

PRODEMAND

YMMS: 2014 Ford F-150 XLT

Engine: 3.7L Eng

VIN:

Jan 7, 2021

License:

Odometer:

PINPOINT TEST DL: Cylinder Head Temperature (CHT) Sensor

Introduction

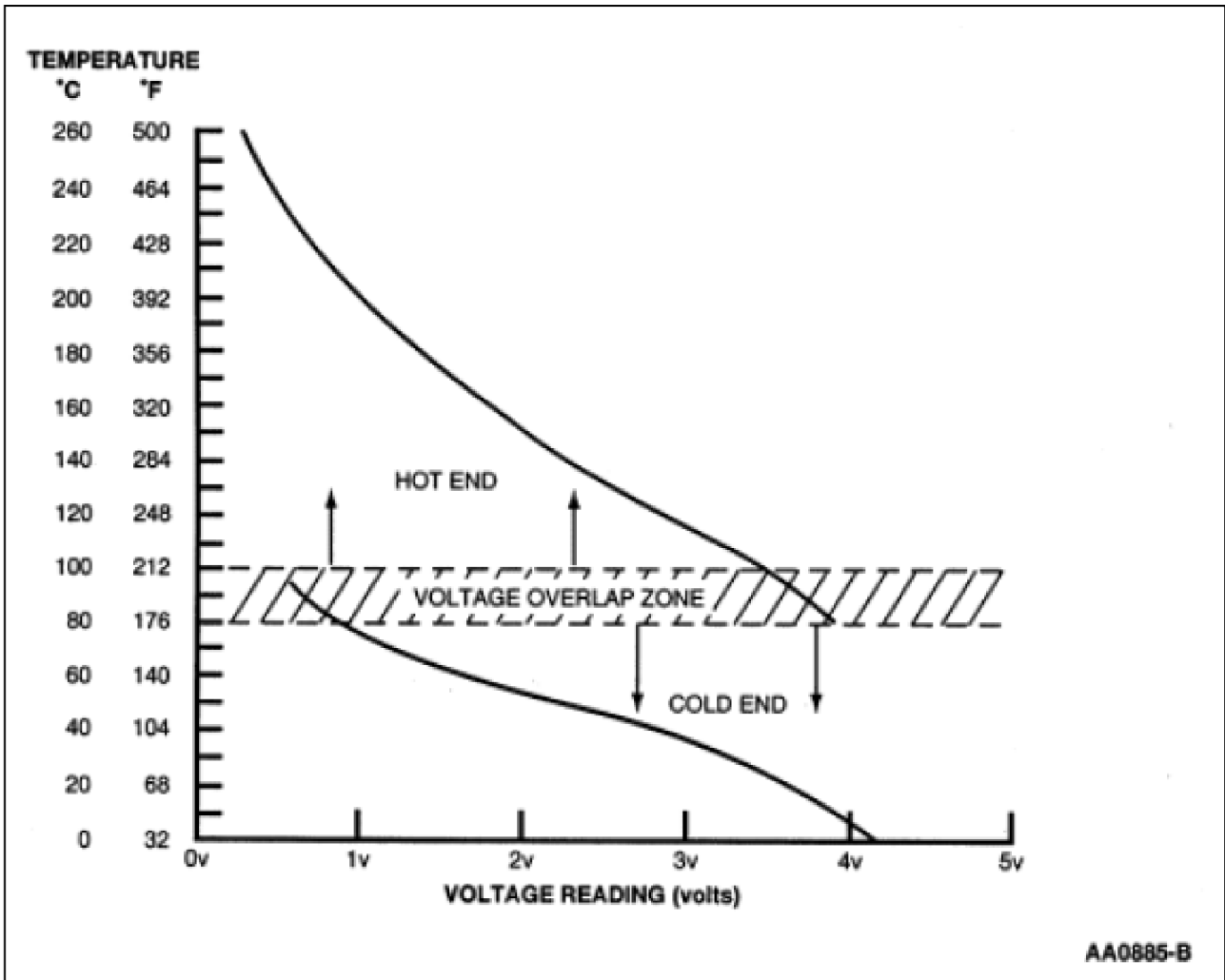
This pinpoint test is intended to diagnose the following:

- CHT sensor (6G004)
- harness circuits: CHT, VREF, and SIGRTN
- powertrain control module (PCM) (12A650)

On applications that do not use an engine coolant temperature (ECT) sensor, the CHT sensor is used to determine the engine coolant temperature. To cover the entire temperature range of both the CHT and ECT sensors, the PCM has a dual switching resistor circuit on the CHT input. A graph showing the temperature switching from the COLD END line to the HOT END line, with increasing temperature and back with decreasing temperature is included. Note the temperature to voltage overlap zone. Within this zone it is possible to have either a COLD END or HOT END voltage at the same temperature. For example, at 90°C (194°F) the voltage could read either 0.60 volt or 3.71 volts. Refer to the table for the temperature to voltage expected values.

