

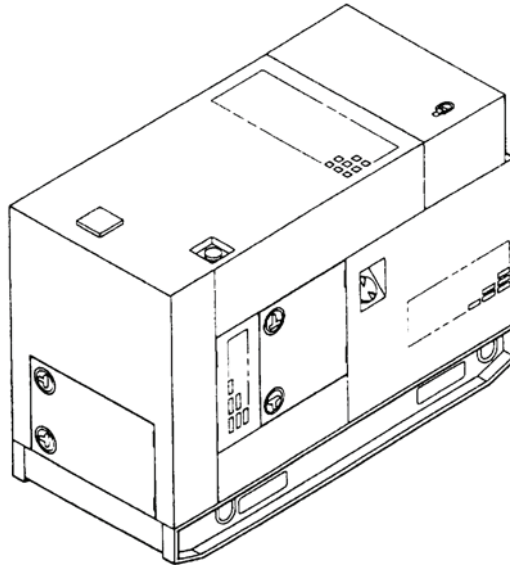
***ARMY TM 9-6115-644-24
AIR FORCE TO 35C2-3-446-12
MARINE CORPS TM 09249A/09246A-IN**

TECHNICAL MANUAL

**FIELD AND SUSTAINMENT MAINTENANCE MANUAL
FOR**

**GENERATOR SET, SKID MOUNTED, TACTICAL QUIET,
30 kW, 50/60 Hz, MEP-805A
(NSN: 6115-01-274-7389) (EIC: VG5)**

**GENERATOR SET, SKID MOUNTED, TACTICAL QUIET,
30 kW, 400 Hz, MEP-815A
(NSN: 6115-01-274-7394) (EIC: VN5)**



***SUPERSEDE NOTICE** - This manual supersedes TM-9-6115-644-24, TO 35C2-3-446-12 & TM 09249A/09246A-IN dated 30 April 1995.
Date of issue for the revised manual is: 15 May 2010.

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

**HEADQUARTERS, DEPARTMENTS OF THE ARMY, AIR
FORCE AND HEADQUARTERS, U.S. MARINE CORPS**

15 MAY 2010

PCN: 184 092490 00

WARNING SUMMARY

FIRST AID

For First Aid information, refer to FM 4-25.11.

SAFETY SUMMARY



5

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK:

1

DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL.

2

IF POSSIBLE, TURN OFF THE ELECTRICAL POWER.

3

IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL.

4

SEND FOR HELP AS SOON AS POSSIBLE.

5

AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION.

WARNING SUMMARY - Continued

WARNING AND CAUTION STATEMENTS

Warning and Caution statements have been strategically placed throughout this text prior to operating procedures, practices, or conditions considered essential to the protection of personnel (WARNING) or equipment and property (CAUTION).

A WARNING or CAUTION will apply each time the related step is repeated. Prior to starting any task the WARNINGS or CAUTIONS included in the text for that task must be reviewed and understood. Refer to the materials list at the beginning of the appropriate manual section for materials used during maintenance of this equipment. This warning summary contains the WARNINGS and CAUTIONS included in the manual. The detailed warnings for hazardous materials only are listed separately in the warning summary as the "Hazardous Materials Warnings" section.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING SUMMARY - Continued

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Prior to making any connections for parallel operation, ensure that there is no input to the load and that the generator sets are shut down. Failure to comply with this warning can cause injury or death to personnel.

WARNING

If it is necessary to move a generator set which has been operating in parallel with another generator set, shut down remaining generator set connected to the load, prior to removing load and ground cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Power is available when the main contactor is open. Avoid accidental contact. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure load is turned off before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Slave receptacle (NATO connector) is electrically live at all times and is unfused. The Battery Disconnect Switch does not remove power from the slave receptacle. NATO slave receptacle has 24 VDC even when Battery Disconnect Switch is set to OFF. This circuit is only dead when the batteries are fully disconnected. Disconnect the batteries before performing maintenance on the slave receptacle. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING SUMMARY - Continued

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Hot engine surfaces from the engine and generator circuitry are possible sources of ignition. When hot refueling with DF-1, DF-2, JP5 or JP8, avoid fuel splash and fuel spill. Do not smoke or use open flame when performing refueling. Remember PMCS is still required. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

In extreme cold weather, skin can stick to metal. Avoid contacting metal items with bare skin in extreme cold weather. Failure to comply with this warning can cause injury to personnel.

WARNING

Operating the generator set exposes personnel to a high noise level. Hearing protection must be worn when operating or working near the generator set when the generator set is running. Failure to comply with this warning can cause hearing damage to personnel.

WARNING

Exhaust discharge contains deadly gases including carbon monoxide. DO NOT operate generator set in enclosed areas unless exhaust discharge is properly vented outside. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Hot exhaust gases can ignite flammable materials. Allow room for safe discharge of hot gases and sparks. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

Top housing panels and exhaust system can get very hot. When performing DURING PMCS, wear gloves and additional protective clothing as required. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING SUMMARY - Continued

WARNING

Exercise extreme caution when performing DURING PMCS checks inside engine compartment. Avoid contact with moving or hot engine parts. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, winterization heater has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow heater to cool before performing maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Each battery weighs more than 70 pounds (32 kg) and requires a two-person lift. Lifting batteries can cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply with this warning can cause injury to personnel.

WARNING

Batteries give off a flammable gas. Do not smoke or use open flame when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Battery acid can cause burns to unprotected skin. Wear safety goggles and chemical gloves and avoid acid splash while working on batteries. Failure to comply with this warning can cause injury to personnel.

WARNING

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

WARNING

Do not operate generator set while servicing radiator. Failure to comply with this warning can cause injury to personnel and damage to the equipment.

WARNING SUMMARY - Continued

WARNING

Fan has sharp blades. Use caution and wear gloves when removing or installing belts. Failure to comply with this warning can cause injury to personnel.

WARNING

Oil filter base and housing springs are under tension and can act as projectiles when being removed. Use eye protection when removing springs. Failure to comply with this warning can cause injury to personnel.

WARNING

The high pressure oil system operates at high temperature and pressure. Contact with hot oil can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Wear heat resistant gloves and avoid contacting hot surfaces. Do not allow hot oil or components to contact skin or hands. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

If not shielded, hot exhaust pipe can ignite flammable wall materials. Failure to comply with this warning can cause injury or death to personnel.

WARNING

An unwrapped exhaust pipe can cause injury if touched. Failure to comply with this warning can cause injury to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate. Failure to comply with this warning can cause injury to personnel.

WARNING

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

WARNING

Eye protection is required when working with compressed air. Compressed air can propel particles at high velocity and injure eyes. Do not exceed 15 psi pressure when using compressed air. Failure to comply with this warning can cause injury to personnel.

WARNING SUMMARY - Continued

WARNING

High pressure steam can blow particles or chemicals into eyes, can cause severe burns, and creates hazardous noise levels. Wear protective eye, skin, and hearing protection when using high pressure steam. Failure to comply with this warning can cause injury to personnel.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Rated capacity of overhead hoist should be at least 1,500 pounds (680 kg). Do not use a hoist with less capacity. Failure to comply with this warning can cause injury or death to personnel, and damage to equipment.

WARNING

Keep hands and feet from underside of engine and generator while using lifting device to remove them from the skid base. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Support components when removing attaching hardware or component may fall. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cleaning solvent is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with cleaning solvent. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cleaning compound is toxic. Avoid prolonged breathing of vapors. Use only in a well-ventilated area. Failure to comply with this warning can cause injury to personnel.

WARNING

Conversion coating material is toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with conversion coating material. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Hot metal surfaces can cause burns to skin. Wear protective gloves and eye protection when applying heat to generator housing. Failure to comply with this warning can cause injury to personnel.

WARNING SUMMARY - Continued

WARNING

Use protective gloves when handling heated rectifier hub. Failure to comply with this warning can cause injury to personnel.

WARNING

Do not use the engine starter to turn the flywheel. Failure to comply with this warning can cause injury to personnel.

WARNING

Catch fuel in suitable container. Keep spilled fuel away from hot engine and all fires. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Muffler and flex hoses can get very hot. Allow them to cool before touching them. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

Engine exhaust fumes contain deadly poisonous gases.

Severe exposure can cause death or permanent brain damage.

Exhaust gases are most dangerous in places with poor airflow. Best defense against exhaust gas poisoning is very good airflow.

To protect yourself and your partners, always obey the following rules:

- DO NOT run engine indoors unless you have VERY GOOD AIRFLOW.
- DO NOT idle engine for a long time unless there is VERY GOOD AIRFLOW.
- Be alert at all times. Check for smell of exhaust fumes.
- REMEMBER: Best defense against exhaust gas poisoning is VERY GOOD AIRFLOW.
- Exhaust gas poisoning causes dizziness, headache, loss of muscle control, sleepiness, coma, and death. If anyone shows signs of exhaust gas poisoning, get ALL PERSONNEL clear of exhaust area. Make sure they have lots of fresh air. KEEP THEM WARM, CALM, AND INACTIVE. GET MEDICAL HELP. If anyone stops breathing, give artificial respiration. See FM 4-25.11 for first aid.

LIST OF EFFECTIVE PAGES / WORK PACKAGES

NOTE: This manual supersedes TM-9-6115-644-24, TO 35C2-3-446-12 & TM 09249A/09246A-IN dated 30 April 1995. Date of issue for the revised manual is: 15 May 2010. Zero in the "Change No." column indicates an original page or work package.

Date of issue for revision is:

Revision 15 MAY 2010

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**HEADQUARTERS,
DEPARTMENTS OF THE ARMY, AIR FORCE AND
HEADQUARTERS, U.S. MARINE CORPS
WASHINGTON, D.C., 15 MAY 2010**

TECHNICAL MANUAL

FIELD AND SUSTAINMENT MAINTENANCE MANUAL

**GENERATOR SET, SKID MOUNTED, TACTICAL QUIET,
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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. Reports, as applicable by the requiring Service, should be submitted as follows:

- (a) (A) Army - Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), located in the back of this manual, directly to: Commander, U.S. Army CECOM (LCMC) and Fort Monmouth, ATTN: AMSEL-LC-LEO-E-CM, Fort Monmouth, NJ 07703-5006. You may also send in your recommended changes via electronic mail or by fax. Our fax number is 732-532-3421, DSN 992-3421. Our e-mail address is MONM-AMSELLEOPUBSCHG@conus.army.mil. Our online web address for entering and submitting DA Form 2028s is <http://edm.monmouth.army.mil/pubs/2028.html>.
- (b) (MC) Submit notice of discrepancies or suggested changes on a NAVMC 10772. The NAVMC may be submitted via the Internet using URL: <http://192.156.19.109/ar/mcefs.nsf>. Once the form is completed click on file in the tool bar at top of screen, scroll to "Send" and select "Page by email", and enter SMB.LOG.Tech.Pubs.fct@usmc.mil, this will come in to the Pubs Sections mailbox. This method of submittal does not require a Common Access Card (CAC) to access the form. The <https://pubs.ala.usmc.mil/front.htm> urn will allow access to the Albany Publications web site where the form can be filled out and be submitted by electronic mail to mbmatcommarlogbases@logcom.usmc.mil. A paper copy NAVMC 10772 can be mailed in an envelope addressed to Commander, Marine Corps Systems Command (LOG/TP), 814 Radford Blvd, Suite 20343, Albany, GA 31704-0343. Problems or questions regarding the NAVMC 10772 program should be reported by calling DSN 567-7628, DSN 567-6439 or DSN 567-5017.
- (d) (F) Air Force - By Air Force AFTO Form 22 (Technical Manual (TM) change Recommendation and Reply) in accordance with paragraph 6-5, Section VI, TO 00 5 1 directly to prime ALC/MST.
A reply will be furnished to you.

***SUPERSEDEURE NOTICE** - This manual supersedes TM-9-6115-644-24, TO 35C2-3-446-12 & TM 09249A/09246A-IN dated 30 April 1995. Date of issue for the revised manual is: 15 May 2010.

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

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How to Use This Manual

This manual contains field instructions for the MEP-805A and MEP-815A Tactical Quiet Generator (TQG) Sets.

NOTE

Throughout the family of manuals, directional orientation in relation to the equipment is described from the point of view of the operator facing the operator's controls looking out over the equipment. From this perspective, the end of the equipment containing the operator's controls will be referred to as the rear.

This manual provides operating procedures, troubleshooting, maintenance, and supporting information required to operate and maintain the 30 kW 50/60 Hz and 400 Hz Tactical Quiet (TQ) Generator Sets. Listed below are some of the features included in this TM to help locate and use the provided information.

WORK PACKAGES

This TM has been organized using the WP concept. Each chapter contains a series of WPs rather than sections and paragraphs. Each WP is designed to stand alone as a complete information module; if the user keeps the section(s) of this TM in a loose-leaf binder, the user will be able to remove just the WP needed to complete a specific task. Here are some WP features of which the user should be aware.

Each WP is numbered using a four-digit number beginning with WP 0001. WPs are numbered sequentially throughout the TM (ex. WP 0016, WP 0020, etc.). The Table of Contents lists each chapter and WP title as well as all figures and tables contained within each. Figures and tables are numbered sequentially for each WP.

The WP number is located at the top right of each page. It is also located at the bottom of the page with the WP page number included (0001-1 would be page 1 of the General Information WP (WP 0001, General Information)).

Each WP starts on a right-hand page. This is done so the user can remove a single WP from the paper TM if needed for a task. Blank pages are assigned a number, but it appears on the preceding or following page. For example, if page 0001-10 of a WP is blank, page 0001-9 will have the number 0001-9/10 blank; or if page 0001-1 of a WP is blank, page 0001-2 will have the number 0001-1 blank/2.

Each WP containing step-by-step maintenance or troubleshooting procedures will end with the words END OF TASK, and each WP ends with the statement END OF WORK PACKAGE. Think of each WP as a small, standalone TM.

Typographical conventions are as follows:

[Unload] indicates a soft key or a switch.

[Previous] + [Next] indicates two simultaneous key presses. [+] [-] indicates two sequential key presses.

References to equipment Data and Description Plates are printed as they appear on the equipment whenever possible.

Warnings, Cautions and Notes Definitions

Warnings, cautions, notes, chapter titles, and paragraph headings are printed in bold type. Icons related to warnings are shown directly above the warning text.

The following definitions apply to WARNINGS, CAUTIONS and NOTES found throughout this publication. Warning, cautions and notes provide supplemental information. Personnel must understand and apply these Warnings, Cautions and Notes during many phases of operation and maintenance to ensure personnel safety and health and the protection of property. Portions of this information may be repeated in certain chapters of this publication for emphasis.

WARNING

A warning identifies a clear danger to the person doing that procedure.

CAUTION

A caution identifies risk of damage to the equipment.

NOTE

A note highlights essential procedures, conditions, or statements or conveys important instructional data to the user.

CHAPTER OVERVIEW

Chapter 1 - General Information, Equipment Description and Theory of Operation

Chapter 1 provides an introduction to the 15 kW 50/60 Hz and 400 Hz Tactical Quiet (TQ) Generator Sets. It is divided into three work packages, as follows:

General Information. This work package provides general information about this manual and the related forms and records. Instructions are provided for making equipment improvement recommendations. Coverage includes a reference to the TM that contains instructions on destruction of materiel to prevent enemy use. Also, a nomenclature cross-reference list is provided as well as a list of abbreviations and acronyms.

Equipment Description and Data. This work package describes capabilities, characteristics, and features. It provides basic equipment data and shows the locations of major components. Descriptions of the major components are also provided.

Theory of Operation. This work package provides functional descriptions of the equipment.

Chapter 2 - Field and Sustainment Troubleshooting Procedures

Chapter 2 covers troubleshooting procedures of the 15 kW 50/60 Hz and 400 Hz Tactical Quiet (TQ) Generator Sets to be performed by the operator. The chapter is divided as follows:

Field and Sustainment Troubleshooting Index. This work package provides a troubleshooting introduction and malfunction/symptom index to direct you to the appropriate troubleshooting procedure at the field and sustainment level.

Field and Sustainment Troubleshooting Procedures. This work package provides troubleshooting procedures and corrective actions that are to be performed by the operator. It also provides references to the applicable technical manuals.

Chapter 3 - Field and Sustainment Maintenance Instructions

Chapter 3 covers maintenance procedures for the 30 kW 50/60 Hz and 400 Hz Tactical Quiet (TQ) Generator Sets to be performed by the operator. Its purpose is to provide you with the information that you need to keep the equipment in good operating condition. The chapter is divided as follows:

Service Upon Receipt. This work package contains instructions for inspecting and servicing the equipment when it is received. It includes instructions for unpacking the equipment when it is received. The instructions also include unpacking and stowing the basic issue items that accompany the 15 kW 50/60 Hz and 400 Hz Tactical Quiet (TQ) Generator Sets. Also included are instructions on positioning the equipment for operation and connecting an external fuel source.

Field and Sustainment Preventive Maintenance Checks and Services (PMCS) Introduction. This work package provides a detailed explanation of each table entry in the PMCS table along with applicable warnings, cautions and notes prior to starting on the PMCS procedures.

Field and Sustainment Preventive Maintenance Checks and Services (PMCS). This work package contains detailed instructions that the operator must perform before, during, and after preventive maintenance checks and services. Coverage includes all operator PMCS for the equipment.

Lubrication Instructions. This work package provides references to the applicable lubrication instructions.

Field and Sustainment Maintenance Procedures. These work packages refer the operator to the preventive maintenance checks and services required by WP 0008.

Preparation for Storage or Shipment. This work package provides information on short-term, intermediate-term, and long-term storage.

Illustrated List of Manufactured Items. These work packages provide instructions for making the items authorized to be manufactured or fabricated at the field maintenance level.

Torque Limits. This work package lists standard torque values for bolts and screws used in maintaining the equipment.

Chapter 4 - Supporting Information

The chapter is divided as follows:

References. This work package lists all publications referenced in the various chapters of the technical manual. The listing includes the title and document number of each publication.

Maintenance Allocation Chart (MAC) Introduction. This work package explains what is covered in the maintenance allocation chart.

Maintenance Allocation Chart (MAC). This work package has three sections, as follows:

Maintenance Allocation Chart (MAC). Table 1 contains a tabular listing that assigns maintenance functions to specific maintenance levels. It lists the work time needed to perform each maintenance function at the assigned level. It also contains a column that has entries keyed to the tools and equipment listed in Table 2. Another column has entries keyed to the remarks in Table 3.

Tool and Test Equipment Requirements. Table 2 contains complete identification information for the items referenced in the tools and equipment column of Table 1.

Remarks. Table 3 provides additional information for each entry in the remarks column of Table 2.

Expendable and Durable Items List. This work package lists expendable/durable supplies and materials needed to operate and maintain your equipment. The work package contains two sections, as follows:

Introduction. This section explains the entries in Table 1.

Expendable and Durable Items List. The list indicates the maintenance level that needs each item and identifies the items by National Stock Number (NSN), description, and unit of measure.

Chapter 5 - Winterization Kit

Chapter 5 provides Field and Sustainment Level information on the operation, troubleshooting and maintenance of the winterization kit designed to be mounted in generator sets where extreme cold temperatures are anticipated. The chapter is divided as follows:

General Information. This work package provides general information concerning the scope of this chapter in the discussion of the operation, maintenance and troubleshooting procedures for the winterization kit. It also contains Repair Parts; Special Tools; Test, Measurement, and Diagnostic Equipment (TMDE); and Special Support Equipment information concerning the RPSTL, support equipment, and maintenance repair parts for the winterization kit at the field level.

Equipment Description and Data. This work package describes winterization kit capabilities, characteristics, and features. It provides descriptions of the major components and tabulated data for the heater.

Theory of Operation. This work package provides a functional description of the winterization kit.

Description and Use of Controls and Indicators. This work package describes and illustrates winterization kit controls and indicators to ensure proper operations.

Service Upon Receipt. This work package provides information concerning the service upon receipt required by field for the winterization kit already installed on the generator set.

Preventive Maintenance Checks and Services (PMCS) Introduction. This work package provides a detailed explanation of each table entry in the PMCS table along with applicable warnings, cautions and notes prior to starting on the PMCS procedures of the winterization kit.

Preventive Maintenance Checks and Services (PMCS). This work package contains detailed instructions that must be performed before, during, and after preventive maintenance checks and services of the winterization kit.

Lubrication Instructions. This work package provides the information that no lubrication is required on the winterization kit.

Installation Instructions. This work package provides the procedures for installing the winterization kit on the 30 kW generator set.

Troubleshooting Index. This work package provides a troubleshooting introduction and malfunction/symptom index to direct you to the appropriate troubleshooting procedure.

Troubleshooting Procedures. This work package lists diagnostic and symptom related malfunctions that may occur during operation of the generator set with the winterization kit installed.

Maintenance Procedures. These work packages provide the maintenance procedures for the winterization kit components.

Removal Instructions. This work package provides instructions for removing the winterization kit from the 30 kW generator set.

HOW TO FIX A GENERATOR SET MALFUNCTION

Determining the Cause

Finding the cause of a malfunction, troubleshooting, is the first step in fixing the generator set and returning it to operation. Follow these simple steps to determine the root of the problem:

1. Turn to the Table of Contents in this manual.
2. Locate "Troubleshooting Procedures" and turn to the page indicated.
3. Follow the instructions in the references.

Preparing for a Task

Be sure that you understand the entire maintenance procedure before beginning any maintenance task. Make sure that all parts, materials, and tools are handy. Read all steps before beginning. Prepare to do the task as follows:

1. Carefully read the entire task before starting. It tells you what you will need and what you have to know to start the task. **DO NOT START THE TASK UNTIL:**
 - a. You know what is needed
 - b. You have everything you need
 - c. You understand what to do
2. If parts are listed, they can be drawn from technical supply. Before you start the task, check to make sure you can get the needed parts.
3. If expendable/durable supplies or materials are needed, get them before starting the task. Refer to WP 0160 for the correct nomenclature and NSN.

How to Do the Task

Before starting, read the entire task. Be sure that you understand the entire procedure before you begin the task. As you read, remember the following:

1. **PAY ATTENTION TO WARNINGS, CAUTIONS, AND NOTES.**
2. Use the List of Abbreviations/Acronyms if you do not understand the special abbreviations or unusual terms used in this manual.
3. The following are standard maintenance practices. Instructions about these practices are usually not included in task steps. When standard maintenance practices do not apply, the task steps will tell you.
 - a. Tag electrical wiring before disconnecting it.
 - b. Discard used preformed packing, retainers, gaskets, cotter pins, lockwashers, and similar items. Install new parts to replace the discarded items.
 - c. Coat packing before installation, in accordance with the task instructions.
 - d. Disassembly procedures describe the disassembly needed for total authorized repair. You may not need to disassemble an item as far as described in the task. Follow the disassembly steps only as far as needed to repair/replace worn or damaged parts.
 - e. Clean the assembly, subassembly, or part before inspecting it.
 - f. Before installing components having mating surfaces, inspect the mating surfaces to make sure they are in serviceable condition.
 - g. Hold the bolt (or screw) head with a wrench (or screwdriver) while tightening or loosening a nut on the bolt (or screw).
 - h. Torque to the special torque cited when the task instructions include the words "torque to." Use standard torques at all other times.
 - i. When a cotter pin is required, align the cotter pin holes within the allowable torque range.

- j. Inspect for foreign objects after performing maintenance.

CHAPTER 1

**FIELD GENERAL INFORMATION, EQUIPMENT
DESCRIPTION AND THEORY OF OPERATION**

FOR

**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL
QUIET GENERATOR SETS**

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
General Information.....	0001
Equipment Description and Data.....	0002
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FIELD AND SUSTAINMENT MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****GENERAL INFORMATION**

SCOPE**Type of Manual**

This manual contains Field and Sustainment maintenance instructions for the 30 kW 50/60 Hz and 400 Hz Tactical Quiet (TQ) Generator Sets (Figure 1), herein referred to as generator sets. Included are descriptions of major components and their functions in relation to other components.

Model Numbers and Equipment Names

<u>Model Number</u>	<u>Equipment Name</u>
MEP-805A	Generator Set, Skid Mounted, Tactical Quiet 30 kW 50/60 Hz
MEP-815A	Generator Set, Skid Mounted, Tactical Quiet 30 kW 400 Hz

Purpose of Equipment

The generator set provides tactical quiet AC power. The generator set is easily transported, operated, and maintained.

LIMITED APPLICABILITY

Some portions of this publication are not applicable to all services. These portions are prefixed to indicate the service(s) to which they pertain: (A) for Army, (F) for Air Force, (N) for Navy, and (MC) for Marine Corps.

MAINTENANCE FORMS, RECORDS, AND REPORTS

1. (A) Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual; DA PAM 738-751, Functional Users Manual for the Army Maintenance Management Systems - Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability.
2. (MC) Maintenance forms and records used by Marine Corps personnel are prescribed by TM 4700-15/1.
3. (N) Navy users should refer to their service peculiar directives to determine applicable maintenance forms and records to be used.
4. (F) Maintenance forms and records used by Air Force personnel are prescribed in AFI 21-101 and the applicable TO 00-20 Series Technical Orders.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATION (EIR)

If your generator set needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. 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 Recommendation (EIR), a Product Quality Deficiency Report (PQDR or a Warranty Claim Action (WCA). 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.

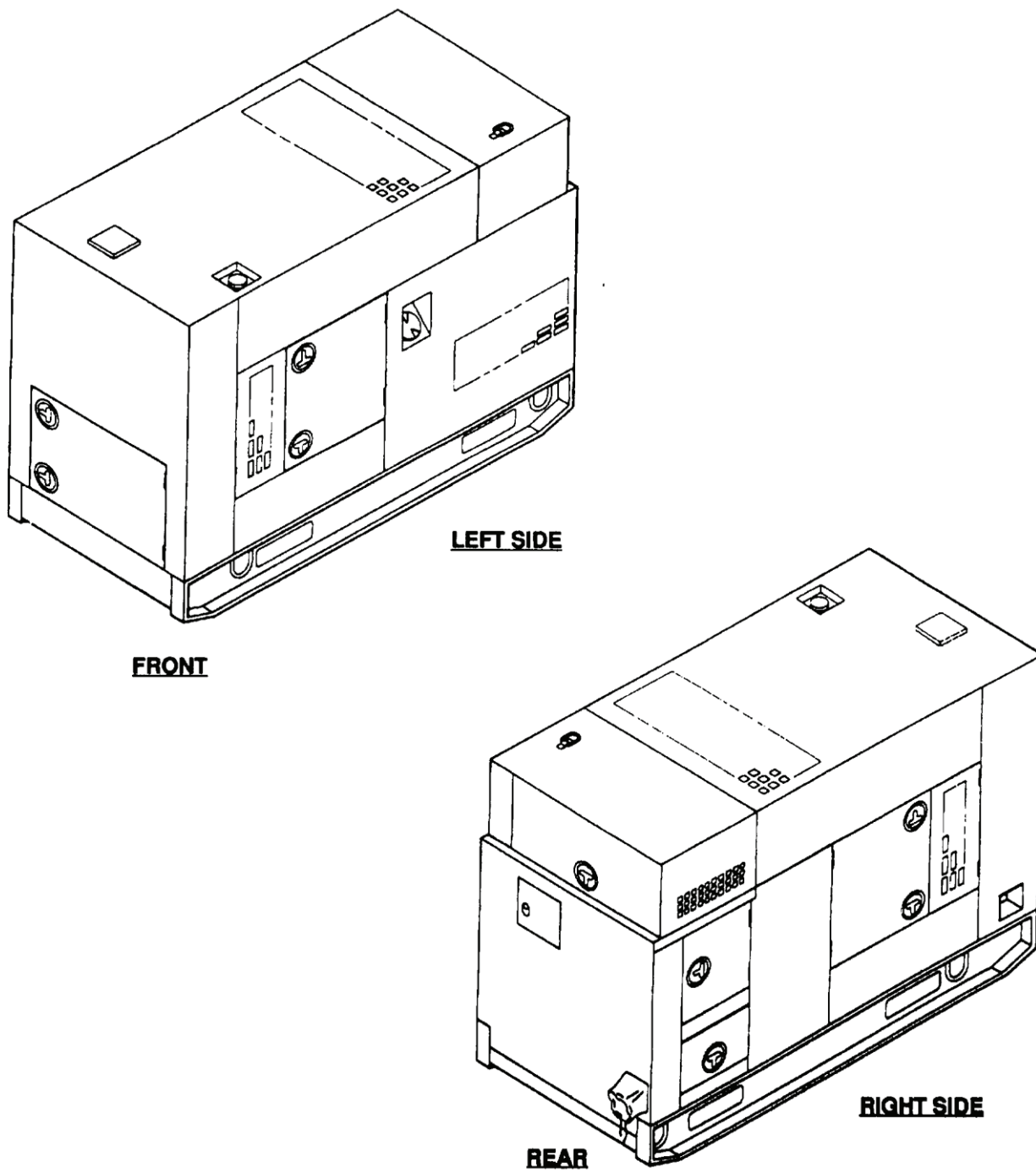


Figure 1. Generator Set, 30 kW, Tactical Quiet.

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.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents), or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking.

SF Form 368, Product Quality Deficiency Report should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

LEVELS OF MAINTENANCE

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

(F) (MC) Refer to the Source Maintenance Recoverability (SMR) Codes for maintenance to be performed.

(N) Navy users shall determine their maintenance levels in accordance with their service directives.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

(A) (MC) Destruction of the generator set to prevent enemy use shall be in accordance with TM 750-244-3.

(F) (N) Air Force and Navy users shall refer to their service directives to obtain procedures for destruction of material to prevent enemy use.

PREPARATION FOR STORAGE OR SHIPMENT

Information on Preparation for Storage or Shipment refer to WP 0128, Preparation for Storage or Shipment.

LIST OF ABBREVIATIONS/ACRONYMS

Not applicable.

QUALITY OF MATERIEL

Material used for replacement, repair, or modification must meet the requirements of this TM 9-6115-644-24. If Quality of Material requirements are not state in this TM 9-6115-644-24, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to subject equipment.

SAFETY, CARE, AND HANDLING

Nuclear, Biological, Chemical (NBC) Contamination

The generator set is capable of being operated by personnel wearing nuclear, biological, or chemical (NBC) protective clothing without special tools or support equipment. Refer to FM 3-5, NBC decontamination, for information on decontamination procedures. The following are specific procedures for the generator set:

Control panel indicators, sealing gaskets, rubber sleeves, rope draw cords at output terminal access ports, control panel door gaskets, access door gaskets, rubber tubing and belts within the engine compartment, coverings for electrical conduits, external water drain tubing, and retaining cords for slave receptacle covers will absorb and retain chemical agents. Replacement of these items is the recommended method of decontamination.

Lubricants, fuel, coolant, or battery fluid may be present on the external surfaces of the generator set or

components due to leaks or normal operation. These fluids will absorb NBC agents. The preferred method of decontamination is removal of these fluids using conventional decontamination methods in accordance with FM 3-5.

Continued decontamination of external generator set surfaces with super-tropical bleach (STB)/ decontaminating solution number 2 (DS2) will degrade clear plastic indicator coverings to a point where reading indicators will become impossible. This problem will become more evident for soldiers wearing protective masks. Therefore, the use of STB or DS2 decontaminants in these areas should be minimized. Indicators should be decontaminated with warm soapy water.

External surfaces of the control panel assembly that are marked with painted or stamped lettering will not withstand repeated decontamination with STB or DS2 without degradation of this lettering. The recommended method of decontamination for these areas is warm soapy water.

Areas that will entrap contaminants, making efficient decontamination extremely difficult, include the following: space behind knobs and switches on the control panel, exposed heads of screws, areas adjacent to and behind exposed wiring conduits, hinged areas of access doors, spaces behind externally mounted equipment specification data plates, areas around external oil drain valve, retaining chains for external receptacle covers, areas behind external receptacle covers, access door locking mechanisms, recessed wells for access door handles, fuel caps, load output terminal board access door, slave receptacles, frequency adjustment controls, areas around tiedown/lifting rings, crevices around access doors, external screens covering ventilation areas, and areas adjacent to the external fuel drain valve. Replacement of these items, if available, is the preferred method of decontamination. Conventional decontamination methods should be used on these areas, while stressing the importance of thoroughness and the probability of some degree of continuing contact and vapor hazard.

In an NBC contaminated environment, the generator set should be operated with all access doors closed to reduce the effects of contamination.

The use of overhead shelters or chemical protective covers is recommended as an additional means of protection against contamination in accordance with FM 3-5. When using covers, care should be taken to provide adequate space for air flow and exhaust.

For additional NBC information, refer to FM 3-3 and 3-4. Other services use applicable publications for NBC.

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

Tools and Equipment

There are no special tools or support equipment required to perform any level of maintenance on the generator set. A list of recommended tools and support equipment required to maintain the generator set is contained in WP 0158, Table 2.

Maintenance Repair Parts

Repair parts and equipment are listed and illustrated in the repair parts and special tools list manuals TM 9-6115-644-24P and TM 9-2815-255-24P.

Fabrication of Tools and Equipment

No requirement exists for fabrication of tools and equipment for maintenance of the generator set.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CAPABILITIES AND FEATURES

The generator sets, models MEP-805A and MEP-815A (WP 0001, Figure 1), are fully enclosed, self-contained, skidmounted, portable units. They are equipped with controls, instruments, and accessories necessary for operation as single units or in parallel with another unit of the same class and mode. The generator sets consist of a diesel engine, brushless generator, excitation system, speed-governing system, fuel system, 24 VDC starting system, control system, and fault system.

TABULATED/ILLUSTRATED DATA

For generator set tabulated data, refer to Table 1.

Table 1. Tabulated Data.

Item	Characteristic
1. Generator Set:	
Model Number:	
30 kW 50/60 Hz	MEP-805A
30 kW 400 Hz	MEP-815A
National Stock Number (NSN):	
MEP-805A	6115-01-274-7389
MEP-815A	6115-01-274-7394
Overall Length:	
MEP-805A	79.7 in. (202.5 cm)
MEP-815A	79.7 in. (202.5 cm)
Overall Width:	
MEP-805A	35.7 in. (90.8 cm)
MEP-815A	35.7 in. (90.8 cm)
Overall Height:	
MEP-805A	55 in. (139.7 cm)
MEP-815A	55 in. (139.7 cm)
Dry Weight (Less Basic Issue Items):	
MEP-805A	2,732 lb. (1239.2 kg.)
MEP-815A	2,732 lb. (1239.2 kg.)
Wet Weight:	
MEP-805A	2,931 lb. (1329.5 kg.)
MEP-815A	2,931 lb. (1329.5 kg.)
2. Engine (MEP-805A/MEP-815A):	
Manufacturer	John Deere
Model	4039T
Type	Four cylinder, four cycle, turbocharged diesel

Table 1. Tabulated Data. - Continued

Item	Characteristic
Displacement	239 cu. in. (3.9 liters)
Altitude Degradation, 4,000 ft (1,220m) to 80,00 ft (2,440m)	3.5% per 1,000 ft (305m)
Firing Order	1, 3, 4, 2
Cold Weather Starting Aid System Use	40 °F (4 °C) or below
Valve Tappet Clearance Adjustment:	
Hot or Cold (Intake)	0.014 in. (0.35 mm)
Hot or Cold (Exhaust)	0.018 in. (0.45 mm)
3. Cooling System (MEP-805A/MEP-815A):	
Type	Pressurized radiator and pump
Capacity	15.5 qts (14.7 liters)
Normal Operating Temperature	170-200 °F (77-93 °C)
Temperature Indicating System Voltage Rating	24 VDC
4. Lubricating System (MEP-805A/MEP-815A):	
Type	Full flow, circulating pressure
Oil Pump Type	Positive displacement gear
Normal Operating Pressure	25-60 psi (172-414 kPa)
Oil Filter Type	Full flow, spin-on, replaceable element
Capacity	6 qts (5.7 liters)
Pressure Indicating System Voltage Rating	24 VDC
5. Fuel System (MEP-805A/MEP-815A):	
Type of Fuel	DF-1, DF-2, DF-A, JP4, JP5, JP8
Fuel Tank Capacity	14 gal. (53 liters)
Fuel Consumption Rate:	
MEP-805A	2.60 gal (9.8 liters) per hour
MEP-815A	2.75 gal (10.4 liters) per hour
Auxiliary Fuel Pump:	
Voltage Rating	24 VDC
Delivery Pressure	5.0-6.5 psi (34.5-65.5 kPa) (max)
Fuel Level Switch:	
Type	Float
Current	0.6 amps (min) at 24 VDC
6. Engine Starting System (MEP-805A/MEP-815A):	
Batteries	Two 12 volt, connected in series
Starter:	
Manufacturer	Nippondenso Co. Ltd.
Model	RE39930A
Voltage Rating	24 VDC

Table 1. Tabulated Data. - Continued

Item	Characteristic
Drive Type	Gear reduction
Battery Charging Alternator:	
Manufacturer	Prestolite
Model	8EM3002GC
Amperage Rating	42 amps at 24 VDC
Protective Fuse	30 amps
7. AC Generator (MEP-805/MEP-815):	
Manufacturer	Marathon Electric
Type	Rotating field, synchronous
Load Capacity	30 kW
Current Ratings:	<u>50 Hz</u> <u>60 Hz</u> <u>400 Hz</u>
120/208 (240/416) Volt Connection	86 (43) amps 104 (52) amps 104 (52) amps
Power Factor	0.8
Cooling	Fan cooled
Drive Type	Direct coupling
Duty Classification	Continuous
8. Governing System (MEP-805A/MEP-815A):	
Load Measuring Unit:	
Manufacturer	Technology Research
Model	19310
Governor Control Unit:	
Manufacturer	Barber-Coleman
Model	DYNA 10502-002-0-2
9. Protection Devices (MEP-805A/MEP-815A):	
Low Oil Pressure Switch:	
Trip Pressure	15±3 psi (103.4±20.7 kPa)
Voltage Rating	12/24 VDC
Current Rating	7 amps resistive; 4 amps inductive
Coolant High Temperature Switch:	
Trip Temperature	225±5 °F (107±3 °C)
Voltage Rating	20-32 VDC
Current Rating	7 amps resistive; 4 amps inductive
Overspeed Switch:	
Element Trip and Reset	2200±40 rpm
Voltage Rating	28 VDC
Current Rating	1 amp
Overvoltage Relay:	
Trip Point Conditions	155±1 VAC for no less than 200 milliseconds (120 VAC coil winding)

Table 1. Tabulated Data. - Continued

Item	Characteristic
Trip Point	No more than 1.25 seconds after trip conditions exist

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

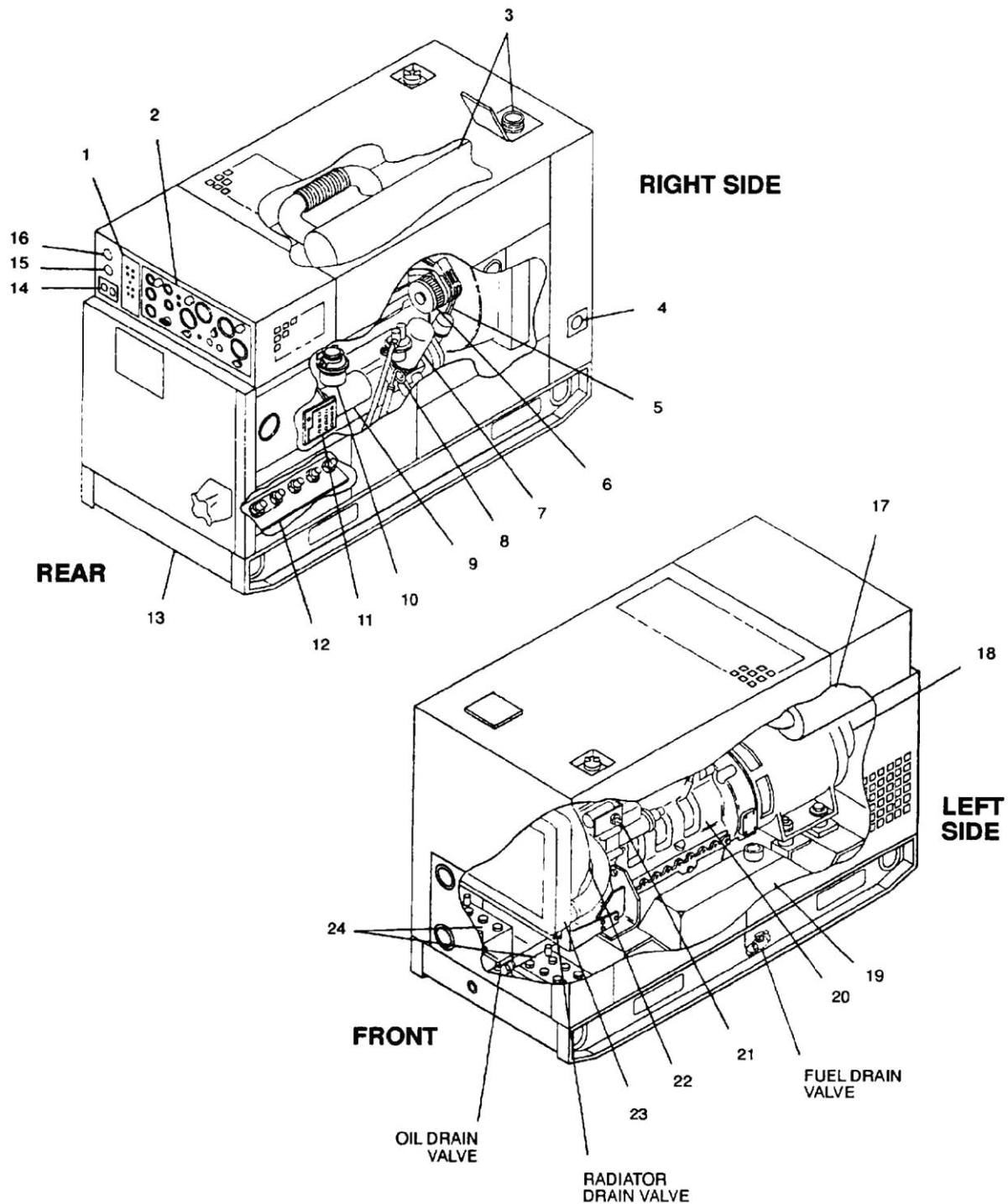


Figure 1. Generator Set Components.

NOTE

All locations (Figure 1) of the index numbers referenced herein are given facing the control box side (rear) of the generator set.

Malfunction Indicator Panel (1). The malfunction indicator panel is located to the left of the control panel assembly. It indicates malfunctions of the generator set components.

Control Panel Assembly (2). The generator set control panel assembly is located at the rear of the generator set and contains controls and instruments for operating the engine and the generator.

Muffler (3). The muffler and exhaust tubing are connected to the turbocharger on the engine. The exhaust exits from the top of the generator set housing. Gases are exhausted upward.

NATO Slave Receptacle (4). The NATO slave receptacle is located on the right side (front) of the generator set. It is a NATO receptacle used for remote battery connection.

Fan Belt (5). The fan belt is located in the engine compartment on the front of the engine. The belt drives the fan, water pump, and battery charging alternator.

Battery Charging Alternator (6). The battery charging alternator is located on the right side of the engine. It is capable of maintaining the batteries in a state of full charge in addition to providing the required 24 VDC control power.

Oil Filter (7). The oil filter is located in the engine compartment on the right side. The filter removes impurities from the engine lube oil.

Dipstick (8). The dipstick is located in the engine compartment on the right side. The dipstick shows the lube oil level in the engine crankcase.

Starter (9). The starter is located on the right side of the engine. The electric cranking motor mechanically engages the engine flywheel in order to start the diesel engine.

Fuel Filter/Water Separator (10). The fuel filter/water separator is located in the engine compartment on the right side. The element removes impurities and water from the diesel fuel.

AC Voltage Reconnection Terminal Board (11). The AC voltage reconnection terminal board is located on the right side (rear) of the generator set. The board allows reconfiguration from 120/208 to 240/416 VAC output.

Load Output Terminal Board (12). The load output terminal board is located on the right side (rear) of the generator set. Four AC output terminals are located on the board. They are marked L1, L2, L3, and L0. A fifth terminal, marked GND, is located next to the output terminals and serves as equipment ground for the generator set. A removable, solid copper bar is connected between the L0 and GND terminals.

Skid Base (13). The skid base supports the generator set. It has fork lift access openings and cross members for short distance movement. The skid base has provisions in the bottom for installation of the generator set on a trailer.

CONVENIENCE RECEPTACLE (14). The CONVENIENCE RECEPTACLE is a 120 VAC receptacle used to operate small plug-in type equipment.

PARALLELING RECEPTACLE (15). The PARALLELING RECEPTACLE is used to connect the paralleling cable between two generator sets of the same size and mode to operate in parallel.

Diagnostic Connector (16). The diagnostic connector is a multi-pin plug that is wired to specific points in the generator set electrical system to enable monitoring and troubleshooting of the generator set operation at a single location.

Air Cleaner Assembly (17). The air cleaner assembly is located on the left side behind the air cleaner access door. It consists of a dry-type, disposable paper filter and canister. The air cleaner assembly features a dust collector which traps large dust particles. The air cleaner assembly has a restriction indicator which will pop up during operation when the air cleaner requires servicing.

AC Generator (18). The AC generator is a single bearing, drip-proof, synchronous, brushless, three phase, air-cooled generator. The generator is coupled directly to the rear of the diesel engine.

Fuel Tank (19). The 23 gallon (87.1 liters) fuel tank is located in the front of the generator set below the engine and between the skid base side members. The fuel tank is a fuel reservoir and has sufficient capacity to enable the generator set to operate for at least 8 hours without refueling.

Engine (20). The generator is powered by a four cylinder, four cycle, fuel injected, turbocharged, liquidcooled diesel engine which occupies the front half of the generator set. The engine is also equipped with a fuel filter/water separator, oil filter, and an air cleaner assembly. Protection devices automatically stop the engine during conditions of high coolant temperature, low oil pressure, no fuel, overspeed, or overvoltage.

DEAD CRANK Switch (21). The DEAD CRANK switch is located in the engine compartment on the left side. The switch allows the engine to be turned over without starting for maintenance purposes.

Water Pump (22). The water pump is located in the engine compartment on the front of the engine. The pump circulates the engine coolant through the engine block and the radiator.

Radiator (23). The radiator is located at the front of the generator set. It acts as a heat exchanger for the engine coolant.

Batteries (24). Two batteries are located at the front of the generator set. The batteries are electrolyte serviceable, lead acid, 12 VDC type. After starting, the generator set is capable of operating with batteries removed. A diode, located behind the control panel, protects the generator set if the batteries are incorrectly connected.

DIFFERENCES BETWEEN MODELS

The differences between models of the generator sets covered in this manual are as follows:

- a. Model MEP-805A is equipped with a 50/60 Hz generator, 50/60 Hz frequency meter, and 50/60 Hz frequency selector switch.
- b. Model MEP-815A is equipped with a 400 Hz generator and a 400 Hz frequency meter.

EQUIPMENT DATA

For generator set performance characteristics, refer to Table 2.

Table 2. Performance Characteristics.

Item	MEP-805A	MEP-815A
1. Voltage:		
a. Voltage Waveform Deviation Factor	5% (max)	5% (max)
Single Voltage Harmonics	2% (max)	2% (max)
b. Voltage Unbalance	5% of rated voltage (max)	5% of rated voltage (max)
c. Phase Balance Voltage	1% of rated voltage (max)	1% of rated voltage (max)
d. Voltage Modulation	1% (max)	1% (max)
e. Voltage Regulation	1% (max)	1% (max)
f. Short-term Stability (30 seconds)	1% of rated voltage	1% of rated voltage
g. Long-term Stability (4 hours)	2% of rated voltage	2% of rated voltage
h. Voltage Drift (60 °F (16 °C)) in 8 hour period)	±1% (max)	±1% (max)
i. Dip and Rise for Rated Load Recovery Time	15% of rated voltage (max) 0.5 second	12% of rated voltage (max) 0.5 second
j. Dip for Low Power Factor Load Recovery Time	30% of no-load voltage (max) 0.7 second 85% of no-load voltage (max)	25% of no-load voltage (max) 0.7 second 85% of no-load voltage (max)

Table 2. Performance Characteristics. - Continued

Item	MEP-805A	MEP-815A
k. Adjustment Range VAC	<u>50 Hz</u>	<u>400 Hz</u>
120/208 V Connection	190-213 V	197-229 V
240/416 V Connection	380-426 V	395-458 V
	<u>60 Hz</u>	
120/208 V Connection	197-240 V	
240/416 V Connection	395-480 V	
2. Frequency:		
a. Regulation	0.25% of rated frequency	0.25% of rated frequency
b. Short-term Steady-state Stability (30 seconds)	0.5% of rated frequency	0.5% of rated frequency
c. Long-term Steady-state Stability (4 hours)	1% of rated frequency	1% of rated frequency
d. Frequency Drift (60 °F (16 °C) in 8 hour period)	0.5% (max)	0.5% (max)
e. Undershoot with Application of Load	4% of rated frequency (max)	4% of rated frequency (max)
Recovery Time	2 seconds	1 second
f. Overshoot with Application of Load	4% of rated frequency (max)	1.5% of rated frequency (max)
Recovery Time	2 seconds	1 second
g. Adjustment Range	48-52 Hz, not below 45 Hz for 50 Hz operation 58-62 Hz, not above 65 Hz for 60 Hz operation	390-420 Hz, not below 370 Hz or above 430 Hz

NOTE

Maintenance procedures for the 50/60 Hz (MEP-805A) and 400 Hz (MEP-815A) generators are identical except where noted.

GENERATOR ASSEMBLY TECHNICAL DESCRIPTION**General**

Revolving field type generators have a DC field revolving within a stationary AC winding called the stator. AC power is distribution from the generator through leads connected to the stator windings. There are no sliding contacts between the AC winding and the load, therefore, great amounts of power may be drawn from this generator.

NOTE

Refer to Figure 2 as needed.

To energize the field, DC excitation must be applied to the generator field coils. The excitation current is supplied from a brushless exciter mounted on the generator shaft.

The brushless exciter is actually an AC generator with its output rectified through a full wave bridge circuit. This type of brushless exciter will provide the necessary excitation current. The generator set field flash circuit, activated during each engine start, applies voltage to the exciter stator to begin the voltage buildup process to energize the generator field.

The generator output voltage is controlled by controlling the alternating field current. This is accomplished by regulating the exciter field coil voltage. The exciter field coil voltage is regulated with a solidstate-type AC Voltage Regulator.

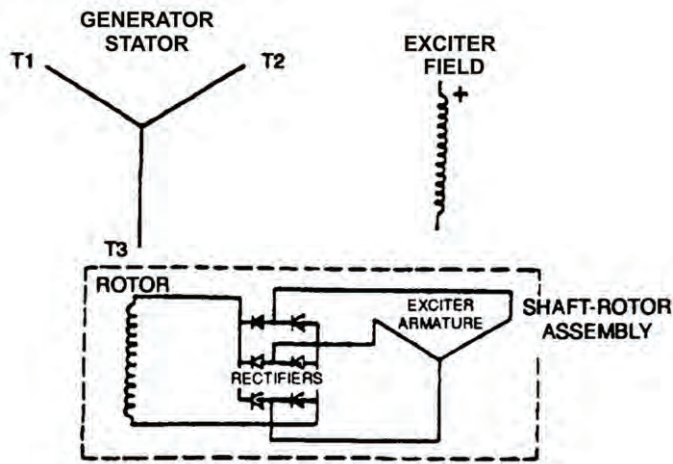


Figure 2. Brushless Generator Schematic.

Damper Bars

Damper bars are inserted through the field laminations and welded at the end to a solid copper plate. The damper windings provide stable parallel operation, reduce damping current losses, and limit the increase of third harmonic voltage with increase in load.

Brushless Exciter

The brushless exciter consists of an armature with a three-phase AC winding and rotating rectifier assembly within a stationary field. The stationary exciter field assembly is mounted in the main generator frame. The exciter armature is press-fit and keyed onto the shaft assembly. The rotating rectifier assembly slides over the bearing end of the generator rotor shaft and is secured with bolts and washers to an adapter hub which is shrunk onto the generator shaft.

Rotating Rectifier Bridge

The rotating rectifier bridge consists of rectifying diodes mounted on a brass heat sink which is in turn mounted on an insulating ring. The entire assembly bolts to the adapter on the generator shaft. Therefore, the rotating rectifier assembly will rotate with the exciter armature eliminating the need for any sliding contacts between the exciter output and the alternator field.

Exciter Field

The exciter field on the high frequency exciter consists of laminated segments of high carbon steel which are fitted together to make up the field poles. The field coils are placed into the slots of the field poles.

Exciter Field Coil Voltage Source

Field coil DC voltage is obtained by rectifying the voltage from a phase to neutral line of the generator output or other appropriate terminal to provide the needed voltage reference. The rectifier bridge is an integral part of the static regulator. The static regulator senses a change in the generator output and automatically regulates current flow in the exciter field coil circuit to increase or decrease the exciter field strength. An external adjust rheostat sized to be compatible with the regulator is used to provide adjustment to the regulator sensing circuit.

Balance

The rotor assembly is precision balanced to a high degree of static and dynamic balance. Balance is achieved with the balance lugs on the field pole tips. The balance will remain dynamically stable at speeds in excess of the design frequencies.

Bearing

The generator rotor assembly is suspended on shielded, factory-lubricated ball bearings. They are greased for life and do not require lubrication.

Stator Assembly

The stator assembly consists of laminations of steel mounted in a rolled steel frame. Random wound stator coils are fitted into the insulated slots.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****THEORY OF OPERATION**

INTRODUCTION

This work package contains functional descriptions of the generator set, explains how the controls and indicators interact with the systems, and provides the location and description of major components.

PRINCIPLES OF OPERATION**Fault System**

The fault system (Figure 1) protects the generator set and any connected load against the potential faults described below and provides an indication of any incurred fault. The following summary of the fault system will assist in understanding the operation of the other generator set systems. Additional details relating to specific protection devices are also provided in the descriptions of the respective systems.

The fault system consists of the malfunction indicator, low fuel level float switch, fuel float switch module, fuel level relay, low oil pressure switch, coolant high temperature switch, overvoltage relay, overload/short circuit relay, overspeed switch, overspeed relay, OVERSPEED RESET switch, undervoltage relay, reverse power relay, engine fault relay, electrical fault relay, and BATTLE SHORT switch. In addition to the fault indicator lamps, the malfunction indicator includes the PUSH TEST & RESET LAMPS switch which, when depressed, illuminates all the lamps and resets any fault indication.

Activation of any one of the following protection devices will cause three events to occur. The AC circuit interrupter relay will open; the generator set engine will be shut down; and a fault indicator lamp will be illuminated to show which malfunction occurred.

Coolant High Temperature Switch. This device will activate when the engine coolant leaving the engine exceeds 225 ± 5 °F (107 ± 3 °C).

Low Oil Pressure Switch. This device activates when the engine lubrication oil pressure falls below 15 ± 3 psi (103.4 ± 20.7 kPa).

Low Fuel Level Float Switch. This device will activate when the fuel level falls to a point at which the operating time of the set at rated load is four minutes.

Overvoltage Relay. This device will activate when the 120-volt generator coil winding has risen to and remained at any value greater than 155 ± 1 volts.

Overspeed Relay. This device will activate when the engine speed exceeds 2200 ± 40 rpm.

Fuel Float Switch Module. The fuel float switch module is a device that prevents inadvertent engine shutdown by providing a one second delay after actuation of the low fuel level float switch.

Electrical Protection. Electrical protection devices will cause two events to occur. The AC circuit interrupter relay will open, and a fault indicator lamp will illuminate to indicate which fault occurred.

Short Circuit Relay. This device will activate when the set output current in any phase exceeds 425 percent of rated value.

Overload Relay. This device will operate when the load current in any phase exceeds 110 percent of rated value.

Undervoltage Relay. This device will activate instantaneously when the 120 volt generator coil winding has dropped to 48 volts and will trip after time delay when the coil voltage drops below 99 volts.

Reverse Power Relay. This device will operate if power flow into the generator set exceeds 20 percent of rated value.

Although it is possible for more than one fault to occur at one time during operation, only the first fault to occur will be displayed by the malfunction indicator. The activated indicator lamp circuit remains illuminated until the malfunction indicator is reset. The lamp will be off with the MASTER SWITCH in the OFF position and will be reilluminated when the MASTER SWITCH is turned to one of the RUN positions. Resetting a fault indication is done in two steps. First, push the PUSH TEST & RESET LAMPS switch located on the malfunction indicator. Second, move the MASTER SWITCH to the OFF position. After a shutdown due to engine overspeed, the OVERSPEED RESET switch must be actuated to reset the engine electrical control circuit before the engine can be restarted.

After the generator set engine has been started, the BATTLE SHORT switch can be used to override all of the potential faults except engine overspeed and short circuit.

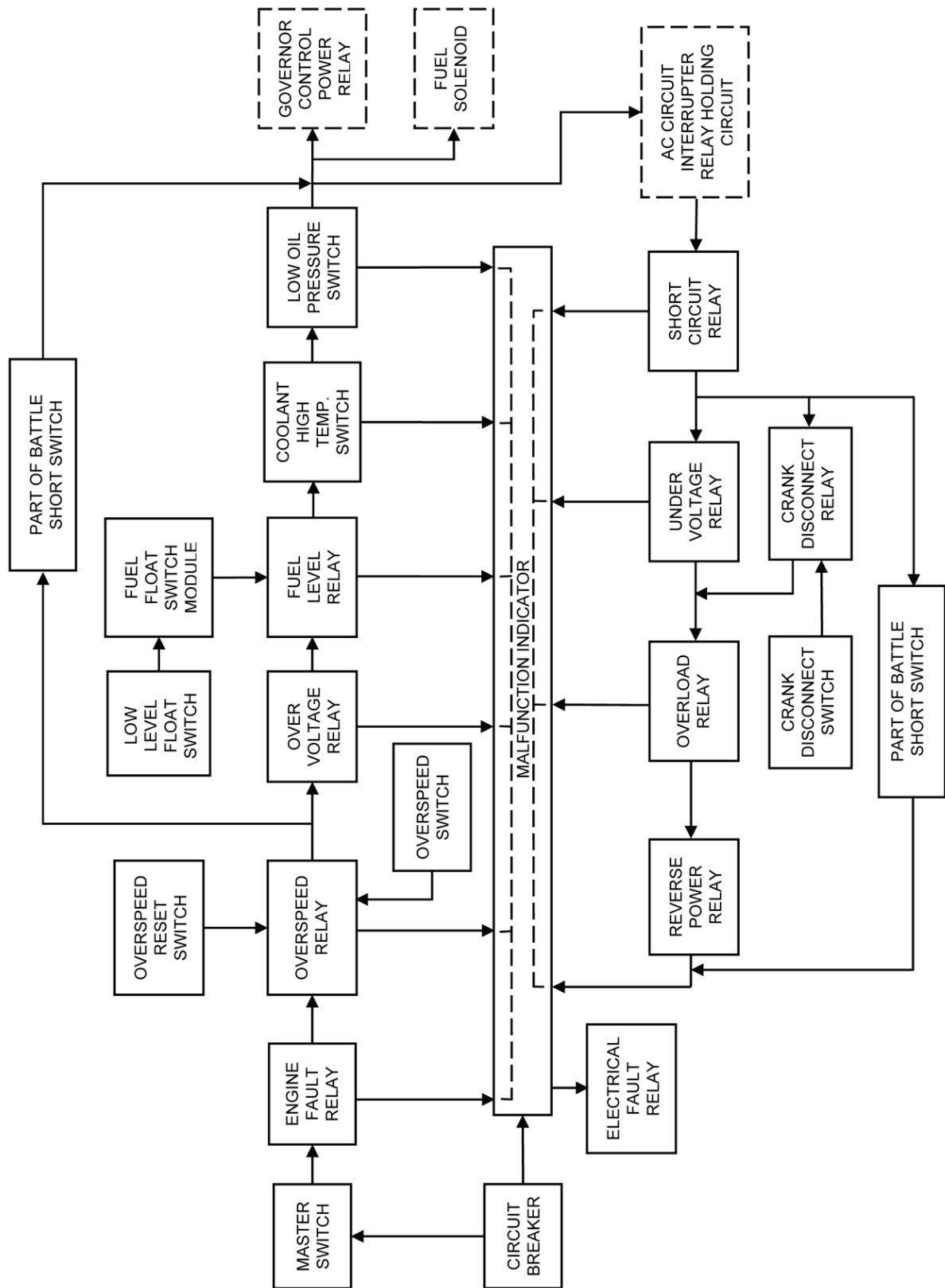


Figure 1. Fault System.

Fuel System

The fuel system (Figure 2) includes a primary subsystem and an auxiliary subsystem.

The primary subsystem consists of fuel lines, fittings, fuel tank, low fuel level float switch, fuel float switch module, fuel level sender, FUEL LEVEL indicator, transfer pump, fuel filter/water separator, injection pump, and injectors. The injection pump includes a 24 VDC fuel shutoff valve.

The injection pump output is controlled by the electronic governor control and governor actuator. When the electronic governor control is deenergized, electrical power is removed from the governor actuator which is spring-loaded to the fuel shutoff position. The electronic governor control is energized by turning the MASTER SWITCH to the START position or either of the two RUN positions. With the engine cranking or running, fuel is drawn from the fuel tank by the transfer pump. After reaching the transfer pump, fuel passes through a fuel filter/water separator where water and small impurities are removed. The fuel then goes to the injection pump. With the governor system energized, the fuel is metered, pressurized, and pushed through the injectors by the injection pump. Fuel is sprayed by the injectors into the diesel engine combustion chambers where it is mixed with air and ignited. The fuel that is not used by the injectors is returned to the fuel tank by an excess fuel return line. Power is removed from the electronic governor control, and the fuel is shut off whenever the MASTER SWITCH is turned to the OFF position. The electronic governor control is also deenergized by the fault system (Fault System). The FUEL LEVEL indicator displays the fuel level of the fuel tank from E (empty) to F (full) in quarter tank increments.

The auxiliary subsystem consists of an auxiliary fuel supply, fuel lines, fittings, auxiliary fuel filter, auxiliary fuel pump, an auxiliary fuel pump float switch located in the fuel tank, and a fuel float switch module.

When the MASTER switch is set on PRIME & RUN AUX FUEL, it actuates the auxiliary fuel pump and transfers fuel from the auxiliary fuel supply to the fuel tank. The auxiliary fuel pump float switch shuts off the auxiliary fuel pump when the fuel tank is full and reactivates the pump as the level drops. The fuel float switch module allows the current used by the auxiliary fuel pump to bypass the float switch.

The 24 VDC control circuits provide control and power for indicators, float switches, fault system, governor control system, and auxiliary fuel pump.

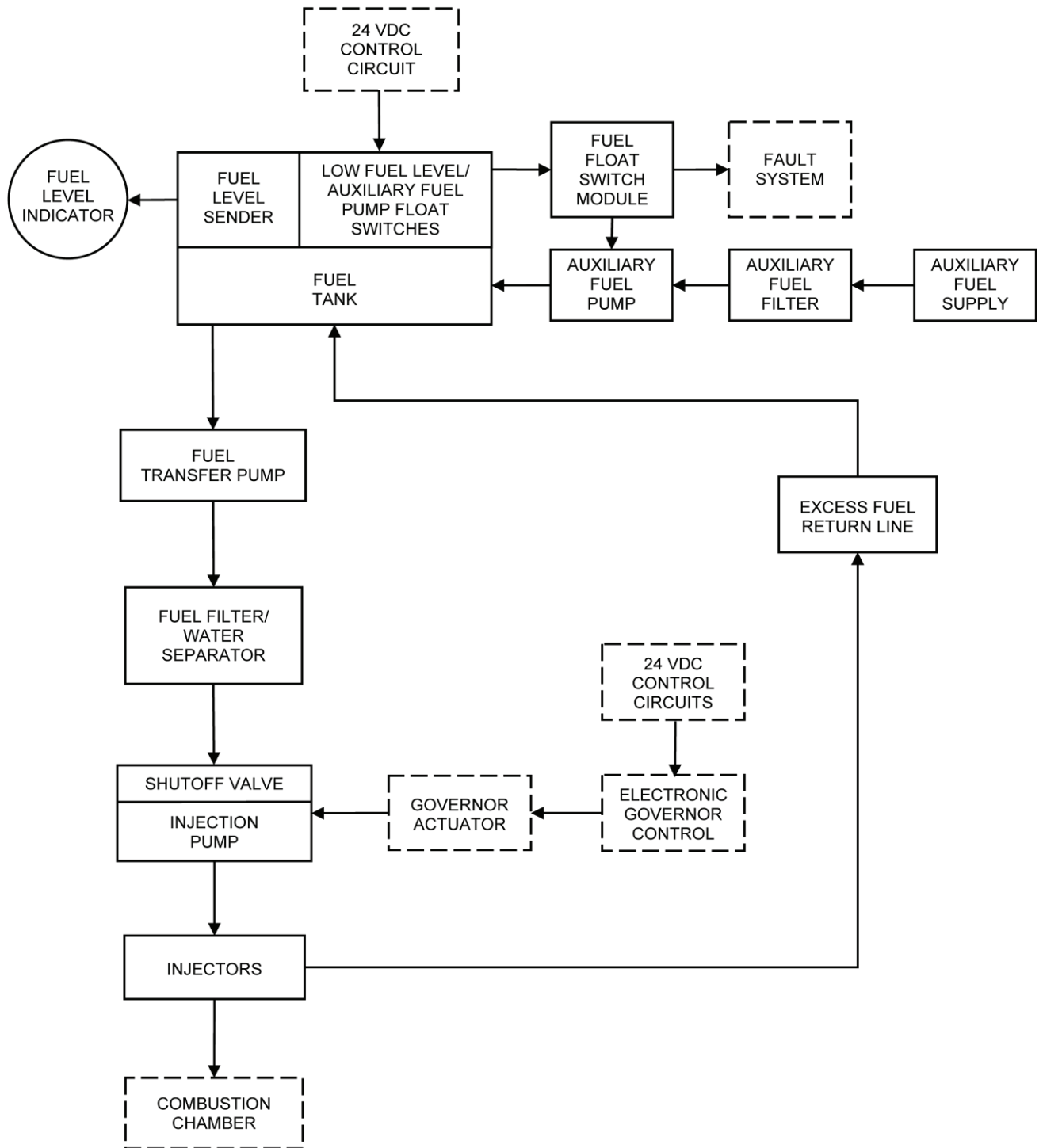


Figure 2. Generator Set Fuel System.

Generator Set Cooling System

The generator set cooling system (Figure 3) includes air intake and exhaust grilles, baffles and ducting within the generator set housing, and the engine-driven radiator cooling fan. The air intake grilles are located in panels on both sides of the generator set housing. The air exhaust grille is located in the housing top panel.

Air is drawn in through the air intake grilles and forced through the engine coolant radiator and out of the generator set through the exhaust grille by the radiator cooling fan. Most of the cooling air flows externally past the generator assembly and engine. Some cooling air is circulated internally through the generator assembly by a generator fan which is an integral part of the AC generator assembly. Baffles, ducting, and sound-absorbing material are used to control the airflow through the generator set and to reduce sound transmission through the grilles.

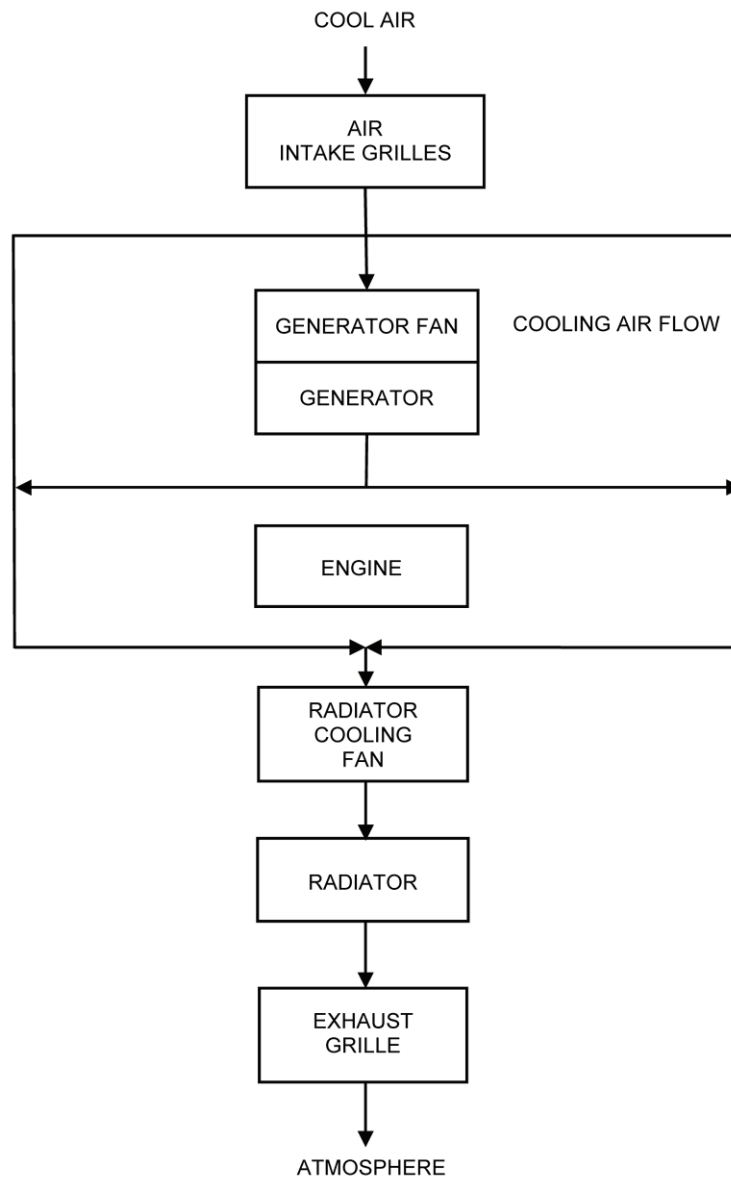


Figure 3. Generator Set Cooling System.

Engine Cooling System

The engine cooling system (Figure 4) consists of a radiator, hoses, thermostat, temperature sender, coolant high temperature switch, COOLANT TEMP indicator, water pump, oil cooler, belt-driven fan, and cooling jackets (part of engine).

The water pump forces coolant through passages (cooling jackets) in the engine block and cylinder head where the coolant absorbs heat from the engine. When the engine reaches normal operating temperature, the thermostat opens and the heated coolant flows through the upper radiator hose assembly into the radiator. The cooling fan circulates air through the radiator where the coolant temperature is reduced.

A coolant high temperature switch in conjunction with the fault system provides automatic shutdown in the event that coolant temperature exceeds 225 ± 5 °F (107 ± 3 °C). The COOLANT TEMP indicator displays the engine coolant temperature from 120 to 240 °F (48 to 115 °C).

The water pump also circulates coolant through the engine oil cooler to cool the engine oil.

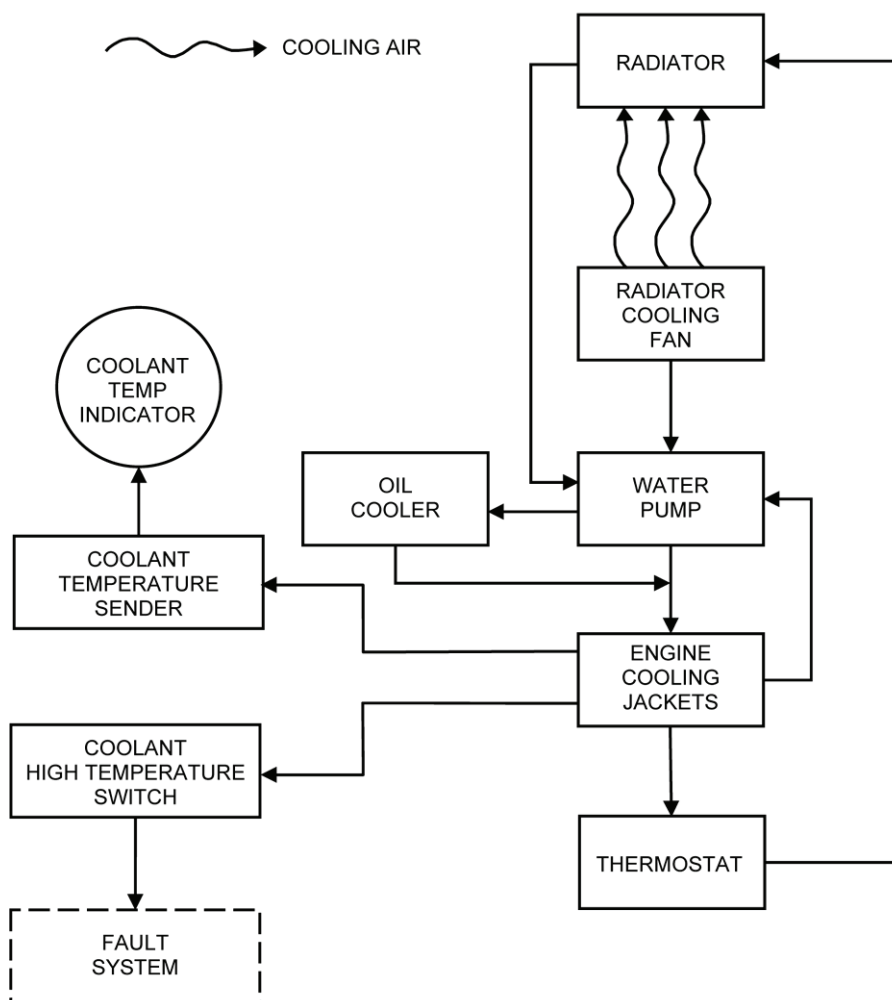


Figure 4. Engine Cooling System.

Engine Lubrication System

The engine lubrication system (Figure 5) consists of an oil pan, dipstick, pump, oil cooler, oil sample valve, oil pressure sender, OIL PRESSURE indicator, low oil pressure switch, and filter.

The oil pan is a reservoir for engine lubricating oil. The dipstick indicates oil level in the pan. The oil level can be checked during engine operation. One side of the dipstick is used for checking oil level while the engine is running and the other side is used while the engine is shut down. The pump draws oil from the oil pan through a screen that removes large impurities. The oil then passes through tubes in the oil cooler. Engine coolant from the engine cooling system is circulated around the tubes to cool the oil. From the cooler, oil passes through a spin-on type filter where small impurities are removed. From the filter, oil is distributed to the engine and turbocharger moving parts and then returns to the oil pan. The oil pressure sender located in the engine block senses oil pressure. The oil pressure is displayed on the OIL PRESSURE indicator. An Army Oil Analysis Program (AOAP) sample valve located in the block allows oil samples to be taken while the engine is operating. The low oil pressure switch, also located in the engine block, functions with the generator set fault system. The engine is automatically shut off if the oil pressure drops below 15 ± 3 psi (103.4 ± 20.7 kPa).

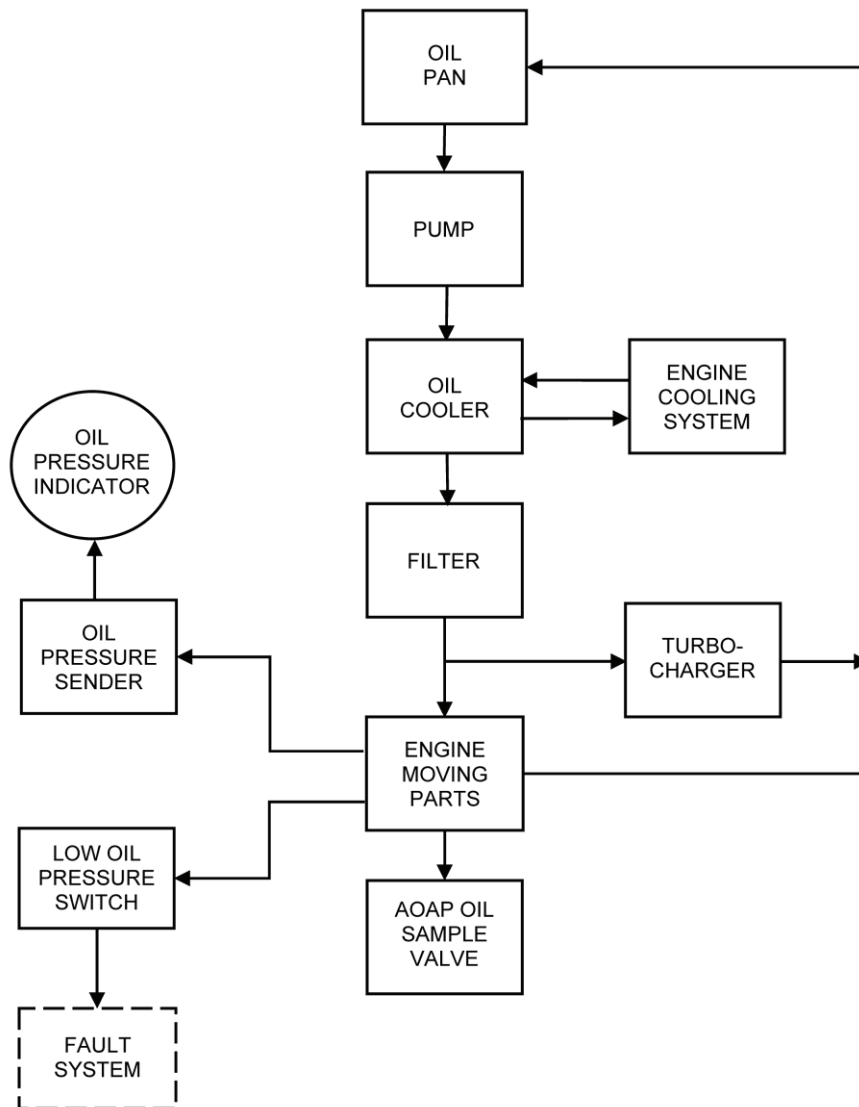


Figure 5. Engine Lubrication System.

Engine Air Intake and Exhaust System

The engine air intake and exhaust system (Figure 6) consists of an air cleaner assembly, intake manifold, ether supply tank, ether solenoid valve, ETHER switch, exhaust manifold, turbocharger, crankcase breather filter, and muffler. The air cleaner assembly includes a dust collector, filter element, restriction indicator, and dust evacuator valve.

Air is drawn into the dust collector and passes through the filter element. Airborne dirt is removed and trapped in the dust collector and filter element. Some dust can be removed from the dust collector by pinching the evacuator valve. The restriction indicator indicates when the filter should be serviced. Filtered air is drawn out of the filter through air intake tubes into the turbocharger where it is compressed and forced into the engine.

The engine exhaust gases are expelled into the exhaust manifold and ported to the turbine of the turbocharger. The turbine drives the turbocharger compressor which compresses the intake air. Exhaust gases discharged by the turbocharger are channeled into the muffler to deaden the sound of the exhaust gases. The gases pass from the muffler through the muffler outlet and are vented upward from the generator set housing. A cover, which is held open by the pressure of the exhaust gases during operation, closes over the exhaust port to prevent rain, water, or other foreign matter from entering the exhaust port when the set is not in use. The cover is easily removed for connection of an exhaust pipe for indoor operation.

Combustion gases which enter the crankcase are filtered through the crankcase breather filter to remove oil droplets and are then recycled through the intake manifold.

An ether supply system is provided to improve engine starting when outside ambient air temperature is below 40 °F (4 °C). The ether system includes an ether supply tank, ether solenoid valve, ETHER switch, and piping from the solenoid valve to the intake manifold. The ether system is activated by turning the MASTER SWITCH to START and holding the ETHER switch in the ON position.

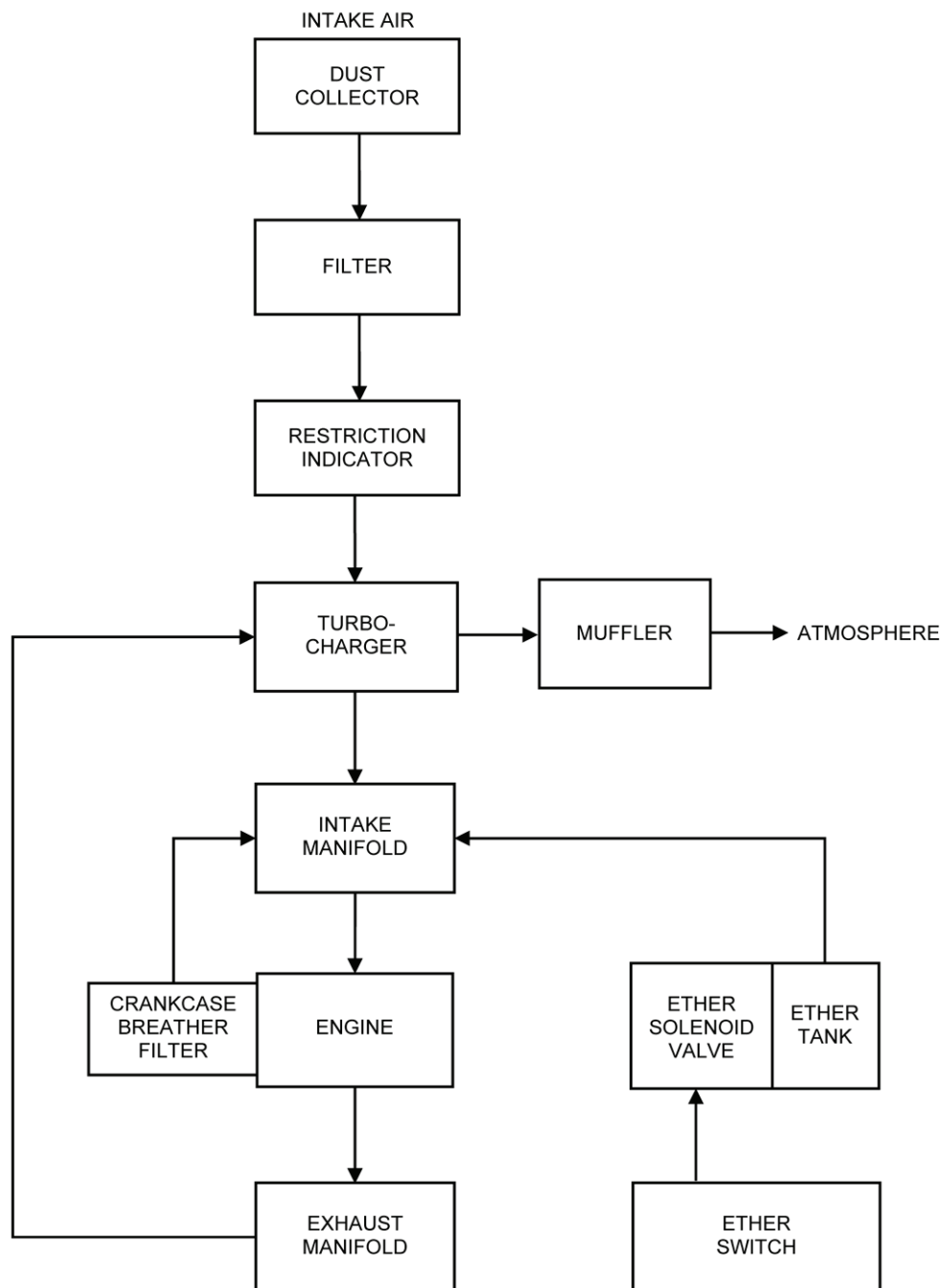


Figure 6. Engine Air Intake and Exhaust System.

Output Supply System

The output supply system (Figure 7) consists of the AC generator, GROUND FAULT CIRCUIT INTERRUPTER (GFCI), CONVENIENCE RECEPTACLE, current transformer, AC voltage reconnection terminal board, AC circuit interrupter relay, load output terminals, AC CIRCUIT INTERRUPTER switch, kilowatt transducer, kilowattmeter (PERCENT POWER), VM-AM transfer switch, AC voltmeter (VOLTS AC), and ammeter (PERCENT RATED POWER).

Power created by the generator is supplied through the current transformer, AC voltage reconnection terminal board, and AC circuit interrupter relay to the output terminals. The AC voltage reconnection terminal board allows configuration of the generator set for 120/208 volt connections or 240/416 volt connections. The AC CIRCUIT INTERRUPTER switch closes and opens the AC circuit interrupter relay. This enables or interrupts the power flow between the AC voltage reconnection terminal board and the load output terminals. The voltage regulation system (Voltage Regulation System) senses generator output voltage and provides a control signal to the generator exciter to maintain the desired generator output voltage. Generator output frequency is controlled by the governor control system (Governor Control System) and is read on the FREQUENCY meter (HERTZ). The current transformer provides a reduced current signal to the kilowatt transducer and ammeter (PERCENT RATED CURRENT). The kilowatt transducer and kilowattmeter (PERCENT POWER) provide an indication of the power being used by the load. The ammeter (PERCENT RATED CURRENT) indicates the percent of rated current being supplied to the load. The position of the VM-AM transfer switch selects the output load terminals from which current and voltage is measured. The AC circuit interrupter relay will open and disconnect the load whenever any of the following faults occur: reverse power, undervoltage, overload, or short circuit.

The AC generator also provides 120 VAC power to the CONVENIENCE RECEPTACLE through the GROUND FAULT CIRCUIT INTERRUPTER.

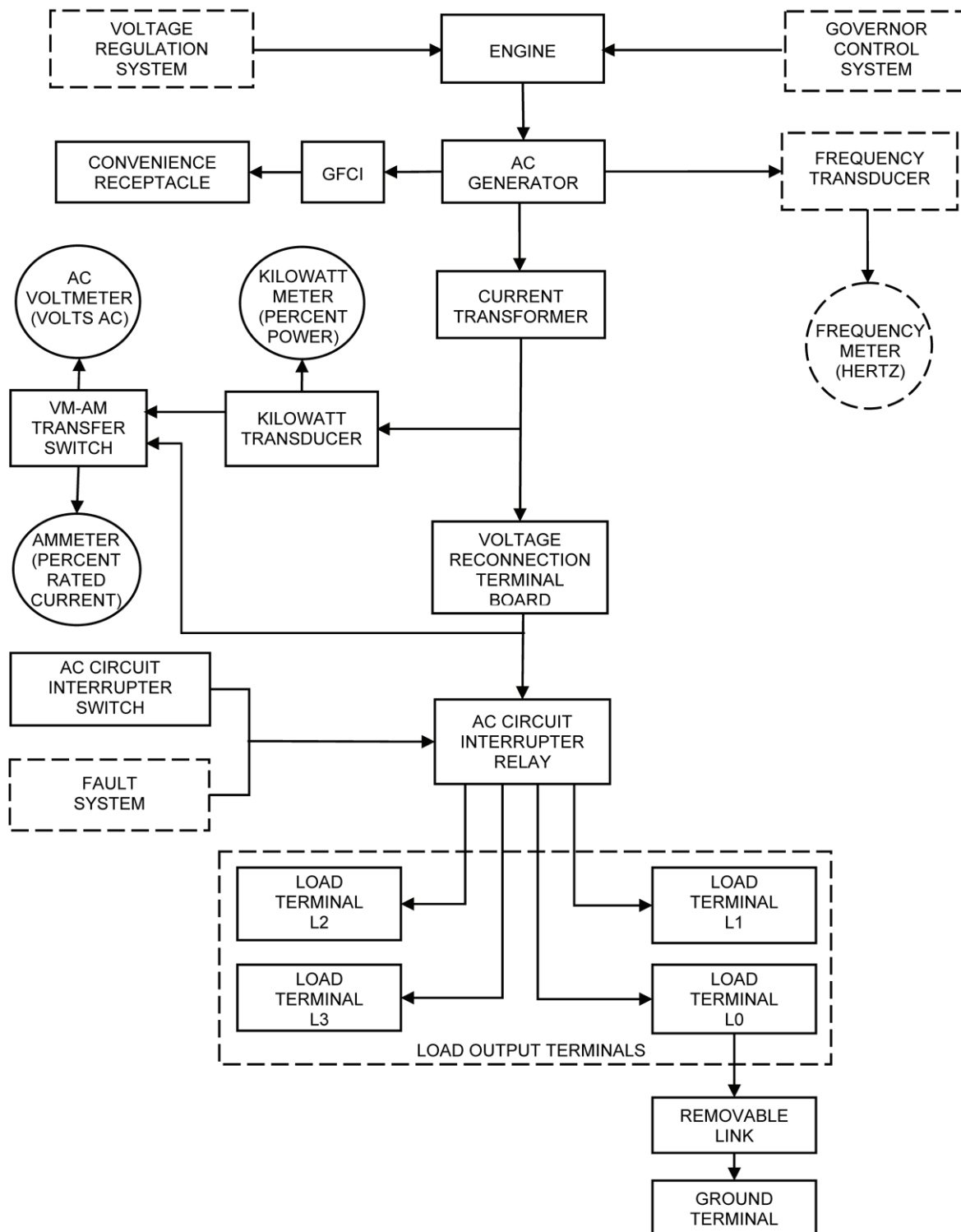


Figure 7. Output Supply System.

Generator Set Controls

Engine Starting System. Engine starting is accomplished primarily with two 12-volt batteries, connected in series to provide 24 VDC power, and a starter (Figure 8). The starter includes a cranking motor and a solenoid. To permit engine starting, the DC CONTROL POWER circuit breaker must be pushed in, the DEAD CRANK switch must be in the NORMAL position, and the BATTLE SHORT switch must be in the OFF position. In addition, any ENGINE SHUTDOWN fault previously registered on the malfunction indicator panel must have been corrected and the malfunction indicator panel must have been reset. When the MASTER SWITCH is then placed in the START position, the starting circuits supply 24 VDC power to the starter. As the engine accelerates to approximately 900 rpm, the starting circuits disconnect power from the starter.

When the MASTER SWITCH is first moved to the START position, the various instrument and control circuits are energized. The engine starting system includes two control circuits. One starting control circuit energizes the start relay through closed switch contacts of the engine fault relay and the BATTLE SHORT switch. The other starting control circuit energizes the cranking relay coil through closed contacts of the crank disconnect switch and the start relay. (The crank disconnect switch is an integral part of the electronic governor control.) With the cranking relay energized, power passes from the batteries through closed contacts of the cranking relay to energize the starter solenoid. With the starter solenoid energized, power passes from the starter solenoid to the cranking motor. The cranking motor then cranks the engine. Engine speed is sensed by the magnetic pickup which sends a signal to the electronic governor control. As the engine accelerates to approximately 900 rpm, the signal from the magnetic pickup causes the crank disconnect switch to open one set of contacts and close another set of contacts. The open contacts break the circuit to the cranking relay and stop engine cranking. The closed contacts cause the field flash relay to be energized. When the MASTER SWITCH is moved to one of the two RUN positions, both starting control circuits are deenergized. The other generator set control and instrument circuits remain energized.

The engine may be cranked without starting by use of the DEAD CRANK switch. With the DEAD CRANK switch in the CRANK position, the cranking relay coil is energized to initiate engine cranking without energizing any other starting or control functions.

The generator set can be started without batteries by connecting an external 24 VDC power source to the NATO slave receptacle. The generator set can also supply starting power to another generator set through the NATO slave receptacle.

The batteries are charged by the battery charging alternator that is belt-driven by the engine. The BATTERY CHARGE ammeter indicates the charge/discharge rate of the batteries from -10 amps to +20 amps. A shunt provides a DC voltage signal, which is directly proportional to the actual battery current flow, to the BATTERY CHARGE ammeter. Normal operating indication on the BATTERY CHARGE ammeter depends on the state of the charge in the batteries. A low charge, which may exist immediately after engine starting, will cause a high reading (needle moves toward CHARGE area). When the charge in the batteries has been restored, the indicator moves near zero (0). The battery charging system is protected from reverse polarity in the battery connections by a fuse and diode.

Field Flash. When the engine reaches sufficient speed (900 rpm), the magnetic pickup causes a set of contacts in the crank disconnect switch to close and energize the field flash relay. This circuit provides current to the exciter field windings which sets up an electromagnetic field. The field current is necessary for the set to generate sufficient voltage for the voltage regulator (Figure 10) to begin controlling the output voltage of the generator set. The field flash circuit is maintained until the MASTER SWITCH is released from the START position.

Operation. Placing the MASTER SWITCH in the PRIME & RUN or PRIME & RUN AUX FUEL position keeps the electronic governor control (Figure 9) energized, and fuel will be supplied to the fuel injection pump as long as no fault condition exists. During operation, the operator should periodically check generator set instruments to ensure they are reading in the normal operating ranges. The VOLTAGE and FREQUENCY potentiometers are adjusted as required to maintain desired frequency and voltage output.

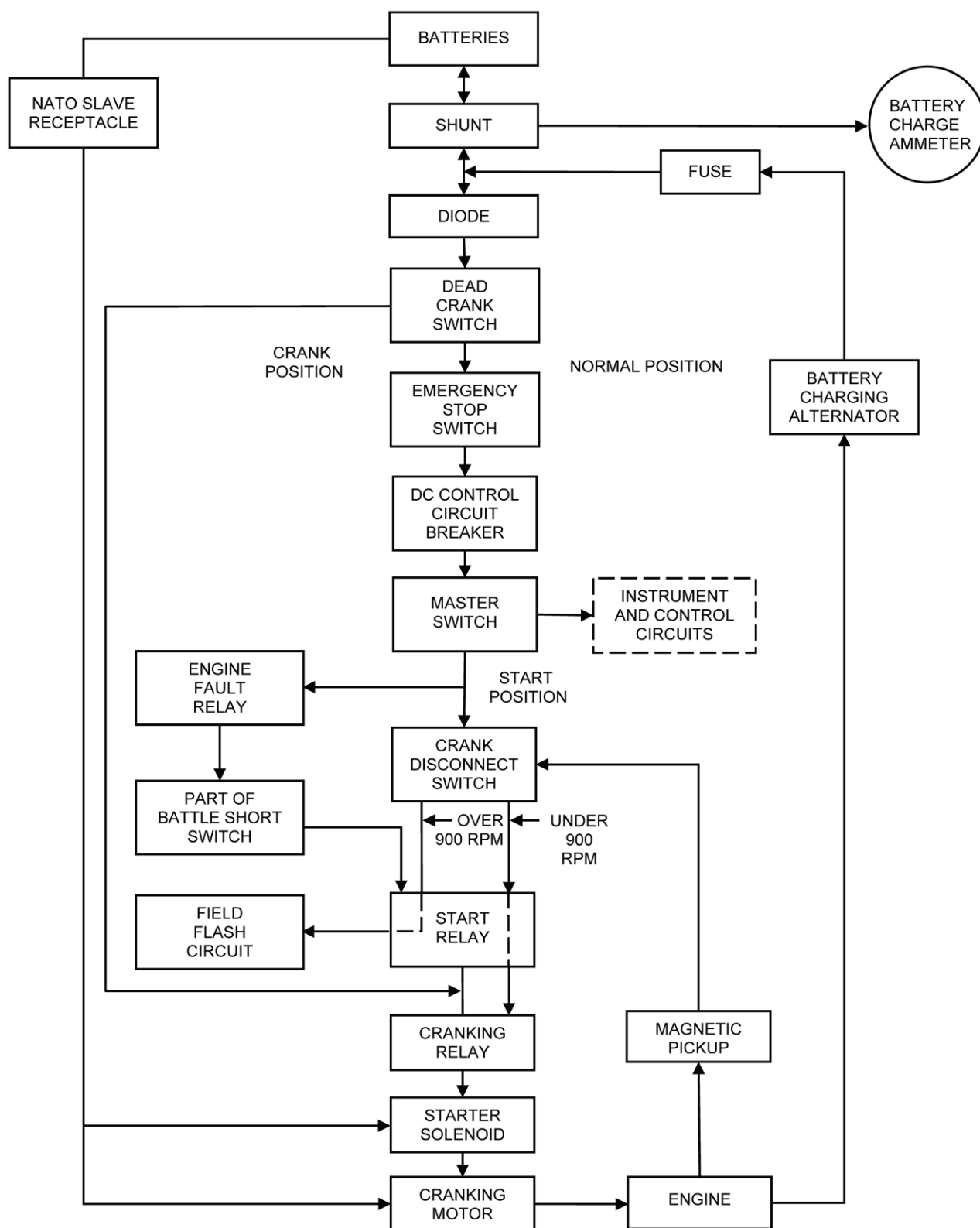


Figure 8. Engine Starting System.

Applying the Load. The load is applied by placing the AC CIRCUIT INTERRUPTER switch in the CLOSED position. This is a momentary contact switch that returns to the neutral or center position. The AC circuit interrupter relay is energized by this momentary contact and a holding circuit keeps it closed, bringing the load on line.

Shutdown. The AC circuit interrupter relay is disengaged by placing the AC CIRCUIT INTERRUPTER switch in the OPEN position. This is a momentary contact switch which will break the AC circuit interrupter relay holding circuit and then return to the neutral or center position disconnecting the load from the line.

The generator set should remain running for five minutes after disconnecting the load. During this five minute interval, oil circulates through the turbocharger, cooling it enough to be shut down.

When the MASTER SWITCH is placed in the OFF position, all power is removed from the control circuit and the engine will stop.

The EMERGENCY STOP switch assembly will remove power from the control circuit by energizing the engine fault relay. This will cause the engine to shut down. The EMERGENCY STOP switch assembly is not to be used as an alternative for routine shutdown procedures. When the generator set is stopped using the EMERGENCY STOP switch assembly, some circuits remain energized causing a drain on the batteries until the MASTER SWITCH is placed in the OFF position.

Paralleling. The generator set is capable of being operated in parallel with one other set of the same model number. This capability is provided by the PARALLELING RECEPTACLE, paralleling cable, LOAD SHARING ADJUST and REACTIVE CURRENT ADJUST rheostats, two SYNCHRONIZATION LIGHTS, UNIT-PARALLEL switch, reverse power relay, voltage sensing relay, droop current transformer, and permissive paralleling relay.

The paralleling cable is used to interconnect the governor and AC voltage regulator paralleling circuits of two generator sets. The UNIT-PARALLEL switch is used to select parallel operation. Voltage and frequency of the two generator sets are synchronized by adjusting each set's VOLTAGE and FREQUENCY controls. Phase synchronization is indicated by the SYNCHRONIZATION LIGHTS. The reverse power relay serves as a safety device that opens the AC circuit interrupter relay when one of the sets fails to produce power and begins to receive power from the other set. The reverse power relay operates when the power received exceeds 20% of set rating. The load sharing adjust and reactive current adjust rheostats, and the droop current transformer are used to adjust power and current for load sharing at the factory or by maintenance. No adjustment of the rheostats is required for normal operation. The permissive paralleling relay monitors the voltage phase relationship and prevents the AC circuit interrupter relay from closing when the units are not properly synchronized. The voltage sensing relay senses the operating voltage range, 120/208 volts or 240/416 volts, and switches an additional resistor to each of the SYNCHRONIZATION LIGHT circuits during 240/416 volts operation to protect the lights.

Governor Control System

The governor control system (Figure 9) includes the electronic governor control, governor actuator, magnetic pickup, load measuring unit, frequency transducer, FREQUENCY meter (HERTZ), kilowatt transducer, fuel injection pump, FREQUENCY SELECT switch, and FREQUENCY adjust potentiometer.

The governor actuator is a linear electromechanical actuator which controls the output of the fuel injection pump in response to the electrical input from the electronic governor control. The FREQUENCY adjust potentiometer, located on the control panel and adjusted by the operator, provides a signal representing the desired engine speed/ generator frequency to the electronic governor control. A signal representative of the actual engine speed/generator frequency is sent to the electronic governor control by the magnetic pickup. Any change in engine speed from that selected by the operator, as sensed by the magnetic pickup, causes the electronic governor control to increase or decrease the fuel injection pump output to maintain the desired speed. The load measuring unit senses changes in external load demand and provides a change signal to the electronic governor control allowing the control to start its response prior to any actual change in engine speed. The generator set frequency and power output are indicated by the FREQUENCY meter (HERTZ) and the kilowattmeter (PERCENT POWER) on the control panel. The FREQUENCY SELECT switch is used to set the generator for 50 or 60 Hz operating frequencies (MEP-805A).

The electronic governor control also contains the engine overspeed switch (fault system) and the crank disconnect switch (engine starting system). These switches function as a result of input from the magnetic pickup.

The 24 VDC power is supplied to the electronic governor control through the governor control power relay. The governor control relay is controlled by the fault system. The electronic governor controls of two generator sets operating in parallel are interconnected by the paralleling cable.

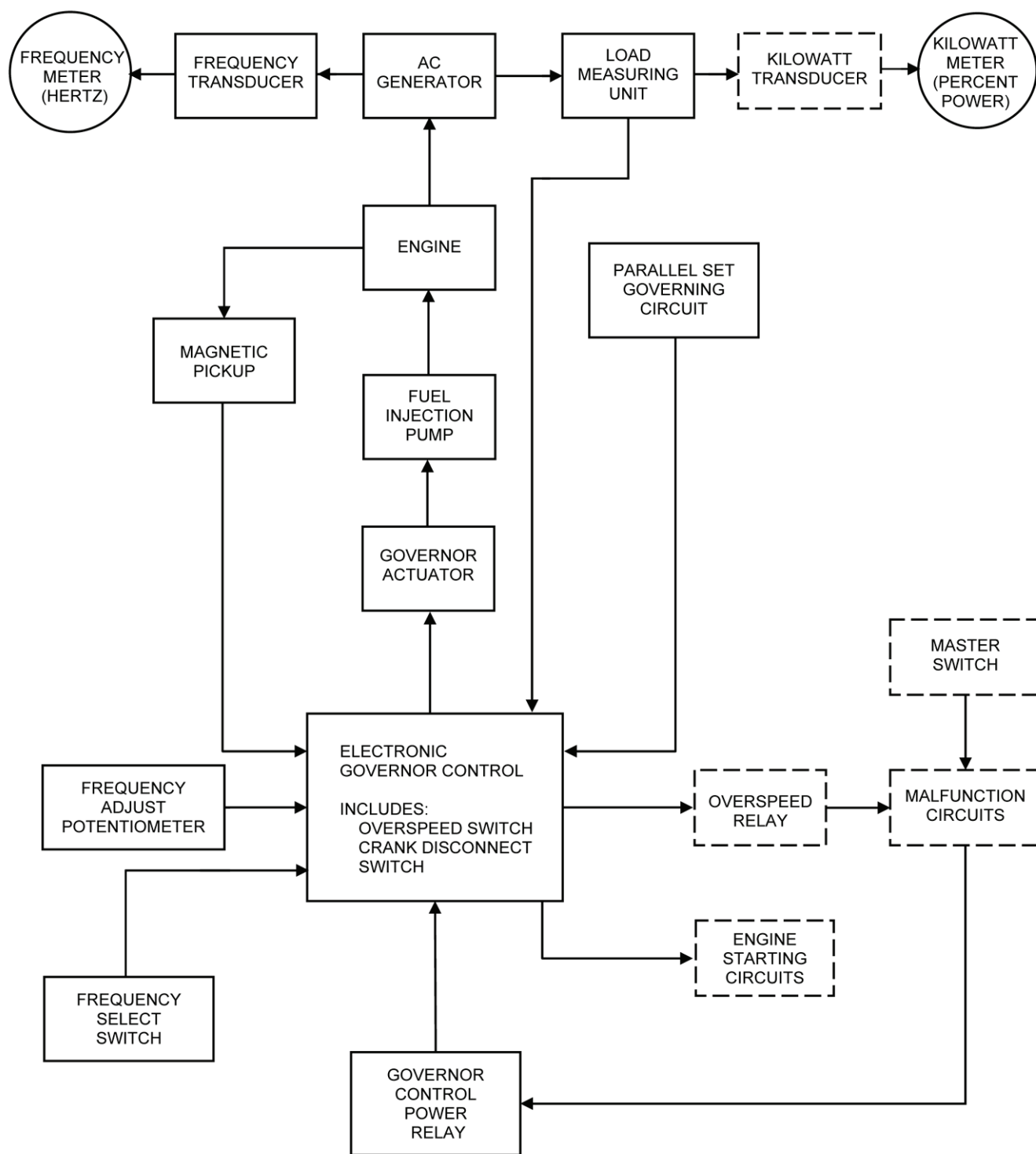


Figure 9. Governor Control System.

Voltage Regulation System

The voltage regulation system (Figure 10) consists of the AC voltage regulator, VOLTAGE adjust potentiometer, and power transformer. The AC voltage regulator senses and controls the generator output voltage which is operator adjustable within the design limits by use of the VOLTAGE adjust potentiometer. The power transformer provides operating power to the AC voltage regulator. The output voltage is indicated by the AC voltmeter (VOLTS AC) on the control panel.

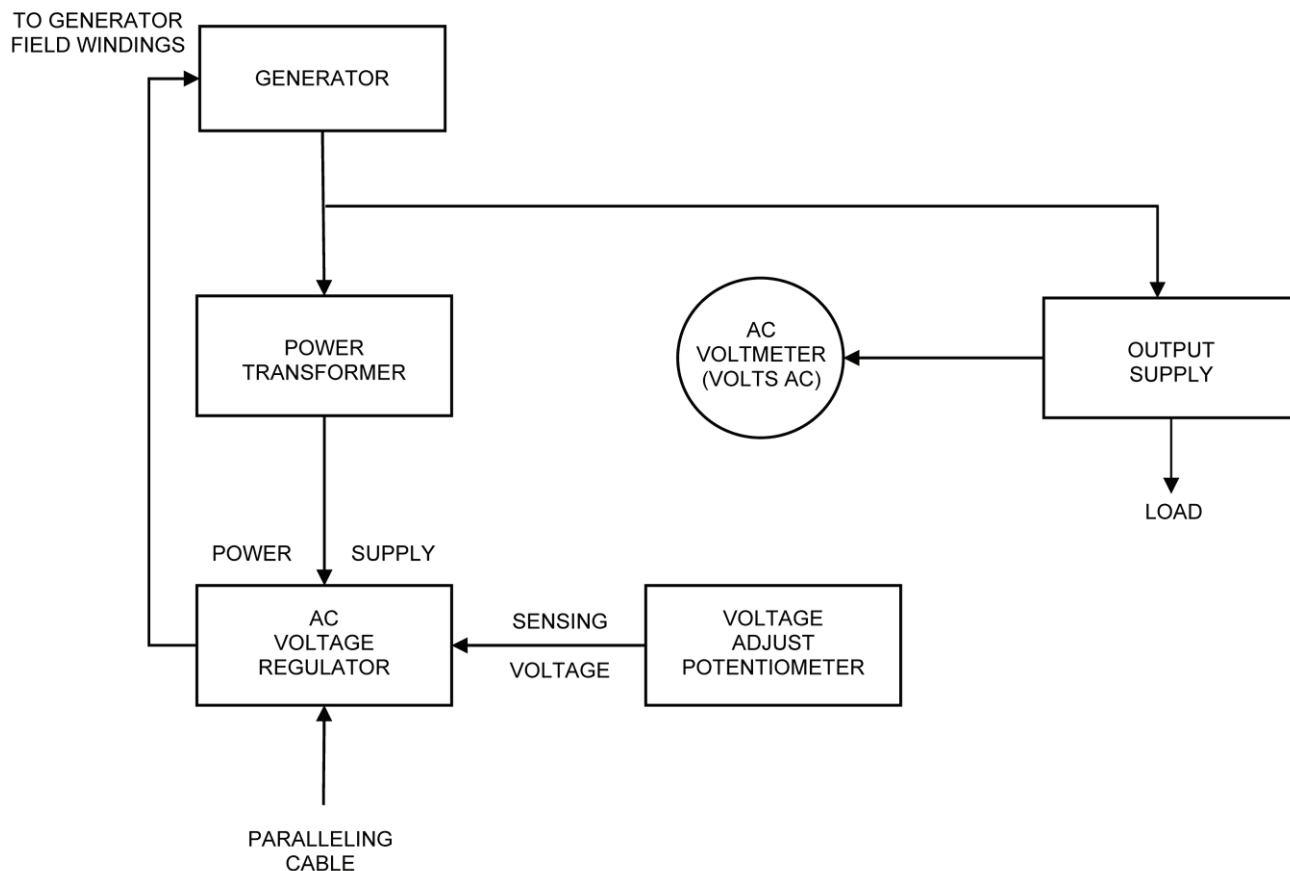


Figure 10. Voltage Regulation System.

RADIO INTERFERENCE SUPPRESSION

General Methods Used To Attain Proper Suppression

Suppression is attained by providing a low resistance path to ground for stray currents. The methods used include shielding the ignition and high-frequency wires, grounding the frame with bonding straps, and using filtering systems.

Interference Suppression Components

Primary Suppression Components. Primary suppression components are those whose primary function is to suppress electromagnetic interference.

The primary suppression components on this generator set are the output box access door EMI seal (outer seal) (WP 0018); the load output terminal board EMI filters (WP 0107); and the voltage reconnection terminal board capacitors (WP 0099).

Secondary Suppression Components. Secondary suppression components have electromagnetic interference suppression functions which are incidental or secondary to their primary function. The only secondary suppression component for the generator set is the housing; refer to WP 0014 through WP 0017, for removal and installation procedures.

END OF WORK PACKAGE

CHAPTER 2

FIELD TROUBLESHOOTING PROCEDURES

FOR

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL

QUIET GENERATOR SETS

CHAPTER 2
TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
Troubleshooting Index.....	0004
Troubleshooting Procedures	0005

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

TROUBLESHOOTING INDEX

INITIAL SETUP:

References

FO-1 Electrical Schematic
 FO-3 Wiring Diagram
 WP 0008, PMCS Including Lubrication Instructions
 WP 0063, Maintenance of Control Box Assembly,
 Diagnostic Connector

PURPOSE OF TROUBLESHOOTING TABLE

This work package contains troubleshooting information for locating and correcting operating troubles which may develop in the generator set. Each malfunction for an individual component, unit, or system is followed by a list of tests or inspections which will help you to determine probable causes and corrective actions to take. You should perform the tests/inspections and corrective actions in the order listed.

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

NOTE

Before you use this table, be sure you have performed your Preventive Maintenance Checks and Services (PMCS).

Before using this table, ensure that operator level troubleshooting steps have been performed.

Refer to the Diagnostic Connector Connection Points WP 0063, Table 1, Electrical Schematic FO-1, and Wiring Diagram FO-3 as troubleshooting aids.

Malfunction/SymptomTroubleshooting
Procedure

COOLING SYSTEM

Engine coolant temperature too low	14
Engine overheating	13

ELECTRICAL SYSTEM

AC voltmeter (VOLTS AC); Does not indicate voltage	21
AC voltmeter (VOLTS AC); Indicates voltage but FREQUENCY meter (HERTZ) is off scale	22
AC voltmeter (VOLTS AC); Voltage fluctuates	23
BATTERY CHARGE ammeter; Shows no charge when batteries are low or discharged	19
BATTERY CHARGE ammeter; Shows excessive charging after prolonged operation	20
FREQUENCY meter (HERTZ); frequency fluctuates	24
No voltage at CONVENIENCE RECEPTACLE	25

ENGINE

TROUBLESHOOTING INDEX - Continued

<u>Malfunction/Symptom</u>	<u>Troubleshooting Procedure</u>
Abnormal engine noise	7
Coolant in crankcase or oil in coolant	16
Cranks but fails to start	2
Does not develop full power	6
Excessive fuel consumption	15
Fails to crank	1
Fails to start in cold weather	18
Misfiring	5
Runs erratically or stalls frequently	4
Stops suddenly	3
Vibrating	17
EXHAUST SYSTEM	
Black or grey smoke in exhaust	8
Blue or white exhaust smoke	9
GENERATOR SET	
Fails to generate power	26
Fails to generate sufficient voltage	27
Noisy when running	30
Output fluctuates	28
Overheats	29
LUBRICATION SYSTEM	
High oil consumption	10
High oil pressure	12
Low oil pressure	11
END OF WORK PACKAGE	

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****TROUBLESHOOTING PROCEDURES**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

One

References

WP 0006, Service Upon Receipt, Table 2 & Table 3
WP 0010, Removal & Installation of Major Components, Engine Assembly
WP 0012, Maintenance of DC Electrical Systems, Batteries
WP 0025, Maintenance of Control Box Assembly, Oil Pressure Indicator
WP 0032, Maintenance of Control Box Assembly, Master Switch
WP 0041, Maintenance of Control Box Assembly, Emergency Stop Switch Assembly
WP 0050, Maintenance of Control Box Assembly, DC Control Power Circuit Breaker
WP 0054, Maintenance of Control Box Assembly, Shunt
WP 0060, Maintenance of Control Box Assembly, Relays
WP 0061, Maintenance of Control Box Assembly, Governor Control Unit (GCO)
WP 0066, Maintenance of Control Box Assembly, Resistor-Diode Assembly

References

WP 0071, Maintenance of Air Intake & Exhaust System, Muffler & Exhaust Pipe
WP 0072, Maintenance of Air Intake & Exhaust System, Air Cleaner Assembly
WP 0086, Maintenance of Fuel System, Low Pressure Fuel Lines/Filters
WP 0087, Maintenance of Fuel System, Auxiliary Fuel Pump
WP 0105, Maintenance of Outbox Assembly, Cranking Relay
WP 0111, Maintenance of Engine Accessories, Oil Pressure Sender
WP 0115, Maintenance of Engine Accessories, Dead Crank Switch
WP 0117, Maintenance of Engine Accessories, Governor Actuator
WP 0118, Maintenance of Lubrication System, Oil Drain Line

Equipment ConditionGrounded, Off & Operational

SYMPTOM

1. ENGINE FAILS TO CRANK.

TEST OR INSPECTION

Step 1. Test for defective DEAD CRANK switch (WP 0115, Testing).

