

RB: Exhaust Gas Temperature (EGT) Sensor

 **WARNING:** Manual regeneration of the particulate filter causes the exhaust gas to quickly get very hot. Initiate a manual regeneration only when the vehicle is on the ground with the area around the tailpipe free of people, obstructions, foreign material or other items. Failure to follow these instructions may result in serious 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.

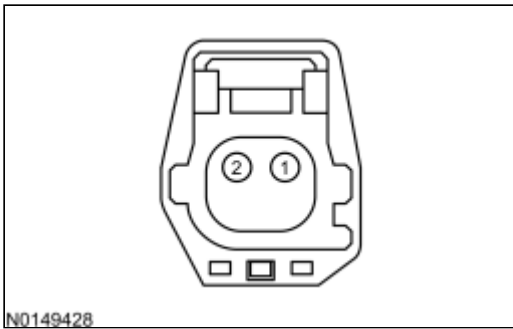
This pinpoint test is intended to diagnose the following:

- EGT sensor (5J213)
- harness circuits: EGT11, EGT21 and SIGRTN
- PCM (12A650)

EGT Sensor Temperature And Resistance Specifications

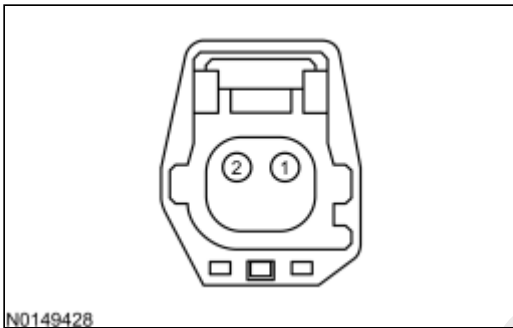
Temperature		Temperature Sensor Value	EGT PID
°C	°F	Resistance (K ohms)	(Volts)
900	1652	0.09	0.41
850	1562	0.11	0.48
800	1472	0.13	0.58
750	1382	0.16	0.70
700	1292	0.21	0.86
650	1202	0.27	1.06
600	1112	0.36	1.26
550	1022	0.5	1.67
500	932	0.73	2.1
450	842	1.1	2.62
400	752	1.77	3.2
350	662	3.09	3.78
300	572	5.92	4.28
250	482	12.39	4.63
200	392	30.28	4.84

Exhaust Gas Temperature Bank 1, Sensor 1 (EGT11) Sensor Connector



Vehicle	Connector	Pin	Circuit
F-150	A	1 2	SIGRTN EGT11
All other vehicles	A	2 1	SIGRTN EGT11

Exhaust Gas Temperature Bank 2, Sensor 1 (EGT21) Sensor Connector



Vehicle	Connector	Pin	Circuit
Aviator, Expedition, Explorer, Mustang, Navigator	A	2 1	SIGRTN EGT21
F-150 3.5L High Output	A	1 2	SIGRTN EGT21

Powertrain Control Module (PCM) Connector

For PCM connector views or reference values, refer to Section 6, Reference Values.

Vehicle	Connector	Pin	Circuit

Vehicle	Connector	Pin	Circuit
Aviator, Explorer 3.0L, Explorer 3.3L	306 PIN	B28 T28 B28 T12	SIGRTN EGT21 SIGRTN EGT11
Continental, Fusion	198 PIN	B18 B32	SIGRTN EGT11
Edge 2.7L	306 PIN	T57 T28 T57 T12	SIGRTN EGT21 SIGRTN EGT11
Expedition, Navigator	198 PIN	B30 E24 B30 B31	SIGRTN EGT21 SIGRTN EGT11
F-150	198 PIN	B46 E24 B46 B31	SIGRTN EGT21 SIGRTN EGT11
Mustang 5.0L	306 PIN	T71 T28 T57 T12	SIGRTN EGT21 SIGRTN EGT11
Nautilus 2.7L	306 PIN	B2 B1 B2 B6	SIGRTN EGT21 SIGRTN EGT11
All other vehicles	198 PIN	B26 B29	SIGRTN EGT11

RB1 PRELIMINARY DIAGNOSIS

Are DTCs P0544, P0545, P0546, P0547, P0548 or P0549 present?

Yes	GO to RB2 .
No	RETURN to Section 3, Symptom Charts for further direction.

RB2 CHECK FOR LEAKS IN THE EXHAUST SYSTEM

- Ignition OFF.
- Visually inspect the exhaust system for the following:
 - exhaust leaks at flanges and gaskets
 - punctures or cracks in the catalyst
 - punctures or cracks in the particulate filter
 - engine coolant or oil contamination

Is a concern present?

Yes	REPAIR as necessary.
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	Clear the PCM DTCs. REPEAT the self-test.
No	GO to RB3 .

RB3 CHECK THE EGT SIGNAL AND SIGRTN CIRCUITS FOR AN OPEN

- Ignition OFF.
- For the EGT11 sensor,
- EGT11 Sensor connector disconnected.
- PCM connector disconnected.
- Measure the resistance between:

(+) EGT11 Sensor Connector, Harness Side	(-) PCM Connector, Harness Side
EGT11	EGT11
SIGRTN	SIGRTN

- For the EGT21 sensor,
- EGT21 Sensor connector disconnected.
- PCM connector disconnected.
- Measure the resistance between:

(+) EGT21 Sensor Connector, Harness Side	(-) PCM Connector, Harness Side
EGT21	EGT21
SIGRTN	SIGRTN

Are the resistances less than 5 ohms?

Yes	GO to RB4 .
No	REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test.