Voltage values calculated for VREF equals 5 volts. These values can vary by 15% due to sensor and VREF variations.

Fig 1: Cylinder Head Temperature Sensor Temperature Versus Voltage Graph



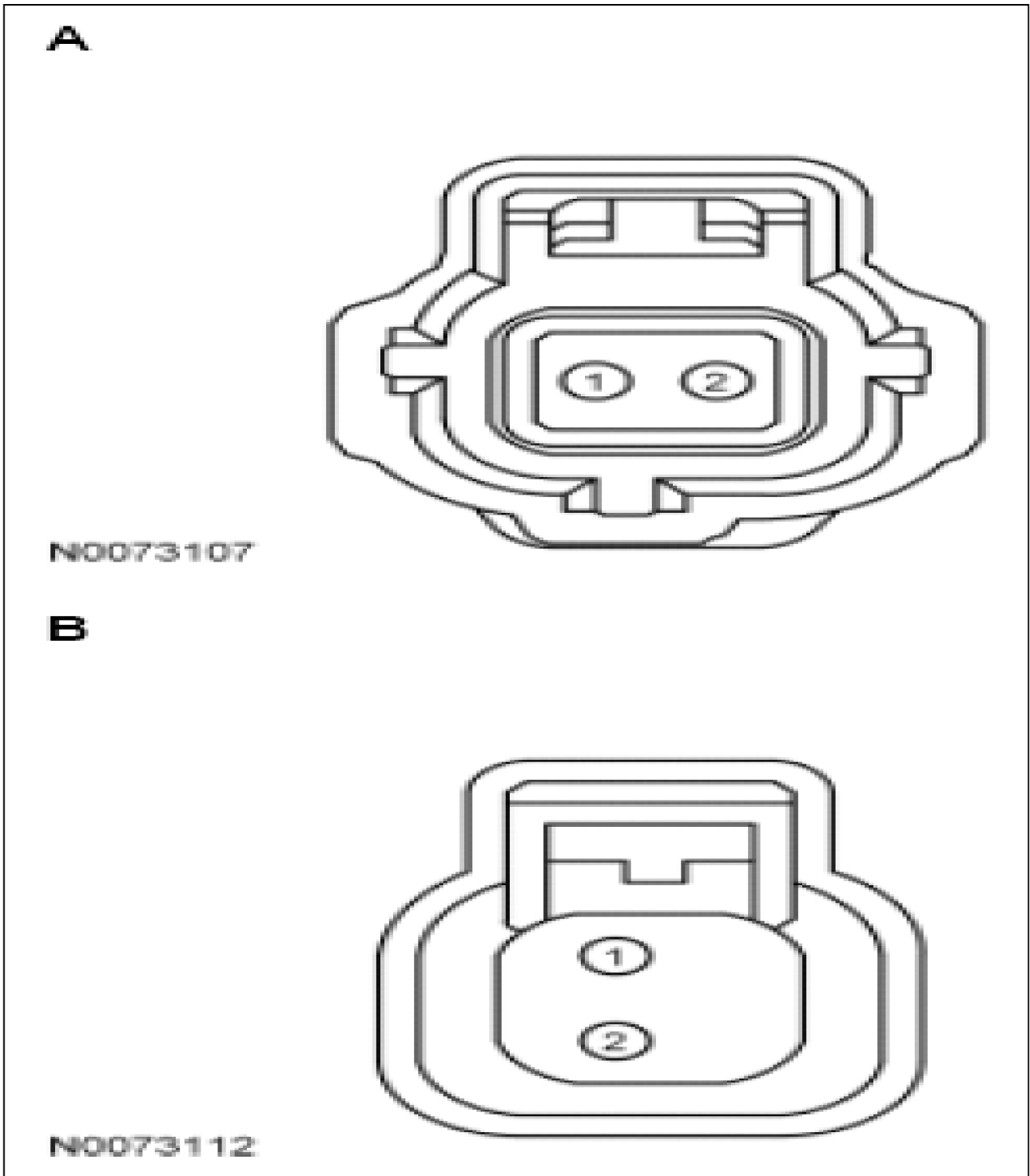
Courtesy of FORD MOTOR CO.

