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< Product: GENERATOR SET
Model: 3456 GENERATOR SET C4G
Configuration: 3456 Generator Set C4G00001-UP

Troubleshooting

3406E and 3456 Generator Set Engines

Media Number -REN2227-04

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i02089740

Digital Sensor Supply Circuit - Test

SMCS - 5574-038

System Operation Description:

Perform this test procedure if the following diagnostic codes are logged or if the following codes are active:

- 263-03
- 263-04

The digital sensor supply provides 8.0 ± 0.5 VDC to the following sensors:

- Coolant level sensor
- Exhaust temperature sensor

The digital sensor supply is output short circuit protected. The ECM is protected from a short to ground and a short to + Battery condition. The digital sensors are not protected.

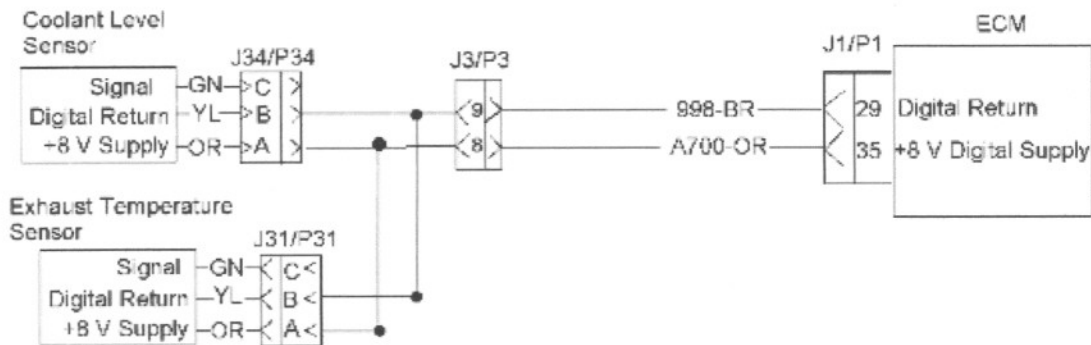


Illustration 1
Schematic

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Test Step 1. Inspect Electrical Connectors and Wiring

- A. Verify that there are no circuit breakers that have been tripped.
- B. Turn the circuit breaker for the battery to the OFF position.
- C. Turn the Engine Control Switch (ECS) to the OFF position.
- D. Thoroughly inspect the J1/P1 ECM connector, the J3/P3 Machine interface connector, and all other connectors in the wiring harness. Check each digital sensor connection. Refer to Troubleshooting, "Electrical Connectors - Inspect" for details.

Expected Result:

All connectors, pins, and sockets are completely inserted and coupled. The harness and wiring is free of corrosion, of abrasions, and of pinch points. All connections and grounds are tight and free of corrosion.

Results:

- **OK** - Proceed to Test Step 2.
- **Not OK** -

Repair: Repair the circuit. Verify that the repair eliminates the problem.

Stop.

