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AIR FORCE TO 35C2-3-519-2
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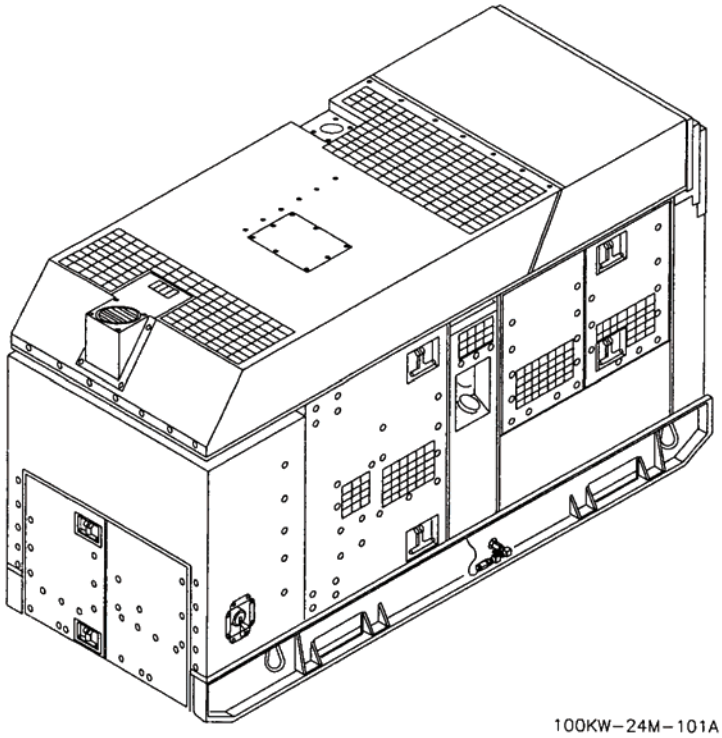
NAVAIR 19-50-27

TECHNICAL MANUAL

FIELD AND SUSTAINMENT MAINTENANCE
FOR

GENERATOR SET, SKID MOUNTED, TACTICAL QUIET
100 kW, 50/60 Hz, MEP-807A
NSN 6115-01-296-1463 (EIC: KP1)

GENERATOR SET, TRAILER MOUNTED, TACTICAL QUIET
100 kW, 50/60 Hz, PU-807A
NSN 6115-01-471-7088 (EIC: KPB)



100KW–24M–101A

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HEADQUARTERS, DEPARTMENT OF THE ARMY, AIR FORCE, NAVY, AND HEADQUARTERS U.S. MARINE CORPS

1 OCTOBER 2006

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WARNING SUMMARY

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

FIRST AID

For first aid, refer to FM 4-25.11.

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

100KW-24M-120

WARNING SUMMARY - Continued

SAFETY AND HAZARDOUS MATERIAL

This manual describes physical and chemical processes that may require the use of chemicals, solvents, paints, or other commercially available material. Users of the manual should obtain the material safety data sheets (Occupational Safety and Health Act (OSHA) Form 20 or equivalent) from the manufacturers or suppliers of materials to be used. Users must be completely familiar with manufacturer/supplier information and adhere to their procedures, recommendations, warnings, and cautions for safe use, handling, storage, and disposal of these materials.

EXPLANATION OF SAFETY WARNING ICONS

ELECTRICAL - electrical wire to hand with electricity symbol running through hand shows that shock hazard exists.

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

EAR PROTECTION - headphones over ears shows that noise level will harm ears.

HEAVY OBJECT - human figure stooping over heavy object shows physical injury potential from improper lifting technique or failure to share lifting task with other persons.

HEAVY PARTS - hand with heavy object on top shows that heavy parts can crush and harm if dropped.

WARNING SUMMARY - Continued

EXPLANATION OF SAFETY WARNING ICONS - Continued

HEAVY PARTS - foot with heavy object on top shows that heavy parts can crush and harm if dropped

MOVING PARTS - hand with figures caught between gears shows that the moving parts of the equipment present a danger to life or limb.

SHARP OBJECT - pointed object in hand shows that a sharp object presents a danger to limb.

HEAVY OBJECT - falling object shows that a heavy item can fall and crush.

EXPLOSION - flame and burst shows that material can explode if subjected to high temperatures, sources of ignition, or high pressure.

EYE PROTECTION - human figure with goggles shows that material can injure eyes.

CRYOGENIC - hand in block of ice shows that the material is extremely cold and can injure human skin or tissue.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

WARNING

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

WARNING

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

WARNING

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

WARNING

High voltage is produced when the generator set is in operation. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply can cause injury or death to personnel.

WARNING

If necessary to move a generator set which has been operating in parallel with another generator set, shut down both generator sets prior to removing load cables or ground. Failure to comply can cause injury or death to personnel by electrocution.

WARNING

Before making any connections for parallel operation or moving generator set which has been operating in parallel, ensure there is no input to the load output terminal board and the generator sets are shut down. Failure to comply can cause injury or death to personnel by electrocution.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

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 observe this warning can result in severe personal injury or death by electrocution.

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 result in 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 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 can cause injury or death to personnel.

WARNING

Ensure power is off before performing troubleshooting procedures. Failure to comply can cause injury to personnel.

WARNING

A strong electrical shock hazard is present if the electrical power is not removed from the ECM. The electronic unit injector system uses 90-120 volts. Failure to comply can cause injury or death to personnel.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

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 can cause injury or death to personnel.

WARNING

Lethal voltages up to 440 Vac are present on wiring any time the generator set is operating or paralleled with other generator sets that are operating. Be very careful when working around these wires and making measurements during troubleshooting. Failure to comply can cause serious injury or death to personnel.

WARNING

High voltages may be present at the generator terminals when the unit is rotating. Tools, equipment, clothing, and your body must be kept clear of rotating parts and electrical connections. Special precautions must be taken during troubleshooting since protective covers and safety devices may be removed or disabled to gain access and perform tests. Be extremely careful. Failure to comply can cause serious injury or death to personnel.

WARNING

Dangerously high voltage can exist across current transformer (CT) output with engine running. CT could explode if disconnected from load with engine running. Do not disconnect CT with generator rotating. Failure to comply can cause serious 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 can cause serious injury 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 can cause injury or death to personnel.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

WARNING

The muffler blanket heat insulation material can cause skin and eye irritation and deteriorate after continued use. Avoid breathing and eye and skin contact with the insulation particles. Wear dust mask, safety goggles, gloves and long sleeve clothes when working on muffler blanket. Failure to comply can cause injury to personnel.

WARNING

Top housing panels can get very hot. Allow panels to cool down before performing maintenance. Failure to comply can cause injury or death to personnel.

WARNING

Exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services and maintenance. Failure to comply can cause severe burns and 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 can cause injury or death 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 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 can cause injury to personnel.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

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. Failure to comply 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 can cause injury or death 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 can cause hearing damage 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 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 can cause injury to personnel.

WARNING

Flywheel weighs more than 50 pounds (23 kg) and requires a two-person lift. Lifting flywheel can cause back strain. Ensure proper lifting techniques are used when lifting flywheel. Failure to comply 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 can cause serious injury or death to personnel.

WARNING SUMMARY - Continued

GENERAL SAFETY WARNINGS DESCRIPTION - Continued

WARNING

Be extremely careful when working near the generator set as it is being positioned on the trailer. Failure to comply can cause injury to personnel.

WARNING

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

WARNING

Retaining rings and springs are under tension and can act as projectiles when being removed. Use eye protection when removing retaining rings or springs. Failure to comply 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 can cause injury to personnel.

WARNING

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

WARNING

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

WARNING SUMMARY - Continued

EXPLANATION OF HAZARDOUS MATERIALS ICONS

EYE PROTECTION - human figure with goggles shows that material can cause injury to eyes.

CHEMICAL - drops of liquid on hand shows that material can cause burns or irritation to human skin or tissue.

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

FIRE - flames show that material is flammable.

EXPLOSION - flame and burst shows that material can explode if subjected to high temperatures, sources of ignition, or high pressure.

RADIATOR - steam in face and body shows that escaping steam and hot water exist.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTION

WARNING

Batteries give off a flammable gas. Do not smoke or use open flame when performing maintenance. Failure to comply can cause injury or death to personnel and equipment damage due to flames and explosion.

WARNING

The connection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard which may result in injury or death. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere.

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. Personnel are to wash exposed skin and change chemical soaked clothing promptly if exposed to fuel. Failure to comply 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 can cause injury or death to personnel.

WARNING

Carbon removing compound is flammable and toxic to eyes, skin, and respiratory tract. Skin and eye protection are required when working in contact with carbon removing compound. Avoid repeated or prolonged contact. Work in ventilated area only. Failure to comply 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 can result in flames and possible explosion and 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 can result in flames and possible explosion and cause injury or death to personnel and damage to the generator set.

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTION - Continued

WARNING

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

WARNING

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

WARNING

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

WARNING SUMMARY - Continued

HAZARDOUS MATERIALS DESCRIPTION - Continued

WARNING

Exhaust discharge contains deadly gases including carbon monoxide. Do not operate generator set in an enclosed area unless exhaust discharge is properly vented outside. Failure to comply can cause injury or death to personnel.

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 HMEE. 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: Zero in the "Change No." column indicates an original page or work package.

Dates of issue for the original manual are:

Original .. 0 .. 1 October 2006

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 64 AND TOTAL NUMBER OF WORK PACKAGES IS 120, CONSISTING OF THE FOLLOWING:

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HEADQUARTERS,
DEPARTMENT OF THE ARMY, AIR FORCE, NAVY, AND
HEADQUARTERS U.S. MARINE CORPS
WASHINGTON, D.C., 1 OCTOBER 2006

TECHNICAL MANUAL

FIELD AND SUSTAINMENT MAINTENANCE FOR

GENERATOR SET SKID MOUNTED, TACTICAL QUIET 100 kW, 50/60 Hz, MEP-807A NSN 6115-01-296-1463 (EIC: KP1)

GENERATOR SET, TRAILER MOUNTED, TACTICAL QUIET 100 kW, 50/60 Hz, PU-807A NSN 6115-01-471-7088 (EIC: KPB)

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. We would prefer that you submit your recommended changes electronically, by email <AMSEL-LC-LEO-PUBS-CHG@mail1.monmouth.army.mil> or online <http://edm.Monmouth.army.mil/pubs/2028.html>. Alternately, you may mail or fax your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 located in back of this manual direct to: Commander, U.S. Army Communications-Electronics Life Cycle Management Command, ATTN: AMSEL-LC-LEO-E-ED, Fort Monmouth, New Jersey 07703-5006. The fax number is 732-532-3421, DSN 992-3421.

For Air Force, use AFTO Form 22 in accordance with TO 00-5-1 and mail directly to Commander, WRALC/LEET, Robins AFB, GA, 31098. You may also e-mail your form to < http://wralc.tilta.afto@robins.af.mil >.

For Marine Corps submit notice of discrepancies or suggested changes on a NAVMC 10772. The NAVMC may be submitted via the Internet using website < http://pubs.logcom.usmc.mil/navmc >. Follow the instructions by filling in the blanks with the requested information. This is a secure site requiring a PKI Certificate and a CAC card. NAVMC 10772 may be submitted by sending electronic mail to <mbmatcommarlogbases@logcom.usmc.mil > (this address will automatically update to the correct one if changes occur), or by mailing a paper copy in an envelope addressed to Commander, Marine Corps Systems Command, Attn: Assistant Commander Acquisitions and Logistics (LOG/TP), 814 Radford Blvd, Suite 20343, Albany, Georgia 31704-0343.

NAVAIR Navy must utilize the Naval Air Technical Data and Engineering Services Command (NATEC) for reporting of errors, and discrepancies on Technical Publications. Errors should be submitted electronically utilizing Technical Publication Deficiency Reports (TPDR) direct to NATEC in accordance with OPNAV Instruction 4790.2, VOL V, Para 10-9. All TPDRs are submitted electronically Direct to NATEC, website http://www.natec.navy.mil>.

In any case we will send you a reply.

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HOW TO USE THIS MANUAL

This manual contains maintenance instructions for the 100 kW Tactical Quiet Generator (TQG) Skid-Mounted MEP-807A and for the TQG, Trailer-Mounted PU-807A. The skid-mounted TQG can be mounted on a 5-ton trailer, Model XM1061E1 and is designated PU-807A in that configuration. Detailed operation and maintenance for the trailer can be found in TM 9-2330-376-14&P.

This maintenance manual is part of a family of manuals which includes an Operator's Manual (TM 9-6115-729-10) and a Repair Parts and Special Tools Lists (RPSTL) Manual (TM 9-6115-729-24P).

Refer to References work package WP 0117, located in Chapter 7, for a listing of other related manuals.

This manual implements the Army Maintenance Transformation and changes the Maintenance Allocation Chart (MAC) to support Field and Sustainment Maintenance under the new two-level maintenance concept.

This manual is written in Work Package (WP) format.

Table of Contents: The table of contents will help you understand the organization of the manual. The overall table of contents in the front of the manual directs you to the Chapters and lists all of the work packages in the manual with tables and figures identified for each work package. The chapters contain descriptive information, maintenance procedures organized by maintenance level, and supporting data. Each chapter contains its own chapter index that lists all the work packages within the chapter to help you find information. Each chapter is divided into work packages with titles that describe the information or procedure in the work package. An alphabetical index at the end of the manual can also be used to find work packages.

NOTE

The generator end of the TQG is referred to as the REAR of the TQG. The control panel is also located on the generator end (REAR) of the TQG. Figure 1 (Sheets 1-6) in WP 0002 shows where TQG components are located.

GENERAL INFORMATION AND EQUIPMENT DATA WORK PACKAGES

Chapter 1 contains general information work packages including required maintenance forms, records, and reports; safety, care, and handling information and directions for finding warranty information. General information includes a list of abbreviations and acronyms. Other WPs in the chapter describe the equipment, and include location of major components, theory of operation, and equipment data.

UNIT (FIELD) LEVEL TROUBLESHOOTING WORK PACKAGES

Chapter 2 Field Level Troubleshooting Work Packages contains Field Level Troubleshooting work packages.

The TQG features electronic troubleshooting that allows you to diagnose problems with the engine and generator by using special indicators and code readouts displayed on the Electronic Modular Control Panel (EMCP).

Before you begin troubleshooting, read the introduction to troubleshooting WP 0004 carefully and familiarize yourself with the operation and meaning of the codes and indicators. You should also use the Operator Manual, TM 9-6115-729-10, so you know how controls and indicators work.

WP 0004 contains an overview of the troubleshooting that tells how the Generator Set Control (GSC) indicator lights and Alarm Module lights work and describes the use of Component Identification (CID) codes and Failure Mode Identifier (FMI). It contains directions for viewing the fault log of recorded controller and engine control module (ECM) faults and engine event codes. The WP also explains the use of the Digital Voltage Regulator (DVR) failure codes and indicators.

HOW TO USE THIS MANUAL - Continued

WP 0005 contains a Field level troubleshooting index. This index is followed by the troubleshooting procedures in a series of related WPs.

WP 0006 contains troubleshooting procedures to be followed for dedicated GSC shutdown indicator lights.

WP 0007 contains troubleshooting procedures for SP Fault Codes.

WP 0008 contains troubleshooting procedures for AL Fault Codes.

WP 0009 contains troubleshooting procedures for GSC Fault Codes based on generator set and engine monitoring electronics for identify operating problems. These procedures contain all the CID FMI fault code combinations that you will see displayed on the GSC display and directs you to the appropriate fault isolation procedure.

WP 0010 contains troubleshooting procedures DVR Fault Codes.

WP 0011 contains troubleshooting for generator set failures without fault codes.

WP 0012 tells you how to prepare the TQG for use with the Maintenance Support Device (MSD), if available, for using Caterpillar Electronics Technician (Cat ET) engine diagnostic software. A laptop or SPORT running with MS Windows 2000 or higher can also be used. The WP describes how to load all software required for proper operation of diagnostics software on your computer in a logical sequence. This includes the software for Caterpillar Communications Adapter II that you must preload on your computer before using the diagnostics software. It also includes instructions for loading the ET software and other necessary instructions or documentation onto your computer.

WP 0013 contains troubleshooting procedures using the Cat ET tool for Direct Support (Field) level troubleshooting.

Before using the MSD and the Cat ET, software for Caterpillar Communication Adapter II should also be preloaded as described in WP 0012. Refer to Caterpillar Service Tool Hardware and Software/User's Manual Communication Adapter II, Ver 1.93 (1.9-B4) and CD NEHS0758.

UNIT (FIELD) LEVEL MAINTENANCE WORK PACKAGES

Chapter 3 Unit (Field) Level Maintenance Instructions contains Unit (Field) Level Maintenance Instructions work packages for the Generator Set.

Read the INITIAL SETUP section of each maintenance work package carefully before you start any maintenance procedure. Get the tools and supplies listed and the personnel needed.

Chapter 4 Unit (Field) Level Troubleshooting Work Packages for Winterization Kit contains Unit (Field) Level Troubleshooting work packages for the optional winterization kit installation.

HOW TO USE THIS MANUAL - Continued

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE WORK PACKAGES

Chapter 5 Direct Support (Field) Level Maintenance Instructions contains Direct Support (Field) Level Maintenance Instructions work packages for the Generator Set.

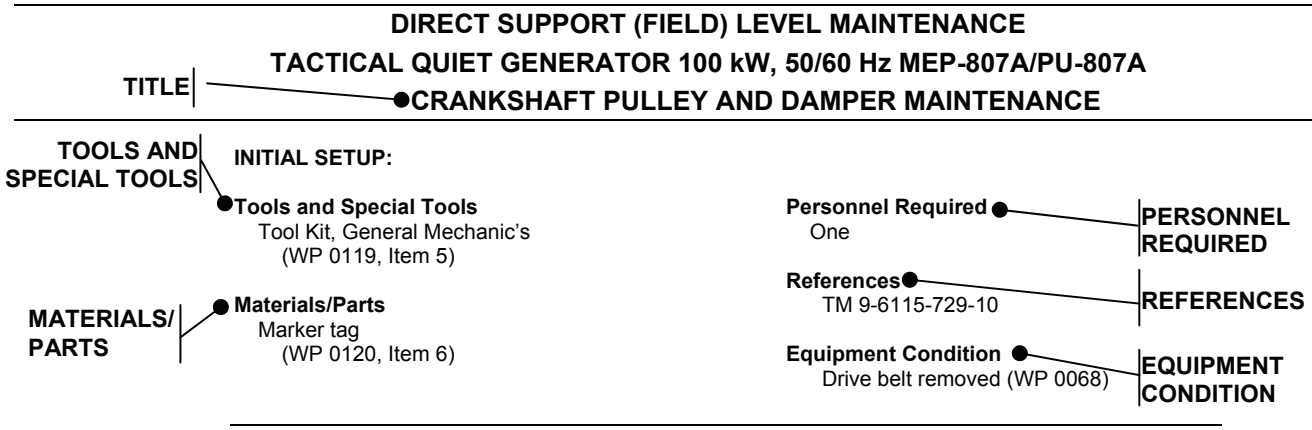
Read the INITIAL SETUP section of each maintenance work package carefully before you start any maintenance procedure. Get the tools and supplies listed and the personnel needed.

Chapter 6 General Support Level Maintenance Instructions. These instructions have been moved to Sustainment (NMWR) in accordance with Implementation of Two Level Maintenance.

Chapter 7 contains Supporting Information, including References WP, Introduction and Two-Level MAC work packages, Expendable and Durable Items List WP, Tool Identification List WP, Mandatory Replacement Parts WP, and any additional support items WPs.

Rear Matter. At the rear of your manual, you will find a Glossary, Alphabetical Index, Foldout schematics, DA Form 2028s.

While performing the procedures in this manual, you may find that you are able to make suggestions that will improve the manual. At the back of this manual, you will find copies of DA Form 2028 that invite you to submit your suggestions.



LEGEND:

TITLE	The name of the procedure.
TOOLS AND SPECIAL TOOLS	The tools and equipment needed to do the procedures.
MATERIALS/PARTS	The supplies and parts needed to do the procedures.
PERSONNEL REQUIRED	The personnel needed to do the procedures.
REFERENCES	Other work packages, manuals, and publications needed to do the procedure.
EQUIPMENT CONDITION	The special condition(s) of the equipment or maintenance procedures to be performed before starting the procedure.

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION

CHAPTER 1

FIELD AND SUSTAINMENT MAINTENANCE
GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION

WORK PACKAGE INDEX

FIELD AND SUSTAINMENT MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
GENERAL INFORMATION

SCOPE

This technical manual (TM) contains instructions for Unit and Direct Support (Field), General Support (Sustainment), Preventive Maintenance Checks and Services (PMCS), maintenance, checks and adjustments, theory of operation, troubleshooting, and corrective maintenance for the 100 kW Tactical Quiet Generator Set, MEP-807A and PU-807A.

Type of Manual: Field and Sustainment Maintenance.

Model Number and Equipment Name: Generator Set, Skid Mounted, Tactical Quiet, 100 kW, 50/60 Hz, MEP-807A and Generator Set, Trailer Mounted, Tactical Quiet, 100kW, 50/60 Hz, PU-807A.

Purpose of Equipment: The 100 kW TQG provides 120/208 Vac or 240/416 Vac, 50/60 Hz, 3-phase power for a wide variety of military applications, offering the mobility and operational characteristics demanded by modern armed forces. Operational characteristics include the ability to operate at all possible humidity levels, at ambient temperature levels from -25°F to +120°F (-32°C to +49°C) down to -50°F (-46°C) with winterization kit, and at altitudes up to 10,000 feet.

CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA PAM 25-30 to determine whether there are new additions, changes, or additional publications pertaining to the equipment.

MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Army Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, as contained in the current Maintenance Management Update (The Army Maintenance Management System (TAMMS). Fill out and forward to the TAMMS clerk, DD Form 5988-E, automated form in the Unit Level Logistics System (ULLS), generated Equipment Maintenance and Inspection Worksheet. When no automation is available, use DA Form 2404, Equipment Inspection and Maintenance Worksheet.

   Air Force Personnel will use AFR 66-1 for maintenance reporting and TO 00-35D-54 for unsatisfactory equipment reporting.

   Marine Corps Units using Asset Tracking Logistics and Supply System (ATLASS) will maintain the forms and records information in accordance with the applicable ATLASS requirements. All other Marine Corps Units will maintain forms and records associated with the operation and maintenance of ground equipment as prescribed by TM 4700-15.

b. Reporting of Item and Packaging Discrepancies. Army and Air Force users fill out and forward SF 364 (Supply Discrepancy Report (SDR)) as prescribed in AR 735-11-2/DLAR 4140.55/SECNAVINST 4355.18A/AFJ 23-215.

   For shipping discrepancies, Marine Corps users fill out and forward SF 364 as prescribed in UM 4400-123, UM 4400-124, and SecNavInst 4355.18A to the Source of Supply (SOS).

MAINTENANCE FORMS, RECORDS, AND REPORTS - Continued

For packing discrepancies, Marine Corps users fill out and forward SF 364 as prescribed in UM 4400-123, UM 4400-124 and SecNavInst 4355.18A to applicable control point identified in the SecNavInst.

c. Transportation Discrepancy Report (TDR) (SF 361). Army users fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

Marine Corps users fill out and forward SF 361 as prescribed in DoD 4500.9-R, Defense Transportation Regulation, Part II, Cargo Movement.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your 100 kW Tactical Quiet Generator Set needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF Form 368, Product Quality Deficiency Report (PQDR). EIRs should be mailed directly to:

Commander
U.S. Army Communications and Electronics Life Cycle Management Command
ATTN: AMSELLC-LEO-E-ED
Fort Monmouth, New Jersey 07703-5006

EQUIPMENT DEFICIENCY REPORTING

a. USAF Deficiency Reporting and Investigating System, TO 00-35D-54, Appendix A procedures will be used for electronic submission. Submit mailed SF 368 forms to:

Warner-Robins AFB
WRALC/LGMTC
375 Perry Street
Robins, AFB GA 31098-1865

b. U.S. Marine Corps Units submit all fit, form, or function deficiencies in accordance with standard Product Quality Deficiency Reporting (PQDR) procedures contained in TM 4700-15/1 and MCO 4855.10 to Navy PDREP automated system by going to site < http://www.nslcptsmh.navsea.navy.mil/pdrep/pdrep.htm >, requesting access and then filling out the PQDR. For additional assistance, e-mail address < mbmatcom-pqdrs@logcom.usmc.mil >. Deployed units only may mail PQDR to:

Marine Corps LogCom Command Element
Attn: Quality Assurance Office (L15)
814 Radford Boulevard, Suite 20330
Albany, Georgia 31704-0330

A reply will be furnished to you.

CORROSION PREVENTION AND CONTROL (CPC)

CPC of 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 systems. While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem. If a corrosion problem is identified, it can be reported using Standard Form 368, Product

CORROSION PREVENTION AND CONTROL (CPC) - Continued

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. Air Force personnel will use TO 25-1-3.

DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

Refer to TM 750-244-2 for demolition procedures when equipment destruction is required.

PREPARATION FOR STORAGE OR SHIPMENT

Requirements for packaging and administrative storage are contained in TM 9-6115-729-10. Requirements for short and long term storage are in WP 0087.

WARRANTY INFORMATION

This section provides information on the Warranty for generator set components. See Table 1 for list of warranted components (this work package).

NOTE

Check the Insp Date on the end-item data plate on the generator set. If the Insp Date is prior to 09/06, the (12) month Warranty period shall begin on 08/31/06.

If the Insp Date on the data plate is 09/06 or after, the standard (12) month Warranty begins on the date stamped.

Warranty service may be obtained through two methods.

1. a. (ARMY ONLY) Fill out the preferred warranty claim SF 368, Product Quality Deficiency Report, or fill out a warranty claim per DA PAM 738-750. The DA Form 2407, Maintenance Request, is also acceptable. Mail completed form to Commander, US Army, Communications-Electronics Life Cycle Management Command, ATTN: AMSEL-LC-CCS-G-GN, 1200 Nealis Avenue, Fort Monmouth, New Jersey 07703-5043. At a minimum, the end item NSN, serial number, and date of shipment to the government, and the defective component part number/CAGE must be included in the documentation.

   b. (OTHER SERVICES) For reporting warranty claims, fill out and forward SF 368 on DA Form 2407 to US Army Communications-Electronics Life Cycle Management Command, ATTN: AMSEL-LC-CCS-G-GN, 1200 Nealis Avenue, Fort Monmouth, NJ 07703-5043.

2. Warranty service can be obtained by contacting the actual warranted component manufacturer listed in column 1. Each manufacturer will provide instructions on filing the claim.

3. Troubleshooting should be performed to the level of warranted component, but no further unless directed by the warranted component manufacturer. Troubleshooting to the failed part inside warranted components may invalidate the warranty.

4. There are some components with short warranty periods that may not be listed in Table 1. Warranty coverage may be available for these components. Submit warranty claims in accordance with DA PAM 738-750 to determine if the components are covered.

5. If you have difficulty with or questions about the warranty process, contact your local CECOM LAR or the CECOM Generator Branch, DSN 992-1313, (732) 532-1313.

MANUFACTURER WARRANTY INFORMATION

Column (1) – MANUFACTURER. This column gives you the name and address of the manufacturer of a component under warranty. Telephone numbers, fax numbers, and internet addresses are listed where available.

Column (2) – COMPONENT UNDER WARRANTY. This column describes the component under warranty with part number (PN) and vendor part number VPN where available.

Column (3) –WARRANTY PERIOD. This column lists the length of the warranty period.

Table 1. Manufacturer's Warranties for 100 kW Generator Set.

(1) MANUFACTURER	(2) COMPONENT UNDER WARRANTY	(3) WARRANTY PERIOD
Caterpillar, Inc. Defense Products Engine Service Engineer PO Box 470 Mossville, IL 61552-0470 Phone: 309-578-4562 Fax: 309-578-3739 CAGE: 11083	Diesel Engine (PN: 0116-1110, VPN: 211-9442) <u>Digital Control System Components</u> GSC+P Controller (PN: 0116-1201-41, VPN: 198-9253) Alarm Module (PN: 0116-1201-34, VPN: 130-3324)	12 Months
Caterpillar, Inc. - Continued Warranty repairs can also be obtained through any Caterpillar dealer. Nearest dealer can be located at www.cat.com	Digital Voltage Regulator (PN: 0116-1201-37, VPN: 155-3832) Load Sharing Module (PN: 0116-1201-39, VPN: 161-0797) Transformer (PN: 0116-1201-32, VPN: 118-0175) Transformer (PN: 0116-1201-40, VPN: 169-4701) Harness Assembly (PN: 0116-1201-43, VPN: 212-8737)	12 Months
Marathon Electric P.O. Box 8003 Wausau, WI 54402-8003 Phone: 715-675-8237	Generator (PN: 0116-1120, VPN: 431PSL6309)	12 months from date of startup or 18 months from date of shipment whichever period shall expire first.

MANUFACTURER WARRANTY INFORMATION - Continued

Table 1. Manufacturer's Warranties for 100kW Generator Set - Continued.

(1) MANUFACTURER	(2) COMPONENT UNDER WARRANTY	(3) WARRANTY PERIOD
Signal Transformer 500 Bayview Avenue Inwood, NY 11096-1792 Phone: 516-239-5777	Transformer 1250 VA (PN: 0116-1257, VPN: HP1-12)	12 Months
Derema Group 46 Acorn Drive Westbrook, CT 06498 Phone 860-399-5669	Switch, Battery Disconnect (PN: 0116-1298, VPN: 2304-A)	12 Months
Contact Industries P.O. Box 3086 25 Lex-Industrial Drive Lexington, OH 44904 Phone: 419-884-9788	Contactor, Load (PN: 0116-1266, VPN: CT400E-24E4S)	12 Months
Madison Company 27 Business Park Drive Branford, CT 06405 Phone: 203-488-4477	Fuel Level Switch (PN: 0116-1304, VPN: M3862)	12 Months
Technology Research Co 5250 140th Avenue North Clearwater, FL 33760 Phone: 727-535-0572 Rwood@TRCI.net	Relay, Overload/Short Circuit (PN: 0116-1219, VPN: 19970)	12 Months
G & O Manufacturing Co. 100 Gando Drive New Haven, CT 60513 Phone: 601-366-1423	Radiator Assembly (PN: 0116-1400, VPN: X6642-00-50)	18 months from shipment or 12 months in service

MANUFACTURER WARRANTY INFORMATION - Continued

Table 1. Manufacturer's Warranties for 100kW Generator Set - Continued.

(1) MANUFACTURER	(2) COMPONENT UNDER WARRANTY	(3) WARRANTY PERIOD
Parker Hannifin Corporation Racor Division Phone: 209-575-7651 hbrizuela@parker.com	Filter, Crankcase Ventilation (PN: 0116-1607-01, VPN: CCV4500-08L)	12 Months
Donaldson Company, Inc. Minneapolis, MN 55440-1299 Phone: 800-374-1374 www.donaldson-filters.com	Muffler, Exhaust (PN: 0116-1500, VPN: WOM12-0743) Air Cleaner Assembly (PN: 0116-1600, VPN: FTG-11-0103)	36 Months 12 Months

Report all defects to your supervisor, who will take appropriate action. Detailed information about warranties is found in TM 9-6115-729-10.

NOMENCLATURE CROSS REFERENCE LIST

See TM 9-6115-729-24 for nomenclature for common names listed alphabetically with a cross-reference to the official nomenclature (i.e., Maintenance Allocation Chart (MAC), Repair Parts and Special Tools Lists (RPSTL)).

Common Name	Official Nomenclature
100 kW TQG	Generator Set, Skid Mounted Tactical Quiet, 100 kW, 50/60 Hz, MEP-807A Generator Set, Trailer Mounted, Tactical Quiet, 100 kW, 50/60 Hz, PU-807A

LIST OF ABBREVIATIONS AND ACRONYMS

Abbreviation/Acronym	Definition
AAL	Additional Authorization List
AGM	Absorbed Glass Mat
AC	Alternating Current
AFPS	Auxiliary Fuel Pump Switch
AFPR	Auxiliary Fuel Pump Relay
AFPV	Auxiliary Fuel Pump Solenoid Valve
AL	Alarm

LIST OF ABBREVIATIONS AND ACRONYMS - Continued

Abbreviation/Acronym	Definition
AMP	Ampere
AR	Alarm Reset
ARS	Air Shut Off Relay
ATB	AC Transformer Box
ATLASS	Asset Tracking Logistics and Supply System
AUX	Auxiliary
BAT	Battery
BDS	Battery Disconnect Switch
BII	Basic Issue Items
BIT	Built-in-Test
BLK	Black
BRT	Brightness
BSS	Battle Short Switch
BTB	Bus Transformer Box
CAGE	Commercial and Government Entity
CBR	Chemical, Biological, and Radiological
CCA	Circuit Card Assembly
CCCT	Cross Current Compensation (Droop) Transformer
CCM	Customer Communication Module
CCS	Contractor Control Switch
CCW	Counterclockwise
CDR	Cool Down Relay
CID	Component Identifier
COEI	Components of End Item
CPC	Corrosion Prevention and Control
CPU	Central Processing Unit
CRFF	Diode Field Flash
CT	Current Transformer
CTA	Common Table of Allowances
CTR	Crank Termination Relay
CW	Clockwise
DBHI	Dead Bus Relay High Sensing
DBLO	Dead Bus Relay Low Sensing
DC	Direct Current
DCS	Dead Crank Switch

LIST OF ABBREVIATIONS AND ACRONYMS - Continued

Abbreviation/Acronym	Definition
DESCP	Description
DVR	Digital Voltage Regulator
ECM	Engine Control Module
ECS	Engine Control Switch
EGR	Electronic Governor Relay
EMCP	Electronic Modular Control Panel
EMI	Electromagnetic Interference
ESD	Electrostatic Discharge
ESPB	Emergency Stop Pushbutton
FCR	Fuel Control Relay
FMI	Failure Mode Indicator
GFCI	Ground Fault Circuit Interrupter
GFE	Government Furnished Equipment
GFR	Generator Fault Relay
GND	Ground
GSC	Generator Set Control
HEUI	Hydraulic Electronic Unit Injector
Hz	Hertz (cycles per second)
IETM	Interactive Electronic Technical Manual
KFF	Relay Field Flash
kPa	KiloPascal
KR	Main Contactor Relay
kVa	Kilovolt-ampere
KVAR	Kilovolt-ampere-reactive
KVARHr	Kilovolt-ampere-reactive hour
kW	Kilowatt
kWh	Kilowatt hour
IAP	Injection Actuation Pressure
JTA	Joint Table of Allowances
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LSM	Load Sharing Module
MAC	Maintenance Allocation Chart
MSD	Maintenance Support Device
MTOE	Modified Table of Organization and Equipment

LIST OF ABBREVIATIONS AND ACRONYMS - Continued

Abbreviation/Acronym	Definition
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, and Chemical
NSN	National Stock Number
OL/SC	Overload and Short Circuit Module
OSHA	Occupational Safety and Health Act
PAR	Paralleling Relay
PF	Power Factor
PMCS	Preventive Maintenance Checks and Services
PN	Part Number
PQDR	Product Quality Deficiency Report
PRMTR	Parameter
PSR	Programmable Spare Relay
PW	Pulse Width
PWM	Pulse Width Modulation
RPSTL	Repair Parts and Special Tools Lists
RR	GSC Run Relay
SCR	Silicon Controlled Rectifier
SDR	Supply Discrepancy Report
SMMS	Starter Motor Magnetic Switch
SMR	Starter Motor Relay
SMS	Sync Mode Switch
SOS	Source of Supply
SP	Spare Input
SR	Slave Receptacle
SRY	Slave Relay
SSP	Speed Setting Potentiometer
TAMMS	The Army Maintenance Management System
TDA	Table of Distribution and Allowances
TDC	Top Dead Center
TDR	Transportation Discrepancy Report
TM	Technical Manual
TMDE	Test Measurement and Diagnostic Equipment
TPI	Threads per Inch

LIST OF ABBREVIATIONS AND ACRONYMS - Continued

Abbreviation/Acronym	Definition
TQG	Tactical Quiet Generator
ULLS	Unit Level Logistics System
U/M	Unit of Measure
USEPA	U.S. Environmental Protection Agency
Vac	Volts Alternating Current
Vdc	Volts Direct Current

SAFETY, CARE, AND HANDLING INFORMATION

The TQG contains no radioactive components or parts or radioactive material requiring special handling or consideration. The TQG contains no electronic modules or components requiring special handling to protect them from electrostatic discharge (ESD).

This manual describes physical and chemical processes that may require the use of chemicals, solvents, paints, or other commercially available material. Users of the manual should obtain the material safety data sheets (Occupational Safety and Health Act (OSHA) Form 20 or equivalent) from the manufacturers or suppliers of materials to be used. Users must be completely familiar with manufacturer/supplier information and adhere to their procedures, recommendations, warnings, and cautions for safe use, handling, storage, and disposal of these materials.

REPAIR PARTS

Repair parts are listed in the Repair Parts and Special Tools List (RPSTL) TM 9-6115-729-24P.

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special Tools; Test, Measure, and Diagnostic Equipment (TMDE); and support equipment are needed for Field maintenance. They are listed in the RPSTL, TM 9-6115-729-24P, and in the Maintenance Allocation Chart (MAC) in WP 0119.

COMMON TOOLS AND TEST EQUIPMENT

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

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The 100 kW Tactical Quiet Generator (TQG) is skid-mounted and is designated MEP-807A. When the 100 kW TQG is mounted on a trailer, it is designated PU-807A. The 100 kW TQG consists of a diesel engine that can operate using diesel fuel or aviation fuel, a brushless alternating current (AC) generator, a digital voltage regulator, an electronic governing system, a fuel system, a 24 Vdc cranking system, and other devices as required to achieve a complete engine driven generator set. The system uses the Caterpillar 3126B engine and a Marathon generator model DOD 431 FR. The engine is electronically controlled. The electronic control is essential to meeting U.S. Environmental Protection Agency (USEPA) and fuel consumption requirements. All the electrical components and assemblies (including the voltage regulator) that provide the required instrumentation and control functions are contained in the Electronic Modular Control Panel (EMCP) located on the generator end (REAR) of the set. The generator end of the TQG is considered the rear of the generator in the following descriptions. Opening the EMCP and side access panels gives access to all the electrical components and essential engine components. Paralleling receptacles are used to connect the paralleling cable between generator sets of the same family. The generator set family includes a 200 kW TQG. The 200 kW TQG is skid-mounted and is designated MEP-809A. When the 200 kW TQG is mounted on a trailer, it is designated PU-809A. These generator sets use the same control system as the MEP-807A and PU-807A 100 kW TQG and can operate in parallel to share an electrical load.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

ENGINE

The engine for the 100 kW TQG is the Caterpillar 3126B engine (Figure 1, Sheet 1, Item 4). The engine is electronically controlled. The Engine Control Module (ECM) controls the amount of fuel that is injected by the unit injectors. The EMCP provides frequency (speed) control, controls long and short-term stability, and adjusts to load conditions. High injection pressures help to reduce fuel consumption and emissions. Precise injection timing optimizes engine performance for starting, emissions, noise and fuel consumption.

AIR CLEANER ASSEMBLY

The air cleaner assembly (Figure 1, Sheet 1, Item 1 and Sheet 5, Item 1 REF) is located on the left side of the engine inside the rear access doors. The air cleaner filters intake air used for engine combustion. The air cleaner is equipped with a restriction indicator (refer to TM 9-6115-729-10, WP 0012/WP 0014).

MUFFLER

The muffler/exhaust system (Figure 1, Sheet 1, Item 2) and exhaust tubing are connected to the engine exhaust manifold and turbocharger. This system reduces engine exhaust noise. Exhaust gases are exhausted upward from the top of the generator set.

TURBOCHARGER

The turbocharger (Figure 1, Sheet 1, Item 3) is located on the right side of the engine. Powered by engine exhaust gases, the turbocharger compresses air from the air filter to provide pressurized air to the engine for combustion.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

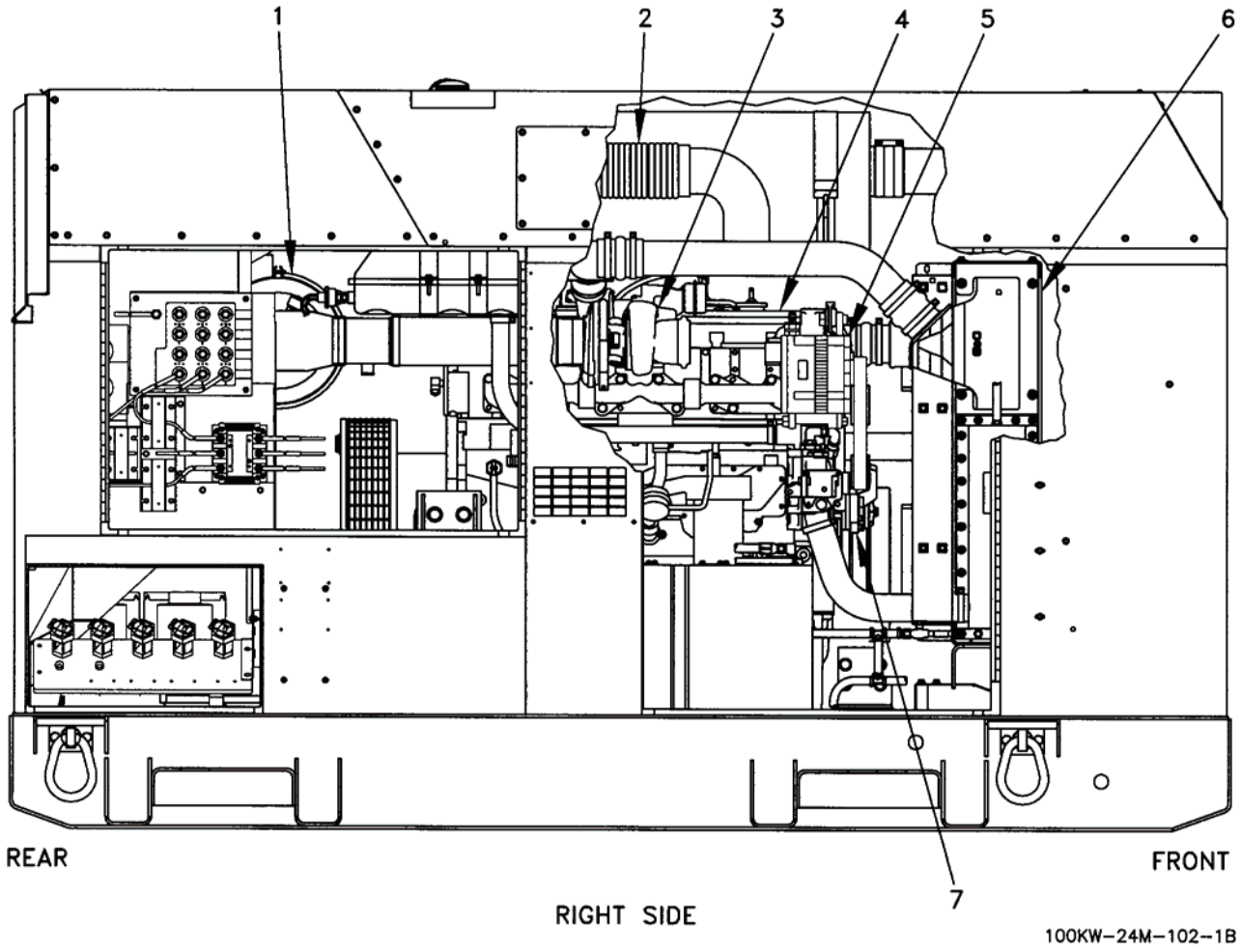


Figure 1. 100 kW Tactical Quiet Generator Location of Components (Sheet 1 of 6).

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

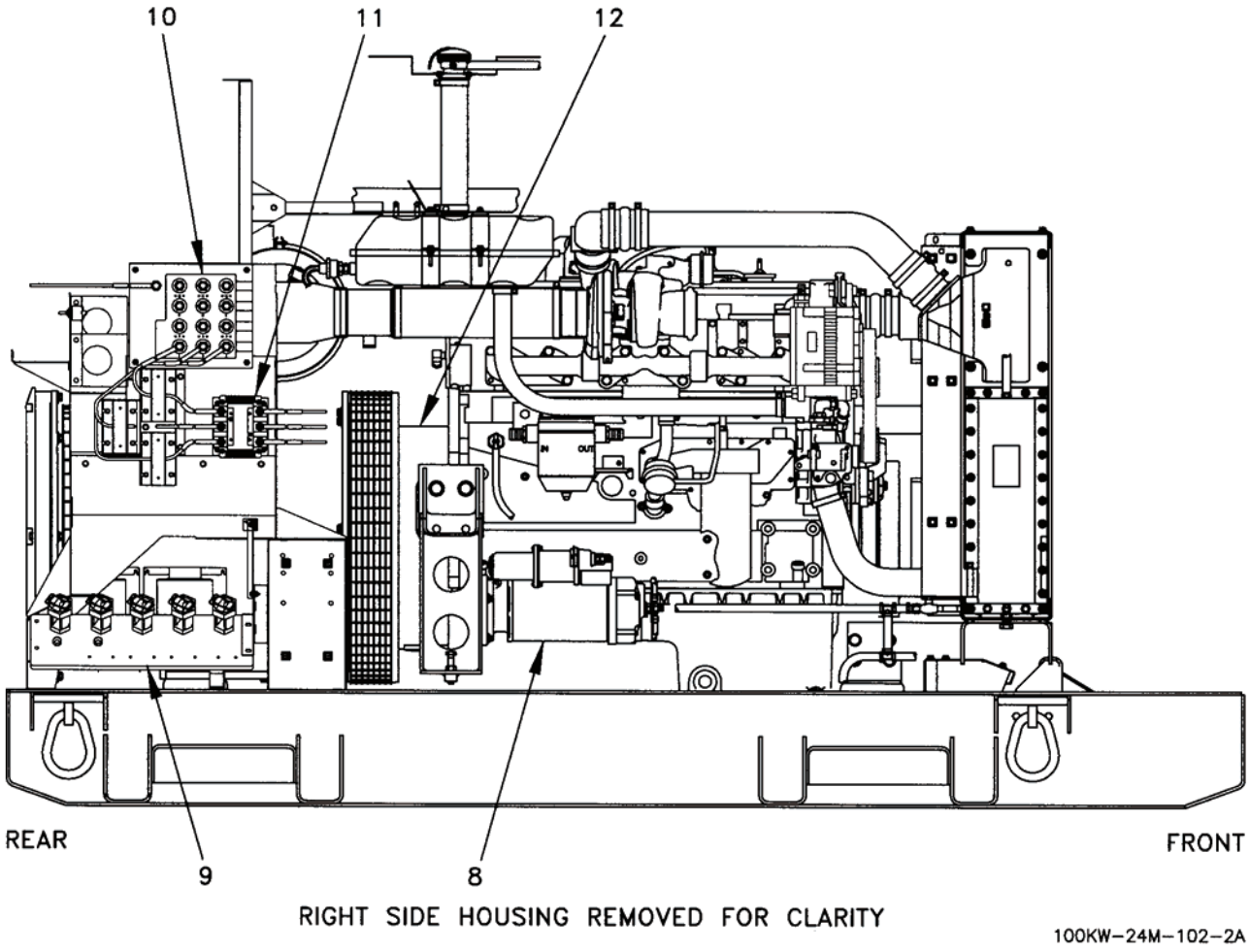


Figure 1. 100 kW Tactical Quiet Generator Location of Components (Sheet 2 of 6).

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

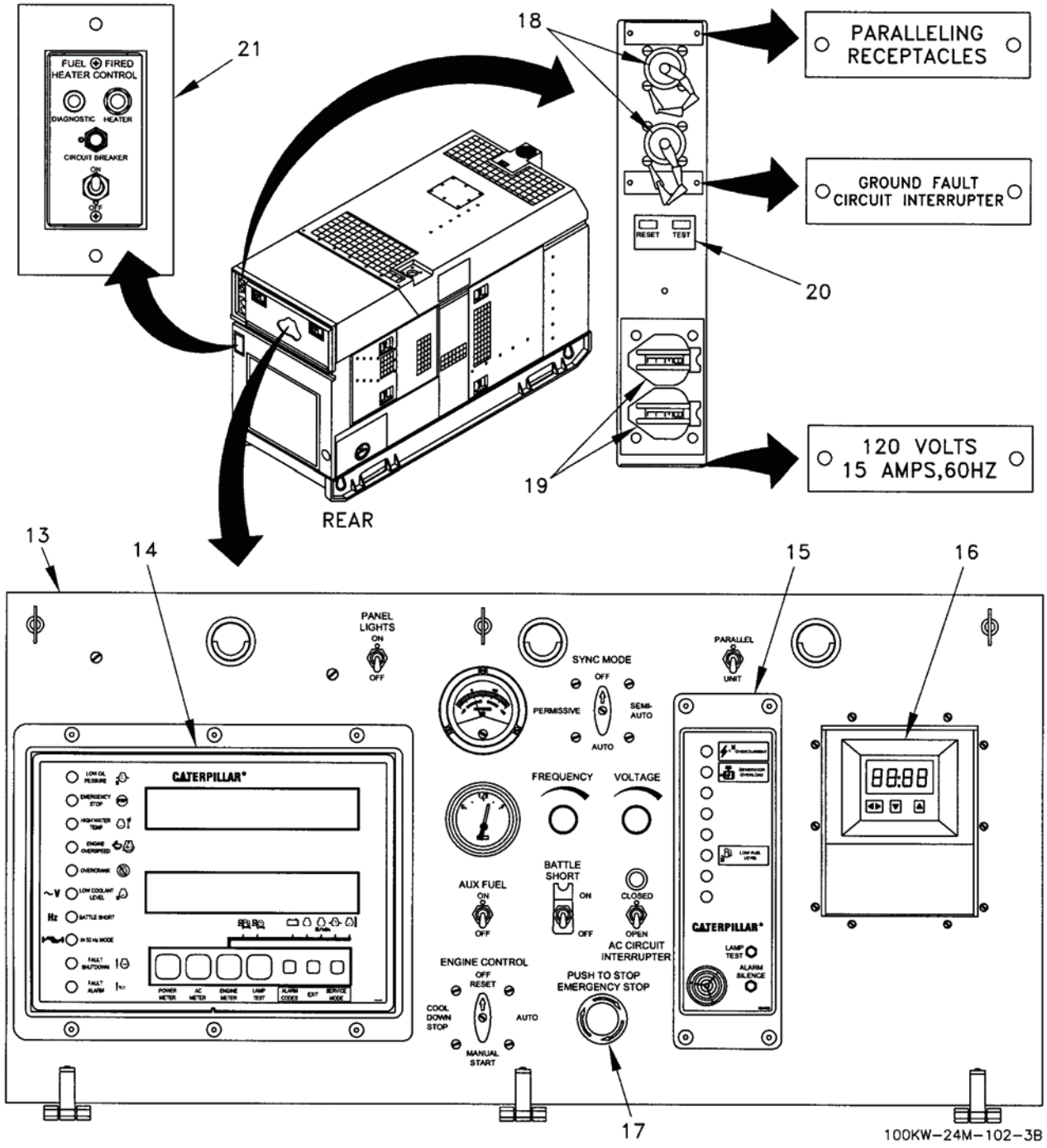


Figure 1. 100 kW Tactical Quiet Generator Location of Components (Sheet 3 of 6).

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

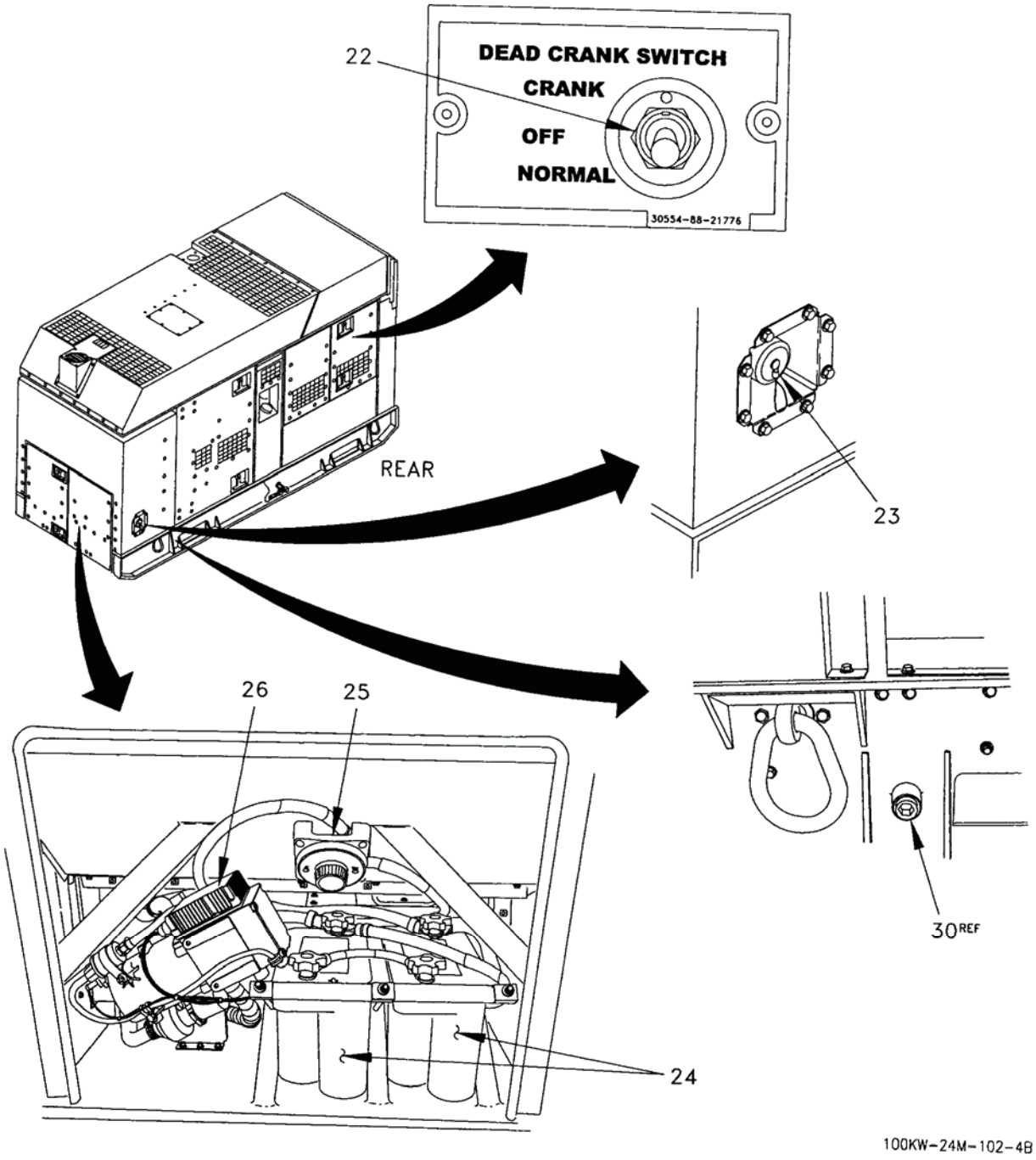


Figure 1. 100 kW Tactical Quiet Generator Location of Components (Sheet 4 of 6).

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

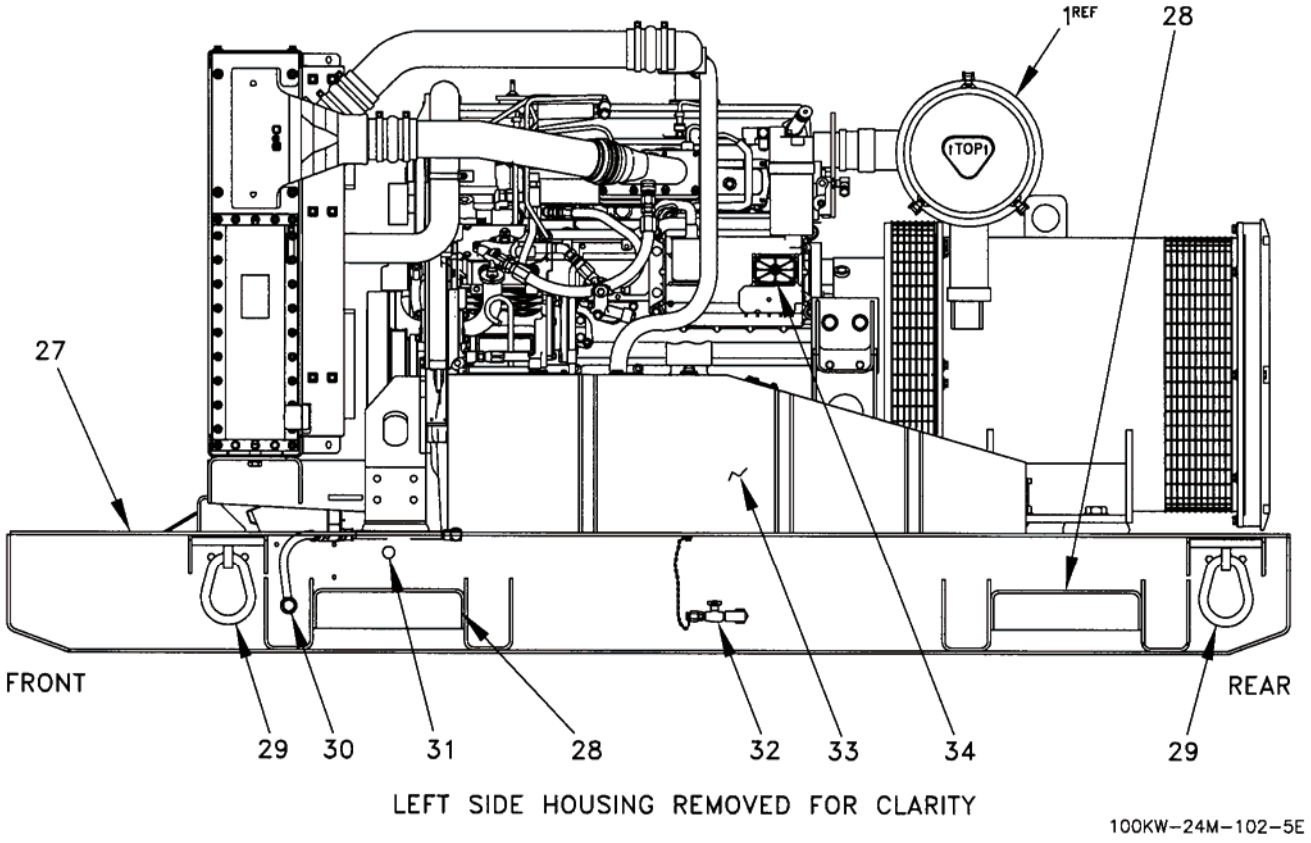


Figure 1. 100 kW Tactical Quiet Generator Location of Components (Sheet 5 of 6).

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

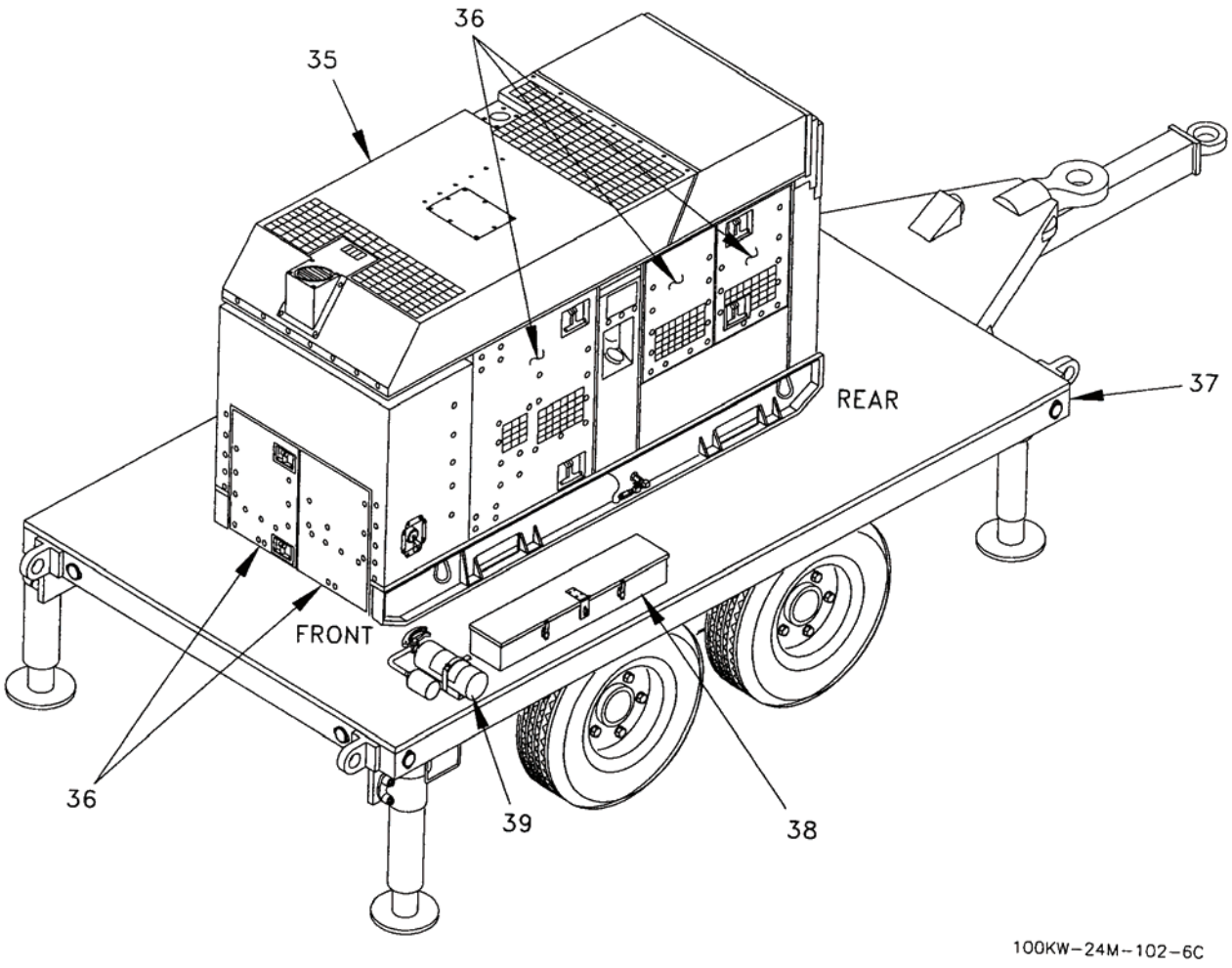


Figure 1. 100 kW Tactical Quiet Generator Location of Components (Sheet 6 of 6).

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

ALTERNATOR

The alternator (Figure 1, Sheet 1, Item 5) is located on the right side of the engine. The alternator maintains the batteries in a state of full charge. The alternator also provides 24 Vdc voltage for TQG control circuits and to the NATO slave receptacle. After starting the engine the voltage output is 28 ±2 Vdc.

RADIATOR

The radiator (Figure 1, Sheet 1, Item 6) located at the front of the TQG eliminates engine heat via circulated coolant and air. The radiator and engine fan are the primary heat exchanger for cooling engine coolant and turbocharged engine intake air.

WATER PUMP

The water pump (Figure 1, Sheet 1, Item 7) located on the right side of the engine circulates coolant through the engine block and radiator to cool the engine.

STARTER

The engine starter motor (Figure 1, Sheet 2, Item 8) is located on the right rear side of the engine. The electric starter engages the flywheel mechanically to start the diesel engine.

LOAD BOARD

The load board (Figure 1, Sheet 2, Item 9) connects load cables to the TQG with heavy duty connector lugs and nuts.

RECONNECTION BOARD

The reconnection board (Figure 1, Sheet 2, Item 10) is used to change the TQG generator output voltage for different load applications. The TQG can be configured for 120/208 Vac or 240/416 Vac operation for 50 Hz or 60 Hz.

MAIN LOAD CONTACTOR

The main load contactor K1 (Figure 1, Sheet 2, Item 11) connects/disconnects generator load output to the load board.

AC GENERATOR

The generator (Figure 1, Sheet 2, Item 12) used in the 100 kW TQG is designed to meet military applications for the TQG. The generator is a brushless, single bearing, rotating rectifier generator. It is close-coupled to the engine via flexible drive disks. Each generator consists of five major components: main stator (armature), main rotor (field), exciter stator (field), exciter rotor (armature), and rotating rectifier assembly.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

ELECTRONIC MODULAR CONTROL PANEL

The TQG EMCP (Figure 1, Sheet 3, Item 13) contains controls and indicators for monitoring TQG operation. Located at the rear end of the generator set, the EMCP contains the Generator Set Control (GSC) (Figure 1, Sheet 3, Item 14), an alarm module (Figure 1, Sheet 3, Item 15), and a Digital Voltage Regulator (DVR) (Figure 1, Sheet 3, Item 16). EMCP displays and indicators allow the user to monitor all engine and generator functions with alarms and identification of malfunctions. Malfunction/Symptom Indices in Troubleshooting work packages identify the malfunctions. The GSC monitors the output frequency of the generator and controls the engine speed to maintain a constant output frequency, regardless of load. The PUSH TO STOP EMERGENCY STOP pushbutton (Figure 1, Sheet 3, Item 17) shuts down the TQG immediately when it is pushed.

PARALLELING RECEPTACLES

The PARALLELING RECEPTACLES panel is located to the left of the EMCP. The paralleling receptacles (Figure 1, Sheet 3, Item 18) are used to connect the paralleling cable between 100/200 kW generator sets of the same family. This 100kW generator set maybe paralleled to another 100kW generator set or paralleled to a 200kW generator set.

CONVENIENCE RECEPTACLES

Two convenience receptacles (Figure 1, Sheet 3, Item 19) are located to the left of the EMCP on the PARALLELING RECEPTACLES panel. The receptacles rated 120 Vac, 15A are available at all times during generator operation. The receptacles are protected by a GROUND FAULT CIRCUIT INTERRUPTER (Figure 1, Sheet 3, Item 20) with TEST and RESET functions. The frequency of the output voltage at the convenience receptacle outlets is set by generator frequency and will be 50 Hz or 60 Hz.

DEAD CRANK SWITCH

The dead crank switch (Figure 1, Sheet 4, Item 22) is located inside the generator housing at the left rear. During maintenance, the dead crank switch allows the engine to be cranked without starting the engine.

NATO SLAVE RECEPTACLE

The NATO slave receptacle (Figure 1, Sheet 4, Item 23) is located on the left side (front) of the TQG. It is used for 24 Vdc slave starting.

BATTERIES

Two sealed 12 Vdc batteries (Figure 1, Sheet 4, Item 24), located at the front of the generator, are connected in series. The batteries provide 24 Vdc power for EMCP controls, engine starting, and to the NATO slave receptacle. These batteries can be disconnected with the Battery Disconnect Switch (Figure 1, Sheet 4, Item 25).

WINTERIZATION KIT (ISSUED TO SELECTED UNITS ONLY)

The winterization kit consists of a fuel-fired heater (Figure 1, Sheet 4, Item 26) to heat engine coolant. The kit also includes resistor heaters located in EMCP. The fuel-fired heater is controlled with the winterization kit control panel (Figure 1, Sheet 3, Item 21).

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

SKID BASE

The skid base (Figure 1, Sheet 5, Item 27) provides the main structural support for the engine and generator. The skid base consists primarily of two formed side rails, cross members, mounting pads, forklift openings, and a bottom plate. Main cross members complete the primary skid base structure to support the engine and generator mounting pads and vibration isolators and reinforce the fork lift openings (Figure 1, Sheet 5, Item 28). Four 25,000 lb (11,400 kg) capacity LIFT/TIEDOWN rings (Figure 1, Sheet 5, Item 29) are attached to the skid base frame. In addition to supporting the engine generator assembly, housing, battery and other components, the skid base has provisions for engine oil drain (Figure 1, Sheet 5, Item 30), coolant drain (opposite side), a water separator drain (Figure 1, Sheet 5, Item 31), and fuel tank drain (Figure 1, Sheet 5, Item 32). The skid base also serves as a support and protective enclosure for the fuel tank.

FUEL TANK

The fuel tank (Figure 1, Sheet 5, Item 33) is a 66 gallon (250L) molded tank located below the diesel engine between the skid assembly side members.

ENGINE CONTROL MODULE

The engine control module (ECM) (Figure 1, Sheet 5, Item 34) monitors most of the engine sensors and controls the amount of fuel that is injected by the unit injectors as well as engine timing functions.

GENERATOR HOUSING

The housing (Figure 1, Sheet 6, Item 35) is fabricated from sheet steel and attaches directly to mating flanges on the skid base. The housing is thus removable for unscheduled maintenance and engine or generator removal. Access openings and doors (Figure 1, Sheet 6, Item 36) allow engine, generator, and other component servicing. Each side of the rear housing has a set of double doors and the large doors at the front of the housing provide accessibility. The housing structure incorporates acoustic damping foam and internal baffle structures to reduce engine noise. The rugged design of the housing includes reinforced corners and access openings to meet transportability, operational, and handling requirements of a mobile military generator set.

TRAILER-MOUNTED CONFIGURATION (PU-807A)

The skid-mounted TQG can be mounted on a model XM1061 E1 5-ton trailer (Figure 1, Sheet 6, Item 37). In this configuration, the TQG can be towed and positioned as required. In the power unit configuration, the trailer-mounted TQG has an accessory box (Figure 1, Sheet 6, Item 38) and two fire extinguishers (Figure 1, Sheet 6, Item 39). The TQG skid is bolted directly to the trailer bed and frame.

EQUIPMENT DATA

Table 1 lists equipment data for the 100 kW TQG.

Table 1. 100 kW TQG Equipment Data.

EQUIPMENT	DATA
100 kW Tactical Quiet Generator Set, 50/60 Hz	MEP-807A/PU-807A
Overall length	106 in. (269 cm)
Width	40 in. (102 cm)
Height	65 in. (165 cm)
Weight	
Wet (includes fuel)	6,100 lb (2767 kg)
Dry	5,500 lb (2495 kg)
Engine	
Manufacturer	Caterpillar
Model	3126B, serial number BDZ series
Type	Six cylinder, in-line, four cycle, turbocharged diesel
Horsepower	280 hp @ 1800 rpm (60 Hz) 233 hp @ 1500 rpm (50 Hz)
Displacement	442 cu. in. (7.25L)
Valves per cylinder	Three (two inlet, one exhaust)
Valve lash setting (cold engine)	Inlet: 0.015 in. (0.38 mm) Exhaust: 0.025 in. (0.64 mm)
Cooling system	
Type	Pressurized radiator and coolant pump
Capacity	38 qt (34.5L)
Normal operating temperature	170°F to 200°F (77°C to 93°C)
Temperature indicating system voltage	24 Vdc, range programmable
Lubricating system	
Type	Full flow, circulating pressure
Pump type	Positive displacement gear
Capacity	30 qt (27.3L)
Normal operating pressure	35 to 70 psi (241 to 483 kPa)
Fuel system	
Fuel type	DF-1, DF-2, (1-D/2-D), JP5, JP8
Fuel tank capacity	66 gal (250L)
Consumption rate	8 hour tank capacity at full load (8.25 gph)
Auxiliary fuel pump	
Manufacturer	Walbro Corp.
Voltage rating	24 Vdc (16 to 30 Vdc)
Delivery rate	34 gph at 30 Vdc; 17 gph at 18 Vdc

EQUIPMENT DATA - Continued

Table 1. 100 kW TQG Equipment Data - Continued.

EQUIPMENT	DATA	
Fuel level switch		
Manufacturer	Madison	
Type	Float	
Model	0116-1303	
Voltage	18-32 Vdc	
Intake air preheater		
Manufacturer	Caterpillar	
Model	118-7284	
Voltage rating	Thermal switch activated, 24Vdc, 78A	
Engine starting system		
Batteries		
Manufacturer	Optima	
Voltage	12 Vdc, qty 2 (sealed units)	
Starter		
Manufacturer	Caterpillar	
Model	128-5626	
Voltage rating	24 Vdc	
Drive type	Direct	
Alternator		
Manufacturer	Caterpillar	
Model	169-3345	
Voltage rating	24 Vdc, 50A	
Drive type	Belt	
Generator		
Manufacturer	Marathon	
Model	431PSL6300	
Type	Alternating current, synchronous, brushless	
Load capacity	100 kW at 60 Hz (1,800 rpm)	83 kW at 50 Hz (1,500 rpm)
Current ratings		
120/208 Vac connection	347A at 60 Hz	289A at 50 Hz
240/416 Vac connection	174A at 60 Hz	145A at 50 Hz
Power factor	0.8	
Cooling	Fan cooled	
Drive type	Direct coupling	
Duty classification	Continuous	

EQUIPMENT DATA - Continued

Table 1. 100 kW TQG Equipment Data - Continued.

EQUIPMENT	DATA
Governing system	
Load measuring unit	
Manufacturer	Caterpillar
Model	161-0797
Engine control module	
Manufacturer	Caterpillar
Model	172-2394
GSC Protective Relay Setpoint Values	
Low oil pressure shutdown	26 psi (179 kPa)
High water (coolant) temperature shutdown	230°F (110°C)
Engine overspeed	2120 rpm
Overcrank (total cycle crank time)	90 seconds
High oil temperature shutdown	253°F (123°C)
Overvoltage alarm threshold	125% overvoltage for programmed voltage
Generator overvoltage shutdown threshold	125% of nameplate voltage
Generator undervoltage alarm threshold	82% of programmed voltage
Generator undervoltage shutdown threshold	75% of nameplate voltage
Generator overfrequency alarm threshold	63 Hz for 60 Hz operation; 53 Hz for 50 Hz operation
Generator overfrequency shutdown threshold	66 Hz for 60 Hz operation; 55 Hz for 50 Hz operation
Generator underfrequency alarm threshold	57 Hz for 60 Hz operation; 48 Hz for 50 Hz operation
Generator underfrequency shutdown	57 Hz for 60 Hz operation; 45 Hz for 50 Hz operation
Generator phase overcurrent alarm threshold	160% of nameplate current
Generator total overcurrent alarm threshold	160% of nameplate current
Generator phase overcurrent shutdown threshold	160% of nameplate current
Generator total overcurrent shutdown threshold	160% of nameplate current
Reverse power shutdown	15% to 17%

END OF WORK PACKAGE

FIELD LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
THEORY OF OPERATION

GENERAL

This work package contains functional descriptions of the generator set and explains how TQG functional systems interact with one another.

ENGINE OVERVIEW

The 100 kW TQG is powered by an in-line six cylinder diesel engine. The firing order of the engine is 1-5-3-6-2-4. The engine rotation is counterclockwise when the engine is viewed from the flywheel end (rear) of the engine. The engine uses a turbocharger and an air-to-air aftercooler. The engine cylinders bore is 4.3 inch (110 mm) with stroke of 5.0 inch (127 mm). Total displacement is 442 cu. in. (7.25L). The engine hydraulic electronic unit injector system (HEUI) eliminates mechanical components that are used in a pump-and-line system. The HEUI provides increased control of the timing and increased control of the fuel air mixture. The timing advance is achieved by precise control of the unit injector timing. Adjusting the injection duration controls engine rpm. An engine speed sensor provides information to the Engine Control Module (ECM) for detection of cylinder position and engine rpm. The engine has built-in diagnostics to ensure that all of the components are operating properly. In the event of a system component failure, the operator will be alerted via the Generator Set Control (GSC) component of the TQG Electronic Modular Control Panel (EMCP). Numerical codes of the faulty component or condition are displayed on the GSC. Intermittent faults are logged and stored in the ECM memory.

Engine Control Module

The Engine Control Module (ECM) automatically provides the correct amount of fuel in order to start the engine. The engine control module is integrated with the engine fuel system and the engine air inlet and exhaust system to control the fuel delivery and the injection timing electronically. The electronic control module provides timing control and fuel air ratio control. Injection timing is achieved by the precise control of the injector firing time. Adjusting the injection duration controls engine rpm. ECM energizes unit injector solenoids in order to start the injection of fuel and de-energizes the unit injector solenoids to stop the injection of fuel.

Electronic Components

The engine uses three types of electronic components: input, control, and output. Input-components send variable electrical signals (voltage, frequency, or pulse width (PW)) to the ECM. ECM interprets input signals about the condition, environment, or operation of the TQG. ECM firmware evaluates input data to control engine components such as fuel injector solenoids or to log and relay information to EMCP.

ENGINE SENSORS

Boost Pressure

Boost is defined as the difference between the inlet and outlet pressures of the turbocharger. The atmospheric pressure sensor on the air inlet to the turbocharger is used to reduce smoke emissions at high altitudes and as the reference for calculating turbocharger boost pressure. Boost pressure measurements are used to reduce smoke emissions during acceleration. The outlet pressure sensor is located at the turbocharger outlet and measures pressure from 3 to 49 psi (20 to 340 kPa).

ENGINE SENSORS - Continued

Oil Pressure

The ECM monitors oil pressure following engine start up and may display a low oil pressure alarm diagnostic code. The code will not be logged for 15 seconds following start up. The output of the oil pressure sensor is pulse width modulated. The base frequency is 500 ±150 Hz. The duty cycle varies from 13 to 85% corresponding to 0 to 100 psi (0 to 690 kPa).

Coolant Level Sensor

A sensor in the coolant detects dangerously low levels of coolant in the system. The output of this sensor is connected to the GSC for display and control.

Primary and Backup Engine Speed/Timing Sensors

Two speed/timing sensors determine engine timing. The primary sensor monitors crankshaft rotation; and is used to determine both engine rpm and fuel injection timing. The other sensor senses rotation in the same manner as the first. With these redundant sensors, the probability of a failure shutting down the engine is greatly reduced. All of the timing for fuel injection is based on the output of these sensors. If the primary sensor fails, timing can continue based on the output of the backup sensor.

Fuel Pressure Sensor

The ECM monitors fuel pressure at the fuel pump between 0 and 100 psi (0 and 690 kPa).

Inlet Air Manifold Temperature Sensor

The ECM monitors air manifold inlet temperature and uses this information to adjust ignition timing.

Coolant Temperature Sensor

The coolant temperature is used to determine whether to operate the engine in cold mode and to notify the operator of excessive engine temperature. If the coolant temperature is below 63°F (17°C) and the engine is not in the cranking phase of starting, the timing is advanced and fuel delivery is reduced to improve cold engine performance. Cold mode remains active until the coolant temperature rises above 63°F (17°C) or until the engine has been running five minutes.

Speed Input

The speed input signal to the ECM is a pulse width modulated control signal, which eliminates the mechanical throttle and governor linkages along with their adjustments. The nominal frequency is 500 ±200 Hz. The pulse width varies from 10% to 90% corresponding to idle and maximum speed of the engine. Signals outside of this range are considered a failure and a fault code is logged.

ENGINE STARTING SYSTEM

The engine starting system (Figure 1) consists of two 12-volt batteries connected in series, a 24 Vdc starter, a 24 Vdc battery charging alternator, a magnetic pickup (for sensing engine speed) and the related switches and relays required for control of the starting system. The PUSH TO STOP EMERGENCY STOP pushbutton on the EMCP will automatically disable the starting system and shut down the TQG if it is pushed in. For engine cranking, battery power is supplied to the starter motor through the starter solenoid that in turn is controlled by the EMCP. The starter engages the engine flywheel causing the engine to turn over. As the engine accelerates to above idle speed (sensed by the magnetic pickup), the EMCP disengages the starter. Moving the ENGINE CONTROL switch to COOL DOWN/STOP may also stop the starting sequence. The engine may be cranked without starting by engaging the DEAD CRANK SWITCH. The DEAD CRANK SWITCH is a three-position switch. Up position is CRANK, the center position is OFF, and the lower position is NORMAL (operation). With the DEAD CRANK SWITCH in CRANK position, the starter motor is energized without activating any other starting or control function. With the switch in the OFF center position, the system is off. With the switch in NORMAL (operation) position, the TQG may be cranked and started. The belt-driven engine alternator charges the batteries. The battery charging alternator also supplies GSC power. Normal operating indication depends on the state of charge in the batteries. A low charge, such as exists immediately after engine starting, will cause a high reading. Cold outside temperatures make starting the engine difficult. To improve engine starting in cold weather the engine contains a 78A intake air preheater. This heater is described in the discussion of the Air Inlet and Exhaust System. If the batteries are dead or inoperable, external +24 Vdc power can be supplied to the TQG via the 24 Vdc NATO slave receptacle to start the generator set engine.

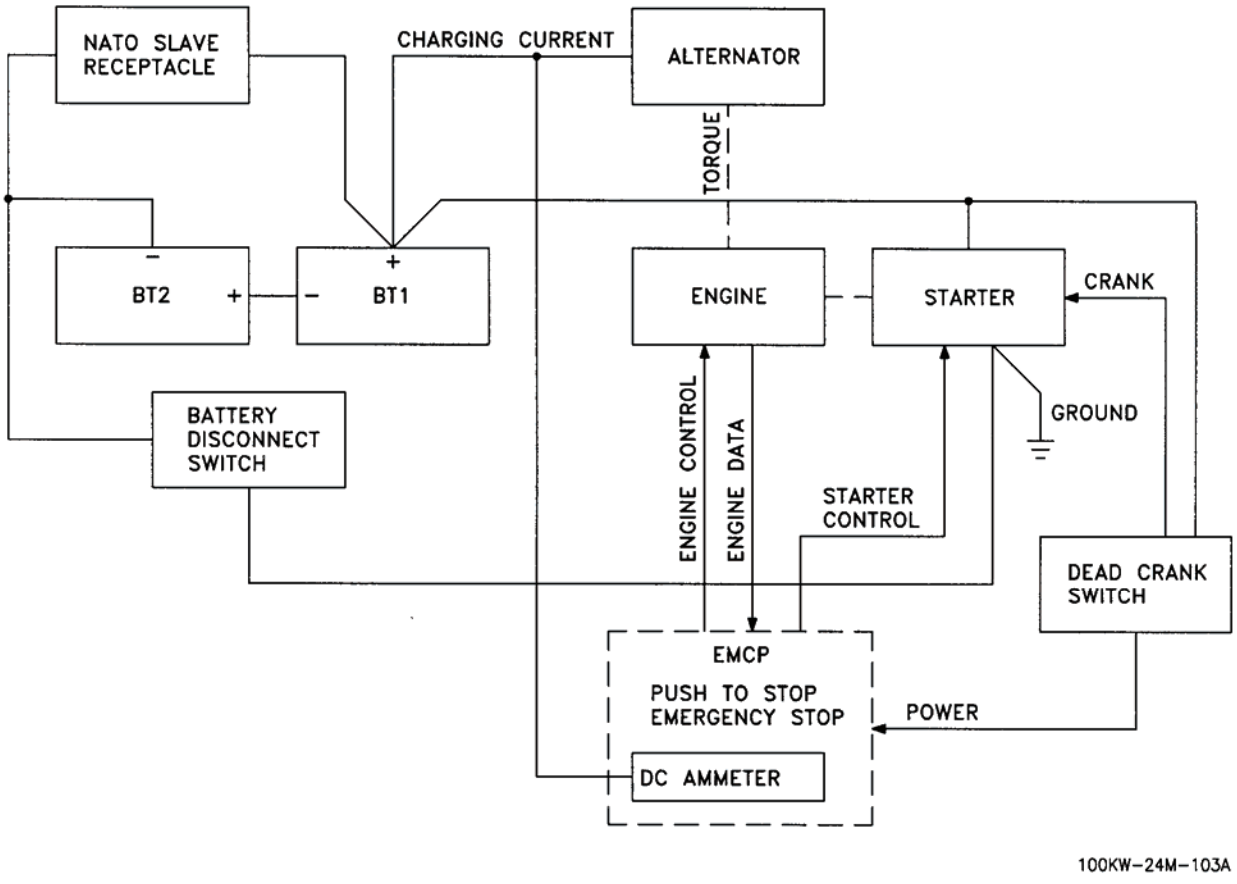


Figure 1. Engine Starting System.

FUEL SYSTEM

The fuel system (Figure 2) consists of hoses, steel injector piping, fuel tank, fuel filter/water separator, fuel transfer pump, injection pump and injectors. Fuel is drawn from the fuel tank by the fuel transfer pump. Fuel passes through a fuel filter/water separator where water and small impurities are removed before arriving at the fuel transfer pump. The fuel is then pushed through the secondary fuel filter that removes even smaller particles from the fuel. The fuel then enters the injector manifold and goes into the injectors which are controlled by the ECM and actuated by a hydraulic injection pump that is part of the high pressure oil system. Through the injectors fuel enters the diesel engine combustion chamber, where it is mixed with air and ignited. The fuel that is not used is cooled and returned to the fuel tank via an excess fuel return line.

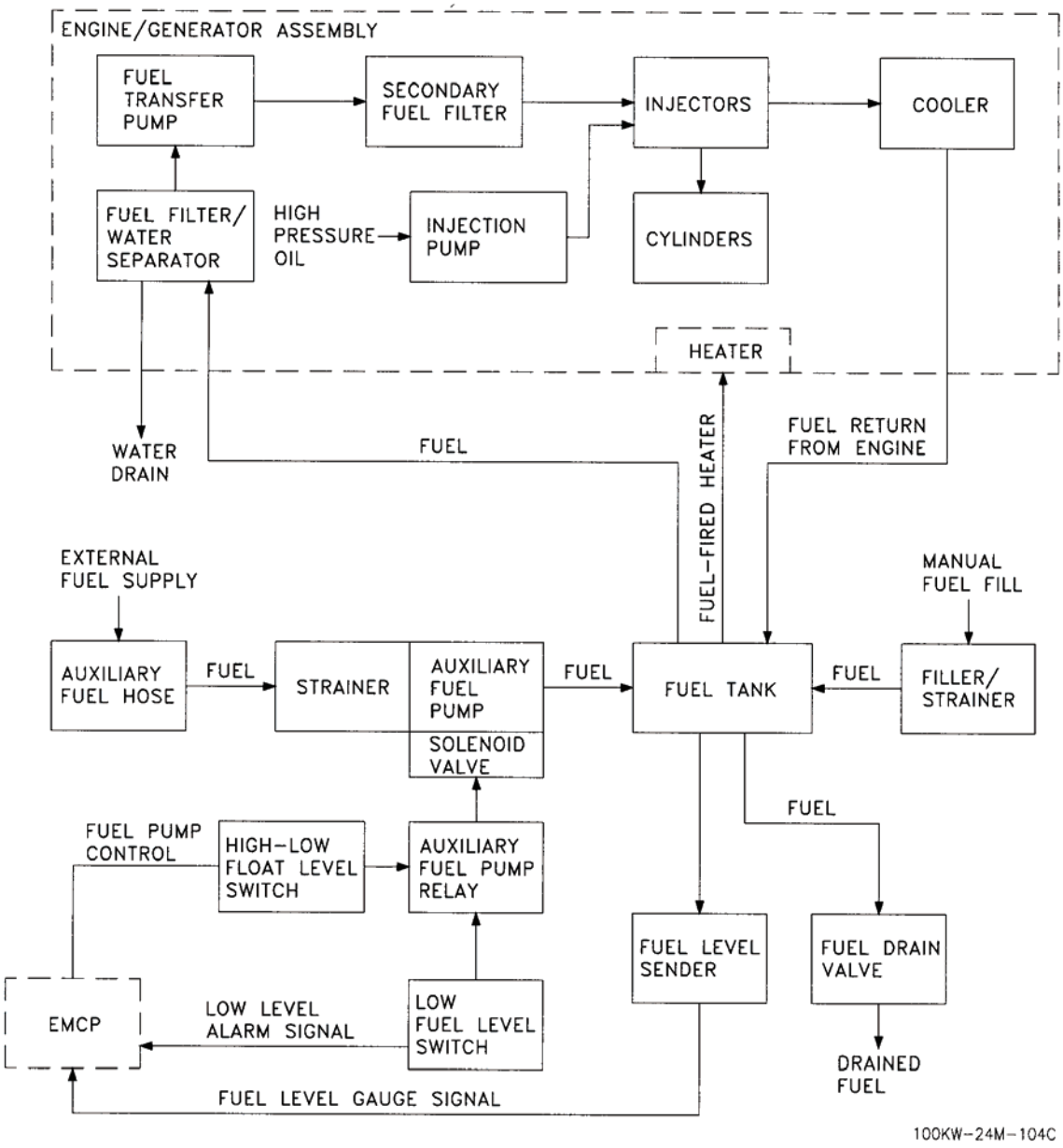


Figure 2. Fuel System.

FUEL SYSTEM - Continued

When the fuel level is low, the fuel level switch will either supply power to the external auxiliary fuel pump for external fuel supply or shut down the TQG to prevent it from completely running out of fuel. If a diesel engine runs out of fuel, it is necessary to fill the fuel filters, purge all air from the lines and pumps, and bleed all injectors. Only hydraulic pressure will open the injectors; air pressure will not.

Auxiliary Fuel System

The auxiliary fuel system consists of an external fuel supply, a fuel hose, a 24 Vdc auxiliary fuel pump with strainer and solenoid valve, fuel lines, and an auxiliary fuel pump relay. When the EMCP AUX FUEL switch is ON, the auxiliary fuel pump can transfer fuel from an external fuel supply to the generator fuel tank. The fuel level float in the fuel tank shuts off power to the auxiliary fuel pump via the auxiliary fuel pump relay when the TQG fuel tank is full and reactivates the pump as the level drops. The fuel level indicator on the EMCP indicates the fuel level of the fuel tank from empty (E) to full (F).

HYDRAULIC ELECTRONIC UNIT INJECTOR (HEUI) FUEL SYSTEM

The operation of the HEUI fuel system (Figure 3) is different from mechanically actuated fuel injection systems. The HEUI fuel system requires no mechanical adjustment. Installing different software in the ECM makes changes in performance.

The engine uses an HEUI in each cylinder. A solenoid on each injector controls the amount of fuel delivered by the injector. An engine speed/timing sensor detects top dead center (TDC). All fuel injection is timed off the occurrence of TDC. The ECM determines how much fuel is to be delivered based on the difference between desired and actual speed. The ECM then sets the timing from TDC for each cylinder based on data received from the coolant temperature sensor, inlet air manifold temperature, atmospheric pressure sensor, and turbocharger outlet (boost) pressure sensor. The ECM adjusts timing and fuel delivery for best engine performance, fuel economy, and white smoke control.

The HEUI fuel system uses a hydraulically actuated electronically controlled unit injector. All fuel systems for diesel engines use a plunger and barrel to pump fuel under high pressure into the combustion chamber. Fuel is pumped into the combustion chamber in precise amounts to control engine performance. The HEUI uses engine oil under high pressure to power the plunger rather than a fuel injection pump camshaft lobe to power the plunger. The HEUI uses engine lubrication oil that is pressurized from 870 psi (6 Mpa) to 3500 psi (24 Mpa) to pump fuel from the injector. The HEUI operates in the same way as a hydraulic cylinder to multiply the force of the high-pressure oil. By multiplying the force of the high-pressure oil, the HEUI produces injection pressures that are very high. This multiplication of pressure is achieved by applying the force of high-pressure oil to a piston. The piston is larger than the plunger by approximately six times. The piston pushes on the plunger. The engine lubrication oil under high pressure is called the actuation pressure of the oil. The actuation pressure of the oil generates the injection pressure delivered by the unit injector, increasing the pressure by a factor of six. Low actuation pressures result in low injection pressure of the fuel. During conditions of low speed such as idle and start, low injection pressure is used. High actuation pressure during high idle and acceleration results in high injection pressure of the fuel. The HEUI fuel system provides infinite control of injection pressure.

HYDRAULIC ELECTRONIC UNIT INJECTOR (HEUI) FUEL SYSTEM - Continued

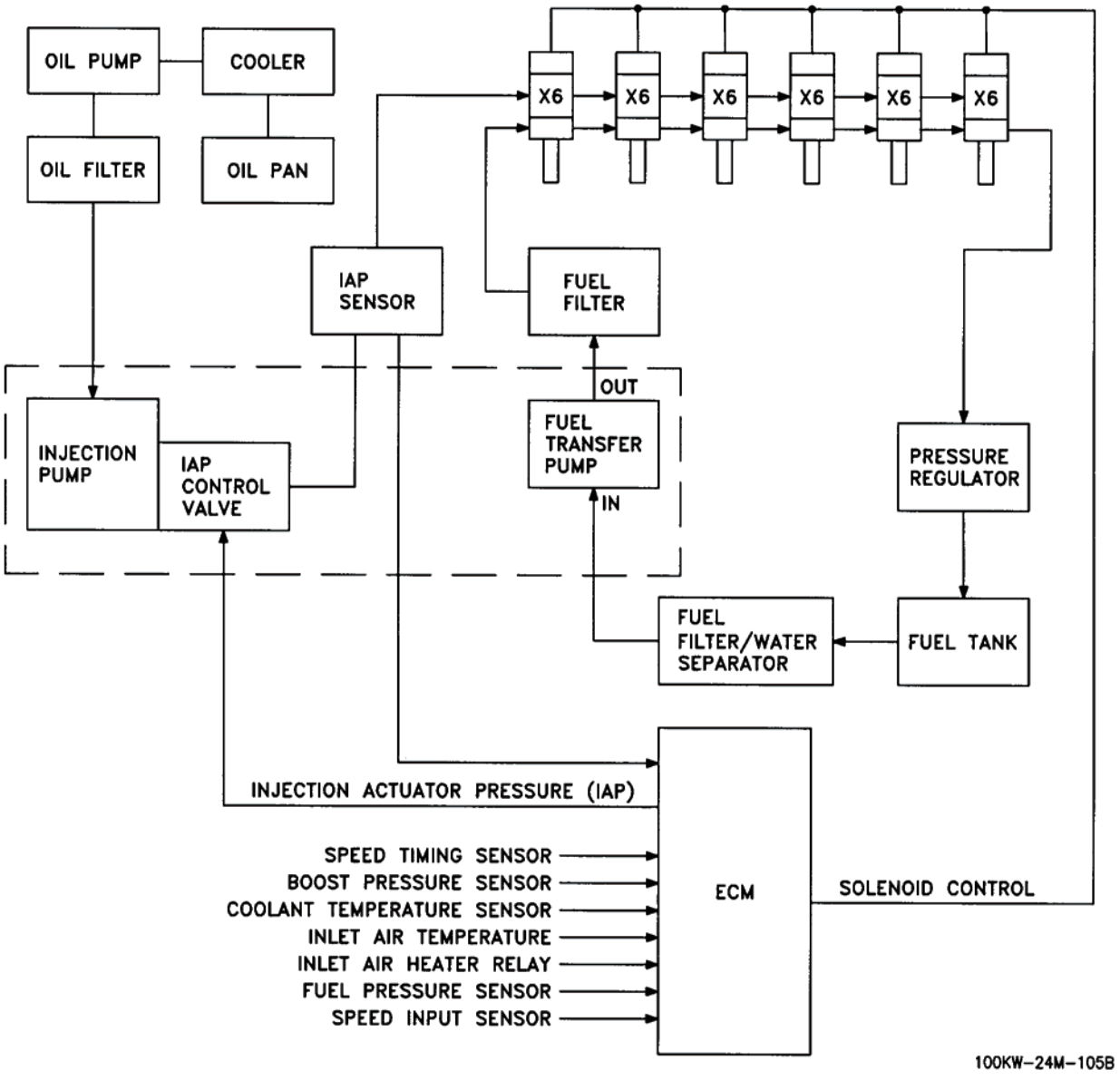


Figure 3. Hydraulic Electronic Unit Injector System.

Electronic Control Module (ECM)

The ECM computer electronically controls engine performance. The ECM uses engine performance data gathered by several sensors to make adjustments to the fuel delivery, injection pressure and injection timing. The ECM contains programmed performance maps (software) to define horsepower, torque curves and rpm. This software is commonly called the personality module. The ECM logs faults of engine performance. The ECM can diagnose problems with itself and the sensors and sensed values input to the module. When a problem is

HYDRAULIC ELECTRONIC UNIT INJECTOR (HEUI) FUEL SYSTEM - Continued

detected, a diagnostic code is generated and sent to the GSC where it is displayed. In most cases, the code is also logged with the engine hour value indicating when the failure occurred. When diagnostic codes are generated, they are referred to as active. They indicate a problem presently exists. These should be serviced first. Diagnostic codes stored in memory are referred to as logged failures. The existence of a logged code does not indicate a current failure. The failure may have occurred some time ago. The logged codes are useful when troubleshooting an intermittent problem. Logged inactive codes require a generic password to clear as described in WP 0004 and WP 0085. Codes not requiring a password are automatically deleted from memory after 100 engine operating hours.

Hydraulic Pump

The hydraulic injection pump (high-pressure oil pump) is located at the left front corner of the engine. The hydraulic pump is a fixed displacement axial piston pump. The hydraulic pump uses a portion of the engine lubrication oil pressurized to the injection actuation pressure required to power the HEUI injectors.

Injection Actuation Pressure Control Valve (IAP Control Valve)

The injection actuation pressure (IAP) control valve is located on the side of hydraulic pump. Under most conditions, the pump produces excess oil flow. The IAP Control Valve discharges excess pump flow to the drain to control injection actuation pressure to the desired level. The performance maps of ECM contain a desired actuation pressure for every engine operating condition. The ECM sends a control current to the IAP control valve. The control current should make the actual actuation pressure equal to the desired actuation pressure. The IAP control valve is an actuator that converts an electrical signal from ECM to the mechanical control of a spool valve that controls pump outlet pressure.

Fuel Transfer Pump

The fuel transfer pump is mounted on the back of hydraulic pump. The fuel transfer pump draws fuel from the fuel tank. The fuel transfer pump pressurizes the fuel to 450 kPa (65 psi). The pressurized fuel is supplied to injectors. The fuel transfer pump is a spring-loaded, single piston pump. The pump is operated by an off-center bearing on the back of the hydraulic pump shaft. There are two check valves in the fuel transfer pump. The inlet check valve opens to allow fuel from the tank into the pump and closes to prevent fuel leakage back to the fuel tank. The outlet check valve opens to supply fuel to the fuel supply passage in the cylinder head. The fuel supply passage supplies fuel to injectors. The outlet check valve closes to prevent pressurized fuel leakage back through the pump.

Injection Actuation Pressure Sensor (IAP)

IAP sensor is installed in the high-pressure oil manifold. The high-pressure oil manifold supplies actuation oil to power the unit injectors. The IAP sensor monitors injection actuation pressure and sends a continuous voltage signal back to ECM.

HEUI FUEL SYSTEM OPERATION

Low Pressure Fuel System

The low pressure fuel system supplies fuel for combustion to injectors, supplies excess fuel flow to cool the unit and to remove air from the system. The low-pressure fuel system consists of fuel tank, filter, transfer pump and pressure regulator. The fuel transfer pump pushes pressurized fuel out of the outlet port and draws new fuel into the inlet port from the fuel tank. Fuel flows from the outlet port of fuel transfer pump to the fuel supply passage in the cylinder head. The fuel supply passage is a drilled hole that begins at the front of the cylinder head and

HEUI FUEL SYSTEM OPERATION - Continued

extends to the back of the cylinder head. This passage connects with each unit injector bore to supply fuel to unit injectors. Fuel from the transfer pump flows through the cylinder head to all of the unit injectors. Excess fuel flows out of the back of the cylinder head and into the fuel pressure regulator. The fuel pressure regulator is an orifice and a spring loaded check valve. The orifice restricts flow to pressurize the supply fuel. The spring loaded check valve opens at 35 kPa (5 psi) to allow the fuel which has flowed through the orifice to return to the fuel tank. When the engine is off and no fuel pressure is present, the spring loaded check valve closes. The spring-loaded check valve closes to prevent the fuel in the cylinder head from draining back to the fuel tank.

Injection Actuation System

The injection actuation system supplies high-pressure oil to power HEUI injectors and controls the injection pressure produced by the unit injectors by changing the actuation pressure of the oil. Oil from the engine oil pump supplies the needs of the engine lubrication system and the hydraulic injection pump for the fuel system. Oil drawn from the engine sump is pressurized to the lubrication system oil pressure by the engine oil pump. Oil flows from the engine oil pump through engine oil cooler, through the engine oil filter and then to the main oil gallery. A separate circuit from the main oil gallery directs a portion of the lubrication oil to supply the injection pump.

Oil flows into the inlet port of injection pump and the oil fills the pump reservoir. Oil from the pump reservoir is pressurized in the hydraulic pump and pushed out of the outlet port under high pressure. Oil then flows from the to the high-pressure oil passage in the cylinder head.

The high-pressure oil passage connects with each unit injector bore to supply high-pressure actuation oil to unit injectors. Oil is contained in the high-pressure oil passage until used by the unit injectors. Oil that has been exhausted by the unit injectors is expelled under the valve covers. This oil returns to the crankcase through oil drain holes in the cylinder head. Under most operating conditions, the injection pump is producing excess flow that must be discharged to a drain to control the system pressure. The IAP control valve regulates system pressure by discharging the precise amount of oil to the drain.

The ECM selects the desired actuation pressure based on sensor inputs and performance maps. The ECM sends a control current to the IAP control valve to change the actual actuation pressure. The IAP control valve reacts to the electrical current from the ECM to change the actual actuation pressure by discharging pump flow to the drain. The IAP control valve is an electrically controlled relief valve. The IAP sensor monitors the actual actuation pressure in the high-pressure oil passage and reports by sending a signal voltage to the ECM. The injection actuation pressure control system operates in a cycle. ECM selects the desired actuation pressure and sends an electrical current to the IAP control valve that should produce that pressure. The IAP control valve changes the pressure relief setting, which in turn changes the actual actuation pressure. The IAP sensor monitors the actual actuation pressure and sends a signal voltage back to the ECM. The ECM interprets the signal voltage to calculate the actual actuation pressure and compares the actual actuation pressure to the desired actuation pressure to adjust the electrical current to the IAP control valve. The IAP control valve responds by changing the actual actuation pressure. This closed loop control system is repeated 67 times per seconds.

Most of the high pressure oil flow from injection pump is used to power unit injectors. Excess flow is returned to the drain through the IAP control valve. The excess flow travels through a drilled passage to the front of the pump. Drain oil flows out of the front of the pump over the pump drive gear and flows down the engine front gear train to the sump.

LUBRICATION SYSTEM

The lubrication system (Figure 4) consists of an oil pan, dipstick, pump, cooler, oil pressure sensor, and filter. The oil pan is a reservoir for engine lubricating oil. Engine oil lubricates, cleans, cools, seals, and preserves engine parts. The dipstick indicates oil level in the oil pan. A pump draws oil from the oil pan and through a screen that blocks large objects from entering the oil pump and cooler. The oil then passes through a spin-on type filter where smaller impurities are removed. From the filter, oil enters the engine and is distributed to the engine's internal moving parts through internal passageways. Oil is also supplied externally to the turbocharger and internally to a high pressure hydraulic pump that actuates the fuel injectors. After passing through the engine, the oil returns to the oil pan. The lower GSC display indicates oil pressure sensed by the oil pressure sender in the engine. The engine shuts down automatically and the red LOW OIL PRESSURE indicator on the GSC flashes if the oil pressure drops to 26 psi (179 kPa). The oil level can be checked with the engine running.

Oil Distribution

The engine oil pump is mounted to the bottom of the cylinder block inside the engine oil pan. The engine oil pump pulls oil from engine oil pan and pushes the oil through the passage to the engine oil cooler and filter. The filtered oil then enters the turbocharger oil supply line and main oil gallery. The main oil gallery distributes oil to main bearings, piston cooling jets, and the camshaft bearing. Oil from the main oil gallery exits the front of the block and enters a groove that is cast in the front housing. Oil enters the crankshaft through holes in the bearing surfaces (journals) for the main bearing. Passages connect the bearing surface for the main bearing with the bearing surface for the connecting rod. The front housing passage sends the oil flow in two directions. At the upper end of the passage, oil is directed back into the block and up to cylinder head gallery through passages to the rocker arm mechanism. Internal passages lubricate the oil pump idler gear bearing and camshaft idler gear bearing. Oil passages in the crankshaft send oil from all the main bearings through the connecting rods to the connecting rod bearings. The passages send oil from the camshaft bearing to pushrod lifters.

Injection Pump

The injection pump is a gear-driven axial piston pump that increases engine oil pressure from the operating oil pressure to the actuation pressure required by the unit injectors as discussed in the fuel system description above. The IAP valve electronically controls the output pressure of the injection pump.

High and Low Pressure Systems

The oil circuit consists of a low-pressure circuit and a high-pressure circuit. The low-pressure circuit typically operates at a pressure of 35 psi (240 kPa) to 70 psi (480 kPa). The low pressure circuit provides filtered engine oil to the injection pump. The low pressure circuit also provides filtered engine oil to the engine lubricating system. The high pressure oil system provides actuation oil to the unit injectors, typically operating between 581 psi (4 Mpa) and 3350 psi (23 Mpa). The high pressure relief valve regulates high pressure in the system. When the oil pressure is at 100 psi (695 kPa) or more, the valve will allow oil to return to engine oil pan. Oil is discharged from the unit injectors under the valve cover so that no return lines are required. After the lubrication is completed, the lubrication oil returns to the engine oil pan.

LUBRICATION SYSTEM - Continued

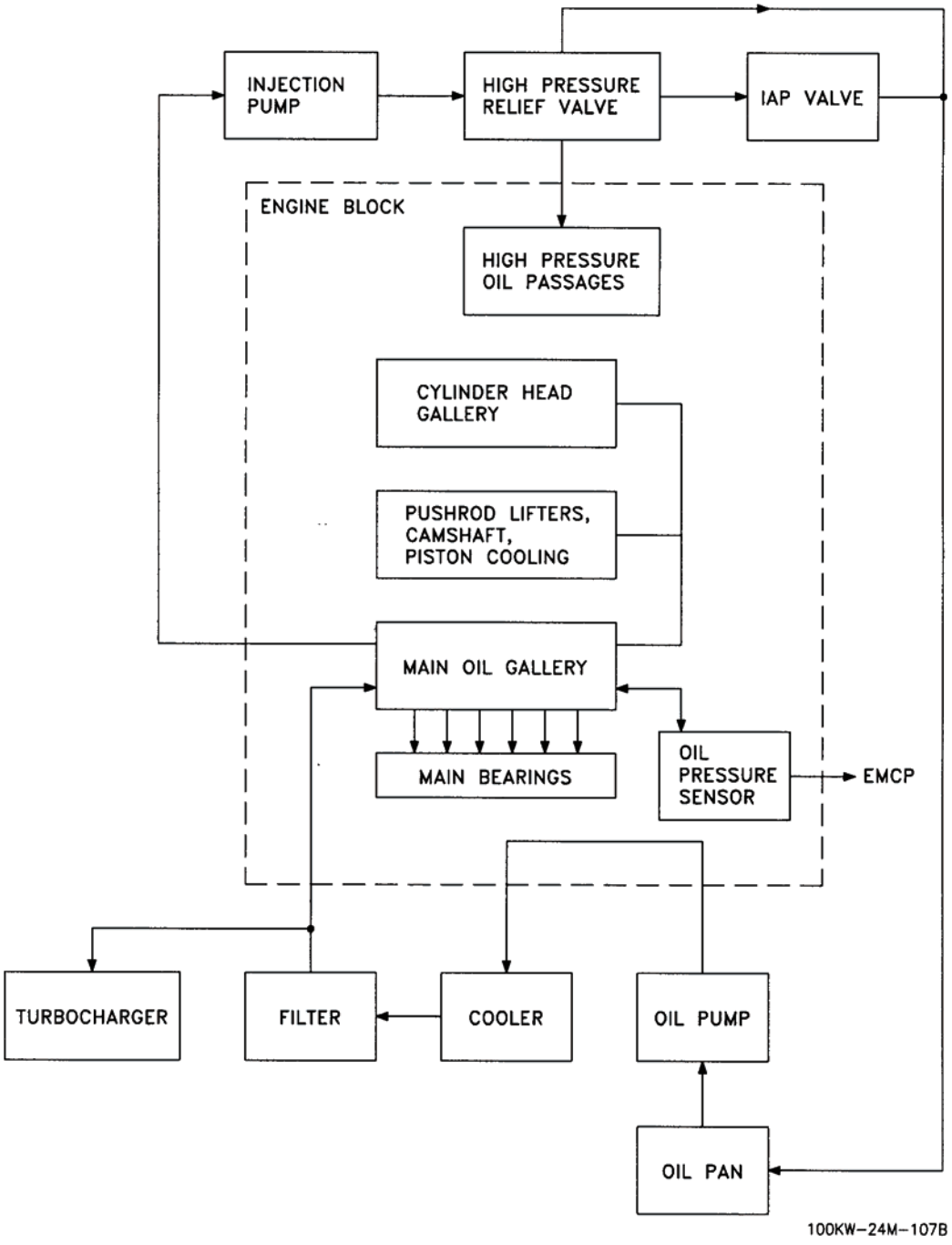


Figure 4. Lubrication System.

ENGINE COOLING SYSTEM

The engine cooling system (Figure 5) consists of a radiator, hoses, thermostat, water pump, surge tank and expansion bottle, a belt driven fan, and cooling jackets. 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. In addition, the fan cools engine and generator set components within the TQG housing by drawing in air from outside the housing through the baffles, circulating the air through the housing and forcing the air through the radiator and out through the housing exhaust vents on the roof. The housing is designed to operate with the doors closed which ensures that the main alternator and other TQG components have access to a good flow of cooling air from outside the generator set. The normal operating temperature of the generator set is 170° F to 200° F (77° C to 93° C). A coolant temperature sensor provides automatic shut down in the event that coolant temperature exceeds 230°F (110°C). The TQG engine has a pressurized cooling system equipped with a shunt line. The cooling system can operate safely at temperatures higher than the normal boiling point of water without water pump cavitation. Cavitation is the sudden formation of low-pressure bubbles in liquids by mechanical forces. The formation of air or steam pockets is more difficult within a pressure type cooling system. The shunt line prevents water pump cavitation by providing a constant flow of coolant. The water pump is located on the right side of the cylinder block. The water pump is belt driven from the crankshaft pulley. Coolant can enter the water pump from via the inlet at the bottom of the water pump, through the bypass hose into the top of the water pump, and through the shunt line into the top of the water pump. Coolant from the bottom of the radiator is pulled into the bottom inlet of the pump by impeller rotation. The coolant exits the back of the pump directly into the oil cooler cavity in the engine block.

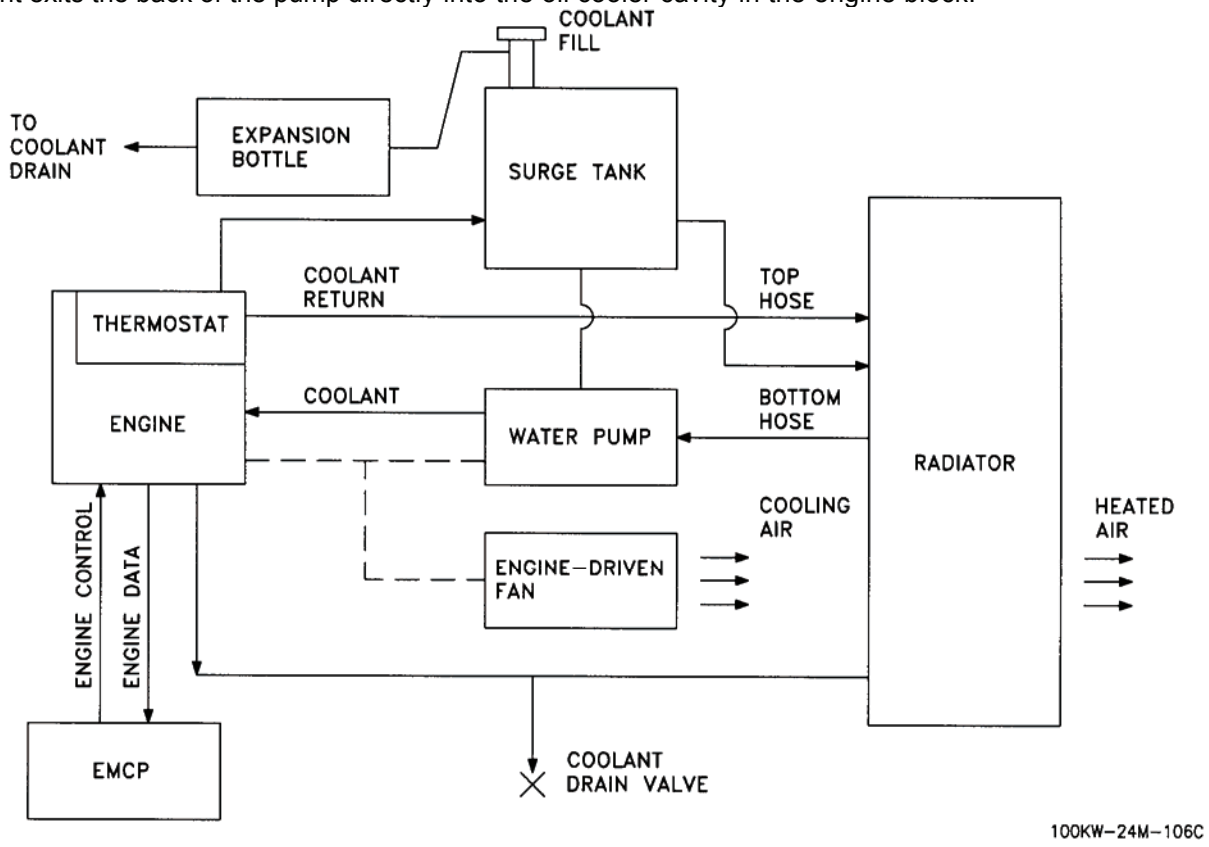


Figure 5. Engine Cooling System.

ENGINE COOLING SYSTEM - Continued

All of the coolant passes through the core of the oil cooler and the coolant enters the cylinder block internal water manifold. The manifold disperses the coolant to water jackets around the cylinder walls. From the cylinder block, the coolant flows into passages in the cylinder head. The passages send the flow around the unit injector sleeves and the inlet and the exhaust passages. The coolant now enters the thermostat housing at the front right side of the cylinder head. The thermostat controls the direction of flow. When the coolant temperature is below the normal operating temperature, the thermostat is closed. The coolant is directed through a bypass hose and into the top inlet of the water pump. When the coolant temperature reaches the normal operating temperature, the thermostat opens. When the thermostat is open, the bypass is closed. Most of the coolant goes through the outlet to the radiator for cooling. The remainder flows through bypass hose and into the water pump. The shunt line extends from the top of the water pump to the surge tank. The shunt line must be routed properly to avoid trapping any air. By providing a constant flow of coolant to the water pump, the shunt line prevents cavitation. The lower GSC display indicates the engine coolant temperature.

AIR INLET AND EXHAUST SYSTEM

The air inlet and exhaust system (Figure 6) consists of an air filter assembly, intake manifold, turbocharger, exhaust manifold and muffler. Ambient air is drawn into the air filter assembly where it passes through the filter elements. Airborne dirt is removed and trapped in the elements. Filtered air is drawn out of the air filter assembly through air intake tubes to the turbocharger where it is pressurized and passed through an aftercooler coil in the radiator. In cold weather, an inlet air preheater is activated to warm the inlet air. The pressurized inlet air enters the intake manifold to the combustion chambers and mixes with fuel from the fuel injectors. The engine exhaust gases are released into the turbocharger, which is mounted on the exhaust manifold. The exhaust gases drive the turbocharger, forcing large amounts of air into the intake manifold. After passing through the turbocharger, the exhaust gases are channeled into a muffler to deaden the sound. The exhaust gases are vented upward from the generator set housing.

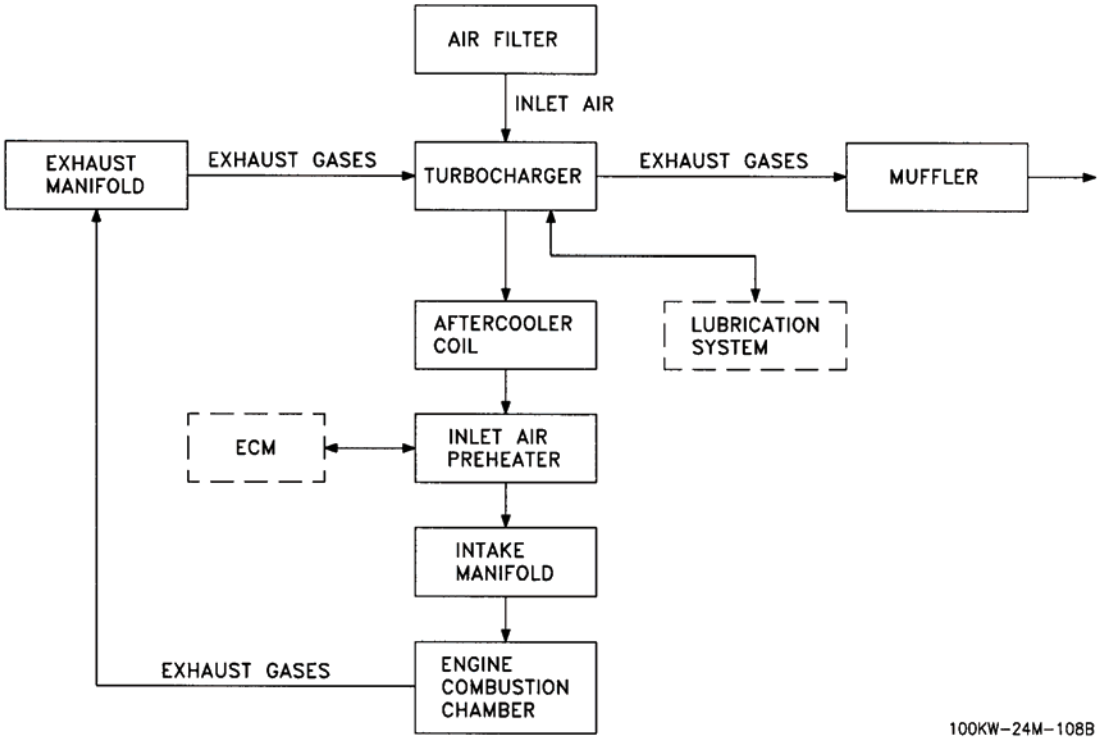


Figure 6. Air Inlet and Exhaust System.

AIR INLET AND EXHAUST SYSTEM - Continued

The components of the air inlet and exhaust system control the quality of the air that is available for combustion. These components also control the amount of the air that is available for combustion. Inlet air is pulled through the air cleaner. The inlet air is then compressed and heated by the compressor wheel of the turbocharger to about 150°C (300°F). The inlet air is then pushed through the air-to-air aftercooler core and the inlet air temperature drops to about 110°F (43°C). Cooling the inlet air increases the combustion efficiency which helps to lower fuel consumption and increases horsepower output. The aftercooler core is a separate cooler core installed above the core (standard) of the engine radiator. The engine fan moves air at ambient temperature across the aftercooler core to cool the turbocharged inlet air. From the aftercooler core the air is forced into the cylinder head to fill the inlet ports. The inlet valves control air flow from the inlet port into the cylinder. There are two inlet valves and one exhaust valve for each cylinder. Inlet valves open when the piston moves down on the inlet stroke to pull air into the cylinder. The inlet valves close and the piston begins to move up on the compression stroke. The air in the cylinder is compressed and fuel is injected into the cylinder. The fuel mixes with the air and combustion starts. During the power stroke, the combustion force pushes the piston downward. Then the piston moves upward in the exhaust stroke. During the exhaust stroke, the exhaust valve opens, and the exhaust gases are pushed through the exhaust port into the exhaust manifold. After the piston completes the exhaust stroke, the exhaust valves close and the cycle starts again. Exhaust gases from exhaust manifold enter the turbine side of turbocharger to turn the turbine wheel. The turbine wheel is connected to a shaft, which drives the compressor wheel. Exhaust gases from the turbocharger pass through the exhaust outlet pipe, the muffler and the exhaust stack.

Turbocharger

The turbocharger is installed on the center section of the exhaust manifold. All the exhaust gases from the engine go through the turbocharger. The compressor side of the turbocharger is connected to the aftercooler by pipe. The exhaust gases go into the turbine housing through the exhaust inlet. The exhaust gases spin the blades of a turbine wheel that is connected by a shaft to the compressor wheel. The rotation of the compressor wheel pulls clean air from the air filters through the compressor housing air inlet. The compressor wheel blades compress the inlet air. Air compression increases engine power by allowing the engine to burn more air and more fuel during combustion. When the load on the engine increases, more fuel is injected into the cylinders producing more exhaust gases to increase the turbocharger speed. As the compressor wheel turns faster, more air is forced into the cylinders. The increased flow of air gives the engine more power by allowing the engine to burn the additional fuel with greater efficiency. The turbocharger uses engine oil under pressure for lubrication. The oil comes in through an oil inlet port, lubricates turbocharger bearings, and returns through an outlet port to the engine lubrication system.

Inlet Air Preheater

The engines are equipped with an electric heater that is located behind the air inlet elbow. The electric heater functions to aid in starting and to clean up white smoke during start-up. Under the proper conditions, the ECM turns on the electric heater based on jacket water coolant temperature, inlet manifold temperature, and duration. The system can deliver heat for 30 seconds prior to start-up and during cranking of the engine. After the engine has started, the system can deliver heat constantly for 7 minutes, or the system can cycle the heat for 13 minutes. During the heating cycle, the heat is on for ten seconds and off for ten seconds. If the air inlet heater malfunctions, the engine will still start and the engine will still run. There may be a concern regarding the amount of white smoke that is present and the need for an alternative starting aid. The engine ECM controls an inlet air heater system to improve the cold starting capability. The ECM measures coolant temperature and controls an air inlet heater relay to apply 24 Vdc from the batteries to the heater to preheat the air as necessary. Regardless of temperature, power is applied to the heater for two seconds when power is applied to the ECM. If the sum of the coolant temperature and the inlet manifold temperature is less than 109°F (25°C), the ECM will turn on the heater for 30 seconds as a preheating cycle. If the operator attempts starting during this preheating cycle, the

AIR INLET AND EXHAUST SYSTEM - Continued

engine will crank and try to start normally. During engine cranking, if the sum of the coolant temperature and the inlet manifold temperature is less than 109°F (25°C), the heater will be turned on. The heater will remain on during cranking. If the engine fails to start, the heater will revert to preheat and the heater will come on for 30 seconds. After the engine has started, if the sum of the coolant temperature and the inlet manifold temperature is less than 109°F (25°C), the heater will remain on continuously for 7 minutes. If the same temperature conditions exist afterwards, the heater will remain on for 13 minutes, turning on for 10 seconds and turning off for 10 seconds. After the 13-minute heat cycle, the heater will turn off. If the coolant temperature sensor fails, the heater will activate if the inlet manifold air temperature is less than 50°F (10°C). If the inlet manifold temperature sensor fails, the heater will activate if the coolant temperature is less than 104°F (40°C). After the engine has been running, if the sum of the coolant temperature and the inlet manifold temperature does not exceed 127°F (35°C), the heater will be activated again. The heater will be activated for no more than 20 minutes at a time. The normal current draw of the air inlet heater is 77 to 95 amps.

AC POWER OUTPUT

The AC output system (Figure 7) consists primarily of the AC generator, the output load terminal board, the voltage reconnection terminal board, the main load contactor and the AC CIRCUIT INTERRUPTER switch on the EMCP. Power created by the AC generator is supplied through the voltage reconnection terminal board and the main load contactor to the output load terminals on the output load terminal board. The voltage reconnection terminal board allows configuration of the generator set for 120/208 volt connections or 240/416 volt connections. **The DVR and GSC must be reprogrammed for voltage changes.** The AC CIRCUIT INTERRUPTER switch located on the EMCP closes and opens the main load contactor. This enables or interrupts the power flow between the voltage reconnection terminal board and the output load terminals. The main load contactor is also opened automatically during any of the specified set faults. The Digital Voltage Regulator (DVR) module in the EMCP senses AC generator output voltage and provides excitation voltage to the AC generator to maintain the desired output voltage. The VOLTAGE adjust potentiometer is connected to the DVR to allow minor voltage adjustments. The user can select which output load terminals to monitor for current and voltage measurements with the GSC keypad AC METER key. The values and terminals are indicated on the upper and lower displays. Refer to AC POWER DISTRIBUTION for a more detailed discussion.

AC POWER OUTPUT - Continued

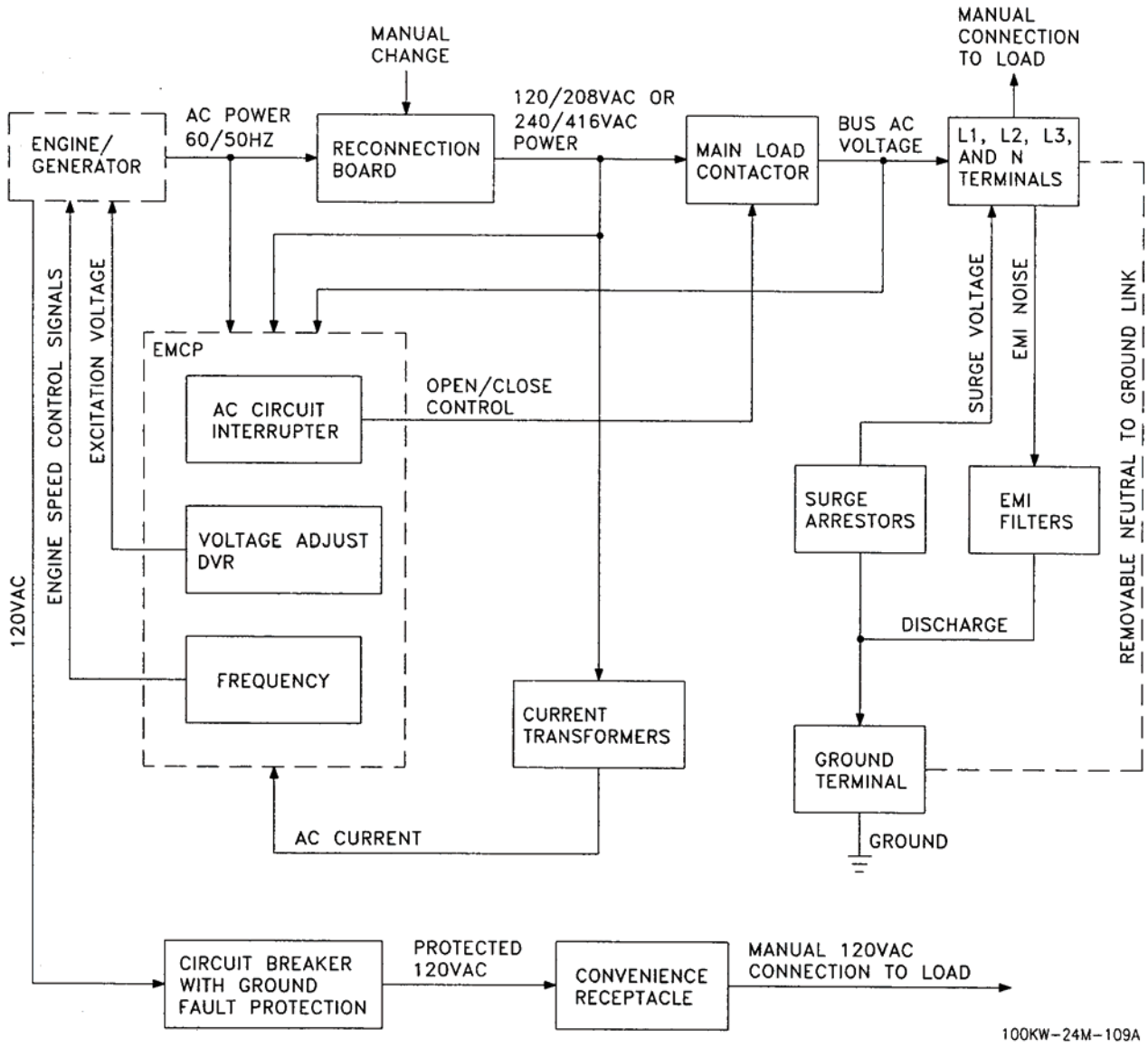


Figure 7. AC Power Output.

DC POWER DISTRIBUTION (FIGURE FO-1, SHEETS 2 AND 3)

The DC battery system (Figure 8) provides 24 Vdc for engine starting and TQG control circuits. The two 12 Vdc batteries are charged by the engine alternator. The DC AMMETER on the EMCP indicates alternator charging rate. Charge rate is shown from -25 to +50 A. Normal operating indication depends on the state of charge in the batteries. A low charge, such as exists immediately after engine starting, will cause a high reading. The battery system includes a manually operated Battery Disconnect Switch to isolate the batteries from the engine. The Battery Disconnect Switch can be used to remove the DC power from the TQG. The batteries connect directly to the 24 Vdc NATO slave receptacle.

DC POWER DISTRIBUTION (FIGURE FO-1, SHEETS 2 AND 3) - Continued

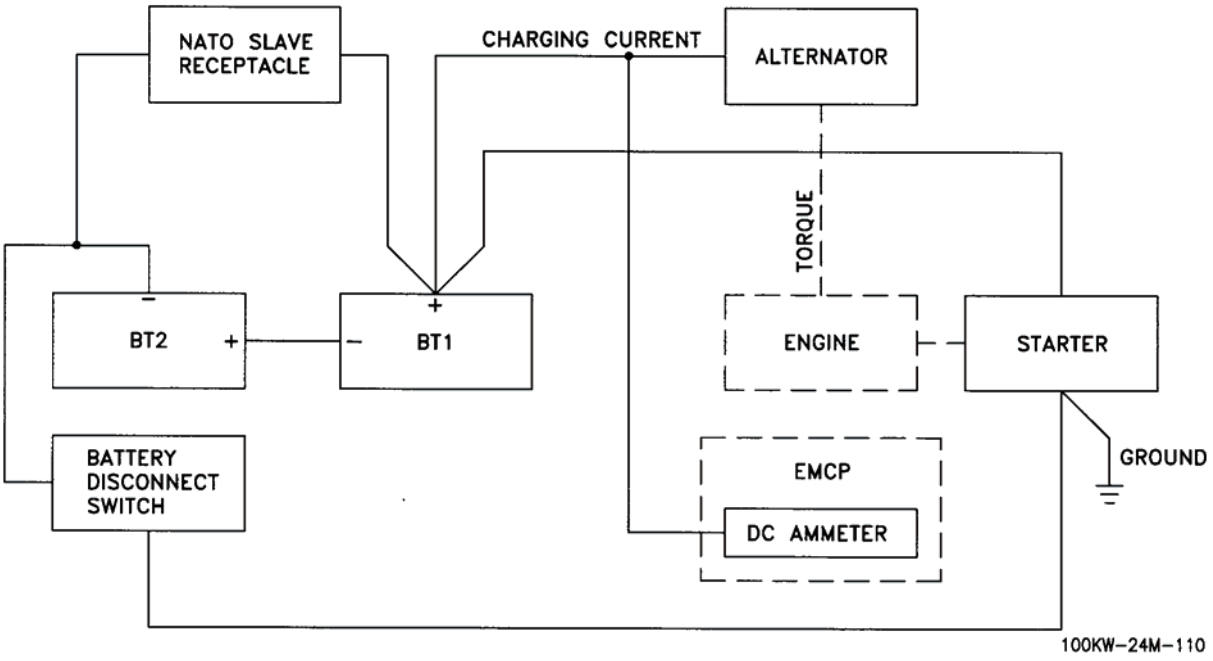


Figure 8. DC Power Distribution.

Batteries

Batteries BT1 and BT2 are 12 Vdc batteries connected in series to supply 24 Vdc for this system. The DC power distribution system operates on 24 Vdc. The Slave Receptacle (SR) is the NATO connector on the generator set. This is useful for charging the batteries and jumping the generator set with another if the batteries become discharged. The Battery Disconnect Switch disconnects the batteries from everything except the slave receptacle. Battery power goes directly to the starter solenoid (Labeled PS (pinion solenoid) on the schematic) for use when cranking or starting the engine. The batteries are connected to the alternator through shunt R4 and circuit breaker CB-5. R4 generates a voltage for the ammeter, which displays the amperage from the alternator when charging the batteries. Battery power is connected to ECM A8 through circuit breaker CB-4 and relay contacts of slave relay (SRY). SRY is energized any time power is applied to the GSC. Battery power goes through D1 to the common of the DEAD CRANK SWITCH. In OFF, battery power is removed from the GSC, DVR, ECM, and Winterization Kit (if supplied). In NORMAL, battery power is applied to the relay module of the GSC through circuit breaker CB1. Power is distributed to the other equipment by the ECS. In CRANK, +24 Vdc is applied to the Starter Motor Magnetic Switch (SMMS) relay coil. SMMS connects battery voltage to the starter solenoid through circuit breaker CB-2, causing the engine to crank. Since power is not supplied to the electronics, the engine will not start.

Emergency Stop Push Button

The Emergency Stop Push Button (ESPB) (PUSH TO STOP EMERGENCY STOP on EMCP) is there to stop the generator set in an emergency. When pushed, contacts 3 and 4 ground P7-38, tell the GSC that the switch is pressed. Contacts 1A and 2A remove the ground from the output to the engine controller, which enables the engine to run. This will stop the engine. Contacts 1 and 2 open the circuit between the GSC and relay SMMS so that the GSC will not be able to attempt to crank the engine.

DC POWER DISTRIBUTION (FIGURE FO-1, SHEETS 2 AND 3) - Continued

When the ECS is set to START, starter motor relay (SMR) A1 K4 is energized. +24 Vdc is applied through the ESPB (if it is not pressed) and D2 to relay SMMS which enables the starter and cranks the engine. D2 prevents voltage from the DEAD CRANK SWITCH from applying power to Relay Field Flash (KFF) relay.

Field Flash Relay

Relay A1 K4 also applies +24 Vdc to the coil of KFF relay. The contacts of KFF apply the +24 Vdc, which is across the coil of KFF, to the generator field coil input (see FO-1, sheet 4) through a 15 Ohm, 25W resistor and diode CRFF (Diode Field Flash). Note that for the acronyms KFF and CRFF, the common reference designators for a relay (K) and a diode (CR) were used. This excitation voltage starts the generator generating voltage. After the process is started, it is self sustaining.

Electronic Governor Relay (EGR) Comm Data Links, MPU, CTR, and GFR

The Electronic Governor Relay (EGR) output of the GSC is connected to the engine controller. P7-21 and 22 are the Communications Data Link between the GSC and the Communication Module (CM). P7-1 and 2 are the inputs from the engine Magnetic Pickup Unit (MPU). This pickup measures speed of rotation of the engine by detecting the starter ring gear teeth. This input is a frequency proportional to engine speed. P7-19 and 20 are the Communications Data Link between the GSC and the electronic control module on the engine. (This is also known as the CAT Data Link.) A1 F1 (Labeled F1 GSC on schematic), and the GSC relay contacts labeled CTR are not used. P7-23 is a low fuel level input from the low fuel level sensor connected to Alarm Module A2 (FO-1, sheet 3). This input is connected to ground when the fuel tank is almost empty. The 10A fuse between RM-34 and RM-7 is A1 F5. The Generator Fault Relay (GFR) K2 in the GSC closes when the GSC detects a generator fault. This energizes the GFR external to the GSC. The contacts for the GFR are used to de-energize K1 and disconnect the load from Generator G1.

Engine Control Switch (ECS)

The ECS consists of two sections. One section consists of pins 1, 2, 3, 4, and 5; the other section consists of pins 6, 7, 8, 9 and 10 of the switch. There is a legend on the schematic that describes which contacts are closed in which positions of the switch. Pins 6 thru 10 apply power to the GSC, Overload and Short Circuit (OL/SC) module, and DVR whenever the switch is not in OFF. This allows the OFF position of this switch to reset any alarms that have occurred. Shorting pins RM 1 and RM 2 on the GSC does this. Note the internal relay connections in the GSC between pins RM 1 and RM 2. This is to ensure that power can not be removed from the GSC when the Fuel Control Relay (FCR) A1 K7 is energized (signifying the engine is running) or the Crank Termination Relay (CTR) A1 K3 is active (signifying that the engine is running and the starter can be released). Pins 1 thru 5 ground a different input line to the GSC for each position of the switch, telling the GSC what to do.

Power to ECM, DVR, OL/SC, Fuel Gauge, Panel Lights, Winterization Kit

Fuse F10 shown between RM 1 and RM 10 is A1 F10 on the back of the GSC. This connects +24 Vdc to pin RM 39 whenever the ENGINE CONTROL switch is in any position other than OFF. Slave Relay (SRY) is connected to RM 39 and is powered up any time the ECS is not in OFF. The contacts of SRY apply +24 Vdc from the battery to ECM A8. Power to DVR A3 module also comes from RM 39. Power to the OL/SC module comes from RM 1 through a set of normally closed contacts on relay AR. AR is energized when the LAMP TEST button is pressed on Alarm Module A2. The fuel gauge (FLG) is connected to RM 39 for power. The signal comes from the fuel sending unit (FLSU) in the fuel tank. The panel lights get their power from RM 2, which has power whenever the DEAD CRANK SWITCH is set to NORMAL. Closing the PANEL LIGHT switch (PLS) applies power to the lights.

DC POWER DISTRIBUTION (FIGURE FO-1, SHEETS 2 AND 3) - Continued

Power to the optional winterization system is applied whenever the DEAD CRANK SWITCH is set to NORMAL. If the winterization kit is turned on at its control panel, +24 Vdc is output to TB5-15. This applies power to the two resistor heaters used to keep the LCD displays in the GSC and the DVR from freezing. There is also a thermally operated switch in the control panel that closes when the temperature falls below -20 ±10° F (-28.9 ±5.6° C). This switch applies +24 Vdc from TB4-17 to the resistors used to keep the LCD displays in the GSC and the DVR from freezing. Note that this power is only available when the ECS is not in OFF.

Coolant Low Sensor Interface

Pins P7-7, 8, 9, 13, 14, 24, 30, and 31 are connected between the GSC and connector J37. P7-9 is +8 Vdc power for the Coolant Low sensor. P7-31 is power return. P7-13 is the Coolant Low signal from the sensor. This sensor detects presence or absence of coolant in the engine and provides an output indicating that the coolant level is dangerously low to allow an operator to add coolant before a forced shutdown occurs.

Load Sharing Module (LSM) A4

The LSM gets an input from the Speed Setting Potentiometer (SSP) (labeled FREQUENCY on the front panel). This signal allows the generator frequency to be adjusted ±10% of nominal. There is a SYNC input on pins 24 and 25 from the GSC. This signal is output on LSM Pins 10 and 11 if this generator is connected to a dead load bus and in AUTO or SEMI-AUTO sync mode. Otherwise, pins 10 and 11 are an input. Pins 10 and 11 are connected to J32 and J33 through contacts on the paralleling relay (PAR). J32 and J33 are the paralleling cable connectors on the rear of the generator set near the control panel. In parallel operation, cables interconnect all of the paralleled generators and these ports are all in parallel. Pins 19 and 20 are a serial communication port to the ECM via J37. Pins 15 and 16 are power and ground respectively.

Alarm Module A2

The alarm module monitors three conditions: Low Fuel, Overload (current), and Short Circuit (OL/SC). The Low Fuel condition is monitored by fuel level switch FL1 in the fuel tank and a set of contacts close when the fuel tank is almost empty. This lights a red lamp on the alarm panel and sounds the alarm buzzer. The lamp will flash at two cycles per second. Pressing the Alarm Silence button on the alarm module will silence the buzzer. This Low Fuel signal is also connected to the GSC at P7-23 (SP-1 input) to notify the GSC that the fuel tank is almost empty. The OL/SC module monitors the Overload and Short Circuit conditions. (The AC Power Distribution discussion describes the module functions.) A set of relay contacts for each condition is input to this panel and each lights a yellow lamp. These conditions do not sound the buzzer. There is a relay coil (AR) connected to the LAMP TEST input/output of the alarm panel. When the LAMP TEST button on the panel is pressed, this relay is energized. The contacts (FO-1, sheet 2) remove power from the OL/SC module when the relay is energized. This resets the output relays and any condition sensed by this module. Power for this module is on pins 1 and 7.

Dead Bus Hi/Lo Inputs

Spare input SP-4 at P7-29 is connected to ground through a set of contacts on DBHI and a set of contacts on DBLO. If there is no voltage on the load bus, DBLO and DBHI will both be de-energized and the contacts used here will both be closed, grounding P7-29. This input is monitored to verify the condition of the load bus. A ground here indicates that there is no voltage on the load bus. This input is compared against the AC voltage monitored at P7-17 and P7-18. If both signals indicate a dead bus, the AUTO mode will close the load contactor onto the dead bus automatically.

DC POWER DISTRIBUTION (FIGURE FO-1, SHEETS 2 AND 3) - Continued

BATTLE SHORT Switch (BSS) Input to ECM

One set of contacts on the BSS is connected to the ECM. This is to notify the ECM when the system is in the Battle Short Mode. In this mode, shutdown conditions are locked out except for Short Circuit Over Speed.

Auxiliary Fuel Pump Circuit

The AUX FUEL switch on the control panel is labeled AFPS (Auxiliary Fuel Pump Switch) on the schematic. The ON position is when terminal 1 and 2 are connected together. The OFF position is when terminals 2 and 3 are connected together. When the AUX FUEL switch is ON, fuel level sensors FL2A and FL2B in the fuel tank control the Auxiliary Fuel Pump Relay (AFPR). When the fuel level in the tank gets low, FL2A and FL2B will be closed, applying power to relay AFPR. One set of contacts on AFPR latch, keeping AFPR energized. Another set of contacts on AFPR apply 24 Vdc to the auxiliary fuel pump. The auxiliary fuel pump will transfer fuel from an external tank to fill the internal tank in the generator set. As the fuel level raises in the tank, FL2B will open. The pump will continue transferring fuel since a set of contacts on AFPR latches the relay to the ON condition. When the fuel level gets to FL2A, those contacts will open. AFPR will drop out and the transfer pump will stop.

SYNC MODE Switch (SMS)

The SYNC MODE switch has three sections and four positions for the four sync modes: OFF, SEMI-AUTO, AUTO, and PERMISSIVE. OFF is used when not paralleling generator sets, the other modes are for paralleling. The first section controls the AUTO SYNC input to the GSC. The AUTO SYNC input to the GSC is grounded in AUTO and PERMISSIVE modes. When grounded, this input enables the automatic synchronization of Generator G1 with the load bus. The second section controls the SYNC CHECK input to the GSC. The SYNC CHECK input to the GSC is grounded in SEMI-AUTO and PERMISSIVE. When grounded, this input enables the synchroscope function on the GSC. The third section is integrated with the opening and closing of the load contactor K1 and is discussed more fully with K1 operation. Note that SEMI-AUTO and PERMISSIVE are wired together.

Load Contactor K1, K1 Relay (KR), and Contactor Control Switch (CCS) aka AC CIRCUIT INTERRUPTER Switch

Load contactor K1 is controlled by K1 Relay (KR), GSC Run Relay (RR) A1 K5, and GSC Programmable Spare Relay (PSR) A1 K8. GSC PSR (A1 K8) is programmed to close whenever there are no alarm conditions sensed by the GSC. When the ENGINE CONTROL switch (ECS) is placed in START (or in AUTO and a remote start command is received), the GSC closes RR (A1 K5). The fuse labeled F7GSC is actually A1 F6. Note that the GSC checks to be sure there are no faults present prior to closing RR and verifies that all previous faults have been reset, otherwise RR will not be closed. As long as no faults are detected, PSR will also be closed. The cool down relay (CDR) is normally closed and opens at the start of Cool-down Mode. Under these conditions, +24 Vdc is connected to relay KR. The SC contacts will be closed unless the OL/SC module detects a short circuit condition. These contacts are reset to closed by turning the ENGINE CONTROL switch to OFF/RESET or pushing the LAMP TEST button on Alarm Module A2. The battle short switch shorts across the next two contacts to disable them in Battle Short Mode. The Generator Fault Relay contacts are normally closed and open when the GSC detects a generator fault condition. The OL contacts will be closed unless the OL/SC module detects an overload condition. These contacts are reset to closed by turning the engine control switch to OFF or pushing the LAMP TEST button on Alarm Module A2.

DC POWER DISTRIBUTION (FIGURE FO-1, SHEETS 2 AND 3) - Continued

NOTE

Electrically, if the SYNC MODE switch is in AUTO, it does not matter which position the PARALLEL/ UNIT switch is in.

If the PARALLEL/UNIT switch is set to PARALLEL and SYNC MODE switch set to AUTO, GSC can apply ground to relay KR by grounding the CLOSE BREAKER output. Auxiliary contacts on K1 latch KR on after KR is energized.

If the PARALLEL/UNIT switch is set to PARALLEL and SYNC MODE switch is in SEMI-AUTO or PERMISSIVE, the CLOSE BREAKER output (P7-37) becomes an enable signal. Closing the AC CIRCUIT INTERRUPTER switch will not apply ground to KR unless the GSC has activated the CLOSE BREAKER output. Auxiliary contacts on K1 latches KR on after KR is energized. A set of auxiliary contacts on KR energizes K1. During operation, run relay (RR) A1 K5 is energized until after cool down mode when the GSC opens the electric governor relay (EGR) on the GSC to stop the engine, then RR is opened also. When ENGINE CONTROL is set to COOL DOWN/STOP mode, the GSC spare output at P7-36 is grounded and relay CDR (cool down relay) is energized. The contacts of CDR are in series with relay KR and drop out KR, which drops out K1. The generator set runs for 5 minutes (programmable) and then shuts down the engine by opening the electric governor relay (EGR) on the GSC.

The short circuit (SC) and overload (OL) contacts are part of the OL/SC module. In the event the output current goes above 130% of maximum (overload condition) or 400% of maximum (short circuit condition) the appropriate contacts will open, de-energizing KR and K1. This will disconnect the load. The GSC directly controls the Generator Fault Relay (GFR). If the GSC detects a generator fault, the GFR output energizes the GFR relay and KR and K1 are de-energized, disconnecting the load from Generator G1. The paralleling relay (PAR) is connected to an auxiliary set of contacts on K1 only when the PARALLEL/UNIT switch is in PARALLEL. Contacts on the paralleling relay connect Load Sharing Module (LSM) A4 to the paralleling connectors and hence to the LSM in all other generators in parallel. The press-to-test lamp above the AC Interrupt switch is connected to a set of auxiliary contacts from K1 to indicate when K1 is energized. A line from this connection goes to a spare input of the GSC (P7-25) to tell it that K1 is closed.

AC POWER DISTRIBUTION (FIGURE FO-1, SHEETS 4 AND 5)

Generator G1

Generator G1 is a three phase Y-connected generator with two sets of coils. When these coils are placed in parallel, the generator is capable of 208 Vac phase-to-phase and 120 Vac any phase-to-ground. If connected in series the generator will put out 416 Vac phase-to-phase and 240 Vac any phase-to-ground. The reconnection board does this changeover from series to parallel connection. The reconnection board (FO-1, Sheet 4) is shown pictorially rather that schematically. Note that the references T3, T6, etc. relate to the numbers on the generator output wires. They are labeled 3, 6, etc correlating with T3, T6, etc. Electrically, T3 is connected to Reconnection Board TB1 terminal labeled 3, T6 is connected to Reconnection Board TB1 terminal labeled 6, etc. There are metal bus bars riveted to Reconnection Board TB1 that short between the generator wires in order to connect the generator coils in parallel for 120/208 mode or in series for 240/416 mode. The bus bars are shown in dotted lines on the schematic. There is also a bus bar connecting terminals labeled 10, 11, 12, and 13. These are all connected to the common wire #10 (Ground) and wire 110 coming in and going out of Reconnection Board TB1.

AC POWER DISTRIBUTION (FIGURE FO-1, SHEETS 4 AND 5)

The output of Reconnection Board TB1 goes through several current transformers, relay K1 (shown as a circuit breaker) and then to the load connection board. The coil of K1 is shown on the DC circuits (FO-1, Sheet 2 and Sheet 3). There are filters and varisters connected between the outputs and chassis ground. A removable jumper on the load connection board connects the chassis ground (which will be externally connected to a grounding rod) and the neutral line out of the generator.

If the PARALLEL/UNIT switch is set to UNIT, setting the AC CIRCUIT INTERRUPTER switch to CLOSED will apply ground to KR, which will close Load Contactor K1, as long as DBHI and DBLO are closed. Auxiliary contacts on K1 latches KR on after KR is energized. DBHI and DBLO are relays on the final generator output (after the load contactor K1) which monitor the output for presence of voltage. If there is no voltage on the load bus, these relay contacts will be closed. If either 208 or 416 Vac are detected by these relays, one or the other contacts will be open and closing of the AC CIRCUIT INTERRUPTER switch will not apply ground to KR. This will inhibit closing the Load Contactor K1. Note that DBHI and DBLO have no affect after KR is latched on.

Digital Voltage Regulator (DVR) A3

DVR A3 monitors the output of the generator G1 prior to Reconnection Board TB1 and regulates the output of the generator according to the parameters programmed into it. The voltage from wires G1-7, G1-8, and G1-9 is connected to the DVR. Also, PT2 measures the voltage between G1-7 and G1-8, divides the voltage in half, and connects this to the DVR. PT3 is the same as PT2, except measures the voltage between G1-8 and G1-9. Fuses F1, F2, and F3 protect PT2 and PT3. Whether the generator is connected for 208 or 416 Vac output, the DVR is monitoring the same voltage. Cross current compensation transformer (CCCT) monitors the current in wire G1-8 and G1-2 from the generator. This total current will not change whether the generator is connected for 208 or 416 Vac output. CCCT generates a voltage across a 1 ohm resistor A7R2 at a rate of 1.25 Vac per 100A. The voltage across this 1 ohm resistor is input to the DVR. Rheostat VAR (Voltage Adjust Rheostat) is connected to the DVR to allow the user to adjust the voltage approximately ± 10%. (This control is labeled VOLTAGE on the front panel.) Power for the DVR comes from the battery (FO-1, Sheet 2 and Sheet 4). The DVR monitors the output voltage from the generator and applies a voltage to the field coil (F+ and F-) on the generator in order to regulate the output voltage of the generator. Essentially, the higher the voltage applied to the field, the higher the output voltage of the generator. The nominal voltage across this coil is 4.6 Vdc at no load and approximately 14 Vdc at full load. The voltage for the field coil actually comes from the generator output through PT2 and PT3. Because of this, a Field Flash circuit provides an excitation at the initial startup of the generator set to start this process. The connections J and K to the field coil circuit come from the Field Flash circuit (FO-1, Sheet 2). This circuit provides an initial voltage excitation to the field in order to get an initial output from the generator. Without this excitation the generator will not produce power capable of supplying a load.

Load Sharing Module (LSM) A4

Three current transformers, CT-7, CT-8, and CT-9, monitor the current from the generator and supply input signals to LSM A4 and the overload (O/L) and short circuit (S/C) module. The output of each current transformer goes through a resistance on LSM A4, then through a resistance on the O/L and S/C module. A voltage is generated across the input of each module for control purposes. LSM A4 is also connected to lines G1-7, G1-8, and G1-9 from the generator and monitors the voltage out of Generator G1 before Reconnection Board TB1. The paralleling input (pins 10, 11, and 12) is repeated completely in the DC circuits (FO-1, Sheet 3) and was discussed there. The ISOCHRONOUS/DROOP switch is connected to LSM A4 through an auxiliary set of contacts on relay A4K1.

Ground Fault Circuit Interrupter (GFCI)

The GFCI picks up one phase (G1-9) from Generator G1 before reconnection board TB1 and connects 120 Vac to a standard 2 gang outlet on the rear of the generator set on the paralleling receptacles panel (WP 0002, Figure 1, Sheet 3) next to the control panel. This is for a trouble light or other auxiliary components.

AC POWER DISTRIBUTION (FIGURE FO-1, SHEETS 4 AND 5) - Continued

GSC Voltage and Current Monitoring

Three current transformers (CT1, CT2, and CT3) measure the current out of Generator G1 after Reconnection Board TB1. The outputs of these current transformers are connected to three transformers located on AC Transformer Box (ATB) A5. The outputs of these transformers go to the GSC for monitoring Generator G1 output current. Lines G1-1, G1-2, and G1-3 from Generator G1 output after Reconnection Board TB1, are connected to transformers T1, T2, and T3 on ATB A5 through protection fuses. The GSC monitors the outputs of these transformers to monitor the output voltage of Generator G1. Two transformers (T1 and T2) on Bus Transformer Box (BTB) A6 monitor the load bus voltage on the output after Load Contactor K1; and their outputs are connected to the GSC. The inputs are fused for protection.

Dead Bus Low (DBLO) and Dead Bus High (DBHI) Monitoring

Relay DBHI is connected after Load Contactor K1 between L1 and L3 (K1A2 to J31-19 and K1 B2 to J31-8) to monitor for voltage on the load bus (the output of the generator set). DBLO energizes if 208 Vac is present on the load bus. DBHI energizes if 416 Vac is detected on the load bus. R3 reduces the voltage seen by the 230 Vac coil of DBHI so that it will only energize if it sees 416 Vac. DBHI will not energize at 208 Vac. One set of contacts on DBHI is used to remove the 416 Vac from the coil of DBLO in order to protect the coil from excessive voltage. The other contacts for DBLO and DBHI are discussed as part of DC Power Distribution.

Overload and Short Circuit (OL/SC) Module

The OL/SC module gets a current input from current transformers CT-7, CT-8, and CT-9, which are connected before Reconnection Board TB1. This module monitors the output current and provides two sets of relay contacts for overload condition and two relay contacts for short circuit condition. Overload condition is defined as an output current over 130% of the maximum current rating of Generator G1. Short circuit is defined as an output current over 400% of the maximum current rating of Generator G1. The relay outputs of the module latch after a condition has been sensed. Setting ENGINE CONTROL to OFF will reset the latched relays on this module. Also pressing the LAMP TEST button on Alarm Module A2 will reset the relays on this module. An overload or short circuit condition causes an alarm on the alarm module and disconnects the load from Generator G1. The overload condition is disabled in Battle Short mode. The relay contacts and the power input connections for the OL/SC module are shown in the AC circuit, but the use is discussed as part of the DC Power Distribution discussion. In the DC distribution drawing, the OL/SC contacts are separate and labeled O/L and S/C respectively.

ELECTRONIC MODULAR CONTROL PANEL (EMCP)

The Electronic Modular Control Panel (EMCP) incorporates Generator Set Control A1 (GSC), Alarm Module A2, Digital Voltage Regulator (DVR) A3, the Woodward Load Sharing Module (LSM) A4, Resistor Assembly A7, a relay module, panel switches and controls, and various terminal boards.

GENERATOR SET CONTROL (GSC)

GSC Inputs

The GSC (Figure 9) is a microprocessor based control system which accepts programmed values, switch inputs, data from ECM A8, and data from LSM A4 to control the speed of the engine. A constant engine speed maintains the desired output frequency. The GSC inputs to the Central Processing Unit (CPU) include signals from panel controls. Touch pad inputs, ENGINE CONTROL switch settings, SYNC MODE switch setting, and the

GENERATOR SET CONTROL (GSC) - Continued

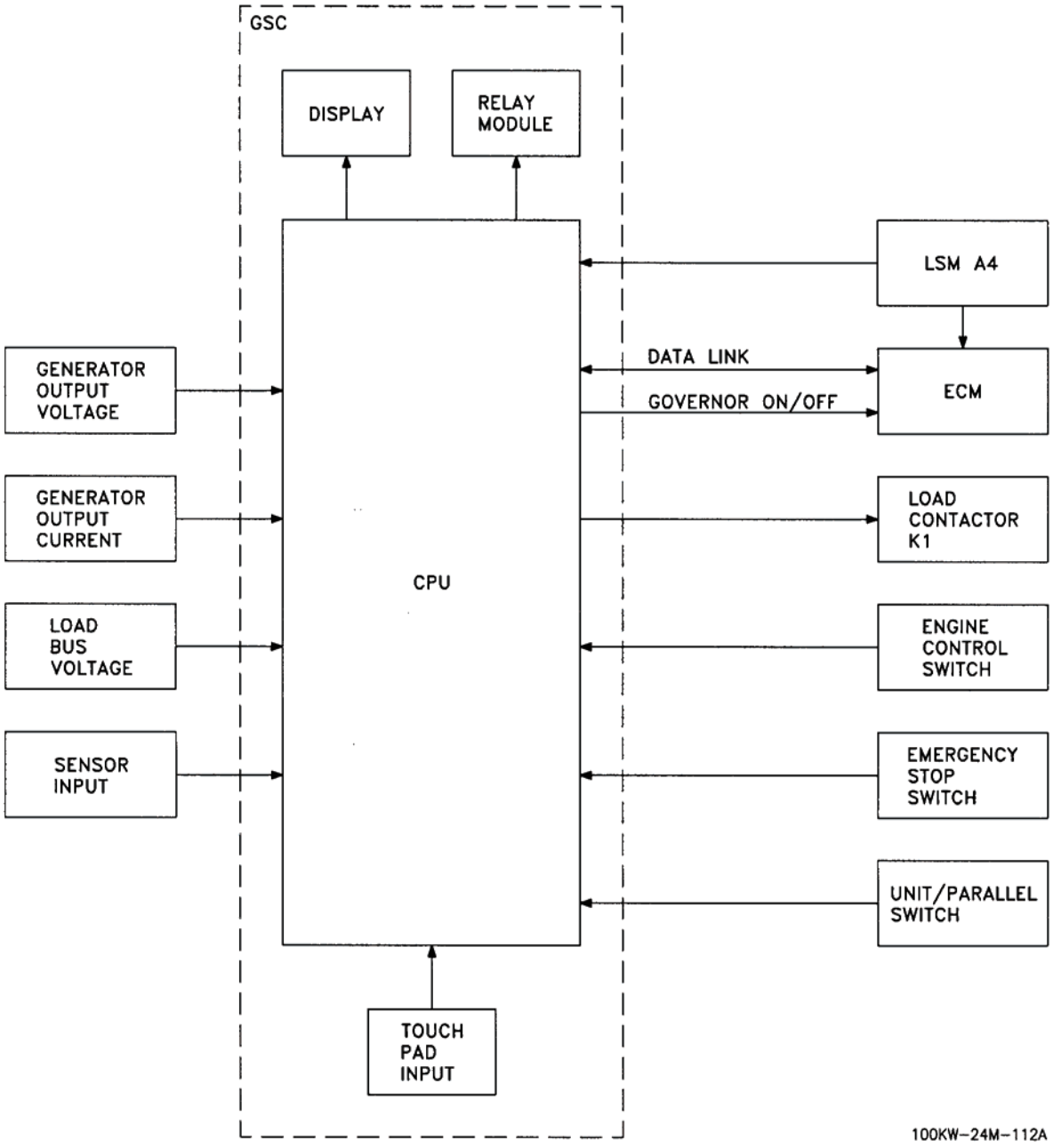


Figure 9. Generator Set Control.

PUSH TO STOP EMERGENCY STOP switch are included. External signals are input from engine sensors, generator output voltage and current samples, load bus voltage samples and the ECM. LSM A4 interacts with the GSC as well. The touch pad allows entering parameters into the GSC to determine the desired output voltage and frequency, and how the GSC reacts to various stimuli. The touch pad also allows display of all the

GENERATOR SET CONTROL (GSC) - Continued

generator set voltages, currents, and calculated power levels, real and reactive. The generator output voltage, current, and load bus voltage are monitored and can be displayed on the EMCP displays as desired. LSM A4 monitors the load that the generator powers and allows fine tuning of that load sharing via a speed setting potentiometer. The LSM sends a speed correction signal to the GSC in order to fine tune the speed based on the load sharing of the generator. This is utilized primarily when the generator set is in parallel with another generator. Most engine sensors are connected to the engine control unit and their status transmitted to the GSC via the CAT Data Link. One engine speed sensor and a low fuel level sensor are directly connected to the GSC. The engine speed sensor provides positive feedback to the GSC that the engine is operating at the desired speed. The low fuel sensor initiates a controlled shutdown before the engine runs out of fuel. The ENGINE CONTROL switch determines whether the engine is to start, stop, or run. The SYNC MODE switch (called System Mode Switch (SMS) in electrical descriptions) determines the mode of operation with regards to the paralleling capability. The PUSH TO STOP EMERGENCY STOP pushbutton (also called Emergency Stop Push Button (ESPB)) immediately stops the engine and should only be used in an emergency. ECM sends alarm signals to the GSC for any sensors that are directly connected to the ECM.

GSC Outputs

The GSC outputs signals to the display, the ECM, Load Contactor K1, and the EMCP relay module. The GSC display consists of an upper display, a lower display, and a column of indicators to the left of the upper and lower displays. The upper display shows the average voltage, frequency, and total current the generator set is putting out. By pressing the AC METER key on the touch pad, the upper display can display: line-to-line voltage, generator frequency, and current for each phase; voltage line-to-line for all three phases; line current for all three phases at once; or voltage line-neutral for all three phases at once. The upper display is also used to display any fault codes identified by the GSC or by the ECM.

GSC Displays

The GSC lower display is capable of displaying one of the following:

Total Real Power (kW)
Total reactive power (KVAR)
Total apparent power (kVA)
Percentage of rated power (%kW)
Power factor (average)
Total energy output (kW/h)
Total reactive energy output (kVARHr)
Real Power Phase A (kW)
Real Power Phase B (kW)
Real Power Phase C (kW)
Power Factor Phase A
Power Factor Phase B
Power Factor Phase C

The lower display also has a series of arrows pointing downward to symbols printed below the display. These arrows appear in order to indicate alarm conditions sensed by the GSC and/or ECM. The lower display also lights up designations K1, K2, etc to indicate the condition of relays K1 through K8 in the relay module internal to the GSC (Table 1). When a particular symbol appears, the associated relay is energized. This is strictly status and is helpful when troubleshooting. An additional feature of the lower display is that of a synchroscope. When manually synchronizing the generator output to another generator, the phase relationship between the generator and the voltage on the load bus are shown graphically on the lower display. This allows the two systems to be brought in sync before bringing the generator on line.

GENERATOR SET CONTROL (GSC) - Continued

Table 1. GSC Display Relay Identification.

A1 RELAY	NAME	LIGHTS WHEN
K1	Electronic Governor Relay (EGR)	On whenever ECM is enabled (engine is running). (Output is not used) Internal connection shorts across ENGINE CONTROL switch so that power can not be removed from GSC while engine is running.
K2	Generator Fault Relay (GFR)	On when a generator fault is detected. Engaged to disconnect the load.
K3	Crank Termination Relay (CTR)	On when the engine is running on its own (and the starter should be released). Output is not used.
K4	Starting Motor Relay (SMR)	After ENGINE CONTROL is set to START, K4 is on while starter is cranking. Goes out after 10 seconds or after engine is detected as running. If engine does not start, light goes off for 10 seconds, then comes back on for 10 seconds trying again to start the engine.
K5	Run Relay (RR)	On whenever the engine should be running.
K6	Air Shut Off Relay (ASR)	On during fault shutdowns. Not used.
K7	Fuel Control Relay (FCR)	On when engine should be running. Output not used. Internal connection shorts across ENGINE CONTROL switch so that power can not be removed from GSC while engine is running.
K8	Programmable Spare Relay (PSR)	On when alarm condition occurs that would cause the GSC to disconnect the load.

The column of indicators at the left side of the GSC indicate impending problems or what condition caused a shutdown. The ECM resides on the engine and controls the operation of the engine, such as starting, stopping, speed control through fuel control, ignition timing, and monitors various sensors on the engine. Problems diagnosed by the ECM are sent via the CAT Data Link to the GSC and displayed on the GSC display with an E suffix to identify them as engine diagnosed. The GSC sends a speed control signal and a governor on/off signal

GENERATOR SET CONTROL (GSC) - Continued

to the ECM to control the speed of the engine, which determines the frequency of the output from the generator. The GSC monitors various sensor outputs, plus the ECM sensors to enable or disable connecting the generator to the load via Load Contactor K1. The GSC is also able to disconnect the generator from the load via Load Contactor K1 in the event that the ECM or the GSC detects a failure that would keep the generator set from performing its duty.

The GSC is a multi-purpose controller meant to be interfaced with a wide range of engine types and configurations. The output from the GSC goes to a relay module inside the GSC and these relay outputs are interconnected to the rest of the control system (refer to DC Power Distribution discussion for this interface). There are also spare inputs and outputs described in the DC Power Distribution discussion. One of the purposes of the GSC is to determine when the generator output is synchronized well enough with the voltage on the load bus in order to connect the generator to the load. This can be done automatically or manually with the aid of the synchroscope feature of the GSC.

DIGITAL VOLTAGE REGULATOR (DVR A3) MODULE OPERATION

DVR A3 (Figure 10) is a microprocessor based, digital voltage regulator. The regulator is specifically designed to regulate the output voltage of a generator in an engine/generator set arrangement. The DVR consists of a touch pad, digital display, CPU, voltage and current monitoring circuits and field drive circuits.

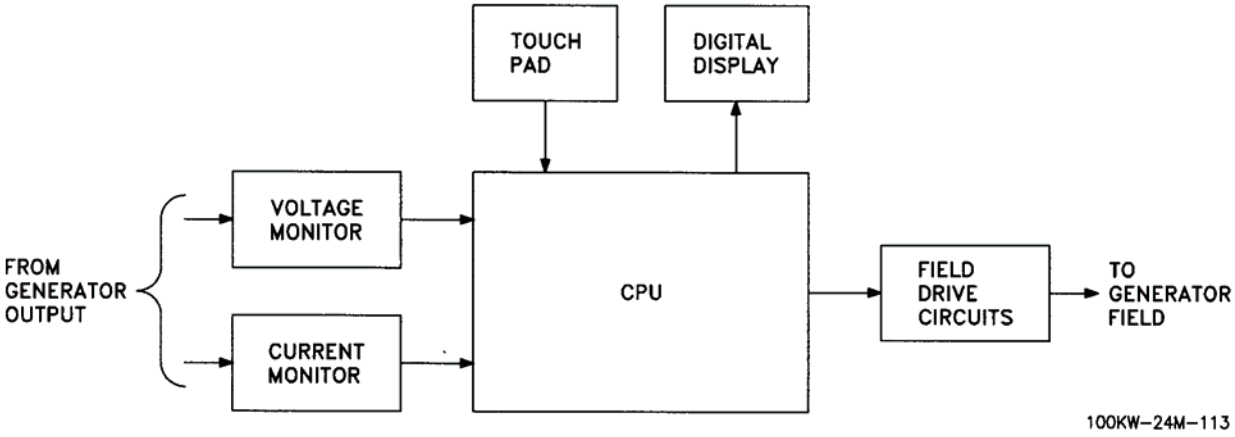


Figure 10. Digital Voltage Regulator.

Touch Pad and Digital Display

The touch pad allows the user to input operating and alarm parameters into the DVR and to check alarm conditions past and present. When power is applied, :01 is displayed. This is the generator output Voltage Parameter. The touch pad allows the user to access the following data, which is displayed on the digital display:

- Voltage
- Frequency
- Current
- Reactive Output Power
- Generator Real Current
- Exciter Field Current
- 3 Phase kVAR
- Hours
- Software ID
- Latest Fault
- Previous Fault

DIGITAL VOLTAGE REGULATOR (DVR A3) MODULE OPERATION - Continued

CPU

The CPU contains the program which monitors generator output voltage and current, determines how much drive current to supply the generator field in order to maintain desired output voltage, and monitors generator operation. Alarm conditions are displayed on the digital display.

Voltage and Current Monitoring Circuits and Field Drive Circuits

The generator output is monitored for voltage and current. This data is input to the CPU where the data is compared to the desired output from the generator. The field drive circuits provide field excitation current for the generator, which regulates the output voltage of the generator.

Startup Profile

The DVR operates under one of two operational profiles. When the DVR senses that the generator is starting to produce voltage, the Startup profile is used. When the output frequency has increased above the knee frequency (programmable), the DVR will switch over to the Loading and Stopping profile.

In the Startup Profile (Figure 11) the DVR will follow a 1:1 V/Hz profile after generator frequency (engine speed) has increased above the under frequency point (parameter: 10). This profile continues until the frequency reaches the knee frequency (parameter :06). Once the knee frequency has been reached, the generator will be regulated by the DVR to produce full rated voltage, as set by parameter :01. The DVR then switches to the loading and stopping profile.

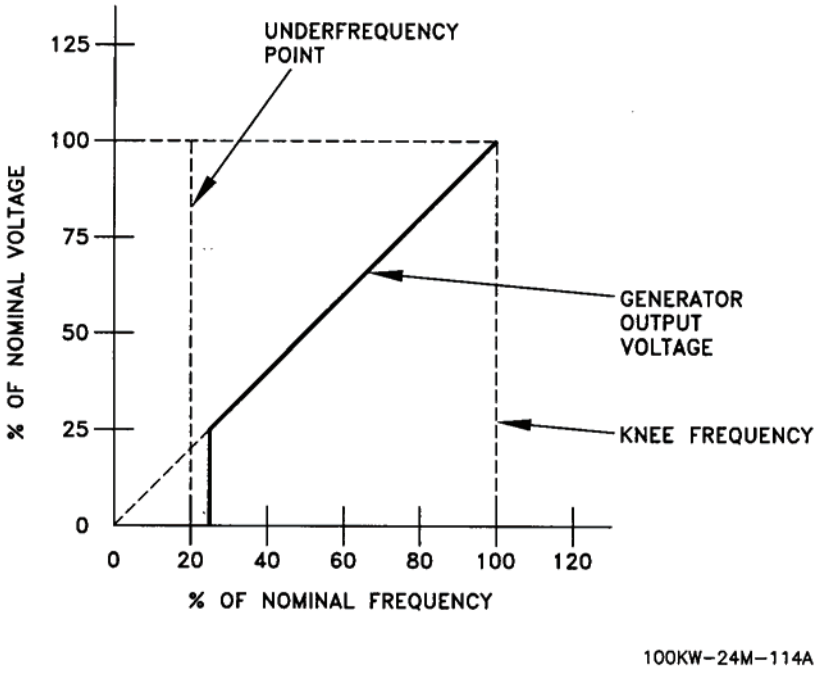


Figure 11. DVR Startup Profile.

DIGITAL VOLTAGE REGULATOR (DVR A3) MODULE OPERATION - Continued

Loading and Stopping Profile

Loading

The loading and stopping profile (Figure 12) defines how the DVR will react to a reduction in frequency below the knee frequency. A drop in frequency from the generator is usually due to one of two occurrences: either a heavy load was applied which will take the generator a few seconds to recover from, or the engine driving the generator is shutting down. In either case, the DVR reduces the generator output voltage. The reduction in voltage reduces the power requirement of the load, thus allowing the engine to recover faster for a given increase in load.

The rate at which the DVR reduces the output voltage is called Decreasing V/Hz Slope 1 and is set to 3 V/Hz by parameter :07. This rate is effective when the generator frequency is no more than 5 Hz below the knee frequency.

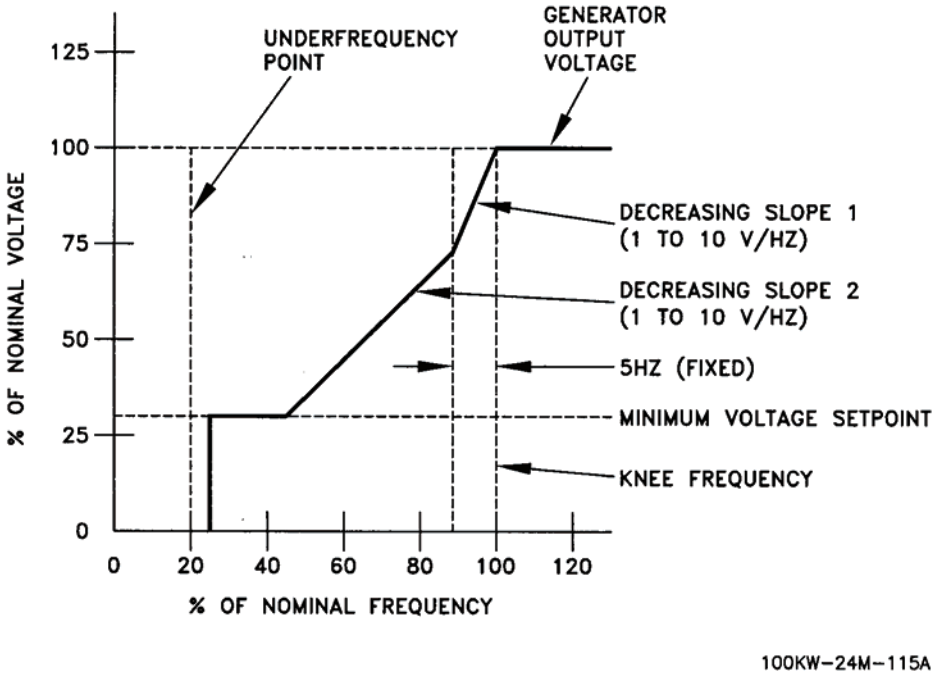


Figure 12. DVR Loading and Stopping Profile.

Stopping

If the frequency drops below 5 Hz below the knee frequency, the generator set is assumed to be shutting down. The DVR will reduce the output voltage further using a parameter called Decreasing V/Hz Slope 2, which is set to 2 V/Hz by parameter :08. This rate is effective until the generator gets to the minimum voltage setpoint (parameter :09). This is the lowest voltage the DVR will attempt to regulate. The voltage will attempt to regulate at this point until the frequency gets to the under frequency point (parameter: 10) at which point the voltage will decrease to a minimum value.

DIGITAL VOLTAGE REGULATOR (DVR A3) MODULE OPERATION - Continued

Voltage Droop When Connected In Parallel

When generators are operated in parallel, the engine speed regulator (i.e. GSC via LSM A4) controls the sharing of the real power requirements (kW) of the total system load. The DVR controls the sharing of the reactive power requirements (kVAR) of the total system load. If the output voltage of one generator is set slightly higher than the other(s), it will supply lagging reactive current to the other generators in the group. This current will circulate between the generators, possibly causing ampere overloading. One method of minimizing this effect is to cause an individual generator output to sag, or "droop", in proportion to the lagging reactive current flow from it. As reactive lagging generator output current increases, the DVR will cause the output voltage to droop (voltage will decrease) proportionally. If the measured reactive output current is leading, the output voltage will rise (voltage will increase) proportionally. In either case, this action will reduce the reactive current for better KVAR sharing with other units. The droop percentage (parameter :30) determines how much the generator output voltage will vary for a given amount of reactive current.

LOAD SHARING MODULE (LSM A4) INTERNAL OPERATION

The LSM consists of load power monitoring, load comparator, sync dynamics summer, speed trim summer, pulse width modulation (PWM) output, A4K1 relay, circuits and a power supply for internal circuitry.

Load Power Monitoring

The output of current transformers CT-7, CT-8, and CT-9 is input to the load power monitoring circuit. Each current is multiplied by the voltage monitored at pins 1, 2, and 3 of the LSM to generate voltages proportional to the power in each phase of the output. These voltages are summed and input to a variable gain amplifier. The amplifier can be calibrated, using the load gain potentiometer, to compensate for variations in components. The output of the amplifier is input to the load comparator circuit.

Load Comparator Circuit

The load signal connection to the load comparator circuit on pins 22 and 23 is used for setup only. The load sharing lines input (pins 10 and 11) to the load contactor circuit are connected to the paralleling connectors J32 and J33 in this generator set. Therefore, this point is connected to all other LSM in other generators. This connection is made through J32, J33, the paralleling relay PAR in the generator set, and A4K1 in this module. Refer to DC circuits (FO-1 Sheet 2 and Sheet 3) for interconnections external to LSM. By connecting the load sharing lines of this module to those in other generator sets (via the paralleling cables), the load signal voltage is balanced with the other generator sets connected here. The load comparator circuit has a load gain potentiometer to adjust each generator set load signal so that the load signal voltage of each is the same at full load. This compensates for different CT ratios or different generator set sizes. In droop mode (A4K1 not energized), some of the power signal from the variable gain amplifier is subtracted from the main power signal by the differential amplifier in the load comparator circuit. The setting of the Droop potentiometer (only active in Droop) controls the amount in the load comparator circuit. This reduces engine power according to the droop percentage set by this potentiometer.

Sync Dynamics Summer

The sync input (pins 24 and 25) comes from the GSC and is a ±5 Vdc signal developed to control the speed of the engine (and hence the generator). This signal is processed by the sync dynamics circuit and summed with the output of the load comparator circuit.

LOAD SHARING MODULE (LSM A4) INTERNAL OPERATION - Continued

Speed Trim Summer

The speed trim potentiometer is the FREQUENCY potentiometer on the EMCP and permits manual adjustment of the load or frequency of the generator. This signal is summed with the output of the sync dynamics summer and input to the PWM circuit. The potentiometer can trim the frequency of the generator output approximately 10% above and below nominal in unit mode. In parallel mode, the potentiometer can change the load demand if in droop mode also.

Pulse Width Modulation (PWM) Output

The PWM circuit takes the sum of all the inputs and converts the analog voltage level to a PWM signal for driving Engine Control Module (ECM), setting the engine speed. The frequency is approximately 500 Hz. The duty cycle ranges from 10% for lowest decrease in speed or load, to 90% for maximum increase in speed or load percentage. The duty cycle varies according to the magnitude of difference between the desired load and the actual power generated.

Relay A4K1

Relay A4K1 is energized when the ISOCHRONOUS/DROOP switch is in ISOCHRONOUS and the load contactor is energized. The contacts of A4K1 connect the load sharing input/output to the load comparator circuit. The 24 Vdc input from the batteries is converted to a plus and minus power source (+V and -V) and a plus and minus reference supply (+VR and -VR) for the amplifiers in the module. In a non-paralleled condition, or when the ISOCHRONOUS/DROOP switch is in DROOP, the load comparator circuit is not connected to the load sharing lines. A4K1 is open in Droop mode and the external PAR relay disconnects this output from any other generators in Unit mode. In this configuration, the power measured by the load power monitoring circuits are summed with the Sync input from the GSC and the speed trim potentiometer and the PWM output generated from that signal. In a paralleled condition, you must be in isochronous mode in order to connect the load sharing lines to at least one other (possibly more) LSM A4. In this mode, this average load signal of all generator sets in parallel is then summed with the sync input and the speed trim potentiometer input to generate the PWM signal to the ECM. By doing this, the speed loop is biased to divide the load equally between paralleled generator sets.

In a paralleled condition with Droop enabled, the frequency will vary with load. To minimize this, one generator must be in isochronous mode. This generator set maintains the frequency of the system. On the paralleled generator sets in droop mode, the droop percentage set into the LSM by the droop potentiometer and the speed setting determine the load that is carried by the individual generator.

GENERATOR

The generator (Figure 13) is a brushless, self-excited, externally voltage regulated, synchronous AC generator. The generator consists of five major components: the main stator (armature); main rotor (field); exciter stator (field); exciter rotor (armature); and rectifier assembly. The DVR controls generator output. The generator exciter consists of a stationary field and a rotating armature. The DVR applies voltage to the stationary field (exciter stator). The exciter armature generates an AC voltage that is rectified by the rotating rectifier assembly, converting it to a pulsating DC signal. This DC is applied to the main rotor (field). As the generator shaft rotates, the main rotor (field) induces a voltage into the main stator (armature). The main stator's voltage output is sampled and compared to the programmed desired value in the DVR. The exciter field power is increased or decreased in order to regulate the main stator output to the desired value. There are four poles on the generator. There are two + poles and two - poles. During each revolution of the generator, two complete sine waves are produced by the alternating +, -, +, - poles. For 60 Hz operation, the generator shaft will have to turn 60 ÷ 2 revolutions per second (rps) = 30 rps. Engine speed is in rpm, therefore 30 rps x 60 seconds per minute = 1800 rpm engine speed required for 60 Hz operation. 50 Hz operation is the same process (or 50 ÷ 60 x 1800 = 1500 rpm). Note that an excitation is required to get the process started. This excitation, also known as a Field Flash, is described in the DC Power Distribution section. Since there is no permanent magnet structure in the generator assembly, a voltage spike is applied to the exciter field (stator) to ensure that the regulation process gets off to a good start. This generator is built with 2/3 pitch main stator windings and full Amortisseur (damper) windings. These features make the generators suitable for parallel operation when used with the proper voltage and load regulating devices.

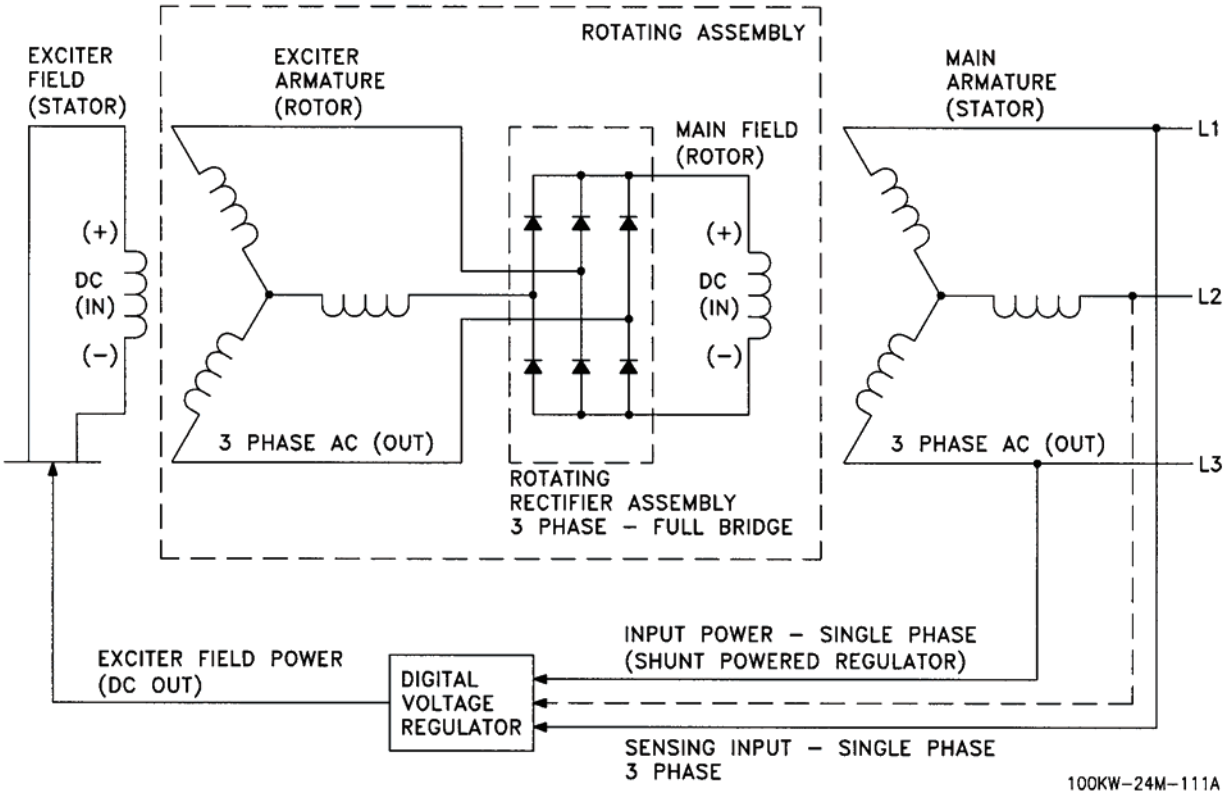


Figure 13. Generator.

WINTERIZATION KIT (FIGURE FO-1, SHEET 6)

There are two components of the winterization kit (Figure 14). One is the LCD display heaters and the other is the fuel-fired coolant water heater and pump. The LCD display heater consists of HTR1 and HTR2. These heaters receive power from one of two directions. There is a thermostatic switch (TS) in the control panel that closes when the temperature falls below -20°F ±10°F (-28.9°C ±5.6°C). This switch applies +24 Vdc power to HTR1 and HTR2 in order to keep the liquid crystal displays (LCD) in the GSC and DVR from freezing. Note that this power is only available when the ECS is NOT in OFF. There is also a connection to the winterization control box that will apply power to these resistors any time the winterization system is turned on at the control panel.

The second component of the winterization kit is a fuel-fired coolant water heater and pump. The heater burns fuel from the main fuel tank in order to heat the coolant. The coolant is circulated through the engine in order to prevent it from freezing. When the fuel-fired heater is turned on, an internal combustion blower starts, the water pump begins circulating coolant, and the preheating phase of the glow plug is started. After approximately 60 seconds, the heater fuel pump starts to add fuel to the combustion chamber. The fuel/air mixture ignites. The speed of the air fan increases as well as the fuel pump speed through four stages. Low, Med, High, and Power in order to bring the combustion chamber up to operating temperature.

The glow plug protection circuit has a flame detector, which will restart the heater if no flame is detected. If no flame is detected twice, the heater is shut down and power must be cycled OFF and back ON to restart. The heater continues to operate in the Power mode until either the temperature exceeds 162°F (72°C) or 2 hours has elapsed (maximum time allowed in Power mode). The heater then switches between the four modes, as required based on temperature of the coolant (which relates to heat necessary to raise the temperature of the coolant).

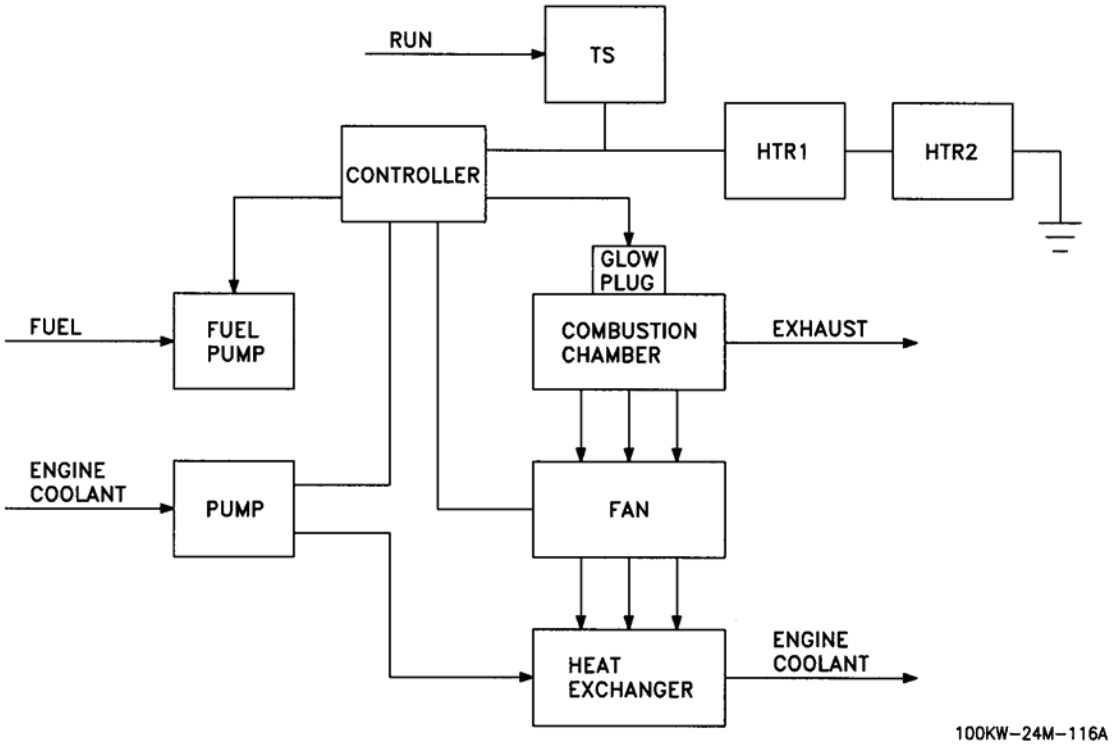


Figure 14. Winterization Kit.

COMMON TOOLS AND TEST EQUIPMENT

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

SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Special Tools; Test, Measure, and Diagnostic Equipment (TMDE); and support equipment are needed for unit and direct support maintenance. They are listed in the Repair Parts and Special Tools List (RPSTL), TM 9-6115-729-24P, and in the Maintenance Allocation Chart (MAC) in WP 0119.

REPAIR PARTS

Repair parts are listed in the TM 9-6115-729-24P.

END OF WORK PACKAGE

CHAPTER 2

FIELD LEVEL
TROUBLESHOOTING PROCEDURES

CHAPTER 2

FIELD LEVEL TROUBLESHOOTING PROCEDURES

WORK PACKAGE INDEX

FIELD LEVEL TROUBLESHOOTING
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
INTRODUCTION

MALFUNCTION/SYMPTOM INDEX

The Field level troubleshooting Malfunction/Symptom Index (WP 0005) lists common malfunctions found during Field level maintenance of the 100 kW Tactical Quiet Generator (TQG). Identify the malfunction/symptom that best describes your problem and then turn to the Troubleshooting Procedures (WP 0006 thru WP 0013). Follow each step in sequence through the corrective actions listed in the troubleshooting procedures table until a fault is identified and resolved.

NOTE

Before you use troubleshooting procedures, be sure you have performed PMCS.

TROUBLESHOOTING PROCEDURES

The Troubleshooting Procedures (WP 0006 thru WP 0013) contain procedures that identify symptoms and malfunctions, that are followed by corrective actions required to return the 100 kW TQG system to normal operation. The troubleshooting procedures cannot list all possible symptoms or malfunctions or the tests and inspections required for corrective action. If a malfunction is not listed or is not corrected by the listed corrective actions, notify your supervisor. Before using troubleshooting be sure you have performed PMCS.

The work package INITIAL SETUP outlines what is needed for the task as well as certain conditions which must be met before starting the task. Don't start a task until the following conditions exist:

1. You understand the task.
2. You understand what you are to do.
3. You understand what is needed to do the work.
4. Ensure that you have the correct manual, all related manuals, and test equipment.

The work package troubleshooting procedures have three divisions: SYMPTOM, MALFUNCTION, and CORRECTIVE ACTION. Note that the SYMPTOMs are first listed in the Malfunction/Symptom Index (see WP 0005).

SYMPTOM: Symptoms are the indication that the generator set is not operating properly or at peak performance. The symptom can be an electronically displayed fault code, an alarm or shutdown of the generator set, a visual observation or a sound. Symptoms tell you that there is a problem.

MALFUNCTION: The malfunctions cause the symptom. In the troubleshooting procedures MALFUNCTIONs are presented in order of the most likely cause for the SYMPTOM. MALFUNCTION troubleshooting procedures should be performed in the order in which they appear.

CORRECTIVE ACTIONs are actions intended to correct the problem. The CORRECTIVE ACTION consists of tests and inspections and any steps you take to isolate the malfunction. A test or inspection leads to a corrective action. These are the "if" statements that tell you what to do when the malfunction is not fixed. For Army, corrective action is accomplished by submitting a 5988E to the TAMMS clerk and the clerk processing a job order, with the unit or direct support (Field Level) maintenance team. For Marine Corps, corrective action is accomplished by submitting a NAVMC 10560. For Air Force, corrective action is accomplished by submitting an AFR 66-1 maintenance reporting form.

Repairable LRUs or secondary repairables (for Marine Corps) shall be turned-in, in accordance with official supply procedures.

TQG TROUBLESHOOTING

The 100 kW TQG set electronics has continuous self-testing capability. Most problems with the generator set will generate a fault code that is displayed on the Generator Set Control (GSC) or the Digital Voltage Regulator (DVR). The troubleshooting procedures for the 100 kW TQG are broken into six separate Work Packages (WP):

WP 0006 GSC Alarm Indicators and Fault Code Troubleshooting Procedures
WP 0007 SP Fault Code Troubleshooting Procedures
WP 0008 AL Fault Code Troubleshooting Procedures
WP 0009 GSC Fault Code Troubleshooting Procedures
WP 0010 DVR Fault Code Troubleshooting Procedures
WP 0011 Failures Without a Fault Code Troubleshooting Procedures
WP 0012 Electronic Technician (ET) Troubleshooting Software Installation
WP 0013 Electronic Technician (ET) Troubleshooting Procedures.

Before trying any fault isolation, make note and record all of the fault codes displayed on the GSC and DVR. Also, note and record any fault lamps that are lit on the GSC and the alarm module.

The failure analysis here usually assumes a single fault code indication. Because of extensive self-testing capability, a single failure will often generate multiple fault codes (e.g. a failure of a power supply will generate a failure code for all of the sensors powered up by that power supply). It may be necessary to read through all of the associated fault isolation procedures prior to starting in order to assess the fault location.

The voltages and currents in the 100 kW TQG are dangerous and capable of causing death instantaneously. The engine and generator set are heavy and represent enormous mechanical power. Refer to the WARNING SUMMARY before attempting to troubleshoot system. The following warnings, cautions, and notes should be read and followed during all attempts at troubleshooting.

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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 can cause injury to personnel and damage to equipment.

Dangerously high voltage can exist across current transformer (CT) output with engine running. CT could explode if disconnected from load with engine running. Do not disconnect CT with generator rotating. Failure to comply can cause serious injury or death to personnel.

TQG TROUBLESHOOTING - Continued

WARNINGS - Continued

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 can cause injury or death to personnel.

GSC ALARM INDICATORS AND FAULT CODE TROUBLESHOOTING

For troubleshooting using the fault identification displayed by the GSC you must first note the condition of the various lamps and displayed information on the GSC displays.

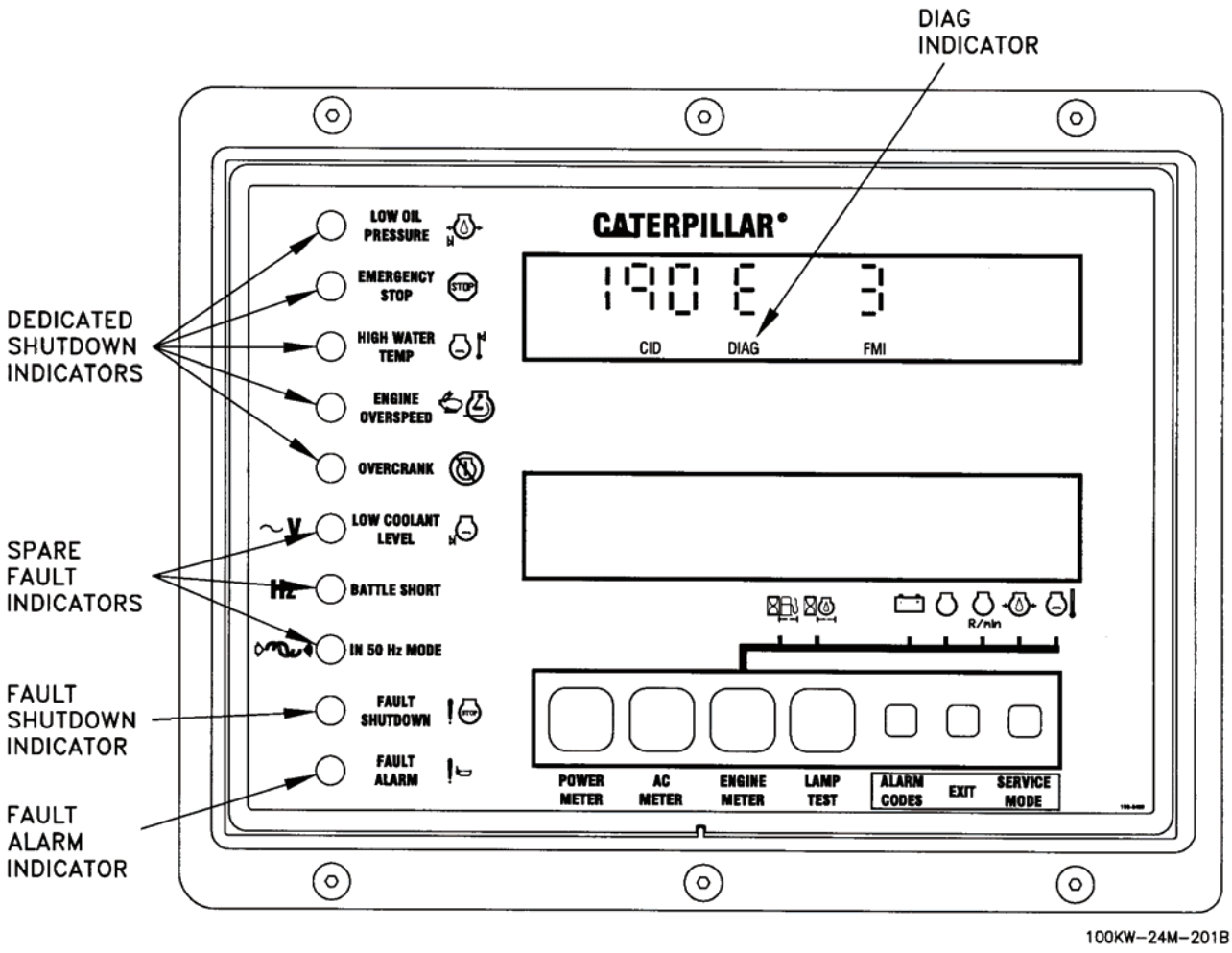


Figure 1. Generator Set Control (GSC) Displays and Dedicated Alarm Indicators.

GSC ALARM INDICATORS AND FAULT CODE TROUBLESHOOTING - Continued

Dedicated Shutdown Indicators	Starts flashing when alarm condition is detected. Lights continuously after shutdown.
Fault Shutdown Indicator	Flashes to indicate system was shut down due to a fault.
Fault Alarm Indicator	Flashes to indicate an alarm condition. Component Identifier (CID) and Failure Mode Identifier (FMI) codes will be displayed on the upper display to identify what is wrong. The CID identifies the component that has a problem, the FMI describes the nature of the failure.
DIAG Indicator	Flashes while there is an active Alarm condition. The diagnostic code should be displayed. Lights continuously when there is an inactive alarm condition or inactive shutdown condition. The diagnostic code is inactive and the CID and FMI were recorded in the Fault Log. If not lit, there are no diagnostic codes available.

There are two basic types of faults: Active and Inactive. An active fault is one that is occurring now, an inactive fault is a fault that has occurred previously.

GSC diagnostic codes are associated with failed components or circuits that provide information to the GSC or that receive information from the GSC. Each diagnostic code consists of the following:

- A component identifier (CID) code
- A failure mode identifier (FMI) code
- The DIAG indicator lit

Two types of faults have diagnostic codes associated with them: alarm faults and shutdown faults. When a fault occurs that has a diagnostic code associated with it, the DIAG indicator flashes, then the GSC flashes either the fault alarm indicator, or the fault shutdown indicator. For a shutdown fault, the CID and FMI are shown on the upper display immediately. For a fault alarm: the ALARM CODES key must be pressed; then the CID and FMI are shown on the upper display. A flashing DIAG indicator means that the fault is presently active. When the DIAG indicator is on continuously, the fault occurred previously.

DIAGNOSTIC EVENTS AND EVENT CODES

The GSC also displays codes for diagnostic events. These event codes are in the same format as the fault codes and they can be active events and may be logged. The Symptom/Malfunction Index and troubleshooting tables show these event codes in sequence with fault codes. Often event codes are related to fault codes and the troubleshooting associated with them. Diagnostic events can be logged in the ENGINE CONTROL Module (ECM) and used to investigate engine malfunctions. Event codes indicate problems with the engine performance and are symptoms to be investigated. They can also relate directly to required maintenance services or actions.

GSC FAULT CODES

Component Identification (CID) Codes

CID codes are displayed on the GSC Upper Display during and after a fault is detected to identify the component that caused the fault. These codes are stored in the GSC fault log. If an E is shown after the CID, the diagnostic code is from the ENGINE CONTROL Module (ECM).

Fault Mode Identification (FMI) Codes

FMI codes are used with the CID codes to describe the type of failure detected. FMI codes are in accordance with SAE practice of J1587 diagnostics. These codes are stored in the GSC fault log.

FMI Code	Description
0	Data is valid but data is above normal operating range
1	Data is valid but data is below normal operating range
2	Erratic, intermittent, or incorrect signal
3	Voltage above normal
4	Voltage below normal
5	Current is below normal or circuit is open
6	Current is above normal or circuit is grounded
7	Improper Mechanical Response
8	Abnormal frequency, pulse width, or period
9	Abnormal Update
10	Abnormal rate of change
11	Failure mode is not identifiable (Mechanical Failure)
12	Failed Component
13	Device is not calibrated

FAULT LOG

The GSC has a fault log to help with troubleshooting of diagnostic codes. Inactive fault codes are recorded in the fault log for viewing later. Also, the number of occurrences is totaled and is shown on the upper display together with the CID and FMI codes. An active alarm fault becomes inactive when the problem is no longer occurring. The ENGINE CONTROL switch (ECS) must be set to OFF/RESET to reset a shutdown fault.

VIEWING FAULT LOG OP1

STEP 1. To view the fault log, set ENGINE CONTROL switch (ECS) to COOL DOWN/STOP.

NOTE

In SERVICE MODE, the buttons on the GSC keypad perform new functions as follows:

POWER METER	is Scroll Right
AC METER	is Scroll Up
ENGINE METER	is Scroll Down
LAMP TEST	is Select
ALARM CODES	is Enter

VIEWING FAULT LOG OP1 - Continued

STEP 2. Press SERVICE MODE key on GSC keypad. SERV will be displayed on upper display. OP1 will be displayed on lower display.

