Modern Automotive Technology
Chapter 40

Cooling System Testing, Maintenance and Repair

North Montco Technical Career Center

Chapter 40

Cooling System Testing, Maintenance and Repair Objectives

- List common cooling system problems
- Describe the common causes of system leakage, over heating and overcooling
- Perform cooling system combustion leak and pressure tests
- Replace cooling system parts
- Drain, flush and fill a cooing system
- Describe and follow safe working practices when working on a cooling system

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Safety First!!!!!

- Never remove the radiator cap when the engine is hot!
- Pressure can be released causing the cooing to boil and expand very quickly.
- Boiling coolant can cause severe burns and blindness!

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1. A COMBUSTION LEAK TEST checks for the presence of gases in the engine coolant.
2. A PRESSURE TESTER is a hand-operated pump used to pressurize the cooling system for leak detection.

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Performing a cooling system pressure Test.
Never exceed radiator pressure cap pressure!

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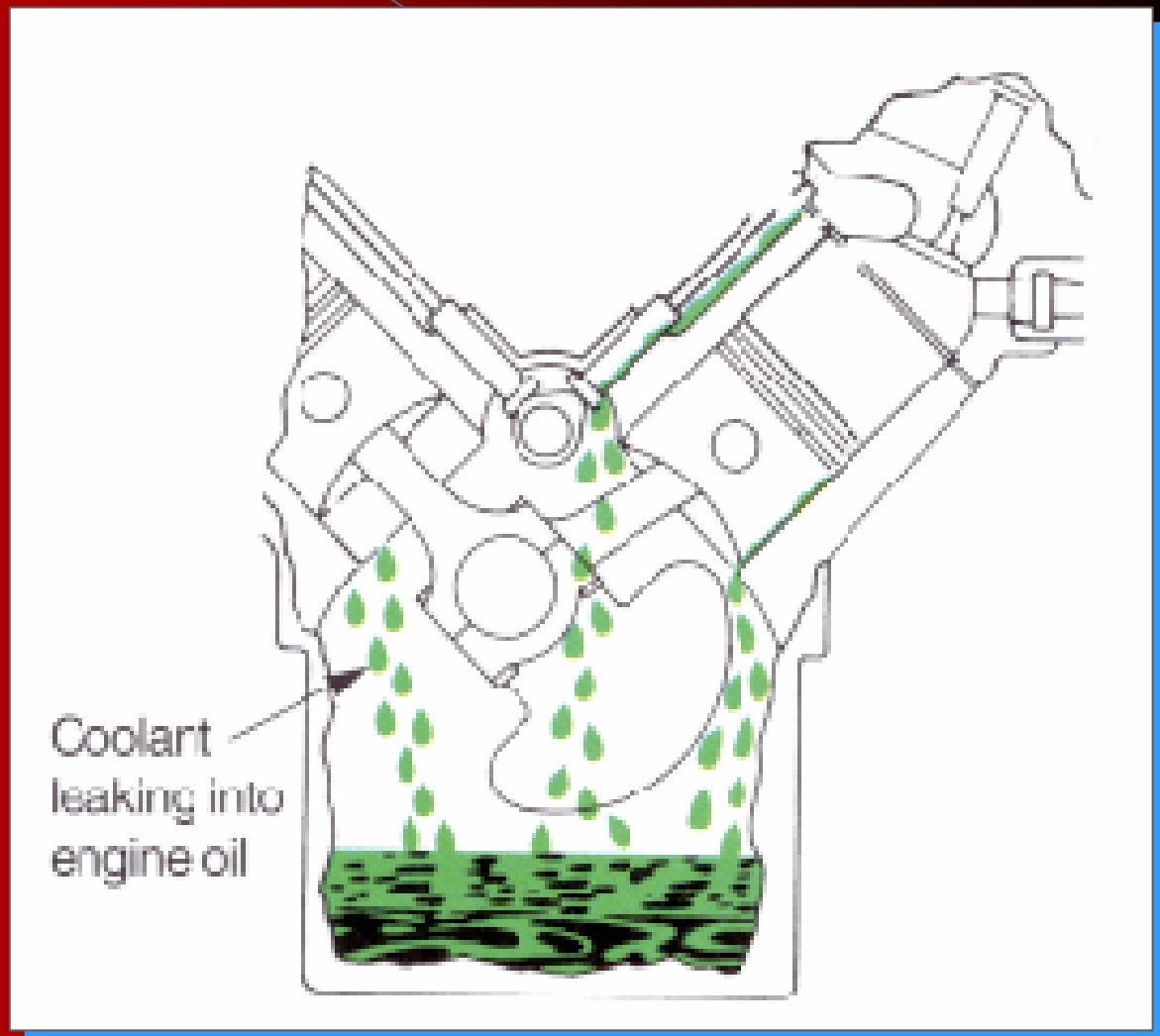
A combustion leak test is done to check for a cracked part or blown gasket that can allow coolant to leak into the engine oil.



