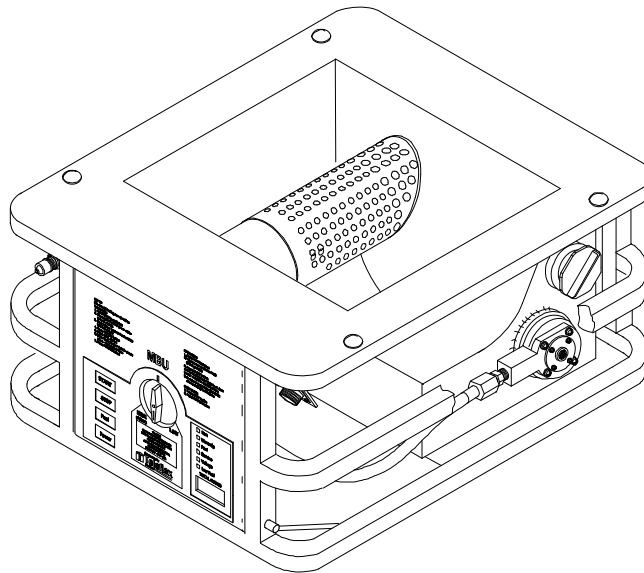


***TM 10-7310-281-13&P**

TECHNICAL MANUAL

**OPERATOR AND FIELD MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST
FOR**

**MODERN BURNER UNIT (MBU)
NSN 7310-01-452-8137
MODERN BURNER UNIT (MBU-V3)
NSN 7310-01-507-9310**



* This manual supersedes TM 10-7310-281-13&P, 31 July 2004, including all changes.

DISTRIBUTION STATEMENT A – Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY

17 MAY 2010

WARNING SUMMARY

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel. Also included are explanations of safety and hazardous material icons used in the technical manual. For first aid treatment, refer to FM 4-25.11.

EXPLANATION OF SAFETY WARNING ICONS



ELECTRICAL - electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.



EXPLOSION - rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition, or high pressure.



FIRE - flame shows that a material may ignite and cause burns.



HEAVY OBJECT - human figure stooping over heavy object shows physical injury potential from improper lifting technique.



HOT AREA – hand over object radiating heat shows that part is hot and can burn.



VAPOR - human figure in a cloud shows that material vapors present a danger to life or health.

GENERAL SAFETY WARNINGS DESCRIPTION

WARNING



Exercise extreme care when destroying equipment by fire using petroleum products. Petroleum products are highly flammable; improper handling may cause injury to personnel.

WARNING



Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures. Failure to observe safety precautions may result in injury or death to personnel.

WARNING



The Battery Pack weighs approximately 93 pounds (42.3 kg). Two persons must carry the Battery Pack. Lift with legs, not back, to prevent injury.

WARNING



The MBU weighs approximately 58 pounds fully fueled (26.3 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

WARNING



Do not store the MBU with fuel in the tank. Improper storage may cause injury to personnel.

GENERAL SAFETY WARNINGS DESCRIPTION – CONTINUED

WARNING



HIGH VOLTAGE is used in the operation of this equipment. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

Never connect electrical equipment unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid.

External power must be shut off before connecting any cables or performing maintenance.

For artificial respiration, refer to FM 4-25.11.

Be careful not to contact high-voltage connections when removing, installing, or operating this equipment.

Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through the vital organs of the body. Voltages as low as 50 volts may cause death.

Do not stand in water while handling live power cords or electrical shock may result. Position all power cables so that they are out of the way during operation and are not lying in water.

WARNING



The MBU has been designed to operate with JP-8 and certain approved diesel fuels. Only JP-8 or an approved alternate diesel fuel may be used. The use of gasoline is **STRICTLY PROHIBITED** and will create a fire danger and potential for explosion. Failure to observe safety precautions may result in injury or death to personnel.

WARNING



Do not attempt to connect a fuel line to the MBU in the vicinity of any open flame. Ensure that the fuel hose connections are made properly, to avoid fuel spillage. Prevent a possible fire hazard by having rags on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

GENERAL SAFETY WARNINGS DESCRIPTION – CONTINUED

WARNING



During operation, the MBU produces harmful carbon monoxide (CO) and other gases. Carbon monoxide is a colorless, odorless, and tasteless gas. Mild cases of carbon monoxide poisoning can cause symptoms such as nausea, dizziness, or headaches. Severe cases of carbon monoxide poisoning can result in brain damage, heart damage, or death. Although CO has no telltale odor, it may mix with other odors which mask its presence; therefore, CO can be present within a mix of seemingly harmless odors.

To prevent CO poisoning, ensure that the MBU operating space is well ventilated during burner operation. Under no circumstances should an MBU be operated in any enclosure with all vents closed.

WARNING



For immediate decontaminating procedures, use ONLY hot, soapy water for spot decontamination of hot surfaces of the MBU. Shut down and cool the MBU for any additional decontamination procedures. DO NOT spray DS2 or any other combustible decontamination solutions or compounds on an operating MBU. DO NOT spray DS2 or any other combustible decontamination solutions or compounds on any equipment surfaces or components where the operating temperatures reach or exceed the flashpoint of DS2 (160° Fahrenheit or 71.1° Celsius).

WARNING



Have rags on hand to clean up fuel spillage that may occur, to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING



Fuel is toxic and highly flammable. Wear protective gloves and be sure to wipe up any spills with rags. Dispose of rags in accordance with Unit SOP and local environmental regulations. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Failure to observe this warning may cause injury or death to personnel.

GENERAL SAFETY WARNINGS DESCRIPTION – CONTINUED

WARNING



Do not perform this procedure near an open flame, to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING



Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 0014. Have rags on hand to clean up fuel spillage that may occur, to prevent contamination. Do not perform this procedure near an open flame, to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING



Before proceeding, the batteries must be removed from the battery pack. Failure to observe safety precautions may result in injury or death to personnel.

WARNING



Batteries may explode if connected incorrectly. Red power lead **MUST** be connected to positive (+) terminal of battery. Black power lead **MUST** be connected to negative (-) terminal of battery.

WARNING



HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: This manual supersedes TM 10-7310-281-13&P dated 31 July 2004. Zero in the "Change No." column indicates an original page or work package.

Date of issue for the original manual is:

Original 17 MAY 2010

**TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 42 AND TOTAL
NUMBER OF WORK PACKAGES IS 74, CONSISTING OF THE FOLLOWING:**

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 17 MAY 2010

**TECHNICAL MANUAL
OPERATOR AND FIELD MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST
FOR**

**MODERN BURNER UNIT (MBU)
NSN 7310-01-452-8137
MODERN BURNER UNIT (MBU-V3)
NSN 7310-01-507-9310**

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) directly to: TACOM Life Cycle Management Command, ATTN: AMSTA-LCL-MPP/TECH PUBS, 1 Rock Island, IL 62199-7630. You may also send in your recommended changes via electronic mail or by fax. Our fax number is DSN 793-0726 and commercial number (309) 782-0726. Our e-mail address is TACOMLCMC.DAForm2028@us.army.mil. A reply will be furnished to you.

* This manual supersedes TM 10-7310-281-13&P, 31 July 2004, including all changes.

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HOW TO USE THIS MANUAL

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When a new system is introduced to the Army inventory, it is the responsibility of the receiving units to notify and inform the Unit Publications Clerk that a Technical Manual is available for the new system. Throughout the life cycle of the new system, the Publications Proponent will also provide updates and changes to the Technical Manual.

To receive new Technical Manuals or change packages to fielded Technical Manuals, provide the Unit Publications Clerk the full Technical Manual number, title, date of publication, and number of copies required. The Unit Publications Clerk will then justify the request through the Unit Publications Officer. When the request is approved, DA Form 12-R is used to order the Technical Manual from the Army Publishing Directorate (APD). Obtain the form and request a publications account from the APD Web site at <http://www.apd.army.mil>. Once on the Website, click on the "Orders/Subscriptions/Reports" tab. From the dropdown menu, select "Establish an Account," then select "Tutorial" and follow the instructions in the tutorial presentation.

Complete information for obtaining Army publications can be found in DA PAM 25-33.

ORGANIZATION OF THIS MANUAL

In this manual, primary chapters appear in upper case/capital letters; work packages are presented in numeric sequence, e.g., 0001, 0002; paragraphs within a work package are not numbered and are presented in a titled format. For a first level paragraph, titles are in all upper case/capital letters, e.g., FRONT MATTER. Subordinate paragraph titles will have the first letter of the first word of each principle word all upper case/capital letters, e.g., Manual Organization and Page Numbering System. The location of additional material that must be referenced is clearly marked. Illustrations supporting maintenance procedures/text are located underneath, or as close as possible to, their referenced paragraph.

FRONT MATTER. Front matter consists of front cover, warning summary, title block, table of contents, and how to use this manual page.

CHAPTER 1 – GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION. Chapter 1 Contains introductory information on the Modern Burner Unit and Modern Burner Unit-V3 its associated equipment as well as theory of operation.

CHAPTER 2 – OPERATOR INSTRUCTIONS. Chapter 2 provides the operation requirements of the Modern Burner Unit and Modern Burner Unit-V3 its associated equipment..

CHAPTER 3 – OPERATOR TROUBLESHOOTING PROCEDURES. Chapter 3 provides malfunction symptom index and the procedures to troubleshoot the MBU and MBU-V3 and where the repair procedure is found in the manual.

CHAPTER 4 – OPERATOR MAINTENANCE INSTRUCTIONS. Chapter 4 provides maintenance procedures authorized at the operator level that include service upon receipt, inspection, testing and in some cases replacement and repair.

CHAPTER 5 – MAINTENANCE INSTRUCTIONS. Chapter 5 provides maintenance procedures authorized at the field service level.

CHAPTER 6 – SUPPORTING INFORMATION. Chapter 6 contains references, maintenance allocation chart and expendable and durable items list.

REAR MATTER. Rear matter consists of alphabetical index, DA Form 2028, authentication page, and back cover.

Manual Organization and Page Numbering System

The Manual is divided into six major chapters that detail the topics mentioned above. Within each chapter are work packages covering a wide range of topics. Each work package is numbered sequentially starting at page 1. The work package has its own page numbering scheme and is independent of the page numbering used by other work packages. Each page of a work package has a page number of the form XXXX YY-ZZ where XXXX is the work package number (e.g. 0010 is work package 10) and YY is the revision number for that work package and ZZ represents the number of the page within that work package. A page number such as **0010-1/2 blank** means that page 1 contains information but page 2 of that work package has been intentionally left blank.

Finding Information

The Table of Contents permits the reader to find information in the manual quickly. The reader should start here first when looking for a specific topic. The Table of Contents lists the topics contained within each chapter and the Work Package Sequence Number where it can be found.

Example: If the reader were looking for instructions on “Replacing the Compressor Assembly”, which is an Operator Maintenance topic, the Table of Contents indicates that Operator Maintenance information can be found in Chapter 4. Scanning down the listings for Chapter 4, “Compressor Assembly” information can be found in WP 0018 (Work Package 18).

An Alphabetical Index can be found at the back of the Manual, and lists specific topics with the corresponding work package

END OF WORK PACKAGE

CHAPTER 1

**GENERAL INFORMATION, EQUIPMENT DESCRIPTION,
AND THEORY OF OPERATION
FOR
MODERN BURNER UNIT
AND
MODERN BURNER UNIT-V3**

OPERATOR AND FIELD MAINTENANCE

GENERAL INFORMATION

SCOPE

Type of Manual

This Technical Manual contains operator and field maintenance instructions for the Modern Burner Unit (MBU and MBU-V3) (Figure 1, Item 1) and its associated equipment. The associated equipment, consists of a Power Converter (Figure 1, Item 2), Battery Pack (Figure 1, Item 3), 110VAC extension cord (Figure 1, Item 4), 24VDC Extension Cables (Figure 1, Item 5), NATO Adapter Cable (Figure 1, Item 6), Fuel Can Adapter (Figure 1, Item 7), Fuel Hose (Figure 1, Item 8), and Branch Cables (Figure 1, Item 9).

An improved Power Converter (Figure 1, Item 10) is available and may be used with all MBUs.

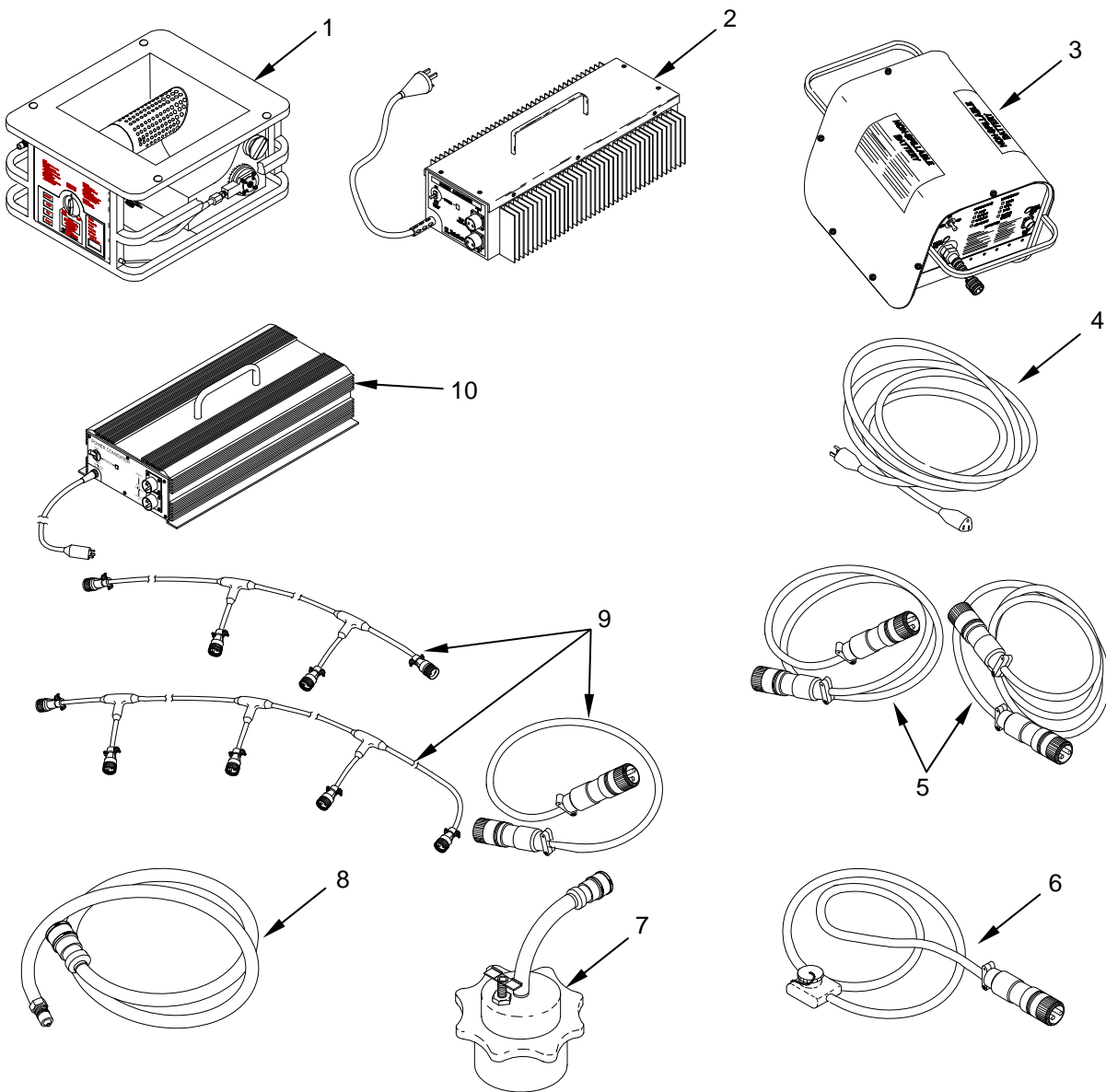


Figure 1. Modern Burner Unit and Associated Equipment.

Model Number(s) and Equipment Name

Modern Burner Unit (MBU100)
Modern Burner Unit-V3 (MBU103)

Purpose of Equipment

The MBU is the primary heat source for the kitchen and sanitation equipment found within all Army field feeding systems.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 750-8 The Army Maintenance Management System (TAMMS) Users Manual.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your MBU 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.

If you have Internet access, the easiest and fastest way to report problems or suggestions is to go to <https://aeps.ria.army.mil/aepspublic.cfm> (scroll down and choose the "Submit Quality Deficiency Report" bar). The Internet form lets you choose to submit an Equipment Improvement (EIR), a Product Quality Deficiency Report (PQDR or a Warranty Claim Action).

You may also submit your information using an SF 368 (Product Quality Deficiency Report). You can send your SF 368 via e-mail, regular mail, or facsimile using the addresses/facsimile numbers specified in DA Pam 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

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

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber 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 SF 368, Product Quality Deficiency Report. Use of key words such as "corrosion," "rust," "deterioration," or "cracking" will ensure that the information is identified as a CPC problem. This form should be submitted to the address specified in DA Pam 750-8.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

GENERAL INFORMATION

Objective

Methods of destruction used to inflict damage on food service equipment should make it impossible to restore equipment to a usable-condition in a combat zone, by either repair or cannibalization.

Authority

Destruction of food service equipment that is in imminent danger of capture by an enemy is a command decision that must be made by a battalion or higher commander, or the equivalent.

Implementation plan

All units that possess food service equipment should have a plan for the implementation of destruction procedures.

Training

All personnel who use or perform such functions as maintenance, or storage food service equipment, should receive thorough training on food service equipment destruction procedures and methods. The destruction methods demonstrated during training should be simulated. Upon completion of training, all applicable personnel should be thoroughly familiar with food service equipment destruction methods and be capable of performing destruction without immediate reference to any publication.

SPECIFIC METHODS

Specific methods of destroying Army materiel to prevent enemy use shall be by mechanical means, fire, or by use of natural surroundings.

Destruction by Mechanical Means

Food service equipment metal assemblies, parts, and packing aids shall be destroyed using hammers, bolt cutters, files, hacksaws, drills, screwdrivers, crowbars, or other similar devices used to smash, break, bend, or cut.

WARNING



Exercise extreme care when using petroleum products to destroy equipment by fire, as these materials are highly flammable. Improper handling may cause injury to personnel.

Destruction by Fire

Items that can be destroyed by fire shall be burned. The destruction of equipment by use of fire is an effective method of destroying low-melting-point metal items (e.g., side rails, threaded portions of nuts and bolts, and platforms). However, mechanical destruction should be completed first, whenever possible, before initiating destruction by fire. When items to be destroyed are made of metal, textile materials (or some comparable low combustible material), they should be packed under and around the items, then soaked with a flammable petroleum product and ignited. Proper concentration of equipment that is suitable for burning will provide a hotter and more destructive fire.

SPECIFIC METHODS – CONTINUED**Destruction by Use of Natural Surroundings**

Small vital parts of assemblies that are easily accessible may be disposed of as follows: Disposal or denial of equipment to an enemy may be accomplished through use of natural surroundings. Accessible vital parts of assemblies may be removed and scattered through dense foliage, buried in dirt or sand, or thrown into a lake, stream, or other body of water. Total submersion of equipment in a body of water will provide water damage as well as concealment. Salt water will inflict extensive damage to air delivery equipment.

PREPARATION FOR STORAGE OR SHIPMENT**WARNING**

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid possibility of burns.

WARNING

The Battery Pack weighs approximately 93 pounds (42.3 kg). Two persons must carry the Battery Pack. Lift with legs, not back, to prevent injury.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.3 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Prior to placing the MBU or any component in storage, it must be inspected IAW WP 0013, After Operation PMCS, cleaned, and have had all necessary maintenance performed.
2. Remove all MBUs from appliances.
3. Drain fuel tank IAW procedures given in WP 0014.
4. If a battery pack is used, ensure the battery has been recharged to 100% capacity IAW procedures given in WP 0005.
5. Collect 110VAC and 24VDC extension, branch, and NATO adapter cables as applicable. Inspect and clean as necessary.

PREPARATION FOR STORAGE OR SHIPMENT – CONTINUED**Disconnect Battery Lead**

If a Battery Pack is used, disconnect the battery leads prior to storage as follows:

1. Remove the six screws and lock washers (Figure 2, Item 1) that secure the outer cover (Figure 2, Item 2).
2. Locate the RED wire (Figure 2, Item 3) that extends from the internal charger (Figure 2, Item 4) to the battery (Figure 2, Item 5).
3. Remove the terminal bolt (Figure 2, Item 6) that secures the RED wire (Figure 2, Item 3) to the battery (Figure 2, Item 5). Remove the wire and cover the connector at the end of the lead with electrical tape.
4. Tuck the wire between the battery (Figure 2, Item 5) and the internal charger (Figure 2, Item 4) and re-install the terminal bolt (Figure 2, Item 6).
5. Install the outer cover (Figure 2, Item 2) on the battery pack with the six screws and lock washers (Figure 2, Item 1) removed earlier.
6. When all components are properly prepared and cleaned, place MBUs, the battery pack, the power converter (if not permanently installed in MKT), and all cables into containers. Equipment should be dry prior to storage.

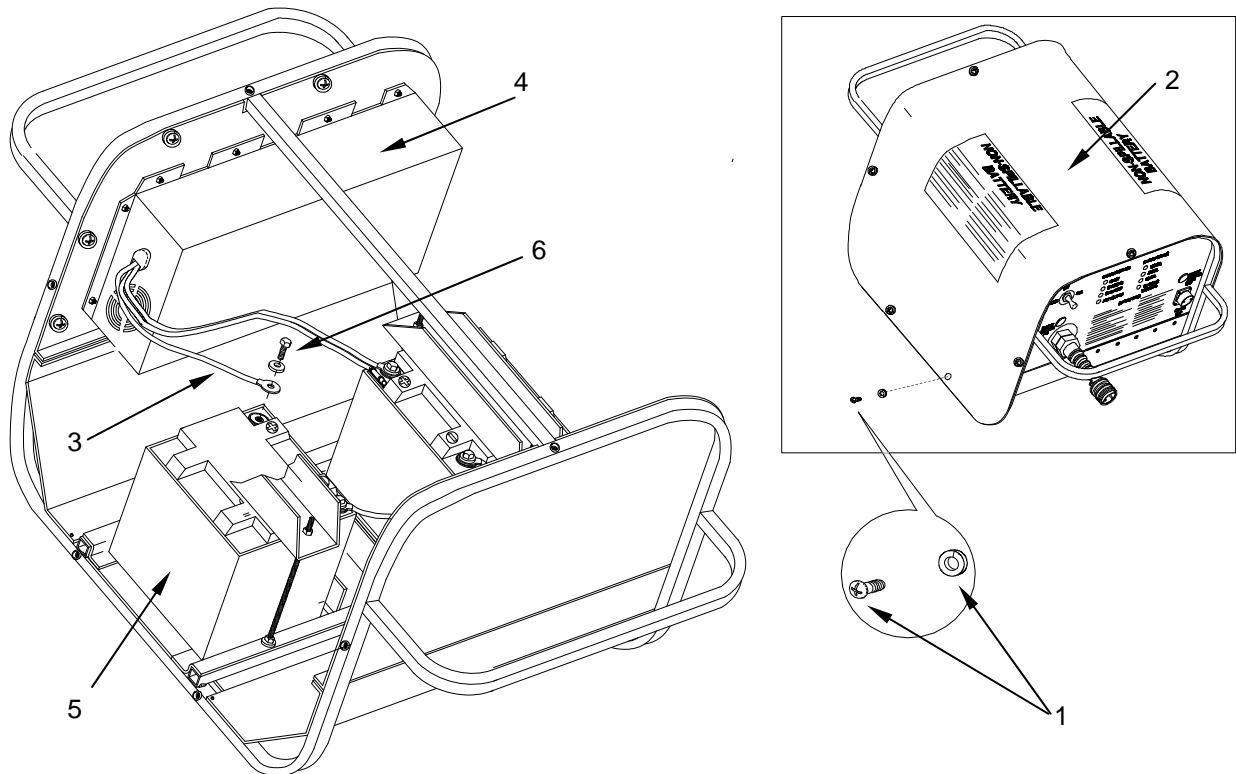


Figure 2. Disconnecting Battery Lead for Storage.

NOMENCLATURE CROSS-REFERENCE LIST**Table 1. Nomenclature Cross-Reference List.**

Common Name	Official Nomenclature
Burner	Modern Burner Unit

Table 2. List of Acronyms and Abbreviations.

Acronym/Abbreviation	Meaning
AAL	Additional Authorization List
AC	Alternating Current
amps	Amperes
APD	Army Publishing Directorate
BG	Bag
BII	Basic Issue Item
BTU	British Thermal Unit
°C	Degrees Celsius; Degrees Centigrade
COEI	Components of End Item
CPC	Corrosion Prevention Control
cm	Centimeter(s)
CTA	Common Table of Allowance
DA	Department of the Army
DC	Direct Current
DS2	Decontamination Solution Number Two
EA	Each
e.g.	For Example
EIR	Equipment Improvement Recommendations
Ext.	Extension
°F	Degrees Fahrenheit
ft	Foot/feet
FSC	Food Sanitation Center
gal	Gallon(s)
GFCI	Ground Fault Circuit Interrupter
GR	Gross
hr	Hour(s)
Hz	Hertz
IAW	In Accordance With
ID	Inside Diameter
in	Inch(es)
KCLFF	Kitchen, Company Level, Field Feeding
KCLFF-E	Kitchen, Company Level, Field Feeding-Enhanced
Kg	Kilogram(s)
KW	Kilowatt(s)
lb	Pound(s)
lt	Liter(s)
m	Meter(s)
MAC	Maintenance Allocation Chart
MBU	Modern Burner Unit
MFK	Modular Field Kitchen
Misc.	Miscellaneous
MKT	Kitchen, Field, Trailer-Mounted
MSDS	Material Safety Data Sheet
MTOE	Modified Table of Organization and Equipment
N/A	Not Applicable

Table 2. List of Acronyms and Abbreviations -- CONTINUED.

Acronym/Abbreviation	Meaning
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, Chemical
No.	number
OD	Outside Diameter
Pam	Pamphlet
Pgs.	pages
PMCS	Preventative Maintenance Checks and Services
POL	Petroleum, Oil and Lubricant
ppm	Parts Per Million
PR	Pair
QD	Quick Disconnect
RO	Roll
RPSTL	Repair Parts and Special Tools List
SF	Standard Form
SOP	Standard Operating Procedure
TM	Technical Manual
TMDE	Test, Measurement, Diagnostic Equipment
TOE	Table of Organization and Equipment
TU	Tube
U/M	Unit of Measure
UOC	Usable On Code
VAC	Volts, Alternating Current
VDC	Volts, Direct Current
WP	Work Package

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this manual. If quality of material requirements are not stated in this manual, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

SAFETY, CARE, AND HANDLING

Always pay attention to Warnings, Cautions and Notes appearing throughout the manual. They will appear prior to applicable procedures. Ensure you read and understand their content to prevent serious injury to yourself and others, or damage to equipment.

SUPPORTING INFORMATION FOR REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items, as applicable to your unit.

The tools required to perform maintenance on the MBU are available as part of the systems in which the MBU is being used (MKT, KCLFF, etc). In cases where those systems tools are not available, the MBU Toolkit is available as an additionally authorized item.

No Special Tools, TMDE, or Support Equipment is required for the MBU.

Repair parts are listed and illustrated in the repair parts list located in WP 0046 through WP 0066.

OPERATOR AND FIELD MAINTENANCE**EQUIPMENT DESCRIPTION AND DATA**

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The MBU features modular construction that allows for easy replacement of malfunctioning components. Its external dimensions are similar to the M2A Burner which it replaces. It can be installed into and used with the same kitchen and sanitation equipment as the M2A. The MBU features automated ignition and uses JP-8 or alternate approved diesel fuel.

Characteristics

- Lightweight construction
- Modular assembly
- Infrared burner

Capabilities

- Generates 22,000 to 52,000 BTU/Hr (MBU)
- Generates 15,000 to 52,000 BTU/Hr (MBU-V3)
- Operation in -25°F (-32°C) to 125°F (52°C)
- Operation in remote locations
- MBU continuous operation (full fuel tank) (setting max, min)..... 4 hrs; 13 hrs
- MBU-V3 continuous operation (full fuel tank) (setting max, min) 5 hrs; 20 hrs

Features

- Powered ignition
- Fully adjustable burner temperature
- Powered refueling
- Fault detection and fuel level indicators

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Frame

The 3/4-inch square aluminum stock frame (Figure 1, Item 1) includes lifting handles (Figure 1, Item 2) and base plate (Figure 1, Item 3).

Reflective Heat Shield and High Temperature Insulation

The stainless steel reflective heat shield (Figure 1, Item 4) directs radiant heat upward, secures the insulation (Figure 1, Item 5) in the burner well (Figure 1, Item 6), and contains food spills during MBU operation. The insulation protects components of the MBU from combustion heat.

Infrared Burner Assembly

The infrared burner assembly (Figure 1, Item 7) projects through the burner well (Figure 1, Item 6), the high temperature insulation (Figure 1, Item 5), and the reflective heat shield (Figure 1, Item 4).

Fuel Delivery Block Assembly

The fuel delivery block assembly (Figure 1, Item 8) controls the fuel/air mixture that is provided to the burner tube assembly.

Control Panel

The hinged control panel (Figure 1, Item 9) opens for access to subassemblies. The control panel includes four pushbutton controls, six indicators, and an hour meter.

Power Receptacle

The power receptacle (Figure 1, Item 10) is mounted at an angle to facilitate easy connection of the 24VDC cable.

Fuel Tank

The two gallon fuel tank (Figure 1, Item 11) is welded to the frame (Figure 1, Item 1) and contains fuel for combustion. A vent valve/level assembly (Figure 1, Item 12) monitors fuel level. The fuel regulator (Figure 1, Item 13) maintains zero pressure fuel for delivery to the fuel nozzle during operation and contains a replaceable fuel filter (Figure 1, Item 14). The fuel tank has a threaded plug (Figure 1, Item 15) for manually filling the fuel tank when the MBU is removed from the appliance.

Fuel Supply QD Nipple

The fuel supply QD nipple (Figure 1, Item 16) provides the connection for the fuel line, allowing the flow of fuel into and out of the tank. It is also used when draining the tank of fuel.

Air Compressor

The air compressor (Figure 1, Item 17), draws air through the air intake filter, which is part of the fuel delivery block assembly (Figure 1, Item 8). The compressor also draws fuel through the QD nipple (Figure 1, Item 16) during refueling.

DIFFERENCES BETWEEN MODELS

The MBU and the MBU-V3 are identical with the exception of an improved fuel delivery block on the MBU-V3. The feedback potentiometer has been omitted from the MBU-V3. An improved power converter is also available for the MBU-V3.

The MBU-V3 is easily identified by the control panel decal. Refer to WP 0005 for illustrations of the control panel decals.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

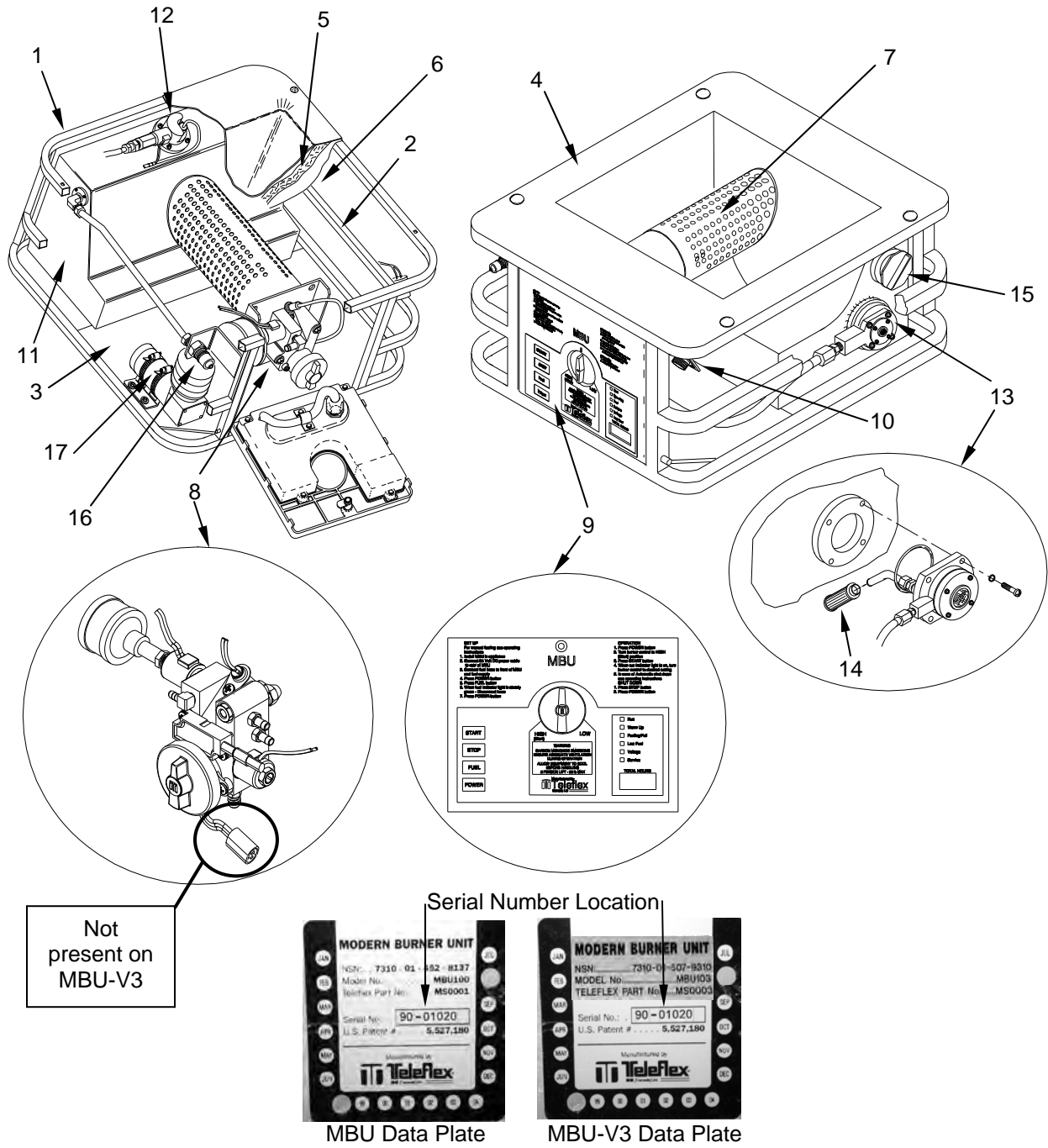


Figure 1. Modern Burner Unit Location and Description of Major Components.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

The associated components of the MBU are illustrated and described below:

Power Converter

Converts 120VAC \pm 4% to 24VDC. Four MBUs can be powered through each of two output connectors. Refer to the appropriate power configuration schematic beginning in WP 0003. A power switch turns the unit on and off. The converter is capable of operating within the same environmental conditions as the MBU.

The original power converter (MS0150) (Figure 2) is no longer manufactured. The newer power converter (MS0160) (Figure 3) is issued as replacement and may be used with all MBUs.

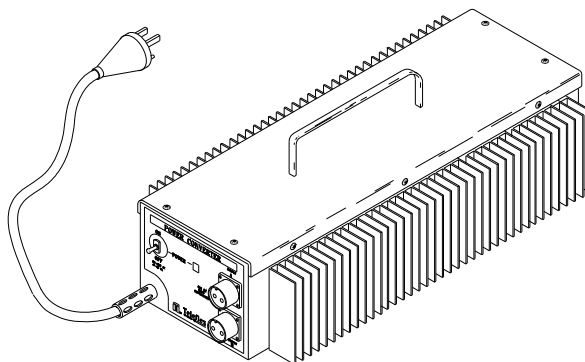


Figure 2. Power Converter MS0150.

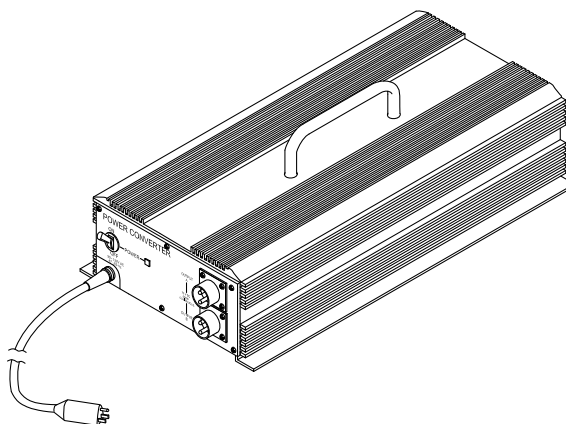


Figure 3. Power Converter MS0160.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED**Battery Pack**

Contains two sealed lead acid batteries and an internal charger. It provides the electrical storage to start and operate three MBUs simultaneously for 3 hours at an ambient of 60°F (15.5°C) and a period of 2 hours at an ambient of -25°F (-32°C). The module is rechargeable through the standard NATO vehicle power connector in 3 hours with temperatures between 60°F (15.5°C) and 120°F (49°C) and in 5 hours at -25°F (-32°C). The battery charger circuit prevents overcharge. A three-position function switch controls the charging function as well as the voltage supplied to the output connector. Indicator lights show the state of the battery charge. The batteries and charger are assembled in an aluminum frame with handles and a cover. The pack is capable of operating within the same environmental conditions as the MBU.

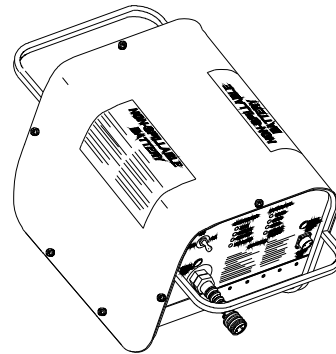


Figure 4. Battery Pack.

24VDC Power Cables

Two types of power cable extensions are available: a 15-ft length for use in the MKT and 3-ft and 25-ft lengths for use with all other systems. These cables cannot be connected directly to the MBU.

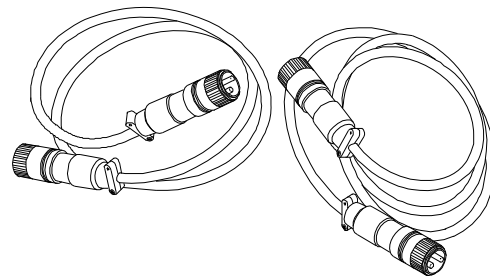


Figure 5. 24VDC Power Cables.

NATO Adapter Cable

To facilitate the connection between a vehicle and the battery module, or between a vehicle and the MBUs directly, a 25-ft adapter cable is available that is compatible with the power-in receptacle of the MBU and battery module, as well as the vehicular output connector.

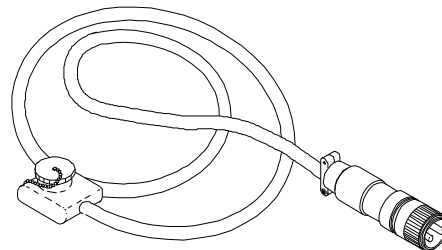


Figure 6. NATO Adapter Cable.

Fuel Can Adapter

This is a standard fuel can adapter (Figure 7) to facilitate fueling and draining of the MBU fuel tank.

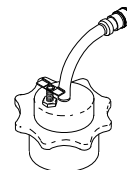


Figure 7. Fuel Can Adapter.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED**Fuel Hose**

A 20-ft fuel hose (Figure 8) facilitates fueling and draining of the MBU fuel tank and is compatible with the MBU quick disconnect and the fuel can adapter coupling.

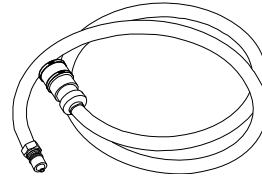


Figure 8. Fuel Hose.

Extension Cord

This 50-ft long extension cord provides the interconnection between a 2 kW generator and the power converter, as well as commercial power sources and the power converter. The extension cord is also available in a 25-ft length.

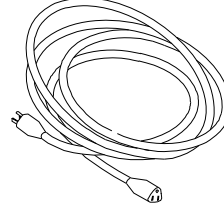


Figure 9. Extension Cord.

4-Branch Cable

This cable (Figure 10) permits the connection of a power source to four MBU power-in receptacles.

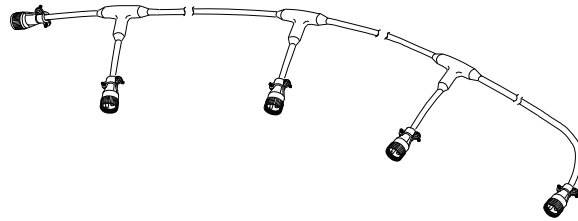


Figure 10. 4-Branch Cable.

2-Branch Cable

This cable (Figure 11) permits the connection of a power source to two MBU power-in receptacles.

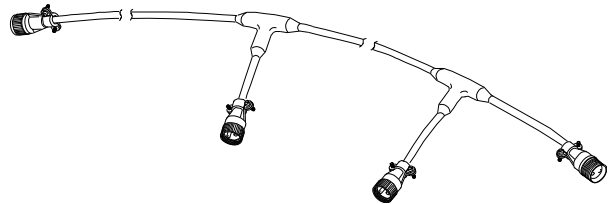


Figure 11. 2-Branch Cable.

1-Branch Cable

This cable (Figure 12) permits the connection of a power source to a single MBU power-in receptacle.

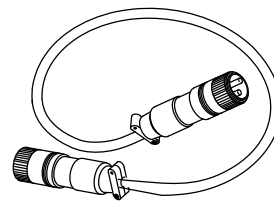


Figure 12. 1-Branch Cable.

EQUIPMENT DATA

The following technical and identification data pertains to the MBU and selected support equipment.

Table 1. Equipment Data.

WEIGHT:	
MBU Fully fueled.....	68 lbs (31.8 Kg)
MBU Without fuel	39 lbs (17.7 Kg)
MBU-V3 Fully fueled	68 lbs (31.8 Kg)
MBU-V3 Without fuel.....	39 lbs (17.7 Kg)
DIMENSIONS:	
Height.....	9.75 in (25 cm)
Depth.....	19 in (48 cm)
Width	23 in (58 cm)
FUEL CAPACITY (Usable):	2 US gal (7.6 lt)
INPUT CONNECTORS:	
Fuel	Parker Double Shut-off Coupling, BH2-60Y
FUEL CONSUMPTION:	
Rate of fuel consumption:	
Operating at maximum firing rate	0.34 gal (1.29 l)/hr
Operating at minimum firing rate	0.1 gal (0.38 l)/hr
MBU continuous operation (full fuel tank) (setting max, min)	4 hrs; 13 hrs
MBU-V3 continuous operation (full fuel tank) (setting max, min).....	5 hrs; 20 hrs
OUTPUTS:	
MBU Heat (setting dependent).....	22,000 to 52,000 BTU/hr
MBU-V3 Heat (setting dependent)	15,000 to 52,000 BTU/hr
Carbon monoxide (setting dependent)	50 to 120 ppm
FUEL REQUIREMENTS:	JP-8 and approved diesel fuels
ELECTRICAL REQUIREMENTS:	22 - 29.5VDC
ENVIRONMENTAL:	
Operating temperatures	-25°F to +125°F (-32°C to +52°C)
Operating elevations to 10,000 ft above sea level	
POWER CONVERTER:	
Capacity.	600 Watts continuous, 1000 Watts for 1 Min. at 26VDC
Input Voltage Range.....	90 to 132VAC
Input Frequency.	47 to 63 Hz
BATTERY PACK:	
Battery Type.....	2 Sealed Lead Acid Batteries, Genesis 0766-2003B0N01
Input Voltage Range.....	22 to 29.5VDC

The tools required to perform maintenance on the MBU are available as part of the systems in which the MBU is being used (MKT, KCLFF, etc). In cases where those systems' tools are not available, the MBU Tool Kit is available as an additionally authorized item. The contents of the MBU Tool Kit are listed in table 2.

Table 2. MBU Tool Kit Contents.

CONTENTS:	QTY:
Bag, Tool	1
Bit Set, Screwdriver.....	1
Knife, Utility	1
Multimeter, Digital.....	1
Nut Driver (7/16").....	1
Pliers	1
Wrench, Adjustable	1
Wrench, Combination (9/16")	1

EQUIPMENT CONFIGURATION

The MBU and its associated components are configured depending on the field feeding system in which it is used and the power source available. Refer to the system power supply diagrams in WP 0003 and identify the configuration for your application. Additional configuration information is provided in WP 0005 and WP 0035.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE**THEORY OF OPERATION**

Electrical Supply

A 24VDC supply is connected to the power connector (Figure 1, Item 1). Voltage is then supplied to the controller (Figure 1, Item 2), which contains all vital electrical circuits.

Fuel Supply

The fuel tank (Figure 1, Item 3) is filled either through the fuel tank fill plug (Figure 1, Item 4), before the MBU is installed into an appliance, by connecting a quick disconnect hose to the fuel fill nipple (Figure 1, Item 5) and the feed adapter on a fuel can, turning the burner control (Figure 1, Item 6) to HIGH (START), then pressing the FUEL button (Figure 1, Item 7). This energizes the air compressor (Figure 1, Item 8) and opens the tank fill valve (Figure 1, Item 9) (requires electrical power connection). A full tank of fuel allows up to a minimum of five hours of operation before the MBU shuts down. A check valve (Figure 1, Item 10) prevents fuel from entering the air line during shipping and handling.

Power-Up

MBU power-up is initiated by pressing the power switch (Figure 1, Item 11). This tests the indicator lights (Figure 1, Item 12) for three seconds. The hour meter (Figure 1, Item 13) back light illuminates to indicate the power-up condition. The digital numbers will sequence before setting on actual accumulated operating hours.

Start-Up

With burner control (Figure 1, Item 6) in HIGH (START) position, MBU startup is initiated by pressing the START button (Figure 1, Item 14), which energizes the igniter (Figure 1, Item 15). After two seconds, the compressor (Figure 1, Item 8) starts, and the fuel valve (Figure 1, Item 17) on the fuel delivery block assembly (Figure 1, Item 18) opens, allowing fuel to flow to the nozzle (Figure 1, Item 19). The vent valve (Figure 1, Item 20) on the fuel tank (Figure 1, Item 3) opens, allowing air to enter the fuel tank. The compressor (Figure 1, Item 8) draws air through the air filter (Figure 1, Item 21) on the fuel delivery block assembly (Figure 1, Item 18), pressurizing the fuel nozzle (Figure 1, Item 19). Simultaneously, fuel is drawn from the fuel tank (Figure 1, Item 3) through a 30-micron filter (Figure 1, Item 22) and a zero pressure regulator (Figure 1, Item 23) to the burner control valve (Figure 1, Item 24), which regulates the flow to the nozzle (Figure 1, Item 19). This fuel-air mixture is sprayed into the burner (Figure 1, Item 25) in a fine mist and ignited. The igniter circuit remains energized for 30 seconds.

NOTE

Holding down the START button will override the fault detection circuitry, preventing shutdown for two minutes. This allows purging of the fuel lines on new units and on units that have been completely drained. It also facilitates troubleshooting.

Actions During Operation (After warm-up is complete)

Adjust the burner control (Figure 1, Item 6) as necessary.

Automatic Shutdown

The following are the usual causes of an automatic shutdown:

- Loss of combustion. If the flame sensor (Figure 1, Item 26) fails to verify combustion, the MBU shuts down immediately and the red SERVICE indicator (Figure 1, Item 27) lights.

- **Low fuel.** When the fuel tank level float switch (Figure 1, Item 28) reaches a minimum set point, a 30-minute shutdown timer is activated. Control Panel indicators will light as follows: LOW FUEL indicator (Figure 1, Item 29) blinks green for 15 minutes, changes to blinking amber for 7.5 minutes, and then changes to blinking red for 7.5 minutes. The indicator (Figure 1, Item 29) lights steady red at shutdown.
- **Voltage.** If input voltage increases to 29.5VDC or greater or decreases to 22VDC or less, the MBU will shut down, and the VOLTAGE indicator (Figure 1, Item 30) will light red.
- **Electrical Short.** An internal circuit breaker is located in the controller (Figure 1, Item 2). The nominal rating of the breaker is 15 amps, depending on ambient temperature. Once the breaker has tripped, it can be reset by turning the power off and eliminating the cause of the short circuit. It will then reset itself in 30 - 60 seconds, depending on ambient temperature. As breakers are typically thermal devices, the point at which they open and close is dependent on the temperature of the internal components. The breaker is connected in series with the POWER Button.

Normal Shutdown

The MBU is shut down by pressing the STOP button.

Tools and Tool Kits

The tools required to perform maintenance on the MBU are available as part of the systems in which the MBU is being used (MKT, KCLFF, etc). In cases where those systems tools are not available, the MBU Tool Kit is available as an additionally authorized item.

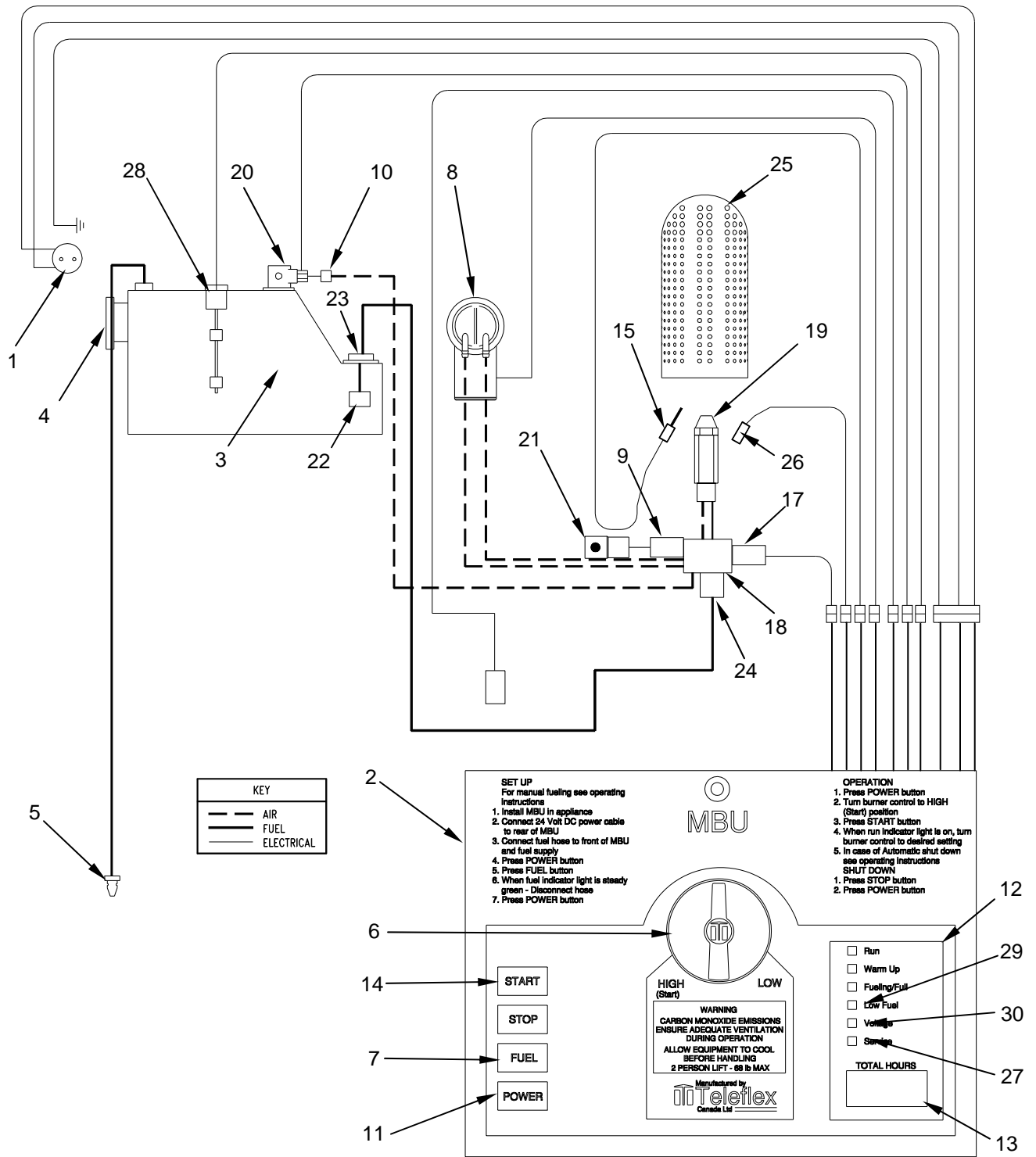


Figure 1. MBU Operational Schematic.

MBU Power Configuration for 110VAC Power Source

Power is drawn from a 110VAC power source using the 110VAC extension cord connected to the power converter. From the converter, power is distributed using a 24VDC power cable extension that is connected to a branch cable, which is, in turn, connected to the individual burners. A maximum of four burners can be supplied by each of the two power converter outlets, supporting a total of eight burners per power converter.

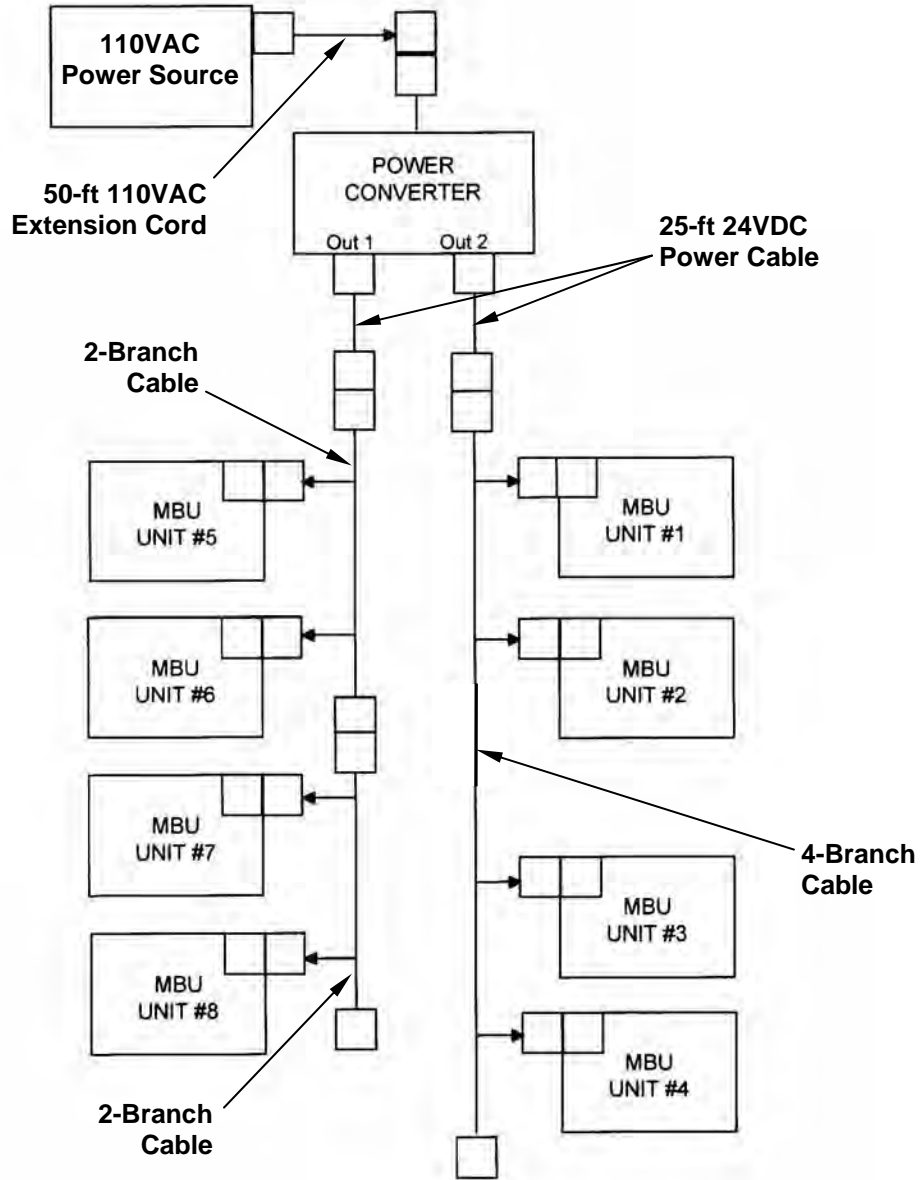


Figure 2. MBU Power Configuration for 110VAC Power Source.

MBU Power Configuration for Vehicular or Battery-Supplied 24VDC Power

Power is drawn from the vehicle using the NATO adapter/cable and connected to the battery pack. From the battery pack, power is distributed using a 25-foot (24VDC) power cable extension connected to a branch cable, which, in turn, is connected to the burner. Up to three MBUs can be operated at one time.

Alternate MBU power configuration for 24VDC power source shows power drawn from the vehicle using the NATO adapter cable and connected directly to one or more burners using a 25-ft (24VDC) power cable extension (as necessary), connected to a branch cable which in turn is connected to burner(s). This configuration can be used if no need to employ the battery module is foreseen.

NOTE

A maximum of seven MBUs may be connected to a single power source.

A second alternative configuration shows the use of the battery pack only. When this power source is used, it is directly connected to the designated burners using a 25-ft (24VDC) extension or if necessary, directly to the branch cable.

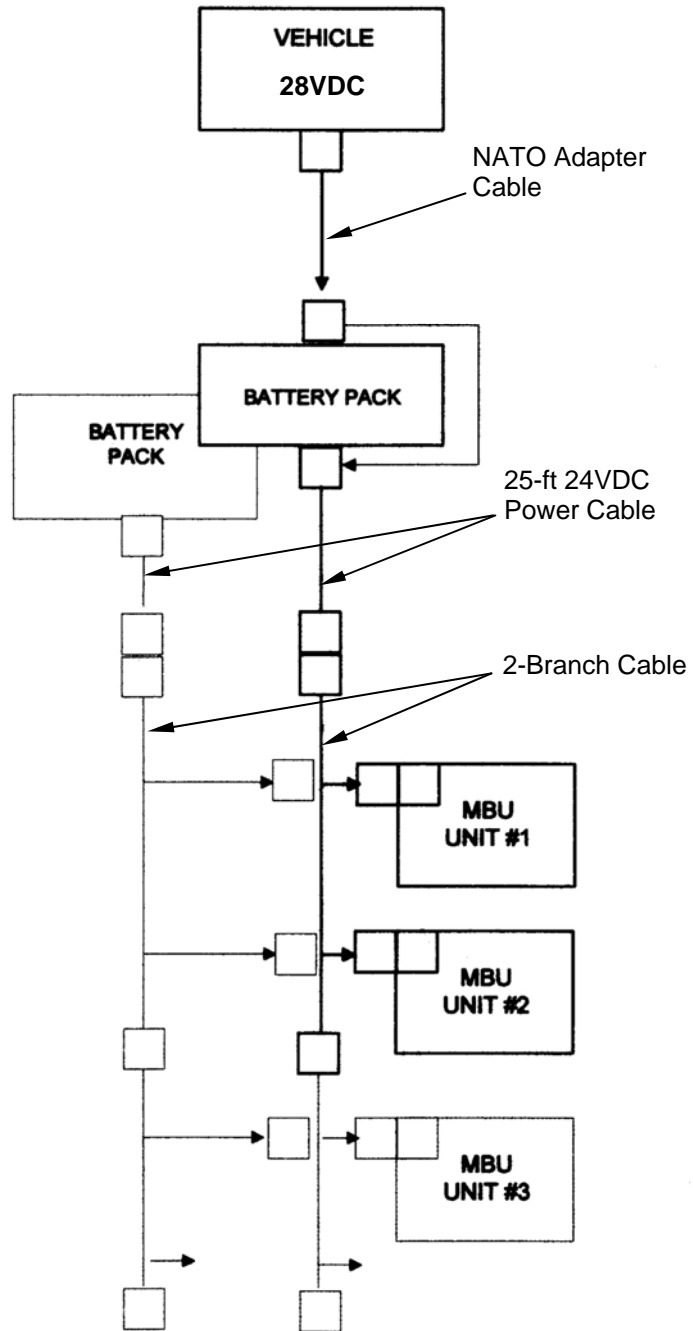


Figure 3. MBU Power Configuration for Vehicular or Battery Supplied 24VDC Power.

CHAPTER 2

OPERATOR INSTRUCTIONS
FOR
MODERN BURNER UNIT
AND
MODERN BURNER UNIT-V3

OPERATOR AND FIELD MAINTENANCE

DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

GENERAL

The following illustrations and tables show the location and list the function of each control and indicator on the MBU, power converter, and battery pack:

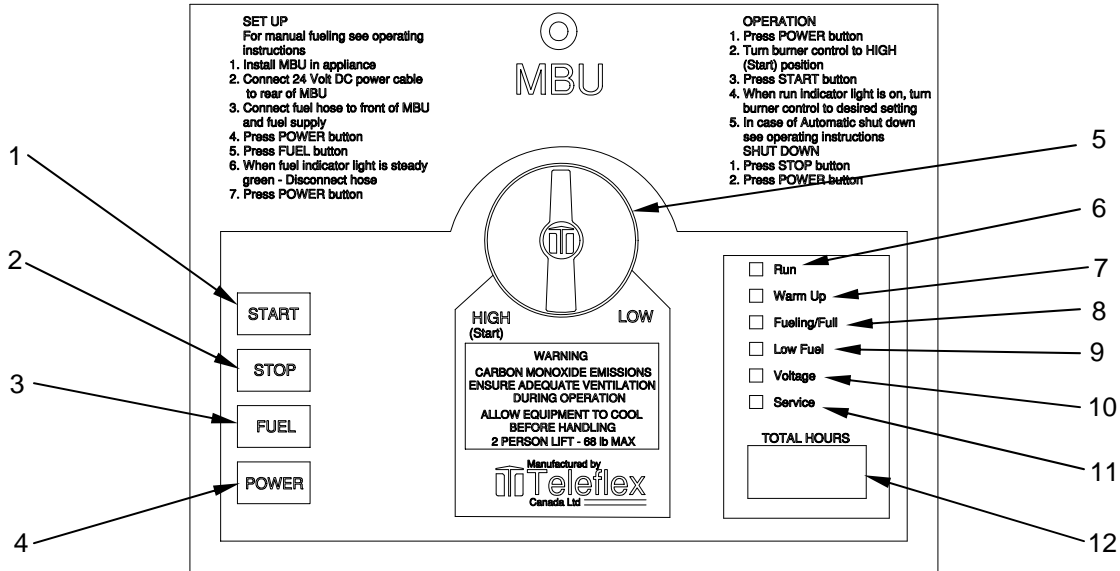


Figure 1. MBU Controls and Indicators (MBU).

Table 1. MBU Controls and Indicators (MBU).

KEY	CONTROL OR INDICATOR	FUNCTION
1	START	Burner start-up.
2	STOP	Burner shut-down.
3	Fuel	Starts fueling function.
4	Power	Main power on/off button.
5	Firing Rate Adjustment (HIGH (Start) LOW)	Adjusts burner firing rate.
6	Run	Indicates burner is operating.
7	Warm Up	Indicates burner is warming up.
8	Fueling/Fuel	Indicates tank is filling (during fueling) or full.
9	Low Fuel	Indicates low fuel shut-down sequence active.
10	Voltage	Indicates incorrect voltage.
11	Service	Indicates mechanical malfunction.
12	TOTAL HOURS	Shows accumulated hours of operation. Background light indicates power-on condition.

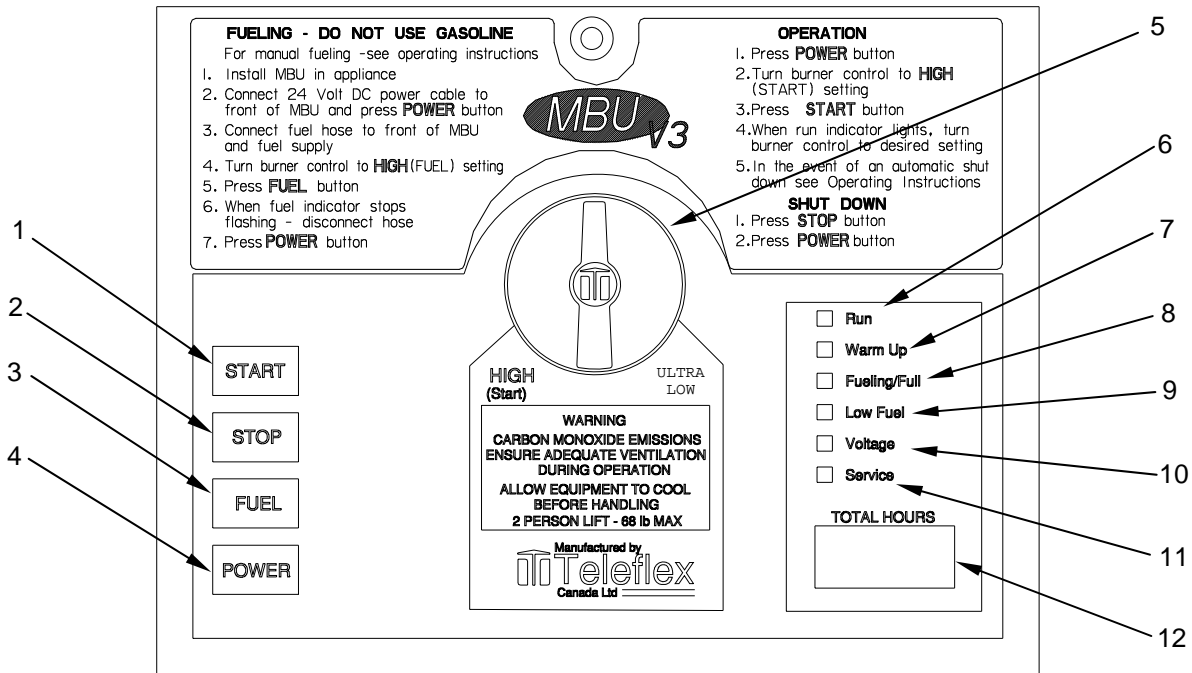
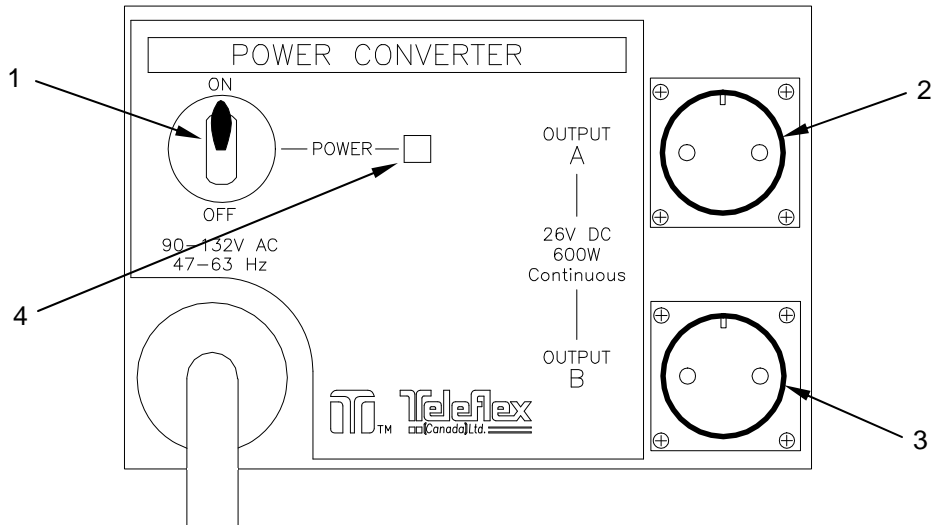


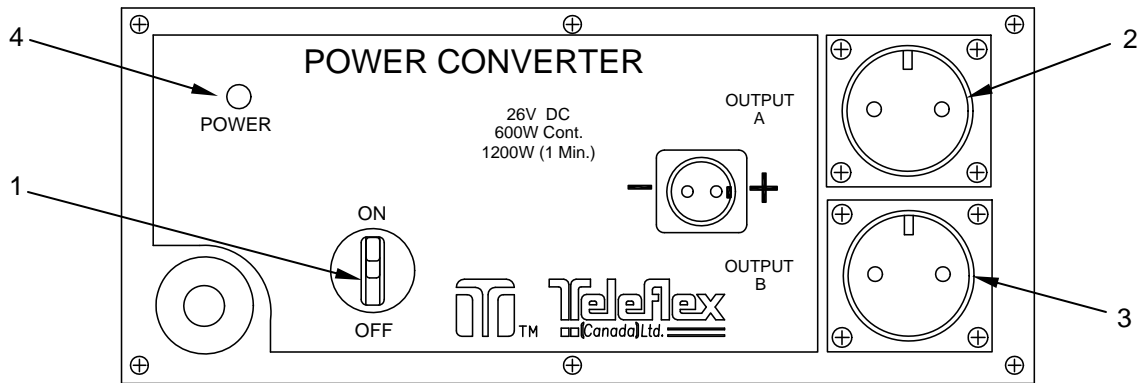
Figure 2. MBU Controls and Indicators (MBU-V3).

Table 2. MBU Controls and Indicators (MBU-V3).

KEY	CONTROL OR INDICATOR	FUNCTION
1	START	Burner start-up.
2	STOP	Burner shut-down.
3	Fuel	Starts fueling function.
4	Power	Main power on/off button.
5	Firing Rate Adjustment (HIGH (Start) LOW)	Adjusts burner firing rate.
6	Run	Indicates burner is operating.
7	Warm Up	Indicates burner is warming up.
8	Fueling/Fuel	Indicates tank is filling (during fueling) or full.
9	Low Fuel	Indicates low fuel shut-down sequence active.
10	Voltage	Indicates incorrect voltage.
11	Service	Indicates mechanical malfunction.
12	TOTAL HOURS	Shows accumulated hours of operation. Background light indicates power-on condition.



Power Converter – Model MS0150



Power Converter – Model MS0160

Figure 3. Power Converter Controls and Indicators.

Table 3. Power Converter Controls and Indicators.

KEY	CONTROL OR INDICATOR	FUNCTION
1	Main Power Switch	Activates main power.
2	Output A	24VDC output connector No. 1.
3	Output B	24VDC output connector No. 2.
4	Indicator Light	Indicates when main power is On.

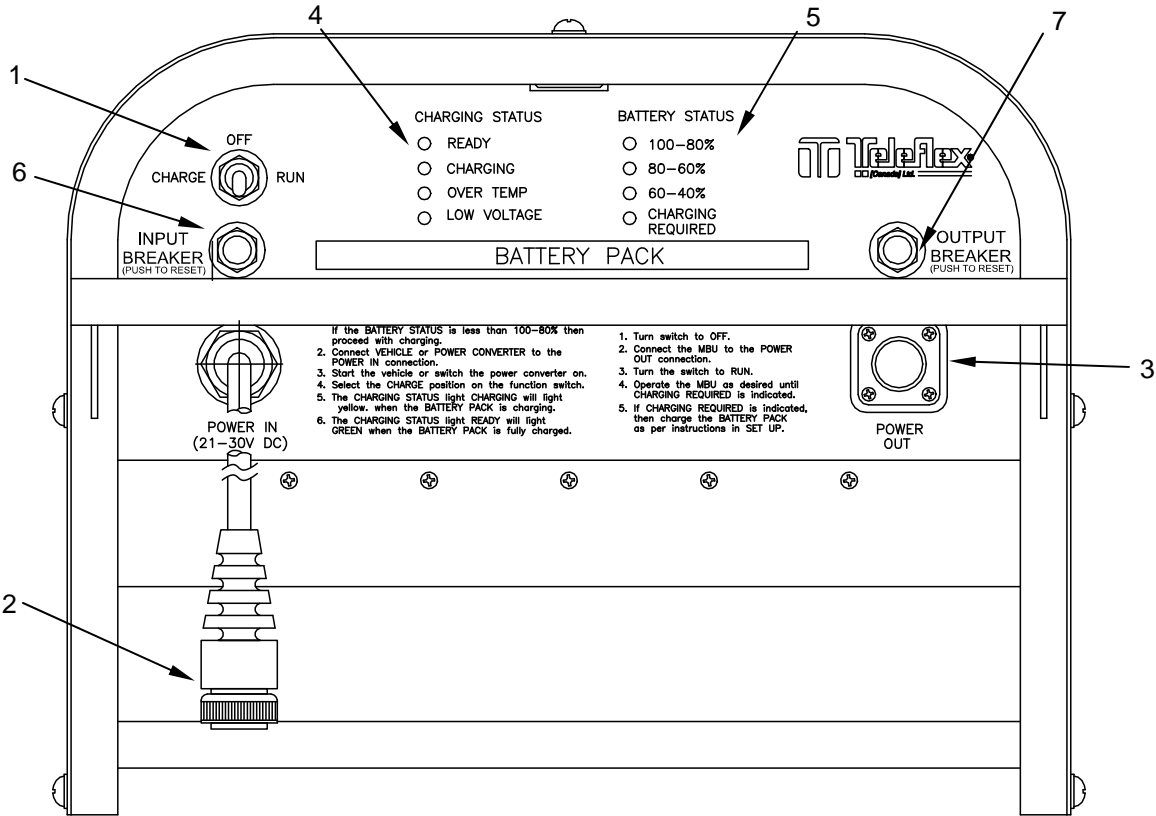


Figure 4. Battery Pack Controls and Indicators.

Table 4. Battery Pack Controls and Indicators.

KEY	CONTROL OR INDICATOR	FUNCTION
1	Three-Position Function Switch	Controls charging and run function.
2	Charging Power In Connector	Connects 24VDC power to battery pack for charging.
3	Power-Out Connector	Provides 24VDC output to power MBU.
4	Charging Status Indicators	Indicate ready, charging, and fault conditions.
5	Battery Status Indicators	Provides indication of percent charge.
6	Input Breaker (push to reset)	Protects input charging circuit from overload.
7	Output Breaker (push to reset)	Protects output circuit from overload.

END OF WORK PACKAGE

OPERATOR AND FEILD MAINTENANCE
OPERATION UNDER USUAL CONDITIONS

INITIAL SETUP:**Personnel Required**

Food Service Specialist 92G (1)
MOS Non-specific (1)

References

WP 0007, WP 0013, WP 0017
WP 0035, WP 0043, WP 0067

INTRODUCTION

This section outlines the siting requirements of field feeding systems determined by the MBU power and fuel requirements, as well as the installation, preparation, and operation of the MBU under usual conditions.

Read all warnings and cautions within this section and follow procedures outlined herein to ensure safe operation of the MBU and associated equipment.

SECURITY MEASURES FOR ELECTRONIC DATA

There are no security measures for electronic data required for the MBU or MBU-V3.

SITING REQUIREMENTS

Siting of the field feeding system may be influenced by the power and fuel requirements of the MBU. When using the primary power (110VAC), the power source must be located within 50ft of the power converter. When a 24VDC power source is used, it must be located within 25ft of the MBU (or battery pack, depending on the power configuration used). The internal location/distribution of the burners within each field feeding system must be in accordance with the prescribed layout for that system so that the 24VDC power cable extension and branch cables can reach each burner. In some cases, limited flexibility is possible or additional burners can be connected to the branch cable end plug. Refer to the specific field feeding system technical manual listed in WP 0067.

ASSEMBLY AND PREPARATION FOR USE

Initial fielding and installation of the MBU and associated equipment into field feeding systems, including application of modification work orders for the MKT, will be accomplished through contracting resources. Subsequent MBU or component replacements received at the unit level do not require reprocessing and can be used in the manner prescribed herein, after unpacking. Assembly is limited to the installation of new batteries into the battery pack as described in WP 0043.

ASSEMBLY AND PREPARATION FOR USE – CONTINUED**Installing MBU into Appliance****WARNING**

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

The MBU will fit into all field kitchen appliances designed to accommodate an external burner, that are found in current and future field feeding systems. It slides into the burner space (Figure 1, Item 1) of the appliances it is intended to be used with in the same manner as the previously used M2 Burner. Install the MBU into its appliance after performing Before Operation PMCS and after filling the tank (unless power fueling is intended).

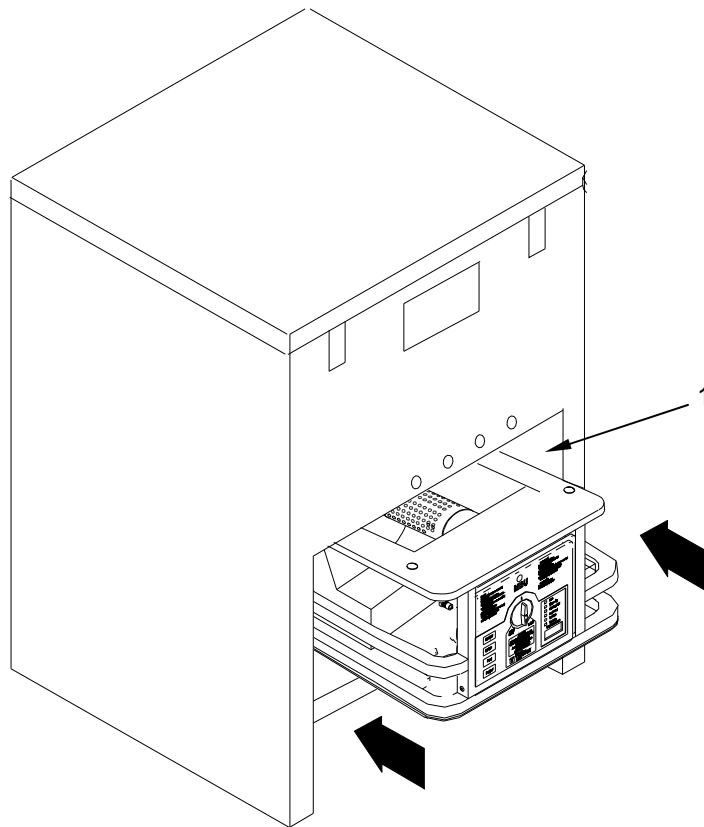


Figure 1. Installing MBU Into an Appliance.

ASSEMBLY AND PREPARATION FOR USE – CONTINUED

Kits are available to enable the user to utilize the MBU in the Modular Field Kitchen (MFK), Mobile Kitchen Trailer (MKT), Food Sanitation Center (FSC), and the Kitchen, Company Level Field Feeding (KCLFF). The following information lists the kits and associated components:

7310-01-455-5718 MFK MBU KIT
(81349) MIL-PRF 44485

NATIONAL STOCK NUMBER	DESCRIPTION, CAGEC, AND P/N	U/M	QTY	CHECK
7310-01-453-6513	POWER CONVERTER, MBU (3AD06) MS0150	EA	1	<input type="checkbox"/>
	OR			
7310-01-502-9455	POWER CONVERTER, MBU (L4703) MS0160	EA	1	<input type="checkbox"/>
7310-01-455-0665	CORD LONG, MBU, CABLE A (4), 25 FT EXTENSION (L4703) MS0101	EA	3	<input type="checkbox"/>
7310-01-455-1017	HARNESS BRANCH, MBU CABLE D (3), 2 BRANCH, (24 VDC) (L4703) MS0104	EA	5	<input type="checkbox"/>
7310-01-458-5060	EXTENSION CORD SHORT, MBU 25 FT (110VAC) (L4703) MS0425	EA	1	<input type="checkbox"/>
7310-01-455-3736	FUEL ADAPTER, MBU (L4703) MIS0300	EA	2	<input type="checkbox"/>
7310-01-455-3735	FUEL LINE, MBU, 20 FT. (L4703) MS0350	EA	2	<input type="checkbox"/>

ASSEMBLY AND PREPARATION FOR USE – CONTINUED

7310-01-455-5675 **MKT MBU KIT**
 (3AD06) MS0450

NATIONAL STOCK NUMBER	DESCRIPTION, CAGEC, AND P/N	U/M	QTY	CHECK
7310-01-453-6513	POWER CONVERTER, MBU (L4703) MS0150	EA	1	<input type="checkbox"/>
	OR			
7310-01-502-9455	POWER CONVERTER, MBU (L4703) MS0160	EA	1	<input type="checkbox"/>
7310-01-455-0896	HARNESS BRANCH, MBU CABLE B (1), 4 BRANCH, (24VDC) (L4703) MS0102	EA	1	<input type="checkbox"/>
6150-01-455-1014	WIRING HARNESS, BRANCHED CABLE C (2), 2 BRANCH, (24VDC) (L4703) MS0103	EA	1	<input type="checkbox"/>
7310-01-455-1206	CORD SHORT, MBU CABLE E (5), (24VDC)15 FT EXTENSION (L4703) MS0105	EA	1	<input type="checkbox"/>
7310-01-454-1241	ELECTRICAL ADAPTER, MBU NATO (24VDC) (L4703) MS0250	EA	1	<input type="checkbox"/>
7310-01-454-1281	EXTENSION CORD, MBU 50FT,(110VAC) (L4703) MS0400	EA	1	<input type="checkbox"/>
7310-01-455-3736	FUEL ADAPTER, MBU (L4703) MS0300	EA	2	<input type="checkbox"/>
7310-01-455-3735	FUEL LINE, MBU, 20 FT. (L4703) MS0350	EA	2	<input type="checkbox"/>

ASSEMBLY AND PREPARATION FOR USE – CONTINUED

7310-01-455-5703 FSC MBU KIT
(3AD06) MS0500

NATIONAL STOCK NUMBER	DESCRIPTION, CAGEC, AND P/N	U/M	QTY	CHECK
7310-01-453-6513	POWER CONVERTER, MBU (3AD06) MS0150	EA	1	<input type="checkbox"/>
	OR			
7310-01-502-9455	POWER CONVERTER, MBU (L4703) MS0160	EA	1	<input type="checkbox"/>
7310-01-455-0665	CORD LONG, MBU, CABLE A (4), 25 FT EXTENSION (L4703) MS0101	EA	1	<input type="checkbox"/>
7310-01-455-1017	HARNESS BRANCH, MBU CABLE D (3), 2 BRANCH, (24 VDC) (3AD06) MS0104	EA	1	<input type="checkbox"/>
7310-01-509-4453	MBU EXT CABLE CABLE 6, 3 FT EXTENSION,(24 VDC) (L4703) MS0106	EA	1	<input type="checkbox"/>
7310-01-454-1281	EXTENSION CORD, MBU 50FT,(110VAC) (L4703) MS0400	EA	1	<input type="checkbox"/>
7310-01-455-3736	FUEL ADAPTER, MBU (3AD06) MS0300	EA	1	<input type="checkbox"/>
7310-01-455-3735	FUEL LINE, MBU, 20 FT. (L4703) MS0350	EA	1	<input type="checkbox"/>

ASSEMBLY AND PREPARATION FOR USE – CONTINUED

7310-01-455-5710 KCLFF MBU KIT
(3AD06) MS0200

NATIONAL STOCK NUMBER	DESCRIPTION, CAGEC, AND P/N	U/M	QTY	CHECK
7310-01-453-6565	BATTERY MODULE, MBU (L4703) MS0200	EA	1	<input type="checkbox"/>
7310-01-454-1249	BATTERIES, MBU (L4703) MS0225	PR	1	<input type="checkbox"/>
7310-01-455-0665	CORD LONG, MBU, CABLE A (4), 25 FT EXTENSION (L4703) MS0101	EA	1	<input type="checkbox"/>
7310-01-455-1017	HARNESS BRANCH, MBU CABLE D (3), 2 BRANCH, (24 VDC) (L4703) MS0104	EA	1	<input type="checkbox"/>
7310-01-509-4453	MBU EXT CABLE CABLE 6, 3 FT EXTENSION,(24 VDC) (L4703) MS0106	EA	1	<input type="checkbox"/>
7310-01-454-1241	ELECTRICAL ADAPTER, MBU NATO (24VDC) (L4703) MS0250	EA	1	<input type="checkbox"/>
7310-01-455-3736	FUEL ADAPTER, MBU (L4703) MS0300	EA	1	<input type="checkbox"/>
7310-01-455-3735	FUEL LINE, MBU, 20 FT. (L4703) MS0350	EA	1	<input type="checkbox"/>

ASSEMBLY AND PREPARATION FOR USE – CONTINUED**Connecting Cables to the MBU Prior to Operation**

Depending on the system in use, ensure that either 110VAC commercial or generator power is available and properly connected to the power converter, or a vehicle supplying 28VDC power through the NATO adapter is properly connected to a 24VDC cable extension/branch cable, or the battery pack.

