
SECTION 1D

ENGINE COOLING

CAUTION: Disconnect the negative battery cable before removing or installing any electrical unit or when a tool or equipment could easily come in contact with exposed electrical terminals. Disconnecting this cable will help prevent personal injury and damage to the vehicle. The ignition must also be in B unless otherwise noted.

TABLE OF CONTENTS

Description and Operation	1D-2	Cooling System Diagnosis	1D-8
General Description	1D-2	Repair Instructions	1D-9
Radiator	1D-2	On-Vehicle Service	1D-9
Surge Tank	1D-2	Draining and Refilling the Cooling System	1D-9
Coolant Pump	1D-3	Surge Tank	1D-10
Thermostat	1D-3	Electric Cooling Fan	1D-11
Electric Cooling Fan	1D-3	Radiator	1D-11
Engine Coolant Temperature Sensor	1D-4	Thermostat (Typical)	1D-12
Coolant Temperature Sensor	1D-4	Thermostat (Euro III)	1D-13
Component Locator	1D-5	Coolant Temperature Sensor	1D-14
Coolant Hose and Components	1D-5	Engine Coolant Temperature Sensor	1D-15
Radiator/Fan	1D-6	Coolant Pump	1D-15
Diagnostic Information and Procedure	1D-7	Specifications	1D-17
Coolant Leaks Test	1D-7	General Specifications	1D-17
Surge Tank Cap Test	1D-7	Fastener Tightening Specifications	1D-18
Thermostat Test	1D-7		

DESCRIPTION AND OPERATION

GENERAL DESCRIPTION

The cooling system maintains the engine temperature at an efficient level during all engine operating conditions. When the engine is cold the cooling system cools the engine slowly or not at all. This slow cooling of the engine allows the engine to warm up quickly.

The cooling system includes a radiator(a) and cooling fan(b), a thermostat and housing(c), a coolant pump(d), a coolant pump drive belt and coolant hose. The timing belt drives the coolant pump.

All components must function properly in order for the cooling system to operate. The coolant pump draws the coolant from the radiator. The coolant then circulates through water jackets in the engine block and the cylinder head, distributor case(e), throttle body(f). When the coolant reaches the operating temperature of the thermostat, the thermostat opens. The coolant then goes back to the radiator where it cools.

This system directs some coolant through the hoses to the heater core(g). This provides for heating and defrosting. The surge tank(h) is connected to the radiator and throttle body to recover the coolant displaced by expansion from the high temperatures. The surge tank maintains the correct coolant level.

The cooling system for this vehicle has no radiator cap and drain cock. The coolant is added to the cooling sys-

tem through the surge tank. To drain the cooling system, disconnect the lower radiator hose and drain the coolant.

RADIATOR

This vehicle has a lightweight tube-and-fin aluminum radiator.

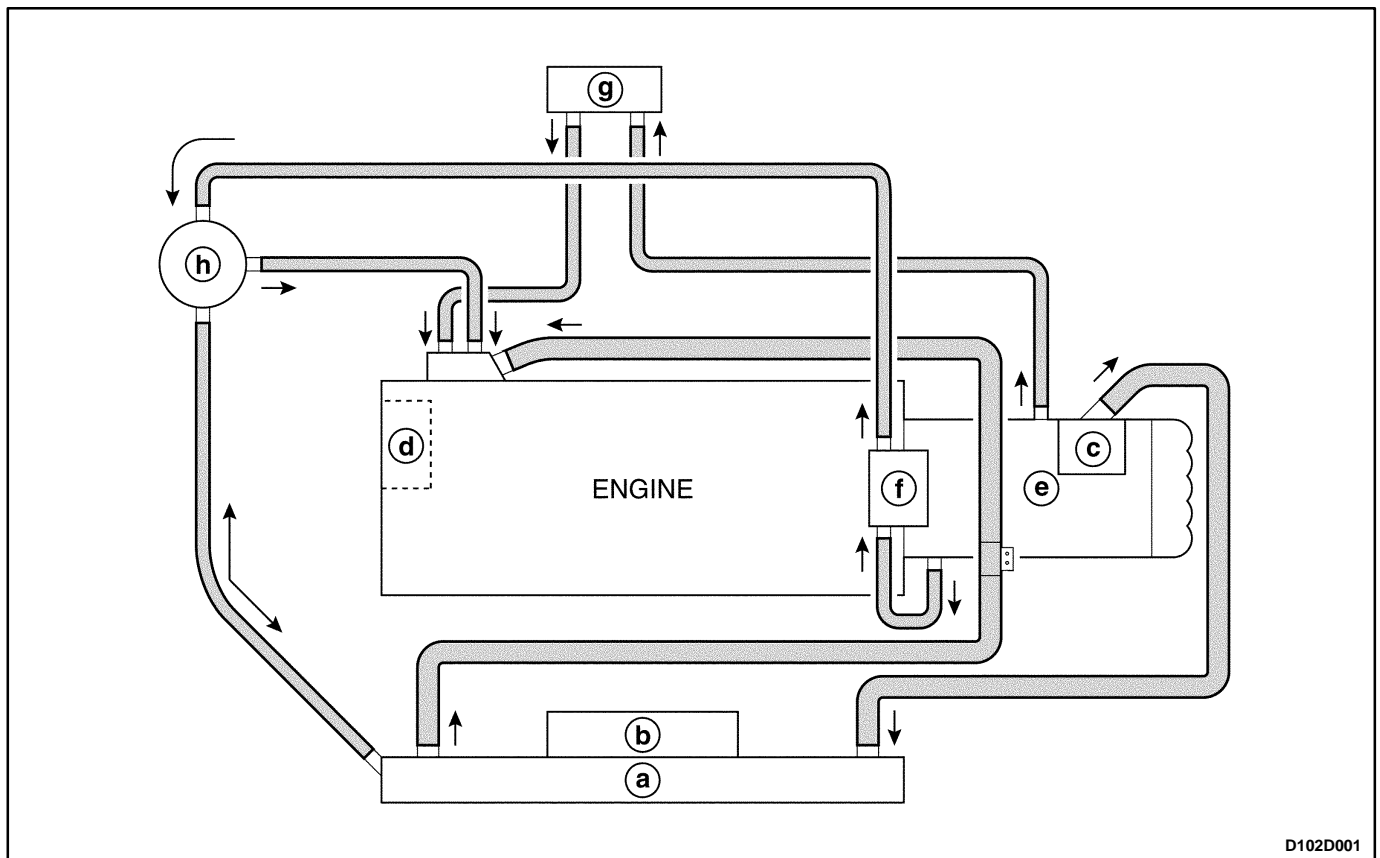
SURGE TANK

The surge tank is a transparent plastic reservoir, similar to the windshield washer reservoir.

The surge tank is connected to the radiator and throttle body by a hose. As the vehicle is driven, the engine coolant heats and expands. The portion of the engine coolant displaced by this expansion flows from the radiator into the surge tank. The air trapped in the radiator is degassed into the surge tank.

When the engine is stops, the engine coolant cools and contracts. The displaced engine coolant is then drawn back into the radiator. This keeps the radiator filled with the coolant to the desired level at all times and increases the cooling efficiency.

Maintain the coolant level between the MIN and the MAX marks on the surge tank when the system is cold.



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COOLANT PUMP

The belt-driven centrifugal coolant pump consists of an impeller, a drive shaft, and a belt pulley.

The impeller is supported by a completely sealed bearing.

The coolant pump is serviced as an assembly and, therefore, cannot be disassembled.

THERMOSTAT

A wax pellet-type thermostat controls the flow of the engine coolant through the engine cooling system. The thermostat(i) is mounted in the thermostat housing.

The thermostat stops the flow of the engine coolant from the engine to the radiator in order to provide faster warm-up, and to regulate the coolant temperature. The thermostat remains closed while the engine coolant is cold, preventing circulation of the engine coolant through the radiator. At this point, the engine coolant is allowed to circulate only throughout the heater core to warm it quickly and evenly.