STEP 3. Press LAMP TEST key on keypad. If more than one diagnostic code is present, codes will scroll on display. The number of occurrences is shown above the COUNT indicator. The lower display shows value from the hour meter at the first occurrence and the last occurrence of each diagnostic code.

STEP 4. Press LAMP TEST key to stop scrolling.

STEP 5. Press POWER METER key. If more than one count of a diagnostic code is logged, the first occurrence with a corresponding value from the hour meter shows on the lower display.

STEP 6. Press LAMP TEST key. Diagnostic codes continue scrolling.

STEP 7. Press EXIT key. OP1 shows on lower display.

STEP 8. Press EXIT to return display to normal mode.

FAULT LOG CLEARING OP4

OP4 is the option for clearing an inactive fault from the fault log. After a diagnostic fault is investigated and the fault is corrected, the fault should be cleared from the fault log. Clearing the fault log prevents confusion if you are investigating later faults.

NOTE

Service mode cannot be entered when the ENGINE CONTROL switch (ECS) is set to AUTO. An active shutdown indictor will be flashing. Active shutdown indicators must be deactivated in order to access service mode.

STEP 1. Set Battery Disconnect switch to ON.

STEP 2. Set DEAD CRANK SWITCH to NORMAL.

STEP 3. On EMCP, set ENGINE CONTROL switch (ECS) to COOL DOWN/STOP.

NOTE

In SERVICE MODE, the buttons on the GSC keypad perform new functions as follows:

POWER METER	is Scroll Right
AC METER	is Scroll Up
ENGINE METER	is Scroll Down
LAMP TEST	is Select
ALARM CODES	is Enter

STEP 4. Press SERVICE MODE key on GSC. SERV will be displayed on upper display. OP1 will be displayed on lower display.

STEP 5. Press AC METER key five times. OP3 will be displayed.

FAULT LOG CLEARING OP4 - Continued

STEP 6. Press the LAMP TEST key. P E _ _ _ _ _ _will be displayed. The left-most underline will be flashing. If an error is made any time during the password entry, P E FAIL will be displayed. Password entry can be restarted by pressing LAMP TEST key.

STEP 7. Press POWER METER key. P E 1 _ _ _ _ will be displayed. The left-most underline will be flashing.

STEP 8. Press ENGINE METER key. P E 1 3 _ _ _ will be displayed. The left-most underline will be flashing.

STEP 9. Press AC METER key. P E 1 3 2 _ _ will be displayed. The left-most underline will be flashing.

STEP 10. Press ENGINE METER key. P E 1 3 2 3 _ will be displayed. The underline will be flashing.

STEP 11. Press POWER METER key. P E 1 3 2 3 1 will be displayed.

STEP 12. Press ALARM CODES key. P E PASS will be displayed.

STEP 13. Press EXIT key. OP4 will be displayed.

STEP 14. Press LAMP TEST. A CID FMI fault code and the number of occurrences will be displayed. Lower display shows hourmeter values of the first occurrence of the fault and the last occurrence of the fault.

STEP 15. Press LAMP TEST. The CID FMI fault code, hourmeter value, and fault count will flash.

STEP 16. Press and hold ALARM CODES for two seconds.

STEP 17. If there was only one CID FMI fault code, the CID FMI fault that was flashing will disappear and the upper display will be blank except for flashing SERV indicator. OP1 is shown on lower display. Proceed to step 20.

STEP 18. If there is more than one CID FMI fault code, the CID FMI that was flashing disappears. The upper display shows the next CID FMI fault code, fault count, and the hourmeter value. Repeat steps 15 thru 17 until all faults are erased. The lower display then shows OP4. Proceed to step 20.

STEP 19. Press EXIT key. OP4 will show on lower display.

STEP 20. Press EXIT key. The display will be in normal mode.

TRANSIENT CODES DURING TROUBLESHOOTING

During troubleshooting certain Work Packages may disconnect the harness from the rear of the GSC. This action will cause failure codes unrelated to the actual failure to appear. Clear these created diagnostic codes after the particular fault is corrected and the diagnostic code is cleared. When the harness connector is removed from the GSC, the following diagnostic codes are recorded in a properly operating system.

CID 100 FMI 02 engine oil pressure sensor
CID 110 FMI 02 engine coolant temperature sensor
CID 111 FMI 03 engine coolant level sensor
CID 175 FMI 03 engine oil temperature sensor
CID 190 FMI 03 engine speed sensor
CID 336 FMI 02 ENGINE CONTROL switch

TRANSIENT CODES DURING TROUBLESHOOTING - Continued

Clear diagnostic codes after the problem is investigated or the problem is corrected. This will avoid confusion during investigation of a future problem. The DIAG indicator is off when all diagnostic codes are cleared from the fault log and no active diagnostic codes exist.

DVR FAULT CODE TROUBLESHOOTING

The DVR will annunciate four types of faults. These are described in detail below.

FAULT CLASSIFICATION	DESCRIPTION
Alarm Fault	Alarm Faults indicate a condition that will not inhibit the function of the DVR and the generator set. Alarm Fault codes are in the 600's range. The generator set will continue to operate at a normal level.
Resetable Shutdown fault	Resetable Shutdown Faults indicate a condition where either DVR or generator set exhibits a degradation of performance. Resetable Shutdown Fault codes are in the 700's range. The generator set continues to operate, but at a reduced level too low to sustain load. Resetting the fault returns the DVR to normal operation. The fault code remains in parameter :92.
Non-resetable Shutdown fault	Non-resetable Shutdown faults indicate a condition where the DVR cannot be safely run. Non-resetable Shutdown Fault codes are in the 800's range. The generator set continues to operate, but at a reduced level too low to sustain load. Setting the ENGINE CONTROL switch to OFF/RESET is required to reset the fault.
Severe fault	Severe faults may indicate the failure of the DVR. Severe faults occur at power-up or when writing a new value to memory. Severe faults stop the DVR from allowing power generation. The keypad will be disabled. Severe faults cannot be reset. The DVR will have to be replaced. Severe Fault codes are in the 900's range.

Fault codes are stored in Parameters. The following DVR parameters are associated with fault isolation:

Parameter :92 - **Latest fault.** Contains the code for the most recently declared, or current, fault that has occurred after the last fault was reset. It may contain either alarm or shutdown faults.

DVR FAULT CODE TROUBLESHOOTING - Continued

Parameter :93 - **Previous fault.** Contains the fault code for the previous fault (both alarm and shutdown faults) that were in parameter :92. This parameter may contain an active alarm if an active alarm was present in parameter :92 and a shutdown fault occurred. The alarm code that was in parameter :92 would be moved here and any code that was here is overwritten. When the code in parameter :92 is cleared using the fault clear function (parameter :94), the code is moved here.

Parameter :94 - **Fault Clear.** This parameter acts like a switch to clear fault codes from latest fault parameter :92. The code that was in parameter :92 is moved to parameter :93 (previous fault) overwriting the code that was there and parameter :92 is returned to 0000.

Parameter :96 - **Shutdown Fault Reset.** Acts like a switch to reset an active shutdown fault. This will allow the DVR to begin regulation again and stop the display from flashing the fault code.

When a fault condition occurs, the fault code will flash on the DVR display. Alarm faults must be cleared using parameter :94 before another alarm fault can be declared. A shutdown fault will override an alarm fault, placing its code in the latest fault parameter (:92), and will move the alarm fault code to the previous fault parameter (:93). Parameter codes are retained during power down of the DVR.

To clear a fault, press and hold up arrow key ▲ or down arrow key ▼ to select parameter :94 on the display and press the function key ◀▶. Each time the fault clear function is activated, the display will flash three times, the code that was in parameter :92 (latest fault) is moved to parameter :93 (previous fault) overwriting the code that was there and parameter :92 is returned to 0000. The display will return to parameter :01.

To reset a shutdown fault, press and hold up arrow key ▲ or down arrow key ▼ to select parameter :96 on the display and press the function key ◀▶. Each time the fault clear function is activated, the display will flash three times, the DVR will begin regulation again, the display will stop flashing, and the display will return to parameter :01.

TROUBLESHOOTING FAILURES WITHOUT A FAULT CODE

For troubleshooting failures without a fault code refer to the malfunction/symptom index in WP 0005.

TROUBLESHOOTING USING MAINTENANCE SUPPORT DEVICE (MSD) AND ELECTRONIC TECHNICIAN (ET) TOOL

The Field level troubleshooting Malfunction/Symptom Index (WP 0005) lists symptoms and malfunctions for troubleshooting diagnostics to be performed for Field maintenance of the 100 kW Tactical Quiet Generator (TQG). Identify the malfunction/symptom and diagnostic procedure that best describes your problem and then if directed, turn to WP 0012 to set up the Electronic Technician (ET) tool and install necessary software. The ET tool allows you to perform engine specific tests for additional diagnostics contained in WP 0013. Follow each step in sequence through the diagnostic tests or inspections listed in the troubleshooting procedures table until a fault is identified and corrected.

END OF WORK PACKAGE

FIELD LEVEL TROUBLESHOOTING
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
TROUBLESHOOTING INDEX

Malfunction/Symptom **Troubleshooting Procedure**

GSC ALARM INDICATORS AND FAULT CODE

SP FAULT CODE

AL FAULT CODE

Malfunction/Symptom **Troubleshooting Procedure**

GSC FAULT CODE

Malfunction/Symptom	Troubleshooting Procedure
22. CID 168 E FMI 02 Electrical System Voltage Erratic, Intermittent, or Incorrect Signal	WP 0009
CID 168 E FMI 03 Electrical System Voltage Voltage Above Normal	WP 0009
CID 168 E FMI 04 Electrical System Voltage Voltage Below Normal	WP 0009
23. CID 169 E FMI 01 Engine Oil Maintenance Required (Active)	WP 0009
24. CID 170 E FMI 01 Fuel Filter Change Required (Active)	WP 0009
25. CID 172 E FMI 00 Inlet Air Temperature Sensor Data is Valid but Data is Above Normal Operating Range (Logged)	WP 0009
CID 172 E FMI 03 Inlet Air Temperature Sensor Voltage Below Normal Voltage Open/ Short to Batt+.	WP 0009
CID 172 E FMI 04 Inlet Air Temperature Sensor Voltage Below Normal Voltage Short to Ground	WP 0009
CID 172 E FMI 11 Inlet Air Temperature Sensor Failure Mode is Not Identifiable (Mechanical Failure) (Logged)	WP 0009
26. CID 175 FMI 02 Engine Oil Temperature Sensor Erratic, Intermittent, or Incorrect Signal (Logged)	WP 0009
CID 175 FMI 03 Engine Oil Temperature Sensor Voltage Above Normal Voltage Open/Short to Batt+	WP 0009
CID 175 FMI 04 Engine Oil Temperature Sensor Voltage Below Normal Voltage Short to Ground	WP 0009
27. CID 190 FMI 02 Magnetic Pickup Unit Erratic, Intermittent, or Incorrect	WP 0009
CID 190 FMI 03 Magnetic Pickup Unit Voltage Above Normal (Logged)	WP 0009
28. CID 190 E FMI 02 Primary Engine Speed/Timing Sensor Erratic, Intermittent, or Incorrect Signal (Logged)	WP 0009
CID 190 E FMI 11 Primary Engine Speed/Timing Sensor Failure Mode is Not Identifiable (Mechanical Failure) (Logged)	WP 0009
29. CID 248 FMI 09 CAT Data Link Abnormal update	WP 0009
30. CID 253 E FMI 02 Personality Module Mismatch Erratic, Intermittent, or Incorrect Signal	WP 0009
31. CID 254 E FMI 12 ECM Self Test Failed Component	WP 0009
32. CID 261 E FMI 13 Engine Timing Calibration Device is Not Calibrated	WP 0009
33. CID 262 E FMI 03 5 V Sensor Power Supply Voltage Above Normal	WP 0009
CID 262 E FMI 04 5 V Sensor Power Supply Voltage Below Normal	WP 0009
34. CID 264 E FMI 03 E-Stop Shutdown Voltage Above Normal (Active)	WP 0009
35. CID 268 FMI 02 GSC Electronic Control Erratic, Intermittent, or Incorrect Signal	WP 0009
36. CID 269 FMI 03 GSC 8V Sensor Power Supply Voltage Above Normal	WP 0009
CID 269 FMI 04 GSC 8V Sensor Power Supply Voltage Below Normal	WP 0009
37. CID 273 FMI 03 Turbo Outlet Pressure Sensor Voltage Above Normal	WP 0009
CID 273 FMI 04 Turbo Outlet Pressure Sensor Voltage Below Normal	WP 0009
38. CID 274 FMI 02 Atmospheric Pressure Sensor Erratic, Intermittent, or Incorrect Signal	WP 0009
39. CID 274 FMI 03 Atmospheric Pressure Sensor Voltage Above Normal	WP 0009
CID 274 FMI 04 Atmospheric Pressure Sensor Voltage Below Normal	WP 0009
40. CID 334 FMI 02 Spare Output (P7-36) Erratic, Intermittent, or Incorrect Signal	WP 0009
CID 334 FMI 03 Spare Output (P7-36) Voltage Above Normal	WP 0009
CID 334 FMI 04 Spare Output (P7-36) Voltage Below Normal	WP 0009
41. CID 336 E FMI 02 ENGINE CONTROL Switch (ECS) Erratic, Intermittent, or Incorrect Signal	WP 0009
42. CID 342 E FMI 02 Secondary (Bottom) Engine Speed/Timing Sensor Erratic, Intermittent, or Incorrect Signal (Logged)	WP 0009
CID 342 E FMI 11 Secondary (Bottom) Engine Speed/Timing Sensor Failure mode is not identifiable (Mechanical Failure) (Logged)	WP 0009
43. CID 360 E FMI 01 Low Engine Oil Pressure Warning (Active & Logged) Data is Valid But Data is Below Normal Operating Range	WP 0009
CID 360 E FMI 02 Low Engine Oil Pressure Derate (Active & Logged) Erratic, Intermittent, or Incorrect Signal	WP 0009
CID 360 E FMI 03 Low Engine Oil Pressure Shutdown (Active & Logged) Voltage Above Normal	WP 0009

Malfunction/Symptom	Troubleshooting Procedure
44. CID 361 E FMI 01 High Engine Coolant Temperature Warning (Active & Logged) Data is Valid But Data is Below Normal Operating Range	WP 0009
CID 361 E FMI 02 High Engine Coolant Temperature Derate (Active and Logged) Erratic, Intermittent, or Incorrect Signal	WP 0009
CID 361 E FMI 03 High Engine Coolant Temperature Shutdown (Active & Logged) Voltage Above Normal	WP 0009
45. CID 362 E FMI 01 Overspeed Warning (Active and Logged) Data is Valid But Data is Below Normal Operating Range	WP 0009
CID 362 E FMI 03 Overspeed Shutdown (Active & Logged) Voltage Above Normal	WP 0009
46. CID 368 E FMI 01 High Inlet Air Temperature Warning (Active and Logged) Data is Valid But Data is Below Normal Operating Range	WP 0009
47. CID 390 E FMI 01 Fuel Filter Restriction Warning (Active and Logged) Data is Valid But Data is Below Normal Operating Range	WP 0009
48. CID 391 E FMI 01 Inlet Air Restriction Warning (Active and Logged) Data is Valid But Data is Below Normal Operating Range	WP 0009
49. CID 441 FMI 12 GSC Engine Governor Relay (EGR) Output Failed Component	WP 0009
50. CID 442 FMI 12 GSC Generator Fault Relay (GFR) Output Failed Component	WP 0009
51. CID 443 FMI 12 GSC Crank Termination Relay (CTR) Output Failed Component	WP 0009
52. CID 444 FMI 12 GSC Starter Motor Relay (SMR) Output Failed Component	WP 0009
53. CID 445 FMI 12 GSC Run Relay (RR) Output Failed Component	WP 0009
54. CID 447 FMI 12 GSC Fuel Control Relay (FCR) Output Failed Component	WP 0009
55. CID 448 FMI 12 GSC Programmable Spare Relay (PSR) Output Failed Component	WP 0009
56. CID 500 FMI 12 GSC Failed Component	WP 0009
57. CID 566 FMI 07 Unexpected Shutdown Improper Mechanical Response	WP 0009
58. CID 590 FMI 09 Engine Electronic Control Module Abnormal Update	WP 0009
59. CID 617 E FMI 02 Intake Air Heater Erratic, Intermittent, or Incorrect Signal	WP 0009
CID 617 E FMI 05 Intake Air Heater Current is Below Normal or Circuit is Open	WP 0009
CID 617 E FMI 06 Intake Air Heater Current is Above Normal or Circuit is Grounded	WP 0009
60. CID 770 FMI 09 Customer Communication Module (CCM) Data Link Abnormal Update	WP 0009
61. CID 858 FMI 02 Close Breaker Output Erratic, Intermittent, or Incorrect Signal	WP 0009
CID 858 FMI 03 Close Breaker Output Voltage Above Normal	WP 0009
CID 858 FMI 04 Close Breaker Output Voltage Below Normal	WP 0009
62. CID 1038 FMI 02 Speed Adjust 1 Output P7-27 (+) and P7-28 (-) Erratic, Intermittent, or Incorrect Signal	WP 0009
CID 1038 FMI 03 Speed Adjust 1 Output P7-27 (+) and P7-28 (-) Voltage Above Normal	WP 0009
CID 1038 FMI 04 Speed Adjust 1 Output P7-27 (+) and P7-28 (-) Voltage Below Normal	WP 0009
63. CID 1167 FMI 04 K1 Sense Input (P7-25) Voltage Below Normal	WP 0009
64. CID 1168 FMI 03 Dead Bus Sense Input (P7-29) Voltage Above Normal	WP 0009
65. CID 1169 FMI 02 AC Transformer Box (ATB) Sensor Erratic, Intermittent, or Incorrect Signal	WP 0009
66. CID 1170 FMI 02 Bus Transformer Box (BTB) Sensor Erratic, Intermittent, or Incorrect Signal	WP 0009
CID 1170 FMI 04 Bus Transformer Box (BTB) Sensor Voltage Below Normal	WP 0009
CID 1170 FMI 08 Bus Transformer Box (BTB) Sensor Abnormal frequency, pulse width, or period	WP 0009
67. CID 1589 E FMI 02 Turbocharger Air Inlet Pressure Sensor Erratic, Intermittent, or Incorrect Signal	WP 0009
68. CID 1589 E FMI 03 Turbocharger Air Inlet Pressure Sensor Voltage Above Normal	WP 0009
CID 1589 E FMI 04 Turbocharger Air Inlet Pressure Sensor Voltage Below Normal	WP 0009

Malfunction/Symptom **Troubleshooting Procedure**

DVR FAULT CODE

FAILURES WITHOUT A FAULT CODE

Malfunction/Symptom **Troubleshooting Procedure**

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING

END OF WORK PACKAGE

FIELD LEVEL TROUBLESHOOTING
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
GSC ALARM INDICATORS AND FAULT CODE TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required	References
One	WP 0085 TM 9-6115-729-10

TROUBLESHOOTING USING DEDICATED SHUTDOWN INDICATORS

The dedicated shutdown indicators identify the system that is responsible for an engine shutdown. The Generator Set Control (GSC) activates the appropriate dedicated shut down fault lamp when the particular fault condition is sensed. The lamp will flash until the GSC shuts the engine down, then the lamp will light continuously. Dedicated shutdowns are not recorded in the GSC fault log.

The GSC dedicated shutdown indicators and their sensors are described in WP 0009.

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. Failure to comply can cause injury or death to personnel.

CAUTION

The dipstick is marked so that the crankcase oil can be checked while engine is stopped or running. Remove oil filler cap when checking oil with engine running.

SYMPTOM

1. LOW OIL PRESSURE light

MALFUNCTION

LOW OIL PRESSURE detected by engine. The signal is routed through Engine Control Module (ECM) to GSC.

CORRECTIVE ACTION

STEP 1. Check oil level and perform service per TM 9-6115-729-10, WP 0017 00.

STEP 2. If fault codes displayed on upper display, troubleshoot per WP 0009.

TROUBLESHOOTING USING DEDICATED SHUTDOWN INDICATORS - Continued

SYMPTOM

2. EMERGENCY STOP light

MALFUNCTION

Detected when PUSH TO STOP EMERGENCY STOP pushbutton on Electronic Modular Control Panel (EMCP) is pressed. Pressing EMERGENCY STOP disables the control input to the ECM, stopping the engine immediately. EMERGENCY STOP disables the starter circuit so that the GSC can not restart the engine (DEAD CRANK SWITCH can still crank the engine). An input from the EMERGENCY STOP notifies the GSC that the button is pressed.

CORRECTIVE ACTION

STEP 1. Correct emergency situation that caused operator to press EMERGENCY STOP.

STEP 2. If fault codes present on upper display, troubleshoot per WP 0009.

STEP 3. When Tactical Quiet Generator (TQG) is returned to service, continue operations.

SYMPTOM

3. HIGH WATER TEMP light

MALFUNCTION

HIGH WATER TEMP is detected by engine sensor. The signal is routed through ECM to GSC.

CORRECTIVE ACTION

STEP 1. Check coolant level and perform service per TM 9-6115-729-10, WP 0015 00.

STEP 2. If fault codes displayed on upper display, troubleshoot per WP 0009.

SYMPTOM

4. ENGINE OVERSPEED light

MALFUNCTION

Engine RPM is monitored directly by the GSC using a magnetic pickup unit (MPU) on the engine flywheel. ENGINE OVERSPEED RPM is set by OP5-0, P010.

CORRECTIVE ACTION

STEP 1. If fault codes displayed on upper display, troubleshoot per WP 0009.

STEP 2. If necessary, verify OP5-0, P010 setpoint EMCP programming (WP 0085, Table 4).

TROUBLESHOOTING USING DEDICATED SHUTDOWN INDICATORS - Continued

SYMPTOM

5. OVERCRANK light

MALFUNCTION

If engine does not start within 90 seconds after setting Engine Control switch (ECS) to MANUAL START (or the remote start contacts are closed with the Engine Control switch (ECS) in AUTO START), GSC declares overcrank condition starting is disabled.

CORRECTIVE ACTION

Correct any displayed faults per WP 0009 or troubleshoot per WP 0009 and WP 0011.

SYMPTOM

6. FAULT SHUTDOWN light flashing red for shut down.

MALFUNCTION

CID and FMI fault codes displayed.

CORRECTIVE ACTION

Troubleshoot displayed CID and FMI codes (WP 0009).

MALFUNCTION

SP1, SP2, SP3, or SP4 displayed. DIAG not on.

CORRECTIVE ACTION

Troubleshoot displayed SP (Spare Input) code (WP 0007).

MALFUNCTION

AL1 thru AL8 fault code displayed. DIAG not on.

CORRECTIVE ACTION

Troubleshoot displayed AL code (WP 0008).

TROUBLESHOOTING USING DEDICATED SHUTDOWN INDICATORS - Continued

SYMPTOM

7. FAULT ALARM light flashing yellow.

MALFUNCTION

CID and FMI fault codes display. Evaluate with dedicated shutdown indicators.

CORRECTIVE ACTION

Troubleshoot CID and FMI codes (WP 0009).

MALFUNCTION

SP1, SP2, SP3, or SP4 displayed. DIAG not on.

CORRECTIVE ACTION

Troubleshoot displayed SP code (WP 0007).

MALFUNCTION

AL1 thru AL8 fault code displayed. DIAG not on.

CORRECTIVE ACTION

Troubleshoot displayed AL code (WP 0008).

SYMPTOM

8. No indicator lit. DIAG not on. Fault codes displayed.

MALFUNCTION

CID and FMI codes displayed.

CORRECTIVE ACTION

Troubleshoot displayed CID and FMI codes (WP 0009).

MALFUNCTION

SP1, SP2, SP3, or SP4 displayed.

CORRECTIVE ACTION

Troubleshoot displayed SP code (WP 0007).

MALFUNCTION

AL1 thru AL8 fault code displayed.

CORRECTIVE ACTION

Troubleshoot displayed AL code (WP 0008).

TROUBLESHOOTING USING DEDICATED SHUTDOWN INDICATORS - Continued

SYMPTOM

9. No indicator lit. DIAG not on. No fault codes displayed.

MALFUNCTION

Undiagnosed shutdown.

CORRECTIVE ACTION

Troubleshoot fault without code (WP 0011).

END OF WORK PACKAGE

FIELD LEVEL TROUBLESHOOTING
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
SP FAULT CODE TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required

One

References

WP 0085
TM 9-6115-729-10

TROUBLESHOOTING USING SP FAULT CODES

SP (Spare Input) Fault Codes are associated with four inputs that are considered spare inputs. Spare fault code programming is contained in OP6-0, Protective Relay Programming (see WP 0085, Table 7 for details). These codes are not stored in the GSC fault log. When a spare input fault is detected, the FAULT SHUTDOWN lamp flashes and the corresponding code (SP1, SP2, etc.) is displayed on the upper GSC display. Fault condition on SP 1 and 4 is programmed to shut down the engine immediately.

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 can result in flames and possible explosion and cause injury or death to personnel and damage to the generator set.

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

NOTE

SP1 thru SP4 must be evaluated using dedicated shutdown lights, alarm conditions, and available fault codes.

TROUBLESHOOTING USING SP FAULT CODES - Continued

SYMPTOM

1. SP1

MALFUNCTION

Low Fuel Level.

CORRECTIVE ACTION

STEP 1. Verify if LOW FUEL LEVEL indicator on alarm module is lit.

STEP 2. Verify fuel level on fuel level gage.

STEP 3. If using internal fuel source, perform fuel service and refill TQG per TM 9-6115-729-10, WP 0016.

STEP 4. If using external (auxiliary) source, verify that auxiliary fuel line is connected per TM 9-6115-729-10, WP 0006 and that AUX FUEL pump switch is set to ON.

STEP 5. Verify that external (auxiliary) fuel is present and clean.

STEP 6. If external (auxiliary) fuel is present and clean, troubleshoot auxiliary fuel pump (WP 0011, SYMPTOM 30).

STEP 7. Verify the problem has been resolved.

SYMPTOM

2. SP2

MALFUNCTION

DVR fault (WP 0010).

CORRECTIVE ACTION

STEP 1. Troubleshoot DVR fault per WP 0010.

STEP 2. If no DVR fault codes are displayed or if DVR will not power up, refer to WP 0011, SYMPTOM 9.

STEP 3. Verify the problem has been resolved.

NOTE

SP3 and SP4 active during paralleling only.

SYMPTOM

3. SP3

MALFUNCTION

Bus Frequency Fault (Paralleling Only).

When main contactor relay K1 is energized and one or both of the following is true for more than 2 seconds an SP3 fault is announced: The difference in frequency between the generator and the bus is greater than 0.2 Hz. The difference in phase between the generator and the bus is greater than 10 degrees. The GSC will stop synchronization process until the fault is cleared and corrected.

TROUBLESHOOTING USING SP FAULT CODES - Continued

CORRECTIVE ACTION

STEP 1. Verify that no fault codes are listed on upper display.

STEP 2. Verify equipment setup is correct per TM 9-6115-729-10, WP 0006.

STEP 3. Verify equipment setup and parameters for synchronization (WP 0085, Table 6).

STEP 4. Restart generator sets.

STEP 5. Adjust and evaluate operation using synchronization lights per TM 9-6115-729-10, WP 0006 00.

STEP 6. Operate per TM 9-6115-729-10, WP 0006.

STEP 7. Verify the problem has been resolved.

SYMPTOM

4. SP4

MALFUNCTION

Bus Voltage Fault (Paralleling Only).

Input is active when 208 or 416 VAC is detected on the load bus by dead bus relay low sensor (DBLO) or dead bus relay high sensor (DBHI). This input is compared to the reading of the bus. If the voltage of phase A is less than 20% of the rated voltage, it is considered to be dead. If the condition of these measurements is different with regards to presence or absence of bus voltage, a fault is announced.

CORRECTIVE ACTION

STEP 1. Verify that no fault codes are listed on upper display.

STEP 2. Verify equipment setup is correct per TM 9-6115-729-10, WP 0006.

STEP 3. Verify equipment setup and parameters for synchronization (WP 0085, Table 6).

STEP 4. Restart generator sets.

STEP 5. Adjust and evaluate operation using synchronization lights per TM 9-6115-729-10, WP 0006.

STEP 6. Operate per TM 9-6115-729-10, WP 0006.

STEP 7. Verify the problem has been resolved.

END OF WORK PACKAGE

FIELD LEVEL TROUBLESHOOTING
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
AL FAULT CODE TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required	References
One	WP 0085 TM 9-6115-729-10

TROUBLESHOOTING USING AL FAULT CODES

Alarm fault codes are shown on the upper display and consist of specific engine fault codes, protective relay function codes, and paralleling fault codes. Alarm fault codes rely upon programmed setpoints.

Engine fault code programming is contained in OP5-0, engine/generator programming (see WP 0085 for details). Protective relay function code programming is contained in OP5-1, protective relay programming (see WP 0085). Paralleling fault code programming is contained in OP5-3, synchronization programming (see WP 0085).

Alarm fault codes are not stored in the GSC fault log.

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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 can cause injury to personnel and damage to equipment.

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

Dangerously high voltage can exist across current transformer (CT) output with engine running. CT could explode if disconnected from load with engine running. Do not disconnect CT with generator rotating. Failure to comply can cause serious injury or death to personnel.

Slave receptacle (NATO connector) is electrically live at all times and is unfused. The Battery Disconnect Switch does not remove power from the NATO connector. Use caution when connecting or disconnecting cable(s) to the NATO connector to prevent damage to equipment. Use caution when troubleshooting this circuit. This circuit is only dead when the batteries are fully disconnected. Failure to comply can cause serious injury or death to personnel.

TROUBLESHOOTING USING AL FAULT CODES - Continued

WARNINGS - Continued

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. Failure to comply can cause injury or death to personnel.

SYMPTOM

1. AL 1

MALFUNCTION

High Coolant Temperature

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL1 appears on upper display. Check setpoints per WP 0085.

Verify GSC OP5-0 setpoint P015 (WP 0085, Table 4).

STEP 4. Verify if any fault codes or engine fault codes are displayed on upper display and record. If fault codes displayed, troubleshoot per WP 0009.

STEP 5. On EMCP set ENGINE CONTROL switch to OFF/RESET. Battery Disconnect switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 6. Open right side engine access door and check coolant level in coolant recovery (overflow) bottle. If required, replace coolant per TM 9-6115-729-10, WP 0015.

STEP 7. Inspect coolant system lines for leaks per PMCS (WP 0015).

STEP 8. Inspect engine for damaged fan. Inspect alternator and water pump belts. Check water pump belt tension and tighten, if required.

a. If fan damaged, repair per WP 0065.

b. If required, replace alternator or water pump belts (WP 0073).

STEP 9. Inspect radiator for obstructions or blockage. Remove obstructions or blockage if present.

STEP 10. Inspect radiator for damage. If radiator damaged, repair or replace (WP 0067).

STEP 11. Verify the problem has been resolved.

TROUBLESHOOTING USING AL FAULT CODES - Continued

SYMPTOM

2. AL 2

MALFUNCTION

Low Coolant Temperature

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL2 appears on upper display.

NOTE

This fault will be displayed if the coolant temperature is below 70° F (programmable by setpoint P016), and may occur for a short time after start up.

STEP 4. Verify if any fault codes or engine fault codes are displayed on upper display and record.

a. If fault codes displayed, troubleshoot per fault code (WP 0009).

b. Verify setpoint P016 (WP 0085, Table 4).

STEP 5. Verify the problem has been resolved.

TROUBLESHOOTING USING AL FAULT CODES - Continued

CAUTION

The dipstick is marked so that the crankcase oil can be checked while engine is running or stopped. Remove oil filler cap when checking oil with engine running.

SYMPTOM

3. AL 3

MALFUNCTION

Low Engine Oil Pressure

Low engine operating speed can cause this alarm code. Note and record engine speed for reference.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL3 appears on upper display.

STEP 4. Verify if any fault codes or engine fault codes are displayed on upper display and record.

STEP 5. Check engine oil level and service engine if oil is low per TM 9-6115-729-10, WP 0017.

STEP 6. If fault codes displayed, troubleshoot per fault code (WP 0009).

STEP 7. Verify setpoints P013 or P014 (WP 0085, Table 4).

STEP 8. Verify the problem has been resolved.

TROUBLESHOOTING USING AL FAULT CODES - Continued

SYMPTOM

4. AL 4

MALFUNCTION

Fault Detected by Engine ECM

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL4 appears on upper display.

STEP 4. Verify if any fault codes or engine fault codes are displayed on upper display and record. Troubleshoot per displayed fault codes (WP 0009).

STEP 5. Verify the problem has been resolved.

SYMPTOM

5. AL 5

MALFUNCTION

Low Engine Coolant Level

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL5 appears on upper display.

STEP 4. Verify if any fault codes or engine fault codes are displayed on upper display and record.

STEP 5. Inspect coolant system lines for leaks.

STEP 6. Inspect engine coolant system per PMCS (WP 0015).

STEP 7. Open right engine access door and check engine coolant level in coolant recovery (overflow) bottle. Check if coolant is low and service surge tank (WP 0064).

STEP 8 Troubleshoot per displayed fault codes and WP 0009.

STEP 9. Verify the problem has been resolved.

TROUBLESHOOTING USING AL FAULT CODES - Continued

SYMPTOM

6. AL 7

MALFUNCTION

Generator Over Voltage

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL7 appears on upper display.

STEP 4. Verify if any faults are displayed on DVR. Check set points (WP 0085, Table 2).

STEP 5. If overvoltage 702 present, go to WP 0010, SYMPTOM 7 and troubleshoot.

STEP 6. Verify that the problem has been resolved.

STEP 7. Troubleshoot per WP 0009, CID 1169 FMI 02, SYMPTOM 65.

STEP 8. Verify if any fault codes displayed and record.

STEP 9. If problem has not been resolved, troubleshoot per WP 0009.

STEP 10. Verify that the problem has been resolved.

SYMPTOM

7. AL 8

MALFUNCTION

Generator Under Voltage

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL8 appears on upper display. Go to WP 0010, SYMPTOM 6 and troubleshoot.

STEP 4. Verify if any faults are displayed on DVR. Check set points (WP 0085, Table 2).

a. If no DVR fault codes are displayed, check ATB fuses (FO-1, Sheet 5).

b. If DVR fault code 701 is present, troubleshoot per WP 0010, SYMPTOM 6.

STEP 5. Verify that the problem has been resolved.

STEP 6. Troubleshoot per WP 0009, CID 1169 FMI 02, SYMPTOM 65.

STEP 7. Verify if any fault codes displayed and record.

STEP 8. If problem has not been resolved, troubleshoot per WP 0009.

STEP 9. Verify that the problem has been resolved.

TROUBLESHOOTING USING AL FAULT CODES - Continued

SYMPTOM

8. AL 9

MALFUNCTION

Generator Over Frequency

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL9 appears on upper display.

STEP 4. Turn the FREQUENCY ADJUST POTENTIONMETER counterclockwise to reduce frequency.

STEP 5. Verify if any fault codes or engine fault codes are displayed on upper display and record.

a. Verify OP5-0 engine/generator setpoints (WP 0085, Table 4)

b. Troubleshoot fault codes and WP 0009, CID 362 E FMI 01.

STEP 6. Verify the problem has been resolved.

SYMPTOM

9. AL 10

MALFUNCTION

Generator Under Frequency

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL10 appears on upper display.

STEP 4. Verify if any fault codes or engine fault codes are displayed on upper display and record.

STEP 5. Troubleshoot per WP 0011, Engine Cannot Reach Operating RPM (SYMPTOM 26).

STEP 6. Verify the problem has been resolved.

TROUBLESHOOTING USING AL FAULT CODES - Continued

NOTE

This alarm code should occur only when the generator sets are operated in parallel mode.

SYMPTOM

10. AL 11

MALFUNCTION

Generator Reverse Power

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Battery Disconnect switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Verify that paralleling cables are securely connected between generator sets to be paralled.

STEP 3. Verify that load cables are connected observing proper phase polarity.

STEP 4. Verify that generator sets are set for same output voltage.

STEP 5. Parallel generator sets in accordance with TM 9-6115-729-10, WP 0006.

a. Verify the problem has been resolved.

b. If problem remains, verify if any fault codes or engine fault codes are displayed on GSC upper display and record.

STEP 6. Troubleshoot per displayed fault codes and WP 0009.

STEP 7. Verify protective relay function code disabled by setpoint P125 (WP 0085).

STEP 8. Enable protective relay function code setpoint P125 (WP 0085, Table 5).

STEP 9. Verify the problem has been resolved.

SYMPTOM

11. AL 12

MALFUNCTION

Phase Over Current

CORRECTIVE ACTION

STEP 1. Verify that generator set load is properly balanced between each of the three phases and that the generator set is not overloaded.

STEP 2. Verify that problem is resolved.

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. On GSC keypad, press ALARM CODES.

STEP 5. Verify AL12 appears on upper display.

TROUBLESHOOTING USING AL FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 6. Verify OP5-1 setpoints P128 thru P137 (WP 0085, Table 5).

a. If setpoints are changed, verify that the problem has been resolved.

b. If setpoints are not changed, verify if any fault codes or engine fault codes are displayed on GSC upper display and record.

STEP 7. Troubleshoot per displayed fault codes and WP 0009.

STEP 8. Verify the problem has been resolved.

STEP 9. If not, replace Overload/Short Circuit Module (WP 0041, Guide).

SYMPTOM

12. AL 13

MALFUNCTION

Generator Total Over Current

CORRECTIVE ACTION

STEP 1. Verify that generator set load is properly balanced between each of the three phases and that the generator set is not overloaded.

STEP 2. Verify that problem is resolved.

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. On GSC keypad, press ALARM CODES.

STEP 5. Verify AL13 appears on upper display.

STEP 6. Verify OP5-1 setpoints P128 thru P137 (WP 0085, Table 5).

a. If setpoints are changed, verify that the problem has been resolved.

b. If setpoints are not changed, verify if any fault codes or engine fault codes are displayed on GSC upper display and record.

STEP 7. Troubleshoot per displayed fault codes and WP 0009.

STEP 8. Verify the problem has been resolved.

STEP 9. If not, replace Overload/Short Circuit Module (WP 0041, Guide).

TROUBLESHOOTING USING AL FAULT CODES - Continued

SYMPTOM

13. AL 14

MALFUNCTION

Phase A No Voltage Input at GSC input (P7-10)

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL14 appears on upper display. Check setpoints per WP 0085.

STEP 4. Troubleshoot A5F1 on ATB A5 per WP 0011, SYMPTOM 4.

STEP 5. If indicated, replace A5F1 on back of ATB A5 (WP 0041).

a. Verify the problem has been resolved.

b. If not, replace ATB A5 (WP 0041).

STEP 6. Verify that problem has been resolved. If not, replace the GSC (WP 0040).

STEP 7. Verify the problem has been resolved.

SYMPTOM

14. AL 15

MALFUNCTION

GSC Configuration Error

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On GSC keypad, press ALARM CODES.

STEP 3. Verify AL15 appears on upper display. Check setpoints per WP 0085, Table 3 and Table 5.

STEP 4. Verify if any fault codes or engine fault codes are displayed on upper display and record.

a. Troubleshoot per displayed fault codes and WP 0009.

b. On EMCP set ENGINE CONTROL switch to MANUAL START.

c. Verify that engine speed rpm is for correct output frequency by pressing ENGINE METER key on GSC.

1800 rpm for 60 Hz

1500 rpm for 50 Hz

STEP 5. Verify the problem has been resolved.

TROUBLESHOOTING USING AL FAULT CODES - Continued

NOTE

This alarm code should occur only when the generator sets are operated in parallel mode.

SYMPTOM

15. AL 16

MALFUNCTION

Incorrect Phase Sequence - Paralleling fault code

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Battery Disconnect switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Verify that paralleling cables are securely connected between generator sets to be paralled.

STEP 3. Verify that load cables are connected observing proper phase polarity.

STEP 4. Verify that generator sets are set for same output voltage.

STEP 5. Parallel generator sets per TM 9-6115-729-10, WP 0006.

a. Verify the problem has been resolved.

b. If problem remains, verify if any fault codes or engine fault codes are displayed on GSC upper display and record.

STEP 6. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 7. On GSC keypad, press ALARM CODES.

STEP 8. Verify AL16 appears on upper display. Check setpoints per WP 0085.

STEP 9. Verify if any fault codes or engine fault codes are displayed on upper display and record.

a. On EMCP set SYNC MODE switch to OFF.

b. Troubleshoot per displayed fault codes and WP 0009.

STEP 10. Verify the problem has been resolved.

TROUBLESHOOTING USING AL FAULT CODES - Continued

NOTE

This alarm code should occur only when the generator sets are operated in parallel mode.

SYMPTOM

16. AL 17

MALFUNCTION

Improper Generator or Bus Voltage - Paralleling fault code

CORRECTIVE ACTION

STEP 1. On generator set GSC displays, check the voltages on for both generator sets and record output voltages for all phases. All phases should be the same for both generator sets.

STEP 2. On EMCP of both generator sets, set ENGINE CONTROL switch to OFF/RESET. Battery Disconnect switch to OFF; DEAD CRANK SWITCH to OFF.

STEP 3. Check both generator sets and verify that all cables are connected properly and all load terminal connections are tight per TM 9-6115-729-10, WP 0006.

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

High voltage is produced when the generator set is in operation. Never attempt to connect or disconnect load cables while the generator set is running. Failure to comply can cause injury or death to personnel.

Slave receptacle (NATO connector) is electrically live at all times and is unfused. The Battery Disconnect switch does not remove power from the NATO connector. Use caution when connecting or disconnecting cable(s) to the NATO connector to prevent damage to equipment. Use caution when troubleshooting this circuit. This circuit is only dead when the batteries are fully disconnected. Failure to comply can cause serious injury or death to personnel.

STEP 4. Parallel generator sets per TM 9-6115-729-10, WP 0006.

STEP 5. Verify the problem has been resolved.

TROUBLESHOOTING USING AL FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 6. If problem remains, set AC CIRCUIT INTERRUPTER switch on GSC to OPEN.

a. On generator set #1, set AC CIRCUIT INTERRUPTER switch on GSC to CLOSED.

b. Measure voltage at output load terminal lugs and record.

c. On generator set #1, set AC CIRCUIT INTERRUPTER switch on GSC to OPEN.

d. On generator set #2, set AC CIRCUIT INTERRUPTER switch on GSC to CLOSED.

b. Measure voltage at output load terminal lugs and record.

c. On generator set #2, set AC CIRCUIT INTERRUPTER switch on GSC to OPEN.

STEP 7. If voltages at output load terminal lugs are different, adjust generator set voltages equal to each other.

STEP 8. Parallel generator sets per TM 9-6115-729-10, WP 0006.

STEP 9. Verify the problem has been resolved.

STEP 10. If not resolved, check wiring at LSM A4.

STEP 11. If wiring at LSM A4 is good, replace LSM A4 (WP 0041, Guide).

TROUBLESHOOTING USING AL FAULT CODES - Continued

NOTE

This alarm code should occur only when the generator sets are operated in parallel mode.

SYMPTOM

17. AL 18

MALFUNCTION

Synchronizer Time-out - Paralleling fault code

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. On keypad, press ALARM CODES.

STEP 3. Verify AL18 appears on upper display. Check setpoints per WP 0085.

STEP 4. Verify if any fault codes or engine fault codes are displayed on upper display and record.

STEP 5. Troubleshoot per displayed fault codes and WP 0009.

STEP 6. On EMCP set SYNC MODE switch to OFF.

STEP 7. Check all paralleling connections to load per TM 9-6115-729-10, WP 0006.

STEP 8. Verify the problem has been resolved.

END OF WORK PACKAGE

FIELD LEVEL TROUBLESHOOTING
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
GSC FAULT CODE TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Tools and Special Tools

Multimeter

Personnel Required

One

References

WP 0085
FO-1
FO-2
FO-3
FO-4
TM 9-6115-729-10

TROUBLESHOOTING USING GSC FAULT CODES

WARNING

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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 can cause injury to personnel and damage to equipment.

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).

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

CID 1 through 6 is for the unit fuel injectors in cylinders 1 through 6 respectively. The ECM is capable of detecting the following conditions:

Open circuit in injector wiring
Open circuit in the internal wiring of the injector
Short to ground
Injector internal short circuit
Short to B+

SYMPTOM

1. CID 1 E FMI 06

   CID 1 E FMI 11

   MALFUNCTION

   Cylinder 1.

   FMI 06 - Injector Current Fault.

   FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

   CORRECTIVE ACTION

   STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

   STEP 2. Inspect connectors ENG-P2 and ENG-P1 on engine harness (FO-2, sheet 1).

   STEP 3. Conduct an appropriate pull test on wires in the ENG-P2 and ENG-P1 connectors to ensure wires are tight and secure.

   STEP 4. Check the wires on the engine harness (ENG-P2 connector to ENG-P1 connector) and the fuel injector harness (ENG-J300 connector to fuel injectors) for abrasion and pinch points (WP 0090).

   Repair the connectors or wiring and/or replace the connectors or wiring, if necessary (WP 0090).

   STEP 5. Perform Injector Solenoid Test (WP 0013, SYMPTOM 8).

   STEP 6. Verify the problem is resolved.

SYMPTOM

2. CID 1 E FMI 06

   CID 2 E FMI 11

   MALFUNCTION

   Cylinder 2.

   FMI 06 - Injector Current Fault.

   FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

   CORRECTIVE ACTION

   Perform steps in SYMPTOM 1.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

3. CID 1 E FMI 06
   CID 3 E FMI 11

MALFUNCTION

Cylinder 3.

FMI 06 - Injector Current Fault.

FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

CORRECTIVE ACTION

Perform steps in SYMPTOM 1.

SYMPTOM

4. CID 1 E FMI 06
   CID 4 E FMI 11

MALFUNCTION

Cylinder 4.

FMI 06 - Injector Current Fault.

FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

CORRECTIVE ACTION

Perform steps in SYMPTOM 1.

SYMPTOM

5. CID 1 E FMI 06
   CID 5 E FMI 11

MALFUNCTION

Cylinder 5.

FMI 06 - Injector Current Fault.

FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

CORRECTIVE ACTION

Perform steps in SYMPTOM 1.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

6. CID 1 E FMI 06

CID 6 E FMI 11

MALFUNCTION

Cylinder 6.

FMI 06 - Injector Current Fault.

FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

CORRECTIVE ACTION

Perform steps in SYMPTOM 1.

SYMPTOM

7. CID 9 E FMI 02

MALFUNCTION

High Altitude Degradation.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

Event Code. Engine power lowered because of altitude. Higher the altitude, the lower the air density. Clean dense air is needed for efficient combustion.

CORRECTIVE ACTION

Check for related alarm codes or fault codes and troubleshoot (WP 0008 and/or WP 0009).

NOTE

Pins 4 (+) and 5 (-) of ECM connector J2 is an 8 Vdc supply. This is supplied by the ECM for an accelerator pedal control when this engine is used in a truck. This supply is not used on the generator set.

SYMPTOM (Not Applicable)

8. CID 41 FMI 02

CID 41 FMI 03

CID 41 FMI 04

MALFUNCTION

8 Volt Power Supply not Normal.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION

STEP 1. Inspect wiring at ECM connector J2.

a. Repair or replace wiring, as required (WP 0090).

b. If wiring is not defective, replace ECM (WP 0084).

STEP 2. Verify the problem is resolved.

SYMPTOM

9. CID 42 E FMI 11

MALFUNCTION

Injection actuator pressure valve.

FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect connectors ENG-P2 and ENG-P3 on engine harness (FO-2, sheet 1).

STEP 3. Conduct an appropriate pull test on the wires in the ENG-P2 and ENG-P3 connectors to ensure the wires are tight and secure.

STEP 4. Check the wires on the engine harness for abrasion and pinch points (WP 0090).

Repair and/or replace the connectors and/or wiring (WP 0090), as necessary.

STEP 5. Verify the problem is resolved.

STEP 6. If not, disconnect engine harness connector ENG-P3 from injection actuation pressure (IAP) control valve connector (WP 0090 Figure 1, sheet 1, and FO-2, sheet 1).

STEP 7. Measure resistance between pins of IAP control valve connector (WP 0090, Figure 2, sheet 2). Measurement should be between 6.5 and 10.5 ohms. Record the value.

If the resistance is not between 6.5 and 10.5 ohms, replace IAP control valve (WP 0103). Verify the problem has been resolved.

STEP 8. Reconnect ENG-P3 to IAP control valve connector.

STEP 9. Verify the problem is resolved.

STEP 10. If not, disconnect P2 of engine harness (FO-2, Sheet 1) from ECM.

STEP 11. Measure resistance between terminals ENG-P2-61 (IAPCV signal) and ENG-P2-62 (IAPCV return). Resistance should be within two (2) ohms of the value measured in TEST STEP 6. Repair and/or replace the connectors and/or wiring (WP 0090). Verify the problem is resolved.

STEP 12. If not, disconnect engine harness connector ENG-P3 from IAP control valve connector.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 13. Measure resistance from engine harness connector ENG-P2-61 to all other terminals in ENG-P2, the engine ground stud, and all terminals on the ECM to EMCP harness connector ENG-P1. The resistance measurements should be open. Repair and/or replace the wiring and/or connectors, if necessary.

STEP 14. Disconnect ECM to EMCP harness ENG-P1 from ECM J1. Measure resistance from engine harness connector ENG-P2-62 to all other terminals in ENG-P2, the engine ground stud, and all terminals on the ECM to EMCP harness connector ENG-P1. The resistance measurements should be open. Repair and/or replace the connectors and/or wiring (WP 0090).

STEP 15. Verify the problem is resolved.

STEP 16. If not, reconnect engine harness connectors ENG-P2 and ENG-P3. Reconnect ECM to EMCP harness connector P1 and retest.

If CID 42 E FMI 11 is still present on the GSC, perform Injection Actuation Pressure Control Valve Circuit Test (WP 0013, SYMPTOM 6).

STEP 17. If the problem is not resolved, replace the ECM (WP 0084). Retest after the ECM has been replaced.

STEP 18. Verify the problem is resolved.

SYMPTOM

10. CID 85 E FMI 01

MALFUNCTION

Shutdown Overridden.

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

Event Code. Red FAULT ALARM indicator flashes on GSC has detected a shutdown fault which was overridden (Battle Short).

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Verify the Battle Short Switch is set to OFF.

STEP 3. Press ALARM CODES on GSC keypad.

STEP 4. Verify associated alarm codes and fault codes and troubleshoot (WP 0008 and/or WP 0009).

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

11. CID 91 FMI 08

MALFUNCTION

Throttle Position Signal.

FMI 08 - Abnormal Frequency, Pulse Width, or Period.

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect connector ENG-P1 on ECM to EMCP harness (FO-2, Sheet 2). Inspect connector ENG-P300 on ECM to ENG-P300 harness (FO-2, Sheet 1).

STEP 3. Conduct an appropriate pull test on wires to ensure wires are tight and secure.

STEP 4. Check the wires on the ECM to EMCP harness for abrasion and pinch points (WP 0090).

Repair and/or replace the connectors and/or wiring (WP 0090), as necessary.

STEP 5. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 6. Measure 24 +/- 3 Vdc between terminal 15 (+) and terminal 16 (-) on LSMA4 (FO-4, sheet 2).

If 24 +/- 3 Vdc is not measured between terminal 15 (+) and terminal 16 (-) on the LSMA4, perform Speed Control Test (WP 0013, SYMPTOM 9, STEP 3).

STEP 7. Verify the problem is resolved.

STEP 8. If 24 +/- 3 Vdc is measured between terminal 15 (+) and terminal 16 (-) on LSM A4 (FO-4, Sheet 2), refer to WP 0013, SYMPTOM 9, STEP 3.

a. On EMCP, turn ENGINE CONTROL switch to MANUAL START.

b. Measure DC voltage between LSM A4 terminals 19 (+) and 20 (-). Measurement should be 3.1 Vdc @ 60 Hz at not load. If not, adjust speed trim potentiometer to bring signal to 3.1 Vdc and generator frequency to 60 Hz.

c. If PWM output of LSM A4 is low and/or cannot be adjusted to 3.1 Vdc, check speed trim potentiometer connections and test speed trim potentiometer resistance. If speed trim potentiometer is ok, replace LSM A4 (WP 0041).

STEP 9. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

12. CID 94 FMI 01

CID 94 FMI 02

MALFUNCTION

Fuel pressure sensor.

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Disconnect engine harness connector ENG-P17 from fuel pressure sensor (WP 0090, Figure 1, sheet 1 and FO-2, sheet 1).

STEP 3. Measure voltage between ENG-P17-A (+) and ENG-P17-B (-) of harness connector (WP 0090, Figure 2, sheet 1).

a. If voltage is not present, repair or replace harness (WP 0090). Verify the problem has been resolved.

b. If repairing wiring does not resolve fault, replace the fuel pressure sensor (WP 0100). Verify the problem has been resolved.

c. If voltage is not present between ENG-P17-A (+) and ENG-P17-B (-) proceed to STEP 3d.

d. Remove ENG-P2 from ECM and verify continuity between ENG-P17-C and ENG-P2-16 per FO-2, sheet 1.

(1) If continuity is not present, repair or replace harness (WP 0090). Verify the problem has been resolved.

(2) If the problem is not resolved, replace ECM (WP 0084).

STEP 4. Verify the problem is resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

This procedure is used for FMI codes 03 and 04 for all pressure sensors.

SYMPTOM

13. CID 94 E FMI 03

CID 94 E FMI 04

MALFUNCTION

Fuel pressure sensor.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect connectors ENG-P2 on the engine harness (FO-2, sheet 1) and ENG-P1 on the ECM to EMCP Harness (FO-2, sheet 2).

STEP 3. Conduct an appropriate pull test on wires in the ENG-P2 and ENG-P1 connectors to ensure wires are tight and secure.

STEP 4. Check the wires on both harnesses for abrasion and pinch points (WP 0090).

Repair and/or replace the connectors and/or wiring (WP 0090) as necessary.

STEP 5. If necessary, disconnect the harness connectors, for the fuel pressure sensor, engine oil pressure sensor, injection actuation sensor, turbo outlet pressure sensor, atmospheric pressure sensor, and turbo inlet pressure sensor.

STEP 6. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 7. Measure 5.0 +/- 0.2 Vdc between terminals A (supply) and B (return) at each sensor connector.

a. If 5.0 +/- 0.2 Vdc is not measured on all sensor connectors, remove ENG-P2 from ECM J2. Check for 5.0 +/- 0.2 Vdc on the pins for the bad sensor reading (WP 0090 and FO-2 Sheet 1). Verify continuity of the signal wire (pin C) for the suspect sensor connector.

b. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is set to OFF.

If the voltage was present, repair/replace the ECM J2 engine harness (WP 0091) as necessary.

c. Reconnect all of the sensor connectors.

d. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP. Retest the system.

e. If the problem is not resolved, proceed to STEP 8.

STEP 8. Turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 9. Disconnect the defective sensor connector.

a. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

b. Check for a 03 diagnostic code.

c. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF. DEAD CRANK SWITCH is set to OFF.

d. Connect a jumper wire and connect to pins B and C of the bad sensor connector.

e. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

f. Check for a 04 diagnostic code. If the correct code is present, the ECM is working OK. Replace the defective sensor (WP 0100).

g. If the diagnostic code remains 03, proceed to STEP 10.

STEP 10. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF. DEAD CRANK SWITCH is set to OFF. Remove the jumper wire.

STEP 11. Replace the ECM (WP 0084) and retest the system. Verify the problem is resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

14. CID 96 E FMI 01

MALFUNCTION

High Fuel pressure Warning.

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

Event Code. Indicates that sensor detects a fuel system backup to cause high pressure warning.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Press ALARM CODES on GSC keypad.

STEP 3. Check for associated alarm code and fault code and troubleshoot (WP 0008 and/or WP 0009).

STEP 4. If no fault code, inspect fuel filter and fuel/water separator per PMCS (WP 0016) and perform service as required.

SYMPTOM

15. CID 97 E FMI 01

MALFUNCTION

Derate Overridden.

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

Event Code. Engine derate overridden. Verify presence of fault.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Press ALARM CODES on GSC keypad.

STEP 3. Check for logged fault code, troubleshoot, and correct (WP 0008 and/or WP 0009).

STEP 4. Verify the problem is resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

The following failure indicates that GSC is unable to receive valid data about oil pressure from ECM.

SYMPTOM

16. CID 100 E FMI 02

MALFUNCTION

Oil pressure sensor.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect connectors ENG-P2 on the engine harness (FO-2, sheet 1) and ENG-P1 on the ECM to EMCP Harness (FO-2, sheet 2).

STEP 3. Conduct an appropriate pull test on wires in the ENG-P2 and ENG-P1 connectors to ensure wires are tight and secure.

STEP 4. Disconnect ENG-P2 from ECM J2, ENG-P15 from the oil pressure sensor, and ENG-P17 from the fuel pressure sensor. Verify continuity from ENG-P15-A to ENG-P17-A and ENG-P2-41. Verify continuity from ENG-P15-B to ENG-P17-B and ENG-P2-42. Verify continuity from ENG-P15-C to ENG-P2-24.

STEP 5. Check the wires on both ENG-P1 and ENG-P2 harnesses for abrasion and pinch points (WP 0090).

STEP 6. If necessary, repair and/or replace the connectors and/or wiring (WP 0090).

STEP 7. Disconnect the harness connectors, for the fuel pressure sensor, engine oil pressure sensor, injection actuation sensor, turbo outlet pressure sensor, atmospheric pressure sensor, and turbo inlet pressure sensor.

STEP 8. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 9. Measure 5.0 +/- 0.2 Vdc between terminals A (supply) and B (return) at each sensor connector.

If 5.0 +/- 0.2 Vdc is not measured on all sensor connectors, perform Electrical Connectors Wiggle Test (WP 0013, SYMPTOM 2).

STEP 10. If the problem is not resolved, replace the oil pressure sensor (WP 0100).

STEP 11. Retest the system. Verify that the problem has been cleared.

STEP 12 If the problem has not been resolved, replace ECM (WP 0084).

STEP 13. Retest the system and verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

The following failure is usually a broken wire, or a frayed wire shorting to an adjacent wire or to ground.

SYMPTOM

17. CID 100 E FMI 03

CID 100 E FMI 04

MALFUNCTION

Oil pressure sensor.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

Troubleshoot oil pressure sensor using steps in SYMPTOM 13.

NOTE

This failure indicates that GSC is unable to receive any valid data about the coolant temperature from the ECM.

SYMPTOM

18. CID 110 E FMI 02

CID 110 E FMI 03

CID 110 E FMI 04

MALFUNCTION

Engine coolant temperature sensor.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect connectors ENG-P2 on the engine harness (FO-2, sheet 1) and ENG-P1 on the ECM to EMCP Harness (FO-2, sheet 2).

STEP 3. Conduct an appropriate pull test on wires in the ENG-P2 and ENG-P1 connectors to ensure wires are tight and secure.

STEP 4. Check the wires on both harnesses for abrasion and pinch points (WP 0090).

Repair and/or replace the connectors and/or wiring (WP 0090).

STEP 5. Disconnect engine harness connector ENG-P6 from engine coolant temperature sensor (WP 0090, Figure 1, sheet 1, and FO-2, sheet 1).

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 6. Connect a new sensor to engine harness connector ENG-P6, but do not install the sensor into the engine.

STEP 7. Turn ENGINE CONTROL switch to COOL DOWN/STOP. Battery Disconnect Switch is ON; DEAD CRANK SWITCH is set to NORMAL.

STEP 8. On GSC keypad, press GSC ALARM CODES button.

a. If the fault has cleared, replace engine coolant temperature sensor (WP 0100).

b. If the fault has not cleared, continue with STEP 9.

STEP 9. Turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 10. Remove engine harness connector ENG-P6 from the new sensor. Leave ENG-P6 disconnected.

a. Use a jumper wire long enough to reach from engine harness connector ENG-P6-1 to the engine ground stud.

b. Install jumper wire onto ENG-P6-1.

STEP 11. Turn ENGINE CONTROL switch to COOL DOWN/STOP. Battery Disconnect Switch is ON; DEAD CRANK SWITCH is set to NORMAL.

STEP 12. On GSC keypad, press GSC ALARM CODES button.

a. Verify a diagnostic code 03 appears.

b. Short the jumper wire (ENG-P6-1) to the engine ground.

c. Verify a diagnostic code 04 appears. This verifies the ECM is working properly.

STEP 13. Turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 14. Remove the jumper wire and connect all wires and connectors.

If a diagnostic code 03 and/or a diagnostic code 04 did not appear in STEP 13, repair or replace the engine harness. Verify the problem has been resolved.

STEP 15. If the problem is not resolved, replace ECM (WP 0084).

STEP 16. Verify the problem is resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

The engine low coolant sensor is powered by 8 Vdc from the GSC. When coolant is present at the sensor, a logic low (near zero volts) is sent to the GSC. When coolant is not present at the sensor, a logic high is sent to the GSC.

SYMPTOM

19. CID 111 E FMI 03

CID 111 E FMI 04

MALFUNCTION

Engine low coolant sensor.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Disconnect ECM to EMCP harness connector ENG-P16 from low coolant sensor (WP 0090, Figure 1 sheet 2, and FO-2, sheet 2).

STEP 3. Measure the voltage on the ECM to EMCP harness connector between ENG-P16-A (+) and ENG-P16-B (-). Also measure the voltage between ENG-P16-C (+) and ENG-P16-B (-).

If the voltage between ENG-P16-A (+) and ENG-P16-B (-) is not 7.5 to 8.5 Vdc or voltage between ENG-P16-C (+) and ENG-P16-B (-) is not 2.0 to 3.0 Vdc, repair or replace ECM to EMCP harness (WP 0090).

STEP 4. If repairing or replacing the ECM to EMCP harness does not correct the problem, replace the engine low coolant sensor (WP 0100).

STEP 5. If replacing the engine low coolant sensor does not correct the problem, proceed to STEP 6.

STEP 6. Turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 7. Disconnect the defective sensor connector.

a. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

b. Check for a 03 diagnostic code.

c. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF. DEAD CRANK SWITCH is set to OFF.

d. Connect a jumper wire and connect to pins B and C of the bad sensor connector.

e. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP turn the ENGINE CONTROL switch to COOL DOWN/STOP.

f. Check for a 04 diagnostic code. If the correct code is present, the ECM is working OK. Replace the defective sensor (WP 0100).

g. If the diagnostic code remains 03, proceed to STEP 8.

STEP 8. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF. DEAD CRANK SWITCH is set to OFF. Remove the jumper wire.

STEP 9. Replace the GSC (WP 0040) and retest the system.

STEP 10. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CAUTION

The dipstick is marked so that the crankcase oil can be checked while engine is stopped or running. Always make sure dipstick is checked. Remove oil filler cap when checking oil with engine running.

NOTE

The following codes indicate that ECM detected an injection actuation pressure above 3500 psi (24,000 kPa). This condition indicates a mechanical problem. The engine may be low on power. The problem may only exist at operating temperature. Additional testing can be accomplished using the Cat ET. Troubleshoot these codes first.

CID 42 FMI 11 (injection actuation pressure control valve driver fault)
CID 164 FMI 02 (injection actuation pressure erratic)
CID 164 FMI 03 (injection actuation pressure open circuit)
CID 164 FMI 04 (injection actuation pressure short circuit)

SYMPTOM

20. CID 164 E FMI 00

CID 164 E FMI 02

CID 164 E FMI 11

MALFUNCTION

Injection actuation pressure system.

FMI 00 - Data is Valid but Data is Above Normal Operating Range.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Check the engine oil level.

a. Check the engine oil level and perform service per TM 9-6115-729-10, WP 0017.

b. If the engine oil level is low add oil to the engine.

c. Set the Battery Disconnect Switch is ON and the DEAD CRANK SWITCH to NORMAL. On EMCP, turn ENGINE CONTROL switch to MANUAL START.

(1) If the engine starts, check for active codes.

(2) If diagnostic code has cleared, the problem is resolved.

(3) If the diagnostic code is still present, proceed to STEP 3.

STEP 3. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 4. Inspect connectors ENG-P2 on the engine harness (FO-2, sheet 1) and ENG-P1 on the ECM to EMCP Harness (FO-2, sheet 2).

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 5. Conduct an appropriate pull test on wires in the ENG-P2 and ENG-P1 connectors to ensure wires are tight and secure.

STEP 6. Check the wires on both harnesses for abrasion and pinch points (WP 0090).

If necessary, repair and/or replace the connectors and/or wiring (WP 0090).

STEP 7. Disconnect the harness connectors, for the fuel pressure sensor, engine oil pressure sensor, injection actuation sensor, turbo outlet pressure sensor, atmospheric pressure sensor, and turbo inlet pressure sensor.

STEP 8. On EMCP, turn ENGINE CONTROL switch to COOL DOWN/STOP. Battery Disconnect Switch is ON. DEAD CRANK SWITCH is set to NORMAL.

STEP 9. Measure 5.0 +/- 0.2 Vdc between terminals A (supply) and B (return) at each sensor connector.

If 5.0 +/- 0.2 Vdc is not measured on all sensor connectors, repair/replace ECM J2 engine harness (WP 0090).

STEP 10. If the problem is not resolved, perform the Injection Actuation Pressure Test (WP 0013, SYMPTOM 5). Perform sections of the test that match the failure codes.

STEP 11. If the problem is not resolved, replace ECM (WP 0084).

STEP 12. Verify the diagnostic code has been cleared.

NOTE

The ECM detected one of the following conditions:

Injection actuation pressure with the engine shut down
Substantial difference between actual and desired pressure
Change in injection actuation pressure was not consistent with change in sensor current

SYMPTOM

21. CID 164 E FMI 03

CID 164 E FMI 04

MALFUNCTION

Injection actuation pressure system.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

Troubleshoot injector actuation pressure sensor using steps in SYMPTOM 13.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

22. CID 168 E FMI 02

CID 168 E FMI 03

CID 168 E FMI 04

MALFUNCTION

Electrical system voltage.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect connectors ENG-P2 on the engine harness (FO-2, sheet 1) and ENG-P1 on the ECM to EMCP Harness (FO-2, sheet 2).

STEP 3. Conduct an appropriate pull test on wires in the ENG-P2 and ENG-P1 connectors to ensure wires are tight and secure.

STEP 4. Check the wires on both harnesses for abrasion and pinch points (WP 0090).

Repair and/or replace the connectors and/or wiring (WP 0090), as necessary.

STEP 5. Perform Electrical Power Supply Test (WP 0013, SYMPTOM 3).

STEP 6. Verify the problem has been resolved.

SYMPTOM

23. CID 169 E FMI 01

MALFUNCTION

Engine oil maintenance required.

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

Event Code. Engine oil change is required.

CORRECTIVE ACTION

STEP 1. Perform engine oil and filter change (WP 0081).

STEP 2. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP, turn ENGINE CONTROL switch to COOL DOWN/ STOP.

STEP 3. Reset CATSW2 after oil filter and oil are changed.

STEP 4. Record engine oil maintenance.

STEP 5. Verify the fault code has cleared.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

24. CID 170 E FMI 01

MALFUNCTION

Fuel filter change required.

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

Event Code. Inspect fuel filter for leaks, proper mounting, cracks, damage, or missing parts and change fuel filter.

CORRECTIVE ACTION

STEP 1 Perform fuel filter change (WP 0079).

STEP 2. Set Battery Disconnect Switch to ON; Set DEAD CRANK SWITCH to NORMAL. On EMCP, turn ENGINE CONTROL switch to COOL DOWN/ STOP.

STEP 3. Reset CATSW1 after fuel filter change.

STEP 4. Record fuel filter maintenance.

STEP 5. Verify the fault code has cleared.

NOTE

The following codes are generated when the air manifold temperature sensor sees a temperature greater than 194° F (90° C) for two seconds or longer (FMI 00); or greater than 228° F (109° C) (FMI 11) for two seconds or longer. This problem is often caused by one of the following:

Incorrect fuel injection timing
Low air inlet system pressure
Restriction in air inlet

SYMPTOM

25. CID 172 E FMI 00

CID 172 E FMI 03

CID 172 E FMI 04

CID 172 E FMI 11

MALFUNCTION

Inlet air temperature sensor.

FMI 00 - Data is Valid but Data is Above Normal Operating Range.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION

STEP 1. Inspect and service air cleaner per WP 0014 of TM9-6115-729-10.

STEP 2. If air cleaner required service, verify the fault code has cleared. If not continue to the next step.

STEP 3. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 4. Inspect connectors ENG-P2 on the engine harness (FO-2, sheet 1) and ENG-P1 on the ECM to EMCP Harness (FO-2, sheet 2).

STEP 5. Conduct an appropriate pull test on wires in the ENG-P2 and ENG-P1 connectors to ensure wires are tight and secure.

STEP 6. Check the wires on both harnesses for abrasion and pinch points (WP 0090).

Repair and/or replace the connectors and/or wiring (WP 0090), as necessary.

STEP 7. Disconnect engine harness connector ENG-P7 from inlet air temperature sensor (WP 0090, Figure 1, sheet 1, and FO-2, sheet 1).

a. Use a jumper wire long enough to reach from engine harness connector ENG-P7-1 to the engine ground stud.

b. Install jumper wire onto ENG-P7-1.

STEP 8. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 9. On GSC keypad, press GSC ALARM CODES button.

a. Verify a diagnostic code 03 appears.

b. Short the jumper wire (ENG-P7-1) to the engine ground.

c. Verify a diagnostic code 04 appears. This verifies the ECM is working properly.

STEP 10. Turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 11. Remove the jumper wire and connect all wires and connectors.

If a diagnostic code 03 and/or a diagnostic code 04 did not appear in STEP 9, use a DVM to verify the wiring between ENG-P7-1 to ENG-P2-35 and between ENG-P7-2 to ENG-P2-18, P6-2, and P18-2. Repair or replace the engine harness (WP 0090) as necessary.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 12. If the problem is not resolved, replace intake manifold air temperature sensor (WP 0100).

STEP 13. Verify the problem is resolved. If not, replace ECM (WP 0084).

STEP 14. Verify the fault code has cleared.

NOTE

The engine oil temperature sensor is read by the ECM and the information sent to the GSC via the CAT data link (ENG-P1 to ENG-P37).

SYMPTOM

26. CID 175 FMI 02

CID 175 FMI 03

CID 175 FMI 04

MALFUNCTION

Engine oil temperature sensor.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect connectors ENG-P2 on the engine harness (FO-2, sheet 1) and ENG-P1 on the ECM to EMCP Harness (FO-2, sheet 2).

STEP 3. Conduct an appropriate pull test on wires in the ENG-P2 and ENG-P1 connectors to ensure wires are tight and secure.

STEP 4. Check the wires on both harnesses for abrasion and pinch points (WP 0090).

Repair and/or replace the connectors and/or wiring (WP 0090), as necessary.

STEP 5. Disconnect engine harness connector ENG-P18 from oil temperature sensor (WP 0090, Figure 1, sheet 1, and FO-2, sheet 1).

a. Fabricate a jumper wire long enough to reach from engine harness connector ENG-P18-1 to the engine ground stud.

b. Install jumper wire onto ENG-P18-1.

STEP 6. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP, turn ENGINE CONTROL switch to COOL DOWN/ STOP.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 7. On GSC keypad, press GSC ALARM CODES button.

a. Verify a diagnostic code 03 appears.

b. Short the jumper wire (ENG-P18-1) to the engine ground.

c. Verify a diagnostic code 04 appears. This verifies the ECM is working properly.

STEP 8. Turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 9. Remove the jumper wire and connect all wires and connectors.

If a diagnostic code 03 and/or a diagnostic code 04 did not appear in STEP 13, use a DVM to verify the wiring between ENG-P18-1 to ENG-P2-34 and between ENG-P7-2 to ENG-P2-18, P6-2, and P18-2. Repair or replace the engine harness (WP 0090) as necessary.

STEP 10. If the problem is not resolved, replace the oil temperature sensor (WP 0100).

STEP 11. Verify the problem is resolved. If not, replace the ECM (WP 0084).

STEP 12. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

The magnetic pickup unit (MPU) on this engine is located at the rear of the engine on the flywheel housing.

SYMPTOM

27. CID 190 FMI 02

CID 190 FMI 03

MALFUNCTION

Loss of engine speed signal.

Magnetic pickup unit (engine speed sensor).

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 03 - Voltage Above Normal.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET.

STEP 2. Disconnect connector ENG-P14 from the magnetic pickup unit (MPU) (WP 0090, Figure 2, sheet 2, and FO-2, sheet 2).

STEP 3. Measure MPU resistance.

a. If resistance is not 100 to 350 ohms, replace the MPU (WP 0100).

b If resistance is correct, set DVM to AC volts. Turn DEAD CRANK SWITCH to CRANK. Measure 2 to 3 Vac on ENG J14-1 to ENG J14-2 (MPU pigtail connector). Turn DEAD CRANK SWITCH to NORMAL.

(1) If voltage measurement is not OK, adjust the MPU (WP 0100). Verify the problem is resolved. If not, the MPU is damaged or it is not functioning. Replace the magnetic pickup unit (WP 0100). Verify the problem is resolved.

(2) If the voltage measurement is OK, the MPU is functioning OK.

(3) Reconnect ENG-P14 to MPU.

STEP 4. Disconnect ENG-P37 from the back of the EMCP. Measure resistance between ENG-P37-1 and ENG-P37-2. Resistance should be 100 to 350 ohms.

a. If resistance is not 100 to 350 ohms, troubleshoot wiring harness between ENG-P37 of EMCP and ENG-P14 (WP 0090). Repair as necessary (WP 0090). Verify the problem has been resolved.

b. If the problem has not been resolved, troubleshoot wiring between EMCP J37-1 to GSC P7-1 and EMCP J37-2 to GSC P7-2. Repair as necessary (WP 0090). Verify the problem has been resolved.

c. If the problem has not been resolved, check all GSC fuses (FO-4, Sheets 3 and 5).

d. If GSC fuses are ok, replace GSC (WP 0040).

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

The primary engine timing sensor on this engine is the top crankshaft timing sensor.

SYMPTOM

28. CID 190 E FMI 02

CID 190 E FMI 11

MALFUNCTION

Loss of engine timing signal.

Primary engine timing sensor.

FMI 01 - Erratic, Intermittent, or Incorrect Signal.

FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Disconnect connector ENG-P4 from the top (primary) engine timing sensor (FO-2, sheet 1). The sensor connector has a wire clip that must be removed in order to disconnect the connector from the sensor.

STEP 3. Measure engine timing sensor resistance.

a. If resistance is not 75 to 230 ohms, replace engine timing sensor assembly (both the primary and secondary timing sensors are contained in the engine timing sensor assembly) (WP 0100).

b. If resistance is correct, inspect and adjust engine timing (WP 0013, SYMPTOM 11).

c. Verify the problem has been resolved. If not, continue to the next step.

STEP 4. If the problem is not resolved, remove and inspect the sensor assembly (WP 0013, SYMPTOM 4, steps 6-a thru 6-f).

a. If sensor is damaged, replace and adjust sensor assembly (WP 0100, WP 0013, SYMPTOM 4). Verify the problem is resolved.

b. If the sensor does not appear to be damaged, reinstall sensor assembly.

STEP 5. Disconnect ENG-P2 from the ECM J2 (WP 0090, Figure 2, sheet 3 and FO-2, sheet 1).

STEP 6. Inspect engine harness and verify continuity between ENG-P4-A and ENG-P2-49 and between ENG-P4-B and ENG-P2-48 (FO-2, sheet 1).

a. If open or shorted, repair or replace engine harness (WP 0090), as necessary.

b. Verify the problem has been resolved. If not, replace the ECM (WP 0084).

STEP 7. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

29. CID 248 FMI 09

MALFUNCTION

CAT data link.

FMI 09 - Abnormal Update.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Disconnect ENG-P1 from ECM.

STEP 3. Verify continuity between CDC P7-E and ENG P1-9 and between CDC P7-D and ENG P1-8 per FO-4, sheet 1, FO-2, sheet 2 and WP 0090, Figure 2, sheet 3.

a. Repair or replace harness, as required (WP 0090).

b. If the problem is not resolved, continue to STEP 4.

STEP 4. Perform Electronic Service Tool (Cat ET) will not communicate with ECM (WP 0013, SYMPTOM 10).

STEP 5. Verify the problem has been resolved.

NOTE

This code indicates that a customer or system parameter has not been programmed, or the code in the personality module in the ECM does not match the code for the ECM. The engine may be limited in horsepower or speed.

SYMPTOM

30. CID 253 E FMI 02

MALFUNCTION

Personality module mismatch.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. On EMCP, turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Verify the flash file in the ECM (WP 0013, SYMPTOM 12).

If flash file is incorrect, load correct flash file into the ECM.

STEP 3. If the problem is not resolved, replace ECM (WP 0084).

Load correct flash file into ECM (WP 0013, SYMPTOM 12).

STEP 4. Verify the problem is resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

This fault code indicates that the ECM has detected an internal power supply or memory problem that can not be repaired.

SYMPTOM

31. CID 254 E FMI 12

MALFUNCTION

ECM self test.

FMI 12 - Failed Component.

CORRECTIVE ACTION

STEP 1. If the ECM fails Self Test, replace ECM (WP 0084).

STEP 2. Load correct flash file into new ECM (WP 0013, SYMPTOM12).

STEP 3. Verify the ECM passes Self Test.

SYMPTOM

32. CID 261 E FMI 13

MALFUNCTION

Engine timing calibration.

FMI 13 - Device is not Calibrated.

CORRECTIVE ACTION

Perform Engine Timing Calibration (WP 0013, SYMPTOM 11).

NOTE

These failures are caused by either a failed sensor or a problem with the wiring.

SYMPTOM

33. CID 262 E FMI 03

CID 262 E FMI 04

MALFUNCTION

5 V sensor power supply.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect connectors ENG-P2 on the engine harness (FO-2, sheet 1) and ENG-P1 on the ECM to EMCP Harness (FO-2, sheet 2).

STEP 3. Conduct an appropriate pull test on wires in the ENG-P2 and ENG-P1 connectors to ensure wires are tight and secure.

STEP 4. Check the wires on both harnesses for abrasion and pinch points (WP 0090).

Repair and/or replace the connectors and/or wiring (WP 0090), as necessary.

STEP 5. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. On EMCP, turn ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 6. Check for FMI 03 and/or FMI 04 failure modes with associated fault codes CID 94 and CID 100 simultaneously or CID 164, CID 273, and CID 274 simultaneously. Perform the following steps if any of the fault codes are active.

a. If found, go to STEP 7 and troubleshoot engine wiring harness. Check for opens or shorts in the sensors common wires.

b. If not found, proceed to STEP 8.

STEP 7. Troubleshoot engine wiring harness per WP 0090, Figure FO-2, Sheets 1 and 2.

a. Disconnect engine wiring harness connectors ENG-P1 and ENG-P2 and the connectors to sensors listed in STEP 8.

b. Check continuity between ENG-P1 and ENG-P2 and all sensors identified in STEP 8.

c. If wires all have continuity, reconnect all sensor connectors, ENG-P1 and ENG-P2. Proceed to STEP 8.

d. If continuity is not found, repair or replace wiring harness as necessary per WP 0090.

e. Reconnect all sensors, ENG-P1 and ENG-P2 and verify is the problem still exists. If so, proceed to STEP 8.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 8. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn ENGINE CONTROL switch to COOL DOWN/STOP. Disconnect the following sensors one at a time, while observing the GSC (WP 0090, Figure 1).

a. Engine oil pressure sensor.

b. Turbo outlet pressure sensor.

c. Fuel pressure sensor.

d. Injection actuation pressure sensor.

e. Atmospheric pressure sensor.

f. Turbo inlet pressure sensor.

STEP 9. On EMCP, turn ENGINE CONTROL switch to OFF/RESET, Battery Disconnect Switch to OFF; and DEAD CRANK SWITCH to OFF.

STEP 10. If the diagnostic code deactivated after a particular sensor was disconnected, replace the sensor causing the fault. Reconnect sensors.

STEP 11. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn ENGINE CONTROL switch to COOL DOWN/STOP. Verify if problem still exists.

a. If faults still exist and not all the sensors have been disconnected; go back to STEP 8.

b. If all sensors have been disconnected and fault remains active, go to STEP 12.

STEP 12. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 13. If STEP 7 was not performed earlier, Troubleshooting wiring harness per STEP 7, (a), (b), (d), and (e).

STEP 14. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn ENGINE CONTROL switch to COOL DOWN/STOP. Check for fault code.

If the fault code has not cleared, continue to STEP 15. If the fault code has cleared, the problem has been resolved.

STEP 15. If problem still exists, replace the ECM (WP 0084).

STEP 16. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn ENGINE CONTROL switch to COOL DOWN/STOP. Verify fault code has cleared.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

34. CID 264 E FMI 03

MALFUNCTION

E-Stop shutdown.

FMI 03 - Voltage Above Normal.

Event Code. Red EMERGENCY STOP indicator on GSC flashes when PUSH TO STOP EMERGENCY STOP pushbutton is pressed on control panel. Engine shuts down and does not start until pushbutton is pulled out and ENGINE CONTROL switch is set to OFF/RESET and back to MANUAL START.

CORRECTIVE ACTION

STEP 1. Determine reason for emergency stop situation.

a. Correct emergency stop condition.

b. Reset emergency stop switch to the OFF position.

c. Verify the fault has cleared. If not proceed to the next step.

d. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Check for an open circuit between the following test points (FO-1, sheet 2; FO-2, sheet 1):

a. GSC A1-13 to PB3-14.

b. Terminal 1A on the Emergency Stop switch and Terminal 2A on the Emergency Stop switch.

c. Terminal TB3-14 and Terminal 1A on the Emergency Stop switch.

d. Terminal 2A on the Emergency Stop switch and the Battery Disconnect Switch.

e. Terminal 27 of the ENG-P37 harness connector and Terminal TB3-14.

f. ECM connector ENG-P1-23 and Terminal 27 of the engine harness connector.

STEP 3. If an open circuit is detected between any of the test points, repair the wiring and/or replace damaged components.

STEP 4. Check each connection for corrosion.

STEP 5. Ensure all wires are properly crimped and/or tightened (WP 0090).

STEP 6. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

The GSC displays a CID 0268 FMI 02 when the setpoint data is invalid or the setpoint data is out of range. After displaying this code, the GSC sets the affected setpoint(s) to the default value(s).

SYMPTOM

35. CID 268 FMI 02

MALFUNCTION

GSC electronic control.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF (to reset the GSC).

STEP 2. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 3. Verify the problem has been resolved. If not, check for other fault codes. Troubleshoot and resolve as required.

STEP 4. Verify all programmable setpoints in the GSC (WP 0085).

STEP 5. If the problem is not resolved, reprogram the GSC setpoints (WP 0085).

STEP 6. If reprogramming the GSC does not resolve the fault, replace the GSC (WP 0040).

STEP 7. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

If the sensor power supply is detected to be greater than 8.5 Vdc or less than 7.5 Vdc, this fault code will appear.

SYMPTOM

36. CID 269 FMI 03

CID 269 FMI 04

MALFUNCTION

GSC 8V sensor power supply.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF. Reset GSC.

STEP 2. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 3. Observe fault codes on GSC.

a. Disconnect low coolant sensor connector ENG-P16. Using DVM, measure voltage between ENG-P16-A and ENG-P16-B. If voltage is between 7.5 and 8.5 Vdc go to STEP 3 d. If voltage is above 8.5 Vdc or below 7.5 Vdc go to STEP 3 b.

b. Inspect wiring and check continuity of wiring on ECM to EMCP harness between GSC ENG-P37 and low coolant sensor connector ENG-P16 (WP 0090). Repair as necessary (WP 0090).

c. If wiring harness was repaired, verify the problem has been resolved.

d. Verify all programmable setpoints in the GSC (WP 0084).

e. If fault still appears on GSC, replace the GSC (WP 0040).

STEP 4. Verify the problem has been resolved.

SYMPTOM

37. CID 273 FMI 03

CID 273 FMI 04

MALFUNCTION

Turbo outlet pressure sensor.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

Troubleshoot turbo outlet pressure sensor using steps in SYMPTOM 13.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

38. CID 274 FMI 02

MALFUNCTION

Atmospheric pressure sensor.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect wiring and verify continuity between engine harness ENG-P2 and atmospheric pressure sensor connector ENG-P11 per FO-2, sheet 1. Repair or replace engine harness wiring (WP 0090), as necessary.

STEP 3. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. Check for an active 02 diagnostic code. If the fault has not been resolved, replace atmospheric pressure sensor (WP 0100).

STEP 5. If replacing sensor does not resolve fault, replace ECM (WP 0084).

STEP 6. Verify the problem has been resolved.

SYMPTOM

39. CID 274 FMI 03

CID 274 FMI 04

MALFUNCTION

Atmospheric pressure sensor.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

Troubleshoot atmospheric pressure sensor using steps in SYMPTOM 13.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

40. CID 334 FMI 02

CID 334 FMI 03

CID 334 FMI 04

MALFUNCTION

Cool Down circuit (P7-36).

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Measure voltage between cool down relay (CDR) pin 13 (+) and TB3-1 (-) per FO-4, sheets 2 and 4.

a. If voltage is not approximately 24 Vdc (battery voltage), repair or replace control box harness (WP 0041). Verify the problem has been resolved.

b. If harness is good, replace relay CDR (WP 0041). Verify the problem has been resolved.

c. If harness repair does not resolve fault and CDR is good, check all GSC fuses (FO-4, Sheets 3 and 5).

d. If GSC fuses are ok, continue with STEP 3.

STEP 3. Turn the ENGINE CONTROL switch to MANUAL START and allow engine to accelerate to operating speed.

STEP 4. After the engine has run for approximately 3 minutes, turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 5. Measure voltage between cool down relay (CDR) pin 13 (+) and GSC P7-36 (-) for voltage of less than 1.0 Vdc, per FO-4, sheets 1, 2, and 4.

STEP 6 If voltage is not less than 1.0 VDC, replace GSC (WP0040).

STEP 7. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

A fault code is generated if none of the GSC inputs from the ENGINE CONTROL switch are connected to ground, or if more than one input is grounded.

SYMPTOM

41. CID 336 FMI 02

MALFUNCTION

ENGINE CONTROL switch.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect the harness between ENGINE CONTROL switch and the GSC per FO-4, sheets 1, 4, and 5. Look for broken and shorted wires. Repair or replace control box harness, as required (WP 0043 and WP 0090).

STEP 3. Verify continuity of ENGINE CONTROL switch in accordance with FO-1, sheet 2.

a. If ENGINE CONTROL switch defective, replace ENGINE CONTROL switch (WP 0040).

b. If ENGINE CONTROL switch is good, check all GSC fuses (FO-4, Sheets 3 and 5).

c. If GSC fuses are ok, replace GSC (WP 0040).

STEP 4. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

The secondary engine timing sensor on this engine is the bottom crankshaft timing sensor.

SYMPTOM

42. CID 342 E FMI 02

CID 342 E FMI 11

MALFUNCTION

Secondary (bottom) engine timing sensor.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 11 - Failure Mode is not Identifiable (Mechanical Failure).

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2 Disconnect engine harness connector ENG-P5 from the secondary (bottom) engine timing sensor (WP 0090, Figure 2, sheet 1, and FO-2, sheet 1). The sensor connector has a wire clip that must be removed in order to disconnect the connector from the sensor.

STEP 3. Measure engine timing sensor resistance.

a. If resistance is not 600 to 1800 ohms, replace engine timing sensor (WP 0100).

b. If resistance is correct, inspect and adjust engine timing (WP 0013, SYMPTOM 11).

c. If sensor damaged, replace and adjust sensor (WP 0100, WP 0013, SYMPTOM 4).

STEP 4. Disconnect engine harness connector ENG-P2 from ECM J2 (WP 0090, Figure 2, Sheet 3, and FO-2, Sheet 1).

STEP 5. Connect ENG-P5 to secondary (bottom) engine timing sensor.

STEP 6. Inspect engine harness and measure continuity between ENG-P2-58 and ENG-P2-59 (WP 0090, Figure 2, sheet 3). Measurement should be approximately the same as in STEP 2 b. If open or shorted, repair or replace engine harness (WP 0090), as necessary.

STEP 7. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

43. CID 360 E FMI 01

CID 360 E FMI 02

CID 360 E FMI 03

MALFUNCTION

Low engine oil pressure warning (Active & Logged).

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 03 - Voltage Above Normal.

Event Code. Red LOW OIL PRESSURE indicator flashes when oil pressure drops below the programmed low oil pressure setpoints. Engine shuts down and does not start until fault is corrected.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Press ALARM CODES on GSC keypad.

STEP 3. Check oil level and perform service per TM 9-6115-729-10, WP 0017.

STEP 4. Verify the fault code has been cleared.

STEP 5. Verify all alarm and fault codes.

a. If CID 100 is active, troubleshoot engine oil pressure sensor per WP 0009, SYMPTOM 17.

b. Troubleshoot other alarm and fault codes, as necessary.

STEP 6. Verify all programmable setpoints (WP 0085).

STEP 7. Verify the fault code has been cleared.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

44. CID 361 E FMI 01

CID 361 E FMI 02

CID 361 E FMI 03

MALFUNCTION

High engine coolant temperature warning (Active & Logged).

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 03 - Voltage Above Normal.

Event Code. Red HIGH WATER TEMP indicator on GSC flashes when coolant temperature rises above programmed setpoints.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Press ALARM CODES on GSC keypad.

STEP 3. Verify associated alarm and fault code and troubleshoot (WP 0008 and/or WP 0009).

a. If CID 110 is active, troubleshoot per WP 0009, SYMPTOM 18.

b. Troubleshoot all other alarm and fault codes per WP 0008 and WP 0009.

STEP 4. Verify all programmable setpoints (WP 0085).

STEP 5. Open right side engine access door and check coolant level in coolant recovery (overflow) bottle.

STEP 6. If required service coolant per TM 9-6115-729-10, WP 0015 00.

STEP 7. Inspect coolant system lines and radiator for leaks per PMCS (WP 0016).

STEP 8. Inspect fan and alternator and water pump belt per PMCS (WP 0016 and WP 0073). Check water pump belt tension. Correct if necessary.

STEP 9. If required, replace water pump belt (WP 0073).

STEP 10. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

45. CID 362 E FMI 01

CID 362 E FMI 03

MALFUNCTION

Overspeed warning (active and logged).

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

FMI 03 - Voltage Above Normal.

Red ENGINE OVERSPEED indicator flashes when engine speed rises above programmed setpoint for engine overspeed.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Press ALARM CODES on GSC keypad.

STEP 3. Check for associated alarm code and fault code and troubleshoot (WP 0008 and/or WP 0009).

a. If CID 190 is active, troubleshoot per WP 0009, SYMPTOM 27.

b. Troubleshoot all alarm and fault codes per WP 0008 and WP 0009.

c. Check programmable setpoint P010 (WP 0085, Table 4).

STEP 4. Correct faults and resume normal generator operations.

SYMPTOM

46. CID 368 E FMI 01

MALFUNCTION

High inlet air temperature warning (active and logged).

FMI 01 - Data is valid but data is below normal operating range.

Event Code. Inlet air manifold temperature sensor detected temperature outside of normal operating range. This input affects ignition timing.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Press ALARM CODES on GSC keypad.

STEP 3. Check for associated alarm code and fault code and troubleshoot (WP 0008 and/or WP 0009).

a. If CID 172 is active, troubleshoot per WP 0009, SYMPTOM 25.

b. Troubleshoot all alarm and fault codes per WP 0008 and WP 0009.

STEP 4. Correct faults and resume normal generator operations.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

47. CID 390 E FMI 01

MALFUNCTION

Fuel filter restriction warning (active and logged).

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

Event Code. Indicates that sensor detects a fuel system restriction.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Press ALARM CODES on GSC keypad.

STEP 3. Check for associated alarm code and fault code and troubleshoot (WP 0008 and/or WP 0009).

a. If CID 94 is active, troubleshoot per WP 0009, SYMPTOMS 12 and 13.

b. Troubleshoot all alarm and fault codes per WP 0008 and WP 0009.

STEP 4. If no fault code, inspect fuel filter and fuel water/separator per PMCS (WP 0016, WP 0060 and WP 0079) and perform service as directed.

SYMPTOM

48. CID 391 E FMI 01

MALFUNCTION

Inlet air restriction warning (active and logged).

FMI 01 - Data is Valid but Data is Below Normal Operating Range.

Event Code. Indicates that sensor detects inlet air restriction.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Press ALARM CODES on GSC keypad.

STEP 3. Check for associated alarm code and fault code and troubleshoot (WP 0008 and/or WP 0009).

a. If CID 1589 is active, troubleshoot per WP 0009, SYMPTOMS 67 and 68.

b. Troubleshoot all alarm and fault codes per WP 0008 and WP 0009.

STEP 4. If no fault code, inspect air inlets (WP 0070 and WP 0071).

STEP 5. Remove debris or obstructions and perform service as directed.

STEP 6. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

When the GSC activates the EGR, K1 is displayed on the GSC lower display.

SYMPTOM

49. CID 441 FMI 12

MALFUNCTION

GSC engine governor relay (EGR) output.

FMI 12 - Failed Component.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Verify that GSC relay module A1-13 is connected to ground A1-28 when the PUSH TO STOP EMERGENCY STOP pushbutton (ESPB) is pulled out per FO-4, sheet 5.

a. Repair or replace control box harness between ESPB and GSC (WP 0043 and WP 0090), as necessary.

b. If harness is good, replace ESPB (WP 0041).

STEP 3. Verify continuity of wiring between GSC pins A1-13 and A1-14 (RM-13 and RM-14) and the ECM per FO-4, sheets 1 and 5, FO-1, sheet 2.

a. Repair or replace harness between GSC and ECM (WP 0090), as necessary.

b. Verify harness is good. If so, check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040). Verify the problem has been resolved. If not, proceed to the next step.

c. If harness is good and GSC is good, replace ECM (WP 0084).

STEP 4. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

SYMPTOM

50. CID 442 FMI 12

MALFUNCTION

GSC generator fault relay (GFR) output.

FMI 12 - Failed Component.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Remove fuse A1F5 from rear of GSC.

STEP 3. Check fuse A1F5.

a. If fuse is bad, replace fuse A1F5.

b. If fuse is good, repair or replace wiring harness (WP 0090), as necessary.

c. If wiring is good, proceed to the next step.

STEP 4. Disconnect wire(s) from GSC relay module A1-22 per FO-4, sheet 5.

STEP 5. On GSC relay module measure resistance between A1-7 and A1-22. Record measured resistance).

STEP 6. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 7. Push in PUSH TO STOP EMERGENCY STOP pushbutton.

STEP 8. Measure resistance between A1-7 and A1-22. If resistance is not less than 5 ohms or not greater than 5,000 ohms measured in STEP 5, check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 9. Reinstall fuse A1F5 and reconnect wire(s) to GSC A1-22.

STEP 10. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

An internal set of CTR contacts short between pins A1-1 and A1-2 on the GSC to maintain power at pin A1-2 if ENGINE CONTROL switch were to be placed in COOL DOWN/STOP position with the engine running. When active GSC CTR output will display K3 on GSC lower display.

SYMPTOM

51. CID 443 FMI 12

MALFUNCTION

GSC crank termination relay (CTR) output.

FMI 12 - Failed Component.

CORRECTIVE ACTION

STEP 1. Check fuse A1F10 on GSC. Replace if necessary.

STEP 2. Verify the problem has been resolved. If not, proceed to the next step.

STEP 3. Check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 4. Verify the problem is resolved.

NOTE

When active GSC SMR output displays K4 GSC lower display.

SYMPTOM

52. CID 444 FMI 12

MALFUNCTION

GSC starter motor relay (SMR) output.

FMI 12 - Failed Component.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Remove fuse A1F4 from rear of GSC.

STEP 3. Check fuse A1F4.

a. If fuse is bad, replace fuse A1F4. Verify the problem has been resolved.

b. If fuse is good, repair or replace wiring harness (WP 0090, Table 1 and Table 2, and WP 0043), as necessary.

c. If wiring is good, remove fuse A1F4 and proceed to the next step.

STEP 4. Disconnect wire(s) from GSC relay module A1-18 per FO-4, sheet 5.

STEP 5. On relay module, measure resistance between A1-6 and A1-18. Record resistance measurement.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 6. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. Turn ENGINE CONTROL switch to MANUAL START.

NOTE

Measurement must be made before the total cycle crank time of 90 seconds (setpoint P017 WP 0086) is exceeded.

STEP 7. Quickly measure resistance between A1-6 and A1-18. If resistance not less than 5 ohms or the resistance was not greater than 5,000 ohms measured in STEP 5, check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 8. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 9. Reinstall fuse A1F4 and reconnect wire(s) to GSC A1-18.

STEP 10. Verify the problem has been resolved.

NOTE

When active GSC RR output displays K5 on GSC lower display.

SYMPTOM

53. CID 445 FMI 12

MALFUNCTION

GSC run relay (RR) output.

FMI 12 - Failed Component.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Remove fuse A1F6 from rear of GSC.

STEP 3. Check fuse A1F6.

a. If fuse is bad, replace A1F6. Verify the problem has been resolved.

b. If fuse is not bad, repair or replace wiring harness (WP 0090 Table 1 and Table 2 and WP 0043).

c. If wiring is good, remove fuse A1F6 and proceed to the next step.

STEP 4. Disconnect wire(s) from GSC relay module A1-24 per FO-4, sheet 5.

STEP 5. Measure the resistance between relay module A1-8 and A1-24. Resistance should be greater than 5,000 ohms. Make a note of resistance measurement.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 6. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to ON. Turn ENGINE CONTROL switch to MANUAL START.

STEP 7. Measure the resistance between A1-8 and A1-24. If resistance not less than 5 ohms or the resistance was not greater than 5,000 ohms, in STEP 5, check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 8. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 9. Reinstall fuse A1F6 and reconnect wire(s) to GSC A1-24.

STEP 10. Verify the problem has been resolved.

NOTE

When the GSC activates the FCR, K7 is displayed on GSC lower display. An internal set of FCR contacts short between Relay Module pins A1-1 and A1-2 on the GSC to maintain power at A1-2 if the ENGINE CONTROL switch is placed in COOL DOWN/STOP position with the engine running.

SYMPTOM

54. CID 447 FMI 12

MALFUNCTION

GSC fuel control relay (FCR) output.

FMI 12 - Failed Component.

CORRECTIVE ACTION

STEP 1. Check fuse A1F10 on GSC. Replace fuse if bad.

STEP 2. Verify the problem has been resolved. If not, proceed to the next step.

STEP 3. Check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 4. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

The programmable spare relays (PSR1 and PSR2) are used for activating customer equipment. PSR1 is normally closed while PSR2 is normally open.

SYMPTOM

55. CID 448 FMI 12

MALFUNCTION

GSC programmable spare relays (PSR1 and PSR2) output.

FMI 12 - Failed Component.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Remove fuse A1F8 and A1F9 from rear of GSC.

STEP 3. Check fuse A1F8 and A1F9.

a. If fuse is bad, replace A1F8 and/or A1F9. Verify the problem has been resolved.

b. If fuse is not bad, repair or replace wiring harness (WP 0090 Table 1 and Table 2 and WP 0043) as necessary. Verify the problem has been resolved.

c. If wiring is good, proceed to the next step.

STEP 4. Disconnect wire(s) from GSC relay module (RM) A1-26 per FO-4, sheet 5.

STEP 5. On the GSC relay module, measure resistance between RM-25 and RM-11. Resistance should be greater than 5000 ohms. Measure resistance between RM-26 and RM-10. Resistance should be less than 5 ohms.

STEP 6. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.. Turn ENGINE CONTROL switch to MANUAL START.

STEP 7. Measure resistance between RM-25 and RM-11. Resistance should be less than 5 ohms. Measure resistance between RM-26 and RM-10. Resistance should be greater than 5000 ohms.

STEP 8. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 9. If any of the measurements fail, check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 10. Reinstall fuse A1F8 and A1F9 and reconnect wire(s) to GSC A1-26.

STEP 11. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

The following fault code means the GSC is unable to measure the AC voltage and AC current. The engine remains able to start and run. This diagnostic code will be shown even when ENGINE CONTROL switch is set to OFF/RESET.

SYMPTOM

56. CID 500 FMI 12

MALFUNCTION

GSC.

FMI 12 - Failed Component.

CORRECTIVE ACTION

STEP 1. Check fuses A5F1, A5F2, and A5F3. Replace if bad.

STEP 2. Verify the problem has been resolved.

STEP 3. Verify the wiring on the A5 module (WP 0090).

STEP 4. Verify the problem has been resolved.

STEP 5. Verify connector A5-P1 is not loose or damaged (WP 0090).

STEP 6. Verify the problem has been resolved.

STEP 7. Verify setpoints (WP 0085, Table 8).

STEP 8. Verify the problem has been resolved.

STEP 9. Check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 10. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

This fault code means the GSC did not control the engine shutdown. The GSC detected that engine speed dropped from rated speed to 0 RPM when the GSC has not called for a shutdown. The GSC has determined that there is no engine speed sensor fault that would explain the engine shutdown. The engine is disabled from running or starting.

SYMPTOM

57. CID 566 FMI 07

MALFUNCTION

Unexpected shutdown.

FMI 07 - Improper Mechanical Response.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Check fuel level and quality.

a. If fuel tank is empty, fill tank per TM 9-6115-729-10.

b. If fuel quality is suspect, drain and replace fuel.

STEP 3. Inspect fuel filter. If fuel filter is clogged, replace fuel filter (WP 0079).

STEP 4. Inspect air filter. If air filter is clogged, replace air filter (WP 0070).

STEP 5. Check fuses A1F2 and A1F10 per FO-4, sheet 5. If fuse is bad, replace fuse.

STEP 6. Refer to engine troubleshooting if there is an obvious engine problem. Troubleshooting without Fault Codes (WP 0011).

STEP 7. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

This fault code means the ECM has stopped responding to the periodic requests for information from the GSC.

SYMPTOM

58. CID 590 FMI 09

MALFUNCTION

Engine electronic control module.

FMI 09 - Abnormal Update.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Verify continuity between GSC P7-19 and ECM ENG-P1-8 and between GSC P7-20 and ECM ENG-P1-9 per FO-4, sheet 1 and FO-2, sheet 2.

a. Repair or replace harness, as required (WP 0090).

b. If harness is good, check all GSC fuses (FO-4, Sheets 3 and 5).

c. If GSC fuses are ok, replace GSC (WP 0040).

d. If replacing GSC does not correct fault, replace ECM (WP 0084).

STEP 3. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

The intake air heater output from the ECM controls the air inlet heater relay attached to the engine. This failure code is usually due to a relay coil open or shorted, or a problem with the harness.

SYMPTOM

59. CID 617 E FMI 02

CID 617 E FMI 05

CID 617 E FMI 06

MALFUNCTION

Intake air heater.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 05 - Current is Below Normal or Circuit is Open.

FMI 06 - Current is Above Normal or Circuit is Grounded.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect engine harness wiring between intake air heater relay connector ENG-P101 and ECM connector ENG-P2 per FO-2, sheet 1.

STEP 3. Repair or replace engine harness wiring (WP 0090), as necessary.

STEP 4. If wiring repair does not resolve fault, perform Air Inlet Heater Circuit Test (WP 0013, SYMPTOM 1).

STEP 5. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

This fault code means the GSC detected a short to B+ or B- on one of the lines (P7-21 and P7-22) of the CCM data link. The CCM output is not used.

SYMPTOM

60. CID 770 FMI 09

MALFUNCTION

Customer communication module (CCM) data link.

FMI 09 - Abnormal Update.

CORRECTIVE ACTION

STEP 1. Troubleshoot data link per WP 0013, SYMPTOM 10.

STEP 2. If the problem is not resolved, replace ECM (WP 0084).

STEP 3. Verify the problem has been resolved.

NOTE

If the close breaker output (P7-37) voltage is detected to be above or below normal, this fault code will appear. This fault occurs only in AUTO PARALLEL mode.

SYMPTOM

61. CID 858 FMI 02

CID 858 FMI 03

CID 858 FMI 04

MALFUNCTION

Close breaker output.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. In control box, locate wire between SYNC MODE switch (SMS) pin 11 and P7-37 per FO-4 sheet 1 and FO-1 sheet 3.

STEP 3. Disconnect wire from SMS pin 11 and measure voltage at end of wire.

a. If voltage is not 5.2 ±1.0 Vdc, repair or replace control box harness (WP 0090 and WP 0043), as necessary. Verify the problem has been resolved.

b. If the problem has not been resolved, check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 4. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

This output varies from +5 Vdc to -5 Vdc and is sent to load sharing module A4 to generate the signal sent to the engine controller to set and control the speed of the engine. If the synchronization is disabled, the output will be approximately 0 Vdc.

Set two generators in parallel mode per TM9-6115-729-10. Generator set A will be the test unit (with the fault) and generator set B will be the load unit.

SYMPTOM

62. CID 1038 FMI 02

CID 1038 FMI 03

CID 1038 FMI 04

MALFUNCTION

Speed adjust 1 output P7-27 (+) and P7-28 (-).

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF on generator set A. Set SYNC MODE switch to OFF.

STEP 2. Disconnect wire from LSM A4-24 per FO-4, sheet 2, on generator set A.

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP, on generator set A.

STEP 4. Measure the voltage on the end of the wire (A4-24+) with respect to A4-25.

a. If voltage not 0 ± 1 Vdc, repair or replace harness (WP 0043 and WP 0090), as necessary.

b. If harness is good continue to next step.

STEP 5. On both generator sets, set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to MANUAL START. Set SYNCH switch to SEMI-AUTOMATIC. Close load contactor on generator set B.

STEP 6. Adjust the engine speed so the frequency, on generator set A is 1 Hz higher than what is on the load bus (generator set B).

STEP 7. Allow the voltage to stabilize.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 8. Measure the voltage on the end of the wire (A4-24+) with respect to A4-25.

a. If voltage not -4 Vdc to -6 Vdc, repair or replace harness (WP 0041 and WP 0090), as necessary.

b. If harness is good and voltages are bad, check all GSC fuses (FO-4, Sheets 3 and 5).

STEP 9. Adjust the engine speed so the frequency is 1 Hz lower than what is on the load bus.

STEP 10. Allow voltage to stabilize.

STEP 11. Measure voltage on the end of the wire (A4-24+) with respect to A4-25.

a. If voltage not 4 Vdc to 6 Vdc, repair or replace harness (WP 0043).

b. If voltages are good, replace LSM A4 (WP 0041).

c. If harness is good and voltages are bad, replace GSC (WP 0040).

STEP 12. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

This failure is displayed when main contactor K1 is closed (input is grounded) and one or both of the following are true:

The difference in frequency between the generator and the bus is greater than 0.2 Hz.
The difference in phase between the generator and the bus is greater than 10 degrees.

When the above conditions are true for more than two seconds, the fault will occur. The GSC will then stop the synchronization process until the fault is cleared and corrected.

SYMPTOM

63. CID 1167 FMI 04

MALFUNCTION

K1 sense input (P7-25).

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Disconnect wire at TB3-12 leading to P7-25 per FO-4, sheet 4.

STEP 3. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. Measure voltage on end of wire (TB3-12 +) with respect to TB3-1 (-). Record measured voltage.

STEP 5. Check A6 BTB fuses (FO-1, Sheet 5). Replace if necessary. Verify wiring for A6 BTB (FO-1, Sheet 5). Repair if necessary (WP 0090).

STEP 6. Turn the ENGINE CONTROL switch to MANUAL START.

STEP 7. Adjust engine speed so the generator frequency is more than 0.2 Hz different (high or low) than what is on the load bus.

STEP 8. Perform the Permissive Paralleling Procedure. TM 9-6115-729-10, WP 0006.

STEP 9. Ensure the Synchroscope is present on the GSC display.

STEP 10. Touch the loose end of the disconnected wire to TB3-1 (Ground).

a. If fault CID 1167 FMI 04 is displayed on the GSC, repair or replace harness (WP 0043 and WP 0090).

b. If fault is not displayed or if voltage measured in STEP 4 was not 9.5 to 11.5 Vdc, check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 11. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

This input is high when the bus is live. Input status is compared to reading of bus voltage at P7-17 and P7-18. If the status of the voltage measurements is different than the dead bus sense input with regards to presence or absence of bus voltage a fault is announced.

SYMPTOM

64. CID 1168 FMI 03

MALFUNCTION

Dead bus sense input (P7-29).

FMI 03 - Voltage Above Normal.

CORRECTIVE ACTION

STEP 1. On EMCP, set the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Disconnect wire from relay DBHI pin 2 per FO-4, sheet 2.

STEP 3. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. Measure the voltage on end of the wire (DBHI-2 +) with respect to relay DBLO pin 4 (-).

a. If voltage is not 9.5 to 11.5 Vdc, repair or replace wiring between GSC and DBHI (WP 0043).

b. If wiring is good, check all GSC fuses (FO-4, Sheets 3 and 5).

STEP 5. On EMCP, set the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 6. Reconnect wire to relay DBHI-2.

STEP 7. Ensure that load bus is dead.

STEP 8. Disconnect the wire from relay DBHI-10.

STEP 9. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP, set the ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 10. Measure the voltage on relay DBHI-10 (+) with respect to relay DBLO-4 (-).

a. If voltage is not 9.5 to 11.5 Vdc, replace relay DBHI (WP 0041).

b. If DBHI is good, repair or replace harness, as required (WP 0041 and WP 0090).

c. If harness is good, replace relay DBLO (WP 0041).

STEP 11. Verify the problem has been resolved. If the problem has not been resolved, replace GSC (WP 0040).

STEP 12. Verify the problem has been resolved.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

NOTE

Slave receptacle (NATO connector) is electrically live at all times and is unfused. The Battery Disconnect Switch does not remove power from the NATO connector. Use caution when connecting or disconnecting cable(s) to the NATO connector to prevent damage to equipment. Use caution when troubleshooting this circuit. This circuit is only dead when the batteries are fully disconnected.

SYMPTOM

65. CID 1169 FMI 02

MALFUNCTION

AC transformer box (ATB) sensor.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

CORRECTIVE ACTION

STEP 1. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to MANUAL START.

STEP 3. Using the GSC, note the values of voltages by phase and record.

a. Turn the ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

b. Check fuses A5F1 thru A5F3 on ATB A5 and replace, as required (WP 0041). Verify the problem is resolved. If fuses are good, replace ATB A5 (WP 0041) and continue to the next step.

c. If voltages were not within 5% of the desired values and within 5% of each other, repair or replace generator harness between GSC and ATB A5 per FO-4, sheet 3 (WP 0090). Verify the problem is resolved. If not proceed to the next step.

d. If voltages were not within 5% of the desired values and within 5% of each other, repair or replace generator harness between generator output and ATB A5 per FO-4, sheet 3 and FO-3, sheet 2 (WP 0090). Verify the problem is resolved. If not proceed to the next step.

f. If ATB A5 is good, continue to next step.

STEP 4. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to MANUAL START.

STEP 5. Read Line to N voltages for all three phases on GSC and record

STEP 6. Measure the voltages at TB1 between terminal 10 and terminals 1, 2 & 3, and record.

STEP 7. Measure the voltages between TB1, terminal 10 and A5F1, A5F2, and A5F3. Record voltages.

STEP 8. If voltages do not match, troubleshoot wiring harness (WP 0090) between TB1 and A5. Repair or replace wiring harness as necessary.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 9. Compare voltages between GSC control panel reading and A5. If they match, troubleshoot wiring harness between TB1 and GSC for loose connection, corrosions, and broken wires. Repair and replace, as necessary (WP 0090).

STEP 10. If GSC voltage and A5 voltage do not match, check continuity of wires between A5P1 and GSCP7 (FO-1, sheet 5).

STEP 11. If continuity is present, replace A5 module (WP 0041).

STEP 12. Verify that problem is resolved. If problem still exists, check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 13. Verify the problem is resolved.

NOTE

The bus transformer box isolates and reduces the load bus voltages for use by the GSC. The GSC uses the reduced value of L1 (Phase A) to determine the voltage level on the load bus. The GSC uses the reduced value of L3 (Phase C) to measure the frequency of the voltage on the load bus.

SYMPTOM

66. CID 1170 FMI 02

CID 1170 FMI 04

CID 1170 FMI 08

MALFUNCTION

Bus transformer box (BTB) sensor.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

FMI 04 - Voltage Below Normal.

FMI 08 - Abnormal Frequency, Pulse Width, or Period.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to OFF.

STEP 2. Check BTB A6 fuses A6F1 and A6F2 per FO-4, sheet 3. Replace BTB A6 fuses, as required (WP 0041).

STEP 3. Remove BTB A6 fuses A6F1 and A6F2. Measure resistance between wires B11 and B12 connected to A6 fuse block. Resistance should be 2140 + / - 400 ohms. If not, replace A6 (WP 0041).

STEP 4. If A6 is replaced, verify that problem is resolved.

STEP 5. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. Turn the ENGINE CONTROL switch to MANUAL START. Set the GSC to display L to L voltage. Adjust voltage to 208 voltage.

TROUBLESHOOTING USING GSC FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 6. Measure and record voltage between A6B21 and A6F1 and between A6B21 and A6F2.

STEP 7. Measure voltage at Load output terminal board, TB2, between terminals L0 and L1 and between L0 and L3. Record voltages.

STEP 8. If voltage is not same as generator output, repair or replace harness between BTB A6 and generator output per FO-4 sheet 3 and FO-3 sheet 2 (WP 0090).

STEP 9. Measure voltage between A6J1-A and A6J1-B per FO-4 sheet 5. Value should be the same as the value in step 4 divided by 15: (208 Vac = 14 Vac) (416 Vac = 28 Vac).

a. If voltage is zero, replace A6 (WP 0041).

b. If voltage is correct, check continuity between A6P1-A and P7-17 and between A6P1-B to P7-18 (WP 0041).

c. If continuity is not present, repair or replace wiring harness as necessary (WP 0090). Verify that problem has been resolved.

d. If problem is not resolved, check all GSC fuses (FO-4, Sheets 3 and 5). If GSC fuses are ok, replace GSC (WP 0040).

STEP 10. Verify the problem is resolved.

SYMPTOM

67. CID 1589 E FMI 02

MALFUNCTION

Turbocharger air inlet pressure sensor.

FMI 02 - Erratic, Intermittent, or Incorrect Signal.

CORRECTIVE ACTION

STEP 1. On EMCP, turn ENGINE CONTROL switch to OFF/RESET. Battery Disconnect Switch is OFF; DEAD CRANK SWITCH is OFF.

STEP 2. Inspect wiring and verify continuity between engine harness ENG-P2 and turbo air inlet pressure sensor connector ENG-P11 per FO-2, sheet 1. Repair or replace engine harness wiring (WP 0090) as necessary.

STEP 3. Set Battery Disconnect Switch to ON, Set DEAD CRANK SWITCH to NORMAL. Turn ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. Check for an active 02 diagnostic code. If the fault has not been resolved, replace turbo air inlet pressure sensor (WP 0100).

STEP 5. If replacing sensor does not resolve fault, replace ECM (WP 0084).

STEP 6. Verify the problem has been resolved.

SYMPTOM

68. CID 1589 E FMI 03

CID 1589 E FMI 04

MALFUNCTION

Turbocharger air inlet pressure sensor.

FMI 03 - Voltage Above Normal.

FMI 04 - Voltage Below Normal.

CORRECTIVE ACTION

Troubleshoot turbocharger air inlet pressure sensor using steps in SYMPTOM 13.

END OF WORK PACKAGE

FIELD LEVEL TROUBLESHOOTING
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
DVR FAULT CODE TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Personnel Required	References
One	WP 0085 FO-1 FO-3 FO-4

TROUBLESHOOTING USING DVR FAULT CODES

WARNING

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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 can cause injury to personnel and damage to equipment.

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.)

TROUBLESHOOTING USING DVR FAULT CODES - Continued

SYMPTOM

1. Code 000 No Fault Present

MALFUNCTION

None

CORRECTIVE ACTION

None

NOTE

This fault signifies that the internal memory failed during a read operation.

SYMPTOM

2. Code 601

MALFUNCTION

Internal Memory Failure

CORRECTIVE ACTION

STEP 1. Set the ENGINE CONTROL switch to OFF/RESET to reset the fault (WP 0006).

STEP 2. Set Battery Disconnect Switch to ON. Set DEAD CRANK Switch to NORMAL. Set the ENGINE CONTROL switch to COOL DOWN/ STOP.

STEP 3. Check all parameters between :01 and :38 (WP 0085).

a. If fault reoccurs periodically, may be indication of failing battery. Check for related failures and correct. Check for battery error codes on GSC. Codes displaying FMI 04 indicate low voltage. Check batteries (WP 0049).

b. If the problem has not been resolved, check for additional DVR fault codes. Correct any fault codes. Verify the problem has been resolved.

c. If the problem has not been resolved, memory is failing in the DVR. Replace the DVR (WP 0041).

STEP 4. Verify the problem is resolved.

TROUBLESHOOTING USING DVR FAULT CODES - Continued

NOTE

The watchdog is a circuit that monitors the computer to be sure it can not go off line. This failure indicates that the computer went off line and was reset by the watchdog circuit. This failure can occur during engine cranking if battery voltage dips too low.

SYMPTOM

3. Code 602

MALFUNCTION

Internal Watchdog Failure.

CORRECTIVE ACTION

STEP 1. Measure voltage at B+ and B- terminals on front of DVR while starting generator set.

a. If voltage is less than 18 Vdc, go to step 2.

b. If voltage is greater than 18 Vdc, replace DVR (WP 0041).

STEP 2. Inspect battery connections for corrosion or loose connections per FO-4, sheet 3. Clean and tighten connections.

STEP 3. Inspect battery connections on TB3, terminals 1-10 and TB4, terminals 17-20 for corrosion or loose connections. Clean and tighten connections.

STEP 4. Inspect battery connections B+ and B- on rear of Generator Set Control (GSC) for corrosion or loose connections. Clean and tighten connections.

STEP 5. Inspect battery connections B+ and B- on front of DVR for corrosion and loose connections. Clean and tighten connections.

STEP 6. Measure voltage drop across resistor assembly A7 CB1 per FO-4, sheet 4. If voltage drop is not less than 0.1 Vdc, replace CB1 (WP 0041).

STEP 7. Troubleshoot charging system per alternator does not charge batteries system troubleshooting procedure (WP 0011, SYMPTOM 23).

STEP 8. If the problem is not resolved, replace DVR (WP 0041).

STEP 9. Verify the problem is resolved.

SYMPTOM

4. Code 603

MALFUNCTION

Rotating Diode Defective

CORRECTIVE ACTION

STEP 1. Check DVR parameter 19 in accordance with WP 0085.

STEP 2. Disconnect wire from DVR A3F1 and check continuity between A3F1 and TB5-2. If continuity does not exist, repair or replace wiring harness as necessary (WP 0090).

TROUBLESHOOTING USING DVR FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 3. Verify that G1F1 is connected to TB5 terminal 2 and G1F2 is connected to TB5 terminal 1.

STEP 4. Disconnect wire from DVR A3 terminal F2. Check continuity between A3F2 and TB1-5 terminal 1. If continuity does not exist, repair or replace wiring harness as necessary (WP 0090).

STEP 5. If continuity exists, replace rotating diodes (WP 0096).

STEP 6. If replacing rotating does not resolve the problem, troubleshoot and repair main generator (G1).

WARNING

Dangerously high voltage can exist across current transformer (CT) output with engine running. CT could explode if disconnected from load with engine running. Do not disconnect CT with generator rotating. Failure to comply can cause serious injury or death to personnel.

NOTE

The DVR detected a 0.4 per unit or greater leading reactive power for a time greater than the value entered in reverse VAR trip time (parameter :20). This fault shuts down the DVR and removes excitation from the field. This function is only active if parameter :21 is set to 2. This function is inactive if parameter :22 is set to 1.

SYMPTOM

5. Code 604

MALFUNCTION

Reverse VAR (Alarm Fault)

CORRECTIVE ACTION

STEP 1. Two connections reversed could cause this fault. Verify current transformer CCCT and voltage inputs from PT2, PT3, and DVR terminals 20, 22, and 24 are connected per FO-3 and FO-4.

STEP 2. Retrieve and verify all DVR parameters (WP 0085). Record :04 (generator rated current) and :05 (current transformer output at rated output current) values.

STEP 3. On EMCP set ENGINE CONTROL switch to MANUAL START.

STEP 4. Connect load at 25% to 50% of rated load. Use 0.8 power factor inductive load, if possible.

STEP 5. On GSC measure current in phase B. Record value.

STEP 6. Measure AC voltage between terminals A3-5 and A3-6 of DVR per FO-4, sheet 3. Record value.

a. The voltage measured, divided by the value in parameter :05 should be roughly equal to the measured current divided by parameter :04.

b. If not approximately the same, replace DVR (WP 0041).

TROUBLESHOOTING USING DVR FAULT CODES Continued

CORRECTIVE ACTION - Continued

STEP 7. Fault code could have been caused by a fault of the load.

a. If problem recurs and fault can not be traced to load, replace DVR (WP 0041).

b. If the problem is not resolved, refer to generator repair (WP 0096) or replacement (WP 0097).

STEP 8. Verify the problem is resolved.

NOTE

The DVR detected that the generator voltage has been less than the undervoltage trip point (parameter :13) for more than the amount of time specified by the undervoltage trip time (parameter :14). This alarm is disabled during the start-up profile.

SYMPTOM

6. Code 701

MALFUNCTION

Undervoltage

CORRECTIVE ACTION

STEP 1. Adjust VOLTAGE adjust potentiometer on control panel clockwise to increase voltage.

STEP 2. If paralleled to other generator sets, check VOLTAGE adjust setting on each set.

STEP 3. Start generator set and verify that problem has been resolved.

STEP 4. If problem is not resolved, perform voltage rheostat test (WP 0040).

STEP 5. Measure battery voltage at B+ and B- terminals on DVR per FO-4, sheet 3. Voltage should be 18 to 32 Vdc.

STEP 6. Verify that correct DVR parameters are entered (WP 0085) and that parameters match the reconnection board position (WP 0012). Enter proper parameters (WP 0085). Verify parameters after entry.

STEP 7. With generator set running, measure AC voltage between pins A3-26 and A3-28, A3-28 and A3-30, and A3-26 and A3-30 per FO-4, sheet 3.

STEP 8. If voltages are not between 95 to 120 Vac at all three locations, shut down generator set.

TROUBLESHOOTING USING DVR FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 9. Check fuses F1-10A, F2-10A, F3-10A and replace defective fuses.

a. Open fuse holder F1, F2, and F3.

b. Check resistance, F1-1 to F2-1, F2-1 to F3-1, and F3-1 to F1-1. Resistance should be less than 1 ohm. If open or above 1 ohm, troubleshoot wires between F12, F2, and F3 to TB1 and alternator.

c. Check resistance, F1-2 to F2-2, F2-2 to F3-2, and F3-2 to F1-1. Resistance should be between 0.2 to 0.4 ohms. If open or above 0.4 ohms, troubleshoot wires between F12, F2, and F3 and transformer PT2 and PT3, and transformer primary winding, PT2, PT3 before removing wires from A3-26, A3-28, and A3-30.

STEP 10. Check resistance, A3-26 to A3-28; A3-28 to A3-30, and A3-30 to A3-26. Resistance should be between 0.2 and 2.0 ohms. If open or above 2 ohms, troubleshoot secondary winding of PT2 and PT3 and wires between A3-26, A3-28 and A3-30 to PT2 and PT3.

STEP 11. Measure AC voltage between pins A3-20 and A3-22, A3-22 and A3-24, and A3-20 and A3-24.

STEP 12. Voltages should be the same and at the proper ratio to the output voltage in accordance with parameter :02. If not, test generator (WP 0096).

STEP 13. If the problem is not resolved, replace DVR (WP 0041).

STEP 14. Verify the problem is resolved.

NOTE

The DVR detected that the generator voltage has been more than the overvoltage trip point (parameter :11) for more than the amount of time specified by the overvoltage trip time (parameter :12).

SYMPTOM

7. Code 702

MALFUNCTION

Overvoltage

CORRECTIVE ACTION

STEP 1. Adjust VOLTAGE adjust potentiometer on control panel counterclockwise to reduce voltage.

STEP 2. If paralleled to other generator sets, check voltage setting on other sets.

STEP 3. Start generator set and verify that problem has been resolved.

TROUBLESHOOTING USING DVR FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 4. If problem not resolved, perform VOLTAGE rheostat test (WP 0040).

STEP 5. Verify that correct parameters are entered in DVR and that parameters match the reconnection board position (WP 0085).

STEP 6. Enter proper parameters (WP 0085). Verify parameters after entry.

STEP 7. With generator set running, measure AC voltage between pins A3-26 and A3-28, A3-28 and A3-30, and A3-26 and A3-30 per FO-4, sheet 3.

STEP 8. If voltages not 95 to 120 Vac at all three locations, shut down generator set.

STEP 9. Check fuses F1-10A, F2-10A, F3-10A and replace defective fuses.

a. Open fuse holder F1, F2, and F3.

b. Check resistance, F1-1 to F2-1, F2-1 to F3-1, and F3-1 to F1-1. Resistance should be less than 1 ohm. If open or above 1 ohm, troubleshoot wires between F12, F2, and F3 to TB1 and alternator.

c. Check resistance, F1-2 to F2-2, F2-2 to F3-2, and F3-2 to F1-1. Resistance should be between 0.2 to 0.4 ohms. If open or above 0.4 ohms, troubleshoot wires between F12, F2, and F3 and transformer PT2 and PT3, and transformer primary winding, PT2, PT3 before removing wires from A3-26, A3-28, and A3-30.

STEP 10. Check resistance, A3-26 to a3-28; A3-28 to A3-30, and A3-30 to A3-26. Resistance should be between 0.2 and 2.0 ohms. If open or above 2 ohms, troubleshoot secondary winding of PT2 and PT3 and wires between A3-26, A3-28 and A3-30 to PT2 and PT3.

STEP 11. Measure AC voltage between pins A3-20 and A3-22, A3-22 and A3-24, and A3-20 and A3-24.

STEP 12. Voltages should be the same and at the proper ratio to the output voltage in accordance with parameter :02. If not, test generator (WP 0096).

STEP 13. If the problem is not resolved, replace DVR (WP 0041).

SYMPTOM

8. Code 703

MALFUNCTION

Overexcitation

CORRECTIVE ACTION

STEP 1. If operating in parallel, re-parallel the generator sets in accordance with TM 9-6115-729-10.

STEP 2. Start generator set and verify that problem has been resolved with no load.

STEP 3. If the problem does not exist with no load, verify that generator set is not overloaded. Reduce load below rated generator set load.

TROUBLESHOOTING USING DVR FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 4. Inspect wiring between TB1 and terminals A3-20, A3-22, and A3-24 of DVR per FO-3 and FO-4.

STEP 5. Repair or replace wiring (WP 0090).

STEP 6. Check DVR A3 parameters (WP 0085).

STEP 7. If the problem exists with no load, replace DVR (WP 0041).

STEP 8. Test generator G1 (WP 0096). Repair or replace as required (WP 0096 or WP 0097).

STEP 9. Verify the problem is resolved.

WARNING

Dangerously high voltage can exist across current transformer (CT) output with engine running. CT could explode if disconnected from load with engine running. Do not disconnect CT with generator rotating. Failure to comply can cause serious injury or death to personnel.

NOTE

The DVR detected a 0.4 per unit or greater leading reactive power for a time greater than the value entered in reverse VAR trip time (parameter :20). This fault shuts down the DVR and removes excitation from the field. This function is only active if parameter :21 is set to 2. This function is inactive if parameter :22 is set to 1.

SYMPTOM

9. Code 704

MALFUNCTION

Reverse VAR (Shutdown Fault)

CORRECTIVE ACTION

STEP 1. Verify current transformer CCCT and voltage inputs from PT2, PT3, and DVR terminals 20, 22, and 24 are connected per FO-3 and FO-4.

STEP 2. Two connections reversed could cause this fault. Connect per schematic and wiring diagram FO-4.

STEP 3. Retrieve and verify all DVR parameters (WP 0085). Record :04 (generator rated current) and :05 (current transformer output at rated output current) values.

STEP 4. On EMCP set ENGINE CONTROL switch to MANUAL START.

STEP 5. Connect load at 25% to 50% of rated load. Use 0.8 power factor inductive load, if possible.

STEP 6. On GSC measure current in phase B. Record value.

TROUBLESHOOTING USING DVR FAULT CODES – Continued

CORRECTIVE ACTION - Continued

STEP 7. Measure AC voltage between terminals A3-5 and A3-6 of DVR per FO-4, sheet 3. Record value.

a. The voltage measured, divided by the value in parameter :05 should be roughly equal to the measured current divided by parameter :04.

b. If not approximately the same, replace DVR (WP 0041).

STEP 8. Fault code could have been caused by a fault of the load.

If the problem is not resolved, refer to generator repair (WP 0096) or replacement (WP 0097).

STEP 9. Verify the problem is resolved.

NOTE

The DVR detected that the exciter field current was greater than approximately 28 Amps. The DVR shut off the exciter field current.

SYMPTOM

10. Code 801

MALFUNCTION

Instantaneous Trip

CORRECTIVE ACTION

STEP 1. On keypad, press ALARM CODES and check GSC related codes. Resolve as required.

STEP 2. Disconnect wire from DVR, A3, and Terminal F2. Measure resistance between disconnected wire and F1.

a. If resistance is less than 4 ohms, troubleshoot exciter circuit between F1, F2, and exciter windings (WP 0090). Repair or replace wiring harness as necessary.

b. Test exciter windings (WP 0096). Repair or replace Generator G1 as necessary.

c. If resistance is 4 ohms or greater, replace DVR (WP 0041).

STEP 3. Verify the problem is resolved.

TROUBLESHOOTING USING DVR FAULT CODES - Continued

CORRECTIVE ACTION - Continued

NOTE

The DVR detects that one of the sense inputs is open or shorted to another input.

SYMPTOM

11. Code 802

MALFUNCTION

Loss of Sensing

CORRECTIVE ACTION

STEP 1. Inspect wiring and verify continuity between TB1 and terminals A3-20, A3-22, and A3-24 of DVR per FO-3 and FO-4.

a. Repair or replace wiring (WP 0043 and WP 0090) as necessary.

b. If the problem is not resolved, replace the DVR (WP 0041).

STEP 2. Verify the problem is resolved.

NOTE

The DVR detects that there is no AC frequency present for 200 mS while the measured voltage is greater than 50% of nominal.

SYMPTOM

12. Code 803

MALFUNCTION

Loss of Frequency

CORRECTIVE ACTION

STEP 1. Check fuses F1, F2, or F3 per FO-1, sheet 4 and FO-3, sheet 1.

STEP 2. Replace fuses F1, F2, or F3, as required (WP 0054).

TROUBLESHOOTING USING DVR FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 3. Troubleshoot wiring harness.

a. Check and repair wiring between PT2, PT3 and DVR, as required (WP 0091).

b. Check and repair wiring between PT2, PT3, and fuses F1, F2, and F3, as required (WP 0091).

c. Check and repair wiring between fuses (F1, F2, and F3) and generator, as required (WP 0091).

d. Remove fuses F1, F2, and F3. Measure resistance between F1 terminal 2 and F2 terminal 2. If not 0.3 +/- 0.1 ohms, replace transformer PT2 (WP 0052).

e. Measure resistance between F2 terminal 2 and F3 terminal 2. If not 0.3 +/- 0.1 ohms, replace transformer PT3 (WP 0052).

f. Measure resistance between F3 terminal 2 and F1 terminal 2. If not 0.6 +/- 0.1 ohms, check all connections on transformers (WP 0052).

g. Measure resistance between J31-5 and J31-6. If not 0.3 +/- 0.1 ohms, replace PT2 (WP 0052).

h. Measure resistance between J31-6 and J31-7. If not 0.3 +/- 0.1 ohms, replace PT3 (WP 0052).

i. On EMCP, set ENGINE CONTROL switch to OFF/RESET to clear bus fault.

STEP 4. Install fuses F1, F2, and F3 (WP 0054).

STEP 5. Start generator set and measure AC voltage between pins A3-26 and A3-28, A3-28 and A3-30, and A3-26 and A3-30. Verify 95 to 120 Vac present at all three locations.

STEP 6. If voltages not present, repair or replace generator (WP 0096 or WP 0097).

STEP 7. Measure AC voltage between pins A3-20 and A3-22, A3-22 and A3-24, and A3-20 and A3-24. Verify 190 to 240 Vac present at all three locations.

a. Repair wiring between DVR and generator (WP 0043 and WP 0090).

b. If the problem is not resolved, replace the DVR (WP 0041).

STEP 8. Verify the problem is resolved.

TROUBLESHOOTING USING DVR FAULT CODES - Continued

SYMPTOM

13. Code 901

MALFUNCTION

DVR Memory Failure (Severe Fault).

CORRECTIVE ACTION

STEP 1. Try to change and store a new parameter value in the DVR (WP 0085).

STEP 2. If code 901 is still present, replace the DVR (WP 0041).

STEP 3. Verify the problem is resolved.

END OF WORK PACKAGE

FIELD LEVEL TROUBLESHOOTING
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
FAILURES WITHOUT A FAULT CODE TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Tools and Special Tools

Connector/Adapter 3Y-2888
Engine Pressure Group IU-5470
Multimeter 146-4080
O-Ring Seal 3J-1907
Temperature Adapter 6V-9130

References

WP 0085
TM 9-6115-729-10

Personnel Required

One

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES

WARNING

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

High voltage is produced when this generator set is in operation. Make sure unit is completely shut down and free of any power source before attempting any repair or maintenance on the unit. Failure to comply 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 can cause injury to personnel and damage to equipment.

SYMPTOM

1. Starting Motor Remains Engaged.

MALFUNCTION

Setpoints Incorrect.

CORRECTIVE ACTION

STEP 1. On electronic modular control panel (EMCP) set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES

CORRECTIVE ACTION - Continued

STEP 2. Disconnect cable connector ENG-P3 from injection actuator pump (IAP) control valve (Figure 1).

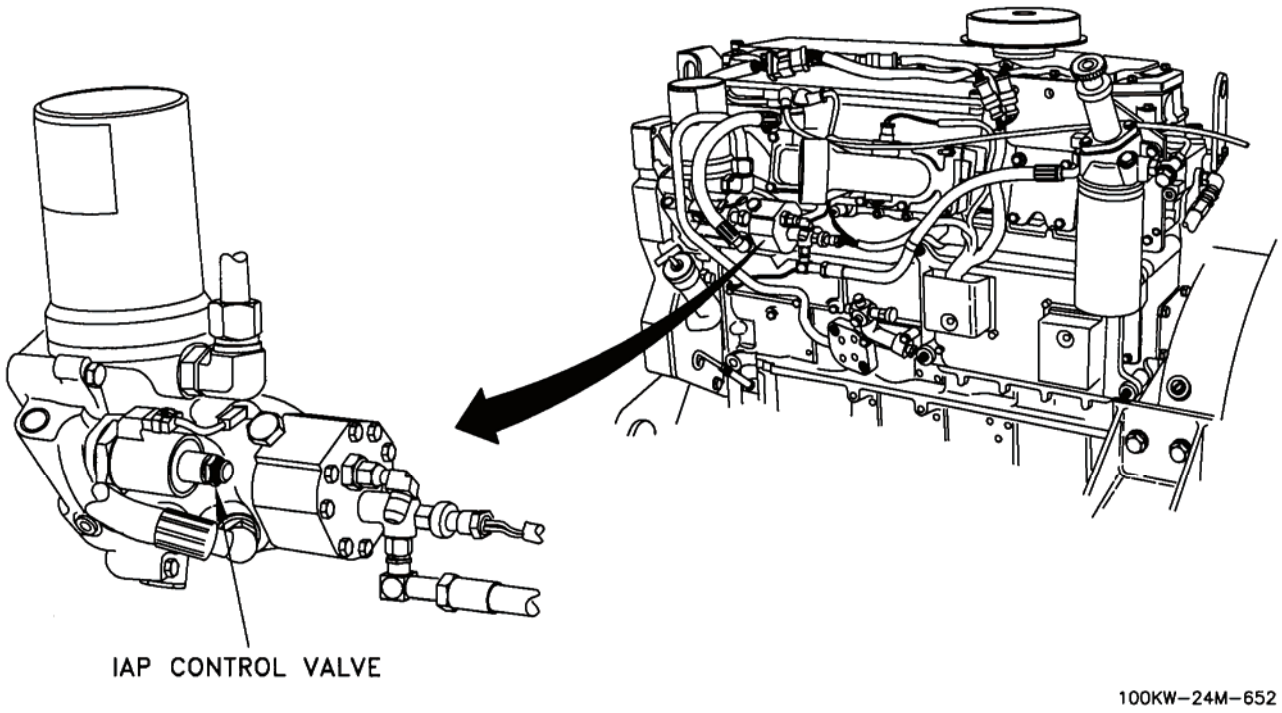


Figure 1. IAP Control Valve Location.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 3. Carefully disconnect one of the push on terminal connectors from the starter motor magnetic switch (SMMS) relay (Figure 2).

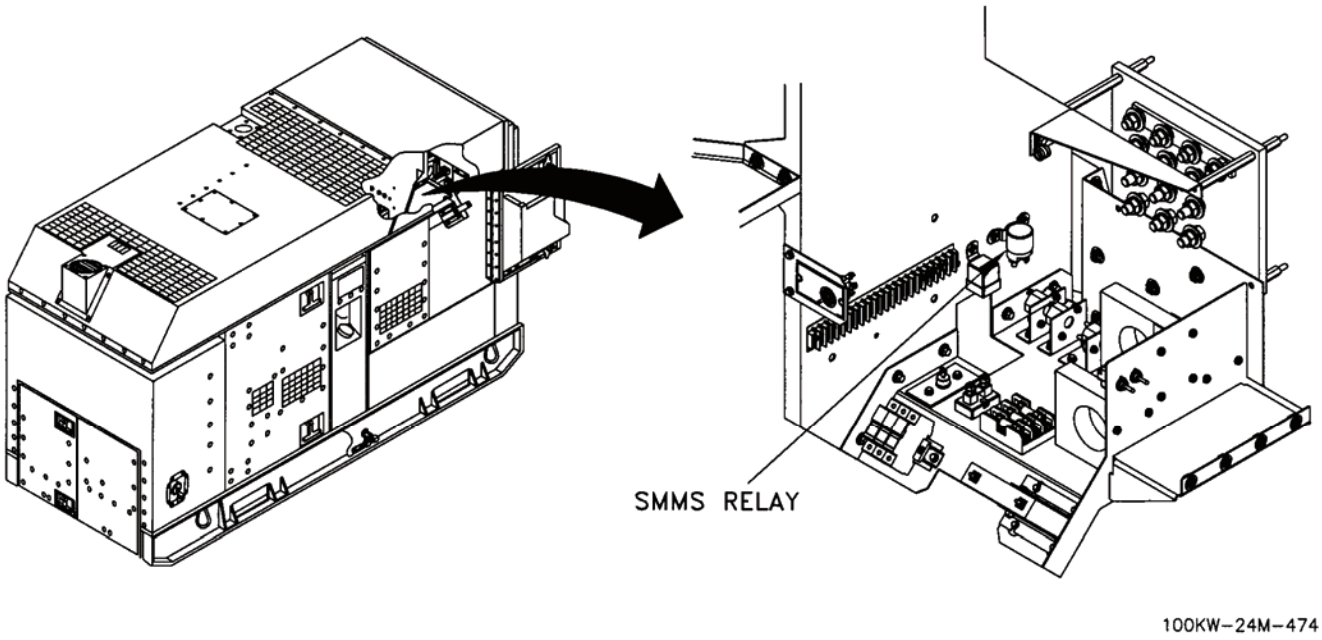


Figure 2. SMMS Relay Location.

STEP 4. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On electronic modular control panel (EMCP) set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 5. If engine cranks, replace SMMS (WP 0054).

STEP 6. If engine does not crank, view and note value of setpoints P011 (Crank terminate speed), P017 (Total cycle crank time), and P018 (Cycle crank time) refer to WP 0085.

STEP 7. Compare setpoints and reprogram, as required (WP 0085).

STEP 8. Verify the problem has been resolved.

MALFUNCTION

Starting Motor Control Circuitry Malfunction (Engine will not crank).

CORRECTIVE ACTION

STEP 1. Disconnect ENG-P3 from connector (FO-2 sheet 1).

STEP 2. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to CRANK.

STEP 3. If engine cranks, proceed to step 18.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 4. If engine does not crank, check for 24 Vdc at each terminal of CB-2 and ground.

STEP 5. If voltages are not present, replace CB-2.

STEP 6. Check for 24 Vdc at each terminal of R4 Shunt and ground.

STEP 7. If voltages are not present, replace R4 Shunt.

STEP 8. Check for 24 Vdc at each terminal of diode D1 and ground.

STEP 9. If voltages are not present, replace diode D1.

STEP 10. With DEAD CRANK SWITCH in CRANK position, check for 24 Vdc at terminal 3 of the starter motor magnetic switch (SMMS) relay and ground.

STEP 11. If voltage present, check for ground at terminal 4 of the SMMS relay.

STEP 12. If voltage is not present, check for 24 Vdc at TB5-5 and ground.

STEP 13. If voltage present, check wiring or replace Battery Disconnect Switch (WP 0050).

STEP 14. If voltage is not present, check wiring or replace DEAD CRANK SWITCH (WP 0054).

STEP 15. Check for 24 Vdc at pinion solenoid terminals (23A10 (+) wire and black jumper wire (-)).

NOTE

It may be necessary to remove cover from pinion solenoid to access solenoid terminals.

STEP 16. If voltage is not present, check wiring or replace SMMS relay (WP 0054).

STEP 17. If voltage is present, check cable at starter or replace starter (WP 0074).

NOTE

When completing CID 444 FMI 12 (WP 0009) do not reinstall fuse A1F4.

STEP 18. On EMCP set ENGINE CONTROL switch to START. If engine does not crank, go to Generator Set Control (GSC) fault isolation for CID 444 FMI 12 (WP 0009).

STEP 19. Set ENGINE CONTROL switch to START observing the following conditions:

a. Engine crank indicator K4 will appear on lower display of GSC for the time duration (in seconds) described by setpoint P017.

b. Engine crank indicator K4 will extinguish for the same duration.

c. Engine crank indicator K4 will appear again for the P017 duration.

d. Cycle will cease when time exceeds P018 duration (in seconds).

STEP 20. If engine crank indicator K4 does not appear and extinguish properly, replace GSC (WP 0040).

STEP 21. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

2. Engine Does Not Shut Down When A Shutdown Fault Occurs or Engine Shuts Down with No GSC Fault Codes.

MALFUNCTION

Setpoint Programming Error.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. View and record value of all GSC setpoints. If setpoints viewed do not agree with programmed data, reprogram setpoints (WP 0085).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Unresolved Diagnostic Codes.

CORRECTIVE ACTION

Check for active diagnostic codes and correct malfunctions as required per WP 0008 and WP 0009.

MALFUNCTION

GSC Relay Module Malfunction.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 2. Check if the yellow fault alarm indicator is on continuously. This alarm indicates that the GSC has been programmed to override the normal shutdown signal. Reprogram the setpoints that could override the shutdown signal (WP 0085).

STEP 3. Check if the red fault shutdown indicator is flashing. If this alarm indicator is off, the GSC has been programmed to override the normal shutdown signal. Reprogram the setpoints that could override the shutdown signal (WP 0085).

STEP 4. Check that the K1 symbol is displayed on the GSC display. If the K1 symbol is present, repeat this entire procedure to verify fault, replace GSC (WP 0040).

STEP 5. With engine running, remove wire from GSC relay module (RM) A1-13 (FO-4, sheet 5).

STEP 6. If engine does not stop running, shut down system by other means.

a. On EMCP press the PRESS TO STOP EMERGENCY STOP pushbutton.

b. Set DEAD CRANK SWITCH to OFF.

c. Set Battery Disconnect Switch to OFF.

STEP 7. Verify continuity of harness between GSC A1-13 and engine control module (ECM) ENG-P1-23 and A1-14 and ENG-P1-40 (FO-2, sheet 2).

a. Repair or replace harness as required (WP 0043 and WP 0090).

b. If harness is good, replace ECM (WP 0084).

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES – Continued

CORRECTIVE ACTION - Continued

STEP 8. Verify the problem has been resolved.

NOTE

GSC fault shutdown indicator flashes at four to five times per second. GSC displays may not be responding. GSC does not respond to any position of the ECS. This is an internal fault of the GSC which may be temporary or permanent. This condition may also be caused by severe electromagnetic fields or radio frequency interference (RFI).

SYMPTOM

3. GSC Operation Is Erratic.

MALFUNCTION

Red Fault Shutdown Indicator Flashing.

CORRECTIVE ACTION

STEP 1. With the engine running, on EMCP set ENGINE CONTROL switch to OFF/RESET.

a. If GSC does not power down, set DEAD CRANK SWITCH to OFF, then back to NORMAL.

b. If GSC does not power down, press EMERGENCY STOP button. Set the Battery Disconnect Switch to OFF and the DEAD CRANK SWITCH to OFF.

STEP 2. Replace GSC (WP 0040).

STEP 3. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 4. If GSC powers up normally, verify all programmed parameters (WP 0085) and retry system.

STEP 5. Verify the problem has been resolved.

NOTE

Zero volts or zero amperes is showing on the GSC display for one or more AC phases while the generator set is running and the load is connected. Separate fault isolation is provided for zero voltage and zero current readings.

SYMPTOM

4. Display Of Voltage on GSC is Zero For One or More Phases.

MALFUNCTION

GSC Malfunction.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 2. Check fuses A5F1, A5F2, and A5F3 on AC transformer box (ATB) A5 (FO-4, sheet 3). Replace fuses, as required (WP 0041 Guide).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START. Do not connect a load.

NOTE

Voltage should correspond with reconfiguration board settings line-to-line.

STEP 4. Measure the line-to-line voltage between the fuses on ATB A5. If voltages are not correct, repair or replace wiring between generator and ATB A5 (WP 0043 and WP 0090).

STEP 5. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 6. Disconnect P7 from rear of GSC (FO-4, sheet 1).

a. Measure resistance between P7-16 to P7-10. If resistance is not 6 to 8 ohms, check wiring or replace ATB A5 (WP 0041 Guide).

b. Measure resistance between P7-16 to P7-11. If resistance is not 6 to 8 ohms, check wiring or replace ATB A5 (WP 0041 Guide).

c. Measure resistance between P7-16 to P7-12. If resistance is not 6 to 8 ohms, check wiring or replace ATB A5 (WP 0041 Guide).

STEP 7. Reconnect P7 to rear of GSC (FO-4, sheet 1).

STEP 8. Remove A5F1, A5F2 and A5F3 fuses from ATB A5.

a. Measure resistance between A5F1 and A5F2 on A5 side. If resistance is not 2100 +/- 100 ohms, replace ATB A5 (WP 0041 Guide).

b. Measure resistance between A5F2 and A5F3 on A5 side. If resistance is not 2100 +/- 100 ohms, replace ATB A5 (WP 0041 Guide).

c. Measure resistance between A5F1 and A5F3 on A5 side. If resistance is not 2100 +/- 100 ohms, replace ATB A5 (WP 0041 Guide).

STEP 9. If ATB A5 is good, replace GSC (WP 0040).

STEP 10. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

5. Display of Current on GSC is Zero For One or More Phases.

MALFUNCTION

GSC Malfunction.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Tag and disconnect wire 151B16 from ATB A5 terminal TBC-51 (leave wire disconnected until finished troubleshooting) (FO-4, sheet 3).

STEP 3. Measure resistance between end of wire and terminal TBC-50. If resistance is not less than 1 ohm, check wiring and/or replace CT1 (WP 0051).

STEP 4. Tag and disconnect wire 152B16 from terminal TBC-52.

STEP 5. Measure resistance between end of wire and terminal TBC-50. If resistance is not less than 1 ohm, check wiring and/or replace CT2 (WP 0051).

STEP 6. Tag and disconnect wire 153B16 from terminal TBC-53.

STEP 7. Measure resistance between end of wire and terminal TBC-50. If resistance is not less than 1 ohm, check wiring and/or replace CT3 (WP 0051).

STEP 8. Measure resistance between ATB A5 terminals A5 TBC-51 and TBC-50. If resistance is not less than 1 ohm, replace ATB A5 (WP 0041 Guide).

STEP 9. Measure resistance between ATB A5 terminals A5 TBC-52 and TBC-50. If resistance is not less than 1 ohm, replace ATB A5 (WP 0041 Guide).

STEP 10. Measure resistance between ATB A5 terminals A5 TBC-53 and TBC-50.

a. If resistance not less than 1 ohm, replace ATB A5 (WP 0041 Guide).

b. If ATB A5 is good, replace GSC (WP 0040).

STEP 11. Disconnect P7 from rear of GSC (FO-4, sheet 1).

STEP 12. Measure resistance between pins P7-4 and P7-16.

a. If resistance is not 100 to 140 ohms, repair or replace wiring (WP 0043).

b. If wiring is good, replace ATB A5 (WP 0041 Guide).

STEP 13. Measure resistance between pins P7-5 and P7-16.

a. If resistance not 100 to 140 ohms, repair or replace wiring (WP 0043).

b. If wiring is good, replace ATB A5 (WP 0041 Guide).

STEP 14. Measure resistance between pins P7-6 and P7-16.

a. If resistance not 100 to 140 ohms, repair or replace wiring (WP 0043).

b. If wiring is good, replace ATB A5 (WP 0041 Guide).

STEP 15. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

6. Display of Voltage on GSC is Inaccurate.

MALFUNCTION

Setpoint Incorrect.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 2. View and record value of setpoint P020. If value does not agree with programmed setpoint, reprogram GSC (WP 0085).

STEP 3. View and record value of setpoints in OP8 (WP 0085).

STEP 4. Open EMCP and record value of bar code setpoints located on AC transformer box A5.

a. If OP8 values do not agree with bar code setpoints marked on ATB A5, reprogram GSC (WP 0085).

b. If setpoints agree, on EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OF. Set DEAD CRANK SWITCH to OFF.

c. Replace GSC (WP 0040).

STEP 5. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 6. View and record value of setpoints in OP10.

a. If value does not agree with programmed setpoint, reprogram GSC (WP 0085).

b. Retest the system.

STEP 7. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

7. Display of Current on GSC is Inaccurate.

MALFUNCTION

Setpoint Incorrect.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 2. View and record value of setpoint P021. If value does not agree with programmed setpoint, reprogram GSC (WP 0085).

STEP 3. View and record value of setpoints in OP8 (WP 0085).

STEP 4. Open EMCP and record value of bar code setpoints located on ATB A5.

a. If values of OP8 setpoints do not agree with bar code setpoints marked on ATB A5, reprogram GSC (WP 0085).

b. If setpoints agree, on EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OF. Set DEAD CRANK SWITCH to OFF.

c. Replace GSC (WP 0040).

STEP 5. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 6. View and record value of setpoints in OP8.

a. If value does not agree with programmed setpoint, reprogram GSC (WP 0085).

b. Retest the system.

STEP 7. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

8. Display of Power on GSC is Inaccurate.

MALFUNCTION

Setpoint Incorrect.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 2. Verify setpoints per WP 0085. If voltage and current readings are accurate, power will be accurate unless the polarity of one or more of the current transformers is incorrect. Carefully check all connections (FO-3, sheet 2).

STEP 3. If connections are correct, on EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 4. Replace GSC (WP 0040).

STEP 5. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 6. Retest the system.

STEP 7. Verify the problem has been resolved.

WARNING

High voltages may be present at the generator terminals when the unit is rotating. Tools, equipment, clothing, and your body must be kept clear of rotating parts and electrical connections. Special precautions must be taken during troubleshooting since protective covers and safety devices may be removed or disabled to gain access and perform tests. Be careful. Serious injury or death can result from these hazards.

SYMPTOM

9. Generator Produces No Voltage or Voltage Builds Up Then Drops to Zero.

MALFUNCTION

DVR malfunction.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check fuse A1F4 and replace as required.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 3. Connect DC voltmeter to relay field flash (KFF), pins 8(+) and 5(-) (FO-4, sheet 2).

STEP 4. Set DEAD CRANK SWITCH to NORMAL and ENGINE CONTROL switch to MANUAL START. Engine should crank.

STEP 5. If +24 Vdc battery voltage is not indicated on voltmeter, check DC voltage between relay KFF-14 (+) and 13 (-).

a. If 24 Vdc is present, replace relay KFF (WP 0041 Guide).

b. If 24 Vdc is not present, check for 24 Vdc at GSC RM-18 (+) and ground with ENGINE CONTROL switch set to MANUAL START.

(1) If 24 Vdc is present, repair wiring between RM-18 and relay KFF-14.

(2) If 24 Vdc is not present, replace GSC (WP 0040).

STEP 6. Set ENGINE CONTROL switch to OFF/RESET.

STEP 7. Connect DC voltmeter to digital voltage regulator (DVR) pins A3-F1 (+) and A3-F2 (-) (FO-4, sheet 3).

STEP 8. Set ENGINE CONTROL switch to MANUAL START. Engine should crank.

a. If +9 to +16 Vdc is not indicated on voltmeter, replace diode CRFF (WP 0041 Guide).

b. If diode is good, replace 15 ohm 25W resistor on resistor assembly A7 (WP 0042).

STEP 9. Allow engine to start and verify generator is rotating at or near proper speed.

STEP 10. Measure DC generator excitation voltage at DVR pins A3-F1 (+) and A3-F2 (-).

a. If voltage is less than +9 Vdc, replace DVR (WP 0041 Guide).

b. If voltage is greater than +15 Vdc, replace generator (WP 0097).

STEP 11. Verify the problem has been resolved.

SYMPTOM

10. Generator Produces Low Voltage Under No Load Condition.

MALFUNCTION

DVR Malfunction.

CORRECTIVE ACTION

STEP 1. Check for DVR fault codes.

a. If DVR fault codes are present, troubleshoot DVR (WP 0010).

b. If DVR fault codes are not present, proceed to step 2.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

STEP 2. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to MANUAL START.

STEP 3. Check generator output at load connection board with a voltmeter.

a. If output is not the same as programmed value, reprogram DVR (WP 0085).

b. If reprogramming does not hold, on EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

c. Replace DVR (WP 0041 Guide).

STEP 4. Inspect all generator connections for corrosion or loose connections. Clean and repair connections, as required.

STEP 5. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to MANUAL START.

STEP 6. Measure voltage at DVR B+ and B- terminals (FO-4, sheet 3).

a. If voltage not 18 to 32 Vdc, check power wiring between DVR and GSC. Repair or replace as required (WP 0043).

b. Refer to troubleshooting procedures for GSC CID 168 E FMI 04 (WP 0009).

STEP 7. Check parameters programmed into DVR.

a. If parameters are not correct, reprogram DVR (WP 0085).

b. If the problem is not resolved, replace generator (WP 0095).

STEP 8. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to MANUAL START.

STEP 9. Check engine speed using GSC or tachometer. RPM should be: 1800 RPM (60 Hz) 1500 RPM (50 Hz).

a. Verify GSC is set for 50 or 60 Hz operation. If not, reprogram GSC and verify reprogramming (WP 0085).

b. Reprogram DVR (WP 0085).

c. If programming is correct or will not verify, on EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

d. Replace GSC (WP 0040).

STEP 10. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CAUTION

If low voltage occurs when load is first connected, excessive motor-starting currents in load may be the fault. Compressor starting currents may be too great for generator set. Air conditioner, refrigerator, and freezer compressor motors often require 5 to 10 times their rated current during start-up. If all of these loads are started at the same time, generator overload is possible.

SYMPTOM

11. Generator Produces Low Voltage When Load is Applied.

MALFUNCTION

DVR Malfunction.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 2. Monitor current at instant of load connection. Current should be less than rated current and the same in each leg.

STEP 3. If current is too close to rated current, generator is being overloaded. Reduce load or add another generator set in parallel.

STEP 4. Check current in each leg of output.

STEP 5. If current is not equal in all legs, selectively turn off loads until balanced.

STEP 6. Reconfigure loads as necessary or check for load failure.

STEP 7. Measure voltage at load connection terminals. Measure voltage at load.

STEP 8. If voltage drop from generator to load is more than 10%, increase wire size between generator set and load.

STEP 9. Check DVR parameter :30 (droop percentage). Voltage should not drop lower than the droop percentage will allow.

a. If output goes lower than the droop percentage allows, on EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Replace DVR (WP 0041 Guide) and retest system.

c. If DVR replacement does not resolve problem, replace generator (WP 0097).

STEP 10. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

12. Generator Produces Fluctuating Voltage.

MALFUNCTION

DVR Malfunction.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 2. Check current in each leg of output. Current should be much less than rated current and the same in each leg.

STEP 3. If current is too close to rated current, generator is overloaded. Reduce load or add generator set in parallel.

STEP 4. If current is not equal in all legs selectively turn off loads until balanced.

STEP 5. Reconfigure loads as necessary or check for load failure.

STEP 6. Check engine speed using tachometer: 1800 RPM (60 Hz) and stable. 1500 RPM (50 Hz) and stable.

STEP 7. If engine speed follows voltage fluctuations, go to Engine misfires, runs rough, or is unstable troubleshooting procedure (SYMPTOM 21).

STEP 8. Check load(s) for fluctuations.

a. Disconnect one load at a time until unstable load is determined.

b. Repair or replace unstable load, or reconfigure system to accommodate load.

c. If all loads are stable, on EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

d. Replace DVR (WP 0041 Guide) and retest system.

e. If DVR replacement does not resolve problem, replace generator (WP 0097).

STEP 9. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

13. Generator Produces High Voltage.

MALFUNCTION

DVR Malfunction.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 2. Check VOLTAGE adjust potentiometer.

a. Adjust VOLTAGE potentiometer for lower voltage, as required.

b. If adjusting VAR will not lower voltage, test VAR by disconnecting VAR wires from DVR and testing resistance of VAR circuit and VAR.

STEP 3. Check voltage at load connection terminals.

a. Check programming of GSC and DVR for the position of the reconnection board (WP 0085 and WP 0014).

b. Reprogram as required (WP 0085).

STEP 4. Verify load connections. Reconfigure load connections for the desired voltage (WP 0012) and (TM 9-6115-729-10, WP 0006).

STEP 5. Check power factor of load. If not close to 1.0, excessive leading power factor (capacitive load) can cause voltage to climb out of control. Reconfigure load.

a. If the problem is not resolved, on EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Replace DVR (WP 0041 Guide) and retest system.

STEP 6. Verify the problem has been resolved.

SYMPTOM

14. Generator is Overheating.

MALFUNCTION

Excessive Generator Load.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 2. Check ventilation screens. Unclog screens, as required.

STEP 3. Check ambient temperature. Improve ventilation, or reduce load.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 4. Check temperature of air at intake. Improve ventilation, or reduce load.

STEP 5. Check current in each leg of output.

a. If not less than rated current, reduce load.

b. Add a generator set in parallel.

c. If load is unbalanced, reconfigure load to improve balance from leg to leg.

STEP 6. Verify the problem has been resolved.

SYMPTOM

15. Equipment Runs Normally on Other Source of Power (Utility or Other Generator Set), But Will Not Run on This Generator Set.

MALFUNCTION

Improper Load.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 2. Verify output of generator set is proper voltage and frequency ± 10%. Reset GSC and DVR parameters to obtain desired output (WP 0085, Table 2).

STEP 3. Check nameplates of load equipment to verify generator set output programming is correct for device(s). Delete load or reset GSC and DVR parameters to obtain desired output (WP 0085, Table 2).

NOTE

Analyze load. Excessive silicon controlled rectifier (SCR) (Thyristor) equipment connected to generator set may distort waveform and equipment that will not run may be more sensitive to waveform distortion than most. Example of SCR equipment would be anything with a variable speed drive 1/4 HP or more. Lamp dimmers are also a source of the kind of noise that creates problems with other equipment.

STEP 4. Disconnect SCR equipment and see if that improves operation.

STEP 5. May need isolation transformer for SCR or sensitive equipment to prevent distortion on the generator output.

STEP 6. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

16. Undesirable Speed Decrease With Load Increase.

MALFUNCTION

Improper Engine Operation.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. On resistor assembly A7 Verify position of ISOCHRONOUS/DROOP switch (TM 9-6115-729-10, WP 0006) and (FO-4, sheet 5).

STEP 3. If in DROOP mode, go to step 4.

STEP 4. On load resistor assembly A7 measure continuity between A7-2 and A7-1 (FO-4, sheet 4). There should be no continuity. If continuity exists, replace ISOCHRONOUS/DROOP switch (WP 0042).

STEP 5. If ISOCHRONOUS/DROOP switch is good, keep switch in DROOP and go to step 10.

STEP 6. Place ISOCHRONOUS/Droop Switch in ISOCHRONOUS mode.

STEP 7. On load resistor assembly A7 measure continuity between A7-2 and A7-1 (FO-4, sheet 4). There should be continuity. If continuity does NOT exist, replace ISOCHRONOUS/DROOP switch (WP 0042). If ISOCHRONOUS/DROOP switch is good, go to step 8.

STEP 8. Disconnect wires from LSM A4-13 (137A18,) and LSM A4-14 (139A18.) Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START. On EMCP set Contactor Control Switch (CCS) to Close. Verify AC Circuit Interrupter Lamp is illuminated.

STEP 9. Check for continuity between LSM A4 wires 137A18 and 139A18.

a. If continuity is present, proceed to step 10.

b. If continuity is not present, replace main load contactor K1 (WP 0048).

STEP 10. Reconnect wire 137A18 to LSM A4-13; reconnect wire 139A18 to LSM A4-14. Operate set in ISOCHRONOUS mode. Apply load.

a. Problem caused by improper engine operation. Engine may not be developing enough horsepower.

b. Go to Low power/poor or no response to throttle troubleshooting procedure (SYMPTOM 22).

STEP 11. Set ISOCHRONOUS/DROOP switch to DROOP.

STEP 12. Note position of droop potentiometer on LSM A4.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 13. Rotate potentiometer counterclockwise (decrease droop percentage). Retest set. If problem still exists go to step 13a.

a. Problem caused by improper engine operation. Engine may not be developing enough horsepower.

b. Go to Low power/poor or no response to throttle troubleshooting procedure (SYMPTOM 22).

STEP 14. Verify the problem has been resolved.

NOTE

Problems, which look like load sharing problems when generator sets are operated in parallel, are often caused by erratic operation of one of the DVR units.

SYMPTOM

17. Load Sharing Module (LSM) A4 Erratic Operation.

MALFUNCTION

Load Gain Adjustment.

CORRECTIVE ACTION

STEP 1. Disconnect generator set completely from load.

STEP 2. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 3. Operate independently with load.

STEP 4. Verify operation of DVR.

a. If DVR operation is incorrect, on EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Troubleshoot DVR (WP 0010).

STEP 5. Perform the load gain adjustment procedure except set the voltage to 3.0 Vdc instead of 6 Vdc. Adjust LSM A4 load gain (WP 0041 Guide).

STEP 6. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

18. Engine Not Properly Sharing Load With Other Generator Sets (Parallel Operation).

MALFUNCTION

Load Sharing Module Malfunction.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 2. Apply full load to generator set.

STEP 3. Measure voltage LSM A4-22 (+) and A4-23 (-) (FO-4, sheet 2). If voltage not +6.0 Vdc ± 1.0 Vdc at full load, perform LSM A4 load gain adjustment (WP 0040) of each generator set running isochronously not paralleled.

STEP 4. Check frequency setting of all units when off line with no load. If not identical, readjust frequency settings to be identical.

STEP 5. On resistor assembly A7 Verify position of ISOCHRONOUS/DROOP switch (TM 9-6115-729-10, WP 0006) and (FO-4, sheet 5).

STEP 6. If in DROOP mode, go to step 7.

STEP 7. On load resistor assembly A7 measure continuity between A7-2 and A7-1 (FO-4, sheet 4). There should be no continuity. If continuity exists, replace ISOCHRONOUS/DROOP switch (WP 0042).

STEP 8. If ISOCHRONOUS/DROOP switch is good, keep switch in DROOP and go to step 14.

STEP 9. Place ISOCHRONOUS/Droop Switch in ISOCHRONOUS mode.

STEP 10. On load resistor assembly A7 measure continuity between A7-2 and A7-1 (FO-4, sheet 4). There should be continuity. If continuity does NOT exist, replace ISOCHRONOUS/DROOP switch (WP 0042). If ISOCHRONOUS/DROOP switch is good, go to step 11.

STEP 11. Disconnect wires from LSM A4-13 (137A18,) and LSM A4-14 (139A18.) Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START. On EMCP set Contactor Control Switch (CCS) to Close. Verify AC Circuit Interrupter Lamp is illuminated.

STEP 12. Check for continuity between LSM A4 wires 137A18 and 139A18.

a. If continuity is present, proceed to step 13.

b. If continuity is not present, replace main load contactor K1 (WP 0048).

STEP 13. Reconnect wire 137A18 to LSM A4-13; reconnect wire 139A18 to LSM A4-14. Operate set in ISOCHRONOUS mode. Apply load.

a. Problem caused by improper engine operation. Engine may not be developing enough horsepower.

b. Go to Low power/poor or no response to throttle troubleshooting procedure (SYMPTOM 22).

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 14. Set ISOCHRONOUS/DROOP switch to DROOP.

STEP 15. Note position of droop potentiometer on LSM A4.

STEP 16. Rotate potentiometer counterclockwise (decrease droop percentage). Retest set. If problem still exists go to step 13a.

a. Problem caused by improper engine operation. Engine may not be developing enough horsepower.

b. Go to Low power/poor or no response to throttle troubleshooting procedure (SYMPTOM 22).

STEP 17. Verify the problem has been resolved.

WARNING

Batteries give off a flammable gas. Do not smoke or use open flame when performing maintenance. Failure to comply can cause injury or death to personnel and equipment damage due to flames and explosion.

Lifting batteries from the battery tray can cause back strain. Ensure proper lifting techniques are used when lifting batteries. Failure to comply can cause serious personal injury.

Battery acid can cause burns to unprotected skin. Wear protective gloves and safety goggles. Failure to comply can cause injury to personnel.

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 can cause serious injury to personnel.

SYMPTOM

19. Engine Will Not Crank (Starter Pinion Engages and Engine Does Not Turn Over).

MALFUNCTION

Starter Motor Defective.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Check battery voltage on GSC display.

a. If battery voltage is 22 Vdc or greater, proceed to step 5.

b. If battery voltage is less than 22 Vdc, proceed to step 3.

STEP 3. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 4. Inspect cables between battery, Battery Disconnect Switch, and starter solenoid (FO-1, sheet 2).

a. Clean and tighten cable ends, as required.

b. Replace cable(s), as required (WP 0046).

WARNING

NATO connector has 24 Vdc battery voltage available continuously. Use caution when connecting DVM to NATO connector.

STEP 5. Connect DVM to NATO connector bottom terminal (+) and top terminal (-).

CAUTION

Crank engine only for a few seconds, long enough to read DVM, or damage to batteries or starting motor may result.

STEP 6. Set DEAD CRANK SWITCH to CRANK and monitor voltage displayed on DVM.

a. If battery voltage is 18 Vdc or greater, charge batteries and proceed to step 7.

b. If battery voltage is 16 Vdc or less, replace batteries (WP 0049).

STEP 7. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 8. Bench-test starting motor. If motor fails replace starter (WP 0074).

STEP 9. Verify free movement of generator. If generator does not turn freely, replace generator G1 (WP 0097).

STEP 10. Verify timing bolt was not left in flywheel after setting valve lash. If timing bolt was left in flywheel, remove pin (WP 0115).

STEP 11. Remove the injectors and check for fluid in the cylinders (hydraulic cylinder lock). Remove fluid from cylinder (WP 0114).

STEP 12. Remove and disassemble engine accessories that can lock up the engine (oil pump WP 0113 or fuel transfer pump WP 0102).

STEP 13. If the problem is not resolved, replace the engine (WP 0098).

STEP 14. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

20. Engine Cranks But Will Not Start.

MALFUNCTION

Fuel Delivery Problem.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for a fuel supply problem and verify fuel pressure (WP 0013, SYMPTOM 13).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Engine Timing Incorrect.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 2. Verify engine speed during cranking using GSC readout of engine speed.

a. If speed is not greater than 50 rpm during cranking, perform load test on batteries. Check batteries and cables as required. Replace as required (WP 0047).

b. If batteries are good, replace starter (WP 0074).

STEP 3. Inspect and adjust engine timing sensors.

a. Inspect sensors and adjust if good (WP 0013).

b. If sensors are damaged, replace/adjust sensors (WP 0013).

STEP 4. Perform Engine Timing Sensor Calibration (WP 0013, SYMPTOM 11). Replace defective injector (WP 0114), if necessary.

STEP 5. Verify the problem has been resolved.

MALFUNCTION

Personality Module Mismatch.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for correct installation of ECM to EMCP harness connector ENG-P1 to ECM J1 and of engine harness connector ENG-P1 to ECM J2 (cables plugged in to ECM) (FO-2, sheet 1 and sheet 2) and (WP 0090, Figure 2, sheet 3). Plug connectors in securely.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 3. Check engine harness timing sensor connectors ENG-P4 and ENG-P5 and unit injector connector ENG-P300/J300. Plug connectors in securely.

STEP 4. Verify that CID 0253 FMI 02 personality module mismatch is not displayed on the GSC. If the ECM has a problem with the internal personality module, the engine will crank, but will not start. Replace ECM (WP 0084).

STEP 5. Verify the problem has been resolved.

MALFUNCTION

Inlet Air Heater Malfunction.

CORRECTIVE ACTION

STEP 1. If cold temperatures have not occurred, proceed to Personality Module Mismatch MALFUNCTION within SYMPTOM 20.

STEP 2. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 3. Feel intake air heater.

STEP 4. If heater is not warm, measure voltage across heater (FO-2, sheet 1).

a. If voltage is +24 Vdc, replace heater (WP 0103).

b. If voltage is 0 Vdc, measure voltage across coil of air intake heater relay.

c. If voltage is +24 Vdc, replace relay (WP 0103).

d. If voltage is not +24 Vdc, check harness between ECM and relay and repair or replace as required (WP 0090).

e. If harness is good, replace ECM (WP 0084).

STEP 5. Verify the problem has been resolved.

MALFUNCTION

Winterization Kit Malfunction.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. If fuel-fired heater was on, check wiring and continuity between winterization kit control panel and fuel-fired heater (FO-1, sheet 6).

a. Repair or replace wiring harness (WP 0095 and WP 0090).

b. Inspect and repair or replace heater hoses (WP 0093).

c. Repair or replace heater control box (WP 0091).

d. Replace fuel-fired heater (WP 0092).

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 3. Check for presence of congealed fuel (wax). If congealed fuel is found, drain tank and replace fuel (TM 9-6115-729-10, WP 0016) and fuel filters (WP 0060 and WP 0079).

STEP 4. Verify the problem has been resolved.

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. Failure to comply can cause injury or death to personnel.

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 can cause injury or death to personnel.

SYMPTOM

21. Engine Misfires, Runs Rough, or is Unstable.

MALFUNCTION

Fuel Supply Problem.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Verify fuel quality. If fuel is not clean or if signs of wax are present, drain and replace fuel (TM 9-6115-729-10, WP 0016).

STEP 3. Check for a fuel supply problem and verify fuel pressure WP 0013, SYMPTOM 13).

STEP 4. If no fuel supply problem is found, engine has an internal problem. Replace the engine (WP 0098).

STEP 5. Verify the problem has been resolved.

MALFUNCTION

Inlet Air or Exhaust Restrictions.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for dirty or clogged air filters. Replace air filters (WP 0070).

STEP 3. Check exhaust system for restrictions. Repair or replace components, as required (WP 0068).

STEP 4. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Electrical Connections Faulty.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 2. Check DC voltage at slave relay (SRY) pin 87 (+) with respect to 86 (-) (FO-2, sheet 2).

a. If voltage is not +24 Vdc, Measure voltage at SRY pin 30 (+) with respect to 86 (-).

b. If voltage is +24 Vdc, measure SRY pin 85 (+) with respect to 86 (-).

c. If voltage is +24 Vdc, replace SRY (WP 0041 Guide).

d. If voltage is not +24 Vdc, replace GSC (WP 0040).

e. If voltage at SRY pin 30 is not +24 Vdc, measure voltage across CB-4.

f. If voltage is greater than +0.2 Vdc, replace CB-4 (WP 0054).

g. Verify voltage at batteries. Recharge or replace batteries as required (WP 0049).

STEP 3. Check for correct installation of ECM to EMCP harness connector ENG-P1 to ECM J1 and of engine harness connector ENG-P2 to ECM J2 (cables plugged in to ECM) (FO-2, sheet 1 and sheet 2) and (WP 0090, figure 2, sheet 3). Plug connectors in securely and torque the ENG-P1/J1 and ENG-P2/J2 connectors to 55 lb. in.

STEP 4. Check engine harness timing sensor connectors ENG-P4 and ENG-P5 and unit injector connector ENG-P300/J300. Plug connectors in securely.

STEP 5. Verify connections between LSM pins A4-19 and A4-20 and the ECM input pins ENG-P1-5 and ENG-P1-66 (FO-4, sheet 2 and FO-3, sheets 1 and 2). Look specifically for intermittent connections FO-2, sheet 1. Repair or replace wiring, as required (WP 0043 and WP 0090).

STEP 6. Verify the problem has been resolved.

MALFUNCTION

ECM May Not Be Leaving Cold Mode Operation.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 2. Check coolant temperature using GSC.

a. Coolant temperature should start at ambient temperature and rise above 64ºF (17ºC) as the engine warms up.

b. If GSC temperature reading does not increase properly, replace coolant temperature sensor (WP 0100).

c. If engine does not warm up, replace engine coolant temperature thermostat(s) (WP 0082).

STEP 3. Verify the problem has been resolved.

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. Failure to comply can cause injury or death to personnel.

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 can cause injury or death to personnel.

SYMPTOM

22. Low Power/Poor or No Response to Throttle.

MALFUNCTION

Programmed Parameters Incorrect.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL.

STEP 2. Check all programmed parameters on GSC and DVR, and verify that they are correct for the voltage selected by the reconnection board. Reprogram parameters, as required (WP 0085).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Fuel Supply Problems.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Verify fuel quality. If fuel is not clean or if signs of wax are present, drain and replace fuel and filters (WP 0060 and WP 0079).

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 3. Check air inlet turbo pipes and exhaust for restrictions and leaks.

a. Remove restrictions.

b. Clean air filters (WP 0070).

c. Repair air leaks found (WP 0071).

STEP 4. Check for a fuel supply problem and verify fuel pressure (WP 0013, SYMPTOM 13).

STEP 5. If no fuel supply problem is found, engine has an internal problem. Replace the engine (WP 0098).

STEP 6. Verify the problem has been resolved.

MALFUNCTION

ECM May Not Be Leaving Cold Mode Operation.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 2. Check coolant temperature using GSC.

a. Coolant temperature should start at ambient temperature and rise above 64ºF (17ºC) as the engine warms up.

b. If GSC temperature reading does not increase properly, replace coolant temperature sensor (WP 0100).

c. If engine does not warm up, replace engine coolant temperature thermostat(s) (WP 0082).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Harness Connections Faulty.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for correct installation of ECM to EMCP harness connector ENG-P1 to ECM J1 and of engine harness connector ENG-P2 to ECM J2 (cables plugged in to ECM) (FO-2, sheet 1 and sheet 2). Plug connectors in and torque the ENG-P1/J1 and ENG-P2/J2 connectors to 55 lb. in.

STEP 3. Check engine harness timing sensor connectors ENG-P4 and ENG-P5 and unit injector connector ENG-P300/J300. Plug connectors in securely.

STEP 4. Verify connections between LSM pins A4-19 and A4-20 and the ECM input pins ENG-P1-5 and ENG-P1-66 (FO-4, sheet 2 and FO-3, sheets 1 and 2). Look specifically for intermittent connections (FO-2, sheet 1). Repair or replace wiring, as required (WP 0043 and WP 0090).

STEP 5. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

NOTE

Use the following procedure whether the engine shuts down completely and had to be restarted or if it falters and does not require restarting. If problem occurs only after engine is warmed up and disappears after engine cools down, problem may be circuit breakers overheating. Check carefully for hot spots and repair or replace, as required.

SYMPTOM

23. Intermittent Engine Shut Downs.

MALFUNCTION

Electrical Connections Faulty.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for correct installation of ECM to EMCP harness connector ENG-P1 to ECM J1 and of engine harness connector ENG-P2 to ECM J2 (cables plugged in to ECM) (FO-2, sheet 1 and sheet 2, and WP 0090, figure 2, sheet 3). Plug connectors in and torque the ENG-P1/J1 and ENG-P2/J2 connectors to 55 in. lbs.

STEP 3. Check engine harness timing sensor connectors ENG-P4 and ENG-P5 and unit injector connector ENG-P300/J300. Plug connectors in securely.

STEP 4. Verify connections between LSM pins A4-19 and A4-20 and the ECM input pins ENG-P1-5 and ENG-P1-66 (FO-4, sheet 2 and FO-3, sheets 1 and 2). Look specifically for intermittent connections. Repair or replace wiring, as required (WP 0043 and WP 0090).

STEP 5. Refer to Low power/poor or no response to throttle troubleshooting procedure SYMPTOM 22.

STEP 6. Check load. Verify load is not causing problem. Replace or reconfigure load.

STEP 7. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

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. Failure to comply can cause injury or death to personnel.

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 can cause injury or death to personnel.

SYMPTOM

24. Excessive Black Smoke.

MALFUNCTION

Air Inlet Problem.

CORRECTIVE ACTION

STEP 1. Check the air inlet and exhaust for restrictions and leaks.

a. Check for a restriction in the air inlet. Inspect and clear the obstruction.

b. Clean or replace air inlet filter (WP 0070).

c. Repair any air leaks in the air inlet system (WP 0071).

d. Check for loose clamps or broken expansion joints on all pipes between the Turbo and air-to-air after cooler and between the air-to-air aftercooler and engine intake manifold.

e. If there are no problems with the air inlet system, replace failed atmospheric or air inlet pressure sensor (WP 0100).

STEP 2. Check for failed turbocharger. Repair or replace turbocharger as required (WP 0106).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Engine Timing.

CORRECTIVE ACTION

STEP 1. Inspect/adjust engine timing sensors.

a. Inspect sensors and install and adjust if good (WP 0013).

b. If sensors are damaged, replace and adjust sensors (WP 0100).

STEP 2. Check valve adjustment.

a. Readjust valves, as required (WP 0115).

b. If any valves cannot be adjusted to specifications, replace the cylinder head (WP 0115).

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 3. Check proper timing orientation between crankshaft and camshaft drive gears.

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Fuel Supply Problem.

CORRECTIVE ACTION

STEP 1. Check for a fuel supply problem and verify fuel pressure (WP 0013, SYMPTOM 13).

STEP 2. Verify the problem has been resolved.

SYMPTOM

25. Excessive White Smoke.

MALFUNCTION

Engine Temperature Low.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 2. Check coolant temperature using GSC. (ECM may not be leaving cold mode operation.)

a. Coolant temperature should start at ambient temperature and rise above 64ºF (17ºC) as the engine warms up.

b. If GSC temperature reading does not increase properly, replace coolant temperature sensor (WP 0100).

c. If engine does not warm up, replace engine coolant temperature thermostat(s) (WP 0082).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Engine Timing.

CORRECTIVE ACTION

STEP 1. Inspect/adjust engine timing sensors.

a. Inspect sensors and adjust if good (WP 0100).

b. If sensors are damaged, replace and adjust sensors (WP 0100).

STEP 2. Check proper orientation between crankshaft and camshaft drive gears.

STEP 3. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Fuel Supply Problem.

CORRECTIVE ACTION

STEP 1. Check for a fuel supply problem and verify fuel pressure (WP 0013, SYMPTOM 13).

STEP 2. Verify the problem has been resolved.

MALFUNCTION

Coolant Leak.

CORRECTIVE ACTION

Coolant leakage into the cylinder or exhaust system can produce symptoms similar to white smoke emissions from unburned fuel. Replace the engine (WP 0098).

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. Failure to comply can cause injury or death to personnel.

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 can cause injury or death to personnel.

SYMPTOM

26. Can Not Reach Operating Engine RPM.

MALFUNCTION

Unresolved Codes.

CORRECTIVE ACTION

Check for fault codes that could cause degraded engine performance.

MALFUNCTION

Fuel Supply Problem.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check the fuel lines for restriction, collapsed lines, and pinched lines (WP 0016).

STEP 3. Check the fuel tank for foreign objects or debris which may block the fuel lines (TM 9-6115-729-10, WP 0016).

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 4. Prime the fuel system if any of the following have been performed.

a. Replacement of the fuel filters (WP 0060 and WP 0079).

b. Service on the low pressure fuel supply circuit.

c. Replacement of unit (fuel) injectors (WP 0114).

STEP 5. Purge air from the low pressure fuel supply circuit.

STEP 6. Check the fuel pressure after the fuel filter while the engine is being cranked (WP 0013, SYMPTOM 14). Perform steps for SYMPTOM 20, MALFUNCTION Fuel Delivery Problem.

a. If the fuel pressure is low, replace the fuel filters (WP 0060 and WP 0079).

b. If the fuel pressure is still low, check the following items.

(1) Fuel transfer pump (WP 0102).

(2) Fuel transfer pump coupling (WP 0102).

(3) Fuel pressure regulating valve (WP 0102).

STEP 7. Perform Injector Solenoid Test and Cylinder Cutout Test (WP 0013, SYMPTOM 8).

STEP 8. Verify the problem has been resolved.

MALFUNCTION

Insufficient Inlet Air.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check air filters for dirty or clogged filters. Replace air filters (WP 0070).

STEP 3. Check exhaust system for restrictions. Remove restrictions (WP 0068).

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Throttle Malfunction.

CORRECTIVE ACTION

STEP 1. Go to Poor Acceleration or Response SYMPTOM 27 within this work package.

STEP 2. If the problem is not resolved, perform Speed Control Test (WP 0013, SYMPTOM 9).

STEP 3. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Engine Temperature.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 2. Check coolant temperature using GSC. (ECM may not be leaving cold mode operation.)

a. Coolant temperature should start at ambient temperature and rise above 64ºF (17ºC) as the engine warms up.

b. If GSC temperature reading does not increase properly, replace coolant temperature sensor (WP 0100).

c. If engine does not warm up, replace engine coolant temperature thermostat(s) (WP 0082).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Generator Faulty.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect generator for problem, which would place excess load on engine. Repair or replace components, as required or replace generator (WP 0097).

STEP 3. If replacing generator does not correct the problem, there is an internal engine problem. Replace the engine (WP 0098).

STEP 4. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

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. Failure to comply can cause injury or death to personnel.

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 can cause injury or death to personnel.

SYMPTOM

27. Poor Acceleration or Response.

MALFUNCTION

Insufficient Inlet Air.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for dirty or clogged air filters. Replace air filters (WP 0070).

STEP 3. Check exhaust system for restrictions. Repair or replace components, as required (WP 0070).

STEP 4. Verify the problem is resolved.

MALFUNCTION

Throttle Malfunction.

CORRECTIVE ACTION

STEP 1. Perform Speed Control Test (WP 0013, SYMPTOM 9).

STEP 2. Start generator set per TM 9-6115-729-10.

STEP 3. Monitor Fuel Position and Rated Fuel Limit during operation at full load. If Fuel Position does not equal Rated Fuel Limit, check the following:

a. Check Turbo Outlet Pressure Sensor and verify an approximate pressure of 4 to 6 PSI (27.6 to 41.4 Kpa) (WP 0013, SYMPTOM 14).

b. Monitor atmospheric pressure (14.6 PSI (100.7 Kpa)) and boost pressure (approximately 18 PSI (124.1 Kpa)). If not correct, repair or replace turbocharger (WP 0106).

STEP 4. Verify the problem is resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Engine Temperature Low.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to START.

STEP 2. Check coolant temperature using GSC.

a. Coolant temperature should start at ambient temperature and rise above 64ºF (17ºC) as the engine warms up.

b. If GSC temperature reading does not increase properly, replace coolant temperature sensor (WP 0085).

c. If engine does not warm up, replace engine coolant temperature thermostat(s) (WP 0082).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Electrical Connections Faulty.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for correct installation of ECM to EMCP harness connector ENG-P1 to ECM J1 and of engine harness connector ENG-P2 to ECM J2 (cables plugged in to ECM) (WP 0090 and FO-2, sheet 1 and sheet 2).

STEP 3. Check engine harness timing sensor connectors ENG-P4 and ENG-P5 and unit injector connector ENG-P300/J300. Plug connectors in securely (WP 0090).

STEP 4. Verify connections between LSM A4 pins A4-19 and A4-20 and the ECM input pins ENG-P1-5 and P1-66 (FO-4, sheet 2 and FO-3, sheets 1 and 2). Look specifically for intermittent connections. Repair or replace wiring, as required (WP 0090).

STEP 5. Verify the problem is resolved.

MALFUNCTION

Fuel Supply Problem.

CORRECTIVE ACTION

STEP 1. Perform Cylinder Cutout test to check for any non-operable unit injectors. If necessary, replace faulty injectors (WP 0114).

STEP 2. Check for a fuel supply problem and verify fuel pressure (WP 0013, SYMPTOM 13).

STEP 3. Verify the problem is resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

28. Poor Fuel Consumption.

MALFUNCTION

Insufficient Inlet Air.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for dirty or clogged air filters. Replace air filters (WP 0070).

STEP 3. Check exhaust system for restrictions. Repair or replace components, as required (WP 0068).

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Electrical Connections.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect/adjust engine timing sensors.

a. Inspect sensor and install and adjust if good (WP 0013).

b. If sensors are damaged, replace/adjust sensors (WP 0013).

STEP 3. Check for correct installation of ECM to EMCP harness connector ENG-P1 to ECM J1 and of Engine Harness connector ENG-P2 to ECM J2 (cables plugged in to ECM) (FO-2, sheet 1 and sheet 2). Plug connectors in securely and torque ENG-P1/J1 and ENG-P2/J2 connectors to 55 lb. in. (WP 0090).

STEP 4. Check engine harness timing sensor connectors ENG-P4 and ENG-P5 and unit injector connector ENG-P300/J300. Plug connectors in securely (WP 0090).

STEP 5. Verify connections between LSM pins A4-19 and A4-20 and the ECM input ENG- pins P1-5 and P1-66 (FO-4, sheet 2 and FO-3, sheets 1 and 2). Look specifically for intermittent connections. Repair or replace wiring, as required (WP 0090).

STEP 6. Verify the problem is resolved.

MALFUNCTION

Fuel Supply Problem.

CORRECTIVE ACTION

STEP 1. Perform Injector Solenoid Test and Cylinder Cutout Test (WP 0013 SYMPTOM 8). Replace faulty injectors (WP 0114).

STEP 2. Check for a fuel supply problem and verify fuel pressure (WP 0013, SYMPTOM 13).

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Generator Malfunction.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect generator for problems or restrictions that would place excess load on engine. Visually check generator rotor shaft for excessive play, vibration, or noise. Replace generator as required (WP 0097).

STEP 3. Verify the problem has been resolved.

SYMPTOM

29. Engine Stalls at Low RPM.

MALFUNCTION

Electrical Connections Faulty.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for correct installation of engine harness ENG-P2 connector to ECM J2 and engine harness connector ENG-P300 to fuel injector harness connector J300 (WP 0090).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Fuel Supply Problem.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check the fuel lines for restriction, collapsed lines, and pinched lines.

STEP 3. Check the fuel tank for foreign objects or debris which may block the fuel lines.

STEP 4. Prime the fuel system if any of the following have been performed (WP 0079).

a. Replacement of the fuel filters.

b. Service on the low pressure fuel supply circuit.

c. Replacement of unit (fuel) injectors.

STEP 5. Purge air from the low pressure fuel supply circuit using the fuel priming pump.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 6. Check the fuel pressure after the fuel filter while the engine is being cranked (WP 0013, SYMPTOM 14).

a. If the fuel pressure is low, replace the fuel filters (WP 0079).

b. If the fuel pressure is still low, check the following items (WP 0102).

(1) Fuel transfer pump.

(2) Fuel transfer pump coupling.

(3) Fuel pressure regulating valve.

STEP 7. Perform the Injector Solenoid Test and the Cylinder Cutout Test (WP 0013, SYMPTOM 8).

STEP 8. Verify the problem has been resolved.

MALFUNCTION

Generator Malfunction.

CORRECTIVE ACTION

Inspect generator for problems or restrictions that would place excess load on engine. Visually check generator rotor shaft for excessive play, vibration, or noise (WP 0096). If problem is not resolved, go to Engine Misfires, Runs Rough, or is Unstable procedure SYMPTOM 21.

SYMPTOM

30. Auxiliary Fuel Pump Does Not Operate.

MALFUNCTION

Auxiliary Fuel Pump Solenoid Valve.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/ STOP.

STEP 2. Check for 24 Vdc across auxiliary fuel pump valve (AFPV) pins 1 and 2 with AUX FUEL switch ON. Listen for auxiliary fuel pump and AFPV operation.

a. If 24 Vdc is present, proceed to step 3.

b. If 24 Vdc is not present, proceed to step 7.

STEP 3. Set Battery Disconnect Switch to OFF/RESET. Set DEAD CRANK SWITCH to OFF. On EMCP set ENGINE CONTROL switch to OFF/RESET.

STEP 4. On EMCP, set AUX FUEL switch to OFF (down).

STEP 5. Open left front doors, left rear doors, and right rear doors.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 6. Verify continuity between auxiliary fuel pump valve (AFPV) pin 2 and TB5-21 (FO-1, sheet 3). Repair or replace wire harness (WP 0090).

STEP 7. Measure resistance between AFPV-1 and TB5-21. If resistance not between 40 and 80 ohms, replace AFPV (WP 0058).

STEP 8. Verify the problem has been resolved.

MALFUNCTION

Fuel Level Switch Assembly.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Measure resistance between fuel level switch assembly FL2B at J8-2 and relay AFPR-8. If not less than 2 ohms, repair or replace wire harness (WP 0090).

STEP 3. Measure resistance between fuel level switch assembly FL2B at J8-1 and AUX FUEL pump switch (AFPS) pin 1 (FO-1, sheet 3 and FO-4, sheet 5). If not less than 2 ohms, repair or replace wire harness (WP 0090).

STEP 4. Check for continuity between J8-3 and AFPR pin 14.

a. If continuity exists, proceed to step 5.

b. If continuity does not exist, troubleshoot wiring (WP 0090).

STEP 5. Unplug connector P8 from fuel level switch assembly FL2 (WP 0055).

STEP 6. If fuel tank level indicator on EMCP shows between 3/4 and FULL, measure continuity between J8-1 and J8-2. If not open circuit, replace fuel level switch assembly (WP 0055).

STEP 7. If fuel tank level is between 3/4 and FULL, measure continuity between J8-3 and J8-2. If not open circuit, replace fuel level switch assembly (WP 0055).

STEP 8. If fuel tank level is below 1/2, measure continuity between J8-1 and J8-2. If not short circuit, replace fuel level switch assembly (WP 0055).

STEP 9. If fuel tank level is below 1/2, measure continuity between J8-2 and J8-3. If not short circuit, replace fuel level switch assembly (WP 0055).

STEP 10. If fuel tank level is above 5/8 measure continuity between J8-3 and J8-2. If not open circuit, replace fuel level switch assembly (WP 0055).

STEP 11. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Auxiliary Fuel Pump Relay.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Measure resistance between float level switch FL2B at J8-3 and TB5-21 (Ground).

STEP 3. If not between 600 and 800 ohms, repair or replace wire harness (WP 0090) or replace AFPR (WP 0058).

STEP 4. If between 600 and 800 ohms, check fuel level switch assembly (WP 0055).

STEP 5. Verify the problem has been resolved.

MALFUNCTION

Auxiliary Fuel Pump Faulty.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Open control box (WP 0020).

STEP 3. Measure resistance between relay AFPR-9 and AFPV-1 (FO-4, sheet 2 and sheet 4). If no continuity, repair or replace wire harness (WP 0043).

STEP 4. Verify wire from auxiliary fuel pump is connected securely to AFPV-1 (WP 0058). If not secure, repair wiring (WP 0090) or replace auxiliary fuel pump (WP 0058).

STEP 5. Verify the problem has been resolved.

SYMPTOM

31. Engine Runs Out of Fuel With No LOW FUEL LEVEL Alarm.

MALFUNCTION

Fuel Level Switch Assembly.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. On EMCP, set AUX FUEL switch to OFF (down).

STEP 3. Open left front doors, left rear doors, and right rear doors.

STEP 4. Unplug ENG-P11 from low fuel alarm switch FL1 (WP 0055 and FO-1, sheet 3).

STEP 5. With fuel level above two inches or fuel level indicator on EMCP showing fuel, measure resistance between J11-1 and J11-2 (FO-1, sheet 3). If not open circuit, replace fuel level switch assembly (WP 0055).

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 6. With fuel level below two inches or fuel level indicator showing empty, measure resistance between J11-1 and J11-2. If not less than 2 ohms, replace fuel level switch assembly (WP 0055).

STEP 7. Verify the problem has been resolved.

SYMPTOM

32. Alternator Does Not Charge Batteries.

MALFUNCTION

Alternator Drive Belt Loose or Defective.

CORRECTIVE ACTION

STEP 1. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect the condition of the alternator drive belt. If the alternator drive belt is worn or damaged, replace drive belt (WP 0073).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Charging Circuit Defective.

CORRECTIVE ACTION

STEP 1. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect cables between battery, Battery Disconnect Switch, and starter solenoid (FO-1, sheet 2).

a. Check shunt (R4) for loose/corroded connections. Clean and tighten as required.

b. Clean and tighten battery cable ends, as required.

c. Replace cable(s), as required (WP 0046).

d. If voltage is correct, perform load test on batteries individually (WP 0049).

e. If battery fails, replace battery (WP 0049).

f. If batteries pass load test, charge batteries fully (WP 0049).

STEP 3. Set Battery Disconnect Switch to on. Set DEAD CRANK switch to NORMAL. On EMCP set Engine Control Switch to COOL DOWN/STOP.

STEP 4. Observe and record battery voltage on GSC display.

a. Set Engine Control Switch to MANUAL START.

b. Observe battery voltage on GSC display. Battery voltage should be 2 Vdc higher than recorded voltage.

c. If voltage is below, or falls below, minimum, replace alternator (WP 0072).

STEP 5. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

33. Coolant in Engine Oil.

MALFUNCTION

Oil Cooler Failure.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect oil cooler for leaks or damage. Replace oil cooler as required (WP 0111).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Cylinder Head Gasket Failure.

CORRECTIVE ACTION

STEP 1. Replace cylinder head gasket (WP 0116).

STEP 2. Verify the problem has been resolved.

MALFUNCTION

Cracked Cylinder Head.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect cylinder head for cracks. Replace cylinder head as required (WP 0116).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Water Pump Failure.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect the weep hole in the water pump for blockage. Check for signs of leakage around water pump seals. Replace water pump as required (WP 0077).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Internal Engine Leakage.

CORRECTIVE ACTION

STEP 1. Replace the engine (WP 0098).

STEP 2. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

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. Failure to comply can cause injury or death to personnel.

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 can cause injury or death to personnel.

SYMPTOM

34. Coolant Temperature Too High.

MALFUNCTION

Excessive Load.

CORRECTIVE ACTION

STEP 1. Ensure that the load is not excessive. Check load current and kW on GSC display. If load is excessive go to step 2.

STEP 2. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 3. Redistribute or disengage loads as required.

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Radiator.

CORRECTIVE ACTION

STEP 1. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Ensure that the engines exhaust does not heat the radiator.

STEP 3. Ensure the air inlet area of the radiator is not obstructed.

STEP 4. Check the fins of the radiator for damage or obstructions. Repair/ clean as required (WP 0067).

STEP 5. Verify the problem has been resolved.

MALFUNCTION

Low Coolant Level.

CORRECTIVE ACTION

STEP 1. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Allow generator set to cool and check coolant level. Add coolant as required.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 3. Pressurize the cooling system to 3 psi (20 kPa) greater than the coolant fill cap rating (13 to 16 psi (90 to 800 kPa)).

STEP 4. Inspect all cooling system components for leaks. Repair or replace components as required (WP 0063, WP 0066, WP 0067, WP 0077, and WP 0082).

STEP 5. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set Engine Control Switch to MANUAL START.

STEP 6. Run the engine to operating temperature. If coolant temperature is normal, proceed to step 17. If temperature is still too high, go to step 7.

STEP 7. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 8. Allow generator set to cool and check coolant level. Add coolant as required.

STEP 9. Check for presence of coolant in engine oil. If coolant is present in engine oil, troubleshoot per SYMPTOM 33.

STEP 10. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set Engine Control Switch to MANUAL START.

STEP 11. Run the engine to operating temperature. If coolant temperature is normal, proceed to step 17. If temperature is still too high, go to step 12.

STEP 12. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 13. Allow generator set to cool and check coolant level. Add coolant as required.

STEP 14. Pressurize the cooling system to 3 psi (20 kPa) greater than the coolant fill cap rating (13 to 16 psi (90 to 800 kPa)).

STEP 15. If pressure reading is not stable after five minutes, inspect all cooling system components for leaks. Repair or replace components as required (WP 0063, WP 0066, WP 0067, WP 0077, and WP 0082). Repeat steps 10 and 11. If coolant temperature is normal, go to step 17. If coolant temperature is still too high, repeat step 12 and then go to step 16.

STEP 16. Pressurize the cooling system to 3 psi (20 kPa) greater than the coolant fill cap rating (13 to 16 psi (90 to 800 kPa)). If pressure reading is not stable after five minutes, replace the engine (WP 0098).

STEP 17. Verify the problem has been resolved.

MALFUNCTION

Air in Coolant.

CORRECTIVE ACTION

STEP 1. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect coolant fill cap for damage. Replace coolant fill cap as required.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

CORRECTIVE ACTION - Continued

STEP 3. If coolant has been replaced recently, ensure that air has been purged from the cooling system by running the engine for a few minutes.

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Thermostat Malfunction.

CORRECTIVE ACTION

STEP 1. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Remove and inspect thermostat. Replace as required (WP 0082).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Water Pump Malfunction.

CORRECTIVE ACTION

STEP 1. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect water pump belt. Replace or tighten as required (WP 0073).

STEP 3. Inspect water pump impeller. Replace water pump if impeller is damaged (WP 0077).

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Engine Coolant Flow Restrictions.

CORRECTIVE ACTION

STEP 1. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. If a buildup of deposits in the cooling system is suspected, clean the cooling system (WP 0066 and WP 0067).

STEP 3. If the flow of coolant through the engine is not sufficient, determine the cause of obstruction and repair as required.

STEP 4. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Exhaust Restriction.

CORRECTIVE ACTION

STEP 1. On EMCP set Engine Control Switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect the exhaust pipes and muffler for damage that could cause restrictions. Repair or replace as required (WP 0068).

STEP 3. Ensure that the exhaust gases are not being drawn into the intake air inlet.

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Combustion Gases in Coolant.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to Normal. On EMCP set Engine Control Switch to Manual Start.

STEP 2. Check for combustion gases in coolant. Combustion gases in coolant can be identified by small air bubbles in the coolant during engine operation. If combustion gases are present, replace the engine (WP 0098).

STEP 3. Verify the problem has been resolved.

SYMPTOM

35. ECM Will Not Communicate With Other Systems or Display Modules.

MALFUNCTION

Wire or Connector Pins Corroded or Damaged.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Disconnect harness connector ENG-P1 from ECM connector J1, harness connector P7 from GSC connector J7, and harness connector ENG-P37 from generator connector J37 (WP 0090).

STEP 3. Inspect harness connectors ENG-P1, P7, and ENG-P37, and generator connector J37 for corrosion or damage. Repair or replace harness as required (WP 0090).

STEP 4. Conduct a wiggle test (WP 0091) on each of the harness wires that are associated with the Cat data link (FO-2, sheet 2 and WP 0090). Repair or replace harness as required (WP 0090).

STEP 5. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Cat Data Link Circuitry Short Circuit.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Disconnect ENG-P1 harness connector from ECM connector J1.

STEP 3. Measure the resistance between ENG-P1 harness connector pin 8 and all other connector pins. All measurements should indicate open, if not repair or replace harness (WP 0090).

STEP 4. Measure the resistance between ENG-P1 harness connector pin 9 and all other connector pins. All measurements should indicate open, if not repair or replace harness (WP 0090).

STEP 5. Verify the problem has been resolved.

MALFUNCTION

Cat Data Link Circuitry Open Circuit.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Disconnect harness connector P7 from GSC connector J7.

