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2008 JEEP Commander OEM Service and Repair Workshop Manual

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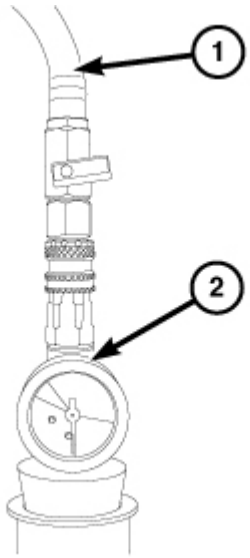


1 - Airline
2 - Gauge

10. Disconnect the vacuum generator / venturi and airline from the adaptor cone/vacuum gauge assembly.
11. Wait approximately 20 seconds, if the pressure readings do not move, the system has no leaks. If the pressure readings move, a leak could be present in the system. Check for leaks and repeat the procedure.

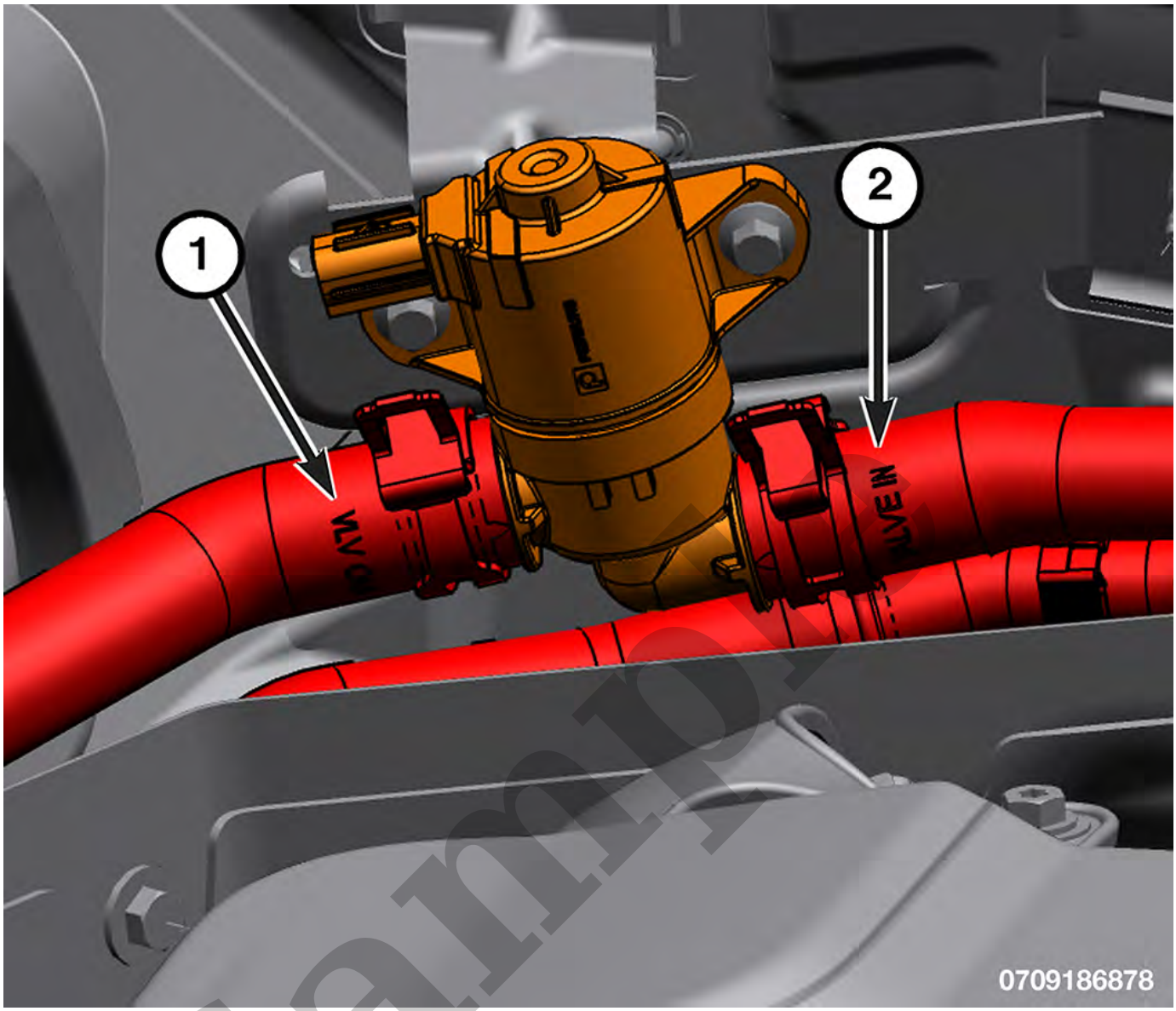
NOTE

Ensure there is a sufficient amount of coolant, mixed to the required strength/protection level available