Test Step 2. Check for Shorts in the Harness from the ECM to the Digital Sensors

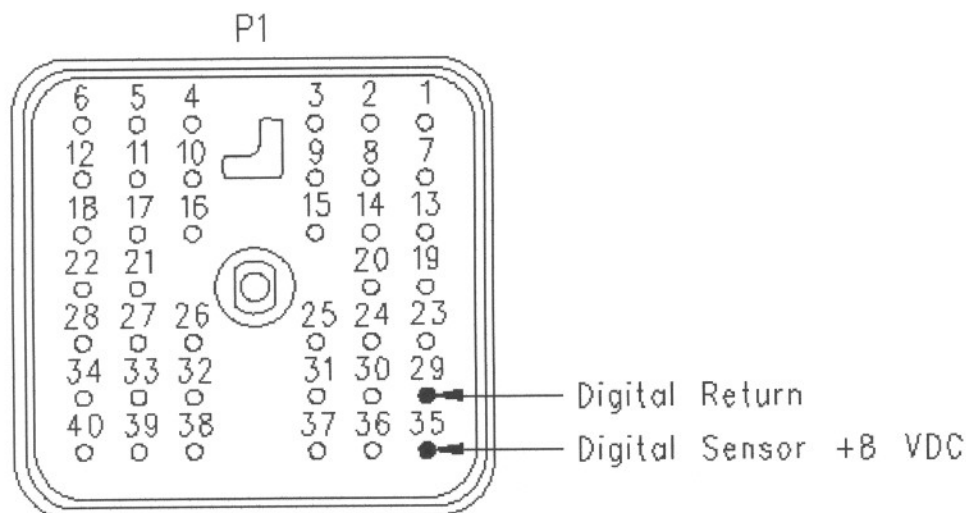


Illustration 2
ECM connector P1

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- A. Disconnect J1/P1 ECM connector and all of the digital sensors.
- B. Measure the resistance between P1:35 (Digital sensor +8 VDC) and engine ground.
- C. Measure the resistance between P1:35 (Digital sensor +8 VDC) and P1:29 (Digital return).
- D. Measure the resistance between P1:35 (Digital sensor +8 VDC) and all the other pins in P1 (ECM connector).

Expected Result:

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

Results:

- **OK** - Proceed to Test Step 3.
- **Not OK** - There is a short between the ECM and one of the sensors.

Repair: Repair the circuit.

Stop.

Test Step 3. Check for Open Circuits in the Harness Between the ECM and the Digital Sensors

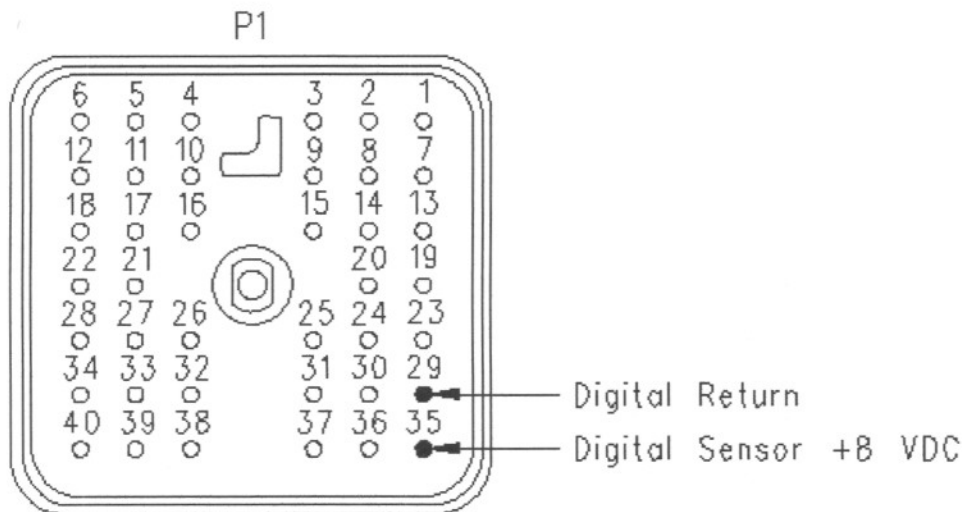


Illustration 3
J1/P1 breakout

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- A. Turn the ECS to the OFF/RESET position and install a **7X-1715** Adapter Cable (40 Pin Breakout T) at the J1/P1 (ECM connector).
- B. Use a suitable piece of wire to short P1:35 (Digital sensor +8 VDC) and P1:29 (Digital return) at the breakout.
- C. Disconnect all of the digital sensors.
- D. Measure the resistance between terminal A (+8 VDC) and terminal B (Digital return) of the connector for each digital sensor.
- E. Remove the wire short from the breakout.

Expected Result:

The resistance is less than 10 Ohms for each measurement.

Results:

- **OK** - Proceed to Test Step 4.
- **Not OK** - There is an open circuit in the wiring harness between the sensor and the ECM.

Repair: Repair the circuit. Verify that the repair eliminates the problem.