CORRECTIVE ACTION

- a. If DEAD CRANK switch is not defective, do Step 2.
- b. If defective, replace DEAD CRANK switch (WP 0115).

TEST OR INSPECTION

Step 2. Check for loose or corroded battery cable terminals or battery posts.

CORRECTIVE ACTION

- a. If terminals are tight and posts are clean, do Step 3.
- b. If not clean and tight, clean and tighten battery cable terminals and posts (WP 0012, Cleaning).

TEST OR INSPECTION

Step 3. Check that batteries are installed correctly (WP 0012, Installation).

CORRECTIVE ACTION

- a. If batteries are installed correctly, do Step 4.
- b. If not incorrectly installed, install batteries correctly (WP 0012, Installation).

TEST OR INSPECTION

Step 4. Test for low or no battery charge (WP 0012, Testing).

CORRECTIVE ACTION

- a. If fully charged, do Step 5.
- b. If not fully charged, replace batteries (WP 0012).

TEST OR INSPECTION

Step 5. Test for defective DC CONTROL POWER circuit breaker (WP 0050, Testing).

CORRECTIVE ACTION

- a. If DC CONTROL POWER circuit breaker is not defective, do Step 6.
- b. If defective, replace DC CONTROL POWER circuit breaker (WP 0050).

TEST OR INSPECTION

Step 6. Test for battery voltage at input of MASTER SWITCH.

CORRECTIVE ACTION

- a. If battery voltage is present, do Step 7.
- b. If battery voltage is not present, do Step 8.

TEST OR INSPECTION

Step 7. Test MASTER SWITCH output voltage in START position.

CORRECTIVE ACTION

- a. If battery voltage is present at MASTER SWITCH output terminal (7) and GND, do Step 11.
- b. If battery voltage is not present at output terminal, test MASTER SWITCH (WP 0032, Testing).

TEST OR INSPECTION

Step 8. Test for defective battery charging ammeter shunt (WP 0054, Testing).

CORRECTIVE ACTION

- a. If battery charging ammeter shunt is not defective, do Step 9.
- b. If defective, replace battery charging ammeter shunt (WP 0054).

TEST OR INSPECTION

Step 9. Test for defective reverse battery diode (CR1) (WP 0066, Testing).

CORRECTIVE ACTION

- a. If reverse battery diode is not defective, do Step 10.
- b. If defective, replace reverse battery diode (WP 0066).

TEST OR INSPECTION

Step 10. Test for defective EMERGENCY STOP switch assembly (WP 0041, Testing).

CORRECTIVE ACTION

- a. If EMERGENCY STOP switch assembly is not defective, do Step 11.

- b. If defective, replace EMERGENCY STOP switch assembly (WP 0041).

TEST OR INSPECTION

Step 11. Test for defective start relay (K15) (WP 0060, Testing).

CORRECTIVE ACTION

- a. If start relay is not defective, do Step 12.
- b. If defective, replace start relay (WP 0060).

TEST OR INSPECTION

Step 12. Test for defective cranking relay (K2) (WP 0105, Testing).

CORRECTIVE ACTION

- a. If cranking relay is not defective, do Step 13.
- b. If defective, replace cranking relay (WP 0105).

TEST OR INSPECTION

Step 13. Test for defective crank disconnect relay (K16) (WP 0060, Testing).

CORRECTIVE ACTION

- a. If crank disconnect relay is not defective, do Step 14.
- b. If defective, replace crank disconnect relay (WP 0060).

TEST OR INSPECTION

Step 14. Check starting circuit for breaks or loose connections; refer to Electrical Schematic FO-1.

CORRECTIVE ACTION

- a. If starting circuit has no breaks and connections are tight, do Step 15.
- b. If defective, repair or replace defective wires or connections.

TEST OR INSPECTION

Step 15. Test for defective starter solenoid (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If starter solenoid is not defective, do Step 16.
- b. If defective, replace starter solenoid (TM 9-2815-255-24).

TEST OR INSPECTION

Step 16. Test for defective starting motor (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If defective, replace starting motor (TM 9-2815-255-24).
- b. If starting motor is not defective, notify next higher level of maintenance.

SYMPTOM

- 2. ENGINE CRANKS BUT FAILS TO START.

TEST OR INSPECTION

Step 1. Test for low battery output (WP 0012, Testing).

CORRECTIVE ACTION

- a. If batteries are fully charged, do Step 2.
- b. If not fully charged, replace batteries (WP 0012).

TEST OR INSPECTION

Step 2. Check for clogged or defective fuel filter/water separator.

CORRECTIVE ACTION

- a. If fuel filter/water separator is not clogged or defective, do Step 3.
- b. If clogged or defective, service fuel filter/water separator (TM 9-2815-255-24).

TEST OR INSPECTION

Step 3. Check for blocked fuel line(s) and/or components starting at injector pump inlet line.

CORRECTIVE ACTION

- a. If fuel lines are not blocked, do Step 4.
- b. If blocked, unblock or replace fuel line(s) and/or components (WP 0086 and/or WP 0087).

TEST OR INSPECTION

Step 4. Check for air in fuel lines.

CORRECTIVE ACTION

- a. If air in fuel lines, bleed fuel lines (TM 9-2815-255-24).
- b. If no air in fuel lines, do Step 5.

TEST OR INSPECTION

Step 5. Check for contaminated or incorrect grade of fuel.

CORRECTIVE ACTION

- a. If fuel is not contaminated and is correct grade, do Step 6.
- b. If contaminated or incorrect grade, drain engine fuel system and service fuel filter/water separator (TM 9-2815-255-24). Drain generator set tank. Service generator set fuel tank with a proper grade of clean fuel (WP 0006, Table 2). Prime engine fuel system (TM 9-2815-255-24).

TEST OR INSPECTION

Step 6. Check for defective fuel supply pump (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If defective, replace fuel supply pump (TM 9-2815-255-24).
- b. If fuel supply pump is not defective, do Step 7.

TEST OR INSPECTION

Step 7. Test fuel injection pump timing (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If injection pump timing is correct, do Step 8.
- b. If not correctly timed, time fuel injection pump (TM 9-2815-255-24).

TEST OR INSPECTION

Step 8. Test for defective governor actuator (WP 0117).

CORRECTIVE ACTION

- a. If governor actuator is not defective, do Step 9.
- b. If defective, replace governor actuator (WP 0117, Removal).

TEST OR INSPECTION

Step 9. Test for defective fuel injection pump (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If fuel injection pump is not defective, do Step 10.
- b. If defective, repair or replace fuel injection pump (TM 9-2815-255-24).

TEST OR INSPECTION

Step 10. Test for defective governor control unit (WP 0061, Testing).

CORRECTIVE ACTION

If defective, replace governor control unit (WP 0061, Replacement).

SYMPTOM

3. ENGINE STOPS SUDDENLY.

TEST OR INSPECTION

Step 1. Check for tripped protective devices.

CORRECTIVE ACTION

- a. If no malfunction indicator lights are illuminated, do Step 2.
- b. If illuminated, correct fault indicated.

TEST OR INSPECTION

Step 2. Check for air lock in fuel supply line.

CORRECTIVE ACTION

- a. If no air lock in fuel line, do Step 3.
- b. If air in line, bleed fuel lines (TM 9-2815-255-24).

TEST OR INSPECTION

Step 3. Check for blocked fuel line(s) and/or components, starting at injection pump inlet line.

CORRECTIVE ACTION

- a. If fuel lines are not blocked, do Step 4.
- b. If blocked, unblock or replace fuel line(s) and/or components (WP 0086 and/or WP 0087).

TEST OR INSPECTION

Step 4. Check for defective fuel supply pump (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If defective, replace fuel supply pump (TM 9-2815-255-24).
- b. If fuel supply pump is not defective, notify next higher level of maintenance.

SYMPTOM

4. ENGINE RUNS ERRATICALLY OR STALLS FREQUENTLY.

TEST OR INSPECTION

Step 1. Check for obstruction in fuel line(s).

CORRECTIVE ACTION

- a. If fuel line(s) are not obstructed, do Step 2.
- b. If obstructed, unblock or replace fuel line(s) (WP 0086).

TEST OR INSPECTION

Step 2. Check for blocked exhaust pipe or muffler.

CORRECTIVE ACTION

- a. If exhaust pipe and muffler are not blocked, do Step 3.
- b. If blocked, unblock exhaust pipe/muffler or replace exhaust pipe/muffler (WP 0071).

TEST OR INSPECTION

Step 3. Check for contaminated or incorrect grade of fuel.

CORRECTIVE ACTION

- a. If contaminated or incorrect grade, drain engine fuel system and service fuel filter/water separator (TM 9-2815-255-24). Drain generator set tank. Service generator set fuel tank with proper grade of clean fuel (WP 0006, Table 2). Prime engine fuel system (TM 9-2815-255-24).
- b. If fuel is not contaminated or incorrect grade, do Step 4.

TEST OR INSPECTION

Step 4. Test fuel injection pump timing (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If fuel injection pump timing is correct, do Step 5.
- b. If not correctly timed, time fuel injection pump (TM 9-2815-255-24).

TEST OR INSPECTION

Step 5. Test for defective fuel injection pump (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If fuel injection pump is not defective, do Step 6.
- b. If defective, repair or replace fuel injector pump (TM 9-2815-255-24).

TEST OR INSPECTION

Step 6. Check cylinder head gasket for leaks (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If cylinder head gasket is not leaking, do Step 7.
- b. If leaking, replace cylinder head gasket (TM 9-2815-255-24).

TEST OR INSPECTION

Step 7. Check valve adjustment (TM 9-2815-255-24)).

CORRECTIVE ACTION

- a. If valves are properly adjusted, do Step 8.
- b. If improperly adjusted, adjust valves (TM 9-2815-255-24).

TEST OR INSPECTION

Step 8. Check for stuck or burnt valves (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If valves are not stuck or burnt, do Step 9.
- b. If stuck or burnt, replace valves (TM 9-2815-255-24).

TEST OR INSPECTION

Step 9. Test for defective governor control unit (WP 0061, Testing).

CORRECTIVE ACTION

- a. If governor control unit is not defective, do Step 10.
- b. Adjust governor control unit (WP 0061, Adjustment) or replace governor control unit (WP 0061, Replacement).

TEST OR INSPECTION

Step 10. Check for low engine compression (TM 9-2815-255-24).

CORRECTIVE ACTION

If compression is low, repair or replace engine (TM 9-2815-255-24).

SYMPTOM

5. ENGINE MISFIRING.

TEST OR INSPECTION

Step 1. Check for contaminated or incorrect grade of fuel.

CORRECTIVE ACTION

- a. If fuel is not contaminated and is correct grade, do Step 2.
- b. If contaminated or incorrect grade, drain engine fuel system and service fuel filter/water separator (TM 9-2815-255-24). Drain generator set tank. Service generator set tank with proper grade of clean fuel (WP 0006, Table 2). Prime engine fuel system (TM 9-2815-255-24).

TEST OR INSPECTION

Step 2. Check for air in fuel lines.

CORRECTIVE ACTION

- a. If air in lines, bleed fuel lines (TM 9-2815-255-24).
- b. If no air in fuel lines, and trouble persists, do Step 3.

TEST OR INSPECTION

Step 3. Check for defective fuel injection nozzles (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If fuel injectors are not defective, do Step 4.
- b. If defective, replace fuel injection nozzles (TM 9-2815-255-24).

TEST OR INSPECTION

Step 4. Test for defective governor actuator (WP 0117, Testing).

CORRECTIVE ACTION

- a. If governor actuator is not defective, do Step 5.
- b. If defective, replace governor actuator (TM 9-2815-255-24).

TEST OR INSPECTION

Step 5. Test fuel injection pump timing (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If fuel injection pump timing is correct, do Step 6.
- b. If defective, repair or replace fuel injection pump (TM 9-2815-255-24).

TEST OR INSPECTION

Step 6. Test for defective fuel injection pump (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If fuel injection pump is not defective, do Step 7.
- b. If defective, repair or replace fuel injector pump (TM 9-2815-255-24).

TEST OR INSPECTION

Step 7. Check valve adjustment (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If valves are properly adjusted, do Step 8.
- b. If improperly adjusted, adjust valves (TM 9-2815-255-24).

TEST OR INSPECTION

Step 8. Check for weak valve springs (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If valve springs are not weak, do Step 9.
- b. If weak, replace valve springs (TM 9-2815-255-24).

TEST OR INSPECTION

Step 9. Check for stuck or burnt valves (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If valves are not stuck or burnt, do Step 10.
- b. If stuck or burnt, replace valves (TM 9-2815-255-24).

TEST OR INSPECTION

Step 10. Test for low engine compression (TM 9-2815-255-24).

CORRECTIVE ACTION

If compression is low, repair or replace engine (TM 9-2815-255-24).

SYMPTOM

6. ENGINE DOES NOT DEVELOP FULL POWER.

TEST OR INSPECTION

Step 1. Test for restricted fuel filter/water separator.

CORRECTIVE ACTION

- a. If fuel filter/water separator is not restricted, do Step 2.
- b. If restricted, service fuel filter/water separator (TM 9-2815-255-24).

TEST OR INSPECTION

Step 2. Check for contaminated or incorrect grade of fuel.

CORRECTIVE ACTION

- a. If fuel is not contaminated and is correct grade, do Step 3.
- b. If contaminated or incorrect grade, drain engine fuel system and service fuel filter/water separator (TM 9-2815-255-24). Drain generator set tank. Service generator set tank with proper grade of clean fuel (WP 0006, Table 2). Prime engine fuel system (TM 9-2815-255-24).

TEST OR INSPECTION

Step 3. Check for blocked air intake system.

CORRECTIVE ACTION

- a. If air intake system is not blocked, do Step 4.
- b. If blocked, unblock or replace air intake system components as required (WP 0072 and/or WP 0073).

TEST OR INSPECTION

Step 4. Check blocked exhaust pipe or muffler.

CORRECTIVE ACTION

- a. If blocked, unblock or replace exhaust pipe/muffler (WP 0071).
- b. If exhaust pipe and muffler are not blocked, and trouble persists, do Step 5.

TEST OR INSPECTION

Step 5. Check for defective fuel injection nozzles (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If fuel injectors are not defective, do Step 6.
- b. If defective, replace fuel injection nozzles (TM 9-2815-255-24).

TEST OR INSPECTION

Step 6. Test for defective governor actuator (WP 0117, Testing).

CORRECTIVE ACTION

- a. If governor actuator is not defective, do Step 7.
- b. If defective, replace governor actuator (WP 0117).

TEST OR INSPECTION

Step 7. Test for defective governor control unit (WP 0061, Testing).

CORRECTIVE ACTION

- a. If governor control unit is not defective, do Step 8.
- b. Adjust governor control unit (WP 0061, Adjustment) or replace governor control unit (WP 0061, Replacement).

TEST OR INSPECTION

Step 8. Test fuel injection pump timing (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If fuel injection pump timing is correct, do Step 9.
- b. If timing is not correct, time fuel injection pump (TM 9-2815-255-24).

TEST OR INSPECTION

Step 9. Check valve adjustment (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If valves are properly adjusted, do Step 10.
- b. If improperly adjusted, adjust valves (TM 9-2815-255-24).

TEST OR INSPECTION

Step 10. Check cylinder head gasket for leaks (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If cylinder head gasket is not leaking, do Step 11.
- b. If leaking, replace cylinder head gasket (TM 9-2815-255-24).

TEST OR INSPECTION

Step 11. Check for weak valve springs (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If valve springs are not weak, do Step 12.
- b. If weak, replace valve springs (TM 9-2815-255-24).

TEST OR INSPECTION

Step 12. Check for stuck or burnt valves (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If valves are not stuck or burnt, do Step 13.
- b. If stuck or burnt, replace valves (TM 9-2815-255-24).

TEST OR INSPECTION

Step 13. Test for low engine compression (TM 9-2815-255-24).

CORRECTIVE ACTION

If compression is low, repair (TM 9-2815-255-24) or replace (WP 0010, Replacement) engine.

SYMPTOM

7. ABNORMAL ENGINE NOISE.

TEST OR INSPECTION

Step 1. Check for contaminated or incorrect grade of fuel.

CORRECTIVE ACTION

- a. If contaminated or incorrect grade, drain engine fuel system and service fuel filter/water separator (TM 9-2815-255-24). Drain generator set tank. Service generator set fuel tank with proper grade of clean fuel (WP 0006, Table 2). Prime engine fuel system (TM 9-2815-255-24).
- b. If fuel is not contaminated and is correct grade, and trouble persists, do Step 2.

TEST OR INSPECTION

Step 2. Check for defective engine mounts.

CORRECTIVE ACTION

- a. If engine mounts are not defective, do Step 3.
- b. If engine mounts are defective, replace mounts (WP 0010).

TEST OR INSPECTION

Step 3. Check valve adjustment (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If valves are properly adjusted, do Step 4.
- b. If improperly adjusted, adjust valves (TM 9-2815-255-24).

TEST OR INSPECTION

Step 4. Check for worn rocker arm shafts (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If rocker arm shafts are not worn, do Step 5.
- b. If worn, replace shafts and/or rocker arms (TM 9-2815-255-24).

TEST OR INSPECTION

Step 5. Check for bent push rods (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If push rods are not bent, do Step 6.
- b. If bent, replace push rods (TM 9-2815-255-24) or replace engine (WP 0010, Replacement).

TEST OR INSPECTION

Step 6. Check for worn idler gears (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If idler gears are not worn, do Step 7.
- b. If worn, replace idler gears (TM 9-2815-255-24) or replace engine (WP 0010, Replacement).

TEST OR INSPECTION

Step 7. Check for foreign material in combustion chamber(s) (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If foreign material is found, clean combustion chamber(s) (TM 9-2815-255-24).
- b. If no foreign matter is found and problem persists, replace engine (WP 0010, Replacement).

SYMPTOM

8. BLACK OR GREY SMOKE IN EXHAUST.

TEST OR INSPECTION

Step 1. Check for improper grade of fuel.

CORRECTIVE ACTION

- a. If improper grade of fuel, drain engine fuel system. Drain generator set tank. Service generator set fuel tank with clean fuel of a proper grade (WP 0006, Table 2). Prime engine fuel system (TM 9-2815-255-24).
- b. If proper grade of fuel, and trouble persists, do Step 2.

TEST OR INSPECTION

Step 2. Check for defective fuel injection nozzles (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If fuel injection nozzles are not defective, do Step 3.
- b. If defective, replace fuel injectors (TM 9-2815-255-24).

TEST OR INSPECTION

Step 3. Test fuel injection pump timing (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If timing is not correct, time fuel injection pump (TM 9-2815-255-24).

SYMPTOM

9. BLUE OR WHITE EXHAUST SMOKE.

TEST OR INSPECTION

Step 1. Check for excessive engine oil level.

CORRECTIVE ACTION

- a. If proper oil level, do Step 2.
- b. If excessive oil level, drain to proper level (WP 0006, Lubricating Oil).

TEST OR INSPECTION

Step 2. Check for improper grade of fuel.

CORRECTIVE ACTION

- a. If proper grade of fuel, do Step 3.
- b. If improper grade, drain engine fuel system and generator set tank. Service generator set fuel tank with clean fuel of a proper grade (WP 0006, Table 2). Prime engine fuel system (TM 9-2815-255-24).

TEST OR INSPECTION

Step 3. Check for defective thermostat (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If defective, replace thermostat (TM 9-2815-255-24).
- b. If thermostat is not defective, and trouble persists, do Step 4.

TEST OR INSPECTION

Step 4. Test fuel injection pump timing (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If timing is not correct, time fuel injection pump (TM 9-2815-255-24).

SYMPTOM

10. HIGH OIL CONSUMPTION.

TEST OR INSPECTION

Step 1. Check for blocked air intake system.

CORRECTIVE ACTION

- a. If air intake system is not blocked, do Step 2.
- b. If blocked, unblock or replace air intake system components as required (WP 0072 and/or WP 0073).

TEST OR INSPECTION

Step 2. Check for improper lube oil type.

CORRECTIVE ACTION

- a. If improper, drain oil and refill with proper lube oil type (WP 0006, Table 3 and WP 0118, Removal). Replace oil filter (TM 9-2815-255-24).
- b. If proper lube oil type, and trouble persists, notify next higher level of maintenance.

SYMPTOM

11. LOW OIL PRESSURE.

TEST OR INSPECTION

Step 1. Check for improper lube oil type.

CORRECTIVE ACTION

- a. If proper lube oil type, do Step 2.
- b. If improper, drain oil and refill with proper lube oil type (WP 0006, Table 3 and WP 0118, Removal). Replace oil filter (TM 9-2815-255-24).

TEST OR INSPECTION

Step 2. Test for defective OIL PRESSURE indicator (WP 0025, Testing).

CORRECTIVE ACTION

- a. If OIL PRESSURE indicator is not defective, do Step 3.
- b. If defective, replace OIL PRESSURE indicator (WP 0025).

TEST OR INSPECTION

Step 3. Test for defective oil pressure sender (WP 0111, Testing).

CORRECTIVE ACTION

- a. If defective, replace oil pressure sender (WP 0111).
- b. If oil pressure sender is not defective, and trouble persists, do Step 4.

TEST OR INSPECTION

Step 4. Check oil regulating valve for proper operation (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If oil regulating valve is operating properly, do Step 5.
- b. If not operating properly, replace oil regulating valve (TM 9-2815-255-24).

TEST OR INSPECTION

Step 5. Check for defective oil pump (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If oil pump is not defective, repair or replace engine (TM 9-2815-255-24).
- b. If oil pump is defective, replace oil pump (TM 9-2815-255-24).

SYMPTOM

12. HIGH OIL PRESSURE.

TEST OR INSPECTION

Step 1. Check for improper lube oil type.

CORRECTIVE ACTION

- a. If proper lube oil type, do Step 2.
- b. If improper, drain oil and refill with proper lube oil type (WP 0006, Table 3 and WP 0118, Removal). Replace oil filter (TM 9-2815-255-24).

TEST OR INSPECTION

Step 2. Test for defective OIL PRESSURE indicator (WP 0025, Testing).

CORRECTIVE ACTION

- a. If OIL PRESSURE indicator is not defective, do Step 3.
- b. If defective, replace OIL PRESSURE indicator (WP 0025).

TEST OR INSPECTION

Step 3. Test for defective oil pressure sender (WP 0111, Testing).

CORRECTIVE ACTION

- a. If defective, replace oil pressure sender (WP 0111).
- b. If oil pressure sender is not defective, and trouble persists, do Step 4.

TEST OR INSPECTION

Step 4. Test for defective oil relief valve (TM 9-2815-255-24).

CORRECTIVE ACTION

If defective, replace oil relief valve (TM 9-2815-255-24).

SYMPTOM

13. ENGINE OVERHEATING.

TEST OR INSPECTION

Step 1. Check for broken or loose fan belt (WP 0084).

CORRECTIVE ACTION

- a. If fan belt is not broken and tension is correct, do Step 2.
- b. If worn or broken, replace fan belt (WP 0084). If loose, adjust fan belt (WP 0084, Testing and Adjustment).

TEST OR INSPECTION

Step 2. Check for defective radiator cap (WP 0077, Inspection and Cleaning).

CORRECTIVE ACTION

- a. If radiator cap is not defective, do Step 3.
- b. If defective, replace radiator cap (WP 0077).

TEST OR INSPECTION

Step 3. Check for defective coolant hose(s).

CORRECTIVE ACTION

- a. If coolant hoses are not leaking or collapsed, do Step 4.
- b. If defective, replace coolant hose(s) (WP 0077, WP 0079, WP 0080, and WP 0081).

TEST OR INSPECTION

Step 4. Test for defective thermostat (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If thermostat is not defective, do Step 5.
- b. If defective, replace thermostat (TM 9-2815-255-24).

TEST OR INSPECTION

Step 5. Check for clogged radiator (WP 0082, Inspection and Cleaning).

CORRECTIVE ACTION

- a. If radiator is not clogged, do Step 6.
- b. If clogged, remove obstruction or replace radiator (WP 0082).

TEST OR INSPECTION

Step 6. Check for defective water pump (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If defective, replace water pump (TM 9-2815-255-24).
- b. If water pump is not defective, and trouble persists, notify next higher level of maintenance.

SYMPTOM

14. ENGINE COOLANT TEMPERATURE TOO LOW.

TEST OR INSPECTION

Step 1. Check for defective thermostat (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If thermostat is operating correctly, do Step 2.
- b. If defective, replace thermostat (TM 9-2815-255-24).

TEST OR INSPECTION

Step 2. Test for defective temperature sender (WP 0112, Testing).

CORRECTIVE ACTION

- a. If temperature sender is not defective, do Step 3.
- b. If defective, replace temperature sender (WP 0112).

TEST OR INSPECTION

Step 3. Test for defective TEMPERATURE indicator (WP 0023, Testing).

CORRECTIVE ACTION

- a. If defective, replace TEMPERATURE indicator (WP 0024).
- b. If TEMPERATURE indicator is not defective, and trouble persists, notify next higher level of maintenance.

SYMPTOM

15. EXCESSIVE FUEL CONSUMPTION.

TEST OR INSPECTION

Step 1. Check for blocked air intake system.

CORRECTIVE ACTION

- a. If air intake system is not blocked, do Step 2.
- b. If blocked, unblock or replace air intake system components as required (WP 0072 and/or WP 0073).

TEST OR INSPECTION

Step 2. Check for leaks in fuel system.

CORRECTIVE ACTION

- a. If no leaks in fuel system, do Step 3.
- b. If leaks are found, repair fuel system as required.

TEST OR INSPECTION

Step 3. Check for contaminated oil.

CORRECTIVE ACTION

- a. If oil is contaminated, change oil (WP 0118, Removal).
- b. If oil is not contaminated, and trouble persists, notify next higher level of maintenance.

SYMPTOM

16. COOLANT IN CRANKCASE OR OIL IN COOLANT.

TEST OR INSPECTION

Step 1. Check for defective oil cooler.

CORRECTIVE ACTION

- a. If defective, replace oil cooler (TM 9-2815-255-24).
- b. If cooler is not defective, and trouble persists, do Step 2.

TEST OR INSPECTION

Step 2. Check for cracked cylinder head or block (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If cylinder head or block is not cracked, do Step 3.
- b. If cracked, replace cylinder head or block (TM 9-2815-255-24).

TEST OR INSPECTION

Step 3. Check for defective cylinder head gasket (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If defective, replace cylinder head gasket (TM 9-2815-254-24).
- b. If not defective and problem persists, repair (TM 9-2815-254-24) or replace (WP 0010, Replacement) engine.

SYMPTOM

17. ENGINE VIBRATING.

TEST OR INSPECTION

Step 1. Check for bent or broken cooling fan blades.

CORRECTIVE ACTION

- a. If fan blades are not damaged, do Step 2.
- b. If damaged, replace cooling fan (WP 0083).

TEST OR INSPECTION

Step 2. Check for loose or defective engine mounts.

CORRECTIVE ACTION

- a. Tighten loose mounting bolts.
- b. If bolts are tight, and trouble persists, notify next higher level of maintenance.

SYMPTOM

18. ENGINE FAILS TO START IN COLD WEATHER.

TEST OR INSPECTION

Step 1. Test for low or no battery charge (WP 0012, Testing).

CORRECTIVE ACTION

- a. If batteries are fully charged, do Step 2.
- b. If not fully charged, replace batteries (WP 0012).

TEST OR INSPECTION

Step 2. Check for improper lube oil type.

CORRECTIVE ACTION

- a. If proper lube oil type, do Step 3.
- b. If improper, drain oil and refill with proper lube oil type (WP 0006, Table 3 and WP 0118, Removal). Replace oil filter (TM 9-2815-255-24).

TEST OR INSPECTION

Step 3. Check for improper grade of fuel.

CORRECTIVE ACTION

- a. If proper grade of fuel, do Step 4.
- b. If improper grade of fuel, drain engine fuel system. Drain generator set tank. Service generator set fuel tank with clean fuel of a proper grade (WP 0006, Table 2). Prime engine fuel system (TM 9-2815-255-24).

TEST OR INSPECTION

Step 4. Check for defective ether start system (WP 0095 and WP 0096).

CORRECTIVE ACTION

- a. If ether start system is operating properly, do Step 5.
- b. If ether start system is not operating properly, replace defective parts (WP 0095 and WP 0096).

TEST OR INSPECTION

Step 5. Test for defective ETHER SWITCH (WP 0033, Testing).

CORRECTIVE ACTION

- a. If defective, replace ETHER SWITCH (WP 0033).
- b. If ETHER SWITCH is not defective, and trouble persists, notify next higher level of maintenance.

SYMPTOM

19. BATTERY CHARGE AMMETER SHOWS NO CHARGE WHEN BATTERIES ARE LOW OR DISCHARGED.

TEST OR INSPECTION

Step 1. Check for broken or loose fan belt (WP 0084).

CORRECTIVE ACTION

- a. If fan belt is not broken and tension is correct, do Step 2.
- b. If worn or broken, replace fan belt (WP 0084). If loose, adjust fan belt (WP 0084, Testing and Adjustment).

TEST OR INSPECTION

Step 2. Check for defective BATTERY CHARGER FUSE (WP 0049, Inspection).

CORRECTIVE ACTION

- a. If BATTERY CHARGER FUSE is not blown, do Step 3.
- b. If defective, replace BATTERY CHARGER FUSE (WP 0049).

TEST OR INSPECTION

Step 3. Test for defective battery charging ammeter shunt (MT4) (WP 0054, Testing).

CORRECTIVE ACTION

- a. If battery charging ammeter shunt is not defective, do Step 4.
- b. If defective, replace battery charging ammeter shunt (WP 0054).

TEST OR INSPECTION

Step 4. Test for defective battery charging alternator (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If battery charging alternator is not defective, do Step 5.
- b. If defective, replace battery charging alternator (TM 9-2815-255-24).

TEST OR INSPECTION

Step 5. Test for defective BATTERY CHARGE AMMETER (WP 0027, Testing).

CORRECTIVE ACTION

- a. If BATTERY CHARGE AMMETER is not defective, do Step 6.
- b. If defective, replace BATTERY CHARGE AMMETER (WP 0027).

TEST OR INSPECTION

Step 6. Check for breaks or loose connections in charging circuit.

CORRECTIVE ACTION

If breaks or loose connections are found, repair charging circuit. Refer to Electrical Schematic FO-1.

SYMPTOM

20. BATTERY CHARGE AMMETER SHOWS EXCESSIVE CHARGING AFTER PROLONGED OPERATION.

TEST OR INSPECTION

Step 1. Test for defective batteries (WP 0012, Testing).

CORRECTIVE ACTION

- a. If batteries are not defective, do Step 2.
- b. If defective, replace batteries (WP 0012).

TEST OR INSPECTION

Step 2. Test for defective BATTERY CHARGE AMMETER (WP 0027, Testing).

CORRECTIVE ACTION

- a. If BATTERY CHARGE AMMETER is not defective, do Step 3.
- b. If defective, replace BATTERY CHARGE AMMETER (WP 0027).

TEST OR INSPECTION

Step 3. Test for defective battery charging alternator (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If battery charging alternator is not defective, do Step 4.
- b. If defective, replace battery charging alternator (TM 9-2815-255-24).

TEST OR INSPECTION

Step 4. Check for short in charging circuit. If shorted, repair charging circuit. Refer to Electrical Schematic FO-1.

SYMPTOM

21. AC VOLTMETER (VOLTS AC) DOES NOT INDICATE VOLTAGE.

TEST OR INSPECTION

Step 1. Test for defective AC voltmeter (VOLTS AC) (WP 0031, Testing).

CORRECTIVE ACTION

- a. If AC voltmeter (VOLTS AC) is not defective, do Step 2.
- b. If defective, replace AC voltmeter (VOLTS AC) (WP 0031).

TEST OR INSPECTION

Step 2. Test for defective VOLTAGE adjust potentiometer (WP 0034, Testing).

CORRECTIVE ACTION

- a. If VOLTAGE adjust potentiometer is not defective, do Step 3.
- b. If defective, replace VOLTAGE adjust potentiometer (WP 0034).

TEST OR INSPECTION

Step 3. Test for defective VM-AM transfer switch (WP 0039, Testing).

CORRECTIVE ACTION

- a. If defective, replace VM-AM transfer switch (WP 0039).
- b. If VM-AM transfer switch is not defective, and trouble persists, notify next higher level of maintenance.

SYMPTOM

22. AC VOLTMETER (VOLTS AC) INDICATES VOLTAGE, BUT FREQUENCY METER (HERTZ) IS OFF SCALE.

TEST OR INSPECTION

Step 1. Test for defective frequency transducer (WP 0052, Testing (MEP-805A)/WP 0052, Testing (MEP-815A)).

CORRECTIVE ACTION

- a. If frequency transducer is not defective, do Step 2.
- b. If defective, replace frequency transducer (WP 0052).

TEST OR INSPECTION

Step 2. Test for defective FREQUENCY meter (HERTZ) (WP 0028, Testing (50/60 Hz) and WP 0028, Testing (400 Hz)).

CORRECTIVE ACTION

- a. If defective, replace FREQUENCY meter (HERTZ) (WP 0028).
- b. If FREQUENCY meter (HERTZ) is not defective, and trouble persists, notify next higher level of maintenance.

SYMPTOM

23. AC VOLTMETER (VOLTS AC) VOLTAGE FLUCTUATES.

TEST OR INSPECTION

Step 1. Check for loose electrical connections. Refer to Electrical Schematic FO-1.

CORRECTIVE ACTION

- a. If no loose connections, do Step 2.
- b. If loose, tighten electrical connections.

TEST OR INSPECTION

Step 2. Test for defective AC voltmeter (VOLTS AC) (WP 0031, Testing).

CORRECTIVE ACTION

- a. If AC voltmeter (VOLTS AC) is not defective, do Step 3.
- b. If defective, replace AC voltmeter (VOLTS AC) (WP 0031).

TEST OR INSPECTION

Step 3. Test for defective VOLTAGE adjust potentiometer (WP 0034, Testing).

CORRECTIVE ACTION

- a. If VOLTAGE adjust potentiometer is not defective, do Step 4.
- b. If defective, replace VOLTAGE adjust potentiometer (WP 0034).

TEST OR INSPECTION

Step 4. Test for defective VM-AM transfer switch (WP 0039, Testing).

CORRECTIVE ACTION

- a. If VM-AM transfer switch is not defective, do Step 5.
- b. If defective, replace VM-AM transfer switch (WP 0039).

TEST OR INSPECTION

Step 5. Check for defective load measuring unit (WP 0065, Inspection).

CORRECTIVE ACTION

- a. If defective, replace load measuring unit (WP 0065).
- b. If load measuring unit is not defective, and trouble persists, notify next higher level of maintenance.

SYMPTOM

24. FREQUENCY METER (HERTZ) FREQUENCY FLUCTUATES.

TEST OR INSPECTION

Step 1. Check for erratic engine operation. Refer to Malfunction 4, ENGINE RUNS ERRATICALLY OR STALLS FREQUENTLY. If engine is operating properly, do Step 2.

TEST OR INSPECTION

Step 2. Test for defective frequency transducer (WP 0052, Testing (MEP-805A) and WP 0052, Testing (MEP-815A)).

CORRECTIVE ACTION

- a. If frequency transducer is not defective, do Step 3.
- b. If defective, replace frequency transducer (WP 0052).

TEST OR INSPECTION

Step 3. Test for defective FREQUENCY meter (HERTZ) (WP 0028, Testing (50/60 Hz) and WP 0028, Testing (400 Hz)).

CORRECTIVE ACTION

- a. If defective, replace FREQUENCY meter (HERTZ) (WP 0028).
- b. If FREQUENCY meter (HERTZ) is not defective, and trouble persists, notify next higher level of maintenance.

SYMPTOM

25. NO VOLTAGE AT CONVENIENCE RECEPTACLE.

TEST OR INSPECTION

Step 1. Open control panel and inspect circuit interrupter on side of GROUND FAULT CIRCUIT INTERRUPTER.

CORRECTIVE ACTION

- a. If device is tripped, reset device for generator sets, contract number DAAK01-94-D-0036 and contract number DAAK02-92-D-0034.
- b. For generator sets contract number DAAK01-88-D-0082, check in-line fuse on black lead of GROUND FAULT CIRCUIT INTERRUPTER.
- c. If device is not tripped, do Step 2.

TEST OR INSPECTION

Step 2. Check GROUND FAULT CIRCUIT INTERRUPTER.

CORRECTIVE ACTION

- a. If indicator is tripped, reset by pressing RESET button.
- b. If Indicator is not tripped, do Step 3.

TEST OR INSPECTION

Step 3. Check voltage across CONVENIENCE RECEPTACLE.

CORRECTIVE ACTION

- a. If voltage is present, replace CONVENIENCE RECEPTACLE.
- b. If voltage is not present, do Step 4.

TEST OR INSPECTION

Step 4. Check voltage across terminals 4 and 6 on TB-5.

CORRECTIVE ACTION

- a. If voltage is present, replace GROUND FAULT CIRCUIT INTERRUPTER.
- b. If voltage is not present, search for loose or broken wires or loose pin in connectors.

SYMPTOM

26. GENERATOR SET FAILS TO GENERATE POWER.

TEST OR INSPECTION

Step 1. Test for defective governor control unit (WP 0061, Testing).

CORRECTIVE ACTION

- a. If a governor control unit is not defective, do Step 2.
- b. If necessary, adjust governor control unit (WP 0061, Adjustment) or replace governor control unit (WP 0061, Replacement).

TEST OR INSPECTION

Step 2. Test for defective AC voltage regulator (WP 0051, Testing, (AC Voltage Regulator P/N 112-3055, for MEP-805A, AC Voltage Regulator P/N 19880-001, for MEP-805A, or AC Voltage Regulator P/N 19890-002, for MEP-815A)).

CORRECTIVE ACTION

- a. If AC voltage regulator is not defective, do Step 3.
- b. If defective, replace AC voltage regulator (WP 0051).

TEST OR INSPECTION

Step 3. Test for defective generator exciter stator (WP 0123, Testing).

CORRECTIVE ACTION

- a. If exciter stator is not defective, do Step 4.
- b. If defective, replace exciter stator (WP 0123).

TEST OR INSPECTION

Step 4. Test for defective generator stator (WP 0126, Testing).

CORRECTIVE ACTION

- a. If generator stator is not defective, do Step 5.
- b. If defective, replace generator stator and housing assembly (WP 0126).

TEST OR INSPECTION

Step 5. Test for defective diode(s) in generator rotating rectifier (WP 0120, Testing).

CORRECTIVE ACTION

- a. If diodes are not defective, do Step 6.
- b. If defective, replace diode(s) (WP 0120).

TEST OR INSPECTION

Step 6. Test for defective generator rotor (WP 0125, Testing).

CORRECTIVE ACTION

- a. If generator rotor is not defective, do Step 7.
- b. If defective, replace generator rotor assembly (WP 0125).

TEST OR INSPECTION

Step 7. Test for defective generator exciter rotor (WP 0124, Testing).

CORRECTIVE ACTION

If defective, replace generator exciter rotor (WP 0124).

SYMPTOM

28. GENERATOR SET FAILS TO GENERATE SUFFICIENT VOLTAGE.

TEST OR INSPECTION

Step 1. Check for low engine speed (TM 9-2815-254-24).

CORRECTIVE ACTION

- a. If engine is operating correctly, do Step 2.
- b. If engine is not operating correctly, repair engine (TM 9-2815-254-24).

TEST OR INSPECTION

Step 2. Test for defective power potential transformer (WP 0103).

CORRECTIVE ACTION

- a. If power potential transformer is not defective, do Step 3.
- b. If defective, replace power potential transformer (WP 0103, Removal).

TEST OR INSPECTION

Step 3. Test for defective AC voltage regulator (WP 0051, Testing, (AC Voltage Regulator P/N 112-3055, for MEP-805A, AC Voltage Regulator P/N 19880-001, for MEP-805A, or AC Voltage Regulator P/N 19890-002, for MEP-815A)).

CORRECTIVE ACTION

- a. If AC voltage regulator is not defective, do Step 4.
- b. If defective, replace AC voltage regulator (WP 0051).

TEST OR INSPECTION

Step 4. Test for defective generator stator (WP 0126, Testing).

CORRECTIVE ACTION

If defective, replace generator stator and housing assembly (WP 0126).

SYMPTOM

29. GENERATOR SET OUTPUT FLUCTUATES.

TEST OR INSPECTION

Step 1. Check for irregular engine speed (frequency fluctuation) (TM 9-2815-255-24).

CORRECTIVE ACTION

- a. If engine is operating correctly, do Step 2.
- b. If engine is not operating correctly, repair engine (TM 9-2815-255-24).

TEST OR INSPECTION

Step 2. Check for loose terminations. Refer to Electrical Schematic FO-1.

CORRECTIVE ACTION

- a. If terminations are tight, do Step 3.
- b. If loose, tighten terminals.

TEST OR INSPECTION

Step 3. Check AC voltage regulator for incorrect output.

CORRECTIVE ACTION

- a. If AC voltage regulator is operating properly, do Step 4.
- b. If AC voltage regulator is inoperative, replace AC voltage regulator (WP 0051).

TEST OR INSPECTION

Step 4. Test for intermediate short in generator exciter field (WP 0123, Testing).

CORRECTIVE ACTION

If shorted, replace exciter stator (WP 0123).

SYMPTOM

30. GENERATOR OVERHEATS.

TEST OR INSPECTION

Step 1. Check for clogged air intake screens.

CORRECTIVE ACTION

- a. If air intake screens are not clogged, do Step 2.
- b. If clogged, clean air intake screens.

TEST OR INSPECTION

Step 2. Check for defective generator fan (WP 0125, Testing).

CORRECTIVE ACTION

- a. If fan is not defective, do Step 3.
- b. If defective, replace fan (WP 0125).

TEST OR INSPECTION

Step 3. Check for dry generator main bearing (WP 0121).

CORRECTIVE ACTION

If dry, replace main bearing (WP 0121).

SYMPTOM

31. GENERATOR NOISY WHEN RUNNING.

TEST OR INSPECTION

Step 1. Check for defective generator main bearing (WP 0121).

CORRECTIVE ACTION

- a. If generator main bearing is not defective, do Step 2.
- b. If defective, replace main bearing (WP 0121).

TEST OR INSPECTION

Step 2. Check for loose engine/generator coupling (WP 0010, Installation).

CORRECTIVE ACTION

- a. If engine/generator coupling is not loose, do Step 3.
- b. If loose, tighten engine/generator coupling bolts (WP 0010, Installation).

TEST OR INSPECTION

Step 3. Test for defective generator.

CORRECTIVE ACTION

If defective, replace generator (WP 0119).

END OF WORK PACKAGE

CHAPTER 3

FIELD MAINTENANCE INSTRUCTIONS

FOR

**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL
QUIET GENERATOR SETS**

CHAPTER 3

MAINTENANCE INSTRUCTIONS

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FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****SERVICE UPON RECEIPT**

SERVICE ON RECEIPT OF MATERIEL

This work package provides information and guidance for inspecting, servicing, and installing the generator set under normal conditions.

Inspection

1. Unpack and inventory all end item components for serviceability.
2. Check that all packing materials have been removed.
3. Check generator set identification plate for proper identification.
4. Inspect generator set exterior for shipping damage.
5. Open battery compartment access door and inspect batteries for damage.
6. Check battery cables for proper polarity connection, damage, and loose connections.
7. Open control panel access door and check panel for damage. Lower control panel and check electrical components for damage/loose connections. Raise control panel and secure fasteners.
8. Check air cleaner assembly for external damage and exhaust opening for obstruction.
9. Check fan belt for looseness and ensure it is not frayed or cracked.
10. Inspect generator set for loose or missing mounting hardware or damaged or missing parts.

NOTE

Dipstick is marked indicating that oil level can be checked and oil added when engine is running or stopped. Make sure the correct side of dipstick is checked.

11. Check oil level. As required, drain preservative from engine and fill with proper lubricating oil; refer to Lubricating Oil.
12. Unpack grounding rod from inside left engine access door, parallel cable, and auxiliary fuel hose from storage box. Inspect each item for damage and accountability.

END OF TASK**Service**

Batteries. When servicing batteries, refer to TM 9-6140-200-14.

WARNING

Each battery weighs more than 70 pounds (32 kg) and requires a two-person lift. Lifting batteries can cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply with this warning can cause injury to personnel.

WARNING

Batteries give off a flammable gas. Do not smoke or use open flame when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Battery acid can cause burns to unprotected skin. Wear safety goggles and chemical gloves and avoid acid splash while working on batteries. Failure to comply with this warning can cause injury to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

Radiator.**WARNING**

Do not operate generator set while servicing radiator. Failure to comply with this warning can cause injury to personnel and damage to the equipment.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

1. Remove radiator cap.
2. Check that radiator drain valve is closed (WP 0002, Figure 1).
3. Fill radiator with proper coolant/antifreeze (Table 1). Fill radiator to a level two inches below fill opening.
4. Remove overflow bottle cap.
5. Fill overflow bottle to COLD level.

Table 1. Coolant.

Ambient Temperature	Radiator Coolant	Ratio
+40 to +120 °F (+4 to +49 °C)	Water: MIL-A-53009A(1) Inhibitor, Corrosion	35:1
-25 to +120 °F (-32 to +49 °C)	Water: A-A-52624A Antifreeze	1:1
-25 to +120 °F (-32 to +49 °C)	A-A-52624A Antifreeze	N/A

6. Install overflow bottle and radiator caps.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fan has sharp blades. Use caution and wear gloves when removing or installing belts. Failure to comply with this warning can cause injury to personnel.

7. After 30 minutes of operation check coolant/antifreeze level at overflow bottle. Add coolant/antifreeze to overflow bottle, as required.

END OF TASK**WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

Fuel Tank.**WARNING**

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

1. Check that fuel drain valve is closed (WP 0002, Figure 1).
2. Remove fuel tank filler cap.
3. Fill fuel tank with fuel type (Table 2). Fuel tank capacity is 23 gallons (87.1 liters).

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

4. Install fuel tank filler cap.

Table 2. Fuel.

Ambient Temperature	Diesel Fuel
+20 to +120 °F (-7 to +49 °C)	A-A-52557A, Grade 2-D MIL-DTL-83133E, JP-8

Table 2. Fuel. - Continued

Ambient Temperature	Diesel Fuel
-25 to +20 °F (-32 to -7 °C)	A-A-52557A, Grade 1-D MIL-DTL-5624T, JP-5

END OF TASK**Lubricating Oil.**

1. Place suitable container under oil drain plug and remove plug.

WARNING

Oil filter base and housing springs are under tension and can act as projectiles when being removed. Use eye protection when removing springs. Failure to comply with this warning can cause injury to personnel.

2. Open battery access door, open oil drain valve (WP 0002, Figure 1), and drain oil.
3. Close oil drain valve and remove oil fill cap.

NOTE

Dipstick is marked indicating that oil level can be checked and oil added when engine is running or stopped. Make sure the correct side of dipstick is checked.

4. Fill engine with proper engine lubricating oil (Table 3) to FULL mark on dipstick. Lubrication system capacity is 15 quarts (14.2 Liters).

WARNING

The high pressure oil system operates at high temperature and pressure. Contact with hot oil can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Wear heat resistant gloves and avoid contacting hot surfaces. Do not allow hot oil or components to contact skin or hands. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

5. Install oil fill cap. Close battery access door.
6. Close battery access door.

Table 3. Lubricating Oil.

Ambient Temperature	Lubricating Oil
+20 to +120 °F (-7 to +49 °C)	MIL-PRF-2104H OE HDO-30 or OE HDO-15/40
0 to +20 °F (-17 to +6 °C)	MIL-PRF-2104H OE HDO-10
-25 to 0 °F (-32 to -17 °C)	MIL-PRF-46167C

END OF TASK

INSTALLATION INSTRUCTIONS

General

WARNING

Exhaust discharge contains deadly gases including carbon monoxide. DO NOT operate generator set in enclosed areas unless exhaust discharge is properly vented outside. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Hot exhaust gases can ignite flammable materials. Allow room for safe discharge of hot gases and sparks. Failure to comply with this warning can cause injury or death to personnel.

1. Ensure that installation site is as level as possible.
2. Provide adequate ventilation to prevent recirculation of hot air exhausted from generator set.
3. Refer to Figure 1 for base mounting measurements.

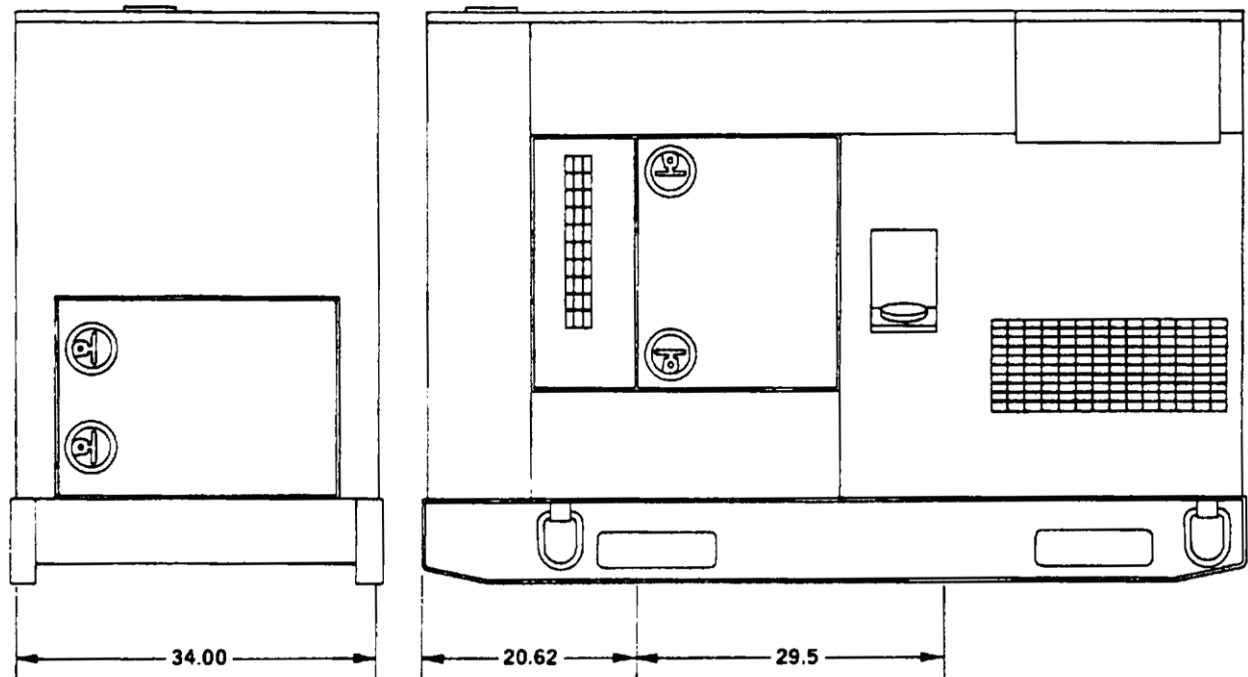


Figure 1. Base Mounting Measurements.

END OF TASK

Outdoor Installation

1. Make use of natural protective barriers.
2. Allow space on all sides for service and maintenance. Refer to Figure 2 for minimum clearance measurements.
3. Ensure that site soil is firm and well drained.
4. Use planks or other material for support in areas where soil will not support generator set.

END OF TASK**Indoor Installation****WARNING**

Hot exhaust gases can ignite flammable materials. Allow room for safe discharge of hot gases and sparks. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Exhaust discharge contains deadly gases including carbon monoxide. DO NOT operate generator set in enclosed areas unless exhaust discharge is properly vented outside. Failure to comply with this warning can cause injury or death to personnel.

CAUTION

Never position generator set with the air inlets near a wall or other object that interferes with cooling air circulation. Damage to equipment could occur.

1. Provide ducts and vents to outside of building if good supply of cooling air is not available.
2. Make air intake and outlet openings in building same size or larger as those on the generator set.
3. Install a gas-tight metal pipe from exhaust pipe of generator set to outside of building.

NOTE

Make exhaust pipe extension as short and straight as possible with only one 90 degree bend, if needed.

4. Ensure that inside diameter of exhaust pipe extension is as large as or larger than generator set exhaust pipe.

WARNING

Hot exhaust gases can ignite flammable materials. Allow room for safe discharge of hot gases and sparks. Failure to comply with this warning can cause injury or death to personnel.

5. Provide for harmless discharge of hot gases and sparks. Do not direct exhaust into area containing flammable materials.

WARNING

If not shielded, hot exhaust pipe can ignite flammable wall materials. Failure to comply with this warning can cause injury or death to personnel.

6. Shield exhaust pipe with fireproof material at point where it passes through a flammable wall.

WARNING

An unwrapped exhaust pipe can cause injury if touched. Failure to comply with this warning can cause injury to personnel.

7. Wrap exhaust pipe in protective material.

8. Allow space on all sides for service and maintenance. Refer to Figure 2 for minimum clearance measurements.

WARNING

Exhaust discharge contains deadly gases including carbon monoxide. DO NOT operate generator set in enclosed areas unless exhaust discharge is properly vented outside. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Engine exhaust fumes contain deadly poisonous gases.

Severe exposure can cause death or permanent brain damage.

Exhaust gases are most dangerous in places with poor airflow. Best defense against exhaust gas poisoning is very good airflow.

To protect yourself and your partners, always obey the following rules:

- DO NOT run engine indoors unless you have VERY GOOD AIRFLOW.
- DO NOT idle engine for a long time unless there is VERY GOOD AIRFLOW.
- Be alert at all times. Check for smell of exhaust fumes.
- REMEMBER: Best defense against exhaust gas poisoning is VERY GOOD AIRFLOW.
- Exhaust gas poisoning causes dizziness, headache, loss of muscle control, sleepiness, coma, and death. If anyone shows signs of exhaust gas poisoning, get ALL PERSONNEL clear of exhaust area. Make sure they have lots of fresh air. KEEP THEM WARM, CALM, AND INACTIVE. GET MEDICAL HELP. If anyone stops breathing, give artificial respiration. See FM 4-25.11 for first aid.

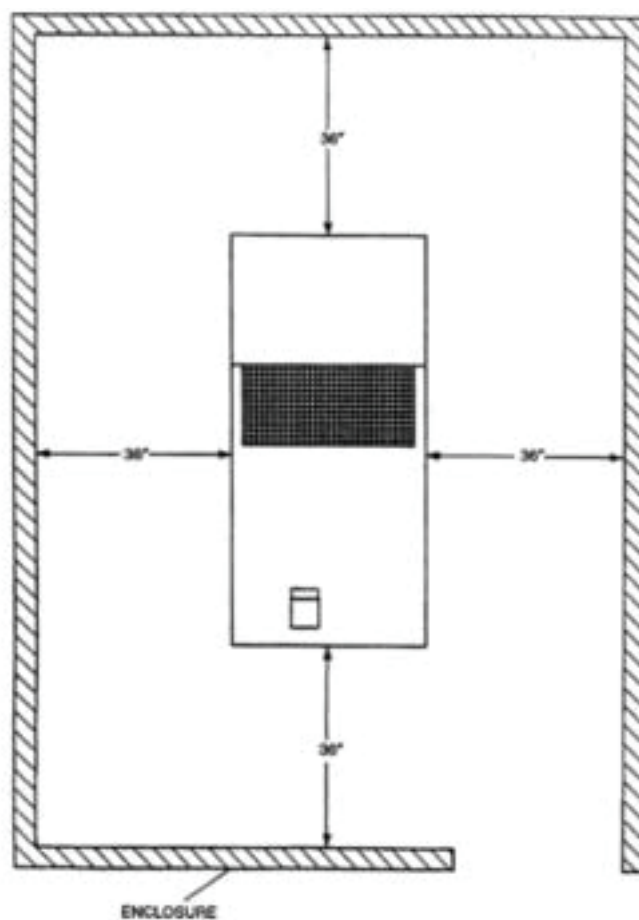


Figure 2. Minimum Enclosure Clearance Measurements.

END OF TASK

FABRICATION/ASSEMBLY OF PARTS

Table 4 provides a list of generator set parts that require fabrication or assembly when replacing. Refer to WP 0129 for an index to fabrication and assembly instructions.

Table 4. Fabricated/Assembled Parts.

NAME	PART NUMBER
Cable Assembly, AC Power	88-22126-1
Cable Assembly, AC Power	88-22126-2
Cable Assembly, AC Power	88-22126-3
Cable Assembly, AC Power	88-22126-4
Cable Assembly, AC Power	88-22126-5
Cable Assembly, AC Power	88-22126-6
Cable Assembly, AC Power	88-22126-7
Cable Assembly, Battery	88-22178

Table 4. Fabricated/Assembled Parts. - Continued

NAME	PART NUMBER
Cable Assembly, Battery	88-22127
Cable Assembly, Battery	88-22181
Cable Assembly, Battery	88-22179
Cable Assembly, Battery	88-22207
Holder, Control Panel	88-22120
Hose Assembly	88-20191-6
Insulation, Panel, Top	88-22582
Insulation, Baffle	88-22592
Insulation, Baffle	88-22593
Insulation, Top, Center	88-22584
Insulation, Top, Rear	88-22585
Insulation, Front Housing	88-22591
Insulation, Top, Front	88-22586
Insulation, Top, Center	88-22587
Insulation, Top, Center	88-22588
Insulation, Top, Front	88-22583
Resistor Assembly	122-3066-1
Resistor Assembly	29879
Resistor Assembly, Volt	88-22631
Resistor-Diode Assembly	88-22632
Resistor-Diode Assembly	88-22106
Solenoid Assembly	88-22553
Switch Assembly, Fuel Level	88-22548
Varistor Wire L1	88-20305-1
Varistor Wire L2	88-20305-2
Varistor Wire L3	88-20305-3
Varistor Wire L0	88-20305-5

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

PMCS INTRODUCTION

INTRODUCTION TO FIELD PMCS TABLE

WP 0008, Table 1 (PMCS table) has been provided so you can keep your equipment in good operating condition and ready for its primary mission.

Warnings and Cautions

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

Explanation of Table Entries

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

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

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

Procedure Column. This column gives the procedures for checking or servicing the item listed in the item to be checked or serviced column. You must perform the procedure to know if the generator set is ready or available for its intended mission or operation. You must do the procedure at the time stated in the interval column.

Equipment Not Ready/Available if: Column. Information in this column tells you what faults will keep the generator set from being capable of performing its primary mission. If checks or services show faults listed in this column, do not return the generator set to service until the faults have been corrected.

NOTE

The terms ready/available and mission capable refer to the same status: generator set is on hand and is able to perform its combat missions (see DA Pam 750-8).

Other Table Entries

Be sure to observe all special information and notes that appear in your table.

Reporting and Correcting Deficiencies

If your generator set does not perform as required, refer to Troubleshooting for possible problems. Report any malfunctions or failures on DA Form 2404, or refer to DA Pam 750-8.

Special Instructions

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

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

1. Keep the generator set clean. Dirt, grease, and oil get in the way and may cover up a serious problem. Use cleaning solvent to clean metal surfaces.
2. Use soap and water to clean rubber or plastic parts and material.
3. Check all bolts, nuts, and screws to make sure they are not loose, missing, bent, or broken. Do not try to check them with a tool, but look for chipped paint, bare metal, or rust around bolt heads. If you find one loose, report it to the next-higher level of maintenance.
4. Inspect welds for loose or chipped paint, rust, or gaps where parts are welded together. If a broken weld is found, report it to the next-higher level of maintenance.
5. Inspect electrical wires, connectors, terminals, and receptacles for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors. Examine terminals and receptacles for serviceability. If deficiencies are found, report them to the next-higher level of maintenance.
6. Inspect hoses and fluid lines. Look for wear, damage, and leaks. Make sure that clamps and fittings are tight. Wet spots and stains around a fitting or connector can mean a leak. If a leak comes from a loose connector, or if something is broken or worn out, report it to the next-higher level of maintenance.

Leakage Definitions

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

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

Operation of Power Unit/Power Plant with Minor Leaks

1. Consider the equipment's capacity for the fluid that is leaking. If the capacity is small, the fluid level may soon become too low for continued operation. If in doubt, *notify your supervisor*.
2. Check the fluid level more often than required in the PMCS table. Add fluid as needed.

Corrosion Prevention and Control (CPC)

CPC of Army materiel is of continuing concern. It is important that any corrosion problems with the equipment be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items. Although corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem. If a corrosion problem is identified, it can be reported using 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. The form should be submitted to the address specified in DA Pam 750-8.

END OF WORK PACKAGE

FIELD MAINTENANCE

**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
PMCS, INCLUDING LUBRICATION INSTRUCTIONS**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Fuel Filter/Auxiliary Fuel Filter
Engine Lubrication Oil
Cleaning Cloth
Coolant
Fan Belt

Personnel Required

One

References

LO 9-6115-644-12
TM 9-6115-2815-255-24
WP 0012, Maintenance Of DC Electrical System, Batteries
WP 0075, Maintenance Of Air Take & Exhaust System, Air Cleaner Tubing & Breather
WP 0076, Maintenance Of Cooling System, Coolant System
WP 0082, Maintenance Of Cooling System, Radiator
WP 0084, Maintenance of Coolant System, Fan Belt
Maintenance of Engine Accessories, Magnetic Pickup

Equipment Condition

Grounded, Off & Operational

SPECIAL LUBRICATION INSTRUCTIONS**NOTE**

There are no special lubrication instructions. Refer to LO 9-6115-644-12 for generator set lubrication requirements.

Table 1. Preventive Maintenance Checks and Services for MEP-805A and MEP-815A.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
1	Semi-Annually, 300 hours	Engine Lube Oil	<p align="center">NOTE</p> <p>Oil filter should be changed with lube oil change (TM 9-2815-255-24).</p> <p>Drain engine lube oil. Add proper lube oil (LO 9-6115-644-12).</p>	
2	Annually, 300 hours	Fuel Filter/Water Separator	Change fuel filter/water separator (TM 9-2815-255-24).	

Table 1. Preventive Maintenance Checks and Services for MEP-805A and MEP-815A. - Continued

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
3	Bi-Annually, 1500 hours	Cooling System	Drain coolant and flush cooling system or add proper coolant (WP 0076, Servicing).	
4	Annually	Radiator Cap	Inspect radiator cap for corrosion, torn or deteriorated seal, and obvious damage.	Radiator cap or seal is damaged.
5	Annually, 300 hours	Batteries	Remove batteries (WP 0012, Removal). Clean batteries, cable terminals, and battery posts; test batteries for state of charge (WP 0012, Testing).	Batteries will not hold charge.
6	Annually, 300 hours	Air Cleaner Assembly	Inspect air cleaner assembly and mounting bracket for cracks, dents, and other damage. Inspect element for clogs and damage. Clean or replace, as necessary. Clean housing with cleaning cloth.	
7	Annually, 750 hours	Air Cleaner Tubing and Breather	Remove, clean, and inspect tubing and breather (WP 0075).	
8	Annually, 300 hours	Hardware and Sound Insulation	Inspect for loose, damaged, or missing hardware and sound insulation. Tighten loose hardware. Repair or replace damaged or missing hardware and insulation.	Hardware or insulation loose, missing, or damaged.
9	Annually, 1500 hours	Radiator and Interior of Generator Set	Clean radiator exterior surfaces (WP 0082, Inspection and Cleaning). Clean engine compartment.	
10	Annually, 1500 hours	Magnetic Pickup	Remove, inspect, and clean magnetic pickup (WP 0114).	Magnetic pickup is damaged.
11	Annually	Wiring Harnesses	Inspect wiring harnesses for breaks and loose connections. Repair and tighten wiring harnesses, as necessary.	Wiring harnesses are damaged or connections are loose.
12	Annually, 3000 hours	Muffler	Check muffler for leaks, restriction, and accumulation of carbon. Replace or clean, as required.	Muffler leaks, is restricted, or has excessive carbon accumulation.
13	Annually, 300 hours	Governor Linkage	Clean and lubricate governor actuator linkage rod.	
14	Annually, 500 hours	Auxiliary Fuel Filter	<p style="text-align: center;">NOTE</p> <p>If the auxiliary fuel system is used as the primary fuel source, then the auxiliary fuel filter must be replaced semi-annually.</p> <p>Check for proper operation using auxiliary fuel system as primary source.</p> <p>Check for proper operation using auxiliary fuel system as primary source.</p>	
15	Annually, 1500 hours	Fan Belt	Replace fan belt (WP 0084).	

Table 1. Preventive Maintenance Checks and Services for MEP-805A and MEP-815A. - Continued

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
16	Every Oil Change, 300 hours	Wetstacking	<p>NOTE</p> <p>Perform if the generator set has been operated for long periods of times at low loads and shows signes of wetstacking.</p> <p>Place an 80 % load on the generator set and operate generator for 1-2 hours until the wetstacking residues burn off.</p> <p>Place an 80 % load on the generator set and operate generator for 1-2 hours until the wetstacking residues burn off.</p>	

Mandatory Replacement Parts List

There are no replacement parts required for these PMCS procedures.

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****REMOVAL AND INSTALLATION OF MAJOR COMPONENTS, ENGINE AND GENERATOR ASSEMBLY:
REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Coolant

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0006, Lubricating Oil & Coolant
WP 0017, Maintenance Of Housing, Front Housing
Section
WP 0018, Maintenance Of Control Box Assembly,
Rear Housing Section
WP 0081, Maintenance Of Coolant System, Coolant
Overflow & Drain Hoses
WP 0082, Maintenance Of Coolant System, Radiator
WP 0086, Maintenance Of Fuel System, Auxiliary
Fuel Pump
WP 0098, Maintenance Of Outbox Assembly,
Outbox Assembly
WP 0118, Maintenance Of Lube System, Oil Drain
Line
WP 0127, Maintenance Of Skid Base

Equipment ConditionGrounded, Off & Operational

GENERAL

The engine and generator are bolted together at the engine flywheel and flywheel housing adapter. The engine and generator may be removed as an assembly or individually. The engine and generator assembly is mounted on the skid base at four points, two at the engine and two at the generator. There are also brackets installed on both sides of the engine which can be adjusted to support the rear of the engine when removing the generator separately. There are bolts and nuts which can be adjusted to support the front of the generator when removing the engine.

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Slave receptacle (NATO connector) is electrically live at all times and is unfused. The Battery Disconnect Switch does not remove power from the slave receptacle. NATO slave receptacle has 24 VDC even when Battery Disconnect Switch is set to OFF. This circuit is only dead when the batteries are fully disconnected. Disconnect the batteries before performing maintenance on the slave receptacle. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

Each battery weighs more than 70 pounds (32 kg) and requires a two-person lift. Lifting batteries can cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply with this warning can cause injury to personnel.

WARNING

Support components when removing attaching hardware or component may fall. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove output box assembly and generator set housing (WP 0098, Removal; WP 0017, Removal; and WP 0018, Removal).
4. Remove radiator (WP 0082, Removal).
5. Drain engine oil and disconnect oil drain line at engine fitting (WP 0118, Removal).
6. Disconnect fuel line at engine fuel pump from fuel pickup (WP 0086, Removal).
7. Disconnect engine excess fuel return line at tank fitting (WP 0086, Removal).
8. Disconnect coolant overflow hose from overflow bottle (WP 0081, Removal).
9. Remove nuts (Figure 1, Item 1), washers (2), snubbing washers (3), washers (37), and bolts (4) from engine mounts (5).
10. Remove rear forklift guide from generator set (WP 0127, Removal).
11. Remove nuts (6), washers (7), bolts (8), snubbing washers (9), and Belleville washers (10) from generator mounts.
12. Tie wrap generator power leads and secure out of the way.

CAUTION

Rated capacity of overhead hoist should be at least 2,000 pounds (907 Kg). Arrange lifting device so that it supports both engine and generator to avoid undue stress on the engine and generator coupling.

13. Attach lifting harness to engine and generator lifting points. Raise engine and generator assembly from skid base.
14. Move engine and generator assembly to maintenance work area. Support assembly on maintenance stand or fixture.
15. Remove engine shock mounts (14) from skid base by removing nuts (11), washers (12), and bolts (13).
16. Remove shock mounts (15) from generator mounting points on skid base.
17. Remove engine mounting brackets (5) by removing bolts (16), lockwashers (17), and washers (18). Discard lockwashers (17).
18. Remove engine support brackets (22) by removing bolts (19), lockwashers (20), and washers (21). Discard lockwashers (20).
19. Remove generator mount angles (29), plates (28), nuts (23 and 27), washers (24 and 26), and bolts (25) from generator.

END OF TASK

INSTALLATION

1. Install engine shock mount (Figure 1, Item 14) on skid base with bolts (13), washers (12), and nuts (11).
2. Position generator shock mounts (15) in skid base.
3. Install engine mounting brackets (5) on engine with bolts (16), new lockwashers (17), and washers (18). Torque bolts to 120 ft•lbs (163 N•m).
4. Install engine support brackets (22) on engine with bolts (19), new lockwashers (20), and washers (21).
5. Install generator mount angles (29) and plates (28) on generator with bolts (25), washers (24 and 26), and nuts (23 and 27).

CAUTION

Rated capacity of overhead hoist should be at least 2,000 pounds (907 Kg). Arrange lifting device so that it supports both engine and generator to avoid undue stress on the engine and generator coupling.

6. Attach lifting harness to engine and generator lifting points. Raise engine and generator assembly from maintenance stand or fixture.
7. Position engine and generator assembly on skid base, aligning mounting holes and brackets.
8. Install bolts (8), Belleville washers (10), snubbing washers (9), washers (7), and nuts (6) to secure generator to skid base. Torque bolts (8) to 210 ft•lbs (285 N•m).
9. Adjust nuts (23 and 27) to obtain 0.5 inch (12.7 mm) minimum clearance between ends of bolts (25) and skid base.
10. Install bolts (4), washers (37), snubbing washers (3), washers (2), and nuts (1) to secure engine to skid base. Torque bolts (4) to 75 ft•lbs (102 N•m).
11. Install rear forklift guide in skid base (WP 0127, Installation).
12. Connect oil drain line to engine fitting (WP 0118, Installation).
13. Connect coolant overflow hose to overflow bottle (WP 0081, Installation).
14. Install radiator (WP 0082, Installation).
15. Connect fuel line to engine fuel pump from fuel pickup (WP 0086, Installation).
16. Connect engine excess fuel return line at tank fitting (WP 0086, Installation).
17. Install output box assembly and generator set housing (WP 0098, Installation; WP 0017, Installation; WP 0018, Installation).
18. Service engine lubrication system (WP 0006, Lubricating Oil).

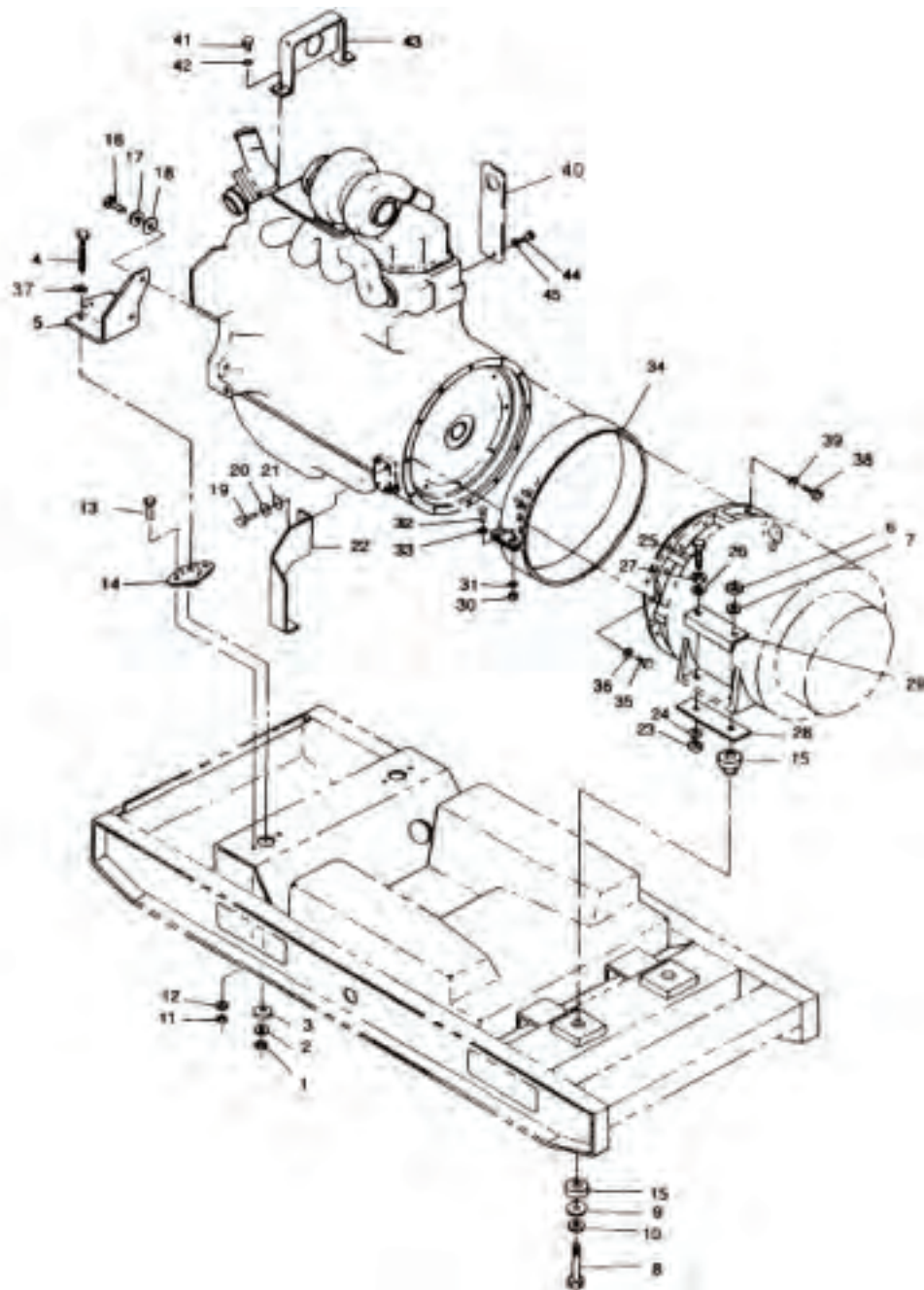


Figure 1. Engine and Generator Assembly.

- 19. Service coolant system (WP 0006, Coolant).
- 20. Connect negative battery cable. Close battery access door.
- 21. Start generator set. Perform operational checks and check for leaks.

END OF TASK

END OF WORK PACKAGE

MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****REMOVAL AND INSTALLATION OF MAJOR COMPONENTS, ENGINE ASSEMBLY: REMOVAL,
INSTALLATION, REPLACEMENT**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Suitable Container for Oil/Coolant Drainage

New Lockwashers

Coolant

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0006, Coolant & Lubrication Oil

WP 0009, Figure 1, Item 22

WP 0019, Maintenance of Control Box Assembly,
Control Box AssemblyWP 0078, Maintenance of Coolant System, Fan
Guards

WP 0084, Figure 1, Item 6

WP 0095, Figure 1, Item 9

WP 0110, Figure 1, Items: 2, 3, 4, 5, 6 & 13

WP 0114, Maintenance of Engine Accessories,
Magnetic Pickup

WP 0117, Figure 1, Item 11

WP 0118, Figure 1, Item 4

Equipment ConditionGrounded, Off & Operational

ENGINE ASSEMBLY**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Slave receptacle (NATO connector) is electrically live at all times and is unfused. The Battery Disconnect Switch does not remove power from the slave receptacle. NATO slave receptacle has 24 VDC even when Battery Disconnect Switch is set to OFF. This circuit is only dead when the batteries are fully disconnected. Disconnect the batteries before performing maintenance on the slave receptacle. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

Each battery weighs more than 70 pounds (32 kg) and requires a two-person lift. Lifting batteries can cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply with this warning can cause injury to personnel.

WARNING

Support components when removing attaching hardware or component may fall. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

3. Using a suitable container, drain engine oil and engine coolant.
4. Remove control box assembly (WP 0019, Removal).
5. Remove bolts (Figure 1, Items 1 and 4), lockwasher (2 and 5), washers (3 and 6), and top housing panel (7) from generator set. Discard lockwashers (2 and 5).
6. Loosen clamp (Figure 2, Item 1) at radiator (2).
7. Loosen clamp (3) and disconnect overflow hose (4) from filler hose and panel assembly (5).

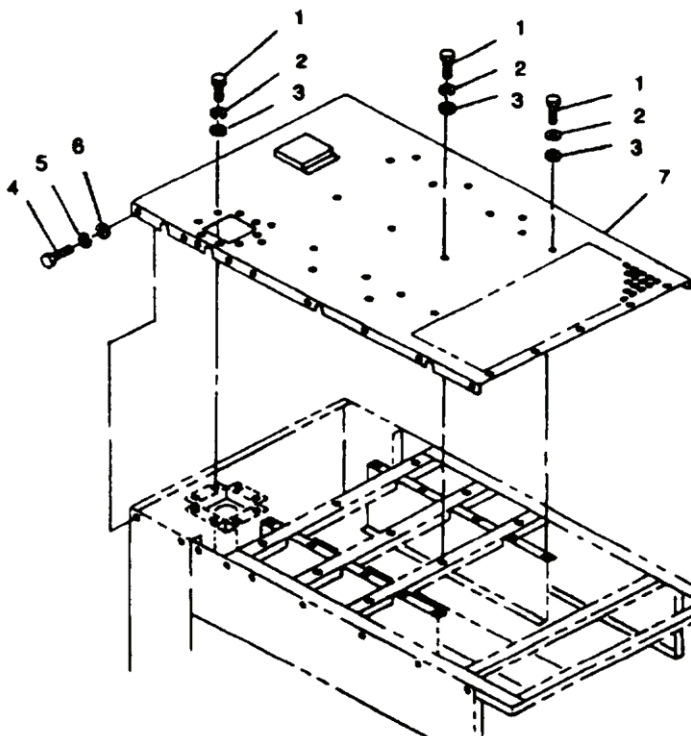


Figure 1. Top Housing Panel.

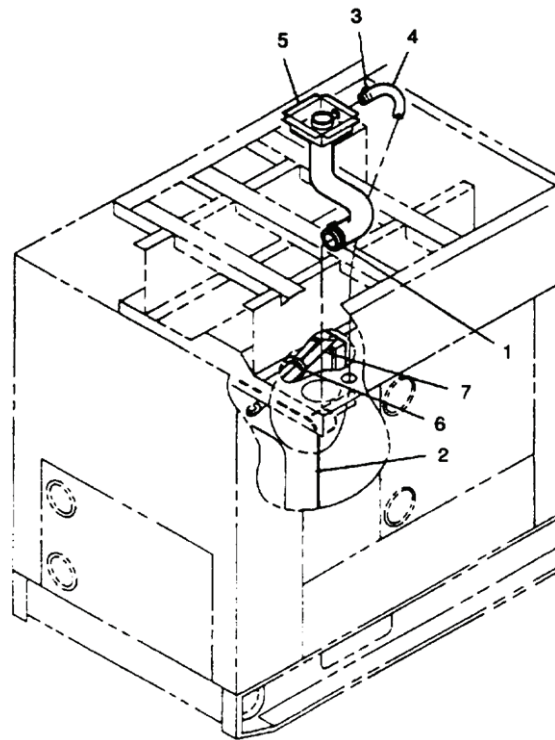


Figure 2. Filler Hose and Panel Assembly.

8. Remove filler hose and panel assembly (5) from generator set.
9. Cut wire ties (6) securing overflow hose (4) to upper radiator supports (7).
10. Remove clamp (Figure 3, Item 1) and disconnect hose (2) from overflow bottle assembly (5).
11. Remove bolts (3), lockwashers (4), and overflow bottle assembly (5) from right side of engine. Discard lockwashers (4).

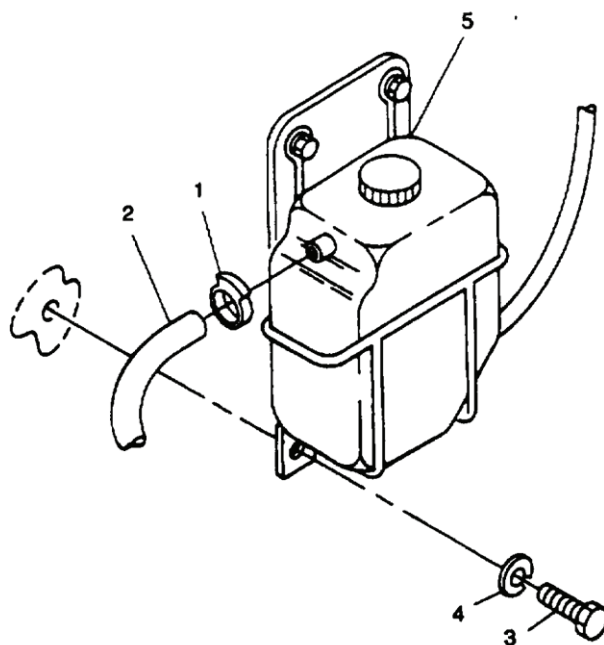


Figure 3. Overflow Bottle Assembly.

12. Remove exhaust pipe clamp (Figure 4, Item 1) at turbocharger outlet.
13. Remove nuts (2), lockwashers (3), flat washers (5), and bolts (4) securing top housing section (10) to front housing. Discard lockwashers (3).
14. Remove assembled nuts (6) and bolts (7) securing top housing section (10) to rear side panels.
15. Remove assembled nut (8) and bolt (9) securing top housing section (10) to output box angle.
16. Using a lifting device, remove top housing section assembly (10) from generator set.
17. Remove fan guards (WP 0078, Removal).
18. Remove bolts (Figure 5, Item 1), washers (3), lockwashers (2), and shroud (4) from radiator assembly (23). Allow shroud (4) to lay on fan (7). Discard lockwashers (2).
19. Remove bolts (5), lockwashers (6), fan (7), spacer (6), and shroud (4). Discard lockwashers (6).
20. Remove nuts (9), lockwashers (10), bolts (11), and washers (12) securing support rods (13) to engine lifting bracket. Discard lockwashers (10).

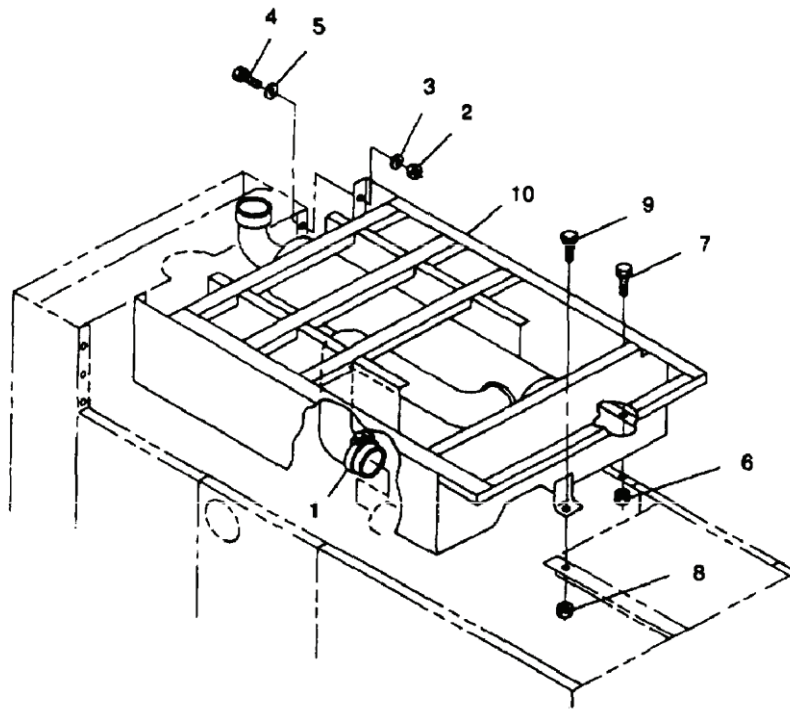


Figure 4. Top Housing Section Assembly.

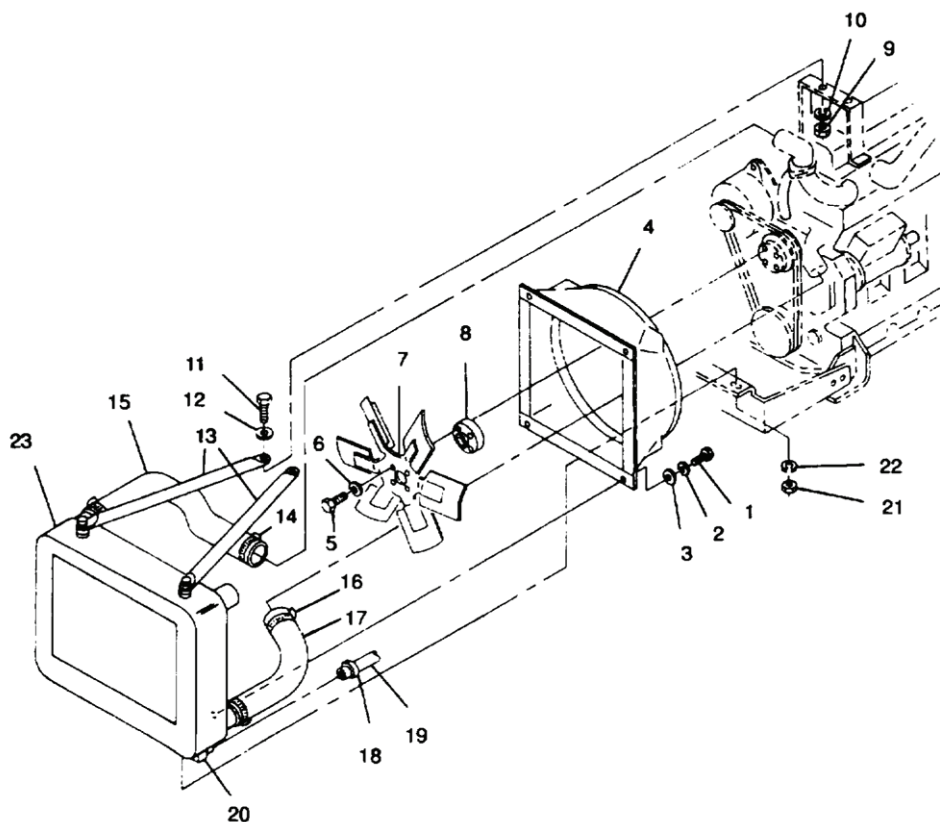


Figure 5. Radiator Assembly.

21. Loosen clamp (14) at thermostat housing and disconnect hose (15).
22. Loosen clamp (16) at water pump and disconnect hose (17).
23. Loosen clamp (18) and disconnect hose (19) from radiator drain valve (20).
24. Remove nuts (21) and lockwashers (22) securing radiator assembly (23). With the aid of an assistant, remove radiator assembly (23). Discard lockwashers (22).
25. Remove bolts (Figure 6, Items 1 and 4), washers (3 and 5), lockwashers (2 and 6), nuts (7), and rear housing panel (8) from generator set. Discard lockwashers (2 and 6).

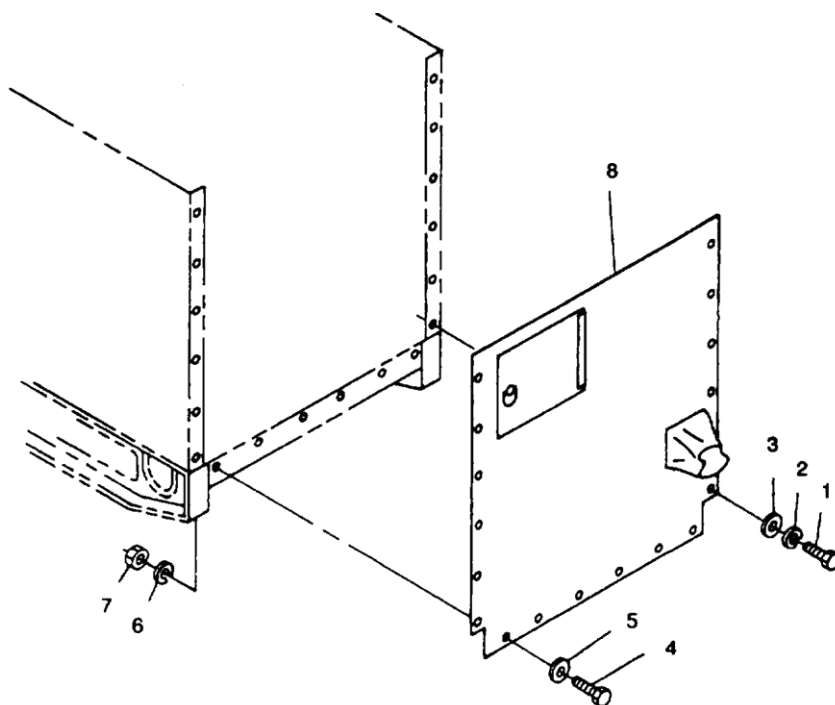


Figure 6. Rear Housing Panel.

26. Loosen clamp (Figure 7, Item 1) securing hose (2) to fuel tank. Cap openings.
27. Loosen clamp (3) and disconnect hose (4) from fuel filler panel assembly (5). Cap openings.
28. Disconnect fuel line (6) from hose (7). Cap openings.
29. Tag and disconnect auxiliary fuel pump (8) and fuel float switch module (9) electrical connectors.
30. Remove bolts (Figure 8, Item 1), lockwashers (2), and washers (3) securing left side panel (4) to skid base. Discard lockwashers (2).
31. Remove nuts (8), lockwashers (6 and 9), washers (7 and 11), and bolts (5 and 10) securing lower left side panel (12) to front housing and skid base. With aid of an assistant, remove left rear side panel (4) and lower left side panel (12) as an assembly. Discard lockwashers (6 and 9).
32. Loosen clamps (Figure 9, Item 1) securing tube (2) to hose (3) and hump hose (4) to turbocharger.

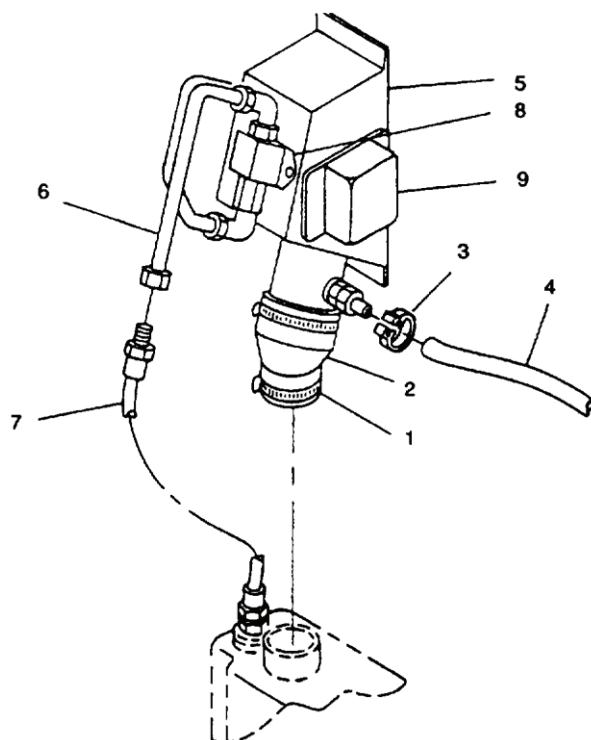


Figure 7. Fuel Filler Hoses and Panel Assembly.

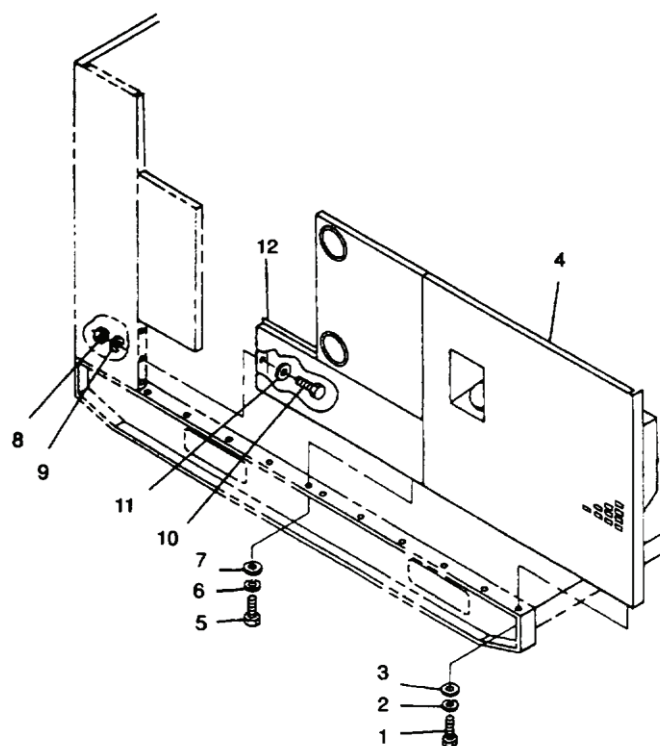


Figure 8. Left Side Housing Panels.

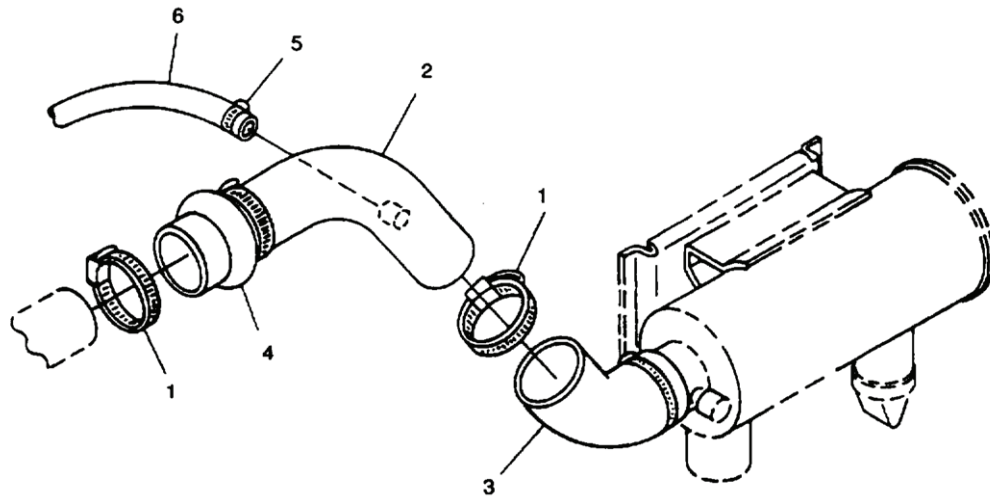


Figure 9. Air Cleaner Hose and Tube Assembly.

33. Loosen clamp (5) and connect hose (6) from tube (2). Remove tube (2) and hump hose (4) as an assembly.
34. Loosen clamp (Figure 10, Item 1) and disconnect oil drain hose (2) from adapter (3).

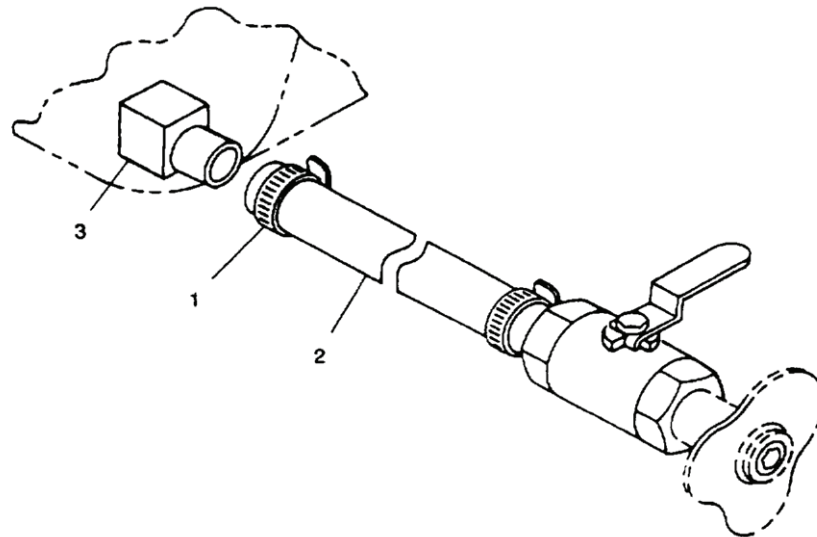


Figure 10. Oil Drain Hose.

35. On left side of engine, tag and disconnect electrical leads from coolant high temperature switch (Figure 11, Item 1), low oil pressure switch (2), oil pressure sender (3), coolant temperature sender (4), magnetic pickup (5), DEAD CRANK switch (6), and fuel injection pump (7).
36. Remove nut (8) from rod end (9). Loosen nuts (10) and remove governor actuator assembly (11) with wiring harness attached. Place out of the way.

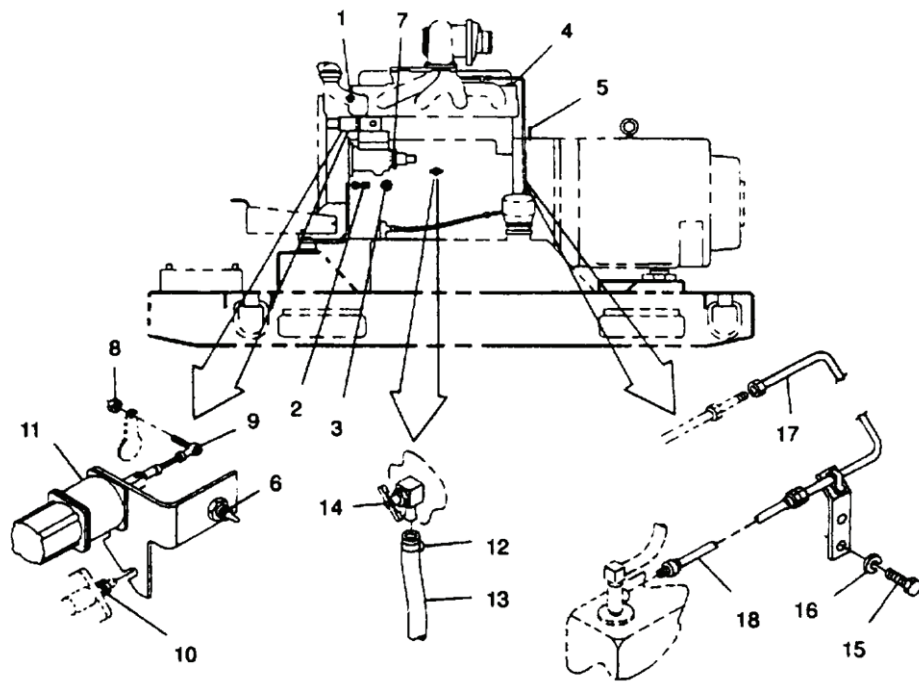


Figure 11. Left Side Engine.

37. Loosen clamp (12) and disconnect coolant drain hose (13) from engine block coolant drain valve (14).
38. Remove bolt (15) and lockwasher (16) securing fuel return line (17) to engine block. Discard lockwasher (16).
39. Disconnect fuel line (17) at injectors excess fuel line, and fuel hose (18) at fuel tank. Remove line (17) and hose (18) as an assembly. Cap openings.
40. Open right side engine access doors, tag and disconnect electrical leads from battery charging alternator (Figure 12, Item 1), starter solenoid (2), and starter motor (3).
41. Disconnect fuel line (4) at fuel pump (5). Cap openings.
42. Disconnect tube (6) from ether start spray nozzle (7) at intake manifold.
43. Remove nut (Figure 13, Item 1) lockwashers (2), and bolt (3) securing ground strap (4) to skid base. Discard lockwashers (2).
44. Remove bolts (5), washers (7), and lockwashers (6) securing load output terminal board assembly (8) to supports (9 and 10). Pull load output terminal board assembly (8) out through access door. Discard lockwashers (6).
45. Remove assembled nuts (11), bolts (12), and support (10) from right side panel.
46. Loosen nuts (Figure 1, Items 23 and 27), turn bolts (25) to contact skid base and tighten nuts (23 and 27).

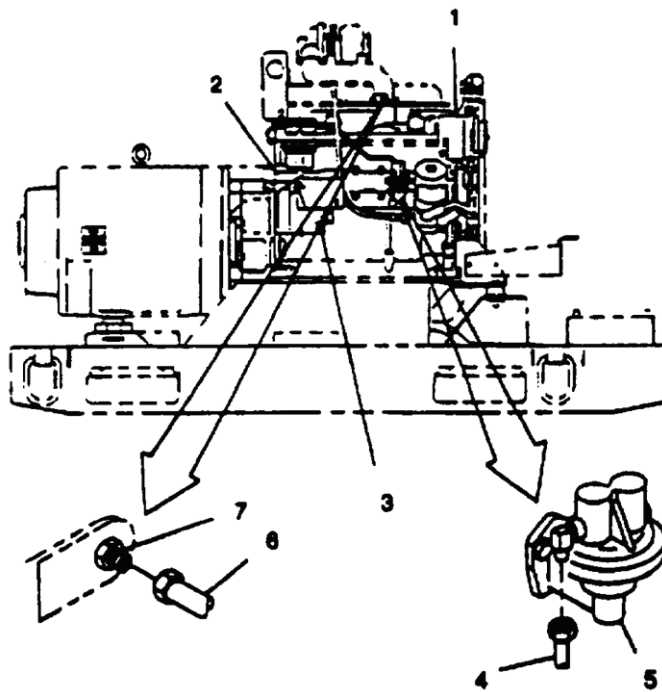


Figure 12. Right Side Engine.

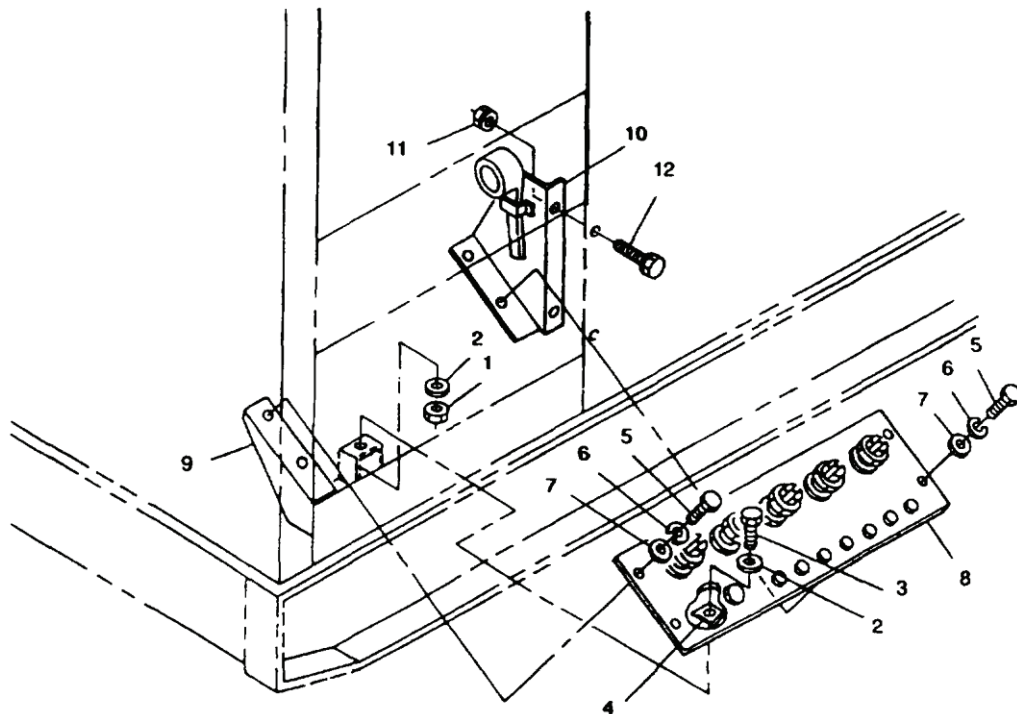


Figure 13. Load Output Terminal Board.

47. Remove nuts (30), lockwashers (31), screws (32), washers (33), and screen/cover (34) from generator case. Discard lockwashers (31).

48. Scribe mark on generator drive disc and engine flywheel for alignment of bolts during installation.
49. Remove bolts (35) and lockwashers (36) securing generator disc drive to engine flywheel. Discard lockwashers (36).

WARNING

Rated capacity of overhead hoist should be at least 1,500 pounds (680 kg). Do not use a hoist with less capacity. Failure to comply with this warning can cause injury or death to personnel, and damage to equipment.

50. Attach lifting harness to engine and overhead hoist. Take up slack.
51. Remove bolts (38) and lockwashers (39) securing generator to flywheel housing. Discard lockwashers (39).
52. Remove nuts (1), washers (2), snubbing washers (3), and bolts (4) securing engine mount brackets (5) to skid base.
53. Remove nuts (Figure 14, Item 1) lockwashers (2), bolts (3), and radiator mounting bracket (4) from engine mount brackets (5). Discard lockwashers (2).

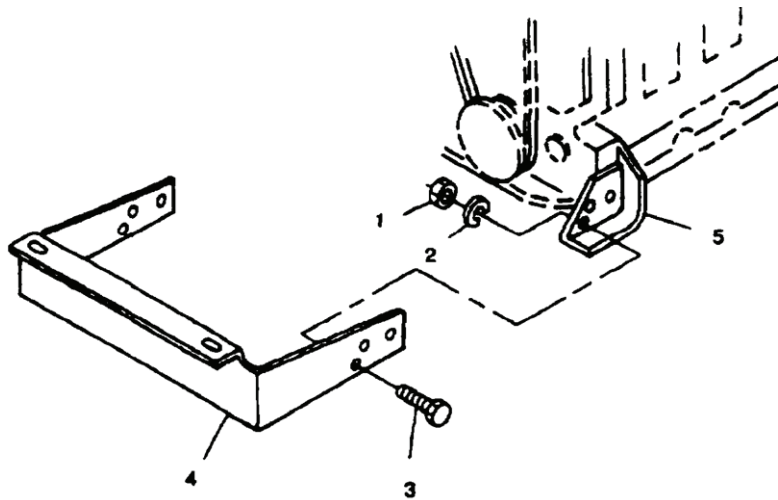


Figure 14. Radiator Mounting Bracket.

54. With aid of an assistant, slowly lift engine assembly from skid base, ensuring that engine flywheel housing separates smoothly from generator without binding. Remove engine from generator set housing and place on engine stand.
55. Remove nuts (WP 0009, Figure 1, Item 11), lockwashers (12), bolts (13), and shock mounts (14) from skid base. Discard lockwashers (12).
56. Remove bolts (16), lockwashers (17), washers (18), and mount brackets (5) from engine block. Discard lockwashers (17).
57. Remove bolts (41), lockwashers (42), and front engine lifting bracket (43) from engine assembly. Discard lockwashers (42).
58. Remove bolt (44), lockwasher (45), and rear engine lifting bracket (40) from engine assembly. Discard lockwasher (45).
59. Remove bolts (19) lockwashers (20) washers (21) and rear engine support brackets (22) from engine assembly. Discard lockwashers (20).

END OF TASK

INSTALLATION

1. Install rear engine support brackets (WP 0009, Figure 1, Item 22) on engine assembly with bolts (19), new lockwashers (20), and washers (21).
2. Install rear engine lifting bracket (40) on engine assembly with bolt (44) and new lockwasher (45).
3. Install front engine lifting bracket (43) on engine assembly with bolts (41) and new lockwashers (42).
4. Install engine mount brackets (5) on engine block with bolts (16), new lockwashers (17), and washers (18).
5. Install shock mounts (14) on skid base with bolts (13), new lockwashers (12) and nuts (11).

WARNING

Rated capacity of overhead hoist should be at least 1,500 pounds (680 kg). Do not use a hoist with less capacity. Failure to comply with this warning can cause injury or death to personnel, and damage to equipment.

6. Attach lifting harness to engine and overhead hoist. Take up slack.

NOTE

While lowering engine make sure oil drain line hose is fed through panel holes located in battery and engine compartment.

7. With aid of an assistant, lift engine from engine stand and position engine on skid base, aligning mounting holes, brackets and generator to flywheel housing.
8. Install bolts (38) and new lockwashers (39), tightening bolts (38) slowly to ensure even and proper seating of generator housing lip to flywheel housing.
9. Secure engine mount brackets (5) to skid base with bolts (4), snubbing washers (3), washers (2), and nuts (1). Torque bolts (4) to 75 ft•lbs (102 N•m).
10. Align scribe mark on generator drive disc and engine flywheel, and install bolts (35) and new lockwashers (36) securing generator drive disc to engine flywheel.
11. Install screen/cover (34) on generator case with screws (32), washers (33), new lockwashers (31), and nuts (30).
12. Loosen nuts (23 and 27) and adjust bolts (25) to obtain 0.5 inch (12.7 mm) minimum clearance with skid base. Torque nuts (23) to 150 ft•lbs (204 N•m).
13. Install radiator mounting bracket (Figure 14, Item 4) with bolts (3), new lockwashers (2), and nuts (1) to engine mount brackets (5).
14. Install support (Figure 13, Item 10) on right side panel with bolts (12) and assembled nuts (11).
15. Install load output terminal board assembly (8) on supports (9 and 10) with bolts (5), new lockwashers (6), and washers (7).
16. Secure ground strap (4) to skid base with bolt (3), new lockwashers (2), and nut (1).
17. Connect tube (Figure 12, Item 6) to ether start spray nozzle (7) at intake manifold.
18. Connect electrical leads to battery charging alternator (1), starter solenoid (2) and starter motor (3) on right side of engine, and remove tags.
19. Remove caps and connect fuel line (4) to engine fuel pump (5).
20. Remove caps and position fuel line (Figure 11, Item 17) and hose (18) in generator set. Connect line (17) to injectors excess fuel line, and hose (18) to fuel tank.
21. Secure fuel line (17) to engine block with bolt (15) and new lockwasher (16).
22. Connect coolant drain hose (13) to engine block coolant drain valve (14) and tighten clamp (12).
23. Install governor actuator assembly (11) to engine assembly with nuts (10), and connect rod end (9) with nut (8).

24. On left side of engine, connect electrical leads to fuel injection pump (7), DEAD CRANK switch (6), magnetic pickup (5), coolant temperature sender (4), oil pressure sender (3), low oil pressure switch (2), and coolant high temperature switch (1). Remove tags.
25. Connect oil drain hose (Figure 10, Item 2) to adapter (3) and tighten clamp (1).
26. Connect tube (Figure 9, Item 2) to hose (3), connect hump hose (4) to turbocharger, and tighten clamps (1).
27. Connect hose (6) to tube (2) and tighten clamp (5).
28. With aid of an assistant, position left rear side housing panel (Figure 8, Item 4) and lower left side panel (12) on generator set.
29. Secure left rear side panel (4) to skid base with bolts (1), new lockwashers (2), and washers (3).
30. Secure lower left side panel (12) to front housing and skid base with bolts (5 and 10), washers (7 and 11), new lockwashers (6 and 9), and nuts (8).
31. Connect auxiliary fuel pump (Figure 7, Item 8) and fuel float switch module (9) electrical connectors and remove tags.
32. Remove caps and connect fuel hose (7) to fuel line (6).
33. Remove caps and connect hose (4) to fuel filler panel assembly (5) and tighten clamp (3).
34. Remove caps and connect hose (2) to fuel tank and tighten clamps (1).
35. Install rear housing panel (Figure 6, Item 8) on generator set with bolts (1 and 4), washers (3 and 5), new lockwashers (2 and 6), and nuts (7).
36. With aid of an assistant, position radiator assembly (Figure 5, Item 23) in generator set with nuts (21) and new lockwashers (22).
37. Connect hose (17) to water pump and tighten clamp (16).
38. Connect hose (15) at thermostat housing and tighten clamp (14).
39. Connect hose (19) at radiator drain valve (20) and tighten clamp (18).
40. Secure support rods (13) to front engine lifting bracket with bolts (11), washers (12), new lockwashers (10), and nuts (9).
41. Position spacer (8), fan (7), and shroud (4) in generator set.
42. Secure spacer (8) and fan (7) on water pump with bolts (5) and new lockwashers (6). Torque bolts (5) to 24 ft•lbs (33 N•m).
43. Install shroud (4) on radiator assembly (23) with bolts (1), washers (3), and new lockwashers (2).
44. Install fan guards (WP 0078, Installation).
45. Using lifting device, position top housing section (Figure 4, Item 10) on generator set.
46. Secure top housing section (10) to output box angle with bolt (9) and assembled nut (8).
47. Secure top housing section (10) to rear side panels with bolts (7) and assembled nuts (6).
48. Secure top housing section (10) to front housing with bolts (4), flat washers (5), new lockwashers (3), and nuts (2).
49. Connect exhaust pipe to turbocharger outlet and install clamp (1).
50. Install overflow bottle assembly (Figure 3, Item 5) on right side of engine with bolts (3) and new lockwashers (4).
51. Connect hose (2) on overflow bottle assembly (5) with clamp (1).
52. Position filler hose and panel assembly (Figure 2, Item 5) in generator set. Connect filler hose and panel assembly (5) to radiator (2) and tighten clamp (1).
53. Connect overflow hose (4) to filler hose and panel assembly (5) and tighten clamp (3).
54. Install new ties (6) on radiator supports (7) to secure overflow hose (4).
55. Install top housing panel (Figure 1, Item 7) with bolts (1 and 4), new lockwashers (2 and 5), and washers (3 and 6).
56. Service coolant system (WP 0006, Coolant).