CYLINDER HEAD TEMPERATURE (CHT) SENSOR EXPECTED VALUES

| Temperature | | CHT Sensor Values | | |
|-------------|-----|-------------------|-----------------|---------------------|
| °C | °F | Cold End (volts) | Hot End (volts) | Resistance (K ohms) |
| -40 | -40 | 4.89 | - | 965.808 |
| -30 | -22 | 4.81 | - | 513.019 |
| -20 | -4 | 4.67 | - | 283.664 |
| -10 | 14 | 4.45 | - | 162.584 |
| 0 | 32 | 4.14 | - | 96.255 |
| 10 | 50 | 3.73 | - | 59.175 |
| 20 | 68 | 3.26 | - | 37.387 |
| 30 | 86 | 2.74 | - | 24.215 |

| | | | | |
|-----|-----|------|------|--------|
| 40 | 104 | 2.23 | - | 16.043 |
| 50 | 122 | 1.76 | - | 10.85 |
| 60 | 140 | 1.36 | - | 7.487 |
| 70 | 158 | 1.04 | - | 5.268 |
| 80 | 176 | 0.79 | 3.99 | 3.775 |
| 85 | 185 | 0.69 | 3.86 | 3.215 |
| 90 | 194 | 0.60 | 3.71 | 2.75 |
| 95 | 203 | 0.53 | 3.56 | 2.361 |
| 100 | 212 | 0.46 | 3.41 | 2.034 |
| 110 | 230 | - | 3.07 | 1.523 |
| 120 | 248 | - | 2.74 | 1.155 |
| 130 | 266 | - | 2.41 | 0.8866 |
| 140 | 284 | - | 2.10 | 0.6891 |
| 150 | 302 | - | 1.81 | 0.5417 |
| 160 | 320 | - | 1.55 | 0.4301 |
| 170 | 338 | - | 1.33 | 0.3449 |
| 180 | 356 | - | 1.13 | 0.2791 |
| 190 | 374 | - | 0.96 | 0.2278 |
| 200 | 392 | - | 0.82 | 0.1875 |
| 210 | 410 | - | 0.70 | 0.155 |
| 220 | 428 | - | 0.60 | 0.130 |
| 230 | 446 | - | 0.51 | 0.109 |
| 240 | 464 | - | 0.44 | 0.092 |
| 250 | 482 | - | 0.35 | 0.078 |
| 260 | 500 | - | 0.33 | 0.067 |

Fig 2: Identifying Cylinder Head Temperature Sensor Connector Terminals



Courtesy of FORD MOTOR CO.

| Vehicle | Connector | Pin | Circuit |
|--|-----------|--------|---------------|
| Fusion 2.5L, Mustang 5.8L, Transit Connect | A | 2 1 | SIGRTN CHT |
| All other vehicles | B | 2 | SIGRTN |

Fig 3: Identifying Cylinder Head Temperature 2 Sensor Connector Terminals



Courtesy of FORD MOTOR CO.

| Pin | Circuit |
|-----|------------------------------------|
| 2 | SIGRTN (Signal Return) |
| 1 | CHT2 (Cylinder Head Temperature 2) |

Powertrain Control Module (PCM) Connector

For PCM connector views or reference values, refer to SECTION 6: REFERENCE VALUES .

| Vehicle | Connector | Pin | Circuit |
|---------------------------------|-----------|-------------------|-----------------------|
| E-Series 4.6L, E-Series 5.4L | 190-PIN | E63 E15 E64 | VREF CHT SIGRTN |

| | | | |
|---|---------|----------------------------------|------------------------|
| E-Series 6.8L | 190-PIN | E57 E30 E32 | VREF CHT SIGRTN |
| Edge 2.0L, Explorer 2.0L | 154 PIN | E15, E18 E34 E56 | VREF SIGRTN CHT2 |
| Escape 1.6L, Fusion 1.5L | 198 PIN | E6, E8 | VREF |
| Escape 2.0L, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, Taurus 2.0L | 198 PIN | E6, E8 E20 E46 | VREF SIGRTN CHT2 |
| Escape 2.5L, Fusion 2.5L, Transit Connect 2.5L | 190-PIN | E35 E39 E49 | VREF CHT SIGRTN |
| Expedition, F-150 5.0L, F-150 6.2L, F-650/F-750, F-Series Super Duty, Motorhome/Stripped Chassis/Step Van, Mustang 5.0L, Navigator | 190-PIN | B52, B66 E30 E32 | VREF CHT SIGRTN |
| Explorer GTDI 3.5L, F-150 3.5L, Flex GTDI 3.5L, MKS 3.5L, MKT 3.5L, Taurus GTDI 3.5L | 198 PIN | E8 E36 E20 | VREF CHT SIGRTN |
| Fiesta GTDI 1.6L, Fiesta 1.0L, Fusion 1.6L | 198 PIN | E3, E7 | VREF |
| Fiesta TiVCT 1.6L | 128 PIN | E30 | VREF |
| Focus GDI 2.0L | 154 PIN | E15, E16, E17, E18, E23, E40 | VREF |
| Focus GTDI 2.0L | 154 PIN | E15, E16, E18, E23 E34 E56 | VREF SIGRTN CHT2 |
| MKZ 3.7L | 190-PIN | B66 E39 E49 | VREF CHT SIGRTN |
| Mustang 5.8L | 190-PIN | E20 E30 E32 | VREF CHT SIGRTN |
| Taurus 3.7L | 190-PIN | E35, E57 | VREF |

| | | | |
|----------------------|---------|------------------------|------------------------|
| | | E39 E49 | CHT SIGRTN |
| Transit Connect 1.6L | 198 PIN | E6, E8 E53 E46 | VREF SIGRTN CHT2 |
| All other vehicles | 190-PIN | B52, B66 E39 E49 | VREF CHT SIGRTN |