for use. Always fill more coolant in the container than required to fill the system. For best results and to assist the refilling procedure, place the coolant container at the same height as the filler neck. If the coolant level is too low, it will pull air into the cooling system which could result in air locks within the system.

12. Place the tool's suction hose into the coolant's container.
13. Connect the tool's suction hose to the adaptor cone/vacuum gauge assembly.
14. Open the suction hose's ball valve to begin filling the cooling system.

NOTE

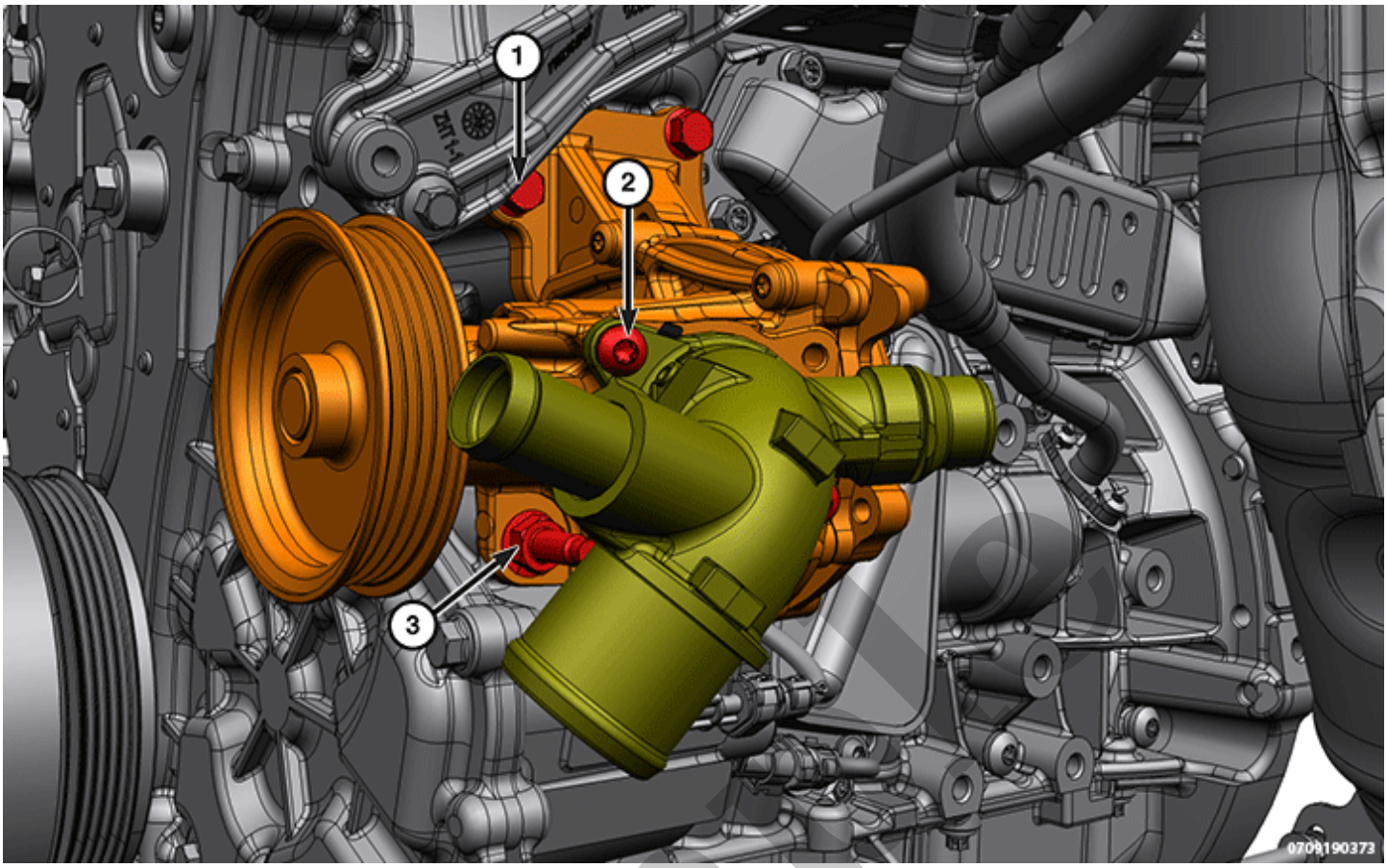
If filling through a pressurized coolant bottle, stop filling when the proper level is reached.



