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Coding Information

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Title: Radiator Internal Restriction and Flush Procedure

Applies To: International vehicles 1990 and newer

CHANGE LOG

Please refer to the change log text box below for recent changes to this article:

07/25/2016 - Updated Author to article
07/21/2016 - Updated Article Coding

DESCRIPTION

When a radiator is thought to have an internal restriction it can normally be confirmed by using a surface temperature indicator to take temperatures of the radiator. See Service Procedure below for instructions. If the radiator has an internal restriction follow the Flush Procedure below to clean the radiator prior to replacing it. This procedure is found in the Service Procedure Section Below. Fleetguard has two coolant cleaners that can be used. For oil contaminated cooling systems, see [IK1201248](#).

PARTS INFORMATION

CC2610 - RESTORE CLEANER 1 gallon Container

CC2611 - RESTORE CLEANER 5 gallon Container

CC2612 - RESTORE CLEANER 55 gallon Drum

CC2638 - RESTORE PLUS CLEANER 1 gallon Container

CC2637 - RESTORE PLUS CLEANER 55 gallon Container

Fleetguard Restore Cleaner (alkaline) is for removal of silicate gelation. Fleetguard Restore Plus Cleaner (Acid) is for removal of scale, corrosion and oil fouling.

Procedure



WARNING:

To avoid personal injury or death from hot coolant or steam use only the following procedure to remove the pressure cap from the radiator and/or expansion tank.

Always wear protective goggles and allow the engine to cool first. Wrap a thick, heavy cloth around the cap. Push down, loosen cap slowly to its first notch position; then pause a moment to allow pressure to release through the overflow tube. After pressure has been released, the pressure cap may be removed.

Service Procedure For Checking Radiator Condition

1. Verify the complaint of the overheating.
2. With the thermostat open use a surface temperature indicator to measure the inlet and the outlet temperature of the radiator.
 - a. The normal temperature drop across the radiator when it is up to operating temperature and the thermostat is open should be 8 to 14 degrees Fahrenheit. Less than 8 degrees F. indicates that there is not enough air flow across the radiator. More than 14 degrees F. indicates that the coolant is not flowing through the cooling system fast enough.
 - b. To help determine the coolant flow through the radiator and determine if some of the tubes are plugged you should take the surface temperature at the following locations: Top of radiator, right side of radiator, bottom of radiator, left side of radiator, and center of radiator.

When checking a down flow radiator, know that the coolant enters the top of the radiator and exits at the bottom. When comparing the temperatures of the different areas of the radiator, the following guidelines should be used: the top of the radiator should be the hottest, the temperature readings across the center of the radiator should be close to each other, and the bottom of the radiator should be the coldest. If the temperatures across the center of the radiator are not close there may be a restriction in the radiator.

When checking a cross flow radiator, know that the coolant enters the left side tank and exits out the right side tank. When comparing the temperatures of the different areas of the radiator, the following guidelines should be used: the left side of the radiator should be the hottest, the temperatures in the middle section of the radiator from the top to the bottom should be close to each other and the right of the radiator should be the coldest. If the temperatures across the center of the radiator are not close there may be a restriction in the radiator.

Service Procedure For Flushing Radiator

1. Drain the cooling system, inspect the coolant and document the condition, then properly dispose of the used coolant. Do not allow the cooling system to dry out. Dried silicate gel or scale/corrosion products are very difficult to remove. Flush with plain water. If the engine has a coolant filter install a blank coolant filter (zero units of DCA).
2. Add cleaner into cooling system per requirements shown below. Fill remaining coolant capacity with water.
 - A 10% solution is suitable for most requirements (1 gallon of cleaner to 9 gallons of water).
 - A 20% solution may be used for heavy corrosion and scale deposits (2 gallons of cleaner, 8 gallons of water).
3. Run engine at high idle or work engine to attain normal operating temperatures. Normal operating temperatures must be achieved (at least 160 Degrees F.). If operating temperature cannot be attained, cleaning will be marginal to non-effective. If there is insufficient flow through the radiator, there will be little cleaning action. Working the engine is much better than running it at high idle.
4. Drain the system and flush with water. Close coolant drains. Refill system with plain water.
5. Run engine at high idle for a minimum of 15 minutes with plain water only.
6. Drain cooling system.
7. Refill cooling system with approved coolant. Install appropriate coolant filter if equipped.

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