

**MALFUNCTION**

Throttle Malfunction.

**CORRECTIVE ACTION**

- STEP 1. Go to: Poor Acceleration or Response SYMPTOM 27.
- STEP 2. If the problem is not resolved, perform Speed Control Test (WP 0012, SYMPTOM 9).
- STEP 3. Verify the problem has been resolved.

**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 64 °F (17 °C) as the engine warms up.
  - b. If GSC temperature reading does not increase properly, replace coolant temperature sensor (WP 0106).
  - c. If engine does not warm up, replace engine coolant temperature thermostat(s) (WP 0081).
- 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 0103).
- STEP 3. If replacing generator does not correct the problem, there is an internal engine problem. Replace the engine (WP 0104).
- 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.

**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.

**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 0069).
- STEP 3. Check exhaust system for restrictions. Repair or replace components, as required (WP 0067).
- STEP 4. Verify the problem is resolved.

**MALFUNCTION**

Throttle Malfunction.

**CORRECTIVE ACTION**

- STEP 1. Perform Speed Control Test (WP 0012, 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 0012, 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 0112).
- STEP 4. Verify the problem is resolved.

**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 64 °F (17 °C) as the engine warms up.
  - b. If GSC temperature reading does not increase properly, replace coolant temperature sensor (WP 0106).
  - c. If engine does not warm up, replace engine coolant temperature thermostat(s) (WP 0081).
- 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 0096 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 0096).
- 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 0096).
- 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 0089).
- STEP 2. Check for a fuel supply problem and verify fuel pressure (WP 0012, SYMPTOM 13).
- STEP 3. Verify the problem is resolved.

**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 0069).
- STEP 3. Check exhaust system for restrictions. Repair or replace components, as required WP 0067).
- 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 0012).
  - b. If sensors are damaged, replace/adjust sensors (WP 0012).
- 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 lbs•in (6.2 N•m). (WP 0096).
- 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 0096).
- STEP 5. Verify connections between LSM pins A4-19 and A4-20 and the ECM input ENGpins 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 0096).

STEP 6. Verify the problem is resolved.

### **MALFUNCTION**

Fuel Supply Problem.

#### **CORRECTIVE ACTION**

STEP 1. Perform Injector Solenoid Test and Cylinder Cutout Test (WP 0012 SYMPTOM 8).  
Replace faulty injectors (WP 0089).

STEP 2. Check for a fuel supply problem and verify fuel pressure (WP 0012, SYMPTOM 13).

### **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 0103).

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 0096).

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 0078).

- 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.

STEP 6. Check the fuel pressure after the fuel filter while the engine is being cranked (WP 0012, SYMPTOM 14).

- a. If the fuel pressure is low, replace the fuel filters (WP 0078).



b. If the fuel pressure is still low, check the following items (WP 0108).

- (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 0012, 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 0102). If problem is not resolved, go to: Engine Misfires, Runs Rough, or is Unstable, 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.
- 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 0096).
- STEP 7. Measure resistance between AFPV-1 and TB5-21. If resistance not between 40 and 80 Ohms, replace AFPV (WP 0057).
- 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 0096).
- 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 0096).
- 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 0096).
- STEP 5. Unplug connector P8 from fuel level switch assembly FL2 (WP 0054).
- 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 0054).
- 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 0054).
- 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 0054).
- 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 0054).
- 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 0054).
- STEP 11. Verify the problem has been resolved.

**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 0096) or replace AFPR (WP 0057).
- STEP 4. If between 600 and 800 Ohms, check fuel level switch assembly (WP 0054).
- 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 0019).
- 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 0042).
- STEP 4. Verify wire from auxiliary fuel pump is connected securely to AFPV-1 (WP 0057). If not secure, repair wiring (WP 0096) or replace auxiliary fuel pump (WP 0057).
- 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 0054 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 0054).
- 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 0054).
- 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 0072).
- 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 0045).
  - d. If voltage is correct, perform load test on batteries individually (WP 0048).
  - e. If battery fails, replace battery (WP 0048).
  - f. If batteries pass load test, charge batteries fully (WP 0048).
- 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 0071).
- STEP 5. Verify the problem has been resolved.

**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 0086).
- STEP 3. Verify the problem has been resolved.

**MALFUNCTION**

Cylinder Head Gasket Failure.

**CORRECTIVE ACTION**

- STEP 1. Replace cylinder head gasket (WP 0091).
- 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 0091).
- 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 0076).
- STEP 3. Verify the problem has been resolved.

**MALFUNCTION**

Internal Engine Leakage.

**CORRECTIVE ACTION**

- STEP 1. Replace the engine (WP 0104).
- STEP 2. 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.

**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.

**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 0066).
- 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.
- 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 0062, WP 0065, WP 0066, WP 0076, and WP 0081).
- 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 5 minutes, inspect all cooling system components for leaks. Repair or replace components as required (WP 0062, WP 0065, WP 0066, WP 0076, and WP 0081). 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 5 minutes, replace the engine (WP 0104).
- 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.
- 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 0081).
- 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 0072).
- STEP 3. Inspect water pump impeller. Replace water pump if impeller is damaged (WP 0076).
- 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 0065 and WP 0066).
- 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.

**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 0067).
- 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 0104).
- 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 0096).
- 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 0096).
- STEP 4. Conduct a wiggle test (WP 0012) on each of the harness wires that are associated with the Cat data link (FO-2, Sheet 2 and WP 0096). Repair or replace harness as required (WP 0096).

STEP 5. Verify the problem has been resolved.

## **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 0096).
- 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 0096).
- 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 0096).
- 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 0096).
- 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 0096). If the ECM does not operate properly, replace ECM (WP 0083).
- STEP 7. Remove jumper wire.
- STEP 8. Verify the problem has been resolved.

## **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 0086).
- 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 0091).
- 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 0091).
- 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 0076).
- STEP 3. Verify the problem has been resolved.

**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 0068).
- 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 0112).
- 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 0091).
- 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 0104).
- STEP 2. Verify the problem has been resolved.

**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 0015).
- 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).
- 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 Too High (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 0086).

STEP 3. Verify the problem has been resolved.

#### **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 0086).

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, 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 0110).

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 are loose, missing parts, or damaged. Tighten or replace engine shock mounts as necessary (WP 0104).

STEP 3. Verify the problem has been resolved.

#### **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 0103).

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 0068).
- 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 0086).
- 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 0112).
- STEP 3. Verify the problem has been resolved.

### MALFUNCTION

Valve Guides Defective.

#### CORRECTIVE ACTION

- STEP 1. If valve guide wear is suspected, replace cylinder head assembly (WP 0091).
- 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 0104).
- 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 0107) 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 0090).
- STEP 2. If rocker shaft and valve components are not excessively worn, adjust valve lash (WP 0090).
- STEP 3. Verify the problem has been resolved.

**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 0069, WP 0070).
- STEP 3. Inspect for exhaust restrictions. Inspect for leaks between exhaust manifold and turbocharger. Clear restrictions and repair leaks (WP 0067).
- 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 0096). 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 0007 and WP 0008).

**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 0089).
- 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 0055).
- 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 0091).
- 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 0108 and WP 0055).
- STEP 3. Verify the problem has been resolved.

**SYMPTOM**

- 44. Intermittent Low Power or Power Cutout.

**MALFUNCTION**

Unresolved Diagnostic Codes.

**CORRECTIVE ACTION**

- Check for inactive diagnostic codes. Correct malfunctions as required (WP 0007 and WP 0008).

**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 0012, 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).
- 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 0012, 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 0055).
- 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).
- 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 0007 and WP 0008).
- STEP 6. If fuel pressure is still low, replace fuel transfer pump (WP 0108).
- STEP 7. Verify the problem has been resolved.

**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).
- 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 (WP 0106).
- 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 0086).

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 0086).

STEP 3. Verify the problem has been resolved. MALFUNCTION

#### **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 (SYMPTOM 43).

#### **MALFUNCTION**

Camshaft or Crankshaft Defective.

##### **CORRECTIVE ACTION**

STEP 1. If the camshaft or crankshaft is suspected of being defective, replace the engine (WP 0104).

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 0090).

STEP 3. If components are not damaged or worn, perform valve lash adjustment (WP 0090).

STEP 4. Verify the problem has been resolved.

#### **MALFUNCTION**

Internal Engine Problem.

##### **CORRECTIVE ACTION**

STEP 1. Replace the engine (WP 0104).

STEP 2. Verify the problem has been resolved.

#### **SYMPTOM**

47. Noise Coming From Cylinder.



**MALFUNCTION**

Unresolved Diagnostic Codes.

**CORRECTIVE ACTION**

Check for active diagnostic codes. Correct malfunctions as required (WP 0007 and WP 0008).

**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).
- 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 0096).
  - a. Perform injector solenoid test (WP 0012) repair as required.
  - b. Thoroughly inspect harness connectors ENG-P1, P7, ENG-P37, and generator connector J37 (WP 0096) for corrosion or damage. Repair or replace harness as required (WP 0096).
- STEP 3. Perform Cylinder Cutout test (WP 0012, SYMPTOM 8).
- STEP 4. Verify the problem has been resolved.

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****ELECTRONIC TECHNICIAN (ET) TROUBLESHOOTING SOFTWARE INSTALLATION**

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**INITIAL SETUP:****References**

TM 9-6115-729-10  
WP 0004  
WP 0005  
WP 0006  
WP 0007  
WP 0008  
WP 0009  
WP 0010

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**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 through WP 0010).

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.

**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.

**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**

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.

**NOTE**

100/200 kW TQG Caterpillar Electronic Technician (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.

**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**

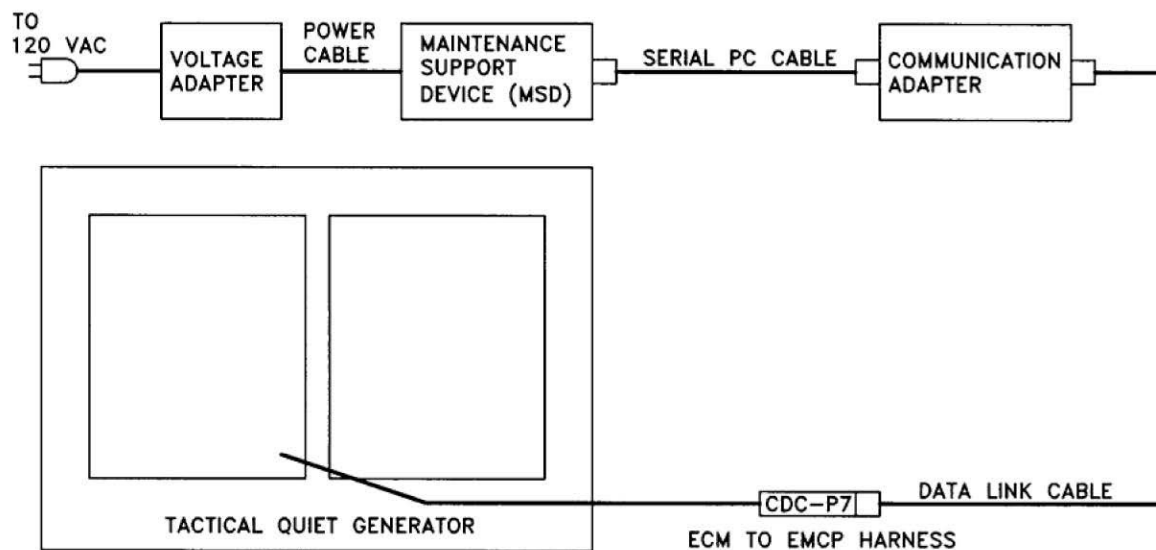
The MSD must be configured to interface the GSC/ECM.

**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.

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.**

## 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 57,600.
- 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, choose 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.

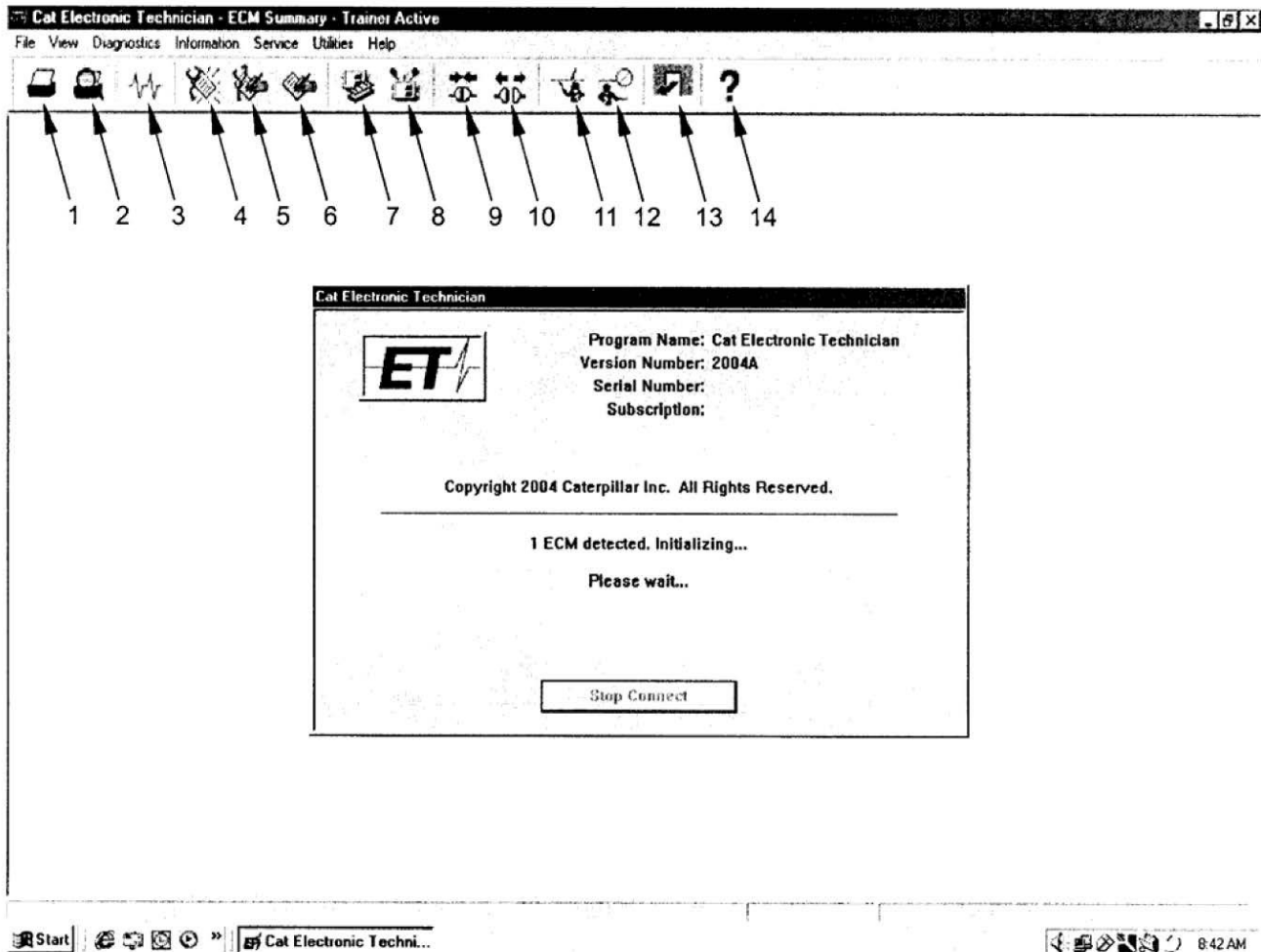
















Figure 2. Caterpillar ET Opening Screen.

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.

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).
- 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
  - Select the test called out in the troubleshooting work package and follow the on screen instructions.

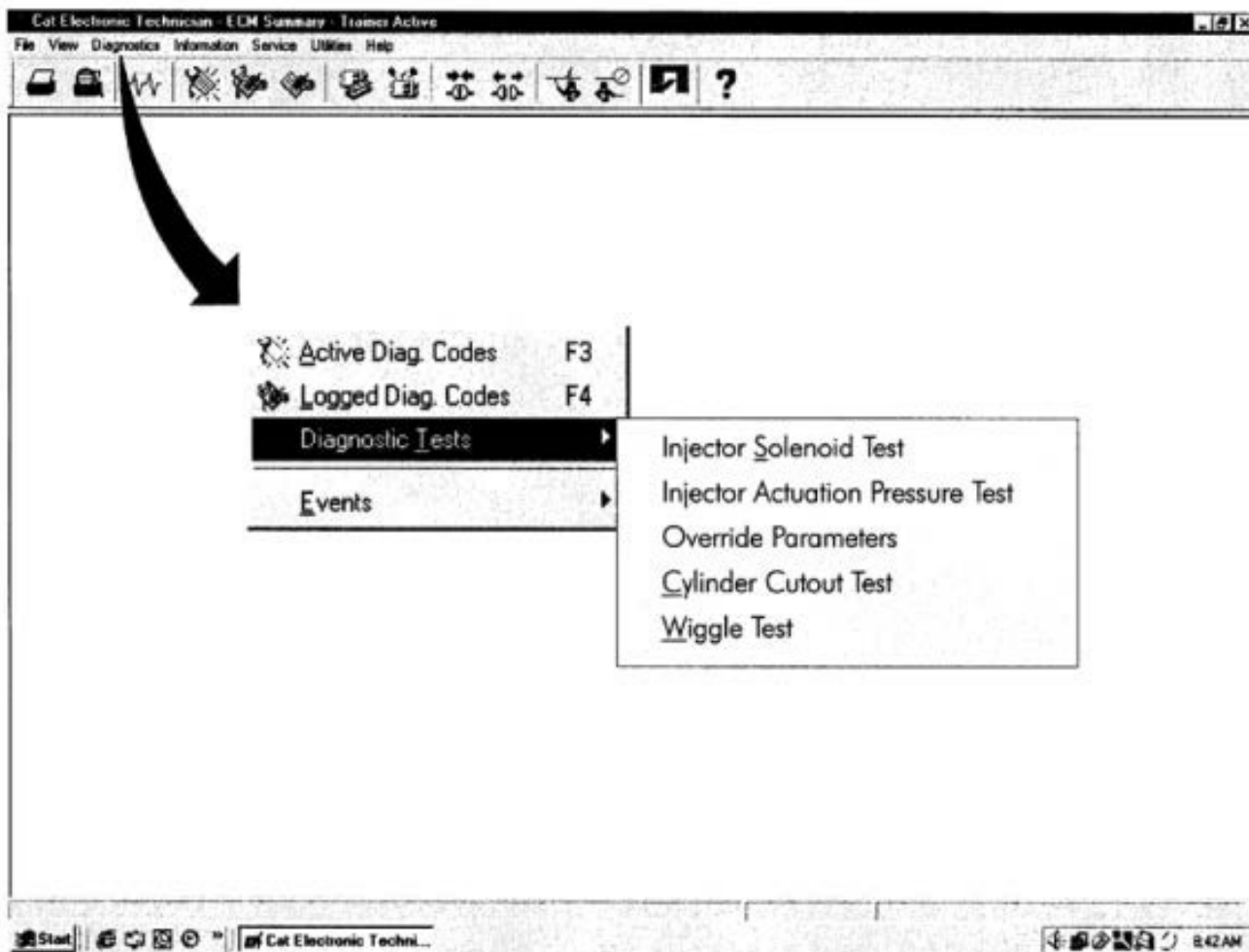


Figure 3. Caterpillar Electronic Technician (Cat ET) Diagnostic Tests (Sheet 1 of 2).

















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.

Figure 3. Caterpillar Electronic Technician (Cat ET) Diagnostic Tests (Sheet 2 of 2).

END OF TASK

END OF WORK PACKAGE



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A**  
**TROUBLESHOOTING PROCEDURES USING ELECTRONIC TECHNICIAN (ET)**

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**INITIAL SETUP:****Tools and Special Tools**

146-4080 Digital Multimeter Group or Equivalent  
Caterpillar Electronic Technician (Cat ET)  
Software Media # NEXG5039 and # JEED3003  
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

**Materials/Parts**

18 gauge wire per M22759/16-18-9  
88-21943 Contacts

**Personnel Required**

One

**References**

FO-1  
FO-2  
FO-3  
FO-4  
WP 0008  
WP 0010  
WP 0011  
WP 0012  
WP 0013  
WP 0039  
WP 0040

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**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.

**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

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

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.

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 0011. 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

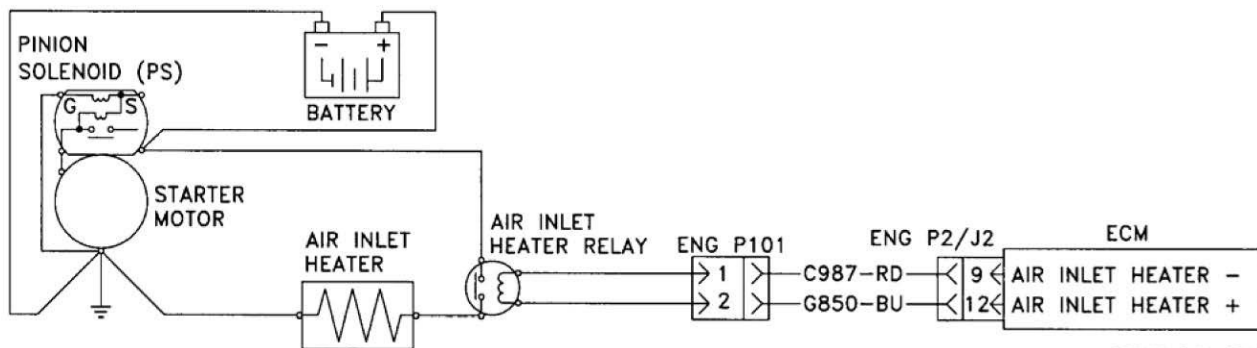


Figure 1. Air Inlet Heater Relay Circuit.

## 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 0011).

- 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.
- Check for active diagnostic codes by selecting Diagnostics from the top of the ET screen.
  - 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.
- Disconnect harness connector ENG-P101 (Figure 2, Item 1) from the air inlet heater relay connector (Figure 2, Item 2).
  - Connect a voltmeter to pins 1 and 2 of harness connector ENG-P101. Refer to WP 0096 for connector pin-outs.
  - Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - Start the Air Inlet Heater Override on Cat ET and observe the voltmeter.
    - If  $+24 \pm 3.0$  VDC is present and code 617-E-05 is still active, replace the air inlet heater relay (WP 0109).
    - If  $+24 \pm 3.0$  VDC is not present and code 617-E-05 is still active, the ECM may be defective.

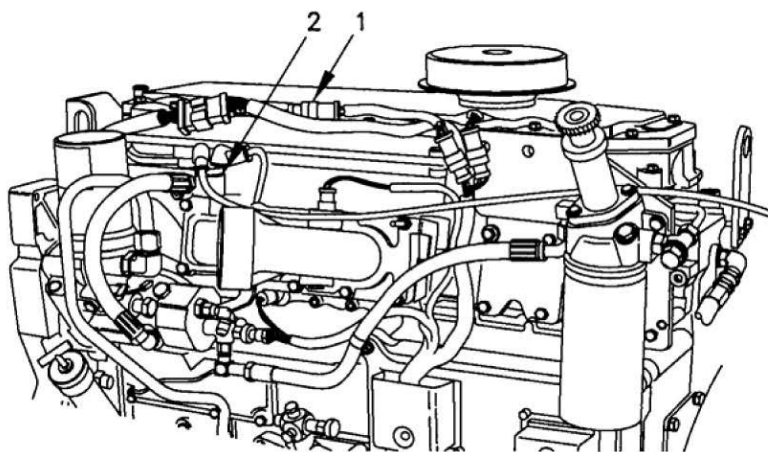


Figure 2. Air Inlet Heater Relay.

### 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 0083).
  - 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).
  - 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 0096).
    - (3) Retest and ensure the voltmeter measures  $24 \pm 3.0$  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  $24 \pm 3.0$  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  $24 \pm 3.0$  VDC, replace the air inlet heater relay (WP 0109).
- 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.
  - 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  $24 \pm 3.0$  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 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.
- 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 0109).
  - (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 0011).
- 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.
- Disconnect connector ENG-P101 from ENG-J101 for the air inlet heater relay control circuit.
  - Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - Start the Air Inlet Heater Override on the Cat ET.
  - 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.

### NOTE

The Air Inlet Heater Override has a one minute timer in order to disable the test when the time expires.

- Stop the Air Inlet Heater Override.
  - On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.
  - Fabricate a 4-inch jumper wire. Use the jumper wire to connect ENG-P101-1 and ENG-P101-2.
  - Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - Start the Air Inlet Heater Override on the Cat ET.
  - 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.
  - 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.
  - 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 0109).
- Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - Recheck the system for active diagnostic codes.
  - 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.
- On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.
  - Remove the wire from the +battery side of the air inlet heater relay.
  - Connect a voltmeter between the wire from the +battery side of the air inlet heater relay and engine ground.
  - Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - Observe the voltmeter.
    - If the voltmeter does not measure  $24 \pm 3.0$  VDC, ensure that the circuit breaker is not tripped.
    - Check the harness from the battery to the air inlet heater relay. Make any necessary repairs (WP 0096).
    - Retest and ensure the voltmeter measures  $24 \pm 3.0$  VDC.
  - 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.
- Reconnect the wire from the +battery to the air inlet heater relay.
  - Remove the wire to the air inlet heater from the air inlet heater relay.
  - Connect a voltmeter between the output terminal of the air inlet heater relay and engine ground.
  - Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - Observe the voltmeter. The voltmeter should not measure any voltage, since the air inlet heater relay is not energized. If the voltmeter measures  $24 \pm 3.0$  VDC, ensure that the voltmeter is connected to the output side of the air inlet heater relay.
  - Run the Air Inlet Heater Override on the Cat ET and observe the voltmeter.
  - 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.

- If the voltmeter does not measure  $24 \pm 3.0$  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.
- Reconnect the wire from the air inlet heater relay to the air inlet heater.
  - Disconnect the wire between the air inlet heater relay and the air inlet heater from the air inlet heater.
  - Connect the voltmeter between the wire at the air inlet heater and engine ground.
  - Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - 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.

- If the voltmeter does not measure  $24 \pm 3.0$  VDC, repair/replace the wire between the air inlet heater relay and the air inlet heater (WP 0096), after power is removed from the ECM.
  - Stop the Air Inlet Heater Override.
  - On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.
  - Reconnect the wire between the air inlet heater relay and the air inlet heater.
  - Verify that the repair eliminates the problem.
- STEP 12. If the problem is not resolved, measure the current through the air inlet heater.
- 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.
  - Connect the current probe to a multimeter.
  - Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - 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 A.

## 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 0109).

STEP 13. Verify the problem has been resolved.

## SYMPTOM

2. Electrical Connectors Wiggle Test.

### System Operation Description:

Most electrical problems are caused by poor connections. The following procedure will 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 0096.

## 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 0011).
- 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 0096).
    - (3) Verify that the repair eliminates the problem.