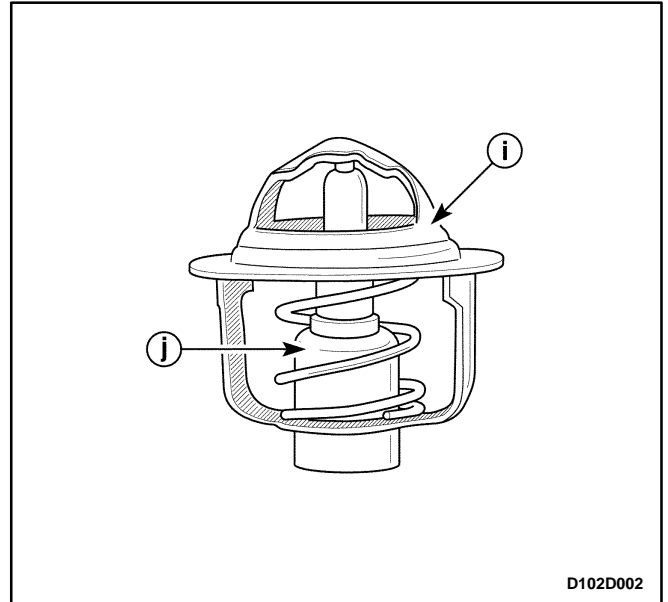
As the engine warms, the thermostat opens. This allows the engine coolant to flow through the radiator, where the heat is dissipated through the radiator. This opening and closing of the thermostat permits enough engine coolant to enter the radiator to keep the engine within proper engine temperature operating limits.

The wax pellet in the thermostat is hermetically sealed in a metal case(j). The wax element of the thermostat expands when it is heated and contracts when it is cooled.

As the vehicle is driven and the engine warms, the engine coolant temperature increases. When the engine coolant reaches a specified temperature, the wax pellet element in the thermostat expands and exerts pressure against the metal case, forcing the valve open. This allows the engine coolant to flow through the engine cooling system and cool the engine.

As the wax pellet cools, the contraction allows a spring to close the valve.

The thermostat begins to open at 82°C (180°F) and is fully open at 95°C (203°F). The thermostat closes at 80°C (176°F).



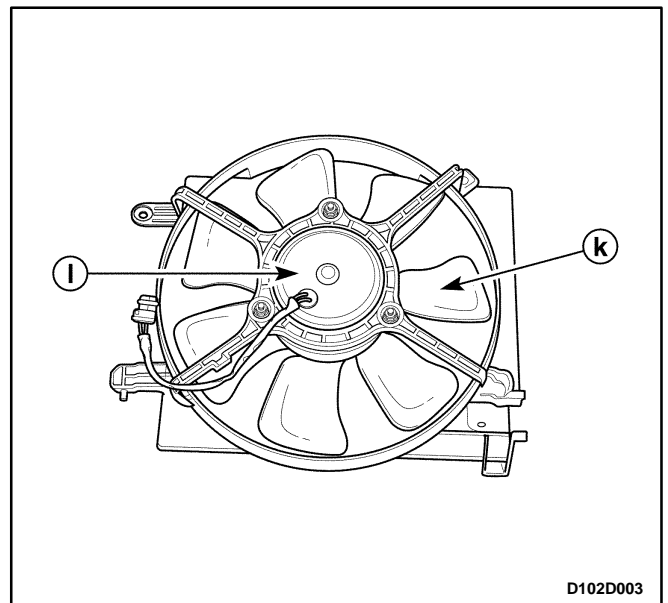
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ELECTRIC COOLING FAN

Caution: Keep hands, tools, and clothing away from the engine cooling fans to help prevent personal injury. This fan is electric and can turn ON whether or not the engine is running.

Caution: If a fan blade is bent or damaged in any way, no attempt should be made to repair or reuse the damaged part. A bent or damaged fan assembly should always be replaced with a new one.

The cooling fans are mounted behind the radiator in the engine compartment. The electric cooling fans increase the flow of air across the radiator fan and across the condenser on air conditioner (A/C)-equipped vehicles. This helps to speed cooling when the vehicle is at idle or moving at low speeds.



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1D-4 ENGINE COOLING

The main fan size is 320 mm (12.6 in.) in diameter with seven blades(k) to aid the air flow through the radiator and the condenser. An electric motor(l) attached to the radiator support drives the fan.

A/C OFF or Non-A/C Model

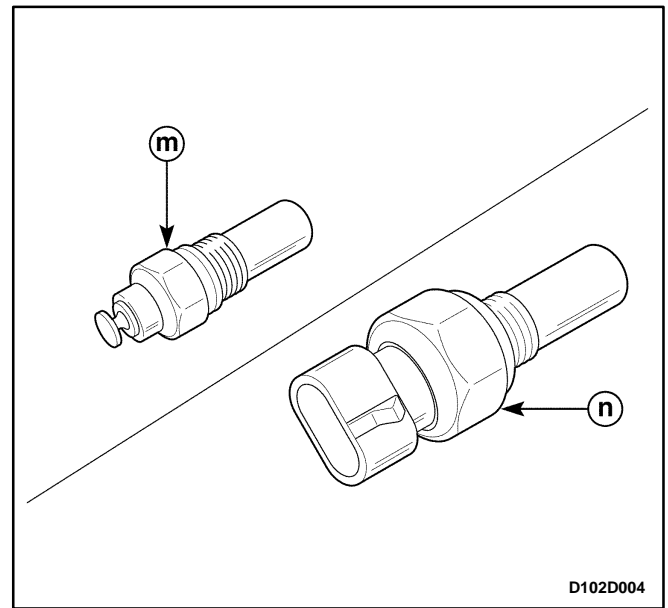
- The cooling fan is actuated by the electronic control module (ECM) using a low speed cooling fan relay and a high speed cooling fan relay. On A/C equipped vehicles, a series/parallel cooling fan relay is also used.
- The ECM will turn the cooling fan on at low speed when the coolant temperature reaches 93°C (199°F) and high speed at 100°C (212°F).
- The ECM will change the cooling fan from high speed to low speed at 97°C (207°F) and turn the cooling fans off at 90°C (194°F).

A/C ON

- The ECM will only turn the cooling fan on at high speed when the A/C system is on regardless of any condition.

ENGINE COOLANT TEMPERATURE SENSOR

The engine coolant temperature (ECT) sensor (n) uses a thermistor to control the signal voltage to the engine control module (ECM).

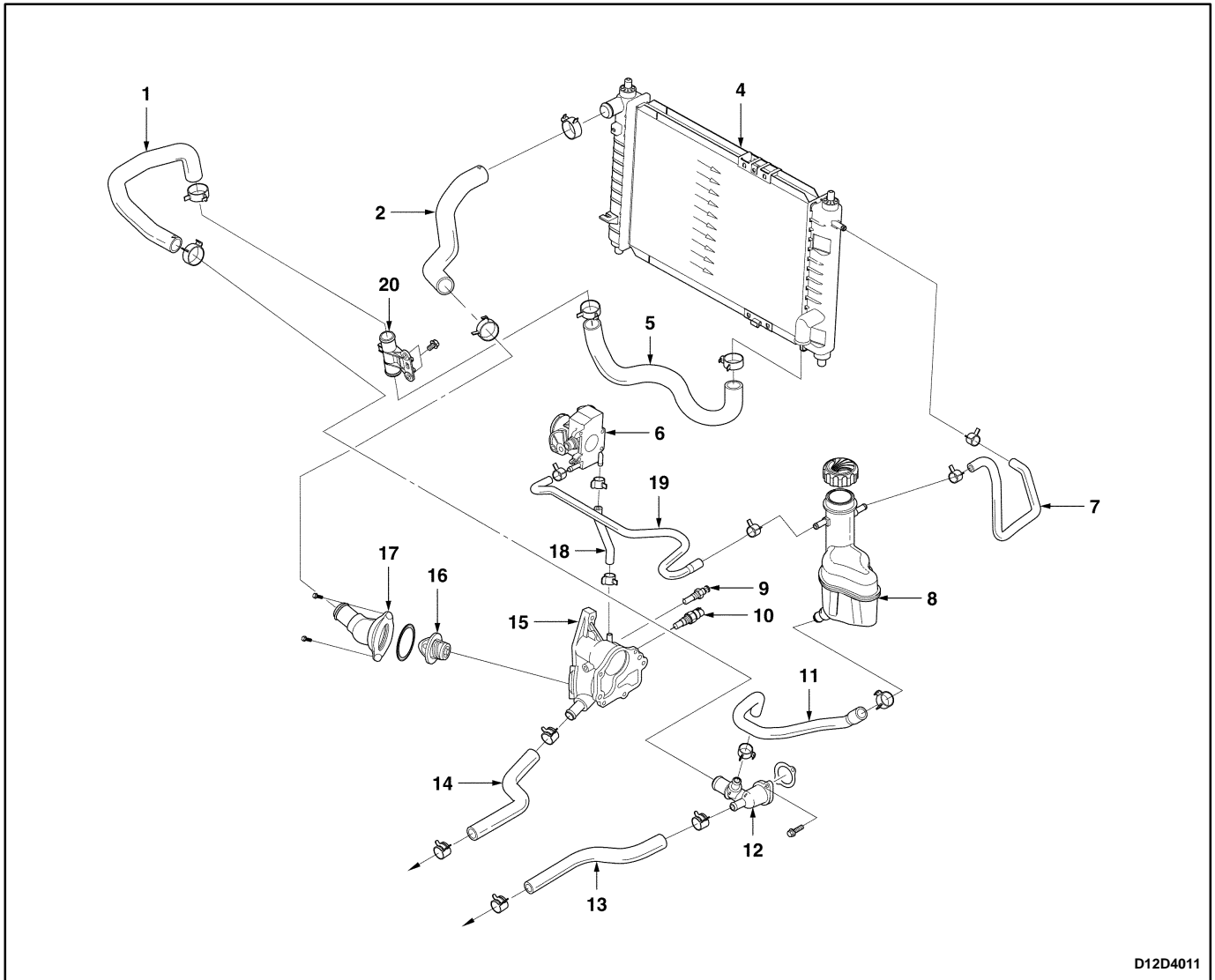


COOLANT TEMPERATURE SENSOR

The coolant temperature sensor(m) controls the instrument panel temperature indicator. The coolant temperature sensor is located on the distributor case with the ECT sensor on an SOHC engine.