Alternatively, a fully charged battery pack may be used to start and operate up to three MBUs for two to three hours, depending on ambient temperatures as described in this WP.

WARNING

HIGH VOLTAGE is used in the operation of this equipment. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

Never connect electrical equipment unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid.

External power must be shut off before connecting any cables or performing maintenance.

For artificial respiration, refer to FM 4-25.11.

Be careful not to contact high-voltage connections when removing, installing, or operating this equipment.

Whenever possible, keep one hand away from the equipment to reduce the hazard of current flowing through the vital organs of the body. Voltages as low as 50 volts may cause death.

Do not stand in water while handling live power cords or electrical shock may result. Position all power cables so that they are out of the way during operation and are not lying in water.

Connect Power Cables in the MKT Using 110VAC Power

1. Be sure that the 12-ft crossway cable has been installed IAW with procedures given in WP 0035.
2. Be sure that all pre-fielding modifications have been done IAW with procedures given in WP 0035.

END OF TASK

ASSEMBLY AND PREPARATION FOR USE – CONTINUED**Mounting the Power Converter in the MKT Cooling Cabinet (if not already installed)**

1. Open the MKT cooling cabinet door (Figure 2, Item 1) and remove the cooling trays. Locate the power converter mounting bracket (Figure 2, Item 2) on the floor of the cooling cabinet.
2. Remove the two self-locking nuts (Figure 2, Item 3) and slide the retaining bar (Figure 2, Item 4) off the shafts (Figure 2, Item 5).
3. Place the power converter (Figure 2, Item 6) on the mounting bracket (Figure 2, Item 2) with the front of the converter facing the front of the cabinet. Push the converter all the way to the back of the cabinet.
4. Place the retaining bar (Figure 2, Item 4) through the handle of the power converter (Figure 2, Item 6) and over the two mounting bracket shafts (Figure 2, Item 5). Be sure to keep the bar level, while sliding over the shafts, to prevent binding.
5. Install the two self locking nuts (Figure 2, Item 3).

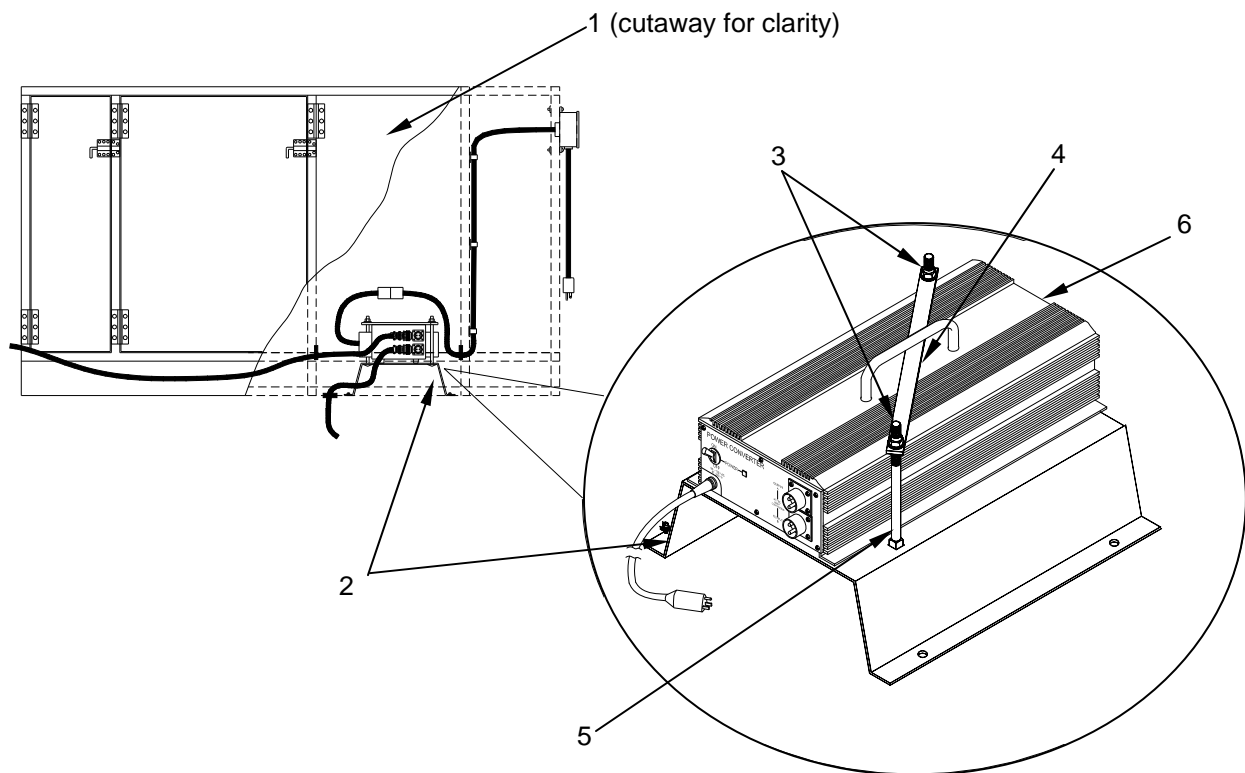


Figure 2. Power Converter Mounting Bracket with Power Converter Installed.

END OF TASK

ASSEMBLY AND PREPARATION FOR USE – CONTINUED**Connect Cables in the MKT**

1. With the power converter in position on the mounting bracket, connect the end of the crossway cable (Figure 3, Item 1) extending up through the floor of the cooling cabinet to the lower output connector (Figure 3, Item 2) on the power converter (Figure 3, Item 3).
2. Connect the main connector (Figure 3, Item 4) of the 2-branch cable to the upper output connector (Figure 3, Item 5) of the power converter (Figure 3, Item 3).
3. Connect the end of the feedway cable (Figure 3, Item 6) extending up through the floor of the cooling cabinet to the power cord (Figure 3, Item 7) of the power converter (Figure 3, Item 3).
4. Pass the remainder of the 2-branch cable through the left side of the cooling cabinet and distribute it under the two M59 Field Ranges (Figure 3, Item 8).
5. Pull the individual branch cables (Figure 3, Item 9) out the front of each appliance and connect each branch to the power-in receptacle (Figure 3, Item 10) of each MBU.
6. Distribute a 4-branch cable (Figure 3, Item 11) along the floor in front of the appliances (Figure 3, Item 12) on the opposite side of the MKT.
7. Connect the main connector (Figure 3, Item 13) of the branch cable to the end of the crossway cable (Figure 3, Item 14), extending up through the floor of the MKT opposite the cooling cabinet.
8. Hang the 4-branch cable along the front of the appliances with cable clips (Figure 3, Item 15) provided with the MBU.
9. Connect each branch (Figure 3, item 16) of the 4-branch cable to the power-in connector (Figure 3, Item 17) of each MBU.
10. Slide the clips (Figure 3, Item 15) left or right as needed to organize the cable along the front of the appliances to help prevent the cable from extending into the work area.
11. With the power converter main power switch OFF, connect the feedway cable receptacle (Figure 3, Item 18), located just below the GFCI outlets (Figure 3, Item 19) mounted to the side of the cooling cabinet, to the designated power source using the 50-ft (110VAC) extension cord (Figure 3, Item 20) provided.

ASSEMBLY AND PREPARATION FOR USE – CONTINUED

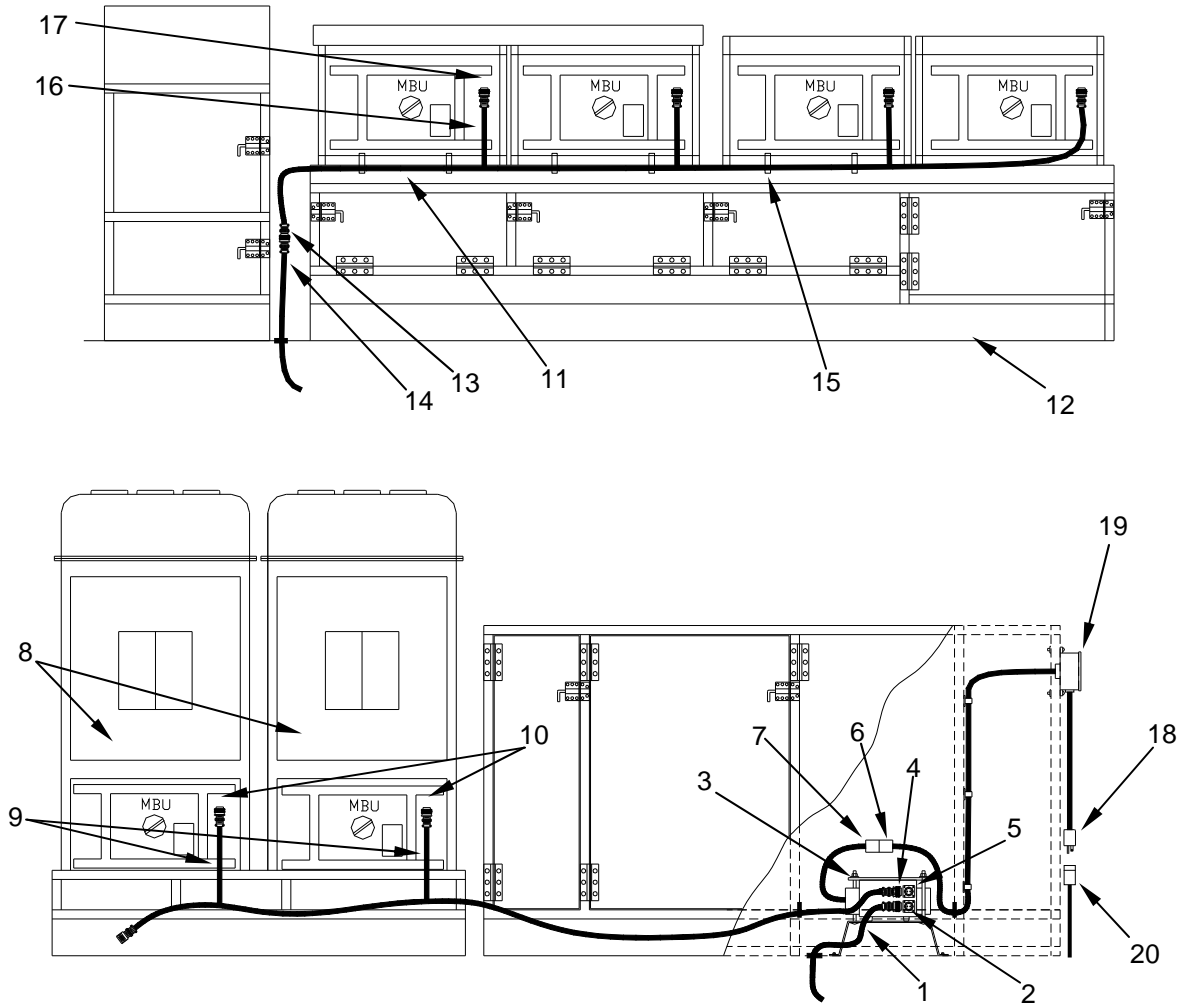


Figure 3. Connecting Power Cables to MKT.

END OF TASK

ASSEMBLY AND PREPARATION FOR USE – CONTINUED

Connect Power Cables with 110VAC Power

1. With the power converter input switch (Figure 4, Item 1) OFF, connect the power converter power cord (Figure 4, Item 2) to the designated power source using the 50-ft (110VAC) extension cord (Figure 4, Item 3) provided.
2. Connect the 25-ft (24VDC) power cable extension (Figure 4, Item 4), if required, to the power converter (Figure 4, Item 2).
3. Connect the 2 or 4-branch cables (24VDC) (Figure 4, Item 5) to the other end of the 25-ft (24VDC) extension (Figure 4, Item 4), if used.
4. With the MBU Power switches (Figure 4, Item 6) OFF, connect the cable branches (Figure 4, Item 7) to the power-in receptacle (Figure 4, Item 8) on the individual burners.

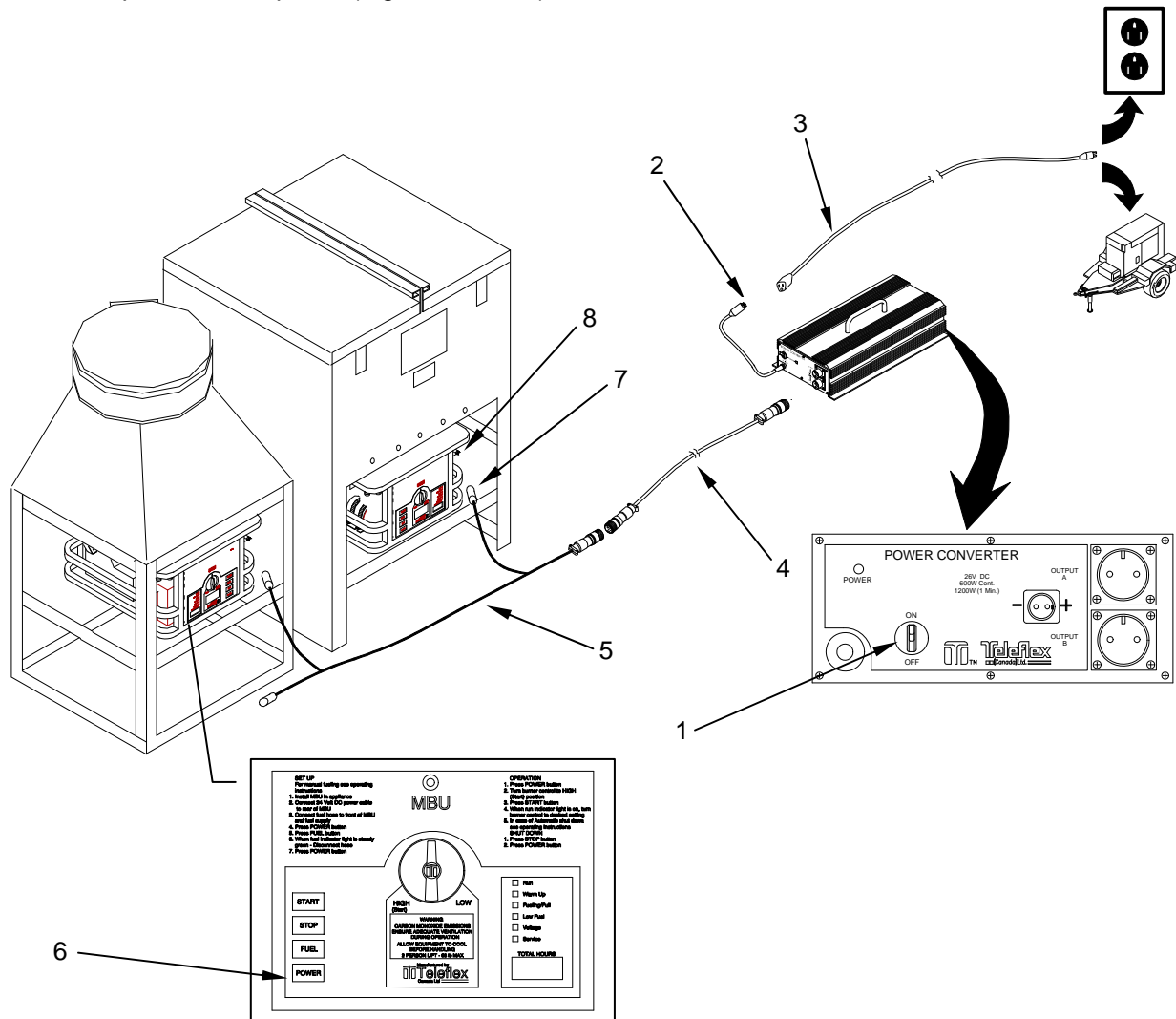


Figure 4. Connect Power Cables with 110VAC Power for Systems Other Than MKT.

END OF TASK

ASSEMBLY AND PREPARATION FOR USE – CONTINUED**Connect Power Cables Using Vehicular Power (22-29 VDC) Alone**

1. Connect the 25-ft NATO adapter cable (Figure 5, Item 1) (24VDC) between the vehicle supplying power (Figure 5, Item 2) and a 2-branch power cable (Figure 5, Item 3). If additional length is required, connect the 25-ft (24VDC) extension cable (Figure 5, Item 4) between the branch cable and the NATO adapter cable.
2. Connect the cable branches (Figure 5, Item 5) (24VDC) to the individual burner power connectors (Figure 5, Item 6).

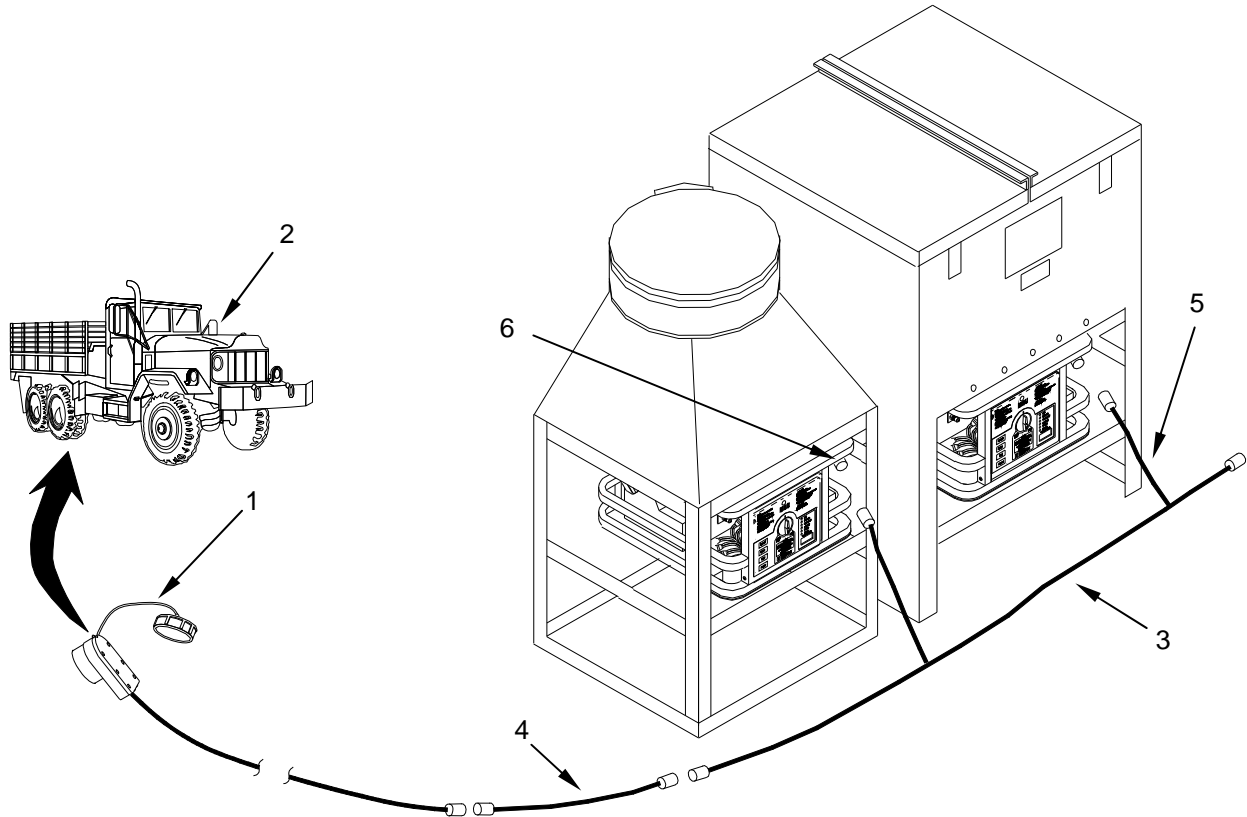


Figure 5. Connect Power Cables Using Vehicular Power Alone.

END OF TASK

ASSEMBLY AND PREPARATION FOR USE – CONTINUED

Connecting Power Cables Using Vehicular Power and Battery Pack

WARNING



The battery pack weighs approximately 93 pounds (42.2 kg). Two persons must carry the battery pack. Lift with legs, not back, to prevent injury.

1. If the battery pack (Figure 6, Item 1) is used to supplement vehicular power, connect the NATO adapter cable (Figure 6, Item 2) to the power input connector (Figure 6, Item 3) of the battery pack.
2. With the battery pack 3-position function switch (Figure 6, Item 4) OFF, connect one end of the 25-ft (24VDC) extension (Figure 6, Item 5) (if required for additional length) to the Battery Pack Power Output Connector (Figure 6, Item 6).
3. The 2-branch cable (Figure 6, Item 7) can then be connected to the opposite end of the 25-ft extension cable (Figure 6, Item 5).
4. The cable branches (Figure 6, Item 8) are then connected to the power-in receptacle of the individual burners (Figure 6, Item 9).

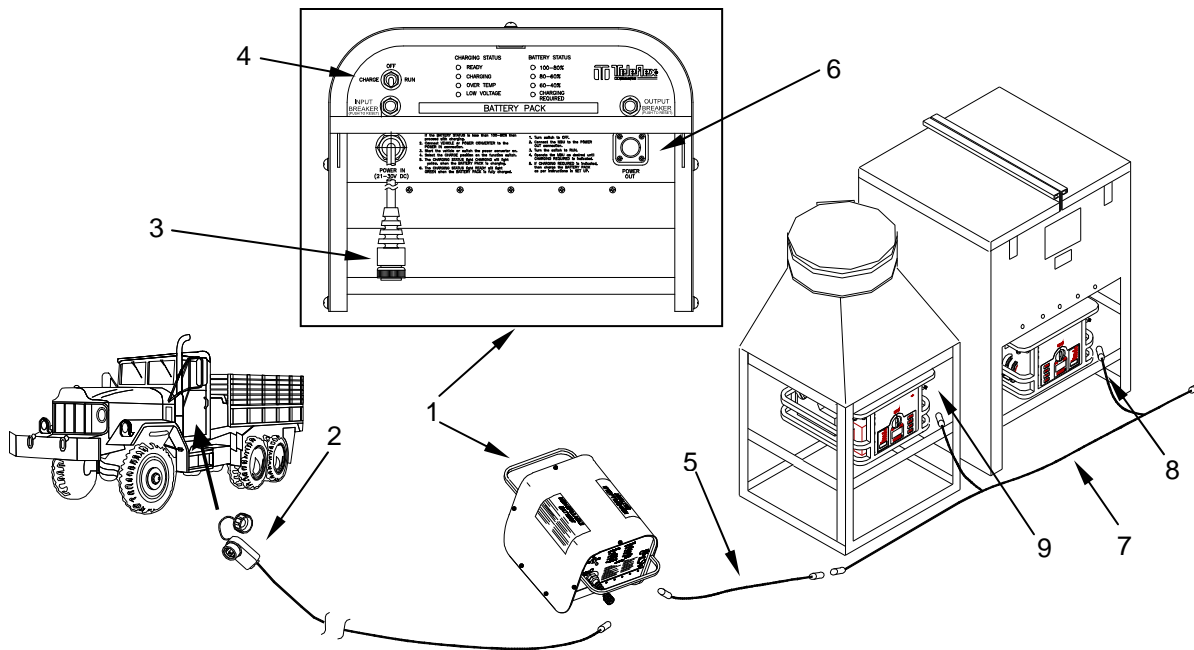


Figure 6. Connecting Power Cables Using Vehicular Power and Battery Pack.

END OF TASK

ASSEMBLY AND PREPARATION FOR USE – CONTINUED

Connecting Power Cables Using the Battery Pack Alone

WARNING



The battery pack weighs approximately 93 pounds (42.2 kg). Two persons must carry the battery pack. Lift with legs, not back, to prevent injury.

1. With the battery pack 3-position function switch (Figure 7, Item 1) in the OFF position, connect one end of the 25-ft extension cable (if used for additional length) (Figure 7, Item 2) to the battery pack power output connector (Figure 7, Item 3).
2. Connect the opposite end of the 25-ft extension cable (Figure 7, Item 2) to one end of a 2-branch power cable (Figure 7, Item 4).
3. If the extension cable (Figure 7, Item 2) is not used, connect one end of the branch cable (Figure 7, Item 4) directly to the power output connector (Figure 7, Item 3) of the battery pack.
4. Connect the cable branches (Figure 7, Item 5) to the power-in receptacles (Figure 7, Item 6) of the individual burners.
5. In order to recharge the batteries, a 24VDC power source, such as a vehicle or power converter, should be made available during operation of the MBUs. When the battery pack is used as the power source to operate the MBUs, the charge indicator lights (Figure 7, Item 7) should be checked frequently to monitor the condition of the batteries. To recharge the batteries, connect the 25-ft NATO adapter cable to a vehicle equipped with a NATO connector and the power-in connector on the battery pack as described later in this work package.

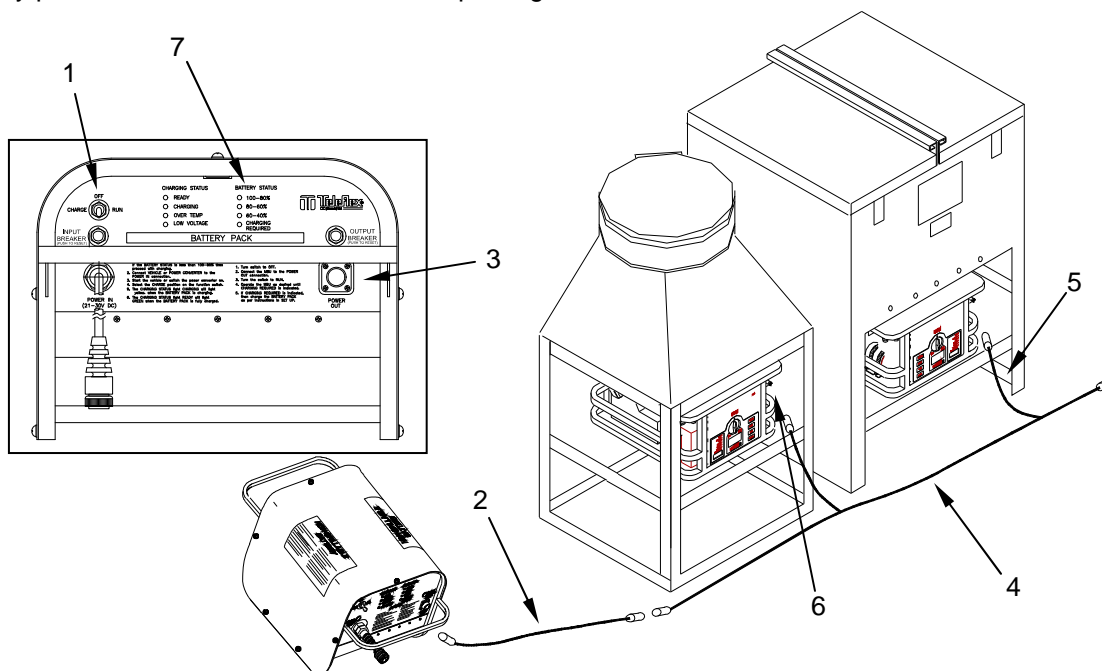


Figure 7. Connecting Power Cables Using the Battery Pack Alone.

END OF TASK

ASSEMBLY AND PREPARATION FOR USE – CONTINUED**Pre-Operational Check**

Perform this visual check of the MBU after its installation into an appliance but prior to system power-up. This check is particularly important where MBUs have been left installed and are being used after a period of inactivity.

1. Slide the MBU (Figure 8, Item 1) halfway out of the appliance (Figure 8, Item 2).
2. Check the burner well (Figure 8, Item 3) for debris or the remains of spilled food.
3. Inspect interior of burner well (Figure 8, Item 3) for debris and clean as needed. Refer to WP 0013 for cleaning instructions.
4. Slide MBU (Figure 8, Item 1) back into appliance.
5. Be sure that the system cables (Figure 8, Item 4) are securely attached.

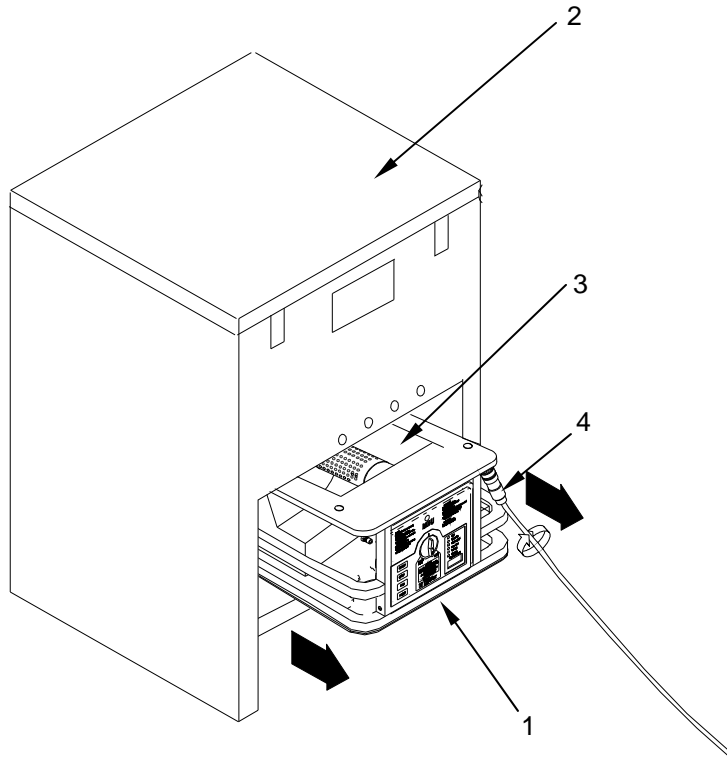


Figure 8. MBU Pre-operational Check.

END OF TASK

OPERATING PROCEDURES

Power-Up Sequence

When the power cables are properly connected and a pre-operational check has been performed, the system is ready for power-up. The power-up sequence should occur as follows:

1. Ensure power is available at the source (Figure 9, Item 1). If 110VAC is used, be sure that commercial power is available or that the generator is running. If a vehicle is being used, be sure that it is running.
2. If 110VAC is used, place power converter switch (Figure 9, Item 2) to ON.
3. If the battery pack is used, make sure the 3-position function switch (figure 9, item 3) is in the "RUN" position.

NOTE

When powering up the MBU, press the POWER button just long enough to activate the indicator lights on the right side of the Control Panel. Holding the Power button in longer than 3 seconds will cause the MBU to enter a Calibration mode that is used for the maintenance of certain assemblies within the MBU. The calibration procedure is explained in WP 0017.

If the MBU enters the Calibration function, the hour meter will display "CAL?" To exit the Calibration function and return to normal standby mode, either WAIT 10 SECONDS or press the STOP button. Pressing the STOP button will immediately return the MBU to normal standby condition. After returning to standby, resume normal operation.

4. Push POWER button (Figure 9, Item 4) on individual MBUs.
5. Verify that the MBU is under power: Indicator lights (Figure 9, Item 5) will flash for about three seconds, and the hour meter background light (Figure 9, Item 6) will illuminate. The hour meter will display a series of characters before displaying the actual accumulated number of operating hours.
6. Observe hour meter reading (Figure 9, Item 7). Note that all required service must be done before operation.

OPERATING PROCEDURES – CONTINUED

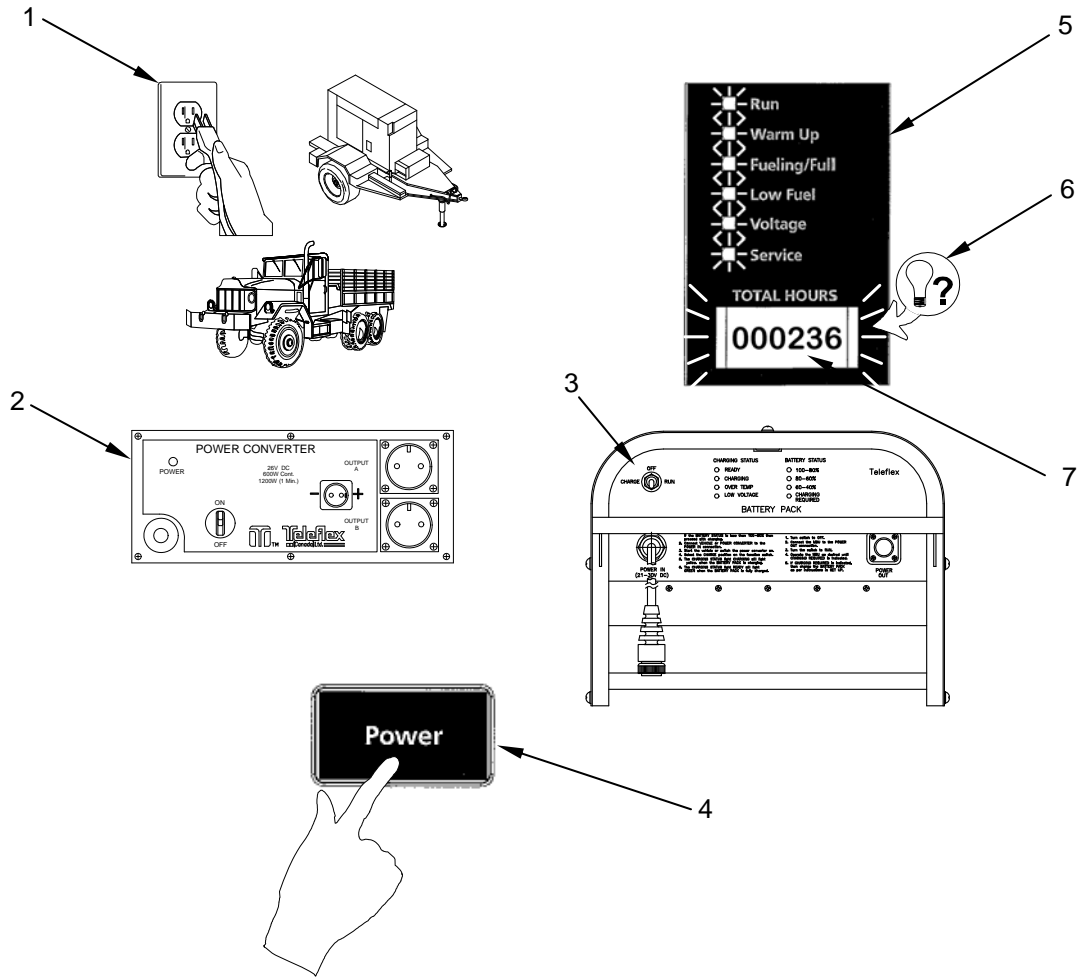


Figure 9. MBU and Associated Equipment Power-up Sequence.

END OF TASK

OPERATING PROCEDURES – CONTINUED**Powered Fueling**

The preferred method of refueling the MBU is through the use of the built-in powered fueling function. To use the powered refueling feature, proceed as follows:

WARNING

The MBU has been designed to operate with JP-8 and certain approved diesel fuels. The use of gasoline is **STRICTLY PROHIBITED** and will create a fire danger and potential for explosion. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Do not attempt to connect a fuel line to the MBU in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having rags on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

When refueling, using the built-in powered fuel function, the unit must be under power, with the burner turned OFF.

1. Position fuel container (Figure 10, Item 1) containing JP-8 fuel, equipped with a fuel can adapter (Figure 10, Item 2), within 20ft of the MBU to be fueled. If refueling an MBU on a MKT, the fuel can must be kept on the ground outside the MKT. The fuel can is **NOT** to be brought onto the MKT.
2. Connect the coupling (Figure 10, Item 3) on the fuel supply hose to the fuel fill nipple (Figure 10, Item 4) on the MBU, then connect the connector on the other end of the fuel supply hose to the hose connector (Figure 10, Item 5) on the fuel can adapter (Figure 10, Item 2). The couplings of the fuel hose should snap onto the fuel fill nipple and adapter hose securely. Ensure that a positive connection is made to avoid fuel spill and ensure proper operation.
3. Open the manual vent cap (Figure 10, Item 6) of the fuel can adapter (Figure 10, Item 2).
4. Be sure that the MBU is connected to a power source as described earlier and press the POWER button (Figure 10, Item 7) on the MBU. Check that the indicators flash and the hour meter illuminates.
5. Set the burner control (Figure 10, Item 8) to HIGH.
6. Press the FUEL button (Figure 10, Item 9). Check that the air compressor starts and that the Fueling/Full indicator blinks as the fuel tank fills. The Fueling/Full indicator will stop blinking and remain steadily lit when tank is full. The air compressor will also turn off when fueling is complete.

OPERATING PROCEDURES – CONTINUED

- When finished refueling, disconnect the fuel hose connector (Figure 10, Item 3) from the fuel fill nipple (Figure 10, Item 4) and adapter hose (Figure 10, Item 5). Connect the two ends of the fuel supply hose together when not in use to prevent spillage and avoid contamination.

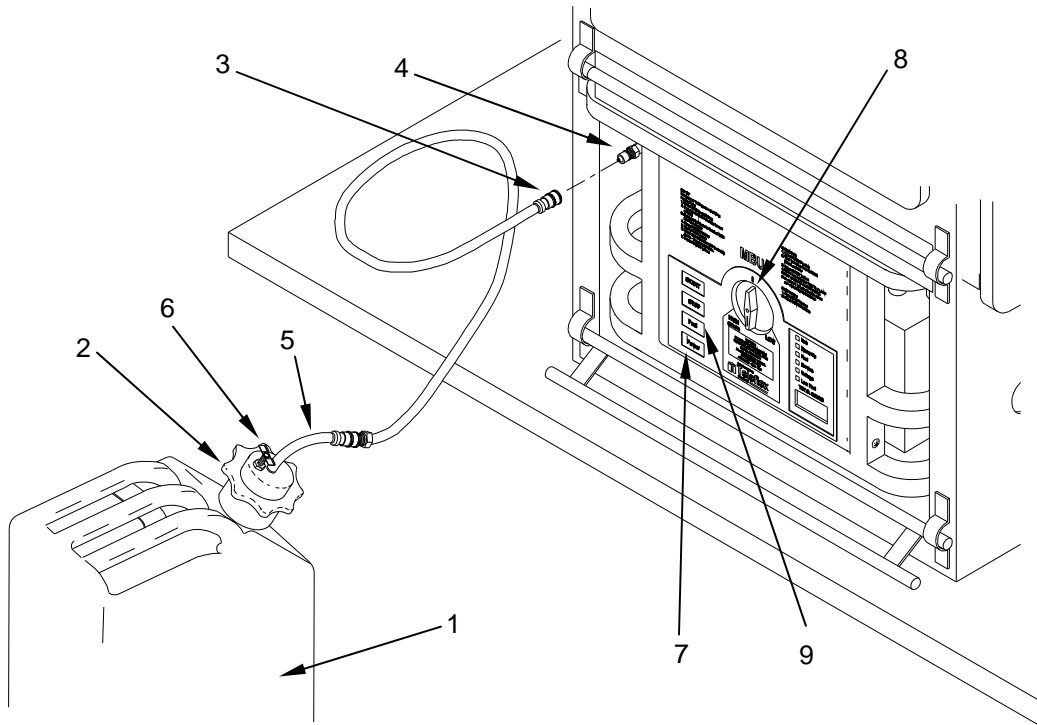


Figure 10. Powered Fueling of MBU.

END OF TASK

OPERATING PROCEDURES – CONTINUED**Manual Fueling**

The MBU fuel tank may be filled manually through the fill plug, prior to installation into an appliance, or as a field expedient if the fuel hose has been damaged. If the MBU is to be fueled manually, proceed as follows:

WARNING

Do not attempt to connect a fuel line to the MBU in the vicinity of any open flame. Ensure that the fuel hose connections are made properly to avoid fuel spillage. Prevent a possible fire hazard by having rags on hand to absorb any spillage. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. In cases where the MBU is required to be fueled manually, petroleum absorbent material (Figure 11, Item 1) will be placed under the burner to catch any fuel that may be spilled.
2. In the event that fuel is spilled on the ground, immediate action will be taken to contain the spill and the appropriate environmental personnel notified.
3. To fuel manually, place the MBU (Figure 11, Item 2) on the absorbent material on its side so that the fill plug (Figure 11, Item 3) is on top as shown. Remove the fill plug.
4. Fill fuel tank, using a fuel can equipped with spout (Figure 11, Item 4), to the bottom of filler neck opening with JP-8 or approved alternate diesel fuel, and re-install fill plug (Figure 11, Item 3).
5. Clean up any spilled fuel with a rag. Dispose of rag and/or absorbent material in accordance with local Material Safety Data Sheet (MSDS) procedure.

OPERATING PROCEDURES – CONTINUED

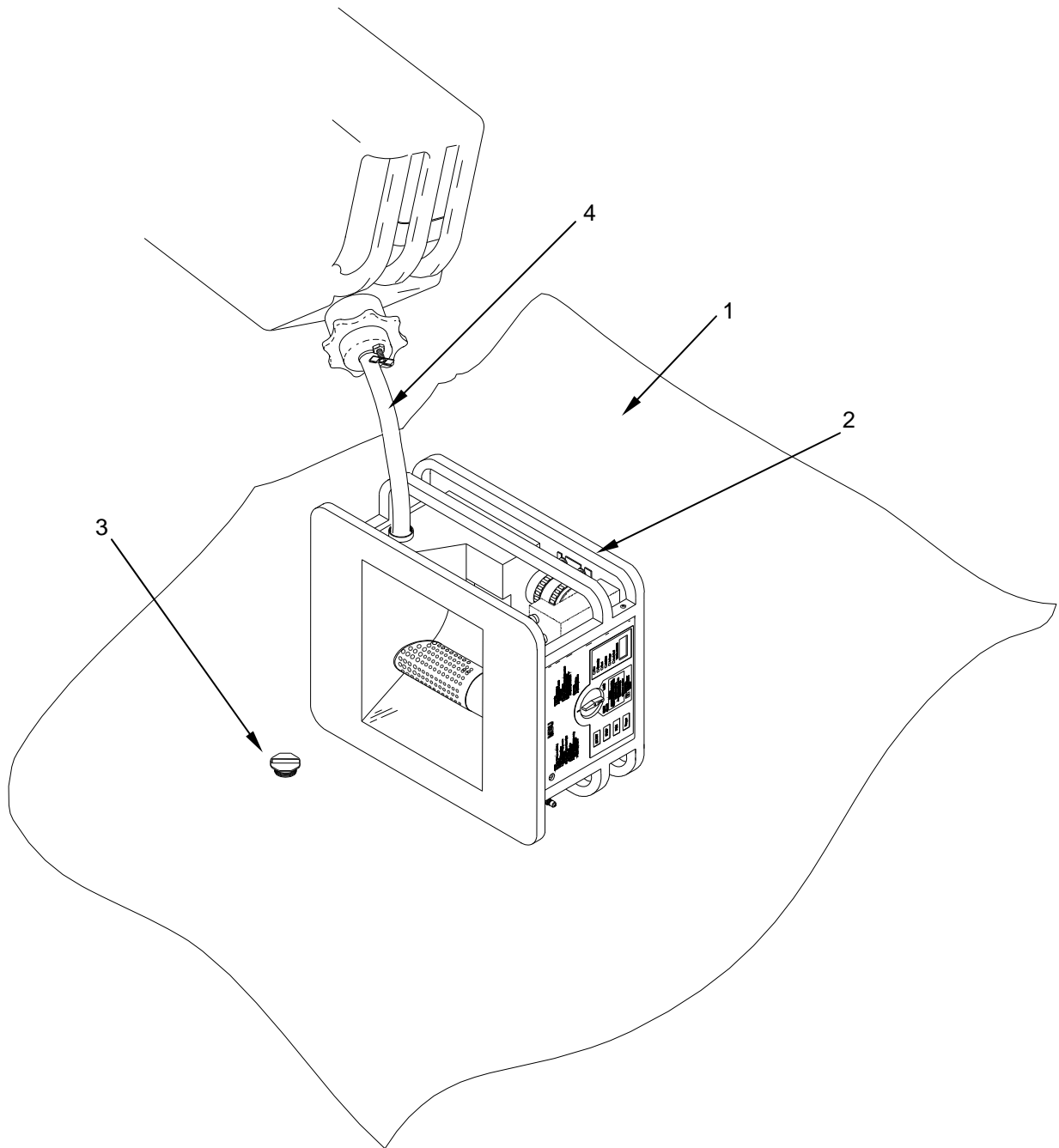


Figure 11. Manual Fueling Procedure.

END OF TASK

OPERATING PROCEDURES – CONTINUED**WARNING**

During operation, the MBU produces harmful carbon monoxide (CO) and other gases. Carbon monoxide is a colorless, odorless, and tasteless gas. Mild cases of carbon monoxide poisoning can cause symptoms such as nausea, dizziness, or headaches. Severe cases of carbon monoxide poisoning can result in brain damage, heart damage, or death. Although CO has no telltale odor, it may mix with other odors which mask its presence; therefore, CO can be present within a mix of seemingly harmless odors.

To prevent CO poisoning, ensure that the MBU operating space is well ventilated during burner operation. Under no circumstances should an MBU be operated in any enclosure with all vents closed.

Start-up

To start a burner that has been properly prepared, proceed as follows:

1. Push the POWER Button. The indicator lights will flash on and off for three seconds, and the hour meter background light will illuminate. The hour meter will display a series of characters before displaying the actual number of hours the MBU has been in operation.
2. Turn burner control to HIGH (START) position.

NOTE

Holding down the START button will override the fault detection circuitry, preventing shut down for two minutes. This allows purging the fuel lines on new units and on units that have been completely drained. It also facilitates troubleshooting.

3. Press START button. The WARM UP indicator will light for approximately two minutes.
4. When RUN indicator lights, MBU is ready for operation.

Burner Control Temperature Adjustment

The MBU Burner Control has a LOW and a HIGH setting indicator and can be set anywhere in between. The minimum and maximum settings correspond to a heat output from approximately 22,000 BTUH to 52,000 BTUH (15,000 BTUH to 52,000 BTUH for MBU-V3).

Each cooking situation is different, and the correct burner control setting for that situation must be determined by trial. The correct settings will become apparent with experience and ongoing use of the burners.

Normal Shutdown

When the burner is no longer required, it should be shut down. To do so, simply push the STOP button. This will stop the fuel flow, and the burner will shut down immediately.

Automatic System Shutdown

The MBU is programmed to shut down automatically when the following conditions exist (appropriate indicator lights will be illuminated). Refer to Table 1 for a detailed description of fault indicators.

OPERATING PROCEDURES – CONTINUED**Voltage**

This indicator lights when the power requirements of the MBU are not being met. The power being supplied to the MBU is either below 22VDC or greater than 29.5VDC. The indicator will light red and the system will shut down. The power source should immediately be checked in the sequence listed below:

1. If commercial or generator supplied power is used:
 - a. Verify that power source is supplying 110VAC.
 - b. Verify that power converter main power switch is ON.
 - c. With power converter switch temporarily in the OFF position, check 24VDC power cable connections between the power converter, 24VDC extension, branch cables, and MBU.
 - d. If problem cannot be resolved, refer to troubleshooting index in WP 0007.
2. If vehicle or battery power is used:
 - a. Verify that vehicle is supplying between 22VDC and 29.5VDC, as measured with a multimeter.
 - b. Verify that battery pack 3-position function switch is in the "RUN" position.
 - c. Verify that the battery pack is operating correctly by checking the Charging Status indicators on the front control panel.
 - d. With battery pack 3-position function switch temporarily in the OFF position, check all 24VDC power cable connections between the battery pack, branch cable, and MBU.
3. If problem cannot be resolved, refer to troubleshooting index in WP 0007.

Service

A fault has occurred in the burner circuitry or mechanical systems that prevent normal operation. The immediate and proper operator response is to check the troubleshooting index in WP 0007.

Low Fuel

This indicator will light GREEN, AMBER, and RED as indicated in Table 1. The burner will shut down when it has run out of fuel. The MBU must be refueled before proceeding.

Table 1. MBU Fault Indicators.

Indicator - color	Indicator Normally Lit	If Lit Before Operation	If Lit While MBU Is Operating	If Lit After Automatic Shutdown
WARMUP - amber	First two minutes of MBU operation.	N/A	Normal first two minutes of operation, abnormal after two minutes.	N/A
RUN - green	After two minutes of operation. WARMUP indicator turns off at the same time.	N/A	Abnormal first two minutes of operation, normal after two minutes.	N/A
FUELING/FULL (green) blinking/steady	When fuel tank is filling/full.	N/A	N/A	N/A
LOW FUEL – indicators light as follows: - green (blinking) - amber (blinking) - red (blinking) - red (steady)	After approximately 3½ hours of operation and for ½ hour thereafter, for the times indicated: For 15 minutes For 7-1/2 minutes For 7-1/2 minutes On MBU shutdown, ½ hour from when LOW FUEL initially blinked green.	<p>NOTE</p> <p>If the MBU is manually shut down while the Low Fuel indicator is lit, it will not restart until it is refueled.</p>		
VOLTAGE - red	At an automatic shutdown, when supply voltage falls to less than 22VDC or greater than 29.5VDC.	Check power source for proper operation.	N/A	Check power source for proper operation.
SERVICE - red		Troubleshoot the problem (WP 0007). Attempt a restart of MBU.		
HOUR METER BACK LIGHT - green	When power is on.	N/A	N/A	N/A

END OF TASK

DECALS AND INSTRUCTION PLATES

The following labels, decals, and instruction plates are found on the MBU components as indicated.

MBU

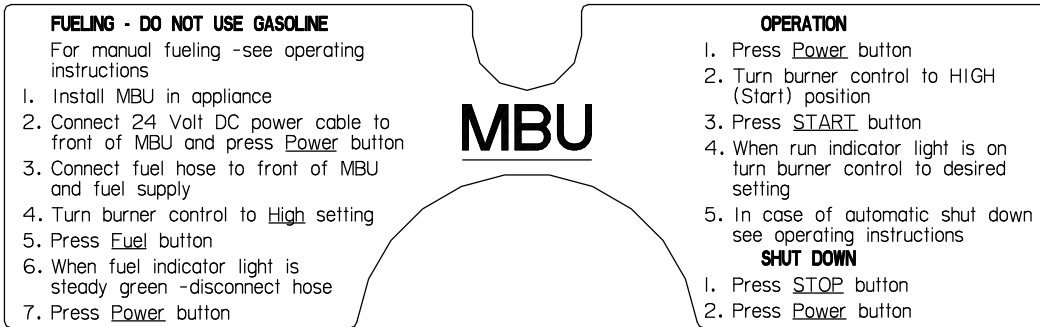


Figure 12. MBU Control Panel Set Up, Operation, and Shut-Down Label.

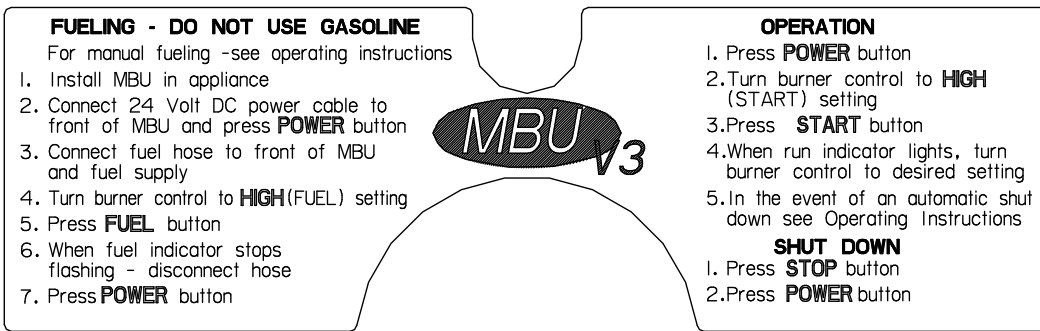


Figure 13. MBU-V3 Control Panel Set Up, Operation, and Shut-Down Label.

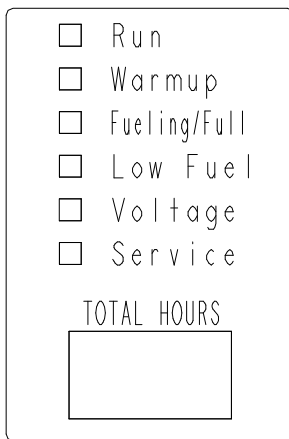


Figure 14. Control Panel Indicator Label.

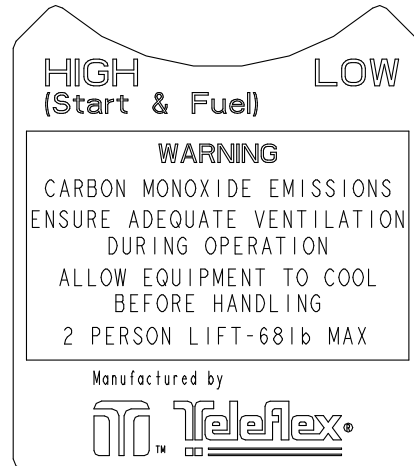


Figure 15. Burner Control Valve Label.

DECALS AND INSTRUCTION PLATES – CONTINUED

Power Converter

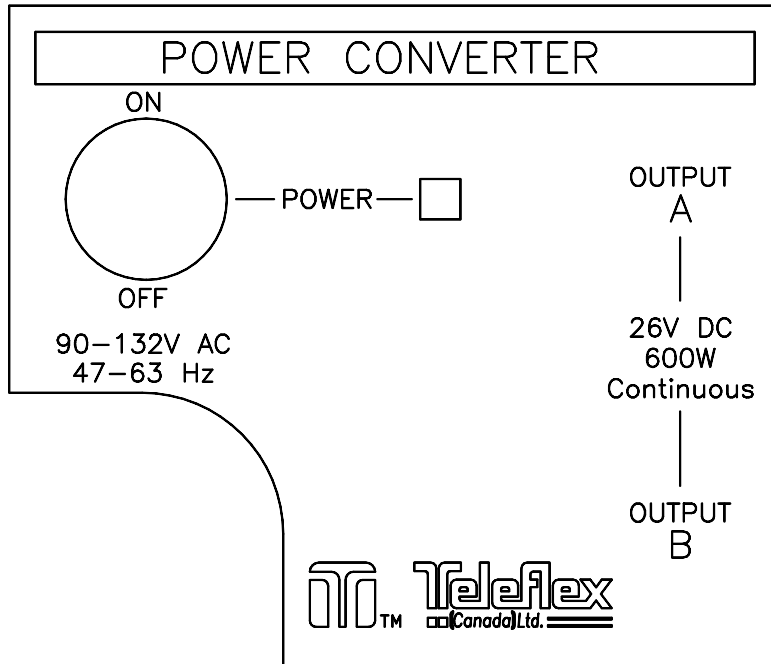


Figure 16. Power Converter Front Panel Label (Model MS0150).

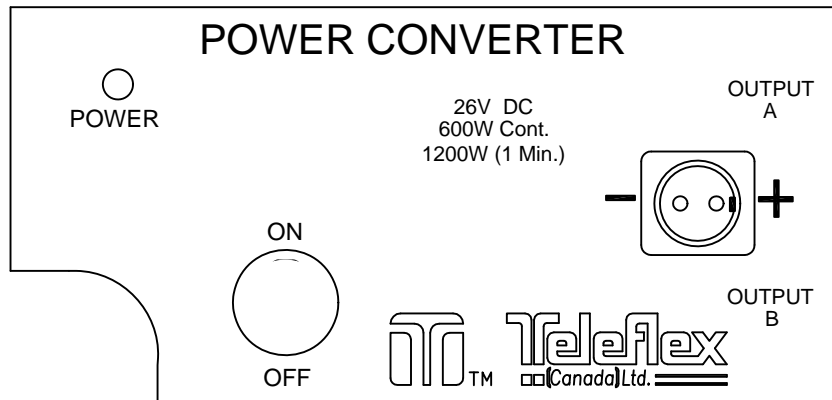


Figure 17. Power Converter Front Panel Label (Model MS0160).

DECALS AND INSTRUCTION PLATES – CONTINUED

Battery Pack

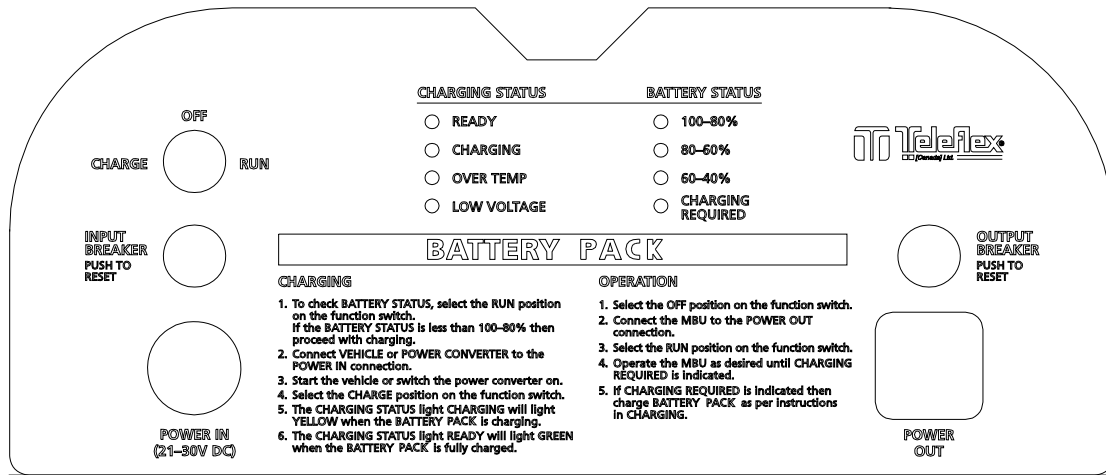


Figure 18. Battery Pack Control Panel Label.

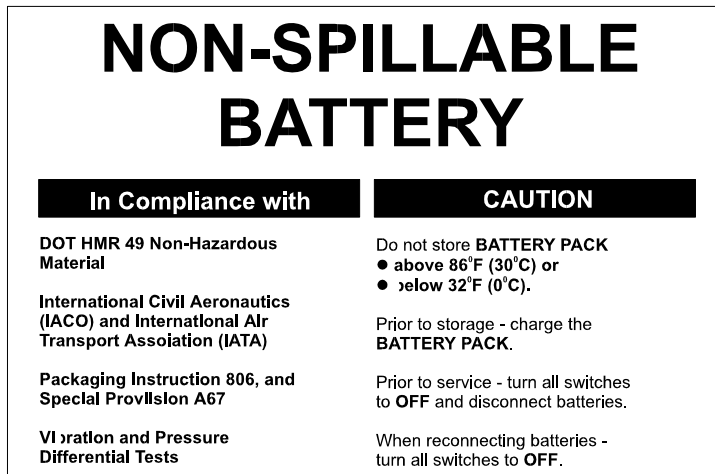


Figure 19. Battery Pack Non-Spillable Battery Outer Cover Label.

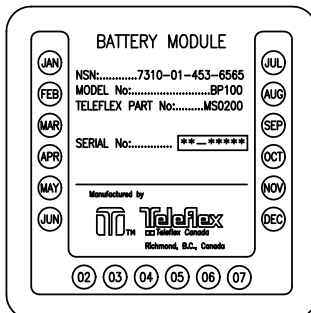


Figure 20. Battery Pack Identification Plate.

OPERATING AUXILIARY EQUIPMENT

Battery Pack Operating Procedures

WARNING



The battery pack weighs approximately 93 pounds (42.2 kg). Two persons must carry the battery pack. Lift with legs, not back, to prevent injury.

The battery pack is issued only with the KCLFF and KCLFF-E field feeding systems. When used by itself, it allows operation of MBUs in forward locations as described below. Whenever possible, a vehicle equipped with a NATO connector should be made available should the battery pack require recharging. Recharging is desirable when the Charging Status indicator reads 40-60% or below.

The battery pack contains two sealed lead acid batteries and an internal charger. When fully charged, it provides the electrical storage to start and operate three MBUs simultaneously for three hours at an ambient temperature of 60°F (15.5°C) and a period of two hours at an ambient temperature of -25°F (-32°C). The batteries are rechargeable through the standard NATO vehicle power connector in three hours in temperatures between 60°F (15.5°C) and 120°F (49°C) and in five hours at -25°F (-32°C). The charger has circuitry that prevents overcharge. A 3-position function switch controls the voltage being supplied to the output connector. The battery status lights indicate the status of the batteries. The percentage displayed indicates the amount of charge remaining.

1. To use the battery pack, proceed as follows:
 - a. Flip the 3-position function switch to the OFF position. Connect the main connector of the branch cable to the POWER OUTPUT connector.
 - b. Connect the individual branches of the cable to the MBU power-in receptacle.
 - c. Flip the 3-position function switch to the ON position.
2. To recharge the battery pack, proceed as follows:
 - a. Turn the 3-position function switch to the RUN position and note the battery status.
 - b. If the status shows 40-60% or CHARGING REQUIRED, proceed with charging.
 - c. Using the NATO adapter cable, connect the battery pack POWER-INPUT connector to a vehicle.
 - d. Start the vehicle engine.
 - e. Turn 3-position function switch to the CHARGE position (The Charging Status indicator light labeled "CHARGING" will illuminate (yellow) to indicate that the batteries are charging).
 - f. The CHARGING STATUS indicator light READY will illuminate (green) to indicate when the batteries are fully charged.
 - g. When charging is complete, return the 3-position function switch to the OFF position.

END OF TASK

PREPARATION FOR MOVEMENT

When preparing to move from one field location to another for continued operation, the MBU can be left installed in the appliance. In situations where the field feeding system and the MBUs will be placed in storage or left for longer periods of inactivity, the MBUs should be removed from the appliances and the system components placed in appropriate containers. These should be stored in a dry place, protected from environmental extremes such as dust and rain.

System Shutdown

1. Shut the burners down in a normal manner as described previously. Depending on the situation, perform the following steps to disassemble the MBU system, as desired.
2. Push the POWER button to turn off power to the MBU (the hour meter background light will turn off).
3. Place power converter (or battery pack) switch to the OFF position.
4. Disconnect power converter (or battery pack) from power source.
5. Disconnect battery pack from vehicle (if NATO Adapter Cable is used).
6. Disconnect 110VAC extension cord from power converter.
7. Disconnect NATO adapter cable from battery pack.
8. Disconnect 24VDC extension and branch cables.

END OF TASK**END OF WORK PACKAGE**

OPERATOR AND FIELD MAINTENANCE
OPERATION UNDER UNUSUAL CONDITIONS

INITIAL SETUP:**Personnel Required**

Food Service Specialist 92G (1)
MOS Non-specific (1)

SECURITY MEASURES FOR ELECTRONIC DATA

There are no security measures for electronic data required for the MBU or MBU V-3.

UNUSUAL ENVIRONMENT/WEATHER

Precautions can be taken to protect the MBU and its associated equipment from the effects of severe weather and to minimize potentially dangerous conditions. The following steps are designed to prevent damage and avoid possible injury to personnel:

High Winds/Dust

During operation in windy and dusty conditions:

1. If possible, position burner with the control panel facing into the wind.
2. Keep burners and associated equipment under cover or indoors when not in use.
3. Follow service procedures; inspect air filter after every use, and replace air filter as necessary. Clean fuel nozzle at every air filter change.
4. Ensure fuel storage cans are tightly capped to prevent fuel from being contaminated by dust.
5. Wipe equipment down more frequently.
6. Check air vents on fuel regulator and vent valve orifice frequently; clean if necessary.

Rain/Wet Climate

During operation in rain and in wet climates:

1. Check cables for secure connections.
2. Avoid letting cable connections remain in running or standing water.
3. Keep components protected from rain wherever possible.
4. Follow service procedures. Replace air filter and fuel nozzle more frequently as needed.

Snow and Extreme Cold

During operation in snow and extreme cold:

1. Keep battery pack under cover whenever possible.
2. Protect fuel supply from exposure to extreme cold whenever possible.
3. Clean fuel nozzle as often as necessary.
4. Check air vents on fuel regulator and vent valve orifice frequently; clean if necessary.
5. Do not touch cold metal surfaces with bare hands.

Extreme Heat

During operation in extremely hot conditions:

1. Keep equipment shaded whenever possible.
2. Do not touch hot metal surfaces with bare hands.
3. Be aware that fuel expands as the temperature rises. Do not store fully fueled burners where they are exposed to the sun for long periods.

MULTISERVICE TACTICS, TECHNIQUES, AND PROCEDURES FOR CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR DECONTAMINATION (CBRN)**WARNING**

For immediate decontaminating procedures, use **ONLY** hot, soapy water for spot decontamination of hot surfaces of the MBU. Shut down and cool the MBU for any additional decontamination procedures. **DO NOT** spray DS2 or any other combustible decontamination solutions or compounds on an operating MBU. **DO NOT** spray DS2 or any other combustible decontamination solutions or compounds on any equipment surfaces or components where the operating temperatures reach or exceed the flashpoint of DS2 (160° Fahrenheit or 71.1° Celsius).

Perform Chemical, Biological, Radiological, and Nuclear Decontamination (CBRN) procedures in accordance with FM 3-11.5 as the mission, resources, and tactical situation permit.

END OF WORK PACKAGE

CHAPTER 3

OPERATOR TROUBLESHOOTING PROCEDURES
FOR
MODERN BURNER UNIT
AND
MODERN BURNER UNIT-V3

OPERATOR MAINTENANCE
TROUBLESHOOTING PROCEDURES
MALFUNCTION SYMPTOM INDEX

MALFUNCTION SYMPTOM INDEX

The malfunction/symptom index is a quick reference index for finding troubleshooting procedures. Associated with each symptom name is a procedure sequence number representing the starting point in a troubleshooting sequence. Should any one symptom require more than one troubleshooting sequence, to arrive at the most likely area of investigation, the additional starting point numbers are also provided.

As the troubleshooting activity progresses through to the conclusion of a particular sequence, a reference is made to the next logical troubleshooting sequence by procedural sequence number or by referring to the malfunction/symptom index to locate the next failure symptom procedure. This type of activity continues until successful fault isolation is achieved.

Table 1. Malfunction Symptom Index.

MALFUNCTION/SYMPTOM	WORK PACKAGE
1. Controller error codes.	0008
2. Burner will not start or shuts down during operation.	0009
3. Burner will not refuel.	0010
4. Burner runs poorly but does not shut down.	0011

END OF WORK PACKAGE

OPERATOR MAINTENANCE

**TROUBLESHOOTING PROCEDURES
MBU CONTROLLER ERROR CODES**

INITIAL SETUP:

None Required

TROUBLESHOOTING PROCEDURE

Controller Error Codes

If any of the internal systems of the MBU experiences a malfunction, an error code may appear on the hour meter display of the control panel. The following table lists the expected error codes and internal systems that may be the cause of various malfunctions. These error codes are not designed to specifically pinpoint the actual MBU assembly at fault but will serve as an aid in narrowing down the source of the malfunction.

Table 1. Controller Error Codes.

Code	Meaning	Suggested Action
ER01	No Flame or flame-out	See troubleshooting procedure "Burner fails to start or shuts down during operation."
ER02	Overvoltage	Check voltage at power source. Check cables and connections between power source and MBU.
ER03	Undervoltage	Check voltage at power source. Check cables and connections between Power source and MBU.
ER04	Tank not full after four minutes of fueling	See troubleshooting procedure "MBU fails to refuel."
ER05	Flame detected	If there is a flame in the burner (when there should NOT be), then extinguish it, or allow to burn out before attempting to operate burner again. If no flame is present, then check flame sensor. NOTE This error may also be caused by a faulty external ground.
ER06	Fuel sensor	Check fuel sensor connection and wiring. Check fuel sensor.
ER07	Invalid key entry	Press STOP button to cancel error. Proceed with MBU operation. If error persists, then check for sticking buttons.
ER09	Fuel solenoid valve or Vent solenoid valve	Check fuel solenoid connection and wiring. Check vent solenoid connection and wiring. Check fuel solenoid. Check vent solenoid.
ER0A	Air solenoid valve	Check air solenoid connection and wiring. Check air solenoid.
ER11	Compressor	Check compressor connection and wiring. Check compressor.
ER12	Igniter	Check igniter connection and wiring. Check igniter.
ER13	Compressor or Igniter	Check compressor connection and wiring. Check igniter connection and wiring. Check compressor. Check igniter.
ER80	Controller	Cycle power. Attempt operation again. If error persists, replace controller.
ER81		
ER82		

OPERATOR MAINTENANCE**TROUBLESHOOTING PROCEDURES
BURNER WILL NOT START OR SHUTS DOWN DURING OPERATION****INITIAL SETUP:****Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Personnel Required

Food Service Specialist 92G (1)

ReferencesWP 0017, WP 0018, WP 0019, WP 0020
WP 0021, WP 0022, WP 0023, WP 0026**Equipment Condition**MBU Shut down and cool (WP 0005)
Power disconnected (WP 0005)**TROUBLESHOOTING PROCEDURE****BURNER WILL NOT START OR SHUTS DOWN DURING OPERATION****NOTE**

The controller will display the following error codes for the condition of "Burner Will Not Start Or Shuts Down During Operation."

1. ER01 is a general fault condition of no flame detected.
2. ER02 indicates a supply voltage overvoltage fault.
3. ER03 indicates a power supply under voltage.
4. ER05 indicates a flame detected prior to start-up or improper electrical grounding.
5. ER06 indicates a faulty vent valve assembly.
6. ER07 is an invalid key entry.
7. ER09 indicates that either the fuel solenoid valve or the vent solenoid valve on the vent valve assembly have failed.
8. ER0A indicates that the air solenoid vent valve has failed.
9. ER11 indicates a bad compressor.
10. ER12 indicates the igniter has failed.
11. ER13 indicates a compressor connection or wiring malfunction.
12. ER80, ER81, and ER82 indicate control panel malfunction.

STEP

1. Do the sub steps below:
 - a. Make sure the burner has fuel and electrical power at the MBU connector.
 - b. Check color coding on wiring connections.
 - c. Press power button. Burner should cycle through self check. If no lights come on, try another MBU that is known to work on the same connector. If this one works, follow all troubleshooting procedures in this section.
 - d. If the burner that is known to work does not come on, find the fault in the power supply system.
 - e. Once burner has power and fuel, press and hold the start button for 30 seconds to purge air from the fuel line.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 2. Yes – Operate burner as normal.

TROUBLESHOOTING PROCEDURE – CONTINUED**STEP**

2. Do the sub steps below:

- a. Retry starting burner by pressing and releasing start button. If the burner goes out cleanly after a few seconds, the flame sensor is probably bad.
- b. Test flame sensor IAW WP 0019. The most likely cause of ER01 is a dirty nozzle. If there is some fuel mist spraying from nozzle, but the flame does not sustain itself, replace the nozzle IAW WP 0022.
- c. Test air filter IAW WP 0020 and/or change fuel filter IAW WP 0026.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 3. Yes – Operate burner as normal.

STEP

3. Do the sub steps below:

- a. Too many MBUs may be hooked up to the power converter, or the power converter has overheated. Decrease number of MBUs on power converter.
- b. Check battery pack state of charge indicator. Recharge battery pack if necessary or refer to generator mechanic to adjust generator voltage output.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 4. Yes – Operate burner as normal.

STEP

4. Check for flame in burner well or burner tube. If present, extinguish flame or let it burn out if the fire does not present a safety hazard.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 5. Yes – Operate burner as normal.

STEP

5. Have a qualified maintainer check voltage and grounding of power supply.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 6. Yes – Operate burner as normal.

STEP

6. Do the sub steps below:

- a. The most likely cause is a bad connection. Check vent valve assembly connections.
- b. If problem persists, replace the vent valve IAW WP 0023.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 7. Yes – Operate burner as normal.

TROUBLESHOOTING PROCEDURE – CONTINUED**STEP**

7. Do the sub steps below:

- a. Press STOP button and wait five seconds, then proceed with operation.
- b. If error persists, verify you are entering a valid key combination.
- c. If you are entering a valid key combination and the error code is still present, replace the controller assembly IAW WP 0017.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 8. Yes – Operate burner as normal.

STEP

8. Check connections for the fuel solenoid valve and the vent solenoid valve. Make sure they are plugged in properly and the color coding of the wires on both connectors match.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 9. Yes – Operate burner as normal.

STEP

9. Do the sub steps below:

- a. Check wire connections to ensure they are tight.
- b. Check the colors of the wires from matching connectors, they should match. If necessary, replace air/fill solenoid valve IAW WP 0019.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 10. Yes – Operate burner as normal.

STEP

10. Do the sub steps below:

- a. Ensure compressor connectors are tight and color coding of wires on both connectors matches.
- b. If the connection is not the problem, replace compressor IAW WP 0018.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 11. Yes – Operate burner as normal.

STEP

11. Replace igniter IAW WP 0021.

CONDITION

Does burner start and keep operating?

DECISION

NO – Step 12. Yes – Operate burner as normal.

TROUBLESHOOTING PROCEDURE – CONTINUED**STEP**

12. Replace controller assembly IAW WP 0017.

CONDITION

Does burner start and keep operating?

DECISION

NO – Replace MBU. Yes – Operate burner as normal.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE
TROUBLESHOOTING PROCEDURES
BURNER WILL NOT REFUEL

INITIAL SETUP:

Tools and Special Tools

MBU Tool Kit (WP 0073, Item 1)

Personnel Required

Food Service Specialist 92G

References

WP 0002, WP 0017, WP 0018, WP 0023

Equipment Condition

MBU Set up and ready to operate (WP 0005)

TROUBLESHOOTING PROCEDURE

BURNER WILL NOT REFUEL

STEP

1. Press stop button, wait 5 seconds, then reattempt refueling.

CONDITION

Will the burner refuel?

DECISION

NO – Step 2. Yes – Operate burner as normal.

STEP

2. When refueling the burner and it will not take fuel, check the following steps first:
 - a. Make sure the fuel can is full with JP8.
 - b. Make sure the fuel connectors are fully engaged.
 - c. Make sure the fuel cap is in place with a good gasket.

CONDITION

Will the burner refuel?

DECISION

NO – Step 3. Yes – Operate burner as normal.

TROUBLESHOOTING PROCEDURE – CONTINUED**NOTE**

If none of the above faults are identified, the controller will display the following error codes for the condition of “Burner Will Not Refuel”:

1. ER03 indicates an under voltage condition.
2. ER04 is shown when the refueling process takes longer than four minutes.
3. ER05 indicates a flame detected prior to start-up.
4. ER06 or ER09 indicate fault in the connectors to vent valve assembly.
5. ER07 means buttons were pressed out of sequence.
6. ER11 indicates fault in the connectors to compressor assembly.
7. For ER80, ER81, and ER82 indicate controller assembly malfunction.

STEP

3. Do the sub steps below:
 - a. Make sure the fuel can is full with JP8.
 - b. Make sure the white dip tube is in place on the suction feed adapter and it reaches the fuel.
 - c. Check fuel can vent valve.

CONDITION

Will the burner refuel?

DECISION

NO – Step 4. Yes – Operate burner as normal.

STEP

4. Push fuel connectors completely on. Fuel connectors should hold tight when pulled on.

CONDITION

Will the burner refuel?

DECISION

NO – Step 5. Yes – Operate burner as normal.

STEP

5. Do the sub steps below:
 - a. Inspect gasket on burner fuel tank and replace if necessary.
 - b. Tighten fuel cap.

CONDITION

Will the burner refuel?

DECISION

NO – Step 6. Yes – Operate burner as normal.

STEP

6. Do the sub steps below:
 - a. There are too many burners operating from the power supply or battery pack.
 - b. Battery pack may require recharging.
 - c. Decrease number of burners on power supply or recharge battery pack.
 - d. Generator may not be outputting correct voltage. Have generator serviced.
 - e. If no fault can be found with the power supply, replace controller assembly IAW WP 0017.

CONDITION

Will the burner refuel?

DECISION

NO – Step 7. Yes – Operate burner as normal.

TROUBLESHOOTING PROCEDURE – CONTINUED**STEP**

7. Do the sub step below:
- Make sure connectors to vent valve assembly are pushed in all the way and color coding on wires match.

CONDITION

Will the burner refuel?

DECISION

NO – Step 8. Yes – Operate burner as normal.

STEP

8. Check vent valve assembly IAW WP 0023. Replace if necessary.

CONDITION

Will the burner refuel?

DECISION

NO – Step 9. Yes – Operate burner as normal.

STEP

9. Check for flame in burner well or burner tube. Extinguish flame or let it burn out if the fire does not present a safety hazard.

CONDITION

Will the burner refuel?

DECISION

NO – Step 10. Yes – Operate burner as normal.

STEP

10. This fault can also occur when the power supply is not grounded properly. Have qualified person check grounding of power supply.

CONDITION

Will the burner refuel?

DECISION

NO – Step 11. Yes – Operate burner as normal.

STEP

11. Press stop button, wait 5 seconds, then reattempt refueling.

CONDITION

Will the burner refuel?

DECISION

NO – Step 12. Yes – Operate burner as normal.

STEP

12. Do the sub steps below:
- Ensure connectors to compressor assembly (see WP 0002, Figure 1, Item 17) are secure and color coding on wires match.
 - If this does not solve the problem, replace compressor assembly IAW WP 0018.

CONDITION

Will the burner refuel?

DECISION

NO – Step 13. Yes – Operate burner as normal.

TROUBLESHOOTING PROCEDURE – CONTINUED**STEP**

13. Replace controller assembly IAW WP 0017.

CONDITION

Will the burner refuel?

DECISION

NO – Replace MBU. Yes – Operate burner as normal.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

**TROUBLESHOOTING PROCEDURES
BURNER RUNS POORLY BUT DOES NOT SHUT DOWN**

INITIAL SETUP:

Tools and Special Tools

MBU Tool Kit (WP 0073, Item 1)

Personnel Required

Food Service Specialist 92G (1)

References

WP 0017, WP 0018, WP 0020, WP 0022
WP 0026

Equipment Condition

MBU Set up and ready to operate (WP 0005)

TROUBLESHOOTING PROCEDURE

BURNER RUNS POORLY BUT DOES NOT SHUT DOWN

STEP

1. Do the sub steps below:
 - a. Operate the burner on low for 15 minutes. If the buildup is minor, it will burn off.
 - b. If carbon build up does not burn off, turn the burner off, let cool, and stand on back end. The burner tube can then be rinsed out with a hose.

CONDITION

Will the burner run correctly?

DECISION

NO – Step 2. Yes – Operate burner as normal.

TROUBLESHOOTING PROCEDURE – CONTINUED**CAUTION**

When rinsing burner tube, do not use a high pressure washer and only spray water into the burner tube.

NOTE

- Carbon buildup in the burner tube is normal, but excessive amounts can cause malfunctioning. Carbon is usually burned off when the burner is operated at low, but if the burner is operated on high for extended periods, excessive amounts of carbon can build up.
- When the burner runs poorly but does not shut down, check for and correct the following items:
 1. Carbon buildup in the burner tube.
 2. Burner sputters.
 3. Clogged air filter.
 4. Clogged fuel filter.
 5. Clogged fuel nozzle
 6. Faulty compressor.
 7. Burner requires recalibration.

STEP

2. Test the air filter IAW WP 0020. Replace an air filter that fails test.

CONDITION

Will the burner run correctly?

DECISION

NO – Step 3. Yes – Operate burner as normal.

STEP

3. Replace the fuel nozzle IAW WP 0022.

CONDITION

Will the burner run correctly?

DECISION

NO – Step 4. Yes – Operate burner as normal.

STEP

4. Replace the fuel filter IAW WP 0026.

CONDITION

Will the burner run correctly?

DECISION

NO – Step 5. Yes – Operate burner as normal.

TROUBLESHOOTING PROCEDURE – CONTINUED**STEP**

5. Test the compressor IAW WP 0018. Replace the compressor if the test fails.

CONDITION

Will the burner run correctly?

DECISION

NO – Step 6. Yes – Operate burner as normal.

STEP

6. Calibrate controller IAW WP 0017.

CONDITION

Will the burner run correctly?

DECISION

NO – Step 7. Yes – Operate burner as normal.

STEP

7. Adjust flame to eliminate sputtering.

CONDITION

Will the burner run correctly?

DECISION

NO – Return burner for replacement. Yes – Operate burner as normal.

END OF TASK

END OF WORK PACKAGE

CHAPTER 4

OPERATOR MAINTENANCE INSTRUCTIONS
FOR
MODERN BURNER UNIT
AND
MODERN BURNER UNIT-V3

OPERATOR AND FIELD MAINTENANCE**PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION**

GENERAL

The following information describes PMCS procedures for the Modern Burner Unit (MBU). The PMCS table has been provided to ensure the MBU is in proper operating condition, and ready for use.

SCOPE

The following work package (WP 0013) contains maintenance procedures that are authorized by the Maintenance Allocation Chart (MAC), and the Source, Maintenance, and Recoverability (SMR) coded items that are identified in the Repair Parts and Special Tools List (RPSTL).

MAINTENANCE FUNCTIONS/PROCEDURES

The work packages above identify maintenance functions specified in the MAC. All maintenance procedures required to complete a maintenance function are identified under PROCEDURE: in the order in which the work is most logically accomplished.

INTRODUCTION

Preventive Maintenance Checks and Services (PMCS) are performed to keep the Modern Burner Unit (MBU) in good operating condition and ready for its primary mission. The checks are used to find, correct, and report problems. PMCS is performed every day the Modern Burner Unit (MBU) is in operation, and is done according to the PMCS table provided. Pay attention to **WARNING**, **CAUTION**, and **NOTE** statements. A **WARNING** indicates that someone could be hurt or killed. A **CAUTION** indicates that equipment could be damaged. A **NOTE** may make your maintenance or repair task easier.

Be sure to perform scheduled PMCS. Always perform PMCS in the same order so it becomes habit. With practice, you will quickly recognize problems with the equipment.

Use DA Form 2404 or DA Form 5998, Equipment Inspection and Maintenance Worksheet, to record any discovered faults. Do not record faults that you fix.

PMCS PROCEDURES

Table 1 lists inspections and care required to keep your equipment in good operating condition. It is arranged so that you can perform before operation checks as you walk around the equipment.

Explanation of Table 1 Columns

Item Number. Indicates the reference number. When completing DA Form 2404 or DA Form 5998, Equipment Inspection and Maintenance Worksheet, include the item number for the item to check/service indicating a fault. Item numbers appear in the order you must perform the checks/services listed.

Interval. Indicates when you must perform the procedure in the procedure column.