## 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.

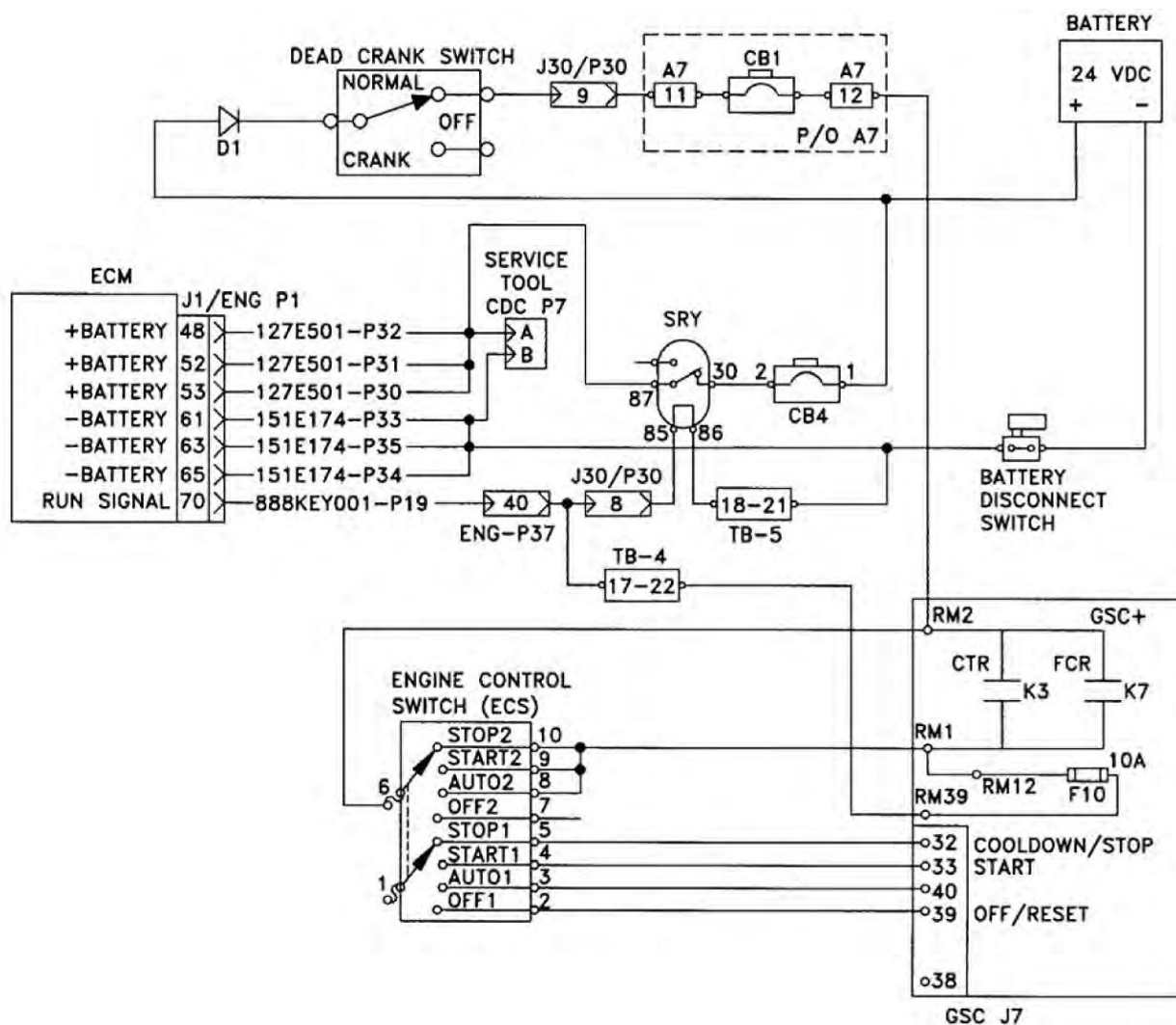


Figure 3. 24 VDC Electrical Circuits.

**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 0048). Use the 4C-4911 battery load tester or equivalent.
    - (1) If the no-load voltage at the batteries is at least  $24 \pm 1$  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 0048). 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  $24 \pm 3$  VDC. The ECM is receiving the correct voltage.
    - (2) On the ECM inputs from the ENGINE CONTROL switch, if the voltage is not  $24 \pm 3$  VDC. Proceed to STEP 4.
    - (3) If the voltage is not  $24 \pm 3$  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.
  - 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  $24 \pm 3$  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 0096).
    - (2) If the voltage is not  $24 \pm 3$  VDC at a test point, repair the device, connectors and/or wiring. (WP 0040, WP 0041, WP 0042, WP 0096, 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

- STEP 5. Check the voltage to the + battery Inputs of the ECM.
- Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - 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.
    - 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 0096; FO-3, Sheet 1).
    - If the voltage is not  $24 \pm 3$  VDC at a test point, check that voltage is present at terminal 85 and terminal 30 of SRY, voltage is not present on terminal 87 of SRY. Also check that 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 0053). 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.

## 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

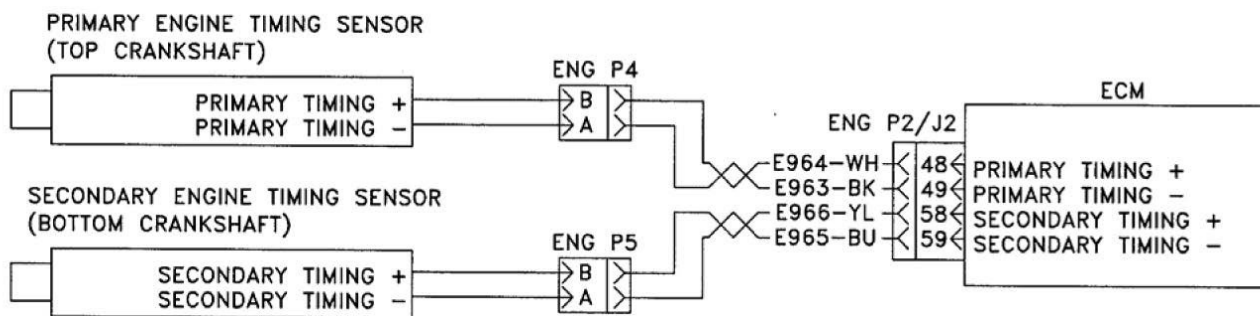


Figure 4. Engine Timing Circuit.

## 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 0011).
- 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.

## 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 0008, SYMPTOM 28, CID 190-E-02.
    - b. If code 342-E-02 is active, refer to WP 0008, 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.

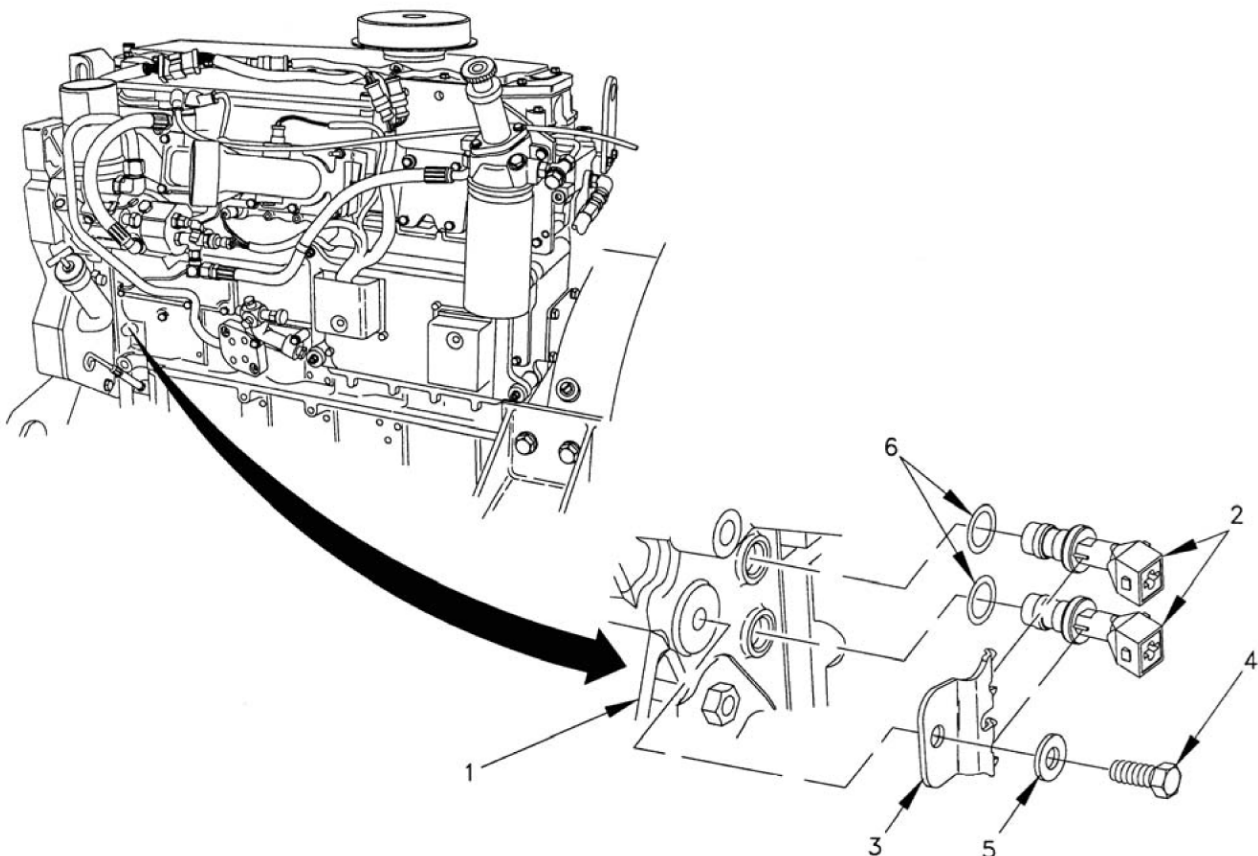


Figure 5. Timing Sensor Troubleshooting.



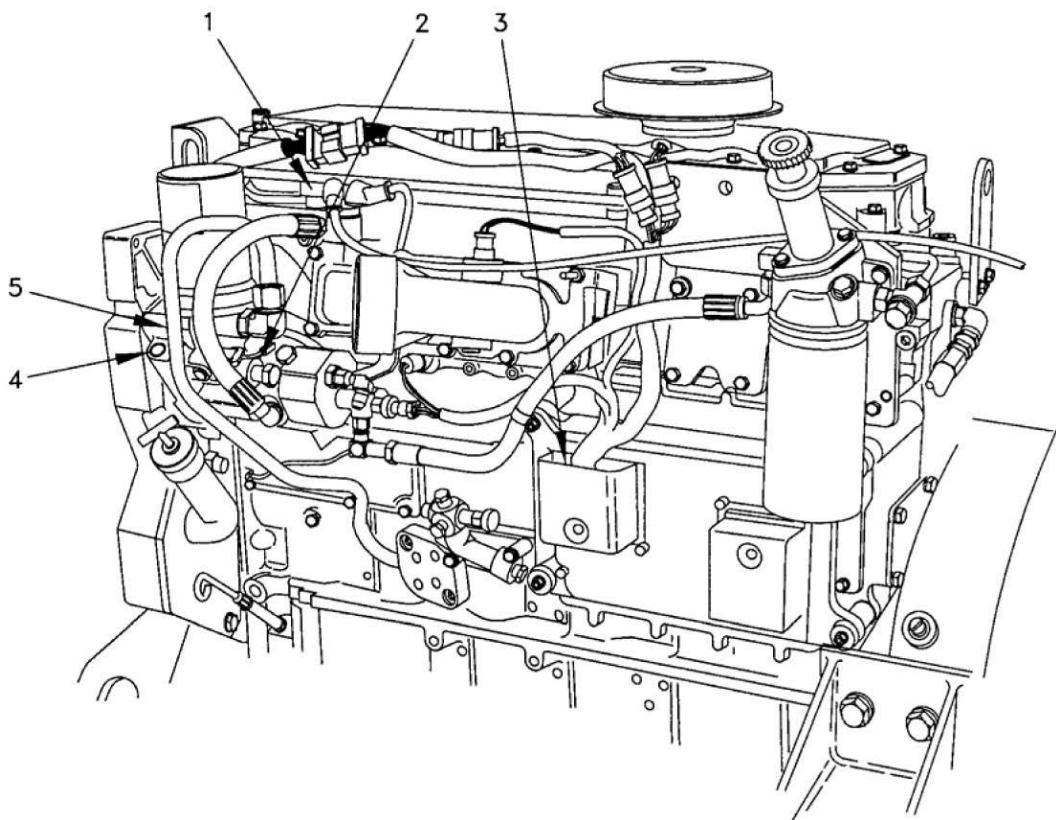
**NOTE**

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.
  - 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 (Figure 5, Item 1). 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 tiedown straps 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 (Figure 5, Item 2).
    - (2) Lubricate each O-ring (Figure 5, Item 6) with engine oil.
    - (3) Fully seat the sensor assembly (Figure 5, Item 2) in the engine (Figure 5, Item 1). Install the bolt (Figure 5, Item 4) and washer (Figure 5, Item 5).
    - (4) Tighten the bolt (Figure 5, Item 4). If the sensor assembly will not fully seat into the engine, inspect the bracket (Figure 5, Item 3) for damage. Replace the sensor assembly (Figure 5, Item 2) 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 tiedown straps are placed in the correct location. Retest and verify that the problem is resolved. Perform Engine Timing Sensor Calibration (WP 0012, 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 0083).
  - 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 0012, SYMPTOM 11).

**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

**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 (WP 0080). 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 0011).
- 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. Use table below.

**Table 3. Injection Actuation Pressure Test Results.**

	MANUAL PRESSURE GAGE	CAT ET	DIFFERENCE
1			
2			
3			
4			

- 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 200 PSI (1,379 kPa). 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.
- Turn the ENGINE CONTROL switch to MANUAL START. Perform the Injection Actuation Pressure Test at operating RPM, using the Cat ET.
  - 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.
  - Record the results in Table 4.
  - Select the STEP-UP button. Results for the next measurement will be displayed.
  - Record results in Table 4.
  - Repeat steps 3d. and 3e. for measurements 3 and 4. Observe the desired pressure reading and compare to actual pressure reading.
  - If the pressure reading is below the desired reading for any measurement, proceed to STEP 5.
  - Shut down Generator Set.
  - Remove wires from terminals 19 and 20 of LSM A4.
  - Start generator set. Engine will increase to idle speed (apx 1,200 RPM.).
  - Perform the Injection Actuation Pressure Test at idle RPM using the Cat ET. Repeat STEP 3 a through g. In STEP 3a, perform test at idle speed instead of operating RPM.
  - 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.
  - If the injection actuation pressure output is not within specifications, proceed to STEP 5.

**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	2811		
LOW IDLE			
	DESIRED INJECTION PRESSURE	ACTUAL INJECTION PRESSURE (CAT ET)	PERCENTAGE OUTPUT (CAT ET)
1	870		
2	1450		
3	2031		
4	2811		

- If the injection actuation pressure output is between 65 and 100 percent of the DESIRED INJECTION PRESSURE, the injection actuation pressure output is within specifications.
- If the injection actuation pressure output is not within specifications. Proceed to STEP 5.

- STEP 4. Install a new injection actuator pressure control valve (IAPCV) and retest the system.
- Install a new IAPCV (WP 0108) 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	2811		
LOW IDLE			
	DESIRED INJECTION PRESSURE	ACTUAL INJECTION PRESSURE (CAT ET)	PERCENTAGE OUTPUT (CAT ET)
1	870		
2	1450		
3	2031		
4	2811		

- If the injection actuation pressure output is between 65 and 100 percent of the DESIRED INJECTION PRESSURE, the injection actuation pressure output is within specifications.
  - 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.
  - If the injection actuation pressure output is not within specifications. Reinstall the original IAPCV (WP 0108).
  - If the problem is not resolved, check for other alarm and fault codes. Troubleshoot the fault codes as applicable.
- 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 0107) 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 0089). 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 0012, SYMPTOM 7).
- STEP 2. After diagnostic code 164-E-02 has been corrected, return to the Injection Actuation Pressure Test, if necessary.

**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 0011).
- 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 0008, 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 870 PSI (6 MPa), the HEUI system is functioning correctly. Refer to Troubleshooting, Engine Cranks but Will Not Start which is located in the Troubleshooting without a fault code (WP 0010, SYMPTOM 20).
  - d. If the injection actuation pressure is below 870 PSI (6 MPa). Proceed to STEP 8.

- STEP 8. Check the oil pressure at the fuel injection pump outlet port.
- Locate the high pressure oil line that supplies high pressure oil to the cylinder head.
  - 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.

- Observed pressure reading
  - Observed RPM
  - Observed injection actuation output percent
- If the oil pressure is above 4,000 PSI (27.5 MPa), remove the pressure gauge from the engine. Proceed to STEP 12.
  - If the oil pressure is below 4,000 PSI (27.5 MPa). Proceed to STEP 9.
- STEP 9. Install a test plug and recheck the oil pressure.
- Remove the injection actuation pressure control valve (IAPCV) (Figure 6, Item 2) (WP 0108).
  - 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.

- If the oil pressure is above 4,000 PSI (27.5 MPa), the HEUI pump is OK. Replace the IAPCV and recheck the oil pressure.
  - If the oil pressure is below 4,000 PSI (27.5 MPa). Remove the pressure gauge from the engine. Proceed to STEP 11.
- STEP 10. Install a new IAPCV (WP 0108) onto the high pressure oil pump (part of fuel transfer pump group).
- Check the oil pressure at the fuel injection pump outlet port. Record the pressure reading.
  - If the oil pressure is above 4,000 PSI (27.5 MPa), the replacement of the IAPCV has corrected the problem. Remove the test equipment from the engine. Verify that the repair has resolved the problem.
  - If the oil pressure is below 4,000 PSI (27.5 MPa), remove the new IAPCV and reinstall the original IAPCV (WP 0108). Proceed to STEP 11.

### NOTE

Perform sections of the test that match the displayed failure codes.

- STEP 11. Check the fuel injection pump drive gear.
- Remove the fuel transfer pump (WP 0108).
  - Check for any physical damage to the drive gear.
  - Verify that the drive gear and the retaining bolt are properly tightened. Also verify that the pump shaft rotates freely.
    - If the drive gear bolt is properly tightened and the pump shaft rotates freely, replace the fuel transfer pump (WP 0108).
    - Verify that the repair has resolved the problem.
    - 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 0108).
    - 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 0108). Verify that the repair has resolved the problem. If this does not fix the problem, replace the engine (WP 0104).
- STEP 12. Verify the problem is resolved.

## 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.

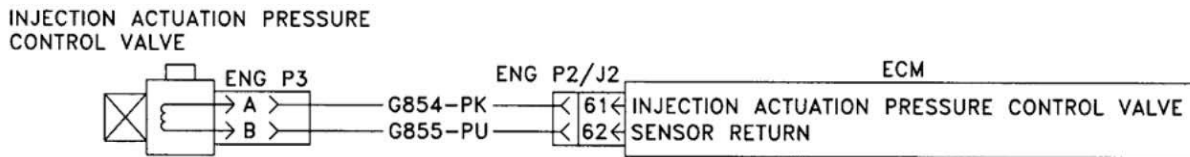


Figure 7. Injection Actuation Pressure Control Valve Circuit.

## 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 0011).
- 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.
- On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.
  - Disconnect ENG-P3 connector from the injection actuation pressure control valve (IAPCV) (Figure 6, Item 2).
  - Insert connector pins into connector ENG-P3-A and ENG-P3-B.
  - Connect a voltmeter to the connector pins in ENG-P3.
  - Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - Crank the engine and observe the voltmeter.
  - If the voltmeter measures  $5 \pm 0.2$  VDC when the engine is cranking, the ECM is OK. Proceed to STEP 7.
  - If the voltmeter fails to measure  $5 \pm 0.2$  VDC when the engine is cranking, replace the ECM (Figure 6, Item 3) (WP 0083). Verify the problem is resolved.
  - Reconnect ENG-P3 to the IAPCV.
- STEP 7. Perform the Injection Actuation Pressure Test using the Cat ET.
- Disconnect ENG-P3 from the IAPCV (WP 0108), FO-2, Sheet 2.
  - Connect ENG-P3 to the IAPCV (WP 0108).
  - Turn the ENGINE CONTROL switch to MANUAL START
  - 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.

- After performing the Injection Actuation Pressure Test, check for an active 42-E-11 diagnostic code.
- If active 42-E-11 diagnostic code is still present, replace the IAPCV (WP 0108). Rerun STEP 7 and verify the problem has been resolved.
- Using the DEAD CRANK SWITCH, crank the engine three times at 30 seconds intervals. This will purge the air from the system.

### SYMPTOM

#### 7. Injection Actuator Pressure Sensor Test.

#### System Operation Description:

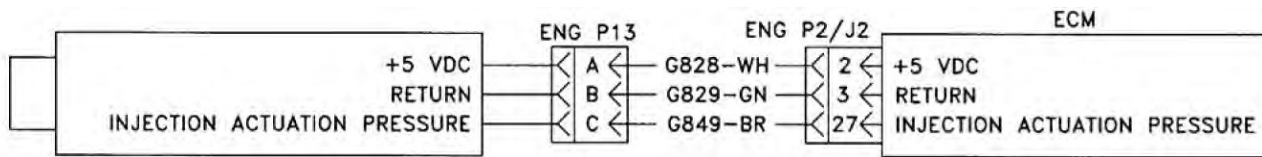
Use Figure 6 and Figure 8 to troubleshoot the system when the following diagnostic code is active:

- 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 0011).
- 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 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 0012, 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 PSI (0 kPa).
  - b. If the value of the injection actuation pressure is above 0 PSI (0 kPa), proceed to STEP 6.
  - c. If the value of the injection actuation pressure is 0 PSI (0 kPa), 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 2,538 PSI (17,500 kPa).

- 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 0096, Figure 2, Sheet 1).
    - (1) If the voltage is not  $5.0 \pm 0.2$  VDC, replace the ECM (WP 0083).
    - (2) If the voltage reading is  $5.0 \pm 0.2$  VDC, the voltage is within the specified range and the sensor is receiving supply voltage. Proceed to STEP 7.

## 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. Caterpillar Electronic Technician (Cat ET) Injection Actuation Pressure vs. Pressure Gauge Readings.**

PRESSURE READING FROM ET TOOL	RANGE OF READINGS FROM PRESSURE GAUGE
870 PSI (6,000 kPa)	580 to 1,130 PSI (4,000 to 7,800 kPa)
1,450 PSI (10,000 kPa)	1,160 to 1,710 PSI (8,000 to 11,800 kPa)
2,175 PSI (15,000 kPa)	1,885 to 2,435 PSI (13,000 to 16,800 kPa)
3,336 PSI (23,000 kPa)	3,045 to 3,595 PSI (21,000 to 24,800 kPa)

- 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 0106) 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.

## 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 Fault 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.

#### 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 0011).
- 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.
- 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 0010.
  - 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.
- 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 0089). 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 to 120 volts. Failure to comply can cause injury or death to personnel.

- 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.

- f. 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 0096). Verify that the repair eliminates the problem.
- g. If the Injector Solenoid Test indicates SHORT for the suspect cylinder, there is a problem with the ECM. Replace the ECM (WP 0083). Verify that the repair eliminates the problem.

- STEP 9. The Injector Solenoid Test reported that one or more cylinders are OPEN. Record the cylinder numbers for the injectors that indicate OPEN.
- 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 volts. Failure to comply can cause injury or death to personnel.

- Disconnect engine wiring harness connector ENG-P300 from Injector Harness ENG-J300 (Figure FO-2, Sheet 2).
- 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.
- 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.

**Table 7. Injector Harness Injector Solenoid Terminals.**

TERMINAL (WP 0115, 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

- Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
- Using Cat ET, perform the Injector Solenoid Test at least two times.
- 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.
- 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 0096). Verify the problem has been resolved.
  - (2) Install another ECM and retest. If the problem is resolved, install a replacement ECM (WP 0083).

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 to 120 volts. Failure to comply can cause injury or death to personnel.

- 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 0107).
- 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 0096, 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 0089). 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 0096). 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.
  - 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 0089). 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 0096). 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 (WP 0104).

## 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.

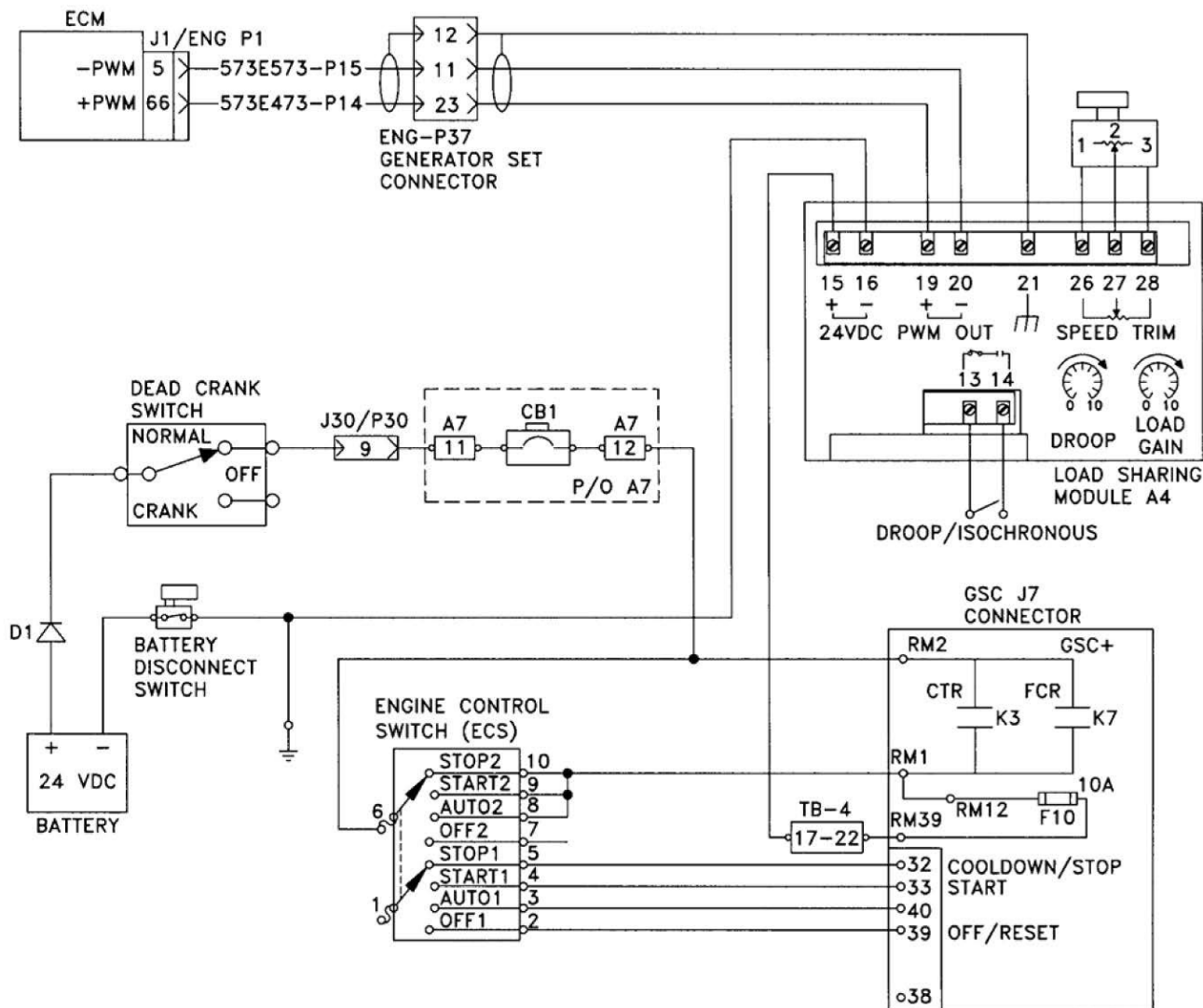


Figure 9. Speed Control Circuits.

**NOTE**

Desired speed can be adjusted from 1,700 to 1,900 RPM for a 60 Hz system and from 1,400 to 1,600 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).
- Verify that the ground wire on terminal 16 has continuity to ground.
  - 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.