Test Procedure

DL1 CHECK FOR DIAGNOSTIC TROUBLE CODES (DTCs)

Are DTCs P0116, P0119, P0125, P0128, P017C, P017D, P017E, P101F, P1021, P1022, P1023, P1024, P1025, P1026, P1285, P1288, P1289, P128A, or P1290 present?

| Yes | No |
|---|---|
| <p>For DTC P101F, P1025 or P1288, GO to DL2. For KOEO and KOER DTCs P017C, P017D, P017E, P1022, P1023, P1024, P1026, P1289 or P1290, GO to DL8. For continuous memory DTCs P017C, P017D, P017E, P0119, P1022, P1023, P1024, P1289, P128A or P1290, GO to DL15. For continuous memory DTCs P0125 or P0128, GO to DL21. For continuous memory DTC P0116, P1021 or P1026, GO to DL23. For DTC P1285, GO to DL18.</p> | <p>For temperature warning indicator lamp or gauge (applications with CHT sensor only) symptom, GO to DL28. For all others, RETURN to NO DIAGNOSTIC TROUBLE CODES (DTCs) PRESENT SYMPTOM CHART INDEX for further direction.</p> |

DL2 CHECK THE COOLING SYSTEM

WARNING: TO AVOID PERSONAL INJURY DO NOT UNSCREW THE COOLANT PRESSURE RELIEF CAP WHILE THE ENGINE IS OPERATING OR HOT. THE COOLING SYSTEM IS UNDER PRESSURE. STEAM AND HOT LIQUID CAN COME OUT FORCEFULLY WHEN THE CAP IS LOOSEMED SLIGHTLY. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

The DTC indicates the temperature sensor is out of self-test range. The engine is not at normal operating temperature.

Check the vehicle coolant level.

Is the cooling system OK?

| Yes | No |
|-------|--|
| GO to | REFER to the applicable service information article, Engine Cooling, for loss of coolant |

| | |
|--------------|---|
| DL3 . | diagnosis. Clear the PCM DTCs. REPEAT the self-test. |
|--------------|---|

DL3 CHECK IF THE VEHICLE ENGINE STARTS

Attempt to start the engine.

Does the engine start and run normally?

| Yes | No |
|------------|--------------------|
| GO to DL6. | GO to DL4 . |

DL4 CHECK THE RESISTANCE OF THE CHT SENSOR WITH THE ENGINE OFF

NOTE: Refer to the chart at the beginning of this test for the resistance and temperature specifications.

Ignition OFF.

For Edge 2.0L, Escape 2.0L, Explorer 2.0L, Focus 2.0L GTDI, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, or Taurus 2.0L,

CHT2 Sensor connector disconnected.

Measure the resistance between:

| (+) CHT2 Sensor Connector, Component Side | (-) CHT2 Sensor Connector, Component Side |
|---|---|
| CHT2 - Pin 1 | SIGRTN - Pin 2 |

For all others,

CHT Sensor connector disconnected.

Measure the resistance between:

| (+) CHT Sensor Connector, Component Side | (-) CHT Sensor Connector, Component Side |
|--|--|
| CHT | SIGRTN |

Is the resistance within specification?

| Yes | No |
|--------------------|--|
| GO to DL5 . | INSTALL a new CHT sensor. REFER to the appropriate Electronic Engine Controls article. Clear the PCM DTCs. REPEAT the self-test. |

DL5 CHECK THE CIRCUIT FROM THE MODULE TO THE COMPONENT

NOTE: Refer to the chart at the beginning of this test for the resistance and temperature specifications.

CHT Sensor connector connected.

Ignition ON, engine OFF.

Access the PCM and monitor the CHT (TEMP) PID.

Using the value from the previous step, compare the temperature resistance value measured at the sensor to the PCM PID value.

Does the measured value at the sensor compare to the PCM PID value?

| Yes | No |
|---|-------------|
| The concern is elsewhere. RETURN to NO DIAGNOSTIC TROUBLE CODES (DTCS) PRESENT SYMPTOM CHART INDEX , for further direction. | GO to DL12. |

DL6 CHECK THE CHT SENSOR OPERATION

Run the engine until the engine temperature stabilizes.

Verify the radiator hoses are hot and the cooling system is pressurized.

Carry out the PCM self-test.