STEP 3. Install a jumper wire between Cat data link harness connector CDC - P7 pins D and E.

STEP 4. Measure the resistance between ENG-P1 harness connector pins 8 and 9. All measurements should indicate a short, if not repair or replace harness (WP 0090).

STEP 5. Measure the resistance between ENG-P37 harness connector pins 19 and 20. All measurements should indicate a short, if not repair or replace harness (WP 0090).

STEP 6. Measure the resistance between P7 GSC harness connector pins 19 and 20. All measurements should indicate a short, if not repair or replace harness (WP 0090). If the ECM does not operate properly, replace ECM (WP 0084).

STEP 7. Remove jumper wire.

STEP 8. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

36. Engine Oil in Coolant.

MALFUNCTION

Oil Cooler Failure.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect oil cooler for leaks or damage. Replace oil cooler as required (WP 0111).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Cylinder Head Gasket Failure.

CORRECTIVE ACTION

STEP 1. Inspect cylinder head for signs of seepage, if present replace cylinder head gasket (WP 0116).

STEP 2. Verify the problem has been resolved.

MALFUNCTION

Cracked Cylinder Head Defect.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect cylinder head for cracks. Repair/replace cylinder head as required (WP 0116).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Water Pump Failure.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect the weep hole in the water pump for blockage. Check for signs of leakage around water pump seals. Replace water pump as required (WP 0077).

STEP 3. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

37. Engine Oil in Exhaust System.

MALFUNCTION

Crankcase Ventilation System Failure.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect crankcase ventilation filter and replace if necessary (WP 0069).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Turbocharger Seals Failure.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect the turbocharger inlet and exhaust manifolds for engine oil. If oil is present, replace turbocharger (WP 0106).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Worn or Damaged Valve Guide Seals.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect valve guide seals for wear or damage. Replace cylinder head (WP 0116).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Internal Engine Oil Leakage/Excessive Blow-by.

CORRECTIVE ACTION

STEP 1. Internal engine oil leakage is suspected. Replace engine (WP 0098).

STEP 2. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

38. Engine Oil Temperature Too High.

MALFUNCTION

Incorrect Engine Oil Specification/Rating.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Verify correct engine oil type and temperature rating for engine (WP 0016).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Incorrect Oil Level.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect engine oil level. Add correct engine oil as necessary (TM 9-6115-729-10, WP 0016).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Coolant Temperature is Too High.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. See coolant temperature is too high troubleshooting procedure (SYMPTOM 34).

MALFUNCTION

Engine Oil Cooler Bypass Valve.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Clean and inspect the engine oil cooler bypass valve. Clean the bore of the bypass valve and ensure the valve is not stuck in the open position. Replace the bypass valve if necessary (WP 0111).

STEP 3. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Engine Oil Cooler Failure.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect for engine oil cooler for damage, blockage, or restrictions in the engine oil cooler oil passages. Replace the engine oil cooler if necessary (WP 0111).

STEP 3. Verify the problem has been resolved.

SYMPTOM

39. Engine Vibration.

MALFUNCTION

Engine Misfires or Runs Rough.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. See Engine misfires, runs rough, or is unstable troubleshooting procedure (SYMPTOM 21).

MALFUNCTION

Engine Vibration Damper Defective.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect the engine vibration damper for damage. Inspect for loose, missing, or damaged mounting bolts. Replace vibration damper or mounting bolts as necessary (WP 0104).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Engine Shock Mounts Defective.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect the engine shock mounts and brackets with the engine running through the speed range. Check for mounts and brackets that loose, missing parts, or damaged. Tighten or replace engine shock mounts as necessary (WP 0098).

STEP 3. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Generator Alignment Incorrect.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect for loose, missing, or damaged generator mounting hardware, including shock mounts. Ensure generator to engine connecting hardware is complete and secure (WP 0097).

STEP 3. Verify the problem has been resolved.

SYMPTOM

40. Excessive Engine Oil Consumption.

MALFUNCTION

Oil Leaks.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect the engine for oil leaks. Repair oil leaks as required.

STEP 3. Check for dirty or clogged crankcase ventilation filters. Clean or replace filters (WP 0069).

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Engine Oil Cooler Defective.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for engine oil leaks around the engine oil cooler and check for engine oil in engine coolant. Repair or replace engine oil cooler (WP 0111).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Turbocharger Defective.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect the air inlet manifold and exhaust manifold for engine oil. Check for engine oil leakage past the seal rings in the impeller end of the turbocharger shaft. Replace the turbocharger if engine oil leakage is found (WP 0106).

STEP 3. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Valve Guides Defective.

CORRECTIVE ACTION

STEP 1. If valve guide wear is suspected, replace cylinder head assembly (WP 0116).

STEP 2. Verify the problem has been resolved.

MALFUNCTION

Piston Rings Defective/Excessive Blow-by.

CORRECTIVE ACTION

STEP 1. If piston ring wear or damage is suspected, replace the engine (WP 0098).

STEP 2. Verify the problem has been resolved.

SYMPTOM

41. Excessive Valve Lash.

MALFUNCTION

Lack of Lubrication to Rocker Shaft Assembly.

CORRECTIVE ACTION

Remove valve cover (WP 0101) and inspect for adequate engine oil at rocker shaft assembly and valves. If rocker shaft assembly or valves lack engine oil, troubleshoot low engine oil pressure (SYMPTOM 45).

MALFUNCTION

Valve Lash Adjustment Incorrect.

CORRECTIVE ACTION

STEP 1. Visually inspect rocker shaft and valve components for excessive wear. Replace worn components as required (WP 0115).

STEP 2. If rocker shaft and valve components are not excessively worn, adjust valve lash (WP 0115).

STEP 3. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

42. Exhaust Temperature is Too High.

MALFUNCTION

Air Inlet and Exhaust Malfunctions.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect air inlet for restrictions or leaks. Clear restrictions and repair leaks (WP 0070, WP 0071).

STEP 3. Inspect for exhaust restrictions. Inspect for leaks between exhaust manifold and turbocharger. Clear restrictions and repair leaks (WP 0068).

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Electrical Connections Faulty.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect harness connector ENG-P2 and ECM mating connector J2 and unit injector cable connectors ENG-P300 and J300 (WP 0090). Ensure connectors are properly seated and secure.

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Unresolved Diagnostic Codes.

CORRECTIVE ACTION

Check for inactive diagnostic codes in historical log that relate to exhaust temperature. Correct malfunctions as required (WP 0008 and WP 0009).

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

43. Fuel in Engine Oil.

MALFUNCTION

Fuel Unit Injectors Leaking.

CORRECTIVE ACTION

STEP 1. Inspect unit injectors for leaking seals and damage and to ensure unit injectors are secure. Tighten unit injectors or replace as required (WP 0114).

STEP 2. Verify the problem has been resolved.

MALFUNCTION

Fuel Lines Leaking.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Inspect fuel hose connected to the cylinder head for leaks. Replace seals or fuel hoses as required (WP 0056).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Crack in Cylinder Head.

CORRECTIVE ACTION

STEP 1. Inspect cylinder head for crack in fuel supply galley or around unit injectors.

STEP 2. Replace cylinder head as necessary (WP 0116).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Fuel Transfer Pump Defective.

CORRECTIVE ACTION

STEP 1. Inspect fuel transfer pump and fuel hoses for leaks.

STEP 2. Replace fuel transfer pump or fuel hoses as required (WP 0102 and WP 0056).

STEP 3. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

44. Intermittent Low Power or Power Cutout.

MALFUNCTION

Unresolved Diagnostic Codes.

CORRECTIVE ACTION

Check for inactive diagnostic codes. Correct malfunctions as required (WP 0008 and WP 0009).

MALFUNCTION

Throttle Malfunction.

CORRECTIVE ACTION

Verify that the status of the throttle position is stable and that the engine is able to reach high idle speed. If any requirement is not met, perform Speed Control Test (WP 0013, SYMPTOM 9).

MALFUNCTION

Injection Actuation Pressure Incorrect.

CORRECTIVE ACTION

STEP 1. Check the engine oil level. Add or remove engine oil as required (TM 9-6115-729-10, WP 0017).

STEP 2. Operate the engine under load and allow to warm up to ensure that air has been purged from the injection actuation system.

STEP 3. Perform Injection Actuation Pressure Test (WP 0013, SYMPTOM 5).

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Low Fuel Pressure.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check fuel hoses for cuts, kinks, and other obstructions. Repair or replace fuel hoses as required (WP 0056).

STEP 3. Inspect the fuel tank for foreign material that may block the fuel pickup tube or fuel hoses. Remove contaminants and foreign objects from fuel tank (TM 9-6115-729-10, WP 0016).

STEP 4. Check for air in the fuel system. If air in the fuel is found, check that all fuel fittings are tight and secure. Purge the air from the fuel system using the priming pump.

STEP 5. Check for fault codes indicating fuel filter restrictions. Correct any faults indicated (WP 0008 and WP 0009).

STEP 6. If fuel pressure is still low, replace fuel transfer pump (WP 0102).

STEP 7. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

45. Low Engine Oil Pressure.

MALFUNCTION

Oil Level Too Low.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check engine oil level. Add engine oil as necessary (TM 9-6115-729-10, WP 0017).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Oil Pressure Sensor Malfunction.

CORRECTIVE ACTION

STEP 1. Check for inactive diagnostic codes. Resolve codes as required.

STEP 2. Verify oil pressure with a 100 PSI minimum gage connected to oil manifold near oil pressure sensor. If oil pressure not correct, replace engine oil pressure sensor.

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Oil Filter Defective.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Replace the engine oil filter. Inspect the engine oil check valve in the oil filter base. Clean or replace components as required (WP 0111).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Engine Oil Cooler Defective.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check for engine oil leaks around the engine oil cooler also check for engine oil in engine coolant. Repair or replace engine oil cooler (WP 0111).

STEP 3. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

MALFUNCTION

Fuel in Engine Oil.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Refer to Fuel in Engine Oil procedure troubleshooting procedure (SYMPTOM 43).

MALFUNCTION

Camshaft or Crankshaft Defective.

CORRECTIVE ACTION

STEP 1. If the camshaft of crankshaft is suspected of being defective, replace the engine (WP 0098).

STEP 2. Verify the problem has been resolved.

SYMPTOM

46. Mechanical Noise (Knock) in Engine.

MALFUNCTION

Valve Train Components Defective.

CORRECTIVE ACTION

STEP 1. Inspect the valve train components.

STEP 2. Replace damaged components, if necessary (WP 0115).

STEP 3. If components are not damaged or worn, perform valve lash adjustment (WP 0115).

STEP 4. Verify the problem has been resolved.

MALFUNCTION

Internal Engine Problem.

CORRECTIVE ACTION

STEP 1. Replace the engine (WP 0098).

STEP 2. Verify the problem has been resolved.

TROUBLESHOOTING FAILURES WITHOUT FAULT CODES - Continued

SYMPTOM

47. Noise Coming From Cylinder.

MALFUNCTION

Unresolved Diagnostic Codes.

CORRECTIVE ACTION

Check for active diagnostic codes. Correct malfunctions as required (WP 0008 and WP 0009).

MALFUNCTION

Fuel Supply Problem.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Verify the correct fuel is being used for current environmental conditions. Change fuel as required (TM 9-6115-729-10, WP 0016).

STEP 3. Verify the problem has been resolved.

MALFUNCTION

Unit Injector Malfunction.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Disconnect harness connector ENG-P1 from ECM connector J1, harness connector P7 from GSC connector J7, and harness connector ENG-P300 from valve cover connector J300 (WP 0090).

a. Perform injector solenoid test (WP 0013) repair as required.

b. Thoroughly inspect harness connectors ENG-P1, P7, ENG-P37, and generator connector J37 (WP 0090) for corrosion or damage. Repair or replace harness as required (WP 0090).

STEP 3. Perform Cylinder Cutout test (WP 0013, SYMPTOM 8).

STEP 4. Verify the problem has been resolved.

END OF WORK PACKAGE

FIELD LEVEL TROUBLESHOOTING

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING SOFTWARE INSTALLATION

INTRODUCTION

Before using the Electronic Technician (ET) tool for fault isolation, make note and record all of the fault codes available on the GSC and DVR. Also, note and record any fault lamps that are lit on the GSC and the alarm module. Complete all other Field level troubleshooting (WP 0004 thru WP 0011).

The failure analysis can begin with a single fault code indication. Because of extensive self-testing capability, a single failure will often generate multiple fault codes. (e.g. a failure of a power supply will generate a failure code for all of the sensors powered up by that power supply). It may be necessary to read through all of the associated fault isolation procedures prior to starting in order to assess the fault location.

The voltages and currents in the 100 kW TQG are dangerous and capable of causing death instantaneously. The engine and generator set are heavy and represent enormous mechanical power. Refer to the WARNING SUMMARY before attempting to troubleshoot system. The following warnings, cautions, and notes should be read and followed during all attempts at troubleshooting.

NOTE

100/200 kW TQG Cat ET software/program is for use on the 100/200 kW TQGs only. Loading 100/200 kW TQG Cat ET software will overwrite existing Cat ET software/program. If commercial Cat ET software is to be reinstalled, record the licensing data prior to installing 100/200 kW TQG Cat ET software/program. The licensing data must be reloaded when reinstalling the original (previous) Cat ET software/program.

WARNING

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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 can cause injury to personnel and damage to equipment.

WARNING

Dangerously high voltage can exist across current transformer (CT) output with engine running. CT could explode if disconnected from load with engine running. Do not disconnect CT with generator rotating. Failure to comply can cause serious injury or death to personnel.

TROUBLESHOOTING USING MAINTENANCE SUPPORT DEVICE (MSD) AND ELECTRONIC TECHNICIAN (ET) TOOL

The MSD is a military laptop computer that interfaces with the TQG via a Caterpillar Communications Adapter that is connected to the engine wire harness and the GSC.

NOTE

The MSD must be configured to interface the GSC/ECM.

Software for Caterpillar Communication Adapter II should be preloaded into MSD. Refer to Caterpillar Service Tool Hardware and Software/User's Manual Communication Adapter II, Ver 1.93 (1.9-B4) and CD NEHS0758.

To configure MSD to interface GSC/ECM, perform the following procedure:

STEP 1. On the EMCP, set Engine Control Switch (ECS) to OFF/RESET. Set the Battery Disconnect Switch to OFF. Set the DEAD CRANK SWITCH to OFF.

STEP 2. Connect data link cable between ECM to Electronic Modular Control Panel (EMCP) harness connector CDC-P7 and communications adapter (Figure 1).

STEP 3. Connect serial PC cable to MSD COM port. Connect power to the PC.

STEP 4. Start and operate TQG per TM 9-6115-729-10.

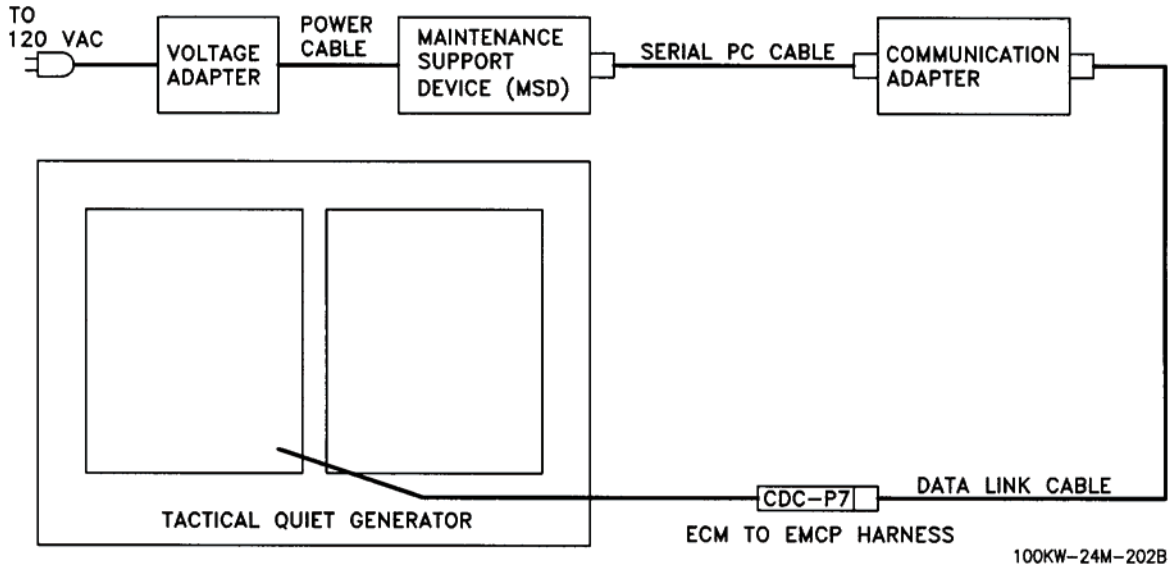


Figure 1. Connecting Caterpillar Communication Adapter.

TROUBLESHOOTING USING MAINTENANCE SUPPORT DEVICE (MSD) AND ELECTRONIC TECHNICIAN (ET) TOOL - Continued

NOTE

Software for Caterpillar Communication Adapter II should be preloaded into MSD. Refer to Caterpillar Service Tool Hardware and Software/User's Manual Communication Adapter II, Ver 1.93 (1.9-B4) and CD NEHS0758.

STEP 5. If the Cat ET has already been licensed, proceed to the section titled **USING ELECTRONIC TECHNICIAN (ET) SOFTWARE** in this Work Package. If the Cat ET has not been licensed, proceed to STEP 6.

STEP 6. Press the POWER switch on MSD and load CD ROM disc.

STEP 7. Select D:\ drive and open CD ROM disc.

END OF TASK

LOADING ELECTRONIC TECHNICIAN (ET) SOFTWARE

When you are directed to use Caterpillar proprietary Electronic Technician (ET) software from Unit (Field Level) maintenance troubleshooting, you must load ET software into the MSD. The ET Getting Started Manual will be on the CD ROM with the Communications Adapter interface software as ET 2002B Getting Started.pdf. There should be no licensing or registration requirements while loading the Cat ET software/program.

STEP 1. Open **Getting Started.pdf** document on the CD ROM.

STEP 2. Install ET Caterpillar software media # EERE3500 as instructed in Caterpillar Service Tool Software/Getting Started Manual.

STEP 3. For all other information pertaining to operation, troubleshooting, and transferring to another computer, consult **Caterpillar Service Tool Software/Getting Started Manual** contained on the CD ROM.

Caterpillar Electronic Service Tools are designed to help the service technician:

a. Obtain data.

b. Diagnose problems.

c. Read parameters.

d. Program parameters.

e. Calibrate sensors.

END OF TASK

USING ELECTRONIC TECHNICIAN (ET) SOFTWARE

The basic Caterpillar ET operations are addressed in the instructions that follow. Figure 2 shows the Caterpillar ET opening screen and Table 1 shows the primary navigation icons and their uses.

STEP 1. Select the **Electronic Technician** icon on the desktop of the MSD computer being used or select the Electronic Technician program under **Start/Programs/Caterpillar ET**.

STEP 2. If a message This program is not licensed. License the program now? appears, select YES and follow the on screen instructions or follow steps 4 through 12 in the previous section titled TROUBLESHOOTING USING ELECTRONIC TECHNICIAN (ET).

STEP 3. On the ET screen, select the **Connect** icon (Table 1) if the Cat ET does not automatically connect to the ECM.

a. If the ET cannot communicate (CONNECT) with the ECM, check the ET communication settings by selecting **Utilities** pull down menu, select **Preferences**. For communications with the Caterpillar Communication Adapter II, **COM 1** should be selected. Click on **Advanced** button. The baud rate should be 57600.

b. Click OK to close the **Baud Rate** window, Click OK to close the **Preferences** window. Select the **Connect** icon again.

STEP 4. At menu selection, chose the **3126B Industrial** engine.

STEP 5. After communications connection is established, the **ECM Summary window** is displayed. All of the top tool bar ICONS (Table 1) should now be available.

STEP 6. Select Active Diagnostics Codes by clicking on the **Active Diagnostics Codes** icon or click on the pull down menu for **Diagnostics** and selecting **Active Diag. Codes**.

a. The codes listed in the Active Diagnostics Code list are shown with the top priority code from the top down. The first code shown is the most important and must be corrected first.

b. If other GSC codes have brought you to this ET screen for troubleshooting a problem, the top priority Active Diagnostic Code problems must be corrected first.

USING ELECTRONIC TECHNICIAN (ET) SOFTWARE - Continued

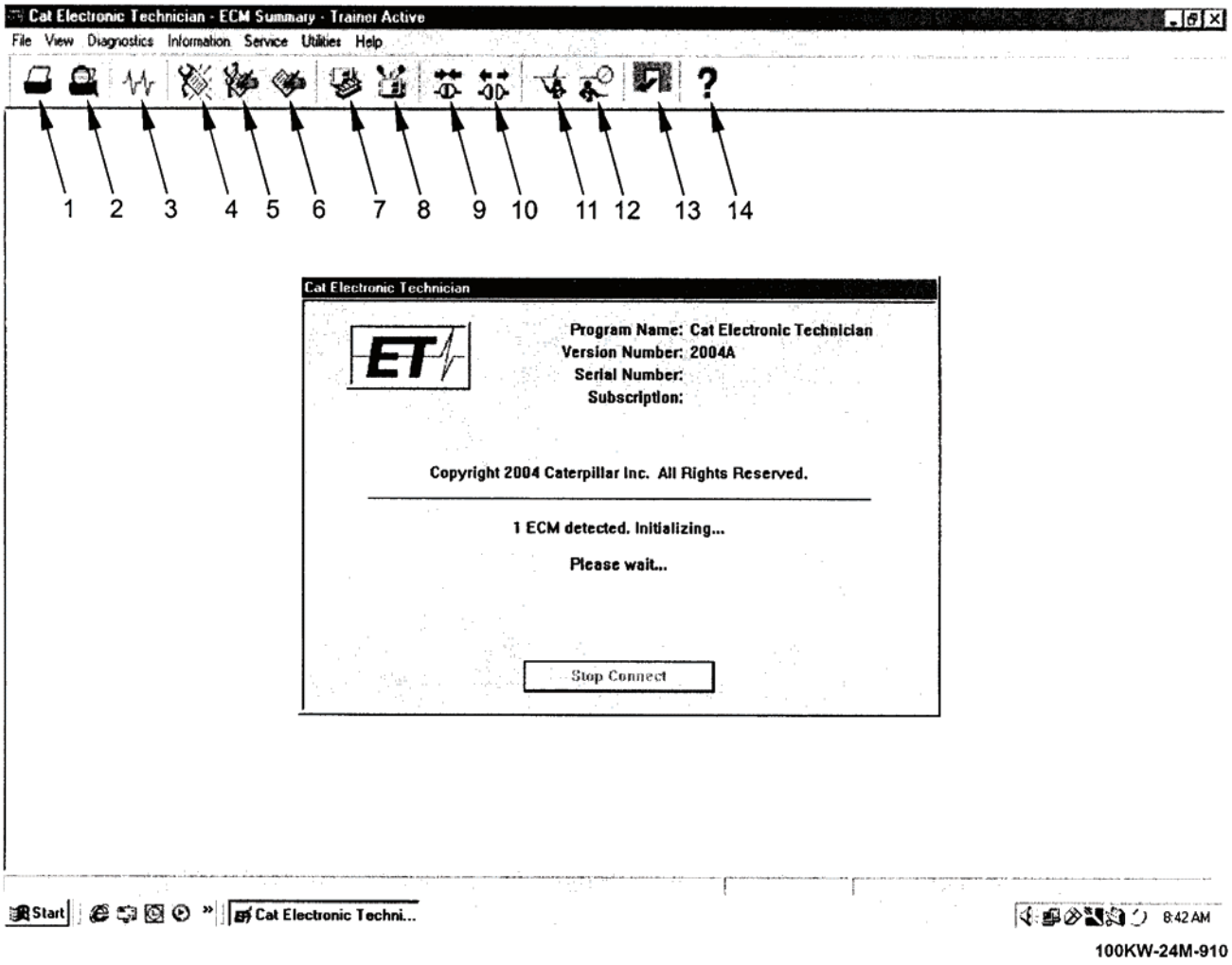


Figure 2. Caterpillar ET Opening Screen.

USING ELECTRONIC TECHNICIAN (ET) SOFTWARE - Continued

Table 1. Caterpillar ET Tool Navigation Icons.

ITEM	ICON	USE OF ICON
1		Print: Prints selected data or log.
2		Print Preview: Displays preview of data to be printed.
3		Status Tool: Opens Status Tool that allows observation of specific engine parameters and operating conditions.
4		Active Diagnostics Codes: Displays Active Diagnostic Codes.
5		Logged Diagnostics Codes: Displays historical log of Diagnostic Codes for analysis and evaluation.
6		Logged Event Codes: Displays historical log of engine event codes.
7		ECM Summary: Summarizes ECM information including engine ID and serial number along with ECM serial number and personality module identification.
8		Configuration Tool: Allows configuration of ECM.
9		Connect: Connects ET tool to engine and establishes communication to ECM.
10		Disconnect: Disconnects ET tool from engine.
11		Enable Trainer: Enables training mode for ET tool familiarization.
12		Disable Trainer: Disables training mode for ET tool familiarization.
13		Exit: Exits ET tool software.
14		Display help contents: Displays software help index and guidance.

100KW-24M-911

USING ELECTRONIC TECHNICIAN (ET) SOFTWARE - Continued

STEP 7. Select Logged Diagnostic Codes by clicking on the **Logged Diagnostic Codes** icon or click on the pull down menu for **Diagnostics** and selecting **Logged Diag. Codes**.

a. The codes listed in the Logged Diagnostics Code list are shown with the top priority code from the top down. The first code shown is the most important and must be corrected first. These codes are the same as the Active Diagnostic Codes except they are logged over time.

b. To CLEAR any or all of the Logged Diagnostic Codes, click on a Logged Diagnostic Code in the list to highlight it. Click on the CLEAR button in the lower left corner of the page.

(1) A pop up window appears with the message Are you sure you want to clear the code?

(2) Click on the YES button to clear the code from the list.

STEP 8. To run the Diagnostic Tests, click on the pull down menu for **Diagnostics**, then select **Diagnostic Tests** (Figure 3).

a. The Diagnostics Tests can run the following tests:

(1) Injector Solenoid Test

(2) Injection Actuation Pressure Test

(3) Override Parameters

(4) Cylinder Cutout Test

(5) Wiggle Test

b. Select the test called out in the troubleshooting work package and follow the on screen instructions.

USING ELECTRONIC TECHNICIAN (ET) SOFTWARE - Continued

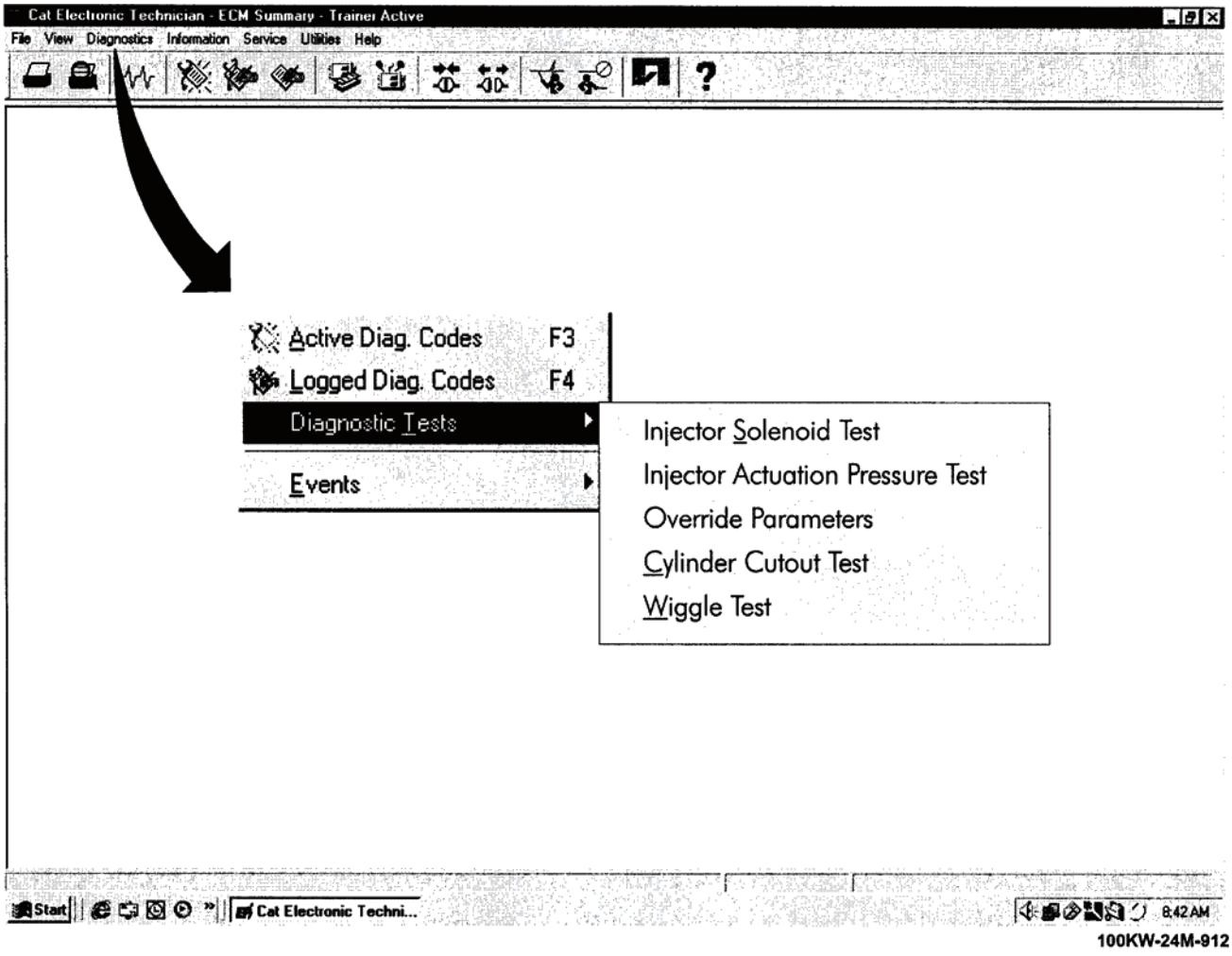


Figure 3. Cat ET Diagnostic Tests.

END OF TASK

END OF WORK PACKAGE

FIELD LEVEL TROUBLESHOOTING
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Tools and Special Tools

146-4080 Digital Multimeter Group or Equivalent
Caterpillar Electronic Technician (ET)
Software Media # NEXG5039 and # JEBD3003
EERE3500 Cat ET for Military 100 and 200 TQG
Caterpillar 171-4400 Communication Adapter II Group
198-4240 Digital Pressure Indicator or Equivalent
1U-5470 Engine Pressure Group or Equivalent
4C-4911 Battery Load Tester or Equivalent
155-5176 AC/DC Current Probe or Equivalent
8T-0852 Pressure Gage or Equivalent
219-2368 Plug (DIAGNOSTIC) or Equivalent
9X-1484 Seal Kit or Equivalent

References

WP 0014
FO-1
FO-2
FO-3
FO-4

Materials/Parts

18 gauge wire per M22759/16-18-9
88-21943 Contacts

Personnel Required

One

ELECTRONIC TECHNICIAN (FIELD) LEVEL TROUBLESHOOTING

NOTE

100/200 kW TQG Cat ET software/program is for use on the 100/200 kW TQGs only. Loading 100/200 kW TQG Cat ET software will overwrite existing Cat ET software/program. If commercial Cat ET software is to be reinstalled, record the licensing data prior to installing 100/200 kW TQG Cat ET software/program. The licensing data must be reloaded when reinstalling the original (previous) Cat ET software/program.

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

ELECTRONIC TECHNICIAN (FIELD) LEVEL TROUBLESHOOTING - Continued

WARNINGS cont'd

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 can cause injury to personnel and damage to equipment.

Field Level Troubleshooting for the Tactical Quiet Generator uses the Caterpillar Electronic Technician (ET) software and the Caterpillar Communication Adapter Group as described in WP 0012. References to Caterpillar ET are included in other sections of the Field level troubleshooting procedures. All other Field level troubleshooting should be performed before progressing to the ELECTRONIC TECHNICIAN procedures.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING

SYMPTOM

1. Air Inlet Heater Circuit Test.

System Operation Description:

Use this procedure to troubleshoot any suspect problems with the air inlet heater circuit (Figure 1). This procedure augments Unit (Field) procedures for the following diagnostic codes displayed on the GSC:

- 617-E-05 air inlet heater relay open/current below normal
- 617-E-06 air inlet heater relay grounded/current above normal

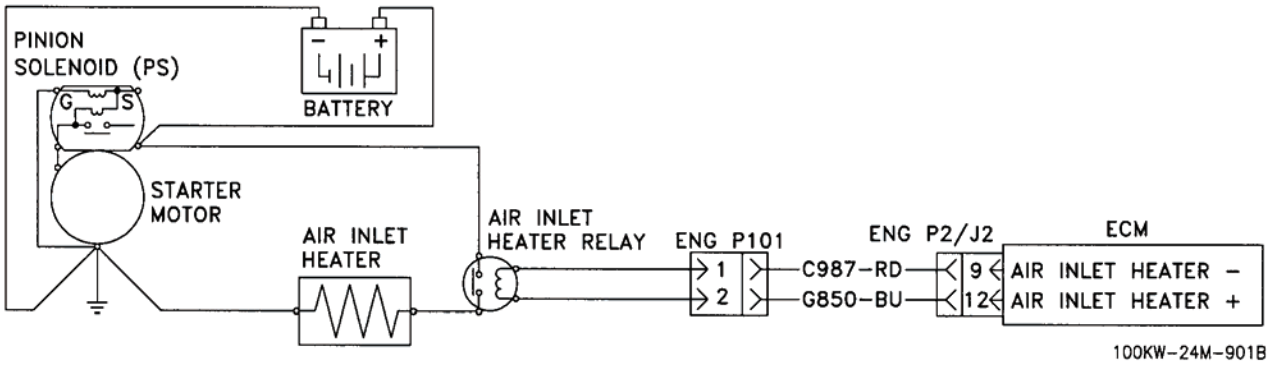


Figure 1. Air Inlet Heater Relay Circuit.

MALFUNCTION

617-E-05 code. Current is below normal or circuit is open.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Caterpillar Electronic Technician (Cat ET) to connector CDC-P7 and start Cat ET (WP 0012).

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. Start the Air Inlet Heater Override on the Cat ET.

a. Check for active diagnostic codes by selecting Diagnostics from the top of the ET screen.

b. Look for Diagnostic Code 617-E-05. Code 617-E-05 indicates the ECM detects an open circuit between the air inlet heater relay and the ECM.

NOTE

Do not leave the Air Inlet Heater Override ON. Avoid unnecessary cycling of the air inlet heater in order to prevent the battery from discharging. The Air Inlet Heater Override has a one minute timer that disables the test when the time expires.

STEP 5. Stop the Air Inlet Heater Override.

STEP 6. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 7. Check for an open circuit in the air inlet heater relay control circuit.

a. Disconnect harness connector ENG-P101 (Figure 2, Item 1) from the air inlet heater relay connector (Figure 2, Item 2).

b. Connect a voltmeter to pins 1 and 2 of harness connector ENG-P101. Refer to WP 0090 for connector pin-outs.

c. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

d. Start the Air Inlet Heater Override on Cat ET and observe the voltmeter.

(1) If +24 +/- 3.0 Vdc is present and code 617-E-05 is still active, replace the air inlet heater relay.

(2) If +24 +/- 3.0 Vdc is not present and code 617-E-05 is still active, the ECM may be defective.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

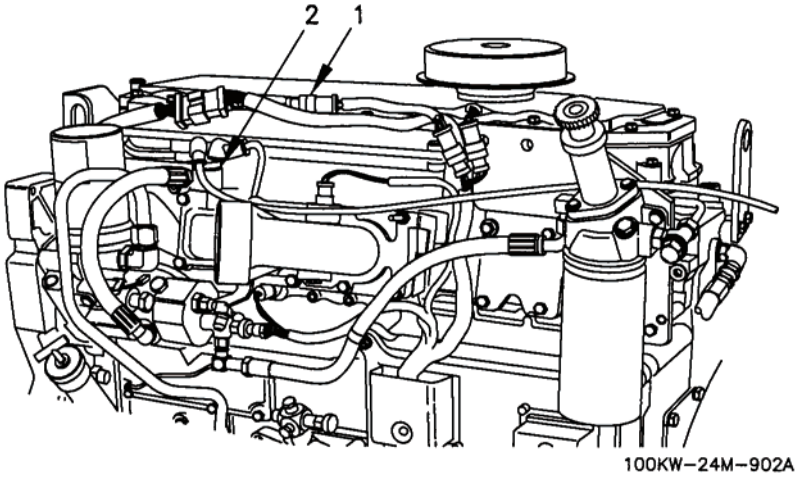


Figure 2. Air Inlet Heater Relay.

NOTE

The Air Inlet Heater Override has a one minute timer in order to disable the test when the time expires. The voltmeter will only be active while the override is active.

e. On Cat ET, stop the Air Inlet Heater Override.

f. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 8. Temporarily connect a spare ECM.

a. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

b. Recheck the system for active diagnostic codes.

c. If the problem is resolved with the spare ECM, reconnect the suspect ECM.

d. If the problem returns with the suspect ECM, replace the ECM (WP 0084).

e. Verify that the repair eliminates the problem.

STEP 9. If the problem is not resolved, check for battery voltage to the air inlet heater relay.

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Connect a voltmeter between the wire from the +battery terminal of the air inlet heater relay and engine ground (Figure 1).

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

c. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

d. Observe the voltmeter.

(1) If the voltmeter indicates zero volts, ensure that the circuit breaker is not tripped.

(2) Check the harness from the battery to the air inlet heater relay. Make any necessary repairs (WP 0090).

(3) Retest and ensure the voltmeter measures 24 +/- 3.0 Vdc.

e. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 10. Check for voltage output at the air inlet heater relay.

a. Reconnect the wire from the +battery to the air inlet heater relay.

b. Remove the wire to the air inlet heater from the air inlet heater relay.

c. Connect a voltmeter between the output terminal of the air inlet heater relay and engine ground (Figure 1).

d. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

e. Observe the voltmeter. The voltmeter should indicate zero volts, since the air inlet heater relay is not energized. If the voltmeter shows 24 +/- 3.0 Vdc, ensure that the voltmeter is connected to the output side of the air inlet heater relay.

f. Run the Air Inlet Heater Override on the Cat ET and observe the voltmeter.

NOTE

The Air Inlet Heater Override has a one minute timer in order to disable the test when the time expires.

g. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

h. If the voltmeter did not measure 24 +/- 3.0 Vdc, replace the air inlet heater relay (WP 0103).

STEP 11. If the problem is not resolved, check the wiring between the air inlet heater relay and the air inlet heater (Figure 1).

a. Reconnect the wire from the air inlet heater relay to the air inlet heater.

b. Disconnect the wire between the air inlet heater relay and the air inlet heater from the air inlet heater side.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

c. Connect a voltmeter between the wire at the air inlet heater and engine ground.

d. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

e. Run the Air Inlet Heater Override on the Cat ET and observe the voltmeter.

NOTE

The Air Inlet Heater Override has a one minute timer in order to disable the test when the time expires.

f. If the voltmeter does not measure 24 +/- 3.0 Vdc, repair/replace the wire between the air inlet heater relay and the air inlet heater, after power is removed from the ECM.

g. Stop the Air Inlet Heater Override.

h. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

i. Reconnect the wire between the air inlet heater relay and the air inlet heater.

j. Verify that the repair eliminates the problem.

STEP 12. If the problem is not resolved, measure the current through the air inlet heater.

a. Connect 155-5176 AC/DC current probe or an equivalent inductive pickup clamp around wire between the air inlet heater relay and the air inlet heater.

b. Connect the current probe to a multimeter.

c. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

d. Run the Air Inlet Heater Override on the Cat ET and observe the current reading on the multimeter. Verify the current is within the specified range of 77 A to 95 A.

NOTE

Do not leave the Air Inlet Heater Override ON. Avoid unnecessary cycling of the air inlet heater in order to prevent the battery from discharging. The Air Inlet Heater Override has a one minute timer in order to disable the test when the time expires.

e. Stop the Air Inlet Heater Override.

f. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

g. If the current is not within the specified range, check continuity of the wire between the air inlet heater and engine ground. Check the connections at the air inlet heater and at engine ground for corrosion.

(1) If the wire between the air inlet heater and engine ground is OK, replace the air inlet heater (WP 0103).

(2) Verify that the problem is resolved.

MALFUNCTION

617-E-06 code. Current is below normal or circuit is open.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. Start the Air Inlet Heater Override on the Cat ET. Look for diagnostic code 617-E-06. Code 617-E-06 indicates the ECM detects a short circuit between the air inlet heater relay and the ECM.

CAUTION

Do not leave the Air Inlet Heater Override ON. Avoid unnecessary cycling of the air inlet heater in order to prevent the battery from discharging. The Air Inlet Heater Override has a one minute timer that disables the test when the time expires.

STEP 5. Stop the Air Inlet Heater Override.

STEP 6. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 7. Check for a short circuit in the air inlet heater relay control circuit.

a. Disconnect connector ENG-P101 from ENG-J101 for the air inlet heater relay control circuit.

b. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

c. Start the Air Inlet Heater Override on the Cat ET.

d. Verify the short circuit diagnostic code 617-E-06 changed to an open circuit diagnostic code 617-E-05 when the control wires to the air inlet heater relay were disconnected.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

NOTE

The Air Inlet Heater Override has a one minute timer in order to disable the test when the time expires.

e. Stop the Air Inlet Heater Override.

f. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

g. Fabricate a 4 inch jumper wire. Use the jumper wire to connect ENG-P101-1 and ENG-P101-2.

h. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

i. Start the Air Inlet Heater Override on the Cat ET.

j. Verify the open circuit diagnostic code 617-E-05 changed to a short circuit diagnostic code 617-E-06 when the control wires to the air inlet heater relay were connected together.

k. The diagnostic codes changing from short circuit code 617-E-06 to open circuit code 617-E-05 and back to short circuit code 617-E-06 verifies that the ECM is working properly.

l. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 8. If the problem is not resolved, replace the air inlet heater relay (WP 0103).

a. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

b. Recheck the system for active diagnostic codes.

c. Verify that the repair eliminates the problem.

STEP 9. If the problem is not resolved, check for battery voltage to the air inlet heater relay.

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Remove the wire from the +battery side of the air inlet heater relay.

c. Connect a voltmeter between the wire from the +battery side of the air inlet heater relay and engine ground.

d. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

e. Observe the voltmeter.

(1) If the voltmeter does not measure 24 +/- 3.0 Vdc, ensure that the circuit breaker is not tripped.

(2) Check the harness from the battery to the air inlet heater relay. Make any necessary repairs (WP 0090).

(3) Retest and ensure the voltmeter measures 24 +/- 3.0 Vdc.

f. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 10. Check for voltage output at the air inlet heater relay.

a. Reconnect the wire from the +battery to the air inlet heater relay.

b. Remove the wire to the air inlet heater from the air inlet heater relay.

c. Connect a voltmeter between the output terminal of the air inlet heater relay and engine ground.

d. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

e. Observe the voltmeter. The voltmeter should not measure any voltage, since the air inlet heater relay is not energized. If the voltmeter measures 24 +/- 3.0 Vdc, ensure that the voltmeter is connected to the output side of the air inlet heater relay.

f. Run the Air Inlet Heater Override on the Cat ET and observe the voltmeter.

g. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

NOTE

The Air Inlet Heater Override has a one minute timer in order to disable the test when the time expires.

h. If the voltmeter does not measure 24 +/- 3.0 Vdc, proceed to STEP 11.

STEP 11. If the problem is not resolved, check the wiring between the air inlet heater relay and the air inlet heater.

a. Reconnect the wire from the air inlet heater relay to the air inlet heater.

b. Disconnect the wire between the air inlet heater relay and the air inlet heater from the air inlet heater.

c. Connect the voltmeter between the wire at the air inlet heater and engine ground.

d. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

e. Run the Air Inlet Heater Override on the Cat ET and observe the voltmeter.

NOTE

The Air Inlet Heater Override has a one minute timer in order to disable the test when the time expires.

f. If the voltmeter does not measure 24 +/- 3.0 Vdc, repair/replace the wire between the air inlet heater relay and the air inlet heater (WP 0090), after power is removed from the ECM.

g. Stop the Air Inlet Heater Override.

h. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

i. Reconnect the wire between the air inlet heater relay and the air inlet heater.

j. Verify that the repair eliminates the problem.

STEP 12. If the problem is not resolved, measure the current through the air inlet heater.

a. Connect a 155-5176 AC/DC current probe or an equivalent inductive pickup clamp around wire between the air inlet heater relay and the air inlet heater.

b. Connect the current probe to a multimeter.

c. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

d. Run the Air Inlet Heater Override on the Cat ET and observe the current reading on the multimeter. Verify the current is within the specified range of between 77 and 95 Amperes.

CAUTION

Do not leave the Air Inlet Heater Override ON. Avoid unnecessary cycling of the air inlet heater in order to prevent the battery from discharging. The Air Inlet Heater Override has a one minute timer that disables the test when the time expires.

e. Stop the Air Inlet Heater Override.

f. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

g. If the current is not within the specified range, check continuity of the wire between the air inlet heater and engine ground. Check the connections at the air inlet heater and at engine ground for corrosion. If the wire between the air inlet heater and engine ground is OK, replace the air inlet heater (WP 0103).

STEP 13. Verify the problem has been resolved.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

2. Electrical Connectors Wiggle Test.

System Operation Description:

Most electrical problems are caused by poor connections. The following procedure will assist help detect problems with connectors and with wiring. If a problem is found correct the condition and verify that the problem is resolved.

Intermittent electrical problems are sometimes resolved by disconnecting and reconnecting connectors. It is very important to check for diagnostic codes immediately before disconnecting a connector. Also check for diagnostic codes after reconnecting the connector. If the status of a diagnostic code is changed due to disconnecting and reconnecting a connector, there are several possible reasons. The likely reasons are loose terminals, improperly crimped terminals, moisture, corrosion, and inadequate mating of a connection.

NOTE

Perform the following test only after completing the tests in WP 0090.

MALFUNCTION

Electrical voltage or signal intermittent/erratic.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. Perform the Wiggle Test on the Cat ET.

a. Select the Wiggle Test from the Diagnostic Tests on Cat ET.

b. Choose the appropriate group of parameters to monitor.

c. Press the Start button for the Wiggle Test. Wiggle the wiring harness in order to reproduce intermittent problems. If an intermittent problem exists, the status will be highlighted and an audible beep will be heard.

d. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

(1) If no intermittent problems were indicated during the Wiggle Test, the harness and connectors appear to be OK. If you were sent from another procedure, return to the procedure and continue testing. If this test has resolved the problem, return the engine to service.

(2) If at least one intermittent problem was indicated, repair the harness or the connector (WP 0090).

(3) Verify that the repair eliminates the problem.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

3. Electrical Power Supply Circuit Test.

System Operation Description:

Use this procedure and Figure 3 to troubleshoot any suspect problems with the electrical supply to the engine Electronic Control Module (ECM). This procedure covers the following diagnostic code:

- 168-02 System voltage intermittent/erratic
- 168-03 System voltage above normal
- 168-04 System voltage below normal

A signal from the ENGINE CONTROL switch (ESC) is provided to Generator Set Control (GSC) interface to the ECM and tells the ECM the position of the ECS. When the ECM senses battery voltage to the GSC interface to the ECM, the ECM will power up. The GSC receives battery voltage when the ECS is in the AUTO, MANUAL START or COOL DOWN/STOP positions. If the voltage is removed from the GSC, the ECM will power down. Cycling power to the GSC interface to the ECM will reset the ECM. The electrical power for the engine comes through the CB4 circuit breaker and the Slave Relay to the battery terminals on the ECM. The presence of three +Battery connections and three −Battery connections to the ECM reduces harness resistance. All of these connections must be complete in order to ensure proper engine operation.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM - Continued

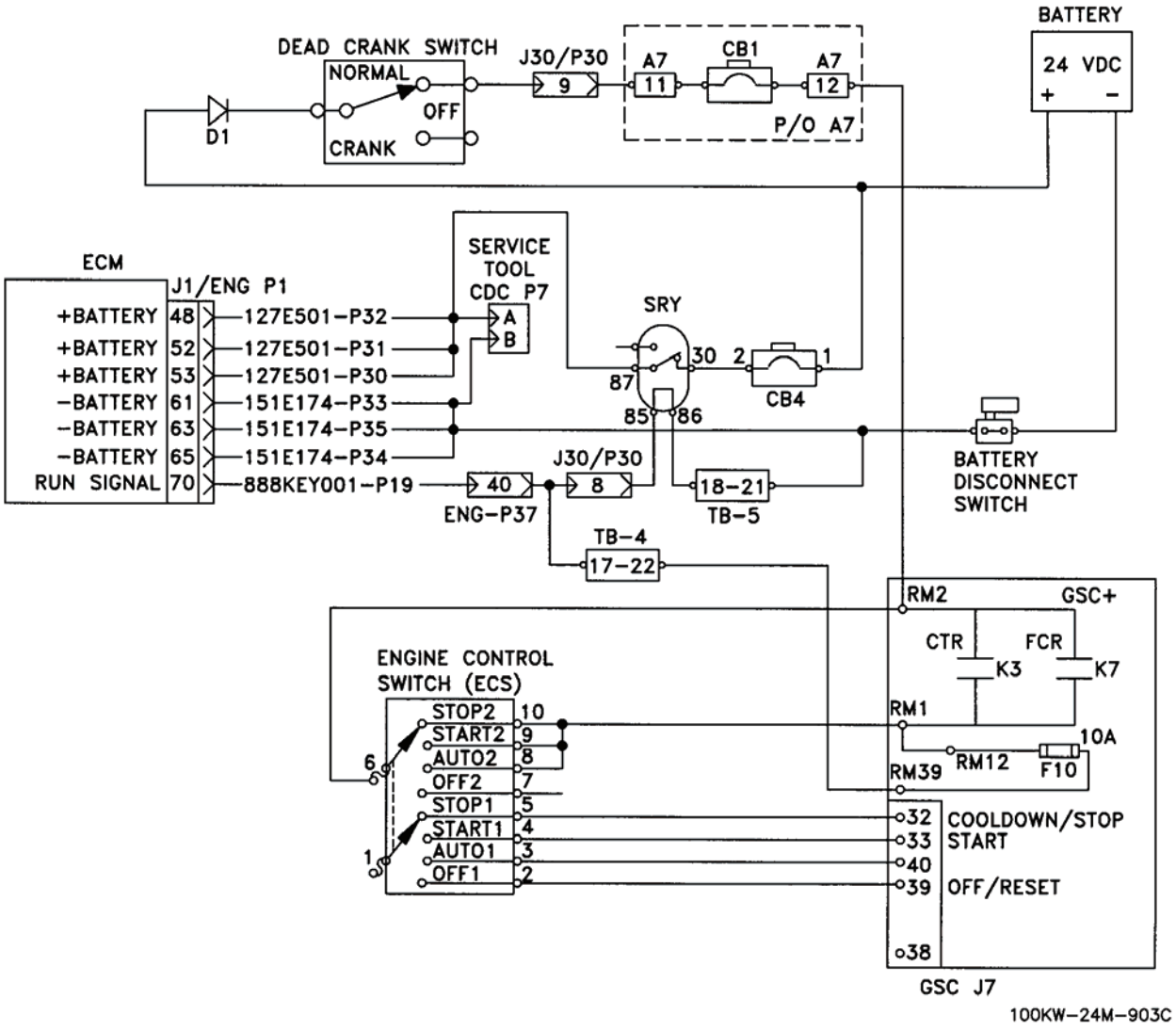


Figure 3. 24 Vdc Electrical Circuits.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

MALFUNCTION

168-02 code. Electrical system voltage intermittent/erratic.

168-03 code. Electrical system voltage above normal.

168-04 code. Electrical system voltage below normal.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Check the battery voltage.

a. Measure the open circuit voltage at the battery terminals.

b. Load test the batteries (WP 0049). Use the 4C-4911 battery load tester or equivalent.

(1) If the no-load voltage at the batteries is at least 24 ± 1 Vdc, and the batteries pass the load test. Proceed to STEP 3.

(2) If the battery voltage is incorrect and/or the battery fails the load test, the batteries or the alternator are causing the problem. Recharge the batteries or replace the batteries (WP 0049). Verify that the original condition is resolved.

STEP 3. Check the voltage to the ECM.

a. Remove ECM connector ENG-P1.

b. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

c. Measure the voltage between ENG-P1-48 and ENG-P1-61.

d. Measure the voltage between ENG-P1-52 and ENG-P1-63.

e. Measure the voltage between ENG-P1-53 and ENG-P1-65.

f. Measure the voltage between ENG-P1-70 and ENG-P1-65.

g. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

h. Reconnect ECM connector ENG-P1.

(1) If the voltage measured at steps 3c., 3d., 3e., and 3f. is 24 ± 3 Vdc. The ECM is receiving the correct voltage.

(2) On the ECM inputs from the ENGINE CONTROL switch, if the voltage is not 24 ± 3 Vdc. Proceed to STEP 4.

(3) If the voltage is not 24 ± 3 Vdc at the +battery terminals on ECM connector P1, proceed to STEP 5.

STEP 4. Check the voltage inputs to ENGINE CONTROL switch and to ECM.

a. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

b. Check the voltage between engine ground and the test points in Table 1. If voltage is not present at a test point, the problem is in the device, in the wire or in the connector that precedes the point in the circuit. Refer to Figure 3 and FO-1, Sheet 2 as required).

(1) If the voltage is 24 ± 3 Vdc at all test points, the wire 800KEY001-P19-T between ECM connector ENG-P1-70 and connector ENG-P37 is defective. Repair wire 800KEY001-P19-T and/or connections between connector ENG-P37 and ECM connector ENG-P1-70 (WP 0090).

(2) If the voltage is not 24 ± 3 Vdc at a test point, repair the device, connectors and/or wiring. (WP 0041, WP 0042, WP 0043, WP 0090, FO-2, sheet 2; FO-4, sheets 1-4).

c. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

Table 1. ECM Supply Voltage Test Points.

DEVICE (Figure 3)	TERMINAL
Diode D1	Either side
DEAD CRANK SWITCH	Terminals for NORMAL crank
J30/P30 connector	9
Resistor Assembly A7	11
Resistor Assembly A7	12
GSC	RM2
ECS	6
ECS	10
GSC	RM1
GSC	RM39
TB-4	17-22
Connector ENG-P37	40

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 5. Check the voltage to the + battery Inputs of the ECM.

a. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

b. Check the voltage between engine ground and the test points in Table 2. If voltage is not present at a test point, the problem is in the device, in the wire or in the connector that precedes the point in the circuit. Refer to Figure 3, FO-2, sheet 2; and FO-4, sheets 1-4.

(1) If voltage is present on terminal 87 of the slave relay (SRY) but not present at the ECM, repair the wires between the ECM and the SRY (WP 0090; FO-3, sheet 1).

(2) If the voltage is not 24 ± 3 Vdc at a test point, check that voltage is present at terminal 85 and terminal 30 of SRY and voltage is not present on terminal 87 of SRY, verify that the wire from terminal 86 of SRY has continuity to the −battery. If the wire from terminal 86 of the SRY has continuity to the −battery, replace SRY (WP 0054). Repair the device, connectors and/or wiring.

Table 2. Battery Voltage Input to ECM Test Points.

DEVICE	TERMINAL
J30/P30 connector	8
Slave relay (SRY)	85
Circuit breaker CB4	1
Circuit breaker CB4	2
SRY	30
SRY	87

c. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

d. Verify the problem has been resolved.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

4. Engine Timing Sensor Circuit Test.

System Operation Description:

Use this procedure and Figure 4 to troubleshoot any suspect problems with the following sensors:

- Primary (top) engine timing sensor
- Secondary (bottom) engine timing sensor

This procedure covers the following diagnostic codes:

- 190-E-02 Loss of primary (top) engine timing signal
- 190-E-11 Primary (top) engine timing sensor mechanical failure
- 342-E-02 Loss of secondary (bottom) engine timing signal
- 342-E-11 Secondary (bottom) engine timing sensor mechanical failure

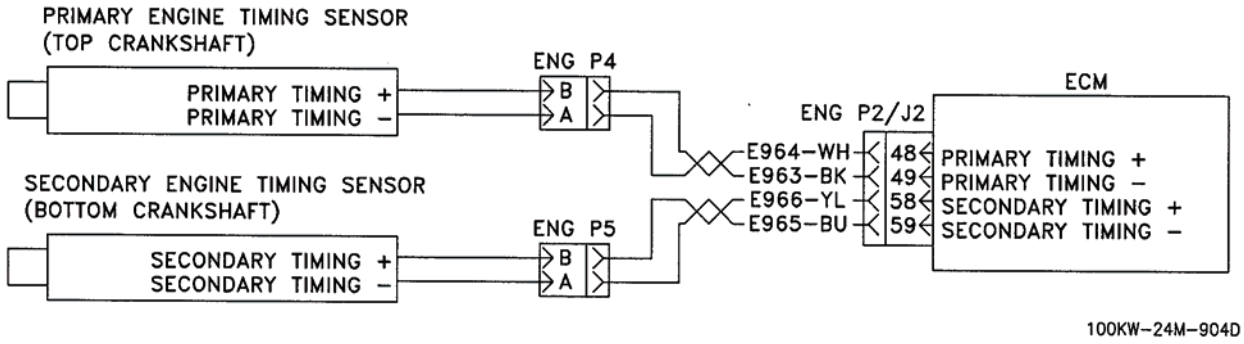


Figure 4. Engine Timing Circuit.

MALFUNCTION

Engine timing sensor. Erratic, Intermittent, or Incorrect Signal.

Engine timing sensor. Failure mode not identifiable (Mechanical Failure).

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. Turn the ENGINE CONTROL switch to MANUAL START.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

NOTE

If the engine will not start, engine rpm can be monitored on the Cat ET while the engine is being cranked by using the Status Tool.

STEP 5. Wait at least 30 seconds for activation of the diagnostic codes. Look for these codes on the Cat ET:

- 190-E-02 – Loss of primary (top) engine timing signal
- 190-E-11 – Primary (top) engine timing sensor mechanical failure
- 342-E-02 – Loss of secondary (bottom) engine timing signal
- 342-E-11 – Secondary (bottom) engine timing sensor mechanical failure

a. If code 190-E-02 is active, refer to WP 0009, SYMPTOM 28, CID 190-E-02.

b. If code 342-E-02 is active, refer to WP 0009, SYMPTOM 42, CID 342-E-02.

c. If codes 190-E-11 and/or 342-E-11 are active, proceed to STEP 6.

NOTE

If the engine will not start and the Cat ET displayed 0 rpm during cranking, select No Engine rpm.

STEP 6. If engine rpm is not indicated on the Cat ET, check the installation of the sensors (Figure 5).

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Visually inspect the sensor assembly without removing the sensor assembly from the engine. Flanges of sensors (Figure 5, Item 2) must be flush against engine (Figure 5, Item 1) in order to ensure proper operation.

c. Inspect bracket (Figure 5, Item 3). Verify that the bracket securely holds the flanges of the sensors flush against the engine. Verify that the bracket is not bent. If the bracket is bent or if an obstruction is preventing the sensor assembly from being installed correctly, the engine will not start.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

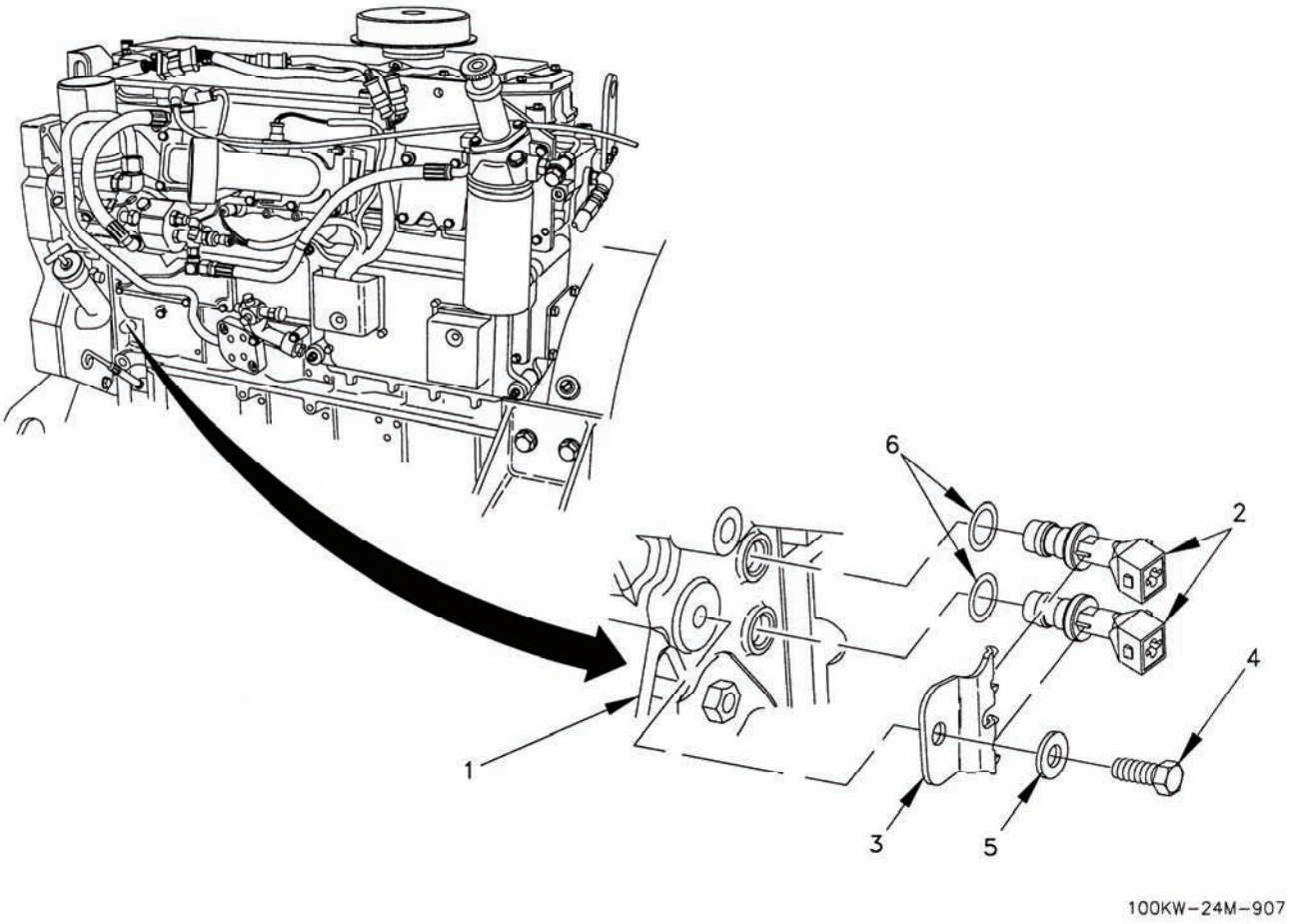


Figure 5. Timing Sensor Troubleshooting.

NOTE

The bracket cannot be replaced separately. Bracket and sensors must be replaced as an assembly.

d. Disconnect connector ENG-P4 from the primary (top)engine timing sensor and connector ENG-P5 from the secondary (bottom) engine timing sensor. Remove bolt (Figure 5, Item 4) and washer (Figure 5, Item 5) and remove the sensor assembly from the engine (Figure 5, Item 1).

e. Ensure that one O-ring (Figure 5, Item 6) is installed on each sensor. Check the O-rings for damage. Replace the O-rings, if necessary.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

f. If the sensors appear undamaged, perform the following steps.

(1) Lubricate each O-ring (Figure 5, Item 6) with clean engine oil.

(2) Fully seat the sensor assembly in the engine. If the sensor assembly will not fully seat into the engine, replace the sensor assembly.

(3) Install bolt (Figure 5, Item 4) and washer (Figure 5, Item 5) and tighten.

(4) Connect connector ENG-P4 to the primary (top) engine timing sensor and connector ENG-P5 to the secondary (bottom) engine timing sensor. Verify that the connectors are latched on both sides.

(5) Ensure that the harness is properly secured, and that the tie-wraps are placed in the correct location. Proceed to STEP 7.

g. If one or both of the sensors are damaged, perform the following steps.

(1) Obtain a new sensor assembly.

(2) Lubricate each O-ring with engine oil.

(3) Fully seat the sensor assembly in the engine. Install the bolt and washer.

(4) Tighten the bracket bolt. If the sensor assembly will not fully seat into the engine, inspect the bracket for damage. Replace the sensor assembly with an undamaged assembly, if necessary.

(5) Connect connector ENG-P4 to the primary (top) engine timing sensor and connector ENG-P5 to the secondary (bottom) engine timing sensor. Verify that the connectors are latched on both sides.

(6) Ensure that the harness is properly secured, and that the tie-wraps are placed in the correct location. Retest and verify that the problem is resolved. Perform Engine Timing Sensor Calibration (WP 0013, SYMPTOM 11). If the problem is not resolved, proceed to STEP 7.

STEP 7. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 8. Turn the ENGINE CONTROL switch to MANUAL START.

If the engine still will not start and the Cat ET displayed 0 rpm during cranking perform the following steps.

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Install a replacement ECM (WP 0084).

c. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

d. Turn the ENGINE CONTROL switch to MANUAL START. Verify the problem is resolved. Perform Engine Timing Sensor Calibration (WP 0013, SYMPTOM 11).

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

5. Injection Actuation Pressure Test.

System Operation Description:

Use the steps that follow to check the operation of the HEUI fuel system. Circle the appropriate answer in the Results section of each test step. Complete all of the test steps that are in this procedure. Figure 6 shows the locations of the left-side engine components referenced in this test.

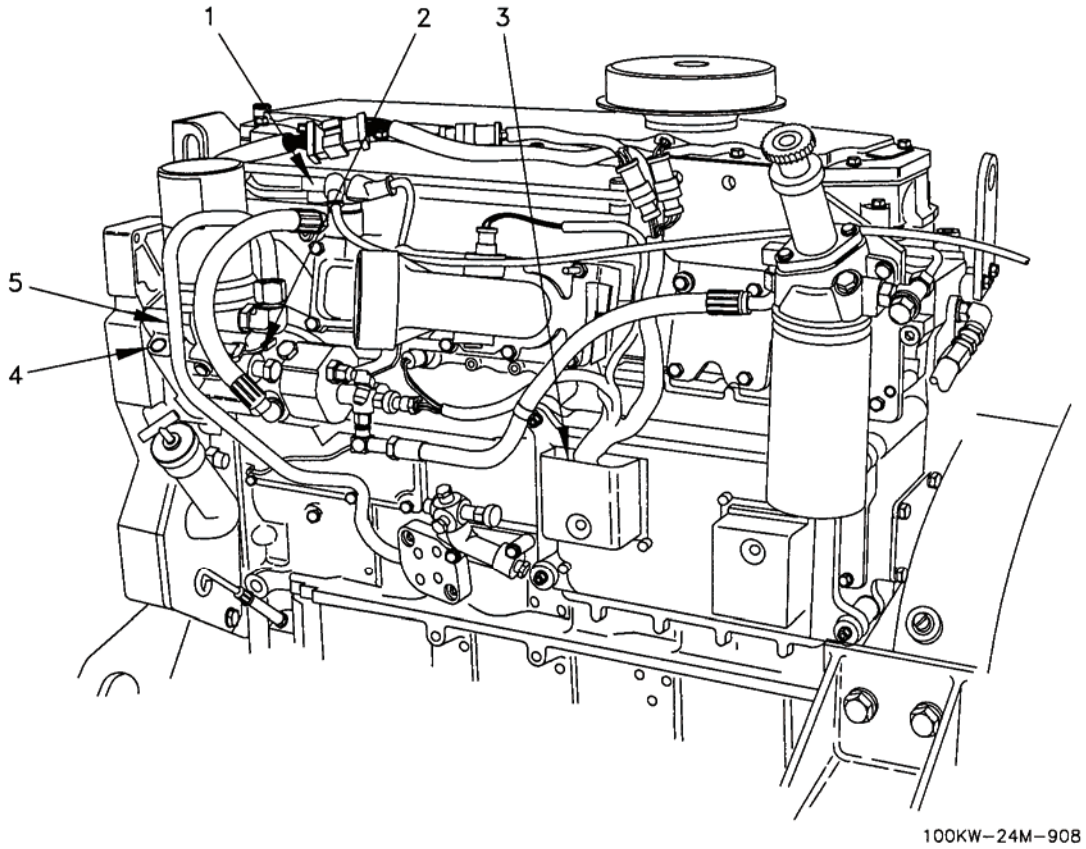


Figure 6. Location of Components for Injection Actuation Pressure Tests.

The following symptoms may occur if there is a problem with the HEUI fuel system:

- The engine cranks but the engine will not start
- The engine runs rough.
- The engine is erratic or unstable at idle or running.
- Low power

The following diagnostic codes might be currently active or logged:

- 164-E-00 High Injection Actuation Pressure
- 164-E-02 Injection Actuation Pressure signal erratic
- 164-E-11 Injection Actuation Pressure system fault

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

MALFUNCTION

164-E-00 Data is Valid but Above Normal Operating Range. High Injection Actuation Oil Pressure.

CORRECTIVE ACTION

STEP 1. Evaluate the quality of the oil.

NOTE

Extended oil drain intervals may affect the operation of the HEUI high pressure oil system.

Check the maintenance records for the engine. Ensure that the oil change interval has not been exceeded.

a. If the engine has been properly maintained. Proceed to STEP 3.

b. If the oil change interval for the engine has been exceeded, perform an oil change on the engine. Run the engine at operating rpm range for 10 to 15 minutes to purge any trapped air or debris that is in the system. If the problem still exists or if the problem recurs in a short period or time, proceed to STEP 3.

STEP 2. Perform the Injection Actuation Pressure Test.

a. Install 8T-0852 pressure gauge or equivalent on the high pressure oil rail (Figure 6, Item 5).

b. Connect the Cat ET to connector CDC-P7 (WP 0012).

c. Perform the Injection Actuation Pressure Test using the Cat ET. Record the results in Table 3.

NOTE

The Injection Actuation Pressure Test can be used to vary the injection actuation pressure. The test adjusts the oil pressure in steps. Some versions of Cat ET may have three steps in the test and some versions of Cat ET may have four or more steps in the test.

Table 3. Injection Actuation Pressure Test Results.

	MANUAL PRESSURE GAGE	CAT ET	DIFFERENCE
1			
2			
3			
4			

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

d. The pressure that is measured with the pressure gauge for each step and the pressure that is displayed on the Cat ET for each step should be within 1379 kPa (200 psi). If the Cat ET readings are good, the pressure gauge readings are not necessary.

(1) If the pressure difference is within specifications the injection actuation pressure sensor is operating properly. Proceed to STEP 4.

(2) If the pressure difference is not within specifications, the injection actuation pressure sensor may be faulty. Replace the sensor and repeat this test step. If the problem still exists, reinstall the original sensor and proceed to STEP 5.

STEP 3. Perform the Injection Actuation Pressure Test at both low idle and at operating RPM.

a. Turn the ENGINE CONTROL switch to MANUAL START. Perform the Injection Actuation Pressure Test at operating RPM, using the Cat ET.

b. Go to the bottom left corner of the Cat ET screen. Select the START button to start the test. Results for the 1st measurement will be displayed.

c. Record the results in Table 4.

d. Select the STEP-UP button. Results for the next measurement will be displayed.

e. Record results in Table 4.

f. Repeat steps 3d. and 3e. for measurements 3 and 4. Observe the desired pressure reading and compare to actual pressure reading.

g. If the pressure reading is below the desired reading for any measurement, proceed to STEP 5.

h. Shut down Generator Set.

i. Remove wires from terminals 19 and 20 of LSM A4.

j. Start generator set. Engine will increase to idle speed (apx 1200 RPM.).

k. Perform the Injection Actuation Pressure Test at idle RPM using the Cat ET. Repeat STEP 3 a thru g. In STEP 3a, perform test at idle speed instead of operating RPM.

l. If the injection actuation pressure output is between 65 percent and 100 percent of the DESIRED INJECTION PRESSURE, the injection actuation pressure output is within specifications.

m. If the injection actuation pressure output is not within specifications, proceed to STEP 5.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

Table 4. Injection Actuation Pressure Output Results.

OPERATING RPM			
	DESIRED INJECTION PRESSURE	ACTUAL INJECTION PRESSURE (CAT ET)	PERCENTAGE OUTPUT (CAT ET)
1	870		
2	1450		
3	2031		
4	2611		
LOW IDLE			
	DESIRED INJECTION PRESSURE	ACTUAL INJECTION PRESSURE (CAT ET)	PERCENTAGE OUTPUT (CAT ET)
1	870		
2	1450		
3	2031		
4	2611		

n. If the injection actuation pressure output is between 65 percent and 100 percent of the DESIRED INJECTION PRESSURE, the injection actuation pressure output is within specifications.

o. If the injection actuation pressure output is not within specifications. Proceed to STEP 5.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 4. Install a new injection actuator pressure control valve (IAPCV) and retest the system.

a. Install a new IAPCV (WP 0102) and perform the Injection Actuation Pressure Test at low idle and at operating RPM per STEP 3. Record the results in Table 5.

Table 5. Injection Actuation Pressure Test at Low Idle and Operating RPM.

OPERATING RPM			
	DESIRED INJECTION PRESSURE	**ACTUAL INJECTION PRESSURE (CAT ET)**	**PERCENTAGE OUTPUT (CAT ET)**
1	870		
2	1450		
3	2031		
4	2611		
LOW IDLE			
	DESIRED INJECTION PRESSURE	**ACTUAL INJECTION PRESSURE (CAT ET)**	**PERCENTAGE OUTPUT (CAT ET)**
1	870		
2	1450		
3	2031		
4	2611		

b. If the injection actuation pressure output is between 65 percent and 100 percent of the DESIRED INJECTION PRESSURE, the injection actuation pressure output is within specifications.

c. If the replacement of the IAPCV corrected the problem run the engine under normal operating conditions in order to verify that the original problem has been resolved.

d. If the injection actuation pressure output is not within specifications. Reinstall the original IAPCV (WP 0102).

e. If the problem is not resolved, check for other alarm and fault codes. Troubleshoot the fault codes as applicable.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 5. Check the high pressure oil system for Leaks.

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 can cause injury or death to personnel.

a. Remove the valve cover (WP 0101) and inspect the high pressure oil system for oil leaks.

(1) While the engine is being cranked, inspect the area around the injector bores for any signs of oil leakage.

(2) Inspect the spill ports of the injector for excessive oil. All six injectors should spill the same amount of oil.

b. If no leaks are apparent, the high pressure oil system is not leaking. If the diagnostic codes are still present, there may be an engine problem.

c. If a leak in the high pressure oil system has been found, replace the o-ring on the injector or replace the damaged injector (WP 0114). Verify that the repair has resolved the problem.

d. If the problem is not resolved, replace the engine.

MALFUNCTION

164-E-02 Injection Actuation Pressure signal erratic, intermittent, or incorrect.

CORRECTIVE ACTION

STEP 1. If diagnostic code 164-E-02 is present, refer to Injection Actuation Pressure Sensor Test (WP 0013, SYMPTOM 7).

STEP 2. After diagnostic code 164-E-02 has been corrected, return to the Injection Actuation Pressure Test if necessary.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

MALFUNCTION

164-E-11 Injection Actuation Pressure signal incorrect. Failure Mode is Not Identifiable.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. DO NOT START THE ENGINE.

STEP 4. Print the lifetime totals and the configuration screen.

STEP 5. Check for active diagnostic codes.

a. If there are no active diagnostic codes with the ENGINE CONTROL switch in the COOL DOWN/STOP position while the engine is off, proceed to STEP 6.

b. If diagnostic code 164-E-03 or 164-E-04 is active with the ENGINE CONTROL switch in the COOL DOWN/STOP position while the engine is off, repeat Troubleshooting with GSC diagnostic codes (WP 0009, SYMPTOM 21).

c. If a 164-E-00, 164-E-02, or 164-E-11 diagnostic code is active with the ENGINE CONTROL switch in the COOL DOWN/STOP position while the engine is off, perform the Injection Actuation Pressure Test using the Cat ET Diagnostics menu.

d. Continue to STEP 6 of this test if the problem is not resolved.

STEP 6. Try to start the engine.

a. On EMCP, set the ENGINE CONTROL switch to MANUAL START.

b. If the engine starts, proceed to STEP 9.

c. If the engine does not start, proceed to STEP 7.

STEP 7. Crank the engine and record the engine data from the Cat ET.

a. Record the actual injection actuation pressure.

b. Record the engine speed.

c. If the injection actuation pressure is above 6 MPa (870 psi), the HEUI system is functioning correctly. Refer to Troubleshooting, Engine Cranks but Will Not Start which is located in the Troubleshooting without a diagnostic code section (WP 0011, SYMPTOM 20).

d. If the injection actuation pressure is below 6 MPa (870 psi). Proceed to STEP 8.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 8. Check the oil pressure at the fuel injection pump outlet port.

a. Locate the high pressure oil line that supplies high pressure oil to the cylinder head.

b. Remove the oil line and install the 8T-0852 pressure gauge or equivalent to the line or to the high pressure port (Figure 6, Item 5) at the pump. Crank the engine and record the oil pressure that is indicated on the gauge.

NOTE

The pressure readings may vary between gauges.

(1) Observed pressure reading

(2) Observed RPM

(3) Observed injection actuation output percent

c. If the oil pressure is above 27.5 MPa (4000 psi), remove the pressure gauge from the engine. Proceed to STEP 12.

d. If the oil pressure is below 27.5 MPa (4000 psi). Proceed to STEP 9.

STEP 9. Install a test plug and recheck the oil pressure.

a. Remove the injection actuation pressure control valve (IAPCV) (Figure 6, Item 2) (WP 0102).

b. SPECIAL TEST. Install a 219-2368 plug (DIAGNOSTIC) and 9X-1484 seal kit or equivalent and perform the pressure test at the fuel injection pump outlet port. Using the DEAD CRANK SWITCH, crank the engine and record the results.

NOTE

If the 219-2368 plug (DIAGNOSTIC) is not available, proceed to STEP 10. Install a New IAPCV and check the oil pressure.

c. If the oil pressure is above 27.5 MPa (4000 psi), the HEUI pump is OK. Replace the IAPCV and recheck the oil pressure.

d. If the oil pressure is below 27.5 MPa (4000 psi). Remove the pressure gauge from the engine. Proceed to STEP 11.

STEP 10. Install a new IAPCV (WP 0102) onto the high pressure oil pump (part of fuel transfer pump group).

a. Check the oil pressure at the fuel injection pump outlet port. Record the pressure reading.

b. If the oil pressure is above 27.5 MPa (4000 psi), the replacement of the IAPCV has corrected the problem. Remove the test equipment from the engine. Verify that the repair has resolved the problem.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 11. Install a new IAPCV (WP 0102) onto the high pressure oil pump (part of fuel transfer pump group).

a. Check the oil pressure at the fuel injection pump outlet port. Record the pressure reading.

b. If the oil pressure is above 27.5 MPa (4000 psi), the replacement of the IAPCV has corrected the problem. Remove the test equipment from the engine. Verify that the repair has resolved the problem.

c. If the oil pressure is below 27.5 MPa (4000 psi), remove the new IAPCV and reinstall the original IAPCV (WP 0102). Proceed to STEP11.

NOTE

Perform sections of the test that match the displayed failure codes.

STEP 12. Check the fuel injection pump drive gear.

a. Remove the fuel transfer pump (WP 0102).

b. Check for any physical damage to the drive gear.

c. Verify that the drive gear and the retaining bolt are properly tightened. Also verify that the pump shaft rotates freely.

(1) If the drive gear bolt is properly tightened and the pump shaft rotates freely, replace the fuel transfer pump (WP 0102).

(2) Verify that the repair has resolved the problem

(3) If the drive gear bolt is loose, the pump shaft rotates freely and there is no obvious mechanical damage that would indicate a different problem, tighten the drive gear bolt. Reinstall the fuel transfer pump (WP 0102).

(4) Recheck the pressure in order to ensure that the problem has been resolved. If this does not fix the problem, replace the fuel transfer pump (WP 0102). Verify that the repair has resolved the problem. If this does not fix the problem, replace the engine.

STEP 13. Verify the problem is resolved.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

6. Injection Actuator Pressure Control Valve Circuit Test.

System Operation Description:

Use Figure 6 and Figure 7 to troubleshoot the system when there is an active 42-E-11 inject actuation control valve open/short.

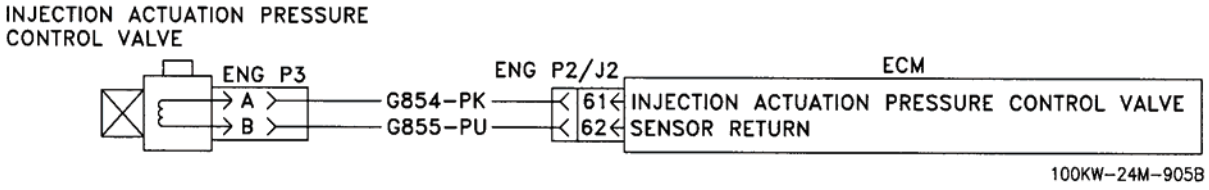


Figure 7. Injection Actuation Pressure Control Valve Circuit.

MALFUNCTION

42-E-11 code. Failure mode is not identifiable (Mechanical Failure).

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. On EMCP set ENGINE CONTROL switch to MANUAL START to start the engine.

STEP 5. Observe the active diagnostic screen on the Cat ET. Wait at least 30 seconds so that any codes may become active. Look for a 42-E-11 diagnostic code that is active.

STEP 6. Check the ECM by running the Injection Press Act Driver Test.

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Disconnect ENG-P3 connector from the injection actuation pressure control valve (IAPCV) (Figure 6, Item 2).

c. Insert connector pins into connector ENG-P3-A and ENG-P3-B.

d. Connect a voltmeter to the connector pins in ENG-P3.

e. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

f. Crank the engine and observe the voltmeter.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

g. If the voltmeter measures 5 +/- 0.2 Vdc when the engine is cranking, the ECM is OK. Proceed to STEP 7.

h. If the voltmeter fails to measure 5 +/- 0.2 Vdc when the engine is cranking, replace the ECM (Figure 6, Item 3) (WP 0084). Verify the problem is resolved.

i. Reconnect ENG-P3 to the IAPCV.

STEP 7. Perform the Injection Actuation Pressure Test using the Cat ET.

a. Disconnect ENG-P3 from the IAPCV (WP 0102), FO-2, sheet 2.

b. Connect ENG-P3 to the IAPCV (WP 0102).

c. Turn the ENGINE CONTROL switch to MANUAL START.

d. Run the Injection Actuation Pressure Test, located under the Diagnostics menu on the Cat ET.

NOTE

Step through all of the pressure ranges indicated by the test.

e. After performing the Injection Actuation Pressure Test, check for an active 42-E-11 diagnostic code.

f. If active 42-E-11 diagnostic code is still present, replace the IAPCV (WP 0102). Rerun STEP 7 and verify the problem has been resolved.

g. Using the DEAD CRANK SWITCH, crank the engine three times at 30 seconds intervals. This will purge the air from the system.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

7. Injection Actuation Pressure Sensor Test.

System Operation Description:

Use Figure 6 and Figure 8 to troubleshoot the system when the following diagnostic code is active:

- 164-E-02 Injector Actuation Pressure signal erratic

NOTE

This procedure can be used to check the accuracy of the injection actuation pressure sensor against a pressure gauge.

The injection actuation pressure sensor measures the pressure of the oil in the high pressure oil manifold. The high pressure oil in the manifold is used to actuate the injectors and the high pressure oil is used to control the fuel injection pressure. The fuel injection pressure is based on inputs from the sensors. The inputs are used by the Electronic Control Module (ECM) for calculating the fuel injection pressure. The ECM uses the signal from the injection actuation pressure sensor to calculate the control signal for the injection actuation pressure control valve.

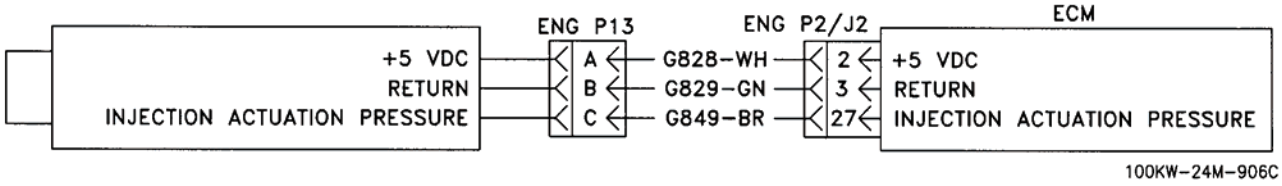


Figure 8. Injection Actuation Pressure Sensor Circuit.

MALFUNCTION

Erratic, Intermittent, or Incorrect Signal.

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 4. Observe the Active Diagnostic screen on the Cat ET. Wait at least 30 seconds so that any codes may become active. Look for an active 164-E-02 diagnostic code.

a. If 164-E-02 diagnostic code is active, try to start the engine by setting the ENGINE CONTROL switch to MANUAL START.

b. If the engine starts and there are no active codes for the injection actuation pressure sensor, there may be an intermittent problem in a harness that is causing the code to be logged. Perform Wiggle Test (WP 0013, SYMPTOM 2).

c. If the engine does not start, proceed to STEP 5.

STEP 5. Check the status of the sensor.

a. Check the value of the injection actuation pressure on the Cat ET. The value of the injection actuation pressure should be 0 kPa (0 psi).

b. If the value of the injection actuation pressure is above 0 kPa (0 psi), proceed to STEP 6.

c. If the value of the injection actuation pressure is 0 kPa (0 psi), proceed to STEP 7.

NOTE

If a 164-E-03 code is active or a 164-E-04 code is active, the status for the injection actuation pressure will default to 17500 kPa (2538 psi).

STEP 6. Check the voltage supply to the injection actuation pressure sensor.

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Disconnect ENG-P13 from the injection actuation pressure sensor (Figure 6, Item 1).

c. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

d. Measure the voltage between terminals A and B on the harness side of connector ENG-P13 (Figure 6, Item 1) (WP 0090, Figure 2, sheet 1).

(1) If the voltage is not 5.0 ± 0.2 Vdc, replace the ECM (WP 0084).

(2) If the voltage reading is 5.0 ± 0.2 Vdc, the voltage is within the specified range and the sensor is receiving supply voltage. Proceed to STEP 7.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

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 can cause injury or death to personnel.

STEP 7. Compare the sensor's output to a pressure gauge.

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Install an 8T-0852 pressure gauge or equivalent in one of the unused oil ports in the high pressure oil rail on the left side of the cylinder head.

c. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

d. On EMCP set ENGINE CONTROL switch to MANUAL START. The engine should start.

e. Go to the Injection Actuation Pressure Test on the diagnostic menu of the Cat ET.

f. Start the Injection Actuation Pressure Test.

g. Refer to Table 6. Observe the value of the injection actuation pressure on the Cat ET. Vary the engine speed in order to obtain each injection actuation pressure value that is listed in the Table. For each pressure value, observe the reading on the pressure gauge.

Table 6. Cat ET Injection Actuation Pressure vs. Pressure Gauge Readings.

PRESSURE READING FROM ET TOOL	RANGE OF READINGS FROM PRESSURE GAUGE
6000 kPa (870 psi)	4000 to 7800 kPa (580 to 1130 psi)
10000 kPa (1450 psi)	8000 to 11800 kPa (1160 to 1710 psi)
15000 kPa (2175 psi)	13000 to 16800 kPa (1885 to 2435 psi)
23000 kPa (3336 psi)	21000 to 24800 kPa (3045 to 3595 psi)

h. If at least one of the values on the pressure gauge is not within the specification, install a new injection actuation pressure sensor (WP 0100) and repeat the test. If the new sensor corrects the problem, leave the new sensor in place. If the new sensor does not correct the problem, the pressure gauge is faulty. Obtain a new pressure gauge and repeat the test.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

8. Injector Solenoid Circuit Test.

System Operation Description:

- An injector solenoid may have a problem.
- You have been directed to this procedure from Troubleshooting, Troubleshooting without a Diagnostic Code.
- There is an active diagnostic code for an injector solenoid.

Use this procedure for the following diagnostic codes:

- 1-E-11 Injector Cylinder 1 fault
- 2-E-11 Injector Cylinder 2 fault
- 3-E-11 Injector Cylinder 3 fault
- 4-E-11 Injector Cylinder 4 fault
- 5-E-11 Injector Cylinder 5 fault
- 6-E-11 Injector Cylinder 6 fault

Perform this procedure under conditions that are identical to the conditions that exist when the problem occurs. Typically, problems with the injector solenoid occur when the engine is warmed up and/or when the engine is under vibration (heavy loads). These engines have hydraulically actuated electronically controlled unit injectors (HEUI). The Engine Control Module (ECM) sends a 105 volt pulse to each injector solenoid. The pulse is sent at the proper time and at the correct duration for a given engine load and speed. The solenoid is mounted on top of the fuel injector body. If an open is detected in the solenoid circuit, a diagnostic code is generated. The ECM continues to try to fire the injector. If a short is detected, a diagnostic code is generated. The ECM will disable the solenoid circuit. The ECM will periodically try to fire the injector. If the short circuit remains, this sequence of events will be repeated until the problem is corrected. The Caterpillar Electronic Technician (ET) includes the following tests that aid in troubleshooting the injector solenoids.

NOTE

Prior to running the Cylinder Cutout Test, all active diagnostic codes must be repaired.

Cylinder Cutout Test

The Cylinder Cutout Test is used on an engine in order to determine the individual cylinder performance while the engine is running. As one or more cylinders are cut out during the test, the Cylinder Cutout Test uses the fuel position of each injector in order to evaluate the performance of the remaining cylinders that are firing. As the different cylinders are cut out, a comparison of the change in fuel position is used to identify cylinders that are weak or misfiring. One reason for a cylinder that is weak or misfiring is an injector that is malfunctioning mechanically. During the test, when a good injector is cut out, the fuel position of the remaining injectors will show a consistent change. This consistent change in the fuel position is caused by the remaining injectors that are compensating for the cut out injector. If a malfunctioning injector is cut out, the fuel position will not show a proportional change. This unbalanced change is the result of the smaller quantity of fuel that is needed to compensate for the power loss from the malfunctioning injector. The Cylinder Cutout Test is used to isolate a malfunctioning injector in order to avoid replacement of injectors that are in good repair.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM - Continued

Injector Solenoid Test

Use the Injector Solenoid Test to aid in diagnosing an open circuit or a short circuit while the engine is not running. The Injector Solenoid Test briefly activates each solenoid. A good solenoid will create an audible click when the solenoid is activated. The Cat ET will indicate the status of the solenoid as OK, Open, or Short.

NOTE

Two injector solenoids share a common return wire (Figure FO-2, sheet 2). For this reason, an open circuit or a short circuit in a return wire could cause diagnostic codes for two injector solenoids.

MALFUNCTION

Cylinder 1 - 6 Injector Solenoids. Failure mode is not identifiable (Mechanical Failure).

CORRECTIVE ACTION

STEP 1. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Prepare for running the Cylinder Cutout Test on the Cat ET.

a. Disconnect harness connector ENG-J1 from ECM.

b. Lift backshell from the side where contact position 47 is located.

NOTE

Fabricate a jumper using approximately 3 feet of 18 gauge wire and 1 contact (p/n 88-21943).

c. Install contact of jumper wire into ENG-J1 position 47.

d. Connect and secure other end of jumper wire to any GROUND location.

e. Reconnect ENG-J1 to ECM.

f. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

g. On GSC, set OP6, SP05 to 1, to disable low speed shutdown

h. Shut off all parasitic loads which could affect the results of the test.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 4. Run the Cylinder Cutout Test.

a. Turn the ENGINE CONTROL switch to MANUAL START. Allow the engine to warm up to the normal operating temperature of 171°F (77°C).

b. In the Cat ET Configuration Menu change the engine low idle speed to 800 rpm.

c. Access the Cylinder Cutout Test. Follow the instructions that are provided. The Cylinder Cutout Tests are interactive so the procedure is guided to the finish. The Cylinder Cutout Test will run 3 times consecutively.

d. Print a report of the test and evaluate the results.

e. If the results of the Cylinder Cutout Test indicate that all of the cylinders are OK, suspect an electrical problem or a mechanical problem with another system on the engine. If the engine is misfiring or if the engine has low power, refer to Troubleshooting, Engine Misfires, Runs Rough or Is Unstable and Troubleshooting, Low Power/Poor or No Response to Throttle in WP 0011.

f. If the Cylinder Cutout Test indicates that there is a weak cylinder. There may be an injector solenoid that is partially shorted or there may be a mechanical problem with the cylinder.

STEP 5. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

a. Remove jumper wire.

b. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

c. Set OP6, SP05 to 0, to enable low speed shutdown.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 6. Monitor the logged diagnostic code screen on the Cat ET. Look for an 11 code that is related to one of the unit injectors.

STEP 7. Use the Injector Solenoid Test to test the injector solenoids.

a. Ensure that the engine has warmed to the normal operating temperature of 171°F (77°C).

b. Stop the engine as follows: On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP. Leave Battery Disconnect Switch to ON. Leave DEAD CRANK SWITCH to NORMAL. DO NOT START THE ENGINE.

c. Access the Injector Solenoid Test on the Cat ET.

d. Activate the test.

NOTE

Do not confuse the Injector Solenoid Test with the Cylinder Cutout Test. The Cylinder Cutout Test is used while the engine is running. The Injector Solenoid Test is used in order to actuate the injector solenoids while the engine is stopped.

e. As each solenoid is energized by the ECM an audible click can be heard at the valve cover. Listen for a click at each valve cover. A black square will appear over the cylinder number on the Cat ET as each cylinder is being fired.

f. Perform the Injector Solenoid Test at least two times.

g. In the previous test step, if the Cylinder Cutout Test indicated a problem with one of cylinders, there may be a problem with the injector for the cylinder or there may be a mechanical problem with the cylinder. If a problem with an injector is suspected, replace the suspect injector with another injector on the engine in order to confirm the problem. Perform the Cylinder Cutout Test again. If the problem moves to the other cylinder with the suspect injector, replace the injector (WP 0114). If the problem remains in the original cylinder, there is a mechanical problem with the cylinder.

WARNING

A strong electrical shock hazard is present if the electrical power is not removed from the ECM. The electronic unit injector system uses 90-120 volts. Failure to comply can cause injury or death to personnel.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 8. If the Injector Solenoid Test reported that one or more cylinders are SHORT, record the cylinder numbers for the injectors that indicate SHORT.

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF. A strong electrical shock hazard is present if the electrical power is not removed from the ECM.

b. Disconnect the connector ENG-P300 from Injector Harness ENG J300 at the valve cover.

c. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

d. If the status of all cylinders indicates OPEN when the connector for the injector harness is disconnected, there is not a short circuit in the engine harness from the ECM connector to the connector for the injector harness. Reconnect the connector for the injector harness. Proceed to STEP 11.

e. If at least one cylinder does not indicate OPEN when the connector for the injector harness is disconnected, record the cylinder numbers that indicate a short circuit.

(1) On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

(2) Disconnect ENG-P2 from ECM J2.

(3) Remove the suspect injector's supply wire and return from the J2 ECM connector. Connect the ENG-P2 ECM connector.

(4) Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

(5) Perform the Injector Solenoid Test at least two times. Record the results.

NOTE

The Cat ET will report an OPEN for the injector that shares the supply with the suspect injector. Disregard the result for this injector.

(6) If the Injector Solenoid Test indicates OPEN for the suspect cylinder, the short circuit is in the engine harness. Repair the engine harness or replace the engine harness, as required (WP 0090). Verify that the repair eliminates the problem.

(7) If the Injector Solenoid Test indicates SHORT for the suspect cylinder, there is a problem with the ECM. Replace the ECM (WP 0084). Verify that the repair eliminates the problem.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 9. The Injector Solenoid Test reported that one or more cylinders are OPEN. Record the cylinder numbers for the injectors that indicate OPEN.

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

WARNING

A strong electrical shock hazard is present if the electrical power is not removed from the ECM. The electronic unit injector system uses 90 to 120 Vdc. Failure to comply can cause injury or death to personnel.

b. Disconnect engine wiring harness connector ENG-P300 from Injector Harness ENG-J300 (Figure FO-2, sheet 2).

c. Fabricate a jumper wire that is long enough to jumper two connector pins at the connector for the injector harness. Crimp connector sockets to each end of the jumper wire.

d. Insert one end of a jumper wire onto the pin of the supply wire of the suspect injector. Insert the other end of the jumper wire onto the pin of the return wire of the suspect injector. For example, if injector 5 is the problem injector, insert the jumper onto terminal 5 and into terminal 8 of the connector for the injector harness. Ensure that the ends of the jumper wire are not in contact with any of the other terminals in the connector. Refer to Table 7.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

Table 7. Injector Harness Injector Solenoid Terminals.

TERMINAL (WP 0091, FO-2, Sheet 2)	SIGNAL
1	Injector 1 Supply
2	Injector 2 Supply
3	Injector 3 Supply
4	Injector 4 Supply
5	Injector 5 Supply
6	Injector 6 Supply
7	Injector 6 Return
8	Injector 5 Return
9	Injector 4 Return
10	Injector 3 Return
11	Injector 2 Return
12	Injector 1 Return

e. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

f. Using Cat ET, perform the Injector Solenoid Test at least two times.

g. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF. Repeat this test for each suspect Injector. Ensure that the Injector Solenoid Test is disabled before handling the jumper wires.

NOTE

The Cat ET may report a SHORT for the injector that shares the supply with the suspect injector. Disregard the result for this injector.

h. If the Injector Solenoid Test indicates SHORT for the cylinder with the jumper wire, the ECM and the engine harness are OK. Remove the jumper wire. Reconnect the connector for the injector harness. Proceed to STEP 11.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

i. If the Injector Solenoid Test indicates open for the cylinder with the jumper wire. The problem is in the engine harness or in the ECM.

(1) If the problem has not been resolved, repair or replace the engine harness (WP 0090). Verify the problem has been resolved.

(2) Install another ECM and retest. If the problem is resolved, install a replacement ECM (WP 0084).

STEP 10. If the problem is not resolved, check the injector harness under the valve cover for open or short circuits in the injector wires.

WARNING

A strong electrical shock hazard is present if the electrical power is not removed from the ECM. The electronic unit injector system uses 90-120 volts.

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Remove the valve cover (WP 0101).

c. Disconnect the connector for the problem injector.

d. Attach a jumper wire to both terminals at the harness side of injector connector for the suspect injector (WP 0090, Figure 2, sheet 3).

e. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

f. Perform the Injector Solenoid Test at least two times. Record the results of the test.

NOTE

The Cat ET may report a SHORT for the injector that shares the supply with the suspect injector. Disregard the result for this injector.

g. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

(1) If the Injection Solenoid Test indicates SHORT for the cylinder with the suspect injector, the harness under the valve cover is OK. The problem is in the windings of the injector solenoid. Replace the injector (WP 0114). Verify that the repair eliminates the problem.

(2) If the Injection Solenoid Test does not report SHORT for the suspect injector, the problem appears to be in the harness under the valve cover. Repair or replace the harness under the valve cover (WP 0090). Run the Injector Solenoid Test in order to check the installation of the new harness before installing the valve covers. Verify that the repair eliminates the problem.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

h. If the short condition was not present, remove the jumper wire and place the connector in a place that will not allow arcing during the test.

i. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

j. Perform the Injector Solenoid Test at least two times.

(1) If the Injector Solenoid Test indicates OPEN for the suspect injector, the harness under the valve cover is OK. The problem is in the windings of the injector solenoid. Replace the injector (WP 0114). Verify that the repair eliminates the problem.

(2) If the Injector Solenoid Test does not indicate OPEN for the suspect injector, the problem appears to be in the engine harness under the valve cover. Replace the harness under the valve cover or repair the harness under the valve cover (WP 0090). Run the Injector Solenoid Test in order to check the installation of the new harness before installing the valve covers. Verify that the repair eliminates the problem.

STEP 11. If the problem is not resolved, there may be a malfunctioning cylinder that is caused by a mechanical problem. Replace the engine.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

9. Speed Control Test.

System Operation Description:

The load sharing module (LSM) A4 provides a throttle signal to the ECM. The output for rated speed is a pulse width modulated (PWM) signal at a constant frequency. The speed signal varies with the position of the FREQUENCY adjust knob. The output signal is referred to as a duty cycle or as a PWM signal. The output signal is expressed as a percentage between 0 and 100 percent for the speed adjust. Figure 9 shows the speed control circuits.

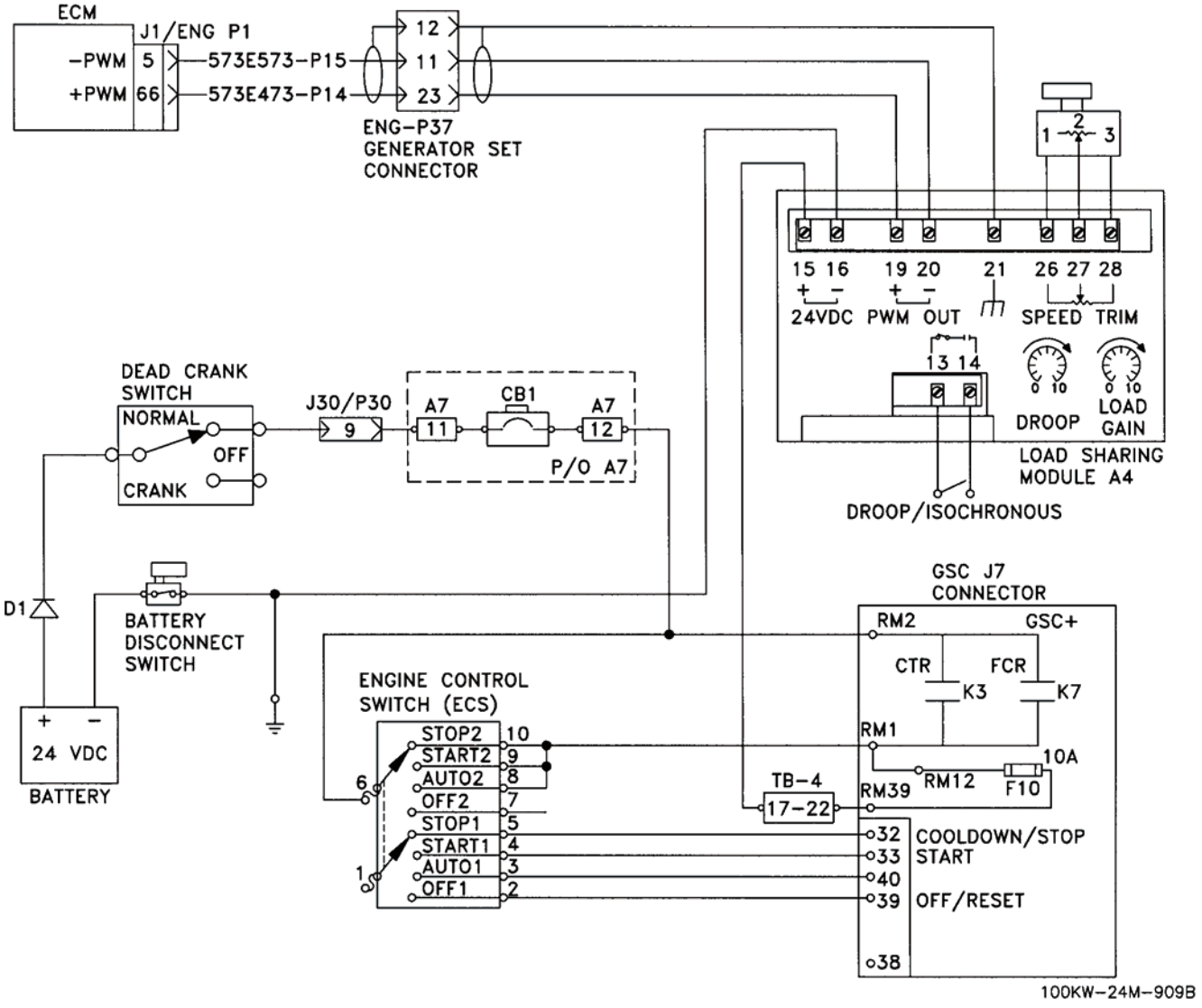


Figure 9. Speed Control Circuits.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM - Continued

NOTE

Desired speed can be adjusted from 1700 to 1900 rpm for a 60 Hz system and from 1400 to 1600 rpm for a 50 Hz system. The ECM calculates the desired engine rpm from the rated speed signal and the droop signal. The rated speed signal is valid when the duty cycle is in the range of 5 to 95 percent. If the ECM determines that the rated speed signal is invalid, the engine rpm will be set to the programmed low idle.

MALFUNCTION

Throttle Position Signal. Abnormal frequency, pulse width, or period.

24 +/- 3 Vdc is not measured between terminal 15 (+) and terminal 16 (-) on LSM A4.

CORRECTIVE ACTION

STEP 1. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 2. Measure the voltage between terminal 15 and terminal 16 on LSM A4 (Figure FO-4, sheet 2). Connect one probe of a voltmeter to the +battery terminal of the speed control unit. Connect one probe of the voltmeter to the −battery terminal of LSM A4.

STEP 3. Measure voltage to LSM A4 (Figure FO-4, sheet 4).

a. Verify that the ground wire on terminal 16 has continuity to ground.

b. Check the voltage between engine ground and the test points listed in Table 8. If voltage is not present at a test point, the problem is in the device, in the wire or in the connector that precedes the point in the circuit.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

Table 8. Speed Control Test Voltage Measurement Points.

DEVICE	TERMINAL
Diode D1	Either side
DEAD CRANK SWITCH	Terminals for NORMAL crank
J30/P30 connector	9
Resistor Assembly A7	11
Resistor Assembly A7	12
GSC	RM2
ECS	6
ECS	10
GSC	RM1
GSC	RM39
TB-4	17-22

STEP 4. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

Connect the Cat ET to connector CDC-P7 (WP 0090).

STEP 5. If the voltage is not 24 ± 3 Vdc at a test point, repair the device, connectors and/or wiring (WP 0041, WP 0042, WP 0043, WP 0090, FO-2, sheet 2; FO-4, sheets 1-4).

STEP 6. After the voltage supply to LSM A4 is correct. Proceed to STEP 7.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 7. Check the throttle position using the Cat ET.

a. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to MANUAL START.

b. Observe the position of the throttle on the Cat ET.

c. Turn the FREQUENCY adjust knob to register the following:
- 60 Hz between 1700 and 1900 rpm
- 50 Hz between 1400 and 1600 rpm

d. Start at the low position. Slowly turn the FREQUENCY adjust knob in the other direction. Monitor the position of the Throttle and the RPM on the Cat ET.

e. If the throttle position shown on the Cat ET changes as the FREQUENCY adjust knob is adjusted, LSM A4 is operating correctly.

f. If the throttle position and RPM reading shown on the Cat ET does not vary as the FREQUENCY adjust knob is adjusted. Proceed to STEP 8.

STEP 8. Check LSM A4.

a. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

b. Remove wires from terminals 19 and 20 of LSM A4.

c. Connect DC voltmeter to terminals 19 and 20 on LSM A4.

d. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

e. Turn FREQUENCY adjust potentiometer up and down. Voltage will vary from approximately 4.5 to 9.5 Vdc. Adjust speed trim potentiometer, if necessary.

f. On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

g. If voltage is correct, remove ENG-P1 connector from the ECM. Measure continuity from the wire on terminals 19 to ENG-P1-66 and the wire on terminal 20 to ENG-P1-5. If continuity is good, replace LSM A4 (WP 0041). Verify the problem is resolved.

h. If voltage is incorrect, or erratic, repair wiring as necessary (WP 0090). Verify the problem is resolved. If wiring is good, perform potentiometer test on FREQUENCY adjust potentiometer (WP 0040). Replace potentiometer, as required (WP 0040). Verify the problem is resolved.

j. If FREQUENCY adjust potentiometer is not defective, replace ECM (WP 0084). Verify the problem is resolved.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

10. Electronic Service Tool (Cat ET) will not communicate with ECM.

If the Electronic Service Tool (Cat ET) will not communicate with the ECM the following possible problems are listed in order of most probable first.

- Configuration for the communications adapter
- Electrical (Cat ET) connectors
- Communication adapter and/or cables
- Electrical power supply to the CDC connector
- Caterpillar Electronic Technician (ET) and related hardware
- Electrical power supply to the Electronic Control Module (ECM)
- Flash file
- Cat Data Link

MALFUNCTION

The Cat ET will not communicate with the ECM.

CORRECTIVE ACTION

STEP 1. On EMCP, set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. Check the configuration for the communications adapter.

a. Access Preferences under the Utilities menu on Cat ET.

b. Verify that the correct communications interface device is selected.

c. Verify that the correct port is selected for use by the communication adapter.

NOTE

The most commonly used port is COM 1.

d. Under Advanced menu, verify the baud rate is set for 57600.

e. Check for any hardware that is utilizing the same port as the communications adapter. If any devices are configured to use the same port, exit or close the software programs for that device.

STEP 5. Check the electrical connectors.

a. Check for correct installation of the ENG-P1 and ENG-P2 ECM connectors (WP 0090).

b. Check the CDC-P7 connector (WP 0012).

c. Inspect all associated electrical wiring and connectors. Refer to Troubleshooting, Electrical Connectors (WP 0090, WP 0013) if an intermittent problem is suspected.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 6. Communication adapter and/or cables

a. If you are using a communication adapter II, ensure that the firmware and driver files for the communication adapter are the most current files that are available. If the firmware and driver files do not match, the communication adapter will not communicate with Cat ET (WP 0090).

b. Disconnect the communication adapter and the cables from connector CDC-P7. Reconnect the communication adapter to the CDC-P7 connector.

c. Verify that the correct cable is being used between the communication adapter and CDC-P7 connector.

STEP 7. Verify that battery voltage is present between terminals A and B of CDC-P7 connector (WP 0090, FO-2, sheet 2). If the communication adapter is not receiving power, the display on the communication adapter will be blank.

STEP 8. In order to eliminate Cat ET and the related hardware as the problem, connect Cat ET to a different engine. If the same problem occurs on a different engine, check Cat ET and the related hardware in order to determine the cause of the problem.

STEP 9. Check power to the ECM. Refer to Troubleshooting, Electrical Power Supply Circuit Test.

NOTE

If the ECM is not receiving battery voltage, the ECM will not communicate.

STEP 10. Ensure that the correct flash file is properly installed in the ECM. (WP 0013 SYMPTOM 12).

NOTE

A new ECM is not programmed to any specific engine until a flash file has been installed. The engine will not start and the engine will not communicate with Cat ET until the flash file has been downloaded. Refer to Troubleshooting, Flash Programming (WP 0013 SYMPTOM 12).

STEP 11. Troubleshoot the Cat data link for possible problems. Refer to Troubleshooting, WP 0009 SYMPTOM 29.

STEP 12. Verify the problem has been resolved.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

11. Engine Timing Sensor Calibrate.

This procedure is required if a 261-E-13 Engine Timing Calibration code is active.

Also use this procedure if any of the following conditions exist:

The ECM has been replaced.
The Engine Timing sensors have been replaced.
The front engine gear group has been serviced.

The following tools are required:

Table 9. Tools Required.

PART NUMBER	DESCRIPTION
7X-1171	Transducer Adapter
6V-2197	Transducer
7X-1695	Cable Assembly
170-3519	Harness

MALFUNCTION

Engine timing is not calibrated.

CORRECTIVE ACTION

STEP 1. On EMCP, set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Remove timing calibration plug from either side of the flywheel housing. Refer to Figure 10. The starter side of the engine is the easiest to access.

STEP 3. Use a flashlight to examine the flywheel through the timing calibration port where the timing calibration plug was removed. Ensure that the timing pin hole that is machined into the flywheel is not aligned with the timing calibration port (hole). Refer to Figure 10. If necessary, rotate the crankshaft in order to cause the misalignment of the holes.

STEP 4. Install the 7X-1171 transducer adapter into the timing calibration port hole.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

NOTE

Do not install the timing calibration probe over the timing pin hole in the flywheel. Damage to the timing calibration probe will result.

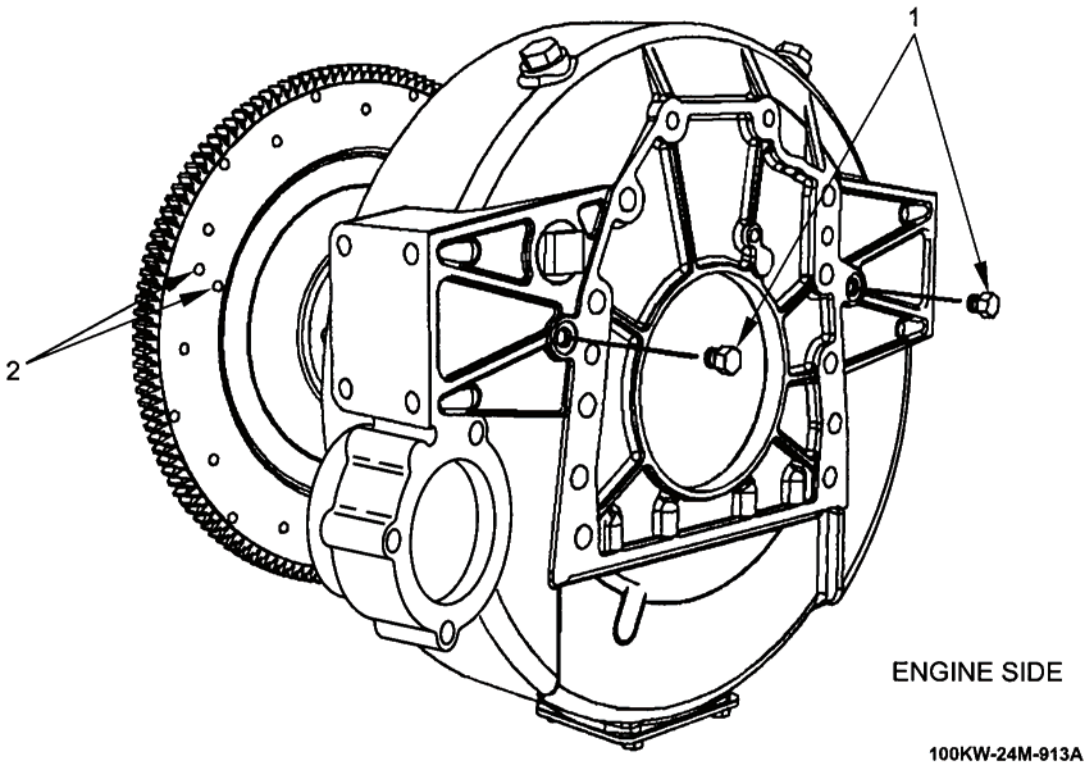


Figure 10. Timing Calibration Plugs.

STEP 5. Install the 6V-2197 transducer as follows:

a. Apply clean oil to a 2D-6392 O-ring seal. Install the o-ring seal on the end of the 6V-2197 transducer.

b. Insert the 6V-2197 transducer through the 7X-1171 transducer adapter. Insert the transducer until contact is made with the surface of the flywheel. Pull the transducer 1.0 mm (0.04inch) away from the flywheel.

c. Tighten the nut on the transducer adapter.

d. Connect the 7X-1695 cable assembly from the engine timing calibration probe (transducer) to the ENG-P10 timing calibration probe connector. Refer to FO-2 Sheet 1. The ENG-P10 connector is located above the ECM.

STEP 6. Connect the Cat ET to connector CDC-P7 (WP 0012).

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

CORRECTIVE ACTION - Continued

STEP 7. Set the Battery Disconnect Switch to ON. Set the DEAD CRANK SWITCH to NORMAL. On the EMCP, set the ENGINE CONTROL switch to MANUAL START. Run the engine until the engine has exited cold mode operation.

STEP 8. Start the Cat ET (WP 0012). Access the TIMING CALIBRATION screen on the Cat ET by going to drop-down menu SERVICE, then CALIBRATONS, then TIMING CALIBRATIONS.

STEP 9. Disconnect wires from terminals 19 and 20 on LSM A4.

STEP 10. Select CONTINUE on the Cat ET. Wait until the Cat ET indicates that the timing is calibrated.

STEP 11. On EMCP, set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

NOTE

Disconnect the 7X-1695 Cable Assembly before exiting the TIMING CALIBRATION screen to prevent diagnostic codes from activating.

STEP 12. Disconnect the 7X-1695 cable assembly.

STEP 13. Exit the TIMING CALIBRATION screen on the Cat ET.

STEP 14. On the EMCP, set the ENGINE CONTROL switch to OFF/RESET.

STEP 15. Remove the 6V-2197 transducer and the 7X-1171 transducer adapter.

STEP 16. Reinstall the timing calibration plug.

STEP 17. Verify the problem has been resolved.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

12. Flash Programming

This is a method of programming or updating the flash file in an engine's Electronic Control Module (ECM). Use this procedure if original ECM flash files are missing or not available. To update configuration files, refer to WP 0013, SYMPTOM 15. Caterpillar Electronic Technician (ET) is used to flash program a file into the memory of the engine's ECM. If you do not have the flash file, it must be obtained from your Caterpillar dealer.

MALFUNCTION

Personality Module Mismatch. ECM has an incorrect or outdated Flash File.

CORRECTIVE ACTION

STEP 1. On EMCP, set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

STEP 4. Establish communication between Cat ET and the engine's ECM.

STEP 5. Select WinFlash from the Utilities menu on Cat ET.

NOTE

If WinFlash will not communicate with the ECM, refer to Troubleshooting, Electronic Service Tool Will Not Communicate with ECM.

STEP 6. Program the flash file into the ECM.

a. Select the engine ECM under the Detected ECMs.

b. Press the Browse button in order to select the name of the flash file that will be programmed into the ECM.

NOTE

The Flash Files are located on a CD provided with the Cat ET software.

c. When the correct flash file is selected, press the Open button.

d. Verify that the File Values match the application. If the File Values do not match the application, obtain the correct flash file.

e. When the correct flash file is selected, press the Begin Flash button.

f. Cat ET will indicate when flash programming has been successfully completed.

STEP 7. Turn the ENGINE CONTROL switch to MANUAL START. Check for proper operation. Repair any active diagnostic or event codes.

WinFlash Error Messages

If you receive any error messages during flash programming, click on the Cancel button in order to stop the process. Access the information about the ECM Summary under the Information menu. Make sure that you are flashing the correct file for your engine.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

13. Engine Fuel Pressure Reading.

This procedure is required if a fuel pressure problem is suspected.

MALFUNCTION

Poor engine performance. Low fuel pressure is suspected.

CORRECTIVE ACTION

STEP 1. On EMCP, set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to MANUAL START.

STEP 4. Establish communication between Cat ET and the engine's ECM.

STEP 5. Select STATUS from the icons list on the Cat ET.

STEP 6. Select a group of engine sensors that include the fuel pressure. Read the fuel pressure with the engine running.

a. The pressure should be 58 to 76 psi (400 to 525 kPa) during both normal operating conditions and load conditions.

b. The pressure should be 58 to 63 psi (400 to 435 kPa) at low idle.

c. If the fuel pressure is not within spec, troubleshoot the restriction and replace components as required (WP 0056 thru WP 0060).

STEP 7. Verify the problem has been resolved.

SYMPTOM

14. Engine Status.

This procedure is required if an engine operating parameter is needed to troubleshoot a performance problem.

MALFUNCTION

Poor engine performance. Need to verify engine operating parameters.

CORRECTIVE ACTION

STEP 1. On EMCP, set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.

STEP 2. Connect the Cat ET to connector CDC-P7 (WP 0012).

STEP 3. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to MANUAL START.

STEP 4. Establish communication between Cat ET and the engine's ECM.

STEP 5. Select STATUS from the icons list on the Cat ET.

STEP 6. Select a group of engine sensors that include the needed parameter. Read the parameter with the engine running.

STEP 7. Use the status data to assist in troubleshooting a problem.

ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING - Continued

SYMPTOM

15. Copy Configuration/ECM Replacement.

When replacing ECM, the configuration data from the old ECM needs to be copied and loaded into the replacement ECM.

MALFUNCTION

Replacement ECM requires configuration data.

CORRECTIVE ACTION

STEP 1. Record the configuration data.

a. Connect Cat ET to connector CDC-P7.

b. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

c. Use the Copy Configuration/ECM Replacement feature that is found under the Service menu on Cat ET. Select Load from ECM in order to copy the configuration data from the suspect ECM.

d. Print the parameters from the Configuration screen on Cat ET. If a printer is unavailable, record all of the parameters. Record any logged diagnostic codes and logged event codes for your records.

NOTE

If the Copy Configuration process fails and the parameters were not obtained in STEP 1 d, the parameters must be obtained elsewhere. Some of the parameters are stamped on the engine information plate. Most of the parameters must be obtained from the factory. If this condition exists, the flash file can be loaded and the ECM will set the configuration parameters to default settings. The configuration parameters can then be manually updated.

STEP 2. After the ECM has been replaced (WP 0084) perform the following steps to copy the configuration data into the replacement ECM.

NOTE

When an ECM is replaced, the system configuration parameters must be programmed into the new ECM. **A new ECM will allow these parameters to be programmed ONCE without factory passwords.** After the initial programming, some parameters are protected by factory passwords.

a. Connect Cat ET to connector CDC-P7.

b. Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.

c. Flash program the flash file into the ECM. Refer to WP 0013, SYMPTOM 12.

CORRECTIVE ACTION - Continued

d. If the Copy Configuration process from Step 1.c was successful, return to the Copy Configuration/ECM Replacement screen on Cat ET and select Program ECM.

e. If the Copy Configuration process from Step 1.c was unsuccessful, manually program the ECM parameters.

END OF WORK PACKAGE

CHAPTER 3

UNIT (FIELD) LEVEL MAINTENANCE INSTRUCTIONS

CHAPTER 3

UNIT (FIELD) LEVEL MAINTENANCE INSTRUCTIONS

WORK PACKAGE INDEX

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

SERVICE UPON RECEIPT

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's, (WP 0119, Item 1)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)

Personnel Required

One

References

AFTO Form 22
DA Form 2028-2
DA PAM 750-8
DD Form 1397
NAVMC 10560
SF Form 361
SF Form 368
TM 9-6115-729-10
TM 9-6115-729-24P
TO 00-5-1

CHECKING UNPACKED EQUIPMENT

1. Read and follow all instructions on DD Form 1397 attached to conspicuous part of TQG.
2. Remove metal strapping, plywood, tapes, seals, and wrappings, if necessary.

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 can cause injury or death to personnel.

3. Remove rust preventive compound from coated exterior parts with breakthrough cleaning solvent.
4. Inspect equipment for damage incurred during shipment. If equipment has been damaged, report damage on SF Form 361, Transportation Discrepancy Report.
5. Check equipment against packing slip to see if shipment is complete. Report all discrepancies in accordance with applicable service instructions (see DA PAM 750-8).
6. Check to see if equipment has been modified.

PRELIMINARY CHECKS AND ADJUSTMENT OF EQUIPMENT

1. (US Army, Air Force, and Marine Corps) Inspect equipment for possible damage incurred during shipment. If equipment has been damaged, report damage on SF Form 368, Product Quality Deficiency Report.

2. (US Army) Check equipment against packing slip to see if shipment is complete. Report all differences using procedure given in DA PAM 750-8.

3. US Army and Air Force perform Preventive Maintenance Checks and Services (PMCS) (TM 9-6115-729-10). Marine Corps use NAVMC 10560 to record all PMCS work.

4. If there is a recommended change to equipment technical publications, complete DA Form 2028-2 and forward it by e-mail to <AMSEL-LC-LEO-PU BS-CHG@mail1.Monmouth.army.mil>, fax to 732-532-3421, or mail to Commander, U.S. Army Communications-Electronics Life Cycle Management Command, ATTN: AMSEL-LC-LEO-E-ED, Fort Monmouth, New Jersey 07703-5000. For Air Force, use AFTO Form 22 in accordance with TO 00-5-1 and mail directly to Commander, WR-ALC/LEET, Robins AFB, GA, 31098. You may also e-mail your form to <http://wralc.tilta.afto@robins.af.mil>.

OUTPUT VOLTAGE SETTING

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, and DEAD CRANK SWITCH is OFF before proceeding.

2. Set Battery Disconnect Switch to OFF.

OUTPUT VOLTAGE SETTING - Continued

3. Remove four nuts (Figure 1, Item 1), washers (Figure 1, Item 2), and clear protective panel (Figure 1, Item 3) from reconnection board.

4. Remove 12 nuts (Figure 1, Item 4) and reconnection board (Figure 1, Item 5).

5. Align arrow on reconnection board (Figure 1, Item 5) with arrow on base corresponding to desired generator output voltage(s).

6. Install reconnection board (Figure 1, Item 5) and secure with 12 nuts (Figure 1, Item 4).

7. Install clear protective panel (Figure 1, Item 3) and secure with four washers (Figure 1, Item 2) and nuts (Figure 1, Item 1).

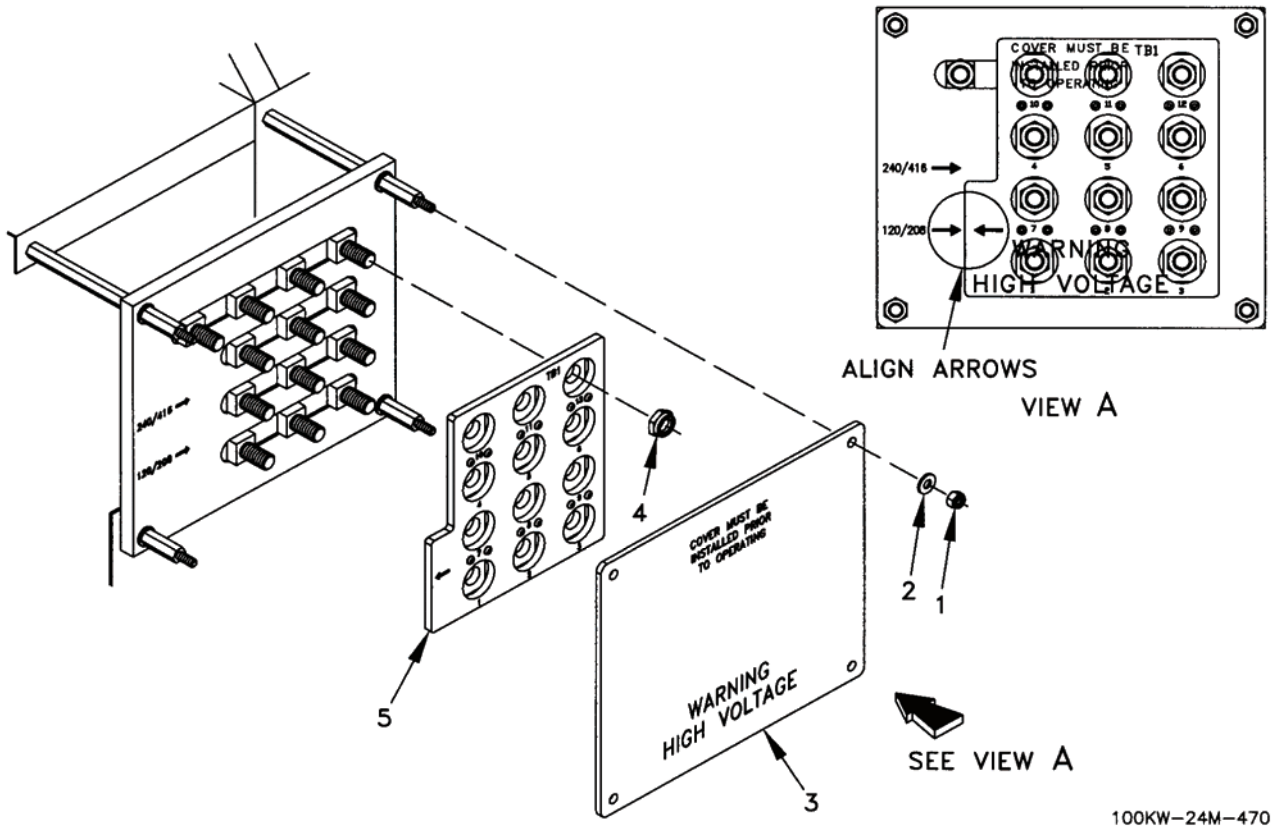


Figure 1. Reconnection Terminal Board Voltage Setting.

8. Close right rear doors.

9. Reprogram DVR and GSC as required per WP 0085.

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
PMCS INTRODUCTION

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's
(WP 0119, Item 1)

Materials/Parts

Breakthrough cleaning solvent
(WP 0120, Item 47)
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

DA Form 5988-E
PAM 750-8
TM 9-2330-376-14&P
TM 750-254
TM 9-6115-729-10

INTRODUCTION

PMCS are performed to keep the TQG in operating condition. Inspect the TQG within specified intervals so defects are found and corrected or problems are reported before any serious damage or failure occurs. Do the PMCS per WP 0016, Table 1. Pay attention to WARNINGs and CAUTIONs. A WARNING means someone might be killed or injured. A CAUTION means equipment could be damaged.

CAUTION

Designated intervals are performed under usual operating conditions. PMCS intervals must be performed more frequently when operating under unusual conditions to prevent premature engine failure.

1. Always perform preventive maintenance in the same order so it gets to be a habit. Once you have had some practice, you will spot anything wrong in a hurry.

2. Tools included with the TQG are to be used when doing the PMCS. Wiping rags are needed to remove dirt or grease.

3. If you find something wrong when performing the PMCS, fix it if you can, using troubleshooting procedures (see WP 0004 thru WP 0011) and/or maintenance procedures (see Chapter 3).

4. Item numbers in column 1 of WP 0016, PMCS Table 1 indicate the PMCS sequence. Use these item numbers for the TM number column on DA Form 5988-E.

5. Information in column 6 of WP 0016, Table 1 lists conditions that make the TQG not ready/available. Write up items not repaired on DA Form 5988-E for DS maintenance. For further information on how to use these forms, see DA PAM 750-8.

6. Ensure all Operator PMCS has been performed (TM 9-6115-729-10).

FLUID LEAKAGE

Wetness around seals, gaskets, fittings, or connections indicates leakage. A stain also denotes leakage. If a fitting or connector is loose, tighten it. If a fitting or connector is broken or defective, repair it.

Leak Definition for PMCS

CAUTION

Operation is allowable with class I and II leakage. However, any wetness or leakage of fuel is classified as a class III leak and the TQG must be shut down immediately and the problem corrected. All other class III leaks must be repaired immediately or reported to your supervisor. When operating with class I or class II leaks, check fluid levels more frequently. Failure to do this will result in damage to the 100 kW TQG.

1. Class I - Leakage indicated by wetness or discoloration, but not great enough to form drops.
2. Class II - Leakage great enough to form drops, but not enough to cause drops to drip from item being checked/inspected.
3. Class III - Leakage great enough to form drops that fall from the item being checked/inspected.

INSPECTION

Look for signs of a problem or trouble. You can feel, smell, hear, or see many problems. Be alert when in or around the TQG.

Inspect the TQG to see if items are in good condition. Are they correctly assembled, stowed, and secured; excessively worn, leaking, or corroded; or properly lubricated? Correct any problems found or notify DS maintenance.

There are some common items to check all over the TQG. These include the following:

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

INSPECTION - Continued

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 can cause injury or death to personnel.

1. Dirt, grease, oil, and debris: They only get in the way and may cover up a serious problem. Keep the equipment clean. Clean as you work and as needed. Use Breakthrough cleaning solvent to clean metal surfaces. Use soap and water to clean rubber or plastic material.

2. Bolts, clamps, nuts, and screws: Continuously check for looseness. Look for chipped paint, bare metal, rust, or corrosion around bolt and screw heads and nuts. Tighten them when you find them loose (WP 0109).

3. Welds: Many items on the TQG are welded. To check these welds, look for chipped paint, rust, corrosion, or gaps. When these conditions exist, notify DS maintenance on DA Form 5988-E.

4. Electrical wires, connectors, and harnesses: Tighten loose connectors. Look for cracked or broken insulation, bare wires, and broken connectors.

5. Hoses and fluid lines: Check hoses and fluid lines for wear, damage, and leaks. Ensure clamps and fittings are tight.

6. Hinges: Check hinges for security and operation.

7. Data plates: Check data, caution, and warning plates for security and legibility.

PMCS COLUMN DESCRIPTIONS (TABLE 1)

ITEM NO. - Lists order in which PMCS should be performed; also used as a source of item numbers for the TM number column on DA Form 5988-E when recording results of PMCS.

INTERVAL - Indicates when each check is to be performed.

MANHOUR - Lists approximate time required to perform check.

ITEM TO BE CHECKED OR SERVICED - Lists item to be checked or serviced.

PROCEDURE - Provides brief description of procedure as well as any information required to accomplish each check or service.

EQUIPMENT NOT READY/AVAILABLE IF - Lists condition in which TQG should not be operated or accepted.

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

PMCS, INCLUDING LUBRICATION INSTRUCTIONS

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

Table 1. Preventive Maintenance Checks and Services.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				100 kW TQG	
1	First 100 hours		Engine Oil/Oil Filter	Change engine oil and oil filter (WP 0081).	Engine oil change/ filter change not accomplished.
2	Quarterly or 300 hours		XM1061E1 Trailer (if mounted)	Perform quarterly PMCS (TM 9-2330-376-14&P).	Any failed inspection.
				TQG EXTERIOR	
3	Quarterly or 300 hours		Housing	Check the entire housing, to include doors, panels, latches, and hinges, for damage, missing parts, and secure mounting. Check mounting points for rust or corrosion and loose or missing parts (WP 0018 thru WP 0039).	Any doors, panels, latches, or hinges damaged, loose, or missing parts. Mounting points loose.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
				TQG INTERIOR	
4	Quarterly or 300 hours		Control Box Assembly	Check panel gauges, switches, controls, decals/data plates for damage, missing parts, readability, and secure mounting (WP 0040, WP 0041).	Any gauges, switches, controls, decals/data plates damaged or missing parts. Any gauges or decals/data plates not readable. Any loose components.
5	Quarterly or 300 hours		Reconnection Terminal Board	Check reconnection terminal board for damage, rust, corrosion, missing parts, and secure mounting (WP 0044).	Terminal board damaged or missing parts. Terminal board cannot be securely mounted.
6	Quarterly or 300 hours		Load Terminal Board	Check load terminal board for damage, rust, corrosion, missing parts, and secure mounting (WP 0045).	Terminal board damaged or missing parts. Terminal board cannot be securely mounted.
7	Quarterly or 300 hours		Battery Cables	Check battery cables for damage, corrosion, missing parts, and secure mounting. Check cables for fraying, cuts, or nicks (WP 0046).	Battery cables damaged, corroded, or missing parts. Cables cannot be securely mounted.
8	Quarterly or 300 hours		Batteries	Clean battery terminals. Check terminals for looseness, breaks, or damage (WP 0049).	Battery terminals loose, broken, or damaged. Batteries will not hold charge.
9	Quarterly or 300 hours		Batteries (if lead-acid type)	Check electrolyte level; add distilled water as required.	Electrolyte level below top of plates.
10	Quarterly or 300 hours		Power Cables	Check power cables for damage, corrosion, missing parts, and secure mounting. Check cables for fraying, cuts, or nicks (WP 0047).	Power cables damaged, corroded, or missing parts. Cables cannot be securely mounted.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
11	Quarterly or 300 hours		Main Load Contactor K1	Check main load contactor for corrosion, loose or missing parts, loose cable connections, evidence of arcing, or loose mounting (WP 0048).	Any defect that would prevent operation.
12	Quarterly or 300 hours		Current Transformers	Check seven current transformers for corrosion, loose or missing parts, loose connections, evidence of arcing or overheating, leaking, or loose mounting (WP 0051).	Any defect that would prevent operation.
13	Quarterly or 300 hours		Power Transformers	Check two potential transformers for corrosion, loose or missing parts, loose connections, evidence of arcing or overheating, leaking, or loose mounting (WP 0052).	Any defect that would prevent operation.
14	Quarterly or 300 hours		Slave Receptacle	Check slave receptacle for corrosion, loose or missing parts, loose connections, evidence of arcing or overheating, or loose mounting (WP 0053).	Any defect that would prevent operation.
15	Quarterly or 300 hours		Electrical Installation	Check electrical components for corrosion, loose or missing parts, loose connections, evidence of arcing or overheating, or loose mounting (WP 0054).	Any defect that would prevent operation.
				ENGINE	
16	Quarterly or 300 hours		Engine Oil/Oil Filter	Change engine oil and oil filter (WP 0081).	Engine oil change/ filter change not accomplished.
17	Quarterly or 300 hours		Oil Pan	Check magnetic plug for metal particles (WP 0081).	Metal particles found on plug.
18	Quarterly or 300 hours		Fuel System	Check fuel system for secure mounting, leaks, damaged tubes or hoses (WP 0055 thru WP 0062).	Any leaks or defect that would prevent operation. Any leak from fuel system.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
19	Quarterly or 300 hours		Fuel Filter	Replace fuel filter (WP 0079).	Fuel filter has not been replaced as required. Any leak.
20	Quarterly or 300 hours		Auxiliary Fuel Pump Strainer	Clean strainer (WP 0058).	Strainer has not been cleaned as required. Any leak.
21	Quarterly or 300 hours		Water Separator Filter	Replace water separator filter element (WP 0060).	Water separator filter has not been replaced as required. Any leak.
22	Quarterly or 300 hours		Cooling System	Check radiator, coolant hoses, surge tank, fan and fan guards for damage and secure mounting. Check radiator for damage or leaks. Use compressed air to remove debris from radiator (WP 0063 thru WP 0067).	Any damage that will prevent operation. Any part that cannot be securely mounted. Radiator leaking or damaged.
23	Quarterly or 300 hours		Cooling System	Check coolant level and add coolant mixture as required. Inspect coolant for discoloration, rust, or contamination (WP 0063).	Any discoloration, rust, or contamination.
24	Quarterly or 300 hours		Muffler	Check muffler for leaks, restrictions, accumulation of carbon deposits, and loose hardware. Replace muffler if required (WP 0068).	Muffler leaks, is damaged, or loose.
25	Quarterly or 300 hours		Winterization Kit (if installed)	Check winterization kit components for rust, corrosion, missing parts, leaks, and secure mounting (WP 0091 thru WP 0095).	Any damage that will prevent operation. Any part that cannot be securely mounted. Any leak.
26	Quarterly or 300 hours		Generator	Check generator for damage, wear, rust, corrosion, missing parts, and secure mounting.	Generator damaged, worn, rusted, or corroded. Parts missing or loose mounting.

Table 1. Preventive Maintenance Checks and Services - Continued.

ITEM NO.	INTERVAL	MAN-HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
27	Semiannually or 750 hours		Air Cleaner	Check air cleaner for cleanliness, damage and secure mounting. Clean or replace air filter element (WP 0070). Clean housing with clean cloth.	Air cleaner clogged, damaged, or loose.
28	Semiannually or 750 hours		Crankcase Ventilation Filter	Check crankcase ventilation filter for cleanliness, damage, and secure mounting. Clean or replace filter element (WP 0069).	Filter clogged, damaged, or loose.
29	Annually or 1500 hours		Fan Belts	Replace fan belts (WP 0073).	Fan belts not replaced as required.
30	Annually or 1500 hours		Cooling System`	Drain and flush cooling system (see TM 750-254). Add proper coolant mixture (WP 0067).	Cooling system has not been flushed as required.
31	Annually or 2000 hours		Engine Mounts	Inspect engine mounts for cracks, worn, loose, or missing hardware, or loose mounting.	Any parts missing. Mounts loose or broken.
32	Annually or 2000 hours		Engine Cleanliness	Clean engine exterior. Pay attention to areas which reveal leakage or damage.	Engine dirty so that leaks or damage cannot be detected.

Table 2. PMCS Mandatory Replacement Parts List.

ITEM NO.	PART NUMBER (CAGEC)	NSN	NOMENCLATURE	QTY
QUARTERLY (300 HOURS)				
1	1R0739 (11083)	2940-01-513-1518	Oil Filter	1
2	1R0751 (11083)	2910-01-424-7315	Fuel Filter	1
3	146-6692 (11083)	4330-01-531-6675	Water Separator Filter Element with Gasket	1
SEMIANNUAL (750 HOURS)				
1	P124046 (18265)	2940-01-158-1462	Air Cleaner Primary Filter Element	1
2	P182070 (18265)	2940-01-531-6465	Air Cleaner Safety Filter Element	1
3	P127329 (18265)	5330-01-148-0217	Gasket	1
4	55248-08 (55752)	2940-01-532-4369	Crankcase Ventilation Filter Element	1
ANNUAL (1500 HOURS)				
1	036675 (11083)	3030-01-437-6084	Water Pump V-belt	1
2	212-9353 (11083)	3030-01-531-6427	Alternator Belt	1

LUBRICATION INSTRUCTIONS

These lubrication instructions are for unit (O) maintenance. Lubrication intervals (on-condition or hard time) are based on normal operation. Lubricate more frequently during constant use, and less during inactive periods. The task-hour specified is the time you need to do all the services prescribed for a particular interval. Use correct grade of lubricant for seasonal temperature expected. The lubrication intervals and symbols are listed below:

300 hours = Quarterly 1000 hours = Annually 2000 hours = Bi-Annually

LUBRICATION INSTRUCTIONS - Continued

WARNING

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination.

Before you start your lubrications:

Always	Never
a. Use Lubrication Instructions as your guide.	a. Use wrong type/grade lubricant.
b. Use correct type/grade lubricant.	b. Use too much lubricant.
c. Clean area where lubricant is to be applied to prevent buildup of dirt, grit, and contaminants.	c. Apply lubricant to dirty components.

Authorized lubricants and fluids are listed in Tables 3 through 6.

LUBRICATION INSTRUCTIONS - Continued

Table 3. Engine Oil.

AMBIENT TEMPERATURE	Degrees F / Degrees C	-50 / -46	-30 / -34	-10 / -23	+10 / -12	+30 / -1	+50 / 10	+70 / 21	+90 / 32	+110 / 43	+130 / 54
MIL-PRF-46167 OEA		———	———	———	———	———	———				
MIL-PRF-2104 OE/HDO-10				———	———	———					
MIL-PRF-2104 OE/HDO-30						———	———	———	———		
MIL-PRF-2104 OE/HDO-40						———	———	———	———	———	
MIL-PRF-2104 OE/HDO-15/40					———	———	———	———	———	———	

Winterization kit required below -25°F (-32°C).

Table 4. Engine Coolant.

AMBIENT TEMPERATURE	RADIATOR COOLANT	RATIO	NOTES
-50 to +120 degrees F (-46 to +49 degrees C)	A-A-52624 antifreeze/ water	Antifreeze 60% Water 40%	This offers the best freeze protection (-60 degrees F) and the best boil protect-tion (+232 degrees F).
40 to +120 degrees F (+4 to +49 degrees C)	Water with MIL-A-53009 corrosion inhibitor	35:1	No freeze or boil protec-tion.

Table 5. Fuel.

AMBIENT TEMP	Degrees F / Degrees C	-50 / -46	-25 / -32	-15 / -26	0 / -18	+5 / -15	+15 / -9	+20 / -7	+30 / -1	+40 / +4	+70 / +21	+90 / +32	+110 / +38	+120 / +49
A-A-52557 DF-1			———	———	———	———	———	———						
A-A-52557 DF-2								———	———	———	———	———	———	———
MIL-PFR-5624 JP-5 MIL-T-83133 JP-8		———	———	———	———	———	———	———	———	———	———	———	———	———

LUBRICATION INSTRUCTIONS - Continued

Table 6. Lubrication Requirements.

INTERVAL	USAGE	CAPACITY	LUBRICANT
First 100 hours	Engine oil and oil filter change (WP 0081)	30 quarts (27.3 L)	Engine Oil (see Table 3)
Quarterly or 300 hours	Engine oil and oil filter change (WP 0081)	30 quarts (27.3 L)	Engine Oil (see Table 3)
Annually or 1000 hours	Door hinges	N/A	Engine oil (see Table 3)
Annually or 1000 hours	Cooling system drain and flush (WP 0067)	38 quart (36 L)	Coolant mixture (see Table 4)

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
GENERAL MAINTENANCE INSTRUCTIONS

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool kit, general mechanic's (WP 0119, Item 1)

Personnel Required

One

References

TC 9-237
TM 9-6115-729-24P

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Crocus cloth (WP 0120, Item 9)
Tags (WP 0120, Item 52)
Wiping rags (WP 0120, Item 36)

SCOPE

These general maintenance instructions contain general shop practices you must be familiar with to properly maintain the TQG. You should read and understand these practices and methods before starting unit maintenance tasks CHECKING UNPACKED EQUIPMENT.

WORK SAFETY

Before starting any task, find out how much repair or replacement is needed to fix the equipment as described in this manual. Sometimes the reason for equipment failure can be obvious and complete teardown is not necessary. Disassemble equipment only as far as necessary to repair or replace damaged or broken parts.

All tags and forms attached to the equipment must be checked to learn the reason for removal from service. Also, check Technical Bulletins (TB) for equipment changes and updates.

In some cases a part may be damaged by removal. If the part appears to be good and other parts behind it are not defective, leave it on and continue the procedure.

CLEANING INSTRUCTIONS

Cleaning instructions will be the same for the majority of parts and components which make up the TQG.

The importance of cleaning must be thoroughly understood by maintenance personnel. Great care and effort are required during cleaning. Dirt and foreign material are a constant threat to satisfactory maintenance. The following should apply to all cleaning, inspection, repair, and assembly operations:

1. Clean all parts before inspection, after repair, and before assembly.

2. Hands should be kept free of any accumulation of grease which can collect dust, dirt, and grit.

3. After cleaning, all parts should be covered or wrapped to protect them from dust and dirt.

CLEANING INSTRUCTIONS - Continued

Castings, Forgings, and Machined Metal Parts

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 can cause injury or death to personnel.

1. Clean inner and outer surfaces with breakthrough cleaning solvent.
2. Remove grease and accumulated deposits with a stiff bristle brush.

WARNING

Cleaning with compressed air can cause flying particles. When using compressed air, wear protective glasses and use clean, low pressure air, less than 30 psi (208 kPa). Failure to comply can cause eye injury to personnel.

3. Blow out all tapped (threaded) holes with compressed air to remove dirt and cleaning fluids.

Electrical Cables and Rubber Components

CAUTION

Do not wash rubber components and electrical cables with breakthrough cleaning solvents or mineral spirits; they will cause serious damage or destroy the material.

Wash electrical cables and rubber components with water and mild soap solution and wipe dry with rag.

INSPECTION INSTRUCTIONS

All components and parts must be carefully checked to determine the following:

1. If they are serviceable for reuse.
2. If they can be repaired.
3. If they must be replaced.

Drilled and Tapped (Threaded) Holes

1. Inspect for wear, distortion, cracks, or any other damage in or around holes.
2. Inspect threaded areas for wear, distortion (stretching), or evidence of cross-threading.
3. Mark all damaged areas for repair or replacement.

INSPECTION INSTRUCTIONS - Continued

Castings, Forgings, and Machined Metal Parts

1. Inspect machined surfaces for nicks, burrs, raised metal, wear, or other damage.
2. Check all inner and outer surfaces for breaks or cracks.
3. Mark all damaged material for repair or replacement.

TAGGING INSTRUCTIONS

When tagging is required during the removal procedure, remove tags during the installation procedure.

REPAIR INSTRUCTIONS

NOTE

Refer to Source, Maintenance, and Recoverability (SMR) Codes assigned to support items listed in the RPSTL (see TM 9-6115-729-24P).

Any repair procedure peculiar to a specific part or component is covered in the work package relating to that item. After repair, clean all parts thoroughly to prevent dirt, metal chips, or other foreign material from entering working parts.

Castings, Forgings, and Machined Metal Parts

1. Minor cracked castings or forgings may possibly be repaired. Refer to TC 9-237.
2. Repair minor damage to machined surfaces with a fine mill file or crocus cloth dipped in breakthrough cleaning solvent.
3. Machined surfaces which are deeply nicked could affect the assembly operation and should be replaced.
4. Minor damage to threaded capscrew holes should be repaired with thread tap of same size to prevent cutting oversize.

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

RIGHT BATTERY ACCESS DOOR ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Foam damping sheet (WP 0120, Item 11)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Turn two latches (Figure 1, Item 1) and open right battery access door (Figure 1, Item 2).
2. Remove eight locknuts (Figure 1, Item 3), washers (Figure 1, Item 4), screws (Figure 1, Item 5), and right battery access door and hinge (Figure 1, Item 2).

END OF TASK

DISASSEMBLY

1. Remove eight locknuts (Figure 1, Item 6), screws (Figure 1, Item 7), and hinge (Figure 1, Item 8) from right battery access door (Figure 1, Item 2).
2. Remove nine nuts (Figure 1, Item 9), screws (Figure 1, Item 10), and document box assembly (Figure 1, Item 11).
3. Remove eight nuts (Figure 1, Item 12), screws (Figure 1, Item 13), and two latches (Figure 1, Item 1).

DISASSEMBLY - Continued

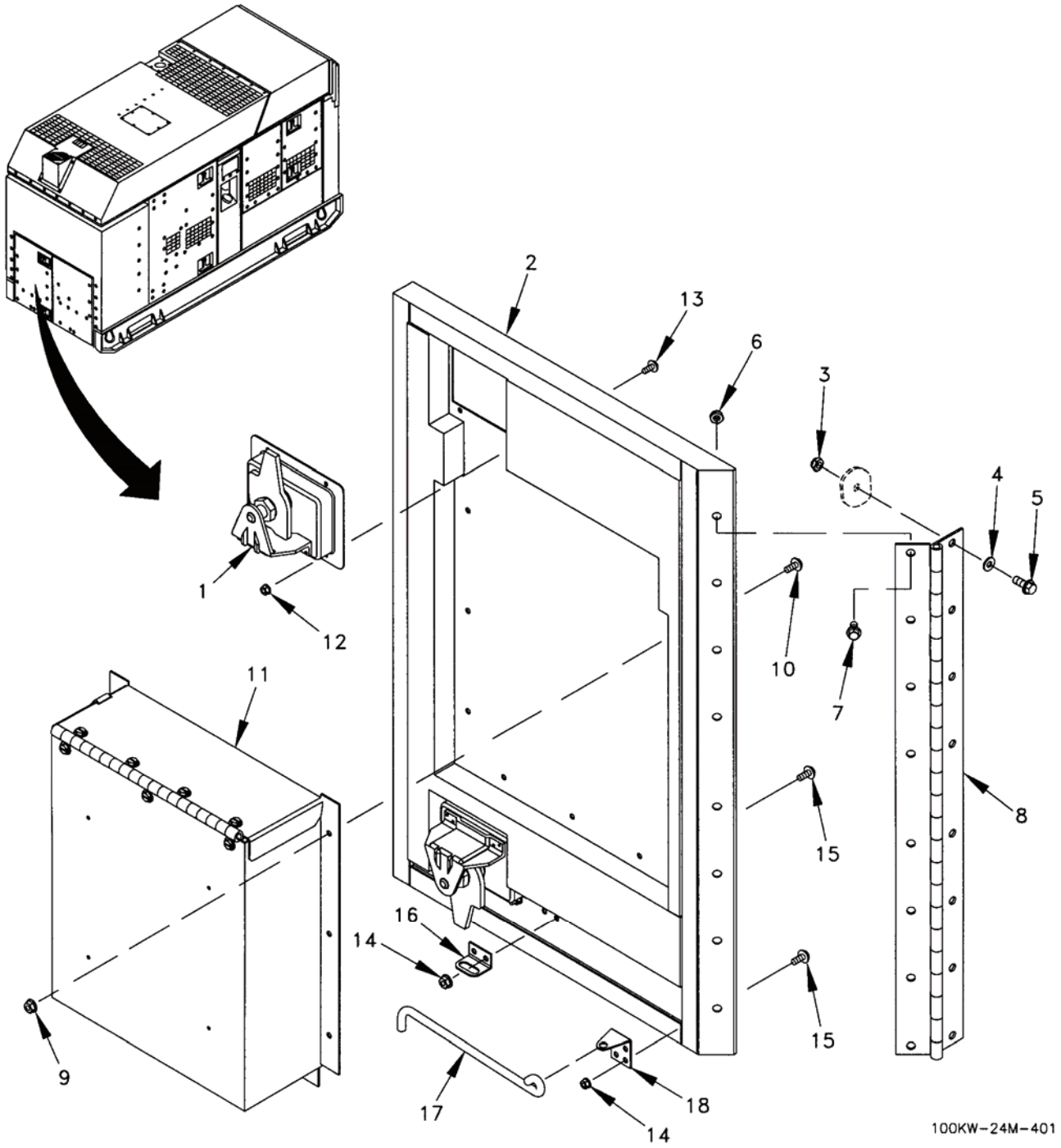


Figure 1. Right Battery Access Door Assembly.

DISASSEMBLY - Continued

4. Remove four nuts (Figure 1, Item 14), screws (Figure 1, Item 15), holding rod bracket (Figure 1, Item 16), door holding rod (Figure 1, Item 17), and door holding bracket (Figure 1, Item 18).

5. Remove two foam damping sheets if required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sheets as templates to cut new foam damping sheets.

2. Install two foam damping sheets.

3. Install door holding bracket (Figure 1, Item 18), door holding rod (Figure 1, Item 17), and holding rod bracket (Figure 1, Item 16) and secure with four screws (Figure 1, Item 15) and nuts (Figure 1, Item 14).

4. Install two latches (Figure 1, Item 1) and secure with eight screws (Figure 1, Item 13) and nuts (Figure 1, Item 12).

5. Install document box assembly (Figure 1, Item 11) and secure with nine screws (Figure 1, Item 10) and nuts (Figure 1, Item 9).

6. Install hinge (Figure 1, Item 8) and secure with eight screws (Figure 1, Item 7) and locknuts (Figure 1, Item 6).

END OF TASK

INSTALLATION

1. Install right battery access door and hinge (Figure 1, Item 2) and secure with eight screws (Figure 1, Item 5), washers (Figure 1, Item 4), and locknuts (Figure 1, Item 3).

2. Close right battery access door (Figure 1, Item 2) and secure by rotating and closing two latches (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

LEFT BATTERY ACCESS DOOR ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Foam damping sheet (WP 0120, Item 11)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Turn two latches (Figure 1, Item 1) and open right and left battery access doors (Figure 1, Item 2) and (Figure 1, Item 3).
2. Remove five locknuts (Figure 1, Item 4), washers (Figure 1, Item 5), screws (Figure 1, Item 6), and left battery access door and hinge (Figure 1, Item 3).

END OF TASK

DISASSEMBLY

1. Remove eight locknuts (Figure 1, Item 7), screws (Figure 1, Item 8), and hinge (Figure 1, Item 9) from left battery access door (Figure 1, Item 3).
2. Remove nine nuts (Figure 1, Item 10), screws (Figure 1, Item 11), and storage box assembly (Figure 1, Item 12).

DISASSEMBLY - Continued

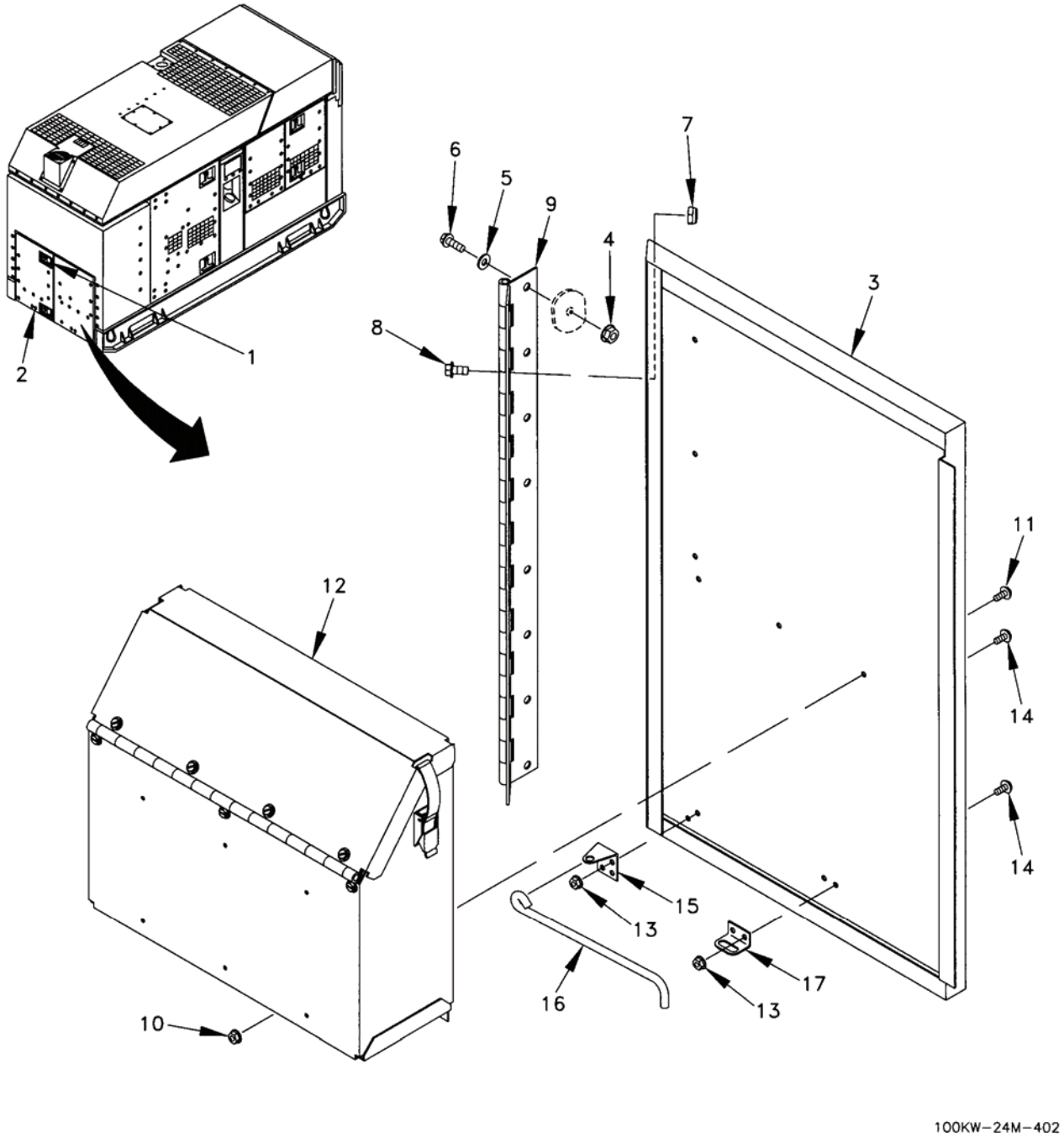


Figure 1. Left Battery Access Door Assembly.

DISASSEMBLY - Continued

3. Remove four nuts (Figure 1, Item 13), screws (Figure 1, Item 14), holding rod bracket (Figure 1, Item 15), door holding rod (Figure 1, Item 16), and door holding bracket (Figure 1, Item 17).

4. Remove foam damping sheet if required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sheet as template to cut new foam damping sheet.

2. Install foam damping sheet.

3. Install door holding bracket (Figure 1, Item 17), door holding rod (Figure 1, Item 16), and holding rod bracket (Figure 1, Item 15) and secure with four screws (Figure 1, Item 14) and nuts (Figure 1, Item 13).

4. Install storage box assembly (Figure 1, Item 12) and secure with nine screws (Figure 1, Item 11) and nuts (Figure 1, Item 10).

5. Install hinge (Figure 1, Item 9) and secure with eight screws (Figure 1, Item 8) and locknuts (Figure 1, Item 7).

END OF TASK

INSTALLATION

1. Install left battery access door and hinge (Figure 1, Item 3) and secure with five screws (Figure 1, Item 6), washers (Figure 1, Item 5), and locknuts (Figure 1, Item 4).

2. Close left and right battery access doors (Figure 1, Item 3) and (Figure 1, Item 2) and secure by rotating and closing two latches (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

CONTROL BOX DOOR ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Personnel Required

One

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Turn two latches (Figure 1, Item 1) and open control box door (Figure 1, Item 2).
2. Remove eight screws (Figure 1, Item 3), washers (Figure 1, Item 4), lockwashers (Figure 1, Item 5), and control box door and hinge (Figure 1, Item 2).

END OF TASK

DISASSEMBLY

1. Remove eight nuts (Figure 1, Item 6), screws (Figure 1, Item 7), and two latches (Figure 1, Item 1).
2. Remove eight locknuts (Figure 1, Item 8), screws (Figure 1, Item 9), and hinge (Figure 1, Item 10).

END OF TASK

ASSEMBLY

1. Install hinge (Figure 1, Item 10) on control box door (Figure 1, Item 2) and secure with eight screws (Figure 1, Item 9) and locknuts (Figure 1, Item 8).

2. Install two latches (Figure 1, Item 1) and secure with eight screws (Figure 1, Item 7), and nuts (Figure 1, Item 6).

END OF TASK

INSTALLATION

1. Install control box door and hinge (Figure 1, Item 2) and secure with eight lockwashers (Figure 1, Item 5), washers (Figure 1, Item 4), and screws (Figure 1, Item 3).

2. Close control box door (Figure 1, Item 2) and secure by rotating and closing two latches (Figure 1, Item 1).

INSTALLATION - Continued

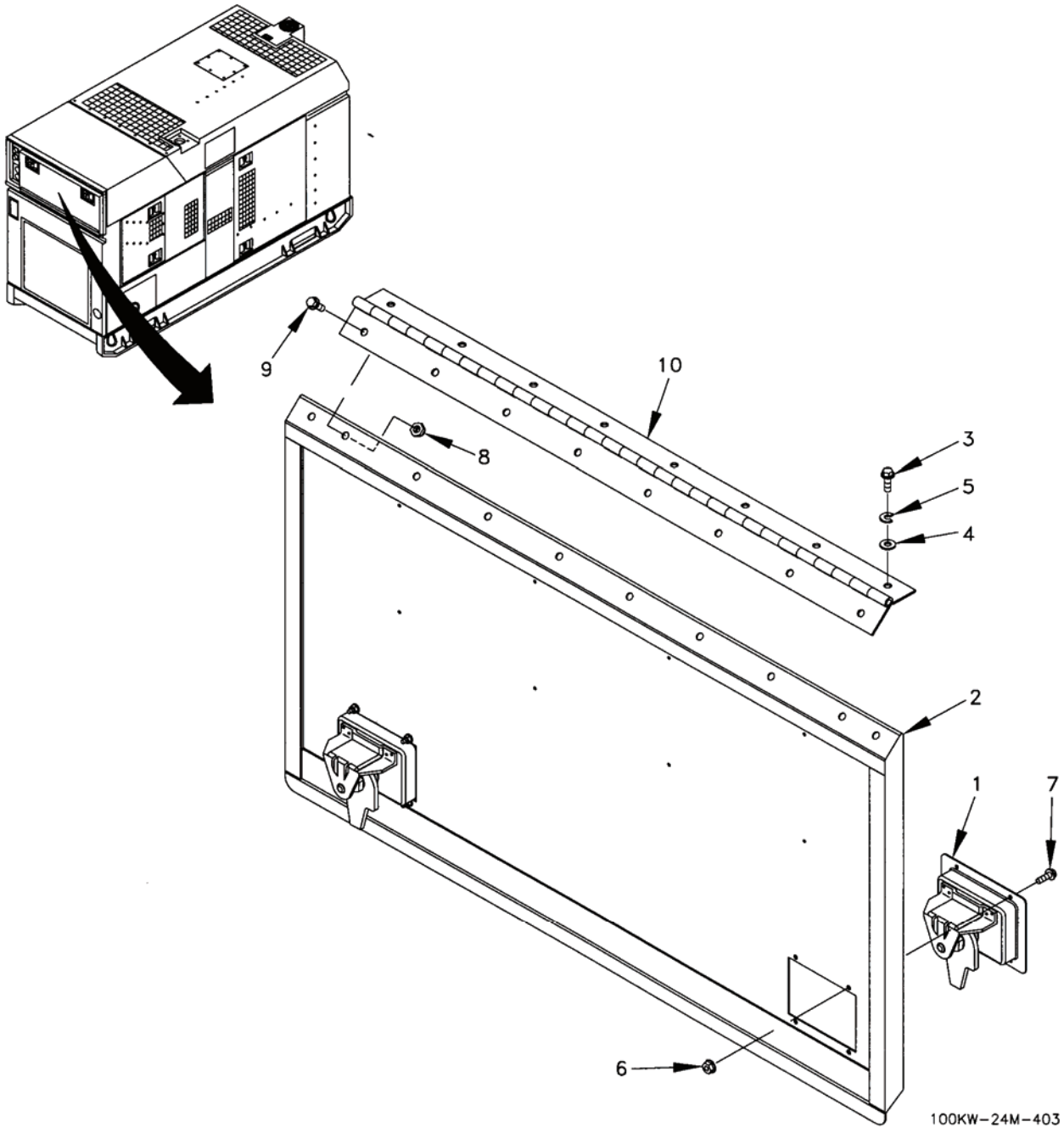


Figure 1. Control Box Door Assembly.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
LEFT FRONT DOOR ASSEMBLY (LATCH) MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Personnel Required

One

Equipment Condition

Grounding rods removed (TM 9-6115-729-10)

Materials/Parts

Foam damping sheet (WP 0120, Item 10)
Foam damping sheet (WP 0120, Item 11)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Turn two latches (Figure 1, Item 1) and open left front door assembly (latch) (Figure 1, Item 2).
2. Remove twelve screws (Figure 1, Item 3), washers (Figure 1, Item 4), lockwashers (Figure 1, Item 5), and left front door assembly (latch) and hinge (Figure 1, Item 2).

END OF TASK

DISASSEMBLY

1. Remove eight nuts (Figure 1, Item 6), screws (Figure 1, Item 7), and two latches (Figure 1, Item 1).

DISASSEMBLY - Continued

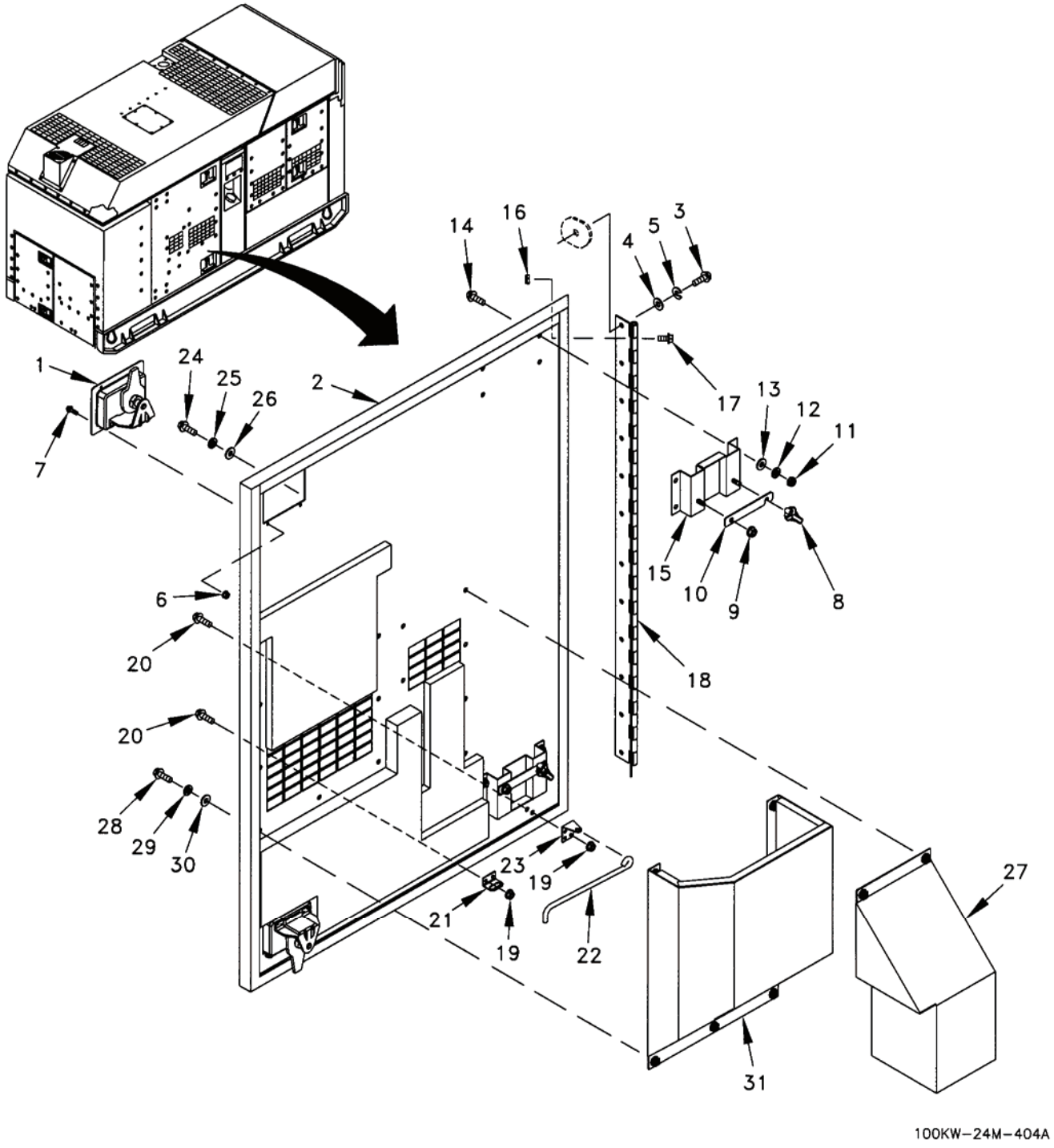


Figure 1. Left Front Door Assembly (Latch).

DISASSEMBLY - Continued

2. Remove two wing nuts (Figure 1, Item 8) two locknuts (Figure 1, Item 9) and two grounding rod retainer latches (Figure 1, Item 10).

3. Remove eight locknuts (Figure 1, Item 11), lockwashers (Figure 1, Item 12), washers (Figure 1, Item 13), screws (Figure 1, Item 14), and two grounding rod retainer brackets (Figure 1, Item 15).

4. Remove twelve locknuts (Figure 1, Item 16), screws (Figure 1, Item 17), and hinge (Figure 1, Item 18).

5. Remove four nuts (Figure 1, Item 19), screws (Figure 1, Item 20), holding rod bracket (Figure 1, Item 21), door holding rod (Figure 1, Item 22), and door holding bracket (Figure 1, Item 23).

6. Remove eight screws (Figure 1, Item 24), lockwashers (Figure 1, Item 25), washers (Figure 1, Item 26), and upper duct (Figure 1, Item 27).

7. Remove nine screws (Figure 1, Item 28), lockwashers (Figure 1, Item 29), washers (Figure 1, Item 30), and lower duct (Figure 1, Item 31).

8. Remove eleven foam damping sections as required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sections as templates to cut new foam damping sections.

2. Install eleven foam damping sections.

3. Install lower duct (Figure 1, Item 31), and secure with nine lockwashers (Figure 1, Item 29), washers (Figure 1, Item 30), and screws (Figure 1, Item 28).

4. Install upper duct (Figure 1, Item 27) and secure with eight washers (Figure 1, Item 26), lockwashers (Figure 1, Item 25), and screws (Figure 1, Item 24).

5. Install door holding bracket (Figure 1, Item 23), door holding rod (Figure 1, Item 22), holding rod bracket (Figure 1, Item 21), and secure with four screws (Figure 1, Item 20) and nuts (Figure 1, Item 19).

6. Install hinge (Figure 1, Item 18) and secure with twelve screws (Figure 1, Item 17) and locknuts (Figure 1, Item 16).

7. Install two grounding rod retainer brackets (Figure 1, Item 15) and secure with eight screws (Figure 1, Item 14), washers (Figure 1, Item 13), lockwashers (Figure 1, Item 12), and locknuts (Figure 1, Item 11).

8. Install two grounding rod retainer latches (Figure 1, Item 10) and secure with two wing nuts (Figure 1, Item 8) and two locknuts (Figure 1, Item 9).

9. Install two latches (Figure 1, Item 1) and secure with eight screws (Figure 1, Item 7) and nuts (Figure 1, Item 6).

END OF TASK

INSTALLATION

1. Install left front door assembly (latch) and hinge (Figure 1, Item 2) and secure with twelve lockwashers (Figure 1, Item 5), washers (Figure 1, Item 4), and screws (Figure 1, Item 3).

2. Close left front door assembly (latch) (Figure 1, Item 2) and secure by rotating and closing two latches (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

LEFT REAR DOOR ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Foam damping sheet (WP 0120, Item 11)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Turn two latches (Figure 1, Item 1) and open left rear door assembly (latch) (Figure 1, Item 2) and left rear door assembly (Figure 1, Item 3).
2. Remove eight screws (Figure 1, Item 4), washers (Figure 1, Item 5), lockwashers (Figure 1, Item 6), and left rear door assembly and hinge (Figure 1, Item 3).

END OF TASK

DISASSEMBLY

1. Remove eight locknuts (Figure 1, Item 7), screws (Figure 1, Item 8), and hinge (Figure 1, Item 9).
2. Remove twelve screws (Figure 1, Item 10), lockwashers (Figure 1, Item 11), washers (Figure 1, Item 12), door holding rod (Figure 1, Item 13), and duct (Figure 1, Item 14).

DISASSEMBLY - Continued

3. Remove six foam damping sections as required.

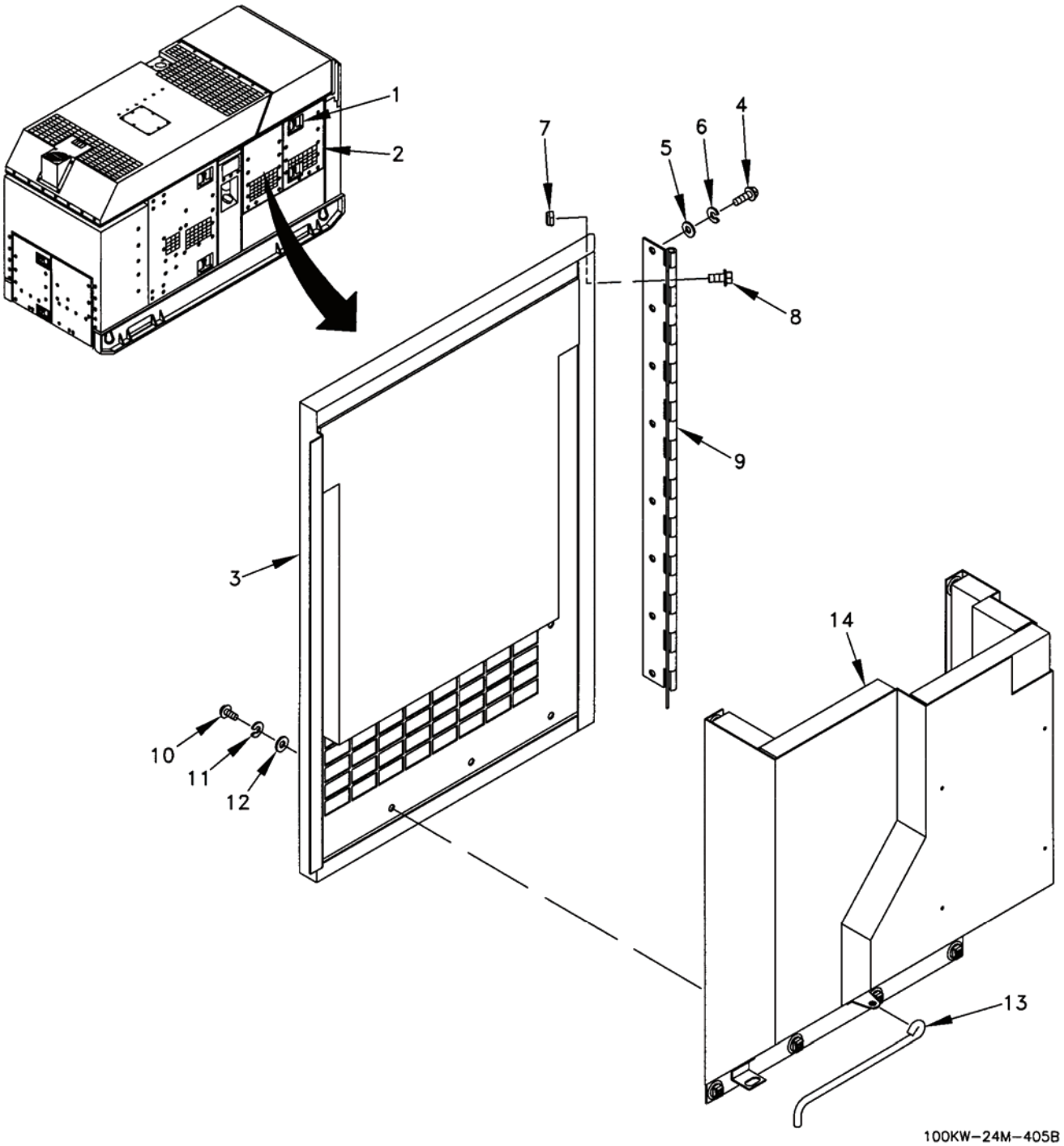


Figure 1. Left Rear Door Assembly.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sections as templates to cut new foam damping sections.
2. Install six foam damping sections.
3. Install duct (Figure 1, Item 14) and door holding rod (Figure 1, Item 13), and secure with twelve washers (Figure 1, Item 12), lockwashers (Figure 1, Item 11), and screws (Figure 1, Item 10).
4. Install hinge (Figure 1, Item 9) and secure with eight screws (Figure 1, Item 8) and locknuts (Figure 1, Item 7).

END OF TASK

INSTALLATION

1. Install left rear door assembly and hinge (Figure 1, Item 3) and secure with eight lockwashers (Figure 1, Item 6), washers (Figure 1, Item 5), and screws (Figure 1, Item 4).
2. Close left rear door assembly (3) and left rear door assembly (latch) (Figure 1, Item 2) and secure by rotating two latches (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

LEFT REAR DOOR ASSEMBLY (LATCH) MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Foam damping sheet (WP 0120, Item 11)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Turn two latches (Figure 1, Item 1) and open left rear door assembly (latch) (Figure 1, Item 2).
2. Remove eight screws (Figure 1, Item 3), washers (Figure 1, Item 4), lockwashers (Figure 1, Item 5), and left rear door assembly (latch) and hinge (Figure 1, Item 2).

END OF TASK

DISASSEMBLY

1. Remove eight locknuts (Figure 1, Item 6), screws (Figure 1, Item 7), and hinge (Figure 1, Item 8).
2. Remove eight nuts (Figure 1, Item 9), screws (Figure 1, Item 10), and two latches (Figure 1, Item 1).
3. Remove eleven screws (Figure 1, Item 11), and duct (Figure 1, Item 12).
4. Remove five foam damping sections as required.

DISASSEMBLY - Continued

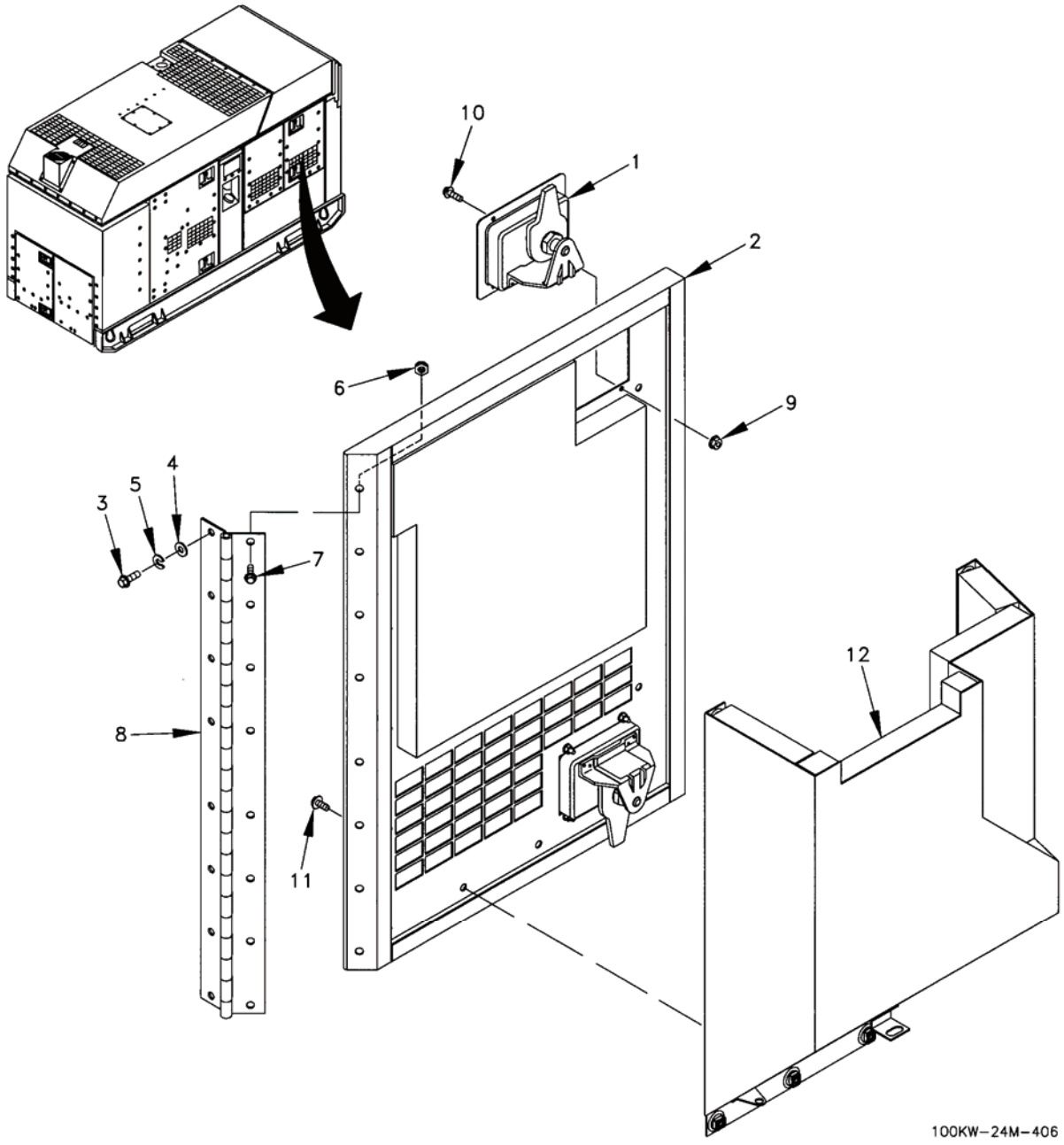


Figure 1. Left Rear Door Assembly (Latch).

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sections as templates to cut new foam damping sections.
2. Install five foam damping sections.
3. Install duct (Figure 1, Item 12) and secure with eleven screws (Figure 1, Item 11).
4. Install two latches (1) and secure with eight screws (Figure 1, Item 10) and nuts (Figure 1, Item 9).
5. Install hinge (Figure 1, Item 8) and secure with eight screws (Figure 1, Item 7) and locknuts (Figure 1, Item 6).

END OF TASK

INSTALLATION

1. Install left rear door assembly (latch) and hinge (Figure 1, Item 2) and secure with eight lockwashers (Figure 1, Item 5), washers (Figure 1, Item 4), and screws (Figure 1, Item 3).
2. Close left rear door assembly (latch) (Figure 1, Item 2) and secure by rotating two latches (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

LOAD BOARD DOOR ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Foam damping sheet (WP 0120, Item 10)
Foam damping sheet (WP 0120, Item 11)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Turn latch (Figure 1, Item 1) and open load board door assembly (Figure 1, Item 2).
2. Remove four screws (Figure 1, Item 3), washers (Figure 1, Item 4), lockwashers (Figure 1, Item 5), and load board door assembly and hinge (Figure 1, Item 2).

END OF TASK

DISASSEMBLY

1. Remove three nuts (Figure 1, Item 6) and screws (Figure 1, Item 7).
2. Remove four nuts (Figure 1, Item 8), screws (Figure 1, Item 9), and latch (Figure 1, Item 1).

DISASSEMBLY - Continued

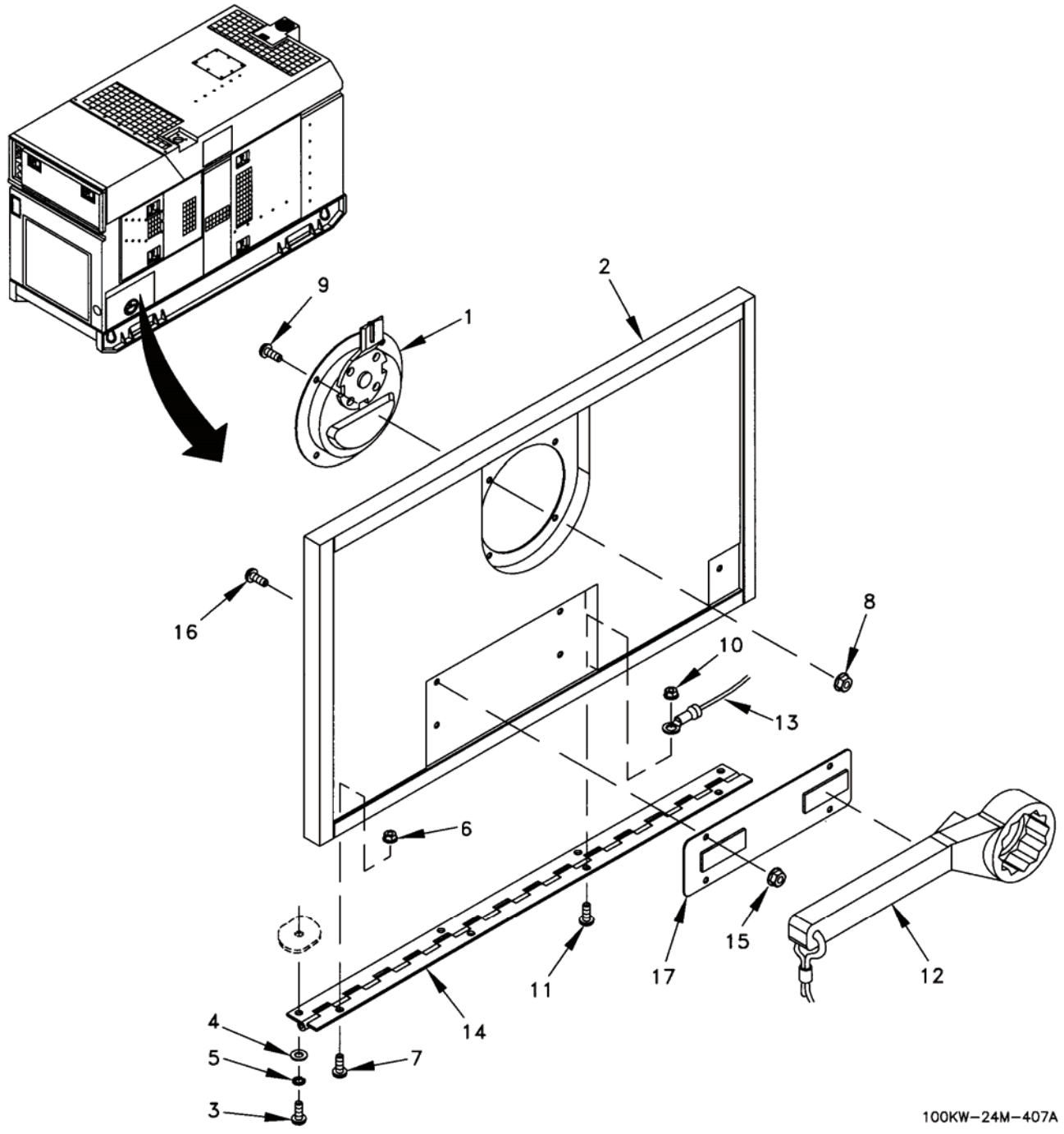


Figure 1. Load Board Door Assembly.

DISASSEMBLY - Continued

3. Remove nut (Figure 1, Item 10), screw (Figure 1, Item 11), wrench (Figure 1, Item 12), cord (Figure 1, Item 13), and hinge (Figure 1, Item 14).

4. Remove four nuts (Figure 1, Item 15), screws (Figure 1, Item 16), and wrench mounting plate (Figure 1, Item 17).

5. Remove foam damping sheet as required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sheet as template to cut new foam damping sheet.

2. Install foam damping sheet.

3. Install wrench mounting plate (Figure 1, Item 17), four screws (Figure 1, Item 16) and nuts (Figure 1, Item 15).

4. Install cord (Figure 1, Item 13), hinge (Figure 1, Item 14), and wrench (Figure 1, Item 12), and secure with screw (Figure 1, Item 11) and nut (Figure 1, Item 10).

5. Install latch (Figure 1, Item 1) and secure with four screws (Figure 1, Item 9) and nuts (Figure 1, Item 8).

6. Install three screws (Figure 1, Item 7) and nuts (Figure 1, Item 6).

END OF TASK

INSTALLATION

1. Install load board door assembly and hinge (Figure 1, Item 2) and secure with four lockwashers (Figure 1, Item 5), washers (Figure 1, Item 4), and screws (Figure 1, Item 3).

2. Close load board door assembly (Figure 1, Item 2) and secure by rotating and closing latch (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

RIGHT FRONT DOOR ASSEMBLY (LATCH) MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Foam damping sheet (WP 0120, Item 10)
Foam damping sheet (WP 0120, Item 11)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Turn two latches (Figure 1, Item 1) and open right front door assembly (latch) (Figure 1, Item 2).
2. Remove twelve screws (Figure 1, Item 3), washers (Figure 1, Item 4), lockwashers (Figure 1, Item 5), and right front door assembly (latch) and hinge (Figure 1, Item 2).

END OF TASK

DISASSEMBLY

1. Remove twelve nuts (Figure 1, Item 6), screws (Figure 1, Item 7), and hinge (Figure 1, Item 8) from right front door assembly (latch) (Figure 1, Item 2).
2. Remove eight nuts (Figure 1, Item 9), screws (Figure 1, Item 10), and two latches (Figure 1, Item 1).

DISASSEMBLY - Continued

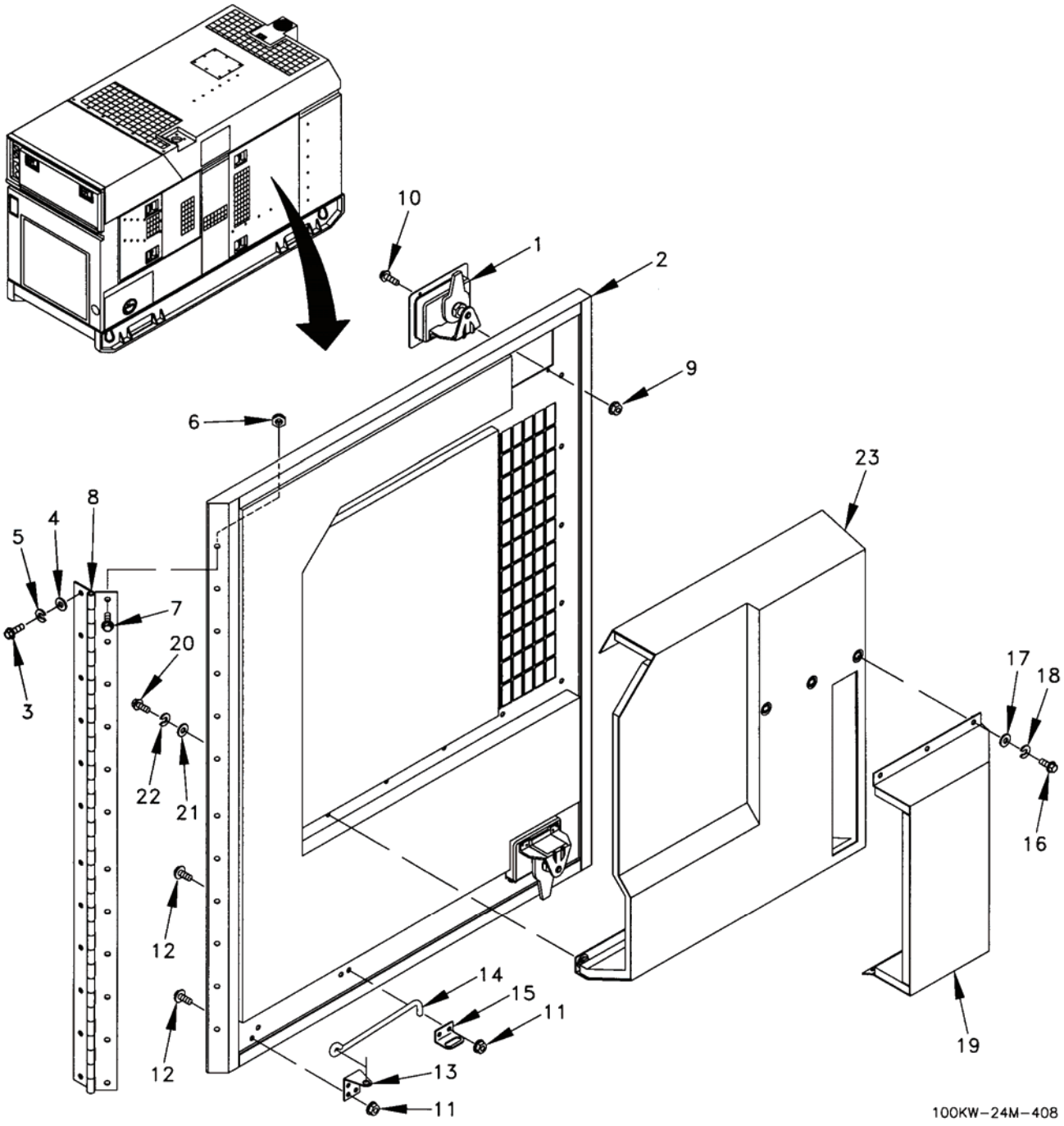


Figure 1. Right Front Door Assembly (Latch).

DISASSEMBLY - Continued

3. Remove four nuts (Figure 1, Item 11), screws (Figure 1, Item 12), door holding bracket (Figure 1, Item 13), door holding rod (Figure 1, Item 14), and holding rod bracket (Figure 1, Item 15).

4. Remove ten screws (Figure 1, Item 16), washers (Figure 1, Item 17), lockwashers (Figure 1, Item 18), and deflector (Figure 1, Item 19).

5. Remove twelve screws (Figure 1, Item 20), washers (Figure 1, Item 21), lockwashers (Figure 1, Item 22), and duct (Figure 1, Item 23).

6. Remove nine foam damping sections as required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sections as templates to cut new foam damping sections.

2. Install foam damping sections.

3. Install duct (Figure 1, Item 23) and secure with twelve lockwashers (Figure 1, Item 22), washers (Figure 1, Item 21), and screws (Figure 1, Item 20).

4. Install deflector (Figure 1, Item 19) and secure with ten lockwashers (Figure 1, Item 18), washers (Figure 1, Item 17), and screws (Figure 1, Item 16).

5. Install holding rod bracket (Figure 1, Item 15), door holding rod (Figure 1, Item 14), door holding bracket (Figure 1, Item 13), and secure with four screws (Figure 1, Item 12), and nuts (Figure 1, Item 11).

6. Install two latches (Figure 1, Item 1) and secure with eight screws (Figure 1, Item 10) and nuts (Figure 1, Item 9).

7. Install hinge (Figure 1, Item 8) and secure with twelve screws (Figure 1, Item 7) and nuts (Figure 1, Item 6).

END OF TASK

INSTALLATION

1. Install right front door assembly (latch) and hinge (Figure 1, Item 2) and secure with twelve lockwashers (Figure 1, Item 5), washers (Figure 1, Item 4), and screws (Figure 1, Item 3).

2. Close right front door assembly (latch) (Figure 1, Item 2) and secure by rotating and closing two latches (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

RIGHT REAR DOOR ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Foam damping sheet (WP 0120, Item 11)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Turn two latches (Figure 1, Item 1) and open right rear door assembly (latch) (Figure 1, Item 2) and right rear door assembly (Figure 1, Item 3).
2. Remove eight screws (Figure 1, Item 4), washers (Figure 1, Item 5), lockwashers (Figure 1, Item 6), and right rear door assembly and hinge (Figure 1, Item 3).

END OF TASK

DISASSEMBLY

1. Remove eight locknuts (Figure 1, Item 7), screws (Figure 1, Item 8), and hinge (Figure 1, Item 9).
2. Remove nine screws (Figure 1, Item 10), washers (Figure 1, Item 11), and duct (Figure 1, Item 12).

DISASSEMBLY - Continued

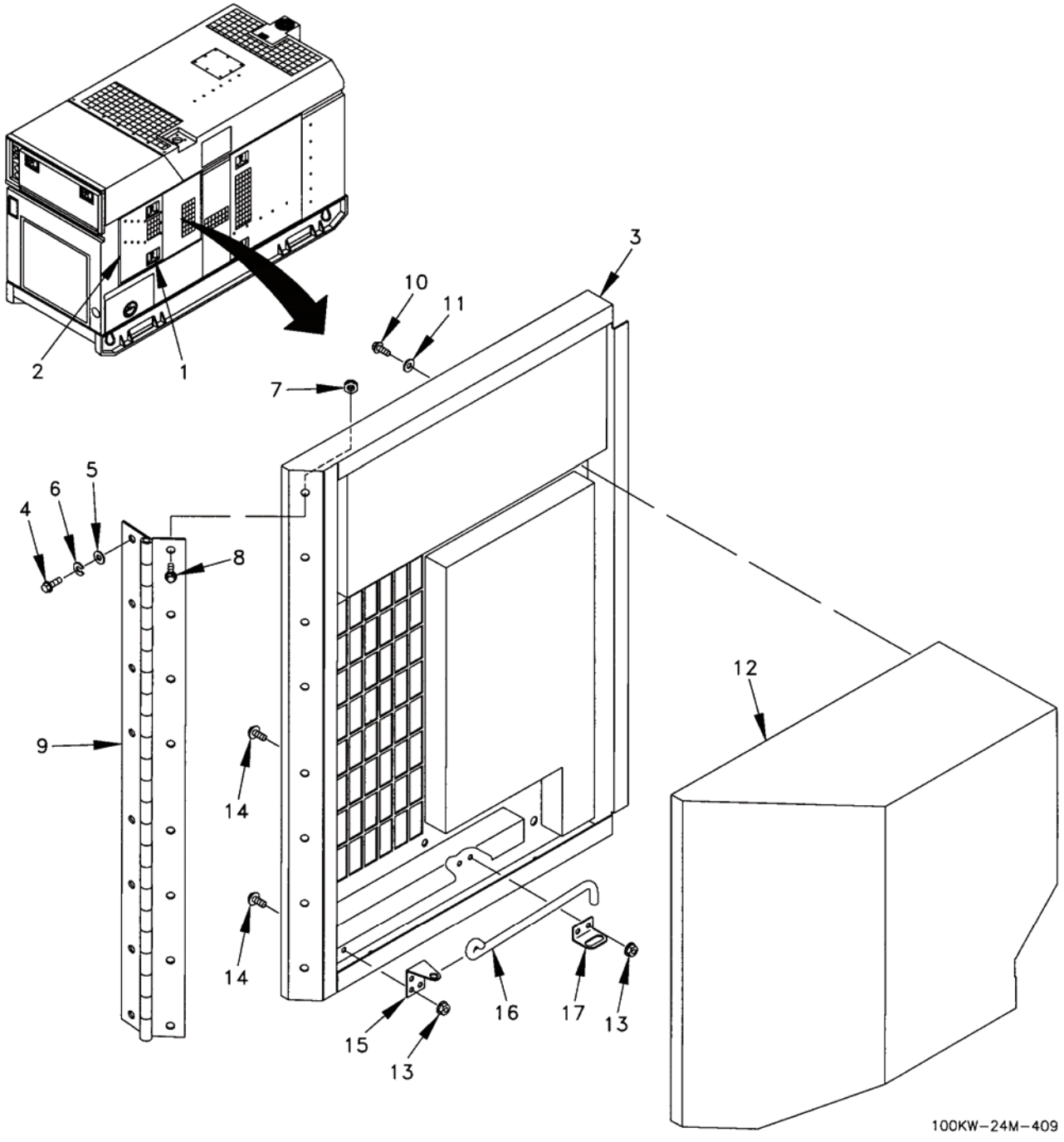


Figure 1. Right Rear Door Assembly.

DISASSEMBLY - Continued

3. Remove four nuts (Figure 1, Item 13), screws (Figure 1, Item 14), door holding bracket (Figure 1, Item 15), door holding rod (Figure 1, Item 16), and holding rod bracket (Figure 1, Item 17).