**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 0096).
- STEP 5. If the voltage is not  $24 \pm 3$  VDC at a test point, repair the device, connectors and/or wiring (WP 0040, WP 0041, WP 0042, WP 0096, FO-2, Sheet 2; FO-4, Sheets 1-4).
- STEP 6. After the voltage supply to LSM A4 is correct. Proceed to STEP 7.
- STEP 7. Check the throttle position using the Cat ET.
- Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to MANUAL START.
  - Observe the position of the throttle on the Cat ET.
  - Turn the FREQUENCY adjust knob to register the following:
    - 60 Hz between 1,700 and 1,900 RPM
    - 50 Hz between 1,400 and 1,600 RPM
  - 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.
  - If the throttle position shown on the Cat ET changes as the FREQUENCY adjust knob is adjusted, LSM A4 is operating correctly.
  - 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.
- On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.
  - Remove wires from terminals 19 and 20 of LSM A4.
  - Connect DC voltmeter to terminals 19 and 20 on LSM A4.
  - Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - Turn FREQUENCY adjust potentiometer up and down. Voltage will vary from approximately 4.5 to 9.5 VDC. Adjust speed trim potentiometer, if necessary.
  - On EMCP set ENGINE CONTROL switch to OFF/RESET. Set Battery Disconnect Switch to OFF. Set DEAD CRANK SWITCH to OFF.
  - 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 0040). Verify the problem is resolved.
  - If voltage is incorrect, or erratic, repair wiring as necessary (WP 0096). Verify the problem is resolved. If wiring is good, perform potentiometer test on FREQUENCY adjust potentiometer (WP 0039). Replace frequency potentiometer, as required (WP 0039). Verify the problem is resolved.
  - If FREQUENCY adjust potentiometer is not defective, replace ECM (WP 0083). Verify the problem is resolved.

## 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 0011).
- 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.
- Access Preferences under the Utilities menu on Cat ET.
  - Verify that the correct communications interface device is selected.
  - 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 57,600.
  - 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 0096).
  - b. Check the CDC-P7 connector (WP 0011).
  - c. Inspect all associated electrical wiring and connectors. Refer to Troubleshooting, Electrical Connectors (WP 0096, WP 0012) if an intermittent problem is suspected.
- 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 0096).
  - 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 0096, 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 0012 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 0012 SYMPTOM 12).

- STEP 11. Troubleshoot the Cat data link for possible problems. Refer to Troubleshooting, WP 0008 SYMPTOM 29.
- STEP 12. Verify the problem has been resolved.

## 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**

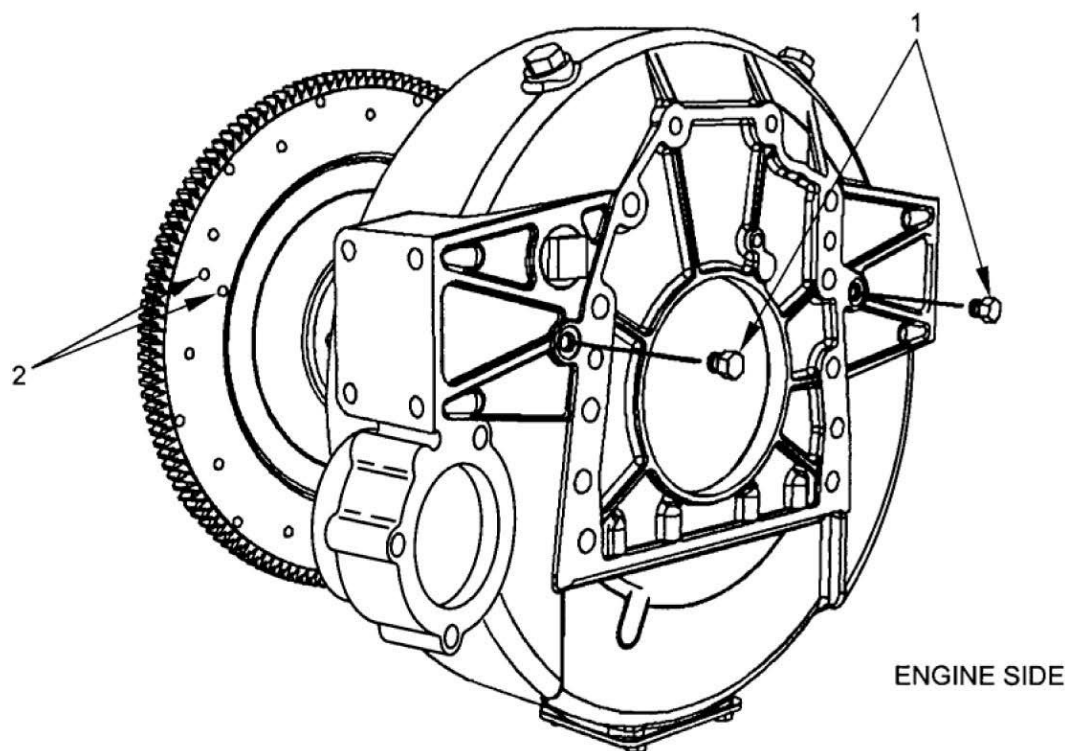
Engine timing is not calibrated.

#### **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.

### **CAUTION**

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:
- Apply clean oil to a 2D-6392 O-ring seal. Install the O-ring seal on the end of the 6V-2197 Transducer.
  - 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 0.04-inch (1.0 mm) away from the flywheel.
  - Tighten the nut on the Transducer Adapter.
  - 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 0011).
- 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 0011). Access the TIMING CALIBRATION screen on the Cat ET by going to drop-down menu SERVICE, then CALIBRATIONS, 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.

## 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 0012, 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 0011).
- 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.

**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 0011).
- 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 0055 through WP 0059).
- 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 0011).
- 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.

## 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.
- Connect Cat ET to connector CDC-P7 (WP 0011).
  - Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
  - 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.
  - 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 0083) 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.

- Connect Cat ET to connector CDC-P7 (WP 0011).
- Set Battery Disconnect Switch to ON. Set DEAD CRANK SWITCH to NORMAL. On EMCP set ENGINE CONTROL switch to COOL DOWN/STOP.
- Flash program the flash file into the ECM. Refer to WP 0012, SYMPTOM 12.
- If the Copy Configuration process from Step 1c. was successful, return to the Copy Configuration/ECM Replacement screen on Cat ET and select Program ECM.
- If the Copy Configuration process from Step 1c. was unsuccessful, manually program the ECM parameters.

**END OF WORK PACKAGE**

**CHAPTER 3**

**FIELD MAINTENANCE INSTRUCTIONS**

**FOR**

**TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz**  
**MEP-807A/PU-807A**

**CHAPTER 3**  
**FIELD MAINTENANCE INSTRUCTIONS**

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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****SERVICE UPON RECEIPT**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)

**Personnel Required**

One

**Materials/Parts**

Breakthrough cleaning solvent (WP 0123, Table 1, Item 49)

**References**

AFTO Form 22  
DA PAM 750-8  
DD Form 1397  
DA Form 2028-2  
NAVMC 10560  
SF Form 361  
SF Form 368  
TM 9-6115-729-10  
TM 9-6115-729-24P  
TO 00-5-1  
WP 0092

**Equipment Condition**

Generator Set Fully Stopped  
Engine Control Switch in OFF Position  
Dead Crank Switch in OFF Position  
Battery Disconnect Switch in OFF Position

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**SERVICE UPON RECEIPT OF MATERIEL****UNPACKING**

1. Remove and set aside packing list from side of box. Also remove and set aside shortage packing list if there is one.

**WARNING**

Steel strapping used in packaging of the power plant/power unit has sharp edges. Wear gloves and use care when cutting and handling steel strapping. Failure to comply with this warning can cause injury to personnel.

2. Using metal cutters, carefully cut strapping from plastic covering generator set, accessory box, and, when unpacking Unit A, the switch box. Remove strapping.
3. Remove plastic cover over generator set by lifting off the cover.
4. Technical manuals are packaged and may be attached to barrier material. If so, remove and save technical manuals.
5. Remove packaged fire extinguisher from within generator set enclosures. Unpack and secure fire extinguisher in bracket on trailer.
6. Open accessory box and remove all packaging/cushioning material from accessories.
7. Using the packing list(s) removed in Step 1, inventory the accessories. Check missing items against shortage packing list (if any). Report any discrepancies to your supervisor.

**END OF TASK**

**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 the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF Form 361, Transportation Discrepancy Report.
5. Check the 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.

**END OF TASK****Deprocessing Unpacked Equipment**

Refer to DA Form 2258, Depreservation Guide for Vehicles and Equipment, packed with the equipment. The depreservation guide explains what was done to the equipment prior to packaging. It also explains what has to be done before placing the equipment in operation. Perform all depreservation actions required by the depreservation guide.

**INSTALLATION INSTRUCTIONS****WARNING**

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

**WARNING**

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

1. Ensure that installation site is as level as possible.
2. Provide adequate ventilation to prevent recirculation of hot air exhausted from generator set.

**END OF TASK****Outdoor Installation**

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

**END OF TASK**



**Indoor Installation****WARNING**

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

**WARNING**

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

**CAUTION**

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

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

**NOTE**

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

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

**WARNING**

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

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

**WARNING**

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

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

**WARNING**

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

7. Wrap exhaust pipe in protective material.
8. Allow space on all sides for service and maintenance.

**WARNING**

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

**WARNING**

Engine exhaust fumes contain deadly poisonous gases.

Severe exposure can cause death or permanent brain damage.

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

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

**END OF TASK****Output Voltage Setting****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.

**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**

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.
3. Open right rear doors.
4. Remove four nuts (Figure 1, Item 1), washers (Figure 1, Item 2), and clear protective panel (Figure 1, Item 3) from reconnection board.
5. Remove 12 nuts (Figure 1, Item 4) and reconnection board (Figure 1, Item 5).
6. Align arrow on reconnection board (Figure 1, Item 5) with arrow on base corresponding to desired generator output voltage(s).
7. Install reconnection board (Figure 1, Item 5) and secure with 13 nuts (Figure 1, Item 4). Torque nuts to 20 ft•lbs (16 N•m)
8. Install clear protective panel (Figure 1, Item 3) and secure with four washers (Figure 1, Item 2) and nuts (Figure 1, Item 1).

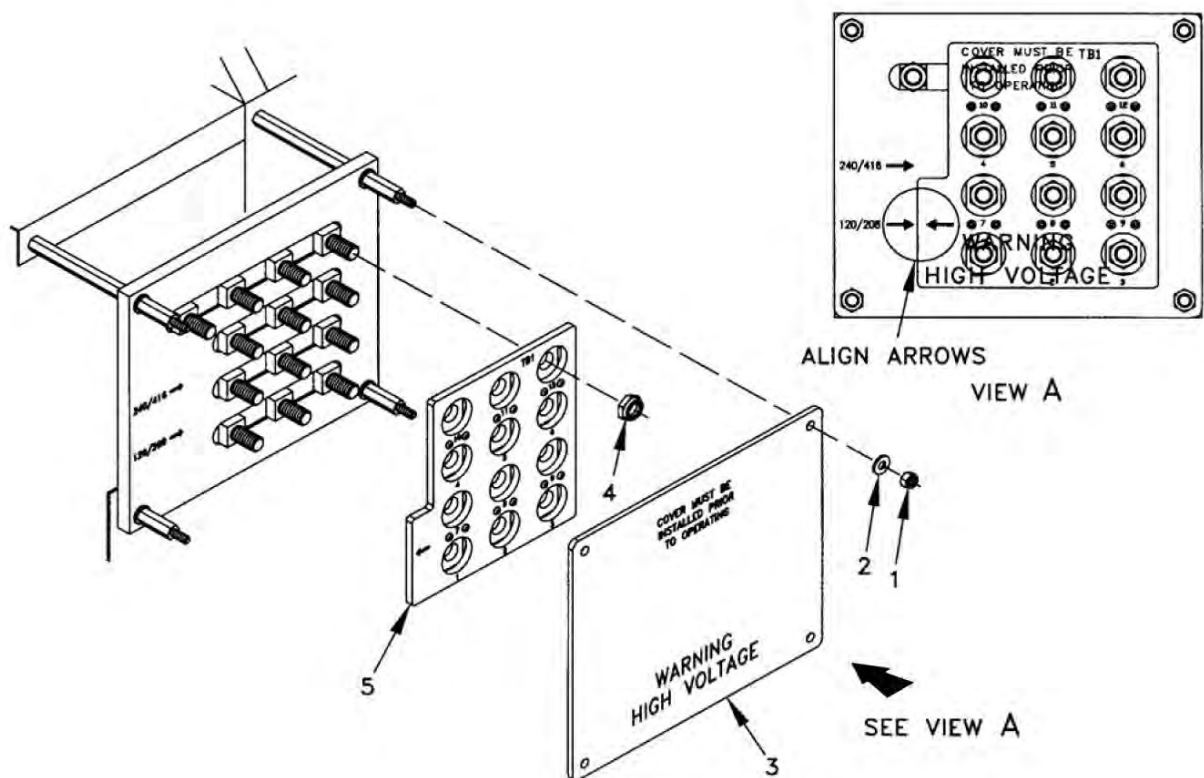


Figure 1. Reconnection Terminal Board Voltage Setting.

9. Close right rear doors.
10. Reprogram DVR and GSC as required per WP 0092.

**END OF TASK**

**END OF WORK PACKAGE**



**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****PMCS INTRODUCTION**

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**GENERAL**

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 0015, 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 through WP 0012) and/or maintenance procedures (see Chapter 3).
4. Item numbers in column 1 of WP 0015, 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 5 of WP 0015, Table 1 lists conditions that make the TQG not ready/available. Write up items not repaired on DA Form 5988-E for Sustainment level 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.

**Leakage Definitions****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 Sustainment level maintenance.

There are some common items to check all over the TQG. These include the following:

### **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.

### **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**

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**

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.
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 Sustainment level 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**

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.

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**





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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A**  
**PMCS, INCLUDING LUBRICATION INSTRUCTIONS**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
or  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Personnel Required**

One

**Materials/Parts**

Breakthrough cleaning solvent (WP 0123, Table 1, Item 49)  
Wiping Rag (WP 0123, Table 1, Item 38)

**References**

TM 9-2330-376-14&P  
TM 750-254  
WP 0017 - WP 0040  
WP 0043  
WP 0044  
WP 0045  
WP 0046  
WP 0047  
WP 0048  
WP 0050 - WP 0062  
WP 0066  
WP 0067  
WP 0068  
WP 0069  
WP 0072  
WP 0078  
WP 0080  
WP 0115  
WP 0119

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**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.

**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.

Table 1. Field Preventive Maintenance Checks and Services.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
<b>100 kW TQG</b>				
1.	First 100 hours	Engine Oil/Oil Filter	Change engine oil and oil filter (WP 0080).	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.
<b>TQG EXTERIOR</b>				
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 0017 through WP 0038).	Any doors, panels, latches, or hinges damaged, loose, or missing parts. Mounting points loose.
<b>TQG INTERIOR</b>				
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 0039, WP 0040).	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 0043).	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 0044).	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 0045).	Battery cables damaged, corroded, or missing parts. Cables cannot be securely mounted.
8.	Quarterly or 300 hours	Batteries	Clean battery terminals. Check for looseness, breaks, or damage (WP 0048).	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 0046).	Power cables damaged, corroded, or missing parts. Cables cannot be securely mounted.

Table 1. Field Preventive Maintenance Checks and Services. - Continued

ITEM NO.	INTERVAL	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 0047).	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 0050).	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 0051).	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 0052).	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 0053).	Any defect that would prevent operation.
<b>ENGINE</b>				
16	Quarterly or 300 hours	Engine Oil/Oil Filter	Change engine oil and oil filter (WP 0080).	Engine oil change/ filter change not accomplished.
17	Quarterly or 300 hours	Oil Pan	Check magnetic plug for metal particles (WP 0080).	Metal particles found on plug.
18	Quarterly or 300 hours	Fuel System	Check fuel system for secure mounting, leaks, damaged tubes or hoses (WP 0054 through WP 0061).	Any leaks or defect that would prevent operation. Any leak from fuel system.
19	Quarterly or 300 hours	Fuel Filter	Replace fuel filter (WP 0078).	Fuel filter has not been replaced as required. Any leak.
20	Quarterly or 300 hours	Auxiliary Fuel Pump Strainer	Clean strainer (WP 0057).	Strainer has not been cleaned as required. Any leak.
21	Quarterly or 300 hours	Water Separator Filter	Replace water separator filter element (WP 0059).	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 0062 through WP 0066).	Any damage that will prevent operation. Any part that cannot be securely mounted. Radiator leaking or damaged.

Table 1. Field Preventive Maintenance Checks and Services. - Continued

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
23	Quarterly or 300 hours	Cooling System	Test and inspect coolant (see TB 750-651). Check coolant level and add coolant as required.	Any deficiency, 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 0067).	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 0115 through WP 0119).	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.
27	Quarterly or 300 hours	Battery Charging Alternator	Visually inspect for damage, arching, and corrosion. Refer to WP 0071.	Alternator is damaged or corroded.
28	Quarterly or 300 hours	Cylinder Head	Inspect cylinder head for cracks and seepage.	If there are any cracks or seepage.
29	Quarterly or 300 hours	Cylinder Head Grounding Stud	Inspect the wiring harness for good connections. The cylinder head grounding stud must have a wire grounding to the battery. Tighten the cylinder head grounding stud at every oil change. Ground wires and straps should be combined at engine grounds. All grounds should be tight and free of corrosion. <ul style="list-style-type: none"> <li>• Clean the cylinder head grounding stud and the terminals with a clean cloth.</li> <li>• If the connections are corroded, clean the connections with a solution of baking soda and water.</li> <li>• Keep the cylinder head grounding stud and the strap clean and coated with MPGM grease or petroleum jelly.</li> </ul>	Grounding Stud is corroded.
30	Quarterly or 300 hours	Fuel System	Drain sediment/water from fuel tank	
31	Quarterly or 300 hours	Belts	Inspect belts for proper routing and that belts are firmly seated in pulley grooves.	Belts not replaced as required.

Table 1. Field Preventive Maintenance Checks and Services. - Continued

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
32	Initial 600 hours	Engine Valve Lash	Inspect to see if the measurement of the valve lash is in the acceptable range. Adjust the valve lash if measurement is not in range. Refer to WP 0090.	
33	Semiannually or 750 hours	Air Cleaner	Check air cleaner for cleanliness, damage and secure mounting. Clean or replace air filter element (WP 0069). Clean housing with clean cloth.	Air cleaner clogged, damaged, or loose.
34	Semiannually or 750 hours	Crankcase Ventilation Filter	Check crankcase ventilation filter for cleanliness, damage, and secure mounting. Clean or replace filter element (WP 0068).	Filter clogged, damaged, or loose.
35	Semiannually or 4,000 hours	Belt Tensioner	Inspect for worn or loose bolts.	
36	Semiannually or 4,000 hours	Cooling System Water Temperature Regulator		
37	Semiannually or 4,000 hours	Crankshaft Vibration Damper	Inspect the engine vibration damper for damage. Inspect for loose, missing, or damaged mounting bolts. Replace vibration damper or mounting bolts as necessary (WP 0110).	Any parts missing or damaged, mount loose or broken.
38	Annually Or 1,500 Hours	Fan Belts	Replace fan belts (WP 0072).	Fan belts not replaced as required.
39	Biennially or 3,000 hours	Cooling System	Drain, clean, and flush cooling system. Refill with proper coolant mixture (WP 0066).	Cooling system has not been serviced as required.
40	Annually or 2,000 hours	Engine Mounts	Inspect engine mounts for cracks, worn, loose, or missing hardware, or loose mounting.	Any parts missing. Mounts loose or broken.
41	Annually or 2,000 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.
42	2,500 hours	Bearing Replacement	Replace bearing when failed or after 2,500 hours with P/N 307-9798 if the engine S/N is between BDZ00012 - BDZ01868 and P/N 61-9235 or P/N 200-2282 is installed.	Bearing not replaced as required.
43	2,000 hours	Fan Drive Bearing	Replace bearing when failed or after 2,500 hours with P/N 307-9798 if the engine S/N is between BDZ00012 - BDZ01868 and P/N 61-9235 or P/N 200-2282 is installed.	

Table 1. Field Preventive Maintenance Checks and Services. - Continued

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/AVAILABLE IF:
44	Annually or 2,000 hours	After cooler Core	Core should be cleaned internally and leak tested to maintain efficiency.	
45	Annually or 2,000 hours	Engine Valve Lash	Inspect to see if the measurement of the valve lash is in the acceptable range. Adjust the valve lash if measurement or not in range. Refer to WP 0090.	

Table 2. PMCS Mandatory Replacement Parts List.

ITEM NO.	PART NUMBER (CAGEC)	NSN	NOMENCLATURE	QTY
<b>QUARTERLY (300 HOURS)</b>				
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
4	311521 (1BY35)	6630-01-011-5039	Antifreeze Test Kit	1
<b>SEMIANNUAL (750 HOURS)</b>				
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
<b>ANNUAL (1,500 HOURS)</b>				
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 field (F) 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

1,000 hours = Annually

2,000 hours = Bi-Annually

**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.

**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**

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.

Before you start your lubrications:

**Always**

- a. Use Lubrication Instructions as your guide.
- b. Use correct type/grade lubricant.
- c. Clean area where lubricant is to be applied to prevent buildup of dirt, grit, and contaminants.

**Never**

- a. Use wrong type/grade lubricant.
- b. Use too much lubricant.
- c. Apply lubricant to dirty components.

Authorized lubricants and fluids are listed in Tables 3 through 6.

**Table 3. Engine Oil.**

LUBRICANTS	AMBIENT TEMPERATURE
mil pref 46167 OEA	-45 to +45 F
mil pref 21260 oe/hdo-10	-25 to +40°F
mil pref 21260 oe/hdo-30	+15 to +120°F
mil pref 2104H oe/hdo-5/40	-30 to +120°F
mil pref 2104H oe/hdo-15/40	0 to +120°F
mil pref 2104H oe/hdo-40	+20 to +120°F
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 protection (+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 protection.



Table 5. Fuel.

AMBIENT TEMPERATURE	Degrees F	-50	-25	-15	0	+5	+15	+20	+30	+40	+70	+90	+110	+120
Degrees C		-46	-32	-26	-18	-15	-9	-7	-1	+4	+21	+32	+38	+49
A-A-52557 DF-1														
A-A-52557 DF-2														
MIL-PFR-5624 JP-5 MIL-T-83133 JP-8														

Table 6. Lubrication Requirements.

INTERVAL	USAGE	CAPACITY	LUBRICANT
First 100 hours	Engine oil and oil filter change (WP 0080)	30 quarts (27.3 L)	Engine Oil (see Table 3)
Quarterly or 300 hours	Engine oil and oil filter change (WP 0080)	30 quarts (27.3 L)	Engine Oil (see Table 3)
Annually or 1,000 hours	Door hinges	N/A	Engine oil (see Table 3)
Annually or 1,500 hours	Cooling system drain and flush (WP 0066)	38 quart (36 L)	Coolant mixture (see Table 4)

END OF WORK PACKAGE



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****GENERAL MAINTENANCE INSTRUCTIONS: WORK SAFETY, CLEANING, INSPECTION, TAGGING  
INSTRUCTIONS, REPAIR**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMKT) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Breakthrough cleaning solvent (WP 0123, Table 1, Item 49)  
Crocus cloth (WP 0123, Table 1, Item 11)  
Marker Tags (WP 0123, Table 1, Item 54)  
Wiping rags (WP 0123, Table 1, Item 38)

**Personnel Required**

One

**References**

TC 9-237  
TM 9-6115-729-24P

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**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 field 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**

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.

**END OF TASK**

**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.

**END OF TASK****Electrical Cables and Rubber Components****CAUTION**

Do not wash rubber components and electrical cables with breakthrough cleaning solvent 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.

**END OF TASK****INSPECTION**

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.

**END OF TASK****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.

**END OF TASK**

**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.

**END OF TASK****TAGGING INSTRUCTIONS**

When tagging is required during the removal procedure, remove tags during the installation procedure.

**END OF TASK****REPAIR****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 TASK****END OF WORK PACKAGE**



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**MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****RIGHT BATTERY ACCESS DOOR ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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**

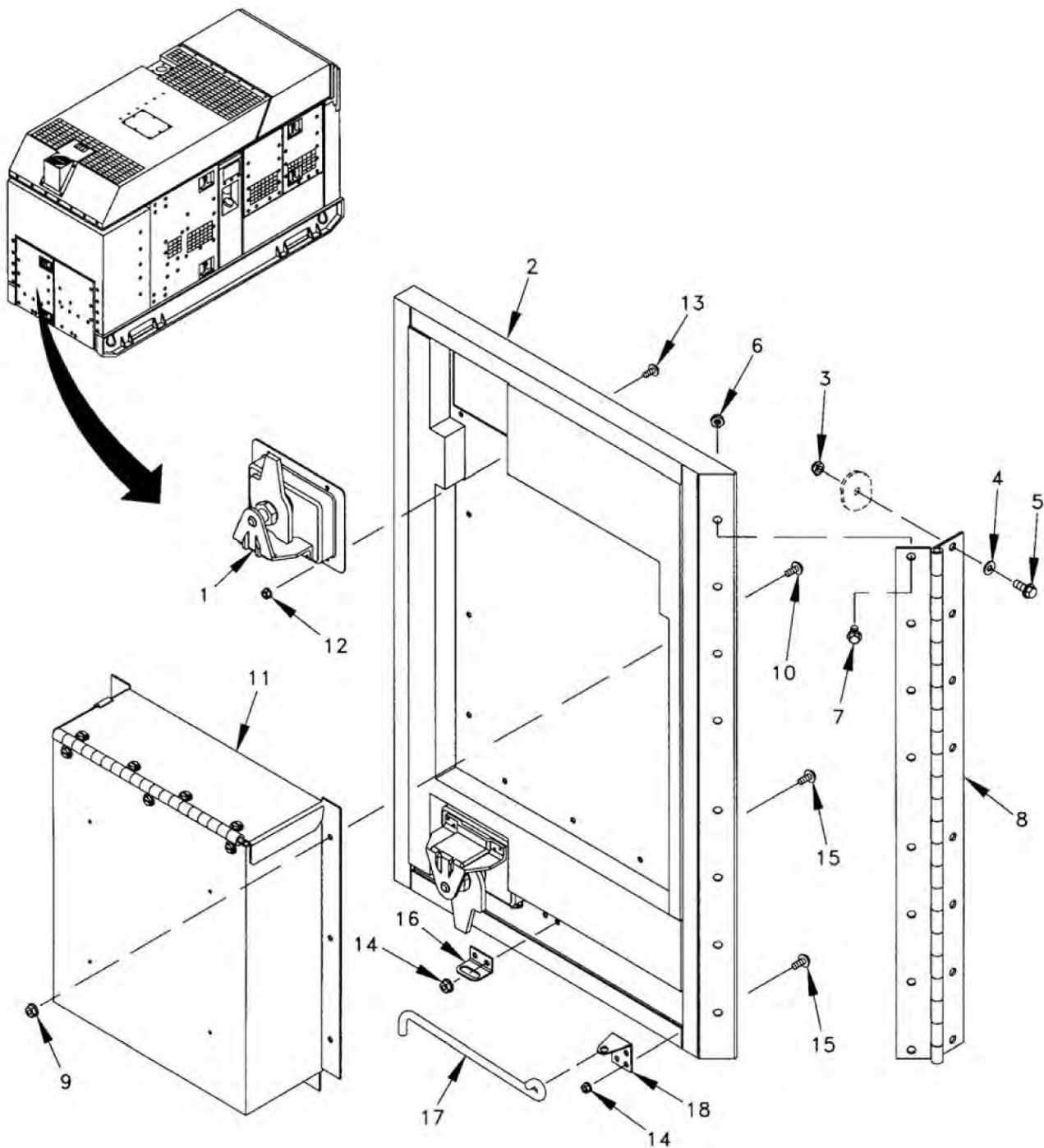
High voltage is produced when the generator set is in operation. Never attempt to start or maintain the generator set unless it is properly grounded. Failure to comply can cause injury or death to personnel.