- before** - perform before equipment operation
- during** - perform during equipment operation
- after** - perform after equipment has been operated
- weekly** - perform every week
- monthly** - perform each month
- hours** - perform at the noted hourly interval

PMCS PROCEDURES – CONTINUED

Item to Check/Service. Indicates the item to be checked or serviced.

Procedure. Indicates the procedure you must perform on the item listed in Item to Check/Service column. You must perform the procedure at the time specified in the Interval column.

Not Fully Mission Capable If: Indicates faults that will prevent your equipment from performing its primary mission. If you perform procedures listed in Procedure column that show faults listed in this column, do not operate the equipment. Follow standard procedures for maintaining the equipment or reporting equipment failure.

Other Special Entries. Observe all special information and notes that appear in Table 1.

When a check/service procedure is required for both weekly and before intervals, it is not necessary to perform the procedure twice if the equipment is operated during the weekly period.

LEAKAGE DEFINITION FOR PERFORMING PMCS

It is necessary for you to know how fluid leakage affects the status of the equipment. The following are the types/classes of leakage an operator needs to know to be able to determine the status of the fuel system. Learn these leakage definitions and remember - when in doubt, notify your supervisor.

CAUTION

Equipment operation is allowable with minor leakages (Class I or II). Of course, consideration must be given to safety of personnel and equipment. When in doubt, notify your supervisor.

Class III leaks, cease all operations and report immediately to your supervisor.

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 item being checked/inspected.

Class III - Leakage of fluid great enough to form drops that fall from items being checked/inspected.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

INITIAL SETUP:**Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Personnel Required

Food Service Specialist 92G (1)
MOS Non-specific (1)

Materials/ Parts

Brush, Acid Swabbing (WP 0072, Item 2)
Rag, Wiping (WP 0072, Item 5)

References

DA Form 2404 or 5988E
DA PAM 750-8
WP 0007, WP 0020, WP 0021, WP 0022
WP 0026

INTRODUCTION

Preventive Maintenance Checks and Services (PMCS) are performed to keep the MBU and its associated equipment in good operating condition. The checks are used to find, correct, or report problems. Operator personnel are to do the PMCS jobs as shown in the PMCS table. PMCS are done every day the MBU is operated, using the PMCS table. Pay attention to **WARNING** and **CAUTION** statements. A **WARNING** means someone could be hurt. A **CAUTION** means equipment could be damaged.

Before you begin using the MBU, do **Before PMCS**.

During use of the MBU, do **During PMCS**.


After using the MBU, do **After PMCS**.

If you find something wrong when performing PMCS, fix it using troubleshooting and/or maintenance procedures.

The right-hand column of the PMCS table lists conditions that make the MBU not fully mission capable. Write up the faults that cannot be repaired on DA Form 2404 or 5988E. For further information on how to use this form, see DA PAM 750-8.

If tools required to perform PMCS are not listed in procedures, notify your supervisor.

Table 1. Preventive Maintenance Checks and Services for MBU.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Before/ During/ After	MBU	<p style="text-align: center;">WARNING</p>  <p>The MBU weighs approximately 58 pounds (26.3 kg) fully fueled. Two persons must carry the MBU when fully fueled. Lift with legs, not back, to prevent injury.</p> <p>Inspect frame (Figure 1, Item 1) for damage, such as bent frame members, cracks, dents or broken welds. Check for damage to fuel connection (Figure 1, Item 2) and power connector (Figure 1, Item 3). Check burner well (Figure 1, Item 4) for debris or food waste. Inspect fuel lines (Figure 1, Item 5) for leaks. Check control panel (Figure 1, Item 6) for damage. Check fuel cap (Figure 1, Item 7) to ensure the gasket is serviceable and in place and the cap is tight. Check fuel hoses and wiring to ensure they are securely connected and not damaged.</p>	<p>Broken frame weld, fuel quick connect or power connector damaged or not secure. Food waste or debris in burner well. Fuel leak or control panel damaged.</p>

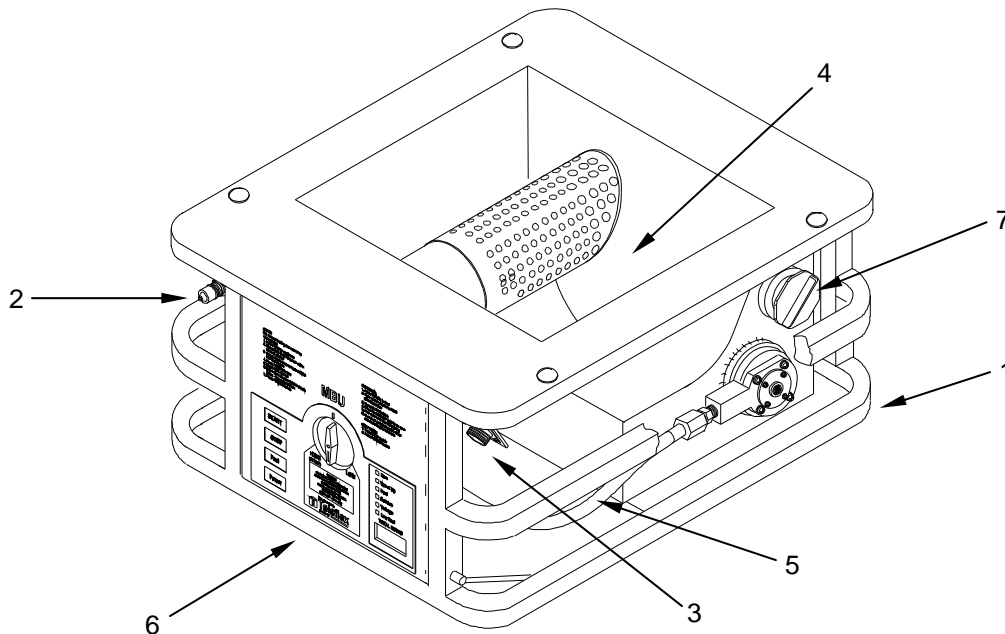


Figure 1. MBU "Before Operation" PMCS.

Table 1. Preventive Maintenance Checks and Services for MBU – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOTREADY/ AVAILABLE IF:
2	Before	Power Converter	<p>Power Converter turned OFF.</p> <p>Visually inspect the converter (Figure 2, Item 1) for external damage, missing or frayed power cord (Figure 2, Item 2), damaged control panel (Figure 2, Item 3), connectors (Figure 2, Item 4), or power switch.</p>	<p>Converter damaged, cooling fins bent, power cord missing or frayed, control panel or power connectors damaged.</p>

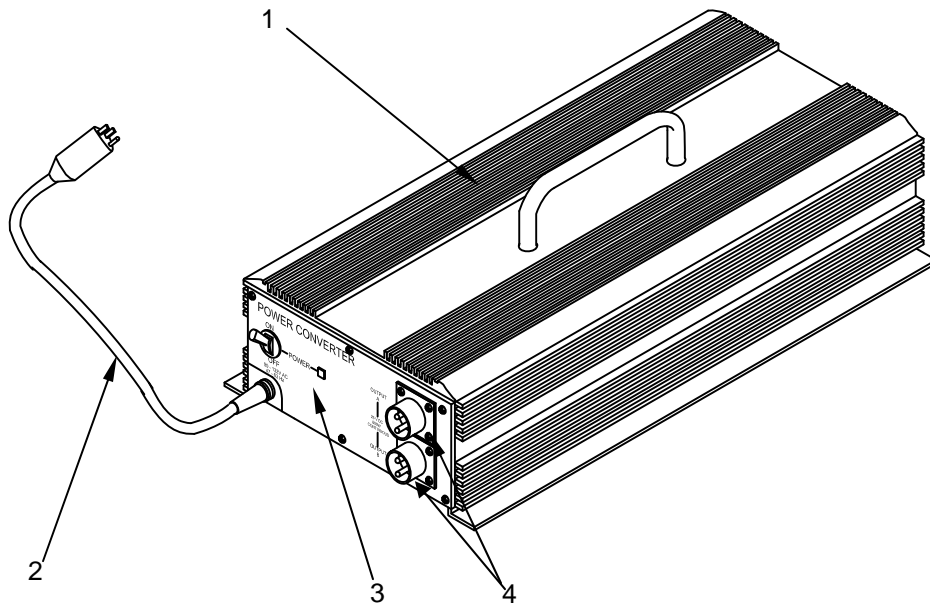



Figure 2. Power Converter “Before Operation” PMCS.

Table 1. Preventive Maintenance Checks and Services for MBU – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
3	Before	Battery Pack	<p style="text-align: center;">WARNING</p>  <p>The Battery Pack weighs approximately 93 pounds (42.2 kg). Two persons must carry the Battery Pack. Lift with legs, not back, to prevent injury.</p> <p>Inspect battery pack cover (Figure 3, Item 1), control panel (Figure 3, Item 2), and power connectors (Figure 3, Item 3) for damage. Check condition and charge status of batteries (Figure 3, Item 4). Flip selector to "RUN" and observe charge status.</p>	Control panel or power connectors damaged. Battery charge less than 40%.

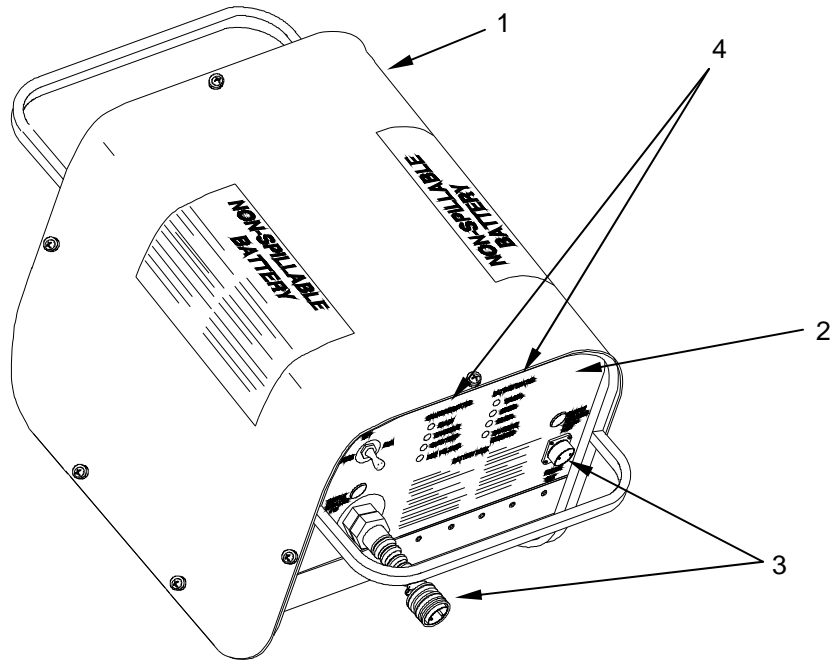


Figure 3. Battery Pack "Before Operation" PMCS.

Table 1. Preventive Maintenance Checks and Services for MBU – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
4	Before	110VAC, 24VDC extension and branch cables. NATO adapter cable.	Inspect the power cables for frayed cable and damaged or dirty connectors.	Frayed cable. Missing or damaged power connectors.

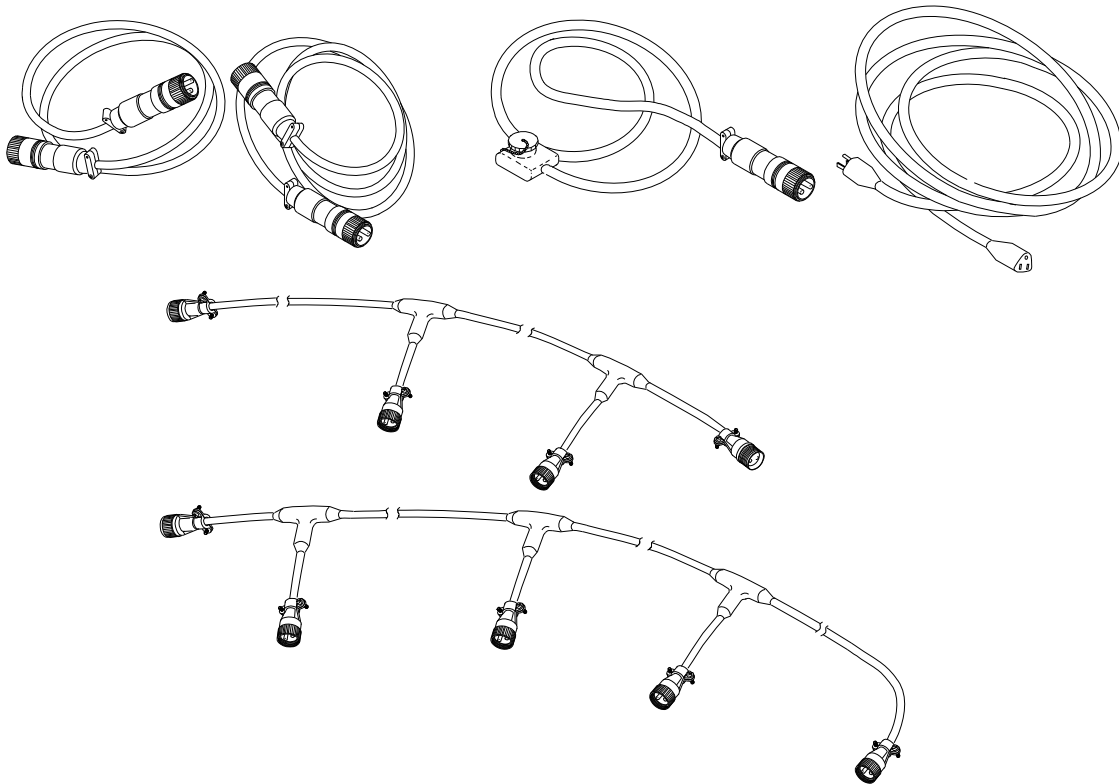



Figure 4. System Cables “Before Operation” PMCS.

Table 1. Preventive Maintenance Checks and Services for MBU – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
4	Before	Fuel Can Adapter and Fuel Hose removed from fuel can.	<p style="text-align: center;">WARNING</p> <div style="text-align: center;">  </div> <p>Fuel is toxic and highly flammable. Wear protective gloves and be sure to wipe up any spills with rags. Dispose of rags in accordance with Unit SOP and local environmental regulations. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Failure to observe this warning may cause injury or death to personnel.</p> <p>Inspect the Fuel Can Adapter (Figure 5, Item 1) for cracks. Inspect the gasket inside the adapter (Figure 5, Item 2) for any cracks that would prevent a proper seal. Inspect the hose (Figure 5, Item 3) and fuel connector (Figure 5, Item 4) at the top of the adapter to ensure that they are securely connected and that the hoses are not cracked or otherwise damaged. If equipped, check the condition of the manual relief valve (Figure 5, Item 5) for proper operation.</p> <p>Inspect the Fuel Hose (Figure 5, Item 6) for any cracking or other deterioration that would cause the hose to leak. Check the condition of the connection (Figure 5, Item 7) between the hose and the QD fitting (Figure 5, Item 8) for a secure seal.</p>	<p>Cracked or leaking fuel can adapter housing; cracked, cut, or leaking hose; broken vent cap; broken QD connector.</p> <p>Cut, cracked or leaking fuel hose. Broken QD fittings.</p>

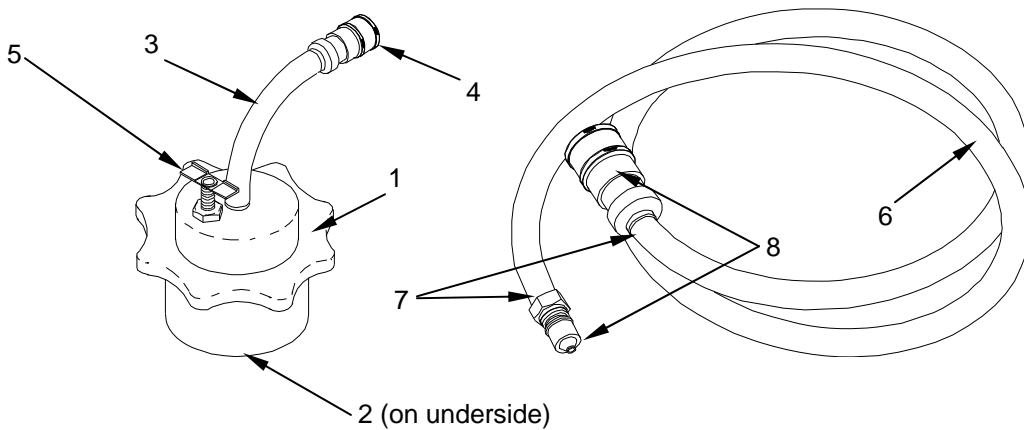



Figure 5. Fuel Can Adapter and Fuel Hose “Before Operation” PMCS.

Table 1. Preventive Maintenance Checks and Services for MBU – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
5	During	MBU and Battery Pack. MBU system in operation.	<p style="text-align: center;">WARNING</p>  <p>Use caution when performing maintenance tasks on an operating burner. Serious injury or death from burns may result if safety precautions are not observed.</p> <p>Monitor the control panel (Figure 6, Item 1) of the MBU for any fault indicators lit up. Respond as described in WP 0007. Check battery charge (Figure 6, Item 2) frequently. Recharge as necessary by leaving charger connected to power. Check charging status indicators (Figure 6, Item 3) for Over-temp or Low Charging Voltage fault indicator.</p>	<p>MBU out of fuel. Battery charge less than 40%.</p> <p>Battery Over-Temp indicator lit. Indicator lit. Low Charging Voltage.</p>

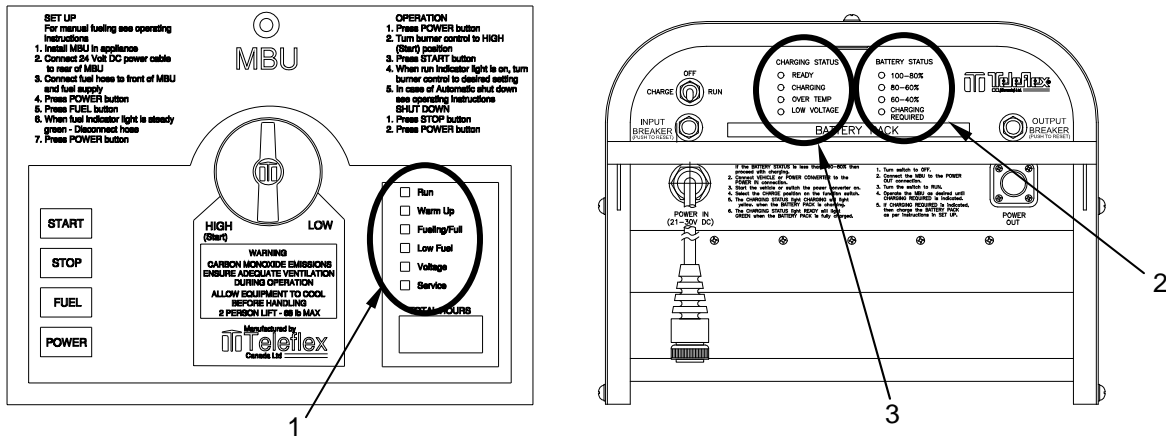




Figure 6. MBU and Battery Pack “During Operation” PMCS.

Table 1. Preventive Maintenance Checks and Services for MBU – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
6	After	MBU and Battery Pack. MBU System shut down and cooled off.	<p style="text-align: center;">WARNING</p>  <p>Let the MBU cool down before performing After Operation PMCS. Serious injury or death from burns may result if safety precautions are not observed.</p> <p style="text-align: center;">WARNING</p>  <p>The Battery Pack and MBU weigh approximately 93 and 58 pounds respectively. Two persons must carry each unit. Lift with legs, not back, to prevent injury.</p> <p>Inspect the MBU burner well (Figure 7, Item 1) for spilled food waste.</p> <p>Check the MBU for evidence of fuel leaks (Figure 7, Item 2).</p> <p>Check Regulator Assembly Air Vent (Figure 7, Item 3), and clean if necessary. Check Vent Valve Assembly Orifice and filter (Figure 7, Item 4), and clean if necessary.</p> <p>Flip selector to “RUN” and check the battery charge (Figure 8, Item 1). Clean equipment components and re-charge batteries if necessary by leaving battery pack connected to power. Check cables for any damage, and replace if necessary.</p>	<p>MBU burner well dirty.</p> <p>Any fuel leaks in MBU.</p> <p>Clogged Fuel Regulator or Vent Valve Assembly Orifice air vents.</p> <p>Battery charge less than 40%. Cables damaged.</p>

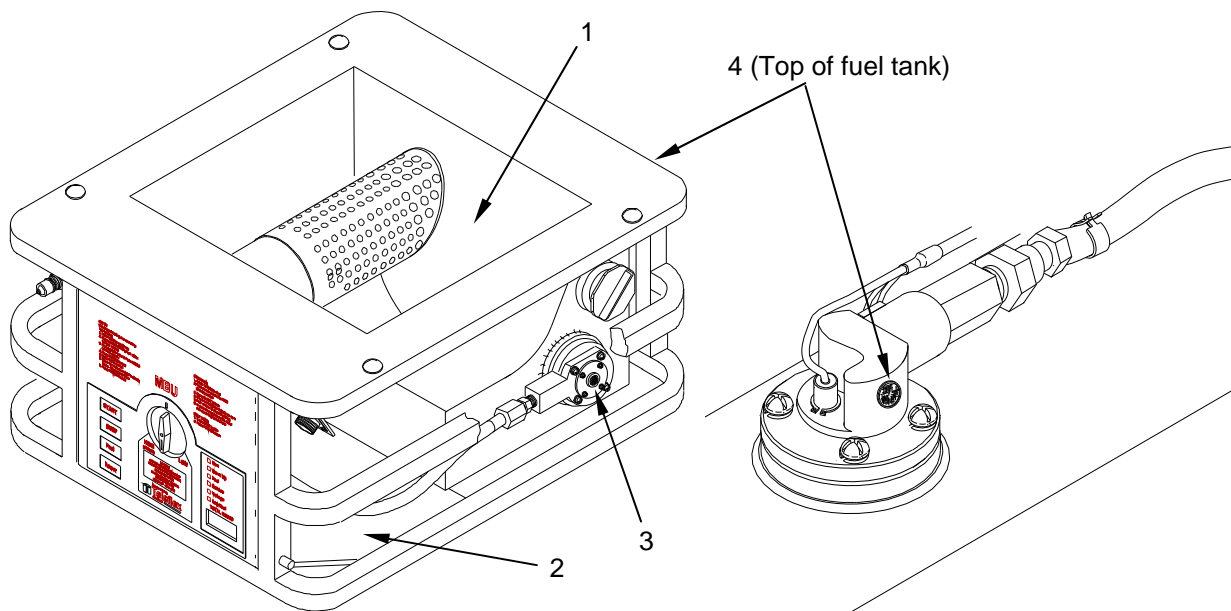


Figure 7. MBU “After Operation” PMCS.

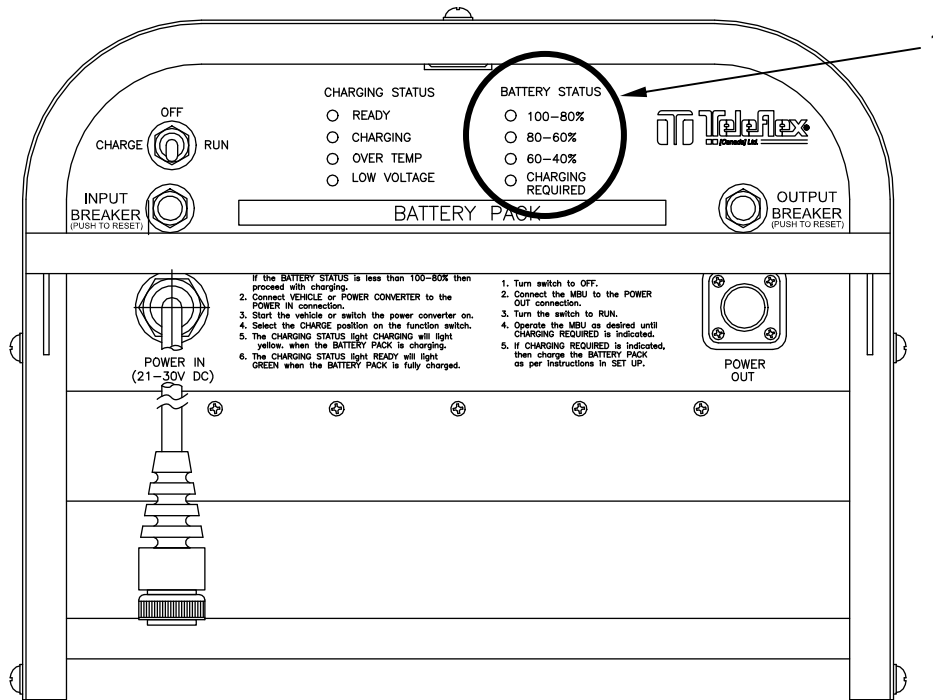


Figure 8. Battery Pack "After Operation" PMCS.

Table 1. Preventive Maintenance Checks and Services for MBU – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
7	300 Hours	Air Inlet Filter. Fuel Filter.	Replace the air filter IAW WP 0020. Replace the fuel filter IAW WP 0026.	Damaged or excessively worn air inlet filter or fuel filter preventing proper operation.
8	2000 Hours	Igniter Fuel Nozzle	Replace the igniter IAW WP 0021. Replace the fuel nozzle IAW WP 0022.	Damaged or excessively worn igniter or fuel nozzle preventing proper operation.

Table 2. PMCS Mandatory Replacement Parts.

Item No.	Part Number/ (CAGEC)	National Stock Number (NSN)	Nomenclature	Qty
300 HOURS				
1	349930K	7310-01-462-4913	Filter, Air Inlet	1
2	953451K	7310-01-462-6765	Fuel Filter, Pickup (In-Tank Filter)	1
2000 HOURS				
3	980260K	7310-01-462-4915	MBU Assembly, Igniter	1
4	928329K	7310-01-462-4919	Fuel Nozzle Assembly	1

Lubrication Instructions

There are no specific lubrication instructions required for the operation and maintenance of the MBU.

END OF WORK PACKAGE

OPERATOR MAINTENANCE**MBU
SERVICE**

INITIAL SETUP:**Materials/Parts**

Absorbent Material (WP 0072, Item 1)
Rag, Wiping (WP 0072, Item 5)

Personnel Required

Food Service Specialist 92G (1)
MOS Non-specific (1)

Equipment Condition

MBU shut down and cool (WP 0005)

SERVICE**Drain the Fuel Tank**

The fuel tank should be drained prior to any service operation that would cause fuel to leak from the system. The tank must also be drained prior to sending to Field or Support Maintenance.

WARNING

Have rags on hand to clean up fuel spillage that may occur, to prevent contamination. Do not perform this procedure near an open flame, to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Place MBU on its left side so the fuel tank fill cap (Figure 1, Item 1) is on top.
2. Connect the fuel hose (Figure 1, Item 2) to the fuel fill quick disconnect (Figure 1, Item 3) on the burner, and connect the other end to the fuel can adapter (Figure 1, Item 4). The fuel can (Figure 1, Item 6) must be located close to and lower than the MBU to allow the fuel to drain out. Coil the excess fuel hose and place on table beside MBU.
3. Remove tank fill cap (Figure 1, Item 1). Open manual relief vent (Figure 1, Item 5) on Fuel Can Adapter (Figure 1, Item 4).

SERVICE – CONTINUED**NOTE**

Ensure the fill cap seal (Figure 1, Item 7) is serviceable. The fill cap seal must fully seal for the MBU to operate. Replace a worn or damaged seal.

4. When fully drained, replace fill cap (Figure 1, Item 1) and disconnect fuel hose (Figure 1, Item 2). Close manual relief vent (Figure 1, Item 5).

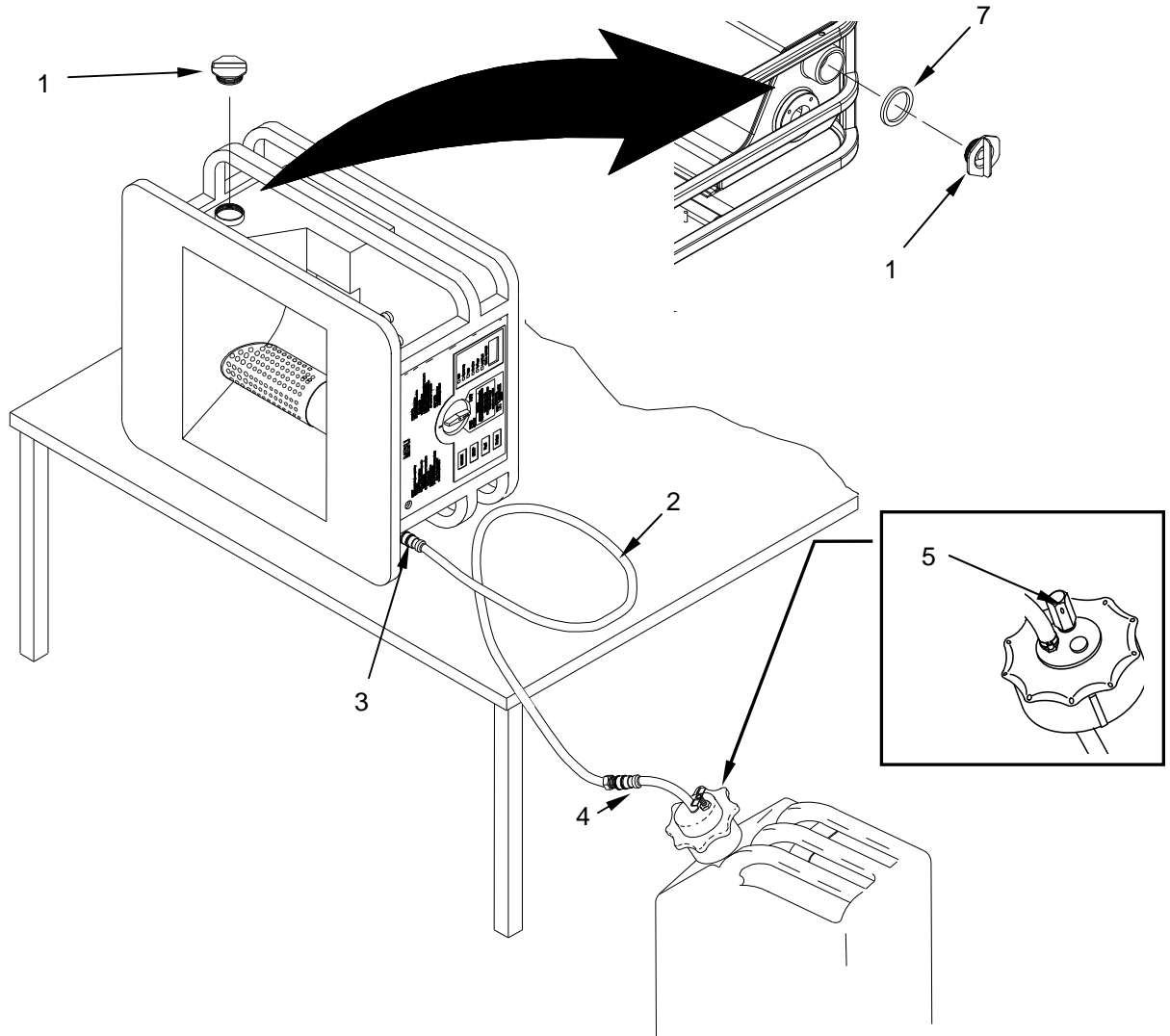


Figure 1. Drain the Fuel Tank.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**CABLE CLIPS
INSPECT, REPLACE**

INITIAL SETUP:**Personnel Required**

Food Service Specialist 92G (1)
MOS Non-specific (1)

Equipment Condition

MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)

References

WP 0037

INSPECT**WARNING**

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures. Failure to observe safety precautions may result in injury or death to personnel.

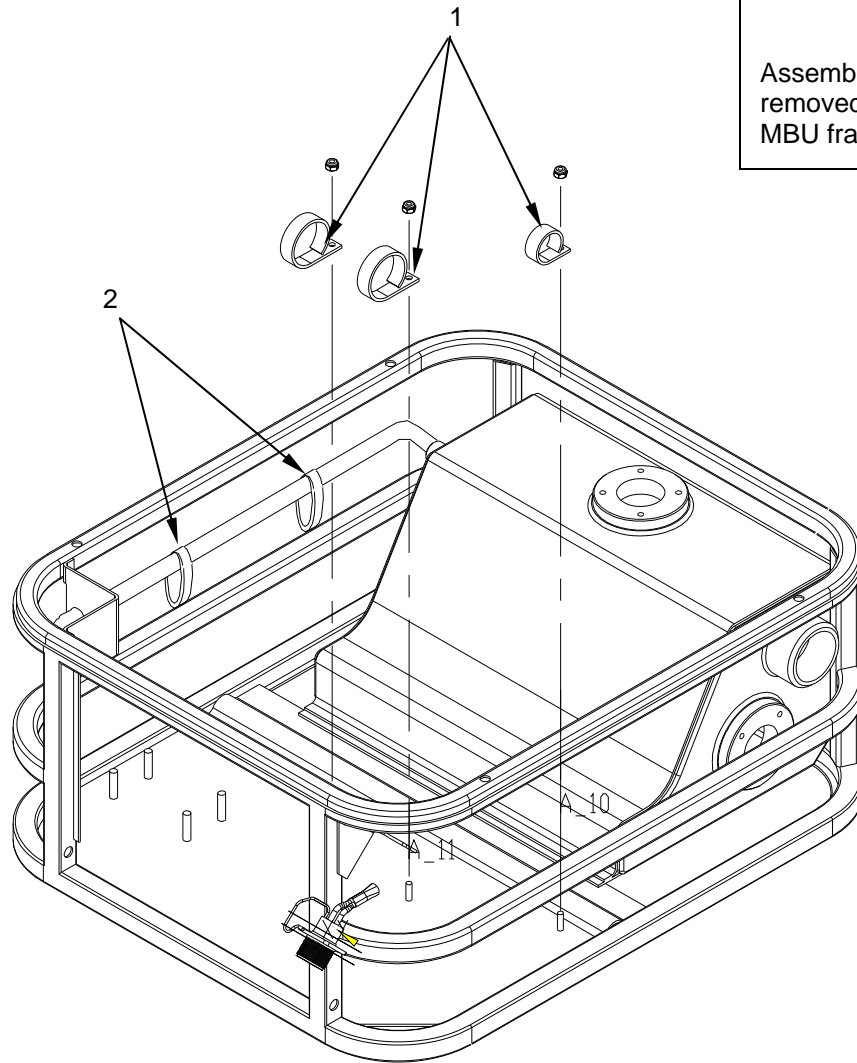
WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

Inspect the Cable Clips and Hose Clamps

1. Inspect each chassis cable clip (Figure 1, Item 1) secured to the MBU frame to ensure that they are not cracked, cut, or otherwise damaged. Refer to field maintenance to replace any unserviceable chassis cable clips IAW WP 0037.
2. Inspect each cable clip (Figure 1, Item 2) securing wires to the copper fuel line to ensure that they are not cracked, cut, or otherwise damaged. Replace any unserviceable cable clips IAW this WP.

INSPECT – CONTINUED



NOTE
Assemblies are shown removed from the MBU frame for clarity.

Figure 1. Inspect Chassis Mounted Cable Clips and Hose Clamps.

END OF TASK

REPLACE**WARNING**

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Locate the two cable clamps (Figure 2, Item 1) that secure the hose and electrical wires to the fuel line (Figure 2, Item 2).
2. Replace the fuel line cable clamp by removing the damaged clamp.
3. Slide the replacement clamp over the fuel line, hose, and wire assembly.
4. Engage the locking mechanism of the clamp so as to retain the hoses and cables securely without squeezing or otherwise deforming them.

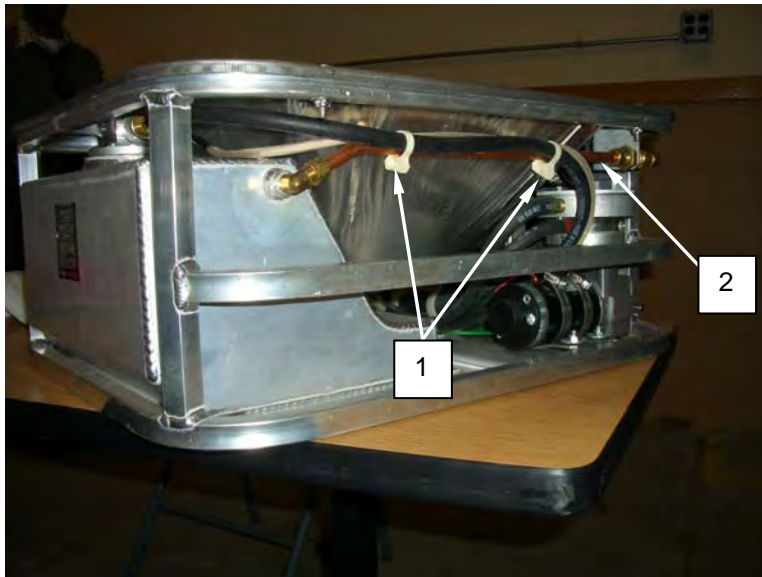


Figure 2. Replace Chassis Mounted Cable Clips and Hose Clamps.

END OF TASK**END OF WORK PACKAGE**

OPERATOR MAINTENANCE

ELECTRICAL CONNECTOR ASSEMBLY
INSPECT

INITIAL SETUP:

Equipment Condition

MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)

Personnel Required

Food Service Specialist 92G (1)
MOS Non-specific (1)

INSPECT

Inspect the Electrical Connector Assembly

WARNING



The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Inspect the electrical connector (Figure 1, Item 1) for dents, loose or missing fasteners, and other damage that may prevent proper connection of a power cable.
2. Follow the wire from the connector and inspect the quick disconnect (QD) (Figure 1, Item 2) connector at the opposite end of the cable for secure connection.

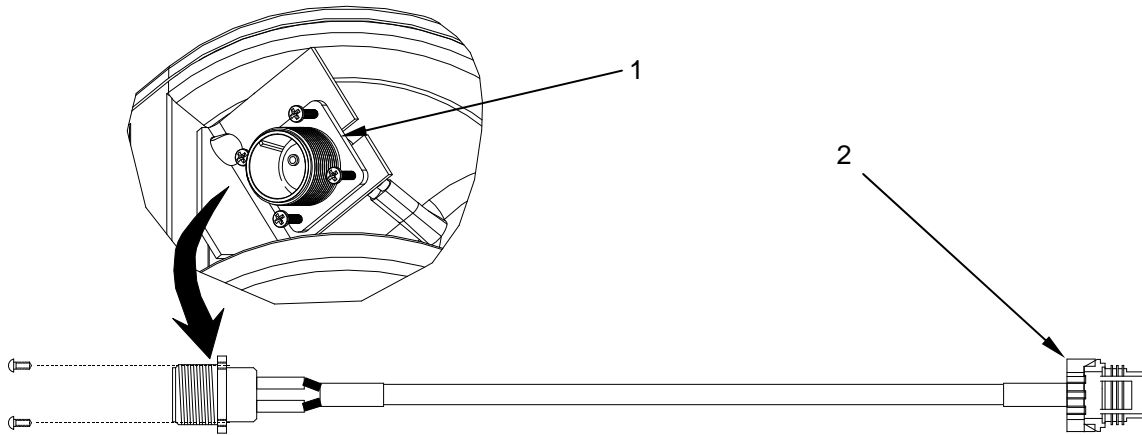


Figure 1. Inspect the Electrical Connector Assembly.

INSPECT – CONTINUED

3. Inspect the connector assembly (Figure 2, Item 2) for loose wires and frayed insulation.



Figure 2. Inspect the Electrical Connector Assembly.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**CONTROLLER ASSEMBLY
INSPECT, CALIBRATE, REPLACE**

INITIAL SETUP:**Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Personnel RequiredFood Service Specialist 92G (1)
MOS Non-specific (1)**References**

WP 0037

Equipment ConditionMBU shut down and cool (WP 0005)
Power disconnected (WP 0005)

INSPECT**Inspect the Controller Assembly**

Procedures for the inspection of the Controller Assembly begin on the next page.

INSPECT – CONTINUED**WARNING**

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Inspect the cross-tip screw head on the face of the locking pawl (Figure 1, Item 1) and attempt to open with a cross-tip screwdriver. If it cannot be opened without the screwdriver slipping and the screw head is worn, the locking pawl will need to be replaced IAW the section of this WP entitled "Replace the Locking Pawl."
2. Inspect condition of controller assembly including the control panel (Figure 1, Item 2), harness and connector housing (Figure 1, Item 3), and hinge pins (Figure 1, Item 4) for damage such as a broken or cracked housing, or loose, missing or bent hinge pins, frayed insulation, loose or exposed wires or broken connector on harness. If there is visible damage which prevents normal operation of the MBU, replace the controller assembly.
3. Connect power.
4. Push the POWER Button (Figure 1, Item 5). The indicator lights will flash on and off for 3 seconds, and the hour meter (Figure 1, Item 6) background light will illuminate. The hour meter will display a series of characters before displaying the actual number of hours the MBU has been in operation. If the background light does not come on, or if the display appears faded, black, or otherwise illegible, replace the controller assembly.
5. Disconnect power.
6. If the pawl operates correctly but does not lock into place, inspect the pawl arm (Figure 1, Item 7) to see if it is straight or excessively worn. If the pawl arm is bent or excessively worn, the locking pawl will need to be replaced IAW the section of this WP entitled "Replace the Locking Pawl."

INSPECT – CONTINUED

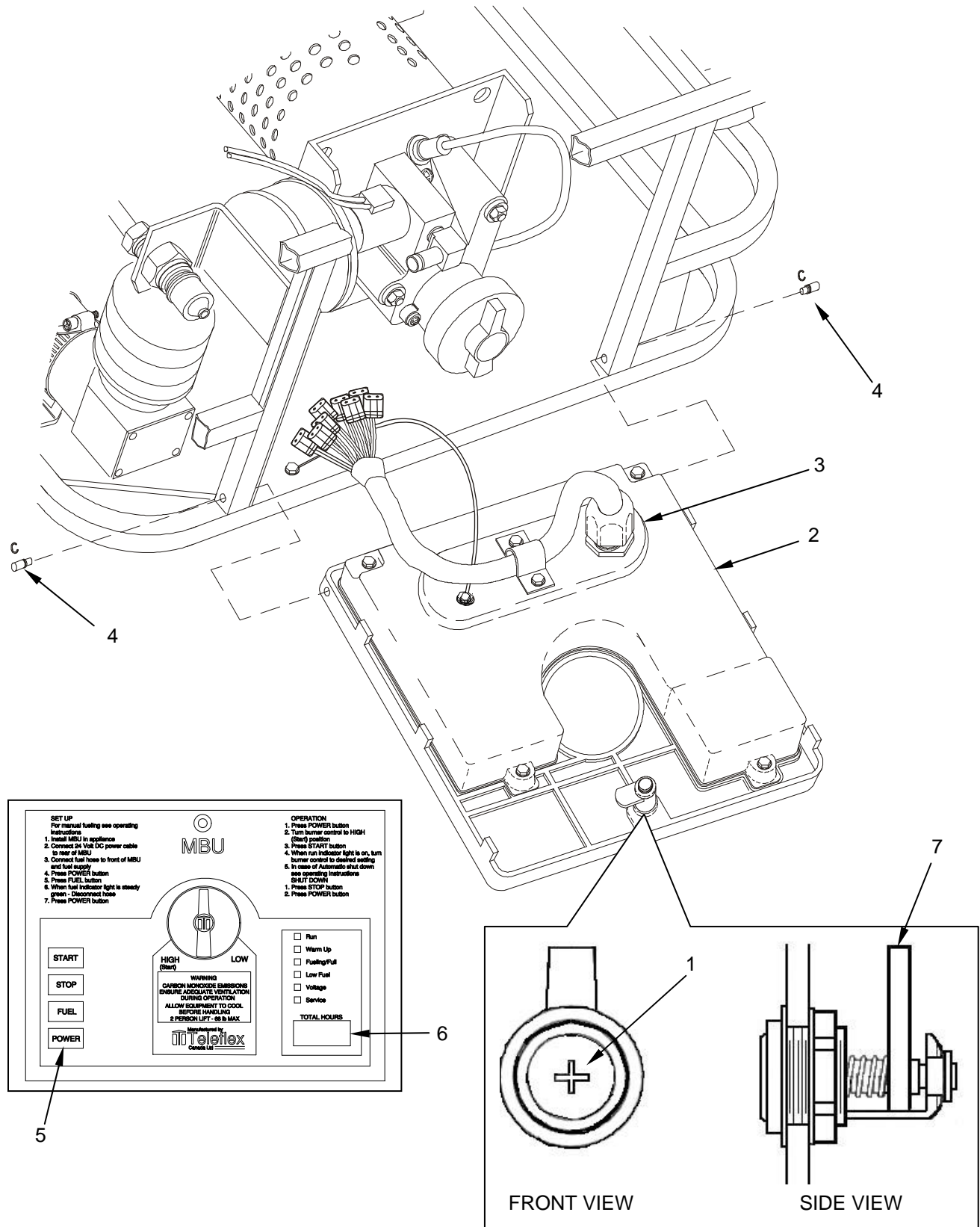


Figure 1. Inspect the Controller Assembly.

END OF TASK

CALIBRATE**Calibrate the Controller Assembly (MBU only)****NOTE**

The calibration procedure outlined below is NOT REQUIRED if the controller assembly software version is 2.0 or higher. The software version is displayed on the liquid crystal display on the lower right front corner of the controller assembly on power-up.

To check the software version, be certain that the MBU is powered down, then press the power button on the front of the MBU. After the normal power-up display sequence, the software version will be displayed if the version is 2.0 or higher. If the software version is NOT displayed on power-up, the calibration procedure detailed below MUST be performed.

If the Calibration function is selected in error (by pressing and holding the Power button longer than 3 seconds), either wait 10 seconds or press the STOP button to return to standby mode.

1. After replacing the controller assembly, perform a calibration procedure by first making sure that the MBU is set up with power connected, powered down, and cool.
2. Press and HOLD the Power button (Figure 2, Item 1) until the power-up routine is complete (approximately 3 seconds) and the hour meter (Figure 2, Item 2) displays "CAL?."
3. Release the Power button (Figure 2, Item 1).
4. Press the Start button (Figure 2, Item 3). The hour meter (Figure 2, Item 2) will display "CAL."
5. Turn the Burner Control Knob (Figure 2, Item 4) through its complete rotation from HIGH (Start) to LOW.
6. Wait approximately 3 seconds for automatic return to standby.

The MBU is now ready to use.

CALIBRATE – CONTINUED

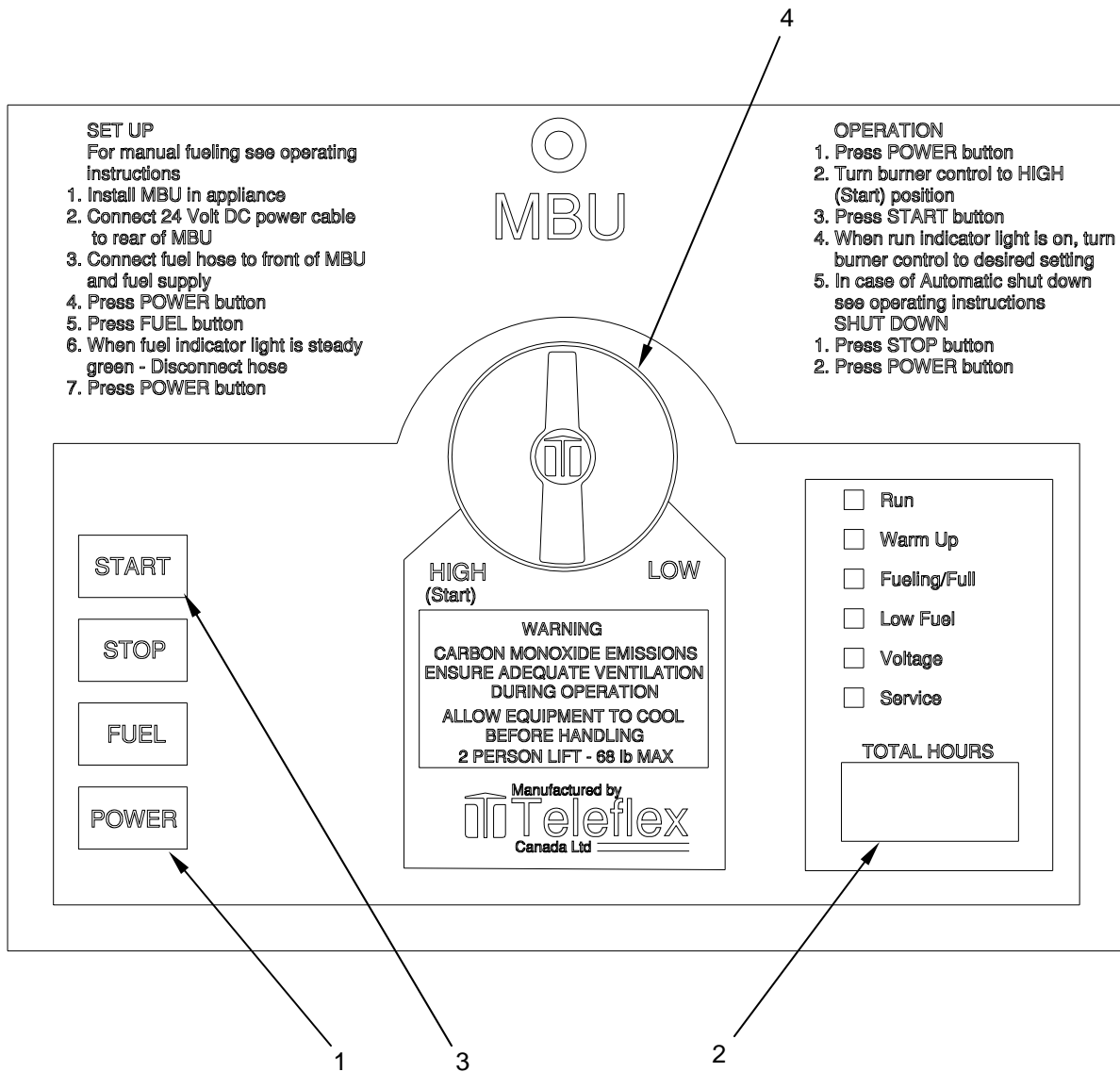


Figure 2. Calibrate the Controller Assembly (MBU only).

END OF TASK

REPLACE**Replace the Controller Assembly**

1. Ensure power is disconnected, and open hinged controller assembly (Figure 3, Item 1).
2. Follow the cable harness (Figure 3, Item 2) from the back of the controller assembly into the MBU. Note that the wires exiting each connector are color coded. Disconnect the eight connectors (Figure 3, Item 3) at the opposite end of the harness.
3. Remove ground screw (Figure 3, Item 4) on door panel using an adjustable wrench.
4. Remove snap rings (Figure 3, Item 5) from hinge pins (Figure 3, Item 6) with flathead screwdriver and remove hinge pins from frame (Figure 3, Item 6).
5. Remove the entire controller assembly (Figure 3, Item 1) from system.

NOTE

The replacement controller assembly may come with replacement hinge pins.

6. To install new hinge pins (Figure 3, Item 6), place controller assembly (Figure 3, Item 1) into position and insert hinge pins through frame (Figure 3, Item 7).
7. Secure hinge pins (Figure 3, Item 6) with snap rings (Figure 3, Item 5).
8. Reinstall the connectors (Figure 3, Item 3) at the end of the controller harness assembly (Figure 3, Item 2). Be sure to follow the color coding of the wires.
9. Attach ground screw to door panel with an adjustable wrench.
10. Close and secure the hinged controller assembly (Figure 3, Item 1).

NOTE

The calibration procedure presented in this WP is NOT REQUIRED if the controller assembly software version is 2.0 or higher. The software version is displayed on the liquid crystal display on the lower right front corner of the Controller Assembly on power-up.

To check the software version, be certain that the MBU is powered down, then press the power button on the front of the MBU. After the normal power-up display sequence, the software version will be displayed if the version is 2.0 or higher. If the software version is NOT displayed on power-up, the calibration procedure detailed below MUST be performed.

If the Calibration function is selected in error (by pressing and holding the Power button longer than 3 seconds), either wait 10 seconds or press the STOP button to return to standby mode.

11. If required, calibrate the controller assembly as described in this WP.

REPLACE – CONTINUED

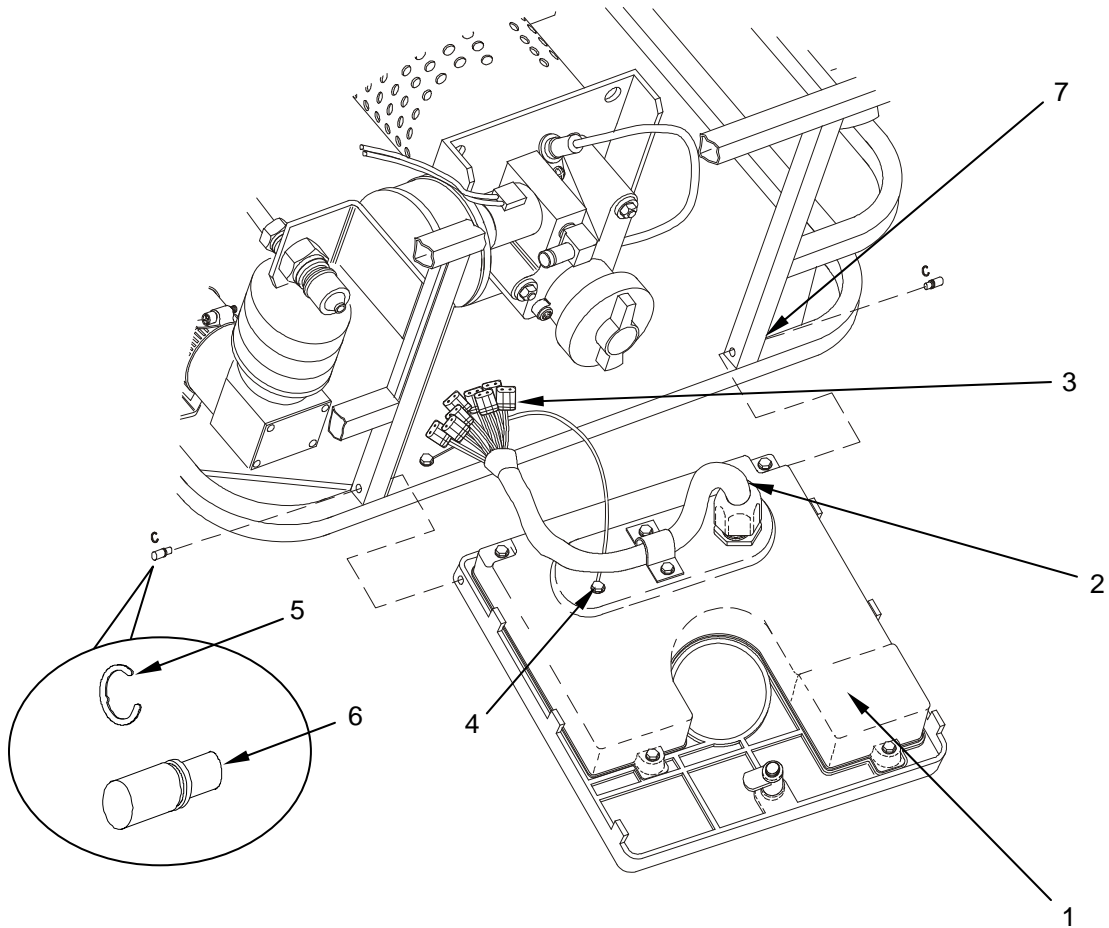


Figure 3. Replace the Controller Assembly.

END OF TASK

REPLACE – CONTINUED**Replace the Locking Pawl**

1. Take note of the position and orientation of the locking pawl before removing. When correctly installed, the pawl should be facing the left and fully extended.
2. Loosen the mounting nut (Figure 4, Item 1) with a suitable wrench.
3. Slide the mounting nut (Figure 4, Item 2) and the lock washer (Figure 4, Item 3) over the end of the pawl body and over the pawl.
4. Withdraw the pawl body and trim washer (Figure 4, Item 4) outwards and pivot to allow the pawl to clear the mounting hole in the controller body.
5. Install the new pawl body and trim washer by pivoting it through the hole in the mounting plate in the controller body (Figure 4, Item 5). Ensure the pawl is in the same position and orientation as noted during disassembly. Ensure the arm is fully extended.
6. Slide the lock washer and the mounting nut over the pawl and onto the pawl body.
7. Position the lock washer and mounting nut over the threaded area and tighten the mounting nut with a suitable wrench.

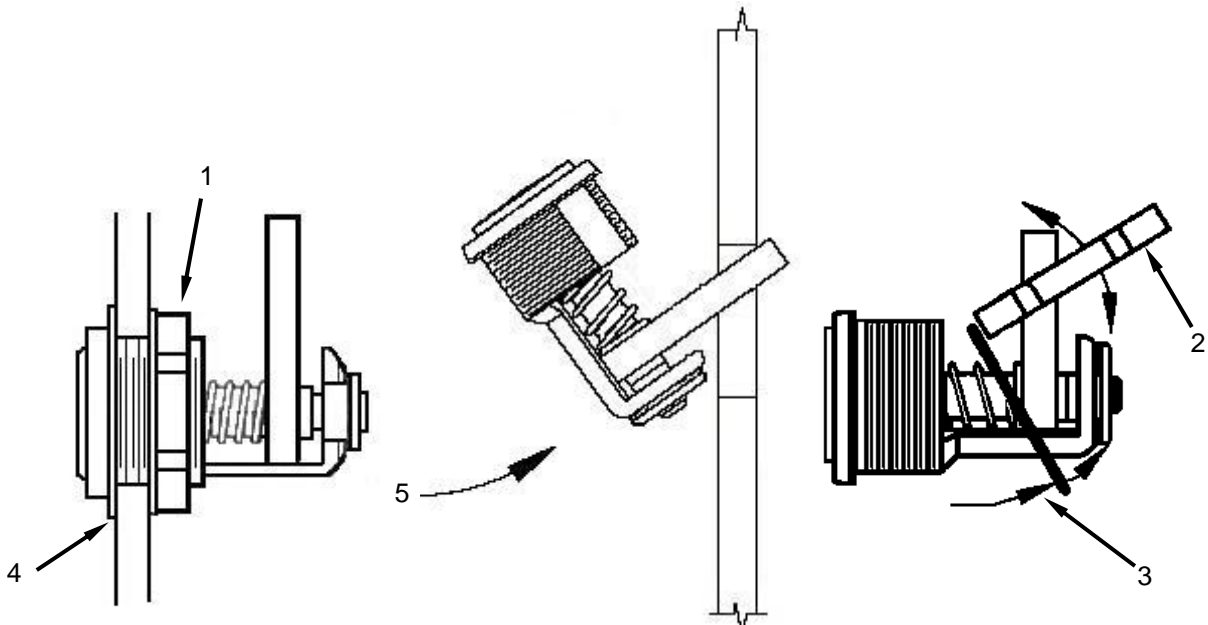


Figure 4. Locking Pawl.

END OF TASK**END OF WORK PACKAGE**

OPERATOR MAINTENANCE**COMPRESSOR ASSEMBLY
INSPECT, TEST, REPLACE****INITIAL SETUP:****Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Personnel Required

MOS Non-specific (2)

Materials/Parts

Rag, Wiping (WP 0072, Item 5)

Equipment Condition

MBU shut down and cool (WP 0005)

Power disconnected (WP 0005)

Fuel tank drained (WP 0014)

References

WP 0005

INSPECT**Inspect the Compressor Assembly****WARNING**

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

Inspect compressor assembly (Figure 1, Item 1) for damage, excessive rust or contamination to the compressor housing, mounting plate, hose clamps, vibration grommets, or mounting hardware. Also inspect the compressor wires for frayed insulation or exposed wires.

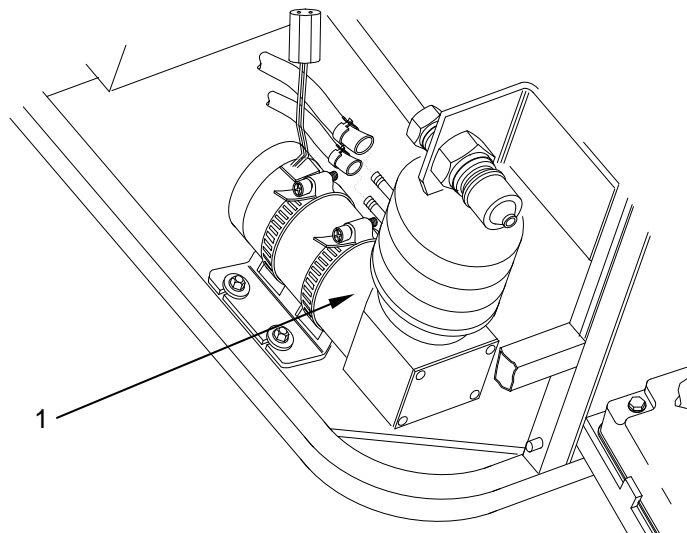


Figure 1. Inspect the Compressor Assembly.

END OF TASK

TEST**Test the Compressor Assembly****WARNING**

Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

1. If necessary to gain access to the compressor assembly, remove the four carriage bolts, washers and self-locking nylon nuts holding the reflective heat shield assembly to the frame. Lift the reflective heat shield assembly away from the MBU frame to gain access to the compressor assembly.

NOTE

The air compressor has two different size hose fittings that accommodate two different size neoprene air hoses. Note that the upper fitting requires a 3/8-inch ID neoprene hose and that the lower fitting requires a 1/4-inch ID neoprene air hose. If the connectors are fused, cut the hose close to the compressor to remove.

2. Disconnect air lines (Figure 2, Item 1) from compressor (Figure 2, Item 2) by compressing the spring clips with a pair of pliers.
3. Connect power to the MBU and press FUEL. The compressor (Figure 2, Item 2) should start, and air should discharge from the compressor air line fittings (Figure 2, Item 3).
4. If air discharges from the compressor air line fittings (Figure 2, Item 3), reconnect the air lines (Figure 2, Item 1) and reassemble the Reflective Heat Shield and Burner Assembly.
5. If the compressor (Figure 2, Item 2) does not start, listen for indications of a locked or damaged compressor, such as a loud humming sound, or uneven or unusually noisy operation. If these indications are present, the compressor must be replaced.
6. If the compressor (Figure 2, Item 2) does not start and there are no indications of mechanical damage to the compressor, disconnect the compressor power wire harness connector (Figure 2, Item 4).

TEST – CONTINUED

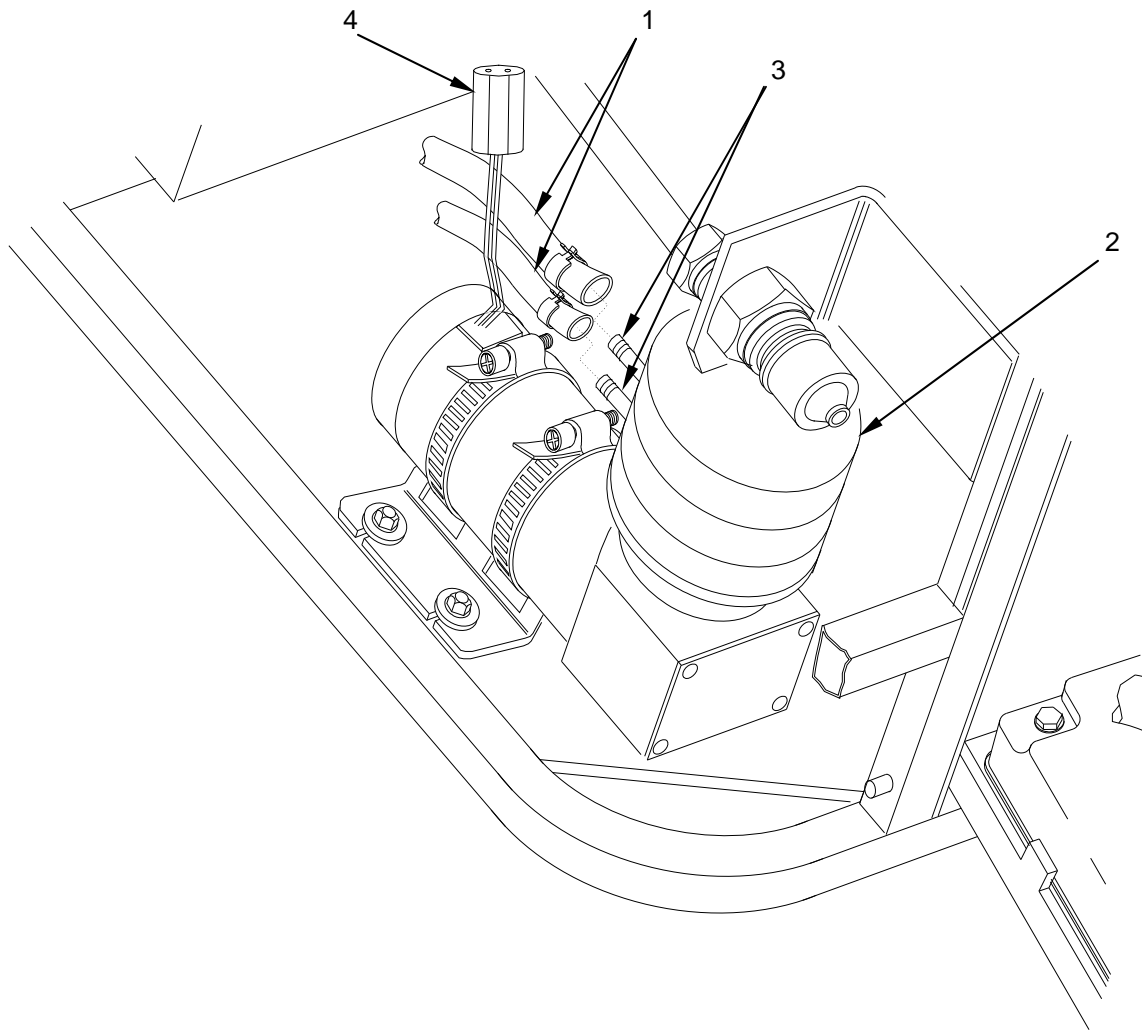


Figure 2. Test the Compressor Assembly.

TEST – CONTINUED

7. Use a multimeter to test for resistance between the two disconnected leads.

NOTE

- You may need to turn on your multimeter before selecting ohms (Ω). On some models, the selector and power switch are combined.
 - Resistance is a measurement of the ability to resist electrical current. The compressor assembly should have some resistance. Infinite resistance or “no continuity” indicates an open circuit and a defective compressor assembly.
- a. Turn the selector to the ohms (Ω) setting. If there is a range of values, select the maximum range or value.
 - b. Connect the red test lead plug to the input terminal labeled for use with volts (V) and ohms (Ω). Your multimeter may have other symbols on this terminal but should at the least have the (V) and (Ω) symbols.
 - c. Connect the black test lead plug to the input terminal labeled for ground or common ground. The symbols (-) or (COM) will be shown on this terminal.
 - d. Place a multimeter lead tip into each of the holes in the disconnected lead plug.
 - e. Hold the leads in place until a steady value can be seen on the display of the multimeter.
 - f. There should be continuity between the two leads and a numeric value should be read on the display. Replace a Compressor Assembly that indicates “no continuity.” No continuity can be identified by the display reading “OL” or “- - - .”
8. Reconnect the compressor power wire harness connector.
 9. Reconnect the air lines to the compressor.
 10. If the reflective heat shield was removed at the beginning of this procedure, install the four carriage bolts, washers, and self-locking nylon nuts securing the reflective heat shield assembly to the frame.
 11. Operate the MBU IAW procedures given in WP 0005 and monitor for normal operation.

END OF TASK

REPLACE**Replace the Compressor Assembly****WARNING**

Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

1. If necessary to gain access to the compressor assembly, remove the four carriage bolts, washers, and self-locking nylon nuts holding the reflective heat shield assembly to the frame. Lift the reflective heat shield assembly away from the MBU frame to gain access to the compressor assembly.
2. Disconnect compressor power wire harness connector (Figure 3, Item 1).

NOTE

The air compressor has two different size hose fittings that accommodate two different size neoprene air hoses. Note that the upper fitting requires a $\frac{3}{8}$ -inch ID neoprene hose and that the lower fitting requires a $\frac{1}{4}$ -inch ID neoprene air hose. If the connectors are fused, cut the hose to remove.

3. Disconnect air lines (Figure 3, Item 2) from compressor (Figure 3, Item 3) by compressing the spring clips with a pair of pliers.
4. Loosen and remove two hose clamps (Figure 3, Item 4) and lift compressor (Figure 3, Item 3) off the mounting plate (Figure 3, Item 5).

NOTE

The replacement compressor may be installed in the existing mounting plate if a replacement mounting plate is not needed. Continue to Step 7.

5. To replace the compressor mounting plate (Figure 3, Item 5), remove four self locking nuts and washers (Figure 3, Item 6) securing the mounting plate to the threaded studs mounted to the MBU base plate (Figure 3, Item 7).
6. Slide new vibration grommets (Figure 3, Item 8) onto mounting plate (Figure 3, Item 5), insert spacers, and secure assembly with four self locking nuts and washers (Figure 3, Item 6) to the threaded studs mounted to the MBU base plate (Figure 3, Item 7).
7. Place two hose clamps onto mounting plate before placing new compressor onto mounting plate.
8. Place new compressor onto mounting plate (Figure 3, Item 5) and secure with two hose clamps (Figure 3, Item 4). Connect air lines (Figure 3, Item 2) previously removed. Note that the $\frac{3}{8}$ -inch ID hose installs on the larger fitting.
9. Connect compressor power wire harness connector (Figure 3, Item 1).
10. If the reflective heat shield was removed at the beginning of this procedure, install the four carriage bolts, washers, and self-locking nylon nuts securing the reflective heat shield assembly to the frame.

REPLACE – CONTINUED

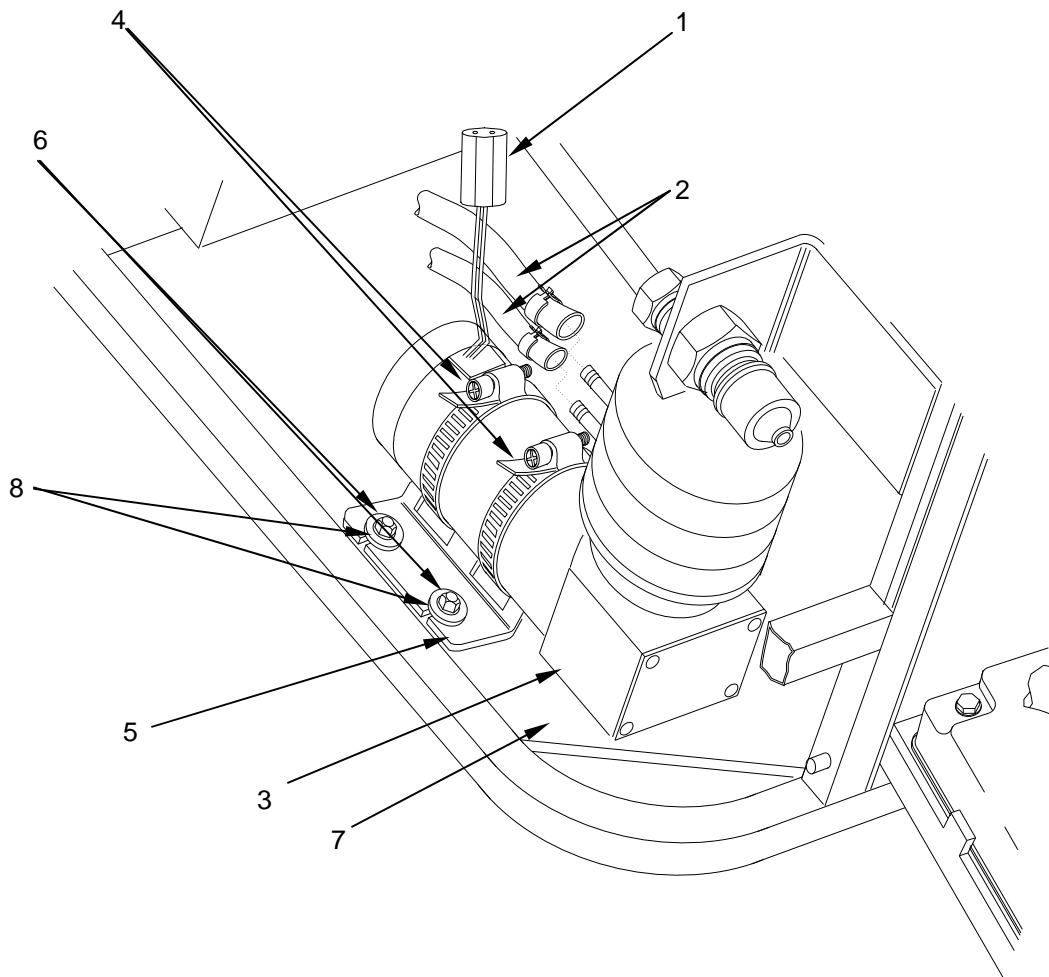


Figure 3. Replace the Compressor Assembly.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**FUEL DELIVERY BLOCK ASSEMBLY
INSPECT, TEST, REMOVE/INSTALL, ADJUST, REPLACE**

INITIAL SETUP:**Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Materials/Parts

Gloves, Chemical (WP 0072, Item 3)
Mask, Disposable (WP 0072, Item 4)
Rag, Wiping (WP 0072, Item 5)
Sealing Compound (WP 0072, Item 6)
Tags, Marking (WP 0072, Item 7)

Personnel Required

Food Service Specialist 92G (1)
MOS Non-specific (1)

References

WP 0005, WP 0014, WP 0020

Equipment Condition

MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)
Fuel tank drained (WP 0014)

INSPECT**WARNING**

Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result death to personnel.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Ensure the MBU is cool, disconnected from power, and has been drained of fuel IAW instructions given in WP 0014.
2. Open control panel Figure 1, Item 1) to gain access to the fuel delivery block assembly (Figure 1, Item 2).
3. Inspect the fuel delivery block assembly for damage to individual components, including leaking or loose fuel hoses (Figure 1, Item 3), frayed or loose electrical connections (Figure 1, Item 4), damage to the solenoids (Figure 1, Item 5), flame sensor (Figure 1, Item 6), igniter (Figure 1, Item 7), and air filter (Figure 1, Item 8). Check the control knob (Figure 1, Item 9) for free movement.
4. Close the control panel (Figure 1, Item 1).

INSPECT – CONTINUED

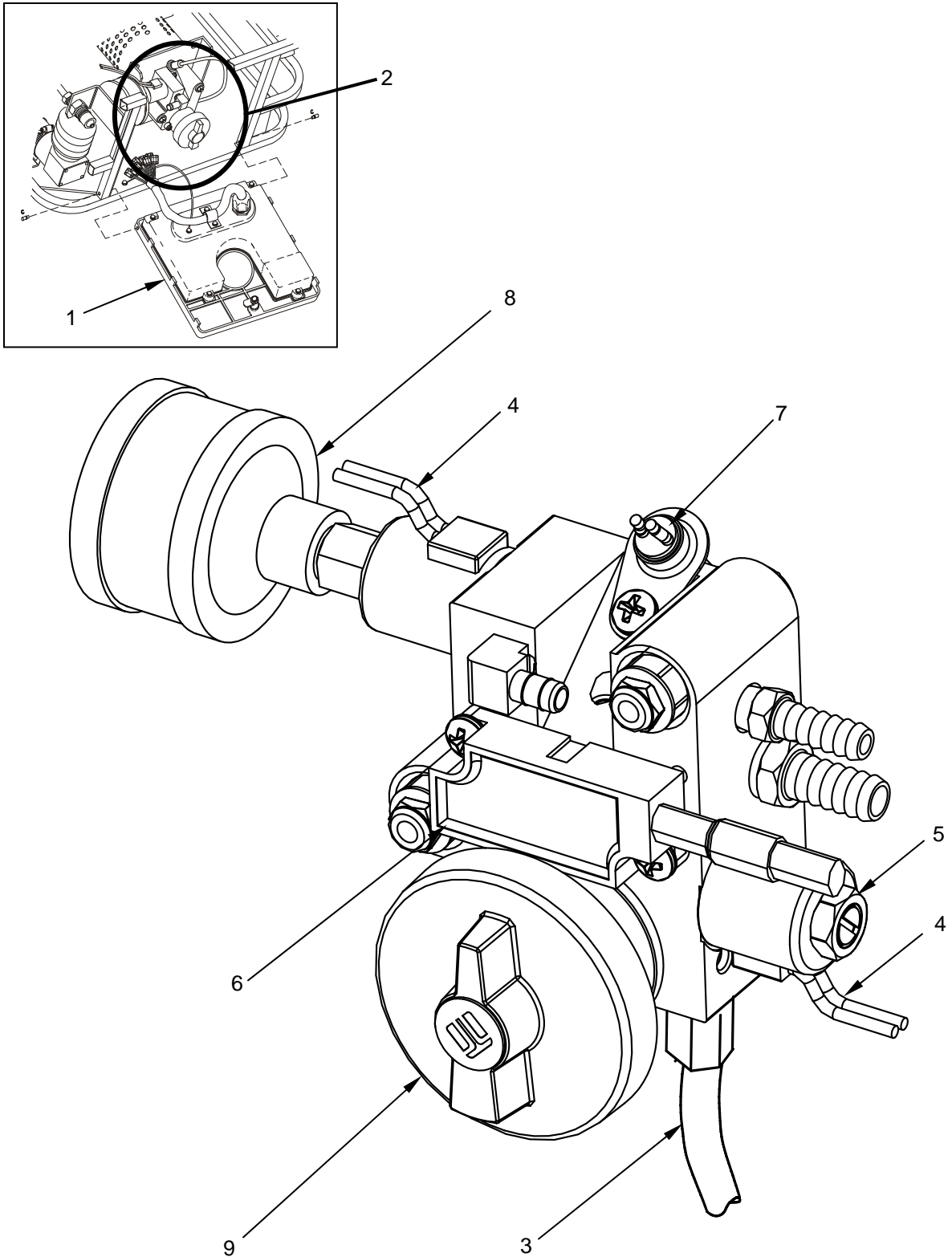


Figure 1. Inspect the Fuel Delivery Block Assembly.

END OF TASK

TEST

Test the Flame Sensor

1. Set up the MBU for operation IAW WP 0005.
2. Attempt to start the MBU by pressing and releasing the start button (Figure 2, Item 1).
3. Begin counting when the start button is pushed. If the flame sensor is bad, the burner will attempt to light, but shut itself down in approximately 8 seconds. The controller checks for the proper signal from the flame sensor. If the flame sensor is bad, error message ER01 will be displayed.
4. Press the stop button (Figure 2, Item 2) to clear the error code.
5. Press and hold the start button (Figure 2, Item 1). Wait for the MBU to ignite and continue holding the start button for another 20 seconds. If the flame sensor is bad, the burner should shut off immediately when the button is released. The burner will display error message ER01.
6. Replace the flame sensor if the MBU does not start and displays error message ER01 during this test.

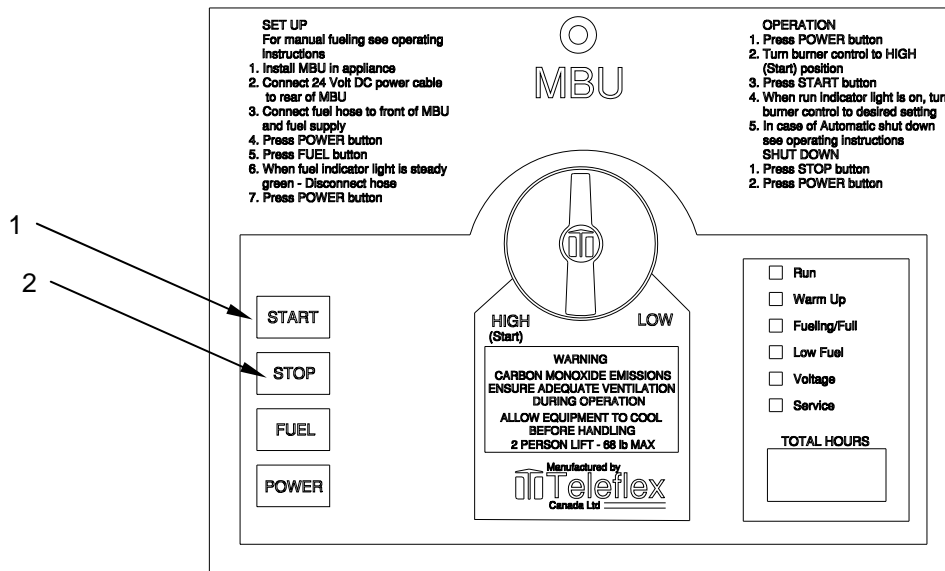


Figure 2. Test the Flame Sensor.

END OF TASK

TEST – CONTINUED**Test the Feedback Potentiometer (MBU only)****NOTE**

The following procedure is not applicable to the MBU-V3. The MBU-V3 does not employ a feedback potentiometer.

1. Ensure the MBU is cool and disconnected from power.
2. Open control panel (Figure 3, Item 1) to gain access to the fuel delivery block assembly (Figure 3, Item 2).
3. Disconnect the feedback potentiometer wiring connector (Figure 3, Item 3) by separating the connector at the end of the harness.
4. Turn the control knob (Figure 3, Item 4) fully counterclockwise.
5. Use a multimeter to test for resistance between the two disconnected leads (Figure 3, Item 5).

NOTE

- You may need to turn on your multimeter before selecting ohms (Ω). On some models, the selector and power switch are combined.
 - Resistance is a measurement of the ability to resist electrical current. The compressor assembly should have some resistance. Infinite resistance or “no continuity” indicates an open circuit and a defective compressor assembly.
- a. Turn the selector to the ohms (Ω) setting. If there is a range of values, select the range that includes or exceeds 600 Ω .
 - b. Connect the red test lead plug to the input terminal labeled for use with volts (V) and ohms (Ω). Your multimeter may have other symbols on this terminal but should at the least have the (V) and (Ω) symbols.
 - c. Connect the black test lead plug to the input terminal labeled for ground or common ground. The symbols (-) or (COM) will be shown on this terminal.
 - d. Place a multimeter lead tip into each of the holes in the disconnected lead plug.
 - e. Hold the leads in place until a steady value can be seen on the display of the multimeter.
 - f. There should be approximately 0-500 ohms (Ω) resistance. A feedback potentiometer that reads over 525 ohms (Ω) is unserviceable.
6. Turn the control knob (Figure 3, Item 4) fully clockwise.