COMPONENT LOCATOR

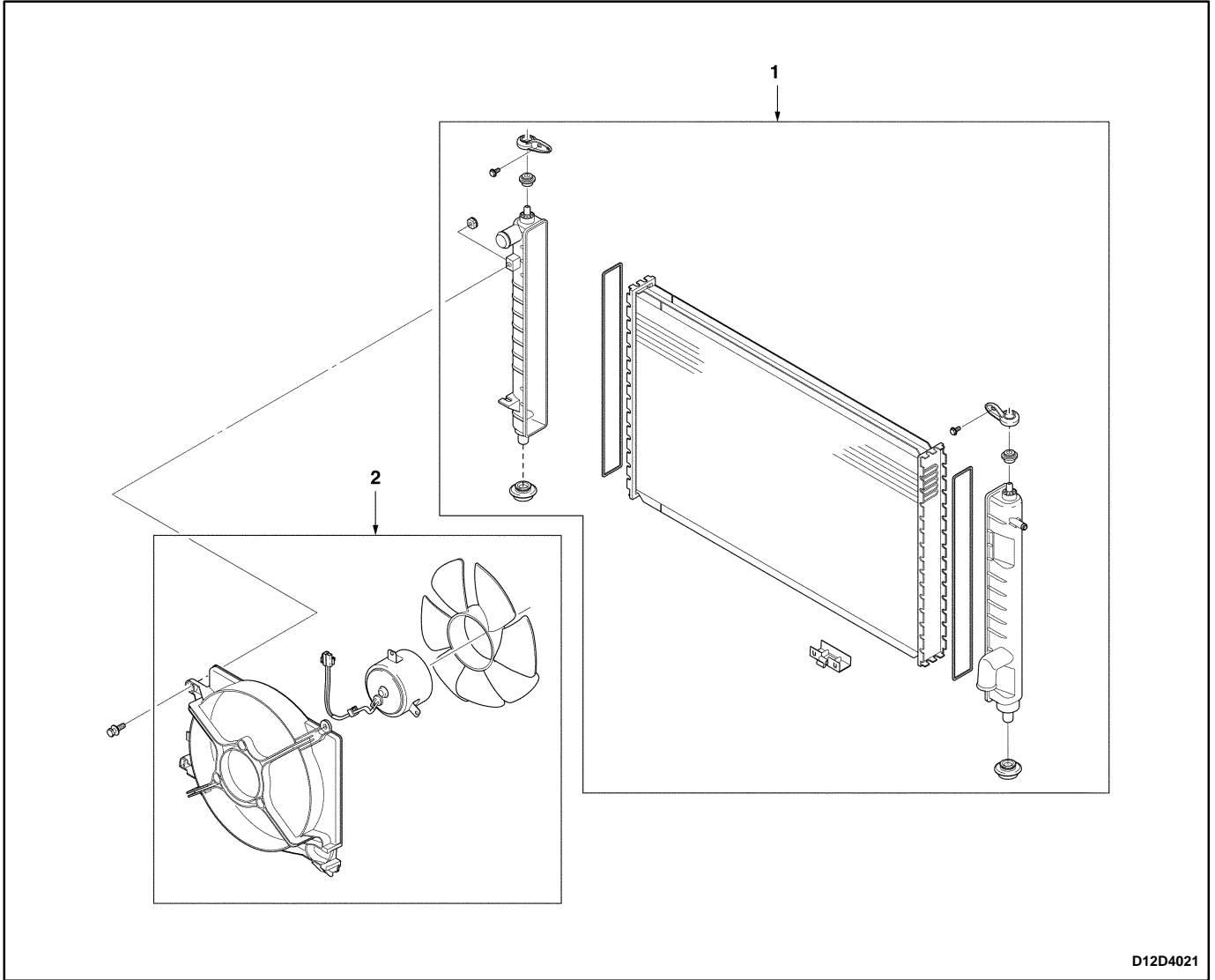
COOLANT HOSE AND COMPONENTS



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- | | |
|--------------------------------------|------------------------------|
| 1 Radiator Coolant Return Hose | 11 Surge Tank Return Hose |
| 2 Upper Radiator Hose | 12 Water Inlet Cap |
| 3 Not Used | 13 Heater Outlet Hose |
| 4 Radiator Assembly | 14 Heater Inlet Hose |
| 5 Lower Radiator Hose | 15 Distributor Case |
| 6 Throttle Body Assembly | 16 Thermostat |
| 7 Surge Tank hose | 17 Thermostat Housing |
| 8 Surge Tank | 18 Throttle Body Inlet Hose |
| 9 Coolant Temperature Sensor | 19 Throttle Body Outlet Hose |
| 10 Engine Coolant Temperature Sensor | 20 Hose Bracket |

RADIATOR/FAN



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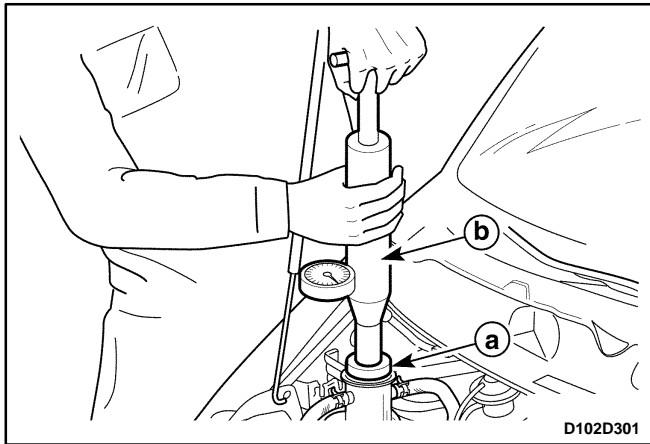
1 Radiator Assembly

2 Electric Cooling Fan Assembly

DIAGNOSTIC INFORMATION AND PROCEDURE

COOLANT LEAKS TEST

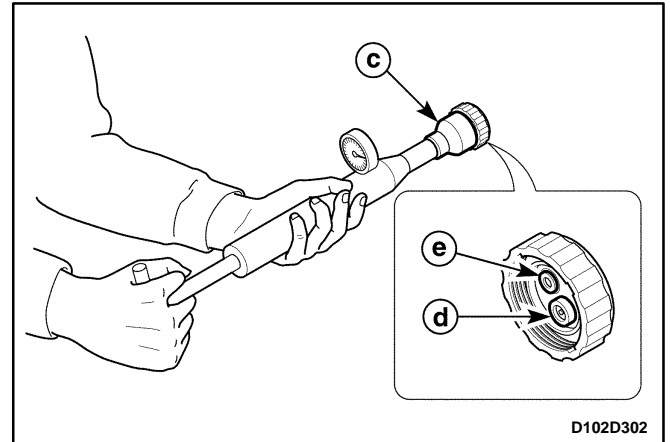
1. Remove the surge tank cap after the engine cools.
2. Check the coolant level.
3. Install a suitable cooling system pressure tester(b) to the surge tank filler neck using the adapter(a) and pressurize (110–120 kPa (16.0–17.4 psi)).
4. Check the coolant leaks on the hoses and connections during 2 minutes.
5. If the leak is checked, replace the parts or repair the connections.



