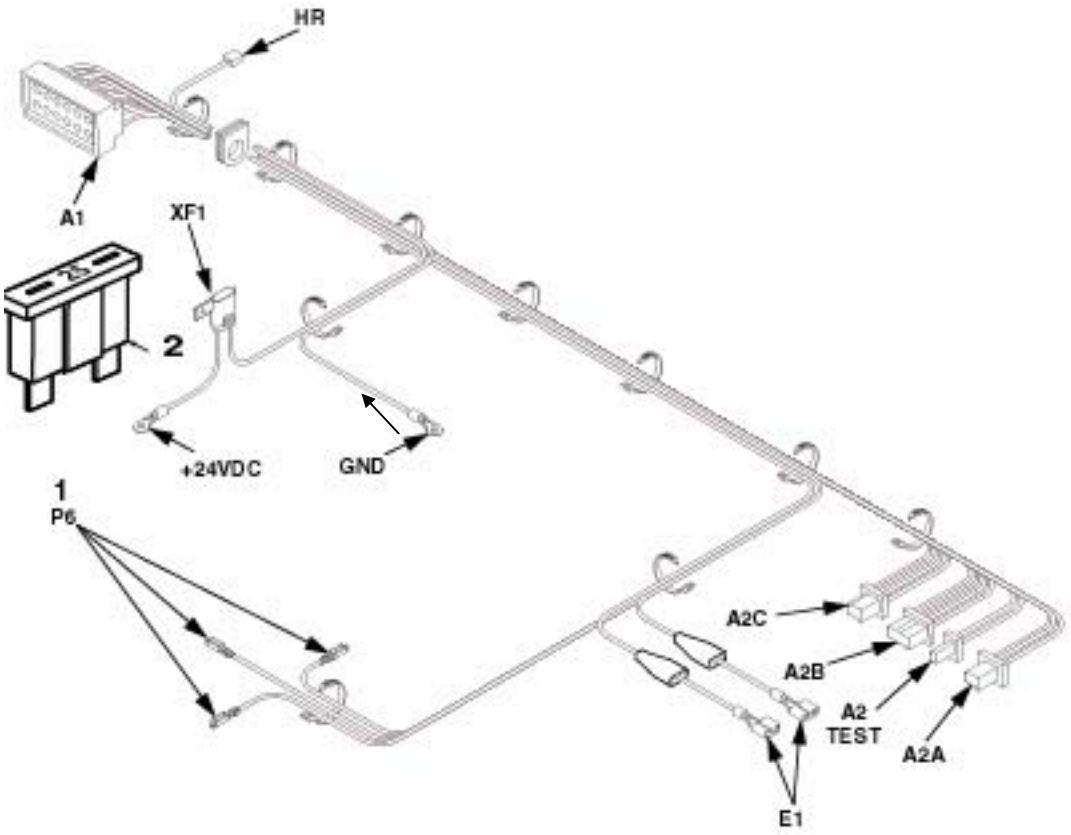


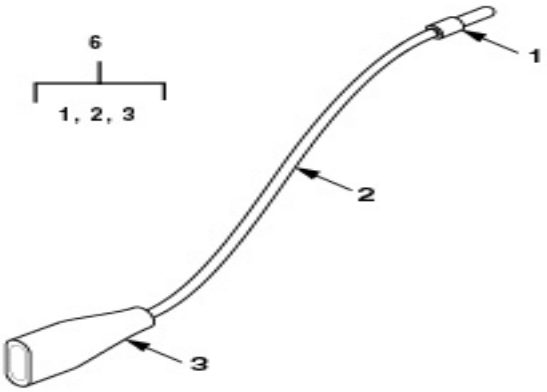
Figure C-9. Wiring Harness, J1, (38453) PN 501-103-0035

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					Group 08 Figure C-9. Wiring Harness	
1	XBOZZ	5999-01-170-0558	00779	66331-8	CONNECTOR, P6	3
2	PAOZZ	5920-01-414-6436	58536	AA55569/02-009	FUSE, INCLOSED, LINK	1
					End of Figure	