4. Remove seven foam damping sections as required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sections as templates to cut new foam damping sections.

2. Install five foam damping sections.

3. Install holding rod bracket (Figure 1, Item 17), door holding rod (Figure 1, Item 16), and door holding bracket (Figure 1, Item 15), and secure with four screws (Figure 1, Item 14), and nuts (Figure 1, Item 13).

4. Install duct (Figure 1, Item 12) and secure with nine washers (Figure 1, Item 11), and screws (Figure 1, Item 10).

5. Install hinge (Figure 1, Item 9) and secure with eight screws (Figure 1, Item 8) and locknuts (Figure 1, Item 7).

END OF TASK

INSTALLATION

1. Install right rear door assembly and hinge (Figure 1, Item 3) and secure with eight lockwashers (Figure 1, Item 6), washers (Figure 1, Item 5), and screws (Figure 1, Item 4).

2. Close right rear door assembly (Figure 1, Item 3) and right rear door assembly (latch) (Figure 1, Item 2) and secure by rotating two latches (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

RIGHT REAR DOOR ASSEMBLY (LATCH) MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Foam damping sheet (WP 0120, Item 10)
Foam damping sheet (WP 0120, Item 11)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Turn two latches (Figure 1, Item 1) and open right rear door assembly (latch) (Figure 1, Item 2) and right rear door assembly (Figure 1, Item 3).
2. Remove eight screws (Figure 1, Item 4), washers (Figure 1, Item 5), lockwashers (Figure 1, Item 6), and right rear door assembly (latch) and hinge (Figure 1, Item 2).

END OF TASK

DISASSEMBLY

1. Remove eight locknuts (Figure 1, Item 7), screws (Figure 1, Item 8), and hinge (Figure 1, Item 9).
2. Remove nine screws (Figure 1, Item 10), washers (Figure 1, Item 11), lockwashers (Figure 1, Item 12), and duct (Figure 1, Item 13).

DISASSEMBLY - Continued

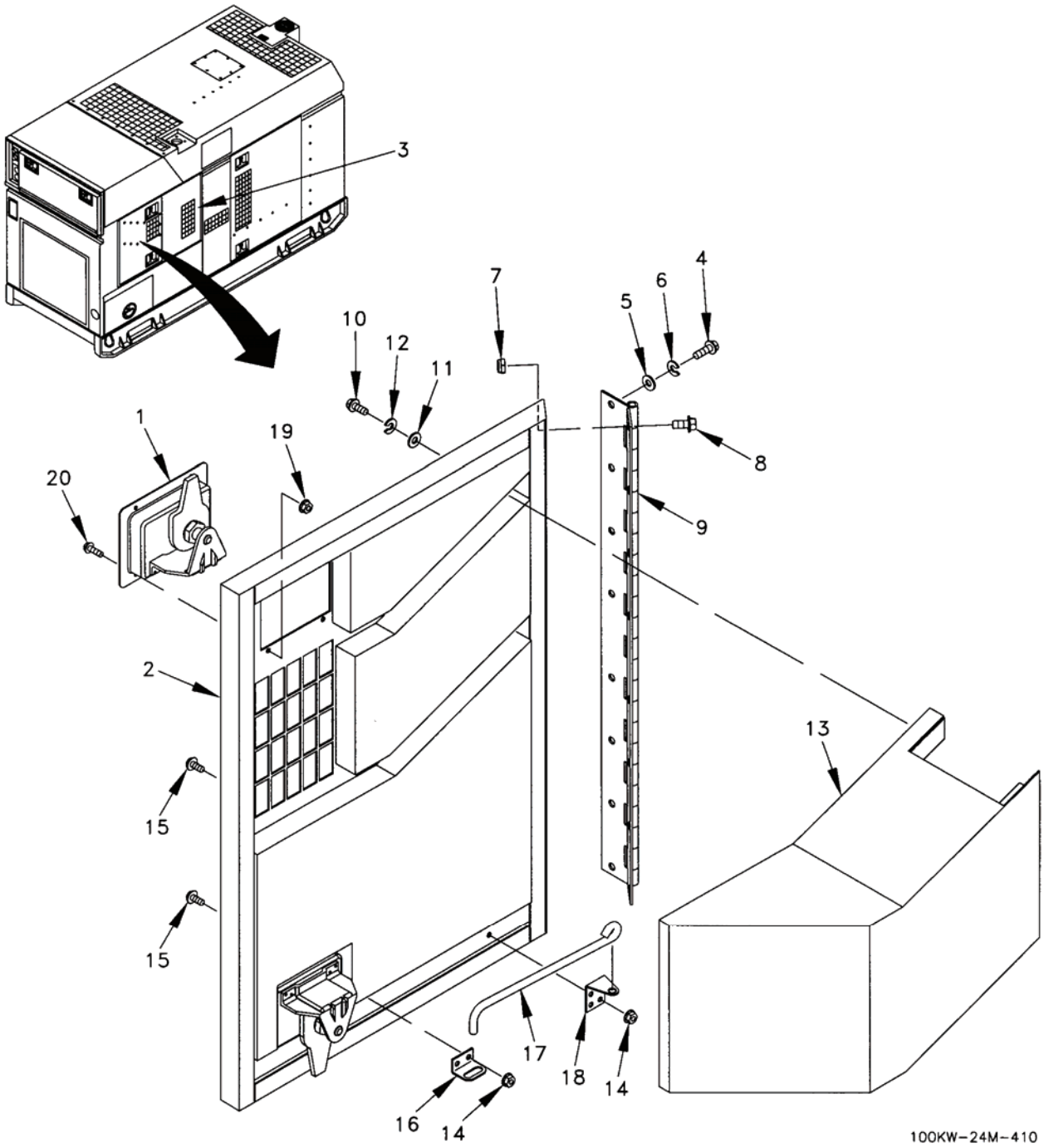


Figure 1. Right Rear Door Assembly (Latch).

DISASSEMBLY - Continued

3. Remove four nuts (Figure 1, Item 14), screws (Figure 1, Item 15), door holding bracket (Figure 1, Item 16), door holding rod (Figure 1, Item 17), and holding rod bracket (Figure 1, Item 18).

4. Remove eight nuts (Figure 1, Item 19), screws (Figure 1, Item 20), and two latches (Figure 1, Item 1).

5. Remove seven foam damping sections as required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sections as templates to cut new foam damping sections.

2. Install seven foam damping sections.

3. Install two latches (Figure 1, Item 1), and secure with eight screws (Figure 1, Item 20) and nuts (Figure 1, Item 19).

4. Install holding rod bracket (Figure 1, Item 18), door holding rod (Figure 1, Item 17), and door holding bracket (Figure 1, Item 16), and secure with four screws (Figure 1, Item 15) and nuts (Figure 1, Item 14).

5. Install duct (Figure 1, Item 13) and secure with nine lockwashers (Figure 1, Item 12), washers (Figure 1, Item 11), and screws (Figure 1, Item 10).

6. Install hinge (Figure 1, Item 9) and secure with eight screws (Figure 1, Item 8) and nuts (Figure 1, Item 7).

END OF TASK

INSTALLATION

1. Install right rear door assembly (latch) and hinge (Figure 1, Item 2) and secure with eight screws (Figure 1, Item 6), washers (Figure 1, Item 5), and lockwashers (Figure 1, Item 4).

2. Close right rear door assembly (Figure 1, Item 3) and right rear door assembly (latch) (Figure 1, Item 2) and secure by rotating two latches (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

ACCESS COVERS MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Foam damping sheet (WP 0120, Item 11)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Remove four screws (Figure 1, Item 1), lockwashers (Figure 1, Item 2), washers (Figure 1, Item 3), and right side access cover (Figure 1, Item 4).
2. Remove four screws (Figure 1, Item 1), lockwashers (Figure 1, Item 2), washers (Figure 1, Item 3), and roof mounted access cover (Figure 1, Item 4).

END OF TASK

DISASSEMBLY

Remove foam damping section as required.

END OF TASK

ASSEMBLY

If necessary, use old foam damping section as template to cut new foam damping section. Install foam damping section.

END OF TASK

INSTALLATION

1. Install roof mounted access cover (Figure 1, Item 4), and secure with eight washers (Figure 1, Item 3), lockwashers (Figure 1, Item 2), and screws (Figure 1, Item 1).

2. Install right side mounted access cover (Figure 1, Item 4), and secure with eight washers (Figure 1, Item 3), lockwashers (Figure 1, Item 2), and screws (Figure 1, Item 1).

INSTALLATION - Continued

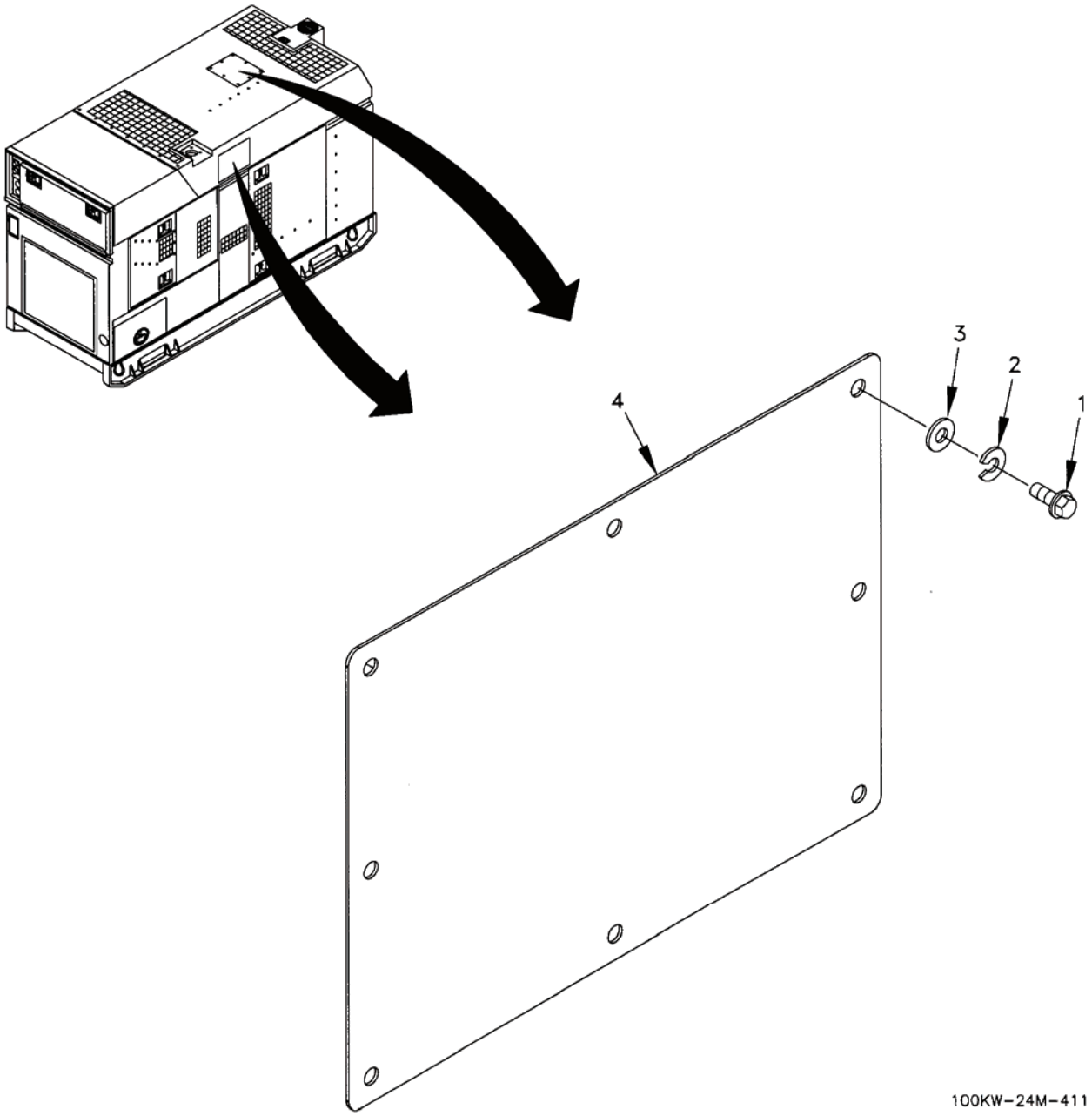


Figure 1. Access Covers.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FRONT ROOF SECTION HOUSING ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Foam damping sheet (WP 0120, Item 12)
Foam damping sheet (WP 0120, Item 14)
Foam damping sheet (WP 0120, Item 15)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Access covers removed (WP 0028)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

WARNING

Top housing panels can get very hot. Allow panels to cool down before performing maintenance. Failure to comply can result in severe burns to personnel.

WARNING

Front roof section weighs more than 37 pounds (17 kg) and requires a two-person lift. Lifting front roof section can cause back strain. Ensure proper lifting techniques are used when lifting front roof section. Failure to comply can cause injury to personnel.

REMOVAL

1. On EMCP, set ENGINE CONTROL switch to OFF/RESET; set Battery Disconnect Switch to OFF; set DEAD CRANK SWITCH to OFF.

2. Remove 43 screws (Figure 1, Sheet 1, Item 1), lockwashers (Figure 1, Sheet 1, Item 2), and washers (Figure 1, Sheet 1, Item 3) from roof section (Figure 1, Sheet 1, Item 4).

3 Loosen clamp (Figure 1, Sheet 1, Item 5) connecting coolant filler hose (Figure 1, Item, 6) to bottom of coolant filler neck (Figure 1, Sheet 1, Item 7) and disconnect hose.

4. Remove clamp (Figure 1, Sheet 1, Item 8) from overflow hose (Figure 1, Sheet 1, Item 9) at coolant filler neck (Figure 1, Sheet 1, Item 7) and pull hose back through hole in front roof section (Figure 1, Sheet 1, Item 4).

5. Remove exhaust clamp (Figure 1, Sheet 1, Item 10) by removing two screws (Figure 1, Sheet 1, Item 11) and lockwashers (Figure 1, Sheet 1, Item 12) (access through access hole).

WARNING

Front roof section weighs more than 37 pounds (17 kg) and requires a two-person lift. Lifting front roof section can cause back strain. Ensure proper lifting techniques are used when lifting front roof section. Failure to comply can cause injury to personnel.

NOTE

Sufficient force is required for removal. Use slide and lift motion to release front roof housing section.

6. Using two persons, slide front roof section housing assembly (Figure 1, Sheet 1, Item 4) toward front of generator set in order to separate exhaust clamp (Figure 1, Sheet 1, Item 10) from muffler. Lift and remove front roof section housing assembly.

END OF TASK

DISASSEMBLY

1. If necessary, remove 97 clips (Figure 1, Sheet 2, Item 13), 64 push-on nuts (Figure 1, Sheet 2, Item 14), and remove twelve foam damping sections as required.

2. Remove eight screws (Figure 1, Sheet 2, Item 15), lockwashers (Figure 1, Sheet 2, Item 16) and washers (Figure 1, Sheet 2, Item 17) and remove exhaust cover (Figure 1, Sheet 2, Item 18) from front roof section (Figure 1, Sheet 2, Item 4).

3. Remove four screws (Figure 1, Sheet 2, Item 19), lockwashers (Figure 1, Sheet 2, Item 20) and remove exhaust out tube assembly (Figure 1, Sheet 2, Item 21).

4. Remove four screws (Figure 1, Sheet 2, Item 22), nuts (Figure 1, Sheet 2, Item 23) and coolant filler neck (Figure 1, Sheet 2, Item 7).

DISASSEMBLY - Continued

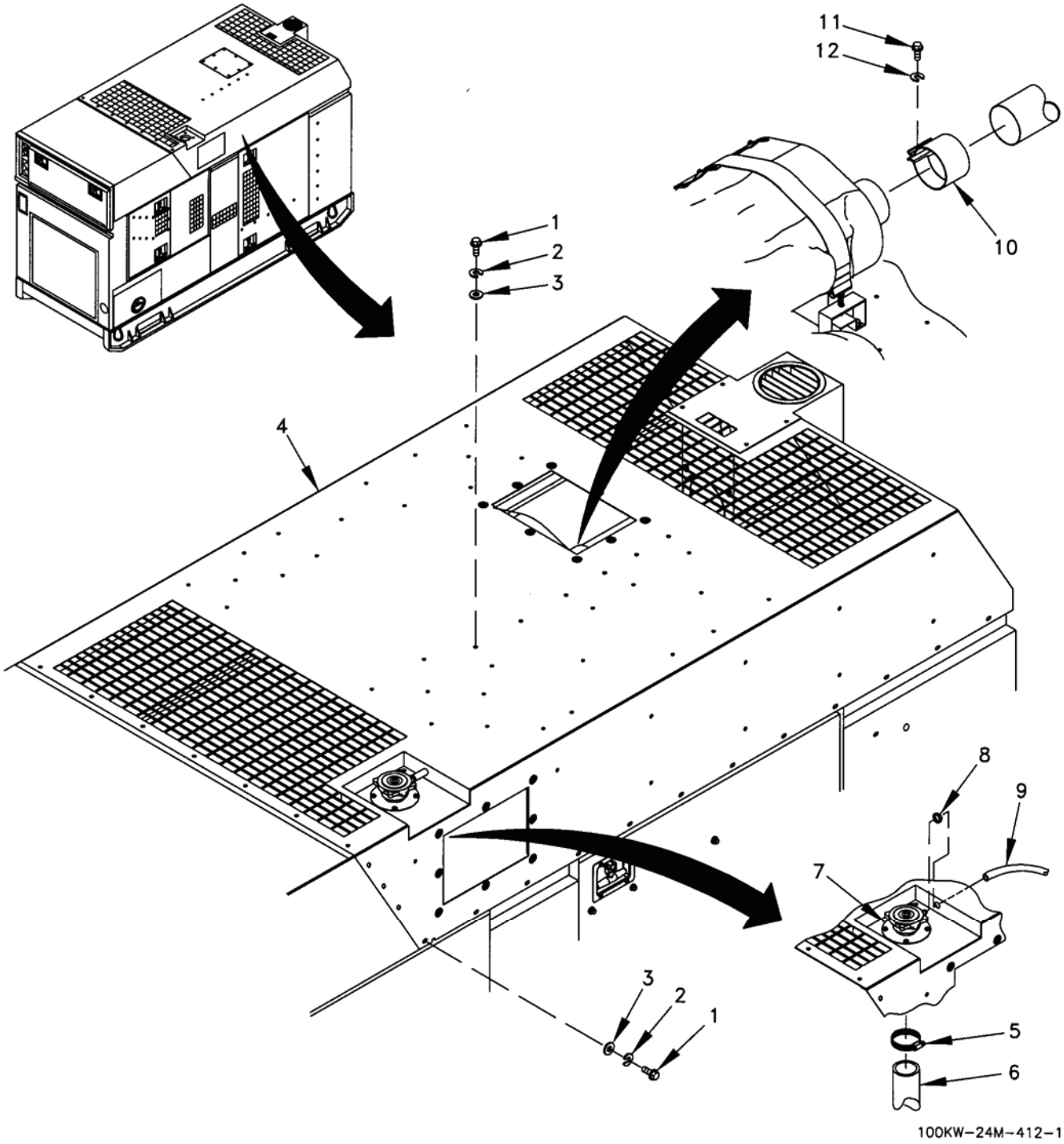


Figure 1. Front Roof Section Housing Assembly (Sheet 1 of 2).

DISASSEMBLY - Continued

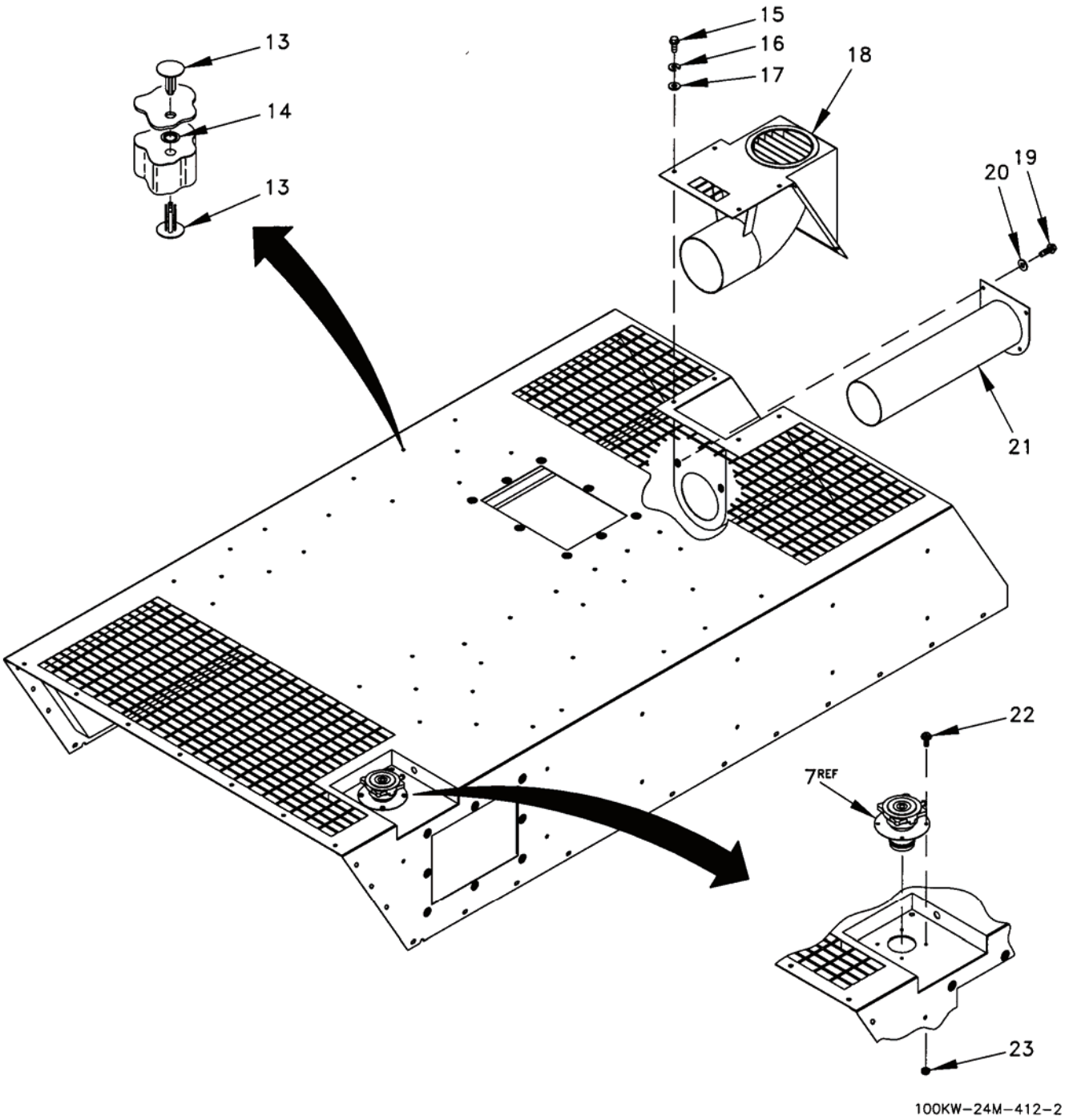


Figure 1. Front Roof Section Housing Assembly (Sheet 2 of 2).

END OF TASK

ASSEMBLY

1. Install four screws (Figure 1, Item 22), nuts (Figure 1, Item 23) and coolant filler neck (Figure 1, Item 7).

2. Install exhaust out tube assembly (Figure 1, Item 21) into front roof section (Figure 1, Item 4) with four screws (Figure 1, Item 19), and lockwashers (Figure 1, Item 20).

3. Install exhaust cover (Figure 1, Sheet 2, Item 18) using eight screws (Figure 1, Item 15), lockwashers (Figure 1, Item 16) and washers (Figure 1, Item 17) into front roof section (Figure 1, Item 4).

4. If necessary, use old foam damping sections as templates to cut new foam damping sections. Install twelve foam damping sections, 64 push-on nuts (Figure 1, Item 14), and 97 clips (Figure 1, Item 13).

END OF TASK

INSTALLATION

1. Using two persons, align exhaust out tube assembly and install front roof section housing assembly (Figure 1, Sheet 1, Item 4).

2. Install exhaust clamp (Figure 1, Sheet 1, Item 10) loosely between muffler and exhaust out tube assembly (Figure 1, Sheet 1, Item 18) while front roof section is loose.

3. Secure front roof section housing assembly (Figure 1, Sheet 1, Item 4) with 43 washers (Figure 1, Sheet 1, Item 3), lockwashers (Figure 1, Sheet 1, Item 2), and screws (Figure 1, Sheet 1, Item 1).

4. Install and tighten two screws (Figure 1, Sheet 1, Item 11) and lockwashers (Figure 1, Sheet 1, Item 12) on exhaust muffler clamp (Figure 1, Sheet 1, Item 10) (access through access hole in cover).

5. Connect hose (Figure 1, Sheet 1, Item 6) to bottom of coolant filler neck (Figure 1, Sheet 1, Item 7) and tighten clamp (Figure 1, Sheet 1, Item 5).

6. Route overflow hose (Figure 1, Sheet 1, Item 9) back through hole in front roof section (Figure 1, Sheet 1, Item 3) and connect hose to coolant filler neck (Figure 1, Sheet 1, Item 7) tighten clamp (Figure 1, Sheet 1, Item 8).

7. Install access covers (WP 0028).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
REAR ROOF SECTION HOUSING ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Foam damping sheet (WP 0120, Item 12)
Foam damping sheet (WP 0120, Item 14)
Foam damping sheet (WP 0120, Item 15)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Front roof section housing assembly removed (WP 0029)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

WARNING

Top housing panels can get very hot. Allow panels to cool down before performing maintenance. Failure to comply can result in severe burns to personnel.

REMOVAL

1. Remove 18 screws (Figure 1, Sheet 1, Item 1), lockwashers (Figure 1, Sheet 1, Item 2), and washers (Figure 1, Sheet 1, Item 3) from rear roof housing assembly (Figure 1, Sheet 1, Item 4).
2. Remove seven screws (Figure 1, Sheet 1, Item 5), lockwashers (Figure 1, Sheet 1, Item 6), and washers (Figure 1, Sheet 1, Item 7).

REMOVAL - Continued

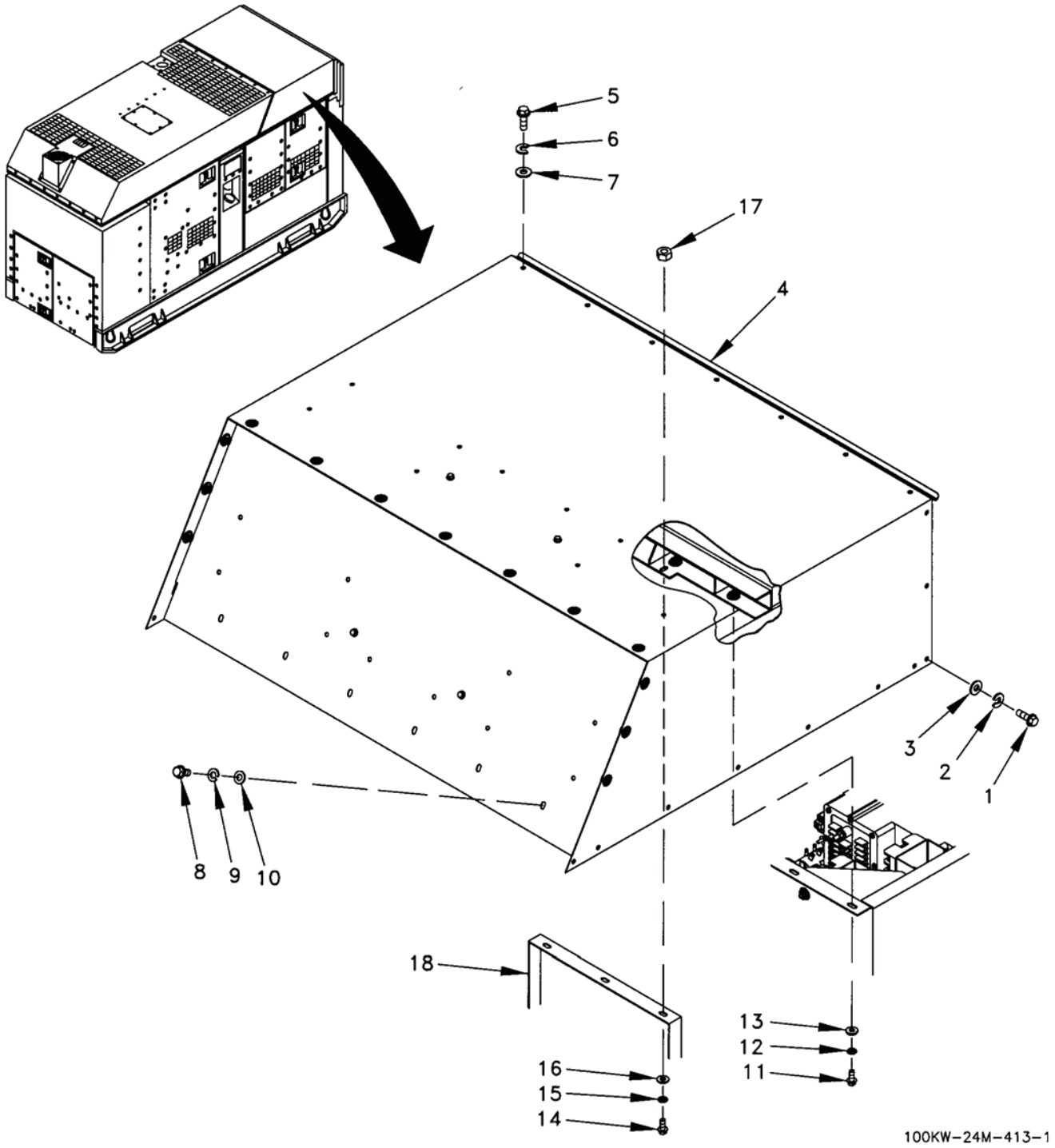


Figure 1. Rear Roof Section Housing Assembly (Sheet 1 of 2).

REMOVAL - Continued

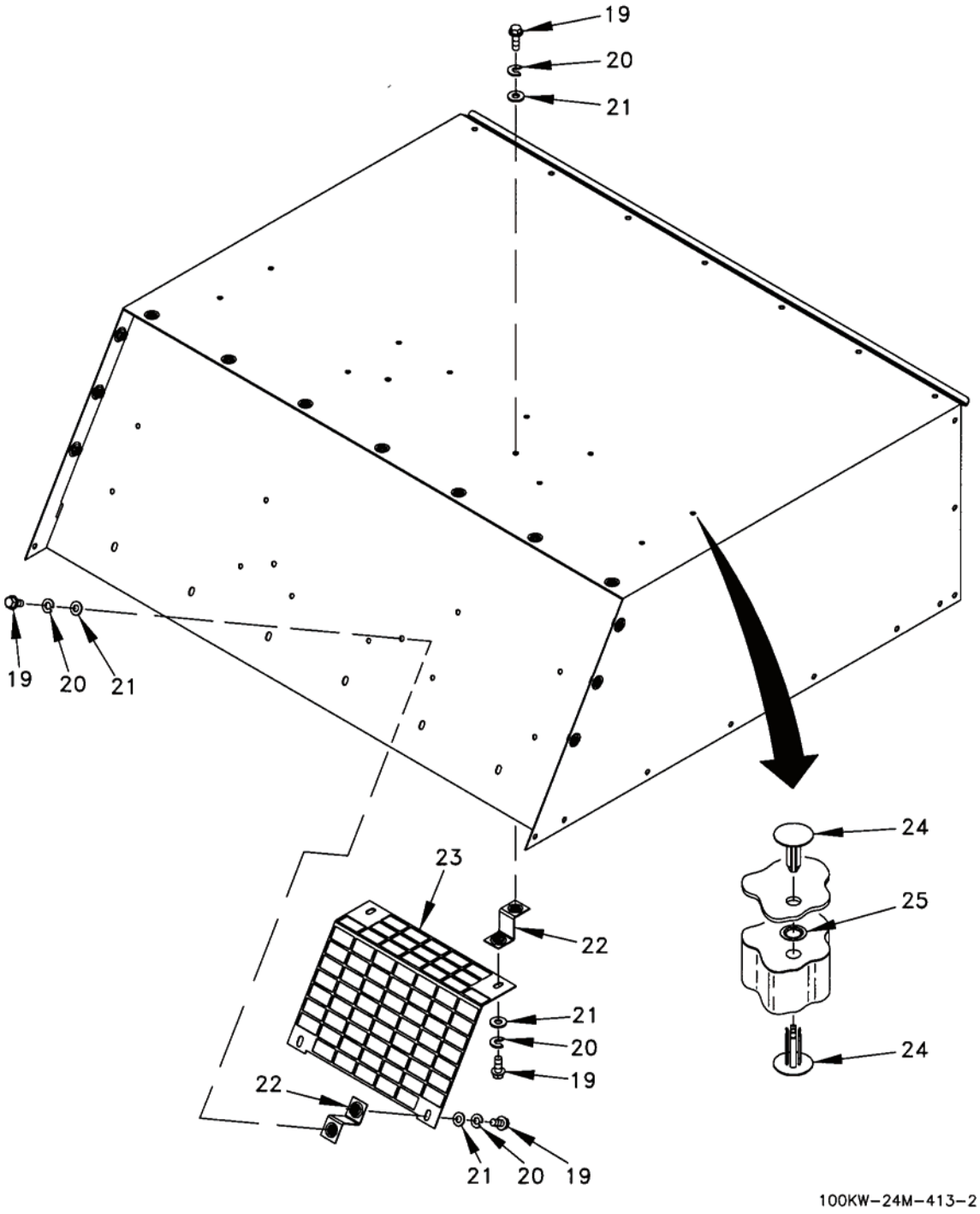


Figure 1. Rear Roof Section Housing Assembly (Sheet 2 of 2).

REMOVAL - Continued

3. Remove six screws (Figure 1, Sheet 1, Item 8), lockwashers (Figure 1, Sheet 1, Item 9), and washers (Figure 1, Sheet 1, Item 10).

4. Remove seven screws (Figure 1, Sheet 1, Item 11), lockwashers (Figure 1, Sheet 1, Item 12), and washers (Figure 1, Sheet 1, Item 13).

5. Remove three screws (Figure 1, Sheet 1, Item 14), lockwashers (Figure 1, Sheet 1, Item 15), washers (Figure 1, Item 16), and nuts (Figure 1, Sheet 1, Item 17) from air cleaner bracket (Figure 1, Sheet 1, Item 18) and rear roof section housing (Figure 1, Sheet 1, Item 4).

6. Remove rear roof section housing assembly (Figure 1, Sheet 1, Item 4).

END OF TASK

DISASSEMBLY

1. Remove eight screws (Figure 1, Sheet 2, Item 19), lockwashers (Figure 1, Sheet 2, Item 20), and washers (Figure 1, Sheet 2, Item 21) four brackets (Figure 1, Sheet 2, Item 22) and grate (Figure 1, Sheet 2, Item 23).

2. If necessary, remove 36 clips (Figure 1, Sheet 2, Item 24), 18 push-on nuts (Figure 1, Sheet 2, Item 25), and remove five foam damping sections as required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sections as templates to cut new foam damping sections. Install five foam damping sections, 18 push-on nuts (Figure 1, Sheet 2, Item 25), and 36 clips (Figure 1, Sheet 2, Item 24).

2. Install grate (Figure 1, Sheet 2, Item 23) and four brackets (Figure 1, Sheet 2, Item 22) using eight screws (Figure 1, Sheet 2, Item 19), lockwashers (Figure 1, Sheet 2, Item 20), and washers (Figure 1, Sheet 2, Item 21).

END OF TASK

INSTALLATION

1. Install rear roof section housing assembly (Figure 1, Sheet 1, Item 4).

2. Install three screws (Figure 1, Sheet 1, Item 14), lockwashers (Figure 1, Sheet 1, Item 15), washers (Figure 1, Sheet 1, Item 16) .through air cleaner bracket (Figure 1, Sheet 1, Item 17) and secure with three nuts (Figure 1, Sheet 1, Item 17).

3. Install seven screws (Figure 1, Sheet 1, Item 11), lockwashers (Figure 1, Sheet 1, Item 12), and washers (Figure 1, Sheet 1, Item 13).

4. Install six screws (Figure 1, Sheet 1, Item 8), lockwashers (Figure 1, Sheet 1, Item 9), and washers (Figure 1, Sheet 1, Item 10).

INSTALLATION - Continued

5. Install seven screws (Figure 1, Sheet 1, Item 5), lockwashers (Figure 1, Sheet 1, Item 6), and washers (Figure 1, Sheet 1, Item 7).

6. Install 18 screws (Figure 1, Sheet 1, Item 1), lockwashers (Figure 1, Sheet 1, Item 2), and washers (Figure 1, Sheet 1, Item 3).

7. Install front roof section housing assembly (WP 0029).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

ENGINE GENERATOR COMPARTMENT CEILING ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Foam damping sheet (WP 0120, Item 11)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Front roof section housing assembly removed (WP 0029)
Rear roof section housing assembly removed (WP 0030)
Exhaust system removed (WP 0068)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

WARNING

Top housing panels can get very hot. Allow panels to cool down before performing maintenance. Failure to comply can result in severe burns to personnel

WARNING

The engine generator compartment ceiling weighs more than 37 pounds (17 kg) and requires a two-person lift. Lifting engine generator compartment ceiling can cause back strain. Ensure proper lifting techniques are used when lifting engine generator compartment ceiling. Failure to comply can cause injury to personnel.

REMOVAL

1. Remove seven screws (Figure 1, Item 1), washers (Figure 1, Item 2), and lockwashers (Figure 1, Item 3).

2. Remove 46 screws (Figure 1, Item 5), lockwashers (Figure 1, Item 6), and washers (Figure 1, Item 7) from engine compartment ceiling assembly (Figure 1, Item 4) (23 sets on each side).

3. Remove two screws (Figure 1, Item 8), lockwashers (Figure 1, Item 9), and washers (Figure 1, Item 10) securing bracket (Figure 1, Item 11) to air cleaner bracket (Figure 1, Item 12).

4. Remove two screws (Figure 1, Item 13), washers (Figure 1, Item 14), lockwashers (Figure 1, Item 15), nuts (Figure 1, Item 17) and four clamps (Figure 1, Item 16) with hoses from second and fifth holes from end of generator set.

5. Remove engine generator compartment ceiling assembly (Figure 1, Item 4).

END OF TASK

DISASSEMBLY

1. Remove five screws (Figure 1, Item 18), washers (Figure 1, Item 19), lockwashers (Figure 1, Item 20), nuts (Figure 1, Item 21) and bracket (Figure 1, Item 22).

2. If necessary, remove 42 clips (Figure 1, Item 23), 21 push-on nuts (Figure 1, Item 24) and remove foam damping section.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping section as template to cut new foam damping section. Install foam damping section, 21 push-on nuts (Figure 1, Item 24), and 42 clips (Figure 1, Item 23).

2. Install bracket (Figure 1, Item 22) using five screws (Figure 1, Item 17), washers (Figure 1, Item 18), lockwashers (Figure 1, Item 19), and nuts (Figure 1, Item 21). (Note that second and fifth hardware sets from rear of generator set are left out in order to attach hoses and clamps under the ceiling after it is installed.)

ASSEMBLY - Continued

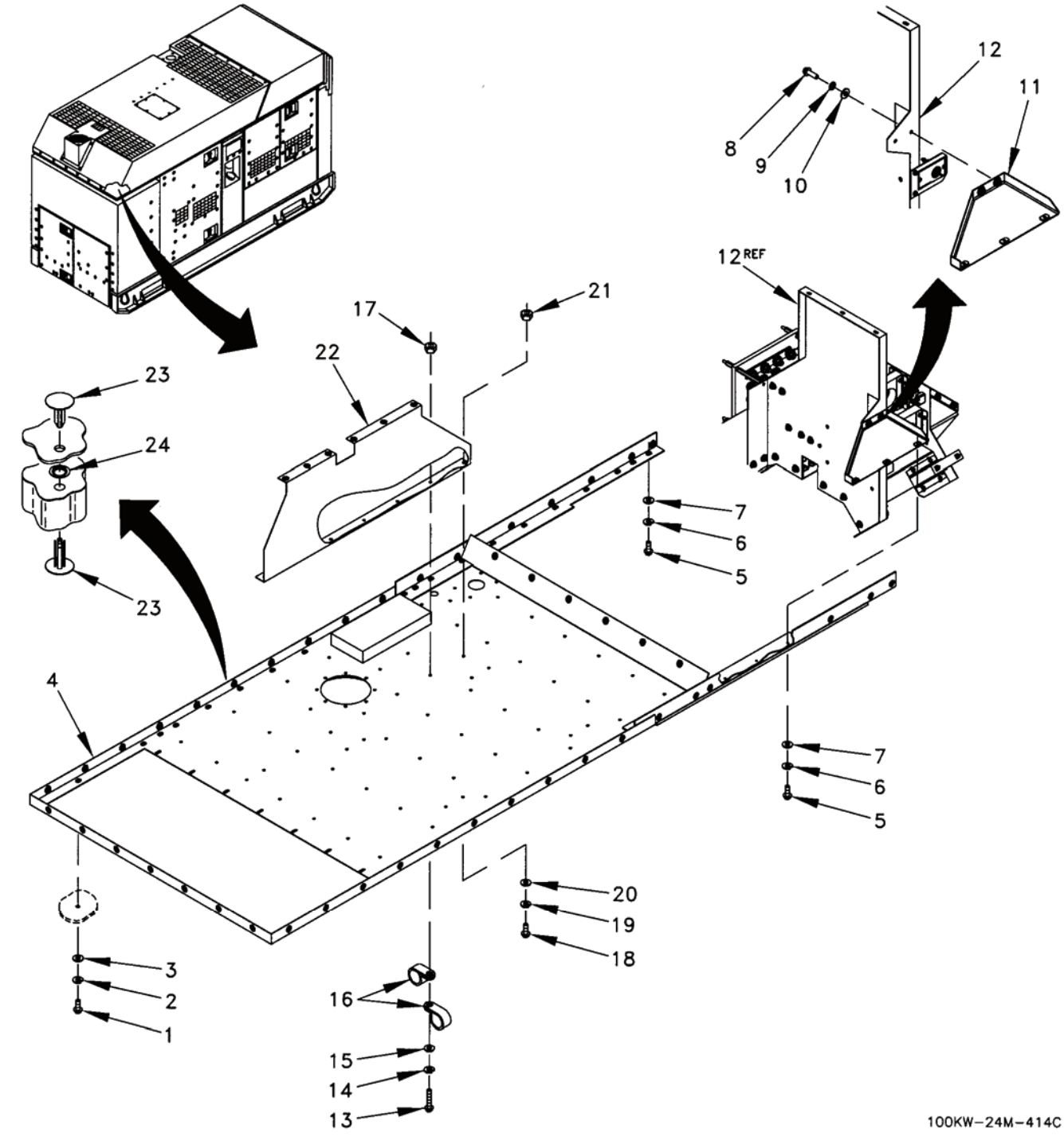


Figure 1. Engine Generator Compartment Ceiling Assembly.

END OF TASK

INSTALLATION

1. Install engine generator compartment ceiling assembly (Figure 1, Item 4).
2. Install four clamps (Figure 1, Item 16) securing two hoses to the engine generator compartment ceiling assembly. (Figure 1, Item 4) using two screws (Figure 1, Item 13), washers (Figure 1, Item 14), lockwashers (Figure 1, Item 15), and nuts (Figure 1, Item 17)
3. Install bracket (Figure 1, Item 11) to air cleaner bracket (Figure 1, Item 12) using two screws (Figure 1, Item 8), lockwashers (Figure 1, Item 9), and washers (Figure 1, Item 10).
4. Install engine compartment ceiling assembly (Figure 1, Item 4) using 46 screws (Figure 1, Item 5), lockwashers (Figure 1, Item 6), and washers (Figure 1, Item 7) from (23 sets on each side).
5. Install seven screws (Figure 1, Item 1), washers (Figure 1, Item 2), and lockwashers (Figure 1, Item 3).
6. Install exhaust system (WP 0068).
7. Install rear roof section housing assembly (WP 0030).
8. Install front roof section housing assembly (WP 0029).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

GENERATOR ACCESS COVER ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Foam damping sheet (WP 0120, Item 11)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

Remove 20 screws (Figure 1, Item 1), washers (Figure 1, Item 2), lockwashers (Figure 1, Item 3), and generator access cover assembly (Figure 1, Item 4).

END OF TASK

DISASSEMBLY

Remove foam damping section as required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping section as template to cut new foam damping section.

2. Install foam damping section.

END OF TASK

INSTALLATION

Install generator access cover assembly (Figure 1, Item 4) and secure with 20 lockwashers (Figure 1, Item 3), washers (Figure 1, Item 2), and screws (Figure 1, Item 1).

INSTALLATION - Continued

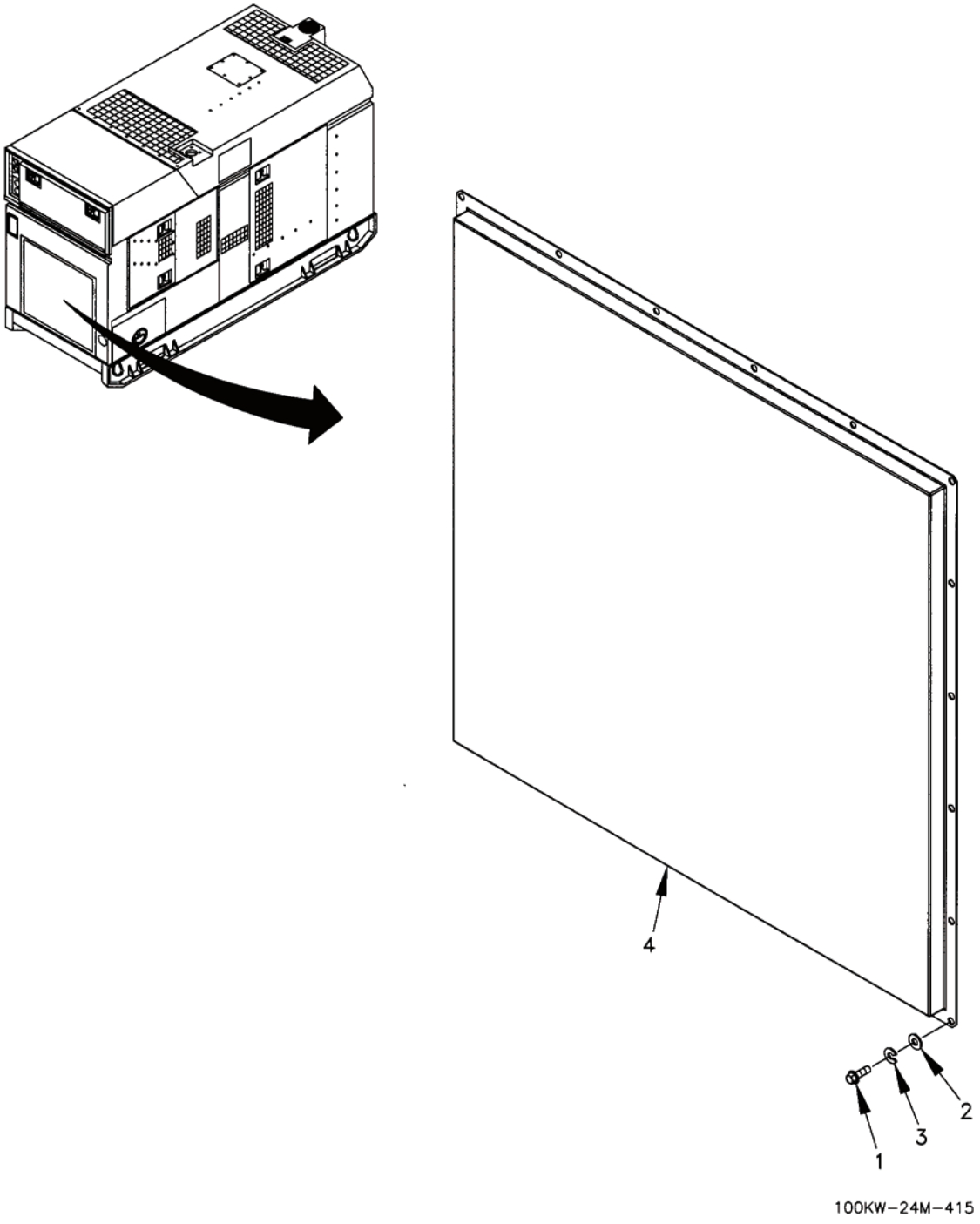


Figure 1. Generator Access Cover Assembly.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FRONT SECTION HOUSING ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Foam damping sheet (WP 0120, Item 11)
Foam damping sheet (WP 0120, Item 12)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Right battery access door assembly removed (WP 0018)
Left battery access door assembly removed (WP 0019)
Front roof section housing removed (WP 0029)
Engine generator compartment ceiling removed (WP 0031)
Right front door assembly (latch) removed (WP 0025)
Left front door assembly (latch) removed (WP 0021)
Batteries removed (WP 0049)
Battery disconnect switch removed (WP 0050)
Slave receptacle removed (WP 0053)
Winterization heater assembly removed, if applicable (WP 0092)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Remove four screws (Figure 1, Sheet 1, Item 1), lockwashers (Figure 1, Sheet 1, Item 2), washers (Figure 1, Sheet 1, Item 3), and nuts (Figure 1, Sheet 1, Item 4).

REMOVAL - Continued

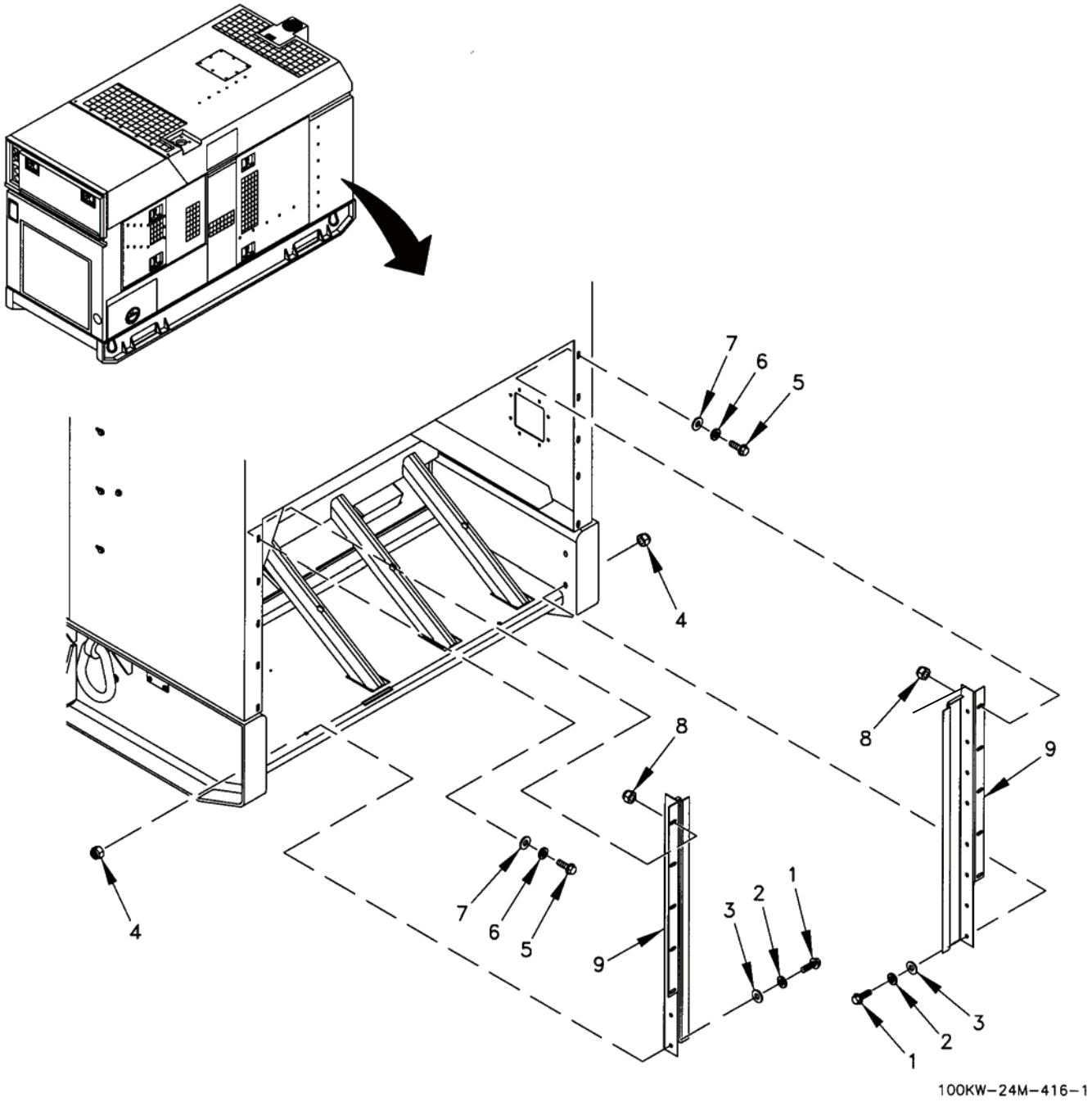


Figure 1. Front Section Housing Assembly (Sheet 1 of 2).

REMOVAL - Continued

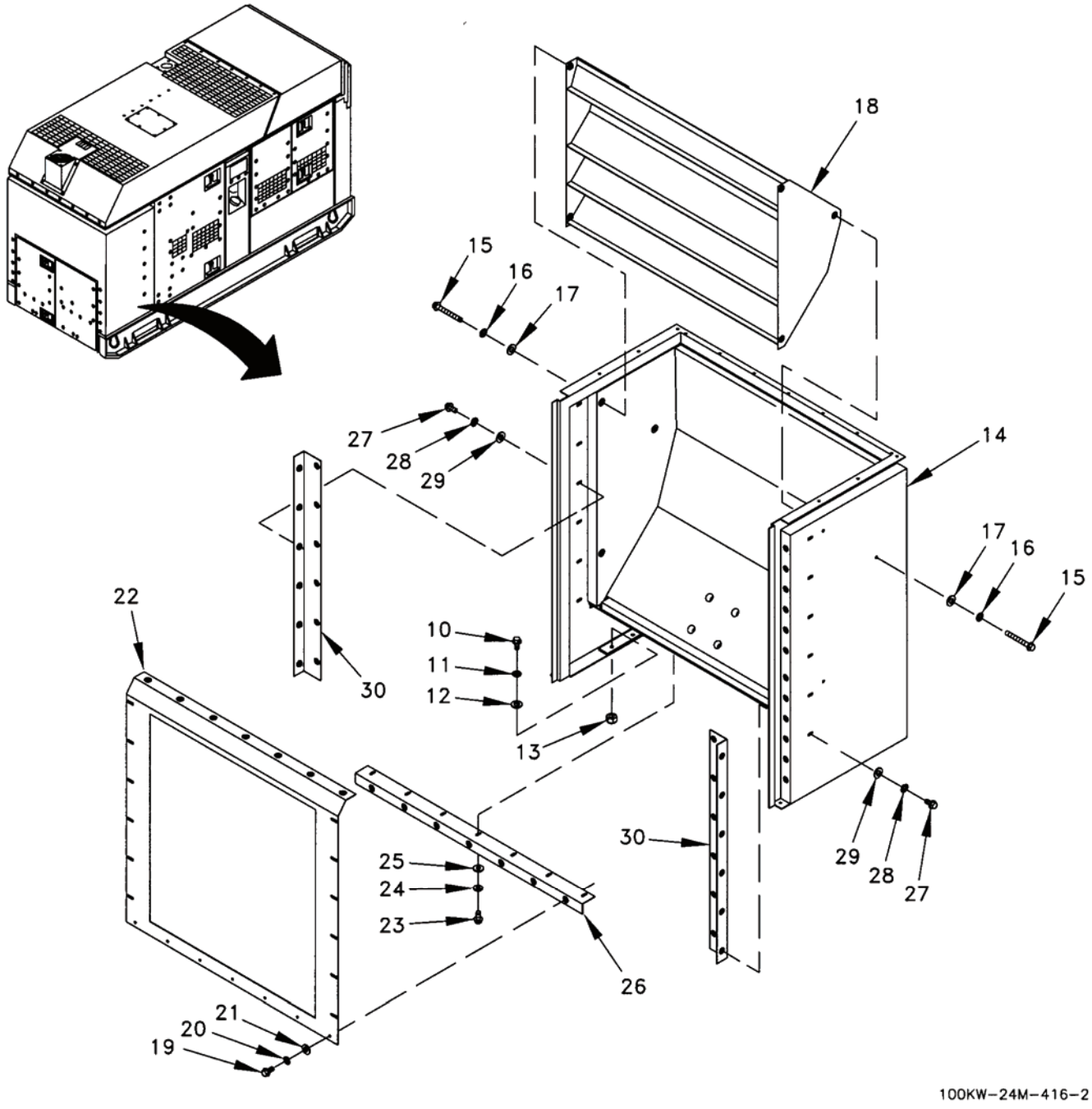


Figure 1. Front Section Housing Assembly (Sheet 2 of 2).

2. Remove six screws (Figure 1, Sheet 2, Item 10), lockwashers (Figure 1, Sheet 2, Item 11), washers (Figure 1, Sheet 2, Item 12), nuts (Figure 1, Sheet 2, Item 13) and front section housing assembly (Figure 1, Sheet 2, Item 14).

END OF TASK

DISASSEMBLY

NOTE

DISASSEMBLY should not be done until front section housing assembly has been removed.

1. Remove six screws (Figure 1, Sheet 2, Item 15), lockwashers (Figure 1, Sheet 2, Item 16), washers (Figure 1, Sheet 2, Item 17), and vane assembly (Figure 1, Sheet 2, Item 18).
2. Remove fourteen screws (Figure 1, Sheet 2, Item 19), lockwashers (Figure 1, Sheet 2, Item 20), washers (Figure 1, Sheet 2, Item 21), and plate assembly (Figure 1, Sheet 2, Item 22).
3. Remove seven screws (Figure 1, Sheet 2, Item 23), lockwashers (Figure 1, Sheet 2, Item 24), washers (Figure 1, Sheet 2, Item 25), and bracket (Figure 1, Sheet 2, Item 26).
4. Remove twelve screws (Figure 1, Sheet 2, Item 27), lockwashers (Figure 1, Sheet 2, Item 28), washers (Figure 1, Sheet 2, Item 29), and two brackets (Figure 1, Sheet 2, Item 30).
5. Remove 10 screws (Figure 1, Sheet 1, Item 5), lockwashers (Figure 1, Sheet 1, Item 6), washers (Figure 1, Sheet 1, Item 7), nuts (Figure 1, Sheet 1, Item 8) and door flanges (Figure 1, Sheet 1, Item 9).
6. Remove three foam damping sheets as required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sheets as templates to cut new foam damping sheets.
2. Install door flanges (Figure 1, Sheet 1, Item 9) and secure with 10 screws (Figure 1, Sheet 1, Item 5), lockwashers (Figure 1, Sheet 1, Item 6), washers (Figure 1, Sheet 1, Item 7), and nuts (Figure 1, Sheet 1, Item 8).
3. Install three foam damping sheets.
4. Install two brackets (Figure 1, Sheet 2, Item 30), twelve washers (Figure 1, Sheet 2, Item 29), lockwashers (Figure 1, Sheet 2, Item 28), and screws (Figure 1, Sheet 2, Item 27).
5. Install bracket (Figure 1, Sheet 2, Item 26), seven washers (Figure 1, Sheet 2, Item 25), lockwashers (Figure 1, Sheet 2, Item 24), and screws (Figure 1, Sheet 2, Item 23).
6. Install plate assembly (Figure 1, Sheet 2, Item 22) and secure with fourteen washers (Figure 1, Sheet 2, Item 21), lockwashers (Figure 1, Sheet 2, Item 20), and screws (Figure 1, Sheet 2, Item 19).
7. Install vane assembly (Figure 1, Sheet 2, Item 18) and secure with six washers (Figure 1, Sheet 2, Item 17), lockwashers (Figure 1, Sheet 2, Item 16), and screws (Figure 1, Sheet 2, Item 15).

END OF TASK

INSTALLATION

1. Install front section housing assembly (Figure 1, Sheet 2, Item 14) and secure with six screws (Figure 1, Sheet 2, Item 10), lockwashers (Figure 1,Sheet 2, Item 11), washers (Figure 1, Sheet 2, Item 12), , and locknuts (Figure 1, Sheet 2, Item 13).
2. Install four screws (Figure 1, Sheet 1, Item 1), lockwashers (Figure 1, Sheet 1, Item 2), washers (Figure 1, Sheet 1, Item 3), and nuts (Figure 1, Sheet 1, Item 4).
3. Install engine generator compartment ceiling (WP 0031).
4. Install front roof section housing (WP 0029).
5. Install battery disconnect switch (WP 0050).
6. Install slave receptacle (WP 0053).
7. Install batteries (WP 0049).
8. Install winterization heater assembly, if removed (WP 0092).
9. Install right front door assembly (latch) (WP 0025).
10. Install left front door assembly (latch) (WP 0021).
11. Install left battery access door assembly (WP 0019).
12. Install right battery access door assembly (WP 0018).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

REAR SECTION HOUSING ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Foam damping sheet (WP 0120, Item 11)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Control box assembly removed (WP 0041)
Generator access cover assembly removed (WP 0032)
Left rear door assembly (latch) removed (WP 0023)
Right rear door assembly (latch) removed (WP 0028)
Winterization heater control box assembly removed, if applicable (WP 0091)
Rear roof section housing assembly removed (WP 0030)
Potential transformers PT2 and PT3 removed (WP 0052)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Remove three screws (Figure 1, Item 1), lockwashers (Figure 1, Item 2), and washers (Figure 1, Item 3).
2. Remove two screws (Figure 1, Item 4), lockwasher (Figure 1, Item 5), and washer (Figure 1, Item 6).
3. Remove six screws (Figure 1, Item 7), lockwashers (Figure 1, Item 8), and washers Figure 1, Item 9).
4. Remove four screws (Figure 1, Item 10), lockwashers (Figure 1, Item 11), and washers (Figure 1, Item 12) and rear section housing assembly (Figure 1, Item 13).

REMOVAL - Continued

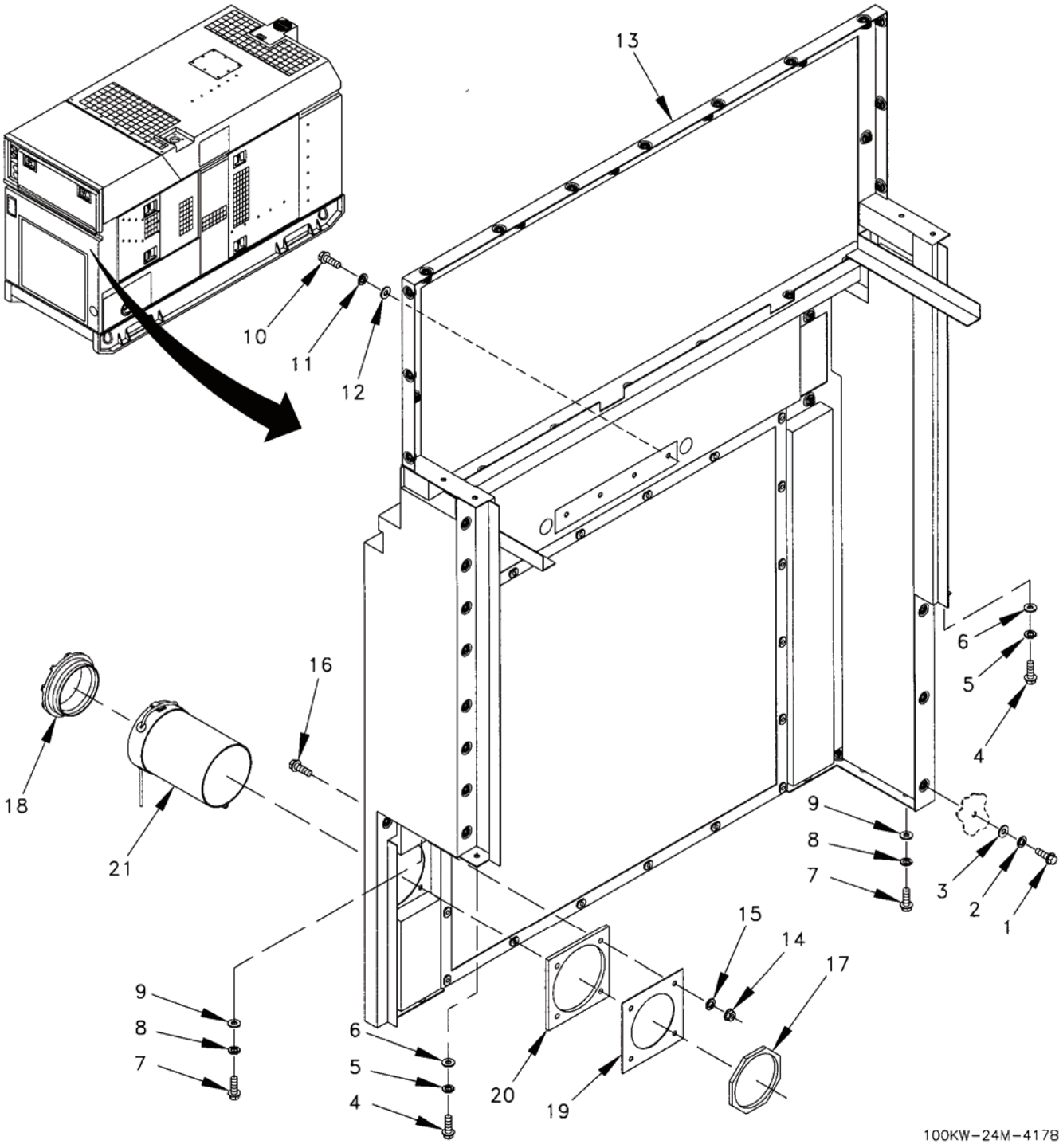


Figure 1. Rear Section Housing Assembly.

END OF TASK

DISASSEMBLY

1. Remove four nuts (Figure 1, Item 14), washers (Figure 1, Item 15), screws (Figure 1, Item 16), lockring (Figure 1, Item 17), bushing (Figure 1, Item 18), retainer plate (Figure 1, Item 19), spacer (Figure 1, Item 20), and sleeve (Figure 1, Item 21).

2. Remove six foam damping sections as required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sections as templates to cut new foam damping sections. Install six foam damping sections.

2. Install sleeve (Figure 1, Item 21), spacer (Figure 1, Item 20), retainer plate (Figure 1, Item 19), bushing (Figure 1, Item 18), lockring (Figure 1, Item 17), four screws (Figure 1, Item 16), washers (Figure 1, Item 15), and nuts (Figure 1, Item 14).

END OF TASK

INSTALLATION

1. Install rear section housing assembly (Figure 1, Item 13).

2. Install four screws (Figure 1, Item 10), lockwashers (Figure 1, Item 11), and washers (Figure 1, Item 12) to rear section housing assembly (Figure 1, Item 13).

3. Install six screws (Figure 1, Item 7), lockwashers (Figure 1, Item 8), and washers Figure 1, Item 9).

4. Install two screws (Figure 1, Item 4), lockwasher (Figure 1, Item 5), and washer (Figure 1, Item 6).

5. Install three screws (Figure 1, Item 1), lockwashers (Figure 1, Item 2), and washers (Figure 1, Item 3).

6. If removed, install winterization heater control box assembly (WP 0091).

7. Install generator access cover assembly (WP 0032).

8. Install control box assembly (WP 0041).

9. Install rear roof section housing assembly (WP 0030).

10. Install potential transformers PT2 and PT3 (WP 0052).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

LEFT CENTER PANEL ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Materials/Parts

Foam damping sheet (WP 0120, Item 10)
Foam damping sheet (WP 0120, Item 11)

Equipment Condition

Left rear door assembly removed (WP 0022)
Left rear panel removed (WP 0038)

Personnel Required

One

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Remove ten nuts (Figure 1, item 1) and screws (Figure 1, item 2) to release left center panel assembly (Figure 1, item 3) from filler neck pocket (Figure 1, item 4).
2. Remove three screws (Figure 1, item 5), lockwashers (Figure 1, item 6), and washers (Figure 1, item 7) from left center panel assembly (Figure 1, item 3).
3. Remove three screws (Figure 1, Item 8), washers (Figure 1, Item 9), lockwashers (Figure 1, Item 10), and left center panel assembly (Figure 1, Item 3).
4. Remove two screws (Figure 1, Item 18), lockwashers (Figure 1, Item 19), and washers (Figure 1, Item 20).

REMOVAL - Continued

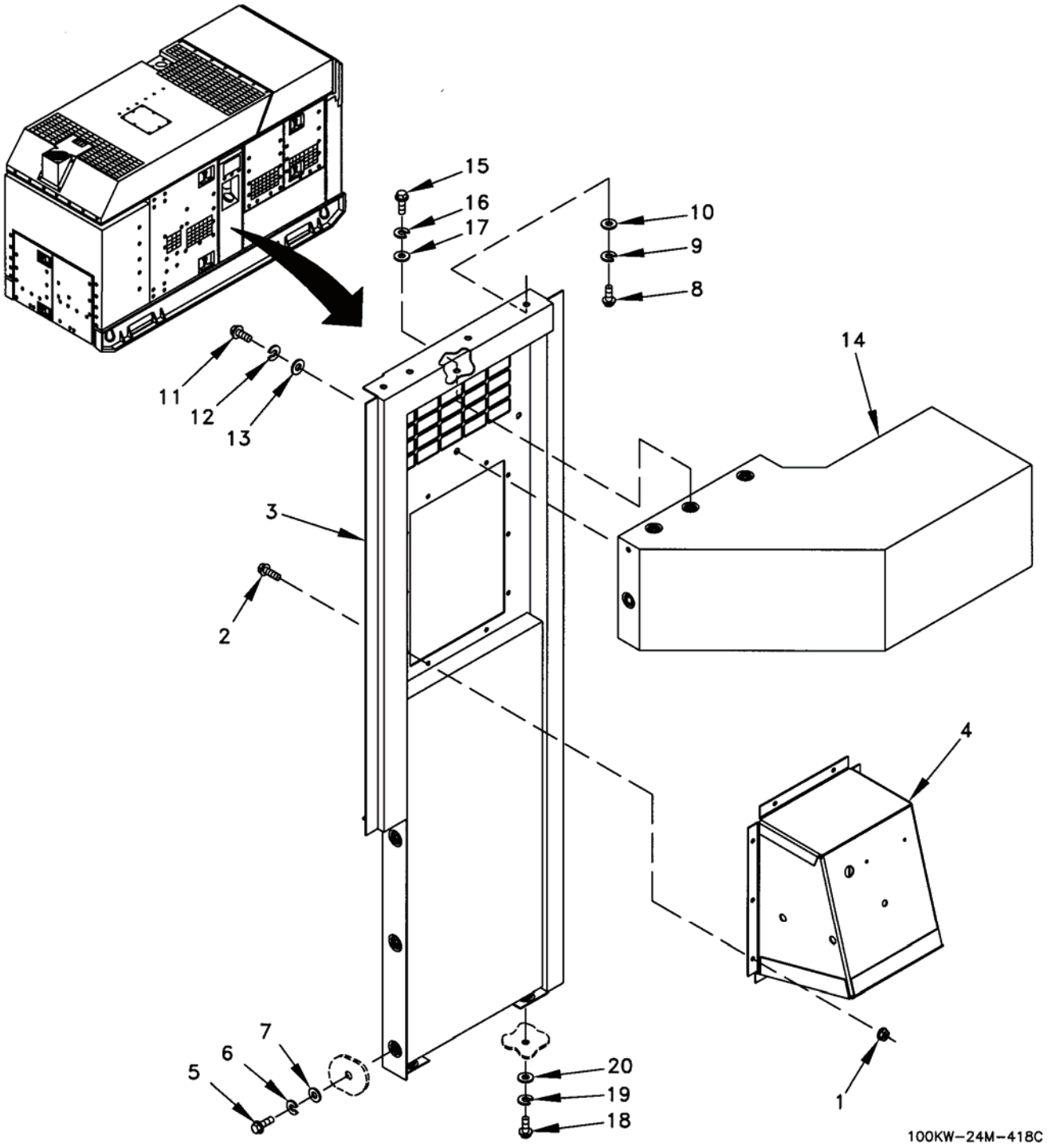


Figure 1. Left Center Panel Assembly.

END OF TASK

DISASSEMBLY

1. Remove four screws (Figure 1, Item 11), lockwashers (Figure 1, Item 12), and washers (Figure 1, Item 13), from duct (Figure 1, Item 14).

2. Remove four screws (Figure 1, Item 15), lockwashers (Figure 1, Item 16), and washers (Figure 1, Item 17), and duct (Figure 1, Item 14).

3. Remove five foam damping sections if required.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sections as templates to cut new foam damping sections. Install five foam damping sections.

2. Install duct (Figure 1, Item 14), and secure with four washers (Figure 1, Item 17), lockwashers (Figure 1, Item 16), and screws (Figure 1, Item 15).

3. Install four washers (Figure 1, Item 13), lockwashers (Figure 1, Item 12), and screws (Figure 1, Item 11).

END OF TASK

INSTALLATION

1. Install left center panel assembly (Figure 1, Item 3), and secure with four washers (Figure 1, Item 10), lockwashers (Figure 1, Item 9), and screws (Figure 1, Item 8).

2. Install two washers (Figure 1, Item 20), lockwashers (Figure 1, Item 19), and screws (Figure 1, Item 18).

3. Install three washers (Figure 1, Item 7), lockwashers (Figure 1, Item 6), and screws (Figure 1, Item 5).

4. Connect fuel filler neck pocket (Figure 1, item 4) to left center panel assembly (Figure 1, Item 3) with ten screws (Figure 1, item 2) and nuts (Figure 1, item 1).

5. Install left rear door assembly (WP 0022).

6. Install left rear panel assembly (WP 0038).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
RIGHT CENTER PANEL ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Foam damping sheet (WP 0120, Item 10)
Foam damping sheet (WP 0120, Item 11)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Right rear panel assembly removed (WP 0037)
Right front door assembly (latch) removed (WP 0025)
Coolant recovery system removed (WP 0063)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

Remove two screws (Figure 1, Item 1), five screws (Figure 1, Item 2), seven washers (Figure 1, Item 3), seven lockwashers (Figure 1, Item 4), and right center panel assembly (Figure 1, Item 5).

END OF TASK

DISASSEMBLY

1. Remove two screws (Figure 1, Item 6) and coolant recovery bracket (Figure 1, Item 7).
2. Remove 11 screws (Figure 1, Item 8) and duct (Figure 1, Item 9).

DISASSEMBLY - Continued

3. Remove six foam damping sections if required.

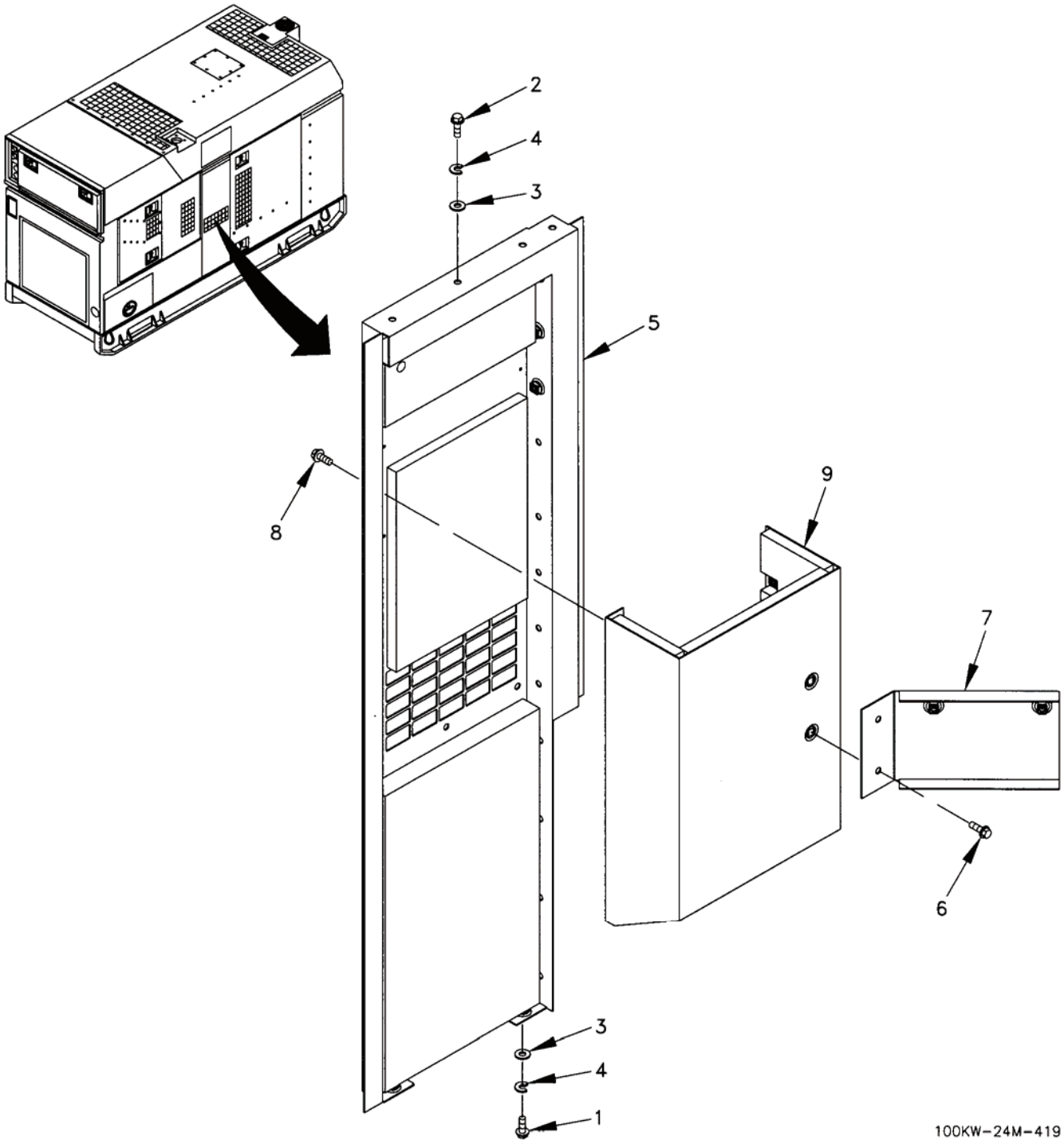


Figure 1. Right Center Panel Assembly.

END OF TASK

ASSEMBLY

1. If necessary, use old foam damping sections as templates to cut new foam damping sections. Install six new foam damping sections.

2. Install duct (Figure 1, Item 9) and secure with 11 screws (Figure 1, Item 8).

3. Install coolant recovery system and bracket (Figure 1, Item 7) and secure with two screws (Figure 1, Item 6).

END OF TASK

INSTALLATION

1. Install rear right center panel assembly (Figure 1, Item 5) and secure with seven lockwashers (Figure 1, Item 4), seven washers (Figure 1, Item 3), five screws (Figure 1, Item 2), and two screws (Figure 1, Item 1).

2. Install coolant recovery system (WP 0063).

3. Install right front door assembly (latch) (WP 0025).

4. Install right rear panel assembly (WP 0037).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

RIGHT REAR PANEL ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Foam damping sheet (WP 0120, Item 11)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

Remove three screws (Figure 1, Item 1), five screws (Figure 1, Item 2), eight lockwashers (Figure 1, Item 3), eight washers (Figure 1, Item 4), and right rear panel assembly (Figure 1, Item 5).

END OF TASK

DISASSEMBLY

Remove two foam damping sections as required.

END OF TASK

ASSEMBLY

If necessary, use old foam damping sections as templates to cut new foam damping sections. Install two foam damping sections.

END OF TASK

INSTALLATION

Install right rear panel assembly (Figure 1, Item 5), and secure with eight washers (Figure 1, Item 4), eight lockwashers (Figure 1, Item 3), five screws (Figure 1, Item 2), and three screws (Figure 1, Item 1).

INSTALLATION - Continued

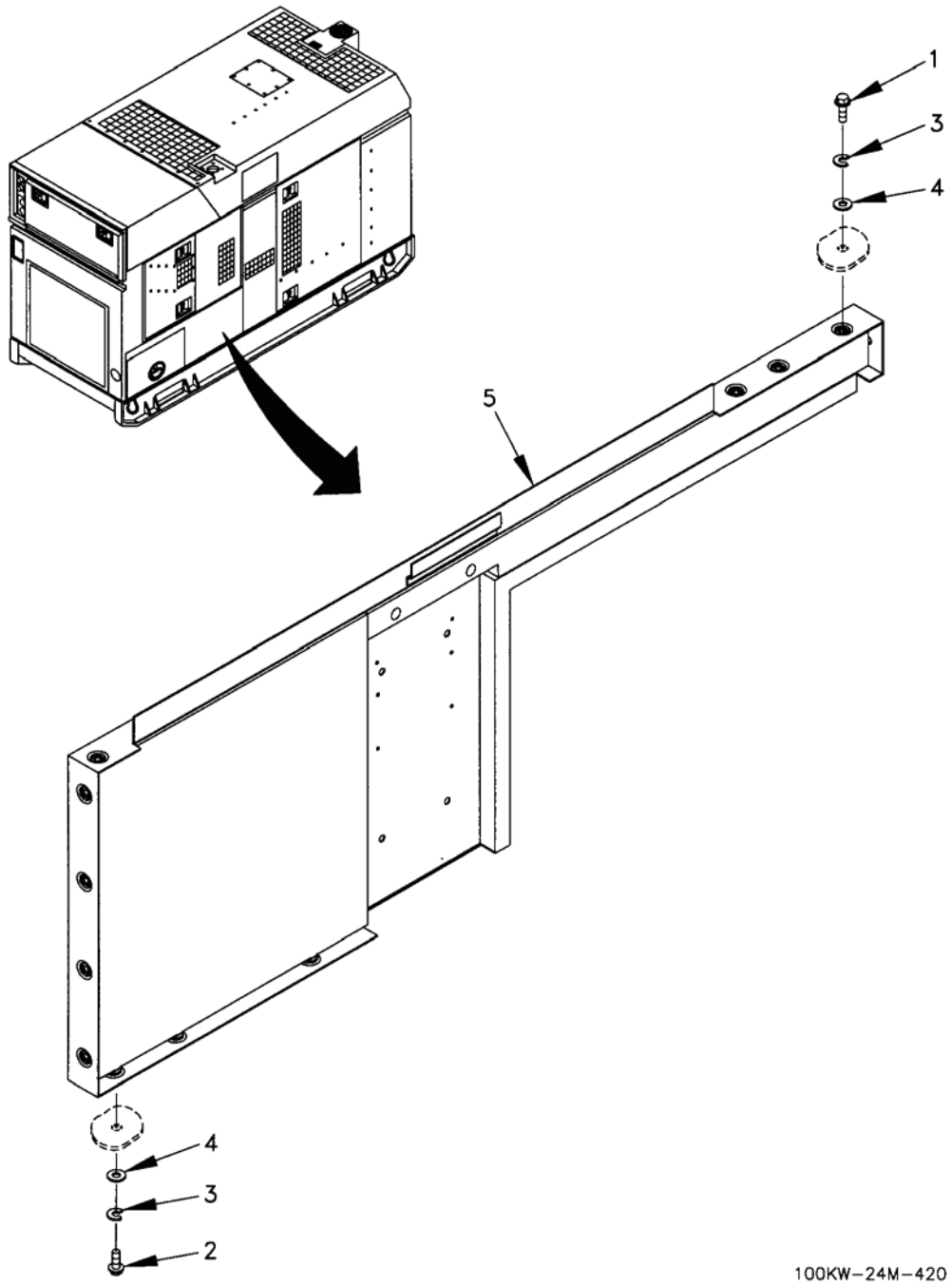


Figure 1. Right Rear Panel Assembly.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
LEFT REAR PANEL ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Materials/Parts

Foam damping sheet (WP 0120, Item 11)

Equipment Condition

Generator access cover removed (WP 0032)
Potential transformer removed (WP 0052)

Personnel Required

One

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Open left rear door assemblies.
2. Remove seven screws (Figure 1, Item 1), lockwashers (Figure 1, Item 2), and washers (Figure 1, Item 3).
3. Remove four screws (Figure 1, Item 4), lockwashers (Figure 1, Item 5), washers (Figure 1, Item 6) and left rear panel assembly (Figure 1, Item 7).

REMOVAL - Continued

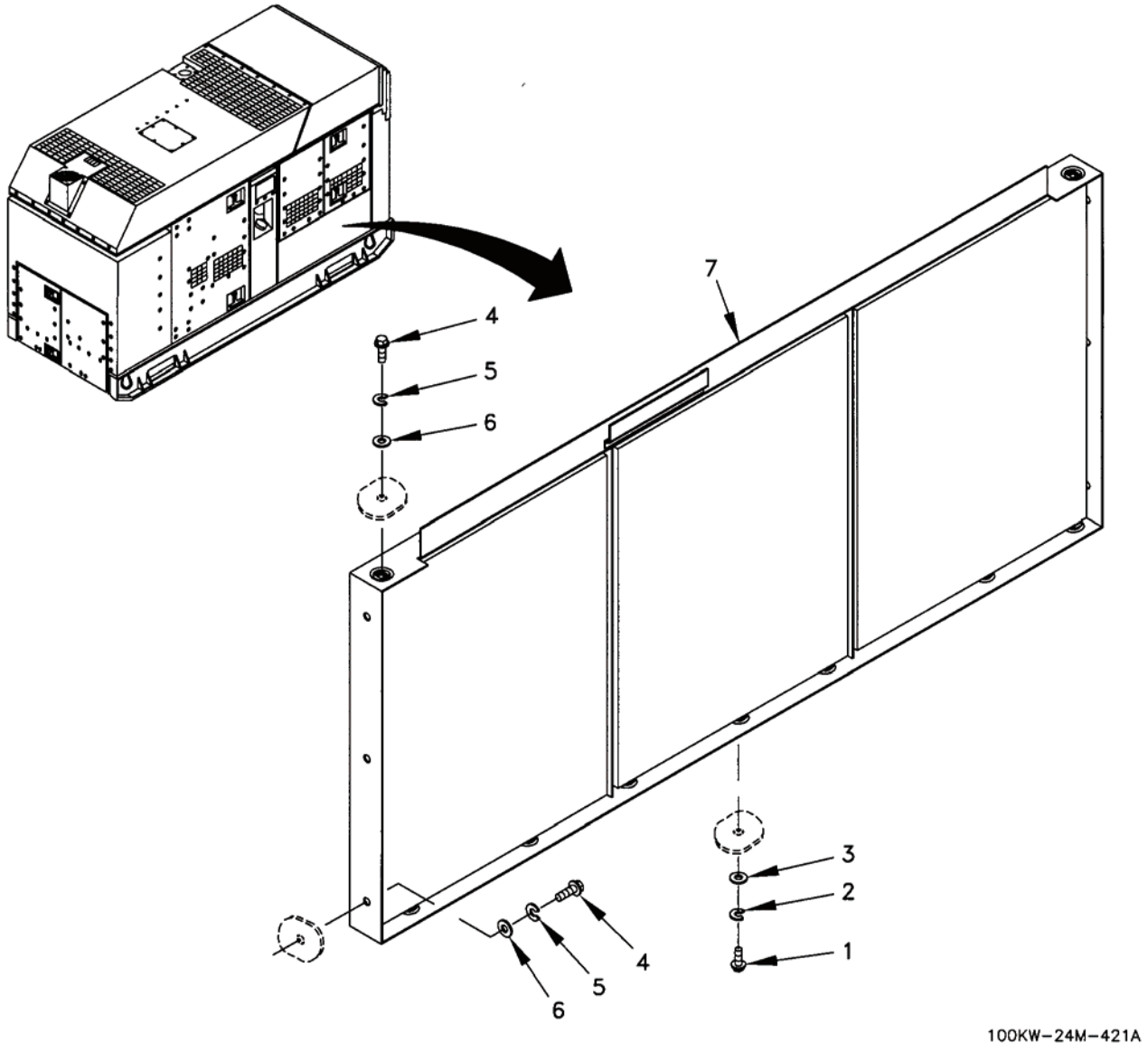


Figure 1. Left Rear Panel Assembly.

END OF TASK

DISASSEMBLY

Remove foam damping section as required.

END OF TASK

ASSEMBLY

If necessary, use old foam damping section as template to cut new foam damping section. Install foam damping section.

END OF TASK

INSTALLATION

1. Install left rear panel assembly (Figure 1, Item 7), and secure with four washers (Figure 1, Item 6), lockwashers (Figure 1, Item 5), and screws (Figure 1, Item 4).
2. Install seven washers (Figure 1, Item 3), lockwashers (Figure 1, Item 2), and screws (Figure 1, Item 1).
3. Install potential transformers (WP 0052).
4. Install generator access cover (WP 0032).
5. Close left rear door assemblies.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

DOOR SUPPORT ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Personnel Required

One

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Open load board door (Figure 1, Item 1).
2. Remove two locknuts (Figure 1, Item 2), four washers (Figure 1, Item 3), two lockwashers (Figure 1, Item 4), and two screws (Figure 1, Item 5).
3. Remove locknut (Figure 1, Item 6), two washers (Figure 1, Item 7), spacer (Figure 1, Item 8), screw (Figure 1, Item 9), and door support bracket (Figure 1, Item 10).
4. Remove locknut (Figure 1, Item 11), two washers (Figure 1, Item 12), spacer (Figure 1, Item 13), screw (Figure 1, Item 14), and link (Figure 1, Item 15).
5. Remove locknut (Figure 1, Item 16), screw (Figure 1, Item 17), washer (Figure 1, Item 18), and door support bracket (Figure 1, Item 19).
6. Remove two locknuts (Figure 1, Item 20), two screws (Figure 1, Item 21), four washers (Figure 1, Item 22), and bracket (Figure 1, Item 23) from load board (Figure 1, Item 24).

REMOVAL - Continued

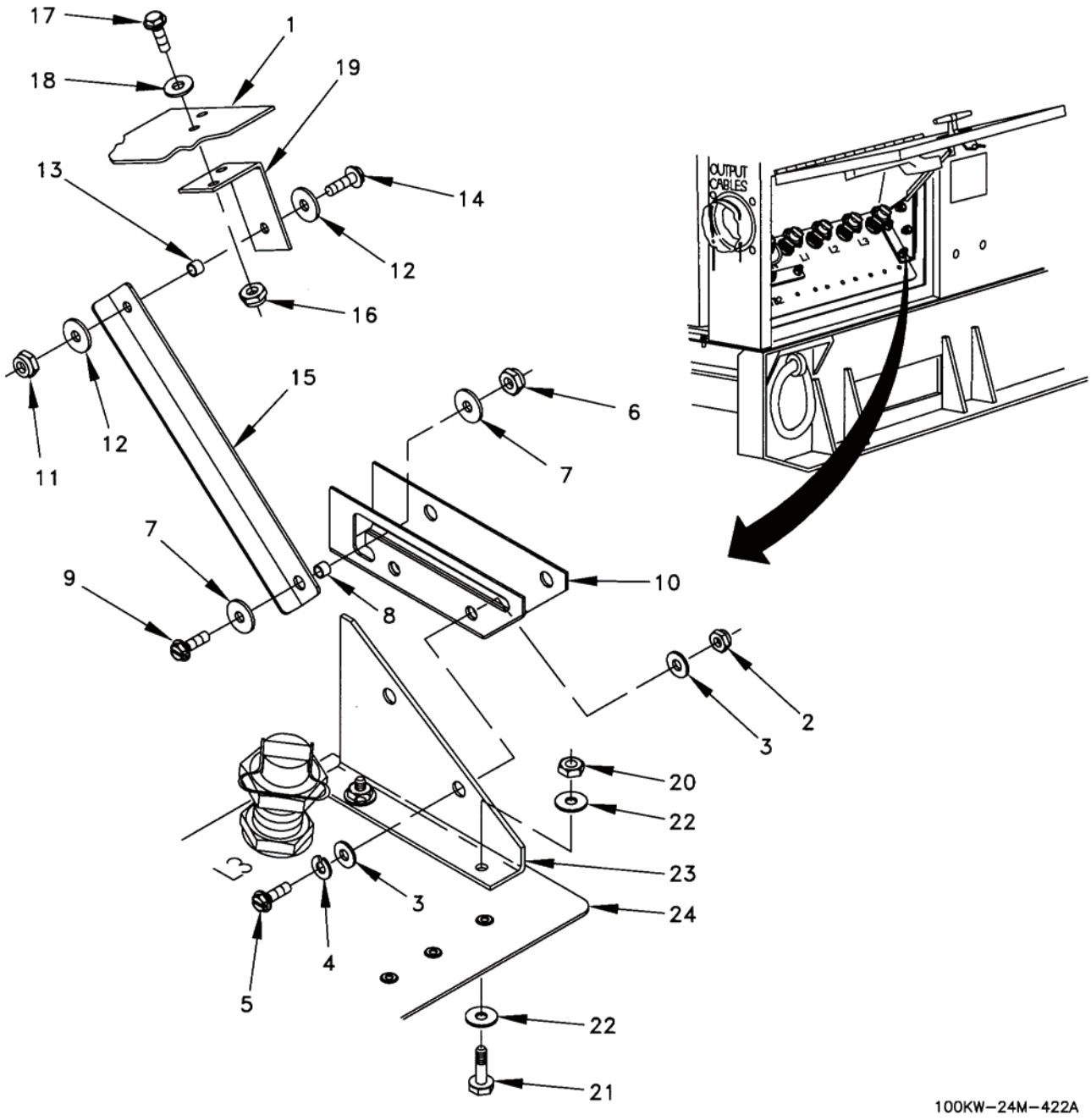


Figure 1. Door Support Assembly.

END OF TASK

INSTALLATION

1. Install bracket (Figure 1, Item 23) on load board (Figure 1, Item 24) and secure with four washers (Figure 1, Item 22), two screws (Figure 1, Item 21), and two locknuts (Figure 1, Item 20).

2. Install door support bracket (Figure 1, Item 19), and secure with washer (Figure 1, Item 18), screw (Figure 1, Item 17), and locknut (Figure 1, Item 16).

3. Install link (Figure 1, Item 15), screw (Figure 1, Item 14), spacer (Figure 1, Item 13), two washers (Figure 1, Item 12), and locknut (Figure 1, Item 11).

4. Install door support bracket (Figure 1, Item 10), and secure with screw (Figure 1, Item 9), spacer (Figure 1, Item 8), two washers (Figure 1, Item 7), and locknut (Figure 1, Item 6).

5. Install door support bracket (Figure 1, Item 10) with two screws (Figure 1, Item 5), two lockwashers (Figure 1, Item 4), four washers (Figure 1, Item 3), and two locknuts (Figure 1, Item 2).

6. Close load board door (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

CONTROL BOX PANEL ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0119, Item 1) Multimeter 146-4080	One
Materials/Parts	**References**
Sealing compound (WP 0120, Item 41)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

NOTE

Table 1 lists removal/installation steps for significant components.

Table 1. WP 0040 Guide.

NAME	FIGURE ITEM	REMOVAL STEPS	DISASSEMBLY STEPS	ASSEMBLY STEPS	INSTALLATION STEPS	TESTING
Generator Set Control (GSC)	12	1 thru 3	1 and 2	20 and 21	1 thru 5	-
Alarm Module A2	55	1 thru 3	12	10	1 thru 4	-
VOLTAGE Adjust Potentiometer	73	16	-	-	6	1 thru 7
FREQUENCY Adjust Potentiometer	75	16	-	-	6	1 thru 10

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is set to OFF/RESET, Battery Disconnect Switch is set to OFF, and DEAD CRANK SWITCH is set to OFF before proceeding.
2. Turn two latches (Figure 1, Sheet 1, Item 1) and open control box door (Figure 1, Sheet 1, Item 2). Refer to Table 1 for removal/installation steps for specific control box panel assembly items. Tag and disconnect wiring to components before removing them.
3. Release three studs (Figure 1, Sheet 1, Item 3) and lower control box panel assembly (Figure 1, Sheet 1, Item 4).

NOTE

Control box panel assembly components can be removed without removing control box panel assembly.

4. Remove three nuts (Figure 1, Sheet 2, Item 5) to remove control box panel assembly (Figure 1, Sheet 1, Item 4) from hinges (Figure 1, Sheet 3, Item 6).
5. Unhook holder (Figure 1, Sheet 1, Item 7) from control box (Figure 1, Sheet 1, Item 8) and remove control box panel assembly (Figure 1, Sheet 1, Item 4) from control box.

REMOVAL - Continued

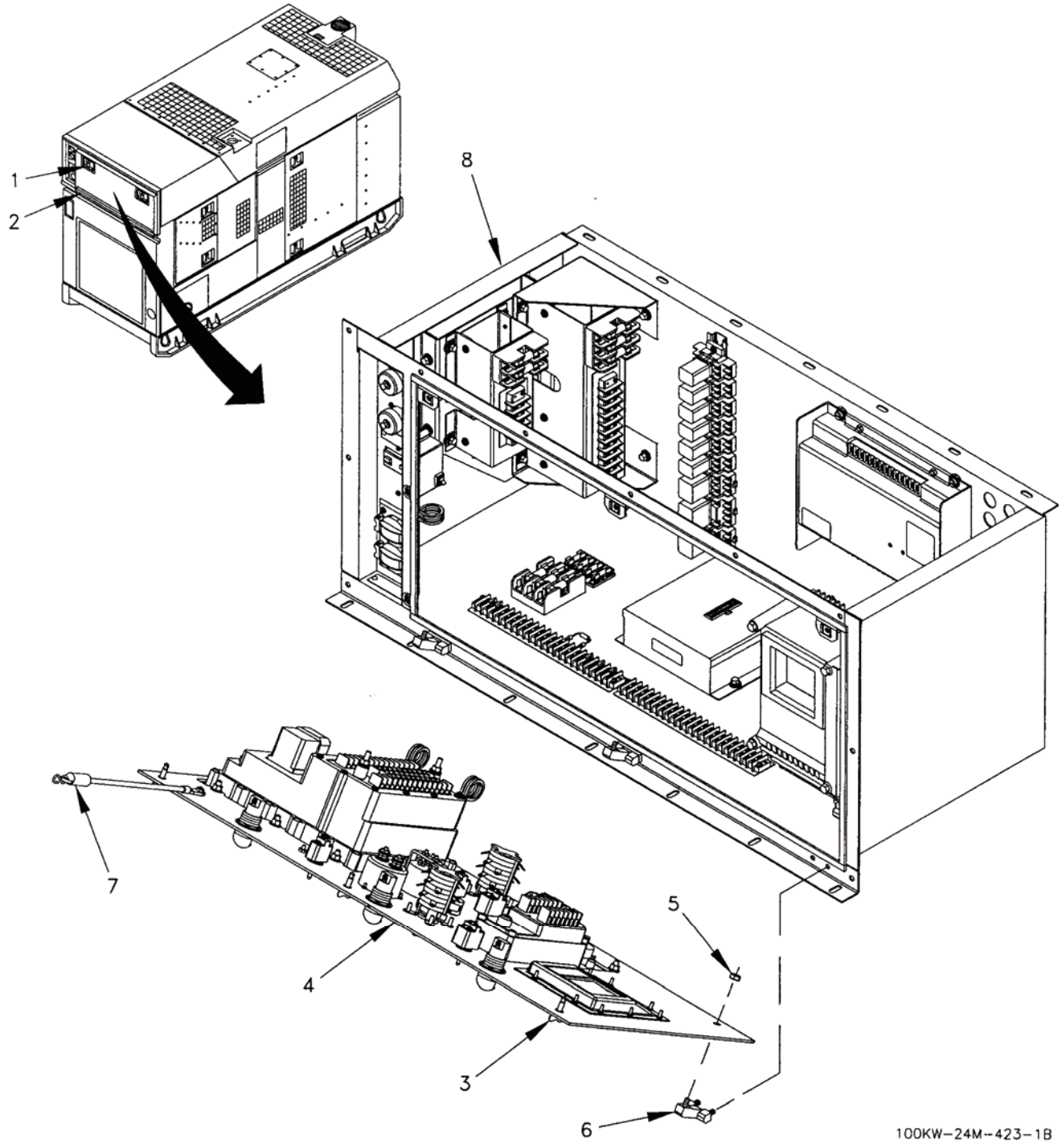


Figure 1. Control Box Panel Assembly (Sheet 1 of 4).

REMOVAL - Continued

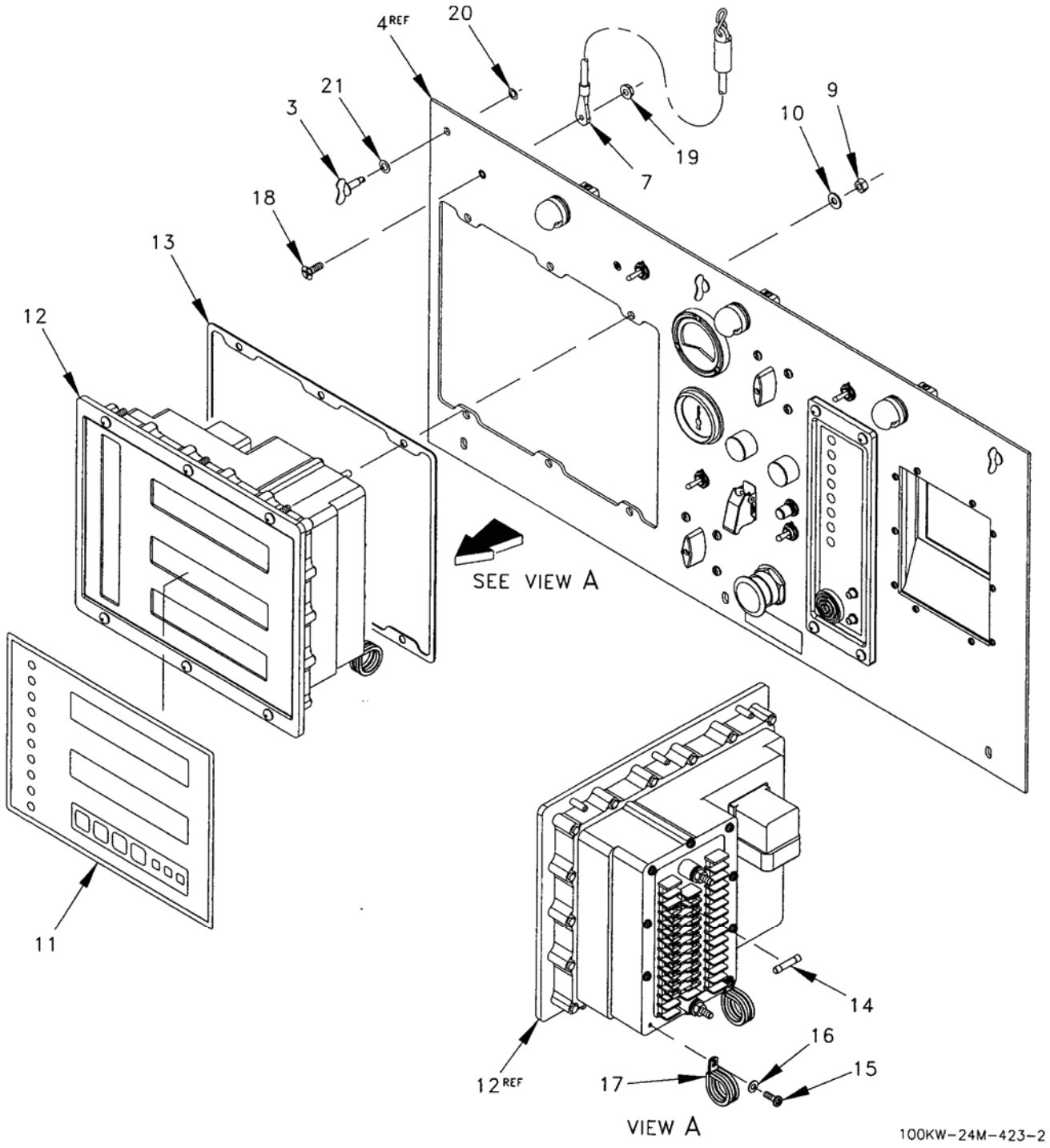


Figure 1. Control Box Panel Assembly (Sheet 2 of 4).

REMOVAL - Continued

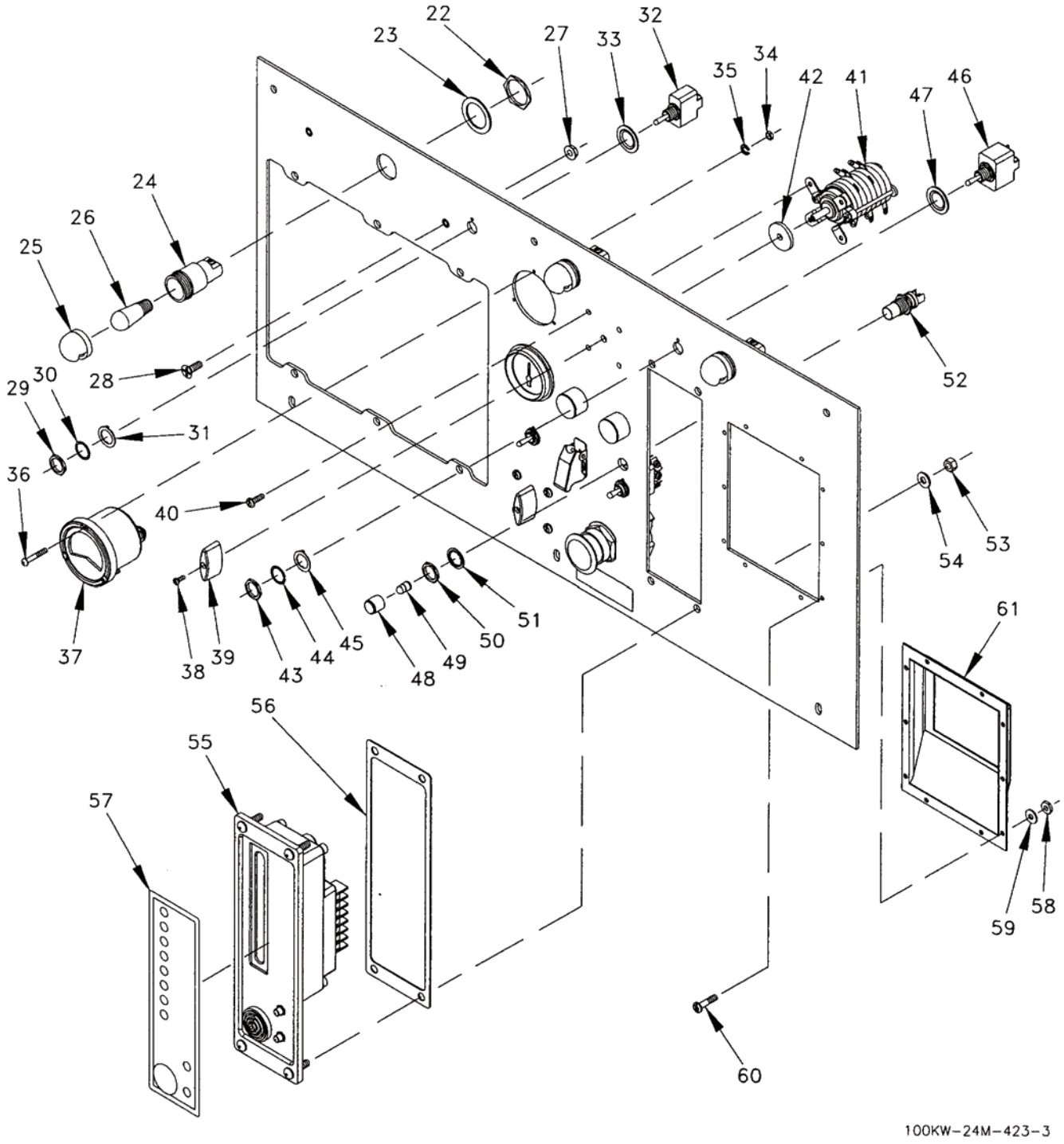


Figure 1. Control Box Panel Assembly (Sheet 3 of 4).

REMOVAL - Continued

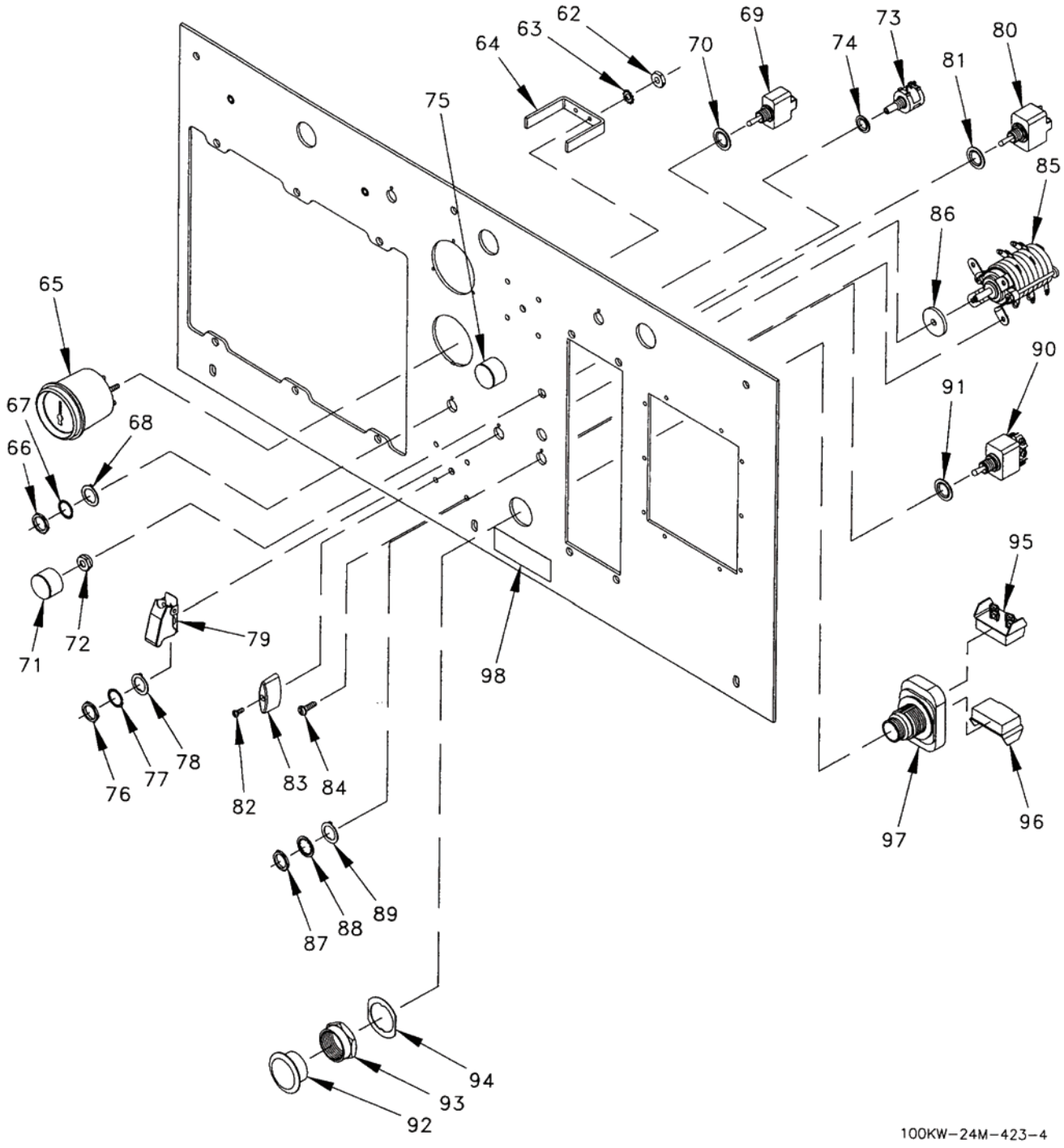


Figure 1. Control Box Panel Assembly (Sheet 4 of 4).

END OF TASK

DISASSEMBLY

1. Loosen screw on front of mating connector using 4mm allen wrench to disconnect connector P7 and remove six locknuts (Figure 1, Sheet 2, Item 9), six washers (Figure 1, Sheet 2, Item 10), film (Figure 1, Sheet 2, Item 11), generator set control (GSC) (Figure 1, Sheet 2, Item 12), and seal (Figure 1, Sheet 2, Item 13).

2. Remove 10 fuses (Figure 1, Sheet 2, Item 14), two screws (Figure 1, Sheet 2, Item 15), two washers (Figure 1, Sheet 2, Item 16), and two loop clamps (Figure 1, Sheet 2, Item 17).

3. Remove screw (Figure 1, Sheet 2, Item 18), nut (Figure 1, Sheet 2, Item 19), and holder (Figure 1, Sheet 1, Item 7).

4. Remove three retainers (Figure 1, Sheet 2, Item 20), washers (Figure 1, Sheet 2, Item 21), and studs (Figure 1, Sheet 1, Item 3).

5. Remove nut (Figure 1, Sheet 3, Item 22), washer (Figure 1, Sheet 3, Item 23), panel light (Figure 1, Sheet 3, Item 24), lens (Figure 1, Sheet 3, Item 25), and lamp (Figure 1, Sheet 3, Item 26). Repeat for other two panel lights.

6. Remove nut (Figure 1, Sheet 3, Item 27) and screw (Figure 1, Sheet 3, Item 28).

7. Remove nut (Figure 1, Sheet 3, Item 29), washer (Figure 1, Sheet 3, Item 30), anti-rotation washer (Figure 1, Sheet 3, Item 31), PANEL LIGHT switch (Figure 1, Sheet 3, Item 32), and seal (Figure 1, Sheet 3, Item 33).

8. Remove three nuts (Figure 1, Sheet 3, Item 34), lockwashers (Figure 1, Sheet 3, Item 35), screws (Figure 1, Sheet 3, Item 36), and DC ammeter (Figure 1, Sheet 3, Item 37).

9. Remove screw (Figure 1, Sheet 3, Item 38), knob (Figure 1, Sheet 3, Item 39), four screws (Figure 1, Sheet 3, Item 40), SYNC MODE switch (Figure 1, Sheet 3, Item 41), and seal (Figure 1, Sheet 3, Item 42).

10. Remove nut (Figure 1, Sheet 3, Item 43), washer (Figure 1, Sheet 3, Item 44), anti-rotation washer (Figure 1, Sheet 3, Item 45), PARALLEL/UNIT switch (Figure 1, Sheet 3, Item 46), and seal washer (Figure 1, Sheet 3, Item 47).

11. Remove lens (Figure 1, Sheet 3, Item 48), lamp (Figure 1, Sheet 3, Item 49), nut (Figure 1, Sheet 3, Item 50), washer (Figure 1, Sheet 3, Item 51), and indicator light (Figure 1, Sheet 3, Item 52).

12. Remove four locknuts (Figure 1, Sheet 3, Item 53), washers (Figure 1, Sheet 3, Item 54), custom alarm module (Figure 1, Sheet 3, Item 55), and gasket (Figure 1, Sheet 3, Item 56). If necessary, remove film (Figure 1, Sheet 3, Item 57).

13. Remove ten locknuts (Figure 1, Sheet 3, Item 58), washers (Figure 1, Sheet 3, Item 59), screws (Figure 1, Sheet 3, Item 60), and DVR adapter (Figure 1, Sheet 3, Item 61).

14. Remove two nuts (Figure 1, Sheet 4, Item 62), lockwashers (Figure 1, Sheet 4, Item 63), bracket (Figure 1, Sheet 4, Item 64), and fuel level indicator (Figure 1, Sheet 4, Item 65).

15. Remove nut (Figure 1, Sheet 4, Item 66), washer (Figure 1, Sheet 4, Item 67), seal (Figure 1, Sheet 4, Item 68), AUX FUEL switch (Figure 1, Sheet 4, Item 69), and seal (Figure 1, Sheet 4, Item 70).

DISASSEMBLY - Continued

NOTE

VOLTAGE and FREQUENCY adjust potentiometers should be tested prior to removal.

16. Remove knob (Figure 1, Sheet 4, Item 71), nut (Figure 1, Sheet 4, Item 72), VOLTAGE adjust potentiometer (Figure 1, Sheet 4, Item 73), and seal (Figure 1, Sheet 4, Item 74). Repeat for FREQUENCY adjust potentiometer (Figure 1, Sheet 4, Item 75).

17. Remove nut (Figure 1, Sheet 4, Item 76), washer (Figure 1, Sheet 4, Item 77), seal (Figure 1, Sheet 4, Item 78), switch guard (Figure 1, Sheet 4, Item 79), BATTLE SHORT switch (Figure 1, Sheet 4, Item 80), and seal (Figure 1, Sheet 4, Item 81).

18. Remove screw (Figure 1, Sheet 4, Item 82), knob (Figure 1, Sheet 4, Item 83), four screws (Figure 1, Sheet 4, Item 84), ENGINE CONTROL switch (Figure 1, Sheet 4, Item 85), and seal (Figure 1, Sheet 4, Item 86).

19. Remove nut (Figure 1, Sheet 4, Item 87), washer (Figure 1, Sheet 4, Item 88), four screws (Figure 1, Sheet 4, Item 89), AC CIRCUIT INTERRUPTER switch (Figure 1, Sheet 4, Item 90), and seal washer (Figure 1, Sheet 4, Item 91).

20. Remove lens (Figure 1, Sheet 4, Item 92), nut (Figure 1, Sheet 4, Item 93), seal (Figure 1, Sheet 4, Item 94), two block contacts (Figure 1, Sheet 4, Item 95) and (Figure 1, Sheet 4, Item 96), and PUSH TO STOP EMERGENCY STOP switch (Figure 1, Sheet 4, Item 97).

21. If necessary, remove label (Figure 1, Sheet 4, Item 98).

END OF TASK

TESTING

VOLTAGE Adjust Potentiometer Test

1. Disconnect wires from terminals 7 and 45 of DVR A3.

2. Set multimeter to measure 10,000 ohms and connect multimeter leads to wires removed from terminals 7 and 45 of DVR A3.

3. Rotate potentiometer shaft counterclockwise as far as it will go.

4. Slowly and smoothly rotate VOLTAGE adjust potentiometer shaft clockwise as far as it will go while observing multimeter.

5. Multimeter indication shall increase at an even rate from 0 - 10,000 ohms. Maximum resistance may vary + or – 1000 ohms.

6. If multimeter indication changes erratically or is not at maximum ohms when rotation is complete, the potentiometer is defective and must be replaced.

7. If there is no continuity at any position of potentiometer, troubleshoot wiring between potentiometer and DVR A3 or replace potentiometer.

TESTING - Continued

FREQUENCY Adjust Potentiometer Test

1. Disconnect wires from terminals 26, 27, and 28 of LSM A4.
2. Set multimeter to measure 10,000 ohms and connect multimeter leads to wires removed from terminals 27and 28 of LSM A4.
3. Rotate potentiometer shaft counterclockwise as far as it will go.
4. Slowly and smoothly rotate FREQUENCY adjust potentiometer shaft clockwise as far as it will go while observing multimeter and note indication.
5. Connect multimeter leads to wires removed from terminals 26 and 27 of LSM A4.
6. Rotate potentiometer shaft clockwise as far as it will go.
7. Slowly and smoothly rotate FREQUENCY adjust potentiometer shaft counterclockwise as far as it will go while observing multimeter.
8. Multimeter indication shall increase at an even rate from 0-10,000 ohms for each setup. Maximum resistance may vary + or – 1000 ohms.
9. If multimeter indication changes erratically or is not at maximum ohms when rotation is complete, the potentiometer is defective and must be replaced.
10. If there is no continuity at any position of potentiometer, troubleshoot wiring between potentiometer and LSM A4 or replace potentiometer.

END OF TASK

ASSEMBLY

1. If removed, install label (Figure 1, Sheet 4, Item 98).
2. Install PUSH TO STOP EMERGENCY STOP switch (Figure 1, Sheet 4, Item 97), two block contacts (Figure 1, Sheet 4, Item 96) and (Figure 1, Sheet 4, Item 95), seal (Figure 1, Sheet 4, Item 94), nut (Figure 1, Sheet 4, Item 93), and lens (Figure 1, Sheet 4, Item 92).
3. Install seal washer (Figure 1, Sheet 4, Item 91), AC CIRCUIT INTERRUPTER switch (Figure 1, Sheet 4, Item 90), four screws (Figure 1, Sheet 4, Item 89), washer (Figure 1, Sheet 4, Item 88), and nut (Figure 1, Sheet 4, Item 87).
4. Install seal (Figure 1, Sheet 4, Item 86), ENGINE CONTROL switch (Figure 1, Sheet 4, Item 85), four screws (Figure 1, Sheet 4, Item 84), knob (Figure 1, Sheet 4, Item 83), and screw (Figure 1, Sheet 4, Item 82).
5. Install seal (Figure 1, Sheet 4, Item 81), BATTLE SHORT switch (Figure 1, Sheet 4, Item 80), switch guard (Figure 1, Sheet 4, Item 79), anti-rotation washer (Figure 1, Sheet 4, Item 78), washer (Figure 1, Sheet 4, Item 77), and nut (Figure 1, Sheet 4, Item 76).
6. Install FREQUENCY adjust potentiometer (Figure 1, Sheet 4, Item 75), seal (Figure 1, Sheet 4, Item 74), nut (Figure 1, Sheet 4, Item 72), and knob (Figure 1, Sheet 4, Item 71). Repeat for VOLTAGE adjust potentiometer (Figure 1, Sheet 4, Item 73).

ASSEMBLY - Continued

7. Install seal (Figure 1, Sheet 4, Item 70), AUX FUEL switch (Figure 1, Sheet 4, Item 69), anti-rotation washer (Figure 1, Sheet 4, Item 68), washer (Figure 1, Sheet 4, Item 67), and nut (Figure 1, Sheet 4, Item 66).

8. Install fuel level indicator (Figure 1, Sheet 4, Item 65), bracket (Figure 1, Sheet 4, Item 64), two lockwashers (Figure 1, Sheet 4, Item 63), and nuts (Figure 1, Sheet 4, Item 62).

9. Install DVR adapter (Figure 1, Sheet 3, Item 61), ten screws (Figure 1, Sheet 3, Item 60), washers (Figure 1, Sheet 3, Item 59), and locknuts (Figure 1, Sheet 3, Item 58).

10. If removed, install film (Figure 1, Sheet 3, Item 57) on custom alarm module (Figure 1, Sheet 3, Item 55). Install gasket (Figure 1, Sheet 3, Item 56), custom alarm module (Figure 1, Sheet 3, Item 55), four washers (Figure 1, Sheet 3, Item 54), and locknuts (Figure 1, Sheet 3, Item 53).

11. Install indicator light (Figure 1, Sheet 3, Item 52), washer (Figure 1, Sheet 3, Item 51), nut (Figure 1, Sheet 3, Item 50), lamp (Figure 1, Sheet 3, Item 49), and lens (Figure 1, Sheet 3, Item 48).

12. Install seal washer (Figure 1, Sheet 3, Item 47), PARALLEL/UNIT switch (Figure 1, Sheet 3, Item 46), seal (Figure 1, Sheet 3, Item 45), washer (Figure 1, Sheet 3, Item 44), and nut (Figure 1, Sheet 3, Item 43).

13. Install seal (Figure 1, Sheet 3, Item 42), SYNC MODE switch (Figure 1, Sheet 3, Item 41), four screws (Figure 1, Sheet 3, Item 40), knob (Figure 1, Sheet 3, Item 39), and screw (Figure 1, Sheet 3, Item 38).

14. Install DC ammeter (Figure 1, Sheet 3, Item 37), three screws (Figure 1, Sheet 3, Item 36), lockwashers (Figure 1, Sheet 3, Item 35), and nuts (Figure 1, Sheet 3, Item 34).

15. Install seal (Figure 1, Sheet 3, Item 33), PANEL LIGHT switch (Figure 1, Sheet 3, Item 32), seal (Figure 1, Sheet 3, Item 31), washer (Figure 1, Sheet 3, Item 30), and nut (Figure 1, Sheet 3, Item 29).

16. Install screw (Figure 1, Sheet 3, Item 28) and nut (Figure 1, Sheet 3, Item 27).

17. Install lamp (Figure 1, Sheet 3, Item 26), lens (Figure 1, Sheet 3, Item 25), panel light (Figure 1, Sheet 3, Item 24), washer (Figure 1, Sheet 3, Item 23), and nut (Figure 1, Sheet 3, Item 22). Repeat for other two panel lights.

18. Install three studs (Figure 1, Sheet 1, Item 3), washers (Figure 1, Sheet 2, Item 21), and retainers (Figure 1, Sheet 2, Item 20).

19. Install holder (Figure 1, Sheet 1, Item 7), nut (Figure 1, Sheet 2, Item 19), and screw (Figure 1, Sheet 2, Item 18).

20. Install two loop clamps (Figure 1, Sheet 2, Item 17), two washers (Figure 1, Sheet 2, Item 16), two screws (Figure 1, Sheet 2, Item 15), and ten fuses (Figure 1, Sheet 2, Item 14).

21. Install seal (Figure 1, Sheet 2, Item 13), generator set control (GSC) (Figure 1, Sheet 2, Item 12), film (Figure 1, Sheet 2, Item 11), six washers (Figure 1, Sheet 2, Item 10), and six locknuts (Figure 1, Sheet 2, Item 9).

22. Install connector P7 and tighten screw on front of mating connector using 4mm allen wrench.

END OF TASK

INSTALLATION

1. Install control box panel assembly (Figure 1, Sheet 1, Item 4) on control box (Figure 1, Sheet 1, Item 8) and hook holder (Figure 1, Sheet 2, Item 7) to control box.

NOTE

Remove tags and connect wiring as required.

2. Install control panel assembly (Figure 1, Sheet 1, Item 4) onto three hinges (Figure 1, Sheet 1, Item 6) and secure with nuts (Figure 1, Sheet 1, Item 5).

3. Raise control box panel assembly (Figure 1, Sheet 1, Item 4) and secure three studs (Figure 1, Sheet 1, Item 3).

4. Close control box door (Figure 1, Sheet 1, Item 2), and turn two latches (Figure 1, Sheet 1, Item 1) to secure.

5. Restore power by setting DEAD CRANK SWITCH to NORMAL, Battery Disconnect Switch ON, and ENGINE CONTROL switch to OFF/RESET.

6. If GSC has been removed and installed, reprogram to restore required generator set values and parameters (WP 0085).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

CONTROL BOX ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Materials/Parts

Gasket

Equipment Condition

Front roof section removed (WP 0029)

Personnel Required

One

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

NOTE

Disassembly of the control panel can be accomplished on or off the generator set, however access to some components may be improved if control box is removed. Table 1 lists specific steps for disassembly and assembly of significant control box components.

Table 1. WP 0041 Guide.

NAME	FIGURE 2 ITEM	DISASSEMBLY STEPS	ASSEMBLY STEPS	RELATED STEPS
AC Transformer Box (ATB) A5	45	1, 2, and 14	16	
Alarm Reset (AR)	73	1, 2, and 20	10	
Auxiliary Fuel Pump Relay (AFPR)	72	1, 2, and 20	10	
Bus Transformer Box (BTB) A6	19	1, 2, and 7	23	
Cool Down Relay (CDR)	71	1, 2, and 20	10	
Dead Bus Relay, High Voltage Sensing (DBHI)	79	1, 2, and 21	9	
Dead Bus Relay, Low Voltage Sensing (DBLO)	78	1, 2, and 21	9	
Digital Voltage Regulator (DVR) A3	98	1, 2, and 26	4	
Relay Field Flash (KFF)	75	1, 2, and 20	10	
Generator Fault Relay (GFR)	74	1, 2, and 20	10	
Ground Fault Circuit Interrupter (GFCI)	42	1, 2, and 13	17	
Load Sharing Module (LSM) A4	28	1, 2, and 9	21	Adjustment 1 thru 4
Main Contactor Relay (KR)	70	1, 2, and 20	10	
Overload/Short Circuit Module	24	1, 2, and 8	22	
Paralleling Relay (PAR)	81	1, 2, and 22	8	
Resistor Assembly A7	112	1, 2, and 28	2	

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is set to OFF/RESET, Battery Disconnect Switch is set to OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Tag and disconnect harness connector P30 from Control Box connector J30.
3. Tag and disconnect harness connector P31 from Control Box connector J31.
4. Tag and disconnect ECM to EMCP harness connector ENG-P37 from Control Box connector J37.
5. Remove ground wire (Figure 1, Item 1), washer (Figure 1, Item 2) and locknut (Figure 1, Item 3) from back of control box terminal (Figure 1, Item 4).

REMOVAL - Continued

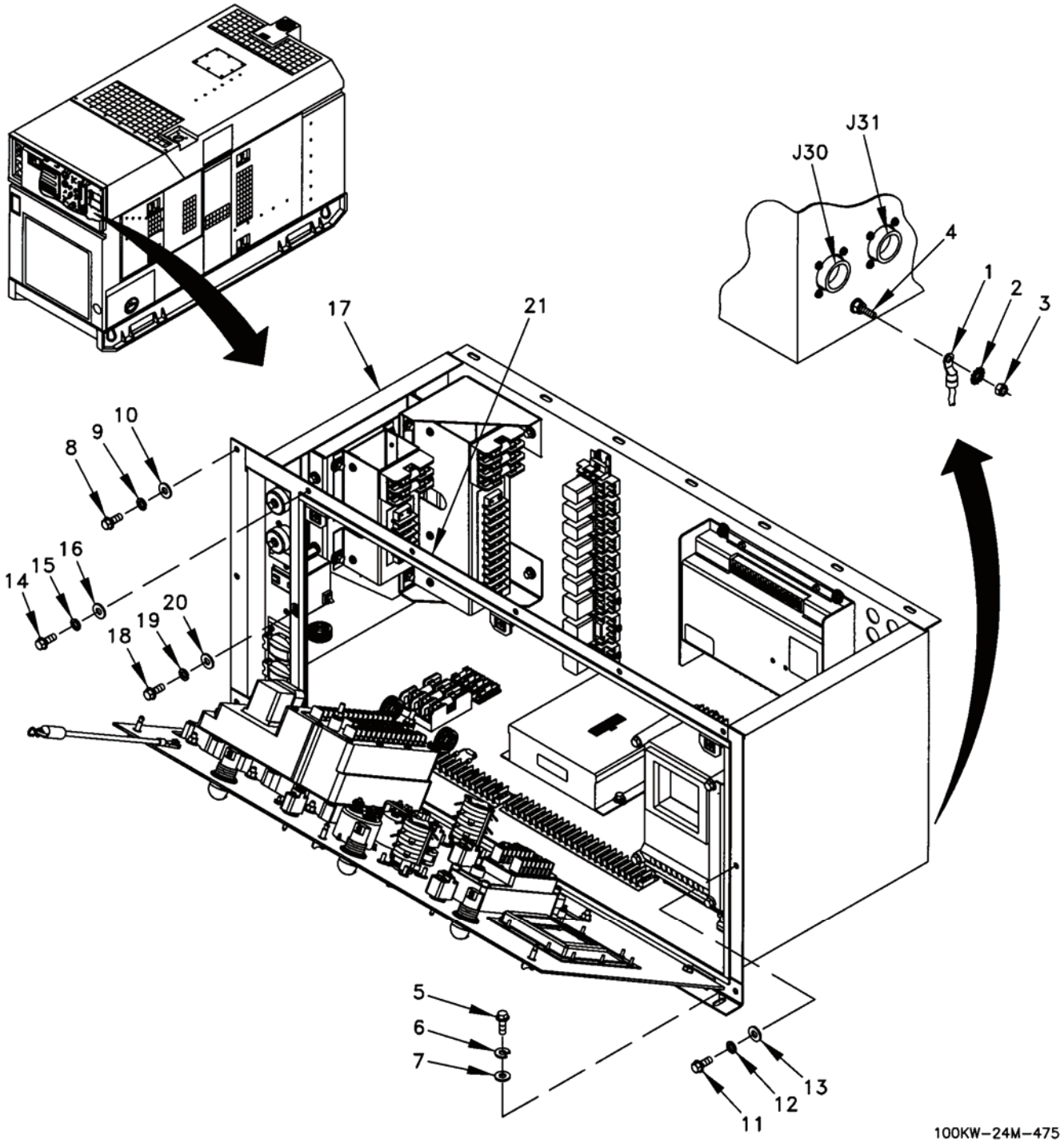


Figure 1. Control Box.

REMOVAL - Continued

6. Remove seven screws (Figure 1, Item 5), lockwashers (Figure 1, Item 6), and washers (Figure 1, Item 7).
7. Remove three screws (Figure 1, Item 8), lockwashers (Figure 1, Item 9), and washers (Figure 1, Item 10).
8. Remove two screws (Figure 1, Item 11), lockwashers (Figure 1, Item 12), and washers (Figure 1, Item 13).
9. Remove five screws (Figure 1, Item 14), lockwashers (Figure 1, Item 15), and washers (Figure 1, Item 16).
10. Slide Control Box (Figure 1, Item 17) out of generator set and place on suitable work surface.
11. If necessary, remove two screws (Figure 1, Item 18), lockwashers (Figure 1, Item 19), washers (Figure 1, Item 20), and brace (Figure 1, Item 21).

END OF TASK

DISASSEMBLY

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is set to OFF/RESET, Battery Disconnect Switch is set to OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Open control box door and control box panel assembly. Control box panel assembly may be removed for access if necessary (WP 0040). Refer to Table 1, WP 0041 Guide, to find disassembly and assembly steps for specific control box assembly items. Tag and disconnect wiring to components before removing them.
3. Remove three receptacles (Figure 2, Sheet 1, Item 1).

NOTE

Tag jumper locations before removal.

4. To remove terminal block TB4 (Figure 2, Sheet 1, Item 2), remove two nuts (Figure 2, Sheet 1, Item 3), screws (Figure 2, Sheet 1, Item 4), terminal block, and strip (Figure 2, Sheet 1, Item 5). Remove ten screws (Figure 2, Sheet 1, Item 6) and jumpers (Figure 2, Sheet 1, Item 7). Repeat for terminal block TB3. On TB4 only, remove two screws (Figure 2, Sheet 1, Item 8), diode (Figure 2, Sheet 1, Item 9), and two spade terminals (Figure 2, Sheet 1, Item 10).
5. To remove fuse block (Figure 2, Sheet 1, Item 11), remove three fuses (Figure 2, Sheet 1, Item 12), two nuts (Figure 2, Sheet 1, Item 13), two screws (Figure 2, Sheet 1, Item 14), and fuse block.
6. To remove fuse block (Figure 2, Sheet 2, Item 15), remove four fuses (Figure 2, Sheet 2, Item 16), two nuts (Figure 2, Sheet 2, Item 17), two screws (Figure 2, Sheet 2, Item 18), and fuse block.
7. To remove bus transformer box A6 (Figure 2, Sheet 2, Item 19), remove two fuses (Figure 2, Sheet 2, Item 20), four screws (Figure 2, Sheet 2, Item 21), four lockwashers (Figure 2, Sheet 2, Item 22), four washers (Figure 2, Sheet 2, Item 23), and transformer box.
8. To remove overload/short circuit relay (Figure 2, Sheet 2, Item 24), remove four screws (Figure 2, Sheet 2, Item 25), lockwashers (Figure 2, Sheet 2, Item 26), washers (Figure 2, Sheet 2, Item 27), and relay.
9. To remove load sharing module (LSM) A4 (Figure 2, Sheet 2, Item 28), remove four screws (Figure 2, Sheet 2, Item 29), washers (Figure 2, Sheet 2, Item 30), and load sharing module.

DISASSEMBLY - Continued

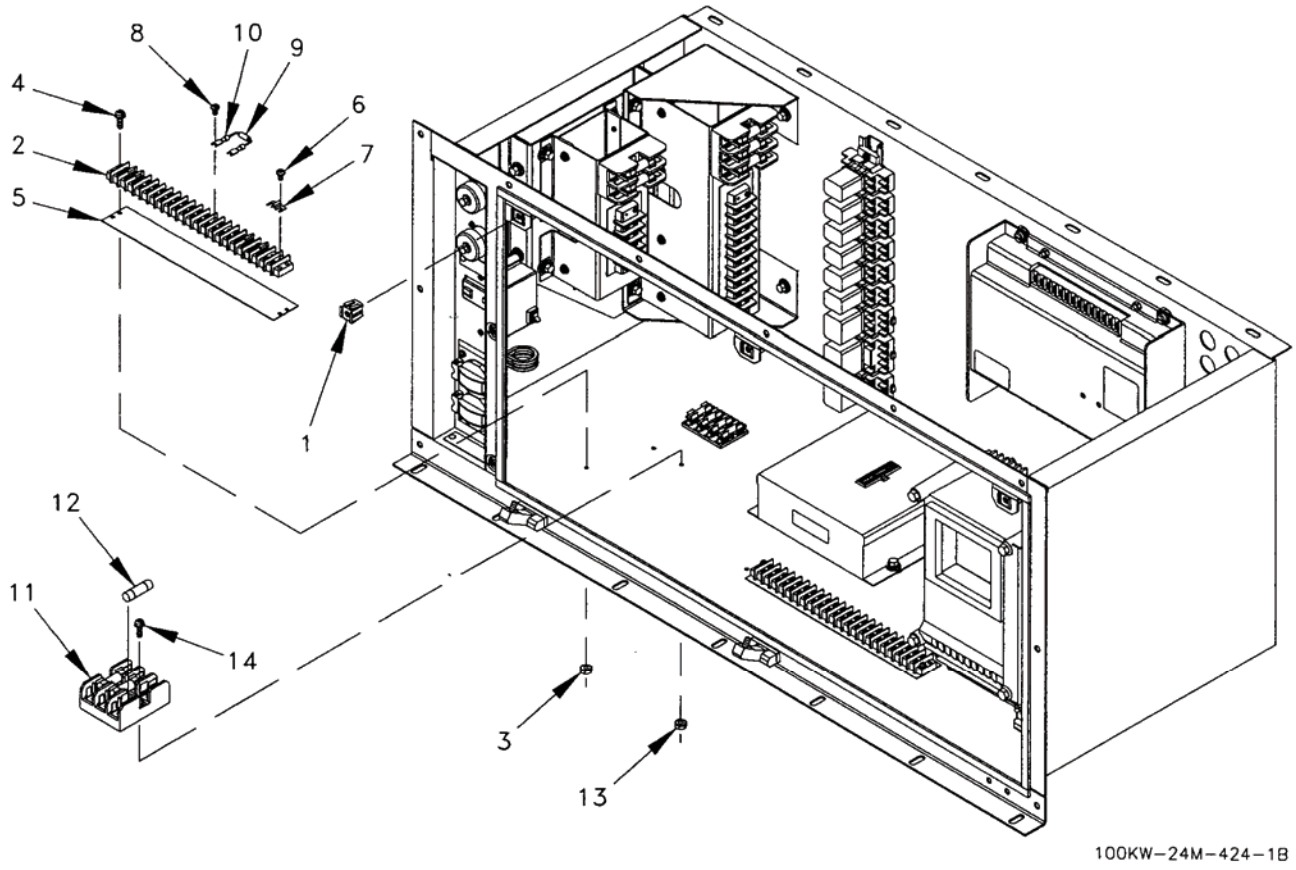


Figure 2. Control Box Assembly (Sheet 1 of 5).

DISASSEMBLY - Continued

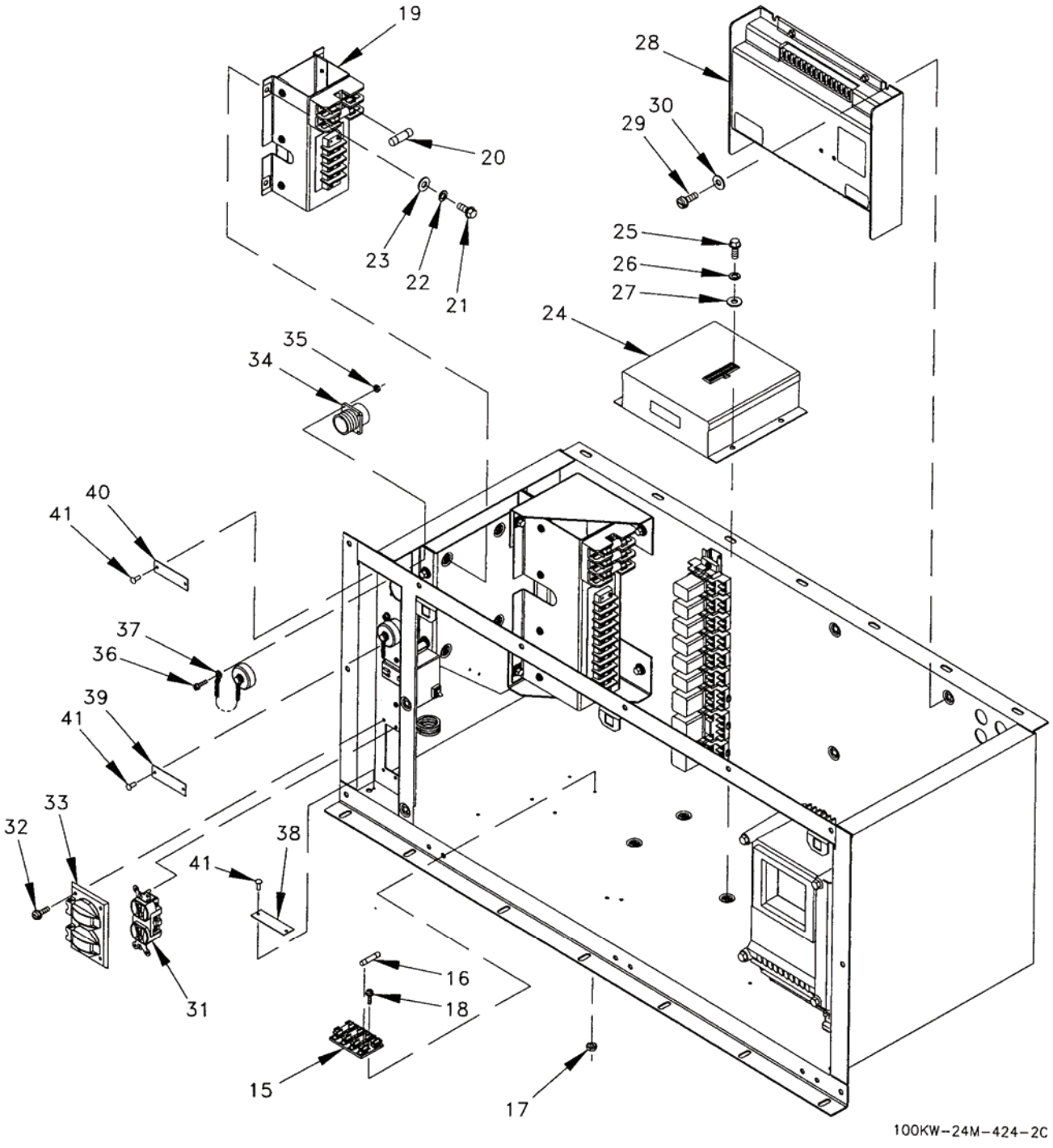


Figure 2. Control Box Assembly Maintenance (Sheet 2 of 5).

DISASSEMBLY - Continued

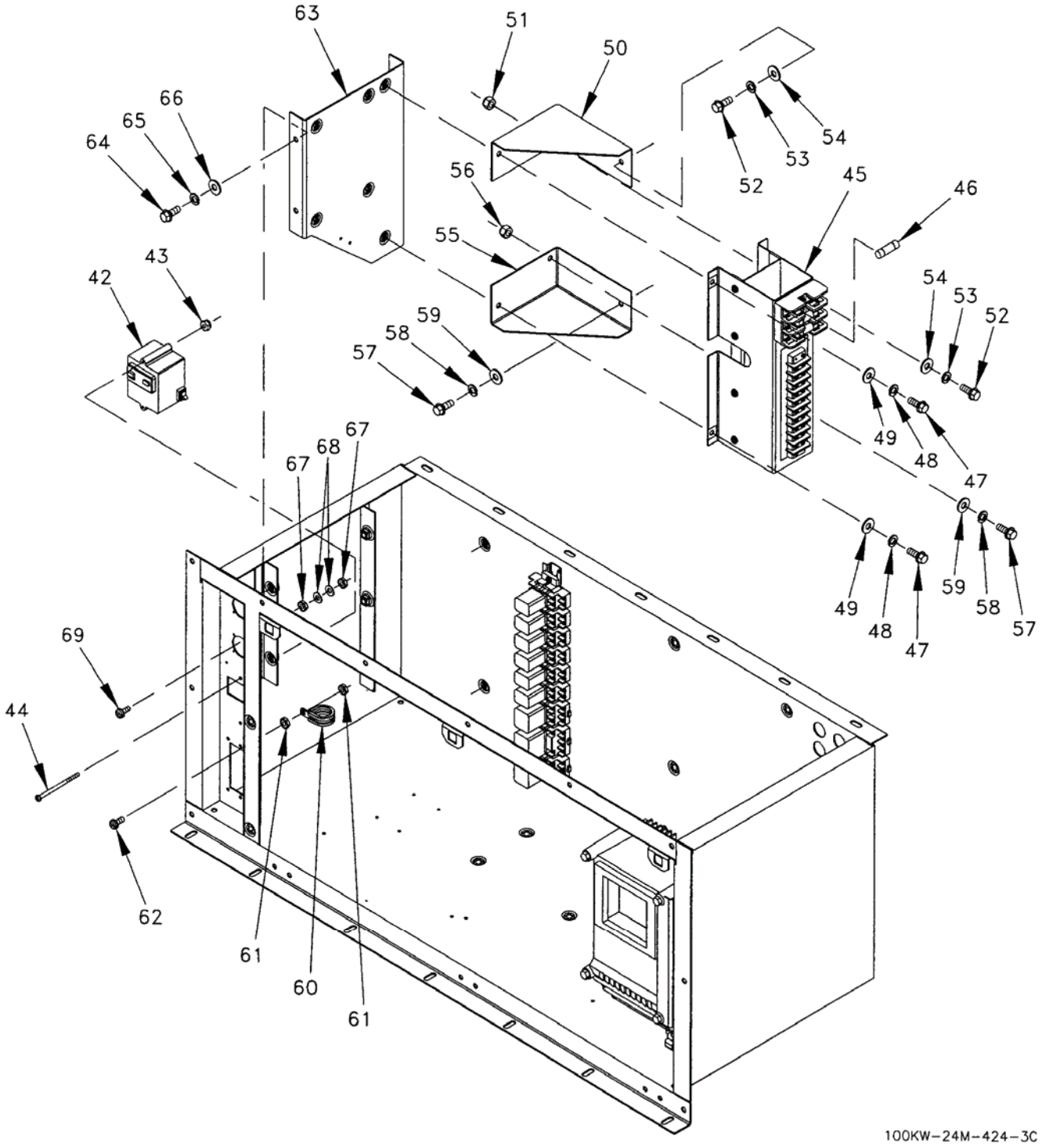


Figure 2. Control Box Assembly Maintenance (Sheet 3 of 5).

DISASSEMBLY - Continued

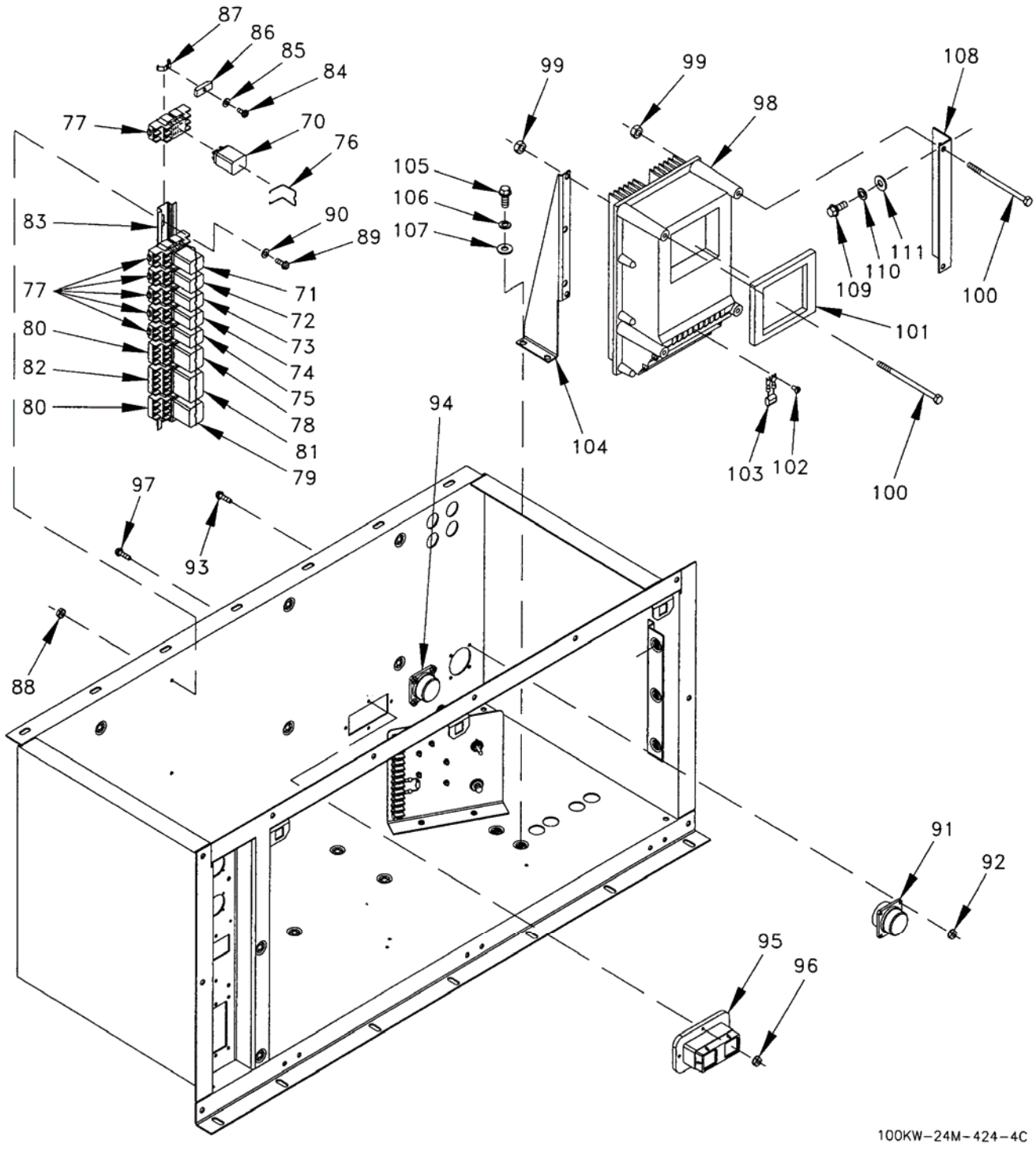


Figure 2. Control Box Assembly Maintenance (Sheet 4 of 5).

DISASSEMBLY - Continued

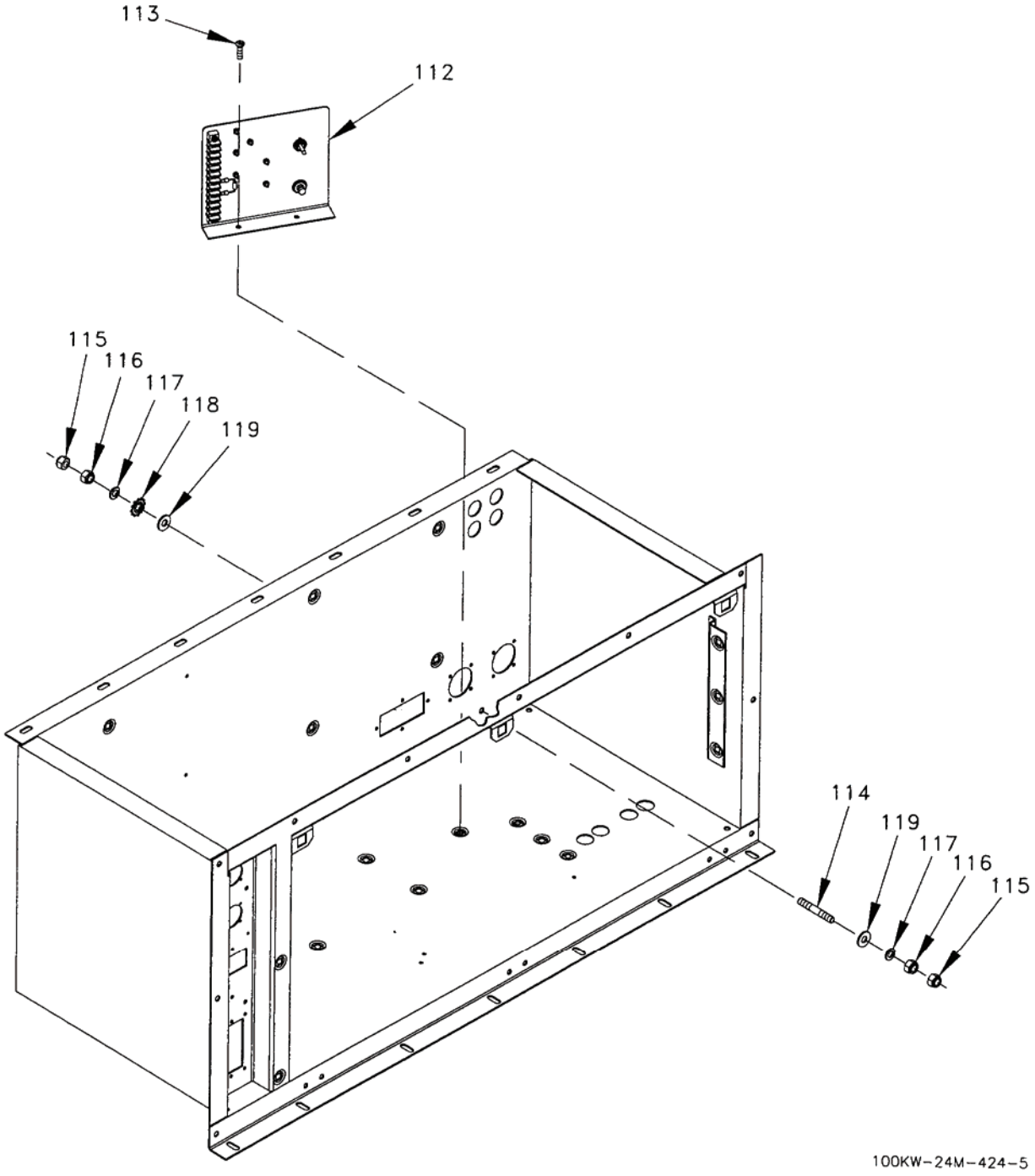


Figure 2. Control Box Assembly Maintenance (Sheet 5 of 5).

DISASSEMBLY - Continued

10. To remove duplex receptacle (Figure 2, Sheet 2, Item 31), remove four screws (Figure 2, Sheet 2, Item 32), cover (Figure 2, Sheet 2, Item 33), and receptacle.

11. To remove paralleling receptacle (Figure 2, Sheet 2, Item 34), remove four nuts (Figure 2, Sheet 2, Item 35), four screws (Figure 2, Sheet 2, Item 36), cover (Figure 2, Sheet 2, Item 37), and receptacle. Repeat for other paralleling receptacle.

12. To remove nameplate (Figure 2, Sheet 2, Item 38), (Figure 2, Sheet 2, Item 39), or (Figure 2, Sheet 2, Item 40), remove two rivets (Figure 2, Sheet 2, Item 41) and nameplate.

13. To remove ground fault circuit interrupter GFCI (Figure 2, Sheet 3, Item 42), remove two nuts (Figure 2, Sheet 3, Item 43), screws (Figure 2, Sheet 3, Item 44), and circuit interrupter.

14. To remove AC transformer box A5 (Figure 2, Sheet 3, Item 45), remove three fuses (Figure 2, Sheet 3, Item 46), four screws (Figure 2, Sheet 3, Item 47), four lockwashers (Figure 2, Sheet 3, Item 48), four washers (Figure 2, Sheet 3, Item 49), and AC transformer box.

15. To remove upper transformer mounting bracket (Figure 2, Sheet 3, Item 50), remove nut (Figure 2, Sheet 3, Item 51), two screws (Figure 2, Sheet 3, Item 52), two lockwashers (Figure 2, Sheet 3, Item 53), two washers (Figure 2, Sheet 3, Item 54), and bracket.

16. To remove lower transformer mounting bracket (Figure 2, Sheet 3, Item 55), remove nut (Figure 2, Sheet 3, Item 56), two screws (Figure 2, Sheet 3, Item 57), two lockwashers (Figure 2, Sheet 3, Item 58), two washers (Figure 2, Sheet 3, Item 59), and bracket.

17. To remove loop clamp (Figure 2, Sheet 3, Item 60), remove nut (Figure 2, Sheet 3, Item 61), loop clamp, nut (Figure 2, Sheet 3, Item 61), and screw (Figure 2, Sheet 3, Item 62).

18. To remove component mounting channel (Figure 2, Sheet 3, Item 63), remove five screws (Figure 2, Sheet 3, Item 64), lockwashers (Figure 2, Sheet 3, Item 65), washers (Figure 2, Sheet 3, Item 66), and channel.

19. Remove nut (Figure 2, Sheet 3, Item 67), two washers (Figure 2, Sheet 3, Item 68), nut, and screw (Figure 2, Sheet 3, Item 69).

20. To remove relay KR (Figure 2, Sheet 4, Item 70), CDR (Figure 2, Sheet 4, Item 71), AFPR (Figure 2, Sheet 4, Item 72), AR (Figure 2, Sheet 4, Item 73), GRF (Figure 2, Sheet 4, Item 74), or KFF (Figure 2, Sheet 4, Item 75), remove spring (Figure 2, Sheet 4, Item 76), relay, and socket (Figure 2, Sheet 4, Item 77).

21. To remove relay DBLO (Figure 2, Sheet 4, Item 78) or DBHI (Figure 2, Sheet 4, Item 79), remove spring (Figure 2, Sheet 4, Item 76), relay, and socket (Figure 2, Sheet 4, Item 80).

22. To remove relay PAR (Figure 2, Sheet 4, Item 81), remove spring (Figure 2, Sheet 4, Item 76), relay, and socket (Figure 2, Sheet 4, Item 82).

23. To remove track (Figure 2, Sheet 4, Item 83), remove two screws (Figure 2, Sheet 4, Item 84), two washers (Figure 2, Sheet 4, Item 85), two insulator blocks (Figure 2, Sheet 4, Item 86), two clips (Figure 2, Sheet 4, Item 87), three nuts (Figure 2, Sheet 4, Item 88), three screws (Figure 2, Sheet 4, Item 89), three washers (Figure 2, Sheet 4, Item 90), and track.

DISASSEMBLY - Continued

24. To remove connector J30 (Figure 2, Sheet 4, Item 91), remove four nuts (Figure 2, Sheet 4, Item 92), screws (Figure 2, Sheet 4, Item 93), and connector. Repeat for connector J31 (Figure 2, Sheet 4, Item 94).
25. To remove connector J37 (Figure 2, Sheet 4, Item 95), remove four nuts (Figure 2, Sheet 4, Item 96), screws (Figure 2, Sheet 4, Item 97), and connector.

26. To remove digital voltage regulator (DVR) A3 (Figure 2, Sheet 4, Item 98), remove four nuts (Figure 2, Sheet 4, Item 99), screws (Figure 2, Sheet 4, Item 100), digital voltage regulator, and gasket (Figure 2, Sheet 4, Item 101). Remove two screws (Figure 2, Sheet 4, Item 102) and capacitor (Figure 2, Sheet 4, Item 103).

27. To remove DVR bracket (Figure 2, Sheet 4, Item 104), remove two screws (Figure 2, Sheet 4, Item 105), lockwashers (Figure 2, Sheet 4, Item 106), washers (Figure 2, Sheet 4, Item 107), and bracket. To remove DVR bracket (Figure 2, Sheet 4, Item 108), remove three screws (Figure 2, Sheet 4, Item 109), lockwashers (Figure 2, Sheet 4, Item 110), washers (Figure 2, Sheet 4, Item 111), and bracket.

28. To remove resistor assembly A7 (Figure 2, Sheet 5, Item 112), remove two screws (Figure 2, Sheet 5, Item 113) and resistor assembly.

29. To remove ground stud (Figure 2, Sheet 5, Item 114), remove two locknuts (Figure 2, Sheet 5, Item 115), two jam nuts (Figure 2, Sheet 5, Item 116), two lockwashers (Figure 2, Sheet 5, Item 117), external tooth lockwasher (Figure 2, Sheet 5, Item 118), two washers (Figure 2, Sheet 5, Item 119), and ground stud.

END OF TASK

ASSEMBLY

1. Install ground stud (Figure 2, Sheet 5, Item 114), two washers (Figure 2, Sheet 5, Item 119), external tooth lockwasher (Figure 2, Sheet 5, Item 118), two lockwashers (Figure 2, Sheet 5, Item 117), two jam nuts (Figure 2, Sheet 5, Item 116), and two locknuts (Figure 2, Sheet 5, Item 115).

2. Install resistor assembly A7 (Figure 2, Sheet 5, Item 112) and two screws (Figure 2, Sheet 5, Item 113).

3. Install DVR bracket (Figure 2, Sheet 4, Item 108), three washers (Figure 2, Sheet 4, Item 111), lockwashers (Figure 2, Sheet 4, Item 110), and screws (Figure 2, Sheet 4, Item 109). Install DVR bracket (Figure 2, Sheet 4, Item 104), three washers (Figure 2, Sheet 4, Item 107), lockwashers (Figure 2, Sheet 4, Item 106), and screws (Figure 2, Sheet 4, Item 105).

4. Install capacitor (Figure 2, Sheet 4, Item 103) and two screws (Figure 2, Sheet 4, Item 102) on digital voltage regulator (DVR) A3 (Figure 2, Sheet 4, Item 98). Install gasket (Figure 2, Sheet 4, Item 101), digital voltage regulator (Figure 2, Sheet 4, Item 98), four screws (Figure 2, Sheet 4, Item 100), and nuts (Figure 2, Sheet 4, Item 99).

5. Install connector J37 (Figure 2, Sheet 4, Item 95), four screws (Figure 2, Sheet 4, Item 97), and nuts (Figure 2, Sheet 4, Item 96).

6. Install connector J30 (Figure 2, Sheet 4, Item 91), four screws (Figure 2, Sheet 4, Item 93), and nuts (Figure 2, Sheet 4, Item 92). Repeat for connector J31 (Figure 2, Sheet 4, Item 94).

ASSEMBLY - Continued

7. Install track (Figure 2, Sheet 4, Item 83), three washers (Figure 2, Sheet 4, Item 90), three screws (Figure 2, Sheet 4, Item 89), three nuts (Figure 2, Sheet 4, Item 88), two clips (Figure 2, Sheet 4, Item 87), two insulator blocks (Figure 2, Sheet 4, Item 86), two washers (Figure 2, Sheet 4, Item 85), and two screws (Figure 2, Sheet 4, Item 84).

8. Install socket (Figure 2, Sheet 4, Item 82), relay PAR (Figure 2, Sheet 4, Item 81), and spring (Figure 2, Sheet 4, Item 76).

9. Install socket (Figure 2, Sheet 4, Item 80), relay DBLO (Figure 2, Sheet 4, Item 78), and spring (Figure 2, Sheet 4, Item 76).

10. Install socket (Figure 2, Sheet 4, Item 77), relay KFF (Figure 2, Sheet 4, Item 75), GFR (Figure 2, Sheet 4, Item 74), AR (Figure 2, Sheet 4, Item 73), AFPR (Figure 2, Sheet 4, Item 72), CDR (Figure 2, Sheet 4, Item 71), KR (Figure 2, Sheet 4, Item 70), and spring (Figure 2, Sheet 4, Item 76).

11. Install screw (Figure 2, Sheet 3, Item 69), nut (Figure 2, Sheet 3, Item 67), two washers (Figure 2, Sheet 3, Item 68), and nut (Figure 2, Sheet 3, Item 67).

12. Install component mounting channel (Figure 2, Sheet 3, Item 63), five washers (Figure 2, Sheet 3, Item 66), lockwashers (Figure 2, Sheet 3, Item 65), and screws (Figure 2, Sheet 3, Item 64).

13. Install screw (Figure 2, Sheet 3, Item 62), nut (Figure 2, Sheet 3, Item 61), loop clamp (Figure 2, Sheet 3, Item 60), and nut (Figure 2, Sheet 3, Item 61).

14. Install lower transformer mounting bracket (Figure 2, Sheet 3, Item 55), two washers (Figure 2, Sheet 3, Item 59), two lockwashers (Figure 2, Sheet 3, Item 58), two screws (Figure 2, Sheet 3, Item 57), and nut (Figure 2, Sheet 3, Item 56).

15. Install upper transformer mounting bracket (Figure 2, Sheet 3, Item 50), two washers (Figure 2, Sheet 3, Item 54), two lockwashers (Figure 2, Sheet 3, Item 53), two screws (Figure 2, Sheet 3, Item 52), and nut (Figure 2, Sheet 3, Item 51).

16. Install AC transformer box A5 (Figure 2, Sheet 3, Item 45), four washers (Figure 2, Sheet 3, Item 49), four lockwashers (Figure 2, Sheet 3, Item 48), four screws (Figure 2, Sheet 3, Item 47), and three fuses (Figure 2, Sheet 3, Item 46). Record barcode values for VA, VB, VC, IA, IB, IC (setpoints AC01 thru AC06) for reprogramming. GSC. Setpoints must be reprogrammed if AC transformer box A5 is replaced (WP 0080).

17. Install ground fault circuit interrupter GFCI (Figure 2, Sheet 3, Item 42), two screws (Figure 2, Sheet 3, Item 44), and nuts (Figure 2, Sheet 3, Item 43).

18. Install nameplate (Figure 2, Sheet 2, Item 40), (Figure 2, Sheet 2, Item 39), or (Figure 2, Sheet 2, Item 38) and two rivets (Figure 2, Sheet 2, Item 41).

19. Install paralleling receptacle (Figure 2, Sheet 2, Item 34), cover (Figure 2, Sheet 2, Item 37), four screws (Figure 2, Sheet 2, Item 36), and four nuts (Figure 2, Sheet 2, Item 35). Repeat for other paralleling receptacle.

20. Install duplex receptacle (Figure 2, Sheet 2, Item 31), cover (Figure 2, Sheet 2, Item 33), and four screws (Figure 2, Sheet 2, Item 32).

ASSEMBLY - Continued

21. Install load sharing module (LSM) A4 (Figure 2, Sheet 2, Item 28), four washers (Figure 2, Sheet 2, Item 30), and screws (Figure 2, Sheet 2, Item 29).

22. Install overload/short circuit relay (Figure 2, Sheet 2, Item 24), four washers (Figure 2, Sheet 2, Item 27), lockwashers (Figure 2, Sheet 2, Item 26), and screws (Figure 2, Sheet 2, Item 25).

23. Install bus transformer box A6 (Figure 2, Sheet 2, Item 19), four washers (Figure 2, Sheet 2, Item 23), four lockwashers (Figure 2, Sheet 2, Item 22), four screws (Figure 2, Sheet 2, Item 21), and two fuses (Figure 2, Sheet 2, Item 20). Record barcode value for VA (setpoint AC07) for reprogramming. GSC setpoints must be reprogrammed if bus transformer box A6 is replaced (WP 0080).

24. Install fuse block (Figure 2, Sheet 2, Item 15), two screws (Figure 2, Sheet 2, Item 18), two nuts (Figure 2, Sheet 2, Item 17), and four fuses (Figure 2, Sheet 2, Item 16).

25. Install fuse block (Figure 2, Sheet 1, Item 11), two screws (Figure 2, Sheet 1, Item 14), two nuts (Figure 2, Sheet 1, Item 13), and three fuses (Figure 2, Sheet 1, Item 12).

26. On terminal block TB4 (Figure 2, Sheet 1, Item 2) only, install two spade terminals (Figure 2, Sheet 1, Item 10), diode (Figure 2, Sheet 1, Item 9), and two screws (Figure 2, Sheet 1, Item 8). Install ten jumpers (Figure 2, Sheet 1, Item 7) and screws (Figure 2, Sheet 1, Item 6). Install strip (Figure 2, Sheet 1, Item 5), terminal block TB4 (Figure 2, Sheet 1, Item 2), two screws (Figure 2, Sheet 1, Item 4), and two nuts (Figure 2, Sheet 1, Item 3). Repeat for terminal block TB3.

27. Install three receptacles (Figure 2, Sheet 1, Item 1).

28. Install control box panel assembly (WP 0038).

END OF TASK

LSAM A4 LOAD GAIN ADJUSTMENT

NOTE

For this procedure the generator set must be running isochronously, not paralleled.

1. Start the generator set and run at full load.

2. Measure the load signal voltage at LSM A4-22 (+) and LSM A4-23 (-).

3. Adjust LSM A4 LOAD GAIN potentiometer for 6.0 Vdc ± 1.0 Vdc.

END OF TASK

INSTALLATION

1. If previously removed, install brace (Figure 1, Item 21) using two screws (Figure 1, Item 18), lockwashers (Figure 1, Item 19), and washers (Figure 1, Item 20).
2. Slide control box (Figure 1, Item 17) fully into generator set.
3. Install five screws (Figure 1, Item 14), lockwashers (Figure 1, Item 15), and washers (Figure 1, Item 16).
4. Install two screws (Figure 1, Item 11), lockwashers (Figure 1, Item 12), and washers (Figure 1, Item 13).
5. Install three screws (Figure 1, Item 8), lockwashers (Figure 1, Item 9), and washers (Figure 1, Item 10).
6. Install seven screws (Figure 1, Item 5), lockwashers (Figure 1, Item 6), and washers (Figure 1, Item 7).
7. Install ground wire (Figure 1, Item 1) to back of control box terminal (Figure 1, Item 4) with washer (Figure 1, Item 2) and locknut (Figure 1, Item 3).
8. Remove tag and connect ECM to EMCP harness connector ENG-P37 to control box connector J37.
9. Remove tag and connect harness connector P31 to control box connector J31.
10. Remove tag and connect harness connector P30 to control box connector J30.
11. Install front roof section (WP 0027).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

RESISTOR ASSEMBLY A7 MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Personnel Required

One

Equipment Condition

Resistor assembly A7 removed from control box (WP 0041)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

DISASSEMBLY

1. Tag and disconnect wires from resistor assembly A7 components.
2. Remove nut (Figure 1, Item 1), washer (Figure 1, Item 2), and ISOCHRONOUS DROOP switch (IDS) (Figure 1, Item 3).
3. Remove nut (Figure 1, Item 4), washer (Figure 1, Item 5), and DC CONTROL POWER circuit breaker CB1 (Figure 1, Item 6).
4. Remove six nuts (Figure 1, Item 7), six screws (Figure 1, Item 8), and resistors R2 (Figure 1, Item 9), R1 (Figure 1, Item 10), and R3 (Figure 1, Item 11).
5. Remove diode CRFF (Figure 1, Item 12).
6. Remove two nuts (Figure 1, Item 13), two screws (Figure 1, Item 14), and terminal board (Figure 1, Item 15).

DISASSEMBLY - Continued

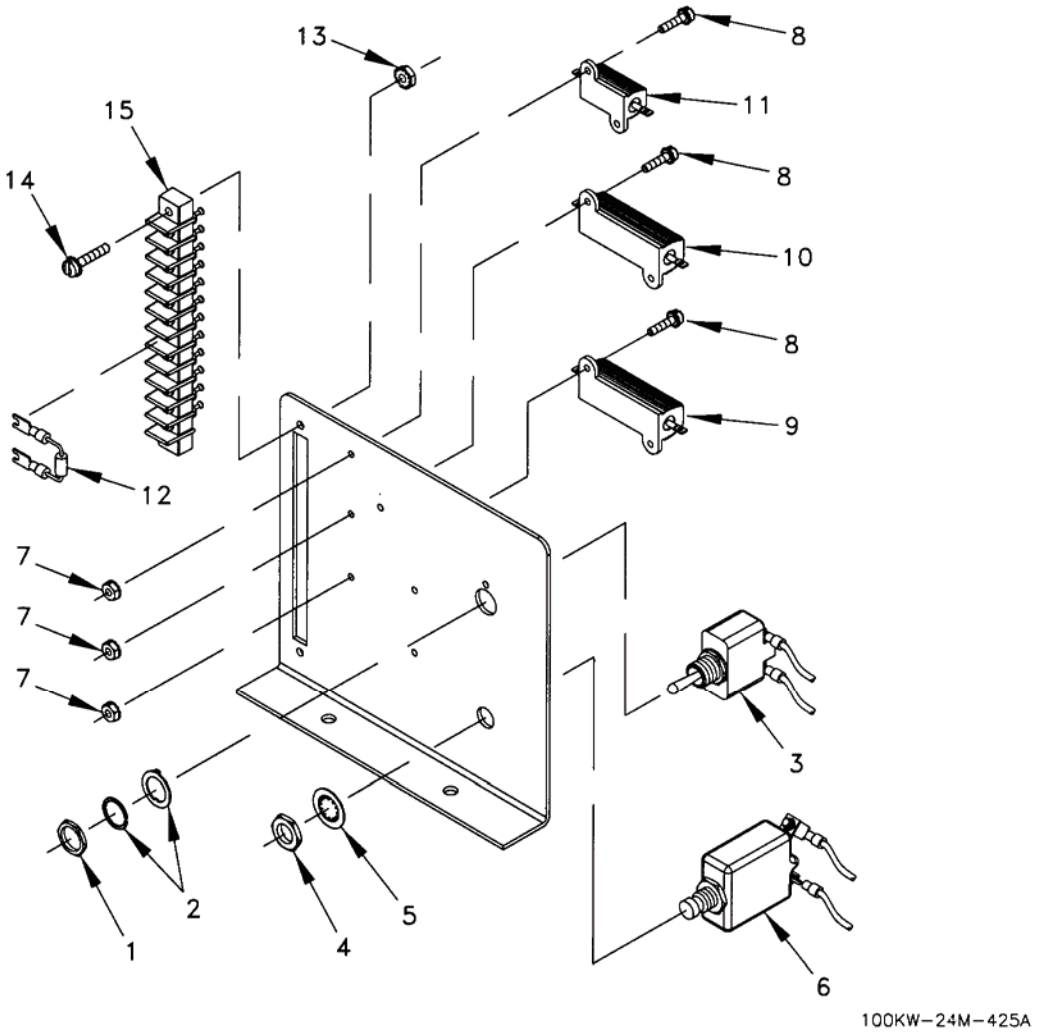


Figure 1. Resistor Assembly A7.

END OF TASK

TEST

1. Using multimeter, measure resistance of the resistors. R1 = 150 ohms +/- 1%, R2 = 10 ohms +/- 1%, and R3 = 15 kohms +/–1%.
2. Using multimeter, check forward and reverse bias on diode CRFF.
3. Replace any components that fail a measurement test.

END OF TASK

ASSEMBLY

1. Install terminal board (Figure 1, Item 15), two screws (Figure 1, Item 14), and two nuts (Figure 1, Item 13).
2. Install diode CRFF (Figure 1, Item 12).
3. Install resistors R3 (Figure 1, Item 11), R1 (Figure 1, Item 10), and R2 (Figure 1, Item 9), with six screws (Figure 1, Item 8) and nuts (Figure 1, Item 7).
4. Install DC CONTROL POWER circuit breaker CB1 (Figure 1, Item 6), washer (Figure 1, Item 5), and nut (Figure 1, Item 4).
5. Install ISOCHRONOUS DROOP switch (IDS) (Figure 1, Item 3), washer (Figure 1, Item 2), and nut (Figure 1, Item 1).
6. Install resistor assembly A7 into control box (WP 0042).
7. Remove tags and connect wires to resistor assembly A7 components.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
CONTROL BOX HARNESS ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Marker tags (WP 0120, Item 52)

References

FO-4
TM 9-6115-729-24P
TM 55-1500-323-24

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right and left battery access doors, left front door, left rear doors, load board door, right front door, right rear doors, and generator access cover.

3. Using Control Panel Harness Wire List (WP 0090) and Control Box Wiring Diagram FO-4 as guides, tag and disconnect control box harness assembly.

END OF TASK

REPAIR OR REPLACEMENT

Repair as required using components identified in Control Panel Harness Wire List and general procedures identified in Installation Practices for Aircraft Electrical and Electronic Wiring, TM 55-1500-323-24.

END OF TASK

INSTALLATION

1. Using Control Panel Harness Wire List (WP 0090) and Control Box Wiring Diagram FO-4 as guides, remove tags and connect control box harness assembly.

2. Close generator access cover, right rear doors, right front door, load board door, left rear doors, and battery access doors.

3. Verify that the generator set operates properly.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

RECONNECTION TERMINAL BOARD ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Tiedown straps (WP 0120, Item 49)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

DISASSEMBLY

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Open right rear doors.
3. Remove four locknuts (Figure 1, Item 1), four washers (Figure 1, Item 2), and protective cover (Figure 1, Item 3).
4. Remove two screws (Figure 1, Item 4) and four standoffs (Figure 1, Item 5), and pull reconnection terminal board assembly (Figure 1, Item 6) away from its lower mounting and from two standoffs (Figure 1, Item 7).

DISASSEMBLY - Continued

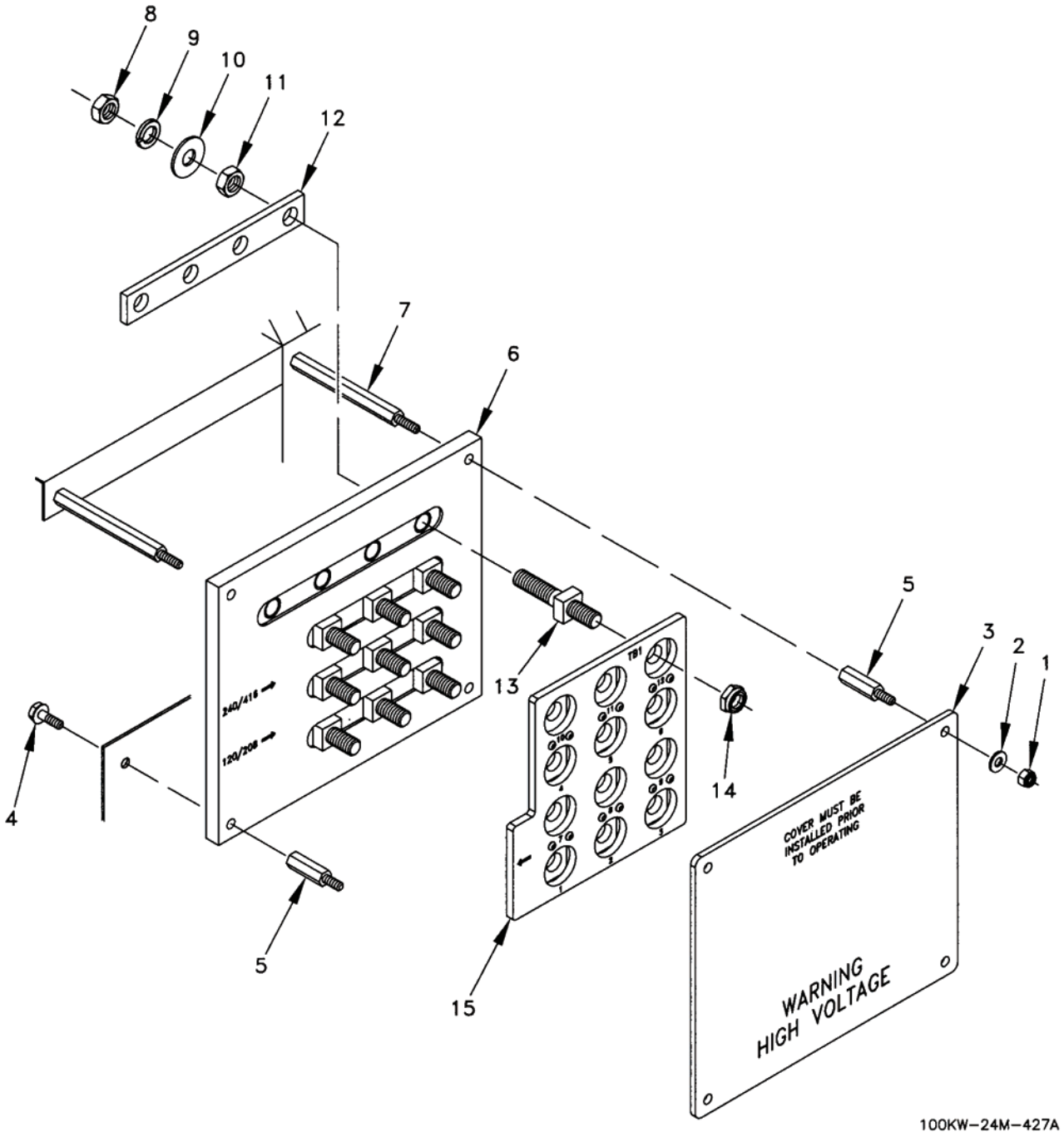


Figure 1. Reconnection Terminal Board Assembly.

DISASSEMBLY - Continued

NOTE

Cut tiedown straps as required.

5. Remove 13 jam nuts (Figure 1, Item 8), lockwashers (Figure 1, Item 9), and washers (Figure 1, Item 10), and tag and disconnect wires from rear of reconnection terminal board assembly (Figure 1, Item 6).

6. Remove 13 jam nuts (Figure 1, Item 11), bus bar (Figure 1, Item 12), 13 studs (Figure 1, Item 13), 13 locknuts (Figure 1, Item 14), and moveable terminal board (Figure 1, Item 15).

END OF TASK

ASSEMBLY

1. Install moveable terminal board (Figure 1, Item 15) on terminal board assembly (Figure 1, Item 6), and secure with 13 locknuts (Figure 1, Item 14), 13 studs (Figure 1, Item 13), bus bar (Figure 1, Item 12), and 13 jam nuts (Figure 1, Item 11).

2. Remove tags and connect wires to rear of reconnection terminal board assembly (Figure 1, Item 6), and secure with 13 washers (Figure 1, Item 10), lockwashers (Figure 1, Item 9), and jam nuts (Figure 1, Item 8).

NOTE

Install tiedown straps as required.

3. Position reconnection terminal board assembly (Figure 1, Item 6) on its lower mounting and two standoffs (Figure 1, Item 7), and secure with four standoffs (Figure 1, Item 5) and two screws (Figure 1, Item 4).

4. Install protective cover (Figure 1, Item 3) and secure with four washers (Figure 1, Item 2) and locknuts (Figure 1, Item 1).

5. Close right rear doors.

6. If required, reprogram GSC and DVR parameters (WP 0085).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

LOAD TERMINAL BOARD ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Marker tags (WP 0120, Item 52)
Tiedown straps (WP 0120, Item 50)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

DISASSEMBLY

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open load board door.

NOTE

Cut tiedown straps as required.

3. Tag and disconnect cables from front of load terminal board (Figure 1, Item 1) and pull cables through opening at rear of generator set.

DISASSEMBLY - Continued

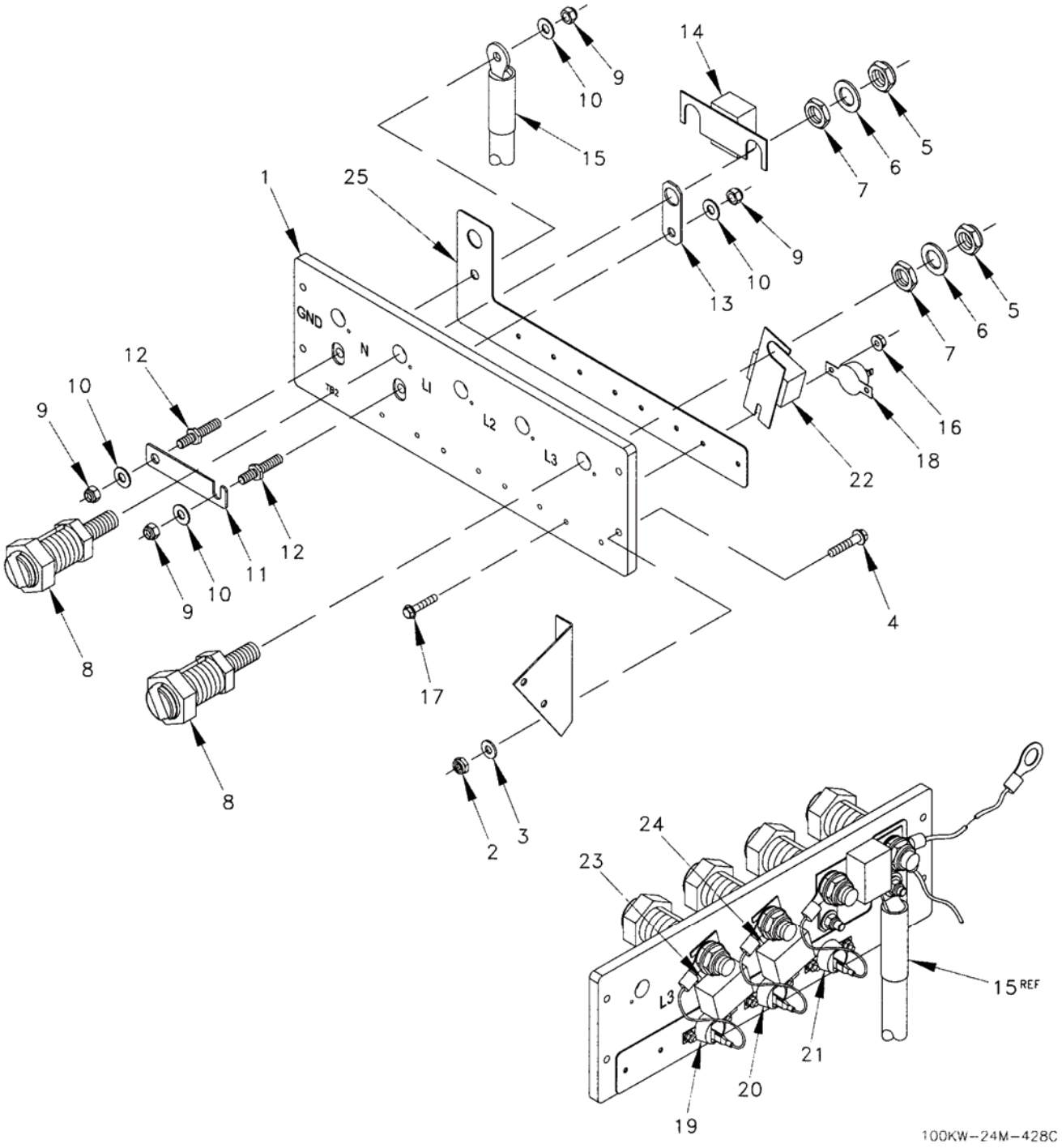


Figure 1. Load Terminal Board Assembly.

DISASSEMBLY - Continued

4. Remove two locknuts (Figure 1, Item 2) two washers (Figure 1, Item 3), two screws (Figure 1, Item 4), and turn load terminal board (Figure 1, Item 1) partly over.

5. Remove five locknuts (Figure 1, Item 5) and washers (Figure 1, Item 6), and tag and disconnect wires from the rear of load terminal board (Figure 1, Item 1).

6. Remove five jam nuts (Figure 1, Item 7) and load terminals (Figure 1, Item 8).

7. Remove four locknuts (Figure 1, Item 9), washers (Figure 1, Item 10), two studs (Figure 1, Item 12), bus bar (Figure 1, Item 11), bus bar (Figure 1, Item 13), N to GND EMI filter (Figure 1, Item 14), and cable (Figure 1, Item 15).

8. Remove eight nuts (Figure 1, Item 16), eight screws (Figure 1, Item 17), varistors N (Figure 1, Item 18), (Figure 1, Item 19), (Figure 1, Item 20), and (Figure 1, Item 21), EMI filters L1 (Figure 1, Item 22), L2 (Figure 1, Item 23), and L3 (Figure 1, Item 24), and ground plane bar (Figure 1, Item 25).

END OF TASK

ASSEMBLY

1. Install ground plane bar (Figure 1, Item 25) , EMI filters L3 (Figure 1, Item 24) , L2 (Figure 1, Item 23) , L1 (Figure 1, Item 22) , varistors L3 (Figure 1, Item 21) , L2 (Figure 1, Item 20) , L1 (Figure 1, Item 19) , and N (Figure 1, Item 18) , eight screws (Figure 1, Item 17) , and nuts (Figure 1, Item 16).

2. Install cable (Figure 1, Item 15), GND EMI filter (Figure 1, Item 14), bus bar (Figure 1, Item 13), two studs (Figure 1, Item 12), bus bar (Figure 1, Item 11), four washers (Figure 1, Item 10), and locknuts (Figure 1, Item 9).

3. Install five load terminals (Figure 1, Item 8) and jam nuts (Figure 1, Item 7).

NOTE

Cut tiedown straps as required.

4. Remove tags, connect wires to rear of load terminal board (Figure 1, Item 1), and install five washers (Figure 1, Item 6) and locknuts (Figure 1, Item 5).

5. Position load terminal board (Figure 1, Item 1) and install two screws (Figure 1, Item 4), two washers (Figure 1, Item 3), and two locknuts (Figure 1, Item 2).

6. Remove tags and connect cables to front of load terminal board (Figure 1, Item 1).

7. Close load board door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

BATTERY CABLE ASSEMBLIES MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Tiedown straps (WP 0120, Item 50)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause serious injury to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Ensure there is no external cable connected to slave receptacle.

REMOVAL - Continued

3. Open right and left battery access doors.

NOTE

Cut tiedown straps as required.

4. Disconnect battery cable 1A40 (Figure 1, Item 1) and battery cable 1C40 (Figure 1, Item 2) from battery BT2 (left battery) negative terminal.

5. Disconnect battery cable 1A40 (Figure 1, Item 1) from battery disconnect switch BDS (Figure 1, Item 4) and remove battery cable 1A40 (Figure 1, Item 1).

6. Disconnect battery cable 12A40 (Figure 1, Item 5) from battery BT1 (right battery) negative terminal (Figure 1, Item 6) and from BT2 (left battery) positive terminal (Figure 1, Item 7) and remove battery cable 12A40.

7. Open left front doors.

8. Remove four nuts (Figure 1, Item 8), screws (Figure 1, Item 9), washers (Figure 1, Item 10), push slave receptacle (Figure 1, Item 11), and retainer (Figure 1, Item 12) out of TQG.

9. Disconnect battery cable 1C40 (Figure 1, Item 2) from slave receptacle SR (Figure 1, Item 11) and remove battery cable 1C40.

10. Disconnect battery cable 24D40 (Figure 1, Item 13) from slave receptacle SR (Figure 1, Item 11). Disconnect battery cable 24D40 and battery cable 24A40 (Figure 1, Item 14) from battery BT1 (right battery) positive terminal (Figure 1, Item 15) and remove battery cable 24D40.

11. Disconnect battery cable 2A40 (Figure 1, Item 16) from battery disconnect switch BDS (Figure 1, Item 4).

12. Open right front doors.

13. Disconnect battery cable 2A40 (Figure 1, Item 16) from engine starter motor SM (Figure 1, Item 17) and remove battery cable 2A40.

14. Disconnect battery cable 24A40 (Figure 1, Item 14) from engine starter motor SM (Figure 1, Item 17) and remove battery cable 24A40.

15. Open right rear doors.

16. Disconnect battery cable 2C40 (Figure 1, Item 18) from engine starter motor SM (Figure 1, Item 17).

17. Open load board door.

18. Disconnect battery cable 2C40 (Figure 1, Item 18) from load board terminal G, (WP 0043) and remove battery cable 2C40.

REMOVAL - Continued

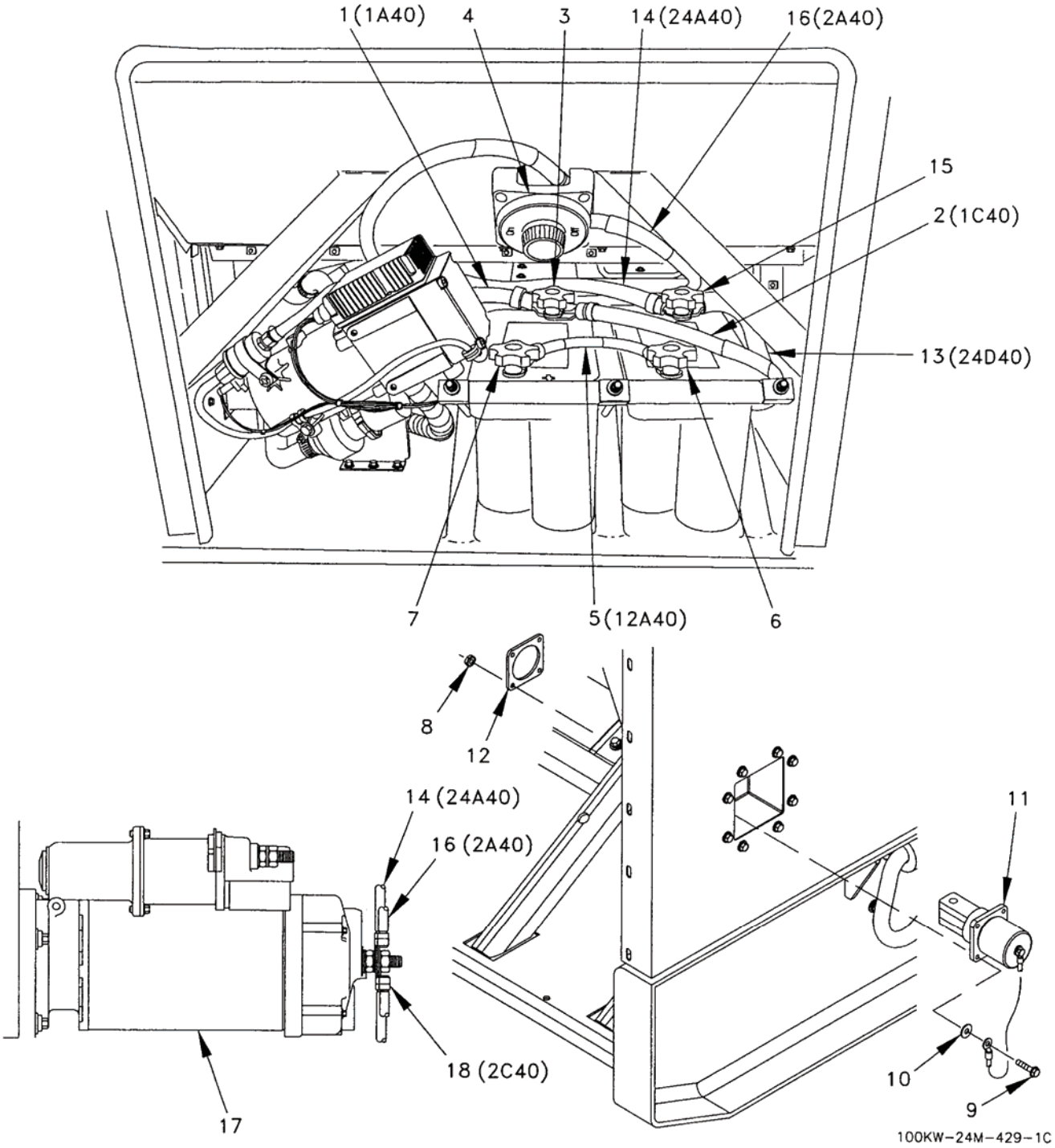


Figure 1. Battery Cable Assemblies (Sheet 1 of 2).

REMOVAL - Continued

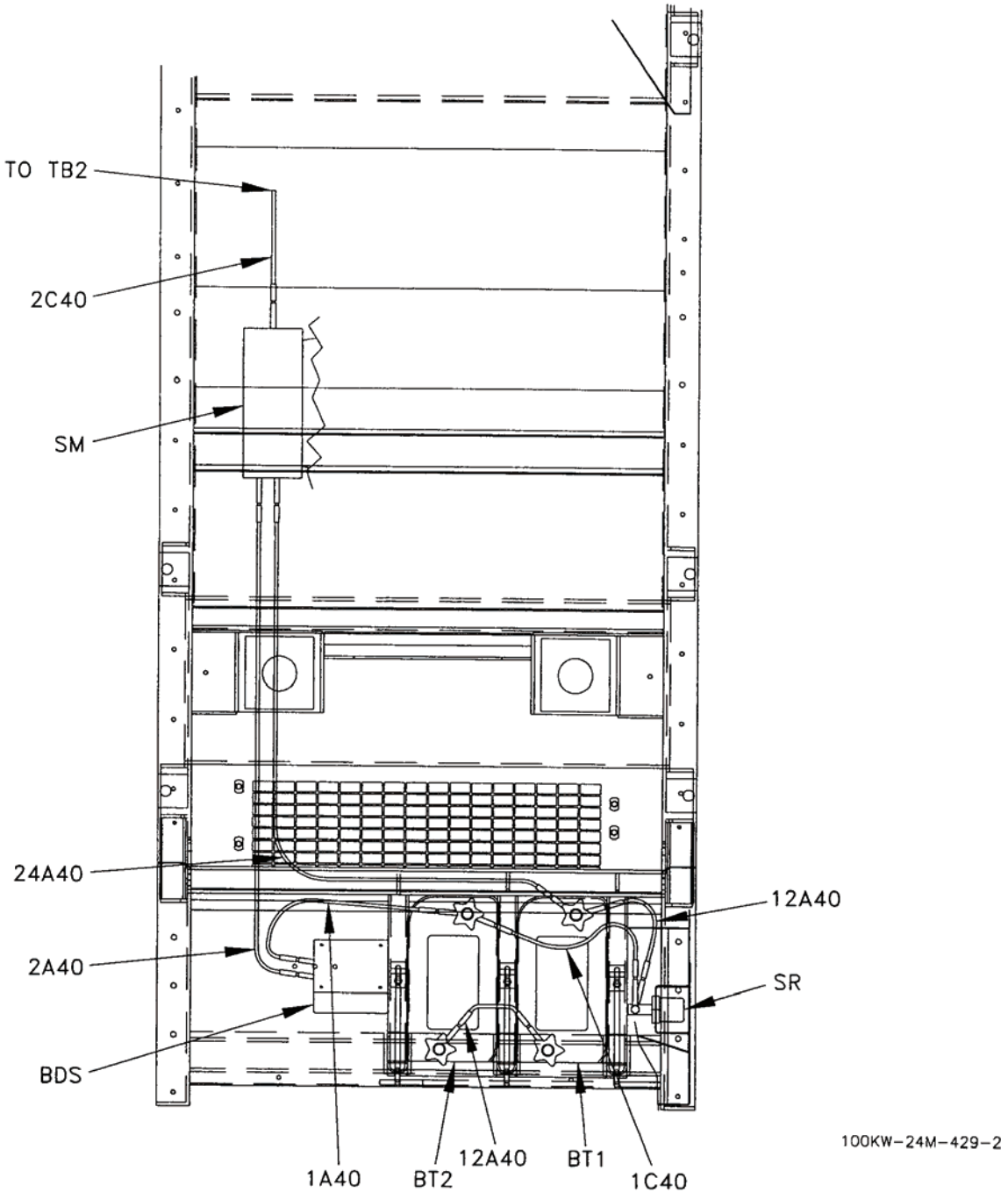


Figure 1. Battery Cable Assemblies (Sheet 2 of 2).

END OF TASK

INSTALLATION

NOTE

Install tiedown straps as required.

1. Install battery cable 2C40 (Figure 1, Item 18) and connect to load board terminal G (WP 0043).
2. Close load board door.
3. Connect battery cable 2C40 (Figure 1, Item 18) to engine starter motor SM (Figure 1, Item 17).
4. Close right rear doors.
5. Install battery cable 24A40 (Figure 1, Item 14) and connect to engine starter motor SM (Figure 1, Item 17).
6. Install battery cable 2A40 (Figure 1, Item 16) and connect to engine starter motor SM (Figure 1, Item 17).
7. Close right front doors.
8. Connect battery cable 2A40 (Figure 1, Item 16) to battery disconnect switch BDS (Figure 1, Item 4).
9. Install battery cable 24D40 (Figure 1, Item 13) and connect battery cable 24D40 and battery cable 24A40 (Figure 1, Item 14) to battery BT1 (right battery) positive terminal (Figure 1, Item 15).
10. Connect battery cable 24D40 (Figure 1, Item 13) to slave receptacle SR (Figure 1, Item 11).
11. Install battery cable 1C40 (Figure 1, Item 2) and connect to slave receptacle SR (Figure 1, Item 11).
12. Push slave receptacle (Figure 1, Item 8) into TQG and install retainer (Figure 1, Item 12), four washers (Figure 1, Item 10), screws (Figure 1, Item 9), and nuts (Figure 1, Item 8).
13. Close left rear doors.
14. Install battery cable 12A40 (Figure 1, Item 5) and connect to battery BT2 (left battery) positive terminal (Figure 1, Item 7) and to battery BT1 (right battery) negative terminal (Figure 1, Item 6).
15. Install battery cable 1A40 (Figure 1, Item 1) and connect to battery disconnect switch BDS (Figure 1, Item 4).
16. Connect battery cable 1C40 (Figure 1, Item 2) and battery cable 1A40 (Figure 1, Item 1) to battery BT2 (left battery) negative terminal (Figure 1, Item 3).
17. Close right and left battery access doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

POWER CABLE ASSEMBLIES MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Marker tags (WP 0120, Item 52)
Tiedown strap (WP 0120, Item 50)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right rear doors. Open load board door.