SURGE TANK CAP TEST

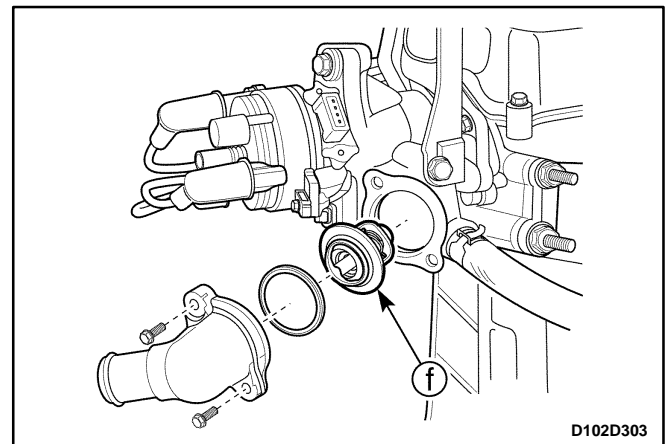
The surge tank cap(c) is equipped with the pressure valve(d) and the vacuum valve(e). Therefore, the surge tank cap maintains proper pressure. And The surge tank cap protects the system from high-pressure by opening a pressure valve, and protects the coolant hoses from collapsing because of a vacuum.

1. Wash any sludge from the surge tank cap and the valve seat of the vacuum pressure valve for the surge tank cap.
2. Check for any damage or deformity to the vacuum pressure valve for the surge tank cap. If any damage or deformity is found, replace the cap.
3. Install a suitable cooling system pressure tester(b) to the cap using the Adapter(a).
4. Pull the vacuum pressure valve to the open position. If the surge tank cap does not seal properly, replace the surge tank cap.
5. Pressurize the cap to 90 to 120kPa (13 to 17psi).
6. Wait 10 seconds and check the pressure held by the tank cap tester.
7. If the pressure held by the cooling system pressure tester falls below 80kPa (11.6psi) replace the surge tank cap.



THERMOSTAT TEST

1. Remove the thermostat(f) from the vehicle. Refer to "Thermostat" in this section.
2. Make sure the valve spring is tight when the thermostat is fully closed. If the spring is not tight, replace the thermostat.
3. Suspend the thermostat and a thermometer in a pan of 50/50 mixture of ethylene glycol and water. Do not let the thermostat or the thermometer rest on the bottom of the pan because the uneven concentration of heat on the bottom could result in inaccurate temperature measurements.
4. Heat the pan on a burner.
5. Use the thermometer to measure the temperature of the heated solution.
6. The thermostat should begin to open at 82°C (180°F) and it should be fully open at 95°C (203.4°F) and it should be fully close at 80°C (176.4°F). If it does not open or close at these temperature, replace the thermostat. Also, the thermostat rod's stroke from the initially open to the fully open should be 8mm (0.31 in.).

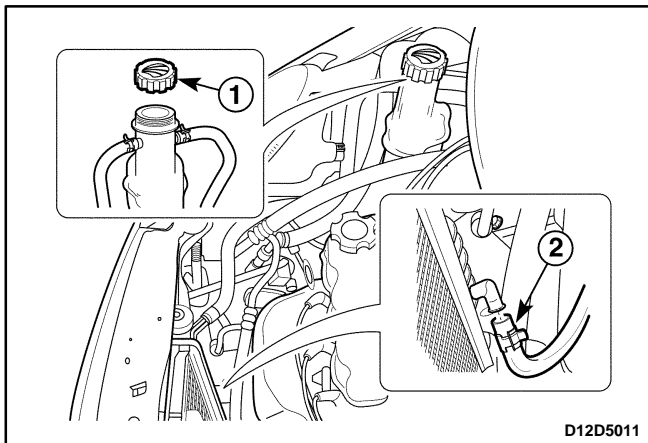


COOLING SYSTEM DIAGNOSIS

Condition	Probable Cause	Correction
Engine Overheats	<ul style="list-style-type: none"> ● A loss of the coolant. 	<ul style="list-style-type: none"> ● Add the coolant.
	<ul style="list-style-type: none"> ● A weak coolant solution. 	<ul style="list-style-type: none"> ● Confirm that the coolant solution is a 50/50 mixture of ethylene glycol and water.
	<ul style="list-style-type: none"> ● Any dirt, any leaves, or any insects on the front of the radiator. 	<ul style="list-style-type: none"> ● Clean the front of the radiator.
	<ul style="list-style-type: none"> ● The leakage from the hoses, the coolant pump, the heater, the thermostat housing, the radiator, the heater core, or the head gasket. 	<ul style="list-style-type: none"> ● Replace any damaged components.
	<ul style="list-style-type: none"> ● A faulty thermostat. 	<ul style="list-style-type: none"> ● Replace a damaged thermostat.
	<ul style="list-style-type: none"> ● Retarded ignition timing. 	<ul style="list-style-type: none"> ● Perform an ECM code diagnosis. ● Confirm the integrity of the timing belt.
	<ul style="list-style-type: none"> ● An improperly operating electric cooling fan. 	<ul style="list-style-type: none"> ● Replace the electric cooling fan.
	<ul style="list-style-type: none"> ● Plugged or rotted radiator hoses. 	<ul style="list-style-type: none"> ● Replace any damaged radiator hoses.
	<ul style="list-style-type: none"> ● A faulty water pump. 	<ul style="list-style-type: none"> ● Replace a faulty water pump.
	<ul style="list-style-type: none"> ● A faulty surge tank cap. 	<ul style="list-style-type: none"> ● Replace a faulty surge tank cap.
	<ul style="list-style-type: none"> ● A cracked or plugged cylinder head or engine block. 	<ul style="list-style-type: none"> ● Repair the damaged cylinder head or the damaged engine block.
Loss of Coolant	<ul style="list-style-type: none"> ● A faulty radiator. 	<ul style="list-style-type: none"> ● Replace a faulty radiator.
	<ul style="list-style-type: none"> ● A leak in the radiator. 	<ul style="list-style-type: none"> ● Replace a damaged radiator.
	<ul style="list-style-type: none"> ● A leak in the surge tank or the hose. 	<ul style="list-style-type: none"> ● Replace the surge tank or the hose.
	<ul style="list-style-type: none"> ● Looseness or damage of radiator hoses, heater hoses, or connections. 	<ul style="list-style-type: none"> ● Reseat the hoses. ● Replace the hoses or the clamps.
	<ul style="list-style-type: none"> ● Leaks in the coolant pump seal. 	<ul style="list-style-type: none"> ● Replace the coolant pump seal.
	<ul style="list-style-type: none"> ● Leaks in the coolant pump gasket. 	<ul style="list-style-type: none"> ● Replace the coolant pump gasket.
	<ul style="list-style-type: none"> ● An improper cylinder head torque. 	<ul style="list-style-type: none"> ● Tighten the cylinder head bolts to specifications. ● Replace the cylinder head gasket, if needed.
Engine Fails to Reach Normal Operating Temperature or Cool Air from the Heater	<ul style="list-style-type: none"> ● Leaks in the intake manifold, cylinder head gasket, heater core. 	<ul style="list-style-type: none"> ● Repair or replace any components, as needed to correct the leak.
	<ul style="list-style-type: none"> ● Thermostat to be stuck open or to be wrong type. 	<ul style="list-style-type: none"> ● Install a new thermostat of the correct type and heat range.
	<ul style="list-style-type: none"> ● The coolant level below the MIN mark on the surge tank. 	<ul style="list-style-type: none"> ● Add sufficient coolant to raise the fluid to the specified mark on the surge tank.

REPAIR INSTRUCTIONS

ON-VEHICLE SERVICE

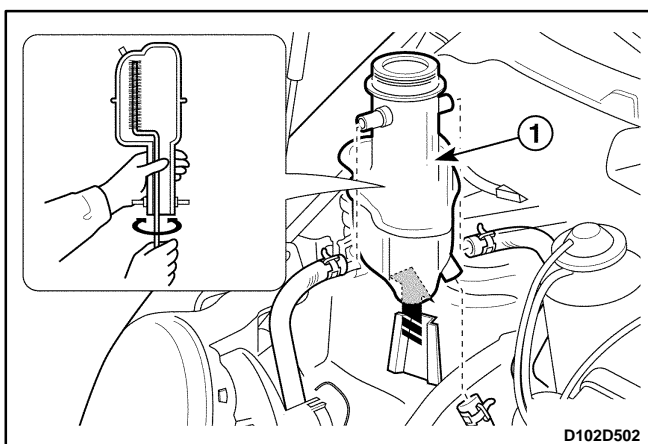


DRAINING AND REFILLING THE COOLING SYSTEM

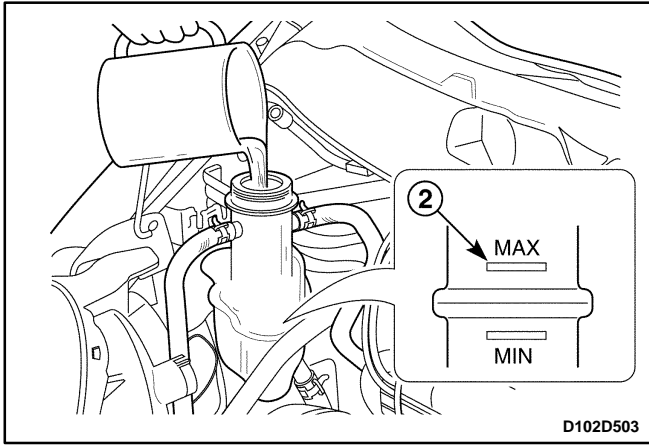
Caution: Do not remove the surge tank cap while the engine and the radiator are hot. Scalding fluid and steam may be blown out under pressure.