TEST – CONTINUED

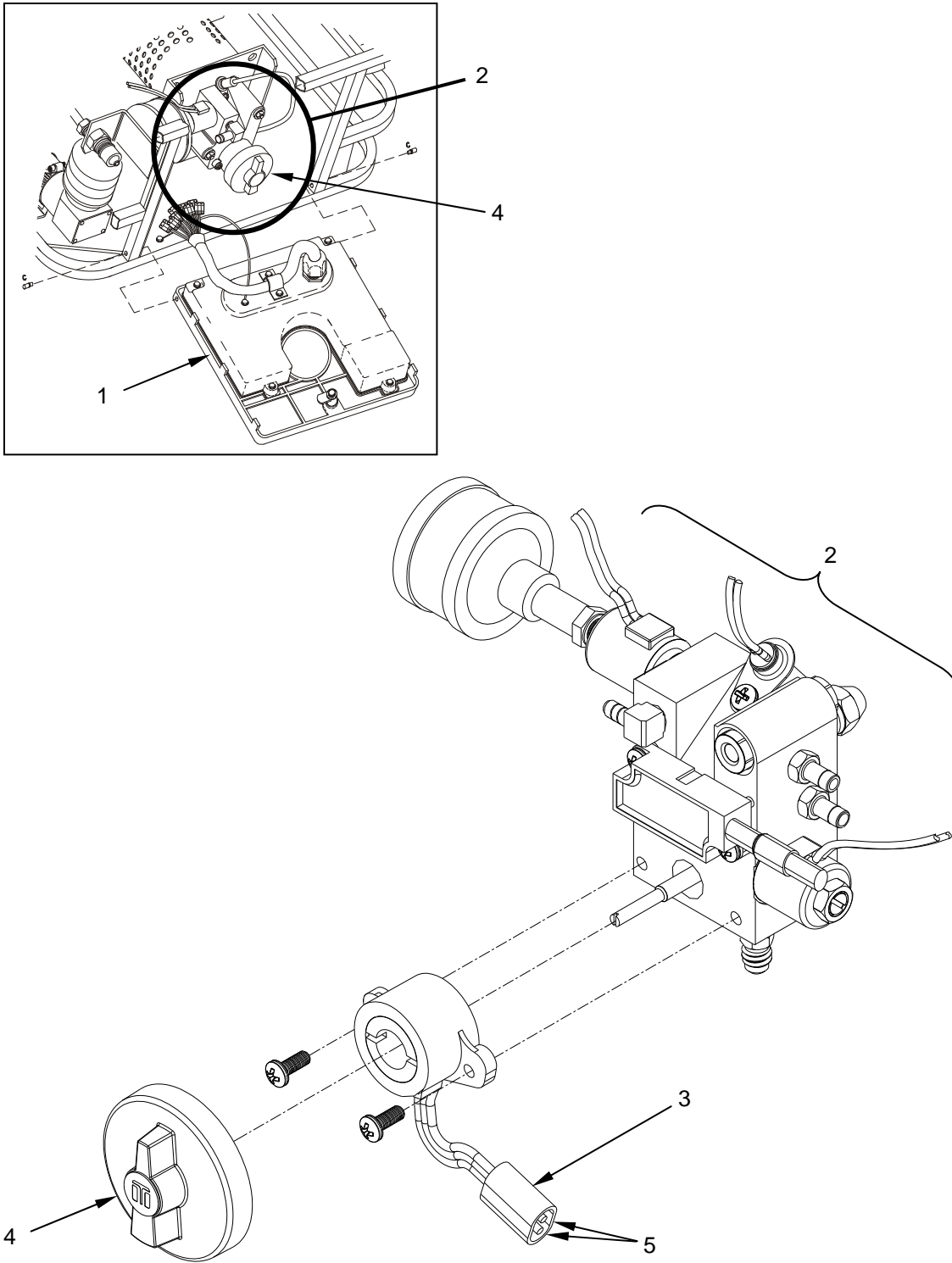


Figure 3. Test the Feedback Potentiometer (MBU only).

TEST – CONTINUED

7. Use a multimeter to test for resistance between the two disconnected leads.

NOTE

- You may need to turn on your multimeter before selecting ohms (Ω). On some models, the selector and power switch are combined.
 - Resistance is a measurement of the ability to resist electrical current. The compressor assembly should have some resistance. Infinite resistance or “no continuity” indicates an open circuit and a defective compressor assembly.
- a. Turn the selector to the ohms (Ω) setting. If there is a range of values, select the range that includes or exceeds 10,000 or 10K ohms (Ω).
 - b. Place a multimeter lead tip into each of the holes in the disconnected lead plug.
 - c. Hold the leads in place until a steady value can be seen on the display of the multimeter.
 - d. There should be approximately 9500 – 10,000 ohms (Ω) resistance. A feedback potentiometer that reads under 9480 ohms (Ω) or over 10,000 ohms (Ω) in this position is unserviceable.

NOTE

If the fuel delivery block is replaced in an MBU, the new fuel delivery block will update the MBU to an MBU-V3. Each replacement fuel delivery block is shipped with labels and decals that indicate that the MBU is now an MBU-V3.

8. If the feedback potentiometer is unserviceable, replace the fuel delivery block IAW the REPLACE procedures in this WP.

END OF TASK

REMOVE/INSTALL**Remove/Install the Fuel Delivery Block****WARNING**

Have rags on hand to clean up fuel spillage that may occur, to prevent contamination. Do not perform this procedure near an open flame, to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

The fuel delivery block assembly (Figure 4, Item 1) **MUST BE TEMPORARILY REMOVED** from the burner tube mounting shafts when replacing the igniter (Figure 4, Item 2), fuel line (Figure 4, Item 3), or air lines (Figure 4, Item 4).

1. Ensure the MBU is cool, disconnected from power, and has been drained of fuel IAW instructions given in WP 0014.
2. To remove the fuel delivery block assembly, proceed as follows:
 - a. Open control panel (Figure 4, Item 5) for access to the fuel delivery block assembly (Figure 4, Item 1).
 - b. Disconnect the fuel line (Figure 4, Item 3).
 - c. Remove the ground screw (Figure 4, Item 6) with a suitable wrench.

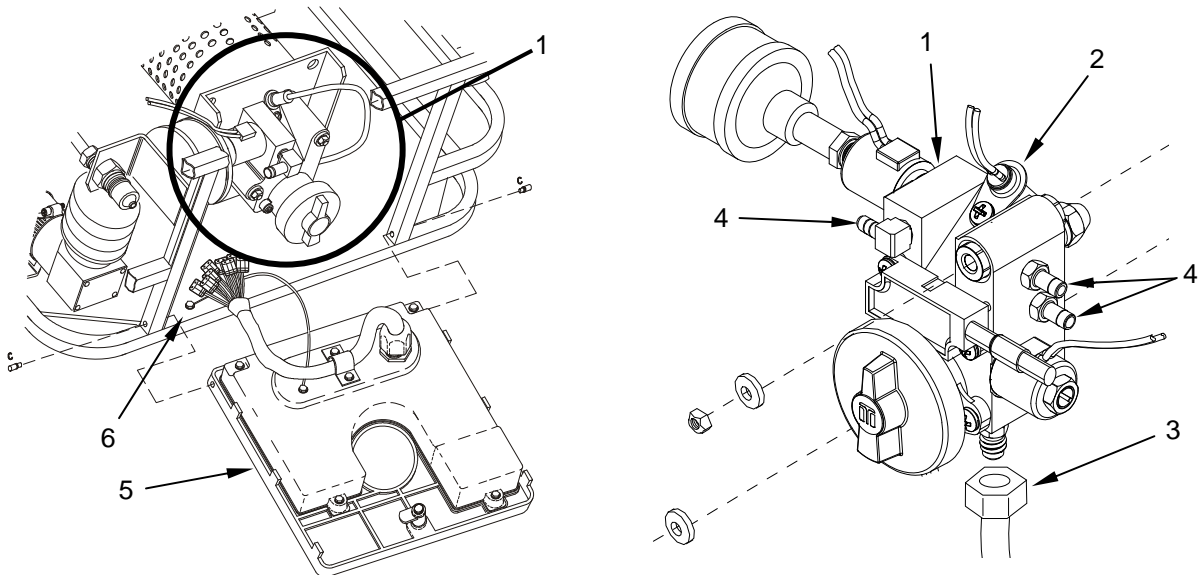


Figure 4. Remove/Install the Fuel Delivery Block Assembly.

REMOVE/INSTALL – CONTINUED

- d. To remove fuel delivery block assembly (Figure 5, Item 1), remove two self-locking nuts and washers (Figure 5, Item 2 and Item 3) that secure the fuel delivery block assembly to the burner tube mounting shafts (Figure 5, Item 4).
 - e. Slide the fuel delivery block assembly (Figure 5, Item 1) off the threaded studs of the burner tube mounting shafts (Figure 5, Item 4).
 - f. Tag and remove the three air lines by squeezing the tabs on hose clamp (Figure 5, Item 5) with a pair of pliers and slide the clamp off the fuel delivery block fitting (Figure 5, Item 6) and onto the neoprene line (Figure 5, Item 7). It may be necessary to cut or replace the hose to remove it.
 - g. Disconnect electrical connections for the air fill solenoid valve (Figure 5, Item 8), fuel solenoid valve (Figure 5, Item 9), flame sensor (Figure 5, Item 10) and igniter (Figure 5, Item 11).
3. To install the fuel delivery block assembly, proceed as follows:
 - a. Reconnect the ground wire.
 - b. Reconnect the three air lines to the fuel delivery block fittings (Figure 5, Item 6) as tagged.
 - c. Reconnect the electrical connections according to the color coding of the connectors.
 - d. Slide the fuel delivery block assembly (Figure 5, Item 1) onto the burner tube mounting shafts (Figure 5, Item 4).
 - e. Install two self-locking nuts and washers (Figure 5, Item 2 and Item 3) to retain the fuel delivery block assembly (Figure 5, Item 1) to the burner tube mounting shafts (Figure 5, Item 4).
 - f. Reconnect the fuel line (Figure 5, Item 12).
 - g. Close and secure the control panel.

REMOVE/INSTALL – CONTINUED

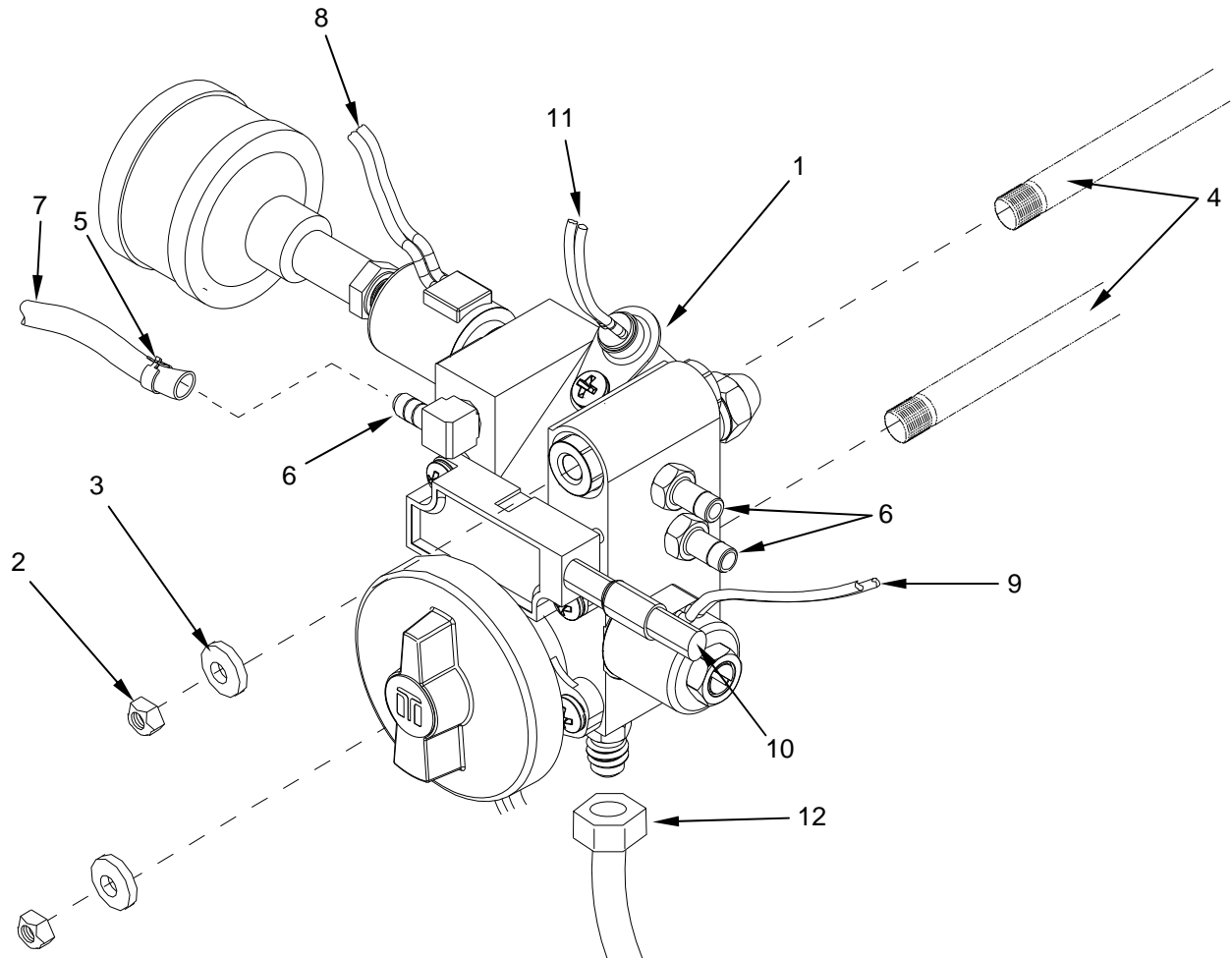


Figure 5. Remove/Install the Fuel Delivery Block Assembly from Burner Tube Mounting Studs.

END OF TASK

ADJUST**Adjust the Flame Control****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. This procedure must be performed with power connected. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Do not attempt this maintenance unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Failure to observe this warning may result in injury or death to personnel.

WARNING

This maintenance is performed with a flame in the burner tube. Ensure the area is clear of fuel and other combustibles. Be aware of hot, metallic surfaces as they may burn you. Failure to observe this warning may result in injury or death to personnel.

NOTE

- If the MBU you are using has not been updated to an MBU-V3, do not perform this procedure. Upgrade your MBU by replacing the fuel delivery block IAW this WP.
 - This procedure is not exact. It relies on the maintainer's judgment for what is a good flame. Do not adjust the flame control on a burner unless it is necessary. Using a properly functioning MBU-V3 burner as a guide is helpful in achieving the proper flame adjustment.
1. Set up the MBU for operation IAW WP 0005.
 2. Open control panel (Figure 6, Item 1) to gain access to the fuel delivery block assembly (Figure 6, Item 2).
 3. Remove the control knob (Figure 6, Item 3), by removing the cap (Figure 6, Item 4), and loosening the retaining nut (Figure 6, Item 5) **ONLY** enough to release the knob from the fuel delivery block (Figure 6, Item 6). Do not disassemble the knob components.
 4. Remove the control knob (Figure 6, Item 3) taking care not to drop the spring (Figure 6, Item 7) located behind the knob.
 5. Using your fingers, turn the brass castle nut (Figure 6, Item 8) clockwise until it stops.
 6. Locate the steel ball (Figure 6, Item 9) embedded in the fuel delivery block body at the 3 o'clock position.
 7. If a notch on the brass castle nut does not line up with this ball, turn the castle nut counterclockwise until the closest one does. As an aid, mark this notch with a permanent marker or dab of paint.

ADJUST – CONTINUED

NOTE

When finished, the marked notch will be the first notch to the left of the notch in the 12 o'clock position, as shown in Figure 6.

8. Rotate the castle nut (Figure 6, Item 8) counterclockwise and count four notches.
9. Hold in the control knob (Figure 6, Item 3) with the pointer in the 3 o'clock position. The tabs on the back of the control knob will align with the notches at the 6 and 12 o'clock positions on the castle nut.
10. Press the control knob onto the flame control shaft. Once the knob has engaged the castle nut, turn it clockwise until it stops.
11. Tighten the control-knob retaining nut (Figure 6, Item 5).
12. Set the burner to high by rotating the control knob (Figure 6, Item 3) counterclockwise until it stops.

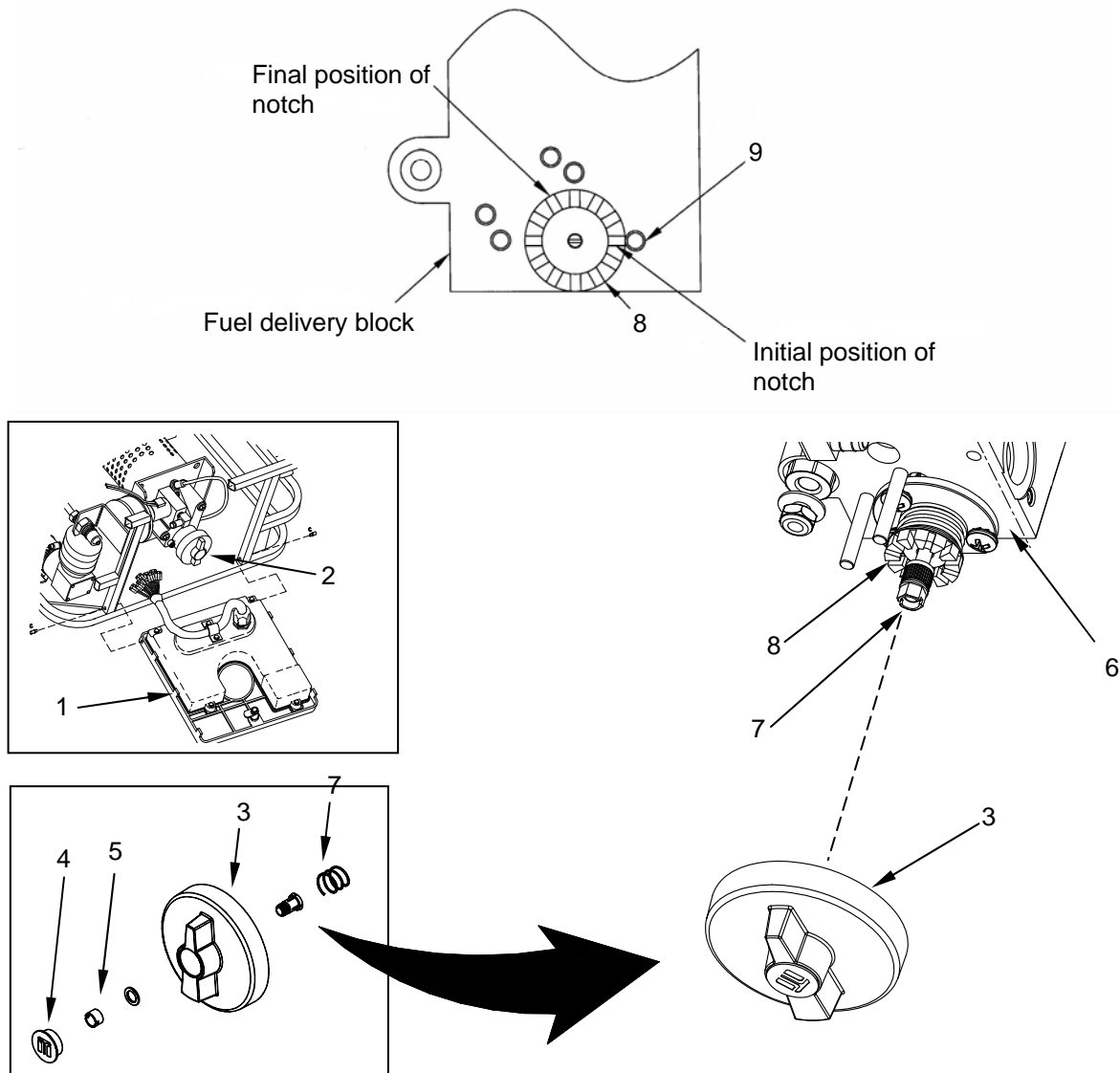


Figure 6. Adjust the Flame Control on the MBU-V3.

ADJUST – CONTINUED

13. Press the start button (Figure 7, Item 1).
14. If the burner starts, wait for the 2-minute warm-up cycle to complete and the green “RUN” button (Figure 7, Item 2) to illuminate and proceed to step 17 of this procedure.
15. If the burner does not start:
 - a. While holding the control knob in place, loosen the control knob retaining nut (Figure 7, Item 3).
 - b. Using a suitable screwdriver, turn the flame control valve (Figure 7, Item 4) ½ turn counterclockwise.
 - c. Tighten the control knob retaining nut (Figure 7, Item 3).
 - d. Press the start button (Figure 7, Item 1).
16. If the burner starts, wait for the warm up cycle to complete and the green light on the control panel (Figure 7, Item 2) to illuminate. If the burner will still not start, go back to step 15 of this section.
17. Set the burner to low by rotating the control-knob (Figure 7, Item 5) clockwise until it stops.
18. If the burner stays lit, go to step 20 of this section.
19. If the burner goes out:
 - a. While holding the control knob in place, loosen the 5/16-inch control knob retaining nut (Figure 7, Item 3).
 - b. Using a suitable screwdriver, turn the flame control valve (Figure 7, Item 4) ½ turn counterclockwise.
 - c. Tighten the control knob retaining nut (Figure 7, Item 3).
 - d. Go back to step 12.
20. While holding the control knob in place, loosen the control knob retaining nut (Figure 7, Item 3).

NOTE

The flame should be as small as possible without producing an odor or irritating combustion gas. A properly adjusted flame will only be a few inches long, but this will vary from burner to burner. There will be very little or no smell at all. The flame should be stable and should not go out or sputter.

21. Using a suitable screwdriver, turn the flame control valve (Figure 7, Item 4) to adjust the flame level.
22. Tighten the control knob retaining nut (Figure 7, Item 3).
23. Rotate the flame control knob (Figure 7, Item 5) throughout its entire range for low to high. The flame should vary smoothly from low to high and should not produce smoke or smell at any setting, if so the adjust procedure is complete. If the low firing rate cannot be adjusted to achieve an acceptable flame, continue to the next step.
24. Place the control knob in the 12 o'clock position as shown in Figure 7.

ADJUST – CONTINUED

25. Loosen the control knob retaining nut and pull it slightly away from the castle nut. Rotate the control knob clockwise until it lines up with the next set of notches on the castle nut. Push the control knob into these slots and tighten the control knob retaining nut.

26. Go back to step 12 of this procedure.

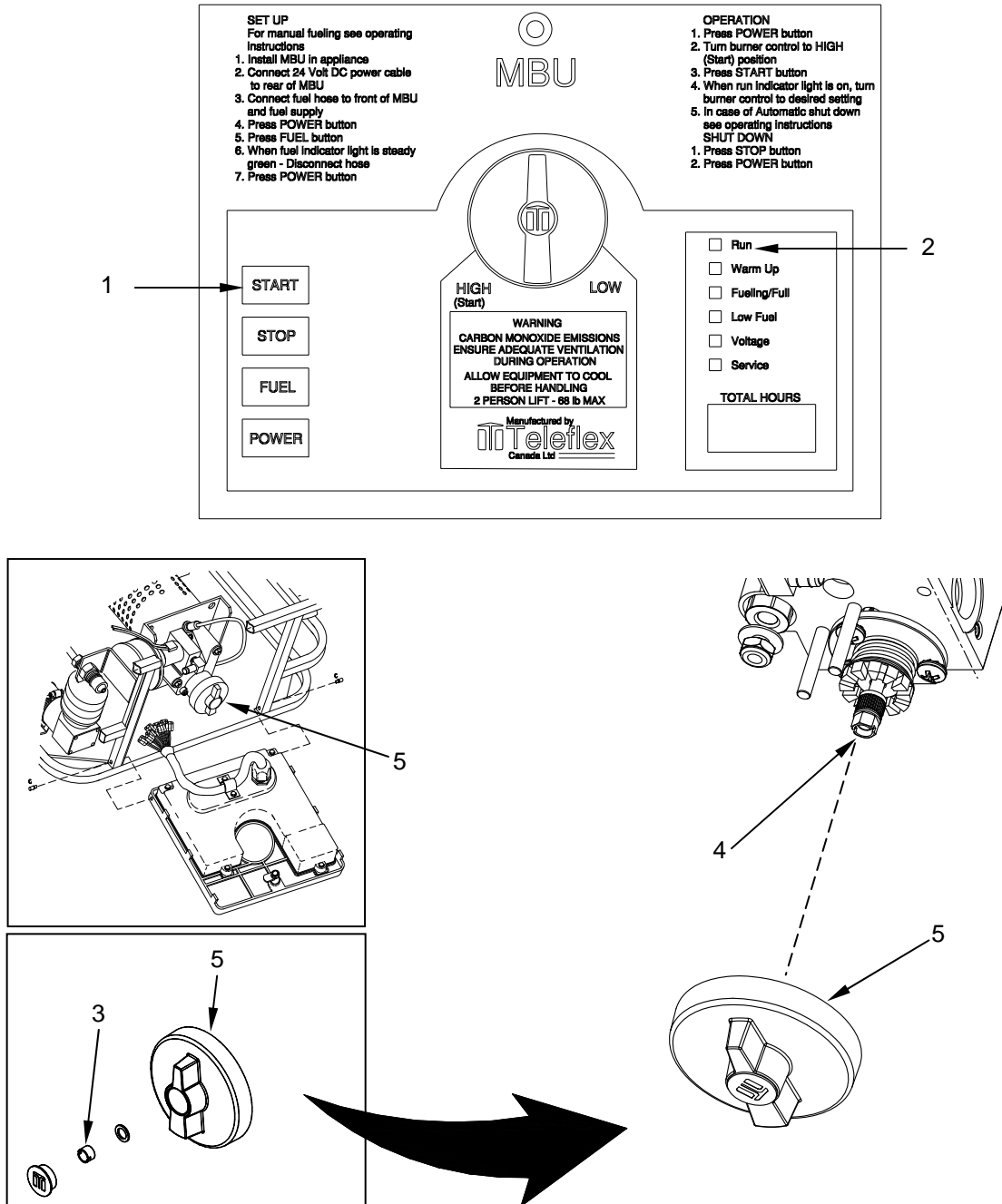


Figure 7. Adjust the Flame Control on the MBU-V3.

END OF TASK

REPLACE

NOTE

The air filter (Figure 8, Item 1), control knob assembly (Figure 8, Item 2), flame sensor (Figure 8, Item 3), fuel feeder line (Figure 8, Item 4), and fuel shut-off solenoid (Figure 8, Item 5) may be removed and replaced **WITHOUT** removing the entire fuel delivery block assembly from the frame.

Replacement of all other components requires removing the fuel delivery block (Figure 8, Item 6) from the burner tube mounting shafts while still connected to all wire harnesses and hoses.

The replacement procedure for the air filter (Figure 8, Item 1) is described in WP 0020.

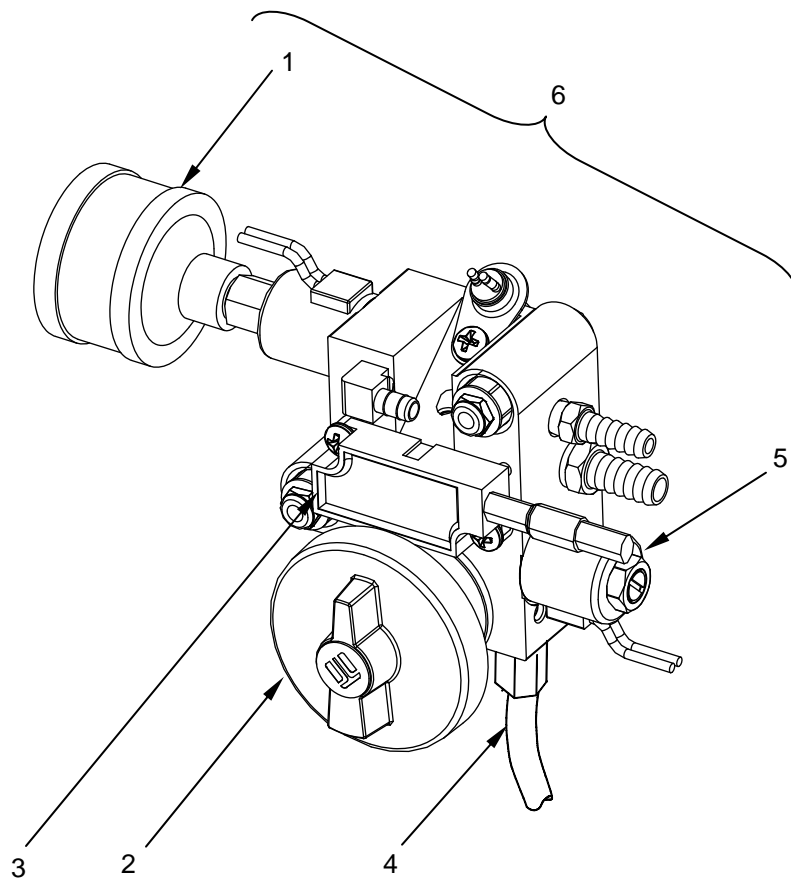


Figure 8. Replacing Parts Without Removing Fuel Delivery Block (MBU-V3 shown).

REPLACE – CONTINUED**Replace the Control Knob Assembly**

1. Ensure the MBU is cool and disconnected from power IAW instructions given in WP 0005. Turn the control knob to point to the 12 o'clock position.
2. Open control panel (Figure 9, Item 1) to gain access to the fuel delivery block assembly (Figure 9, Item 2).
3. To replace the control knob assembly (Figure 9, Item 10), remove the cap (Figure 9, Item 4), and loosen the retaining nut (Figure 9, Item 5) ONLY enough to release the knob from the fuel delivery block (Figure 9, Item 6). Do not remove the retaining nut or disassemble the other knob components.
4. Remove the control knob (Figure 9, Item 3), taking care not to drop the spring (Figure 9, Item 7) located behind the knob.
5. Loosen the retaining nut (Figure 9, Item 5) on the new knob until it is just held in place. Make sure that the spring (Figure 9, Item 7) is in place.
6. Using a screwdriver, or nut driver, placed in the slot of the retaining nut to hold it steady, position the new control knob assembly (Figure 9, Item 3) at a 12 o'clock position and press onto the needle valve shaft (Figure 9, Item 8).
7. Press the control knob until the collet (Figure 9, Item 9) on the back of the control knob is firmly engaged on the needle valve shaft (Figure 9, Item 8).
8. Secure the control knob assembly (Figure 9, Item 3) by tightening the retaining nut (Figure 9, Item 5).
9. Replace the cap (Figure 9, Item 4).
10. Close the control panel (Figure 9, Item 1).

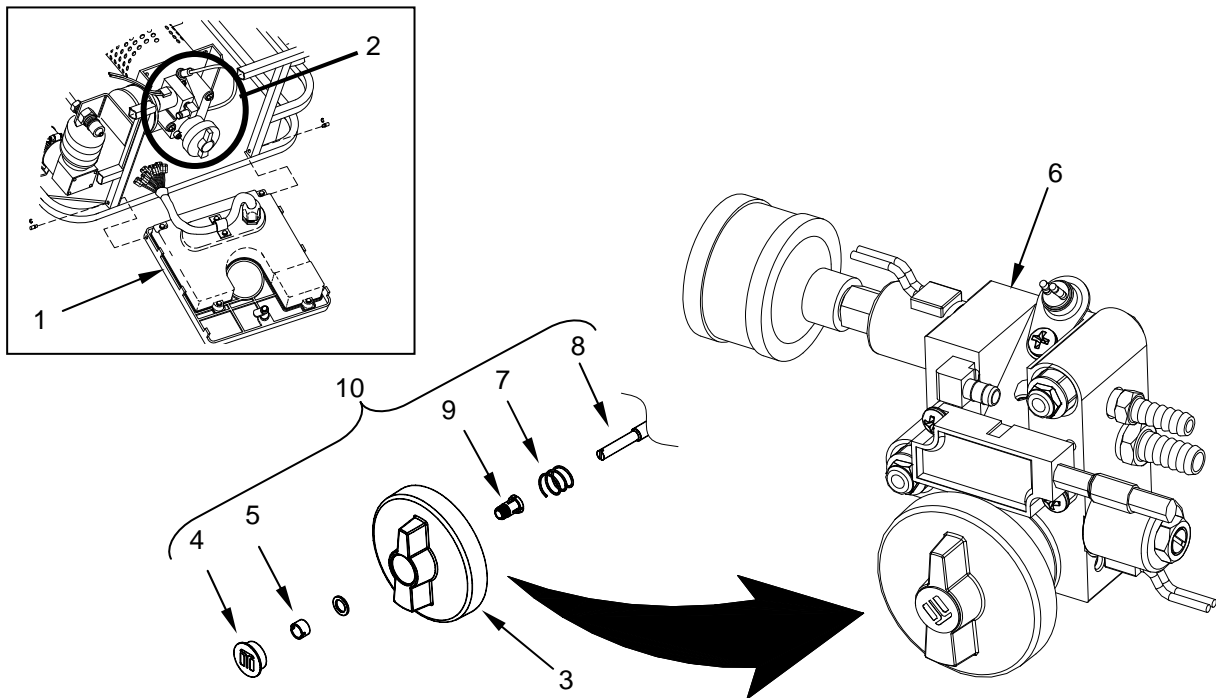


Figure 9. Replace the Control Knob Assembly.

END OF TASK

REPLACE – CONTINUED**Replace the Flame Sensor**

1. Ensure the MBU is cool and disconnected from power.
2. Open the control panel (Figure 10, Item 1) to gain access to the fuel delivery block assembly (Figure 10, Item 2).
3. To replace the flame sensor (Figure 10, Item 3), remove the two screws (Figure 10, Item 4) with a suitable screwdriver.
4. Disconnect the flame sensor wiring harness (Figure 10, Item 5) by opening the clamp and separating the connector at the end of the harness.
5. Remove the flame sensor assembly (Figure 10, Item 3).
6. Install a new flame sensor assembly (Figure 10, Item 3) on the fuel delivery block (Figure 10, Item 6).
7. Ensure the lock washers (Figure 10, Item 7) are in place, and secure the two screws (Figure 10, Item 4) with a suitable screwdriver.
8. Reconnect the flame sensor wiring harness assembly connector (Figure 10, Item 5).
9. Close the control panel (Figure 10, Item 1).

REPLACE – CONTINUED

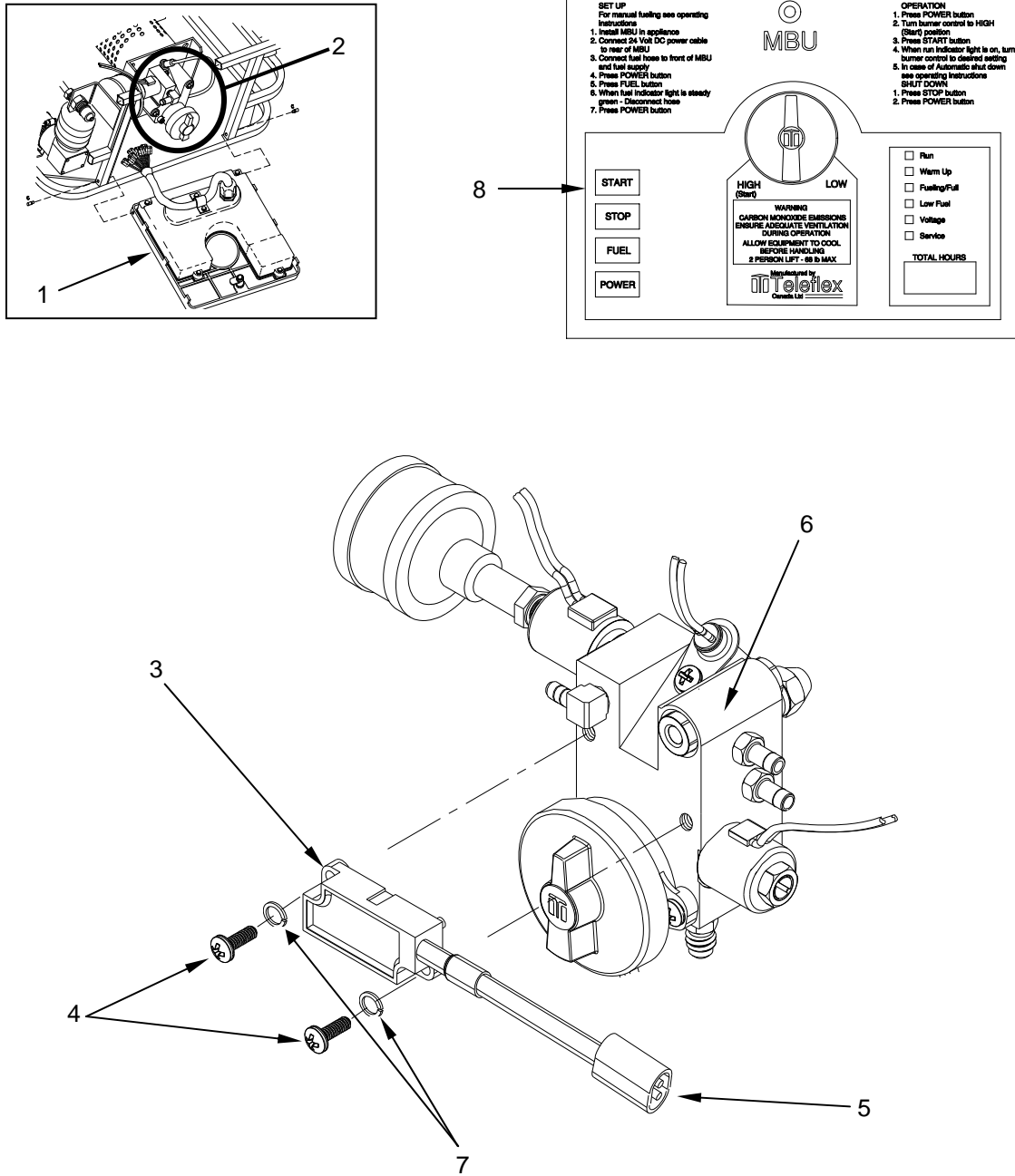


Figure 10. Replace the Flame Sensor.

END OF TASK

REPLACE – CONTINUED**Replace the Fuel Feeder Line****WARNING**

Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 0014. Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

1. Ensure the MBU is cool, disconnected from power IAW 0005, and has been drained of fuel IAW WP 0014.
2. Open control panel (Figure 11, Item 1) to gain access to the fuel delivery block assembly (Figure 11, Item 2).
3. Loosen the nut (Figure 11, Item 3) attached to the fuel delivery block fitting (Figure 11, Item 4) with a wrench. Drain any fuel remaining in the line into an approved container. Wipe up any fuel that may have spilled.
4. Remove the opposite end of the fuel feeder line (Figure 11, Item 5) by loosening the nut (Figure 11, Item 6) attached to the regulator assembly fitting (Figure 11, Item 7).
5. Remove the fuel feeder line (Figure 11, Item 5).
6. Install a serviceable fuel feeder line (Figure 11, Item 5) by threading the nut (Figure 11, Item 3) onto the fitting (Figure 11, Item 4) of the fuel delivery block (Figure 11, Item 8). Tighten using a wrench.
7. Install the nut (Figure 11, Item 6) on the opposite end of the fuel feeder line (Figure 11, Item 5) onto the regulator assembly fitting (Figure 11, Item 7). Tighten using a wrench.
8. Close the control panel (Figure 11, Item 1).

REPLACE – CONTINUED

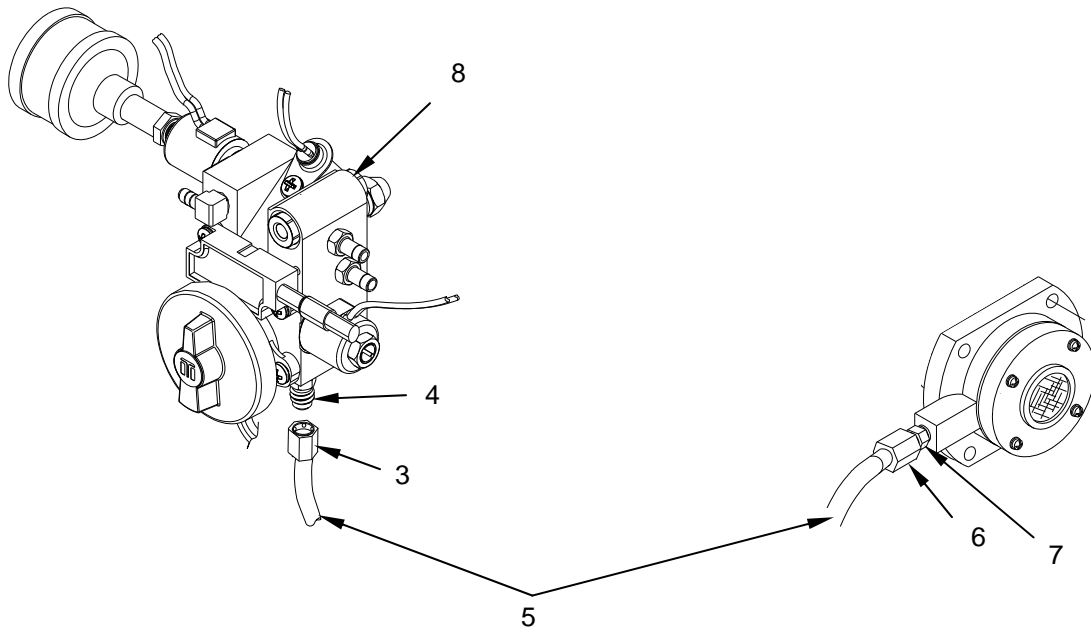
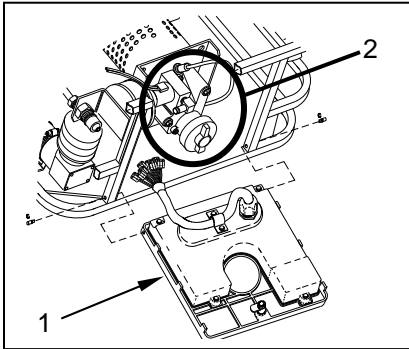


Figure 11. Replace the Fuel Feeder Line.

END OF TASK

REPLACE – CONTINUED**Replace the Air/Fill Solenoid Valve**

1. Ensure the MBU is cool and disconnected from power.
2. Remove the fuel delivery block IAW the procedures in the REMOVE/INSTALL section of this WP.
3. To replace the air/fill solenoid valve (Figure 12, Item 3), grasp air filter (Figure 12, Item 4) and rotate counterclockwise (hold body of solenoid to prevent turning) to unscrew air filter from the threaded fitting on the air/fill solenoid valve (Figure 12, Item 3).
4. Disconnect the solenoid valve wiring (Figure 12, Item 5) by separating the connector at the end of the harness.
5. Loosen and remove the retaining screw (Figure 12, Item 6) securing the air/fill solenoid valve (Figure 12, Item 3) to the fuel delivery block (Figure 12, Item 7) with a flat blade screwdriver. It may be necessary to grasp the body of the solenoid valve to keep it from turning. Note the position of the wires exiting the solenoid for proper reconnection later in the procedure.
6. A small spring tensioned plunger (Figure 12, Item 8) is located inside the solenoid valve (Figure 12, Item 3). Take care not to drop the plunger into the MBU. Carefully remove the solenoid valve assembly by pulling straight out.
7. Install a serviceable air/fill solenoid valve (Figure 12, Item 3) in the fuel delivery block (Figure 12, Item 7). Be certain that the plunger (Figure 12, Item 8) is installed in the solenoid body so that the end of the plunger with the spring is inserted into the solenoid body first. The end of the plunger with the small rubber pad should face out of the solenoid.
8. The base of the solenoid valve (Figure 12, Item 3) should be flush with the fuel delivery block (Figure 12, Item 7) when properly installed. Rotate the body of the solenoid so that the wiring (Figure 12, Item 5) is oriented as it was prior to removal.
9. Reinstall the retaining screw (Figure 12, Item 6) through the body of the solenoid (Figure 12, Item 3) and tighten. Reconnect the connector at the end of the solenoid wiring (Figure 12, Item 5).
10. Screw the air filter (Figure 12, Item 4) onto the air/fill solenoid valve (Figure 12, Item 3) until it is securely in place. Hand tighten the air filter.
11. Close the control panel (Figure 12, Item 1).

REPLACE – CONTINUED

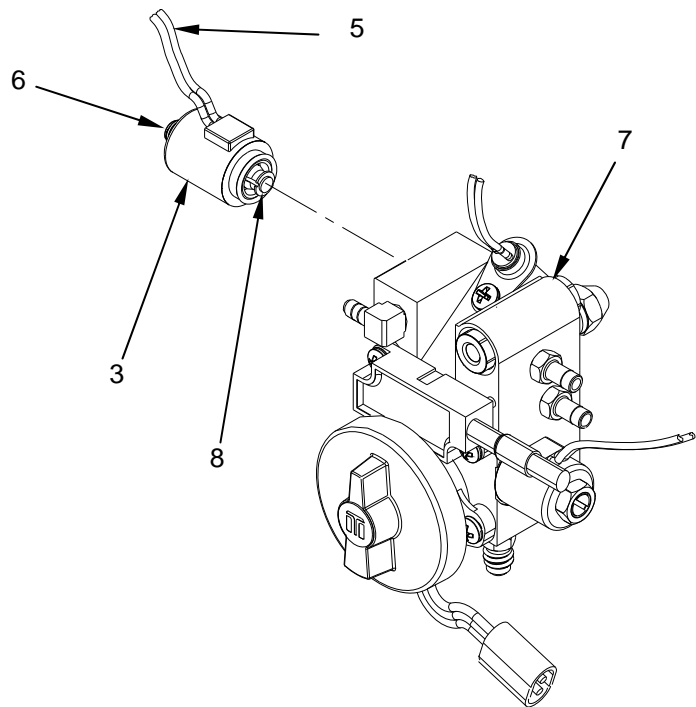
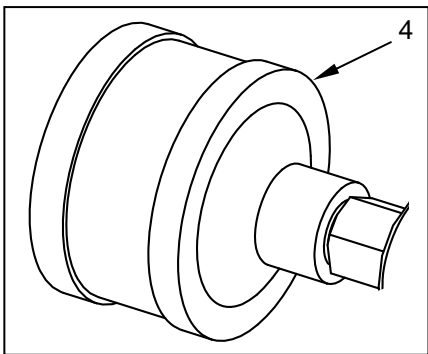
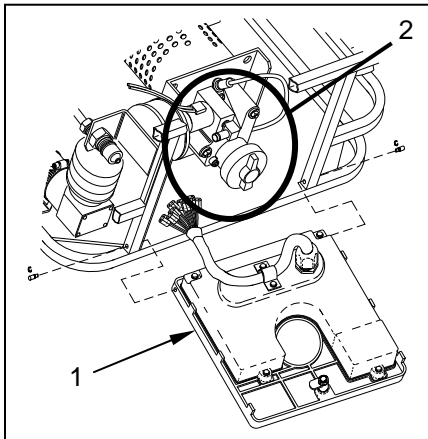


Figure 12. Replacement of Air/Fill Solenoid Valve (MBU-V3 shown).

END OF TASK

REPLACE – CONTINUED**Replace the Fuel Shut-Off Solenoid Valve****WARNING**

Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

1. Ensure the MBU is cool and disconnected from power.
2. Open control panel (Figure 13, Item 1) to gain access to the fuel delivery block assembly (Figure 13, Item 2).
3. To replace the fuel shut-off solenoid valve (Figure 13, Item 3), disconnect the solenoid valve wiring (Figure 14, Item 4) by separating the connector at the end of the harness.
4. Loosen and remove the nut (Figure 13, Item 5) on the end of the solenoid valve (Figure 13, Item 3). It may be necessary to grasp the body of the solenoid valve to keep it from turning.
5. Loosen and remove the retaining screw (Figure 13, Item 6) securing the fuel shut-off solenoid valve (Figure 13, Item 3) to the fuel delivery block (Figure 13, Item 7) with a suitable screwdriver. It may be necessary to grasp the body of the solenoid valve to keep it from turning. Take note of the orientation of the wiring (Figure 13, Item 4) so that it may be installed in its proper position later in this procedure.
6. A small spring tensioned plunger is located inside the solenoid valve (Figure 13, Item 3). Take care not to drop the plunger into the MBU. Carefully remove the solenoid valve assembly by pulling straight out.
7. Install a serviceable fuel shut-off solenoid valve (Figure 13, Item 3) in the fuel delivery block (Figure 13, Item 7). Be certain that the plunger is installed in the solenoid body so that the end of the plunger with the spring is inserted into the solenoid body first. The end of the plunger with the small rubber pad should face out of the solenoid.
8. The base of the solenoid valve (Figure 13, Item 3) should be flush with the fuel delivery block (Figure 13, Item 7) when properly installed. Rotate the body of the solenoid so that the wiring harness assembly (Figure 13, Item 4) is as it was prior to removal.
9. Reinstall the retaining screw (Figure 13, Item 6) through the body of the solenoid and tighten.
10. Reinstall the nut (Figure 13, Item 5) and tighten.
11. Reconnect the connector at the end of the solenoid wiring (Figure 13, Item 4).
12. Close the control panel (Figure 13, Item 1).

REPLACE – CONTINUED

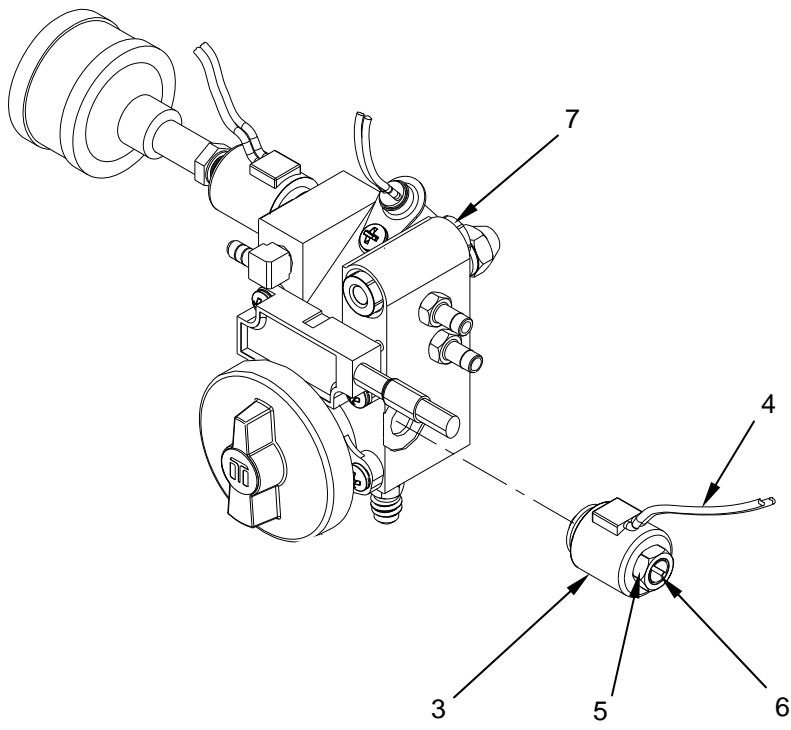
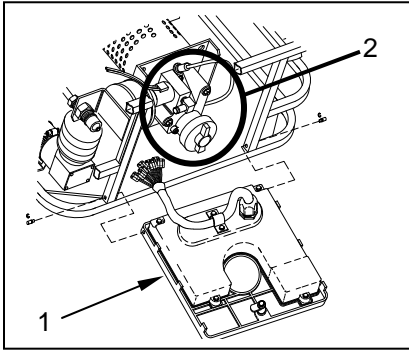


Figure 13. Replace the Fuel Shut-Off Solenoid Valve (MBU-V3 shown).

END OF TASK

REPLACE – CONTINUED**Replace the Air Line to Vent Valve****WARNING**

Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

1. To replace the air line (Figure 14, Item 1), temporarily remove the fuel delivery block (Figure 14, Item 2) from the burner tube mounting studs IAW procedures given in the section of this WP entitled "Remove/Install the Fuel Delivery Block."
2. Squeeze the tabs on hose clamp (Figure 14, Item 3) with a pair of pliers and slide the clamp off the elbow fitting (Figure 14, Item 4) on the fuel delivery block and onto the neoprene line (Figure 14, Item 1). If it is necessary to replace the fitting, remove with a wrench and install a new fitting.
3. Squeeze the tabs on hose clamp (Figure 14, Item 5) with a pair of pliers and slide the clamp off the elbow fitting (Figure 14, Item 4) on the fuel delivery block and onto the air line (Figure 14, Item 1).
4. After removing the clamp, grasp the end of the air line (Figure 14, Item 1) connected to the elbow fitting (Figure 14, Item 4) on the fuel delivery block and pull, while wiggling from side to side, until the line is free.
5. Remove the end of the air line (Figure 14, Item 1) connected to the vent valve fitting (Figure 14, Item 6) in a similar manner. If the vent valve fitting needs replacement, unscrew and install a new vent valve fitting.
6. Using the damaged air line (Figure 14, Item 1) as a size guide, cut a new piece of fuel line of the same length from the bulk supply of neoprene hose.
7. Remove the clamps (Figure 14, Items 3 and 5) from the damaged air line and install on the new line, sliding each about 1-1/2 to 2 inches from the end.
8. Install the serviceable line, pushing one end fully onto the elbow fitting (Figure 14, Item 4) on the fuel delivery block and the other end onto the vent valve fitting (Figure 14, Item 6).
9. Squeeze the tabs on the clamps (Figure 14, Items 3 and 5) with a pair of pliers and slide one clamp up on the elbow fitting (Figure 14, Item 4) on the fuel delivery block and the other end onto the vent assembly fitting (Figure 14, Item 6). Be sure to position the tabs so that they can be easily accessed should service be required at a later date.
10. Install the fuel delivery block (Figure 14, Item 2) onto the burner tube mounting studs IAW procedures given in this WP entitled "Remove/Install the Fuel Delivery Block."

REPLACE – CONTINUED

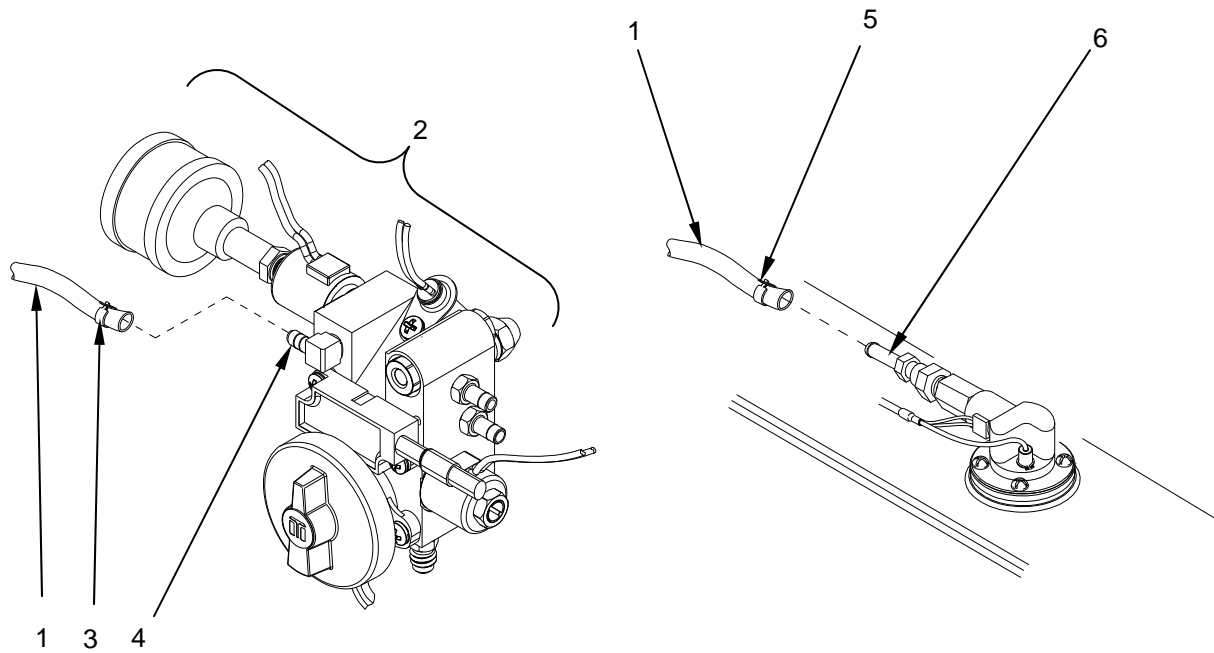


Figure 14. Replace the Air Line to Vent Valve.

END OF TASK

REPLACE – CONTINUED**Replace Air Line to Compressor****NOTE**

There are two neoprene air lines extending from the fuel delivery block assembly to the air compressor. Note that the two lines are different sizes. The replacement procedure for both air lines is identical.

1. Ensure the MBU is cool, disconnected from power IAW WP 0005, and has been drained of fuel IAW WP 0014.
2. Open control panel (Figure 15, Item 1) to gain access to the fuel delivery block assembly (Figure 15, Item 2). Remove the fuel delivery block IAW the section of this WP titled "Remove/Install Fuel Delivery Block."
3. To replace either of the neoprene air lines (Figure 15, Item 3), squeeze the tabs on hose clamp (Figure 16, Item 4) with a pair of pliers and slide the clamp off the fuel delivery block fitting (Figure 16, Item 5) and onto the air line.
4. Squeeze the tabs on hose clamp (Figure 15, Item 6) with a pair of pliers and slide the clamp off the air compressor fitting (Figure 15, Item 7) and onto the air line (Figure 15, Item 3).
5. After removing the clamp, grasp the end of the air line (Figure 15, Item 3) connected to the fuel delivery block fitting (Figure 15, Item 5) and pull while wiggling from side to side, until the line is free. If any of the fuel delivery block fittings require replacement, simply loosen with an open end wrench and install a new fitting.
6. Remove the end of the air line (Figure 15, Item 3) connected to the air compressor fitting (Figure 15, Item 7) in a similar manner. If any of the air compressor fittings require replacement, simply loosen with an open end wrench and install a new fitting.

NOTE

The neoprene air line connected to the upper fitting on the compressor is $\frac{3}{8}$ -inch ID. The neoprene air line connected to the lower fitting on the compressor is $\frac{1}{4}$ -inch ID.

7. Using the damaged air line (Figure 15, Item 3) as a size guide, cut a new piece of air line of the same length from the bulk supply of neoprene hose. Remove the clamps (Figure 15, Items 4 and 6) from the damaged air line and install on the new line, sliding each about 1.5 to 2 inches from the end.
8. Install the serviceable line, pushing one end fully onto the fuel delivery block fitting (Figure 15, Item 5) and the other end onto the air compressor fitting (Figure 15, Item 7).
9. Squeeze the tabs on the clamps (Figure 15, Item 4 and Item 6) with a pair of pliers and slide one clamp up on the fuel delivery block fitting (Figure 15, Item 5) and the other end onto the air compressor fitting (Figure 15, Item 7). Be sure to position the tabs so that they can be easily accessed should service be required at a later date.
10. Close the control panel (Figure 15, Item 1).

REPLACE – CONTINUED

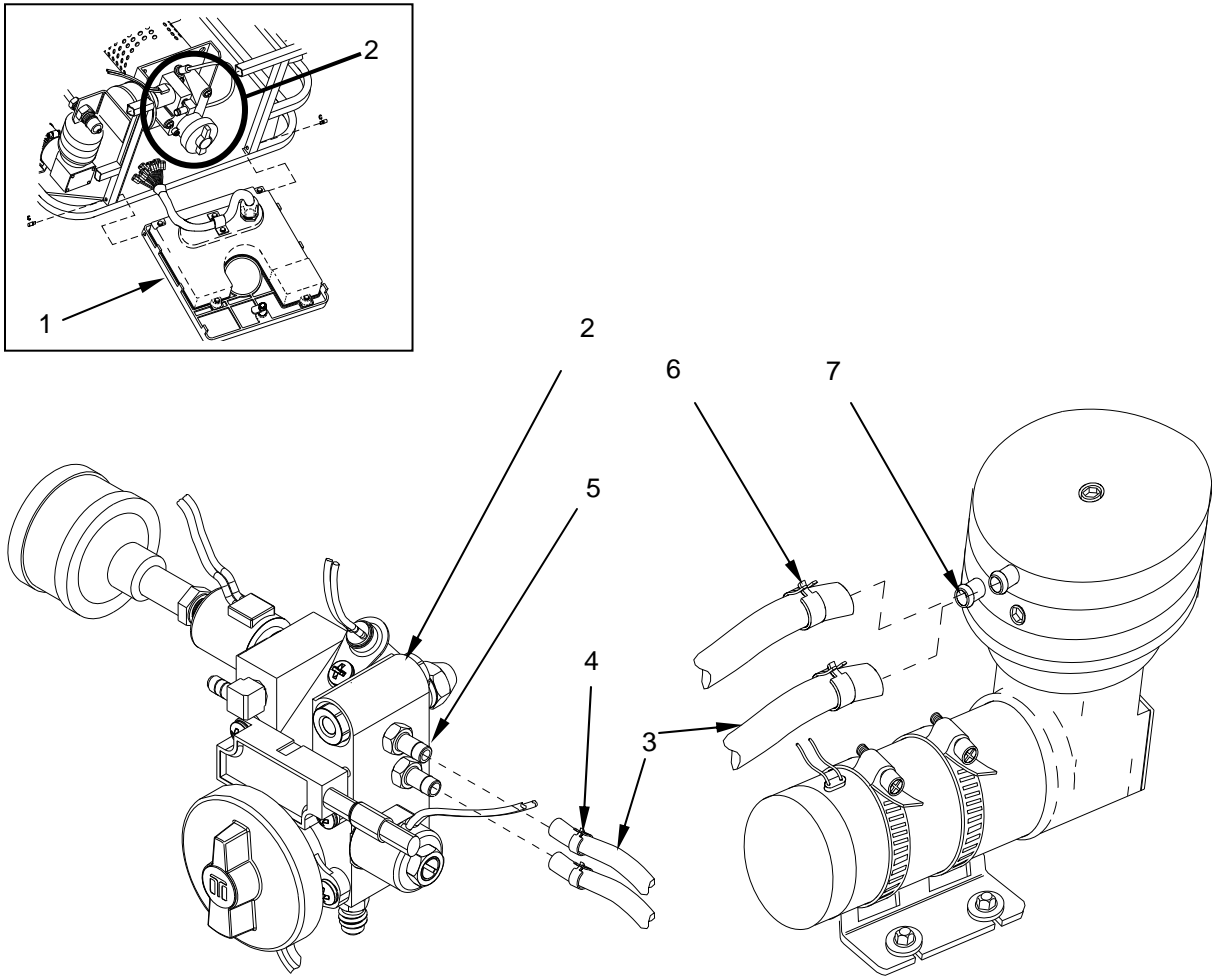


Figure 15. Replace the Air Line to Compressor.

END OF TASK

REPLACE – CONTINUED**Replace the Fuel Delivery Block Assembly****WARNING**

Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

There are no field serviceable items within the fuel delivery block.

1. Remove fuel delivery block (Figure 16, Item 1) from the burner tube mounting studs IAW procedures given in this WP entitled "Remove/Install the Fuel Delivery Block."
2. To replace the entire fuel delivery block assembly (Figure 16, Item 1), disconnect the fuel line (Figure 16, Item 2), fuel feeder line (Figure 16, Item 3), and air hoses (Figure 16, Items 4 and 5) from the fuel delivery block assembly.
3. Disconnect the air/fill solenoid harness connector (Figure 16, Item 6) and the fuel shut-off solenoid harness connector (Figure 16, Item 7).
4. Disconnect the flame sensor harness connector (Figure 16, Item 8).
5. Disconnect the feedback potentiometer, if fitted (MBU only) (Figure 16, Item 9).
6. Disconnect the igniter assembly (Figure 16, Item 10). Remove the control knob (Figure 16, Item 11) and the ground wire (Figure 16, Item 12).
7. Remove the fuel delivery block assembly from the MBU frame (Figure 16, Item 13).
8. To install the serviceable fuel delivery block assembly (Figure 16, Item 1), place the assembly in the MBU frame (Figure 16, Item 13) with the control knob (Figure 16, Item 11) facing toward the front of the MBU.

NOTE

The air line connected to the upper fitting on the compressor is $\frac{3}{8}$ -inch ID. The air line connected to the lower fitting on the compressor is $\frac{1}{4}$ -inch ID.

9. Connect the fuel line (Figure 16, Item 2), fuel feeder line (Figure 16, Item 3) and air hoses (Figure 16, Items 4 and 5) to the fuel delivery block assembly (Figure 16, Item 1). Note that neoprene hoses are two sizes. Install correct size hose on correct size fitting.
10. Connect the air/fill solenoid harness connector (Figure 16, Item 6) and the fuel shut-off solenoid harness connector (Figure 16, Item 7).
11. Connect the feedback potentiometer, if fitted (MBU only) (Figure 16, Item 9).
12. Connect the flame sensor harness connector (Figure 16, Item 8). This will not be connected after replacement with a MBU-V3 fuel delivery block.

REPLACE – CONTINUED

13. Install the ground wire (Figure 16, Item 12).
14. Install the fuel delivery block (Figure 16, Item 1) onto the burner tube mounting studs IAW procedures given in this WP entitled "Remove/Install the Fuel Delivery Block."

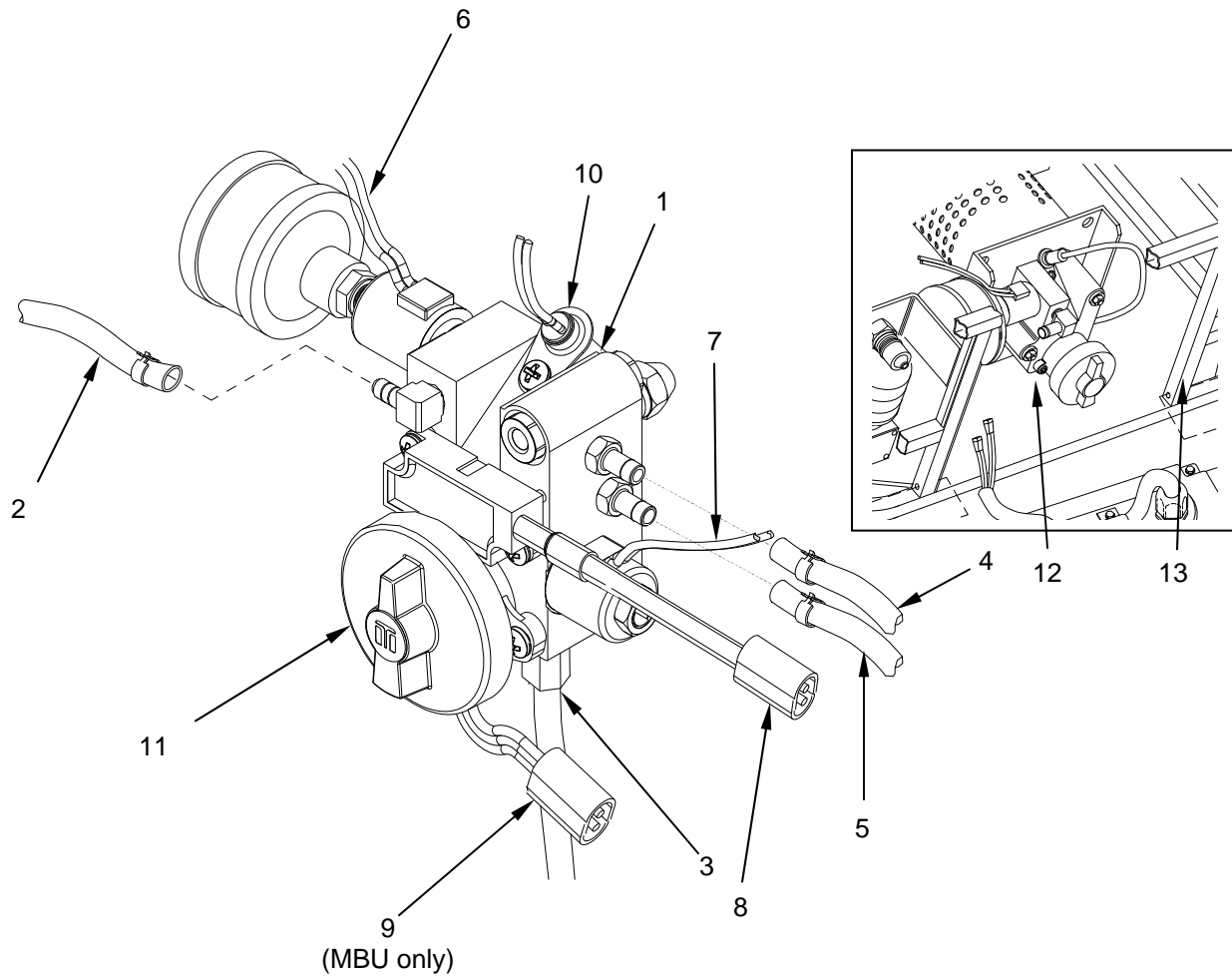


Figure 16. Replace the Fuel Delivery Block Assembly.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**AIR FILTER
TEST, REPLACE**

INITIAL SETUP:**Personnel Required**

Food Service Specialist 92G (1)
MOS Non-specific (1)

Equipment Condition

MBU shut down and cool (WP 0005)

TEST**Air Filter Test**

1. Start the MBU and observe the flame quality.
2. Open the control panel.
3. Loosen and remove air filter while the MBU is operating.
4. If the flame quality improves, shut down the MBU and replace air filter.
5. If flame quality remains constant, air filter does not require replacement.

END OF TASK**REPLACE****Replace the Air Filter**

The air filter is to be replaced after 300 hours of operation. Replace the air filter more often in dusty or extremely humid conditions or whenever recommended as part of the troubleshooting procedures.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Turn locking latch (Figure 1, Item 1) on top of front panel (Figure 1, Item 2) counterclockwise. Lower front panel of MBU to gain access to fuel delivery block (Figure 1, Item 3) and Air Filter (Figure 1, Item 4).
2. Grasp air filter (Figure 1, Item 4) and rotate counterclockwise (hold body of solenoid to prevent turning) to unscrew from the threaded fitting (Figure 1, Item 5) on the air/fill solenoid valve of the fuel delivery block (Figure 1, Item 3).
3. Screw the new air filter (Figure 1, Item 4) onto the threaded fitting (Figure 1, Item 5) until it is securely in place. Hand tighten the air filter.
4. Close and secure front panel (Figure 1, Item 1).

REPLACE – CONTINUED

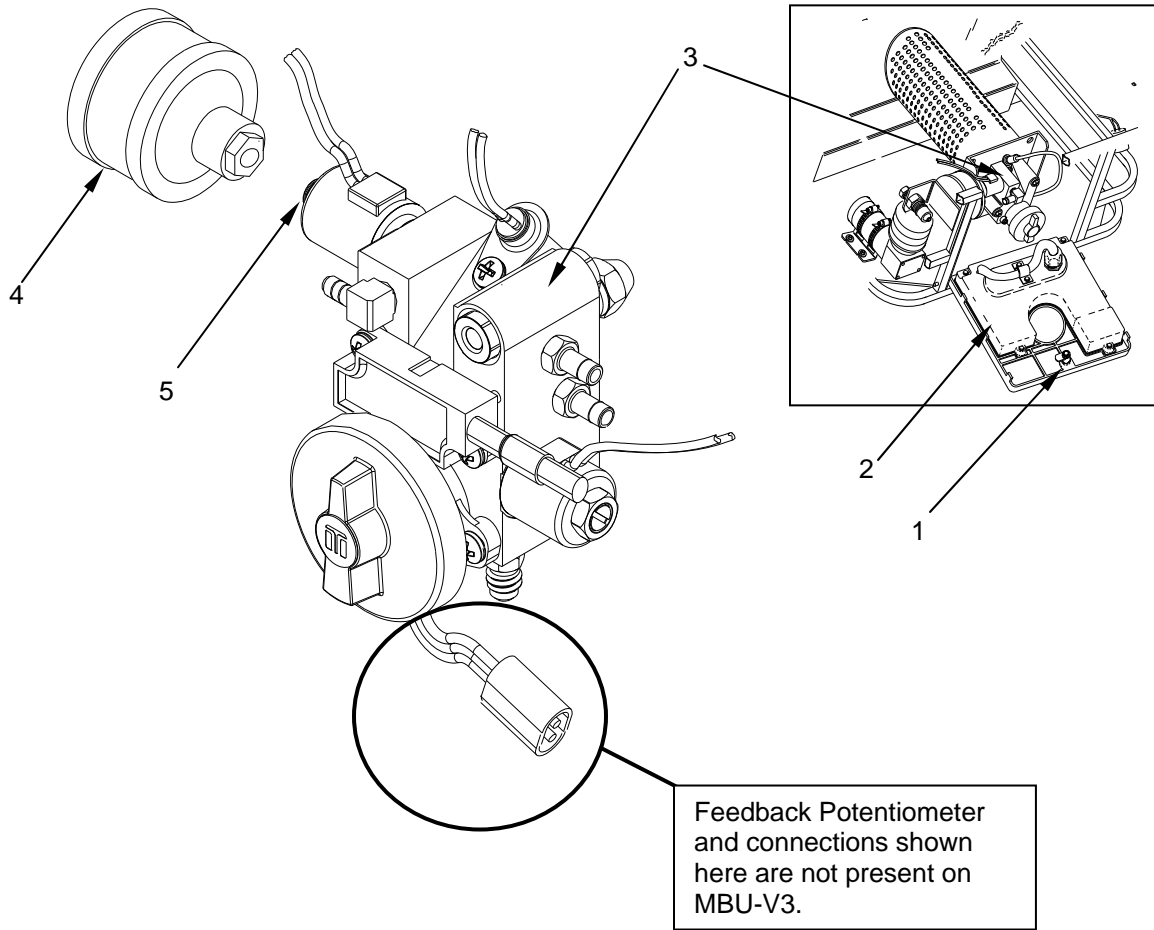


Figure 1. Replace the Air Filter.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**IGNITER
REPLACE**

INITIAL SETUP:**Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Personnel RequiredFood Service Specialist 92G (1)
MOS Non-specific (1)**Materials/Parts**

Rag, Wiping (WP 0072, Item 5)

Equipment ConditionMBU shut down and cool (WP 0005)

REPLACE

Replace the igniter every 2000 Hrs of operation or whenever recommended as part of a troubleshooting procedure.

WARNING

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

1. Turn the locking latch counterclockwise and open MBU control panel (Figure 1, Item 1) to gain access to the fuel delivery block (Figure 1, Item 2).
2. Remove two hex nuts and washers (Figure 1, Item 3) securing fuel delivery block (Figure 1, Item 2) to the burner tube (Figure 1, Item 4).
3. Disconnect igniter assembly wire (Figure 1, Item 6).
4. Move fuel delivery block (Figure 1, Item 2) to expose igniter (Figure 1, Item 5).
5. Remove igniter retainer screw (Figure 1, Item 7) and remove igniter (Figure 1, Item 5) and bracket from the fuel delivery block (Figure 1, Item 2). Note routing of igniter cable.

CAUTION

When replacing the nozzle, be careful not to damage the igniter.

6. Open electrical cable clamp to release igniter assembly wire.
7. Disconnect igniter power lead.
8. Install new igniter assembly (Figure 1, Item 5), and tighten the retainer screw (Figure 1, Item 7).

REPLACE – CONTINUED

9. Connect the igniter power lead into light blue connector (Figure 1, Item 6). Route igniter cable as previously noted.
10. Move fuel delivery block (Figure 1, Item 2) into position and replace and tighten two hex nuts and washers (Figure 1, Item 3) while holding the block against the burner tube assembly (Figure 1, Item 4).
11. Close control panel (Figure 1, Item 1), and secure.

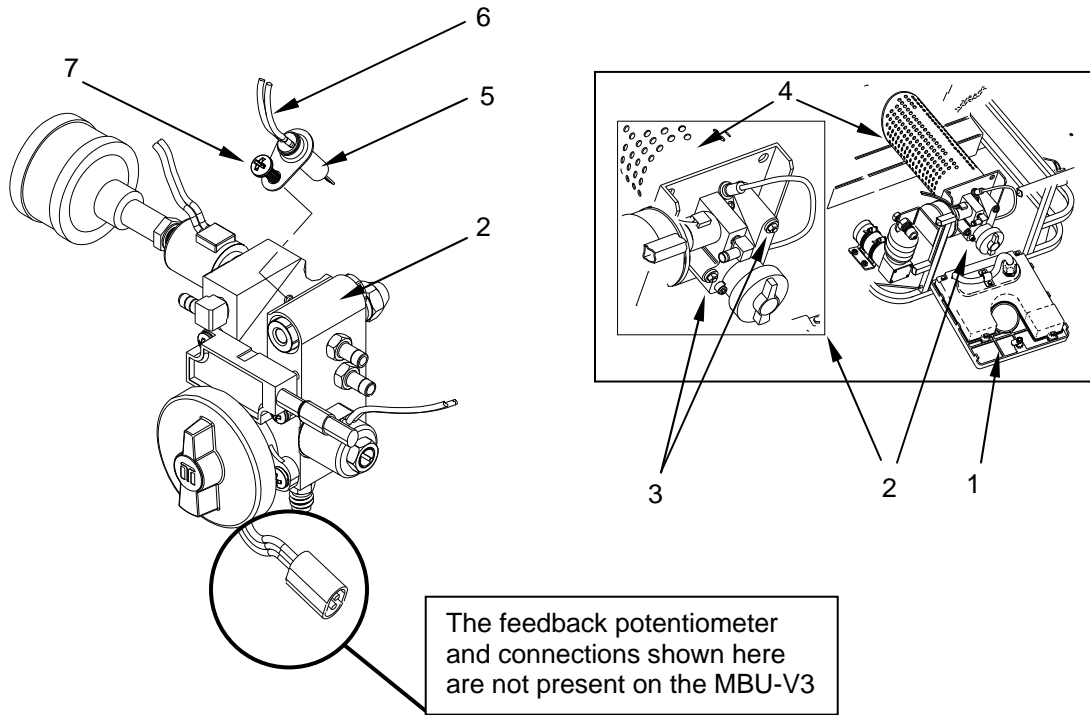


Figure 1. Replace the Igniter Assembly.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**FUEL NOZZLE
REPLACE**

INITIAL SETUP:**Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Materials/Parts

Rag, Wiping (WP 0072, Item 5)

References

WP 0014

Personnel RequiredFood Service Specialist 92G (1)
MOS Non-specific (1)**Equipment Condition**MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)
Fuel tank drained (WP 0014)

REPLACE

Replace the nozzle every 2000 hours of operation or whenever recommended as part of a troubleshooting procedure.

WARNING

Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 0014. Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

1. Open control panel (Figure 1, Item 1) to gain access to fuel delivery block (Figure 1, Item 2).
2. Remove two hex nuts and washers (Figure 1, Item 3) securing fuel delivery block (Figure 1, Item 2) to the burner tube assembly (Figure 1, Item 4).
3. Move fuel delivery block (Figure 1, Item 2) out of the way to gain access to the nozzle (Figure 1, Item 5).

REPLACE – CONTINUED**CAUTION**

When replacing the nozzle, be careful not to damage the igniter.

4. Unscrew the nozzle (Figure 1, Item 5) from the fuel delivery block (Figure 1, Item 2).
5. Lubricate the O-ring (Figure 1, Item 6) on the replacement fuel nozzle (Figure 1, Item 5) with a small amount of clean fuel. The O-ring is supplied in place on the fuel nozzle.
6. Screw the replacement fuel nozzle (Figure 1, Item 5) into the fuel delivery block (Figure 1, Item 2).
7. With the replacement nozzle (Figure 1, Item 5) installed, move the fuel delivery block (Figure 1, Item 2) into position. Replace tighten two hex nuts and washers (Figure 1, Item 3) securing them tightly to the burner tube (Figure 1, Item 4).
8. Close control panel (Figure 1, Item 1) and secure.

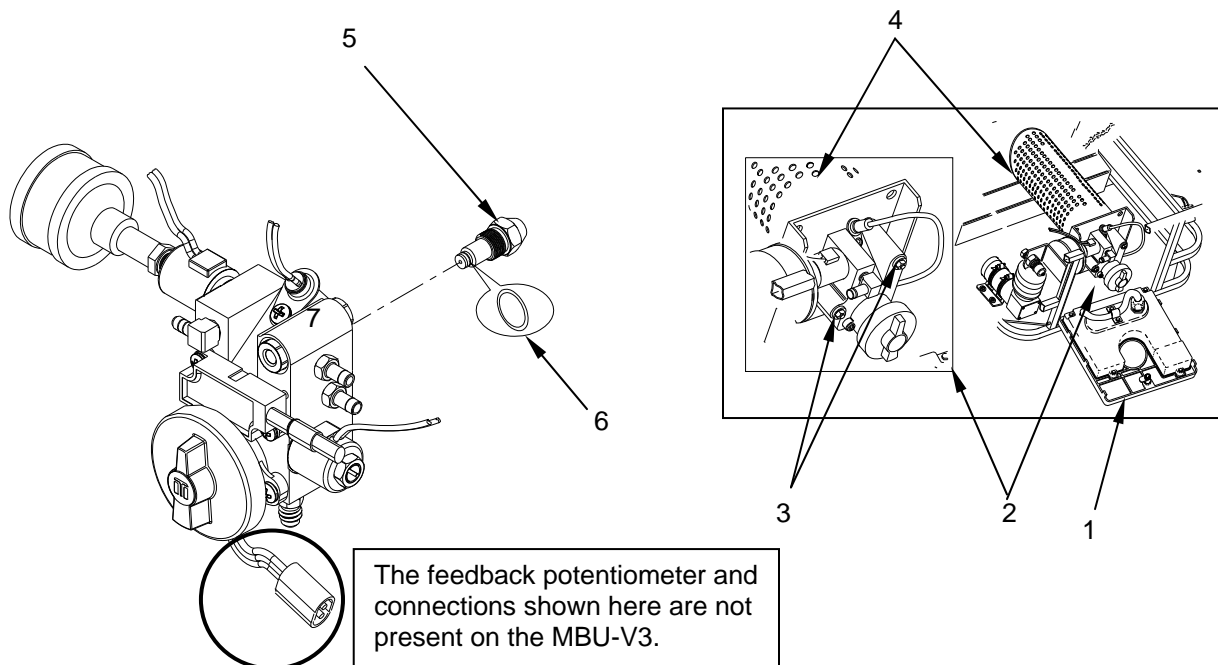


Figure 1. Replace the Fuel Nozzle.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

VENT VALVE ASSEMBLY
INSPECT, TEST, SERVICE, REPLACE

INITIAL SETUP:**Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)
Punch, Drive Pin (WP 0071)
Wrench, Box and Open End, Combination (WP 0071)

Personnel Required

Food Service Specialist 92G (1)
MOS Non-specific (1)

Materials/Parts

Rag, Wiping (WP 0072, Item 5)

Equipment Condition

MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)
Fuel tank drained (WP 0014)

References

WP 0005, WP 0014

INSPECT**Inspect the Vent Valve Assembly****WARNING**

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

Inspect the vent valve assembly (Figure 1, Item 1) for proper seating on the fuel tank (Figure 1, Item 2). Check for damage to the valve head (Figure 1, Item 3), and solenoid (Figure 1, Item 4). Check for loose power leads (Figure 1, Item 5) to the solenoid and float switch. Ensure vent orifice (Figure 1, Item 6) is not clogged.