NOTE

Cut tiedown straps as required.

3. Partly remove load terminal board assembly (Figure 1, Item 1), (WP 0045) sufficiently to gain access to rear of load terminal board assembly.

REMOVAL - Continued

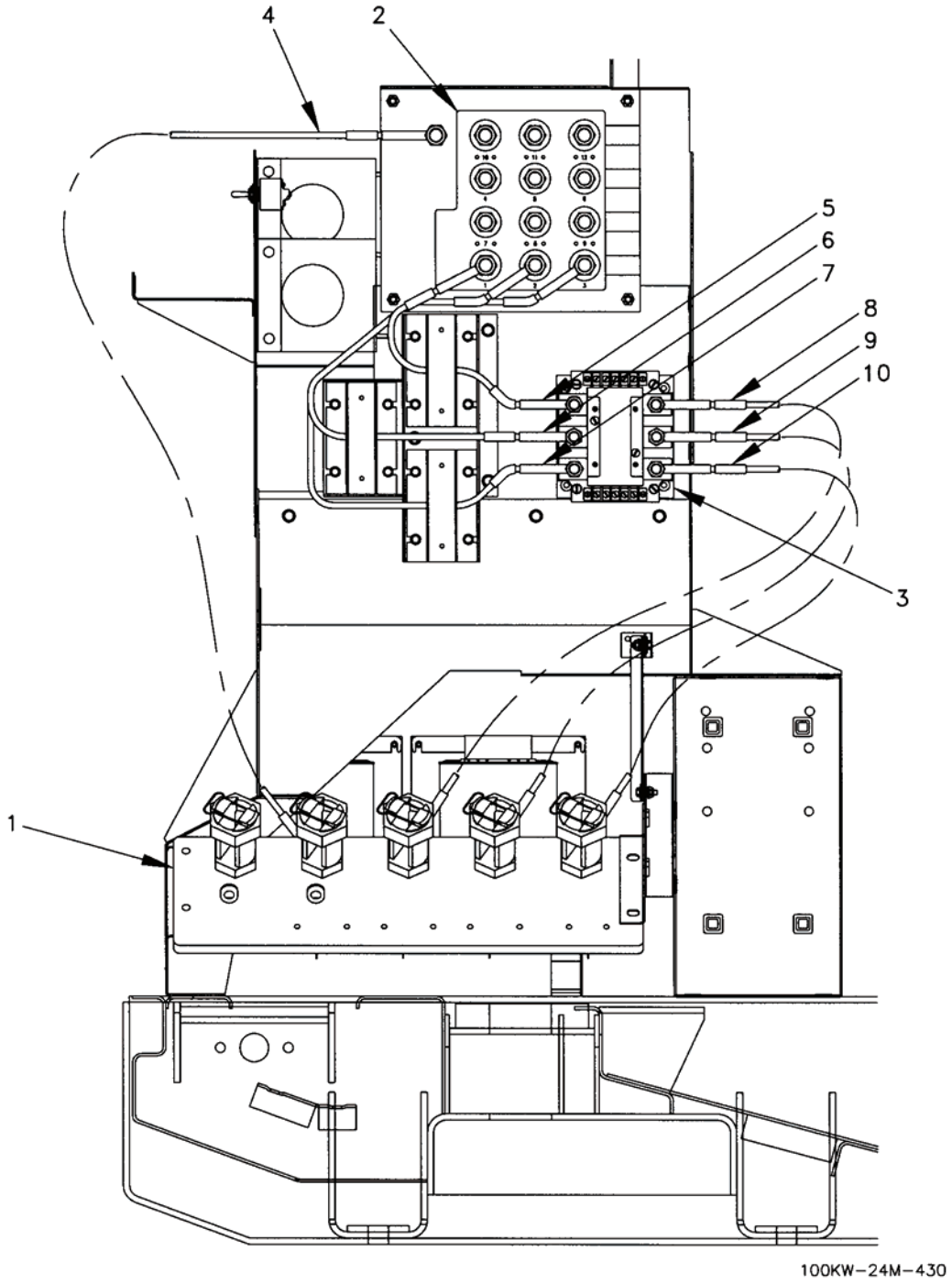


Figure 1. Power Cable Assemblies.

REMOVAL - Continued

4. Partly remove reconnection terminal board (Figure 1, Item 2), (WP 0044) sufficiently to gain access to rear of reconnection terminal board.

5. Remove two plates from front of main load contactor (Figure 1, Item 3), (WP 0048) to gain access to cable terminals on front of main load contactor.

6. Tag and disconnect cable 110K (Figure 1, Item 4) from terminal 13 on reconnection terminal board (Figure 1, Item 2) and terminal N on load terminal board assembly (Figure 1, Item 1).

7. Tag and disconnect cable 101A (Figure 1, Item 5) from terminal 1 on reconnection terminal board (Figure 1, Item 2) and from terminal A1 on main load contactor (Figure 1, Item 3).

8. Tag and disconnect cable 102A (Figure 1, Item 6) from terminal 2 of reconnection terminal board (Figure 1, Item 2) and from terminal B1 on main load contactor (Figure 1, Item 3).

9. Tag and disconnect cable 103A (Figure 1, Item 7) from terminal 3 on reconnection terminal board (Figure 1, Item 2) and from terminal C1 on main load contactor (Figure 1, Item 3).

10. Tag and disconnect cable 121A (Figure 1, Item 8) from terminal A2 on main load contactor (Figure 1, Item 3) and from terminal L1 on load terminal board (Figure 1, Item 1).

11. Tag and disconnect cable 122A (Figure 1, Item 9) from terminal B2 on main load contactor (Figure 1, Item 3) and from terminal L2 on load terminal board (Figure 1, Item 1).

12. Tag and disconnect cable 123A (Figure 1, Item 10) from terminal C2 on main load contactor (Figure 1, Item 3) and from terminal L3 on load terminal board (Figure 1, Item 1).

END OF TASK

INSTALLATION

NOTE

Install tiedown straps as required.

1. Remove tags and connect cable 123A (Figure 1, Item 10) to terminal L3 on load terminal board (Figure 1, Item 1) and to terminal C2 on main load contactor (Figure 1, Item 3).

2. Remove tags and connect cable 122A (Figure 1, Item 9) to terminal L2 on load terminal board (Figure 1, Item 1) and to terminal B2 on main load contactor (Figure 1, Item 3).

3. Remove tags and connect cable 121A (Figure 1, Item 8) to terminal L1 on load terminal board (Figure 1, Item 1) and to terminal A2 on main load contactor (Figure 1, Item 3).

4. Remove tags and connect cable 103A (Figure 1, Item 7) to terminal C1 on main load contactor (Figure 1, Item 3) and to terminal 3 on reconnection terminal board (Figure 1, Item 2).

5. Remove tags and connect cable 102A (Figure 1, Item 6) to terminal B1 on main load contactor (Figure 1, Item 3) and to terminal 2 on reconnection terminal board (Figure 1, Item 2).

6. Remove tags and connect cable 101A (Figure 1, Item 5) to terminal A1 on main load contactor (Figure 1, Item 3) and to terminal 1 on reconnection terminal board (Figure 1, Item 2).

INSTALLATION - Continued

7. Remove tags and connect cable 110K (Figure 1, Item 4) to terminal N on load terminal board (Figure 1, Item 1) and to terminal 13 on reconnection terminal board (Figure 1, Item 2).
8. Install two plates on front of main load contactor (Figure 1, Item 3) (WP 0048).
9. Install reconnection terminal board (Figure 1, Item 2) (WP 0044).
10. Install load terminal board (Figure 1, Item 1) (WP 0045).
11. Close load board door. Close rear doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

MAIN LOAD CONTACTOR K1 MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Marker tags (WP 0120, Item 52)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Open right rear door (latch) and right rear door.
3. Remove four screws (Figure 1, Item 1), four lockwashers (Figure 1, Item 2), and cover (Figure 1, Item 3).
4. Tag and disconnect cables and wires from main load contactor K1 (Figure 1, Item 4).
5. Remove four screws (Figure 1, Item 5), lockwashers (Figure 1, Item 6), lockwashers (Figure 1, Item 7), and main load contactor K1 (Figure 1, Item 4).

REMOVAL - Continued

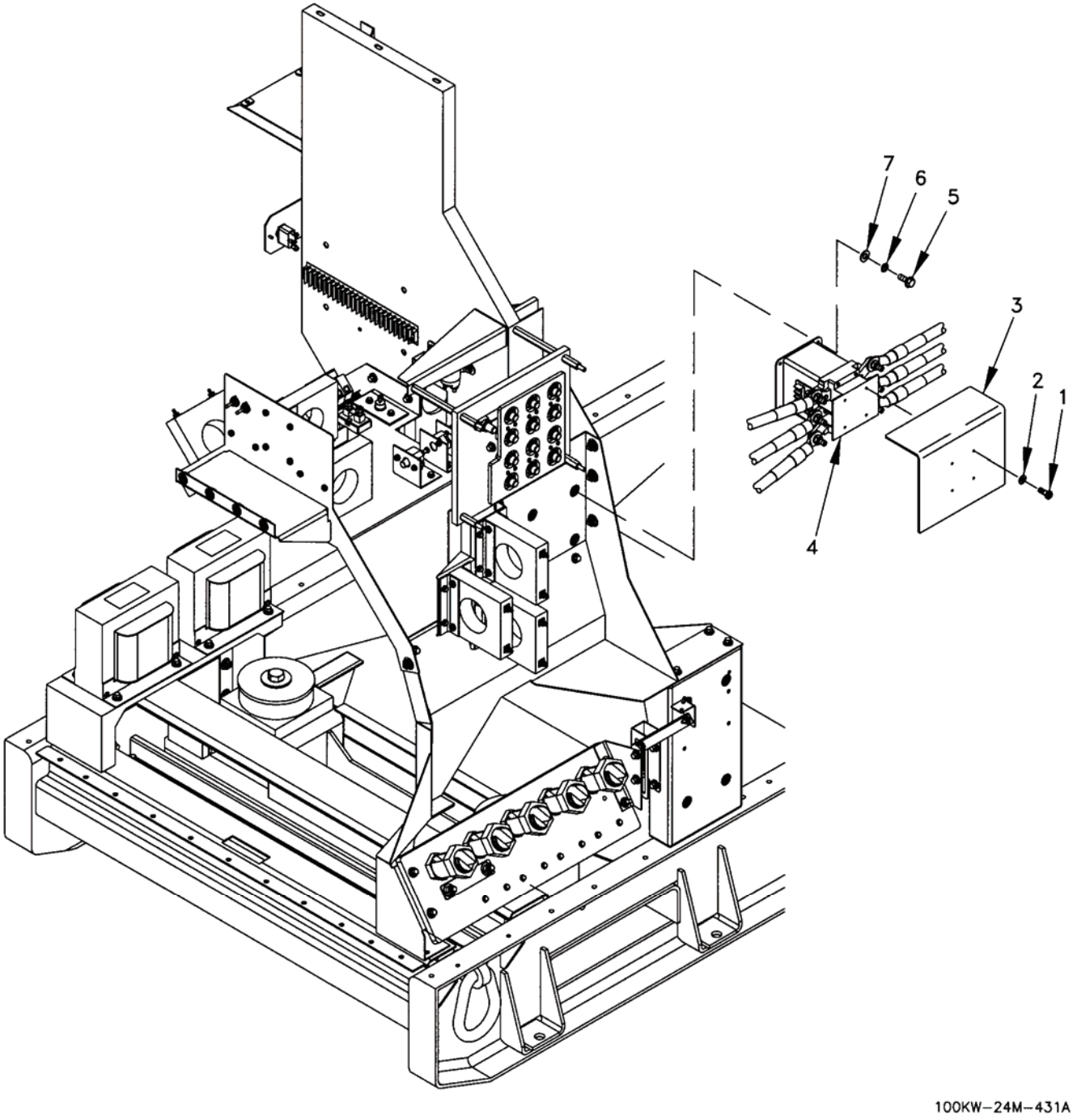


Figure 1. Main Load Contactor K1.

END OF TASK

INSTALLATION

1. Install main load contactor K1 (Figure 1, Item 4) with four washers (Figure 1, Item 7), lockwashers (Figure 1, Item 6), and screws (Figure 1, Item 5).
2. Remove tags and connect wires and cables to main load contactor K1 (Figure 1, Item 4).
3. Install cover (Figure 1, Item 3), four lockwashers (Figure 1, Item 2), and screws (Figure 1, Item 1).
4. Close right rear door and right rear door (latch).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

BATTERIES MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)
Battery Load Tester 4C-4911

Materials/Parts

Marker tags (WP 0120, Item 52)

Personnel Required

Two

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause serious 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 can cause injury to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Ensure there is no external cable connected to slave receptacle.

3. Open right and left side battery access doors.

4. Tag and disconnect battery cables 1C40 (Figure 1, Item 1) and 1A40 (Figure 1, Item 2) from left battery BT2 negative terminal (Figure 1, Item 3).

5. Tag and disconnect battery cable 12A40 (Figure 1, Item 4) from right battery BT1 negative terminal (Figure 1, Item 5) and from left battery BT2 positive terminal (Figure 1, Item 6).

6. Tag and disconnect battery cables 24D40 (Figure 1, Item 7) and 24A40 (Figure 1, Item 8) from right battery BT1 positive terminal (Figure 1, Item 9).

7. Remove three nuts (Figure 1, Item 10), lockwashers (Figure 1, Item 11), washers (Figure 1, Item 12), and pull battery hold down angle (Figure 1, Item 13) off three threaded rods (Figure 1, Item 14).

8. Remove right battery BT1 (Figure 1, Item 15) and left battery BT2 (Figure 1, Item 16).

END OF TASK

TESTING AND CHARGING

NOTE

The testing and charging procedures apply only to the absorbed glass mat (AGM) type batteries supplied with the TQG.

Do not mix AGM batteries with conventional flooded lead acid batteries, or reduced capacity, shorter battery life, and possible undercharge problems may occur.

1. Allow battery to sit for at least 3 hours, preferably 8 hours. The battery must be disconnected from any load or any other battery, and the ambient temperature should be approximately 70 degrees F (21 degrees C). Use the battery load tester (4C-4911) to measure the open circuit voltage across the terminals for 12.8 to 13 Vdc, indicating a fully charged battery.

2. If battery is not fully charged, charge the battery, using the SEALED or GEL setting on the battery charger, before proceeding.

3. If battery is fully charged, apply a load of 550 amps for 15 seconds, using battery load tester (4C-4911). Check the open circuit voltage again for a minimum or 9.6 Vdc.

4. If open circuit voltage is 9.6 Vdc or above, recharge the battery using the SEALED or GEL setting on the battery charger.

5. If the open circuit voltage is less than 9.6 Vdc, battery is defective and must be replaced.

TESTING AND CHARGING - Continued

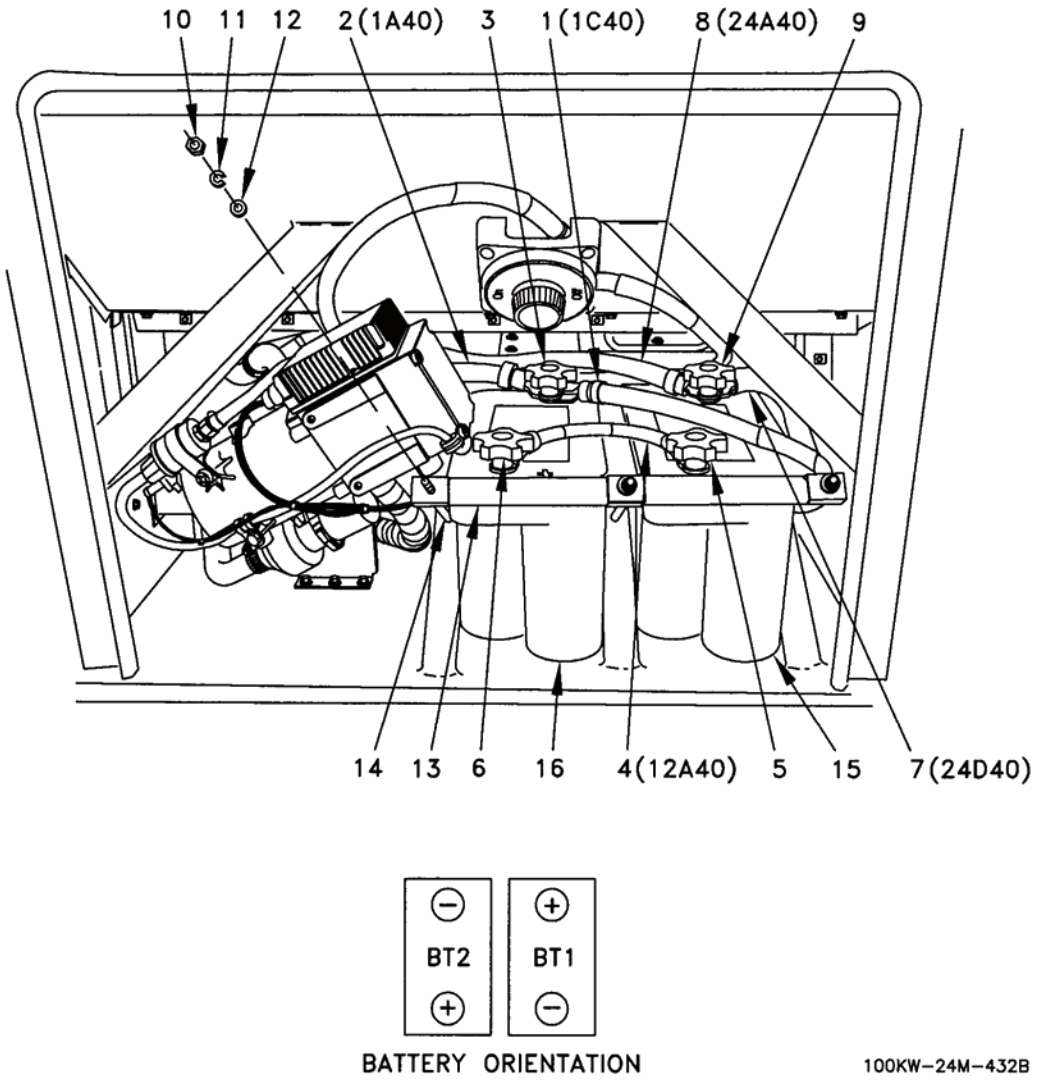


Figure 1. Batteries.

END OF TASK

INSTALLATION

1. Install left battery BT2 (Figure 1, Item 16) so that positive terminal (Figure 1, Item 3) is close to doorway.
2. Install right battery BT1 (Figure 1, Item 15) so that negative terminal (Figure 1, Item 2) is close to doorway.
3. Position battery hold down angle (Figure 1, Item 13) on three threaded rods (Figure 1, Item 14) and install three washers (Figure 1, Item 12), lockwashers (Figure 1, Item 11), and nuts (Figure 1, Item 10).
4. Remove tags and connect battery cables 24A40 (Figure 1, Item 8) and 24D40 (Figure 1, Item 7) to right battery BT1 positive terminal (Figure 1, Item 9).
5. Remove tags and connect battery cable 12A40 (Figure 1, Item 4) to left battery BT2 positive terminal (Figure 1, Item 6) and to right battery BT1 negative terminal (Figure 1, Item 5).
6. Remove tags and connect battery cables 1A40 (Figure 1, Item 2) and 1C40 (Figure 1, Item 1) to left battery BT2 negative terminal (Figure 1, Item 3).
7. Close left and right side battery access doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

BATTERY DISCONNECT SWITCH MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	Personnel Required
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Marker tags (WP 0120, Item 52)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause serious injury to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Ensure there is no external cable connected to slave receptacle.
3. Open right and left side battery access doors.

REMOVAL - Continued

4. Tag and disconnect battery cable 1A40 (Figure 1, Item 1) and battery cable 1C40 (Figure 1, Item 2) from left battery BT2 negative terminal (Figure 1, Item 3).

5. Tag and disconnect battery cable 12A40 (Figure 1, Item 4) from right battery BT1 negative terminal (Figure 1, Item 5).

6. Remove four screws (Figure 1, Item 6), lockwashers (Figure 1, Item 7), and washers (Figure 1, Item 8) and pull battery disconnect switch (Figure 1, Item 9) away from wall.

7. At rear of battery disconnect switch (Figure 1, Item 9), tag and disconnect battery cable 1A40 (Figure 1, Item 1) and battery cable 2A40 (Figure 1, Item 10).

8. Remove battery disconnect switch (Figure 1, Item 9).

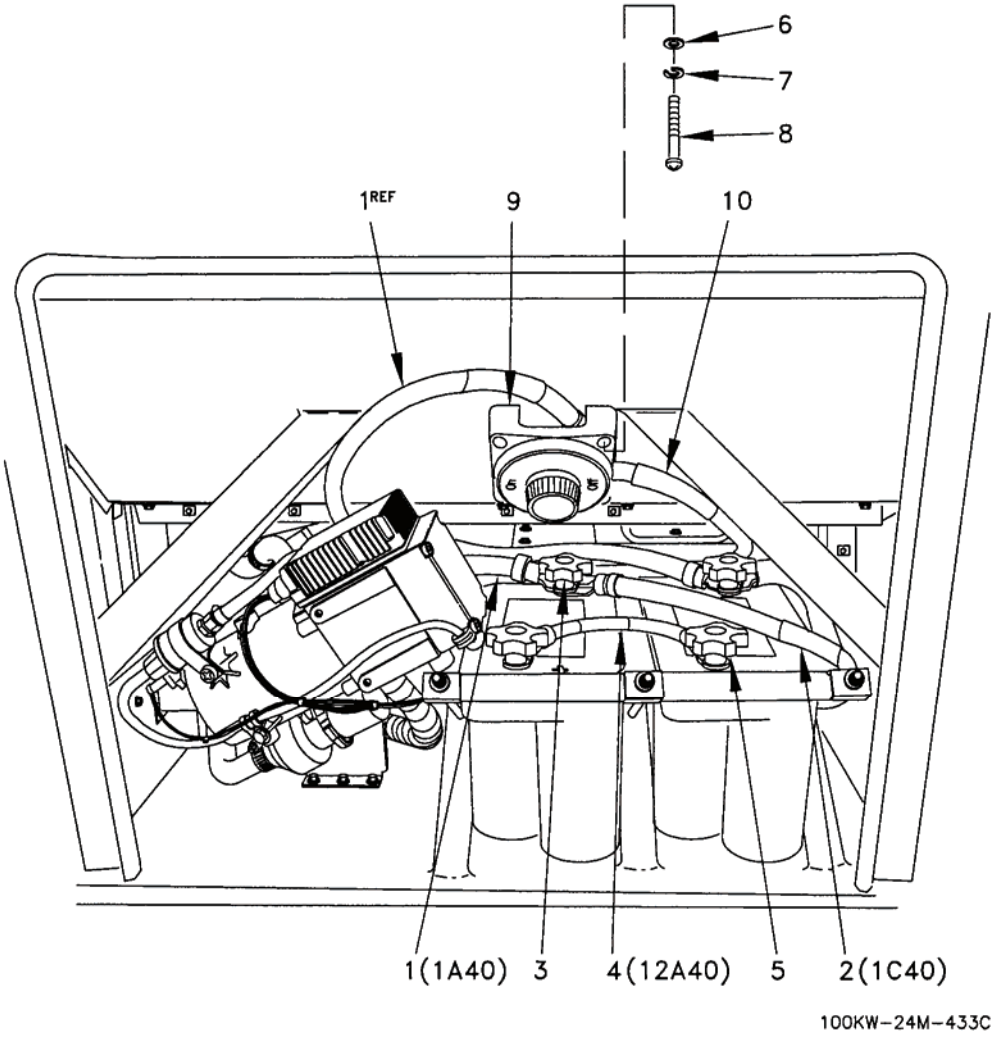


Figure 1. Battery Disconnect Switch.

END OF TASK

INSTALLATION

1. Position battery disconnect switch (Figure 1, Item 9) near where it is to be installed. Remove tags and connect battery cable 2A40 (Figure 1, Item 10) and battery cable 1A40 (Figure 1, Item 1).

2. Install battery disconnect switch (Figure 1, Item 9) with four washers (Figure 1, Item 8), lockwashers (Figure 1, Item 7), and screws (Figure 1, Item 6).

3. Remove tag and connect battery cable 12A40 (Figure 1, Item 4) to right battery BT1 negative terminal (Figure 1, Item 5).

4. Remove tags and connect battery cable 1C40 (Figure 1, Item 2) and battery cable 1A40 (Figure 1, Item 1) to left battery BT2 negative terminal (Figure 1, Item 3).

5. Close right and left side battery access doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

CURRENT TRANSFORMER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Tiedown straps (WP 0120, Item 49)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

Dangerously high voltage can exist across current transformer (CT) output with engine running. CT could explode if disconnected from load with engine running. Do not disconnect CT with generator rotating. Failure to comply can cause serious injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Open right rear doors.

REMOVAL - Continued

3. Open left rear doors.

NOTE

Each current transformer has a cable running through it. These cables must be disconnected at one end in order to remove the current transformer.

Cut tiedown straps as required.

4. Identify the cables running through three current transformers (Figure 1, Sheet 1, Item 1) adjacent to main load contactor K1 and disconnect one end of each cable.

5. Remove twelve screws (Figure 1, Sheet 1, Item 2), lockwashers (Figure 1, Sheet 1, Item 3), washers (Figure 1, Sheet 1, Item 4), and three current transformers (Figure 1, Sheet 1, Item 1).

6. If necessary, remove two screws (Figure 1, Sheet 1, Item 5), lockwashers (Figure 1, Sheet 1, Item 6), washers (Figure 1, Sheet 1, Item 7), and current transformer bracket (Figure 1, Sheet 1, Item 8).

7. Identify the cables running through three current transformers (Figure 1, Sheet 2, Item 9) above the generator and disconnect one end of each cable.

8. Remove twelve screws (Figure 1, Sheet 2, Item 10), lockwashers (Figure 1, Sheet 2, Item 11), washers (Figure 1, Sheet 2, Item 12), locknuts (Figure 1, Sheet 2, Item 13), and three current transformers (Figure 1, Sheet 2, Item 9).

9. Identify the cable running through current transformer (Figure 1, Sheet 2, Item 14) above two power transformers and disconnect one end of cable.

10. Remove four screws (Figure 1, Sheet 2, Item 15), washers (Figure 1, Sheet 2, Item 16), lockwashers (Figure 1, Sheet 2, Item 17), and current transformer (Figure 1, Sheet 2, Item 14).

END OF TASK

TEST

1. Using multimeter, measure continuity between the two leads for each transformer. Ensure that continuity is measured and that there are no opens.

END OF TASK

INSTALLATION

1. Put one end of cable through current transformer (Figure 1, Sheet 2, Item 14) to be installed above two power transformers, remove tag, and connect end of cable.

2. Install current transformer (Figure 1, Sheet 2, Item 14), four washers (Figure 1, Sheet 2, Item 16), lockwashers (Figure 1, Sheet 2, Item 17), and screws (Figure 1, Sheet 2, Item 15). Connect wires to current transformer (Figure 1, Sheet 2, Item 14).

INSTALLATION - Continued

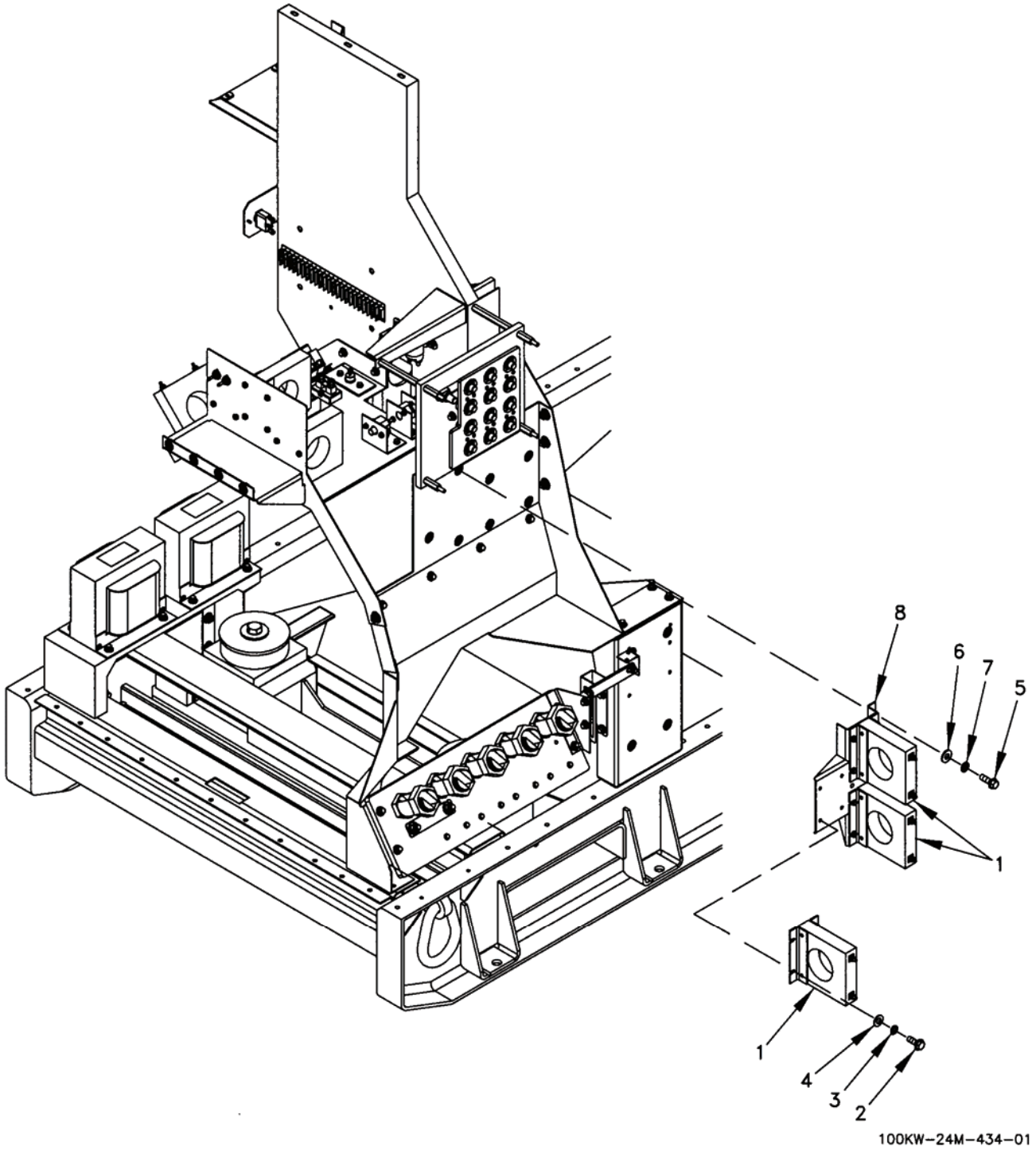


Figure 1. Current Transformer (Sheet 1 of 2).

INSTALLATION - Continued

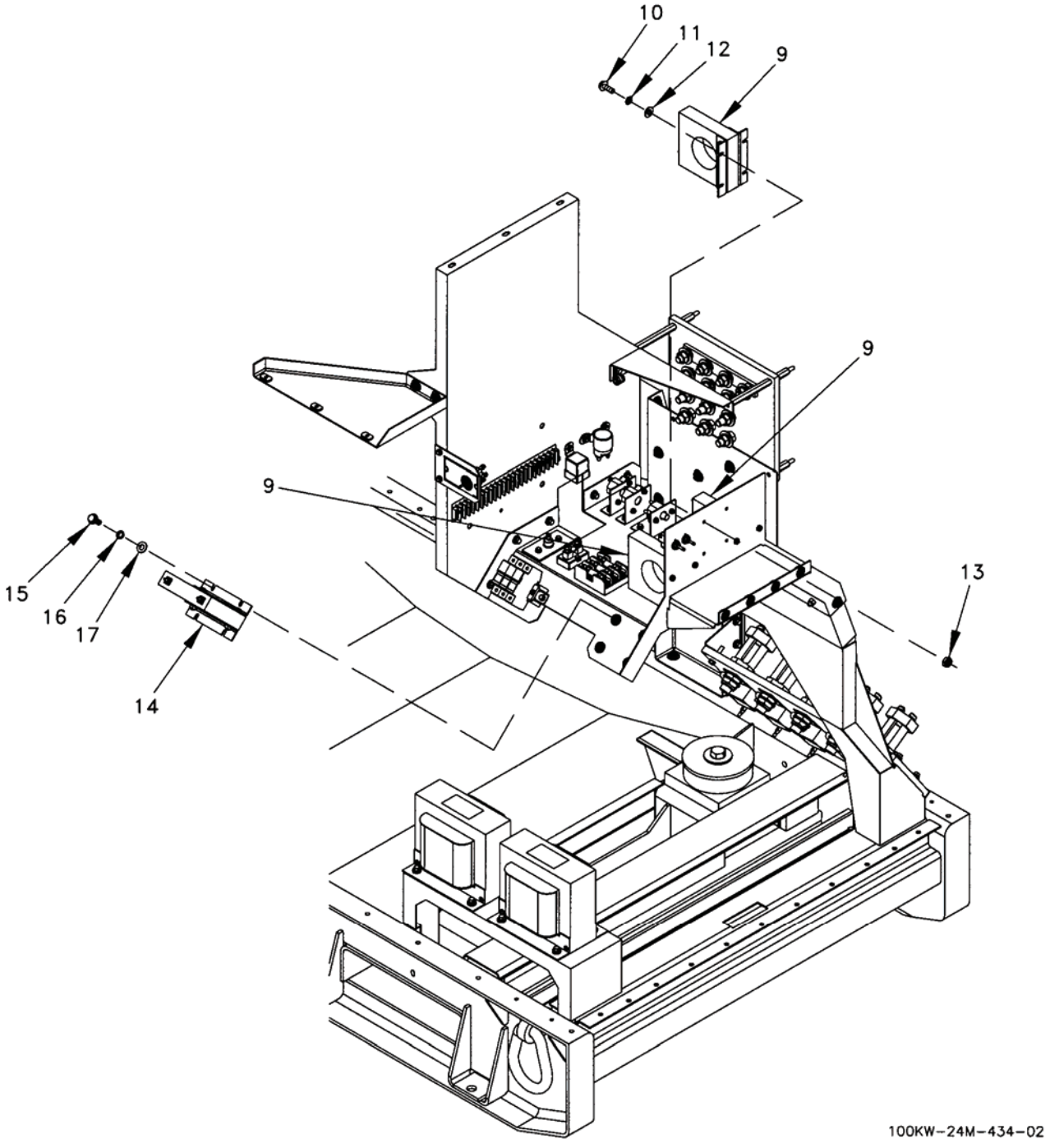


Figure 1. Current Transformer (Sheet 2 of 2).

INSTALLATION - Continued

3. Put one end of cable through each of three current transformers (Figure 1, Sheet 2, Item 9) to be installed above the generator, remove tags, and connect end of each cable.

4. Install three current transformers (Figure 1, Sheet 2, Item 9), locknuts (Figure 1, Sheet 2, Item 13), twelve lockwashers (Figure 1, Sheet 2, Item 11), washers (Figure 1, Sheet 2, Item 12), and screws (Figure 1, Sheet 2, Item 10).

5. Install current transformer bracket (Figure 1, Sheet 1, Item 8), two washers (Figure 1, Sheet 1, Item 7), lockwashers (Figure 1, Sheet 1, Item 6), and screws (Figure 1, Sheet 1, Item 5).

6. Put one end of cable through each of three current transformers (Figure 1, Sheet 1, Item 1) to be installed adjacent to AC Circuit interrupter, remove tags, and connect end of each cable.

7. Install three current transformers (Figure 1, Sheet 1, Item 1), twelve washers (Figure 1, Sheet 1, Item 4), lockwashers (Figure 1, Sheet 1, Item 3), and screws (Figure 1, Sheet 1, Item 2).

8. Close left and right rear doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
POTENTIAL TRANSFORMER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Materials/Parts

Marker tags (WP 0120, Item 52)
Tiedown straps (WP 0120, Item 50)

Equipment Condition

Generator access cover removed (WP 0032)

Personnel Required

One

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

REMOVAL - Continued

NOTE

Cut tiedown straps as required.

2. Tag and disconnect wire harness from potential transformer PT3 (Figure 1, Item 1) and PT2 (Figure 1, Item 2).

3. Remove four screws (Figure 1, Item 3), washers (Figure 1, Item 5), lockwashers (Figure 1, Item 4), and transformer PT3 (Figure 1, Item 1). Repeat for transformer PT2 (Figure 1, Item 2).

4. If removing bracket, remove two screws (Figure 1, Item 6), lockwashers (Figure 1, Item 7), and washers (Figure 1, Item 8).

5. If removing bracket, remove two screws (Figure 1, Item 9), lockwashers (Figure 1, Item 10), washers (Figure 1, Item 11), and potential transformers bracket (Figure 1, Item 12).

END OF TASK

INSTALLATION

NOTE

Install tiedown straps as required.

1. If bracket was removed, install potential transformer bracket (Figure 1, Item 12), washers (Figure 1, Item 11), lockwasher (Figure 1, Item 10), and two screws (Figure 1, Item 9).

2. If bracket was removed, install two washers (Figure 1, Item 8), lockwasher (Figure 1, Item 7), and screws (Figure 1, Item 6).

3. Install potential transformer PT2 (Figure 1, Item 2), four lockwashers (Figure 1, Item 5), washers (Figure 1, Item 4), and screws (Figure 1, Item 3). Repeat for potential transformer PT3 (Figure 1, Item 1).

4. Remove tags and connect wire harness to potential transformers PT2 (Figure 1, Item 2) and PT3 (Figure 1, Item 1).

5. Install generator access cover (WP 0032).

INSTALLATION - Continued

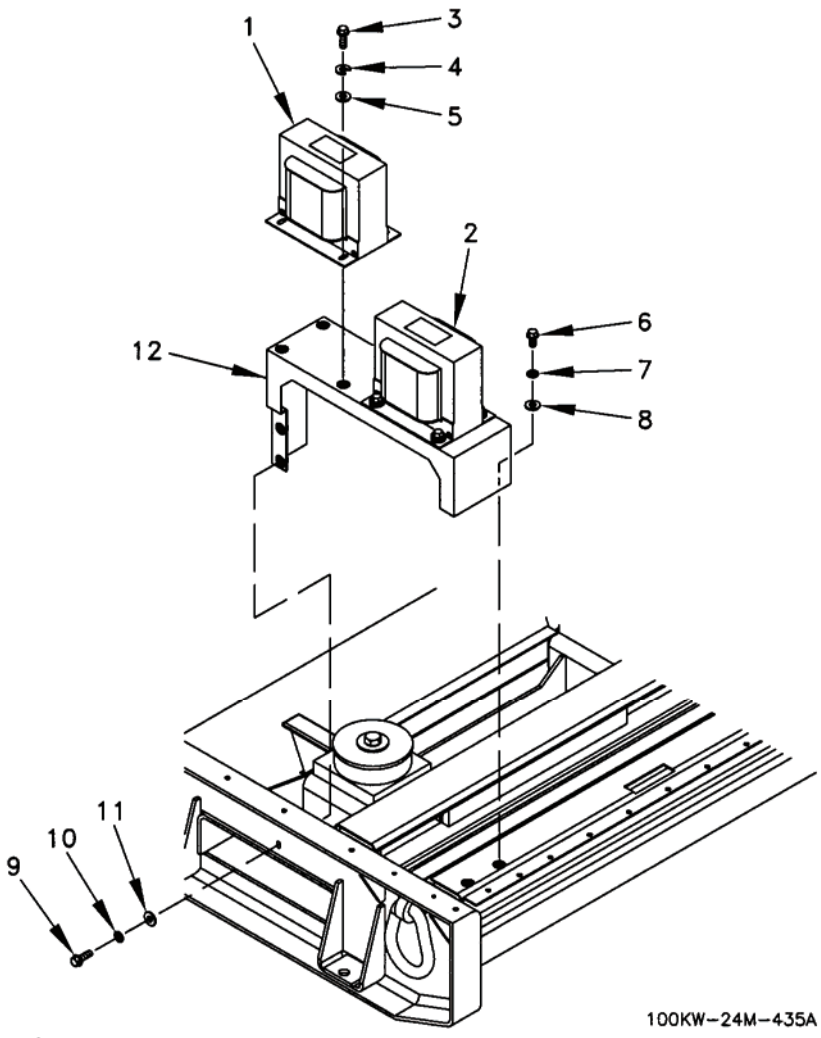


Figure 1. Potential Transformer.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
SLAVE RECEPTACLE MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Marker tags (WP 0120, Item 52)
Tiedown straps (WP 0120, Item 48)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause serious injury to personnel.

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 batteries before performing maintenance on the slave receptacle. Failure to comply can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Ensure there is no external cable connected to slave receptacle.

3. Open right and left battery access doors. Open left front door.

NOTE

Cut tiedown straps as required.

4. Tag and disconnect battery cables 1C40 (Figure 1, Item 1) and 1A40 (Figure 1, Item 2) from left battery BT2 negative terminal (Figure 1, Item 3).

5. Tag and disconnect battery cable 12A40 (Figure 1, Item 4) from right battery BT1 negative terminal (Figure 1, Item 5).

6. Remove four nuts (Figure 1, Item 6), screws (Figure 1, Item 7), washers (Figure 1, Item 8), retainer (Figure 1, Item 9), and push slave receptacle (Figure 1, Item 10) out of TQG.

7. Tag and disconnect battery cables 1C40 (Figure 1, Item 1) and 24D40 (Figure 1, Item 11) from slave receptacle (Figure 1, Item 10).

8. Remove eight locknuts (Figure 1, Item 12), washers (Figure 1, Item 13), screws (Figure 1, Item 14), and slave receptacle pocket (Figure 1, Item 15).

END OF TASK

INSTALLATION

NOTE

Install tiedown straps as required.

1. Install slave receptacle pocket (Figure 1, Item 15), eight screws (Figure 1, Item 14), washers (Figure 1, Item 13), and locknuts (Figure 1, Item 12).

2. Remove tags and connect battery cables 1C40 (Figure 1, Item 1) and 24D40 (Figure 1, Item 11) to slave receptacle (Figure 1, Item 10).

3. Install slave receptacle (Figure 1, Item 10) and retainer (Figure 1, Item 9) with four washers (Figure 1, Item 8), screws (Figure 1, Item 7), and nuts (Figure 1, Item 6).

4. Remove tags and connect battery cable 12A40 (Figure 1, Item 4) to right battery BT1 negative terminal (Figure 1, Item 5).

5. Remove tags and connect battery cables 1C40 (Figure 1, Item 1) and 1A40 (Figure 1, Item 2) to left battery BT2 negative terminal (Figure 1, Item 3).

6. Close left front door. Close right and left battery access doors.

INSTALLATION - Continued

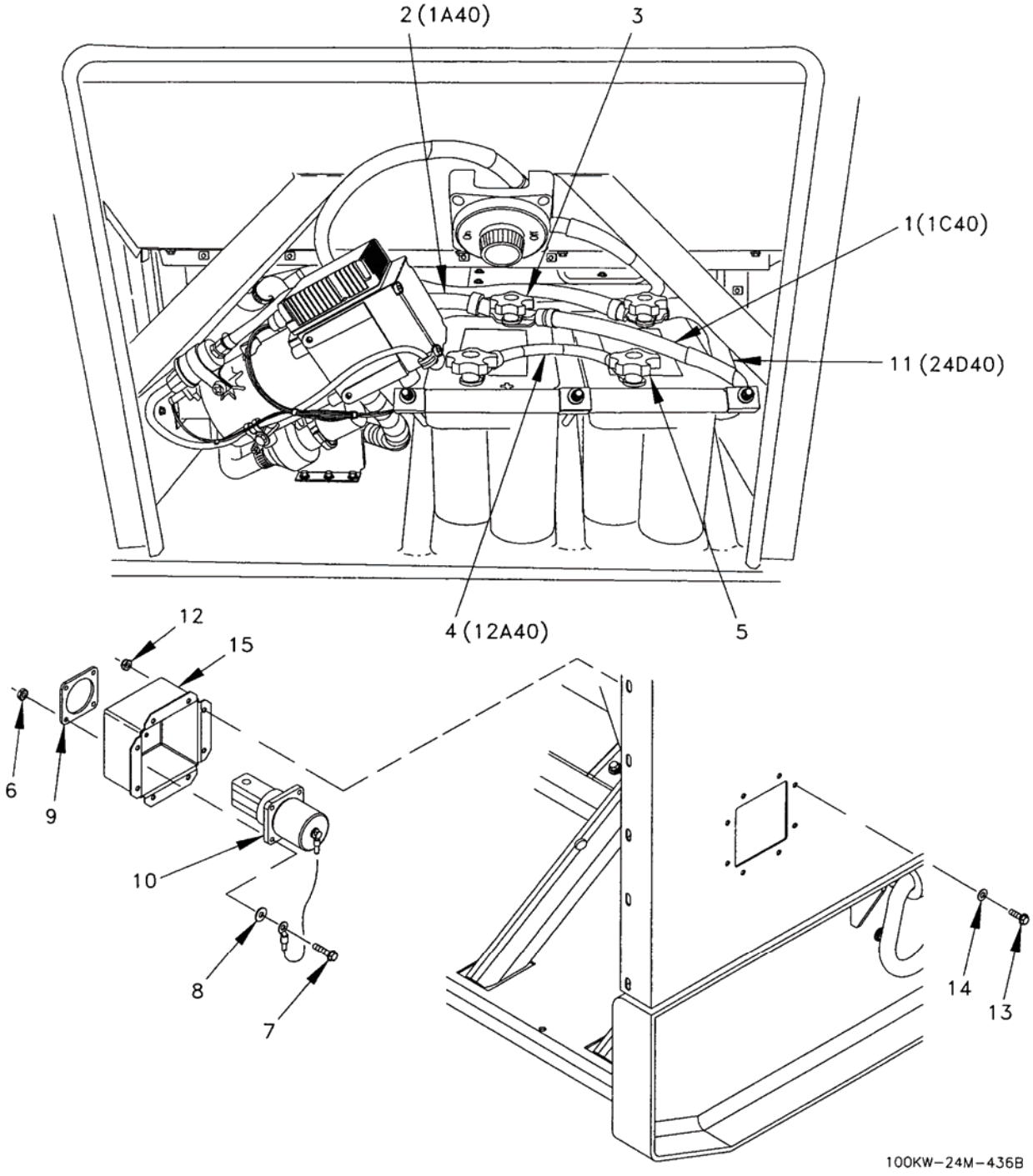


Figure 1. Slave Receptacle.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

ELECTRICAL INSTALLATION MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Marker tags (WP 0120, Item 52)
Rivets
Tiedown straps (WP 0120, Item 48)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

REMOVAL

NOTE

Table 1 identifies removal and installation steps for maintenance significant components of the electrical installation. Cut tiedown straps as required.

Table 1. WP 0054 Guide.

NAME	FIGURE 1 ITEM	REMOVAL STEP	INSTALLATION STEP
DEAD CRANK SWITCH	1	1 thru 3	15
CATSW1 (RESET SW FUEL)	18	1, 2, and 6	12
CATSW2 (RESET SW OIL)	19	1, 2, and 6	12
Slave relay SRY	22	1, 2, and 7	11
Starter motor magnetic switch (SMMS) relay	22	1, 2, and 8	10
Circuit breaker CB2	48	1, 2, and 13	4
Circuit breaker CB4	52	1, 2, and 14	3
Circuit breaker CB5	47	1, 2, and 13	4
Ammeter shunt R4	40	1, 2, and 11	6
Diode D1	42	1, 2, and 12	5
Fuses F1, F2, and F3	30	1, 2, and 9	9

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right rear doors and left rear doors.

3. To remove DEAD CRANK SWITCH (Figure 1, Sheet 1, Item 1), tag and disconnect wires from switch, remove nut (Figure 1, Sheet 1, Item 2), lockwasher (Figure 1, Sheet 1, Item 3), and switch.

4. If necessary, drill out two rivets (Figure 1, Sheet 1, Item 4) and remove dead crank plate (Figure 1, Sheet 1, Item 5). Remove two locknuts (Figure 1, Sheet 1, Item 6), lockwashers (Figure 1, Sheet 1, Item 7), washers (Figure 1, Sheet 1, Item 8), screws (Figure 1, Sheet 1, Item 9), and switch plate (Figure 1, Sheet 1, Item 10) from air cleaner bracket (Figure 1, Sheet 1, Item 11).

REMOVAL - Continued

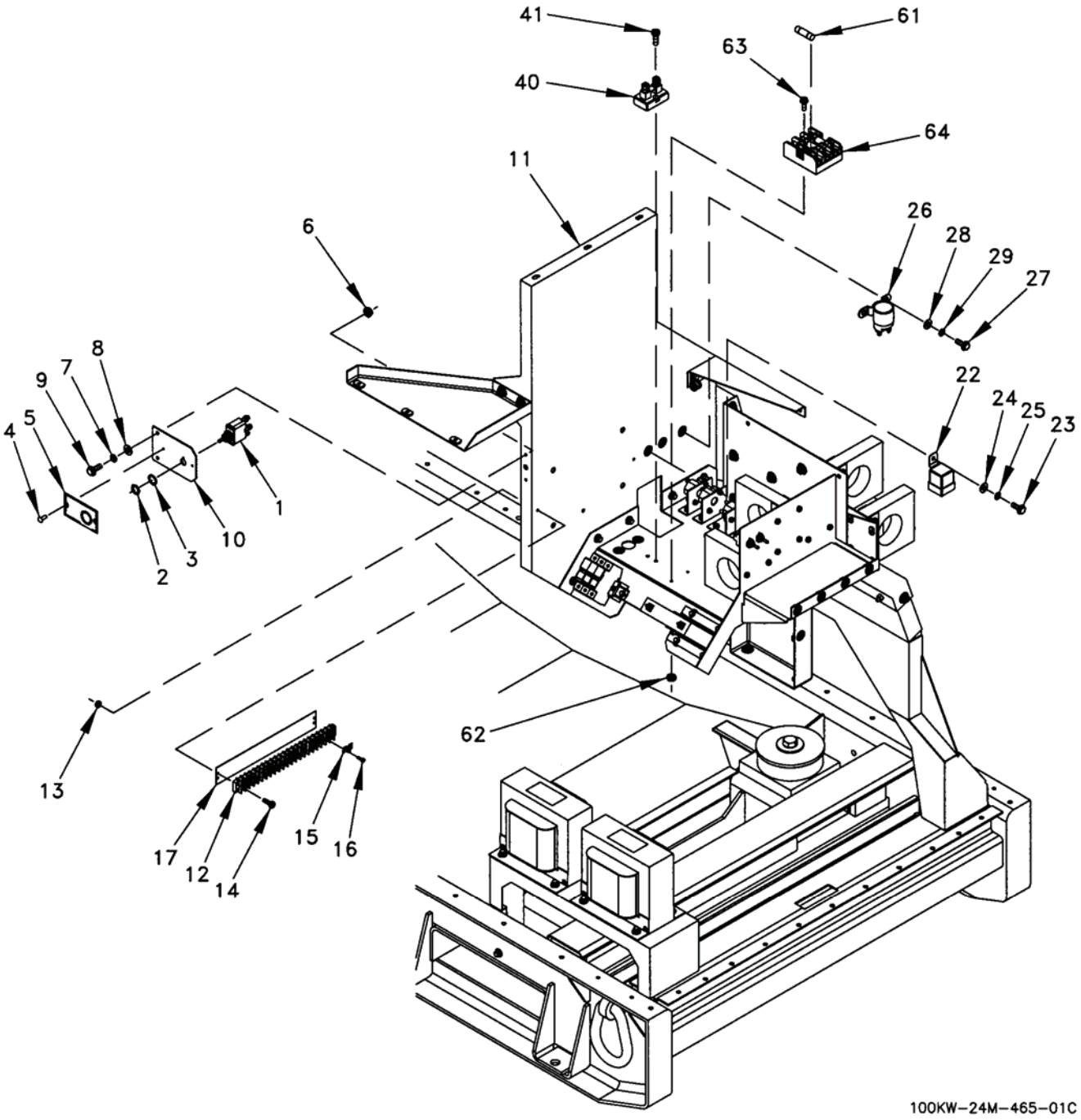


Figure 1. Electrical Installation (Sheet 1 of 3).

REMOVAL - Continued

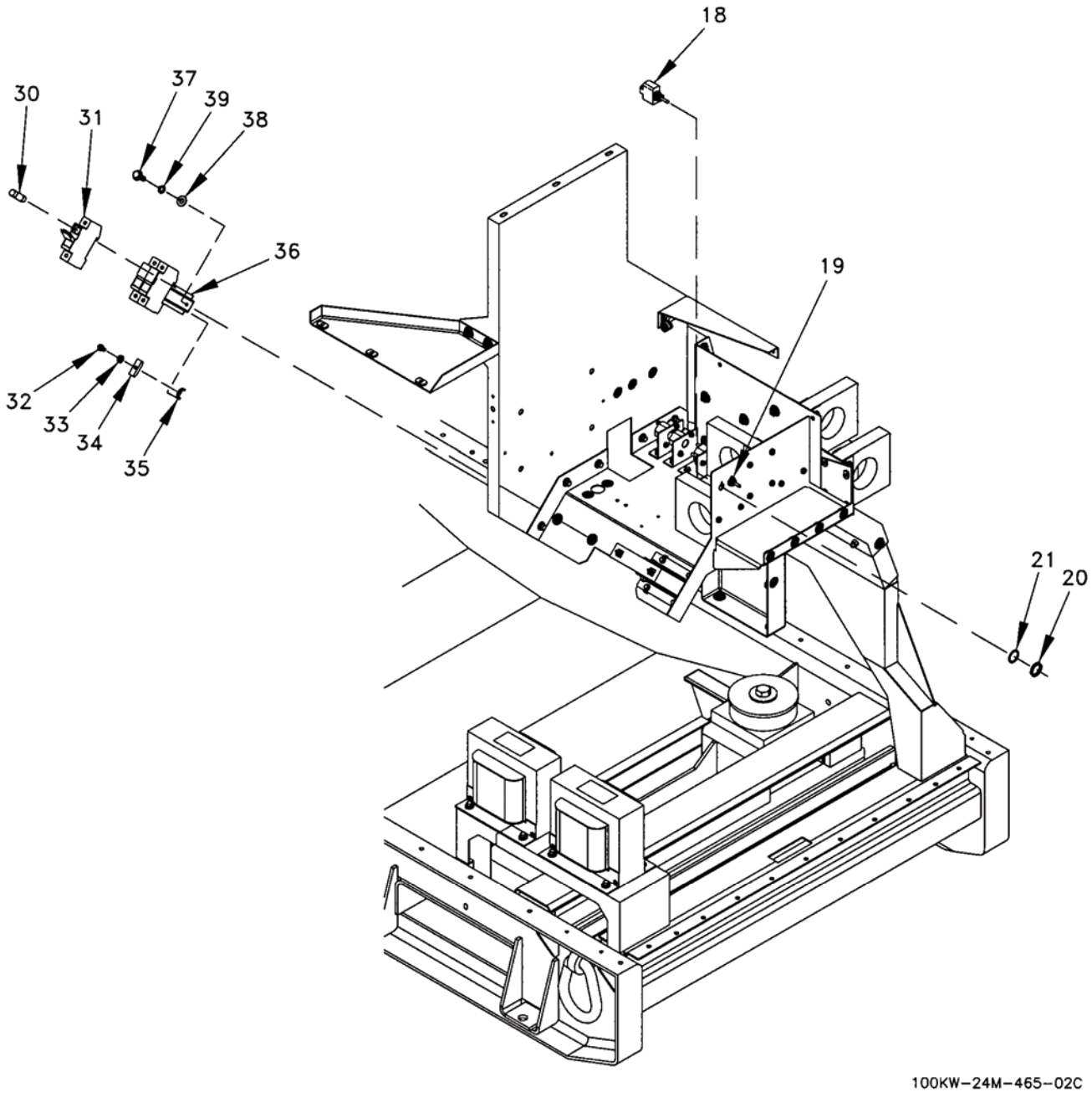


Figure 1. Electrical Installation (Sheet 2 of 3).

REMOVAL - Continued

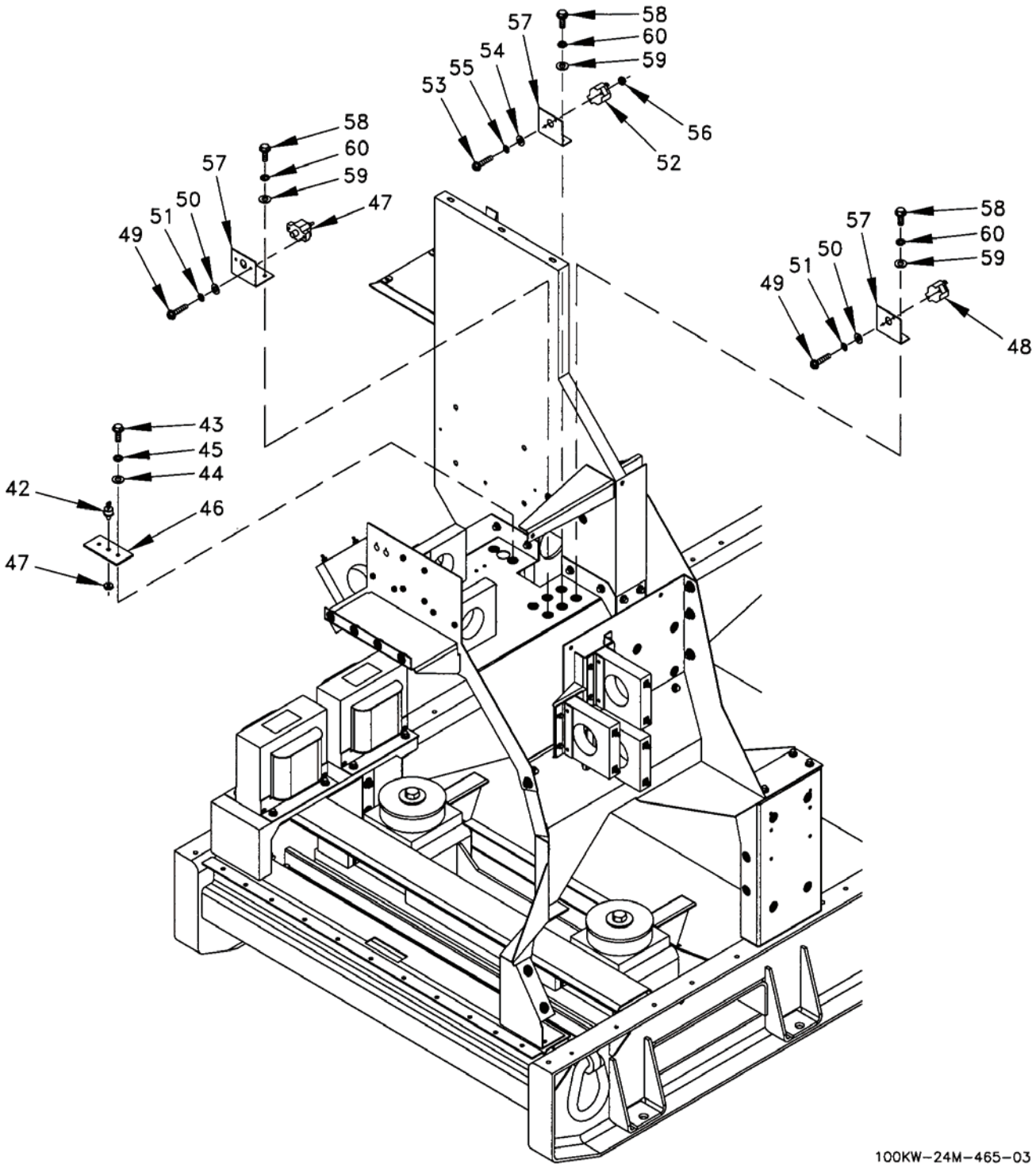


Figure 1. Electrical Installation (Sheet 3 of 3).

REMOVAL - Continued

5. To remove terminal board TB5 (Figure 1, Sheet 1, Item 12), tag and disconnect wires from terminal board, remove two nuts (Figure 1, Sheet 1, Item 13), screws (Figure 1, Sheet 1, Item 14), terminal board (Figure 1, Sheet 1, Item 12), and strip (Figure 1, Sheet 1, Item 17). Tag jumpers (Figure 1, Sheet 1, Item 15) locations. Remove screws (Figure 1, Sheet 1, Item 16) and jumpers (Figure 1, Sheet 1, Item 15).

6. To remove either switch CATSW1 (Figure 1, Sheet 2, Item 18) or switch CATSW2 (Figure 1, Sheet 2, Item 19), tag and disconnect wires from switch, remove nut (Figure 1, Sheet 2, Item 20), lockwasher (Figure 1, Sheet 2, Item 21), and switch.

7. To remove slave relay SRY (Figure 1, Sheet 1, Item 22), tag and disconnect wires from relay, remove screw (Figure 1, Sheet 1, Item 23), washer (Figure 1, Sheet 1, Item 24), lockwasher (Figure 1, Sheet 1, Item 25), and relay.

8. To remove starter motor magnetic switch (SMMS) relay (Figure 1, Sheet 1, Item 26), tag and disconnect wires from SMMS relay, remove two screws (Figure 1, Sheet 1, Item 27), washers (Figure 1, Sheet 1, Item 28), lockwashers (Figure 1, Sheet 1, Item 29), and SMMS relay.

9. To remove any of three fuses F1, F2, and F3 (Figure 1, Sheet 2, Item 30), pull fuse out of fuseholder (Figure 1, Sheet 2, Item 31). To remove fuseholder (Figure 1, Sheet 2, Item 31), remove two screws (Figure 1, Sheet 2, Item 32), washers (Figure 1, Sheet 2, Item 33), clips (Figure 1, Sheet 2, Item 34), fuseholder, and two insulators (Figure 1, Sheet 2, Item 35).

10. To remove fuseholder track (Figure 1, Sheet 2, Item 36), remove two screws (Figure 1, Sheet 2, Item 37), washers (Figure 1, Sheet 2, Item 38), lockwashers (Figure 1, Sheet 2, Item 39), and track.

11. Two remove ammeter shunt R4 (Figure 1, Sheet 1, Item 40), tag and disconnect wires from shunt, remove two screws (Figure 1, Sheet 1, Item 41) and shunt.

12. To remove diode D1 (Figure 1, Sheet 3, Item 42), tag and disconnect wires from diode, remove two screws (Figure 1, Sheet 3, Item 43), washers (Figure 1, Sheet 3, Item 44), lockwashers (Figure 1, Sheet 3, Item 45), insulator (Figure 1, Sheet 3, Item 46), and diode. Remove nut (Figure 1, Sheet 3, Item 47), and diode from insulator.

13. To remove circuit breaker CB5 (Figure 1, Sheet 3, Item 47) or CB2 (Figure 1, Sheet 3, Item 48), remove two screws (Figure 1, Sheet 3, Item 49), washers (Figure 1, Sheet 3, Item 50), lockwashers (Figure 1, Sheet 3, Item 51), and circuit breaker.

14. To remove circuit breaker CB4 (Figure 1, Sheet 3, Item 52), remove two screws (Figure 1, Sheet 3, Item 53), washers (Figure 1, Sheet 3, Item 54), lockwashers (Figure 1, Sheet 3, Item 55), nut (Figure 1, Sheet 3, Item 56), and circuit breaker.

15. To remove brackets (Figure 1, Sheet 3, Item 57) for CB5, CB4, or CB2, remove two screws (Figure 1, Sheet 3, Item 58), washers (Figure 1, Sheet 3, Item 59), lockwashers (Figure 1, Sheet 3, Item 60), and bracket.

16. Remove three spare fuses (Figure 1, Sheet 1, Item 61), two nuts (Figure 1, Sheet 1, Item 62), two screws (Figure 1, Sheet 1, Item 63), and spare fuseholder (Figure 1, Sheet 1, Item 64).

END OF TASK

INSTALLATION

NOTE

Install tiedown straps as required.

1. Install spare fuseholder (Figure 1, Sheet 1, Item 64), two screws (Figure 1, Sheet 1, Item 63), two nuts (Figure 1, Sheet 1, Item 62), and three spare fuses (Figure 1, Sheet 1, Item 61).

2. To install circuit breaker brackets (Figure 1, Sheet 3, Item 57) for CB5, CB4, or CB2, install bracket, two screws (Figure 1, Sheet 3, Item 58), washers (Figure 1, Sheet 3, Item 59), and lockwashers (Figure 1, Sheet 3, Item 60).

3. To install circuit breaker CB4 (Figure 1, Sheet 3, Item 52), install circuit breaker, two screws (Figure 1, Sheet 3, Item 53), washers (Figure 1, Sheet 3, Item 54), lockwashers (Figure 1, Sheet 3, Item 55), and nut (Figure 1, Sheet 3, Item 56).

4. To install circuit breaker CB5 (Figure 1, Sheet 3, Item 47) or CB2 (Figure 1, Sheet 3, Item 48), install circuit breaker, two screws (Figure 1, Sheet 3, Item 49), washers (Figure 1, Sheet 3, Item 50), and lockwashers (Figure 1, Sheet 3, Item 51).

5. To install diode D1 (Figure 1, Sheet 3, Item 42), install diode, insulator (Figure 1, Sheet 3, Item 46), two lockwashers (Figure 1, Sheet 3, Item 45), washers (Figure 1, Sheet 3, Item 44), and screws (Figure 1, Sheet 3, Item 43). Connect wires as tagged.

6. To install ammeter shunt R4 (Figure 1, Sheet 1, Item 40), install shunt and two screws (Figure 1, Sheet 1, Item 41). Connect wires as tagged.

7. To install fuseholder track (Figure 1, Sheet 2, Item 36), install two screws (Figure 1, Sheet 2, Item 37), washers (Figure 1, Sheet 2, Item 38), lockwashers (Figure 1, Sheet 2, Item 39), and track.

8. To install any fuseholder (Figure 1, Sheet 2, Item 31), install fuseholder, two insulators (Figure 1, Sheet 2, Item 35), two clips (Figure 1, Sheet 2, Item 34), washers (Figure 1, Sheet 2, Item 33), and two screws (Figure 1, Sheet 2, Item 32). Connect wires as tagged.

9. To install any of three fuses F1, F2, and F3 (Figure 1, Sheet 2, Item 30), push fuse into fuseholder (Figure 1, Sheet 2, Item 31).

10. To install relay SMMS (Figure 1, Sheet 1, Item 25), install relay, two lockwashers (Figure 1, Sheet 1, Item 29), lockwashers (Figure 1, Sheet 1, Item 28), and two screws (Figure 1, Sheet 1, Item 27). Connect wires as tagged.

11. To install relay SRY (Figure 1, Sheet 1, Item 22), install relay, lockwasher (Figure 1, Sheet 1, Item 25), washer (Figure 1, Sheet 1, Item 24), and screw (Figure 1, Sheet 1, Item 23). Connect wires as tagged.

12. To install either switch CATSW2 (Figure 1, Sheet 2, Item 19), or CATSW1 (Figure 1, Sheet 2, Item 18), install switch, lockwasher (Figure 1, Sheet 2, Item 21), and nut (Figure 1, Sheet 2, Item 20). Connect wires as tagged.

13. Install jumpers (Figure 1, Sheet 1, Item 15) using screws (Figure 1, Sheet 1, Item 16) onto terminal board (Figure 1, Sheet 1, Item 12). To install terminal board TB5 (Figure 1, Sheet 1, Item 12), install strip (Figure 1, Sheet 1, Item 17), terminal board, two screws (Figure 1, Sheet 1, Item 14) and nuts (Figure 1, Sheet 1, Item 13). Connect wires as tagged.

INSTALLATION - Continued

14. Install switch plate (Figure 1, Sheet 1, Item 10) on air cleaner bracket (Figure 1, Sheet 1, Item 11), and secure with two screws (Figure 1, Sheet 1, Item 9), washers (Figure 1, Sheet 1, Item 8), lockwashers (Figure 1, Sheet 1, Item 7), and locknuts (Figure 1, Sheet 1, Item 6). If necessary, install dead crank plate (Figure 1, Sheet 1, Item 5) and secure with two rivets (Figure 1, Sheet 1, Item 4).

15. To install DEAD CRANK SWITCH (Figure 1, Sheet 1, Item 1), install switch, lockwasher (Figure 1, Sheet 1, Item 3), and nut (Figure 1, Sheet 1, Item 2).

16. Close left rear doors and right rear doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FUEL LEVEL SWITCH ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Gasket
Sealing compound (WP 0120, Item 41)
Tiedown straps (WP 0120, Item 49)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open left front door.

REMOVAL - Continued

NOTE

Cut tiedown straps as required.

3. Tag and disconnect wires from fuel level switch (Figure 1, Item 1).

CAUTION

Cover hole in fuel tank to prevent contamination.

4. Remove five screws (Figure 1, Item 2), lockwashers (Figure 1, Item 3), washers (Figure 1, Item 4), fuel level switch assembly (Figure 1, Item 1), and gasket (Figure 1, Item 5).

END OF TASK

INSTALLATION

1. Apply sealing compound to both sides of gasket (Figure 1, Item 5) and install gasket, fuel level switch assembly (Figure 1, Item 1), five washers (Figure 1, Item 4), lockwashers (Figure 1, Item 3), and screws (Figure 1, Item 2).

2. Remove tags and connect wires from fuel level switch (Figure 1, Item 1).

3. Close left front door.

INSTALLATION - Continued

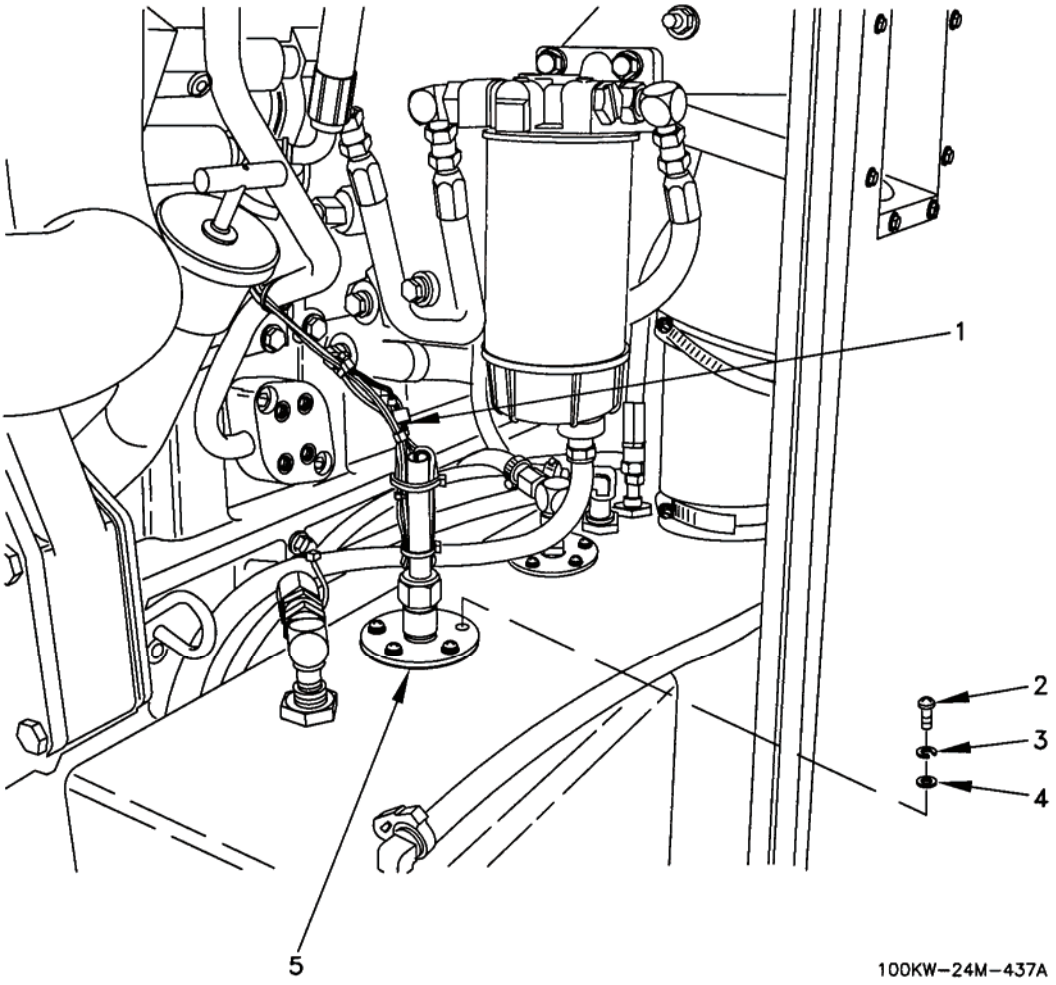


Figure 1. Fuel Level Switch Assembly.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FUEL HOSES MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's, (WP 0119, Item 1)

Materials/Parts

Cap and plug set (WP 0120, Item 6)
Sealing compound (WP 0120, Item 38)
Tiedown straps (WP 0120, Item 48)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Radiator removed (WP 0067)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the fuel system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open left front doors, left rear doors, right front doors, and right rear doors.

NOTE

Cut tiedown straps as required.

3. Disconnect hose assembly (Figure 1, Sheet 3, Item 1) from elbow (Figure 1, Sheet 3, Item 2) on fuel pickup tube assembly (Figure 1, Sheet 3, Item 3) and from elbow (Figure 1, Sheet 3, Item 4) on water separator filter (Figure 1, Sheet 3, Item 5).

4. If necessary, remove elbow (Figure 1, Sheet 3, Item 2) and elbow (Figure 1, Sheet 3, Item 4).

5. Remove two hose clamps and disconnect hose (Figure 1, Sheet 1, Item 6) from elbow (Figure 1, Sheet 1, Item 7) on fuel tank (Figure 1, Sheet 1, Item 8) and from adapter (Figure 1, Sheet 1, Item 9) on tee (Figure 1, Sheet 1, Item 10) mounted on fuel tank filler neck (Figure 1, Sheet 1, Item 11).

6. Remove two hose clamps and disconnect hose (Figure 1, Sheet 2, Item 12) from elbow (Figure 1, Sheet 2, Item 13) on tee (Figure 1, Sheet 2, Item 14) mounted on fuel tank (Figure 1, Sheet 1, Item 8) and from tee (Figure 1, Sheet 1, Item 10) mounted on fuel tank filler neck (Figure 1, Sheet 1, Item 11).

7. If necessary, remove elbow (Figure 1, Sheet 2, Item 13), fitting (Figure 1, Sheet 1, Item 15), adapter (Figure 1, Sheet 1, Item 9), seal nut (Figure 1, Sheet 1, Item 16), washer (Figure 1, Sheet 1, Item 17), and nipple (Figure 1, Sheet 1, Item 18).

8. Remove two hose clamps and disconnect hose (Figure 1, Sheet 3, Item 19) from male connector (Figure 1, Sheet 3, Item 20) on tee (Figure 1, Sheet 2, Item 14) mounted on fuel tank (Figure 1, Sheet 1, Item 8) and from elbow (Figure 1, Sheet 3, Item 21) mounted on fuel tank (Figure 1, Sheet 1, Item 8).

9. If necessary, remove male connector (Figure 1, Sheet 3, Item 20), tee (Figure 1, Sheet 2, Item 14), and elbow (Figure 1, Sheet 3, Item 21).

10. Disconnect hose assembly (Figure 1, Sheet 3, Item 22) from elbow (Figure 1, Sheet 3, Item 23) on fuel tank (Figure 1, Sheet 1, Item 8) and from fuel cooler (Figure 1, Sheet 3, Item 24). If necessary, remove elbow (Figure 1, Sheet 3, Item 23).

11. Remove two clamps and disconnect hose assembly (Figure 1, Sheet 3, Item 25) from adapter (Figure 1, Sheet 3, Item 26) on regulator (Figure 1, Sheet 3, Item 27) at engine fuel return and from swivel elbow (Figure 1, Sheet 3, Item 28) on fuel cooler (Figure 1, Sheet 3, Item 24).

12. If necessary, remove adapter (Figure 1, Sheet 3, Item 26), regulator (Figure 1, Sheet 3, Item 27), and swivel elbow (Figure 1, Sheet 3, Item 28).

13. Disconnect hose assembly (Figure 1, Sheet 2, Item 29) from adapter (Figure 1, Sheet 2, Item 30) on fuel tank (Figure 1, Sheet 1, Item 8) and from elbow (Figure 1, Sheet 2, Item 31) on auxiliary fuel pump (Figure 1, Sheet 2, Item 32). If necessary, remove adapter (Figure 1, Sheet 2, Item 30) and elbow (Figure 1, Sheet 2, Item 31).

14. Disconnect hose assembly (Figure 1, Sheet 3, Item 33) from elbow (Figure 1, Sheet 3, Item 34) on water separator filter (Figure 1, Sheet 3, Item 5) and from elbow (Figure 1, Sheet 1, Item 35) on engine fuel pump.

REMOVAL - Continued

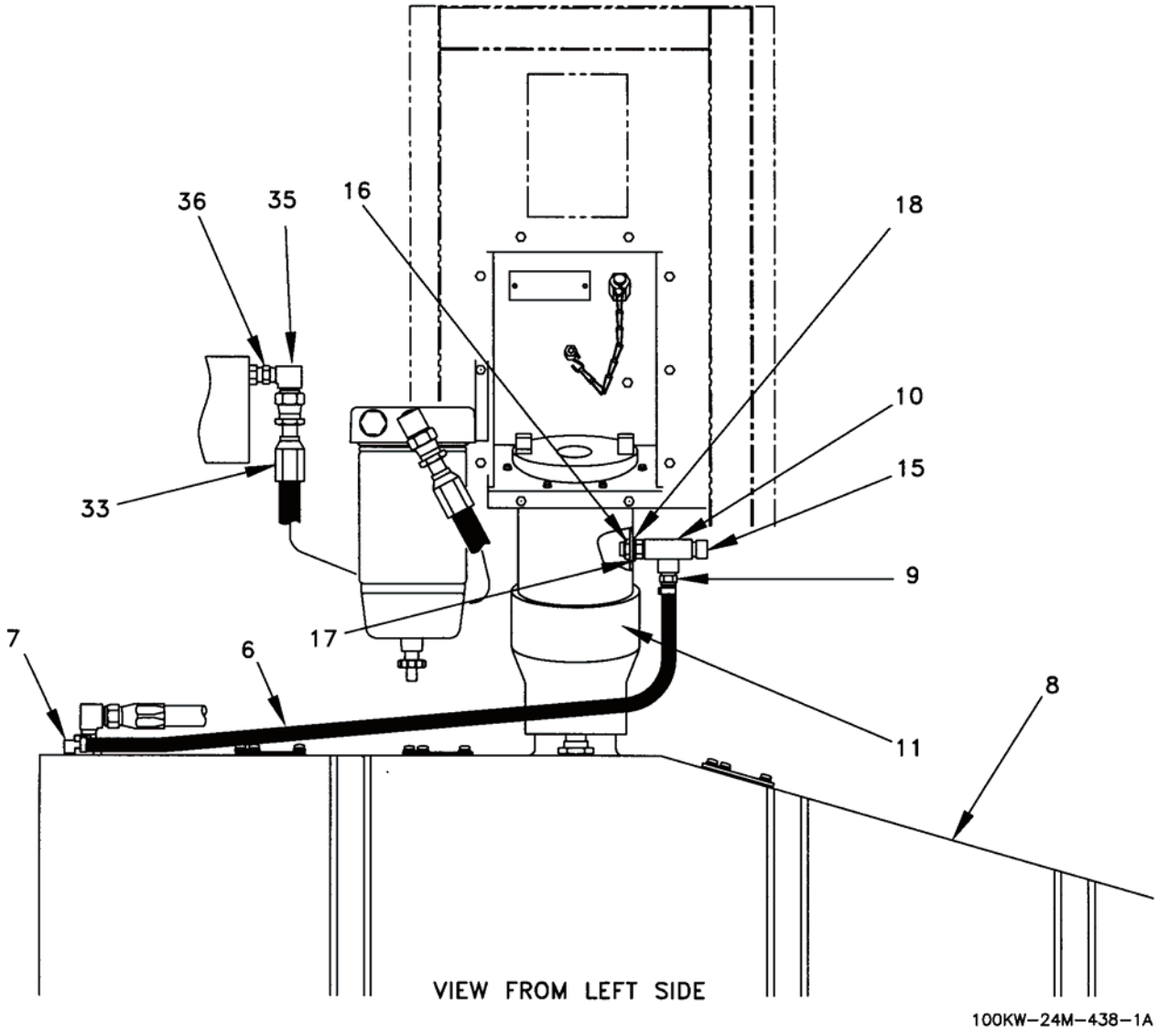


Figure 1. Fuel Hoses (Sheet 1 of 3).

REMOVAL - Continued

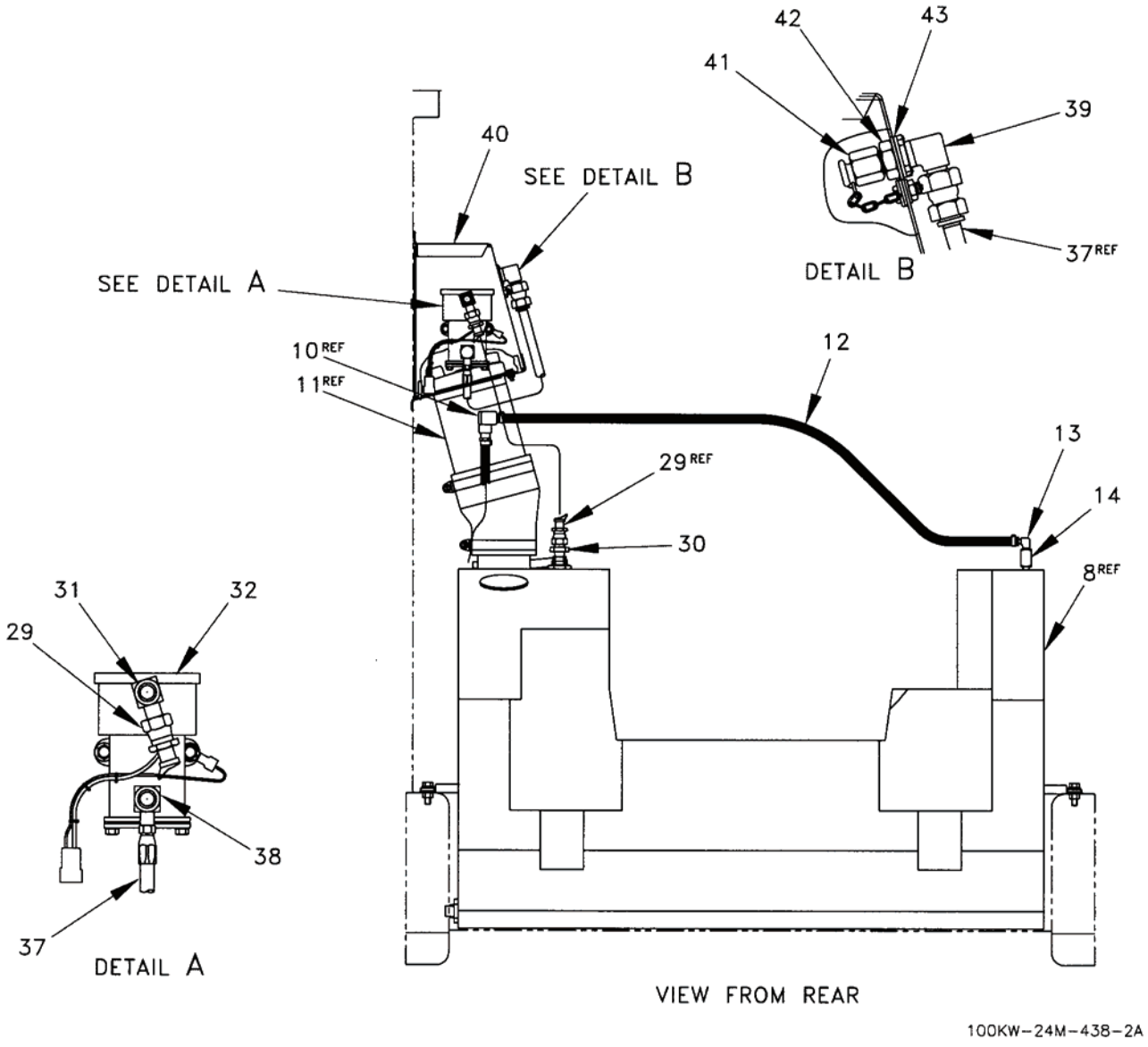


Figure 1. Fuel Hoses (Sheet 2 of 3).

REMOVAL - Continued

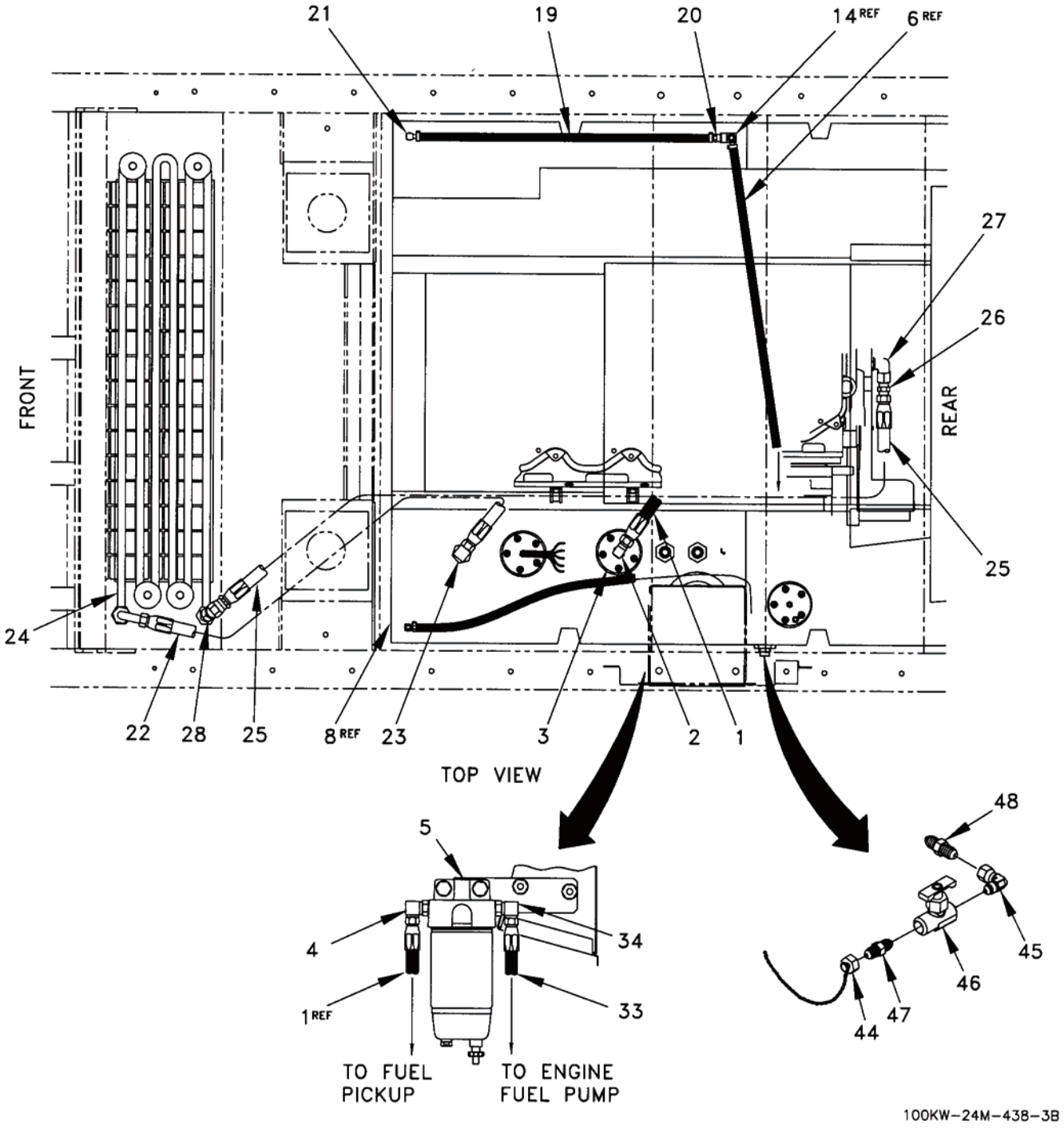


Figure 1. Fuel Hoses (Sheet 3 of 3).

REMOVAL - Continued

15. If necessary, remove elbow (Figure 1, Sheet 3, Item 34), elbow (Figure 1, Sheet 1, Item 35), and adapter (Figure 1, Sheet 1, Item 36).

16. Disconnect hose assembly (Figure 1, Sheet 2, Item 37) from elbow (Figure 1, Sheet 2, Item 38) on auxiliary fuel pump (Figure 1, Sheet 2, Item 32) and from bulkhead elbow (Figure 1, Sheet 2, Item 39) on filler neck pocket (Figure 1, Sheet 2, Item 40).

17. If necessary, remove elbow (Figure 1, Sheet 2, Item 38), cap (Figure 1, Sheet 2, Item 41), oversize washer (Figure 1, Sheet 2, Item 42), bulkhead locknut (Figure 1, Sheet 2, Item 43), and bulkhead elbow (Figure 1, Sheet 2, Item 39).

18. Remove cap (Figure 1, Sheet 3, item 44) and drain fuel from tank (Figure 1, Sheet 1, item 8). Use suitable container to collect fuel and dispose of in accordance with local ordinances.

19. Remove elbow (Figure 1, Sheet 3, item 45), drain valve (Figure 1, Sheet 1, item 46), and adapter (Figure 1, Sheet 3, item 47) as an assembly.

20. Disassemble elbow (Figure 1, Sheet 3, item 45), drain valve (Figure 1, Sheet 3, item 46) and adapter (Figure 1, Sheet 3, item 47).

21. Remove pipe coupling (48) from fuel tank (Figure 1, Sheet 1, item 8).

END OF TASK

INSTALLATION

NOTE

Apply sealing compound to all male pipe threads before connecting.

Install tiedown straps as required.

1. Install pipe coupling (48) into fuel tank (Figure 1, Sheet 1, item 8).

2. Assemble adapter (Figure 1, Sheet 3, item 47), drain valve (Figure 1, Sheet 3, item 46), and elbow (Figure 1, Sheet 3, item 45).

3. Install elbow (Figure 1, Sheet 3, item 45), drain valve (Figure 1, Sheet 1, item 46), and adapter (Figure 1, Sheet 3, item 47) as an assembly.

4. Install cap (Figure 1, Sheet 3, item 44).

5. If removed, install bulkhead elbow (Figure 1, Sheet 2, Item 39), bulkhead locknut (Figure 1, Sheet 2, Item 43), oversize washer (Figure 1, Sheet 2, Item 42), and cap (Figure 1, Sheet 2, Item 41) on filler neck pocket (Figure 1, Sheet 2, Item 40).

6. Install elbow (Figure 1, Sheet 2, Item 38) on auxiliary fuel pump (Figure 1, Sheet 2, Item 32).

7. Connect hose assembly (Figure 1, Sheet 2, Item 37) to elbow (Figure 1, Sheet 2, Item 38) on auxiliary fuel pump (Figure 1, Sheet 2, Item 32) and to bulkhead elbow (Figure 1, Sheet 2, Item 39) on filler neck pocket (Figure 1, Sheet 2, Item 40).

INSTALLATION - Continued

8. If removed, install adapter (Figure 1, Sheet 1, Item 36) and elbow (Figure 1, Sheet 1, Item 35) on engine fuel pump, and install elbow (Figure 1, Sheet 3, Item 34) on water separator filter (Figure 1, Sheet 3, Item 5).

9. Connect hose assembly (Figure 1, Sheet 3, Item 33) to elbow (Figure 1, Sheet 1, Item 35) and to elbow (Figure 1, Sheet 3, Item 34).

10. If removed, install elbow (Figure 1, Sheet 2, Item 31) on auxiliary fuel pump (Figure 1, Sheet 2, Item 32) and install adapter (Figure 1, Sheet 2, Item 30) on fuel tank (Figure 1, Sheet 1, Item 8). Connect hose assembly (Figure 1, Sheet 2, Item 29) to elbow (Figure 1, Sheet 2, Item 31) and to adapter (Figure 1, Sheet 2, Item 30).

11. If removed, install swivel elbow (Figure 1, Sheet 3, Item 28) on fuel cooler (Figure 1, Sheet 3, Item 24), and install regulator (Figure 1, Sheet 3, Item 27) and adapter (Figure 1, Sheet 3, Item 26) on engine fuel return.

12. Connect hose assembly (Figure 1, Sheet 3, Item 25) to swivel elbow (Figure 1, Sheet 3, Item 28) and to adapter (Figure 1, Sheet 3, Item 26).

13. If removed, install elbow (Figure 1, Sheet 3, Item 23) on fuel tank (Figure 1, Sheet 1, Item 8). Connect hose assembly (Figure 1, Sheet 3, Item 22) to elbow (Figure 1, Sheet 3, Item 23) and to fuel cooler (Figure 1, Sheet 3, Item 24).

14. Install radiator (WP 0067).

15. If removed, install elbow (Figure 1, Sheet 3, Item 21), tee (Figure 1, Sheet 2, Item 14), and male connector (Figure 1, Sheet 3, Item 20) on fuel tank (Figure 1, Sheet 1, Item 8).

16. Connect hose assembly (Figure 1, Sheet 3, Item 19) to elbow (Figure 1, Sheet 3, Item 21) and to male connector (Figure 1, Sheet 3, Item 20).

17. If removed, install nipple (Figure 1, Sheet 1, Item 18), washer (Figure 1, Sheet 1, Item 17), seal nut (Figure 1, Sheet 1, Item 16), adapter (Figure 1, Sheet 1, Item 9), and fitting (Figure 1, Sheet 1, Item 15) on fuel tank filler neck (Figure 1, Sheet 1, Item 11).

18. Install elbow (Figure 1, Sheet 2, Item 13) on tee (Figure 1, Sheet 2, Item 14).

19. Connect hose assembly (Figure 1, Sheet 2, Item 12) to elbow (Figure 1, Sheet 2, Item 13) and to tee (Figure 1, Sheet 1, Item 10).

20. If removed, install elbow (Figure 1, Sheet 1, Item 7) on fuel tank (Figure 1, Sheet 1, Item 8). Connect hose assembly (Figure 1, Sheet 1, Item 6) to elbow (Figure 1, Sheet 1, Item 7) and to adapter (Figure 1, Sheet 1, Item 9).

21. If removed, install elbow (Figure 1, Sheet 3, Item 4) on water separator filter (Figure 1, Sheet 3, Item 5), and install elbow (Figure 1, Sheet 3, Item 2) on fuel pickup tube assembly (Figure 1, Sheet 3, Item 3).

22. Connect hose assembly (Figure 1, Sheet 3, Item 1) to elbow (Figure 1, Sheet 3, Item 2) and to elbow (Figure 1, Sheet 3, Item 4).

23. Close right rear doors, right front doors, left rear doors, and left front doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FUEL PICKUP TUBE ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Cap and plug set (WP 0120, Item 6)
Gasket
Sealing compound (WP 0120, Item 41)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the fuel system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open left front doors.

3. Disconnect hose (Figure 1, Item 1) from fuel pickup tube (Figure 1, Item 2).

4. Remove five screws (Figure 1, Item 3), lockwashers (Figure 1, Item 4), washers (Figure 1, Item 5), fuel pickup tube (Figure 1, Item 2), and gasket (Figure 1, Item 6).

END OF TASK

INSTALLATION

1. Clean area on fuel tank where gasket (Figure 1, Item 6) will be installed.

2. Apply sealing compound to both sides of gasket (Figure 1, Item 6), and install gasket, fuel pickup tube (Figure 1, Item 2), five washers (Figure 1, Item 5), lockwashers (Figure 1, Item 4), and screws (Figure 1, Item 3).

3. Connect hose (Figure 1, Item 1) to fuel pickup tube (Figure 1, Item 2).

4. Close left front doors.

INSTALLATION - Continued

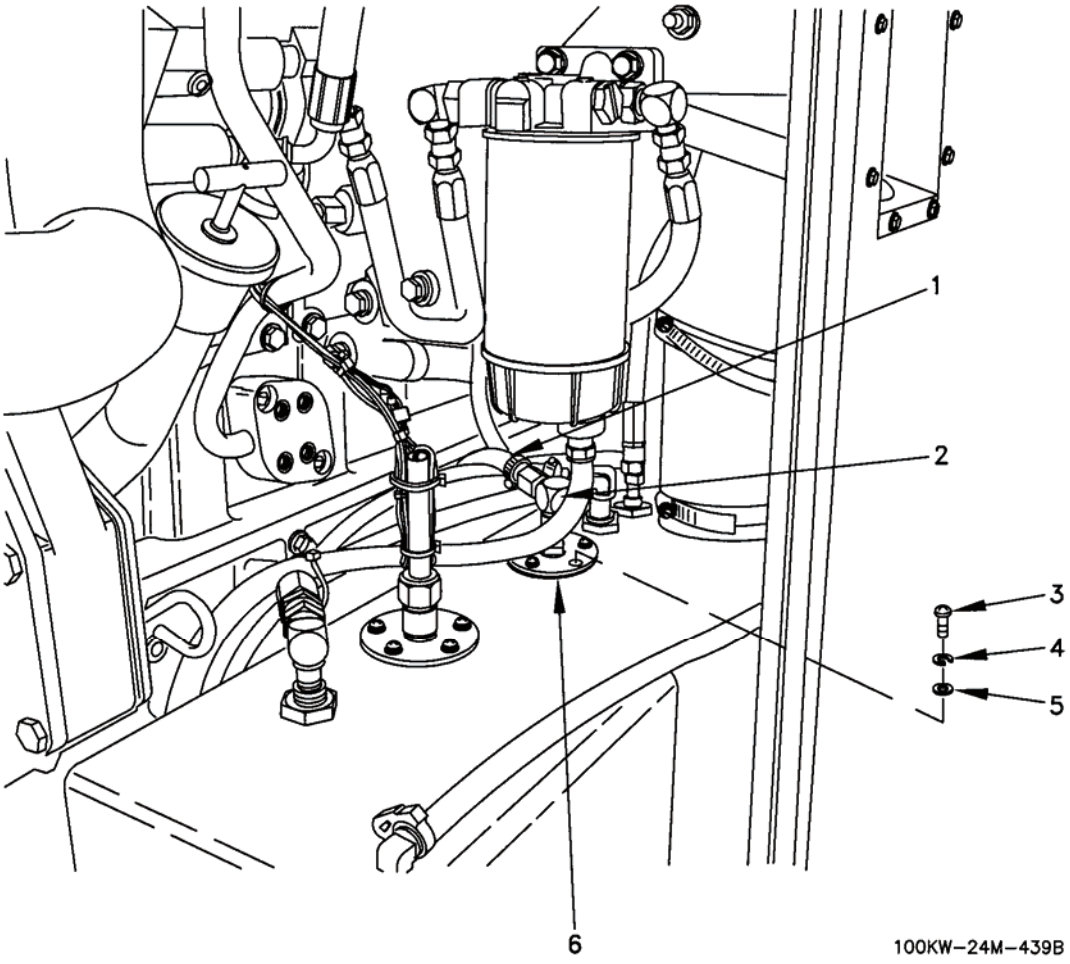


Figure 1. Fuel Pickup Tube Assembly.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

AUXILIARY FUEL PUMP ASSEMBLY AND SOLENOID VALVE MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Cap and plug set (WP 0120, Item 6)
Fuel (WP 0120, Items 16, 17, 53, or 54)
Gasket
Marker tags (WP 0120, Item 52)
Sealing compound (WP 0120, Item 41)

Materials/Parts (cont.)

Tiedown straps (WP 0120, Item 51)

Personnel Required

Two

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the fuel system.

SERVICING

NOTE

Servicing can be performed without removing auxiliary fuel pump.

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Open left front doors, and left rear doors.
3. Remove three screws (Figure 1, Item 1), cover (Figure 1, Item 2), gasket (Figure 1, Item 3), and strainer (Figure 1, Item 4) from auxiliary fuel pump (Figure 1, Item 5).
4. Clean strainer (Figure 1, Item 4) with clean fuel. Replace strainer if damaged.
5. Install strainer (Figure 1, Item 4), gasket (Figure 1, Item 3), cover (Figure 1, Item 2), and three screws (Figure 1, Item 1).

END OF TASK

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Open left front doors, and left rear doors.

NOTE

Cut tiedown straps as required.

3. Disconnect hose (Figure 1, Item 6) and hose (Figure 1, Item 7) from auxiliary fuel pump (Figure 1, Item 5).
4. Tag and disconnect wires coming from solenoid valve (Figure 1, Item 8).
5. Remove two locknuts (Figure 1, Item 9), washers (Figure 1, Item 10), screws (Figure 1, Item 11), and auxiliary fuel pump (Figure 1, Item 5).
6. If necessary, remove elbow (Figure 1, Item 12) and elbow (Figure 1, Item 13).
7. Disconnect two hoses (Figure 1, Item 14) and (Figure 1, Item 15) from solenoid valve (Figure 1, Item 8).
8. Remove two screws (Figure 1, Item 16), lockwashers (Figure 1, Item 17), and solenoid valve (Figure 1, Item 8).
9. If necessary, remove two elbows (Figure 1, Item 18).

REMOVAL - Continued

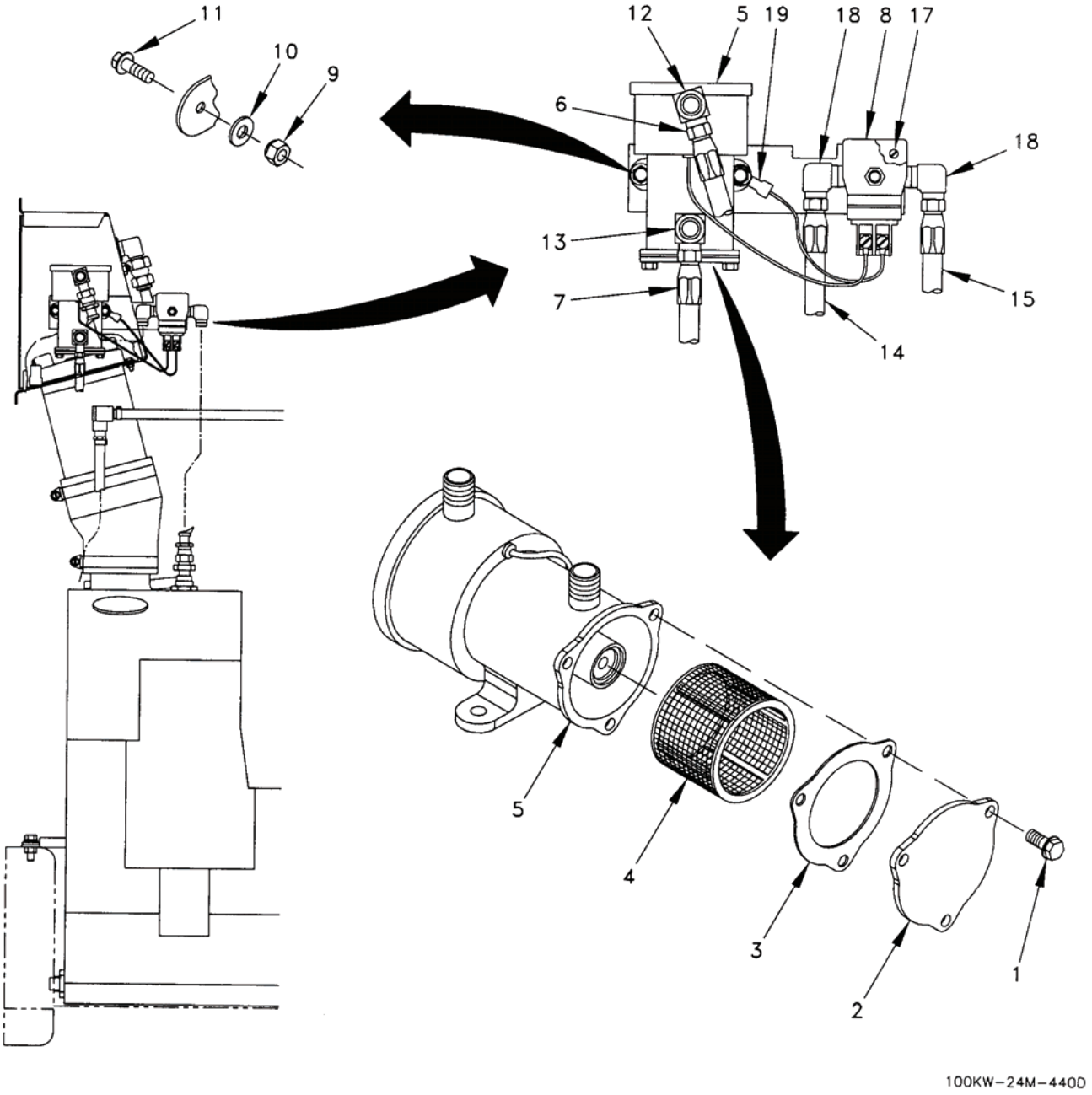


Figure 1. Auxiliary Fuel Pump Assembly and Solenoid Valve.

END OF TASK

INSTALLATION

NOTE

Apply sealing compound to all male pipe threads before connecting.

1. If removed, install two elbows (Figure 1, Item 18).
2. Install solenoid valve (Figure 1, Item 8), two lockwashers (Figure 1, Item 17), and two screws (Figure 1, Item 16).
3. Connect two hoses (Figure 1, Item 15) and (Figure 1, Item 14) to solenoid valve (Figure 1, Item 8).
4. If removed, install two elbows (Figure 1, Item 13) and (Figure 1, Item 12) to auxiliary fuel pump (Figure 1, Item 5).
5. Making sure ground lug (Figure 1, Item 19) is positioned between screw (Figure 1, Item 11) and washer (Figure 1, Item 10), install auxiliary fuel pump (Figure 1, Item 5), two screws (Figure 1, Item 11), washers (Figure 1, Item 10), and locknuts (Figure 1, Item 9).

NOTE

Install tiedown straps as required.

6. Remove tags and connect wires to solenoid valve (Figure 1, Item 8).
7. Connect hose (Figure 1, Item 7) and hose (Figure 1, Item 6).
8. Close left rear doors, and left front doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FUEL COOLER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Cap and plug set (WP 0120, Item 6)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Radiator removed (WP 0067)
Front roof housing assembly removed (WP 0029)
Engine compartment ceiling removed (WP 0031)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the fuel system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Remove eight nuts (Figure 1, Sheet 2, Item 1), lockwashers (Figure 1, Sheet 2, Item 2), bolts (Figure 1, Sheet 2, Item 3) and left and right radiator mounting brackets (Figure 1, Sheet 2, Item 4).

3. Remove two screws (Figure 1, Sheet 1, Item 5), two screws (Figure 1, Sheet 1, Item 6), lockwashers (Figure 1, Sheet 1, Item 7), washers (Figure 1, Sheet 1, Item 8), and plate (Figure 1, Sheet 1, Item, 9).

4. Remove three screws (Figure 1, Sheet 1, Item, 10), lockwashers (Figure 1, Sheet 1, Item, 11), washers (Figure 1, Sheet 1, Item, 12).

5. Remove three screws (Figure 1, Sheet 1, Item 13), lockwashers (Figure 1, Sheet 1, Item 14), washers (Figure 1, Sheet 1, Item 15).

6. Remove four screws (Figure 1, Sheet 1, Item 16), lockwashers (Figure 1, Sheet 1, Item 17), washers (Figure 1, Sheet 1, Item 18).

7. Remove three screws (Figure 1, Sheet 1, Item 19), lockwashers (Figure 1, Sheet 1, Item 20), washers (Figure 1, Sheet 1, Item 21).

8. Remove base baffle left (Figure 1, Sheet 1, Item 22) and base baffle right (Figure 1, Sheet 1, Item 23).

9. Remove four screws (Figure 1, Sheet 1, Item 24), lockwashers (Figure 1, Sheet 1, Item 25), washers (Figure 1, Sheet 1, Item 26), two baffle base brackets (Figure 1, Sheet 1, Items 27 and 28).

10. Remove screw (Figure 1, Sheet 1, Item 29), lockwasher (Figure 1, Sheet 1, Item 30), and washer (Figure 1, Sheet 1, Item 31).

11. Remove two screws (Figure 1, Sheet 1, Item 32), lockwashers (Figure 1, Sheet 1, Item 33), and washers (Figure 1, Sheet 1, Item 34).

12. Remove four screws (Figure 1, Sheet 1, Item 35), lockwashers (Figure 1, Sheet 1, Item 36), washers (Figure 1, Sheet 1, Item 37), and left lower front base baffle (38) and bottom front baffle (39).

13. Disconnect hose (Figure 1, Sheet 2, Item 40) and hose (Figure 1, Sheet 2, Item 41) from fuel cooler (Figure 1, Sheet 2, Item 42).

14. Remove four screws (Figure 1, Sheet 2, Item 43), eight washers (Figure 1, Sheet 2, Item 44), and bushings (Figure 1, Sheet 2, Item 45).

15. Remove fuel cooler (Figure 1, Sheet 2, Item 42).

REMOVAL - Continued

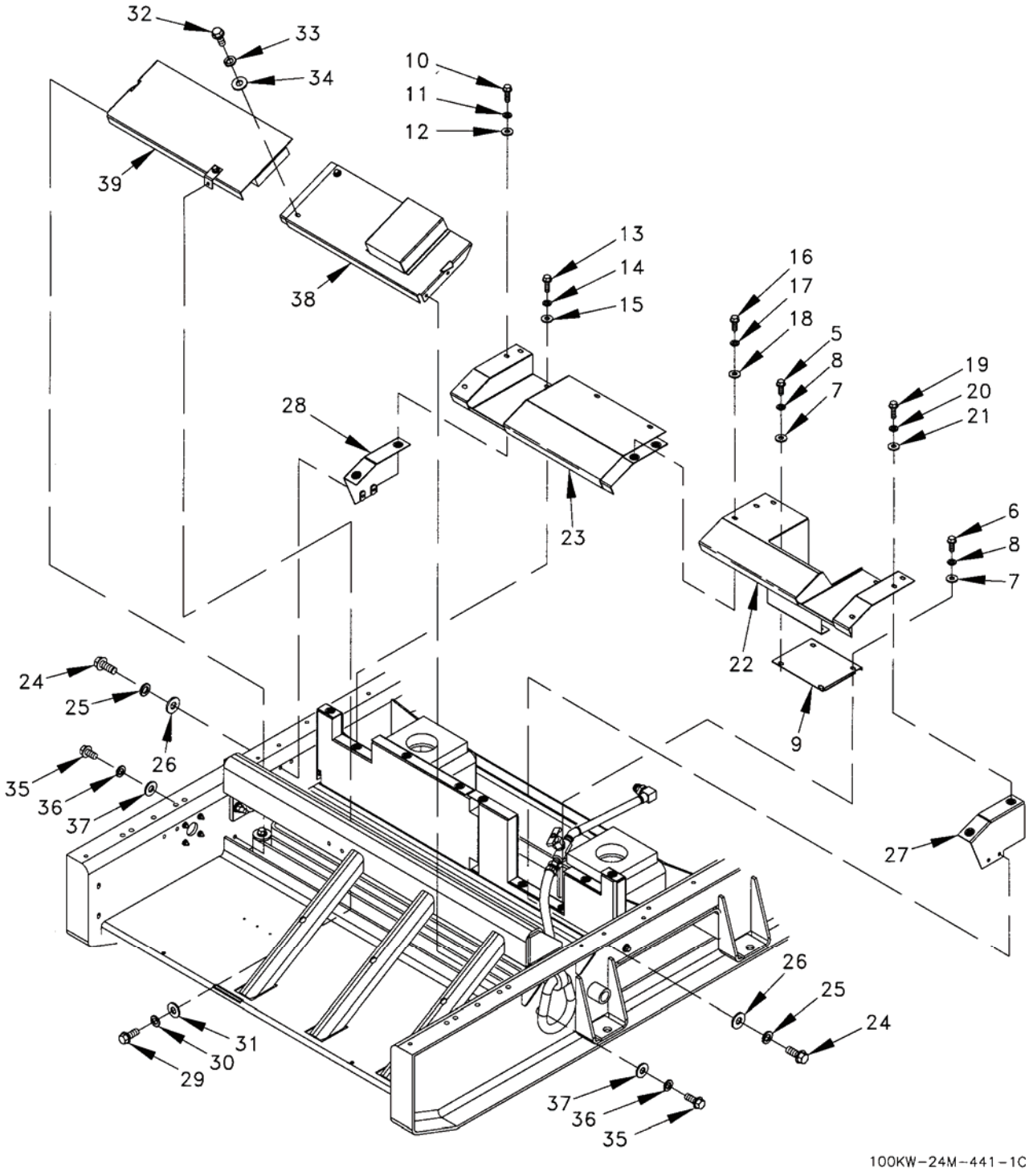


Figure 1. Fuel Cooler (Sheet 1 of 2).

REMOVAL - Continued

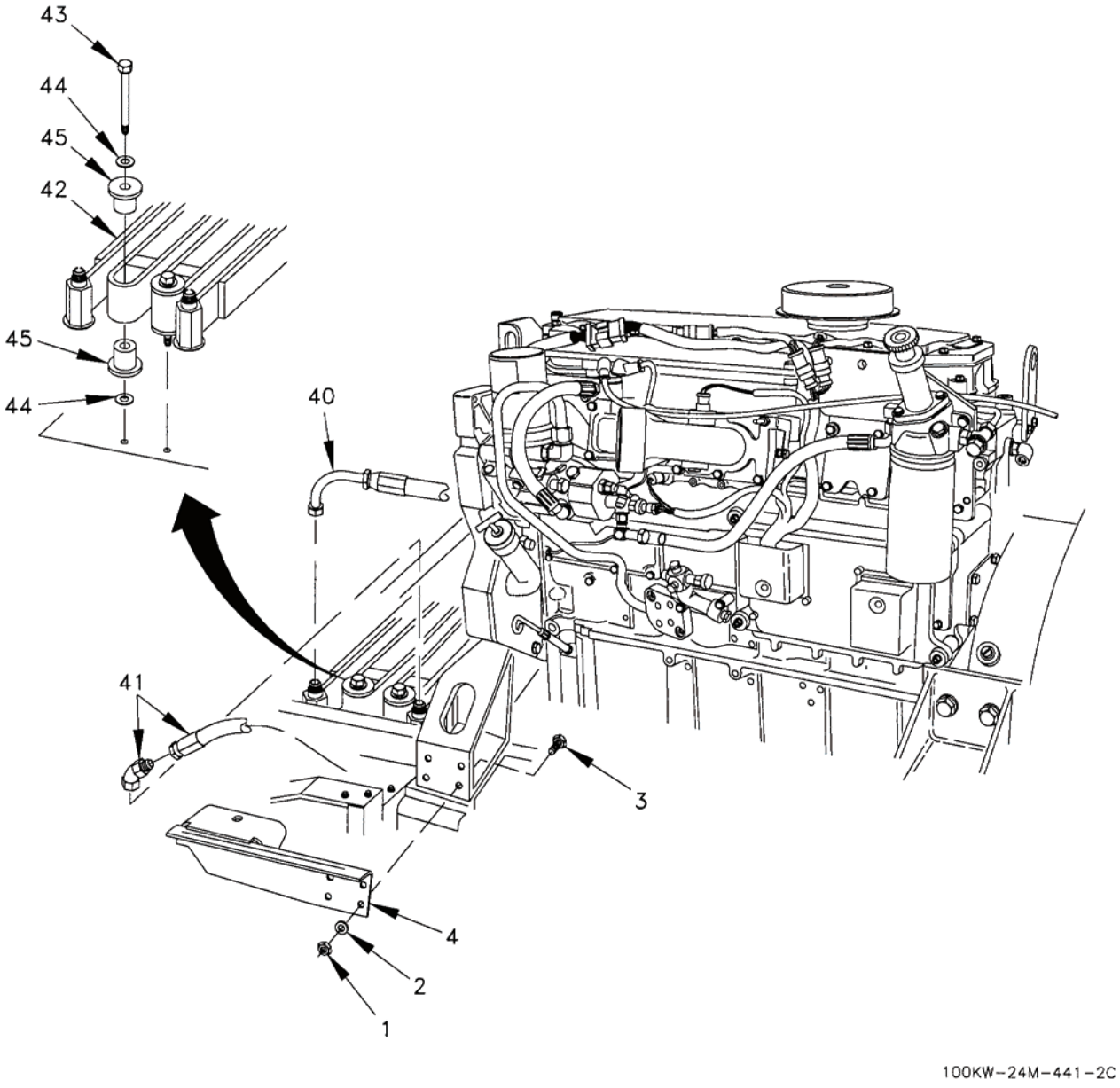


Figure 1. Fuel Cooler (Sheet 2 of 2).

END OF TASK

INSTALLATION

1. Install fuel cooler (Figure 1, Sheet 1, Item 42), eight bushings (Figure 1, Sheet 1, Item 45), washers (Figure 1, Sheet 1, Item 44), and four screws (Figure 1, Sheet 1, Item 43).

2. Connect hose (Figure 1, Sheet 1, Item 41) and hose (Figure 1, Sheet 1, Item 40). Install tiedown straps as required.

3. Install bottom front baffle (Figure 1, Sheet 1, Item 39) and left lower front base baffle (Figure 1, Sheet 1, Item 38) with four washers (Figure 1, Sheet 1, Item 37), lockwashers (Figure 1, Sheet 1, Item 36), and screws (Figure 1, Sheet 1, Item 35).

4. Install four washers (Figure 1, Sheet 1, Item 34), lockwashers (Figure 1, Sheet 1, Item 33), and screws (Figure 1, Sheet 1, Item 32).

5. Install four washers (Figure 1, Sheet 1, Item 31), lockwashers (Figure 1, Sheet 1, Item 30), and screws (Figure 1, Sheet 1, Item 29).

6. Install two baffle base brackets (Figure 1, Sheet 1, Item 28 and 27) with four washers (Figure 1, Sheet 1, Item 26), lockwashers (Figure 1, Sheet 1, Item 25), and screws (Figure 1, Sheet 1, Item 24).

7. Install base baffle left (Figure 1, Sheet 1, Item 23) and base baffle right (Figure 1, Sheet 1, Item 22).

8. Install three washers (Figure 1, Sheet 1, Item 21), lockwashers (Figure 1, Sheet 1, Item 20), screws (Figure 1, Sheet 1, Item 19),

9. Install four washers (Figure 1, Sheet 1, Item 18), lockwashers (Figure 1, Sheet 1, Item 17), screws (Figure 1, Sheet 1, Item 16),

10. Install three washers (Figure 1, Sheet 1, Item 15), lockwashers (Figure 1, Sheet 1, Item 14), screws (Figure 1, Sheet 1, Item 13),

11. Install three washers (Figure 1, Sheet 1, Item 12), lockwashers (Figure 1, Sheet 1, Item 11), screws (Figure 1, Sheet 1, Item 10),

12. Install plate (Figure 1, Sheet 1, Item 9) four washers (Figure 1, Sheet 1, Item 8), lockwashers (Figure 1, Sheet 1, Item 7), two screws (Figure 1, Sheet 1, Item 6) and screws (Figure 1, Sheet 1, Item 5),

13. Install left and right radiator mounting brackets (Figure 1, Sheet 1, Item 4) with eight nuts (Figure 1, Sheet 1, Item 3), washers (Figure 1, Sheet 1, Item 2), and bolts (Figure 1, Sheet 1, Item 1).

14. Install radiator (WP 0067).

15. Install engine compartment ceiling (WP 0031).

16. Install front roof housing assembly (WP 0029).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

WATER SEPARATOR FILTER AND BRACKET MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Cap and plug set (WP 0120, Item 6)
Filter
Gasket
Tiedown strap (WP 0120, Item 48)
Sealing compound (WP 0120, Item 41)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the fuel system.

DRAINING

1. Open left front door.
2. Rotate valve (Figure 1, Item 1) and air vent (Figure 1, Item 2) to allow water to drain from bowl (Figure 1, Item 3).
3. Rotate valve (Figure 1, Item 1) and air vent (Figure 1, Item 2) to close.
4. Close left front door.

END OF TASK

FILTER ELEMENT REPLACEMENT

1. Open left front doors.
2. Remove clamp (Figure 1, Item 4) and disconnect hose (Figure 1, Item 5) from drain port on bottom of water separator filter bowl (Figure 1, Item 3).
3. Remove bowl (Figure 1, Item 3) and gasket (Figure 1, Item 6) from water separator filter assembly (Figure 1, Item 7) and remove filter element (Figure 1, Item 8).
4. Inspect gasket and replace as required.
5. Add a light coat of fuel to the gasket and install new filter element (Figure 1, Item 8) into water separator assembly (Figure 1, Item 7). Apply a light coat of fuel to the gasket and install gasket (Figure 1, Item 6) and bowl (Figure 1, Item 3).
6. Connect hose (Figure 1, Item 5) to bottom of bowl (Figure 1, Item 3) and install clamp (Figure 1, Item 4).
7. Close left front doors.

FILTER ELEMENT REPLACEMENT - Continued

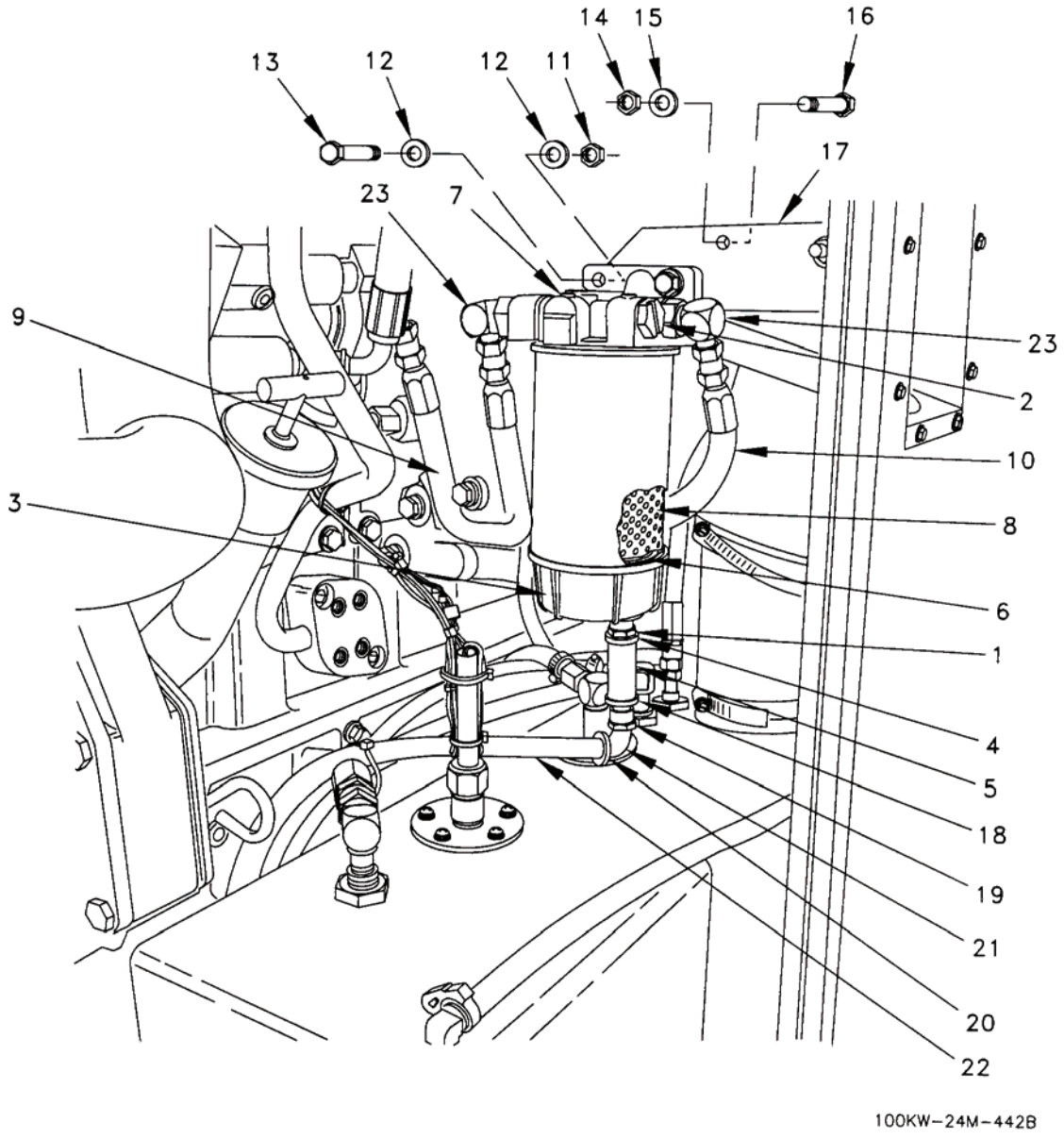


Figure 1. Water Separator Filter and Bracket.

END OF TASK

WATER SEPARATOR FILTER REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

NOTE

Cut tiedown straps as required.

2. Open left front doors.
3. Remove clamp (Figure 1, Item 4) and disconnect hose (Figure 1, Item 5) from drain port on bottom of water separator filter bowl (Figure 1, Item 3).
4. Disconnect hose (Figure 1, Item 9) and hose (Figure 1, Item 10) from water separator filter assembly (Figure 1, Item 7).
5. Remove two nuts (Figure 1, Item 11), four washers (Figure 1, Item 12), two screws (Figure 1, Item 13), and water separator filter assembly (Figure 1, Item 7).
6. Remove two nuts (Figure 1, Item 14), washers (Figure 1, Item 15), screw (Figure 1, Item 16), and bracket (Figure 1, Item 17).
7. Remove hose clamp (Figure 1, Item 18), swivel (Figure 1, Item 19), clamp (Figure 1, Item 20), and elbow (Figure 1, Item 21), from hose (Figure 1, Item 22).
8. If necessary, remove two elbows (Figure 1, Item 23).

END OF TASK

WATER SEPARATOR FILTER INSTALLATION

NOTE

Install tiedown straps as required.

1. Apply sealing compound to male threads and install two elbows (Figure 1, Item 23) on water separator filter assembly (Figure 1, Item 7).
2. Install elbow (Figure 1, Item 21) on hose (Figure 1, Item 22), with swivel (Figure 1, Item 19), and clamp (Figure 1, Item 18).
3. Install bracket (Figure 1, Item 17), two screws (Figure 1, Item 16), washers (Figure 1, Item 15), and nuts (Figure 1, Item 14).
4. Install water separator filter assembly (Figure 1, Item 7) on bracket (Figure 1, Item 17), and secure with two screws (Figure 1, Item 13), four washers (Figure 1, Item 12), and two nuts (Figure 1, Item 11).

WATER SEPARATOR FILTER INSTALLATION - Continued

5. Connect hose (Figure 1, Item 10) and hose (Figure 1, Item 9) to water separator filter assembly (Figure 1, Item 7).

6. Connect hose (Figure 1, Item 5) to drain port on bottom of water separator filter bowl (Figure 1, Item 3) and install clamp (Figure 1, Item 4).

7. Close left front door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FUEL LEVEL SENDER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Cap and plug set (WP 0120, Item 6)
Gasket
Sealing compound (WP 0120, Item 41)
Tiedown strap (WP 0120, Item 49)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the fuel system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open left rear doors.

NOTE

Cut tiedown straps as required.

3. Tag and disconnect wires from fuel level sender (Figure 1, Sheet 1, Item 1).

CAUTION

Note and mark orientation of sender assembly to ensure proper orientation of float when installed, or incorrect fuel level indications will result.

4. Remove five screws (Figure 1, Sheet 1, Item 2), lockwashers (Figure 1, Sheet 1, Item 3), washers (Figure 1, Sheet 1, Item 4), fuel level sender assembly (Figure 1, Sheet 1, Item 1), and gasket (Figure 1, Sheet 1, Item 5).

END OF TASK

TEST AND INSPECTION

1. Set up fuel level sender (Figure 1, Sheet 1, Item 1), fuel level indicator (WP 0038, Item 65), and DC power supply as shown. Adjust power supply for 24-28 Vdc.

2. Hold fuel level sender (Figure 1, Sheet 1, Item 1) in vertical position with armature (Figure 1, Sheet 1, Item 6) hanging down. Fuel level indicator should read “E” +/- 1/8 inch.

3. Raise armature (Figure 1, Sheet 1, Item 6) to full up position. Fuel level indicator should read “F” +/- 1/8 inch.

4. Check resistance with armature (Figure 1, Sheet 1, Item 6) full down and full up for correct readings.

5. If fuel level indicator readings or resistance measurements are incorrect, replace fuel level sender (Figure 1, Sheet 1, Item 1).

6. Bend armature (Figure 1, Sheet 1, Item 6) as required to achieve dimensions shown.

TEST AND INSPECTION - Continued

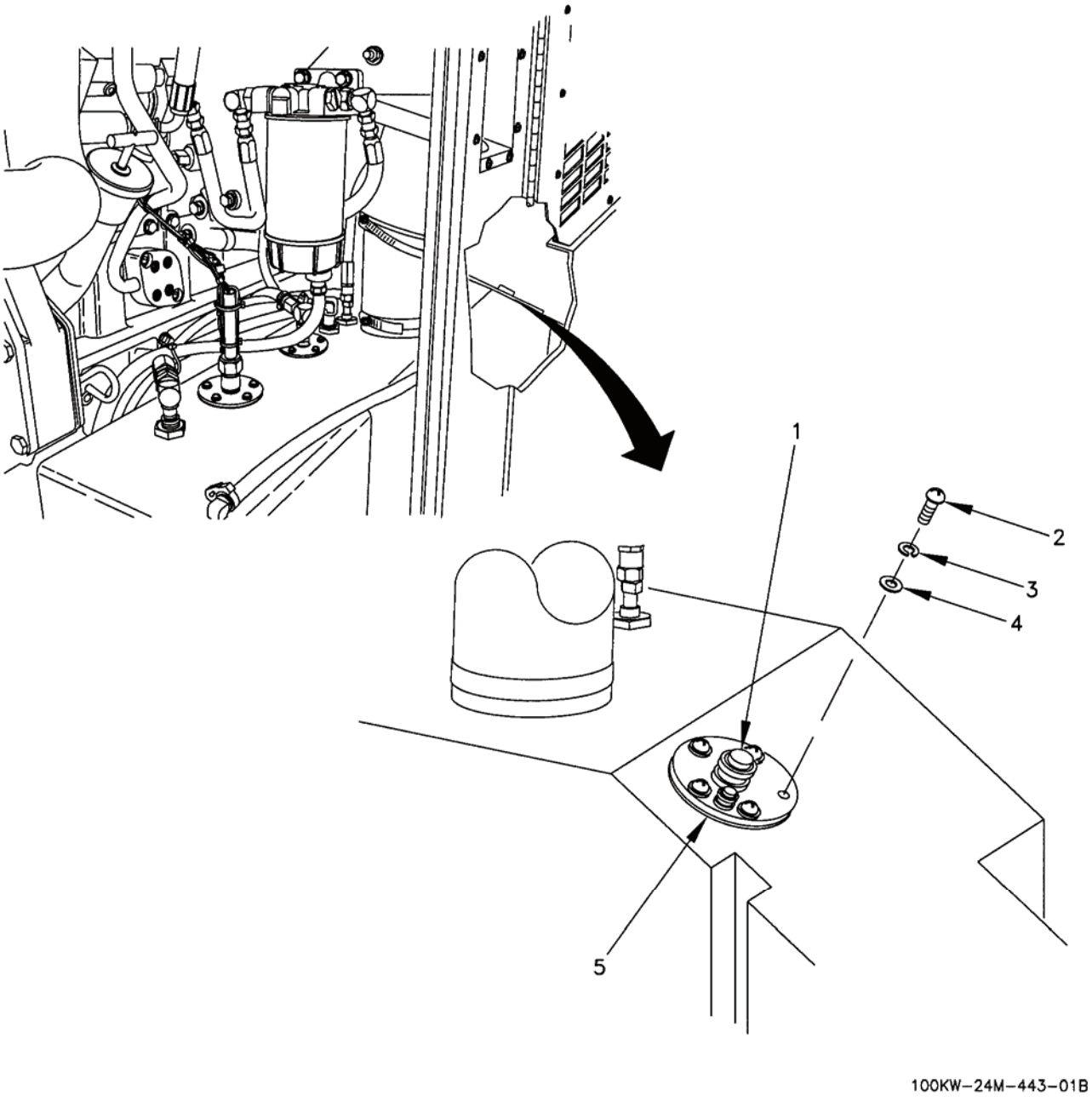


Figure 1. Fuel Level Sender (Sheet 1 of 2).

TEST AND INSPECTION - Continued

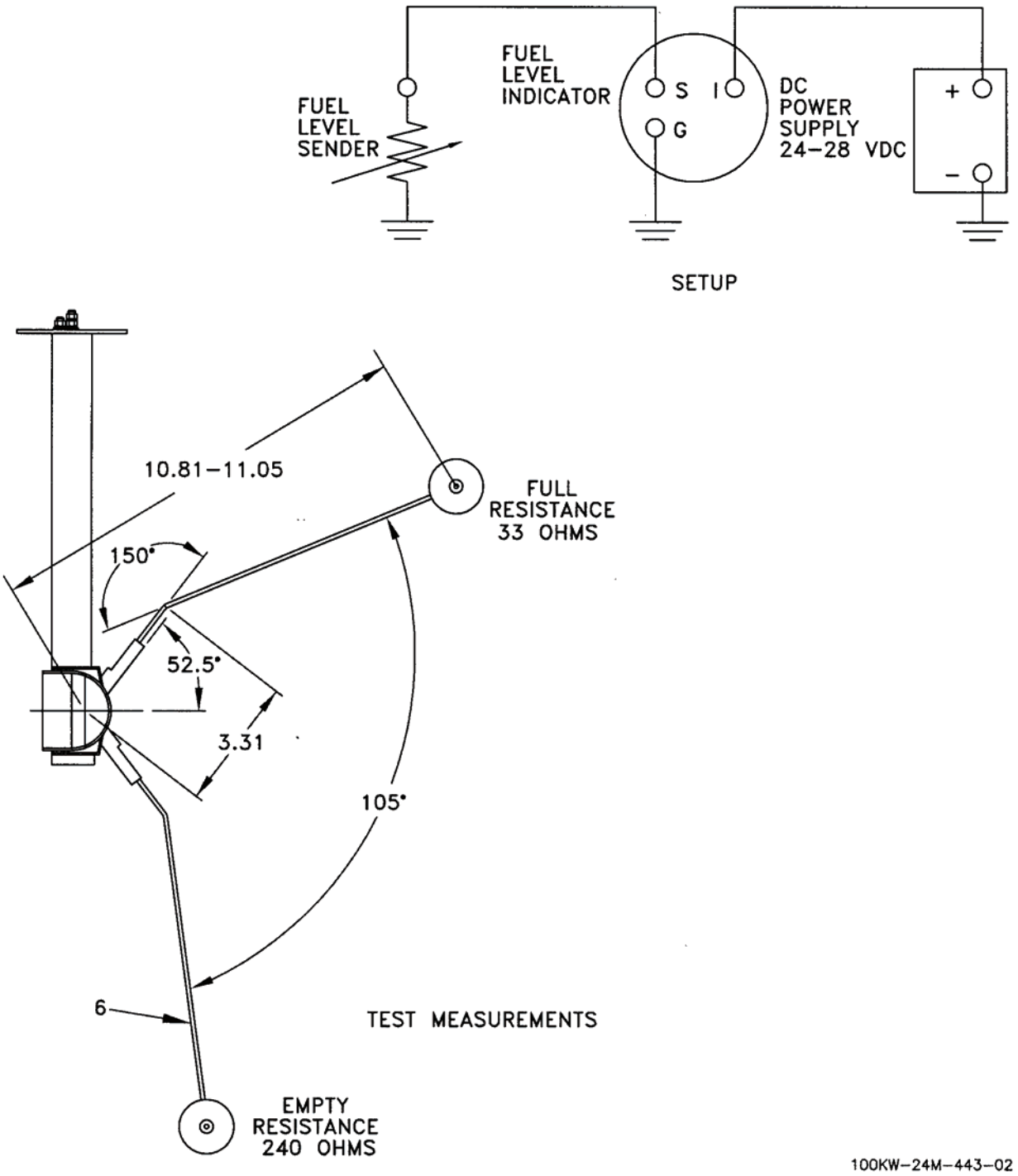


Figure 1. Fuel Level Sender (Sheet 2 of 2).

END OF TASK

INSTALLATION

1. Clean area on fuel tank where gasket (Figure 1, Sheet 1, Item 5) is to be installed.

CAUTION

Install sender assembly as marked, to ensure proper orientation of float when installed, or incorrect fuel level indications will result.

2. Apply sealing compound to both sides of gasket (Figure 1, Sheet 1, Item 5) and install gasket, fuel level sender assembly (Figure 1, Sheet 1, Item 1), five washers (Figure 1, Sheet 1, Item 4), lockwashers (Figure 1, Sheet 1, Item 3), and screws (Figure 1, Sheet 1, Item 2).

NOTE

Install tiedown straps as required.

3. Remove tags and connect wires from fuel level sender (Figure 1, Sheet 1, Item 1).

4. Close left rear doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FUEL TANK MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Part

Repair kit, adhesive (WP 0120, Item 37)

References

TM 9-6115-729-10
TM 9-6115-729-24P

Personnel Required

One

Equipment Condition

Auxiliary fuel pump removed (WP 0058)
Engine removed (WP 0098)
Fuel level switch assembly removed (WP 0055)
Fuel pickup tube assembly removed (WP 0057)
Fuel level sender removed (WP 0061)
Fuel filler inlet disconnected (WP 0056)
Fuel hoses and fittings removed (WP 0056)
Fuel drain valve and piping removed (WP 0056)
Front roof housing assembly removed (WP 0029)
Rear roof housing assembly removed (WP 0030)
Engine compartment ceiling assembly removed (WP 0031)
Front section housing assembly removed (WP 0033)
Rear section housing assembly removed WP 0034)
Left center panel assembly removed (WP 0035)
Right center panel assembly removed (WP 0036)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the fuel system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Remove four screws (Figure 1, item 1), washers (Figure 1, item 2), nuts (Figure 1,item 3), two hold down assemblies (Figure 1, item 4), and remove fuel tank (Figure 1, item 5).

END OF TASK

REPAIR

Repair damage to fuel tank with adhesive repair kit, following directions provided with the kit.

END OF TASK

INSTALLATION

1. Install fuel tank (Figure 1, item 5), two hold down assemblies (Figure 1, item 4), four screws (Figure 1, item 1), washers (Figure 1, item 2), and nuts (Figure 1, item 3).

2. Install fuel drain valve and piping (WP 0056).

3. Install fuel hoses and fittings (WP 0056).

4. Connect fuel filler inlet (WP 0056).

5. Install fuel level sensor (WP 0061).

6. Install fuel pickup tube (WP 0057).

7. Install fuel level switch assembly (WP 0055).

8. Install engine (WP 0098).

9. Install auxiliary fuel pump (WP 0058).

INSTALLATION - Continued

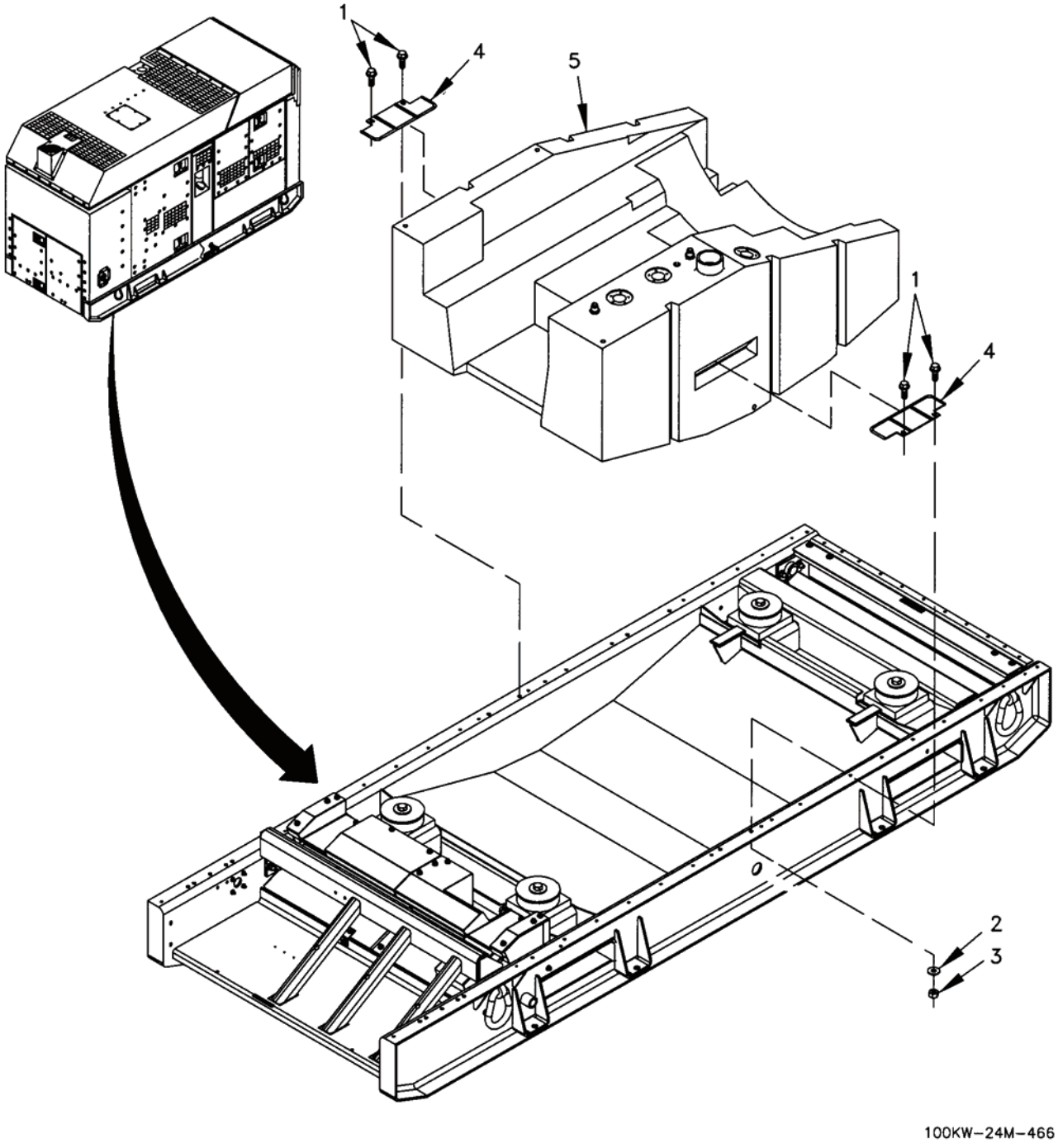


Figure 1. Fuel Tank Maintenance.

INSTALLATION - Continued

10. Install engine compartment ceiling assembly (WP 0031).
11. Install front section housing assembly (WP 0033).
12. Install rear section housing assembly (WP 0034).
13. Install front roof housing assembly (WP 0029).
14. Install rear roof housing assembly (WP 0030).
15. Install left center panel assembly (WP 0035).
16. Install right center panel assembly (WP 0036).
10. Service fuel tank (TM 9-6115-729-10).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

COOLANT RECOVERY SYSTEM MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Antifreeze (WP 0120, Item 5)
Cap and plug set (WP 0120, Item 6)

Personnel Required

One

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the coolant system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right rear doors.

3. Place container under coolant recovery system bottle (Figure 1, Item 1).

4. Remove two hose clamps (Figure 1, Item 2) securing hoses (Figure 1, Item 3) and (Figure 1, Item 4) to coolant recovery system bottle (Figure 1, Item 1) and disconnect two hoses.
5. Drain coolant into suitable container until coolant recovery system is empty. Retain coolant for refilling cooling system.

6. Remove two screws (Figure 1, Item 5), washers (Figure 1, Item 6), lockwashers (Figure 1, Item 7), and coolant recovery system bottle (Figure 1, Item 1).

END OF TASK

INSTALLATION

1. Install coolant recovery system bottle (Figure 1, Item 1), two lockwashers (Figure 1, Item 7), washers (Figure 1, Item 6), and screws (Figure 1, Item 5).

2. Connect two hoses (Figure 1, Item 3) and (Figure 1, Item 4) to coolant recovery system bottle (Figure 1, Item 1) and secure with two hose clamps (Figure 1, Item 2).

3. Pour coolant into coolant recovery system bottle (Figure 1, Item 1). If necessary, add coolant so level is between HOT and COLD marks on bottle.

4. Close right rear doors.

INSTALLATION - Continued

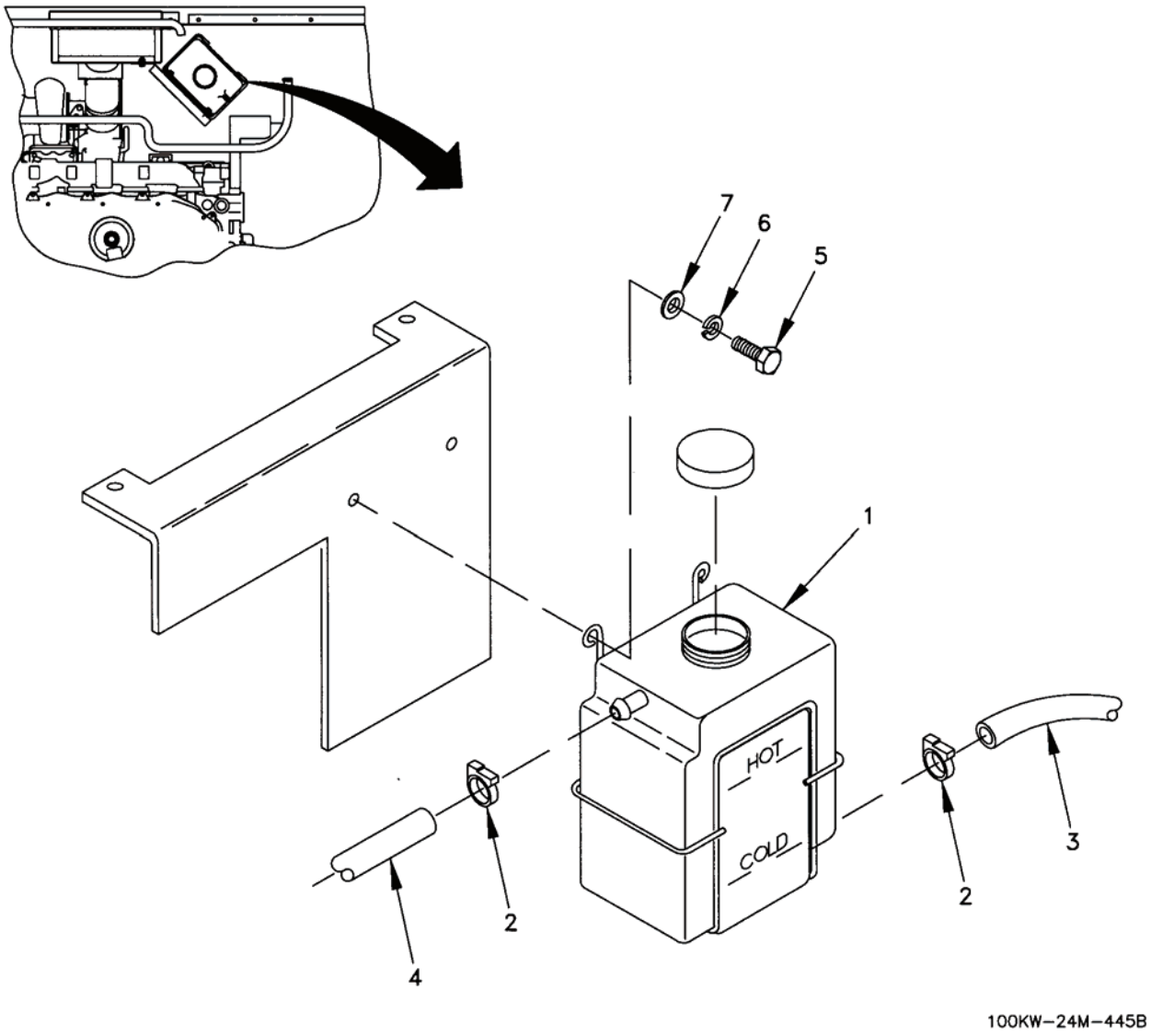


Figure 1. Coolant Recovery System.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

SURGE TANK MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Antifreeze (WP 0120, Item 5)
Cap and plug set (WP 0120, Item 6)
Sealing compound (WP 0120, Item 41)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Right side access cover removed (WP 0028)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the coolant system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right rear doors and right front door.

3. Place container under COOLANT DRAIN on right side of TQG.

4. Remove coolant fill cap (Figure 1, Item 1) and open drain valve (Figure 1, Item 2) on right rear and drain valve (Figure 1, Item 3) on lower right side of engine. Drain approximately two gallons of coolant into suitable container until surge tank (Figure 1, Item 4) is empty. Retain coolant for refilling cooling system.

5. Close drain valves (Figure 1, Item 2) and (Figure 1, Item 3).

6. Remove hose clamp (Figure 1, Item 5) and disconnect hose (Figure 1, Item 6) from bottom of surge tank (Figure 1, Item 4).

7. Remove coolant level sensor (Figure 1, Item 7) and reducer fitting (Figure 1, Item 8) from surge tank (Figure 1, Item 4).

8. Loosen two hose clamps (Figure 1, Item 9) and disconnect water hose (Figure 1, Item 10) from top of surge tank (Figure 1, Item 3).

9. Loosen two hose clamps and tag and disconnect two hoses (Figure 1, Item 11) and (Figure 1, Item 12) from top of surge tank (Figure 1, Item 4).

10. Remove four locknuts (Figure 1, Item 13), washers (Figure 1, Item 14), and screws (Figure 1, Item 15), and remove two lower surge tank brackets (Figure 1, Item 16) and surge tank (Figure 1, Item 4) from two upper surge tank brackets (Figure 1, Item 17).

11. Remove four screws (Figure 1, Item 18), lockwashers (Figure 1, Item 19), and washers (Figure 1, Item 20), and remove two upper surge tank brackets (Figure 1, Item 17).

END OF TASK

INSTALLATION

1. Install two upper surge tank brackets (Figure 1, Item 17) and secure with four washers (Figure 1, Item 20), lockwashers (Figure 1, Item 19), and screws (Figure 1, Item 18).

2. Install surge tank (Figure 1, Item 4) and two lower surge tank brackets (Figure 1, Item 16) and secure with four screws (Figure 1, Item 15), washers (Figure 1, Item 14), and locknuts (Figure 1, Item 13).

3. Remove tags and connect two hoses (Figure 1, Item 12) and (Figure 1, Item 11) to top of surge tank (Figure 1, Item 4).

4. Connect water hose (Figure 1, Item 10) to top of surge tank (Figure 1, Item 4) and tighten two hose clamps (Figure 1, Item 9).

5. Apply sealing compound to male threads of reducer fitting (Figure 1, Item 8) and coolant level sensor (Figure 1, Item 7) and install reducer and coolant level sensor on surge tank (Figure 1, Item 4).

INSTALLATION - Continued

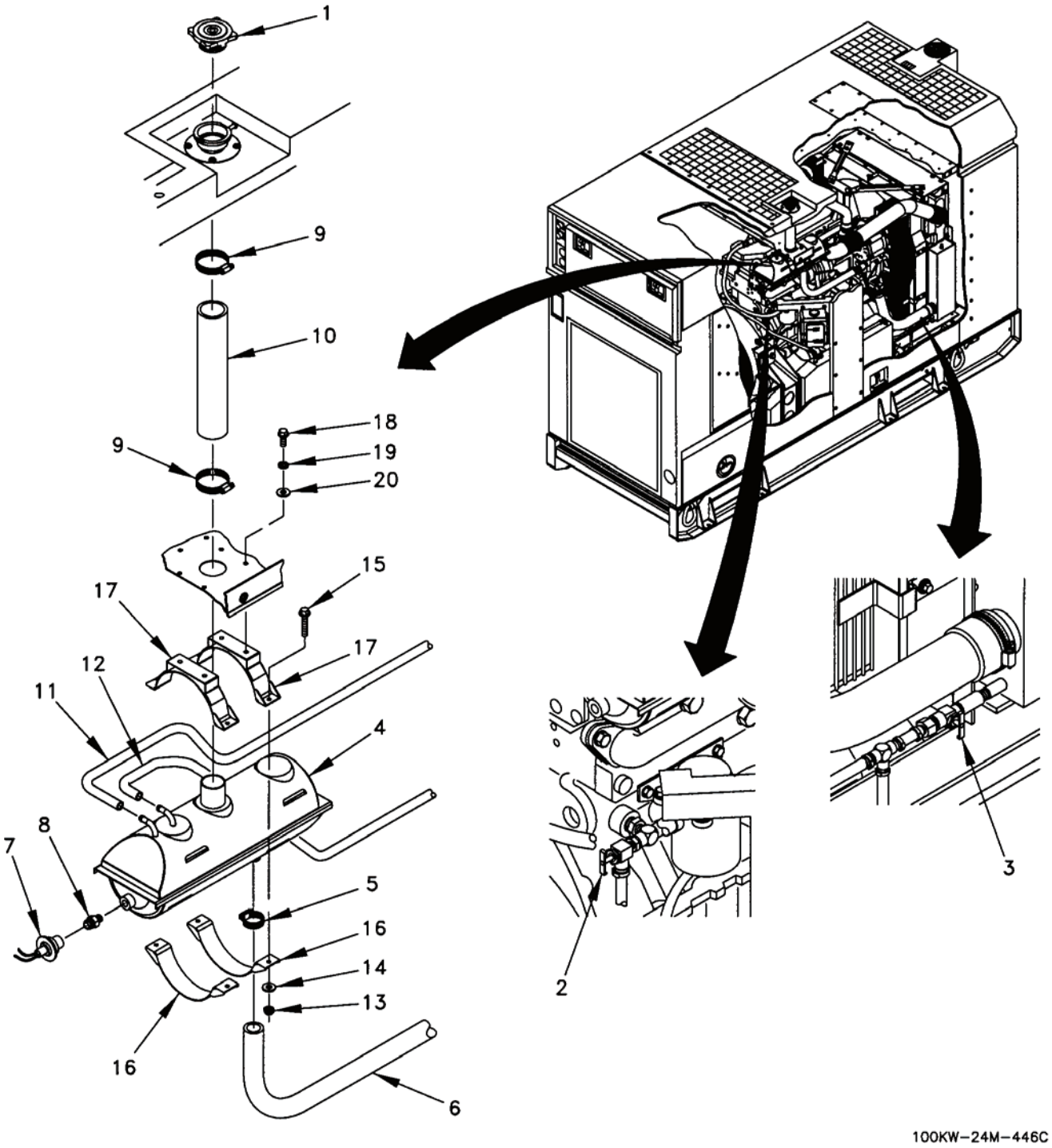


Figure 1. Surge Tank.

INSTALLATION - Continued

6. Connect hose (Figure 1, Item 6) to bottom of surge tank (Figure 1, Item 4) and install hose clamp (Figure 1, Item 5).

7. Pour coolant into COOLANT FILL and install fill cap (Figure 1, Item 1). If necessary, add coolant so level is between HOT and COLD marks on coolant recovery system bottle.

WARNING

Operating the generator set with any access door open exposes personnel to a high noise level. Double hearing protection must be worn when operating or working near the generator set with any access door open. Failure to comply can cause hearing damage to personnel.

8. Operate TQG and check for leaks.

9. Install right side access cover (WP 0028).

10. Close right rear doors and right front door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FAN AND FAN GUARDS MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Materials/Parts

Antifreeze (WP 0120, Item 5)

Equipment Condition

Cooling system drained (WP 0067)

Personnel Required

Two

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply 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 can cause injury to personnel.

WARNING

When running, generator set engine 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 can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right front door and left front door.

NOTE

Table 1 lists removal and installation steps for fan and fan guard elements.

Table 1. WP 0065 Guide.

NAME	FIGURE 1 ITEM	REMOVAL STEPS	INSTALLATION STEPS
Upper right fan guard	5	3	4 thru 9, 10 and 11, 20
Lower right fan guard	9	4 and 5	4 thru 9, 10 and 11, 18 and 19
Upper left fan guard	16	6 and 7	3, 10 thru 13, 16 and 17
Lower left fan guard	17	8 and 9	3, 10 thru 15
Left shroud flange	21	10, 11, 12, 15 thru 20	3, 10 thru 13
Right shroud flange	6	10, 11, 12, 13, 14	4 thru 9, 10 and 11
Fan and adapter	71, 72	3 thru 21	1 and 2

3. Remove four screws (Figure 1, Sheet 1, Item 1), lockwashers (Figure 1, Sheet 1, Item 2), washers (Figure 1, Sheet 1, Item 3), hose clamp (Figure 1, Sheet 1, Item 4), and upper right fan guard (Figure 1, Sheet 1, Item 5) from right shroud flange (Figure 1, Sheet 1, Item 6).

4. Remove nut (Figure 1, Sheet 1, Item 7) and washer (Figure 1, Sheet 1, Item 8) securing lower right fan guard (Figure 1, Sheet 1, Item 9) to engine.

REMOVAL - Continued

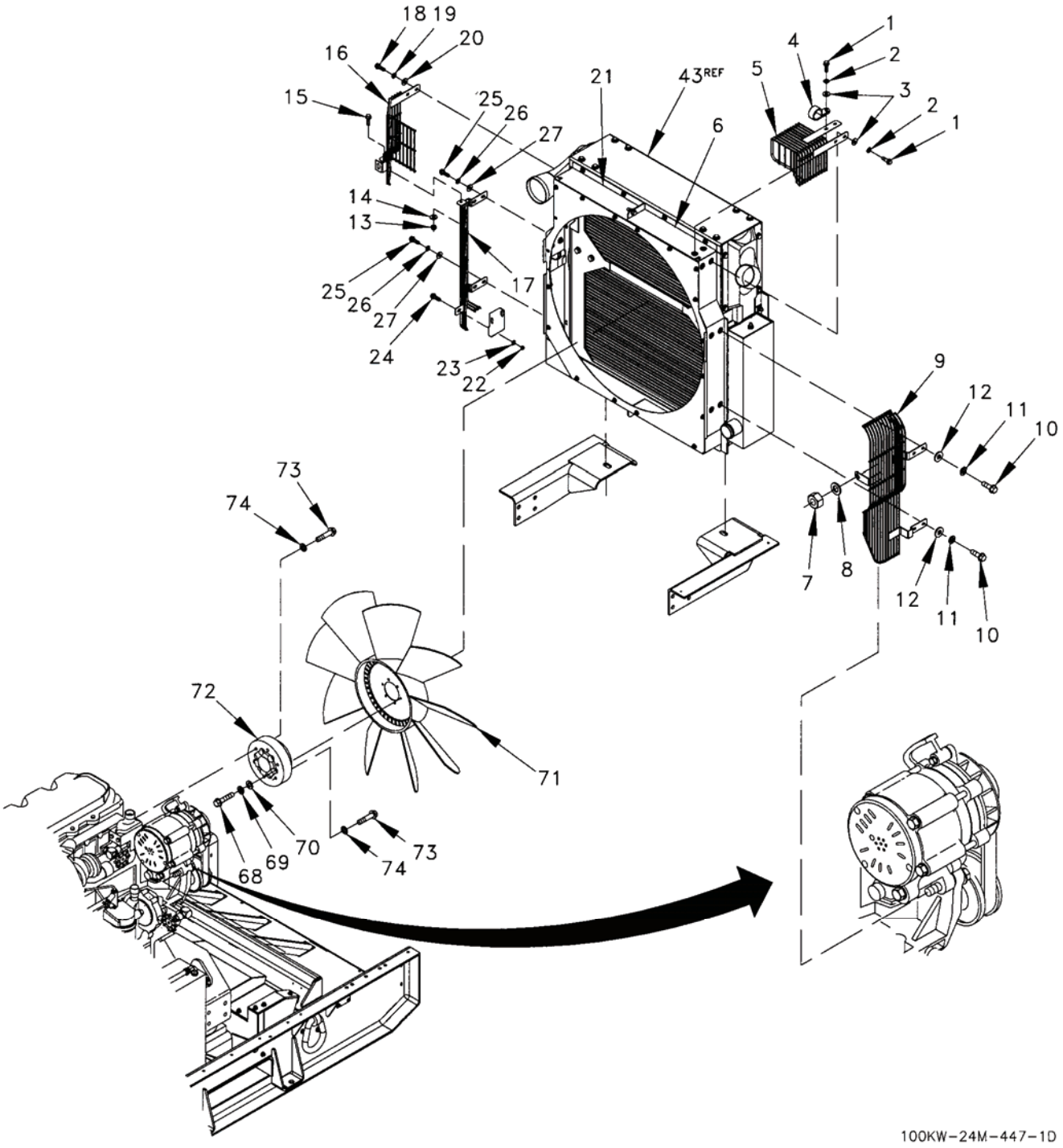


Figure 1. Fan and Fan Guards (Sheet 1 of 3).

REMOVAL - Continued

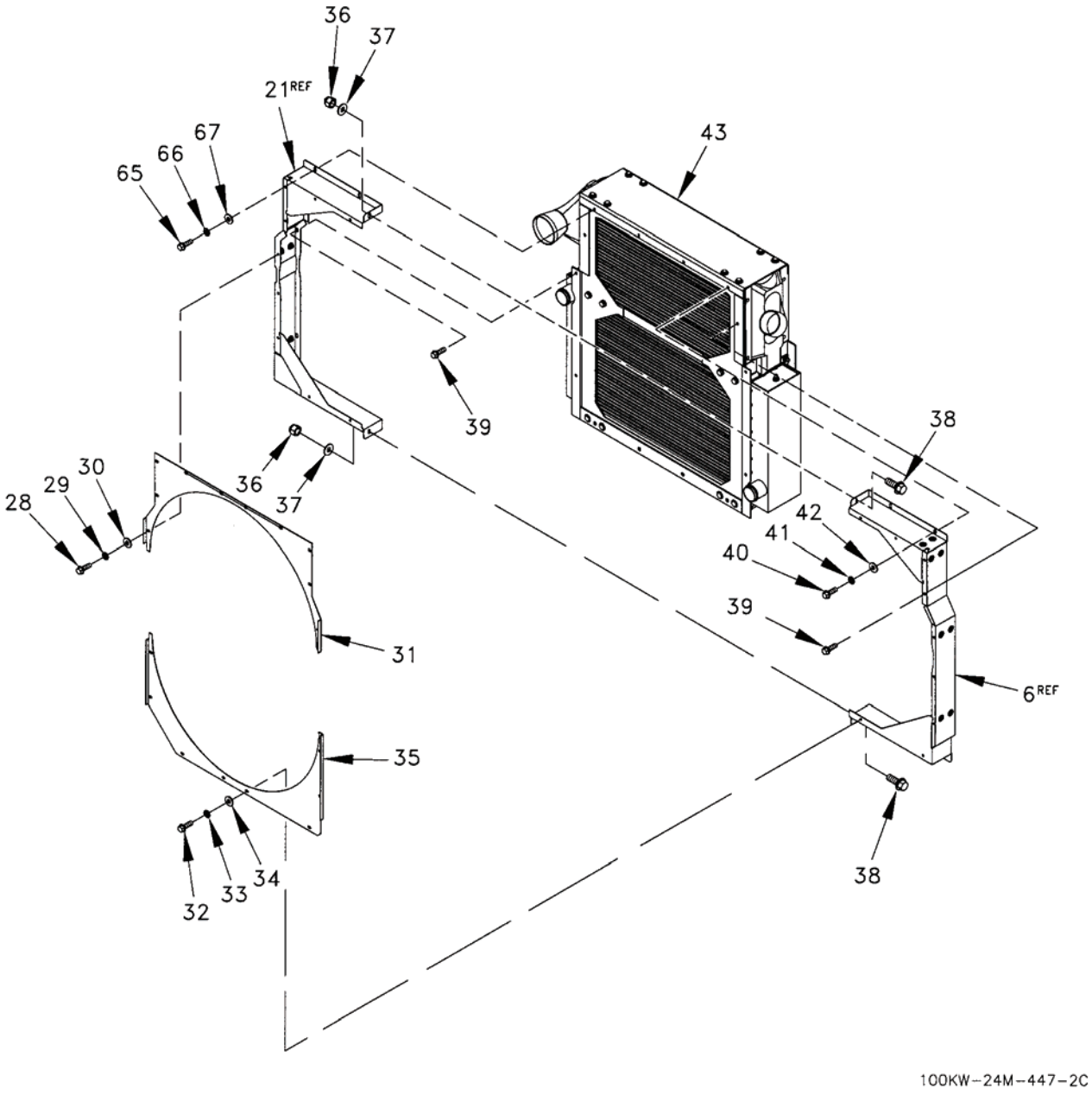


Figure 1. Fan and Fan Guards (Sheet 2 of 3).

REMOVAL - Continued

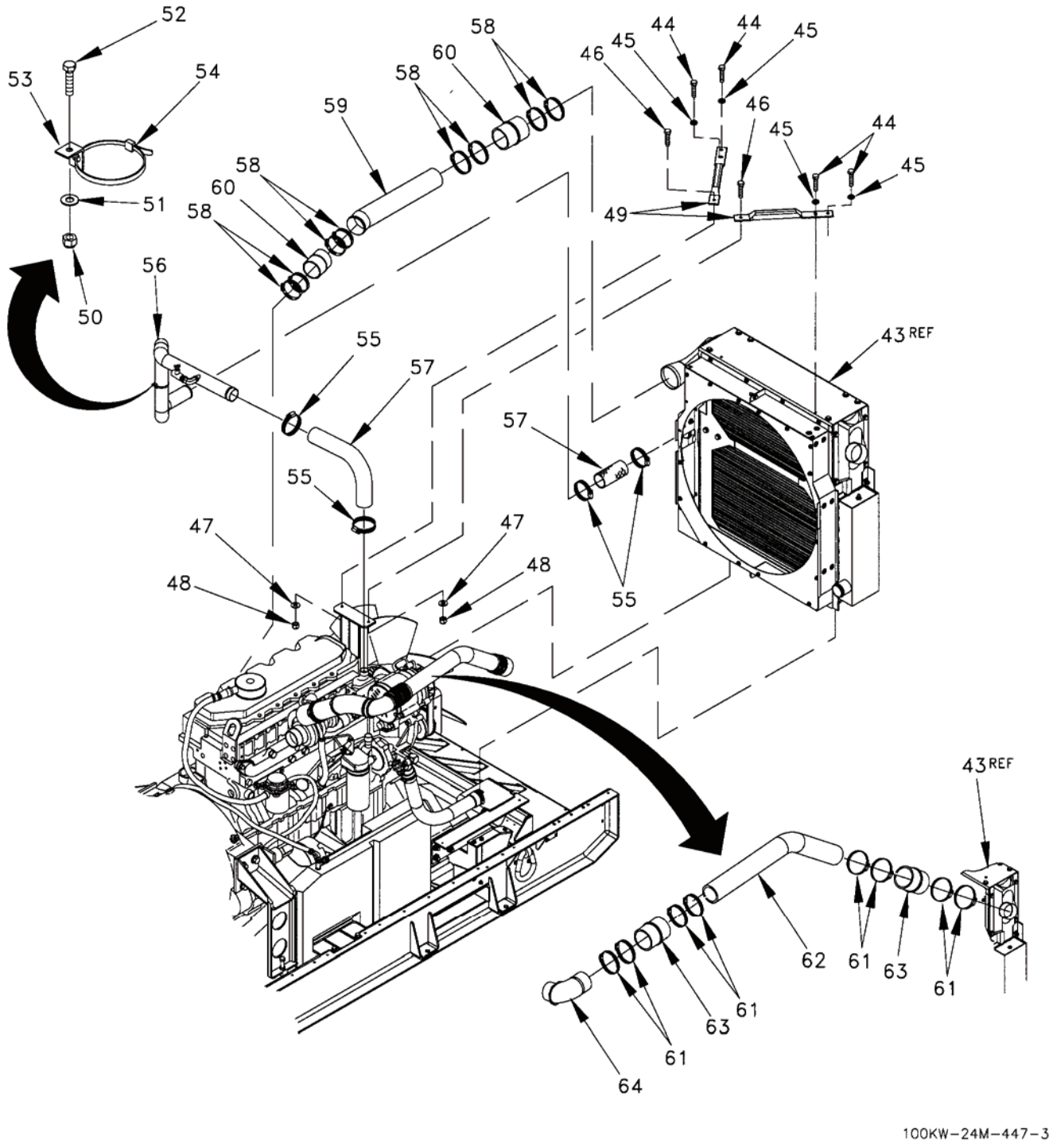


Figure 1. Fan and Fan Guards (Sheet 3 of 3).

REMOVAL - Continued

5. Remove four screws (Figure 1, Sheet 1, Item 10), lockwashers (Figure 1, Sheet 1, Item 11), washers (Figure 1, Sheet 1, Item 12), and lower right fan guard (Figure 1, Sheet 1, Item 9) from right shroud flange (Figure 1, Sheet 1, Item 6).

6. Remove locknut (Figure 1, Sheet 1, Item 13), washer (Figure 1, Sheet 1, Item 14), and screw (Figure 1, Sheet 1, Item 15) that attach upper left fan guard (Figure 1, Sheet 1, Item 16) to lower left fan guard (Figure 1, Sheet 1, Item 17).

7. Remove two screws (Figure 1, Sheet 1, Item 18), lockwashers (Figure 1, Sheet 1, Item 19), washers (Figure 1, Sheet 2, Item 20), and upper left fan guard (Figure 1, Sheet 2, Item 16) from left shroud flange (Figure 1, Sheet 2, Item 21).

8. Remove locknut (Figure 1, Sheet 1, Item 22), washer (Figure 1, Sheet 1, Item 23), and screw (Figure 1, Sheet 1, Item 24) securing lower left fan guard (Figure 1, Sheet 1, Item 17) to engine bracket.

9. Remove four screws (Figure 1, Sheet 1, Item 25), lockwashers (Figure 1, Sheet 1, Item 26), washers (Figure 1, Sheet 1, Item 27), and lower left fan guard (Figure 1, Sheet 1, Item 17) from left shroud flange (Figure 1, Sheet 1, Item 21).

10. Remove 10 screws (Figure 1, Sheet 2, Item 28), lockwashers (Figure 1, Sheet 2, Item 29), washers (Figure 1, Sheet 2, Item 30), and upper shroud plate (Figure 1, Sheet 2, Item 31) from left shroud flange (Figure 1, Sheet 1, Item 21) and right shroud flange (Figure 1, Sheet 1, Item 6).

11. Remove eight screws (Figure 1, Sheet 2, Item 32), lockwashers (Figure 1, Sheet 2, Item 33), washers (Figure 1, Sheet 2, Item 34), and lower shroud plate (Figure 1, Sheet 2, Item 35) from left shroud flange (Figure 1, Sheet 1, Item 21) and right shroud flange (Figure 1, Sheet 1, Item 6).

12. Remove locknut (Figure 1, Sheet 2, Item 36), washer (Figure 1, Sheet 2, Item 37), screw (Figure 1, Sheet 2, Item 38) in two places, top and bottom, that attach right shroud flange (Figure 1, Sheet 1, Item 6) and left shroud flange (Figure 1, Sheet 1, Item 21) together.

13. Remove three screws (Figure 1, Sheet 2, Item 39) from left fan shroud (Figure 1, Sheet 1, Item 21) and three screws (Figure 1, Sheet 2, Item 39) from right fan shroud (Figure 1, Sheet 1, Item 6).

14. Remove four screws (Figure 1, Sheet 2, Item 40), lockwashers (Figure 1, Sheet 2, Item 41), washers (Figure 1, Sheet 2, Item 42), and right shroud flange (Figure 1, Sheet 1, Item 6) from radiator (Figure 1, Sheet 2, Item 43).

15. Remove four screws (Figure 1, Sheet 3, Item 44) and lockwashers (Figure 1, Sheet 3, Item 45), two screws (Figure 1, Sheet 3, Item 46), washers (Figure 1, Sheet 3, Item 47), nuts (Figure 1, Sheet 3, Item 48), and two upper radiator mounting tie rods (Figure 1, Sheet 3, Item 49).

16. Remove nut (Figure 1, Sheet 3, Item 50), washer (Figure 1, Sheet 3, Item 51), screw (Figure 1, Sheet 3, Item 52), bracket (Figure 1, Sheet 3, Item 53), and loop clamp (Figure 1, Sheet 3, Item 54).

17. Remove four hose clamps (Figure 1, Sheet 3, Item 55), upper radiator hose (Figure 1, Sheet 3, Item 56), and two coolant hoses (Figure 1, Sheet 3, Item 57).

18. Remove eight hose clamps (Figure 1, Sheet 3, Item 58), two hose connectors (Figure 1, Sheet 3, Item 59), and manifold in hose (Figure 1, Sheet 3, Item 60).

REMOVAL - Continued

19. Remove eight hose clamps (Figure 1, Sheet 3, Item 61), manifold out tube (Figure 1, Sheet 3, Item 62), and two hose connectors (Figure 1, Sheet 3, Item 63) from radiator (Figure 1, Sheet 3, Item 43) and from turbo out elbow (Figure 1, Sheet 3, Item 64).

20. Remove four screws (Figure 1, Sheet 2, Item 65), lockwashers (Figure 1, Sheet 2, Item 66), washers (Figure 1, Sheet 2, Item 67), and left shroud flange (Figure 1, Sheet 1, Item 21) from radiator (Figure 1, Sheet 2, Item 43).

21. Remove six screws (Figure 1, Sheet 1, Item 68), lockwashers (Figure 1, Sheet 1, Item 69), washers (Figure 1, Sheet 1, Item 70), and fan (Figure 1, Sheet 1, Item 71) from fan mounting adapter (Figure 1, Sheet 1, Item 72).

22. Remove six screws (Figure 1, Sheet 1, Item 73), lockwashers (Figure 1, Sheet 1, Item 74), and fan mounting adapter (Figure 1, Sheet 1, Item 72).

END OF TASK

INSTALLATION

1. Install fan mounting adapter (Figure 1, Sheet 1, Item 72), six lockwashers (Figure 1, Sheet 1, Item 74), and screws (Figure 1, Sheet 1, Item 73). Torque screws (Figure 1, Sheet 1, Item 73) to 27-33 lb-ft (37-44 Nm).

2. Install fan (Figure 1, Sheet 1, Item 71) on fan mounting adapter (Figure 1, Sheet 1, Item 72), and secure with six washers (Figure 1, Sheet 1, Item 70), lockwashers (Figure 1, Sheet 1, Item 69), and screws (Figure 1, Sheet 1, Item 68). Torque screws (Figure 1, Sheet 1, Item 68) to 27-33 lb-ft (37-44 Nm).

3. Install left shroud flange (Figure 1, Sheet 1, Item 21) on radiator (Figure 1, Sheet 2, Item 43), and secure with four washers (Figure 1, Sheet 2, Item 67), lockwashers (Figure 1, Sheet 2, Item 66), and screws (Figure 1, Sheet 2, Item 65).

4. Install two hose connectors (Figure 1, Sheet 3, Item 63), and manifold out tube (Figure 1, Sheet 3, Item 62) onto radiator (Figure 1, Sheet 3, Item 43) and turbo out elbow (Figure 1, Sheet 3, Item 64) with eight hose clamps (Figure 1, Sheet 3, Item 61).

5. Install manifold in hose (Figure 1, Sheet 3, Item 60), two hose connectors (Figure 1, Sheet 3, Item 59), and eight hose clamps (Figure 1, Sheet 3, Item 58).

6. Install two coolant hoses (Figure 1, Sheet 3, Item 57), upper radiator hose (Figure 1, Sheet 3, Item 56), and four hose clamps (Figure 1, Sheet 3, Item 55).

7. Install bracket (Figure 1, Sheet 3, Item 53), and loop clamp (Figure 1, Sheet 3, Item 54), with screw (Figure 1, Sheet 3, Item 52), washer (Figure 1, Sheet 3, Item 51), and nut (Figure 1, Sheet 3, Item 50).

8. Install two upper radiator mounting tie rods (Figure 1, Sheet 3, Item 49), two screws (Figure 1, Sheet 3, Item 46), washers (Figure 1, Sheet 3, Item 47), nuts (Figure 1, Sheet 3, Item 48), four screws (Figure 1, Sheet 3, Item 44) and lockwashers (Figure 1, Sheet 3, Item 45).

9. Install right shroud flange (Figure 1, Sheet 1, Item 6) on radiator (Figure 1, Sheet 2, Item 43), and secure with four washers (Figure 1, Sheet 2, Item 42), lockwashers (Figure 1, Sheet 2, Item 41), and screws (Figure 1, Sheet 1, Item 40).

INSTALLATION - Continued

10. Install three screws (Figure 1, Sheet 2, Item 39) to left fan shroud and three screws (Figure 1, Sheet 2, Item 39) to right fan shroud.

11. Secure right shroud flange (Figure 1, Sheet 1, Item 6) and left shroud flange (Figure 1, Sheet 1, Item 21) together by installing screw (Figure 1, Sheet 2, Item 38), washers (Figure 1, Sheet 2, Item 37), and locknut (Figure 1, Sheet 1, Item 36) in two places, top and bottom.

12. Install lower shroud plate (Figure 1, Sheet 2, Item 35) on left shroud flange (Figure 1, Sheet 1, Item 21) and right shroud flange (Figure 1, Sheet 2, Item 6), and secure with eight washers (Figure 1, Sheet 2, Item 34), lockwashers (Figure 1, Sheet 2, Item 33), and screws (Figure 1, Sheet 2, Item 32).

13. Install upper shroud plate (Figure 1, Sheet 2, Item 31) on left shroud flange (Figure 1, Sheet 1, Item 21) and right shroud flange (Figure 1, Sheet 1, Item 6), and secure with 10 washers (Figure 1, Sheet 2, Item 30), lockwashers (Figure 1, Sheet 2, Item 29), and screws (Figure 1, Sheet 2, Item 28).

14. Install lower left fan guard (Figure 1, Sheet 1, Item 17) on left shroud flange (Figure 1, Sheet 1, Item 21), and secure with four washers (Figure 1, Sheet 1, Item 27), lockwashers (Figure 1, Sheet 1, Item 26), and screws (Figure 1, Sheet 1, Item 25).

15. Install screw (Figure 1, Sheet 1, Item 24), washer (Figure 1, Sheet 1, Item 23), and locknut (Figure 1, Sheet 1, Item 22) on lower left fan guard (Figure 1, Sheet 2, Item 17).

16. Install upper left fan guard (Figure 1, Sheet 1, Item 16) on left shroud flange (Figure 1, Sheet 1, Item 21), and secure with two washers (Figure 1, Sheet 1, Item 20), lockwashers (Figure 1, Sheet 1, Item 19), and screws (Figure 1, Sheet 1, Item 18).

17. Connect upper left fan guard (Figure 1, Sheet 1, Item 16) to lower left fan guard (Figure 1, Sheet 1, Item 17), and secure with screw (Figure 1, Sheet 1, Item 15), washer (Figure 1, Sheet 1, Item 14), and locknut (Figure 1, Sheet 1, Item 13).

18. Install lower right fan guard (Figure 1, Sheet 1, Item 9) on right shroud flange (Figure 1, Sheet 1, Item 6), and secure with four washers (Figure 1, Sheet 1, Item 12), lockwashers (Figure 1, Sheet 1, Item 11), and screws (Figure 1, Sheet 1, Item 10).

19 Install washer (Figure 1, Sheet 1, Item 8) and nut (Figure 1, Sheet 1, Item 7) securing lower right fan guard (Figure 1, Sheet 1, Item 9) to engine.

20. Install upper right fan guard (Figure 1, Sheet 1, Item 5) and hose clamp (Figure 1, Sheet 1, Item 4) on right shroud flange (Figure 1, Sheet 1, Item 6), and secure with four washers (Figure 1, Sheet 1, Item 3), lockwashers (Figure 1, Sheet 1, Item 2), and screws (Figure 1, Sheet 1, Item 1).

21. Refill cooling system with saved coolant and add coolant as required (WP 0067).

22. Close left front door and right front door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

COOLANT HOSE ASSEMBLIES MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Antifreeze (WP 0120, Item 5)
Cap and plug set (WP 0120, Item 6)
Sealing compound (WP 0120, Item 41)

Personnel Required

One

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the coolant system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open left front door and right front door.

NOTE

Coolant system capacity is 38 quarts (34.5 liters).

3. Place suitable container under coolant drain on front right side of TQG. Open drain valve (Figure 1, Sheet 1, Item 1) on right side at rear of engine, and drain valve (Figure 1, Sheet 1, Item 2) on front right side bottom of engine, and drain coolant. Save coolant for refilling system.

4. On right side, remove two clamps (Figure 1, Sheet 2, Item 3) and hose (Figure 1, Sheet 1, Item 4) from radiator filler neck (Figure 1, Sheet 2, Item 5) and from coolant recovery system (under surge tank) (Figure 1, Sheet 2, Item 6).

5. At lower right rear of engine, remove two clamps (Figure 1, Sheet 1, Item 7) and hose (Figure 1, Sheet 1, Item 8) from coolant recovery system (Figure 1, Sheet 2, Item 6) and from drain tee (Figure 1, Sheet 1, Item 9) on lower right rear of engine.

6. Remove hose clamp (Figure 1, Sheet 1, Item 10) and hose clamp (Figure 1, Sheet 1, Item 11) and remove hose (Figure 1, Sheet 1, Item 12) from drain tee (Figure 1, Sheet 1, Item 9) and drain valve (Figure 1, Sheet 1, Item 1), and remove drain valve (Figure 1, Sheet 1, Item 1), reducer bushing (Figure 1, Sheet 1, Item 13), tee (Figure 1, Sheet 1, Item 14), pipe plug (Figure 1, Sheet 1, Item 15), nipple (Figure 1, Sheet 1, Item 16), and adapter fitting (Figure 1, Sheet 1, Item 17).

7. Remove two hose clamps (Figure 1, Sheet 1, Item 7) and (Figure 1, Sheet 1, Item 18), and remove hose (Figure 1, Sheet 1, Item 19) and drain tee (Figure 1, Sheet 1, Item 9).

8. Remove hose clamp (Figure 1, Sheet 1, Item 20) and hose (Figure 1, Sheet 1, Item 21).

9. Remove fitting (Figure 1, Sheet 1, Item 22), two hose clamps (Figure 1, Sheet 1, Item 23), hose (Figure 1, Sheet 1, Item 24), fitting (Figure 1, Sheet 1, Item 25), drain valve (Figure 1, Sheet 1, Item 2), nipple (Figure 1, Sheet 1, Item 26), and elbow (Figure 1, Sheet 1, Item 27).

10. At left side of engine, remove locknut (Figure 1, Sheet 2, Item 28), washer (Figure 1, Sheet 2, Item 29), screw (Figure 1, Sheet 2, Item 30), clamp (Figure 1, Sheet 2, Item 31), four hose clamps (Figure 1, Sheet 2, Item 33), upper radiator hose (Figure 1, Sheet 2, Item 32), radiator hose (Figure 1, Sheet 2, Item 34), and radiator hose (Figure 1, Sheet 2, Item 35).

11. Remove two hose clamps (Figure 1, Sheet 2, Item 36) and remove hose (Figure 1, Sheet 2, Item 37) from surge tank and engine. Remove fitting (Figure 1, Sheet 2, Item 38).

REMOVAL - Continued

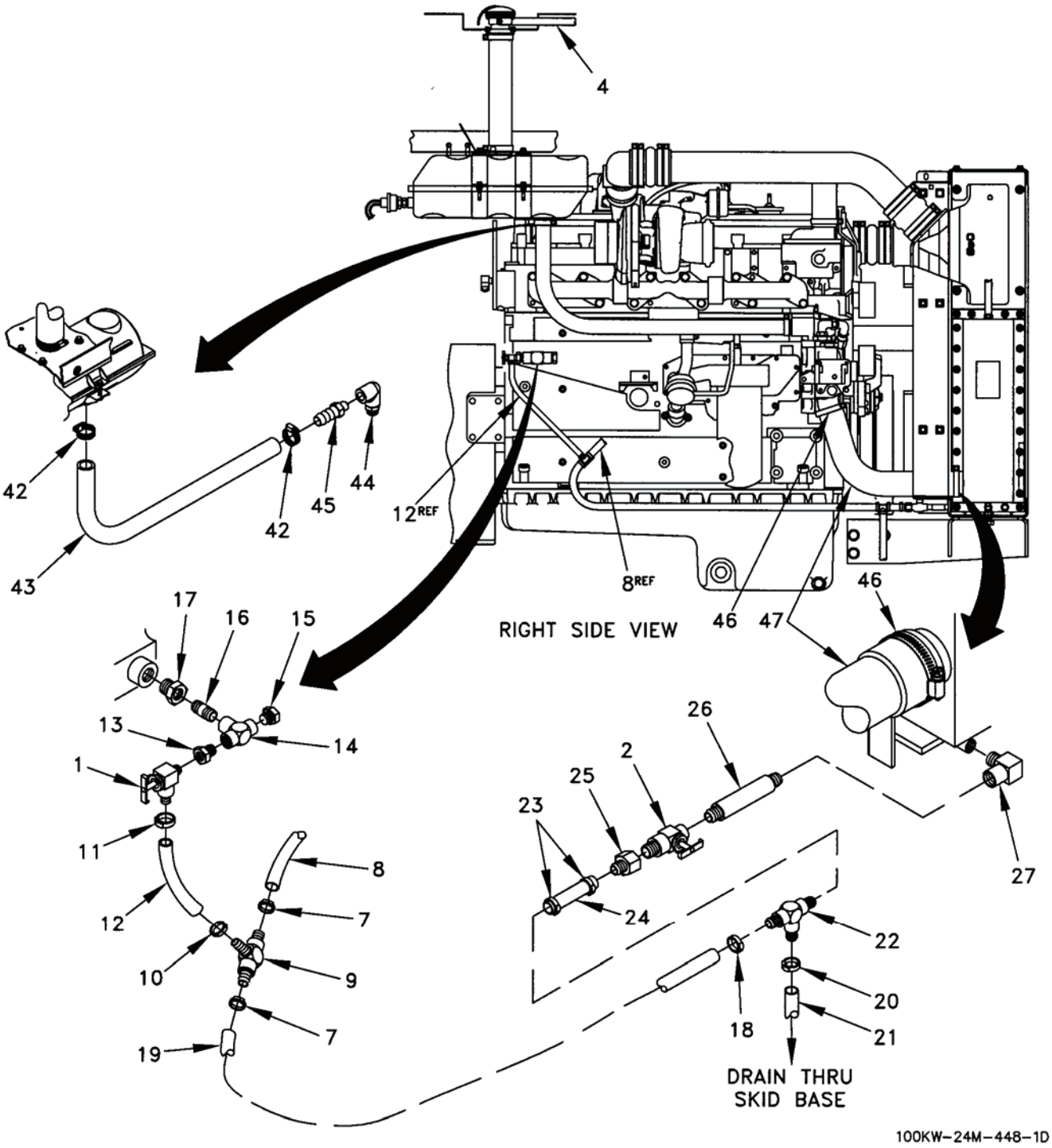


Figure 1. Coolant Hose Assemblies (Sheet 1 of 2).

REMOVAL - Continued

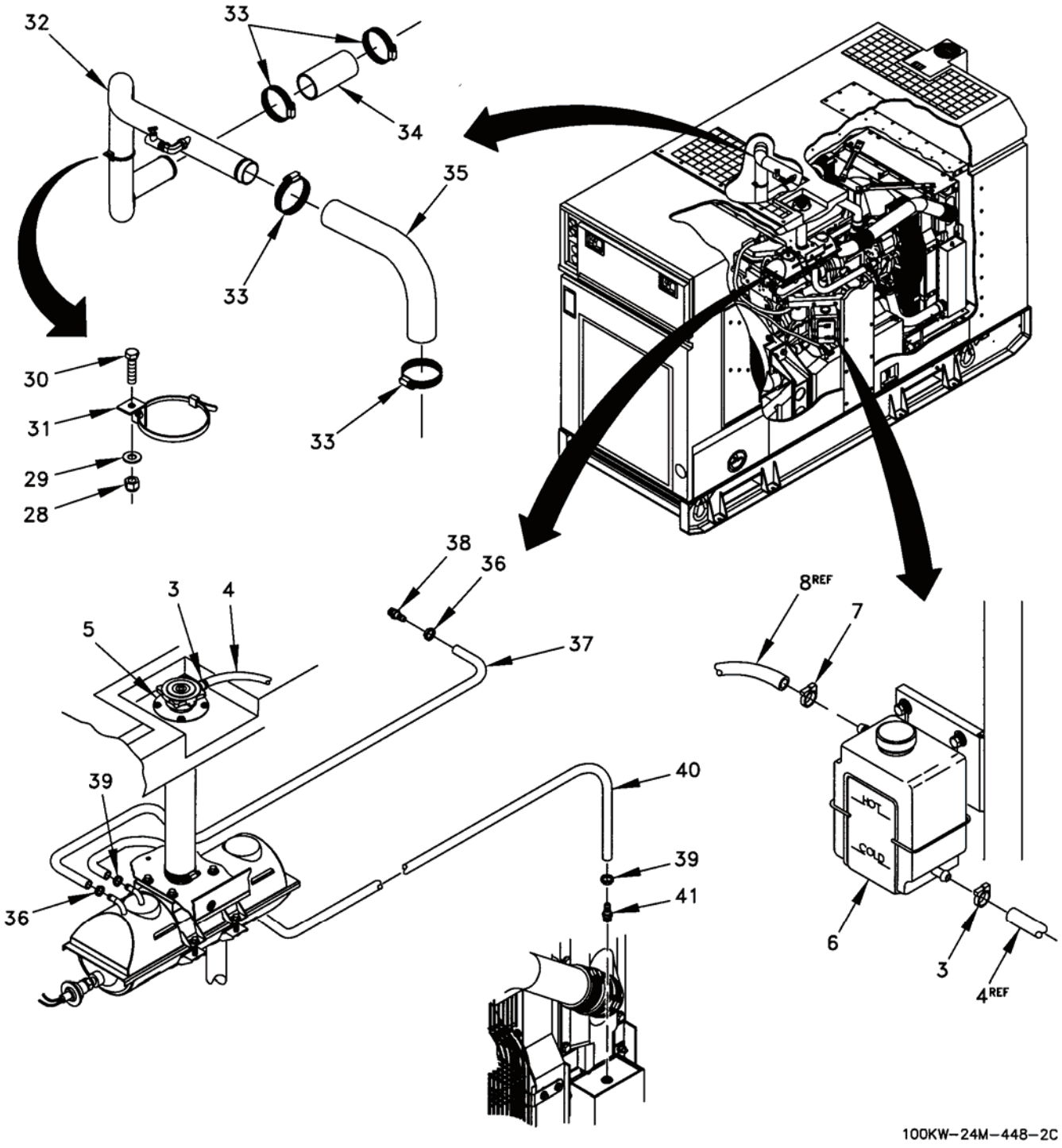


Figure 1. Coolant Hose Assemblies (Sheet 2 of 2).

REMOVAL - Continued

12. Remove two hose clamps (Figure 1, Sheet 2, Item 39) and remove hose (Figure 1, Sheet 2, Item 40) from surge tank and radiator. Remove fitting (Figure 1, Sheet 2, Item 41).

13. Remove two hose clamps (Figure 1, Sheet 1, Item 42) and remove hose (Figure 1, Sheet 1, Item 43) from beneath surge tank and from elbow (Figure 1, Sheet 1, Item 44). Remove elbow (Figure 1, Sheet 1, Item 44) and fitting (Figure 1, Sheet 1, Item 45) from engine.

14. Remove two hose clamps (Figure 1, Sheet 1, Item 46) and lower radiator hose (Figure 1, Sheet 1, Item 47).

END OF TASK

INSTALLATION

NOTE

Apply sealing compound to all male pipe threads before connecting.

1. At right side of engine, install lower radiator hose (Figure 1, Sheet 1, Item 47) and two hose clamps (Figure 1, Sheet 1, Item 46).

2. Install fitting (Figure 1, Sheet 1, Item 45) and elbow (Figure 1, Sheet 1, Item 44) on engine. Install hose (Figure 1, Sheet 1, Item 43) to elbow (Figure 1, Sheet 1, Item 44) and to bottom side of surge tank with two hose clamps (Figure 1, Sheet 2, Item 42).

3. Install fitting (Figure 1, Sheet 2, Item 41) to right top side of radiator, and install hose (Figure 1, Sheet 2, Item 40) to fitting (Figure 1, Sheet 2, Item 41) and to top of surge tank with two hose clamps (Figure 1, Sheet 2, Item 39).

4. Install fitting (Figure 1, Sheet 2, Item 38) to right side of engine, and install hose (Figure 1, Sheet 2, Item 37) to fitting (Figure 1, Sheet 2, Item 38) and to top of surge tank with two hose clamps (Figure 1, Sheet 2, Item 36).

5. Install radiator hose (Figure 1, Sheet 2, Item 35), radiator hose (Figure 1, Sheet 2, Item 34), and upper radiator hose (Figure 1, Sheet 2, Item 32), four hose clamps (Figure 1, Sheet 2, Item 33), clamp (Figure 1, Sheet 2, Item 31), screw (Figure 1, Sheet 2, Item 30), washer (Figure 1, Sheet 2, Item 29), and locknut (Figure 1, Sheet 2, Item 28).

6. At lower right front of engine, install elbow (Figure 1, Sheet 1, Item 27), nipple (Figure 1, Sheet 1, Item 26), drain valve (Figure 1, Sheet 1, Item 2), fitting (Figure 1, Sheet 1, Item 25), hose (Figure 1, Sheet 1, Item 24), fitting (Figure 1, Sheet 1, Item 22), and two hose clamps (Figure 1, Sheet 1, Item 23).

7. Install hose (Figure 1, Sheet 1, Item 21) and hose clamp (Figure 1, Sheet 1, Item 20).

8. Connect hose (Figure 1, Sheet 1, Item 19) and install drain tee (Figure 1, Sheet 1, Item 9) and two hose clamps (Figure 1, Sheet 1, Item 7).

9. At lower right rear of engine, install adapter fitting (Figure 1, Sheet 1, Item 17), nipple (Figure 1, Sheet 1, Item 16), pipe plug (Figure 1, Sheet 1, Item 15), tee (Figure 1, Sheet 1, Item 14), reducer bushing (Figure 1, Sheet 1, Item 13), and drain valve (Figure 1, Sheet 1, Item 1). Connect hose (Figure 1, Sheet 1, Item 12) to drain tee (Figure 1, Sheet 1, Item 9) and to drain valve (Figure 1, Sheet 1, Item 1) with hose clamp (Figure 1, Sheet 1, Item 11) and hose clamp (Figure 1, Sheet 1, Item 10).

INSTALLATION - Continued

10. Connect hose (Figure 1, Sheet 1, Item 8) from coolant recovery system (Figure 1, Sheet 2, Item 6) (under surge tank) to drain tee (Figure 1, Sheet 1, Item 9) using hose clamps (Figure 1, Sheet 1, Item 7) and (Figure 1, Sheet 2, Item 7).

11. Connect hose (Figure 1, Sheet 1, Item 4) from radiator filler neck (Figure 1, Sheet 2, Item 5) to coolant recovery system (Figure 1, Sheet 2, Item 6) using hose clamps (Figure 1, Sheet 2, Item 3).

12. Close drain valve (Figure 1, Sheet 1, Item 2) and drain valve (Figure 1, Sheet 1, Item 1).

13. Refill cooling system with coolant.

14. Close right front door and left front door.

15. Bring generator set to operating temperature and check for leaks.

16. Check coolant and fill as required.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
RADIATOR ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Antifreeze (WP 0120, Item 5)
Cap and plug set (WP 0120, Item 6)
Sealing compound (WP 0120, Item 41)

Personnel Required

Two

References

TM 750-254
TM 9-6115-729-24P

Equipment Condition

Fan guards, shrouds, and upper and lower shroud plates removed (WP 0065)
Engine generator compartment ceiling assembly removed (WP 0031)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

WARNING

Radiator weighs more than 37 pounds (17 kg) and requires a two-person lift. Lifting radiator can cause back strain. Ensure proper lifting techniques are used when lifting radiator. Failure to comply can cause injury to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the coolant system.

REMOVAL

1. Ensure generator set is fully stopped, Engine Control switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open left front door and right front door.

NOTE

Coolant system capacity is 38 quarts (34.5 liters).

3. Place suitable container under COOLANT DRAIN on front right side of TQG. Open drain valve (Figure 1, Sheet 1, Item 1) on right side at rear of engine, and drain valve (Figure 1, Sheet 1, Item 2) on lower right front of engine, and drain coolant. Save coolant for refilling system.

4. Remove four hose clamps (Figure 1, Sheet 1, Item 3), manifold out tube (Figure 1, Sheet 1, Item 4), and two hose connectors (Figure 1, Sheet 1, Item 5) from radiator (Figure 1, Sheet 1, Item 6) and from turbo out elbow (Figure 1, Sheet 1, Item 7).

5. Remove two hose clamps (Figure 1, Sheet 1, Item 8) and lower radiator hose (Figure 1, Sheet 1, Item 9).

6. Remove hose clamp (Figure 1, Sheet 1, Item 10) and disconnect coolant hose (Figure 1, Sheet 1, Item 11) from female connector (Figure 1, Sheet 1, Item 12) on drain valve (Figure 1, Sheet 1, Item 2) on lower right side of engine.

7. Remove female connector (Figure 1, Sheet 1, Item 12), drain valve (Figure 1, Sheet 1, Item 2), and nipple (Figure 1, Sheet 1, Item 13) from radiator (Figure 1, Sheet 1, Item 6).

8. At left side of engine, remove four hose clamps (Figure 1, Sheet 2, Item 14), manifold in hose (Figure 1, Sheet 2, Item 15), and two hose connectors (Figure 1, Sheet 2, Item 16) from radiator (Figure 1, Sheet 1, Item 6) and manifold.

9. At top of radiator (Figure 1, Sheet 1, Item 6), remove nut (Figure 1, Sheet 2, Item 17), washer (Figure 1, Sheet 2, Item 18), screw (Figure 1, Sheet 2, Item 19), loop clamp (Figure 1, Sheet 2, Item 20), and bracket (Figure 1, Sheet 2, Item 21) supporting upper radiator hose (Figure 1, Sheet 2, Item 22).

10. Remove four hose clamps (Figure 1, Sheet 2, Item 23), upper radiator hose (Figure 1, Sheet 2, Item 22), and two coolant hoses (Figure 1, Sheet 2, Item 24).

11. Remove four screws (Figure 1, Sheet 2, Item 25) and lockwashers (Figure 1, Sheet 2, Item 26), two screws (Figure 1, Sheet 2, Item 27), washers (Figure 1, Sheet 2, Item 28), nuts (Figure 1, Sheet 2, Item 29), and two upper radiator mounting tie rods (Figure 1, Sheet 2, Item 30).