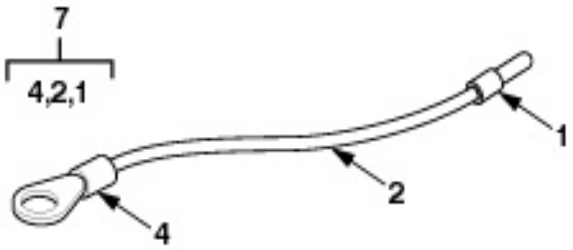
WIRE LIST

WIRE NO.	TERMINATION FROM	ITEM NAME	TERMINATION TO	ITEM NAME	WIRE AWG.
1	A1-1	Heater Assembly	A2C-2	Control Unit	18
2	A1-2	Heater Assembly	GND	—	18
3	A1-3	Heater Assembly	GND	—	18
4	A1-4	Heater Assembly	A2C-5	Control Unit	18
5	A1-6	Heater Assembly	A2C-5	Control Unit	18
6	A1-5	Heater Assembly	A2C-1	Control Unit	18
7	A1-7	Heater Assembly	A2A-1	Control Unit	18
8	A1-8	Heater Assembly	A2A-1	Control Unit	18
9	A1-9	Heater Assembly	A2A-3	Control Unit	18
10	A1-10	Heater Assembly	A2A-5	Control Unit	18
11	A1-11	Heater Assembly	A2B-1	Control Unit	18
12	A1-12	Heater Assembly	A2B-2	Control Unit	18
13	E1-1	Fuel Pump	A2B-2	Control Unit	18
14	E1-2	Fuel Pump	A2A-4	Control Unit	18
15	HR-1	Glow Plug	GND	—	10
16	HR-2	Glow Plug	A2C-3	Control Unit	10
17	A2TEST-S	Control Unit	P6-24	Heater Switch	18
18	A2TEST-T	Control Unit	P6-17	Heater Switch	18
19	A2C-6	Control Unit	P6-16	Heater Switch	18
20	A2C-6	Control Unit	A2C-4	Control Unit	18
21	XF1-2	Fuse	A2C-4	Control Unit	10
22	XF1-1	Fuse	+24 VDC	—	10
23	E1-2	Fuel Pump	GND	—	18

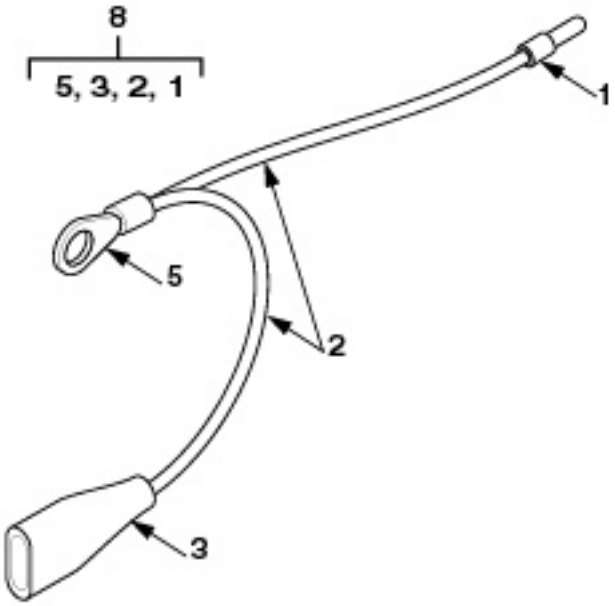
Section II. Repair Parts List-(Cont)



P/N 98-2049-4



P/N 98-2049-3



P/N 98-2050

Figure C-10. Electrical Leads

Section II. Repair Parts List-(Cont)

Part Number	Termination	Termination	Wire	Dimension
	From Find #	To Find #	Find #	
98-2049-4	J6-17 1	DS1 3	2*	44”
98-2049-3	J6-16 1	S1-2 4	2*	44”
98-2050	J6-24 1	S1-3 5	2*	44”
	DS1+ 5	S1-3 5	2*	5”

(1) ITEM NO	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) CAGE	(5) PART NUMBER	(6) DESCRIPTION	(7) QTY
					Group 99 Figure C-10. Electrical Leads Bulk Items	
1	XBOZZ	5940-00-813-0698	00779	31879	TERMINAL, LUG	3
2	XBOZZ	6145-00-851-8505	81349	M5086/2-20-9	WIRE, ELECTRICAL	AR
3	XBOZZ	5999-01-366-5119	00779	66332-8	CONTACT ASSEMBLY	2
4	MOOZZ	5940-00-411-5913	00779	640916-1	TERMINAL, QUICK DISC	1
5	XBOZZ	5940-00-283-5280	81343	MS25036-106	TERMINAL, LUG	1
6	MOOOO		30554	98-2049-4	LEAD, ELECTRICAL	1
7	MOOOO		30554	98-2049-3	LEAD, ELECTRICAL	1
8	MOOOO		30554	98-2050	LEAD, ELECTRICAL	1
					End of Figure	