1 - Coolant Outlet Hose
2 - Coolant Inlet Hose

4. Disconnect the coolant outlet hose.

5. Disconnect the coolant inlet hose.

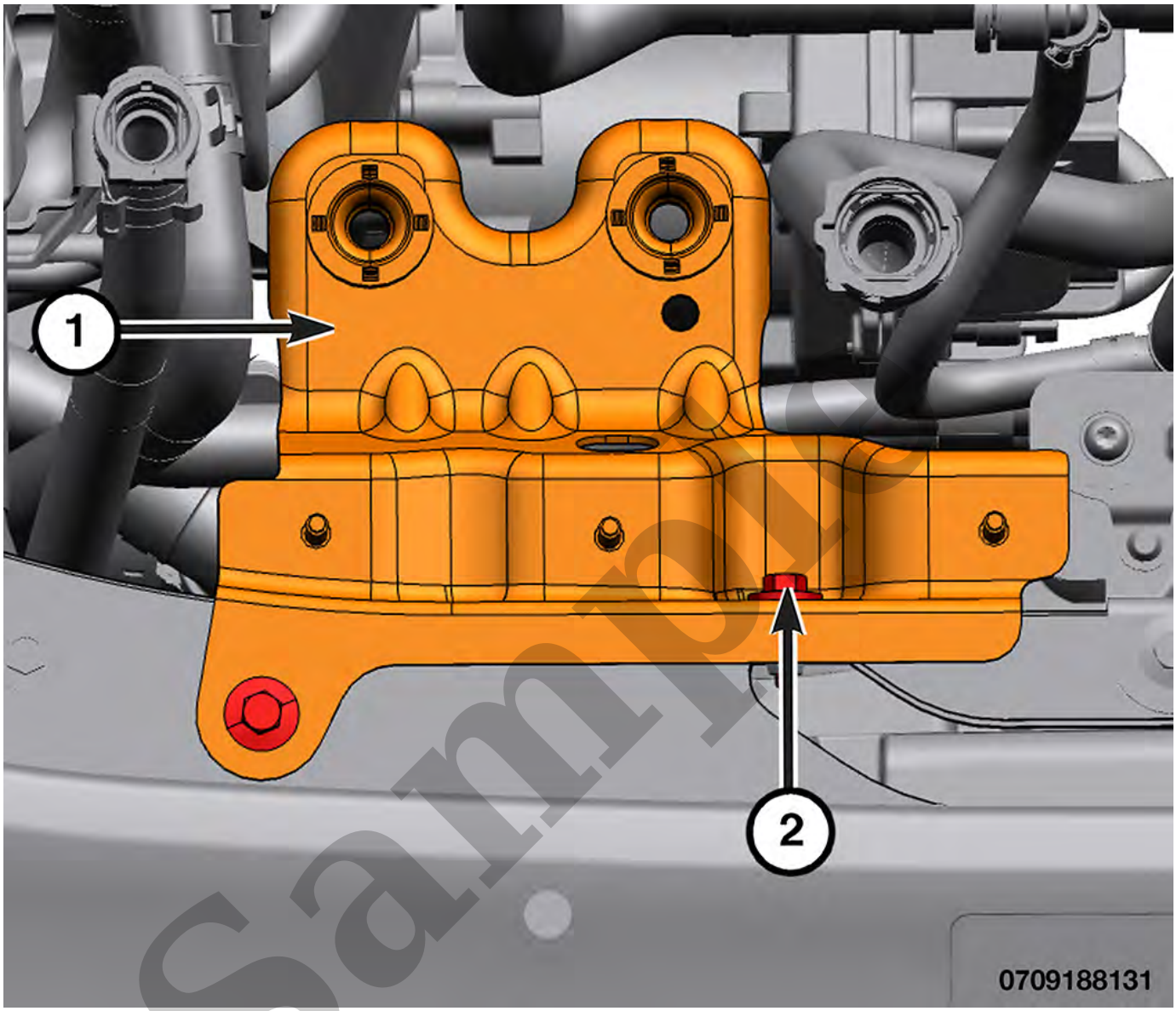


CALLOUT	DESCRIPTION	SPECIFICATION	COMMENTS
1	Water Pump M8 Bolts	**25 N·m (18 Ft. Lbs.)**	—
2	Water Pump Inlet Tube M5 Bolts	**8 N·m (71 In. Lbs.)**	—
3	Water Pump M8 Stud Bolt	**25 N·m (18 Ft. Lbs.)**	—
–	Ground Wire Nut	**9 N·m (80 In. Lbs.)**	—
–	Engine Coolant Temperature Sensor	**20 N·m (15 Ft. Lbs.)**	—
–	Thermostat Housing Bolts	**10 N·m (89 In. Lbs.)**	—
–	Thermostat Coolant Manifold Bolts	**10 N·m (89 In. Lbs.)**	—

Refer To List:

List 1

4. Lift up the low temp pressurized coolant bottle and disconnect the lower coolant hose. Then remove the low temp pressurized coolant bottle.



1 - Coolant Bottle Bracket
2 - Coolant Bottle Bracket Bolts

5. If necessary, remove the coolant bottle bracket bolts and the coolant bottle bracket.

INSTALLATION

Follow the removal procedure in reverse for general reassembly of the components on the vehicle. The steps listed below are calling out specific procedures that should be followed during installation.

- Fill the low temp cooling system (Refer to Engine/Cooling Systems/Engine Cooling/Standard Procedure).