REMOVAL - Continued

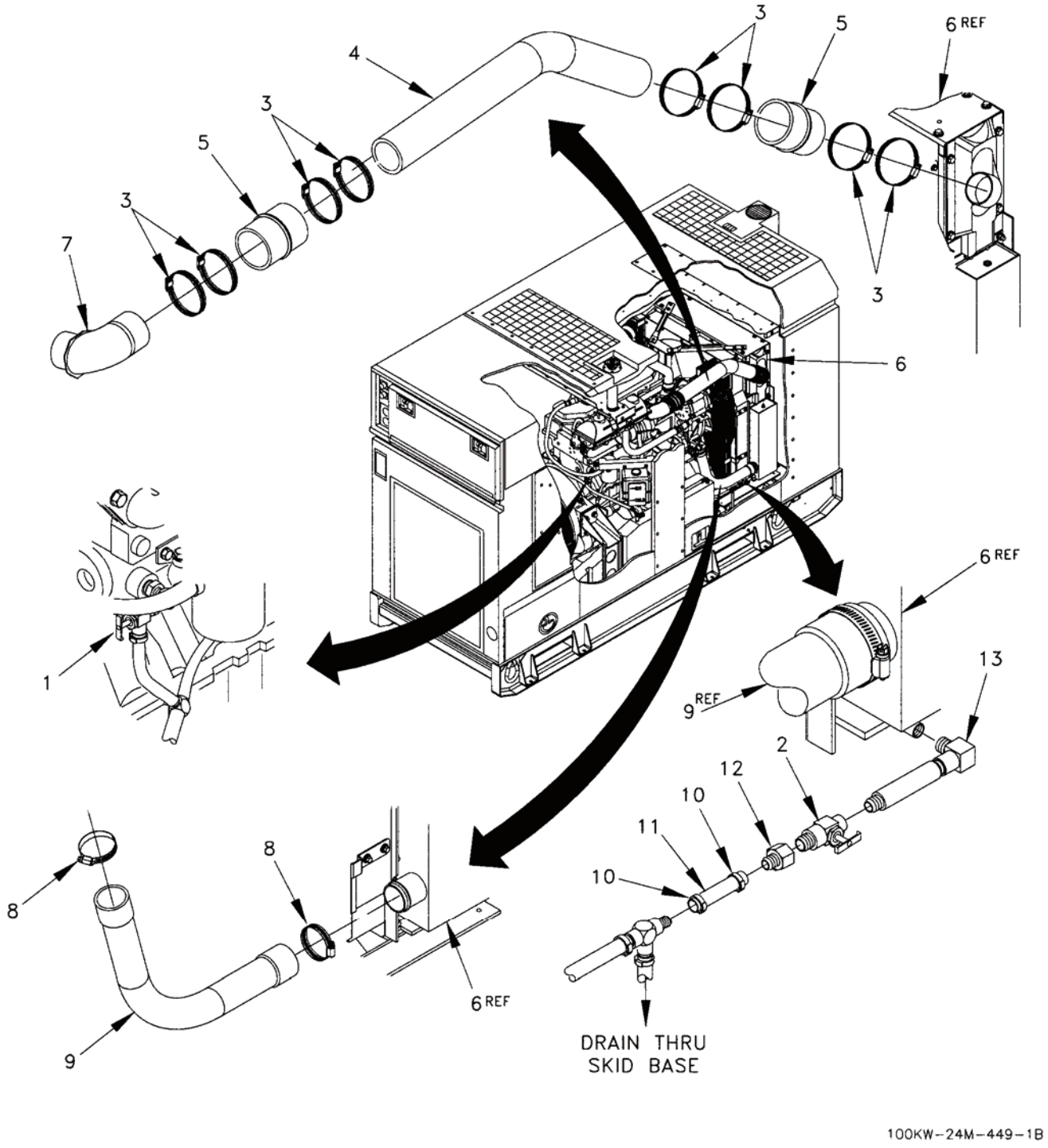


Figure 1. Radiator Assembly (Sheet 1 of 2).

REMOVAL - Continued

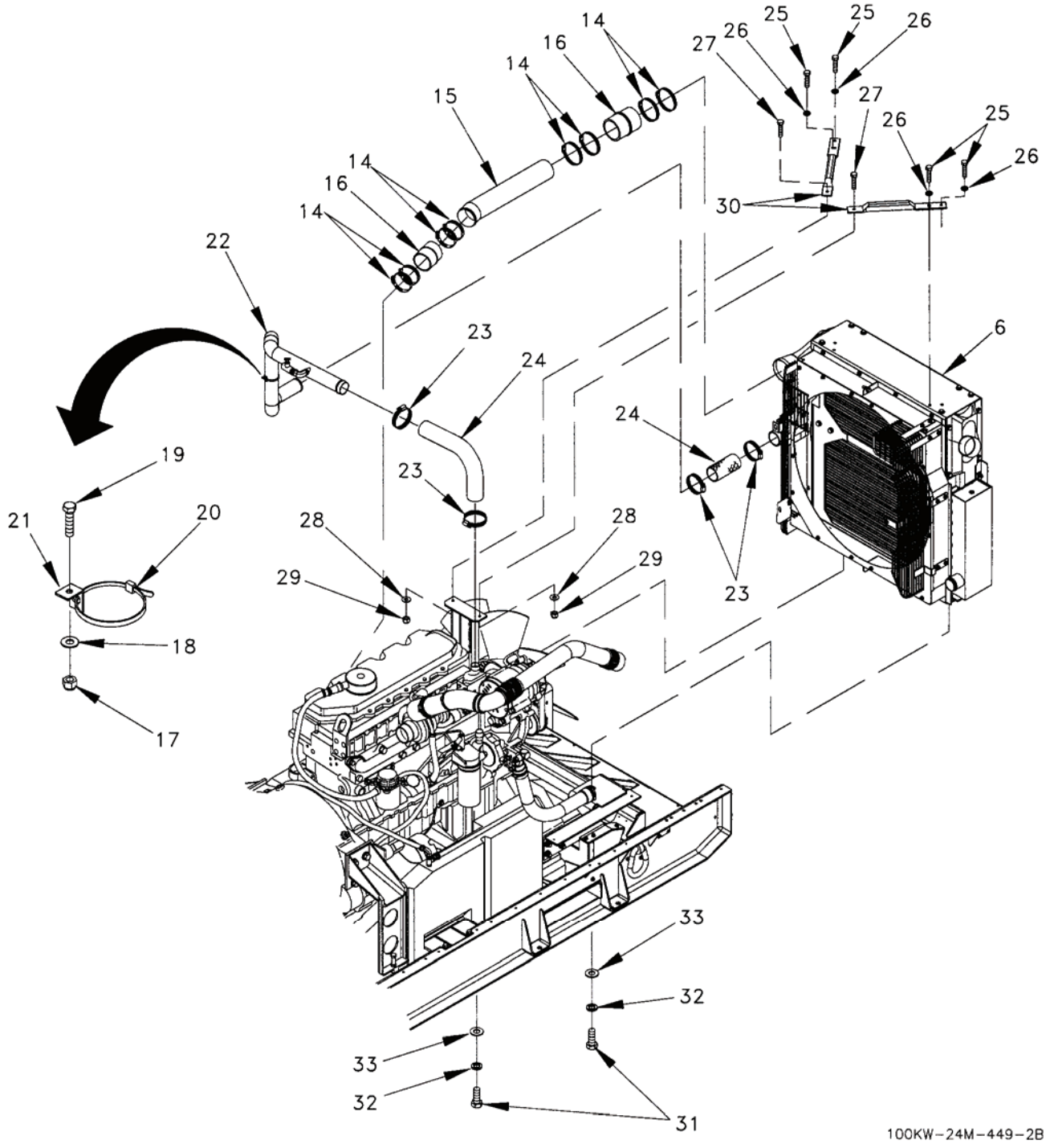


Figure 1. Radiator Assembly (Sheet 2 of 2).

REMOVAL - Continued

WARNING

Radiator weighs 140 pounds (64 kg) and requires a two-person lift. Lifting radiator can cause back strain. Ensure proper lifting techniques are used when lifting radiator. Failure to comply can cause injury to personnel

12. Under radiator (Figure 1, Sheet 1, Item 6), remove two screws (Figure 1, Sheet 2, Item 31), lockwashers (Figure 1, Sheet 2, Item 32), and washers (Figure 1, Sheet 2, Item 33), and remove radiator.

END OF TASK

REPAIR

For repair of the radiator, refer to procedures in TM 750-254, Cooling Systems: Tactical Vehicles.

END OF TASK

INSTALLATION

NOTE

Apply sealing compound to all male pipe threads before connecting.

1. Install radiator (Figure 1, Sheet 1, Item 6) through left front door assembly (latch) and install two washers (Figure 1, Sheet 2, Item 33), lockwashers (Figure 1, Sheet 2, Item 32) and screws (Figure 1, Sheet 2, Item 31) under radiator.

2. At top of radiator (Figure 1, Sheet 1, Item 6), install two upper radiator mounting tie rods (Figure 1, Sheet 2, Item 30), four nuts (Figure 1, Sheet 2, Item 29), washers (Figure 1, Sheet 2, Item 28), and screws (Figure 1, Sheet 2, Item 27), and four lockwashers (Figure 1, Sheet 2, Item 26) and screws (Figure 1, Sheet 2, Item 25).

3. Install two coolant hoses (Figure 1, Sheet 2, Item 24), upper radiator hose (Figure 1, Sheet 2, Item 22), and four hose clamps (Figure 1, Sheet 2, Item 23).

4. Install bracket (Figure 1, Sheet 2, Item 21), loop clamp (Figure 1, Sheet 2, Item 20), screw (Figure 1, Sheet 2, Item 19), washer (Figure 1, Sheet 2, Item 18), and nut (Figure 1, Sheet 2, Item 17).

5. At left side of engine, install two hose connectors (Figure 1, Sheet 2, Item 16), manifold in hose (Figure 1, Sheet 2, Item 15), and four hose clamps (Figure 1, Sheet 2, Item 14).

6. At lower right side of engine, install nipple (Figure 1, Sheet 1, Item 13), drain valve (Figure 1, Sheet 1, Item 2), and female connector (Figure 1, Sheet 1, Item 12) on radiator (Figure 1, Sheet 1, Item 6).

7. Connect coolant hose (Figure 1, Sheet 1, Item 11) to female connector (Figure 1, Sheet 1, Item 12) and install hose clamp (Figure 1, Sheet 1, Item 10).

8. Install lower radiator hose (Figure 1, Sheet 1, Item 9) and two hose clamps (Figure 1, Sheet 1, Item 8).

9. On right side of engine, connect two hose connectors (Figure 1, Sheet 1, Item 5) to radiator (Figure 1, Sheet 1, Item 6) and to turbo out elbow (Figure 1, Sheet 1, Item 7), and install manifold out tube (Figure 1, Sheet 1, Item 4) and four hose clamps (Figure 1, Sheet 1, Item 3).

INSTALLATION - Continued

10. Install fan and fan guards (WP 0065).

11. Install engine generator compartment ceiling assembly (WP 0031).

NOTE

Coolant system capacity is 38 quarts (34.5 liters).

12. Close drain valves (Figure 1, Sheet 1, Item 1) and (Figure 1, Sheet 1, Item 2). Refill cooling system with coolant. Add coolant as required.

13. Set Battery Disconnect Switch to ON and DEAD CRANK SWITCH to ON. On EMCP set Engine Control Switch (ECS) to START.

14. With engine running, check for leaks.

15. Close left front door and right front door.

END OF TASK

FLUSHING

For flushing of the cooling system, refer to procedures in TM 750-254, Cooling Systems: Tactical Vehicles.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
EXHAUST SYSTEM MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Wire, nonelectrical (WP 0120, Item 7)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Access covers removed (WP 0028)
Front roof section housing assembly removed (WP 0029)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

Exhaust system can get very hot. Shut down generator set, and allow system to cool before performing checks, services, and maintenance. Failure to comply can cause severe burns and injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch (ECS) is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

REMOVAL - Continued

2. Open left front door and right front door.

WARNING

The muffler blanket is made of fiberglass fabric which can break down with heat and flexing. Fiberglass fibers can irritate the flesh and respiratory passages. Wear protective eyewear, mask, and gloves when removing or installing muffler blanket. Failure to comply can cause injury to personnel.

3. Remove lacing and elbow blanket (Figure 1, Item 1), inlet pipe turbo end blanket (Figure 1, Item 2), inlet pipe muffler end blanket (Figure 1, Item 3), and muffler blanket (Figure 1, Item 4).

4. Remove pipe clamp (Figure 1, Item 5) from exhaust in elbow (Figure 1, Item 6).

5. Remove two exhaust pipe clamps (Figure 1, Item 7) and one ceramic strip (Figure 1, Item 8) that attaches flex exhaust tube assembly (Figure 1, Item 9) to muffler (Figure 1, Item 10). Remove flex exhaust tube assembly (Figure 1, Item 9) from muffler and exhaust in elbow (Figure 1, Item 6).

6. Remove eight locknuts (Figure 1, Item 11), washers (Figure 1, Item 12), and screws (Figure 1, Item 13), and remove exhaust flange (Figure 1, Item 14), exhaust in elbow (Figure 1, Item 6), and bellows (Figure 1, Item 15). Remove clamp (Figure 1, Item 16) and insulation strip (Figure 1, Item 17).

7. Remove two locknuts (Figure 1, Item 18) and washers (Figure 1, Item 19) from each of two muffler tie down strap assemblies (Figure 1, Item 20). Remove straps and muffler (Figure 1, Item 10).

8. Remove four locknuts (Figure 1, Item 21), washers (Figure 1, Item 22), and screws (Figure 1, Item 23) from each of two muffler brackets (Figure 1, Item 24), and remove two brackets (Figure 1, Item 24) from engine/generator compartment ceiling.

END OF TASK

INSTALLATION

1. Install two brackets (Figure 1, Item 24) to engine/generator compartment ceiling, and secure with four screws (Figure 1, Item 23), washers (Figure 1, Item 22), and locknuts (Figure 1, Item 21).

2. Install muffler (Figure 1, Item 10), two muffler tiedown strap assemblies (Figure 1, Item 20), two washers (Figure 1, Item 19), and locknuts (Figure 1, Item 18).

3. Install exhaust flange (Figure 1, Item 14) and bellows (Figure 1, Item 15) on exhaust in elbow (Figure 1, Item 6). Install insulation strip (Figure 1, Item 17) and clamp (Figure 1, Item 16). Install eight screws (Figure 1, Item 13), washers (Figure 1, Item 12), and locknuts (Figure 1, Item 11).

INSTALLATION - Continued

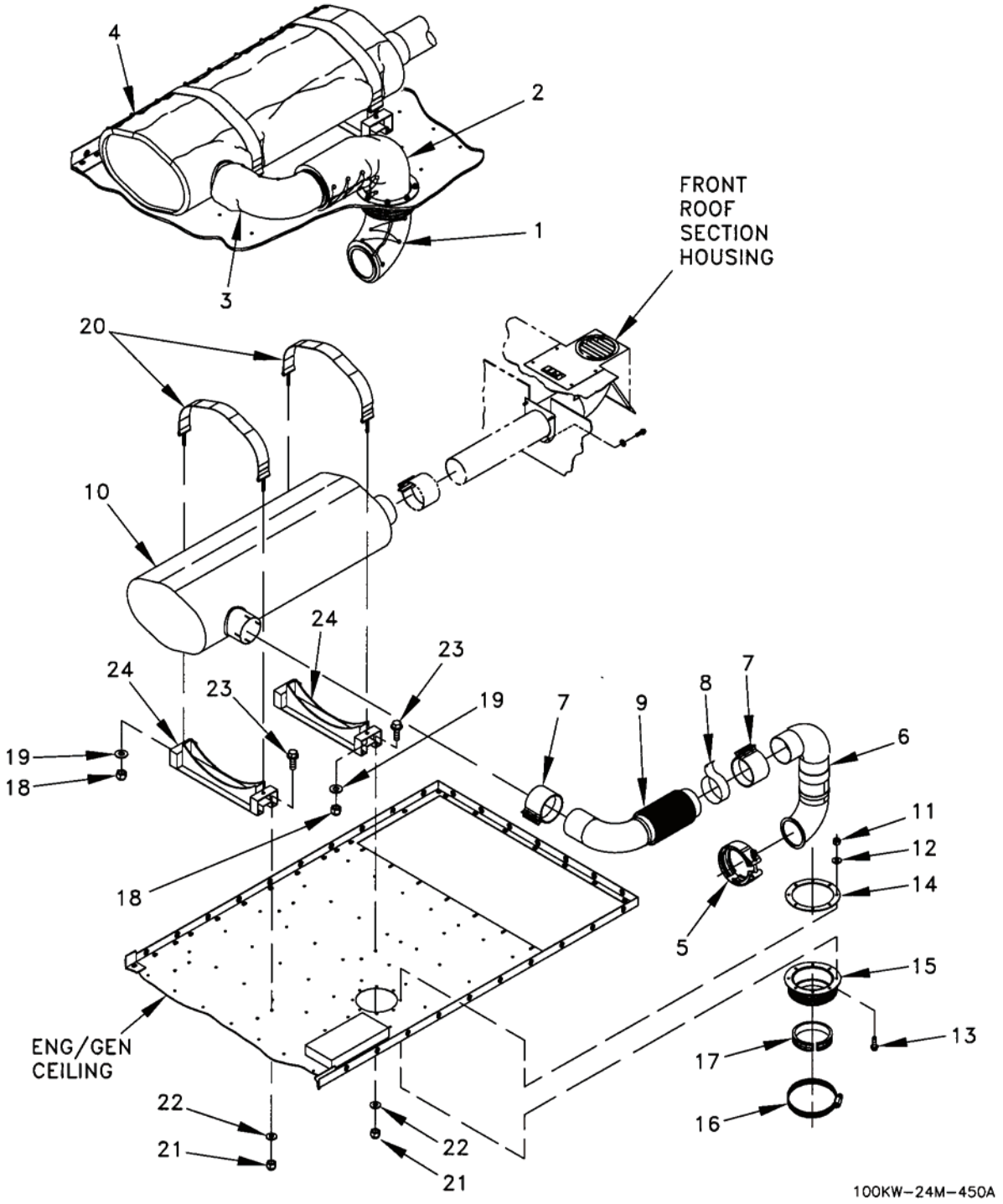


Figure 1. Exhaust System.

INSTALLATION - Continued

4. Install flex exhaust tube assembly (Figure 1, Item 9) on muffler (Figure 1, Item 10) and exhaust in elbow (Figure 1, Item 6) and install ceramic strip (Figure 1, Item 8) and two exhaust pipe clamps (Figure 1, Item 7).

5. Install pipe clamp (Figure 1, Item 5) on exhaust in elbow (Figure 1, Item 6).

WARNING

The muffler blanket is made of fiberglass fabric which can break down with heat and flexing. Fiberglass fibers can irritate the flesh and respiratory passages. Wear protective eyewear, mask, and gloves when removing or installing muffler blanket. Failure to comply can cause injury to personnel.

6. Install muffler blanket (Figure 1, Item 4), inlet pipe muffler end blanket (Figure 1, Item 3), inlet pipe turbo end blanket (Figure 1, Item 2), elbow blanket (Figure 1, Item 1), and secure with lacing.

7. Install front roof section housing assembly (WP 0029).

8. Install access covers (WP 0028).

9. Close left front door and right front door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

CRANKCASE VENTILATION FILTER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Cap and plug set (WP 0120, Item 6)
Filter
Wiping rags (WP 0120, Item 30)

References

TM 9-6115-7129-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the air cleaner system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right rear doors and right front door.

3. Disconnect hose (Figure 1, Item 1) and reducer (Figure 1, Item 2) from bottom of crankcase ventilation filter (Figure 1, Item 3).

4. Unlatch bowl (Figure 1, Item 4) from crankcase ventilator filter (Figure 1, Item 3) and remove filter element (Figure 1, Item 5).

5. Wipe up any spilled oil.

END OF TASK

INSTALLATION

1. Install filter element (Figure 1, Item 5) and latch bowl (Figure 1, Item 4) back onto crankcase ventilation filter (Figure 1, Item 3).

2. Install reducer (Figure 1, Item 2) on bottom of crankcase ventilation filter (Figure 1, Item 3) and install hose (Figure 1, Item 1).

3. Close right rear doors and right front door.

INSTALLATION - Continued

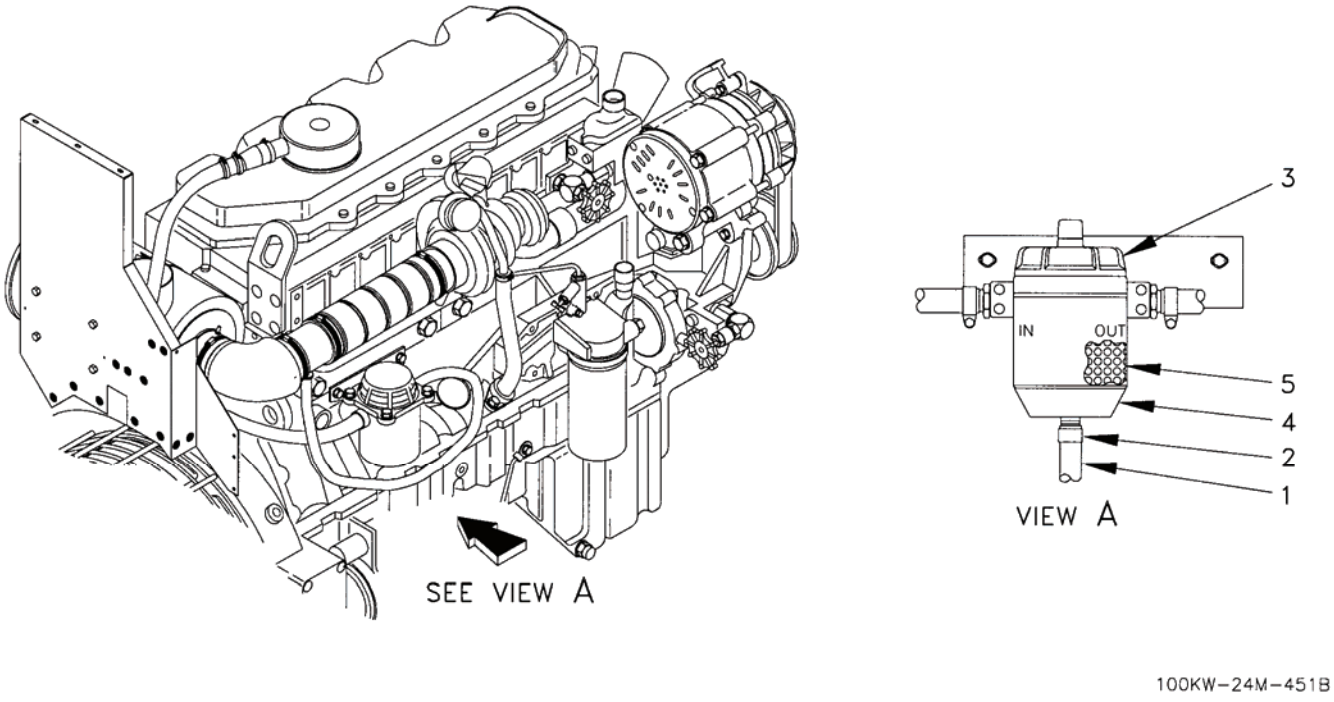


Figure 1. Crankcase Ventilation Filter.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

AIR CLEANER FILTER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Cap and plug set (WP 0120, Item 6)
Filter, primary
Filter, safety
Gasket
Wiping rags (WP 0120, Item 36)

References

TM 9-2350-729-10
TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the air cleaner system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open left rear door.

3. Unfasten four clips (Figure 1, Item 1) and remove air cleaner cover (Figure 1, Item 2) and gasket (Figure 1, Item 3) from air cleaner canister (Figure 1, Item 4).

CAUTION

Do not twist filter elements or filter elements may be damaged.

4. Pull out primary filter element (Figure 1, Item 5) and safety filter element (Figure 1, Item 6).

END OF TASK

INSPECTION

Inspect the air cleaner filter elements (TM 9-2350-729-10).

END OF TASK

CLEANING

WARNING

Cleaning with compressed air can cause flying particles. When using compressed air, wear protective glasses and use clean, low pressure air, less than 30 psi (208 kPa). Failure to comply can cause eye injury to personnel.

1. Clean filter elements with low pressure (less than 30 psi) compressed air.

2. Replace filter elements when damaged or they cannot be cleaned, or when restriction gauge (Figure 1, Item 7) stays red.

CLEANING - Continued

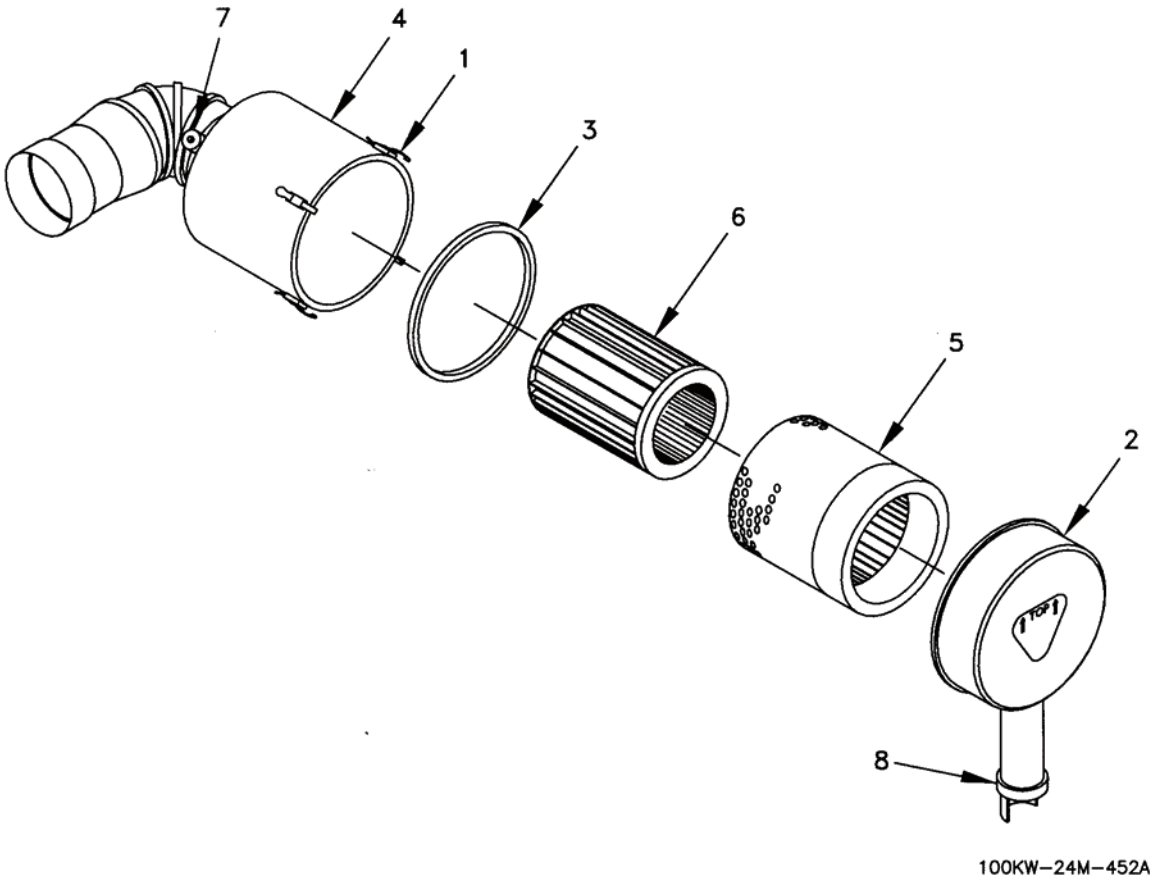


Figure 1. Air Cleaner Filter.

3. Check restriction gauge (Figure 1, Item 7) for cracks. Ensure gauge can be read, and that it returns to green when reset is pushed.

4. Squeeze rubber dust cup (Figure 1, Item 8) several times to expel dust and debris.

END OF TASK

INSTALLATION

1. Install safety filter element (Figure 1, Item 6) inside primary filter element (Figure 1, Item 5) and install into air cleaner canister (Figure 1, Item 4).
2. Install gasket (Figure 1, Item 3) and cover (Figure 1, Item 2) and fasten four clips (Figure 1, Item 1).
3. Close left rear door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

AIR CLEANER SYSTEM MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Cap and plug set (WP 0120, Item 6)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the air cleaner system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right front door and left front door.

3. Remove air cleaner indicator (Figure 1, Sheet 1, Item 11) from air cleaner (Figure 1, Sheet 1, Item 13).

4. Remove two clamps (Figure 1, Sheet 1, Item 3) and collar (Figure 1, Sheet 1, Item 4) and reducing elbow (Figure 1, Sheet 1, Item 5) from air cleaner (Figure 1, Sheet 1, Item 2) and restricted tap sleeve (Figure 1, Sheet 1, Item 6).

5. Remove sensor (Figure 1, Sheet 1, Item 7) from restricted tap sleeve (Figure 1, Sheet 1, Item 6).

6. Remove two clamps (Figure 1, Sheet 1, Item 8) and hose (Figure 1, Sheet 1, Item 9) from restricted tap sleeve (Figure 1, Sheet 1, Item 6) and OUT port fitting on crankcase ventilation filter (Figure 1, Sheet 2, Item 10).

7. Remove clamp (Figure 1, Sheet 1, Item 11) and disconnect restricted tap sleeve (Figure 1, Sheet 1, Item 6) from air vent hose (Figure 1, Item 12).

8. Remove clamp (Figure 1, Sheet 1, Item 13) and disconnect air vent hose (Figure 1, Sheet 1, Item 12) from engine turbo.

9. Remove two clamps (Figure 1, Sheet 1, Item 14) and hose (Figure 1, Sheet 1, Item 15) from IN port fitting on crankcase ventilation filter (Figure 1, Sheet 2, Item 10) and engine crankcase filter adapter.

10. Remove two clamps (Figure 1, Sheet 2, Item 16) and disconnect hose (Figure 1, Sheet 2, Item 17) from swivel fitting (Figure 1, Sheet 2, Item 18) on bottom of crankcase ventilation filter (Figure 1, Sheet 2, Item 10) and from elbow (Figure 1, Sheet 2, Item 19) on right hand rear engine dipstick port.

11. Remove elbow (Figure 1, Sheet 2, Item 19), check valve (Figure 1, Sheet 2, Item 20) and adapter (Figure 1, Sheet 2, Item 21) from right hand rear engine dipstick port.

12. Remove two fittings (Figure 1, Sheet 2, Item 22) from IN port and OUT ports on crankcase ventilation filter (Figure 1, Sheet 2, Item 10).

13. Remove swivel fitting (Figure 1, Sheet 2, Item 18) from bottom of crankcase ventilation filter (Figure 1, Sheet 2, Item 10).

14. Remove two screws (Figure 1, Sheet 2, Item 23), lockwashers (Figure 1, Sheet 2, Item 24), and washers (Figure 1, Sheet 2, Item 25) to remover crankcase ventilation filter (Figure 1, Sheet 2, Item 10) from bracket (Figure 1, Sheet 2, Item 26).

15. Remove two screws (Figure 1, Sheet 2, Item 27), lockwashers (Figure 1, Sheet 2, Item 28), and washers (Figure 1, Sheet 2, Item 29), and spacers (Figure 1, Sheet 2, Item 30) to remove crankcase ventilation filter bracket (Figure 1, Sheet 2, Item 26).

16. Remove air cleaner cover (Figure 1, Sheet 1, Item 31) by releasing four clamps (Figure 1, Sheet 1, Item 32).

17. Loosen nut (Figure 1, Sheet 1, Item 33) on each air cleaner mounting band (Figure 1, Sheet 1, Item 34) and remove air cleaner (Figure 1, Sheet 1, Item 2).

REMOVAL - Continued

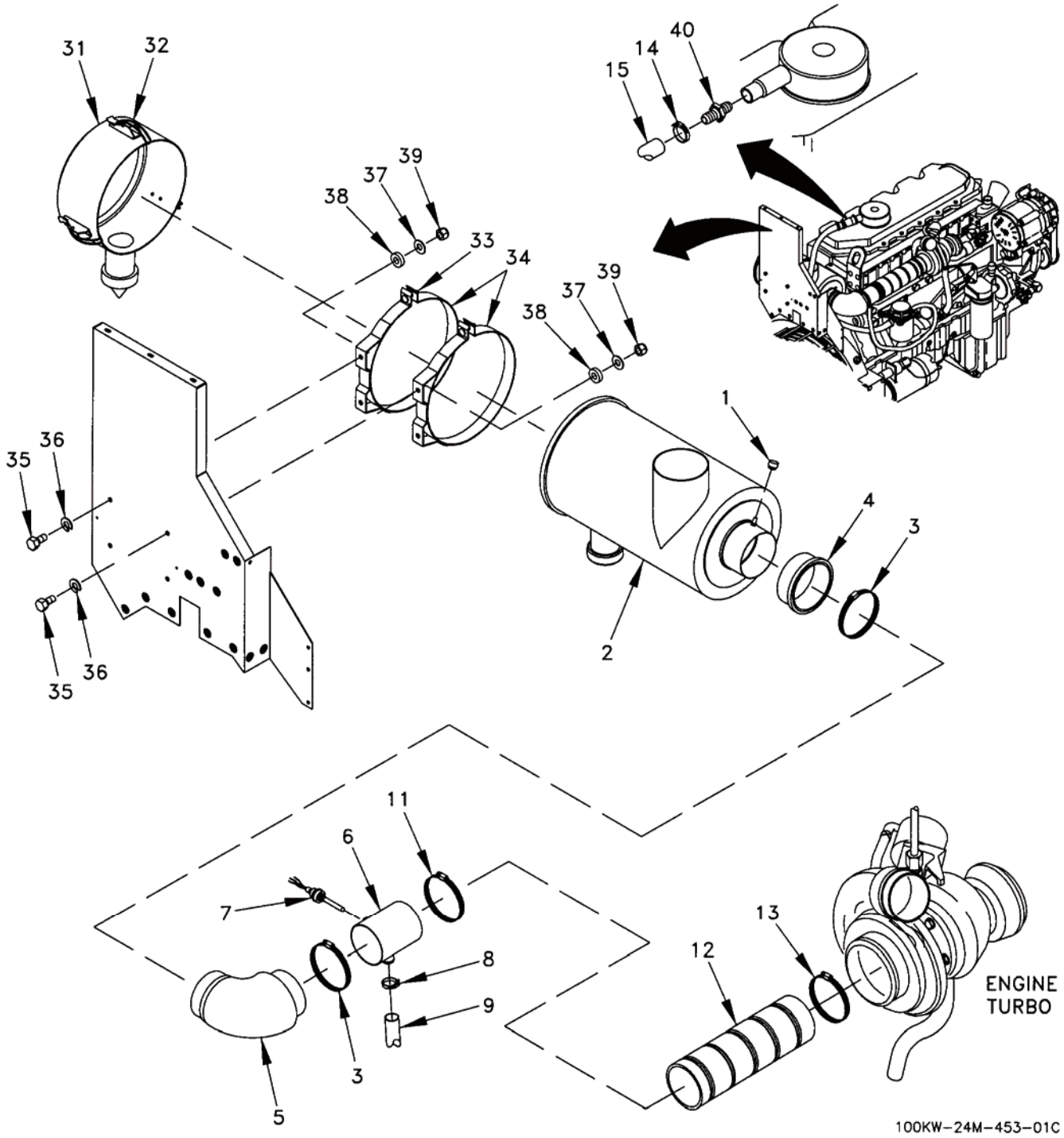


Figure 1. Air Cleaner System (Sheet 1 of 2).

REMOVAL - Continued

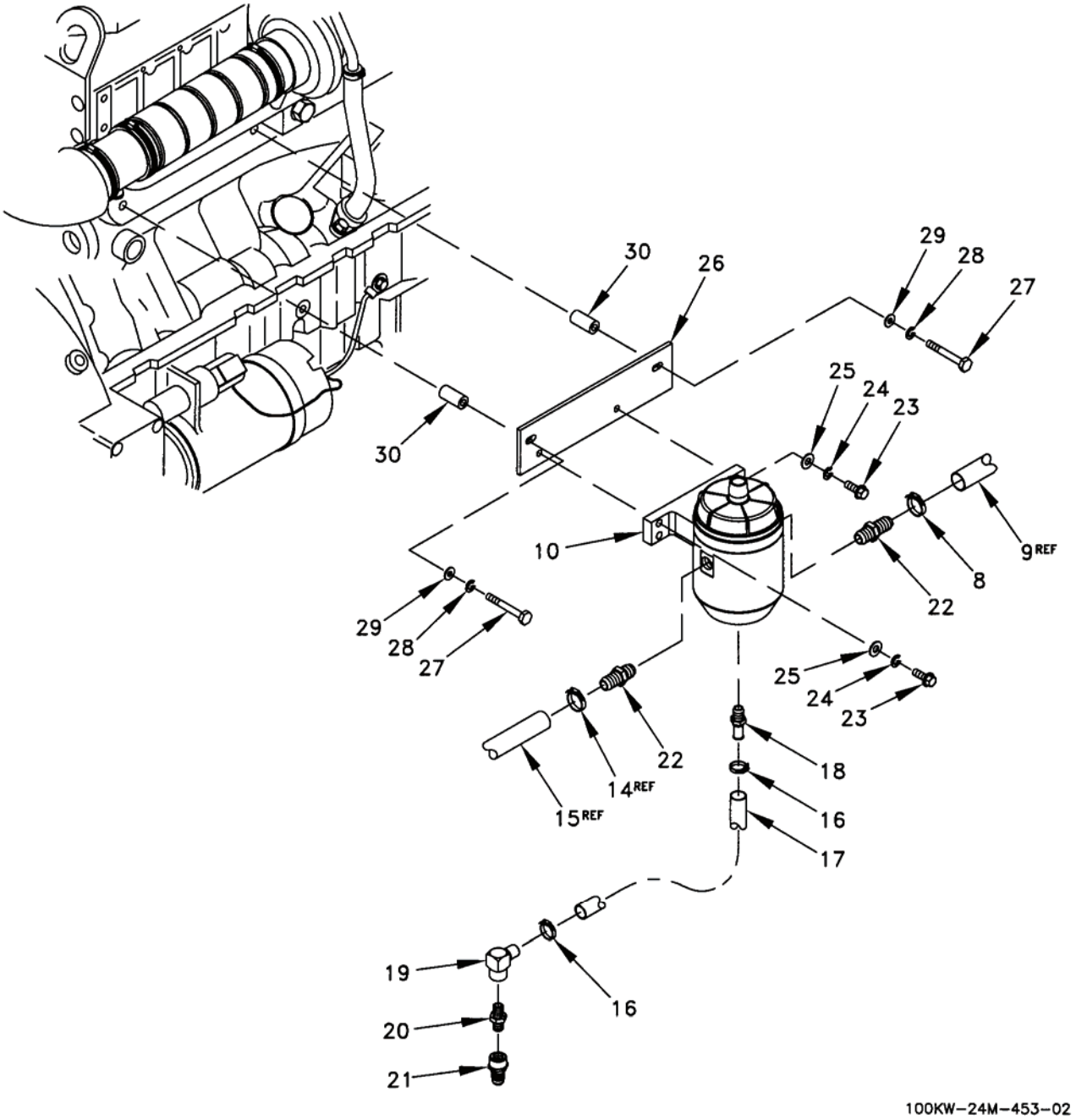


Figure 1. Air Cleaner System (Sheet 2 of 2).

REMOVAL - Continued

18. Remove four screws (Figure 1, Sheet 1, Item 35), lockwashers (Figure 1, Sheet 1, Item 36), washers (Figure 1, Sheet 1, Item 37), four spacers (Figure 1, Sheet 1, Item 38), four lock nuts (Figure 1, Sheet 1, Item 39), and two air cleaner mounting bands (Figure 1, Sheet 1, Item 34).

19. Remove straight barb connector (Figure 1, Sheet 1, Item 40) from engine crankcase filter adapter.

END OF TASK

INSTALLATION

1. Install straight barb connector (Figure 1, Sheet 1, Item 40) on engine crankcase filter adapter.

2. Install two air cleaner mounting bands (Figure 1, Sheet 1, Item 34), four lock nuts (Figure 1, Sheet 1, Item 39), four spacers (Figure 1, Sheet 1, Item 38), washers (Figure 1, Sheet 1, Item 37), lockwashers (Figure 1, Sheet 1, Item 36), and four screws (Figure 1, Sheet 1, Item 35).

3. Install air cleaner (Figure 1, Sheet 1, Item 2) into air cleaner mounting bands (Figure 1, Sheet 1, Item 34) and tighten two nuts (Figure 1, Sheet 1, Item 33).

4. Install air cleaner cover (Figure 1, Sheet 1, Item 31) by fastening four clamps (Figure 1, Sheet 1, Item 32).

5. Install two screws (Figure 1, Sheet 2, Item 27), lockwashers (Figure 1, Sheet 2, Item 28), washers (Figure 1, Sheet 2, Item 29), spacers (Figure 1, Sheet 2, Item 30) and crankcase ventilation filter bracket (Figure 1, Sheet 2, Item 26).

6. Install crankcase ventilation filter (Figure 1, Sheet 2, Item 10) on bracket (Figure 1, Sheet 2, Item 26) and secure with two washers (Figure 1, Sheet 2, Item 25), lockwashers (Figure 1, Sheet 2, Item 24), and screws (Figure 1, Sheet 2, Item 23).

7. Install swivel fitting (Figure 1, Sheet 2, Item 18) on bottom of crankcase ventilation filter (Figure 1, Sheet 2, Item 10). Install two fittings (Figure 1, Sheet 2, Item 22), one to IN port and one to OUT port, on crankcase ventilation filter (Figure 1, Sheet 2, Item 10).

8. Install adapter (Figure 1, Sheet 2, Item 21) and check valve (Figure 1, Sheet 2, Item 20) on right hand rear engine dipstick port.

9. Connect hose (Figure 1, Sheet 2, Item 17) to swivel fitting (Figure 1, Sheet 2, Item 18) on bottom of crankcase ventilation filter (Figure 1, Sheet 2, Item 10) and to check valve (Figure 1, Sheet 2, Item 20) on right hand rear engine dipstick port and install two clamps (Figure 1, Sheet 2, Item 16).

10. Connect hose (Figure 1, Sheet 1, Item 15) to IN port fitting on crankcase ventilation filter (Figure 1, Sheet 2, Item 10) and to straight barb connector (Figure 1, Sheet 1, Item 35) on engine crankcase filter adapter.

11. Connect air vent hose (Figure 1, Sheet 1, Item 12) to engine turbo and install clamp (Figure 1, Sheet 1, Item 13).

12. Connect restricted tap sleeve (Figure 1, Sheet 1, Item 6) to air vent hose (Figure 1, Sheet 1, Item 12) and install clamp (Figure 1, Sheet 1, Item 11).

INSTALLATION - Continued

13. Connect hose (Figure 1, Sheet 1, Item 9) to restricted tap sleeve (Figure 1, Sheet 1, Item 6) and to OUT port fitting on crankcase ventilation filter (Figure 1, Sheet 1, Item 10).

14. Install sensor (Figure 1, Sheet 1, Item 7) on restricted tap sleeve (Figure 1, Sheet 1, Item 6).

15. Install reducing elbow (Figure 1, Sheet 1, Item 5) on air cleaner (Figure 1, Sheet 1, Item 2) and restricted tap sleeve (Figure 1, Sheet 1, Item 6) and install collar (Figure 1, Sheet 1, Item 4), and two clamps (Figure 1, Sheet 1, Item 3).

16. Install air cleaner indicator (Figure 1, Sheet 1, Item 1) on air cleaner (Figure 1, Sheet 1, Item 2).

17. Close left front door and right front door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

ALTERNATOR MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Personnel Required

One

Equipment Condition

Manifold out tube removed (WP 0066)
Upper and lower right fan guards removed (WP 0065)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right front door.

3. Note routing of alternator belt (Figure 1, Item 1). Place wrench on tensioner pulley (Figure 1, Item 2) and use to rotate tensioner pulley clockwise (CW) sufficiently to relieve tension on alternator belt (Figure 1, Item 1) and slip belt off alternator pulley (Figure 1, Item 3). Allow tensioner pulley (Figure 1, Item 2) to rotate slowly back into place.

4. Tag and disconnect wiring from alternator (Figure 1, Item 4).

WARNING

Support alternator when removing attaching hardware or alternator may fall. Failure to comply can cause injury to personnel and equipment damage.

5. Remove nut (Figure 1, Item 5), two washers (Figure 1, Item 6), bolt (Figure 1, Item 7), nut (Figure 1, Item 8), two washers (Figure 1, Item 9), bolt (Figure 1, Item 10), and alternator (Figure 1, Item 4).

END OF TASK

INSTALLATION

WARNING

Support alternator when removing attaching hardware or alternator may fall. Failure to comply can cause injury to personnel and equipment damage.

1. Install alternator (Figure 1, Item 4) and secure with bolt (Figure 1, Item 10), two washers (Figure 1, Item 9), nut (Figure 1, Item 8), bolt (Figure 1, Item 7), two washers (Figure 1, Item 6), and nut (Figure 1, Item 5). Tighten nuts.

2. Connect wiring to alternator (Figure 1, Item 4).

3. Place wrench on tensioner pulley (Figure 1, Item 2) and use to rotate tensioner pulley clockwise (CW) sufficiently to allow alternator belt (Figure 1, Item 1) to be slipped on alternator pulley (Figure 1, Item 3). Allow tensioner pulley (Figure 1, Item 2) to rotate slowly back into place.

4. Check alternator belt (Figure 1, Item 1) for correct routing and to be sure the belt is firmly seated in all pulley grooves.

5. Install upper and lower right side fan guards (WP 0065).

6. Install manifold out tube (WP 0066).

7. Close right front door.

INSTALLATION - Continued

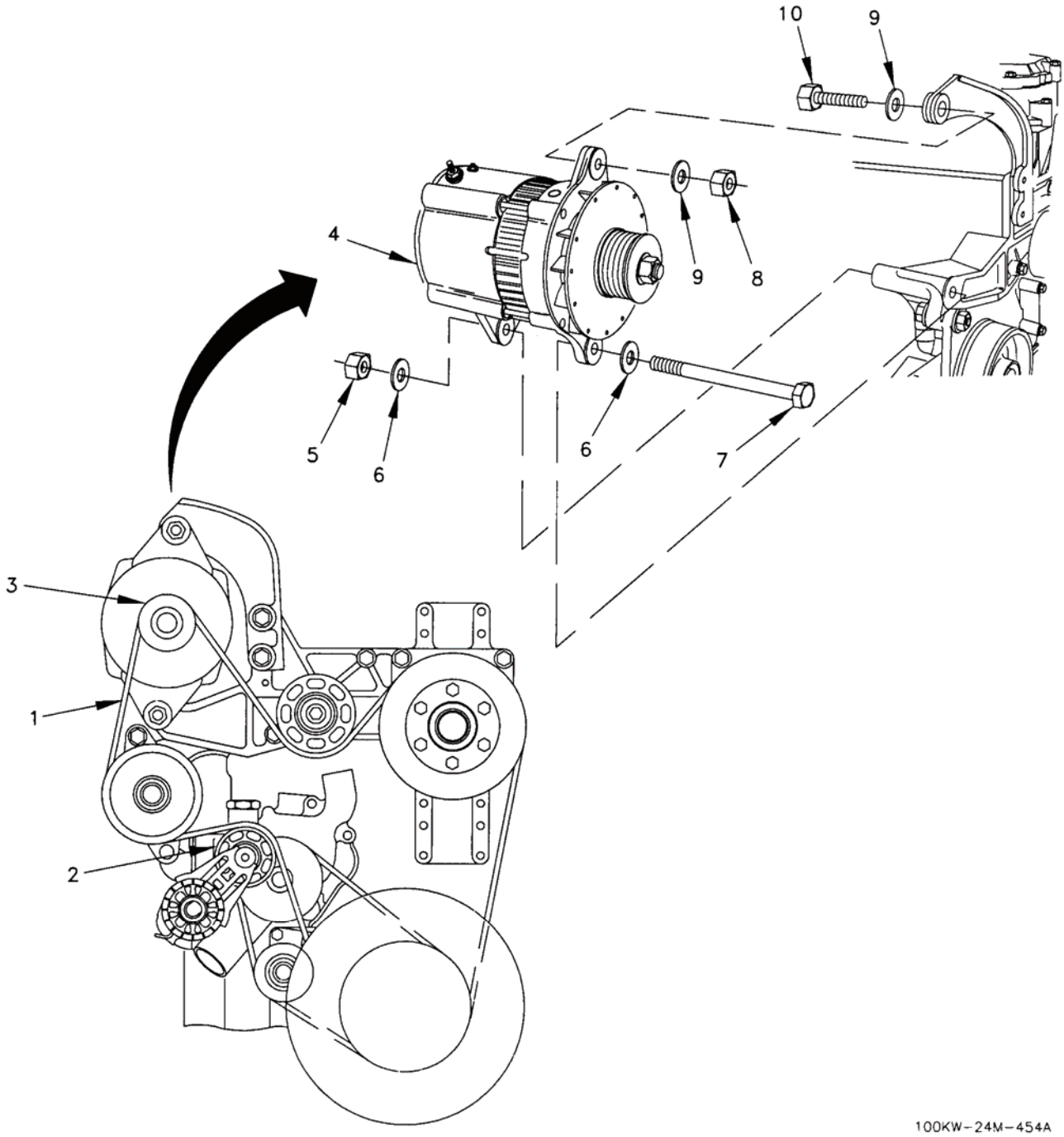


Figure 1. Alternator.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

BELT MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Materials/Parts

Belt

Equipment Condition

Upper and lower right fan guards removed (WP 0065)

Personnel Required

One

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL Switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right front door.

3. Note routing of alternator belt (Figure 1, Item 1).

WARNING

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

4. Place wrench on tensioner pulley (Figure 1, Item 2) and use to rotate tensioner pulley (Figure 1, Item 2) clockwise (CW) sufficiently to relieve tension on alternator belt (Figure 1, Item 1) and slip belt off alternator pulley (Figure 1, Item 3). Allow tensioner pulley (Figure 1, Item 2) to rotate slowly back into place.

5. Carefully remove alternator belt (Figure 1, Item 1) off idler (Figure 1, Item 4), pulley (Figure 1, Item 5), crankshaft pulley (Figure 1, Item 6), tensioner pulley (Figure 1, Item 2), and idler (Figure 1, Item 7).

6. Carefully thread alternator belt (Figure 1, Item 1) over fan blades and remove belt.

7. Loosen bolt (Figure 1, Item 8) and slot bolt (Figure 1, Item 9). Push idler bracket (Figure 1, Item 10) toward left side of engine to relax tension on water pump belt (Figure 1, Item 11).

8. Carefully remove water pump belt (Figure 1, Item 11) from idler pulley (Figure 1, Item 12), water pump pulley (Figure 1, Item 13), and crankshaft pulley (Figure 1, Item 6).

9. Carefully thread water pump belt over fan blades and remove belt.

END OF TASK

INSTALLATION

WARNING

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

1. Carefully thread water pump belt (Figure 1, Item 11) over fan blades, then onto crankshaft pulley (Figure 1, Item 6), water pump pulley (Figure 1, Item 13), and idler pulley (Figure 1, Item 12).

2. Use breaker bar on idler bracket (Figure 1, Item 10) to tighten water pump belt (Figure 1, Item 11) and tighten slot bolt (Figure 1, Item 9) and bolt (Figure 1, Item 8).

INSTALLATION - Continued

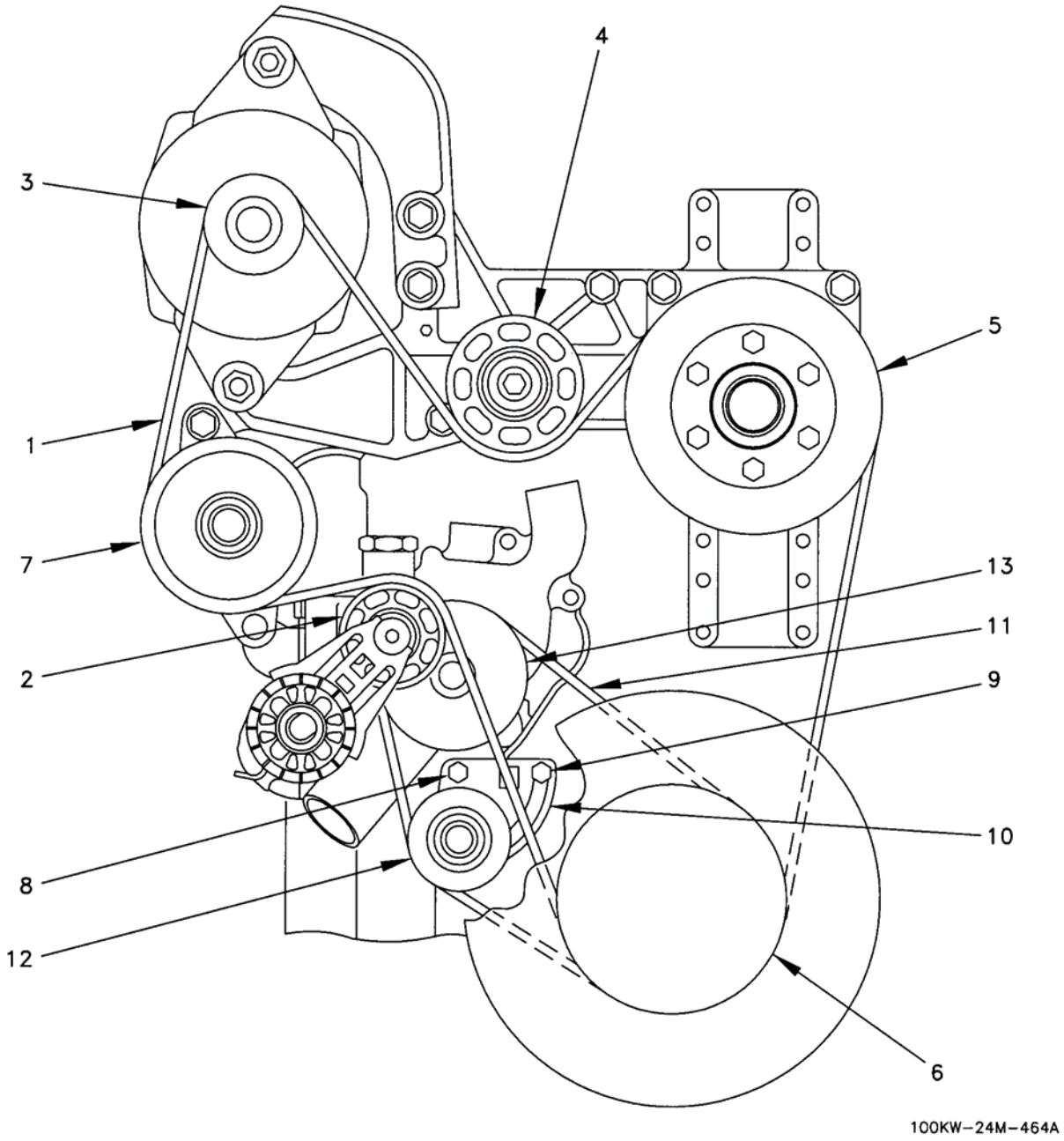


Figure 1. Belt.

INSTALLATION - Continued

3. Carefully thread alternator belt (Figure 1, Item 1) over fan blades, then onto idler (Figure 1, Item 7), tensioner pulley (Figure 1, Item 2), crankshaft pulley (Figure 1, Item 6), pulley (Figure 1, Item 5), and idler (Figure 1, Item 4).

4. Place wrench on tensioner pulley (Figure 1, Item 2) and use to rotate tensioner pulley clockwise (CW) sufficiently to allow alternator belt (Figure 1, Item 1) to be slipped onto alternator pulley (Figure 1, Item 3). Allow tensioner pulley (Figure 1, Item 2) to slowly rotate back into place.

5. Check alternator belt (Figure 1, Item 1) and water pump belt (Figure 1, Item 11) for correct routing and be sure belts are firmly seated in all pulley grooves.

6. Install upper and lower right side fan guards (WP 0065).

7. Close right front door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

STARTER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Personnel Required

Two

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right front door, and right rear doors.

WARNING

Support starter when removing attaching hardware or starter may fall. Failure to comply can cause injury to personnel and equipment damage.

3. Tag and disconnect wiring from ground terminal and solenoid on starter (Figure 1, Item 1).

4. Remove three bolts (Figure 1, Item 2), washers (Figure 1, Item 3), and starter (Figure 1, Item 1).

END OF TASK

INSTALLATION

WARNING

Support starter when removing attaching hardware or starter may fall. Failure to comply can cause injury to personnel and equipment damage.

1. Position starter (Figure 1, Item 1) into flywheel housing, ensure starter gear teeth mesh with flywheel gear teeth, and line up mounting holes. Install three washers (Figure 1, Item 3) and bolts (Figure 1, Item 2). Tighten bolts.

2. Clean electrical contacts if necessary.

3. Remove tags. Connect wiring to solenoid on starter (Figure 1, Item 1) and wiring to ground terminal.

4. Close right front door and right rear doors.

INSTALLATION - Continued

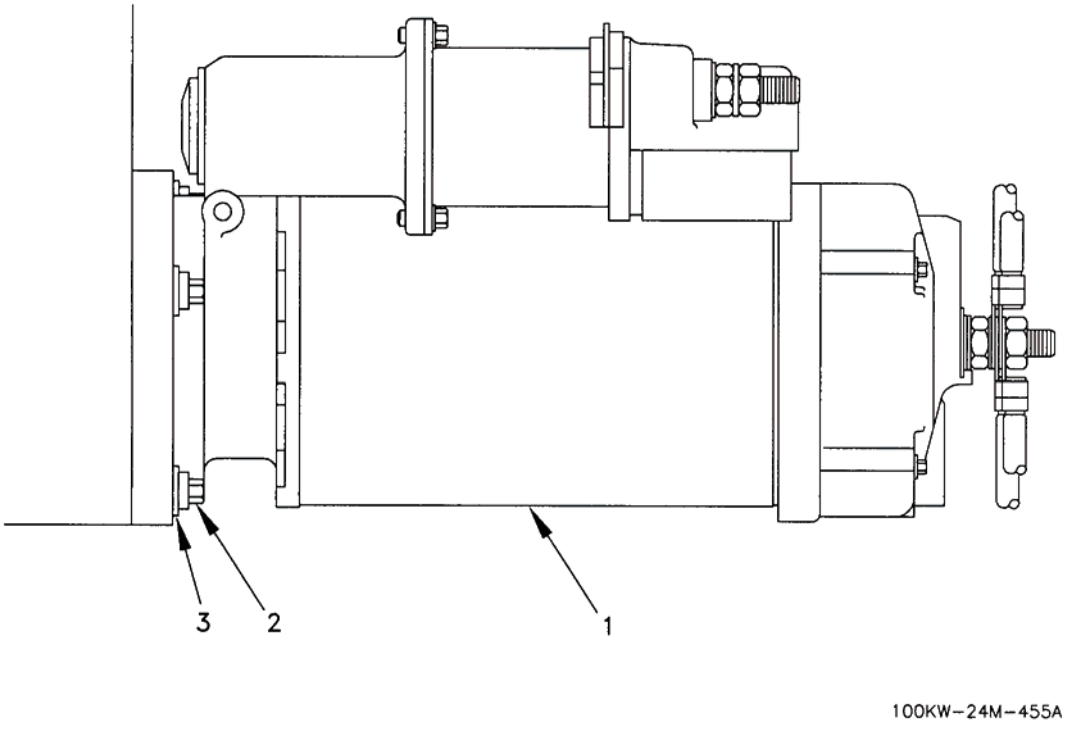


Figure 1. Starter.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

TENSIONER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

References

TM 9-6115-729-24P

Personnel Required

One

Equipment Condition

Upper left and upper right fan guards removed (WP 0065)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 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 can cause injury to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right front door.

3. Note routing of alternator belt (Figure 1, Item 1).

4. Place wrench on tensioner pulley (Figure 1, Item 2) and use to rotate tensioner pulley clockwise (CW) sufficiently to relieve tension on alternator belt (Figure 1, Item 1) and slip belt off alternator pulley (Figure 1, Item 3). Allow tensioner pulley (Figure 1, Item 2) to rotate slowly back into place.

5. Remove bolt (Figure 1, Item 4), washer (Figure 1, Item 5), and sleeve (Figure 1, Item 6) from side of tensioner (Figure 1, Item 7), and remove bolt (Figure 1, Item 8) and washer (Figure 1, Item 9) from front of tensioner, and remove tensioner.

END OF TASK

INSTALLATION

1. Position tensioner (Figure 1, Item 7) on bracket and install washer (Figure 1, Item 9) and bolt (Figure 1, Item 8) on front, and install sleeve (Figure 1, Item 6), washer (Figure 1, Item 5), and bolt (Figure 1, Item 4) on side of tensioner. Tighten bolts.

2. Place wrench on tensioner pulley (Figure 1, Item 2) and use to rotate tensioner pulley clockwise (CW) sufficiently to allow alternator belt (Figure 1, Item 1) to be slipped on alternator pulley (Figure 1, Item 3). Allow tensioner pulley (Figure 1, Item 2) to rotate slowly back into place.

3. Check alternator belt (Figure 1, Item 1) for correct routing and to be sure the belt is firmly seated in all pulley grooves.

4. Install upper left and upper right fan guards (WP 0065).

5. Close right front door.

INSTALLATION - Continued

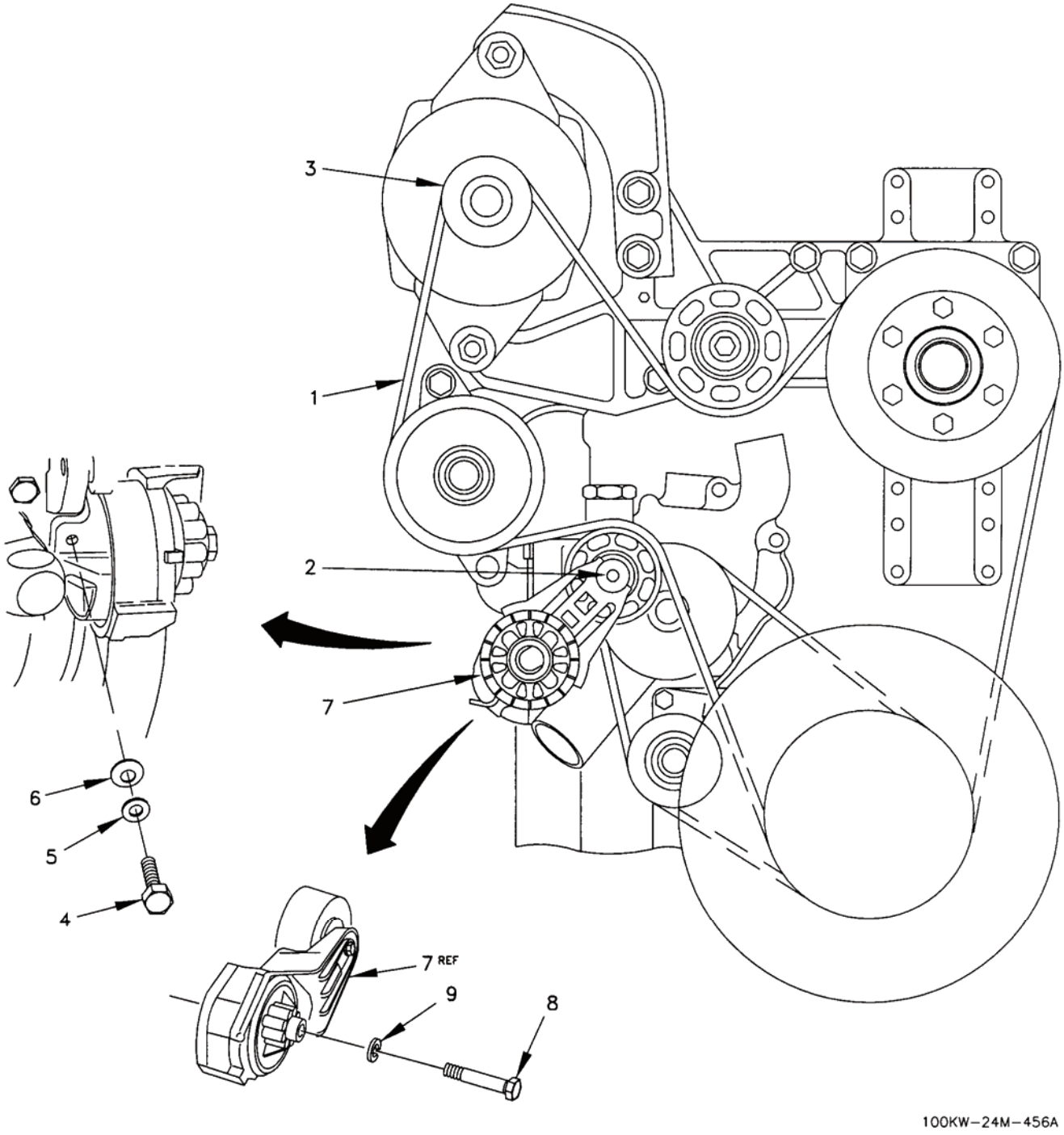


Figure 1. Tensioner.

END OF TASK

END OF WORK PACKAGE

UNIT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
FAN PULLEY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Grease (WP 0120, Item 23)
O-ring
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Engine cooling fan removed (WP 0065)
Upper right fan guard removed (WP 0065)
Fan belt removed (WP 0072)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Remove six bolts (Figure 1, Item 1) and fan pulley (Figure 1, Item 2).
2. Remove three bolts (Figure 1, Item 3), washers (Figure 1, Item 4), and shaft (Figure 1, Item 5) with parts attached.
3. Remove two bolts (Figure 1, Item 6), plate (Figure 1, Item 7), O-ring (Figure 1, Item 8), bearing (Figure 1, Item 9), and retainer (Figure 1, Item 10) from shaft (Figure 1, Item 5).

REMOVAL - Continued

4. Remove four bolts (Figure 1, Item 11), washers (Figure 1, Item 12), and bracket (Figure 1, Item 13).
5. If necessary, remove grease fitting (Figure 1, Item 14).

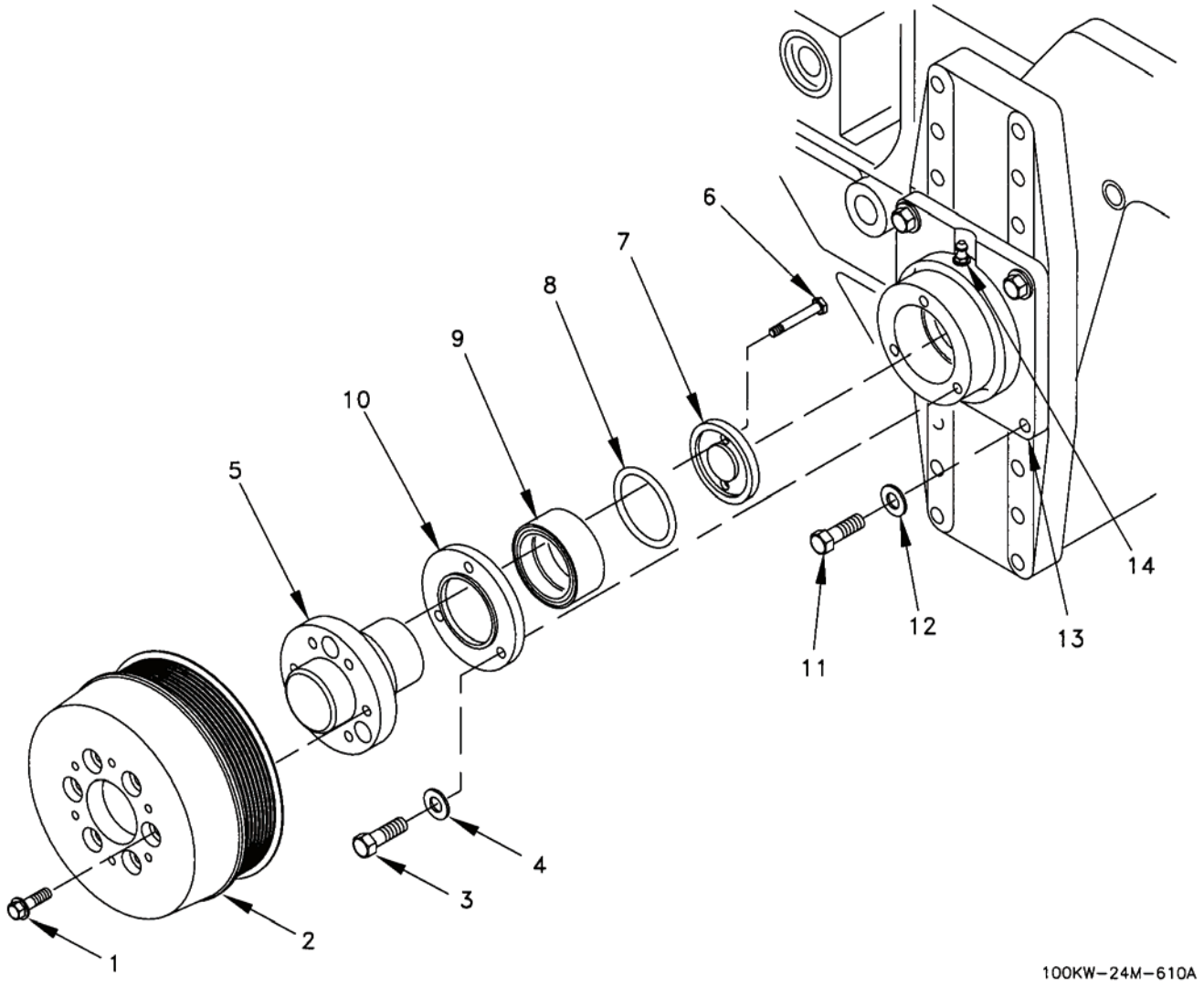


Figure 1. Fan Pulley.

END OF TASK

INSTALLATION

1. If removed, install grease fitting (Figure 1, Item 14) on bracket (Figure 1, Item 13).
2. Install bracket (Figure 1, Item 13) and secure with four washers (Figure 1, Item 12) and bolts (Figure 1, Item 11).
3. Fill cavity of bearing (Figure 1, Item 9) with approximately 1 ounce (30 grams) of grease.

NOTE

Install bearing with lip seal facing away from engine.

4. Install retainer (Figure 1, Item 10), bearing (Figure 1, Item 9), O-ring (Figure 1, Item 8), and plate (Figure 1, Item 7) on shaft (Figure 1, Item 5) and secure with two bolts (Figure 1, Item 6). Torque bolts (WP 0089).
5. Install shaft (Figure 1, Item 5) and attached parts on bracket (Figure 1, Item 13) and secure with three washers (Figure 1, Item 4) and bolts (Figure 1, Item 3). Torque bolts (WP 0089).
6. Install fan pulley (Figure 1, Item 2) and secure with six bolts (Figure 1, Item 1). Torque bolts (WP 0089).
7. Install engine cooling fan and upper right fan guard (WP 0065).
8. Install engine cooling fan belt (WP 0072).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
WATER PUMP MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Antifreeze (WP 0120, Item 5)
Sealing compound (WP 0120, Item 41)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Fan removed (WP 0065)
Idler pulley loosened (WP 0073)
Alternator belt removed (WP 0073)
Tensioner removed (WP 0075)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 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. Failure to comply can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open right front door and left front door.

3. Place suitable container under coolant drain on front right side of TQG. Open drain valve on right side at rear of engine and drain valve on front right side bottom of engine, and drain approximately two gallons of coolant. Save coolant for refilling system.

4. Loosen pulley assembly mounting bracket bolt (Figure 1, Item 1), remove slot bolt (Figure 1, Item 2) and washer (Figure 1, Item 3), and move pulley (Figure 1, Item 4) to relax tension on water pump belt (Figure 1, Item 5). Remove water pump belt (Figure 1, Item 5). Remove pulley assembly mounting bracket bolt (Figure 1, Item 1), washer (Figure 1, Item 6), and pulley assembly (Figure 1, Item 7) and O-ring (8).

5. Remove clamp (Figure 1, Item 9) and hose (Figure 1, Item 10) from top right side of water pump (Figure 1, Item 11). Remove clamp (Figure 1, Item 12) hose (Figure 1, Item 13), elbow (Figure 1, item 14), and O-ring (Figure 1, item 15) from top left side of water pump (Figure 1, Item 11).

6. Remove hose clamp (Figure 1, Item 16) and lower radiator hose (Figure 1, Item 17) from water pump (Figure 1, Item 11).

7. If winterization kit is installed, remove hose clamp (Figure 1, Item 18), heater hose (Figure 1, Item 19), shut-off valve (Figure 1, Item 20), elbow (Figure 1, Item 21), fitting (Figure 1, Item 22), and O-ring (23) from water pump (Figure 1, Item 11).

8. Remove four bolts (Figure 1, Item 24) and water pump (Figure 1, Item 11).

9. Remove O-ring (Figure 1, item 25).

10. Remove plug (Figure 1, item 26) and O-ring (Figure 1, item 27), if necessary.

END OF TASK

INSTALLATION

1. Install O-ring (Figure 1, item 27) and plug (Figure 1, item 26), if necessary.

2. Install O-ring (Figure 1, item 25) into recessed hole at rear of water pump (Figure 1, item 11).

3 Install water pump (Figure 1, Item 11) and secure with four bolts (Figure 1, Item 24). Torque bolts (WP 0089).

INSTALLATION - Continued

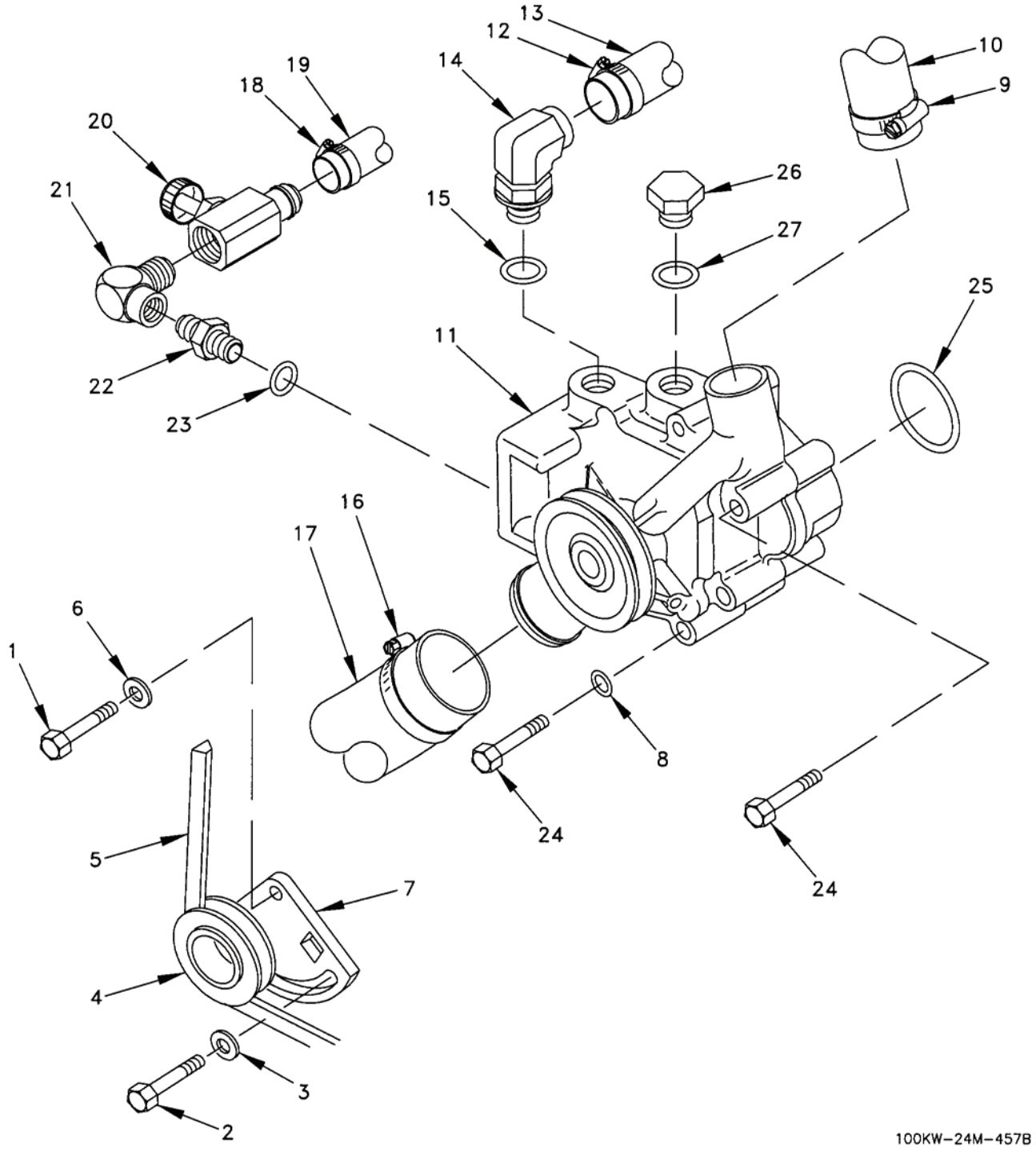


Figure 1. Water Pump.

INSTALLATION - Continued

NOTE

Apply sealing compound to all male pipe threads before connecting.

4. If winterization kit is installed, install O-ring (Figure 1, item 23), fitting (Figure 1, Item 22), elbow (Figure 1, Item 21), shut-off valve (Figure 1, Item 20), heater hose (Figure 1, Item 19), and hose clamp (Figure 1, Item 18) on water pump (Figure 1, Item 11).

5. Install lower radiator hose (Figure 1, Item 17) and hose clamp (Figure 1, Item 16) on water pump (Figure 1, Item 11).

6. Install O-ring (15), elbow (14), hose (Figure 1, Item 13) and hose clamp (Figure 1, Item 12) on top left side of water pump (Figure 1, Item 11). Install hose (Figure 1, Item 10) and clamp (Figure 1, Item 9) on top right side of water pump (Figure 1, Item 11).

7. Install O-ring (Figure 1, item 8), pulley assembly (Figure 1, Item 7), washer (Figure 1, Item 6) and pulley assembly mounting bracket bolt (Figure 1, Item 1). Tighten bolt.

8. Install water pump belt (Figure 1, Item 5) on water pump pulley (Figure 1, Item 4).

9. Install washer (Figure 1, Item 3) and slot bolt (Figure 1, Item 2). Do not tighten.

10. Check water pump belt (Figure 1, Item 5) for correct routing and to be sure the belt is firmly seated in all pulley grooves.

11. Use breaker bar on pulley assembly (Figure 1, Item 7) to apply tension to belt and tighten slot bolt (Figure 1, Item 2) and pulley assembly mounting bracket bolt (Figure 1, Item 1). Tighten bolt.

12. Refill cooling system with coolant.

13. Install fan (WP 0065).

14. Install alternator belt (WP 0073).

15. Tighten idler pulley (WP 0073).

16. Install tensioner (WP 0075).

17. Close right front door and left front door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FUEL PRIMING PUMP MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Gasket
Wiping rags (WP 0120, Item 36)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 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. Failure to comply can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open left rear doors.

3. Remove two bolts (Figure 1, Item 1), washers (Figure 1, Item 2), fuel priming pump (Figure 1, Item 3), and gasket (Figure 1, Item 4).

END OF TASK

INSTALLATION

1. Clean area where gasket (Figure 1, Item 4) will mate with engine.

2. Apply a light coat of fuel to gasket and install gasket (Figure 1, Item 4), fuel priming pump (Figure 1, Item 3), two washers (Figure 1, Item 2), and bolts (Figure 1, Item 1). Tighten bolts.

3. Close left rear doors.

INSTALLATION - Continued

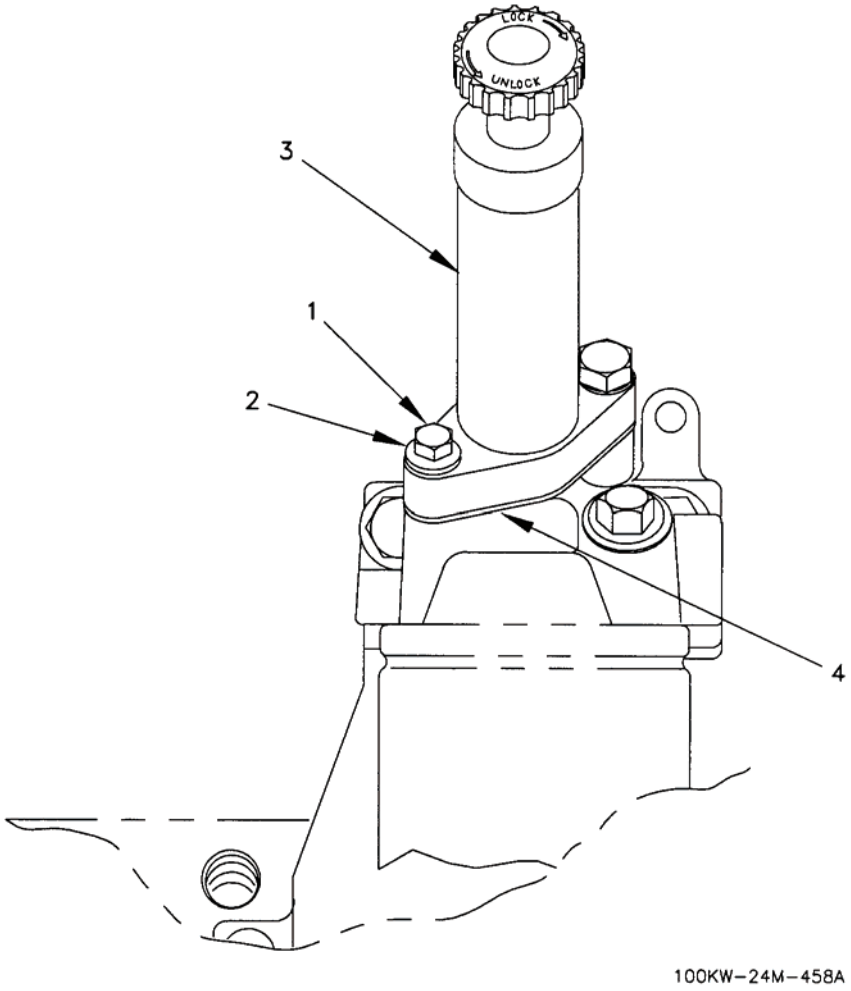


Figure 1. Fuel Priming Pump.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
FUEL FILTER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Fuel (WP 0120, Items 16, 17, 53, or 54)
Fuel filter
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 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. Failure to comply can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Open left rear doors.
3. Place suitable container under fuel filter (Figure 1, Item 1) to retain spillage.
4. Remove fuel filter (Figure 1, Item 1), using strap wrench if necessary.

END OF TASK

INSTALLATION

1. Clean area where seal (Figure 1, Item 2) will mate with engine.
2. Apply light coat of fuel to seal (Figure 1, Item 2).
3. Install fuel filter (Figure 1, Item 1) by hand. Turn ¾ additional turn after seal (Figure 1, Item 2) contacts base.
4. Inside control box, verify that resistor assembly A7 DC POWER CONTROL circuit breaker CB1 is pushed in.
5. Set Battery Disconnect Switch to ON, and DEAD CRANK SWITCH to NORMAL. On EMCP, set ENGINE CONTROL switch to COOL DOWN/STOP.
6. Reset CATSW1, (RESET SW FUEL) switch, inside left rear door.
7. Operate fuel priming pump (Figure 1, Item 3) until strong pressure is felt.

WARNING

Operating the generator set with any access door open exposes personnel to a high noise level. Double hearing protection must be worn when operating or working near the generator set with any access door open. Failure to comply can cause hearing damage to personnel.

8. Close left rear doors.
9. Operate engine and check for leaks.

INSTALLATION - Continued

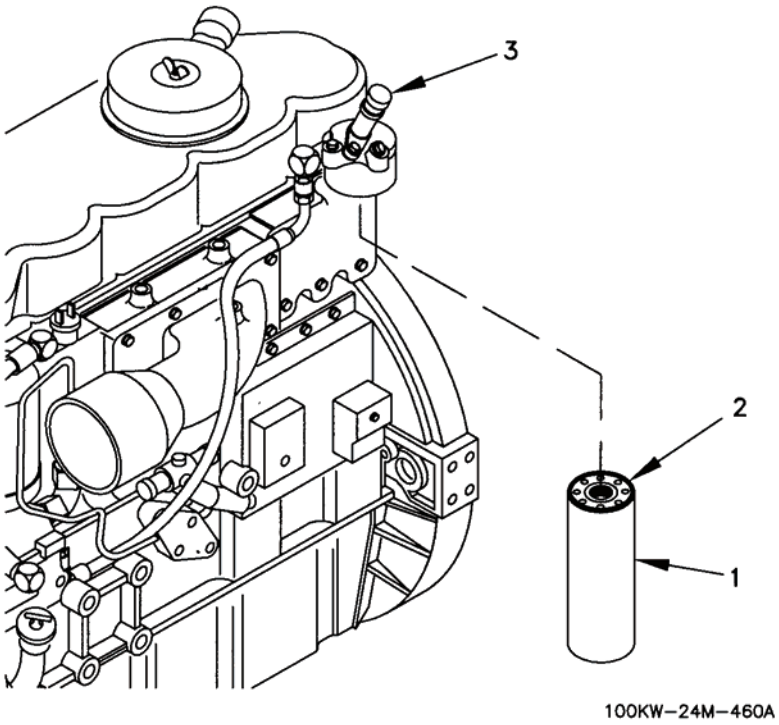


Figure 1. Fuel Filter.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
FUEL FILTER BASE MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
O-Ring
O-Ring
O-Ring
O-Ring
Preformed packing
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Fuel priming pump removed (WP 0078)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Place suitable drain pan under fuel filter element (Figure 1, Item 1) to retain spillage.
2. Remove fuel filter element (Figure 1, Item 1) using strap wrench if necessary.
3. Disconnect tube assembly (Figure 1, Item 2) and remove O-ring (Figure 1, Item 3) from tee (Figure 1, Item 4).

REMOVAL - Continued

4. Remove plug (Figure 1, Item 5), O-ring (Figure 1, Item 6), tee (Figure 1, Item 4), and O-ring (Figure 1, Item 7) from fuel filter base (Figure 1, Item 8).

5. Disconnect hose (Figure 1, Item 9) and remove O-ring (Figure 1, Item 10), elbow (Figure 1, Item 11), and O-ring (Figure 1, Item 12) from fuel filter base (Figure 1, Item 8).

6. Remove two bolts (Figure 1, Item 13) and fuel filter base (Figure 1, Item 8) from bracket (Figure 1, Item 14).

7. Remove plug (Figure 1, Item 15) and preformed packing (Figure 1, Item 16) from fuel filter base (Figure 1, Item 8).

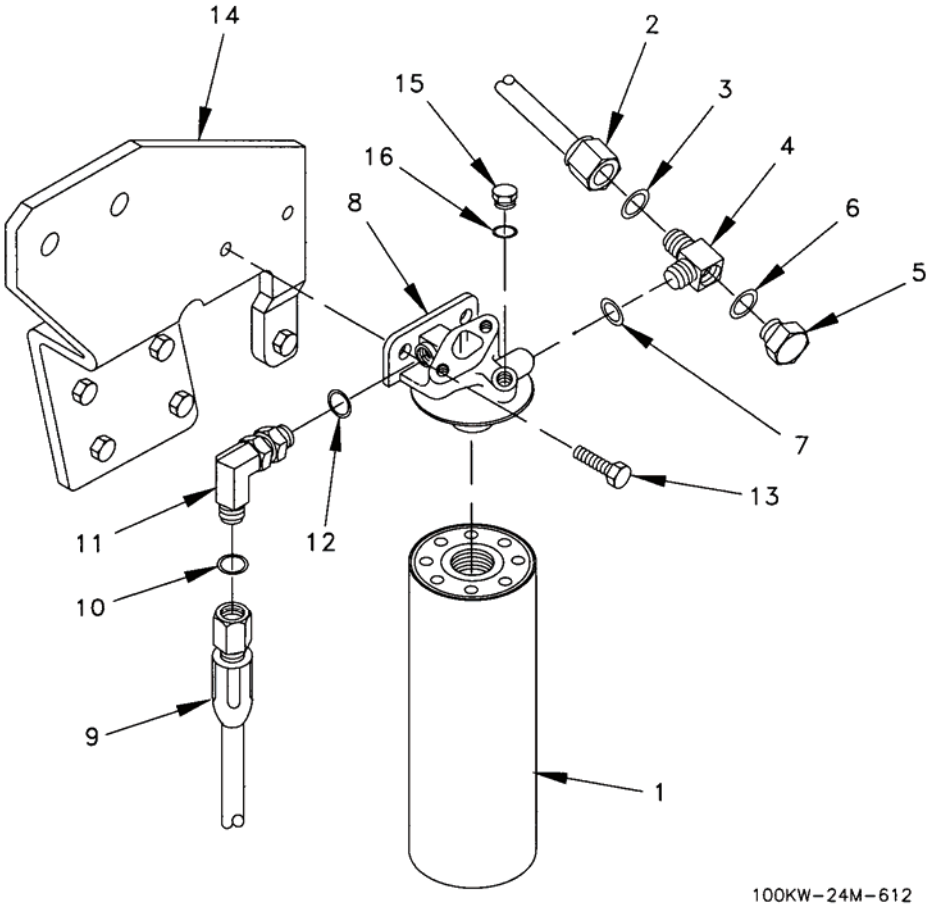


Figure 1. Fuel Filter Base.

END OF TASK

INSTALLATION

1. Install preformed packing (Figure 1, Item 16) and plug (Figure 1, Item 15) on fuel filter base (Figure 1, Item 8).
2. Install fuel filter base (Figure 1, Item 8) on bracket (Figure 1, Item 14) and secure with two bolts (Figure 1, Item 13). Tighten bolts.
3. Install O-ring (Figure 1, Item 12), elbow (Figure 1, Item 11), and O-ring (Figure 1, Item 10) on fuel filter base (Figure 1, Item 8), and connect hose (Figure 1, Item 9).
4. Install O-ring (Figure 1, Item 7), tee (Figure 1, Item 4), O-ring (Figure 1, Item 6), and plug (Figure 1, Item 5) on fuel filter base (Figure 1, Item 8).
5. Install O-ring (Figure 1, Item 3) on tee (Figure 1, Item 4), and connect tube assembly (Figure 1, Item 2).
6. Apply light coat of fuel to seal and install fuel filter element (Figure 1, Item 1) by hand. Turn ¾ additional turn after seal contacts fuel filter base (Figure 1, Item 8).
7. Install fuel priming pump (WP 0078).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

OIL FILTER MAINTENANCE AND OIL CHANGE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Lubricating oil (WP 0120, Items 27 thru 34)
Oil filter
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

FILTER REMOVAL AND OIL DRAIN

1. Ensure generator set is fully stopped. On EMCP, set ENGINE CONTROL Switch to OFF/RESET, set Battery Disconnect Switch to OFF, and set DEAD CRANK SWITCH to OFF. before proceeding.

CAUTION

Do not drain oil when engine is cold. When engine is cold, oil contaminants are not suspended in the oil and will not be removed during the draining process. This will allow contaminants to remain in oil and will cause equipment damage.

2. Allow engine to cool for approximately 10 minutes.

NOTE

Engine oil capacity is 30 quarts (27.3 L).

3. Open right front door and left front door.
4. Place suitable container below oil drain, located at lower front left side of TQG, near slave receptacle.
5. Remove plug (Figure 1, Item 1) from oil drain.
6. Open oil drain valve (Figure 1, Item 2) at lower left side of oil pan and allow oil to drain from system.
7. Remove oil filter (Figure 1, Item 3) using strap wrench if necessary.
8. Remove magnetic plug (Figure 1, Item 4) and preformed packing (Figure 1, Item 5) from lower right side of oil pan, opposite drain valve (Figure 1, Item 2). Inspect magnetic plug for metal particles. If metal particles are present, notify supervisor. Wipe off plug.

END OF TASK

FILTER INSTALLATION AND OIL FILL

1. Clean area where oil filter mounts.
2. Install preformed packing (Figure 1, Item 5) and magnetic plug (Figure 1, Item 4).
3. Apply thin coat of lubricating oil to rubber seal (Figure 1, Item 6) on oil filter (Figure 1, Item 3).
4. Install oil filter (Figure 1, Item 3) by hand until seal (Figure 1, Item 6) contacts base, then tighten by hand ¾ turn more.
5. Close oil drain valve (Figure 1, Item 2).

NOTE

Engine oil capacity is 30 quarts (27.3 L).

6. Remove oil filler cap (Figure 1, Item 7) on left front of engine. Refill system with oil (see WP 0014 for proper oil). Install oil filler cap (Figure 1, Item 7).

FILTER INSTALLATION AND OIL FILL - Continued

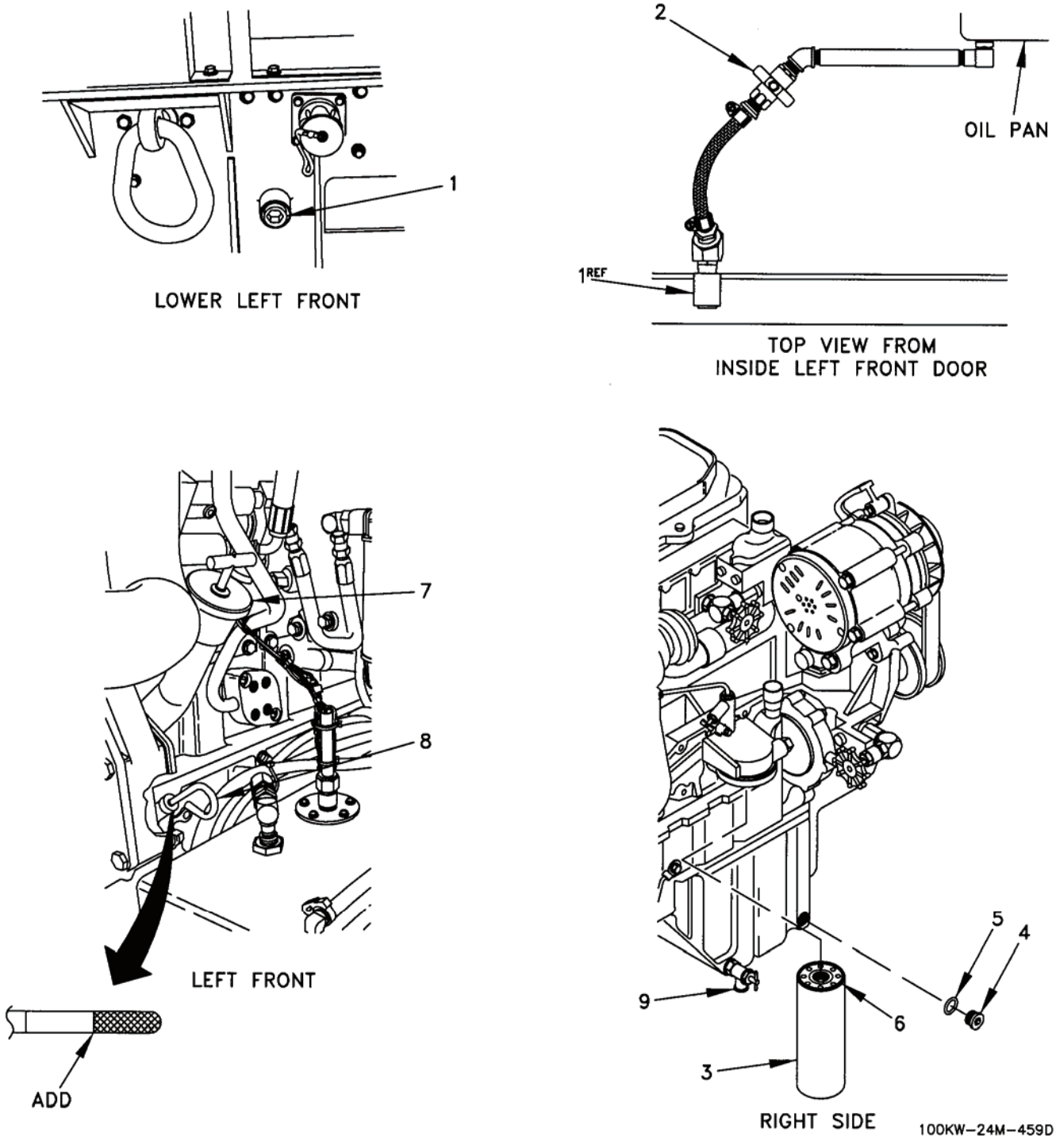


Figure 1. Oil Filter Maintenance and Oil Change.

FILTER INSTALLATION AND OIL FILL - Continued

7. Check dipstick (Figure 1, Item 8) for correct oil level.
8. Inside control box, verify that resistor assembly A7 DC POWER CONTROL circuit breaker CB1 is pushed in (engaged).
9. Set Battery Disconnect Switch to ON, and set DEAD CRANK SWITCH to NORMAL. On EMCP, set ENGINE CONTROL Switch to COOL DOWN/STOP.
10. Reset CATSW2, (RESET SW OIL) switch, inside left rear door.

WARNING

Operating the generator set with any access door open exposes personnel to a high noise level. Double hearing protection must be worn when operating or working near the generator set with any access door open. Failure to comply can cause hearing damage to personnel.

11. Operate engine and check for leaks.
12. Check dipstick (Figure 1, Item 8) for correct oil level.
13. Close right front door and left front door.

END OF TASK

OIL SAMPLING

CAUTION

Do not sample oil when engine is cold. When engine is cold, oil contaminants are not suspended in the oil and a true representative sample of the oil will not be obtained. This may cause equipment damage.

NOTE

Oil sampling is performed in accordance with AOAP requirements and processes.

1. Allow engine to cool for approximately 10 minutes.
2. Ensure generator set is fully stopped. On EMCP, set ENGINE CONTROL Switch to OFF/RESET, set Battery Disconnect Switch to OFF, and set DEAD CRANK SWITCH to OFF. before proceeding.
3. Open right front door assembly (latch).
4. Open oil drain valve (Figure 1, Item 9) on right side of engine below oil filter, collect oil sample, and close drain valve.
5. Close right front door assembly (latch).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
THERMOSTAT MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Antifreeze (WP 0120, Item 5)
Gasket
Sealing compound (WP 0120, Item 41)
Thermostat (2)

Personnel Required

One

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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. Failure to comply can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Open right front door.
3. Position suitable drain pan below coolant drain, located below right front door assembly (latch).

NOTE

Engine coolant capacity is 38 quarts (35.9 L).

4. Open coolant drain valve (Figure 1, Item 1), located below and to the right rear of the radiator. Drain 8-10 quarts (7.5-9.5 L) of coolant into drain pan. Save coolant for refilling.
5. Place several rags under thermostat housing (Figure 1, Item 2) to soak up spills.
6. Remove six screws (Figure 1, Item 3), washers (Figure 1, Item 4), thermostat elbow (Figure 1, Item 5), and gasket (Figure 1, Item 6) from thermostat housing (Figure 1, Item 2). Discard gasket.
7. Remove two thermostats (Figure 1, Item 7) from thermostat housing (Figure 1, Item 2).
8. Scrape gasket debris from thermostat housing (Figure 1, Item 2) and thermostat elbow (Figure 1, Item 5).

END OF TASK

INSTALLATION

1. Apply sealing compound to gasket contact surface of thermostat housing (Figure 1, Item 2).
2. Position gasket (Figure 1, Item 6) on thermostat housing (Figure 1, Item 2).
3. Install two thermostats (Figure 1, Item 7), short end up, on thermostat housing (Figure 1, Item 2).
4. Apply sealing compound to mating surface of thermostat elbow (Figure 1, Item 5).
5. Install thermostat elbow (Figure 1, Item 5) on thermostat housing (Figure 1, Item 2) and secure with six washers (Figure 1, Item 4) and screws (Figure 1, Item 3). Tighten screws evenly.
6. Close coolant drain valve (Figure 1, Item 1).
7. Refill coolant system with coolant from drain pan.

WARNING

Operating the generator set with any access door open exposes personnel to a high noise level. Double hearing protection must be worn when operating or working near the generator set with any access door open. Failure to comply can cause hearing damage to personnel.

8. Operate engine and check for leaks.
9. Close right front door.

INSTALLATION - Continued

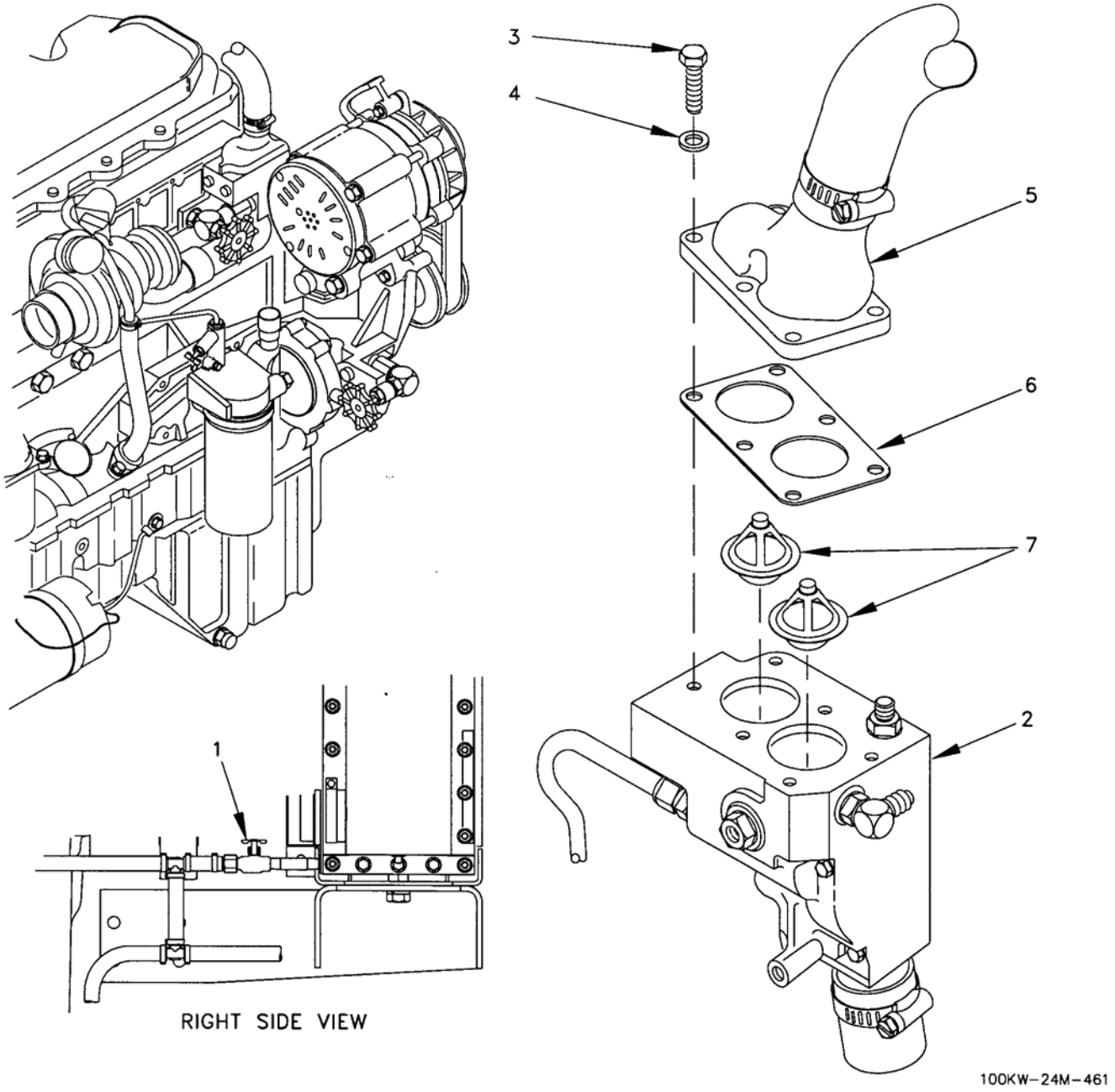


Figure 1. Thermostat.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
THERMOSTAT HOUSING MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Adhesive (WP 0120, Item 3)
Breakthrough cleaning solvent (WP 0120, Item 47)
Gasket
O-Ring

Materials/Parts (cont.)

Thermostat (2)
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Position suitable drain pan below thermostat housing (Figure 1, Item 1) to catch spills.
2. Loosen hose clamp (Figure 1, Item 2) and disconnect hose (Figure 1, Item 3).
3. If optional winterization kit is installed, loosen hose clamp (Figure 1, Item 4) and disconnect hose (Figure 1, Item 5).
4. Loosen hose clamp (Figure 1, Item 6) and disconnect hose (Figure 1, Item 7).

REMOVAL - Continued

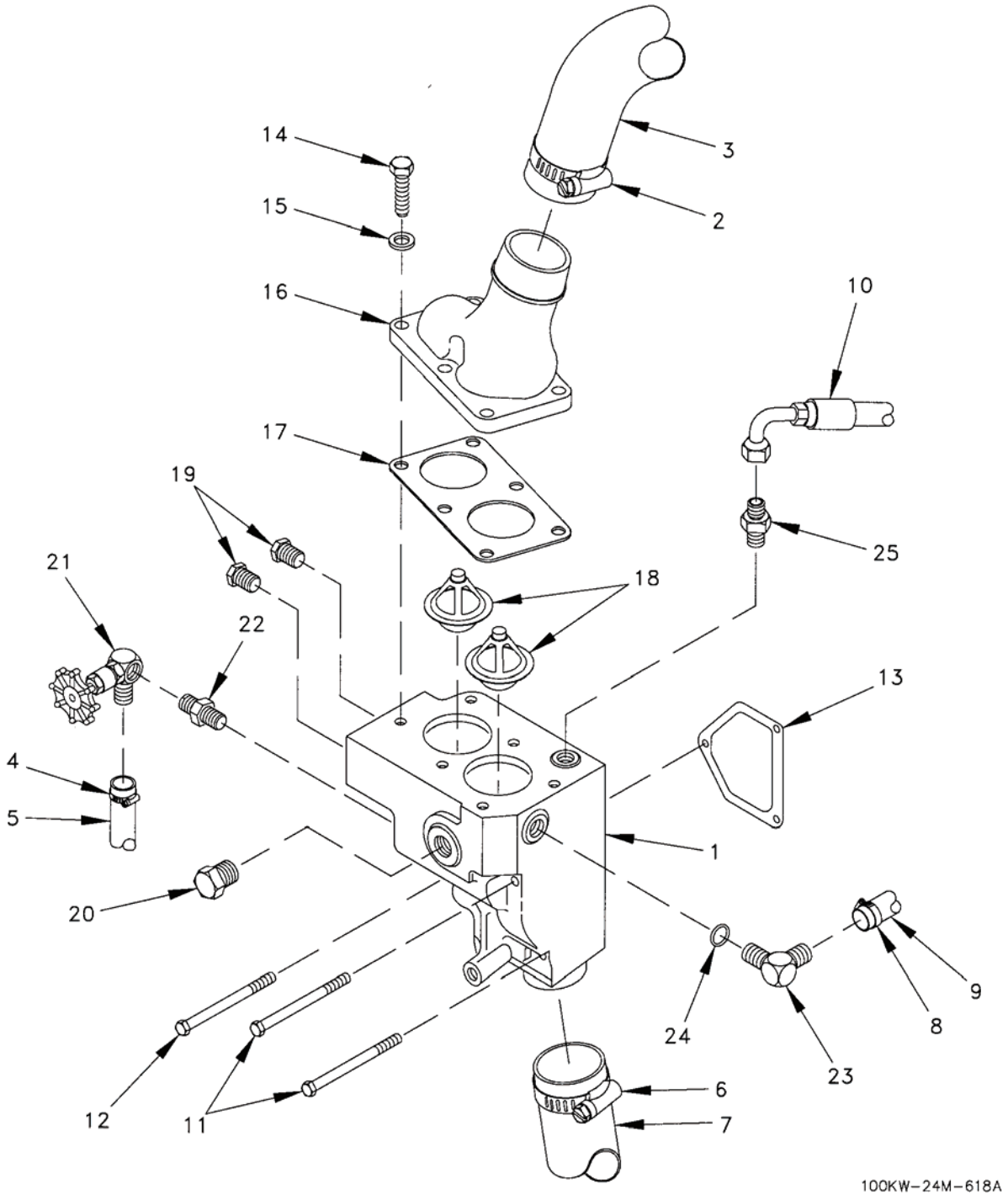


Figure 1. Thermostat Housing.

REMOVAL - Continued

5. Loosen hose clamp (Figure 1, Item 8) and disconnect hose (Figure 1, Item 9).

6. Disconnect hose (Figure 1, Item 10).

7. Remove two screws (Figure 1, Item 11), screw (Figure 1, Item 12), thermostat housing (Figure 1, Item 1), and gasket (Figure 1, Item 13). Discard gasket.

END OF TASK

DISASSEMBLY

1. Remove six screws (Figure 1, Item 14), washers (Figure 1, Item 15), thermostat elbow (Figure 1, Item 16), gasket (Figure 1, Item 17), and two thermostats (Figure 1, Item 18). Discard gasket.

2. Remove two plugs (Figure 1, Item 19) and plug (Figure 1, Item 20).

3. If optional winterization kit is installed, remove valve (Figure 1, Item 21) and connector (Figure 1, Item 22),

4. Remove elbow (Figure 1, Item 23), O-ring (Figure 1, Item 24), and connector (Figure 1, Item 25).

END OF TASK

ASSEMBLY

1. Scrape all old gasket material from thermostat housing (Figure 1, Item 1), thermostat elbow (Figure 1, Item 16), and mating surface of engine block.

2. Apply adhesive to threads of connector (Figure 1, Item 25) and install connector (Figure 1, Item 25).

3. Apply adhesive to thermostat housing side threads of elbow (Figure 1, Item 23), and install O-ring (Figure 1, Item 24) and elbow (Figure 1, Item 23).

4. If optional winterization kit is installed, apply adhesive to threads of connector (Figure 1, Item 22), and install connector (Figure 1, Item 22) and valve (Figure 1, Item 21).

5. Apply adhesive to threads of plug (Figure 1, Item 20) and install plug (Figure 1, Item 20).

6. Install two plugs (Figure 1, Item 19).

7. Apply adhesive to both sides of gasket (Figure 1, Item 17). Install two thermostats (Figure 1, Item 18), short end up, gasket (Figure 1, Item 17), thermostat elbow (Figure 1, Item 16), six washers (Figure 1, Item 15), and screws (Figure 1, Item 14). Tighten screws (Figure 1, Item 14) evenly.

END OF TASK

INSTALLATION

1. Install gasket (Figure 1, Item 13), thermostat housing (Figure 1, Item 1), two screws (Figure 1, Item 11), and screw (Figure 1, Item 12). Tighten screws.
2. Connect hose (Figure 1, Item 10).
3. Connect hose (Figure 1, Item 9) and tighten hose clamp (Figure 1, Item 8).
4. Connect hose (Figure 1, Item 7) and tighten hose clamp (Figure 1, Item 6).
5. Connect hose (Figure 1, Item 5) and tighten hose clamp (Figure 1, Item 4).
6. Connect hose (Figure 1, Item 3) and tighten hose clamp (Figure 1, Item 2).

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

ENGINE CONTROL MODULE MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Tiedown straps (WP 0120, Item 48)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Water separator filter and bracket removed (WP 0060)
Fuel filter base removed (WP 0080)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

REMOVAL

1. Refer to WP 0013, SYMPTOM 15 to copy the configuration data from the old ECM.

2. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

3. Open right front door and right rear doors.

NOTE

Cut tie down straps as required.

4. Tag and disconnect engine harness connector ENG-P2/J2 (Figure 1, Item 1) and ECM J1 to EMCP harness connector ENG-P1/J1 (Figure 1, Item 2) from engine control module (Figure 1, Item 3).

5. Remove four bolts (Figure 1, Item 4), washers (Figure 1, Item 5), ground strap (Figure 1, Item 6), and engine control module (Figure 1, Item 3).

INSTALLATION

NOTE

When installing ECM ensure personality module is positioned at lower left.
Top left bolt on ECM also secures the grounding strap and is longer than the other three.

1. Install engine control module (Figure 1, Item 3), ground strap (Figure 1, Item 6), four washers (Figure 1, Item 5), and bolts (Figure 1, Item 4).

2. Install ECM J1 to EMCP harness connector ENG-P1/J1 (Figure 1, Item 2) and engine harness connector J2/P2 (Figure 1, Item 1). Torque ENG-P1/J1 and ENG-P2/J2 ECM connectors to 55 lb. in +13.0 -4.0 lb. in (6.0 +1.5 -0.5 Nm)

3. Close right front door and right rear doors.

4. Refer to WP 0013, SYMPTOM 12 to flash program the flash file into the ECM.

5. Refer to WP 0013, SYMPTOM 15 to copy the configuration data into the ECM.

6. Refer to WP 0013, SYMPTOM 11 to calibrate the engine timing sensor.

INSTALLATION - Continued

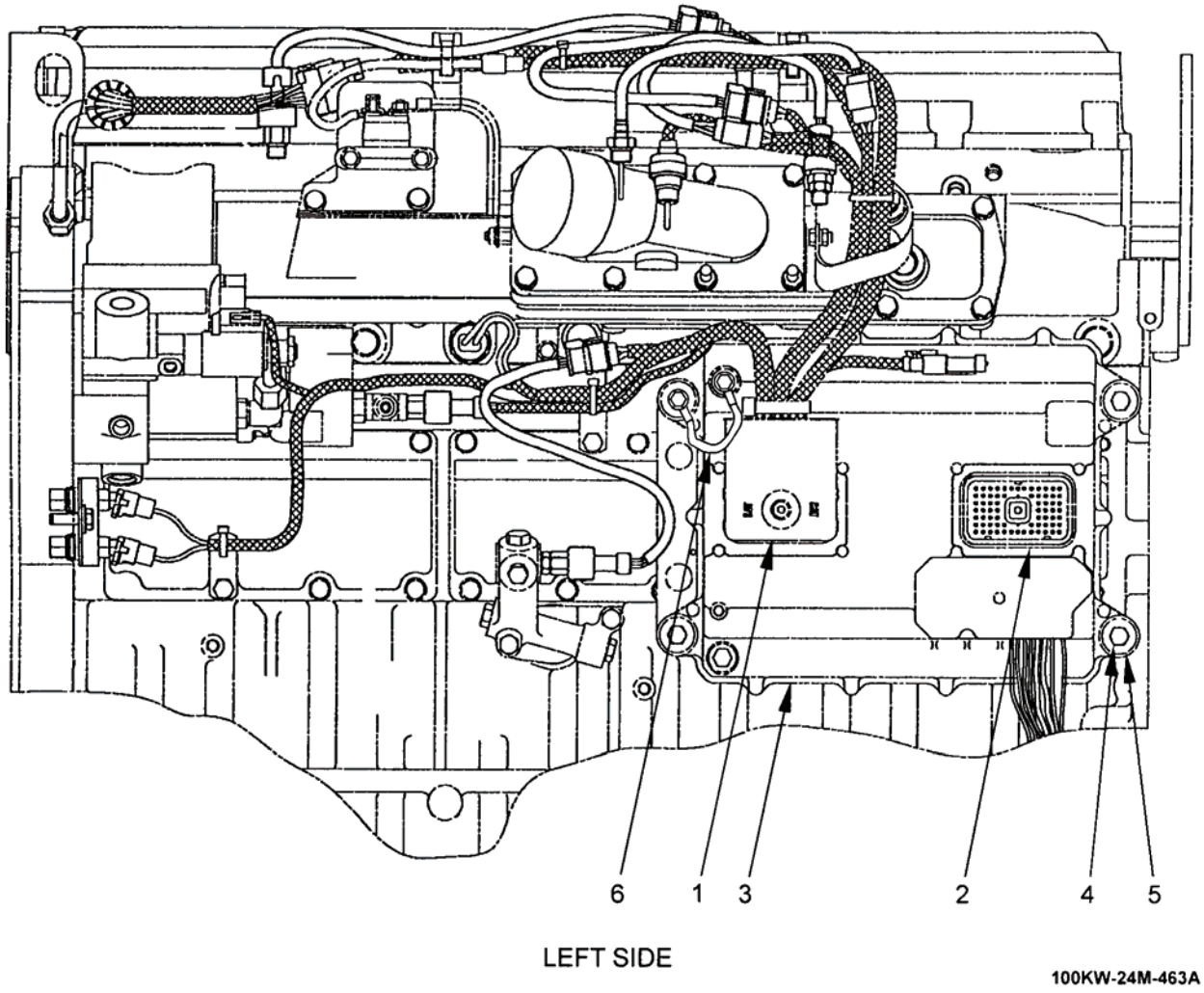


Figure 1. Engine Control Module.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

REPROGRAMMING

INITIAL SETUP:

Personnel Required

One

Equipment Condition

TQG is not operating and powered down

References

WP 0003
TM 9-6115-729-24P

REPROGRAMMING DVR PARAMETERS FOR VOLTAGE AND FREQUENCY CHANGE

The following procedure is used if the voltage and frequency settings for the generator set must be changed because of mission requirements. When that occurs, the reconnection board must be repositioned and the DVR must be reprogrammed for specified frequency and voltage. Note that the GSC OP-5 parameters must be reprogrammed, also.

1. Set Battery Disconnect Switch to ON.
2. Set DEAD CRANK SWITCH to NORMAL.
3. On EMCP, set ENGINE CONTROL Switch (ECS) to COOL DOWN/STOP.
4. Select reprogramming data from Table 1 below according to the desired output voltage and desired frequency. Mission requirements will define requirements.

NOTE

All six of the DVR PARAMETERS must be changed or verified.

Table 1. 100 kW TQG DVR Voltage and Frequency Programming Parameters and Setpoints.

DESIRED OUTPUT		DVR PARAMETER NUMBER					
VOLTS	HERTZ	:01	:02	:03	:04	:05	:06
120/208	60	217	1.0	0	347	4.34	58.8
120/208	50	205	1.0	0	289	3.61	49.8
240/416	60	434	2.0	0	174	4.34	58.8
240/416	50	410	2.0	0	145	3.61	49.8

REPROGRAMMING DVR PARAMETERS FOR VOLTAGE AND FREQUENCY CHANGE - Continued

5. Press the up arrow key ▲. DVR display should read :01 (the colon with the number indicates that the number is a parameter number).
6. Press and hold up arrow key ▲ until display shows parameter number :90. Parameter number: 90 is a password that can be used to protect the settings.
7. Press Function ◀▶ key on DVR once to display data for parameter :90.
8. Press and hold up arrow key ▲ or down arrow key ▼ to set the data for parameter number :90 to 0200.
9. Press Function ◀▶ key on DVR once to display parameter :90.
10. Press and hold up arrow key ▲ or down arrow key ▼ to change to parameter number :01.
11. Press Function ◀▶ key on DVR once to display data for parameter.
12. Press and hold up arrow key ▲ or down arrow key ▼ to set the data for parameter per Table 1.
13. Press Function ◀▶ key on DVR once to switch back to the parameter number.
14. Press up arrow key ▲ once to change to next parameter number per Table 1.
15. Keep repeating from step 9, entering parameter data from Table 1, until all 6 parameter data is entered or verified to be correct.
16. Press Function ◀▶ key on DVR once to display data for parameter :90.
17. Press and hold up arrow key ▲ or down arrow key ▼ to set the data for parameter number :90 to any number but 0009 to lock the DVR. DVR will not stay locked when Engine Control switch is switched from either COOL DOWN/STOP to OFF/RESET and back to COOL DOWN/STOP or from COOL DOWN/STOP to MANUAL START.
18. Press Function ◀▶ key on DVR once to switch back to parameter number. Press and hold up arrow key ▲ or down arrow key ▼ to set the parameter number back to 01.
19. Proceed to **REPROGRAMMING GSC SETPOINTS FOR VOLTAGE AND FREQUENCY CHANGE** and reprogram the OP5 parameters for P028 thru P031 (steps 1 thru 25).
20. If the generator set is not to be used, set ENGINE CONTROL Switch (ECS) to OFF/RESET, set DEAD CRANK SWITCH to OFF, and set Battery Disconnect Switch to OFF.

END OF TASK

REPROGRAMMING OR VERIFYING DVR PARAMETERS

The following procedure is used to reprogram the DVR if a DVR is replaced or if there is some reason to verify DVR parameters. Table 2 describes the parameters and lists values to be programmed or verified.

1. Set Battery Disconnect Switch to ON.
2. Set DEAD CRANK SWITCH to NORMAL.
3. On EMCP, set ENGINE CONTROL Switch (ECS) to COOL DOWN/STOP.
4. Select reprogramming data or parameter to be verified from Table 2.
5. DVR display should read :01 (the colon with the number indicates that the number is a parameter number).
6. Press and hold up arrow key ▲ until display shows parameter number :90.
7. Press Function ◀▶ key on DVR once to display data for parameter :90

REPROGRAMMING OR VERIFYING DVR PARAMETERS - Continued

Table 2. 100 kW TQG DVR Programming Parameters.

				TQG SETPOINTS 240/216		TQG SETPOINTS 120/206	
DESCRIPTION	**PARAMETER**	**ACTION**	**UNITS**	**60 Hz**	**50 Hz**	**60 Hz**	**50 Hz**
Generator output Voltage	:01	Program	Volts	434	410	217	205
Ratio of output volts to sensing volts	:02	Program	–	2.0	2.0	1.0	1.0
Generator type	:03	Program	–	0	0	0	0
Rated Generator Output Current	:04	Program	Ampere	174	145	347	289
CT Voltage at Rated Output Current	:05	Program	Volts	4.34	3.61	4.34	3.61
Knee Frequency	:06	Program	Hz	58.8	49.8	58.8	49.8
Decreasing Volts/Hz Slope 1	:07	Program	Volts/Hz	3.0	3.0	3.0	3.0
Decreasing Volts/Hz Slope 2	:08	Program	Volts/Hz	2.0	2.0	2.0	2.0
Minimum Voltage	:09	Program	%	50.0	50.0	50.0	50.0
Under Frequency Point	:10	Program	Hz	25.0	25.0	25.0	25.0
Overvoltage Trip Point	:11	Program	%	125.0	125.0	125.0	125.0
Overvoltage Trip Time	:12	Program	Seconds	2	2	2	2
Under Voltage Trip Point	:13	Program	%	75	75	75	75
Under Voltage Trip Time	:14	Program	Seconds	30	30	30	30
Voltage Gain (IR Compensation)	:15	Program	%	0	0	0	0

REPROGRAMMING OR VERIFYING DVR PARAMETERS - Continued

Table 2. 100 kW TQG DVR Programming Parameters - Continued.

				TQG SETPOINTS 240/216		TQG SETPOINTS 120/206	
DESCRIPTION	**PARAMETER**	**ACTION**	**UNITS**	**60 Hz**	**50 Hz**	**60 Hz**	**50 Hz**
Integral Gain	:16	Program	–	2.4	2.4	2.4	2.4
Proportional Gain	:17	Program	–	1.0	1.0	1.0	1.0
Single Phase Sensing 3ph=0 1ph=1	:18	Program	–	0000	0000	0000	0000
Diode Monitor Trip Point	:19	Program	Ampere	2.0	2.0	2.0	2.0
Reverse VAR Trip Time	:20	Program	Seconds	.5	.5	.5	.5
Reverse VAR Fault Selection	:21	Program	–	2	2	2	2
Droop/CCC Select 0+D 1=CCC	:22	Program	–	0	0	0	0
Droop Percentage	:30	Program	%	1.8	1.8	1.8	1.8
Reverse Power Trip Point	:34	Program	%	20	20	20	20
Reverse Power Trip Time	:35	Program	Seconds	7	7	7	7
Frequency	:50	View	Hz	–	–	–	–
Voltage	:51	View	Volts	–	–	–	–
Current	:52	View	Ampere	–	–	–	–
Reactive Output Current	:53	View	Ampere	–	–	–	–
Generator Real Current	:54	View	Ampere	–	–	–	–

REPROGRAMMING OR VERIFYING DVR PARAMETERS - Continued

Table 2. 100 kW TQG DVR Programming Parameters - Continued.

				TQG SETPOINTS 240/216		TQG SETPOINTS 120/206	
DESCRIPTION	**PARAMETER**	**ACTION**	**UNITS**	**60 Hz**	**50 Hz**	**60 Hz**	**50 Hz**
Exciter Field Current	:55	View	Ampere	–	–	–	–
3-phase kW	:56	View	kW	–	–	–	–
Power factor	:57	View	–	–	–	–	–
3-phase kVAR	:58	View	–	–	–	–	–
Hours	:60	View	Hours	–	–	–	–
Password	:90	Program	–	0009	0009	0009	0009
Software ID	:91	View	–	1.05	1.05	1.05	1.05
Latest Fault	:92	View	–	–	–	–	–
Previous Fault	:93	View	–	–	–	–	–
Fault Clear	:94	Switch	–	–	–	–	–
Shutdown Fault Reset	:96	Switch	–	–	–	–	–

8. Press and holdup arrow key ▲ or down arrow key ▼ to set the data for parameter number :90 to 0009. DVR will not stay locked when Engine Control switch is switched from either COOL DOWN/STOP to OFF/RESET and back to COOL DOWN/STOP or from COOL DOWN/STOP to MANUAL START.

9. Press Function ◀▶ key on DVR once to display parameter: 90.

10. Press and hold up arrow key ▲ or down arrow key ▼ to change to parameter number :01.

11. Press Function ◀▶ key on DVR once to display data for parameter.

12. Press and hold up arrow key ▲ or down arrow key ▼ to set the data for parameter per Table 2.

REPROGRAMMING OR VERIFYING DVR PARAMETERS - Continued

13. Press Function ◀▶ key on DVR once to switch back to the parameter number.
14. Press up arrow key ▲ once to change to next parameter number per Table 2.
15. Keep repeating from step 7, entering or viewing parameter data from Table 2, until all parameter data is entered or verified to be correct.
16. Press Function ◀▶ key on DVR once to display data for parameter :90.
17. Press and hold up arrow key ▲ or down arrow key ▼ to set the data for parameter number :90 to any number but 0009 to lock the DVR. DVR will not stay locked when Engine Control switch is switched from either COOL DOWN/STOP to OFF/RESET and back to COOL DOWN/STOP or from COOL DOWN/STOP to MANUAL START.
18. If the generator set is not to be used, set ENGINE CONTROL Switch (ECS) to OFF/RESET, set DEAD CRANK SWITCH to OFF, and set Battery Disconnect Switch to OFF.

END OF TASK

REPROGRAMMING GSC SETPOINTS FOR VOLTAGE AND FREQUENCY CHANGE

1. Set Battery Disconnect Switch to ON.
2. Set DEAD CRANK SWITCH to NORMAL.
3. On EMCP, set ENGINE CONTROL Switch (ECS) to COOL DOWN/STOP.
4. Select programming data for GSC from Table 3 for desired output voltage and desired frequency.

Table 3. 100 kW TQG GSC Programming Setpoints.

DESIRED OUTPUT		OP5-0				OP5-1			
VOLTS	**HERTZ**	**P028**	**P029**	**P030**	**P031**	**P114**	**P117**	**P120**	**P123**
120/208	60	208	347	100	60	63	66	57	54
120/208	50	208	289	83	50	53	55	48	45
240/416	60	416	173	100	60	63	66	57	54
240/416	50	416	144	83	50	53	55	48	45

REPROGRAMMING GSC SETPOINTS FOR VOLTAGE AND FREQUENCY CHANGE - Continued

NOTE

In SERVICE MODE, the buttons on the GSC keypad perform new functions as follows:

POWER METER is Scroll Right
AC METER is Scroll Up
ENGINE METER is Scroll Down
LAMP TEST is Select
ALARM CODES is Enter

5. Press SERVICE MODE key on GSC. SERV will be displayed on upper display. OP1 will be displayed on lower display.
6. Press AC METER key four times. OP3 will be displayed.
7. Press the LAMP TEST key. P E ---------- will be displayed. The left-most underline will be flashing. If an error is made any time during the password entry, P E FAIL will be displayed. Password entry can be restarted by pressing LAMP TEST key.
8. Press POWER METER key. P E 1 _ _ _ _ will be displayed. The left-most underline will be flashing.
9. Press ENGINE METER key. P E 1 3 _ _ _ will be displayed. The left-most underline will be flashing.
10. Press AC METER key. P E 1 3 2 _ _ will be displayed. The left-most underline will be flashing.
11. Press ENGINE METER key. P E 1 3 2 3 _ will be displayed. The underline will be flashing.
12. Press POWER METER key. P E 1 3 2 3 1 will be displayed.
13. Press ALARM CODES key. P E PASS will be displayed.
14. Press EXIT key. OP4 will be displayed.
15. Press AC METER key. OP5 will be displayed.

NOTE

For input values the OP set and the parameter values will toggle between the upper and lower displays as each OP set is entered.

16. Press AC METER key or ENGINE METER key until OP5-0 is displayed.
17. Press LAMP TEST key. P001 will be displayed followed by the value of the setpoint.
18. Press ENGINE METER key until P028 is displayed (P028 is first setpoint in table).
19. Press LAMP TEST key. The value of the setpoint will begin to flash.
20. Press AC METER key or ENGINE METER key to change the value, as required, to what is shown in Table 3 corresponding to the desired voltage and frequency.
21. Press ALARM CODES key. The value of the setpoint will stop flashing.

REPROGRAMMING GSC SETPOINTS FOR VOLTAGE AND FREQUENCY CHANGE - Continued

22. Repeat steps 18 through 21 until all setpoint values are checked or changed for OP5-0.

23. Repeat steps 16 through 22 for OP5-1. The first setpoint displayed will be P101. The first setpoint to be changed/verified is P114, per Table 3.

24. At the completion of the programming, press EXIT key until SERV is no longer displayed on upper display.

25. If the generator set is not to be used, set ENGINE CONTROL Switch (ECS) to OFF/RESET, set DEAD CRANK SWITCH to OFF, and set Battery Disconnect Switch to OFF.

END OF TASK

REPROGRAMMING OR VERIFYING GSC SETPOINTS

The following procedure is used to reprogram the GSC if a GSC is replaced or if there is some reason to verify GSC setpoints as part of troubleshooting or analysis. Table 4 describes 100 kW OP5-0 Engine/Generator Setpoint Programming and lists values to be programmed or verified. Table 5 describes OP5-1 Protective Relaying Setpoint Programming and lists values to be programmed or verified. Table 6 describes OP5-3 Synchronization Setpoint Programming and lists values to be programmed or verified. Table 7 describes OP6-0 Spare Input/Output Setpoint Programming. Table 8 describes OP8 data from ATB and BTB transformers in the control panel that must be entered if either of those devices is replaced.

1. Set Battery Disconnect Switch to ON.

2. Set DEAD CRANK SWITCH to NORMAL.

3. On EMCP, set ENGINE CONTROL Switch (ECS) to COOL DOWN/STOP.

4. Select programming data for GSC from Tables 4 thru 8 for GSC programming to be verified or completed. If GSC has been replaced, all setpoints must be verified or reprogrammed. Factory default values must be verified and TQG custom values must be programmed.

NOTE

In SERVICE MODE, the buttons on the GSC keypad perform new functions as follows:

POWER METER is Scroll Right
AC METER is Scroll Up
ENGINE METER is Scroll Down
LAMP TEST is Select
ALARM CODES is Enter

5. Press SERVICE MODE key on GSC. SERV will be displayed on upper display. OP1 will be displayed on lower display.

6. Press AC METER key four times. OP3 will be displayed.

7. Press the LAMP TEST key. P E ---------- will be displayed. The left-most underline will be flashing. If an error is made any time during the password entry, P E FAIL will be displayed. Password entry can be restarted by pressing LAMP TEST key.

8. Press POWER METER key. P E 1 _ _ _ _ will be displayed. The left-most underline will be flashing.

9. Press ENGINE METER key. P E 1 3 _ _ _ will be displayed. The left-most underline will be flashing.

10. Press AC METER key. P E 1 3 2 _ _ will be displayed. The left-most underline will be flashing.

11. Press ENGINE METER key. P E 1 3 2 3 _ will be displayed. The underline will be flashing.

12. Press POWER METER key. P E 1 3 2 3 1 will be displayed.

13. Press ALARM CODES key. P E PASS will be displayed.

14. Press EXIT key. OP4 will be displayed.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

15. Press AC METER key. OP5 will be displayed.

NOTE

For input values the OP set and the parameter values will toggle between the upper and lower displays as each OP set is entered.

16. Press AC METER key or ENGINE METER key until OP5-0 is displayed.
17. Press LAMP TEST key. P001 will be displayed followed by the value of the setpoint.
18. Press ENGINE METER key until next setpoint to be verified or changed is displayed.
19. Press LAMP TEST key. The value of the setpoint will begin to flash.
20. Press AC METER key or ENGINE METER key to change the value, as required, to what is shown in Table 4 corresponding to the desired setpoint value.
21. Press ALARM CODES key. The value of the setpoint will stop flashing.
22. Repeat steps 18 through 21 until all setpoint values are checked or changed for OP5-0.
23. Repeat the process in steps 16 through 22 for OP5-1. The first setpoint displayed for OP5-1 will be P101. The first setpoint to be changed/verified is P101 per Table 5.
24. Repeat the process in steps 16 through 22 for OP5-3. The first setpoint displayed for OP5-3 will be P301. The first setpoint to be changed/verified is P301, per Table 6.
25. Repeat the process in steps 16 through 22 for OP6-0. The first setpoint displayed for OP6-0 will be SP01. The first setpoint to be changed/verified is SP01 per Table 7.
26. At the completion of the programming, press EXIT key until SERV is no longer displayed on upper display.
27. If the generator set is not to be used, set ENGINE CONTROL Switch (ECS) to OFF/RESET, set DEAD CRANK SWITCH to OFF, and set Battery Disconnect Switch to OFF.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 4. 100 kW OP5-0 Engine/Generator Setpoint Programming.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	240/416 60 Hz (50 Hz) [8]	120/208 60Hz (50 Hz)
P001 – Fuel Solenoid Type: Type of fuel system solenoid used on the TQG.	0 – ETR fuel solenoid 1 – ETS fuel solenoid	0	0	0
P002 – Units Shown: Type of measurement units shown on the GSC display.	0 – for English units (psi, °F) 1 – for metric units (kPa, °C)	0	0	0
P003 – Shutdown Override for Engine Fault: GSC response to a low engine oil pressure or high coolant temperature fault.	0 – for engine shutdown 1 – for alarm only (shutdown override, no engine shutdown)	0	0	0
P004 – Shutdown Override For Sensor Fault: GSC response to a diagnostic fault with the engine oil pressure sensor, coolant temperature sensor, oil temperature sensor, sensor power supply, or coolant loss sensor.	0 – for alarm only (shutdown override, no engine shutdown) 1 – for engine shutdown	0	0	0
P005 – Coolant Loss Sensor Installed: Tells whether or not the optional engine coolant loss sensor is installed on the TQG.	0 – for TQGs without a coolant loss sensor 1 – for TQGs with coolant loss sensor	0	1	1
P006 – Shutdown Override for Coolant Loss Fault: GSC response to an engine coolant loss fault.	0 – for engine shutdown 1 – for alarm only (shutdown override, no engine shutdown)	0	1	1
P007 – System Voltage, 24 or 32 Volts: System voltage (battery voltage) of the TQG.	24 or 32	24	24	24
P008 – This setpoint is not currently being used by GSC and cannot be programmed.	N/A	N/A	N/A	N/A

[8] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 4. 100 kW OP5-0 Engine/Generator Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	240/416 60 Hz (50 Hz) [8]	120/208 60Hz (50 Hz)
P009 – Number of Ring Gear Teeth: Number of teeth on the ring gear of the engine. Used by GSC to determine engine speed.	95 to 350 teeth in increments of one tooth.	136	156	156
P010 – Engine Overspeed: Engine speed used by GSC to declare that an engine overspeed fault exists. The engine overspeed setpoint (for all 60 Hz applications) is 1.18 times rated speed.	500 to 4330 rpm in increments of 10 rpm.	2120 rpm	2120 rpm	2120 rpm
P011 – Crank Terminate Speed: Engine speed used by GSC to disengage starting motor during engine cranking.	100 to 1000 rpm in increments of 10 rpm.	400 rpm	400 rpm	400 rpm
P012 – Oil Step Speed: Engine speed used by GSC for distinguishing between rated speed and idle speed when a low oil pressure fault exists.	400 to 1800 rpm in increments of 10 rpm	1350 rpm	1350 rpm	1350 rpm
P013 – Low Oil Pressure Shutdown at Rated Speed: Oil pressure used by GSC to declare that a low oil pressure shutdown fault exists with engine at rated speed (the engine speed must have exceeded the oil step speed for nine seconds). [2]	34 to 420 kPa (5 to 61 psi) in increments of 1	205 kPa (30 psi)	26 psi	26 psi

[2] When oil pressure drops to within 34 kPa (5 psi) of the P013 or P014 setpoint, GSC issues a low oil pressure alarm.

[8] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 4. 100 kW OP5-0 Engine/Generator Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	240/416 60 Hz (50 Hz) [8]	120/208 60Hz (50 Hz)
P014 – Low Oil Pressure Shutdown at Idle Speed: Oil pressure used by GSC to declare that a low oil pressure shutdown fault exists with the engine at idle speed (the engine must have been running for at least 9 seconds and the engine speed must be less than oil step speed). [2]	20 to 336 kPa (3 to 49 psi) in increments of 1	70 kPa (10 psi)	10 psi	10 psi
P015 – High Water Temperature Shutdown: Coolant temperature used by GSC to declare a high coolant temperature shutdown fault exists (after a 10 second delay). [3]	85 to 123°C (185 to 253°F) in increments of 1	107°C (225°F)	230°F	230°F
P016 – Low Water Temperature Alarm: Coolant temperature used by GSC to declare that a low coolant temperature alarm fault exists (after a 2 second delay).	0 to 36°C (32 to 97°F) in increments of 1	21°C (70°F)	70°F	70°F
P017 – Total Cycle Crank Time: Cycle crank time used by GSC to declare that an overcrank fault exists.	5 to 120 seconds in increments of 1 second	90 sec	90 sec	90 sec
P018 – Cycle Crank Time: Amount of time GSC cranks and then rests the starting motor during a single crank cycle.	5 to 60 seconds in increments of 1 second	10 sec	30 sec	30 sec

[2] When oil pressure drops to within 34 kPa (5 psi) of the P013 or P014 setpoint, GSC issues a low oil pressure alarm.

[3] When coolant temperature rises to within 6°C (11°F) of the P015 setpoint, GSC issues high coolant temperature alarm.

[8] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 4. 100 kW OP5-0 Engine/Generator Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	240/416 60 Hz (50 Hz) [8]	120/208 60Hz (50 Hz)
P019 – Cooldown Time: Amount of time GSC allows the engine to run after a normal shutdown is initiated.	0 to 30 minutes in increments of 1 minute.	5 min	5 min	5 min
P020 – AC Voltage: Nominal AC voltage of generator. The GSC measures and displays the AC voltage. [4]	700, 150, 300, 500, 600, 750, 3.0k, 4.5k, 5.20k, 5.25k, 9.0k, 15.0k, 18.0k, 30.0k	700	700	700
P021 – AC Current Full Scale: Nominal full scale AC current of generator. AC current full scale is equal to ratio of external current transformers in generator housing.	75, 100, 150, 200, 300, 400, 600, 800, 1000, 1200, 1500, 2000, 2500, 3000, and 4000A		400	400
P022 – GSC Engine Number: Informs other devices on the CAT Data Link of the engine number for GSC. [5]	01 through 08	01	01	01
P023 – Engine Type: Identifies the engine as a mechanical unit injector (MUI) diesel, spark ignited (gas), or electronic unit injector (EUI) diesel engine.	0 – MUI diesel 1 – Gas 2 – EUI diesel	0	2	2

[4] The values other than the default (700V) are for switch gear applications and require the use of external potential transformers and the removal of the AC voltage range jumper located in the relay module.

[5] After setpoint P022 is reprogrammed, GSC must be power cycled (powered down and then powered up).

[8] Setpoint to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 4. 100 kW OP5-0 Engine/Generator Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	240/416 60 Hz (50 Hz) [8]	120/208 60Hz (50 Hz)
P024 – Crank Time Delay: Amount of time GSC delays activation of the fuel control relay (FCR) during a crank cycle. This setpoint is for gas engines only. The P024 setpoint only functions when the P023 setpoint is set to 1 (gas engine). [7]	0 to 20 seconds in increments of 1 second	5 sec	5 sec	5 sec
P025 – Oil Temperature Sensor Installed: Tells whether or not the optional engine oil temperature sensor is installed on the TQG.	0 – for TQGs without an oil temperature sensor 1 – for TQGs with an oil temperature sensor	0	0	0
P026 – High Oil Temperature Shutdown: Oil temperature used by GSC to declare a high oil temperature shutdown fault exists (after a 10 second delay). Refer to the panel model number.	85 to 123°C (185 to 253°F) in increments of 1	107°C (225°F)	253°F	253°F
P027 – Shutdown Override for High Oil Temperature Fault: GSC+ response to an engine high oil temperature fault.	0 – for alarm only (shutdown override, no engine shutdown) 1 – for engine shutdown	0	0	0
P028 – Nameplate Voltage: Rated voltage of generator. This setpoint is used for protective relaying functions.	100 to 25kV in increments of 1	480V	416V (416V)	208V (208V)
P029 – Nameplate Current: Rated current output of generator.	0 to 4000 A in increments of 1	600A	173A (144A)	347A (288A)

[7] The P024 setpoint only functions when the P023 setpoints is set to 1 (gas engine).
[8] Setpoints to be changed from factory defaults to 100 TQG setpoint at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 4. 100 kW OP5-0 Engine/Generator Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	240/416 60 Hz (50 Hz) [8]	120/208 60Hz (50 Hz)
P030 – Nameplate Power: Rated power capability of generator.	0 through 10 MW in increments of 1 kW	400 kW	100 kW (83 kW)	100 kW (83 kW)
P031 – Rated Frequency: Nominal frequency rating of TQG.	50 or 60 Hz	60 Hz	60 Hz (50 Hz)	60 Hz (50 Hz)
P032 – Connection Configuration of Generator: Wye or Delta configuration of generator.	0 – Wye 1 – Delta	0	0	0
P033 – Number of Generator Poles. [6]	0 through 254 in increments of 2	4	4	4

[1] The setpoints (stored or being programmed) must match the specified setpoints of the TQG.
[6] When P033 is programmed to 0 poles, the AL15 (GSC Configuration Error) fault is disabled.
[8] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

Table 5. OP5-1 Protective Relaying Setpoint Programming.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS 60 Hz (50 Hz) [3]
P101 Generator Overvoltage Alarm Enable: GSC enables or disables generator overvoltage alarm function.	0 – disabled 1 – enabled	1	1
P102 – Generator Overvoltage Alarm Threshold: Voltage GSC uses to issue overvoltage alarm.	100 to 125% of nameplate voltage in increments of 1%	105%	125%
P103 – Generator Overvoltage Alarm Time Delay: Amount of time the FSC+ waits before issuing overvoltage alarm.	0 through 120 seconds [2] in increments of 1	10 sec	0 sec

[2] When programmed to 0 seconds, the actual time is from 0.5 to 1.0 seconds.
[3] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.
[4] Setpoint values for disabled parameters are for fail safe/pack purposes.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 5. OP5-1 Protective Relaying Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS 60 Hz (50 Hz) [3]
P104 – Generator Overvoltage Shutdown Enable: GSC enables or disables the generator overvoltage shutdown function.	0 – disabled 1 – enabled	1	1
P105 – Generator Overvoltage Shutdown Threshold: Voltage GSC used to issue an overvoltage shutdown.	100 to 125% of nameplate voltage in increments of 1%	110%	125%
P106 – Generator Overvoltage Shutdown Time Delay: Amount of time GSC waits before issuing an overvoltage shutdown.	0 through 120 seconds [2] in increments of 1	10 sec	1 sec
P107 – Generator Undervoltage Alarm Enable: GSC enables or disables the generator undervoltage alarm function.	0 – disabled 1 – enabled	1	1
P108 – Generator Undervoltage Alarm Threshold: Voltage GSC uses to issue an undervoltage alarm.	60 to 100% of nameplate voltage in increments of 1%	90%	82%
P109 – Generator Undervoltage Alarm Time Delay: Amount of time GSC waits before issuing an undervoltage alarm.	0 through 120 seconds [2] in increments of 1	10 sec	6 sec
P110 – Generator Undervoltage Shutdown Enable: GSC enables or disables the generator undervoltage shutdown function.	0 – disabled 1 – enabled	1	0
P111 – Generator Undervoltage Shutdown Threshold: Voltage GSC uses to issue an undervoltage shutdown.	60 to 100% of nameplate voltage in increments of 1%	85%	75%
P112 – Generator Undervoltage Shutdown Time Delay: Amount of time GSC waits before issuing an undervoltage shutdown.	0 through 120 seconds [2] in increments of 1	15 sec	6 sec

[2] When programmed to 0 seconds, the actual time is from 0.5 to 1.0 seconds.
[3] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 5. OP5-1 Protective Relaying Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS 60 Hz (50 Hz) [3]
P113 – Generator Overfrequency Alarm Enable: GSC enables or disables the generator overfrequency alarm function.	0 – disabled 1 – enabled	1	1
P114 – Generator Overfrequency Alarm Threshold: Frequency GSC uses to issue an overfrequency alarm.	50-60 Hz, for 50 Hz generator 60-70 Hz, for 60 Hz generator 400-480 Hz, for 400 Hz generator	53 Hz 63 Hz 422 Hz	63 Hz/53 Hz
P115 – Generator Overfrequency Alarm Time Delay: Amount of Time GSC waits before issuing an overfrequency alarm.	0 through 120 seconds [2] in increments of 1	10 sec	10 sec
P116 – Generator Overfrequency Shutdown Enable: GSC enables or disables the generator overfrequency shutdown function.	0 – disabled 1 – enabled	1	0
P117 – Generator Overfrequency Shutdown Threshold: Frequency GSC uses to issue an overfrequency shutdown.	50-60 Hz, for 50 Hz generator 60-70 Hz, for 60 Hz generator 400-480 Hz, for 400 Hz generator	55 Hz 66 Hz 440 Hz	66 Hz/55 Hz
P118 – Generator Overfrequency Shutdown Time Delay: Amount of time GSC waits before issuing an overfrequency shutdown.	0 through 120 seconds [2] in increments of 1	10 sec	10 sec
P119 – Generator Underfrequency Alarm Enable: GSC enables or disables the generator underfrequency alarm function.	0 – disabled 1 – enabled	1	1

[2] When programmed to 0 seconds, the actual time is from 0.5 to 1.0 seconds.
[3] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 5. OP5-1 Protective Relaying Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS 60 Hz (50 Hz) [3]
P120 – Generator Underfrequency Alarm Threshold: Frequency GSC uses to issue an underfrequency alarm.	30-50 Hz, for 50 Hz generator 36-60 Hz, for 60 Hz generator 240-400 Hz, for 400 Hz generator	48 Hz 57 Hz 378 Hz	57 Hz/48 Hz
P121 – Generator Underfrequency Alarm Time Delay: Amount of time GSC waits before issuing an underfrequency alarm.	0 through 120 seconds [2] in increments of 1	10 sec	10 sec
P122 – Generator Underfrequency Shutdown Enable: GSC enables or disables the generator underfrequency shutdown function.	0 – disabled 1 – enabled	1	0
P123 – Generator Underfrequency Shutdown Threshold: Frequency GSC uses to issue an underfrequency shutdown.	30-50 Hz, for 50 Hz generator 36-60 Hz, for 60 Hz generator 240-400 Hz, for 400 Hz generator	45 Hz 54 Hz 360 Hz	54 Hz/45 Hz
P124 – Generator Underfrequency Shutdown Time Delay: Amount of time GSC waits before issuing an underfrequency shutdown.	0 through 120 seconds [2] in increments of 1	15 sec	15 sec
P125 – Generator Reverse Power Shutdown Enable: GSC enables or disables the generator reverse power shutdown function.	0 – disabled 1 – enabled	1	1
P126 – Generator Reverse Power Shutdown Threshold: Level of reverse power GSC uses to issue a reverse power shutdown.	0 through 20% of rated power in increments of 1%	15%	17%

[2] When programmed to 0 seconds, the actual time is from 0.5 to 1.0 seconds.
[3] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 5. OP5-1 Protective Relaying Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS 60 Hz (50 Hz) [3]
P127 – Generator Reverse Power Shutdown Time Delay: Amount of time the FSC+ waits before issuing a reverse power shutdown.	0 through 30 seconds [2] in increments of 1	10 sec	3 sec
P128 – Generator Overcurrent Alarm Enable: GSC enables or disables the overcurrent alarm.	0 – disabled 1 – enabled	1	1
P129 – Generator Phase Overcurrent Alarm Threshold: Level of current GSC uses to issue a phase overcurrent alarm.	100 through 160% of nameplate current in increments of 5%	105%	160%
P130 – Generator Phase Overcurrent Alarm Time Delay: Amount of time GSC waits before issuing a phase overcurrent alarm.	0 through 250 seconds [2] in increments of 1	0 sec	0 sec
P131 – Generator Total Overcurrent Alarm Threshold: Level of current GSC uses to issue a total overcurrent alarm.	100 through 160% of nameplate current in increments of 5%	105%	160%
P132 – Generator Total Overcurrent Alarm Time Delay: Amount of time GSC waits before issuing a total overcurrent alarm.	0 through 250 seconds [2] in increments of 1	0 sec	0 sec
P133 – Generator Overcurrent Shutdown Enable: GSC enables or disables the overcurrent shutdown.	0 – disabled 1 – enabled	1	0
P134 – Generator Phase Overcurrent Shutdown Threshold: Level of current GSC uses to issue a phase overcurrent shutdown.	100 through 160% in increments of 5%	110%	160%
P135 – Generator Phase Overcurrent Shutdown Time Delay: Amount of time GSC waits before issuing a phase overcurrent shutdown.	0 through 500 seconds [2] in increments of 1	0 sec	0 sec

[2] When programmed to 0 seconds, the actual time is from 0.5 to 1.0 seconds.
[3] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 5. OP5-1 Protective Relaying Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS 60 Hz (50 Hz) [3]
P136 – Generator Total Overcurrent Shutdown Threshold: Level of current GSC uses to issue a total overcurrent shutdown.	100 through 160% of three times nameplate current in increments of 5%	110%	160%
P137 – Generator Total Overcurrent Shutdown Time Delay: Amount of time GSC waits before issuing a total overcurrent shutdown.	0 through 500 seconds [2] in increments of 1	0 sec	0 sec
P138 – KW Level Relay Enable: GSC enables or disables the kW level relay function.	0 – disabled 1 – enabled	1	1
P139 – KW Level Relay Threshold: Level of power GSC uses to activate the kW level relay function.	0 through 110% of nameplate power in increments of 1%	105%	110%
P140 – KW Level Relay Time Delay: Amount of time GSC waits before activating the kW level relay function.	0 through 120 seconds [2] in increments of 1	0 sec	0 sec
P141 – KW Level Relay Disengage Threshold: Level of power GSC uses to deactivate the kW level relay function.	0 through 110% of nameplate power in increments of 1%	100%	100%
P142 – KW Level Relay Disengage Time Delay: Amount of time GSC waits before deactivating the kW level relay function.	0 through 120 seconds [2] in increments of 1	10 sec	10 sec

[1] Setpoints are programmed at the factory to default value. Some setpoints changed to satisfy application requirements.
[2] When programmed to 0 seconds, the actual time is from 0.5 to 1.0 seconds.
[3] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 6. OP5-3 Synchronization Setpoint Programming.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS
P301 – Synchronization Enable: Enables or disables synchronization function and specifies Load Share control being driven.	0 – disabled 1 – Woodward	0	1
P302 – Breaker Coil Time Limit: Maximum amount of time breaker coil can be energized without damaging coil.	0.2 to 5.0 seconds in increments of 0.1 seconds	1.0 sec	1
P303 – Voltage Limit Enable: Enables or disables generator-bus voltage checking during automatic synchronization.	0 – disabled 1 – enabled	1	1
P304 – Voltage Limit: Maximum acceptable difference between bus voltage and oncoming voltage, expressed as a percentage of bus voltage.	1% to 15% in increments of 1%	1%	4%
P305 – Phase Tolerance Limit: Maximum phase angle magnitude allowed for breaker closure. [2]	1 to 25 degrees in increments of 1 degree	5 deg	5 deg
P306 – Dwell Time: Time during which the phase angle between generator and bus must be within Phase Tolerance Limit for breaker closure. [2]	0.1 to 1.0 seconds in increments of 0.1 second	0.5 sec	0.5 sec
P307 – Speed Control Gain: Controls how fast engine speed will change during synchronization. [2 3]	0.0% to 100.0% in increments of 0.1%	50.0%	% varies typical 12%

[2] P305, P306, P307, P308, and P309 can be adjusted to precisely match individual engine response and breaker closure characteristics using OP11-Synchronization Setpoint Turning.

[3] GSC used P-1-D (proportional-integral-derivation) control to accomplish synchronization quickly and smoothly. The P, 1, and D parameters are independently controlled by setpoints P307, P308, and P309, respectively. Adjusting any one of these setpoints will not affect the other two settings.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 6. OP5-3 Synchronization Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS
P308 – Speed Control Rate: Controls rate of change of the phase angle difference between the generator and bus during synchronization. [2 3]	0.0% to 100.0% in increments of 0.1%	50.0%	% varies typical 17%
P309 – Speed Control Damping: Controls rate of change of the phase angle difference between the generator and bus during synchronization. [2 3]	0.0% to 100.0% in increments of 0.1%	0.0%	% varies typical 8%
P310 – Dead Bus Closure Enabled: Enables or disables automatic closure to a dead bus.	0 – disabled 1 – enabled	0	1
P311 – Dead Bus Limit: Maximum acceptable voltage for bus to be considered dead as a percentage of rated voltage.	5% to 50% in increments of 1%	20%	20%
P312 – Dead Bus On Time Delay: Amount of time GSC waits before closing to a dead bus.	0 to 120 seconds in increments of 1 second	0 sec	2 sec
P313 – Frequency Match Notification Time: Amount of time before notification of possible synchronization failure. Must not be greater than the Maximum Synchronization Time.	5 to 1000 seconds in increments of 1 second	20 sec	20 sec
P314 – Maximum Synchronization Time: Maximum amount of time to spend attempting to synchronize before setting Synchronization Timeout Alarm.	5 to 1000 seconds in increments of 1 second	20 sec	30 sec

[1] Setpoints are programmed at the factory to the default value. Setpoints changed to satisfy application requirements.

[2] P305, P306, P307, P308, and P309 ca be adjusted to precisely match individual engine response and breaker closure characteristics using OP11-Synchronization Setpoint Turning.

[3] GSC used P-1-D (proportional-integral-derivation) control to accomplish synchronization quickly and smoothly. The P, 1, and D parameters are independently controlled by setpoints P307, P308, and P309, respectively. Adjusting any one of these setpoints will not affect the other two settings.

[4] Setpoints to be changed from factory defaults to 100 TQG setpoints at switch gear supplier.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 7. OP6 Spare Input/Output Setpoint Programming.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS
SP01 – Spare Input 1 Active State: Input state used by GSC to declare that SP01 fault exists.	0 – Active low 1 – Active high	0	0
SP02 – Spare Input 1 Response: GSC response to SP01 fault.	0 – Shutdown 1 – Alarm	0	0
SP03 – Spare Input 1 Time Delay: Amount of time GSC waits before responding to a SP01 fault.	0 to 250 seconds in increments of 1	0 seconds	1 seconds
SP04 – Spare Input 2 Active State: Input stated used by GSC to declare that SP02 fault exists.	0 – Active low 1 – Active high	0	1
SP05 – Spare Input 2 Response: GSC response to SP02 fault.	0 – Shutdown 1 – Alarm	0	0
SP06 – Spare Input 2 Time Delay: Amount of time GSC waits before responding to SP02 fault.	0 to 250 seconds in increments of 1	0 seconds	0 seconds
SP07 – Spare Input 3 Active State: Input state used by GSC to declare that SP03 fault exists.	0 – Active low 1 – Active high	0	0
SP08 – Spare Input 3 Response: GSC response to SP03 fault.	0 – Shutdown 1 – Alarm	0	0
SP09 – Spare Input 3 Time Delay: Amount of time GSC waits before responding to SP03 fault.	0 to 250 seconds in increments of 1	0 seconds	0 seconds
SP10 – Spare Input 4 Active State: Input state used by GSC to declare that SP04 fault exists.	0 – Active low 1 – Active high	0	0
SP11 – Spare Input 4 Response: GSC response to SP04 fault.	0 – Shutdown 1 – Alarm	0	0

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 7. OP6 Spare Input/Output Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS
SP12 – Spare Input 4 Time Delay: Amount of time GSC waits before responding to SP04 fault.	0 to 250 seconds in increments of 1	0 seconds	0 seconds
SP13 – Spare Output Response: GSC response to the spare output trigger condition.	0 – Active low 1 – Active high	0	0
SP15 – Spare Relay Output Response: GSC response to the spare relay trigger condition.	0 – Relay inactive when triggered 1 – Relay active when triggered	1	1
SP14 – Spare Output Trigger Condition: The condition used by GSC to trigger the spare output trigger response.	0 – Unused 1 – Active SP01 fault [2] 2 – Active SP02 fault [2] 3 – Active SP03 fault [2] 4 – Active SP04 fault [2] 5 – Any combination of active SP01, SP02, SP03, or SP04 faults [2] 6 – Any active shutdown fault (AL1 thru AL14, SP01 – SP04, or CID FMI) 7 – Any active alarm or shutdown fault (AL1 thru AL15, SP01 thru SP04, or CID FMI) 8 – Cooldown mode 9 – Coolant loss fault [2] 10 – High oil temperature fault [2] 11 – CCM control [2] 12 – Other protective relay	8	8
SP16 – Spare Relay Output Trigger Condition: The condition used by GSC to trigger the spare relay.		8	12

[2] Either alarm or shutdown faults are valid trigger conditions.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 7. OP6 Spare Input/Output Setpoint Programming - Continued.

DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINTS
SP17 – Spare Indicator 1 Trigger Condition: The condition used by GSC to trigger Spare Indicator 1. SP18 – Spare Indicator 2 Trigger Condition: The condition used by GSC to trigger Spare Indicator 2. SP19 – Spare Indicator 3 Trigger Indicator: The condition used by GSC to trigger Spare Indicator 3.	0 – Unused 1 – Active SP01 fault [3] 2 – Active SP02 fault [3] 3 – Active SP03 fault [3] 4 – Active SP04 fault [3] 5 – Any combination of active SP01, SP02, SP03, or SP04 faults [3] 6 – Coolant loss fault [3] 7 – High oil temperature fault [3] 8 – kW level relay active	0 0 0	0 0 0

[1] The setpoints are programmed at the factory to the default value. The setpoints may be changed to satisfy customer requirements or application requirements.

[3] SP14 is programmed to 11 (CCM control), the spare output is always active low. When SP16 is programmed to 11 (CCM control), the spare relay is always active when triggered.

REPROGRAMMING OR VERIFYING GSC SETPOINTS - Continued

Table 8. OP8 Voltmeter Ammeter Programming.

SETPOINT	NAME	DESCRIPTION	RANGE OF VALUES	FACTORY DEFAULT	SETPOINT
AC01	VA	Phase A voltage calibration used by GSC to compensate for voltage characteristics of ATB A5.	0 to 255 in increments of 1	0	Barcode on ATB A5
AC02	VB	Phase B voltage calibration used by GSC to compensate for voltage characteristics of ATB A5.	0 to 255 in increments of 1	0	Barcode on ATB A5
AC03	VC	Phase C voltage calibration used by GSC to compensate for voltage characteristics of ATB A5.	0 to 255 in increments of 1	0	Barcode on ATB A5
AC04	IA	Phase A current calibration used by GSC to compensate for current characteristics of ATB A5.	0 to 255 in increments of 1	0	Barcode on ATB A5
AC05	IB	Phase B current calibration used by GSC to compensate for current characteristics of ATB A5.	0 to 255 in increments of 1	0	Barcode on ATB A5
AC06	IC	Phase C current calibration used by GSC to compensate for current characteristics of ATB A5.	0 to 255 in increments of 1	0	Barcode on ATB A5
AC07	VA	Phase A voltage calibration used by GSC to compensate for voltage characteristics of BTB A6.	0 to 255 in increments of 1	0	Barcode on BTB A6

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

INSTALLATION OF GENERATOR SET ON TRAILER

INITIAL SETUP:

Tools and Special Tools

Lifting Device, 7000 lb (3175 kg) Capacity
Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

Two

References

TM 9-2330-376-14&P
TM 9-6115-729-24P

WARNING

The 100 kW TQG weighs approximately 6100 lb (2767 kg) and requires a lifting device (forklift, overhead lifting device) with sufficient capacity. Failure to comply can cause serious injury or death to personnel.

Be extremely careful when working near the 100 kW TQG as it is being positioned on the trailer. Failure to comply can cause injury to personnel.

INSTALLATION

1. Park M1061/M1061A1 trailer (Figure 1, Item 1) on level hard surface. Lower support legs (TM 9-2330-376-14&P). Level trailer and chock wheels.
2. Using lifting device with sufficient capacity (at least 7000 lb (3175 kg), maneuver TQG (Figure 1, Item 2), with control panel end toward tongue of trailer.
3. Slowly lower TQG (Figure 1, Item 2) into position onto trailer (Figure 1, Item 1).
4. Align with mounting holes.
5. Remove lifting device.

NOTE

All TQG-mounting screws are installed with nuts on top of bed of trailer, except at location A, at right rear of trailer.

6. Install eight screws (Figure 1, Item 3), 16 washers (Figure 1, Item 4), and eight nuts (Figure 1, Item 5) on trailer (Figure 1, Item 1). Torque to 125 lb-ft (69 Nm).

INSTALLATION - Continued

7. Install two fire extinguisher brackets (Figure 1, Item 6), eight screws (Figure 1, Item 7), washers (Figure 1, Item 8), and locknuts (Figure 1, Item 9).

8. Install accessory box (Figure 1, Item 10), four screws (Figure 1, Item 7), washers (Figure 1, Item 8), and locknuts (Figure 1, Item 9).

9. Install load terminal (Figure 1, Item 11), washer (Figure 1, Item 12), and locknut (Figure 1, Item 13).

10. Install grommet (Figure 1, Item 14) in deck.

INSTALLATION - Continued

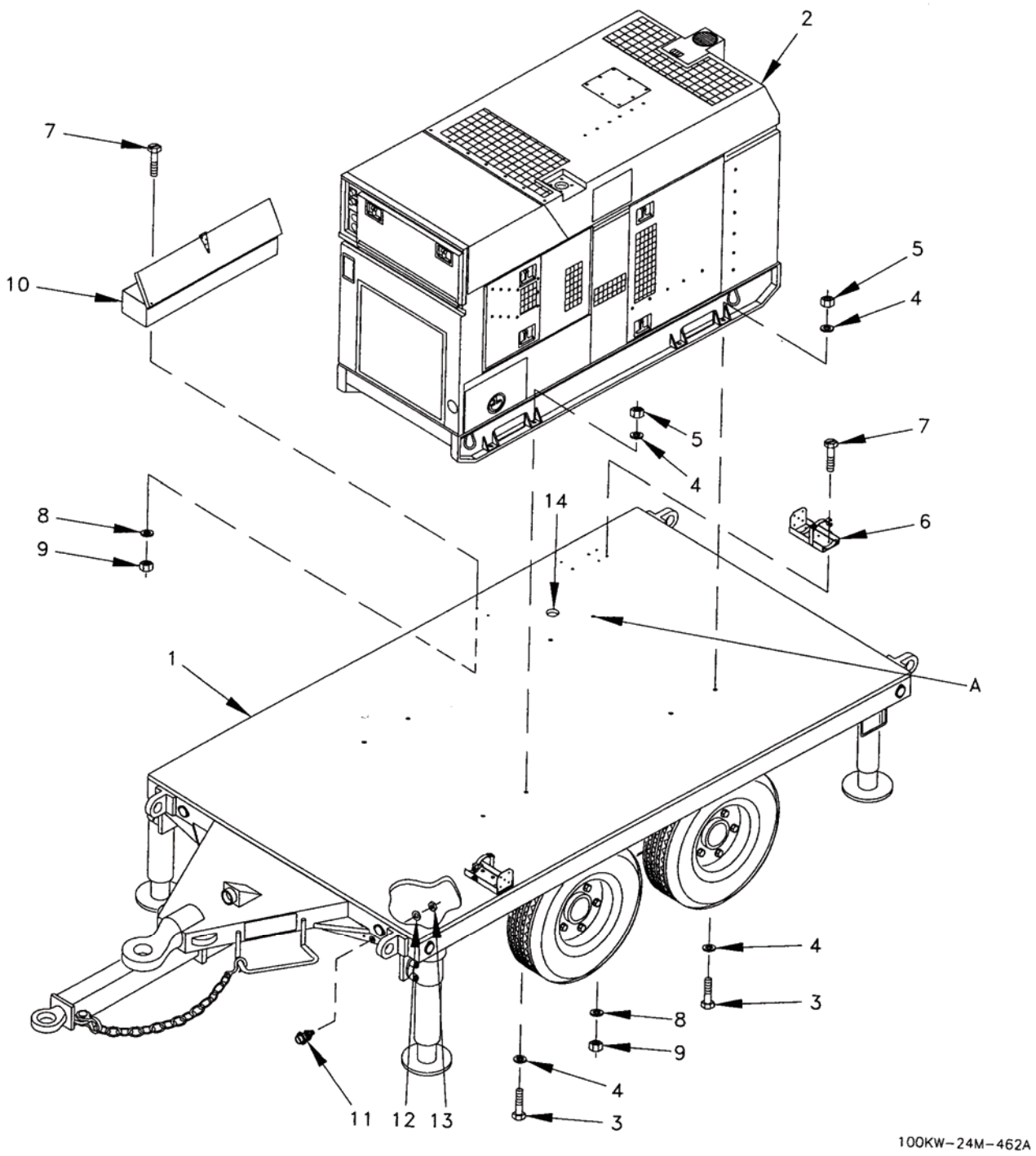


Figure 1. Installation of Generator Set on Trailer.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
PREPARATION FOR STORAGE OR SHIPMENT

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

Antifreeze (WP 0120, Item 5)
Fuel (WP 0120, Item 17)
Lubricating oil, preservation (WP 0120, Item 34A)
Lubricating oil, preservation (WP 0120, Item 34B)
Lubricating oil, general purpose (WP 0120, Item 34C)
Petroleum jelly (WP 0120, Item 34D)
Tape (WP 0120, Item 52A)
Wiping rags (WP 0120, Item 36)
Wood block, 1 in. (2.54 cm) thick

Personnel Required

One

References

TM 9-6115-729-10
TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the engine.

SHORT TERM STORAGE

NOTE

Short term is storage from 1 to 45 days.

1. Perform Quarterly PMCS (WP 0015). Correct all deficiencies found.
2. Check that all Modification Work Orders (Army), MIs (Marines), and TCTOs (Air Force) have been applied.
3. Top off engine oil level with preservation oil (WP 0081).
4. Drain cooling system completely (WP 0067). Refill cooling system with a 50/50 mixture of antifreeze and water. Operate engine for a minimum of five minutes to circulate mixture.
5. Place auxiliary fuel lines and paralleling cables in the storage box inside the left battery access door.
6. Place TM 9-6115-729-10 and TM 9-6115-729-24 in a heat sealed bag in the document box (inside right battery access door).
7. Select an indoor storage site, if possible. If inside storage is not available, a truck, conex container, or other container may be used.

END OF TASK

LONG TERM STORAGE

NOTE

Long term is storage longer than 45 days

1. Perform Quarterly PMCS (WP 0015). Correct all deficiencies found.
2. Check that all Modification Work Orders have been applied.
3. Drain cooling system completely (WP 0067). Refill cooling system with 50/50 mixture of antifreeze and water. Operate engine for a minimum of five minutes to circulate the antifreeze. Stop engine and allow to cool for 10 minutes.
4. Drain engine oil completely (WP 0081). Refill engine with preservation oil (WP 0120, Item 34A).
5. Open left front doors.
6. Disconnect fuel pickup hose (Figure 1, Item 1), from elbow (Figure 1, Item 2) on fuel tank (Figure 1, Item 3). Disconnect fuel return hose (Figure 1, Item 4) from elbow (Figure 1, Item 5) on fuel tank (Figure 1, Item 3).
7. Position three containers, with at least a two gallon capacity each, beside the left doors.
8. Place end of fuel return hose (Figure 1, Item 4) into container A (waste container).
9. Fill container B with one gallon fuel (WP 0120). Fill container C with one gallon general purpose oil (WP 0120).
10. Place end of fuel pickup hose (Figure 1, Item 1) into container B (fuel).

LONG TERM STORAGE - Continued

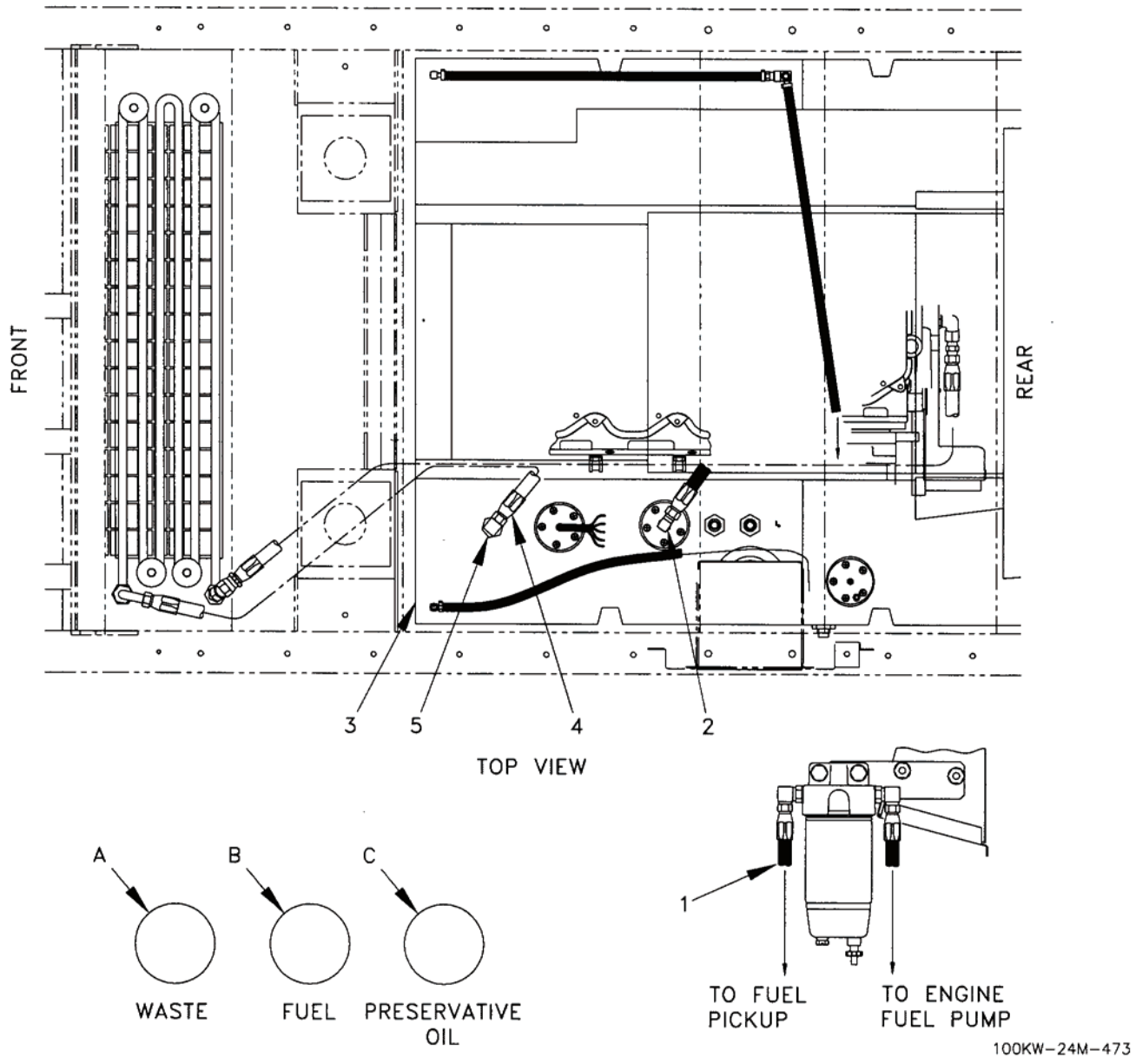


Figure 1. Preparation for Storage or Shipment.

11. Start engine and run for two minutes using the fuel in container B. After two minutes, place end of fuel pickup hose (Figure 1, Item 1) into container C (oil). Operate until oil from container C comes out of fuel return line into container A (waste container). Shut down engine and allow to cool at least 10 minutes.

12. Reconnect fuel pickup hose (Figure 1, Item 1) to elbow (Figure 1, Item 2) on fuel tank (Figure 1, Item 3). Connect fuel return hose (Figure 1, Item 4) to elbow (Figure 1, Item 5) on fuel tank (Figure 1, Item 3).

LONG TERM STORAGE - Continued

CAUTION

Do not use waste fuel/oil mixture to preserve other engines or damage may occur.

13. Dispose of fuel/oil mixture in container A (waste) in accordance with local regulations.

14. Open left rear door. Disconnect manifold in hose from intake manifold (WP 0067). While using dead crank switch to turn over engine, use a pneumatic oil gun to spray preservative oil (WP 0120, Item 34B) into air inlet for one minute. Release dead crank switch. Connect manifold in hose.

15. Remove air cleaner cover (WP 0070), gasket, and both filter elements. While using dead crank switch to turn over engine, use a pneumatic oil gun to spray preservative oil (WP 0120) into air cleaner housing for 30 seconds. Release dead crank switch. Install both filter elements, gasket, and air cleaner cover.

16. Allow muffler to cool. Use a pneumatic oil gun to spray preservative oil (WP 0120) into exhaust outlet housing for 30 seconds.

17. On left side of TQG, place a suitable container under the fuel drain. Remove cap from fuel drain and open the fuel drain valve. Completely drain the fuel tank. Close fuel drain valve and install cap to first locking position.

18. Completely drain cooling system (WP 0067).

19. Apply preservative oil (WP 0120) to all hinges and latches on the TQG.

20. Disconnect all battery cables from batteries (WP 0049). Secure battery cable terminals away from the batteries with tape. Apply petroleum jelly to all battery terminals.

21. Select an indoor storage site, if possible. If inside storage is not available, a truck, conex container, or other container may be used.

22. Place TM 9-6115-729-10 and TM 9-6115-729-24 in a heat sealed bag in the document box (inside left battery access door).

23. Place auxiliary fuel lines and paralleling cables in the storage box inside the left battery access door.

24. Close all doors.

25. Prepare tag with the following statements: “CRANKCASE FILLED WITH PRESERVATIVE OIL (MIL-PRF-21260, GRADE 30). GOOD FOR OPERATION UNTIL FIRST REQUIRED OIL CHANGE.”

26. Prepare tag with the following statements: “COOLING SYSTEM DRAINED. FILL WITH PROPER ANTIFREEZE MIXTURE BEFORE OPERATION.”

LONG TERM STORAGE - Continued

27. Prepare tag with the following statements: “FUEL SYSTEM PRESERVED WITH PRESERVATIVE OIL (MIL-PRF-21260, GRADE 10W). DRAIN FUEL LINES BEFORE OPERATING. CHANGE FUEL FILTER AFTER ONE HOUR OF OPERATION.

28. Place all the above tags on the control panel and secure with tape.

29. Secure all doors with tape.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
ILLUSTRATED LIST OF MANUFACTURED ITEMS

INITIAL SETUP:

Not Applicable

INTRODUCTION

Scope

This work package includes complete instructions for making items authorized to be manufactured or fabricated at the field level maintenance.

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 page 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.

Table 1. Index of Manufactured Items.

ITEM NO.	PART NO.	NAME	PAGE NO.
		Not Applicable	

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

TORQUE LIMITS

INTRODUCTION

This work package contains the torque standards for specific types and sizes of hardware. It defines the different types of bolts by grade. Special torque values and sequences are listed in the specific maintenance procedure.

TORQUE TABLES

How To Use Torque Tables 1 and 2

1. Measure diameter of screw being installed (Figure 1).

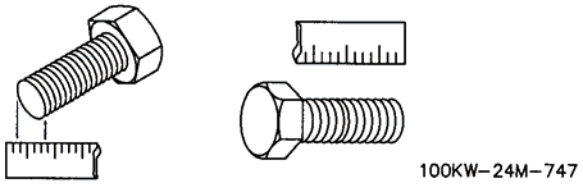


Figure 1. Measuring Screw.

2. Count number of threads per inch (TPI) or use a pitch grade.

3. Under heading SIZE, look down DIA IN. column until you find diameter of screw being installed. (There will usually be two lines beginning with same size.)

4. Under heading SIZE, look down TPI column to find numbers of threads per inch that match number of threads counted in step 2. (Not required for metric screws.)

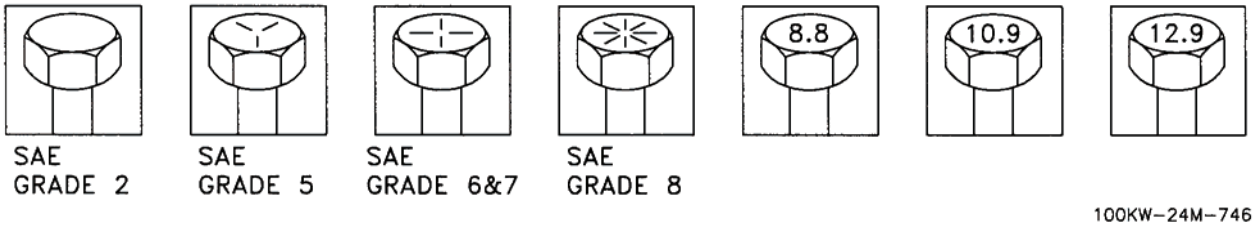


Figure 2. Capscrew Head Markings.

NOTE

Manufacturer's marks may vary. Standard is all SAE Grade 5 (3-line). Metric screws are of three grades: 8.8, 10.9, and 12.9. Grades and manufacturer's marks appear on the screw head.

5. To find the grade screw being installed, match markings on screw head to correct picture of CAPSCREW HEAD MARKINGS in Figure 2.

TORQUE TABLES - Continued

Table 1. Standard Dry Torque Limits.

SIZE			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 OR 7		SAE GRADE NO. 8	
DIA IN.	TPI	DIA MM	LB-FT	NM	LB-FT	NM	LB-FT	NM	LB-FT	NM
1/4	20	6.35	5	7	8	11	10	14	12	16
1/4	28	6.35	6	9	10	14	12	16	14	19
5/16	18	7.94	11	15	17	23	21	28	25	34
5/16	24	7.94	12	16	19	26	24	33	25	34
3/8	16	9.53	20	27	30	41	40	54	45	61
3/8	24	9.53	23	31	35	47	45	61	50	68
7/16	14	11.11	30	41	50	68	60	81	70	95
7/16	20		35	47	55	75	70	95	90	108
1/2	13	12.70	50	68	75	102	95	129	110	149
1/2	20		55	75	90	122	100	135	120	163
9/16	12	14.29	65	85	110	149	135	183	150	203
9/16	18		75	102	120	163	150	203	170	231
5/8	11	15.88	90	122	150	203	190	258	220	298
5/8	18		100	136	180	244	210	285	240	325
3/4	10	19.05	160	217	260	353	240	434	380	515
3/4	16		180	244	300	407	360	488	420	597
7/8	9	22.23	140	190	400	542	520	705	600	814
7/8	14		155	210	440	597	580	786	660	895
1	8	25.40	220	298	580	786	800	1085	900	1220
1	12		240	325	640	868	860	1166	1000	1350
1-1/8	7	25.58	300	407	800	1085	1120	1519	1280	1736
1-1/8	12		340	461	880	1193	1260	1709	1440	1953

TORQUE TABLES - Continued

Table 1. Standard Dry Torque Limits - Continued.

SIZE			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 OR 7		SAE GRADE NO. 8	
DIA IN.	TPI	DIA MM	LB-FT	NM	LB-FT	NM	LB-FT	NM	LB-FT	NM
1-1/4	7	31.75	420	570	1120	1519	1580	2142	1820	2468
1-1/4	12		460	624	1240	1681	1760	2387	2000	2712
1-3/8	6	34.93	560	759	1460	1980	2080	2820	2380	3227
1-3/8	12		640	868	1680	2278	2360	3227	2720	3668
1-1/2	6	38.10	740	1003	1940	2631	2780	3770	3160	4285
1-1/2	12		840	1139	2200	2983	3100	4204	3560	4827

Table 2. Metric Dry Torque Limits.

SIZE		METRIC GRADE 8.8		METRIC GRADE 10.9		METRIC GRADE 12.9	
DIA IN.	DIA MM	LB-FT	NM	LB-FT	NM	LB-FT	NM
0.157	4	2	3	3	4	4	5
0.197	5	4	5	6	8	7	9
0.237	6	7	9	10	14	11	15
0.276	7	11	15	16	32	20	27
0.315	8	18	24	25	34	29	39
0.394	10	32	43	47	64	58	79
0.473	12	58	79	83	113	100	136
0.630	16	144	195	196	266	235	319
0.709	18	190	258	269	365	323	438
0.788	20	260	353	366	496	440	597

TORQUE TABLES - Continued

Table 2. Metric Dry Torque Limits - Continued.

SIZE		METRIC GRADE 8.8		METRIC GRADE 10.9		METRIC GRADE 12.9	
DIA IN.	DIA MM	LB-FT	NM	LB-FT	NM	LB-FT	NM
0.867	22	368	499	520	705	678	919
0.946	24	470	637	664	900	794	1077
1.064	27	707	959	996	1351	1235	1675
1.182	30	967	1311	1357	1840	1630	2210

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
WIRE LISTS

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Materials/Parts

None

References

FO-1
FO-2
FO-3
FO-4
TM 55-1500-323-24

Personnel Required

One

INTRODUCTION

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

This work package contains the wire lists for the 100 kW Tactical Quiet Generator Set (TQG). The wire lists are used in conjunction with the schematic diagrams (Figure FO-1 thru FO-4, located in the back of this manual) during troubleshooting and repair of the TQG. All wiring information is provided, including wire color, wire gauge, wire type by part number/specification, and wire splice data. The wire lists are double ended which lists each wire path twice. The second wire path listing transposes the origin and destination components. Double ending a wire list facilitates locating a particular wire path by permitting a search for either component as the origin.

INTRODUCTION - Continued

Notes peculiar to each wire list are located on the first page of each wire list.

Location diagrams of the engine sensors and connector diagrams are Figure 1 and Figure 2, ahead of the wire lists.

This work package contains the following wire lists:

Table 1. Control Panel Wire List
Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List
Table 3. ECM to EMCP Harness Wire List
Table 4. Engine Harness Wire List
Table 5. Engine Harness to Unit Injectors Wire List
Table 6. Winterization Control Panel Wire List
Table 7. Winterization Kit Heater Cable Wire List
Table 8. Winterization Kit Power Cable Wire List

GENERAL WIRING REPAIR PROCEDURES

The following general procedures should be followed as a guide to wiring repair and troubleshooting. Detailed repair procedures and the use of standard repair tools and methods are found in TM 55-1500-323-24 (TO 1-1A-14/NAVAIR 01-1A-505).

1. Verify 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.
2. Tag and identify all wires before removing or disconnecting.
3. Inspect wire labels and replace if missing or damaged.
4. Verify continuity of wires point to point using digital multimeter.
5. Inspect all wires for breaks, nicks, abrasions, and heat damage.
6. Inspect wiring for signs of arcing or electrical damage.
7. Tighten all connectors and check for cracks, signs of electrical damage, or missing pins or sockets.
8. Inspect for loose connections at electrical components and tighten as necessary.
9. Inspect terminal board connections and tighten spade connectors as necessary.
10. Inspect wire harnesses and ensure that wire ties are not broken or removed.
11. Replace wire ties as necessary to prevent wires from chafing or other damage.

HARNESS INSPECTION PROCEDURES

Most electrical problems are caused by poor connections. The following procedure will assist in detecting problems with connectors and wiring. If a problem is found, correct the condition and verify that the problem is resolved. Intermittent electrical problems are sometimes resolved by disconnecting and reconnecting connectors. It is very important to check for diagnostic codes immediately before disconnecting a connector. Also check for diagnostic codes after reconnecting the connector. If the status of a diagnostic code is changed due to disconnecting and reconnecting a connector, there are several possible reasons. The likely reasons are loose terminals, improperly crimped terminals, moisture, corrosion, and inadequate mating of a connection. Follow these guidelines:

1. Always use the correct tools designed for each connector. Never solder the terminals onto the wires.

2. Always use a breakout harness for a voltmeter probe or a test light. Never break the insulation of a wire in order to access to a circuit for measurements.

3. If a wire is cut, always install a new terminal as part of the repair.

WARNING

The connection or disconnection of any electrical equipment and the disconnection of any electrical equipment may cause an explosion hazard which may result in injury or death. Do not connect any electrical equipment or disconnect any electrical equipment in an explosive atmosphere.

Moisture and Corrosion Inspection

1. Inspect all wiring harnesses. Ensure that the routing of the wiring harness allows the wires to enter the face of each connector at a perpendicular angle. Otherwise, the wire will deform the seal and will create a path for the entrance of moisture. Verify that the seals for the wires are sealing properly.

2. Ensure that the sealing plugs are in place. If any of the plugs are missing, replace the plug. Ensure that the plugs are inserted correctly into the connector.

3. Disconnect the suspect connector and inspect the connector seal. Ensure that the seals are in good condition. If necessary, replace the connector.

4. Thoroughly inspect the connectors for evidence of moisture.

NOTE

Minor abrasion on connector seals is normal and will not allow the entry of moisture.

5. If moisture or corrosion is evident in the connector, the source of the moisture must be found and repaired. If the source of the moisture is not repaired, the problem will recur. Simply drying the connector will not fix the problem. Check the following items for possible moisture entry.

   a. Missing or improperly installed seals.

   b. Nicks in exposed insulation

   c. Improperly mated connectors

Moisture and Corrosion Inspection - Continued

6. Moisture can also travel to a connector through the inside of a wire. If moisture is found in a connector, thoroughly check the connector's harness for damage. Also check other connectors that share the harness for moisture. Repair the connectors or the wiring, as required. Ensure that all of the seals are properly in place and that the connectors have been reconnected.

NOTE

The ECM is a sealed unit. If moisture is found in an ECM connector, the ECM is not the source of the moisture. Do not replace the ECM.

7. If corrosion is evident on the terminals or the connector, use only denatured alcohol to remove the corrosion. Use a cotton swab or a soft brush to remove the corrosion.

8. If moisture was found in the connectors, run the engine for several minutes and check again for moisture. If moisture reappears, the moisture is wicking into the connector. Even if the moisture entry path is repaired, it may be necessary to replace the wires.

Wire Insulation Damage Inspection

1. Carefully inspect each wire for signs of abrasion, of nicks, and of cuts. Inspect the wires for the following conditions:

   a. Exposed conductors

   b. Wire rubbing against the engine

   c. Wire rubbing against a sharp point

2. Check all wiring harness fasteners and verify that the harness is properly secured. Also check all of the fasteners and verify that the harness is not compressed. Pull back the harness sleeves in order to check for a flattened portion of wire. A fastener that has been over-tightened flattens the harness. This damages the wires that are inside the harness. Repair or replace damaged wires, as required.

Connector Terminal Inspection

Visually inspect each terminal in the connector. Verify that the terminals are not damaged. Verify that the terminals are properly aligned in the connector and verify that the terminals are properly located in the connector. Repair the terminals and/or replace the terminals, as required.

Wire Terminal Connection Pull Test

1. Ensure that the locking wedge for the connector is installed properly. Terminals cannot be retained inside the connector if the locking wedge is not installed properly.

2. Conduct an adequate pull test on each wire. Each terminal and each connector should easily withstand 10 lb (45 N) of tension and each wire should remain in the connector body. This test checks whether the wire was properly crimped in the terminal and whether the terminal was properly inserted into the connector. Replace damaged connectors, as required.

Terminal Retention into Socket Inspection

Verify that the connector sockets provide good retention for the terminals. Insert a new terminal into each connector socket one at a time in order to check for a good grip on the terminal by the socket. If a new terminal is not secure in the connector socket, replace the connector.

Connector Locking Mechanism Inspection

1. Ensure that the connectors lock properly. After locking the connectors, ensure that the two mating connector sections cannot be pulled apart. Repair the connector or replace the connector, as required.

2. Verify that the latch tab of the connector is properly latched. Also verify that the latch tab of the connector returns to the locked position. Repair the connector or replace the connector, as required.

Connector Allen Head Screw Inspection

1. Visually inspect the allen head screws on the ECM connectors (Figure 2, Sheet 2).

2. Ensure that the threads on each allen head screw are not damaged.

3. Connect the engine harness connectors to the ECM connectors J1 and J2. Connect ENG-P37 to J37.

    a. Torque the allen head screw for the ECM harness connectors to 55.0 +13.0 –4.0 lb in. (6.0 +1.5 -0.5 Nm). If connector cannot be tightened, repair or replace the connector, as required.

    b. Torque the allen head screw for the ECM harness connector J37 to 20.0 ±2.0 lb in. (2.25 ± 0.25 Nm). If connector cannot be tightened, repair or replace the connector, as required.

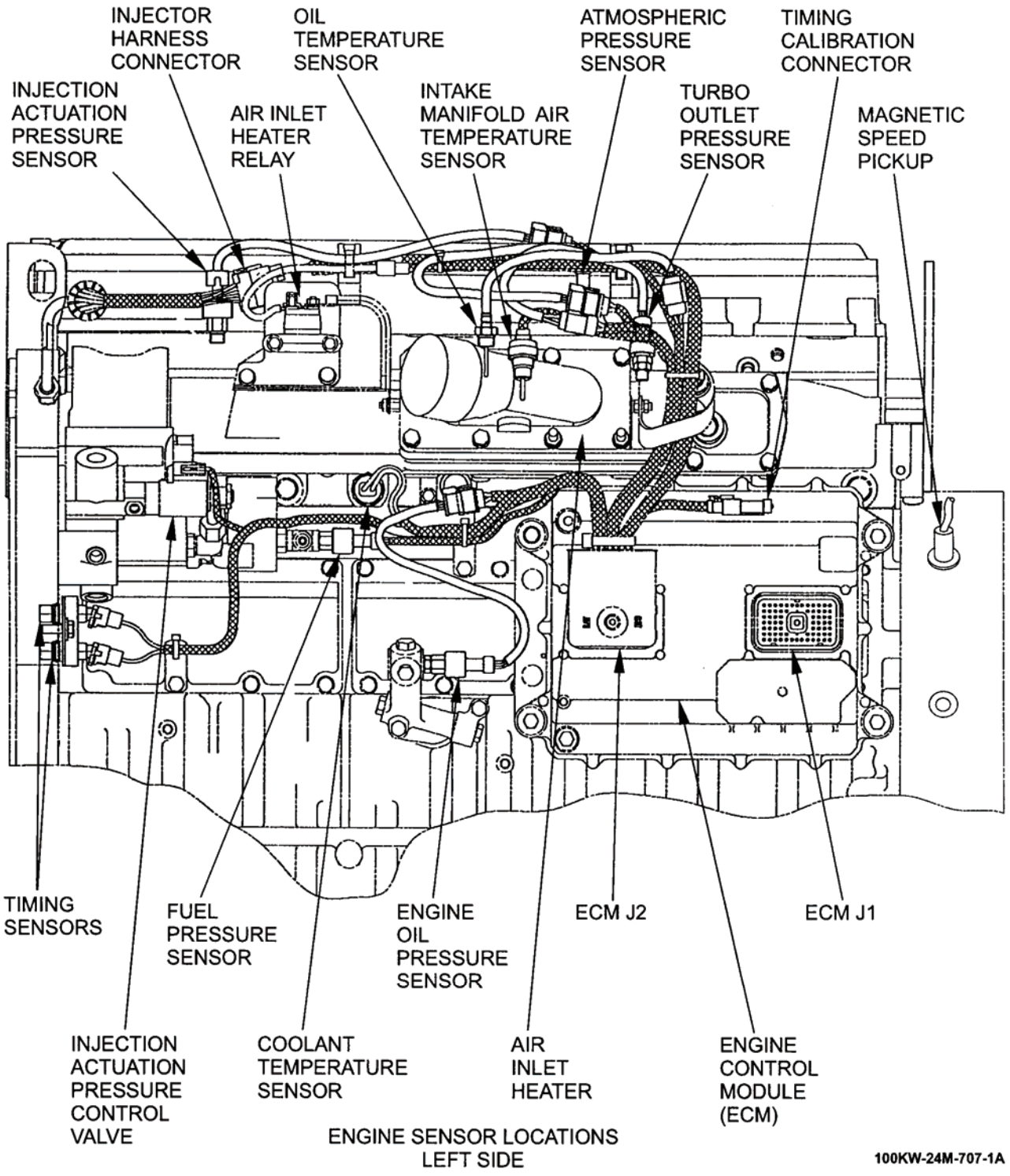


Figure 1. Engine Sensors (Sheet 1 of 2).

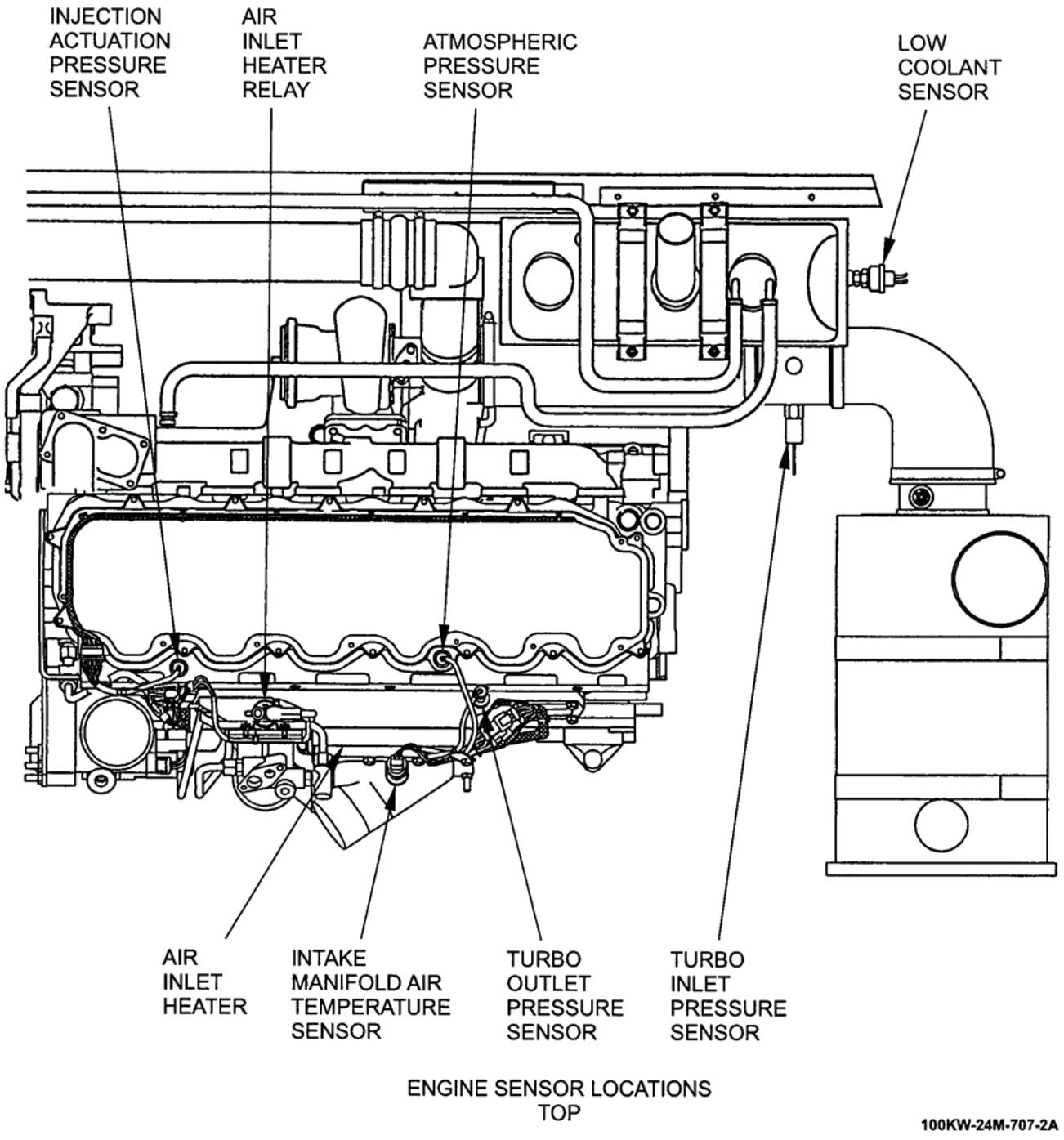


Figure 1. Engine Sensors (Sheet 2 of 2).

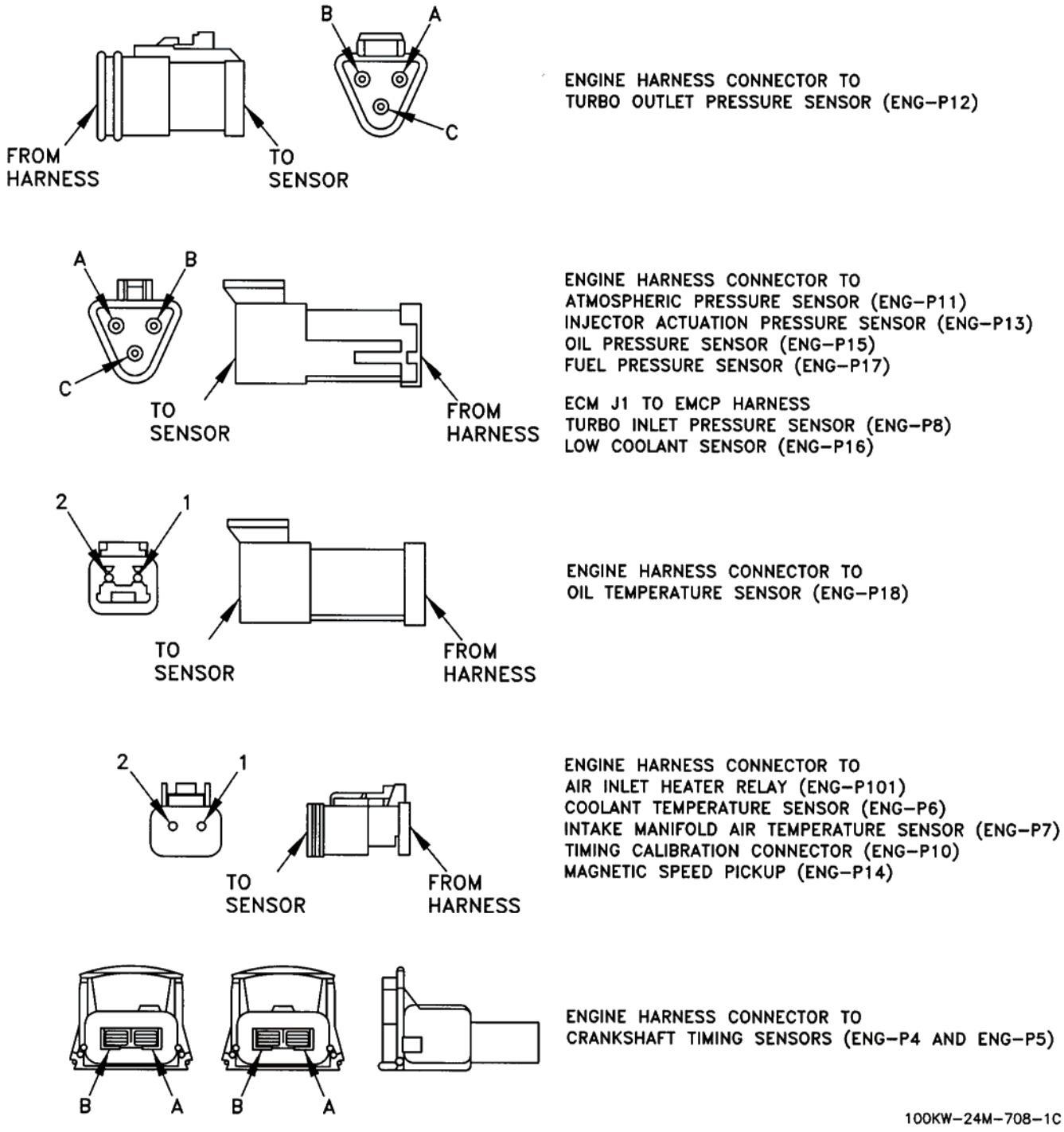


Figure 2. Wire Harness Connectors (Sheet 1 of 3).