57. Service lubrication system (WP 0006, Lubricating Oil).
58. Install control box assembly (WP 0019, Installation).
59. Connect negative battery cable and close battery access door.
60. Close all access doors.
61. Start generator set, check for leaks and proper operation.
62. Shut down generator set and service fluid levels as necessary.

END OF TASK

REPLACEMENT

1. Remove old engine assembly from generator set (Engine Assembly, Removal).
2. Remove the following from new engine and return with old engine:
 - a. Cooling fan.
 - b. Fan spacer.
 - c. Fan belt.
3. Disconnect throttle lever cable (Figure 15, Item 1) from fuel injection pump of old engine.
4. Remove throttle lever cable bracket (2), with cable (1) attached, from old engine and install on new engine.
5. Connect throttle lever cable (1) to fuel injection pump lever of new engine.
6. Remove the following from old engine and install on new engine:
 - a. Oil sample valve and low oil pressure switch assembly (Figure 15, Item 3).
 - b. Alternator guard (Figure 16, Item 1). Use hardware from old engine.
 - c. Fuel filter drain valve assembly (Figure 16, Item 2).
 - d. Oil drain line adapter (WP 00118, Figure 1, Item 4) with hose attached.
 - e. Governor actuator bracket (WP 0117, Figure 1, Item 18) with governor actuator (11) and linkage, and DEAD CRANK switch (WP 0110, Figure 1, Item 11) attached. Use hardware from old engine.
 - f. Ether start spray nozzle (WP 0095, Figure 1, Item 9).
 - g. Oil pressure sender (WP 0110, Figure 1, Item 2).
 - h. Coolant drain valve (WP 0110, Figure 1, Item 3).
 - i. Coolant temperature sender (WP 0110, Figure 1, Item 4).
 - j. Coolant high temperature switch (WP 0110, Figure 1, Item 5).
 - k. Magnetic pickup (WP 0110, Figure 1, Item 6). Screw into flywheel housing until magnetic pickup bottoms out, back out 1-1/2 turns and tighten jam nut (6A).
 - l. Diode assembly (WP 0110, Figure 1, Item 13). Install with band end toward engine.
 - m. Fan belt (WP 0084, Figure 1, Item 6).
7. Install new engine in generator set (Engine Assembly, Installation).
8. Check and adjust governor actuator as necessary (WP 0117, Adjustment).
9. Check and adjust magnetic pickup as necessary (WP 0114, Adjustment).
10. Check and adjust fan belt as necessary (WP 0084, Testing and Adjustment).
11. Start generator set, check for leaks and proper operation.

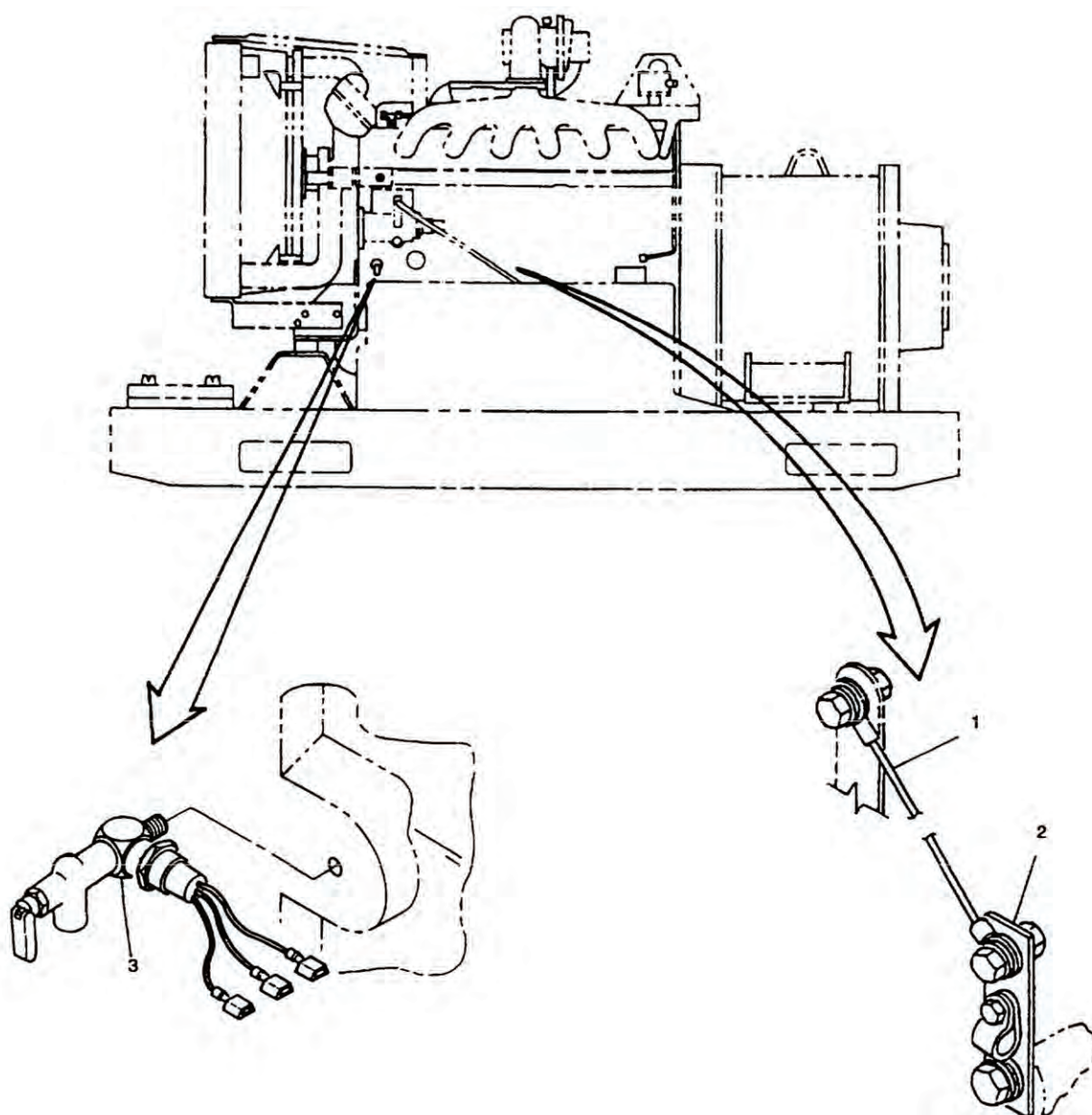


Figure 15. Engine Components (Left Side).

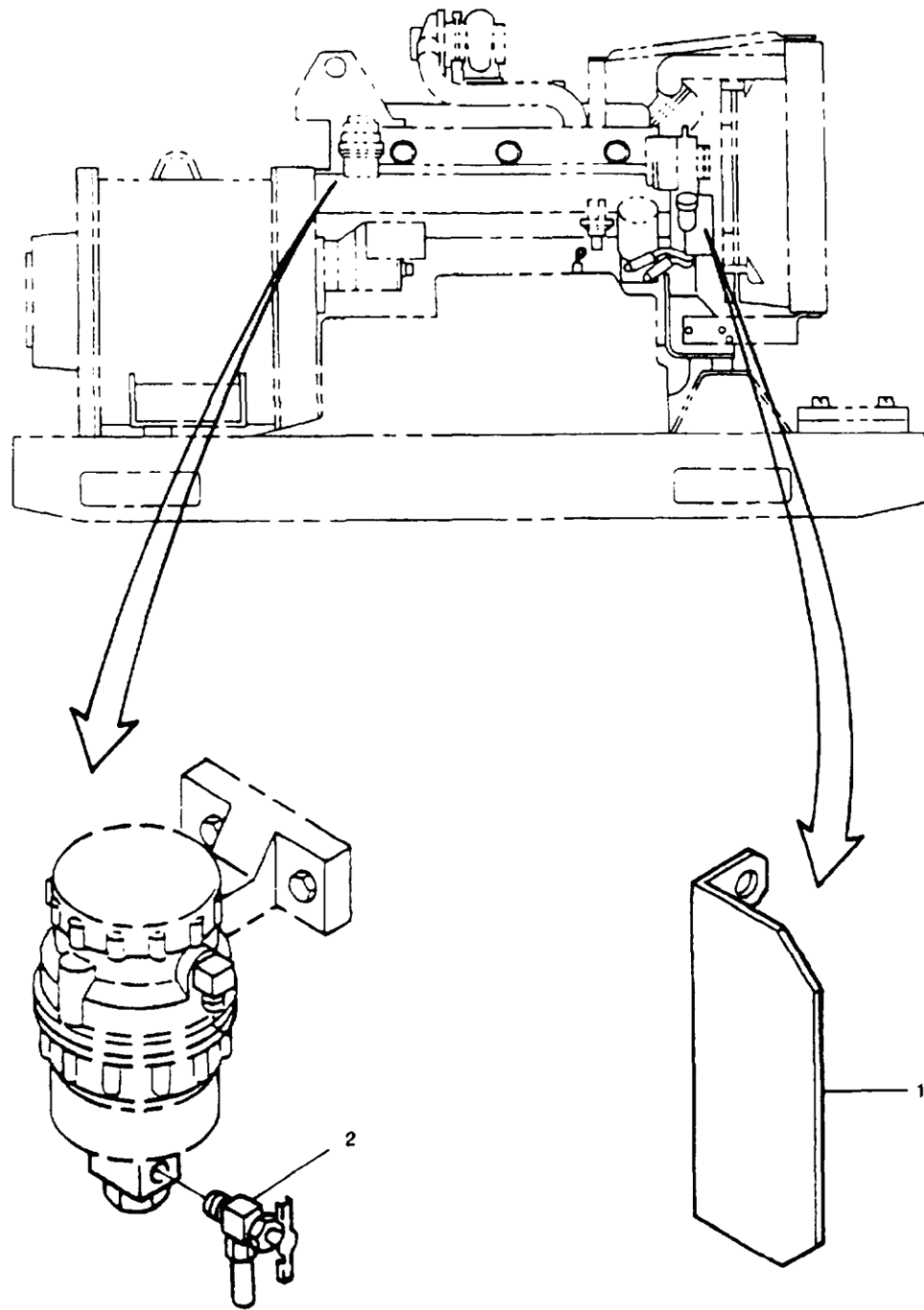


Figure 16. Engine Components (Right Side).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF DC ELECTRICAL SYSTEM, BATTERY AND SLAVE RECEPTACLE CABLES:
INSPECTION, REMOVAL, CLEANING, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

References

TM 9-6115-644-10

WP 0013, Figure 1, Items: 3 & 4

WP 0129, Illustrated List of Manufactured Items

Equipment ConditionGrounded, Off & Operational

INTRODUCTION

Work packages 0012 through 0014 contain field maintenance procedures for the DC Electrical System. Deficiencies noted during inspection/repair which are beyond the scope of field maintenance and shall be reported to the next higher level of maintenance.

NOTE

Refer to TM 9-6115-644-10 for all operator procedures.

WARNING

Slave receptacle (NATO connector) is electrically live at all times and is unfused. The Battery Disconnect Switch does not remove power from the slave receptacle. NATO slave receptacle has 24 VDC even when Battery Disconnect Switch is set to OFF. This circuit is only dead when the batteries are fully disconnected. Disconnect the batteries before performing maintenance on the slave receptacle. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

NOTE

This procedure is typical for the positive, negative, and interconnect battery cables, and the positive and negative NATO slave receptacle cables.

INSPECTION

1. Shut down generator set.
2. Open battery access door and right side engine access doors.
3. Inspect battery/slave receptacle cables for security; cracked insulation; broken, burned, or corroded terminals; missing parts; or other damage. Close access doors.

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and right side engine access doors.

NOTE

Tag all cables before removal.

3. Disconnect negative battery cable terminal lug (Figure 1, Item 1) from battery.
4. Disconnect and remove applicable cable assembly (Figure 1/WP 0013, Figure 1).

END OF TASK**CLEANING**

1. Remove terminal cover(s) (Figure 1, Item 2) from battery post(s), if applicable.
2. Clean battery post(s) and cable terminals with battery terminal cleaner.
3. Install terminal cover(s) (2), if removed.

END OF TASK**REPAIR****WARNING**

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

NOTE

If cable cannot be repaired, refer to WP 0129.

1. Remove nut(s) (Figure 1, Item 5) and battery cable terminal lug(s), as necessary.
2. Remove broken or damaged terminal (Figure 1, Item 3/WP 0013, Figure 1, Item 3) from cable assembly.
3. Slide new shrinkable tubing (Figure 1, Item 4/WP 0013, Figure 1, Item 4) over cable end.
4. Install terminal (3) to cable end (WP 0129).
5. Heat shrinkable tubing (4) with heat gun until secure.

6. Install battery cable terminal lug(s) with nuts(s) (Figure 1, Item 5), as necessary.

END OF TASK

INSTALLATION

1. Install applicable cable assembly as shown in Figure 1/WP 0013, Figure 1.
2. Connect negative battery cable terminal lug (Figure 1, Item 1) to battery. Close access doors.

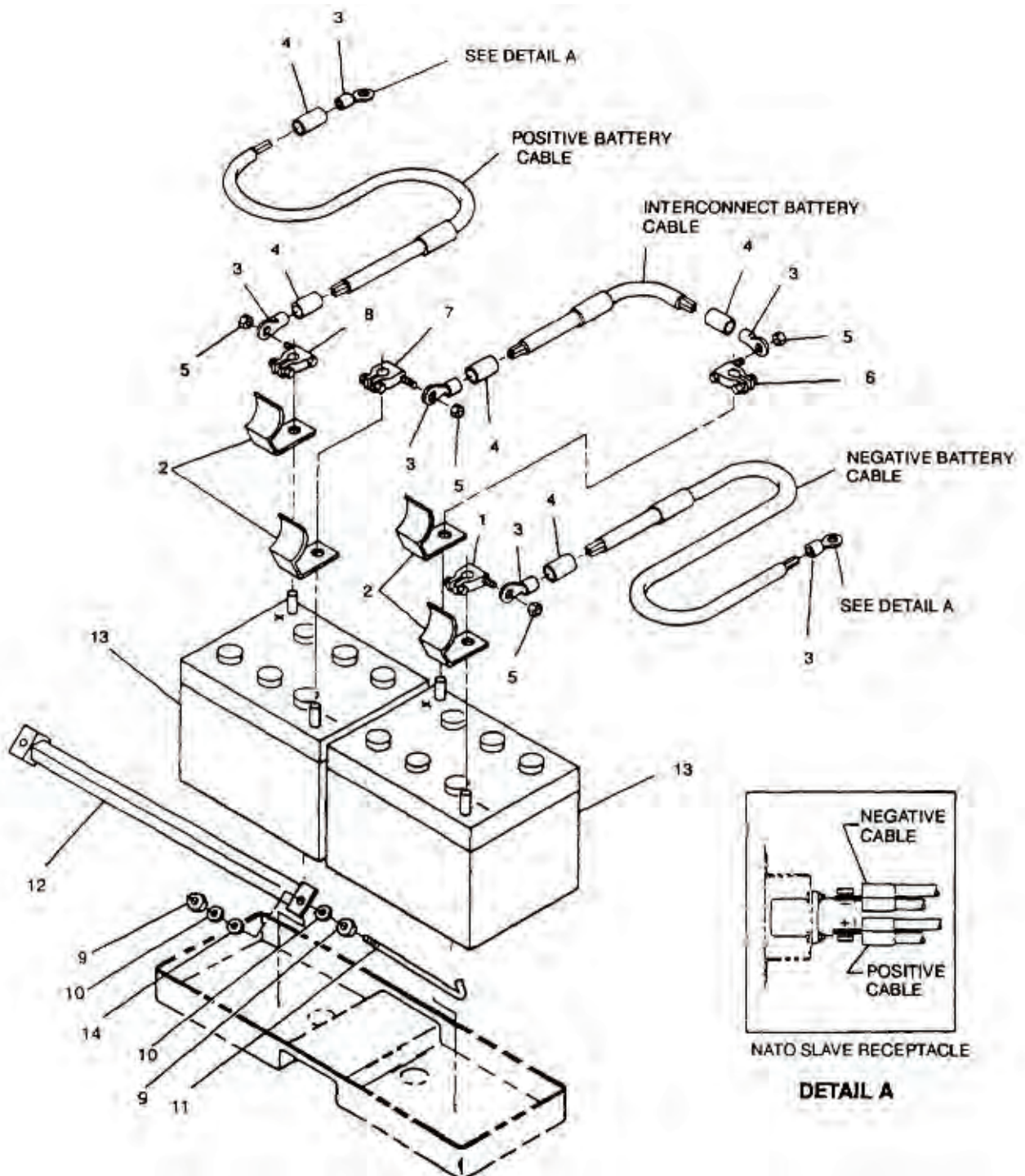


Figure 1. Batteries and Cables.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

MAINTENANCE OF DC ELECTRICAL SYSTEM, BATTERIES: TESTING, REMOVAL, INSPECTION,
SERVICING, INSTALLATION

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Materials/PartsBatteries
General Purpose Grease
New Lockwashers**Personnel Required**Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0011, Figure 1, Items: 1, 2 & 13

WP 0159, Expendable Durable Items List Item 11

Equipment Condition

Grounded, Off & Operational

TESTING

WARNING

Batteries give off a flammable gas. Do not smoke or use open flame when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove battery vent caps.
4. Test specific gravity of electrolyte in each battery cell with a hydrometer. Refer to Table 1 for state of charge with specific gravity corrected to 80 °F (27 °C). Refer to Table 2 for specific gravity temperature corrections.
5. Recharge or replace batteries, as necessary. Retest batteries per above instructions.
6. Install battery vent caps.
7. Connect negative battery cable and close battery access door.

**Table 1. State of Charge with Specific Gravity
Corrected to 80 °F (27 °C).**

Specific Gravity	Percent Charge
1.280	100
1.250	75
1.220	50
1.190	25
1.160	Little useful capacity
1.130	Discharged

Table 2. Specific Gravity Temperature Corrections.

Temperature °F	Correction Factor
+120 °F (49 °C)	+0.016
+115 °F (46 °C)	+0.014
+110 °F (43 °C)	+0.012
+105 °F (41 °C)	+0.010
+100 °F (38 °C)	+0.008
+95 °F (35 °C)	+0.006
+90 °F (32 °C)	+0.004
+85 °F (29 °C)	+0.002
+80 °F (27 °C)	0
+75 °F (24 °C)	-0.002
+70 °F (21 °C)	-0.004
+65 °F (19 °C)	-0.006
+60 °F (16 °C)	-0.008
+55 °F (13 °C)	-0.010
+50 °F (10 °C)	-0.012
+45 °F (7 °C)	-0.014
+40 °F (5 °C)	-0.016
+35 °F (2 °C)	-0.018
+30 °F (-1 °C)	-0.020
+25 °F (-4 °C)	-0.022
+20 °F (-7 °C)	-0.024
+15 °F (-9 °C)	-0.026
+10 °F (-12 °C)	-0.028
+5 °F (-15 °C)	-0.030
0 °F (-18 °C)	-0.032
-5 °F (-20 °C)	-0.034
-10 °F (-23 °C)	-0.036
-15 °F (-26 °C)	-0.038
-20 °F (-29 °C)	-0.040

END OF TASK**REMOVAL****WARNING**

Batteries give off a flammable gas. Do not smoke or use open flame when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

WARNING

Each battery weighs more than 70 pounds (32 kg) and requires a two-person lift. Lifting batteries can cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply with this warning can cause injury to personnel.

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery compartment access door and disconnect negative battery cable terminal lug (WP 0011, Figure 1, Item 1).
3. Disconnect interconnect battery cable terminal lugs (6 and 7) and remove interconnect battery cable assembly. Disconnect positive battery cable terminal lug (8).
4. Remove nuts (9), washers (10), lockwashers (14), hook bolts (11), and battery hold-down (12). Discard lockwashers (14).
5. Remove batteries (13).

END OF TASK**INSPECTION**

1. Remove batteries (Removal).
2. Inspect batteries for cracked cases; broken, burned, or corroded posts; missing parts; and other damage.
3. Install batteries (Installation).

END OF TASK**SERVICING**

1. Remove terminal covers (WP 0011, Figure 1, Item 2).
2. Clean cable terminal lugs and battery posts.
3. Install terminal covers (2) on batteries (13).

END OF TASK**INSTALLATION**

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Position batteries (WP 0011, Figure 1, Item 13) in generator set. Ensure that batteries (13) are serviced and fully charged.
2. Apply general purpose grease (WP 0159, Item 11) to battery posts and cable terminal lugs (1, 6, 7, and 8). (F) Apply petrolatum or equal.
3. Install hook bolts (11) and battery hold-down (12) with new lockwashers (14), washers (10), and nuts (9).

WARNING

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

4. Connect positive cable terminal lug (8).
5. Position interconnect battery cable and connect terminal lugs (6 and 7).
6. Connect negative battery cable terminal lug (1). Close battery compartment access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF DC ELECTRICAL SYSTEM, NATO SLAVE RECEPTACLE: INSPECTION, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

Equipment Condition

Grounded, Off & Operational

See "One Qualified Technician" Warning

INSPECTION**WARNING**

Slave receptacle (NATO connector) is electrically live at all times and is unfused. The Battery Disconnect Switch does not remove power from the slave receptacle. NATO slave receptacle has 24 VDC even when Battery Disconnect Switch is set to OFF. This circuit is only dead when the batteries are fully disconnected. Disconnect the batteries before performing maintenance on the slave receptacle. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door.
3. Inspect NATO slave receptacle for security, corrosion, missing hardware, and other damage. Close battery access door.

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Tag and disconnect battery and slave receptacle cables from slave receptacle (Figure 1, Item 7) by removing bolts (1) and lockwashers (2). Discard lockwashers (2).
4. Remove bolts (5), nuts (6), and NATO slave receptacle (7) from generator set housing.
5. Remove nut (8), bolt (9), and cover (10) from generator set.

END OF TASK**INSTALLATION**

1. Insert NATO slave receptacle (Figure 1, Item 7) into generator set housing.
2. Secure receptacle (7) with bolts (5) and nuts (6).

3. Connect slave receptacle and battery cables to slave receptacle (7) with bolts (1) and new lockwashers (2). Remove tags.
4. Install cover (10) on generator set with bolt (9) and nut (8).
5. Connect negative battery cable. Close battery access door.

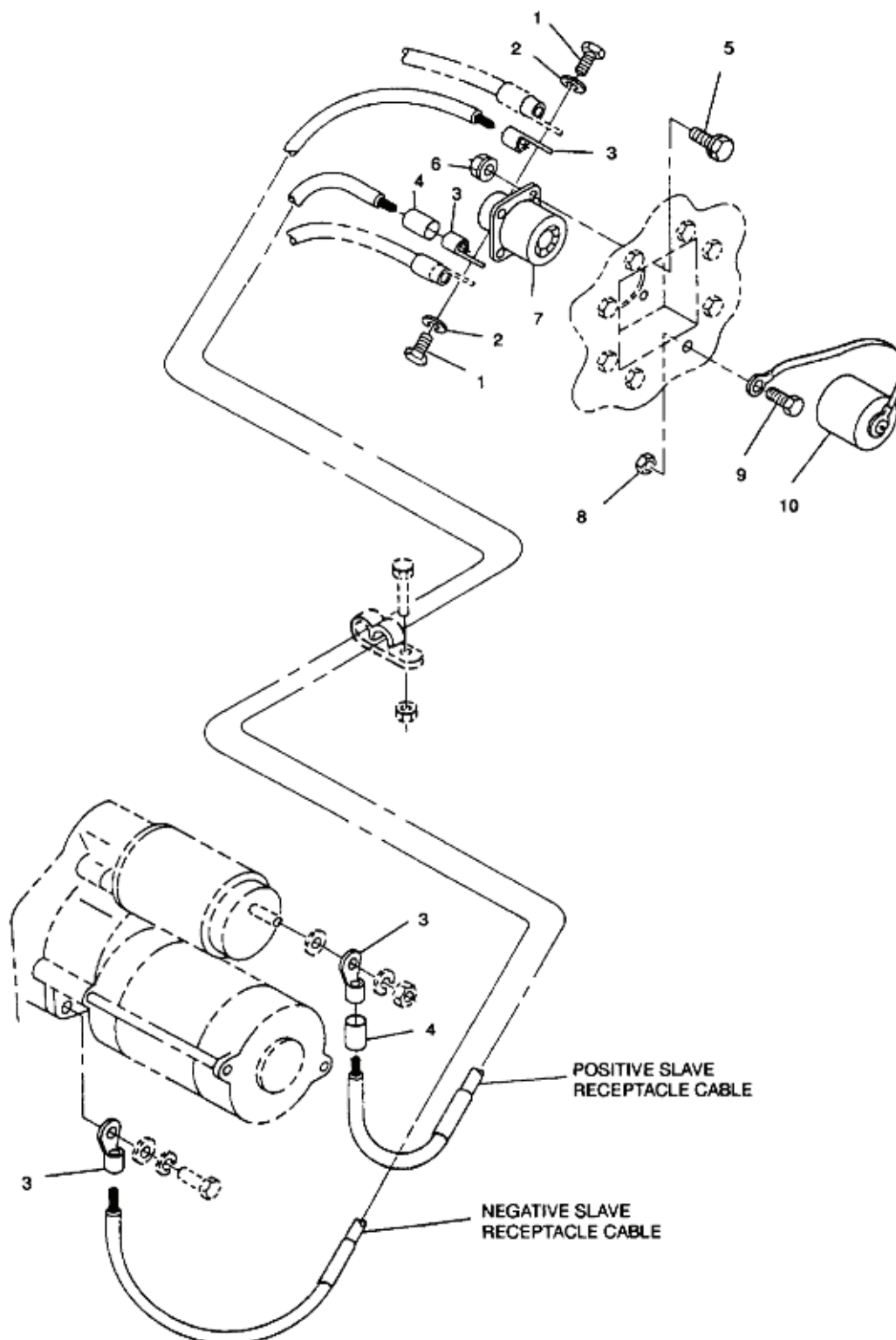


Figure 1. NATO Slave Receptacle and Cables.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF HOUSING, ACCESS DOORS: REMOVAL, INSPECTION, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

CARC Paint
Protective Eye Wear, Mask & Gloves
Fine Grit Abrasive Paper
New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0159, Expendable and Durable Items List
TM 43-0139

Equipment ConditionGrounded, Off & Operational

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

NOTE

This procedure is written for the left engine access door, but is typical for all access doors, hinges, latches, and data plates. When removing and installing battery access door, note position of spacers for door hold open mechanism.

REMOVAL**WARNING**

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open left side engine access doors.
3. Remove nuts (Figure 1, Item 1), lockwashers (2), bolts (3), washers (4), and hinges (5). Discard lockwashers (2).
4. Remove left rear engine access door (6) from generator set.
5. Remove assembled nuts (7), bolts (8), and document box (9) from engine access door (6).
6. Drill out rivets (10) and remove fuel system diagram (11) from document box (9).
7. Remove assembled nuts (12), bolts (13), bracket (14), and holding rod (15) from engine access door (6).
8. Remove assembled nuts (16), bolts (17), and bracket (18) from engine access door (6).
9. Remove nuts (19), screws (20), and latches (21) from engine access door (6).

END OF TASK**INSPECTION**

1. Shut down generator set.
2. Inspect access doors, hinges, latches, and baffles for loose and missing hardware, cracks, dents, loose paint, and corrosion.
3. Inspect data plates for readability and loose or missing rivets.

END OF TASK**REPAIR****WARNING**

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

1. Repair all dents and cracks and remove loose paint.
2. Remove light corrosion with fine grit abrasive paper (WP 0159, Item 17).
3. Repaint surfaces in accordance with TM 43-0139. (F) Use applicable directives.
4. Replace unreadable data plates.
5. Replace loose or missing rivets.

END OF TASK**INSTALLATION**

1. Install latches (Figure 1, Item 21) in left rear engine access door (6) with screws (20) and nuts (19).
2. Install bracket (18) on engine access door (6) with bolts (17) and assembled nuts (16).
3. Install bracket (14) and holding rod (15) on engine access door (6) with bolts (13) and assembled nuts (12).
4. Install fuel system diagram (11) on document box (9) with rivets (10).

5. Install document box (9) on engine access door (6) with bolts (8) and assembled nuts (7).
6. Install left rear engine access door (6) and hinges (5) on generator set with bolts (3), washers (4), new lockwashers (2), and nuts (1). Close left side engine access doors.

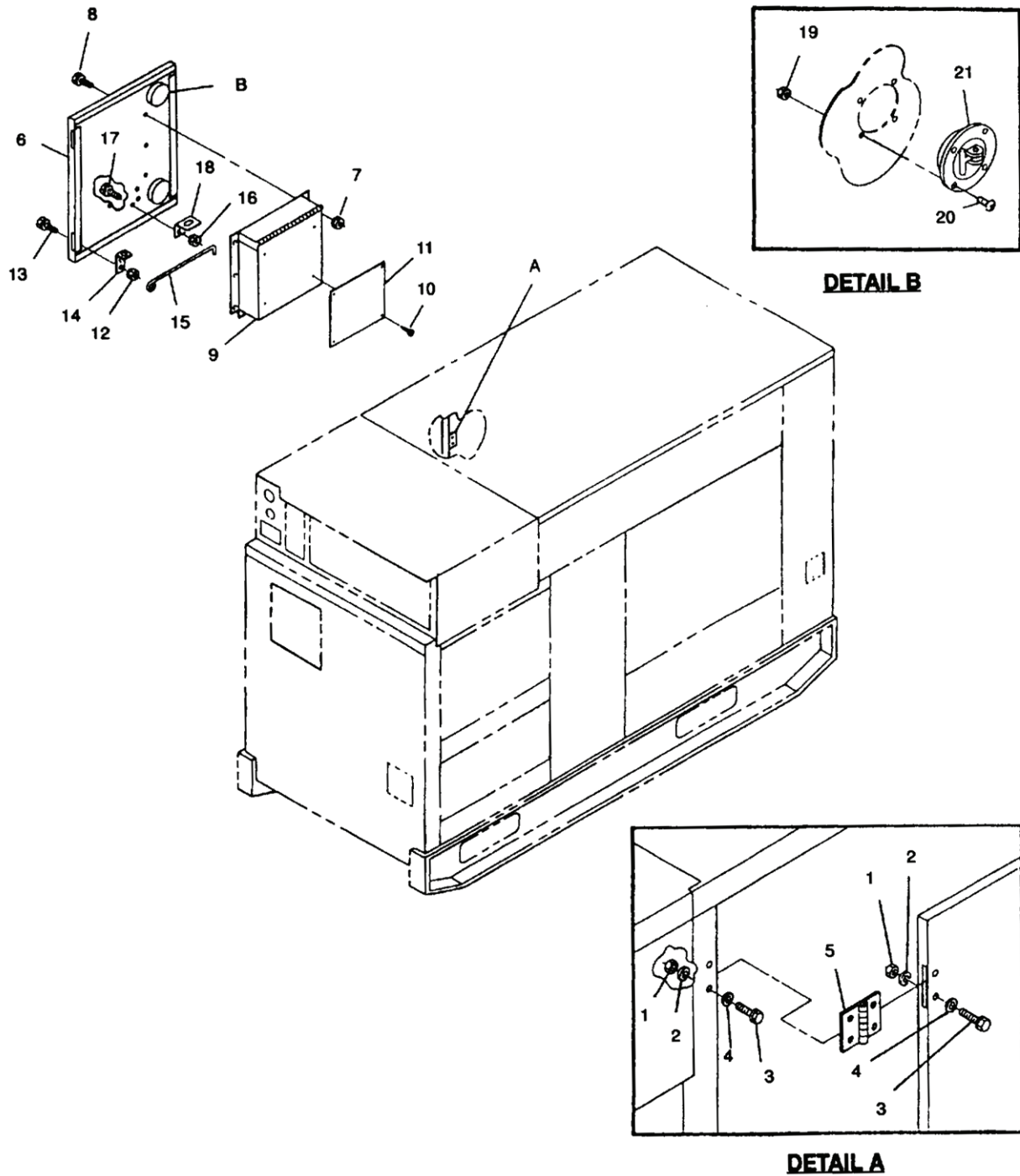


Figure 1. Generator Set Access Doors.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF HOUSING, CONTROL BOX TOP PANEL: REMOVAL, INSPECTION, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Protective Eye Wear, Mask & Gloves

CARC Paint

Fine Grit Abrasive Paper

New Lockwashers

New Gasket

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0014, Maintenance of Housing, Access Doors

WP 0159, Expendable & Durable Items List, Item 17

TM 43-139

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control panel access door (WP 0014, Removal).

4. Lower control panel and remove bolts (Figure 1, Item 1), flat washers (2), lockwashers (3), and assembled nuts (4) from top panel (5). Discard lockwashers (3).

CAUTION

The control box top panel is attached to the generator set with a silicone sealant to prevent water from entering the control box. Care must be taken not to bend or scratch the control box top panel when separating.

5. Separate and remove control box top panel (5).
6. Remove gasket (15), if damaged.
7. Remove bolts (6), washers (7), lockwashers (8), nuts (9), and stiffener (10) from control box assembly. Discard lockwashers (8).
8. Remove bolts (11), assembled nuts (12), bracket (13), and ring (14) from control box top panel

END OF TASK

INSPECTION

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Inspect control box top panel (Figure 1, Item 5) for dents, cracks, loose paint, and corrosion.

END OF TASK

REPAIR

WARNING

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

1. Repair all dents and cracks, and remove all loose paint.
2. Remove light corrosion with fine grit abrasive paper (WP 0159, Item 17).
3. Repaint surfaces in accordance with TM 43-0139. (F) Refer to applicable directives.

END OF TASK

INSTALLATION

1. Install ring (Figure 1, Item 14) and bracket (13) on control box top panel (5) with bolts (11) and assembled nuts (12).
2. Install stiffener (10) in control box assembly with bolts (6), washers (7), new lockwashers (8), and nuts (9).

NOTE

When replacing old sealant with new gasket, ensure all old sealant residue is completely removed.

3. Install new gasket (15), if removed.
4. Immediately install top panel (5) with bolts (1), flat washers (2), new lockwashers (3), and assembled nuts (4).
5. Install control panel access door (WP 0014, Installation).
6. Connect negative battery cable. Close battery access door

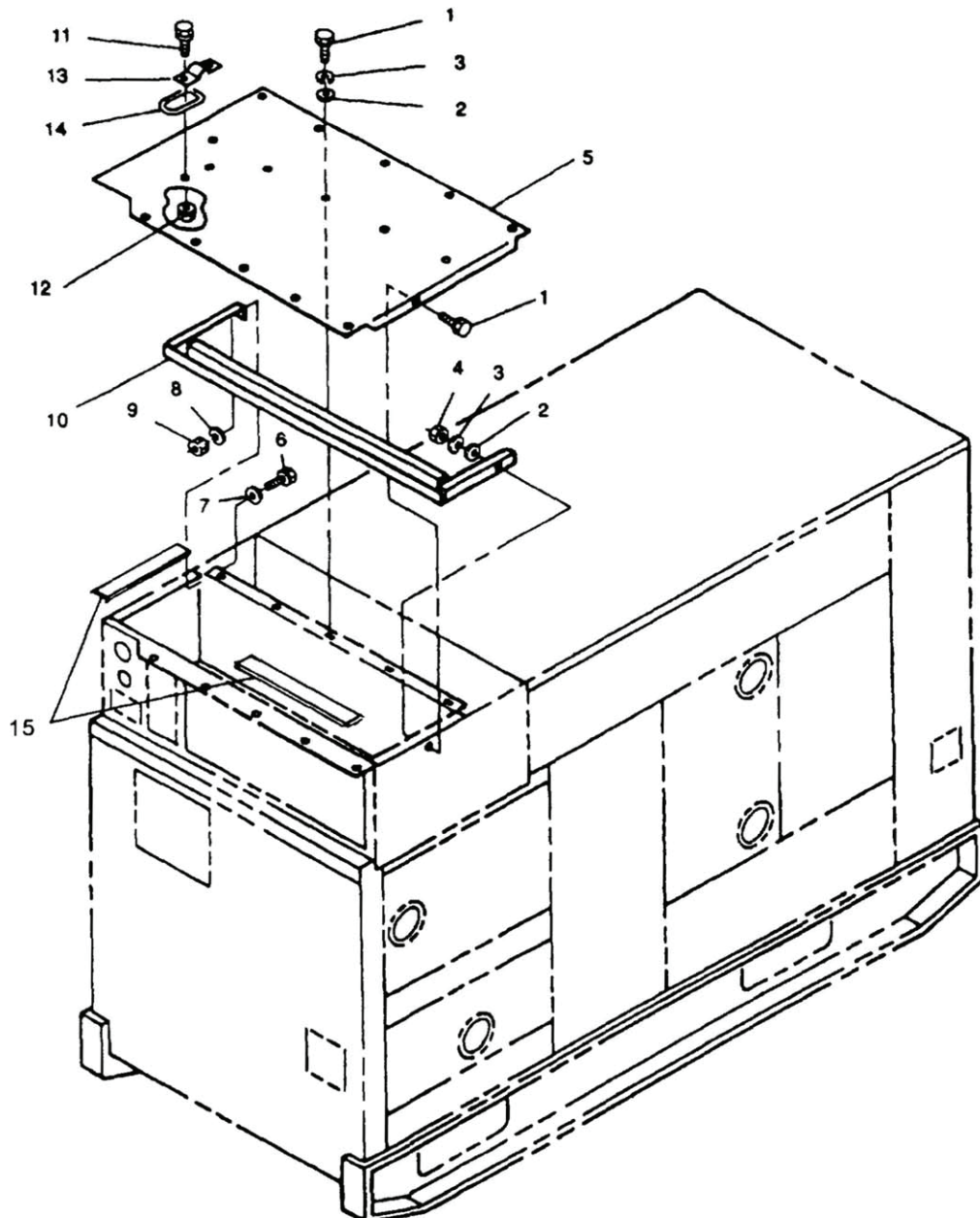


Figure 1. Control Box Top Panel.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF HOUSING, TOP HOUSING SECTION: REMOVAL, INSPECTION, REPAIR,
INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsCARC Paint
Protective Eye Wear, Mask & Gloves
Fine Grit Abrasive Paper
New Lockwashers**Personnel Required**Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

ReferencesWP 0019, Maintenance of Control Box Assembly,
Control Box Assembly
WP 0071, Maintenance of Air Intake & Exhaust
System, Muffler & Exhaust Pipe
WP 0159, Expendable & Durable Items List, Item 17
WP 0129, Fabrication of Insulation
TM 43-0139**Equipment Condition**Grounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Remove control box assembly (WP 0019, Removal).
3. Remove bolts (Figure 1, Item 1), flat washers (3), lockwashers (2), mount (4), and exhaust cover (5) from top housing panel (6). Discard lockwashers (2).
4. Remove bolts (7 and 10), flat washers (9 and 12), lockwashers (8 and 11), and top housing panel (6) from generator set. Discard lockwashers (8 and 11).
5. Disconnect radiator fill hose and overflow hose from radiator fill panel (13) and remove radiator fill panel (13) from generator set.
6. Remove bolts (14), flat washers (16), lockwashers (15), and frame (17) from generator set. Discard lockwashers (15).
7. Remove muffler (WP 0071, Removal).
8. Remove bolts (18), assembled nuts (19), and air duct channels (20 and 21).
9. Remove bolts (22 and 24), assembled nuts (23 and 25), and panel (26).
10. Remove bolts (27, 29 and 33), flat washers (30 and 35), lockwashers (31 and 34), assembled nuts (28), nuts (32), and top side panels (36 and 37) with top section floor panel (38). Discard lockwashers (31 and 34).
11. Remove bolts (39), assembled nuts (40), and panel (41) from floor panel (38).
12. Remove bolts (42), assembled nuts (43), and support (44) from panel (41).
13. Remove bolts (45), assembled nuts (46), and side panels (36 and 37) from floor panel (38).
14. Remove bolt (47), assembled nut (48), and bracket (49) from angle (52).

NOTE

Open output box access door to reach assembled nuts (51).

15. Remove bolts (50), assembled nuts (51), and angle (52) from generator set.
16. Remove clip halves (53) and insulation (54 through 64) from top panel (6) as necessary.
17. Remove clip halves (65) and insulation (66 and 67) from side panels (36 and 37) as necessary.

END OF TASK**INSPECTION**

1. Shut down generator set.
2. Inspect all top housing section panels for dents, cracks, loose paint, and corrosion.
3. Inspect sound insulation for damage and missing clip halves.
4. Inspect seal (Figure 1, Item 69) for tears, looseness, and deterioration.

END OF TASK**REPAIR****WARNING**

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

1. Repair all dents and cracks, and remove all loose paint.
2. Remove light corrosion with fine grit abrasive paper (WP 0159, Item 17).
3. Repaint surfaces in accordance with TM 43-0139. (F) Refer to applicable directives.
4. Replace any cage nuts (Figure 1, Item 68) that are stripped or cracked.
5. Replace damaged sound insulation and missing clip halves. Refer to WP 0129 for fabrication of insulation.
6. Replace loose or damaged seal (69).

END OF TASK

INSTALLATION

1. Install angle (Figure 1, Item 52) in generator set with bolts (50) and assembled nuts (51).
2. Install bracket (49) to angle (52) with bolt (47) and assembled nut (48).
3. Install insulation (54 through 64) on top panel (6) with clip halves (53) as required.
4. Install insulation (66 and 67) on side panels (36 and 37) with clip halves (65) as required.
5. Install top side panels (36 and 37) on top section floor panel (38) with bolts (45) and assembled nuts (46).

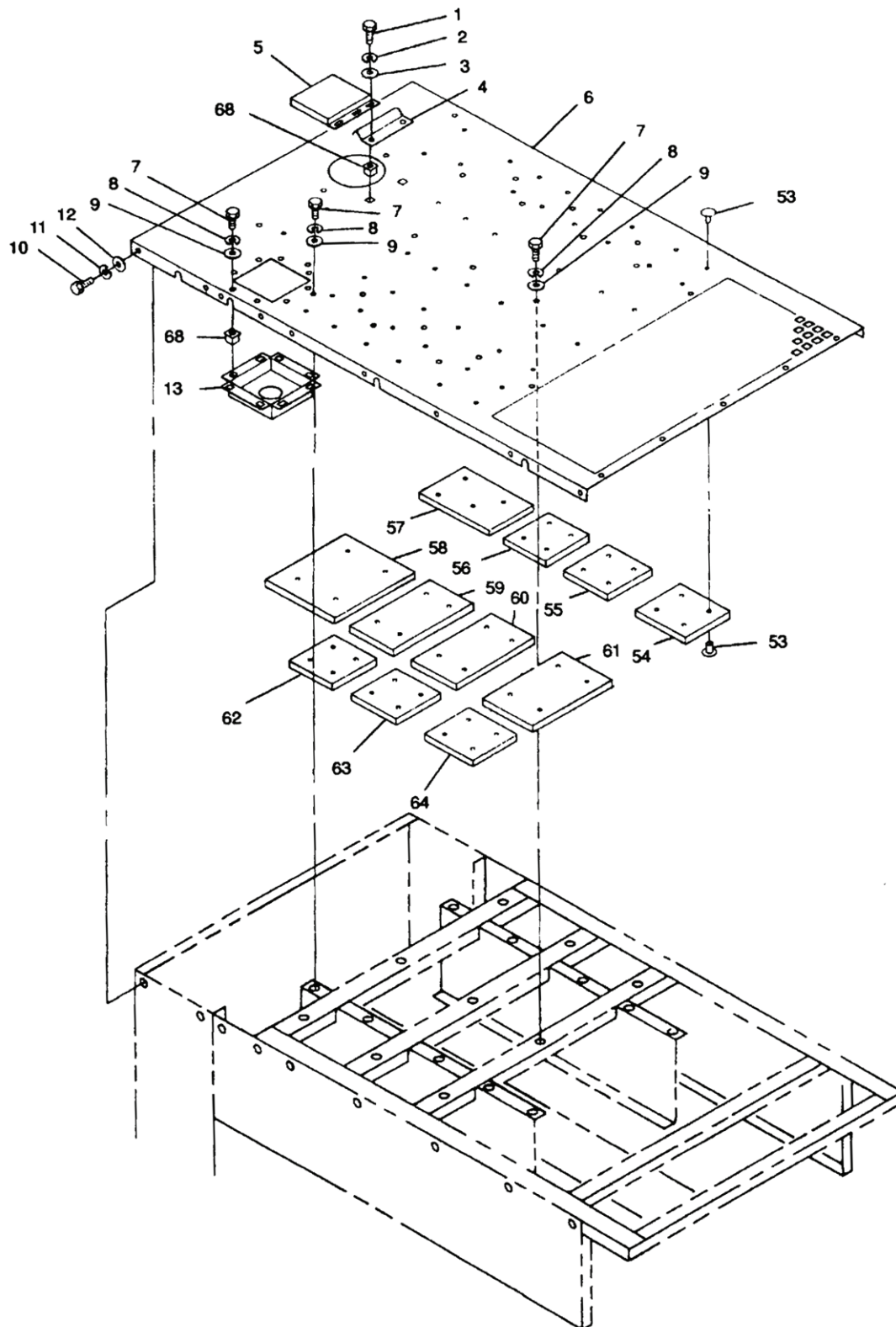


Figure 1. Generator Set Top Housing Section (Sheet 1 of 2).

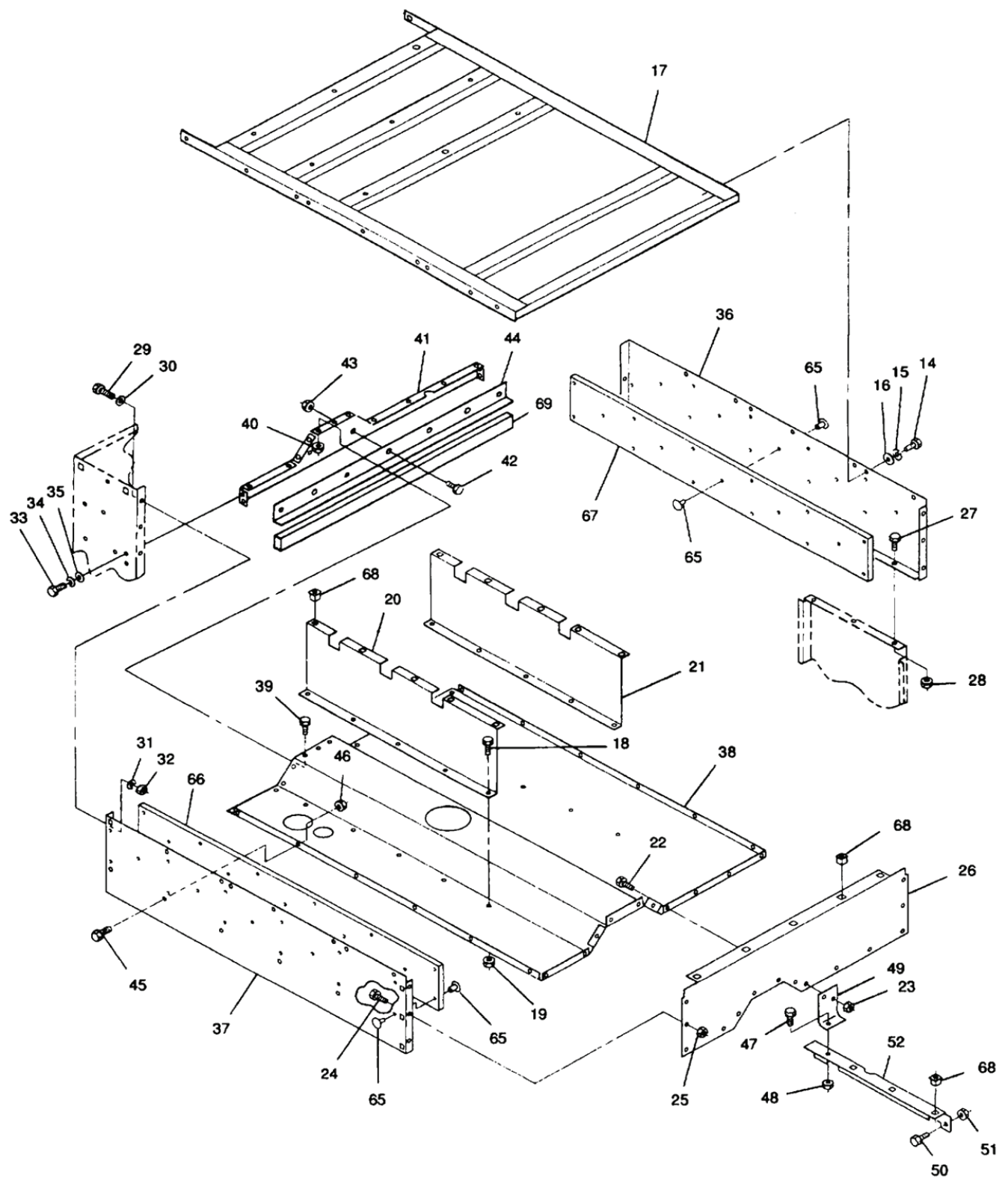


Figure 1. Generator Set Top Housing Section (Sheet 2 of 2).

6. Install support (44) on panel (41) with bolts (42) and assembled nuts (43).
7. Install panel (41) on top section floor panel (38) with bolts (39) and assembled nuts (40).

8. Position top section floor panel (38), with side and front panels attached, in generator set and secure with bolts (27, 29 and 33), flat washers (30 and 35), new lockwashers (31 and 34), assembled nuts (28), and nuts (32).
9. Install panel (26) with bolts (22 and 24) and assembled nuts (23 and 25).
10. Install air duct channels (20 and 21) with bolts (18) and assembled nuts (19).
11. Install muffler (WP 0071, Installation).
12. Install frame (17) with bolts (14), flat washers (16), and new lockwashers (15).
13. Install radiator fill panel (13) in generator set and connect radiator fill hose and overflow hose to panel (13).
14. Install top housing panel (6) with bolts (7 and 10), flat washers (9 and 12), and new lockwashers (8 and 11).
15. Install mount (4) and exhaust cover (5) with bolts (1), flat washers (3), and new lockwashers (2).
16. Install control box assembly (WP 0019, Installation).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF HOUSING, FRONT HOUSING SECTION: REMOVAL, INSPECTION, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

CARC Paint
Protective Eye Wear, Mask & Gloves
Fine Grit Abrasive Paper
New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0012, Maintenance of DC Electrical System, Batteries

WP 0013, Maintenance of DC Electrical System, NATO Slave Receptacle

WP 0014, Maintenance of Housing, Access Doors
WP 0016, Maintenance of Housing, Top Housing Section

WP 0129, Fabrication & Insulation

WP 0159, Expendable & Durable Items List, Item 17

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Remove battery box access door (WP 0014, Removal).
3. Remove engine access doors (WP 0014, Removal).
4. Remove top housing section (WP 0016, Removal).
5. Remove batteries (WP 0012, Removal) and slave receptacle (WP 0013, Removal).
6. Remove bolts (Figure 1, Item 1) and ground rods (2) from brackets (54).
7. Remove bolts (3, 6, and 10), flat washers (5, 7, and 11), lockwashers (4, 8, and 12), nuts (9 and 13), and front panel (14) from generator set. Discard lockwashers (4, 8, and 12).
8. Remove bolts (15 and 18), flat washers (17 and 19), lockwashers (16 and 20), nuts (21), and side panels (22 and 23) from generator set. Discard lockwashers (16 and 20).
9. Remove clip halves (24) and insulation (25) from front panel (14).
10. Remove bolts (26 and 29), washers (28), lockwashers (27), assembled nuts (30), and air deflector (31) from front panel (14). Discard lockwashers (27).
11. Remove bolts (32), lockwashers (33), washers (34), and panels (35 and 36) from front panel (14). Discard lockwashers (33).
12. Remove bolts (37), assembled nuts (38), and supports (39 and 40) from panels (35 and 36).
13. Remove bolts (41) and panel (42) from front panel (14).
14. Remove bolts (43), assembled nuts (44), and support (45) from panel (42).
15. Remove bolts (46), assembled nuts (47), and support channel (48) from front panel (14).
16. Remove bolts (49), assembled nuts (50), and slave receptacle box (51) from front panel (14).
17. Remove bolts (52), assembled nuts (53), and brackets (54) from panels (14 and 22).
18. If necessary, drill out rivets (55, 56, and 57); remove identification plates (58, 59, and 60).

END OF TASK**INSPECTION**

1. Shut down generator set.
2. Inspect all front housing section panels for dents, cracks, loose paint, corrosion, and other damage.
3. Inspect all cage nuts (Figure 1, Item 61) for cracking or stripped threads.
4. Inspect insulation for damage and missing clip halves (24).
5. Inspect seals (62 and 63) for tears, looseness, and deterioration.

END OF TASK**REPAIR****WARNING**

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

1. Repair all dents and cracks and remove all loose paint.
2. Remove light corrosion with fine grit abrasive paper (WP 0159, Item 17).
3. Repaint surfaces in accordance with TM 43-0139. (F) Refer to applicable directives.
4. Replace any cracked or stripped cage nuts (Figure 1, Item 61).
5. Replace damaged insulation and missing clip halves (24). Refer to WP 0129 for fabrication of insulation.
6. Replace loose or damaged seals (62 and 63).

END OF TASK

INSTALLATION

1. Install identification plates (Figure 1, Items 58, 59, and 60) on front panel (14) and side panel (22) with rivets (55, 56, and 57), if removed.
2. Install brackets (54) on panels (14 and 22) with bolts (52) and assembled nuts (53).
3. Install slave receptacle box (51) on front housing panel (14) with bolts (49) and assembled nuts (50).
4. Install side panels (22 and 23) on generator set with bolts (15 and 18), flat washers (17 and 19), new lockwashers (16 and 20), and nuts (21).
5. Install support channel (48) on front panel (14) with bolts (46) and assembled nuts (47).
6. Install support (45) on panel (42) with bolts (43) and assembled nuts (44).
7. Install panel (42) on front panel (14) with bolts (41).
8. Install supports (39 and 40) on panels (35 and 36) with bolts (37) and assembled nuts (38).
9. Install panels (35 and 36) on front panel (14) with bolts (32), new lockwashers (33), and washers (34).
10. Install air deflector (31) on front panel (14) with bolts (26 and 29), washers (28), new lockwashers (27), and assembled nuts (30).
11. Install insulation (25) on front panel (14) with clip halves (24).
12. Install front housing panel (14) on generator set with bolts (3, 6, and 10), flat washers (5, 7, and 11), new lockwashers (4, 8, and 12), and nuts (9 and 13).
13. Install slave receptacle (WP 0013, Installation) and batteries (WP 0012, Installation).
14. Install battery box access door and engine access doors (WP 0014, Installation).
15. Install top housing section (WP 0016, Installation).
16. Install ground rods (2) in brackets (54) and secure with bolts (1). Close all access doors.

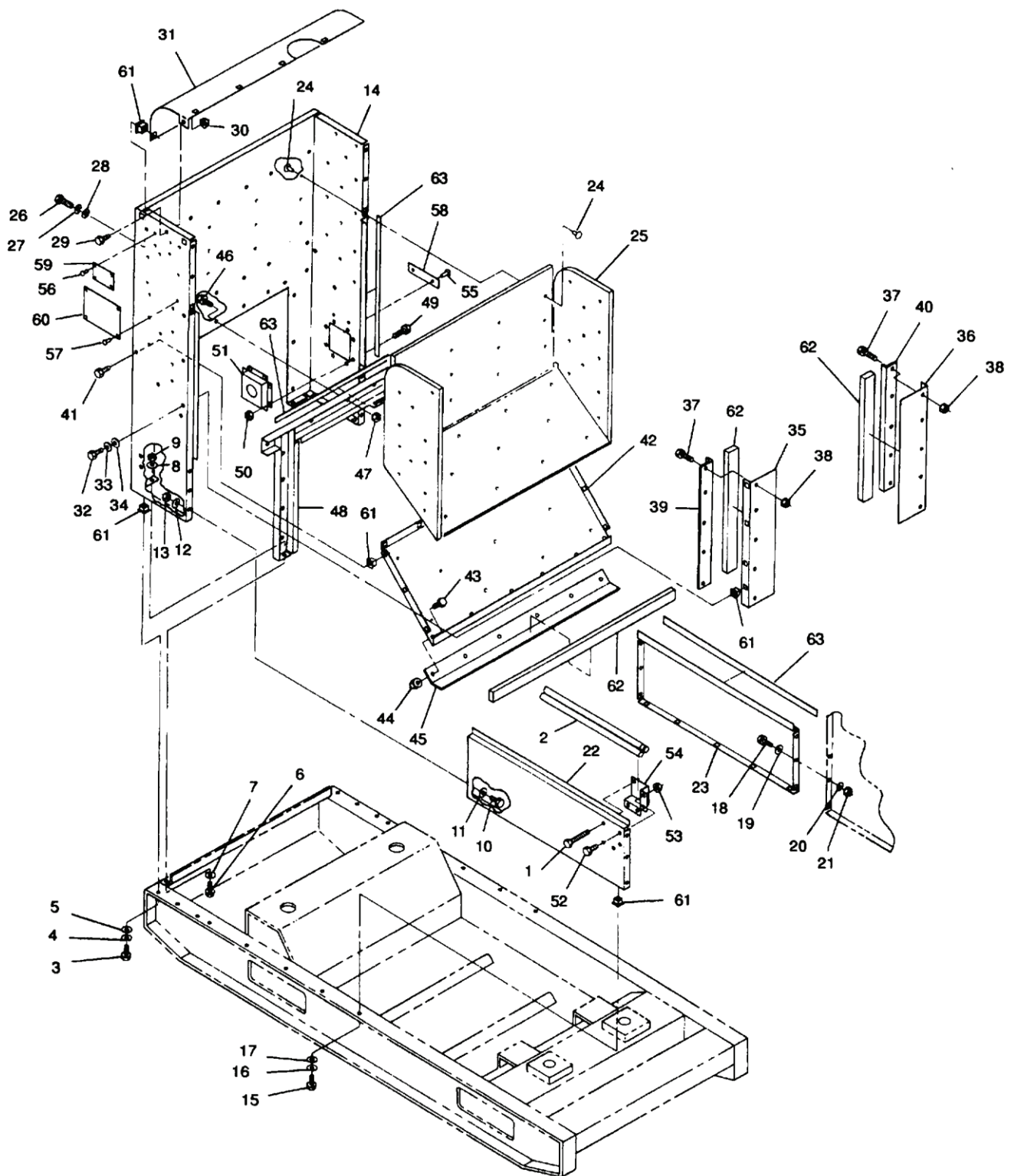


Figure 1. Generator Set Front Housing Section.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, REAR HOUSING SECTION: REMOVAL, INSPECTION, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsNew Lockwashers
Adhesive**Personnel Required**Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

ReferencesTM 43-0139
WP 0016, Maintenance of Housing, Top housing
Section: Steps 4 & 14
WP 0019, Maintenance of Control Box Assembly,
Control Box Assembly
WP 0073, Maintenance of Air Intake & Exhaust
System, Air Cleaner Assembly
WP 0087, Maintenance of Fuel System, Auxiliary
Fuel Pump
WP 0088, Maintenance of Fuel System, Fuel Tank
Filler Neck
WP 0093, Maintenance of Fuel System, Fuel Float
Module
WP 0096, Maintenance of Fuel System, Ether
Solenoid Valve
WP 0159, Expendable & Durable Items List, Items: 2
& 17**Equipment Condition**Grounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Remove control box assembly (WP 0019, Removal).
3. Remove air cleaner assembly (WP 0073, Removal).
4. Remove output box access door and load terminal board access door (WP 0014, Removal).
5. Remove rear engine access doors and air cleaner access door (WP 0014, Removal).
6. Remove fuel tank filler neck (WP 0088, Removal).
7. Remove auxiliary fuel pump (WP 0087, Removal).
8. Remove fuel float module (WP 0093, Removal).
9. Remove ether solenoid valve (WP 0096, Removal).
10. Remove top housing panel (WP 0016, Removal, Step 4).
11. Remove bolts (Figure 1, Items 1 and 4), flat washers (3 and 5), lockwashers (2 and 6), nuts (7), and rear panel (8) from generator set. Discard lockwashers (2 and 6).
12. Remove bolts (9), assembled nuts (10), and load cable entrance box (11) from rear panel (8).
13. Remove bolts (12 and 16), flat washers (13 and 17), lockwashers (14 and 18), nuts (15), and left side rear panel (19) from generator set. Discard lockwashers (14 and 18).
14. Remove bolts (20), assembled nuts (21), and baffle (22) from left side rear panel (19).
15. Remove clip halves (23) and insulation (24) from baffle (22).
16. Remove bolts (25), assembled nuts (26), and fuel tank filler neck panel (27) from left side rear panel (19).

NOTE

Ensure output box assembly is secured prior to removal of corner post and door sills.

17. Remove bolts (28, 32, and 34), flat washers (29), lockwashers (30), nuts (31), assembled nuts (33 and 35), corner post (36), and door sills (37 and 38) from generator set. Discard lockwashers (30).
18. Remove bolts (39, 42, 46, and 48), flat washers (41 and 43), lockwashers (40 and 44), nuts (45), assembled nuts (47 and 49), and right side panel (50) from generator set. Discard lockwashers (40 and 44).
19. If necessary, drill out rivets (51) and remove plate (52) from left side rear panel (19).
20. If necessary, drill out rivets (53) and remove plate (54) from fuel filler neck panel (27).
21. If necessary, remove output box EMI seals (55) from door sill (37), corner post (36), and right side panel (50).

END OF TASK**INSPECTION**

1. Shut down generator set.
2. Inspect rear housing section panels for dents, cracks, loose paint, corrosion, and other damage.
3. Inspect all cage nuts (Figure 1, Item 57) for cracking or stripped threads.
4. Inspect all insulation for damage and missing clip halves.
5. Inspect EMI seals (55) for tears, looseness, and deterioration.
6. Inspect door seals (56) for tears, looseness, and deterioration.

END OF TASK**REPAIR****WARNING**

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

1. Repair all dents and cracks, and remove all loose paint.
2. Remove light corrosion with fine grit abrasive paper (WP 0159, Item 17).

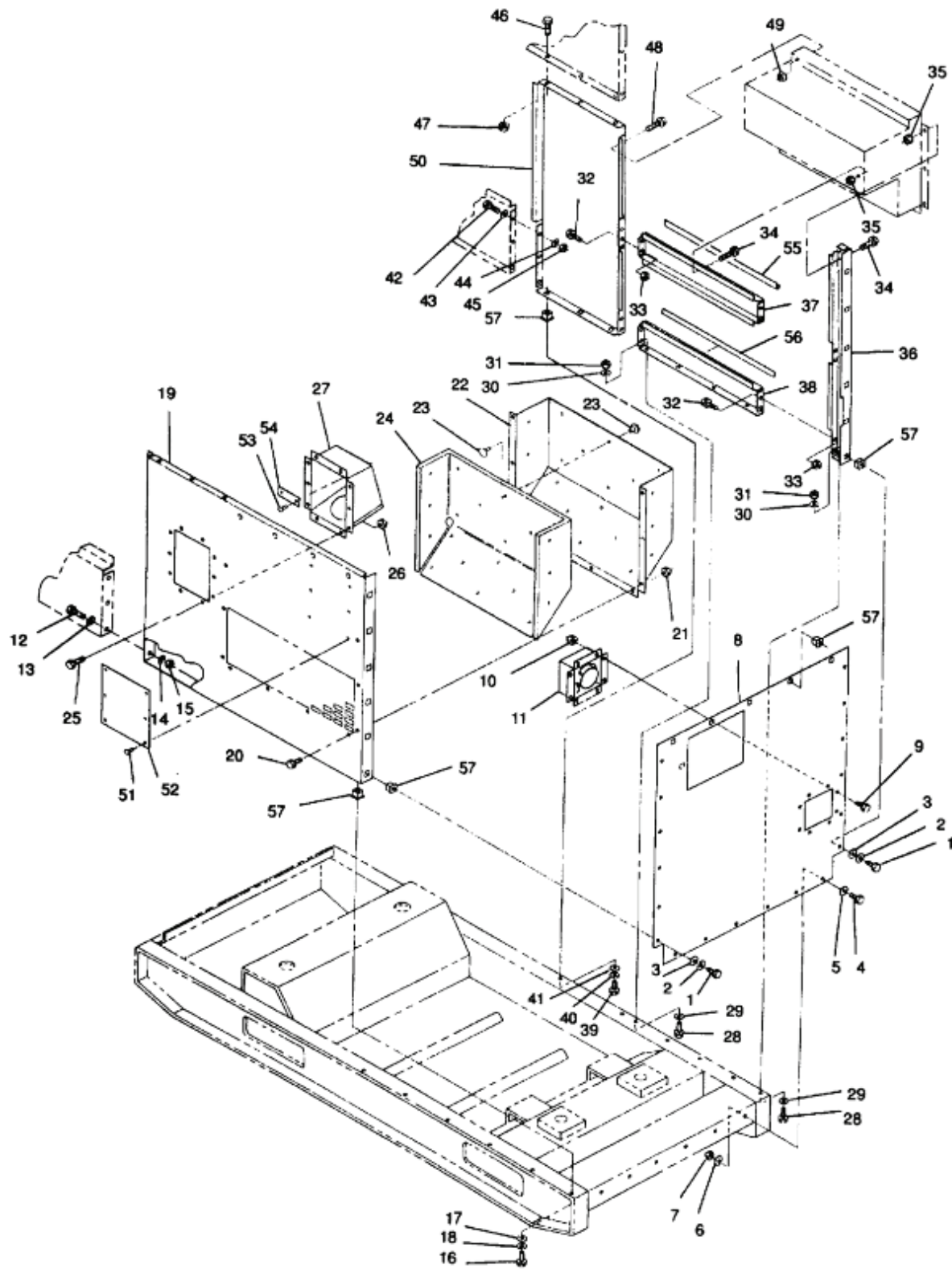


Figure 1. Generator Set Rear Housing Section.

3. Repaint surfaces in accordance with TM 43-0139. (F) Use applicable directives.
4. Replace all cracked or stripped cage nuts (Figure 1, Item 57).
5. Replace damaged insulation (24) and missing clip halves (23). Refer to WP 0129 for fabrication of insulation.
6. Replace EMI seals (55) that are loose or show any evidence of damage.
7. Replace damaged door seals (56).

END OF TASK

INSTALLATION

1. If removed, install plate (Figure 1, Item 54) on fuel tank filler neck panel (27) with rivets (53).
2. If removed, install plate (52) on left side rear panel (19) with rivets (51).
3. Install right side panel (50) on generator set with bolts (39, 42, 46, and 48), flat washers (41 and 43), new lockwashers (40 and 44), nuts (45), and assembled nuts (47 and 49).
4. Install door sills (37 and 38) and corner post (36) on generator set with bolts (28, 32, and 34), flat washers (29), new lockwashers (30), nuts (31), and assembled nuts (33 and 35).
5. Install fuel filler neck panel (27) on left side rear panel (19) with bolts (25) and assembled nuts (26).
6. Install insulation (24) on baffle (22) with clip halves (23).
7. Install baffle (22) on left side rear panel (19) with bolts (20) and assembled nuts (21).
8. Install left side rear panel (19) on generator set with bolts (12 and 16), flat washers (13 and 17), new lockwashers (14 and 18), and nuts (15).
9. Install load entrance box (11) on rear panel (8) with bolts (9) and assembled nuts (10).
10. Install rear panel (8) on generator set with bolts (1 and 4), flat washers (3 and 5), new lockwashers (2 and 6), and nuts (7).
11. If removed, install output box EMI seals (55) on door sill (37), corner post (36), and right side panel (50) with adhesive (WP 0159, Item 2). Ensure closed side of seal faces outward.
12. Install top housing panel (WP 0016, Installation, Step 14).
13. Install ether solenoid valve (WP 0096, Installation).
14. Install fuel float module (WP 0093, Installation).
15. Install auxiliary fuel pump (WP 0087, Installation).
16. Install fuel tank filler neck (WP 0088, Installation).
17. Install air cleaner access door and engine access doors (WP 0014, Installation).
18. Install load terminal board access door and output box access door (WP 0014, Installation).

NOTE

Output box EMI seals are primary suppression components. Ensure that a complete seal is made between output box door and generator set.

19. Install air cleaner assembly (WP 0073, Installation).
20. Install control box assembly (WP 0019, Installation).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, CONTROL BOX ASSEMBLY: INSPECTION, REMOVAL, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

References

WP 0015, Maintenance of Housing, Control Box Top Panel

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect control box assembly for cracks, breaks, corrosion, loose paint, and missing parts.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Open output box access door and disconnect two control box harness connectors.
5. Remove bolts (Figure 1, Items 1 and 5), lockwashers (2), flat washers (3), nuts (4), and control box assembly (6) from generator set. Discard lockwashers (2).

END OF TASK**REPAIR**

Repair control box assembly by replacing damaged terminals, damaged or missing hardware, and damaged or defective components.

END OF TASK**INSTALLATION**

1. Install control box assembly (Figure 1, Item 6) on generator set with bolts (1 and 5), flat washers (3), new lockwashers (2), and nuts (4).
2. Connect two control box harness connectors.
3. Install control box top panel (WP 0015, Installation).
4. Connect negative battery cable and close battery access door.

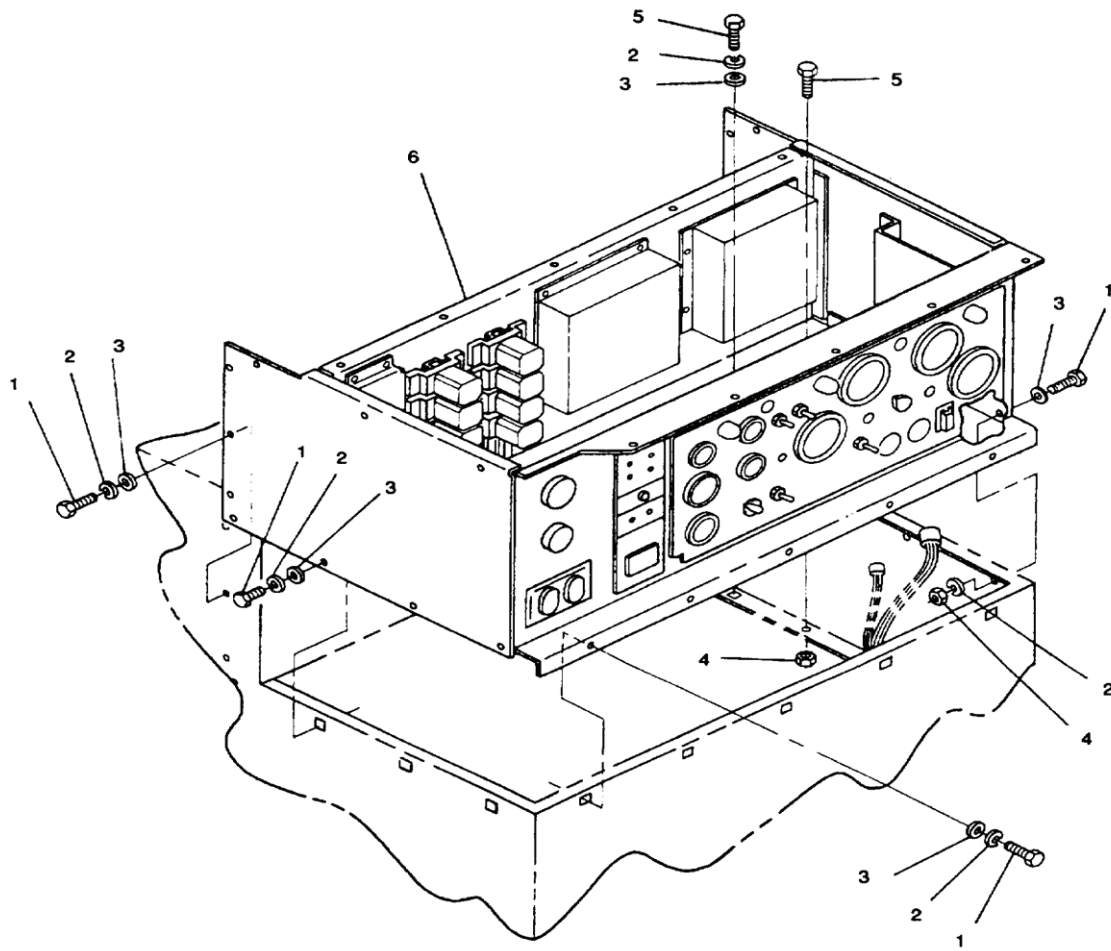


Figure 1. Control Box Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF CONTROL BOX ASSEMBLY, PANEL LIGHTS: INSPECTION, REMOVAL,
DISASSEMBLY, ASSEMBLY, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "Never Work Alone" Warning

See "One Qualified Technician" Warning

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

Inspect panel light holder and directional cap for cracks, corrosion, stripped threads, and other damage.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect panel light (Figure 1, Item 1) electrical leads.
5. Remove nut (2) and washer (3).
6. Remove panel light (1) from control panel.

END OF TASK**DISASSEMBLY****WARNING**

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

1. Remove panel light directional cap (Figure 1, Item 4) from panel light housing (1).
2. Remove panel light bulb (5).

END OF TASK**ASSEMBLY**

1. Install panel light bulb (Figure 1, Item 5) into panel light housing (1).
2. Install panel light directional cap (4).

END OF TASK**INSTALLATION**

1. Insert panel light (Figure 1, Item 1) into control panel.
2. Install washer (3) and nut (2).
3. Connect panel light electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

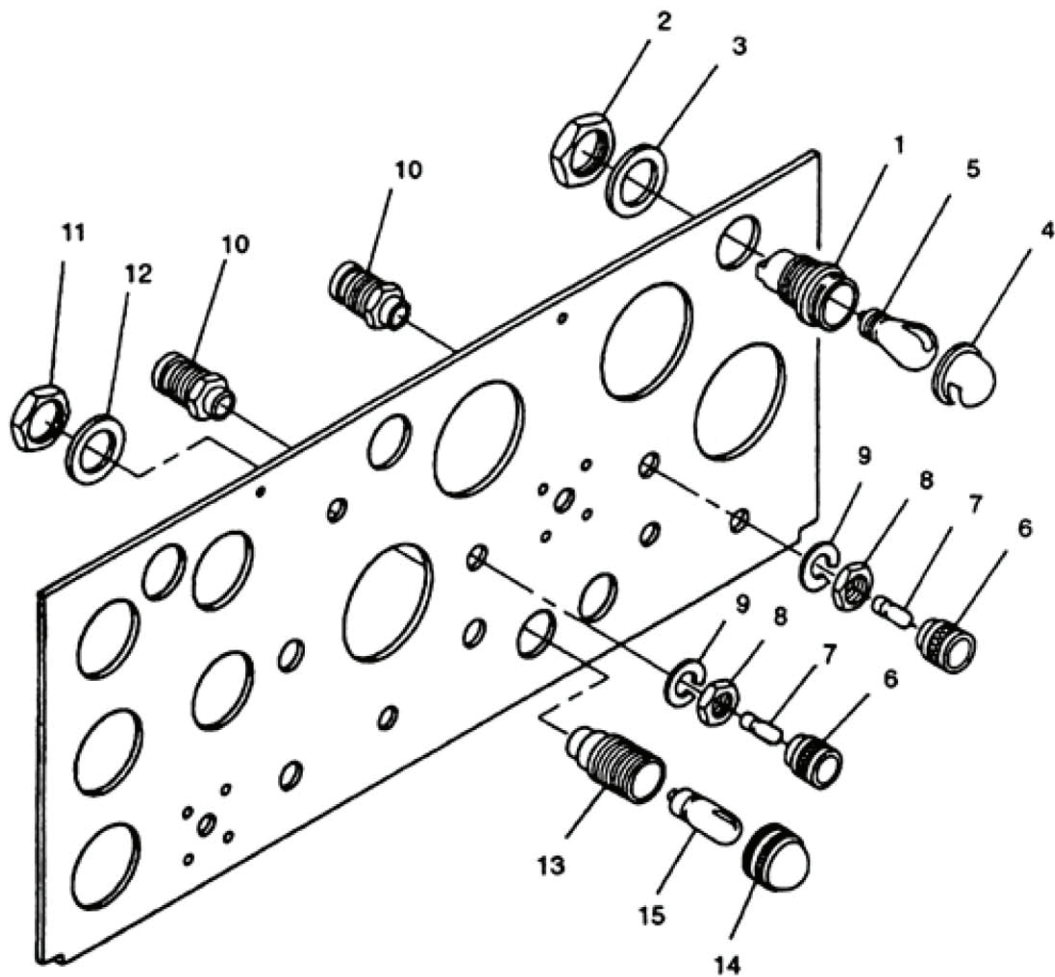


Figure 1. Control Panel Lights.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, PRESS-TO-TEST LIGHTS: INSPECTION, TESTING,
REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**

WP 0020, Figure 1, Items: 6 & 10

See "Never Work Alone" Warning

See "One Qualified Technician" Warning

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch set to OFF/RESET

Equipment Condition

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Inspect lights for cracks, corrosion, evidence of shorting, and other damage.
2. Replace or repair lights as necessary.

END OF TASK**TESTING**

1. Place MASTER SWITCH in PRIME & RUN position.
2. Press in lamp holders (WP 0020, Figure 1, Item 6) and check that lamps are illuminated.
3. If lamp (7) fails to light, perform Steps 4 through 5 below.
4. Release control panel by turning two fasteners and lower control panel slowly.
5. Set multimeter for DC volts and check for voltage at terminals 1 and 3 on receptacle (10).
6. If voltage is present, replace press-to-test light assembly.
7. Raise and secure control panel.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect electrical leads to light receptacles (WP 0020, Figure 1, Item 10).
5. Remove lamp holders (6), nuts (8), lockwashers (9), and receptacles (10) from control panel. Discard lockwashers (9).
6. If necessary, remove lamps (7) from lamp holders (6).

END OF TASK**INSTALLATION**

1. Install press-to-test light receptacles (WP 0020, Figure 1, Item 10) in control panel with new lockwashers (9) and nuts (8).
2. If removed, install lamps (7) in lamp holders (6).
3. Install lamp holders (6) on receptacles (10).

4. Connect electrical leads. Remove tags.
5. Raise and secure control panel.
6. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, SYNCHRONIZING LIGHTS: INSPECTION, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0020, Figure 1, Item 13

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL switch OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

Inspect synchronizing lights for cracks, corrosion, evidence of shorting, and other damage.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect synchronizing lights (WP 0020, Figure 1, Item 13) electrical connections.
5. Remove nuts (11) and washers (12).
6. Remove synchronizing lights (13) from control panel.
7. Unscrew lenses (14) and remove lamps (15) from light receptacles (13).

END OF TASK**INSTALLATION**

1. Insert synchronizing lights (WP 0020, Figure 1, Item 13) into control panel.
2. Install washers (12) and nuts (11).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Install lamps (15) and screw lenses (14) on light receptacles (13).
6. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, FUEL LEVEL INDICATOR: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL switch OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect indicator for broken lens, cracked housing, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.

NOTE

For MEP-805A, ensure frequency selector switch is in 50 Hz position.

4. Isolate generator set VOLTAGE adjust potentiometer by disconnecting wire 137A from AC voltage regulator terminal 5 and wire 107G from kilowatt transducer terminal V1.
5. Disconnect and isolate electrical lead from terminal S of FUEL LEVEL indicator.
6. Set multimeter for ohms and connect between wires 137A and 107G.
7. Adjust potentiometer until multimeter indicates between 216 and 264 ohms resistance.
8. Remove multimeter, but do not disturb potentiometer adjustment.
9. Connect jumper wire between disconnected wire 107G and terminal G of FUEL LEVEL indicator.
10. Connect jumper wire between disconnected wire 137A and terminal S of FUEL LEVEL indicator.
11. Connect negative battery cable and move MASTER SWITCH to PRIME & RUN position.
12. FUEL LEVEL indicator should indicate EMPTY ($\pm 1/8$ inch).
13. Move MASTER SWITCH to OFF position, disconnect negative battery cable, and remove jumper wires.
14. Repeat Steps 6 through 10 above, setting potentiometer between 29.7 and 36.3 ohms resistance.
15. Connect negative battery cable and move MASTER SWITCH to PRIME & RUN position.

16. FUEL LEVEL indicator should indicate FULL ($\pm 1/8$ inch).
17. Move MASTER SWITCH to OFF position and disconnect negative battery cable.
18. Replace FUEL LEVEL indicator if it fails to function properly.
19. Remove jumper wires and connect electrical leads to FUEL LEVEL indicator, voltage regulator, and kilowatt transducer.
20. Raise and secure control panel.
21. Connect negative battery cable and close battery access door.

END OF TASK

REMOVAL

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect FUEL LEVEL indicator (Figure 1, Item 4) electrical leads.
5. Remove nuts (1), washers (2), and clamp (3).
6. Remove FUEL LEVEL indicator (4) from control panel.

END OF TASK

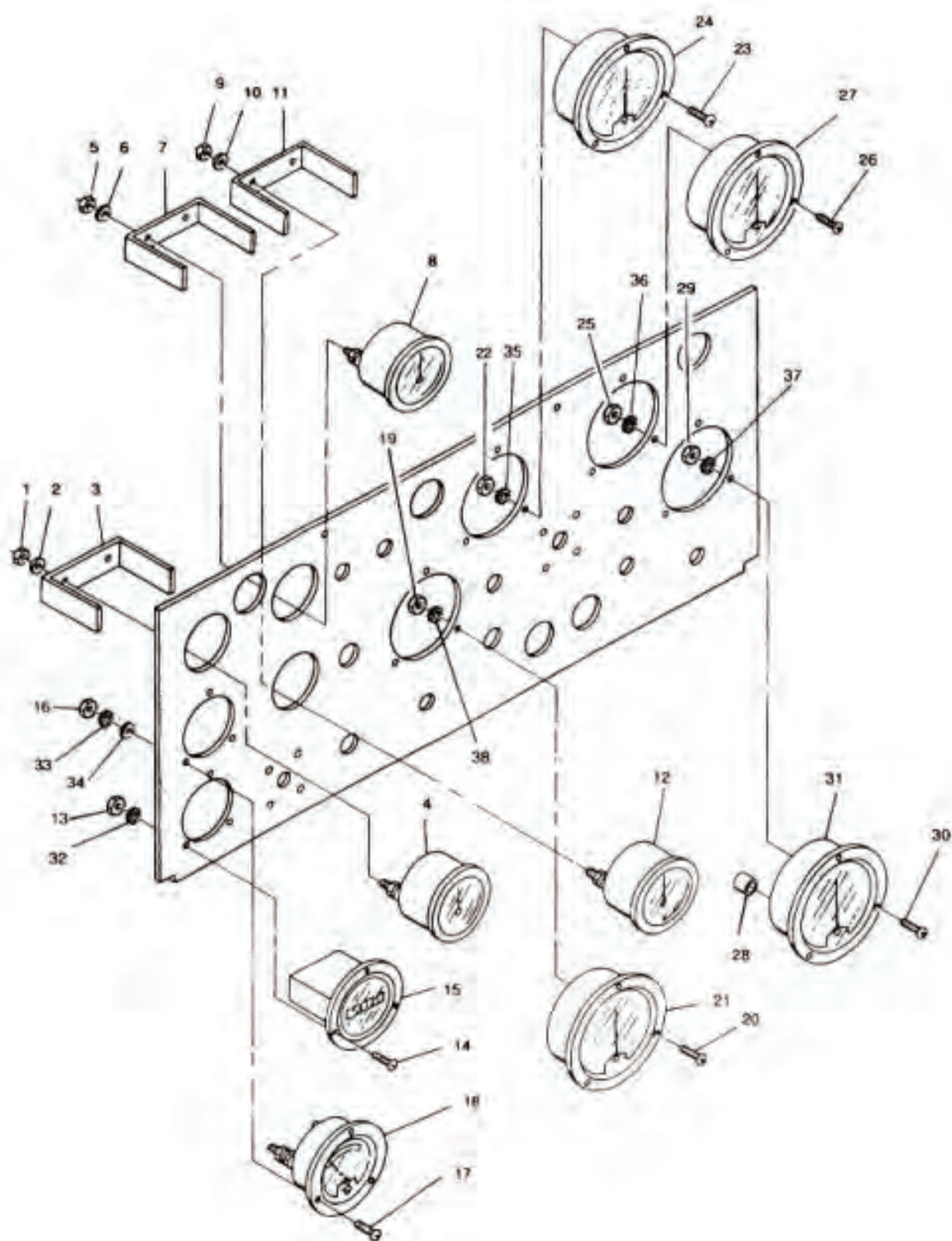


Figure 1. Control Panel Indicators.

INSTALLATION

1. Insert FUEL LEVEL indicator (Figure 1, Item 4) into control panel.
2. Install clamp (3), washers (2), and nuts (1).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, TEMPERATURE INDICATOR: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0023, Figure 1, Item 8

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch is OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect indicator for broken lens, cracked housing, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.

NOTE

For MEP-805A, ensure frequency selector switch is in 50 Hz position.

4. Isolate generator set VOLTAGE adjust potentiometer by disconnecting wire 137A from AC voltage regulator terminal 5 and wire 107G from kilowatt transducer terminal V1.
5. Disconnect and isolate electrical lead from terminal S of TEMPERATURE indicator.
6. Set multimeter for ohms and connect between wires 137A and 107G.
7. Adjust potentiometer until multimeter indicates between 117 and 143 ohms resistance.
8. Disconnect multimeter but do not disturb potentiometer setting.
9. Connect jumper wire between disconnected wire 137A and terminal S of TEMPERATURE indicator.
10. Connect jumper wire between disconnected wire 107G and terminal G of TEMPERATURE indicator.
11. Connect negative battery cable and move MASTER SWITCH to PRIME & RUN position.
12. TEMPERATURE indicator should indicate between 116 °F and 164 °F (46 °C and 73 °C).
13. Move MASTER SWITCH to OFF position, disconnect negative battery cable, and remove jumper wires.
14. Repeat Steps 6 through 10 above, setting potentiometer between 58.5 and 71.5 ohms resistance.
15. Connect negative battery cable and move MASTER SWITCH to PRIME & RUN position.

16. TEMPERATURE indicator should indicate between 156 °F and 204 °F (68 °C and 95 °C).
17. Move MASTER SWITCH to OFF position and disconnect negative battery cable.
18. Replace TEMPERATURE indicator if indications are other than above.
19. Remove jumper wires and connect electrical leads to TEMPERATURE indicator, AC Voltage Regulator, and kilowatt transducer.
20. Raise and secure control panel.
21. Connect negative battery cable and close battery access door.

END OF TASK

REMOVAL

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect TEMPERATURE indicator (WP 0023, Figure 1, Item 8) electrical leads.
5. Remove nuts (5), washers (6), and clamp (7).
6. Remove TEMPERATURE indicator (8) from control panel.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Insert TEMPERATURE indicator (WP 0023, Figure 1, Item 8) in control panel.
2. Install clamp (7), washers (6), and nuts (5).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, OIL PRESSURE INDICATOR: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0023, Figure 1, Item 12

WP 0043, Figure 1, Item 40

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch is OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect indicator for broken lens, cracked housing, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.

NOTE

For MEP-805A, ensure frequency selector switch is in 50 Hz position.

4. Isolate generator set VOLTAGE adjust potentiometer by disconnecting wire 137A from AC Voltage Regulator terminal 5 and wire 107G from kilowatt transducer (WP 0043, Figure 1, Item 40) terminal V1.
5. Disconnect and isolate electrical lead from terminal S of OIL PRESSURE indicator.
6. Set multimeter for ohms and connect between wires 137A and 107G.
7. Adjust potentiometer until multimeter indicates between 92.7 and 113.3 ohms resistance.
8. Disconnect multimeter, but do not disturb potentiometer adjustment.
9. Connect jumper wire between disconnected wire 137A and terminal S of OIL PRESSURE indicator.
10. Connect jumper wire between disconnected wire 107G and terminal G of OIL PRESSURE indicator.
11. Connect negative battery cable and move MASTER SWITCH to PRIME & RUN position.
12. OIL PRESSURE indicator should indicate between 32 and 48 PSI.
13. Move MASTER SWITCH to OFF position, disconnect negative battery cable, and remove jumper wires.
14. Repeat Steps 6 through 10 above, setting potentiometer to between 30.15 and 36.85 ohms resistance.
15. Connect negative battery cable and move MASTER SWITCH to PRIME & RUN position.

16. OIL PRESSURE indicator should indicate between 72 and 80 PSI.
17. Move MASTER SWITCH to OFF position and disconnect negative battery cable.
18. Replace OIL PRESSURE indicator if it does not function properly.
19. Remove jumper wires and connect electrical leads to OIL PRESSURE indicator, AC Voltage Regulator, and kilowatt transducer.
20. Raise and secure control panel.
21. Connect negative battery cable and close battery access door.

END OF TASK

REMOVAL

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect OIL PRESSURE indicator (WP 0023, Figure 1, Item 12) electrical leads.
5. Remove nuts (9), washers (10), and clamp (11).
6. Remove OIL PRESSURE indicator (12) from control panel.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Insert OIL PRESSURE indicator (WP 0023, Figure 1, Item 12) into control panel.
2. Install clamp (11), washers (10), and nuts (9).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, TIME METER (TOTAL HOURS): INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0023, Figure 1, Item 15

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch is OFF/RESET

INSPECTION

1. Shut down generator set.
2. Inspect meter for broken lens, cracked housing, and other damage.

END OF TASK**TESTING**

1. Release control panel by turning two fasteners and lower control panel slowly.
2. Turn MASTER SWITCH to PRIME & RUN position.
3. Crank engine momentarily to energize time meter relay.
4. Set multimeter for DC volts and connect across terminals 1 and 2 of time meter (TOTAL HOURS).
5. If 24 VDC is present, wait approximately 6 minutes. Time meter (TOTAL HOURS) should move 1/10 of an hour.
6. If time meter (TOTAL HOURS) does not operate properly, meter is defective and must be replaced.
7. Raise and secure control panel.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect time meter (TOTAL HOURS) (WP 0023, Figure 1, Item 15) electrical leads.
5. Remove screws (14), washers (32), and nuts (13).
6. Remove time meter (TOTAL HOURS) (15) from control panel.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Insert time meter (TOTAL HOURS) (WP 0023, Figure 1, Item 15) into control panel.
2. Install screws (14), washers (32), and nuts (13).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, BATTERY CHARGE AMMETER: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0023, Figure 1, Items: 18 & 21

Equipment ConditionGrounded, Off & Operational
ENGINE CONTROL Switch OFF/RESET

INSPECTION

1. Shut down generator set.
2. Inspect ammeter for broken lens, cracked housing, and other damage.

END OF TASK**TESTING**

1. Start and operate generator set at rated voltage and frequency.
2. Release control panel by turning two fasteners and lower control panel slowly.
3. Set multimeter for DC volts and connect across BATTERY CHARGE ammeter terminals. Connect positive lead to positive terminal and negative lead to negative terminal if you observe or think battery is charging. Multimeter should indicate up to 50 mV (25 mV equals +10 amps on BATTERY CHARGE ammeter).
4. Reverse multimeter leads if you observe or think battery is discharging. Multimeter should indicate up to 25 mV (25 mV equals -10 amps on BATTERY CHARGE ammeter).
5. If multimeter indicates millivolt reading and BATTERY CHARGE ammeter is not within $\pm 10\%$ of equal ampere reading, or ammeter is not indicating, replace BATTERY CHARGE ammeter.
6. Raise and secure control panel.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect BATTERY CHARGE ammeter (WP 0023, Figure 1, Item 18) electrical leads.
5. Remove nuts (16), washers (33 and 34), and screws (17).
6. Remove BATTERY CHARGE ammeter (18).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Insert BATTERY CHARGE ammeter (WP 0023, Figure 1, Item 18) into control panel.
2. Install screws (17), washers (33 and 34), and nuts (16).
3. Connect electrical leads and remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, FREQUENCY METER (HERTZ): INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician

See "Never Work Alone" Warning

References

WP 0023, Figure 1, Item 21

WP 0052, Testing MEP-805A or Testing MEP-815A

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect meter for broken lens, cracked housing, and other damage.

END OF TASK**TESTING 50/60 Hz****NOTE**

Test frequency transducer in accordance with WP 0052, Testing MEP-805A or Testing MEP-815A prior to testing FREQUENCY meter (HERTZ).

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Disconnect wire 181A from positive (+) terminal of FREQUENCY meter (HERTZ).
5. Set multimeter for DC milliamps and connect negative lead to positive (+) terminal of FREQUENCY meter (HERTZ) and positive lead to wire 181A.
6. Position FREQUENCY SELECT switch to 60 Hz.
7. Connect negative battery cable, start and operate generator set at rated voltage, and adjust frequency to 60 Hz.
8. Multimeter indication should be between 0.781 and 0.923 DC milliamps.
9. Position FREQUENCY SELECT switch to 50 Hz and adjust frequency to 50 Hz.
10. Multimeter indication should be between 0.071 and 0.213 DC milliamps.
11. Replace FREQUENCY meter (HERTZ) if meter readings are not as stated above.
12. Raise and secure control panel.

END OF TASK

TESTING 400 Hz

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Disconnect wire 181A from positive (+) terminal of FREQUENCY meter (HERTZ).
5. Set multimeter for DC milliamps and connect negative lead to positive (+) terminal of FREQUENCY meter (HERTZ) and positive lead to wire 181A.
6. Connect negative battery cable, start and operate generator set at rated voltage, and adjust frequency to 400 Hz.
7. Multimeter indication should be between 0.240 and 0.260 DC milliamps.
8. Replace FREQUENCY meter (HERTZ) if multimeter readings are not as stated above.
9. Raise and secure control panel.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect FREQUENCY meter (HERTZ) (WP 0023, Figure 1, Item 21) electrical leads.
5. Remove nuts (19), washers (38), and screws (20).
6. Remove FREQUENCY meter (HERTZ) (21) from control panel.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Insert FREQUENCY meter (HERTZ) (WP 0023, Figure 1, Item 21) into control panel.
2. Install screws (20), washers (38), and nuts (19).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, AMMETER (PERCENT RATED CURRENT): INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0023, Figure 1, Item 24

Equipment ConditionGrounded, Off & Operational
ENGINE CONTROL Switch OFF/RESET
Battery Disconnect Switch is OFF
DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect ammeter for broken lens, cracked housing, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect wire 183A from terminal 1 of ammeter (PERCENT RATED CURRENT).
5. Set multimeter for AC amperes and connect between disconnected wire 183A and terminal 1 of ammeter (PERCENT RATED CURRENT). Place VM-AM transfer switch in L1 - L0 position.
6. Connect negative battery cable, start and operate generator set at rated voltage and frequency, and apply some load to generator set.
7. Observe and note indications on multimeter and ammeter (PERCENT RATED CURRENT).
8. Shut down generator set.
9. Calculate percent of current from multimeter indication using the following formula:

$$\text{Percent of current} = \frac{100 \times \text{Multimeter Indication}}{0.75 \text{ amperes}}$$

10. Compare calculated percent of current to ammeter (PERCENT RATED CURRENT) indication noted during operation. If difference is greater than 10 percent, replace ammeter.
11. Disconnect negative battery cable.
12. Remove multimeter and connect wire 183A to ammeter (PERCENT RATED CURRENT).
13. Raise and secure control panel.
14. Connect negative battery cable and close battery access door.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.

4. Tag and disconnect ammeter (PERCENT RATED CURRENT) (WP 0023, Figure 1, Item 24) electrical leads.
5. Remove nuts (22), washers (35), and screws (23).
6. Remove ammeter (PERCENT RATED CURRENT) (24) from control panel.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Insert ammeter (PERCENT RATED CURRENT) (WP 0023, Figure 1, Item 24) into control panel.
2. Install screws (23), washers (35), and nuts (22).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, KILOWATTMETER (PERCENT POWER): INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0023, Figure 1, Item 27

Equipment ConditionGrounded, Off & Operational
ENGINE CONTROL Switch OFF/RESET
Battery Disconnect Switch is OFF
DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect meter for broken lens, cracked housing, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect wire 120A from positive terminal of kilowattmeter (PERCENT POWER).
5. Set multimeter for milliamperes and connect between disconnected wire 120A and positive terminal of kilowattmeter.
6. Connect negative battery cable, start and operate generator set at rated voltage and frequency, and apply some load to generator set.
7. Observe and note indications on multimeter and kilowattmeter.
8. Shut down generator set.
9. Calculate percent of power from multimeter indication using the following formula:

$$\text{Percent of power} = \frac{133 \times \text{Multimeter Indication}}{1.2 \text{ Ma.}}$$

10. Compare calculated percent of power to kilowattmeter indication noted during operation. If difference is greater than 13%, replace kilowattmeter (PERCENT POWER).
11. Disconnect negative battery cable.
12. Remove multimeter and connect wire 120A to kilowattmeter (PERCENT POWER).
13. Raise and secure control panel.
14. Connect negative battery cable and close battery access door.

END OF TASK**REMOVAL****WARNING**

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.

4. Tag and disconnect kilowattmeter (PERCENT POWER) (WP 0023, Figure 1, Item 27) electrical leads.
5. Remove nuts (25), washers (36), and screws (26).
6. Remove kilowattmeter (PERCENT POWER) (27) from control panel.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Insert kilowattmeter (PERCENT POWER) (WP 0023, Figure 1, Item 27) into control panel.
2. Install screws (26), washers (36), and nuts (25).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, AC VOLTMETER (VOLTS AC): INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0023, Figure 1, Item 31

Equipment ConditionGrounded, Off & Operational
ENGINE CONTROL Switch OFF/RESET
Battery Disconnect Switch is OFF
DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect AC Voltmeter (Volts AC) for broken lens, cracked housing, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Release control panel by turning two fasteners and lower control panel slowly.
3. Set multimeter for AC volts and connect to AC Voltmeter (Volts AC) terminals.
4. Move voltage reconnection board to 120/208 position.
5. Start and operate generator set at rated voltage and frequency.
6. Move VM-AM transfer switch to L3-L1 position. Note indications on multimeter and AC Voltmeter (Volts AC).
7. Move VM-AM transfer switch to L3-L0 position. Note indications on multimeter and AC Voltmeter (Volts AC).
8. Shut down generator set.
9. Move voltage reconnection board to 240/416 position.
10. Start and operate generator set at rated voltage and frequency.
11. Repeat Steps 6 and 7 above.
12. Shut down generator set.
13. Compare AC Voltmeter (Volts AC) readings to multimeter in each position.
14. Replace AC Voltmeter (Volts AC) if readings differ more than ± 5 VAC between 115-125 VAC or ± 10 VAC between 200-250 VAC.
15. Remove multimeter.
16. Raise and secure control panel.

END OF TASK

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect AC Voltmeter (Volts AC) (WP 0023, Figure 1, Item 31) electrical leads and remove sleeves (28).

5. Remove nuts (29), washers (37), and screws (30).
6. Remove AC Voltmeter (Volts AC) (31) from control panel.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Insert AC Voltmeter (Volts AC) (WP 0023, Figure 1, Item 31) into control panel.
2. Install screws (30), washers (37), and nuts (29).
3. Connect electrical leads, remove tags, and install sleeves (28) over terminals.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, MASTER SWITCH: INSPECTION, REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

FO-1 Electrical Schematic

Equipment ConditionGrounded, Off & Operational
ENGINE CONTROL Switch OFF/RESET
Battery Disconnect Switch is OFF
DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect switch for loose connections/mounting and other damage.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Loosen setscrew (Figure 1, Item 1) and remove knob (2) from MASTER SWITCH (5).
5. Remove nuts (3) and screws (4).
6. Remove MASTER SWITCH (5) from control panel.
7. Tag and disconnect MASTER SWITCH (5) electrical leads.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect MASTER SWITCH (Figure 1, Item 5) electrical leads.
5. Set multimeter for ohms and check switch for continuity. Refer to Electrical Schematic FO-1 (S-1 Circuit Schedule) to determine circuits made to corresponding switch positions.
6. Check continuity until all four positions have been checked.
7. If open circuit is noted in any switch position switch is unserviceable and must be replaced.
8. Connect electrical leads to MASTER SWITCH (5). Remove tags.
9. Raise and secure control panel.
10. Connect negative battery cable and close battery access door.

END OF TASK**INSTALLATION**

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Connect electrical leads to MASTER SWITCH (Figure 1, Item 5). Remove tags.
2. Insert MASTER SWITCH (5) into control panel.
3. Install screws (4) and nuts (3).
4. Install knob (2) and tighten setscrew (1).
5. Raise and secure control panel.
6. Connect negative battery cable and close battery access door.

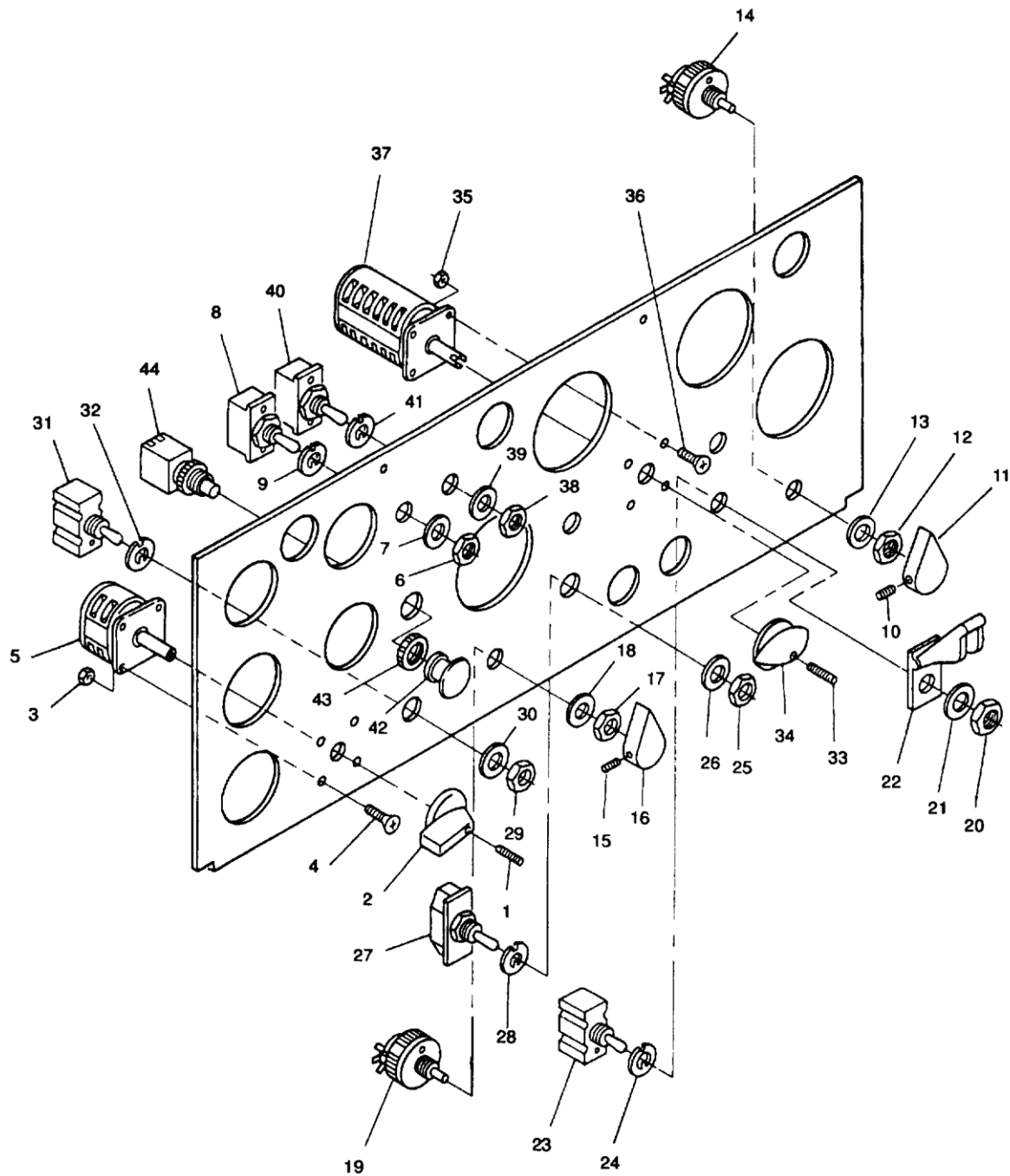


Figure 1. Control Panel Switches.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, ETHER SWITCH: INSPECTION, REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Ether Switch (if indications during testing are not in accordance to this work package)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0032, Figure 1, Items: 8 & 9

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect switch for loose connections/mounting and other damage.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect ETHER switch (WP 0032, Figure 1, Item 8) electrical leads.
5. Remove nut (6) and washer (7).
6. Remove ETHER switch (8) from control panel and remove tab washer (9).

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect ETHER switch (WP 0032, Figure 1, Item 8) electrical leads.
5. Set multimeter for ohms and connect across ETHER switch terminals. Multimeter should indicate open circuit.
6. Hold ETHER switch in ON position. Multimeter should indicate continuity.
7. Replace ETHER switch if indications are not as above.
8. Connect electrical leads to ETHER switch (8). Remove tags.
9. Raise and secure control panel.
10. Connect negative battery cable and close battery access door.

END OF TASK

INSTALLATION**WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install tab washer (WP 0032, Figure 1, Item 9) and insert ETHER switch (8) into control panel.
2. Install washer (7) and nut (6).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, VOLTAGE ADJUST POTENTIOMETER: INSPECTION,
REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsPotentiometer (if defective)
New Shrinkable Tubing**Personnel Required**

Two: (1) Power Generation Mechanic (52D) & (1)

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0032, Figure 1, Item 14

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch is OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect potentiometer for loose connections/mounting and other damage.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect VOLTAGE adjust potentiometer (WP 0032, Figure 1, Item 14) electrical leads using soldering gun. Remove shrinkable tubing.
5. Remove setscrews (10) and knob (11).
6. Remove nut (12) and washer (13).
7. Remove VOLTAGE adjust potentiometer (14) from control panel.

END OF TASK**TESTING**

1. Remove VOLTAGE adjust potentiometer (Removal).
2. Set multimeter for ohms and connect across two outer terminals of potentiometer (WP 0032, Figure 1). Indication shall be as follows:
 - 10,000 ohms (part number RV4NAYSD103A installed)
 - 20,000 ohms (part number RV4NAYSD203A installed)
3. Rotate potentiometer shaft counterclockwise (CCW) as far as it will go.
4. Connect multimeter between center terminal and either outer terminal.
5. Slowly and at an even rate, rotate potentiometer shaft clockwise (CW) as far as it will go while observing multimeter.
6. Multimeter indication shall increase at an even rate as follows:
 - 0 to 10,000 ohms (part number RV4NAYSD103A installed)

0 to 20,000 ohms (part number RV4NAYSD203A installed)

7. If multimeter indication changes erratically or is not at maximum ohms when rotation is complete, potentiometer is defective and must be replaced.
8. Install VOLTAGE adjust potentiometer (Installation).

END OF TASK

INSTALLATION

1. Insert VOLTAGE adjust potentiometer (WP 0032, Figure 1, Item 14) into control panel.
2. Install washer (13) and nut (12).
3. Install knob (11) and setscrews (10).
4. Install new shrinkable tubing and connect electrical leads using soldering gun. Remove tags.
5. Raise and secure control panel.
6. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, FREQUENCY ADJUST POTENTIOMETER: INSPECTION,
REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Shrinkable Tubing

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**

WP 0032, Figure 1, Item 19

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch is OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect switch for loose connections/mounting and other damage.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect FREQUENCY adjust potentiometer (WP 0032, Figure 1, Item 19) electrical leads using soldering gun. Remove shrinkable tubing.
5. Remove setscrews (15) and knob (16).
6. Remove nut (17) and washer (14).
7. Remove FREQUENCY adjust potentiometer (19) from control panel.

END OF TASK**TESTING**

1. Remove FREQUENCY adjust potentiometer (Removal).
2. Set multimeter for ohms and connect across outer terminals of potentiometer (WP 0032, Figure 1, Item 19). Multimeter should indicate between 4,500 and 5,500 ohms resistance.
3. Rotate potentiometer shaft CCW as far as it will go.
4. Connect multimeter between center terminal and either outer terminal. Multimeter should indicate 0 ohms resistance.
5. Slowly and at an even rate, rotate potentiometer shaft CW as far as it will go. Multimeter should increase at an even rate from 0 to 5,000 ohms.
6. If multimeter indication changes erratically or is not between 4,500 and 5,500 ohms when rotation is completed, potentiometer is defective and must be replaced.
7. Install FREQUENCY adjust potentiometer (Installation).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Insert FREQUENCY adjust potentiometer (WP 0032, Figure 1, Item 19) into control panel.
2. Install washer (18) and nut (17).
3. Install knob (16) and setscrews (15).
4. Install new shrinkable tubing and solder leads. Remove tags.
5. Raise and secure control panel.
6. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, BATTLE SHORT SWITCH: INSPECTION, TESTING,
REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0032, Figure 1, Item 23

FO-3 Wiring Diagram

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL Switch is OFF

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect switch for loose connections/mounting and other damage.

END OF TASK**TESTING****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect BATTLE SHORT switch (WP 0032, Figure 1, Item 23) electrical leads.
5. Place switch in ON position.

NOTE

Refer to Wiring Diagram FO-3 for terminal positions.

6. Set multimeter for ohms and check for continuity between terminals 2 and 3, 5 and 6, 8 and 9, and 11 and 12.
7. Place switch in OFF position.
8. Check for continuity between terminals 1 and 2, 4 and 5, 7 and 8, and 10 and 11.
9. Replace switch if any open circuit is indicated.
10. Connect electrical leads to switch (23). Remove tags.
11. Raise and secure control panel.
12. Connect negative battery cable and close battery access door.

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect BATTLE SHORT switch (WP 0032, Figure 1, Item 23) electrical leads.
5. Remove nut (20), washer (21), and protective cover (22).
6. Remove BATTLE SHORT switch (23) from control panel and tab washer (24) from switch stem.

END OF TASK

INSTALLATION**WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install tab washer (WP 0032, Figure 1, Item 24) and insert BATTLE SHORT switch (23) into control panel.
2. Install protective cover (22), washer (21), and nut (20).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, AC CIRCUIT INTERRUPTER SWITCH: INSPECTION,
TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

AC Circuit Interrupter Switch (If continuity check does not comply with testing procedures in this work package)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

ReferencesWP 0032, Figure 1, Item 27
FO-2 Wiring Diagram**Equipment Condition**

Grounded, Off & Operational

ENGINE CONTROL SWITCH is OFF/RESET

Battery Disconnect Switch is OFF

DEAD CRANK SWITCH is OFF

INSPECTION

1. Shut down generator set.
2. Inspect switch for loose connections/mounting and other damage.

END OF TASK**TESTING****WARNING**

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect AC CIRCUIT INTERRUPTER switch (WP 0032, Figure 1, Item 27) electrical leads.

NOTE

Refer to Wiring Diagram FO-2 for terminal positions.

5. Set multimeter for ohms and check for continuity between terminals 5 and 4 and terminals 2 and 3.
6. Check for open circuits between terminals 5 and 6 and terminals 1 and 2.
7. Place and hold AC CIRCUIT INTERRUPTER switch in CLOSED position.
8. Check for continuity between terminals 5 and 6 and terminals 2 and 3.
9. Check for open circuits between terminals 5 and 4 and terminals 2 and 1.
10. Place and hold AC CIRCUIT INTERRUPTER switch in OPEN position.
11. Check for continuity between terminals 5 and 4 and terminals 1 and 2.
12. Check for open circuits between terminals 5 and 6 and terminals 3 and 1.
13. Replace switch if any continuity check is other than indicated above.
14. Connect electrical leads to switch (27). Remove tags.
15. Raise and secure control panel.
16. Connect negative battery cable and close battery access door.