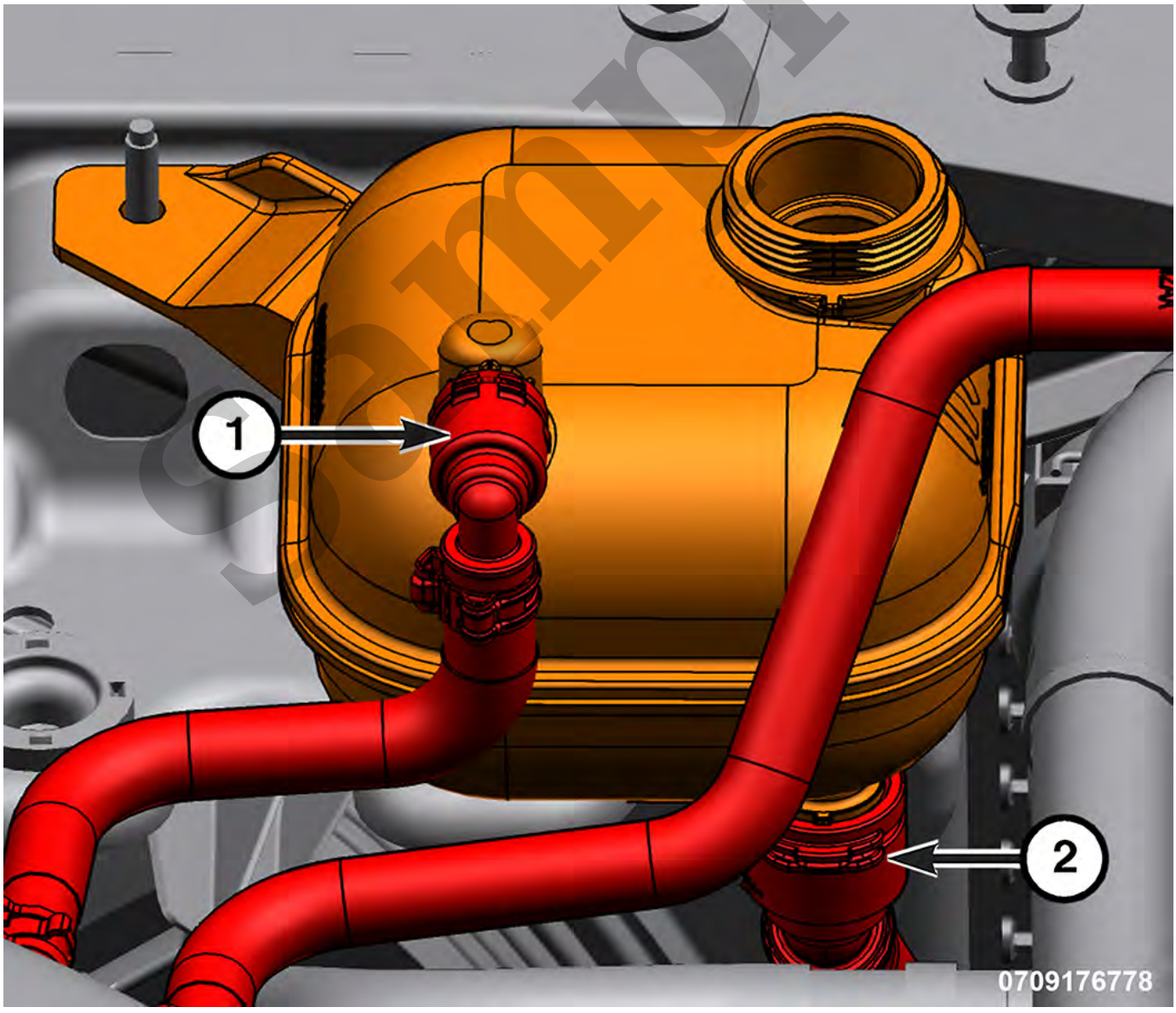
YOUR CURRENT VEHICLE