Stop.

Test Step 4. Check the Digital Sensor Supply Voltage at the Sensor Connectors

- A. Disconnect all of the digital sensors.
- B. Measure the voltage across terminal A (+8 VDC) and terminal B (Digital return) of the connector for each digital sensor.

Expected Result:

The digital sensor supply voltage is 8.0 ± 0.5 VDC.

Results:

- **OK** - The supply voltage is reaching the sensor. Proceed to Test Step 5.
- **Not OK** - The supply voltage is not reaching the sensor. Proceed to Test Step 7.

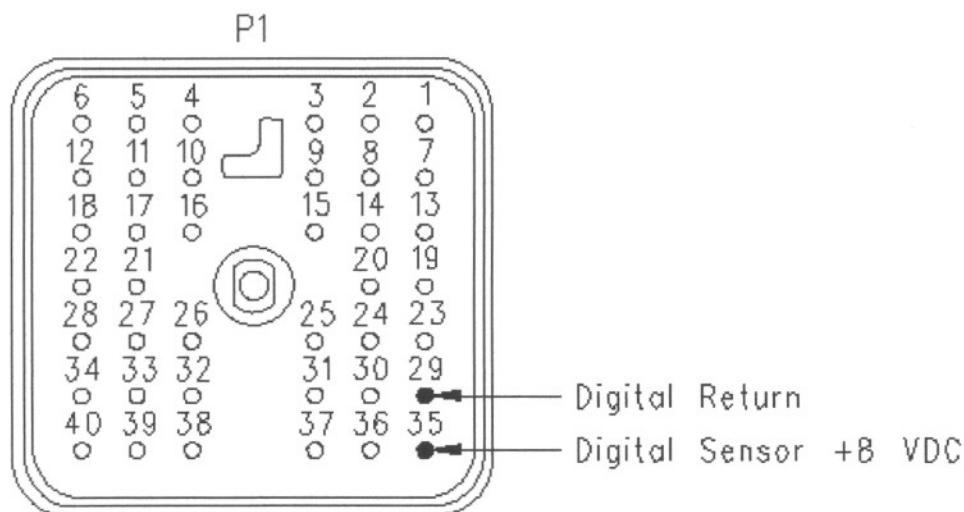
Test Step 5. Check the Digital Sensors for Internal Shorts

Illustration 4
J1/P1 breakout

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- A. Disconnect all of the digital sensors.
- B. Reconnect each of the digital sensors while you observe the voltage across P1:35 (Digital sensor +8 VDC) and P1:29 (Digital return) at the breakout.

Expected Result:

The supply voltage is 8.0 ± 0.5 VDC. The voltage does not drop when the sensors are connected.

Results:

- **OK** - None of the sensors are internally shorted.

Repair: Refer to Troubleshooting, "Electrical Connectors - Inspect" if the problem is intermittent.

Stop.

- **Not OK** - The sensor that caused the voltage to drop may have an internal short. Proceed to Test Step 6.