1. Place a pan below the vehicle to catch the draining coolant.
2. Drain the coolant.
 - Remove the surge tank cap (1).
 - Disconnect the lower radiator hose (2).

Caution: Dispose of the used coolant to a used coolant holding tank to be picked up with the used oil for disposal. Never pour the used coolant down the drain. Ethylene glycol antifreeze is an extremely toxic chemical. Disposing of it into the sewer system or the ground water can contaminate the local environment.



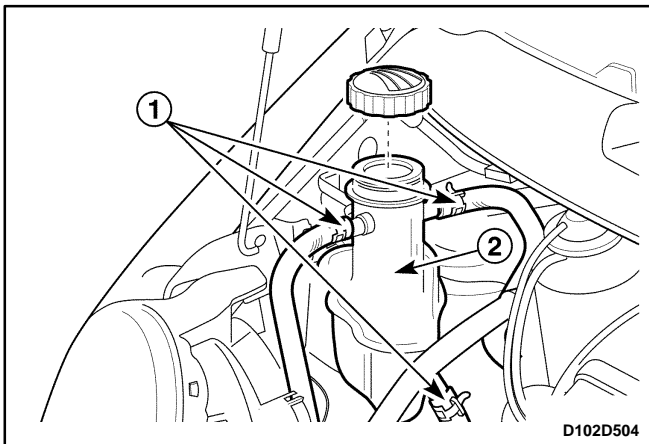
3. Connect the lower radiator hose.
4. Clean the cooling system.
 - Remove all sludge and dirt from inside the surge tank. And install the surge tank. Refer to "Surge Tank" in this section (1).



- Add the clean water to the surge tank (2).
5. Run the engine until the thermostat opens. You can tell the thermostat is open when both radiator hoses are hot to the touch.
 6. Stop the engine and disconnect the lower radiator hose to drain the coolant.
 7. Repeat steps 3 through 6 until the drained water is clear and free of coolant and rust.

Notice: Never use an antifreeze mixture more concentrated than 60 percent antifreeze to 40 percent water. The solution freezing point increases above this concentration.

8. Fill the cooling system through the surge tank with a mixture of ethylene glycol antifreeze and water. The mixture must be at least 50 percent antifreeze, but not more than 60 percent antifreeze for cold weather operation.
9. Fill the surge tank to the specified MAX fill mark on the outside of the tank.
10. Install the surge tank cap.

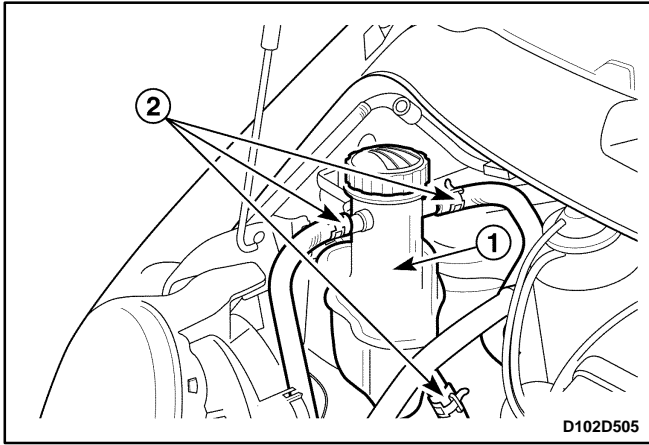


SURGE TANK

Removal Procedure

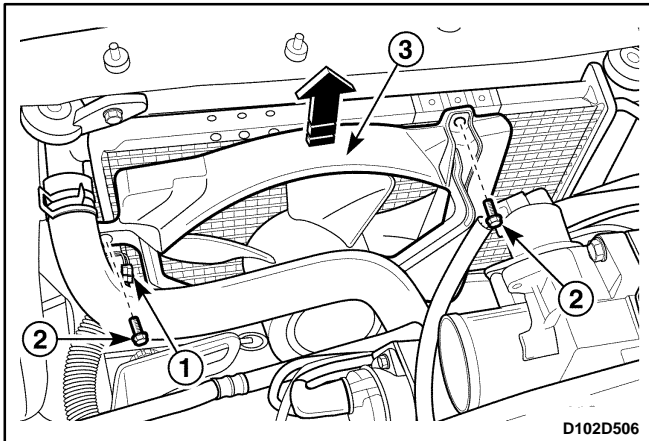
Caution: To prevent personal injury, do not remove the surge tank cap while the engine and the radiator are hot, because the heat causes the system to remain under pressure scalding fluid and steam may be blown out under pressure.

1. Drain the engine coolant to below the level of the surge tank.
2. Remove the surge tank.
 - Loosen the overflow hose clamps and disconnect the overflow hoses from the surge tank (1).
 - Remove the surge tank (2).
3. Clean the inside and the outside of the surge tank and the surge tank cap with soap and water.
4. Rinse the surge tank and the cap thoroughly.
5. Check the surge tank and the cap for crack or other damage.



Installation Procedure

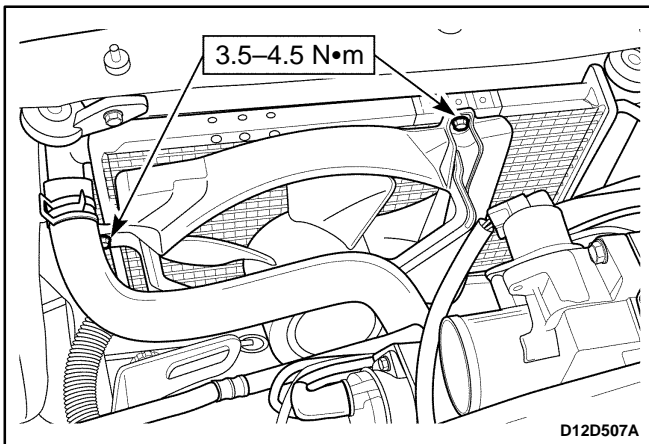
1. Install the surge tank to the vehicle.
 - Install the surge tank with pressing down (1).
 - Connect the overflow hoses to the surge tank (2).
2. Secure the overflow hoses to the surge tank with the hose clamps.
3. Fill the surge tank with coolant to the MAX mark.



ELECTRIC COOLING FAN

Removal Procedure

1. Disconnect the negative battery cable.
2. Remove the electric cooling fan assembly.
 - Disconnect the cooling fan electrical connector (1).
 - Remove the bolts (2).
 - Remove the electric cooling fan assembly (3).



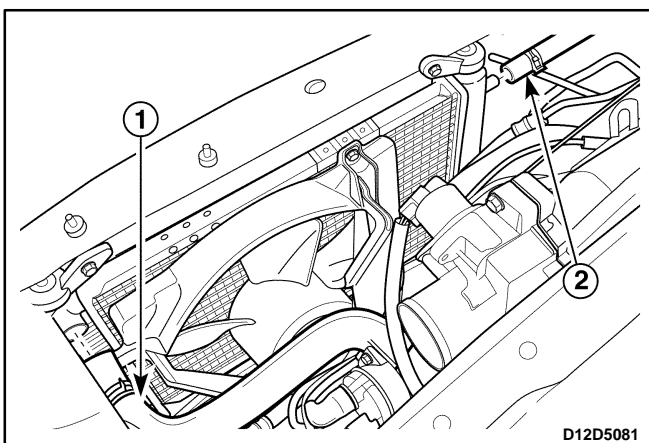
Installation Procedure

1. Install the electric cooling fan assembly with the bolts.

Tighten

Tighten the bolts to 3.5-4.5 N·m (31-40 lb-in).