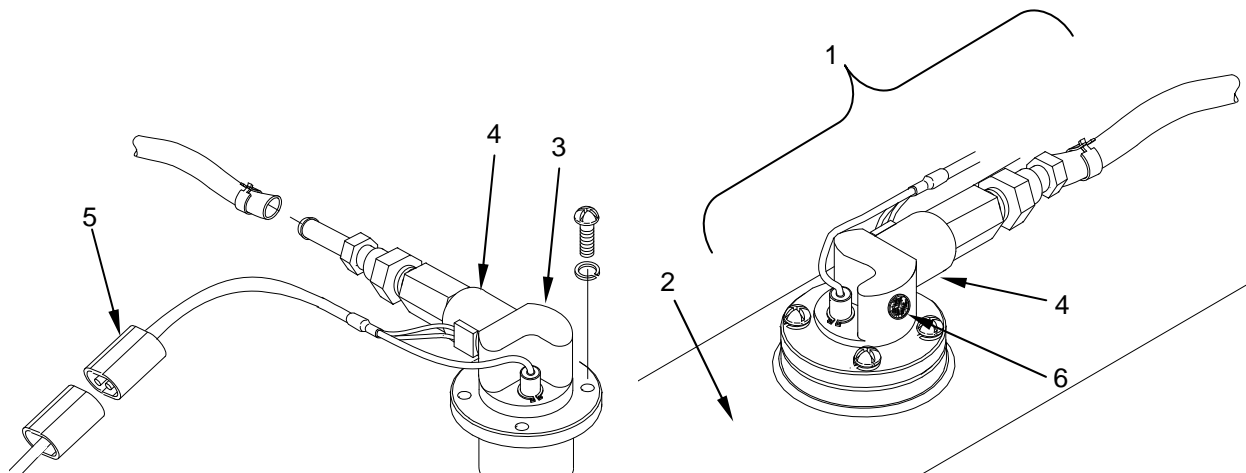


Figure 1. Inspect the Vent Valve Assembly.

END OF TASK

TEST

WARNING

Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 0014. Wear protective equipment to keep fuel out of eyes and away from skin. Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Set up the MBU IAW WP 0005.
2. Ensure the gasket is in serviceable condition on the fuel tank filler cap and that the cap is tight. If this gasket leaks or is missing, the MBU will operate, but it cannot be refueled because air will be drawn into the tank instead of fuel.
3. With the fuel line adapter disconnected from the MBU, press the fuel button. The fuel cycle will start and the MBU should pull air from the tank. After a few seconds, depress the middle of the fuel fill quick-connector on the MBU. You should hear a hiss as the air rushes into the tank. The noise is hard to detect, so listen closely to hear the momentary sound.
4. If you hear the air rushing into the tank, the check valve is functioning properly. If no air rushes into the fitting, the check valve is more than likely stuck.
5. Press the Stop button and disconnect power to the MBU.
6. Remove the four carriage bolts, washers, and self-locking nylon nuts holding the reflective heat shield assembly to the frame, and set the hardware aside for reassembly.
7. Lift the top pan of the reflective heat shield and position it to the side. The pan does not have to be completely removed. The fuel delivery block may stay attached.

TEST – CONTINUED

8. Remove the air hose by squeezing the tabs on hose clamp (Figure 2, Item 1) with a pair of pliers and slide the clamp off the vent valve fitting (Figure 2, Item 2) and onto the neoprene line (Figure 2, Item 3). It may be necessary to cut or replace the hose to remove it.
9. Remove the check valve (Figure 2, Item 4) by holding the solenoid fitting (Figure 2, Item 5) with a suitable wrench while turning the check valve with another suitable wrench. Be careful not to turn the fitting on the solenoid valve.
10. Connect power and press the POWER button on the MBU control panel.
11. Place the check valve back into the air line and press the FUEL button on the MBU control panel.

CAUTION

DO NOT press the start button or the MBU will attempt to start.

12. If air is not drawn in through the check valve, it is not functioning properly. Press STOP, then POWER on the MBU control panel. Disconnect power to the MBU. Service the check valve IAW procedures in this WP. If the check valve is damaged, replace it IAW the REPLACE procedures in this WP.
13. If air is drawn through the check valve, it is serviceable. Remove the check valve (Figure 2, Item 4) from the air line (Figure 2, Item 3).
14. Install the check valve (Figure 2, Item 4) by holding the solenoid fitting (Figure 2, Item 5) with a suitable wrench and turn the check valve with another suitable wrench. Be careful not to turn the fitting on the solenoid valve.
15. Connect the air line (Figure 2, Item 3) to the vent valve fitting (Figure 2, Item 2).
16. Replace the reflective heat shield assembly on the MBU frame and secure with the hardware removed earlier.
17. Connect power to the MBU and operate IAW procedures in WP 0005. Monitor for normal operation.

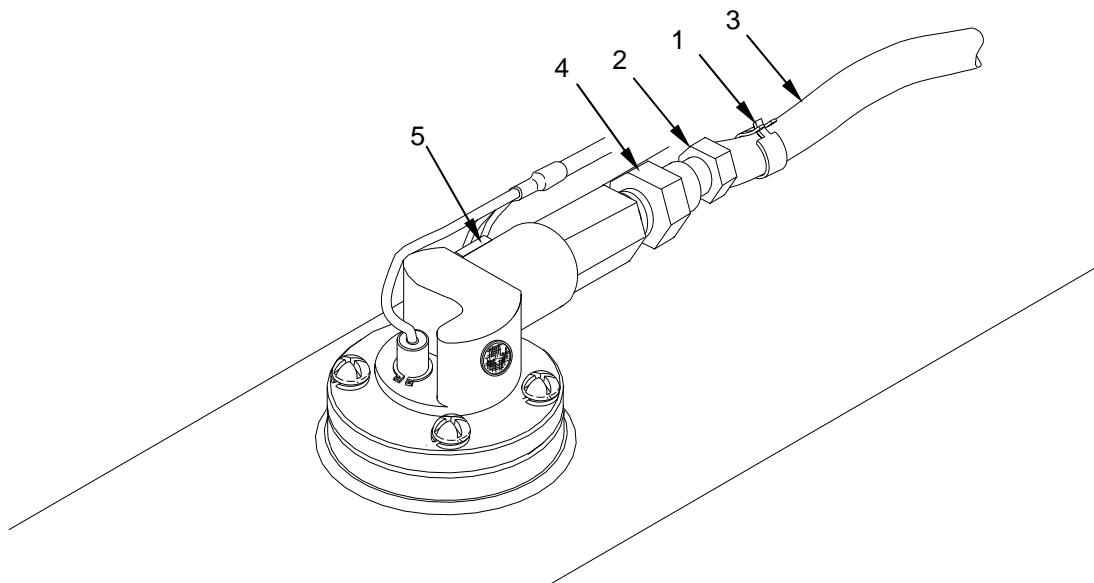


Figure 2. Inspect the Check Valve.

END OF TASK

SERVICE**Check Valve****WARNING**

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

NOTE

- The check valve is a component of the vent valve assembly. It may be sticking or damaged, causing the vent valve assembly to malfunction. The following service procedures may correct the malfunction, allowing the vent valve to operate correctly.
 - This service procedure begins with the check valve removed from the vent valve assembly IAW the TEST procedure in this WP. If you have not removed the check valve, perform the TEST procedures listed in this WP before beginning service.
1. Remove the check valve (Figure 3, Item 3) from the air line (Figure 3, Item 1).
 2. Locate the plunger on the inside of the check valve (Figure 3, Item 3). Use a pin punch (Figure 3, Item 5) to gently push the plunger in from the threaded side of the check valve. If it is stuck, it should take slight pressure to get it to move in freely. The plunger is spring loaded and should return to the closed position automatically.
 3. Ensure the plunger moves in and out freely. If it does not, replace the check valve.
 4. Install the check valve (Figure 3, Item 3) by holding the solenoid (Figure 3, Item 4) with a suitable wrench and turn the check valve with another suitable wrench. Be careful not to turn the fitting on the solenoid valve.
 5. Connect the air line (Figure 3, Item 1) to the barb fitting on the vent valve assembly (Figure 3, Item 2).
 6. Replace the reflective heat shield assembly on the MBU frame and secure with the hardware removed earlier.
 7. Connect power to the MBU and operate IAW procedures in WP 0005. Monitor for normal operation.

END OF TASK**Clean the Vent Valve Assembly Orifice**

1. Locate the Vent Valve Assembly (Figure 3, Item 2) on the top surface of the fuel tank (Figure 3, Item 6). The Air Vent Orifice (Figure 3, Item 7) is the 3/8-inch diameter hole located on the side of the assembly facing the rear of the MBU.
2. Ensure that the orifice (Figure 3, Item 7) is clear of any dust or debris, as this would prevent venting of the fuel tank and affect fuel flow. Use a small cleaning brush to clean the debris out of the orifice. DO NOT use any tool or object that would push any debris further into the orifice.

END OF TASK

SERVICE – CONTINUED

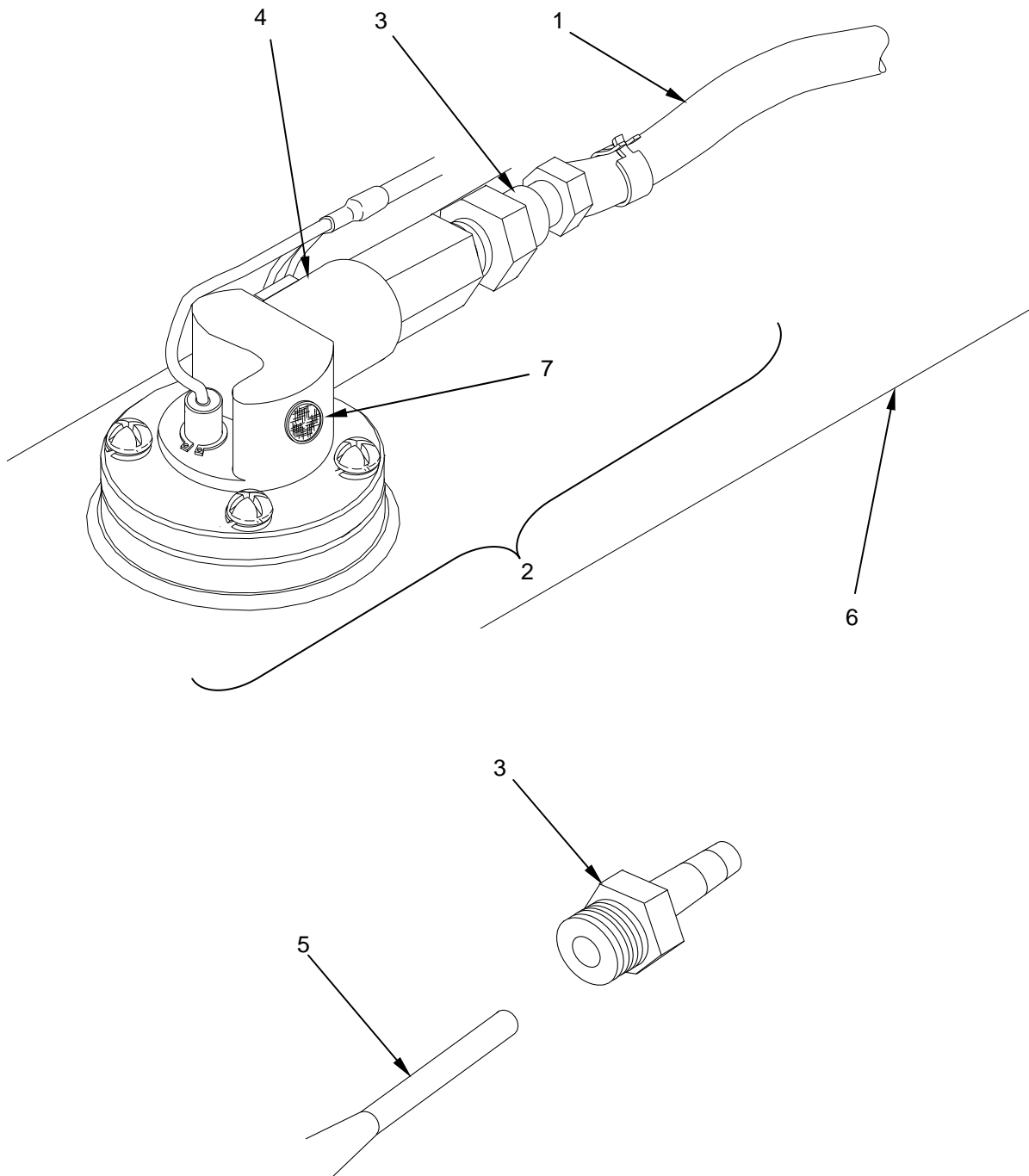


Figure 3. Service the Check Valve.

END OF TASK

REPLACE

WARNING



HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

WARNING



Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 0014. Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING



Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

WARNING



The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Remove the four carriage bolts (Figure 4, Item 1), washers, and self-locking nylon nuts holding the reflective heat shield assembly to the frame and set the hardware aside for reassembly.
2. Remove the retainer clamps (Figure 4, Item 2) from the fuel line assembly. Retain the clamps for reassembly.
3. Remove the four screws (Figure 4, Item 3) securing the vent assembly to the fuel tank (Figure 4, Item 4). Retain the fasteners for reassembly.
4. Remove the air hose (Figure 4, Item 5) by squeezing the tabs on hose clamp (Figure 4, Item 6) with a pair of pliers and slide the clamp off the vent valve fitting (Figure 4, Item 7) and onto the air hose (Figure 4, Item 5). It may be necessary to cut or replace the hose to remove it.

REPLACE - CONTINUED

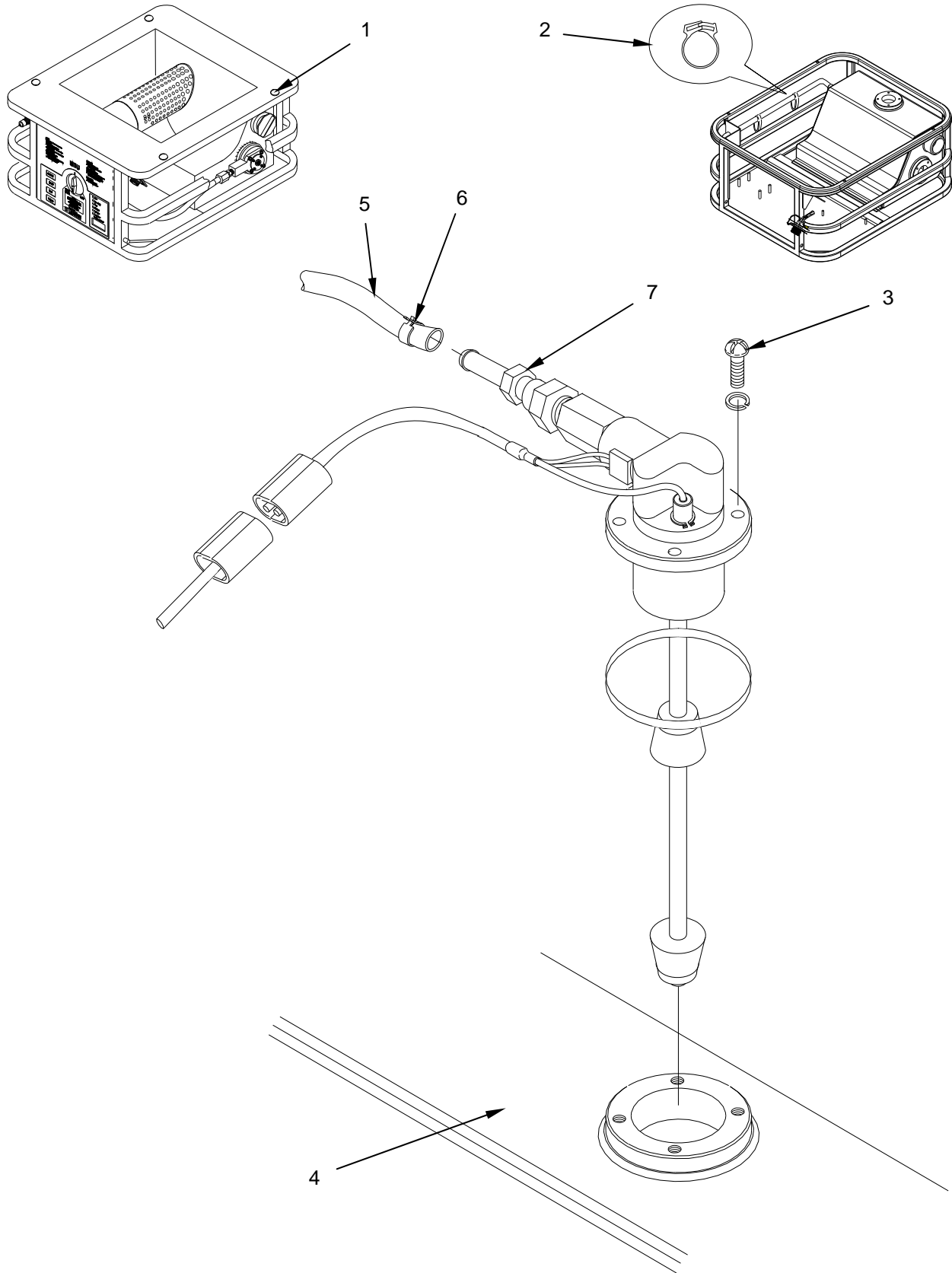


Figure 4. Replace the Vent Valve Assembly.

REPLACE – CONTINUED

5. Remove the check valve (Figure 5, Item 1) by holding the solenoid fitting (Figure 5, Item 2) with a suitable wrench while turning the check valve with another suitable wrench. Be careful not to turn the fitting on the solenoid valve.
6. Disconnect the wiring connector (Figure 5, Item 3) from end of the harness (Figure 5, Item 4).
7. Remove the vent valve assembly (Figure 5, Item 5) from the fuel tank (Figure 5, Item 6).
8. Discard the old O-ring (Figure 5, Item 7).
9. Lubricate the new O-ring (Figure 5, Item 7) with clean fuel and install.
10. Place the serviceable vent valve assembly (Figure 5, Item 5) into position into the fuel tank (Figure 5, Item 6). Ensure the vent is facing the rear of the MBU.
11. Install the four screws (Figure 5, Item 8) that secure the vent valve assembly to the fuel tank (Figure 5, Item 6).
12. Install the check valve (Figure 5, Item 1) by holding the solenoid fitting (Figure 5, Item 2) with a suitable wrench and turn the check valve with another suitable wrench. Be careful not to turn the fitting on the solenoid valve.
13. Connect the wiring connector (Figure 5, Item 3) from end of the harness (Figure 5, Item 4).
14. Connect the air line (Figure 5, Item 9) to the check valve (Figure 5, Item 1).
15. Install the retainer clamps (Figure 5, Item 10) around the fuel line assembly (Figure 5, Item 5), air line (Figure 5, Item 9), and wire leading to the wiring connector (Figure 5, Item 3).
16. Replace the reflective heat shield assembly on the MBU frame and secure with the hardware removed earlier.
17. Connect power to the MBU and operate IAW procedures in WP 0005. Monitor for normal operation.

REPLACE – CONTINUED

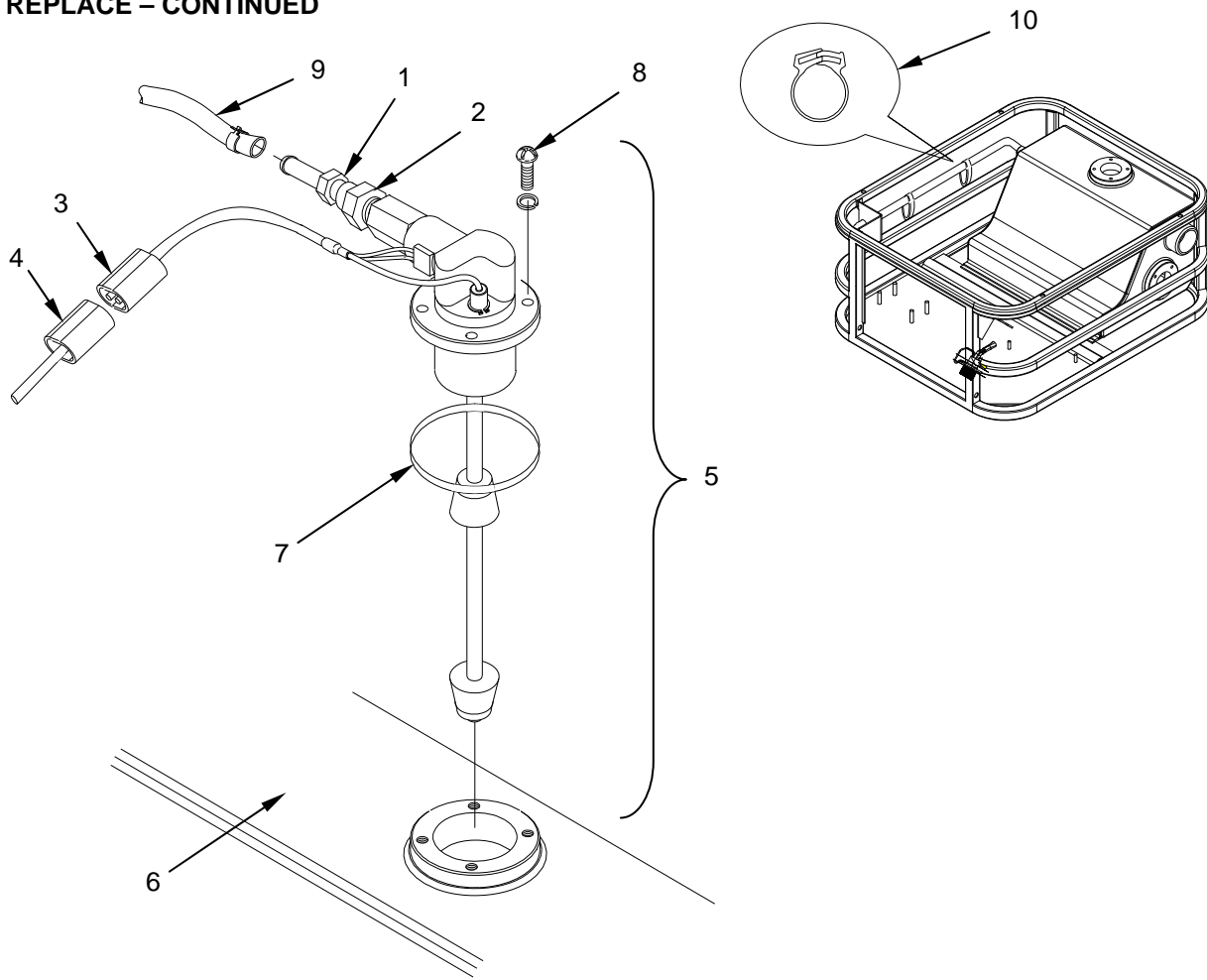


Figure 5. Replace the Vent Valve Assembly.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**BURNER ASSEMBLY AND REFLECTIVE HEAT SHIELD ASSEMBLY
INSPECT, REPLACE**

INITIAL SETUP:**Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Personnel RequiredFood Service Specialist 92G (1)
MOS Non-specific (1)**Materials/Parts**

Gloves, Chemical (WP 0072, Item 3)

Equipment ConditionMBU shut down and cool (WP 0005)
Power disconnected (WP 0005)**References**WP 0014

INSPECT

Inspection procedures for the reflective heat shield assembly and burner assembly begin on the next page.

INSPECT – CONTINUED**WARNING**

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

CAUTION

When rinsing burner tube, do not use a high-pressure washer and only spray water into the burner tube.

NOTE

Carbon buildup in the burner tube is normal, but excessive amounts can cause malfunctioning. Carbon is usually burned off when the burner is operated at low, but if the burner is operated on high for extended periods, excessive amounts of carbon can build up.

Inspect the reflective heat shield (Figure 1, Item 1) and burner tube assembly (Figure 1, Item 2) for physical damage, such as dents, perforations, or severe warping. Check mounting hardware (Figure 1, Item 3) for security. Check for carbon buildup in the burner tube. Clean if necessary by burning off or washing.

INSPECT – CONTINUED

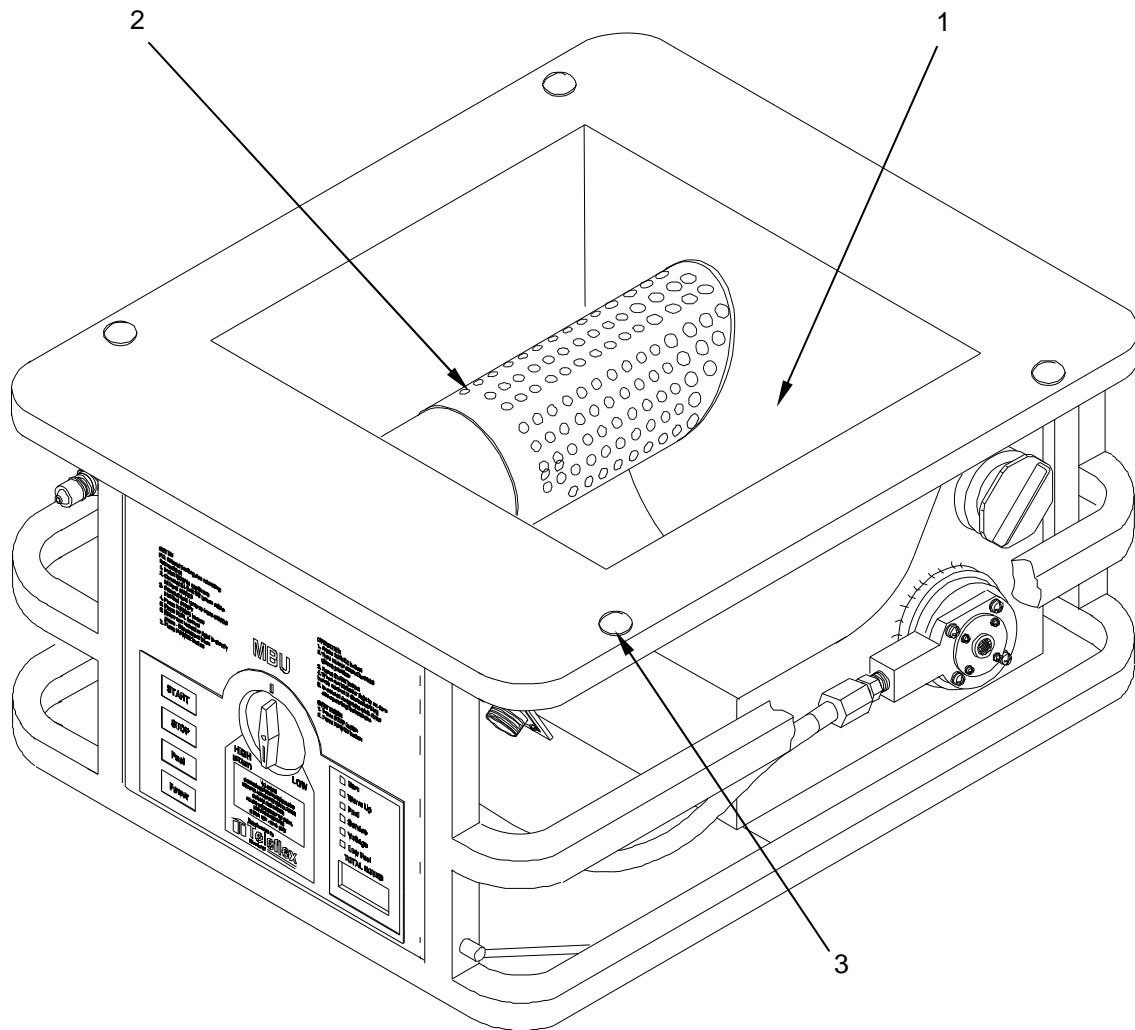


Figure 1. Inspect the Burner Assembly and Reflective Heat Shield Assembly.

END OF TASK

REPLACE – CONTINUED**WARNING**

Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 014. Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Ensure the MBU is cool, disconnected from power, and has been drained of fuel IAW instructions given in WP 0014.
2. Open control panel (Figure 2, Item 1) for access to the fuel delivery block assembly (Figure 2, Item 2).
3. To remove fuel delivery block assembly (Figure 2, Item 2), remove two self-locking nuts and washers (Figure 2, Item 3 and Item 4) that secure the fuel delivery block assembly to the burner tube mounting shafts (Figure 2, Item 5).
4. Slide the fuel delivery block assembly (Figure 2, Item 2) off the burner tube mounting shafts (Figure 2, Item 5).
5. To replace any part of the reflective heat shield assembly (Figure 2, Item 6) or burner tube assembly (Figure 2, Item 7), remove the four carriage bolts (Figure 2, Item 8), washers (Figure 1, Item 9) and self-locking nylon nuts (Figure 2, Item 10) holding the reflective heat shield assembly to the frame (Figure 2, Item 11).
6. Lift the reflective heat shield and burner tube assembly (Figure 2, Item 6 and Item 7) off the MBU frame (Figure 2, Item 11) and place face down on a flat surface.
7. Remove the burner tube assembly by removing the four screws (Figure 2, Item 12). Set screws aside for reassembly.

REPLACE - CONTINUED

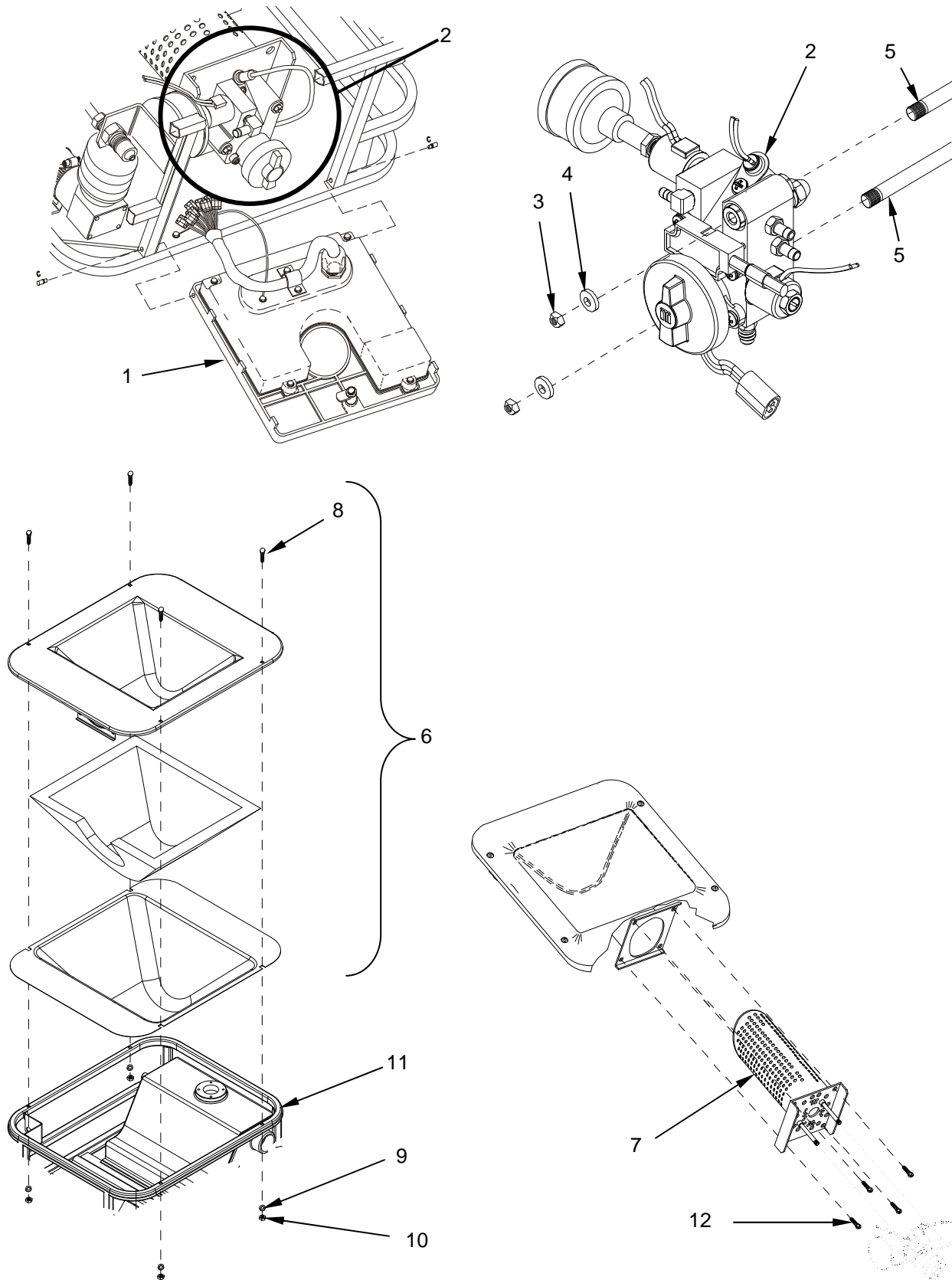


Figure 2. Replace the Burner Assembly and Reflective Heat Shield Assembly.

REPLACE – CONTINUED**WARNING**

The reflective heat shield assembly insulation (Figure 3, Item 5) is made of fiberglass. Wear gloves to protect hands and a respirator to prevent inhalation of fiberglass particles.

8. If replacing the reflective heat shield assembly (Figure 3, Item 1), put a replacement reflective heat shield (Figure 3, Item 2) into position, making sure that the flange (Figure 3, Item 3) of the reflective heat shield (Figure 3, Item 2) fits through the opening on the burner well (Figure 3, Item 4) and that the insulation (Figure 3, Item 5) is not entering the well of the reflective heat shield (Figure 3, Item 2).
9. Flip the entire assembly face down on a work surface and press down on the burner well to expose the flange (Figure 3, Item 3).
10. Install the burner tube assembly (Figure 3, Item 6), making sure that the holes in the burner tube face out of the reflective heat shield when the assembly is mounted back on the MBU frame (Figure 3, Item 7). Secure burner tube with screws retained earlier.
11. Place the entire reflective heat shield and burner tube assembly back in place on the MBU frame (Figure 3, Item 7).
12. Install the four carriage bolts (Figure 3, Item 8), washers (Figure 3, Item 9), and self-locking nylon nuts (Figure 3, Item 10) securing the reflective heat shield assembly (Figure 3, Item 1) to the frame (Figure 3, Item 7).
13. Slide the fuel delivery block assembly (Figure 3, Item 11) onto the burner tube mounting shafts and secure with the hardware retained earlier.
14. Close and secure the control panel (Figure 3, Item 12).

REPLACE – CONTINUED

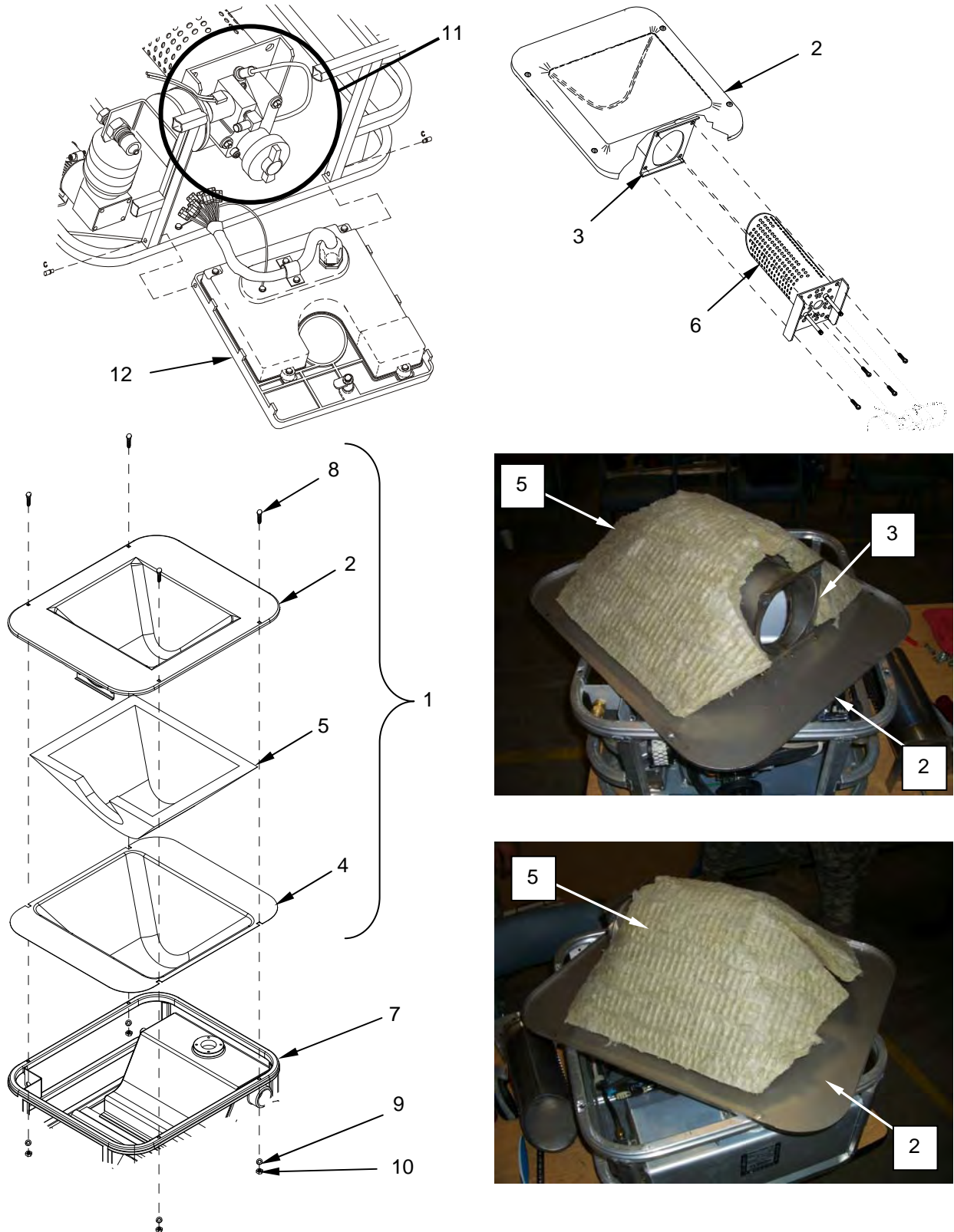


Figure 3. Replace the Burner Assembly and Reflective Heat Shield Assembly.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**FUEL REGULATOR ASSEMBLY
INSPECT, SERVICE, REPLACE**

INITIAL SETUP:**Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Materials/PartsRag, Wiping (WP 0072, Item 5)
Wrench, Box and Open End, Combination (WP 0071)**References**

WP 0014

Personnel RequiredFood Service Specialist 92G (1)
MOS Non-specific (1)**Equipment Condition**MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)
Fuel tank drained (WP 0014)

INSPECT

Inspection procedures for the fuel regulator assembly begin on the next page.

INSPECT – CONTINUED**WARNING**

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

Inspect the regulator assembly (Figure 1, Item 1) for proper seating on the fuel tank (Figure 1, Item 2). Check for security of the valve head, and fuel line fitting. Ensure vent is not clogged.

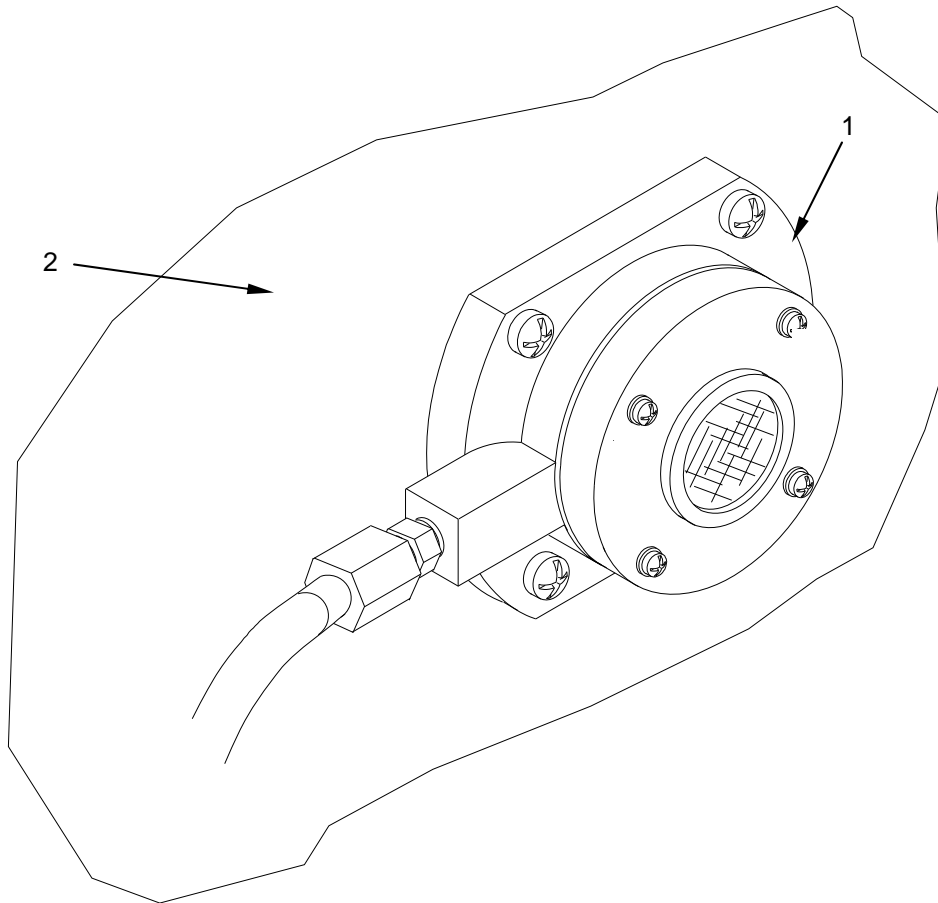


Figure 1. Inspect the Fuel Regulator Assembly.

END OF TASK

SERVICE

1. Locate the regulator assembly air vent (Figure 2, Item 1) on the right side of the fuel tank (Figure 2, Item 2) just below and to the left of the fuel tank filler cap. The air vent is located on the top center of the assembly and is a gold colored metallic material.
2. Ensure that the vent (Figure 2, Item 1) is clean and unobstructed by using a small cleaning brush to gently remove any dirt or debris that might be found.

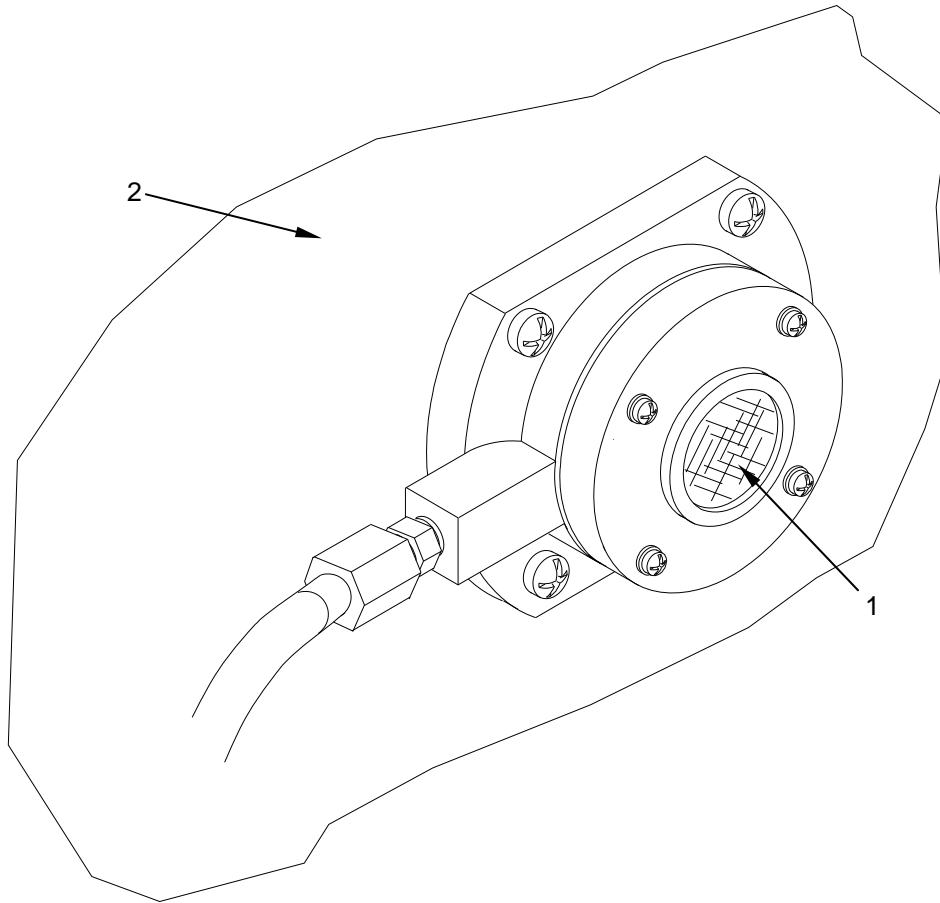


Figure 2. Clean the Fuel Regulator Assembly Air Vent.

END OF TASK

REPLACE**Replace the Fuel Regulator Assembly****WARNING**

Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 0014. Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Disconnect power to the MBU.
2. Drain the fuel tank IAW WP 0014.
3. To replace the fuel regulator assembly (Figure 3, Item 2), disconnect the fuel feeder line (Figure 3, Item 6) by loosening the compression fitting nut (Figure 3, Item 5) from the fuel regulator fitting (Figure 3, Item 4).
4. Remove the four retaining screws (Figure 3, Item 3) with a suitable screwdriver.
5. Remove the fuel regulator assembly (Figure 3, Item 2) from the fuel tank (Figure 3, Item 10).
6. Discard O-ring (Figure 3, Item 1).
7. Pull the fuel filter (Figure 3, Item 9) of the fuel regulator assembly.
8. Using two wrenches, loosen the fuel pickup tube nut (Figure 3, Item 8) from the tube adapter (Figure 3, Item 7).
9. Remove the tube adapter (Figure 3, Item 7), with fuel pickup tube still attached, from the fuel regulator. Retain the tube adapter and fuel pickup tube for reassembly.

REPLACE – CONTINUED

10. Install the retained tube adapter (Figure 3, Item 7) with fuel pickup tube attached, onto the serviceable fuel regulator (Figure 3, Item 2) as shown in Figure 3.
11. Push fuel filter (Figure 3, Item 9) onto fuel pickup tube until fully seated.
12. Lubricate the O-ring (Figure 3, Item 1) with a small amount of clean fuel.
13. Install a new regulator assembly by installing a new O-ring (Figure 3, Item 1) between the fuel regulator (Figure 3, Item 2) and fuel tank (Figure 3, Item 10).
14. Insert the fuel regulator assembly (Figure 3, Item 2) into the fuel tank (Figure 3, Item 10) and secure with the four retaining screws (Figure 3, Item 3) using a suitable screwdriver. Ensure the fuel line fitting is facing the front of the MBU and the fuel filter and pickup tube point down into the fuel tank.
15. Reconnect the fuel feeder line (Figure 3, Item 6) by tightening the compression nut (Figure 3, Item 5) to the fuel regulator fitting (Figure 3, Item 4). Use two wrenches, one on the fitting and one on the compression nut.

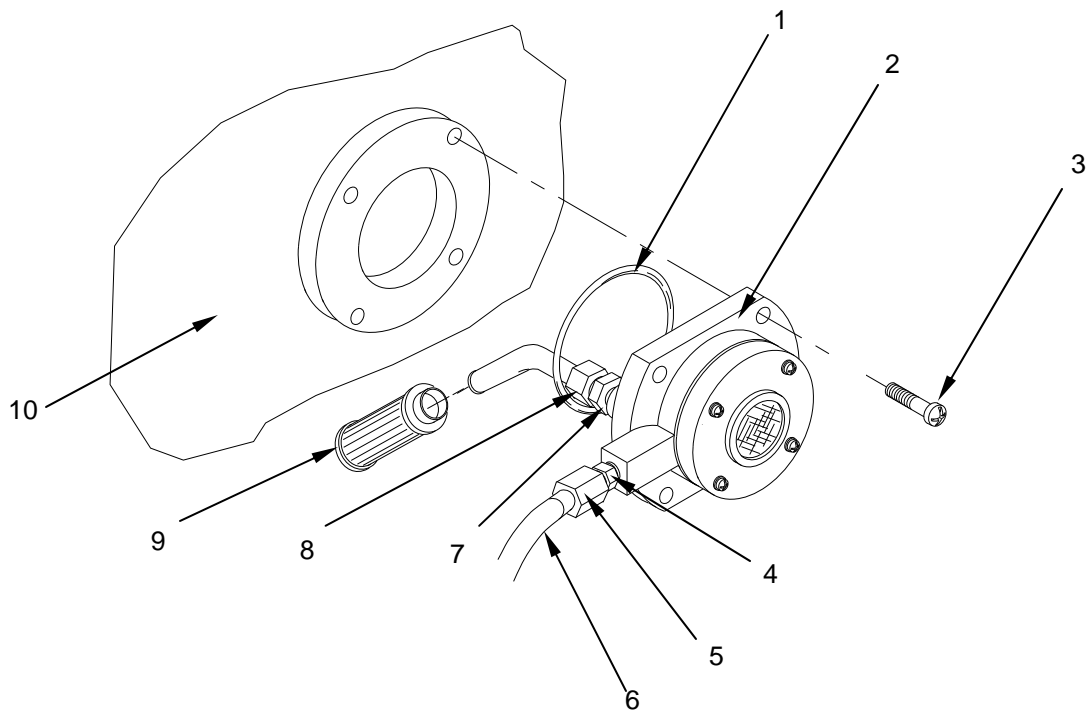


Figure 3. Replace the Fuel Regulator Assembly.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**FUEL FILTER
REPLACE**

INITIAL SETUP:**Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Materials/Parts

Brush, Acid Swabbing (WP 0072, Item 2)

Rag, Wiping (WP 0072, Item 5)

References

WP 0014, WP 0025

Personnel Required

Food Service Specialist 92G (1)

MOS Non-specific (1)

Equipment Condition

MBU shut down and cool (WP 0005)

Power disconnected (WP 0005)

Fuel tank drained (WP 0014)

REPLACE**Replace the Pickup Fuel Filter**

The pickup fuel filter is to be replaced after 300 hours operation. Replace the pickup fuel filter on the regulator assembly more often in dusty or extremely humid conditions or whenever recommended as part of a troubleshooting procedure.

WARNING

Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 0014. Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

1. Check the fuel regulator air vent (Figure 1, Item 3) for dirt or debris and clean with a small soft-bristle brush. Do not use any tool that will force the debris into the filter surface or damage it in any way.
2. Remove the fuel regulator assembly (Figure 1, Item 2) from the fuel tank (Figure 1, Item 1) IAW WP 0025.
3. Pull the fuel filter (Figure 1, Item 5) off the fuel pick up tube (Figure 1, Item 4).
4. Install the new fuel filter (Figure 1, Item 5) onto the fuel pick up tube (Figure 1, Item 4) until it is fully seated.

REPLACE – CONTINUED

5. Re-install the fuel regulator assembly (Figure 1, Item 2) into the fuel tank (Figure 1, Item 1) IAW WP 0025.

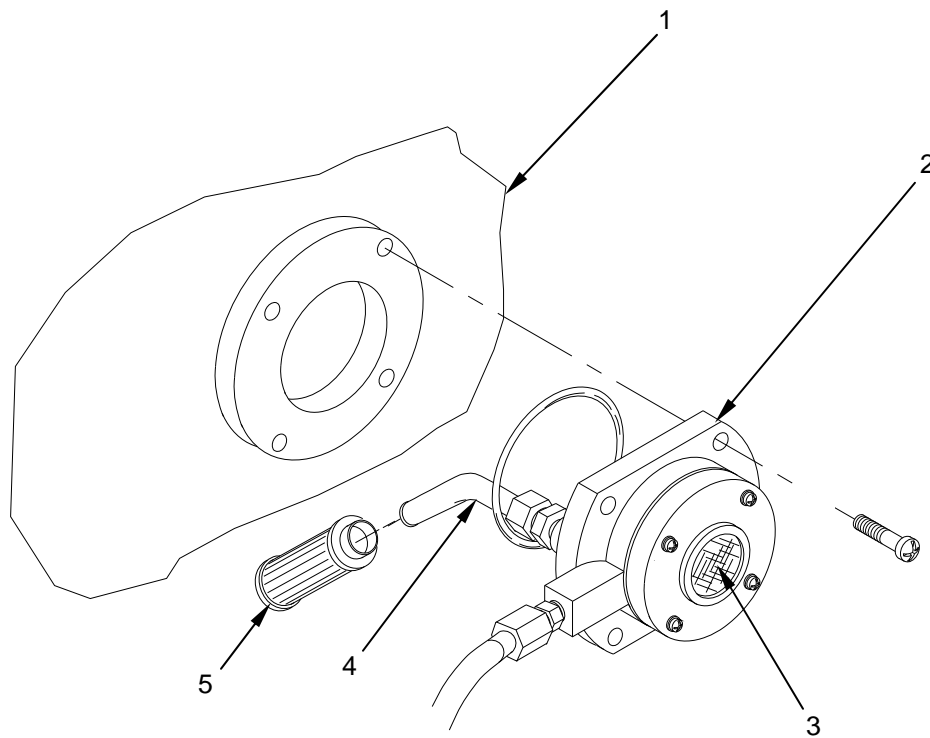


Figure 1. Replace the Pickup Fuel Filter.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

**FUEL LINE ASSEMBLY
INSPECT**

INITIAL SETUP:

Equipment Condition

MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)

Personnel Required

Food Service Specialist 92G (1)
MOS Non-specific (1)

References

WP 0039

INSPECT

Inspection procedures for the fuel line assembly begin on the next page.

INSPECT – CONTINUED**WARNING**

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

Inspect the fuel line assembly for damage to the fuel line (Figure 1, Item 1) and fittings. Check for leaks or loose connections (Figure 1, Item 2). Dents or kinks in the fuel line can restrict or prevent proper fuel flow. Refer to Field Maintenance to replace a damaged fuel line IAW WP 0039.

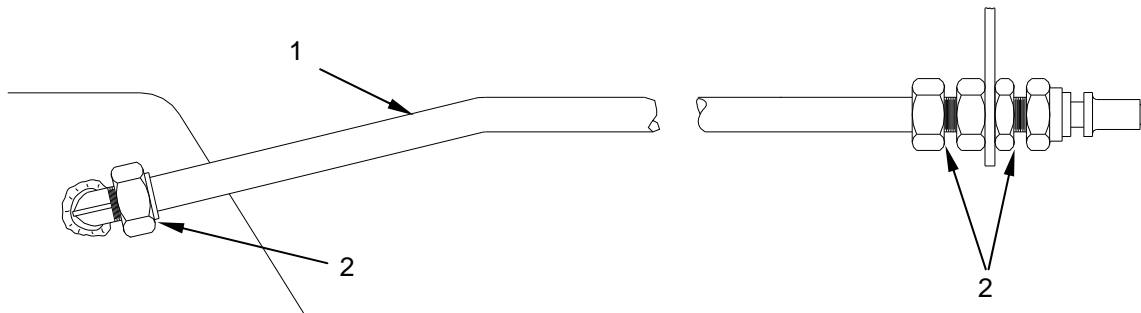


Figure 1. Inspect the Fuel Line Assembly.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**FUEL INTERFACE FITTING
INSPECT****INITIAL SETUP:****Equipment Condition**

MBU shut down and cool (WP 0005)
 Power disconnected (WP 0005)
 Fuel tank drained (WP 0014)

Personnel Required

Food Service Specialist 92G (1)
 MOS Non-specific (1)

References

WP 0014

INSPECT**Inspect the Fuel Interface Fitting****WARNING**

Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 0014. Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

Inspect the fuel interface fitting (Figure 1, Item 1) for physical damage, secure attachment, and leakage. Check free movement of the valve stem. Arrange for Field Maintenance to replace a damaged or leaking fuel interface fitting IAW WP 0040.

INSPECT – CONTINUED

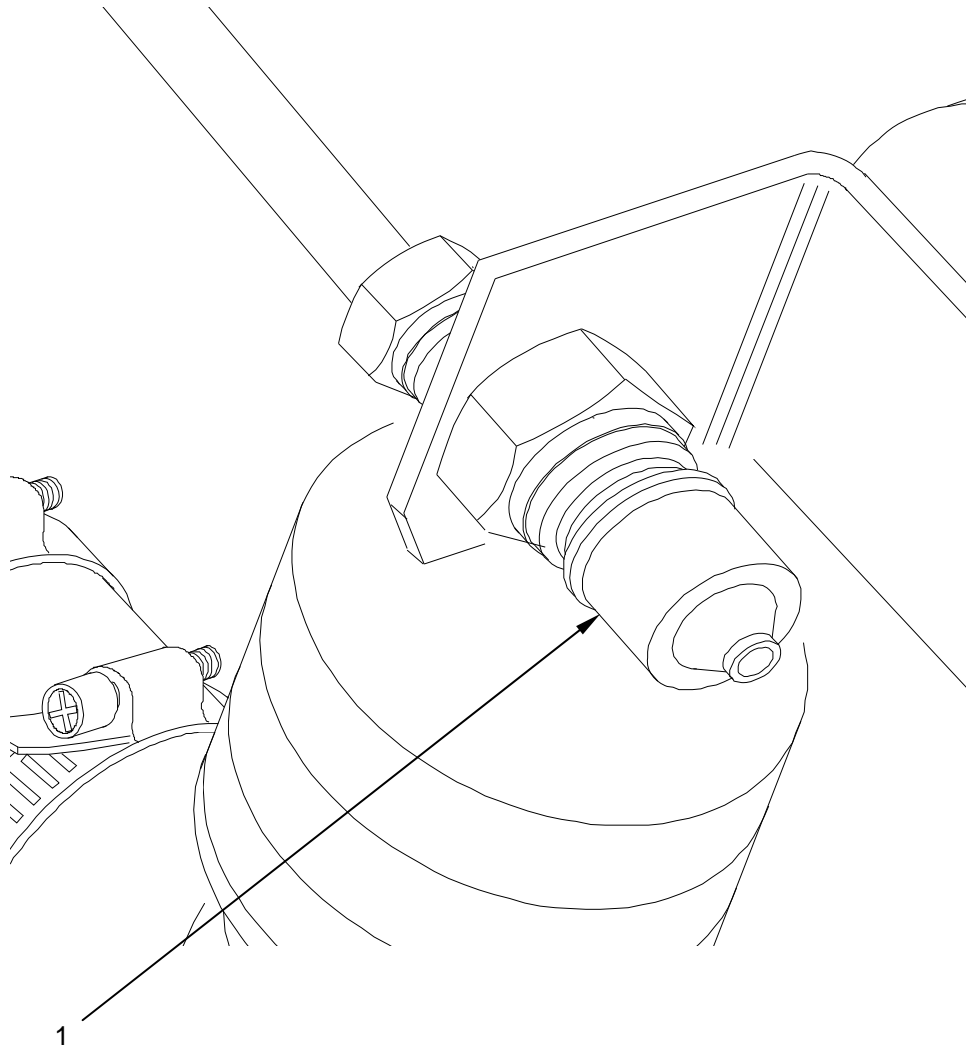


Figure 1. Inspect the Fuel Interface Fitting.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**POWER CONVERTER
INSPECT**

INITIAL SETUP:**Equipment Condition**

Power converter disconnected (WP 0005)

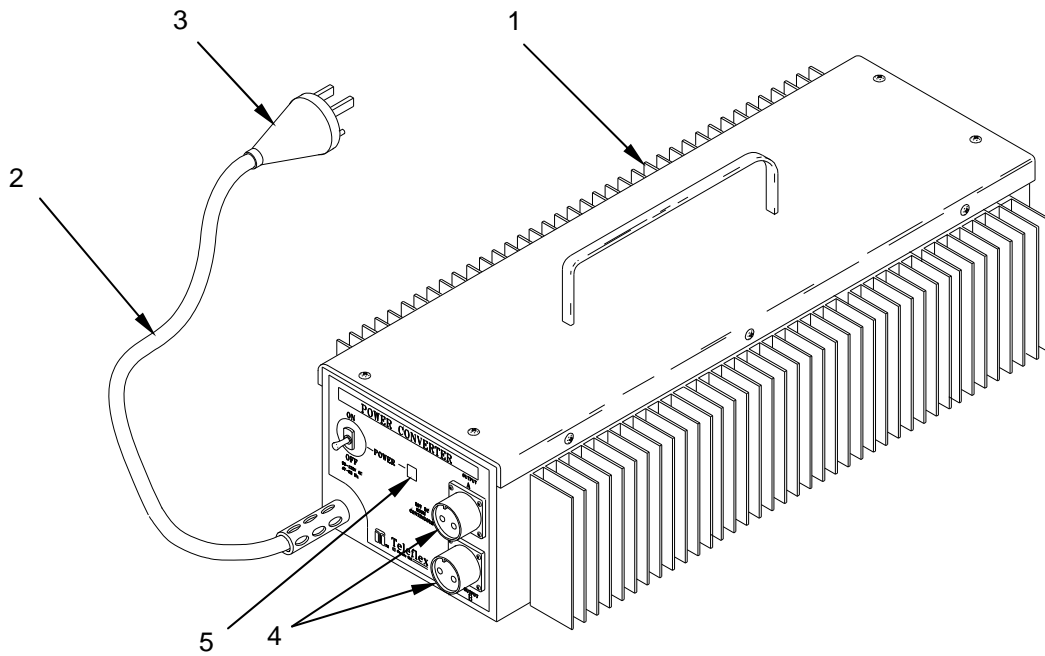
Personnel RequiredFood Service Specialist 92G (1)
MOS Non-specific (1)**References**WP 0041

INSPECT**WARNING**

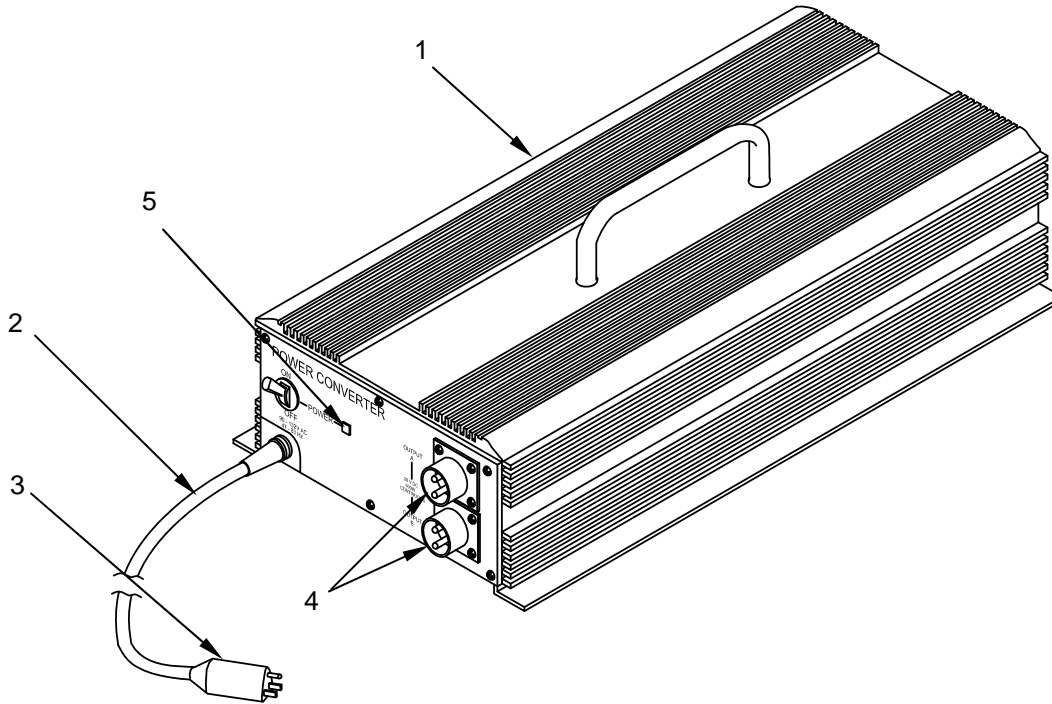
HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting with this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

1. Inspect the outer case of the power converter (Figure 1, Item 1) for any damage that would expose or damage the internal components.
2. Inspect the power cord (Figure 1, Item 2) is not cut, frayed, or otherwise damaged.
3. Ensure the plug (Figure 1, Item 3) on the power cord has not been damaged.
4. Ensure that the power output connectors (Figure 1, Item 4) are not bent, or damaged in any way that would prevent the proper insertion of cable connectors.
5. Connect the power converter (Figure 1, Item 1) to an approved power source, and ensure that the LED indicator (Figure 1, Item 5) operates correctly.
6. If any of the above components are damaged, arrange for Field Maintenance to replace the power converter IAW WP 0041.

INSPECT – CONTINUED



MS0150



MS0160

Figure 1. Inspect the Power Converter.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**BATTERY PACK, BATTERIES, AND BATTERY CHARGER
INSPECT**

INITIAL SETUP:**Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Personnel RequiredFood Service Specialist 92G (1)
MOS Non-specific (1)**References**

WP 0045

Equipment ConditionPower disconnected (WP 0005)

INSPECT**NOTE**

The inspection procedures for the battery pack, batteries, and battery charger require the battery pack cover be removed. If all three components are going to be inspected, do not replace the battery cover until you have finished inspecting all three components.

The inspection procedures for the battery pack, batteries, and battery charger begin on the next page.

INSPECT – CONTINUED

Inspect the Battery Pack

WARNING



HIGH VOLTAGE is used in the operation of this equipment. This procedure must be performed with power disconnected. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Do not attempt this maintenance unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Failure to observe this warning may result in injury or death to personnel.

WARNING



The battery pack weighs approximately 93 pounds (42.3 kg). Two persons must carry the battery pack. Lift with legs, not back, to prevent injury.

1. Remove the battery pack outer cover (Figure 1, Item 1) by removing the cover retaining screws (Figure 1, Item 2) with a suitable screwdriver. Retain the screws for reassembly.
2. Inspect the battery pack for broken or loose welds on the frame (Figure 1, Item 3). If broken or loose welds are found, refer to Field Maintenance for repair IAW WP 0045.
3. Install the outer cover (Figure 1, Item 1) and secure with the cover retaining screws (Figure 1, Item 2).

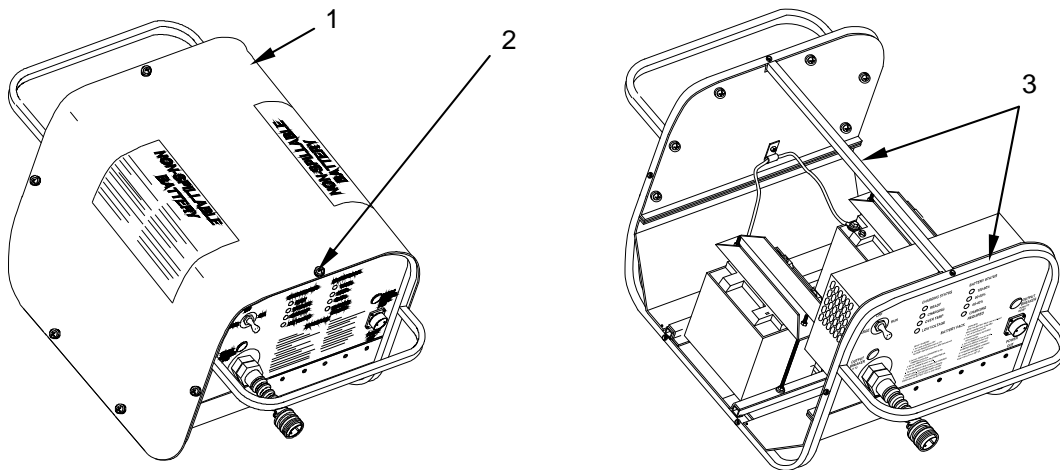


Figure 1. Inspect the Battery Pack.

END OF TASK

INSPECT – CONTINUED**Inspect the Batteries****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. This procedure must be performed with power disconnected. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Do not attempt this maintenance unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Failure to observe this warning may result in injury or death to personnel.

WARNING

The battery pack weighs approximately 93 pounds (42.3 kg). Two persons must carry the battery pack. Lift with legs, not back, to prevent injury.

1. Remove the battery pack outer cover (Figure 2, Item 1) by removing the cover retaining screws (Figure 2, Item 2) with a suitable screwdriver. Retain the screws for reassembly.
2. Inspect the outer casing of the lead acid batteries (Figure 2, Item 3) inside the battery pack (Figure 2, Item 1) for any damage or signs that the batteries could be leaking.
3. Visually inspect the four battery terminals (Figure 2, Item 4) for corrosion.
4. If the batteries show signs of leakage or the terminals are badly corroded arrange for the Field Maintenance to test or replace the batteries.
5. Install the outer cover (Figure 2, Item 2) and secure with the cover retaining screws (Figure 2, Item 3).

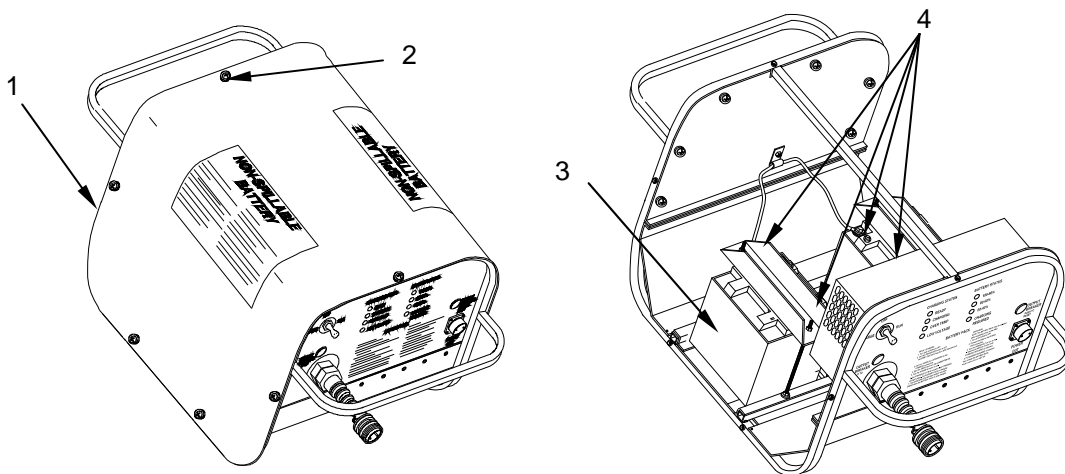


Figure 2. Inspect the Batteries.

END OF TASK

INSPECT – CONTINUED**Inspect the Battery Charger****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. This procedure must be performed with power disconnected. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Do not attempt this maintenance unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Failure to observe this warning may result in injury or death to personnel.

WARNING

The battery pack weighs approximately 93 pounds (42.3 kg). Two persons must carry the battery pack. Lift with legs, not back, to prevent injury.

1. Inspect the front panel of the battery charger (Figure 3, Item 1).
2. Check the condition of the power out connector (Figure 3, Item 2) for dents or other damage that would prevent the proper connection of a cable connector.
3. Check the condition of the power in cable (Figure 3, Item 3) for cuts or other damage that expose the wiring.
4. Remove the screws (Figure 3, Item 4) retaining the battery pack cover (Figure 3, Item 5), and remove the cover. Retain the screws for reassembly.
5. Inspect the battery charger (Figure 3, Item 1) for indications of physical damage, such as dents, corrosion, or burnt components.
6. Inspect the battery charger wires (Figure 3, Item 6) for damage such as chafed or burnt insulation, loose or corroded connections, or exposed wiring.
7. Inspect the temperature sensor (Figure 3, Item 7) for damage such as chafed or burnt insulation, loose or corroded connections, or exposed wiring.
8. If there are no indications of any faults with the battery charger (Figure 3, Item 1), install battery pack cover (Figure 3, Item 5) and retain with screws (Figure 3, Item 4).

INSPECT – CONTINUED

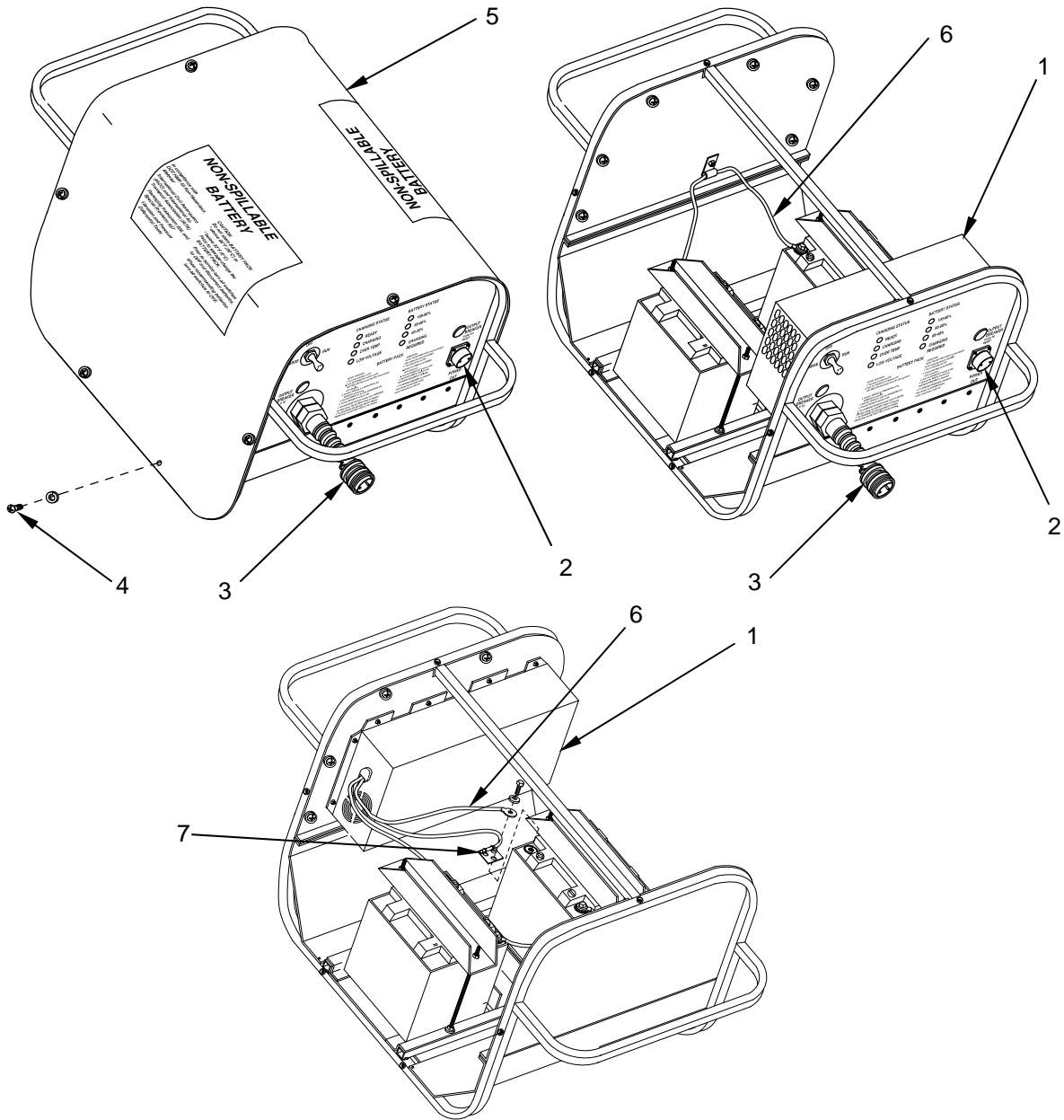


Figure 3. Inspect the Battery Charger.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**FUEL CAN ADAPTER AND FUEL HOSE
INSPECT, REPLACE****INITIAL SETUP:****Tools and Special Tools**

MBU Tool Kit (WP 0073, Item 1)

Personnel Required

Food Service Specialist 92G (1)

MOS Non-specific (1)

Equipment Condition

Adapter and fuel hose disconnected (WP 0005)

INSPECT**Inspect Fuel Can Adapter**

1. Inspect the Fuel Can Adapter (Figure 1, Item 1) for any signs of damage or cracks.
2. Inspect the female quick disconnect (Figure 1, Item 2) and its attached hose for signs of damage or deterioration. Also check that the outer collar pulls back freely.
3. Inspect the relief valve (Figure 1, Item 3) for cleanliness and security. Older models have a manual relief valve; newer models have a self-venting relief valve. Ensure the valve is present and not clogged or dirty.
4. Inspect the seal under the cap (Figure 1, Item 4) to see if it is in place or shows signs of deterioration.
5. Inspect the pickup fuel hose (Figure 1, Item 5) for any signs of cracks or deterioration.

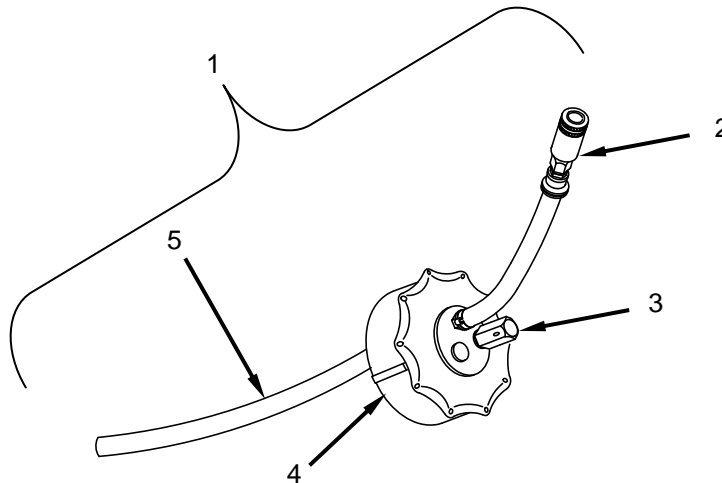


Figure 1. Inspect Fuel Adapter Cap.

6. If any component of the cap is damaged, the cap must be replaced IAW this WP.

END OF TASK

INSPECT – CONTINUED**Inspect Fuel Hose**

1. Inspect fuel hose (Figure 2, Item 1) for signs of deterioration and cracks.
2. Inspect the female quick disconnect (Figure 2, Item 2) for signs of damage. Also check that the outer collar pulls back freely but returns to place under spring tension.
3. Inspect the male quick disconnect (Figure 2, Item 3) for signs of damage. Also check the nipple is secure and it is held in place by spring tension.

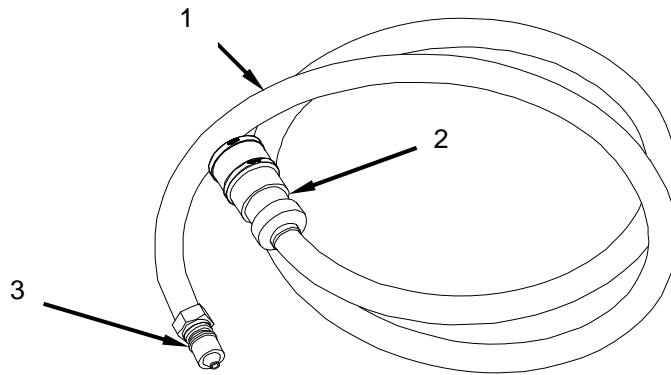


Figure 2. Inspect Fuel Hose.

4. If any component of the fuel hose is damaged, the hose must be replaced.

REPLACE

1. Disconnect the fuel hose from the fuel can adapter quick disconnect fitting (Figure 3, Item 1).
2. If replacing a damaged fuel hose (Figure 3, Item 2), proceed as follows:
 - a. Disconnect the opposite end of the fuel hose from the MBU fuel interface fitting.
 - b. Connect a replacement fuel hose to the MBU fuel interface fitting.
3. If replacing the fuel can adapter (Figure 3, Item 3), proceed as follows:
 - a. Unscrew and remove the fuel can adapter from the fuel can.
 - b. Ensure the dip tube (Figure 3, Item 4) is seated in the replacement fuel can adapter.
 - c. Lower the dip tube into the fuel can and screw the replacement fuel can adapter to the fuel can.
4. Connect the fuel hose to the fuel can adapter quick disconnect fitting (Figure 3, Item 1).

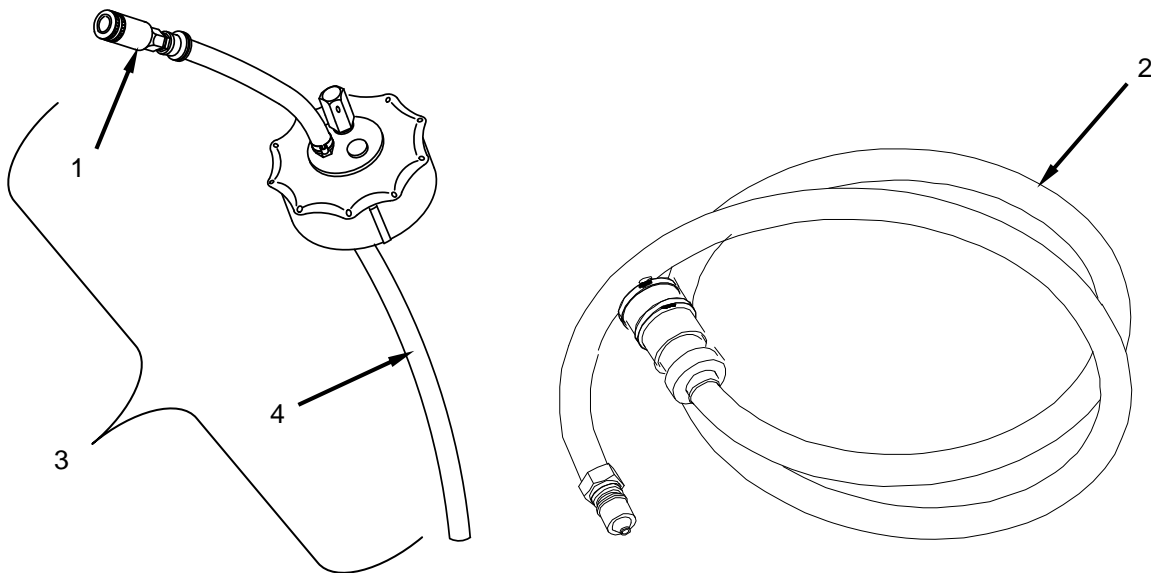


Figure 3. Fuel Can Adapter and Fuel Hose.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**NATO ADAPTER CABLE
INSPECT**

INITIAL SETUP:**Equipment Condition**

NATO Adapter Cable disconnected (WP 0005)

Personnel RequiredFood Service Specialist 92G (1)
MOS Non-specific (1)

INSPECT**Inspect the NATO Adapter Cable****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. This procedure must be performed with power disconnected. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Do not attempt this maintenance unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Failure to observe this warning may result in injury or death to personnel.