Test Step 6. Temporarily Install a New Sensor

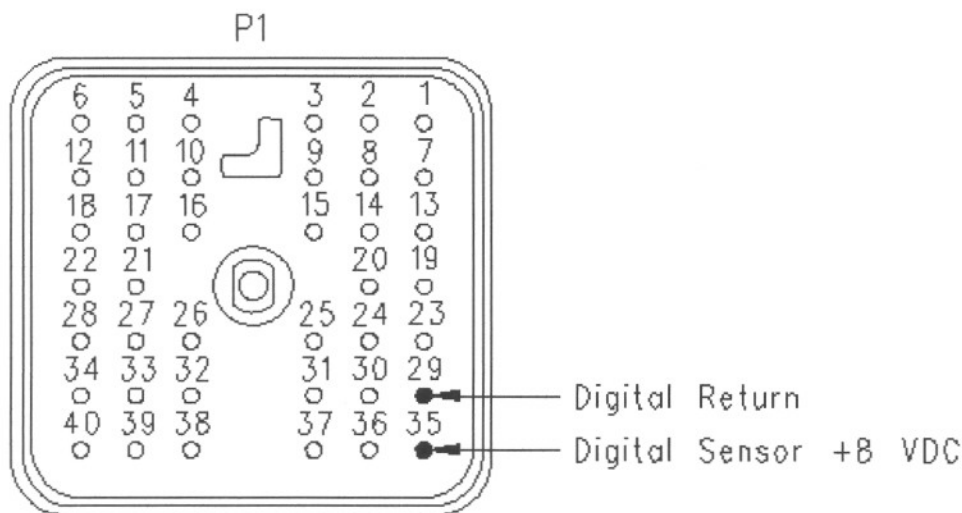


Illustration 5
J1/P1 breakout

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- Disconnect the suspect sensor and remove the suspect sensor.
- Temporarily install a new sensor.
- Observe the voltage across P1:35 (Digital sensor +8 VDC) and P1:29 (Digital return) at the breakout while you connect the new sensor.

Expected Result:

The supply voltage is 8.0 ± 0.5 VDC. The voltage does not drop when the sensor is connected.

Results:

- **OK** - The suspect sensor was faulty.

Repair: Permanently install the new sensor.

Stop.

- **Not OK** - The sensor and the circuit appear to be OK at this time.

Repair: Refer to Troubleshooting, "Electrical Connectors - Inspect" if the problem is intermittent.

Stop.

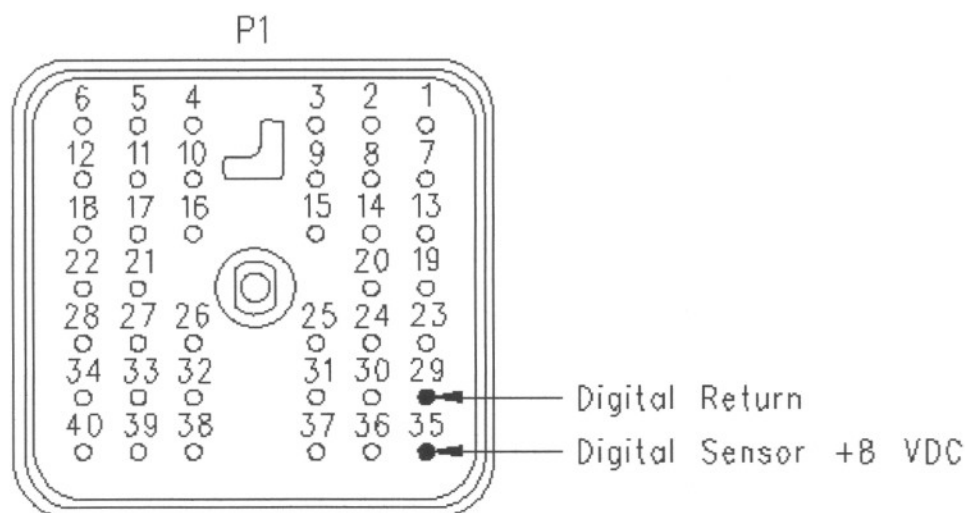
Test Step 7. Check the Digital Sensor Supply Voltage at the ECM

Illustration 6
J1/P1 breakout

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- Disconnect all of the digital sensors.
- Measure the voltage across P1:35 (Digital Sensor +8 VDC) and P1:29 (Digital Return) at the breakout.

Expected Result:

The supply voltage is 8.0 ± 0.5 VDC.

Results:

- **OK** - The ECM is supplying the correct voltage.

Repair: Refer to Troubleshooting, "Electrical Connectors - Inspect" if the problem is intermittent.

Stop.

- **Not OK** - The ECM is not supplying the correct voltage.

Repair: Verify your results. Replace the ECM. Refer to Troubleshooting, "Replacing the ECM" before replacing the ECM. Verify that the repair eliminates the problem.

Stop.