RB4 CHECK THE EGT SIGNAL CIRCUIT FOR A SHORT TO GROUND OR SIGRTN

- For the EGT11 sensor,
- Measure the resistance between:

(+) EGT11 Sensor Connector, Harness Side	(-)
EGT11	Ground

- Measure the resistance between:

(+) EGT11 Sensor Connector, Harness Side	(-) EGT11 Sensor Connector, Harness Side
EGT11	SIGRTN

- For the EGT21 sensor,
- Measure the resistance between:

(+) EGT21 Sensor Connector, Harness Side	(-)
EGT21	Ground

- Measure the resistance between:

(+) EGT21 Sensor Connector, Harness Side	(-) EGT21 Sensor Connector, Harness Side
EGT21	SIGRTN

Is the resistance greater than 10K ohms?

Yes	GO to RB5 .
No	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.

RB5 CHECK THE EGT SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition ON, engine OFF.
- For the EGT11 sensor,
- Measure the voltage between:

(+) EGT11 Sensor Connector, Harness Side	(-)
EGT11	Ground
SIGRTN	Ground

- For the EGT21 sensor,
- Measure the voltage between:

(+) EGT21 Sensor Connector, Harness Side	(-)
EGT21	Ground
SIGRTN	Ground

Is any voltage present?

Yes	REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test.
No	GO to RB6 .

RB6 CHECK THE EGT SENSOR AND CIRCUITS FOR AN INTERMITTENT SHORT OR OPEN

Note: If any EGT sensor connector has been disconnected during testing, with the ignition ON and the engine OFF, connect the EGT sensor. Turn the ignition OFF for 30 seconds before attempting to start the vehicle. Do not crank or start the engine until the ignition has been turned OFF for a minimum of 30 seconds. Failure to do so may result in a 60 minute no crank, no start condition and a failure mode effects management (FMEP) condition.

- Ignition OFF.
- For the EGT11 sensor,
- EGT11 Sensor connector connected.
- PCM connector connected.
- Ignition ON, engine running.

- Allow the engine to reach normal operating temperature.
- Access the PCM and monitor the EGT11 (TEMP) PID.
- Record the EGT11 (TEMP) PID.
- Set the scan tool EGT11 (TEMP) PID limit as follows:
 - set the lower limit to 30°C (54°F) below the EGT11 (TEMP) PID.
 - set the upper limit to 20°C (36°F) above the EGT11 (TEMP) PID.
- Carry out a thorough wiggle test on the EGT11 harness from the PCM connector to the EGT11 sensor connector.
- Tap lightly around the sensor to simulate road shock.
- For the EGT21 sensor,
 - EGT21 Sensor connector connected.
 - PCM connector connected.
 - Ignition ON, engine running.
 - Allow the engine to reach normal operating temperature.
 - Access the PCM and monitor the EGT21 (TEMP) PID.
 - Record the EGT21 (TEMP) PID.
 - Set the scan tool EGT21 (TEMP) PID limit as follows:
 - set the lower limit to 30°C (54°F) below the EGT21 (TEMP) PID.
 - set the upper limit to 20°C (36°F) above the EGT21 (TEMP) PID.
 - Carry out a thorough wiggle test on the EGT21 harness from the PCM connector to the EGT21 sensor connector.
 - Tap lightly around the sensor to simulate road shock.

Does the EGT11 (TEMP) PID value or the EGT21 (TEMP) PID exceed the set limits range?

Yes	REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test.
No	GO to RB7 .

RB7 CHECK THE EGT SENSOR PERFORMANCE

Note: An EGT sensor may exceed its operating range only while in regeneration mode, which may result in performance DTCs being set.

- Access the PCM and monitor the EGT11(TEMP) PID and the EGT21 (TEMP) PID.
- Drive the vehicle at several steady state speeds above and below 50 km/h (30 mph). Monitor the EGT11 and EGT21 PID while driving to verify the concern.

Does the EGT11 or the EGT21 temperature ever exceed 950°C (1740°F)?

Yes	CHECK the circuits for corrosion or loose wires. WIGGLE the harness attempting to recreate the concern. REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test.
No	GO to RB8 .

RB8 CHECK THE EGT SENSOR FOR CORRECT RESISTANCE

- Ignition OFF.
- For the EGT11 sensor,
 - EGT11 Sensor connector disconnected.
 - Measure the resistance between:

(+) EGT11 Sensor Connector, Component Side	(-) EGT11 Sensor Connector, Component Side
EGT11	SIGRTN

- For the EGT21 sensor,
 - EGT21 Sensor connector disconnected.
 - Measure the resistance between:

(+) EGT21 Sensor Connector, Component Side	(-) EGT21 Sensor Connector, Component Side
EGT21	SIGRTN

Is the resistance greater than 80 ohms?

Yes	GO to RB9 .
No	INSTALL a new EGT sensor. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. Clear the PCM DTCs. REPEAT the self-test.

RB9 CHECK FOR CORRECT EGT SENSOR OPERATION

- Ignition ON, engine OFF.
- For the EGT11 sensor,
- Access the PCM and monitor the EGT11_V (VOLT) PID.
- For the EGT21 sensor,
- Access the PCM and monitor the EGT21_V (VOLT) PID.

Is the EGT11 sensor or the EGT21 PID value greater than 4.7 V when disconnected?

Yes	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.
No	CHECK for a loose connection, and damaged or corroded terminals. WIGGLE the harness attempting to recreate the concern. REPAIR as necessary. If no concerns were found during the visual inspection, INSTALL a new EGT sensor. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. Clear the PCM DTCs. REPEAT the self-test.