Section III. Special Tools List

NOT APPLICABLE

Section IV. NATIONAL STOCK NUMBER (NSN) AND PART NUMBER INDEXES

NATIONAL STOCK NUMBER INDEX

(1) STOCK NUMBER	(2) FIG	(3) ITEM
5310-00-014-5850	C-2	2
	C-6	3
	C-8	7
5310-00-045-3296	C-2	3
	C-6	4
	C-8	6
4730-00-236-4066	C-8	4
4730-00-268-2403	C-4	10
5940-00-283-5280	C-10	5
5940-00-411-5913	C-10	4
5310-00-533-2743	C-2	4
	C-6	5
	C-8	5
5340-00-550-5943	C-8	8
5940-00-813-0698	C-10	1
6145-00-851-8505	C-10	2
4370-00-908-3193	C-7	1
5320-00-932-1972	C-3	2
5306-01-156-7663	C-2	1
	C-6	1
5999-01-170-0558	C-9	1
4720-01-293-4415	C-4	8
5930-01-366-0048	C-3	7
5999-01-366-5119	C-10	3
5305-01-381-9970	C-4	11
5920-01-414-6436	C-9	2
5340-01-470-5184	C-8	1
2915-01-482-8924	C-1	1
2990-01-483-4051	C-1	3
	C-7	5
2910-01-483-4069	C-1	4
	C-4	4
4720-01-484-6004	C-7	7
4720-01-484-6062	C-7	4
4730-12-167-2104	C-5	4
2920-12-187-7756	C-5	1
4320-12-326-9400	C-5	3
5905-14-485-6282	C-5	2

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Section IV. NATIONAL STOCK NUMBER (NSN) AND PART NUMBER INDEXES (Con't)

PART NUMBER INDEX

(1) PART NUMBER	(2) FIG	(3) ITEM
0102124405	C-5	1
090 31 118	C-4	7
090 31 125	C-4	3
1.25 ID HT4100S	C-8	2
12325869	C-2	1
	C-6	1
125HB-3-4	C-4	6
13214E3789-2	C-3	2
13218E0320-49	C-2	4
	C-6	5
	C-8	5
2191QU5-24V	C-3	10
4-4-4 140424B	C-4	10
501-103-0035	C-1	2
55LC1WD21SN	C-4	9
31879	C-10	1
640916-1	C-10	4
66332-8	C-10	3
80404	C-7	7
80407	C-7	4
88-20260-34	C-4	11
66331-8	C-9	1
8906K4692	C-3	7
A7416-1032-0	C-8	1
AA55569/02-009	C-9	2
J1508-10 TYPE D	C-4	1
J1508-13 TYPE D	C-4	5
J1670-10 TYPE F	C-7	3
J1670-24	C-7	1
J30R7-TYPE 1-3/16ID	C-4	8
J30R7-TYPE 1-5/32ID	C-4	2
MS122920	C-8	8
MS25036-106	C-10	5
MS27183-42	C-2	2
	C-6	3
	C-8	7
MS35338-43	C-2	3
	C-6	4
	C-8	6
MS35928-9	C-8	4
M5086/2-20-9	C-10	2
PT312010PG	C-3	8
R36	C-8	3

Section IV. PART NUMBER INDEX-Cont

10 2064 03 20 50	C-5	4
25 1667 01 00 01	C-5	2
25 1671 25 01 00	C-5	3
98-2000	C-1	3
	C-7	5
98-2001	C-3	3
98-2002	C-6	2
98-2009	C-7	2
98-2013	C-1	4
	C-4	4
98-2014	C-1	1
98-2015	C-1	
98-2021	C-3	9
98-2022	C-7	6
98-2041	C-3	1
98-2049-3	C-3	5
	C-10	7
98-2049-4	C-3	4
	C-10	6
98-2050	C-3	6
	C-10	8
98-2053-3	C-1	5

APPENDIX D

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

Section I. INTRODUCTION

D-1. SCOPE.