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect AC CIRCUIT INTERRUPTER switch (WP 0032, Figure 1, Item 27) electrical leads.
5. Remove nut (25) and washer (26).
6. Remove AC CIRCUIT INTERRUPTER switch (27) from control panel and tab washer (28) from switch stem.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install tab washer (WP 0032, Figure 1, Item 28) and insert AC CIRCUIT INTERRUPTER switch (27) into control panel.
2. Install washer (26) and nut (25).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, PARALLEL-UNIT SWITCH: INSPECTION, REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Parallel-Unit Switch (If any open circuit is indicated during testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

ReferencesWP 0032, Figure 1, Items: 28 & 31
FO-2 Wiring Diagram**Equipment Condition**

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect switch for loose connections/mounting and other damage.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect PARALLEL-UNIT switch (WP 0032, Figure 1, Item 31) electrical leads.
5. Remove nut (29) and washer (30).
6. Remove PARALLEL-UNIT switch (31) from control panel and tab washer (32) from switch stem.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect PARALLEL-UNIT switch (WP 0032, Figure 1, Item 31) electrical leads.

NOTE

Refer to Wiring Diagram FO-2 for terminal positions.

5. Place switch in PARALLEL position.
6. Set multimeter for ohms and check for continuity between terminals 1 and 2, 4 and 5, 7 and 8, and 10 and 11.
7. Place switch in UNIT position.
8. Check for continuity between terminals 2 and 3, 5 and 6, 8 and 9, and 11 and 12.

9. Replace switch if any open circuit is indicated.
10. Connect electrical leads to switch (31). Remove tags.
11. Raise and secure control panel.
12. Connect negative battery cable and close battery access door.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install tab washer (WP 0032, Figure 1, Item 28) and insert PARALLEL-UNIT switch (27) into control panel.
2. Install washer (26) and nut (25).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, VM-AM TRANSFER SWITCH: INSPECTION, REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

VA-AM Transfer Switch (if open circuit is indicated during testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

ReferencesFO-1 Electrical Schematic
WP 0032, Figure 1, Item 37**Equipment Condition**Grounded, Off & Operational
ENGINE CONTROL SWITCH OFF/RESET
Battery Disconnect Switch OFF
DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect switch for loose connections/mounting and other damage.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Remove setscrew (WP 0032, Figure 1, Item 33) and knob (34).
5. Remove nuts (35) and screws (36).
6. Remove VM-AM Transfer Switch (37) from control panel.
7. Tag and disconnect VM-AM Transfer Switch (37) electrical leads.

END OF TASK**TESTING**

1. Shut down generator set.
2. Remove VM-AM Transfer Switch (Removal).
3. Set multimeter for ohms and check VM-AM Transfer Switch for continuity. Refer to Electrical Schematic FO-1 (S-6 Circuit Schedule) to determine circuits made to corresponding switch positions.
4. Check continuity in all six switch positions.
5. Replace VM-AM Transfer Switch If open circuit is indicated.
6. Install VM-AM Transfer Switch (Installation).

END OF TASK**INSTALLATION**

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Connect electrical leads to VM-AM Transfer Switch (WP 0032, Figure 1, Item 37). Remove tags.
2. Insert VM-AM Transfer Switch (37) into control panel.
3. Install screws (36) and nuts (35).
4. Install knob (34) and setscrew (33).
5. Raise and secure control panel.
6. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, PANEL LIGHTS SWITCH: INSPECTION, REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Panel Light Switch (if readings don't comply during testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0032, Figure 1, Items: 40 & 41

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect switch for loose connections/mounting and other damage.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect PANEL LIGHTS switch (WP 0032, Figure 1, Item 40) electrical leads.
5. Remove nut (38) and washer (39).
6. Remove PANEL LIGHTS switch (40) from control panel and tab washer (41) from switch stem.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect PANEL LIGHTS switch (WP 0032, Figure 1, Item 40) electrical leads.
5. Set multimeter for ohms and connect across switch terminals.
6. Place switch in ON position. Multimeter should indicate continuity.
7. Place switch in OFF position. Multimeter should indicate open circuit.
8. Replace PANEL LIGHTS switch if readings are not as above.
9. Connect electrical leads to switch (40). Remove tags.
10. Raise and secure control panel.
11. Connect negative battery cable and close battery access door.

END OF TASK

INSTALLATION**WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install tab washer (WP 0032, Figure 1, Item 41) and insert PANEL LIGHTS switch (40) into control panel.
2. Install washer (39) and nut (38).
3. Install electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, EMERGENCY STOP SWITCH ASSEMBLY: INSPECTION, REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Emergency Stop Switch (if no continuity is indicated during testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0032, Figure 1, Item 44

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect switch assembly for loose connections/mounting and other damage.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect EMERGENCY STOP switch assembly (WP 0032, Figure 1, Item 44) electrical leads.
5. Remove knob (42) and nut (43).
6. Remove EMERGENCY STOP switch assembly (40) from control panel.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect EMERGENCY STOP switch assembly (WP 0032, Figure 1, Item 44) electrical leads.
5. With switch in normal (out) position, set multimeter for ohms and check circuit between switch terminals. If no continuity is indicated, EMERGENCY STOP switch assembly is defective.
6. Push EMERGENCY STOP switch assembly to in position.
7. Check for continuity between switch terminals. Replace EMERGENCY STOP switch assembly if continuity is indicated.
8. Connect electrical leads to EMERGENCY STOP switch assembly (44). Remove tags.
9. Raise and secure control panel.
10. Connect negative battery cable and close battery access door.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Insert EMERGENCY STOP switch assembly (WP 0032, Figure 1, Item 44) into control panel.
2. Install nut (43) and knob (42).
3. Connect electrical leads. Remove tags.
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, REACTIVE CURRENT ADJUST RHEOSTAT: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Shrinkable Tubing

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Item 3

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect rheostat for loose connections/mounting and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Disconnect wires 143C from TB4 terminal 21, 142A from TB6 terminal 12, and 135B from TB5 terminal 4.
5. Mark reading of REACTIVE CURRENT ADJUST rheostat to reposition at conclusion of testing steps.
6. Set multimeter for ohms and connect to wires 135B and 142A. Multimeter reading should be between 4.5 and 5.5 ohms.
7. Connect multimeter to wires 135B and 143C and turn REACTIVE CURRENT ADJUST rheostat to full CW position. Multimeter reading should be approximately 0 ohms. Turn REACTIVE CURRENT ADJUST rheostat slowly to full CCW position and observe multimeter. Multimeter reading should evenly increase to between 4.5 and 5.5 ohms.
8. Connect multimeter to wires 142A and 143C and turn REACTIVE CURRENT ADJUST rheostat to full CW position. Multimeter reading should be between 4.5 and 5.5 ohms. Turn REACTIVE CURRENT ADJUST rheostat slowly to full CCW position and observe multimeter. Multimeter reading should evenly decrease to approximately 0 ohms.
9. Replace REACTIVE CURRENT ADJUST rheostat if multimeter readings are other than above.
10. Reposition REACTIVE CURRENT ADJUST rheostat as marked in Step 5 above.
11. Connect electrical wires as tagged.
12. Install control box top panel (WP 0015, Installation).

13. Connect negative battery cable and close battery access door.

END OF TASK

REMOVAL

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.

3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect REACTIVE CURRENT ADJUST rheostat (WP 0043, Figure 1, Item 3) electrical leads by unsoldering and remove shrinkable tubing.
5. Remove nuts (1 and 2) and rheostat (3).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install rheostat (WP 0043, Figure 1, Item 3) in mounting bracket.
2. Install nuts (1 and 2).
3. Install new shrinkable tubing and solder electrical leads. Remove tags.
4. Install control box top panel (WP 0015, Installation).
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, LOAD SHARING ADJUST RHEOSTAT: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect rheostat for loose connections/mounting and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect wire 161B from reverse power relay terminal 2. Insulate end of wire.
5. Disconnect wire 159A from governor control unit terminal 11.
6. Set multimeter for ohms and connect positive lead to wire 159A and negative lead of multimeter to terminal 12 of governor control unit. Record reading of rheostat.
7. Turn LOAD SHARING ADJUST rheostat to full CCW position. Multimeter reading should be between 4,500 and 5,500 ohms.
8. Turn LOAD SHARING ADJUST rheostat to full CW position. Multimeter reading should be approximately 0 ohms.
9. Replace LOAD SHARING ADJUST rheostat if multimeter readings are other than above.
10. If readings are within tolerance, return rheostat to reading recorded in Step 6 above.
11. Connect electrical wires as tagged.
12. Install control box top panel (WP 0015, Installation).
13. Connect negative battery cable and close battery access door.

END OF TASK

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect LOAD SHARING ADJUST rheostat (Figure 1, Item 7) electrical leads.

5. Remove nuts (4 and 5), lockwasher (6), and rheostat (7). Discard lockwasher (6).

END OF TASK

INSTALLATION

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install LOAD SHARING ADJUST rheostat (Figure 1, Item 7) in mounting bracket.
2. Install new lockwasher (6) and nuts (5 and 4).
3. Connect electrical leads. Remove tags.

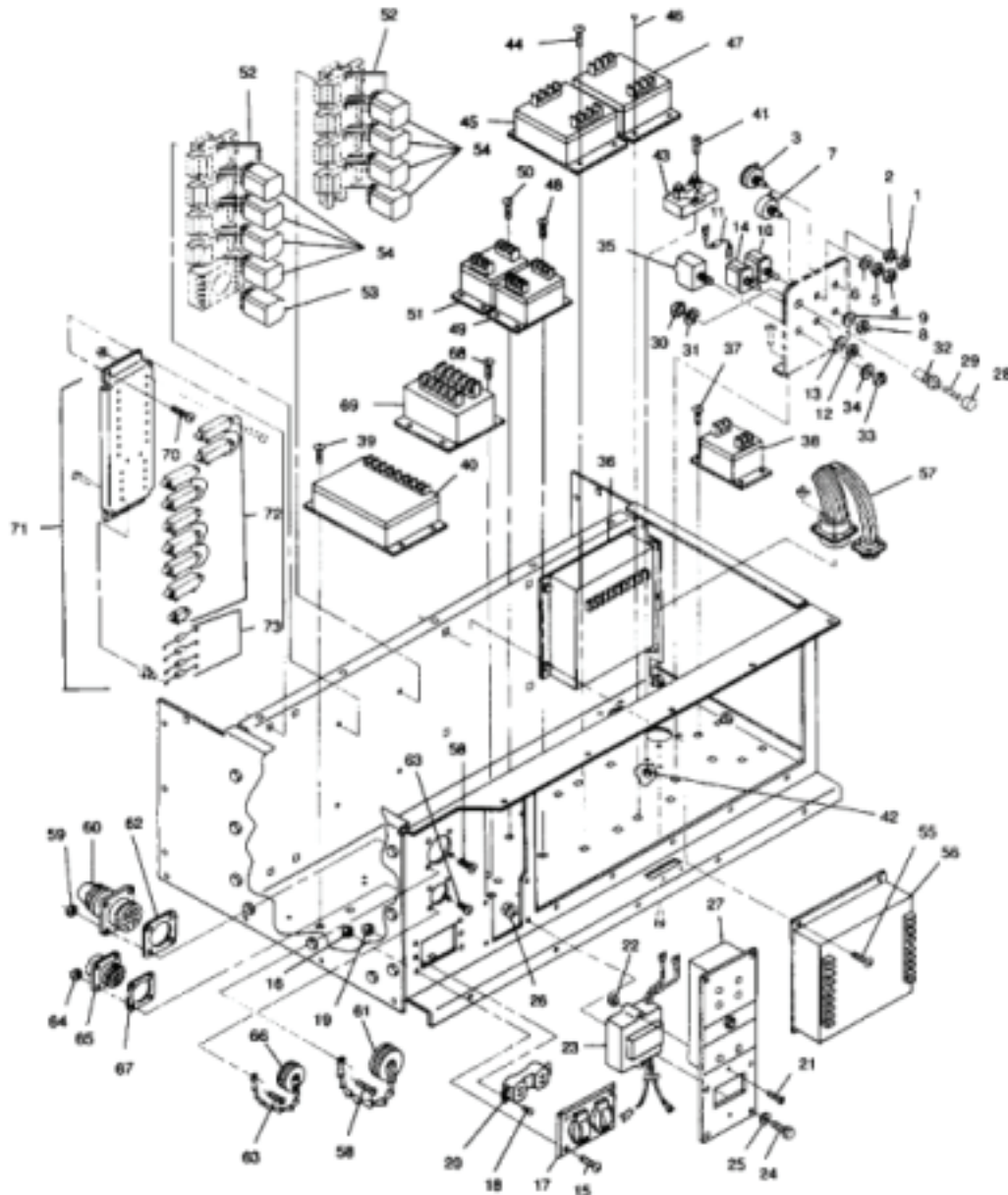


Figure 1. Control Box Components.

4. Install control box top panel (WP 0015, Installation).
5. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, OVERSPEED RESET SWITCH: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Item 10

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect rheostat for loose connections/mounting and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect OVERSPEED RESET switch (WP 0043, Figure 1, Item 10) electrical leads.
5. Set multimeter for ohms and connect across switch terminals. Multimeter should indicate continuity.
6. Position and hold switch in up position. Multimeter should indicate open circuit.
7. Replace OVERSPEED RESET switch if indications are other than above.
8. Connect electrical leads to switch (10). Remove tags.
9. Install control box top panel (WP 0015, Installation).
10. Connect negative battery cable and close battery access door.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect OVERSPEED RESET switch (WP 0043, Figure 1, Item 10) electrical leads.
5. Remove nut (8), lockwasher (9), and switch (10). Discard lockwasher (9).

END OF TASK**INSTALLATION**

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install OVERSPEED RESET switch (WP 0043, Figure 1, Item 10) in mounting bracket.
2. Install new lockwasher (9) and nut (8).
3. Connect electrical leads. Remove tags.
4. Install control box top panel (WP 0015, Installation).
5. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, FREQUENCY SELECT SWITCH (MEP-805A):
INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Item 14

Equipment ConditionGrounded, Off & Operational

INSPECTION

1. Shut down generator set.
2. Inspect switch for loose connections/mounting and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect FREQUENCY SELECT switch (WP 0043, Figure 1, Item 14) electrical leads.
5. Set multimeter for ohms and connect across switch terminals.
6. Place switch in up (60 Hz) position. Multimeter should indicate continuity.
7. Place switch in down (50 Hz) position. Multimeter should indicate continuity.
8. Replace FREQUENCY SELECT switch (14) if indications are other than above.
9. Connect electrical leads to switch (14). Remove tags.
10. Install control box top panel (WP 0015, Installation)
11. Connect negative battery cable and close battery access door.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect electrical leads from FREQUENCY SELECT switch (WP 0043, Figure 1, Item 14).
5. Tag and remove resistor (11) from FREQUENCY SELECT switch (14).
6. Remove nut (12), lockwasher (13), and FREQUENCY SELECT switch (14). Discard lockwasher (13).

END OF TASK**INSTALLATION**

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Position FREQUENCY SELECT switch (WP 0043, Figure 1, Item 14) in mounting bracket.
2. Install new lockwasher (13) and nut (12).
3. Install resistor (11) on FREQUENCY SELECT switch (14). Remove tags.
4. Connect electrical leads. Remove tags.
5. Install control box top panel (WP 0015, Installation).
6. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, CONVENIENCE RECEPTACLE: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Convenience Receptacle (if continuity is indicated during testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Items: 15 & 20

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect CONVENIENCE RECEPTACLE for cracks, breaks, corrosion, bent terminals, and other damage.
3. Inspect cover for cracks, corrosion, or damaged springs.
4. Replace defective parts.

END OF TASK**TESTING**

1. Shut down generator set.
2. Remove control box top panel (WP 0015, Removal).
3. Tag and disconnect CONVENIENCE RECEPTACLE (WP 0043, Figure 1, Item 20) electrical leads.
4. Set multimeter for ohms and check for continuity between upper side terminals and lower side terminals of each plug outlet.
5. Replace CONVENIENCE RECEPTACLE (20) if continuity is indicated between terminals.
6. Connect electrical leads to receptacle (20). Remove tags.
7. Install control box top panel (WP 0015, Installation).

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Remove screws (WP 0043, Figure 1, Item 15) and nuts (16).
5. Remove CONVENIENCE RECEPTACLE cover (17).
6. Remove machine screws (18), nuts (19), and CONVENIENCE RECEPTACLE (20).
7. Tag and disconnect CONVENIENCE RECEPTACLE (20) electrical leads.

END OF TASK**INSTALLATION**

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Connect electrical leads to CONVENIENCE RECEPTACLE (WP 0043, Figure 1, Item 20). Remove tags.
2. Install CONVENIENCE RECEPTACLE (20) into panel cutout with machine screws (18) and nuts (19).
3. Install CONVENIENCE RECEPTACLE cover (17) with screws (15) and nuts (16).
4. Install control box top panel (WP 0015, Installation).
5. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, GROUND FAULT CIRCUIT INTERRUPTER: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

TM 9-6115-644-24P

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Items: 23, 24 & 27

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect GROUND FAULT CIRCUIT INTERRUPTER for cracks, corrosion, frayed wires, and other damage.

END OF TASK**TESTING**

1. Start and operate generator set at rated voltage and frequency.
2. Set multimeter for AC volts, press TEST button, and check for zero voltage at CONVENIENCE RECEPTACLE.
3. Press RESET button on GROUND FAULT CIRCUIT INTERRUPTER and use multimeter to check for 120 VAC at CONVENIENCE RECEPTACLE.
4. Replace GROUND FAULT CIRCUIT INTERRUPTER if indications are other than above.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect GROUND FAULT CIRCUIT INTERRUPTER (WP 0043, Figure 1, Item 23) electrical leads from TB4 and K5 and CONVENIENCE RECEPTACLE (20).
5. Remove screws (21) and nuts (22).
6. Remove GROUND FAULT CIRCUIT INTERRUPTER (23) from malfunction indicator panel (27).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install GROUND FAULT CIRCUIT INTERRUPTER (WP 0043, Figure 1, Item 23) in malfunction indicator panel (27) with screws (21) and nuts (22).
2. Connect electrical leads to TB4 and K5 and CONVENIENCE RECEPTACLE (20). Remove tags.
3. Install control box top panel (WP 0015, Installation).

END OF TASK

IN-LINE FUSE INSTALLATION**NOTE**

The following procedure applies to generator sets under contract number DAAK01-88-D-0082.

NOTE

When replacing GROUND FAULT CIRCUIT INTERRUPTER, use new GROUND FAULT CIRCUIT INTERRUPTER with integral circuit breaker. Refer to TM 9-6115-644-24P for new part number.

1. Shut down generator set.
2. Open left side engine access door and disconnect negative battery cable.
3. Remove malfunction indicator panel screws (WP 0043, Figure 1, Item 24), washers (25), and nuts (26). Lay malfunction indicator panel (27) to the side.
4. Cut black wire on load side of GROUND FAULT CIRCUIT INTERRUPTER (23).
5. Strip wires on in-line fuse holder (Figure 1, Item 2) and install butt splices (3) at each end. Connect ends of black wire to in-line fuse holder butt splices (3).
6. Install fuse (1) in fuse holder (2).
7. Secure excess wire to wiring harness using tie wrap.
8. Install malfunction indicator panel (WP 0043, Figure 1, Item 27), screws (24), washers (25), and nuts (26).
9. Reconnect negative battery cable and close battery access door.

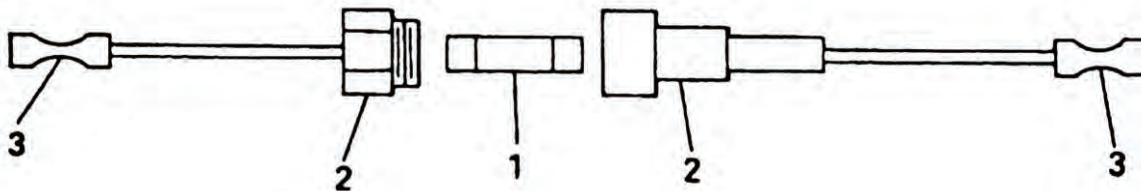


Figure 1. In-Line Fuse Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, MALFUNCTION INDICATOR PANEL: INSPECTION,
TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0043, Figure 1, Item 27

WP 0047 Maintenance of Control Box Assembly,
Ground Fault Circuit Interrupter**Equipment Condition**

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect malfunction indicator panel for broken indicator lights, cracked housing, corrosion, and other damage.

END OF TASK**TESTING**

1. Depress TEST/RESET button and check that all indicators are illuminated.
2. Replace malfunction indicator panel if one or more indicators do not illuminate.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut off generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Remove GROUND FAULT CIRCUIT INTERRUPTER (WP 0047, Removal). (Do not disconnect electrical leads.)
5. Disconnect multi-pin connector at rear of malfunction indicator panel (WP 0043, Figure 1, Item 27).
6. Remove bolts (24), washers (25), and nuts (26).
7. Remove malfunction indicator panel (27) from control panel.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install malfunction indicator panel (WP 0043, Figure 1, Item 27) in control panel with bolts (24), washers (25), and nuts (26).
2. Install multipin connector at rear of panel.

3. Install GROUND FAULT CIRCUIT INTERRUPTER (WP 0047, Installation).
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, BATTERY CHARGER FUSE: REMOVAL, INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

References

WP 0043, Figure 1, Items: 28 & 32

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Remove cap (WP 0043, Figure 1, Item 28) and fuse (29) from fuse holder (32).
5. Tag and unsolder electrical leads from fuse holder (32).
6. Remove nut (30), lockwasher (31), and fuse holder (32). Discard lockwasher (31).

END OF TASK**INSPECTION**

1. Shut down generator set.
2. Inspect for blown fuse.
3. Inspect fuse, fuse holder, and cap for cracks, corrosion, and obvious damage.
4. Replace defective parts.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install fuse holder (WP 0043, Figure 1, Item 32) and secure with new lockwasher (31) and nut (30).
2. Solder electrical leads to fuse holder (32). Remove tags.
3. Install fuse (29) and cap (28).
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, DC CONTROL POWER CIRCUIT BREAKER: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Circuit Breaker (If indications do not comply with testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0043, Figure 1, Items: 33 & 35

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect circuit breaker for loose connections and mounting, cracked housing, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect DC CONTROL POWER circuit breaker (WP 0043, Figure 1, Item 35) electrical leads.
5. Place circuit breaker in OPEN position.
6. Set multimeter for ohms and connect across circuit breaker terminals. Multimeter should indicate open circuit.
7. Place circuit breaker in CLOSED position. Multimeter should indicate continuity.
8. Replace circuit breaker if indications are not as above.
9. Connect electrical leads to circuit breaker (35). Remove tags.
10. Raise and secure control panel.
11. Connect negative battery cable and close battery access door.

END OF TASK**REMOVAL**

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Remove nut (WP 0043, Figure 1, Item 33) and flat washer (34).
5. Remove DC CONTROL POWER circuit breaker (35) from mounting bracket.
6. Tag and disconnect DC CONTROL POWER circuit breaker (35) electrical leads.

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Connect electrical leads. Remove tags.
2. Insert DC CONTROL POWER circuit breaker (WP 0043, Figure 1, Item 35) into mounting bracket.
3. Install flat washer (34) and nut (33).
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, AC VOLTAGE REGULATOR: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves

AC Voltage Regulator (If defective)

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) &
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0043, Figure 1, Item 36

WP 0061, Governor Control Unit

WP 0062, Figure 1, Item 2

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION

Inspect AC Voltage Regulator (WP 0043, Figure 1, Item 36) for cracked case, broken wires, security, and other damage.

END OF TASK**TESTING****AC Voltage Regulator, P/N 112-3055, for MEP-805A**

1. Shut down generator set.
2. Open output box access door.
3. Note position of voltage reconnection terminal board and set FREQUENCY SELECT switch to 60 Hz position.
4. Start generator set and turn VOLTAGE adjust potentiometer to ensure adjustment ranges on Table 1 are met, depending on position of voltage reconnection terminal board.

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

5. Shut down generator set.
6. If no voltage or low voltage was indicated, or voltage adjustment range could not be achieved, perform the following steps. Otherwise, AC Voltage Regulator (WP 0062, Figure 1, Item 2) is serviceable.
7. Disconnect wire 141A from terminal 1 of AC Voltage Regulator.
8. Set multimeter for DC volts and connect positive lead to wire 141A. Connect negative lead of multimeter to terminal 3 of AC Voltage Regulator. Start generator set and operate at rated frequency. Move and hold MASTER SWITCH in START position. Multimeter should indicate between 4 and 12 VDC. If no voltage is indicated, proceed to troubleshooting the Governor Control Unit, WP 0061.
9. Shut down generator set. Isolate wire 141A.

10. Set multimeter for AC volts and connect to terminals 10 and 11 of AC Voltage Regulator. Start generator set and operate at rated frequency. Move and hold MASTER SWITCH in START position. Multimeter should indicate 230 to 380 VAC. If no voltage or low voltage is indicated, proceed to troubleshooting the droop current transformer, WP 0102.
11. Shut down generator set.
12. Disconnect wire 137A from terminal 5 of AC Voltage Regulator. Set multimeter for ohms and connect positive lead to wire 137A and negative lead to terminal 4 of AC Voltage Regulator. Move VOLTAGE adjust potentiometer to full counterclockwise (CCW) position. Multimeter should indicate approximately 3,000 ohms with FREQUENCY SELECT switch in 60 Hz position, and approximately 0 ohms with FREQUENCY SELECT switch in 50 Hz position. Move VOLTAGE adjust potentiometer slowly clockwise (CW) while observing multimeter. Multimeter should increase smoothly to approximately 10,000 ohms.
13. If Steps 8, 10, and 12 are as indicated above, AC Voltage Regulator is defective and must be replaced (Removal and Installation).
14. Connect all wires previously disconnected. Close output box access door.

Table 1. Voltage Adjustment Range (MEP-805A).

Voltage Reconnection Terminal Board Position	Adjustment Range
120/208	197-240 volts
240/416	395-480 volts

END OF TASK

AC Voltage Regulator, P/N 19880-001, for MEP-805A.

1. Shut down generator set.
2. Open output box access door.
3. Note position of voltage reconnection terminal board and set FREQUENCY SELECT switch to 60 Hz position.
4. Start generator set and turn VOLTAGE adjust potentiometer to ensure adjustment ranges on Table 1 are met, depending on position of voltage reconnection terminal board.
5. Shut down generator set.
6. If no voltage or low voltage was indicated or voltage adjustment range could not be achieved, perform the following steps. Otherwise, AC Voltage Regulator (WP 0062, Figure 1, Item 2) is serviceable.
7. Disconnect wire 141A from terminal 1 of AC Voltage Regulator.
8. Set multimeter for DC volts and connect positive lead to wire 141A. Connect negative lead of multimeter to terminal 3 of AC Voltage Regulator. Start generator set and operate at rated frequency. Move and hold MASTER SWITCH in START position. Multimeter should indicate between 4 and 12 VDC.
9. Shut down generator set. Isolate wire 141A.
10. Set multimeter for AC volts and connect to terminals 10 and 11 of AC Voltage Regulator. Start generator set and operate at rated frequency. Move and hold MASTER SWITCH in START position. Multimeter should indicate 110 to 160 VAC.
11. Shut down generator set.
12. Disconnect wire 137A from terminal 5 of AC Voltage Regulator. Set multimeter for ohms and Set multimeter for ohms and connect positive lead to wire 137A and negative lead to terminal 4 of AC Voltage Regulator. Move VOLTAGE adjust potentiometer to full CCW position. Multimeter should indicate no more than 2 ohms with FREQUENCY SELECT switch in 60 Hz position or 50 Hz position. Move VOLTAGE adjust potentiometer slowly CW while observing multimeter. Multimeter should increase smoothly to approximately 20,000 ohms.
13. If Steps 8, 10, and 12 are as indicated above, AC Voltage Regulator is defective and must be replaced (WP 0051, Removal and Installation).

14. Connect all wires previously disconnected. Close output box access door.

END OF TASK

AC Voltage Regulator, P/N 19890-002, for MEP-815A

1. Shut down generator set.
2. Open output box access door.
3. Note position of voltage reconnection terminal board.
4. Start generator set and turn VOLTAGE adjust potentiometer to ensure adjustment ranges on Table 2 are met, depending on position of voltage reconnection terminal board.
5. Shut down generator set.
6. If no voltage or low voltage was indicated or voltage adjustment range could not be achieved, perform the following steps. Otherwise, AC Voltage Regulator (WP 0062, Figure 1, Item 2) is serviceable.
7. Disconnect wire 141A from terminal 1 of AC Voltage Regulator.
8. Set multimeter for DC volts and connect positive lead to wire 141A. Connect negative lead of multimeter to terminal 3 of AC Voltage Regulator. Start generator set and operate at rated frequency. Move and hold MASTER SWITCH in START position. Multimeter should indicate between 4 and 12 VDC.
9. Shut down generator set. Isolate wire 141A.
10. Set multimeter for AC volts and connect to terminals 10 and 11 of AC Voltage Regulator. Start generator set and operate at rated frequency. Move and hold MASTER SWITCH in START position. Multimeter should indicate 110 to 160 VAC.
11. Shut down generator set.
12. Disconnect wire 137A from terminal 5 of AC Voltage Regulator. Set multimeter for ohms and connect positive lead to wire 137A and negative lead to terminal 4 of AC Voltage Regulator. Move VOLTAGE adjust potentiometer to full CCW position. Multimeter should indicate approximately 0 ohms. Move VOLTAGE adjust potentiometer slowly CW while observing multimeter. Multimeter should increase smoothly to approximately 20,000 ohms.
13. If Steps 8, 10, and 12 are as indicated above, AC Voltage Regulator is defective and must be replaced (Removal and Installation).
14. Connect all wires previously disconnected. Close output box access door.

Table 2. Voltage Adjustment Range (MEP-815A).

Voltage Reconnection Terminal Board Position	Adjustment Range
120/208	197-229 volts
240/416	395-458 volts

END OF TASK

REMOVAL

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect AC Voltage Regulator (WP 0062, Figure 1, Item 2) electrical leads.
5. Remove screws (1) and AC Voltage Regulator (2).

END OF TASK

INSTALLATION**CAUTION**

The components of the AC voltage regulator kit are not interchangeable. Ensure the part number of the component to be installed is the same as the removed component. Failure to observe this caution will result in equipment damage.

1. Install AC Voltage Regulator (WP 0062, Figure 1, Item 2) with screws (1).
2. Connect electrical leads. Remove tags.
3. Raise and secure control panel.
4. Connect negative battery cable. Close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, FREQUENCY TRANSDUCER: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

ReferencesWP 0015, Maintenance of Housing, Control Box Top Panel
WP 0043, Figure 1, Item 38**Equipment Condition**Grounded, Off & Operational
ENGINE CONTROL SWITCH OFF/RESET
Battery Disconnect Switch OFF
DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect transducer for cracked casing, burned or broken terminals, and other damage.

END OF TASK**TESTING****MEP-805A**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Release control panel by turning two fasteners and lower control panel slowly.
5. Disconnect wire 181A from positive (+) terminal of FREQUENCY meter (HERTZ).
6. Set multimeter for DC milliamperes (0 to 2 Ma range) and connect positive lead to disconnected wire 181A and negative lead to vacant terminal of FREQUENCY meter (HERTZ).
7. Move FREQUENCY SELECT switch to 60 Hz position.
8. Connect negative battery cable.
9. Start generator set and adjust frequency to 60 Hz.
10. Multimeter indication should be between 0.781 and 0.923 Ma.
11. Adjust frequency to 62 Hz and multimeter indication should be between 0.875 and 1.125 Ma.
12. Move FREQUENCY SELECT switch to 50 Hz position.
13. Adjust frequency to 50 Hz and multimeter indication should be between 0.071 and 0.213 Ma.
14. Adjust frequency to 52 Hz and multimeter indication should be between 0.213 and 0.284 Ma.
15. Shut down generator set.
16. Replace frequency transducer if readings are other than above.
17. If no repair is needed, remove multimeter and connect wire 181A to positive (+) terminal of FREQUENCY

meter (HERTZ).

18. Raise and secure control panel.
19. Install control box top panel (WP 0015, Installation).

END OF TASK

MEP-815A

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Release control panel by turning two fasteners and lower control panel slowly.
5. Disconnect wire 181A from positive terminal (+) of FREQUENCY meter (HERTZ).
6. Set multimeter for DC milliamperes (0 to 2 Ma range) and connect positive lead to free end of wire 181A and connect negative lead to positive terminal (+) of FREQUENCY meter (HERTZ).
7. Connect negative battery cable.
8. Start and operate generator set at rated voltage and adjust frequency to 400 Hz.
9. Multimeter indication should be between 0.229 and 0.271 Ma.
10. Adjust frequency to 412 Hz. Multimeter indication should be between 0.479 and 0.521 Ma.
11. Shut down generator set.
12. Replace frequency transducer if readings are other than above.
13. If no repair is needed, remove multimeter and connect wire 181A to positive terminal (+) of FREQUENCY meter (HERTZ).
14. Raise and secure control panel.
15. Install control box top panel (WP 0015, Installation).

END OF TASK

REMOVAL

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect frequency transducer (WP 0043, Figure 1, Item 38) electrical leads.
5. Remove screws (37) and frequency transducer (38).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install frequency transducer (WP 0043, Figure 1, Item 38) with screws (37).
2. Connect all electrical leads. Remove tags.
3. Install control box top panel (WP 0015, Installation).
4. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, KILOWATT TRANSDUCER: INSPECTION, TESTING,
REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Kilowatt Transducer (If indications do not comply with testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Item 40

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect transducer for cracked casing, burned or broken terminals, and other damage.

END OF TASK**TESTING**

1. Start and operate generator set at rated voltage and frequency.
2. Apply some load to generator set.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Set multimeter for AC volts and take readings between terminals V1 and N1, V2 and N2, and V3 and N3. Multimeter indication should be 120 VAC between each set of terminals.
5. Take readings between terminals S1 and -, S2 and -, S3 and -, L1 and -, L2 and -, and L3 and -. Multimeter indication should be 0.1 to 3 VAC. (Reading will vary depending on amount of load applied to generator set.)
6. Change multimeter setting to DC millivolts and take reading between terminals + and -. Multimeter indication should be 0.1 to 50 mV (dependent on amount of load applied to generator set).
7. Shut down generator set.
8. Replace kilowatt transducer if multimeter indications are within ranges stated in Steps 4 and 5 above, but not within range stated in Step 6 above.
9. If no repair is needed, raise and secure control panel.

END OF TASK

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect kilowatt transducer (WP 0043, Figure 1, Item 40) electrical leads.

5. Remove screws (39) and kilowatt transducer (40).

END OF TASK**INSTALLATION**

1. Install kilowatt transducer (WP 0043, Figure 1, Item 40) with screws (39).
2. Connect electrical leads. Remove tags.
3. Install control box top panel (WP 0015, Installation).
4. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, SHUNT: INSPECTION, TESTING, REMOVAL,
INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Shunt (If multimeter indicates less than 0.5 ohms)

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) &
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

ReferencesWP 0015, Maintenance of Housing, Control Box Top
PanelWP 0019, Maintenance of Control Box Assembly,
Panel Lights

WP 0043, Figure 1, Item 43

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect shunt for cracked casing, burned or broken terminals, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Remove control box top panel (WP 0015, Removal).
3. Open battery access door and disconnect negative battery cable.
4. Tag and disconnect shunt (WP 0043, Figure 1, Item 43) electrical leads.
5. Set multimeter for ohms and connect to shunt terminals 1 and 4. Multimeter should indicate less than 0.5 ohms.
6. Replace shunt if multimeter indication is greater than above.
7. If no repair is needed, connect electrical leads to shunt (43). Remove tags.
8. Install control box top panel (WP 0015, Installation).
9. Connect negative battery cable and close battery access door.

END OF TASK

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect shunt (WP 0043, Figure 1, Item 43) electrical leads.

5. Remove control box assembly (WP 0019, Removal).
6. Remove screws (41), nuts (42), and shunt (43).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install shunt (WP 0043, Figure 1, Item 43) and secure with screws (41) and nuts (42).
2. Install control box assembly (WP 0019, Installation).
3. Connect all electrical leads. Remove tags.
4. Install control box top panel (WP 0015, Installation).
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, OVERVOLTAGE/UNDERVOLTAGE RELAY: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Overvoltage/Undervoltage Relay (If no compliance during testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Item 45

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect relay for cracked casing, burned or broken terminals, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.

CAUTION

The following procedure disables AC voltage regulator and allows generator to reach an overvoltage condition. Do not allow generator set to operate for an extended period of time in an extreme overvoltage condition.

4. Disconnect wire 137A from AC Voltage Regulator terminal 5 and insulate wire end.
5. Connect negative battery cable.
6. Start generator set. As generator set accelerates to rated speed, it should instantly shut down and the OVERVOLTAGE lamp on malfunction indicator panel should illuminate. If this does not occur, immediately shut down generator set.
7. Reconnect wire 137A and disconnect wire 141A from AC Voltage Regulator terminal 1. Insulate wire end.
8. Start generator set. As generator set accelerates to rated speed, the UNDERVOLTAGE lamp on malfunction indicator should illuminate. Move AC CIRCUIT INTERRUPTER switch to CLOSED position. AC circuit interrupter relay should not close.
9. Shut down generator set.
10. Replace overvoltage/undervoltage relay if generator set does not operate as above.

11. If no repair is needed, reconnect wire 141A at AC Voltage Regulator.
12. Raise and secure control panel.

END OF TASK

REMOVAL

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.

2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect overvoltage/undervoltage relay (WP 0043, Figure 1, Item 45) electrical leads.
5. Remove screws (44) and overvoltage/undervoltage relay (45).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install overvoltage/undervoltage relay (WP 0043, Figure 1, Item 45) with screws (44).
2. Connect electrical leads. Remove tags.
3. Install control box top panel (WP 0015, Installation).
4. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, SHORT CIRCUIT/OVERLOAD RELAY: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Relay (Replace any found to be defective)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0043, Figure 1, Item 47

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect relay for cracked casing, burned or broken terminals, and other damage.

END OF TASK**TESTING****CAUTION**

Make sure battery cable is disconnected prior to removing wires. Failure to observe this caution could result in equipment damage.

1. Tag and remove all wires from terminals 5 through 12.
2. Set multimeter for ohms and check for open circuits between terminals 5 and 6, 9 and 10. Check for closed circuits between terminals 7 and 8, 11 and 12. Replace any relay that fails the above tests. If a problem still exists, go to Step 4.
3. If no repair is needed reconnect wires as tagged.

CAUTION

Make sure negative battery cable is disconnected prior to removing wires. Failure to observe this caution could result in equipment damage.

4. Remove short circuit/overload relay (Removal).
5. Install relay in test circuit (Figure 1)
6. Set multimeter for OHMS and check for open circuits between terminals 5 and 6, 9 and 10. Check for closed circuits between terminals 7 and 8, 11 and 12. If relay fails the above test, replace relay. If relay tests good, continue with remainder of test.
7. Activate power source G1. Adjust voltage to 0 volts.
8. Place switch S2 in the "A" position and close S1.

9. Slowly increase output voltage of G1 to 6.18 VAC (110% rated load). Leave G1 at this setting for 10 minutes. Relay should not trip; circuits should remain as indicated in Step 3 above.
10. Set multimeter for OHMS and check across terminals 5 and 6 while slowly increasing output voltage of G1 to 7.30 VAC (130% rated load). The relay should trip within 8 +/-2 minutes. When relay trips circuit 5 and 6 should close, circuit 7 and 8 should open.
11. With multimeter set on OHMS, check across terminals 9 and 10. Slowly increase output voltage of G1. When voltage reaches 23.9 +/-1.4 VAC the relay should trip. When relay trips, circuit 9 and 10 should close and circuit 11 and 12 should open.
12. Return output voltage of G1 to 0 and open S1, allowing relay to reset.
13. Place switch S2 in "B" position and close switch S1.
14. Repeat Steps 6 through 9.
15. Place switch S2 in "C" position and close switch S1.
16. Repeat Steps 6 through 9.
17. The voltages at which relay trips in positions A, B, and C should be within 1 volt.
18. Replace any relay found to be defective.
19. Install short circuit/overload relay (Installation).

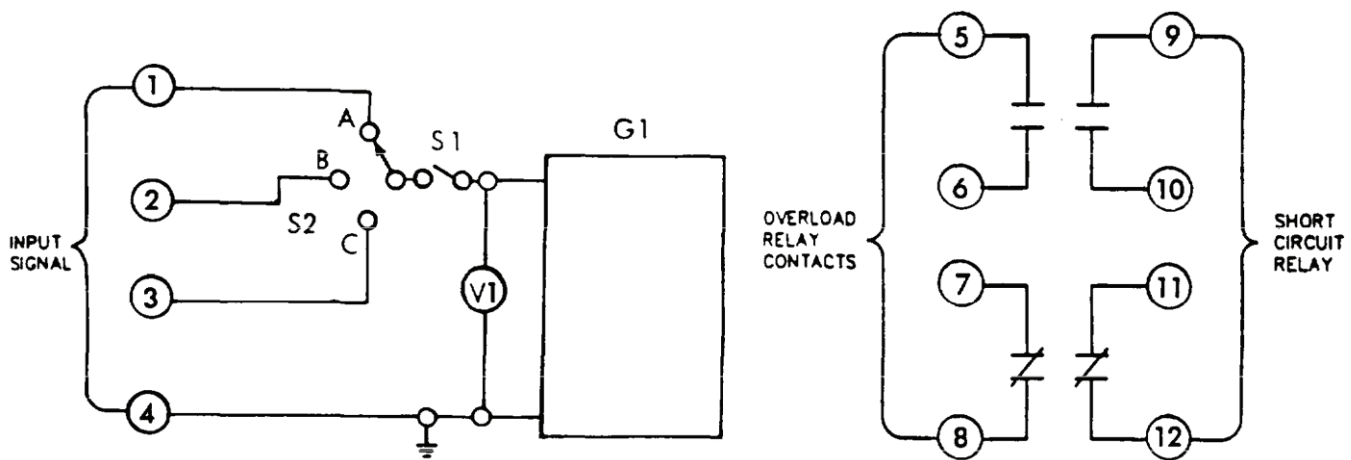


Figure 1. Test Circuit.

END OF TASK

REMOVAL

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect short circuit/overload relay (WP 0043, Figure 1, Item 47) electrical leads.
5. Remove screws (46) and short circuit/overload relay (47).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install short circuit/overload relay (WP 0043, Figure 1, Item 47) with screws (46).

2. Connect electrical leads. Remove tags.
3. Raise and secure control panel.
4. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, PERMISSIVE PARALLELING RELAY: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Permissive Paralleling Relay (If operation doesn't comply with this work package)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0043, Figure 1, Item 49

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect relay for cracked casing, burned or broken terminals, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Disconnect and insulate wires 102D from terminal 1, and 196A and 196B from terminal 2 of permissive paralleling relay.
5. Mark a 10,000 ohm potentiometer as follows:
Center terminal = C
Two outside terminals = L and R
6. Set up a test circuit (Figure 1). Connect 120 VAC source (can be obtained from CONVENIENCE RECEPTACLE) to terminals L and R of potentiometer. Connect a wire from terminal C of potentiometer to terminal 1 of permissive paralleling relay. Connect a second wire from terminal R of potentiometer to terminal 2 of permissive paralleling relay. Set multimeter for AC volts and connect to terminals 1 and 2 of permissive paralleling relay.
7. Adjust 10,000 ohm potentiometer to full CCW position.
8. Connect negative battery cable.
9. Start and operate generator set at rated frequency and voltage. Multimeter indication should be 0 volts.
10. Move AC CIRCUIT INTERRUPTER switch to CLOSED position; AC circuit interrupter relay should close. Move AC CIRCUIT INTERRUPTER switch to OPEN position; AC circuit interrupter relay should open. Observe AC CIRCUIT INTERRUPTER light for actuation of relay.

11. Adjust 10,000 ohm potentiometer CW until multimeter indicates 10 VAC.
12. Move AC CIRCUIT INTERRUPTER switch to CLOSED position. AC circuit interrupter relay should not close (AC CIRCUIT INTERRUPTER light should remain dark).
13. Shut down generator set.
14. Disconnect negative battery cable.
15. Replace permissive paralleling relay if operation is not as above.
16. If no repair is needed, remove multimeter and test circuit wires. Reconnect wires 102D, 196A and 196B to permissive paralleling relay.
17. Raise and secure control panel.
18. Connect negative battery cable and close battery access door.

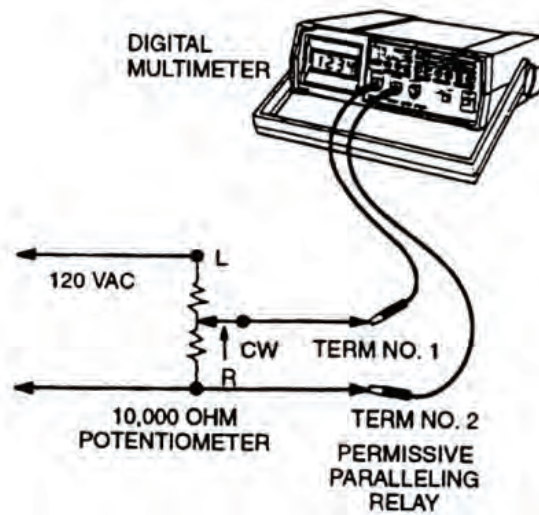


Figure 1. Permissive Paralleling Relay Test Setup.

END OF TASK

REMOVAL

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect permissive paralleling relay (WP 0043, Figure 1, Item 49) electrical leads.
5. Remove screws (48) and permissive paralleling relay (49).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install permissive paralleling relay (WP 0043, Figure 1, Item 49) with screws (48).
2. Connect all electrical leads. Remove tags.
3. Raise and secure control panel.
4. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, REVERSE POWER RELAY: INSPECTION, TESTING,
REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Reverse Power Relay (If operation does not comply with testing procedures in this work package)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0043, Figure 1, Item 51

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect relay for cracked casing, burned or broken terminals, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Disconnect and insulate wires 158B and 158C from terminal 1 and wires 161A and 161B from terminal 2 of reverse power relay.
5. Mark a 5,000 ohm potentiometer as follows:
 - Center terminal = C
 - Two outside terminals = L and R

CAUTION

Voltage polarity is very important to prevent damage to generator set.

6. Set up a test circuit (Figure 1). Connect 24 VDC source to terminals L and R of potentiometer. Connect a wire between terminal C of potentiometer and terminal 1 of reverse power relay. Connect a second wire between terminal R of potentiometer and terminal 2 of reverse power relay. Set multimeter for DC volts and connect positive lead of multimeter to terminal 1 and negative lead to terminal 2 of reverse power relay.
7. Adjust 5,000 ohm potentiometer to full CCW position. Multimeter should indicate 0 volts.
8. Connect negative battery cable.
9. Start and operate generator set at rated frequency and voltage.

10. Move AC CIRCUIT INTERRUPTER switch to CLOSED position. AC CIRCUIT INTERRUPTER light should illuminate.
11. Adjust 5,000 ohm potentiometer CW and at same time observe multimeter and AC CIRCUIT INTERRUPTER light. AC CIRCUIT INTERRUPTER light should go out at between 1.7 and 2.3 VDC, indicating that AC circuit interrupter relay is open.
12. Shut down generator set.
13. Disconnect negative battery cable.
14. Replace reverse power relay if operation is not as above.
15. Remove multimeter and test circuit wires. Reconnect wires 158B, 158C, 161A, and 161B at reverse power relay.
16. Raise and secure control panel.
17. Connect negative battery cable and close battery access door.

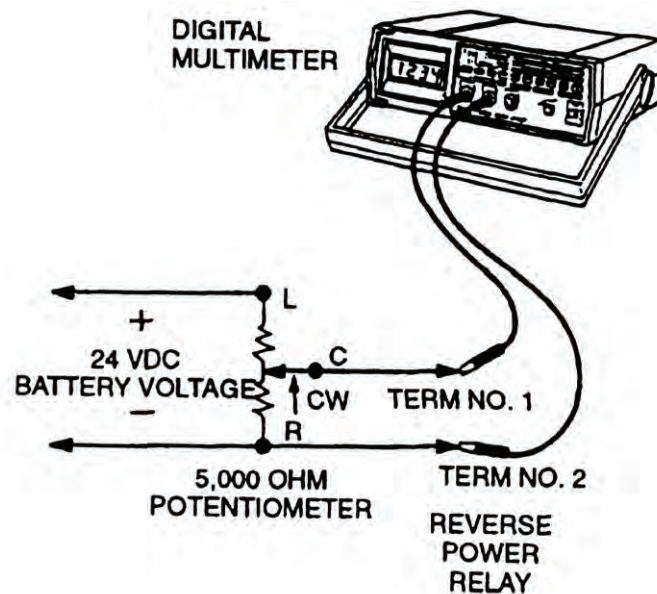


Figure 1. Reverse Power Relay Test Setup.

END OF TASK

REMOVAL

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect reverse power relay (WP 0043, Figure 1, Item 51) electrical leads.
5. Remove screws (50) and reverse power relay (51).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install reverse power relay (WP 0043, Figure 1, Item 51) with screws (50).

2. Connect electrical leads. Remove tags.
3. Raise and secure control panel.
4. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, VOLTAGE SENSING RELAY: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Voltage Sensing Relay (If indications do not comply with testing in this work package)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

References

WP 0043, Figure 1, Items: 52 & 53

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect relay for cracks, loose mounting, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Remove voltage sensing relay (K-11) (Removal).
3. Set multimeter for ohms and check for open circuits between terminals 1 and 3 and terminals 8 and 6 of voltage sensing relay.
4. Check for continuity between terminals 1 and 4 and terminals 8 and 5.
5. Connect multimeter between terminals 2 and 7 of relay and check for between 1,260 and 1,890 ohms.
6. Depress reset button; check for open circuits between terminals 1 and 4 and terminals 8 and 5.
7. Continue to depress reset button and check for continuity between terminals 1 and 3 and terminals 8 and 6.
8. Replace voltage sensing relay if indications are not as above.
9. If no repair is needed, install voltage sensing relay (Installation).

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Release wire clip (WP 0043, Figure 1, Item 52) and remove voltage sensing relay (K-11) (53) by gently pulling from socket.

END OF TASK**INSTALLATION**

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install voltage sensing relay (K-11) (WP 0043, Figure 1, Item 53) in socket and secure by snapping wire clip (55) over relay.
2. Raise and secure control panel.
3. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, RELAYS: INSPECTION, TESTING, REMOVAL,
INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Relay (If indications do not comply with this work package)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0043, Figure 1, Item 54

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect relays for cracks, loose mounting, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Remove applicable relay (Removal).
3. Set multimeter for ohms and check for open circuits between terminals 7 and 4, 8 and 5, and 9 and 6. Check for closed circuits between terminals 7 and 1, 8 and 2, and 9 and 3.
4. Connect multimeter between terminals A and B and check for between 427.5 and 522.5 ohms.
5. Apply battery voltage across terminals A and B. Using multimeter, check for open circuits between terminals 7 and 1, 8 and 2, and 9 and 3. Check for closed circuits between terminals 7 and 4, 8 and 5, and 9 and 6.
6. Replace relay if indications are other than above.
7. If no repair is needed, install relay (Installation).

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Locate suspected defective relay (WP 0043, Figure 1, Item 54), release wire clip (52), and remove relay by gently pulling from socket.

END OF TASK**INSTALLATION**

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install relay (WP 0043, Figure 1, Item 54) in socket and secure by snapping wire clip (52) over relay.
2. Raise and secure control panel.
3. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, GOVERNOR CONTROL UNIT (GCU): INSPECTION, TROUBLESHOOTING PROCEDURES, TESTING, ADJUSTMENT, REMOVAL, INSTALLATION, REPLACEMENT**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Governor Control Unit (If functional criteria does not comply with this work package)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0043, Figure 1, item 56

WP 0062, Figure 1, Item 3

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION

1. Shut down generator set.
2. Inspect governor control unit for loose connections and mounting, and other damage.

END OF TASK**TROUBLESHOOTING PROCEDURES**

1. While holding master switch (S-1) in START position, check for voltage from pin positions 1, 3, 5 on GCU (A-5) to ground. Readings should be battery voltage. If there is no voltage between any connections, GCU (A-5) is not receiving proper voltage and wiring harness should be checked. Refer to Electrical Schematic FO-1.

NOTE

With the generator set running, the voltage will read zero.

2. Place master switch (S-1) in OFF position. Connect multimeter leads to terminals 19 and 20 on GCU (A-5); then, move master switch (S-1) to START position. Reading should be battery voltage when generator set does not crank. If there is no voltage between terminal positions, GCU (A-5) is not functioning properly and should be replaced (Replacement).

NOTE

With the generator set running, there will be battery voltage.

3. Place master switch (S-1) in OFF position. Connect multimeter leads to terminals 19 and 18 on GCU (A-5); then move master switch (S-1) to START position. Reading should be ZERO voltage when generator set does not crank. If there is voltage between terminal positions, GCU (A-5) is not functioning properly and should be replaced (Replacement).

END OF TASK**TESTING**

1. Shut down generator set.
2. Open output box access door. Remove protective cover and attach voltage and frequency recorder to terminals 9 and 12 of voltage reconnection terminal board.
3. Open load terminal board access door and attach load bank to generator set (4-wire connection).

NOTE

Ensure load bank and generator set voltage reconnection terminal board are set for same configuration (i.e., 120/208 or 240/416 VAC).

4. Start and operate generator set at rated voltage and frequency.

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

WARNING

Operating the generator set exposes personnel to a high noise level. Hearing protection must be worn when operating or working near the generator set when the generator set is running. Failure to comply with this warning can cause hearing damage to personnel.

5. Turn on voltage and frequency recorder and operate at minimum chart speed of 5 mm/sec (chart resolution of 0.2 mm/sec). Adjust recorder voltage amplifier for a minimum chart resolution of 1.0 volt/mm, and frequency deviation amplifier for a minimum resolution of 0.2 Hz/mm.

WARNING

High voltage power is available when the main contactor is closed. Avoid accidental contact with live components. Ensure load cables are properly connected and the load cable door is shut before closing main contactor. Ensure load is turned off before closing main contactor. Ensure that soldiers working with/on loads connected to the generator set are aware that main contactor is about to be closed before closing main contactor. Failure to comply with this warning can cause injury or death to personnel.

6. Set load bank for a load equal to 75% of generator set rated load.
7. Apply and remove 75% load to generator set at 40-second intervals three times.
8. Repeat Steps 6 and 7 above at 50 percent rated load.
9. Repeat Steps 6 and 7 above at 25 percent rated load.
10. Repeat Steps 6 and 7 above at 100 percent rated load.
11. Shut down generator set.
12. Turn off voltage and frequency recorder.
13. Examine voltage and frequency recorder chart. Generator set should meet the following performance criteria:
 - a. Frequency regulation shall not exceed 1/4 of 1 percent of rated frequency.
 - b. Frequency short-term stability (30 seconds): frequency will remain constant within a bandwidth equal to 1/2 of 1 percent rated frequency, without repetitive frequency variations, commonly called hunting.
 - c. Generator set will reestablish stable engine operating conditions within 2 seconds of a sudden load change (within 1 second for 400 Hz unit). Maximum transient frequency change above or below (overshoot or undershoot) new steady state frequency shall not be more than 4 percent of rated frequency (not more than 1-1/2 percent for 400 Hz unit).
14. If above criteria is not met, adjust GCU (WP 0062, Figure 1, Item 3) (Adjustment).
15. If above criteria cannot be met by adjustment, GCU must be replaced (Replacement).
16. Disconnect load bank. Close load terminal board access door.

17. Disconnect voltage and frequency recorder and install voltage reconnection terminal board protective cover. Close output box access door.

END OF TASK

ADJUSTMENT

1. Shut down generator set.
2. Open output box access door, remove cover from voltage reconnection terminal board, and attach voltage and frequency recorder to terminals 9 and 12 of voltage reconnection terminal board.

NOTE

The following procedures require monitoring frequency, voltage, current, and power. All readings except for frequencies will utilize the generator set control panel gauges. However, since the designed overspeed trip frequency is greater than the range of the control panel FREQUENCY meter (HERTZ), a frequency counter will be required.

3. Attach frequency counter to voltage reconnection terminal board terminals 9 and 12.
4. Open load terminal board access door and attach load bank to generator set (4-wire connection).

NOTE

Ensure load bank and generator set voltage reconnection are set for same configuration (i.e., 120/208 or 240/416 VAC).

5. Check for proper adjustment of governor actuator (WP 0117, Adjustment). Adjust as necessary.
6. Check for proper adjustment of magnetic pickup (WP 0114, Adjustment). Adjust as necessary.
7. Lower generator set control panel and turn INTEG, GOV GAIN, and LOAD PULSE potentiometer on GCU to their full CCW positions.
8. Loosen jam nut (Figure 1, Item 1) and back out high idle stop screw (2) on fuel injection pump.

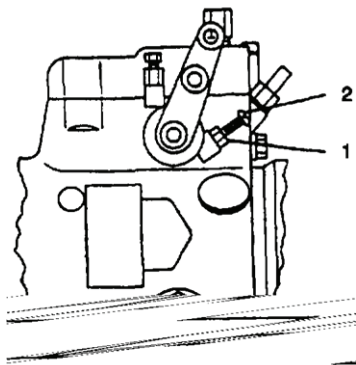


Figure 1. Fuel Injection Pump High Idle Speed Adjustment.

9. Start generator set and operate at rated voltage and frequency.
10. Observing frequency counter, slowly increase operating frequency of generator set by turning GCU FREQUENCY range potentiometer CW until frequency counter indicates between 65.94 and 66.06 Hz (MEP-805A)/436 and 444 Hz (MEP-815A). At this point generator set has reached overspeed trip frequency and generator set should shut down.

NOTE

Perform Steps 11 and 12 below if generator set does not shut down within limits noted in Step 10 above. Otherwise, proceed to Step 13 below.

11. If generator set has not shut down at upper limit of frequency noted in Step 10 above, proceed as follows:
 - a. Turn FREQUENCY range potentiometer CCW until frequency counter indicates midrange of overspeed trip frequency. (Example: 66 Hz for MEP-805A)
 - b. Turn OVERSPEED control potentiometer on GCU CCW until generator set shuts down.
 - c. Activate OVERSPEED RESET switch.
 - d. Repeat Steps 9 and 10 above.
12. If generator set shuts down prior to reaching lower limit of frequency noted in Step 10 above, proceed as follows:
 - a. Turn OVERSPEED control potentiometer CW one turn for each hertz generator set shut down prior to lower frequency limit.
 - b. Activate OVERSPEED RESET switch.
 - c. Repeat Steps 9 and 10 above.
13. Actuate OVERSPEED RESET switch.
14. Loosen jam nut (Figure 1, Item 1), set 8th idle stop screw (2) to position recorded for Step 8, and tighten jam nut (1).
15. Turn FREQUENCY range potentiometer on GCU two turns CCW.
16. Start and operate generator set at rated voltage and turn FREQUENCY adjust potentiometer on control panel to midrange.
17. Turn FREQUENCY range potentiometer until rated frequency (50, 60, or 400 Hz) is indicated on control panel FREQUENCY meter (HERTZ).
18. Set load bank for generator set rated load and apply load. Observe generator set instruments and adjust load as needed to ensure rated load is applied.
19. Set multimeter for DC volts and connect to terminals 11 and 12 of GCU (WP 0062, Figure 1, Item 3).
20. Adjust LOAD SHARING ADJUST rheostat until multimeter indicates 6 VDC. Disconnect multimeter.
21. Remove load.
22. Turn on voltage and frequency recorder and operate at minimum chart speed of 5 mm/sec (chart resolution of 0.2 mm/sec). Adjust recorder voltage amplifier for minimum chart resolution of 1.0 volt/mm and frequency deviation of 0.2 Hz/mm.
23. Adjust GOV GAIN potentiometer on GCU as follows:
 - a. Turn GOV GAIN potentiometer to its full CW position.
 - b. Momentarily actuate and turn off LOAD switch on control panel.
 - c. Observe strip chart on recorder for frequency oscillation (hunting). If required, slow GOV GAIN CCW until frequency oscillation disappears.
24. Apply and remove rated load to generator set at 40-second intervals. Repeat this step two more times.
25. Shut down generator set and turn off recorder.
26. Examine voltage and frequency strip chart for the following performance criteria:
 - a. Frequency regulation shall not exceed 1/4 of 1 percent of rated frequency.
 - b. Frequency short-term stability (30 seconds): bandwidth equal to 1/2 of 1 percent of rated frequency, without repetitive frequency variations (hunting).
 - c. Generator set will reestablish stable engine operation within 2 seconds of a sudden load change (i.e., from a load to no-load condition) (within 1 second for 400 Hz units). Maximum transient frequency change above (overshoot) and below (undershoot) new steady state frequency shall not be more than 4 percent of rated frequency (not more than 1-1/2 percent for 400 Hz units).

NOTE

All required INTEG and LOAD PULSE potentiometer adjustments will be in 10 percent increments.

27. Adjust INTEG potentiometer on GCU CW to decrease recovery time of load transients.
28. Adjust LOAD PULSE potentiometer on GCU CW to decrease frequency overshoot and undershoot and to decrease recovery time of overshoot/undershoot transients.
29. Start generator set.

NOTE

Steps 23, a and 23, b are not required when doing Step 30.

30. Repeat Steps 22 through 24 until generator set meets performance requirements stated in Step 26.
31. Apply and remove 75 percent rated load to generator set at 40-second intervals. Repeat this step two more times.
32. Apply and remove 50 percent rated load to generator set at 40-second intervals. Repeat this step two more times.
33. Apply and remove 25 percent rated load to generator set at 40-second intervals. Repeat this step two more times.
34. Shut down generator set and turn off strip chart recorder.
35. Examine voltage and frequency strip chart for the following performance criteria:
 - a. Frequency regulation shall not exceed 1/4 of 1 percent of rated frequency.
 - b. Frequency short-term stability (30 seconds): frequency will remain constant within a bandwidth equal to 1/2 of 1 percent rated frequency, without repetitive frequency variations (hunting).
 - c. Generator set will reestablish stable engine operation within 2 seconds of a sudden load change (i.e., from a load to no-load condition) (within 1 second for 400 Hz units). Maximum transient frequency change above (overshoot) and below (undershoot) new steady state frequency shall not be more than 4 percent of rated frequency (not more than 1-1/2 percent for 400 Hz units).
36. Disconnect load bank. Close load terminal board access door.
37. Disconnect frequency counter and voltage and frequency recorder from voltage reconnection terminal board.
38. Install voltage reconnection terminal board cover. Close output box access door.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Release control panel by turning two fasteners and lower control panel slowly.
4. Tag and disconnect governor control unit (WP 0043, Figure 1, Item 56) electrical leads.
5. Remove screws (55) and governor control unit (56).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install governor control unit (WP 0043, Figure 1, Item 56) with screws (55).
2. Connect electrical leads. Remove tags.
3. Raise and secure control panel.
4. Connect negative battery cable and close battery access door.

END OF TASK**REPLACEMENT**

1. Remove GCU (Removal).
2. Install new GCU (Installation).

3. Perform adjustment of GCU (Adjustment).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, CONTROL BOX WIRING HARNESS: INSPECTION, TESTING, REPAIR, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0019, Maintenance of Control Box Assembly, Control Box Assembly

WP 0043, Figure 1, Item: 27, 43 & 57

WP 0059, Maintenance of Control Box Assembly, Voltage Sensing Relay

WP 0060, Maintenance of Control Box Assembly, Relays

FO-2, Wiring Diagram

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION

1. Shut down generator set.
2. Inspect control box harness (WP 0043, Figure 1, Item 57) wiring for breaks, damaged insulation, and loose or damaged terminals.
3. Inspect harness connectors, sockets, and terminal boards for cracks, corrosion, stripped threads, broken pins, and other visible damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Set multimeter for ohms.
5. Check individual wires, connectors, and terminal boards for continuity. Refer to Wiring Diagram FO-2 for wire identification.
6. If no repair is needed, install control box top panel (WP 0015, Installation), connect negative battery cable, and close battery access door.

END OF TASK**REPAIR****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

1. Replace individual wires, damaged terminal ends, clamps, and tie wraps.
2. Ensure proper connection of wires not indicating continuity.
3. Replace damaged cable assemblies, terminals, connectors, sockets, and terminal boards.
4. Replace or ensure proper connection of all wires not indicating continuity.

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box assembly (WP 0019, Removal).
4. Remove voltage sensing relay (WP 0059, Removal).
5. Remove relays (WP 0060, Removal).
6. Remove screws (Figure 1, Item 4), washers (5), insulators (6), and clips (7).
7. Tag and remove sockets (8) from tracks (9).
8. Remove screws (10) and nuts (11) to free terminal boards (12).
9. Tag and disconnect electrical leads from AC Voltage Regulator (2) and governor control unit (3).
10. Tag and disconnect electrical leads from shunt (WP 0043, Figure 1, Item 43), BATTERY CHARGER FUSE assembly (32), DC Control Power Circuit Breaker (35), REACTIVE CURRENT ADJUST rheostat (3), LOAD SHARING ADJUST rheostat (7), FREQUENCY SELECT switch (14), OVERSPEED RESET switch (10), overvoltage/undervoltage relay (45), frequency transducer (38), short circuit/overload relay (47), permissive paralleling relay (51), reverse power relay (49), load measuring unit (69), watt transducer (40), and resistor-diode assembly (71).
11. Tag and disconnect electrical leads to CONVENIENCE RECEPTACLE (20), GROUND FAULT CIRCUIT INTERRUPTER (23), and connector to malfunction indicator panel (27).

12. Tag and disconnect electrical leads to all indicators, switches, and lights on control panel.
13. Remove screws (Figure 1, Items 13 and 17), nuts (14 and 18), caps (16 and 20), diagnostic connector (15), parallel connector (19), and gaskets (21 and 22) from control box panel.
14. Remove screws (23) and nuts (24) from harness connectors and remove harness assembly (25) from control box.

END OF TASK

INSTALLATION

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

1. Position control box wiring harness assembly (Figure 1, Item 25) in control box.
2. Secure harness connectors to control box with screws (23) and nuts (24).
3. Install gaskets (21 and 22), diagnostic connector (15), parallel connector (19), and caps (16 and 20) in control box panel with screws (13 and 17) and nuts (14 and 18).
4. Connect all electrical leads to control panel indicators, switches, and lights as tagged during removal. Remove tags.
5. Connect electrical connector to malfunction indicator panel (WP 0043, Figure 1, Item 27) and electrical leads to CONVENIENCE RECEPTACLE (20) and GROUND FAULT CIRCUIT INTERRUPTER (23).
6. Connect electrical leads, as tagged during removal, to watt transducer (40), load measuring unit (69), reverse power relay (49), permissive paralleling relay (51), resistor-diode assembly (71), short circuit/overload relay (47), frequency transducer (38), overvoltage/undervoltage relay (45), DC Control Power Circuit Breaker (35), BATTERY CHARGER FUSE assembly (32), OVERSPEED RESET switch (10), FREQUENCY SELECT switch (14), REACTIVE CURRENT ADJUST rheostat (3), LOAD SHARING ADJUST rheostat (7), and shunt (43). Remove tags.
7. Connect electrical leads to AC Voltage Regulator (Figure 1, Item 2) and governor control unit (3). Remove tags.
8. Secure terminal boards (12) to control box with screws (10) and nuts (11).

9. Position sockets (8) on tracks (9) as tagged during removal.
10. Secure sockets (8) to tracks (9) with clips (7), insulators (6), washers (5), and screws (4). Remove tags.
11. Install relays (WP 0060, Installation).
12. Install voltage sensing relay (WP 0059, Installation).
13. Install control box assembly (WP 0019, Installation).
14. Connect negative battery cable.
15. Start and operate generator set at rated voltage and frequency.
16. Close battery access door.

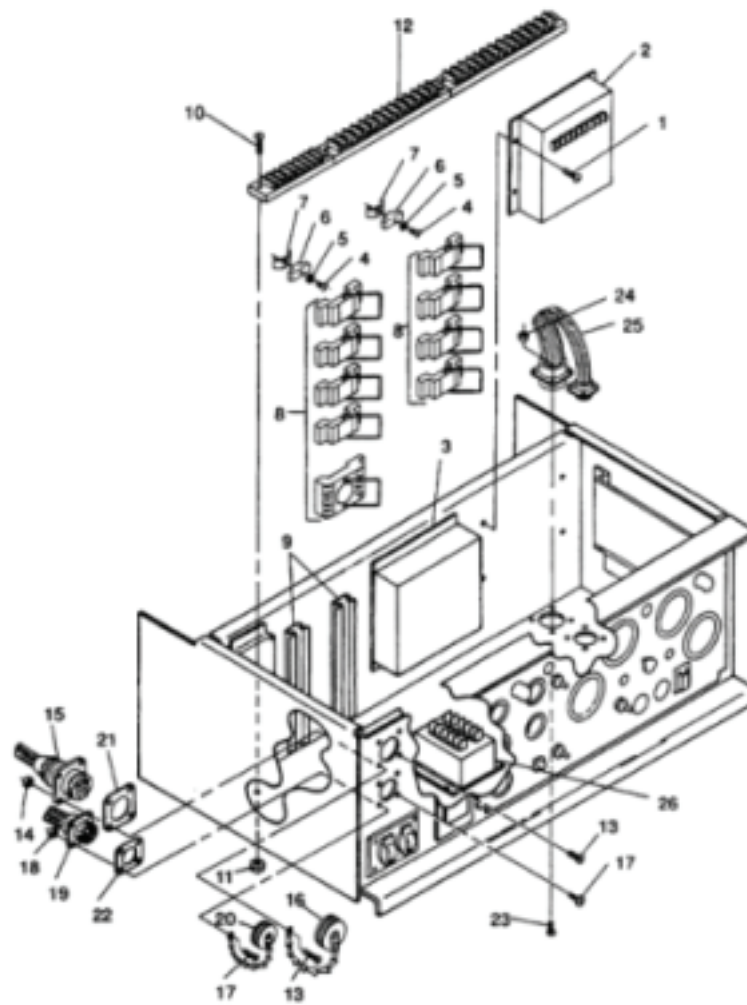


Figure 1. Control Box Components.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, DIAGNOSTIC CONNECTOR: INSPECTION, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52d) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Item 60

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

NOTE

The diagnostic connector can be used as an aid in troubleshooting. Refer to Figure 1 and Table 1. Diagnostic connector is a component of the control box harness assembly, but can be removed and installed separately.

INSPECTION

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Inspect diagnostic connector for cracks, breaks, corrosion, bent terminals, burns, or other indications of damage.
4. Inspect cap for cracks, corrosion, or broken chain.
5. Inspect gasket for tears and deterioration.
6. Replace any defective part.
7. If no repair is needed, connect negative battery cable and close battery access door.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Loosen rear outer ring and plastic insert from diagnostic connector (WP 0043, Figure 1, Item 60).
5. Tag and disconnect electrical leads to diagnostic connector (60) by inserting removal tool into pins of connector.
6. Remove screws (58) and nuts (59).
7. Remove diagnostic connector cap (61), diagnostic connector (60), and gasket (62).

END OF TASK**INSTALLATION**

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install diagnostic connector (WP 0043, Figure 1, Item 60), gasket (62), and cap (61) with screws (58) and nuts (59).
2. Connect electrical leads to diagnostic connector (60) by using insert tool. Remove tags.
3. Install plastic insert and tighten rear outer ring on connector.
4. Install control box top panel (WP 0015, Installation).
5. Connect negative battery cable and close battery access door.

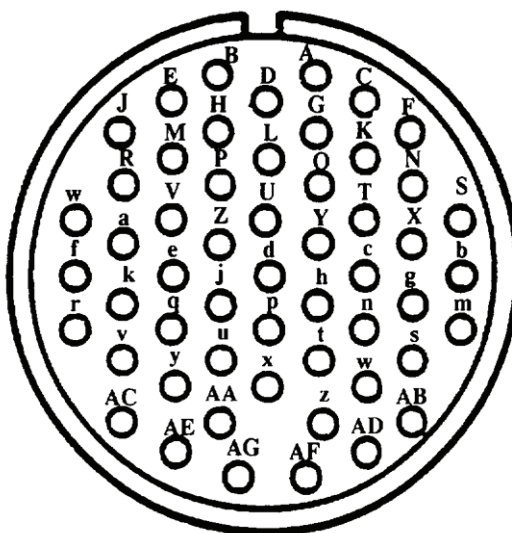


Figure 1. Diagnostic Connector Pin Positions.

NOTE

The diagnostic connector can be used as a troubleshooting tool. Refer to Figure 1 for pin positions.

Table 1. Diagnostic Connector Connection Points.

Pin	Description	Expected Output*
B	Chassis ground (GND)	Continuity 0 volts
C	DC paralleling voltage for governor synchronization	0-20 VDC (*,5)
D	Chassis ground (GND)	Continuity 0 volts
E	Paralleling voltage for AC Voltage Regulator	0-20 VAC set freq. (*,5)
F	DC exciter field voltage (positive)	0-60 VDC (*,6)
G	DC paralleling voltage for governor synchronization	0-20 VDC (*,5)
H	Paralleling voltage for AC Voltage Regulator	0-20 VAC set freq. (*)
J	DC exciter field voltage (negative)	0-60 VDC (*,7)
M	DC voltage input to governor	24 VDC (*)

Table 1. Diagnostic Connector Connection Points. - Continued

Pin	Description	Expected Output*
N	DC starter motor solenoid coil	24 VDC (2 or 3)
O	DC voltage across fuel pump (Aux)	24 VDC (1)
P	DC voltage S1 terminal 7	24 VDC (2)
S	DC voltage across engine fuel solenoid coil	24 VDC (*)
T	DC voltage across starter crank relay coil	24 VDC (2 or 3)
U	DC voltage (output of DC circuit breaker)	24 VDC
V	DC voltage across output circuit interrupter coil	24 VDC (*)
X	DC starter motor (motor side of solenoid contacts)	24 VDC (2 or 3)
Z	DC voltage across fuel level contacts	24 VDC (4)
a	DC voltage across low oil pressure switch	0 volts (*)
b	DC voltage across low oil pressure switch	24 VDC (4)
c	DC voltage across ether bottle solenoid coil	24 VDC when selected (2)
d	DC battery charging voltage	24-27.6 VDC
x	Input frequency sensing voltage to governor	2-6 volts, 0-4,000 Hz (3, 8)
y	Input frequency sensing voltage to governor	2-6 volts, 0-4,000 Hz (3, 8)
*	With generator set operating (refers to all others not numbered)	
(1)	Auxiliary fuel pump in operation (note fuel level); MASTER SWITCH in PRIME & RUN AUX FUEL position	
(2)	During engine starting	
(3)	Use DEAD CRANK switch	
(4)	MASTER SWITCH in PRIME & RUN position	
(5)	AC circuit interrupter closed	
(6)	Read between pins F and J	
(7)	Read between pins J and F	
(8)	Read between pins x and y	

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, PARALLEL CONNECTOR: INSPECTION, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Item 65

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

NOTE

The parallel connector is a component of the control box harness assembly, but can be removed and installed separately.

INSPECTION

1. Shut down generator set.
2. Inspect parallel connector for cracks, corrosion, stripped or damaged threads, evidence of shorting, or other damage.
3. Inspect cap for cracks, corrosion, and broken chain.
4. Inspect gasket for tears and deterioration.
5. Replace defective parts.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect parallel connector (WP 0043, Figure 1, Item 65) electrical leads by inserting removal tool into pins of connector.
5. Remove screws (63), nuts (64), and cap (66).
6. Remove parallel connector (65) and gasket (67).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install parallel connector (WP 0043, Figure 1, Item 65), gasket (67), and cap (66) with screws (63) and nuts (64).
2. Connect electrical leads using insert tool. Remove tags.
3. Install control box top panel (WP 0015, Installation).

4. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, LOAD MEASURING UNIT: INSPECTION, REMOVAL,
INSTALLATION, TESTING, REPLACEMENT**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Item 69

WP 0062, Figure 1, Item 26

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION

1. Shut down generator set.
2. Inspect load measuring unit for damaged case, cracked or broken terminal lugs, and loose or missing hardware.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Release control panel by turning two fasteners and lower control panel slowly.
5. Tag and disconnect load measuring unit (WP 0043, Figure 1, Item 69) electrical leads.
6. Remove screws (68) and load measuring unit (69).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install load measuring unit (WP 0043, Figure 1, Item 69) with screws (68).
2. Connect all electrical leads. Remove tags.
3. Install control box top panel (WP 0015, Installation)
4. Raise and secure control panel.
5. Connect negative battery cable and close battery access door.

END OF TASK**TESTING**

1. Start and operate generator set at rated frequency and voltage.
2. Apply a resistive load to generator set.
3. Note reading on kilowattmeter (PERCENT POWER).
4. Determine DC voltage (calculated value) from kilowattmeter reading using the following formula:

10.8 X (kilowattmeter reading)

100

5. Release control panel by turning two fasteners and lower control panel slowly.
6. Set multimeter for DC volts and connect positive lead to terminal 11 of load measuring unit (WP 0062, Figure 1, Item 26) and negative lead to terminal 12.
7. Compare DC voltage (calculated value) to multimeter reading.
8. Load measuring unit (26) must be replaced if difference is more than ± 1.2 VDC.
9. Shut down generator set.
10. Remove multimeter from load measuring unit (26) terminals.
11. Raise and secure control panel.

END OF TASK

REPLACEMENT

1. Remove load measuring unit (WP 0062, Figure 1, Item 26) (Removal).
2. Install new load measuring unit (26) (Installation).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, RESISTOR-DIODE ASSEMBLY: INSPECTION, TESTING, REMOVAL, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0043, Figure 1, Item 71

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Shut down generator set.
2. Inspect resistor-diode assembly for cracks, breaks, corrosion, bent terminals, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Release control panel by turning two fasteners and lower control panel slowly.

NOTE

Isolate component before testing.

5. Set multimeter for ohms and measure resistance across resistors R10, R11, and R12. Multimeter indication should be between 7.125 and 7.875 ohms for each resistor.
6. Using multimeter, measure resistance across resistor R14. Multimeter indication should be between 61.75 and 68.25 ohms for MEP-805A generator set, and between 38.00 and 42.00 ohms for MEP-815A generator set.
7. Using multimeter, measure resistance across resistor R15. Multimeter indication should be between 1,235 and 1,365 ohms.
8. Using multimeter, measure resistance across resistors R6 and R8. Multimeter indication should be between 4,750 and 5,250 ohms.
9. Using multimeter, measure resistance across resistors R7 and R9. Multimeter indication should be between 2,850 and 3,150 ohms.
10. Connect positive lead of multimeter to cathode side and negative lead to anode side of each diode (CR1, CR2, CR3, and CR4). Refer to Figure 1. Note ohms indication on multimeter for each diode.
11. Reverse multimeter leads so positive lead is connected to anode side and negative lead is connected to

cathode side of each diode (CR1, CR2, CR3, and CR4). Note ohms indication on multimeter for each diode.

12. Multimeter indications should be 1:10 ratio or greater.
13. If any indications are other than above, replace defective component.

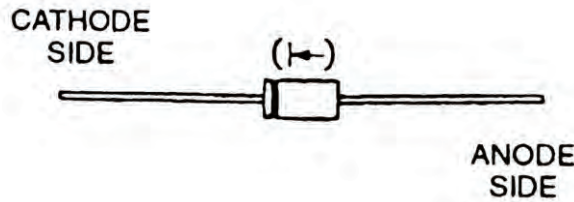


Figure 1. Diode Identification.

14. If no repair is needed, install control box top panel (WP 0015, Installation).
15. Raise and secure control panel.
16. Connect negative battery cable and close battery access door.

END OF TASK

REMOVAL

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Tag and disconnect resistor-diode assembly (WP 0043, Figure 1, Item 71) electrical leads.
5. Remove screws (70) and resistor-diode assembly (71).

END OF TASK**REPAIR**

Repair resistor-diode assembly (WP 0043, Figure 1, Item 71) by replacing resistors (72) and diodes (73).

END OF TASK**INSTALLATION****WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install resistor-diode assembly (WP 0043, Figure 1, Item 71) and secure with screws (70).
2. Connect electrical leads. Remove tags.
3. Install control box top panel (WP 0015, Installation).
4. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, CONTROL PANEL: INSPECTION, REMOVAL, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

CARC Paint

Protective Eyewear, Mask & Gloves

Fine Grit Abrasive Paper

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

TM 43-0139

WP 0021, Maintenance of Control Box Assembly, Press-To-Test Lights

WP 0034, Maintenance of Control Box Assembly, Voltage Adjust Potentiometer

WP 0035, Maintenance of Control Box Assembly, Frequency & Adjust Potentiometer

WP 0159, Item 17

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

Inspect control panel (Figure 1, Item 10) for dents, cracks, loose paint, and corrosion.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove press-to-test lights from control panel (WP 0021, Removal). (Do not unsolder wires.)
4. Remove VOLTAGE adjust potentiometer from control panel (WP 0034, Removal). (Do not remove wires.)
5. Remove FREQUENCY adjust potentiometer from control panel (WP 0035, Removal). (Do not remove wires.)
6. Tag and disconnect all electrical leads to remaining indicators and switches on control panel.
7. Remove screw (Figure 1, Item 1), nut (2), and strap (3).
8. Remove bolts (4 and 6), nuts (5 and 7), bracket (9), clamp (8), and control panel (10) from control box assembly.
9. Remove bolts (11), nuts (12), and hinge (13) from control box assembly.

END OF TASK**REPAIR****WARNING**

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

1. Repair all dents and cracks and remove all loose paint.
2. Remove light corrosion with fine grit abrasive paper (WP 0159, Item 17).
3. Repaint surface in accordance with TM 43-0139. (F) Refer to applicable directives.

END OF TASK

INSTALLATION

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

1. Install hinge (Figure 1, Item 13) on control box assembly with bolts (11) and nuts (12).
2. Install control panel (10), clamp (8), and bracket (9) on control box assembly with bolts (4 and 6) and nuts (5 and 7).
3. Install strap (3) on control panel (10) with screw (1) and nut (2).
4. Connect all electrical wires to indicators and switches as tagged. Remove tags.
5. Install press-to-test lights (WP 0021, Installation).
6. Install VOLTAGE adjust potentiometer (WP 0034, Installation).
7. Install FREQUENCY adjust potentiometer (WP 0035, Installation).
8. Connect negative battery cable and close battery access door.

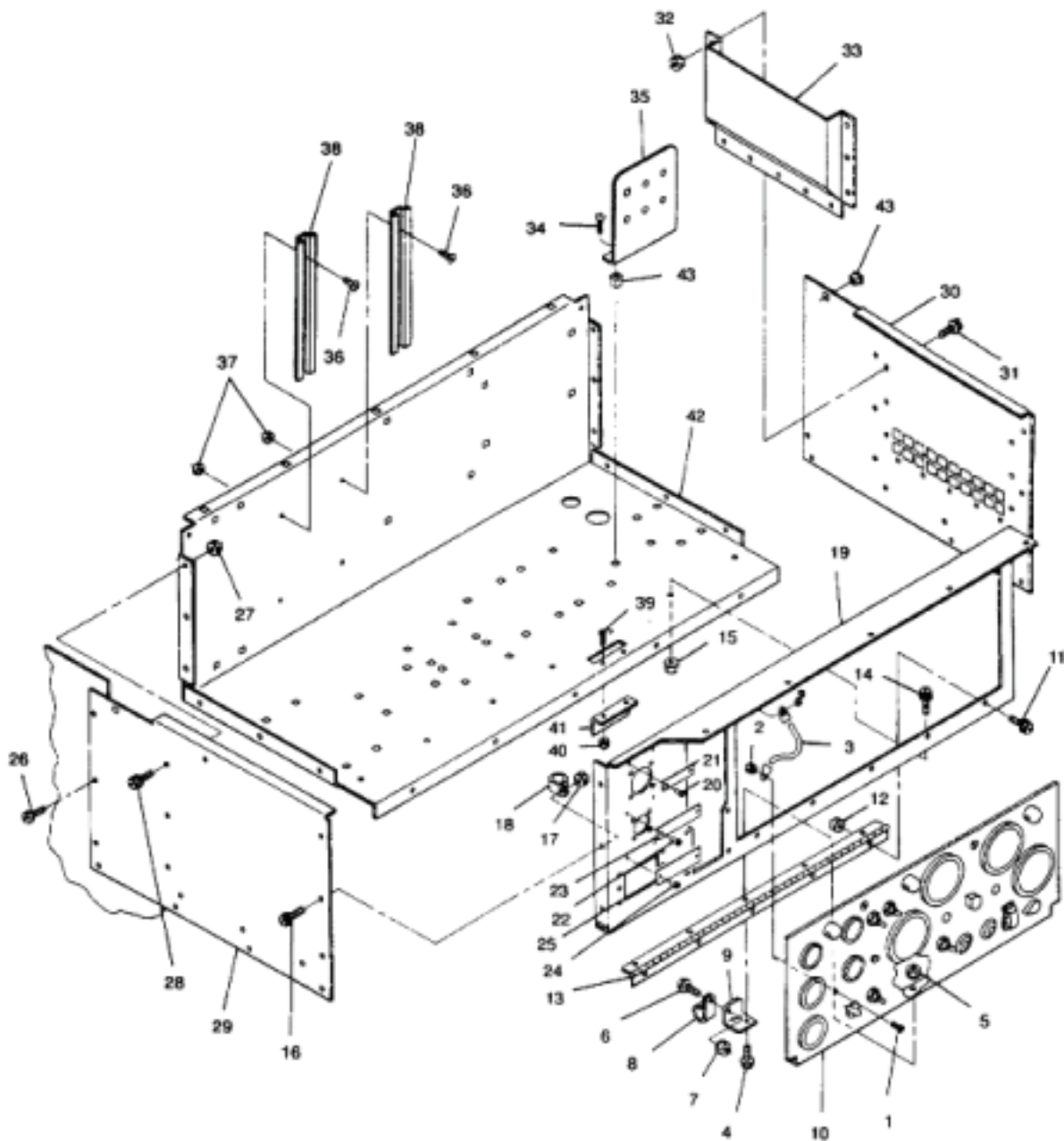


Figure 1. Control Box Panels.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, CONTROL PANEL FRAME: INSPECTION, REMOVAL, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Grounded, Off & Operational

Materials/Parts

CARC Paint

Protective Eyewear, Mask & Gloves

Fine Grit Abrasive Paper

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0019, Maintenance of Control Box Assembly, Control Box Assembly

WP 0046, Maintenance of Control Box Assembly, Convenience Receptacle

WP 0019, Maintenance of Control Box Assembly, Ground Fault Circuit Interrupter

WP 0063, Maintenance of Control Box Assembly, Diagnostic Connector

WP 0064, Maintenance of Control Box Assembly, Parallel Connector

WP 0067, Figure 1, Item 19

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

Inspect control panel frame (WP 0067, Figure 1, Item 19) for dents, cracks, loose paint, and corrosion.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box assembly (WP 0019, Removal).
4. Remove control panel (WP 0067, Removal).
5. Remove diagnostic connector (WP 0063, Removal). (Do not remove wires.)
6. Remove parallel connector (WP 0064, Removal). (Do not remove wires.)
7. Remove CONVENIENCE RECEPTACLE (WP 0046, Removal); GROUND FAULT CIRCUIT INTERRUPTER (WP 0047, Removal); and malfunction indicator panel (WP 0048, Removal).
8. Remove bolts (WP 0067, Figure 1, Items 14 and 16), nuts (15 and 17), clamp (18), and control panel frame (19) from control box assembly.
9. Drill out rivets (20, 22, and 24) and remove identification plates (21, 23, and 25), if necessary.

END OF TASK**REPAIR****WARNING**

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

1. Repair all dents and cracks and remove all loose paint.
2. Remove light corrosion with fine grit abrasive paper (WP 0159, Item 17).
3. Repaint surface in accordance with TM 43-0139. (F) Refer to applicable directives.

END OF TASK**INSTALLATION**

1. Install control panel frame (WP 0067, Figure 1, Item 19) and clamp (18) to control box assembly with bolts (14 and 16) and nuts (15 and 17).
2. If removed, install identification plates (21, 23, and 25) on control panel frame (19) with rivets (20, 22, and 24).
3. Install malfunction indicator panel (WP 0048, Installation); GROUND FAULT CIRCUIT INTERRUPTER (WP 0047, Installation); CONVENIENCE RECEPTACLE (WP 0046, Installation); parallel connector (WP 0064, Installation); and diagnostic connector (WP 0063, Installation).
4. Install control panel (WP 0067, Installation).
5. Install control box assembly (WP 0019, Installation).
6. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, CONTROL BOX SIDE PANELS: INSPECTION, REMOVAL, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

CARC Paint

Protective Eyewear, Mask & Gloves

Fine Grit Abrasive Paper

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

TM 43-0139

WP 0015, Maintenance of Housing, Control Box Top Panel

WP 0067, Figure 1, Items: 16, 26, 28, 29, 30, 33 & 43

WP 0159, Item 1

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Inspect side panels (WP 0067, Figure 1, Items 29 and 30) and air deflector (33) for dents, cracks, loose paint, and corrosion.
2. Inspect for missing or damaged cage nuts (43).

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box top panel (WP 0015, Removal).
4. Remove bolts (WP 0067, Figure 1, Items 16, 26, and 28), nuts (17 and 27), and control box side panels (29 and 30) from generator set.
5. Remove bolts (31), nuts (32), and air deflector (33) from side panel (30).

END OF TASK**REPAIR****WARNING**

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

1. Repair all dents and cracks and remove all loose paint.
2. Remove light corrosion with fine grit abrasive paper (WP 0159, Item 17).
3. Repaint surface in accordance with TM 43-0139. (F) Refer to applicable directives.
4. Replace missing or damaged cage nuts (WP 0067, Figure 1, Item 43).

END OF TASK

INSTALLATION

1. Apply a light coat of sealant (WP 0159, Item 1) to flanges of air deflector (WP 0067, Figure 1, Item 33).
2. Install air deflector (33) on control box side panel (30) with bolts (31) and nuts (32).
3. Install control box side panels (29 and 30) on generator set with bolts (16, 26, and 28) and nuts (17 and 27). Ensure center bolt (16) and nut (17) on left side panel secures clamp (18).
4. Install control box top panel (WP 0015, Installation).
5. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF CONTROL BOX ASSEMBLY, CONTROL BOX TRAY (BOTTOM): INSPECTION,
REMOVAL, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

CARC Paint

Protective Eyewear, Mask & Gloves

Fine Grit Abrasive Paper

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

References

TM 43-0139

WP 0019, Maintenance of Control Box Assembly,
Control Box AssemblyWP 0042 through WP 0050, WP 0052 through WP
0061

WP 0065 & WP 0066

WP 0067, Figure 1, Items: 34, 41, 42 & 43

WP 0068, Maintenance of Control Box Assembly,
Control Panel FrameWP 0069, Maintenance of Control Box Assembly,
Control Box Side Panels**Equipment Condition**

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

INSPECTION

1. Inspect control box bottom (WP 0067, Figure 1, Item 42) for dents, cracks, loose paint, and corrosion.
2. Inspect for missing or damaged cage nuts (43).

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. SHUT DOWN generator set and make sure it is free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box assembly (WP 0019, Removal).
4. Remove control panel frame (WP 0068, Removal).
5. Remove control box side panels (WP 0069, Removal).
6. Remove control box components (WP 0042 through WP 0050, WP 0052 through WP 0061, WP 0065 and WP 0066).
7. Contact Direct Support Maintenance to remove AC Voltage Regulator and control box harness.
8. Remove screws (WP 0067, Figure 1, Item 34) and bracket (35) from control box bottom (42).
9. Remove screws (36), nuts (37), and relay tracks (38) from control box bottom (42).
10. Remove screws (39), nuts (40), and latch plate (41) from control box bottom (42).

END OF TASK**REPAIR****WARNING**

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

1. Repair all dents and cracks and remove all loose paint.
2. Remove light corrosion with fine grit abrasive paper (WP 0159, Item 17).
3. Repaint surface in accordance with TM 43-0139. (F) Refer to applicable directives.
4. Replace missing or damaged cage nuts (WP 0067, Figure 1, Item 43).

END OF TASK**INSTALLATION**

1. Install latch plate (WP 0067, Figure 1, Item 41) on control box bottom (42) with screws (39) and nuts (40).
2. Install relay tracks (38) on control box bottom (42) with screws (36) and nuts (37).
3. Install bracket (35) on control box bottom (42) with screws (34).
4. Contact Direct Support Maintenance to install control box harness and AC Voltage Regulator.
5. Install control box components (WP 0042 through WP 0050, WP 0052 through WP 0061, WP 0065 and WP 0066).
6. Install control box side panels (WP 0069, Installation).
7. Install control panel frame (WP 0068, Installation).
8. Install control box assembly (WP 0019, Installation).
9. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF AIR INTAKE AND EXHAUST SYSTEM, MUFFLER AND EXHAUST PIPE: INSPECTION, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0016, Maintenance of Housing, Top Housing Section

Equipment ConditionGrounded, Off & Operational

INSPECTION

1. Shut down generator set.
2. Remove top housing panel and top housing frame (WP 0016, Removal) and open engine access doors.
3. Inspect muffler (Figure 1, Item 3) and pipe (4) for cracks, excessive corrosion, clogging, and other damage.
4. Replace damaged parts.
5. Install top housing frame and top housing panel (WP 0016, Installation) and close engine access doors.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

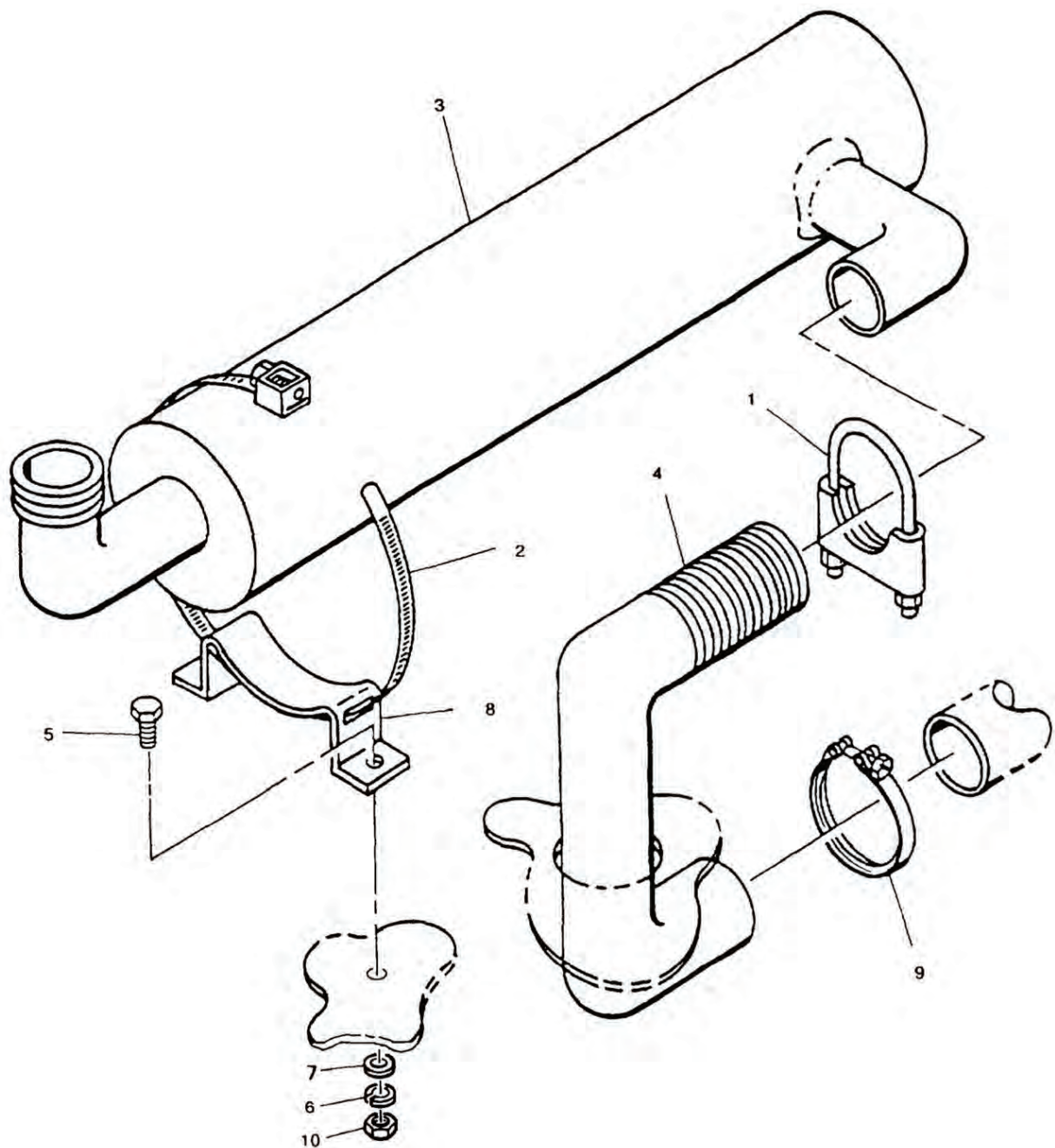


Figure 1. Muffler and Exhaust Pipe.

1. Shut down generator set.
2. Remove top housing panel and top housing frame (WP 0016, Removal) and open engine access doors.
3. Loosen nuts and remove clamp (Figure 1, Item 1).
4. Open bands (2) and separate muffler (3) and pipe (4). Remove muffler (3) from generator set.
5. Remove bolts (5), lockwashers (6), washers (7), nuts (10), and muffler supports (8). Discard lockwashers (6).
6. Loosen exhaust pipe clamp (9) at turbocharger outlet.
7. Remove left side air deflector and sufficient hardware securing top housing section panel (WP 0016, Removal) to allow removal of exhaust pipe (4) from generator set.

END OF TASK**INSTALLATION**

1. Install muffler supports (Figure 1, Item 8) with bolts (5), new lockwashers (6), washers (7) and nuts (10).
2. Install pipe (4) with clamp (9). Do not tighten clamp (9).
3. Install left side air deflector and hardware securing top housing section panel (WP 0016, Installation).
4. Couple muffler (3) to exhaust adapter (12) with clamp (1). Do not tighten clamp.
5. Secure muffler (3) to supports (8) with bands (2).
6. Tighten clamp (1).
7. Install top housing frame and top housing panel (WP 0016, Installation). Close engine access doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF AIR INTAKE AND EXHAUST SYSTEM, AIR RESTRICTION INDICATOR: INSPECTION,
REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**

WP 0073, Figure 1, Item 1

See "One Qualified Technician" Warning

Equipment ConditionGrounded, Off & Operational

INSPECTION

1. Shut down generator set.
2. Open left side engine access doors.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

3. Inspect air restriction indicator (WP 0073, Figure 1, Item 1) for cracks, stripped threads, or other obvious damage.
4. Close engine access doors.

END OF TASK**REMOVAL****WARNING**

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open left side engine access doors.
3. Unscrew air restriction indicator (WP 0073, Figure 1, Item 1) from air cleaner housing (7).

END OF TASK**INSTALLATION**

1. Install air restriction indicator (WP 0073, Figure 1, Item 1) on air cleaner housing (7). Hand tighten only. Close engine access doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF AIR INTAKE AND EXHAUST SYSTEM, AIR CLEANER ASSEMBLY: INSPECTION,
SERVICING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves

New Lockwashers

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

ReferencesWP 0019, Maintenance of Control Box Assembly,
Control Box AssemblyWP 0074, Maintenance of Air Intake & Exhaust
System, Air Cleaner Element

WP 0159, Item 9

Equipment ConditionGrounded, Off & Operational

INSPECTION

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box assembly (WP 0019, Removal).
4. Inspect air cleaner assembly and mounting bracket for cracks, dents, and other damage.
5. Install control box assembly (WP 0019, Installation).
6. Connect negative battery cable and close battery access door.

END OF TASK**SERVICING**

1. Remove air cleaner element (WP 0074, Removal).
2. Wipe inside of air cleaner housing with cleaning cloth (WP 0159, Item 9).
3. Install new air cleaner element (WP 0074, Installation).

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box assembly (WP 0019, Removal).
4. Loosen clamp (Figure 1, Item 2) and remove hose (15) from air cleaner housing (7).
5. Remove bolts (3), washers (4), lockwashers (5), nuts (6), mounting bracket (11), and air cleaner assembly from generator set. Discard lockwashers (5).
6. Remove bolts (8), nuts (10), lockwashers (9), and mounting bracket (11) from air cleaner assembly. Discard lockwashers (9).

END OF TASK**INSTALLATION**

1. Install mounting bracket (Figure 1, Item 11) on air cleaner assembly with bolts (8), new lockwashers (9), and nuts (10).
2. Install air cleaner assembly and mounting bracket (11) on generator set with bolts (3), washers (4), new lockwashers (5), and nuts (6).
3. Install hose (15) and clamp (2) on air cleaner housing (7). Tighten clamp (2).
4. Install control box assembly (WP 0019, Installation).
5. Connect negative battery cable and close battery access door.

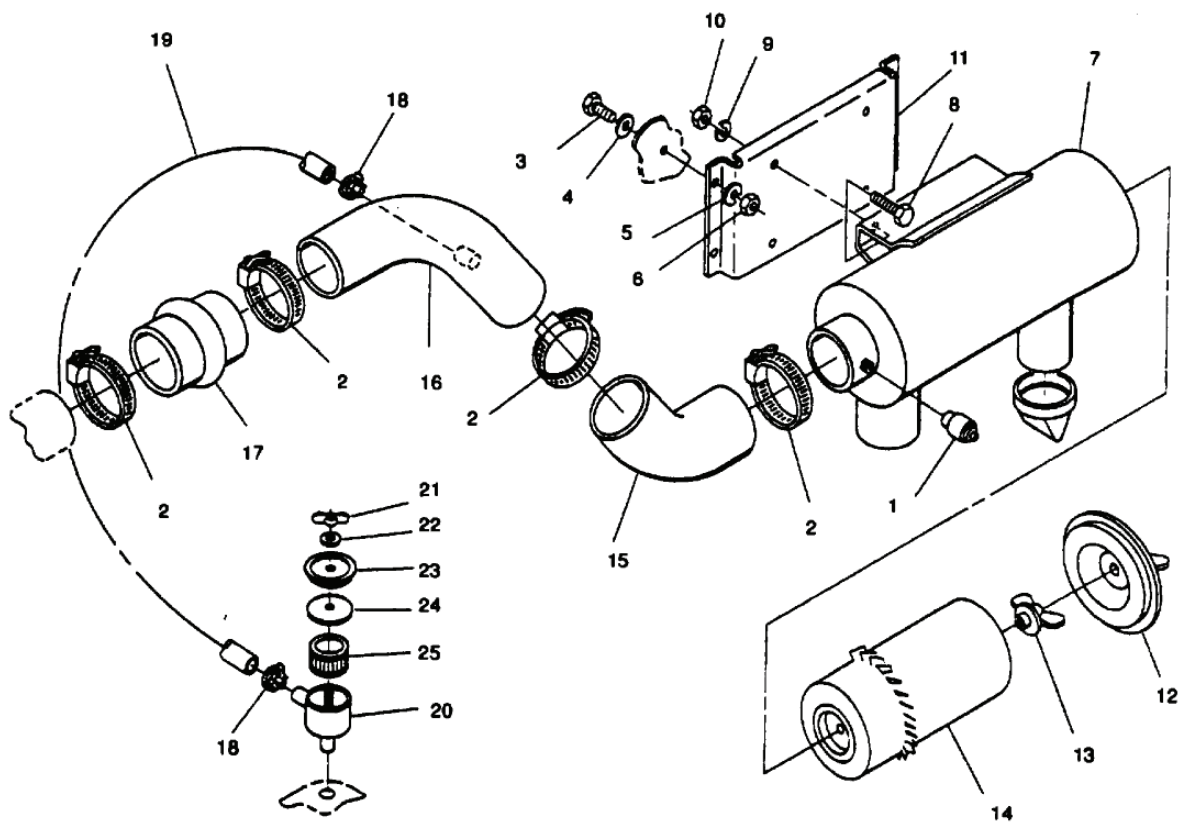


Figure 1. Air Cleaner Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF AIR INTAKE AND EXHAUST SYSTEM, AIR CLEANER ELEMENT: REMOVAL, INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves

Clean Cloth

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0073, Figure 1, Items: 12 & 14

WP 0159, Item 9

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.

2. Open air cleaner access door.
3. Loosen wing nut caged to cover (WP 0073, Figure 1, Item 12) and remove cover (12) from air cleaner housing (7).
4. Remove wing nut (13) and air cleaner element (14) from air cleaner housing (7).

END OF TASK**INSPECTION**

1. Shut down generator set.
2. Remove air cleaner element (Removal).
3. Inspect element (WP 0073, Figure 1, Item 14) for debris and damage. Replace, as necessary.
4. Wipe inside of air cleaner housing (7) with cleaning cloth (WP 0159, Item 9).
5. Install air cleaner element (Installation).

END OF TASK**INSTALLATION**

1. Install air cleaner element (WP 0073, Figure 1, Item 14) in air cleaner housing (7). Tighten wing nut (13).
2. Install cover (12) on air cleaner housing (7). Tighten caged wing nut.
3. Close air cleaner access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF AIR INTAKE AND EXHAUST SYSTEM, AIR CLEANER TUBING AND BREATHER:
INSPECTION, SERVICING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Goggles & Heat Resistant Gloves

Cleaning Cloth & Dry Cleaning Solvent

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0073, Figure 1, Items: 2, 18, 20 & 25

WP 0159, Items: 9 & 21

Equipment ConditionGrounded, Off & Operational

INSPECTION

1. Shut down generator set.
2. Open engine access doors.
3. Inspect all tubing for cracks, tears, and holes.
4. Inspect clamps for cracks.
5. Inspect breather (WP 0073, Figure 1, Item 20) and cover (23) for dents, cracks, and corrosion.
6. Remove wing nut (21), washer (22), cover (23), rubber seal (24), and element (25) from breather (20).
7. Inspect breather element (25) for clogs, tears, or other damage.
8. Inspect threaded parts for damaged or stripped threads.
9. Replace parts, as necessary.
10. Install element (25), rubber seal (24), cover (23), washer (22), and wing nut (21) on breather (20).
11. Close engine access doors.

END OF TASK**SERVICING**

1. Remove air cleaner tubing and breather (Removal).

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

2. Clean air cleaner tubing and breather housing with cleaning cloth (WP 0159, Item 9) dampened with dry cleaning solvent (WP 0159, Item 21).
3. Replace breather element (WP 0073, Figure 1, Item 25).
4. Install air cleaner tubing and breather (Installation).

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Top housing panels and exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply with this warning can cause severe burns and injury to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open engine access doors.
3. Loosen clamps (WP 0073, Figure 1, Items 2 and 18).
4. Remove hose (15) and clamps (2) from air cleaner housing (7) and tube (16).
5. Remove tube (16) and clamps (18 and 2) from breather hose (19) and hump hose (17).
6. Remove hump hose (17) and clamp (2) from turbocharger.
7. Remove breather hose (19) and clamp (18) from breather (20).
8. Remove breather (20) from valve cover.
9. Remove wing nut (21), washer (22), cover (23), rubber seal (24), and element (25) from breather (20).

END OF TASK**INSTALLATION**

1. Install element (WP 0073, Figure 1, Item 25), rubber seal (24), cover (23), washer (22), and wing nut (21) on breather (20).
2. Install breather (20) in valve cover.

3. Install breather hose (19) and clamp (18) on breather (20).
4. Install hump hose (17) and clamp (2) on turbocharger.
5. Install tube (16) and clamp (2) on hump hose (17).
6. Install breather hose (19) and clamp (18) on tube (16).
7. Install hose (15) and clamps (2) on tube (16) and air cleaner housing (7).
8. Tighten clamps (2 and 18).
9. Close engine access doors.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF COOLANT SYSTEM, COOLANT SYSTEM: TESTING, SERVICING**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**

TM 750-254

See "One Qualified Technician" Warning

Equipment ConditionGrounded, Off & Operational

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

TESTING

1. Shut down generator set.
2. Slowly remove radiator cap (Figure 1, Item 1).
3. Install coolant system pressure tester (ST255) in radiator neck and open engine access doors.
4. Pump pressure tester until 8 psi is indicated and check coolant system for leaks.
5. Pump pressure tester until 7 psi (± 1) is indicated and ensure radiator cap releases.
6. Release pressure from pressure tester and remove from radiator neck.
7. Install radiator cap (1). Close engine access doors.

END OF TASK**SERVICING**

1. Shut down generator set.
2. Open left side engine access door.
3. Flush or drain coolant system in accordance with TM 750-254.
4. Close left side engine access door.

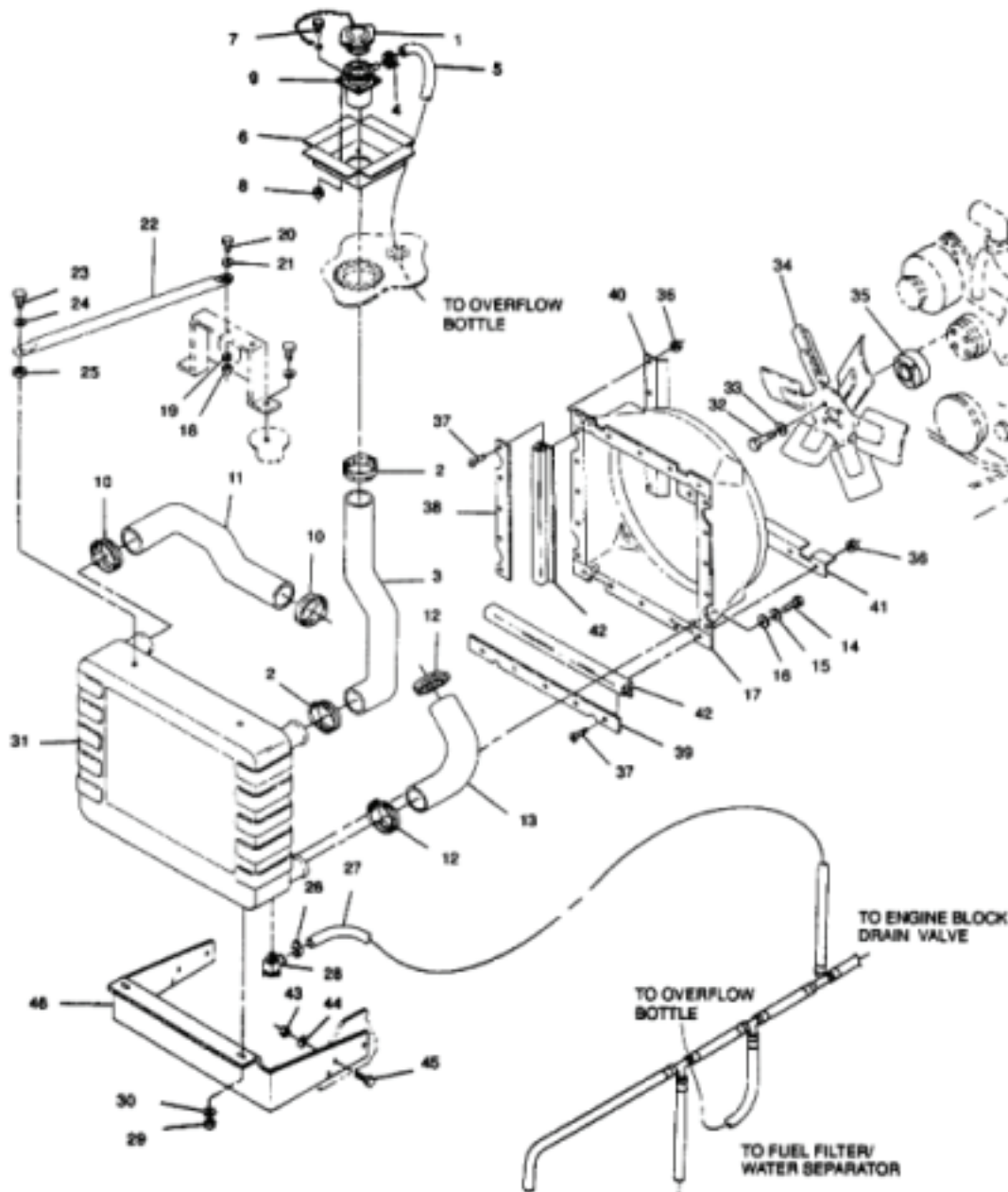


Figure 1. Coolant System.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF COOLANT SYSTEM, RADIATOR FILLER HOSE AND PANEL ASSEMBLY: REMOVAL, INSPECTION AND CLEANING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsSuitable Container for Coolant/Antifreeze Drainage
Protective Eyewear**Personnel Required**Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

ReferencesWP 0006, Service Upon Receipt
WP 0016, Maintenance of Housing, Top Housing
Section
WP 0076, Figure 1, Item 1, 3 & 9**Equipment Condition**Grounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open engine access doors.
3. Remove generator housing top panel (WP 0016, Removal).
4. Slowly remove radiator cap (WP 0076, Figure 1, Item 1).
5. Open radiator drain valve (28) and drain coolant/antifreeze into suitable container to a level below radiator

filler hose (3) connection at radiator (31).