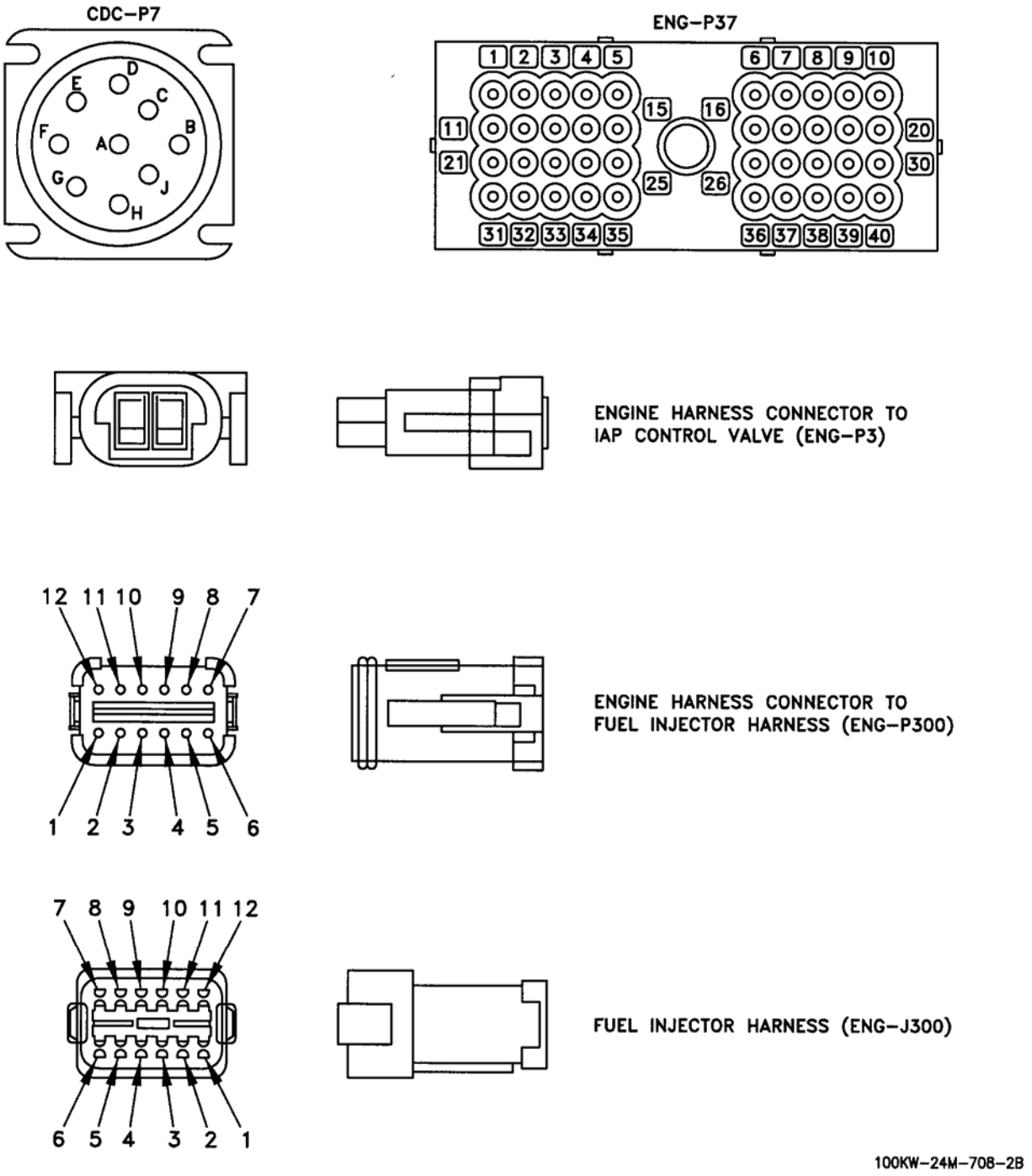


Figure 2. Wire Harness Connectors (Sheet 2 of 3).

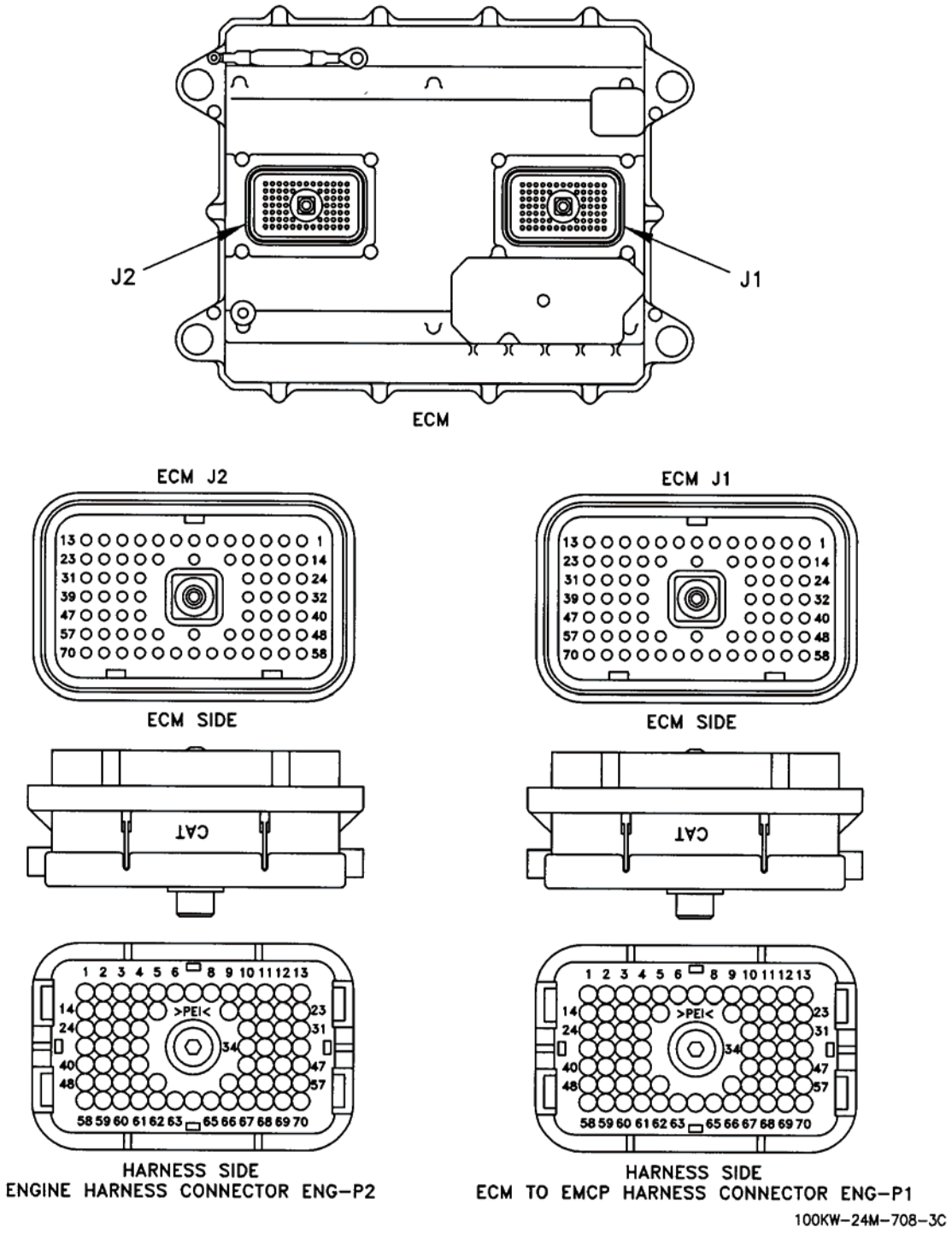


Figure 2. Wire Harness Connectors (Sheet 3 of 3).

Table 1. Control Panel Wire List.

NOTES

Color Code

0 Black	5 Green
1 Brown	6 Blue
2 Red	7 Violet
3 Orange	8 Gray
4 Yellow	9 White

Abbreviations used in table can be found in FO-1 at the back of this manual or in List of Abbreviations/Acronyms (WP 0001).

The list below describes End Prep in Table 1:

Code	Part Number	Nomenclature
1	88-20274-1	Terminal, Spade, 22-18 AWG #6
2	88-20274-5	Terminal, Spade, 16-14 AWG #6
3	88-20274-10	Terminal, Spade, 12-10 AWG #6
4	88-2219-18	Terminal, Ring Tongue, 16-14 AWG 1/4
5	0116-1201-19	Socket, Connector
6	88-21943	Pin
7	0116-1201-17	Plug, Seal
8	0116-1223	Pin, Connector
9	0116-1201-16	Pin, Connector
10	98-19529-02	Contact, Electrical, Female, 18-24 AWG
11	88-20274-11	Terminal, Spade, 16-14 AWG #8
12	88-20274-6	Terminal, Spade, 16-14 AWG #10
13	88-22119-17	Terminal Lug, Ring Tongue 12-10 AWG 1/4
14	88-20274-3	Terminal, Spade, 22-18 AWG #8
15	88-20274-4	Terminal, Spade, 22-18 AWG #10
16	MS25036-102	Terminal Lug
17	-	Solder to terminal
18	0116-1207-02	Contact, Electrical, Male

The list below describes Wire Type column in Table 1:

Wire Code	Nomenclature	Part Number
A	Wire, Electric, 14 Ga	M22759/16-14-9
B	Wire, Electric, 16 Ga	M22759/16-16-9
C	Wire, Electric, 18 Ga	M22759/16-18-9
D	Wire, Electric, 10 Ga	M22759/16-10-9
E	Cable, Shielded 2 Conductor, 18 AWG	0116-1262-01
F	Cable, Shielded 3 Conductor, 18 AWG	0116-1262-02

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
A1	B+	4	A	14	9			TB4	22B	27C14
A1	1	1	C	18	9			AR	1	41E18
A1	2		A	14	9			A1	B (+)	
A1	10	2	B	16	9			A1	24	61A16
A1	13	1	C	18	9			TB3	14B	44C18
A1	14	1	C	18	9			J37	26	45A18
A1	18	1	C	18	9			KFF	12	14A18
A1	22	1	C	18	9			GFR	14	43A18
A1	24	2	B	16	9			A1	10	61A16
A1	26	2	B	16	9			TB4	11A	54A16
A1	27	1	C	18	9			TB3	7A	2AL18
A1	28		A	14	9			A1	B (-)	-
A1	28						SH9$	511 SHIELD	GND	
A1	28						SH10$	512 SHIELD	GND	
A1	28						SH4$	504 SHIELD	GND	
A1	29		A	14	9			A1	B (+)	
A1	38	1	C	18	9			TB4	21A	27F18
A1	39	2	A	14	9			TB4	19B	21Al4
A1	B(-)	4	B	16	9			CB	GND	2J16
A1	B(-)	4	B	16	9			CP	GND	2K16
A2	1	1	C	18	9			TB4	19B	21H18
A2	4	1	C	18	9			TB3	19A	4A18
A2	7	1	C	18	9			TB3	5A	2AG18
A2	8	1	C	18	9			P51	18	5A18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
A2	9	1	C	18	9			P51	5	6A18
A2	12	1	C	18	9			AR	13	3A18
A3	B(-)	1	C	18	9			TB3	9A	2AT18
A3	B+	1	C	18	9			TB4	18A	21L18
A3	F1	2	A	14	9			TB3	22B	99A14
A3	F2	2	A	14	9			TB3	21B	98A14
A3	GND	2	A	14	9			CB	GND	2BN14
A3	3	2	E	18	9			P7	24	34A18
A3	5	2	B	16	9			A7	5	116A16
A3	6	2	B	16	9			A7	6	115A16
A3	7	1	E	18	2		SH5	VAR	3	505
A3	20	2	B	16	9			TB4	6B	109D16
A3	22	2	B	16	9			TB4	8B	107D16
A3	24	2	B	16	9			TB4	7B	108D16
A3	26	2	A	14	9			J31	6	135A14
A3	28	2	A	14	9			J31	7	136A14
A3	30	2	A	14	9			J31	5	134A14
A3	45	1	E	-	-		SH5$	Dead		
A3	45	1	E	18	9		SH5	VAR	1	505
A4	GND	1	C	18	9			TB3	5A	2AA18
A4	1	1	C	18	9			TB4	8A	107E18
A4	2	1	C	18	9			TB4	7A	108E18
A4	3	1	C	18	9			TB4	6A	109H18
A4	4	2	B	16	9			J31	16	111B16
A4	5	2	B	16	9			P51	2	127A16
A4	6	2	B	16	9			J31	15	112B16

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
A4	7	2	B	16	9			P51	1	128A16
A4	8	2	B	16	9			J31	18	113B16
A4	9	2	B	16	9			P51	12	129A16
A4	10	1	E	18	2		SH1	PAR	10	501
A4	11	1	E	18	9		SH1	PAR	9	501
A4	12	1	E	-	-		SH1$	Dead End		501
A4	13	1	C	18	9			A7	1	137A18
A4	14	1	C	18	9			J30	32	139A18
A4	15	2	A	14	9			TB4	19A	21C14
A4	16	2	A	14	9			TB3	4A	2T14
A4	19	1	E	18	2		SH8	J37	23	508
A4	20	1	E	18	9		SH8	J37	11	508
A4	21	1	F	-	-		SH6$	Dead End		506
A4	21	1	E	-	-		SH7$	Dead End		507
A4	21	1	E	-	-		SH8$	J37	12	508
A4	24	1	E	18	2		SH7	P7	27	507
A4	25	1	E	18	9		SH7	P7	28	507
A4	25	2	B	16	9			TB3	9A	2AW16
A4	26	1	F	18	0		SH6	SSP	3	506
A4	27	1	F	18	9		SH6	SSP	2	506
A4	28	1	F	18	2		SH6	SSP	1	506
A5	F1	14	C	18	9			J31	1	101D18
A5	F2	14	C	18	9			J31	3	102D18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
A5	F3	14	C	18	9			J31	12	103D18
A5	H21	1	C	18	9			TB4	2A	110G18
A5	TBC 50	2	B	16	9			J31	14	150B16
A5	TBC 51	2	B	16	9			J31	4	151B16
A5	TBC 52	2	B	16	9			J31	9	152B16
A5	TBC 53	2	B	16	9			J31	13	153B16
A5P1	1	9	C	18	9			P7	10	149A18
A5P1	2	9	C	18	9			P7	11	148A18
A5P1	3	9	C	18	9			P7	12	147A18
A5P1	4	9	C	18	9			P7	4	144A18
A5P1	5	9	C	18	9			P7	5	145A18
A5P1	6	9	C	18	9			P7	6	146A18
A5P1	7	9	C	18	9			P7	16	110E18
A5P1	8	9	C	18	9			A6P1	C	110D18
A6	B21	1	C	18	9			TB4	1A	110F18
A6	F1	14	C	18	9			J31	19	121D18
A6	F2	14	C	18	9			DBHI	14	123F18
A6P1	A	9	C	18	9			P7	17	155A18
A6P1	B	9	C	18	9			P7	18	156A18
A6P1	C	9	C	18	9			A5P1	8	110D18
A7	1	1	C	18	9			A4	13	137A18
A7	11	2	A	14	9			J30	9	17B14
A7	12	2	A	14	9			TB4	22A	27B14
A7	2	1	C	18	9			J30	31	138B18
A7	3	1	C	18	9			DBHI	4	122E18
A7	4	1	C	18	9			DBHI	13	154A18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
A7	5	2	B	16	9			A3	5	116A16
A7	5	2	B	16	9			J30	35	116B16
A7	6	2	B	16	9			A3	6	115A16
A7	6	2	B	16	9			J30	36	115B16
A7	8	1	C	18	9			KFF 8	8	15A18
A7	9	1	C	18	9			TB3	22A	99D18
AFPR	5	1	C	18	9			TB4	20A	21E18
AFPR	8	1	C	18	9			J30	2	10AI8
AFPR	9	1	C	18	9			J30	1	8A18
AFPR	12	1	C	18	9			AFPR	14	11B18
AFPR	13	1	C	18	9			TB3	1B	2U18
AFPR	14	1	C	18	9			AFPR	12	11B18
AFPR	14	1	C	18	9			J30	3	11A18
AFPS	1	1	C	18	9			J30	5	69A18
AFPS	2	1	C	18	9			TB4	18B	21K18
AR	1	1	C	18	9			A1	1	41E18
AR	1	1	C	18	9			TB4	16B	41D18
AR	9	1	C	18	9			P51	8	42A18
AR	13	1	C	18	9			A2	12	3A18
AR	14	1	C	18	9			TB4	20A	21F18
BSS	1	2	C	18	9			TB3	16B	56A18
BSS	2	2	C	18	9			GFR	9	52B18
BSS	4	1	C	18	9			J37	35	73A18
BSS	5	1	C	18	9			TB3	3B	2AS18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
CB	GND	14	A	14	9			A3	GND	2BN14
CB	GND	4	B	16	9			AI	B(-)	2J16
CB	GND	13	D	10	9			TB3	4A	2H10
CCL	1	17	C	18	9			TB4	22B	27D18
CCL	2	17	C	18	9			TB3	12B	68B18
CCL	3	17	C	18	9			TB3	8B	2AX18
CCS	1	2	C	18	9			PSU	2	65A18
CCS	2	2	C	18	9			TB4	15B	49B18
CCS	4	2	C	18	9			TB4	15B	49A18
CCS	5	2	C	18	9			TB3	16B	56B18
CDR	4	2	C	18	9			TB4	11B	54D18
CDR	12	1	C	18	9			KR	14	36A18
CDR	13	1	C	18	9			P7	36	78A18
CDR	14	2	C	18	9			KR	12	54C18
CP	GND	11	B	16	9			A1	B(-)	2K16
DBHI	1	1	C	18	9			DBLO	1	58A18
DBHI	2	1	C	18	9			P7	29	29A18
DBHI	4	1	C	18	9			A7	3	122E18
DBHI	4	1	C	18	9			J31	8	122D18
DBHI	9	1	C	18	9			PSU	3	57A18
DBHI	10	1	C	18	9			DBLO	12	59A18
DBHI	12	1	C	18	9			DBLO	13	157A18
DBHI	13	1	C	18	9			A7	4	154A18
DBHI	14	1	C	18	9			A6	F2	123F18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
DBHI	14	1	C	18	9			DBLO	14	123E18
DBLO	1	1	C	18	9			DBHI	1	58A18
DBLO	4	1	C	18	9			TB3	3B	2Y18
DBLO	9	1	C	18	9			TB3	4B	2Z18
DBLO	12	1	C	18	9			DBHI	10	59A18
DBLO	13	1	C	18	9			DBHI	12	157A18
DBLO	14	1	C	18	9			DBHI	14	123E18
DBLO	14	1	C	18	9			J31	17	123D18
DCA	(-)	4	C	18	9			J30	24	24G18
DCA	(+)	4	C	18	9			J30	25	25D18
ECS	1	15	C	18	9			TB3	6A	2AJ18
ECS	2	15	C	18	9			P7	39	39A18
ECS	3	15	C	18	9			P7	40	40A18
ECS	4	7	C	18	9			TB3	17B	33B18
ECS	5	15	C	18	9			P7	32	32A18
ECS	6	15	C	18	9			TB4	21B	27H18
ECS	8	15	C	18	9			TB4	16A	41A18
ECS	9	15	C	18	9			TB4	16A	41B18
ECS	10	15	C	18	9			TB4	16B	41C18
End	-	505	-							
ESPB	1	1	C	18	9			KFF	14	14C18
ESPB	1A	1	C	18	9			TB3	14B	44A18
ESPB	2	1	C	18	9			J30	15	60A18
ESPB	2A	1	C	18	9			TB3	6A	2AH18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
ESPB	3	1	C	18	9			P7	38	38A18
ESPB	4	1	C	18	9			TB3	7A	2AK18
FLG	G	14	C	18	9			TB3	5B	2AB18
FLG	I	14	C	18	9			TB4	20B	21D18
FLG	S	14	C	18	9			J30	7	80B18
GFR	1	2	C	18	9			P51	10	53A18
GFR	9	2	C	18	9			BSS	2	52B18
GFR	9	2	C	18	9			P51	7	52A18
GFR	13	1	C	18	9			TB3	1B	2V18
GFR	14	1	C	18	9			A1	22	43A18
J101	G	11	C	16	9			TB3	7B	2AV16
J30	1	6	C	18	9			AFPR	9	8A18
J30	2	6	C	18	9			AFPR	8	10AI8
J30	3	6	C	18	9			AFPR	14	11A18
J30	4	6	C	18	9			TB3	19A	4C18
J30	5	6	C	18	9			AFPS	1	69A18
J30	7	6	C	18	9			FLG	S	80B18
J30	8	6	B	16	9			TB4	19A	21B16
J30	9	8	A	14	9			A7	11	17B14
J30	10	6	B	16	9			TB4	6A	109C16
J30	12	6	C	18	9			TB3	12A	68C18
J30	13	6	B	16	9			TB4	21A	27J16
J30	14	6	C	18	9			TB4	10A	76B18
J30	15	6	C	18	9			ESPB	2	60A18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
J30	16	8	A	14	9			TB4	5A	109F14
J30	17	8	A	14	9			TB4	1A	110M14
J30	18	6	B	16	9			TB4	17A	21M16
J30	19	6	C	18	9			TB4	15A	49C18
J30	20	6	B	16	9			TB3	4B	2S16
J30	23	6	B	16	9			KR	8	50A16
J30	24	6	C	18	9			DCA	(-)	24G18
J30	25	6	C	18	9			DCA	(+)	25D18
J30	28	8	A	14	9			TB3	21A	98C14
J30	29	8	A	14	9			TB3	22A	99C14
J30	31	6	C	18	9			A7	2	138B18
J30	32	6	C	18	9			A4	14	139A18
J30	33	7	C	18	9			TB3	17A	33C18
J30	34	6	B	16	9			TB4	7A	108C16
J30	35	6	B	16	9			A7	5	116B16
J30	36	6	B	16	9			A7	6	115B16
J30	37	6	B	16	9			TB4	8A	107C16
J31	1	6	C	18	9			A5	F1	101D18
J31	3	6	C	18	9			A5	F2	102D18
J31	4	6	B	16	9			A5	TBC-51	151B16
J31	5	8	A	14	9			A3	30	134A14
J31	6	8	A	14	9			A3	26	135A14
J31	7	8	A	14	9			A3	28	136A14
J31	8	6	C	18	9			DBHI	4	122D18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
J31	9	6	B	16	9			A5	TBC-52	152B16
J31	10	6	B	16	9			TB4	3A	110C16
J31	11	6	B	16	9			TB4	14A	114D16
J31	12	6	C	18	9			A5	F3	103D18
J31	13	6	B	16	9			A5	TBC-53	153B16
J31	14	6	B	16	9			A5	TBC-50	150B16
J31	15	6	B	16	9			A4	6	112B16
J31	16	6	B	16	9			A4	4	111B16
J31	17	6	C	18	9			DBLO	14	123D18
J31	18	6	B	16	9			A4	8	113B16
J31	19	6	C	18	9			A6	F1	121D18
J32	A	17	E	18	9		SH2	PAR	5	502
J32	B	17	E	18	2		SH2	PAR	6	502
J32	E	-	C	18	9			RP GND		2JA18
J33	A	17	E	18	9		SH3	PAR	5	503
J33	B	17	E	18	2		SH3	PAR	6	503
J33	E	-	C	18	9			RP GND		2JB18
J37	1	9	E	18	2		SH4	P7	1	504
J37	2	9	E	18	9		SH4	P7	2	504
J37	3	18	E	-	-		SH4$	A1	28	504
J37	7	9	C	18	9			P7	7	19A18
J37	8	9	C	18	9			P7	8	20AI8
J37	9	9	C	18	9			P7	9	9A18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
J37	11	9	E	18	9		SH8	A4	20	508
J37	12	18	E	-	-		SH8$	A4	21	508
J37	13	9	C	18	9			P7	13	13A18
J37	14	9	C	18	9			P7	14	16A18
J37	19	9	E	18	2		SH9	P7	19	511
J37	20	9	E	18	9		SH9	P7	20	511
J37	21	9	E	18	2		SH10	P7	21	512
J37	22	9	E	18	9		SH10	P7	22	512
J37	23	9	E	18	2		SH8	A4	19	508
J37	26	9	C	18	9			A1	14	45A18
J37	27	9	C	18	9			TB3	14A	44B18
J37	30	9	C	18	9			P7	30	18A18
J37	31	6	C	18	9			P7	31	31A18
J37	35	9	C	18	9			BSS	4	73A18
J37	40	9	B	16	9			TB4	17A	21N16
KFF	5	1	C	18	9			TB3	21A	98E18
KFF	8	1	C	18	9			A7	8	15A18
KFF	9	1	C	18	9			TB3	2B	2X18
KFF	12	1	C	18	9			A1	18	14A18
KFF	12	1	C	18	9			KFF	14	14B18
KFF	13	1	C	18	9			TB3	2B	2W18
KFF	14	1	C	18	9			ESPB	1	14C18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
KFF	14	1	C	18	9			KFF	12	14B18
KR	8	2	B	16	9			J30	23	50A16
KR	12	2	C	18	9			CDR	14	54C18
KR	12	2	B	16	9			TB4	11B	54B16
KR	13	6	C	18	9			P51	6	51A18
KR	14	1	C	18	9			CDR	12	36A18
P51	6	10	C	18	9			KR	13	51A18
P51	1	10	B	16	9			A4	7	128A16
P51	2	10	B	16	9			A4	5	127A16
P51	3	10	B	16	9			TB4	14B	114E16
P51	4	10	C	18	9			TB3	2A	2N18
P51	5	10	C	18	9			A2	9	6A18
P51	7	10	C	18	9			GFR	9	52A18
P51	8	10	C	18	9			AR	9	42A18
P51	9	10	C	18	9			TB3	3A	2M18
P51	10	2	C	18	9			GFR	1	53A18
P51	11	10	B	16	9			TB4	14B	114F16
P51	12	10	B	16	9			A4	9	129A16
P51	13	10	B	16	9			TB4	14A	114G16
P51	15	10	B	16	9			TB4	5A	109G18
P51	16	10	C	18	9			TB4	2A	110H18
P51	18	10	C	18	9			A2	8	5A18
P51	19	10	C	18	9			TB3	2A	2P18
P51	20	10	C	18	9			TB3	16A	56C18
P7	1	5	E	18	2		SH4	J37	1	504

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
P7	2	5	E	18	9		SH4	J37	2	504
P7	4	5	C	18	9			A5P1	4	144A18
P7	5	5	C	18	9			A5P1	5	145A18
P7	6	5	C	18	9			A5P1	6	146A18
P7	7	5	C	18	9			J37	7	19A18
P7	8	5	C	18	9			J37	8	20AI8
P7	9	5	C	18	9			J37	9	9A18
P7	10	5	C	18	9			A5P1	1	149A18
P7	11	5	C	18	9			A5P1	2	148A18
P7	12	5	C	18	9			A5P1	3	147A18
P7	13	5	C	18	9			J37	13	13A18
P7	14	7	C	18	9			J37	14	16A18
P7	15	5	C	18	9			SMS	1	55A18
P7	16	5	C	18	9			A5P1	7	110E18
P7	17	5	C	18	9			A6P1	A	155A18
P7	18	5	C	18	9			A6P1	B	156A18
P7	19	5	E	18	2		SH9	J37	19	511
P7	20	5	E	18	9		SH9	J37	20	511
P7	21	5	E	18	2		SH10	J37	21	512
P7	22	5	E	18	9		SH10	J37	22	512
P7	23	7	C	18	9			TB3	19B	4D18
P7	24	5	C	18	9			A3	3	34A18
P7	25	5	C	18	9			TB3	12A	68D18
P7	26	5	C	18	9			SMS	6	46A18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
P7	27	5	E	18	2		SH7	A4	24	507
P7	28	5	E	18	9		SH7	A4	25	507
P7	29	5	C	18	9			DBHI	2	29A18
P7	30	5	C	18	9			J37	30	18A18
P7	31	5	C	18	9			J37	31	31A18
P7	32	5	C	18	9			ECS	5	32A18
P7	33	5	C	18	9			TB3	17B	33A18
P7	36	5	C	18	9			CDR	13	78A18
P7	37	5	C	18	9			SMS	11	47A18
P7	38	5	C	18	9			ESPB	3	38A18
P7	39	5	C	18	9			ECS	2	39A18
P7	40	5	C	18	9			ECS	3	40A18
PAR	5	1	E	18	9		SH2	J32	A	502
PAR	5	1	E	18	9		SH3	J33	A	503
PAR	6	1	E	18	2		SH2	J32	B	502
PAR	6	1	E	18	2		SH3	J33	B	503
PAR	9	1	E	18	9		SH1	A4	11	501
PAR	10	1	E	18	2		SH1	A4	10	501
PAR	13	1	C	18	9			PSU	5	64A18
PAR	14	1	C	18	9			TB4	22A	27E18
PL1	(-)	1	C	18	9			TB3	8A	2AM18
PL1	(+)	1	C	18	9			TB3	11B	30D18
PL2	(-)	1	C	18	9			TB3	8A	2AN18
PL2	(+)	1	C	18	9			TB3	11A	30B18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
PL3	(-)	1	C	18	9			TB3	8B	2AP18
PL3	(+)	1	C	18	9			TB3	11B	30C18
PLS	1	1	C	18	9			TB4	21B	27G18
PLS	2	1	C	18	9			TB3	11A	30A18
PSU	1	2	C	18	9			TB3	15A	48A18
PSU	2	1	C	18	9			CCS	1	65A18
PSU	3	1	C	18	9			DBHI	9	57A18
PSU	4	1	C	18	9			TB3	12B	68A18
PSU	5	1	C	18	9			PAR	13	64A18
RP	GND	15	C	18	9			TB3	9B	2AR18
RP	GND	-	C	18	9			J32E		2JA18
RP	GND	15	C	18	9			J33E		2JB18
RP	GND	15	E	-	-		SH2$	Dead End		502
RP	GND	15	E	-	-		SH3$	Dead End		503
SMS	1	15	C	18	9			P7	15	55A18
SMS	4	15	C	18	9			TB3	5B	2AC18
SMS	5	15	C	18	9			TB3	6B	2AD18
SMS	6	15	C	18	9			P7	26	46A18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
SMS	8	15	C	18	9			TB3	6B	2AE18
SMS	10	15	C	18	9			TB3	7B	2AF18
SMS	11	15	C	18	9			P7	37	47A18
SMS	13	2	C	18	9			TB3	15B	48C18
SMS	14	2	C	18	9			TB4	13A	63A18
SMS	15	12	C	18	9			TB3	15B	48B18
SSP	1	17	F	18	2		SH6	A4	28	506
SSP	2	17	F	18	9		SH6	A4	27	506
SSP	3	17	F	18	0		SH6	A4	26	506
TB3	1B	1	C	18	9			AFPR	13	2U18
TB3	1 B	1	C	18	9			GFR	13	2V18
TB3	2A	1	C	18	9			P51	4	2N18
TB3	2A	1	C	18	9			P51	19	2P18
TB3	2B	1	C	18	9			KFF	13	2W18
TB3	2B	1	C	18	9			KFF	9	2X18
TB3	3A	1	C	18	9			P51	9	2M18
TB3	3B	1	C	18	9			BSS	5	2AS18
TB3	3B	1	C	18	9			DBLO	4	2Y18
TB3	4A	3	D	10	9			CB	GND	2H10
TB3	4A	2	A	14	9			A4	16	2T14
TB3	4B	1	C	18	9			DBLO	9	2Z18
TB3	4B	1	B	16	9			J30	20	2S16
TB3	5A	1	C	18	9			A2	7	2AG18
TB3	5A	1	C	18	9			A4	GND	2AA18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
TB3	5B	1	C	18	9			FLG	G	2AB18
TB3	5B	1	C	18	9			SMS	4	2AC18
TB3	6A	1	C	18	9			ECS	1	2AJ18
TB3	6A	1	C	18	9			ESPB	2A	2AH18
TB3	6B	1	C	18	9			SMS	5	2AD18
TB3	6B	1	C	18	9			SMS	8	2AE18
TB3	7A	1	C	18	9			A1	27	2AL18
TB3	7A	1	C	18	9			ESPB	4	2AK18
TB3	7B	2	B	16	9			J101	3	2AV16
TB3	7B	1	C	18	9			SMS	10	2AF18
TB3	8A	1	C	18	9			PL1	(-)	2AM18
TB3	8A	1	C	18	9			PL2	(-)	2AN18
TB3	8B	1	C	18	9			CCL	3	2AX18
TB3	8B	1	C	18	9			PL3	(-)	2AP18
TB3	9A	1	C	18	9			A3	B(-)	2AT18
TB3	9A	2	B	16	9			A4	25	2AW16
TB3	9B	1	C	18	9			RP	GND	2AR18
TB3	10B	1	C	18	9			HTR2	1	2BM18
TB3	11A	1	C	18	9			PL2	(+)	30B18
TB3	11A	1	C	18	9			PLS	2	30A18
TB3	11B	1	C	18	9			PL1	(+)	30D18
TB3	11B	1	C	18	9			PL3	(+)	30C18
TB3	12A	1	C	18	9			J30	12	68C18
TB3	12A	1	C	18	9			P7	25	68D18
TB3	12B	1	C	18	9			CCL	2 (-)	68B18

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
TB3	12B	1	C	18	9			PSU	4	68A18
TB3	14A	1	C	18	9			J37	27	44B18
TB3	14B	1	C	18	9			A1	13	44C18
TB3	14B	1	C	18	9			ESPB	1A	44A18
TB3	15A	2	C	18	9			PSU	1	48A18
TB3	15B	2	C	18	9			SMS	15	48B18
TB3	15B	2	C	18	9			SMS	13	48C18
TB3	16A	2	C	18	9			P51	20	56C18
TB3	16B	2	C	18	9			CCS	5	56B18
TB3	16B	2	C	18	9			BSS	1	56A18
TB3	17A	5	C	18	9			J30	33	33C18
TB3	17B	15	C	18	9			ECS	4	33B18
TB3	17B	15	C	18	9			P7	33	33A18
TB3	19A	1	C	18	9			A2	4	4A18
TB3	19A	1	C	18	9			J30	4	4C18
TB3	19B	1	C	18	9			P7	23	4D18
TB3	21A	2	A	14	9			J30	28	98C14
TB3	21A	1	C	18	9			KFF	5	98E18
TB3	21B	2	A	14	9			A3	F2	98A14
TB3	22A	1	C	18	9			A7	9	99D18
TB3	22A	2	A	14	9			J30	29	99C14
TB3	22B	2	A	14	9			A3	F1	99A14
TB4	1A	1	C	18	9			A6	B21	110F18
TB4	1A	2	A	14	9			J30	17	110M14
TB4	1B				9			CB3	LINE	

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
TB4	2A	1	C	18	9			A5	H21	110G18
TB4	2A	1	C	18	9			P51	16	110H18
TB4	3A	1	B	16	9			J31	10	110C16
TB4	5A	2	A	14	9			J30	16	109F14
TB4	5A	1	C	18	9			P51	15	109G18
TB4	5B				2			CB3	LINE	
TB4	6A	1	C	18	9			A4	3	109H18
TB4	6A	2	B	16	9			J30	10	109C16
TB4	6B	2	B	16	9			A3	20	109D16
TB4	7A	1	C	18	9			A4	2	108E18
TB4	7A	2	B	16	9			J30	34	108C16
TB4	7B	2	B	16	9			A3	24	108D16
TB4	8A	1	C	18	9			A4	1	107E18
TB4	8A	2	B	16	9			J30	37	107C16
TB4	8B	2	B	16	9			A3	22	107D16
TB4	10A	1	C	18	9			J30	14	76B18
TB4	10B	1	C	18	7			HTR1	1	76C18
TB4	11A	2	B	16	9			A1	26	54A16
TB4	11B	2	C	18	9			CDR	4	54D18
TB4	11B	2	B	16	9			KR	12	54B16
TB4	12B	2	C	18	9			TS	2	87WA18
TB4	13A	2	C	18	9			SMS	14	63A18
TB4	14A	2	B	16	9			J31	11	114D16
TB4	14A	2	B	16	9			P51	13	114G16
TB4	14B	2	B	16	9			P51	3	114E16

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
TB4	14B	2	B	16	9			P51	11	114F16
TB4	15A	2	C	18	9			J30	19	49C18
TB4	15B	2	C	18	9			CCS 4	4	49A18
TB4	15B	2	C	18	9			CCS	2	49B18
TB4	16A	1	C	18	9			ECS	8	41A18
TB4	16A	1	C	18	9			ECS	9	41B18
TB4	16B	1	C	18	9			AR	1	41D18
TB4	16B	1	C	18	9			ECS	10	41C18
TB4	17A	2	B	16	9			J30	18	21M16
TB4	17A	2	B	16	9			J37	40	21N16
TB4	17B	1	C	18	9			TS	1	21WA18
TB4	18A	1	C	18	9			A3	B+	21L18
TB4	18B	1	C	18	9			AFPS	2	21K18
TB4	19A	2	A	14	9			A4	15	21C14
TB4	19A	2	B	16	9			J30	8	21B16
TB4	19B	2	A	14	9			A1	39	21A14
TB4	19B	1	C	18	9			A2	1	21H18
TB4	20A	1	C	18	9			AFPR	5	21E18
TB4	20A	1	C	18	9			AR	14	21F18
TB4	20B	1	C	18	9			FLG	I	21D18
TB4	21A	1	C	18	9			A1	38	27F18
TB4	21A	2	B	16	9			J30	13	27J16
TB4	21B	1	C	18	9			ECS	6	27H18
TB4	21B	1	C	18	9			PLS	1	27G18
TB4	22A	2	A	14	9			A7	12	27B14

Table 1. Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
TB4	22A	1	C	18	9			PAR	14	27E18
TB4	22B	2	A	14	9			A1	(B+)	27C14
TB4	22B	1	C	18	9			CCL	1 (+)	27D18
VAR	1	17	E	18	9		SH5	A3	45	505
VAR	3	17	E	18	2		SH5	A3	7	505

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List.

NOTES

Color Code

0 Black	5 Green
1 Brown	6 Blue
2 Red	7 Violet
3 Orange	8 Gray
4 Yellow	9 White

Abbreviations used in table can be found in FO-1 at the back of this manual or in List of Abbreviations/Acronyms (WP 0001).

The list below describes End Prep in Table 2:

Code	Part Number	Nomenclature
1	88-21944	Socket (18-16 AWG)
2	88-20274-1	Terminal, Spade 20 AWG, #6
3	88-20477	Contact, Electrical, Female
4	88-20274-3	Terminal, Spade 20 AWG, #8
5	88-20274-10	Terminal, Spade 12 AWG, #6
6	MS25036-158	Terminal Lug, Ring Tongue, 10 AWG
7	88-20274-5	Terminal, Spade 16 AWG, #6
8	401256-001	Terminal Lug, Push-on
9	0116-1215	Adapter, Terminal Disconnect
10	88-22119-19	Terminal Lug, Ring Tongue, 10-12 AWG
11	88-22119-21	Terminal Lug, Ring Tongue, 4AWG
13	MS25036-125	Terminal Lug, Ring Tongue, 4 AWG
14	0116-1224	Socket, Connector (18 - 14 AWG)
15	88-20274-9	Terminal, Spade 12 AWG, #8
16	88-20274-7	Terminal, Spade 12 AWG, #10
17	-	Solder to terminal
18	88-20274-11	Terminal, Spade 16 AWG, #8
19	88-22119-17	Terminal Lug, Ring Tongue
20	88-22119-18	Terminal Lug, Ring Tongue
21	MS25036-155	Terminal Lug, Ring Tongue, 16 AWG
22	MS25036-151	Terminal Lug, Ring Tongue, 20 AWG
23	0116-1232-02	Terminal, Pin, 16-14 AWG
24	88-22119-13	Terminal Lug, Ring Tongue
25	MS25036-105	Terminal Lug, Ring Tongue, 20 AWG

The list below describes Wire Type column in Table 2:

Wire Code	Nomenclature	Part Number
A	Wire, Electric, Extruded ETFE 14 Ga	M22759/16-14-9
B	Wire, Electric, Extruded ETFE 16 Ga	M22759/16-16-9
C	Wire, Electric, Extruded ETFE 18 Ga	M22759/16-18-9
D	Wire, Electric, Extruded ETFE 10 Ga	M22759/16-18-9
E	Wire, Electrical, 4 AWG	88-20540-10

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
AFP	CASE	-	C	18	9			AFPV	2	2BH18
AFP	1	-			0			AFPV	1	
AFPV	1	1	C	18	9			P30	1	8B18
AFPV	2	1	C	18	9			AFP	CASE	2BH18
AFPV	2	3	C	18	9			TB5	17B	2BG18
ALT	(-)	10	D	10	9			SM	(-)	2BE10
ALT	(+)	6	D	10	9			CB5	2	28A10
BDS	1	-	-	-	0			BT2	(-)	1A410
BDS	2	-	-	-	0			SM	(-)	2A410
BT1	(-)	-	-	-	0			BT2	(+)	12A410
BT1	(+)	-	-	-	0			PS	(+)	24A410
BT1	(+)	-	-	-	0			SR	(+)	24D410
BT2	(-)	-	-	-	0			BDS	1	1A410
BT2	(-)	-	-	-	0			SR	(-)	1C410
BT2	(+)	-	-	-	0			BT1	(-)	12A410
BDS Field	A	8	C	16	9			TB5	5A	22B16
BDS Field	B		B	16	9			TB5	6A	91A16
CATSW1	2	2	C	18	9			TB5	21A	2BJ18
CATSW2	2	2	C	18	9			TB5	21A	2BK18

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
CB	GND	10	D	10	9			SM	(-)	2D10
CB2	1	15	D	10	9			PS	(+)	24C10
CB2	2	11	D	10	9			SMMS	1	75A10
CB4	1	18	A	14	9			R4	4	25E14
CB4	2	18	A	14	9			SRY	30	74A14
CB5	1	16	D	10	9			R4	4	25A10
CB5	2	18	D	10	9			ALT	(+)	28A10
CCCT	X1	11	B	16	9			P30	36	115C16
CCCT	X2	11	B	16	9			P30	35	116C16
CT1	X1	11	B	16	9			P31	4	151A16
CT1	X2	11	B	16	9			CT2	X2	150C16
CT1	X2	11	B	16	9			P31	14	150A16
CT2	X1	11	B	16	9			P31	9	152A16
CT2	X2	11	B	16	9			CT1	X2	150C16
CT2	X2	11	B	16	9			CT3	X2	150D16
CT3	X1	11	B	16	9			P31	13	153A16
CT3	X2	11	B	16	9			CT2	X2	150D16
CT7	X1	11	B	16	9			P31	16	111A16
CT7	X2	11	B	16	9			CT8	X2	114C16
CT8	X1	11	B	16	9			P31	15	112A16
CT8	X2	11	B	16	9			CT7	X2	114C16
CT8	X2	11	B	16	9			CT9	X2	114B16
CT9	X1	11	B	16	9			P31	18	113A16

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
CT9	X2	11	B	16	9			CT8	X2	114B16
CT9	X2	11	B	16	9			P31	11	114A16
D1	Anode	17	D	10	9			R4	4	25B10
D1	Cathode	21	A	14	9			DCS	2	26A14
DCS	1	2	C	18	9			TB5	5A	22A18
DCS	2	7	A	14	9			D1	Cathode	26A14
DCS	3	7	A	14	9			P30	9	17A14
F1	1	23	B	16	9			TB5	7A	107F16
F1	2	23	B	16	9			PT3	IN-115	124A16
F2	1	23	B	16	9			TB5	8A	108F16
F2	2	23	B	16	9			PT2	IN-0	125A16
F3	1	23	B	16	9			TB5	9A	109J16
F3	2	23	B	16	9			PT2	IN-115	126A16
FLSU	1	15	C	18	9			P30	7	80A18
FLSU	G	4	C	18	9			TB5	20A	2AZ18
Frame	Gnd	13	E	4	9			TB2	GND	2F4
GEN	GND	13	E	4	9			TB2	GND	2E4
K1	A1	-	-	-	0			TB1	1	101A410
K1	A2	25	C	18	9			P31	19	121C1 8
K1	B1	-	-	-	0			TB1	2	102A410
K1	B2	25	C	18	9			P31	8	122C18
K1	C1	-	-	-	0			TB1	3	103A410
K1	C2	27	C	18	9			P31	17	123C18

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
K1	X1	7	B	16	9			P30	23	50B16
K1	X2	7	B	16	9			TB5	19B	2BR16
K1	21	7	B	16	9			TB5	20B	2BB16
K1	22	2	C	18	9			P30	12	68E18
K1	41	7	B	16	9			TB5	20B	2BC16
K1	42	2	C	18	9			P30	19	49D18
P11	1	3	C	18	9			P30	4	4B18
P11	2	3	C	18	9			TB5	19A	2AY18
P12	1	3	C	18	9			P30	1	8B18
P30	1	1	C	18	9			AFPV	1	8B18
P30	2	1	C	18	9			P8	2	10B18
P30	3	1	C	18	9			P8	3	11C18
P30	4	1	C	18	9			P11	1	4B18
P30	5	1	C	18	9			P8	1	69B18
P30	7	1	C	18	9			FLSU-S	1	80A18
P30	8	1	B	16	9			TB5	12B	21P16
P30	9	14	A	14	9			DCS	3	17A14
P30	10	1	B	16	9			TB1	9	109B16
P30	12	1	C	18	9			K1	22	68E18
P30	13	1	B	16	9			TB5	16B	27K16
P30	14	1	C	18	9			TB5	15B	76A18
P30	15	1	C	18	9			TB5	4B	60B18
P30	16	14	A	14	9			TB1	9	109E14
P30	17	14	A	14	9			TB1	13	110N14
P30	18	1	B	16	9			TB5	11B	21R16

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
P30	19	1	C	18	9			K1	42	49D18
P30	20	1	B	16	9			TB5	20A	2AU16
P30	23	1	B	16	9			K1	X1	50B16
P30	24	1	C	18	9			R4	2	24F18
P30	25	1	C	18	9			R4	3	25C18
P30	28	14	A	14	9			TB5	1B	98B14
P30	29	14	A	14	9			TB5	2B	99B14
P30	33	1	C	18	9			TB5	22A	33D18
P30	34	1	B	16	9			TB5	8B	108B16
P30	35	1	B	16	9			CCCT	X2	116C16
P30	36	1	B	16	9			CCCT	X1	115C16
P30	37	1	B	16	9			TB5	7B	107B16
P31	1	1	C	18	9			TB1	1	101C18
P31	3	1	C	18	9			TB1	2	102C18
P31	4	1	B	16	9			CT1	X1	151A16
P31	5	14	A	14	9			PT2	OP-115	134B14
P31	6	14	A	14	9			PT3	OP-0	135B14
P31	7	14	A	14	9			PT3	OP-115	136B14
P31	8	1	C	18	9			K1	B2	122C18
P31	9	1	B	16	9			CT2	X1	152A16
P31	10	1	B	16	9			TB5	10A	110B16
P31	11	1	B	16	9			CT9	X2	114A16
P31	12	1	C	18	9			TB1	3	103C18

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
P31	13	1	B	16	9			CT3	X1	153A16
P31	14	1	B	16	9			CT1	X2	150A16
P31	15	1	B	16	9			CT8	X1	112A16
P31	16	1	B	16	9			CT7	X1	111A16
P31	17	1	C	18	9			K1	C2	123C18
P31	18	1	B	16	9			CT9	X1	113A16
P31	19	1	C	18	9			K1	A2	121C18
P8	1	3	C	18	9			P30	5	69B18
P8	2	3	C	18	9			P30	2	10B18
P8	3	3	C	18	9			P30	3	11C18
PS	(+)	6	D	10	9			CB2	1	24C10
PS	(+)	6	D	10	9			R4	1	24E10
PS	Coil (+)	16	D	10	9			SMMS	2	23A10
PT2	ESS	11	B	16	9			PT3	ESS	2BS16
PT2	IN-0	11 & 9	B	16	9			F2	2	125A16
PT2	IN-0	23	B	16	9			PT2	IN-115	Jumper
PT2	IN-0	23	B	16	9			PT3	IN-0	125B16
PT2	IN-115	11	B	16	9			F3	2	126A16
PT2	IN-115	23	B	16	9			PT2	IN-0	Jumper
PT2	OP-0	23	A	14	9			PT2	OP-0	135E14
PT2	OP-0	23	A	14	9			PT2	OP-0	135E14
PT2	OP-0	11 & 9	A	14	9			PT3	OP-0	135D14

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
PT2	OP-115	23	A	14	9			PT2	OP-115	134C14
PT2	OP-115	23	A	14	9			PT2	OP-115	134C14
PT2	OP-115	11	A	14	9			P31	5	134B14
PT2	OP-ESS	23	B	16	9			PT2	OP-GND	Jumper
PT2	OP-GND	18	B	16	9			PT2	OP-ESS	Jumper
PT3	ESS	11	B	16	9			PT2	ESS	2BS16
PT3	GND	11	B	16	9			TB5	18B	2BT16
PT3	IN-0	23	B	16	9			PT3	IN-115	Jumper
PT3	IN-0	23	B	16	9			PT2	IN-0	125B16
PT3	IN-115	11	B	16	9			F1	2	124A16
PT3	IN-115	23	B	16	9			PT3	IN-0	Jumper
PT3	OP-ESS	23	B	16	9			PT3	OP-GND	Jumper
PT3	OP-GND	18	B	16	9			PT3	OP-ESS	Jumper
PT3	OP-0	11	A	14	9			PT2	OP-0	135D14
PT3	OP-0	23	A	14	9			PT3	OP-0	135C14
PT3	OP-0	23	A	14	9			PT3	OP-0	135C14
PT3	OP-0	11	A	14	9			P31	6	135B14
PT3	OP-115	23	A	14	9			PT3	OP-115	136C14
PT3	OP-115	23	A	14	9			PT3	OP-115	136C14
PT3	OP-115	11	A	14	9			P31	7	136B14
R4	1	10	D	10	9			PS	(+)	24E10
R4	2	4	C	18	9			P30	24	24F18
R4	3	5	C	18	9			P30	25	25C18

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
R4	4	20	A	14	9			CB4	1	25E14
R4	4	10	D	10	9			CB5	1	25A10
R4	4	10	D	10	9			D1	Anode	25B10
SM	(-)				0			BDS	2	2A410
SM	(-)	6	D	10	9			ALT	GND	2BE10
SM	(-)				0			TB2	GND	2C410
SM	(-)	6	D	10	9			CB	GND	2D10
SM	(-)	6	D	10	9			TB5	19B	2BA10
SMMS	1	15	D	10	9			CB2	2	75A10
SMMS	2	15	D	10	9			PS	Coil (+)	23A10
SMMS	3	7	B	16	9			TB5	6A	91B16
SMMS	4	8	C	18	9			TB5	18A	2BD18
SRY	30	11	A	14	9			CB4	2	74A14
SRY	85	8 & 9	C	18	9			TB5	12A	21S18
SRY	86	8 & 9	C	18	9			TB5	18B	2BF18
TB1	1			4	0			K1	A1	101A410
TB1	1	22	C	18	9			P31	1	101C18
TB1	2			4	0			K1	B1	102A410
TB1	2	22	C	18	9			P31	3	102C18
TB1	3			4	0			K1	C1	103A410
TB1	3	22	C	18	9			P31	12	103C18
TB1	7	21	B	16	9			TB5	7B	107A16
TB1	8	21	B	16	9			TB5	8B	108A16

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
TB1	9	21	B	16	9			TB5	9B	109A16
TB1	9	21	B	16	9			P30	10	109B16
TB1	9	21	A	14	9			P30	16	109E14
TB1	9	21	A	14	9			P30	16	109E14
TB1	10			4				TB2	N	110K410
TB1	12							TB2	N	110K410
TB1	13	21	B	16	9			TB5	10B	110A16
TB2	GND	5	E	4	9			Frame	Gnd	2F4
TB2	GND	12	E	14	9			GEN	GND	2E4
TB2	GND							SM	(-)	2C410
TB2	L1	24	B	16	9			V1	1	121E16
TB2	L1							K1	A2	121A410
TB2	L1							K1	A2	121B410
TB2	L2	24	B	16	9			V2	1	122F16
TB2	L2							K1	B2	122A410
TB2	L2							K1	B2	122B410
TB2	L3	24	B	16	9			V3	1	123H16
TB2	L3							K1	C2	123A410
TB2	L3							K1	C2	123B410
TB2	N	24	B	16	9			V4	1	110J16
TB2	N			4	0			TB1	10	110K410
TB2	N			4	0			TB1	12	110L410
TB5	1A	7	A	14	9			G1	F2	
TB5	1B	7	A	14	9			P30	28	98B14
TB5	2A	7	A	14	9			G1	F1	

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
TB5	2B	7	A	14	9			P30	29	99B14
TB5	4	2	C	18	9			P30	15	60B18
TB5	5A	2	C	18	9			DCS	1	22A18
TB5	5A	2	C	18	9			BDS Field	A	22B16
TB5	6A	7	B	16	2			SMMS	3	91A16
TB5	6A	8	B	16	2			BDS FIELD	B	91B16
TB5	7A	7	B	16	9			F1	1	107F16
TB5	7B	7	B	16	9			P30	37	107B16
TB5	7B	7	B	16	9			TB1	7	107A16
TB5	8A	7	B	16	9			F2	1	108F16
TB5	8B	7	B	16	9			P30	34	108B16
TB5	8B	7	B	16	9			TB1	8	108A16
TB5	9A	7	B	16	9			F3	1	109J16
TB5	9B	7	B	16	9			TB1	9	109A16
TB5	10A	7	B	16	9			P31	10	110B16
TB5	10B	7	B	16	9			TB1	13	110A16
TB5	11B	7	B	16	9			P30	18	21R16
TB5	12A	2	C	18	9			SRY	85	21S18
TB5	12B	7	B	16	9			P30	8	21P16
TB5	15A	2	C	18	9			P26	B	76WA18
TB5	15B	2	C	18	9			P30	14	76A18
TB5	16A	2	C	18	9			P26	E	27WA14
TB5	16B	7	B	16	9			P30	13	27K16
TB5	17A	2	C	18	9			P26	A	2WB14

Table 2. Generator Set Harness (Generator, Engine, Control Panel) Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
TB5	17B	2	C	18	9			P12	2	2BG18
TB5	18A	2	C	18	9			SMMS	4	2BD18
TB5	18B	7	B	16	9			PT3	GND	2BT16
TB5	18B	2	C	18	9			SRY	86	2BF18
TB5	19A	2	C	18	9			P11	2	2AY18
TB5	19B	7	B	16	9			K1	X2	2BR16
TB5	19B	5	D	10	9			SM	(-)	2BA10
TB5	20	2	C	18	9			FLSU	G	2AZ18
TB5	20A	2	B	16	9			P30	20	2AU16
TB5	20B	7	B	16	9			K1	21	2BB16
TB5	20B	7	B	16	9			K1	41	2BC16
TB5	21A	2	C	18	9			CATSW1	2	2BJ18
TB5	21A	2	C	18	9			CATSW2	2	2BK18
TB5	22A	2	C	18	9			P30	33	33D18
V1	1	3	B	16	9			TB2	L1	121E16
V2	1	3	B	16	9			TB2	L2	122F16
V3	1	3	B	16	9			TB2	L3	123H16
V4	1	3	B	16	9			TB2	N	110J16

Table 3. ECM to EMCP Harness Wire List.

NOTES

Color Code

0 Black	5 Green
1 Brown	6 Blue
2 Red	7 Violet
3 Orange	8 Gray
4 Yellow	9 White

Abbreviations used in table can be found in FO-1 at the back of this manual or in List of Abbreviations/Acronyms (WP 0001).

The list below describes End Prep in Table 3:

Code	Part Number	Nomenclature
1	9X-3402	Socket
2	9X-0141	Plug Assy
3	9W-0852	Pin
4	126-1768	Socket
5	8T-8730	Socket
6	8T-8729	Pin
7	-	

The list below describes Wire Type in Table 3:

Wire Code	Nomenclature	Part Number
A	Wire, 16 GA T (twisted pair)	6A-3770
B	Wire, 14 GA T (twisted pair)	5P-4704
C	Wire, 16 GA GN/YEL	6V-8241
D	Wire, 18 GA BK	5P-3075
E	Wire, 18 GA WH	6V-2648

The list below describes the ECM J1 to EMCP Harness Connectors

Connector	Description
CDC-P7	Plug, Cat Diagnostic Computer Connector
ENG-P1	Plug, ECM Connector J1
ENG-P8	Plug, Turbo Inlet Pressure Sensor
ENG-P14	Plug, Magnetic Speed Pickup (MPU) Connector
ENG-P16	Plug, Low Coolant Sensor Connector
ENG-P37	Plug, EMCP Connector

Table 3. ECM to EMCP Harness Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
BATT	(-)	7	C	16	54			Splice 3	2	
CATSW1	1	7	D	18	0			ENG-P1	6	
CATSW2	1	7	D	18	0			ENG-P1	60	
ENG-P1	1	1	D	18	0			CDC-P7	J	
ENG-P1	2	1	A	16	T			ENG-P8	B	
ENG-P1	3	1	A	16	T			ENG-P8	A	
ENG-P1	5	1	E	18	9			ENG-P37	11	
ENG-P1	6	1	D	18	0			CATSW1	1	
ENG-P1	8	1	D	18	0			CDC-P7	D	
ENG-P1	9	1	E	18	9			CDC-P7	E	
ENG-P1	14	1	E	18	9			CDC-P7	H	
ENG-P1	17	1	A	16	T			ENG-P8	C	
ENG-P1	23	1	A	16	T			ENG-P37	27	
ENG-P1	34	1	E	18	9			CDC-P7	G	
ENG-P1	40	1	A	16	T			ENG-P37	26	
ENG-P1	42	1	D	18	0			CDC-P7	C	Shield
ENG-P1	48	4	B	14	T			Splice 4	1	
ENG-P1	50	1	D	18	0			CDC-P7	F	
ENG-P1	52	4	B	14	T			Splice 4	1	
ENG-P1	53	4	B	14	T			Splice 4	1	
ENG-P1	58	1	A	16	T			ENG-P37	35	
ENG-P1	60	1	D	18	0			CATSW2	1	
ENG-P1	61	1	C	16	54			Splice 3	1	
ENG-P1	63	1	C	16	54			Splice 3	1	
ENG-P1	65	1	C	16	54			Splice 3	1	

Table 3. ECM to EMCP Harness Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
ENG-P1	66	1	D	18	0			ENG-P37	23	
ENG-P1	70	1	A	16	T			ENG-P37	40	
ENG-P1	-	-	D	18	0			ENG-P37	12	Shield
CDC-P7	A	3	B	14	T			Splice 4	2	
CDC-P7	B	3	C	16	54			Splice 3	2	
CDC-P7	C	6	D	18	0			ENG-P1	42	Shield
CDC-P7	D	3	D	18	0			ENG-P1	8	
CDC-P7	D	3	D	18	0			ENG-P37	19	
CDC-P7	E	3	E	18	9			ENG-P1	9	
CDC-P7	E	3	E	18	9			ENG-P37	20	
CDC-P7	F	6	D	18	0			ENG-P1	50	
CDC-P7	G	6	E	18	9			ENG-P1	34	
CDC-P7	H	6	E	18	9			ENG-P1	14	
CDC-P7	J	6	D	18	0			ENG-P1	1	
CDC-P7	-	-	D	18	0			ENG-P37	18	Shield
ENG-P8	A	6	A	16	T			ENG-P1	3	
ENG-P8	B	6	A	16	T			ENG-P1	2	
ENG-P8	C	6	A	16	T			ENG-P1	17	
ENG-P14	1	5	D	18	0			ENG-P37	1	
ENG-P14	2	5	E	18	9			ENG-P37	2	
ENG-P14	-	-	D	18	0			ENGP37	3	Shield
ENG-P16	A	5	A	16	T			ENG-P37	9	
ENG-P16	B	5	A	16	T			ENG-P37	31	
ENG-P16	C	5	A	16	T			ENG-P37	13	
ENG-P37	1	5	D	18	0			ENG-P14	1	

Table 3. ECM to EMCP Harness Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
ENG-P37	2	5	E	18	9			ENG-P14	2	
ENG-P37	3	5	D	18	0			ENG-P14		Shield
ENG-P37	9	1	A	16	T			ENG-P16	A	
ENG-P37	11	5	E	18	9			ENG-P1	5	
ENG-P37	12	5	D	18	0			ENG-P1		Shield
ENG-P37	13	1	A	16	T			ENG-P16	C	
ENG-P37	18	5	D	18	0			CDC-P7		Shield
ENG-P37	19	5	D	18	0			CDC-P7	D	
ENG-P37	20	5	E	18	9			CDC-P7	E	
ENG-P37	23	5	D	18	0			ENG-P1	66	
ENG-P37	26	2	A	16	T			ENG-P1	40	
ENG-P37	27	2	A	16	T			ENG-P1	23	
ENG-P37	31	1	A	16	T			ENG-P16	B	
ENG-P37	35	1	A	16	T			ENG-P1	58	
ENG-P37	40	1	A	16	T			ENG-P1	70	
Splice 3	1	-	C	16	54			ENG-P1	61	
Splice 3	1	-	C	16	54			ENG-P1	63	
Splice 3	1	-	C	16	54			ENG-P1	65	
Splice 3	2	-	C	16	54			BATT	(-)	
Splice 3	2	-	C	16	54			CDC-P7	B	
Splice 4	1		B	14	T			ENG-P1	48	
Splice 4	1		B	14	T			ENG-P1	52	
Splice 4	1		B	14	T			ENG-P1	53	
Splice 4	2	-	B	14	T			CDC-P7	A	
Splice 4	2		B	14	T			SRY	87	
SRY	87	7	B	14	T			Splice 4	2	

Table 4. Engine Harness Wire List.

NOTES

Color Code

0 Black	5 Green
1 Brown	6 Blue
2 Red	7 Violet
3 Orange	8 Gray
4 Yellow	9 White

Abbreviations used in table can be found in FO-1 at the back of this manual or in List of Abbreviations/Acronyms (WP 0001).

The list below describes End Prep in Table 4:

Code	Part Number	Nomenclature
1	180-9340	Socket
2	180-9339	Pin
3	111-1567	Socket
4	123-1198	Socket

The list below describes Wire Type in Table 4:

Wire Code	Nomenclature	Part Number
A	Wire, 18 GA BU	5P-9082
B	Wire, 18 GA GY	130-4672
C	Wire, 18 GA PU	130-4671
D	Wire, 18 GA BR	130-4675
E	Wire, 18 GA GN	130-4676
F	Wire, 18 GA BU	130-4670
G	Wire, 18 GA RD	5P-9073
H	Wire, 18 GA YL	5P-9074
I	Wire, 18 GA PK	5P-9076
J	Wire, 18 GA BK	5P-3075
K	Wire, 18 GA WH	6V-2648
L	Wire, 18 GA GN	5P-9080
M	Wire, 18 GA BR	5P-9072
N	Wire, 18 GA RD	5P-9073
O	Wire, 18 GA OR	5P-9075
P	Wire, 18 GA PU	5P-9077
Q	Wire, 18 GA WH	130-4669
R	Wire, 18 GA OR	130-4674
S	Wire, 18 GA YL	130-4673
T	Wire, 18 GA GY	5P-3074

Table 4. Engine Harness Wire List - Continued.

The list below describes ECM J2 Engine Harness Connectors

Connector	Description
ENG-P2	Plug, ECM Connector J2
ENG-P3	Plug, IAP Control Valve
ENG-P4	Plug, Top Crankshaft Timing Sensor
ENG-P5	Plug, Bottom Crankshaft Timing Sensor
ENG-P6	Plug, Coolant Temperature Sensor
ENG-P7	Plug, Intake Manifold Air Temperature Sensor
ENG-P10	Plug, TDC Probe Connector (Timing Calibration)
ENG-P11	Plug, Atmospheric Pressure Sensor
ENG-P12	Plug, Turbo Outlet Pressure Sensor
ENG-P13	Plug, Injector Actuation Pressure Sensor
ENG-P15	Plug, Oil Pressure Sensor
ENG-P17	Plug, Fuel Pressure Connector
ENG-P18	Plug, Oil Temperature Sensor
ENG-P101	Plug, Air Inlet Heater Relay Connector
ENG-P300	Plug, Fuel Injector Harness Connector

Table 4. Engine Harness Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
ENG-P2	2	1	K	18	9			Splice 6	1	G828-NG1
ENG-P2	3	1	L	18	6			Splice 5	1	G829-NG2
ENG-P2	9	1	G	18	2			ENG-P101	1	C987-NG46
ENG-P2	12	1	A	18	6			ENG-P101	2	G850-NG3
ENG-P2	14	1	T	18	8			ENG-P11	C	R747-NG4
ENG-P2	16	1	I	18	PK			ENG-P17	C	C991-NG51
ENG-P2	18	1	I	18	PK			Splice 2	1	G833-NG5
ENG-P2	22	1	K	18	9			ENG-P10	1	G856-NG6
ENG-P2	23	1	H	18	4			ENG-P10	2	G857-NG7
ENG-P2	24	1	H	18	4			ENG-P15	C	C990-NG8
ENG-P2	27	1	M	18	1			ENG-P13	C	G849-NG9
ENG-P2	32	1	A	18	6			ENG-P6	1	995-NG10
ENG-P2	34	1	L	18	5			ENG-P18	1	F411-NG45
ENG-P2	35	1	O	18	3			CDC-P7	1	G853-NG12
ENG-P2	36	1	B	18	8			ENG-P300	1	A701-NG13
ENG-P2	37	1	C	18	7			ENG-P300	2	A702-NG14
ENG-P2	38	1	D	18	1			ENG-P300	3	A703-NG15
ENG-P2	39	1	E	18	5			ENG-P300	4	A704-NG16
ENG-P2	40	1	I	18	PK			ENG-P12	C	R746-NG17
ENG-P2	41	1	M	18	1			Splice 8	1	G826-NG56
ENG-P2	42	1	A	18	6			Splice 9	1	G827-NG57

Table 4. Engine Harness Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
ENG-P2	44	1	Q	18	9			Splice 4	1	L983-NG19
ENG-P2	45	1	R	18	3			Splice 7	1	L984-NG20
ENG-P2	46	1	S	18	4			Splice 3	1	L985-NG47
ENG-P2	48	1	K	18	9	TW1		ENG-P4	B	E964-NG21
ENG-P2	49	1	J	18	0	TW1		ENG-P4	A	E963-NG22
ENG-P2	54	1	F	18	6			ENG-P300	5	A705-NG23
ENG-P2	55	1	B	18	8			ENG-P300	6	A706-NG24
ENG-P2	58	1	H	18	4	TW2		ENG-P5	B	E966-NG25
ENG-P2	59	1	A	18	6	TW2		ENG-P5	A	E965-NG26
ENG-P2	61	1	I	18	PK			ENG-P3	1	G854-NG27
ENG-P2	62	1	P	18	7			ENG-P3	2	G855-NG28
ENG-P101	1	1	G	18	2			ENG-P2	9	C987-NG46
ENG-P101	2	1	A	18	6			ENG-P2	12	G850-NG3
ENG-P3	1	4	I	18	PK			ENG-P2	61	G854-NG27
ENG-P3	2	4	P	18	7			ENG-P2	62	G855-NG28
ENG-P4	A	3	J	18	0	TW1		ENG-P2	49	E963-NG22
ENG-P4	B	3	K	18	9	TW1		ENG-P2	48	E964-NG21
ENG-P5	A	3	A	18	6	TW2		ENG-P2	59	E965-NG26
ENG-P5	B	3	H	18	4	TW2		ENG-P2	58	E966-NG25
ENG-P6	1	1	A	18	6			ENG-P2	32	995-NG10

Table 4. Engine Harness Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
ENG-P6	2	1	I	18	PK			Splice 2	2	G833-NG42
ENG-P7	1	1	O	18	3			ENG-P2	35	G853-NG12
ENG-P7	2	1	I	18	PK			Splice 2	1	G833-NG43
ENG-P300	1	2	B	18	8			ENG-P2	36	A701-NG13
ENG-P300	2	2	C	18	7			ENG-P2	37	A702-NG14
ENG-P300	3	2	D	18	1			ENG-P2	38	A703-NG15
ENG-P300	4	2	E	18	5			ENG-P2	39	A704-NG16
ENG-P300	5	2	F	18	6			ENG-P2	54	A705-NG23
ENG-P300	6	2	B	18	8			ENG-P2	55	A706-NG24
ENG-P300	7	2	S	18	4			Splice 3	2	L985-NG40
ENG-P300	8	2	S	18	4			Splice 3	2	L985-NG39
ENG-P300	9	2	R	18	3			Splice 7	2	L984-NG38
ENG-P300	10	2	R	18	3			Splice 7	2	L984-NG37
ENG-P300	11	2	Q	18	9			Splice 4	2	L983-NG36
ENG-P300	12	2	Q	18	9			Splice 4	2	L983-NG35
ENG-P10	1	1	K	18	9			ENG-C1	22	G856-NG6
ENG-P10	2	1	H	18	4			ENG-C1	23	G857-NG7
ENG-P11	A	2	K	18	9			Splice 6	2	G828-NG30
ENG-P11	B	2	L	18	6			Splice 5	2	G829-NG34
ENG-P11	C	2	T	18	8			ENG-P2	14	R747-NG4

Table 4. Engine Harness Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
ENG-P12	A	1	K	18	9			Splice 6	2	G828-NG29
ENG-P12	B	1	L	18	6			Splice 5	2	G829-NG33
ENG-P12	C	1	I	18	PK			ENG-P2	40	R746-NG17
ENG-P13	A	2	K	18	9			Splice 6	2	G828-NG31
ENG-P13	B	2	L	18	6			Splice 5	2	G829-NG32
ENG-P13	C	2	M	18	1			ENG-P2	27	G849-NG9
ENG-P15	A	2	M	18	1			Splice 8	1	G826-NG18
ENG-P15	B	2	A	18	6			Splice 9	2	G827-NG48
ENG-P15	C	2	H	18	4			ENG-P2	24	C990-NG8
ENG-P17	A	2	M	18	1			Splice 8	2	G826-NG53
ENG-P17	B	2	A	18	6			Splice 9	2	G827-NG54
ENG-P17	C	2	I	18	PK			ENG-P2	16	C991-NG51
ENG-P18	1	2	L	18	5			ENG-P2	34	F411-NG45
ENG-P18	2	2	I	18	PK			Splice 2	1	G833-NG44
Splice 2	1		I	18	PK			ENG-P18	2	G833-NG44
Splice 2	1		I	18	PK			CDC-P7	2	G833-NG43
Splice 2	1		I	18	PK			ENG-P2	18	G833-NG5
Splice 2	2		I	18	PK			ENG-P6	2	G833-NG42
Splice 3	1		S	18	4			ENG-P2	46	L985-NG47

Table 4. Engine Harness Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
Splice 3	2		S	18	4			ENG-P300	7	L985-NG40
Splice 3	2		S	18	4			ENG-P300	8	L985-NG39
Splice 4	1		Q	18	9			ENG-P2	44	L983-NG19
Splice 4	2		Q	18	9			ENG-P300	11	L983-NG36
Splice 4	2		Q	18	9			ENG-P300	12	L983-NG35
Splice 5	1		L	18	6			ENG-P2	3	G829-NG2
Splice 5	2		L	18	6			ENG-P13	B	G829-NG32
Splice 5	2		L	18	6			ENG-P11	B	G829-NG34
Splice 5	2		L	18	6			ENG-P12	B	G829-NG33
Splice 6	1		K	18	9			ENG-P2	2	G828-NG1
Splice 6	2		K	18	9			ENG-P11	A	G828-NG30
Splice 6	2		K	18	9			ENG-P12	A	G828-NG29
Splice 6	2		K	18	9			ENG-P13	A	G828-NG31
Splice 7	1		R	18	3			ENG-P2	45	L984-NG20
Splice 7	2		R	18	3			ENG-P300	9	L984-NG38
Splice 7	2		R	18	3			ENG-P300	10	L984-NG37
Splice 8	1		M	18	1			ENG-P15	A	G826-NG18
Splice 8	1		M	18	1			ENG-P2	41	G826-NG56
Splice 8	2		M	18	1			ENG-P17	A	G826-NG53
Splice 9	1		A	18	6			ENG-P2	42	G827-NG57
Splice 9	2		A	18	6			ENG-P15	B	G827-NG48
Splice 9	2		A	18	6			ENG-P17	B	G827-NG54

Table 5. Engine Harness to Unit Injectors Wire List.

NOTES

Color Code

0 Black	5 Green
1 Brown	6 Blue
2 Red	7 Violet
3 Orange	8 Gray
4 Yellow	9 White

Abbreviations used in table can be found in FO-1 at the back of this manual or in List of Abbreviations/Acronyms (WP 0001).

The list below describes End Prep in Table 5:

Code	Part Number	Nomenclature
1	126-1766	Socket
2	154-2389	Socket

The list below describes Wire Type in Table 5:

Wire Code	Nomenclature	Part Number
A	Wire 16 Ga GY	3E-9420
B	Wire 16 Ga PU	3E-9475
C	Wire 16 Ga BR	3E-9472
D	Wire 16 Ga GN	3E-9469
E	Wire 16 Ga BU	3E-9471
F	Wire 16 Ga WH	3E-9474
G	Wire 16 Ga YL	3E-9467
H	Wire 16 Ga OR	3E-9468

The list below describes the Engine Harness to Unit Injectors Harness Connectors

Connector	Description
ENG-J300	Jack, Unit Injector Harness Connector
ENG-P301	Plug, Unit Injector No. 1 Connector
ENG-P302	Plug, Unit Injector No. 2Connector
ENG-P303	Plug, Unit Injector No. 3 Connector
ENG-P304	Plug, Unit Injector No. 4 Connector
ENG-P305	Plug, Unit Injector No. 5 Connector
ENG-P306	Plug, Unit Injector No. 6 Connector

Table 5. Engine Harness to Unit Injectors Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
ENG-J300	1	1	A	16	8			ENG-P301	A	
ENG-J300	2	1	B	16	7			ENG-P302	A	
ENG-J300	3	1	C	16	1			ENG-P303	A	
ENG-J300	4	1	D	16	5			ENG-P304	A	
ENG-J300	5	1	E	16	6			ENG-P305	A	
ENG-J300	6	1	A	16	8			ENG-P306	A	
ENG-J300	7	1	F	16	9			ENG-P301	B	
ENG-J300	8	1	F	16	9			ENG-P302	B	
ENG-J300	9	1	H	16	3			ENG-P303	B	
ENG-J300	10	1	H	16	3			ENG-P304	B	
ENG-J300	11	1	G	16	4			ENG-P305	B	
ENG-J300	12	1	G	16	4			ENG-P306	B	
ENG-P301	A	2	A	16	8			ENG-J300	1	
ENG-P301	B	2	F	16	9			ENG-J300	7	
ENG-P302	A	2	B	16	7			ENG-J300	2	
ENG-P302	B	2	F	16	9			ENG-J300	8	
ENG-P303	A	2	C	16	1			ENG-J300	3	
ENG-P303	B	2	H	16	3			ENG-J300	9	
ENG-P304	A	2	D	16	5			ENG-J300	4	
ENG-P304	B	2	H	16	3			ENG-J300	10	
ENG-P305	A	2	E	16	6			ENG-J300	5	
ENG-P305	B	2	G	16	4			ENG-J300	11	
ENG-P306	A	2	A	16	8			ENG-J300	6	
ENG-P306	B	2	G	16	4			ENG-J300	12	

Table 6. Winterization Control Panel Wire List.

NOTES

Color Code

0 Black	5 Green
1 Brown	6 Blue
2 Red	7 Violet
3 Orange	8 Gray
4 Yellow	9 White

Abbreviations used in table can be found in FO-1 at the back of this manual or in List of Abbreviations/Acronyms (WP 0001).

The list below describes End Prep in Table 6:

Code	Part Number	Nomenclature
1	-	Solder to terminal
2	MS25036-102	Terminal Lug, Ring Terminal 22-18 AWG .138 Stud
3	MS25036-153	Terminal Lug Ring Terminal 16-14 AWG .164 Stud
4	MS25036-149	Terminal Lug Ring Terminal 22-18 AWG .164 Stud

The list below describes Wire Type in Table 6:

Wire Code	Nomenclature	Part Number
A	Wire, Electric, Extruded ETFE 14 Ga	M22759/16-14-9
B	Wire, Electric, Extruded ETFE 18 Ga	M22759/16-18-9

Table 6. Winterization Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
CB1	1	3	A	14	9			J26	E	
CB1	2	3	A	14	9			J27	E	
CB1	2	4	B	18	9			S1	4	
CR1	1	2	B	18	9			K20	9	
CR1	3	2	B	18	9			J26	B	
DS1	1	1	B	18	9			K20	13	
DS1	1	1	B	18	9			J26	A	
DS1	2	1	B	18	9			K20	9	
DS1	3	1	B	18	9			S1	1	
DS2	(+)	1	B	18	9			S1	3	
DS2	(-)	1	B	18	9			J27	D	
J26	A	1	B	18	9			DS1	1	
J26	A	1	A	14	9			J27	A	
J26	B	1	B	18	9			CR1	3	
J26	E	1	A	14	9			CB1	1	
J27	A	1	A	14	9			J26	A	
J27	B	1	B	18	9			K20	14	
J27	C	1	B	18	9			S1	3	
J27	D	1	B	18	9			DS2	(-)	
J27	E	1	A	14	9			CB1	2	
K20	9	1	B	18	9			CR1	1	
K20	9	1	B	18	9			DS1	2	
K20	5	1	B	18	9			S1	6	
K20	13	1	B	18	9			DS1	1	
K20	14	1	B	18	9			J27	B	

Table 6. Winterization Control Panel Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
S1	1	2	B	18	9			DS1	3	
S1	1	2	B	18	9			S1	4	
S1	3	2	B	18	9			J27	C	
S1	3	2	B	18	9			DS2	(+)	
S1	4	2	B	18	9			S1	1	
S1	4	2	B	18	9			CB1	2	
S1	6	2	B	18	9			K20	5	

Table 7. Winterization Kit Heater Cable Wire List.

NOTES

Color Code

0 Black	5 Green
1 Brown	6 Blue
2 Red	7 Violet
3 Orange	8 Gray
4 Yellow	9 White

Abbreviations used in table can be found in FO-1 at the back of this manual or in List of Abbreviations/Acronyms (WP 0001).

The list below describes End Prep in Table 7:

Code	Part Number	Nomenclature
1	-	Solder to terminal
2	0116-1811-006	Connector Kit (comes with pins)
3	88-20274-1	Terminal, Spade 22-18 AWG #6

The list below describes Wire Type in Table 7:

Wire Code	Nomenclature	Part Number
A	Wire, Electric, Extruded ETFE 14 Ga	M22759/16-14-9
B	Wire, Electric, Extruded ETFE 18 Ga	M22759/16-18-9

Table 7. Winterization Kit Heater Cable Wire List - Continued.

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
P27	A	1	A	14	9			P28	C3	2WA14
P27	B	1	B	18	9			P27	C	82WB18
P27	C	1	B	18	9			P27	B	82WB18
P27	C	1	B	18	9			P28	A1	82WA18
P27	D	1	B	18	9			P28	B3	83WA18
P27	E	1	A	14	9			P28	C2	27WB14
P28	A1	2	B	18	9			P27	C	82WA18
P28	B3	2	B	18	9			P27	D	83WA18
P28	C2	2	A	14	9			P27	E	27WB14
P28	C3	2	A	14	9			P27	A	2WA14
P28	C4	2	B	18	9			P29	2	84WB18
P29	1	2	B	18	9			TB5	17B	2WC18
P29	2	2	B	18	9			P28	C4	84WB18
TB5	17B	3	B	18	9			P29	1	2WC18

Table 8. Winterization Kit Power Cable Wire List.

NOTES

Color Code

0 Black	5 Green
1 Brown	6 Blue
2 Red	7 Violet
3 Orange	8 Gray
4 Yellow	9 White

Abbreviations used in table can be found in FO-1 at the back of this manual or in List of Abbreviations/Acronyms (WP 0001).

The list below describes End Prep in Table 8:

Code	Part Number	Nomenclature
1	88-20274-5	Terminal, Spade 16-14 AWG #6
2	88-20274-1	Terminal, Spade 22-18 AWG #6
3	-	Solder to terminal

The list below describes Wire Type in Table 8:

Wire Code	Nomenclature	Part Number
A	Wire, Electric, Extruded ETFE 14 Ga	M22759/16-14-9
B	Wire, Electric, Extruded ETFE 18 Ga	M22759/16-18-9

FROM REF DES	PIN	END PREP	WIRE TYPE	GAGE	COLOR	TWISTED WITH	SHIELD	TO REF DES	PIN	NOTES
TB5	15A	2	B	18	9			P26	B	
TB5	16A	1	A	14	9			P26	E	
TB5	17A	1	A	14	9			P26	A	
P26	A	3	A	14	9			TB5	17A	
P26	B	3	B	18	9			TB5	15A	
P26	E	3	A	14	9			TB5	16A	

END OF WORK PACKAGE

CHAPTER 4

UNIT (FIELD) LEVEL
MAINTENANCE INSTRUCTIONS
WINTERIZATION KIT

CHAPTER 4

UNIT (FIELD) LEVEL MAINTENANCE INSTRUCTIONS WINTERIZATION KIT

WORK PACKAGE INDEX

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

WINTERIZATION HEATER CONTROL BOX ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
Tool Kit, General Mechanic's, (WP 0119, Item 1)	Two
Materials/Parts	**References**
Tiedown straps (WP 0120, Item 49)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Open left rear doors.
3. Disconnect connector P26 from connector J26 (Figure 1, Item 1) and connector P27 from connector J27 (Figure 1, Item 2) of winterization heater control box assembly.
4. Remove two screws (Figure 1, Item 3), lockwashers (Figure 1, Item 4), and washers (Figure 1, Item 5), and remove winterization heater control box assembly (Figure 1, Item 6) from rear of generator housing.

REMOVAL - Continued

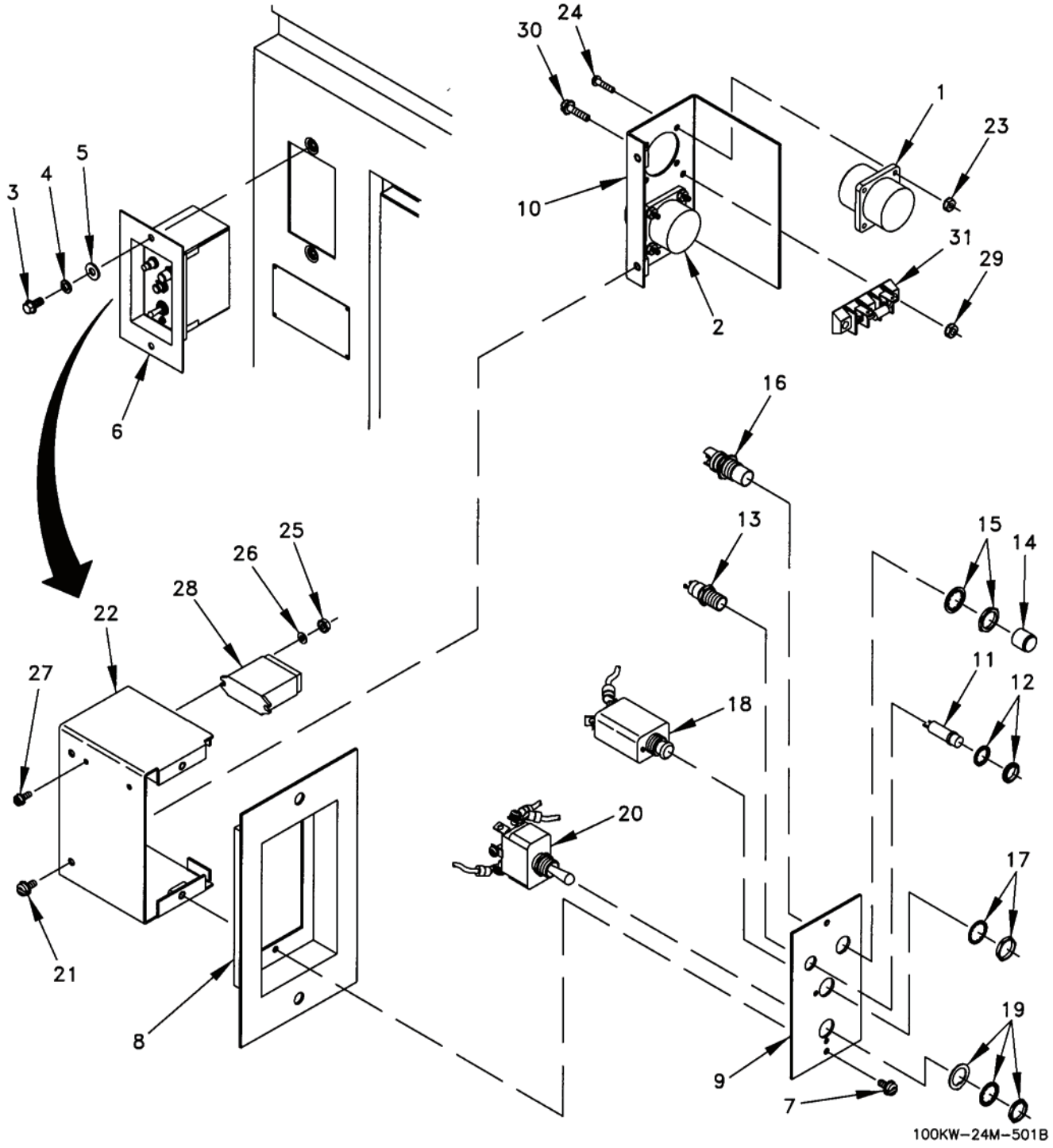


Figure 1. Winterization Heater Control Box Assembly.

END OF TASK

DISASSEMBLY

1. Remove two screws (Figure 1, Item 7), control box mounting bracket (Figure 1, Item 8), and control box faceplate (Figure 1, Item 9) from control box frame (Figure 1, Item 10).

NOTE

Tag and disconnect wiring during component removal.

2. Remove collar (Figure 1, Item 11), jam nut and lockwashers (Figure 1, Item 12), and LED holder (Figure 1, Item 13) from control box faceplate (Figure 1, Item 9).

3. Remove lens cap (Figure 1, Item 14), jam nut and lockwashers (Figure 1, Item 15), and press-test indicator light (Figure 1, Item 16) from control box faceplate (Figure 1, Item 9).

4. Remove jam nut and lockwashers (Figure 1, Item 17) and circuit breaker (Figure 1, Item 18) from control box faceplate (Figure 1, Item 9).

5. Remove jam nut and lockwashers (Figure 1, Item 19) and toggle switch (Figure 1, Item 20) from control box faceplate (Figure 1, Item 9).

6. Remove two screws (Figure 1, Item 21) and control box cover (Figure 1, Item 22) from control box frame (Figure 1, Item 10).

7. Remove eight nuts (Figure 1, Item 23), screws (Figure 1, Item 24), connector J26 (Figure 1, Item 1) and J27 (Figure 1, Item 2) from control box frame (Figure 1, Item 10).

8. Remove two nuts (Figure 1, Item 25), washers (Figure 1, Item 26), screws (Figure 1, Item 27), and relay (Figure 1, Item 28) from control box frame (Figure 1, Item 10).

9. Remove two nuts (Figure 1, Item 29), screws (Figure 1, Item 30), and terminal block and rectifier assembly (Figure 1, Item 31) from control box frame (Figure 1, Item 10).

END OF TASK

ASSEMBLY

NOTE

Connect wiring as tagged and remove tags during component installation.

1. Install terminal block and rectifier assembly (Figure 1, Item 31) on control box frame (Figure 1, Item 10) with two screws (Figure 1, Item 30) and nuts (Figure 1, Item 29).

2. Install relay (Figure 1, Item 28) on control box frame (Figure 1, Item 10) with two screws (Figure 1, Item 27), washers (Figure 1, Item 26) and nuts (Figure 1, Item 25).

3. Install connectors J27 and J26 (Figure 1, Item 2) and (Figure 1, Item 1) on control box frame (Figure 1, Item 9) with eight screws (Figure 1, Item 24) and nuts (Figure 1, Item 23).

ASSEMBLY - Continued

4. Install control box cover (Figure 1, Item 22) on control box frame (Figure 1, Item 10) with two screws (Figure 1, Item 21).

5. Install toggle switch (Figure 1, Item 20) on control box faceplate (Figure 1, Item 9) with jam nut and lockwashers (Figure 1, Item 19).

6. Install circuit breaker (Figure 1, Item 18) on control box faceplate (Figure 1, Item 9) with jam nut and lockwashers (Figure 1, Item 17).

7. Install press-test indicator light (Figure 1, Item 16) on control box faceplate (Figure 1, Item 9) and install jam nut and lockwashers (Figure 1, Item 15) and lens cap (Figure 1, Item 14).

8. Install LED holder (Figure 1, Item 13) on control box faceplate (Figure 1, Item 9) and install jam nut and lockwashers (Figure 1, Item 10) and collar (Figure 1, Item 11).

9. Install control box faceplate (Figure 1, Item 9) and control box mounting bracket (Figure 1, Item 8) on control box frame (Figure 1, Item 10) with two screws (Figure 1, Item 7).

END OF TASK

INSTALLATION

1. Install winterization heater control box assembly (Figure 1, Item 6) on rear of generator housing and secure with two washers (Figure 1, Item 5), lockwashers (Figure 1, Item 4), and screws (Figure 1, Item 3).

2. Connect connector P27 to connector J27 (Figure 1, Item 2) and connector P26 to connector J26 (Figure 1, Item 1).

3. Close left rear doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

WINTERIZATION HEATER ASSEMBLY MAINTENANCE

INITIAL SETUP:

Tools and Special Tools	**Personnel Required**
Tool Kit, General Mechanic's (WP 0119, Item 1)	One
Materials/Parts	**References**
Cap and plug set (WP 0120, Item 6)	TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the heater system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open battery access doors and right front door.

3. Close shutoff valves (Figure 1, Item 1) and (Figure 1, Item 2).

4. Remove hose clamp (Figure 1, Item 3) and disconnect low-pressure hose (Figure 1, Item 4) from IN side of fuel metering pump (Figure 1, Item 5) on heater (Figure 1, Item 6).

5. Remove hose clamp (Figure 1, Item 7) and disconnect flexible braided hose (Figure 1, Item 8) from OUT side of fuel metering pump (Figure 1, Item 5) on heater (Figure 1, Item 6).

6. Disconnect generator set wiring harness (Figure 1, Item 9) connectors P28 and P29 from heater (Figure 1, Item 6).

7. Remove hose clamp (Figure 1, Item 10) and disconnect 90-degree elbow coolant hose (Figure 1, Item 11) from fitting on top of heater (Figure 1, Item 6).

8. Remove hose clamp (Figure 1, Item 12) and disconnect 90-degree elbow coolant hose (Figure 1, Item 13) from bottom of heater (Figure 1, Item 6).

9. Remove screw (Figure 1, Item 14), washer (Figure 1, Item 15), clamp (Figure 1, Item 16) and fuel metering pump (Figure 1, Item 5) from heater (Figure 1, Item 6).

10. Remove hose clamp (Figure 1, Item 17) and disconnect flexible exhaust tubing (Figure 1, Item 18) from heater (Figure 1, Item 6).

11. Remove four screws (Figure 1, Item 19), lockwashers (Figure 1, Item 20), washers (Figure 1, Item 21), and heater (Figure 1, Item 6) from vertical heater mounting bracket (Figure 1, Item 22).

NOTE

Horizontal heater bracket attaches in one place to vertical bracket and two places to skid base.

12. Remove three locknuts (Figure 1, Item 23), washers (Figure 1, Item 24), screws (Figure 1, Item 25), and horizontal heater bracket (Figure 1, Item 26).

NOTE

Three nuts can be accessed from under the bottom of the skid base and two nuts can be accessed from right side of bracket.

13. Remove five locknuts (Figure 1, Item 27), washers (Figure 1, Item 28), screws (Figure 1, Item 29), and vertical heater mounting bracket (Figure 1, Item 22).

REMOVAL - Continued

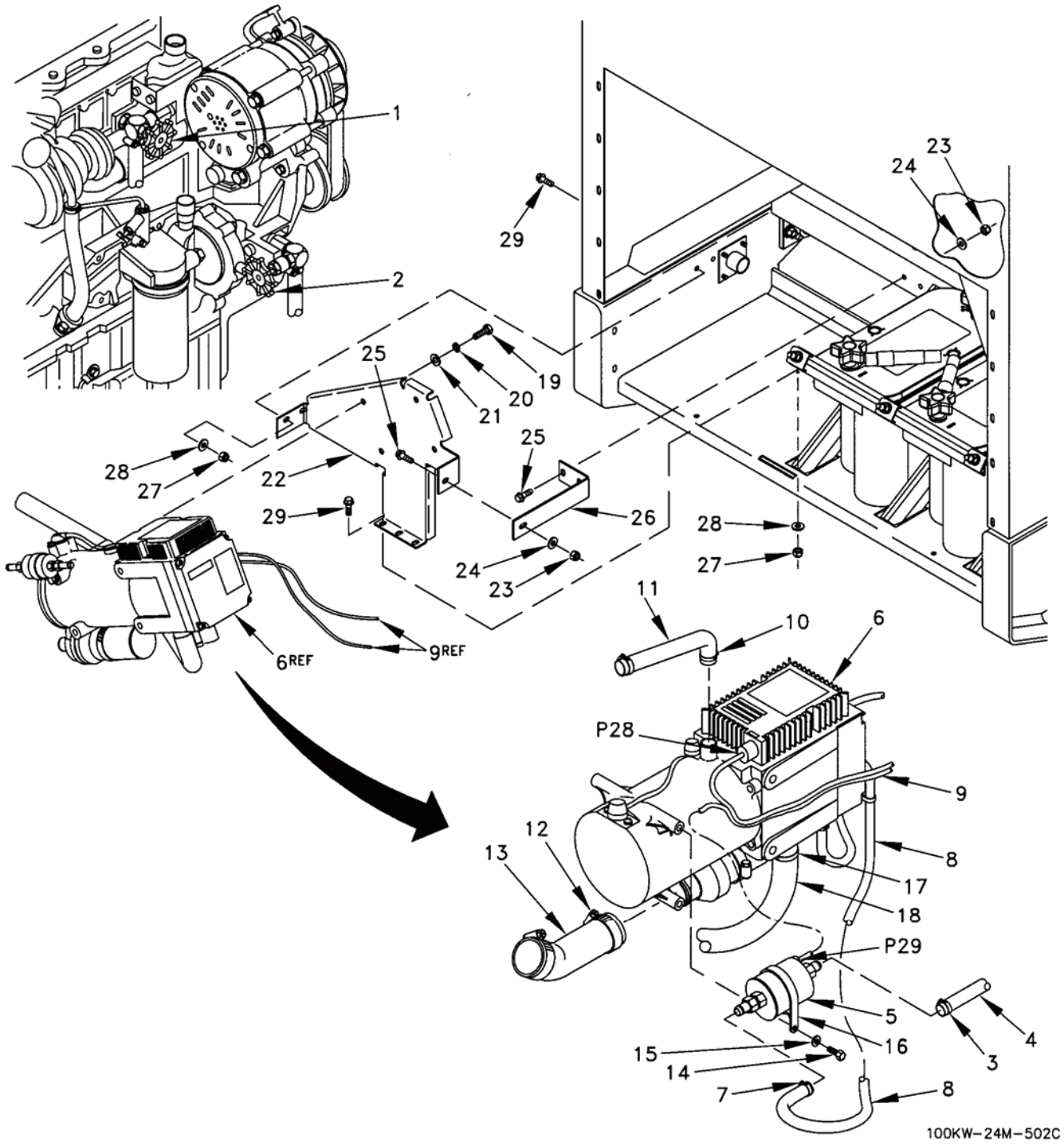


Figure 1. Winterization Heater Assembly.

END OF TASK

INSTALLATION

NOTE

Three nuts can be accessed from under the bottom of the skid base and two nuts can be accessed from right side of bracket.

1. Install vertical heater mounting bracket (Figure 1, Item 22) and secure with five screws (Figure 1, Item 29), washers (Figure 1, Item 28), and locknuts (Figure 1, Item 27).

NOTE

Horizontal heater bracket attaches in one place to vertical bracket and two places to skid base.

2. Install horizontal heater bracket (Figure 1, Item 26), and secure with three screws (Figure 1, Item 25), washers (Figure 1, Item 24), and locknuts (Figure 1, Item 23).
3. Install heater (Figure 1, Item 6) on vertical heater mounting bracket (Figure 1, Item 22) and secure with four washers (Figure 1, Item 21), lockwashers (Figure 1, Item 20), and screws (Figure 1, Item 19).
4. Connect flexible exhaust tubing (Figure 1, Item 18) on heater (Figure 1, Item 6) and install hose clamp (Figure 1, Item 17).
5. Install fuel metering pump (Figure 1, Item 5) and clamp (Figure 1, Item 16) on heater (Figure 1, Item 6) and secure with washer (Figure 1, Item 15) and screw (Figure 1, Item 14).
6. Connect 90-degree elbow coolant hose (Figure 1, Item 13) to bottom of heater (Figure 1, Item 6) and install hose clamp (Figure 1, Item 12).
7. Connect 90-degree elbow coolant hose (Figure 1, Item 11) to top of heater (Figure 1, Item 6) and install hose clamp (Figure 1, Item 10).
8. Connect generator set wiring harness (Figure 1, Item 9) connectors P28 and P29 to heater (Figure 1, Item 6) in two places.
9. Connect flexible braided hose (Figure 1, Item 8) to OUT side of fuel metering pump (Figure 1, Item 5) and install hose clamp (Figure 1, Item 7).
10. Connect low-pressure hose (Figure 1, Item 4) to IN side of fuel metering pump (Figure 1, Item 5) and install hose clamp (Figure 1, Item 3).
11. Open shutoff valves (Figure 1, Item 2) and (Figure 1, Item 1).
12. Close battery access doors and right front door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
WINTERIZATION HEATER HOSES MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool kit, general mechanic's (WP 0119, Item 1)

Materials/Parts

Cap and plug set (WP 0120, Item 6)
Sealing compound (WP 0120, Item 41)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Cooling system drained (WP 0064)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the heater system.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.
2. Open battery access doors, and right and left front doors.
3. Close shutoff valves (Figure 1, Sheet 1, Item 1) and (Figure 1, Sheet 1, Item 2).
4. Remove hose clamp (Figure 1, Sheet 1, Item 3) and disconnect hose (Figure 1, Sheet 1, Item 4) from shutoff valve (Figure 1, Sheet 1, Item 1) located behind alternator.
5. Remove screws (Figure 1, Sheet 2, Item 5), lockwasher (Figure 1, Sheet 2, Item 6), and hose clamp (Figure 1, Sheet 2, Item 7).
6. Remove hose clamp (Figure 1, Sheet 2, Item 8) and disconnect hose (Figure 1, Sheet 1, Item 4) from hose mender fitting (Figure 1, Sheet 2, Item 9) at bottom of heater (Figure 1, Sheet 2, Item 10), and remove hose (Figure 1, Sheet 1, Item 4).
7. Remove two hose clamps (Figure 1, Sheet 2, Item 11), hose mender fitting (Figure 1, Sheet 2, Item 9), and 90-degree hose elbow (Figure 1, Sheet 2, Item 12) from heater (Figure 1, Sheet 2, Item 10).
8. Remove hose clamp (Figure 1, Sheet 1, Item 13) and disconnect hose (Figure 1, Sheet 1, Item 14) from shutoff valve (Figure 1, Sheet 1, Item 2) located below alternator.
9. Remove two screws (Figure 1, Sheet 2, Item 15), two nuts (Figure 1, Sheet 2, Item 16), and two hose clamps (Figure 1, Sheet 2, Item 17).
10. Remove hose clamp (Figure 1, Sheet 2, Item 18) and disconnect hose (Figure 1, Sheet 1, Item 14) from hose mender fitting (Figure 1, Sheet 2, Item 19) at top of heater (Figure 1, Sheet 2, Item 10), and remove hose (Figure 1, Sheet 1, Item 14).
11. Remove two hose clamps (Figure 1, Sheet 2, Item 20), hose mender fitting (Figure 1, Sheet 2, Item 19), and 90-degree hose elbow (Figure 1, Sheet 2, Item 21) from heater (Figure 1, Sheet 2, Item 10).
12. Remove hose clamp (Figure 1, Sheet 2, Item 22) and disconnect low-pressure hose (Figure 1, Sheet 2, Item 23) from IN side of fuel metering pump (Figure 1, Sheet 2, Item 24).
13. Remove hose clamp (Figure 1, Sheet 1, Item 25) and disconnect low-pressure hose (Figure 1, Sheet 1, Item 23) from male hose barb fitting (Figure 1, Sheet 1, Item 26) on left side of fuel tank, and remove hose (Figure 1, Sheet 1, Item 23).
14. Remove two hose clamps (Figure 1, Sheet 2, Item 27) and disconnect flexible braided leak-off hose (Figure 1, Sheet 2, Item 28) from OUT side of fuel metering pump (Figure 1, Sheet 2, Item 24) and from bottom of heater (Figure 1, Sheet 2, Item 10).

REMOVAL - Continued

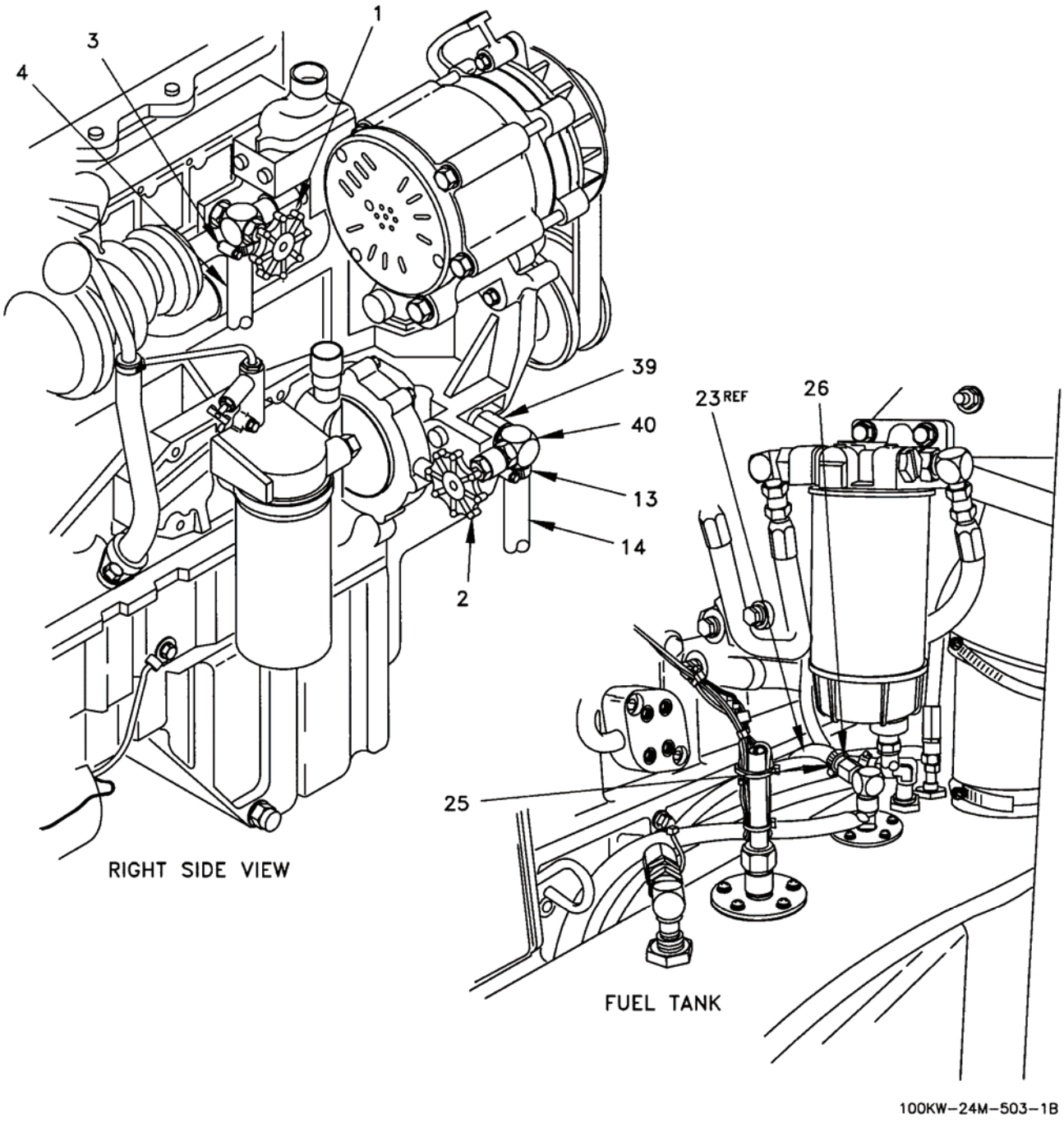


Figure 1. Winterization Heater Hoses (Sheet 1 of 2).

REMOVAL - Continued

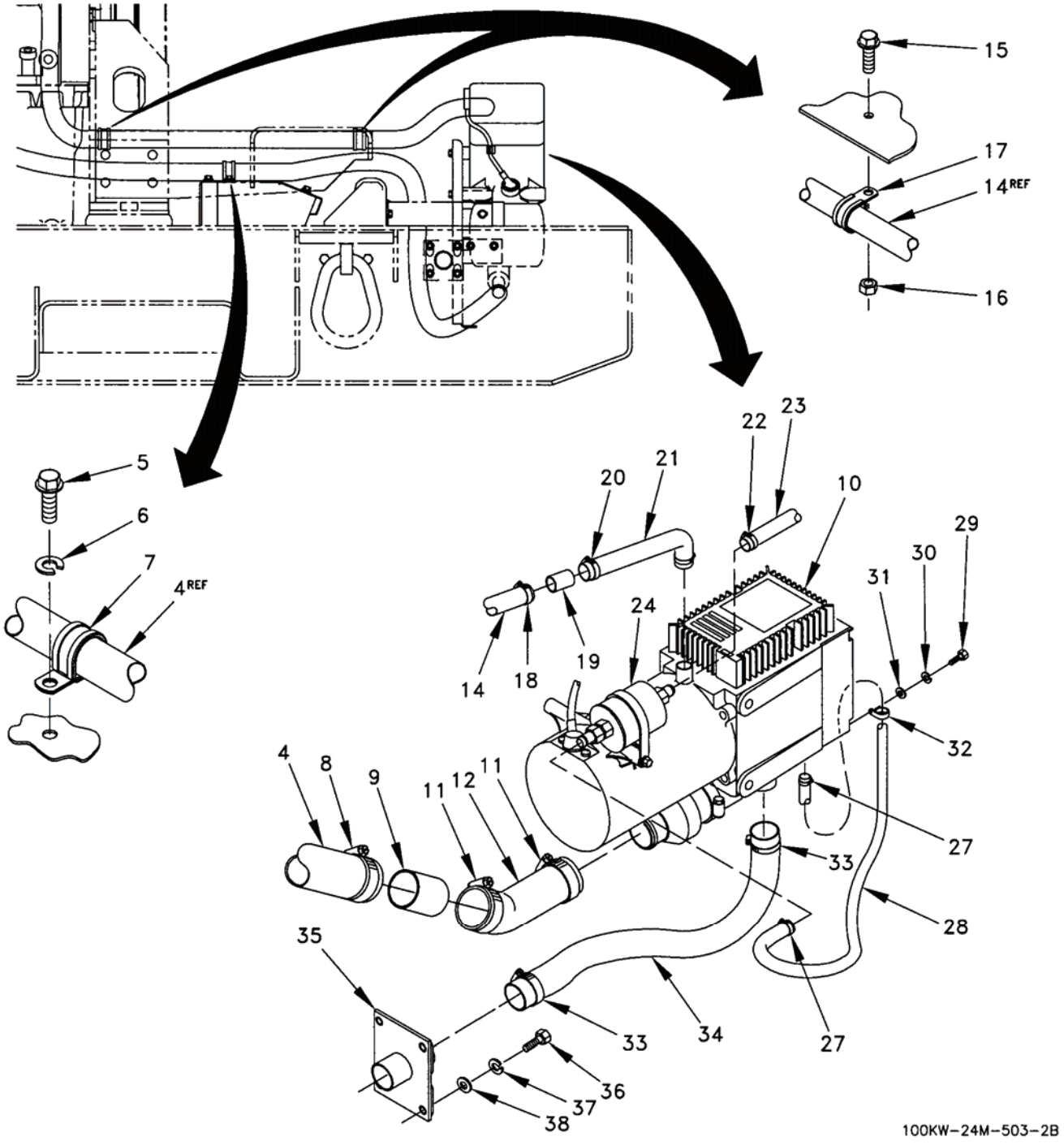


Figure 1. Winterization Heater Hoses (Sheet 2 of 2).

REMOVAL - Continued

15. Remove screw (Figure 1, Sheet 2, Item 29), lockwasher (Figure 1, Sheet 2, Item 30), washer (Figure 1, Sheet 2, Item 31), clamp (Figure 1, Sheet 2, Item 32), and flexible braided leak-off hose (Figure 1, Sheet 2, Item 28).

16. Remove two hose clamps (Figure 1, Sheet 2, Item 33) and disconnect flexible exhaust tubing (Figure 1, Sheet 2, Item 34) from heater (Figure 1, Sheet 2, Item 10) and from heater exhaust adapter (Figure 1, Sheet 2, Item 35).

17. Remove four screws (Figure 1, Sheet 2, Item 36), lockwashers (Figure 1, Sheet 2, Item 37), washers (Figure 1, Sheet 2, Item 38), and heater exhaust adapter (Figure 1, Sheet 2, Item 35) from skid base.

18. Remove shutoff valve (Figure 1, Sheet 1, Item 2), adapter (Figure 1, Sheet 1, Item 39), and elbow (Figure 1, Sheet 1, Item 40). Repeat for other shutoff valve (Figure 1, Sheet 1, Item 1).

END OF TASK

INSTALLATION

NOTE

Apply sealing compound to all male pipe threads before connecting.

1. Install elbow (Figure 1, Sheet 1, Item 40), adapter (Figure 1, Sheet 1, Item 39), and shutoff valve (Figure 1, Sheet 1, Item 2). Repeat for other shutoff valve (Figure 1, Sheet 1, Item 1).

2. Install heater exhaust adapter (Figure 1, Sheet 2, Item 35) on skid base and secure with four washers (Figure 1, Sheet 2, Item 38), lockwashers (Figure 1, Sheet 2, Item 37), and screws (Figure 1, Sheet 2, Item 36).

3. Connect flexible exhaust tubing (Figure 1, Sheet 2, Item 34) to heater exhaust adapter (Figure 1, Sheet 2, Item 35) and to heater (Figure 1, Sheet 2, Item 10) and install two hose clamps (Figure 1, Sheet 2, Item 33).

4. Install flexible braided leak-off hose (Figure 1, Sheet 2, Item 28), hose clamp (Figure 1, Sheet 2, Item 32), washer (Figure 1, Sheet 2, Item 31), lockwasher (Figure 1, Sheet 2, Item 30), and screw (Figure 1, Sheet 2, Item 29).

5. Connect flexible braided leak-off hose (Figure 1, Sheet 2, Item 28) to OUT side of fuel metering pump (Figure 1, Sheet 2, Item 24) and to bottom of heater (Figure 1, Sheet 2, Item 10) and install two hose clamps (Figure 1, Sheet 2, Item 27).

6. Connect low-pressure hose (Figure 1, Sheet 1, Item 23) to male hose barb fitting (Figure 1, Sheet 1, Item 26) on left side of fuel tank and install hose clamp (Figure 1, Sheet 1, Item 25).

7. Connect low-pressure hose (Figure 1, Sheet 1, Item 23) to IN side of fuel metering pump (Figure 1, Sheet 2, Item 24) and install hose clamp (Figure 1, Sheet 2, Item 22).

8. Install 90-degree hose elbow (Figure 1, Sheet 2, Item 21) and hose mender fitting (Figure 1, Sheet 1, Item 19) on top of heater (Figure 1, Sheet 2, Item 10), and install two hose clamps (Figure 1, Sheet 1, Item 20).

9. Connect hose (Figure 1, Sheet 1, Item 14) to hose mender fitting (Figure 1, Sheet 2, Item 19), and install hose clamp (Figure 1, Sheet 2, Item 18).

INSTALLATION - Continued

10. Install two hose clamps (Figure 1, Sheet 2, Item 17) with two screws (Figure 1, Sheet 2, Item 15) and two nuts (Figure 1, Sheet 2, Item 16).

11. Connect hose (Figure 1, Sheet 1, Item 14) to shutoff valve (Figure 1, Sheet 1, Item 2) located below alternator and install hose clamp (Figure 1, Sheet 1, Item 13).

12. Install 90-degree hose elbow (Figure 1, Sheet 2, Item 12) and hose mender fitting (Figure 1, Sheet 2, Item 9) on bottom of heater (Figure 1, Sheet 2, Item 10) and install two hose clamps (Figure 1, Sheet 2, Item 11).

13. Connect hose (Figure 1, Sheet 1, Item 4) to hose mender fitting (Figure 1, Sheet 2, Item 9) and install hose clamp (Figure 1, Sheet 2, Item 8).

14. Install hose clamp (Figure 1, Sheet 2, Item 7) with screw (Figure 1, Sheet 2, Item 5) and lockwasher (Figure 1, Sheet 2, Item 6).

15. Connect hose (Figure 1, Sheet 1, Item 4) to shutoff valve (Figure 1, Sheet 1, Item 1) located behind alternator and install hose clamp (Figure 1, Sheet 1, Item 3).

16. Open shutoff valves (Figure 1, Sheet 1, Item 1) and (Figure 1, Sheet 1, Item 2).

17. Refill coolant system (WP 0064).

18. Close right and left front doors and battery access doors.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

WINTERIZATION THERMOSTAT, RESISTORS, AND DIODE MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Insulation sleeving (WP 0120, Item 26)
Solder (WP 0120, Item 46)
Tiedown strap (WP 0120, Item 49)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

WARNING

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

REMOVAL

NOTE

Cut tiedown straps as required.

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Open control box door and control box panel.

3. To remove thermostat (Figure 1, Item 1), at left side of control box assembly, tag and disconnect spade terminals as follows:

   Lead from TS-1 to TB4-17
   Lead from TS-2 to TB4-12

4. Remove two nuts (Figure 1, Item 2), screws (Figure 1, Item 3), and thermostat (Figure 1, Item 1).

5. To remove either resistor HTR1 (Figure 1, Item 4), located below GSC+P, or HTR2 (Figure 1, Item 5), located on right side of control panel, unsolder leads and remove two nuts (Figure 1, Item 6), screws (Figure 1, Item 7), and resistor (Figure 1, Item 4) or (Figure 1, Item 5).

6. Tag and disconnect spade terminals and wiring as follows:

   HTR-1 lead 1 to TB4-10B
   HTR-2 lead 1 to TB3-10B
   HTR-1 lead 2 to HTR-2 lead 2

NOTE

Note orientation of diode before removing.

7. To remove diode (Figure 1, Item 8), tag and disconnect spade terminals as follows:

   Cathode of diode to TB4-10
   Anode of diode to TB4-12

8. Remove diode (Figure 1, Item 8).

END OF TASK

INSTALLATION

NOTE

Install tiedown straps as required.

1. To install diode (Figure 1, Item 8), connect spade terminals as follows:

   Cathode of diode to TB4-10
   Anode of diode to TB4-12

INSTALLATION - Continued

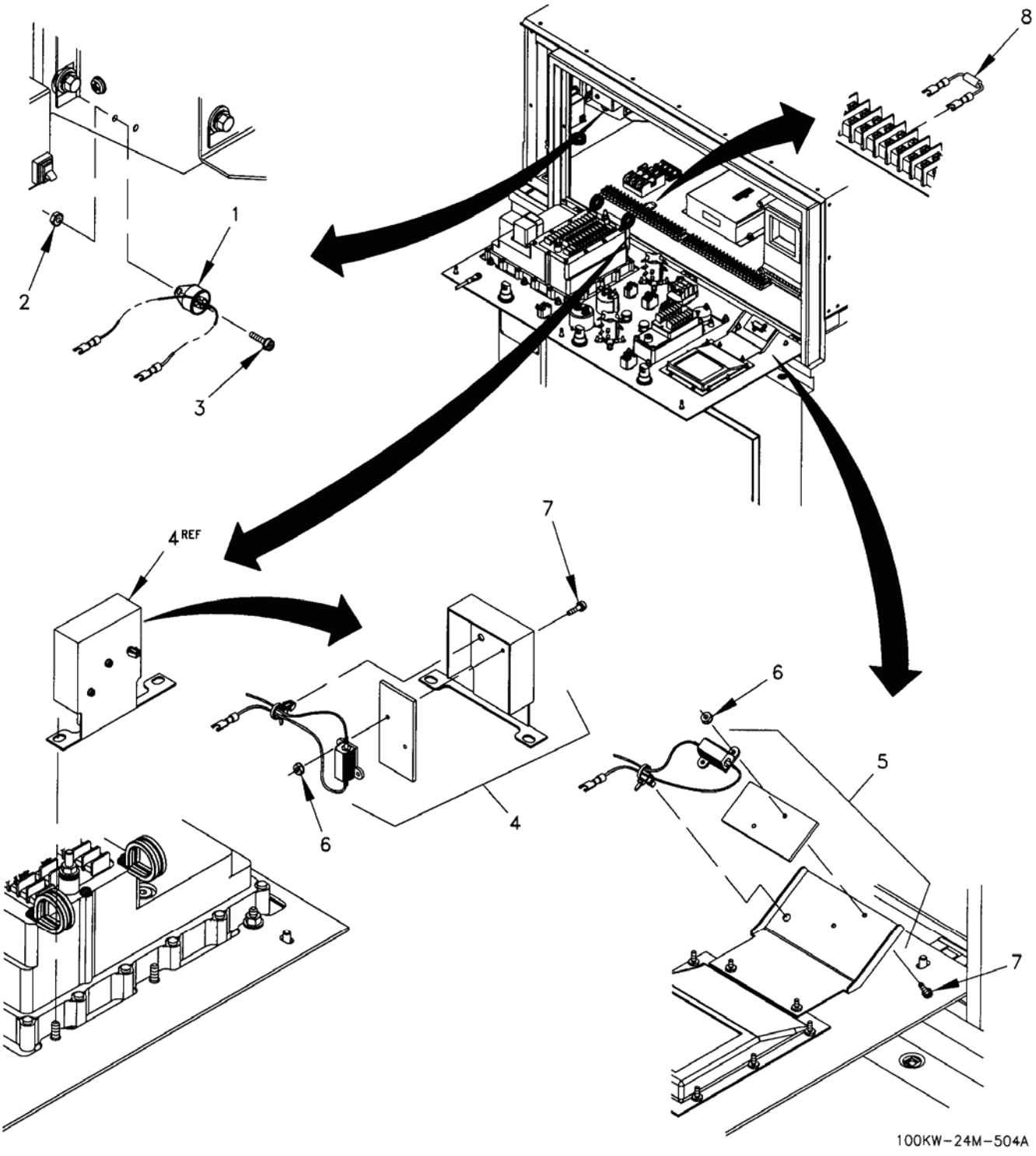


Figure 1. Winterization Thermostat, Resistors, and Diode.

INSTALLATION - Continued

NOTE

Replace heat shrink sleeving when soldering wiring on resistor leads.

2. To install resistor HTR1 (Figure 1, Item 4) or HTR2 (Figure 1, Item 5), position resistor and secure with two screws (Figure 1, Item 7) and nuts (Figure 1, Item 6).

3. Connect spade terminals as follows:

   HTR-1 lead 1 to TB4-10B
   HTR-2 lead 1 to TB3-10B
   HTR-1 lead 2 to HTR-2 lead 2

4. To install thermostat (Figure 1, Item 1), position thermostat and secure with two screws (Figure 1, Item 3) and nuts (Figure 1, Item 2).

5. Connect spade terminals to TB 4 as follows:

   Lead from TS-1 to TB 4-17
   Lead from TS-2 to TB 4-12

6. Close control box panel and control box door.

END OF TASK

END OF WORK PACKAGE

UNIT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

WINTERIZATION WIRING HARNESSES MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Tool Kit, General Mechanic's (WP 0119, Item 1)

Personnel Required

One

Materials/Parts

Marker tags (WP 0120, Item 52)
Tiedown strap (WP 0120, Item 49)

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

NOTE

Cut tiedown straps as required.

2. Open left rear doors and battery access doors.
3. To remove winterization power input wiring harness, disconnect connector P26 (Figure 1, Item 1) from connector J26 (Figure 1, Item 2) on rear of winterization heater control box (Figure 1, Item 3).
4. On terminal board TB5 (Figure 1, Item 4), tag and disconnect three spade terminals from TB5-15A, TB5-16A, and TB5-17A.
5. Remove winterization power wiring harness.
6. To remove heater to heater control box wiring harness, disconnect connector P27 (Figure 1, Item 5) from connector J27 (Figure 1, Item 6) on rear of winterization heater control box (Figure 1, Item 3).
7. On terminal board TB5 (Figure 1, Item 4), tag and disconnect spade terminal from TB5-17B.
8. On winterization heater (Figure 1, Item 7), disconnect connector P28 (Figure 1, Item 8) (FO-1, Sheet 6) from top of heater and connector P29 (Figure 1, Item 9) (FO-1, Sheet 6) from end of heater.
9. Remove winterization heater to heater control box wiring harness.

END OF TASK

INSTALLATION

NOTE

Install tiedown straps as required.

1. To install winterization heater to heater control box wiring harness, connect connector P29 (Figure 1, Item 9) (FO-1, Sheet 6) to end of heater (Figure 1, Item 7) and connector P28 (Figure 1, Item 8) (FO-1, Sheet 6) to top of heater.
2. On terminal board TB 5 (Figure 1, Item 4), connect spade terminal to TB5-17B.
3. Connect connector P27 (Figure 1, Item 5) to connector J27 (Figure 1, Item 6) on rear of winterization heater control box (Figure 1, Item 3).
4. To install winterization power wiring harness, connect three spade terminals to TB5-17A, TB5-16A, and TB5-15A on terminal board TB5 (Figure 1, Item 4).
5. Connect connector J26 (Figure 1, Item 2) to connector P26 (Figure 1, Item 1) on rear of winterization heater control box (Figure 1, Item 3).
6. Close left rear doors and battery access doors.

INSTALLATION - Continued

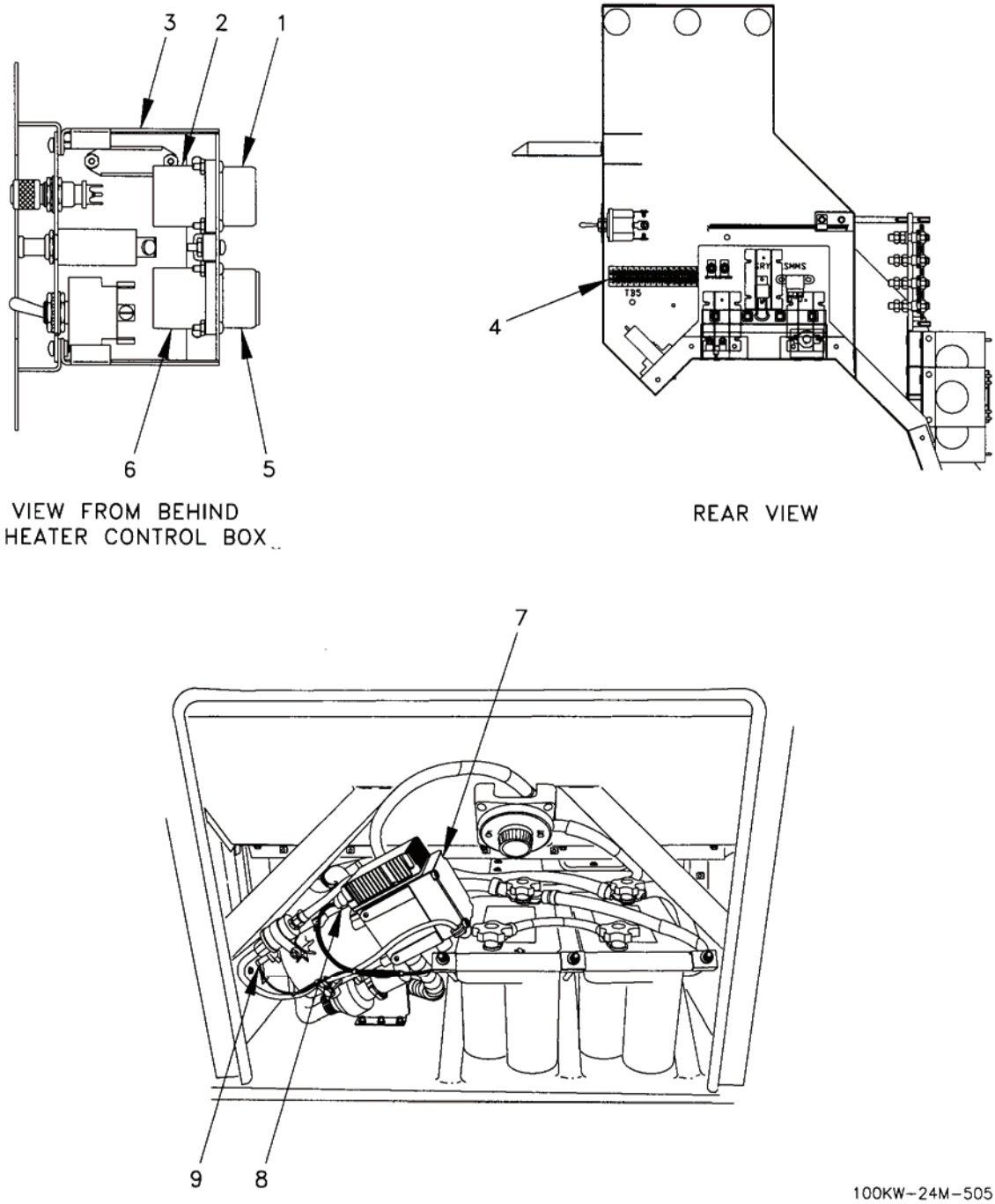


Figure 1. Winterization Wiring Harnesses.

END OF TASK

END OF WORK PACKAGE

CHAPTER 5

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE INSTRUCTIONS

CHAPTER 5

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE INSTRUCTIONS

WORK PACKAGE INDEX

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

GENERATOR MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Grease (WP 0120, Item 23)
Technical alcohol (WP 0120, Item 4)
Wiping rags (WP 0120, Item 36)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

If necessary for disassembly/repair, generator removed from generator set (WP 0097)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the engine.

DISASSEMBLY

1. Remove twelve screws (Figure 1, Item 1) and cover (Figure 1, Item 2) from body assembly (Figure 1, Item 3).

CAUTION

Bearing bracket supports the main rotor, which will drop and sustain damage when bearing bracket is removed. To avoid damage to rotor, bar rotor so that two main rotor poles are vertical in stator. This will limit amount of rotor drop.

2. Bar rotor (Figure 1, Item 4) so that two main rotor poles are vertical in body assembly (Figure 1, Item 3).

NOTE

Tag and disconnect wiring before removal of components as required.

3. Remove eight screws (Figure 1, Item 5), lockwashers (Figure 1, Item 6), nuts (Figure 1, Item 7), and bearing bracket (Figure 1, Item 8) with exciter stator (Figure 1, Item 9) attached.

CAUTION

If bearing needs to be removed, it is easily damaged, and should be replaced.

4. Use bearing puller to remove bearing (Figure 1, Item 10) from shaft of rotor (Figure 1, Item 4) and discard bearing.

5. Remove rotating rectifier (Figure 1, Item 11) from rotor (Figure 1, Item 4).

CAUTION

Magnets in exciter stator are very strong and will attract loose screws, washers, etc, which may cause damage to stator. Keep loose hardware away from stator. Strong magnets in stator will also impede removal of stator.

6. Note orientation of Belleville washers (Figure 1, Item 12) and remove four screws (Figure 1, Item 13), Belleville washers (Figure 1, Item 12), and exciter stator (Figure 1, Item 9) from bearing bracket (Figure 1, Item 8).

7. Remove two nuts (Figure 1, Item 14), screws (Figure 1, Item 15), and exhaust screen (Figure 1, Item 16).

8. Remove 16 screws (Figure 1, Item 17), lockwashers (Figure 1, Item 18), washers (Figure 1, Item 19), and flywheel housing adapter (Figure 1, Item 20).

CAUTION

Rotor and attached parts must be removed carefully to avoid damaging rotor or stator windings. Do not apply any force to fan when removing rotor to avoid damage to fan.

9. Use suitable rotor lifting device to carefully remove rotor (Figure 1, Item 4) and attached parts from body assembly (Figure 1, Item 3).

DISASSEMBLY - Continued

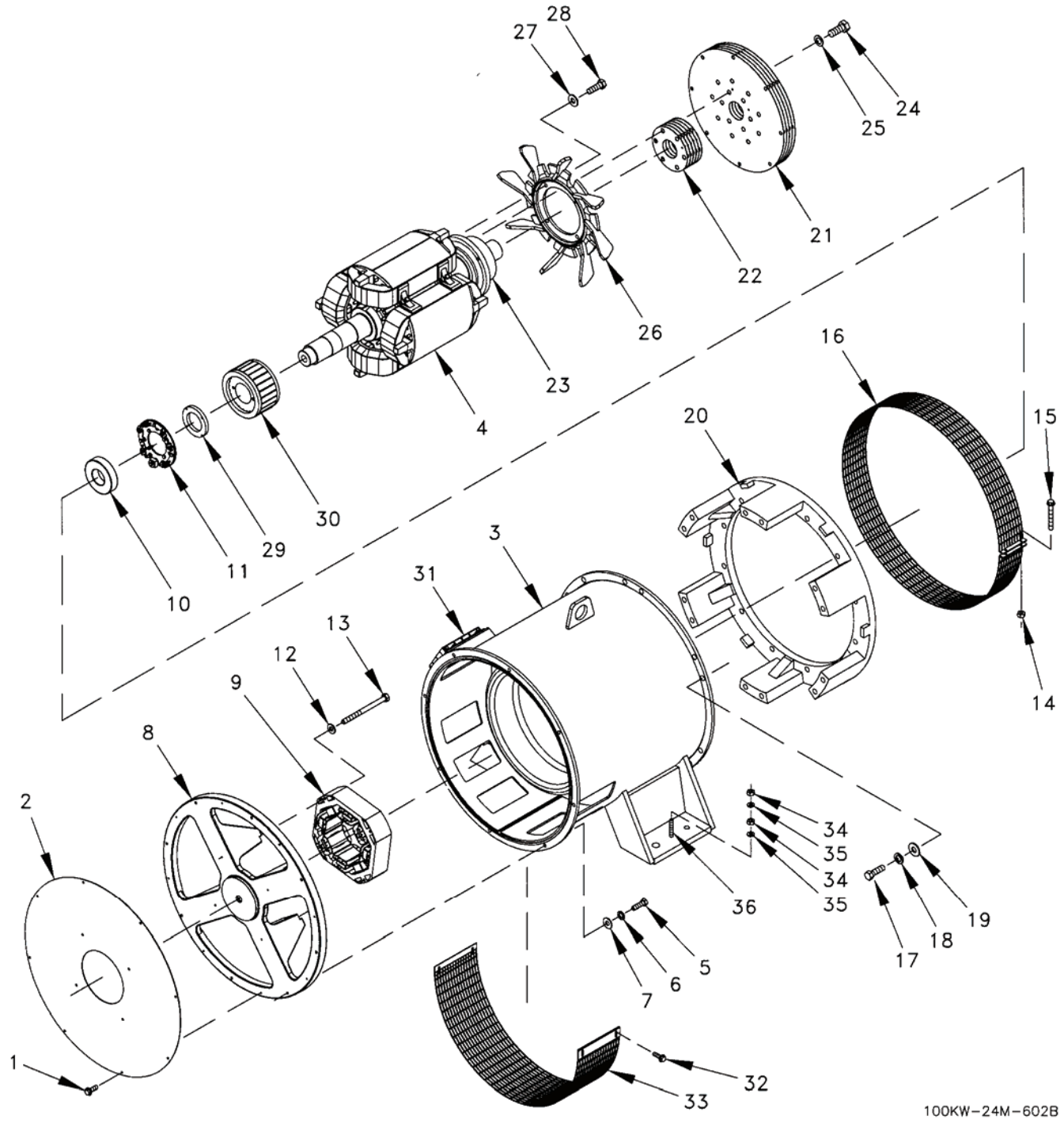


Figure 1. Generator Repair.

DISASSEMBLY - Continued

10. Mark drive discs (Figure 1, Item 21), spacer discs (Figure 1, Item 22), and drive hub (Figure 1, Item 23) for proper alignment during assembly.

11. Remove six screws (Figure 1, Item 24), washers (Figure 1, Item 25), five drive discs (Figure 1, Item 21) and six spacer discs (Figure 1, Item 22) from drive hub (Figure 1, Item 23).

12. Mark fan (Figure 1, Item 26) and drive hub (Figure 1, Item 23) for proper alignment and balancing of fan during assembly.

13. Note orientation of Belleville washers (Figure 1, Item 27) as they are removed, and remove four screws (Figure 1, Item 28), Belleville washers (Figure 1, Item 27), and fan (Figure 1, Item 26) from drive hub (Figure 1, Item 23).

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after generator drive hub has been heated. Wear additional protective clothing as required. Failure to comply can cause injury to personnel.

14. Install suitable puller to drive hub (Figure 1, Item 23) Use torch to rapidly heat only outside diameter of drive hub (Figure 1, Item 23) (to avoid expanding rotor shaft) while tightening puller. Remove drive hub (Figure 1, Item 23) from rotor (Figure 1, Item 4).

15. Remove rectifier mounting hub (Figure 1, Item 29) and exciter rotor (Figure 1, Item 30) from rotor (Figure 1, Item 4).

16. If necessary, remove lead block assembly (Figure 1, Item 31).

17. Remove four screws (Figure 1, Item 32) and intake air screen (Figure 1, Item 33).

18. If necessary, remove nameplate and three decals.

19. Remove two nuts (Figure 1, Item 34), two lockwashers (Figure 1, Item 35), and grounding stud (Figure 1, Item 36).

END OF TASK

CLEANING

CAUTION

Winding varnishes are epoxy or polyester based. Do not use any cleaning materials which will attack these materials. Be careful not to damage magnet wire or winding insulation. Do not use a wire brush.

1. Most components of the generator can be cleaned with alcohol or breakthrough cleaning solvent and a soft brush or cloth.

CLEANING - Continued

WARNING

Cleaning with compressed air can cause flying particles. When using compressed air, wear protective glasses and use clean, low pressure air, less than 30 psi (208 kPa). Failure to comply can cause eye injury to personnel.

2. Compressed air may be used to clean dirt from areas where a cloth will not reach. Use low pressure compressed air, 30 psi maximum.

3. Dry dust and dirt may be removed by vacuum cleaning.

4. When completely disassembled, most generator components (except electronic parts) may be steam cleaned.

5. Make sure all components are completely dry before assembly.

END OF TASK

ASSEMBLY

1. Install grounding stud (Figure 1, Item 36), two lockwashers (Figure 1, Item 35), and two nuts (Figure 1, Item 34).

2. If removed, install three decals and nameplate.

3. Install intake air screen (Figure 1, Item 33) and four screws (Figure 1, Item 32).

4. If removed, install lead block assembly (Figure 1, Item 31).

5. Install exciter rotor (Figure 1, Item 30) and rectifier mounting hub (Figure 1, Item 29) on rotor (Figure 1, Item 4).

WARNING

Wear heat resistant gloves and avoid contacting hot metal surfaces with your hands after generator drive hub has been heated. Wear additional protective clothing as required. Failure to comply can cause injury to personnel.

6. Heat new drive hub (Figure 1, Item 23) in oven to 500-600 degrees F (260-316 degrees C). Using suitable heat resistant gloves, slide drive hub (Figure 1, Item 23) on shaft until it seats against shaft shoulder. Allow drive hub (Figure 1, Item 23) to cool for one hour.

CAUTION

Fan and drive hub must be installed and aligned properly to avoid an unbalanced condition and considerable vibration.

7. Align marks on fan (Figure 1, Item 26) with marks on drive hub (Figure 1, Item 23). Note orientation of Belleville washers (Figure 1, Item 27). Install fan (Figure 1, Item 26), four Belleville washers (Figure 1, Item 27), and screws (Figure 1, Item 28). Torque screws (Figure 1, Item 28) in an alternating pattern to 60 lb-ft (81 Nm).

ASSEMBLY - Continued

8. Align marks made on drive discs (Figure 1, Item 21) and spacer discs (Figure 1, Item 22) with marks on drive hub (Figure 1, Item 23). Install five spacer discs (Figure 1, Item 22), five drive discs (Figure 1, Item 21), six washers (Figure 1, Item 25) and screws (Figure 1, Item 24). Torque screws (Figure 1, Item 24) in an alternating pattern to 192 lb-ft (260 Nm).

CAUTION

Rotor and attached parts must be installed carefully to avoid damaging rotor or stator windings.

9. Use suitable lifting device and carefully install rotor (Figure 1, Item 4) and attached parts into body assembly (Figure 1, Item 3).

10. Install flywheel housing adapter (Figure 1, Item 20), 16 washers (Figure 1, Item 19), lockwashers (Figure 1, Item 18), and screws (Figure 1, Item 17). Torque screws (Figure 1, Item 17) in an alternating pattern to 25 lb-ft (34 Nm).

11. Install exhaust screen (Figure 1, Item 16), two screws (Figure 1, Item 15), and nuts (Figure 1, Item 14).

12. Note orientation of Belleville washers (Figure 1, Item 12). Install exciter stator (Figure 1, Item 9) in bearing bracket (Figure 1, Item 8) and install four Belleville washers (Figure 1, Item 12) and screws (Figure 1, Item 13). Torque screws (Figure 1, Item 13) to 60 lb-ft (81 Nm).

13. Install rotating rectifier assembly (Figure 1, Item 11) on rotor (Figure 1, Item 4).

WARNING

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

CAUTION

Do not strike bearing directly with hammer. Do not apply pressure to outer race. Use only light taps from a soft mallet, or bearing will be damaged.

14. Heat new bearing (Figure 1, Item 10) in an oven to a maximum of 212 degrees F (100 degrees C). Apply a thin coat of clean oil to the press fit area of the shaft on rotor (Figure 1, Item 4). Using heat resistant gloves, install bearing (Figure 1, Item 10) over end of shaft until it seats against shaft shoulder. Bearing should slide on shaft and be seated without excessive force. If bearing binds on shaft before fully seated, use a piece of tubing slightly larger than the press fit area and a soft mallet to drive bearing into place. Use light taps and apply pressure only to inner race of bearing. After installation, allow bearing to cool for one hour before continuing assembly of generator.

15. After bearing (Figure 1, Item 10) has cooled, fill bearing grease cavity one third to one half full of grease.

ASSEMBLY - Continued

16. Install bearing bracket (Figure 1, Item 8) with exciter stator (Figure 1, Item 9) attached onto body assembly (Figure 1, Item 3) with eight washers (Figure 1, Item 7), lockwashers (Figure 1, Item 6), and screws (Figure 1, Item 5). Torque screws (Figure 1, Item 5) in an alternating pattern to 25 lb-ft (34 Nm).

17. Install cover (Figure 1, Item 2) and 12 screws (Figure 1, Item 1). Torque screws (Figure 1, Item 1) in an alternating pattern to 25 lb-ft (34 Nm).

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
GENERATOR REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Lifting Device, 2000 lb (907 kg) Capacity
Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Left rear door assembly removed (WP 0022)
Left rear door assembly (latch) removed (WP 0023)
Right rear door assembly removed (WP 0026)
Right rear door assembly (latch) removed (WP 0027)
Front roof section housing assembly removed (WP 0029)
Rear roof section housing assembly removed (WP 0030)
Engine generator compartment ceiling assembly removed (WP 0031)
Rear section housing assembly removed (WP 0034)
Right rear panel assembly removed (WP 0037)
Potential transformers removed (WP 0052)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

CAUTION

When rear and right side panels and doors are removed it may be necessary to support the electrical component mounting brackets assembly with a block of wood between generator and bracket assembly or damage to equipment may result.

REMOVAL

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

2. Tag and disconnect ten generator cables T1 thru T10 from reconnection board TB1 (Figure 1, Sheet 1, Item 1).

3. Tag and disconnect two generator field leads G1-F2 and G1-F1 from terminal board TB5-1 and -2 (Figure 1, Sheet 1, Item 2 and FO-3, sheet 1).

4. Cut ty-raps as required and tag and remove generator leads from current transformers (Figure 1, Sheet 1, Item 3).

5. Remove two screws (Figure 1, Sheet 1, Item 4), lockwashers (Figure 1, Sheet 1, Item 5), and washers (Figure 1, Sheet 1, Item 6).

6. Remove two screws (Figure 1, Sheet 1, Item 7), lockwashers (Figure 1, Sheet 1, Item 8), and washers (Figure 1, Sheet 1, Item 9).

7. Carefully remove electrical component mounting brackets assembly (Figure 1, Sheet 1, Item 10) and position at left side of engine generator frame.

8. Lay generator cables across generator (Figure 1, Sheet 2, Item 11).

9. Remove two nuts (Figure 1, Sheet 2, Item 12), screws (Figure 1, Sheet 2, Item 13), and air exhaust screen (Figure 1, Sheet 2, Item 14).

10. Loosen two nuts (Figure 1, Sheet 2, Item 15) and turn two jackscrews (Figure 1, Sheet 2, Item 16) clockwise (CW) to raise engine (Figure 1, Sheet 2, Item 17) approximately ½ inch (1.27 cm) to allow separation of generator (Figure 1, Sheet 2, Item 11) and engine (Figure 1, Sheet 2, Item 17).

11. Remove eight screws (Figure 1, Sheet 2, Item 18) and lockwashers (Figure 1, Sheet 2, Item 19) to uncouple the generator (Figure 1, Sheet 2, Item 11) rotor from the engine (Figure 1, Sheet 2, Item 17) flywheel.

12. Remove 12 screws (Figure 1, Sheet 2, Item 20) and lockwashers (Figure 1, Sheet 2, Item 21) to disconnect the generator (Figure 1, Sheet 2, Item 11) from the engine (Figure 1, Sheet 2, Item 17).

REMOVAL - Continued

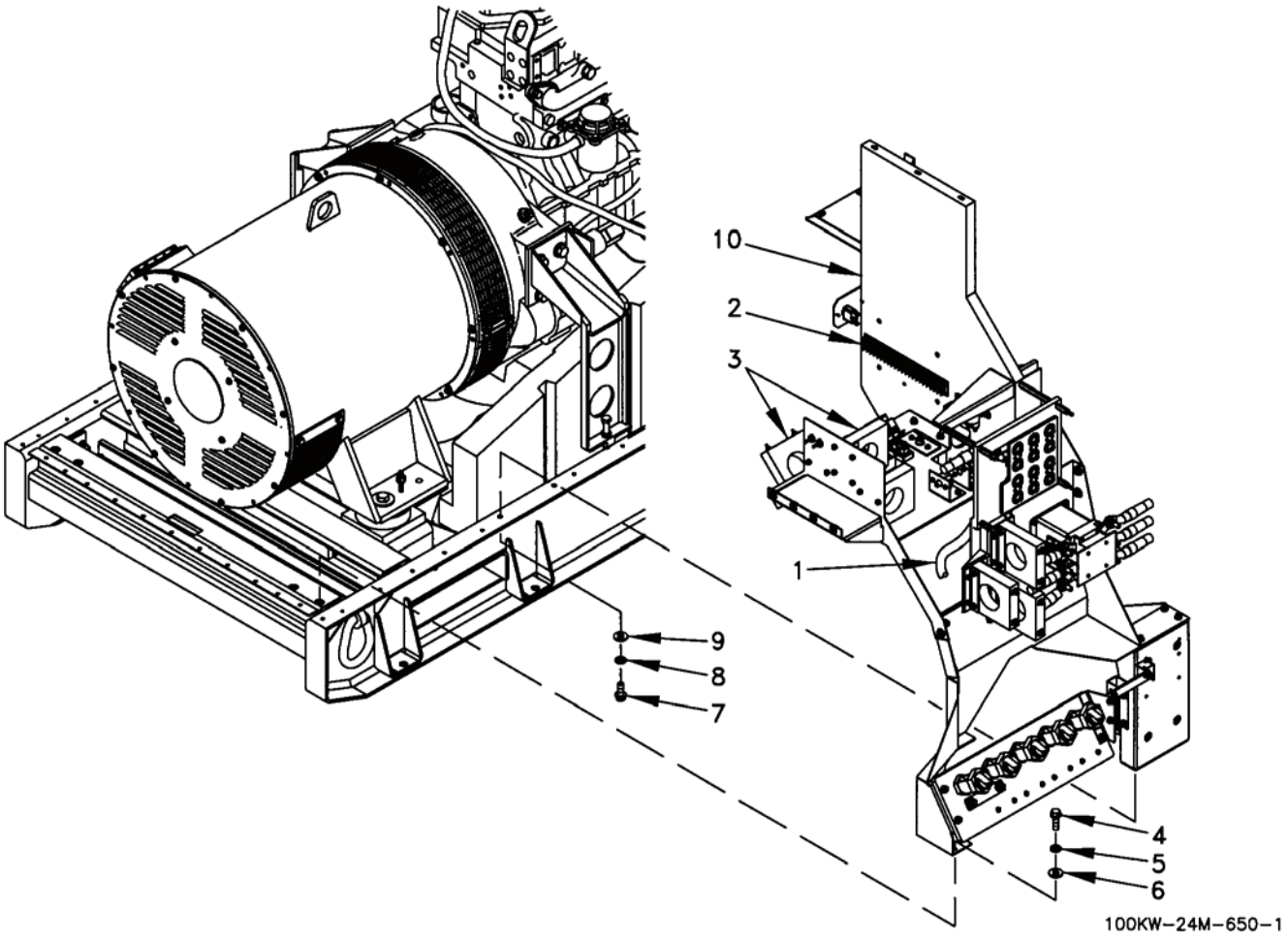


Figure 1. Generator Replacement (Sheet 1 of 2).

REMOVAL - Continued

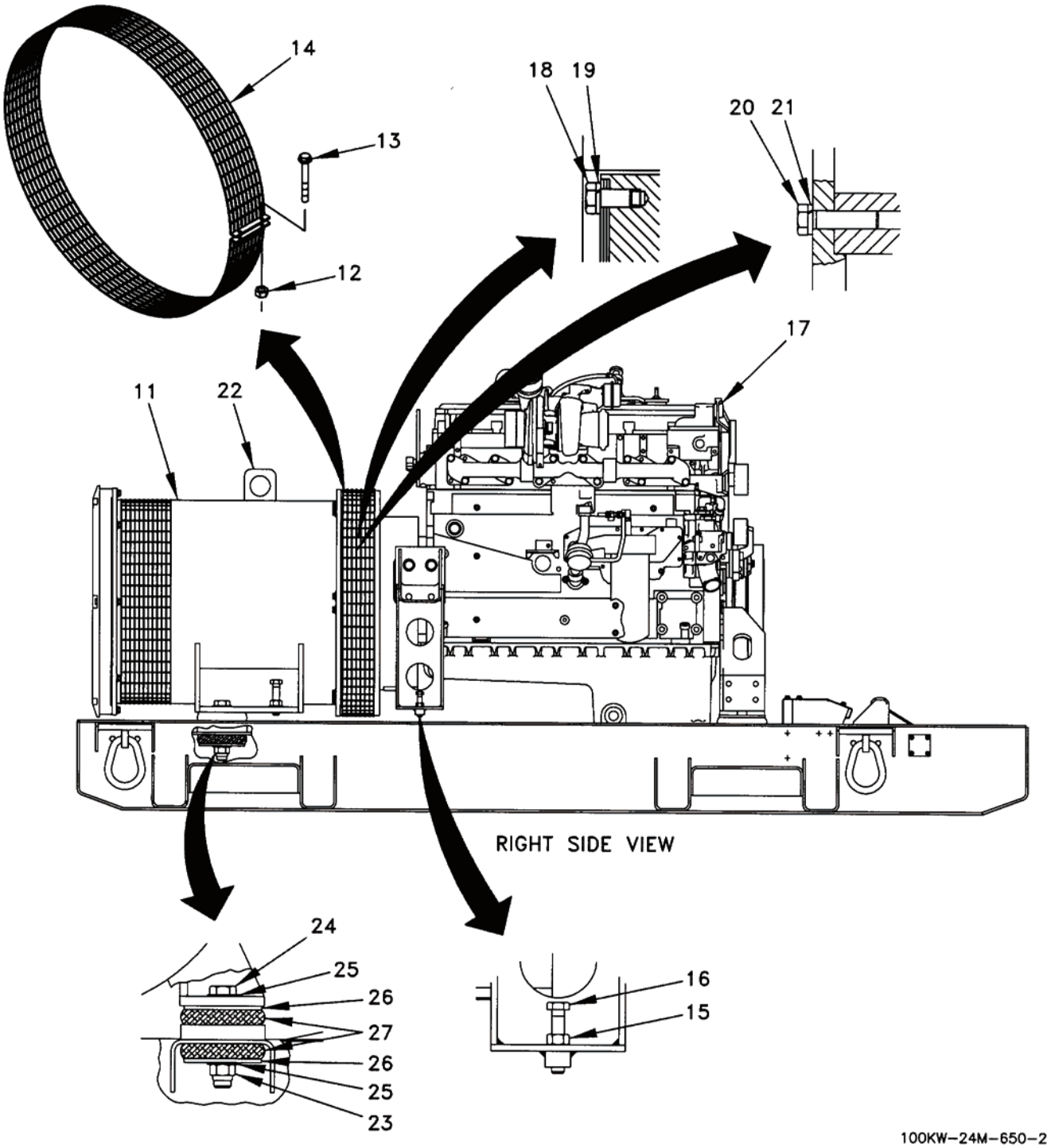


Figure 1. Generator Replacement (Sheet 2 of 2).

REMOVAL - Continued

WARNING

The generator weighs more than 1500 pounds (680 kg) and requires an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Be careful and keep hands and arms out of the way when lifting generator out of engine generator base. Failure to comply can cause serious injury or death to personnel.

13. Attach suitable lifting device with at least 2000 lb (907 kg) capacity to lifting eye (Figure 1, Sheet 2, Item 22) on generator (Figure 1, Sheet 2, Item 11) and take slack out of lifting device.

14. Remove two locknuts (Figure 1, Sheet 2, Item 23), two screws (Figure 1, Sheet 2, Item 24), four washers (Figure 1, Sheet 2, Item 25), and four snubbing washers (Figure 1, Sheet 2, Item 26) from generator shock mounts (Figure 1, Sheet 2, Item 27).

15. Carefully lift generator (Figure 1, Sheet 2, Item 11) out of engine generator base.

END OF TASK

INSTALLATION

WARNING

The generator weighs more than 1500 pounds (680 kg) and requires an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Be careful and keep hands and arms out of the way when lifting generator out of engine generator base. Failure to comply can cause serious injury or death to personnel.

1. Install two top generator shock mounts (Figure 1, Sheet 2, Item 27), snubbing washers (Figure 1, Sheet 2, Item 26), and washers (Figure 1, Sheet 2, Item 25).

2. Using suitable lifting device with at least 2000 lb (907 kg) capacity, carefully lower generator (Figure 1, Sheet 2, Item 11) onto engine generator base and align with engine (Figure 1, Sheet 2, Item 17).

3. Install two bottom generator shock mounts (Figure 1, Sheet 2, Item 27), snubbing washers (Figure 1, Sheet 2, Item 26), with two screws (Figure 1, Sheet 2, Item 24) and two locknuts (Figure 1, Sheet 2, Item 23). Torque screws to 216-264 lb-ft (293-357 Nm).

4. Turn two jackscrews (Figure 1, Sheet 2, Item 16) counterclockwise (CCW) to lower engine (Figure 1, Sheet 2, Item 17) into proper alignment with generator (Figure 1, Sheet 2, Item 11). Tighten two nuts (Figure 1, Sheet 2, Item 15).

5. Allow slack in lifting device and disconnect from lifting eye (Figure 1, Sheet 2, Item 22) on generator (Figure 1, Sheet 2, Item 11).

6. Align holes and install 12 lockwashers (Figure 1, Sheet 2, Item 21) and screws (Figure 1, Sheet 2, Item 20). Align holes and install eight lockwashers (Figure 1, Sheet 2, Item 19) and screws (Figure 1, Sheet 2, Item 18). Torque screws (Figure 1, Sheet 2, Item 20) and (Figure 1, Sheet 2, Item 18) to 41-49 lb-ft (56-66 Nm).

7. Install air exhaust screen (Figure 1, Sheet 2, Item 14), two screws (Figure 1, Sheet 2, Item 13), and nuts (Figure 1, Sheet 2, Item 12).

INSTALLATION - Continued

8. Carefully position electrical component mounting brackets assembly (Figure 1, Sheet 1, Item 10) over generator (Figure 1, Sheet 1, Item 11) and onto engine generator frame.

9. Install two washers (Figure 1, Sheet 1, Item 9), lockwashers (Figure 1, Sheet 1, Item 8), and screws (Figure 1, Sheet 1, Item 7).

10. Install two washers (Figure 1, Sheet 1, Item 6), lockwashers (Figure 1, Sheet 1, Item 5), and screws (Figure 1, Sheet 1, Item 4).

11. Remove tags and route generator cables through current transformers (Figure 1, Sheet 1, Item 3).

12. Remove tags and connect two generator field leads G1-F2 and G1-F1 to terminal board TB5-1 and -2 (Figure 1, Sheet 1, Item 2 and FO-3, sheet 1).

13. Remove tags and connect ten generator cables T1 thru T10 to reconnection board TB1 (Figure 1, Sheet 1, Item 1).

14. Install potential transformers (WP 0052).

15. Install right rear panel assembly (WP 0037).

16. Install rear section housing assembly (WP 0034).

17. Install engine generator compartment ceiling assembly (WP 0031).

18. Install rear roof section housing assembly (WP 0030).

19. Install front roof section housing assembly (WP 0029).

20. Install right rear door assembly (latch) (WP 0027).

21. Install right rear door assembly (WP 0026).

22. Install left rear door assembly (latch) (WP 0023).

23. Install left rear door assembly (WP 0022).

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
ENGINE REPLACEMENT

INITIAL SETUP:

Tools and Special Tools

Lifting Device, 2000 lb (907 kg) Capacity
Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Personnel Required

Two

References

WP 0055
WP 0056
WP 0061
WP 0063
WP 0072
WP 0074
WP 0090
WP 0092
WP 0097
WP 0100
TM 9-6115-729-24P

Equipment Condition

Batteries removed (WP 0049)
Left front door assembly (latch) removed (WP 0021)
Left rear door assembly removed (WP 0022)
Left rear door assembly (latch) removed (WP 0023)
Load board door assembly removed (WP 0024)
Right front door assembly (latch) removed (WP 0025)
Right rear door assembly removed (WP 0026)
Right rear door assembly (latch) removed (WP 0027)
Access covers removed (WP 0028)
Front roof section housing assembly removed (WP 0029)
Control box assembly removed (WP 0041)
Rear roof section housing assembly removed (WP 0030)
Coolant recovery system bottle removed (WP 0063)
Surge tank removed (WP 0064)
Exhaust system removed (WP 0068)
Fan guards and shrouds from engine removed (WP 0065)
Coolant hoses removed from engine (WP 0066)
Radiator removed (WP 0067)
Engine generator compartment ceiling assembly removed (WP 0031)
Front section housing assembly removed (WP 0033)
Left center panel assembly removed (WP 0035)
Right center panel assembly removed (WP 0036)
Right rear panel assembly removed (WP 0037)
Left rear panel assembly removed (WP 0038)
Door support assembly removed (WP 0039)
Auxiliary fuel pump assembly and solenoid valve removed (WP 0058)
Air cleaner system removed (WP 0071)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

WARNINGS

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

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

REMOVAL

1. Attach suitable lifting device with at least 2000 lb (907 kg) capacity to front lifting bracket (Figure 1, Item 1) and rear lifting bracket (Figure 1, Item 2) on engine (Figure 1, Item 3) and take slack out of lifting device.
2. Tag and disconnect wires from fuel level switch (WP 0055).
3. Tag and disconnect wires from alternator (WP 0072).
4. Tag and disconnect wires from fuel level sender (WP 0061).
5. Tag and disconnect magnetic speed pickup from engine harness connector ENG-P14 (WP 0100).
6. Tag and disconnect turbo inlet pressure sensor from engine harness connector ENG-P15 (WP 0100).
7. Tag and disconnect low coolant sensor from engine harness connector ENG-P16 (WP 0100).
8. Tag and disconnect engine harness connector ENG-P1 from ECM connector J1 (WP 0090).
9. Tag and disconnect fuel hose from engine fuel pump (WP 0056).
10. Tag and disconnect all wires and cables from starter (WP 0074).
11. Tag and disconnect winterization heater hoses from engine (if installed) (WP 0092).
12. Remove two locknuts (Figure 1, Item 4), two screws (Figure 1, Item 5), four washers (Figure 1, Item 6), and two snubbing washers (Figure 1, Item 7) and bottom engine shock mounts (Figure 1, Item 8).
13. Loosen two nuts (Figure 1, Item 9) and snug down two jackscrews (Figure 1, Item 10). Retighten two nuts.
14. Adjust generator jackscrews to support generator (WP 0097).
15. Remove hardware connecting generator to engine and flywheel (WP 0097).

REMOVAL - Continued

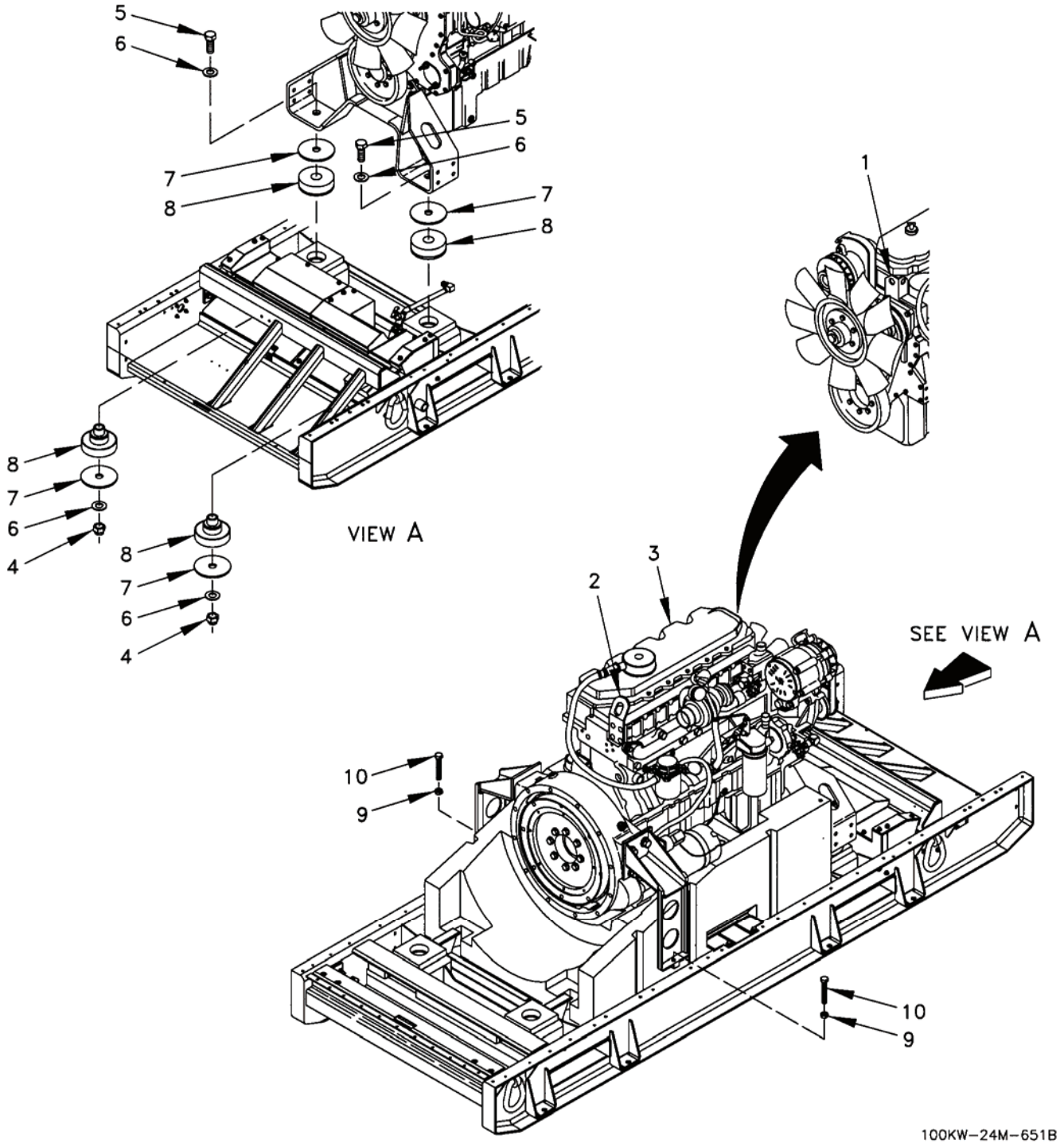


Figure 1. Engine Replacement.

REMOVAL - Continued

WARNING

The engine weighs more than 1500 pounds (680 kg) and requires an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Be careful and keep hands and arms out of the way when lifting engine out of engine generator base. Failure to comply can cause serious injury or death to personnel.

16. Carefully lift engine (Figure 1, Item 3) off engine generator base.

17. Remove two top snubbing washers (Figure 1, Item 7) and two top engine shock mounts (Figure 1, Item 8).

END OF TASK

INSTALLATION

WARNING

The engine weighs more than 1500 pounds (680 kg) and requires an assistant and a lifting device (forklift, overhead lifting device) with sufficient capacity. Be careful and keep hands and arms out of the way when lifting engine out of engine generator base. Failure to comply can cause serious injury or death to personnel.

1. Install two top engine shock mounts (Figure 1, Item 8) and snubbing washers (Figure 1, Item 7).

2. Using a suitable lifting device with at least 2000 lb (907 kg) capacity, connected to front lifting bracket (Figure 1, Item 1) and rear lifting bracket (Figure 1, Item 2), carefully lower engine (Figure 1, Item 3) onto engine generator base and top engine shock mounts assemblies. Align flywheel to generator.

3. Install two bottom engine shock mounts (Figure 1, item 8), snubbing washers (Figure 1, Item 7), four washers (Figure 1, Item 6), two screws (Figure 1, Item 5), and two locknuts (Figure 1, Item 4). Torque screws (Figure 1, Item 5) to 216-264 lb-ft (293-357 Nm).

4. Install hardware connecting generator to engine and flywheel (WP 0097).

5. Draw-up generator jackscrews (WP 0097).

6. Loosen two jackscrews (Figure 1, Item 10) and two nuts (Figure 1, Item 9). Draw-up bolts and tighten nuts.

7. Connect winterization heater hoses to engine (WP 0092, Items 11 and 13) (if previously installed).

8. Remove tags and connect wires and cables to starter (WP 0074).

9. Connect fuel hose to engine fuel pump (WP 0056).

10. Remove tag and connect engine harness connector ENG-P1 to ECM connector J1 (WP 0090).

11. Remove tag and connect low coolant sensor to engine harness connector ENG-P16 (WP 0100).

INSTALLATION - Continued

12. Remove tag and connect turbo inlet pressure sensor to engine harness connector ENG-P15 (WP 0100).
13. Remove tag and connect magnetic speed pickup to engine harness connector ENG-P14 (WP 0100).
14. Remove tags and disconnect wires to fuel level sender (WP 0061).
15. Remove tags and connect wires to alternator (WP 0072).
16. Remove tags and connect wires to fuel level switch (WP 0055).
17. Install air cleaner system (WP 0071).
18. Install radiator (WP 0067).
19. Remove tags and connect coolant hoses to engine (WP 0066).
20. Install fan guards and shrouds (WP 0065).
21. Install auxiliary fuel pump assembly and solenoid valve (WP 0058).
22. Install doors and panels (WP 0039 thru WP 0035 and WP 0033).
23. Install engine generator compartment ceiling assembly (WP 0031).
24, Install exhaust system (WP 0071).
25. Install surge tank (WP 0064).
26. Install coolant recovery system bottle (W 0063).
27. Install rear roof section housing assembly (WP 0030).
28. Install control box assembly (WP 0041).
29. Install door and panels (WP 0029 and WP 0021).
30. Install batteries (WP 0049).

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
ENGINE/GENERATOR BASE ASSEMBLY REPAIR

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common no. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Crocus cloth (WP 0120, Item 9)
Foam damping sheet (WP 0120, Item 10)
Foam damping sheet (WP 0120, Item 11)
Foam damping sheet (WP 0120, Item 12)

Materials/Parts (cont.)

Foam damping sheet (WP 0120, Item 13)
Foam damping sheet (WP 0120, Item 15)

Personnel Required

Two

References

TM 9-6115-729-24P
MIL-DTL-53072C
TC 9-237

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury to personnel.

REPAIR OR REPLACEMENT

1. Ensure generator set is fully stopped, ENGINE CONTROL switch is OFF/RESET, Battery Disconnect Switch is OFF, and DEAD CRANK SWITCH is OFF before proceeding.

NOTE

Repair of the engine/generator base assembly is limited to removal of corrosion, welding of cracks, and painting.

2. Remove attached assemblies as required to gain access to parts of engine/generator base assembly requiring repair.
3. Remove corrosion as required using crocus cloth (WP 0120, Item 9).
4. Repair cracks in weldment by welding in accordance with TC 9-237.
5. Clean weld surface and surrounding area, pretreat, and paint in accordance with MIL-DTL-53072C, green color 383, with top coat to a thickness of 1-2 mils.
6. Replace foam damping sections by using the old sections as templates to cut the new sections.
7. Install attached assemblies that were removed.

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

ENGINE ELECTRICAL SYSTEM REPAIR

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common no. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Cap and plug set (WP 0120, Item 6)
Tiedown straps (WP 0120, Item 48)
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Fuel drained to prevent spillage when removing fuel pressure sensor (WP 0056)
Coolant drained below the coolant temperature sensor (WP 0067)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

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 can cause injury to personnel and damage to equipment.

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 can cause injury or death to personnel.

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the fuel, oil, or air system.

NOTE

Cut tiedown straps as required during removal. Install tiedown straps as required during installation. Table 1 identifies removal and installation steps for engine sensors.

REMOVAL

Table 1. WP 0100 Guide.

NAME	FIGURE 1 ITEM	REMOVAL STEPS	INSTALLATION STEPS	RELATED WP
Injector actuation pressure sensor	1	1 and 2	29 and 30	
Oil temperature sensor	2	3 and 4	27 and 28	
Turbo outlet temperature sensor	3	5 and 6	25 and 26	
Magnetic speed pickup	4	7 and 8	20 thru 24	
Engine oil pressure sensor	6	9 and 10	18 and 19	
Coolant temperature sensor	7	11 thru 13	15 thru 17	WP 0064
Fuel pressure sensor	8	14 thru 16	12 and 14	WP 0056 and WP 0016
Engine timing sensors	10	17 and 18	9 thru 11	WP 0013
Atmospheric pressure sensor	11	19 and 20	7 and 8	
Low coolant sensor	12	21 and 22	5 and 6	
Turbo inlet pressure sensor	13	23 and 24	3 and 4	
Intake manifold air temperature sensor	14	25 and 26	1 and 2	

1. Tag and disconnect engine harness connector ENG-P13 from the injector actuation pressure sensor.
2. Remove the injector actuation pressure sensor (Figure 1, Sheet 1, Item 1) by unscrewing the sensor.
3. Tag and disconnect engine harness connector ENG-P18 from the oil temperature sensor.
4. Remove the oil temperature sensor (Figure 1, Sheet 1, Item 2) by unscrewing the sensor.

REMOVAL - Continued

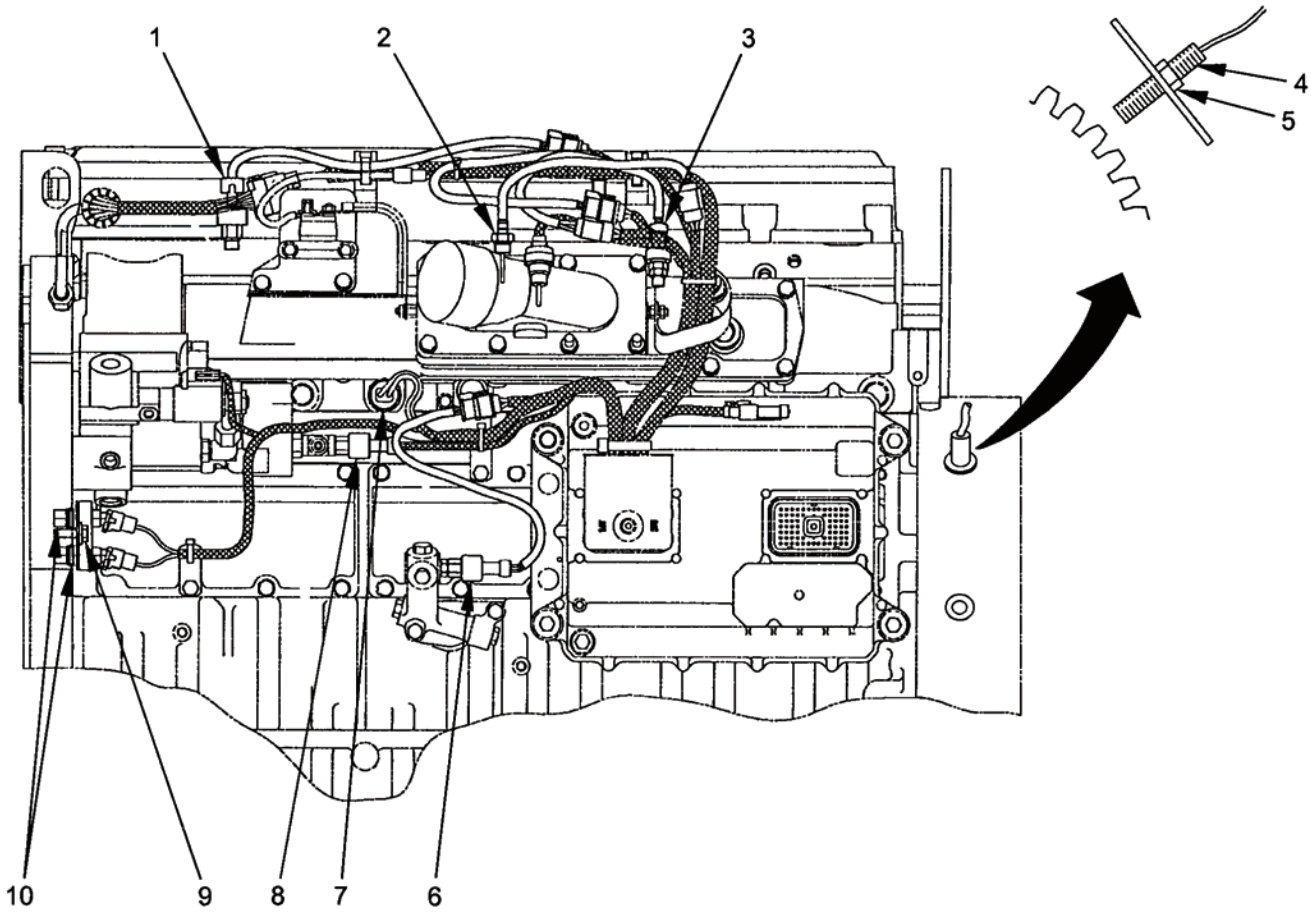


Figure 1. Electrical System (Sheet 1 of 2).

REMOVAL - Continued

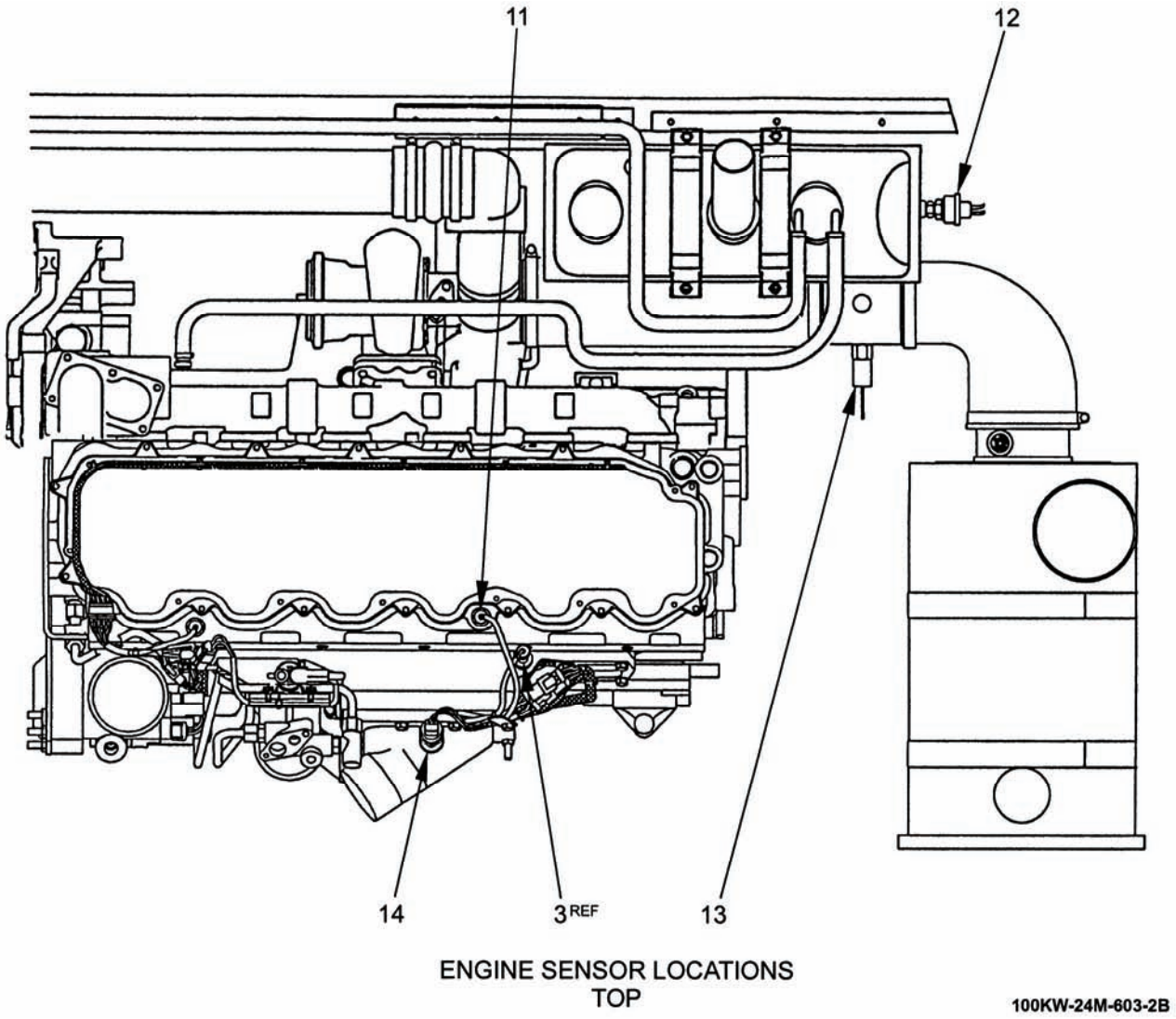


Figure 1. Electrical System (Sheet 2 of 2).

5. Tag and disconnect engine harness connector ENG-P12 from the turbo outlet pressure sensor.
6. Remove the turbo outlet pressure sensor (Figure 1, Sheet 1, Item 3) by unscrewing the sensor.
7. Tag and disconnect ECM to EMCP harness connector ENG-P14 from the magnetic speed pickup sensor.
8. Loosen locknut (Figure 1, Sheet 1, Item 5) and remove magnetic speed pickup (Figure 1, Sheet 1, Item 4) by loosening the top nut and then unscrewing the sensor.

REMOVAL - Continued

9. Tag and disconnect engine harness connector ENG-P15 from the engine oil pressure sensor.
10. Remove the engine oil pressure sensor (Figure 1, Sheet 1, Item 6) by unscrewing the sensor.
11. Drain level of coolant below the coolant temperature sensor (Figure 1, Sheet 1, Item 7) (WP 0067).
12. Tag and disconnect engine harness connector ENG-P6 from the coolant temperature sensor.
13. Remove the coolant temperature sensor (Figure 1, Sheet 1, Item 7) by unscrewing the sensor.
14. Drain sufficient fuel from system so fuel does not spill during removal of the fuel pressure sensor (WP 0056).
15. Tag and disconnect engine harness connector ENG-P17 from the fuel pressure sensor.
16. Remove the fuel pressure sensor (Figure 1, Sheet 1, Item 8) by unscrewing the sensor.
17. Tag and disconnect engine harness connectors ENG-P4 and ENG-P5 from the engine timing sensors.
18. Remove bolt (Figure 1, Sheet 1, Item 9) and two engine timing sensors (Figure 1, Sheet 1, Item 10). The engine timing sensors pull out after the bracket bolt is removed.
19. Tag and disconnect engine harness connector ENG-P11 from the atmospheric pressure sensor.
20. Remove the atmospheric pressure sensor (Figure 1, Sheet 2, Item 11).
21. Tag and disconnect ECM to EMCP harness connector ENG-P16 from the low coolant sensor.
22. Remove the low coolant sensor (Figure 1, Sheet 2, Item 12) by unscrewing the sensor.
23. Tag and disconnect ECM to EMCP harness connector ENG-P8 from the turbo inlet pressure sensor.
24. Remove the turbo inlet pressure sensor (Figure 1, Sheet 2, Item 13).
25. Tag and disconnect engine harness connector ENG-P7 from intake manifold air temperature sensor.
26. Remove the intake manifold air temperature sensor (Figure 1, Sheet 2, Item 14) by unscrewing the sensor.

END OF TASK

INSTALLATION

1. Install the intake manifold air temperature sensor (Figure 1, Sheet 2, Item 14). Screw in and torque sensor to 11-19 lb-ft (15-25 Nm).
2. Remove tag and connect engine harness connector ENG-P7 to the intake manifold air temperature sensor.
3. Install the turbo inlet pressure sensor (Figure 1, Sheet 2, Item 13) by screwing in.
4. Remove tag and connect ECM to EMCP harness connector ENG-P8 to the turbo inlet pressure sensor.
5. Install the low coolant sensor (Figure 1, Sheet 2, Item 12) by screwing in.
6. Remove tag and connect ECM to EMCP harness connector ENG-P16 to the low coolant sensor.
7. Install the atmospheric pressure sensor (Figure 1, Sheet 2, Item 11). Screw in and torque sensor to 72-108 lb-in (8-12 Nm).
8. Remove tag and connect engine harness connector P11 to the atmospheric pressure sensor.

NOTE

Engine timing sensors must be replaced as a pair.

9. Ensure sensors are properly seated on flanges.
10. Install the two engine timing sensors (Figure 1, Sheet 1, Item 10) and install bolt (Figure 1, Sheet 1, Item 9).
11. Remove tag and connect engine harness connectors ENG-P4 and ENG-P5 to the engine timing sensors. Perform Engine Timing Sensor Calibrate (WP 0013, SYMPTOM 11).
12. Install the fuel pressure sensor (Figure 1, Sheet 1, Item 8) by screwing in.
13. Remove tag and connect engine harness connector ENG-P17 to the fuel pressure sensor.
14. Refill fuel system as required (WP 0016).
15. Install the coolant temperature sensor (Figure 1, Sheet 1, Item 7). Screw in and torque sensor to 11-19 lb-ft (15-25 Nm).
16. Remove tag and connect engine harness connector ENG-P6 to the coolant temperature sensor.
17. Refill cooling system to the correct level (WP 0067).
18. Install the engine oil pressure sensor (Figure 1, Sheet 1, Item 6). Screw in and torque sensor to 72-108 lb-in (8-12 Nm).
19. Remove tag and connect engine harness connector ENG-P15 to the engine oil pressure sensor.
20. Align a ring gear tooth directly in the center of the threaded sensor opening.
21. Screw the magnetic speed pickup (Figure 1, Sheet 1, Item 4) into hole until end contacts gear tooth.
22. Turn the magnetic speed pickup (Figure 1, Sheet 1, Item 4) counterclockwise (CCW) 270 degrees (three-fourths turn.

INSTALLATION - Continued

23. Tighten locknut (Figure 1, Sheet 1, Item 5) to 14-22 lb-ft (20-30 Nm).
24. Remove tag and connect ECM to EMCP harness connector P14 to the Magnetic Speed Pickup sensor.
25. Install the turbo outlet pressure sensor (Figure 1, Sheet 2, Item 3) by screwing in.
26. Remove tag and connect engine harness connector ENG-P12 to the turbo outlet pressure sensor.
27. Install the oil temperature sensor (Figure 1, Sheet 1, Item 2). Screw in and torque sensor to 72-108 lb-in (8-12 Nm).
28. Remove tag and connect engine harness connector ENG-P18 to the oil temperature sensor.
29. Install the injector actuation pressure sensor (Figure 1, Sheet 1, Item 1). Screw in and torque sensor to 72-108 lb-in (8-12 Nm).
30. Remove tag and connect engine harness connector ENG-P13 to the injector actuation pressure sensor.

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
VALVE COVER, GASKET, AND MANIFOLD MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Gasket
Gasket
Sealing compound (WP 0120, Item 42)

Materials/Parts (cont.)

Silicone sealant (WP 0120, Item 39)
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

WARNINGS

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

REMOVAL

1. Remove bolt (Figure 1, Item 1) and washer (Figure 1, Item 2), and pull breather (Figure 1, Item 3) and gasket (Figure 1, Item 4) away from valve cover (Figure 1, Item 5).
2. Remove 14 bolts (Figure 1, Item 6), washers (Figure 1, Item 7), valve cover (Figure 1, Item 5), and gasket (Figure 1, Item 8).
3. Disconnect unit injector plug from wiring harness at left front of valve cover manifold (Figure 1, Item 9).
4. Disconnect plug (Figure 1, Item 10) from each of six unit injectors (Figure 1, Item 11).

REMOVAL - Continued

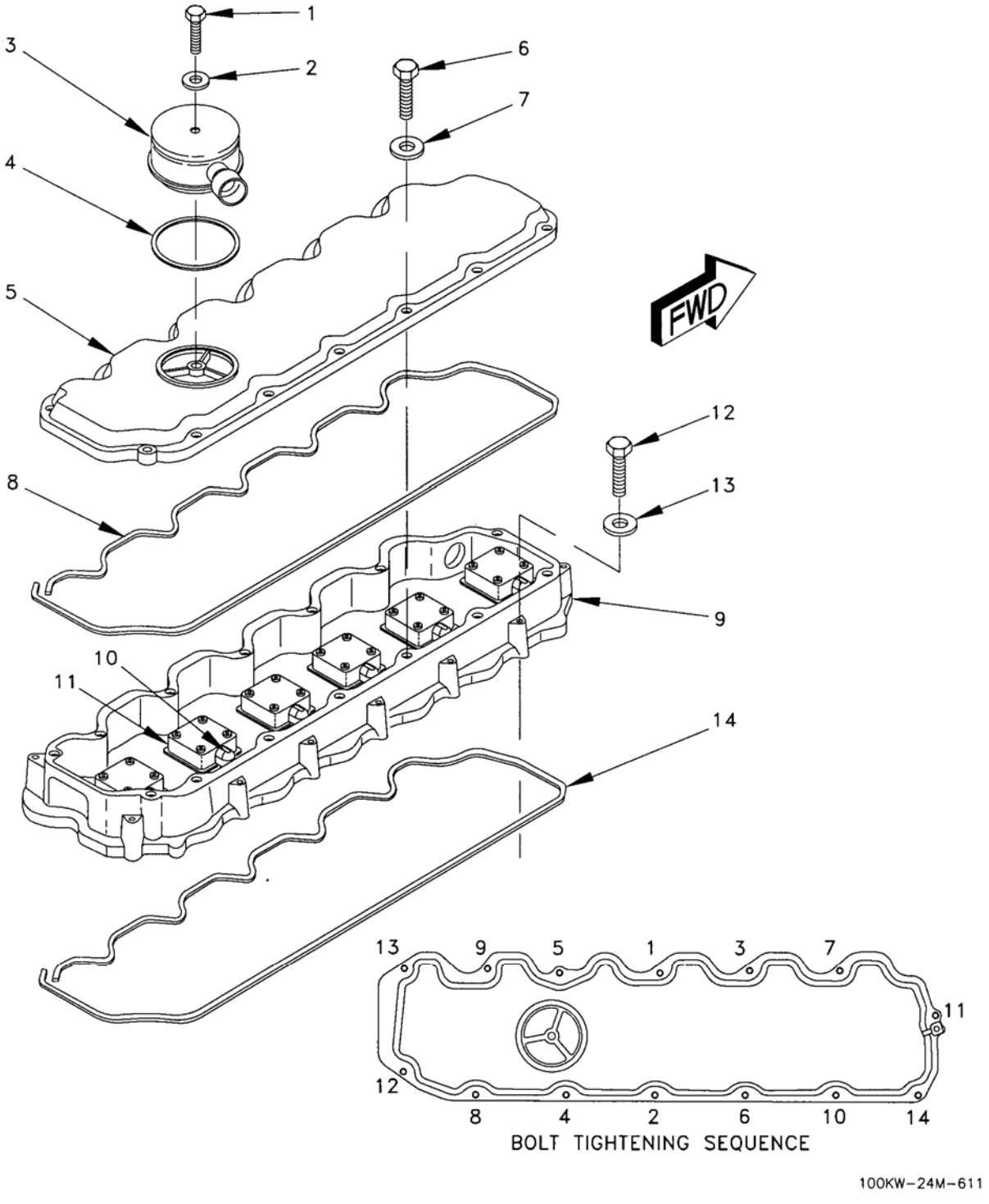

Figure 1. Valve Cover, Gasket, and Manifold.

REMOVAL - Continued

5. Remove 14 bolts (Figure 1, Item 12), washers (Figure 1, Item 13), valve cover manifold (Figure 1, Item 9), and gasket (Figure 1, Item 14).

END OF TASK

CLEANING

1. Remove remaining gasket material from cylinder head, top and bottom surfaces of valve cover manifold (Figure 1, Item 9), and mating surface of valve cover (Figure 1, Item 5).

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 can cause injury or death to personnel.

2. Clean all parts thoroughly before installing.

END OF TASK

INSTALLATION

1. Apply bead of sealing compound to both sides of new gasket (Figure 1, Item 14).

2. Install gasket (Figure 1, Item 14), valve cover manifold (Figure 1, Item 9), fourteen washers (Figure 1, Item 13), and bolts (Figure 1, Item 12). Using the illustrated sequence, torque bolts (Figure 1, Item 12) to 79-133 lb-in (9-15 Nm).

3. Connect plug (Figure 1, Item 10) to each of six unit injectors (Figure 1, Item 11). Connect unit injector plug to wiring harness.

4. Apply bead of silicone sealant to both sides of new gasket (Figure 1, Item 8).

5. Install gasket (Figure 1, Item 8), valve cover (Figure 1, Item 5), 14 washers (Figure 1, Item 7), and bolts (Figure 1, Item 6). Using the illustrated sequence, torque bolts (Figure 1, Item 6) to 79-133 lb-in (9-15 Nm).

6. Install gasket (Figure 1, Item 4), breather (Figure 1, Item 3), washer (Figure 1, Item 2), and bolt (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FUEL TRANSFER PUMP/INJECTION ACTUATION PUMP, AND INJECTION ACTUTION PRESSURE CONTROL VALVE MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
O-Ring
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

WARNINGS

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

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

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the fuel system.

NOTE

The injection actuation pressure control valve (IAPCV) is part of the fuel transfer pump. The IAPCV can be replaced without further disassembly of the pump. DISASSEMBLY and ASSEMBLY procedures should be followed for replacement of the IAPCV. These procedures can be performed without removal of the fuel transfer pump.

REMOVAL

1. Place a suitable drain pan under components to catch any fuel which may drain.

2. Tag and disconnect hose (Figure 1, Item 1) and electrical connector (Figure 1, Item 2) from fuel transfer pump (Figure 1, Item 3).

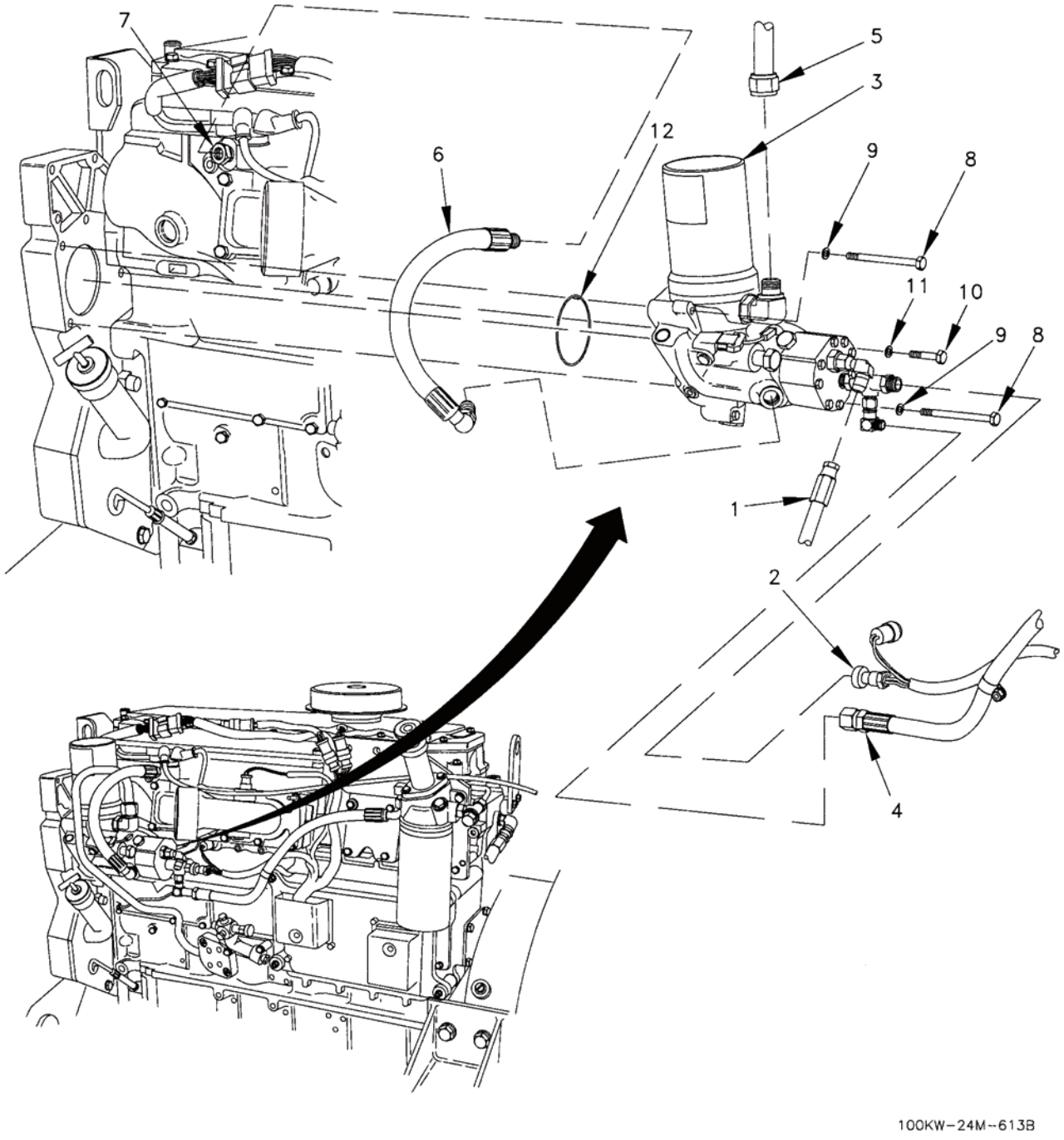

Figure 1. Fuel Transfer Pump.

REMOVAL - Continued

3. Disconnect hose (Figure 1, Item 4) and tube (Figure 1, Item 5) from fuel transfer pump (Figure 1, Item 3).
4. Disconnect hose (Figure 1, Item 6) from adapter (Figure 1, Item 7) on engine and from fuel transfer pump (Figure 1, Item 3).
5. Remove two screws (Figure 1, Item 8), washers (Figure 1, Item 9), screw (Figure 1, Item 10), and washer (Figure 1, Item 11). Remove fuel transfer pump (Figure 1, Item 3) and O-ring (Figure 1, Item 12).

END OF TASK

DISASSEMBLY

CAUTION

Except for removal of the IAPCV, do not attempt to disassemble the fuel transfer pump or pump will be damaged.

1. Place a suitable drain pan under components to catch any fluid which may drain.
2. Tag and disconnect engine wiring harness connector C3 (Figure 2, Item 1) from injection actuation pressure control valve (IAPCV) (Figure 2, Item 2).
3. Remove nut (Figure 2, Item 3), spacer (Figure 2, Item 4), and solenoid valve (Figure 2, Item 5) from IAPCV (Figure 2, Item 2).
4. Remove IAPCV (Figure 2, Item 2) from fuel transfer pump (Figure 2, Item 6).
5. Remove O-rings (Figure 2, Items 7 and 8) and backup ring (Figure 2, Item 9).
6. Inspect components of the IAPCV for wear and damage and replace as needed.

END OF TASK

ASSEMBLY

1. Clean IAPCV and components before assembly.
2. Lubricate O-rings with clean engine oil and install new backup ring (Figure 2, Item 9), and O-rings (Figure 2, Items 7 and 8) on IAPCV (Figure 2, Item 2).
3. Install IAPCV (Figure 2, Item 2) into fuel transfer pump (Figure 2, Item 6). Torque to 50 ± 5 Nm (37 ± 4 lb.).
4. Install solenoid valve (Figure 2, Item 5) and spacer (Figure 2, Item 4) to IAPCV (Figure 2, Item 2) and secure with nut (Figure 2, Item 3). Torque nut to 5.5 ± 1.5 Nm (49 ± 13 lb-in.).
5. Remove tag and connect engine wiring harness connector C3 (Figure 2, Item 1) to IAPCV (Figure 2, Item 2).

ASSEMBLY - Continued

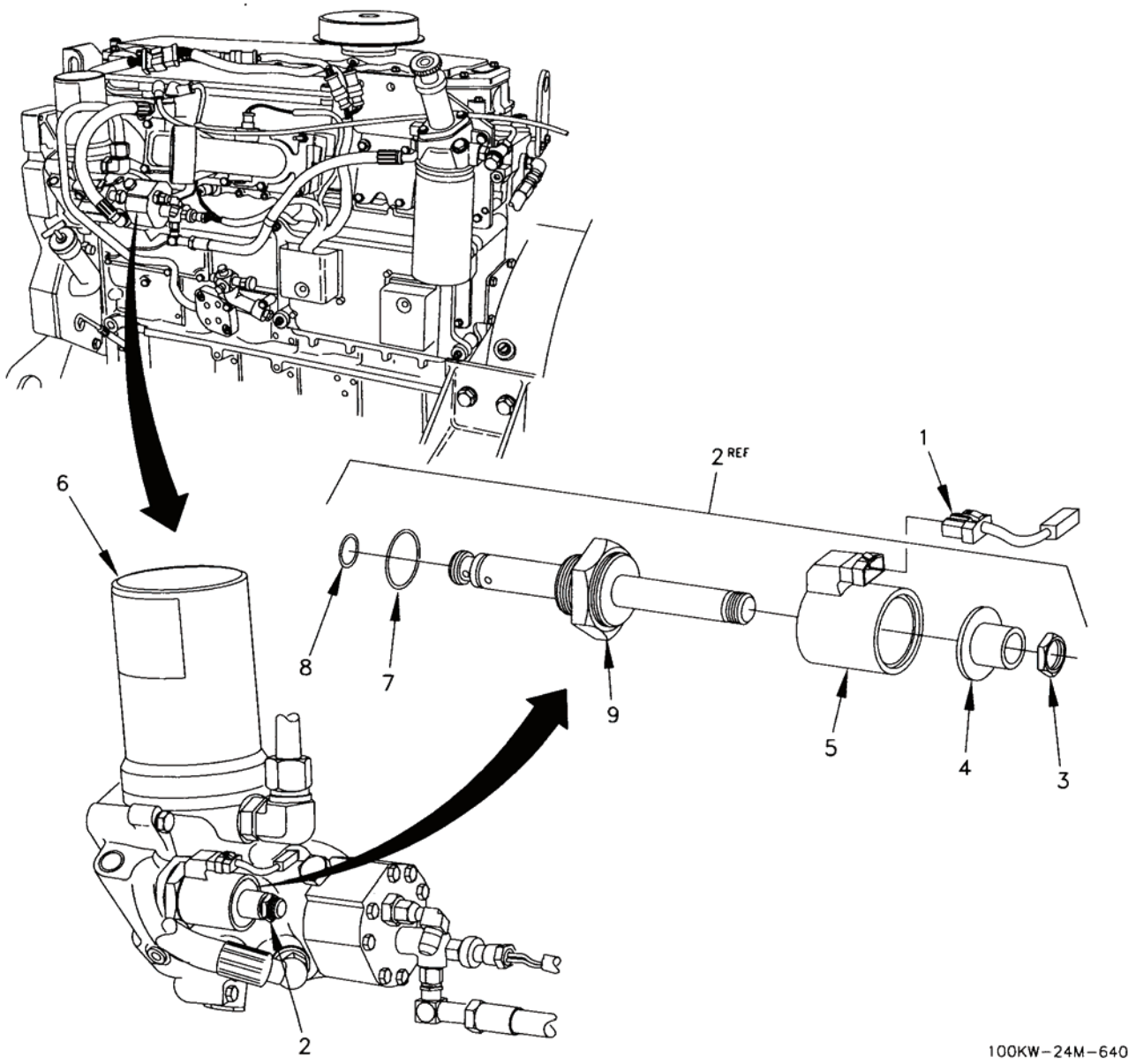

Figure 2. Injection Actuation Pump Control Valve.

END OF TASK

INSTALLATION

1. Install O-ring (Figure 1, Item 12) and fuel transfer pump (Figure 1, Item 3) with washer (Figure 1, Item 11), screw (Figure 1, Item 10), two washers (Figure 1, Item 9), and screws (Figure 1, Item 8).

2. Install hose (Figure 1, Item 6) onto adapter (Figure 1, Item 7) on engine and onto fuel transfer pump (Figure 1, Item 3) by aligning the hose fitting into the mating fittings, pushing the hose fittings until a definite snap and a solid stop are felt. Then abruptly pull back out on the hose on both ends to verify a proper connection has been made.

3. Connect tube (Figure 1, Item 5) and hose (Figure 1, Item 4) to fuel transfer pump (Figure 1, Item 3).

4. Connect electrical connector (Figure 1, Item 2) and hose (Figure 1, Item 1) to fuel transfer pump (Figure 1, Item 3).

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

AIR INLET ELBOW, HEATER, AND MANIFOLD COVER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Gasket
O-Ring
O-Ring
Primer, sealant compound (WP 0120, Item 35)
Sealant, adhesive (WP 0120, Item 38)
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Fuel filter and fuel filter base removed (WP 0080)
Air inlet temperature sensor removed (WP 0100)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the engine.

REMOVAL

1. Remove nut (Figure 1, Item 1) and lockwasher (Figure 1, Item 2), and disconnect bracket (Figure 1, Item 3) from air inlet heater (Figure 1, Item 4).

2. Pull back boot on cable (Figure 1, Item 5), remove nut (Figure 1, Item 6) and lockwasher (Figure 1, Item 7), and disconnect cable (Figure 1, Item 5) from air inlet heater (Figure 1, Item 4).

3. Pull back boot on cable (Figure 1, Item 5), remove nut (Figure 1, Item 8) and lockwasher (Figure 1, Item 9), and remove cable (Figure 1, Item 5) from air inlet heater relay (Figure 1, Item 10).

4. Pull back boot on cable (Figure 1, Item 11), remove nut (Figure 1, Item 12) and lockwasher (Figure 1, Item 13), and disconnect cable (Figure 1, Item 11) from air inlet heater relay (Figure 1, Item 10).

5. Remove two nuts (Figure 1, Item 14), four washers (Figure 1, Item 15), two bolts (Figure 1, Item 16), and air inlet heater relay (Figure 1, Item 10).

6. Remove nut (Figure 1, Item 17), two washers (Figure 1, Item 18), screw (Figure 1, Item 19), and loop clamp (Figure 1, Item 20) from air inlet heater relay bracket (Figure 1, Item 21).

7. Remove two bolts (Figure 1, Item 22), washers (Figure 1, Item 23), and air inlet heater relay bracket (Figure 1, Item 21).