Is DTC P1288 present?

| Yes | No |
|--------------------|--|
| GO to DL7 . | The engine temperature was not stabilized. REPAIR any other DTCs as necessary. |

DL7 CHECK THE RESISTANCE OF THE CHT SENSOR

NOTE: Refer to the chart at the beginning of this test for the resistance and temperature specifications.

The vehicle must be at normal operating temperature.

Ignition OFF.

For Edge 2.0L, Escape 2.0L, Explorer 2.0L, Focus 2.0L GTDI, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, or Taurus 2.0L,

CHT2 Sensor connector disconnected.

Measure the resistance between:

| (+) CHT2 Sensor Connector, Component Side | (-) CHT2 Sensor Connector, Component Side |
|---|---|
| CHT2 - Pin 1 | SIGRTN - Pin 2 |

For all others,

CHT Sensor connector disconnected.

Measure the resistance between:

| (+) CHT Sensor Connector, Component Side | (-) CHT Sensor Connector, Component Side |
|--|--|
| CHT | SIGRTN |

Is the resistance within specification?

| Yes | No |
|-----|----|
| | |

| | |
|-------------|--|
| GO to DL30. | INSTALL a new CHT sensor. REFER to the appropriate Electronic Engine Controls article. Clear the PCM DTCs. REPEAT the self-test. |
|-------------|--|

DL8 ACCESS THE CHT PID AND CHECK THE VALUE

Ignition ON, engine OFF.

Access the PCM and monitor the CHT (TEMP) PID.

Is the temperature less than 115°C (240°F)?

| Yes | No |
|-------------|--------------------|
| GO to DL10. | GO to DL9 . |

DL9 CHECK FOR A GROUNDED CIRCUIT

CHT Sensor connector disconnected.

Ignition ON, engine OFF.

Access the PCM and monitor the CHT (TEMP) PID.

Is the temperature less than -10°C (14°F)?

| Yes | No |
|--|-------------|
| INSTALL a new CHT sensor. REFER to the appropriate Electronic Engine Controls article. Clear the PCM DTCs. REPEAT the self-test. | GO to DL14. |

DL10 CHECK THE CHT CIRCUIT FOR A SHORT TO VOLTAGE

For Edge 2.0L, Escape 2.0L, Explorer 2.0L, Focus 2.0L GTDI, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, or Taurus 2.0L,

CHT2 Sensor connector disconnected.

Ignition ON, engine OFF.

Measure the voltage between:

| (+) CHT2 Sensor Connector, Harness Side | (-) |
|---|--------|
| CHT2 - Pin 1 | Ground |

For all others,

CHT Sensor connector disconnected.

Ignition ON, engine OFF.

Measure the voltage between:

| (+) CHT Sensor Connector, Harness Side | (-) |
|--|--------|
| CHT | Ground |

Is any voltage present?

| Yes | No |
|---|---------------------|
| REPAIR the short circuit. CHECK the CHT sensor for damage. GO to DL11 . | GO to DL11 . |

DL11 CHECK THE RESISTANCE OF THE CHT SENSOR WITH THE ENGINE OFF

NOTE: Refer to the chart at the beginning of this test for the resistance and temperature specifications.

Ignition OFF.

For Edge 2.0L, Escape 2.0L, Explorer 2.0L, Focus 2.0L GTDI, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, or Taurus 2.0L,

CHT2 Sensor connector disconnected.

Measure the resistance between:

| (+) CHT2 Sensor Connector, Component Side | (-) CHT2 Sensor Connector, Component Side |
|---|---|
| CHT2 - Pin 1 | SIGRTN - Pin 2 |

For all others,

CHT Sensor connector disconnected.

Measure the resistance between:

| (+) CHT Sensor Connector, Component Side | (-) CHT Sensor Connector, Component Side |
|--|--|
| CHT | SIGRTN |

Is the resistance within specification?

| Yes | No |
|-------------------|---|
| GO to DL12 | INSTALL a new CHT sensor. REFER to the appropriate Electronic Engine Controls article. Clear the PCM DTCs. REPEAT the self-test. |

DL12 CHECK THE SIGNAL AND SIGRTN CIRCUITS FOR AN OPEN

PCM connector disconnected.

For Edge 2.0L, Escape 2.0L, Explorer 2.0L, Focus 2.0L GTDI, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, or Taurus 2.0L,

Measure the resistance between:

| (+) CHT2 Sensor Connector, Harness Side | (-) PCM Connector, Harness Side |
|---|---------------------------------|
| CHT2 - Pin 1 | CHT2 |
| SIGRTN - Pin 2 | SIGRTN |

For all others,

Measure the resistance between:

| (+) CHT Sensor Connector, Harness Side | (-) PCM Connector, Harness Side |
|--|---------------------------------|
| CHT | CHT |
| SIGRTN | SIGRTN |

Are the resistances less than 5 ohms?

| Yes | No |
|---------------------|--|
| GO to DL13 . | REPAIR the open circuit. Clear the PCM DTCs. REPEAT the self-test. |

DL13 CHECK THE SENSOR SIGNAL FOR A SHORT TO VREF

Ignition OFF.