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3. OVERCOOLING may be indicated by slow engine warm-up, insufficient warmth from the heater, low fuel economy, and sluggish engine performance.
4. COOLANT LEAKS show up as wet, discolored areas in the engine compartment or on the ground.

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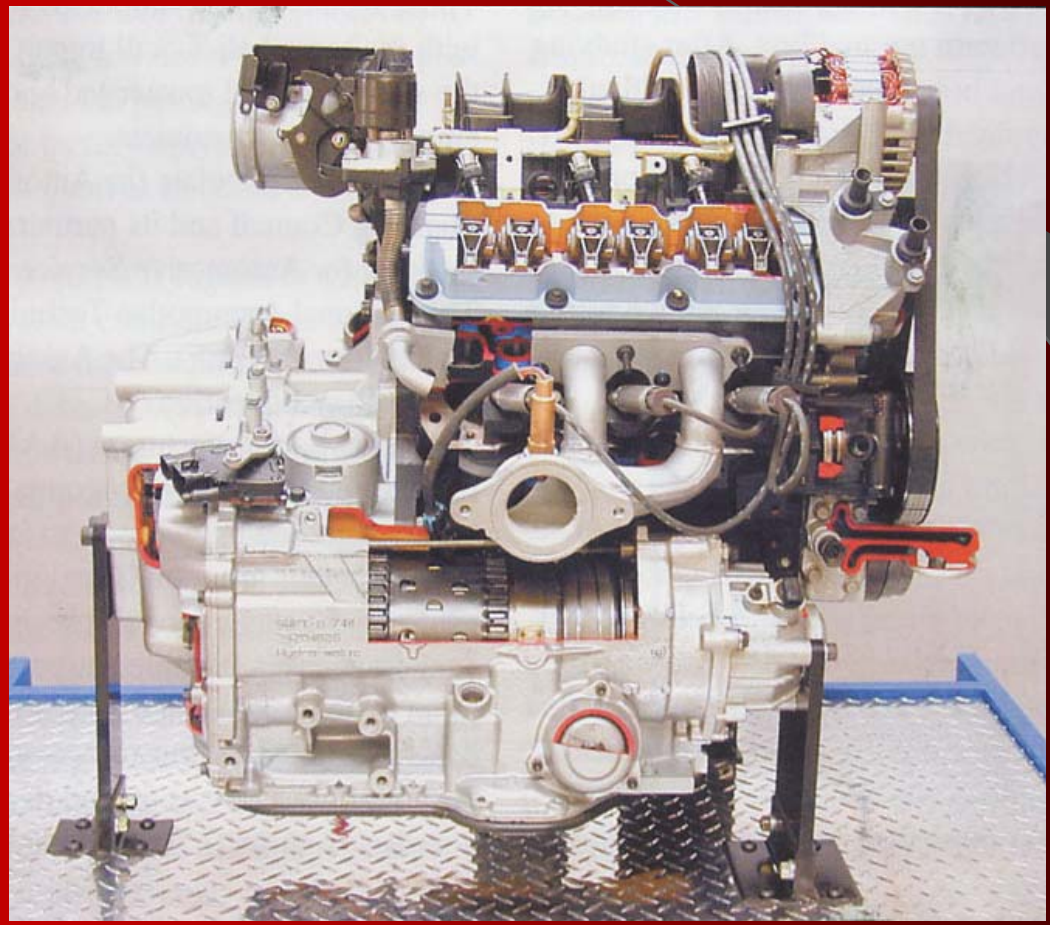

