

L: Engine Oil Temperature (EOT) Sensor

⚠ WARNING: Be aware of moving vehicle components and heat. Failure to follow these instructions may result in personal injury.

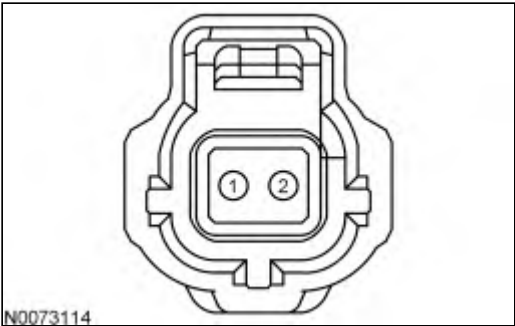
Note: Regeneration may occur during normal operation. During regeneration, diagnostic procedures may display biased values. If a regeneration occurs during diagnostic procedures, allow the process to complete before continuing diagnostics.

This pinpoint test is intended to diagnose the following:

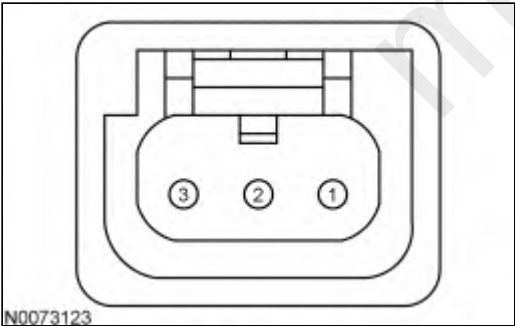
- EOT sensor (12A648)
- harness circuits: EOT and SIGRTN
- PCM (12A650)