6. Loosen clamps (2) and remove radiator filler hose (3) and clamps (2).
7. Loosen clamp (4) and disconnect overflow hose (5) from radiator filler neck (9).
8. Remove radiator fill panel (6) and filler neck (9) from generator set.
9. Remove bolts (7), nuts (8), cap (1), and radiator filler neck (9) from radiator fill panel (6).

END OF TASK

INSPECTION AND CLEANING

1. Shut down generator set.
2. Remove radiator filler hose and panel (Removal).
3. Inspect radiator filler hose (WP 0076, Figure 1, Item 3) for cracks, holes, and dry rot.
4. Inspect filler panel (6), filler neck (9), and cap (1) for cracks, excessive corrosion, and other damage.
5. Clean light corrosion from filler hose attaching points with fine grit abrasive paper (WP 0159, Item 17).
6. Replace damaged parts.
7. Install radiator filler hose and panel (Installation).

END OF TASK

INSTALLATION

WARNING

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate. Failure to comply with this warning can cause injury to personnel.

1. Install radiator filler neck (WP 0076, Figure 1, Item 9) and cap (1) on radiator fill panel (6) with bolts (7) and nuts (8).
2. Position radiator fill panel (6) and filler neck (9) in generator set and attach overflow hose (5) with clamp (4).
3. Install radiator filler hose (3) on filler neck (9) and radiator (31) with clamps (2).
4. Install generator housing top panel (WP 0016, Installation).
5. Close radiator drain valve (28) and add coolant/antifreeze to proper level (WP 0006, Radiator).
6. Solder tab (Figure 1) and hook chain to tab if replacing radiator cap (WP 0076, Figure 1, Item 1).
7. Install radiator cap (1).
8. Start generator set and allow unit to reach operating temperature and check for leaks.
9. Add coolant/antifreeze to overflow bottle, as required. Close engine access doors.

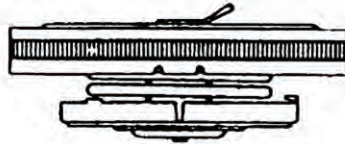
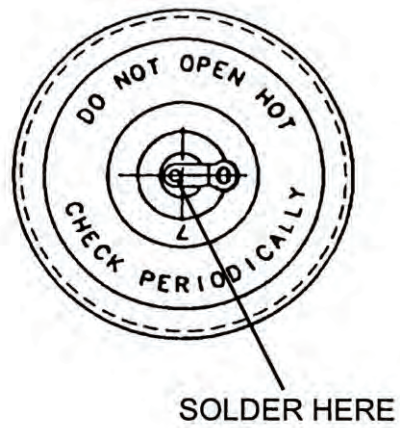


Figure 1. Radiator Cap.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF COOLANT SYSTEM, FAN GUARDS: INSPECTION, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves

New Lockwashers

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**Equipment Condition**

Grounded, Off & Operational

See "One Qualified Technician" Warning

INSPECTION

1. Shut down generator set.
2. Open both side engine access doors.
3. Inspect fan guards, brackets, and attaching hardware for damage, corrosion, and loose or missing hardware.
4. Replace all damaged and missing components and tighten all loose attaching hardware. Close both side engine access doors.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fan has sharp blades. Use caution and wear gloves when removing or installing belts. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open both side engine access doors.
3. Remove bolts (Figure 1, Item 1), washers (2), nuts (3), and lockwashers (4) securing fans guards (5 and 6). Discard lockwashers (4).
4. Remove bolts (7), lockwashers (8), washers (9), and brackets (10 and 11) from radiator shroud. Discard

lockwashers (8).

5. Remove bolt (12), lockwasher (13), and bracket (14) from engine head. Discard lockwasher (13).
6. Remove nut (15), lockwasher (16), washer (17), and bracket (18) from injection pump mount. Discard lockwasher (16).
7. Remove nut (19), lockwasher (20), bolt (21), and bracket (22) from alternator mount. Discard lockwasher (20).

END OF TASK

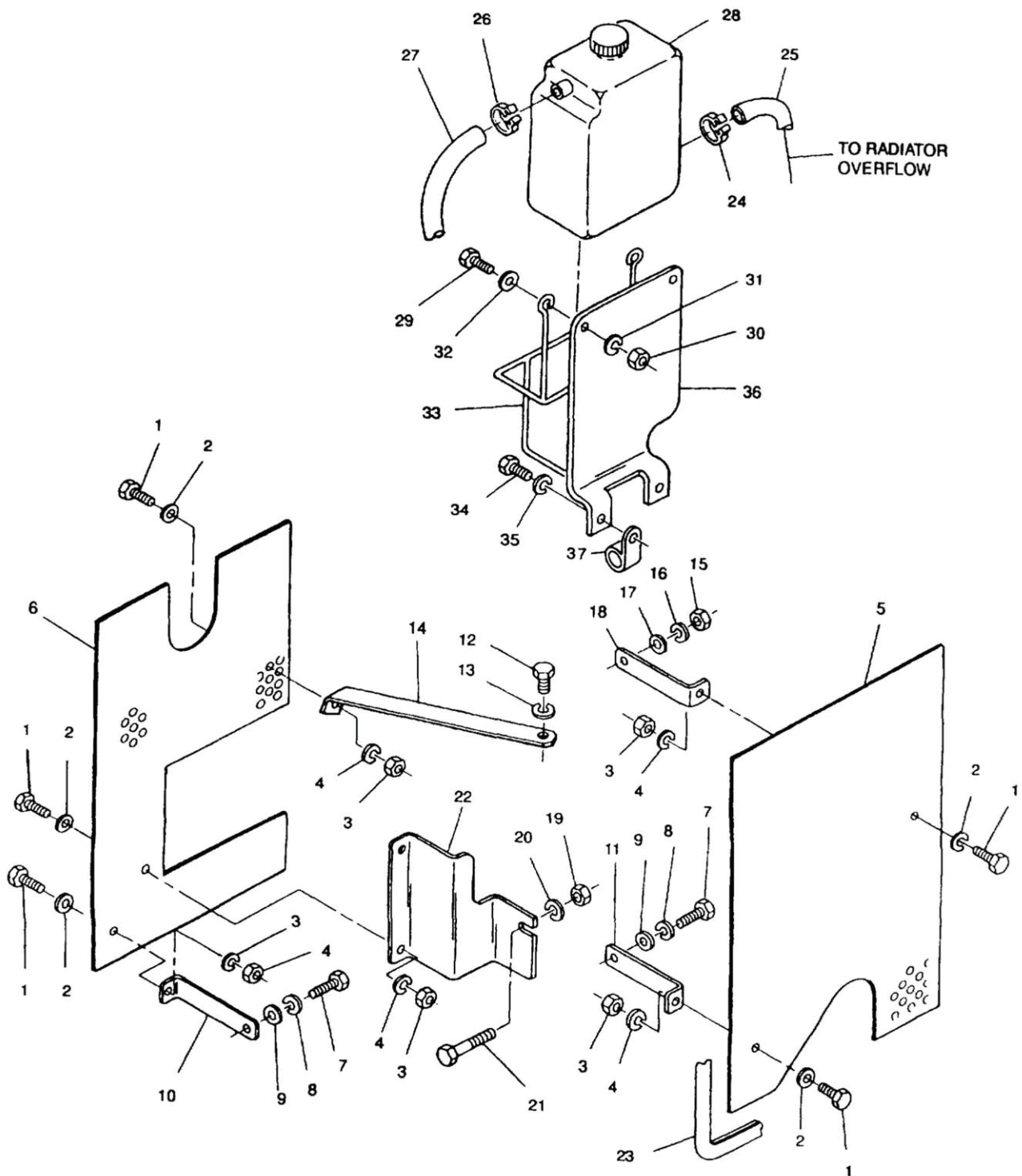


Figure 1. Fan Guards and Coolant Recovery System.

INSTALLATION

1. Install bolts (Figure 1, Item 7), new lockwashers (8), and washers (9) securing brackets (10 and 11) to radiator shroud.

2. Install bracket (14) to engine head with bolt (12) and new lockwasher (13).
3. Install bracket (18) to injection pump mount with nut (15), new lockwasher (16), and washer (17).
4. Install bracket (22) to alternator mount with bolt (21), new lockwasher (20), and nut (19).

NOTE

If damaged or if replacing fan guards, install protective edging. Cut to fit.

5. Install bolts (1), washers (2), nuts (3), and new lockwashers (4) securing fan guards (5 and 6).
6. Close both side engine access doors, connect negative battery cable, and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF COOLANT SYSTEM, UPPER COOLANT HOSE: REMOVAL, INSPECTION AND
CLEANING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Fine Grit Abrasive Paper

Coolant/Antifreeze

Gloves, Goggles & Protective Clothing

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0006, Service Upon Receipt

WP 0076, Figure 1, Item 1, 11

WP 0078, Maintenance of Coolant System, Fan
Guards

WP 0159, Item 17

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open engine access doors.
3. Slowly remove radiator cap (WP 0076, Figure 1, Item 1).

4. Remove fan guards (WP 0078, Removal).
5. Open radiator drain valve (28) and drain coolant/antifreeze into suitable container.
6. Loosen clamps (10) and remove upper coolant hose (11) and clamps (10).

END OF TASK**INSPECTION AND CLEANING**

1. Shut down generator set.
2. Remove upper coolant hose (Removal).
3. Inspect upper coolant hose (WP 0076, Figure 1, Item 11) for cracks, holes, and dry rot.
4. Clean light corrosion from upper coolant hose attaching points with fine grit abrasive paper (WP 0159, Item 17).
5. Install upper coolant hose (Installation).

END OF TASK**INSTALLATION**

1. Install upper coolant hose (WP 0076, Figure 1, Item 11) on thermostat housing opening and radiator (32) with clamps (10).
2. Close radiator drain valve (34) and add coolant/antifreeze to proper level (WP 0006, Radiator).
3. Install fan guards (WP 0078, Installation).
4. Install radiator cap (1).
5. Connect negative battery cable and close battery access door.
6. Start generator set and allow unit to reach operating temperature and check for leaks.
7. Add coolant/antifreeze to overflow bottle, as required. Close engine access doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF COOLANT SYSTEM, LOWER COOLANT HOSE: REMOVAL, INSPECTION AND CLEANING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Fine Grit Abrasive Paper

Gloves, Goggles & Protective Clothing

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0076, Figure 1, Items: 1, & 13

WP 0078, Maintenance of Coolant System, Fan Guards

WP 0159, Item 17

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open engine access doors.
3. Slowly remove radiator cap (WP 0076, Figure 1, Item 1).
4. Remove fan guards (WP 0078, Removal).
5. Open radiator drain valve (28) and drain coolant into suitable container.

6. Loosen clamps (12) and remove lower coolant hose (13).

END OF TASK**INSPECTION AND CLEANING**

1. Shut down generator set.
2. Remove lower coolant hose (Removal).
3. Inspect lower coolant hose (WP 0076, Figure 1, Item 13) for cracks, holes, and dry rot.
4. Clean lower coolant hose attaching points with fine grit abrasive paper (WP 0159, Item 17).
5. Install lower coolant hose (Installation).

END OF TASK**INSTALLATION**

1. Install lower coolant hose (WP 0076, Figure 1, Item 13) on radiator outlet opening and water pump opening with clamps (12).
2. Close radiator drain valve (28) and add coolant/antifreeze to proper level (WP 0006, Radiator).
3. Install fan guards (WP 0078, Installation).
4. Install radiator cap (1).
5. Connect negative battery cable and close battery access door.
6. Start generator set and allow unit to reach operating temperature; check for leaks.
7. Add coolant/antifreeze to overflow bottle, as required. Close engine access doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF COOLANT SYSTEM, COOLANT OVERFLOW AND DRAIN HOSES: REMOVAL, INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves, Goggles, & Protective Clothing

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

References

WP 0076, Maintenance of Coolant System, Coolant System

See "One Qualified Technician" Warning

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open engine access doors.
3. Locate overflow or drain hose to be removed (WP 0076, Figure 1).
4. Disconnect hose at both ends and remove from generator set.

END OF TASK

INSPECTION

1. Shut down generator set.
2. Open engine access doors.
3. Inspect hoses for cracks, holes, and dry rot. Close engine access doors.

END OF TASK**INSTALLATION**

1. Install overflow or drain hose in generator set as removed.
2. Close engine access doors, connect negative battery cable, and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF COOLANT SYSTEM, RADIATOR: REMOVAL, INSPECTION AND CLEANING, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers
Protective Eyewear, Mask & Gloves
Dry Cleaning Solvent

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

TM 750-254
WP 0006, Service Upon Receipt
WP 0016, Figure 1, Item 1
WP 0076, Figure 1, Item: 1 & 28
WP 0077, Maintenance of Coolant System, Radiator
Filler Hose & Panel Assembly
WP 0078, Maintenance of Coolant System, Fan
Guards
WP 0079, Maintenance of Coolant System, Upper
Coolant Hose
WP 0080, Maintenance of Coolant System, Lower
Coolant Hose
WP 0159, Item 21

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open engine access doors.
3. Remove generator set top housing section (WP 0016, Removal).
4. Slowly remove radiator cap (WP 0076, Figure 1, Item 1).
5. Remove fan guards (WP 0078, Removal).
6. Open radiator drain valve (28) and drain coolant/antifreeze into suitable container.
7. Remove radiator filler hose and panel assembly (WP 0077, Removal).
8. Remove upper coolant hose (WP 0079, Removal).
9. Remove lower coolant hose (WP 0080, Removal).
10. Remove bolts (14), lockwashers (15), and washers (16); allow shroud (17) to rest on fan (34). Discard lockwashers (15).
11. Remove nuts (18), lockwashers (19), bolts (20), and washers (21) securing support rods (22) to bracket on engine. Discard lockwashers (19).
12. Remove bolts (23), lockwashers (24), support rods (22), and spacers (25) from radiator (31). Discard lockwashers (24).
13. Loosen clamp (26) and disconnect radiator drain hose (27) from radiator drain valve (28).
14. Remove nuts (29) and lockwashers (30) from radiator mounting points. Discard lockwashers (30).
15. Lift radiator (31) up and out of generator set housing.
16. Remove radiator drain valve (28) from radiator (31).

END OF TASK**INSPECTION AND CLEANING**

1. Shut down generator set.
2. Remove radiator (Removal).
3. Inspect radiator for excessive corrosion, cracks, or bent cooling fins.
4. Check inside of radiator for corrosion and scale.

WARNING

Eye protection is required when working with compressed air. Compressed air can propel particles at high velocity and injure eyes. Do not exceed 15 psi pressure when using compressed air. Failure to comply with this warning can cause injury to personnel.

WARNING

High pressure steam can blow particles or chemicals into eyes, can cause severe burns, and creates hazardous noise levels. Wear protective eye, skin, and hearing protection when using high pressure steam. Failure to comply with this warning can cause injury to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

5. Clean dirt particles from radiator core air passages using filtered, compressed air.
6. Clean exterior surface of radiator with dry cleaning solvent (WP 0159, Item 21).
7. Install radiator (Installation).

END OF TASK**REPAIR****WARNING**

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate. Failure to comply with this warning can cause injury to personnel.

1. Repair radiator by straightening bent radiator fins and soldering minor leaks.
2. Repair radiator in accordance with TM 750-254.

END OF TASK**INSTALLATION**

1. Install drain valve (WP 0076, Figure 1, Item 28) in radiator (31).
2. Position radiator (31) on radiator mount and install nuts (29) and new lockwashers (30).
3. Install shroud (17) on radiator (31) with bolts (14), new lockwashers (15), and washers (16).
4. Connect radiator drain hose (27) on radiator drain valve (28) with clamp (26).
5. Connect support rods (22) to radiator (31) with spacers (25), new lockwashers (24) and bolts (23).
6. Attach support rods (22) to bracket on engine with bolts (20), washers (21), new lockwashers (19), and nuts (18).
7. Install lower coolant hose (WP 0080, Installation).
8. Install upper coolant hose (WP 0079, Installation).
9. Install radiator filler hose and panel assembly (WP 0077, Installation).
10. Install fan guards (WP 0078, Installation).
11. Install generator set top housing section (WP 0016, Installation).
12. Ensure radiator drain valve (28) is closed; add coolant/antifreeze to proper level (WP 0006, Radiator).
13. Install radiator cap (1).
14. Start generator set and allow unit to reach operating temperature; check for leakage.
15. Add coolant to overflow bottle, as required. Close engine access doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF COOLANT SYSTEM, GENERATOR SET COOLING FAN: REMOVAL, INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Protective Eyewear, Mask & Gloves

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0076, Figure 1, Items: 14, 34 & 42

WP 0078, Maintenance of Coolant System; Fan Guards

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open engine access doors.
3. Remove fan guards (WP 0078, Removal).
4. Remove bolts (WP 0076, Figure 1, Item 14), washers (16), and lockwashers (15); allow shroud (17) to rest on fan (34). Discard lockwashers (15).
5. Remove bolts (32), lockwashers (33), fan (34), spacer (35) and shroud (17) from generator set. Discard

lockwashers (33).

6. Remove nuts (36), screws (37), stiffeners (38 and 39), supports (40 and 41), and seals (42) from each side of shroud (17).

END OF TASK

INSPECTION

WARNING

Eye protection is required when working with compressed air. Compressed air can propel particles at high velocity and injure eyes. Do not exceed 15 psi pressure when using compressed air. Failure to comply with this warning can cause injury to personnel.

WARNING

High pressure steam can blow particles or chemicals into eyes, can cause severe burns, and creates hazardous noise levels. Wear protective eye, skin, and hearing protection when using high pressure steam. Failure to comply with this warning can cause injury to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

1. Shut down generator set.
2. Remove cooling fan, Removal.
3. Inspect fan (WP 0076, Figure 1, Item 34) and blades for cracks, bends, loose rivets, or other damage.
4. Inspect seals (42), supports (40 and 41), and stiffeners (38 and 39) for damage.
5. Replace damaged parts.
6. Install cooling fan (Installation).

END OF TASK

INSTALLATION

1. Install seals (WP 0076, Figure 1, Item 42), supports (40 and 41), and stiffeners (38 and 39) on each side of shroud (17) with screws (37) and nuts (36).
2. Position fan (34), spacer (35), and shroud (17) in generator set and secure with bolts (32) and new lockwashers (33). Torque bolts (32) to 24 ft•lbs (32.5 N•m).
3. Install fan shroud (17) with bolts (14), new lockwashers (15), and washers (16).
4. Install fan guards (WP 0078, Installation).
5. Close engine access doors, connect negative battery cable, and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF COOLANT SYSTEM, FAN BELT: INSPECTION, TESTING AND ADJUSTMENT,
REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

ReferencesWP 0076, Figure 1, Item 34
WP 0078, Maintenance of Coolant System, Fan
Guards**Equipment Condition**Grounded, Off & Operational

INSPECTION**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fan has sharp blades. Use caution and wear gloves when removing or installing belts. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open engine access doors.
3. Inspect fan belt (Figure 1, Item 6) for frays, cracks, oil soaking, and other damage.
4. Replace fan belt that shows any of above or cannot be adjusted for proper tension.
5. Close engine access doors, connect negative battery cable, and close battery access door.

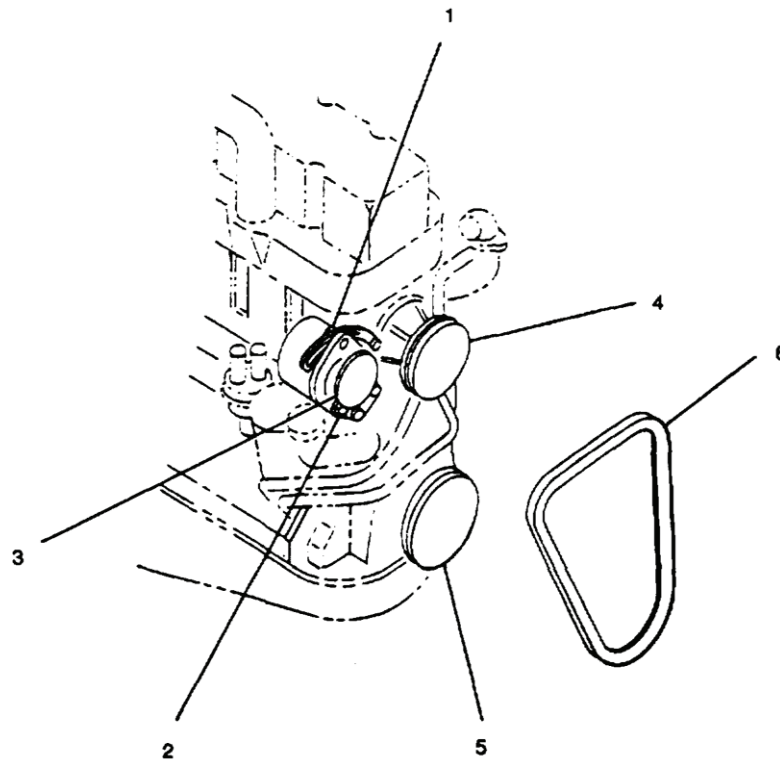


Figure 1. Fan Belt.

END OF TASK

TESTING AND ADJUSTMENT

NOTE

Run engine for 5 minutes if belt is cold. If belt is hot, let cool for 10 to 15 minutes.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open engine access doors.
3. Check fan belt (Figure 1, Item 6) for 1/2 inch (1.27 cm) deflection midway between alternator pulley (3) and crankshaft pulley (5).
4. If fan belt needs adjustment, loosen alternator mounting bolt (1) and nut (2).

CAUTION

Do not pry against alternator rear frame. Damage to alternator or mounting brackets could occur.

5. Apply outward pressure to alternator front frame until belt tension is correct.
6. Tighten alternator mounting bolt (1) and nut (2).
7. Close engine access doors, connect negative battery cable, and close battery access door.

END OF TASK

REMOVAL

WARNING

Fan has sharp blades. Use caution and wear gloves when removing or installing belts. Failure to comply with this warning can cause injury to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open engine access doors.
3. Remove fan guards (WP 0078, Removal).
4. Loosen alternator mounting bolt (Figure 1, Item 1) and nut (2).
5. Pivot alternator to relieve tension on fan belt (6) and remove belt (6) from alternator pulley (3), fan pulley (4), and crankshaft pulley (5).
6. Slip belt (6) over fan (WP 0076, Figure 1, Item 34) and remove belt from generator set.

END OF TASK**INSTALLATION****WARNING**

Fan has sharp blades. Use caution and wear gloves when removing or installing belts. Failure to comply with this warning can cause injury to personnel.

1. Slip fan belt (Figure 1, Item 6) over fan (WP 0076, Figure 1, Item 34).
2. Install belt (Figure 1, Item 6) onto alternator pulley (3), fan pulley (4), and crankshaft pulley (5).
3. Adjust tension on fan belt (6) (Testing and Adjustment).
4. Install fan guards (WP 0078, Installation).
5. Close engine access doors.
6. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF COOLANT SYSTEM, COOLANT RECOVERY SYSTEM: INSPECTION, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

New Lockwashers

Suitable Containers for Coolant Drainage

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0006, Table 1

WP 0078, Figure 1, Items: 24 & 36

Equipment Conditionfoo eqpconds condition foo eqpconds reason

INSPECTION**WARNING**

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

In extreme cold weather, skin can stick to metal. Avoid contacting metal items with bare skin in extreme cold weather. Failure to comply with this warning can cause injury to personnel.

1. Shut down generator set.
2. Open right side engine access doors.
3. Inspect coolant recovery system components for cracks, holes, or other damage.
4. Close right side engine access doors.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open right side engine access doors.
3. Loosen clamp (WP 0078, Figure 1, Item 24) and disconnect hose (25) from overflow bottle (28) and drain coolant into suitable container.
4. Loosen clamp (26) and disconnect hose (27) from overflow bottle (28).
5. Remove overflow bottle (28) from wire holder (33).
6. Remove bolts (29), nuts (30), lockwashers (31), washers (32), and wire holder (33) from mount (36). Discard lockwashers (31).
7. Remove bolts (34), lockwashers (35), clamp (37), and mount (36) from engine. Discard lockwashers (35).

END OF TASK**INSTALLATION****WARNING**

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

1. Install mount (WP 0078, Figure 1, Item 36) and clamp (37) on engine with bolts (34) and new lockwashers (35).
2. Install wire holder (33) on mount (36) with bolts (29), washers (32), new lockwashers (31), and nuts (30).
3. Install coolant overflow bottle (28) in holder (33) and connect hoses (25 and 27) with clamps (24 and 26).
4. Fill overflow bottle (28) with coolant to the COLD level. Refer to WP 0006, Table 1 for proper coolant.
5. Start generator set, check for leaks, and run until normal operating temperature is reached.
6. Add coolant to HOT level of overflow bottle (28) and close right side engine access doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF FUEL SYSTEM, LOW PRESSURE FUEL LINES AND FITTINGS: REMOVAL,
INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**

WP 0087, Figure 1

See "One Qualified Technician" Warning

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set; open battery access door and disconnect negative battery cable.
2. Identify fuel line or fitting that is damaged or leaking and must be removed (WP 0087, Figure 1).
3. Disconnect fuel line at both ends and remove any clamps.
4. Remove fuel line or fitting from generator set.
5. Cover or cap all openings.

END OF TASK**INSTALLATION**

1. Remove any caps and position fuel line or fitting in generator set.
2. Install any clamps as removed and connect fuel line at both ends (WP 0087, Figure 1).
3. Connect negative battery cable and close battery access door.
4. Start generator set and check for fuel leaks.
5. Shut down generator set. Close all access doors.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF FUEL SYSTEM, AUXILIARY FUEL PUMP: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsGloves, Protective Clothing & Eyewear
New Lockwashers**Personnel Required**Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**Equipment Condition**

Grounded, Off & Operational

See "One Qualified Technician" Warning

INSPECTION

1. Shut down generator set.
2. Inspect auxiliary fuel pump (Figure 1, Item 8) for leaks, cracks, missing hardware, loose connections, and other damage.

END OF TASK**TESTING**

1. Shut down generator set.
2. Connect generator set to auxiliary fuel supply (ensure auxiliary fuel supply is no more than 6 feet (1.83m) below generator set).
3. Open left side engine access doors.
4. Disconnect auxiliary fuel pump outlet line (Figure 1, Item 13) at fuel tank fitting and place disconnected end in measuring container.
5. Move generator set MASTER SWITCH to PRIME & RUN AUX FUEL position for 1 minute; return MASTER SWITCH to OFF position.
6. Measuring container should have collected at least 36 ounces (1.06 liters) of fuel.
7. Replace auxiliary fuel pump if delivery amount is other than above.
8. Connect auxiliary fuel pump outlet line (13) at fuel tank fitting.
9. Disconnect generator set from auxiliary fuel supply. Close left side engine access doors.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Tag and disconnect auxiliary fuel pump (Figure 1, Item 8) electrical connector.
4. Loosen clamps (1A). Disconnect filter (10) and remove adapter fitting (1B) from filler neck panel fitting (12). Remove adapter fitting (1B) from fuel inlet hose (1). Remove filter (10) from auxiliary fuel pump (8). Cap fuel inlet hose (1).
5. Disconnect auxiliary fuel outlet line (2) from auxiliary fuel pump (8).
6. Remove nuts (3), lockwashers (4), bolts (5), washers (6), cap and chain assembly (7), and auxiliary fuel pump (8). Discard lockwashers (4).
7. If necessary, remove fitting (9) from auxiliary fuel pump (8). Some auxiliary fuel pumps are supplied with integral 90-degree outlet port fitting.
8. If necessary, remove nut (11) and fitting (12) from fuel filler panel.

END OF TASK**INSTALLATION**

1. If removed, install fitting (Figure 1, Item 12) and nut (11) in fuel filler panel.
2. If necessary, install fitting (9) on auxiliary fuel pump (8).
3. Install auxiliary fuel pump (8) and cap and chain assembly (7) in generator set with bolts (5), washers (6), new lockwashers (4), and nuts (3).
4. Connect auxiliary fuel outlet line (2) to auxiliary fuel pump (8).
5. Remove caps from fuel inlet hose (1). Install filter (10) on auxiliary fuel pump (8). Install adapter fitting (1B) on

fuel inlet hose (1) and connect adapter fitting (1B) to filler neck panel fitting (12). Connect other end of fuel inlet hose (1) to filter (10). Tighten clamps (1A).

6. Connect auxiliary fuel pump (8) electrical connector. Remove tag.
7. Connect negative battery cable and close battery access door.
8. Move generator set MASTER SWITCH to PRIME & RUN AUX FUEL position and check for fuel leaks.
9. Return MASTER SWITCH to OFF position. Close left side engine access doors.

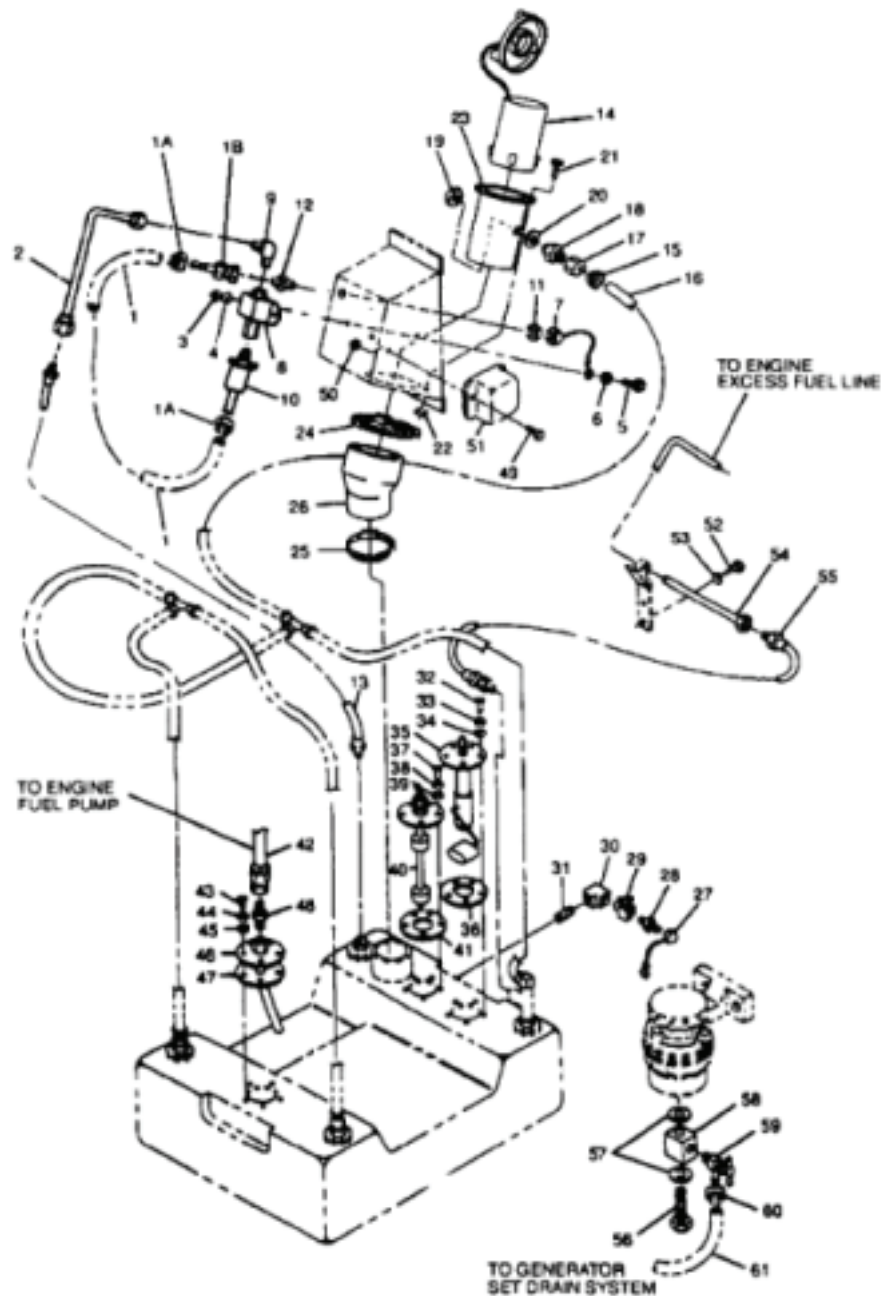


Figure 1. Fuel Tank Filler Neck and Low Pressure Fuel System.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF FUEL SYSTEM, FUEL TANK FILLER NECK: REMOVAL, INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves, Protective Clothing & Eyewear

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**WP 0006, Table 2
WP 0087, Figure 1, Item: 26 & 27

See "One Qualified Technician" Warning

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove cap (WP 0087, Figure 1, Item 27), open fuel drain valve (29), and drain fuel into suitable container.
4. Open left side engine access doors.
5. Remove filler neck cap and tube assembly (14).
6. Loosen clamp (15) and disconnect hose (16) from adapter (17).
7. Remove adapter (17) from fitting (18).
8. Remove nut (19), washer (20), and fitting (18) from side of filler neck (23).
9. Remove bolts (21) and nuts (22) securing filler neck (23) to generator set housing.
10. Remove clamps (24 and 25), hose (26), and filler neck (23) from fuel tank opening. Cover fuel tank opening.

END OF TASK

INSPECTION

1. Shut down generator set.
2. Remove fuel tank filler neck (Removal).
3. Inspect hose (WP 0087, Figure 1, Item 26) for cracking, wear, or other damage.
4. Inspect filler neck (23) for corrosion, cracking, or other damage.
5. Inspect filler neck cap and tube assembly (14) for damage.
6. Install fuel tank filler neck (Installation).

END OF TASK

INSTALLATION

1. Position hose (WP 0087, Figure 1, Item 26), clamps (24 and 25), and filler neck (23) on fuel tank.
2. Install bolts (21) and nuts (22) securing filler neck (23) to generator set housing.
3. Tighten clamps (24 and 25).
4. Install fitting (18), washer (20), and nut (19) inside of filler neck (23).
5. Install adapter (17) on fitting (18) and connect hose (16) to adapter (17) with clamp (15).
6. Install filler neck cap and tube assembly (14).
7. Close fuel drain valve (29), install cap (27), and service fuel tank. Refer to WP 0006, Table 2 for proper fuel.
8. Connect negative battery cable. Close battery access door and left side engine access doors.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS**
MAINTENANCE OF FUEL SYSTEM, FUEL DRAIN VALVE: REMOVAL, INSTALLATION

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**WP 0006, Table 2
WP 0087, Figure 1, Items: 27 & 31

See "One Qualified Technician" Warning

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Remove cap and chain assembly (WP 0087, Figure 1, Item 27) from adapter (28).
4. Open drain valve (29) and drain fuel into suitable container.
5. Remove drain valve (29) and adapter (28) from elbow (30).
6. Remove adapter (28) from drain valve (29).
7. If necessary, remove elbow (30) and adapter (31) from fuel tank fitting.

END OF TASK**INSTALLATION**

1. If removed, Install adapter (WP 0087, Figure 1, Item 31) and elbow (30) in fuel tank fitting.
2. Install fuel drain valve (29) into elbow (30).
3. Install adapter (28) into drain valve (29), and cap and chain assembly (27) on adapter (28).
4. Ensure fuel drain valve (29) is closed and service fuel tank. Refer to WP 0006, Table 2 for proper fuel.
5. Check fuel drain valve and fittings for leakage.
6. Close left side engine access doors, connect negative battery cable, and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF FUEL SYSTEM, FUEL LEVEL SENDER: INSPECTION, REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

New Lockwashers

Fuel Level Sender (If indications do not comply with testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0087, Figure 1, Items: 35 & 36

WP 0159, Item 18

Equipment ConditionGrounded, Off & Operational

INSPECTION

1. Shut down generator set.
2. Open left side engine access doors.
3. Inspect fuel level sender (WP 0087, Figure 1, Item 35) for loose connections/mounting and other damage.
4. Close left side engine access doors.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Disconnect fuel level sender (WP 0087, Figure 1, Item 35) electrical lead.

NOTE

Mark position of float when removing sender. Float must be in same position when installing to ensure clearance with fuel tank.

4. Remove screws (32), lockwashers (33), flat washers (34), fuel level sender (35), and gasket (36) from generator set fuel tank. Discard lockwashers (33) and gasket (36).
5. Cover opening in fuel tank.

END OF TASK**TESTING**

1. Shut down generator set.
2. Remove fuel level sender (Removal).
3. Position fuel level sender in vertical position, similar to position as installed in fuel tank.
4. Set multimeter for ohms and connect positive lead to fuel level sender terminal and negative lead to sender ground.
5. With fuel level sender arm resting freely in what would be an empty position, multimeter should indicate between 216 and 264 ohms.
6. Move fuel level sender arm up to what would be a full position and multimeter should indicate between 29.7 and 36.3 ohms.
7. Replace fuel level sender if indications are not as above.
8. Install fuel level sender (Installation).

END OF TASK

INSTALLATION

1. Remove cover in fuel tank opening.
2. Thoroughly clean, make flat and smooth mating surfaces for new gasket (WP 0087, Figure 1, Item 36). Ensure no foreign material enters fuel tank. Apply sealant (WP 0159, Item 18) to both sides of new gasket (36).
3. Insert fuel level sender (35) and gasket (36) into fuel tank. Ensure float is in same position as removed.
4. Install screws (32), new lockwashers (33), and flat washers (34).
5. Connect electrical lead and remove tag. Close left side engine access doors.
6. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF FUEL SYSTEM, LOW FUEL LEVEL/AUXILIARY FUEL PUMP FLOAT SWITCH:
INSPECTION, REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

New Lockwashers

Sealant

New Gasket

Low Fuel Level/Auxiliary Fuel Pump Float Switch (If indications do not comply with testing)

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

ReferencesWP 0087, Figure 1, Items: 40, & 41
WP 0159, Item 18**Equipment Condition**Grounded, Off & Operational

INSPECTION

1. Shut down generator set.
2. Open left side engine access doors.
3. Inspect low fuel level/auxiliary fuel pump float switch (WP 0087, Figure 1, Item 40) for loose connections/mounting and other damage.
4. Close left side engine access doors.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Tag and disconnect low fuel level/auxiliary fuel pump float switch (WP 0087, Figure 1, Item 40) electrical connector.
4. Remove screws (37), lockwashers (38), flat washers (39), float switch (40), and gasket (41) from fuel tank. Discard lockwashers (38) and gasket (41).
5. Cover opening in fuel tank.

END OF TASK**TESTING**

1. Shut down generator set.
2. Remove low fuel level/auxiliary fuel pump float switch (Removal).
3. Position float switch in vertical position, similar to position as installed in fuel tank.
4. For the top float, set multimeter for ohms and connect positive lead to pin 2 and negative lead to pin 1 of float switch electrical connector.
5. With upper or lower float moving toward the down position, multimeter should indicate continuity 1/4-inch before float reaches the down position.
6. Move upper float to full up position. Multimeter should indicate open circuit.
7. Disconnect multimeter leads from pins 1 and 2. To check lower float, connect positive lead to pin 3 and negative lead to pin 4 of electrical connector.
8. Repeat Steps 5 and 6, except with lower float.
9. Replace low fuel level/auxiliary fuel pump float switch if indications are other than above.
10. Install low fuel level/auxiliary fuel pump float switch (Installation).

END OF TASK

INSTALLATION

1. Loosen float switch plate adjusting nut.
2. Remove cover in fuel tank opening.
3. Thoroughly clean, make flat and smooth mating surfaces for new gasket (WP 0087, Figure 1, Item 41). Ensure no foreign material enters fuel tank. Apply sealant (WP 0159, Item 18) to both sides of new gasket (41).
4. Position gasket (41) and float switch (40) in fuel tank.
5. Install screws (37), new lockwashers (38), and flat washers (39).
6. Set float switch stem 1/16-inch from bottom of fuel tank. Tighten float switch plate adjusting nut.
7. Connect electrical connector and remove tag. Close left side engine access doors.
8. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF FUEL SYSTEM, FUEL PICKUP: REMOVAL, INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsGloves & Protective Clothing
New Lockwashers & New Gasket
Sealant**Personnel Required**Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

ReferencesWP 0087, Figure 1, Items: 43 & 47
WP 0159, Item 18**Equipment Condition**Grounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open right side engine access doors.
3. Disconnect fuel line (WP 0087, Figure 1, Item 42) from fitting (48).

NOTE

Mark position of fuel pickup before removing.

4. Remove screws (43), lockwashers (44), flat washers (45), fuel pickup (46), and gasket (47) from fuel tank. Discard lockwashers (44) and gasket (47).
5. Remove fitting (48) from fuel pickup (46).
6. Cover opening in fuel tank.

END OF TASK**INSPECTION**

1. Shut down generator set.
2. Remove fuel pickup (Removal).
3. Inspect fuel pickup and fitting for clogs, stripped threads, and other damage.
4. Replace damaged parts.
5. Install fuel pickup (Installation).

END OF TASK**INSTALLATION****NOTE**

Ensure fuel pickup is in same position as marked on removal.

1. Remove cover in fuel tank opening.
2. Thoroughly clean, make flat and smooth mating surfaces for new gasket (WP 0087, Figure 1, Item 47). Ensure no foreign material enters fuel tank. Apply sealant (WP 0159, Item 18) to both sides of new gasket (47).
3. Install gasket (47) and fuel pickup (46) in fuel tank with screws (43), new lockwashers (44), and flat washers (45).
4. Install fitting (48) in fuel pickup (46).
5. Connect fuel line (42) to fitting (48). Close right side engine access doors.
6. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF FUEL SYSTEM, FUEL FLOAT MODULE: INSPECTION, TESTING, REMOVAL,
INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

Fuel Float Module (If operation does not comply with testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0087, Figure 1, Item 51

Equipment ConditionGrounded, Off & Operational

INSPECTION

1. Shut down generator set.
2. Open left side engine access doors.
3. Inspect fuel float module (WP 0087, Figure 1, Item 51) for cracked housing, broken or damaged connectors and wiring, and other damage.
4. Close left side engine access doors.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open left side engine access doors.
3. Disconnect fuel float module (WP 0087, Figure 1, Item 51) electrical connector (J12) from fuel float switch connector (P12).
4. Connect pins 1 and 2 of fuel float module electrical connector (J12) together with a jumper wire.
5. Move MASTER SWITCH to PRIME & RUN AUX FUEL position and auxiliary fuel pump should start operating. Remove jumper wire and auxiliary fuel pump should stop operating.
6. Start and operate generator set at rated voltage and frequency.
7. Using jumper wire, make connection between pins 3 and 4 of fuel float module electrical connector (J12). Generator set should shut down after approximately 2 seconds and NO FUEL lamp on malfunction indicator panel should light.
8. Replace fuel float module if operation is other than above.
9. Close left side engine access doors.

END OF TASK**REMOVAL**

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Tag and disconnect electrical connectors from fuel float module (WP 0087, Figure 1, Item 51).
4. Remove bolts (49), nuts (50), and fuel float module (51) from generator set.

END OF TASK**INSTALLATION**

1. Install fuel float module (WP 0087, Figure 1, Item 51) in generator set with bolts (49) and nuts (50).
2. Connect electrical connectors; remove tags. Close left side engine access doors.
3. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF FUEL SYSTEM, FUEL FILTER/DRAIN VALVE ASSEMBLY: REMOVAL, INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsGloves & Protective Clothing
Washers**Personnel Required**Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**

WP 0087, Figure 1, Item: 58 & 60

See "One Qualified Technician" Warning

Equipment ConditionGrounded, Off & Operational

NOTE

Maintenance for the fuel filter/water separator is found in the engine TM. Retain fuel filter drain valve assembly for use with new filters.

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Remove clamp (WP 0087, Figure 1, Item 60) and hose (61) from drain valve (59).
4. Remove bolt (56), washers (57), and adapter (58). Discard washers (57).
5. Remove drain valve (59) from adapter (58).

END OF TASK**INSPECTION**

Check drain valve assembly for defects and proper operation.

END OF TASK**INSTALLATION**

1. Install adapter (WP 0087, Figure 1, Item 58) on drain valve (59).
2. Install new washers (57) and bolt (56) to adapter (58) and tighten to bottom of fuel filter/water separator.
3. Install hose (61) and clamp (60) to drain valve (59). Close left side engine access doors.
4. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF FUEL SYSTEM, ETHER CYLINDER: REMOVAL, INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

New Lockwashers

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**Equipment Condition**

Grounded, Off & Operational

See "One Qualified Technician" Warning

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open right side engine access doors.
3. Loosen wing nut (Figure 1, Item 1) and unscrew ether cylinder (2) from ether solenoid valve (14).
4. Install cap (15) in solenoid valve (14).
5. Remove nuts (3), lockwashers (4), bolts (5), washers (6), and ether cylinder bracket assembly (7) from generator set housing. Discard lockwashers (4).

END OF TASK**INSPECTION**

1. Shut down generator set.
2. Open right side engine access doors.
3. Inspect ether cylinder bracket assembly (Figure 1, Item 7) for cracks, corrosion, stripped or damaged threads, or other damage.
4. Replace defective parts.
5. Close right side engine access doors.

END OF TASK**INSTALLATION**

1. Install bracket assembly (Figure 1, Item 7) on generator set housing with bolts (5), washers (6), new lockwashers (4), and nuts (3).
2. Remove cap (15) from ether solenoid valve (14).
3. Insert ether cylinder (2) through bracket (7) and screw into ether solenoid valve (14).
4. Close clamp (7) and tighten wing nut (1).
5. Close right side engine access doors.

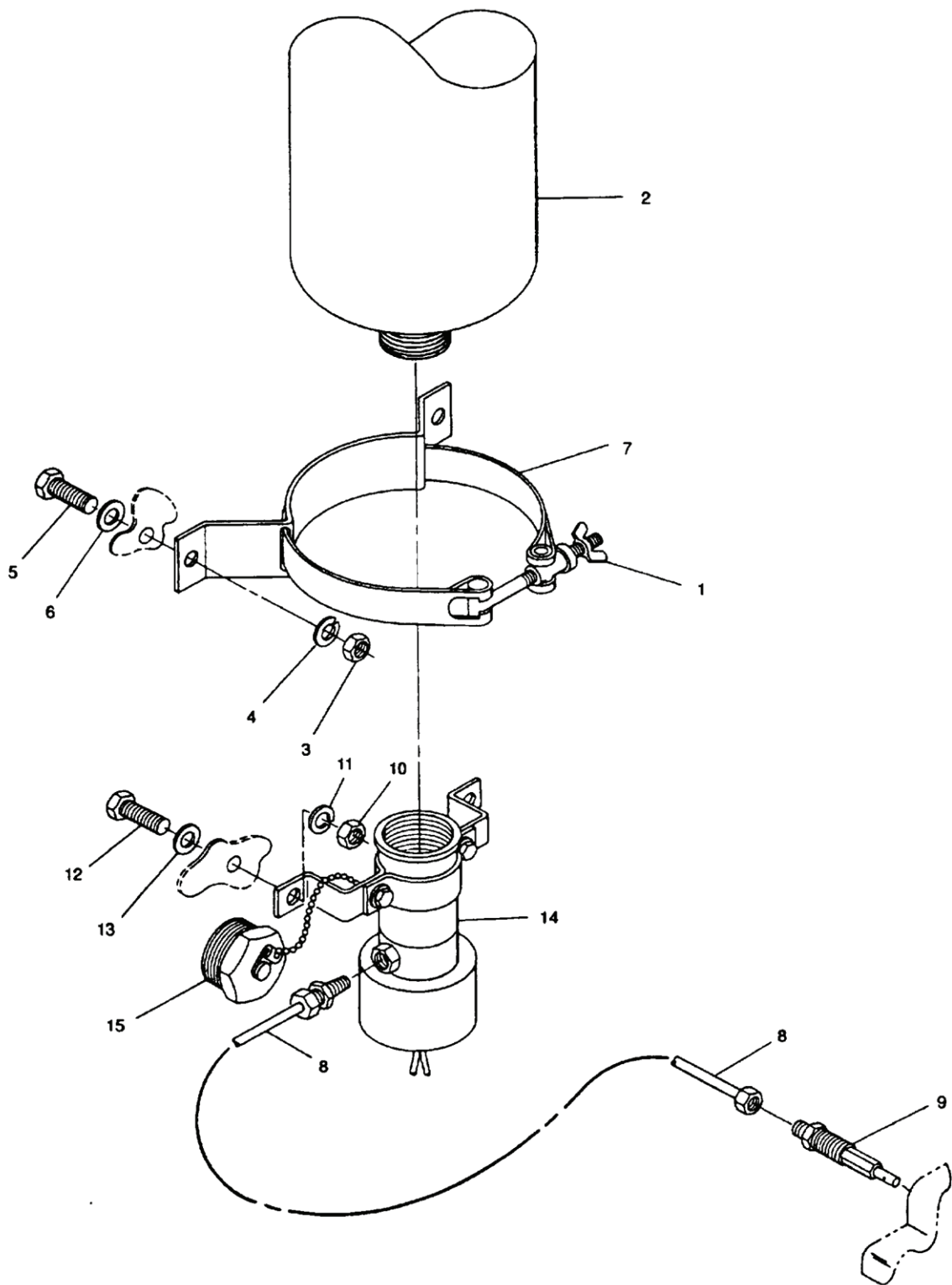


Figure 1. Ether Start System.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF FUEL SYSTEM, ETHER SOLENOID VALVE: REMOVAL, INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

New Lockwashers

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**

WP 0095, Figure 1, Item 14

See "One Qualified Technician" Warning

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Open right side engine access doors.
4. Tag and disconnect ether solenoid valve (WP 0095, Figure 1, Item 14) electrical leads.
5. Remove tube assembly (8) from ether solenoid valve (14) and spray nozzle (9).
6. Remove ether cylinder (2) from ether solenoid valve (14) (WP 0095, Removal).
7. Remove nuts (10), lockwashers (11), bolts (12), washers (13), and ether solenoid valve (14) from generator set housing. Discard lockwashers (11).
8. Remove spray nozzle (9) from engine intake manifold.

END OF TASK

INSPECTION

1. Shut down generator set.
2. Remove ether solenoid valve (WP 0095, Figure 1, Item 14) (Removal).
3. Inspect ether solenoid valve (14) for cracks, corrosion, damaged threads, evidence of shorting, or other damage.
4. Inspect tube assembly (8) for cracks, breaks, pinching, damaged threads, or other damage.
5. Inspect spray nozzle (9) for cracks, corrosion, clogging, or other damage.
6. Replace any defective parts.
7. Install ether solenoid valve (14) (Installation).

END OF TASK

INSTALLATION

1. Install ether solenoid valve (WP 0095, Figure 1, Item 14) on generator set housing with bolts (12), washers (13), new lockwashers (11), and nuts (10).
2. Install ether cylinder (2) into ether solenoid valve (14) (WP 0095, Installation).
3. Install spray nozzle (9) in engine intake manifold.
4. Install tube assembly (8) into ether solenoid valve (14) and spray nozzle (9).
5. Connect electrical leads, remove tags, and close right side engine access doors.
6. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF FUEL SYSTEM, FUEL TANK: INSPECTION, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Protective Eyewear & Skin Protection

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0006, Table 2

WP 0009, Maintenance & Installation of Major Components, Engine & Generator Assembly

WP 0089, Maintenance of Fuel System, Fuel Drain Valve

WP 0090, Maintenance of Fuel System, Fuel Level Sender

WP 0091, Maintenance of Fuel System, Low Fuel Level/Auxiliary Fuel Pump Float Switch

WP 0092, Maintenance of Fuel System, Fuel Pickup

Equipment ConditionGrounded, Off & Operational

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION

1. Shut down generator set.
2. Remove fuel tank (Removal).
3. Inspect fuel tank (Figure 1, Item 6) for leaks, cracks, missing hardware, and other damage.
4. If no damage is found, install fuel tank (Installation).

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Drain fuel tank.
4. Remove engine and generator assembly (WP 0009, Removal).
5. Remove fuel tank drain valve (WP 0089, Removal).
6. Remove nuts (Figure 1, Item 1), lockwashers (2), washers (3), bolts (4), and plates (5) securing fuel tank (6) to skid base. Discard lockwashers (2).
7. Remove fuel tank (6) from skid base.
8. Remove low fuel level/auxiliary fuel pump float switch (WP 0091, Removal).
9. Remove fuel level sender (WP 0090, Removal).
10. Remove fuel pickup (WP 0092, Removal).
11. Remove fittings (7 and 8) from excess fuel studs (10) on right side of tank.
12. Remove fitting (9) from excess fuel stud (10) on left side of tank.
13. Remove studs (10), washers (11), and bushings (12) from fuel tank (6).
14. Cover all openings.

END OF TASK**INSTALLATION**

1. Remove covers placed over openings.
2. Install bushings (Figure 1, Item 12), washers (11), and studs (10) in fuel tank (6).
3. Install fitting (9) in excess fuel stud (10) on left side of fuel tank (6).
4. Install fittings (7 and 8) in excess fuel studs (10) on right side of fuel tank.
5. Install low fuel level/auxiliary fuel pump float switch (WP 0091, Installation).
6. Install fuel level sender (WP 0090, Installation).

7. Install fuel pickup (WP 0092, Installation).
8. Install fuel tank (6) in skid base and secure with plates (5), bolts (4), washers (3), new lockwashers (2), and nuts (1).
9. Install engine and generator assembly (WP 0009, Installation).
10. Install fuel tank drain valve (WP 0089, Installation).
11. Service fuel tank; refer to WP 0006, Table 2 for proper fuel.
12. Connect negative battery cable. Close battery access door.

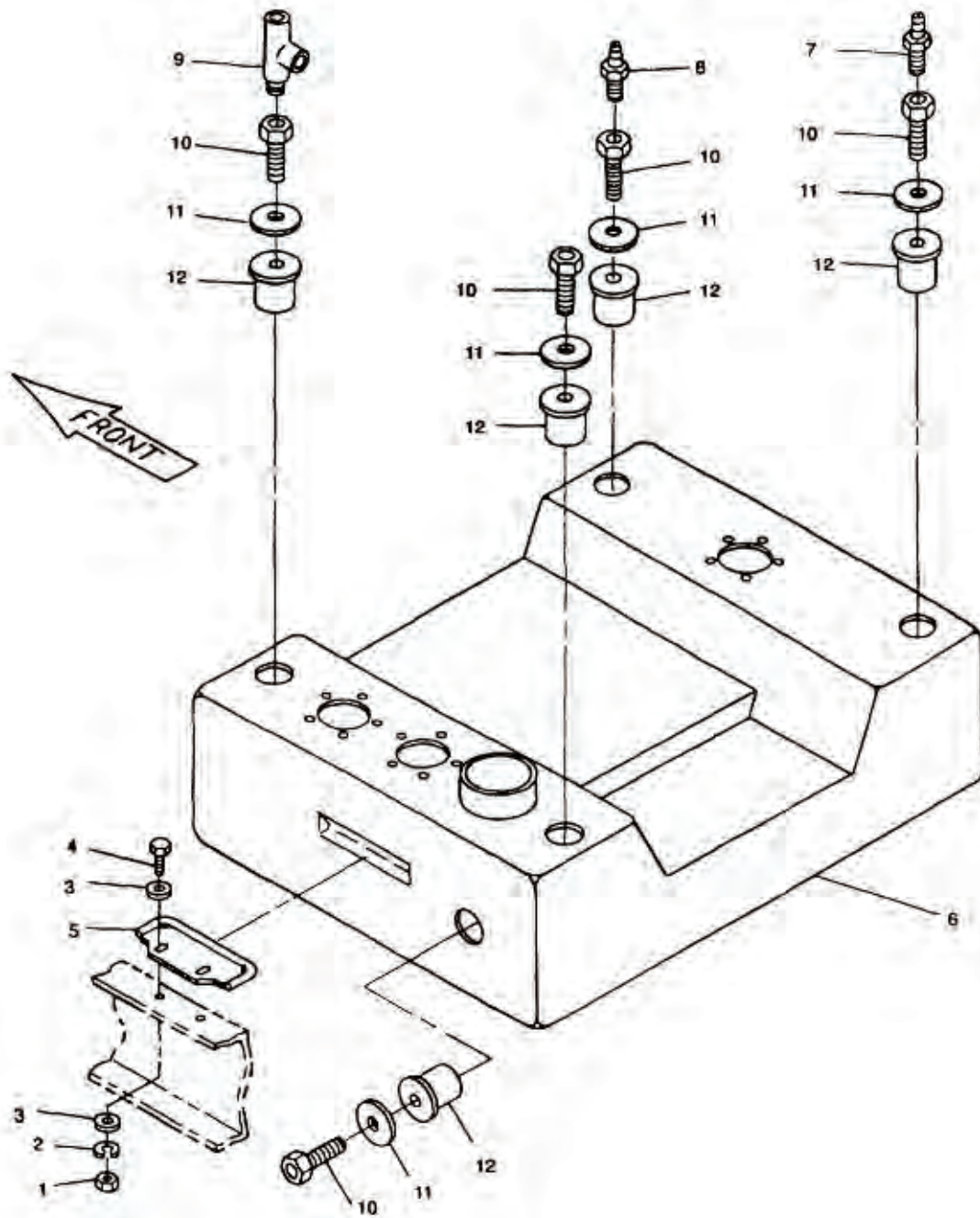


Figure 1. Fuel Tank.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MEP-805A****GENERATOR SET, SKID MOUNTED, TACTICAL QUIET, 30 kW, 400 Hz****MEP-815A****MAINTENANCE OF OUTPUT BOX ASSEMBLY, OUTPUT BOX ASSEMBLY: REMOVAL, INSTALLATION****INITIAL SETUP:****Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves & Protective Clothing

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0016, Maintenance of Housing, Top Housing Section

WP 0014, Maintenance of Housing, Access Doors

WP 0018, Maintenance of Control Box Assembly, Rear Housing Section

WP 0019, Maintenance of Control Box Assembly, Control Box Assembly

WP 0073, Maintenance of Air Intake & Exhaust System

WP 0099, Maintenance of Output Box Assembly, Voltage Reconnection Terminal Board

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

REMOVAL

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box assembly (WP 0019, Removal).
4. Remove top housing section, (WP 0016, Removal).
5. Remove air cleaner assembly (WP 0073, Removal).
6. Remove output box access door (WP 0014, Removal).
7. Remove rear housing panel (WP 0018, Removal).
8. Open left side engine access door. Tag and disconnect electrical leads from fuel injection pump, governor actuator, coolant high temperature switch, DEAD CRANK switch, oil pressure sender, low oil pressure switch, coolant temperature sender, auxiliary fuel pump, fuel float module, fuel level sender, and magnetic pickup.
9. Open right side engine access door. Tag and disconnect electrical leads from battery charging alternator, starter, and ether solenoid valve.
10. Note locations and remove loop clamps securing output box harness to engine.
11. Remove voltage reconnection terminal board (WP 0099, Removal).
12. Remove nuts (Figure 1, Item 1), bolts (2), and output box top panel (3) from output box assembly.

NOTE

Record number and direction of wraps when removing main generator cables from transformers to aid installation.

13. Unwrap main generator cables from droop current transformer (34) and current transformer (31).
14. Remove screws (4) and cover (5) from AC circuit interrupter relay (40).
15. Tag and disconnect output cables from terminals A2, B2, and C2 of AC circuit interrupter relay (40).
16. Tag and disconnect exciter leads F1 and F2 from terminals 1 and 2 of terminal board (26).
17. Remove nuts (6), bolts (7), and output box assembly from generator set.

END OF TASK

INSTALLATION

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

1. Install output box assembly in generator set with bolts (Figure 1, Item 7) and nuts (6).
2. Connect exciter leads F1 and F2 to terminals 1 and 2 of terminal board (26). Remove tags.
3. Connect output cables to terminals A2, B2, and C2 of AC circuit interrupter relay (40). Remove tags.
4. Install cover (5) on AC circuit interrupter (40) with screws (4).
5. Install main generator cables onto current transformer (31) and droop current transformer (34) with the same number of wraps recorded during removal.
6. Install voltage reconnection terminal board (WP 0099, Installation).
7. Connect output box harness electrical leads to battery charging alternator, starter, and ether solenoid valve through right engine access doors and remove tags.
8. Connect output box harness electrical leads to magnetic pickup, coolant temperature sender, auxiliary fuel pump, fuel float module, fuel level sender, low oil pressure switch, oil pressure sender, governor actuator, fuel injection pump, DEAD CRANK switch, and coolant high temperature switch through left engine access doors and remove tags.
9. Install loop clamps securing output box harness to engine as noted during removal. Close engine access doors.
10. Install output box top panel (3) with bolts (2) and nuts (1).
11. Install top housing section (WP 0016, Installation).
12. Install air cleaner assembly (WP 0073, Installation).
13. Install rear housing panel (WP 0018, Installation).
14. Install control box assembly (WP 0019, Installation).
15. Install output box access door (WP 0014, Installation).
16. Connect negative battery cable. Close battery access door.

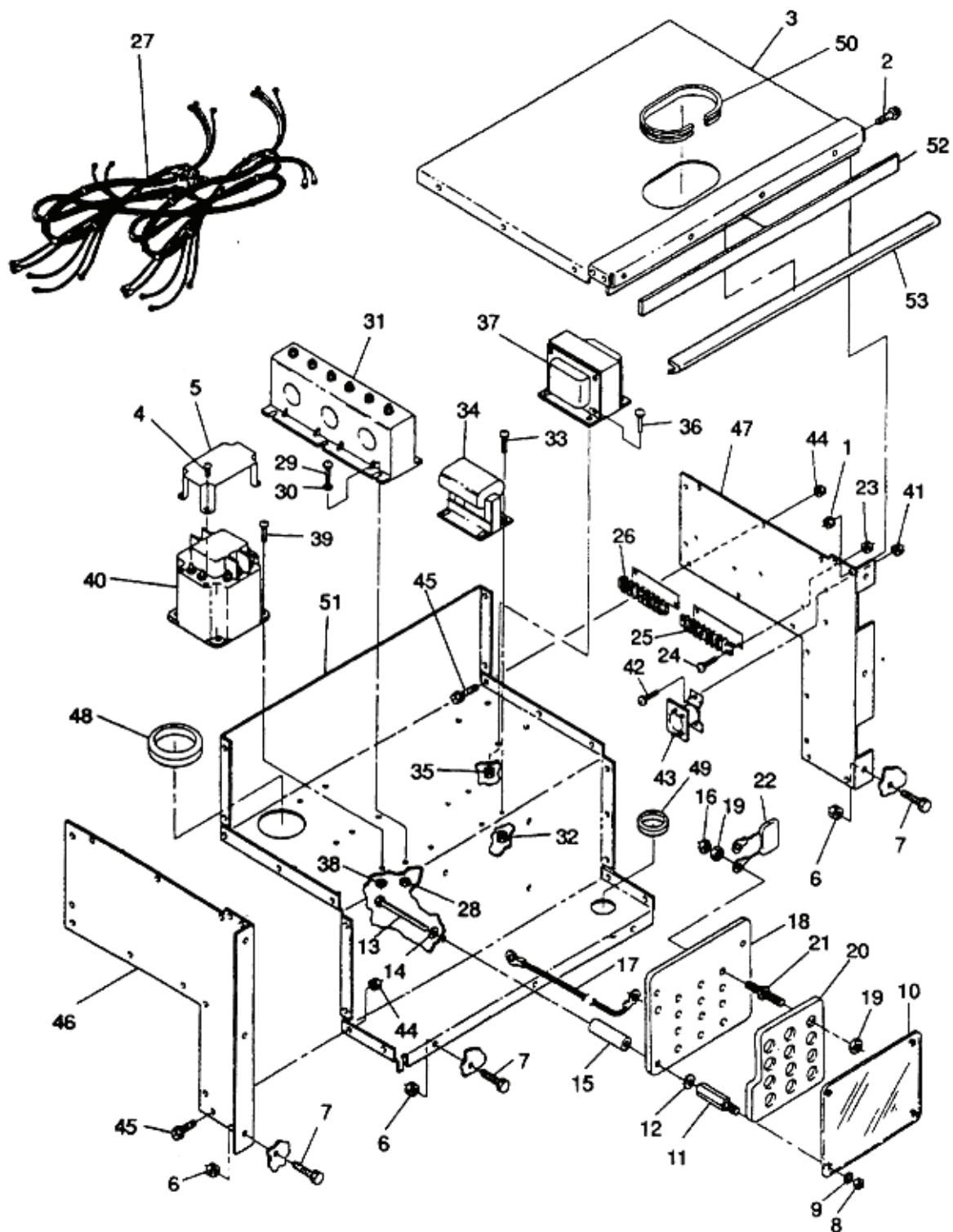


Figure 1. Output Box Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF OUTPUT BOX ASSEMBLY, VOLTAGE RECONNECTION TERMINAL BOARD:
INSPECTION, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsProtective Clothing, Safety Goggles
Chemical Gloves/Heat Resistant Gloves**Personnel Required**Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**WP 0098, Figure 1, Item 21
WP 0100, Figure 1, Item 3

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

Equipment ConditionGrounded, Off & Operational
ENGINE CONTROL SWITCH OFF/RESET
Battery Disconnect Switch OFF
DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION

1. Shut down generator set.
2. Open output box access door.
3. Inspect protective cover (WP 0100, Figure 1, Item 3) and moveable terminal board (5) for cracks, breaks, corrosion, and other damage.
4. Replace damaged parts.
5. Close output box access door.

END OF TASK**REMOVAL****WARNING**

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Batteries give off a flammable gas. Do not smoke or use open flame when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Battery acid can cause burns to unprotected skin. Wear safety goggles and chemical gloves and avoid acid splash while working on batteries. Failure to comply with this warning can cause injury to personnel.

WARNING

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Open output box access door and load terminal board access door.
4. Remove nuts (WP 0098, Figure 1, Item 8), washers (9), and cover (10) from voltage reconnection board (18).
5. Unscrew standoffs (11) and remove washers (12), bolts (13), washers (14), and mounts (15).
6. Remove nuts (16). Tag and disconnect electrical cables (17) and main generator cables from voltage reconnection board (18).
7. Remove voltage reconnection board (18) and moveable terminal board (20) from generator set as an assembly.
8. Tag position of capacitors (22) on voltage reconnection board (18).
9. Remove nuts (19), movable terminal board (20), studs (21), and capacitors (22) from voltage reconnection board (18).

END OF TASK**INSTALLATION****WARNING**

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

1. Insert studs (WP 0098, Figure 1, Item 21) in voltage reconnection board (18). Position capacitors (22), as tagged, align moveable terminal board (20) with voltage reconnection board (18), and install nuts (19). Remove tags.
2. Position voltage reconnection board (18) and moveable terminal board (20) in generator set.
3. Connect electrical cables (17) and main generator cables to voltage reconnection board (18) with nuts (16). Remove tags.
4. Secure voltage reconnection board (18) to generator set with bolts (13), washers (14), mounts (15), washers (12), and standoffs (11).
5. Install cover (10) with washers (9) and nuts (8). Close output box and load terminal board access doors.
6. Connect negative battery cable. Close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF OUTPUT BOX ASSEMBLY, OUTPUT BOX WIRING HARNESS: INSPECTION,
REMOVAL, TESTING, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves & Protective Clothing

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

FO-2 Wiring Diagram

WP 0019, Maintenance of Control Box Assembly,
Control Box Assembly

WP 0098, Figure 1, Item: 4 & 27

WP 0098, Steps: 10 & 12

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Remove output box wiring harness (Removal).
3. Inspect wiring harness (Figure 1, Item 6) for burned, bent, corroded, and broken terminals.
4. Inspect connectors for cracks, corrosion, stripped threads, bent or broken pins, and obvious damage.
5. Inspect wire insulation for burns, deterioration, and chafing.
6. Install output box wiring harness (Installation).

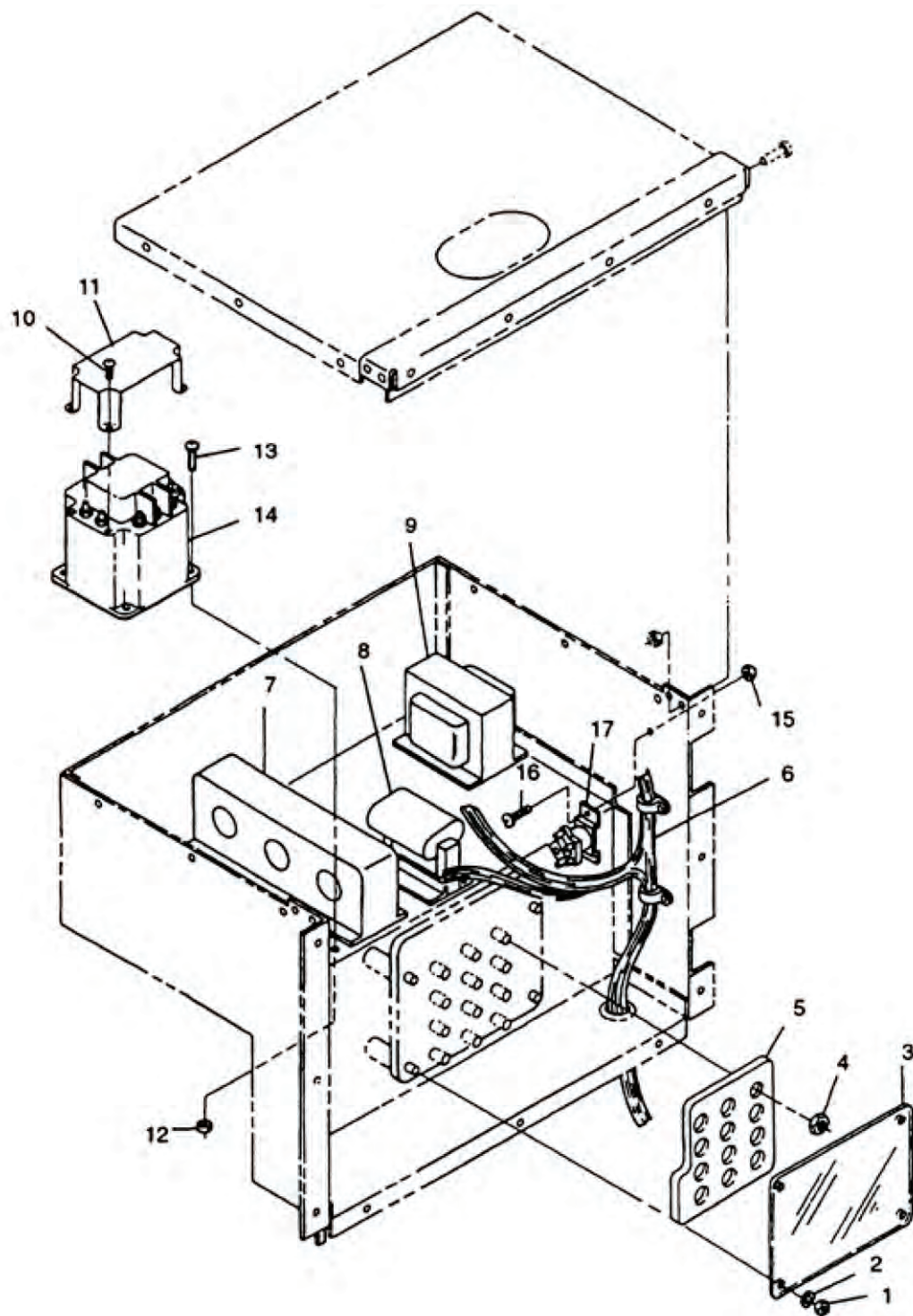


Figure 1. Output Box Assembly.

END OF TASK

REMOVAL

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box assembly (WP 0019, Removal).
4. Remove output box top panel (WP 0098, Removal, Step 12).
5. Open right side engine access doors, tag and disconnect electrical leads from battery charging alternator, starter solenoid, starter motor, and ether solenoid valve.
6. Open left side engine access doors, tag and disconnect electrical leads from coolant high temperature switch, DEAD CRANK switch, low oil pressure switch, oil pressure sender, governor actuator, fuel injection pump, coolant temperature sender, magnetic pickup, fuel level sender, fuel float module, and auxiliary fuel pump.
7. Open output box access door. Remove screws (WP 0098, Figure 1, Item 4) and cover (5) from AC circuit interrupter relay (40). Tag and disconnect electrical leads from cranking relay (43), current transformer (31), AC circuit interrupter relay (40), power potential transformer (37), and voltage reconnection board (18).
8. Tag and disconnect electrical leads for droop current transformer (34) from terminal board (25).
9. Remove screws (24) and nuts (23) securing terminal boards (25 and 26) in output box.
10. Remove all clamps securing output box harness (27) to generator set.
11. Remove output box harness (27) from output box and generator set.

END OF TASK**TESTING****WARNING**

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open output box and engine access doors.
3. Set multimeter for ohms.
4. Check individual wires, connectors, and terminal boards for continuity. Refer to Wiring Diagram FO-2 for wire identification.
5. Close output box and engine access doors, connect negative battery cable, and close battery access door.

END OF TASK**REPAIR****WARNING**

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open applicable access doors.
3. Replace damaged cable assemblies, terminals, connectors, sockets, and terminal boards.

4. Replace wires with damaged insulation and those that do not indicate continuity.
5. Connect negative battery cable and close all access doors.

END OF TASK

INSTALLATION

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

1. Position output box wiring harness (WP 0098, Figure 1, Item 27) in output box and generator set.
2. Install all clamps, as removed, securing output box wiring harness in generator set.
3. Secure terminal boards (25 and 26) in output box with screws (24) and nuts (23).
4. Connect electrical leads for droop current transformer (34) to terminal board (25). Remove tags
5. Connect electrical leads to AC circuit interrupter relay (40), current transformer (31), cranking relay (43), power potential transformer (37), and voltage reconnection board (18). Install cover (5) with screws (4) on AC circuit interrupter relay (40). Remove tags and close output box access door.
6. On left side of engine connect electrical leads to auxiliary fuel pump, fuel level sender, fuel float module, magnetic pickup, coolant temperature sender, governor actuator, fuel injection pump, oil pressure sender, low oil pressure switch, DEAD CRANK switch, and coolant high temperature switch. Remove tags and close left side engine access doors.
7. On right side of engine connect electrical leads to ether solenoid valve, starter motor, starter solenoid, and battery charging alternator. Remove tags and close right side engine access doors.
8. Install output box top panel (WP 0098, Installation, Step 10).
9. Install control box assembly (WP 0019, Installation).
10. Connect negative battery cable. Close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF OUTPUT BOX ASSEMBLY, CURRENT TRANSFORMER: INSPECTION, REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves & Protective Clothing

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0019, Maintenance of Control Box Assembly, Control Box Assembly

WP 0098, Steps: 10 & 12 & Figure 1, Item 31

WP 0100, Figure 1, Item 7

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open output box access door.
3. Inspect current transformer (WP 0100, Figure 1, Item 7) for security, cracked housing, broken or stripped terminals, and loose or missing hardware.
4. Close output box access door.

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box assembly (WP 0019, Removal).
4. Remove output box top panel (WP 0098, Removal, Step 12).
5. Open output box and right side engine access doors.
6. Tag and disconnect current transformer (WP 0098, Figure 1, Item 31) electrical leads.
7. Tag and disconnect main generator cables T2 and T8 from voltage reconnection board (18).
8. Unwrap main generator cables from droop current transformer (34) and current transformer (31). Note number and direction of wraps.
9. Remove screws (29), flat washers (30), nuts (28), and current transformer (31) from output box.

END OF TASK**TESTING****WARNING**

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open output box access door.
3. Tag and disconnect electrical leads from current transformer (WP 0100, Figure 1, Item 7) secondary terminals.
4. Remove current transformer (Removal).
5. Set multimeter for ohms and check for continuity between secondary terminals A1 and A2, B1 and B2, and C1 and C2.
6. If continuity is present, connect electrical leads to secondary terminals. Remove tags.
7. If continuity is not present, current transformer is defective and must be replaced.
8. Set up a test circuit using 10 gauge wire (Figure 1). Make sure to have ten passes with wire through phase A window.
9. Turn on power source and load bank. Adjust load bank until 27.7 amps is indicated on ammeter.
10. Set multimeter for amperes and connect to secondary terminals A1 and A2. Multimeter indication must be 0.9 to 1.1 amps.
11. Repeat Steps 8, 9, and 10 above using phase B window and secondary terminals B1 and B2.
12. Repeat Steps 8, 9, and 10 above using phase C window and secondary terminals C1 and C2.
13. Replace current transformer if multimeter indication in any phase is other than stated in Step 10 above.
14. Remove current transformer from test circuit.
15. Install current transformer (Installation).

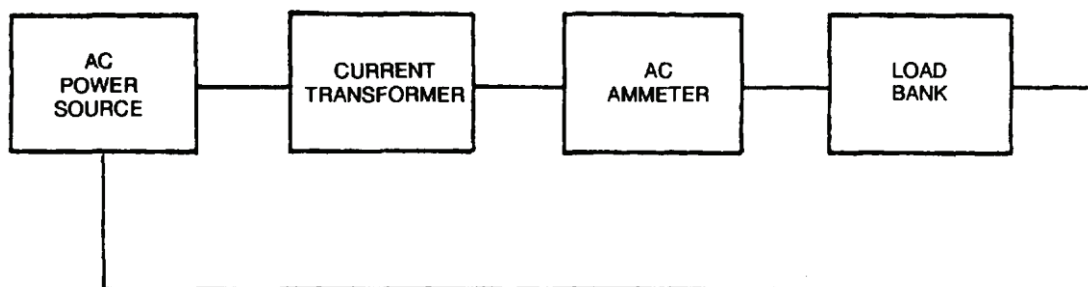


Figure 1. Testing Current Transformer.

END OF TASK

INSTALLATION**WARNING**

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

1. Install current transformer (WP 0098, Figure 1, Item 31) with screws (29), flat washers (30), and nuts (28).
2. Wrap main generator cables around current transformer (31) and droop current transformer (34) using same number of wraps noted during removal.
3. Connect main generator cables to voltage reconnection board (18). Remove tags.
4. Connect electrical leads to current transformer (31). Remove tags. Close output box and right side engine access doors.
5. Install output box top panel (WP 0098, Installation, Step 10).
6. Install control box assembly (WP 0019, Installation).
7. Connect negative battery cable. Close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF OUTPUT BOX ASSEMBLY, DROOP CURRENT TRANSFORMER: INSPECTION,
REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves & Protective Clothing
Droop Current Transformer (If multimeter indications
do not comply with testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0098, Figure 1, Items: 18 & 34

WP 0100, Figure 1, Item 8

Equipment Condition

Grounded, Off & Operational
ENGINE CONTROL SWITCH OFF/RESET
Battery Disconnect Switch OFF
DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open output box access door.
3. Inspect droop current transformer (WP 0100, Figure 1, Item 8) for cracked housing, security, broken wire terminals, loose or missing hardware, and other damage.
4. Close output box access door.

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Open output box and right side engine access doors.
4. Tag and disconnect main generator cables T2 and T8 from voltage reconnection board (WP 0098, Figure 1, Item 18).

5. Unwrap main generator cables T2 and T8 from droop current transformer (34). Note number and direction of wraps.
6. Tag and disconnect droop current transformer (34) electrical leads from terminal board (25).
7. Remove screws (33), nuts (32), and droop current transformer (34) from output box.

END OF TASK

TESTING

1. Remove droop current transformer (Removal).
2. Set multimeter for ohms and check for continuity between secondary leads 1 and 2.
3. If continuity is present, continue with test. If continuity is not present, droop current transformer is defective and must be replaced.
4. Set up a test circuit using 10 gauge wire (Figure 1). Make ten passes with wire through window of droop current transformer.
5. Turn on power supply and load bank. Adjust load bank until 20.8 amps is indicated on AC ammeter.
6. Set multimeter for AC amperes and connect to secondary leads 1 and 2. Multimeter indication must be between 0.9 and 1.1 amps.
7. Replace droop current transformer if multimeter indication is other than above.
8. Remove droop current transformer from test circuit.
9. Install droop current transformer (Installation).

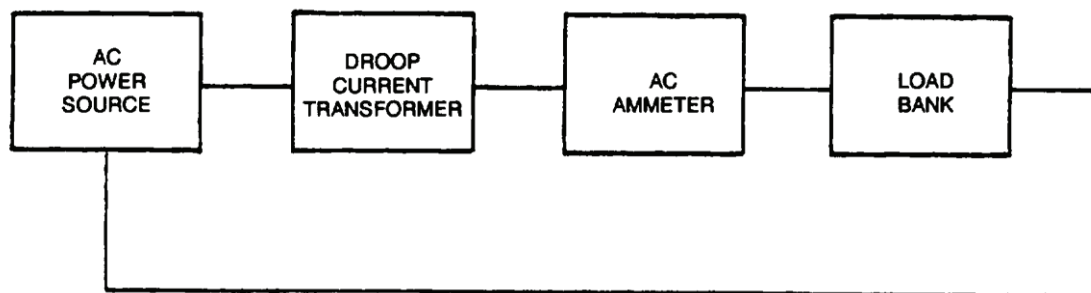


Figure 1. Testing Droop Current Transformer.

END OF TASK

INSTALLATION

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

1. Install droop current transformer (WP 0098, Figure 1, Item 34) in output box with screws (33) and nuts (32).
2. Wrap main generator cables around droop current transformer (34) using same number of wraps noted during removal.
3. Connect main generator cables to voltage reconnection board (18). Remove tags.
4. Connect droop current transformer (34) electrical leads to terminal board (25). Remove tags. Close output box and engine access doors.
5. Connect negative battery cable. Close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF OUTPUT BOX ASSEMBLY, POWER POTENTIAL TRANSFORMER: INSPECTION,
REMOVAL, TESTING, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsHeat Resistant Gloves & Protective Clothing
Power Potential Transformer (If readings do not
comply with Testing)**Personnel Required**Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

ReferencesWP 0019, Maintenance of Control Box Assembly,
Control Box Assembly
WP 0098, Steps: 10 & 12 & Figure 1, Item 37
WP 0100, Figure 1, Item 8**Equipment Condition**Grounded, Off & Operational
ENGINE CONTROL SWITCH OFF/RESET
Battery Disconnect Switch OFF
DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open output box access door.
3. Inspect power potential transformer (WP 0100, Figure 1, Item 9) for security, cracked housing, broken wire terminals, loose or missing hardware, and other damage.
4. Close output box access door.

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box assembly (WP 0019, Removal).
4. Remove output box top panel (WP 0098, Removal, Step 12).
5. Tag and disconnect power potential transformer (WP 0098, Figure 1, Item 37) electrical leads.

6. Remove screws (36), nuts (35), and power potential transformer (37) from output box.

END OF TASK

TESTING

Power Potential Transformer, P/N 17910

1. Remove power potential transformer (WP 0098, Figure 1, Item 37) (Removal).
2. Connect terminals 1 and 2 of power potential transformer (37) to an AC power source (polarity is not important).
3. Set power supply for 208 VAC, 60 Hz. Turn on power supply.
4. Set multimeter for AC volts and take readings between the following terminals and compare to voltages shown:
 - Terminals 3 and 7 = 144-176 VAC
 - Terminals 4 and 6 = 27-33 VAC
5. Replace power potential transformer (37) if readings are not as voltages above.
6. Install power potential transformer (37) (Installation).

END OF TASK

Power Potential Transformer, P/N A1497B, for MEP-805A

1. Remove power potential transformer (WP 0098, Figure 1, Item 37) (Removal).
2. Connect terminals 1 and 2 of power potential transformer (37) to an AC power source (polarity is not important).
3. Set power supply at 208 VAC, 60 Hz. Turn on power supply.
4. Set multimeter for AC volts and take readings between the following terminals and compare to voltages shown:
 - Terminals 5 and 6 = 54-66 VAC
 - Terminals 5 and 4 = 54-66 VAC
 - Terminals 5 and 3 = 126-154 VAC
 - Terminals 5 and 7 = 126-154 VAC
5. Replace power potential transformer (37) if readings are not as above.
6. Install power potential transformer (37) (Installation).

END OF TASK

INSTALLATION

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

1. Install power potential transformer (WP 0098, Figure 1, Item 37) with screws (36) and nuts (35).
2. Connect electrical leads and remove tags.
3. Install output box top panel (WP 0098, Installation, Step 10).
4. Install control box assembly (WP 0019, Installation).
5. Connect negative battery cable. Close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF OUTPUT BOX ASSEMBLY, AC CIRCUIT INTERRUPTER RELAY: INSPECTION,
TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0100, Figure 1, Items: 10 & 14

Equipment ConditionGrounded, Off & Operational

INSPECTION**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open output box access door.
3. Inspect AC circuit interrupter relay (WP 0100, Figure 1, Item 14) for security, cracked housing, broken wire terminals, and other damage.
4. Close output box access door.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open output box access door.
3. Set multimeter for ohms and check for open circuits between terminals A1 and A2, B1 and B2, C1 and C2, and 11 and 12.
4. Connect jumper wire from cranking relay terminal A1 to AC circuit interrupter relay terminal X.
5. Connect negative battery cable.
6. Check for closed circuits (continuity) between terminals A1 and A2, B1 and B2, C1 and C2, and 11 and 12.
7. Disconnect negative battery cable.
8. Replace AC circuit interrupter relay if indications are other than above.
9. If replacement is not needed, remove jumper wire and close output box access door.
10. Connect negative battery cable and close battery access door.

END OF TASK**REMOVAL****WARNING**

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open output box access door.
3. Remove screws (WP 0100, Figure 1, Item 10) and cover (11) from AC circuit interrupter relay (14).
4. Tag and disconnect AC circuit interrupter relay (14) electrical leads.
5. Remove screws (13), nuts (12), and AC circuit interrupter relay (14) from output box.

END OF TASK**INSTALLATION**

1. Install AC circuit interrupter relay (WP 0100, Figure 1, Item 14) in output box with screws (13) and nuts (12).
2. Connect AC circuit interrupter relay (14) electrical leads. Remove tags.
3. Install cover (11) on AC circuit interrupter relay (14) with screws (10).

4. Close output box access door, connect negative battery cable, and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF OUTPUT BOX ASSEMBLY, CRANKING RELAY: INSPECTION, TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0100, Figure 1, Items: 17

Equipment ConditionGrounded, Off & Operational

INSPECTION**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open output box and right side engine access doors.
3. Inspect cranking relay (WP 0100, Figure 1, Item 17) for security, cracked housing, broken wire terminals, and other damage.
4. Close all access doors.

END OF TASK**TESTING**

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open output box access door.
3. Tag and disconnect wires from terminals X1, X2, and A2 of cranking relay (WP 0100, Figure 1, Item 17).
4. Connect a jumper wire between terminals A1 and X1 of cranking relay (17).
5. Connect negative battery cable.
6. Connect X2 wire disconnected in Step 3 above to cranking relay (17) and listen for audible actuation.
7. Set multimeter for ohms and check for continuity between terminals A1 and A2 of cranking relay (17). If no continuity is indicated, cranking relay (17) is defective and must be replaced.
8. If replacement is not needed, disconnect negative battery cable.
9. Remove jumper wire and connect remaining wires to cranking relay (17) as tagged.
10. Close output box access door, connect negative battery cable, and close battery access door.

END OF TASK**REMOVAL****WARNING**

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open output box and right side engine access doors.
3. Tag and disconnect cranking relay (WP 0100, Figure 1, Item 17) electrical leads.
4. Remove screws (16), nuts (15), and cranking relay (17) from output box.

END OF TASK**INSTALLATION**

WARNING

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

1. Install cranking relay (WP 0100, Figure 1, Item 17) with screws (16) and nuts (15).
2. Connect cranking relay (17) electrical leads. Remove tags.
3. Close output box and right side engine access doors, connect negative battery cable, and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF OUTPUT BOX ASSEMBLY, LOAD OUTPUT TERMINAL BOARD: REMOVAL, INSPECTION, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Antiseize Compound

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0018, Maintenance of Control Box Assembly, Rear Housing Section

WP 0107, Maintenance of Output Box Assembly, Load Output Terminals

WP 0108, Maintenance of Output Box Assembly, Varistors

WP 0159, Item 7

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open load terminal board access door.
3. Disconnect load output cables L1, L2, L3, and L0 from load output terminal board.
4. Remove generator set housing rear panel (WP 0018, Removal).
5. Remove bolt (Figure 1, Item 1), nut (2), flat washer (3), and lockwasher (4) securing ground strap (15) to skid base. Discard lockwasher (4).
6. Remove bolts (5), lockwashers (6), and washers (7) securing terminal board assembly (12) to supports. Discard lockwashers (6).
7. Remove nuts (8) and washers (9). Tag and disconnect all main power leads (10) and varistor leads (11) from load terminals (23).
8. Remove terminal board assembly (12) from generator set.
9. Remove load output terminals (WP 0107, Removal).
10. Remove EMI filter (24) positioned between L0 and GND terminals (23).
11. Remove varistor leads (11) from varistors (27). Remove varistors (27) (WP 0108, Removal).
12. Remove EMI filters (28) positioned between load terminals (23) and varistors (27).
13. Remove nuts (13), washers (14), ground strap (15), studs (16), bus bars (17 and 22), and ground plane bar (29) from terminal board (12).
14. Remove nuts (18) and washers (19) from studs (16).
15. Remove bolts (30), nuts (31), and load output terminal board supports (32 and 33) from generator set.
16. Remove nuts (34), bolts (35), cord (36), wrench (37), and bracket (38) from support (33).

END OF TASK**INSPECTION**

1. Shut down generator set.
2. Open load terminal board access door.
3. Inspect load output terminal board for cracks, corrosion, and obvious damage.
4. Inspect threaded components for stripped threads.
5. Inspect varistor electrical leads for damaged insulation and loose terminals.
6. Replace damaged and defective parts.
7. Close load terminal board access door.

END OF TASK**REPAIR**

WARNING

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

Repair load output terminal board assembly by replacing damaged or defective wires, load terminals, EMI filters, and varistors.

END OF TASK

INSTALLATION

1. Install load output terminal board supports (Figure 1, Items 32 and 33) in generator set with bolts (30) and nuts (31).
2. Install ground plane bar (29), bus bars (17 and 22), and ground strap (15) on terminal board (12) with studs (16), washers (14 and 19), and nuts (13 and 18).
3. Position EMI filters (28) between varistors (27) and L1, L2, and L3 load terminals (23) mounting holes.
4. Install varistors (27) (WP 0108, Installation).
5. Position EMI filter (24) between L0 and GND terminals (23) mounting holes.
6. Install load terminals (WP 0107, Installation).
7. Connect leads (11) to varistors (27).
8. Position load output terminal board assembly in generator set and connect varistor leads (11) and main power leads (10) to load terminals (23) with washers (9) and nuts (8). Remove tags.
9. Secure terminal board assembly (12) to supports (32 and 33) with washers (7), new lockwashers (6), and bolts (5).
10. Apply a thin coat of antiseize compound (WP 0159, Item 7) to skid at ground strap (15) attaching point.
11. Install bolt (1), flat washer (3), new lockwasher (4), and nut (2) securing ground strap (15) to skid base.
12. Install bracket (38), wrench (37), and cord (36) on support (33) with bolts (35) and nuts (34).
13. Install generator set housing rear panel (WP 0018, Installation).
14. Connect load output cables L1, L2, L3, and L0 at load output terminal board and close load terminal access door.
15. Connect negative battery cable and close battery access door.

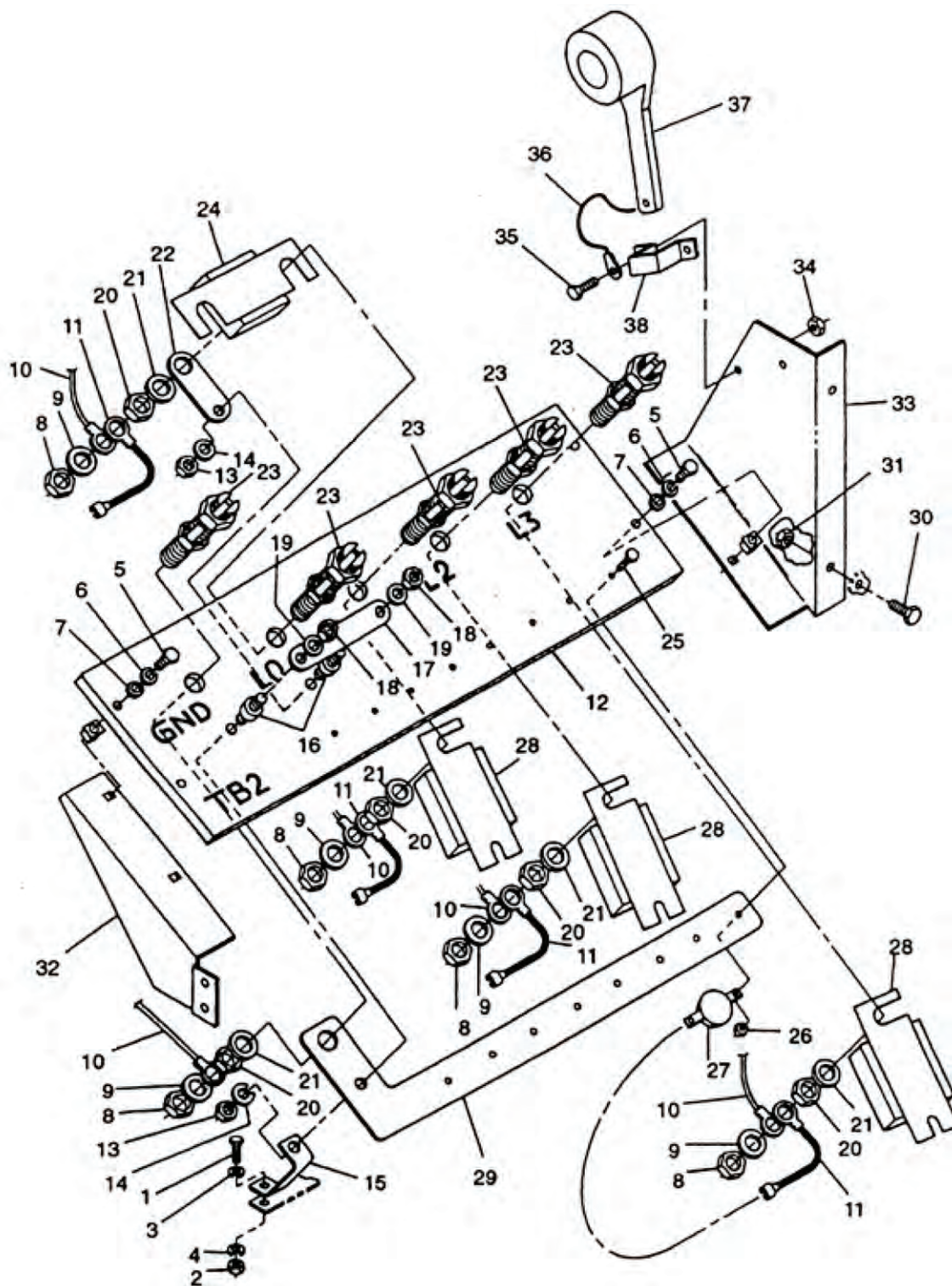


Figure 1. Load Terminal Board Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF OUTPUT BOX ASSEMBLY, LOAD OUTPUT TERMINALS: REMOVAL, INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0106, Maintenance of Output Box Assembly, Load Output Terminal Board

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Open load terminal board access door and disconnect load cables.
4. Remove load output terminal board assembly from generator set (WP 0106, Removal).
5. Remove nuts (WP 0106, Figure 1, Item 20), copper washers (21), and load terminals (23) from terminal board assembly (12).

END OF TASK**INSPECTION**

1. Shut down generator set.
2. Open load terminal board access door.
3. Inspect load terminals for stripped threads and other obvious damage.
4. Replace damaged load terminals, as necessary.
5. Close load terminal board access door.

END OF TASK**INSTALLATION**

1. Install load output terminals (WP 0106, Figure 1, Item 23) on load output terminal board assembly (12) with copper washers (21) and nuts (20).
2. Install load output terminal board assembly in generator set (WP 0106, Installation).

NOTE

Ensure GND load terminal passes through ground plane bracket (29) and L0 load terminal passes through bus bar (22).

3. Connect load cables and close load terminal board access door.
4. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF OUTPUT BOX ASSEMBLY, VARISTORS: REMOVAL, TEST AND INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0106, Maintenance of Output Box Assembly, Load Output Terminal Board

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove load output terminal board assembly from generator set (WP 0106, Removal).
4. Tag and disconnect varistor leads (WP 0106, Figure 1, Item 11) from varistors (27).
5. Remove nuts (26), bolts (25), and varistors (27) from load terminal board assembly (12).

END OF TASK

TEST AND INSPECTION

1. Shut down generator set.
2. Remove varistors (Removal).
3. Inspect varistors (WP 0106, Figure 1, Item 27) for obvious external damage.
4. Set multimeter for ohms and test each varistor (27) by connecting multimeter to varistor terminals 1 and 2. Note multimeter indication.
5. Reverse multimeter leads and note multimeter indication.
6. Multimeter indications should be infinite ohms in both directions.
7. Varistors (27) are defective and must be replaced if indications are other than above.
8. Install varistors (Installation).

END OF TASK

INSTALLATION

1. Install varistors (WP 0106, Figure 1, Item 27) on load output terminal board assembly (12) with bolts (25) and nuts (26).
2. Connect varistor leads (11) to varistors (27). Remove tags.
3. Install load output terminal board assembly in generator set (WP 0106, Installation).
4. Connect negative battery cable and close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF OUTPUT BOX ASSEMBLY, OUTPUT BOX PANELS: INSPECTION, REMOVAL, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

CARC Paint

Protective Eyewear, Mask & Gloves/Heat Resistant
Gloves

Fine Grit Abrasive Paper

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

References

TM 43-0139

WP 0013, Maintenance of DC Electrical System,
NATO Slave ReceptacleWP 0017, Maintenance of Housing, Front Housing
SectionWP 0018, Maintenance of Control Box Assembly,
Rear Housing SectionsWP 0072, Maintenance of Air Intake & Exhaust
System, Air Restriction IndicatorWP 0097, Figure 1, Items: 2, 3, 46, 47, 48, 49, 50 &
51WP 0098, Maintenance of Output Box Assembly,
Output Box AssemblyWP 0099, Maintenance of Output Box Assembly,
Voltage Reconnection Terminal BoardWP 0100, Maintenance of Output Box Assembly,
Output Box Wiring HarnessWP 0101, Maintenance of Output Box Assembly,
Current TransformerWP 0102, Maintenance of Output Box Assembly,
Droop Current Transformer

WP 0159, Item 17

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION

1. Inspect output box panels (WP 0097, Figure 1, Items 3, 46, 47, and 51) for cracks, dents, loose paint, corrosion, and other damage.
2. Inspect grommets (48, 49, and 50); door seal (52); and electromagnetic interference (EMI) seal (53) for looseness, tears, deterioration, and other damage.

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove control box assembly (WP 0018, Removal).
4. Remove generator housing rear panel (WP 0017, Removal).
5. Remove output box access door (WP 0013, Removal).

6. Remove air cleaner assembly (WP 0072, Removal).
7. Remove bolts (WP 0097, Figure 1, Item 2), nuts (1), and output box top panel (3).
8. Remove voltage reconnection terminal board (WP 0098, Removal).
9. Remove droop current transformer (WP 0101, Removal).
10. Remove power potential transformer (WP 0102, Removal).
11. Remove current transformer (WP 0100, Removal).
12. Remove output box wiring harness (WP 0099, Removal).
13. Remove nuts (38), screws (39), and AC circuit interrupter relay (40).
14. Remove nuts (41), screws (42), and cranking relay (43).
15. Remove nuts (6), bolts (7), and output box panels from generator set.
16. Remove bolts (45), nuts (44), and output box side panels (46 and 47) from output box bottom panel (51).
17. Remove grommets (48, 49, and 50) from output box panels (3 and 51).
18. Remove door seal (52) and EMI seal (53) from output box top panel (3), if necessary.

END OF TASK

REPAIR

WARNING

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

1. Repair all dents and cracks and remove all loose paint.
2. Remove light corrosion with fine grit abrasive paper (WP 0158, Item 17).
3. Replace damaged seals and grommets.
4. Repaint surfaces in accordance with TM 43-0139. (F) Refer to applicable directives.

END OF TASK

INSTALLATION

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

1. Install grommets (WP 0097, Figure 1, Items 48, 49, and 50) in output box panels (3 and 51).
2. Install output box side panels (46 and 47) on output box bottom panel (51) with bolts (45) and nuts (44).
3. Install output box panels in generator set with bolts (7) and nuts (6).
4. Install cranking relay (43) with screws (42) and nuts (41).
5. Install AC circuit interrupter relay (40) with screws (39) and nuts (38).
6. Install current transformer (WP 0100, Installation).
7. Install power potential transformer (WP 0102, Installation).
8. Install droop current transformer (WP 0101, Installation).
9. Install voltage reconnection terminal board (WP 0098, Installation).
10. Install output box wiring harness (WP 0099, Installation).
11. Install air cleaner assembly (WP 0072, Installation).
12. Install output box top panel (3) with bolts (2) and nuts (1).
13. If removed, install self-adhesive door seal (52) and EMI seal (53) with adhesive (WP 0158, Item 2) on output box top panel (3).
14. Install output box access door (WP 0013, Installation).
15. Install generator housing rear panel (WP 0017, Installation).
16. Install control box assembly (WP 0018, Installation).
17. Connect negative battery cable. Close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF ENGINE ACCESSORIES, LOW OIL PRESSURE SWITCH: TESTING, REMOVAL,
CLEANING AND INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves

Eye Protection

Cleaning Cloth

Dry Cleaning Solvent

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0159, Items: 9 & 21

Equipment ConditionGrounded, Off & Operational

TESTING**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Ensure nuts on ground terminals are properly secured creating a good ground. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Tag and disconnect electrical leads from low oil pressure switch (Figure 1, Item 1).
4. Set multimeter for ohms and connect across switch connector pins C and NO. Multimeter shall indicate open circuit.
5. Connect multimeter to switch connector pins C and NC. Multimeter shall indicate continuity.
6. Connect negative battery cable.
7. Start generator set. Place BATTLE SHORT switch in ON position before releasing MASTER SWITCH from START position.
8. Connect multimeter to switch connector pins C and NC. Multimeter shall indicate open circuit.
9. Connect multimeter to switch connector pins C and NO. Multimeter shall indicate continuity.
10. Shut down generator set. Return BATTLE SHORT switch to OFF position.
11. Disconnect negative battery cable.
12. If switch fails to meet continuity requirements, replace low oil pressure switch (1).
13. If replacement is not needed, connect electrical leads to low oil pressure switch (1). Remove tags and close left side engine access doors.
14. Connect negative battery cable and close battery access door.

END OF TASK**REMOVAL****WARNING**

The high pressure oil system operates at high temperature and pressure. Contact with hot oil can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Wear heat resistant gloves and avoid contacting hot surfaces. Do not allow hot oil or components to contact skin or hands. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Tag and disconnect low oil pressure switch (Figure 1, Item 1) electrical leads.
4. Unscrew low oil pressure switch (1) from oil sample valve assembly.

END OF TASK**CLEANING AND INSPECTION**

1. Shut down generator set.

2. Remove low oil pressure switch (Figure 1, Item 1) (Removal).

WARNING

Eye protection is required when working with compressed air. Compressed air can propel particles at high velocity and injure eyes. Do not exceed 15 psi pressure when using compressed air. Failure to comply with this warning can cause injury to personnel.

WARNING

Cleaning solvent is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with cleaning solvent. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

3. Clean low oil pressure switch (1) with dry, filtered compressed air and wipe with a cleaning cloth (WP 0159, Item 9) lightly moistened with dry cleaning solvent (WP 0159, Item 21).
4. Inspect low oil pressure switch (1) for cracked casing, stripped or damaged threads, corrosion, or other damage.
5. If no repair is needed, install low oil pressure switch (1) (Installation).

END OF TASK

INSTALLATION

1. Install low oil pressure switch (Figure 1, Item 1) into oil sample valve assembly.
2. Connect electrical leads. Remove tags and close left side engine access doors.
3. Connect negative battery cable and close battery access door.

END OF TASK

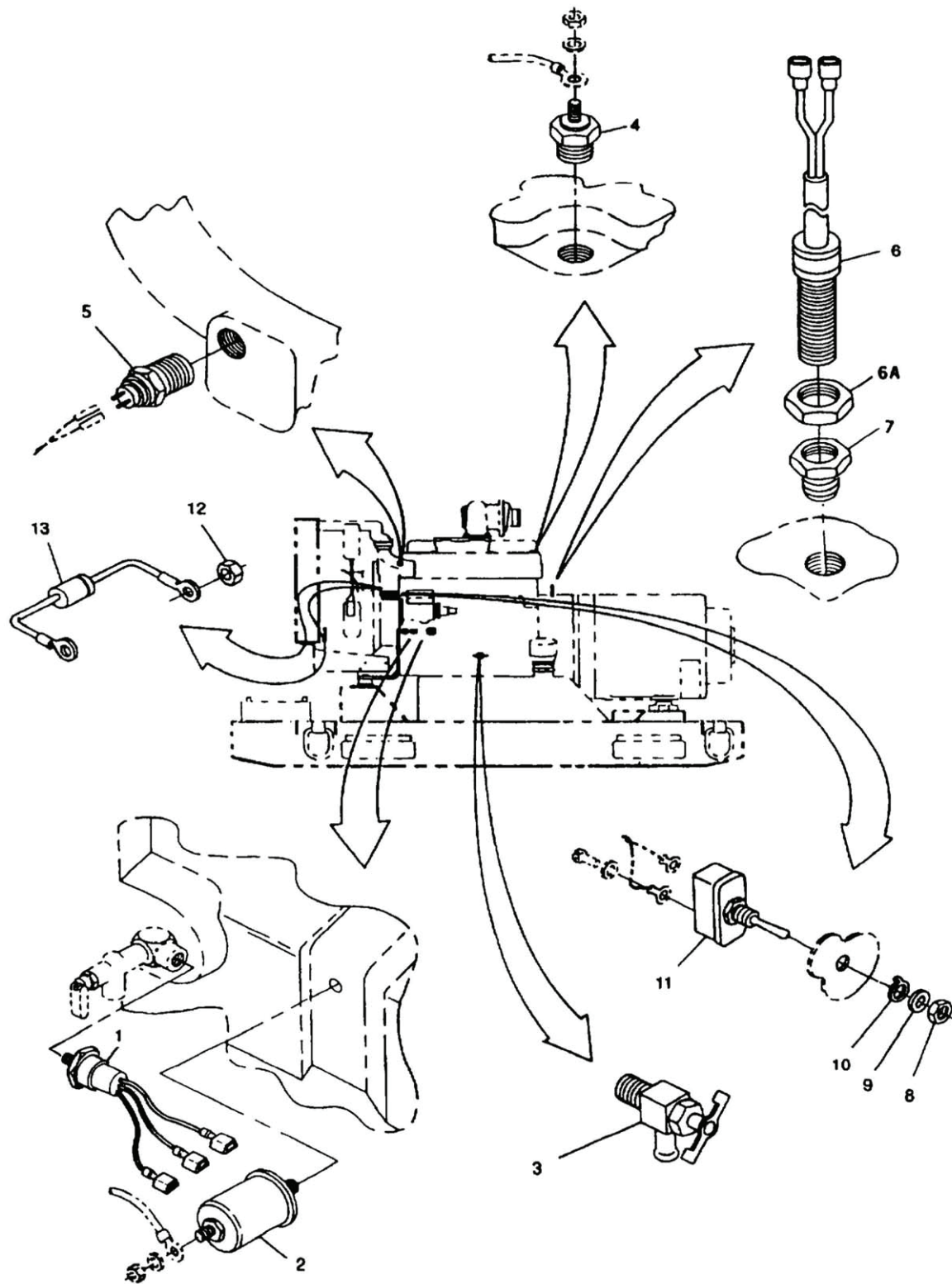


Figure 1. Engine Switches and Senders.

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF ENGINE ACCESSORIES, OIL PRESSURE SENDER: TESTING, REMOVAL, CLEANING
AND INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves & Goggles

Cleaning Cloth

Dry Cleaning Solvent

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0110, Figure 1, Item 2)

WP 0159, Item 21)

Equipment ConditionGrounded, Off & Operational

TESTING**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Disconnect electrical lead to oil pressure sender (WP 0110, Figure 1, Item 2).
4. Set multimeter for ohms and connect between sender terminal and casing.
5. Multimeter indication shall be between 216 and 264 ohms.
6. Connect negative battery cable.
7. Start generator set.
8. As engine is cranking and accelerates to rated speed, observe multimeter. Indication shall decrease to between 100 and 33 ohms.
9. Shut down generator set and disconnect negative battery cable.
10. Replace oil pressure sender (2) if indications are not as above.
11. If replacement is not needed, connect electrical lead to oil pressure sender (2).
12. Close left side engine access doors, connect negative battery cable, and close battery access door.

END OF TASK**REMOVAL****WARNING**

The high pressure oil system operates at high temperature and pressure. Contact with hot oil can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Wear heat resistant gloves and avoid contacting hot surfaces. Do not allow hot oil or components to contact skin or hands. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Disconnect oil pressure sender (WP 0110, Figure 1, Item 2) electrical lead.
4. Unscrew and remove oil pressure sender (2) from engine block.

END OF TASK**CLEANING AND INSPECTION**

1. Shut down generator set.
2. Remove oil pressure sender (WP 0110, Figure 1, Item 2) (Removal).
3. Clean oil pressure sender (2) with dry, filtered compressed air and wipe with a cleaning cloth (WP 0159, Item 9) lightly moistened with dry cleaning solvent (WP 0159, Item 21).

WARNING

Cleaning solvent is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with cleaning solvent. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

WARNING

Eye protection is required when working with compressed air. Compressed air can propel particles at high velocity and injure eyes. Do not exceed 15 psi pressure when using compressed air. Failure to comply with this warning can cause injury to personnel.

4. Inspect oil pressure sender (2) for cracked casing, stripped or damaged threads, corrosion, or other visible damage.
5. If no repair is needed, install oil pressure sender (2) into engine block (Installation).

END OF TASK**INSTALLATION**

1. Screw oil pressure sender (WP 0110, Figure 1, Item 2) into engine block.
2. Connect electrical lead and close left side engine access doors.
3. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF ENGINE ACCESSORIES, COOLANT TEMPERATURE SENDER: TESTING, REMOVAL,
CLEANING AND INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves, Protective Clothing & Eyewear
Coolant Temperature Sender (If indications do not
comply with testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0076, Figure 1, Item 1
WP 0078, Figure 1, Item 28
WP 0110, Figure 1, Items: 3 & 4

Equipment ConditionGrounded, Off & Operational

TESTING**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Disconnect electrical lead from coolant temperature sender (WP 0110, Figure 1, Item 4).
4. Set multimeter for ohms and connect positive lead to temperature sender terminal and negative lead to case. Multimeter indication shall be greater than 300 ohms.
5. Connect negative battery cable and start generator set.
6. Allow the engine to operate while observing multimeter.
7. Ohms indication should decrease as temperature rises.
8. Shut down generator set and disconnect negative battery cable.
9. Replace coolant temperature sender (4) if indications are not as above.
10. If replacement is not needed, connect electrical lead to sender.
11. Close left side engine access doors, connect negative battery cable and close battery access door.

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

3. Slowly remove radiator cap (WP 0076, Figure 1, Item 1).
4. Open left side engine access doors, open engine block drain valve (WP 0110, Figure 1, Item 3), and drain coolant into suitable container. Close drain valve (3).
5. Disconnect coolant temperature sender (4) electrical lead and unscrew coolant temperature sender (4) from engine head.

END OF TASK**CLEANING AND INSPECTION**

1. Shut down generator set.
2. Remove coolant temperature sender (WP 0110, Figure 1, Item 4) (Removal).
3. Clean temperature sender with dry, filtered compressed air and cleaning cloth (WP 0159, Item 9) lightly moistened with dry cleaning solvent (WP 0159, Item 21).

WARNING

Cleaning solvent is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with cleaning solvent. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

WARNING

Eye protection is required when working with compressed air. Compressed air can propel particles at high velocity and injure eyes. Do not exceed 15 psi pressure when using compressed air. Failure to comply with this warning can cause injury to personnel.

4. Inspect temperature sender for cracked casing, corrosion, and damaged threads and connector.
5. If no repair is needed, install coolant temperature sender (4) (Installation).