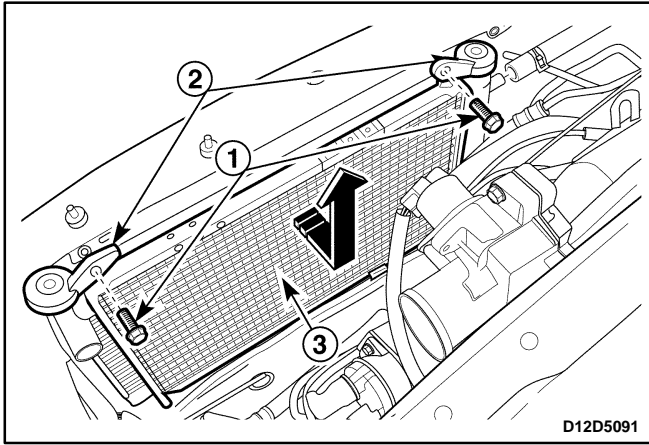
2. Connect the cooling fan electrical connector.
3. Connect the negative battery cable.



RADIATOR

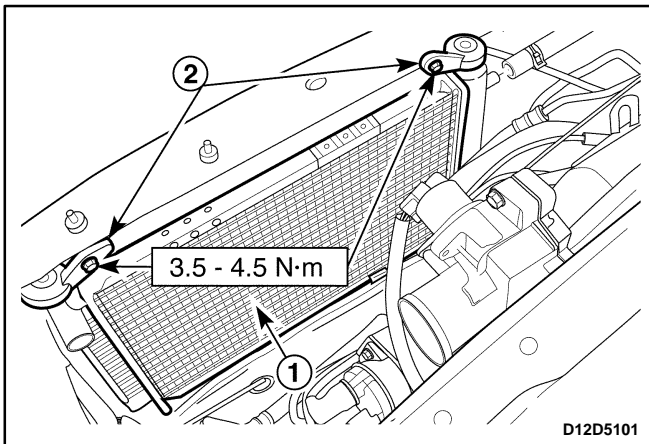
Removal Procedure

1. Disconnect the negative battery cable.
2. Disconnect the lower radiator hose and drain the engine cooling system. Refer to "Draining and Refilling the Cooling System" in this section.
3. Disconnect the upper radiator hose and the surge tank hose.
 - Loosen the upper radiator hose clamp and disconnect the upper radiator hose (1).
 - Loosen the surge tank hose clamp and disconnect the surge tank hose (2).



4. Remove the electric cooling fan.
Refer to "Electric Cooling Fan" in this section.
5. Remove the radiator.
 - Remove the bolts (1).
 - Remove the radiator support brackets (2).
 - Remove the radiator (3).
6. Check the radiator for breaking, clog or other damage.

Important: The radiator still contains a substantial amount of coolant. Drain the remainder of the coolant from the radiator into a drain pan.



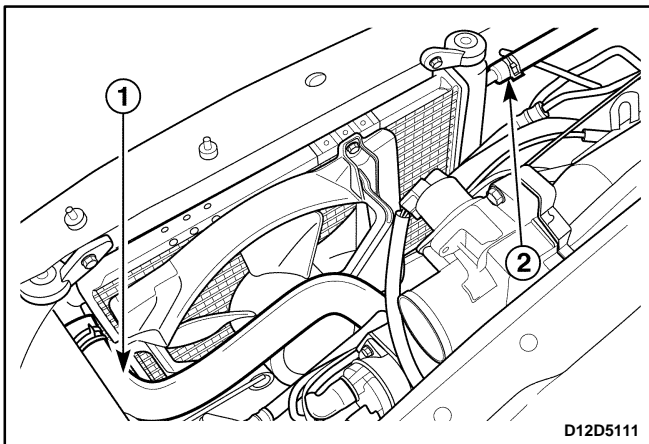
Installation Procedure

1. Install the radiator with the mounting bolts (1) and the support brackets (2).

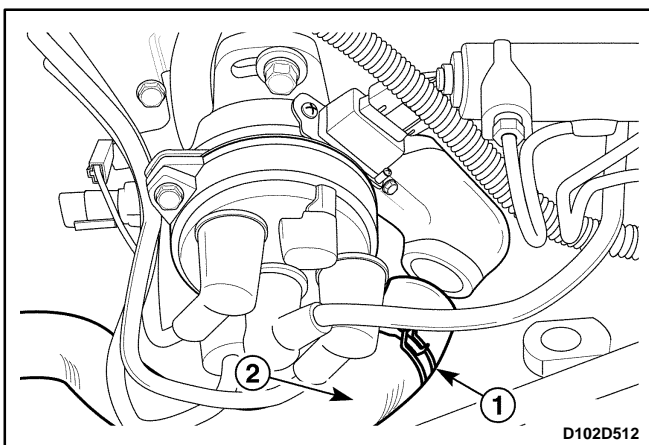
Tighten

Tighten the support bracket bolts to 3.5–4.5 N•m (31–40 lb-in).

2. Install the electric cooling fan.
Refer to "Electric Cooling Fan" in this section.



3. Connect the upper radiator hose to the radiator (1).
4. Connect the surge tank hose to the radiator (2).
5. Secure each hose with hose clamps.
6. Refill the engine cooling system. Refer to "Draining and Refilling the Cooling System" in this section.
7. Connect the negative battery cable.



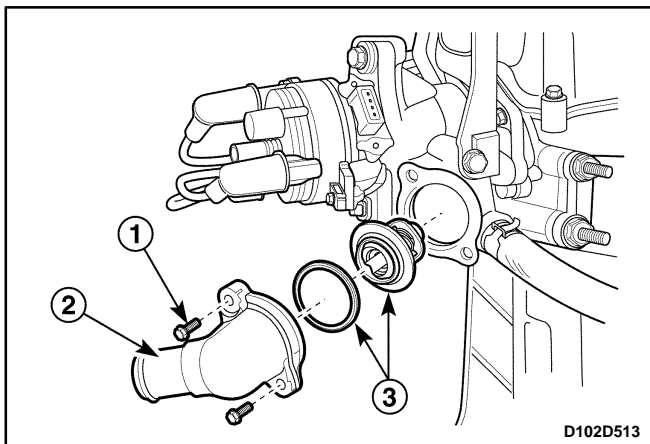
THERMOSTAT (TYPICAL)

Removal Procedure

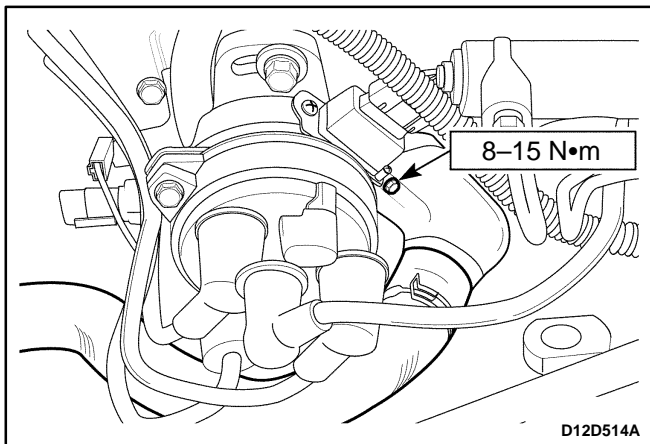
Caution: To prevent personal injury, do not remove the surge tank cap while the engine and the radiator are hot because the heat causes the system to remain under pressure. Scalding fluid and steam may be blown out under pressure.

1. Remove air filter assembly. Refer to Section 1B, SOHC Engine Mechanical.
2. Disconnect the lower radiator hose and drain the coolant. Refer to "Drain and Refilling the Cooling System"
3. Disconnect the upper radiator hose.

- Loosen the hose clamp (1).
- Disconnect the upper radiator hose (2).



4. Remove the thermostat.
 - Remove the bolts (1).
 - Remove the thermostat housing (2).
 - Remove the thermostat with the gasket (3).
5. Check the gasket for crack or other damage.
6. Inspect the valve seat for foreign matter that could prevent the valve from seating properly.
7. Inspect the thermostat for proper operation. Refer to "Thermostat Test" in this section.