1. Remove the outer cap (Figure 1, Item 1) of the large power connector (Figure 1, Item 2) and inspect the interior surfaces for any dirt, damage, or corrosion that would prevent a good electrical connection.
2. Inspect the connection point (Figure 1, Item 3) between the large power connector (Figure 1, Item 2) and the cable (Figure 1, Item 4) for any cracks, separations, or exposed wires. Inspect the length of the cable jacket (Figure 1, Item 4) for any cracks, cuts, or other damage that would expose the inner wires.
3. Inspect the small power connector (Figure 1, Item 6) for any cracks, dents, or damage to the outer collar that would prevent a proper and secure electrical connection.
4. Inspect the interior surfaces of the connector (Figure 1, Item 6) for dirt or damage to the internal contacts.
5. Ensure that the outer cable jacket (Figure 1, Item 4) is securely attached to the connector and that there are no exposed wires.
6. Inspect the cap lanyard (Figure 1, Item 5) is secure and not showing signs of deterioration.
7. If there are any signs of damage or deterioration of the NATO cable adapter, arrange for it to be tested or replaced by Field Maintenance.

INSPECT – CONTINUED

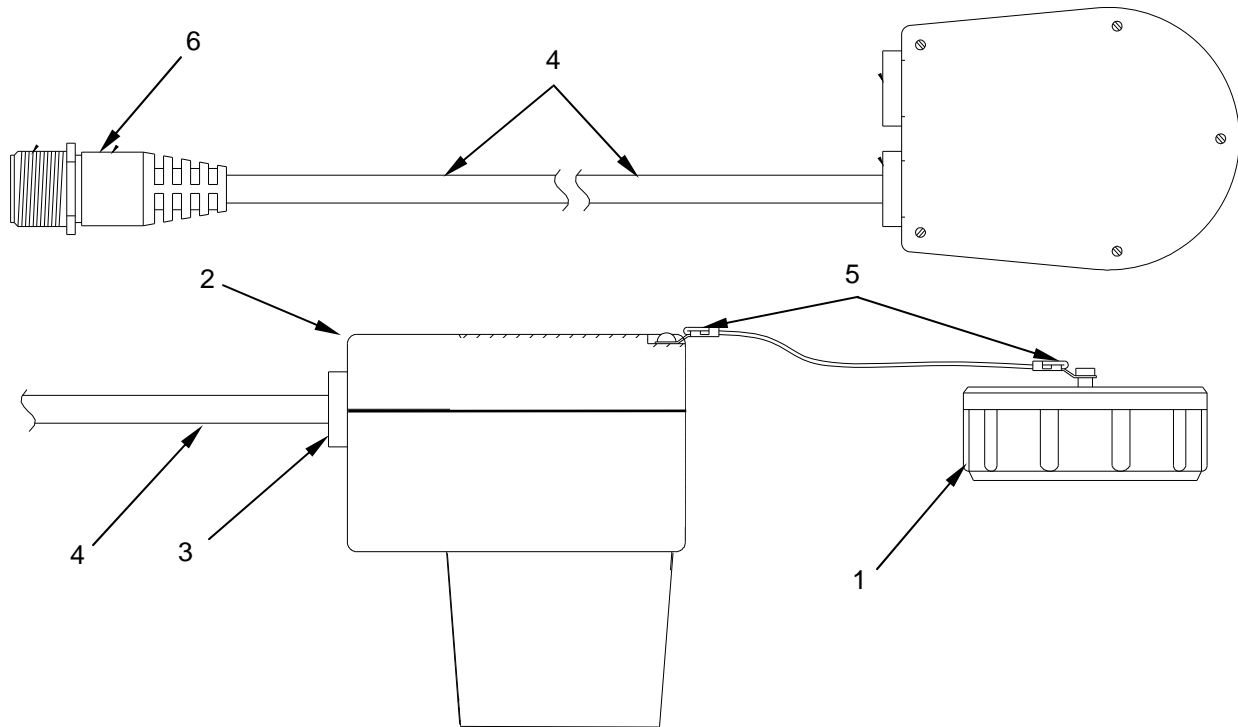


Figure 1. Inspect the NATO Adapter Cable.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE

**CABLES 24VDC, EXTENSION AND BRANCH
INSPECT, REPLACE**

INITIAL SETUP:

Equipment Condition

MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)

Personnel Required

Food Service Specialist 92G (1)
MOS Non-specific (1)

References

WP 0003

INSPECT

WARNING



HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

1. Inspect all of the 24VDC cables (Figure 1, Items 1, 2, 3, 4, 5, and 6) for signs of deterioration or damage to the insulation.

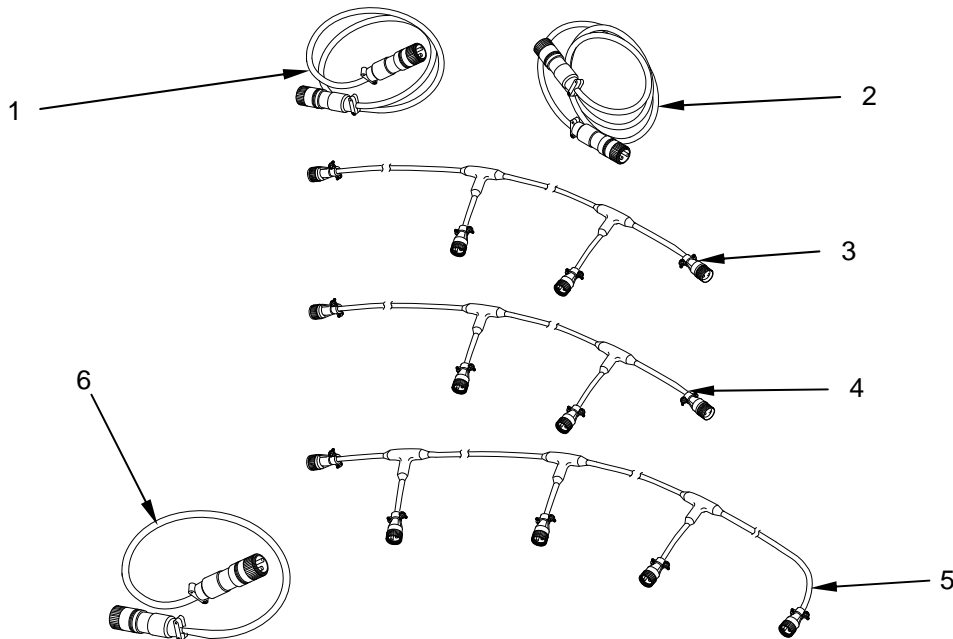


Figure 1. Inspect 24VDC Extension and Branch Cables.

INSPECT – CONTINUED

2. Inspect the exterior of the female (Figure 2, Item 1) and male (Figure 2, Item 2) connectors for signs of physical damage.
3. Inspect the external threads of the female connectors (Figure 2, Item 3) to see if they are damaged.
4. Inspect the internal threads of the male connectors (Figure 2, Item 4) to see if they are damaged.
5. Check that the internal threaded cap of the male connector is free to rotate (Figure 2, Item 4).
6. Inspect the pins of the male connectors (Figure 2, Item 5) to ensure that they are secure and straight.
7. Inspect the recesses of the female connector (Figure 2, Item 6) to ensure they are clear of foreign material and are not crushed.
8. Inspect the two screws and locking clamps (Figure 2, Item 7) of both types of connectors for correct installation and security.

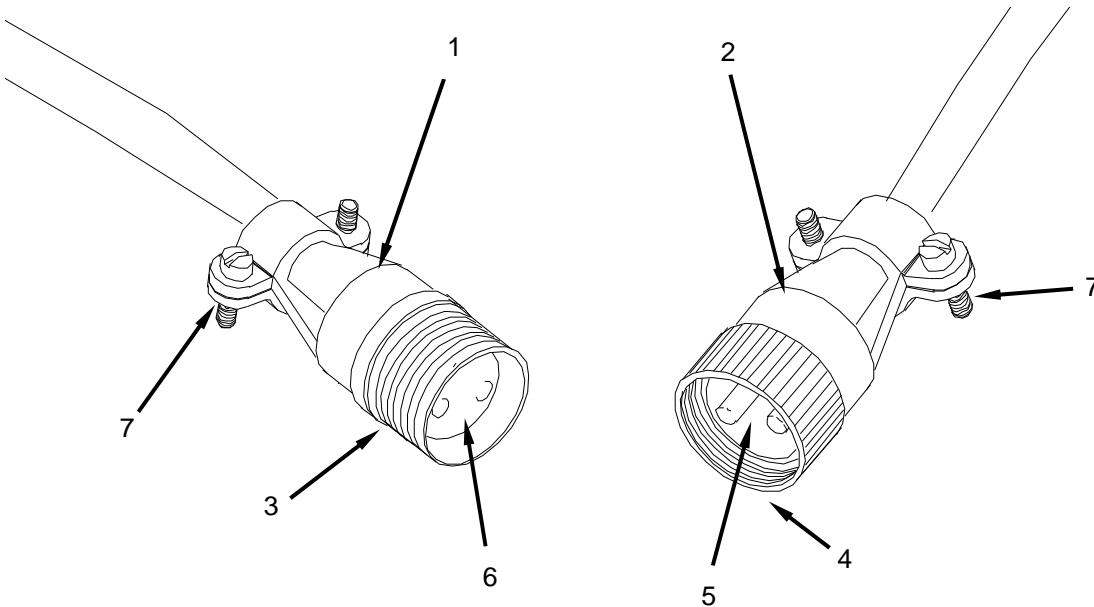


Figure 2. Inspect Male and Female Plugs.

9. If any damage is found on a particular cable, it is to be replaced with a serviceable item.

END OF TASK

REPLACE**Replace 24VDC Cables****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. This procedure must be performed with power disconnected. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions. Do not attempt this maintenance unless there is at least one other person nearby who is familiar with the operation and hazards of the equipment. That person should also be competent in giving first aid. Failure to observe this warning may result in injury or death to personnel.

WARNING

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

1. If a cable needs to be replaced, ensure the power supply is disconnected and the burners have been cooled down.
2. Disconnect and remove the faulty cable.
3. Depending on the configuration, install the serviceable replacement cable as detailed in the procedures described in WP 0003.

END OF TASK

REPLACE – CONTINUED**Replace a Damaged Crossway Cable**

1. Remove the rubber grommets (Figure 3, Item 1) at each end of the cable (Figure 3, Item 2) and pull the cable through the trailer floor at both ends. Set the rubber grommets aside.
2. Remove the screws (Figure 3, Item 3) retaining the cable clamps (Figure 3, Item 4) to the trailer support beam (Figure 3, Item 5), and remove the cable clamps.
3. Remove the damaged cable (Figure 3, Item 2).
4. Install the replacement cable (Figure 3, Item 2) as described in the section of this WP entitled, "Install the 12-ft Crossway Cable".

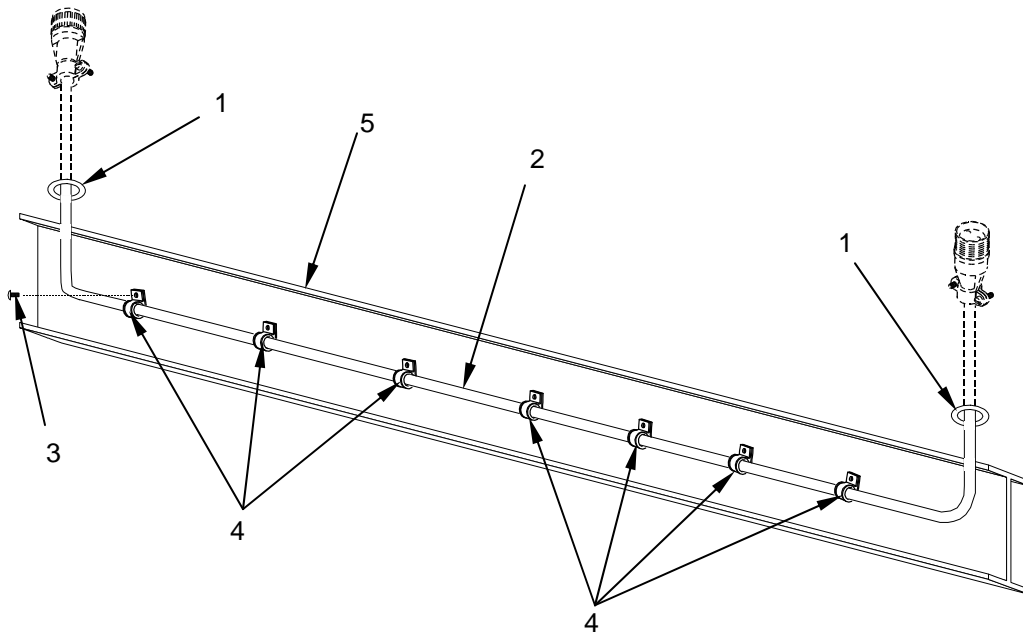


Figure 3. Replace a Damaged 12-ft MKT Crossway Cable.

END OF TASK

END OF WORK PACKAGE

OPERATOR MAINTENANCE**110VAC EXTENSION CABLES
INSPECT, REPLACE**

INITIAL SETUP:**Equipment Condition**

Extension cable disconnected (WP 0005)

Personnel RequiredFood Service Specialist 92G (1)
MOS Non-specific (1)

INSPECT**Inspect the 110VAC Extension Cables****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting with this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

NOTE

There are two 110VAC Extension Cables supplied with the MBU, one is 50 ft long and the other is 25 ft long. The inspection procedure for both is exactly the same.

1. Inspect the insulated exterior surface of the extension cable (Figure 1, Item 1) for any cuts, tears and sign of deteriorating.
2. Inspect the area where the cable and the female and male plugs meet for signs of separation.
3. If there any signs of damage or separation on the insulated surface or at the plug interface the cable must be replaced IAW this WP.

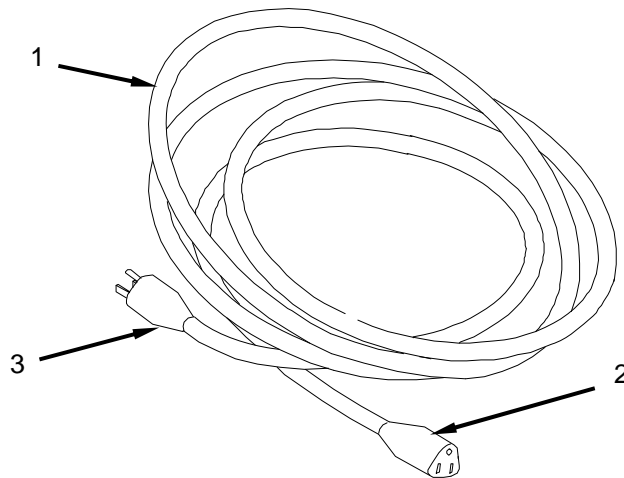


Figure 1. Inspect 110VAC Extension Cable.

INSPECT – CONTINUED

4. Inspect the male plug to ensure that the three prongs (Figure 2, Item 1) are in place and secure.
5. Inspect the female plug to ensure the three recesses (Figure 2, Item 2) are clear of foreign material and not crushed.
6. Insert the male plug into the female plug to confirm steps 4 and 5.
7. If the plugs do not interface correctly or there is any doubt regarding the plugs or the insulation, the extension cable must be replaced IAW this WP.



Figure 2. Inspect 110VAC Male and Female Plugs.

8. If the extension cord and the plugs appear to be serviceable but there is no power to the MBU, refer to WP 0007 to troubleshoot the MBU.

END OF TASK**REPLACE****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting with this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

1. If a cable needs to be replaced, ensure the power supply is disconnected.
2. Disconnect and remove the faulty cable.
3. Depending on the configuration, install the serviceable replacement cable as detailed in the procedures described in WP 0003.

END OF TASK**END OF WORK PACKAGE**

CHAPTER 5

FIELD MAINTENANCE INSTRUCTIONS
FOR
MODERN BURNER UNIT
AND
MODERN BURNER UNIT-V3

FIELD MAINTENANCE**SERVICE UPON RECEIPT**

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (WP 0073, Item 2)

Personnel Required

MOS Non-specific (2)

ReferencesWP 0005, DD Form 361, DA PAM 750-8

SERVICE UPON RECEIPT OF MATERIAL**Unpacking**

The initial fielding of the MBU and its associated components, including equipment modifications to the MKT to accommodate the system, will be accomplished using contractor resources. Subsequent shipments containing replacement items will be individually packaged. None of these components require any kind of de-processing. They should be removed from their packing containers and used as outlined in WP 0005.

Inspection

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 361, Transportation Discrepancy Report. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with applicable service instructions (e.g., for Army instructions, see DA PAM 750-8. Check to see whether equipment has been modified.

INSTALLATION INSTRUCTIONS

Food Service System Equipment Modification

The adaptation of the MBU to the field feeding systems does not require modification of any equipment except the Mobile Kitchen Trailer (MKT). Three modifications to that system are necessary. All three will be applied by the fielding contractor prior to issue of the MBU equipment to the using unit. These modifications involve the installation of various components as described in the sections that follow:

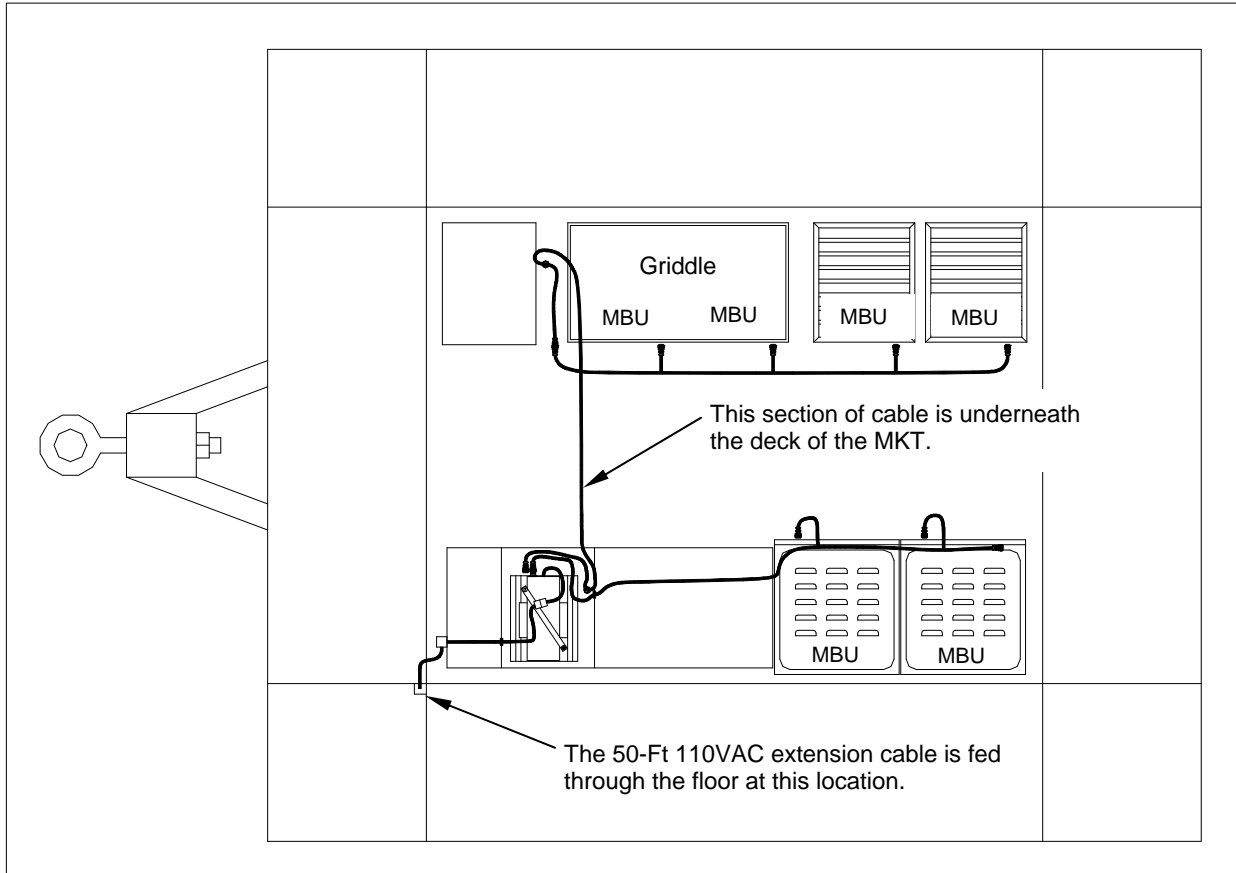


Figure 1. Overview of MKT Modification.

INSTALLATION INSTRUCTIONS – CONTINUED

Crossway Cable (24VDC)

The 12-ft crossway cable (Figure 2) connects the power converter and the 24VDC, 4-branch cable. The fielding contractor will drill the necessary holes in the trailer frame and install cable clamps below the deck in preparation for this installation. The cable will be furnished with the MBU equipment and installed by the unit. For instructions on installing and replacing the Crossway Cable, refer to the details below.

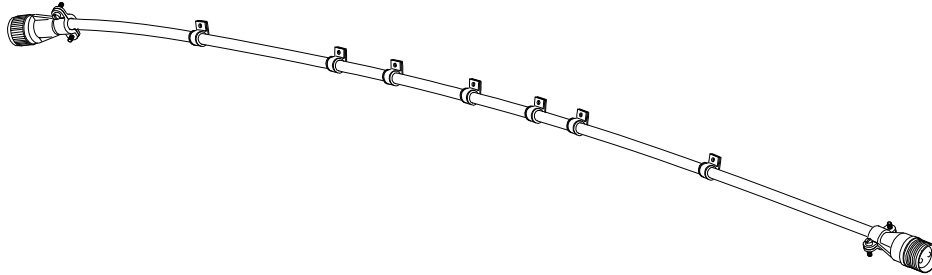


Figure 2. MKT Modification (Crossway Cable).

Install the 12-ft Crossway Cable

Before the MBU can be used with the MKT, the Crossway Cable (Figure 1, Item 1) must be installed under the trailer. This is a one-time procedure performed when the MBU is initially fielded. Once installed, the Crossway Cable remains in place unless the cable is damaged in some way and requires replacement.

The cable clamps (Figure 3, Item 2) that secure the Crossway Cable to the MKT support beam (Figure 3, Item 3) are installed by the fielding contractor and will be in place prior to installing the Crossway Cable.

1. To install the Crossway Cable (Figure 3, Item 1), take position with the required tools under the right, rear end of the MKT in the vicinity of the cooling cabinet that houses the Power Converter Mounting Bracket.
2. Locate the support beam (Figure 3, Item 3) on which the cable clamps (Figure 3, Item 2) are mounted.
3. Distribute the Crossway Cable (Figure 3, Item 1) along the ground under the trailer support beam (Figure 3, Item 3) so that an equal amount of cable is available to pass up through the trailer floor under the cooling cabinet as well as under the left side between the cabinet and griddle.
4. Approximately 1 to 1½ ft of cable should be available on each end to pass through the trailer floor.
5. Once the cable has been distributed to allow a sufficient amount to pass up through the floor of the trailer, move to the far left end of the support beam and remove the screw (Figure 3, Item 4) that secures the first cable clamp (Figure 3, Item 5).
6. Place the cable in position on the support beam (Figure 3, Item 3) and reinstall the clamp.
7. Move down the support beam, installing the cable under each clamp, one at a time, until the entire cable has been installed under all the clamps.
8. While under the cooling cabinet area on the right side of the trailer, remove the rubber grommet (Figure 3, Item 6) mounted in the trailer floor.
9. Cut the grommet and install over the Crossway Cable (Figure 3, Item 1).

INSTALLATION INSTRUCTIONS – CONTINUED

10. Push the connector (Figure 3, Item 7) of the Crossway Cable up through the hole in the floor of the trailer and reinstall the rubber grommet (Figure 3, Item 6).
11. Move to the left end of the support beam (Figure 3, Item 3) and remove the second rubber grommet (Figure 3, Item 8). Cut as before and wrap around the cable.
12. Pass the connector end (Figure 3, Item 9) of the cable up through the floor of the trailer and reinstall the grommet in the floor of the trailer.

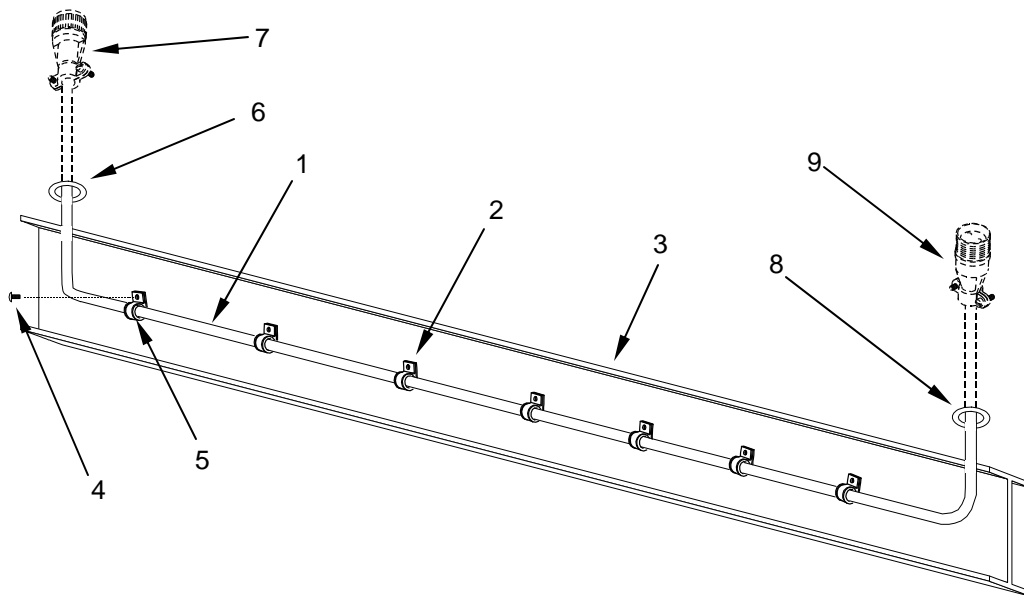


Figure 3. Install the 12-ft MKT Crossway Cable.

INSTALLATION INSTRUCTIONS – CONTINUED**Feeder Cable Harness**

The second modification involves the installation of a feeder cable harness (Figure 4) connecting the 110VAC power cord extension to the power converter. The modification also provides two ground fault circuit interrupt (GFCI) 110VAC utility outlets and installation of a grounding lug on the MKT chassis. The fielding contractor will complete this installation. There are no unit responsibilities involved in this modification.

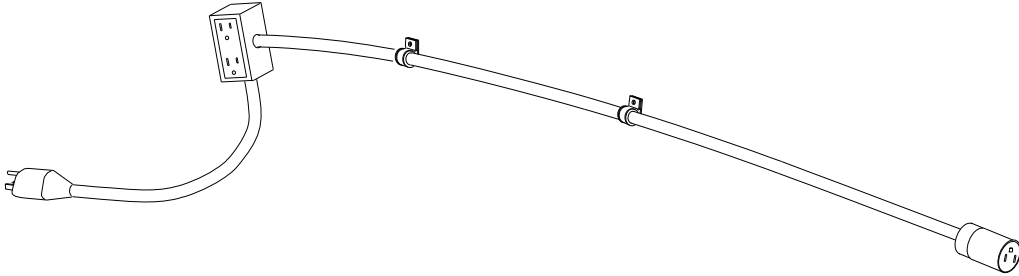


Figure 4. MKT Modification (Feeder Cable Harness).

Power Converter Mounting Bracket

A third modification involves the installation of a power converter mounting bracket assembly (Figure 5, Item 1) onto the floor of the MKT cooling cabinet. The fielding contractor will install the bracket into which the unit will install the power converter received with the MBU shipment.

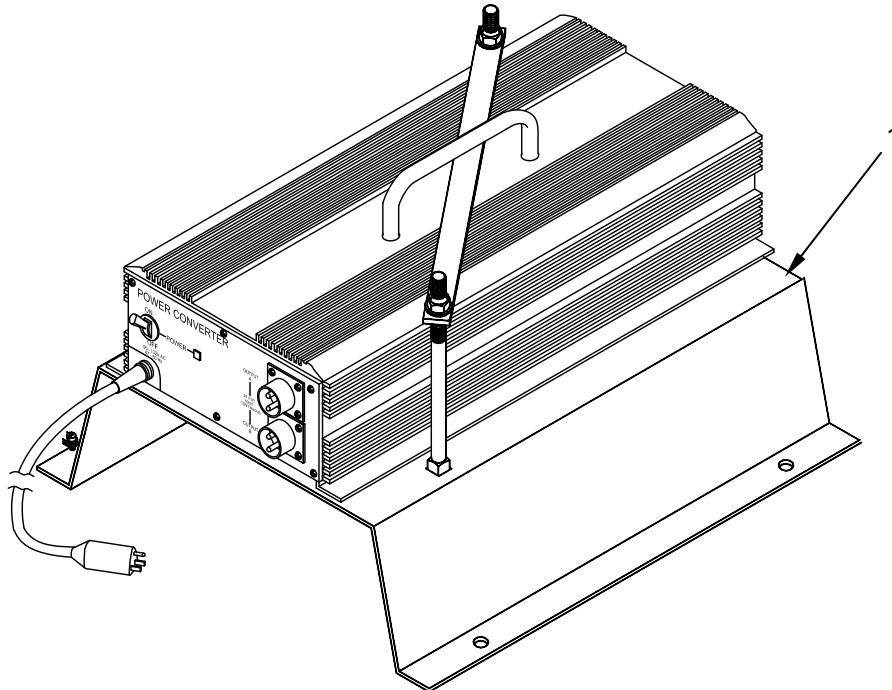


Figure 5. MKT Modification (Power Converter Mounting Bracket).

INSTALLATION INSTRUCTIONS – CONTINUED**MKT Grounding Rod**

A 2KW Generator is typically used to provide 110VAC power to the power converter. The grounding rod is supplied in sections (Figure 6, Item 1) that are connected together using threaded fittings (Figure 6, Item 2). The grounding rod is driven into the ground in the vicinity of the MKT grounding lug that is located on the front driver's side of the vehicle chassis. The grounding cable (Figure 6, Item 3) is then connected between the MKT grounding lug and the grounding rod.

The lug on the MKT can be utilized to ground the MKT when AC power is provided from a source other than a properly grounded 2 KW generator, such as directly from a building. In this instance, the grounding rod from the 2 KW generator may be used to ground the MKT or a separate grounding rod may be purchased. The grounding rod is on the additional authorized list for the MKT.

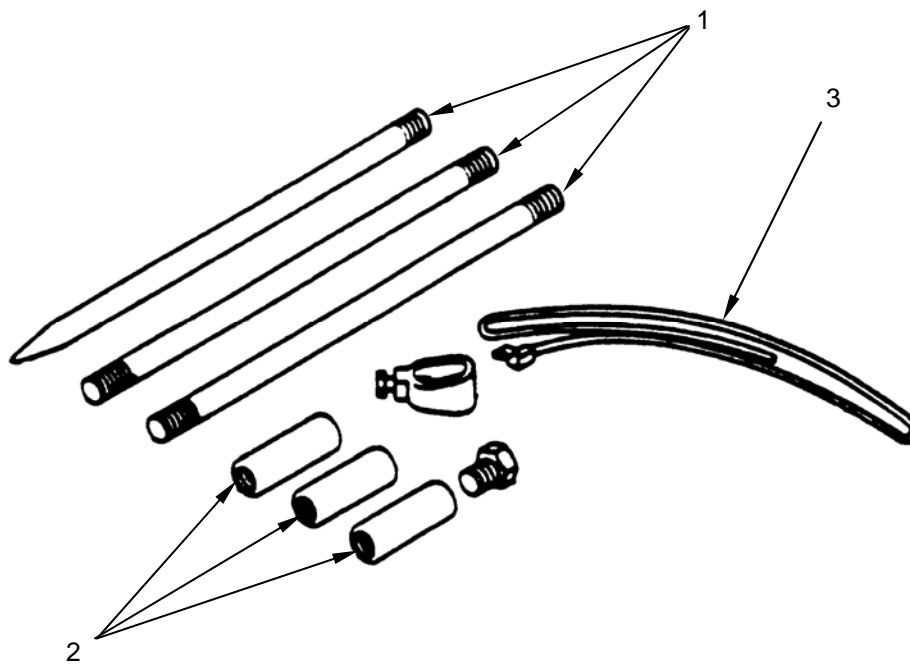


Figure 6. Grounding Rod Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**FRAME ASSEMBLY
REPAIR**

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (WP 0073, Item 2)
Welding Shop (WP 0073, Item 3)

Personnel Required

Metal Worker 91W (1)
Machinist 91E (1)

Materials/Parts

Rag, Wiping (WP 0072, Item 5)

References

TC 9-237
WP 0011, WP 0017, WP 0018, WP 0019
WP 0023, WP 0024, WP 0025, WP 0039

Equipment Condition

MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)
Fuel tank drained (WP 0014)

REPAIR**Repair the MBU****WARNING**

Before proceeding, the MBU fuel tank must be drained completely as described in WP 0011. Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not attempt this repair on an assembled MBU. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Remove the controller assembly IAW WP 0017.
2. Remove the fuel delivery block, with air filter attached IAW WP 0019.
3. Remove the reflective heat shield and burner tube assemblies IAW WP 0024.

REPAIR – CONTINUED

4. Remove the compressor IAW WP 0018.
5. Remove the fuel regulator assembly, with fuel filter attached IAW WP 0025.
6. Remove the fuel line assembly IAW WP 0039.
7. Remove the vent valve assembly IAW WP 0023.
8. Perform welding operations as specified in TC 9-237, Welding Theory and Application.
9. Install the vent valve assembly IAW WP 0023.
10. Install the fuel line assembly IAW WP 0039.
11. Install the fuel regulator assembly, with fuel filter attached IAW WP 0025.
12. Install the compressor IAW WP 0018.
13. Install the reflective heat shield and burner tube assemblies IAW WP 0024.
14. Install the fuel delivery block, with air filter attached IAW WP 0019.
15. Install the controller assembly IAW WP 0017.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**CABLE CLIPS
REPLACE**

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (WP 0073, Item 2)

Personnel Required

MOS Non-specific (2)

Equipment Condition

MBU shut down and cool (WP 0005)

Power disconnected (WP 0005)

REPLACE**Replace the Cable Clips and Hose Clamps****WARNING**

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. To replace the chassis cable clips, proceed as follows:

NOTE

The chassis mounted cable clips come in two different sizes. The procedure to replace both sizes is exactly the same.

- a. Locate the three chassis mounted cable clips (Figure 1, Item 1 and 2) on the bottom surface of the MBU. Take note that there are two sizes.
- b. Replace the chassis cable clips (Figure 1, Item 1 and 2) by removing the cables/hoses retained by the strap.
- c. Remove the nut (Figure 1, Item 3) securing the cable clips to the chassis.
- d. Install a new cable clip in place on the threaded chassis stud and fasten with the nut (Figure 1, Item 3) removed earlier.
- e. Reinstall the hoses/cables inside the cable clip (Figure 1, Item 1 and 2).

REPLACE – CONTINUED

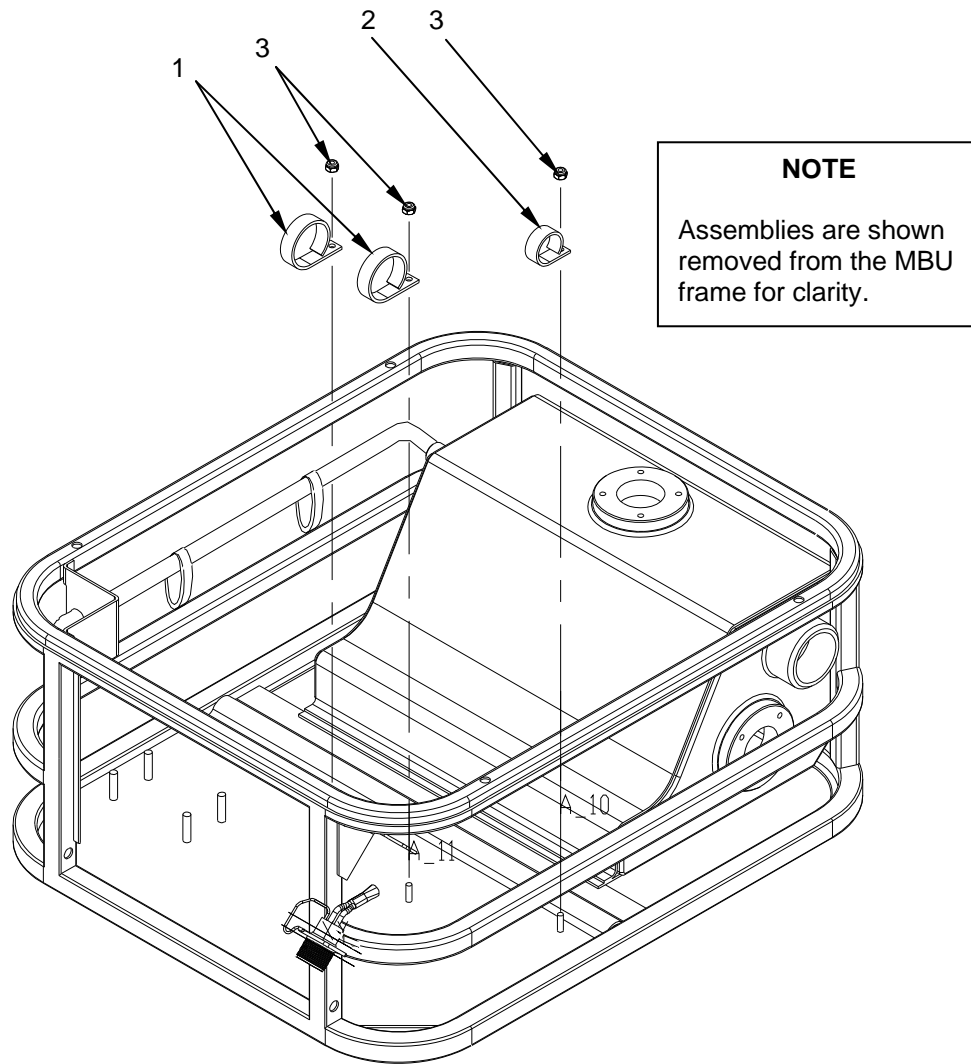


Figure 1. Replace Chassis Mounted Cable Clips and Hose Clamps.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

ELECTRICAL CONNECTOR ASSEMBLY
TEST, REPLACE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0073, Item 2)

Personnel Required

MOS Non-specific (2)

Equipment Condition

MBU shut down and cool (WP 0005)

Power disconnected (WP 0005)

TEST

Test the Electrical Connector Assembly

WARNING



The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Disconnect the connector assembly plug (Figure 1, Item 1) from its interface connection.
2. Using a multimeter (Figure 1, Item 2), test the leads for continuity between the plug (Figure 1, Item 1) and the terminals in the receptacle plug (Figure 1, Item 3).
3. If the wires are open, replace the electrical connector assembly.
4. Reconnect the connector assembly plug (Figure 1, Item 1) to its interface connection.

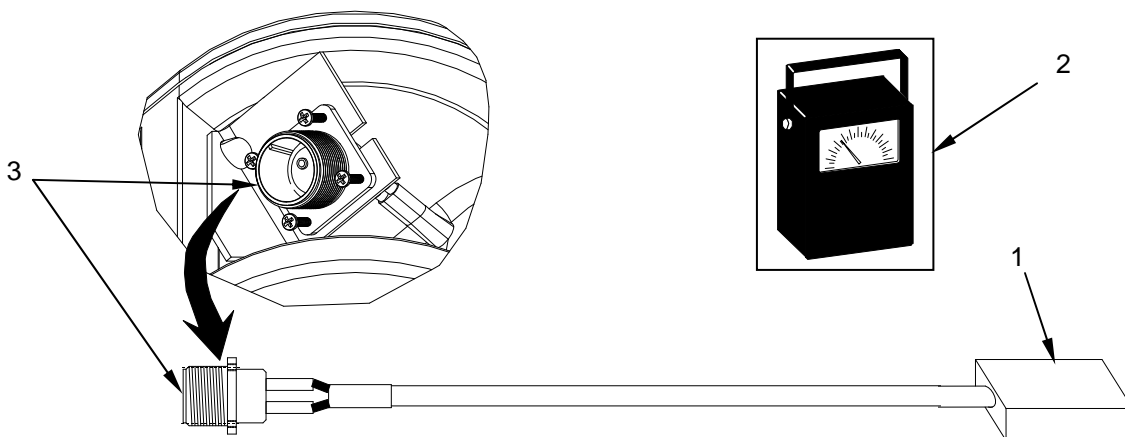


Figure 1. Test the Electrical Connector Assembly.

END OF TASK

REPLACE**Replace the Electrical Connector Assembly****WARNING**

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. Replace the connector assembly (Figure 2, Item 1) by removing the four screws (Figure 2, Item 2). Retain the screws for reassembly.
2. Slide the connector assembly (Figure 2, Item 1) from the bracket (Figure 2, Item 3).
3. Disconnect the plug (Figure 2, Item 4) at the end of the connector assembly from its interface connection and fully withdraw the cable.
4. Slide the serviceable connector assembly (Figure 2, Item 1) into place on the bracket (Figure 2, Item 3).
5. Connect the connector assembly plug (Figure 2, Item 4) to its interface connection.
6. Secure the connector assembly in place with the four retainer screws.

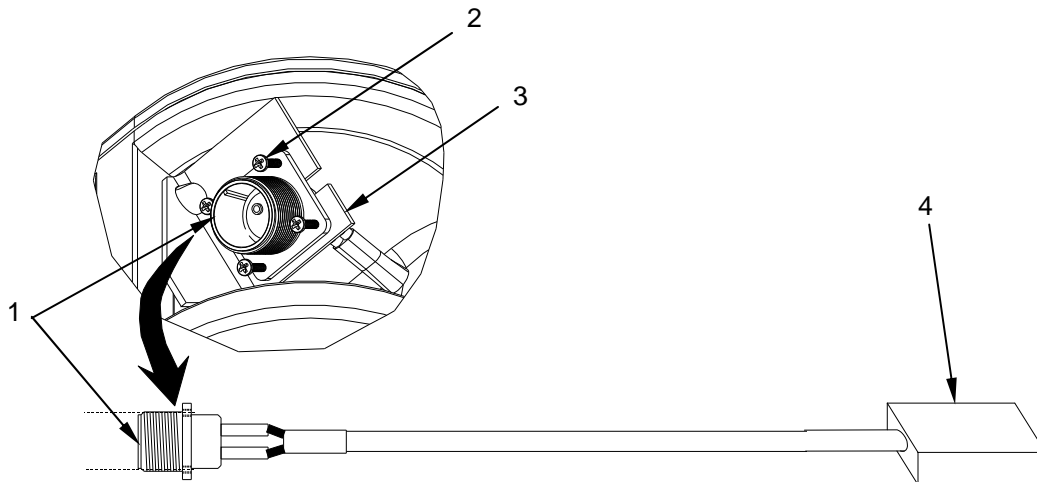


Figure 2. Replace the Electrical Connector Assembly.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**FUEL LINE ASSEMBLY
REPLACE**

INITIAL SETUP:**Tools Special Tools**

Tool Kit, General Mechanic's (WP 0073, Item 2)

Personnel Required

MOS Non-specific (2)

Materials/PartsRag, Wiping (WP 0072, Item 5)
Sealing Compound (WP 0072, Item 6)**Equipment Condition**MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)
Fuel tank drained (WP 0014)**References**WP 0014, WP 0040

REPLACE**Replace the Fuel Line Assembly**

Procedures for replacing the fuel line assembly begin on the next page.

REPLACE – CONTINUED**WARNING**

Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 0014. Have rags on hand to clean up fuel spillage that may occur to prevent contamination. Do not perform this procedure near an open flame to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures to avoid the possibility of burns.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. To replace the fuel line assembly (Figure 1, Item 9), remove the fuel interface fitting (Figure 1, Item 5) IAW WP 0040.
2. Remove the two clamps that are supporting the fuel line assembly (Figure 1, Item 9).
3. Loosen the fuel line compression fitting (Figure 1, Item 2) on the fuel line attached to the elbow fitting (Figure 1, Item 1).
4. Loosen the compression fitting (Figure 1, Item 8) while holding the inner union locking nut (Figure 1, Item 3) with a second wrench.
5. Back off the inner union locking nut (Figure 1, Item 3) while holding the outer union locking nut (Figure 1, Item 4) with a second wrench until the union (Figure 1, Item 7) has some sideways movement.
6. Remove the fuel line assembly (Figure 1, Item 9) from between the elbow fitting (Figure 1, Item 1) and the union (Figure 1, Item 7).
7. Fully remove the inner union locking nut (Figure 1, Item 3) and remove the union (Figure 1, Item 7) from the bracket (Figure 1, Item 6).
8. Make note of the angle at which the elbow fitting (Figure 1, Item 1) is mounted in the fuel tank port (Figure 1, Item 10).
9. Remove the elbow fitting (Figure 1, Item 1) from the fuel tank port (Figure 1, Item 10).

REPLACE – CONTINUED

10. Clean off any pipe sealer compound residue with a rag.

CAUTION

Antiseize tape is **NEVER** to be used as a substitute for the approved Pipe Sealing Compound. Antiseize tape may shred and clog the fuel delivery system of the MBU.

11. Apply new pipe sealer compound to the serviceable elbow fitting (Figure 1, Item 1) and screw in place on fuel tank port (Figure 1, Item 10). Make sure that the elbow is installed at the same angle as before removal.
12. Install the union (Figure 1, Item 7) through the bracket (Figure 1, Item 6) and thread the inner locking union (Figure 1, Item 3) onto the union. The union must have a small amount of sideways movement to allow for the correct alignment of the fuel line.
13. Install the serviceable fuel line assembly (Figure 1, Item 9) into the elbow fitting (Figure 1, Item 1) and hand tighten the compression fitting (Figure 1, Item 2).
14. Align the fuel line assembly (Figure 1, Item 9) to the union, and hand tighten the compression fitting (Figure 1, Item 8) onto the union (Figure 1, Item 7).
15. When the fuel line assembly (Figure 1, Item 9) is in the correct alignment, between the elbow fitting (Figure 1, Item 1) and the union (Figure 1, Item 7), hand tighten the outer union locking nut (Figure 1, Item 4) against the bracket. Then hand tighten the inner locking union nut (Figure 1, Item 3) against the bracket.
16. Using suitable wrenches, tighten the inner union locking nut (Figure 1, Item 3) and the outer union locking nut (Figure 1, Item 4) into place.
17. Tighten the fuel line compression fitting (Figure 1, Item 8) to the union (Figure 1, Item 7). Support the fuel line so that it does not rotate out of alignment.
18. Tighten the fuel line compression fitting (Figure 1, Item 2) to the elbow fitting (Figure 1, Item 1).
19. Install two serviceable clamps to the fuel line assembly (Figure 1, Item 9) and the MBU frame.
20. Install fuel interface fitting (Figure 1, Item 5) as described in WP 0040.

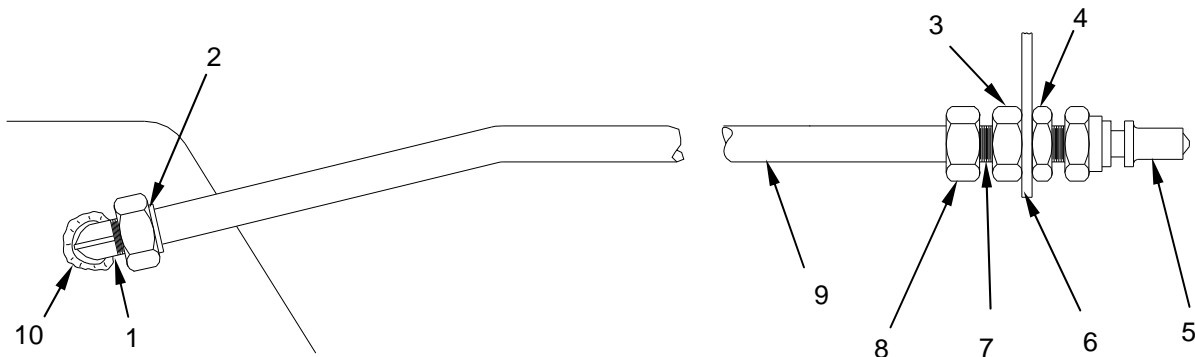


Figure 1. Replace the Fuel Line Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**FUEL INTERFACE FITTING
REPLACE**

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (WP 0073, Item 2)

Personnel Required

MOS Non-specific (2)

Materials/PartsRag, Wiping (WP 0072, Item 5)
Sealing Compound (WP 0072, Item 6)**Equipment Condition**MBU shut down and cool (WP 0005)
Power disconnected (WP 0005)
Fuel tank drained (WP 0014)**References**WP 0014

REPLACE**Replace the Fuel Interface Fitting**

Procedures for replacing the fuel interface fittings begin on the next page.

REPLACE – CONTINUED**WARNING**

Before proceeding with this procedure, the MBU fuel tank must be drained completely as described in WP 0014. Have rags on hand to clean up fuel spillage that may occur, to prevent contamination. Do not perform this procedure near an open flame, to prevent fire. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Do not attempt service procedures on a burner that has recently been in operation. Let the burner cool down before performing these procedures, to avoid the possibility of burns.

WARNING

The MBU weighs approximately 58 pounds fully fueled (26.4 kg). Two persons must carry the MBU. Lift with legs, not back, to prevent injury.

1. To replace the fuel interface fitting (Figure 1, Item 1), loosen and remove the fitting from the union (Figure 1, Item 2) using a suitable wrench, while holding the union in place with a second wrench.
2. Remove joint sealing compound residue from the union (Figure 1, Item 2).

REPLACE – CONTINUED

CAUTION

Antiseize tape is **NEVER** to be used as a substitute for the approved pipe sealing compound. Antiseize tape may shred and clog the fuel delivery system of the MBU.

3. Apply new joint sealing compound to the union (Figure 1, Item 2), and thread the serviceable fuel interface fitting (Figure 1, Item 1) onto the union, while holding the union in place with a wrench.

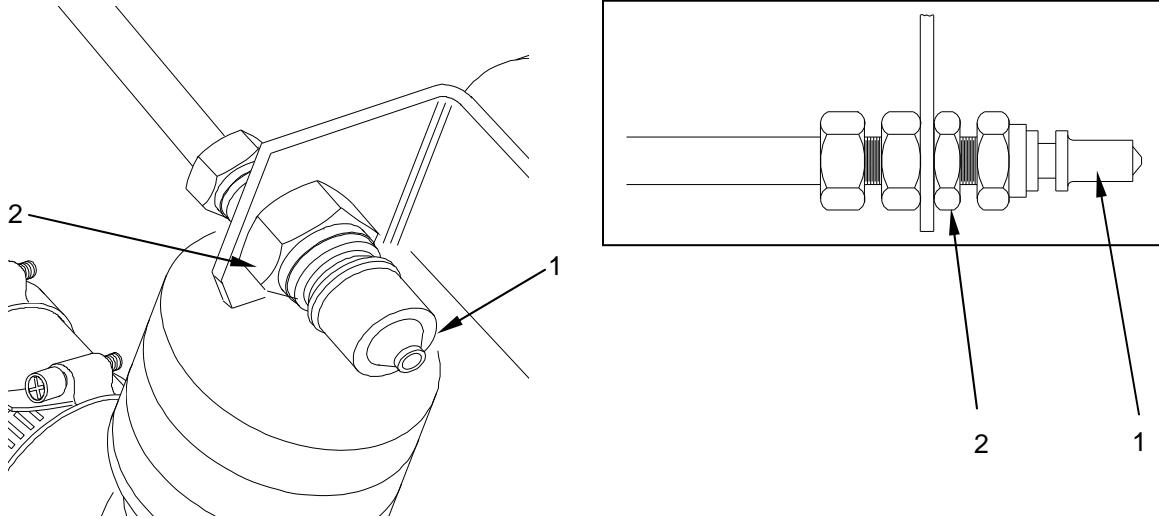


Figure 1. Replace the Fuel Interface Fitting.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**POWER CONVERTER
TEST, REPLACE**

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (WP 0073, Item 2)

Personnel Required

MOS Non-specific (2)

Equipment ConditionPower converter disconnected (WP 0005)

TEST**Test the Power Converter (MS0150)****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

1. Connect the power converter (Figure 1, Item 1) to an approved power source.
2. Use a multimeter to verify that the output voltage of the power converter (Figure 1, Item 1) is 23-29 VDC. If the output voltage is correct, no further testing is required. If there is no voltage output, go to Step 3. If the voltage is out of range, replace the converter and return to service.
3. Disconnect the power converter (Figure 1, Item 1) from the power source.
4. To test the power converter switch (Figure 1, Item 5), remove the top cover (Figure 1, Item 2) of the power converter by removing the ten sets of fasteners (Figure 1, Item 3). Retain for reassembly.
5. Loosen and remove the hex nut with protective rubber cap (Figure 1, Item 4) of the main power switch (Figure 1, Item 5).
6. Make a note of the location, color, and connection point of the two wires connected to the main power switch (Figure 1, Item 5) inside the power converter (Figure 1, Item 1), to ensure that the wires are reconnected properly when the switch is replaced.
7. Reach inside the power converter case and disconnect the spade connector (Figure 1, Item 6) which connects the power switch (Figure 1, Item 5) to the AC filter block (Figure 1, Item 7).
8. Loosen and remove the screw (Figure 1, Item 8) that secures the wire (Figure 1, Item 9) to the second terminal. Retain the wire and the fasteners for reassembly.
9. Remove the main power switch (Figure 1, Item 5) from the power converter.

TEST – CONTINUED

10. Test for continuity through the power switch (Figure 1, Item 5) with a multimeter. If the power switch is not defective, check for continuity through the power cord (Figure 1, Item 10). If both the power switch and power cord are not defective, the entire power converter should be replaced.
11. Install the main power switch (Figure 1, Item 5). Install the short wire (Figure 1, Item 9), set aside earlier on the switch terminal labeled "LOAD." Secure with screw.
12. Place the switch (Figure 1, Item 5) in position in the power converter's front panel. Be sure to position the switch so that the screw terminal labeled "LOAD" is facing up and out of the case, while the terminal labeled "LINE" is facing down into the power converter case.
13. Install the hex nut with protective rubber cap (Figure 1, Item 4) onto the front of the power switch (Figure 1, Item 5).
14. Connect the spade terminal (Figure 1, Item 6) to the lug on the AC filter block (Figure 1, Item 7).
15. Secure power converter cover (Figure 1, Item 2) with the retained fasteners (Figure 1, Item 3).

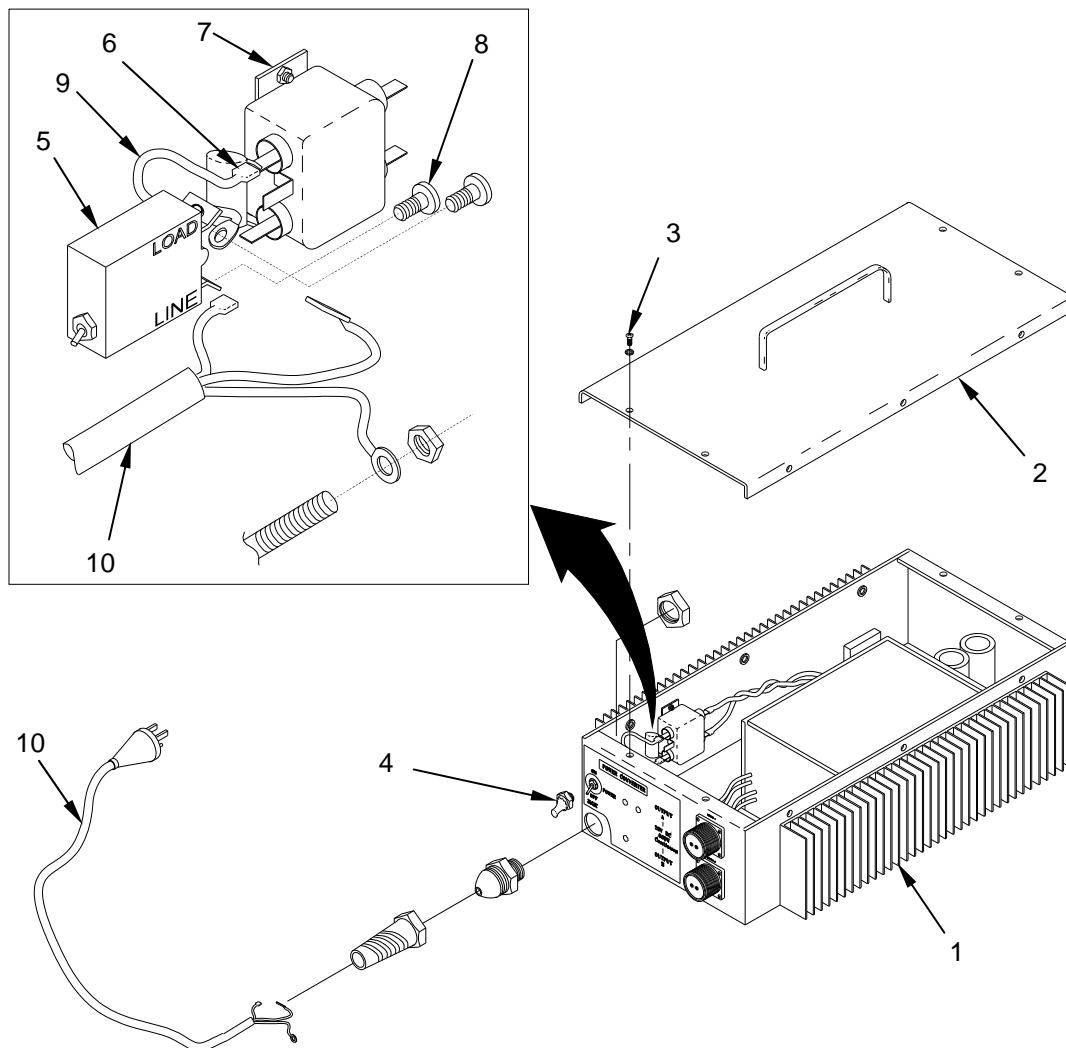


Figure 1. Test the Power Converter (MS0150).

END OF TASK

TEST – CONTINUED**Test the Power Converter (MS0160)****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

1. Connect the power converter (Figure 2, Item 1) to an approved power source.
2. Use a multimeter to verify that the output voltage of the power converter (Figure 2, Item 1) is 23-29VDC. If the output voltage is correct, no further testing is required.
3. Disconnect the power converter (Figure 2, Item 1) from the power source.
4. Remove the fasteners (Figure 2, Item 2) retaining the bottom cover of the power converter (Figure 2, Item 1), and then remove the bottom cover (Figure 2, Item 3). Retain the fasteners for reassembly.
5. Loosen and remove the hex nut with protective rubber cap (Figure 2, Item 4) on the main power switch (Figure 2, Item 5).
6. Reach inside the power converter case and withdraw the main power switch (Figure 2, Item 5) from the case as far as the wiring will allow.
7. Take note of the location, color, and connection point of the two wires connected to the main power switch (Figure 2, Item 5) inside the power converter to ensure that the wires are reconnected properly when the switch is replaced. Tag the wires as necessary.
8. Loosen and remove the fasteners securing the wires to the terminals on the main power switch (Figure 2, Item 6). Retain the fasteners for reassembly. Move the wires aside.
9. Move the power switch to the ON position and test for continuity through the power switch (Figure 2, Item 5) with a multimeter. If the power switch is not defective, check for continuity through the power cord (Figure 2, Item 7). If both the power switch and power cord are not defective, the entire power converter should be replaced.
10. To install the main power switch (Figure 2, Item 5), reconnect the wiring to the switch as tagged and secure with the retained fasteners (Figure 2, Item 6).
11. Place the main power switch (Figure 2, Item 5) in position in the power converter's front panel. Be sure to position the switch so that the screw terminal labeled "LOAD" is facing up and out of the case while the terminal labeled "LINE" is facing down into the power converter case.
12. Install the hex nut with protective rubber cap (Figure 2, Item 4) on the front of the main power switch (Figure 2, Item 5).
13. Install the bottom cover (Figure 2, Item 3) of the power converter (Figure 2, Item 1) and secure with the retained fasteners (Figure 2, Item 2).

TEST – CONTINUED

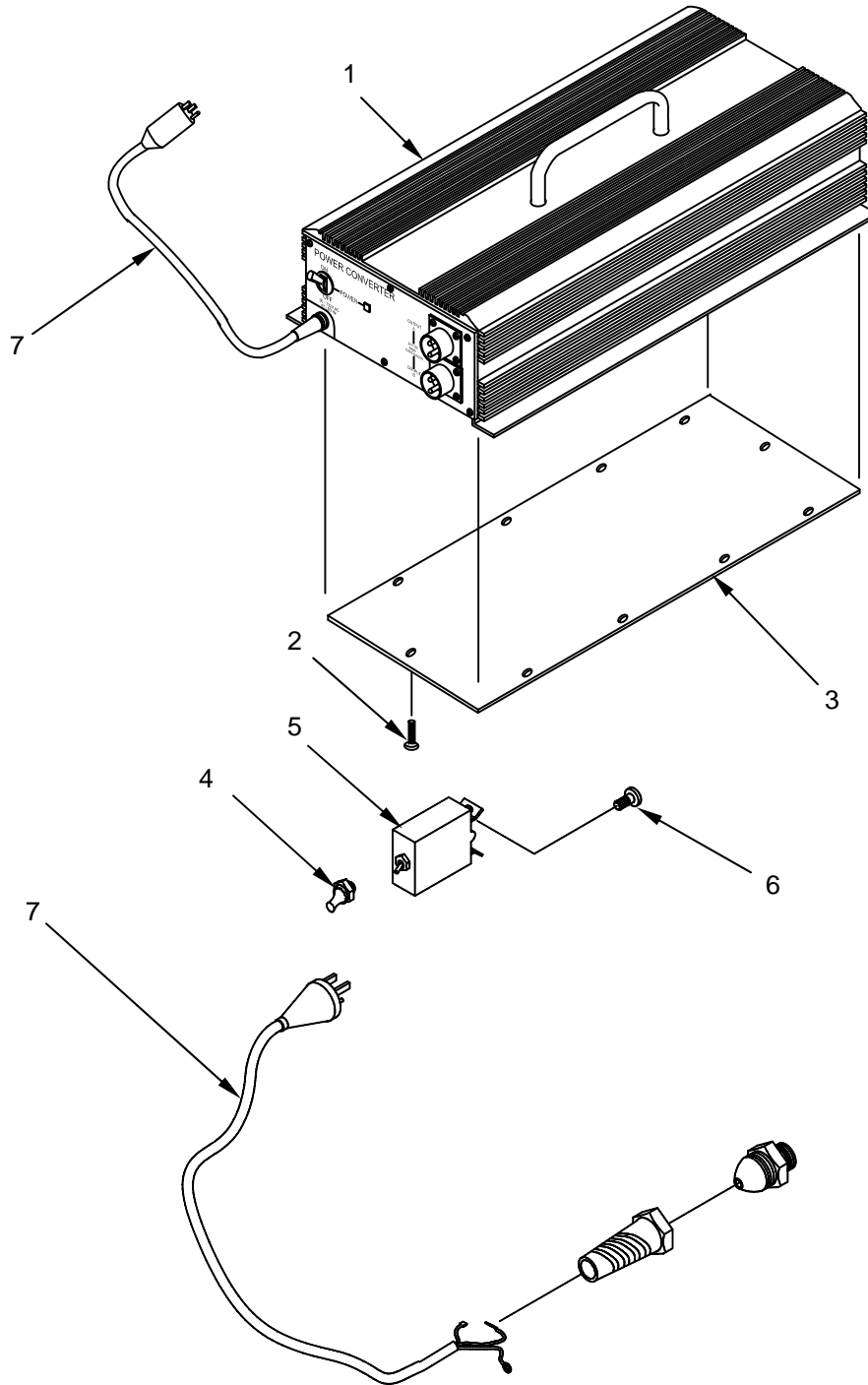


Figure 2. Test the Power Converter (MS0160).

END OF TASK

REPLACE**Replace the Main Power Switch (MS0150)****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

1. Disconnect the power converter (Figure 3, Item 3) from the power source.
2. Remove the fasteners (Figure 3, Item 1) retaining the top cover (Figure 3, Item 2) of the power converter (Figure 3, Item 3) and remove the top cover.
3. Loosen and remove the hex nut with protective rubber cap (Figure 3, Item 4) of the main power switch (Figure 3, Item 5).
4. Take note of the location, color, and connection point of the two wires connected to the main power switch (Figure 3, Item 5) inside the power converter (Figure 3, Item 3) to ensure that the wires are reconnected properly when the switch is replaced.
5. Reach inside the power converter (Figure 3, Item 3) case and disconnect the spade connector (Figure 3, Item 6) which connects the power switch (Figure 3, Item 5) to the AC filter block (Figure 3, Item 7).
6. Loosen and remove the screw that secures the wire (Figure 3, Item 8) to the second terminal. Retain the screw for reassembly. Set this wire aside.
7. Loosen and remove the screw retaining the power cord wire (Figure 3, Item 9) to the switch (Figure 3, Item 5) at the LINE terminal.
8. Remove the main power switch (Figure 3, Item 5) from the power converter (Figure 3, Item 3).
9. To install a new main power switch (Figure 3, Item 5), install the short wire (Figure 3, Item 8) set aside earlier on the switch terminal labeled "LOAD." Secure with retained screw.
10. Place the switch (Figure 3, Item 5) in position in the power converter's (Figure 3, Item 3) front panel. Be sure to position the switch so that the screw terminal labeled "LOAD" is facing up and out of the case while the terminal labeled "LINE" is facing down into the power converter case.
11. Install the hex nut with protective rubber cap (Figure 3, Item 4) on the front of the power switch (Figure 3, Item 5).
12. Connect the spade terminal (Figure 3, Item 6) to the lug on the AC filter block (Figure 3, Item 7).
13. Connect the power cord wire (Figure 3, Item 9) to the switch (Figure 3, Item 5) at the terminal marked "LINE," and secure with screw.
14. Install power converter cover (Figure 3, Item 2) and secure with the retained fasteners (Figure 3, Item 1).

REPLACE – CONTINUED

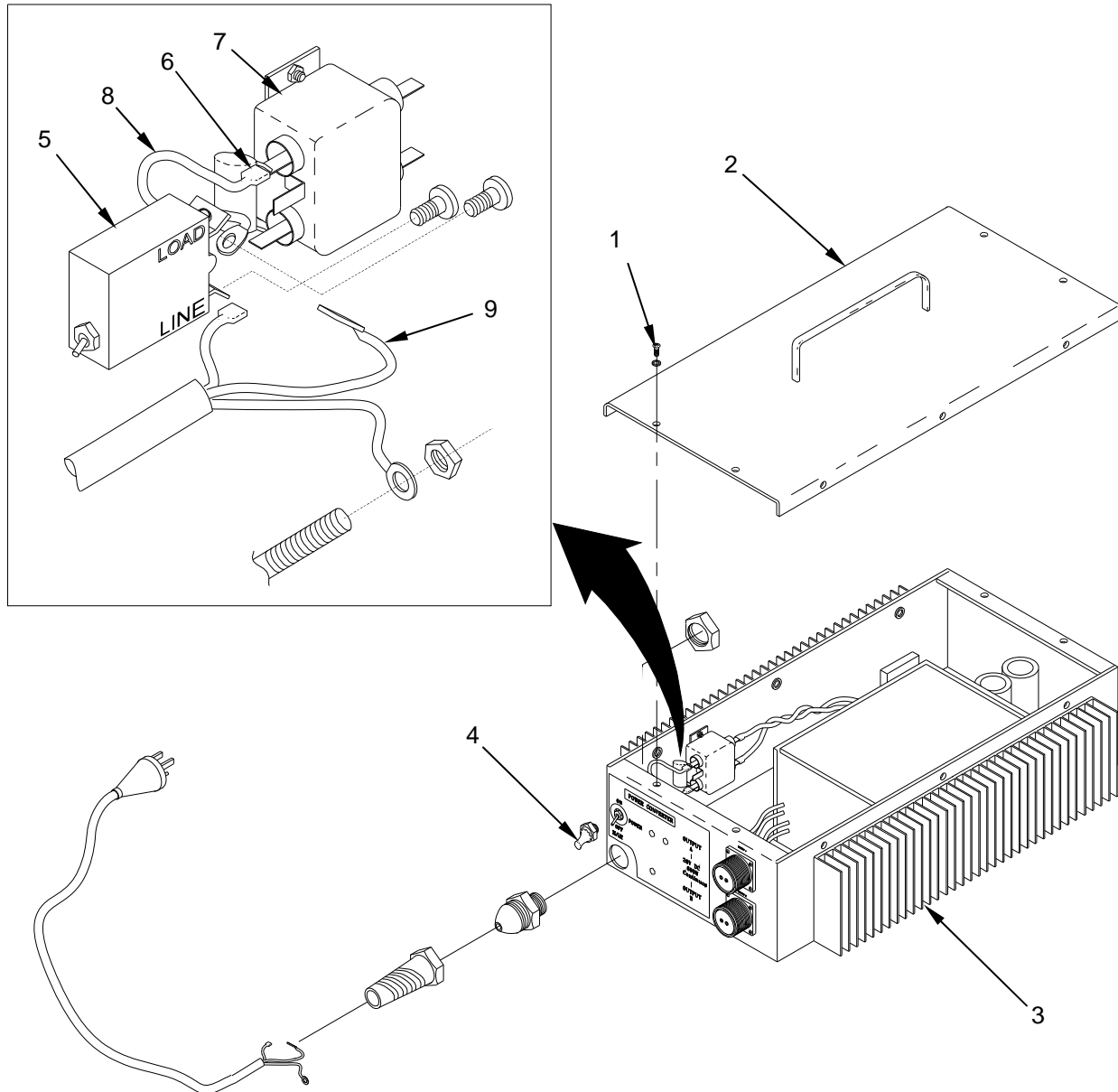


Figure 3. Replace the Main Power Switch (MS0150).

END OF TASK

REPLACE – CONTINUED**Replace the Main Power Switch (MS0160)****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

1. Remove the fasteners (Figure 4, Item 2) retaining the bottom cover of the power converter (Figure 4, Item 1), and then remove the bottom cover (Figure 4, Item 3). Retain the fasteners for reassembly.
2. Loosen and remove the hex nut with protective rubber cap (Figure 4, Item 4) of the main power switch (Figure 4, Item 5).
3. Reach inside the power converter case and withdraw the main power switch (Figure 4, Item 5) from the case as far as the wiring will allow.
4. Take note of the location, color, and connection point of the two wires connected to the main power switch (Figure 4, Item 5) inside the power converter to ensure that the wires are reconnected properly when the switch is replaced. Tag the wires as necessary.
5. Loosen and remove the fasteners securing the wires to the terminals on the main power switch (Figure 4, Item 5). Retain the fasteners for reassembly. Move the wires aside.
6. To install the main power switch (Figure 4, Item 5), reconnect the wiring to the switch as tagged and secure with the retained fasteners (Figure 4, Item 6).
7. Place the switch (Figure 4, Item 5) in position in the power converter's front panel. Be sure to position the switch so that the screw terminal labeled "LOAD" is facing up and out of the case while the terminal labeled "LINE" is facing down into the power converter case.
8. Install the hex nut with protective rubber cap (Figure 4, Item 4) on the front of the power switch (Figure 4, Item 5).
9. Install the bottom cover (Figure 4, Item 3) of the power converter (Figure 4, Item 1) and secure with the retained fasteners (Figure 4, Item 2).

REPLACE – CONTINUED

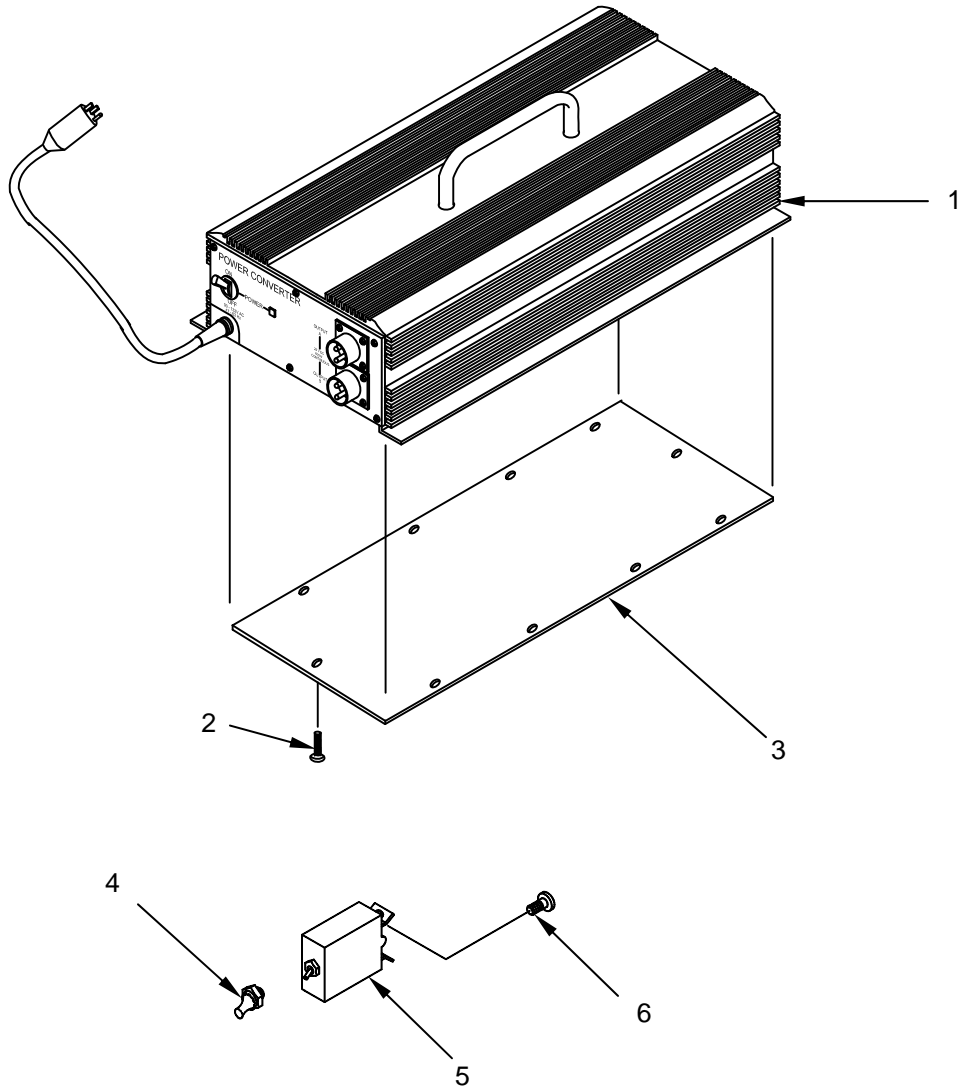


Figure 4. Replace the Main Power Switch (MS0160).

END OF TASK

REPLACE – CONTINUED**Replace the Power Cord (MS0150)****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

1. Remove the fasteners (Figure 5, Item 1) that secure the power converter cover (Figure 5, Item 2) and remove the cover. Retain the fasteners and cover for reassembly.
2. Remove the main power switch (Figure 5, Item 3) as detailed in “Replace the Main Power Switch (MS0150)” section of this WP.
3. Take note of the color of the power cord wires (Figure 5, Item 10) and where they are connected, to ensure that the cord is reconnected properly.
4. Disconnect the power cord spade terminal (Figure 5, Item 11) from the lower lug of the AC filter block (Figure 5, Item 5).
5. Remove the hex nut retaining the power cord ground wire (Figure 5, Item 12) to the grounding stud (Figure 5, Item 6) and remove the power cord ground wire. Retain the hex nut for reassembly.
6. Loosen and remove the inner plastic hex nut (Figure 5, Item 7) that is part of the cord securing collar. Retain the plastic hex nut for reassembly.
7. Pull the entire power cord assembly (Figure 5, Item 4) out of the power converter (Figure 5, Item 9).
8. Unscrew the strain relief (Figure 5, Item 8) from the outer section of the securing collar and pull the power cord (Figure 5, Item 4) free. Retain the securing collar (Figure 5, Item 7) and the strain relief for reassembly.

NOTE

Replace a damaged or otherwise unserviceable strain relief.

9. Thread the serviceable power cord (Figure 5, Item 4) through the strain relief (Figure 5, Item 8) and then the outer section of the securing collar (Figure 5, Item 7).
10. Slide the plastic hex nut (Figure 5, Item 7) over the terminal end of the power cord (Figure 5, Item 4).
11. Insert the terminal ends of the power cord (Figure 5, Item 4), with the strain relief assembly (Figure 5, Item 8) and the outer section of the securing collar (Figure 5, Item 7), through the hole in the front panel of the power converter (Figure 5, Item 9).
12. Connect the spade terminal of the BLUE wire to the lower terminal of the AC Filter block (Figure 5, Item 5).
13. Connect the GREEN/YELLOW wire to the grounding stud (Figure 5, Item 6), on the inside surface of the front panel, and retain with hex nut.
14. Reinstall the main power switch (Figure 5, Item 3) as detailed in “Replace the Main Power Switch

REPLACE – CONTINUED

(MS0150) section of this WP.

15. Connect the BROWN power cord wire to the terminal on the power switch labeled "LINE." Secure with screw.
16. Secure the inner plastic hex nut (Figure 5, Item 7) onto the outer section of the securing collar (Figure 5, Item 7).
17. Secure the stain relief (Figure 5, Item 8) to the outer section of the securing collar (Figure 5, Item 7).
18. Reinstall the power converter cover (Figure 5, Item 2) and secure with the retained fasteners (Figure 5, Item 1).

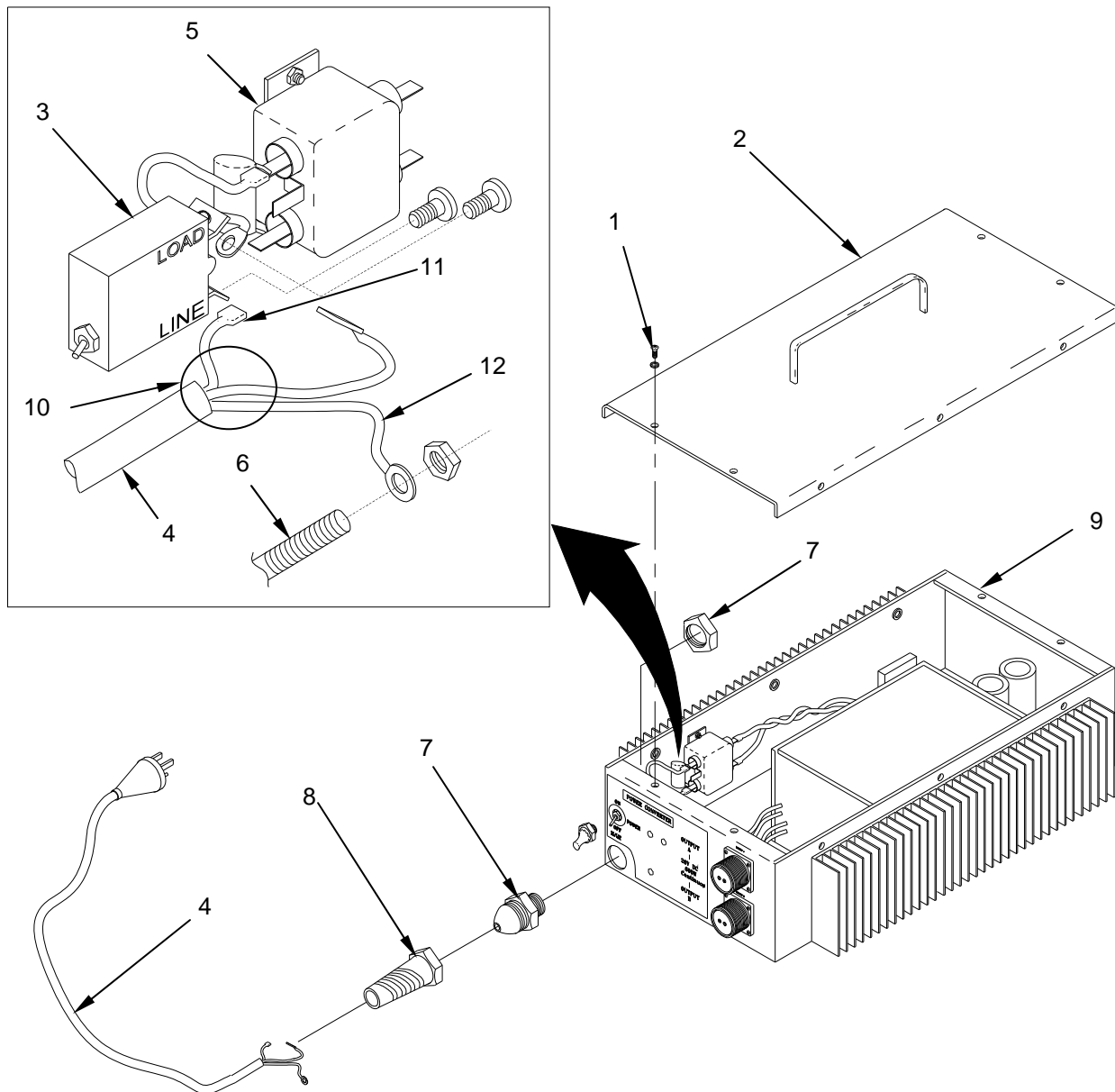


Figure 5. Replace the Power Cord (MS0150).

END OF TASK

REPLACE – CONTINUED**Replace the Power Cord (MS0160)****WARNING**

HIGH VOLTAGE is used in the operation of this equipment. Ensure power is disconnected before attempting this maintenance procedure. **DEATH ON CONTACT** may result if personnel fail to observe safety precautions.

1. Disconnect the power converter (Figure 6, Item 3) from the power source.
2. Remove the fasteners (Figure 6, Item 1) that secure the bottom cover (Figure 6, Item 2) of the power converter (Figure 6, Item 3). Retain the fasteners and cover for reassembly.
3. Remove the main power switch (Figure 6, Item 4) as detailed in “Replace the Main Power Switch (MS0160)” section of this WP.
4. Take note of the color of the power cord (Figure 6, Item 5) wires and where they are connected, to ensure that the cord is reconnected properly. Tag wires as necessary (one lead has been disconnected in the removal of the main power switch).
5. Tag and disconnect the remaining “BLUE” power cord (Figure 6, Item 5) wire.
6. Locate and remove the hex nut on the grounding stud (Figure 6, Item 6) and remove the power cord (Figure 6, Item 5) ground wire.
7. Loosen and remove the inner plastic hex nut of the securing collar (Figure 6, Item 7) on the inside of the power converter front panel that secures the power cord strain relief (Figure 6, Item 8).
8. Pull the entire power cord assembly (Figure 6, Item 5) out of the power converter (Figure 6, Item 3).
9. Separate and remove the strain relief (Figure 6, Item 8) and the securing collar (Figure 6, Item 7) from the power cord (Figure 6, Item 5).
10. Slide the strain relief (Figure 6, Item 8) and the outer section of the securing collar (Figure 6, Item 7) over the replacement power cord (Figure 6, Item 5).
11. Insert the terminal end of the power cord (Figure 6, Item 5) through the hole in the front panel of the power converter (Figure 6, Item 3) and through the inner plastic hex nut of the securing collar (Figure 6, Item 7).
12. Install the power cord ground wire on the grounding stud (Figure 6, Item 6) and secure with the hex nut.
13. Connect the “BLUE” power cord (Figure 6, Item 5) wire as tagged.
14. Reinstall the main power switch (Figure 6, Item 4) as detailed in “Replace the Main Power Switch (MS0160)” section of this WP.
15. Secure the inner plastic hex nut (Figure 6, Item 7) onto the outer section of the securing collar (Figure 6, Item 7).
16. Secure the strain relief (Figure 6, Item 8) to the outer section of the securing collar (Figure 6, Item 7).

