

AT: Engine Coolant Temperature And Engine Oil Temperature Correlation

 **WARNING:** 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.

- This pinpoint test is intended to diagnose the following:
- low engine coolant level
- cooling system flow restriction
- engine coolant temperature (ECT) sensor (12A648)
- engine oil temperature (EOT) sensor (12A648)

AT1 CHECK FOR AN ENGINE COOLANT LOSS OR AN ENGINE OVERHEATING CONCERN

- Carry out a visual inspection. Refer to the Workshop Manual Section 303-03, Engine Cooling.
- Verify the pressure relief cap is capable of holding system pressure.
- Verify that the coolant and cooling system maintenance has been carried out as recommended.

Is the engine overheating or losing coolant?

Yes	REFER to the Workshop Manual Section 303-03, Engine Cooling, Symptom Charts to continue diagnosis of the engine overheats or loss of coolant symptoms.
No	GO to AT2 .

AT2 CHECK FOR DTCS

- Retrieve and record all DTCs.
- Record the freeze frame data.

Are there any DTCs other than P012F or P2560 present?

Yes	DISREGARD the current diagnostic trouble code (DTC) at this time. DIAGNOSE the next DTC. GO to Section 4, Diagnostic Trouble Code (DTC) Charts and Descriptions .
No	GO to AT3 .

AT3 CHECK ECT OR EOT SENSOR FOR DAMAGE

- Inspect the ECT and EOT sensor and circuits at the sensor and PCM for the following:
 - pinched, shorted, and corroded wiring and pins
 - oil or water contamination
 - crossed sensor wires
 - contaminated or damaged sensor

Is a concern present?

Yes	REPAIR as necessary. Clear the PCM DTCs. REPEAT the self-test.
No	For DTC P2560, GO to AT5 . For all others, GO to AT4 .

AT4 CHECK FOR CORRECT ECT AND EOT SENSOR OPERATION AFTER A COLD SOAK

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

- Clear the PCM DTCs.

- Cold soak the vehicle at ambient temperature for a minimum of 7 hours.
- Ignition ON, engine OFF.
- Access the PCM and monitor the EOT (TEMP) PID.
- Access the PCM and monitor the RPM (RPM) PID.
- Access the PCM and monitor the ECT (TEMP) PID.
- Record the ECT and EOT sensor temperature values.
- 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 ECT PID and the EOT PID temperature values change by a minimum of 6°C (10°F) from when the ignition ON, engine OFF values were recorded?

Yes	The concern is not present at this time. CHECK for a loose connection, and damaged or corroded pins. WIGGLE the harness attempting to recreate the concern. REPAIR as necessary. RETURN to Section 3, Symptom Charts for further direction.
No	INSTALL a new ECT or EOT sensor in question. REFER to the Workshop Manual Section 303-14, Electronic Engine Controls. Clear the PCM DTCs. REPEAT the self-test.

AT5 CHECK FOR CORRECT ECT AND EOT SENSOR OPERATION

- Clear the PCM DTCs.
- Ignition ON, engine OFF.
- Access the PCM and monitor the EOT (TEMP) PID.
- Access the PCM and monitor the RPM (RPM) PID.
- Access the PCM and monitor the ECT (TEMP) PID.
- Record the ECT and EOT sensor temperature values.
- Drive the vehicle at an engine speed greater than 1,800 RPM until the EOT sensor temperature value has reached a minimum of 70°C (158°F). Select the appropriate gear to achieve the operating conditions.

Does the EOT PID temperature value exceed the ECT temperature value by greater than 50°C (122°F)?

Yes	INSTALL a new engine oil cooler. REFER to the Workshop Manual Section 303-01, Engine, Oil Cooler.
No	The concern is not present at this time. CHECK for a loose connection, and damaged or corroded pins. WIGGLE the harness attempting to recreate the concern. REPAIR as necessary. RETURN to Section 3, Symptom Charts for further direction.

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