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Troubleshooting

EMCP 3

Media Number -REN7902-01

Publication Date -01/01/2006

Date Updated -27/01/2006

i02463497

Charging System

SMCS - 1401; 1405

System Operation Description:

The EMCP 3 monitors its battery supply voltage based on the +BATT and –BATT voltage inputs to the EMCP 3 control. If the battery voltage rises above the High Battery Voltage Event Threshold setpoint value, the high battery voltage event timer will begin timing. When the high battery voltage timer expires, the High Battery Voltage event is made active (if the battery voltage has been above the event threshold level continuously while timing). If the battery voltage drops below the High Battery Voltage Warning Threshold, the High Battery Voltage event will be made inactive and the timer will be reset.

If a battery overvoltage condition is detected, "HIGH BATTERY VOLTAGE SHUTDOWN" or "HIGH BATTERY VOLTAGE WARNING" will be displayed on the EMCP 3 in order to inform the operator of a high battery voltage condition.

If the battery voltage drops below the Low Battery Voltage Warning Threshold setpoint value, the low battery voltage event timer will begin timing. When the low battery voltage event timer expires, the Low Battery Voltage event is made active (if the battery voltage has been below the event threshold level continuously while timing). If the battery voltage rises above the Low Battery Voltage Event Threshold, the Low Battery Voltage event will be made inactive and the timer will be reset.

If a battery undervoltage condition is detected, "LOW BATTERY CHARGING SYS VOLT WARN" or "LOW BATTERY VOLTAGE WARNING" will be displayed on the EMCP 3 in order to inform the operator of an undervoltage condition.

Note: The severity of the battery over/under voltage condition will determine if a warning or shutdown event occurs.

Conditions Which Generate This Code:

This code is generated when the measured battery voltage value goes above or below the programmed thresholds for a configurable duration.

Test Step 1. PERFORM THE INITIAL CHECK.

- A. The battery and charging system are located on the engine. Use the Caterpillar Electronic Technician in order to check for active diagnostic codes on the Engine ECM. If any codes are present, correct the engine diagnostic codes first.

Expected Result:

No other diagnostic codes or indicators are active on the Engine ECM.

Results:

- **OK** - No other diagnostic codes or indicators are active. 2
- **NOT OK** - Another Engine ECM diagnostic code is active.

Repair: Exit this procedure. Troubleshoot the active code or indicator. Refer to the engine Troubleshooting manual for your particular genset.

STOP

Test Step 2. CHECK THE SETPOINTS.

- A. View the Battery Voltage Monitor setpoints. Make a note of the setpoints. See Testing and Adjusting, "Electronic Control Module (Generator Set) - Configure". Compare the setpoints against the default setpoints of the particular generator set.

Expected Result:

The setpoints are correct.

Results:

- **OK** - The setpoints are correct for your particular genset. Proceed to test step 3
- **NOT OK** - The setpoints are NOT correct.

Repair: Reprogram the setpoints. Reset the genset. Resume normal operation and verify that the problem has been corrected.

STOP

Test Step 3. COMPARE ACTUAL BATTERY VOLTAGE TO THE VOLTAGE DISPLAYED ON THE EMCP 3 DISPLAY

- A. Shut down the engine.
- B. Disconnect the harness connector from the EMCP 3.

- C. At the harness connector, measure the battery voltage between pin number 52 and pin number 65.

Expected Result:

The measured battery voltage should be the same as the battery voltage displayed on the EMCP 3 display screen.

Results:

- **OK** - The measured battery voltage is the same as the battery voltage displayed on the EMCP 3 Display Screen. Proceed to test step 4
- **NOT OK** - The measured battery voltage is not the same as the battery voltage displayed on the EMCP 3 Display Screen. The EMCP 3 may have failed.

Repair: It is unlikely that the EMCP 3 has failed. Exit this procedure and perform this procedure again. If the cause of the failure is not found, replace the EMCP 3. See Testing and Adjusting, "Electronic Control Module (Generator Set) - Replace".

STOP

Test Step 4. CHECK THE BATTERY VOLTAGE WIRING BETWEEN THE EMCP 3 AND THE BATTERY SOURCE

- A. Check the battery negative ("B-") wiring to the battery negative input for a short circuit or open circuit. Check the battery positive ("B+") wiring to the battery positive input for a short circuit or open circuit. Check the wires in the generator control panel. Check the wires in the engine harness. Refer to the appropriate wiring diagrams for the circuit that is being checked.

Expected Result:

The wiring is correct.

Results:

- **OK** - No problems can be found with the battery voltage supply wiring. Proceed to test step 5
- **NOT OK** - The battery voltage supply wiring is defective.

Repair: Repair the wiring or replace the wiring.

Proceed to test step 5

Test Step 5. CHECK IF THE DIAGNOSTIC CODE REMAINS

- A. Inspect the harness connectors and clean the contacts of the harness connectors.
- B. Reconnect all harness connectors.
- C. Reset the genset.

- D. Operate the genset.
- E. Check the status of the diagnostic code.

Expected Result:

The diagnostic code is not active.

Results:

- **OK** - The diagnostic code is not active. The diagnostic code does not exist at this time. The initial diagnostic code was probably caused by a poor connection or a short at one of the connectors that was disconnected and reconnected. Resume normal operation.**STOP**
- **NOT OK** - The code is active. The diagnostic code has not been corrected. The ECM may have failed.

Repair: It is unlikely that the ECM has failed. Exit this procedure and perform this procedure again. If the cause of the failure is not found, replace the ECM. See Testing and Adjusting, "Electronic Control Module (Generator Set) - Replace".

STOP