PCM connector disconnected.

For Edge 2.0L, Escape 2.0L, Explorer 2.0L, Focus 2.0L GTDI, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, or Taurus 2.0L,

Measure the resistance between:

| (+) PCM Connector, Harness Side | (-) PCM Connector, Harness Side |
|---------------------------------|---------------------------------|
| CHT2 | VREF |

For all others,

Measure the resistance between:

| (+) PCM Connector, Harness Side | (-) PCM Connector, Harness Side |
|---------------------------------|---------------------------------|
| CHT | VREF |

Is the resistance greater than 10K ohms?

| Yes | No |
|---------------------|---|
| GO to DL30 . | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |

DL14 CHECK THE SENSOR SIGNAL FOR A SHORT TO GROUND

Ignition OFF.

For Edge 2.0L, Escape 2.0L, Explorer 2.0L, Focus 2.0L GTDI, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, or Taurus 2.0L,

Measure the resistance between:

| (+) CHT2 Sensor Connector, Harness Side | (-) CHT2 Sensor Connector, Harness Side |
|---|---|
| CHT2 - Pin 1 | SIGRTN - Pin 2 |

Measure the resistance between:

| (+) CHT2 Sensor Connector, Harness Side | (-) 12 Volt Vehicle Battery |
|---|-----------------------------|
| CHT2 - Pin 1 | Negative terminal |

For all others,

Measure the resistance between:

| (+) CHT Sensor Connector, Harness Side | (-) CHT Sensor Connector, Harness Side |
|--|--|
| CHT | SIGRTN |

Measure the resistance between:

| | |
|--|--|
| | |
|--|--|

| | |
|--|-----------------------------|
| (+) CHT Sensor Connector, Harness Side | (-) 12 Volt Vehicle Battery |
| CHT | Negative terminal |

Are the resistances greater than 10K ohms?

| Yes | No |
|-------------|---|
| GO to DL30. | REPAIR the short circuit. Clear the PCM DTCs. REPEAT the self-test. |

DL15 INTERMITTENT CHECK

Ignition ON, engine OFF.

Access the PCM and monitor the CHT (TEMP) PID.

While observing the PID, carry out the following:

tap on the sensor to simulate road shock

wiggle the sensor connector

Is there a large change in the temperature value?

| Yes | No |
|--|---------------------|
| DISCONNECT and INSPECT the connector. If OK, INSTALL a new CHT sensor. REFER to the appropriate Electronic Engine Controls article. Clear the PCM DTCs. REPEAT the self-test. | GO to DL16 . |

DL16 CHECK THE ELECTRONIC ENGINE CONTROL (EEC) WIRING HARNESS

Access the PCM and monitor the CHT (TEMP) PID.

While observing the PID, wiggle, shake, and bend small sections of the wiring harness while working from the sensor to the PCM.

Is there a large change in the temperature value?

| Yes | No |
|---|---------------------|
| ISOLATE the concern. REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test. | GO to DL17 . |

DL17 CHECK THE PCM AND VEHICLE HARNESS CONNECTORS

PCM connector disconnected.

CHT Sensor connector disconnected.

Are the connectors and terminals OK?

| Yes | No |
|-------------|---|
| GO to DL30. | REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test. |

DL18 EARLY WARNING OF ENGINE OVERHEAT CONDITION

WARNING: TO AVOID PERSONAL INJURY DO NOT UNSCREW THE COOLANT PRESSURE RELIEF CAP WHILE THE ENGINE IS OPERATING OR HOT. THE COOLING SYSTEM

IS UNDER PRESSURE. STEAM AND HOT LIQUID CAN COME OUT FORCEFULLY WHEN THE CAP IS LOOSEMED SLIGHTLY. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

NOTE: *If the electric cooling fan does not operate, return to DIAGNOSTIC TROUBLE CODE (DTC) CHARTS AND DESCRIPTIONS for electric cooling fan DTC. Return to NO DIAGNOSTIC TROUBLE CODES (DTCS) PRESENT SYMPTOM CHART INDEX for symptom diagnosis.*

An engine overheat condition is sensed by the CHT sensor.

Check the cooling system for:

- correct coolant level
- internal or external coolant leaks
- blockage of the radiator
- cooling fan operation

Is the cooling system OK?

| Yes | No |
|-------------------|--|
| GO to DL19 | REFER to the appropriate Engine Cooling article, to diagnose the engine overheats. Clear the PCM DTCs. REPEAT the self-test. |

DL19 CHECK THE OPERATION OF THE CYLINDER HEAD TEMPERATURE SENSOR

Run the engine until the engine temperature stabilizes.