Cut-Away of an General Motors 3.8L (3800) Engine

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5. FLUSHING the coolant systems should be done when rust or scale is found in the system.
6. A COOLING SYSTEM HYDROMETER is used to measure the freezing point of antifreeze solution.

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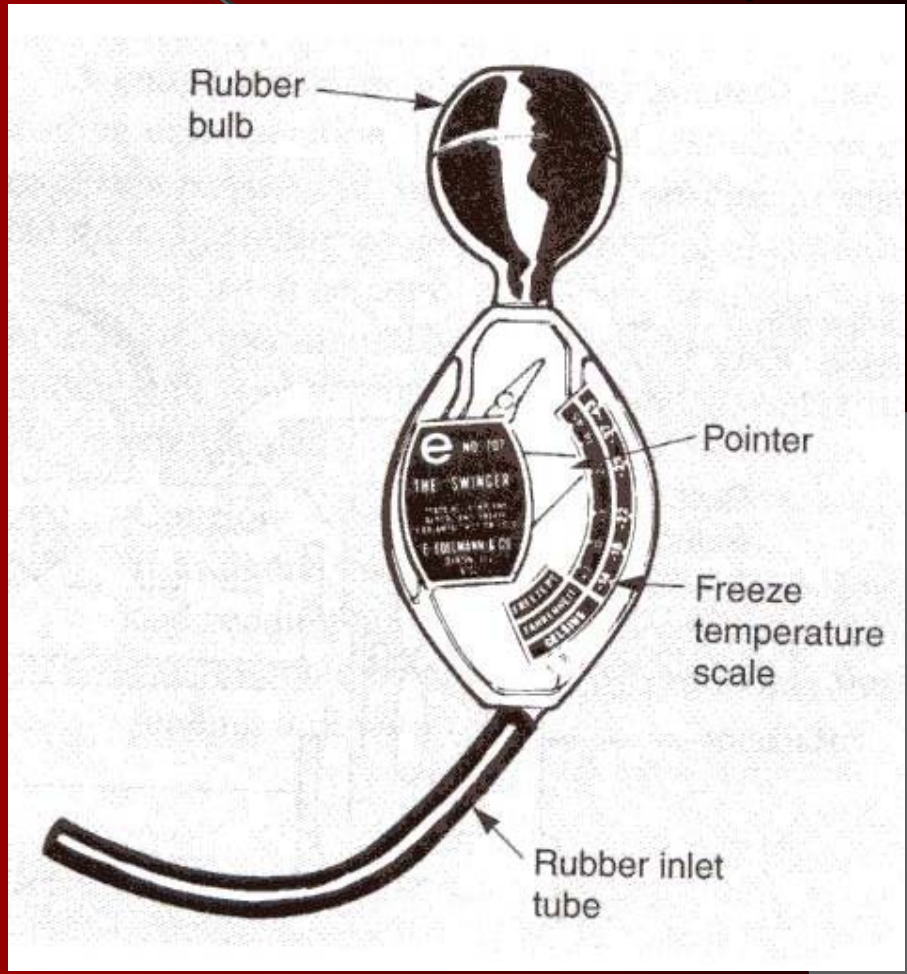
- A 50/50 mixture of antifreeze and water protects the cooling system to –34F°
- The radiator cap usually maintains 12-16 PSI, raising the boiling point of coolant to 250-260F°