Engine Oil Temperature (EOT) Sensor Connector

A

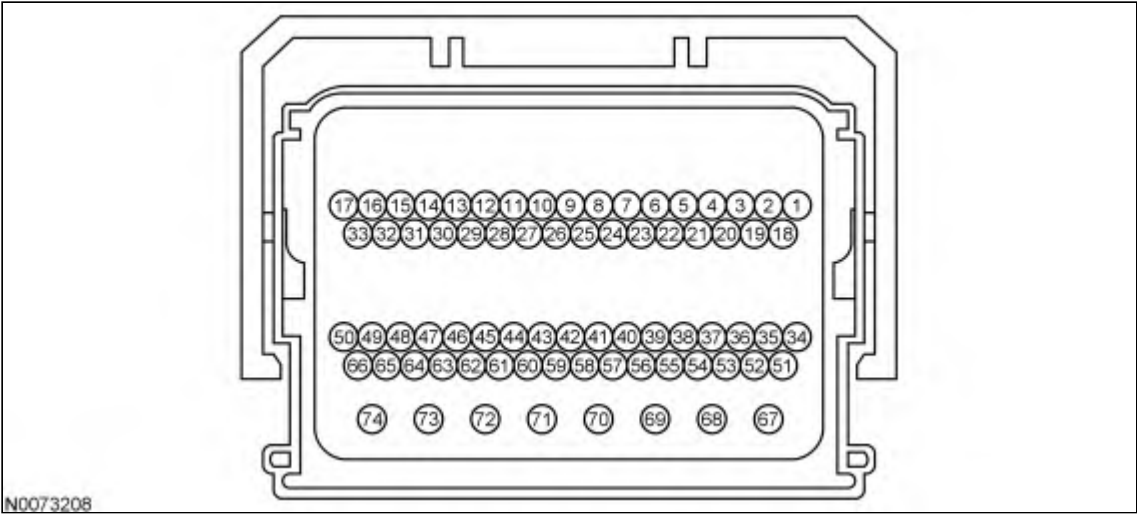


B



Vehicle	Connector	Pin	Circuit
F-650 / F-750	A	1	EOT
Transit	B	2	EOT

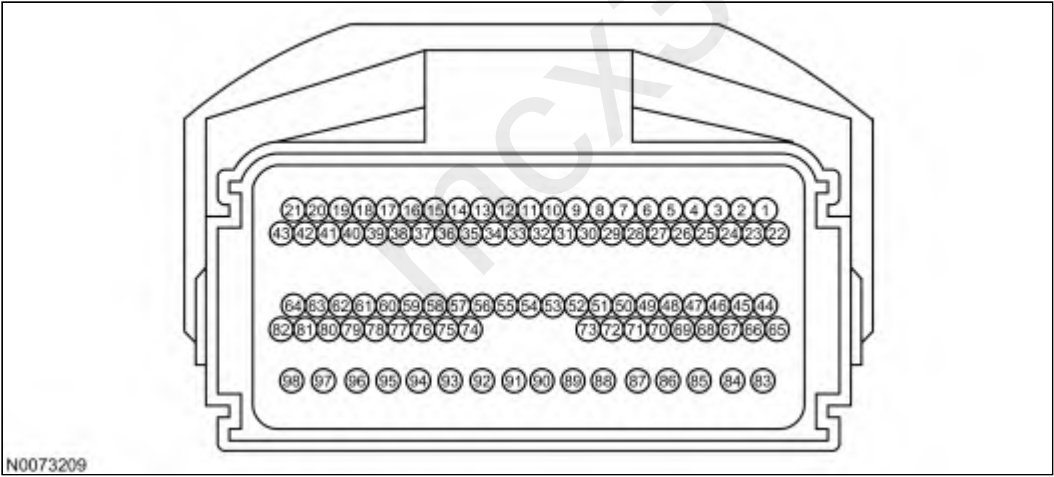
Powertrain Control Module-B (PCM-B) Connector



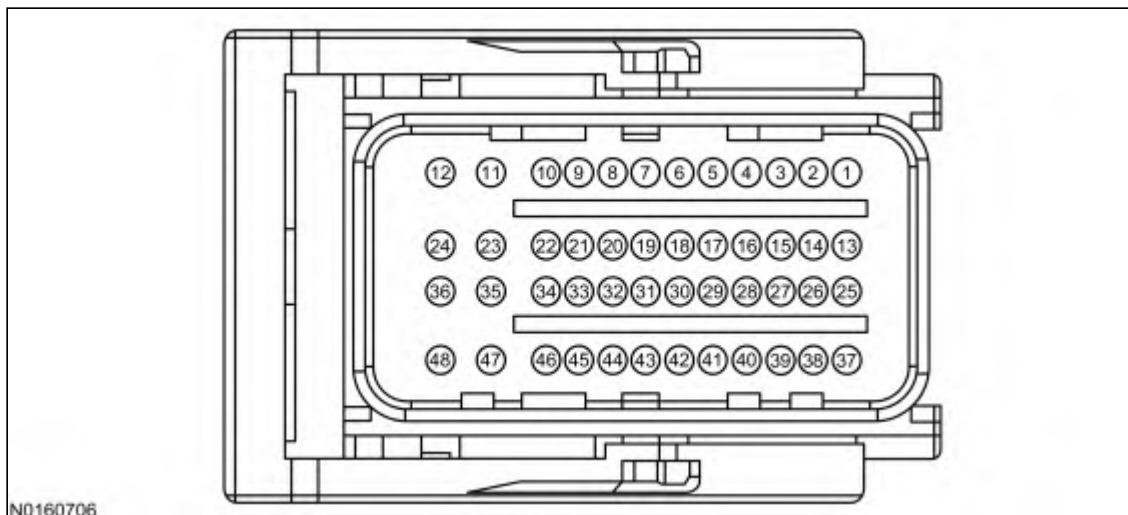
Pin	Circuit
44	SIGRTN (Signal Return)

Powertrain Control Module-E (PCM-E) Connector

A



B



N0160706

Vehicle	Connector	Pin	Circuit
F-650 / F-750	A	36	EOT
Transit	B	21 19	SIGRTN EOT

L1 CHECK FOR DTCS

Are DTCs P0195, P0196, P0197, P0198 or P1184 present?