Verify the radiator hoses are hot and the cooling system is pressurized.

Carry out the PCM self-test.

Is DTC P1285 present?

| Yes | No |
|-------------------|--|
| GO to DL20 | An engine overheat temperature was not detected. REPAIR any other DTCs as necessary. |

DL20 CHECK THE RESISTANCE OF THE CHT SENSOR

NOTE: *Refer to the chart at the beginning of this test for the resistance specifications.*

The vehicle must be at normal operating temperature.

Ignition OFF.

For Edge 2.0L, Escape 2.0L, Explorer 2.0L, Focus 2.0L GTDI, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, or Taurus 2.0L,

CHT2 Sensor connector disconnected.

Measure the resistance between:

| | |
|---|---|
| (+) CHT2 Sensor Connector, Component Side | (-) CHT2 Sensor Connector, Component Side |
| CHT2 - Pin 1 | SIGRTN - Pin 2 |

For all others,
CHT Sensor connector disconnected.
Measure the resistance between:

| | |
|--|--|
| (+) CHT Sensor Connector, Component Side | (-) CHT Sensor Connector, Component Side |
| CHT | SIGRTN |

Is the resistance within specification?

| Yes | No |
|-------------|---|
| GO to DL30. | INSTALL a new CHT sensor. REFER to the appropriate Electronic Engine Controls article. Clear the PCM DTCs. REPEAT the self-test. |

DL21 CHECK THE ENGINE COOLANT LEVEL

WARNING: TO AVOID PERSONAL INJURY DO NOT UNSCREW THE COOLANT PRESSURE RELIEF CAP WHILE THE ENGINE IS OPERATING OR HOT. THE COOLING SYSTEM IS UNDER PRESSURE. STEAM AND HOT LIQUID CAN COME OUT FORCEFULLY WHEN THE CAP IS LOOSEMED SLIGHTLY. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

NOTE: DTC P0125 or P0128 indicates the engine coolant temperature has not achieved the required engine operation temperature level, since start-up within a specified amount of time.

Check the engine coolant level.

Is the engine coolant fill level correct?

| Yes | No |
|--------------|--|
| GO to DL22 . | REFER to the applicable service information article, Engine Cooling, to diagnose the loss of coolant. Clear the PCM DTCs. REPEAT the self-test. |

DL22 CHECK THE SENSOR OPERATION

Run the engine until the engine temperature stabilizes.

Verify the radiator hoses are hot and the cooling system is pressurized.

Access the PCM and monitor the CHT (TEMP) PID.

Is the temperature greater than 77°C (170.6°F)?

| Yes | No |
|---|---|
| The test is complete. Clear the PCM DTCs. REPEAT the self-test. | REFER to the applicable service information article, Engine Cooling, to diagnose the engine not reaching normal operating temperature. Clear the PCM DTCs. REPEAT the self-test. |

DL23 CHECK THE RESISTANCE OF THE CHT SENSOR WITH THE ENGINE OFF

NOTE: Verify the engine temperature is at ambient room temperature before continuing with this test. A soak period of 6 hours may be required. Refer to DIAGNOSTIC TROUBLE CODE (DTC) CHARTS AND DESCRIPTIONS for information concerning P0116.

Ignition OFF.

For Edge 2.0L, Escape 2.0L, Explorer 2.0L, Focus 2.0L GTDI, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, or Taurus 2.0L,

CHT2 Sensor connector disconnected.

Measure the resistance between:

| (+) CHT2 Sensor Connector, Component Side | (-) CHT2 Sensor Connector, Component Side |
|---|---|
| CHT2 - Pin 1 | SIGRTN - Pin 2 |

For all others,

CHT Sensor connector disconnected.

Measure the resistance between:

| (+) CHT Sensor Connector, Component Side | (-) CHT Sensor Connector, Component Side |
|--|--|
| CHT | SIGRTN |

Is the resistance within specification?

| Yes | No |
|-------------------|---|
| GO to DL24 | INSTALL a new CHT sensor. REFER to the appropriate Electronic Engine Controls article. Clear the PCM DTCs. REPEAT the self-test. |

DL24 CHECK THE RESISTANCE OF THE CHT SENSOR

NOTE: Verify the engine is at operating temperature before taking the CHT reading.

CHT Sensor connector connected.

CHT2 Sensor connector connected.

Run the engine until the engine temperature stabilizes.

Ignition OFF.

For Edge 2.0L, Escape 2.0L, Explorer 2.0L, Focus 2.0L GTDI, Fusion 2.0L, MKT 2.0L, MKZ 2.0L, or Taurus 2.0L,

CHT2 Sensor connector disconnected.

Measure the resistance between:

| (+) CHT2 Sensor Connector, Component Side | (-) CHT2 Sensor Connector, Component Side |
|---|---|
| CHT2 - Pin 1 | SIGRTN - Pin 2 |

For all others,

CHT Sensor connector disconnected.