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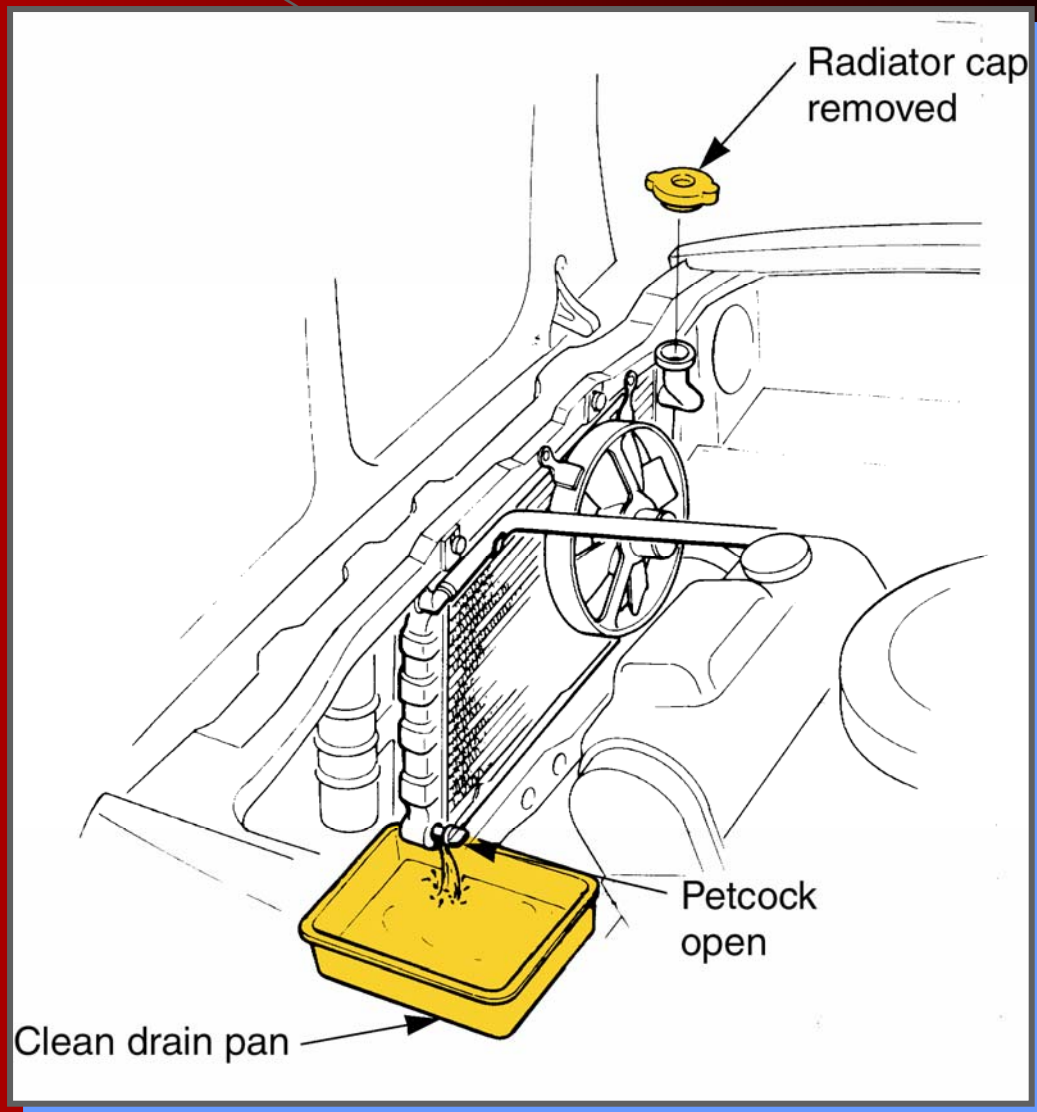
- Draining the coolant into a clean drain pan.
- All old coolant must be disposed of properly, and not poured down the drain!