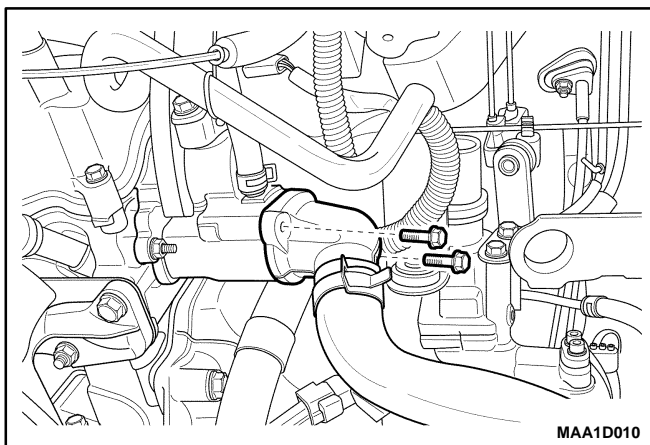
Installation Procedure

1. Install the thermostat with the bolts and the thermostat housing.

Tighten

Tighten the mounting bolts to 8-15 N·m (71-130 lb-in).

2. Secure the upper radiator hose to the thermostat housing with a hose clamp.
3. Refill the engine cooling system. Refer to "Draining and Refilling the Cooling System" in this section.

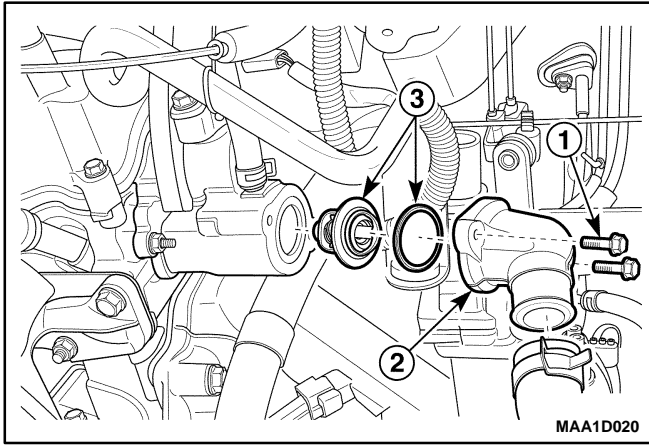


THERMOSTAT (EURO III)

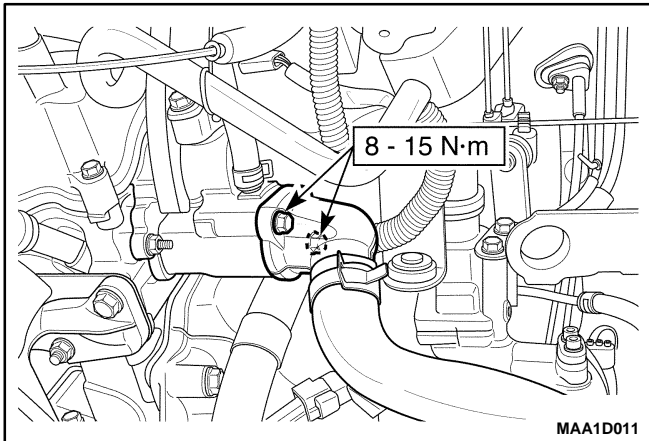
Removal Procedure

Caution: To prevent personal injury, do not remove the surge tank cap while the engine and the radiator are hot because the heat causes the system to remain under pressure. Scalding fluid and steam may be blown out under pressure.

1. Remove air filter assembly. Refer to Section 1B, SOHC Engine Mechanical.
2. Disconnect the lower radiator hose and drain the coolant. Refer to "Drain and Refilling the Cooling System"
3. Disconnect the upper radiator hose.



4. Remove the thermostat.
 - Remove the bolts.
 - Remove the thermostat housing.
 - Remove the thermostat with the gasket.
5. Check the gasket for crack or other damage.
6. Inspect the valve seat for foreign matter that could prevent the valve from seating properly.
7. Inspect the thermostat for proper operation. Refer to "Thermostat Test" in this section.



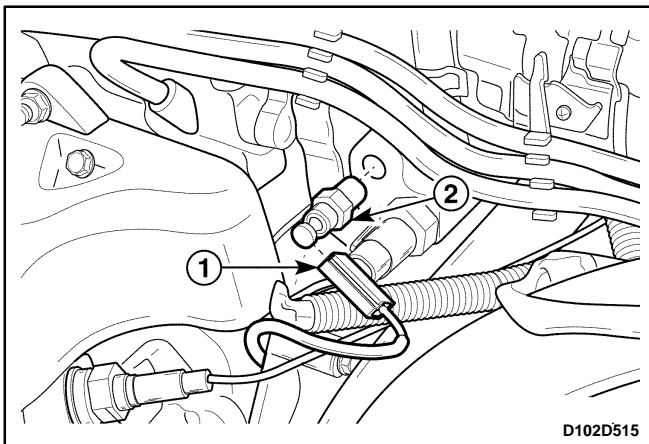
Installation Procedure

1. Install the thermostat with the bolts and the thermostat housing.

Tighten

Tighten the mounting bolts to 8–15 N•m (71–130 lb-in).

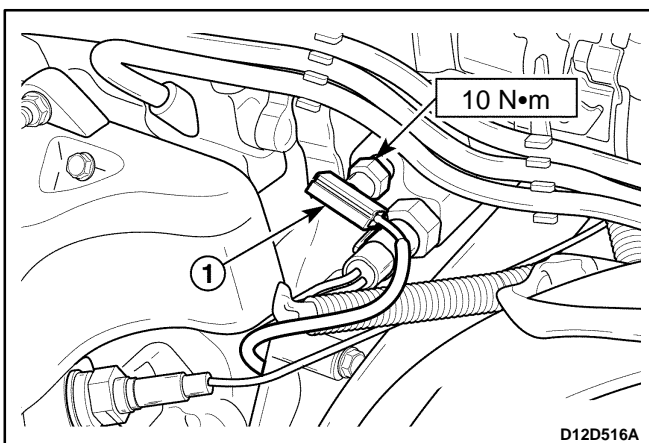
2. Secure the upper radiator hose to the thermostat housing with a hose clamp.
3. Refill the engine cooling system. Refer to "Draining and Refilling the Cooling System" in this section.
4. Install the air filter assembly. Refer to *Section 1B, SOHC Engine Mechanical*.



COOLANT TEMPERATURE SENSOR

Removal Procedure

1. Disconnect the negative battery cable.
2. Disconnect the lower radiator hose and drain the coolant. Refer to "Draining and Refilling the Cooling System" in this section.
3. Remove the coolant temperature sensor.
 - Disconnect the electrical connector (1).
 - Remove the coolant temperature sensor (2).



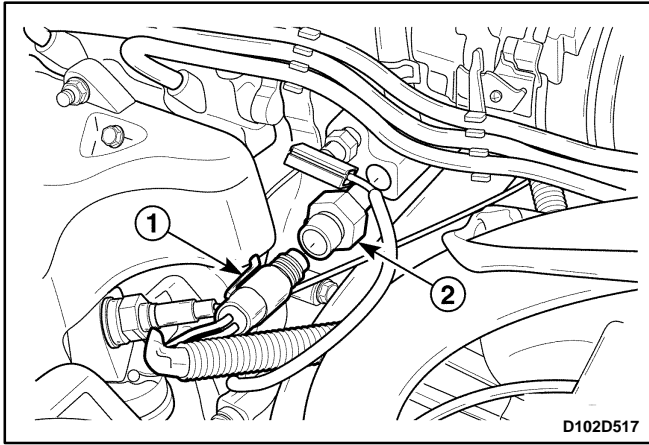
Installation Procedure

1. Install the coolant temperature sensor into the threaded hole in the intake manifold.

Tighten

Tighten the coolant temperature sensor to 10 N•m (89 lb-in).

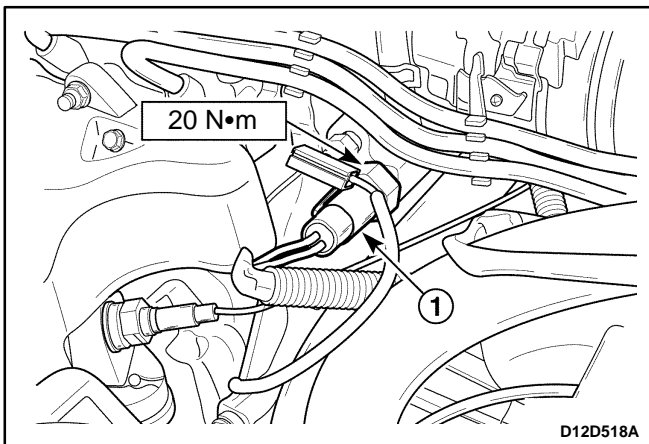
- Connect the electrical connector to the coolant temperature sensor (1).
2. Connect the lower radiator hose and refill the coolant. Refer to "Draining and refilling the cooling system" in this section.
 3. Connect the negative battery cable.