END OF TASK**INSTALLATION**

1. Install coolant temperature sender (WP 0110, Figure 1, Item 4) in engine head. Connect electrical lead.
2. Add coolant to overflow bottle (WP 0078, Figure 1, Item 28), as necessary, to replace drained coolant.
3. Close left side engine access doors, connect negative battery cable, and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF ENGINE ACCESSORIES, COOLANT HIGH TEMPERATURE SWITCH: TESTING,
REMOVAL, CLEANING AND INSPECTION, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

foo tools name
foo tools partno (EIC: N/A)
NSN:0000-00-000-0000 (EIC: N/A) (2)

Materials/Parts

Gloves & Protective Clothing
Suitable Container For Coolant
Cleaning Cloth
Dry Cleaning Solvent

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator
See "One Qualified Technician" Warning
See "Never Work Alone" Warning

References

WP 0076, Figure 1, Item 1
WP 0078, Figure 1, Item 28
WP 0110, Figure 1, Items: 3 & 5
WP 0159, Items: 9 & 21

Equipment Condition

Grounded, Off & Operational

TESTING**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Remove coolant high temperature switch (WP 0110, Figure 1, Item 5) (Removal).
3. Suspend coolant high temperature switch (5) in a container of 50/50 mixture of antifreeze and water so that sensing element is completely immersed but not touching sides or bottom of container.
4. Suspend a reliable thermometer in container. Do not allow end of thermometer to rest on bottom of container.
5. Set multimeter for ohms and check for continuity between switch terminals. Switch operates under open conditions.
6. Gradually heat antifreeze/water mixture, stirring so that heat will be evenly distributed and observe thermometer and multimeter.
7. At between 220 °F and 230 °F (101 °C and 107 °C), multimeter should indicate continuity.
8. Replace coolant high temperature switch (5) if it fails to operate as above.
9. If replacement is not needed, install coolant high temperature switch (5) (Installation).

END OF TASK**REMOVAL**

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

3. Slowly remove radiator cap (WP 0076, Figure 1, Item 1).
4. Open left side engine access doors, open engine block drain valve (WP 0110, Figure 1, Item 3), and drain coolant into suitable container. Close drain valve (3).
5. Tag and disconnect coolant high temperature switch (5) electrical leads.
6. Unscrew coolant high temperature switch (5) from lower thermostat housing.

END OF TASK**CLEANING AND INSPECTION**

1. Shut down generator set.
2. Remove coolant high temperature switch (WP 0110, Figure 1, Item 5) (Removal).

WARNING

Cleaning solvent is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with cleaning solvent. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

WARNING

Eye protection is required when working with compressed air. Compressed air can propel particles at high velocity and injure eyes. Do not exceed 15 psi pressure when using compressed air. Failure to comply with this warning can cause injury to personnel.

3. Clean coolant high temperature switch (5) with dry, filtered compressed air and cleaning cloth (WP 0159, Item 9) lightly moistened with dry cleaning solvent (WP 0159, Item 21).
4. Inspect coolant high temperature switch (5) for cracked casing, corrosion, stripped or damaged threads, and bent or broken connector pins.
5. If no repair is needed, install coolant high temperature switch (5) (Installation).

END OF TASK**INSTALLATION**

1. Install coolant high temperature switch (WP 0110, Figure 1, Item 5) in lower thermostat housing.
2. Connect electrical leads; remove tags.
3. Add coolant to overflow bottle (WP 0078, Figure 1, Item 28), as necessary, to replace drained coolant.
4. Close left side engine access doors, connect negative battery cable, and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF ENGINE ACCESSORIES, MAGNETIC PICKUP: REMOVAL, CLEANING AND
INSPECTION, INSTALLATION, ADJUSTMENT**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Protective Eyewear, Clothing & Gloves

Cleaning Cloth

Dry Cleaning Solvent

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0043, Figure 1, Item 56

WP 0110, Figure 1, Item: 6, 7 & 11

WP 0159, Items: 9 & 21

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Tag and disconnect magnetic pickup (WP 0110, Figure 1, Item 6) electrical leads.
4. Loosen locknut (6A) and remove magnetic pickup (6) and reducer bushing (7) from flywheel housing.

END OF TASK**CLEANING AND INSPECTION**

1. Shut down generator set.
2. Remove magnetic pickup (WP 0110, Figure 1, Item 6) (Removal).

WARNING

Cleaning solvent is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with cleaning solvent. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

WARNING

Eye protection is required when working with compressed air. Compressed air can propel particles at high velocity and injure eyes. Do not exceed 15 psi pressure when using compressed air. Failure to comply with this warning can cause injury to personnel.

3. Clean magnetic pickup (6) with dry, filtered compressed air and wipe with a cleaning cloth (WP 0159, Item 9) lightly moistened with dry cleaning solvent (WP 0159, Item 21).
4. Inspect magnetic pickup (6) for cracked casing, stripped or damaged threads, corrosion, or other visible damage.
5. If no repair is needed, install magnetic pickup (6) (Installation).

END OF TASK**INSTALLATION**

1. Install reducer bushing (WP 0110, Figure 1, Item 7) into flywheel housing. Screw magnetic pickup (6) into reducer bushing (7) until contact is made with top surface of gear tooth on flywheel. Back magnetic pickup (6) off one complete revolution and tighten locknut (6A).
2. Connect electrical leads; remove tags.
3. Connect negative battery cable and close battery access door.
4. Adjust magnetic pickup (Adjustment).
5. Close left side engine access doors.

END OF TASK**ADJUSTMENT**

1. Release control panel by turning two fasteners and lower control panel slowly.
2. Disconnect wire 147C from terminal 16 and wire 148C from terminal 17 of governor control unit (WP 0043, Figure 1, Item 56).
3. Set multimeter for ohms and connect to ends of disconnected wires 147C and 148C. Multimeter should indicate between 800 and 900 ohms.
4. Leave multimeter connected to wires 147C and 148C and set multimeter for AC volts.
5. Crank engine with DEAD CRANK switch (WP 0110, Figure 1, Item 11) and observe multimeter. Multimeter indication should be between 2.0 and 3.0 VAC.

CAUTION

Do not adjust magnetic pickup (6) inward more than one eighth turn each time or damage to magnetic pickup may result.

6. To adjust output voltage in Step 5 above, loosen locknut (6A) and turn magnetic pickup (6) in no more than one-eighth turn at a time to increase or decrease output voltage. Tighten locknut (6A).
7. Repeat Steps 5 and 6 above until proper output voltage is achieved.
8. Remove multimeter and connect wires to governor control unit (WP 0043, Figure 1, Item 56).
9. Raise and secure control panel.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF ENGINE ACCESSORIES, DEAD CRANK SWITCH: TESTING, REMOVAL,
INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator**References**

WP 0110, Figure 1, Items: 8 & 11

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

Equipment ConditionGrounded, Off & Operational

TESTING**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Tag and disconnect electrical leads from DEAD CRANK switch (WP 0110, Figure 1, Item 11).
4. Set multimeter for ohms and, with switch (11) in NORMAL position, check for continuity between contacts 2 and 3.
5. Move switch (11) to CRANK position and check for continuity between contacts 1 and 2.
6. If DEAD CRANK switch (11) fails continuity checks, replace switch.
7. If replacement is not needed, connect electrical leads to switch (11) and remove tags.
8. Close left side engine access doors, connect negative battery cable, and close battery access door.

END OF TASK**REMOVAL****WARNING**

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Open left side engine access doors and remove nut (WP 0110, Figure 1, Item 8), lockwasher (9), and tab washer (10). Discard lockwasher (9).
4. Remove DEAD CRANK switch (11) from governor actuator mounting plate.
5. Tag and disconnect DEAD CRANK switch (11) electrical leads.

END OF TASK**INSTALLATION**

1. Connect electrical leads to DEAD CRANK switch (WP 0110, Figure 1, Item 11) and remove tags.
2. Install DEAD CRANK switch (11) in governor actuator mounting plate with tab washer (10), new lockwasher (9), and nut (8). Close left side engine access doors.
3. Connect negative battery cable and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF ENGINE ACCESSORIES, DIODE ASSEMBLY: REMOVAL, TESTING, REPAIR,
INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Diode Assembly (If indications do not comply with testing)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0110, Figure 1, Items: 12 & 13

Equipment ConditionGrounded, Off & Operational

REMOVAL**WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

Shut down generator set before performing inspection of wiring. Failure to comply with this warning can cause injury or death to personnel.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open left side engine access doors.
3. Remove nuts (WP 0110, Figure 1, Item 12) and diode assembly (13) from top of fuel injection pump.

END OF TASK**TESTING**

1. Shut down generator set.
2. Remove diode assembly (WP 0110, Figure 1, Item 13) (Removal).
3. Set multimeter for ohms and connect positive lead to terminal on banded side of diode assembly and negative lead to plain side. Note ohms indication on multimeter.
4. Reverse multimeter leads on diode assembly. Note ohms indication on multimeter.
5. Multimeter indication should be high in Step 3 and low in Step 4.
6. Diode assembly (13) is defective and must be replaced if indications are other than above.
7. If replacement is not needed, install diode assembly (13) (Installation).

END OF TASK**REPAIR**

Repair diode assembly (WP 0110, Figure 1, Item 13) by replacing damaged terminal ends.

END OF TASK**INSTALLATION**

1. Position diode assembly (WP 0110, Figure 1, Item 13) on fuel injection pump with band end toward engine.
2. Secure diode assembly (13) to fuel injection pump with nuts (12).
3. Close left side engine access doors, connect negative battery cable, and close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF ENGINE ACCESSORIES, GOVERNOR ACTUATOR: TESTING, REMOVAL,
INSTALLATION, ADJUSTMENT**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Safety Goggles & Chemical Gloves

Protective Clothing & Heat Resistant Gloves

New Lockwashers

Governor Actuator (If does not comply with Testing

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

ReferencesWP 0115, Maintenance of Engine Accessories,
Dead Crank Switch**Equipment Condition**

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Batteries give off a flammable gas. Do not smoke or use open flame when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Battery acid can cause burns to unprotected skin. Wear safety goggles and chemical gloves and avoid acid splash while working on batteries. Failure to comply with this warning can cause injury to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Fuels used in the generator set are flammable. Do not smoke or use open flames when performing maintenance. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

WARNING

Fuels used in the generator set are flammable. When filling the fuel tank, maintain metal-to-metal contact between filler nozzle and fuel tank opening to eliminate static electrical discharge. Failure to comply with this warning can cause injury or death to personnel, and damage to the generator set.

TESTING

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Open left side engine access doors and disconnect connector (Figure 1, Item 1) from engine electrical harness.
4. Connect 5 ohm, 25 watt resistor in series with pin 2 of connector (1) and ground.

5. Connect jumper wire from pin 1 of connector (1) to battery positive terminal (24 VDC).
6. Connect negative battery cable; governor actuator (11) shaft should extend to full fuel position.
7. Disconnect negative battery cable; governor actuator (11) shaft should retract to no fuel position.
8. Replace governor actuator (11) if it does not function as above.
9. Remove resistor and jumper wire from connector (1), ground, and battery.
10. Connect connector (1) to engine electrical harness. Close left side engine access doors.
11. Connect negative battery cable. Close battery access door.

END OF TASK

REMOVAL

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Open left side engine access doors and remove DEAD CRANK switch (WP 0115, Removal).
4. Tag and disconnect connector (Figure 1, Item 1) from engine electrical harness.
5. Remove nuts (2 and 3), bolt (4), and rod assembly (5) from fuel injection pump lever and clevis (7).
6. Loosen nut (6) and unscrew clevis (7) from governor actuator (11) shaft.

NOTE

Count number of turns required to remove clevis (7) for initial adjustment during installation.

7. Remove nuts (8 and 28), lockwashers (9), bolts (10), and governor actuator (11) from mounting bracket (18). Discard lockwashers (9).
8. Remove nut (12), bolt (13), and clamp (14) securing electrical wiring to mounting bracket (18).
9. Remove nuts (15), lockwashers (16), washers (17), and mounting bracket (18) from front cover mounting bolts. Discard lockwashers (16).

NOTE

Count number of turns required to separate rod ends for initial adjustment during installation.

10. If necessary, disassemble rod assembly (5) by loosening nuts (19 and 20) and unscrewing rod ends (21 and 22) from rod (23).
11. If necessary, remove nut (24) and bolt (25) from rod end (22).
12. If necessary, drill out rivets (26) and remove identification plate (27) from bracket (18).

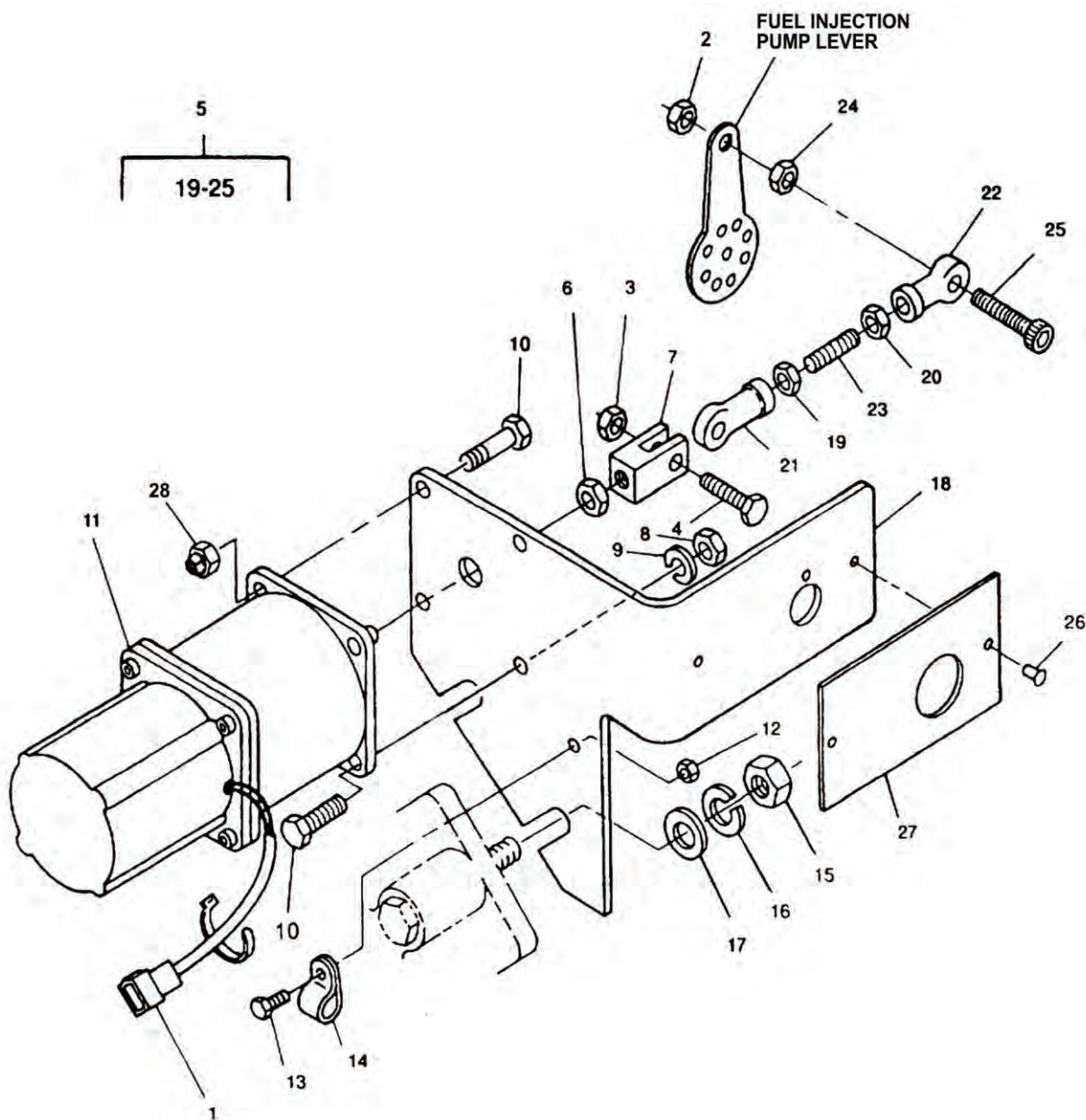


Figure 1. Governor Actuator Assembly.

END OF TASK

INSTALLATION

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after components have been heated. Wear additional protective clothing as required. Failure to comply with this warning can cause injury to personnel.

1. If disassembled, screw rod ends (Figure 1, Items 21 and 22) onto rod (23) the same number of turns noted on disassembly, and tighten nuts (19 and 20) finger tight only.
2. If removed, install bolt (25) and nut (24) into rod end (22).
3. If removed, install identification plate (27) on bracket (18) with rivets (26).
4. Install mounting bracket (18) on front cover mounting bolts with washers (17), new lockwashers (16), and nuts (15).
5. Secure electrical wiring to mounting bracket (18) with clamp (14), bolt (13), and nut (12).
6. Install governor actuator (11) on mounting bracket (18) with bolts (10), new lockwashers (9) and nuts (8 and 28).
7. Screw clevis (7) on governor actuator (11) shaft the same number of turns noted on disassembly, and tighten nut (6) finger tight only.
8. Install rod assembly (5) on injection pump lever and clevis (7) with bolt (4) and nuts (2 and 3).
9. Install DEAD CRANK switch (WP 0115, Installation).
10. Connect connector (1) to engine harness and remove tag.
11. Connect negative battery cable and close battery access door.
12. Adjust governor actuator (Adjustment).

END OF TASK**ADJUSTMENT**

1. Tag and disconnect connector (Figure 1, Item 1) from engine harness.
2. Remove nut (2) and disconnect rod assembly (5).
3. Manually move fuel injection pump lever to full fuel position.
4. Start generator set while holding fuel injection pump lever in position.
5. Slowly move fuel injection pump lever toward no fuel position until generator set shuts down.
6. Mark position of fuel injection pump lever on engine block at exact no fuel (shut down) point. Measure injection pump lever center line position to mounting surface of actuator. Refer to Figure 2.
7. Adjust rod assembly (Figure 1, Item 5) and clevis (7) as necessary so that center line of fuel injection pump lever when connected and measured as in Step 6, will be positioned past the no fuel point by 0.125 to 0.250 inch (3.17 to 6.35mm). Tighten nuts (6, 19, and 20).
8. Install rod assembly (5) on fuel injection pump lever with nut (2).
9. Connect connector (1) to engine harness.

10. Start generator set, check generator performance and adjust governor control unit as necessary in accordance with WP 0061, Adjustment.

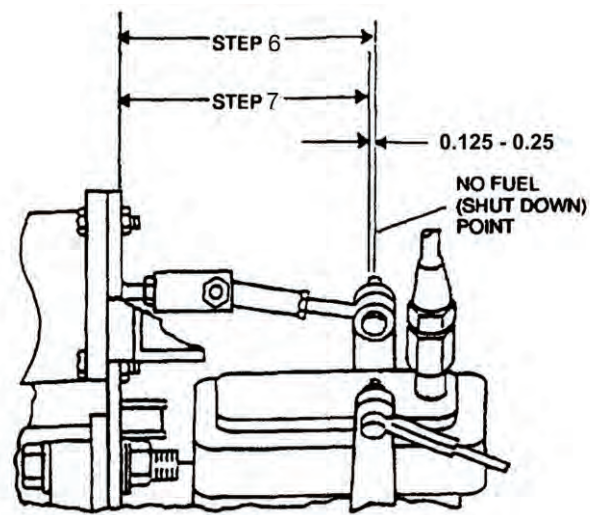


Figure 2. Governor Actuator Adjustment.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF LUBRICATION SYSTEM, OIL DRAIN LINE: INSPECTION, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Heat Resistant Gloves

Protective Eyewear

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

References

WP 0006, Service Upon Receipt, Lubricating Oil

Equipment ConditionGrounded, Off & Operational

INSPECTION**WARNING**

The high pressure oil system operates at high temperature and pressure. Contact with hot oil can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Wear heat resistant gloves and avoid contacting hot surfaces. Do not allow hot oil or components to contact skin or hands. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Oil filter base and housing springs are under tension and can act as projectiles when being removed. Use eye protection when removing springs. Failure to comply with this warning can cause injury to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery and right side engine access doors.
3. Inspect oil drain line for cracks, holes, loose or missing hardware, and other damage.
4. Close battery and right side engine access doors.

END OF TASK**REMOVAL****WARNING**

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

When running, generator set engine has hot metal surfaces that will burn flesh on contact. Shut down generator set and allow engine to cool before performing checks, services, and maintenance. Wear gloves and additional protective clothing as required. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door, disconnect negative battery cable, and open right side engine access doors.
3. Remove plug (Figure 1, Item 1), open drain valve (2), and drain engine oil into suitable container.
4. Loosen clamp (3) and remove oil drain hose from adapter (4).
5. Remove drain valve (2) from skid fitting.
6. Remove adapter (4) and pipe fitting (5) from oil drain valve (2).

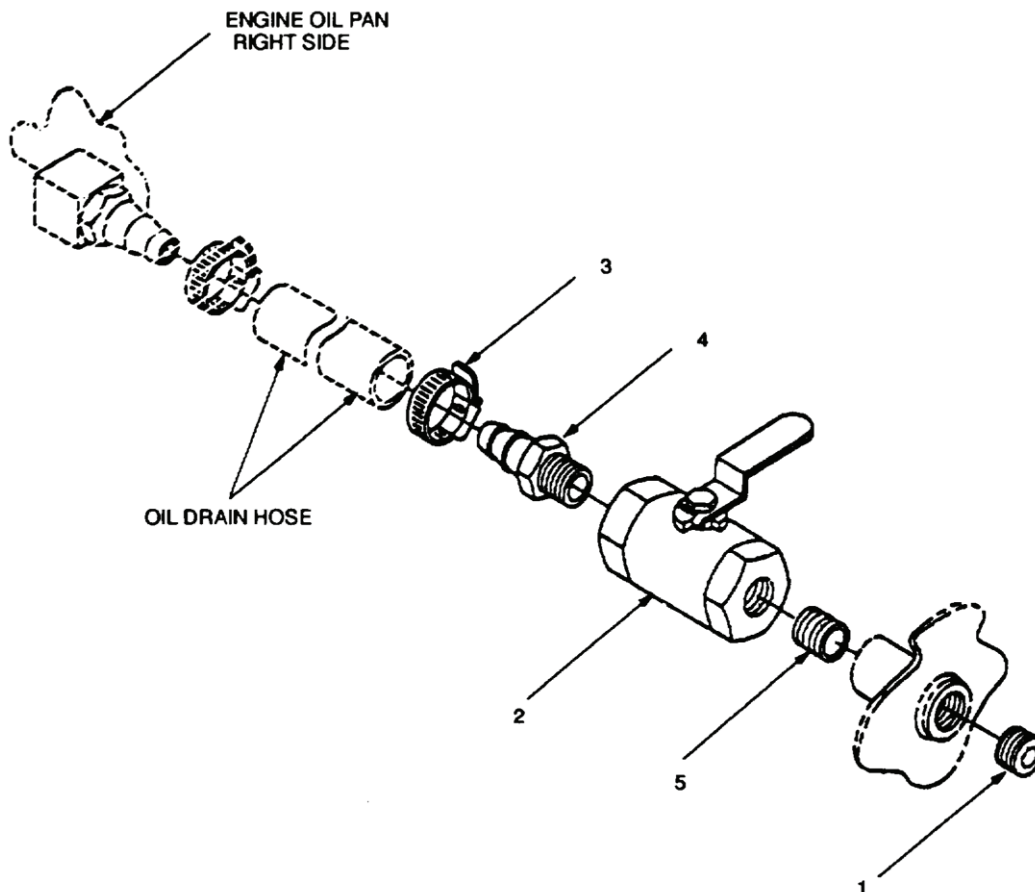


Figure 1. Oil Drain Line.

END OF TASK

INSTALLATION

1. Install adapter (Figure 1, Item 4) and pipe fitting (5) in oil drain valve (2).
2. Install oil drain valve (2) on skid fitting.
3. Install oil drain hose on adapter (4). Secure with clamp (3).
4. Ensure oil drain valve (2) is closed. Install plug (1) and service engine oil (WP 0006, Lubricating Oil).
5. Check engine oil drain line and valve for leakage.
6. Connect negative battery cable. Close battery and right side engine access doors.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF GENERATOR ASSEMBLY, GENERATOR ASSEMBLY: REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0018, Maintenance of Control Box Assembly, Rear Housing Section

WP 0098, Maintenance of Output Box Assembly, Output Box Assembly

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere. Failure to comply with this warning can cause injury or death to personnel.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

WARNING

High voltage is produced when the generator set is in operation. DO NOT touch live voltage connections. Never attempt to connect or disconnect load cables or paralleling cables while the generator set is running. Failure to comply with this warning can cause injury or death to personnel.

REMOVAL**WARNING**

When disconnecting or removing batteries, disconnect the negative lead that connects directly to the grounding stud first; disconnect the negative end of the interconnection cable next. When installing batteries, reverse the connection sequence. Failure to comply with this warning can cause injury to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove output box assembly (WP 0098, Removal).
4. Remove generator set rear housing section (WP 0018, Removal).
5. Loosen bolts (Figure 1, Item 1) and lower engine support brackets (2) to contact skid base. Tighten bolts. If necessary, place wooden shims under brackets to ensure contact with skid base.

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Rated capacity of overhead hoist should be at least 1,500 pounds (680 kg). Do not use a hoist with less capacity. Failure to comply with this warning can cause injury or death to personnel, and damage to equipment.

WARNING

Keep hands and feet from underside of engine and generator while using lifting device to remove them from the skid base. Failure to comply with this warning can cause injury or death to personnel.

6. Attach lifting harness to overhead hoist and generator lifting eye and take up slack.
7. Remove nuts (3), lockwashers (4), washers (6), screws (5) and screen/cover (7) from generator case. Discard lockwashers (4).
8. Remove bolts (8) and lockwashers (9) securing generator disc drive to engine flywheel. Discard lockwashers (9).
9. Remove bolts (11) and lockwashers (13) securing generator to flywheel housing. Discard lockwashers (13).

10. Remove nuts (14), washers (15), snubbing washers (16), bolts (18), and Belleville washers (17) securing generator to skid base.
11. Lift generator slowly from skid base, ensuring that engine flywheel housing and generator separate smoothly to avoid any undue stress.

NOTE

Mark location of spacers, washers, and bolts to ensure correct positioning during installation.

12. Remove shock mounts (19) from skid base.
13. Remove nuts (20), washers (21), bolts (10), angles (24), and plates (12) from generator.

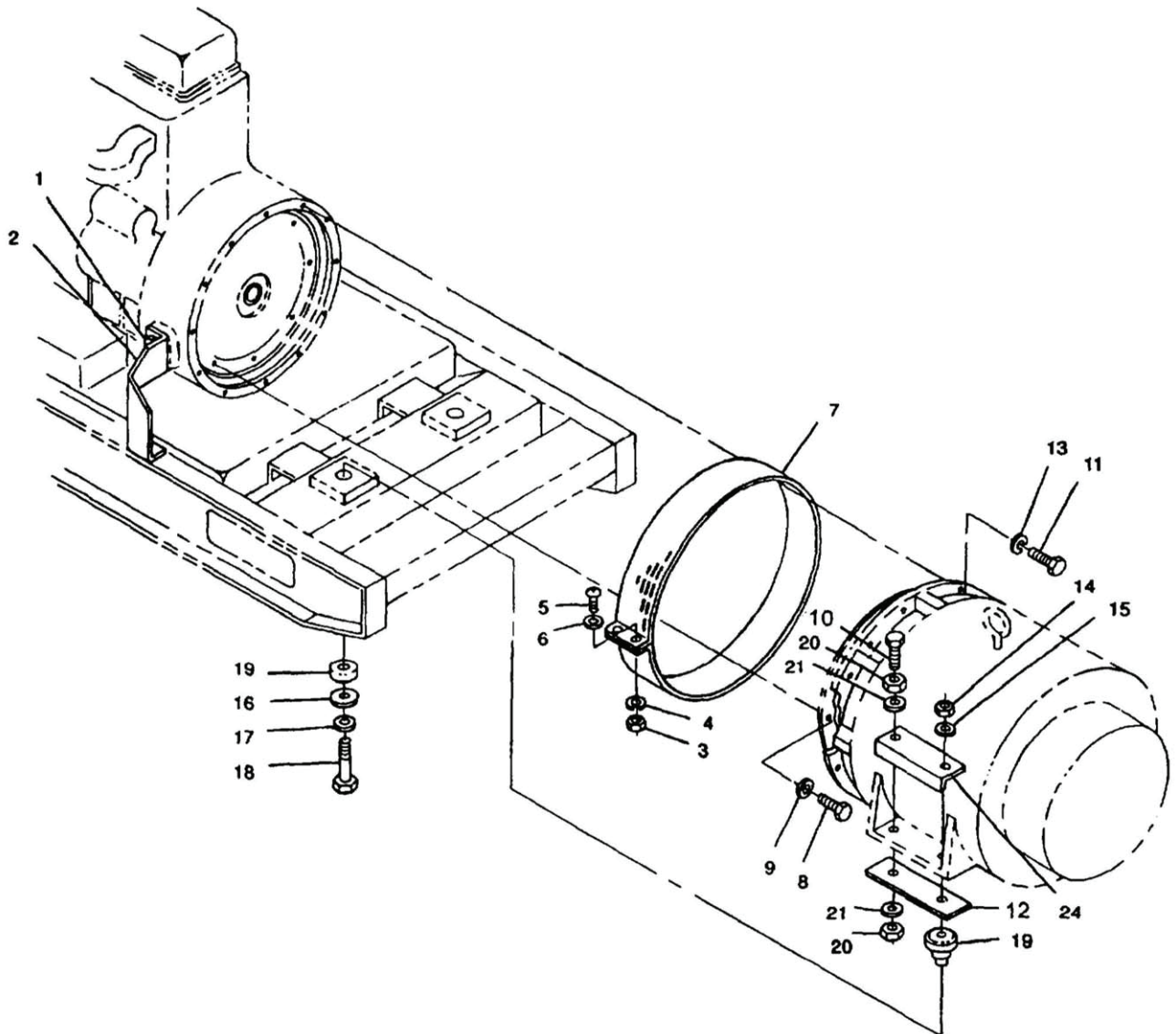


Figure 1. Generator Assembly Removal.

END OF TASK

INSTALLATION

1. Position generator shock mounts (Figure 1, Item 19) in skid base.
2. Install angles (24) and plates (12) on generator with bolts (10), washers (21), and nuts (20).

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Rated capacity of overhead hoist should be at least 1,500 pounds (680 kg). Do not use a hoist with less capacity. Failure to comply with this warning can cause injury or death to personnel, and damage to equipment.

WARNING

Keep hands and feet from underside of engine and generator while using lifting device to remove them from the skid base. Failure to comply with this warning can cause injury or death to personnel.

3. Attach lifting harness to overhead hoist and generator lifting eye.
4. Position generator on skid base aligning mounting holes with mounts and engine flywheel housing.
5. Install bolts (11) and new lockwashers (13), tightening bolts (11) slowly to ensure even and proper seating of generator housing lip to flywheel housing.
6. Install bolts (18), Belleville washers (17), snubbing washers (16), washers (15), and nuts (14) securing generator assembly to skid base. Torque nuts (14) to 210 ft•lbs (285 N•m).
7. Align scribe mark on generator drive disc and engine flywheel, and install bolts (8) and new lockwashers (9) securing generator drive disc to engine flywheel.
8. Install screen/cover (7) on generator case with screws (5), washers (6), new lockwashers (4), and nuts (3).
9. Adjust nuts (20) on generator mount to obtain 0.5 inch (12.7 mm) minimum clearance between ends of bolts (10) and skid base.
10. Install generator set rear housing section (WP 0018, Installation).
11. Install output box assembly (WP 0098, Installation).
12. Connect negative battery cable. Close battery access door.
13. Start generator set and check for proper operation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF GENERATOR ASSEMBLY, ROTATING RECTIFIER DIODES: TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

TM 9-2815-255-24

WP 0018, Maintenance of Control Box Assembly, Rear Housing Section

WP 0121, Maintenance of Generator Assembly, End Bell and Main Bearing

WP 0159, Item 10

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

TESTING

1. Shut down generator set. Allow generator to cool to ambient temperature.
2. Open battery access door and disconnect negative battery cable.
3. Remove generator set housing rear panel (WP 0018, Removal).

4. Remove generator end bell cover plates (WP 0121, Removal, Step 4).

NOTE

It will be necessary to bar (turn) engine in order to position a specific area of the rotating rectifier at one of the end bell access holes. Use center bolt on harmonic balancer to turn engine; refer to TM 9-2815-255-24.

5. Remove nuts (Figure 1, Item 1) and lockwashers (2) from rotating rectifier terminals. Discard lockwashers (2).
6. Tag and remove main rotor and diode leads from rotating rectifier terminals.

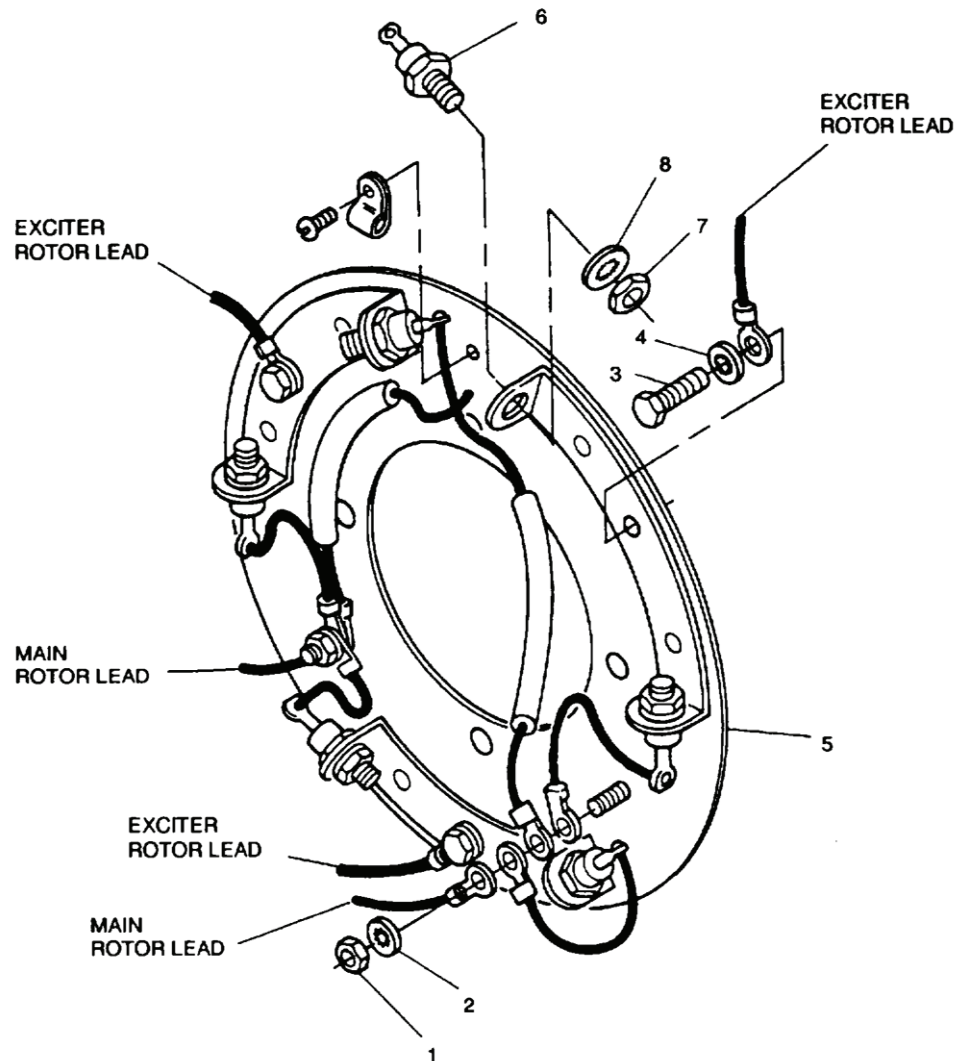


Figure 1. Rectifier Assembly.

7. Tag exciter rotor leads and remove bolts (3), washers (4), and exciter rotor leads from rectifier mounting plate (5).
8. Set multimeter for ohms and connect positive lead to one side and negative lead to other side of each diode (6). Record multimeter reading for each diode.
9. Repeat Step 8 above with multimeter leads reversed.
10. Resistance (ohms) readings should be low in one direction and high in reversed direction. If readings are high or low in both directions, diode (6) is defective and must be replaced.

11. Install diode (6) and main rotor leads to rotating rectifier terminals with nuts (1) and new lockwashers (2). Remove tags.
12. Install exciter rotor leads to rectifier mounting plate (5) with washers (4) and bolts (3). Remove tags.
13. Install generator end bell cover plates (WP 0121, Installation, Step 6).
14. Install generator set housing rear panel (WP 0018, Installation).
15. Connect negative battery cable. Close battery access door.

END OF TASK

REMOVAL

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove generator set housing rear panel (WP 0018, Removal).
4. Remove generator end bell top cover and louvered covers (WP 0121, Removal, Step 4).

NOTE

It will be necessary to bar (turn) engine in order to position a specific area of the rotating rectifier at one of the end bell access holes. Use center bolt on harmonic balancer to turn engine; refer to TM 9-2815-255-24.

5. Unsolder electrical lead from diode (Figure 1, Item 6) being removed.
6. Remove nut (7), lockwasher (8), and diode (6) from rectifier mounting plate (5) through access hole in end bell. Discard lockwasher (8).

END OF TASK

INSTALLATION

1. Run bead of thermal-electric compound (WP 0159, Item 10) around base of diode (Figure 1, Item 6) prior to installing. Do not coat threads.
2. Insert diode (6) through generator end bell access hole, and install on rectifier mounting plate (5) with new lockwasher (8) and nut (7). Torque nut (7) 28 to 30 in•lbs. (3.16 to 3.38 N•m).

3. Using solder (WP 0159, 20) and soldering iron, solder electrical lead to diode (6).
4. Install generator end bell top cover and louvered covers (WP 0121, Installation, Step 6).
5. Install generator set housing rear panel (WP 0018, Installation).
6. Connect negative battery cable. Close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
MAINTENANCE OF GENERATOR ASSEMBLY, END BELL AND MAIN BEARING: REMOVAL,
INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

New Bearing (If removing bearing for any reason)

Personnel RequiredTwo: (1) Power Generation Mechanic (52D) & (1)
Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

TM 9-2815-255-24

WP 0018, Maintenance of Control Box Assembly,
Rear Housing Section**Equipment Condition**

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

REMOVAL

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove generator set housing rear panel (WP 0018, Removal).
4. Remove bolts (Figure 2, Item 1), lockwashers (2), top cover (3), and louvered covers (4) from end bell (5). Discard lockwashers (2).

CAUTION

The end bell supports the main rotor, thus the rotor will drop on the stator once the end bell is removed. Prior to proceeding, bar engine by using center bolt on harmonic balancer (refer to TM 9-2815-255-24) until two main rotor poles are vertical in generator stator. Having the rotor in this position will limit the amount of drop, otherwise, damage to rotor and/or stator could occur.

5. Remove bolts (6) and lockwashers (7) from end bell (5). Discard lockwashers (7).
6. Install two bolts (6) in "backout" holes in end bell (5) flange; refer to Figure 1.
7. Loosen lead clamp assembly (Figure 2, Item 33) clamping generator leads at side of generator housing. Ensure that wires F1 and F2 are free to slide in and out of generator housing.
8. Remove end bell (5), with exciter stator (16) attached, from generator housing (11) by tightening bolts (6) evenly into "back-out" holes.
9. Remove preformed packing (9) from end bell (5).

CAUTION

If bearing needs to be removed for any reason, always install new bearing. Main bearing is easily damaged when removed from rotor shaft. Damage to equipment could result.

10. Using bearing puller, remove bearing (8) from main rotor shaft (10).

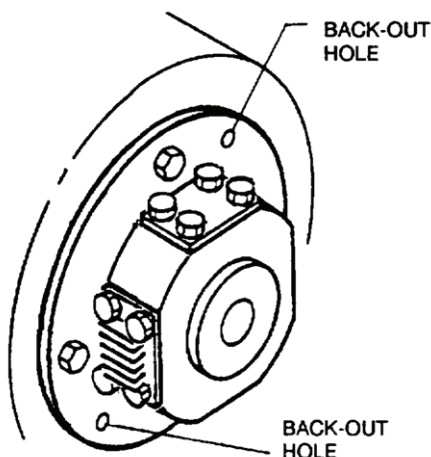


Figure 1. End Bell Removal.

END OF TASK

INSTALLATION

1. Install bearing (Figure 2, Item 8). Ensure that bearing is seated squarely against main rotor shaft (10) shoulder by applying pressure to inner race only.

CAUTION

If bearing needs to be removed for any reason, always install new bearing. Main bearing is easily damaged when removed from rotor shaft. Damage to equipment could result.

2. Install preformed packing (9) in end bell (5).
3. Position bearing (8) in end bell (5).

NOTE

It may be necessary to use a lifting device to raise and align end bell (5) with generator housing (11).

4. Position end bell (5), with exciter stator (16) attached, on generator housing (11) while pulling slack of wires F1 and F2 through side of generator housing. Secure end bell (5) with bolts (6) and new lockwashers (7). Torque bolts (6) 59 to 61 in•lbs (6.7 to 7.0 N•m).
5. Tighten lead clamp assembly (33) at side of generator housing ensuring that generator leads are clamped securely.
6. Install top cover (3) and louvered covers (4) on end bell (5) with bolts (1) and new lockwashers (2).
7. Install generator set housing rear panel (WP 0018, Installation).
8. Connect negative battery cable. Close battery access door.

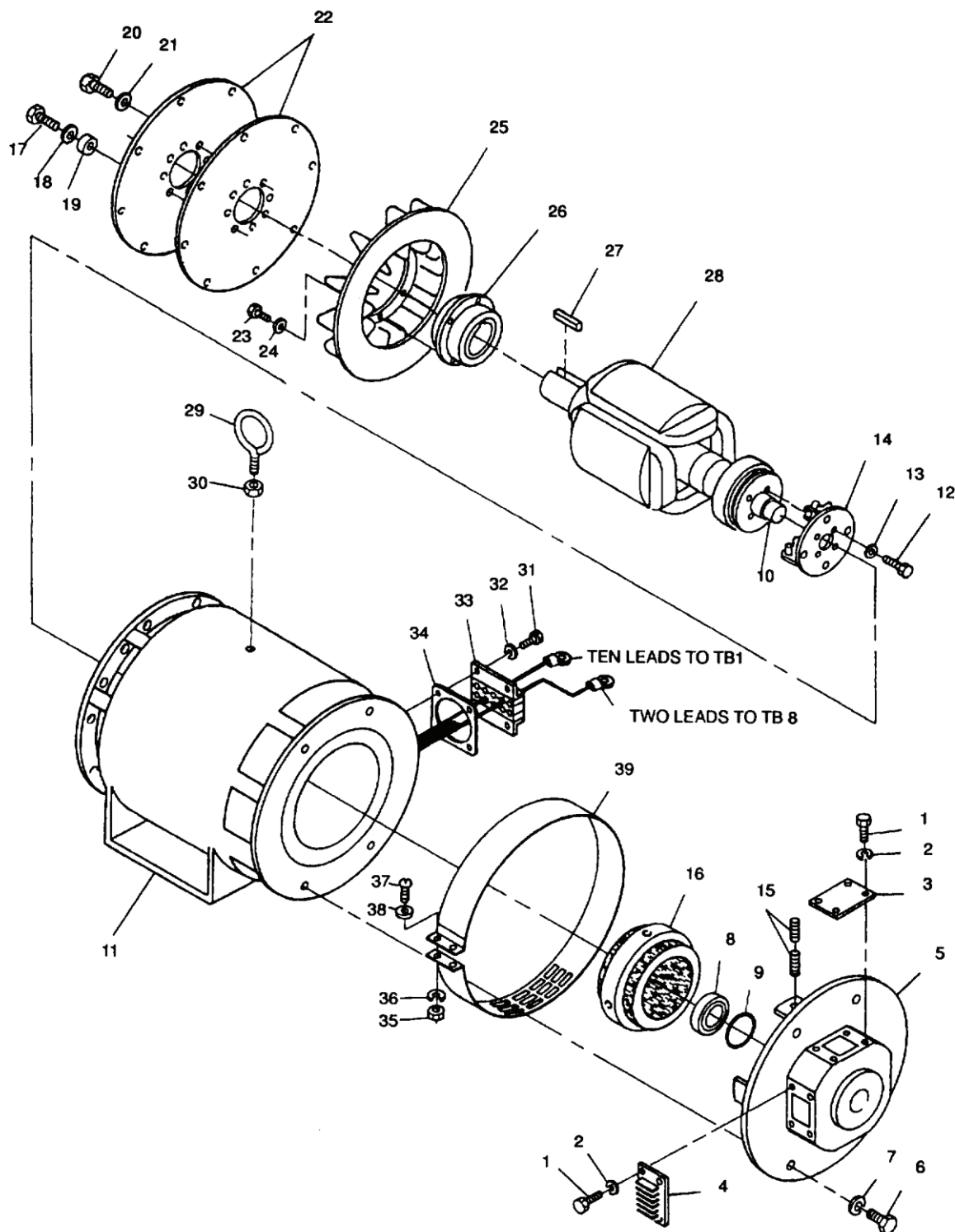


Figure 2. Generator Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF GENERATOR ASSEMBLY, ROTATING RECTIFIER: REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0018, Maintenance of Control Box Assembly, Rear Housing Section

WP 0120, Figure 1, Items: 2 & 3

WP 0121, Figure 2, Items: 12 & 14

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

REMOVAL**WARNING**

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove generator set housing rear panel (WP 0018, Removal).
4. Remove generator end bell and main bearing (WP 0121, Removal).
5. Remove bolts (WP 0120, Figure 1, Item 3) and lockwashers (4) securing exciter rotor leads (3 places) to rotating rectifier. Tag and remove exciter rotor leads. Discard lockwashers (4).
6. Remove nuts (1) and lockwashers (2); tag and remove two main rotor leads and rotating rectifier diode leads. Discard lockwashers (2).
7. Remove bolts (WP 0121, Figure 2, Item 12), lockwashers (13), and rotating rectifier (14) from rotor assembly (28).

END OF TASK**INSTALLATION**

1. Install rotating rectifier (WP 0121, Figure 2, Item 14) on rotor assembly (28) with bolts (12) and new lockwashers (13).
2. Connect two main rotor leads and rotating rectifier diode leads with new lockwashers (WP 0120, Figure 1, Item 2) and nuts (1).
3. Connect three exciter rotor leads to rotating rectifier with bolts (3) and new lockwashers (4).
4. Install main bearing and generator end bell (WP 0121, Installation).
5. Install generator set housing rear panel (WP 0018, Installation).
6. Connect negative battery cable. Close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF GENERATOR ASSEMBLY, EXCITER STATOR: TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Exciter Stator (If multimeter reading doesn't comply with Table 1 in this work package)

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0018, Maintenance of Control Box Assembly, Rear Housing Section

WP 0121, Figure 2, Items 15 & 16

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

TESTING

1. Shut down generator set. Allow generator to cool to ambient temperature.
2. Open battery access door and disconnect negative battery cable.
3. Open output box access door and disconnect exciter field leads F1 and F2 from terminals 1 and 2 of TB8.
4. Set multimeter for ohms and connect between disconnected exciter field leads. Multimeter reading should be

as shown in Table 1.

5. A multimeter reading other than shown in Table 1 indicates open or shorted windings an exciter stator must be replaced.

Table 1. Generator Resistance Values at 25 °C (77 °F).

Component	Resistance	
	MEP-805A	MEP-815A
Exciter Stator	Between 24.85 and 33.61 ohms	Between 24.9693 and 33.7819 ohms
Exciter Rotor	Between 0.202 and 0.274 ohms	Between 0.2061 and 0.2787 ohms
Generator Rotor	Between 1.03 and 1.51 ohms	Between 1.9874 and 2.6888 ohms
Generator Stator	Between 0.0736 and 0.0994 ohms	Between 0.0306 and 0.0412 ohms

NOTE

Ambient temperature must be expressed in °C. To convert °F to °C, use $^{\circ}\text{F} = ^{\circ}\text{C} \times 9/5 + 32$.

- a. To determine the resistance values at current ambient temperature, use the following formula:

$$R_1 = R_{25} [1 + 0.00385 (T - 25)]$$

Where:

R_1 = Unknown resistance

R_{25} = Known resistance at 25 °C (77 °F)

T = Current ambient temperature

- b. Example for exciter stator leads at 5 °C (41 °F):

$$R_1 = 33.714 [1 + 0.00385 (5 - 25)]$$

$$R_1 = 33.714 [1 + 0.00385 (-20)]$$

$$R_1 = 33.714 [1 \pm 0.077]$$

$$R_1 = 33.714 [0.923]$$

$$R_1 = 31.118 \pm 15\% \text{ ohms}$$

6. Connect multimeter between each exciter field lead and generator frame in turn.
7. A multimeter reading of less than infinity indicates defective ground insulation and exciter stator must be replaced.
8. Connect exciter field leads to terminals 1 and 2 of TB8. Close output box access door.
9. Connect negative battery cable. Close battery access door.

END OF TASK

REMOVAL

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Open battery access door and disconnect negative battery cable.
3. Remove generator set housing rear panel (WP 0018, Removal).
4. Open output box access door and disconnect exciter field leads F1 and F2 from terminals TB8-1 and TB8-2.
5. Attach "fish wires" to disconnected F1 and F2 leads to aid in installation process.
6. Remove generator end bell (WP 0121, Removal).
7. Remove setscrews (WP 0121, Figure 2, Item 15) and exciter stator (16) from end bell (5).
8. Detach "fish wires" once F1 and F2 leads clear generator housing (11).

END OF TASK**INSTALLATION**

1. Attach "fish wires" to F1 and F2 leads of exciter stator (WP 0121, Figure 2, Item 16).
2. Gently pull on "fish wires" to pull F1 and F2 leads back through generator housing (11). Disconnect "fish wires" and position F1 and F2 leads in output box.
3. Position exciter stator (16) in end bell (5) and secure in place with setscrews (15).
4. Install generator end bell (WP 0121, Installation).
5. Install generator set housing rear panel (WP 0018, Installation).
6. Connect exciter field leads F1 and F2 to terminals TB8-1 and TB8-2. Close output box access door.
7. Connect negative battery cable. Close battery access door.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF GENERATOR ASSEMBLY, EXCITER ROTOR: TESTING**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Excitor Rotator (If multimeter readings do not comply with testing)
New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

TM 9-2815-255-24

WP 0018, Maintenance of Control Box Assembly, Rear Housing Section

WP 0120, Figure 1, Items: 3 & 4

WP 0121, Removal, Steps: 4 & Installation, Step 6

WP 0123, Table 1

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

TESTING

1. Shut down generator set. Allow generator to cool to ambient temperature.
2. Open battery access door and disconnect negative battery cable.

3. Remove generator set housing rear panel (WP 0018, Removal).
4. Remove generator end bell top cover and louvered covers (WP 0121, Removal, Step 4).
5. Tag and disconnect exciter rotor leads (3 places) from rotating rectifier by removing bolts (WP 0120, Figure 1, Item 3) and lockwashers (4). Discard lockwashers.

NOTE

It will be necessary to bar (turn) engine in order to position a specific area of the rotating rectifier at one of the end bell access holes. Use center bolt on harmonic balancer to turn engine; refer to TM 9-2815-255-24.

6. Connect resistance bridge between two exciter rotor leads and note resistance reading. Continue this procedure until readings are noted for each combination of leads (i.e., 1 and 2, 1 and 3, and 2 and 3).
7. Resistance readings should be as shown in WP 0123, Table 1 for each combination of leads. A reading other than shown in WP 0123, Table 1 indicates open or shorted windings and exciter rotor must be replaced.
8. Set multimeter for ohms and connect between each exciter rotor lead and end bell in turn.
9. A multimeter reading of less than infinity indicates defective ground insulation and the exciter rotor must be replaced.
10. Connect exciter rotor leads to rotating rectifier with new lockwashers (WP 0120, Figure 1, Item 4) and bolts (3). Remove tags.
11. Install end bell top cover and louvered covers (WP 0121, Installation, Step 6).
12. Install generator set housing rear panel (WP 0018, Installation).
13. Connect negative battery cable. Close battery access door.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF GENERATOR ASSEMBLY, MAIN ROTOR ASSEMBLY: TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

TM 9-2815-255-24

WP 0018, Maintenance of Control Box Assembly, Rear Housing Section

WP 0119, Maintenance of Generator Assembly, Generator Assembly

WP 0120, Figure 1, Item 1

WP 0121, Removal, Steps: 4, Installation, Step 6 & Figure 2, Items: 19, 27 & 28

WP 0122, Maintenance of Generator Assembly, Rotating Rectifier

WP 0123, Table 1

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

TESTING

1. Shut down generator set. Allow generator to cool to ambient temperature.
2. Open battery access door and disconnect negative battery cable.
3. Remove generator set housing rear panel (WP 0018, Removal).
4. Remove generator end bell cover plates (WP 0121, Removal, Step 4).
5. Tag and disconnect main rotor leads (2 places) from rotating rectifier by removing nuts (WP 0120, Figure 1, Item 1) and lockwashers (2). Discard lockwashers (2).

NOTE

It will be necessary to bar (turn) engine in order to position a specific area of the rotating rectifier at one of the end bell access holes. Use center bolt on harmonic balancer to turn engine; refer to TM 9-2815-255-24.

6. Set multimeter for ohms and connect between disconnected main rotor leads. Multimeter reading should be as shown in WP 0123, Table 1.
7. A reading other than shown in WP 0123, Table 1 indicates shorted or open windings and main rotor must be replaced.
8. Connect multimeter between each main rotor lead and end bell in turn.
9. A reading of less than infinity indicates defective ground insulation and main rotor must be replaced.
10. Connect main rotor leads to rotating rectifier with nuts (WP 0120, Figure 1, Item 1) and new lockwashers (2). Remove tags.
11. Install generator end bell top cover and louvered covers (WP 0121, Installation, Step 6).
12. Install generator set housing rear panel (WP 0018, Installation).
13. Connect negative battery cable. Close battery access door.

END OF TASK

REMOVAL

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Remove generator assembly from generator set (WP 0119, Removal).

NOTE

Mark location of spacers (WP 0121, Figure 2, Item 19), washers (18), and bolts (17) to ensure correct positioning during installation.

3. Remove bolts (17 and 20), washers (18 and 21), spacers (19), and drive discs (22) from drive hub (26).
4. Remove bolts (23), lockwashers (24), and fan (25) from drive hub (26). Discard lockwashers (24).
5. Attach a suitable rotor lifting device to drive hub (26) and overhead hoist (Figure 1).
6. Remove generator end bell (WP 0121, Removal).

CAUTION

Special care should be taken when removing rotor assembly. Winding damage could result if rotor is allowed to hit main stator.

7. Carefully remove rotor assembly (WP 0121, Figure 2, Item 28) and attached components from main stator and generator housing (11).
8. Remove main bearing (WP 0121, Removal)
9. Remove rotating rectifier (WP 0122, Removal).
10. Using bearing puller, remove drive hub (26) and key (27) from rotor assembly (28).

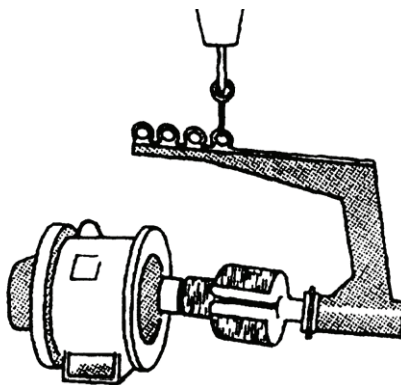


Figure 1. Rotor Assembly Lifting Device (Typical).

END OF TASK**INSTALLATION**

1. Place key (WP 0121, Figure 2, Item 27) on rotor assembly (28) and install drive hub (26) over key (27) and onto main rotor assembly (28).

NOTE

Ensure gap between fan halves are equal from side to side.

2. Install rotating rectifier (WP 0122, Installation).
3. Install main bearing (WP 0121, Installation).

CAUTION

Special care must be taken when installing rotor assembly. Winding damage could result if rotor is allowed to hit main stator.

4. Attach a suitable rotor lifting device to drive hub (26) and overhead hoist (Figure 1).

5. Carefully install rotor assembly (28) and attached components into main stator and generator housing (11).
6. Install generator end bell (WP 0121, Installation) and remove rotor lifting device.
7. Install fan (25) on drive hub (26) with new lockwashers (24) and bolts (23).

NOTE

Make sure all disc mounting holes at the inner and outer diameters are properly aligned.

NOTE

Ensure correct positioning of spacers, washers, and bolts as marked on removal.

8. Install drive discs (22) on drive hub (26) with spacers (19), washers (18 and 21), and bolts (17 and 20). Torque bolts (20) to 28 ft•lbs (38 N•m) and bolts (17) to 35 ft•lbs (47 N•m).
9. Install generator assembly in generator set (WP 0119, Installation).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF GENERATOR ASSEMBLY, MAIN STATOR AND HOUSING: TESTING, REMOVAL, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

References

WP 0119, Maintenance of Generator Assembly, Generator Assembly

WP 0098, Figure 1, Item 37

WP 0099, Maintenance of Output Box Assembly, Voltage Reconnection Terminal

WP 0106, Figure 1, Item 17

Equipment Condition

Grounded, Off & Operational

ENGINE CONTROL SWITCH OFF/RESET

Battery Disconnect Switch OFF

DEAD CRANK SWITCH OFF

WARNING

High voltage is produced when the generator set is in operation. Never attempt to start the generator set unless it is properly grounded. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Dangerous voltage exists on live circuits. Always observe precautions and never work alone. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Ensure that the engine cannot be started while maintenance is being performed. (ENGINE CONTROL switch set to OFF/RESET; Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF). Failure to comply with this warning can cause injury or death to personnel.

WARNING

DC voltages are present at generator set electrical components even with generator set shut down. Avoid shorting any positive with ground/negative. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

TESTING

1. Shut down generator set. Allow generator to cool to ambient temperature.
2. Open battery access door and disconnect negative battery cable.
3. Remove protective cover and moveable terminal board from voltage reconnection terminal board (WP 0099,

Removal).

4. Disconnect two electrical connectors from bottom of control box assembly.
5. Tag and disconnect wires 107C and 109J from terminals 1 and 2 of power potential transformer (WP 0098, Figure 1, Item 37).
6. Connect resistance bridge and note readings between terminals T1 and T4, T2 and T5, T3 and T6, T7 and T0, T8 and T0, and T9 and T0 of AC voltage reconnection terminal board.
7. All resistance readings should be as shown in WP 0123, Table 1.
8. If resistance is low, there are shorted windings; if resistance is high, stator windings are open. In either case, stator must be replaced.
9. Disconnect removable grounding link (WP 0106, Figure 1, Item 17) on load output terminal board.
10. Set multimeter for ohms and connect between each coil lead and ground in turn.
11. If multimeter indicates resistance on any connection, stator windings are grounded and stator must be replaced.
12. Connect removable grounding link (17) on load output terminal board.
13. Connect wires 107C and 109J to terminals 1 and 2 of power potential transformer (WP 0098, Figure 1, Item 37). Remove tags.
14. Connect two electrical connectors to bottom of control box assembly.
15. Install moveable terminal board and protective cover on voltage reconnection terminal board (WP 0099, Installation).
16. Connect negative battery cable. Close battery access door.

END OF TASK

REMOVAL

WARNING

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Remove generator assembly from generator set (WP 0119, Removal).
3. Remove generator rotor assembly (WP 0125, Removal).
4. Remove lifting eye (WP 0121, Figure 2, Item 29) and nut (30) from generator housing (11).
5. Remove bolts (31), lockwashers (32), lead clamp assembly (33), and gasket (34) from generator housing (11). Discard lockwashers (32).

6. Remove nuts (35), lockwashers (36), screws (37), washers (38), and cover/screen (39) from generator housing (11). Discard lockwashers (36).

END OF TASK**INSTALLATION**

1. Install generator rotor assembly (WP 0125, Installation).
2. Install cover/screen (WP 0121, Figure 2, Item 39) on generator housing (11) with screws (37), washers (38), new lockwashers (36), and nuts (35).
3. Install gasket (34) and lead clamp assembly (33) on generator housing (11) with bolts (31) and new lockwashers (32).
4. Install lifting eye (29) in generator housing (11) and tighten nut (30).
5. Install generator assembly in generator set (WP 0119, Installation).

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****MAINTENANCE OF SKID BASE: REMOVAL, REPAIR, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

CARC Paint

Protective Eyewear, Mask & Gloves

New Lockwashers

Personnel Required

Two: (1) Power Generation Mechanic (52D) & (1) Assistant/Operator

See "One Qualified Technician" Warning

See "Never Work Alone" Warning

ReferencesWP 0009, Removal & Installation of Major Components, engine and Generator Assembly
WP 0097, Maintenance of Fuel System, Fuel Tank**Equipment Condition**Grounded, Off & Operational

REMOVAL**WARNING**

Many components require a two-person lift. Lifting heavy components can cause back strain. Ensure proper lifting techniques are used when lifting heavy components. Failure to comply with this warning can cause injury to personnel.

WARNING

The generator set, engine, and generator are extremely heavy and require an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply with this warning can cause injury or death to personnel.

WARNING

All metal jewelry can conduct electricity and become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply with this warning can cause injury or death to personnel.

WARNING

DO NOT wear loose clothing when performing checks, services and maintenance. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Support components when removing attaching hardware or component may fall. Failure to comply with this warning can cause injury to personnel, and damage to equipment.

WARNING

A qualified technician must make the power connections and perform all continuity checks. The power source may be a generator or commercial power. Failure to comply with this warning can cause injury or death to personnel.

1. Shut down generator set.
2. Remove engine and generator assembly (WP 0009, Removal).

3. Remove fuel tank (WP 0097, Removal).
4. Remove nuts (Figure 1, Item 1), lockwashers (2), bolts (3), washers (4), and forklift guides (5) from skid base. Discard lockwashers (2).
5. Remove cable grommets (6 and 7) from skid base.

END OF TASK

REPAIR

Repair of skid base will be limited to corrosion control and spot welding minor cracks. If major structural damage to skid base has occurred, replace skid base.

WARNING

CARC paint is a health hazard, and is irritating to eyes, skin, and respiratory system. Wear protective eyewear, mask, and gloves when applying or removing CARC paint. Failure to comply with this warning can cause injury to personnel.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

WARNING

Eye protection is required when working with compressed air. Compressed air can propel particles at high velocity and injure eyes. Do not exceed 15 psi pressure when using compressed air. Failure to comply with this warning can cause injury to personnel.

WARNING

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate. Failure to comply with this warning can cause injury to personnel.

END OF TASK

INSTALLATION

1. Install forklift guides (Figure 1, Item 5) in skid base with bolts (3), washers (4), new lockwasher (2), and nuts (1).
2. Install cable grommets (6 and 7) in skid base.
3. Install fuel tank (WP 0097, Installation).
4. Install engine and generator assembly (WP 0009, Installation).

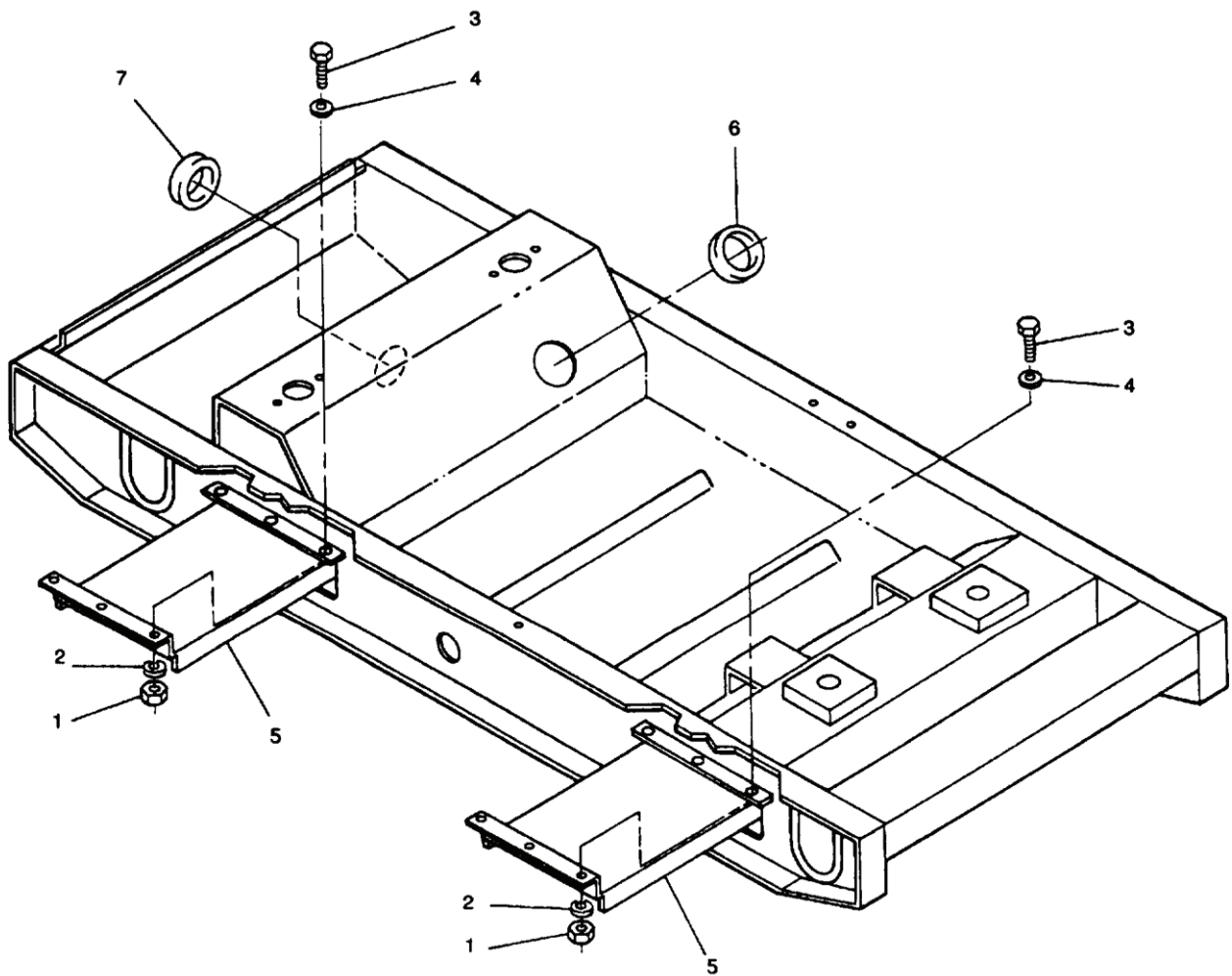


Figure 1. Skid Base.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****PREPARATION FOR STORAGE OR SHIPMENT**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

One

References

MIL-STD-129P(4)

TB 740-97-2

TO 38-1-5

Equipment ConditionGrounded, Off & Operational

PREPARATION FOR STORAGE OR SHIPMENT**Preservation**

Preserve generator sets in accordance with levels A/A, A/B, C/B or C/C of PPP-G-2919.

Preserve generator set cooling systems in accordance with method II of PPP-G-2919 or the antifreeze and water procedure of ATPD 2232.

Packing

Pack generator sets in accordance with levels A/A, A/B, C/B or C/C of PPP-G-2919.

Marking

Mark for shipment or storage in accordance with MIL-STD-129P(4).

Use of Corrosion-Preventive Compounds, Moisture Barriers, and Desiccant Materials

(A) Refer to Corrosion and Corrosion Prevention/Metal, MIL-HDBK-729 NOT 1.

Storage

(A) For storage information, refer to TB 740-97-2. (F) Refer to TO 38-1-5.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

ILLUSTRATED LIST OF MANUFACTURED ITEMS INTRODUCTION

ILLUSTRATED LIST OF MANUFACTURED ITEMS INTRODUCTION

Scope

WP 0130 through WP 0154 includes complete instructions for making items authorized to be manufactured or fabricated at the field maintenance level.

How to Use the Index of Manufactured Items

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

Explanation of the Illustrations of Manufactured Items

All instructions needed by maintenance personnel to manufacture the item are included on the illustrations. All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

INDEX OF MANUFACTURED ITEMS

P/N AND/OR DWG NO	PART DESCRIPTION	REFERENCE
88-22126-1 through 88-22126-7	Cable Assembly, AC Power (P/N 88-22126-1 through 88-22126-7)	WP 0130
88-22178	Cable Assembly, Battery (P/N 88-22178)	WP 0131
88-22127	Cable Assembly, Battery (P/N 88-22127)	WP 0132
88-22181	Cable Assembly, Battery (P/N 88-22181)	WP 0133
88-22179	Cable Assembly, Battery (P/N 88-22179)	WP 0134
88-22207	Cable Assembly, Battery (P/N 88-22207)	WP 0135
88-22120	Holder, Control Panel (P/N 88-22120)	WP 0136
88-20191-6	Hose Assembly (P/N 88-20191-6)	WP 0137
88-22582	Insulation, Panel, Top (P/N 88-22582)	WP 0138
88-22592	Insulation, Baffle (P/N 88-22592)	WP 0139
88-22593	Insulation, Baffle (P/N 88-22593)	WP 0140
88-22584	Insulation, Top, Center (P/N 88-22584)	WP 0141
88-22585	Insulation, Top, Rear (P/N 88-22585)	WP 0142
88-22591	Insulation, Front Housing (P/N 88-22591)	WP 0143

INDEX OF MANUFACTURED ITEMS - Continued

P/N AND/OR DWG NO	PART DESCRIPTION	REFERENCE
	88-22591)	
88-22586	Insulation, Top, Front (P/N 88-22586)	WP 0144
88-22587	Insulation, Top, Center (P/N 88-22587)	WP 0145
88-22588	Insulation, Top, Center (P/N 88-22588)	WP 0146
88-22583	Insulation, Top, Front (P/N 88-22583)	WP 0147
122-3066-1 and 29879	Resistor Assembly (P/N 122-3066-1 and 29879)	WP 0148
88-22631	Resistor Assembly, Volt (P/N 88-22631)	WP 0149
88-22632	Resistor-Diode Assembly (P/N 88-22632)	WP 0150
88-22106	Resistor-Diode Assembly (P/N 88-22106)	WP 0151
88-22553	Solenoid Assembly (P/N 88-22553)	WP 0152
88-22548	Switch Assembly, Fuel Level (P/N 88-22548)	WP 0153
88-20305-1 through 88-20305-3 and 88-20305-5	Wire, Varistor (P/N 88-20305-1 through 88-20305-3 and 88-20305-5)	WP 0154

END OF WORK PACKAGE

FIELD MAINTENANCE

**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
CABLE ASSEMBLY, AC POWER (P/N 88-22126-1 THROUGH 88-22126-7)****INITIAL SETUP:****Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

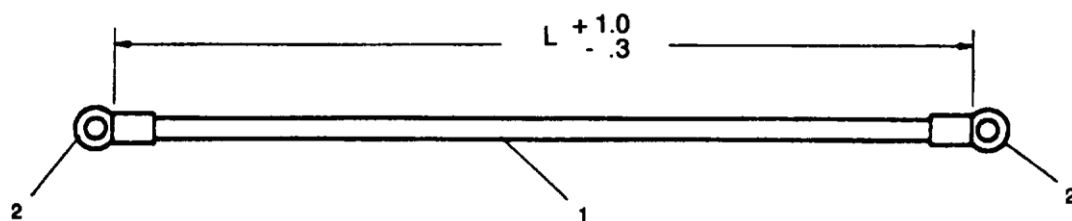
One

References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22126-1 THROUGH 88-22126-7**NOTES:**

1. Dimensions shown are in inches.
2. Refer to TM 9-6115-644-24P for materials required and length (L) of wire.

PROCEDURES:

1. Cut wire (1) to length indicated.
2. Strip 0.75 inch of insulation from each end of wire (1).
3. Crimp terminal (2) on each end of wire (1).

Figure 1. Cable Assembly, AC Power (P/N 88-22126-1 through 88-22126-7).**END OF TASK****END OF WORK PACKAGE**

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

CABLE ASSEMBLY, BATTERY (P/N 88-22178)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Personnel Required

One

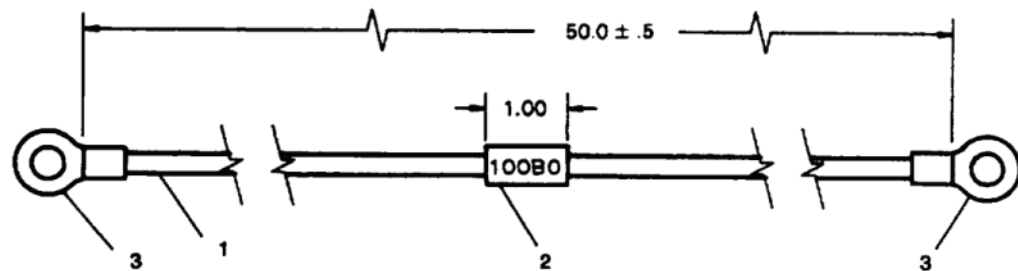
References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22178



NOTES:

1. Dimensions shown are in inches.
2. Refer to TM 9-6115-644-24P for materials required.

PROCEDURES:

1. Cut wire (1) to length indicated.
2. Strip 0.75 inch of insulation from each end of wire (1).
3. Position insulation sleeving (2) on center of wire (1), mark with wire number "100B0" and shrink to fit.
4. Crimp terminal (3) on each end of wire (1).

Figure 1. Cable Assembly, Battery (P/N 88-22178).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

CABLE ASSEMBLY, BATTERY (P/N 88-22127)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Personnel Required

One

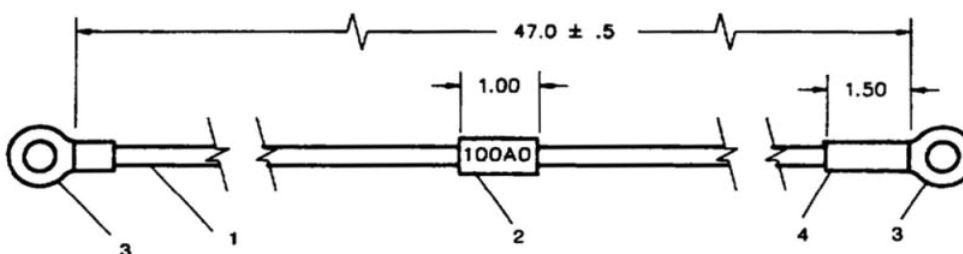
References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22127



NOTES:

1. Dimensions shown are in inches.
2. Refer to TM 9-6115-644-24P for materials required.

PROCEDURES:

1. Cut wire (1) to length indicated.
2. Strip 0.75 inch of insulation from each end of wire (1).
3. Position insulation sleeving (2) on center of wire (1), mark with wire number "100A0" and shrink to fit.
4. Mark insulation sleeving (4) with "NEGATIVE" and slide over one end of wire (1).
5. Crimp terminal (3) on each end of wire (1).
6. Position insulation sleeving (4) as shown and shrink to fit.

Figure 1. Cable Assembly, Battery (P/N 88-22127).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

CABLE ASSEMBLY, BATTERY (P/N 88-22181)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Personnel Required

One

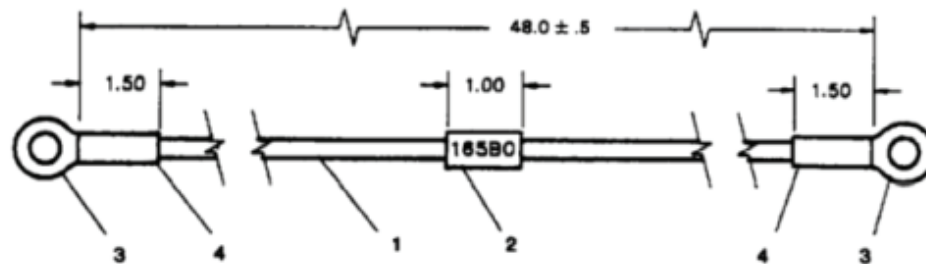
References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22181



NOTES:

1. Dimensions shown are in inches.
2. Refer to TM 9-6115-644-24P for materials required.

PROCEDURES:

1. Cut wire (1) to length indicated.
2. Strip 0.75 inch of insulation from each end of wire (1).
3. Position insulation sleeving (2) on center of wire (1), mark with wire number "165B0" and shrink to fit.
4. Mark insulation sleeving (4) with "POSITIVE" and slide over each end of wire (1).
5. Crimp terminal (3) on each end of wire (1).
6. Position insulation sleeving (4) as shown and shrink to fit.

Figure 1. Cable Assembly, Battery (P/N 88-22181).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

CABLE ASSEMBLY, BATTERY (P/N 88-22179)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Personnel Required

One

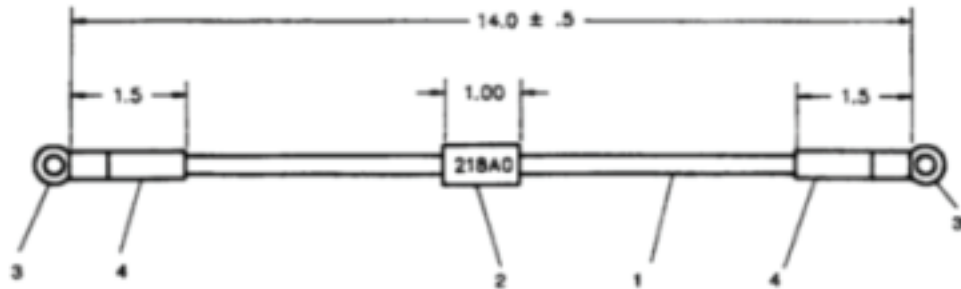
References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22179



NOTES:

1. Dimensions shown are in inches.
2. Refer to TM 9-6115-644-24P for materials required.

PROCEDURES:

1. Cut wire (1) to length indicated.
2. Strip 0.75 inch of insulation sleeving from each end of wire (1).
3. Mark insulation sleeving (2) with wire number "165AO", position on center of wire (1) and shrink to fit.
4. Mark insulation sleeving (4) with "POSITIVE" and slide over each end of wire (1).
5. Crimp terminal (3) on each end of wire (1).
6. Position insulation sleeving (4) as shown and shrink to fit.

Figure 1. Cable Assembly, Battery (P/N 88-22179).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

CABLE ASSEMBLY, BATTERY (P/N 88-22207)

INITIAL SETUP:

Tools and Special Tools

Grounded, Off & Operational

Personnel Required

One

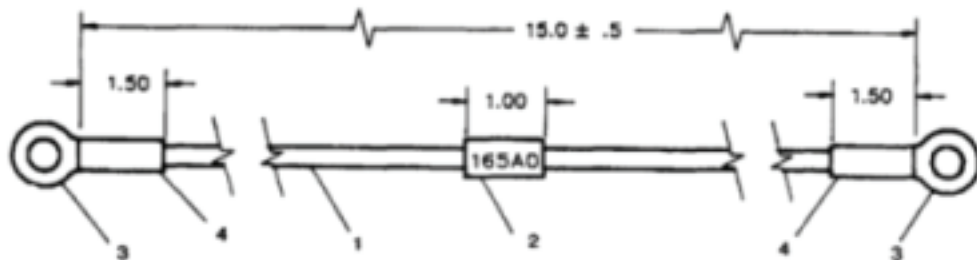
References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22207



NOTES:

1. Dimensions shown are in inches.
2. Refer to TM 9-6115-644-24P for materials required.

PROCEDURES:

1. Cut wire (1) to length indicated.
2. Strip 0.75 inch of insulation sleeving from each end of wire (1).
3. Mark insulation sleeving (2) with wire number "165A0", position on center of wire (1) and shrink to fit.
4. Mark insulation sleeving (4) with "POSITIVE" and slide over each end of wire (1).
5. Crimp terminal (3) on each end of wire (1).
6. Position insulation sleeving (4) as shown and shrink to fit.

Figure 1. Cable Assembly, Battery (P/N 88-22207).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
HOLDER, CONTROL PANEL (P/N 88-22120)****INITIAL SETUP:****Tools and Special Tools**

Grounded, Off & Operational

Personnel Required

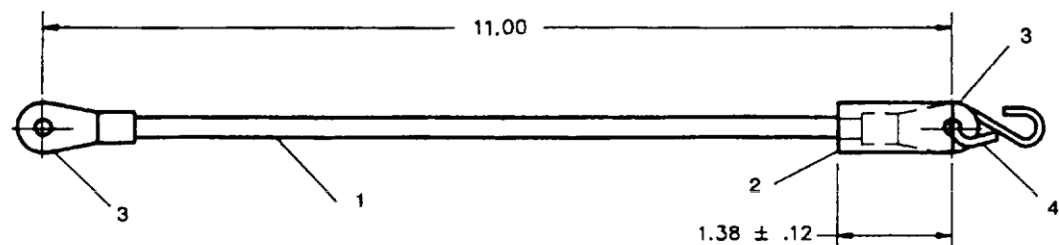
One

References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22120**NOTES:**

1. Dimensions shown are in inches.
2. Refer to TM 9-6115-644-24P for terminals required.

PROCEDURES:

1. Cut rope (1) to length indicated.
2. Slide insulation sleeving (2) over one end of rope (1).
3. Crimp terminal (3) on each end of rope (1).
4. Install hook (4) in one terminal (3) and close hook end, securing it to terminal (3).
5. Position insulation sleeving (2) as shown and shrink to fit.

Figure 1. Holder, Control Panel (P/N 88-22120).**END OF TASK****END OF WORK PACKAGE**

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

HOSE ASSEMBLY (P/N 88-20191-6)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Personnel Required

One

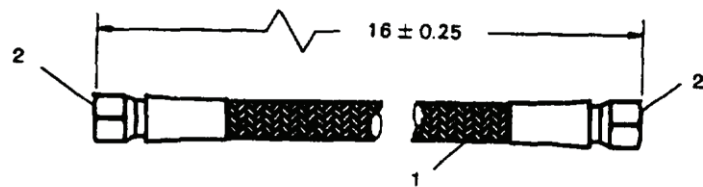
References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-20191-6

**NOTES:**

1. Dimensions shown are in inches.
2. Refer to TM 9-6115-644-24P for materials required.

PROCEDURES:

1. Cut hose (1) to obtain dimension shown with adapters (2) installed.
2. Crimp adapter (2) on each end of hose (1).

Figure 1. Hose Assembly (P/N 88-20191-6).**END OF TASK****END OF WORK PACKAGE**

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
INSULATION, PANEL, TOP (P/N 88-22582)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

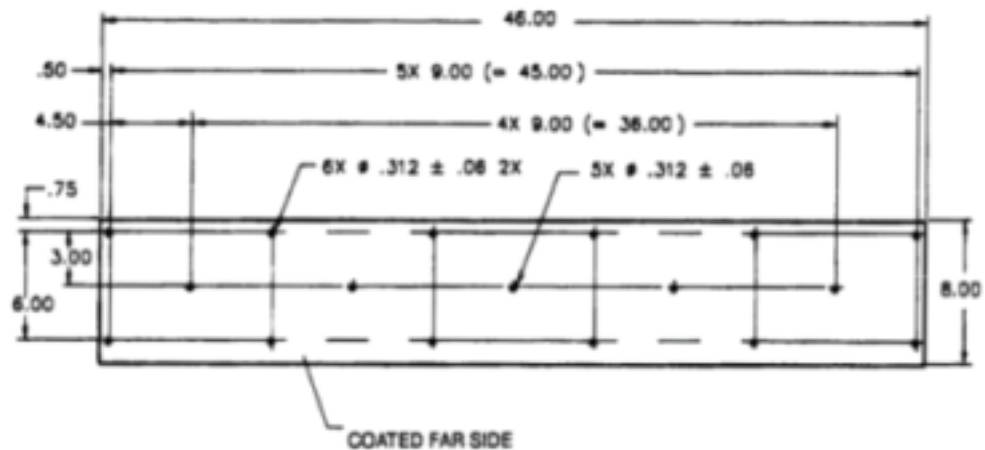
Personnel Required

One

Equipment Condition

Grounded, Off & Operational

P/N 88-22582



Description	MATERIALS	Part Number
Foam, Sound Absorbing		FF40JM02

NOTES:

1. Dimensions shown are in inches.
2. Tolerances are 0.1 inch unless otherwise stated.

PROCEDURES:

1. Cut foam to dimensions shown.
2. Drill holes as shown.

Figure 1. Insulation, Panel, Top (P/N 88-22582).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****INSULATION, BAFFLE (P/N 88-22592)**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Sealing Compound

Personnel Required

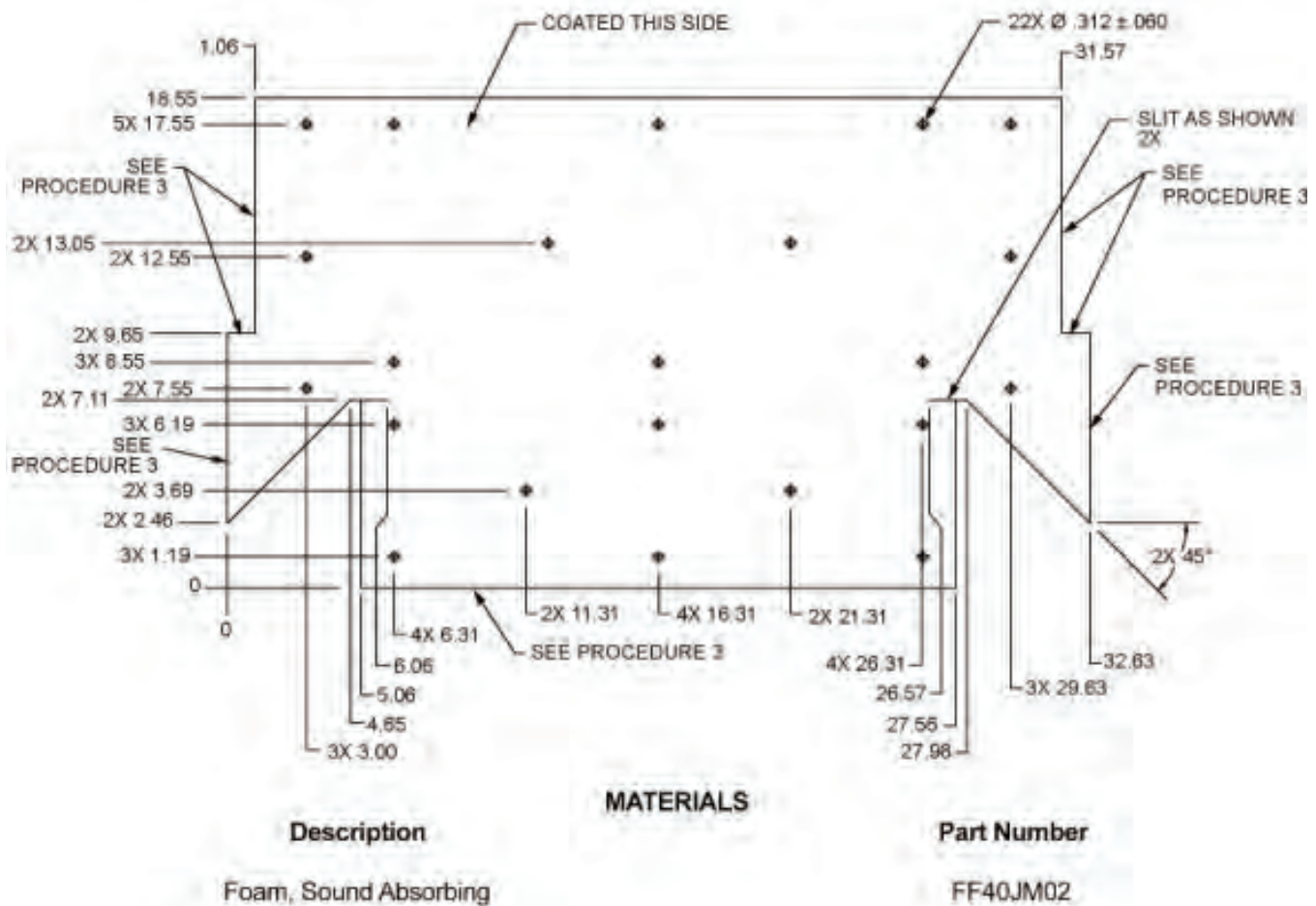
One

References

WP 0159, Item 19

Equipment ConditionGrounded, Off & Operational

P/N 88-22592

**NOTES:**

1. Dimensions shown are in inches.
2. Tolerances are 0.1 inch unless otherwise stated.

PROCEDURES:

1. Cut foam to dimensions shown.
2. Drill holes as shown.
3. Coat this edge using sealant (WP 0159, Item 19).

Figure 1. Insulation, Baffle (P/N 88-22592).

END OF TASK

END OF WORK PACKAGE

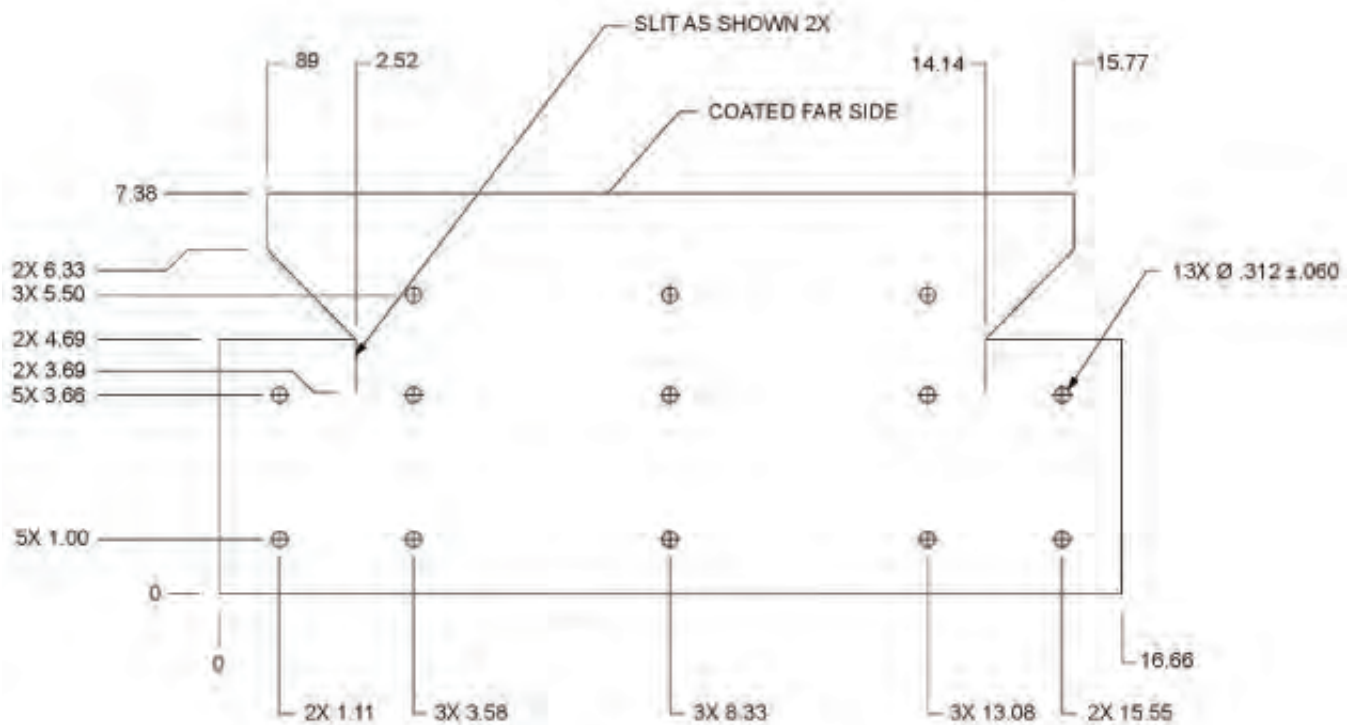
FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

INSULATION, BAFFLE (P/N 88-22593)

INITIAL SETUP:

P/N 88-22593



Description	MATERIALS	Part Number
Foam, Sound Absorbing		FF40JM02

NOTES:

1. Dimensions shown are in inches.
2. Tolerances are 0.1 inch unless otherwise stated.

PROCEDURES:

1. Cut foam to dimensions shown.
2. Drill holes as shown.

Figure 1. Insulation, Baffle (P/N 88-22593).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****INSULATION, TOP, CENTER (P/N 88-22584)**

INITIAL SETUP:**Tools and Special Tools**

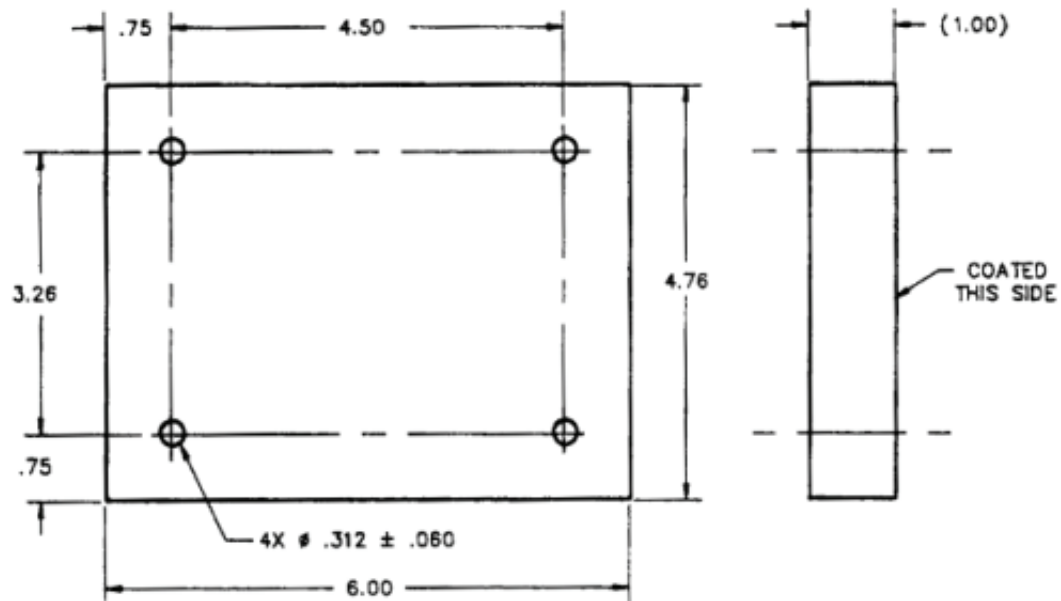
Generator Mechanical Tool Kit

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

P/N 88-22584



Description	MATERIALS	Part Number
Foam, Sound Absorbing		FF40JM02

NOTES:

1. Dimensions shown are in inches.
2. Tolerances are 0.1 inch unless otherwise stated.

PROCEDURES:

1. Cut foam to dimensions shown.
2. Drill holes as shown.

Figure 1. Insulation, Top, Center (P/N 88-22584).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS INSULATION, TOP, REAR (P/N 88-22585)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Materials/Parts

Sealing Compound

Personnel Required

One

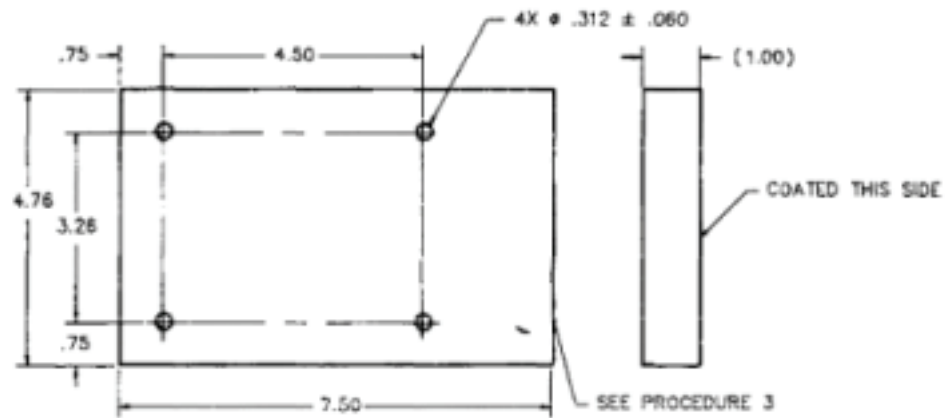
References

WP 0159, Item 19

Equipment Condition

Grounded, Off & Operational

P/N 88-22585



Description	MATERIALS	Part Number
Foam, Sound Absorbing		FF40JM02

NOTES:

1. Dimensions shown are in inches.
2. Tolerances are 0.1 inch unless otherwise stated.

PROCEDURES:

1. Cut foam to dimensions shown.
2. Drill holes as shown.
3. Coat this edge using sealant (WP 0159, Item 19).

Figure 1. Insulation, Top, Rear (P/N 88-22585).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****INSULATION, FRONT HOUSING (P/N 88-22591)**

INITIAL SETUP:**Tools and Special Tools**

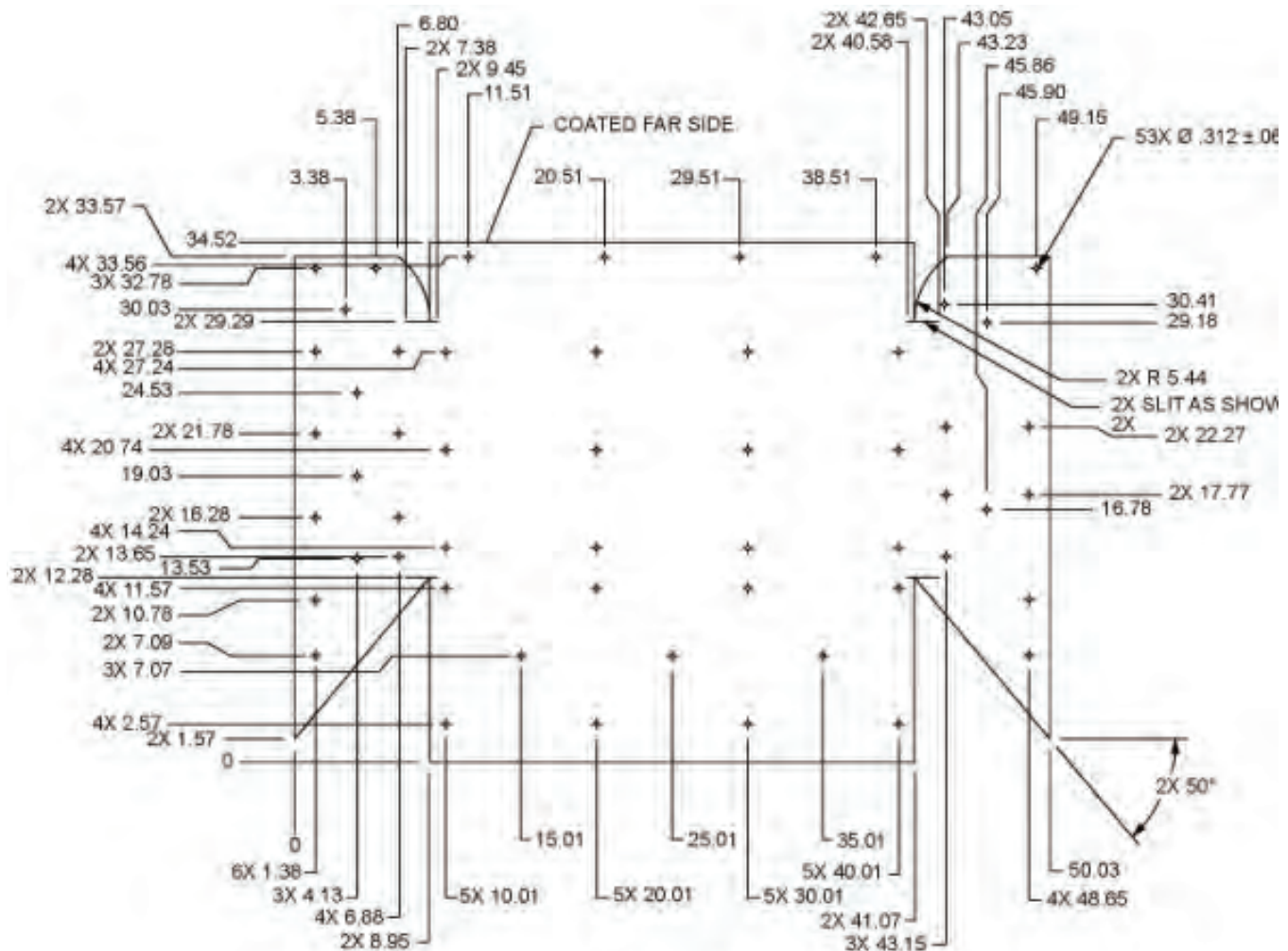
Generator Mechanical Tool Kit

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

P/N 88-22591



MATERIALS

Description

Foam, Sound Absorbing

Part Number

FF40JM02

NOTES:

1. Dimensions shown are in inches.
2. Tolerances are 0.1 inch unless otherwise stated.

PROCEDURES:

1. Cut foam to dimensions shown.

Figure 1. Insulation, Front Housing (P/N 88-22591).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****INSULATION, TOP, FRONT (P/N 88-22586)**

INITIAL SETUP:**Tools and Special Tools**

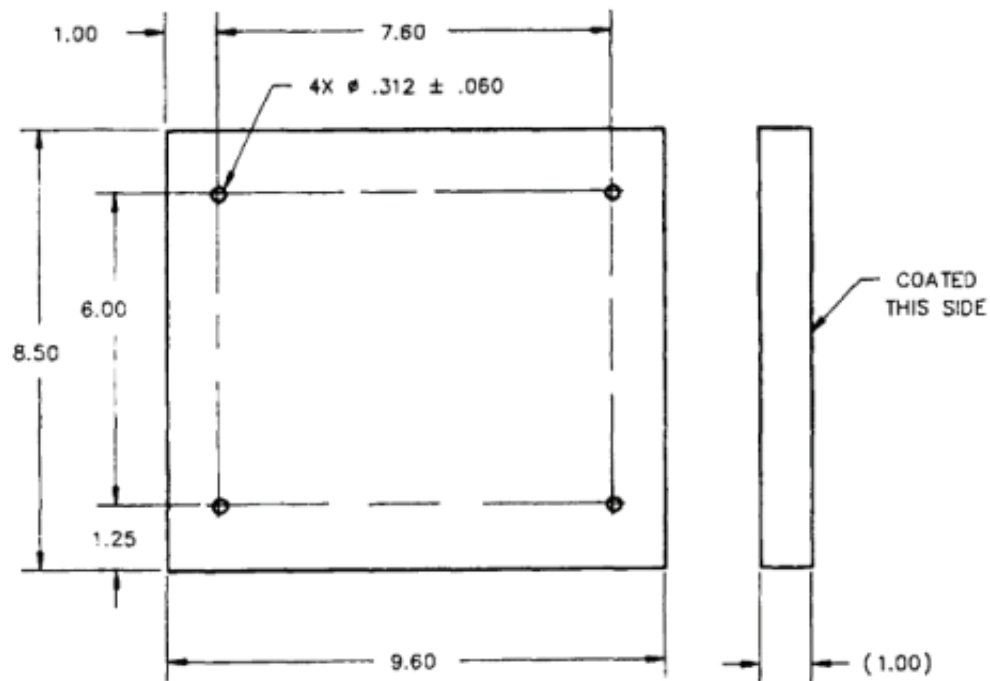
Generator Mechanical Tool Kit

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

P/N 88-22586



Description	MATERIALS	Part Number
Foam, Sound Absorbing		FF40JM02

NOTES:

1. Dimensions shown are in inches.
2. Tolerances are 0.1 inch unless otherwise stated.

PROCEDURES:

1. Cut foam to dimensions shown.
2. Drill holes as shown.

Figure 1. Insulation, Top, Front (P/N 88-22586).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****INSULATION, TOP, CENTER (P/N 88-22587)**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Sealing Compound

Personnel Required

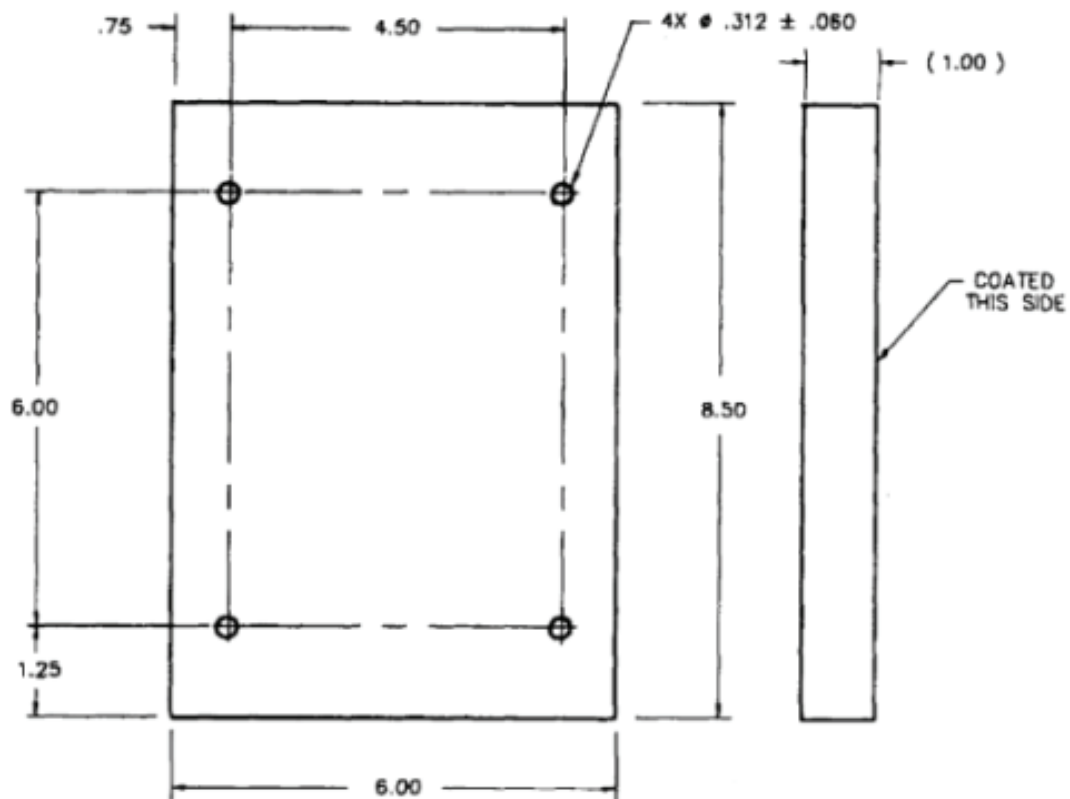
One

References

WP 0159, Item 19

Equipment ConditionGrounded, Off & Operational

P/N 88-22587



Description	MATERIALS	Part Number
Foam, Sound Absorbing		FF40JM02

NOTES:

1. Dimensions shown are in inches.
2. Tolerances are 0.1 inch unless otherwise stated.

PROCEDURES:

1. Cut foam to dimensions shown.
2. Drill holes as shown.

Figure 1. Insulation, Top, Center (P/N 88-22587).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****INSULATION, TOP, CENTER (P/N 88-22588)**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Sealing Compound

Personnel Required

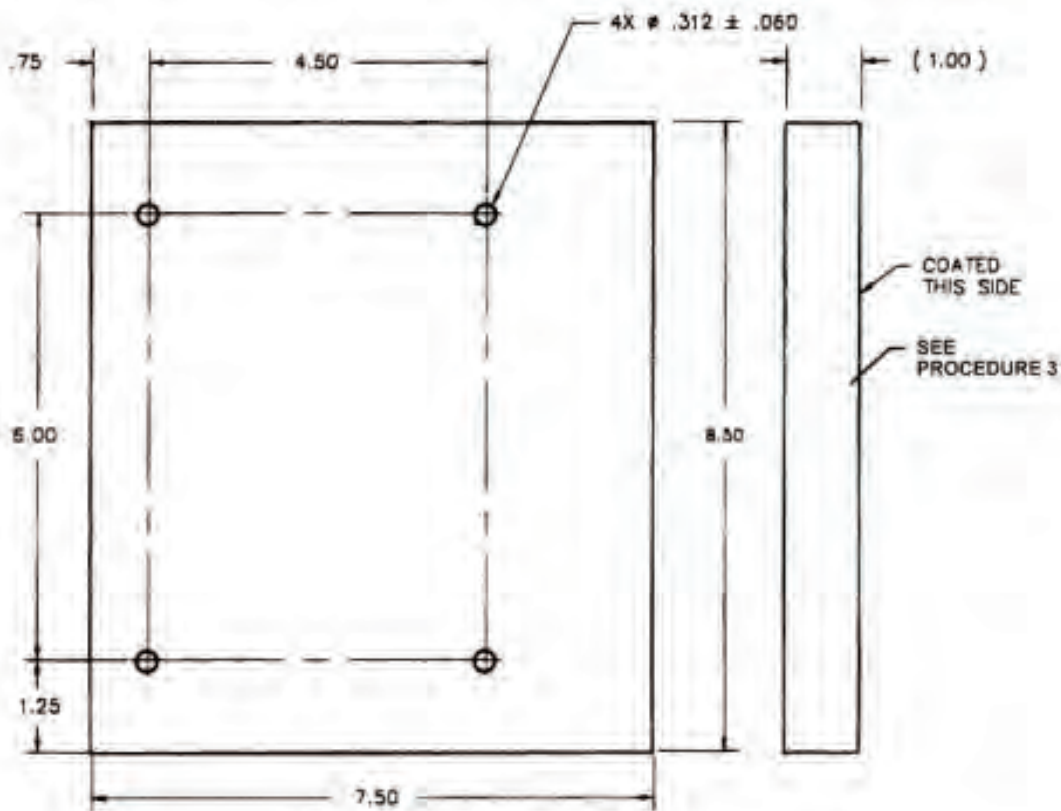
One

References

WP 0159, Item 19

Equipment ConditionGrounded, Off & Operational

P/N 88-22588



Description	MATERIALS	Part Number
Foam, Sound Absorbing		FF40JM02

NOTES:

1. Dimensions shown are in inches.
2. Tolerances are 0.1 inch unless otherwise stated.

PROCEDURES:

1. Cut foam to dimensions shown.
2. Drill holes as shown.
3. Coat this edge using sealant (WP 0159, Item 19).

Figure 1. Insulation, Top, Center (P/N 88-22588).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****INSULATION, TOP, FRONT (P/N 88-22583)**

INITIAL SETUP:**Tools and Special Tools**

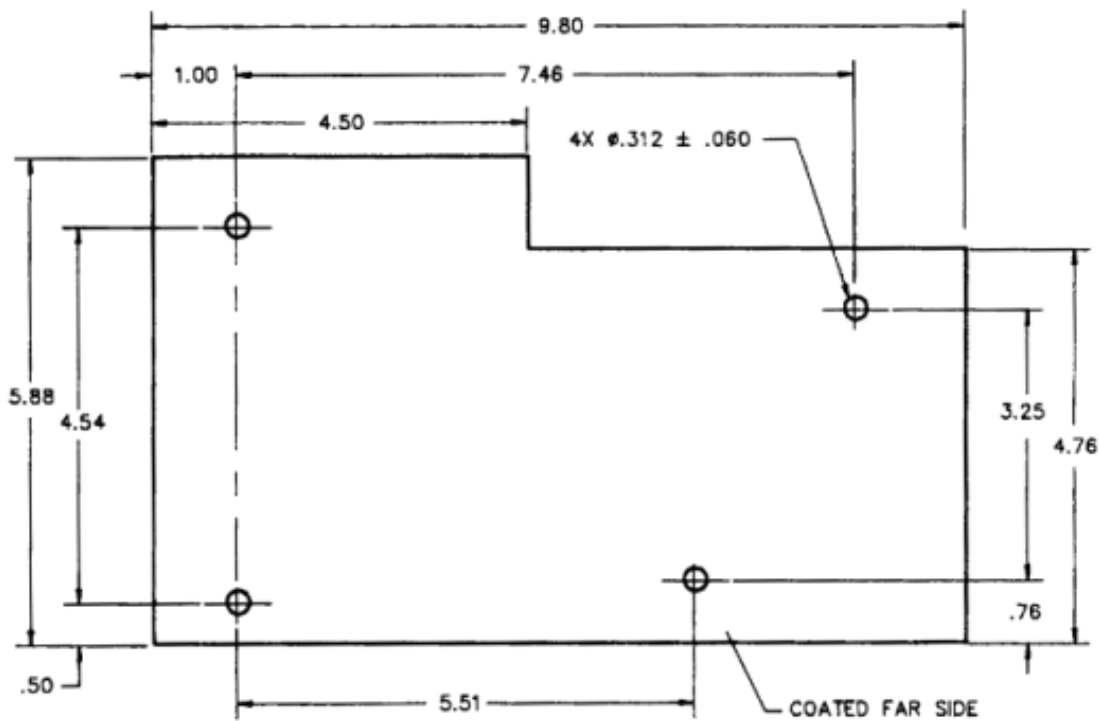
Generator Mechanical Tool Kit

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

P/N 88-22583



Description	MATERIALS	Part Number
Foam, Sound Absorbing		FF40JM02

NOTES:

1. Dimensions shown are in inches.
2. Tolerances are 0.1 inch unless otherwise stated.

PROCEDURES:

1. Cut foam to dimensions shown.
2. Drill holes as shown.

Figure 1. Insulation, Top, Front (P/N 88-22583).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

RESISTOR ASSEMBLY (P/N 122-3066-1 AND 29879)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Personnel Required

One

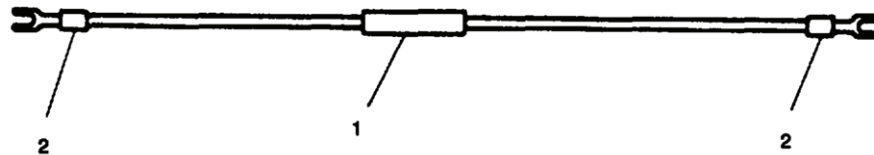
References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 122-3066-1 AND 29879



NOTES:

1. Refer to TM 9-6115-644-24P for materials required.
2. Resistors (1) are different depending on part number being assembled.