8. Remove two studs (Figure 1, Item 24), six bolts (Figure 1, Item 25), eight washers (Figure 1, Item 26), clip (Figure 1, Item 27), bracket (Figure 1, Item 3), air inlet elbow (Figure 1, Item 28), and air inlet heater (Figure 1, Item 4), from air inlet manifold cover (Figure 1, Item 29).

9. Remove two bolts (Figure 1, Item 30), washers (Figure 1, Item 31), four bolts (Figure 1, Item 32), five washers (Figure 1, Item 33), clip (Figure 1, Item 34), fuel filter bracket (Figure 1, Item 35), air inlet manifold cover (Figure 1, Item 29), and gasket (Figure 1, Item 36).

10. Remove two plugs (Figure 1, Item 37), O-rings (Figure 1, Item 38), plug (Figure 1, Item 39), and O-ring (Figure 1, Item 40).

END OF TASK

INSTALLATION

1. Install O-ring (Figure 1, Item 40) and plug (Figure 1, Item 39) in air inlet elbow (Figure 1, Item 28).

2. Install two O-rings (Figure 1, Item 38) and plugs (Figure 1, Item 37) in air inlet manifold cover (Figure 1, Item 29).

3. Apply primer to both mating sides of gasket (Figure 1, Item 36) and allow to dry for five minutes.

INSTALLATION - Continued

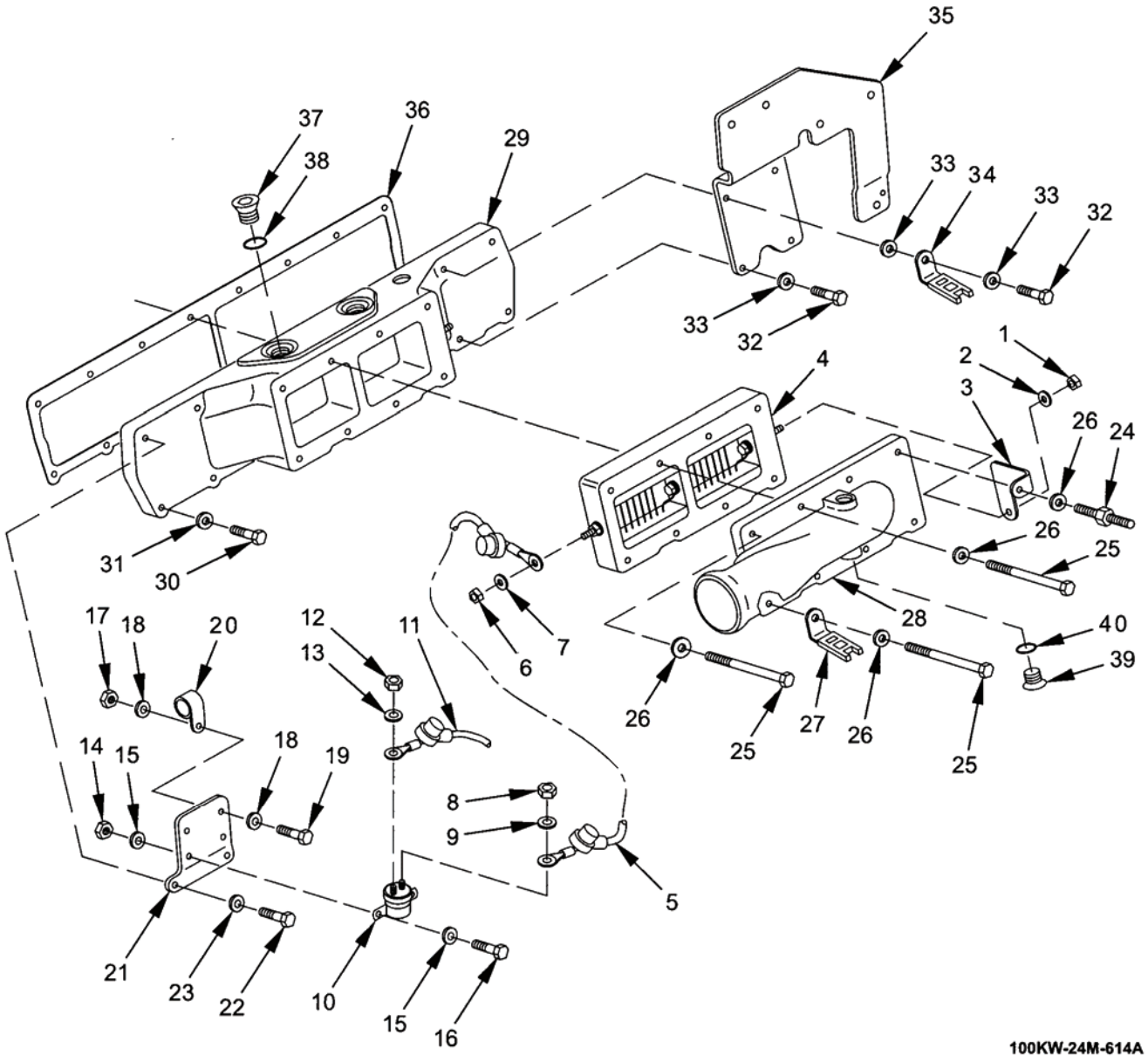

Figure 1. Air Inlet Elbow, Heater, and Manifold Cover.

INSTALLATION - Continued

NOTE

Sealant will harden in less than ten minutes. Installation must continue immediately.

4. Apply sealant to both mating sides of gasket (Figure 1, Item 36). Install gasket (Figure 1, Item 36), air inlet manifold cover (Figure 1, Item 29), fuel filter bracket (Figure 1, Item 35), clip (Figure 1, Item 34), five washers (Figure 1, Item 33), four bolts (Figure 1, Item 32), two washers (Figure 1, Item 31), and two bolts (Figure 1, Item 30). Tighten bolts (Figure 1, Item 32) and (Figure 1, Item 30) in an alternating pattern, making sure that the gasket (Figure 1, Item 36) does not slip. Torque bolts (Figure 1, Item 32) and (Figure 1, Item 30) to 16-26 lb-ft (21-35 Nm).

5. Apply primer to mating sides of air inlet manifold cover (Figure 1, Item 29) and air inlet heater (Figure 1, Item 4) and allow to dry for five minutes.

NOTE

Sealant will harden in less than ten minutes. Installation must continue immediately.

6. Apply sealant to mating sides of air inlet manifold cover (Figure 1, Item 29) and air inlet heater (Figure 1, Item 4). Install air inlet heater (Figure 1, Item 4),air inlet elbow (Figure 1, Item 28), clip (Figure 1, Item 27), bracket (Figure 1, Item 3), bracket (Figure 1, Item 26), six bolts (Figure 1, Item 25), and two studs (Figure 1, Item 24). Tighten studs (Figure 1, Item 24) and bolts (Figure 1, Item 25) in an alternating pattern. Torque studs (Figure 1, Item 24) and bolts (Figure 1, Item 25) to 16-26 lb-ft (21-35 Nm).

7. Install air inlet heater relay bracket (Figure 1, Item 21), two washers (Figure 1, Item 23), and two bolts (Figure 1, Item 22). Torque two bolts (Figure 1, Item 22) to 16-26 lb-ft (21-35 Nm).

8. Install loop clamp (Figure 1, Item 20) on air inlet heater relay bracket (Figure 1, Item 21) with screw (Figure 1, Item 19), two washers (Figure 1, Item 18), and screw (Figure 1, Item 17).

9. Install air inlet heater relay (Figure 1, Item 10), two bolts (Figure 1, Item 16), four washers (Figure 1, Item 15), and two nuts (Figure 1, Item 14).

10. Connect cable (Figure 1, Item 11) to air inlet heater relay (Figure 1, Item 10) and install lockwasher (Figure 1, Item 13) and nut (Figure 1, Item 12). Torque nut (Figure 1, Item 12) to 49-57 lb-in (6-7 Nm).

11. Connect cable (Figure 1, Item 5) to air inlet heater relay (Figure 1, Item 10) and install lockwasher (Figure 1, Item 9) and nut (Figure 1, Item 8). Torque nut (Figure 1, Item 8) to 49-57 lb-in (6-7 Nm).

12. Connect cable (Figure 1, Item 5) to air inlet heater (Figure 1, Item 4) and install lockwasher (Figure 1, Item 7) and nut (Figure 1, Item 6). Torque nut (Figure 1, Item 6) to 60-78 lb-in (7-9 Nm).

13. Install bracket (Figure 1, Item 3) to air inlet heater (Figure 1, Item 4) and install lockwasher (Figure 1, Item 2) and nut (Figure 1, Item 1). Torque nut (Figure 1, Item 1) to 60-78 lb-in (7-9 Nm).

14. Install air inlet temperature sensor and oil temperature sensor (WP 0100).

15. Install fuel filter base and fuel filter (WP 0080).

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
CRANKSHAFT PULLEY AND DAMPER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Grease (WP 0120, Item 23)
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Fan and fan guards removed (WP 0065)
Fan belt removed (WP 0073)
Alternator belt removed (WP 0072)

WARNINGS

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REMOVAL

1. Use a wrench to rotate tensioner pulley (Figure 1, Item 1) clockwise (CW) to relieve tension on alternator belt (Figure 1, Item 2) and remove belt from damper pulley (Figure 1, Item 3).

2. Loosen two screws (Figure 1, Item 4) to relieve tension on water pump belt (Figure 1, Item 5) and remove water pump belt from crankshaft pulley (Figure 1, Item 6).

3. Remove eight bolts (Figure 1, Item 7), washers (Figure 1, Item 8), damper (Figure 1, Item 9), and damper pulley (Figure 1, Item 3).

REMOVAL - Continued

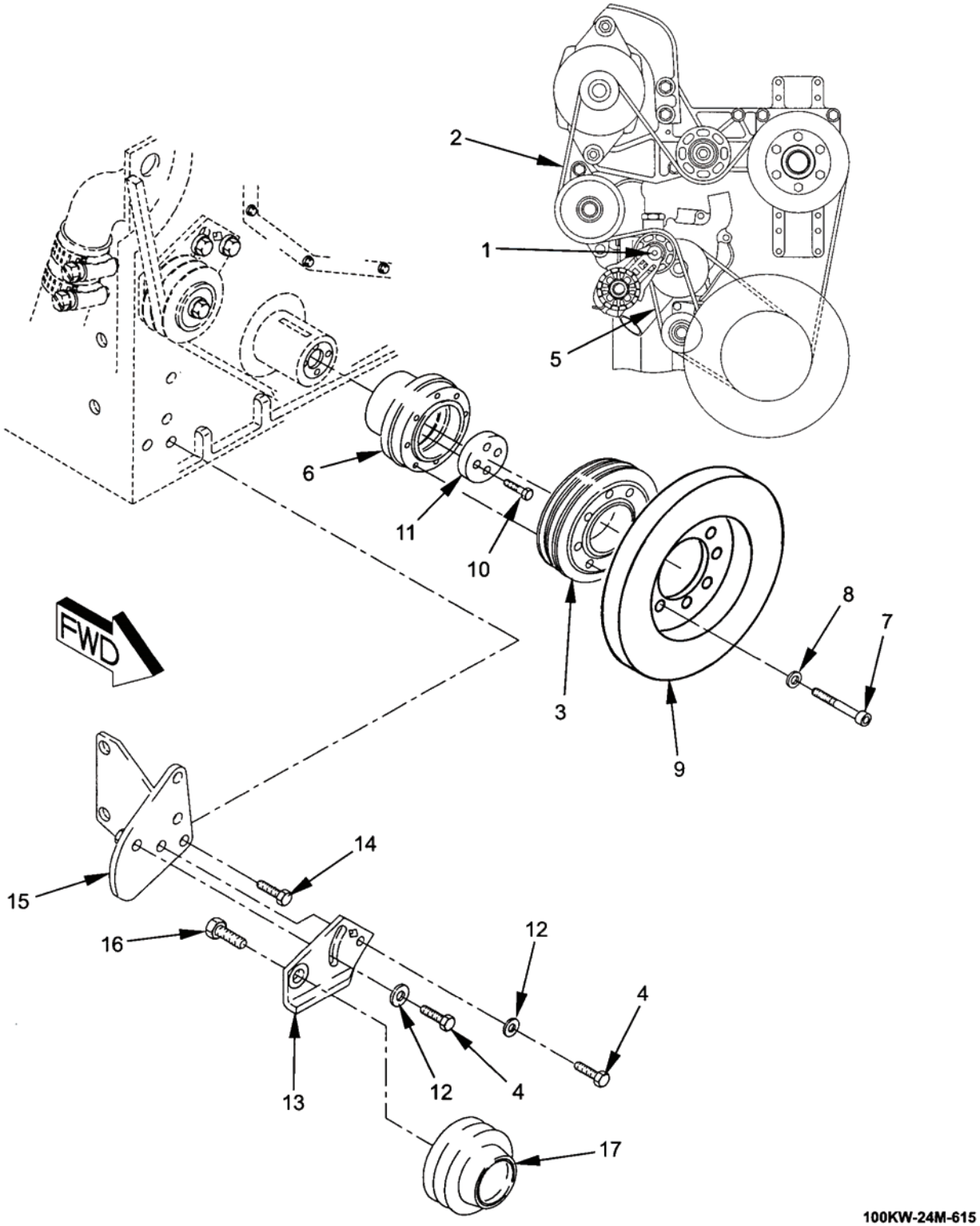

Figure 1. Crankshaft Pulley and Damper.

REMOVAL - Continued

4. Remove four screws (Figure 1, Item 10), retaining plate (Figure 1, Item 11), and crankshaft pulley (Figure 1, Item 6).

5. Remove two screws (Figure 1, Item 4), washers (Figure 1, Item 12), and belt adjusting arm (Figure 1, Item 13).

6. Remove three screws (Figure 1, Item 14) and bracket (Figure 1, Item 15).

7. Remove screw (Figure 1, Item 16) and idler pulley (Figure 1, Item 17).

END OF TASK

INSTALLATION

1. Apply grease to bearings in idler pulley (Figure 1, Item 17). Install idler pulley (Figure 1, Item 17) on belt adjusting arm (Figure 1, Item 13) with screw (Figure 1, Item 16).

2. Install bracket (Figure 1, Item 15) and three screws (Figure 1, Item 14).

3. Install belt adjusting arm (Figure 1, Item 13), two washers (Figure 1, Item 12), and two screws (Figure 1, Item 4), but do not tighten screws (Figure 1, Item 4).

4. Install crankshaft pulley (Figure 1, Item 6), retaining plate (Figure 1, Item 11), and four screws (Figure 1, Item 10). Torque screws (Figure 1, Item 10) to 130-165 lb-ft (175-225 Nm).

NOTE

Dash marks on front of the damper must be in alignment, or a new damper must be installed. Maximum permissible runout on the face of the damper is 0.080 in. (2.03 mm).

5. Install damper pulley (Figure 1, Item 3), damper (Figure 1, Item 9), eight washers (Figure 1, Item 8), and eight bolts (Figure 1, Item 7). Torque bolts (Figure 1, Item 7) to 33-47 lb-ft (45-65 Nm).

6. Position water pump belt (Figure 1, Item 5) on crankshaft pulley (Figure 1, Item 6) and idler pulley (Figure 1, Item 17). Tighten tension on belt adjusting arm (Figure 1, Item 13) and tighten two screws (Figure 1, Item 4). Torque two screws (Figure 1, Item 4) to 43-51 lb-ft (58-69 Nm).

7. Use a wrench to rotate tensioner pulley (Figure 1, Item 1) clockwise (CW), position alternator belt (Figure 1, Item 2) on damper pulley (Figure 1, Item 3) and tensioner pulley (Figure 1, Item 1), and slowly release tensioner pulley (Figure 1, Item 1).

8. Install alternator belt (WP 0072).

9. Install fan belt (WP 0073).

10. Install fan and fan guards (WP 0065).

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
CRANKSHAFT FRONT SEAL MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Seal
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Crankshaft pulley removed (WP 0104)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Remove excluder (Figure 1, Item 1).

CAUTION

Care must be taken to avoid damaging the crankshaft flange.

CAUTION

Crankshaft front seal will be damaged during removal and must be replaced with a new seal.

2. Use a small drill bit to drill three evenly spaced holes in front seal (Figure 1, Item 2).

REMOVAL - Continued

3. Use slide hammer puller to remove front seal (Figure 1, Item 2).

END OF TASK

INSTALLATION

CAUTION

Crankshaft flange and adjacent front housing must be thoroughly clean before installing a new front seal or seal will be damaged.

NOTE

Replacement crankshaft front seal is supplied with a shipping sleeve. Do not remove shipping sleeve until seal is installed.

Crankshaft front seal is designed to be installed dry.

1. Position crankshaft front seal (Figure 1, Item 2) over crankshaft.
2. Use old front seal to protect new front seal and install. Remove old front seal.
3. Install retaining plate (Figure 1, Item 3), four washers (Figure 1, Item 4), and screws (Figure 1, Item 5).

NOTE

Front seal is properly seated when recessed into front housing 0.08-0.12 in. (0.20-0.30 cm).

4. Measure distance from surface of crankshaft front seal (Figure 1, Item 2) to surface of front housing. Tighten four screws (Figure 1, Item 5) until seal is properly seated.
5. Remove four screws (Figure 1, Item 5), washers (Figure 1, Item 4), and retaining plate (Figure 1, Item 3).
6. Remove shipping sleeve from crankshaft front seal (Figure 1, Item 2).
7. Apply light coat of liquid cleaner to inside diameter of excluder (Figure 1, Item 1).
8. Install excluder (Figure 1, Item 1) on crankshaft pulley (Figure 1, Item 6) approximately 1/4 inch (0.6 cm).
9. Continue installation of crankshaft pulley and damper (WP 0104).

INSTALLATION - Continued

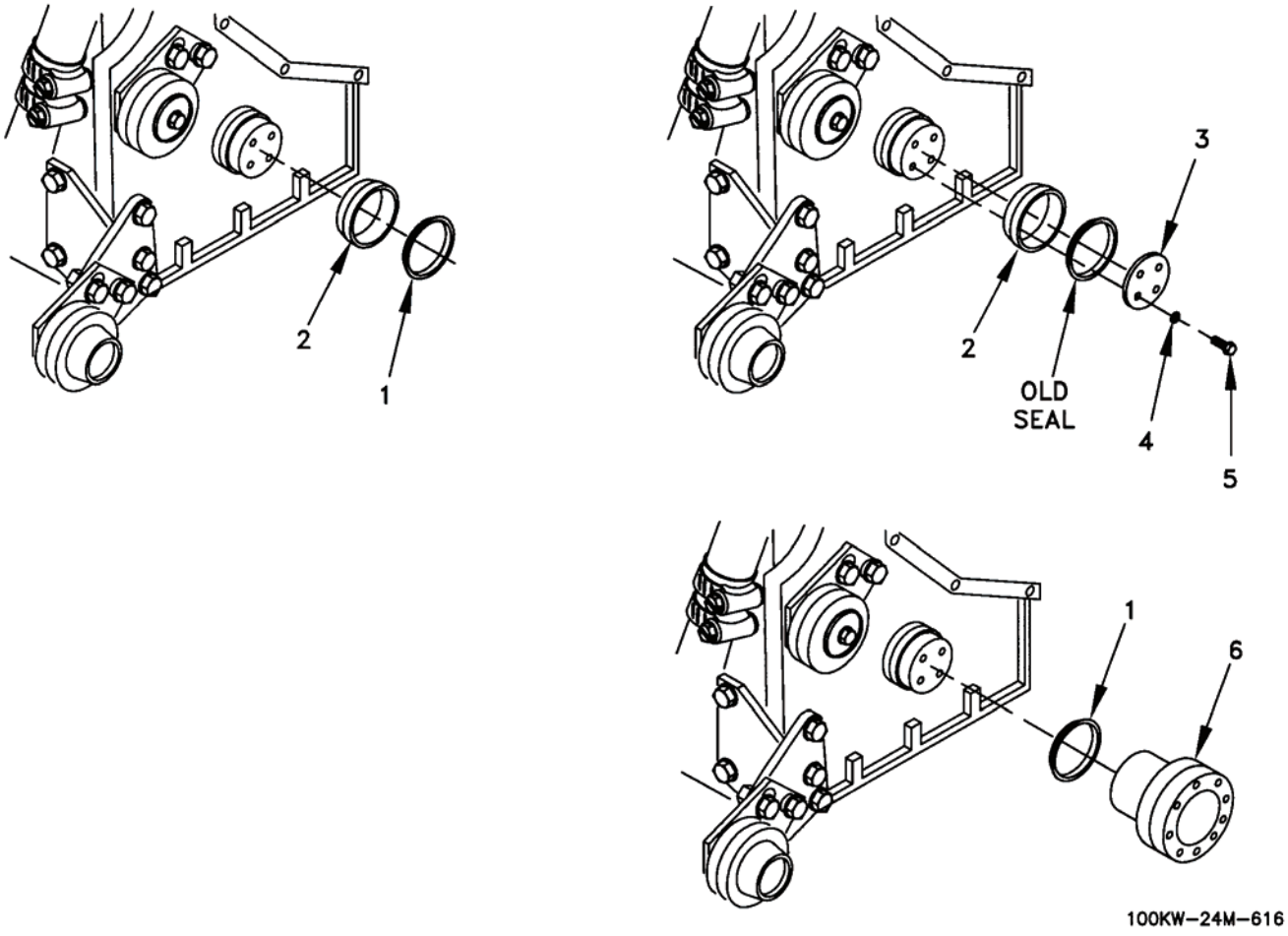

Figure 1. Crankshaft Front Seal.

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

TURBOCHARGER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Anti-seize compound (WP 0120, Item 1)
Breakthrough cleaning solvent (WP 0120, Item 47)
Gasket
Gasket
O-Ring
O-Ring
Seal
Wiping rags (WP 0120, Item 36)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Turbo out elbow removed (WP 0066)
Exhaust in elbow removed (WP 0068)
Air vent hose removed (WP 0071)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

CAUTION

All fittings and openings must be plugged immediately after opening to prevent contamination of the engine.

REMOVAL

1. Remove two screws (Figure 1, Item 1), washers (Figure 1, Item 2), tube (Figure 1, Item 3), gasket (Figure 1, Item 4), and seal (Figure 1, Item 5).

2. Disconnect tube (Figure 1, Item 6) and remove two O-rings (Figure 1, Item 7) and connector (Figure 1, Item 8) from turbocharger (Figure 1, Item 9).

3. Loosen two hose clamps (Figure 1, Item 10) and remove hose (Figure 1, Item 11).

4. Remove four locknuts (Figure 1, Item 12), turbocharger (Figure 1, Item 9), and gasket (Figure 1, Item 13) from four studs (Figure 1, item 14) of engine block.

END OF TASK

INSTALLATION

1. Apply antiseize compound to threads of four studs (Figure 1, Item 14). Install gasket (Figure 1, Item 13), turbocharger (Figure 1, Item 9), and four locknuts (Figure 1, Item 12). Torque four locknuts to 36-44 lb-ft (49-60 Nm).

2. Install hose (Figure 1, Item 11) and tighten two hose clamps (Figure 1, Item 10).

3. Install two O-rings (Figure 1, Item 7) and connector (Figure 1, Item 8) on turbocharger (Figure 1, Item 9), and connect tube (Figure 1, Item 6).

4. Install seal (Figure 1, Item 5), gasket (Figure 1, Item 4), tube (Figure 1, Item 3), two washers (Figure 1, Item 2), and screws (Figure 1, Item 1). Torque screws (Figure 1, Item 1) to 15-25 lb-ft (20-34 Nm).

5. Install air vent hose (WP 0071).

6. Install exhaust in elbow (WP 0068).

7. Install turbo out elbow (WP 0066).

INSTALLATION - Continued

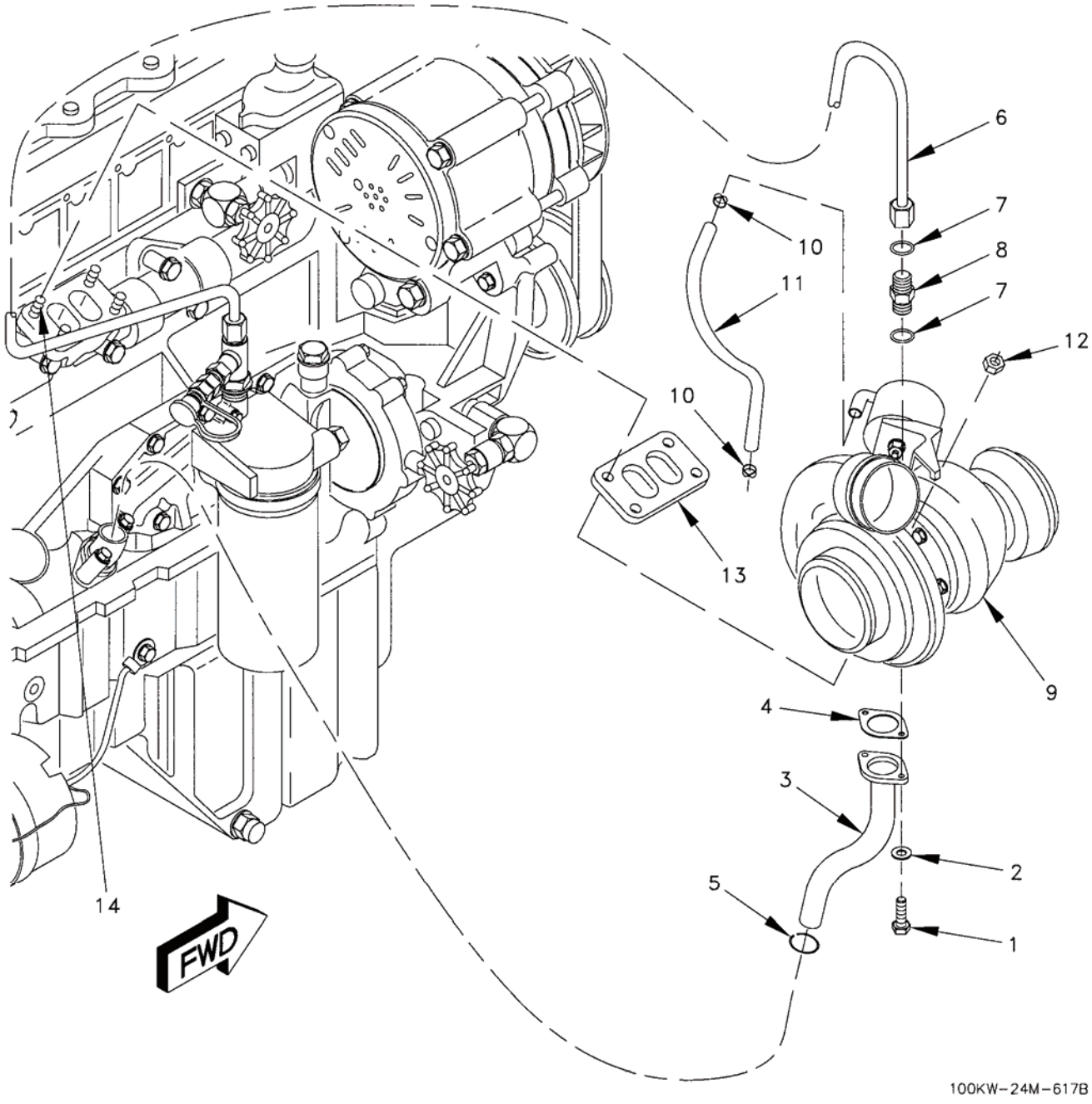

Figure 1. Turbocharger.

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

EXHAUST MANIFOLD MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Anti-seize compound (WP 0120, Item 2)
Breakthrough cleaning solvent (WP 0120, Item 47)
Engine oil (WP 0120, Items 27 thru 34)
Gasket (3)
High temperature sealer (WP 0120, Item 40)
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Turbocharger removed (WP 0106)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

CAUTION

All fittings and openings must be plugged immediately after opening with clean rags to prevent contamination of the engine.

REMOVAL

1. Remove ten bolts (Figure 1, Item 1) and spacers (Figure 1, Item 2).

NOTE

Exhaust manifold breaks into three parts.

2. Remove two bolts (Figure 1, Item 3), spacers (Figure 1, Item 4), two exhaust manifolds (Figure 1, Item 5), exhaust manifold (Figure 1, Item 6), and three gaskets (Figure 1, Item 7).

3. Remove two studs (Figure 1, Item 8).

END OF TASK

INSTALLATION

1. Apply antiseize compound to threads of two studs (Figure 1, Item 8). Install two studs (Figure 1, Item 8) and torque to 22-29 lb-ft (30-40 Nm).

2. Apply thin coat of sealer to outside diameter of male ends of two exhaust manifolds (Figure 1, Item 5). Apply light coat of engine oil to female ends of exhaust manifold (Figure 1, Item 6). Assemble all three exhaust manifolds (Figure 1, Item 5) and (Figure 1, Item 6).

3. Install three gaskets (Figure 1, Item 7), exhaust manifolds (Figure 1, Item 5) and (Figure 1, Item 6), ten spacers (Figure 1, Item 2), ten bolts (Figure 1, Item 1), two bolts (Figure 1, Item 3), and spacers (Figure 1, Item 4). Tighten bolts (Figure 1, Item 1) and (Figure 1, Item 3) hand tight.

4. Following bolt tightening sequence, torque twelve bolts (Figure 1, Item 1) and (Figure 1, Item 3) to 2-3 lb-in (3-5 Nm). Then, following bolt tightening sequence, re-torque twelve bolts (Figure 1, Item 1) and (Figure 1, Item 3) to 30-36 lb-in (40-50 Nm).

5. Install turbocharger (WP 0106).

INSTALLATION - Continued

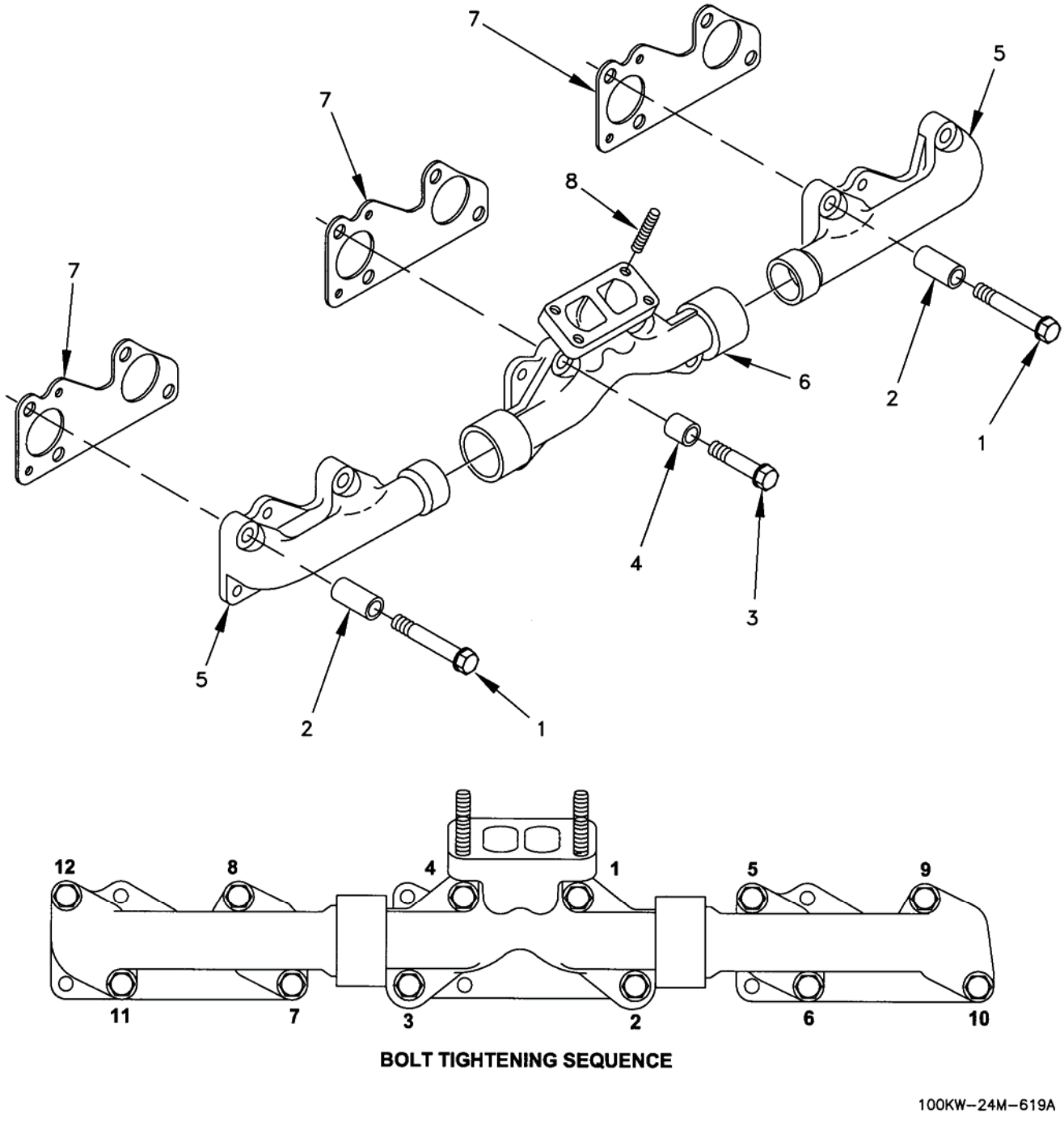

Figure 1. Exhaust Manifold.

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FLYWHEEL MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Thread locking compound (WP 0120, Item 44)
Wiping rags (WP 0120, Item 36)

Personnel Required

Two

References

TM 9-6115-729-24P

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

WARNING

Flywheel weighs more than 50 pounds (23 kg) and requires a two-person lift. Lifting flywheel can cause back strain. Ensure proper lifting techniques are used when lifting flywheel. Failure to comply can cause injury to personnel.

1. Remove top bolt (Figure 1, Item 1) and washer (Figure 1, Item 2).
2. Install guide bolt that is longer than the top bolt (Figure 1, Item 1) to assist in removal of flywheel (Figure 1, Item 3).

REMOVAL - Continued

3. Remove seven remaining bolts (Figure 1, Item 1) and washers (Figure 1, Item 2).
4. Remove flywheel (Figure 1, Item 3) from crankshaft (Figure 1, Item 4), and remove guide bolt.

END OF TASK

INSTALLATION

1. Apply thread locking compound to threads of eight bolts (Figure 1, Item 1).
2. Install guide bolt in top hole.
3. Align arrows on flywheel (Figure 1, Item 3) and crankshaft (Figure 1, Item 4) and position flywheel (Figure 1, Item 3).
4. Install seven washers (Figure 1, Item 2) and bolts (Figure 1, Item 1).
5. Remove guide bolt. Install top washer (Figure 1, Item 2) and bolt (Figure 1, Item 1).
6. Torque eight bolts (Figure 1, Item 1) to 75-100 lb-ft (100-140 Nm).

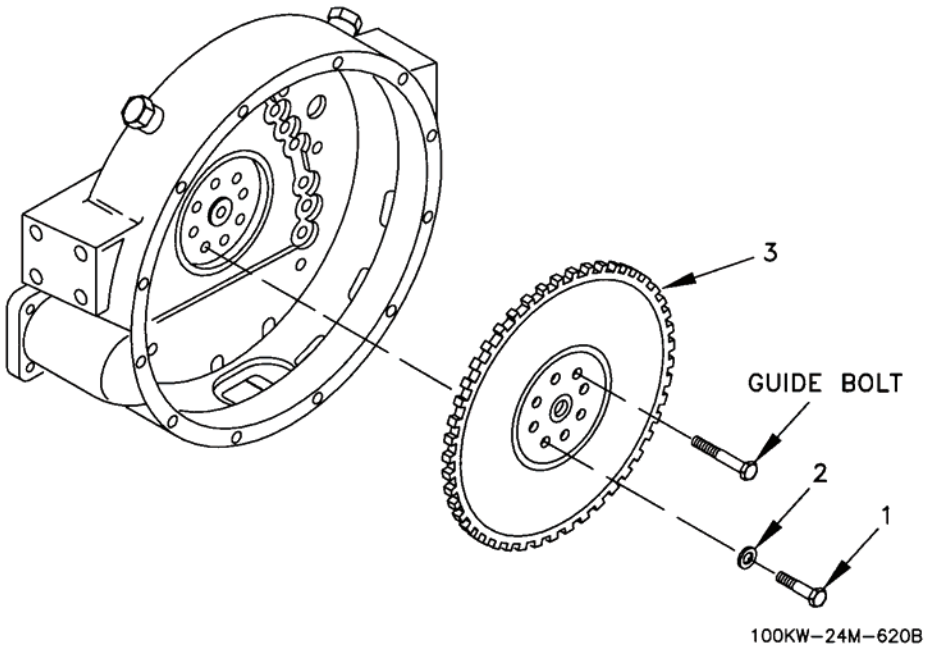

Figure 1. Flywheel.

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
FLYWHEEL HOUSING MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Sealing compound (WP 0120, Item 41)
Wiping rags (WP 0120, Item 36)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Starter removed (WP 0074)
Flywheel removed (WP 0108)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

WARNING

Flywheel housing weighs more than 55 pounds (25 kg) and requires a two-person lift. Lifting flywheel housing can cause back strain. Ensure proper lifting techniques are used when lifting flywheel housing. Failure to comply can cause injury to personnel.

1. Remove two screws (Figure 1, Item 1), ten screws (Figure 1, Item 2), and flywheel housing (Figure 1, Item 3).

REMOVAL - Continued

2. Remove two plugs (Figure 1, Item 4), pipe plug (Figure 1, Item 5), and plug (Figure 1, Item 6).

END OF TASK

INSTALLATION

1. Install plug (Figure 1, Item 6), pipe plug (Figure 1, Item 5), and two plugs (Figure 1, Item 4).
2. Apply sealing compound to contact surface of flywheel housing (Figure 1, Item 3) and install flywheel housing, ten screws (Figure 1, Item 2), and two screws (Figure 1, Item 1).
3. Torque two screws (Figure 1, Item 1) to 33-47 lb-in (45-65 Nm). Torque ten screws (Figure 1, Item 2) to 98-144 lb-ft (130-190 Nm).
4. Install flywheel (WP 0108).
5. Install starter (WP 0074).

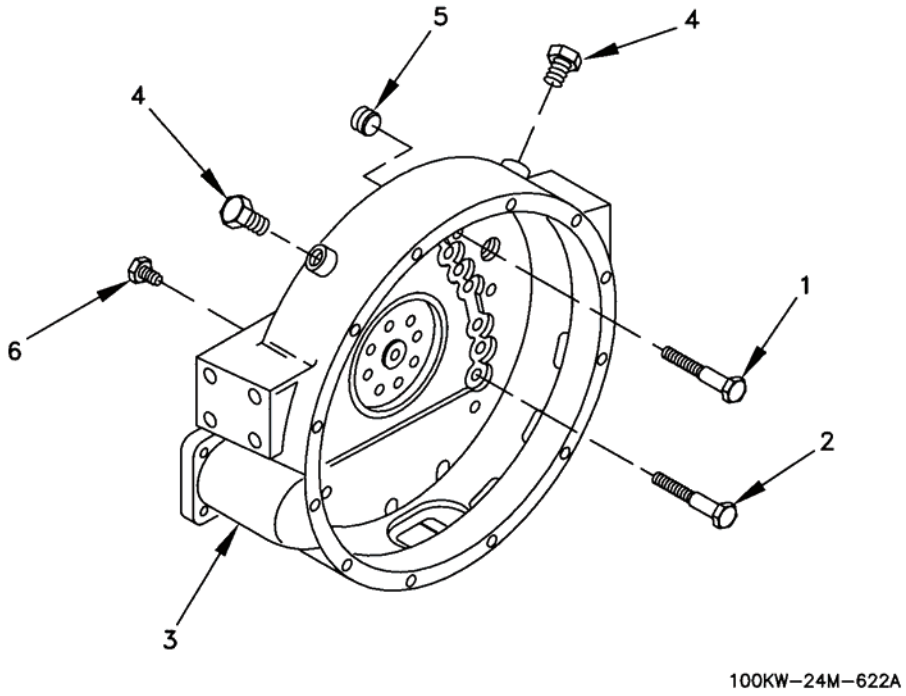

Figure 1. Flywheel Housing.

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

FRONT COVER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Gasket
Seal
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Fan pulley removed (WP 0076)
Crankshaft pulley and damper removed (WP 0104)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

CAUTION

All openings must be plugged immediately after opening with clean rags to prevent contamination of the engine.

REMOVAL

1. Remove two screws (Figure 1, Item 1), eleven bolts (Figure 1, Item 2), front cover (Figure 1, Item 3), and gasket (Figure 1, Item 4) from front housing (Figure 1, Item 5).

2. Remove two screws (Figure 1, Item 6), washers (Figure 1, Item 7), cover (Figure 1, Item 8), and seal (Figure 1, Item 9).

END OF TASK

INSTALLATION

1. Install seal (Figure 1, Item 9), cover (Figure 1, Item 8), two washers (Figure 1, Item 7), and cover (Figure 1, Item 6) on front cover (Figure 1, Item 3).

CAUTION

Front housing and front cover must be clean before installation of front cover.

2. Install gasket (Figure 1, Item 4) and front cover (Figure 1, Item 3) on front housing (Figure 1, Item 5) and secure with eleven bolts (Figure 1, Item 2) and two screws (Figure 1, Item 1).

3. Torque two studs to 15-25 lb-ft (20-34 Nm).

4. Install crankshaft pulley and damper (WP 0104).

5. Install fan pulley (WP 0076).

INSTALLATION - Continued

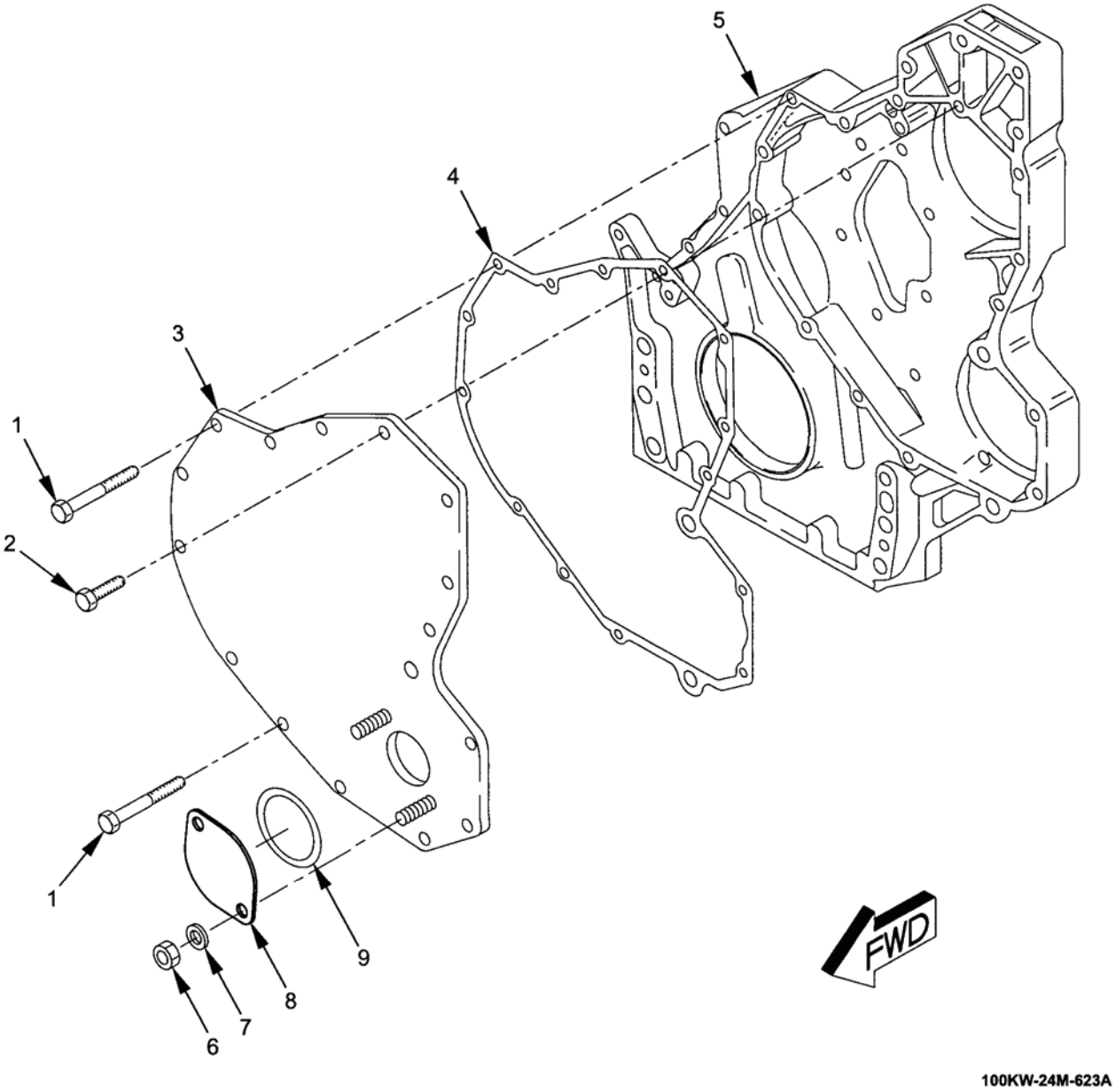

Figure 1. Front Cover.

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

ENGINE OIL FILTER BASE AND OIL COOLER MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Gasket
Gasket
Lubricating oil (WP 0120, Items 27 thru 34)
O-Ring
O-Ring
O-Ring (2)
O-Ring (3)

Materials/Parts (cont.)

Preformed packing
Preformed packing
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Oil filter removed (WP 0081)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the engine.

REMOVAL

1. Remove three screws (Figure 1, Item 1), two bolts (Figure 1, Item 2), five washers (Figure 1, Item 3), oil filter base (Figure 1, Item 4), and three O-rings (Figure 1, Item 5).

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 can cause injury to personnel.

2. Remove plug (Figure 1, Item 6), spring (Figure 1, Item 7), check valve (Figure 1, Item 8), and preformed packing (Figure 1, Item 9).

3. Disconnect tube (Figure 1, Item 10) and remove O-ring (Figure 1, Item 11), elbow (Figure 1, Item 12), and O-ring (Figure 1, Item 13) from oil cooler (Figure 1, Item 14).

4. Remove seven bolts (Figure 1, Item 15), two screws (Figure 1, Item 16), nine washers (Figure 1, Item 17), oil cooler (Figure 1, Item 14), and gasket (Figure 1, Item 18).

5. Remove oil cooler core (Figure 1, Item 19), gasket (Figure 1, Item 20), and two O-rings (Figure 1, Item 21).

6. Remove plug (Figure 1, Item 22), spring (Figure 1, Item 23), check valve (Figure 1, Item 24), and preformed packing (Figure 1, Item 25).

END OF TASK

INSTALLATION

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 can cause injury to personnel.

NOTE

Apply light coat of engine oil to all O-rings and preformed packings before installation.

1. Install preformed packing (Figure 1, Item 25), check valve (Figure 1, Item 24), spring (Figure 1, Item 23), and plug (Figure 1, Item 22).

2. Install two O-rings (Figure 1, Item 21), gasket (Figure 1, Item 20), and oil cooler core (Figure 1, Item 19).

3. Install gasket (Figure 1, Item 18), oil cooler (Figure 1, Item 14), nine washers (Figure 1, Item 17), two screws (Figure 1, Item 16), and seven bolts (Figure 1, Item 15). Torque screws (Figure 1, Item 16) and bolts (Figure 1, Item 15) to 15-25 lb-ft (20-34 Nm).

INSTALLATION - Continued

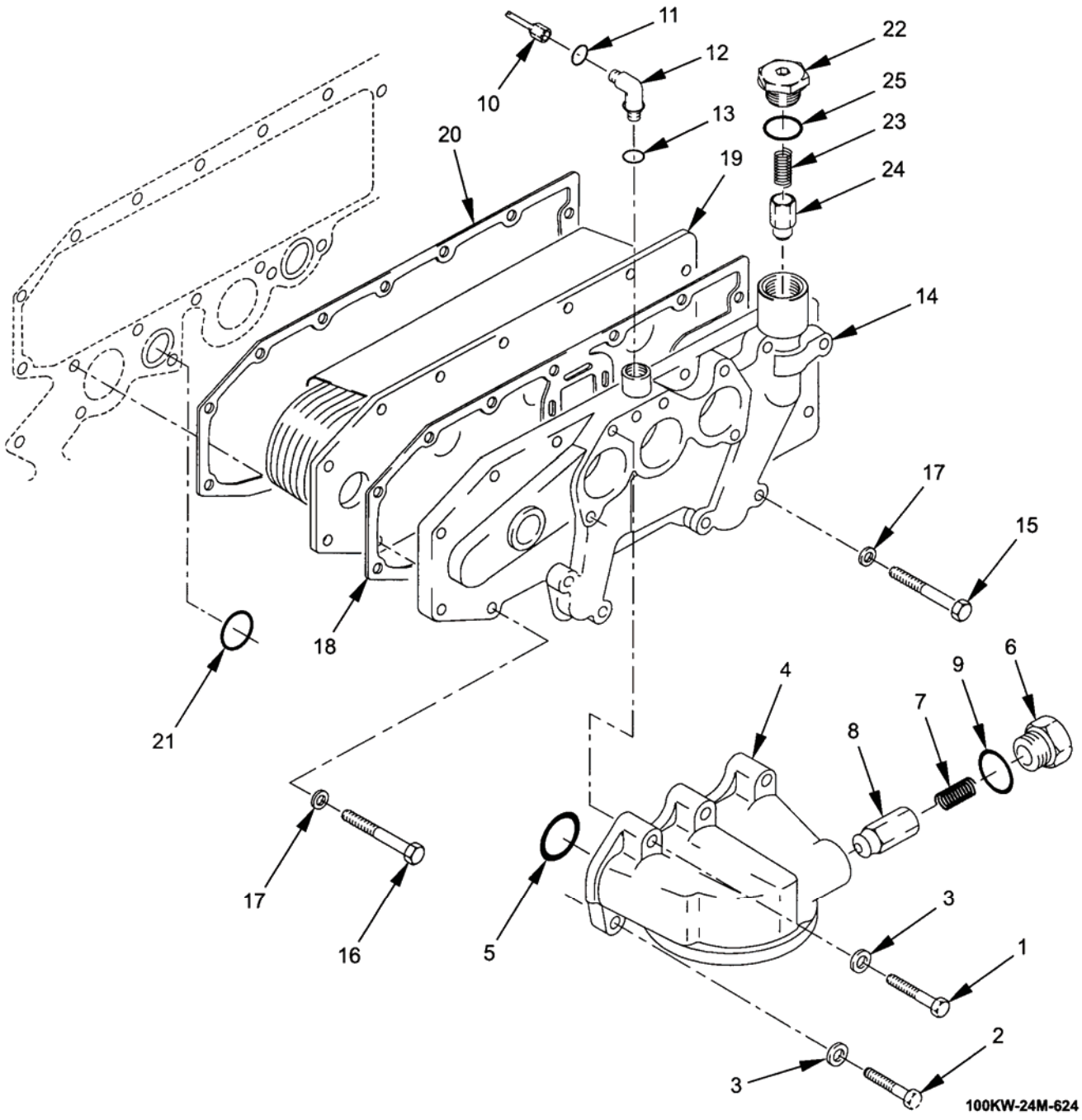

Figure 1. Engine Oil Filter Base and Oil Cooler.

INSTALLATION - Continued

4. Install O-ring (Figure 1, Item 13), elbow (Figure 1, Item 12), and O-ring (Figure 1, Item 11) and connect tube (Figure 1, Item 10).

5. Install preformed packing (Figure 1, Item 9), check valve (Figure 1, Item 8), spring (Figure 1, Item 7), and plug (Figure 1, Item 6).

6. Install three O-rings (Figure 1, Item 5), oil filter base (Figure 1, Item 4), five washers (Figure 1, Item 3), two bolts (Figure 1, Item 2), and three screws (Figure 1, Item 1). Torque bolts (Figure 1, Item 2) and screws (Figure 1, Item 1) to 15-25 lb-ft (20-34 Nm).

7. Install oil filter (WP 0081).

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A

ENGINE OIL PAN MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Engine oil (WP 0120, Items 27 thru 34)
Gasket
Gasket cement (WP 0120, Item 19)
O-Ring
O-Ring
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Engine removed (WP 0098)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

CAUTION

All fittings and openings must be plugged immediately after opening with clean rags to prevent contamination of the engine.

REMOVAL

NOTE

Engine oil capacity is 30 quarts (27.3 L).

1. Place suitable container below oil drain valve (Figure 1, Item 1) at lower right side of oil pan (Figure 1, Item 2) and allow oil to drain from system.
2. Remove 36 bolts (Figure 1, Item 3), washers (Figure 1, Item 4), and oil pan (Figure 1, Item 2). Scrape gasket (Figure 1, Item 5) from oil pan (Figure 1, Item 2) or engine block.
3. Remove plug (Figure 1, Item 6), O-ring (Figure 1, Item 7), drain valve (Figure 1, Item 1), and O-ring (Figure 1, Item 8).
4. Remove magnetic drain plug (Figure 1, Item 9) and preformed packing (Figure 1, Item 10). Inspect magnetic drain plug (Figure 1, Item 9) for metal particles and wipe clean. Notify supervisor if particles are present.

END OF TASK

INSTALLATION

1. Install preformed packing (Figure 1, Item 10) and magnetic drain plug (Figure 1, Item 9).
2. Install O-ring (Figure 1, Item 8), drain valve (Figure 1, Item 1), O-ring (Figure 1, Item 7), and plug (Figure 1, Item 6).
3. Apply thin coat of gasket cement between bolt holes only at four corners of oil pan (Figure 1, Item 2).

CAUTION

Do not get gasket cement on any part of engine block, gasket, or oil pan not specifically designated.

4. Position gasket (Figure 1, Item 5) on oil pan (Figure 1, Item 2) and install oil pan (Figure 1, Item 2) on engine block. Install four washers (Figure 1, Item 4) and bolts (Figure 1, Item 3) at locations marked “X” hand tight.
5. Install remaining 32 washers (Figure 1, Item 4) and bolts (Figure 1, Item 3). Tighten hand tight.
6. Beginning at the left rear corner (location marked “Z”), torque 36 bolts (Figure 1, Item 3) in a counterclockwise pattern to 21-25 lb-ft (28-34 Nm). Re-torque 36 bolts (Figure 1, Item 3) in a counterclockwise pattern to 21-25 lb-ft (28-34 Nm).
7. Refill engine with oil (WP 0081).
8. Install engine (WP 0098).

INSTALLATION - Continued

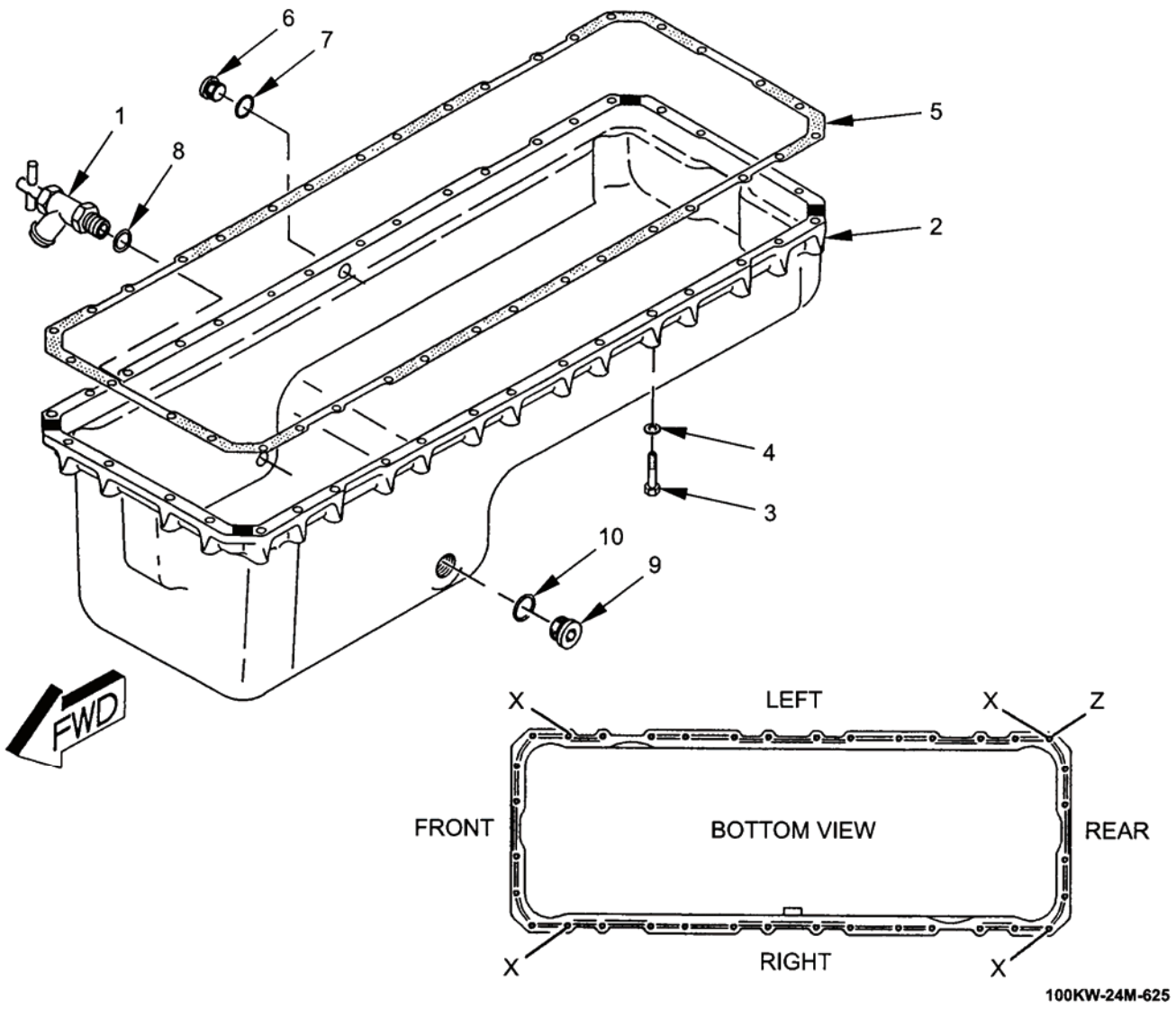

Figure 1. Engine Oil Pan.

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
ENGINE OIL PUMP MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Breakthrough cleaning solvent (WP 0120, Item 47)
Engine oil (WP 0120, Items 27 thru 34)
Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Engine oil pan removed (WP 0114)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

CAUTION

All fittings and openings must be plugged immediately after opening with clean rags to prevent contamination of the engine.

REMOVAL

Remove two screws (Figure 1, Item 1), lockwashers (Figure 1, Item 2), and oil pump (Figure 1, Item 3).

END OF TASK

INSTALLATION

1. Install oil pump (Figure 1, Item 3), two lockwashers (Figure 1, Item 2), and screws (Figure 1, Item 1).
2. Torque two screws (Figure 1, Item 1) to 33-47 lb-ft (45-64 Nm).
3. Install engine oil pan (WP 0114).

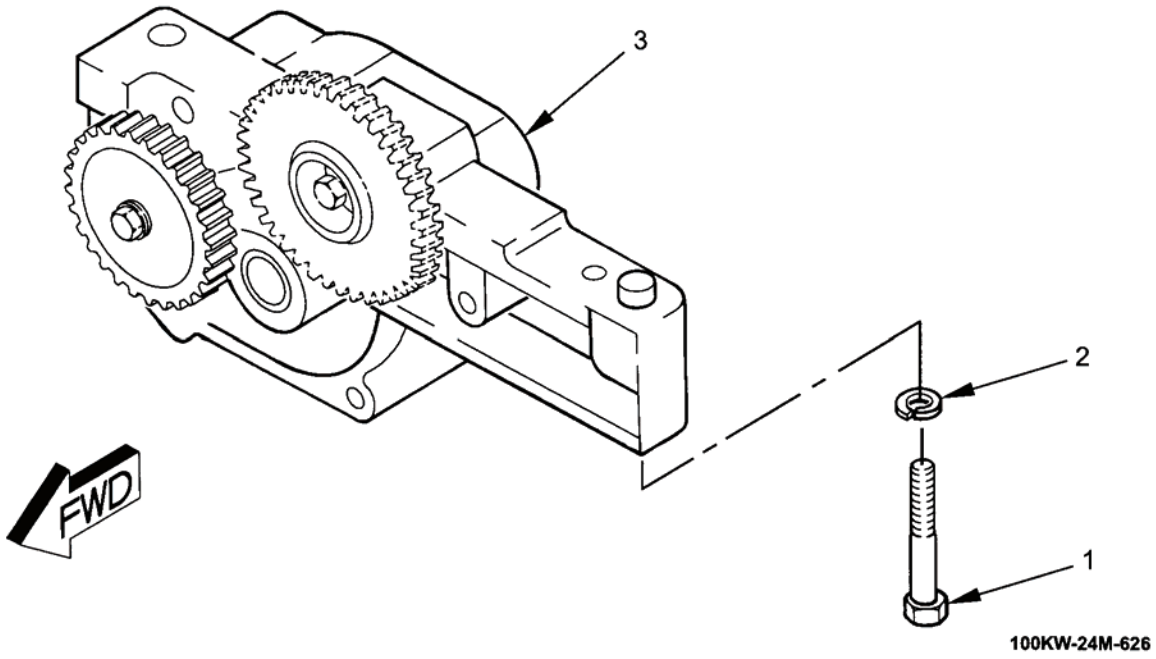

Figure 1. Engine Oil Pump.

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
UNIT INJECTOR MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Backup ring
Backup ring
Backup ring
Cleaning solvent (WP 0120, Item 8)
Engine oil (WP 0120, Items 27 thru 34)
O-Ring (2)
Seal (2)
Seal (2)
Seal (2)

Materials/Parts (cont.)

Wiping rags (WP 0120, Item 36)

Personnel Required

One

References

TM 9-6115-729-24P

Equipment Condition

Injection actuation pressure sensor removed (WP 0100)
Valve cover, gasket, and manifold removed (WP 0101)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

CAUTION

All fittings and openings must be plugged immediately after opening with clean rags to prevent contamination of the engine. Injector cleanliness is essential.

REMOVAL

1. Remove two oil drain plugs (Figure 1, Item 1) and O-rings (Figure 1, Item 2). Allow engine oil to drain from the ports in the cylinder head (Figure 1, Item 3).

2. Disconnect unit injector harness connector from unit injector (Figure 1, Item 4).

3. Remove shoulder bolt (Figure 1, Item 5), bolt (Figure 1, Item 6), and deflector (Figure 1, Item 7).

CAUTION

Do not pry up on unit injector at locations A or B. Pry up gently at location C only on the flywheel side of the unit injector or unit injector will be damaged.

4. Gently pry up on both sides of unit injector (Figure 1, Item 4) at location C on flywheel side of injector only and remove unit injector (Figure 1, Item 4).

5. Remove seal (Figure 1, Item 8), backup ring (Figure 1, Item 9), seal (Figure 1, Item 10), seal (Figure 1, Item 11), backup ring (Figure 1, Item 12), and backup ring (Figure 1, Item 13) from unit injector (Figure 1, Item 4).

6. Repeat steps 4 thru 7 for remaining unit injectors (Figure 1, Item 4).

END OF TASK

INSTALLATION

1. Install backup ring (Figure 1, Item 13), backup ring (Figure 1, Item 12), seal (Figure 1, Item 11), seal (Figure 1, Item 10), backup ring (Figure 1, Item 9), and seal (Figure 1, Item 8) on unit injector (Figure 1, Item 4).

2. Lubricate seals and backup rings (Figure 1, Item 8) thru (Figure 1, Item 13) with engine oil.

3. Clean unit injector seating surface on cylinder head (Figure 1, Item 3).

CAUTION

Do not strike unit injector with hammer. Push injector firmly straight into the injector bore by hand only or unit injector will be damaged. To avoid damaging the injector, do not use shoulder bolt or side pressure to seat injector.

4. Push unit injector (Figure 1, Item 4) straight into injector bore with the hand on top of the injector solenoid.

5. Install deflector (Figure 1, Item 7), bolt (Figure 1, Item 6), and shoulder bolt (Figure 1, Item 5). Torque bolt (Figure 1, Item 6) to 79-133 lb-in (9-15 Nm). Torque shoulder bolt (Figure 1, Item 5) to 45-63 lb-in (5-7 Nm).

6. Connect unit injector harness connector to unit injector (Figure 1, Item 4).

7. Repeat steps 1 thru 6 for remaining unit injectors (Figure 1, Item 4).

INSTALLATION - Continued

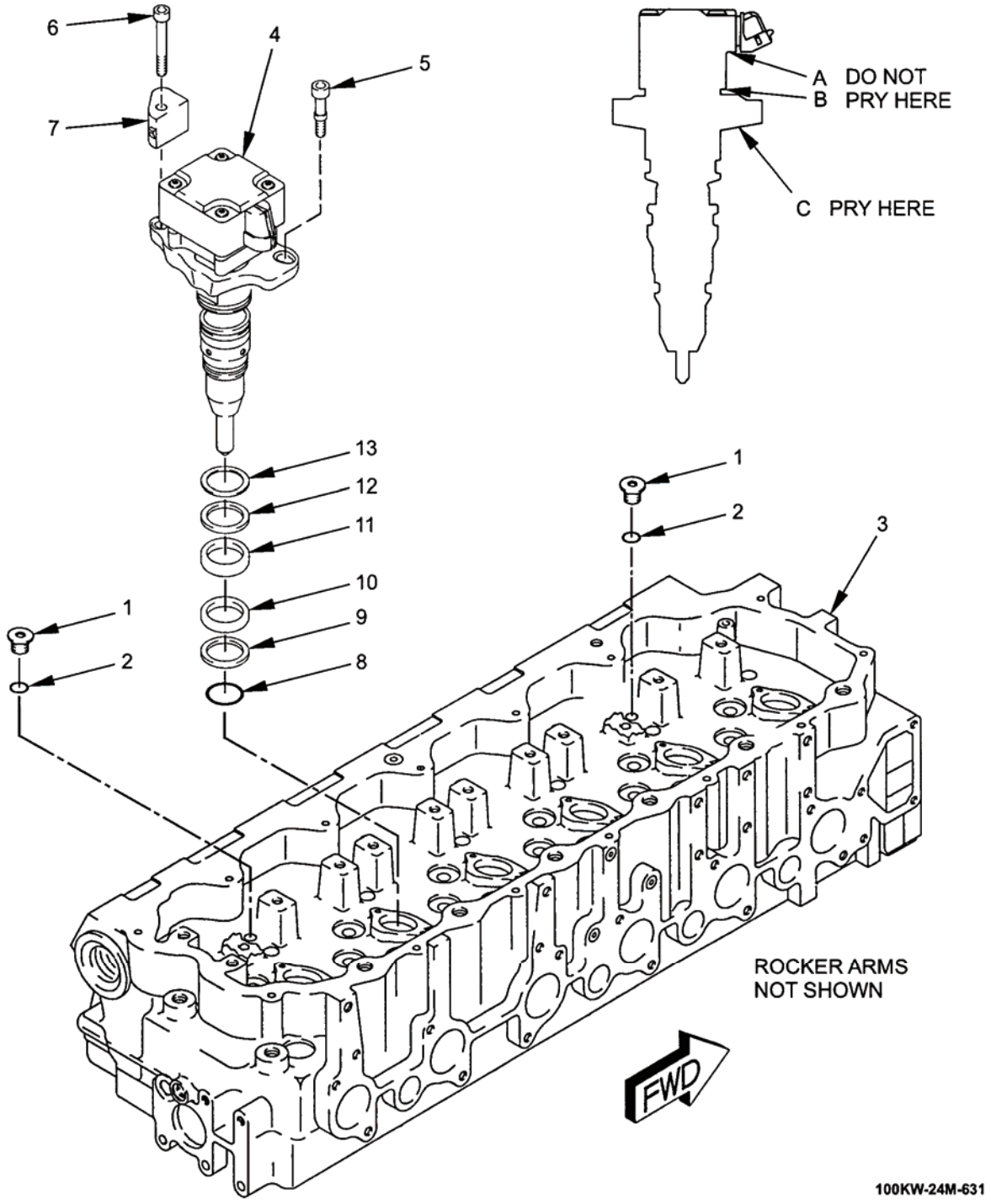

Figure 1. Unit Injector.

INSTALLATION - Continued

8. Install two O-rings (Figure 1, Item 2) and oil drain plugs (Figure 1, Item 1) in cylinder head (Figure 1, Item 3).
9. Install manifold, gasket, and valve cover (WP 0101).
10. Install injection actuation pressure sensor (WP 0100).

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
ROCKER SHAFT AND PUSHRODS MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)
Shop Equipment, Field Maintenance, Basic (WP 0119, Item 3)

Materials/Parts

Timing bolt, P/N 4C5851
Engine oil (WP 0120, Items 27 thru 34)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Valve cover and manifold removed (WP 0101)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

CAUTION

All fittings and openings must be capped or plugged immediately after opening to prevent contamination of the engine.

REMOVAL

1. Remove two bolts (Figure 1, Item 1) and washers (Figure 1, Item 2) from rocker shaft assembly.
2. Remove 11 bolts (Figure 1, Item 3), washers (Figure 1, Item 4), and entire rocker shaft assembly from cylinder head (Figure 1, Item 5).
3. Remove 12 pushrods (Figure 1, Item 6) from cylinder head (Figure 1, Item 5).

REMOVAL - Continued

4. Remove six inlet valve bridges (Figure 1, Item 7) from cylinder head (Figure 1, Item 5).

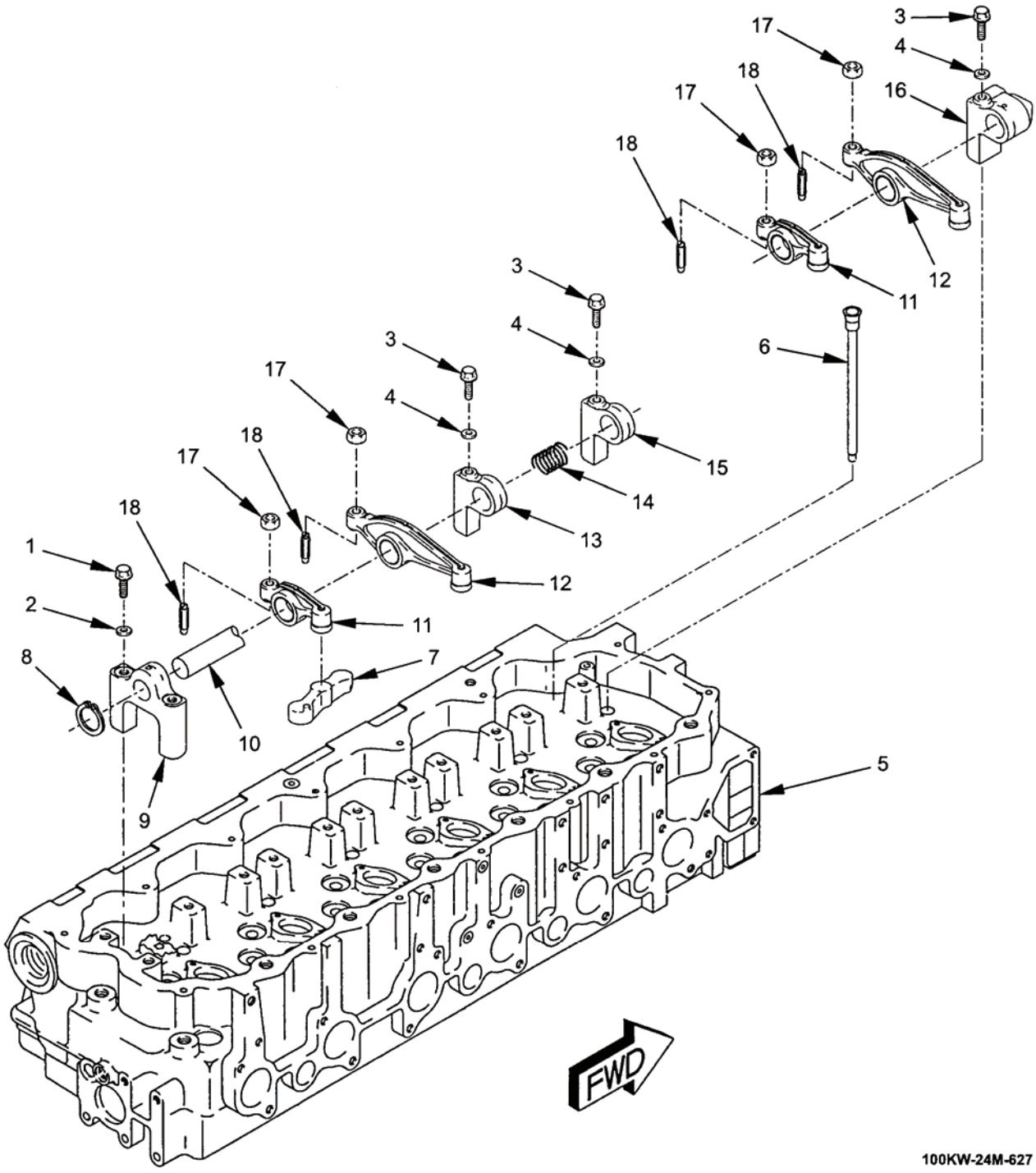

Figure 1. Rocker Shaft and Pushrods Removal and Installation.

END OF TASK

DISASSEMBLY

WARNING

Retaining rings are under tension and can act as projectiles when being removed. Use eye protection when removing retaining rings. Failure to comply can cause injury to personnel.

1. At rear end of rocker shaft assembly, remove retaining ring (Figure 1, Item 8) and stand (Figure 1, Item 9) from rocker shaft (Figure 1, Item 10).

2. Remove inlet rocker arm (Figure 1, Item 11), exhaust rocker arm (Figure 1, Item 12), stand (Figure 1, Item 13), spring (Figure 1, Item 14), and stand (Figure 1, Item 15).

3. At front end of rocker shaft assembly, remove inlet rocker arm (Figure 1, Item 11), exhaust rocker arm (Figure 1, Item 12), and stand (Figure 1, Item 16).

4. Remove 12 nuts (Figure 1, Item 17) and adjustment screws (Figure 1, Item 18) from six inlet rocker arms (Figure 1, Item 11) and six exhaust rocker arms (Figure 1, Item 12).

END OF TASK

ASSEMBLY

1. Install 12 adjusting screws (Figure 1, Item 18) and nuts (Figure 1, Item 17) on six exhaust rocker arms (Figure 1, Item 12) and six inlet rocker arms (Figure 1, Item 11).

2. At front end of rocker shaft assembly, install stand (Figure 1, Item 16), exhaust rocker arm (Figure 1, Item 12), and inlet rocker arm (Figure 1, Item 11).

3. Install stand (Figure 1, Item 15), spring (Figure 1, Item 14), stand (Figure 1, Item 13), exhaust rocker arm (Figure 1, Item 12), and inlet rocker arm (Figure 1, Item 11). Repeat for next four sets of rocker arms.

4. At rear end of rocker shaft assembly, install stand (Figure 1, Item 9) and retaining ring (Figure 1, Item 8).

END OF TASK

INSTALLATION

1. Install six inlet valve bridges (Figure 1, Item 7) on cylinder head (Figure 1, Item 5).

2. Install 12 pushrods (Figure 1, Item 6) in cylinder head (Figure 1, Item 5).

3. Position entire rocker shaft assembly on cylinder head (Figure 1, Item 5) and install 11 washers (Figure 1, Item 4) and bolts (Figure 1, Item 3).

4. Install two washers (Figure 1, Item 2) and bolts (Figure 1, Item 1) on stand (Figure 1, Item 9).

END OF TASK

VALVE LASH CHECK

WARNING

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

NOTE

All clearance measurements must be made with the engine stopped and the valves fully closed. Otherwise, incorrect adjustments will be made resulting in engine damage.

Valve lash adjustment is not necessary if measurement is in the acceptable range.

Engine must be turned with the four large bolts on crankshaft retaining plate.

1. Remove crankshaft damper and damper pulley (WP 0104). Leave retaining plate and crankshaft pulley in place.
2. Remove plug (Figure 2, Item 19) from timing hole on right front side of flywheel housing. Insert timing bolt (Figure 2, Item 20) through timing hole.
3. Using four large bolts on crankshaft retaining plate, turn flywheel in direction of normal engine rotation until timing bolt (Figure 2, Item 20) engages hole in flywheel.
4. If flywheel is turned beyond point of engagement, turn flywheel in opposite direction approximately 30 degrees. Then turn flywheel in direction of normal engine rotation until timing bolt (Figure 2, Item 20) engages hole in flywheel.

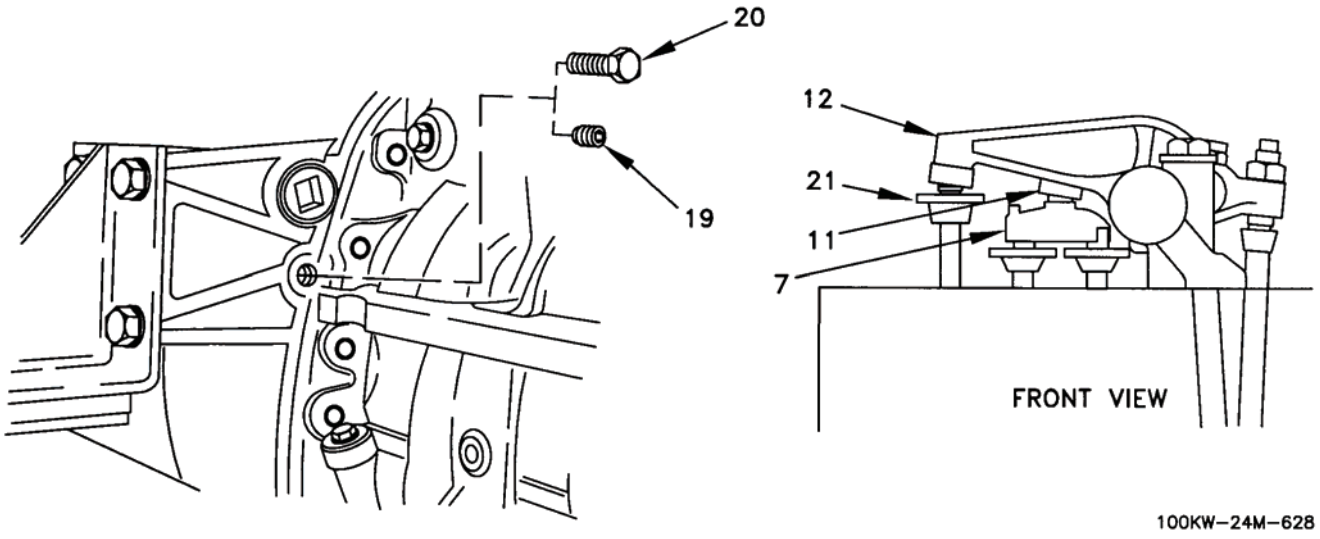

Figure 2. Valve Clearance Measurements.

VALVE LASH CHECK - Continued

5. Inlet valves and exhaust valve for cylinder number 1 are fully closed if piston number 1 is on the compression stroke and the rocker arms can be moved by hand. If rocker arms cannot be moved by hand and the valves are slightly open, the number 1 piston is on the exhaust stroke.

6. Refer to Table 1 for crankshaft positions for valve lash settings.

Table 1. Crankshaft Positions for Valve Lash Setting.

Rotation (viewed from flywheel end)	Counterclockwise
Check and adjust with piston no. 1 on this stroke	Top center compression stroke
Inlet valves	1-2-4
Exhaust Valves	1-3-5
Check and adjust with no. 1 piston on this stroke	Top center exhaust stroke
Inlet valves	2-5-6
Exhaust valves	2-4-6
Firing order)	1-5-3-6-2-4

7. For inlet valves, valve lash is measured between rocker arm (Figure 2, Item 11) and bridge (Figure 2, Item 7). For exhaust valves, valve lash is measured between rocker arm (Figure 2, Item 12) and valve stem (Figure 2, Item 21).

8. Tap each inlet rocker arm (Figure 2, Item 11) and each exhaust rocker arm (Figure 2, Item 12) with a soft face mallet. Check valves for correct valve lash shown in Table 2. Valves within the acceptable range do not have to be adjusted.

Table 2. Check for Valve Lash.

Valves	**Acceptable Range**
Inlet	0.012-0.018 in. (0.30-0.46 mm)
Exhaust	0.022-0.028 in. (0.56-0.72 mm)

9. If valve lash for all valves is within acceptable range, proceed with steps 11 thru 13.

10. Perform valve lash adjustment on any valve with readings outside the acceptable range.

11. Remove timing bolt (Figure 2, Item 20) and install plug (Figure 2, Item 19) on flywheel housing.

12. Install crankshaft damper and crankshaft pulley (WP 0104).

13. Install manifold and valve cover (WP 0101).

END OF TASK

VALVE LASH ADJUSTMENT

NOTE

Perform steps 1 thru 10 if No. 1 cylinder is on compression stroke.

1. Loosen nut (Figure 3, Item 17) and loosen adjustment screw (Figure 3, Item 18) on inlet rocker arm (Figure 3, Item 11) for cylinders 1, 2, and 4.

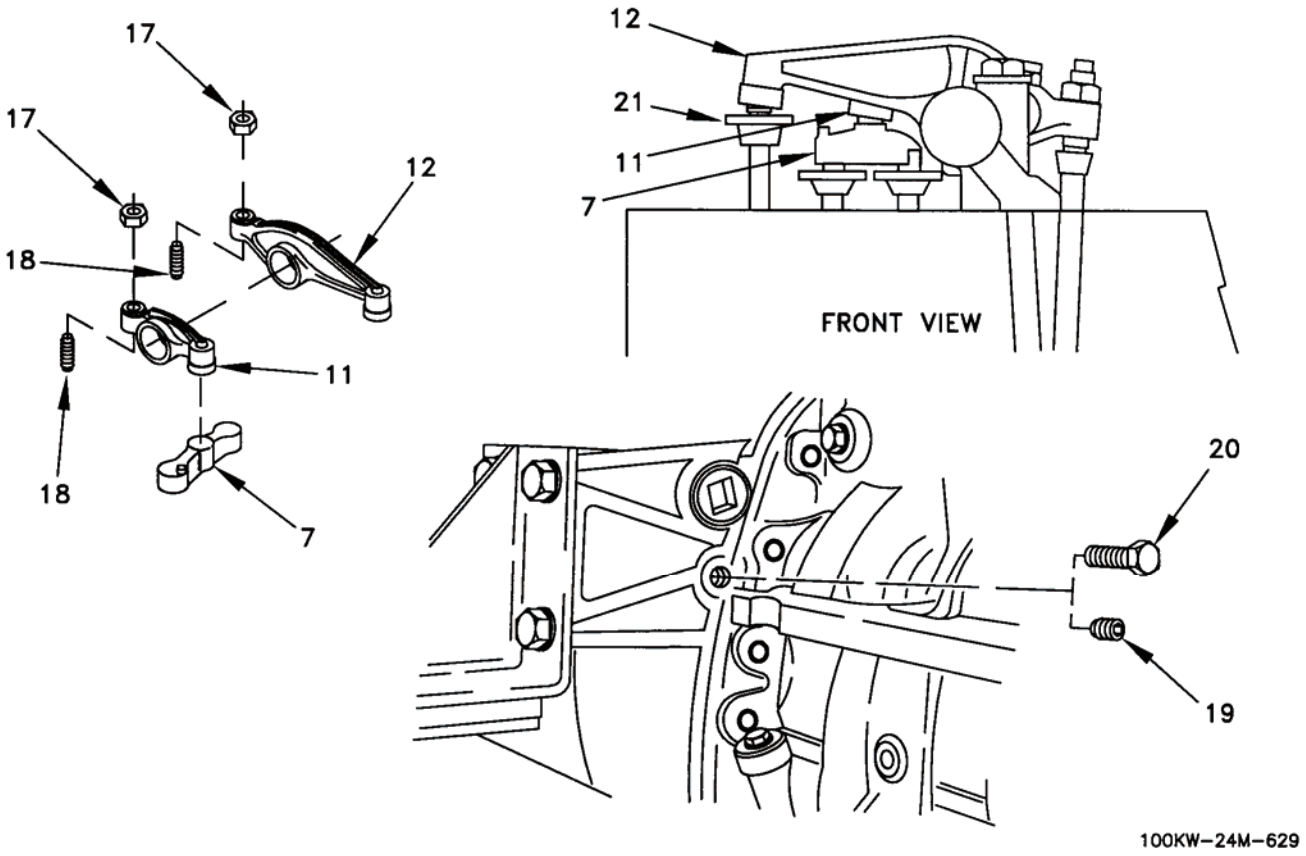

Figure 3. Valve Lash Adjustment.

2. Refer to Table 3 and insert feeler gage of correct dimension between inlet rocker arm (Figure 3, Item 11) and inlet bridge (Figure 3, Item 7).

3. Turn adjustment screw (Figure 3, Item 18) clockwise (CW) until inlet rocker arm (Figure 3, Item 11) is set to specification in Table 3.

Table 3. Valve Lash Settings.

Valves	Gage Dimension
Inlet	0.015 in. (0.38 mm)
Exhaust	0.025 in. (0.64 mm)

VALVE LASH ADJUSTMENT - Continued

4. Tighten nut (Figure 3, Item 17) on adjustment screw to 13-23 lb-ft (18-32 Nm).
5. Check adjustment and perform steps 1 thru 4 until inlet rocker arm (Figure 3, Item 11) is set to specification.
6. Perform steps 1 thru 5 on remaining two inlet rocker arms (Figure 3, Item 11).
7. Loosen nut (Figure 3, Item 17) and loosen adjustment screw (Figure 3, Item 18) on exhaust rocker arms (Figure 3, Item 12) for cylinders 1, 3, and 5.
8. Refer to Table 3 and insert feeler gage of correct dimension between exhaust rocker arm (Figure 3, Item 12) and exhaust valve stem (Figure 3, Item 21).
9. Turn adjustment screw clockwise (CW) until exhaust rocker arm (Figure 3, Item 12) is set to specification in Table 3.
10. Tighten nut (Figure 3, Item 17) on adjustment screw (Figure 3, Item 18) to 13-23 lb-ft (18-32 Nm).
11. Check adjustment and perform steps 7 thru 10 until exhaust rocker arm (Figure 3, Item 12) is set to specification.
12. Perform steps 7 thru 11 on remaining two exhaust rocker arms (Figure 3, Item 12).
13. Remove timing bolt (Figure 3, Item 20) from front of flywheel housing. Rotate flywheel 360 degrees counterclockwise (CCW). Install timing bolt (Figure 3, Item 20) in front of flywheel housing.

NOTE

Perform steps 14 thru 17 if No. 1 cylinder is on exhaust stroke.

14. Loosen nut (Figure 3, Item 17) and loosen adjustment screw (Figure 3, Item 18) on inlet rocker arms (Figure 3, Item 11) for cylinders 3, 5, and 6.
15. Perform steps 1 thru 5 on three inlet rocker arms (Figure 3, Item 11).
16. Loosen nut (Figure 3, Item 17) and loosen adjustment screw (Figure 3, Item 18) on exhaust rocker arms (Figure 3, Item 12) for cylinders 2, 4, and 6.
17. Perform steps 7 thru 11 on three exhaust rocker arms (Figure 3, Item 12).
18. Remove timing bolt (Figure 3, Item 20) and install plug (Figure 3, Item 19) on front of flywheel housing.
19. Install crankshaft damper and damper pulley (WP 0104).
20. Install manifold and valve cover (WP 0101).

END OF TASK

END OF WORK PACKAGE

DIRECT SUPPORT (FIELD) LEVEL MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
CYLINDER HEAD AND GASKET MAINTENANCE

INITIAL SETUP:

Tools and Special Tools

Lifting Device, 200 lb (91 kg) Capacity
Shop Equipment, Automotive Maintenance, Common No. 1 (WP 0119, Item 2)

Materials/Parts

Cleaning solvent (WP 0120, Item 8)
Engine oil (WP 0120, Items 27 thru 34)
Gasket
Wiping rags (WP 0120, Item 36)

Personnel Required

Two

References

TM 9-6115-729-24P

Equipment Condition

Fuel filter base removed (WP 0080)
Air inlet elbow, heater, and cover removed (WP 0103)
Thermostat housing removed (WP 0083)
Exhaust manifold removed (WP 0107)
Rocker shaft and pushrods removed (WP 0115)

WARNINGS

Metal jewelry will conduct electricity. All jewelry can become entangled in generator set components. Remove all jewelry when working on generator set. Failure to comply can cause injury or death to personnel by electrocution.

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

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

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

REMOVAL

1. Remove fourteen bolts (Figure 1, Item 1) and ring spacers (Figure 1, Item 2).
2. Remove six bolts (Figure 1, Item 3) and lockwashers (Figure 1, Item 4).

REMOVAL - Continued

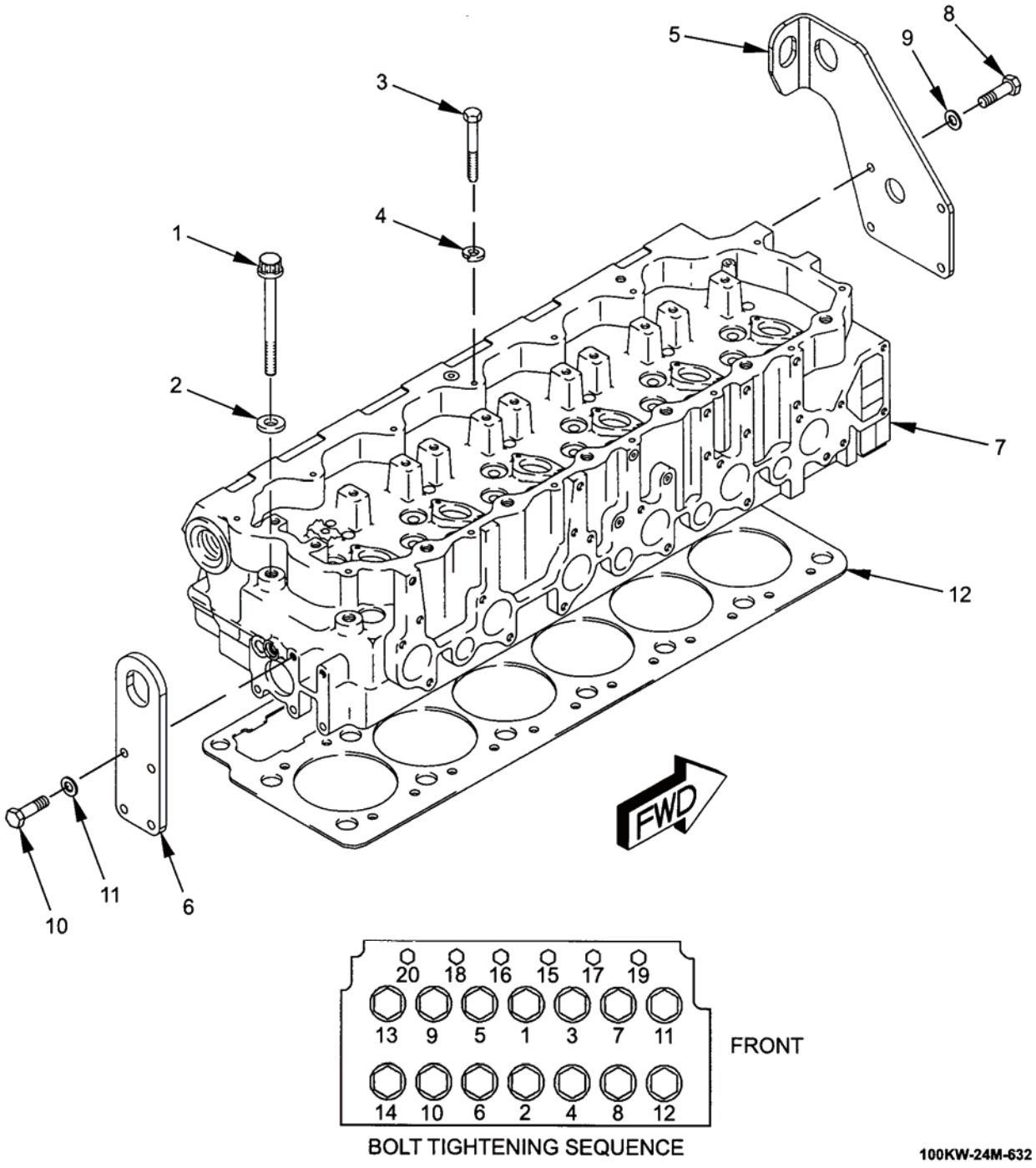

Figure 1. Cylinder Head and Gasket.

REMOVAL - Continued

WARNING

Cylinder head weighs more than 187 pounds (85 kg) and requires an assistant and a suitable lifting device. Ensure proper lifting techniques are used when lifting cylinder head. Failure to comply can cause injury to personnel.

CAUTION

Cylinder head must be removed level and straight up, or damage will result.

3. With lifting device attached to front lifting bracket (Figure 1, Item 5) and rear lifting bracket (Figure 1, Item 6), carefully lift cylinder head (Figure 1, Item 7) straight up away from engine block.

4. Remove four bolts (Figure 1, Item 8), lockwashers (Figure 1, Item 9), and front lifting bracket (Figure 1, Item 5).

5. Remove four bolts (Figure 1, Item 10), lockwashers (Figure 1, Item 11), and rear lifting bracket (Figure 1, Item 6).

6. Remove gasket (Figure 1, Item 12).

END OF TASK

CLEANING AND INSPECTION

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 can cause injury or death to personnel.

1. Clean all parts with cleaning solvent.

CAUTION

Be careful not to gouge or scrape contact surface of cylinder head or engine block. Imperfections in contact surface may cause leakage of cylinder head gasket and equipment damage.

Contact surfaces of cylinder head and engine block must be thoroughly clean before installation or cylinder head gasket may leak and cause equipment damage.

2. Carefully remove all remnants of head gasket from bottom of head gasket and from top of engine block.

3. Measure contact surface of cylinder head for flatness. Maximum deviation should not exceed 0.002 in (0.03 cm) in a six inch area, or 0.006 in (0.02 cm) overall.

END OF TASK

INSTALLATION

1. Install rear lifting bracket (Figure 1, Item 6) on cylinder head (Figure 1, Item 7) with four lockwashers (Figure 1, Item 11) and bolts (Figure 1, Item 10).

2. Install front lifting bracket (Figure 1, Item 5) on cylinder head (Figure 1, Item 7) with four lockwashers (Figure 1, Item 9) and bolts (Figure 1, Item 8).

3. Place gasket (Figure 1, Item 12) on engine block.

WARNING

Cylinder head weighs more than 187 pounds (85 kg) and requires an assistant and a suitable lifting device. Ensure proper lifting techniques are used when lifting cylinder head. Failure to comply can cause injury to personnel.

CAUTION

Cylinder head must be removed level and straight up, or damage will result.

4. With lifting device attached to front lifting bracket (Figure 1, Item 5) and rear lifting bracket (Figure 1, Item 6), carefully position cylinder head (Figure 1, Item 7) straight over engine block and carefully lower cylinder head onto engine block.

5. Apply engine oil to threads of fourteen bolts (Figure 1, Item 1) and six bolts (Figure 1, Item 3).

6. Install fourteen washers (Figure 1, Item 2) and bolts (Figure 1, Item 1). Install six washers (Figure 1, Item 4) and bolts (Figure 1, Item 3).

7. Torque fourteen bolts (Figure 1, Item 1) in sequence shown to 210-232 lb-ft (285-315 Nm).

8. Loosen fourteen bolts until washers (Figure 1, Item 2) are loose.

9. Torque fourteen bolts (Figure 1, Item 1) in sequence shown to 85-107 lb-ft (115-145 Nm).

10. Re-tighten fourteen bolts (Figure 1, Item 1) in sequence shown to 85-107 lb-ft (115-145 Nm).

11. Tighten fourteen bolts (Figure 1, Item 1) in sequence shown an additional one-fourth turn.

12. Torque six bolts (Figure 1, Item 3) to 36-45 lb-ft (48-62 Nm).

13. Install unit injectors (WP 0114).

INSTALLATION - Continued

14. Install rocker shaft and pushrods (WP 0115).
15. Install exhaust manifold (WP 0107).
16. Install thermostat housing (WP 0083).
17. Install air inlet elbow, heater, and cover (WP 0103).
18. Install fuel filter base (WP 0080).

END OF TASK

END OF WORK PACKAGE

CHAPTER 6

GENERAL SUPPORT
Moved to Sustainment (NMWR)

CHAPTER 7

SUPPORTING INFORMATION

CHAPTER 7

SUPPORTING INFORMATION

WORK PACKAGE INDEX

FIELD AND SUSTAINMENT MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
REFERENCES

SCOPE

This work package lists all field manuals, forms, technical manuals, technical bulletins, commercial manuals, and miscellaneous publications for use with the Tactical Quiet Generator.

FIELD MANUALS

FM 3-3	Chemical and Biological Contamination Avoidance
FM 3-3-1	Nuclear Contamination Avoidance
FM 3-11.4	NBC Protection
FM 3-11.5	NBC Decontamination
FM 3.97.6	Mountain Operations
FM 4-25.11	First Aid
FM 5-20	Camouflage
FM 9-207	Operation and Maintenance of Ordnance Materiel in Cold Weather (0° to –65°)
FM 10-67-1	Concepts and Equipment of Petroleum Operations
FM 10-564	Air Drop of Supplies and Equipment
FM 21-6	Techniques of Military Instruction
FM 21-30	Military Symbols
FM 21-40	Chemical, Biological, Radiological, and Nuclear Defense
FM 21-305	Manual for Wheeled Vehicle Driver
FM 31-70	Basic Cold Weather Manual
FM 31-71	Northern Operations

FORMS

AFTO Form 22	Technical Order Publication Improvement Report
AFR 66-1	Maintenance Reporting
DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2028-2	Recommended Changes to Equipment Technical Publications
NAVMC 10772	Recommended Changes to Publications and Blank Forms
DA Form 2062	Hand Receipt
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2407	Maintenance Request
DA Form 2408	Equipment Log Assembly (Records)
DA Form 2408-9	Equipment Control Record
DA Form 2408-20	Oil Analysis Log
DA Form 5988-E	Equipment Inspection and Maintenance Worksheet
DD Form 314	Preventive Maintenance Schedule and Record
DD Form 518	Accident Identification Card
DD Form 1397	Processing and Deprocessing Record for Shipment, Storage, and Issue of Vehicles and Spare Engines
DD Form 2326	Preservation and Packing Data
NAVMC10524	Consolidated Engineer Equipment Operations Log and Service Record

FORMS - Continued

NAVMC10560	Worksheet for Quarterly Preventive Maintenance and Technical Inspection for Engineer Equipment
NAVMC 10772	Tracking Program
SF Form 91	Motor Vehicle Accident Report
SF Form 361	Transportation Discrepancy Report
SF Form 364	Report of Discrepancy (ROD)
SF Form 368	Product Quality Deficiency Report

MISCELLANEOUS PUBLICATIONS

AR 190-13	Army Physical Security Program
AR 190-16	Physical Security
AR 385-11	Safety Ionizing Protection
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
CTA 8-100	Army Medical Department Expendable/Durable Items
CTA 50-970	Expendable Items (Except Medical Class V, Repair Parts, and Heraldic Items)
TC 38-3	Guide for Basic Military Preservation and Packing
TC 9-237	Operator's Circular, Welding Theory and Application

PAMPHLETS

DA PAM 25-30	Consolidated Index of Publications and Blank Forms
DA PAM 750-8	Functional Users Manual for the Army Maintenance Management System (TAMMS)

TECHNICAL BULLETINS

TB 43-0209	Color, Marking, and Camouflage Painting of Military Vehicles, Construction Equipment, and Materials Handling Equipment
TB 43-0213	Corrosion Prevention and Control
TB ORD 1032	Description, Use, Bonding Techniques, and Properties of Adhesives

MILITARY STANDARDS AND SPECIFICATIONS

MIL-DTL-53072C	Chemical Agent Resistant Coating (CARC) System Application Procedures and Quality Control Inspection
MIL-PRF-2104	Lubricating Oil, Internal Combustion Engine, Combat/Tactical Service
MIL-L-21260	Lubricating Oil, Internal Combustion Engine, Preservative and Break-In
MIL-L-46167	Lubricating Oil, Internal Combustion Engine, Arctic
MIL-PRF-5624	Turbine Fuels, Aviation, Grades JP-4, JP-5, and JP-5/JP-8 ST
A-A-52557	Fuel Oil, Diesel
MIL-STD-913	Requirements for the Certification of Sling Loaded Military Equipment for External Transportation by Department of Defense Helicopters

DEPARTMENT OF DEFENSE (DOD) STANDARDS

DOD 4100-1-R	Department of Defense Materiel Management Regulations
DOD 4100-39-M	FLIS Program Manual

DETAIL SPECIFICATION

MIL-DTL 83133E	Turbine Fuels, Aviation, Kerosene Types NATO F-34 (JP-8), NATO F-35, and JP8+10

TECHNICAL MANUALS

TO 00-350-54	Unsatisfactory Equipment Reporting
TM 3-220	Chemical, Biological, and Radiological (CBR) Decontamination
TM 9-214	Inspection, Care, and Maintenance of Antifriction Bearings
TM 9-238	Deepwater Fording of Ordnance Material
TM 9-247	Materials Used for Cleaning, Preserving, Abrading, and Cementing Ordnance Material and Related Material Including Chemicals
TM 43-0139	Painting Instructions for Army Materiel
TM 4700-15	Operation and Maintenance of Ground Equipment
TM 55-1500-323-24	Installation Practices for Aircraft Electrical and Electronic Wiring
TM 740-90-1/TO 35-1-4	Administrative Storage of Equipment
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use
TM 9-6115-729-10	Operator Manual Tactical Quiet Generator Set, Skid Mounted, 100 kW, 50/60 Hz MEP-807A and Tactical Quiet Generator Set, Trailer Mounted, 100 kW, 50/60 Hz, PU-807A
TM 9-6115-729-24P	Repair Parts and Special Tools Lists for Tactical Quiet Generator Set, Skid Mounted, 100 kW, 50/60 Hz MEP-807A and Tactical Quiet Generator Set, Trailer Mounted, 100 kW, 50/60 Hz, PU-807A
TM 9-2330-376-14&P	Operator's, Organizational, DS, and GS Maintenance Manual Including Repair Parts and Special Tools Lists for Trailer, 5-Ton, 4-Wheel, GEMSS, XM979; Trailer, Flatbed: 5-Ton, 4-Wheel, XM1061/M1061A1; and Trailer, General Purpose, Flatbed: 7-1/2-Ton, XM1073

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz
6115-01-296-1463 MEP-807A/6115-01-471-7088 PU-807A

MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at various maintenance levels under the two-level Army Maintenance System concept.

The 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 Level – includes three subcolumns, C (operator/crew), O (unit) maintenance, and F (direct support)

Sustainment Level – includes two subcolumns, H (general support) and D (depot).

The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks (immediately following the tools and test equipment requirements) contain 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 gagings 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 mark (restore obliterated identification), to clean (includes decontaminate, when required), to preserve, to drain, to touchup paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms.
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.

Maintenance Functions - Continued

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. 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.
9. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures, painting, 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 lowest 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.

10. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR/NMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
11. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age 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.)

Explanation of Columns in the MAC - Continued

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 man hours in whole hours or decimals) in the appropriate sub column. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures 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 under the two level maintenance concept are as follows:

Field:
C - Operator or Crew maintenance
O - Unit maintenance
F - Direct Support maintenance

Sustainment:
L - Specialized Repair Activity (SRA)
H - General Support 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 a 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 under the two-level MAC.

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, model number, or type 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

TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz
6115-01-296-1463 MEP-807A/6115-01-471-7088 PU-807A

MAINTENANCE ALLOCATION CHART (MAC)

Table 1. MAC

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
GROUP	COMPONENT	MAINTENANCE	C	O	F	H	D	REF CODE TOOLS AND EQUIPMENT	REMARKS
00	100 kW Generator Set	None	N/A	N/A					
	Set Assembly	Test			1.0			3	
	Quarterly	Service		8.0				1,2	
	Semi-Annual	Service		10.0					
	Annual	Service		16.0					
		Repair			2.0	8.0		3	
		Adjust			1.0				
0101	Housing Installation	Inspect	0.1	0.2					
	Door Assemblies	Repair		1.0					
	Ceiling Assemblies	Repair		3.0					
	Access Covers	Repair		1.0					
	Housing Assemblies	Repair		1.0					
	Panel Assemblies	Repair		1.0					
	Complete Assembly	Repair		7.0				1	A
0102	Control Box Assembly	Inspect	0.1	0.2					B
	Diode	Test		0.2					
		Replace		0.5					
	Load Sharing Module A4	Repair		1.0					R
	Digital Voltage Regulator A3	Repair		1.0					R
	Bus Transformer Box A6	Test		0.2					
		Replace		0.8					R
	AC Transformer Box A5	Test		0.2					
		Replace		0.8					
	Resistor Assembly A7	Repair		1.0					
	Switches	Test		0.2					
		Replace		0.3					
	Relay	Repair		0.5					
	Harness Assembly	Repair		5.0					
	Complete Assembly	Repair		11.2				1	B
010201	Control Box Door	Replace						1	H
	Panel Assembly			3.0					
	Generator Set Control A1	Repair		1.0				1	
	Alarm Module A2	Repair		1.0					R
	Switches/Gauges	Test		0.2					
		Replace		0.2					

Table 1. MAC - Continued

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
GROUP	COMPONENT	MAINTENANCE	C	O	F	H	D	REF CODE TOOLS AND EQUIPMENT	REMARKS
0103	Electrical Component Installation	Inspect		0.5					
		Repair		2.0				1,2	
	Battery Disconnect Switch	Repair		0.5					R
	Batteries	Repair		1.0					R
	Dead Crank Switch	Repair		0.5					R
	NATO Slave Receptacle	Repair		1.5					
	Main Load Contactor K1	Repair		1.0					R
	Engine to EMCP Harness Assembly	Repair		3.0					
	Engine Harness Assembly	Repair		16.0					
010301	Reconnection Terminal Board Assembly	Inspect	0.1	0.2					C
	Terminal Stud	Replace		0.5					R
	Complete Assembly	Repair		1.5				1	C
010302	Load Board Assembly	Inspect	0.1	0.1					
	EMI Filter Assembly L1, L2, and L3	Repair		1.0					R
	EMI Filter Assembly N to Ground	Repair		1.0					R
	Varistor Wire	Replace		0.2					R
	Terminal Stud	Replace		0.5					R
	Output Load Terminal Board TB2	Repair		3.5					
010303	Cable Assemblies	Inspect		1.5					E
	Battery Cable Assemblies	Repair		0.5					
	Complete Assembly	Repair		3.0					
	Power Cable Assemblies	Repair		16.0				1,2	E, R
0104	Fuel System Installation	Inspect	0.1	0.8					F
	Fuel Level Switch Assembly	Repair		1.0					
	Fuel Hose Assemblies	Replace		1.5					
	Fuel Pickup Tube Assembly	Repair		1.0					
	Fuel Level Sender	Repair		1.0					
	Auxiliary Fuel Pump	Repair		1.0					
	Solenoid Valve	Repair		1.0					
	Hose Assemblies	Replace		0.5					
	Fuel Tank				25.0				
0105	Cooling System Installation	Inspect	0.2	0.2					
		Service	0.2	1.0				1	
	Surge Tank	Repair		0.5					
	Coolant Recovery Tank	Repair		0.5					
	Radiator	Repair		8.0					
	Engine Fan	Repair		2.0					

Table 1. MAC - Continued

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
GROUP	COMPONENT	MAINTENANCE	C	O	F	H	D	REF CODE TOOLS AND EQUIPMENT	REMARKS
	Radiator Shrouds	Repair		2.0					
	Coolant Hoses	Repair		1.5					
0106	Exhaust System	Inspect	0.1	0.5					
	Muffler Inlet Tubes	Replace		0.5					
	Exhaust Muffler	Replace		1.0					
	Muffler Outlet Tubes	Replace		0.5					
	Complete Assembly			2.0					
0107	Air Cleaner	Inspect							
	Installation		0.1	0.1					
		Service		0.3				1	
		Repair		0.5					
	Complete Assembly	Replace		1.5					
	Crankcase Ventilation Assembly	Replace		0.5					
0108	Engine/Generator	Inspect							
	Base Assembly		0.1	0.1					
		Repair			1.0	2.0		3	
010801	Generator	Inspect	0.1	0.5					
	Main Stator	Repair			22.0				R
		Test			1.0				
	Exciter Stator	Repair			23.0				R
		Test			0.5				
	Main Rotor	Repair			23.0				R
		Test			1.0				
	Complete Assembly	Repair			23.0			2,4	R
010802	Engine	Inspect	0.2	0.5					
	Engine	Replace			24.0				
	Engine Tensioner	Replace		1.0					R
	Engine Pulley	Replace		6.0					R
	Water Pump	Replace		2.0					R
	Water Line	Repair		1.5					R
	Thermostat	Replace		1.5					
	Starter Motor	Repair		3.5					R
	Alternator	Repair		1.5					
01080201	Engine Electrical System	Inspect			0.2				
	Sensor and Wiring Group	Repair			3.0				R
	Engine control module	Repair			3.0				R
	Sensor	Replace			1.5				
01080202	Engine Intake and Exhaust System	Inspect		0.5	0.5				
	Turbocharger	Replace			2.5				R
	Exhaust Manifold	Repair			3.0				R
	Heater and Air Inlet	Repair			3.0				R
01080203	Engine Oil System	Inspect		0.1	0.2				
	Oil Pan	Replace			25.0				
	Oil Pump	Replace			25.0				
	Oil Filter-Cooler	Replace			1.5				
	Oil Filler	Replace		0.5					
	Oil Line	Replace			0.5				

Table 1. MAC - Continued

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
GROUP	COMPONENT	MAINTENANCE	C	O	F	H	D	REF CODE TOOLS AND EQUIPMENT	REMARKS
001080204	Engine Fuel System	Inspect			0.2				
	Injectors	Replace			3.0				
	Priming Fuel Pump	Repair		0.5					
	Fuel Filter and Line	Replace		1.5					
01080205	Engine Cylinder Head Assembly	Inspect			0.2				
	Valve cover	Replace			2.5				
	Cylinder Head	Replace			10.5				
	Camshaft Group	Repair				6.5			
01080206	Engine Flywheel and Housing Assembly	Inspect			0.2				
	Flywheel	Replace			25.0				R
	Flywheel Housing Group	Repair			25.0				R
01080207	Engine Crankshaft Pulley	Inspect			0.2				
		Repair			1.0			3	N
	Crankshaft-Damper	Repair							
	Crankshaft	Repair							
01080208	Engine Timing Gear Cover	Inspect			0.2				
		Repair			1.0			3	O
	Front Cover	Repair							
	Front Housing	Repair							
	Front Gear	Repair							
01080209	Engine Block Assembly	Inspect			0.2				
		Repair			1.0			3	P
	Engine Support	Repair							
	Carrier Seal Group	Repair							
	Cylinder Block Group	Repair							
	Piston and Rod Group	Repair							
03	Winterization Kit Installation	Inspect	0.2	0.2					Q
		Replace		0.5				1	R
		Repair		3.1					
		Repair			1.0			1	Q
04	Trailer Installation	Repair		1.0				1	

Table 2. Tools and Test Equipment Requirements.

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	O	Tool Kit, General Mechanic's, Automotive (GMTK)	5180-00-177-7033	SC 5180-95-N26 (01 September 2001)
2	O F	Shop Equipment, Automotive Maintenance and Repair; Organizational Maintenance, Common No. 1, Less Power	4910-00-754-0654	SC 4910-95-A74 (01 September 2001)
3	F H	Shop Equipment, Automotive Maintenance and Repair: Field Maintenance, Basic, Less Power	4910-00-754-0705	SC 4910-95-A31 (01 September 2001)
4	F H	Lifting Strap, 2000 lb. capacity	5120-00-388-9344	EE2801, P/N 60803

Table 3. Remarks.

REMARKS CODE	REMARKS
A	Housing Installation repair function includes replacement of Right Battery Access Door Assembly, Left Battery Door Assembly, Control Box Door Assembly, Left Front Door Assembly (Latch), Left Rear Door Assembly, Left Rear Door Assembly (Latch), Load Board Door Assembly, Right Front Door Assembly (Latch), Right Rear Door Assembly, Right Rear Door Assembly (Latch), Engine Generator Compartment Ceiling Assembly, Access Cover Assembly, Generator Access Cover Assembly, Front Section Housing Assembly, Rear Section Housing Assembly, Front Roof Section Housing Assembly, Rear Roof Section Housing Assembly, Left Center Panel Assembly, Right Center Panel Assembly, Right Rear Panel Assembly, and Left Rear Panel Assembly.
B	Control Box Assembly repair function includes replacement of Load Sharing Module A4, Digital Voltage Regulator A3, Alarm Module A2, Generator Set Control A1, and all other components.
C	Reconnection Terminal Board Assembly repair function includes replacement of Reconnection Terminal Board.
D	Load Terminal Board Assembly repair function includes replacement of EMI Filter Assembly L1, L2, and L3, EMI Filter Assembly N to Ground, Varistor Wire L1, Varistor Wire L2, Varistor Wire L3, and Varistor Wire N.
E	Cables Assemblies inspect, service, and repair functions include inspection, servicing, and replacement of Battery Cable Assembly 12A, Battery Cable Assembly 24D, Battery Cable Assembly 1 C, Battery Cable Assembly 2A, Battery Cable Assembly 1A, Battery Cable Assembly 24A, Battery Cable Assembly 2C, Power Cable Assembly 110K, Power Cable Assembly 121A, Power Cable Assembly 122A, Power Cable Assembly 123A, Power Cable Assembly 103A, Power Cable Assembly 102A, and Power Cable Assembly 101A.
F	Fuel System Installation inspection and repair functions include inspection and replacement of Fuel Level Switch Assembly, Fuel Hose Assemblies, and Fuel Pickup Tube Assembly.
G	Engine repair functions include repair, replacement and adjustment of Engine Tensioner Group, Engine Pulley Group, Water Pump Group, Water Line Group, Lifting Group, and Starter Motor Group
H	Engine Electrical System repair functions include inspection, repair, and replacement of Sensor and Wiring Group and Controller Group

Table 3. Remarks - Continued.

REMARKS CODE	REMARKS
I	Engine Intake and Exhaust System repair functions include inspection, replacement and repair of Turbocharger Group, Exhaust Manifold Group, and Heater and Air Inlet Group
J	Engine Oil System repair functions include inspection and repair of Oil Pan Group, Oil Pump Lines Group, Oil Filter-Cooler Group, Oil Filler Group, Oil Line Group, and Oil Level Gage Group
K	Engine Fuel System repair functions include inspection and repair of Injector Pump Group, Priming Fuel Pump Group, and Fuel Filter and Line Group
L	Engine Cylinder Head Assembly repair functions include inspection and repair of Cylinder Head Group, Fuel Injectors Group, Cylinder Head Cover Group, and Camshaft Group
M	Engine Flywheel and Housing Assembly repair functions include inspection and repair of Flywheel Group and Flywheel Housing Group
N	Engine Crankshaft Pulley repair functions include inspection and repair of Crankshaft-Damper Group and Crankshaft Group
O	Engine Timing Gear Cover repair functions include inspection and repair of Front Cover Group, Front Housing Group, and Front Gear Group
P	Engine Block Assembly repair functions include inspection and repair of Engine Support Group, Carrier Seal Group, Cylinder Block Group, and Piston and Rod Group
Q	Winterization Kit Installation repair function includes replacement of Winterization Heater Control Box Assembly, Winterization Heater Assembly, Winterization Heater Hoses, Winterization Thermostat, Resistors, and Diode, and Winterization Wiring Harness.
R	Refer to Removal and Installation procedures for Replacement functions.

END OF WORK PACKAGE

FIELD AND SUSTAINMENT MAINTENANCE
TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A
EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

This work package lists expendable and durable items that you will need to operate and maintain the 100 kW Tactical Quiet Generator. 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.

EXPENDABLE/DURABLE ITEMS LIST COLUMN DESCRIPTIONS (TABLE 1)

Column (1) - ITEM NUMBER. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use adhesive (WP 0129, Item 4)).

Column (2) - LEVEL. This column identifies the lowest level of maintenance that requires the listed item (C = Operator/Crew, O = Unit, F = Direct Support, H = General Support, 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 NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
1	F	8030-00-597-5367	Antiseize Compound 2-1/2 lb can MIL-A-907 (81349)	CN
2	F	8030-01-451-1403	Antiseize Compound 5P3931 (11083)	TU
3	F	8030-00-117-8510	Adhesive 10 cc bottle RTV 3145 Clear (71984)	BT
4	F	6810-00-286-5435	Alcohol, Technical 1 gallon can TT-I-735 (81348)	CN

Table 1. Expendable and Durable Items List - Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
5	C	6850-00-664-1403	Antifreeze, Ethylene Glycol 1 gallon A-A-52624 (58536)	GL
6	O	5340-00-450-5718	Cap and Plug Set Protective 10935405 (19207)	KT
7	H	6850-00-543-7801	Carbon Removing Compound, Type II 5 gallon can MIL-C-19853 (81349)	CN
8	F	6850-00-281-1985	Cleaning Solvent 1 gallon can PS-661 (02978)	CN
9	O	5350-00-221-0872	Cloth, Abrasive Crocus A-A-1206 (58536)	PG
10	F		Damping Sheet Adhesive Back 0116-1957-01 (93742)	SH
11	F		Damping Sheet Adhesive Back 0116-1957-02 (93742)	SH
12	F		Damping Sheet Adhesive Back 0116-1957-03 (93742)	SH
13	F		Damping Sheet Adhesive Back U-127U-PSA (69202)	SH
14	F		Damping Sheet Adhesive Back U-381 U-PSA (69202)	SH
15	F		Damping Sheet Adhesive Back V-05 (69202)	SH
16	C	9140-00-286-5286	Fuel, Diesel, DF-1 bulk A-A-52557 (58536)	GL

Table 1. Expendable and Durable Items List - Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
17	C	9140-00-286-5294	Fuel, Diesel, DF-2 bulk A-A-52557 (58536)	GL
18	H	5210-00-640-6176	Gage, Bearing Clearance box of 12 PLASTIGAGE PB1 (77220)	EA
19	F	8040-01-038-5043	Gasket Cement 8 oz can 5H2471 (11083)	CN
20	F	8040-01-038-5043	Gasket Cement 8 oz can 5H2471 (11083)	CN
21	F	5330-01-438-1861	Gasket Forming Compound 8C-8422 (11083)	CN
22	H	9150-01-035-5391	Gear Lubricating Oil 5 gallon can MIL-PRF-2105 (81349)	CN
23	O	9150-01-197-7689	Grease, Automotive and Artillery 6.5 lb can MIL-PRF-10924 (81349)	CN
24	H	9150-00-223-4004	Grease, Molybdenum Disulfide 6-1/2 lb can MIL-G-21164 (81349)	CN
25	C	6850-01-287-8067	Inhibitor, Corrosion, Liquid Cooling System 1 gallon MIL-A-53009 (81349)	GL
26	O	5970-00-815-1300	Insulation Sleeving Electrical MIL-I-23053/5 (81349)	FT
27	C	9150-01-402-2372	Lubricating Oil, Engine, Arctic, OEA 5 gallon can MIL-PRF-46167 (81349)	CN
28	C	9150-01-189-6727	Lubricating Oil, Engine, OE/HDO-10 1 quart MIL-PRF-2104 (81349)	QT
29	C	9150-01-186-6668	Lubricating Oil, Engine, OE/HDO-10 5 gallon MIL-PRF-2104 (81349)	CN

Table 1. Expendable and Durable Items List - Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
30	C	9150-00-186-6681	Lubricating Oil, Engine, OE/HDO-30 1 quart MIL-PRF-2104 (81349)	QT
31	C	9150-00-188-9858	Lubricating Oil, Engine, OE/HDO-30 5 gallon MIL-PRF-2104 (81349)	CN
32	C	9150-01-152-4117	Lubricating Oil, Engine, OE/HDO-15/40 1 quart MIL-PRF-2104 (81349)	QT
33	C	9150-01-152-4119	Lubricating Oil, Engine, OE/HDO-15/40 5 gallon MIL-PRF-2104 (81349)	CN
34	C	9150-00-405-2987	Lubricating Oil, Engine, OE/HDO-40 1 gallon MIL-PRF-2104 (81349)	GL
34A	O	9150-00-111-0209	Lubricating Oil, Engine, Preservation, Grade 30W 5 gallon MIL-PRF-21260 (81349)	CN
34B	O	9150-00-111-3199	Lubricating Oil, Engine, Preservation, Grade 10W 5 gallon MIL-PRF-21260 (81349)	CN
34C	O	9150-00-231-6689	Lubricating Oil, General Purpose 1 quart can MIL-PRF-32033 (81349)	CN
34D	O	9150-00-250-0926	Petroleum Jelly 1 lb can VV-P-236 (81348)	CN
35	F	8030-00-043-1688	Primer, Sealing Compound 1 gallon can Locktite N (05972)	CN
36	O	7920-00-205-3571	Rag, Wiping, Cotton and Cotton Synthetic Grade B DDD-R-0030 (81348)	BX
37	O	8040-01-108-6660	Repair Kit Adhesive 900M-195 (73168)	KT

Table 1. Expendable and Durable Items List - Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
38	F	8030-00-981-7005	Sealant Locktite AA15-1 (05972)	
39	F	8030-00-656-1426	Sealant, Silicone 1 pint can MIL-S-45180 (81349)	CN
40	F	5330-01-485-8999	Sealer High Temperature 2P-2333 (11083)	
41	F	8040-01-173-9815	Sealing Compound 12 oz. tube RTV-108 (01139)	TU
42	F	8030-01-155-3238	Sealing Compound 50 ml tube 6V6640 (11083)	TU
43	H	8030-01-025-1692	Sealing Compound 250 cc bottle Locktite 242 (05972)	BT
44	F	8030-00-148-9833	Sealing Compound, Thread Locking, Type II, Grade N 10 cc bottle MIL-S-46163 (81349)	BT
45	O	8030-01-063-7510	Sealing Compound, Thread Locking, Type I Grade L 50 cc bottle MIL-S-46163 (80244)	BT
46	F	3439-00-974-1873	Solder, Tin Alloy, SN60WRMAP2 1 lb spool QQ-571 E (81348)	LB
47	O	6850-01-378-0679	Solvent, Cleaning Compound 5 gallon can BREAKTHROUGH (OK209)	CN
48	O	5975-01-128-0390	Strap, Tiedown Electrical PLT-27 (06383)	HD

Table 1. Expendable and Durable Items List - Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, PART NUMBER/(CAGEC)	(5) U/I
49	O	5975-01-364-7334	Strap, Tiedown Electrical PLT.7M-C (06383)	HD
50	O	5975-01-376-6480	Strap, Tiedown Electrical PLT1.51 (06383)	HD
51	O	5975-01-273-8134	Strap, Tiedown Electrical PLM2S-D (06383)	EA
52	O	9905-00-537-8954	Tag, Marker 50 each bundle MIL-T-12755 (81349)	BD
52A	O	7510-00-073-1337	Tape, Pressure Sensitive Adhesive, 3/4 in. W 60 yd Roll PPP-T-60 (81348)	RL
53	C	9130-00-273-2379	Turbine Fuel, Aviation bulk, JP5 MIL-PRF-5624 (81349)	GL
54	C	9130-01-031-5816	Turbine Fuel, Aviation bulk, JP8 MIL-T-83133 (81349)	GL
55	O	9505-00-684-4841	Wire, nonelectrical, 0.031 in. dia 1 lb roll ASTM A641 (81346)	RL

END OF WORK PACKAGE

GLOSSARY

TERM	DEFINITION
Bus	The common power conducting wires or bars to which all power sources within the power system are connected through their individual circuit breakers.
Dead Bus	A bus from which all the available power sources are disconnected.
De-energize	To remove voltage from a circuit or device in order to deactivate it.
Droop	Paralleling mode that allows slight fluctuations in frequency so that lagging generator set can match frequency of companion generator.
EMI	Electromagnetic interference is any electromagnetic disturbance that interrupts, obstructs or other wise degrades or limits the effective performance of electronics and electrical equipment as a result of spurious emissions and responses.
Energize	To apply voltage to a circuit or device in order to activate it.
Excitation voltage	DC voltage applied from the voltage regulator to the generator exciter field windings.
Generator overload condition	Load greater than the load for which the system or mechanism was intended. For TQGs, overload is defined as the condition when current in all three phases exceeds 100% of rated current or when current in a single phase exceeds 130% of rated current.
Ground fault circuit interrupter (GFCI)	A device intended for the protection of personnel that functions to de-energize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protection device of the supply circuit. The TQG convenience receptacle is protected by a GFCI.
Incoming generator	The generator that is being connected to the bus.
Isochronous	Paralleling mode that requires precise matching of frequency for companion generators.
kV	Kilovolt. One kilovolt equals 1000 volts.
KVAR	Kilovolt amperes reactive. Measure of reactive power.
KVARhr	Kilovolt amperes reactive hours. Measure of reactive power over time.
kW	Kilowatt. One kilowatt equals 1000 watts. Measure of real power.
Load bus	Common power conducting wires or bars to which all generator set loads are connected through their individual circuit breakers.
Overcurrent condition	Any current in excess of the rated current of equipment. The condition may result from overload, short circuit, or ground fault.
Paralleling	The procedure for synchronizing and connecting two or more generator sets to a common load bus.

GLOSSARY - Continued

TERM	DEFINITION
Reverse power	Power flows from one generator set into another generator set when operating in parallel. For the TQGs, reverse shutdown power occurs when reverse power exceeds 17% of rated value.
TQG control circuit	Primarily consists of 24 Vdc circuitry, meters and controls for generator set starting, stopping, monitory, and fault annunciation.
Wet stacking	Buildup of unburned diesel fuel and carbon residues in the engine and exhaust system of diesel engines. Wet stacking can cause an oily, tar-like residue to exit from the exhaust pipe.

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INDEX - Continued

INDEX - Continued

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS

For use of this form, see AR 25–30; the proponent agency is ODISC4.

Use Part II (*reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/ Supply Manuals (SC/SM)

DATE: 8/30/02

TO: (*Forward to proponent of publication or form)(Include ZIP Code)*
Commander, U.S. Army C-E LCMC
ATTN: AMSEL-LC-LEO-E-ED-P
FORT MONMOUTH, NJ 07703-5000

FROM: (*Activity and location)(Include ZIP Code)*
Jane Q. Doe, SFC
1234 Any Street
Nowhere Town, AL 34565

PART 1 – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 11-4940-355-12	16 Sep 2002	Organizational, Direct Support, And General Support Maintenance Manual for Machine Gun, .50 Caliber M3P and M3P Machine Gun Electrical Test Set Used On Avenger Air Defense Weapon System

ITEM NO.	PAGE NO.	PARA–GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON
1	WP0005 PG 3		2			Test or Corrective Action column should identify a different WP number.

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/ AUTOVON, PLUS EXTENSION	SIGNATURE
Jane Q. Doe, SFC	788–1234	

TO: (*Forward direct to addressee listed in publication*)	**FROM:** (*Activity and location) (Include ZIP Code)*	**DATE**
Commander, U.S. Army C-E LCMC ATTN: AMSEL-LC-LEO-E-ED-P FORT MONMOUTH, NJ 07703-5000	Jane Q. Doe, SFC 1234 Any Street Nowhere Town, AL 34565	8/30/02

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III – REMARKS (*Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Jane Q. Doe, SFC	788–1234	

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS **For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.**	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** *(Activity and location) (Include ZIP Code)*	

PART I - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO.*	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Exact wording of recommended change must be given)*

** Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

DA FORM 1 FEB 74 **2028**

REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.

TO: *(Forward to proponent of publication or form) (Include ZIP Code)*	**FROM:** *(Activity and location) (Include ZIP Code)*	**DATE**

PART II- REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION/FORM NUMBER	DATE	TITLE

PAGE NO.	COLM NO.	LINE NO.	FEDERAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPROTED	RECOMMENDED ACTION

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TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

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By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0627714

DISTRIBUTION:

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SCHEMATIC AND WIRING DIAGRAM LEGEND

REFERENCE DESIGNATION	ITEM DESCRIPTION
A1	GENERATOR SET CONTROL (GSC)
A2	ALARM MODULE
A3	DIGITAL VOLTAGE REGULATOR (DVR)
A4	LOAD SHARING MODULE (LSM)
A5	AC TRANSFORMER BOX (ATB)
A6	BUSS TRANSFORMER BOX (BTB)
A7	RESISTOR ASSY
A8	ENGINE CONTROL MODULE (ECM)
AFP	AUXILIARY FUEL PUMP
AFPR	AUXILIARY FUEL PUMP RELAY
AFPS	AUXILIARY FUEL PUMP SWITCH
AFPV	AUXILIARY FUEL PUMP SOLENOID VALVE
ALM	ALARM
ALT	ALTERNATOR
AR	ALARM RESET
AS	ALARM SILENCE SWITCH
ATB	AC TRANSFORMER BOX
BDS	BATTERY DISCONNECT SWITCH
BSS	BATTLE SHORT SWITCH
BTB	BUS TRANSFORMER BOX
CATSW1	FUEL FILTER RESET
CATSW2	OIL FILTER RESET
CB1	DC POWER CIRCUIT BREAKER
CB2	STARTER SOLENOID CIRCUIT BREAKER
CB3	CIRCUIT BREAKER AND GFCI PROTECTION FOR CONVENIENCE RECEPTACLE
CB4	ECM POWER CIRCUIT BREAKER
CB5	ALTERNATOR CIRCUIT BREAKER
CCCT	CROSS CURRENT COMPENSATION (OR DROOP) TRANSFORMER
CCL	CONTACTOR CLOSED LIGHT
CCS	CONTACTOR CONTROL SWITCH
CDR	COOL DOWN RELAY
CT1, CT2, CT3	CURRENT TRANSFORMERS, LOAD OUTPUT
CT7, CT8, CT9	CURRENT TRANSFORMER, LOAD SHARING
CTR	CRANK TERMINATION RELAY
D1	DIODE MAIN POWER
D2	DIODE DEAD CRANK BLOCKING
D3	DIODE FIELD FLASH BLOCKING
D4	DIODE BREAKER CLOSURE BLOCKING
DBHI	DEAD BUS RELAY HIGH VOLTAGE SENSING
DBLO	DEAD BUS RELAY LOW VOLTAGE SENSING
DCA	DC AMMETER
DCS	DEAD CRANK SWITCH
ECS	ENGINE CONTROL SWITCH (MASTER)
EGR	ELECTRONIC GOVERNOR RELAY
ENG HTR	ENGINE HEATER
ESPB	EMERGENCY STOP PUSH BUTTON
F1, F2, F3	FUSE, POTENTIAL TRANSFORMERS
FCR	FUEL CONTROL RELAY
FL1	LOW LEVEL FUEL ALARM SWITCH
FL2A	AUX FUEL PUMP OFF SWITCH
FL2B	AUX FUEL PUMP ON SWITCH
FLG	FUEL LEVEL GAUGE
FLSU	FUEL LEVEL SENDING UNIT
FLT1, FLT2, FLT3, FLT4	FILTER, EMI
G1	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER, CONVIENCE RECEPTACLE
GFR	GENERATOR FAULT RELAY
GND	GROUND
HTR1, HTR2	HEATER RESISTOR WINTERIZATION
IDS	ISOCHRONOUS DROOP SWITCH

REFERENCE DESIGNATION	ITEM DESCRIPTION
J7	A1 CONNECTOR
J8	FUEL SWITCH PUMP CONTROL
J11	FUEL SWITCH LOW LEVEL SHUTDOWN
J30	CONNECTOR, CONTROL BOX 37 PIN
J31	CONNECTOR, CONTROL BOX 19 PIN
J32, J33	CONNECTOR, PARALLELING
J37	CONNECTOR, CONTROL BOX
J101	CONVENIENCE RECEPTACLE
K1	MAIN LOAD CONTACTOR
KAFP	RELAY AUXILIARY FUEL PUMP
KFF	RELAY FIELD FLASH
KR	MAIN CONTACTOR RELAY
L1, L2, L3	LOAD LEADS
LCL	LOW COOLANT LEVEL SENSOR
LFL	LOW FUEL LEVEL
LSM	LOAD SHARING MODULE
LT	LAMP TEST SWITCH
MAN	MANUAL
MPU	MAGNETIC SPEED PICKUP
N	NEUTRAL
NEU	NEUTRAL
OL/SC	OVERLOAD / SHORT CIRCUIT MODULE
P7	A1 CONNECTOR
P8	FUEL SWITCH PUMP CONTROL
P11	FUEL SWITCH LOW LEVEL SHUTDOWN
P30	CONTROL BOX 37 PIN
P31	CONTROL BOX 19 PIN
P32	PARALLEL CABLE PLUGS
P37	CONTROL BOX /A1 CONNECTOR
PL1, PL2, PL3	PANEL ILLUMINATION LIGHT
PLS	PANEL LIGHT SWITCH
PS	PINION SOLENOID (STARTER SOLENOID)
PSR	PROGRAMMABLE SPARE RELAY
PSU	PARALLEL / SINGLE UNIT SWITCH
PT2, PT3	POTENTIAL TRANSFORMERS FOR POWER INPUT TO A3 (DVR)
R1	RESISTOR FIELD FLASH
R2	RESISTOR VOLTAGE DROOP
R3	RESISTOR DEAD BUS
R4	DC AMMETER SHUNT
RM	RELAY MODULE
RR	RUN RELAY
SM	STARTER MOTOR
SMMS	STARTER MOTOR MAGNETIC SWITCH
SMR	STARTER MOTOR RELAY
SMS	SYNCHRONIZING MODE SELECTOR SWITCH
SR	SLAVE RECEPTACLE
SRY	SLAVE RELAY
SSP	SPEED SETTING POTENTIOMETER
T1–T10	GENERATOR LINE LEADS
TB1	GENERATOR RECONNECTION BOARD
TB2	LOAD CONNECTION BOARD
TB5	TERMINAL STRIP (ENGINE GENERATOR)
V1, V2, V3, V4	VARISTOR
VAR	VOLTAGE ADJUST RHEOSTAT

NOTES:

1. DC VOLTAGES SHOWN ARE NOMINAL VALUES, VOLTAGES MAY VARY BETWEEN 20–32VDC UNLESS OTHERWISE SPECIFIED.
2. AC VOLTAGES SHOWN ARE NOMINAL VALUES. VOLTAGE MAY VARY ±10%.
3. GSC A1 RELAY MODULE PIN NUMBERS ARE PREFIXED BY RM.
4. J37 CONNECTS TO THE ENGINE CONTROL PANEL INTERFACE HARNESS.
5. ✳ NUMBER REFERS TO INTERCONNECTION BEARING SAME NUMBER.

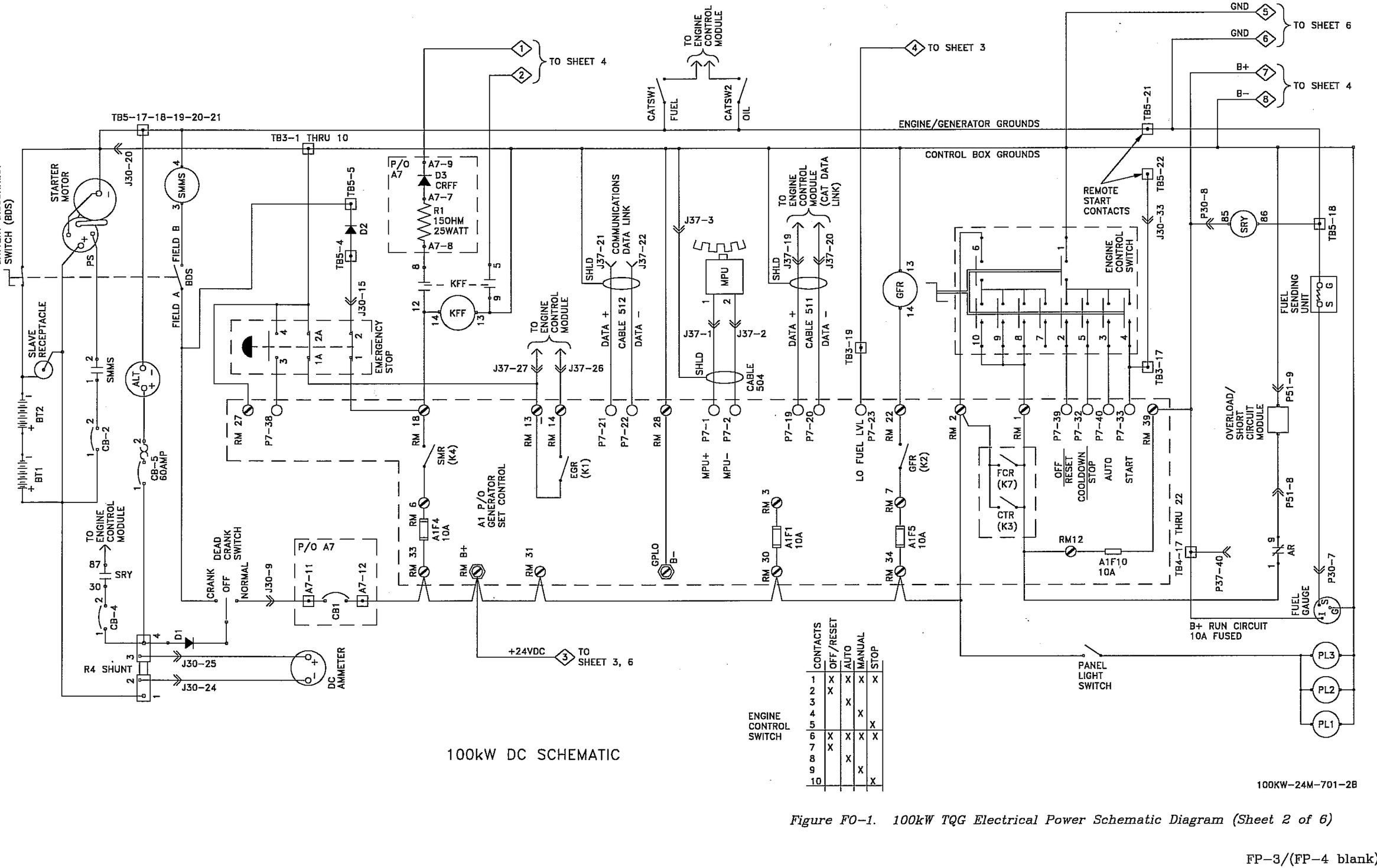
SYMBOL LEGEND

⊘ RELAY MODULE TERMINAL

○ GSC CONNECTOR CONTACT

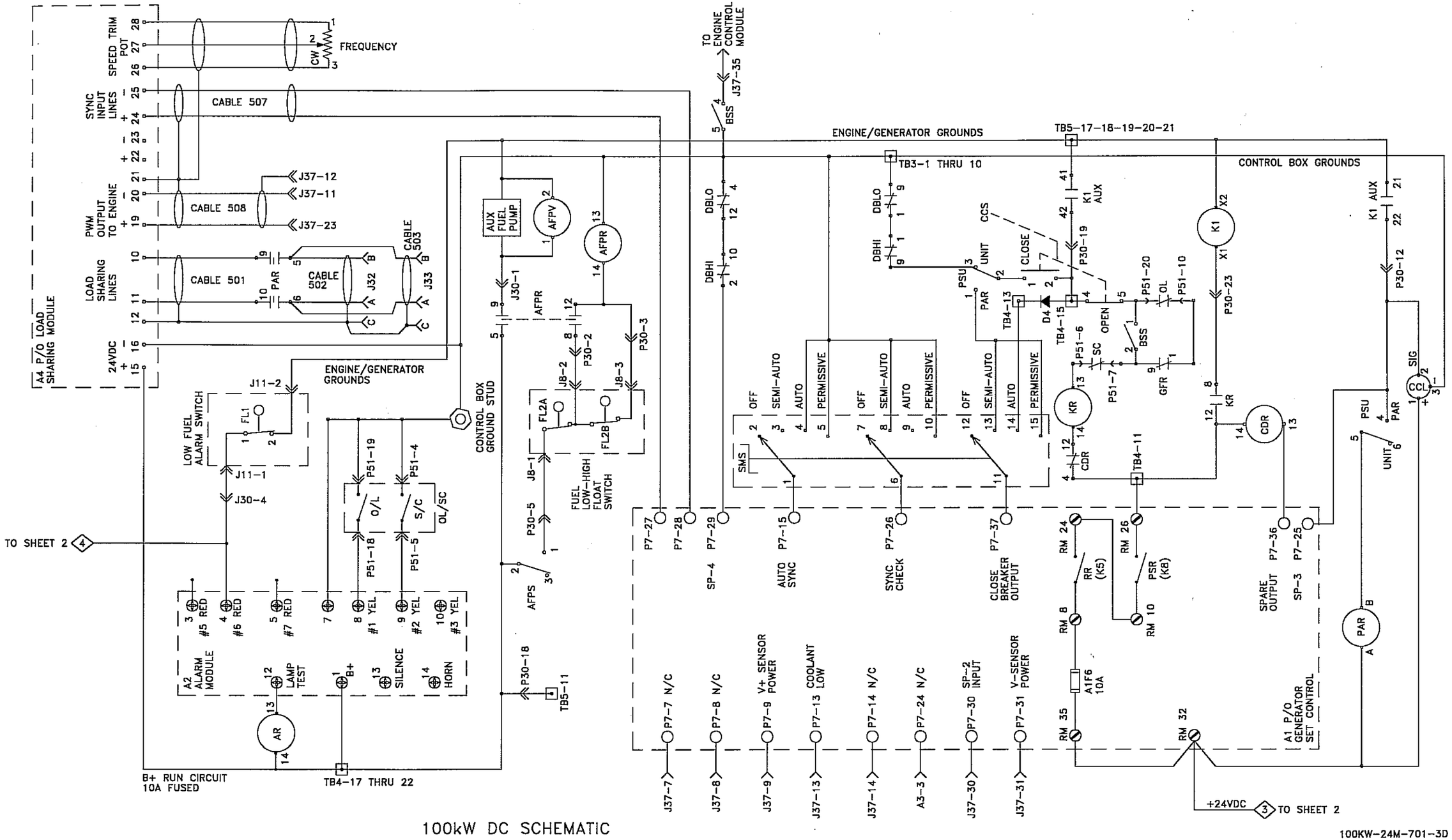
100KW-24M-701-10

Figure FO–1. 100kW TQG Electrical Power Schematic Diagram (Sheet 1 of 6)



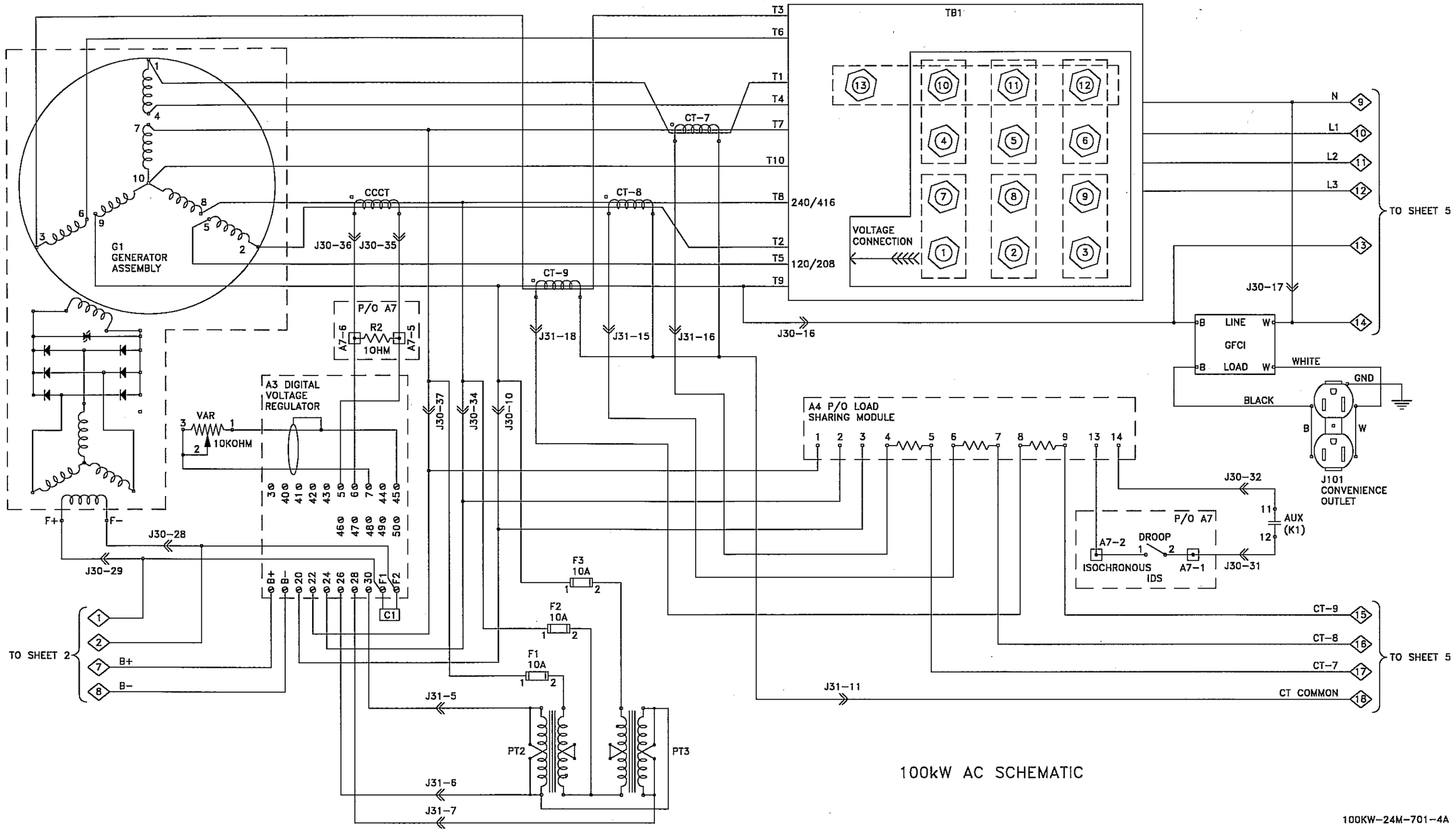
100kW DC SCHEMATIC

Figure FO-1. 100kW TQG Electrical Power Schematic Diagram (Sheet 2 of 6)



100kW DC SCHEMATIC

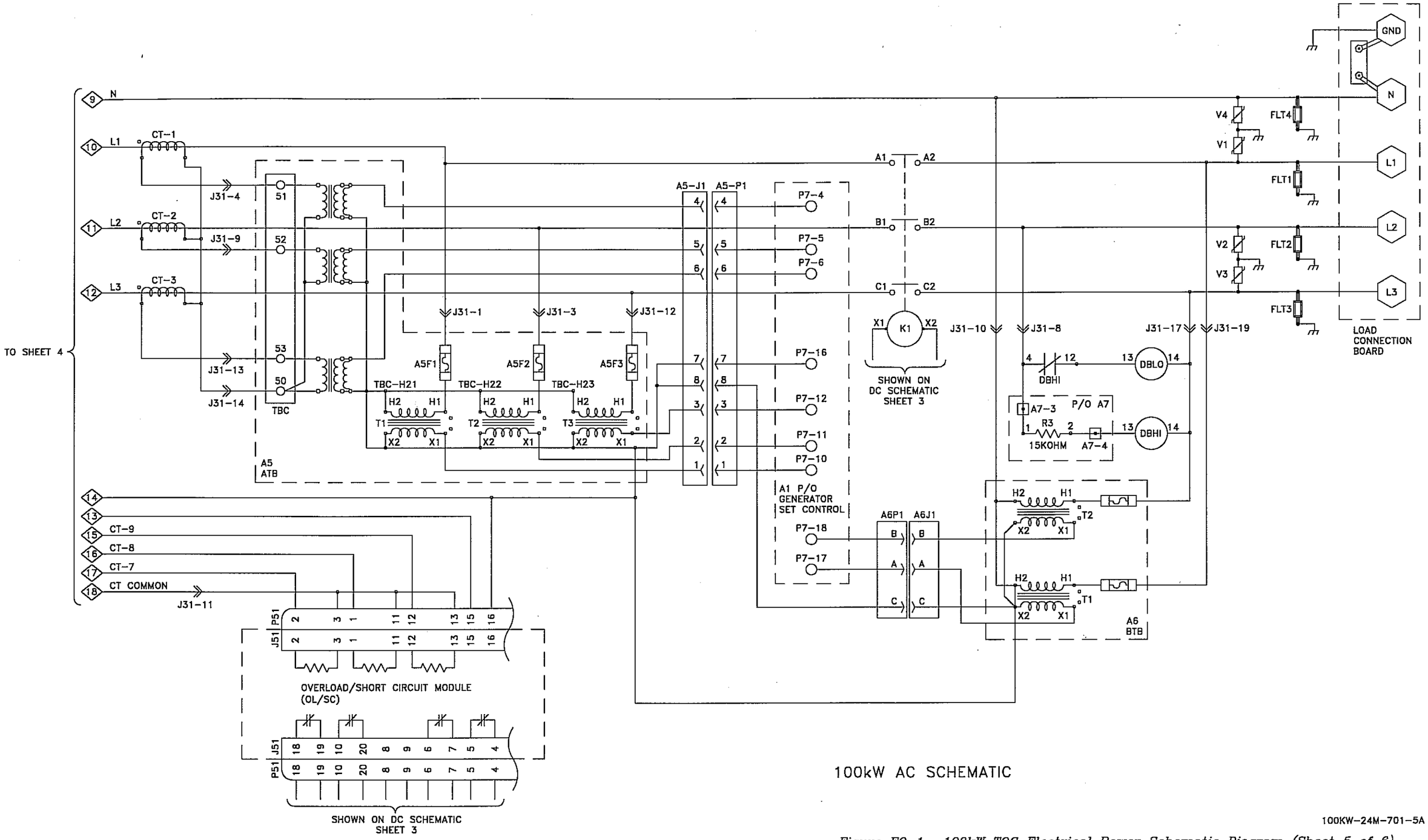
Figure FO-1. 100kW TQG Electrical Power Schematic Diagram (Sheet 3 of 6)



100kW AC SCHEMATIC

100KW-24M-701-4A

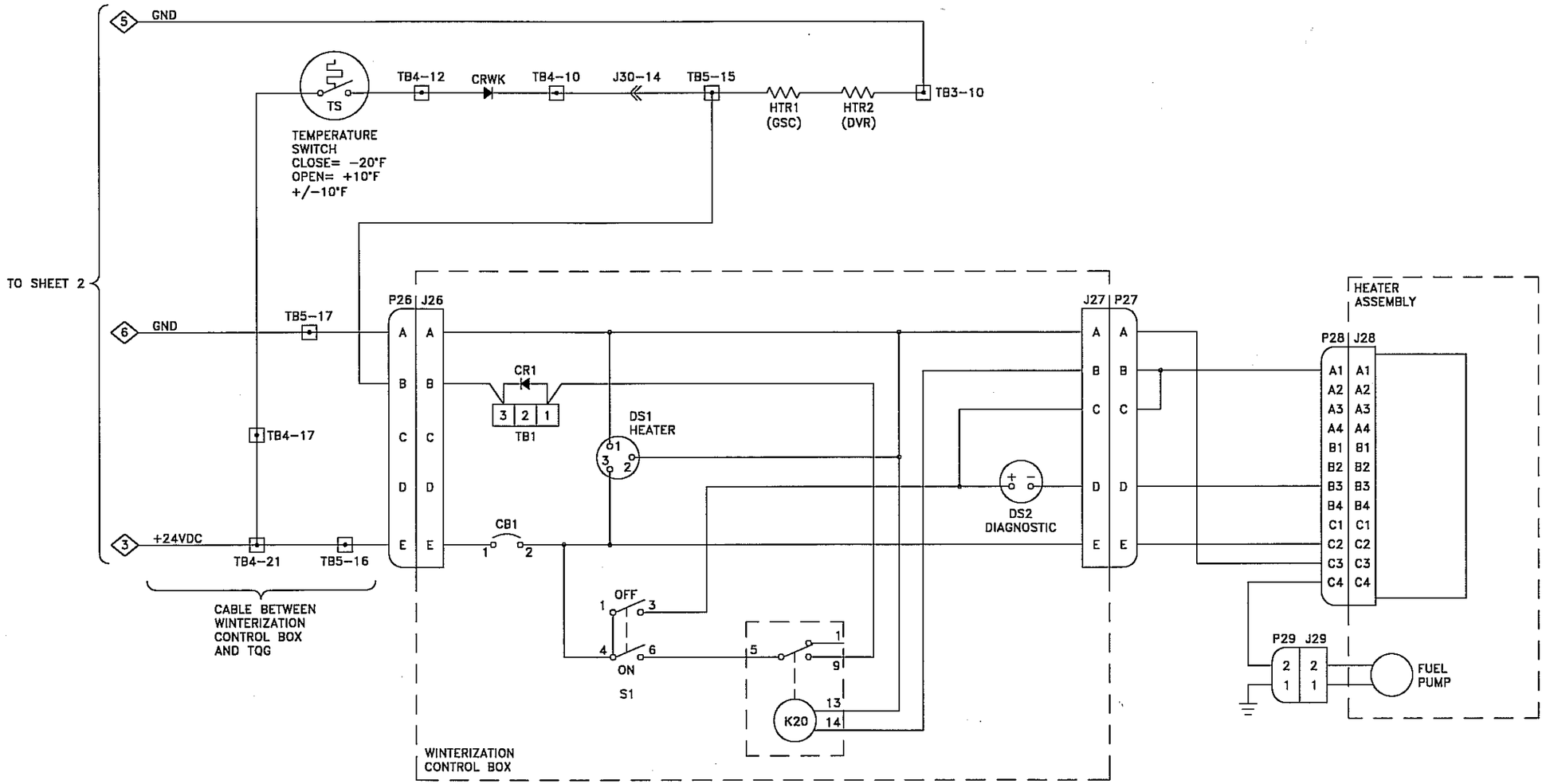
Figure FO-1. 100kW TQG Electrical Power Schematic Diagram (Sheet 4 of 6)



100kW AC SCHEMATIC

100KW-24M-701-5A

Figure FO-1. 100kW TQG Electrical Power Schematic Diagram (Sheet 5 of 6)



WINTERIZATION KIT

100KW-24M-701-6A

Figure FO-1. 100kW TQG Electrical Power Schematic Diagram (Sheet 6 of 6)

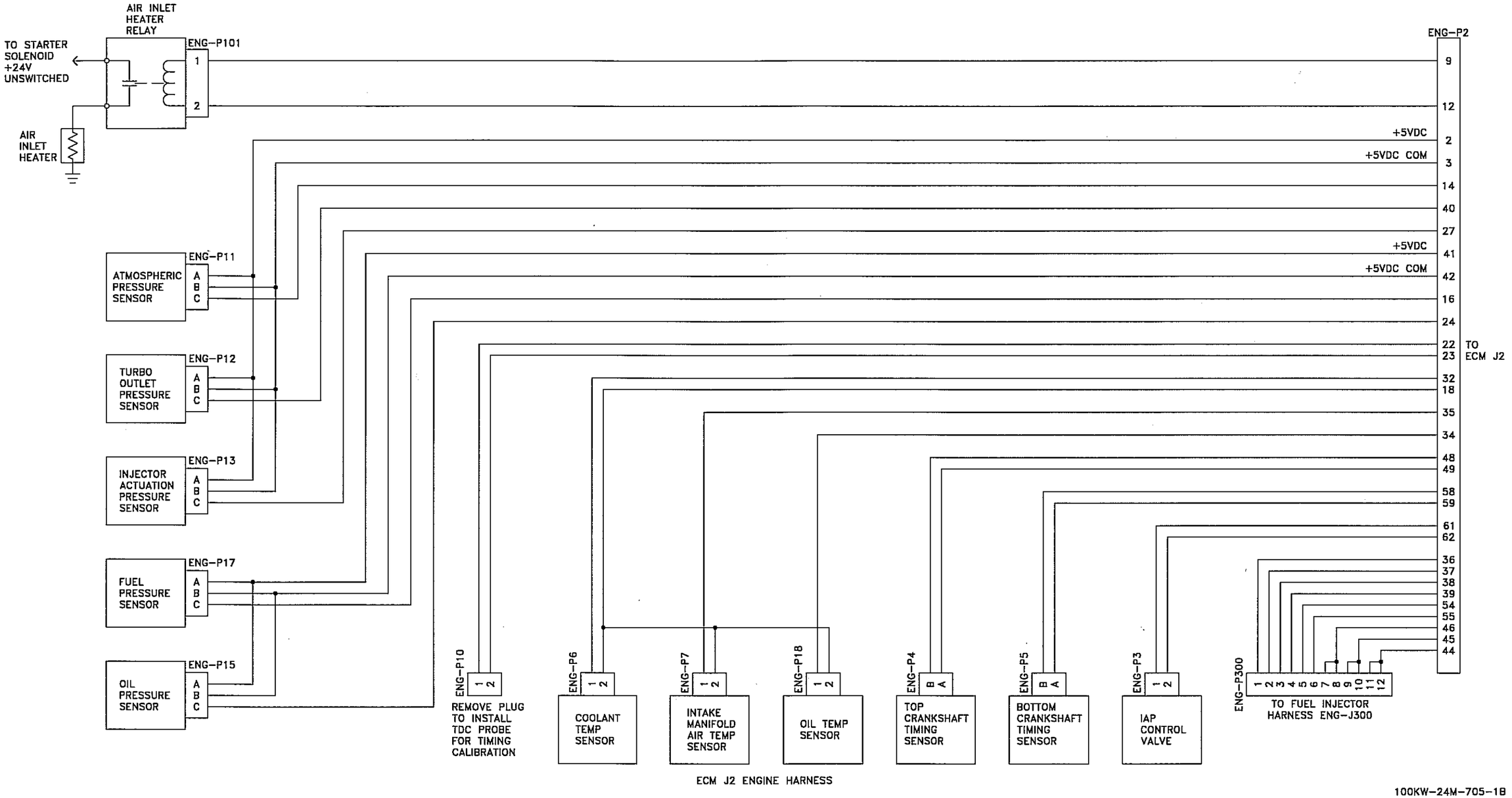
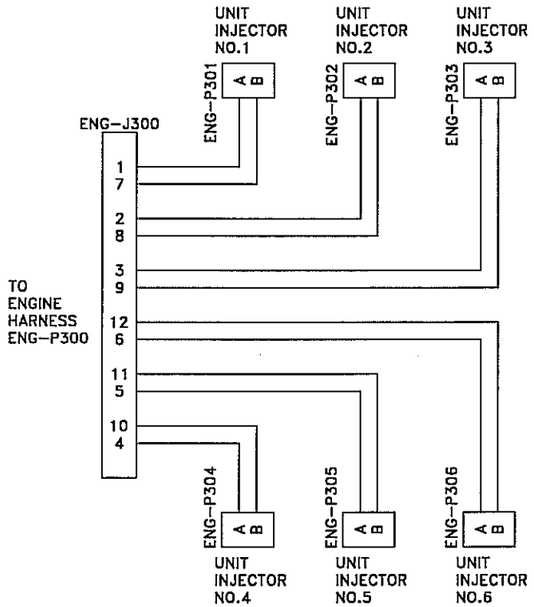
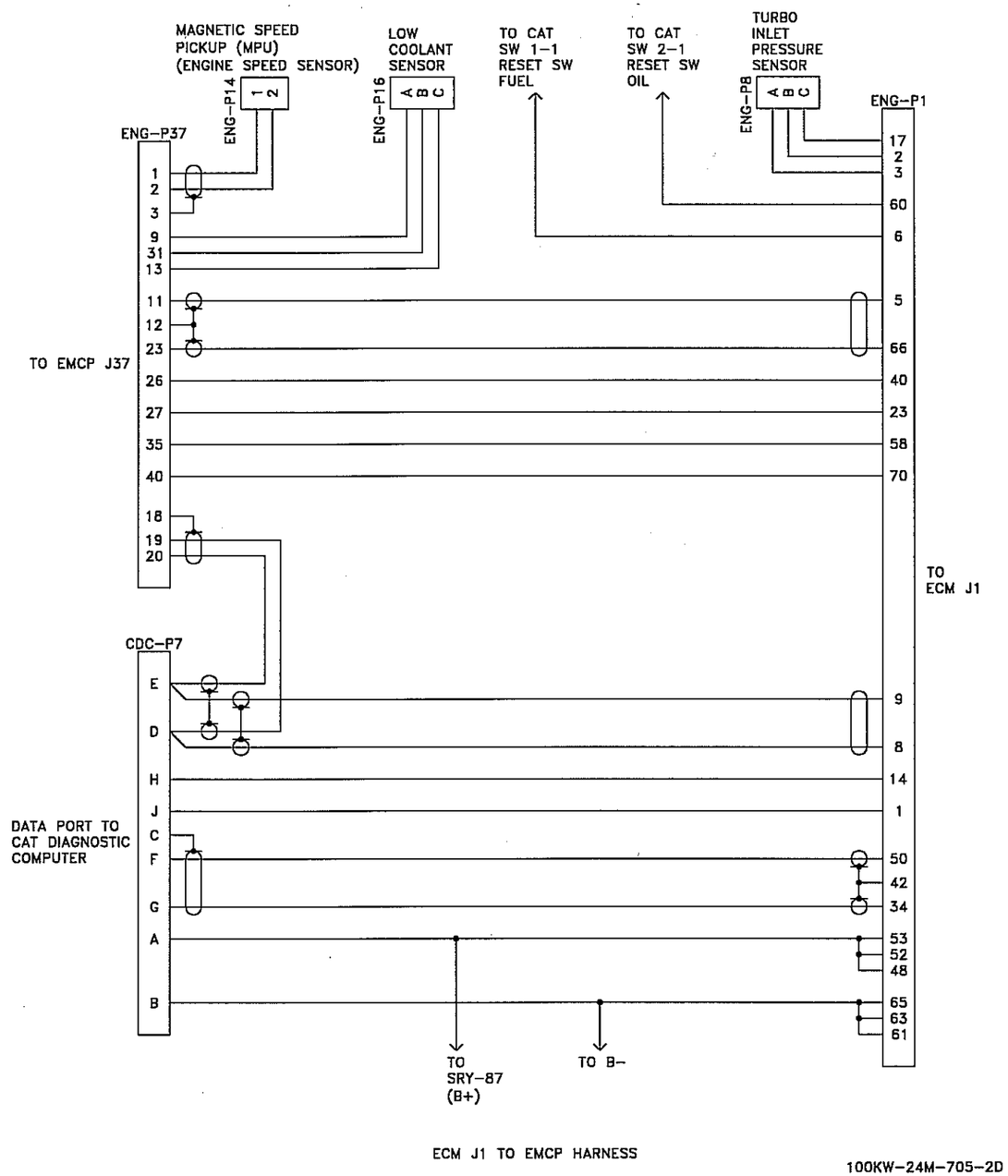


Figure FO-2. 100kW Engine Harnesses - Schematic Diagram (Sheet 1 of 2)

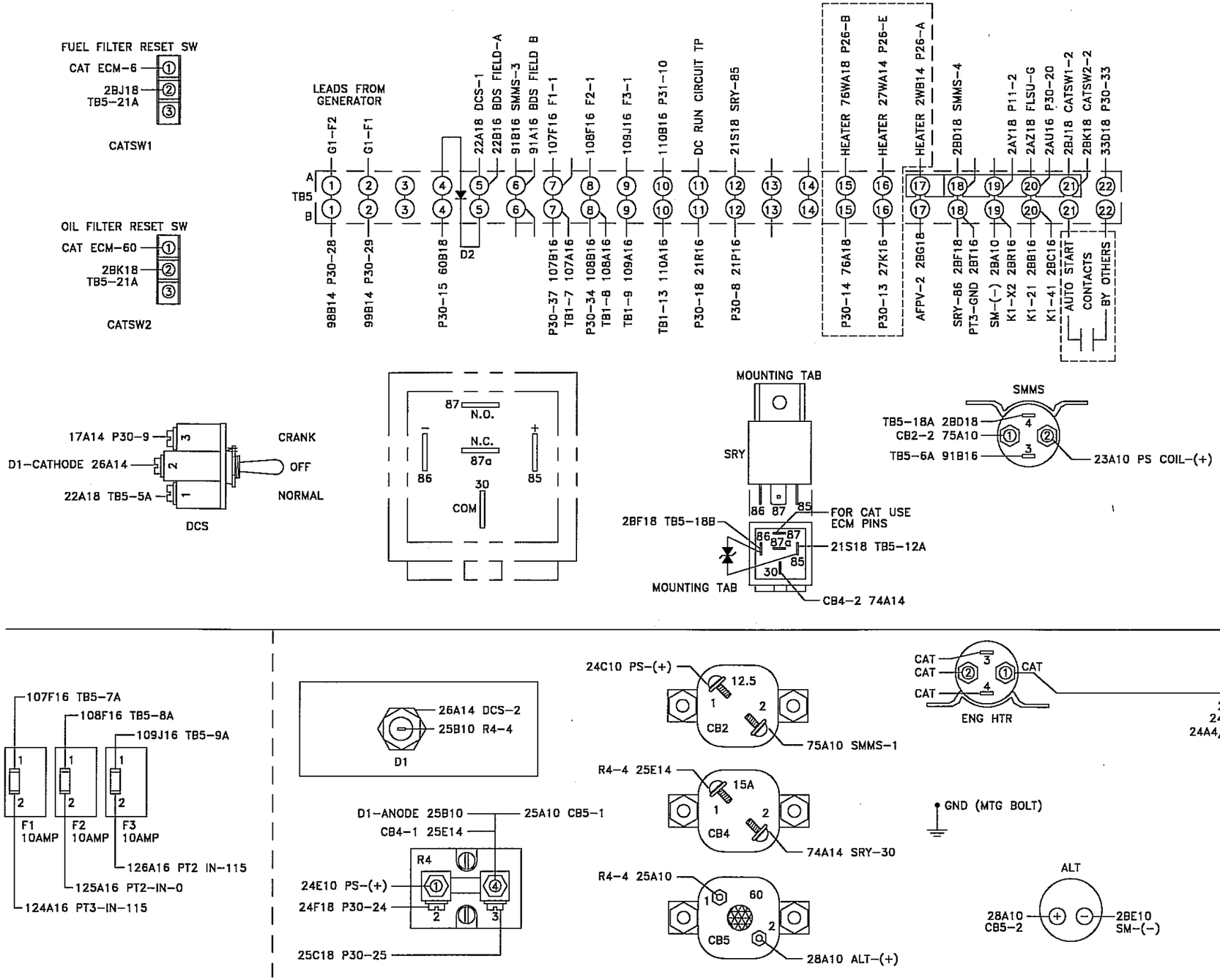


ENGINE HARNESS TO UNIT INJECTORS



ECM J1 TO EMCP HARNESS

Figure FO-2. 100kW Engine Harnesses - Schematic Diagram (Sheet 2 of 2)



NOTES:

1. REFER TO ELECTRICAL POWER SCHEMATIC SHEET 1 FOR REFERENCE DESIGNATORS, ACRONYMS AND ABBREVIATIONS.
2. DC VOLTAGES SHOWN ARE NOMINAL VALUES, VOLTAGES MAY VARY BETWEEN 20-32VDC UNLESS OTHERWISE SPECIFIED.
3. AC VOLTAGES SHOWN ARE NOMINAL VALUES. VOLTAGE MAY VARY ±10%.

100KW-24M-704-1D

Figure FO-3. Generator Set Wiring Diagram (Sheet 1 of 2)

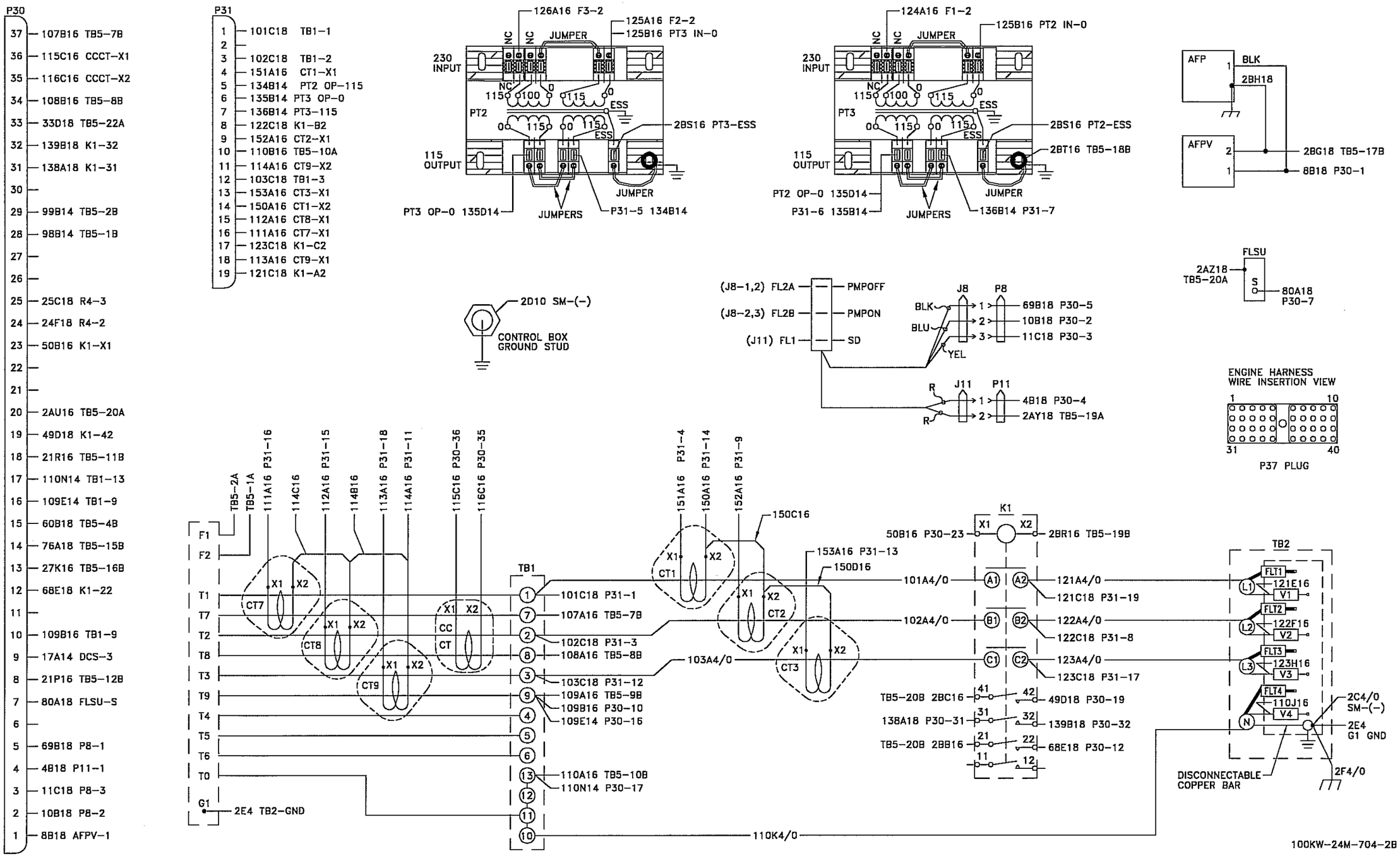


Figure FO-3. Generator Set Wiring Diagram (Sheet 2 of 2)

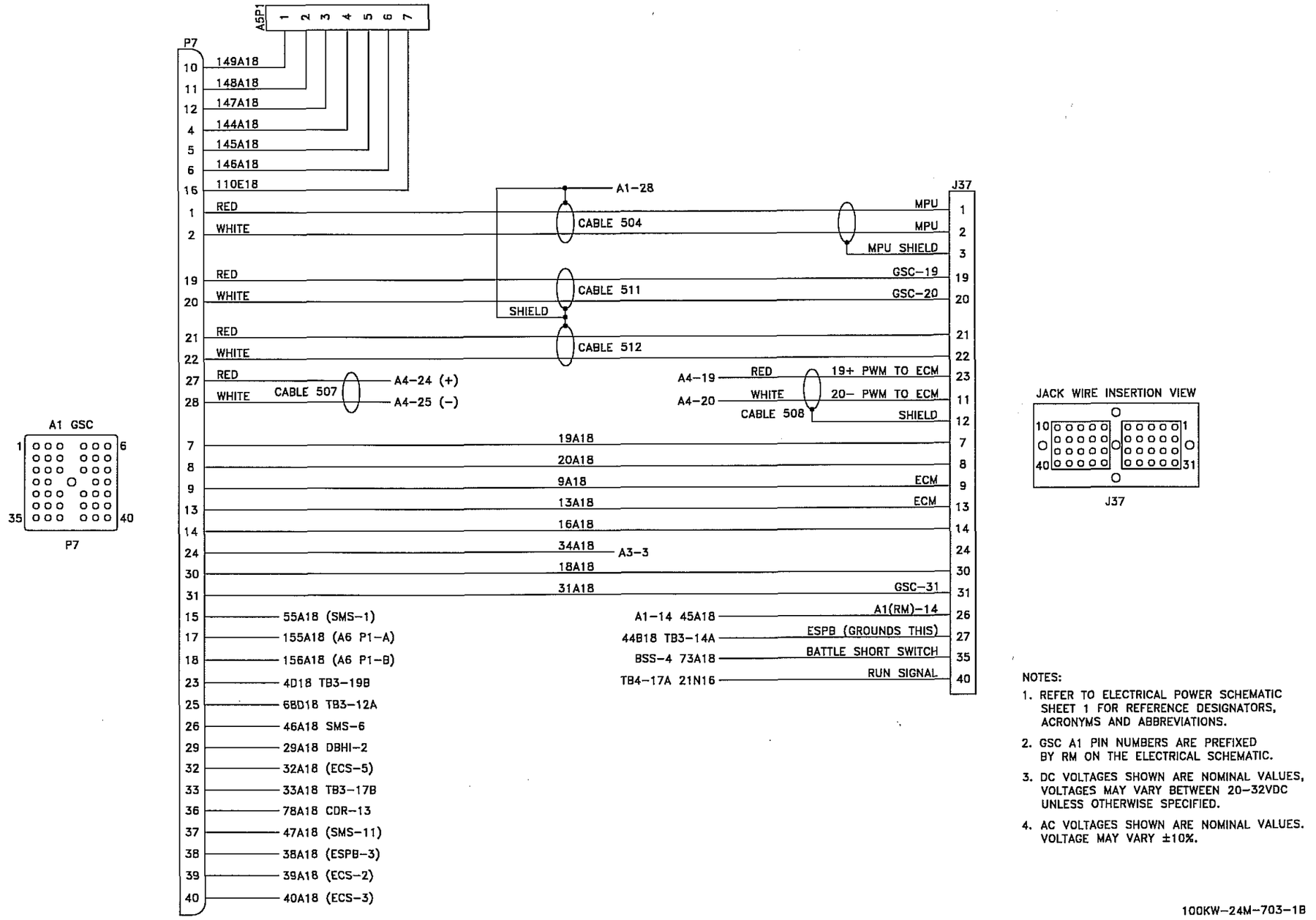
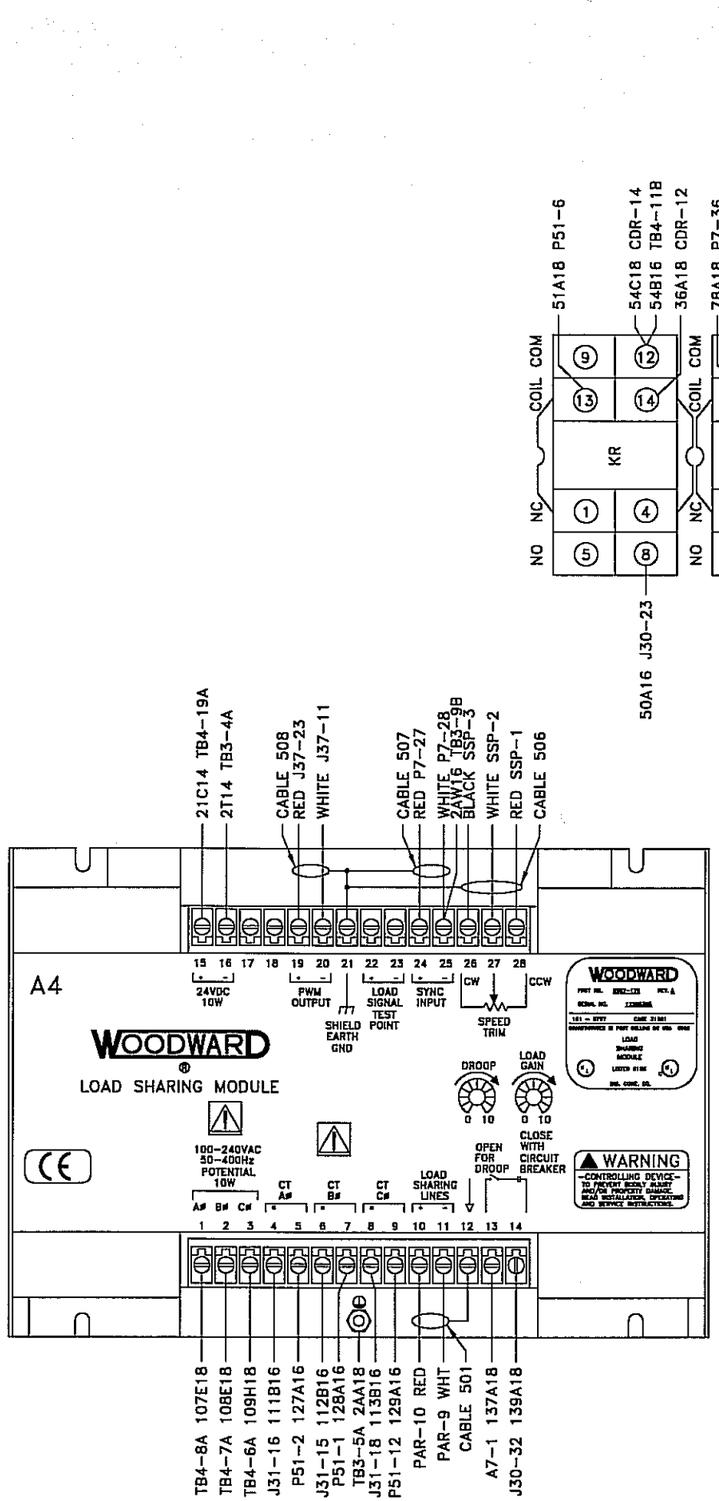
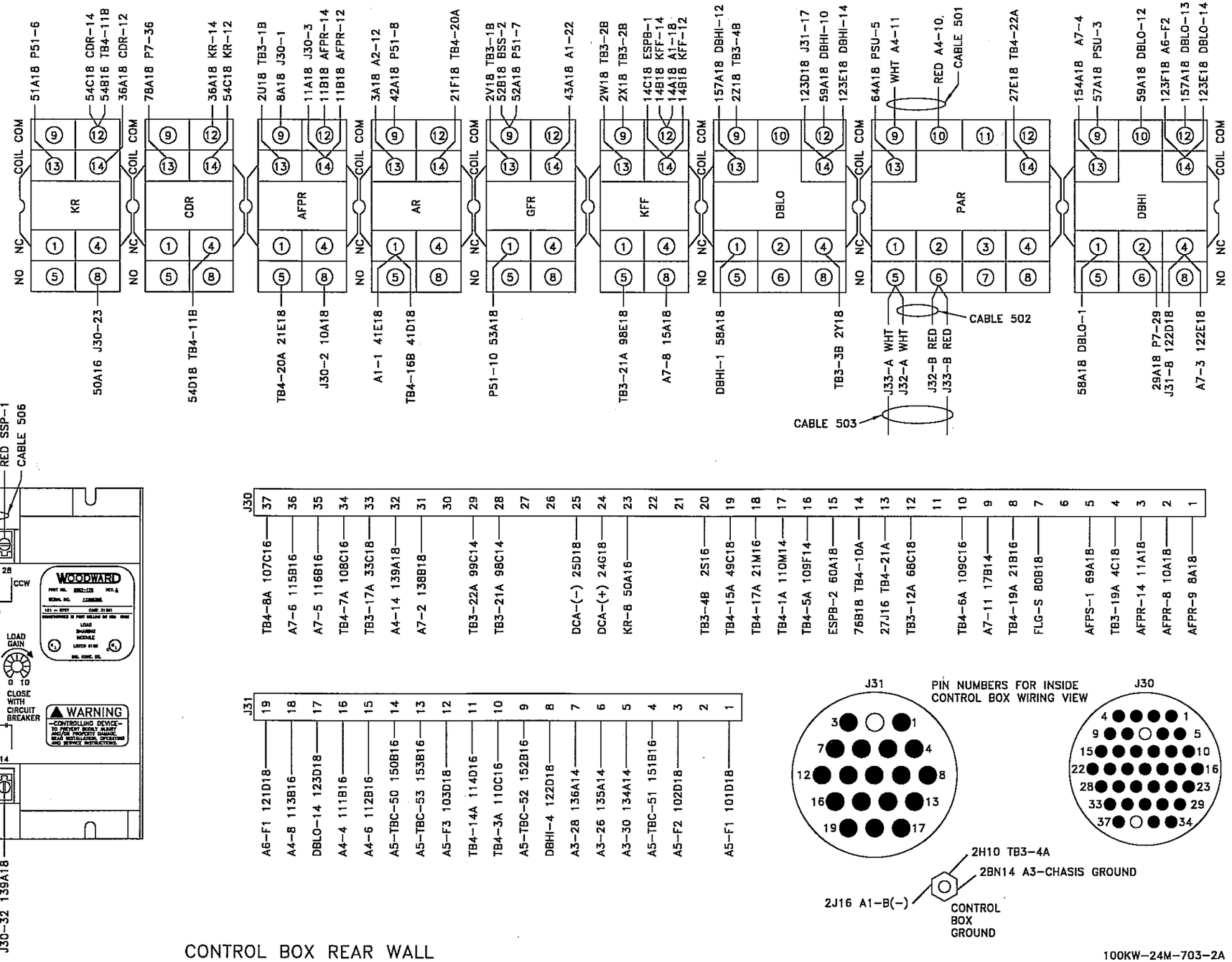


Figure FO-4. Control Box Wiring Diagram (Sheet 1 of 5)

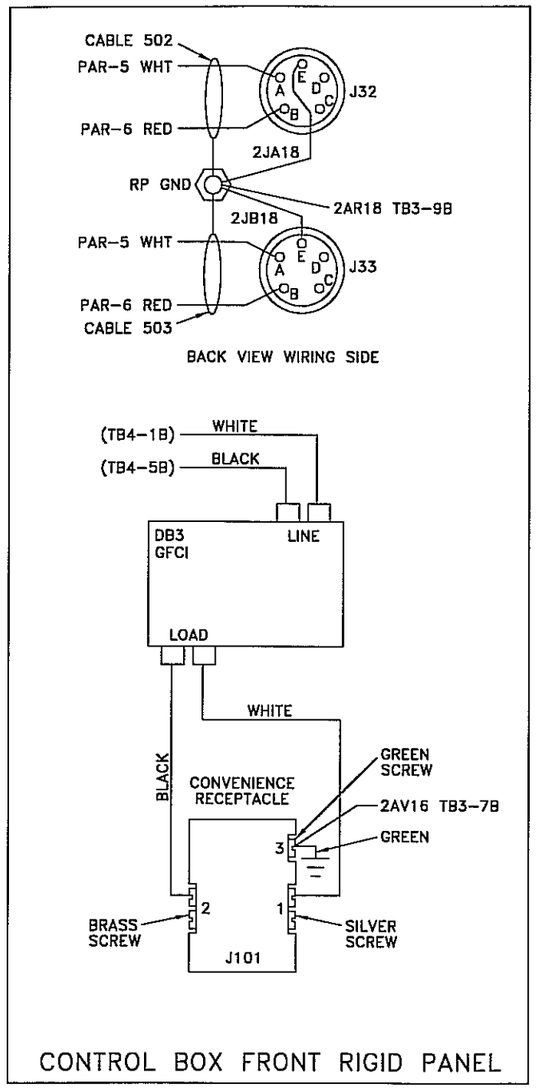


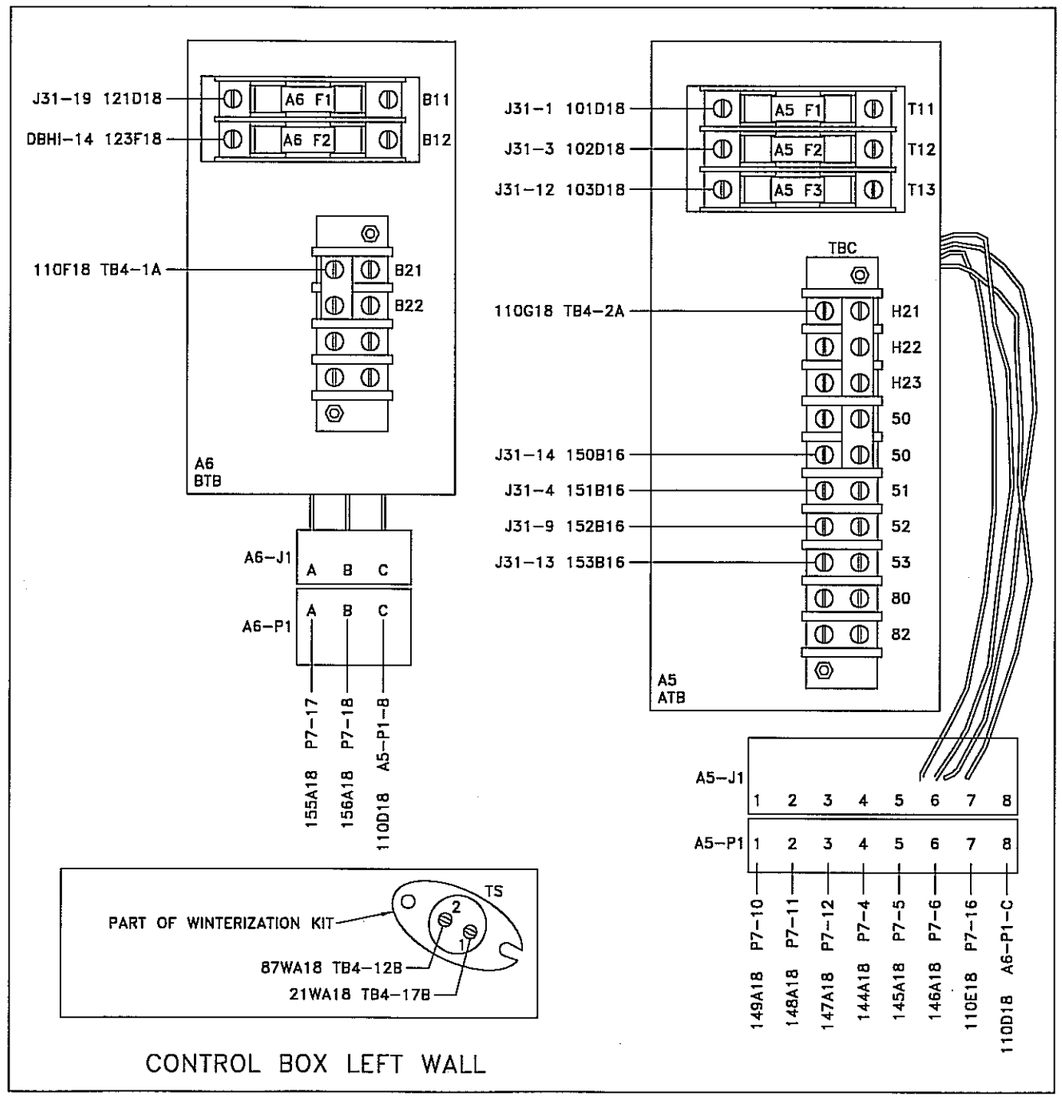


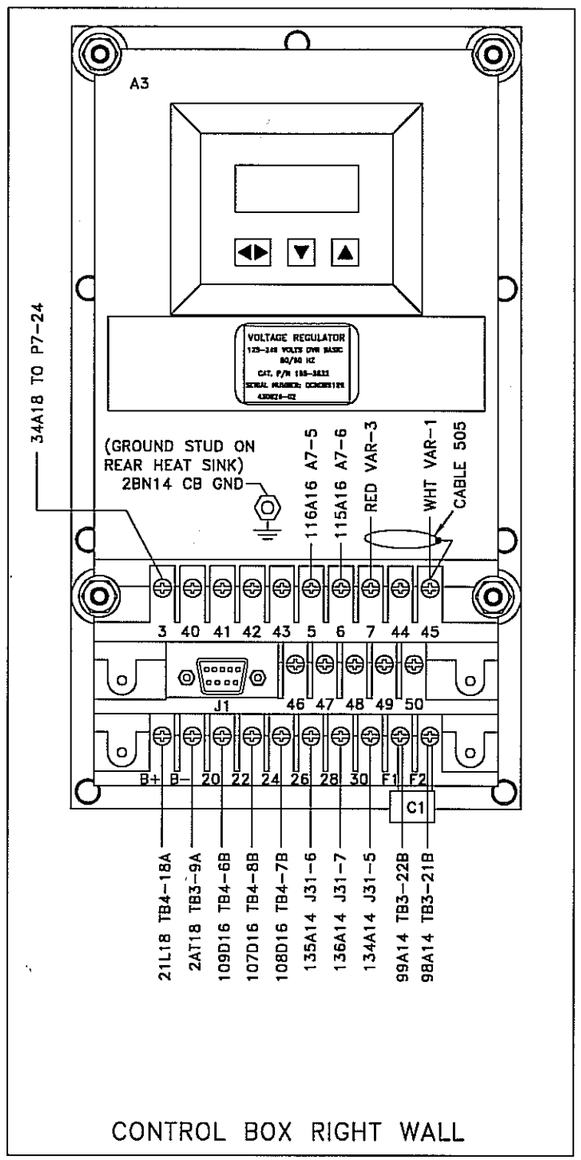
CONTROL BOX REAR WALL

100KW-24M-703-2A

Figure FO-4. Control Box Wiring Diagram (Sheet 2 of 5)



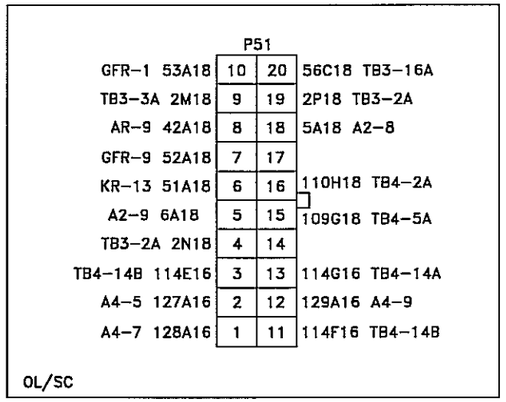


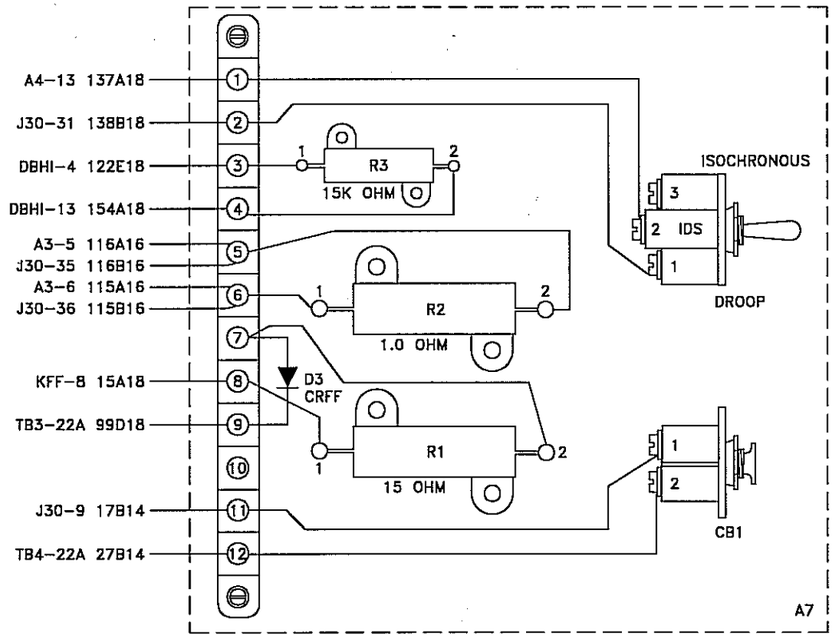


CONTROL BOX FRONT
LEFT AND RIGHT WALLS

100KW-24M-703-3B

Figure FO-4. Control Box Wiring Diagram (Sheet 3 of 5)





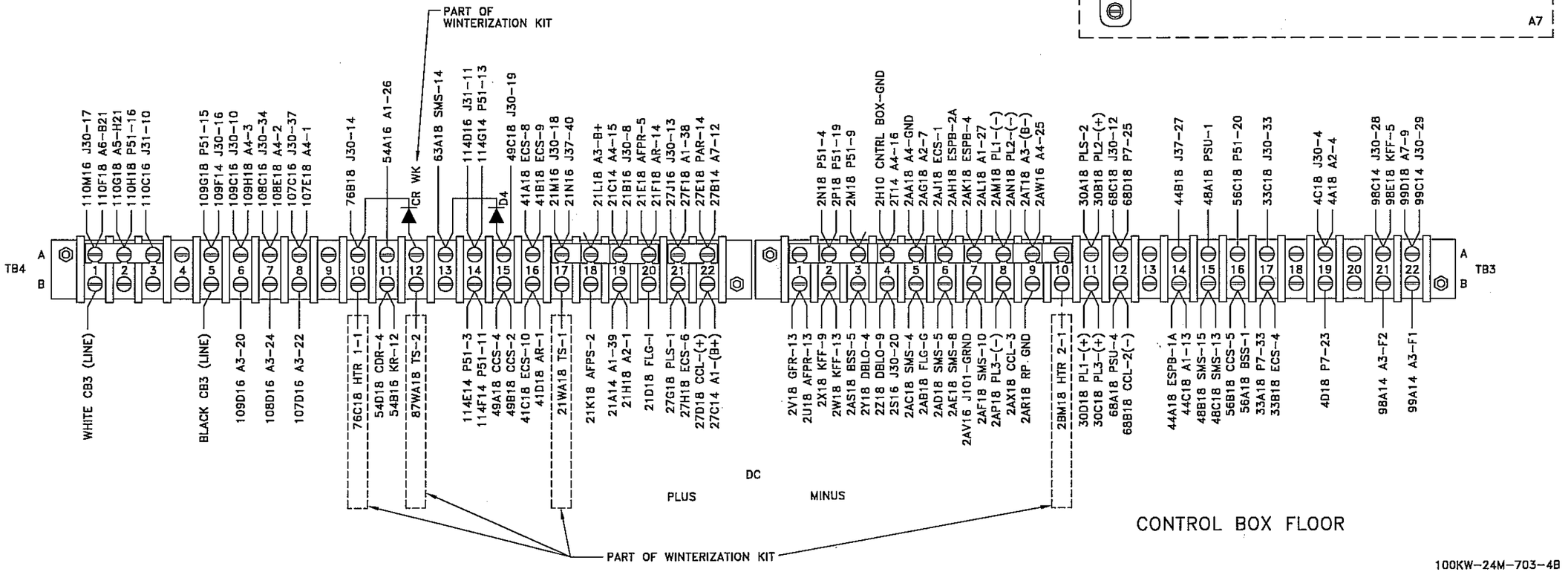
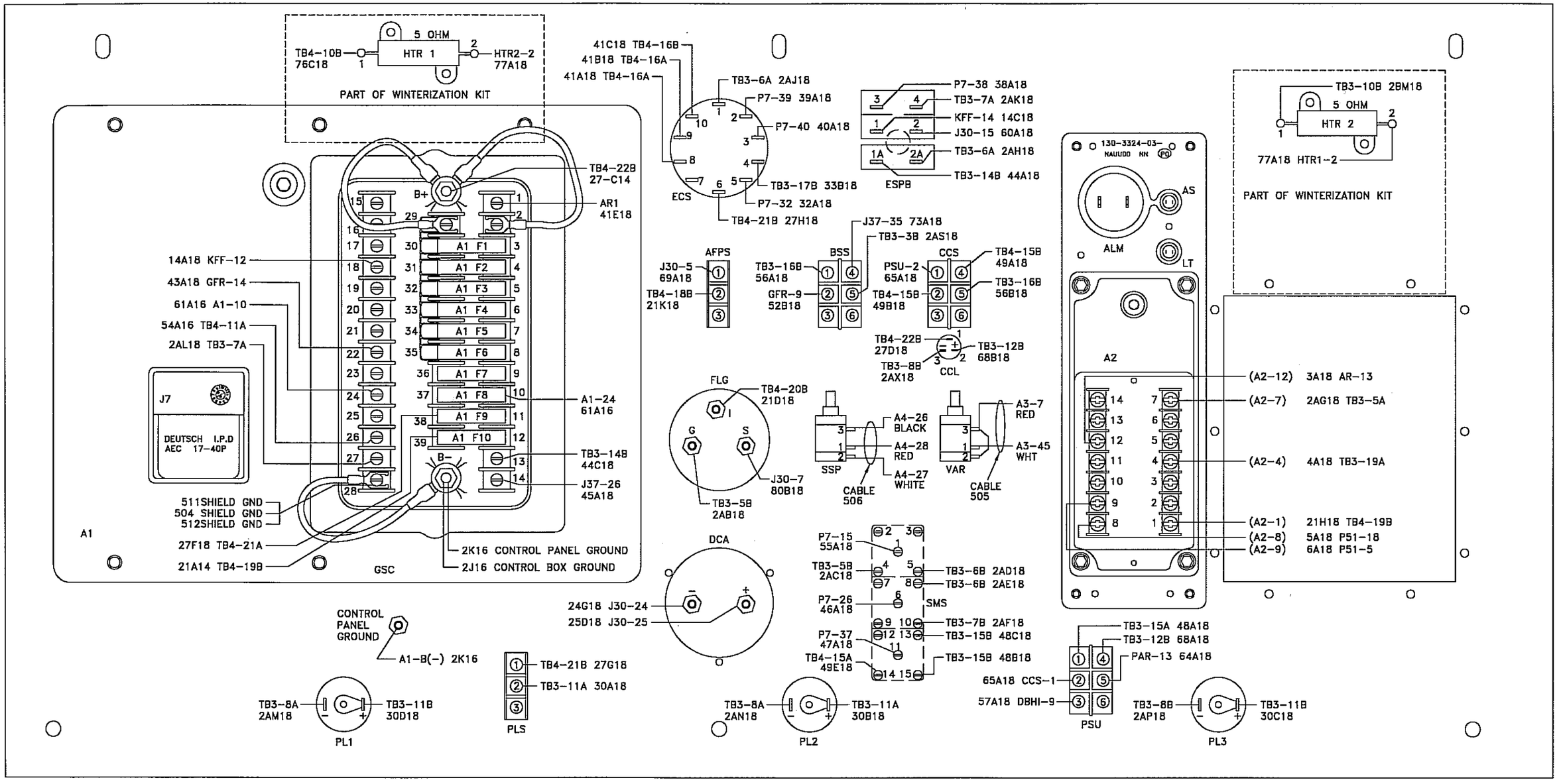


Figure FO-4. Control Box Wiring Diagram (Sheet 4 of 5)



CONTROL BOX HINGED CONTROL PANEL

100KW-24M-703-5A

Figure FO-4. Control Box Wiring Diagram (Sheet 5 of 5)

THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 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 = 1000 Grams = 2.2 Lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
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. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

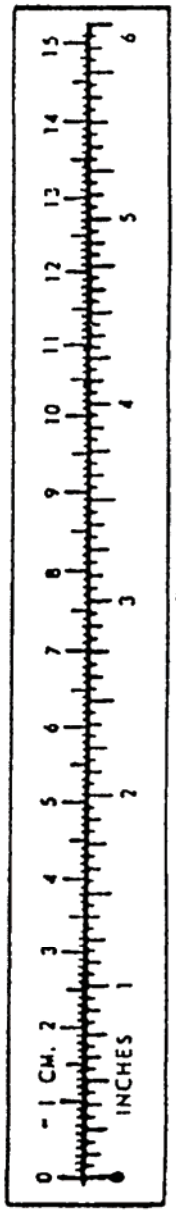
TEMPERATURE

5/9 (°F – 32) = °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 (°C + 32) = °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	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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