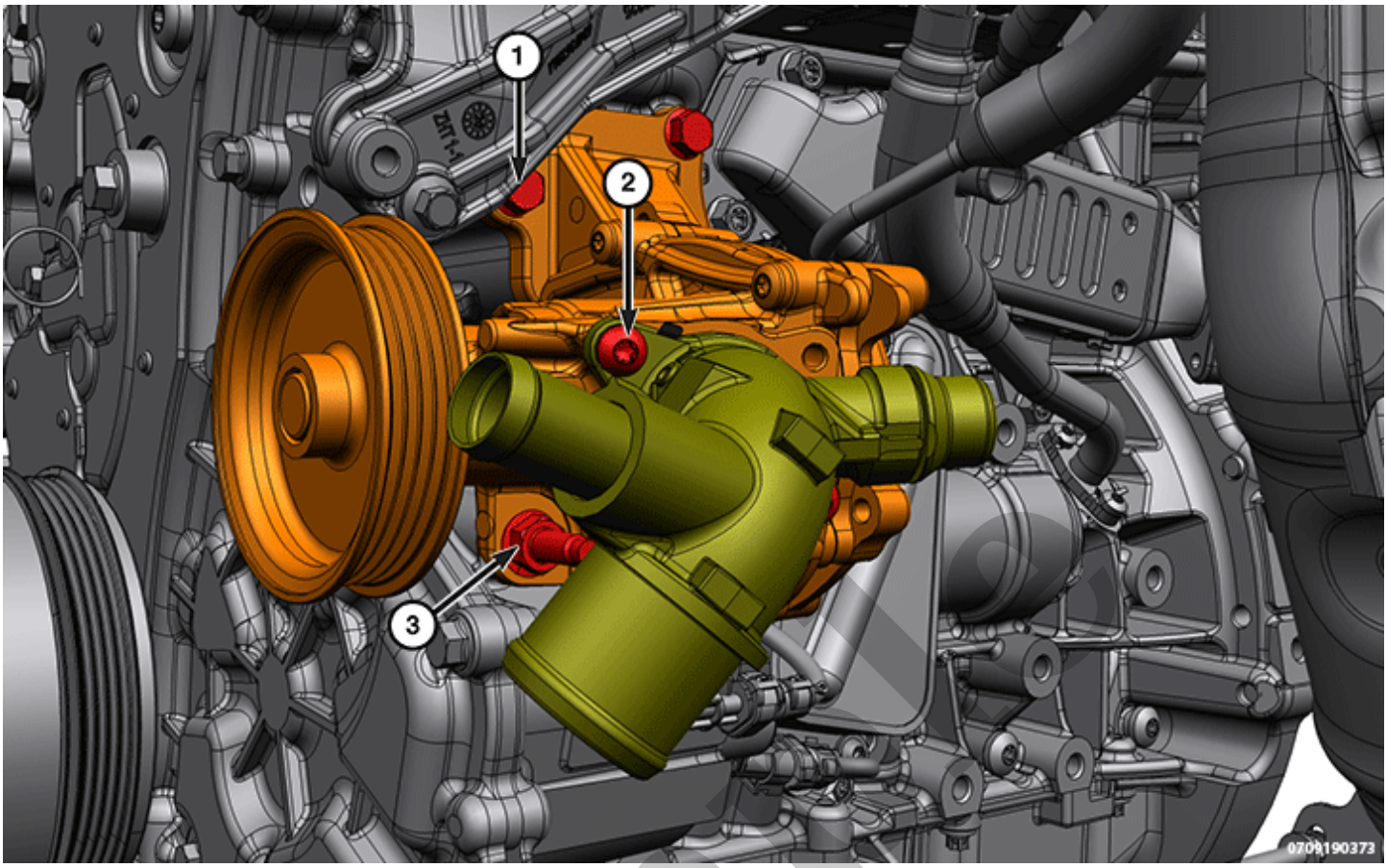
Low Temperature Pressurized Coolant Bottle