This appendix lists components of the end item and basic issue items for the Winterization Kit to help to inventory items required for safe and efficient operation of the equipment.

D-2. GENERAL.

The Components of End Item (COEI) and Basic Issue Items (BII) Lists are divided into the following sections:

D-2.1 Section II, Components of End Item (COEI). This listing is for informational purposes only, and is not authority to requisition replacements. The Repair Parts and Special Tools List or RPSTL in this TM is the authority to requisition replacements for items in the COEI Listing. These items are part of the Winterization Kit but they 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.

D-2.2 Section III, Basic Issue Items (BII). These essential items are required to place the Winterization Kit in operation, operate it, and to do emergency repairs. Although shipped separately, BII must be with the Winterization Kit during operation and when it is transferred between property accounts. The BII listing of these items is the authority to request/requisition them for replacement based on authorization of the end item by the Table of Organizational Equipment/Modified Table of Organizational Equipment (TOE/MTOE).

D-3. EXPLANATION OF COLUMNS.

The following provides an explanation of columns found in the tabular listings:

D-3.1 Column (1), Item Number, gives the number of the item listed.

D-3.2 Column (2), National Stock Number, identifies the stock number of the item to be used for requisitioning purposes.

D-3.3 Column (3), Description, CAGE, and Part Number identifies the Federal item name followed by a minimum description when needed. The line below the description is the CAGE (Commercial and Government Entity) code (in parentheses) and the part number.

D-3. EXPLANATION OF COLUMNS. (Cont'd)

D-3.4 Column (4), U/I (Unit of Issue), indicates how the item is issued for the National Stock Number shown in column two.

D-3.5 Column (5), Qty Rqd, indicates the quantity required.

Section II. COMPONENTS OF END ITEM

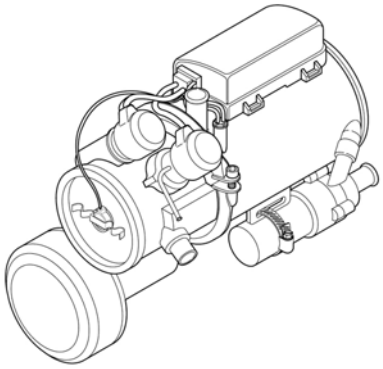
(1) Item Number	(2) National Stock Number	(3) Description, CAGE and Part Number	(4) U/I	(5) Qty Rqd
1	2915-01-482-8924	Control Unit, (38453) 25 1600 50 00 00	Ea	1
2		Wiring Harness, (38453) 501-103-0035	Ea	1
3	2990-01-483-4051	Heater Assembly, (30554) 98-2000	Ea	1
4	2910-01-483-4069	Fuel System and Attachment, (30554) 98-2013	Ea	1

Section III. BASIC ISSUE ITEMS

(1) Item Number	(2) National Stock Number	(3) Description, CAGE and Part Number	(4) U/I	(5) Qty Rqd
1		TB 9-6115-643-13	Ea	1

TECHNICAL BULLETIN

OPERATOR, UNIT AND DIRECT SUPPORT TECHNICAL BULLETIN



WINTERIZATION KIT
(NSN: 6115-01-477-0566) (EIC: N/A)

INSTALLED ON
GENERATOR SET, SKID MOUNTED,
TACTICAL QUIET,
15kW, 50/60 and 400 Hz
MEP-804A (50/60Hz) (6115-01-274-7388)
MEP-814A (400Hz) (6115-01-274-7393)

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Operating Instructions 2-1

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RPSTL C-1

Alphabetical Index Index-1

HEADQUARTERS, DEPARTMENT OF THE ARMY

15 February 2002

APPENDIX E

ADDITIONAL AUTHORIZATION LIST (AAL)

Section I. INTRODUCTION

E-1. The Winterization Kit does not require additional authorized items.

APPENDIX F

EXPENDABLE AND DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

F-1 SCOPE.

This appendix lists expendable and durable items that are needed to operate and maintain the Winterization Kit. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized by CTA 50-790, Expendable/Durable Items (except medical, class V, repair parts, and heraldic items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

F-2 EXPLANATION OF COLUMNS.

a. Column 1 - Item Number. This number is assigned to the entry in the listing and may be referenced in the narrative instructions to identify the item (e.g., "Use detergent, general purpose, item 3, Appendix E").