**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).



**Figure 1. Right Battery Access Door Assembly.**

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**



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**MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****LEFT BATTERY ACCESS DOOR ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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**

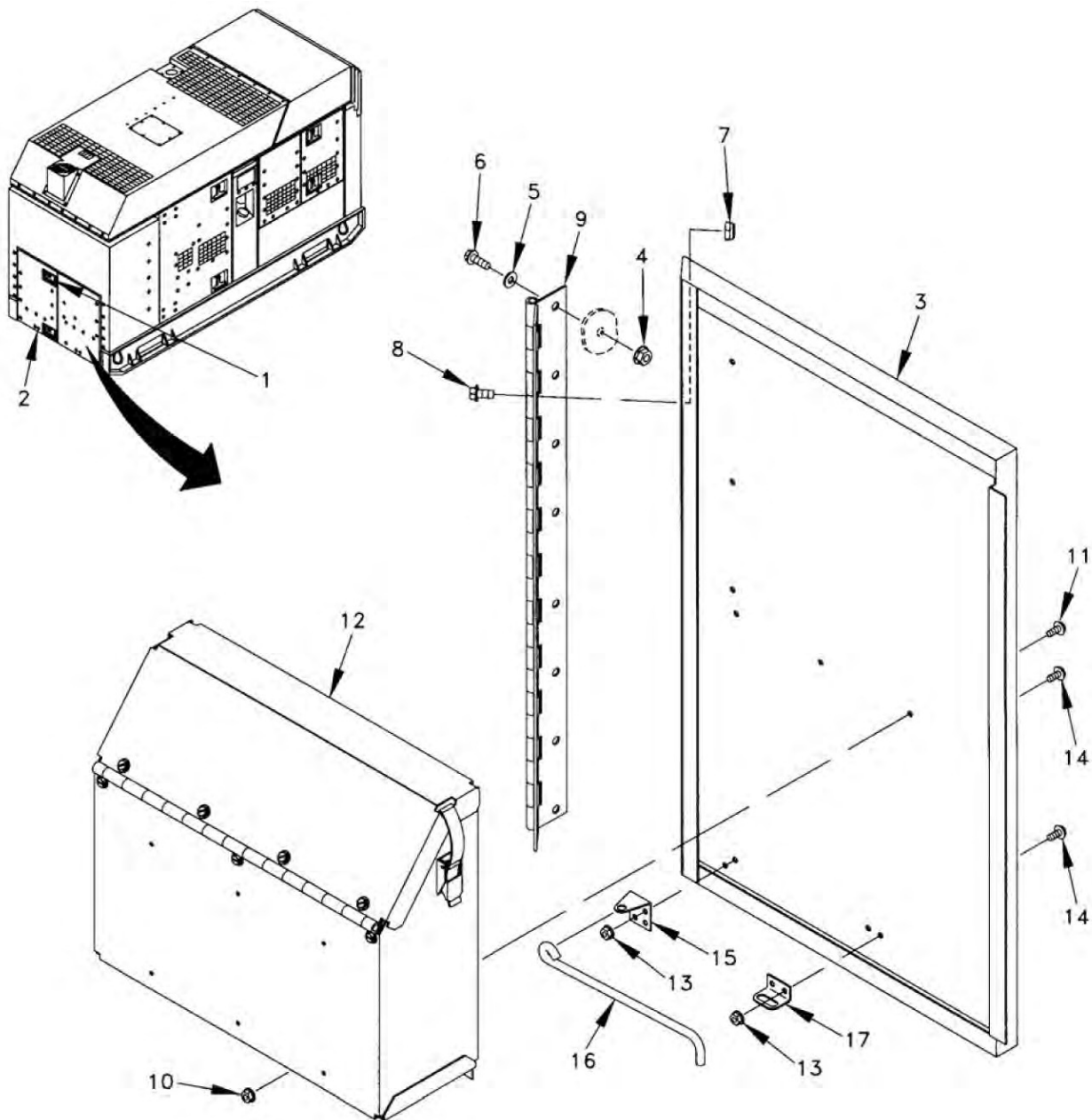
High voltage is produced when the generator set is in operation. Never attempt to start or maintain the generator set unless it is properly grounded. Failure to comply can cause injury or death to personnel.

**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).



**Figure 1. Left Battery Access Door Assembly.**

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**



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**MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****CONTROL BOX DOOR ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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.

**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), lock washers (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).

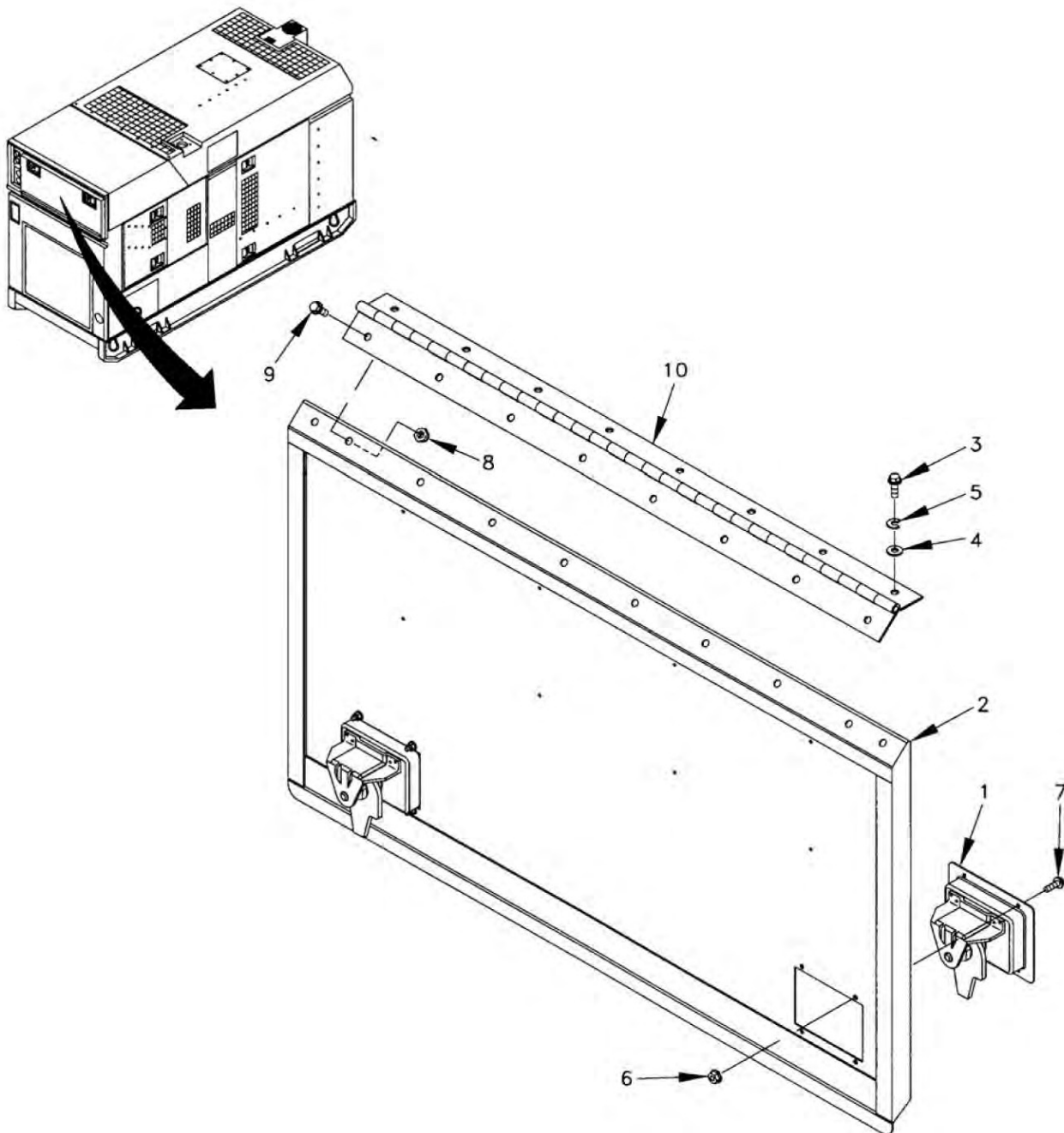


Figure 1. Control Box Door Assembly.

END OF TASK



**INSTALLATION**

1. Install control box door and hinge (Figure 1, Item 2) and secure with eight lock washers (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).

**END OF TASK****END OF WORK PACKAGE**



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**MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****LEFT FRONT DOOR ASSEMBLY (LATCH): REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

---

**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 12)  
Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

**Equipment Condition**

Grounding rods removed (TM 9-6115-729-10)

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**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.

**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**

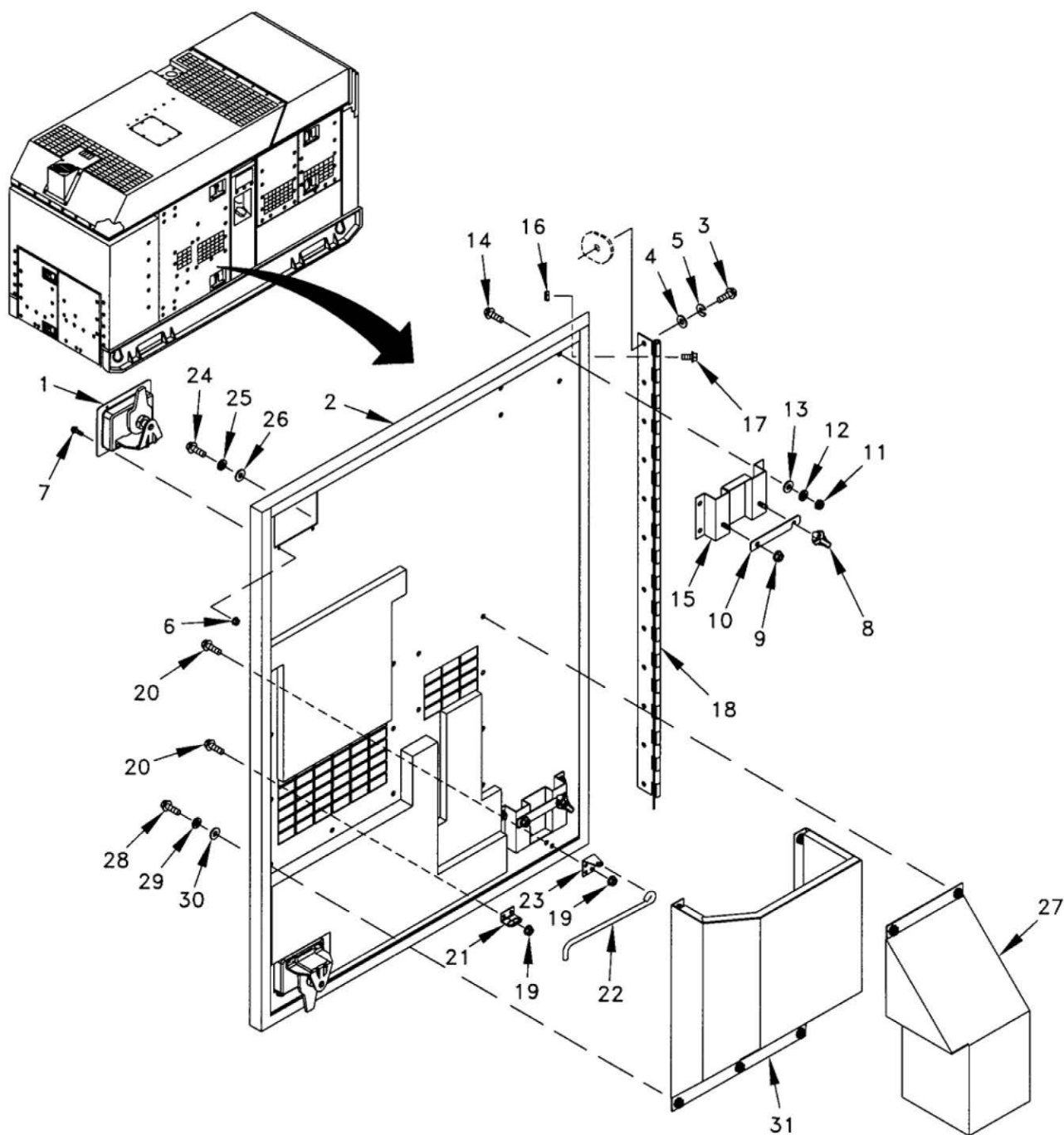
High voltage is produced when the generator set is in operation. Never attempt to start or maintain the generator set unless it is properly grounded. Failure to comply can cause injury or death to personnel.

**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), lock washers (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).



**Figure 1. Left Front Door Assembly (Latch).**

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), lock washers (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), lock washers (Figure 1, Item 25), washers (Figure 1, Item 26), and upper duct (Figure 1, Item 27).
7. Remove nine screws (Figure 1, Item 28), lock washers (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 lock washers (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), lock washers (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), lock washers (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 lock washers (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**



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**MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****LEFT REAR DOOR ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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.

**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), lock washers (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), lock washers (Figure 1, Item 11), washers (Figure 1, Item 12), door holding rod (Figure 1, Item 13), and duct (Figure 1, Item 14).
3. Remove 6 foam damping sections as required.

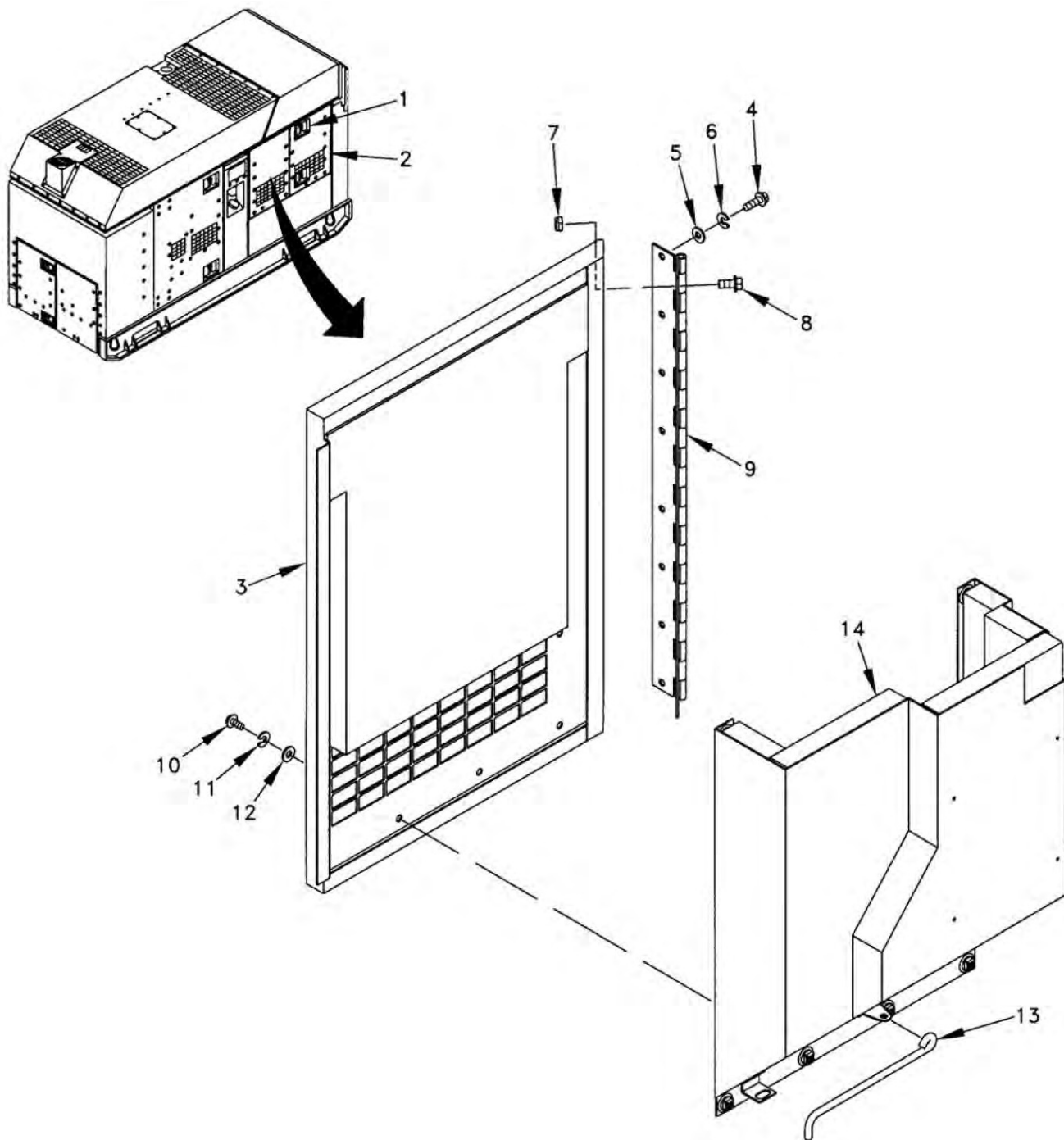


Figure 1. Left Rear Door Assembly.

## 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), lock washers (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 lock washers (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**



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**MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****LEFT REAR DOOR ASSEMBLY (LATCH): REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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.

**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), lock washers (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.

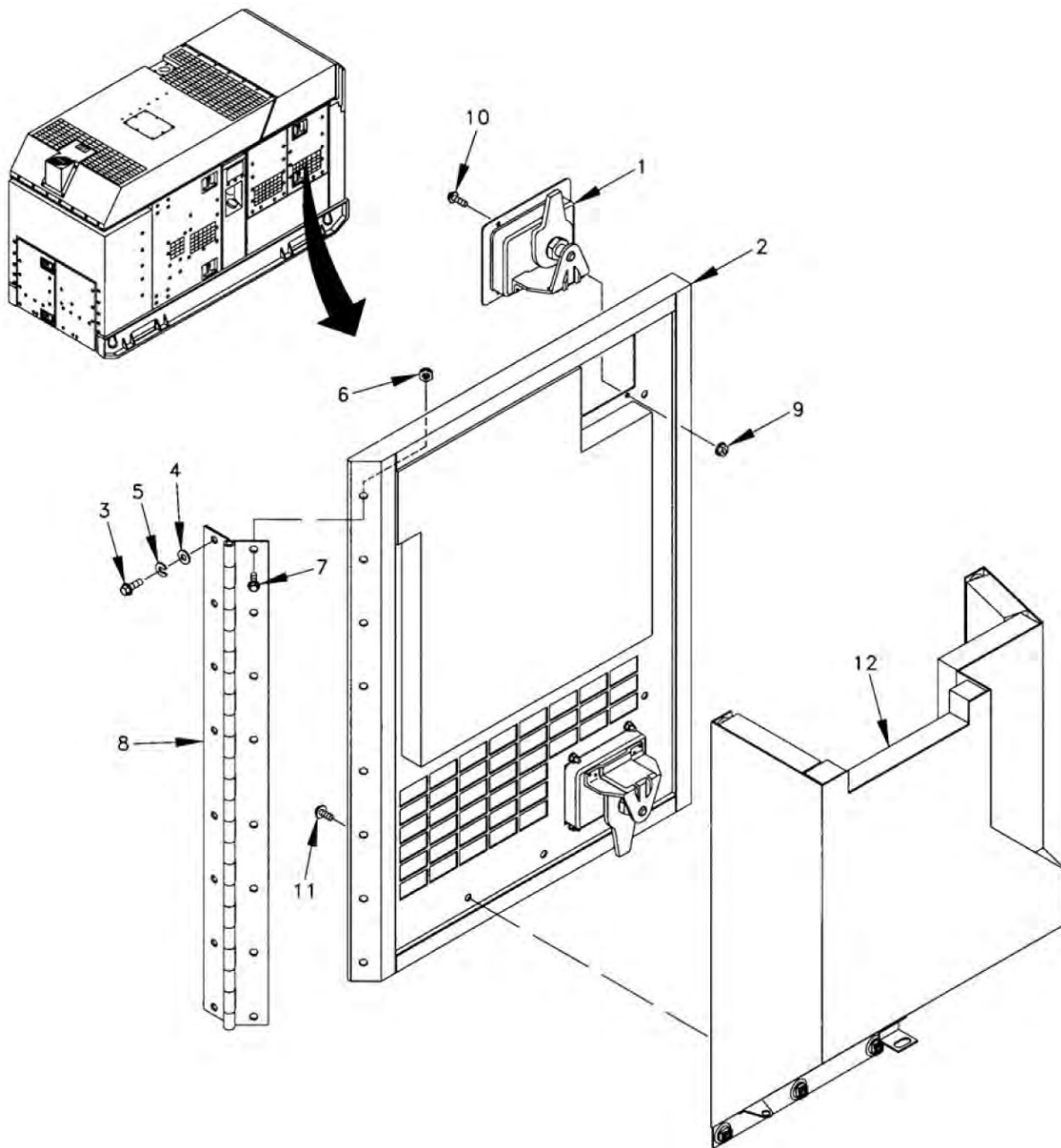


Figure 1. Left Rear Door Assembly (Latch).

## 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 lock washers (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**



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**MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****LOAD BOARD DOOR ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 12)  
Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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**

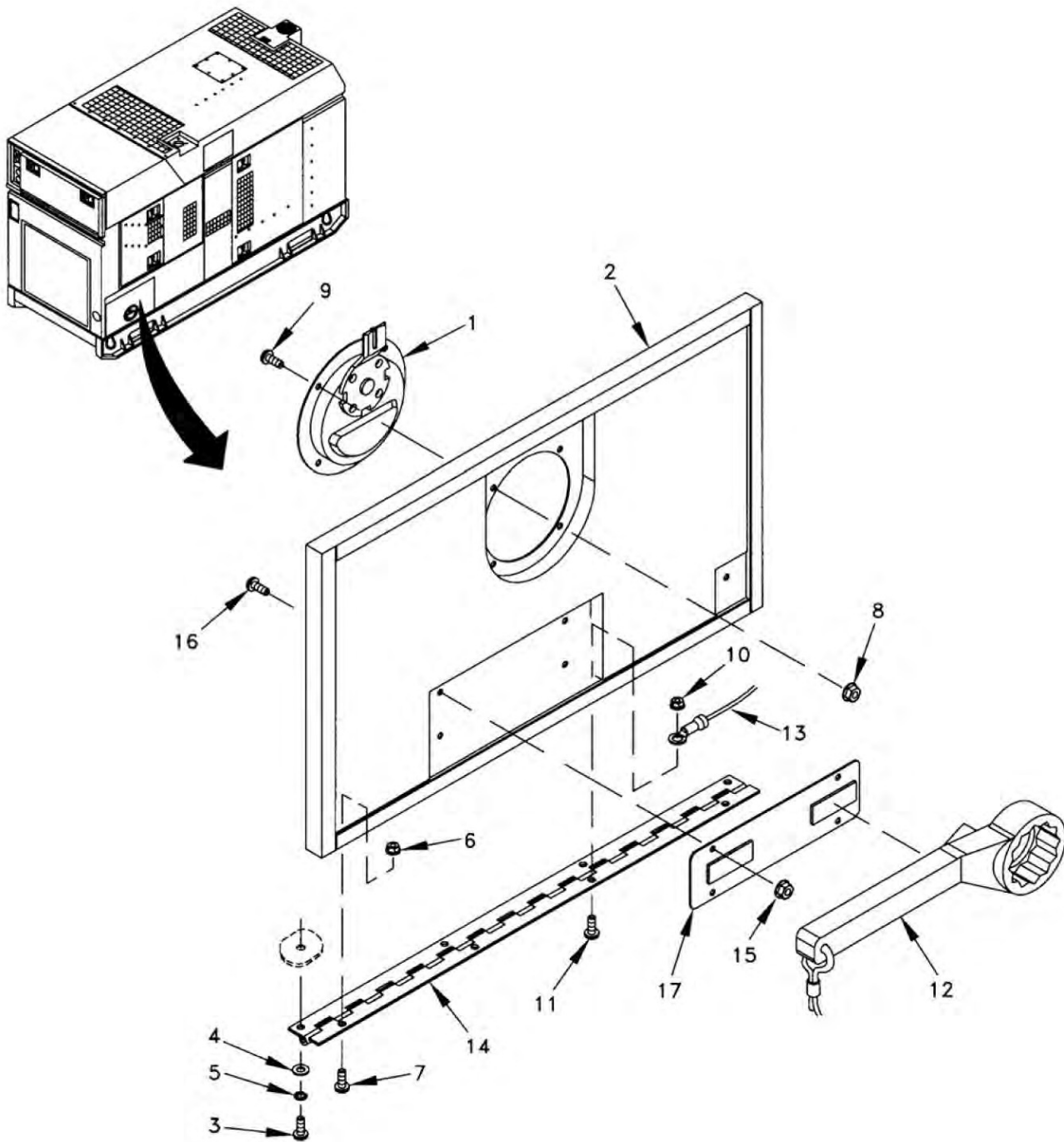
High voltage is produced when the generator set is in operation. Never attempt to start or maintain the generator set unless it is properly grounded. Failure to comply can cause injury or death to personnel.

**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), lock washers (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).



**Figure 1. Load Board Door Assembly.**

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 lock washers (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**



**MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****RIGHT FRONT DOOR ASSEMBLY (LATCH): REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 12)  
Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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**

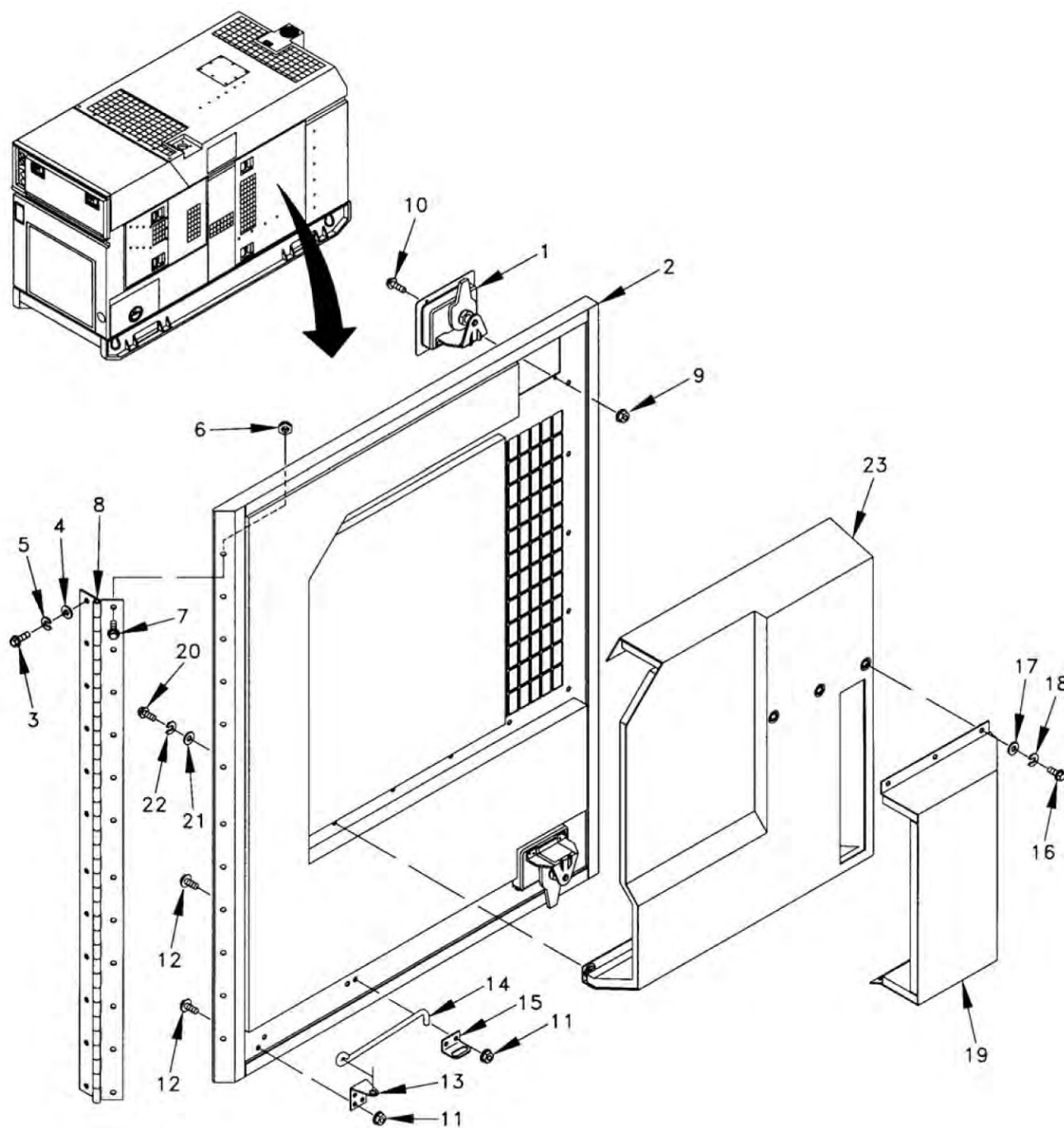
High voltage is produced when the generator set is in operation. Never attempt to start or maintain the generator set unless it is properly grounded. Failure to comply can cause injury or death to personnel.