LOW TEMPERATURE PRESSURIZED COOLANT BOTTLE

REMOVAL

1. Partially drain the low temperature cooling system (Refer to Engine/Cooling Systems/Engine Cooling/Standard Procedure).





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inputs such as ambient temperature and PIM internal temperature factor into system operation. As the power electronics modules operate they will build heat. To maintain proper cooling of the system components the PIM commands the auxiliary low temperature coolant pumps to operate circulating coolant through the system. The coolant temperature flowing into and out of the low temperature radiator is monitored through two hard-wired temperature sensors. Heat induced in the cooling system is dissipated as the coolant passes through the low temperature radiator. The cooling fan can be operated to aid in dissipating heat. When the engine is running heat will build in the turbocharger. The low temperature cooling system will operate to reduce turbocharger bearing temperature and cool the charge air cooler which reduces the temperature of the air entering the engine. The PCM can send a command to the PIM to operate an after-run mode to cool the turbocharger bearings after the engine is turned off. This reduces heat soak that can cause turbocharger bearing damage on short engine off cycles.

FUNCTIONAL DESCRIPTION - AUXILIARY COOLANT PUMPS

The auxiliary coolant pumps are a smart device used to circulate coolant through the cooling system. The pumps are provided either a direct fused battery feed or fused ignition feed (refer to the wiring information) and a chassis ground. The smart pumps are controlled using a LIN bus communication line. The controlling Electronic Control Unit (ECU) will send a command with an rpm request to the pump electronics. The auxiliary coolant pump will operate the pump motor and monitor the internal motor operation and circuitry for faults. The auxiliary coolant pump communicates feedback to the ECU regarding the following operating parameters and failure modes:

- Motor rpm target
- Motor rpm actual
- Motor temperature
- Motor current
- Dry run operation error
- Blocked pump error
- Overtemp condition error
- Over current condition error
- Voltage error
- Fail Safe activated

DIAGNOSTICS:

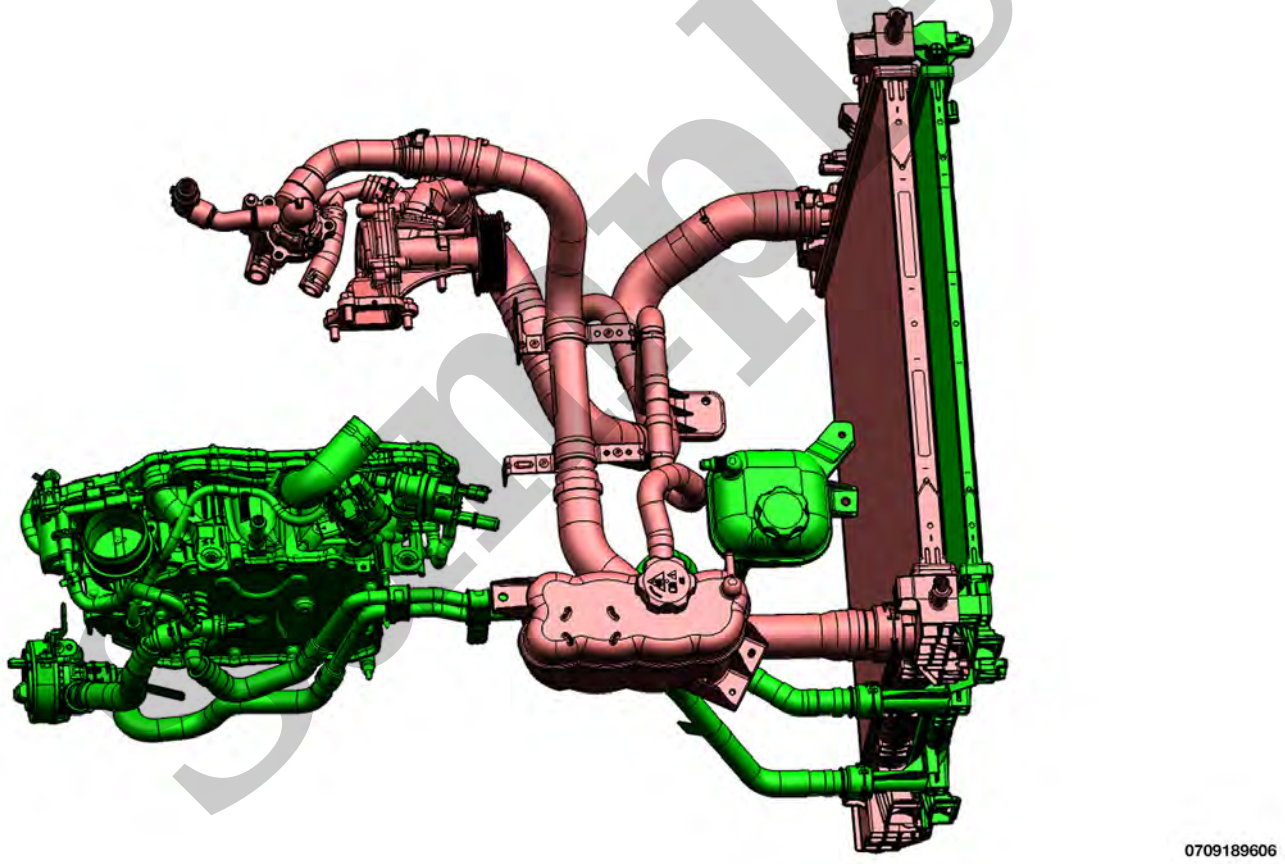
The ECU will set a performance fault against the faulty auxiliary coolant pump when a failure is reported by the pump. The failure can be due to an internal circuit issue, or some type of system failure such as low coolant or restricted flow. Air pockets will cause a dry run condition. The pump can detect this either by detecting a low current draw or higher than expected pump speed. Or in some cases, both conditions being present. A blocked pump or excessive restriction in the coolant flow can cause a high current draw or lower than expected pump speed. These possible mechanical failures should be investigated before condemning an auxiliary coolant pump with a performance fault set against it.

YOUR CURRENT VEHICLE

Description And Operation - Low Temperature Cooling System

DESCRIPTION AND OPERATION - LOW TEMPERATURE COOLING SYSTEM

DESCRIPTION – ENTIRE COOLING SYSTEM



The 2.0L turbo engine heating and cooling requirements are managed with a combination of two cooling system loops to provide temperature control of the gas engine, passenger compartment, turbocharger system and transmission heating. The two cooling systems are the Engine Coolant Loop (Red) and Low Temperature Coolant Loop (Green).

- The Engine Coolant Loop (Red) consists of a mechanical coolant pump and thermostat. The high temperature engine cooling loop can maintain proper engine temperature as well as provide heat to the passenger compartment.

The Charge Air Cooler (CAC) is located between the engine and cooling fan. Coolant is routed through an internal passage in the CAC to remove excessive heat created from the heat of the turbocharger transferred to the incoming air and heat created by compressing the air.

FUNCTIONAL DESCRIPTION - CAC COOLANT TEMPERATURE SENSOR

The CAC temperature sensor is a two wire sensor used to monitor the coolant temperature and provides a voltage input to the PCM.

FUNCTIONAL DESCRIPTION - LOW-TEMPERATURE (LT) PRESSURIZED COOLANT COOLING FAN

The electric cooling fan is integral to the fan shroud and is located between the radiator and the engine. The electric fan is controlled by the PCM. The electric cooling fan is not serviceable. Any failure of the fan blade, electric motor or fan shroud requires replacement of the fan module. The electric cooling fan is powered by a fuse located in the Power Distribution Center (PDC).

FUNCTIONAL DESCRIPTION - LOW TEMP (LT) COOLANT RADIATOR

A cross-flow aluminum auxiliary low temperature cooler is used. As air passes through the radiator core, the heat within the coolant is dissipated into the ambient air. The auxiliary low temperature cooler is mounted in front of the A/C condenser. If the auxiliary cooler has been damaged individual parts are not available and the cooler must be replaced.

FUNCTIONAL DESCRIPTION - AUXILIARY COOLANT PUMPS

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