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the item. One of the following codes appears in column 2.

C - Operator/Crew Maintenance
O - Unit Maintenance
F - Direct Support Maintenance

c. Column 3 - National Stock Number. This is the national stock number assigned to the item; use it to requisition the item.

d. Column 4 - Item Name, Description, Commercial and Government Entity (CAGE) code, and Part Number. This provides the other information needed to identify the item.

e. Column 5 - Unit of Measure (U/M). This code shows the physical measurement or count of an item, such as gallon, gross, etc.

Section II. TABLE OF EXPENDABLE AND DURABLE SUPPLIES AND MATERIALS

(1) Item Number	(2) Level	(3) National Stock Number	(4) Item Name, Description, CAGE, Part Number	(5) U/M
	C	8030-00-118-0012	Sealing Compound (05792) 57141	CC
	C	8030-01-268-5917	Retaining Compound (05972) 62040	CC
	C	8040-01-145-1768	Adhesive (01139) RTV106	OZ

APPENDIX G

ILLUSTRATED LIST OF MANUFACTURED ITEMS

G-1 INTRODUCTION.

This appendix includes complete instructions for making items authorized to be manufactured or fabricated at unit, direct support, and general support maintenance levels.

A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the figure that covers fabrication criteria.

Part number or specification number in a tabular list on the illustration lists all bulk materials needed for manufacture of an item.

G-2 MANUFACTURED ITEMS PART NUMBER INDEX.

Part Number of Manufactured Item	Applicable Figure
98-2049-4	G-1
98-2049-3	G-2
98-2050	G-3

G-3 GENERAL INSTRUCTIONS

The manufacture of items listed above consists of cutting wires to length specified on figures and soldering terminal lugs or connectors on appropriate wires. Use standard shop procedures in the manufacture of these items.