REPLACE – CONTINUED

17. Reinstall the bottom cover (Figure 6, Item 2) of the power converter (Figure 6, Item 3) and secure with the retained fasteners (Figure 6, Item 1).

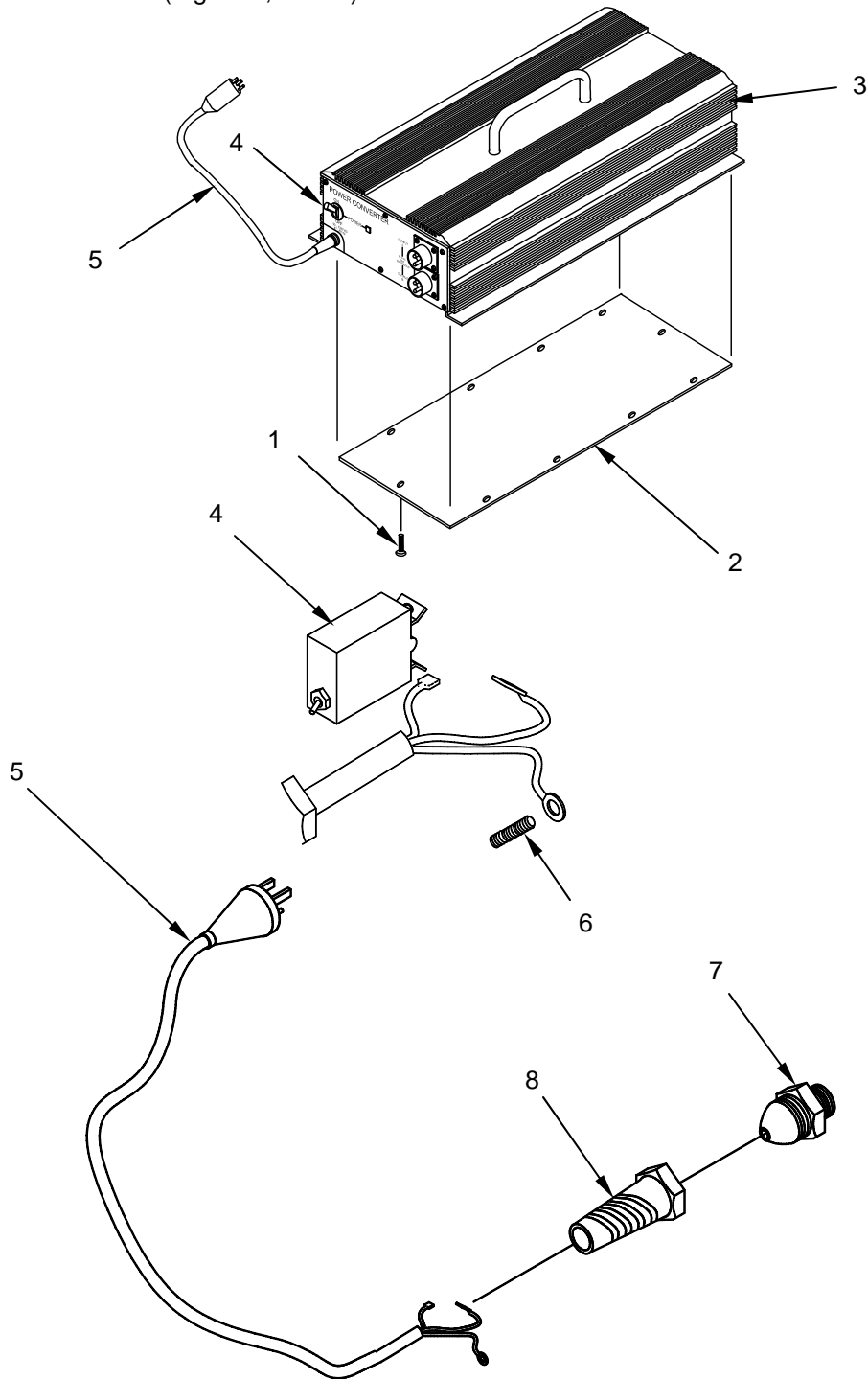


Figure 6. Replace the Power Cord (MS0160).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**BATTERY PACK
REPAIR, REPLACE**

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (WP 0073, Item 2)
Welding Shop (WP 0073, Item 3)

Personnel Required

Metal Worker 91W (1)
Machinist 91E (1)

References

TC 9-237, TC 9-510, WP 0043, WP 0044

Equipment Condition

Battery pack disconnected (WP 0005)

REPAIR**Repair the Battery Pack****WARNING**

Before proceeding, the batteries must be removed from the battery pack. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

The battery pack weighs approximately 80 pounds (36.2 kg). Two persons must carry the battery pack. Lift with legs, not back, to prevent injury.

1. Remove the batteries IAW instructions given in WP 0043.
2. Remove the battery charger IAW instructions given in WP 0044.
3. Perform welding operations as specified in TC 9-237, Operator's Manual: Welding Theory and Application.
4. Perform repairs to the sheet metal cover as described in TC 9-510, Metal Body Repair and Related Operations.
5. Install the battery charger IAW instructions given in WP 0044.
6. Install the batteries IAW instructions given in WP 0043.

END OF TASK

FIELD MAINTENANCE**BATTERIES
TEST, REPLACE**

INITIAL SETUP**Tools and Special Tools**

Tool Kit, General Mechanic's (WP 0073, Item 2)

Personnel Required

MOS Non-specific (2)

References

WP 0005

Equipment ConditionBattery pack disconnected (WP 0005)

TEST**Test the Batteries****WARNING**

The battery pack weighs approximately 93 pounds (42.3 kg). Two persons must carry the battery pack. Lift with legs, not back, to prevent injury.

1. To determine the status of the batteries, attempt to charge the battery pack (Figure 1, Item 1) until the "READY" indicator is lit. Refer to WP 0005 as necessary for operating procedures.
2. If the "READY" indicator does not light after approximately 2 hours of charging, discontinue the charging operation and disconnect the power source from the Power Input connector. Refer to WP 0005 as necessary for operating procedures.
3. Remove the fasteners (Figure 1, Item 2) retaining the battery pack cover (Figure 1, Item 3) and remove the cover. Retain the fasteners and cover for reassembly.
4. Tag and disconnect the power leads (Figure 1, Item 4) that extend from the charger to the battery terminals (Figure 1, Item 5) so that the batteries (Figure 1, Item 6) are no longer connected to the charger or each other.
5. With a multimeter set to measure DC volts, place the (+) positive lead of the multimeter on the (+) positive terminal of one battery (Figure 1, Item 6) and the (-) negative lead of the multimeter on the (-) negative terminal of the same battery.
6. Read the output voltage of the battery (Figure 1, Item 6) on the multimeter. If the voltage is 11VDC or less, the battery is most likely no longer capable of holding a full charge and requires replacement.
7. Repeat steps 5 and 6 with the remaining battery (Figure 1, Item 6).

TEST – CONTINUED

WARNING

Batteries may explode if connected incorrectly. RED power lead MUST be connected to positive (+) terminal of battery. BLACK power lead MUST be connected to negative (-) terminal of battery.

8. Connect the power leads (Figure 1, Item 4) to the battery terminals (Figure 1, Item 5) as tagged.
9. If the batteries (Figure 1, Item 6) pass the voltage test, install the battery pack cover (Figure 1, Item 3) and secure with the retained fasteners (Figure 1, Item 2).

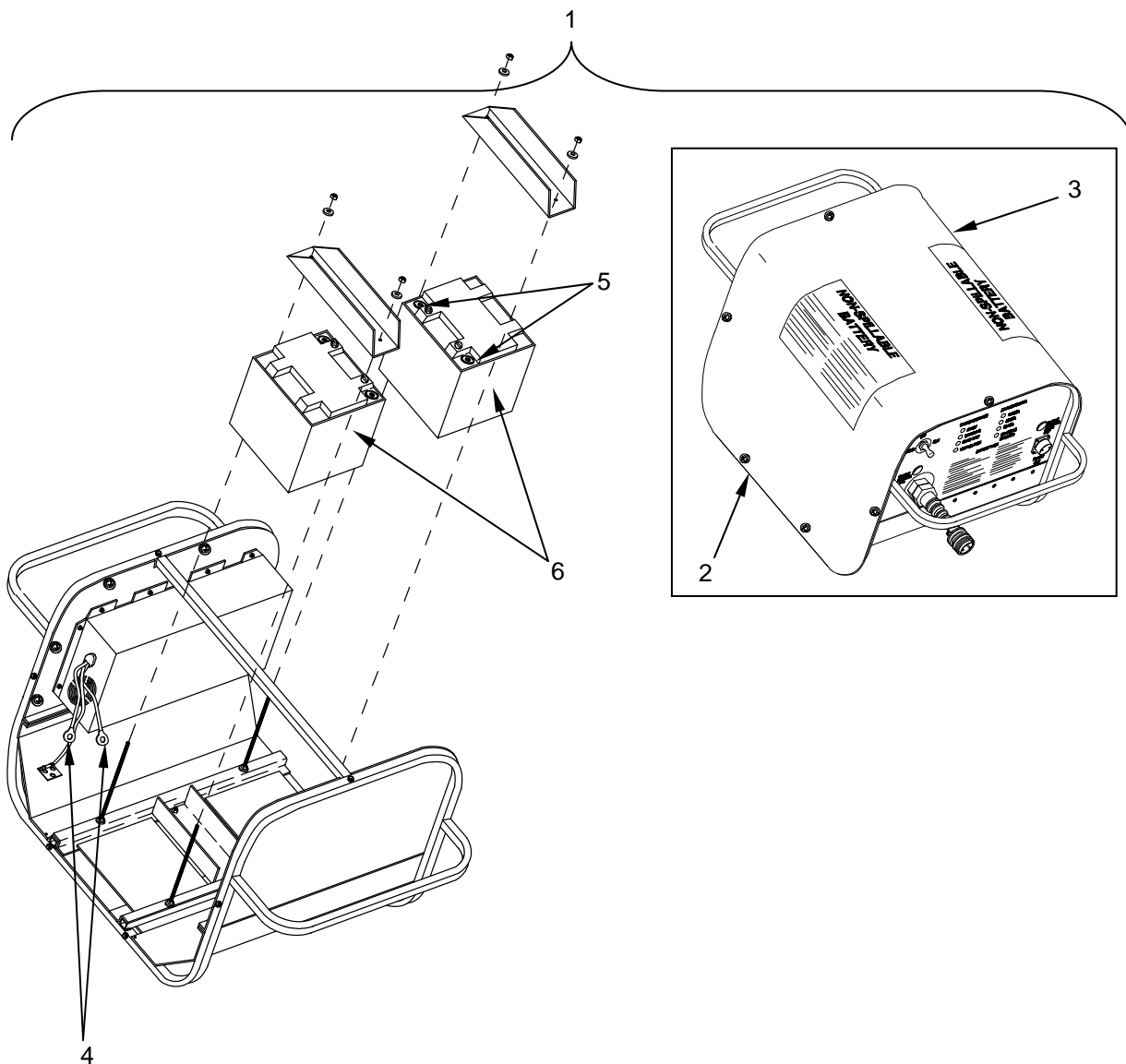


Figure 1. Test the Batteries.

END OF TASK

REPLACE**Replace the Batteries****NOTE**

Replace both batteries at the same time, if possible.

1. To replace the battery pack batteries (Figure 2, Item 1), remove the battery pack outer cover (Figure 2, Item 2) by removing the cover retaining fasteners (Figure 2, Item 3) with a suitable screwdriver. Retain the fasteners for reassembly.
2. Remove the two nylon locking nuts and washers (Figure 2, Item 4) on the hold-down bracket (Figure 2, Item 5) of the battery being replaced.
3. Lift the hold-down bracket (Figure 2, Item 5) off the threaded shafts (Figure 2, Item 6) and remove.
4. Loosen and remove the battery terminal hex head bolts (Figure 2, Item 7) that secure the power leads (Figure 2, Item 8) to the battery terminals of the battery being replaced.

NOTE

Take care when handling the batteries, as each weighs approximately 35 pounds. Due to their weight, the batteries may stick to the neoprene cushion of the battery pack base plate (Figure 2, Item 9) and may require a moderate amount of force to break the bond.

5. Remove the defective battery (Figure 2, Item 1) and set aside.
6. Install the new battery (Figure 2, Item 1) onto the battery pack base plate (Figure 2, Item 9).
7. Slide the hold-down bracket (Figure 2, Item 5) onto the threaded shafts (Figure 2, Item 6).
8. Reinstall the two nylon locking nuts (Figure 2, Item 4) on the hold-down bracket (Figure 2, Item 5) of the battery.

WARNING

Batteries may explode if connected incorrectly. RED power lead MUST be connected to positive (+) terminal of battery. BLACK power lead MUST be connected to negative (-) terminal of battery.

9. Reconnect each power lead (Figure 2, Item 8) making sure to attach the "RED" lead to the positive (+) battery terminal and the temperature sensor (Figure 2, Item 10) under the "BLACK" negative lead of the negative (-) battery terminal. Secure the power lead to the battery terminals with hex head bolts (Figure 2, Item 7).
10. Dispose of defective batteries (Figure 2, Item 1) IAW unit SOP or in an environmentally approved manner per local commander's requirements.
11. Install the battery pack outer cover (Figure 2, Item 2) and secure with the retained fasteners (Figure 2, Item 3).

REPLACE – CONTINUED

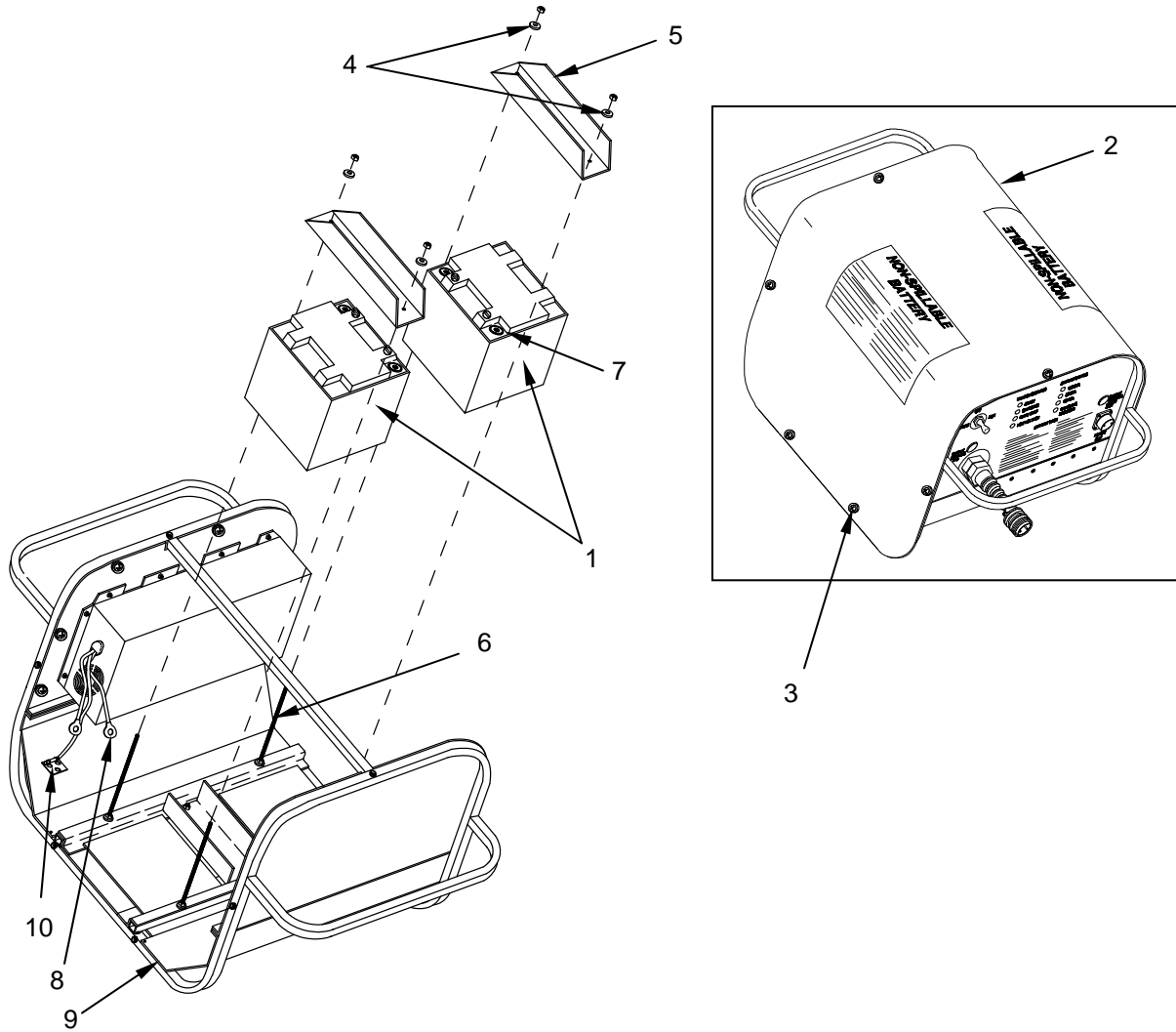


Figure 2. Replace the Batteries.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**BATTERY CHARGER
TEST, REPLACE**

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (WP 0073, Item 2)

Personnel Required

MOS Non-specific (2)

Materials/Parts

Tape, Insulation, Electrical (WP 0072, Item 8)

Equipment Condition

Battery pack disconnected (WP 0005)

ReferencesWP 0043

TEST**Test the Battery Charger****WARNING**

The battery pack weighs approximately 93 pounds (42.3 kg). Two persons must carry the battery pack. Lift with legs, not back, to prevent injury.

1. Remove the fasteners (Figure 1, Item 1) retaining the battery pack cover (Figure 1, Item 2) and remove the cover. Retain the cover and fasteners for reassembly.
2. Tag and disconnect the battery charger wiring (Figure 1, Item 3) from the batteries (Figure 1, Item 4).
3. Use electrical tape to insulate the terminal end of each battery charger wire (Figure 1, Item 3). Leave the end open to allow access to the terminal.

CAUTION

Ensure the terminals are completely insulated from each other and from any conductive components. Failure to do so may allow a short circuit and may damage the charger.

4. Connect the battery charger (Figure 1, Item 5) to an approved power source, and set the 3-Position switch (Figure 1, Item 6) to "CHARGE."
5. Set a multimeter to read DC voltage, and check the voltage between the two charger wire terminals (Figure 1, Item 3). The charger (Figure 1, item 5) should deliver approximately 24 to 28VDC. Replace a charger with low or no voltage.
6. Disconnect the battery charger (Figure 1, Item 5) from the power source.

TEST – CONTINUED

WARNING



Batteries may explode if connected incorrectly. RED power lead MUST be connected to positive (+) terminal of battery. BLACK power lead MUST be connected to negative (-) terminal of battery.

7. Remove the electrical tape from the wire terminals (Figure 1, Item 3), and connect the charger wiring to the batteries (Figure 1, Item 4) as tagged.
8. Install the battery pack cover (Figure 1, Item 2), and secure with the retained fasteners (Figure 1, Item 1).

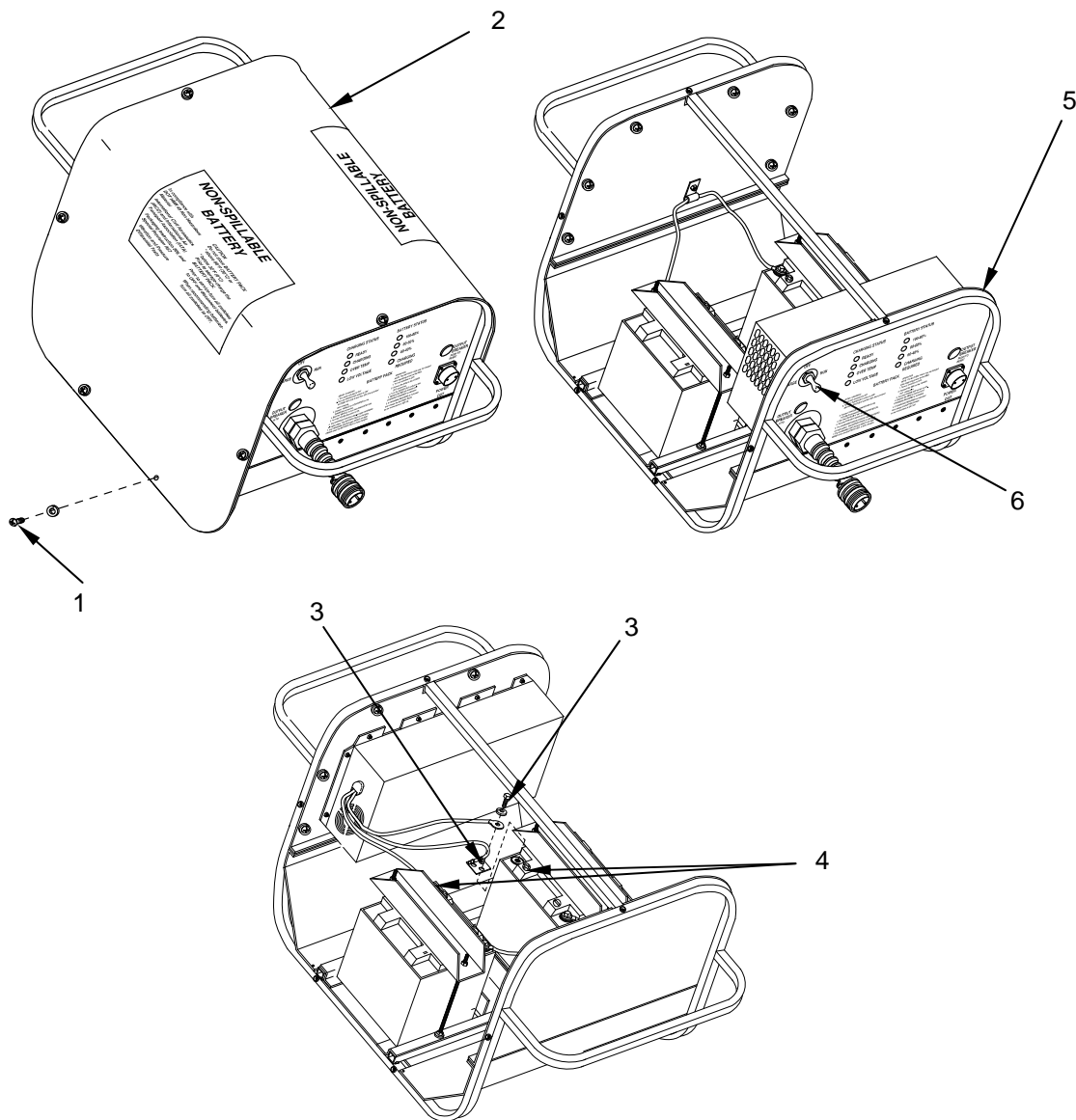


Figure 1. Test the Battery Charger.

END OF TASK

REPLACE**Replace the Battery Charger****WARNING**

The battery pack weighs approximately 93 pounds (42.3 kg). Two persons must carry the battery pack. Lift with legs, not back, to prevent injury.

1. To replace the internal battery charger (Figure 2, Item 1), remove batteries IAW WP 0043.
2. Loosen the two hex nuts (Figure 2, Item 2) at the base of the threaded shafts (Figure 2, Item 3) just behind the charger assembly.
3. Remove the two shafts (Figure 2, Item 3) (it is not necessary to remove rear shafts), making sure not to drop the nuts and washers under the battery pack base plate that secure the shafts to the frame.
4. Remove the six retaining screws and washers (Figure 2, Item 4) that secure the battery charger (Figure 2, Item 1) to the battery pack frame (Figure 2, Item 5). Retain the fasteners for reassembly.
5. Remove the charger assembly (Figure 2, Item 1).
6. Install a new charger (Figure 2, Item 1) in place on the battery pack frame (Figure 2, Item 5).
7. Secure in place with the six retaining screws and washers (Figure 2, Item 4).
8. Install the two threaded shafts (Figure 2, Item 3) removed earlier and secure.

WARNING

Batteries may explode if connected incorrectly. RED power lead MUST be connected to positive (+) terminal of battery. BLACK power lead MUST be connected to negative (-) terminal of battery.

9. Reinstall the batteries and battery pack cover IAW WP 0043.

REPLACE – CONTINUED

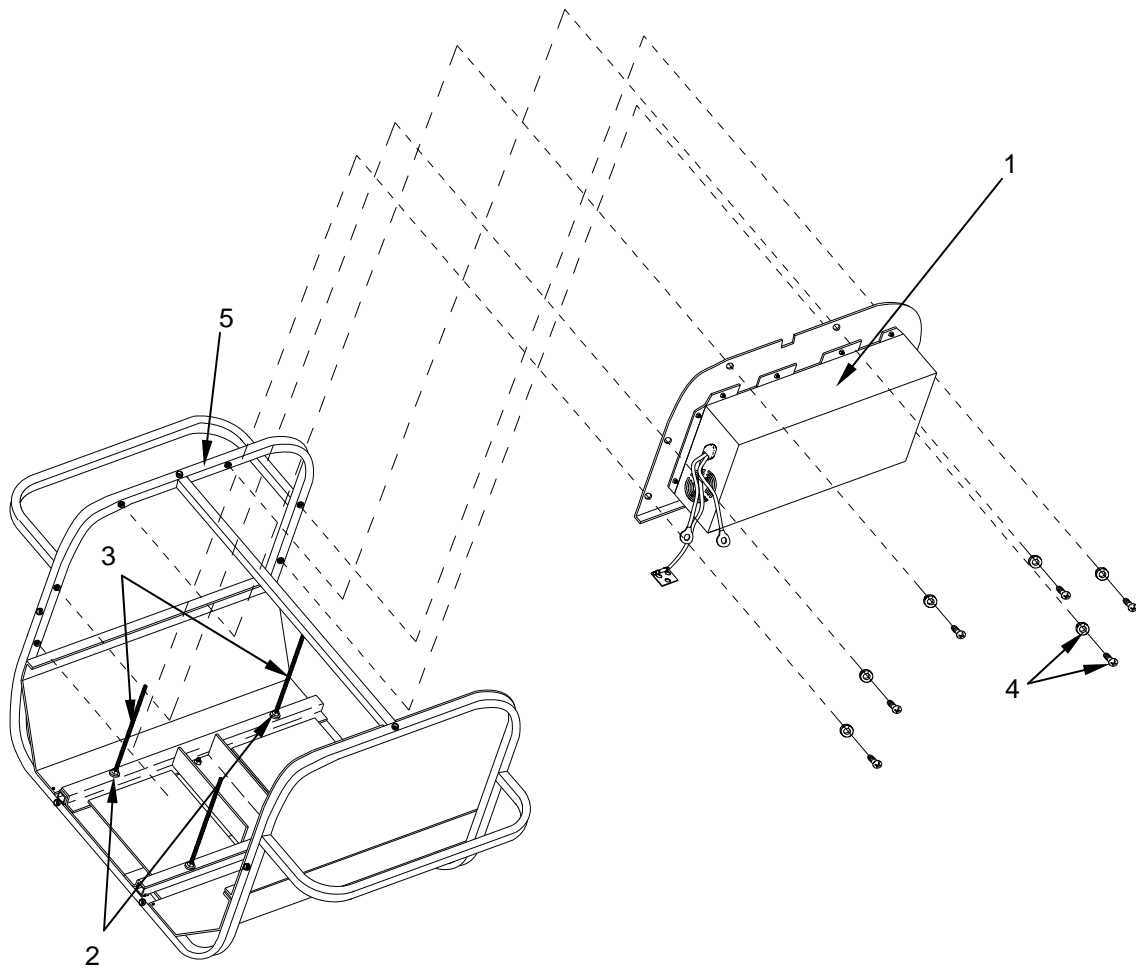


Figure 2. Replace the Battery Charger.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**NATO ADAPTER CABLE
TEST, REPLACE**

INITIAL SETUP:**Tools and Special Tools**

Tool Kit, General Mechanic's (WP 0073, Item 2)

Personnel Required

MOS Non-specific (2)

Equipment ConditionNATO Adapter Cable disconnected (WP 0005)

TEST**Test the NATO Adapter Cable**

1. Remove the outer cap (Figure 1, Item 3) of the large power connector (Figure 1, Item 2).
2. Use a multimeter to test for continuity between the terminal (Figure 1, Item 5) in the large power connector (Figure 1, Item 2) and each terminal in the small power connector (Figure 1, Item 1). There should be continuity with only one terminal in the small power connector. Replace a NATO Adapter Cable which does not pass this test.
3. Use a multimeter to test for continuity between the socket (Figure 1, Item 4) in the large power connector (Figure 1, Item 2) and each terminal in the small power connector (Figure 1, Item 1). There should be continuity with only one terminal in the small power connector. Replace a NATO Adapter Cable which does not pass this test.
4. Install the outer cap (Figure 1, Item 3) on the large power connector (Figure 1, Item 2).

TEST – CONTINUED

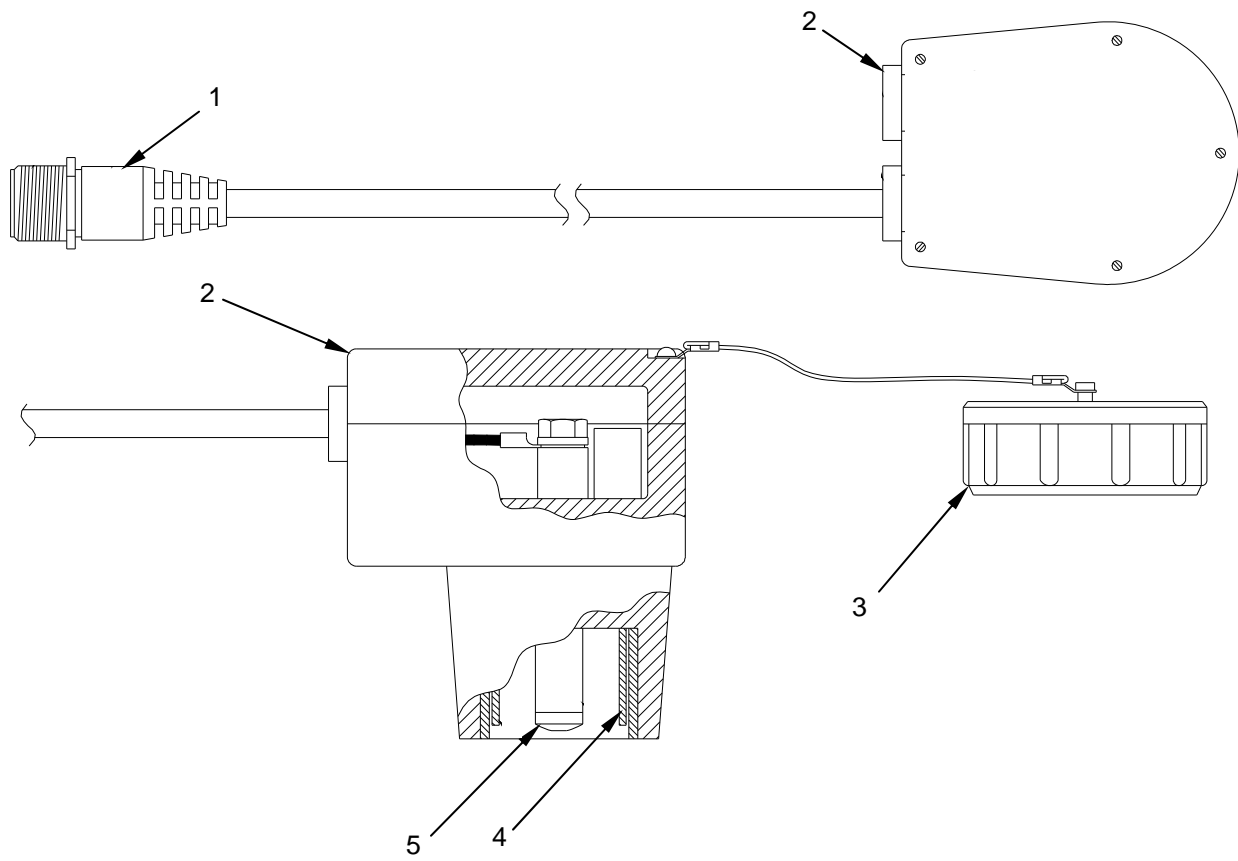


Figure 1. Test the NATO Adapter Cable.

END OF TASK

REPLACE**Replace NATO Adapter Cable Components**

1. Remove the protective cap (Figure 2, Item 1).
2. Remove the six screws that secure the back cover of the main connector head (Figure 2, Item 2).
3. Remove the two hex head bolts (Figure 2, Item 3) that secure the power cable (Figure 2, Item 4) to the main power connector head (Figure 2, Item 2) and remove the cable assembly.
4. Install a new power cable (Figure 2, Item 4) or new main connector head (Figure 2, Item 2) making sure to place the power cable strain relief (Figure 2, Item 5) into the slot on the main power connector head.
5. Place the power cable terminals in position by aligning the (+) positive lead of the cable with the (+) terminal (Figure 2, Item 6) on the main connector head (Figure 2, Item 2) and install the two hex head bolts (Figure 2, Item 3).
6. Place the back cover of the main connector head (Figure 2, Item 2) into position. Place a new cap, or the cap removed earlier, into position over the top screw hole (Figure 2, Item 7) and secure the six cover screws.
7. If the main power connector head and power cable are both damaged, replace the entire NATO Adapter Cable assembly.

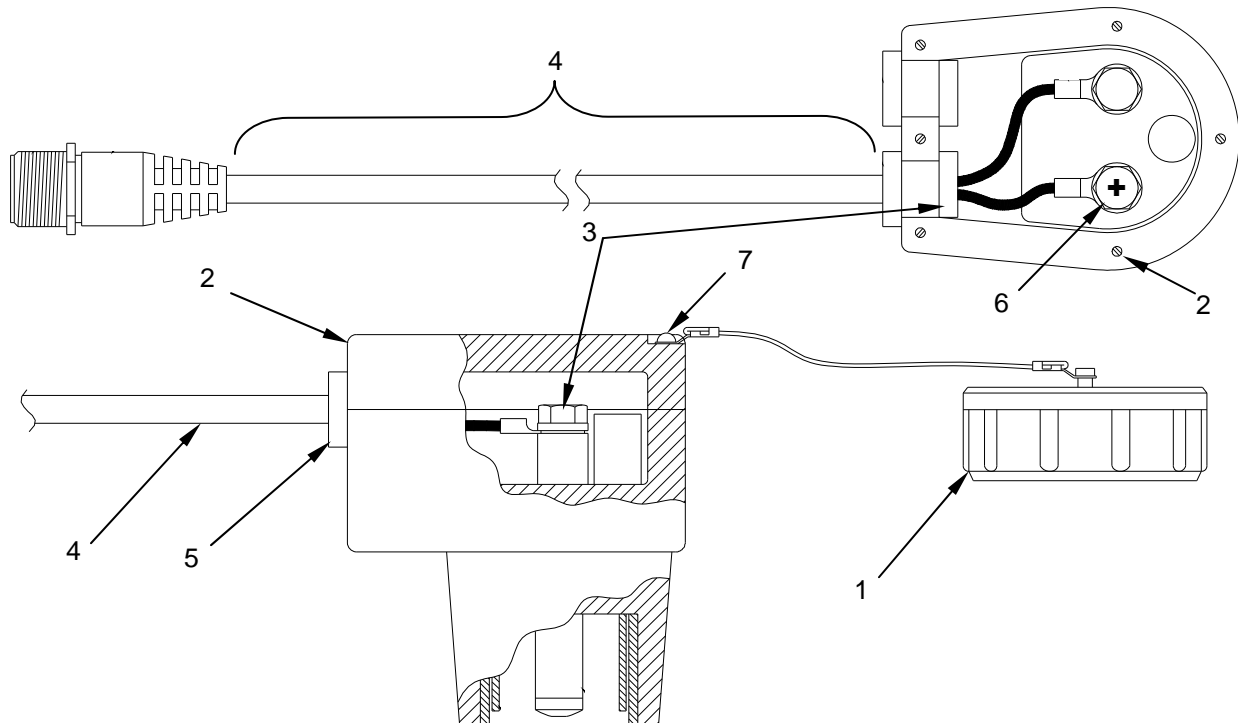


Figure 2. Replace NATO Adapter Cable Components.

END OF TASK**END OF WORK PACKAGE**

CHAPTER 6

**PARTS INFORMATION
FOR
MODERN BURNER UNIT
AND
MODERN BURNER UNIT-V3**

OPERATOR AND FIELD MAINTENANCE

REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)

INTRODUCTION

SCOPE

This RPSTL lists and authorizes spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE); and other special support equipment required for performance of operator, unit, and field maintenance of the Modern Burner Unit (MBU). It authorizes the requisitioning, issue, and disposition of spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

GENERAL

In addition to the Introduction work package, this RPSTL is divided into the following work packages.

1. **Repair Parts List Work Packages.** Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed at the end of the individual work packages. Repair parts for repairable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.
2. **Special Tools List Work Packages.** Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.
3. **Cross-Reference Indexes Work Packages.** There are two cross-reference indexes work packages in this RPSTL: the National Stock Number (NSN) Index work package and the Part Number (P/N) Index work package. The National Stock Number Index work package refers you to the figure and item number. The Part Number Index work package refers you to the figure and item number.

EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGES

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column (2)). The SMR code containing supply/requisitioning information, maintenance level authorization criteria, and disposition instruction, as shown in the following breakout. This entry may be subdivided into 4 subentries, one for each service.

Table 1. SMR Code Explanation.

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

*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.

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:

Source Code

Application/Explanation

PA
PB
PC
PD
PE
PF
PG
PH
PR
PZ

NOTE

Items coded PC are subject to deterioration.

Stock items; use the applicable NSN to requisition/request items with these source codes. They are authorized to the level indicated by the code entered in the 3rd position of the SMR code.

KD
KF
KB

Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.

MF-Made at Field
MH-Made at below depot/sustainment level
ML-Made at SRA
MD-Made at depot
MG-Navy only

Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the bulk material group work package of the RPSTL. If the item is authorized to you by the third position code of the SMR code, but the source code indicates it is made at higher level, order the item from the higher level of maintenance.

AF-Assembled by Field
AH-Assembled by below depot/sustainment level
AL-Assembled by SRA
AD-Assembled by depot
AG-Navy only

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 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.

XA

Do not requisition an "XA" coded item. Order the next higher assembly.(Refer to NOTE below.)

XB

If an item is not available from salvage, order it using the CAGEC and part number.

XC

Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's part number.

XD

Item is not stocked. Order an XD-coded item through normal supply channels using the CAGEC and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes except for those items source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

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:

Third Position. 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 the following levels of maintenance:

Maintenance

<u>Code</u>	<u>Application/Explanation</u>
F -	Field maintenance can remove, replace, and use the item.
H -	Below Depot Sustainment maintenance can remove, replace, and use the item.
L -	Specialized Repair Activity can remove, replace, and use the item.
G -	Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only).
K -	Contractor facility can remove, replace, and use the item.
Z -	Item is not authorized to be removed, replace, or used at any maintenance level.
D -	Depot can remove, replace, and use the item.

*NOTE - Army may use C in the third position. However, for joint service publications, Army will use O.

Fourth Position. 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 (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.

Maintenance

<u>Code</u>	<u>Application/Explanation</u>
F -	Field is the lowest level that can do complete repair of the item.
H -	Below Depot Sustainment is the lowest level that can do complete repair of the item.
L -	Specialized Repair Activity is the lowest level that can do complete repair of the item.
D -	Depot is the lowest level that can do complete repair of the item.
G -	Both afloat and ashore intermediate levels are capable of complete repair of item (Navy only).
K -	Complete repair is done at contractor facility.
Z -	Nonreparable. No repair is authorized.
B -	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

Recoverability Code

<u>Recoverability Code</u>	<u>Application/Explanation</u>
Z -	Nonreparable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in the third position of the SMR code.
F -	Reparable item. When uneconomically reparable, condemn and dispose of the item at the field level.
D -	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item are not authorized below depot level.
L -	Reparable item. Condemnation and disposal not authorized below SRA.
A -	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
G -	Field level reparable item. Condemn and dispose at either afloat or ashore intermediate levels (Navy only).
K -	Reparable item. Condemnation and disposal to be performed at contractor Facility.

NSN (Column (3)). The NSN for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

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 number listed.

DESCRIPTION AND USABLE ON CODE (UOC) (Column (6)). This column includes the following information:

1. The federal item name, and when required, a minimum description to identify the item.
 2. Part numbers of bulk materials are referenced in this column in the line entry to be manufactured or fabricated.
 3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.
 4. The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.
- 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, subfunctional group, or an assembly. A "V" appearing in this column instead of a quantity indicates that the quantity is variable and quantity may change from application to application.

**EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGES
FORMAT AND COLUMNS**

1. National Stock Number (NSN) Index Work Package. NSN's in this index are listed in National Item Identification Number (NIIN) sequence.

STOCK NUMBER Column. This column lists the NSN in NIIN sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first four digits of the NSN. However, the complete NSN should be used when ordering items by stock number. For example, if the NSN is 5385-01-574-1476, the NIIN is 01-574-1476.

FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts list and special tools list work packages.

ITEM Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index Work Package. Part numbers in this index are listed in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

PART NUMBER Column. Indicates the part number assigned to the item.

FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list and special tools list work packages.

ITEM Column. The item number is the number assigned to the item as it appears in the figure referenced in the adjacent figure number column."

SPECIAL INFORMATION

UOC. The UOC appears in the lower left corner of the Description Column heading. Usable on codes are shown as "UOC:..." in the Description Column (justified left) on the first line under the applicable item/nomenclature. Uncoded items are applicable to all models. Identification of the UOCs used in the RPSTL are:

<u>Code</u>	<u>Used On</u>
FQG	MBU
FTW	MBU-V3

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in the applicable maintenance work package.

Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the NSN / Part Number (P/N) Index work packages and the bulk material list in the repair parts list work package.

Illustrations List. The illustrations in this RPSTL contain field authorized items. Illustrations published in (enter applicable TM number for the higher maintenance level RPSTL, e.g., for field, below depot sustainment, etc.) that contain field authorized items also appear in this RPSTL. The tabular list in the repair parts list work package contains only those parts coded "O" in the third position of the SMR code, therefore, there may be a break in the item number sequence.

HOW TO LOCATE REPAIR PARTS**1. When NSNs or Part Numbers Are 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 lists are divided into the same groups.

Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number(s).

Fourth. Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When NSN Is Known.

First. If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

3. When Part Number Is Known.

First. If you have the part number and not the NSN, look in the PART NUMBER column of the part number index work package. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

FRAME ASSEMBLY

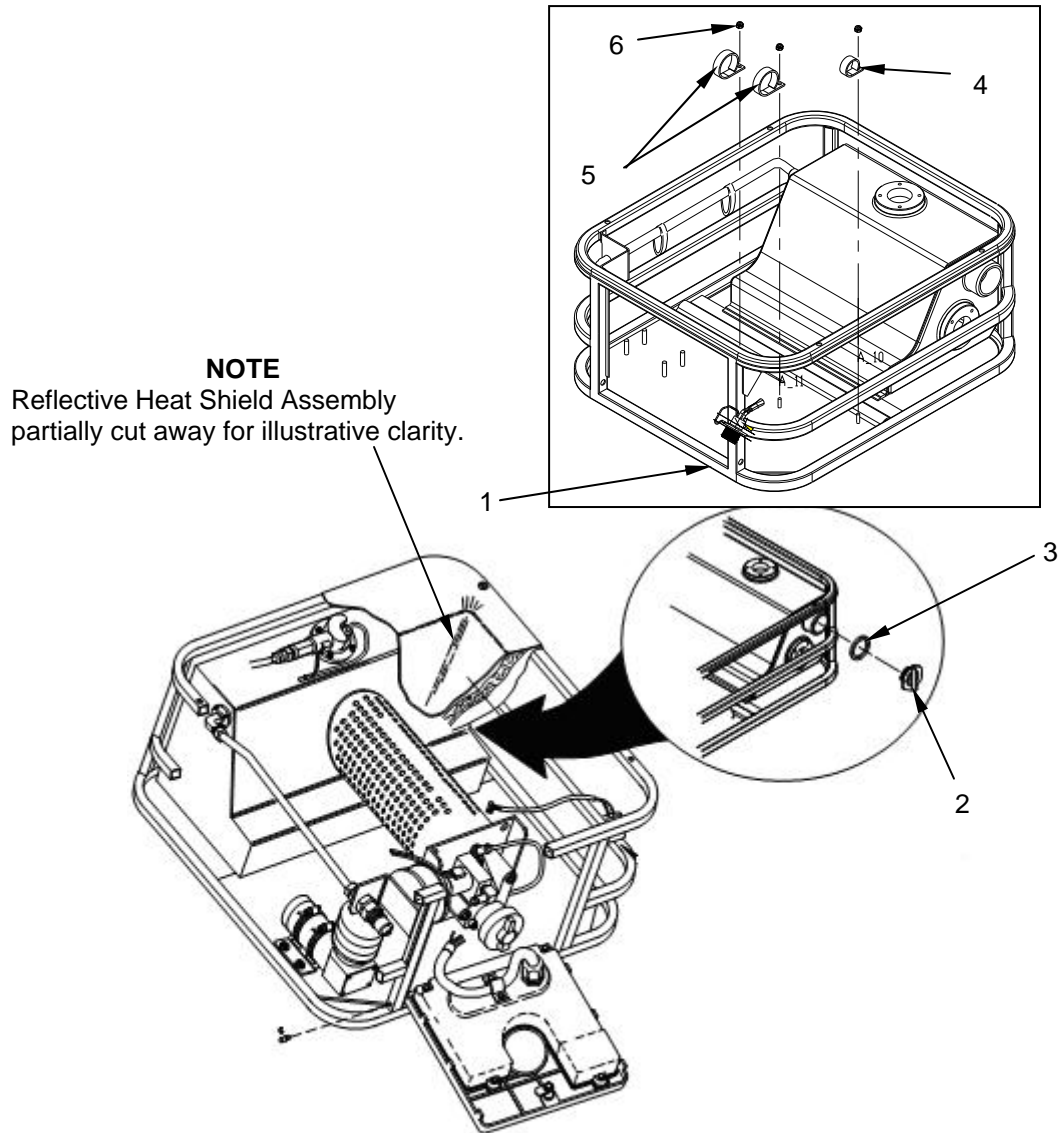


Figure 1. Frame Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
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GROUP 01 FRAME ASSEMBLY

FIG. 1 FRAME ASSEMBLY

1	PAFFF	7310-01-462-4864	3AD06	980250K	KIT, MBU FRAME, TANK, PLATE ASSY	1
2	PACOO	7310-01-462-4865	L4703	935631K	. MBU CAP, FILLER, FUEL TANK	1
3	PACZZ	7310-01-462-4867	L4703	980940K	. MBU SEAL FUEL TANK	1
4	PACZZ	5340-01-479-5144	06915	WHC-1000-01	. CLIP, SPRING TENSION (SMALL)	1
5	PAFZZ	5340-01-479-5180	06915	WHC-1500-01	. CLIP, SPRING TENSION (LARGE)	2
6	PACZZ	5310-00-984-6610	18876	9171692-3	. NUT, SELF-LOCKING, HEXAGON	3

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

ELECTRICAL CONNECTOR ASSEMBLY

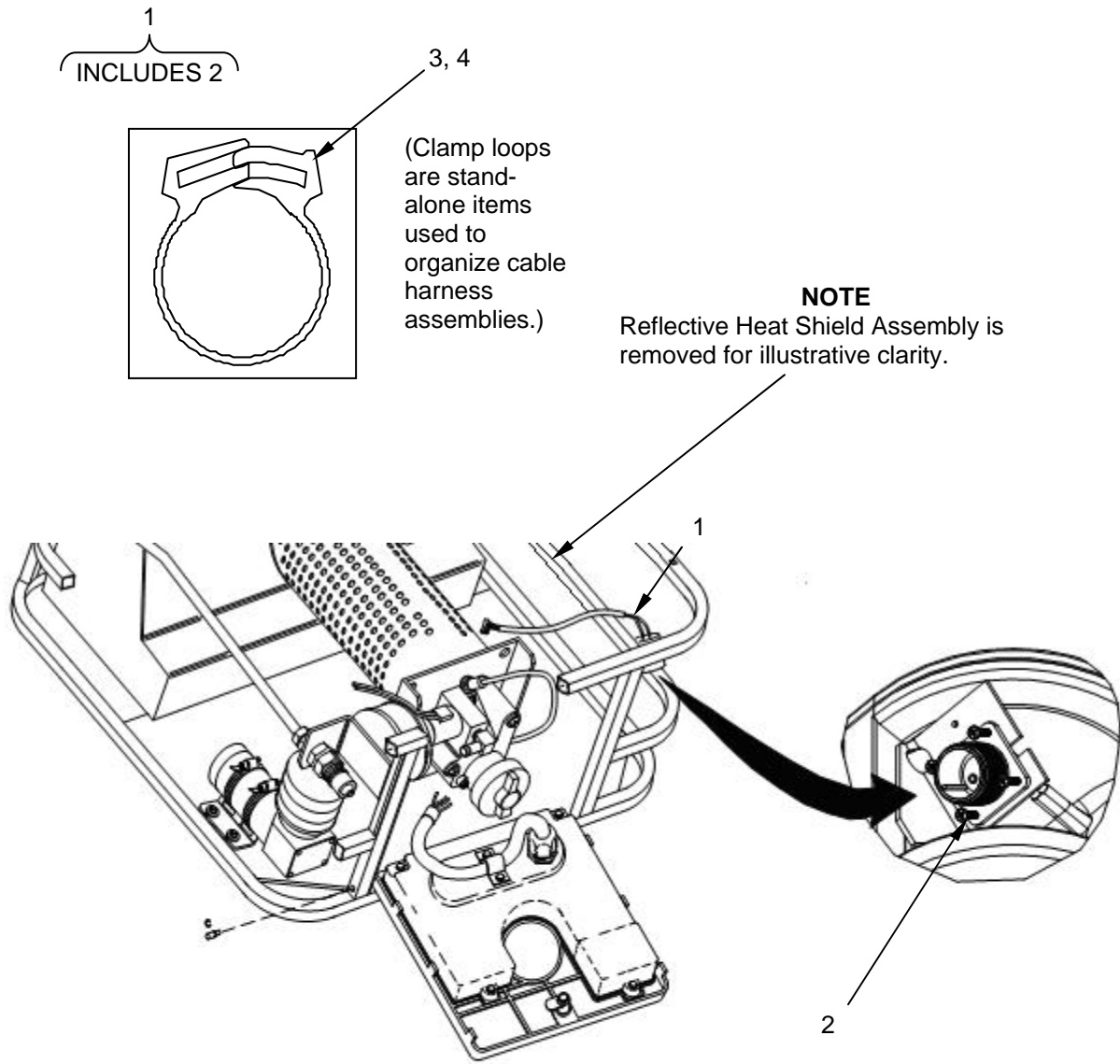


Figure 2. Electrical Connector Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
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GROUP 02 ELECTRICAL CONNECTOR ASSEMBLY

FIG. 2 ELECTRICAL CONNECTOR ASSEMBLY

1	PAFFF	7310-01-462-4868	L4703	930740K	KIT, MBU CONNECTOR ASSY	1
2	XDFZZ		9W655	491-100	. SCREW, #4-40X1/4ZP	4
3	PAFZZ	5340-01-479-7770	06915	SHC-50	CLAMP, LOOP (SMALL)	2
4	PAFZZ	5340-01-479-7760	06915	SHC-80	CLAMP, LOOP (LARGE)	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

CONTROLLER ASSEMBLY

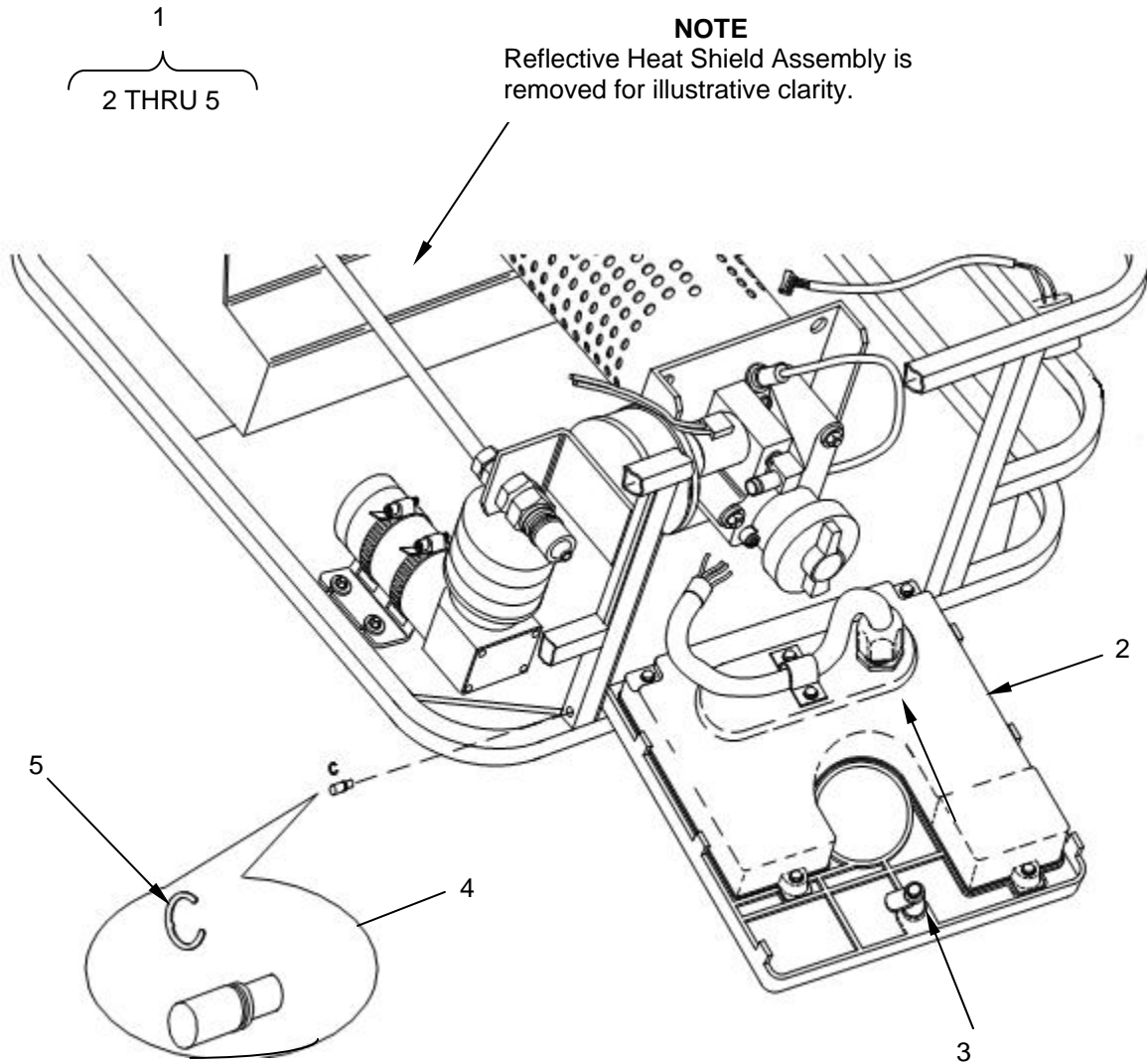


Figure 3. Controller Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
GROUP 03 CONTROLLER ASSEMBLY						
FIG. 3 CONTROLLER ASSEMBLY						
1	PACZZ	7310-01-507-9302	L4703	PD MBU-001	MBU ASSY CONTROLLER [USE ONLY ON MBU-V3] (FTW)	1
2	XACZZ		L4703	980350	. MBU ASSY CONTROLLER (FTW)	1
1	PACZZ	7310-01-462-4869	L4703	980240K	MBU ASSY CONTROLLER [USE ONLY ON MBU] (FQG)	1
2		7810-01-507-9302	L4703	980350K	. MBU ASSY CONTROLLER (FQG)	1
3	PACZZ	5340-01-479-8335	94222	48-99-221-92N	. FASTENER, PAWL	1
4	PACZZ	7310-01-462-4871	3AD06	930929K	. MBU PIN HINGE	1
5	PACZZ	5325-00-721-7889	79136	5137-37MD	. . RING, RETAINING	2

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

COMPRESSOR ASSEMBLY

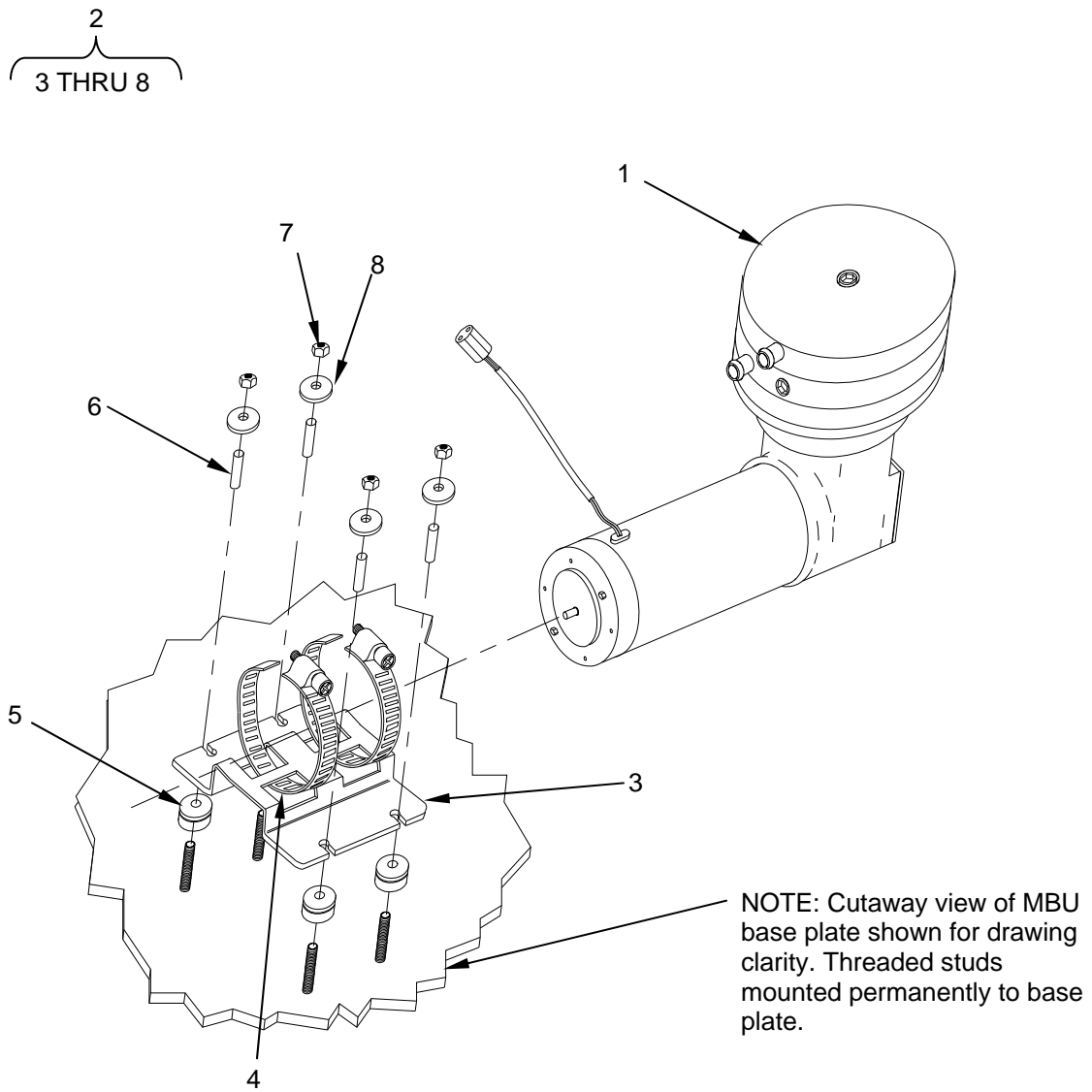


Figure 4. Compressor Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC NUMBER	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
GROUP 04 COMPRESSOR ASSEMBLY						
FIG. 4 COMPRESSOR ASSEMBLY						
1	PACOO	7310-01-462-4899	L4703	980124K	MBU ASSY, COMPRESSOR	1
2	PACZZ	7310-01-462-4902	L4703	933827K	MBU ASSY BRACKET	1
3	XACZZ		L4703	933900	. BRACKET, COMPRESSOR	1
4	PACZZ	4730-01-486-1138	L4703	HC5-36	. CLAMP, HOSE	2
5	XDCZZ		76385	Z103 TYPE SC	. GROMMET, NONMETALLIC	4
6	PACZZ	5365-21-920-9924	94223	607-085-RC	. SPACER, SLEEVE	4
7	PACZZ	5310-00-984-6610	18876	79NTE040	. NUT, SELF-LOCKING, HEXAGON	4
8	PACZZ	5310-21-921-0253	94223	W-167	. WASHER, FLAT	4

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

FUEL DELIVERY BLOCK ASSEMBLY

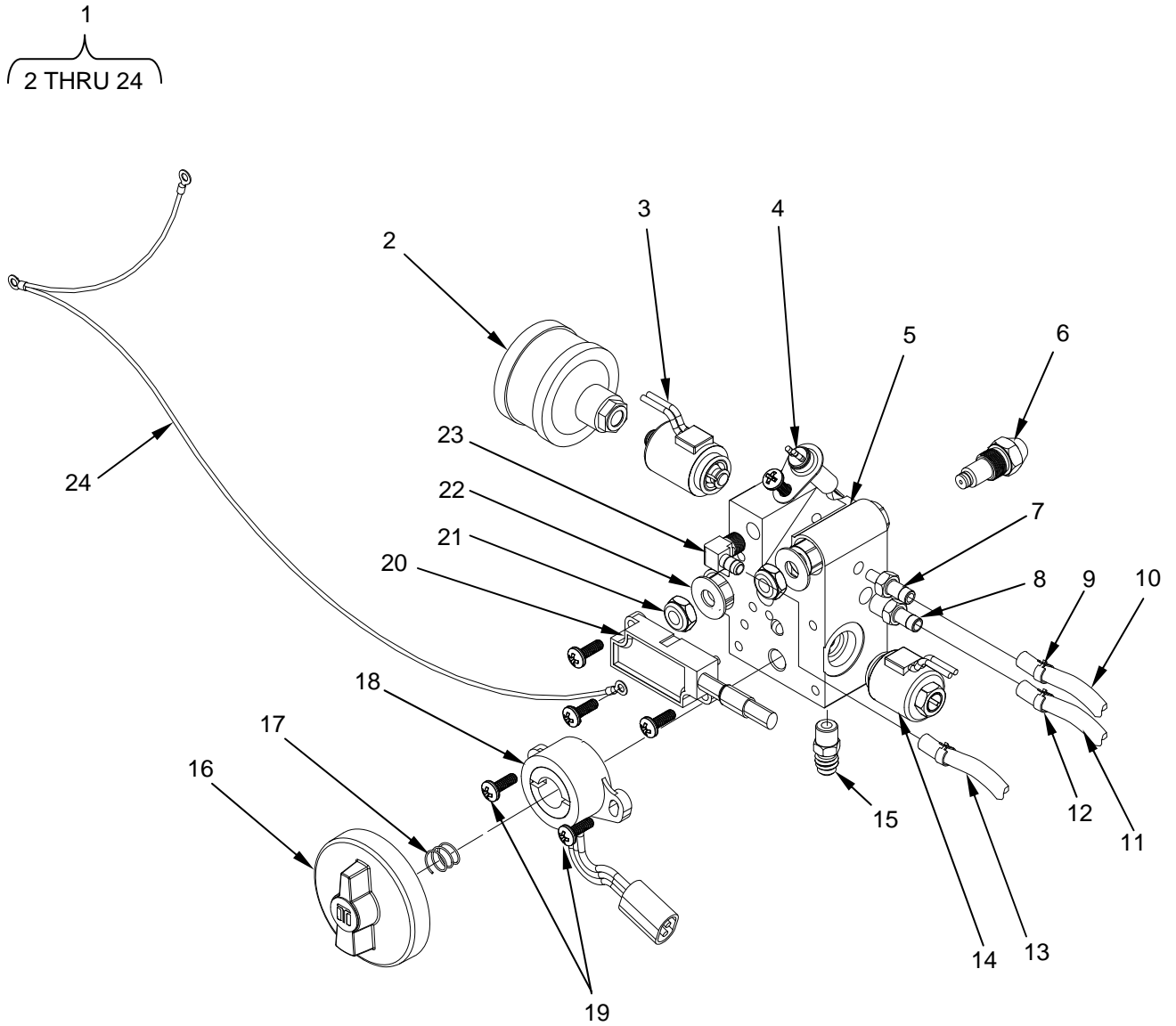


Figure 5. Fuel Delivery Block Assembly (Sheet 1 of 2).

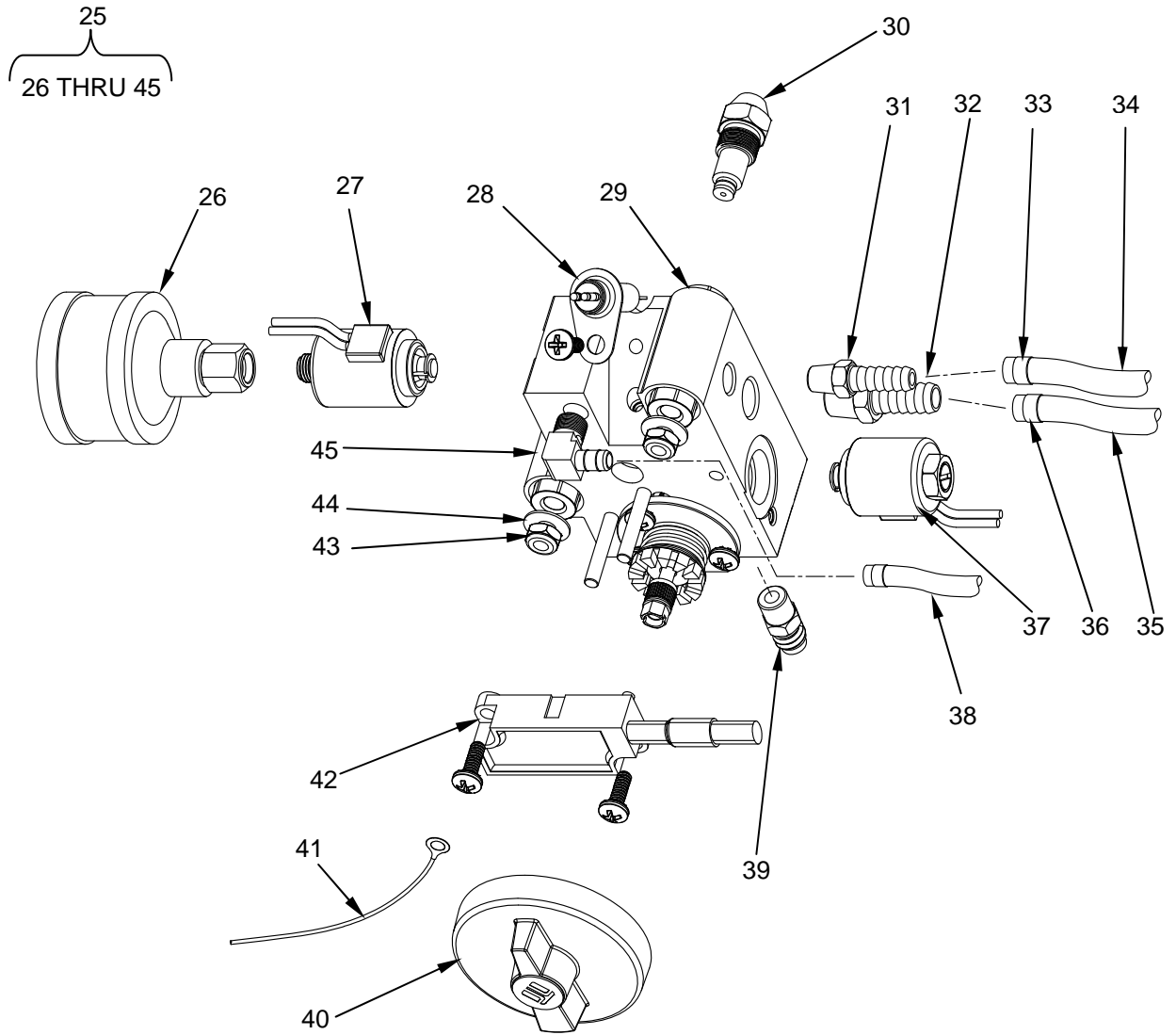


Figure 5. Fuel Delivery Block Assembly (Sheet 2 of 2).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
GROUP 05 FUEL DELIVERY BLOCK ASSEMBLY						
FIG. 5 FUEL DELIVERY BLOCK ASSEMBLY						
1	PACZZ	7310-01-462-4905	L4703	980230K	MBU FUEL DELIVERY BLOCK UOC: FQG	1
2	PACZZ	7310-01-462-4913	L4703	349930K	. MBU FILTER AIR INLET	1
3	PACZZ	4810-01-480-0851	73212	2X1323-24VDC	. VALVE, SOLENOID	1
4	PACZZ	7310-01-462-4915	L4703	980260K	. MBU ASSY IGNITOR UOC: FQG	1
5	XACZZ		3AD06	930700	. FUEL DELIVERY BODY UOC: FQG	1
6	PACZZ	7310-01-462-4919	L4703	928329K	. MBU ASSY FUEL NOZZLE	1
7	PACZZ	4730-01-481-9200	0J2W4	125-4A	. ADAPTER, STRAIGHT, PIPE TO HOSE, ¼ BARB X 1/8 NPTM	1
8	PACZZ	4730-01-481-9210	0J2W4	125-6B	. ADAPTER, STRAIGHT, PIPE TO HOSE, 3/8 BARB X 1/4 NPTM	1
9	PACZZ	4730-00-954-1251	59199	UM5008	. CLAMP, 1/4 ID HOSE	4
10	MOCZZ		3AD06	989000K	. HOSE, NONMETALLIC (NEOPRENE AIR LINE ¼ ID, MAKE FROM P/N J30-30R7-1/4ID, 2 FT LENGTH)	1
11	MOCZZ		3AD06	989038K	. HOSE, NONMETALLIC (NEOPRENE AIR LINE 3/8 ID, MAKE FROM P/N6675-06298, 2 FT LENGTH)	1
12	PACZZ	5342-01-210-7340	59199	UM5010	. CLAMP, 3/8 ID HOSE	2
13	MOCZZ		3AD06	989038K	. HOSE, NONMETALLIC (NEOPRENE AIR LINE 3/8 ID, MAKE FROM P/N 6675-06298, 2 FT 8 IN LENGTH)	1
14	PACZZ	4810-01-480-0861	73212	1X1024-24VDC	. VALVE, SOLENOID	1
15	PACZZ	4730-01-481-9121	0J2W4	48-4A	. ADAPTER, STRAIGHT, PIPE TO TUBE, 1/8-#4 STRAIGHT	1
16	PACZZ	7310-01-462-4907	3AD06	880150K	. MBU CONTROL KNOB	1
17	XACZZ		3AD06	981028	. . SPRING, KNOB, NEEDLE VALVE UOC: FQG	1
18	PACZZ	7310-01-462-4928	L4703	980610K	. MBU, FEEDBACK POTENTIOMETER UOC: FQG	1
19	PACZZ	5305-01-481-0580	9W655	180629	. SCREW UOC: FQG	2
20	PACZZ	7310-01-462-4918	L4703	930125K	. MBU FLAME SENSOR	1
21	PACZZ	5310-00-984-6610	18876	79NTE040	. NUT, SELF-LOCKING, HEXAGON	2
22	PACZZ	5310-00-582-5677	80205	MS15759-810	. WASHER, FLAT	2
23	PACZZ	4730-01-070-7680	93061	229-6-2	. ELBOW, PIPE TO HOSE (3/8 TUBE X 1/8 NPT)	1
24	PACZZ	7310-01-462-4936	3AD06	910729K	. MBU GROUND WIRE	1
25	PACOO	7310-01-462-4905	L4703	980310K	MBU FUEL DELIVERY BLOCK UOC: FTW	1
26	PACZZ	7310-01-462-4913	L4703	349930K	. MBU AIR FILTER INLET	1
27	PACZZ	4810-01-480-0851	73212	2X1323-24VDC	. VALVE, SOLENOID UOC: FTW	1
28	PACZZ	7310-01-462-4915	L4703	980260K	. MBU ASSY IGNITOR	1
29	XACZZ		L4703	935874	. FUEL DELIVERY BODY UOC: FTW	1
30	PACZZ	7310-01-462-4919	L4703	928329K	. MBU ASSY FUEL NOZZLE	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
31	PACZZ	4730-01-481-9200	0J2W4	125-4A	. ADAPTER, STRAIGHT, PIPE TO HOSE, ¼ BARB X 1/8 NPTM	1
32	PACZZ	4730-01-481-9210	0J2W4	125-6B	. ADAPTER, STRAIGHT, PIPE TO HOSE, 3/8 BARB X ¼ NPTM	1
33	PACZZ	4730-00-954-1251	59199	UM5008	. CLAMP, 1/4 ID HOSE UOC: FTW	4
34	MOCZZ		3AD06	989000K	. HOSE, NONMETALLIC (NEOPRENE AIR LINE ¼ ID, MAKE FROM P/N J30-30R7-1/4 ID, 2 FT LENGTH) UOC: FTW	1
35	MOCZZ		3AD06	989038K	. HOSE, NONMETALLIC (NEOPRENE AIR LINE 3/8 ID, MAKE FROM P/N 667-06298, 2 FT LENGTH)	1
36	PACZZ	5342-01-210-7340	3AD06	860073	. CLAMP, 3/8 ID HOSE	2
37	PACZZ	4810-01-480-0861	73212	1X1024-24VDC	. VALVE, SOLENOID	1
38	MOCZZ		3AD06	989038K	. HOSE, NONMETALLIC (NEOPRENE AIR LINE 3/8 ID, MAKE FROM P/N 6675-06298, 2 FT 8 IN LENGTH)	1
39	PACZZ	4730-01-481-9121	0J2W4	48-4A	. ADAPTER, STRAIGHT, PIPE TO TUBE, 1/8-#4 STRAIGHT	1
40	PACZZ	7310-01-462-4907	3AD06	880150K	. MBU CONTROL KNOB	1
41	PACZZ	7310-01-462-4936	3AD06	910729K	. MBU GROUND WIRE	1
42	PACZZ	7310-01-462-4918	L4703	930125K	. MBU FLAME SENSOR	1
43	PACZZ	5310-00-984-6610	18876	79NTE040	. NUT, SELF-LOCKING, HEXAGON	2
44	PACZZ	5310-00-582-5677	80205	MS15795-810	. WASHER, FLAT	2
45	PACZZ	4730-01-070-7680	93061	229-6-2	. ELBOW, PIPE TO TUBE, 3/8 TUBE X 1/8 NPT	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

VENT VALVE ASSEMBLY

1
2 THRU 4

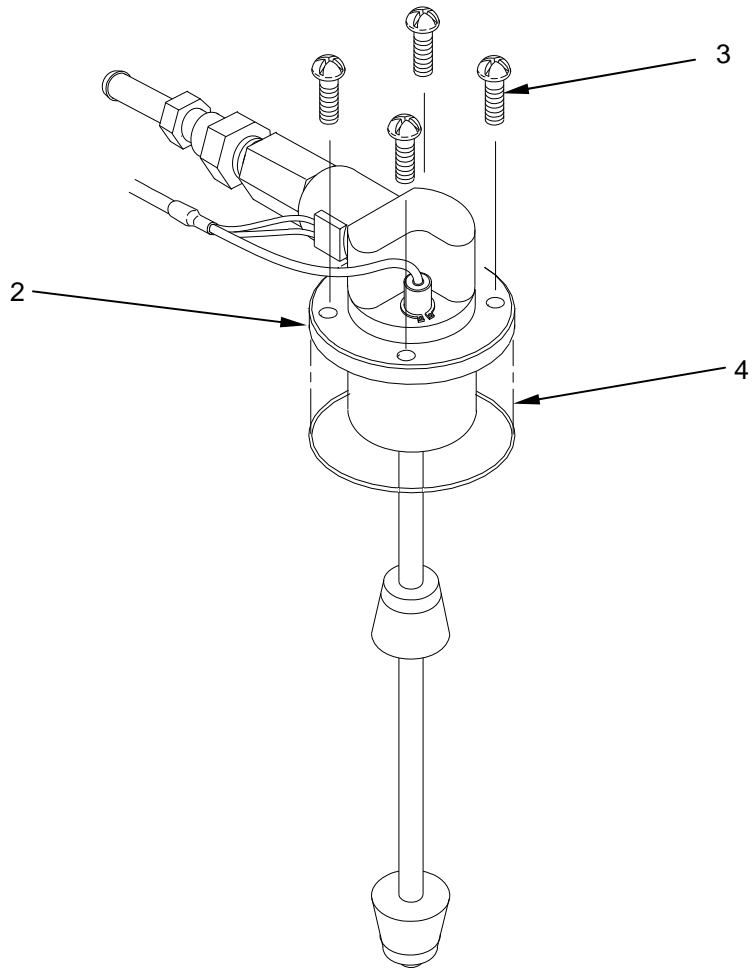


Figure 6. Vent Valve Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 06 VENT VALVE ASSEMBLY	
					FIG. 6 VENT VALVE ASSEMBLY	
1	PACZZ	7310-01-462-4942	L4703	980280K	MBU ASSY VENT VALVE	1
2	XACZZ		3AD06	980280	. VENT VALVE	1
3	PACZZ	5305-01-481-0580	9W655	180629	. SCREW, MACHINE, #10 C/W L/WASHER	4
4	PACZZ	5331-01-183-0991	81343	M83461/1-223	. O-RING, 233 COMP 1	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

BURNER ASSEMBLY

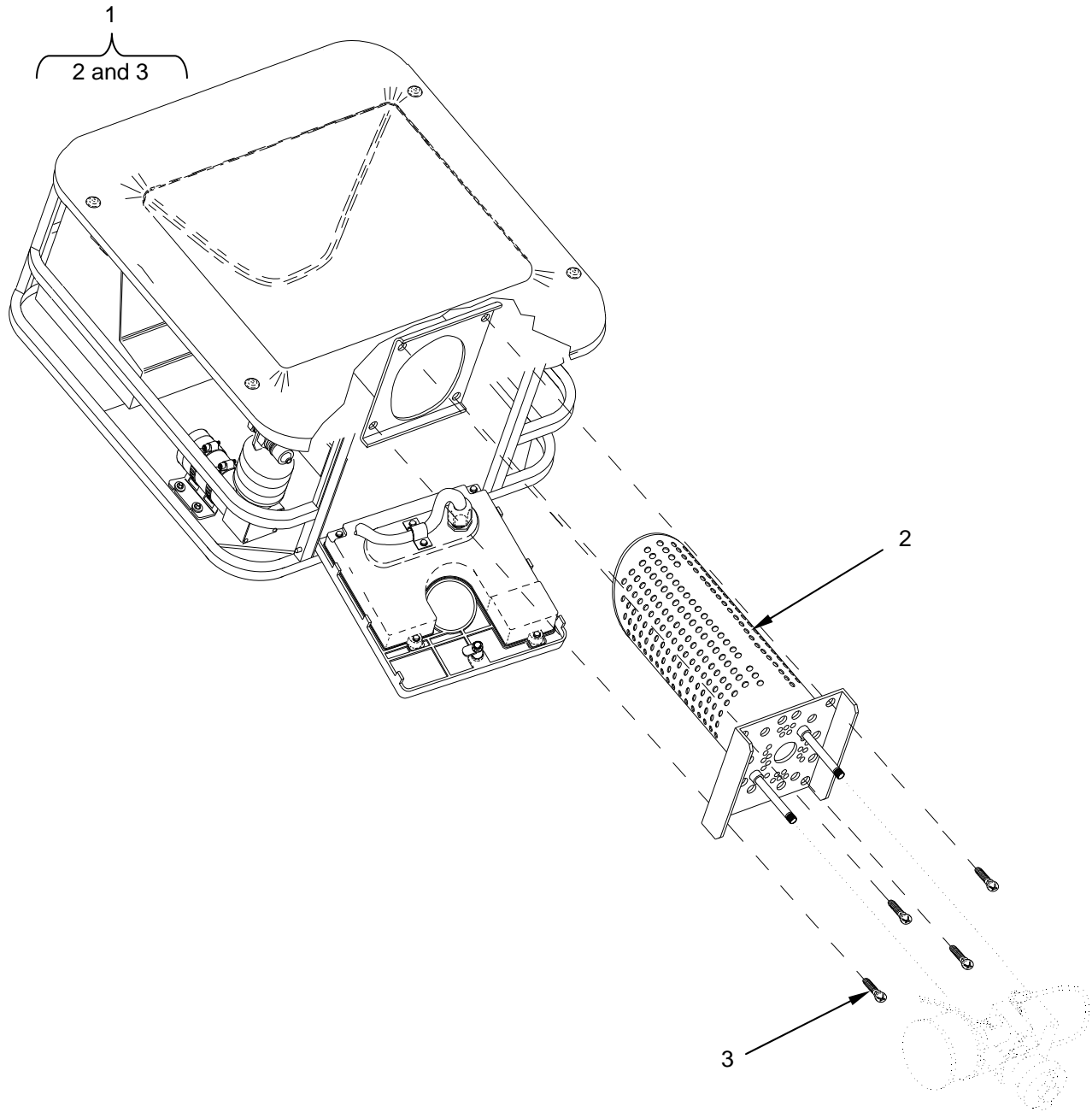


Figure 7. Burner Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
GROUP 07 BURNER ASSEMBLY						
FIG. 7 BURNER ASSEMBLY						
1	PACZZ	7310-01-462-4943	L4703	880110K	MBU ASSY, BURNER	1
2	XACZZ		L4703	880110	. BURNER TUBE	1
3	PACZZ	5305-01-483-3412	9W655	029422	. SCREW, MACHINE, PHMS 1/4NC X 5/8 SS	4