**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), lock washers (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).



**Figure 1. Right Front Door Assembly (Latch).**

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), lock washers (Figure 1, Item 18), and deflector (Figure 1, Item 19).
5. Remove twelve screws (Figure 1, Item 20), washers (Figure 1, Item 21), lock washers (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 lock washers (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 lock washers (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 lock washers (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**



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**MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****RIGHT REAR DOOR ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMKT) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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**

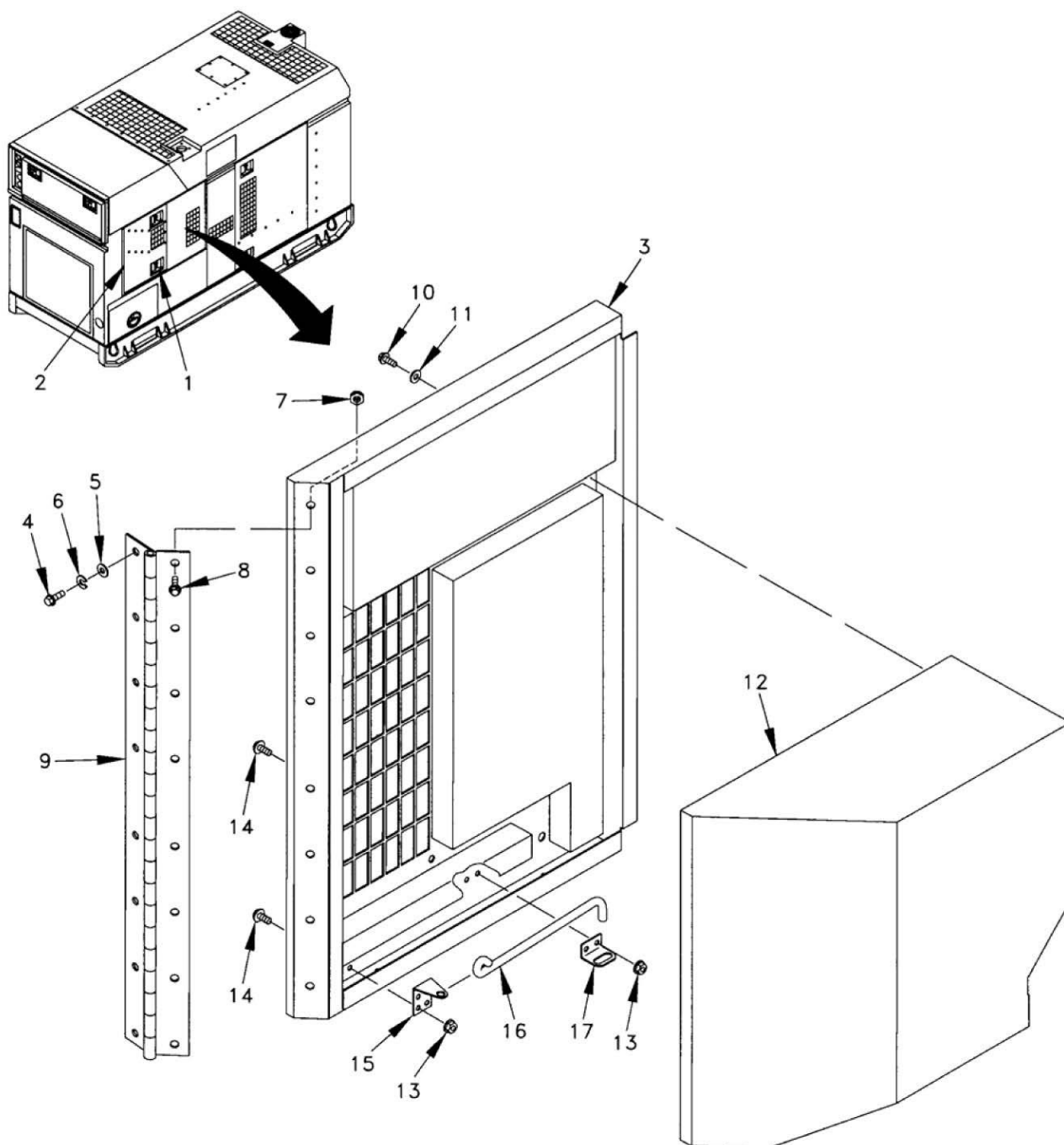
High voltage is produced when the generator set is in operation. Never attempt to start or maintain the generator set unless it is properly grounded. Failure to comply can cause injury or death to personnel.

**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), lock washers (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).



**Figure 1. Right Rear Door Assembly.**

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 lock washers (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**



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**MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****RIGHT REAR DOOR ASSEMBLY (LATCH): REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 12)  
Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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**

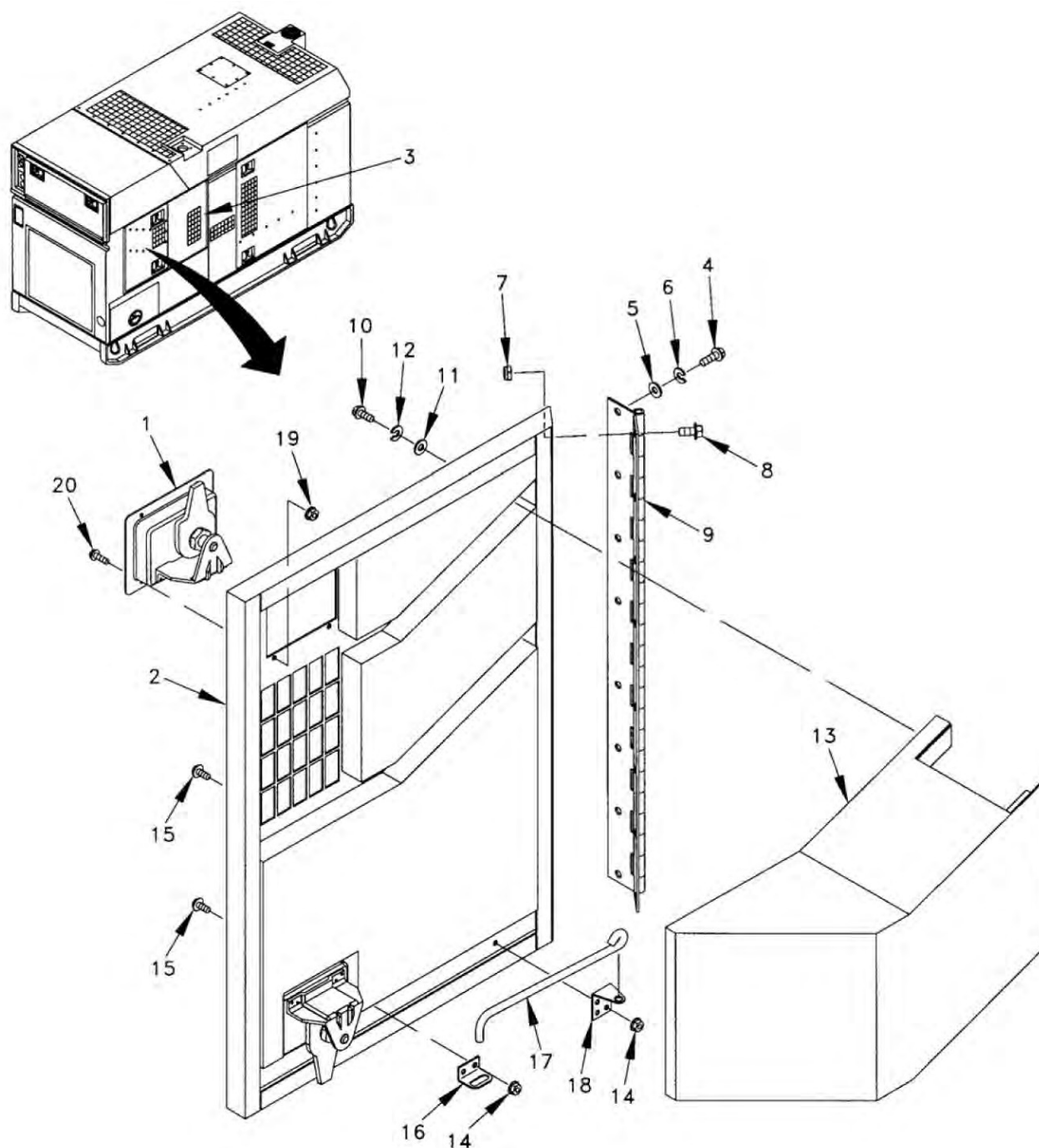
High voltage is produced when the generator set is in operation. Never attempt to start or maintain the generator set unless it is properly grounded. Failure to comply can cause injury or death to personnel.

**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), lock washers (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), lock washers (Figure 1, Item 12), and duct (Figure 1, Item 13).



**Figure 1. Right Rear Door Assembly (Latch).**

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 lock washers (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 4), washers (Figure 1, Item 5), and lock washers (Figure 1, Item 6).
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**



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****ACCESS COVERS: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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.

**REMOVAL**

1. Remove four screws (Figure 1, Item 1), lock washers (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), lock washers (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.

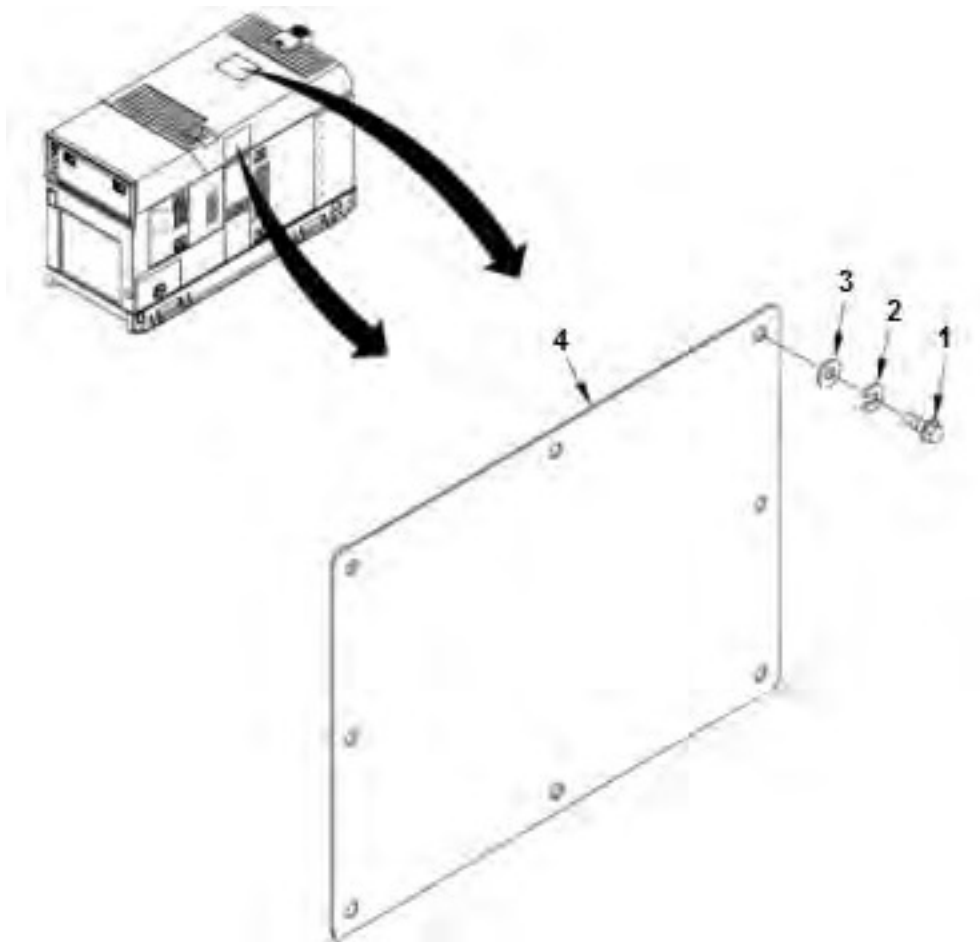
**END OF TASK**

**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), lock washers (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), lock washers (Figure 1, Item 2), and screws (Figure 1, Item 1).



**Figure 1. Access Covers.**

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****FRONT ROOF SECTION HOUSING ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 14)  
Foam damping sheet (WP 0123, Table 1, Item 16)  
Foam damping sheet (WP 0123, Table 1, Item 17)

**Personnel Required**

Two

**References**

TM 9-6115-729-24P

**Equipment Condition**

Access covers removed (WP 0027)  
Engine Control Switch in OFF/RESET position  
Battery Disconnect Switch to OFF  
Dead Crank Switch to OFF

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**WARNING**

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**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**

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**

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), lock washers (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 lock washers (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

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), lock washers (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), lock washers (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).

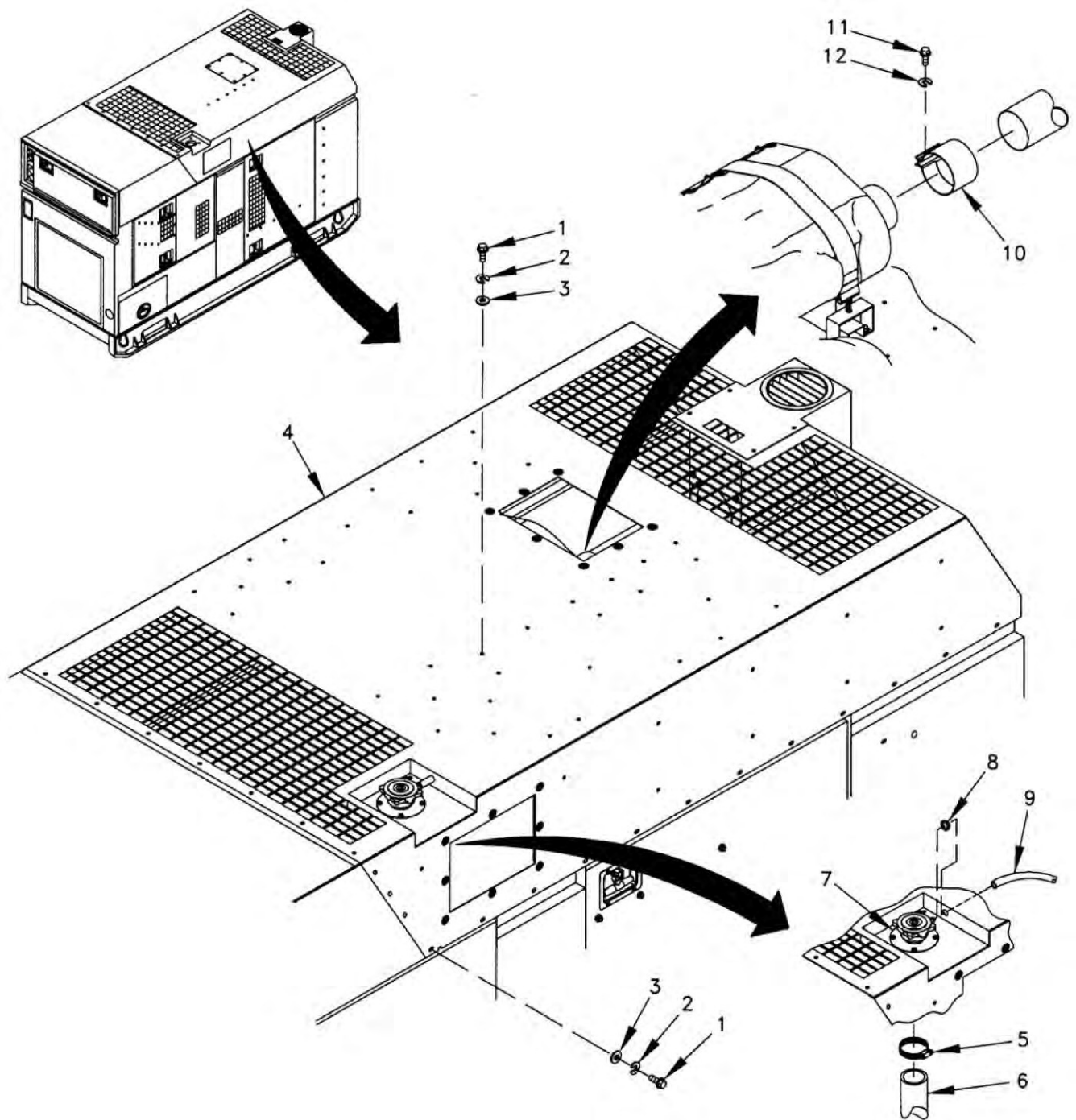


Figure 1. Front Roof Section Housing Assembly (Sheet 1 of 2).

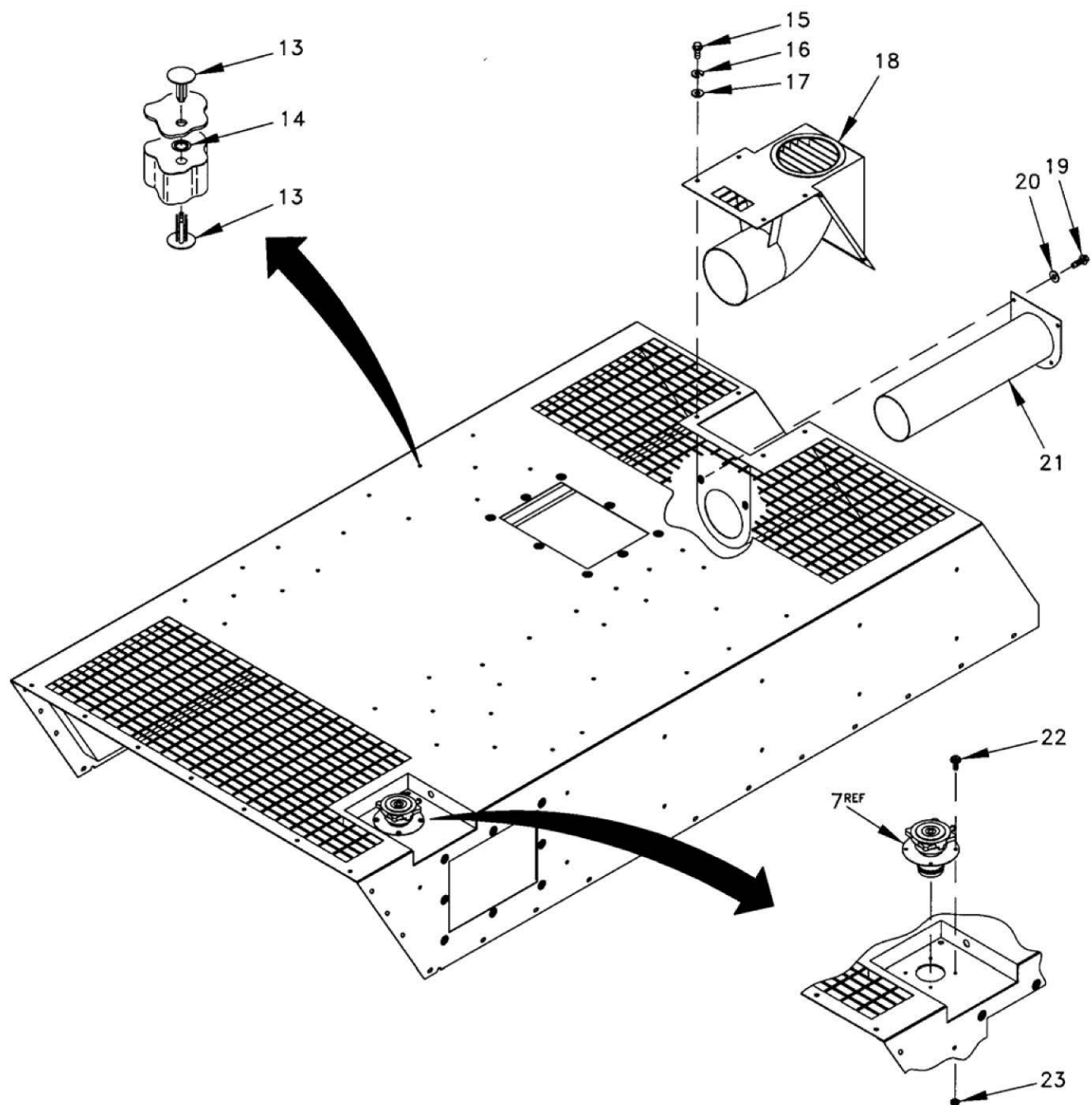


Figure 1. Front Roof Section Housing Assembly (Sheet 2 of 2).

## END OF TASK

## ASSEMBLY

1. Install four screws (Figure 1, Sheet 2, 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, Sheet 1, Item 4) with four screws (Figure 1, Sheet 2, Item 19), and lock washers (Figure 1, Item 20).

3. Install exhaust cover (Figure 1, Sheet 2, Item 18) using eight screws (Figure 1, Item 15), lock washers (Figure 1, Item 16) and washers (Figure 1, Item 17) into front roof section (Figure 1, Sheet 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, Sheet 2, 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 2, Item 21) 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), lock washers (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 lock washers (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 4) and connect hose to coolant filler neck (Figure 1, Sheet 1, Item 7) tighten clamp (Figure 1, Sheet 1, Item 5).
7. Install access covers (WP 0027).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****REAR ROOF SECTION HOUSING ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 14)  
Foam damping sheet (WP 0123, Table 1, Item 16)  
Foam damping sheet (WP 0123, Table 1, Item 17)

**Personnel Required**

Two

**References**

TM 9-6115-729-24P

**Equipment Condition**

Front roof section housing assembly removed (WP 0028)

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**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.

**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**

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.

**REMOVAL**

1. Remove 18 screws (Figure 1, Sheet 1, Item 1), lock washers (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), lock washers (Figure 1, Sheet 1, Item 6), and washers (Figure 1, Sheet 1, Item 7).

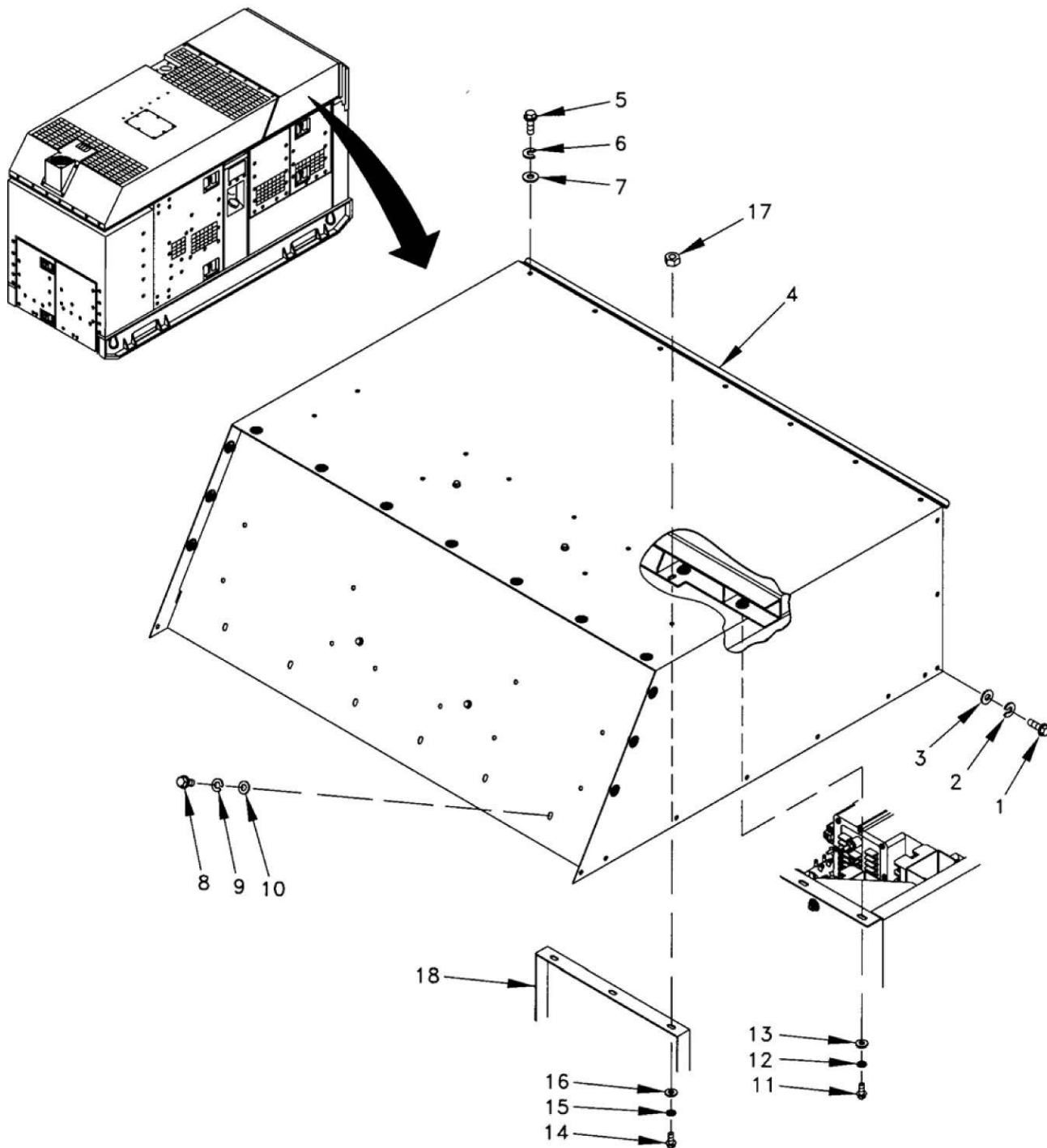
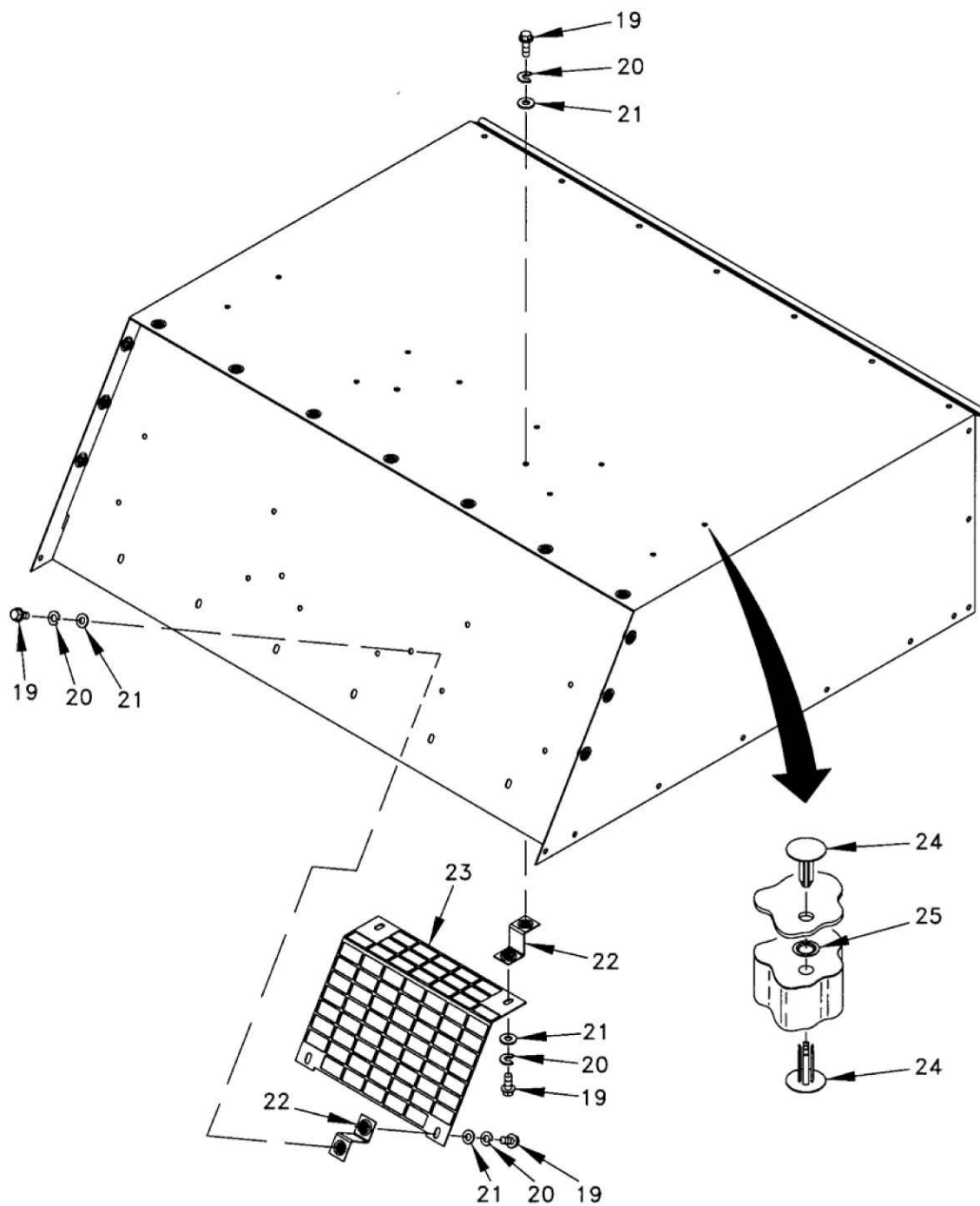


Figure 1. Rear Roof Section Housing Assembly (Sheet 1 of 2).