Measure the resistance between:

| (+) CHT Sensor Connector, Component Side | (-) CHT Sensor Connector, Component Side |
|--|--|
| CHT | SIGRTN |

Is the resistance within specification?

| Yes | No |
|---|--|
| The concern is not present at this time. CARRY OUT the OBD drive cycle to determine if fuel, HO2S, catalyst and misfire monitors can be executed. REFER to ON BOARD DIAGNOSTIC (OBD) DRIVE CYCLE . REPEAT the PCM self-test if necessary. | INSTALL a new CHT sensor. REFER to the appropriate Electronic Engine Controls article. Clear the PCM DTCs. REPEAT the self-test. |

DL25 ENGINE OIL OVER TEMPERATURE CONDITION

NOTE: The engine oil temperature protection strategy in the PCM has been activated. This protects the engine against mechanical damage due to overheating. Refer to DIAGNOSTIC TROUBLE CODE (DTC) CHARTS AND DESCRIPTIONS for possible causes and additional DTC description information.

Check for an overheating condition and base engine concerns.

Are there any overheating or base engine concerns?

| | |
|--|--|
| | |
|--|--|

| Yes | No |
|--|---------------------|
| ISOLATE the concern. REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test. | GO to DL26 . |

DL26 CHECK FOR CHT DTCS

Carry out the PCM self-test.

Are DTCs P1285, P1288, P1289 or P1299 present?

| Yes | No |
|---|---------------------|
| DISREGARD the engine oil temperature (EOT) DTC at this time. ADDRESS the next DTC. GO to DIAGNOSTIC TROUBLE CODE (DTC) CHARTS AND DESCRIPTIONS . | GO to DL27 . |

DL27 ROAD TEST THE VEHICLE AND MONITOR FOR ENGINE OVER TEMPERATURE

Access the freeze frame data (if available) and record the DTC conditions.

Access the PCM and monitor the CHT (TEMP) PID.

Test drive the vehicle and allow the engine to reach normal operating temperature.

Observe CHT PID.

Does the engine overheat?

| Yes | No |
|--|---|
| REFER to the applicable service information article, Engine Cooling to diagnose the overheat symptom. Clear the PCM DTCs. REPEAT the self-test. | Unable to duplicate or identify the concern at this time. |

DL28 ENGINE TEMPERATURE WARNING INDICATOR LAMP ON OR TEMPERATURE GAUGE INDICATES HOT, BUT ENGINE IS NOT OVERHEATING

NOTE: *The PCM self-test must be carried out prior to entering this pinpoint test.*

Was the PCM self-test carried out prior to entering this pinpoint test?

| Yes | No |
|---------------------|---|
| GO to DL29 . | The concern is elsewhere. RETURN to NO DIAGNOSTIC TROUBLE CODES (DTCS) PRESENT SYMPTOM CHART INDEX for further direction. |

DL29 ENGINE TEMPERATURE INDICATOR LAMP ON OR TEMPERATURE GAUGE INDICATES HOT WITH NO DTCS

NOTE: *The engine temperature warning indicator (gauge or lamp) is a warning system that gives the driver information during an engine overheating condition. The PCM monitors the cylinder head temperature (CHT) sensor and determines if fail-safe cooling mode is needed. If fail-safe cooling mode is*

needed, the PCM sends a controller area network (CAN) message to the instrument panel cluster (IPC) to signal an overheating condition. This causes the IPC indicator to illuminate and forces the temperature gauge to the H (hot) zone. DTC P1285 is stored in the PCM.

NOTE: For Engine Temperature Warning Indicator system problems, refer to the applicable service information article, Instrumentation, Message Center, and Warning Chimes.

PCM connector disconnected.
Ignition ON, engine OFF.

Does the engine temperature warning indicator lamp turn OFF (prove out) and/or the temperature gauge return to the normal zone with the PCM disconnected?

| Yes | No |
|---|---|
| REFER to the applicable service information article, Engine Cooling to diagnose the overheat symptom. Clear the PCM DTCs. REPEAT the self-test. | REFER to the applicable service information article, Instrumentation, Message Center, and Warning Chimes to diagnose the incorrect temperature gauge. Clear the PCM DTCs. REPEAT the self-test. |

DL30 CHECK FOR CORRECT PCM OPERATION

Disconnect all the PCM connectors.

Visually inspect for:

- pushed out pins
- corrosion

Connect all the PCM connectors and make sure they seat correctly.

Carry out the PCM self-test.

Verify the concern is still present.

Is the concern still present?

| Yes | No |
|---|--|
| INSTALL a new PCM. REFER to FLASH ELECTRICALLY ERASABLE PROGRAMMABLE READ ONLY MEMORY (EEPROM) , Programming the VID Block for a Replacement PCM. | The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. |