Troubleshooting

EMCP 3

Media Number -RENR7902-01 **Publication Date -01/01/2006** **Date Updated -27/01/2006**

i02463551

Data Link Circuit Fault

SMCS - 4490

System Operation Description:

This procedure checks for an open circuit or a short circuit in a Data Link. There are three data links associated with the EMCP 3.

- J1939 Accessory Data Link
- J1939 Primary Data Link
- Modbus RS-485 SCADA Data Link

Refer to Systems Operation, "General Information" for details on each data link.

Note: Use the wiring diagram for your particular genset in order to troubleshoot the Data Links.

Test Step 1. Inspect the Electrical Connectors and the Wiring

A. Turn the keyswitch to the OFF position.

B. Thoroughly inspect the EMCP 3 connector, the service tool connector, and all other connectors in the circuit for the data link.

Reference Refer to Troubleshooting, "Electrical Connectors - Inspect" for details.

Expected Result:

All connectors, pins, and sockets are completely inserted and coupled. The harness and wiring are free of corrosion, of abrasion, and of pinch points.

Results:

- **OK** - In order to troubleshoot the Modbus RS-485 SCADA Data Link, proceed to Test Step 2
- **OK** - In order to troubleshoot the J1939 Primary or the J1939 Accessory Data Link, proceed to Test Step 4
- **Not OK** -

  Repair: Repair the wiring or replace the wiring.

  STOP

Test Step 2. Check for Shorts in the Modbus RS-485 SCADA Data Link Harness

A. Disconnect all connectors from the suspected data link.

B. Measure the resistance between (data link +) and data link -).

C. Measure the resistance between (data link +) and chassis ground.

D. Measure the resistance between (data link -) and chassis ground.

Expected Result:

The resistance is greater than 20,000 Ohms for each measurement.

Results:

- **OK** - Proceed to Test Step 5
- **Not OK** - There is a short circuit in the harness or connectors.

  Repair: Repair the wiring or replace the wiring.

  Proceed to Test Step 5

Test Step 3. Check the Resistance through the Modbus RS-485 SCADA Data Link Harness

A. Disconnect all connectors from the suspected data link.

B. Use a suitable piece of wire to short (Data Link +) and (Data Link -) at the EMCP 3.

C. Measure the resistance between (Data Link +) and (Data Link -) at all other connectors in the circuit for the data link.

Expected Result:

The resistance is less than 10 Ohms.

Results:

- **OK** - The Data Link is OK. Proceed to test step 5
- **Not OK** - There is an open circuit or excessive resistance in the harness or connectors.

  Repair: Repair the wiring or replace the wiring.

  Proceed to Test Step 5

Test Step 4. Check for Shorts in the J1939 Data Link Harness

A. Disconnect all connectors from the suspected data link.

B. Measure the resistance between (data link +) and data link -).

Expected Result:

The resistance is approximately 60 Ohms.

Results:

- **OK** - Proceed to Test Step 5.
- **Not OK** - If the resistance is approximately 120 ohms, a termination resistor is missing. If the resistance is much greater than 120 ohms, both termination resistors are missing or there is an open data link circuit. if the resistance is much less than 60 ohms, there is a short circuit

  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 Data Link harness connectors and clean the contacts of the harness connectors.

B. Reconnect all Data Link 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

Tue Aug 14 11:47:42 EDT 2007