**Figure 1. Rear Roof Section Housing Assembly (Sheet 2 of 2).**

3. Remove six screws (Figure 1, Sheet 1, Item 8), lock washers (Figure 1, Sheet 1, Item 9), and washers (Figure 1, Sheet 1, Item 10).
4. Remove seven screws (Figure 1, Sheet 1, Item 11), lock washers (Figure 1, Sheet 1, Item 12), and washers (Figure 1, Sheet 1, Item 13).
5. Remove three screws (Figure 1, Sheet 1, Item 14), lock washers (Figure 1, Sheet 1, Item 15), washers (Figure 1, Sheet 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), lock washers (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 76 clips (Figure 1, Sheet 2, Item 24), 38 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, 38 push-on nuts (Figure 1, Sheet 2, Item 25), and 76 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), lock washers (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), lock washers (Figure 1, Sheet 1, Item 15), washers (Figure 1, Sheet 1, Item 16) through air cleaner bracket (Figure 1, Sheet 1, Item 18) and secure with three nuts (Figure 1, Sheet 1, Item 17).
3. Install seven screws (Figure 1, Sheet 1, Item 11), lock washers (Figure 1, Sheet 1, Item 12), and washers (Figure 1, Sheet 1, Item 13).
4. Install six screws (Figure 1, Sheet 1, Item 8), lock washers (Figure 1, Sheet 1, Item 9), and washers (Figure 1, Sheet 1, Item 10).
5. Install seven screws (Figure 1, Sheet 1, Item 5), lock washers (Figure 1, Sheet 1, Item 6), and washers (Figure 1, Sheet 1, Item 7).
6. Install 18 screws (Figure 1, Sheet 1, Item 1), lock washers (Figure 1, Sheet 1, Item 2), and washers (Figure 1, Sheet 1, Item 3).
7. Install front roof section housing assembly (WP 0028).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****ENGINE GENERATOR COMPARTMENT CEILING ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

Two

**References**

TM 9-6115-729-24P

**Equipment Condition**

Front roof section housing assembly removed (WP 0028)  
Rear roof section housing assembly removed (WP 0029)  
Exhaust system removed (WP 0067)

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**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.

**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**

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**

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), lock washers (Figure 1, Item 2), and washers (Figure 1, Item 3).
2. Remove 46 screws (Figure 1, Item 5), lock washers (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), lock washers (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), lock washers (Figure 1, Item 14), washers (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), lock washers (Figure 1, Item 19), washers (Figure 1, Item 20), nuts (Figure 1, Item 21) and bracket (Figure 1, Item 22).
2. If necessary, remove 86 clips (Figure 1, Item 23), 43 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, 43 push-on nuts (Figure 1, Item 24), and 86 clips (Figure 1, Item 23).
2. Install bracket (Figure 1, Item 22) using five screws (Figure 1, Item 18), lock washers (Figure 1, Item 19), washers (Figure 1, Item 20), and nuts (Figure 1, Item 21).

**NOTE**

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.

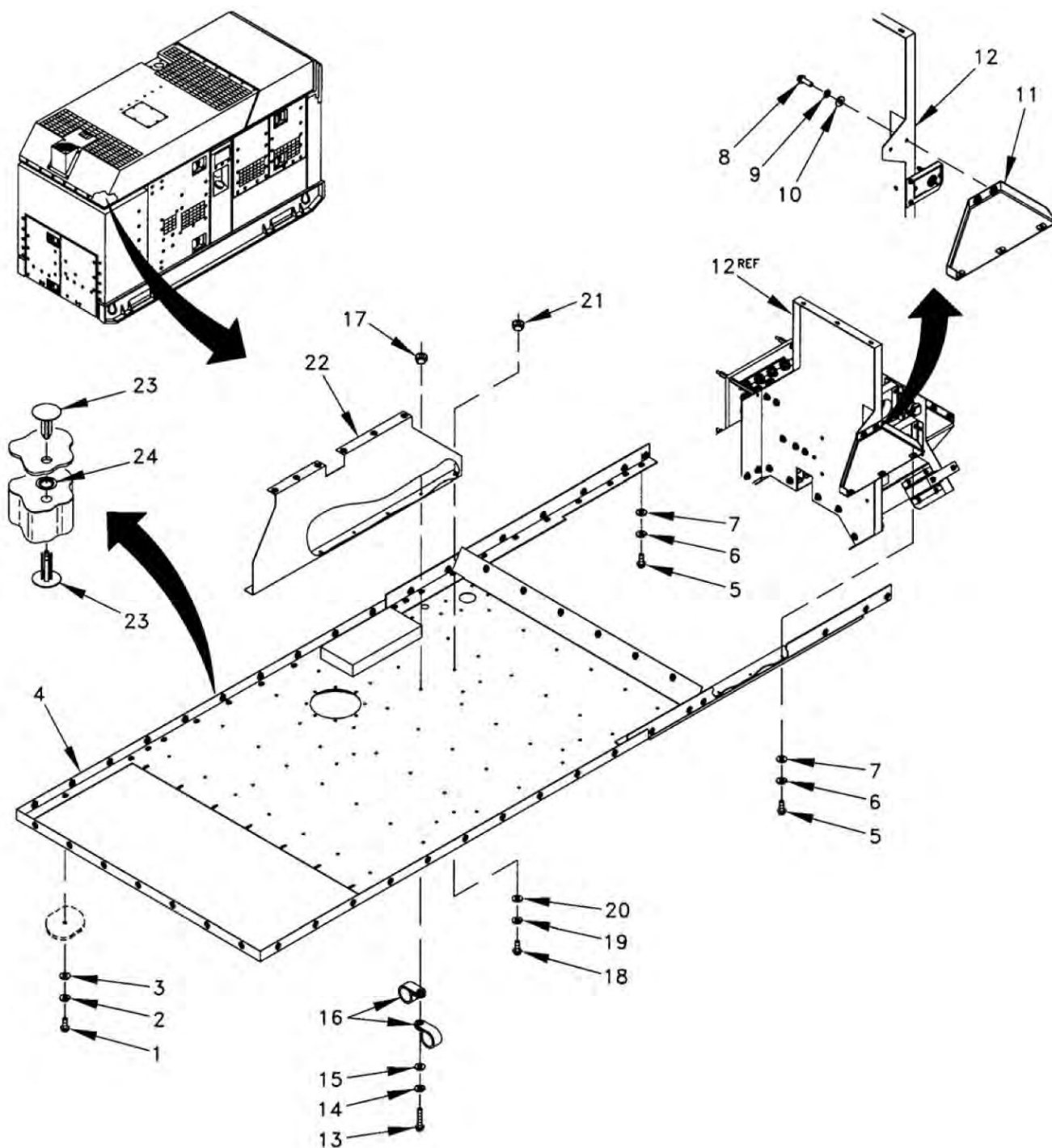


Figure 1. Engine Generator Compartment Ceiling Assembly.

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), lock washers (Figure 1, Item 14), washers (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), lock washers (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), lock washers (Figure 1, Item 6), and washers (Figure 1, Item 7) from (23 sets on each side).
5. Install seven screws (Figure 1, Item 1), lock washers (Figure 1, Item 2), and washers (Figure 1, Item 3).
6. Install exhaust system (WP 0067).
7. Install rear roof section housing assembly (WP 0029).
8. Install front roof section housing assembly (WP 0028).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****GENERATOR ACCESS COVER ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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.

**REMOVAL**

Remove 20 screws (Figure 1, Item 1), washers (Figure 1, Item 2), lock washers (Figure 1, Item 3), and generator access cover assembly (Figure 1, Item 4).

**END OF TASK****DISASSEMBLY**

Remove foam damping section as required.

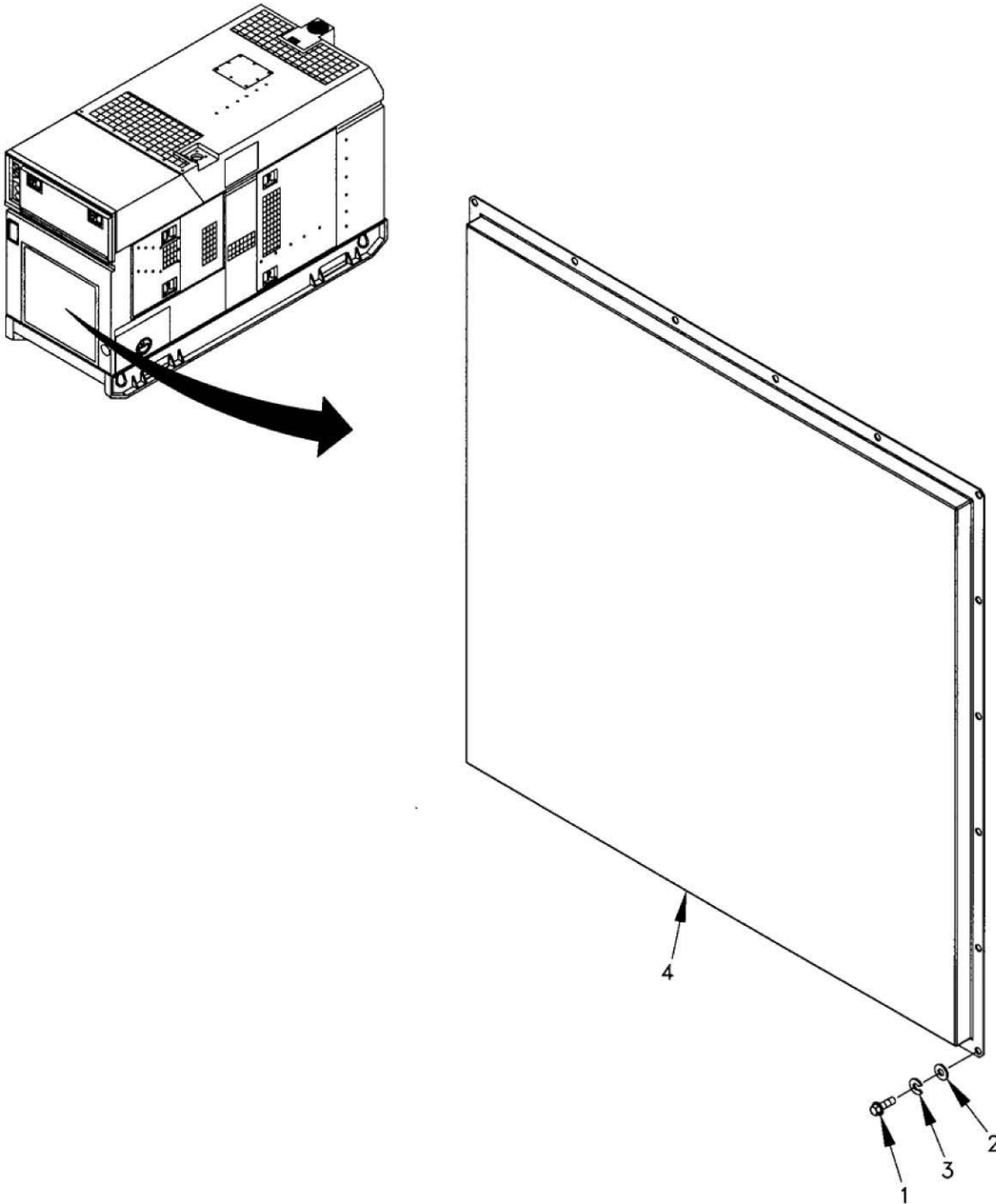
**END OF TASK****ASSEMBLY**

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**

1. Install generator access cover assembly (Figure 1, Item 4) and secure with 20 lock washers (Figure 1, Item 3), washers (Figure 1, Item 2), and screws (Figure 1, Item 1).



**Figure 1. Generator Access Cover Assembly.**

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****FRONT SECTION HOUSING ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)  
Foam damping sheet (WP 0123, Table 1, Item 14)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

**Equipment Condition**

Right battery access door assembly removed (WP 0017)  
Left battery access door assembly removed (WP 0018)  
Front roof section housing removed (WP 0028)  
Engine generator compartment ceiling removed (WP 0030)  
Right front door assembly (latch) removed (WP 0024)  
Left front door assembly (latch) removed (WP 0020)  
Batteries removed (WP 0048)  
Battery disconnect switch removed (WP 0049)  
Slave receptacle removed (WP 0052)  
Winterization heater assembly removed, if applicable (WP 0116)

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**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.

**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.

**REMOVAL**

1. Remove four screws (Figure 1, Sheet 1, Item 1), lock washers (Figure 1, Sheet 1, Item 2), washers (Figure 1, Sheet 1, Item 3), and nuts (Figure 1, Sheet 1, Item 4).

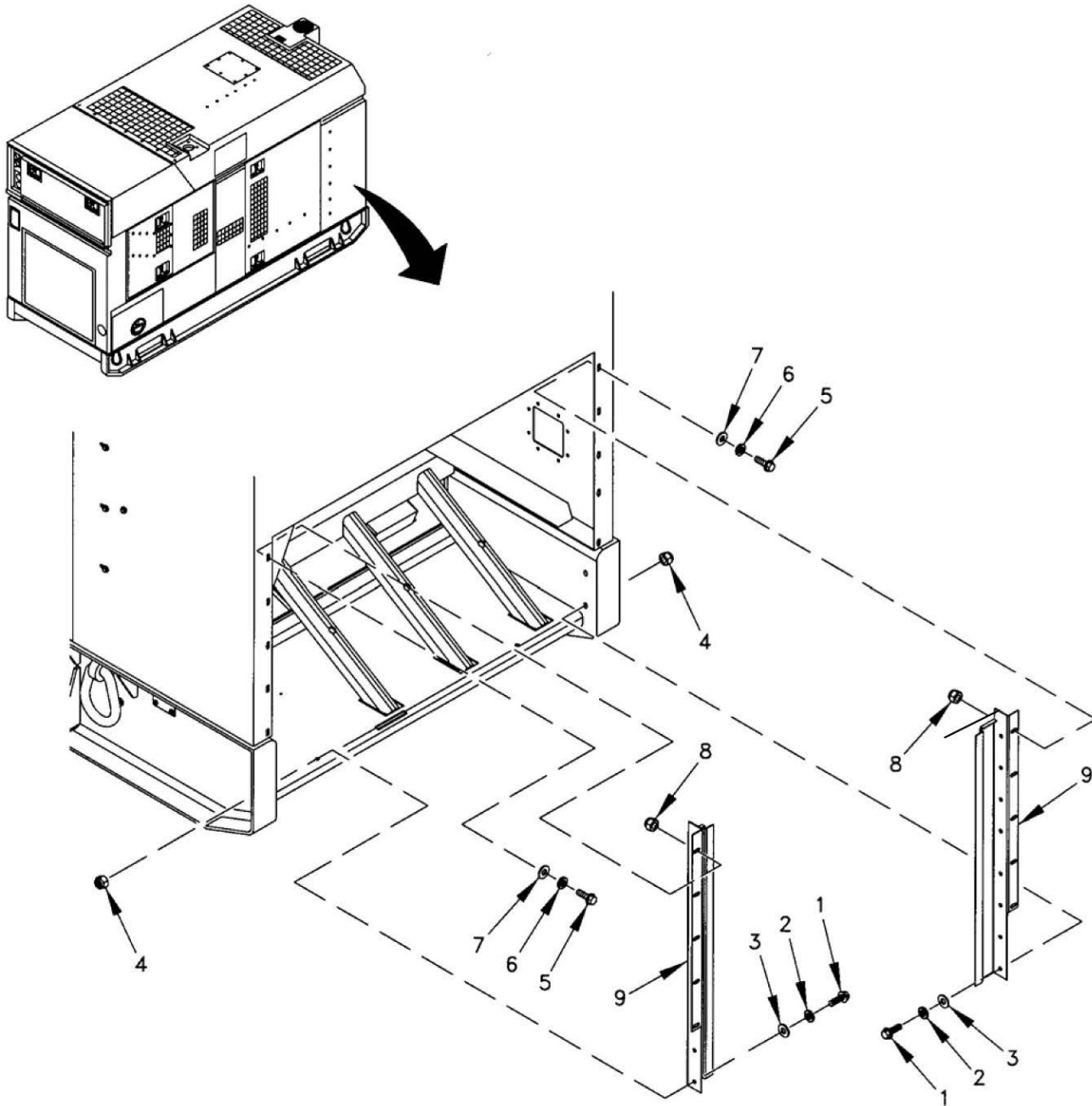
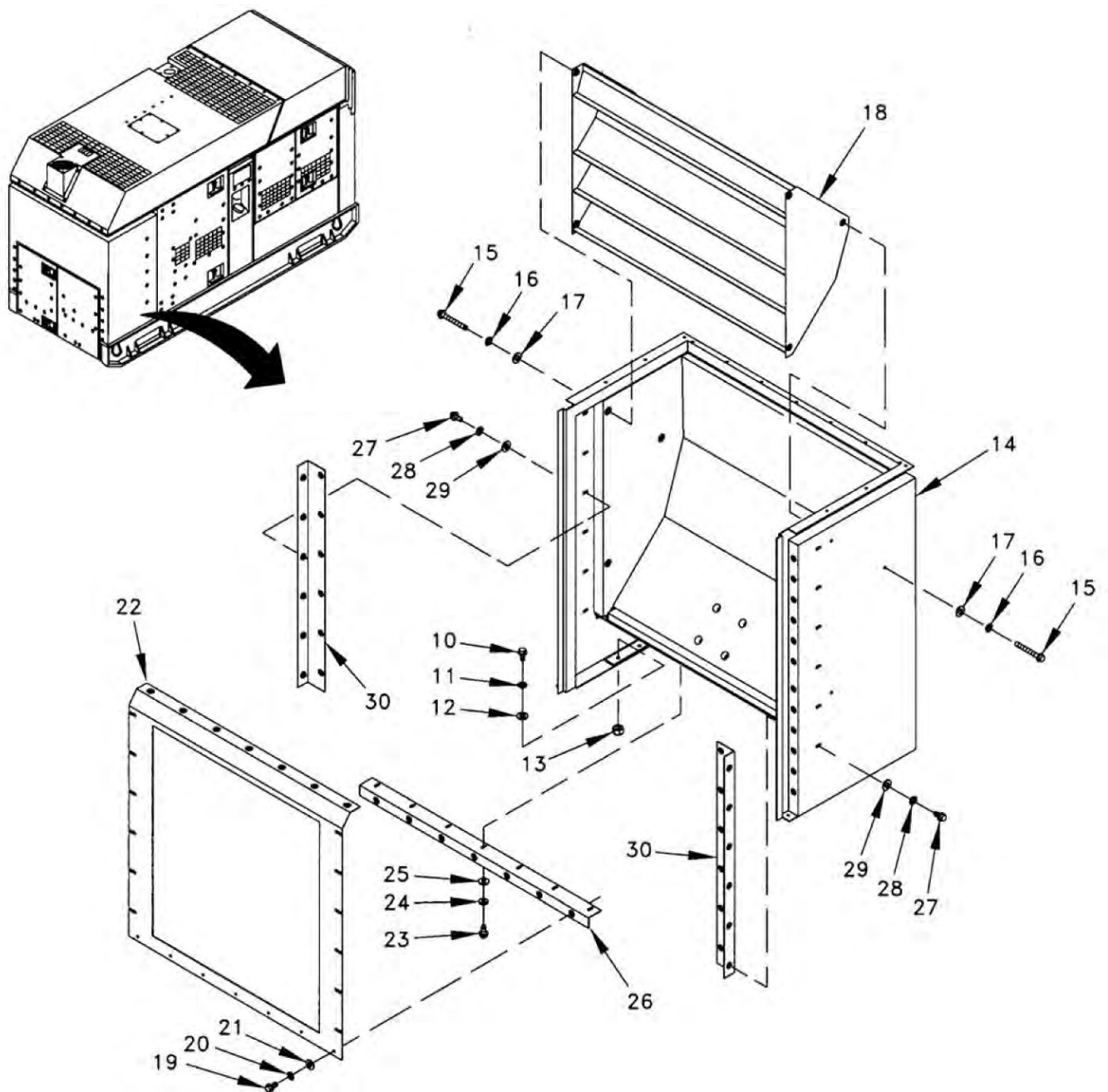


Figure 1. Front Section Housing Assembly (Sheet 1 of 2).



**Figure 1. Front Section Housing Assembly (Sheet 2 of 2).**

2. Remove six screws (Figure 1, Sheet 2, Item 10), lock washers (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), lock washers (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), lock washers (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), lock washers (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), lock washers (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), lock washers (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), lock washers (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), lock washers (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), lock washers (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), lock washers (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), lock washers (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), lock washers (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), lock washers (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 0030).
4. Install front roof section housing (WP 0028).
5. Install battery disconnect switch (WP 0049).
6. Install slave receptacle (WP 0052).
7. Install batteries (WP 0048).
8. Install winterization heater assembly, if removed (WP 0116).

9. Install right front door assembly (latch) (WP 0024).
10. Install left front door assembly (latch) (WP 0020).
11. Install left battery access door assembly (WP 0018).
12. Install right battery access door assembly (WP 0017).

**END OF TASK**

**END OF WORK PACKAGE**



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****REAR SECTION HOUSING ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

**Equipment Condition**

Control box assembly removed (WP 0040)  
Generator access cover assembly removed (WP 0031)  
Left rear door assembly (latch) removed (WP 0022)  
Right rear door assembly (latch) removed (WP 0026)  
Winterization heater control box assembly removed, if applicable (WP 0115)  
Rear roof section housing assembly removed (WP 0029)  
Potential transformers PT2 and PT3 removed (WP 0051)

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**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.

**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.

**REMOVAL**

1. Remove three screws (Figure 1, Item 1), lock washers (Figure 1, Item 2), and washers (Figure 1, Item 3).
2. Remove two screws (Figure 1, Item 4), lock washer (Figure 1, Item 5), and washer (Figure 1, Item 6).
3. Remove six screws (Figure 1, Item 7), lock washers (Figure 1, Item 8), and washers Figure 1, Item 9).

4. Remove four screws (Figure 1, Item 10), lock washers (Figure 1, Item 11), and washers (Figure 1, Item 12) and rear section housing assembly (Figure 1, Item 13).

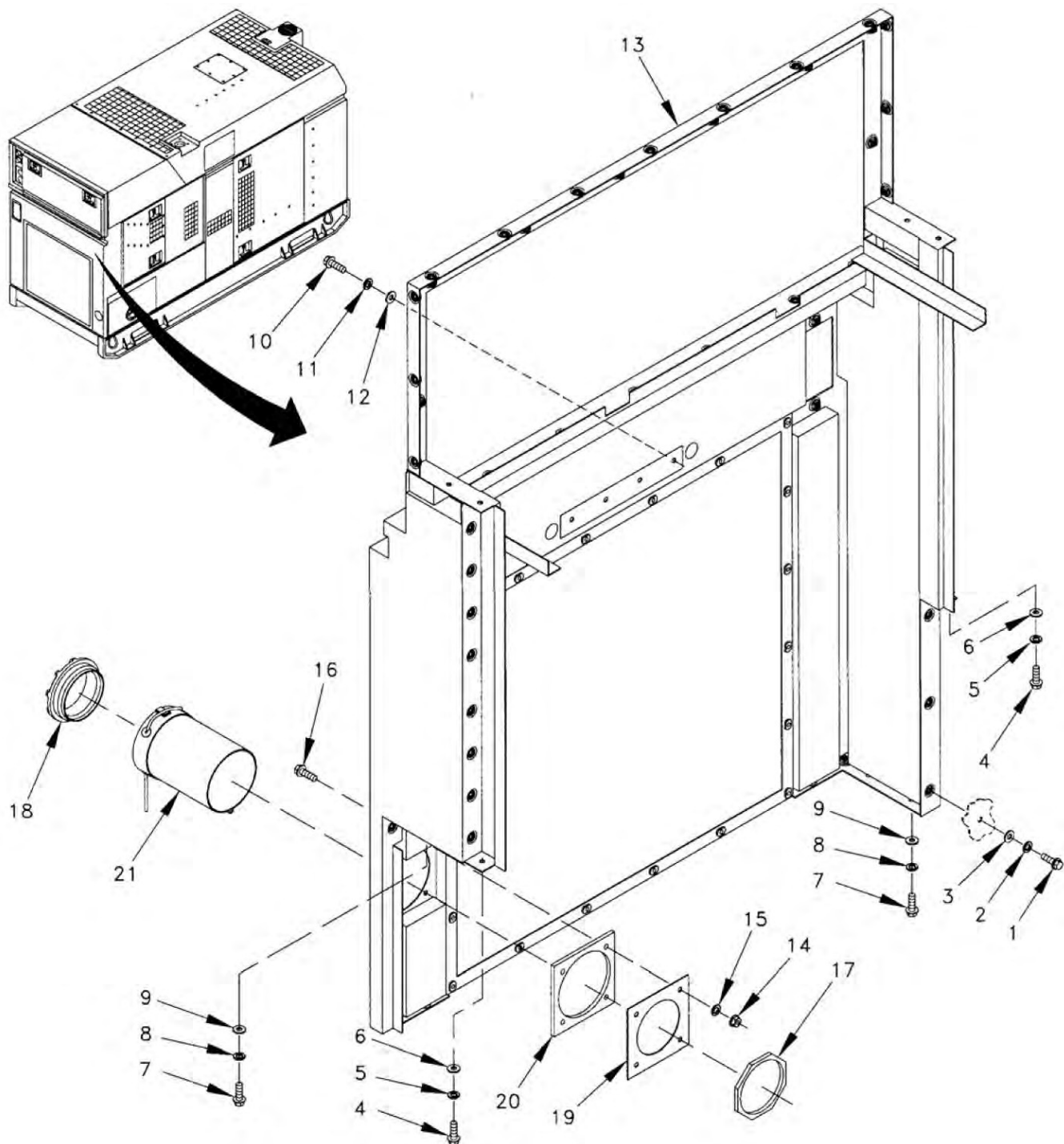


Figure 1. Rear Section Housing Assembly.