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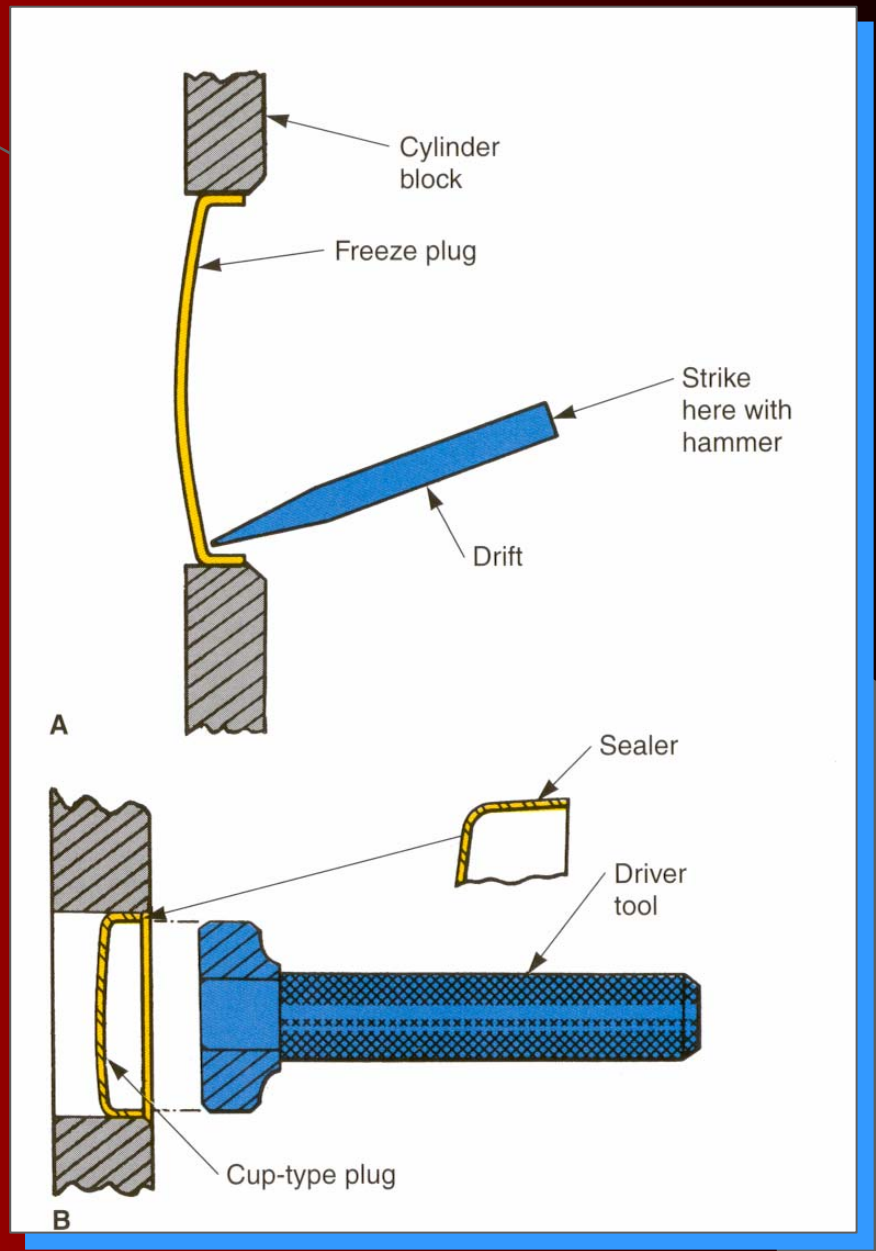
7. An EXPANSION FREEZE PLUG is installed by tightening a nut which causes the plug to expand and lock in the hole.
8. A LOOSE FAN BELT will slip and may rotate the water pump and fan too slowly, causing the engine to overheat.

Freeze Plug Replacement

A. Drive drift through plug, pry out

B. Clean and coat hole with sealer, install



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9. The THERMOSTAT HOUSING is usually the fitting for the upper radiator hose.
10. To check for a BAD WATER PUMP SEAL, pressure test the system and watch for leakage at the pump weep-hole.