PROCEDURES:

1. Crimp terminal (2) on end of each resistor (1) lead.

Figure 1. Resistor Assembly (P/N 122-3066-1 and 29879).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

RESISTOR ASSEMBLY, VOLT (P/N 88-22631)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Personnel Required

One

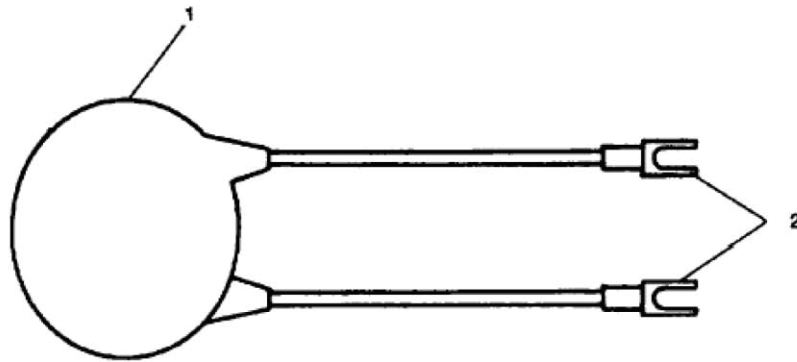
References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22631



NOTES:

1. Refer to TM 9-6115-644-24P for materials required.

PROCEDURES:

1. Crimp and solder terminals (2) on end of each resistor (1) lead.

Figure 1. Resistor Assembly, Volt (P/N 88-22631).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

RESISTOR-DIODE ASSEMBLY (P/N 88-22632)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Personnel Required

One

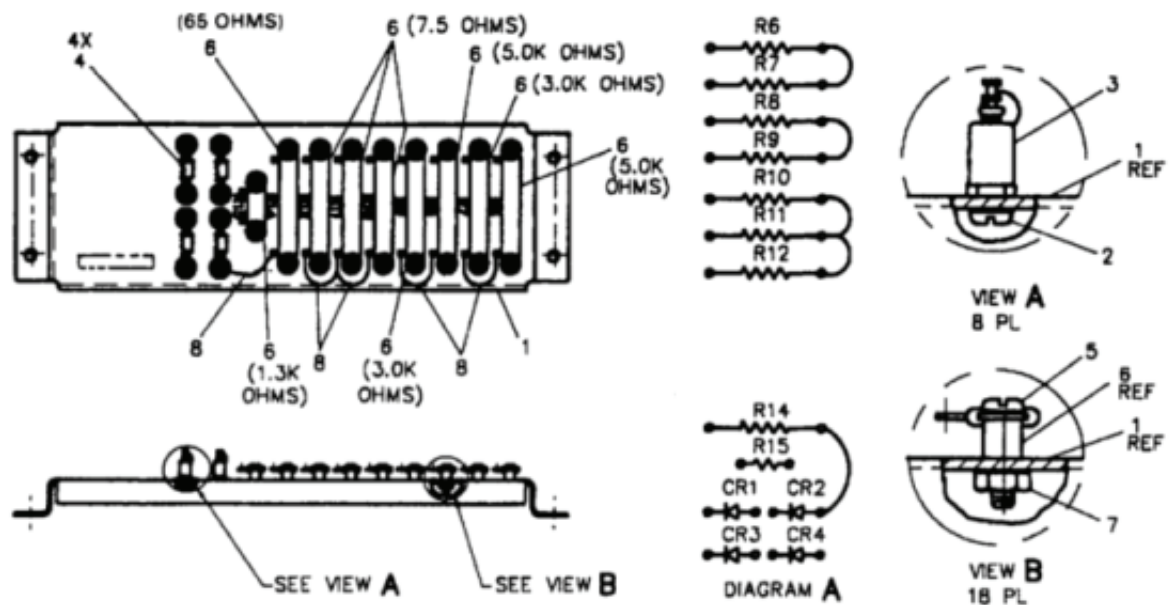
References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22632



NOTES:

Refer to TM 9-6115-644-24P for materials required and positioning of resistors by ohm rating.

PROCEDURES:

1. Install screws (2) and insulated terminals (3) on bracket (1) as shown.
2. Solder diodes (4) to insulated terminals (3) as shown.
3. Install screws (5), resistors (6), and nuts (7) on bracket (1) as shown.
4. Position wires (8) and solder connections as shown.

Figure 1. Resistor-Diode Assembly (P/N 88-22632).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

RESISTOR-DIODE ASSEMBLY (P/N 88-22106)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Personnel Required

One

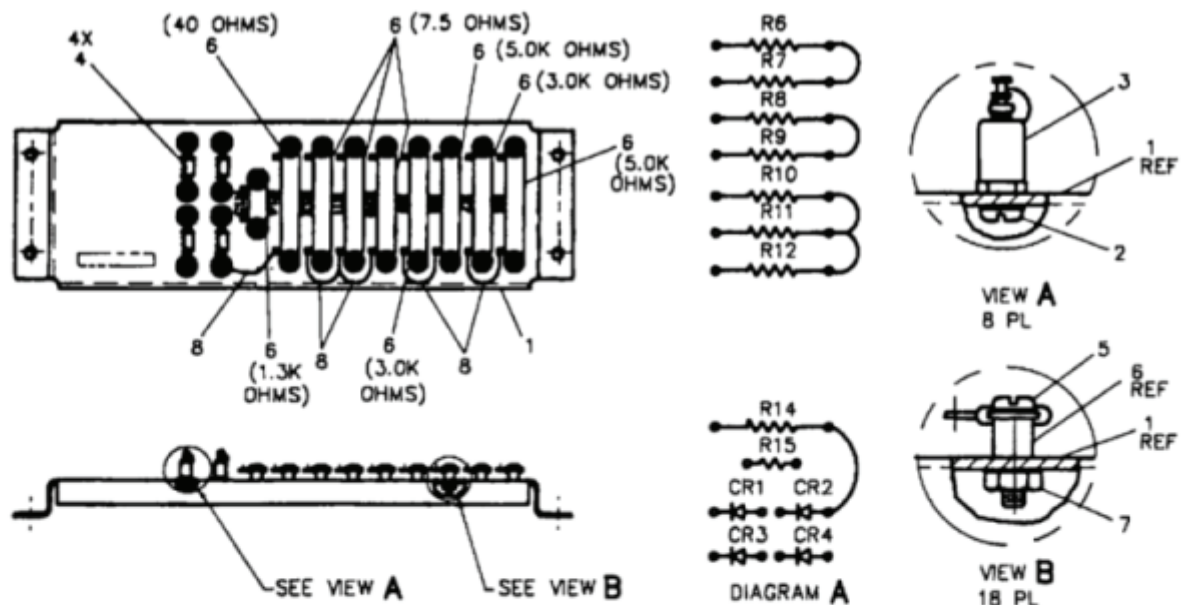
References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22106



NOTES:

Refer to TM 9-6115-644-24P for materials required and positioning of resistors by ohm rating.

PROCEDURES:

1. Install screws (2) and insulated terminals (3) on bracket (1) as shown.
2. Solder diodes (4) to insulated terminals (3) as shown.
3. Install screws (5), resistors (6), and nuts (7) on bracket (1) as shown.
4. Position wires (8) and solder connections as shown.

Figure 1. Resistor-Diode Assembly (P/N 88-22106).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

SOLENOID ASSEMBLY (P/N 88-22553)

INITIAL SETUP:

Tools and Special Tools

Generator Mechanical Tool Kit

Personnel Required

One

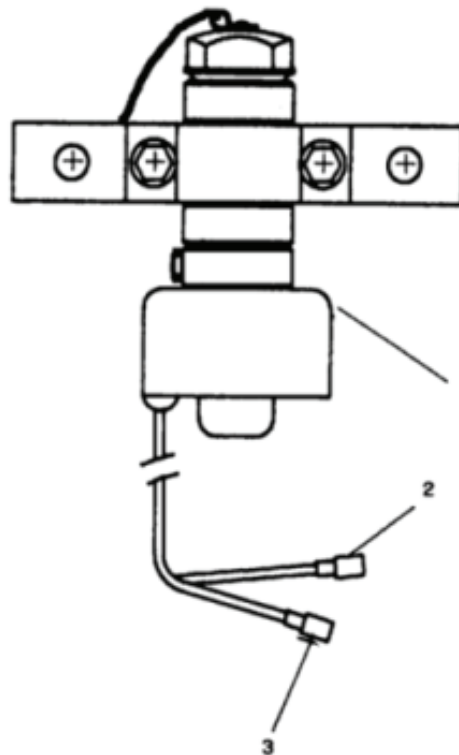
References

TM 9-6155-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-22553

**NOTES:**

1. Refer to TM 9-6115-644-24P for materials required.
2. Solenoid wiring is not polarity sensitive, so position of terminals is not important.

PROCEDURES:

1. Strip 0.125 inch of insulation from end of each solenoid (1) lead.
2. Crimp terminal (2) on one end of solenoid (1) lead and terminal (3) on other end.

Figure 1. Solenoid Assembly (P/N 88-22553).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****SWITCH ASSEMBLY, FUEL LEVEL (P/N 88-22548)**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

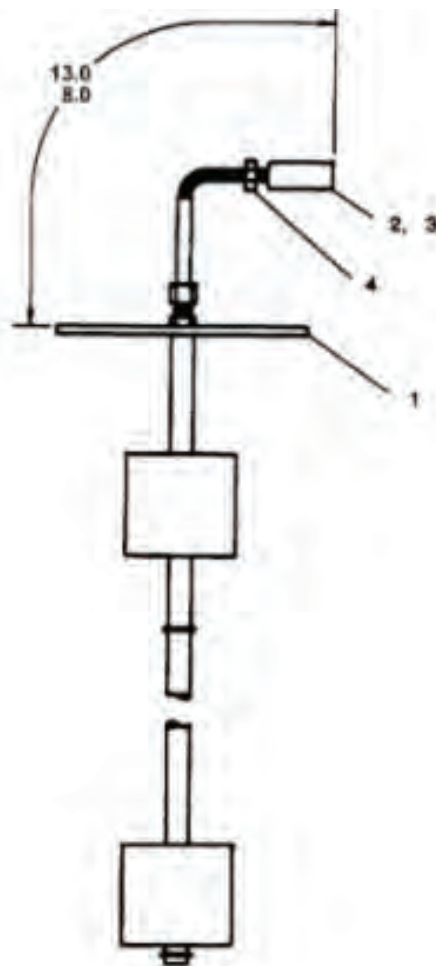
One

References

TM 9-6115-644-24P

Equipment ConditionGrounded, Off & Operational

P/N 88-22548

**NOTES:**

1. Dimensions shown are in inches.
2. Refer to TM 9-6115-644-24P for materials required.

PROCEDURES:

1. Strip 0.125 inch of insulation from end of each switch (1) lead.
2. Crimp male terminal (2) on red wire and female terminal (3) on black wire.
3. Insert pins into housing (3) with lead A in position 1, lead B in position 2, lead C in position 3, and lead D in position 4.
4. Mark "P12" on strap (4) and install in position shown.

Figure 1. Switch Assembly, Fuel Level (P/N 88-22548).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
WIRE, VARISTOR (P/N 88-20305-1 THROUGH 88-20305-3 AND 88-20305-5)**INITIAL SETUP:****Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

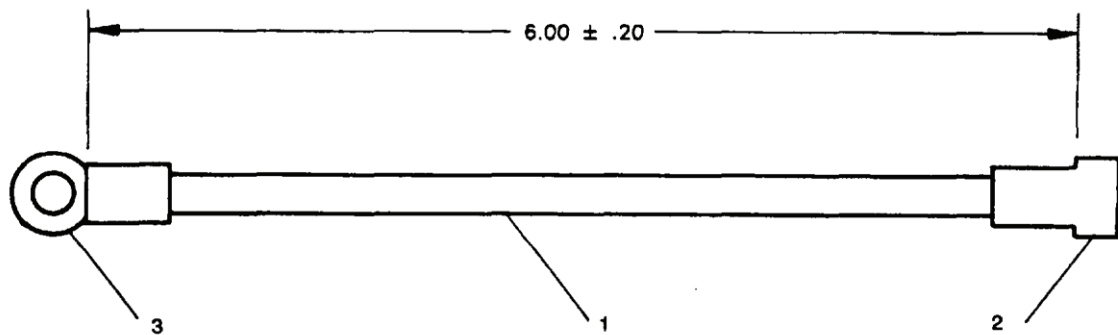
One

References

TM 9-6115-644-24P

Equipment Condition

Grounded, Off & Operational

P/N 88-20305-1 THROUGH 88-20305-3 AND 88-20305-5**NOTES:**

1. Dimensions shown are in inches.
2. Refer to TM 9-6115-644-24P for materials required.

PROCEDURES:

1. Cut wire (1) to length indicated.
2. Strip 0.50 inch from each end of wire (1).
3. Crimp terminal (2) on one end of wire (1) and terminal (3) on other end.

Figure 1. Wire, Varistor (P/N 88-20305-1 through 88-20305-3 and 88-20305-5).**END OF TASK****END OF WORK PACKAGE**

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

TORQUE LIMITS

INITIAL SETUP:

Table 1. Torque Limits.

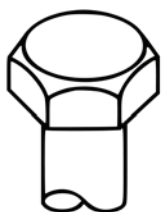
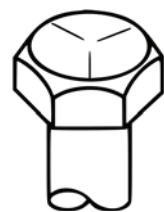

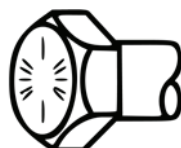
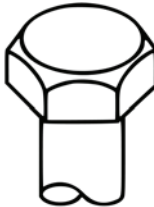
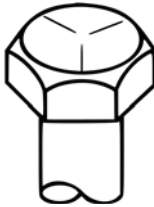
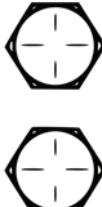
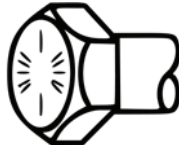
SAE Grade Number		1 or 2		5		6 or 7		8	
Quality of Material		Indeterminate		Minimum Commercial		Medium Commercial		Best Commercial	
Capscrew Head Markings									
<div>NOTE</div> <div>Head marking may vary with different manufacturers.</div>									
Capscrew Body Size		Torque		Torque		Torque		Torque	
(Inches)	(Thread)	Ft Lb	(N.m)	Ft Lb	(N.m)	Ft Lb	(N.m)	Ft Lb	(N.m)
1/4	20	5	(7)	8	(11)	10	(14)	12	(16)
	28	6	(8)	10	(14)			14	(19)
5/16	18	11	(15)	17	(23)	19	(26)	24	(33)
	24	13	(18)	19	(16)			27	(37)
3/8	16	18	(24)	31	(42)	34	(46)	44	(60)
	24	20	(27)	35	(47)			49	(66)
7/16	14	28	(38)	49	(66)	55	(75)	70	(95)
	20	30	(41)	55	(75)			78	(106)
1/2	13	39	(53)	75	(102)	85	(115)	105	(142)
	20	41	(56)	85	(115)			120	(163)
9/16	12	51	(69)	110	(149)	120	(163)	155	(210)
	18	55	(75)	120	(163)			170	(231)
5/8	11	83	(113)	150	(203)	167	(226)	210	(285)
	18	95	(129)	170	(231)			240	(325)
3/4	10	105	(142)	270	(366)	280	(380)	375	(508)
	16	115	(156)	295	(400)			420	(569)
7/8	9	160	(217)	395	(536)	440	(597)	605	(820)

Table 1. Torque Limits. - Continued

SAE Grade Number	1 or 2		5		6 or 7		8		
Quality of Material	Indeterminate		Minimum Commercial		Medium Commercial		Best Commercial		
Capscrew Head Markings									
<div>NOTE</div> <div>Head marking may vary with different manufacturers.</div>									
Capscrew Body Size		Torque		Torque		Torque		Torque	
(Inches)	(Thread)	Ft Lb	(N.m)	Ft Lb	(N.m)	Ft Lb	(N.m)	Ft Lb	(N.m)
	14	175	(237)	435	(590)			675	(915)
1	8	235	(319)	590	(800)	660	(895)	910	(1234)
	14	250	(339)	660	(895)			990	(1342)

NOTE

Always use the torque values listed above when specific torque values are not available.

END OF WORK PACKAGE

CHAPTER 4

FIELD SUPPORTING INFORMATION

FOR

**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL
QUIET GENERATOR SETS**

CHAPTER 4
SUPPORTING INFORMATION

WORK PACKAGE INDEX

<u>Title</u>	<u>WP Sequence No.</u>
References	0156
Maintenance Allocation Chart (MAC) Introduction	0157
Maintenance Allocation Chart (MAC)	0158
Expendable and Durable Items List.....	0159

FIELD AND SUSTAINMENT MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****REFERENCES**

SCOPE

This work package lists all forms, regulations, pamphlets, specifications, standards, technical manuals, technical bulletins, lubrication orders, field manuals, and miscellaneous publications referenced in this TM.

FORMS

AFTO Form 22	Air Force Reporting of Errors Form
DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2028-2	Recommended Changes to Equipment Technical Publications
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 5988-E	Equipment Inspection and Maintenance Worksheet
DD Form 314	Preventive Maintenance Schedule and Record
SF Form 364	Report of Discrepancy
SF Form 368	Product Quality Deficiency Report

ARMY REGULATIONS

AR 310-25	Dictionary of United States Army Terms
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DEPARTMENT OF THE ARMY PAMPHLETS

DA PAM 750-8	The Army Maintenance Management System (TAMMS)
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MILITARY SPECIFICATIONS

MIL-A-53009A(1)	Additive, Antifreeze Extender, Liquid Cooling Systems
MIL-DTL-5624U	Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-DTL-83133E	Turbine Fuels, Aviation, Kerosene Types, NATO F-34 (JP-8), NATO F-35, and JP-8+100
MIL-PRF-2104H	Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service
MIL-PRF-46167D	Lubricating Oil, Internal Combustion Engine, Arctic

COMMERCIAL ITEM DESCRIPTIONS

A-A-52557A	Fuel Oil, Diesel; for Posts, Camps, and Stations
A-A-52624A	Antifreeze, Multi Engine Type
ASME-Y14.38M	Abbreviations for Use on Drawings, and in Specifications, Standards and Technical Documents
PPP-G-2919	Generator Sets, Mobile Electric Power and Supplemental Equipment, Packaging of

MILITARY STANDARDS

MIL-HDBK-729NOT1	Corrosion and Corrosion Prevention Metals
MIL-STD-129P(4)	Military Marking for Shipment and Storage

TECHNICAL MANUALS

TM 43-0139	Painting Instructions for Army Material
TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use (Mobility Equipment Command)
TM 750-254	Cooling Systems: Tactical Vehicles
TM 9-2815-255-24	Unit, Direct Support and General Support Maintenance Instructions, Diesel Engine, Model 4039T, 4-Cylinder, 4 Cycle, Fuel Injected, Turbocharged
TM 9-2815-255-24P	Unit, Direct Support and General Support Maintenance Repair Parts and Special Tools List, Diesel Engine, Model 4039T, 4-Cylinder, 4 Cycle, Fuel Injected, Turbocharged
TM 9-6115-644-10	Operator's Manual, Generator Set, Skid Mounted, Tactical Quiet, 30 kW, 50/60 and 400 Hz
TM 9-6115-644-24P	Unit, Direct Support and General Support Maintenance Repair Parts and Special Tools List, Generator Set, Tactical Quiet, 30 kW, 50/60 and 400 Hz
TM 9-6140-200-14	Operator's, Unit, Direct Support and General Support Maintenance Manual for Lead Storage Batteries

TECHNICAL BULLETINS

TB 740-97-2	Preservation of USAMECOM Mechanical Equipment for Shipment and Storage
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LUBE ORDERS

LO 9-6115-644-12	Generator Set, Skid Mounted, Tactical Quiet 30 kW, 50/60 and 400 Hz
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FIELD MANUALS

FM 21-30	Military Symbols
FM 21-40	Chemical, Biological, Radiological, and Nuclear Defense
FM 3-3	Chemical and Biological Contamination Avoidance
FM 3-4	NBC Protection
FM 3-5	NBC Decontamination
FM 31-70	Basic Cold Weather Manual
FM 4-25.11	First Aid
FM 5-424	Theater of Operations, Electrical Systems
FM 9-207	Operation and Maintenance of Ordnance Materiel in Cold Weather (0° to -65°)

MISCELLANEOUS PUBLICATIONS

AFR 66-1	Air Force Maintenance Forms and Records
AR 700-138	Army Logistics Readiness and Sustainability
AR 735-11-2	Reporting of Supply Discrepancies
AR 750-1	Army Materiel Maintenance Policy and Retail Maintenance Operations
AR 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use
ATPD 2232	Engines: Preparation for Storage and Shipment of, Purchase Description
CTA 8-100	Army Medical Department Expendable/Durable Items

CTA 50-970

Expendable Items (Except Medical Class V, Repair Parts and Heraldic Items)

TO 38-1-5

Processing and Inspection of Nonmounted, Nonaircraft Gasoline and Diesel Engines for Storage and Shipment

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****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 gaugings 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

FIELD AND SUSTAINMENT MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

MAINTENANCE ALLOCATION CHART (MAC)

Table 1. MAC for MEP-805A and MEP-815A.

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARK CODES
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
00	GENERATOR SET 30 kW (LESS ENGINE)	Inspect Inspect Test Service Service Adjust Repair	.2 .3 	 .5 2.0 .3 1.3 6.0			6, 8, 7, 9 9 9 6, 8, 9 6, 8, 7, 9	
01	DC ELECTRICAL SYSTEM	Inspect Inspect Test Repair	.1 	 .1 .2 .3			6, 9 6, 9	
0101	BATTERY AND SLAVE RECEPTACLE CABLES	Inspect Inspect Repair Remove Install Replace	.1 	 .1 .3 .2 .2 .3			6, 9 9 9 6, 9	
0102	BATTERIES	Inspect Inspect Test Service Service Remove Install Replace	.1 .1 	 .1 .1 .1 .2 .2 .2			6, 9 9 9 9 9 9	
0103	SLAVE RECEPTACLE	Inspect Inspect Remove Install Replace	.1 	 .1 .1 .1 .1			9 9 9 9	B
02	HOUSING	Inspect Inspect Repair Remove Install	.2 	 .3 1.0 2.0 2.0			9 9 9 9	B
0201	ACCESS DOORS	Inspect Inspect Repair Remove Install Replace	.1 	 .1 .5 .5 .5 .5			9 9 9 9 9	B
0202	TOP HOUSING SEC- TION	Inspect Inspect Repair Remove Install Replace	.1 	 .2 1.0 1.0 1.0 1.0			9 9 9 9 9	B

Table 1. MAC for MEP-805A and MEP-815A. - Continued

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARK CODES
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
0203	FRONT HOUSING SECTION	Inspect Inspect Repair Remove Install Replace	.1	.2 1.0 .6 .6 .6			9 9 9 9	B
0204	REAR HOUSING SECTION	Inspect Inspect Repair Remove Install Replace	.1	.2 1.0 1.0 1.0 1.0			9 9 9 9	
0205	DECALS AND PLATES	Inspect Inspect Remove Install Replace	.1	.1 .3 .3 .3			6, 1 6, 1 6, 1	B
03	CONTROL BOX ASSEMBLY	Inspect Inspect Test Repair Remove Install Replace	.1	.2 1.5 3.0 .2 .2 .2			6, 8, 7, 9, 3, 2 6, 7, 9 9 9 9	
0301	PANEL LIGHTS	Inspect Inspect Remove Install Replace Repair	.1	.1 .3 .3 .3 .2			9 9 9 9	B C
0302	INDICATORS	Inspect Inspect Test Remove Install Replace	.1	.1 .3 .2 .2 .2			6, 9 9 9 9	B
0303	SWITCHES	Inspect Inspect Test Remove Install Replace	.1	.1 .2 .2 .2 .2			6, 9 6, 9 6, 9 6, 9	
0304	CONVENIENCE RECEPTACLE	Inspect Inspect Test Remove Install Replace	.1	.1 .2 .5 .5 .5			6, 9 9 9 9	B
0305	GROUND FAULT INTERRUPTER	Inspect Inspect Test Test Remove Install Replace	.1 .1	.1 .1 .5 .5 .5			6, 9 6, 9 9 9 9	

Table 1. MAC for MEP-805A and MEP-815A. - Continued

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARK CODES	
			FIELD		SUSTAINMENT				
			CREW	MAINTAINER	BELOW DEPOT	DEPOT			
			C	F	H	D			
0306	MALFUNCTION INDICATOR PANEL	Inspect Inspect Test Test Remove Install Replace	.1 .1 	 .1 .1 .5 .5 .5			9 9 9	B	
0307	FUSE AND CIRCUIT BREAKER	Inspect Inspect Test Remove Install Replace	.1 	 .1 .2 .5 .5 .5			6, 9 6, 9 6, 9 6, 9		B
0308	AC Voltage Regulator	Inspect Test Remove Install Replace	 	.1 .5 .5 .5 .5			6, 9 9 9 9		
0309	RELAYS AND TRANS- DUCERS	Inspect Test Remove Install Replace	 	.1 1.3 .4 .4 .4			6, 8, 9, 3, 2 9 9 9	B	
0310	GOVERNOR CON- TROL UNIT	Inspect Inspect Test Adjust Remove Install Replace	.1 	 .1 1.0 1.0 .2 .2 .2			8, 9 8, 9 9 9 9		B
0311	CONTROL BOX HAR- NESS	Inspect Inspect Test Repair Remove Install Replace	.1 	 .4 2.0 1.5 1.5 1.5 1.5			6, 7, 9 6, 7, 9 6, 9 6, 9 7, 9		
312	LOAD MEASURING UNIT	Inspect Inspect Test Remove Install Replace	.1 	 .1 .5 .5 .5 .5			7, 9 9 9 9	B	
0313	RESISTOR-DIODE ASSEMBLY	Inspect Inspect Test Repair Remove Install Replace	.1 	 .1 .5 1.0 1.0 1.0 1.0			6, 9 6, 9 6, 9 6, 9 6, 9		B
0314	CONTROL BOX PAN- ELS	Inspect Inspect Repair Remove Install Replace	.1 	 .1 .2 3.0 3.0 3.0			9 9 9 9		

Table 1. MAC for MEP-805A and MEP-815A. - Continued

(1)	(2)	(3)	(4)				(5)	(6)
			MAINTENANCE LEVEL					
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
GROUP NUMBER	COMPONENT / ASSEMBLY	MAINTENANCE FUNCTION	C	F	H	D	TOOLS AND EQUIPMENT REF CODE	REMARK CODES
0315	DECALS AND PLATES	Inspect Inspect Remove Install Replace	.1	.1 .3 .3 .3			6, 1 6, 1 6, 1	B
04	AIR INTAKE/ EXHAUST SYSTEM	Inspect Inspect Repair	.2	.2 1.5			9	
0401	MUFFLER AND PIPES	Inspect Inspect Remove Install Replace	.1	.5 .7 .7 .7			9 9 9	B
0402	AIR CLEANER ASSEMBLY	Inspect Inspect Service Service Repair Remove Install Replace	.1 .2	.2 .2 .5 .5 .5 .5			9 9 9 9	B
05	COOLANT SYSTEM	Inspect Inspect Test Service Service Repair	.1 .1	.2 .2 .5 3.0			6, 10 9 9 6, 7, 9	
0501	COOLANT HOSES	Inspect Inspect Remove Install Replace	.1	.1 .5 .5 .5			9 9 9	B
0502	RADIATOR	Inspect Inspect Repair Remove Install Replace	.1	.2 3.0 1.0 1.0 1.0			6, 7, 9 9 9 9	B
0503	COOLING FAN	Inspect Inspect Remove Install Replace	.1	.1 .8 .8 .8			9 9 9 9	B
0504	FAN BELT	Inspect Inspect Test Adjust Remove Install Replace	.1	.1 .1 .5 .5 .5 .5			9 9 9 9	B
0505	COOLANT RECOV- ERY SYSTEM	Inspect Inspect Remove Install Replace	.1	.1 .5 .5 .5			9 9 9 9	B

Table 1. MAC for MEP-805A and MEP-815A. - Continued

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARK CODES
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
06	FUEL SYSTEM	Inspect	.1					
		Inspect		.2				
		Repair		2.5			9	
0601	LOW PRESSURE FUEL LINES	Inspect	.1					
		Inspect		.2				
		Remove		.5			9	
		Install		.5			9	
		Replace		.5			9	
0602	AUXILIARY FUEL PUMP	Inspect		.1				
		Test		.5			9	
		Repair		.5			9	
		Remove		.5			9	
		Install		.5			9	
		Replace		.5			6, 9	
0603	FUEL TANK	Inspect	.3					
		Service	.3					
		Inspect		.2				
		Service		.2				
		Remove		2.5			9	
		Install		2.5			9	
		Replace		2.5			9	
0604	FUEL TANK FLOATS AND SWITCHES	Inspect		.2				
		Test		.3			6, 9	
		Remove		.5			9	
		Install		.5			9	
		Replace		.5			9	
0605	ETHER START SYS- TEM	Inspect	.1					
		Inspect		.2				
		Service		.2			9	
		Repair		.5			9	
		Remove		.5			9	
		Install		.5			9	
		Replace		.5			9	
07	OUTPUT BOX ASSEMBLY	Inspect	.2					
		Test	1.0				6, 7, 9	
		Test		2.0			6, 7, 9	
		Repair	2.0				6, 7, 9	
		Repair		3.0			6, 7, 9	
		Remove		2.0			9	
		Install		2.0			9	
		Replace		2.0			9	
0701	VOLTAGE RECON- NECTION BOARD	Inspect		.2				
		Remove		.4			9	
		Install		.4			9	
		Replace		.4			9	
0702	OUTPUT BOX HAR- NESS AND CABLES	Inspect	.1					
		Inspect		.2				
		Test		.6			6, 8, 9	
		Repair		1.5			6, 7, 9	
		Remove		2.0			9	
		Install		2.0			9	
		Replace		2.0			9	

Table 1. MAC for MEP-805A and MEP-815A. - Continued

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARK CODES	
			FIELD		SUSTAINMENT				
			CREW	MAINTAINER	BELOW DEPOT	DEPOT			
			C	F	H	D			
0703	TRANSFORMERS	Inspect Inspect Test Remove Install Replace	.1	.2 1.0 1.3 1.3 1.3			8, 9 9 9 9	B	
0704	AC CIRCUIT INTER- RUPTER	Inspect Test Remove Install Replace		.2 .5 .5 .5 .5			6, 9 9 9 9		
0705	START RELAY	Inspect Test Remove Install Replace		.2 .5 .5 .5 .5			6, 9 9 9 9		B
0706	OUTPUT BOX PAN- ELS	Inspect Inspect Repair Remove Install Replace	.1	.1 1.2 2.0 2.0 2.0			9 9 9 9		B
0707	AUXILIARY FUEL FIL- TER	Inspect Remove Install Replace	.1	.2 .2 .2			9 9 9		
08	OUTPUT LOAD TER- MINAL BOARD ASSEMBLY	Inspect Inspect Test Repair Remove Install Replace	.1	.1 .5 1.0 1.5 1.5 1.5			6 9 9 9 9		B
0801	LOAD TERMINALS	Inspect Repair Remove Install Replace		.1 .5 .5 .5 .5			9 9 9 9	B	
0802	VARISTORS	Inspect Test Remove Install Replace		1.0 1.1 1.0 1.0 1.0			6, 9 9 9 9	B	
0803	LOAD TERMINAL BOARD	Inspect Inspect Remove Install Replace	.1	.1 1.5 1.5 1.5			9 9 9	B	
09	ENGINE ACCESSOR- IES	Inspect Inspect Test Repair	.1	.1 .5 .5			6, 9 9		

Table 1. MAC for MEP-805A and MEP-815A. - Continued

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARK CODES		
			FIELD		SUSTAINMENT					
			CREW	MAINTAINER	BELOW DEPOT	DEPOT				
			C	F	H	D				
0901	SENDERS AND SWITCHES	Inspect Inspect Test Repair Remove Install Replace	.1	.1 .5 .5 .5 .5 .5			6, 9 9 9 9 9	B		
0902	GOVERNOR ACTU- ATOR	Inspect Inspect Test Adjust Repair Remove Install Replace	.1	.1 .3 .3 1.0 .5 .5 .5			9 9 6, 9 9 9 9			
0903	DEAD CRANK SWITCH	Inspect Inspect Test Remove Install Replace	.1	.1 .5 .5 .5 .5			6, 9 9 9 9		B	
0904	DECALS AND PLATES	Inspect Inspect Remove Install Replace	.1	.1 .3 .3 .3			6, 1 6, 1 6, 1			B
10	LUBRICATION SYS- TEM	Inspect Inspect Service Repair	.1 .2	.2 .5			9			
1001	OIL DRAIN LINE	Inspect Inspect Repair Remove Install Replace	.1	.2 1.0 1.0 1.0 1.0			9 9 9 9		B	
11	GENERATOR ASSEMBLY	Inspect Test Repair Remove Install Replace		.2 2.0 4.0 4.0 4.0 4.0			6, 8, 7, 9 9 6, 7, 9 6, 7, 9 6, 7, 9			B A B
12	ENGINE ASSEMBLY	Inspect Remove Install Replace	.2	4.0 4.0 4.0			6, 7, 9 6, 7, 9 6, 7, 9			
13	SKID BASE	Inspect Inspect Repair Remove Install Replace	.1	.1 1.0 3.0 3.0 3.0			9 9 9 9		B	

Table 2. Tools and Test Equipment Requirements for MEP-805A and MEP-815A.

TOOLS OR TEST EQUIPMENT	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	O	POP RIVET GUN	5120-00-508-1588	GGG-R-00395
2	O	POTENTIOMETER, 10,000 OHMS	—	—
3	O	POTENTIOMETER, 5,000 OHMS	—	—
4	F	RESISTOR, FIXED, 5 OHM, 25 WATT	—	—
5	F	ROTOR LIFTING SLING/DEVICE	—	—
6	O,F	SHOP EQUIPMENT, AUTOMOTIVE MAINT AND REPAIR	4910-00-754-0654	SC4910-95-CL-A74
7	F	SHOP EQUIPMENT, AUTOMOTIVE MAINT AND REPAIR, FIELD	4910-00-348-7696	SC4910-95-CL-A02
8	F	SHOP EQUIPMENT, ELECTRICAL REPAIR	4910-01-096-4475	SC4940-95-CL-B05
9	O,F	TOOL KIT, GENERAL MECHANIC	5180-00-177-7033	SC5180-90-CL-N26
10	O	TORQUE ADAPTER	5120-01-112-4498	—

Table 3. Remarks for MEP-805A and MEP-815A.

REMARK CODES	REMARKS
A	Refer to TM 9-2815-255-24.
B	Replace function identical to removal/install function.
C	Repair is limited to replacement of bulbs.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

EXPENDABLE AND DURABLE ITEMS LIST

EXPENDABLE AND DURABLE ITEMS LIST

Scope

This work package lists expendable and durable items that you will need to operate and maintain the (30Kw 50/60 and 400 Hz Skid Mounted Tactical Quiet Generator Sets). 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.

EXPLANATION OF COLUMNS IN THE 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 identifies the lowest level of maintenance that requires the listed item (include as applicable: C = Crew, O = AMC, F = Maintainer or ASB, H = BelowDepot or TASMG, D = Depot).

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	O,F	8040-00-843-0802	Adhesive, RTV108	OZ
2	O,F	8040-00-380-7959	Adhesive, Seal, EC847	QT
3	O,F	6650-01-464-9125	Antifreeze, A-A-52624, 1 Gal. Can	GL
4	O,F	6650-00-181-7933	Antifreeze, A-A-52624, 5 Gal. Can	GL
5	O,F	6850-01-441-3223	Antifreeze, A-A-52624, 55 Gal. Drum	GL
6	O,F	6650-01-441-3248	Antifreeze, MILA11755, 55 Gal. Drum	GL
7	O,F	8030-01-234-2792	Antiseize, Compound, CP8, 1/2 Lb. Can	OZ
8	O	2910-00-646-9727	Cartridge, Engine, Ether, MS39254	EA
9	O,F	7920-01-338-3329	Cloth, Cleaning, TX-1250	EA
10	F	8030-00-056-8673	Compound, Thermo, PENETROX A	OZ
11	O,F	9150-00-663-1770	Grease, General Purpose, 630AA, 6 Lb. Can	LB
12	O,F	6850-01-160-3868	Inhibitor, Corrosion, MIL-A-53009A(1)	QT
13	O,F	9150-00-186-6681	Lubricating Oil, Engine, ALIEDC030, 30W	QT
14	O,F	9150-00-189-6727	Lubrication Oil, Engine, BRAYC0421C, 10W	QT

Table 1. Expendable and Durable Items List. - Continued

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number / (CAGEC)	(5) U/I
15	O,F	9150-01-152-4117	Lubricating Oil, Engine, MIL-PRF-2104H, 15/40W	QT
16	O,F	9150-00-402-2372	Lubricating Oil, Engine, MIL-PRF-46167D, OEA	QT
17	O,F	5350-00-543-3600	Paper, Abrasive, ALOXGRIT80	SH
18	O,F	8030-00-849-0071	Sealing Compound, FORM-A-GASKET 2	TU
19	O,F	8030-01-408-9944	Sealing Compound, PES-821-B	QT
20	O,F	3439-00-974-1873	Solder, Tin Alloy, SN60WRAP2, 1 Lb. Spool	OZ
21	O,F	6850-00-264-9038	Solvent, Dry Cleaning, P-D-680, 5 Gal. Can	GL

END OF WORK PACKAGE

CHAPTER 5

FIELD SUPPORTING INFORMATION

FOR

**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL
QUIET GENERATOR SETS**

CHAPTER 5
WINTERIZATION KIT

WORK PACKAGE INDEX

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Winterization Kit, General Information.....	0160
Winterization Kit, Equipment Description and Data.....	0161
Winterization Kit, Theory of Operation.....	0162
Winterization Kit, Description and Use of Controls and Indicators	0163
Winterization Kit, Troubleshooting Index.....	0164
Winterization Kit, Troubleshooting Procedures	0165
Winterization Kit, Service Upon Receipt.....	0166
Winterization Kit, PMCS Introduction	0167
Winterization Kit, PMCS, Including Lubrication Instructions.....	0168
Winterization Kit, Installation Instructions	0169
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Winterization Kit, Heater Assembly Maintenance.....	0171
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Winterization Kit, Coolant Hose Maintenance	0175
Winterization Kit, Air Inlet and Exhaust Hose Maintenance	0176
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Winterization Kit, Removal Instructions.....	0180

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
WINTERIZATION KIT, GENERAL INFORMATION**

INTRODUCTION**SCOPE**

This work package is for your use in operating and maintaining the Winterization Kit installed on the 30 kW Tactical Quiet Generator Sets. The chapter covers field maintenance, installation instructions, and removal instructions as well as troubleshooting procedures for the kit.

Levels of Maintenance

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

REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SPECIAL SUPPORT EQUIPMENT**Common Tools and Equipment**

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

Special Tools, TMDE, and Special Support Equipment. No special tools or special support equipment are required for maintenance of the modification kit.

Repair Parts. Repair parts for the modification kit are listed and illustrated in WP 0159.

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS WINTERIZATION KIT, EQUIPMENT DESCRIPTION AND DATA

GENERAL

The winterization kit is designed to be mounted in generator sets where extreme cold temperatures are anticipated. The kit consists of a coolant heater, which allows the generator set to operate to -50 °F (-45.6 °C). The coolant heater circulates the coolant from the generator set through the heater pump and heats the coolant by the heater and returns it back through the radiator of the generator set. The cycle continues until the temperature reaches 176 °F (80 °C). The heater then goes into low-heat mode; if the coolant temperature drops to 158 °F (70 °C), the heater will switch to high-heat mode.

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES**Characteristics**

The Winterization Kit contains a coolant heater that heats the coolant and allows the generator set to operate to -50 °F (-45.6 °C).

Capabilities and Features

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

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Figure 1 illustrates the major components of the kit and shows their locations on the 30 kW Tactical Quiet Generator (TQG) Set. (Refer to Table 1 for item names).

Table 1. Description of Major Winterization Kit Components.

Item No.	Item Name	Description
	Winterization Kit	A fuel-burning heater, pre-heats engine coolant permitting generator set Operation to -50 °F (-45.6 °C).
1	Control Unit	Controls heater operations.
2	Heater	Heats coolant for operation in extreme cold temperatures.
3	Fuel Pump	Pumps fuel from the generator set fuel tank to the heater.
4	Fuel Lines	Provides a means of transporting fuel to heater.
5	Coolant Pump	Circulates coolant from generator set through the heater.
6	Coolant Lines	Provides a means of transporting coolant for circulation.
7	Switch/Lamp	Switches heater on or off and lamp indicates heater function codes.
8	Wiring Harness	Electrically connects Winterization Kit components.
9	Exhaust Hose	Provides a means of exhausting combustion gases from heater.
10	Air Inlet Hose	Provides intake air to winterization heater.

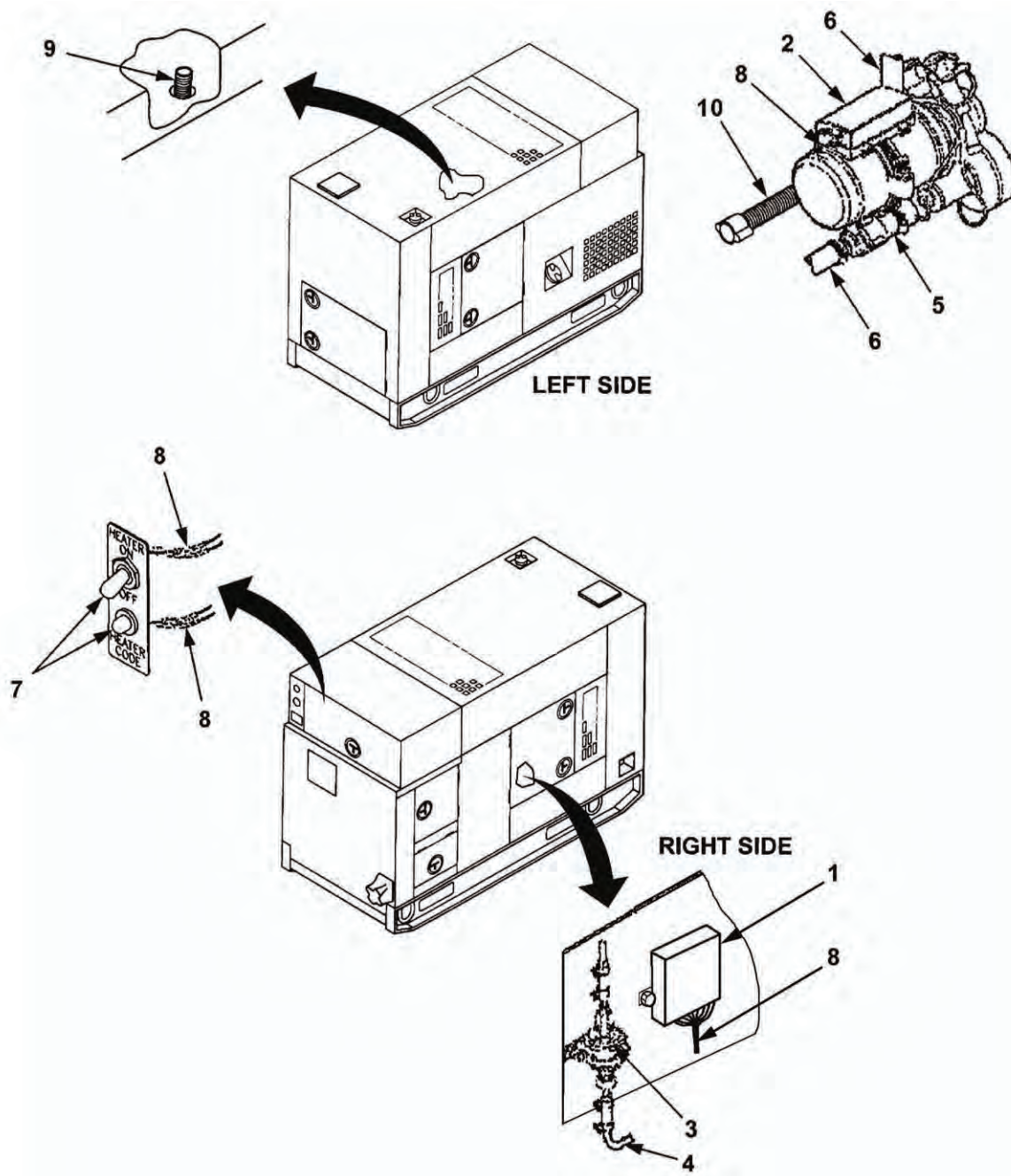


Figure 1. Location of Major Winterization Kit Components.

TABULATED/ILLUSTRATED DATA

Tabulated data for the heater is located in Table 2.

Table 2. Heater Operating Data.

Item Name	Data
1. Winterization Kit	
a. National Stock Number	6115-01-474-8354
b. Overall Length	10.787 in
c. Overall Width	5.984 in
d. Overall Height	7.815 in
e. Weight	15 lbs.
2. Heater	
a. Manufacturer	Active Gear
b. Model	D5W
3. Heating	Water Coolant
Capacity	High: 17,000 BTU/Hr. Low: 4250 BTU/Hr.
4. Rated Voltage	24 VDC
a. Operating Voltage Range	20-28 VDC
b. Current at 24 VDC	Start: 20 Amps/Hr. Running High: 1.8 Amps/Hr. Running Low: 1.2 Amps/Hr.
5. Fuel	Diesel
Fuel Consumption	High: 0.06 Gal/Hr. Low: 0.04 Gal/Hr.
6. Coolant Pump Flow	250 Gal/Hr.

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****WINTERIZATION KIT, THEORY OF OPERATION**

GENERAL

This work package contains a functional description of the winterization kit.

Functional Description

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

NOTE

Heater warms generator engine block sufficiently to start in below zero temperatures.

1. The circulation pump, ceramic glow plug, and combustion air fan start operation after the heater is turned on.
2. After approximately 50 seconds, the fuel pump starts, combustion starts, and the ceramic igniter/glow plug is turned off.
3. When the coolant temperature reaches 176 °F (80 °C), the heater switches to low-heat mode.
4. If the coolant temperature drops to 158 °F (70 °C), the heater switches to high-heat mode.
5. If the coolant temperature rises to 185 °F (85 °C), the heater will switch off. The heater will automatically restart in high-heat mode when the coolant temperature reaches 158 °F (70 °C).
6. When switched off, the fuel pump stops and the flame is extinguished. The combustion air fan blower and coolant circulating pump continue to run for a 3-minute cool-down cycle.
7. If the voltage drops below 21.0 VDC or rises above 30.0 VDC at any time, the heater will shut down after a 20 second delay.

END OF WORK PACKAGE

FIELD MAINTENANCE

**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
WINTERIZATION KIT, DESCRIPTION AND USE OF CONTROLS AND INDICATORS**

INITIAL SETUP:**References**

WP 0161, Figure 1, Item 7

GENERAL

This work package describes and illustrates the winterization kit controls and indicators to ensure proper operations.

1. **Controls/Indicators.** There are three controls/indicators; the heater indicator light, a control unit, and the ON-OFF switch.
2. **Heater Indicator Light.** A light at the heater ON-OFF switch (WP 0161, Figure 1, Item 7) lights when the heater is operating. The light also serves as a troubleshooting code light (WP 0164, Code Light Pulses).
3. **Control Unit.** The control unit (1) is a sealed unit, mounted on the generator wall, which controls heater operation.
4. **Heater ON-OFF Switch.** The ON-OFF switch (7) is a single-pole, single-throw toggle switch. Placed in the ON position, the switch closes the 24 VDC circuit to the control unit and illuminates the heater indicator light.
5. **Function and Identification Plates.** There are three data plates pertaining to the winterization kit. See Table 1 for description and corresponding figures for general graphic representation.

Table 1. Data Plates.

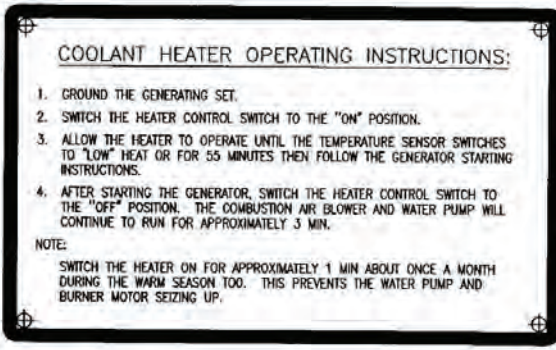
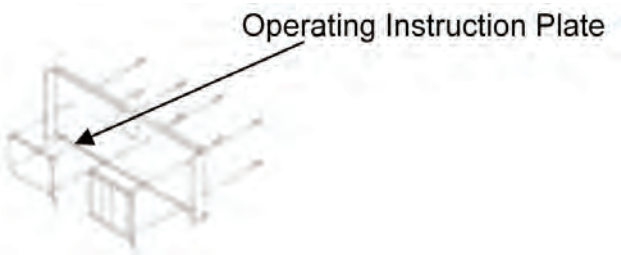
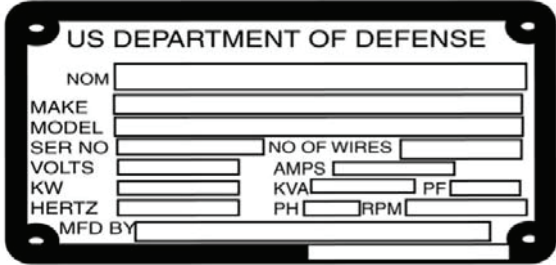
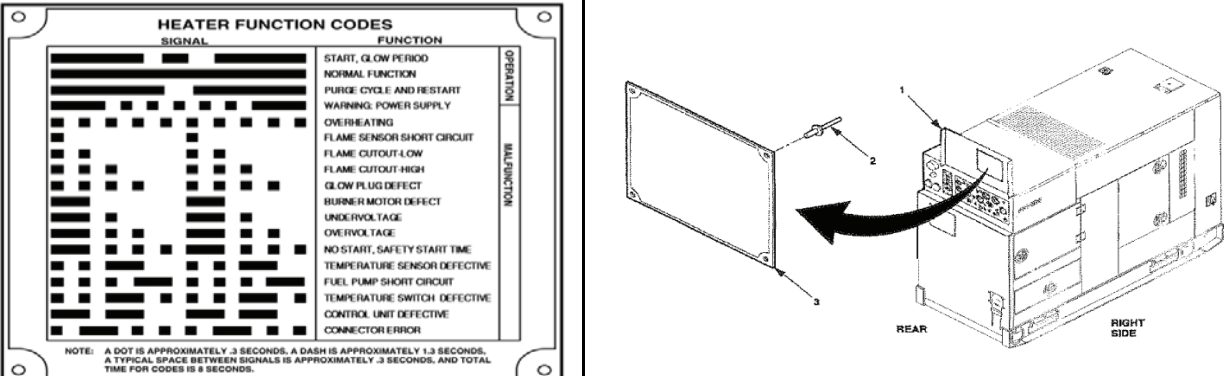
Item No.	Item Name/Description	Function/Location
1.	Heater Operating Instructions 	Mounted on generator control panel access door that describes heater operating procedures. 
2.	Function Code Plate	Mounted on the generator control panel access door and lists the sequence of pulses for each malfunction.

Table 1. Data Plates. - Continued

Item No.	Item Name/Description	Function/Location
3.	<p data-bbox="170 735 451 762">Identification Data Plate</p>  <p>The identification data plate is a rectangular plate with a black border. It features the text 'US DEPARTMENT OF DEFENSE' at the top. Below this, there are several fields for identification: 'NOM', 'MAKE', 'MODEL', 'SER NO', 'NO OF WIRES', 'VOLTS', 'AMPS', 'KW', 'KVA', 'PF', 'HERTZ', 'PH', 'RPM', and 'MFD BY'. Each field is followed by a horizontal line for handwritten entry.</p>	 <p>The top part of the diagram shows a 'HEATER FUNCTION CODES' data plate. It has two columns: 'SIGNAL' and 'FUNCTION'. The 'SIGNAL' column contains a series of horizontal bars of varying lengths representing different codes. The 'FUNCTION' column lists the corresponding functions: START, GLOW PERIOD; NORMAL FUNCTION; PURGE CYCLE AND RESTART; WARNING, POWER SUPPLY; OVERHEATING; FLAME SENSOR SHORT CIRCUIT; FLAME CUTOFF-LOW; FLAME CUTOFF-HIGH; GLOW PLUG DEFECT; BURNER MOTOR DEFECT; UNDERVOLTAGE; OVERVOLTAGE; NO START, SAFETY START TIME; TEMPERATURE SENSOR DEFECTIVE; FUEL PUMP SHORT CIRCUIT; TEMPERATURE SWITCH DEFECTIVE; CONTROL UNIT DEFECTIVE; and CONNECTOR ERROR. A note at the bottom states: 'NOTE: A DOT IS APPROXIMATELY .3 SECONDS, A DASH IS APPROXIMATELY 1.3 SECONDS, A TYPICAL SPACE BETWEEN SIGNALS IS APPROXIMATELY .3 SECONDS, AND TOTAL TIME FOR CODES IS 8 SECONDS.'</p> <p>The bottom part of the diagram shows a 3D perspective view of a generator access door. A curved arrow points from the 'HEATER FUNCTION CODES' data plate to the door, indicating its mounting location. The door is labeled 'REAR' and 'RIGHT SIDE'.</p> <p data-bbox="773 735 1393 793">Mounted on the generator access door and identifies winterization kit characteristics.</p>

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****WINTERIZATION KIT, TROUBLESHOOTING INDEX**

INITIAL SETUP:**References**

TM 9-2815-255-24
WP 0165, Troubleshooting Table
WP 0169, Figure 8

GENERAL

Refer to Chapter 2 for generator set troubleshooting procedures (TM 9-2815-255-24 for engine troubleshooting procedures). This work package lists diagnostic and symptom related malfunctions you may find during operation of the generator set with the Winterization Kit installed and the generator set running. These pulses are shown visually on the Function Codes plate mounted inside the generator set control panel cover. Each malfunction is listed individually in the Symptom Index, and helps determine probable causes and corrective actions to take. The troubleshooting symptom or diagnostic fault index cannot list all faults that may occur, nor all the tests, inspections, and/or corrective actions. If a malfunction is not listed or cannot be corrected by listed corrective actions, notify your supervisor. There are two types of faults associated with troubleshooting: Symptom related Faults and Diagnostic Faults.

Symptom Related Faults

This is the soldier's ability to recognize faults occurring during normal operation that may or may not prompt a diagnostic/lamp fault.

Basic items of concern would include:

- Fuses
- Proper Electrical Connections
- Air Inlet and Exhaust Pipe clearance
- Fuel in the tank
- Correct Battery Voltage
- Coolant Flow

Diagnostic Faults

The indicator light near the heater switch is designed to blink code sequences to signal malfunctions in the system. See Heater Function Codes.

HEATER FUNCTION CODES**Code Light Pulses**

The indicator light near the heater ON-OFF switch will blink in different sequences of long and short pulses to indicate malfunctions. A plate (Figure 1) mounted on the generator control panel access door (WP 0169, Figure 8) lists the malfunctions and shows each sequence of pulses for diagnostic faults given. Figure 2 provides an example of the Troubleshooting Table found in WP 0165.

HEATER FUNCTION CODES		
SIGNAL	FUNCTION	
[Signal: 3 dashes]	START, GLOW PERIOD	OPERATION
[Signal: 1 dash]	NORMAL FUNCTION	
[Signal: 3 dashes]	PURGE CYCLE AND RESTART	
[Signal: 1 dash, 1 dot]	WARNING: POWER SUPPLY	MALFUNCTION
[Signal: 1 dash, 1 dot]	OVERHEATING	
[Signal: 1 dash, 1 dot]	FLAME SENSOR SHORT CIRCUIT	
[Signal: 1 dash, 1 dot]	FLAME CUTOFF-LOW	
[Signal: 1 dash, 1 dot]	FLAME CUTOFF-HIGH	
[Signal: 1 dash, 1 dot]	GLOW PLUG DEFECT	
[Signal: 1 dash, 1 dot]	BURNER MOTOR DEFECT	
[Signal: 1 dash, 1 dot]	UNDERVOLTAGE	
[Signal: 1 dash, 1 dot]	OVERVOLTAGE	
[Signal: 1 dash, 1 dot]	NO START, SAFETY START TIME	
[Signal: 1 dash, 1 dot]	TEMPERATURE SENSOR DEFECTIVE	
[Signal: 1 dash, 1 dot]	FUEL PUMP SHORT CIRCUIT	
[Signal: 1 dash, 1 dot]	TEMPERATURE SWITCH DEFECTIVE	
[Signal: 1 dash, 1 dot]	CONTROL UNIT DEFECTIVE	
[Signal: 1 dash, 1 dot]	CONNECTOR ERROR	

NOTE: A DOT IS APPROXIMATELY .3 SECONDS, A DASH IS APPROXIMATELY 1.3 SECONDS, A TYPICAL SPACE BETWEEN SIGNALS IS APPROXIMATELY .3 SECONDS, AND TOTAL TIME FOR CODES IS 8 SECONDS.

Figure 1. Heater Function Codes Plate.

SYMPTOM ##

1. (dot, dash, dot... if present) (Symptom Description or Fault Code Description)

TEST OR INSPECTION

Perform this test or inspection.

CORRECTIVE ACTION

- a. If result is good, perform this corrective/maintenance action or next step.
- b. If result is not good, perform this corrective/maintenance action.

Figure 2. Example Troubleshooting Table.

NOTE

When the heater is switched on, the light will perform one of the sequences of light pulses shown visually on the Heater Function Codes Plate (Figure 1) mounted inside the generator set control panel cover. Before each symptom, this index lists in parentheses the light sequence associated with it.

Malfunction/Symptom**Troubleshooting
Procedure****SYMPTOM INDEX**

(dash, dash) - Heater Restart Attempted During Purge Cycle	1
(dash, 5 dots, dash) - Warning: Power Supply	2
(10 dots) - Overheating	3
(dot, dot) - Flame Sensor Short-Circuit	4
(2 dots, 2 dots) - Flame Cutout-LOW	5
(3 dots, 3 dots) - Flame Cutout-HIGH	6
(4 dots, 4 dots) - Glow Plug Defect	7
(dash, dash) - Burner Motor Defect	8
(dash, dot, dash, dot) - Under Voltage	9/10
(dash, 2 dots, dash, 2 dots) - Over Voltage	9/10
(dash, 3 dots, dash, 3 dots) - Non-Start	11
(2 dots, dash, 2 dots, dash) - Temperature Sensor Defective	12
(3 dots, dash, 3 dots, dash) - Fuel Pump Short Circuit	13/14/15/16
(2 dots, dash, 3 dots, dash, dot) - Temperature Switch Defective	13/14/15/16
(4 dashes) - Control Unit Defective	13/14/15/16
(dot, dash, 3 dots, dash, 2 dots) - Connection Error	13/14/15/16
No Indication of Heater Operation When Switch Is In ON Position	17

END OF WORK PACKAGE

FIELD MAINTENANCE

30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS

WINTERIZATION KIT, TROUBLESHOOTING PROCEDURES

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

One

References

WP 0076, Maintenance of Coolant System, Coolant System
 WP 0169, Figure 7 & Installation Procedures, Step 8
 WP 0170, Winterization Kit, Control Unit Maintenance
 WP 0171, Winterization Kit, Heater Assembly Maintenance
 WP 0172, Winterization Kit, Pump Maintenance
 WP 0174, Winterization Kit, Heater Switch Plate/Heater Switch/Indicator Light Maintenance
 WP 0177, Winterization Kit, Wiring Harness Maintenance
 WP 0179, Winterization Kit, Function Codes/Operating ID Plate Maintenance

Equipment Condition

Grounded, Off & Operational

SYMPTOM 1

1. (dash, dash) Purge Cycle and Heater Restart (Starts while heater still NOT shut OFF).

TEST OR INSPECTION

If the heater fails to start the first time, it will automatically attempt a second start as long as coolant temperature is 158 °F (70 °C). If that attempt fails, the heater will automatically shut down.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

CORRECTIVE ACTION

- a. Shut down generator set.
- b. Make sure battery power is still applied and EMERGENCY STOP SWITCH is pushed IN.
- c. Release DCS control panel by turning two fasteners and lowering panel.

NOTE

See WP 0169, Figure 7 for all Wiring Harness troubleshooting.

- d. Check fuel level, check for leaks and that fuel pump is properly working. Place a container under the output end of the fuel pump line and remove the line. Turn the pump on and observe the fuel flow.
 - (1) If no fuel leaks and pump IS working properly, go to Step e.
 - (2) If fuel pump is NOT working properly, continue to SYMPTOM 13 (Fuel Pump Short Circuit).
- e. Ensure purge cycle of at least 90 seconds has elapsed and coolant temperature falls below the triggering point of 158 °F (70 °C).

- (1) If temperature is as specified and flame is NOT stable, inspect glow plug for proper seating. See WP 0179.
- (2) If temperature is as specified and flame IS stable, replace Heater Assembly per WP 0171.

END OF TASK**SYMPTOM 2**

2. (dash, 5 dots, dash) Warning: Power Supply

TEST OR INSPECTION**NOTE**

This fault will more than likely accompany SYMPTOMS 9/10 and a safety shut down will occur.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

CORRECTIVE ACTION

- a. Shut down generator set.
- b. Make sure battery power is still applied and EMERGENCY STOP SWITCH is pushed IN.
- c. Release DCS control panel by turning two fasteners and lowering panel.
- d. Record any accompanying fault/s and check voltage output of batteries.
 - (1) If voltage is less than 21 VDC, check electrolyte levels as per WP 0012. Charge batteries as necessary.
 - (2) If voltage is greater than 30 VDC, troubleshoot 25A main fuse/s as per wiring diagram WP 0169, Figure 7.
 - (3) If voltage is within normal range between 21 and 30 VDC, replace control unit per WP 0170.

END OF TASK**SYMPTOM 3**

3. (10 dots) Overheating

TEST OR INSPECTION

If the temperature of the heat exchanger or the coolant rises above 185 °F (85 °C) at any given time, this fault will more than likely produce a safety cut out and malfunction shutdown. Fault is normally due to a lack of water/coolant, air restriction, or poorly bled coolant system.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

CORRECTIVE ACTION

- a. Shut down generator set.
- b. Make sure EMERGENCY STOP SWITCH is pushed IN on generator set.
- c. Release DCS control panel by turning two fasteners and lowering panel.

CAUTION

Coolant must contain a minimum of 10% antifreeze at all times to protect against corrosion. Fresh water will corrode internal heater parts.

- d. Check coolant level and add coolant as required per WP 0076, Servicing.
- e. Check to ensure coolant pump is working properly. Measure continuity of coolant pump wiring: A2-C2 and A1-1 (A1-2 GND).
 - (1) If continuity is present, go to Step f.
 - (2) If continuity is not present, repair/replace wiring harness as required per WP 0177.
- f. Check to ensure voltage is present at positive end of coolant pump with ON/OFF heater switch in the ON position.
 - (1) If voltage is as specified, replace heater per WP 0171.
 - (2) If voltage is NOT as specified, go to SYMPTOM 2 (Warning: Power Supply).

END OF TASK**SYMPTOM 4**

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

TEST OR INSPECTION

The flame is monitored by the flame sensor and at the point of ignition, will automatically switch the glow plug OFF. This fault will typically present itself in the event fuel quantities are sufficient and no flame is found.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

NOTE

See WP 0169, Figure 7 for Wiring Harness troubleshooting.

CORRECTIVE ACTION

- a. Shut down generator set.
- b. Make sure EMERGENCY STOP SWITCH is pushed IN on generator set.
- c. Remove heater assembly and test according to WP 0171.
 - (1) If flame sensor is good, repair/replace wiring harness as required (WP 0177).
 - (2) If continuity is NOT good, replace heater assembly (WP 0171).

END OF TASK**SYMPTOM 5**

- 5. (2 dots, 2 dots) Flame Cutout - Low

TEST OR INSPECTION

The flame is monitored by the flame sensor and at the point of ignition, will automatically switch the glow plug OFF. This fault will typically present itself when there is NOT a sufficient fuel supply or fuel pump operation is suspect. A higher than normal blower motor RPM (greater than 5500) may also prevent flame from sustaining itself. A fault shutdown is imminent.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

NOTE

See WP 0169, Figure 7 for Wiring Harness troubleshooting.

CORRECTIVE ACTION

- a. Shut down generator set.
- b. Make sure EMERGENCY STOP SWITCH is pushed IN on generator set.
- c. Turn heater switch momentarily OFF and then back ON to reset the fault shutdown. If heater does not start, it will continue to shut down.
- d. Check fuel level and/or fuel line restrictions. Refill if needed.
- e. Test fuel metering pump per WP 0172 for proper operation.
 - (1) If fuel metering pump works as specified, continue to Step f.
 - (2) If fuel metering pump does NOT work as specified, repair/replace fuel metering pump per WP 0172.
- f. Measure blower motor voltage at A2-Pin C5. If voltage is not as specified, verify 24 VDC power source and/or replace heater control unit per WP 0170.

END OF TASK**SYMPTOM 6**

6. (3 dots, 3 dots) Flame Cutout - High

TEST OR INSPECTION

The flame is monitored by the flame sensor and at the point of ignition, will automatically switch the glow plug OFF. This fault will typically present itself when the heater and/or fuel system is under extreme use and develops vapor lock in the fuel line.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

NOTE

See WP 0169, Figure 7 for J7 Wiring Harness troubleshooting.

CORRECTIVE ACTION

- a. Shut down generator set and wait for a period of 30 minutes.
- b. Make sure EMERGENCY STOP SWITCH is pushed IN on generator set.
- c. Turn heater switch momentarily OFF and then back ON to reset the fault shutdown. If heater does not start, it will continue to shut down.
- d. Check for use of proper fuel and fill level. Refill if needed.

NOTE

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

- e. Check installation position of fuel metering pump per WP 0169, Installation Procedures, Step 8,f.

NOTE

Variances greater than 15° from vertical could cause fuel blockage.

- f. Remove possible vapor lock from fuel line. Reduced suction will caution vapor in the line. See testing per WP 0172.

END OF TASK**SYMPTOM 7**

- 7. (4 dots, 4 dots) Glow Plug Defect

TEST OR INSPECTION

The flame is monitored by the flame sensor and at the point of ignition, will automatically switch the glow plug OFF. IF the glow plug is faulty, then it will not start regardless.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

NOTE

See WP 0169, Figure 7 for Wiring Harness troubleshooting.

CORRECTIVE ACTION

- a. Shut down generator set and wait for a period of 30 minutes.
- b. Make sure EMERGENCY STOP SWITCH is pushed IN on generator set.
- c. Turn heater switch momentarily OFF and then back ON to reset the fault shutdown. If heater does not start, it will continue to shut down.
- d. Perform TEST procedures per WP 0178 to determine if glow plug or resistor is faulty.
 - (1) If glow plug and resistor continuity is good, continue to Step e.
 - (2) If glow plug or resistor is bad, replace as needed.
- e. Measure continuity between A2-C Pin 3 and HR Pin 2 and HR Pin 1 and HR Pin 2. If continuity is NOT good, repair/replace wiring harness as required per WP 0177.

END OF TASK**SYMPTOM 8**

- 8. (dash, dash) Burner Motor Defect

TEST OR INSPECTION

When the heater is started, the functioning of the blower motor is checked once. If it does not start, the heater will undergo a fault shutdown. During operation, the blower motor is monitored in cycles. If the motor speed is below the permitted limit, a fault shutdown will also occur. A fault shutdown may or may not occur during rough idling. This is typically due to a fuel, air mixture, or low voltage related problem.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

NOTE

See WP 0169, Figure 7 for Wiring Harness troubleshooting.

CORRECTIVE ACTION

- a. Shut down generator set.
- b. Make sure EMERGENCY STOP SWITCH is pushed IN on generator set.
- c. Turn heater switch momentarily OFF and then back ON to reset the fault shutdown. If heater does not start, it will continue to shut down.
- d. Clear any obstructions or debris from air intake or exhaust lines.
- e. Check 7.5 AMP fuse.
 - (1) If fuse is bad, replace fuse as required.
 - (2) If fuse is good, continue to Step f.
- f. Measure voltage at A1- Pin 4 and GND to determine correct voltage is applied.
 - (1) If voltage is NOT as specified, replace heater assembly per WP 0171.

END OF TASK**SYMPTOM 9 and 10**

9. (dash, dot, dash, dot) Under Voltage
10. (dash, 2 dots, dash, 2 dots) Over Voltage

TEST OR INSPECTION

SYMPTOM 2 may or may not illuminate simultaneously with a SYMPTOM 9 or 10 fault. Troubleshooting for all three should be carried out in the same procedure as directed below. A fault shutdown will occur in the event the voltage is less than 21 VDC or greater than 30 VDC.

NOTE

See SYMPTOM 2 (Warning: Power Supply).

END OF TASK**SYMPTOM 11**

11. (dash, 3 dots, dash, 3 dots) Non-Start, Automatic Cut-Out

TEST OR INSPECTION

This fault is the result of having one or more faults causing multiple indications simultaneously. As described below, this fault should be the LAST malfunction to troubleshoot if there are a series of malfunctions in order to find the root of the problem. Some of these symptoms may be eliminated due to proper PMCS being performed. Those include but not limited to:

- Fuel/Ignition system (SYMPTOM 5)
- Power requirements (SYMPTOM 2)
- Intermittent wiring or cable connections (SYMPTOM 15)

NOTE

If the heater fails to start the first time, it will automatically attempt a second start as long as coolant temperature is 158 °F (70 °C). If that attempt fails, the heater will automatically shut down.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

CORRECTIVE ACTION

- a. Shut down generator set.
- b. Make sure battery power is still applied and EMERGENCY STOP SWITCH is pushed IN.
- c. Release DCS control panel by turning two fasteners and lowering panel.

NOTE

See WP 0169, Figure 7 for all Wiring Harness troubleshooting.

- d. Have all other SYMPTOMS been extinguished?
 - (1) If other SYMPTOMS exist, go to those respective SYMPTOMS.
 - (2) If there are no other SYMPTOMS, and fault still exist, replace control unit per WP 0170.

END OF TASK**SYMPTOM 12**

12. (2 dots, dash, 2 dots, dash) Temperature Sensor Defective

TEST OR INSPECTION

The temperature sensor is a device to acknowledge temperature change. If the temperature of the heat exchanger wall or the coolant rises above the maximum permissible temperature, the safety thermal cutout fuse (switch) is blown and initiates a malfunction shutdown. The inability to switch between LOW- and HIGH-Heat modes presents the possibility of a SYMPTOM 12 or 13 fault.

NOTE

If the heater fails to start the first time, it will automatically attempt a second start as long as coolant temperature is 158 °F (70 °C). If that attempt fails, the heater will automatically shut down.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

CORRECTIVE ACTION

- a. Shut down generator set.
- b. Make sure battery power is NOT applied and EMERGENCY STOP SWITCH is pushed IN.
- c. Remove Heater Assembly and test according to WP 0171.
- d. Turn heater switch momentarily to OFF and then back ON to reset the fault shutdown.
 - (1) If sensor is bad, replace heater assembly (WP 0171).
 - (2) If sensor is good and fault still remains, repair/replace wiring harness per WP 0177.

END OF TASK**SYMPTOM 13, 14, 15, 16**

13. (3 dots, dash, 3 dots, dash) Fuel Pump Short Circuit

14. (2 dots, dash, 3 dots, dash, dot) Temperature/Thermal Cutout Switch (Fuse Defective)
15. (4 dashes) Control Unit Defective
16. (dot, dash, 3 dots, dash, 2 dots) Connection Error

TEST OR INSPECTION

The above faults are usually as a result of a bad connection or considered an intermittent fault. Follow the procedures below as the corrective action is the same for each.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

CORRECTIVE ACTION

- a. Troubleshoot the above SYMPTOM fault conditions by checking for possible wiring harness disconnects.
- b. Turn heater switch momentarily to OFF and then back ON to reset the fault shutdown. If wiring harness and/or connections are good, replace the respective faulty component:
 - Fuel Pump Short Circuit per WP 0172.
 - Temperature/Thermal Cutout Switch (heater assembly per WP 0171).
 - Control Unit per WP 0170.
 - Wiring Harness per WP 0177.

END OF TASK

SYMPTOM 17

17. (No Indication of Heater Operation When Switch is in ON Position)

TEST OR INSPECTION

Some of these symptoms may be eliminated due to proper PMCS being performed. Those include but not limited to:

- Power requirements (SYMPTOM 2).
- Intermittent wiring or cable connections (SYMPTOM 16).

NOTE

If the heater fails to start the first time, it will automatically attempt a second start as long as coolant temperature is 158 °F (70 °C). If that attempt fails, the heater will automatically shut down.

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

CORRECTIVE ACTION

- a. Shut down generator set.
- b. Make sure 24±2 VDC battery power is still applied and EMERGENCY STOP SWITCH is pushed IN.
- c. Release DCS control panel by turning two fasteners and lowering panel.

NOTE

See WP 0169, Figure 7 for all Wiring Harness troubleshooting.

- d. Check 7.5A fuse (XF1) supplying power to blower motor.
 - (1) If fuse is bad, replace if needed.
 - (2) If fuse is good, continue to Step e.
- e. Check for +24 VDC at S1-2 on heater switch.
 - (1) If voltage is as specified, continue to Step f.
 - (2) If voltage is not as specified, continue checking for +24 VDC between power source and heater switch according to WP 0169, Figure 7.
- f. Place S1 switch to ON position and check for +24 VDC at S1-3.
 - (1) If voltage is as specified, continue to Step g.
 - (2) If voltage is not as specified, replace S1 per WP 0174.
- g. Remove A2-Test connector from control unit. Check for +24 VDC at Pin S with S1 in ON position.
 - (1) If voltage is as specified, continue to Step h.
 - (2) If voltage is not as specified, repair/replace wiring harness (WP 0177).
- h. Remove A2-A connector (6 pin) from control unit. Check continuity from Pin 3 to GND.
 - (1) If circuit indicates short, replace control unit per WP 0170.
 - (2) If circuit indicates an open, repair/replace wiring harness (WP 0177).

END OF TASK

END OF WORK PACKAGE

MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****WINTERIZATION KIT, SERVICE UPON RECEIPT**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Personnel Required

One

References

WP 0169, Winterization Kit, Installation Instructions

WP 0180, Winterization Kit, Removal Instructions

SERVICE UPON RECEIPT OF MATERIEL FOR WINTERIZATION KIT

If the winterization kit is already installed on the generator set, the normal service on receipt of the generator set is sufficient, and no separate service on receipt is required by unit for the winterization kit. If the kit is not installed, refer to WP 0169.

REMOVAL INSTRUCTIONS

Refer to WP 0180, Removal Instructions.

END OF WORK PACKAGE

FIELD MAINTENANCE

**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
WINTERIZATION KIT, PMCS INTRODUCTION**

GENERAL

WP 0168 (PMCS Table 1) has been provided so you can keep your equipment in good operating condition and ready for its primary mission.

Warnings, Cautions, and Notes

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

Explanation of Table Entries

The PMCS table is divided into five columns. Each column is explained in the following paragraphs.

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

Interval Column. This column tells you when you must do the procedure described in the procedure column. "BEFORE" procedures must be done before you operate the equipment for its intended mission. "DURING" procedures must be done during the time you are operating the equipment for its intended mission. "AFTER" procedures must be done immediately after you have operated the equipment. Perform "WEEKLY" procedures at the listed interval.

Item to be Checked or Serviced. This column lists the location and the item to be checked or serviced. The item location is underlined.

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

Equipment Not Ready/Available if: Column. Information in this column tells you what faults will keep your equipment from being capable of performing its primary mission. If you perform checks or services that show faults listed in this column, do not operate the equipment.

Reporting and Correcting Deficiencies

If Winterization Kit does not perform as required, perform operator troubleshooting procedures as referenced in WP 0164.

Other Table Entries

Be sure to observe all special information and notes that appear in your table.

Special Instructions

Preventive maintenance is not limited to performing the checks and services listed in the PMCS Table in WP 0168. Figure 1 depicts general Winterization Kit PMCS routing. (Refer to WP 0168, Table 1 for item locations/procedures). Covering unused receptacles, stowing unused accessories and other routine procedures such as equipment inventory, cleaning components, and touch up painting are not listed in the table. These are things you should do any time you see that they need to be done. If a routine check is listed in the PMCS Table, it is because experience has shown that problems may occur with this item. Take along tools and cleaning cloths needed to perform the required checks and services. Use the following information to help identify potential problems before and during checks and services. Use the information in the following paragraphs to help you identify problems at any time.

WARNING

Solvent used to clean parts is potentially dangerous to personnel and property. Clean parts in a well-ventilated area. Avoid inhalation of solvent fumes. Wear goggles and rubber gloves to protect eyes and skin. Wash exposed skin thoroughly. Do not smoke or use near open flame or excessive heat. Failure to comply with this warning can cause injury to personnel, and damage to the equipment.

CAUTION

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

1. Keep it clean. Dirt, grease, and oil get in the way and may cover up a serious problem. Use a dry cleaning solvent to clean metal surfaces.
2. Use soap and water to clean rubber or plastic parts and material.
3. Check all bolts, nuts, and screws to make sure they are not loose, missing, bent, or broken. Do not try to check them with a tool, but look for chipped paint, bare metal, or rust around bolt heads. If you find one loose, report it to the next-higher level of maintenance.
4. Inspect welds for loose or chipped paint, rust, or gaps where parts are welded together. If a broken weld is found, report it to the next-higher level of maintenance.
5. Inspect electrical wires, connectors, terminals, and receptacles for cracked or broken insulation, bare wires, and loose or broken connectors. Tighten loose connectors and make sure wires are in good condition. Examine terminals and receptacles for serviceability. If deficiencies are found, report them to the next-higher level of maintenance.
6. Inspect hoses and fluid lines. Look for wear, damage, and leaks. Make sure that clamps and fittings are tight. Wet spots and stains around a fitting or connector can mean a leak. If a leak comes from a loose connector, or if something is broken or worn out, report it to the next-higher level of maintenance.

Leakage Definitions

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

Table 1. Leakage Definitions.

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

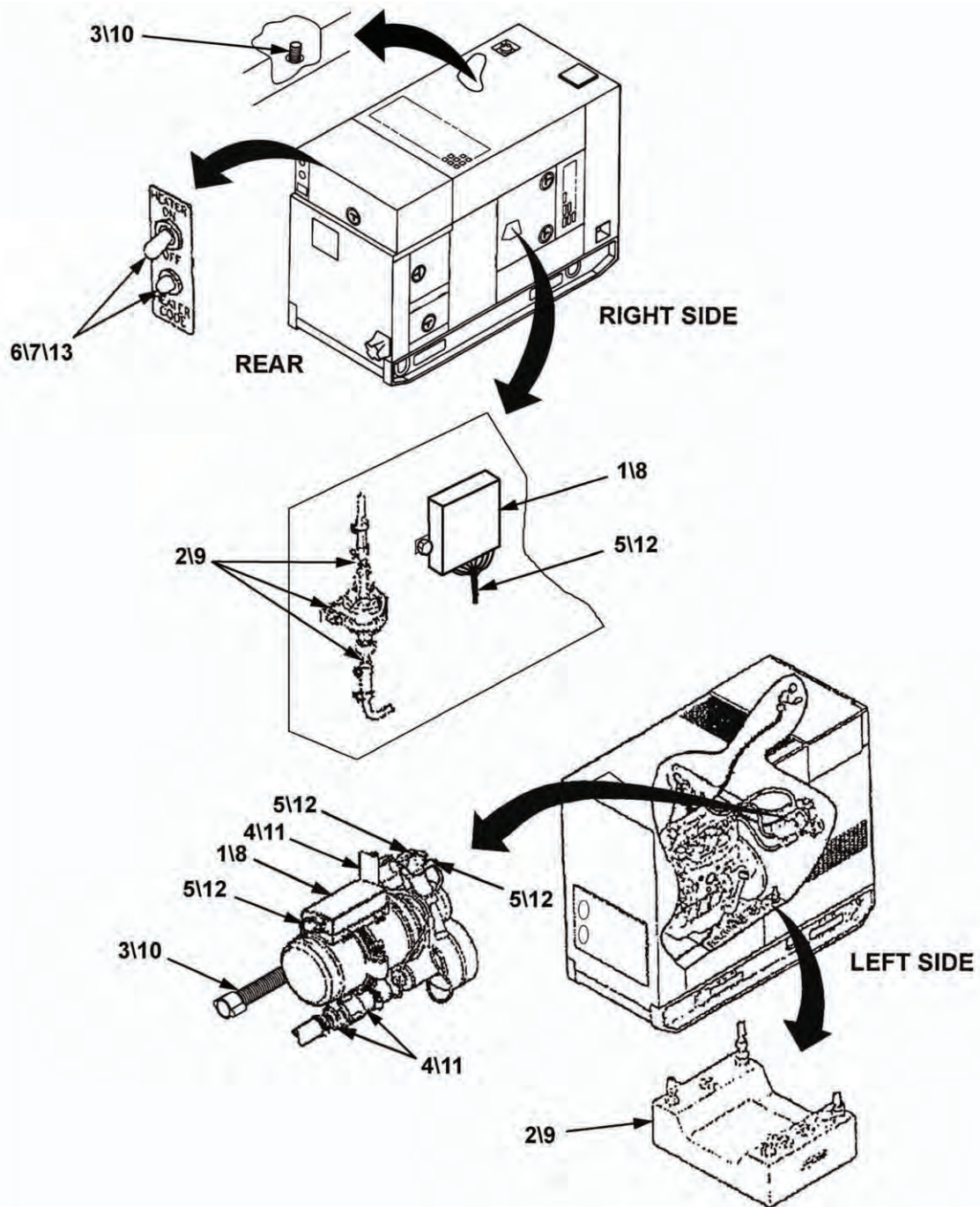


Figure 1. Winterization PMCS Routing Diagram.

END OF WORK PACKAGE

FIELD MAINTENANCE

**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
WINTERIZATION KIT, PMCS, INCLUDING LUBRICATION INSTRUCTIONS**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

References

WP 0008

TM 9-6115-644-10 (Chapter 2)

LUBRICATION FOR WINTERIZATION KIT

No lubrication is required on the winterization kit.

Table 1. Preventive Maintenance Checks and Services for Winterization Kit.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
NOTE				
Be sure that Generator Set PMCS is completed first in accordance with Chapter 4, WP 0008 and TM 9-6115-644-10 (Chapter 2).				
1	Before	<u>VISUAL INSPECTION</u> HEATER ASSEMBLY CONTROL UNIT	a. Check for damage. b. Ensure that heater assembly is mounted securely. Check for loose or broken wires or damage.	Damage that renders equipment unsafe. Heater not mounted securely. Wires loose or broken or control unit damaged.
2	Before	FUEL LEVEL FUEL LINES FUEL PUMP	Check for sufficient fuel supply. Inspect winterization kit fuel lines for kinks, leaks, loose or damaged clamps. Inspect fuel pump for leaks.	Generator is low on fuel. Fuel lines damaged; clamps missing. Any fuel leak.
3	Before	EXHAUST HOSE AIR INLET HOSE	Inspect for obstruction, missing or damaged mounting clamp. Inspect for obstruction, missing or damaged mounting clamp.	Hose obstructed; hose or clamp missing or damaged. Inlet hose obstructed.
WARNING				
Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.				

Table 1. Preventive Maintenance Checks and Services for Winterization Kit. - Continued

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
4	Before	WINTERIZATION KIT COOLANT LINES COOLANT PUMP	Inspect for loose, damaged or missing clamps. Inspect for leaks. Inspect for leaks.	Class III leaks or missing clamps or hoses. Class III leaks or missing clamps or hoses. Class III leaks or missing clamps or hoses.
5	Before	WIRE HARNESS	Inspect wiring for burned or frayed insulation or loose terminals.	Wiring is loose or burned.
6	Before	HEATER CONTROL AND SWITCH LAMP	Check that indicator light is operable. Check Heater function Code Plate.	Indicator light not operable. Heater Function Code Plate missing.
7	During	HEATER CONTROL AND SWITCH LAMP	a. Check that indicator light is on when heater is operating. b. Check Heater function Code Plate.	Lamp blinks showing failure in accordance with Heater Function Code Plate.
8	After	HEATER ASSEMBLY CONTROL UNIT	a. Check for damage. b. Ensure that heater assembly is mounted securely. Loose or broken wires or damage.	Damage that renders equipment unsafe. Heater not mounted securely. Wires loose or broken or control unit damaged.
9	After	FUEL LEVEL FUEL LINES FUEL PUMP	Check for sufficient fuel supply. Inspect winterization kit fuel lines for kinks, leaks, loose or damaged clamps. Inspect fuel pump for leaks.	Generator is low on fuel. Fuel lines damaged, clamps missing, or any leaks. Any fuel leak.
10	After	EXHAUST HOSE AIR INLET HOSE	Inspect for obstruction, missing or damaged mounting clamp. Inspect for obstruction, missing or damaged mounting clamp.	Obstructed exhaust. Inlet hose obstructed.
<p style="text-align: center;">WARNING</p> <p>Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.</p>				
11	After	WINTERIZATION KIT COOLANT LINES	Inspect for loose, damaged, or missing clamps. Inspect for leaks.	Class III leaks or missing clamps or hoses. Class III leaks or missing clamps or hoses.

Table 1. Preventive Maintenance Checks and Services for Winterization Kit. - Continued

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
		COOLANT PUMP	Inspect for leaks.	Class III leaks or missing clamps or hoses.
12	After	WIRE HARNESS	Inspect wiring for burned or frayed insulation or loose terminals.	Wiring is loose or damaged.
13	After	HEATER CONTROL AND SWITCH LAMP	Check that indicator light is operable. Check Heater Function Code Plate.	Indicator light not operable. Heater Function Code Plate missing.

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS**
WINTERIZATION KIT, INSTALLATION INSTRUCTIONS

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Gloves & Protective Clothing

New Lockwashers

Personnel Required

One

References

TM 9-2815-255-24

WP 0012, Maintenance of DC Electrical System, Batteries

WP 0016, Maintenance of Housing, Top Housing Section

WP 0075, Maintenance of Air Intake & Exhaust System Air Cleaner

WP 0076, Maintenance of Coolant System, Coolant System

Equipment ConditionGrounded, Off & Operational

GENERAL

The following instructions have been provided so you can install the Winterization Kit, NSN: 6115-01-474-8354 on your 30 kW Generator Set.

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

Diesel fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with diesel fuel. Avoid repeated or prolonged contact. Provide adequate ventilation. Operators are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Catch fuel in suitable container. Keep spilled fuel away from hot engine and all fires. Failure to comply with this warning can cause injury or death to personnel.

INSTALLATION PROCEDURES**NOTE**

Use packing list provided with kit.

1. Open battery access door and disconnect negative battery cable from right battery and the positive battery cable from the left battery per WP 0012, before doing the following procedures.
2. Using the heater mounting plate (Figure 1, Item 5) as a template, drill holes from the outside on left side panel. Before drilling holes, open left side rear door and look inside generator set to verify proper positioning and clearance of mounting plate. To install the heater mounting plate, perform the following steps: using the plate as a template, place it 1.75" from the top left access door flange and 2.00" across from the door hinge flange to locate the edge of the plate.

NOTE

When mounting the heater (7) to the heater mounting plate (5), the burner end of the heater (7) shall be higher than the coolant intake end.

3. Open left side rear door (8) and install heater mounting plate (5) using bolts (4), flat washers (3), lockwashers (2), and nuts (1). Attach heater (7) with bracket (part of 7) to the mounting plate (5) and to the left inside panel (6) with bolts (4), flat washers (3), lockwashers (2) and nuts (1). The bolts come through the mounting plates from outside of the generator set.
4. Remove top panel from Generator Set in accordance with maintenance procedure at WP 0016.

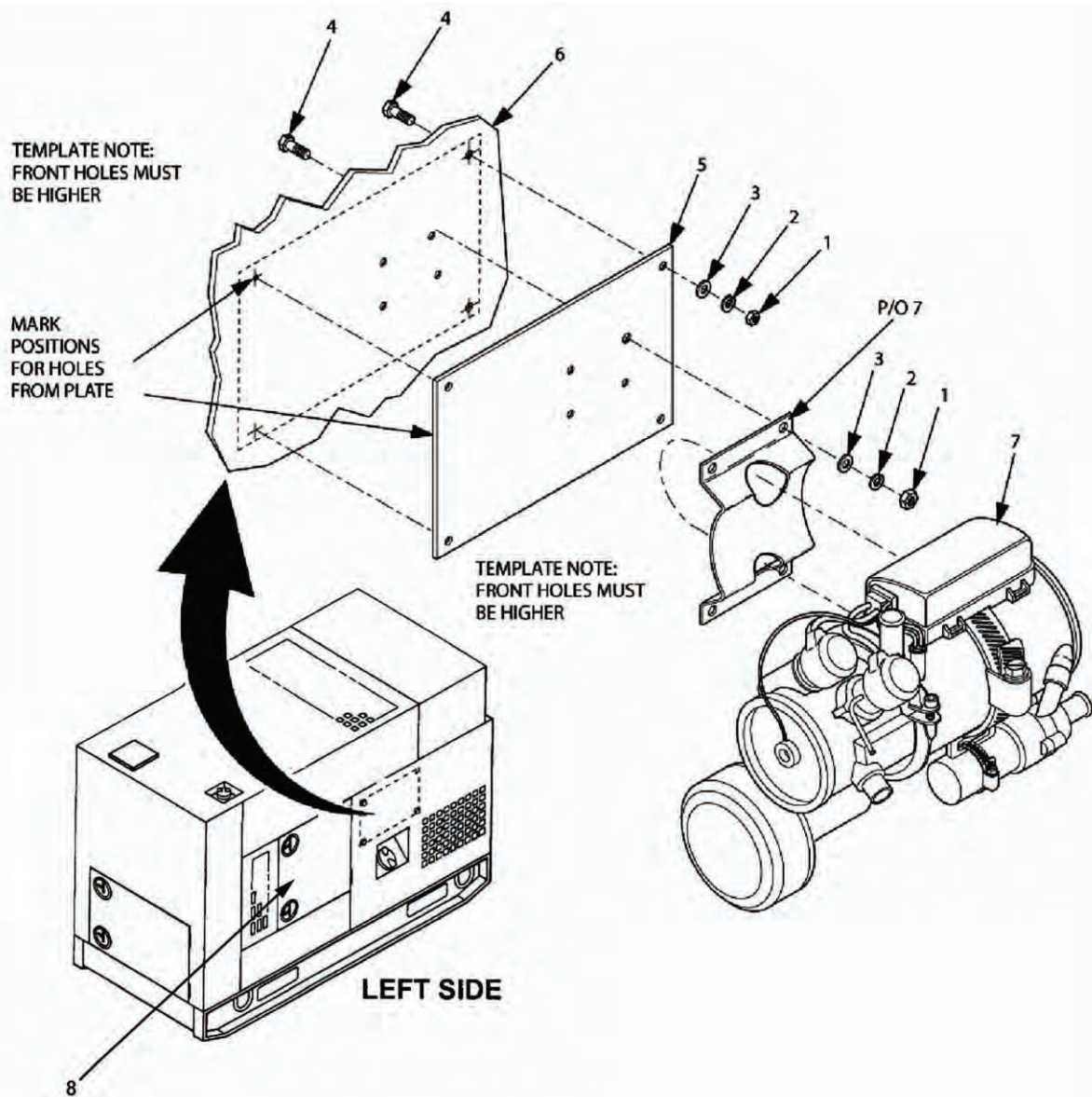


Figure 1. Heater Mounting.

5. Approximately 10" from inside of left door hinge (Figure 2) and 3" from left side panel, drill 1-7/16" diameter hole in exhaust duct floor.
6. Attach one end of exhaust hose (Figure 2, Item 1) to exhaust elbow (9) with clamp (8). Apply 2 thick beads of RTV around exhaust port of heater (7) and attach exhaust elbow (9) to heater (7). Move elbow (9) in a position that doesn't interfere with anything in the route to the hole drilled above in Step 5.

7. Route exhaust hose (1) through hole drilled (Step 5) and turn hose down to exhaust duct floor. Using one of the existing screws that mount the air duct channel to the exhaust duct floor, attach spacer (2) to the existing screw that will allow the exhaust hose (1) to be secured approximately in the middle. Using RTV provided in kit, apply RTV around hose and hole in exhaust duct floor to prevent movement. Secure exhaust hose (1) to spacer (2) using clamp (6), nut (5), lockwasher (4), and washer (3). Reinstall top panel per WP 0016.

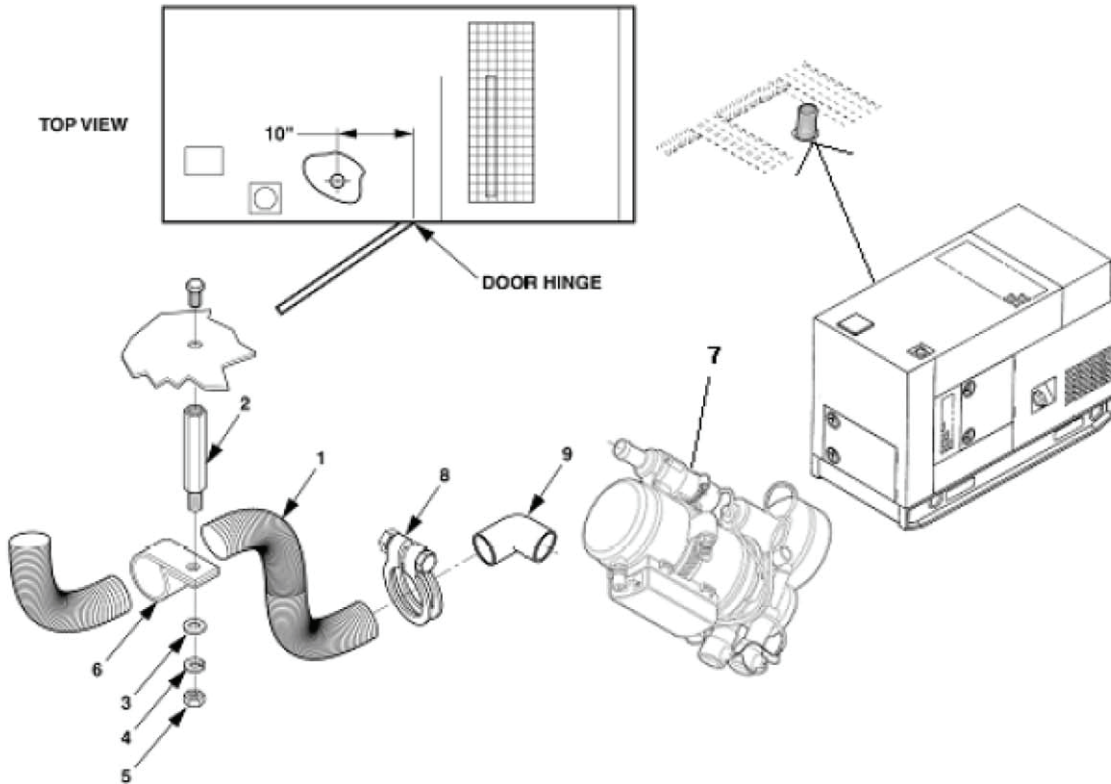


Figure 2. Exhaust Hose Assembly.

8. Drain coolant system in accordance with maintenance procedure at WP 0076.

NOTE

Perform Steps a through e to install coolant lines to heater.

- Remove plug from rear of engine head (refer to engine TM 9-2815-255-24) and install adapter (Figure 3, Item 1), bushing (2), and elbow (3).
- Install coolant hose (5) to elbow (3) and secure with clamp (4).
- Install the other end of coolant hose (5) to heater coolant intake using clamp (4).
- Provide a .206-.224 diameter hole 1.5" above left side door flange and 4" from door hinge flange.

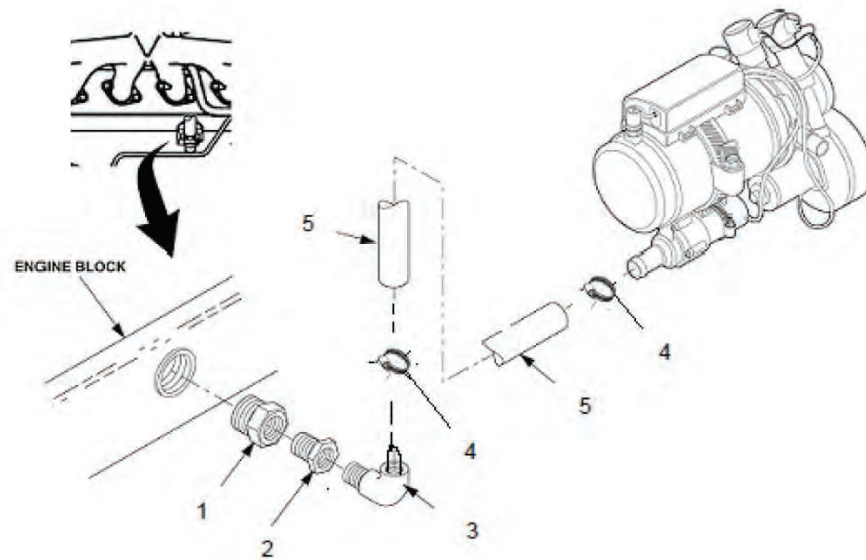


Figure 3. Coolant Inlet Hose Assembly.

- e. Remove plug from water pump, part of engine, and install elbow (Figure 4, Item 1), then stand-off (2). Install 90° preformed side of hose (4) to heater coolant return. Route hose (4) along left side panel above door and attach to stand-off (2); secure with clamp (3). Secure hose (4) to left side panel using clamp (5), screw (6), flat washer (7), lockwasher (8), and nut (9) in hole provided in Step d. If necessary, trim hose (4) to prevent hose from sagging during operation. Secure end of hose (4) to heater with clamp (3).

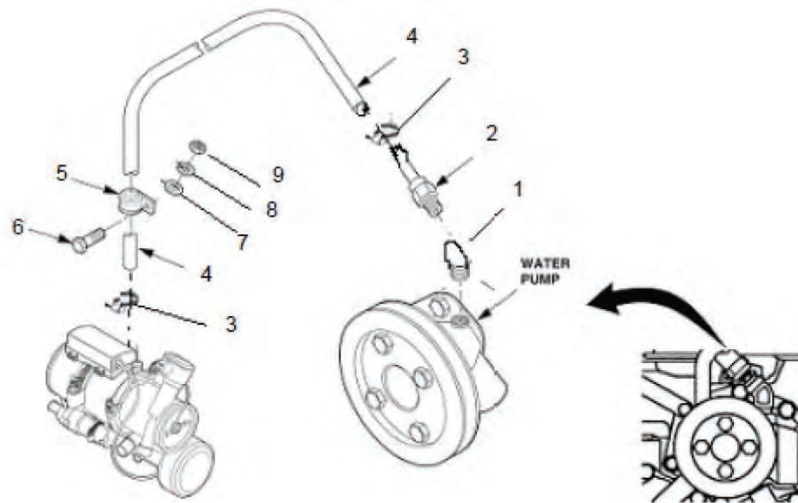


Figure 4. Coolant Outlet Hose Assembly.

- f. Install control unit (Figure 5, Item 1) and fuel pump (2) on the outside of the output box using existing hardware: flat washer (3), lockwasher (4), and bolt (5). Fuel pump electrical connections will be on top, which is the output line to the heater.

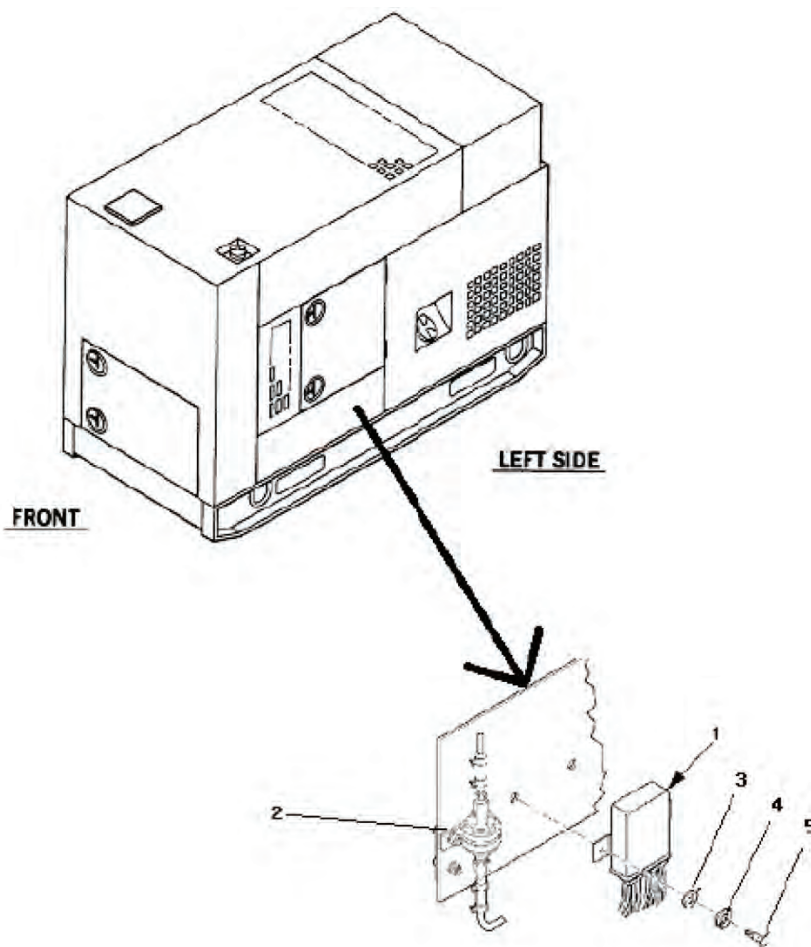


Figure 5. Control Unit Assembly.

- g. Disconnect generator fuel supply line (Figure 6, Item 11) from fuel pickup tube assembly (12). Attach tee fitting (10) to fuel pickup tube assembly (12) and attach generator fuel supply line (11) to top of tee fitting (10).

NOTE

The proper connection of fuel lines is with use of butt joints (2 and 7).

- h. Install barbed adapter (9) to tee fitting (10) along with butt splice (7) and fuel tubing (8), securing with clamps (6).
- i. Install butt splice (7) with fuel tubing (8) to inlet of pump (4), securing with two clamps (6). Attach butt splices (2) and tubing (3) to outlet from pump (4) and to heater inlet tube, securing with clamps (1).

NOTE

Seal all pipe threads with sealing compound contained in kit.

- j. Open output box door.
- k. Remove wire 172D from P6-18 of generator (generator wiring harness) and tie back wire with straps provided in kit.

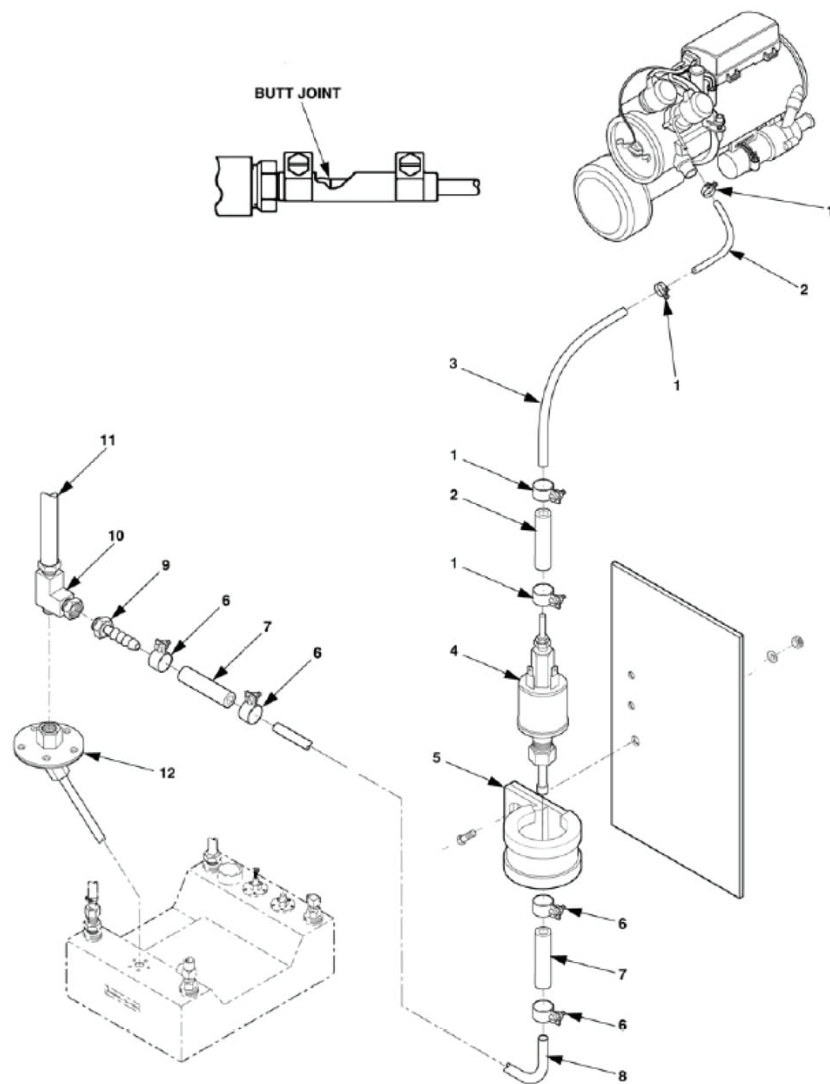


Figure 6. Fuel System Assembly.

- l. Remove and discard pins from P6-16 and P6-24, Figure 7.
- m. Install wiring harness (Figure 7, Item 2) in accordance with wiring diagram. Secure harness with straps contained in kit.

NOTE

Install fuse (25 AMP, 32 V) in fuse holder (1), part of harness (2), if not already installed.

- n. Install fuse by connecting 24V terminal wire from fuse holder (1) to the positive side of the slave receptacle (Figure 7), and the ground wire to the negative side of the slave receptacle.
- o. Drill a 1/5" hole in a visible location next to the slave receptacle and mount fuse holder (1) using screw, flat washer, lockwasher, and nut provided in kit.

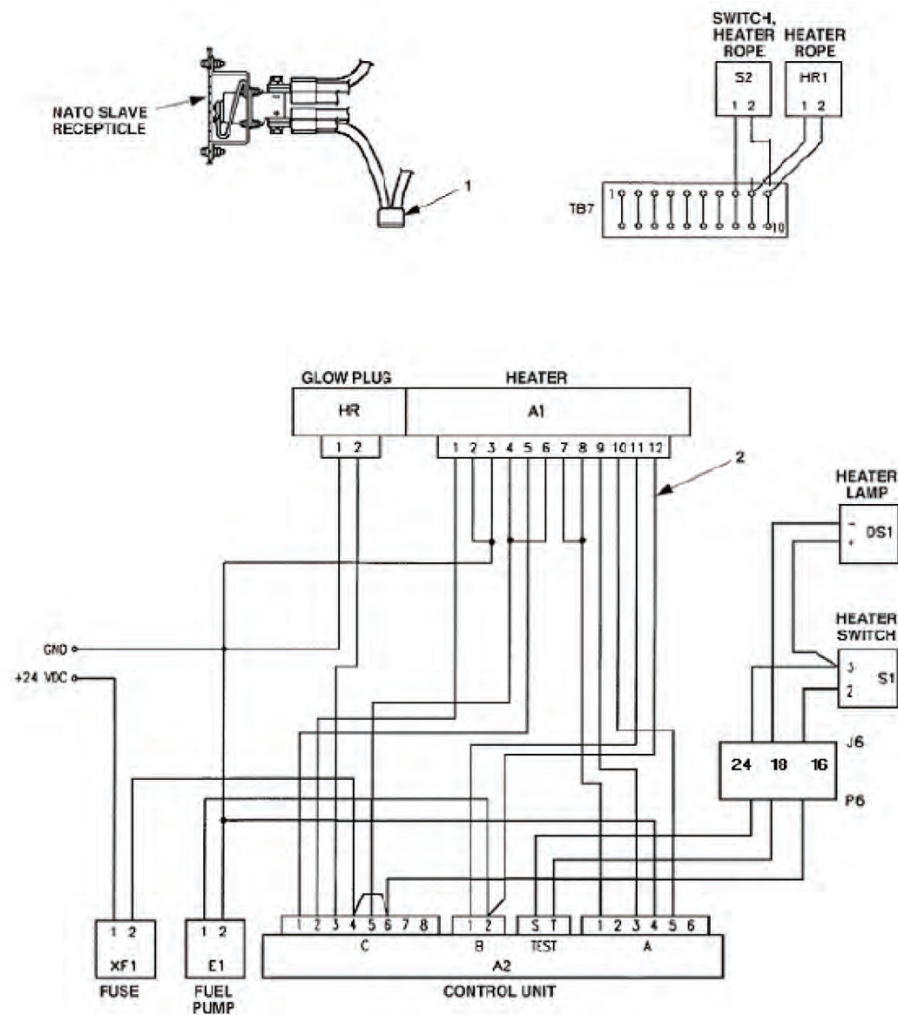


Figure 7. Fuse and Wiring Harness.

- p. Open control panel access door (Figure 8, Item 1).
- q. Locate operating instruction plate (2) and heater function codes plate (3), and match drill holes in control panel access door (1). Plates shall be readable when the door is open.
- r. Install rivets (4). Rivet head shall be to the outside of the unit.
- s. Remove toggle switch (5) and wire 172A from TB5-9 and wire 190D from TB6-8. Tie back switch and wires in harness with straps contained in kit.
- t. Locate heater switch label (7), with existing hole for switch, and match drill hole in control panel (8) for indicator light (6).
- u. Install heater switch label (7), indicator light (6), and toggle switch (5), with the keyway side down, to control panel.
- v. Using a pin remove tool, remove wire 172C from J6-18 (see Figure 7) and tie back in harness with straps contained in kit.
- w. Using a pin removal tool, remove and discard pins from J6-16 and J6-24.
- x. Install three electrical leads in accordance with wiring diagram (see Figure 7). Secure leads with straps contained in kit.

- y. Remove clamps (Figure 9, Item 8), and discard hose from crankcase breather air intake tube in accordance with WP 0075, Removal. Wrap rope heater (2) assembly spirally on new air breather hose (1) provided in kit approximately five (5) revolutions, leaving approximately six (6) inches of rope heater (2) on each end of hose. Wrap rope heater (2) and air breather hose (1) with foil tape (3) provided in kit. Install pipe insulation (4) over air breather hose (1), rope heater (2), and foil tape (3), leaving rope heater wires exposed for electrical connection. Install assembled air breather hose (1) between crankcase breather and air intake hose. Secure air breather hose (1) with clamps (8) removed from above.
- z. Install rope heater to TB-7, HR1 inside output box and electrical leads in accordance wiring diagram, Figure 7. Secure leads (Figure 9, Items 6 and 7) with straps contained in kit.
- aa. Install thermostat assembly (5) to TB-7 pins 8 and 9.

CAUTION

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

- ab. Add coolant to proper level.
- ac. Install thermostat assembly (5) to TB-7 pins 8 and 9.
- ad. Connect positive and negative battery cables.
- ae. Start and run engine until the radiator thermostat has opened.
- af. Start the heater coolant pump by connecting a jumper from positive power to pin A6 of the A2 control unit. This will start the coolant pump only. Continue until pitch sound changes.
- ag. If necessary, top off coolant.
- ah. Disconnect positive lead from pin A6 of the A2 control unit.
- ai. Double check all hose connections for leaks.
- aj. With engine running, start heater. Check the indicator light (Figure 8, Item 6) per the heater function codes plate (3) for heater operation.
- ak. Turn off the engine and allow heater to run until the coolant reaches temperature at which the heater will cycle to low-heat mode.
- al. Switch heater off.