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), lock washers (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), lock washers (Figure 1, Item 8), and washers Figure 1, Item 9).
4. Install two screws (Figure 1, Item 4), lock washer (Figure 1, Item 5), and washer (Figure 1, Item 6).
5. Install three screws (Figure 1, Item 1), lock washers (Figure 1, Item 2), and washers (Figure 1, Item 3).
6. If removed, install winterization heater control box assembly (WP 0115).
7. Install generator access cover assembly (WP 0031).
8. Install control box assembly (WP 0040).
9. Install rear roof section housing assembly (WP 0029).
10. Install potential transformers PT2 and PT3 (WP 0051).
11. Install left rear door assembly (latch) (WP 0022).
12. Install right rear door assembly (latch) (WP 0026).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****LEFT CENTER PANEL ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 12)  
Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

**Equipment Condition**

Left rear door assembly removed (WP 0021)  
Left rear panel assembly removed (WP 0037)

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**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.

**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.

**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 fuel filler neck pocket (Figure 1, item 4).
2. Remove three screws (Figure 1, item 5), lock washers (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), lock washers (Figure 1, Item 9), washers (Figure 1, Item 10), and left center panel assembly (Figure 1, Item 3).
4. Remove two screws (Figure 1, Item 18), lock washers (Figure 1, Item 19), and washers (Figure 1, Item 20).

**END OF TASK**

**100 kW Drain Guard Installation Instructions.****REMOVAL**

Remove bolts and washers (Figure 1, Items 18, 19, 20, and WP 0037, Figure 1, Items 4, 5, 6).

**END OF TASK****INSTALLATION**

Align drain guard with holes indicated and install bolts and washers (Figure 1, Items 18, 19, 20, and WP 0037, Figure 1, Items 4, 5, 6).

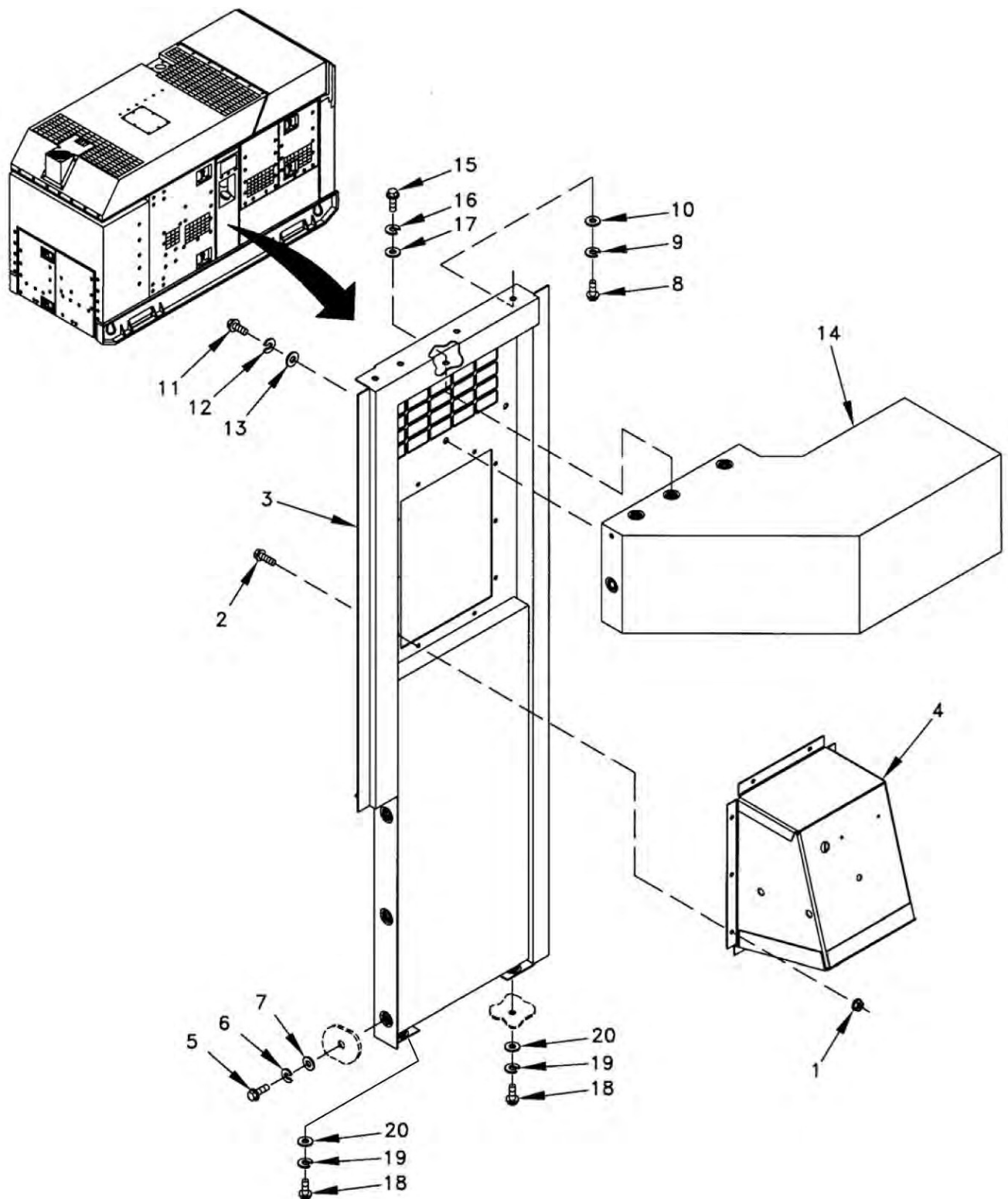


Figure 1. Left Center Panel Assembly.

END OF TASK

**DISASSEMBLY**

1. Remove four screws (Figure 1, Item 11), lock washers (Figure 1, Item 12), and washers (Figure 1, Item 13), from duct (Figure 1, Item 14).
2. Remove four screws (Figure 1, Item 15), lock washers (Figure 1, Item 16), and washers (Figure 1, Item 17), from 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), lock washers (Figure 1, Item 16), and screws (Figure 1, Item 15).
3. Install four washers (Figure 1, Item 13), lock washers (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), lock washers (Figure 1, Item 9), and screws (Figure 1, Item 8).
2. Install two washers (Figure 1, Item 20), lock washers (Figure 1, Item 19), and screws (Figure 1, Item 18).
3. Install three washers (Figure 1, Item 7), lock washers (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 0021).
6. Install left rear panel assembly (WP 0037).

**END OF TASK****END OF WORK PACKAGE**

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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****RIGHT CENTER PANEL ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 12)  
Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

**Equipment Condition**

Right rear panel assembly removed (WP 0036)  
Right front door assembly (latch) removed (WP 0024)  
Coolant recovery system removed (WP 0062)

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**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.

**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.

**REMOVAL**

Remove two screws (Figure 1, Item 1), five screws (Figure 1, Item 2), seven washers (Figure 1, Item 3), seven lock washers (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).
3. Remove six foam damping sections if required.

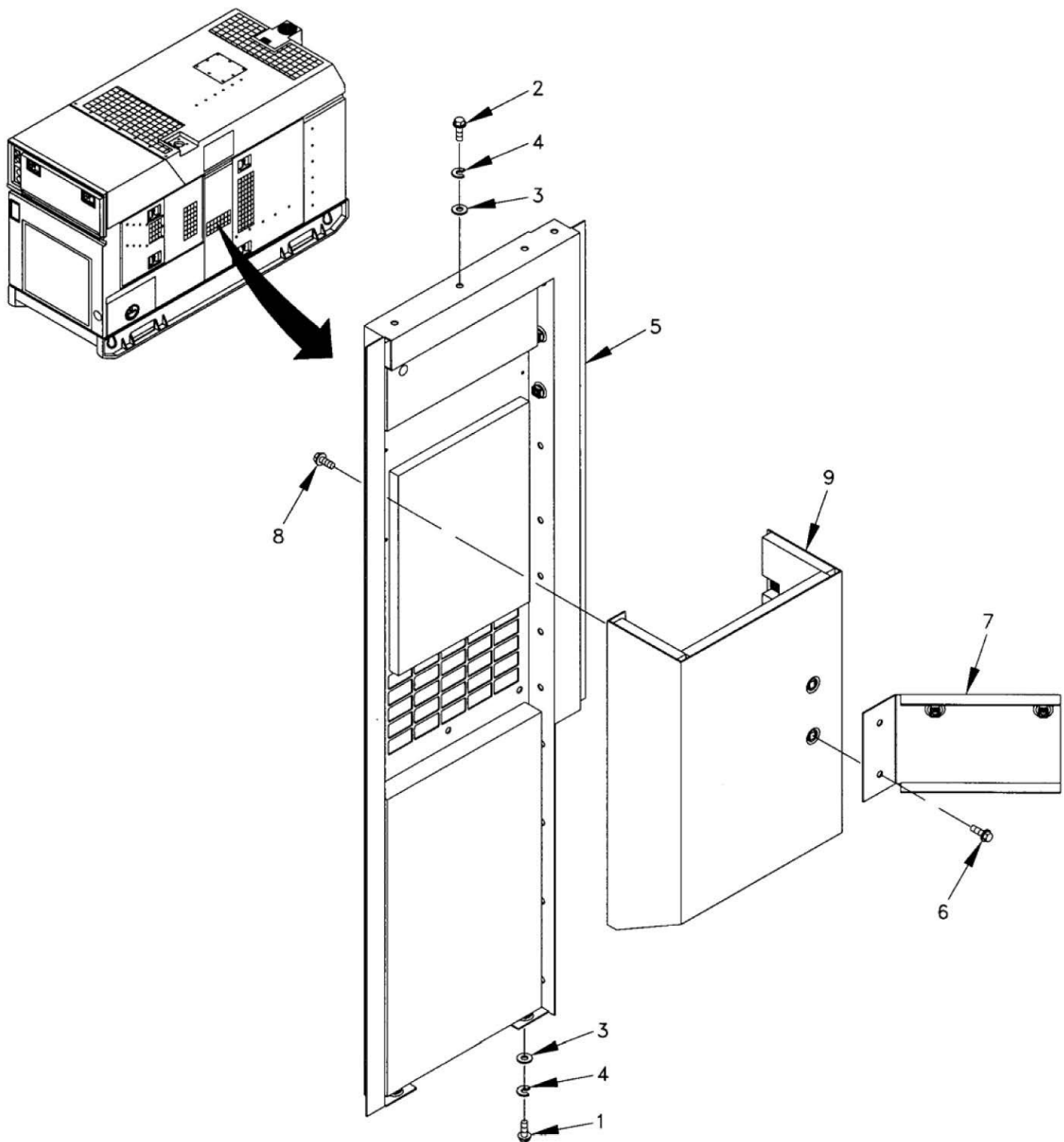


Figure 1. Right Center Panel Assembly.

#### 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 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 lock washers (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 0062).
3. Install right front door assembly (latch) (WP 0024).
4. Install right rear panel assembly (WP 0036).

**END OF TASK****END OF WORK PACKAGE**



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****RIGHT REAR PANEL ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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.

**REMOVAL**

Remove three screws (Figure 1, Item 1), five screws (Figure 1, Item 2), eight lock washers (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 lock washers (Figure 1, Item 3), five screws (Figure 1, Item 2), and three screws (Figure 1, Item 1).

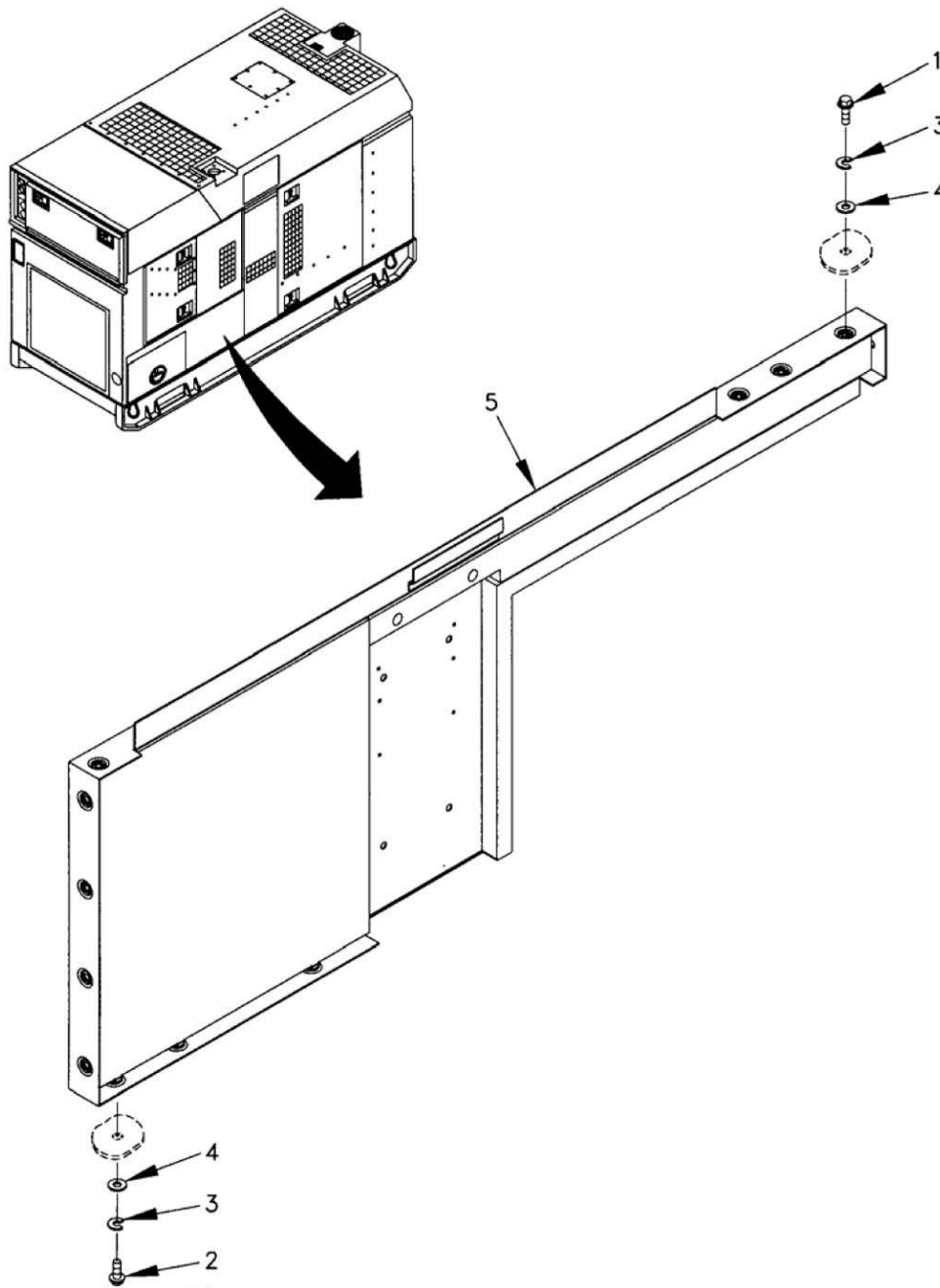


Figure 1. Right Rear Panel Assembly.

END OF TASK

END OF WORK PACKAGE

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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****LEFT REAR PANEL ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Foam damping sheet (WP 0123, Table 1, Item 13)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

**Equipment Condition**

Generator access cover assembly removed (WP 0031)  
Potential transformer removed (WP 0051)

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**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.

**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.

**REMOVAL**

1. Open left rear door assemblies.
2. Remove seven screws (Figure 1, Item 1), lock washers (Figure 1, Item 2), and washers (Figure 1, Item 3).
3. Remove four screws (Figure 1, Item 4), lock washers (Figure 1, Item 5), washers (Figure 1, Item 6) and left rear panel assembly (Figure 1, Item 7).

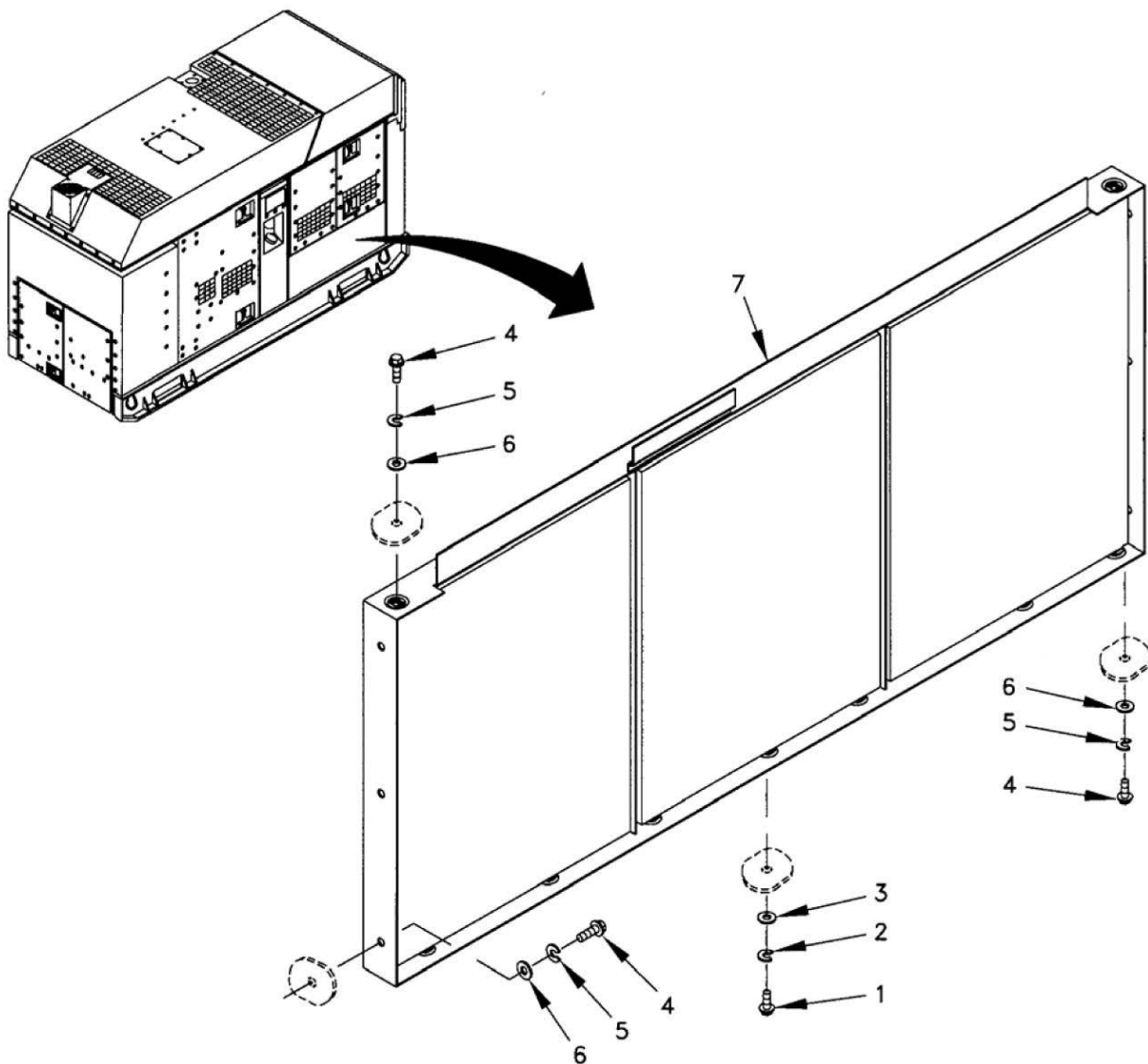


Figure 1. Left Rear Panel Assembly.

**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), lock washers (Figure 1, Item 5), and screws (Figure 1, Item 4).
2. Install seven washers (Figure 1, Item 3), lock washers (Figure 1, Item 2), and screws (Figure 1, Item 1).
3. Install potential transformers (WP 0051).
4. Install generator access cover assembly (WP 0031).
5. Close left rear door assemblies.

**END OF TASK****END OF WORK PACKAGE**





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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****DOOR SUPPORT ASSEMBLY: REMOVAL, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Personnel Required**

One

**References**

TM 9-6115-729-24P

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**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.

**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.

**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 lock washers (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).

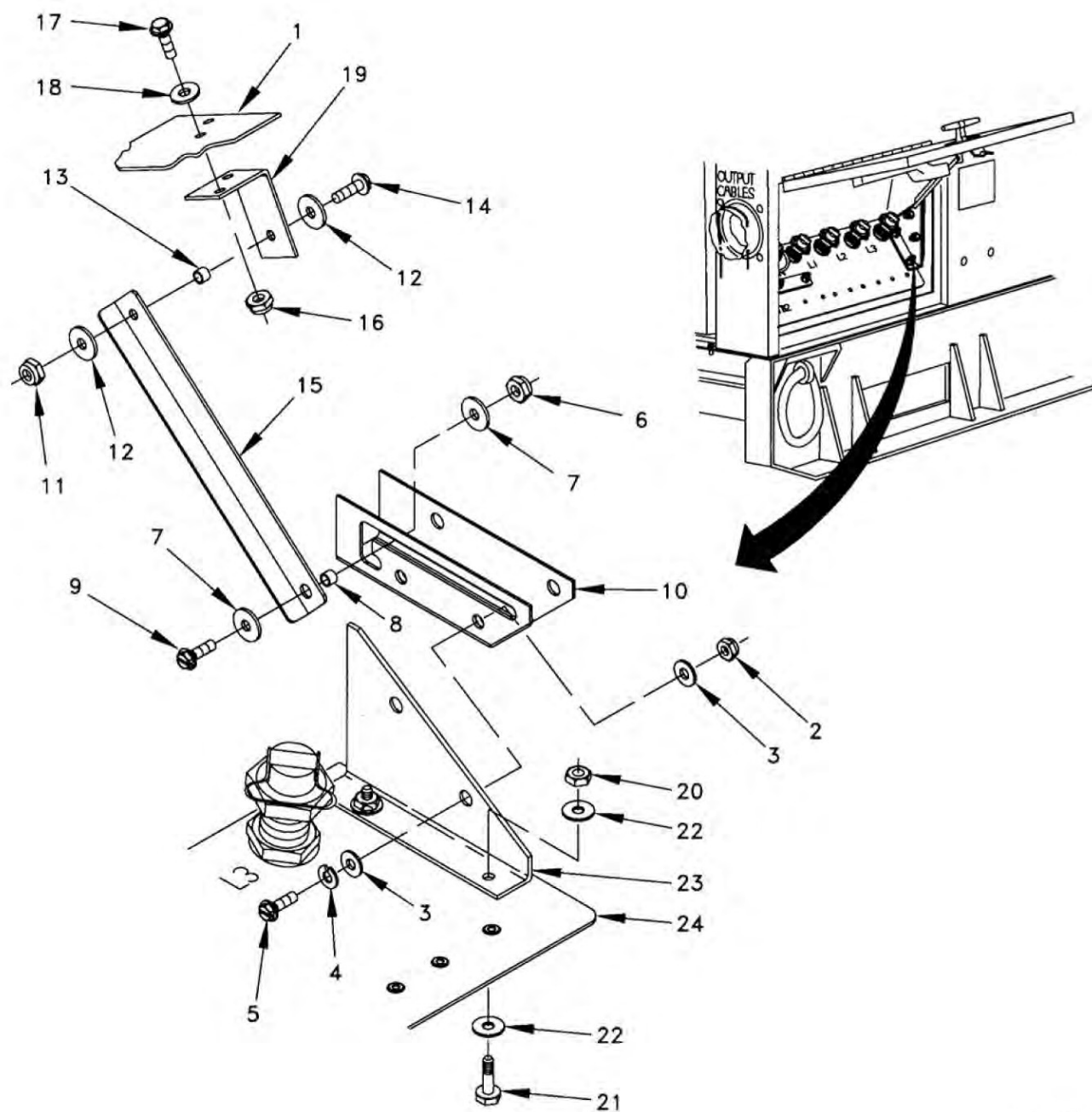


Figure 1. Door Support Assembly.

**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 lock washers (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**



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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****CONTROL BOX PANEL ASSEMBLY: REMOVAL, DISASSEMBLY, TESTING, INSTALLATION**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)  
Multimeter 146-4080

**Materials/Parts**

Sealing compound (WP 0123, Table 1, Item 43)

**Personnel Required**

One

**References**

TM 9-6115-729-24P  
WP 0092

**Equipment Condition**

Generator Set fully stopped  
Engine Control Switch in OFF/RESET Position  
Battery Disconnect Switch set in OFF Position  
Dead Crank Switch set in OFF Position

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**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.

**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**

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 0039 Guide.

NAME	FIGURE ITEM	REMOVAL STEPS	DISASSEMBLY STEPS	ASSEMBLY STEPS	INSTALLATION STEPS	TESTING
Generator Set Control (GSC)	12	1 through 3	1 and 2	20 and 21	1 through 5	-
Alarm Module A2	55	1 through 3	12	10	1 through 4	-
VOLTAGE Adjust Potentiometer	73	16	-	-	6	1 through 7
FREQUENCY Adjust Potentiometer	75	16	-	-	6	1 through 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 1, Item 5) to remove control box panel assembly (Figure 1, Sheet 1, Item 4) from hinges (Figure 1, Sheet 1, 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 (Figure 1, Sheet 1, Item 8).