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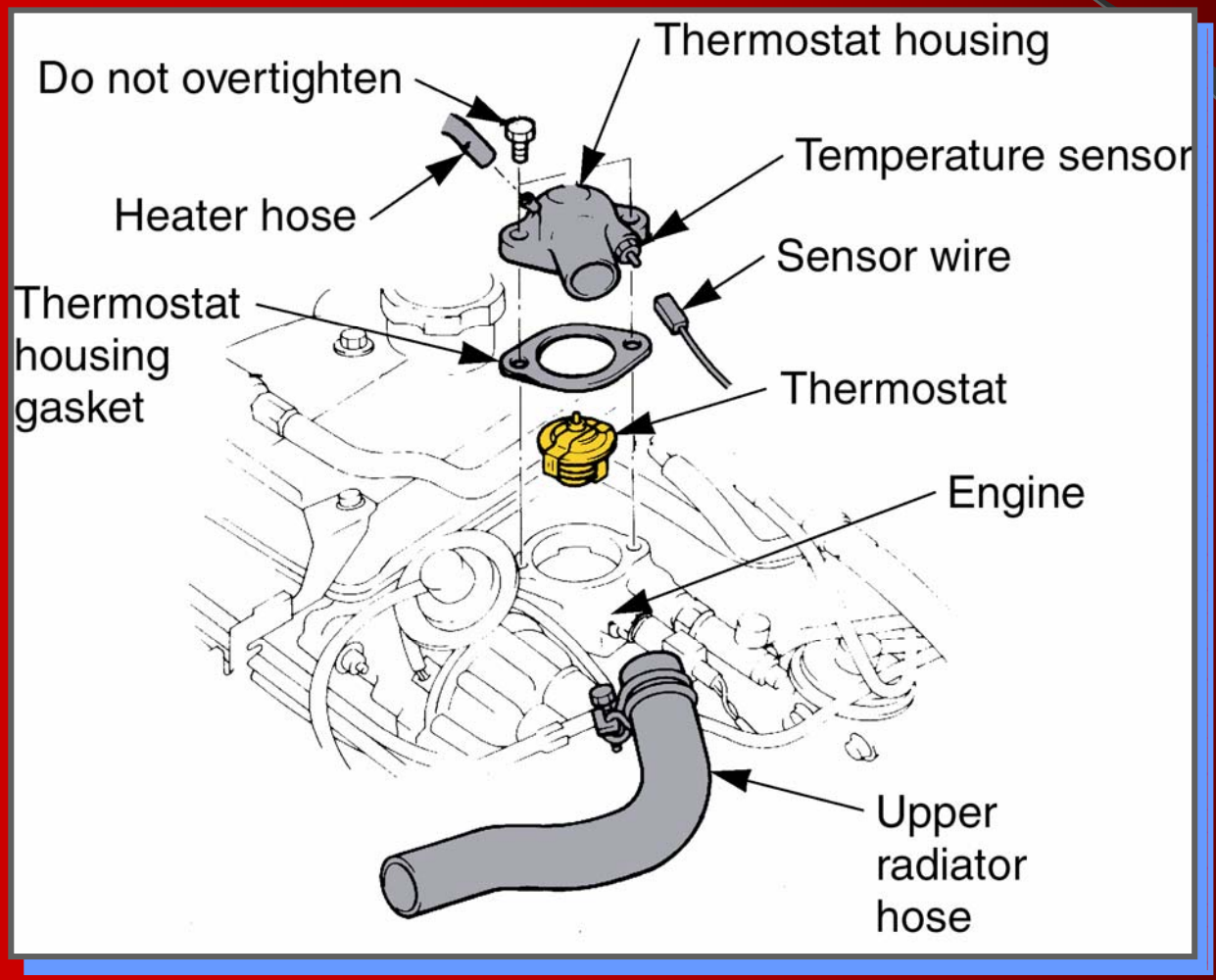