ENGINE COOLANT TEMPERATURE SENSOR

Removal Procedure

1. Disconnect the negative battery cable.
2. Disconnect the lower radiator hose and drain the coolant "Draining and Refilling the Cooling System" in this section.
3. Remove the engine coolant temperature (ECT) sensor.
 - Disconnect the electrical connector (1).
 - Remove the ECT sensor (2).



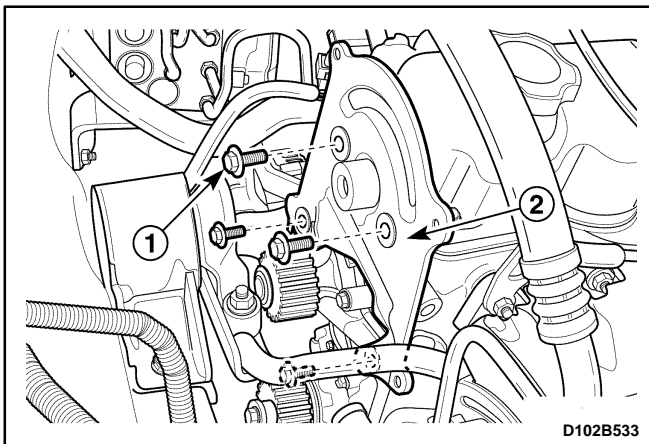
Installation Procedure

1. Install the ECT sensor.

Tighten

Tighten the ECT sensor to 20 N•m (15 lb-ft).

- Connect the electrical connector to the ECT sensor (1).
2. Connect the lower radiator hose and refill the coolant. Refer to "Draining and Refilling the Cooling System" in this section.
 3. Connect the negative battery cable.

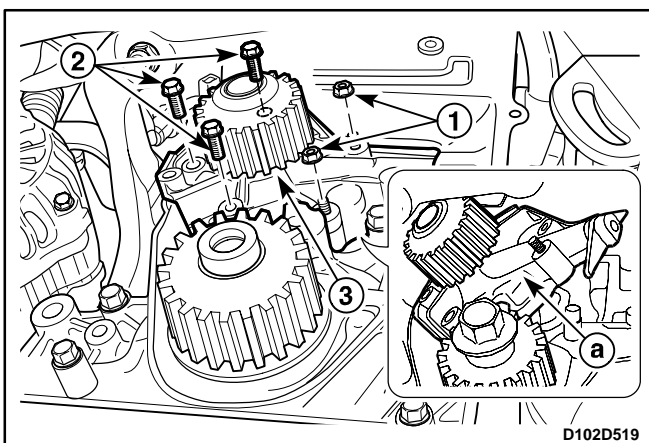


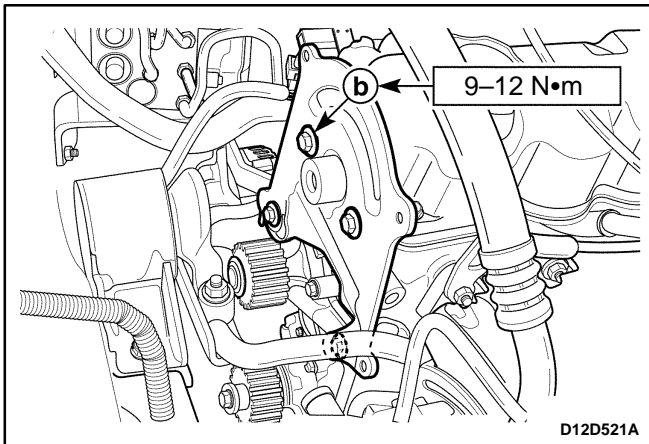
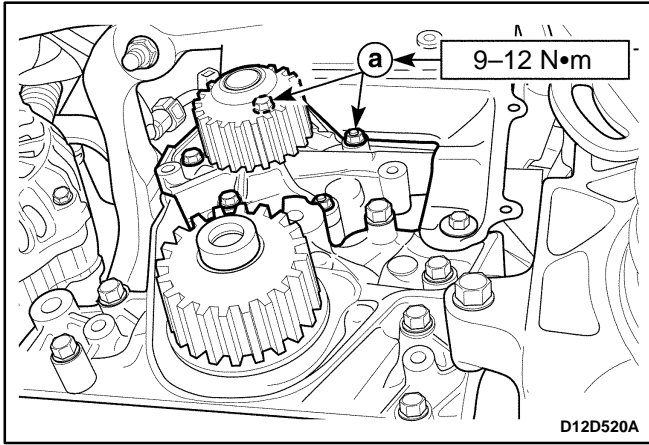
COOLANT PUMP

Removal Procedure

1. Disconnect the negative battery cable.
2. Disconnect the lower radiator hose and drain the coolant. Refer to "Draining and Refilling the Cooling System" in this section.
3. Remove the timing belt. Refer to *Section 1B, Engine Mechanical*.
4. Remove the rear timing belt cover.
 - Remove the bolts (1).
 - Remove the rear timing belt cover (2).
5. Remove the coolant pump.
 - Remove the nuts (1).
 - Remove the bolts (2).
 - Remove the coolant pump (3).
 - Remove the gasket.

Notice: Remove the coolant pump as shown figure (a).





Installation Procedure

1. Install the coolant pump with the new gasket.

Tighten

Tighten the bolts and the nuts to 9–12 N•m (80–106 lb-in) (a).

2. Install the rear timing belt cover.

Tighten

Tighten the bolts to 9–12 N•m (80–106 lb-in) (b).

3. Install the timing belt. Refer to *Section 1B, Engine Mechanical*.
4. Connect the lower radiator hose and drain the coolant. Refer to “Draining and Refilling the Cooling System” in this section.
5. Connect the negative battery cable.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Application	Description	Unit	Standard	Limit
Cooling System	Cooling Type	–	Forced Water Circulation	
Coolant	Coolant Capacity	L/qt	3.8/4.00	
Thermostat	Thermostat Type	–	Pellet Type	
	Temperature(opened initially)	°C(°F)	82(180)	
	Temperature(perfectly opened)	°C(°F)	95(203.4)	
	Temperature(perfectly closed)	°C(°F)	80(176.4)	
	Stroke(perfectly opened)	mm(in.)	8 (0.32)	
Electric Cooling Fan	Cooling Fan Type	–	Electric	
	Blade Number	EA	6	
	Cooling Fan Diameter	mm(inch)	300(11.8)	
	Temperature At Low Speed ON	°C(°F)	93(199.8)	
	Temperature At Low Speed OFF	°C(°F)	90(194.4)	
	Temperature At High Speed ON	°C(°F)	100(212.4)	
	Temperature At High Speed OFF	°C(°F)	97(207)	
Surge Tank	Open Pressure of The Pressure Valve	kPa (psi)	120–150 (17.4–21.8)	
	Open Pressure of The Vacuum Valve	kPa (psi)	10 (1.5)	
Coolant Pump	Water Pump Type	–	Centrifugal	
	Impeller Diameter	mm(in.)	60(2.36)	
	Impeller Blade Number	EA	7	
Radiator	Radiator Type	–	Cross–Flow	
	Core Width	mm(in.)	458(18.03)	
	Core Height	mm(in.)	295(11.61)	
	Core Depth (Standard/Heavy Duty)	mm(in.)	16/27(0.63/1.06)	
Coolant Temperature Sensor	Resistance (Coolant Temperature 50°C(122.4°F))	Ω	185.2	
	Resistance (Coolant Temperature 85°C(185.4°F))	Ω	49.2	
	Resistance (Coolant Temperature 105°C(221.4°F))	Ω	27.5	
Engine Coolant Temperature Sensor	Resistance (Coolant Temperature 20°C(68.4°F))	Ω	3,520	
	Resistance (Coolant Temperature 80°C(176.4°F))	Ω	332	

FASTENER TIGHTENING SPECIFICATIONS

Application	N•m	Lb-Ft	Lb-In
Engine Coolant Temperature Sensor	10	–	89
Coolant Temperature Sensor	20	15	–
Coolant Pipe Bolt	8 – 15	–	71 – 130
Electric Cooling Fan Motor Nut	3.0 – 3.2	–	27 – 28
Electric Cooling Fan Assembly Bolt	3.5 – 4.5	–	31 – 40
Distributor Case Bolt/Nut	8 – 12	–	71 – 106
Radiator Mounting Bracket Bolt	3.5 – 4.5	–	31 – 40
Thermostat Housing Bolt	8 – 15	–	71 – 130
Water Inlet Cap Bolt	8 – 12	–	71 – 106
Coolant Pump Bolt/Nut	9–12	–	80 – 106
Coolant Pump Stud Bolt	9–12	–	80 – 106