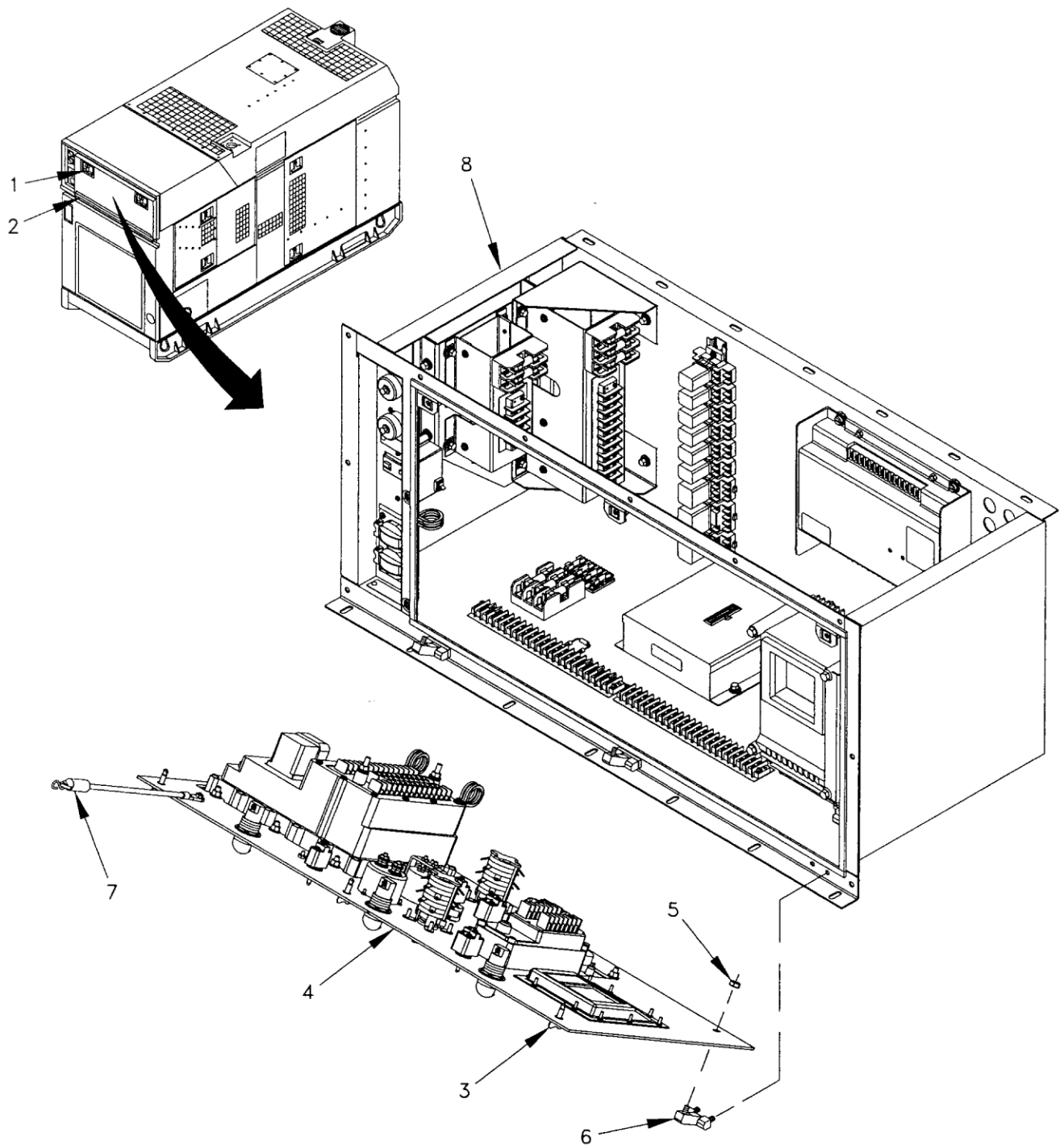


Figure 1. Control Box Panel Assembly (Sheet 1 of 4).

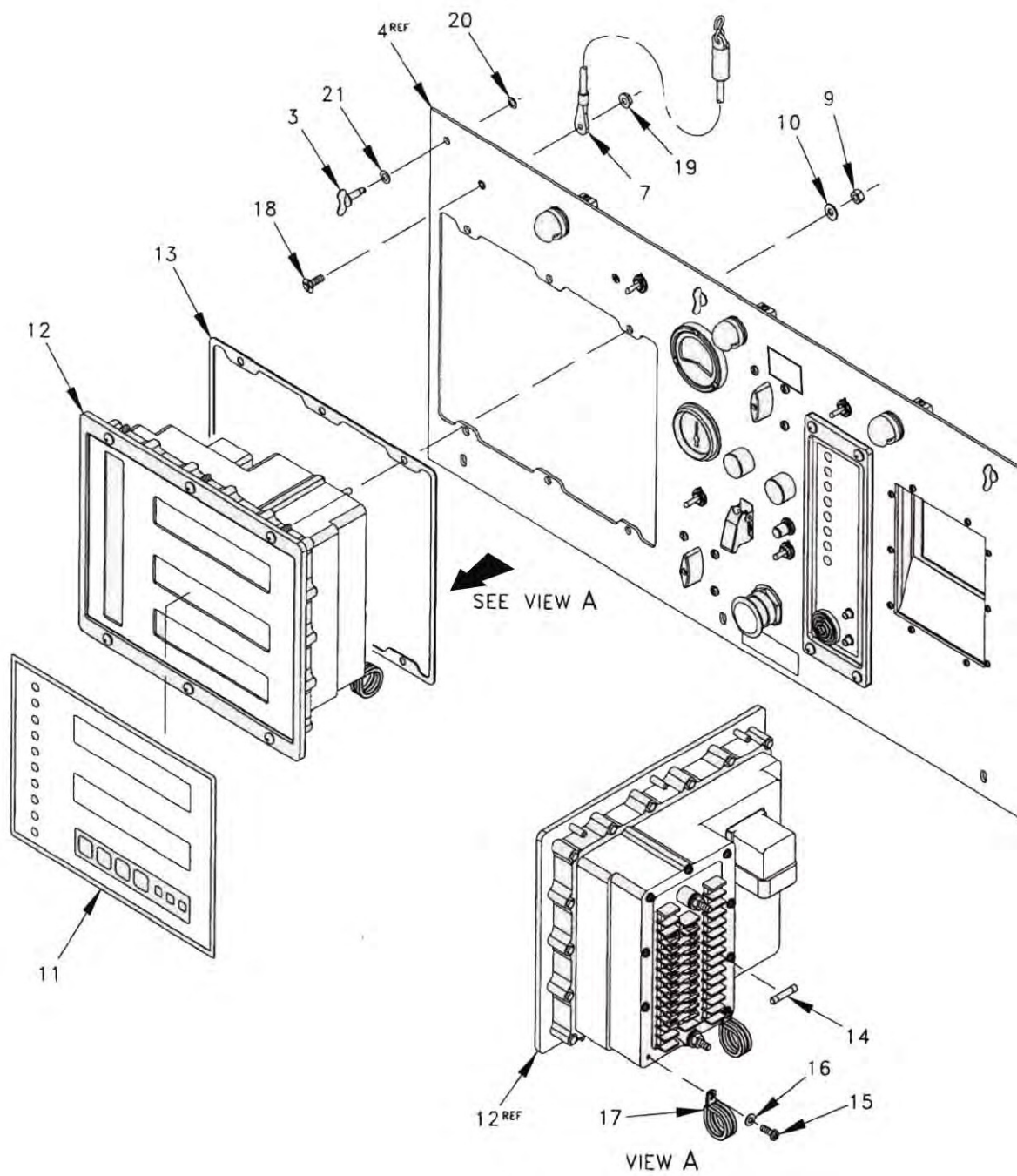


Figure 1. Control Box Panel Assembly (Sheet 2 of 4).



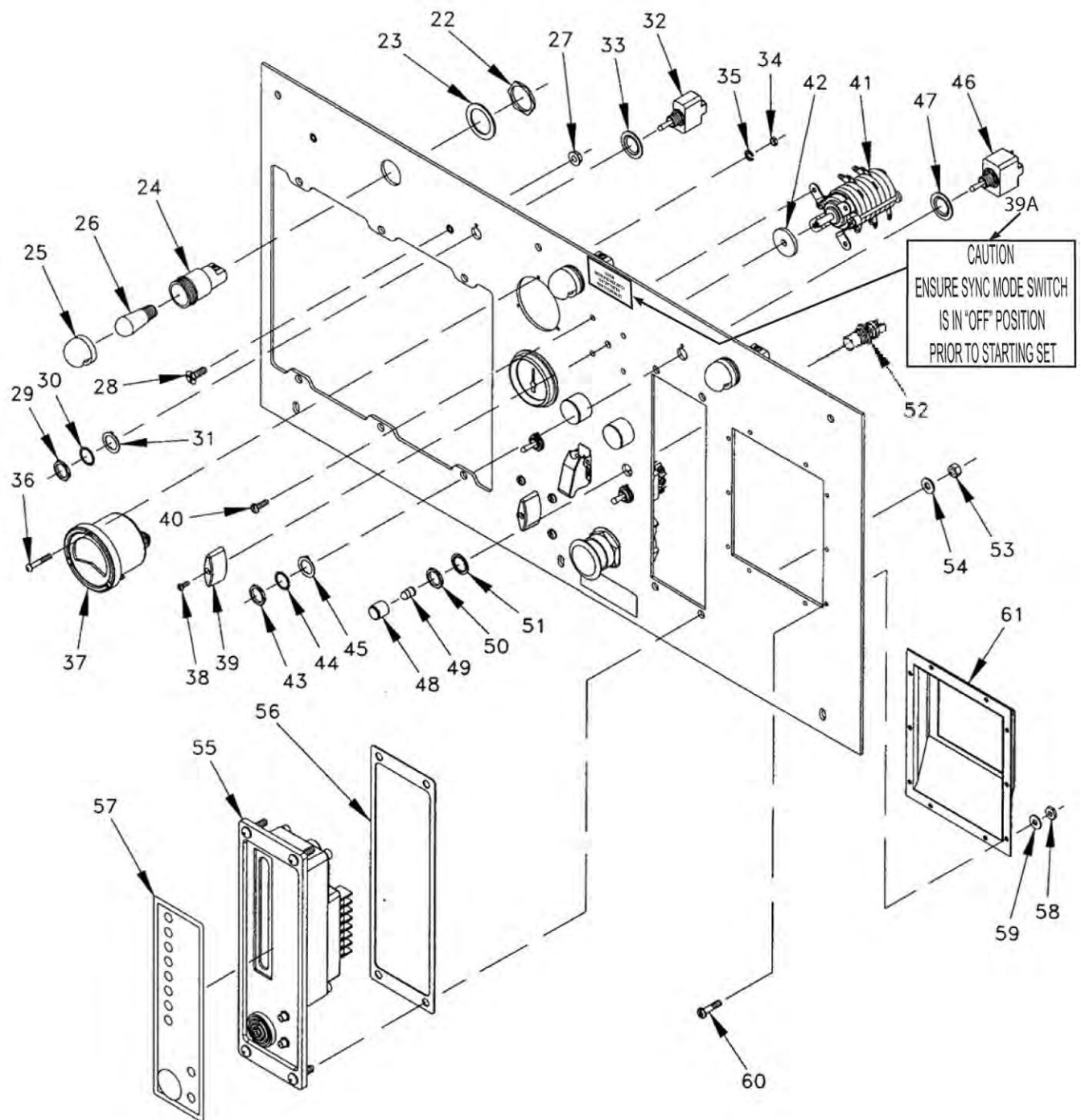


Figure 1. Control Box Panel Assembly (Sheet 3 of 4).

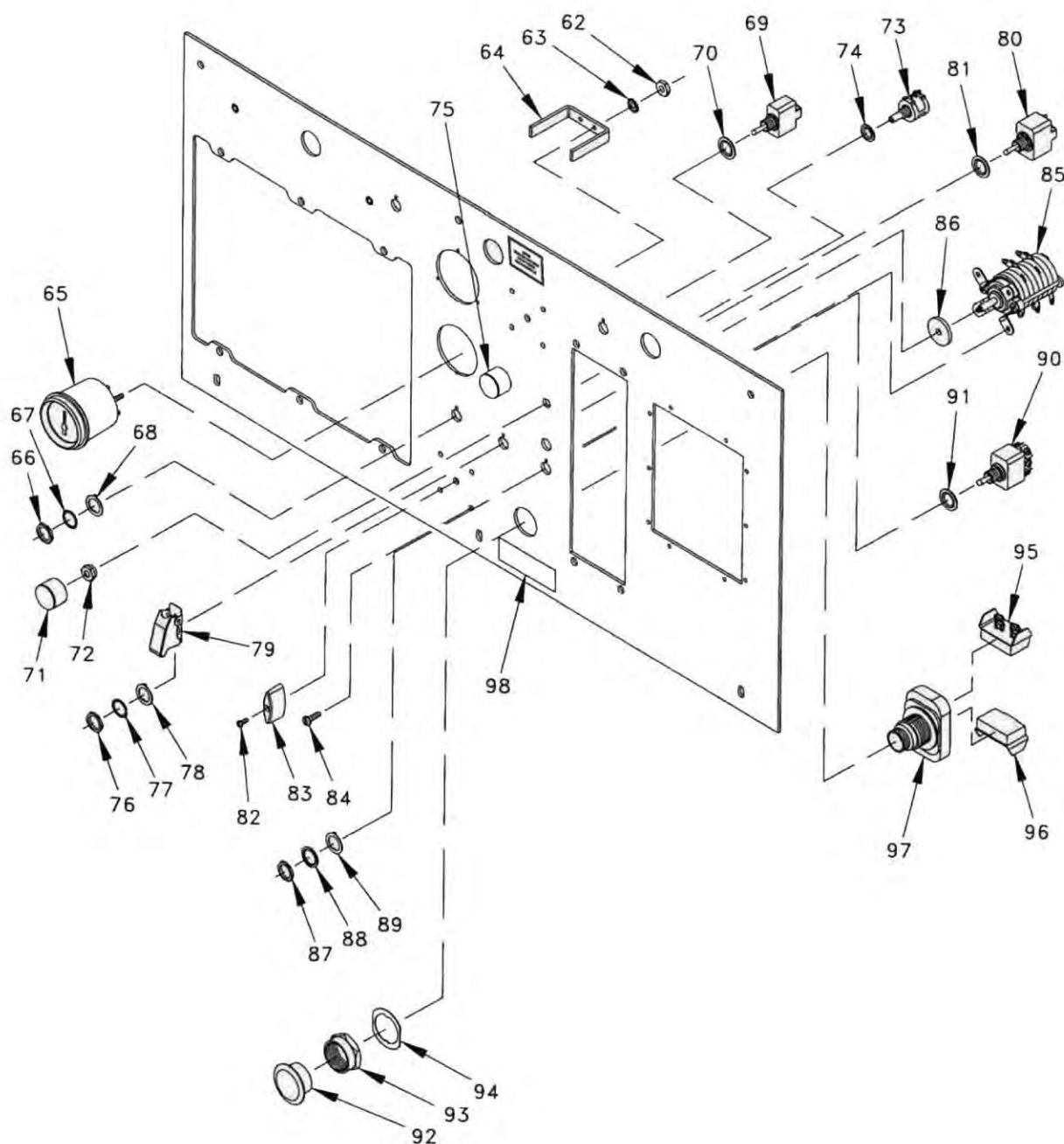


Figure 1. Control Box Panel Assembly (Sheet 4 of 4).

## 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), lock washers (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), lock washers (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).

### 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 lock washers (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  $\pm 1,000$  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.

## END OF TASK

### 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 27 and 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  $\pm 1,000$  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), seal (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 VOLTAGE adjust potentiometer (Figure 1, Sheet 4, Item 73), seal (Figure 1, Sheet 4, Item 74), nut (Figure 1, Sheet 4, Item 72), and knob (Figure 1, Sheet 4, Item 71). Repeat for FREQUENCY adjust potentiometer (Figure 1, Sheet 4, Item 75).
  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 lock washers (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), 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), SYNC MODE switch caution label (Figure 1, Sheet 3, Item 39A, if not installed), 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), lock washers (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 2, 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 0092).

**END OF TASK**

**END OF WORK PACKAGE**

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**FIELD MAINTENANCE****TACTICAL QUIET GENERATOR 100 kW, 50/60 Hz MEP-807A/PU-807A****CONTROL BOX ASSEMBLY: REMOVAL, DISASSEMBLY, ASSEMBLY, INSTALLATION, ADJUSTMENT**

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**INITIAL SETUP:****Tools and Special Tools**

Tool Kit, General Mechanic's (GMTK) (WP 0122, Table 2, Item 2)  
Tool Set, Standard Automotive (SATS) Base (WP 0122, Table 2, Item 3)

**Materials/Parts**

Gasket

**Personnel Required**

One

**References**

TM 9-6115-729-24P  
WP 0028  
WP 0039  
WP 0040 (Table 1)  
WP 0092

**Equipment Condition**

Front roof section housing assembly removed (WP 0028)  
Generator Set fully stopped  
Engine Control Switch in OFF/RESET Position  
Battery Disconnect Switch set in OFF Position  
Dead Crank Switch set in OFF Position

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**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.

**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**

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.

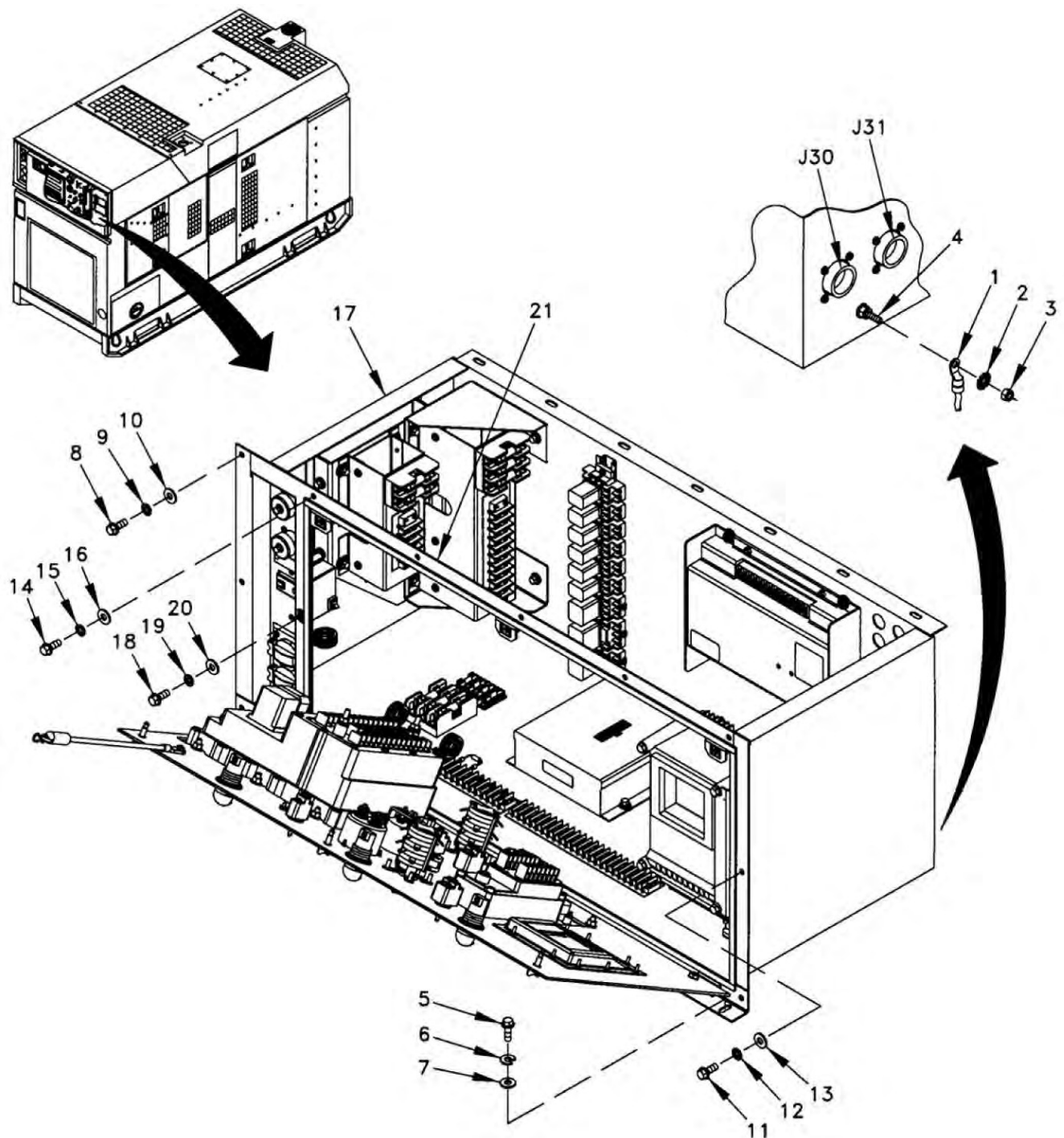
**Table 1. WP 0040 Guide.**

NAME	FIGURE 2 ITEM	DISASSEMBLY STEPS	ASSEMBLY STEPS	RELATED STEPS
AC Transformer Box (ATB) A5	45	1, 2, and 14	16	Adjustment 1 through 3
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 (RFF)	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	
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).





**Figure 1. Control Box.**

6. Remove seven screws (Figure 1, Item 5), lock washers (Figure 1, Item 6), and washers (Figure 1, Item 7).
7. Remove three screws (Figure 1, Item 8), lock washers (Figure 1, Item 9), and washers (Figure 1, Item 10).
8. Remove two screws (Figure 1, Item 11), lock washers (Figure 1, Item 12), and washers (Figure 1, Item 13).
9. Remove five screws (Figure 1, Item 14), lock washers (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), lock washers (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 0039). Refer to Table 1, WP 0040 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 lock washers (Figure 2, Sheet 2, Item 22), four washers (Figure 2, Sheet 2, Item 23), and transformer box.
8. To remove overload/short circuit module (Figure 2, Sheet 2, Item 24), remove four screws (Figure 2, Sheet 2, Item 25), lock washers (Figure 2, Sheet 2, Item 26), washers (Figure 2, Sheet 2, Item 27), and module.
9. To remove load sharing module (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.

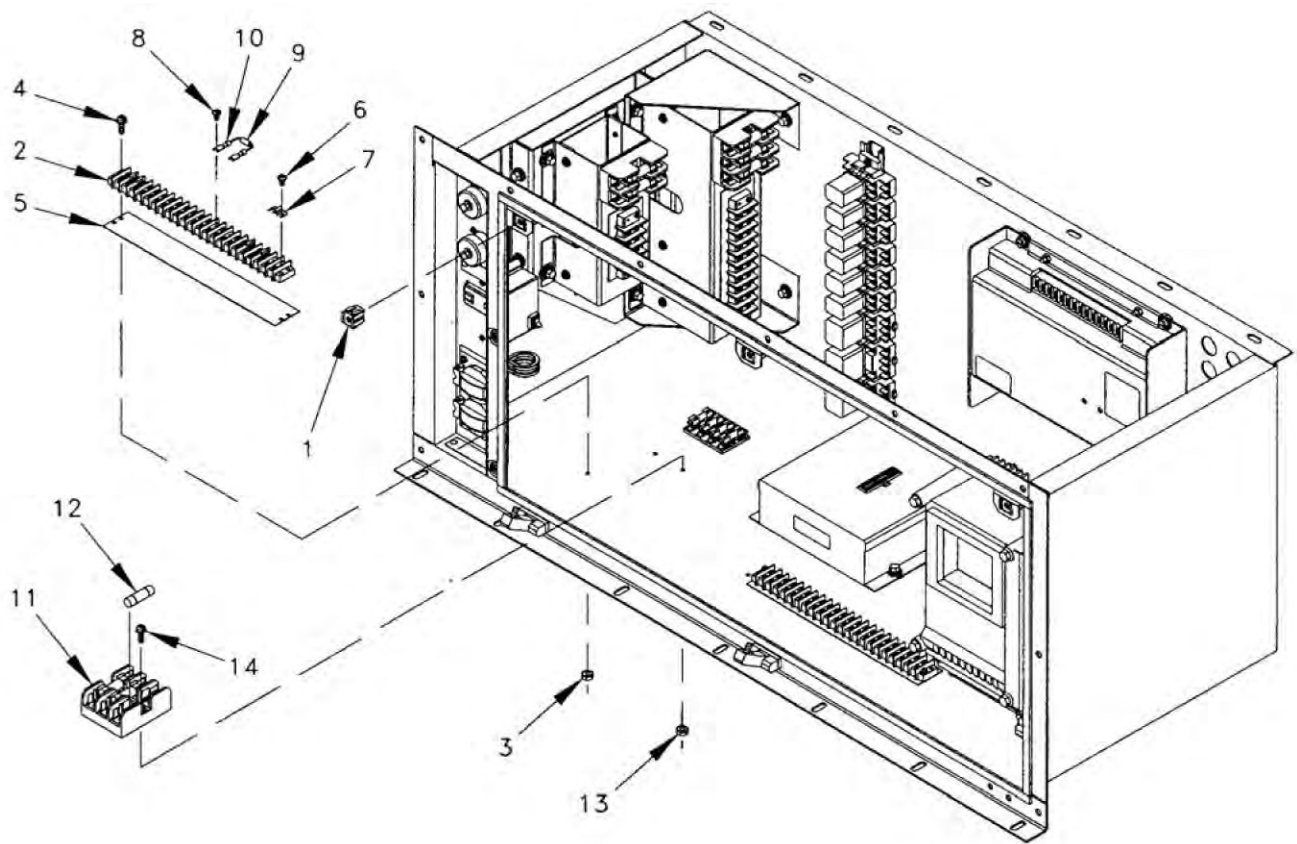


Figure 2. Control Box Assembly (Sheet 1 of 5).

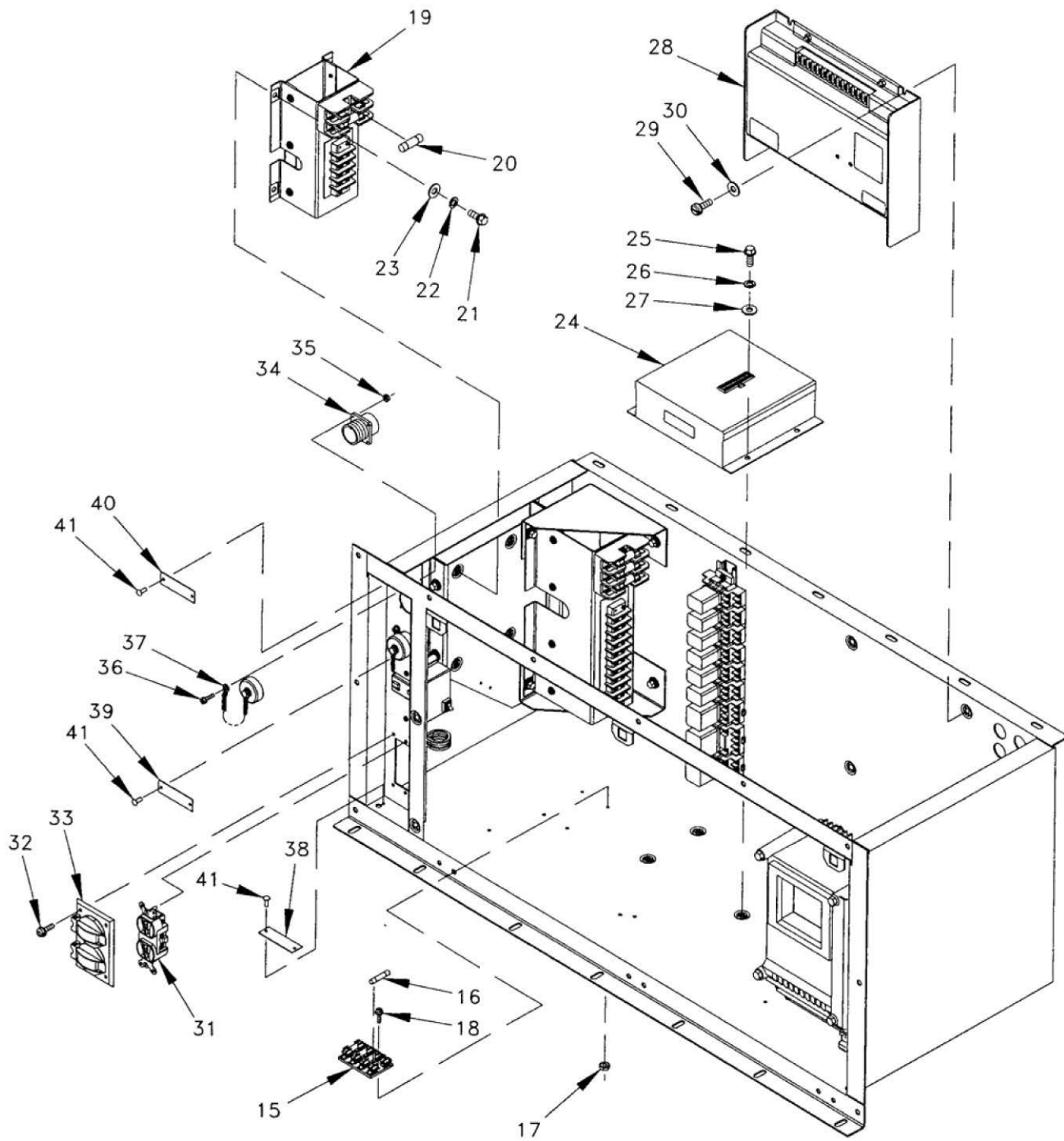


Figure 2. Control Box Assembly (Sheet 2 of 5).