NOTE

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

- am. Locate identification plate (2) below existing plates on left side of housing. Match and drill four holes in housing. Install four rivets.

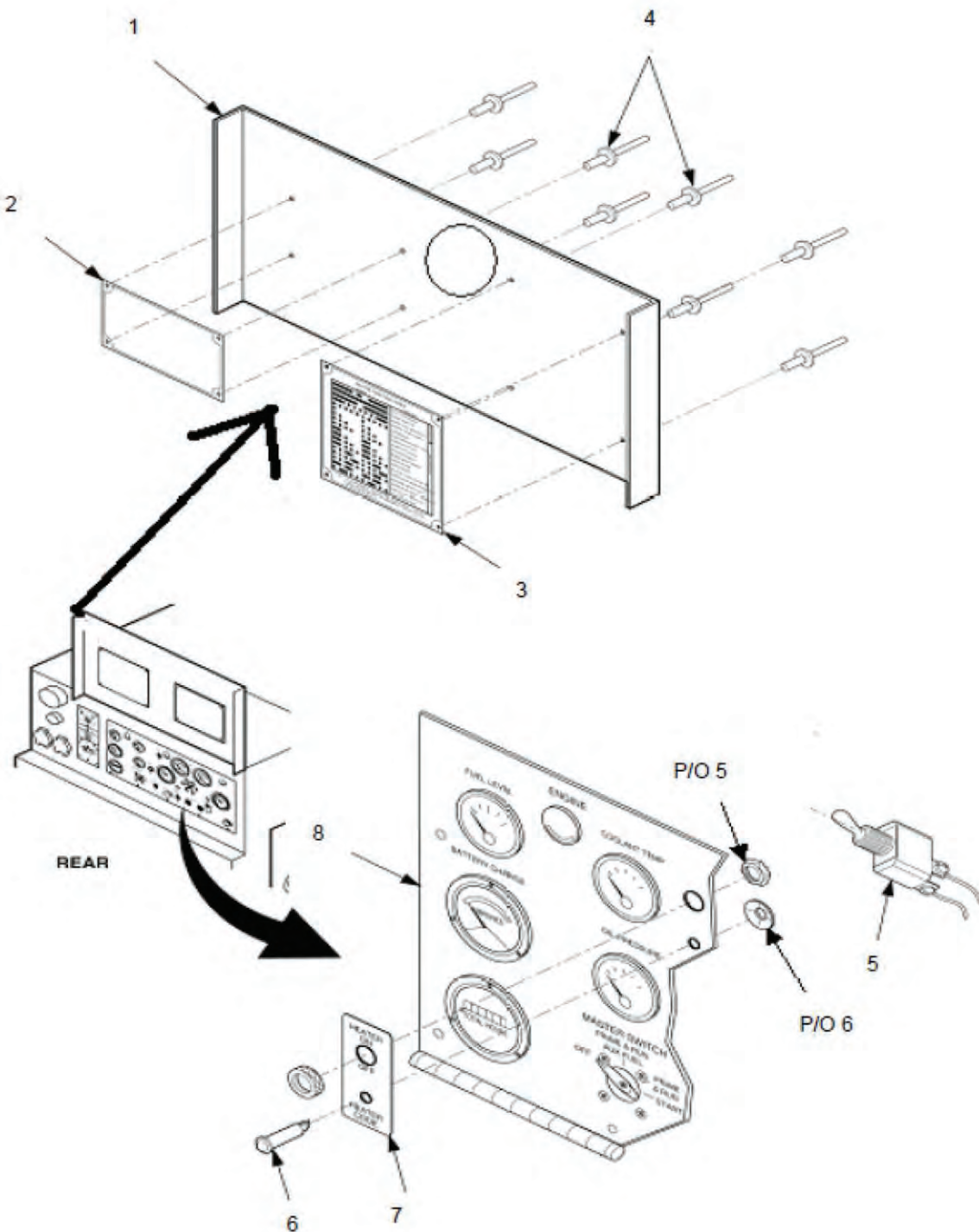


Figure 8. Cover and Instrument Panel.

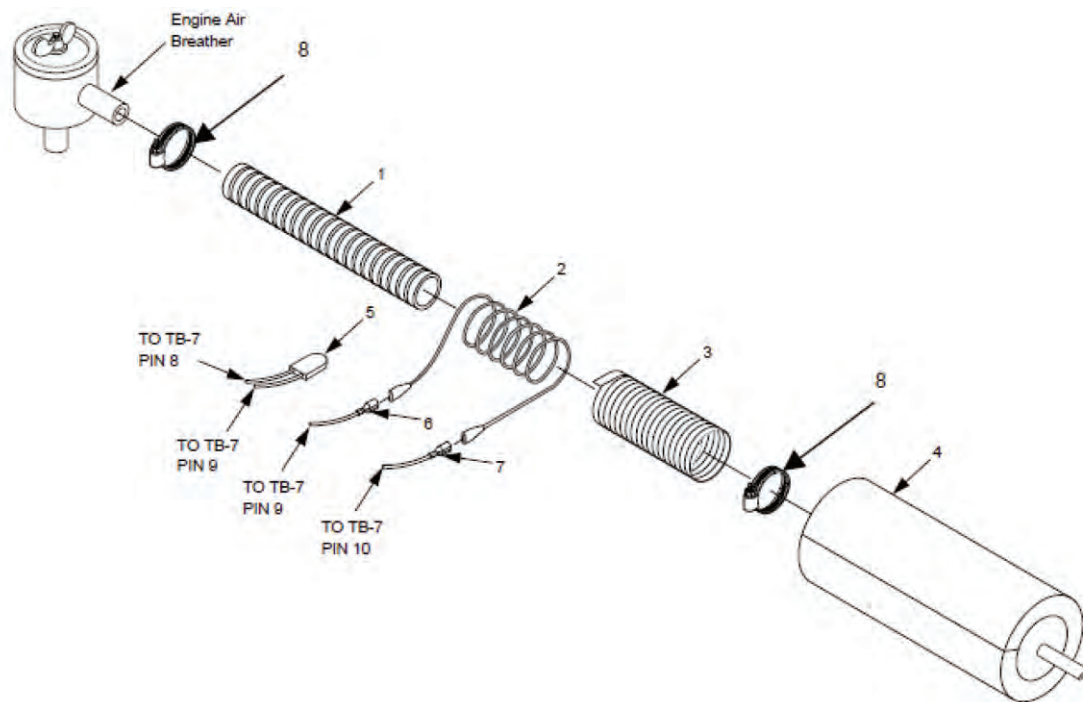


Figure 9. Breather Tube Heater Assembly.

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
WINTERIZATION KIT, CONTROL UNIT MAINTENANCE: TESTING, INSPECTION, REMOVAL,
REPLACEMENT, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Personnel Required

One

ReferencesWP 0165, Winterization Kit, Troubleshooting
Procedures**Equipment Condition**Grounded, Off & Operational

WARNING

Do not attempt to perform any maintenance tasks on the Winterization Kit while the generator set is operating. Failure to comply with this warning can cause injury or death to personnel.

TESTING

Refer to WP 0165, troubleshooting procedures, symptom index 13/14/15/16.

END OF TASK**INSPECTION**

1. Open right side engine access door.
2. Inspect control unit for loose or missing wires and damaged parts.
3. Close engine access door.

END OF TASK**REMOVAL****WARNING**

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

1. Disconnect negative battery cable and then positive battery cable.
2. Disconnect electrical connectors.
3. Remove two screws (Figure 1, Item 2), lockwashers (3), flat washers (4), and control unit (1). Discard lockwashers (3).

END OF TASK

REPLACEMENT

1. Perform removal steps.
2. Perform installation steps substituting new control unit for the defective one.

END OF TASK

INSTALLATION

1. Install control unit (Figure 1, Item 1), securing with screws (2), new lockwashers (3), and flat washers (4).
2. Reconnect wiring harness to control unit (1).
3. Reconnect positive battery cable and then negative battery cable.

END OF TASK

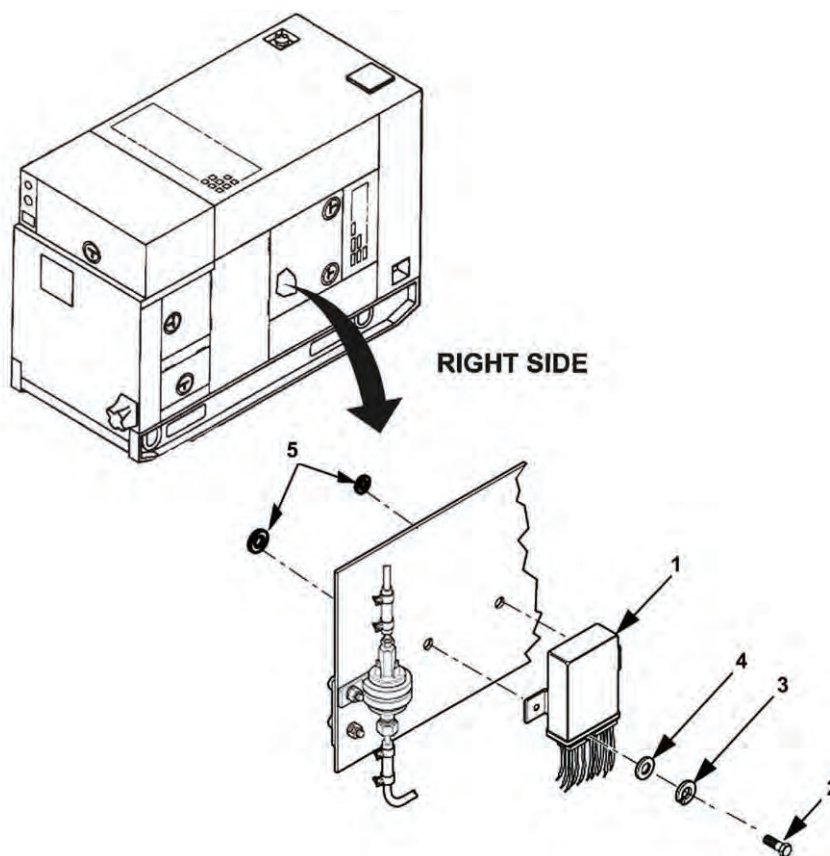


Figure 1. Control Unit Maintenance.

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****WINTERIZATION KIT, HEATER ASSEMBLY MAINTENANCE: INSPECTION, REMOVAL, REPAIR, REPLACEMENT, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Suitable Container for Fuel Drainage

Personnel Required

foo persnreq name

foo persnreq nameid

(2)

References

WP 0076, Maintenance of Coolant System, Coolant System

Equipment ConditionGrounded, Off & Operational

INSPECTION

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

END OF TASK**REMOVAL****WARNING**

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

Catch fuel in suitable container. Keep spilled fuel away from hot engine and all fires. Failure to comply with this warning can cause injury or death to personnel.

1. Disconnect negative battery cable and then positive battery cable.
2. Drain coolant system (WP 0076, Servicing).
3. Disconnect fuel clamp (Figure 1, Item 1) and fuel line (2) from heater and drain any fuel from hose into a suitable container.
4. Disconnect wiring harness connector (17) from heater.

5. Remove screw clamp (15), elbow (16), and exhaust hose (6) from heater (3).
6. Position a suitable container under heater to catch coolant from hoses, and loosen screw clamps (7) to disconnect coolant inlet hose (8) and outlet hose (9) from heater (3).
7. Remove four nuts (10), lockwashers (11), flat washers (12), bolts (14), and heater (3) with mounting plate (13) from bulkhead housing (18). Discard lockwashers (11).

END OF TASK**REPAIR**

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

END OF TASK**REPLACEMENT**

1. Perform removal steps.
2. Perform installation steps substituting new heater assembly for the defective one.

END OF TASK**INSTALLATION**

1. Install heater (Figure 1, Item 3) with attached mounting plate (13) on bulkhead housing (18). Secure with bolts (14), flat washers (12), new lockwashers (11), and nuts (10).
2. Connect coolant inlet hose (8) and outlet hose (9) to heater (3), using screw clamps (7). Top off radiator to replace any coolant lost in removing hoses.
3. Attach elbow (16) to heater unit (3) and exhaust flex hose (6) to elbow using screw clamp (15).
4. Connect wiring harness connector (17) to the heater (3).
5. Connect fuel line (2) to heater assembly (3) using clamp (1).
6. Top off coolant system.
7. Reconnect positive battery cable and then negative battery cable.

END OF TASK

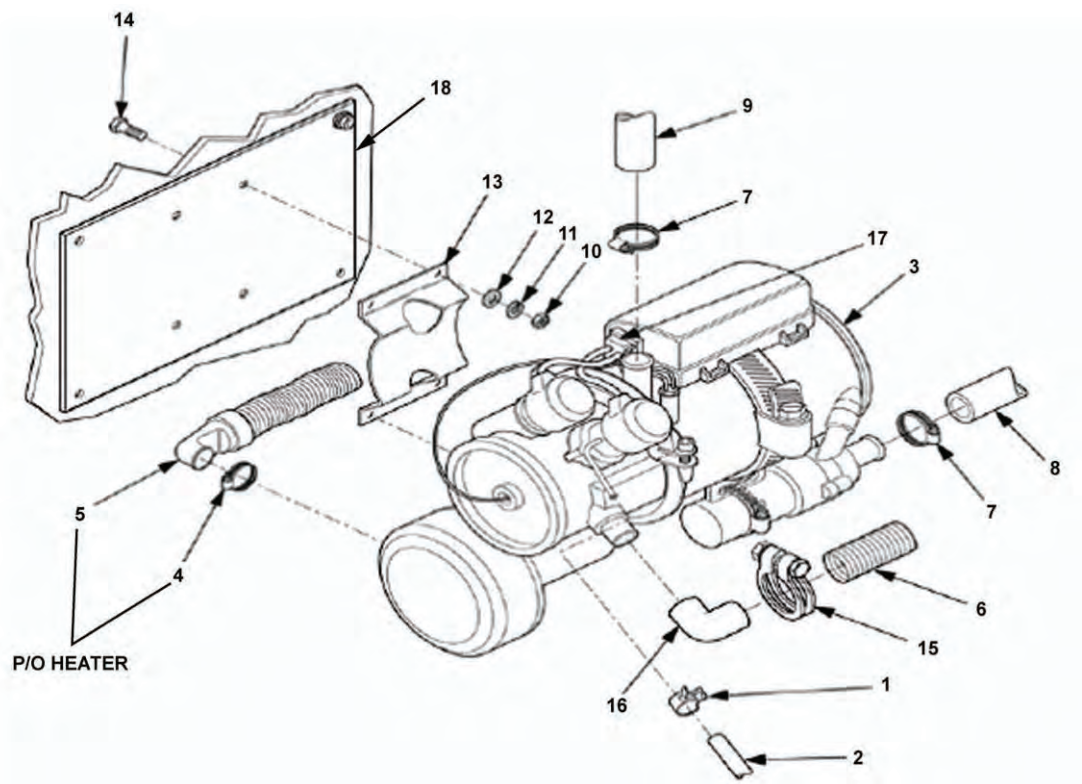


Figure 1. Heater Assembly Maintenance.

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****WINTERIZATION KIT, FUEL PUMP MAINTENANCE: TESTING, REMOVAL, REPLACEMENT, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Lockwashers

Gloves & Protective Clothing

Suitable Container for Fuel Drainage

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

TESTING

1. Disconnect fuel line at heater assembly.

WARNING

Catch fuel in suitable container. Keep spilled fuel away from hot engine and all fires. Failure to comply with this warning can cause injury or death to personnel.

2. Remove fuel line from output end of fuel pump and place into container suitable for catching fuel.
3. Apply 24 VDC to electrical input of pump. Pump should hum. Fuel will then start flowing into the container.

END OF TASK**REMOVAL****WARNING**

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

Catch fuel in suitable container. Keep spilled fuel away from hot engine and all fires. Failure to comply with this warning can cause injury or death to personnel.

1. Disconnect negative battery cable and then positive battery cable.
2. Disconnect electrical leads (Figure 1, Item 12) from connector (11) on fuel pump (14).
3. Loosen screw clamp (3) to disconnect fuel line (6) and butt splice (4) from input end (2) of fuel pump (14).

Drain any fuel from line into a suitable container.

4. Remove nut (10), lockwasher (9), and flat washer (8) from bolt (7), then remove bolt (7). Discard lockwasher (9).
5. Remove fuel pump (14) and clamp(13).

END OF TASK

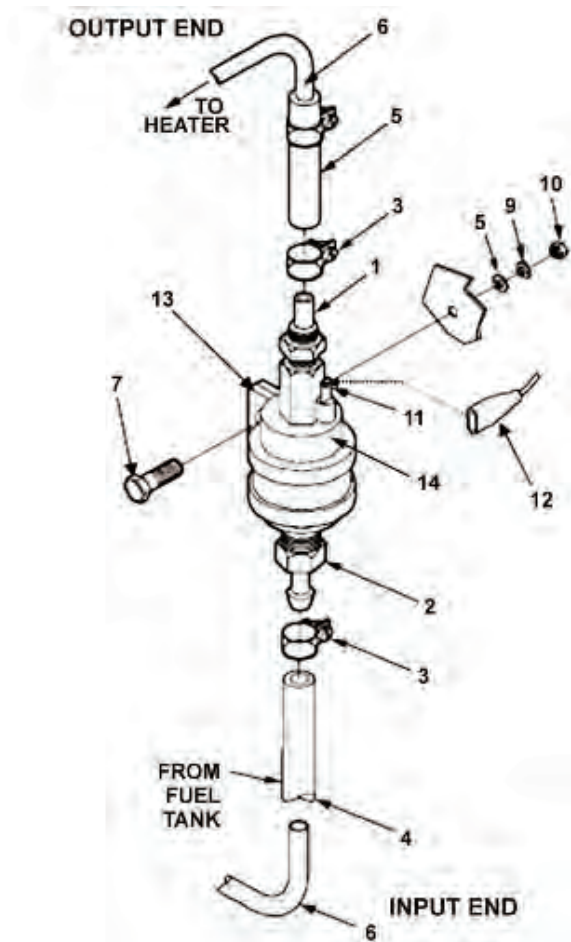


Figure 1. Fuel Pump Maintenance.

REPLACEMENT

1. Perform removal steps.
2. Perform installation steps substituting new fuel pump (Figure 1, Item 14) for the defective one.

END OF TASK

INSTALLATION

1. Install new fuel pump (Figure 1, Item 14) with clamp (13) and secure to housing with bolt (7), flat washer (8), new lockwasher (9), and nut (10).
2. Install butt splice (5) and fuel line (6) on outlet end (1) of fuel pump (14) and secure with screw clamp (3).
3. Install fuel line (6) and butt splice (4) on inlet end (2) of fuel pump (14) and secure with screw clamp (3).
4. Plug in electrical leads (12) at connector (11) on fuel pump (14).

5. Reconnect positive battery cable and then negative battery cable.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
WINTERIZATION KIT, FUEL LINE MAINTENANCE: INSPECTION, REMOVAL, REPLACEMENT,
INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

New Fuel Line

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

INSPECTION

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

END OF TASK**REMOVAL****WARNING**

Catch fuel in suitable container. Keep spilled fuel away from hot engine and all fires. Failure to comply with this warning can cause injury or death to personnel.

1. Loosen screw clamps (Figure 1, Item 1), to remove butt splices (2) and fuel line (9) between primary fuel tank (3) and fuel pump (4). Drain any fuel from line into a suitable container.
2. Loosen screw clamps (5) to remove butt splices (6) and fuel line (7) between fuel pump (4) and heater (8).

END OF TASK**REPLACEMENT**

1. Perform removal steps.
2. Perform installation steps substituting new fuel line for the defective one.

END OF TASK**INSTALLATION****NOTE**

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

1. Install a new fuel line (Figure 1, Item 9) and butt splices (2) between primary fuel tank (3) and fuel pump (4), securing with screw clamps (1).
2. Install a new fuel line (7) and butt splices (6) between fuel pump (4) and heater (8), securing with screw clamps (5).

END OF TASK

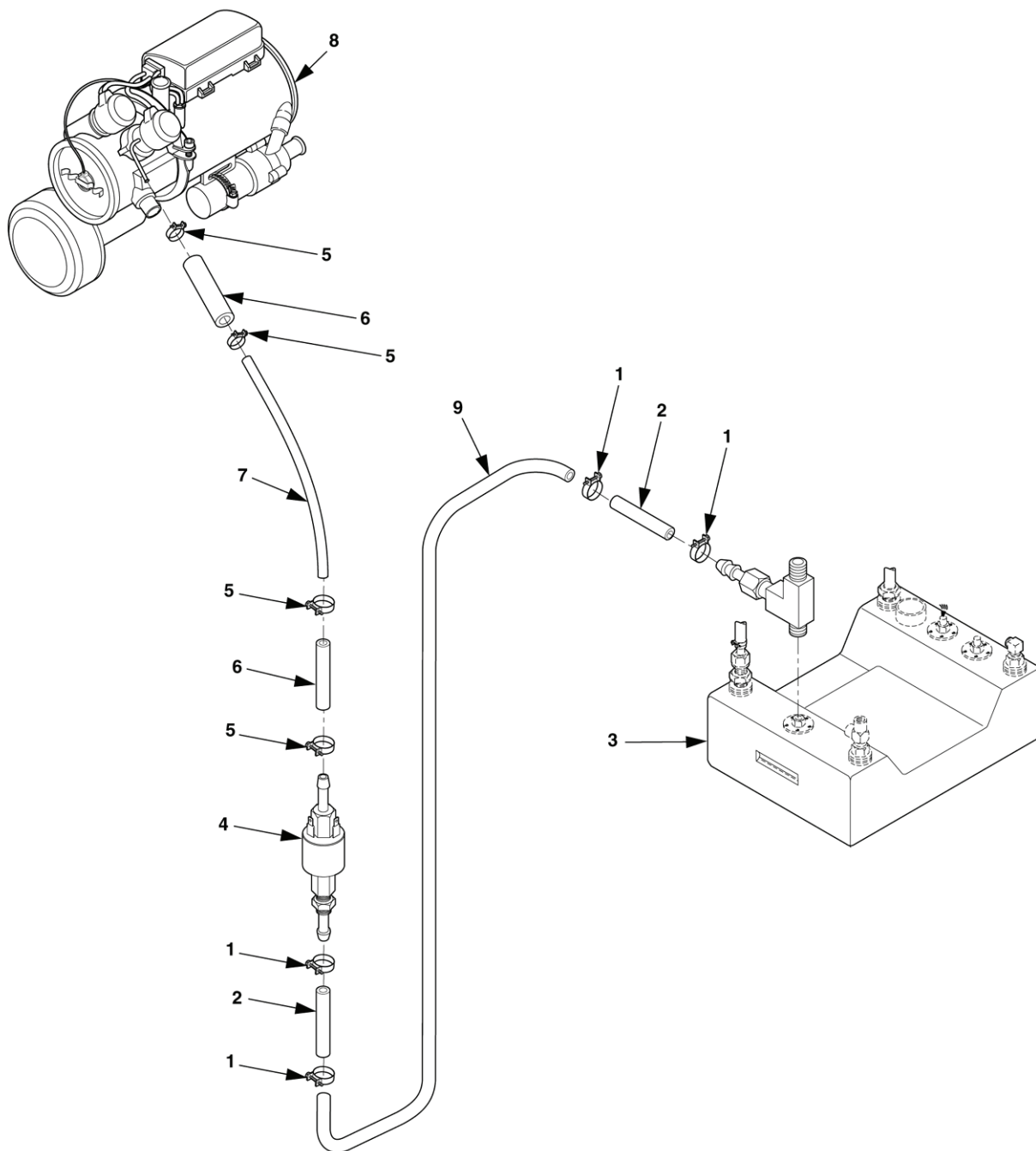


Figure 1. Fuel Line Maintenance.

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****WINTERIZATION KIT, HEATER SWITCH PLATE/HEATER SWITCH/INDICATOR LIGHT MAINTENANCE:
INSTALLATION, INSPECTION, TESTING, REMOVAL, REPLACEMENT**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Indicator Light (If replacement necessary)

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

INSTALLATION - HEATER SWITCH PLATE

1. Using the heater switch plate (Figure 1, Item 4) as a guide, drill a 5/16" and a 1/2" hole in control panel (1).
2. Align and attach heater switch plate, using blind rivets.

END OF TASK**INSPECTION - HEATER SWITCH**

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

END OF TASK**TESTING - HEATER SWITCH**

1. Disconnect lead from terminal of switch (Figure 1, Item 2) and use multimeter to measure for continuity across switch terminals with switch in on position. With switch in off position, there should be an open circuit.
2. If readings are not as above, replace switch.

END OF TASK**REMOVAL - HEATER SWITCH****WARNING**

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

1. Disconnect negative battery cable and then positive battery cable.
2. Open control box door and release control panel by turning two fasteners and carefully lowering control panel.
3. At generator control panel (Figure 1, Item 1), tag and disconnect all electrical leads to switch (2).
4. Remove knurled nut (5) and mounting nut (6) from control panel (1).

END OF TASK**REPLACEMENT - HEATER SWITCH**

1. Perform Steps 1 through 4 of Removal - Heater Switch.

2. Perform Steps 1 through 3 of Installation - Heater Switch, substituting new heater switch for the defective one.

END OF TASK

INSTALLATION - HEATER SWITCH

1. Install switch (Figure 1, Item 2), mounting nut (6), knurled nut (5), and reconnect electrical leads to switch (2).
2. Raise and secure control panel (1) and close control box door.
3. Reconnect positive battery cable and then negative battery cable.

END OF TASK

INSPECTION - INDICATOR LIGHT

Inspection is limited to visual inspection of components. Check for defects.

END OF TASK

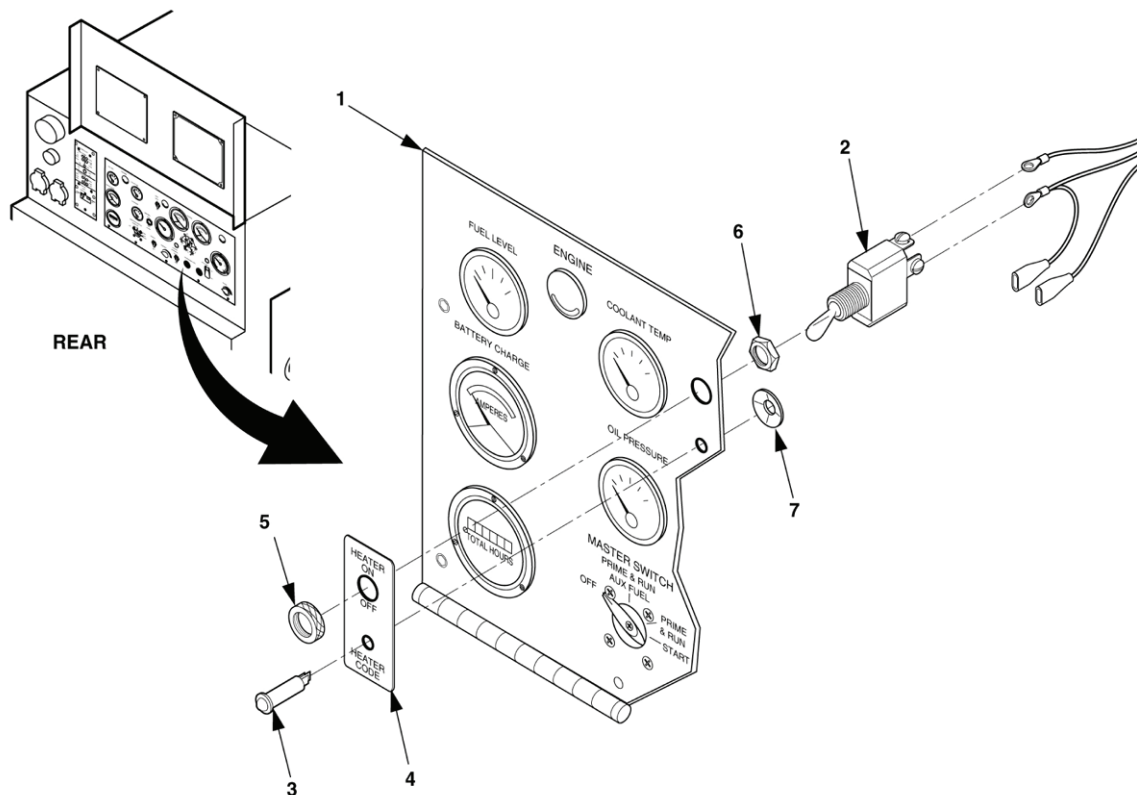


Figure 1. Heater Switch/Heater Switch Plate/Indicator Light Maintenance.

INSTALLATION - INDICATOR LIGHT

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

1. Disconnect negative battery cable and then positive battery cable.
2. Open control box door and release control panel by turning two fasteners and carefully lowering control panel.
3. At generator control panel (Figure 1, Item 1), tag and disconnect all electrical leads to switch (2).
4. Install indicator light (3) with push on nut (7).

END OF TASK**REMOVAL - INDICATOR LIGHT**

Remove push on nut (Figure 1, Item 7) from indicator light (3).

END OF TASK**REPLACEMENT - INDICATOR LIGHT**

1. Complete Steps 1 through 4 of Installation - Indicator Light.
2. Complete step of Removal - Indicator Light.
3. Replace defective indicator light with new indicator light.

END OF TASK**END OF WORK PACKAGE**

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****WINTERIZATION KIT, COOLANT HOSE MAINTENANCE: INSPECTION, REMOVAL, REPLACEMENT, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsGloves & Protective Clothing
Suitable Container for Coolant Drainage**Personnel Required**

One

References

TM 750-254

Equipment ConditionGrounded, Off & Operational

INSPECTION

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

END OF TASK**REMOVAL****WARNING**

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

1. Drain coolant (see TM 750-254).
2. Loosen screw clamps (Figure 1, Item 1) to disconnect either or both coolant hoses, inlet (2) or outlet (3) from the heater. Drain any coolant from the hoses into a suitable container.

END OF TASK**REPLACEMENT**

1. Perform removal steps.
2. Perform installation steps substituting new coolant hose for defective one.

END OF TASK**INSTALLATION**

1. Install new hose (Figure 1, Items 2 and/or 3) securing with screw clamps (1).
2. Top off radiator coolant level to replace coolant lost in hose removal.

END OF TASK

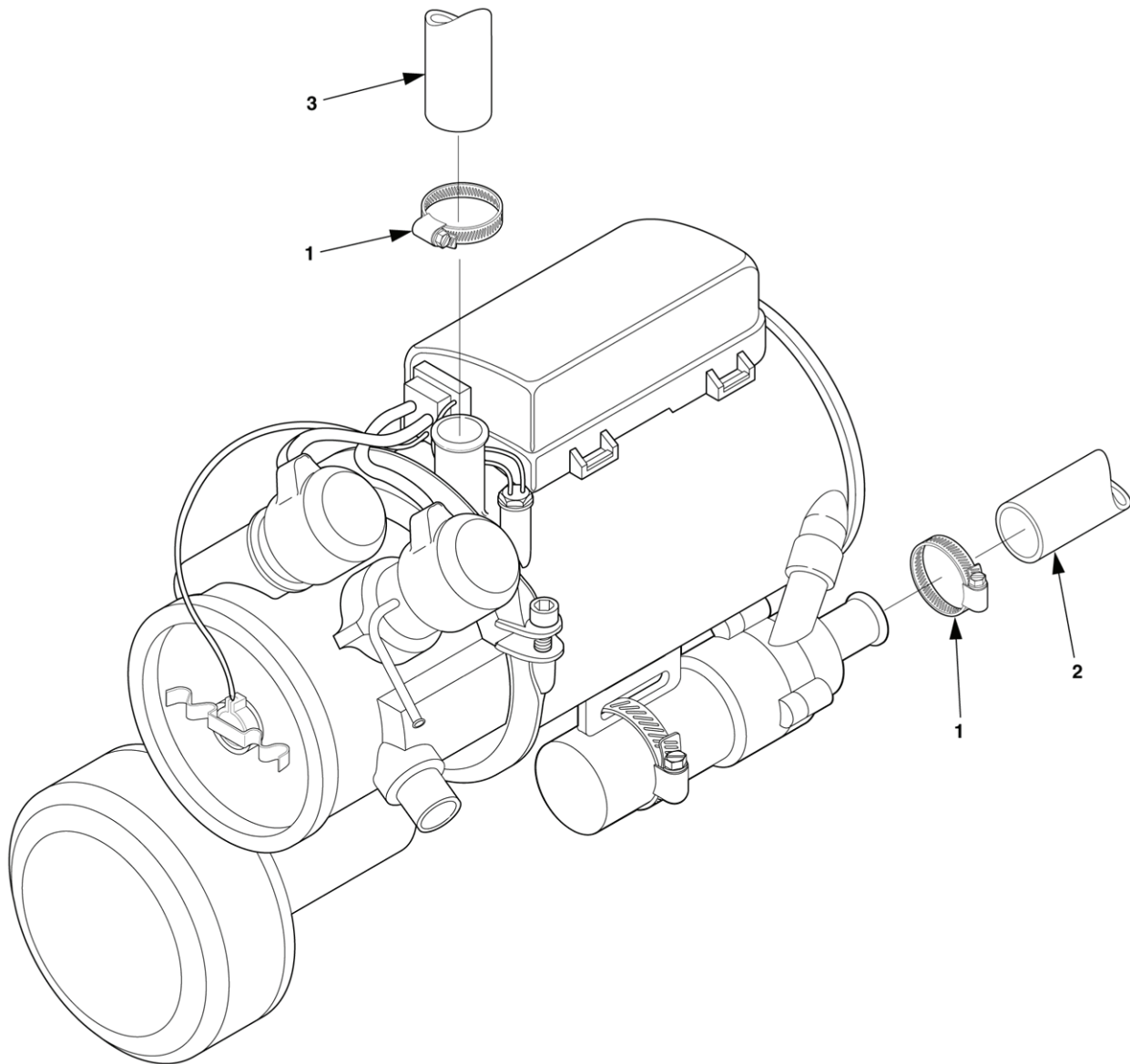


Figure 1. Coolant Hose Maintenance.

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****WINTERIZATION KIT, AIR INLET AND EXHAUST HOSE MAINTENANCE: INSPECTION, REMOVAL, REPLACEMENT, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

High Heat Sealing Compound

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

INSPECTION

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

END OF TASK**REMOVAL****WARNING**

Muffler and flex hoses can get very hot. Allow them to cool before touching them. Failure to comply with this warning can cause severe burns and injury to personnel.

1. Loosen screw clamp (Figure 1, Item 7) to remove air inlet hose (1) from heater (6).
2. Loosen screw clamp (4) to remove air exhaust hose (3) and elbow (5) from heater (6).
3. Remove RTV (high heat sealing compound), air exhaust hose (3) and clamp (2).

END OF TASK**REPLACEMENT**

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

END OF TASK**INSTALLATION**

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

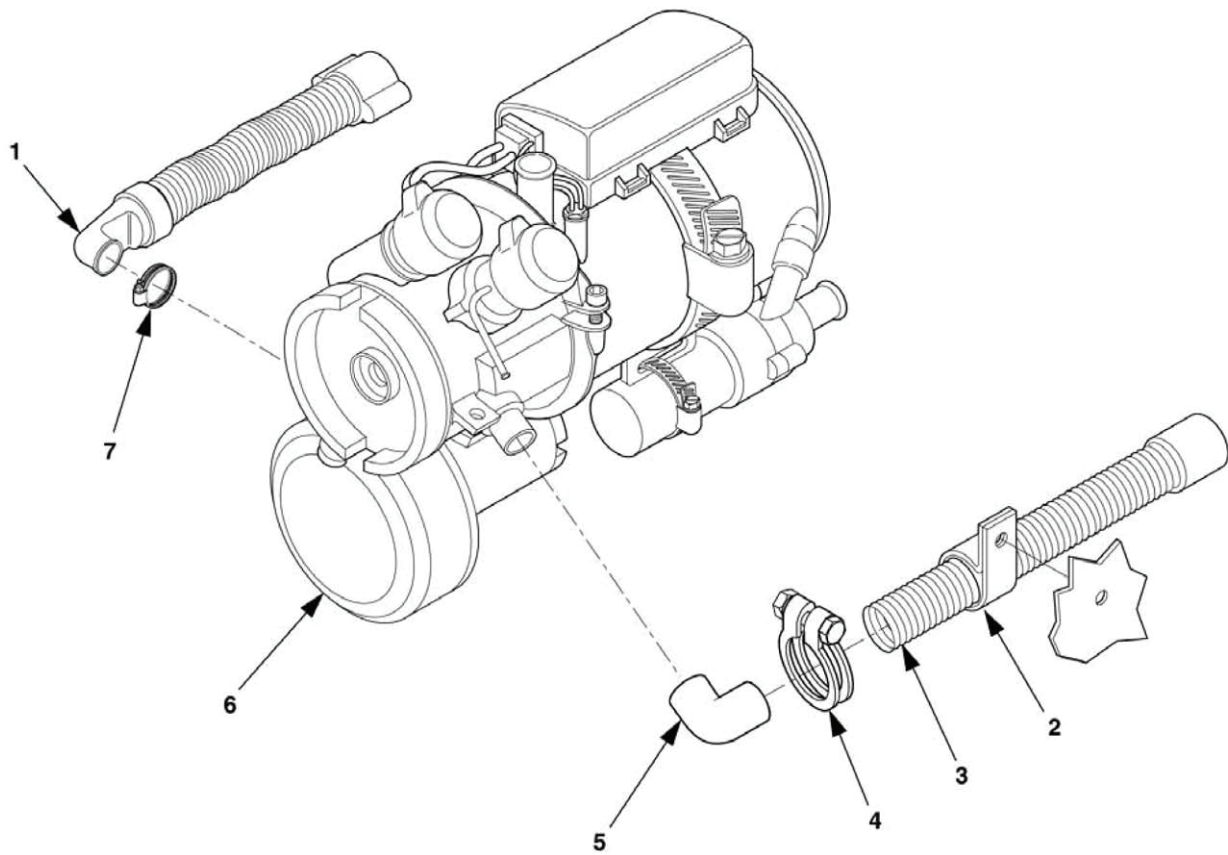


Figure 1. Air Inlet and Exhaust Hose Maintenance.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****WINTERIZATION KIT, WIRING HARNESS MAINTENANCE: INSPECTION, TESTING, REMOVAL, REPAIR, REPLACEMENT, INSTALLATION**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Wires Or Connectors (If needed)

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

WARNING

High voltage is produced when this generator set is in operation. Make sure generator set is completely shut down and free of any power source before attempting any repair or maintenance on the set, or when connecting or disconnecting load cables. Failure to comply with this warning can cause injury or death to personnel.

INSPECTION

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

END OF TASK**TESTING**

Test wiring for continuity. Replace any open or broken wires or connectors.

END OF TASK**REMOVAL**

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

END OF TASK**REPAIR**

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

END OF TASK**REPLACEMENT**

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

END OF TASK**INSTALLATION**

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

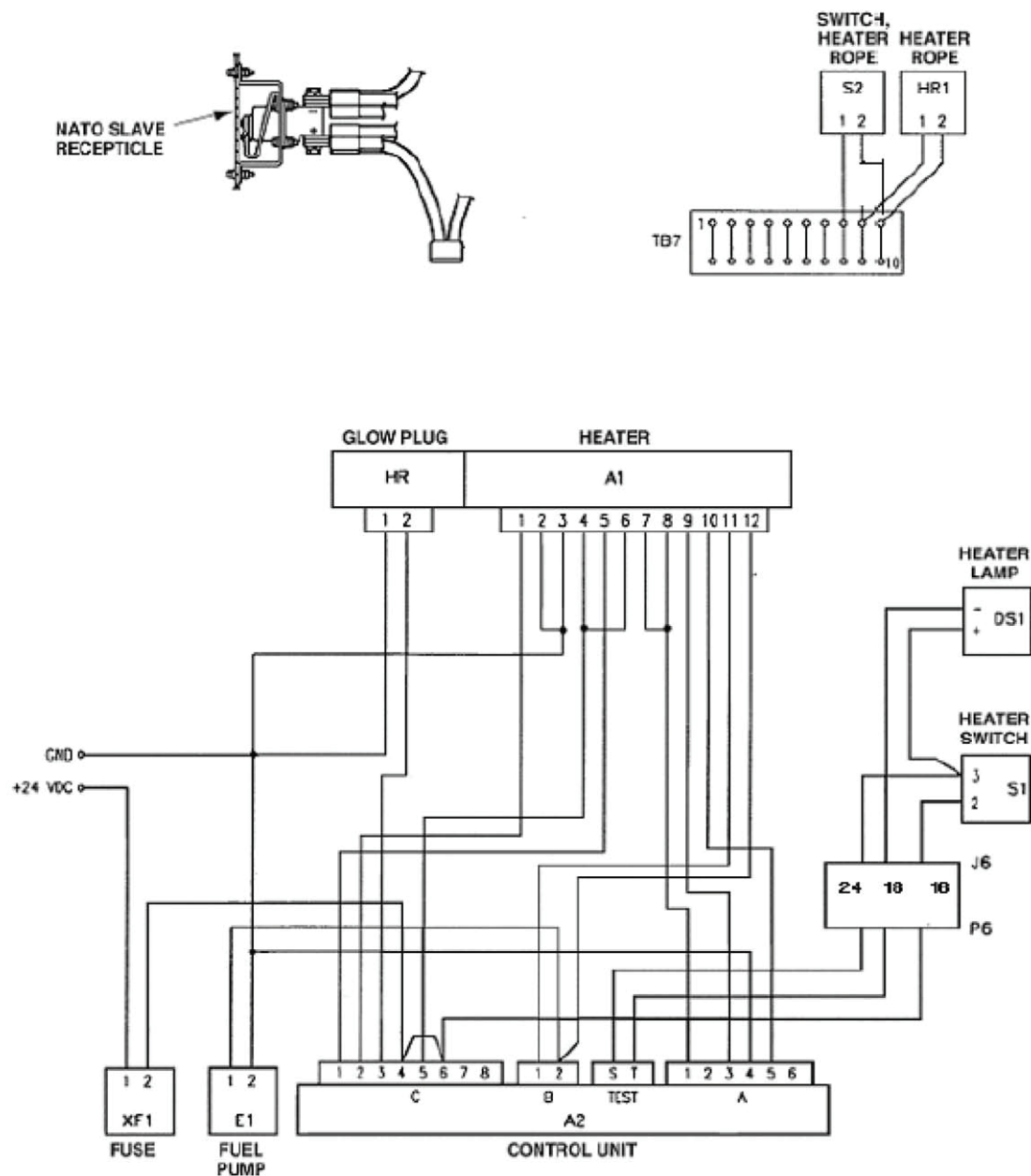


Figure 1. Wiring Harness Maintenance.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS****WINTERIZATION KIT, IGNITER/GLOW PLUG AND RESISTOR MAINTENANCE: TESTING, REPLACEMENT**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Angled Hook

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

TESTING

1. Disconnect negative battery cable, and then disconnect positive battery cable.
2. Remove caps (Figure 1, Item 5) from igniter/glow plug (4) and resistor (1).
3. Loosen hex nuts (2) and disconnect cable (3) from igniter/glow plug (4) and resistor (1).
4. Check continuity between igniter/glow plug (4) and ground and the resistor (1) and ground.
5. Reconnect cable (3) and tighten hex nuts (2) on igniter/glow plug (4) and resistor (1).
6. Replace caps (5) on igniter/glow plug (4) and resistor (1).
7. Reconnect positive battery cable, and then reconnect negative battery cable.

END OF TASK**REPLACEMENT**

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

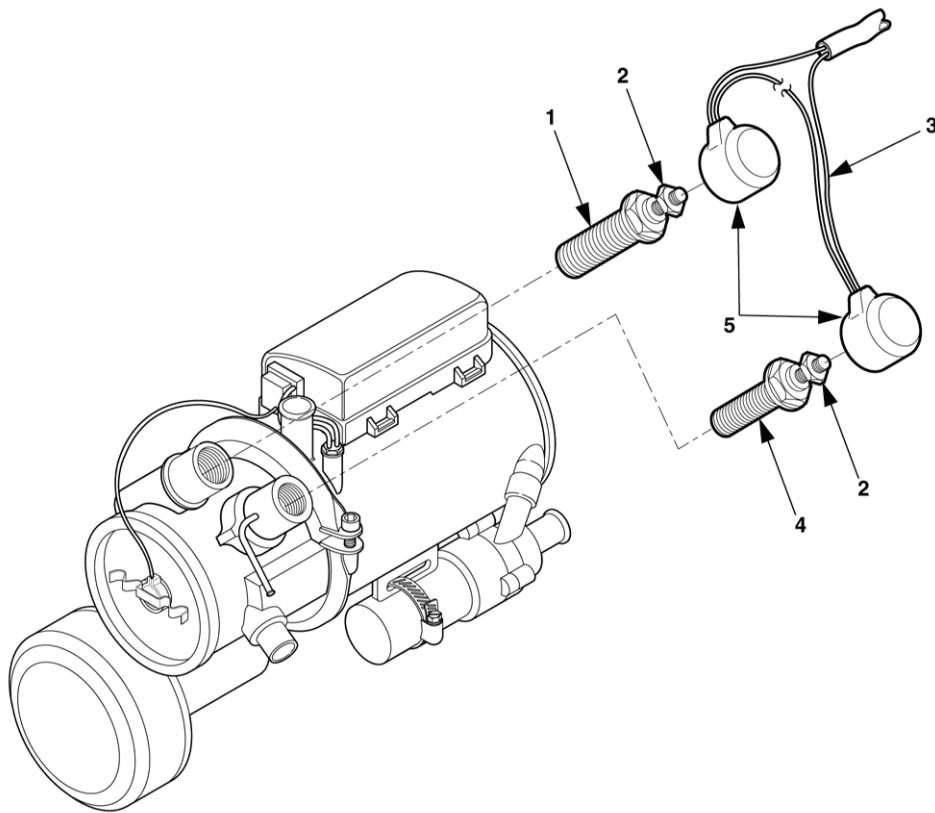


Figure 1. Igniter/Glow Plug and Resistor Maintenance.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
WINTERIZATION KIT, FUNCTION CODES/OPERATING ID PLATE MAINTENANCE: INSPECTION,
INSTALLATION, REMOVAL, REPLACEMENT**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/Parts

Electric Drill

Four (4) Blind Rivets

New Function Codes Plate (If Needed)

Personnel Required

One

Equipment ConditionGrounded, Off & Operational

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

NOTE

Placement of function code plate: Function code plate edge should be placed approximately .50" from top of control panel door when opened and approximately 11" from right edge of control panel door. Plate shall be readable when door is opened.

INSPECTION - FUNCTION CODES PLATE

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

END OF TASK**INSTALLATION - FUNCTION CODES PLATE**

1. Lift generator control box door (Figure 1, Item 1).
2. Using function code plate (4) as a template, drill four 1/8" inch holes.
3. Install function codes plate (4) using four blind rivets (2). Rivet head shall be on the outside of unit.

END OF TASK**REMOVAL - FUNCTION CODES PLATE**

1. Lift generator control box door (Figure 1, Item 1).
2. Using electric drill with 1/8" drill bit, drill each of the rivets and punch out.
3. Remove four rivets (2) and function codes plate (4).
4. Close control box door (1).

END OF TASK**REPLACEMENT - FUNCTION CODES PLATE**

1. Lift generator control panel cover (Figure 1, Item 1).

2. Perform Steps 2 and 3 of Removal - Function Codes Plate.
3. Install new function codes plate (4) using four blind rivets (2). Rivet head shall be on outside of unit.
4. Close control box door (1).

END OF TASK**INSPECTION - OPERATING INSTRUCTION PLATE**

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

END OF TASK**WARNING**

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

NOTE

Placement of operation instruction code plate: Operating instruction plate edge should be placed approximately 1" from top of control panel door when opened and approximately 5" from left edge of control panel door. Plate shall be readable when door is opened.

INSTALLATION - OPERATING INSTRUCTION PLATE

1. Lift generator control panel cover (Figure 1, Item 1).
2. Using operation instruction plate (3) as a template, drill four 1/8" inch holes.
3. Install operating instruction plate (3) using four blind rivets (2). Rivet head shall be on the outside of unit.

END OF TASK**REMOVAL - OPERATING INSTRUCTION PLATE**

1. Lift generator control panel cover (Figure 1, Item 1).
2. Using electric drill with 1/8" drill bit, drill each of the rivets and punch out.
3. Remove four rivets (2) and operating instruction plate (3).
4. Close control box door (1).

END OF TASK**REPLACEMENT - OPERATING INSTRUCTION PLATE**

1. Perform Steps 1 through 3 of Removal - Operating Instructions Plate.
2. Install new operating instruction plate (Figure 1, Item 3) and using four blind rivets (2). Rivet head shall be on outside of unit.
3. Close control box door (1).

END OF TASK

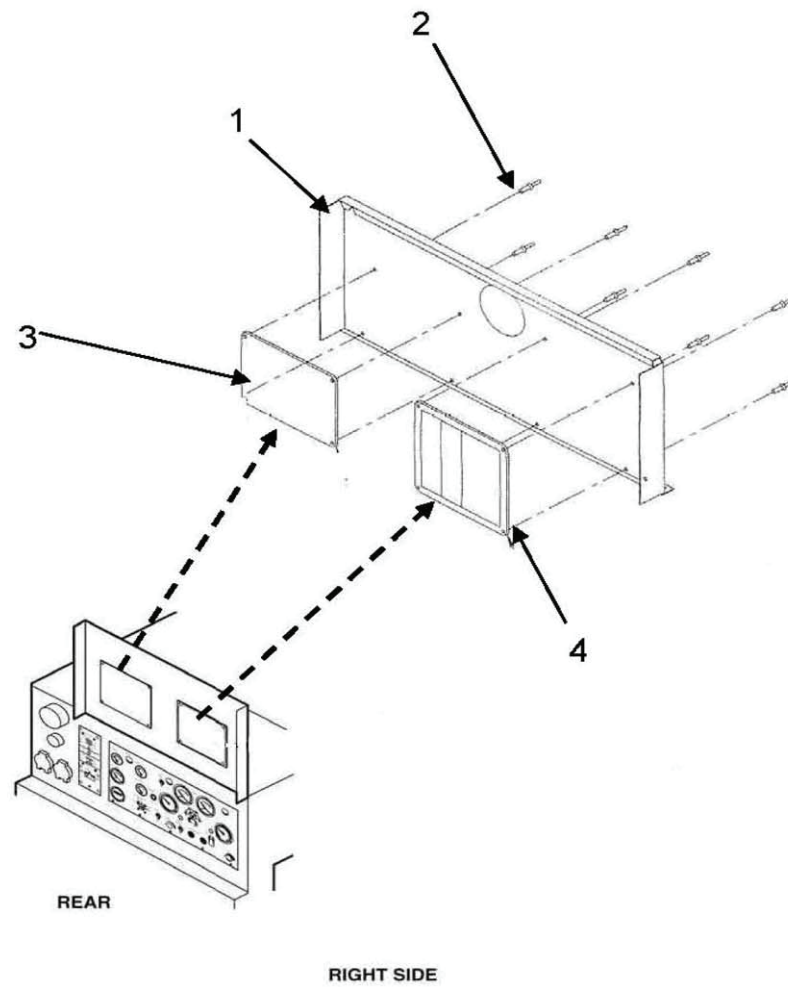


Figure 1. Function Codes Plate/Operating Instruction Plate Maintenance.

END OF WORK PACKAGE

FIELD MAINTENANCE**30 kW 50/60 AND 400 Hz SKID MOUNTED TACTICAL QUIET GENERATOR SETS
WINTERIZATION KIT, REMOVAL INSTRUCTIONS**

INITIAL SETUP:**Tools and Special Tools**

Generator Mechanical Tool Kit

Materials/PartsGloves, Protective Clothing & Goggles
New Lockwashers**Personnel Required**

One

ReferencesWP 0012, Batteries
WP 0076, Servicing
WP 0169, Figure 8, Items: 1 & 5**Equipment Condition**Grounded, Off & Operational

GENERAL

The following instructions have been provided so you can remove Heater Kit, 30 kW Generator Set NSN: 6115-01-474-8354 from your Generator Set.

WARNING

Disconnect negative battery cable from right battery and the positive battery cable from the left battery before doing the following procedures. Reconnect cables in reverse order. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Cooling system operates at high temperature and pressure. Contact with high pressure steam and/or liquids can result in burns and scalding. Shut down generator set, and allow system to cool before performing checks, services and maintenance, or wear gloves and additional protective clothing and goggles as required. Failure to comply with this warning can cause injury or death to personnel.

WARNING

Always remove radiator cap slowly to permit any pressure to escape. Failure to comply with this warning can cause injury to personnel.

WARNING

Catch fuel in suitable container. Keep spilled fuel away from hot engine and all fires. Failure to comply with this warning can cause injury or death to personnel.

REMOVAL PROCEDURES

1. Turn heater and generator set off.
2. Open left and right access doors and disconnect negative battery cable from right battery and the positive battery cable from the left battery per WP 0012, Batteries.
3. Drain generator coolant system per WP 0076, Servicing.
4. Open control panel access door (WP 0169, Figure 8, Item 1).
5. Remove electrical leads from J6-16, 18, and 24 (see Figure 5).

6. Remove toggle switch (WP 0169, Figure 8, Item 5), indicator light (6), and heater switch label (7) from instrument panel (8). Remove rivets (4) from function code plate (3) and operating plate (2). Remove function code and operating plates (3 and 2) from control panel door (1).
7. Remove two nuts (Figure 1, Item 5), bolts (2), flat washers (3), lockwashers (4) and control unit (1) from engine access side of output box. Replace existing hardware.

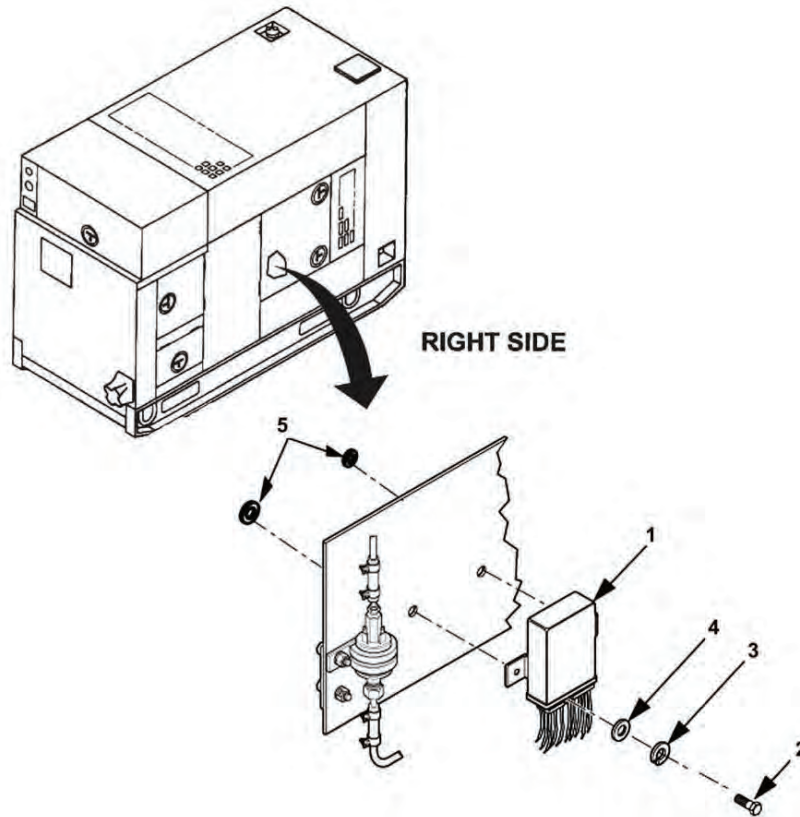


Figure 1. Control Unit Removal.

8. Remove Bolt (Figure 2, Item 13), flat washer (14), lockwasher (15), nut (16), clamp (5), fuel pump (4), butt splices (7), clamps (6 and 1), fuel lines (2, 3 and 8), barbed adapter (9) and fuel line tee (10) from fuel pickup tube assembly (12). Be sure to use a suitable container to catch any fuel from lines. Install generator fuel supply line (11) back into fuel pickup tube assembly (12).

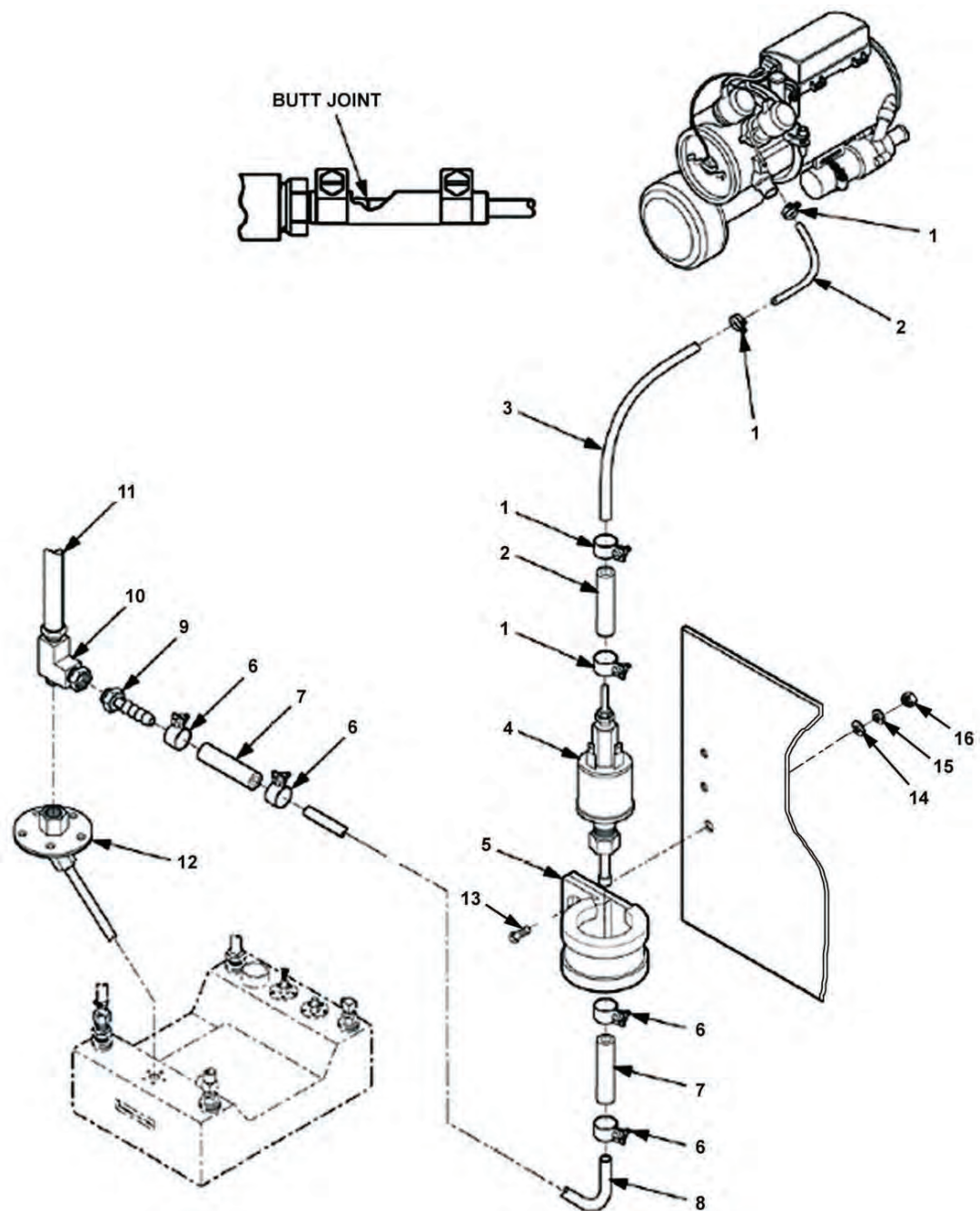


Figure 2. Fuel Pump and Lines Removal.

9. Remove clamps (Figure 3, Item 4) and coolant hose (5) from heater coolant pump. Remove adapter (1), bushing (2), and elbow 90° extension (3) from engine block and install new expansion plug in engine block hole.

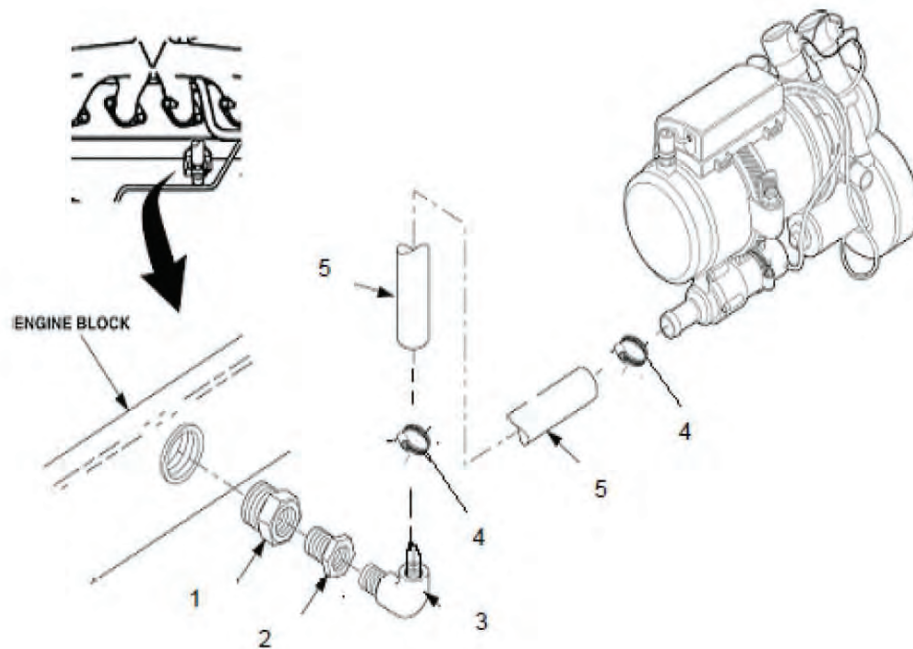


Figure 3. Coolant Inlet Hose Removal.

10. Remove elbow 90° (Figure 4, Item 1), standoff (2), clamps (3 and 5), coolant hose (4), screw (6), flat washer (7), lockwasher (8), and nut (9) from water pump and heater assembly. Replace new plug in water pump.

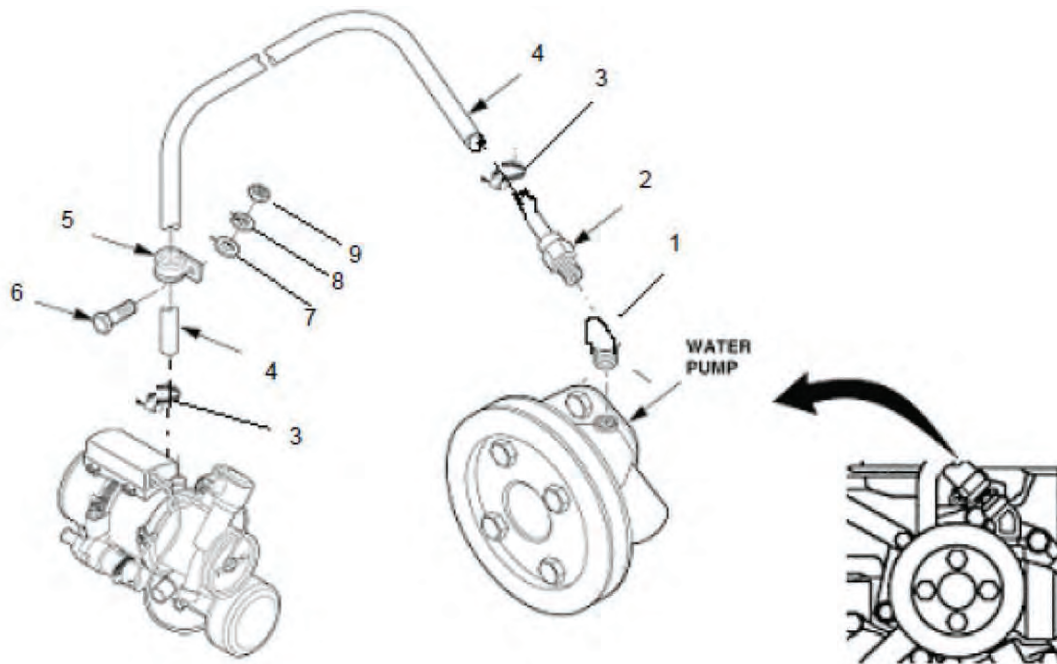


Figure 4. Coolant Outlet Hose Removal.

11. Remove wiring harness from generator set per Figure 5. Reinsert pins 16 and 24 into P6 and reinstall wire 172D to P6-18.

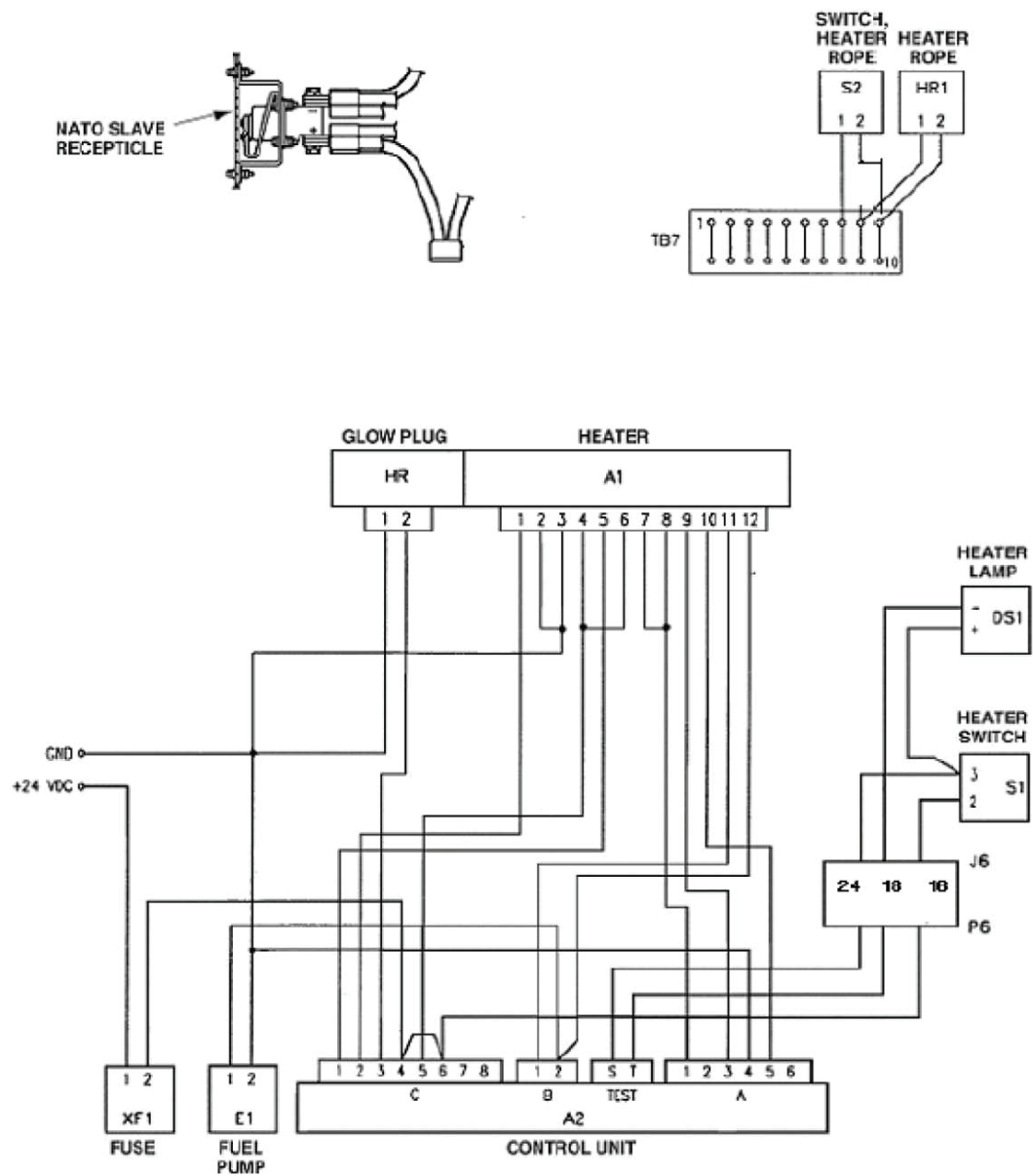


Figure 5. Wiring Harness Removal.

12. Remove heater assembly (7) by removing bolts (Figure 6, Item 4), nuts (1), lockwashers (2), flat washers (3), and plate (6) from left side panel (5).

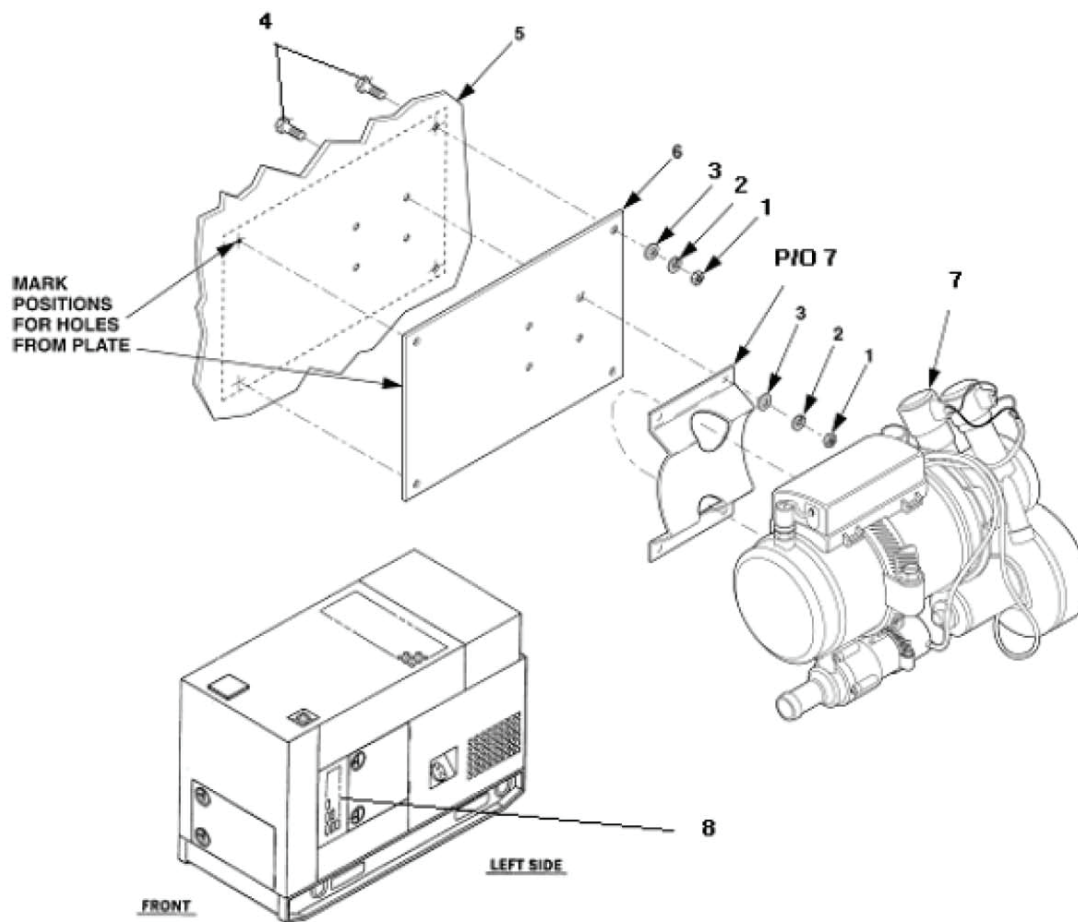


Figure 6. Heater Assembly Removal.

13. Remove insulator (Figure 7, Item 4), foil tape (3), rope heater (2), clamps (8), metallic hose (1), and electrical leads (6 and 7) from rope heater (2) to TB-7 in output box. Remove thermostat (5) from TB-7.
14. Remove exhaust hose (Figure 8, Item 1), spacer (2), nut (5), lockwasher (4), flat washer (3), and clamps (6 and 8). Remove exhaust elbow (9) from heater (7). Screw is secured with nut. If necessary, add spacer to prevent threads from protruding.

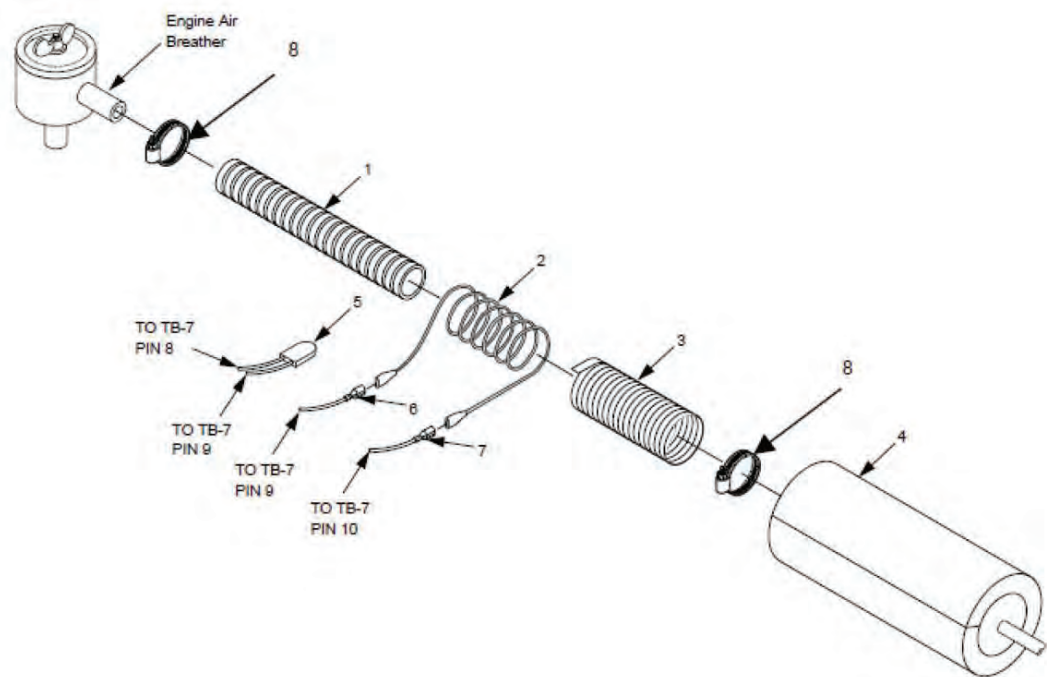


Figure 7. Breather Tube Heater Assembly Removal.

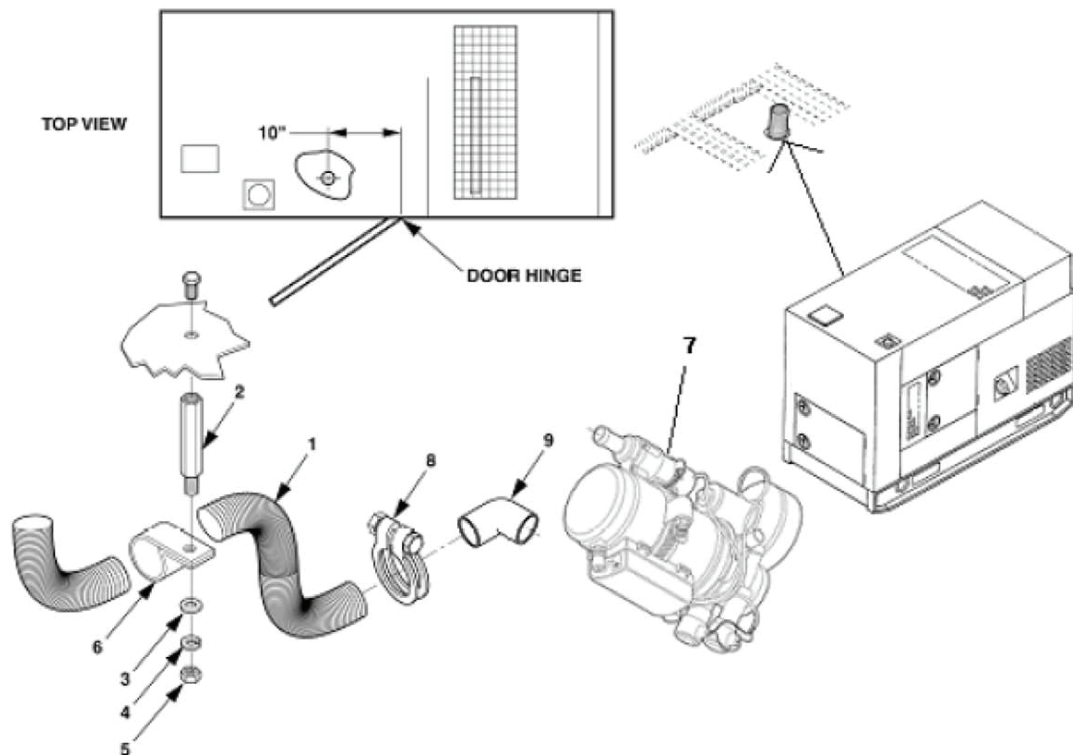


Figure 8. Exhaust Hose Removal.

END OF WORK PACKAGE

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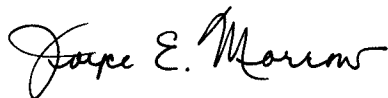
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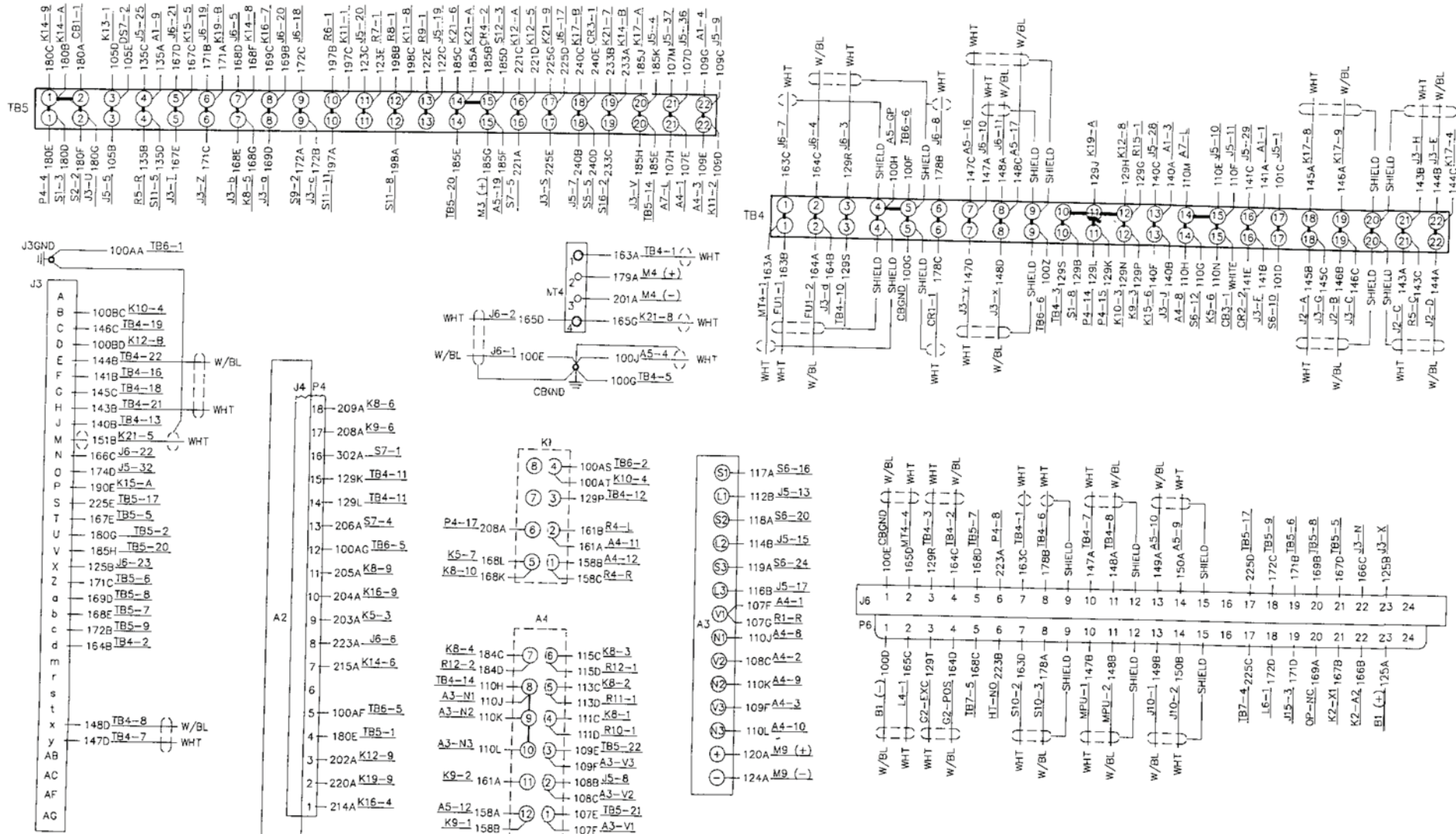
M.A. MICUCCI
COL, USMC, Product Group Director, PG-15
Ground Transportation Engineer Systems
Marine Corps System Command

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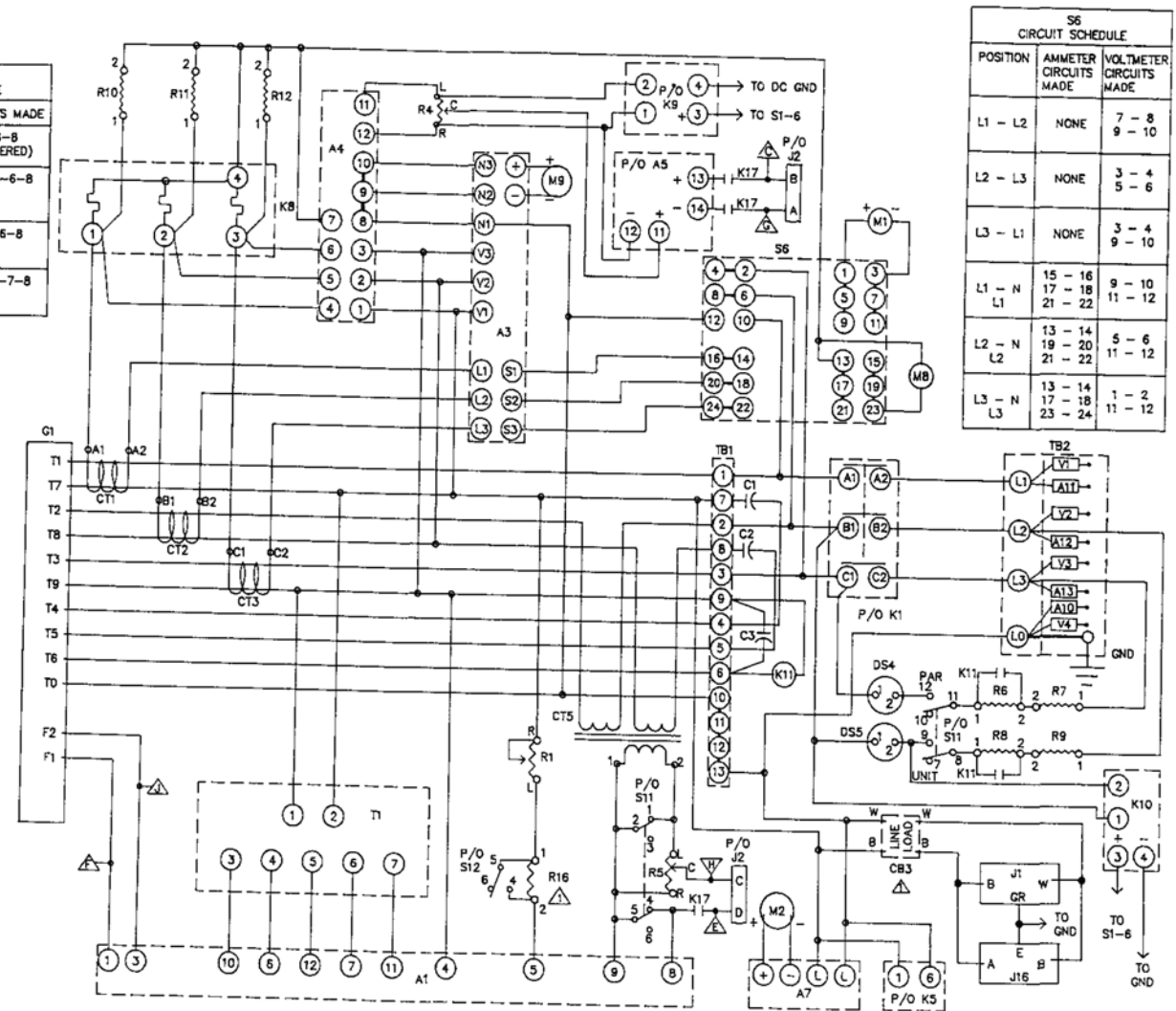
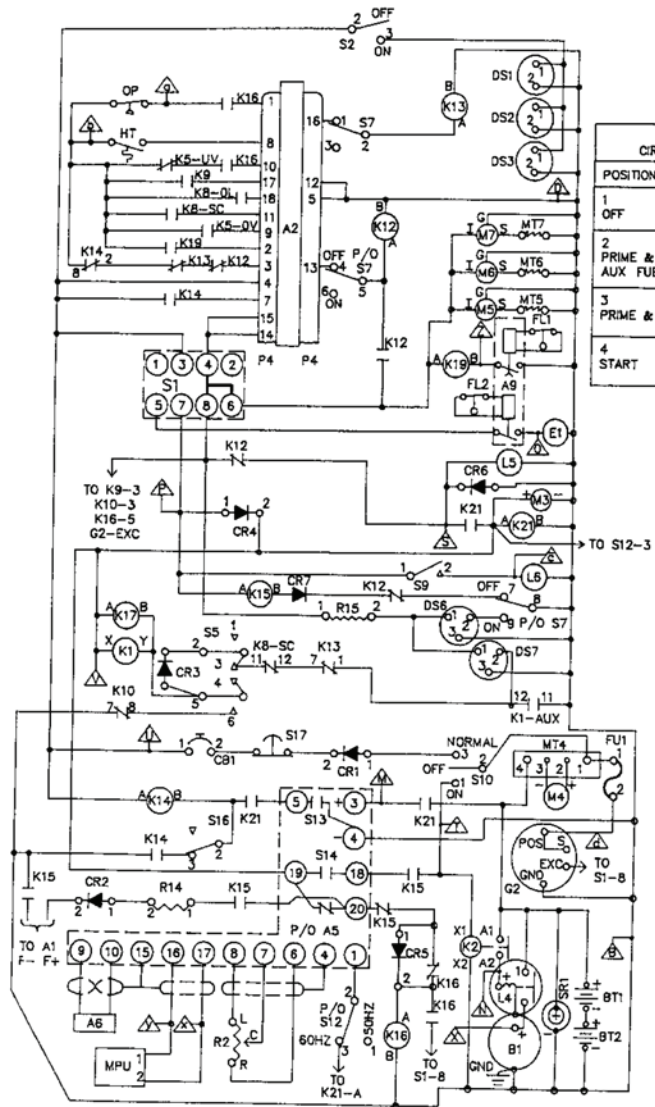
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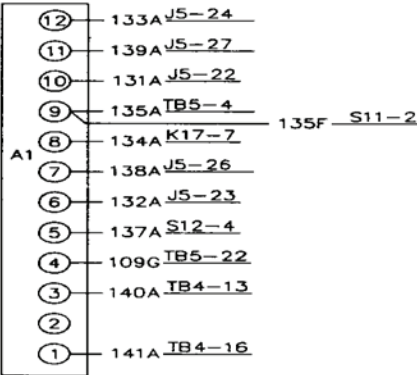
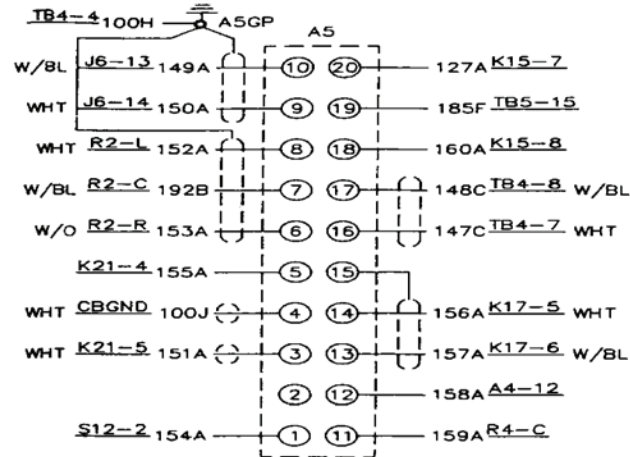
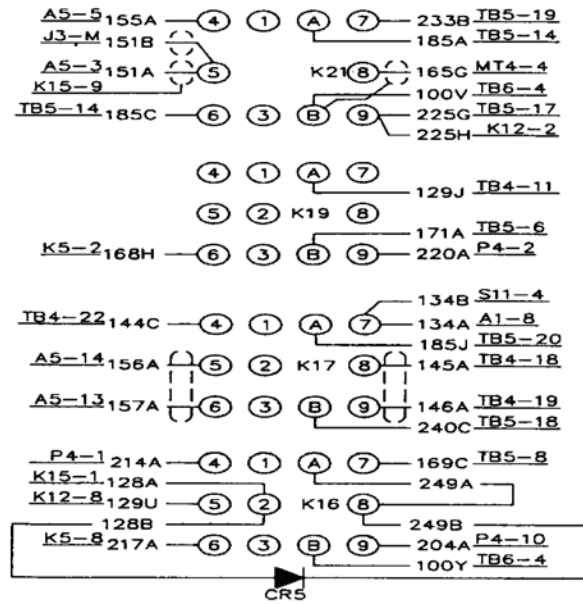
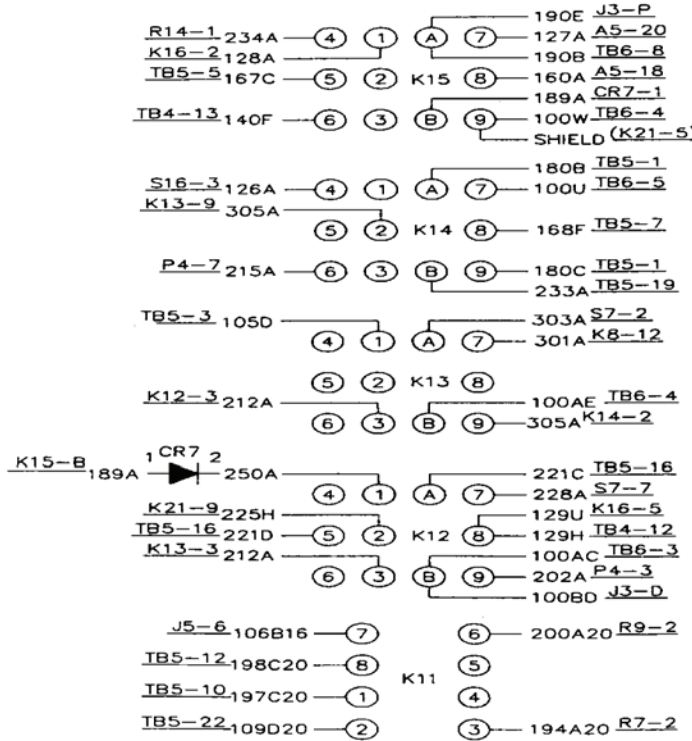
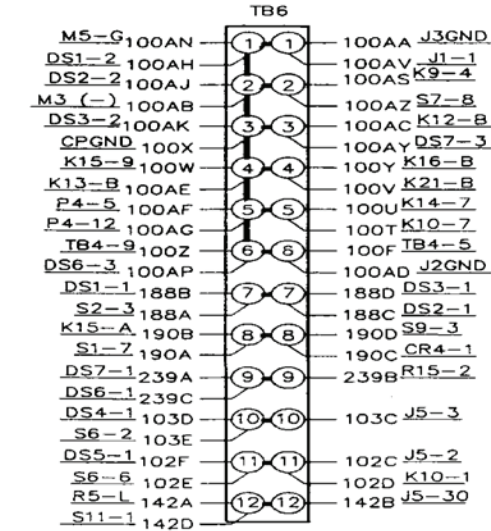
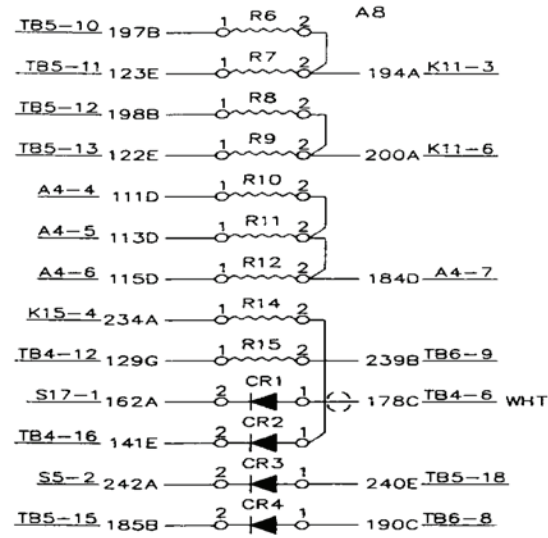
- | | | | |
|---------|----------------------------------|-------|-------------------------------------|
| A1 | AC VOLTAGE REGULATOR | K17 | K1 AUXILIARY RELAY |
| A2 | MALFUNCTION INDICATOR | K19 | FUEL LEVEL RELAY |
| A3 | KILOWATT TRANSDUCER | K21 | GOVERNOR CONTROL POWER |
| A4 | LOAD MEASURING UNIT | L0 | OUTPUT TERMINAL |
| A5 | ELECTRONIC GOVERNOR CONTROL | L1 | OUTPUT TERMINAL |
| A6 | ELECTRONIC GOVERNOR ACTUATOR | L2 | OUTPUT TERMINAL |
| A7 | FREQUENCY TRANSDUCER | L3 | OUTPUT TERMINAL |
| A8 | RESISTOR ASSEMBLY | L4 | STARTER SOLENOID |
| A9 | FLOAT SWITCH MODULE | L5 | FUEL SOLENOID VALVE |
| A10 A13 | EMI FILTER | L6 | ETHER SOLENOID VALVE |
| B1 | CRANKING MOTOR | M1 | AC VOLTMETER |
| BT1 | BATTERY 12V | M2 | FREQUENCY METER |
| BT2 | BATTERY 12V | M3 | TIME METER |
| C1 C3 | EMI CAPACITOR | M4 | BATTERY CHARGING AMMETER |
| CB1 | DC CONTROL POWER CIRCUIT BREAKER | M5 | FUEL LEVEL INDICATOR |
| CB3 | GROUND FAULT CIRCUIT INTERRUPTER | M6 | COOLANT TEMPERATURE INDICATOR |
| CBND | CONTROL BOX GROUND | M7 | OIL PRESSURE INDICATOR |
| CPND | CONTROL PANEL GROUND | M8 | AC AMMETER |
| CR1 | DIODE REVERSE BATTERY | M9 | KILOWATT METER |
| CR2 | DIODE FIELD FLASH | MPU | MAGNETIC PICKUP |
| CR3 7 | DIODE BLOCKING | MPU | BATTERY CHARGING AMMETER SHUNT |
| CT1 | CURRENT TRANSFORMER | MT5 | FUEL LEVEL SENDER |
| CT2 | CURRENT TRANSFORMER | MT6 | COOLANT TEMPERATURE SENDER |
| CT3 | CURRENT TRANSFORMER | MT7 | OIL PRESSURE SENDER |
| CT5 | DROOP CURRENT TRANSFORMER | OP | LOW OIL PRESSURE SWITCH |
| DS1 | PANEL LIGHT | P4 | PLUG MALFUNCTION INDICATOR |
| DS2 | PANEL LIGHT | R1 | VOLTAGE ADJUST POTENTIOMETER |
| DS3 | PANEL LIGHT | R2 | FREQUENCY ADJUST POTENTIOMETER |
| DS4 | SYNCHRONIZATION LIGHT | R4 | LOAD SHARING RHEOSTAT |
| DS5 | SYNCHRONIZATION LIGHT | R5 | KVA SHARING RHEOSTAT |
| DS6 | BATTLE SHORT LIGHT | R6 | SYNC LIGHTS DROPPING RESISTOR |
| DS7 | AC CIRCUIT INTERRUPTER LIGHT | R7 | SYNC LIGHTS DROPPING RESISTOR |
| E1 | AUXILIARY FUEL PUMP | R8 | SYNC LIGHTS DROPPING RESISTOR |
| FL1 | LOW FUEL LEVEL FLOAT SWITCH | R9 | SYNC LIGHTS DROPPING RESISTOR |
| FL2 | AUXILIARY FUEL PUMP FLOAT SWITCH | R10 | BURDEN RESISTOR |
| FU1 | FUSE | R11 | BURDEN RESISTOR |
| G1 | AC GENERATOR | R12 | BURDEN RESISTOR |
| G2 | BATTERY CHARGING ALTERNATOR | R14 | FIELD FLASH RESISTOR |
| GND | GROUND | R15 | LED RESISTOR |
| HT | COOLANT HIGH TEMPERATURE SWITCH | R16 | VOLTAGE ADJUST RESISTOR |
| J1 | CONVENIENCE RECEPTACLE | S1 | MASTER SWITCH |
| J2 | PARALLEL RECEPTACLE | S2 | PANEL LIGHT SWITCH |
| J3 | DIAGNOSTIC RECEPTACLE | S5 | AC CIRCUIT INTERRUPTER SWITCH |
| J16 | SWITCH BOX RECEPTACLE | S6 | AM/VM TRANSFER SWITCH |
| K1 | AC CIRCUIT INTERRUPTER | S7 | BATTLE SHORT SWITCH |
| K2 | CRANKING RELAY | S8 | ETHER START ASSIST SWITCH |
| K5 | OVER/UNDER VOLTAGE RELAY | S10 | DEAD CRANK SWITCH |
| K6 | OVERLOAD/SHORT CIRCUIT RELAY | S11 | UNIT PARALLEL SWITCH |
| K8 | REVERSE POWER RELAY | S12 | FREQUENCY SELECTOR SWITCH |
| K10 | PERMISSIVE PARALLELING RELAY | S13 | OVERSPEED SWITCH |
| K11 | VOLTAGE SENSING RELAY | S14 | OVERSPEED RESET SWITCH |
| K12 | ENGINE FAULT RELAY | S16 | OVERSPEED STOP SWITCH |
| K13 | ELECTRICAL FAULT RELAY | S17 | EMERGENCY STOP SWITCH |
| K14 | OVERSPEED RELAY | SR1 | SLAVE RECEPTACLE |
| K15 | START RELAY | T1 | POTENTIAL TRANSFORMER |
| K16 | CRANK DISCONNECT RELAY | TB | TERMINAL BOARD (S) |
| | | TB1 | VOLTAGE RECONNECTION TERMINAL BOARD |
| | | TB2 | LOAD OUTPUT TERMINAL BOARD |
| | | V1 V4 | VARISTOR AC LOAD LINES |
| | | | VARISTOR DC SYSTEM |

NOTE SIZE DESIGNATOR OMITTED FROM WIRE NUMBERS FOR CLARITY

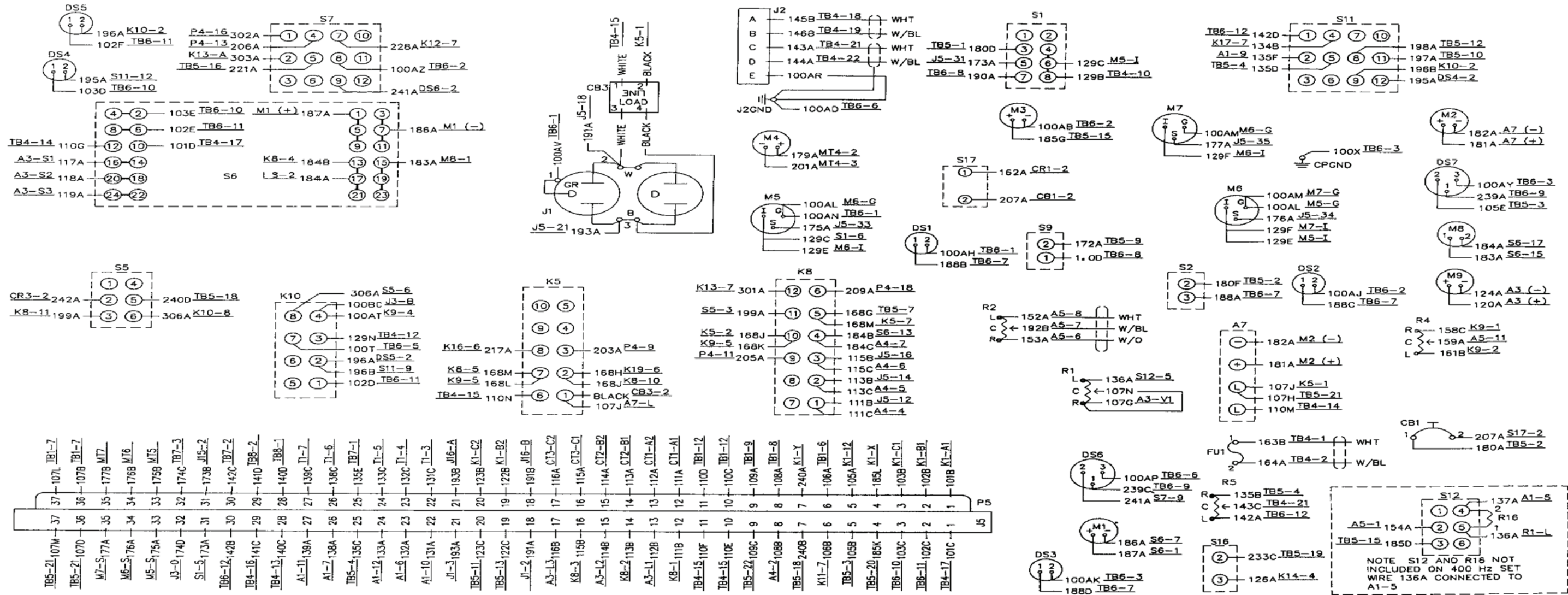


- A1 AC VOLTAGE REGULATOR
A2 MALFUNCTION INDICATOR
A3 KILOWATT TRANSducer
A4 LOAD MEASURING UNIT
A5 ELECTRONIC GOVERNOR CONTROL
A6 ELECTRONIC GOVERNOR ACTUATOR
A7 FREQUENCY TRANSducer
A8 RESISTOR ASSEMBLY
A9 FLOAT SWITCH MODULE
A10-A13 EMI FILTER
B1 CRANKING MOTOR
B11 BATTERY 12V
B12 BATTERY 12V
C1-C3 EMI CAPACITOR
CB1 DC CONTROL POWER CIRCUIT BREAKER
CB3 GROUND FAULT CIRCUIT INTERRUPTER
CB2ND CONTROL BOX GROUND
CP2ND CONTROL PANEL GROUND
CR1 DIODE REVERSE BATTERY
CR2 DIODE FIELD FLASH
CR3-7 DIODE BLOCKING
CR8 DIODE SUPPRESSING
CT1 CURRENT TRANSFORMER
CT2 CURRENT TRANSFORMER
CT3 CURRENT TRANSFORMER
CT5 DROOP CURRENT TRANSFORMER
DS1 PANEL LIGHT
DS2 PANEL LIGHT
DS3 PANEL LIGHT
DS4 SYNCHRONIZATION LIGHT
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DS6 BATTLE SHORT LIGHT
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GND GROUND
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J1 CONVENIENCE RECEPTACLE
J2 PARALLEL RECEPTACLE
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J6 SWITCH BOX RECEPTACLE
K1 AC CIRCUIT INTERRUPTER
K2 CRANKING RELAY
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K19 FUEL LEVEL RELAY
K21 GOVERNOR CONTROL POWER
L0 OUTPUT TERMINAL
L1 OUTPUT TERMINAL
L2 OUTPUT TERMINAL
L3 OUTPUT TERMINAL
L4 STARTER SOLENOID
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L6 ETHER START ASSIST VALVE
M1 AC VOLTMETER
M2 FREQUENCY METER
M3 TIME METER
M4 BATTERY CHARGING AMMETER
M5 FUEL LEVEL INDICATOR
M6 COOLANT TEMPERATURE INDICATOR
M7 OIL PRESSURE INDICATOR
M8 AC AMMETER
M9 KILOWATT METER
MPU MAGNETIC PICKUP
MT4 BATTERY CHARGING AMMETER SHUNT
MT5 FUEL LEVEL SENDER
MT6 COOLANT TEMPERATURE SENDER
MT7 OIL PRESSURE SENDER
OP LOW OIL PRESSURE SWITCH
P4 PLUG MALFUNCTION INDICATOR
R1 VOLTAGE ADJUST POTENTIOMETER
R2 FREQUENCY ADJUST POTENTIOMETER
R3 LOAD SHARING RHEOSTAT
R4 KVA SHARING RHEOSTAT
R5 SYNC LIGHTS DROPPING RESISTOR
R7 SYNC LIGHTS DROPPING RESISTOR
R8 SYNC LIGHTS DROPPING RESISTOR
R9 SYNC LIGHTS DROPPING RESISTOR
R10 BURDEN RESISTOR
R11 BURDEN RESISTOR
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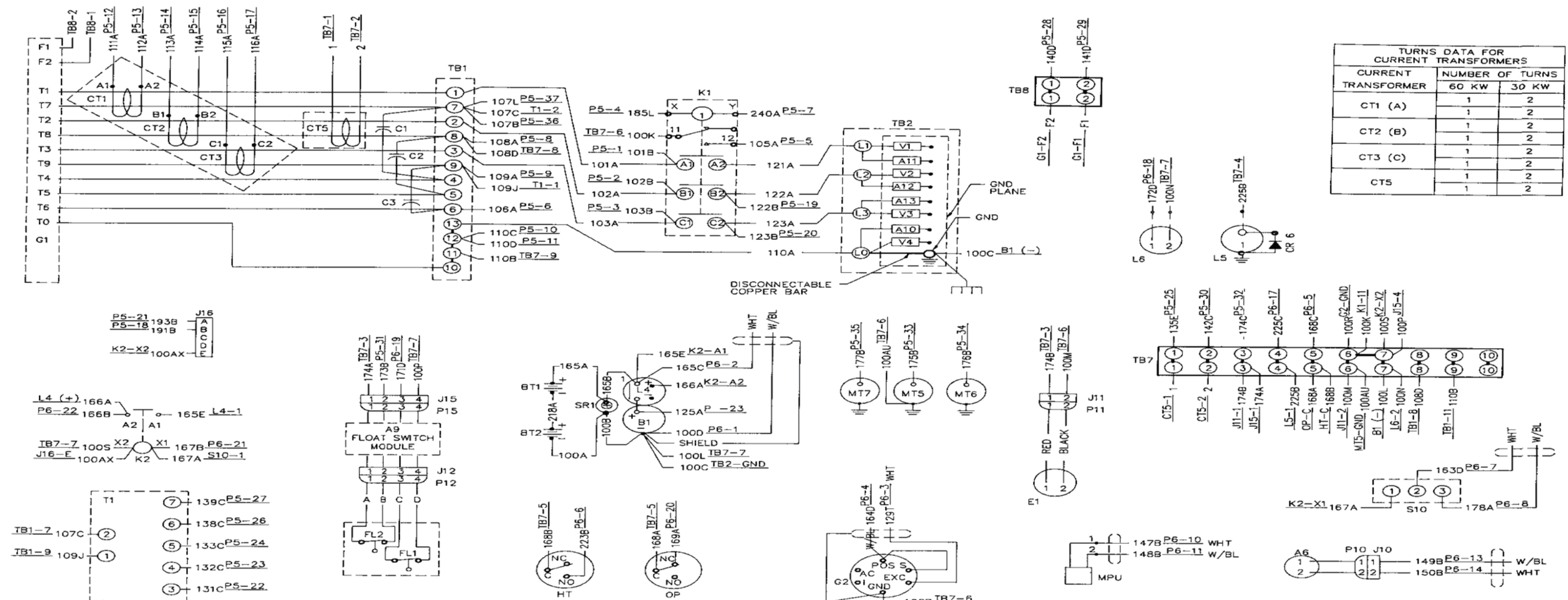
INDICATES PIN ON DIAGNOSTIC RECEPTACLE (J3)
• LETTER DESIGNATION
NOTE R16 AND S12 ARE NOT INCLUDED ON 400 HZ SETS



F0-2 Wiring Diagram (Sheet 2 of 4)



FO-2 Wiring Diagram (Sheet 3 of 4)



FO-2 Wiring Diagram (Sheet 4 of 4)

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeter = 0.01 Meters = 0.3937 inches
 1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 inches
 1 kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
 1 Kilogram = 100 Grams = 2.2 lb. 1 Cu. Meter = 1,000,000
 1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Millimeter = 0.001 Liters = 0.0338 Fluid Ounces
 1 Liter = 1000 Millimeters = 32.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeter = 0.155 Sq. Inches
 1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Inches
 1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
 1 Cu. Centimeters = 35.31 Cu. Feet

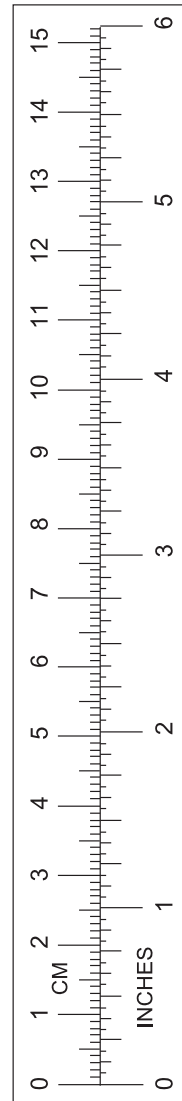
TEMPERATURE

$5/9 (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$
 212° Fahrenheit is equivalent to 100° Celsius
 90° Fahrenheit is equivalent to 32.2° Celsius
 32° Fahrenheit is equivalent to 0° Celsius
 $9/5 ^{\circ}\text{C} + 32 = ^{\circ}\text{F}$

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches.....	Centimeters.....	2.540
Feet.....	Meters.....	0.305
Yards.....	Meters.....	0.914
Miles.....	Kilometers.....	1.609
Square Inches.....	Square Centimeters.....	6.451
Square Feet.....	Square Meters.....	0.093
Square Yards.....	Square Meters.....	0.836
Square Miles.....	Square Kilometers.....	2.590
Acres.....	Square Hectometers.....	0.405
Cubic Feet.....	Cubic Meters.....	0.028
Cubic Yards.....	Cubic Meters.....	0.765
Fluid Ounces.....	Milliliters.....	29.573
Pints.....	Liters.....	0.473
Quarts.....	Liters.....	0.946
Gallons.....	Liters.....	3.785
Ounces.....	Grams.....	28.349
Pounds.....	Kilograms.....	0.454
Short Tons.....	Metric Tons.....	0.907
Pound-Feet.....	Newton-Meters.....	1.356
Pounds per Square Inch.....	Kilo pascals.....	6.895
Miles per Gallon.....	Kilometers per Liter.....	0.425
Miles per Hour.....	Kilometers per Hour.....	1.609

TO CHANGE	TO	D I V I D E B Y
Centimeters.....	Inches.....	2.540
Meters.....	Feet.....	0.305
Meters.....	Yards.....	0.914
Kilometers.....	Miles.....	1.609
Square Centimeters.....	Square Inches.....	6.451
Square Meters.....	Square Feet.....	0.093
Square Meters.....	Square Yards.....	0.836
Square Kilometers.....	Square Miles.....	2.590
Square Hectometers.....	Acres.....	0.405
Cubic Meters.....	Cubic Feet.....	0.028
Cubic Meters.....	Cubic Yards.....	0.765
Milliliters.....	Fluid Ounces.....	29.573
Liters.....	Pints.....	0.473
Liters.....	Quarts.....	0.946
Liters-Meters.....	Gallons.....	3.785
Grams.....	Ounces.....	28.349
Kilograms.....	Pounds.....	0.454
Metric Tons.....	Short Tons.....	0.907
Newton-Meters.....	Pound-Feet.....	1.356
Kilo pascals.....	Pounds per Square Inch.....	6.895
Kilometers per Liter.....	Miles per Gallon.....	0.425
Kilometers per Hour.....	Miles per Hour.....	1.609



PIN:071748-000