

# 11-12 TROUBLESHOOTING

## 1-E. Engine Cooling System

### 1. Engine overheats

- a. Check the coolant level. Set the heater temperature to full hot and check for internal air pockets, bleed the cooling system and inspect for leakage. Top off the cooling system with the correct coolant mixture.
- b. Pressure test the cooling system and radiator cap for leaks. Check for seepage caused by loose hose clamps, failed coolant hoses, and cooling system components such as the heater control valve, heater core, radiator, radiator cap, and water pump. Replace defective parts and fill the cooling system with the recommended coolant mixture.
- c. On vehicles with electrically controlled cooling fans, check the cooling fan operation. Check for blown fuses or defective fan motors, temperature sensors and relays, and replace failed components.
- d. Check for a coolant leak caused by a failed head gasket, or a porous water jacket casting in the cylinder head or engine block. Replace defective parts as necessary.
- e. Check for an internally restricted radiator. Flush the radiator or replace if the blockage is too severe for flushing.
- f. Check for a damaged water pump. If coolant circulation is poor, check for a loose water pump impeller. If the impeller is loose, replace the water pump.

### 2. Engine loses coolant

- a. Pressure test the cooling system and radiator cap for leaks. Check for seepage caused by loose hose clamps, failed coolant hoses, and cooling system components such as the heater control valve, heater core, radiator, radiator cap, and water pump. Replace defective parts and fill the cooling system with the recommended coolant mixture.
- b. Check for a coolant leak caused by a failed head gasket, or a porous water jacket casting in the cylinder head or engine block. Replace defective parts as necessary.

### 3. Engine temperature remains cold when driving

- a. Check the thermostat operation. Replace the thermostat if it sticks in the open position.
- b. On vehicles with electrically controlled cooling fans, check the cooling fan operation. Check for defective temperature sensors and stuck relays, and replace failed components.
- c. Check temperature gauge operation if equipped to verify proper operation of the gauge. Check the sensors and wiring for defects, and repair or replace defective components.

### 4. Engine runs hot

- a. Check for an internally restricted radiator. Flush the radiator or replace if the blockage is too severe for flushing.
- b. Check for a loose or slipping water pump drive belt. Inspect the drive belt condition. Replace the belt if brittle, cracked or damaged. Check the pulley condition and properly tension the belt.
- c. Check the cooling fan operation. Replace defective fan motors, sensors or relays as necessary.
- d. Check temperature gauge operation if equipped to verify proper

operation of the gauge. Check the sensors and wiring for defects, and repair or replace defective components.

- e. Check the coolant level. Set the heater temperature to full hot, check for internal air pockets, bleed the cooling system and inspect for leakage. Top off the cooling system with the correct coolant mixture. Once the engine is cool, recheck the fluid level and top off as needed.

**NOTE: The engine cooling system can also be affected by an engine's mechanical condition. A failed head gasket or a porous casting in the engine block or cylinder head could cause a loss of coolant and result in engine overheating.**

Some cooling systems rely on electrically driven cooling fans to cool the radiator and use electrical temperature sensors and relays to operate the cooling fan. When diagnosing these systems, check for blown fuses, damaged wires and verify that the electrical connections are fully connected, clean and not physically damaged. If necessary, clean the electrical contacts using electrical contact cleaner. The use of cleaning agents not specifically designed for electrical contacts could leave a film or damage the insulation of the wiring.

## 1-F. Engine Exhaust System

### 1. Exhaust rattles at idle speed

- a. Check the engine and transmission mounts and replace mounts showing signs of damage or wear.
- b. Check the exhaust hangers, brackets and mounts. Replace broken, missing or damaged mounts.
- c. Check for internal damage to mufflers and catalytic converters. The broken pieces from the defective component may travel in the direction of the exhaust flow and collect and/or create a blockage in a component other than the one which failed, causing engine running and stalling problems. Another symptom of a restricted exhaust is low engine manifold vacuum. Remove the exhaust system and carefully remove any loose or broken pieces, then replace any failed or damaged parts as necessary.
- d. Check the exhaust system clearance, routing and alignment. If the exhaust is making contact with the vehicle in any manner, loosen and reposition the exhaust system.

### 2. Exhaust system vibrates when driving

- a. Check the exhaust hangers, brackets and mounts. Replace broken, missing or damaged mounts.
- b. Check the exhaust system clearance, routing and alignment. If the exhaust is making contact with the vehicle in any manner, check for bent or damaged components and replace, then loosen and reposition the exhaust system.
- c. Check for internal damage to mufflers and catalytic converters. The broken pieces from the defective component may travel in the direction of the exhaust flow and collect and/or create a blockage in a component other than the one which failed, causing engine running and stalling problems. Another symptom of a restricted exhaust is low engine manifold vacuum. Remove the exhaust system and carefully remove any loose or broken pieces, then replace any failed or damaged parts as necessary.