Yes	GO to L2 .
No	For symptoms without DTCs, GO to L2 . For all others, RETURN to Section 3, Symptom Charts for further direction.

L2 CHECK SENSOR CONNECTIONS

- Inspect the EOT sensor circuitry at the sensor and PCM. Inspect for damaged, loose or pushed-out pins, and loose or poorly crimped wires.

Is a concern present?

Yes	REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test.
No	GO to L3 .

L3 CHECK FOR A OPEN

- Ignition OFF.
- EOT Sensor connector disconnected.
- For Transit,
- PCM-E connector disconnected.
- Measure the resistance between:

(+) PCM-E Connector, Harness Side	(-) EOT Sensor Connector, Harness Side
EOT	EOT

(+) PCM-E Connector, Harness Side	(-) EOT Sensor Connector, Harness Side
SIGRTN	SIGRTN

- For all others,
- PCM-B connector disconnected.
- PCM-E connector disconnected.
- Measure the resistance between:

(+) PCM-E Connector, Harness Side	(-) EOT Sensor Connector, Harness Side
EOT	EOT

- Measure the resistance between:

(+) PCM-B Connector, Harness Side	(-) EOT Sensor Connector, Harness Side
SIGRTN - Pin 44	SIGRTN

Are the resistances less than 5 ohms?

Yes	GO to L4 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

L4 CHECK THE EOT SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND

- Measure the resistance between:

(+) EOT Sensor Connector, Harness Side	(-)
EOT	Ground

Is the resistance greater than 10K ohms?

Yes	GO to L5 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

L5 CHECK THE SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition ON, engine OFF.
- Measure the voltage between:

(+) EOT Sensor Connector, Harness Side	(-)
EOT	Ground

Is any voltage present?

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Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	GO to L6 .

L6 CHECK THE EOT SENSOR OPERATION

NOTICE: Strict observance of posted speed limits and attention to driving conditions are mandatory when carrying out the road test. Failure to follow these instructions may result in personal injury.

Note: Verify no accessories are in use (engine block or oil heaters).

- Ignition OFF.
- PCM-B connector connected.
- PCM-E connector connected.
- EOT Sensor connector connected.
- Clear the PCM DTCs.
- Verify the engine temperature is at ambient temperature before continuing with this test. A soak period of 8 hours may be required.
- Ignition ON, engine OFF.
- Access the PCM and monitor the EOT (TEMP) PID.
- Access the PCM and monitor the RPM (RPM) PID.
- Record the EOT sensor temperature value.
- Drive the vehicle at an engine speed greater than 1,800 RPM for at least 15 minutes. Select the appropriate gear to achieve the operating conditions.

Does the EOT sensor temperature value change by at least 6°C (10°F) from the ignition ON value recorded?

Yes	GO to L7 .
No	INSTALL a new EOT sensor. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. Clear the PCM DTCs. REPEAT the self-test.

L7 CHECK THE COOLING SYSTEM

NOTICE: Strict observance of posted speed limits and attention to driving conditions are mandatory when carrying out the road test. Failure to follow these instructions may result in personal injury.

- Drive the vehicle an additional 15 minutes at an engine speed greater than 1,800 RPM.

Does the EOT sensor temperature reading increase above 50°C (122°F)?

Yes	Unable to duplicate the condition. CHECK for a loose connection, and damaged or corroded terminals. WIGGLE the harness attempting to recreate the concern. REPAIR as necessary. RETURN to Section 3, Symptom Charts for further direction.
No	CHECK the thermostat for correct operation. REFER to the Workshop Manual Section 303-03, Engine Cooling, Component Tests to continue diagnosis. If a concern is present, INSTALL a new thermostat. REFER to the Workshop Manual Section 303-03, Engine Cooling. If a thermostat concern is not present, INSTALL a new EOT sensor. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. Clear the PCM DTCs. REPEAT the self-test.

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