Thermostat and its related parts

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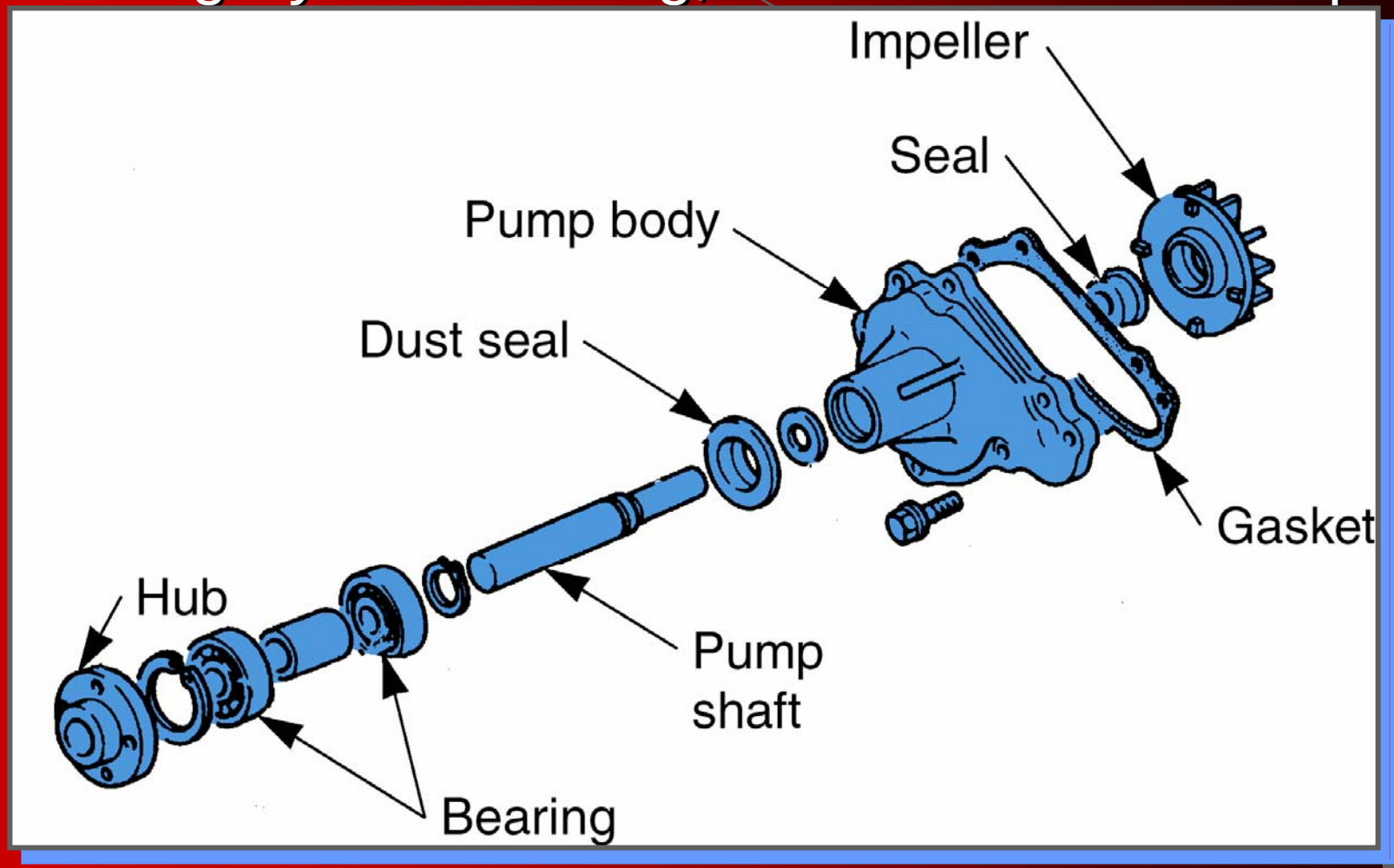

Parts of a Water Pump

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