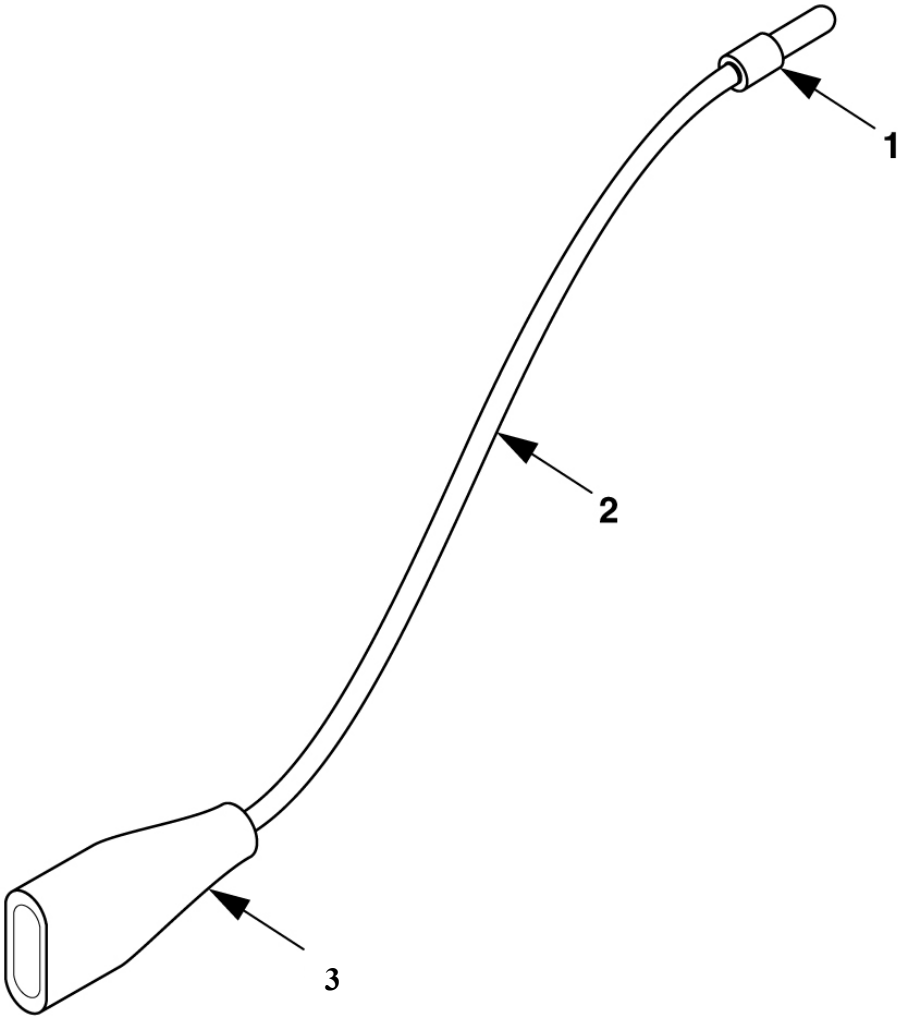

Figure G-1. Electrical Lead P/N 98-2049-4

TERMINATION		TERMINATION		WIRE	DIMENSION
FROM	FIND NO.	TO	FIND NO.	FIND NO.	44”
J6-17	1	DS1	3	2	

PARTS LIST

Find No.	Part No.	Quantity Required	Description
1	31879	1	Terminal, Lug
2	M5086/2-20-9	AR	Wire, Electrical (20 AWG)
3	66332-8	1	Contact Assembly

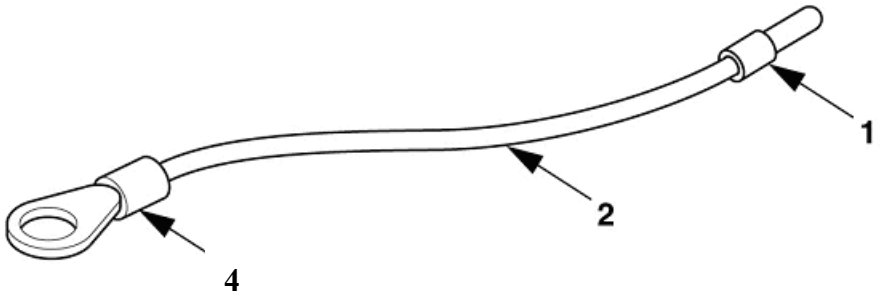

Figure G-2. Electrical Lead P/N 98-2049-3

TERMINATION FROM	FIND NO.	TERMINATION TO	FIND NO.	WIRE FIND NO.	DIMENSION 44”
J6-16	1	S1-2	4	2	

PARTS LIST

Find No.	Part No.	Quantity Required	Description
1	31879	1	Terminal Lug
2	M5086/2-20-9	AR	Wire, Electrical (20 AWG)
4	640916-1	1	Terminal, Quick Disconnect

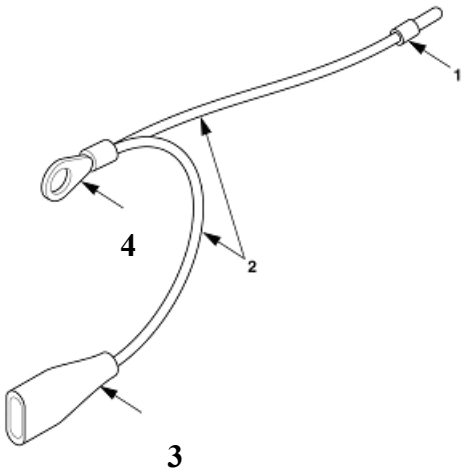

Figure G-3. Electrical Lead P/N 98-2050

TERMINATION		TERMINATION		WIRE	DIMENSION
FROM	FIND NO.	TO	FIND NO.	FIND NO.	
J6-24	1	S1-3	5	2	44”
DS1+	5	S1-3	5	2	5”

PARTS LIST

Find No.	Part No.	Quantity Required	Description
1	31879	1	Terminal Lug
2	M5086/2-20-9	AR	Wire, Electrical (20 AWG)
3	66332-8	1	Contact Assembly
4	MS25036-106	1	Terminal Lug

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PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5840-340-20	23 Jan 74	Radar Set AN/PRC-76

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 20 IFF antenna lag rather than 10. REASON: Experience has shown that with only a 10 lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 20 without degradation of operation.
3-10	3-3		3-1	Item 5, Functional Column. Change • 2 dB" to • 3 dB". REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 dB (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, • Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		FO-3		Zone C 3. On J1-2, change • +24 VDC" to • +5 VDC". REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

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