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

FUEL REGULATOR ASSEMBLY

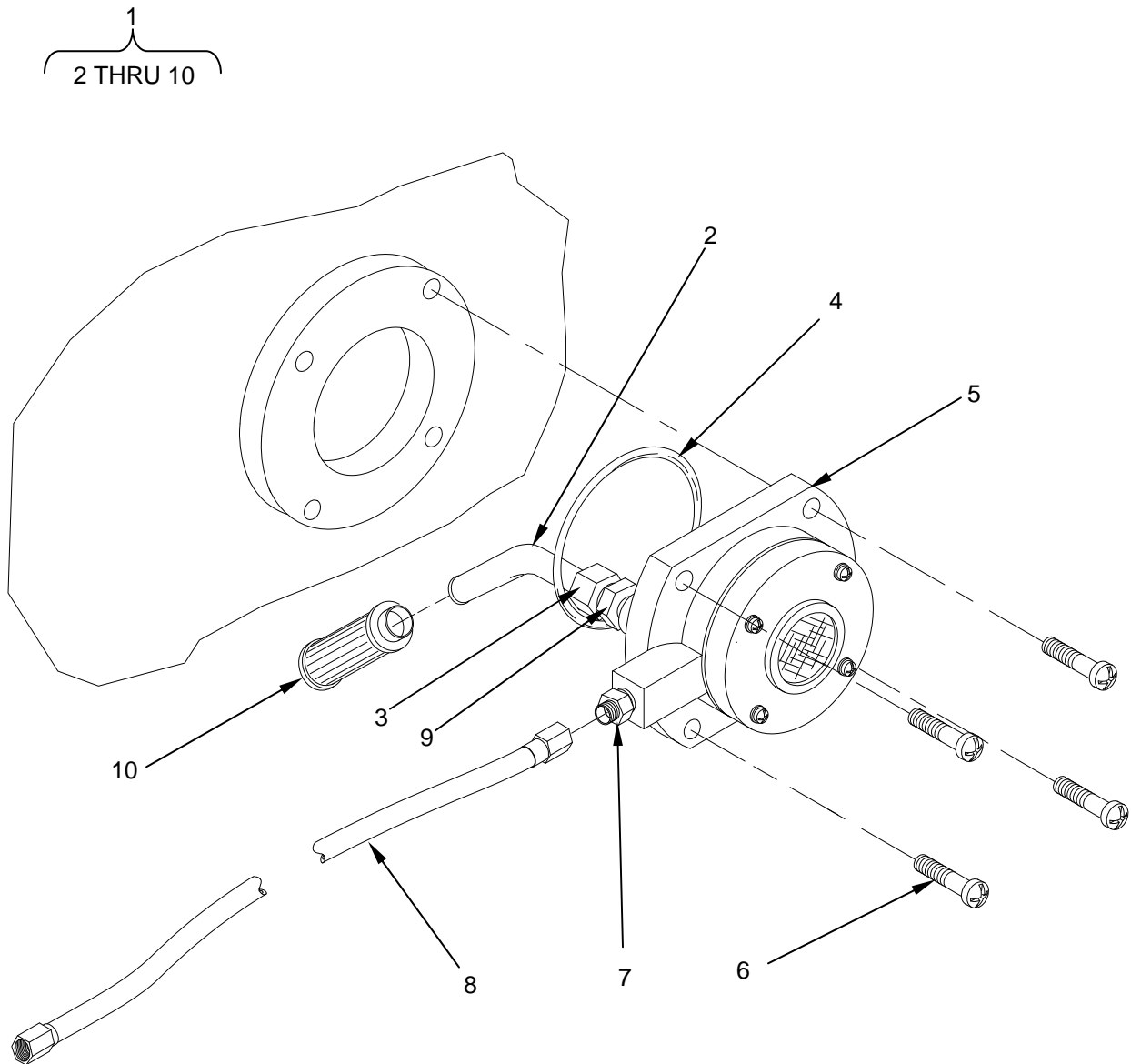


Figure 8. Fuel Regulator Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
GROUP 08 FUEL REGULATOR ASSEMBLY						
FIG. 8 FUEL REGULATOR ASSEMBLY						
1	PACZZ	7310-01-462-4944	L4703	880050K	MBU ASSY, FUEL REGULATOR	1
2	PACZZ	7310-01-462-4946	3AD06	980101K	. FUEL PICKUP TUBE	1
3	PACZZ	4730-01-071-9080	93061	61CA-6	.. NUT, TUBE COUPLING, 3/8 IN	1
4	PACZZ	5331-01-183-0991	81343	M83461/1-223	. O-RING, 233 COMP 1	1
5	XACZZ		3AD06	980270	. FUEL REGULATOR	1
6	PACZZ	5305-01-481-0580	9W655	180629	. SCREW, MACHINE, #10 C/W LWASHER	4
7	PACZZ	4730-00-542-5796	93601	68C-6-2	. ADAPTER, STRAIGHT, PIPE TO TUBE, 3/8T - 1/8 NPTM	1
8	PACZZ	4720-01-486-0595	50599	031803E0200	. HOSE ASSY, NONMETALLIC, FUEL FEEDER	1
9	PACZZ	5305-01-481-9121	0J2W4	48-4A	. ADAPTER, STRAIGHT, PIPE TO TUBE, 1/8-#4	1
10	PACZZ	7310-01-462-6765	L4703	953451K	. MBU FILTER FUEL PICKUP	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

REFLECTIVE HEAT SHIELD ASSEMBLY

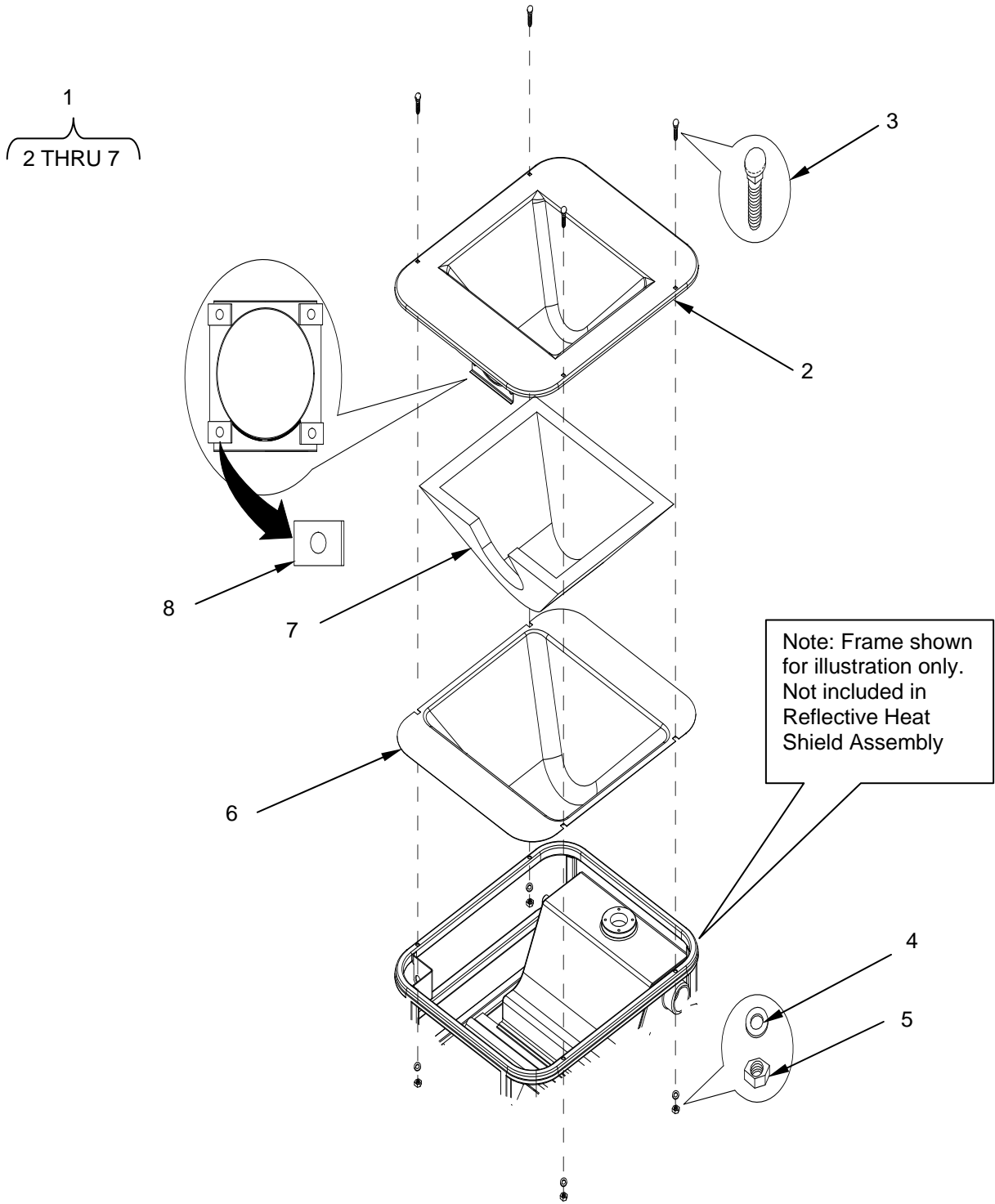


Figure 9. Reflective Heat Shield Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
GROUP 09 REFLECTIVE HEAT SHIELD ASSEMBLY						
FIG 9 REFLECTIVE HEAT SHIELD ASSEMBLY						
1	PACZZ	7310-01-462-4948	L4703	880004K	MBU ASSY, REFLECTIVE HEAT SHIELD	1
2	PACZZ	7310-01-462-4949	3AD06	880005K	. MBU REFLECTIVE HEAT SHIELD	1
3	PACZZ	5306-01-481-5242	9W655	025C0125CGE	. BOLT, SQUARE NECK, CARRIAGE 1/4NC X 1-1/4 SS	4
4	PACZZ	5310-00-582-5677	80205	MS15795-810	. WASHER, FLAT 1/4 ID SS 5/8 OD	4
5	PACZZ	5310-00-984-6610	18876	79NTE040	. NUT, SELF-LOCKING, HEXAGON	4
6	PACZZ	7310-01-462-4955	3AD06	880080K	. MBU BURNER WELL	1
7	PACZZ	7310-01-462-4959	3AD06	880090K	. MBU INSULATION	1
8	PACZZ	5310-21-920-9094	94223	202-026	. NUT, SHEET SPRING	4

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

FUEL LINE ASSEMBLY

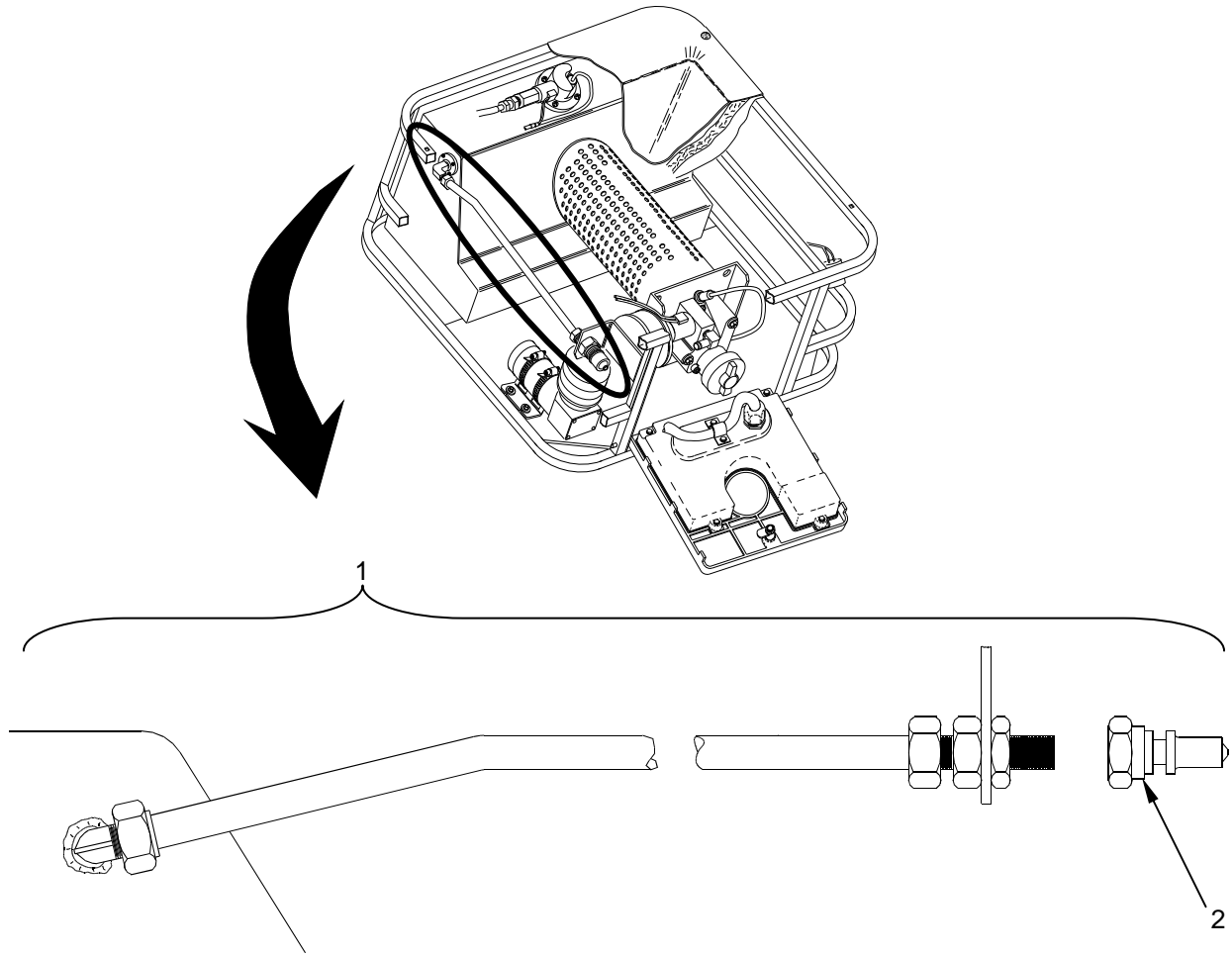


Figure 10. Fuel Line Assembly.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 10 FUEL LINE ASSEMBLY	
					FIG. 10 FUEL LINE ASSEMBLY	
1	PAFZZ	7310-01-462-4964	3AD06	980130K	MBU ASSY FUEL LINE	1
2	XDFZZ		97111	BH2-61Y	. FITTING, FUEL INTERFACE	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

POWER CONVERTER

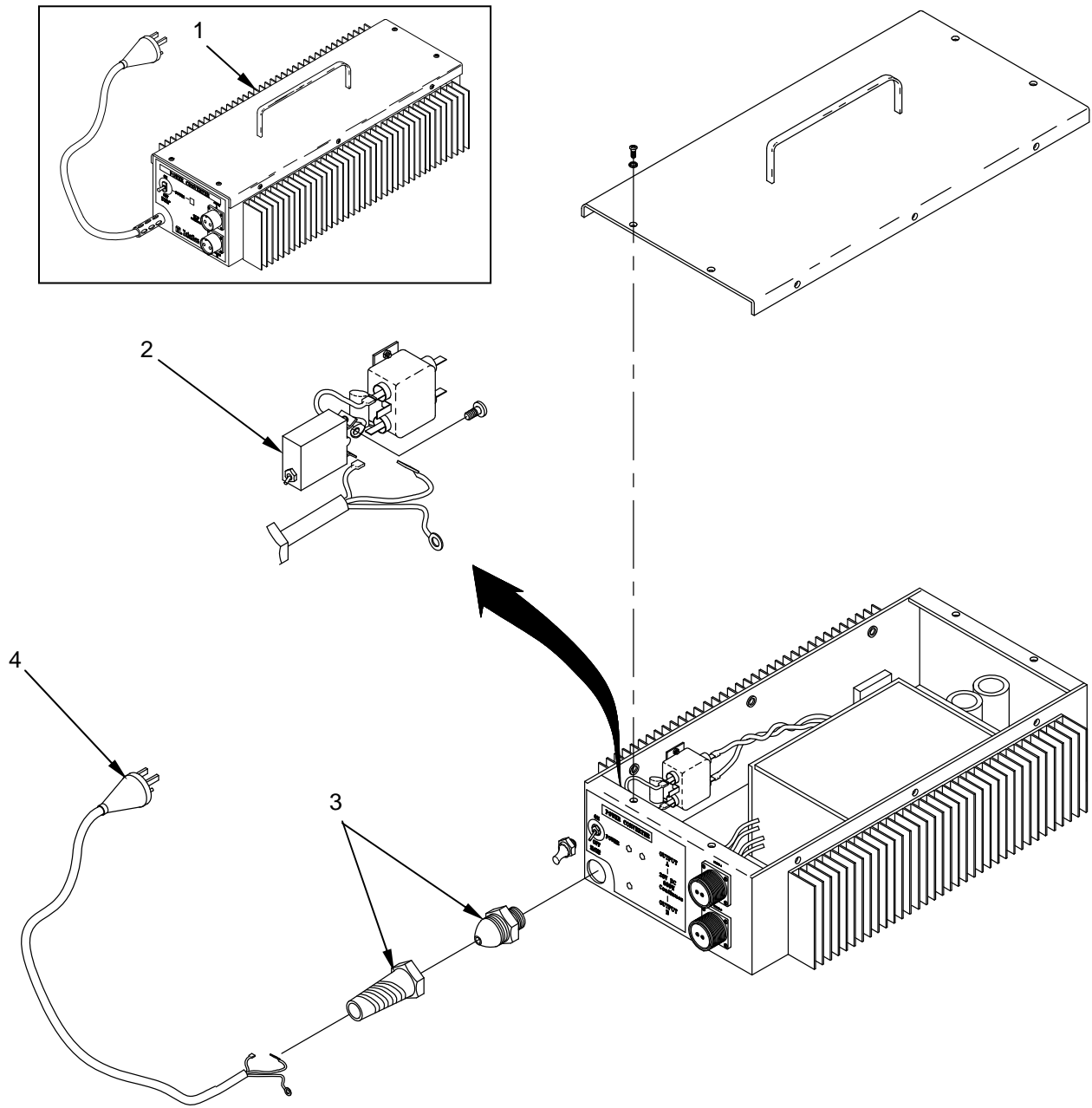


Figure 11. Power Converter for MBU (Sheet 1 of 2).

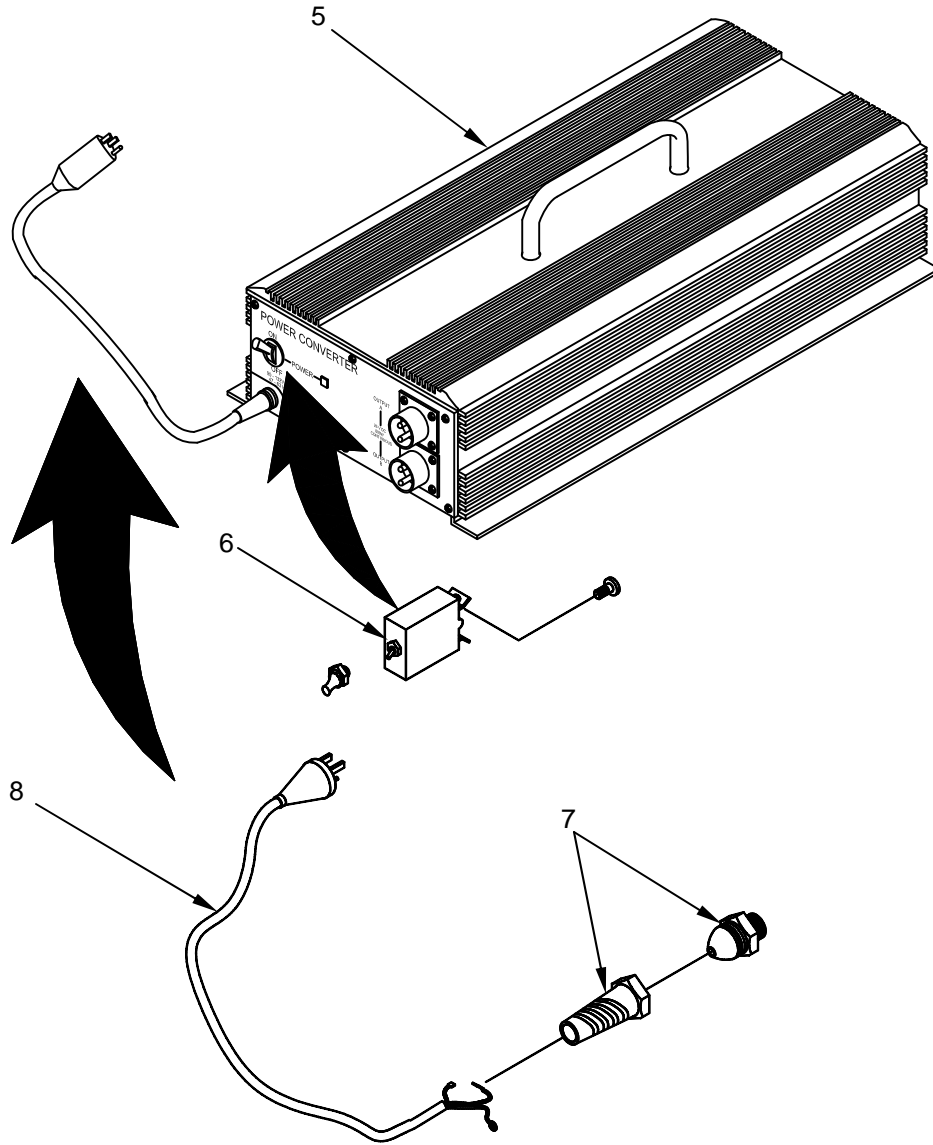


Figure 11. Power Converter for MBU-V3 (Sheet 2 of 2).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 11 POWER CONVERTER	
					FIG. 11 POWER CONVERTER	
1	PAFFF	7310-01-453-6513	3AD06	MS0150	POWER CONVERTER, MBU (FQG)	1
2	PAFZZ	7310-01-462-4990	L4703	981002K	. POWER SWITCH (FQG)	1
3	PAFZZ	5975-01-480-1302	28520	3249	. ADAPTER, ELECTRICAL CONDUIT, STRAIN RELIEF, POWER CORD (FQG)	1
4	PAFZZ	6150-01-267-5488	1M3W9	17516	. CABLE ASSY, POWER, ELECTRICAL (FQG)	1
5	PAFFF	7310-01-502-9455	L4703	MS0160	MBU, POWER CONVERTER	1
6	PAFZZ	5930-20-000-5584	3AD06	980122K	. POWER SWITCH	1
7	PAFZZ	5975-01-480-1302	28520	3249	. ADAPTER, ELECTRICAL CONDUIT, STRAIN RELIEF, POWER CORD	1
8	PAFZZ	6150-01-267-5488	1M3W9	17516	. CABLE ASSY, POWER, ELECTRICAL	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

BATTERY PACK

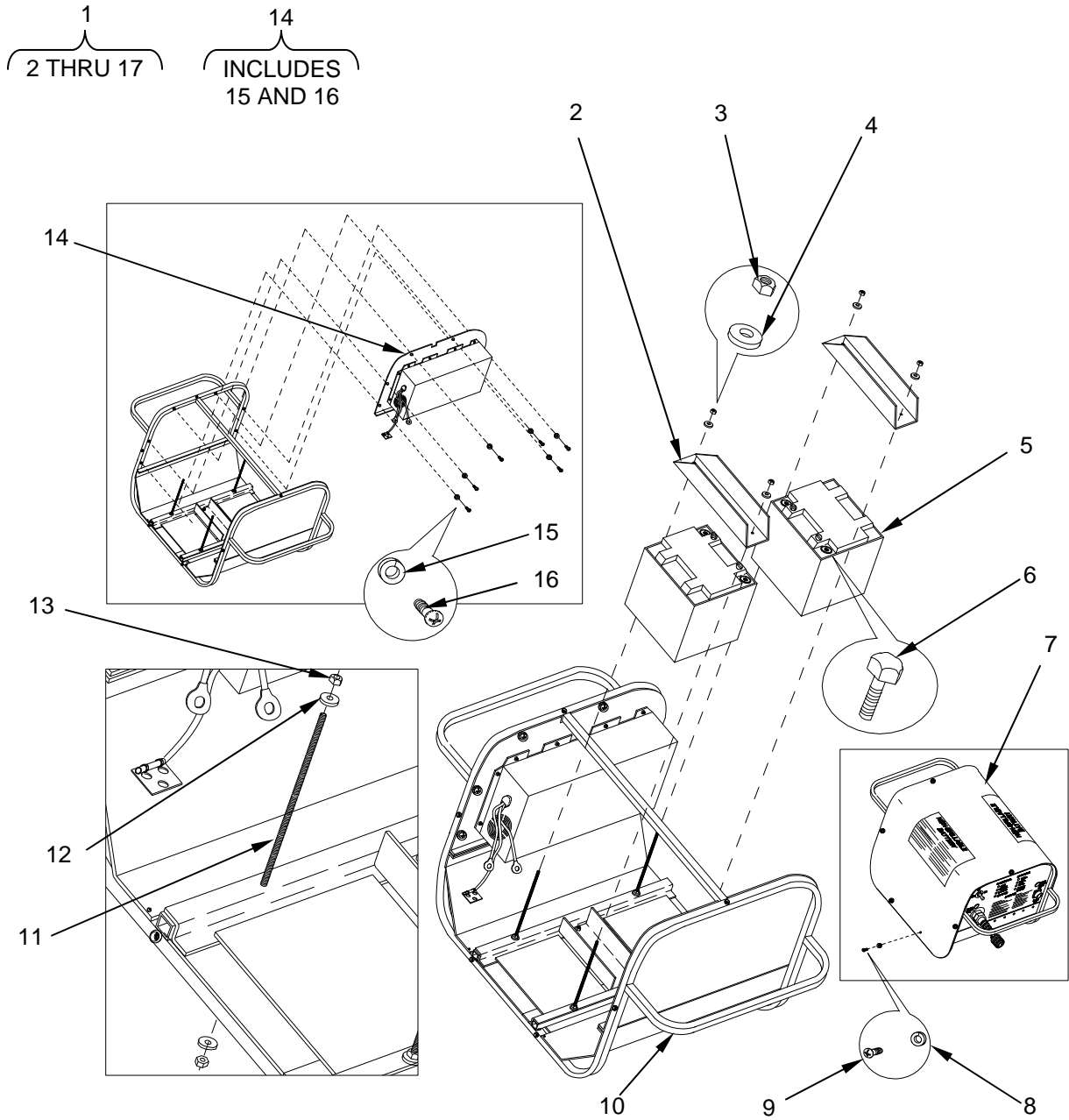


Figure 12. Battery Pack.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
GROUP 12 BATTERY PACK						
FIG. 12 BATTERY PACK						
1	PAFFF	7310-01-453-6565	L4703	MS0200	BATTERY MODULE, MBU	1
2	PAFZZ	7310-01-462-4994	3AD06	800205K	. MBU BATTERY HOLD DOWN BRACKET	2
3	PAFZZ	5310-01-396-8168	3AD06	191424	. NUT, SELF-LOCKING, HEXAGON, ¼-20 SS	4
4	PAFZZ	5310-00-582-5677	80205	MS15795-810	. WASHER, FLAT, ¼ ID X 5/8 OD SS	4
5	PAFZZ	7310-01-454-1249	L4703	MS0225	. BATTERIES, MBU (pair)	1
6	PAFZZ	5305-21-910-7640	94223	344-015	. . SCREW,MACHINE	4
7	PAFFF	7310-01-462-4992	3AD06	800207K	. MBU BATTERY PACK COVER	1
8	PAFZZ	5310-21-905-5279	94223	667-002	. WASHER, LOCK, SPRING	6
9	PAFZZ	5305-01-483-3412	9W655	029422	. SCREW, MACHINE, ¼-20 X 5/8 LG SS	6
10	PAFFF	7310-01-462-4997	3AD06	800203K	. MBU BATTERY PACK FRAME	1
11	PAFZZ	5306-21-920-9092	94223	TR-2005	. ROD, SS THREADED ¼-20 X 7.5 IN (CUT TO LENGTH)	4
12	PAFZZ	5310-21-905-5279	94223	667-002	. WASHER, LOCK, SPRING	8
13	PAFZZ	5310-00-903-5966	96906	MS51971-1	. NUT, PLAIN, HEXAGON, SS ¼-20	8
14	PAFZZ	7310-01-462-4998	3AD06	980611K	. MBU BATTERY PACK CHARGER	1
15	PAFZZ	5310-21-905-5279	94223	667-002	. LOCKWASHER, SPRING	6
16	PAFZZ	5305-01-483-3412	9W655	029422	. SCREW, MACHINE, ¼-20 X 5/8 LG SS	6

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

FUEL CAN ADAPTER AND FUEL HOSE

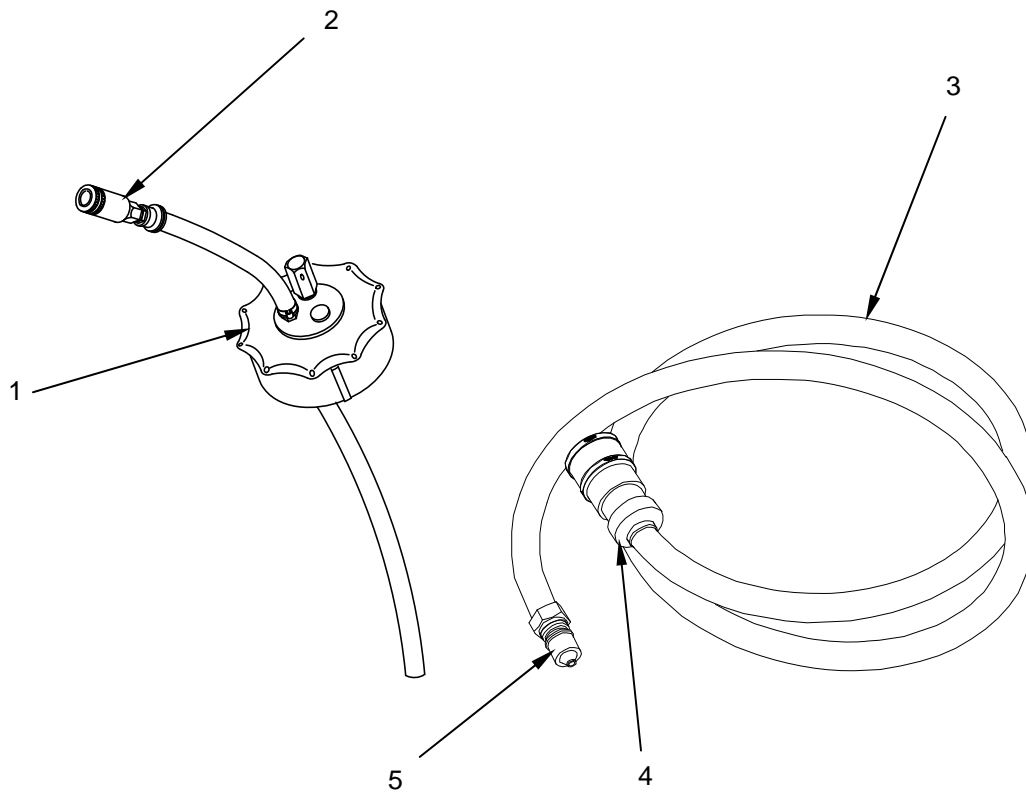


Figure 13. Fuel Can Adapter and Fuel Hose.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
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GROUP 1301 FUEL CAN ADAPTER AND FUEL HOSE

FIG. 13 FUEL CAN ADAPTER AND FUEL HOSE

1	PACZZ	7310-01-455-3736	L4703	MS0300	FUEL ADAPTER, MBU	1
2	XACZZ		97111	BH2-60Y	. COUPLING HALF, QUICK DISCONNECT (FEMALE)	1
3	PACZZ	7310-01-455-3735	L4703	MS0350	FUEL LINE, MBU	1
4	XACZZ		97111	BH2-60Y	. COUPLING HALF, QUICK DISCONNECT (FEMALE)	1
5	XACZZ		97111	BH2-61Y	. COUPLING HALF, QUICK DISCONNECT (MALE)	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

NATO ADAPTER CABLE

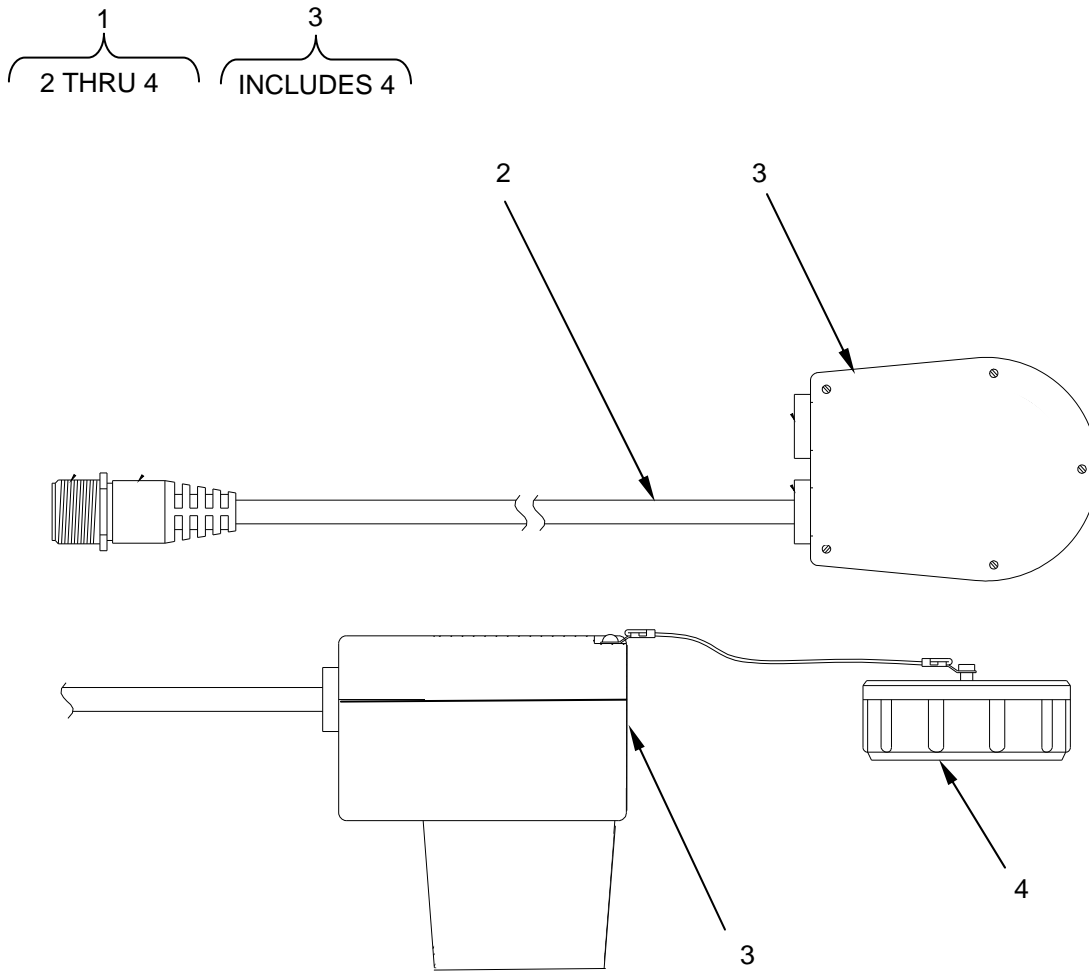


Figure 14. NATO Adapter Cable.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1302 NATO ADAPTER CABLE	
					FIG. 14 NATO ADAPTER CABLE	
1	PAFFF	7310-01-454-1241	L4703	MS0250	ELECTRICAL ADAPTER, MBU, NATO CABLE	1
2	XAFZZ		3AD06	981026K	. CABLE, POWER	1
3	PAFZZ	5935-00-567-0128	05593	151605	. CONNECTOR, PLUG, ELECTRICAL, NATO	1
4	PAFZZ	5340-01-316-1624	19207	12314225	. CAP, PROTECTIVE, DUST AND MOISTURE SEAL	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE
24VDC EXTENSION AND BRANCH CABLES

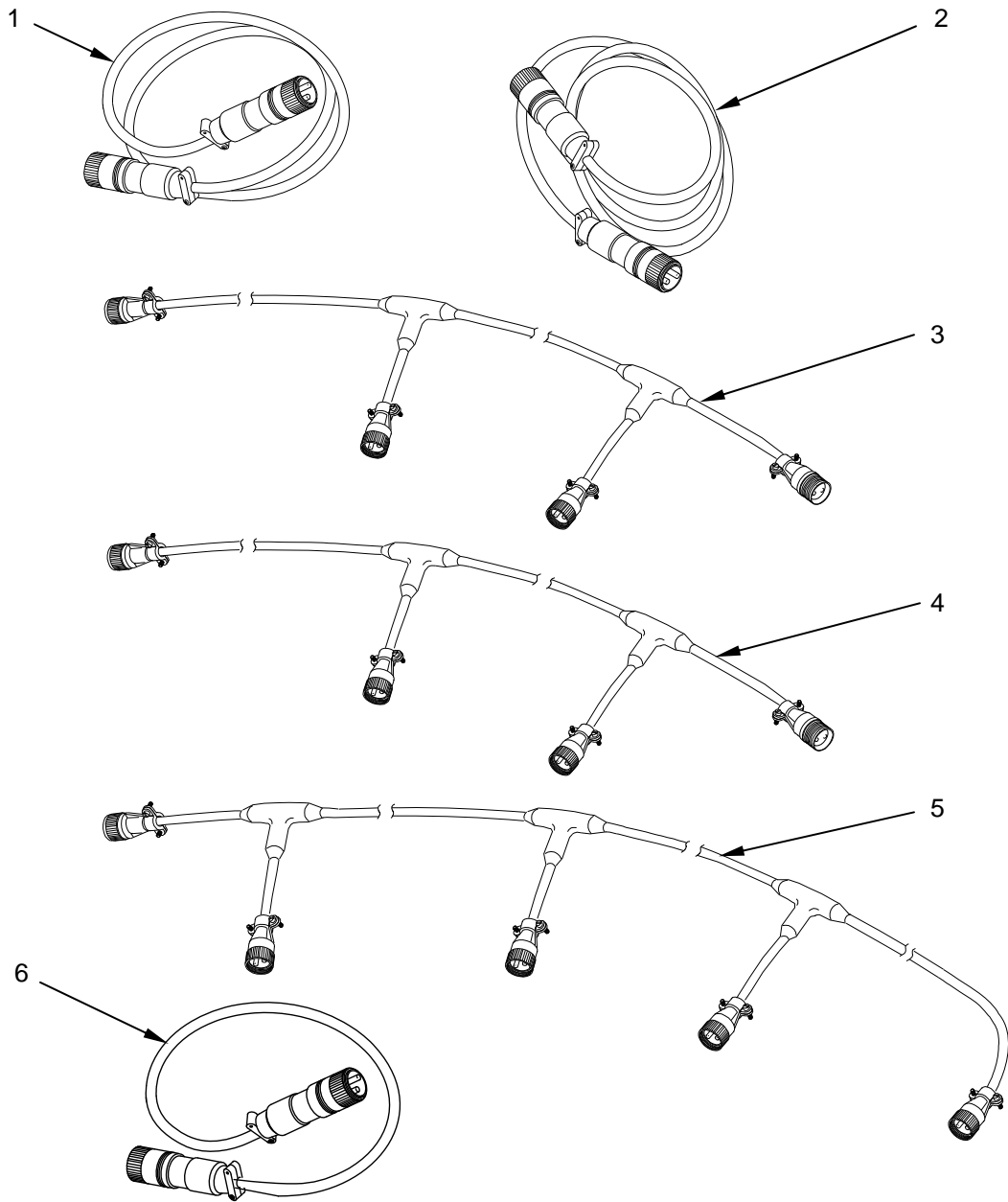


Figure 15. 24VDC Extension and Branch Cables.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
GROUP 1303 24VDC EXTENSION AND BRANCH CABLES						
FIG.15 24VDC EXTENSION AND BRANCH CABLES						
1	PACZZ	7310-01-455-0665	L4703	MS0101	CORD LONG, MBU (CABLE A)	1
2	PACZZ	7310-01-455-1206	L4703	MS0105	CORD SHORT, MBU (CABLE E)	1
3	PACZZ	6150-01-455-1014	L4703	MS0103	WIRING HARNESS, BRANCHED (CABLE C)	1
4	PACZZ	7310-01-455-1017	3AD06	MS0104	HARNESS BRANCH, MBU (CABLE D)	1
5	PACZZ	7310-01-455-0896	L4703	MS0102	HARNESS BRANCH, MBU (CABLE B)	1
6	PACZZ	7310-01-509-4453	L4703	MS0106	MBU EXT CABLE (CABLE F)	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

110VAC EXTENSION CABLES

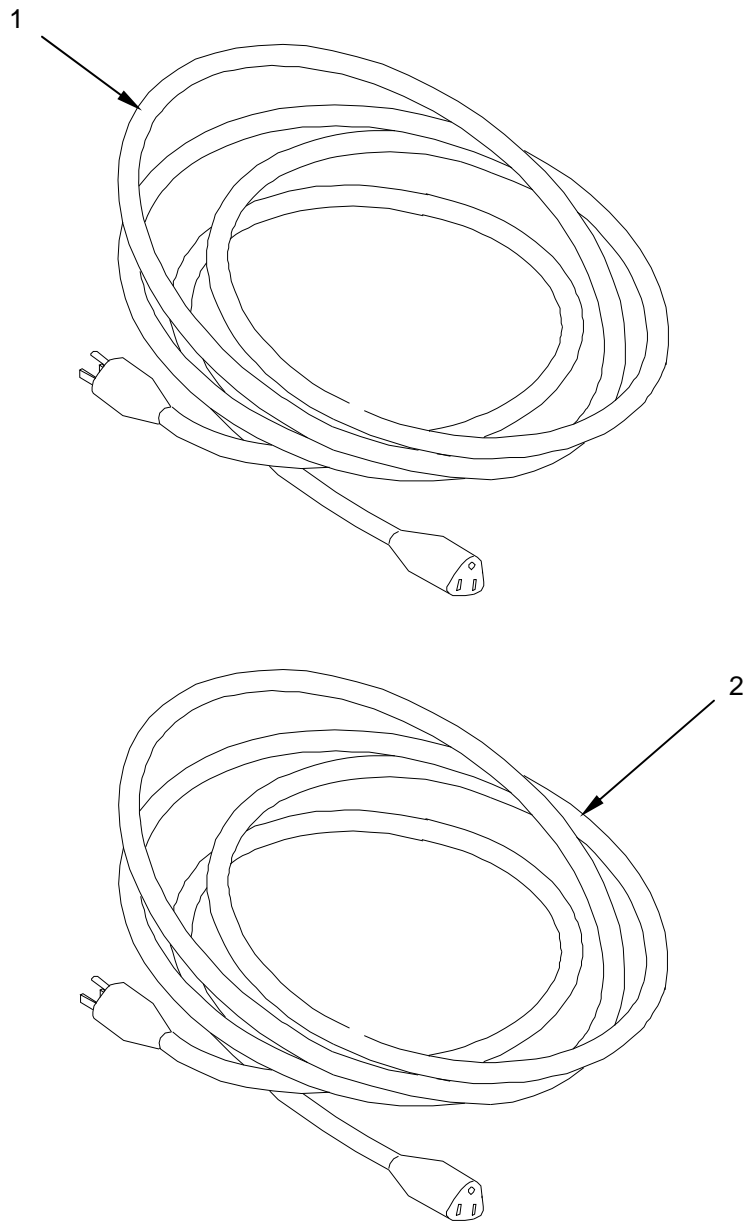


Figure 16. 110VAC Extension Cables.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
					GROUP 1304 110VAC EXTENSION CABLES	
					FIG. 16 110VAC EXTENSION CABLES	
1	PACZZ	7310-01-454-1281	L4703	MS0400	EXTENSION CORD, MBU (50 FT)	1
2	PACZZ	7310-01-458-5060	L4703	MS0425	EXTENSION CORD SHORT, MBU (25 FT).....	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

BULK MATERIAL

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USABLE ON CODE (UOC)	(7) QTY
GROUP 99 GENERAL USE STANDARDIZED PARTS						
GROUP 99 BULK MATERIAL						
FIG. 99 BULK						
1	PACZZ	4720-01-247-5457	81343	J30-30R7-1/4ID	HOSE, NONMETALLIC (1/4 ID)	2
2	PACZZ	4720-01-483-6944	21868	6675-06298	HOSE, NONMETALLIC (3/8 ID)	5
3	MOCZZ		3AD06	989038K	HOSE, NONMETALLIC (1/4 ID)	1

END OF FIGURE

OPERATOR AND FIELD MAINTENANCE

SPECIAL TOOLS LIST

There are no special tools required for the MBU, the MBU-V3, or associated equipment.

OPERATOR AND FIELD MAINTENANCE

NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
4730-00-542-5796	8	7		5	25
5935-00-567-0128	14	3	7310-01-462-4907	5	16
5310-00-582-5677	5	22		5	40
	5	44	7310-01-462-4913	5	2
	9	4		5	26
	12	4	7310-01-462-4915	5	4
5325-00-721-7889	3	5		5	28
5310-00-903-5966	12	13	7310-01-462-4918	5	20
5365-00-920-9924	4	6		5	42
4730-00-954-1251	5	9	7310-01-462-4919	5	6
	5	33		5	30
5310-00-984-6610	1	6	7310-01-462-4928	5	18
	4	7	7310-01-462-4936	5	24
	5	21		5	41
	5	43	7310-01-462-4942	6	1
	9	5	7310-01-462-4943	7	1
4730-01-070-7680	5	23	7310-01-462-4944	8	1
	5	45	7310-01-462-4946	8	2
4730-01-071-9080	8	3	7310-01-462-4948	9	1
5331-01-183-0991	6	4	7310-01-462-4949	9	2
	8	4	7310-01-462-4955	9	6
5342-01-210-7340	5	12	7310-01-462-4959	9	7
	5	36	7310-01-462-4964	10	1
4720-01-247-5457	BULK	1	7310-01-462-4990	11	2
6150-01-267-5488	11	4	7310-01-462-4992	12	7
	11	8	7310-01-462-4994	12	2
5340-01-316-1624	14	4	7310-01-462-4997	12	10
5310-01-396-8168	12	3	7310-01-462-4998	12	14
7310-01-453-6513	11	1	7310-01-462-6765	8	10
7310-01-453-6565	12	1	5340-01-479-5144	1	4
7310-01-454-1241	14	1	5340-01-479-5180	1	5
7310-01-454-1249	12	5	5340-01-479-7760	2	4
7310-01-454-1281	16	1	5340-01-479-7770	2	3
7310-01-455-0665	15	1	5340-01-479-8335	3	3
7310-01-455-0896	15	5	4810-01-480-0851	5	3
6150-01-455-1014	15	3		5	27
7310-01-455-1017	15	4	4810-01-480-0861	5	14
7310-01-455-1206	15	2		5	37
7310-01-455-3735	13	3	5975-01-480-1302	11	3
7310-01-455-3736	13	1		11	7
7310-01-458-5060	16	2	5305-01-481-0580	5	19
7310-01-462-4864	1	1		6	3
7310-01-462-4865	1	2		8	6
7310-01-462-4867	1	3	5306-01-481-5242	9	3
7310-01-462-4868	2	1	4730-01-481-9121	5	15
7310-01-462-4869	3	1		5	39
7310-01-462-4871	3	4		8	9
7310-01-462-4899	4	1	4730-01-481-9200	5	7
7310-01-462-4902	4	2		5	31
7310-01-462-4905	5	1	4730-01-481-9210	5	8

STOCK NUMBER	FIG.	ITEM	STOCK NUMBER	FIG.	ITEM
	5	32	7310-01-509-4453	15	6
5305-01-483-3412	7	3	5930-20-000-5584	11	6
	12	9	5310-21-905-5279	12	8
	12	16		12	12
4120-01-483-6944	BULK	2		12	15
			5305-21-910-7640	12	6
4720-01-486-0595	8	8	5306-21-920-9092	12	11
4730-01-486-1138	4	4	5310-21-920-9094	9	8
7310-01-502-9455	11	5	5365-21-920-9924	4	6
7310-01-507-9302	3	1	5310-21-921-0253	4	8
	3	2			

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

PART NUMBER INDEX

PART NUMBER	FIG	ITEM	PART NUMBER	FIG	ITEM
BH2-60Y	13	2		11	8
	13	4	180629	5	19
BH2-61Y	10	2		6	3
	13	5		8	6
HC5-36	4	4	191424	12	3
J30-30R7-1/4ID	BULK	1	1X1024-24VDC	5	14
M83461/1-223	6	4		5	37
	8	4	202-026	9	8
MS0101	15	1	229-6-2	5	23
MS0102	15	5		5	45
MS0103	15	3	2X1323-24VDC	5	3
MS0104	15	4		5	27
MS0105	15	2	3249	11	3
MS0106	15	6		11	7
MS0150	11	1	344-015	12	6
MS0160	11	5	349930K	5	2
MS0200	13	1		5	26
MS0225	12	5	48-4A	5	15
MS0250	14	1		5	39
MS0300	13	1		8	9
MS0350	13	3	48-99-221-92N	3	3
MS0400	16	1	491-100	2	2
MS0425	16	2	5137-37MD	3	5
MS15795-810	5	22	61CA-6	8	3
	12	4	667-002	12	8
	5	44		12	12
MS51971-1	12	13		12	15
PD MBU-001	3	1	6675-06298	BULK	2
SHC-50	2	3	68C-6-2	8	7
SHC-80	2	4	79NTE040	9	5
TR-2005	12	11		5	21
UM 5010	5	12		5	43
UM 5008	5	9	800203K	12	10
	5	33	800205K	12	2
W-167	4	8	800207K	12	7
WHC-1000-01	1	4	860073	5	36
WHC-1500-01	1	5	880004K	9	1
Z103 TYPE SC	4	5	880005K	9	2
025C0125CGE	9	3	880050K	8	1
029422	12	9	880080K	9	6
	12	16	880090K	9	7
	7	3	880110	7	2
031803E0200	8	8	880110K	7	1
12314225	14	4	880150K	5	16
125-4A	5	7		5	40
	5	31	9171692-3	1	6
125-6B	5	8	910729K	5	24
	5	32		5	41
151605	14	3	928329K	5	6
17516	11	4		5	30

PART NUMBER	FIG	ITEM	PART NUMBER	FIG	ITEM
930125K	5	20	980270	8	5
	5	42	980280	6	2
930700	5	5	980280K	6	1
930740K	2	1	980310K	5	25
930929K	3	4	980350	3	2
933827K	4	2	980350K	3	2
933900	4	3	980610K	5	18
935631K	1	2	980611K	12	14
935874	5	29	980940K	1	3
953451K	8	10	981002K	11	2
980101K	8	2	981026K	14	2
980122K	11	6	981028	5	17
980124K	4	1	989000K	5	10
980130K	10	1		5	34
980230K	5	1	989038K	5	11
980240K	3	1		5	13
980250K	1	1		5	35
980260K	5	4		5	38
	5	28		BULK	3

END OF WORK PACKAGE

CHAPTER 7
SUPPORTING INFORMATION
FOR
MODERN BURNER UNIT
AND
MODERN BURNER UNIT-V3

OPERATOR AND FIELD MAINTENANCE

REFERENCES

SCOPE

This Work Package lists all field manuals, forms, technical manuals and miscellaneous publications referenced in this manual.

FIELD MANUALS

Basic Doctrine for Army Field Feeding and Class I Operations Management FM 10-23
 Basic Cold Weather Manual..... FM 31-70
 Northern Operations..... FM 31-71
 NBC Packaging of Material – Preservation FM 38-700
 Packaging of Material – Packing FM 38-701
 Mountain Operations FM 3-97.6
 First Aid FM 4-25.11
 Multiservice Tactics, Techniques and Procedures for Nuclear, Biological, Radiological, and
 Nuclear Decontamination FM 3-11.5

FORMS

Product Quality Deficiency ReportSF 368
 Recommended Changes to Publications and Blank Forms..... DA Form 2028
 Hand Receipt/Annex Number..... DA Form 2062
 Equipment Control Record.....DA Form 2408-9
 Equipment Inspection and Maintenance Worksheet.....DA Form 2404
 Equipment Inspection Maintenance Worksheet..... DA Form 5988-E
 Transportation Discrepancy Report.....DD Form 361

TECHNICAL MANUALS

Operator’s Manual: Welding Theory and Application..... TC 9-237
 Metal Body Repair and Related Operation TC 9-510
 Operator’s, Unit and Direct Support Maintenance Manual
 Including Repair Parts and Special Tools List for
 2KW Military Tactical Generator Sets
120 VAC, 60Hz
 MEP 531A (Dewey) (NSN 6115-01-435-1565) (EIC: LKA)
 Mechron (NSN 6115-21-912-0393) (EIC: N/A)
28 VDC
 MEP 531A (Dewey) (NSN 6115-01-435-1567) (EIC: LKD)
 Mechron (NSN 6115-21-912-0392) (EIC: N/A)TM 9-6115-673-13&P
 Operator, Organizational and Direct Support Maintenance Manual
 Including Repair Parts and Special Tools List for
 Range Outfit, Gasoline, Model M59 (NSN 7360-00-082-2153);
 Burner Unit, Gasoline, Model M2 (NSN 7310-00-842-9247);
 Burner Unit, Model M2A (NSN 7310-01-017-1285);
 Burner Unit, Model M2A with Safety Device (NSN 7310-01-113-9172);
 Accessory Outfit, Gasoline, Field Range with Baking Rack
 (NSN 7360-00-187-4757).....TM 10-7360-204-13&P
 Operator’s, Unit and Direct Support Maintenance Manual
 for Kitchen, Field, Trailer Mounted
 MKT-75 (NSN 7360-00-138-7782)
 MKT-75A (NSN 7360-01-155-6020)
 MKT-82 (NSN 7360-01-155-6020)..... TM 10-7360-206-13

REFERENCES – CONTINUED

Operator's Manual For
 Truck, Utility: Cargo/Troop Carrier, 1-1/4 Ton, 4x4, M998
 (2320-01-107-7155) (EIC: BBD);
 M998A1 (2320-01-371-9577) (EIC: BBN);
 Truck, Utility: Cargo/Troop Carrier, 1-1/4 Ton, 4x4, W/Winch, M1038
 (2320-01-107-7156) (EIC: BBE);
 M1038A1 (2320-01-371-9578) (EIC: BBP);
 Truck, Utility: Heavy Variant, 4x4,
 M1097 (2320-01-346-9317) (EIC: BBM);
 M1097A1 (2320-01-371-9583) (EIC: BBU);
 M1097A2 (2320-01-380-8604) (EIC: BB6);
 M1123 (2320-01-455-9593) (EIC: B6G);
 Truck, Utility: Tow Carrier, Armored, 1-1/4 Ton, 4x4,
 M966 (2320-01-107-7153) (EIC: BBC);
 M966A1 (2320-01-372-3932) (EIC: BBX);
 M1121 (2320-01-956-1282) (EIC: B6H);
 Truck, Utility: Tow Carrier, Armored, 1-1/4 Ton, 4x4, W/Winch,
 M1036 (2320-01-107-7154) (EIC: BBH);
 Truck, Utility: Tow Carrier, W/Supplemental Armor, 1-1/4 Ton, 4x4,
 M1045 (2320-01-146-7191);
 M1045A1 (2320-01-371-9580) (EIC: BBR);
 M1045A2 (2320-01-380-8229) (EIC: BB5);
 Truck, Utility: Tow Carrier, W/Supplemental Armor, 1-1/4 Ton, 4x4, W/Winch,
 M1046 (2320-01-146-7188);
 M1046A1 (2320-01-371-9582) (EIC: BBT);
 Truck, Utility: Armament Carrier, Armored, 1-1/4 Ton, 4x4, M1025
 (2320-01-128-9551) (EIC: BBF);
 M1025A1 (2320-01-371-9584) (EIC: BBV);
 M1025A2 (2320-01-380-8233) (EIC: BB3);
 Truck, Utility: Armament Carrier, Armored, 1-1/4 Ton, 4x4, W/Winch,
 M1026
 (2320-01-128-9552) (EIC: BBG);
 M1026A1 (2320-01-371-9579) (EIC: BBQ);
 Truck, Utility: Armament Carrier, W/Supplemental Armor,
 1-1/4 Ton, 4x4, M1043
 (2320-01-146-7190); M1043A1 (2320-01-372-3933) (EIC: BBY);
 M1043A2 (2320-01-380-8213) (EIC: BB4);
 Truck, Utility: Armament Carrier, W/Supplemental Armor, 1-1/4 Ton, 4x4,
 W/Winch, M1044 (2320-01-146-7189);
 M1044A1 (2320-01-371-9581) (EIC: BBS);
 Truck, Utility: S250 Shelter Carrier, 4x4, M1037 (2320-01-146-7193)
 (EIC: BBK);
 Truck, Utility: S250 Shelter Carrier, 4x4, W/Winch,
 M1042 (2320-01-146-7187);
 Truck, Ambulance, 2-Litter, Armored, 4x4, M996 (2310-01-111-2275)
 (EIC: BBB); M996A1 (2310-01-372-3935) (EIC: BB2);
 Truck, Ambulance, 4-Litter, Armored, 4x4, M997
 (2310-01-111-2274) (EIC: BBA);
 M997A1 (2310-01-372-3934) (EIC: BBZ); M997A2
 (2310-01-380-8225) (EIC: BB8);
 Truck, Ambulance, 2-Litter, Soft Top, 4x4,
 M1035 (2310-01-146-7194);
 M1035A1 (2310-01-371-9585) (EIC: BBW);
 M1035A2 (2310-01-380-8290) (EIC: BB9)..... TM 9-2320-280-10

REFERENCES – CONTINUED

Unit and Direct Support Maintenance Repair Parts and Special Tools List
 Kitchen, Field, Trailer Mounted TM 10-7360-206-23P
 Operator’s, Unit, and Direct Support Maintenance Manual
 Including Repair Parts and Special Tools List for Modular Field Kitchen
 (NSN 7360-01-276-9817).....TM 10-7360-208-13&P
 Operator, Organizational and Direct Support Maintenance Manual
 Including Repair Parts and Special Tools List for
 Kitchen, Company Level Field Feeding (KCLFF) (NSN 7360-01-200-9828)
 Kitchen, Company Level Field Feeding – Enhanced (KCLFF-E)
 (NSN 7360-01-374-1980).....TM 10-7360-209-13&P
 Operator’s, Unit and Direct Support Maintenance Manual
 Including Repair Parts and Special Tools List for Food Sanitation Center (FSC)
 (NSN 7360-01-277-2558).....TM 10-7360-211-13&P
 Procedures for Destruction of Equipment to Prevent Enemy
 Use (Mobility Equipment Command)TM 750-244-3

PAMPHLETS

The Army Maintenance Management System (TAMMS) User ManualDA Pam 750-8

MISCELLANEOUS PUBLICATIONS

Occupational and Environmental Health Food Sanitation.....TB MED 530
 Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).....CTA 50-970
 Army Medical Department Expendable/Durable ItemsCTA 8-100

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE**MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION**

MAINTENANCE ALLOCATION CHART (MAC)**INTRODUCTION****The Army Maintenance System MAC**

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

This MAC (immediately following the introduction) 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 shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field – includes two subcolumns, Crew (C) and Maintainer (F).

Sustainment – includes two subcolumns, Below Depot (H) and Depot (D).

The maintenance to be performed at field and sustainment levels is described as follows:

1. Crew maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter "C" in the third position of the SMR code. A "C" appearing in the fourth position of the SMR code indicates complete repair is possible at the crew maintenance level.
2. Maintainer maintenance. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "F" appearing in the third position of the SMR code. An "F" appearing in the fourth position of the SMR code indicates complete repair is possible at the field maintenance level. Items are returned to the user after maintenance is performed at this level.
3. Below depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "H" appearing in the third position of the SMR code. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at the below depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this level.
4. Depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "D" or "K" appearing in the third position of the SMR code. Depot sustainment maintenance can be performed by either depot personnel or contractor personnel. A "D" or "K" appearing in the fourth position of the SMR code indicates complete repair is possible at the depot sustainment maintenance level. Items are returned to the supply systems after maintenance is performed at this level.

The tools and test equipment requirements table (immediately following the MAC) lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks table (immediately following the tools and test equipment requirements) contains supplemental instructions and explanatory notes for a particular maintenance function.

Maintenance Functions

Maintenance functions are limited to and defined as follows:

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). This includes scheduled inspection and gauging and evaluation of cannon tubes.
2. **Test.** To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. **Service.** Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:
 - a. **Unpack.** To remove from packing box for service or when required for the performance of maintenance operations.
 - b. **Repack.** To return item to packing box after service and other maintenance operations.
 - c. **Clean.** To rid the item of contamination.
 - d. **Touch up.** To spot paint scratched or blistered surfaces.
 - e. **Mark.** To restore obliterated identification.
4. **Adjust.** To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.
5. **Align.** To adjust specified variable elements of an item to bring about optimum or desired performance.
6. **Calibrate.** To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
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.
8. **Paint (ammunition only).** To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.
9. **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.
10. **Repair.** The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

NOTE

The following definitions are applicable to the "repair" maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

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).

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

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

11. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

Explanation of Columns in the MAC

Column (1) 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).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions refer to "Maintenance Functions" outlined above).

Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. 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 are to 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 time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:

- C Crew maintenance
- F Maintainer maintenance

Sustainment:

- L Specialized Repair Activity (SRA)
- H Below depot maintenance
- D Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the "H" column of 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.

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.

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

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) – Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

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

Column (3) – Nomenclature. Name or identification of the tool or test equipment.

Column (4) – National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) – Tool Number. The manufacturer's part number.

Explanation of Columns in the Remarks

Column (1) – Remarks Code. The code recorded in column (6) of the MAC.

Column (2) – Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE

MAINTENANCE ALLOCATION CHART (MAC)

Table 1. MAC for Modem Burner Unit (MBU and MBU-V3).

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
00	MBU	Inspect Service	0.1 0.5				1 A, B, C	
01	ASSEMBLY, FRAME	Inspect Repair	0.1	0.5			3 D, E	
0101	CLIPS, CABLE	Inspect Replace	0.1 0.2	0.2				
02	ASSEMBLY, ELECTRICAL CONNECTOR	Inspect Test Replace	0.1	0.1 0.4			2 2 C C	
03	ASSEMBLY, CONTROLLER	Inspect Replace Calibrate	0.1 0.4 0.1				1 1 C C	
0301	ASSEMBLY, CONTROLLER PAWL	Inspect Replace	0.1 0.4				1 C	
04	ASSEMBLY, COMPRESSOR	Inspect Test Replace	0.1 0.3 0.4				1 1 C C	
05	ASSEMBLY, FUEL DELIVERY BLOCK	Inspect Test Remove/ Install Adjust Replace	0.1 0.3 0.3 0.5 0.5				1 1 1 1 C C	
0501	FILTER, AIR	Test Replace	0.1 0.2				1 1	
0502	IGNITER	Replace	0.2				1	
0503	NOZZLE, FUEL	Replace	0.2				1	

Table 1. MAC for Modem Burner Unit (MBU and MBU-V3) - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
06	ASSEMBLY, VENT VALVE	Inspect	0.1					
		Service	0.1			1	A	
		Replace	0.5			1	A, C	
07	ASSEMBLY, BURNER	Inspect	0.1					
		Replace	0.4			1	C	
08	ASSEMBLY, FUEL REGULATOR	Inspect	0.1					
		Service	0.1			1		
		Replace	0.2			1	C	
0801	FILTER, FUEL	Replace	0.2					
09	ASSEMBLY, REFLECTIVE HEAT SHIELD	Inspect	0.1					
		Replace	0.2			1	C	
10	ASSEMBLY, FUEL LINE	Inspect	0.1					
		Replace		0.5		2	C	
1001	FITTING, FUEL INTERFACE	Inspect	0.1					
		Replace		0.4		2	C	
11	CONVERTER, POWER	Inspect	0.1					
		Test		0.4		2	C	
		Replace		0.5		2	C	
12	PACK, BATTERY	Inspect	0.1			1		
		Repair		0.5		2	C, D, E	
		Replace		0.1		2		
1201	BATTERIES	Inspect	0.1			1	C	
		Test		0.3		2	C	
		Replace		0.4		2	C	
1202	CHARGER, BATTERY	Inspect	0.1			1	C	
		Test		0.5		2	C	
		Replace		0.4		2	C	
13	ASSEMBLIES, MISC.							
1301	ADAPTER, FUEL CAN, AND FUEL HOSE	Inspect	0.1				C	
		Replace	0.1				C	

Table 1. MAC for Modem Burner Unit (MBU and MBU-V3) - Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
1302	CABLE, NATO ADAPTER	Inspect Test Replace	0.1	0.2 0.1		2 2	C C C	
1303	CABLES, 24VDC EXTENSION AND BRANCH	Inspect Replace	0.1 0.1				F	
1304	CABLES, 110VAC EXTENSION	Inspect Replace	0.1 0.1					

Table 2. Tools and Test Equipment for Modern Burner Unit (MBU and MBU-V3).

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER (NSN)	TOOL NUMBER
1	C	MBU TOOL KIT	5180-01-565-2047	DFP TRI-013
2	C	TOOL KIT, GENERAL MECHANIC'S: AUTOMOTIVE	5180-01-454-3787 5180-01-483-0249	SC 5180-95-B47
3	F	WELDING SHOP, TRAILER MOUNTED	3431-01-090-1231	SC 3431-95-CL- A04

Table 3. Remarks for Modern Burner Unit (MBU and MBU-V3).

REMARKS CODE	REMARKS
A	Availability of tools necessary for operator to perform this maintenance function is dependent on application. Refer to Setup information in the maintenance work package.
B	Service is specific to draining the fuel tank.
C	Maintenance shall be performed using the tools associated with the systems in which the MBU is being used (MKT, KCLFF, etc). The MBU Tool Kit is an additional authorized tool kit located in WP 0073 that should be used when the tools necessary to perform maintenance are not available.
D	Perform welding operations as directed in TC 9-237, Welding Theory and Application.
E	Perform repairs to the body as directed in TC 9-510, Metal Body Repair and Related Operations.
F	This includes the 12-ft Crossway Cable.

END OF WORK PACKAGE

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

INTRODUCTION**Scope**

This work package lists COEI and BII for the Modern Burner Unit (MBU and MBU-V3) to help you inventory items for safe and efficient operation of the equipment.

General

The COEI and BII information is divided into the following lists:

Components of End Item (COEI). This list is for information purposes only and is not authority to requisition replacements. These items are part of the Modern Burner Unit (MBU and MBU-V3). As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

Basic Issue Items (BII). These essential items are required to place the Modern Burner Unit (MBU and MBU-V3) in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the Modern Burner Unit (MBU and MBU-V3) during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

Explanation of Columns in the COEI List and BII List

Column (1) Illus Number. Gives you the number of the item illustrated.

Column (2) National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (3) Description, Part Number/(CAGEC). Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The stowage location of COEI and BII is also included in this column. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (4) Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below:

<u>Code</u>	<u>Used On</u>
FQG	MBU
FTW	MBU-V3

Column (5) U/I. Unit of Issue (U/I) indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (2).

Column (6) Qty Rqr. Indicates the quantity required.

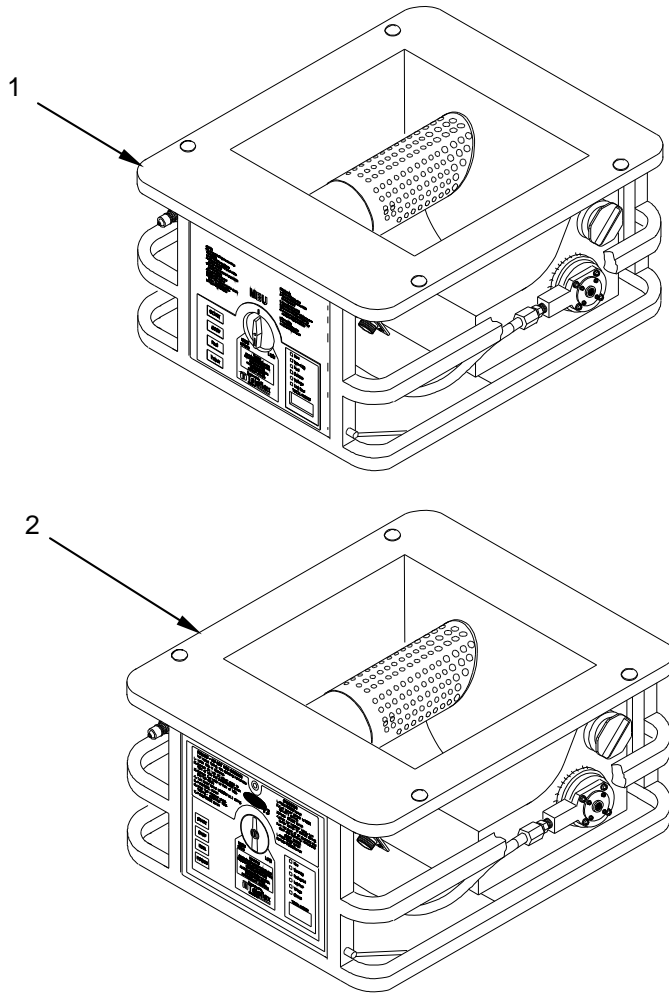


Table 1. Components of End Item List.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
1	7310-01-452-8137	MBU (3AD06) MS0001	FQG	EA	1
	OR				
2	7310-01-507-9310	MBU-V3 (L4703) MS0003	FTW	EA	1

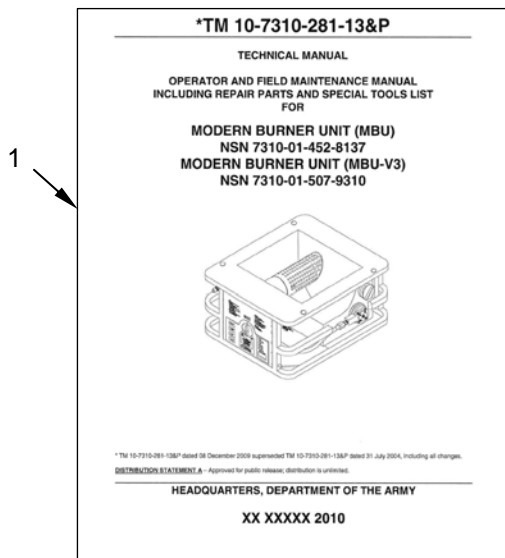


Table 2. Basic Issue Items List.

(1) Illus Number	(2) National Stock Number (NSN)	(3) Description, Part Number/(CAGEC)	(4) Usable On Code	(5) U/I	(6) Qty Rqr.
1	N/A	TM 10-7310-281-13&P		EA	1

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
ADDITIONAL AUTHORIZATION LIST (AAL)

INTRODUCTION**Scope**

This work package lists additional items you are authorized for the support of the Modern Burner Unit (MBU and MBU-V3).

General

This list identifies items that do not have to accompany the Modern Burner Unit (MBU and MBU-V3) and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

Explanation of Columns in the AAL

Column (1) National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (2) Description, Part Number/(CAGEC) identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the part number part number and Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (3) Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment. These codes are identified below:

<u>Code</u>	<u>Used On</u>
PAA	MFK KIT
PAB	MKT KIT
PAC	FSC KIT
PAD	KCLFF-E KIT

Column (4) U/I. Unit of Issue (U/I) indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (1).

Column (5) Qty Recm. Indicates the quantity recommended.

Table 1. Additional Authorization List.

(1) National Stock Number (NSN)	(2) Description, Part Number/(CAGEC)	(3) Usable On Code	(4) U/I	(5) Qty Recm
7310-01-454-1249	BATTERY (L4703) MS0225		EA	2
7310-01-453-6565	BATTERY PACK (L4703) MS0200	PAD	EA	1
7310-01-455-0665	CABLE A, EXTENSION 25FT (L4703) MS0101	PAA PAC PAD	EA EA EA	3 1 1
7310-01-455-0896	CABLE B, MKT, 4 BRANCH (L4703) MS0105	PAB	EA	1
7310-01-455-1014	CABLE C, MKT, 2 BRANCH (L4703) MS0103	PAB	EA	1
7310-01-455-1017	CABLE D, 2 BRANCH (3AD06) MS0104	PAA PAC PAD	EA EA EA	5 2 2
7310-01-455-1206	CABLE E, MKT EXTENSION 12FT (L4703) MS0105	PAB	EA	1
7310-01-509-4453	CABLE F, EXTENSION 3FT (L4703) MS0106	PAC PAD	EA EA	1 1
1025-01-214-6568	CLEANING KIT, BORE, WEAPON, SMALL (65983) BOR-CAP-20		EA	1
7310-01-458-5060	EXTENSION CORD, 25FT (110VAC) (L4703) MS0425	PAA PAB PAC	EA EA EA	1 1 1
7310-01-454-1281	EXTENSION CORD, 50FT (110VAC) (L4703) MS0400	PAA PAB PAC	EA EA EA	1 1 1
7240-01-337-5269 (GREEN) OR 7240-01-337-5268 (TAN)	FUEL CAN (GREEN) (56161) OR FUEL CAN (TAN) (19204) RIA 150374-1		EA	2
7310-01-455-3736	FUEL ADAPTER, MBU (L4703) MS0300	PAA PAB PAC PAD	EA EA EA EA	2 2 1 1

Table 1. Additional Authorization List – Continued.

(1) National Stock Number (NSN)	(2) Description, Part Number/(CAGEC)	(3) Usable On Code	(4) U/I	(5) Qty Recm
7310-01-455-3735	FUEL LINE, MBU (L4703) MS0350	PAA	EA	2
		PAB	EA	2
		PAC	EA	1
		PAD	EA	1
5180-01-565-2047	MBU TOOL KIT	PAA	EA	1
7310-01-454-1241	NATO ELECTRICAL ADAPTER (24VDC) (L4703) MS0250	PAD	EA	1
7310-01-453-6513	POWER CONVERTER FOR MBU-V3 (3AD06) MS0150	PAA	EA	1
		PAB	EA	1
		PAC	EA	1
7310-01-502-9455	POWER CONVERTER FOR MBU (L4703) MS0160	PAA	EA	1
		PAB	EA	1
		PAC	EA	1
5120-01-548-9061	PUNCH, DRIVE PIN (59678) 21002	PAA	EA	1
5975-00-878-3791	ROD, GROUNDING (58536) AA55804-3B 9FT		EA	1
7240-00-177-6154	SPOUT, CAN FLEXIBLE (19207) 11677020		EA	1
5120-00-228-9505	WRENCH, BOX AND OPEN END, COMBINATION (05047) B107.100	PAA	EA	1

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE**EXPENDABLE AND DURABLE ITEMS LIST**

INTRODUCTION**Scope**

This work package lists expendable and durable items that you will need to operate and maintain the Modern Burner Unit (MBU and MBU V-3). This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanations of Columns in Expendable/Durable Items List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use brake fluid (WP 0098, Item 5)).

Column (2) Level. This column includes the lowest level of maintenance that requires the listed item (C=Crew, F=Maintainer/ASB).

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses).

Column (5) U/I. Unit of Issue (U/I) code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

Table 1. Expendable and Durable Items List.

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
1	C, F	7930-01-363-8631	ABSORBENT MATERIAL, OIL AND WATER MAT203 (1JA49)	BG
2	C, F	7920-00-514-2417	BRUSH, ACID SWABBING 7920-00-514-2417 (80244)	GR
3	C, F	8415-00-009-1900	GLOVES, CHEMICAL AND OIL PROTECTIVE N36 (86523)	PR
4	C, F	4230-01-323-5298	MASK, FACE, DISPOSABLE 5453T42 (39428)	EA
5	C, F	7920-00-205-1711	RAG, WIPING 7920-00-205-1711 (80244)	BE
6	F	8030-01-166-0675	SEALING COMPOUND 56747 (05972)	TU
7	C, F	9905-00-537-8954	TAGS, MARKING 9905-00-537-8954 (64067)	BD
8	F	5970-00-419-4291	TAPE, INSULATION, ELECTRICAL MIL-I-24391 (81349)	RO

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
TOOL IDENTIFICATION LIST

INTRODUCTION**Scope**

This work package lists all common tools and supplements and special tools/fixtures needed to maintain the Modern Burner Unit and Modern Burner Unit-V3.

Explanation of Columns in the Tool Identification List

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the initial setup to identify the item (e.g., Extractor (WP 0090, Item 32)).

Column (2) Item Name. This column lists the item by noun nomenclature and other descriptive features (e.g., Gage, belt tension).

Column (3) National Stock Number (NSN). This is the National Stock Number (NSN) assigned to the item; use it to requisition the item.

Column (4) Part Number/(CAGEC). 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. The manufacturer's Commercial and Government Entity Code (CAGEC) is also included.

Column (5) Reference. This column identifies the authorizing supply catalog or RPSTL for items listed in this work package.

Table 1. Tool Identification List.

(1) Item No.	(2) Item Name	(3) National Stock Number (NSN)	(4) Part Number/ (CAGEC)	(5) Reference
1	MBU Tool Kit	5180-01-565-2047	DFP TRI-013 (19207)	TM 10-7310-281-13&P
2	Tool Kit, General Mechanic's: Automotive (GMTK)	5180-01-483-0249	12B470000-1 (59678)	TM 10-7310-281-13&P
3	Welding Shop, Trailer Mounted	3431-01-090-1231	SC3431-95-CLA04 (19204)	TM 10-7310-281-13&P

END OF WORK PACKAGE

OPERATOR AND FIELD MAINTENANCE
MANDATORY REPLACEMENT PARTS LIST

INTRODUCTION

This work package includes a list of all mandatory replacement parts referenced in the task initial setups and procedures. These are items that must be replaced during maintenance whether they have failed or not. This includes items based on usage intervals such as miles, time, rounds fired, etc.

MANDATORY REPLACEMENT PARTS LIST**Table 1. Mandatory Replacement Parts List.**

ITEM NO.	PART NUMBER (CAGEC)	NATIONAL STOCK NUMBER (NSN)	NOMENCLATURE	QTY
EVERY 300 HOURS				
1	PD MBU-001 (81349)	7310-01-462-4905	MBU Fuel Delivery Block	1
2	953451K (L4703)	7310-01-462-6765	In-Tank Fuel Filter	1
3	M83461/1-223 (81343)	5331-01-183-0991	Fuel Regulator O-ring	1
EVERY 2000 HOURS				
4	980260K (L4703)	7310-01-462-4915	MBU, Assembly, Igniter	1
5	928329K (L4703)	7310-01-462-4919	Fuel Nozzle	1

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These are the instructions for sending an electronic 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@avma27.army.mil>
To: TACOMLCMC.DAForm2028@us.army.mil

Subject: DA Form 2028

1. From: Joe Smith
2. Unit: home
3. Address: 4300 Park
4. City: Hometown
5. St: MO
6. Zip: 77777
7. Date Sent: 19-OCT-09
8. Pub no: TM 10-5411-239-13&P
9. Pub Title: TM
10. Publication Date: 01-JUL-09
11. Change Number: 7
12. Submitter Rank: MSG
13. Submitter FName: Joe
14. Submitter MName: T
15. Submitter LName: Smith
16. Submitter Phone: 123-123-1234
17. Problem: 1
18. Page: 2
19. Paragraph: 3
20. Line: 4
21. NSN: 5
22. Reference: 6
23. Figure: 7
24. Table: 8
25. Item: 9
26. Total: 123
27. Text:

This is the text for the problem below line 27.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.						Use Part II (<i>reverse</i>) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE 21 October 2009
TO: (<i>Forward to proponent of publication or form</i>) (<i>Include ZIP Code</i>) COMMAND TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LCL-MPP/TECH PUBS 1 Rock Island Arsenal Rock Island, IL 61299-7630						FROM: (<i>Activity and location</i>) (<i>Include ZIP Code</i>) PFC Jane Doe CO A 3rd Engineer BR Ft. Leonardwood, MO 63108	
PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS							
PUBLICATION/FORM NUMBER TM 10-5411-239-13&P				DATE 12 December 2008	TITLE Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems		
ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if possible).</i>	
	0036 00-2				1	<i>In table 1, Sewing Machine Code Symbols, the second sewing machine code symbol should be MD ZZ not MD22.</i> <i>Change the manual to show Sewing Machine, Industrial: Zig-Zag; 308 stitch; medium-duty; NSN 3530-01-181-1421 as a MD ZZ code symbol.</i>	
<i>*Reference to line numbers within the paragraph or subparagraph.</i>							
TYPED NAME, GRADE OR TITLE Jane Doe, PFC				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 508-233-4141		SIGNATURE Jane Doe <i>Jane Doe</i>	

TO: (Forward direct to addressee listed in publication) COMMAND TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LCL-MPP/TECH PUBS 1 Rock Island Arsenal Rock Island, IL 61299-7630	FROM: (Activity and location) (Include ZIP Code) <i>PFC Jane Doe</i> <i>CO A 3rd Engineer BR</i> <i>Ft. Leonardwood, MO 63108</i>	DATE 21 October 2009
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PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER TM 10-5411-239-13&P	DATE 12 December 2008	TITLE Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems
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PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
0066 00-1					4			<i>Callout 16 in figure 4 is pointed to a D-Ring. In the Repair Parts List key for figure 4, item 16 is called a Snap Hook. Please correct one or the other.</i>

PART III – REMARKS (Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)

TYPED NAME, GRADE OR TITLE Jane Doe, PFC	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 508-233-4141	SIGNATURE Jane Doe <i>Jane Doe</i>
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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
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TO: (Forward to proponent of publication or form) (Include ZIP Code) US ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LCL-MPP/TECHPUBS 1 Rock Island Arsenal ROCK ISLAND, IL 61299-7360	FROM: (Activity and location) (Include ZIP Code)
---	---

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER TM 10-7310-281-13&P	DATE 17 MAY 2010	TITLE Operator and Field Maintenance Manual Including Repair Parts and Special Tools List for Modern Burner Unit (MBU)
--	---------------------	---

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON <i>(Provide exact wording of recommended changes, if possible).</i>
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**Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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TO: <i>(Forward to proponent of publication or form) (Include ZIP Code)</i> US ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LCL-MPP/TEHPUBS 1 Rock Island Arsenal ROCK ISLAND, IL 61299-7360	FROM: <i>(Activity and location) (Include ZIP Code)</i>	DATE
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PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER TM 10-7310-281-13&P				DATE 17 MAY 2010			TITLE Operator and Field Maintenance Manual Including Repair Parts and Special Tools List for Modern Burner Unit (MBU)	
PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III – REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
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TO: (Forward to proponent of publication or form) (Include ZIP Code) US ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LCL-MPP/TECHPUBS 1 Rock Island Arsenal ROCK ISLAND, IL 61299-7360	FROM: (Activity and location) (Include ZIP Code)
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PART III – REMARKS *(Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

Empty space for remarks

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
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PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

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TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
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By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:



JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
1013105

DISTRIBUTION:

To be distributed in accordance with initial distribution number (IDN) 256531 requirements for TM 10-7310-281-13&P.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 dekagram = 10 grams = .35 ounce
 1 hectogram = 10 dekagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 feet

Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

 _F Fahrenheit temperature $\frac{5}{9}$ (after subtracting 32) Celsius temperature _C

PIN: 077378-000