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Service Information Bulletin

SUBJECT	DATE
Engine Coolant Temperature	July 2014

Additions, Revisions, or Updates

Publication Number / Title	Platform	Section Title	Change
DDC-SVC-MAN-0084	DD Platform	High Engine Coolant Temperature	Improved diagnostics.
		Low Engine Coolant Temperature	

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2 High Engine Coolant Temperature

Check as follows:

NOTICE:

The engine fan does not turn on until coolant temperature reaches 105°C (221°F).

1. Check for fault codes.
   a. If SPN 110 / FMI 0 is active, Refer to section "SPN 110/FMI 0 - EPA07 - EPA10 - GHG14".
   b. If no fault codes are active, Go to step 2.
2. Check the condition of the fan and water pump belts. Refer to section "Belt Drive Noise". Are the belts in acceptable condition?
   a. Yes; Go to step 3.
   b. No; Replace the belts.
3. Check the condition of the belt tensioner. Refer to section "Belt Drive Noise". Are the belt tensioner in acceptable condition?
   a. Yes; Go to step 4.
   b. No; Replace the belt tensioner. Refer to section "Removal of the Belt Tensioner".
4. Check the condition of the idler and accessory drive pulleys. Are the drive pulleys in acceptable condition?
   a. Yes; Go to step 5.
   b. No; replace and repair as necessary.
5. Visually inspect the coolant level. Is the coolant level within an acceptable range?
   a. Yes; Go to step 6.
   b. No; fill coolant system to correct level.
6. Pressure test the radiator cap according to Original Equipment Manufacturer (OEM) procedure. Does the radiator cap pass the test?
   a. Yes; Go to step 7.
   b. No; replace the radiator cap.
7. Pressure test the cooling system with a pressure tester according to OEM procedure. Does the cooling system pass the test?
   a. Yes; Go to step 8.
   b. No; repair according to OEM procedure.
8. Visually examine the radiator and radiator shrouding.
9. Clean the exterior radiator of all clogging, debris, or excessive dirt; refer to OEM guidelines. Remove winter front (if equipped).
   a. If the radiator shrouding is damaged, incorrectly positioned, or inadequate, repair or replace damaged radiator shrouding; refer to OEM guidelines.
   b. If the radiator is absent of clogging, debris, and dirt, check the radiator shrouding for damage or incorrect positioning. If there is no damage or clogging to the radiator. Go to step 10.
10. Visually examine cooling system hoses; refer to OEM guidelines. Are the cooling system hoses in acceptable condition?
    a. Yes; Go to step 11.
    b. No; remove and replace damaged or worn coolant hoses as necessary; refer to OEM instructions.
11. Test the cooling fan; refer to OEM guidelines. Does the cooling fan function properly?
    a. Yes; Go to step 12.
    b. No; replace inoperative cooling fan; refer to OEM guidelines.
12. Inspect thermostat for correct operation. Three different operating conditions occur due to the coolant inlet temperature:
    a. **Bypass mode:** When the coolant inlet temperature is less than 85°C (185°F) the circulating thermostat is closed. The coolant circulates in the engine and coolant can flow through the vehicle heating system.

b. **Mixed mode:** For a coolant inlet temperature of greater than 85°C (185°F) to less than 95°C (203°F) the circulating thermostat opens partially and the coolant flows at the same time through the engine radiator and the short circuit line to the coolant thermostat.
c. **Radiator operation:** When the coolant inlet temperature is greater than 95°C (203°F), the circulating thermostat is completely open. The coolant is freely flowing to the engine radiator.

13. Is the thermostat opening correctly?
    a. Yes; Go to step 14.
    b. No; replace the thermostat. Refer to section "Removal of the Engine Coolant Thermostat and Seal".
14. Remove the water pump.
    a. For a standard water pump, Refer to section "Removal of the Water Pump".
    b. For a variable speed water pump, Refer to section "Removal of the Variable Speed Water Pump".
15. Inspect the water pump.
    a. For a standard water pump, Refer to section "Inspection of the Water Pump".
    b. For a variable speed water pump, Refer to section "Inspection of the Variable Speed Water Pump".
16. Is the water pump damaged?
    a. Yes; replace the water pump.
       For a standard water pump, Refer to section "Installation of the Water Pump".
       For a variable speed water pump, Refer to section "Installation of the Variable Speed Water Pump".
    b. No; contact Customer Support Center at 800-445-1980.

3 Low Engine Coolant Temperature

To determine if faulty thermostats are causing low engine coolant temperature, perform the following:

1. Inspect thermostat for correct operation. Three different operating conditions occur due to the coolant inlet temperature:
   a. **Bypass mode:** When the coolant inlet temperature is less than 85°C (185°F) the circulating thermostat is closed. The coolant circulates in the engine and coolant can flow through the vehicle heating heat exchange.
   b. **Mixed mode:** For a coolant inlet temperature of greater than 85°C (185°F) to less than 95°C (203°F) the circulating thermostat opens partially and the coolant flows at the same time through the engine radiator and the short circuit line to the coolant thermostat.
   c. **Radiator operation:** When the coolant inlet temperature greater than 95°C (203°F) the circulating thermostat is completely open. The coolant is freely flowing to the engine radiator.
2. Is the thermostat opening correctly?
   a. Yes; Go to step 3.
   b. No, replace the thermostat. Refer to section "Removal of the Engine Coolant Thermostat and Seal".

WARNING: ENGINE EXHAUST

To avoid injury from inhaling engine exhaust, always operate the engine in a well-ventilated area. Engine exhaust is toxic.

WARNING: PERSONAL INJURY

To avoid injury before starting and running the engine, ensure the vehicle is parked on a level surface, parking brake is set, and the wheels are blocked.

3. Start and run the engine.
4. Run the engine through its operating range with no-load for approximately 15 minutes, allowing the engine coolant to reach normal operating range.
   a. If the engine coolant temperature is 85 to 95°C (185 to 203°F), no further troubleshooting is required. Shut down the engine.
   b. If the engine coolant temperature is below 85 to 95°C (185 to 203°F), shut down the engine. Contact Customer Support Center at 800-445-1980.

