

## SECTION 303-03A Engine Cooling

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## DESCRIPTION AND OPERATION

### Engine Cooling

**NOTICE:**

**The engine cooling system is filled with Motorcraft Premium Gold Engine Coolant. Mixing coolant types degrades the corrosion protection of Motorcraft Premium Gold Engine Coolant.**

The 4.0L (SOHC) cooling system components include the:

- block heater (if equipped).
- Engine Coolant Temperature (ECT) sensor.
- cooling fan motor and shroud assembly.
- radiator.
- heater tube assembly.
- pressure relief cap.
- thermostat housing assembly.
- radiator draincock.
- coolant pump.
- coolant thermostat.
- oil filter adapter.
- radiator overflow hose.
- degas bottle.
- upper radiator hose.
- lower radiator hose.

The coolant thermostat:

- controls the engine coolant temperature.
- allows for quicker engine warm-up.

The degas bottle:

- provides a location for service fill.
- contains coolant expansion and system pressurization.
- provides air separation during operation.
- replenishes the engine coolant to the system.

The engine coolant flows:

- from the lower radiator hose to the coolant pump.
- from the coolant pump to the engine block and the cylinder heads.

The 4.6L (3V) and 5.4L (4V) cooling system components include the:

- block heater (if equipped).
- Cylinder Head Temperature (CHT) sensor.
- fan motor and shroud assembly.
- radiator.
- radiator cap.
- radiator draincock.
- coolant pump.
- coolant thermostat.
- oil filter adapter.
- radiator overflow hose.
- degas bottle.
- upper radiator hose.
- lower radiator hose.
- ECT sensor (5.4L [4V] only).

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**DESCRIPTION AND OPERATION (Continued)**

The fan blade draws air through the radiator to help cool the engine coolant.

The fan motor:

- operates only when the ignition switch is in the RUN position.
- will not operate with the switch in the OFF position.

The engine coolant:

- flows from the thermostat through the radiator tubes and is cooled by passing air over the cooling fins.
- is then circulated from the radiator outlet tank through the oil adapter and into the cylinder block to complete the circuit.

A closed coolant thermostat returns the engine coolant to the coolant pump. An open coolant thermostat allows the engine coolant to flow to the radiator.

Engine coolant provides freeze protection, boil protection, cooling efficiency and corrosion protection to the engine and cooling components. In order to obtain these protections, the engine coolant must be maintained at the correct concentration and fluid level in the degas bottle.

When adding engine coolant, use a 50/50 mixture of engine coolant and deionized water.

To maintain the integrity of the coolant and the cooling system:

- add Motorcraft Premium Gold Engine Coolant or equivalent (yellow color) meeting Ford specification WSS-M97B51-A1. Use the same coolant that is present in the cooling system. Do not mix coolant types.
- do not add/mix orange-colored Motorcraft Speciality Orange Engine Coolant or equivalent meeting Ford specification WSS-M97B44-D. Mixing coolants may degrade the coolant's corrosion protection.
- do not add alcohol, methanol or brine, or any engine coolants mixed with alcohol or methanol antifreeze. These can cause engine damage from overheating or freezing.
- Ford Motor Company does NOT recommend the use of recycled engine coolant in vehicles originally equipped with Motorcraft Premium Gold Engine Coolant since a Ford-approved recycling process is not yet available.

The optional block heater:

- electrical heating element is installed in the core plug opening.
- uses a standard 110V electrical supply
- keeps the engine coolant warm during cold weather.

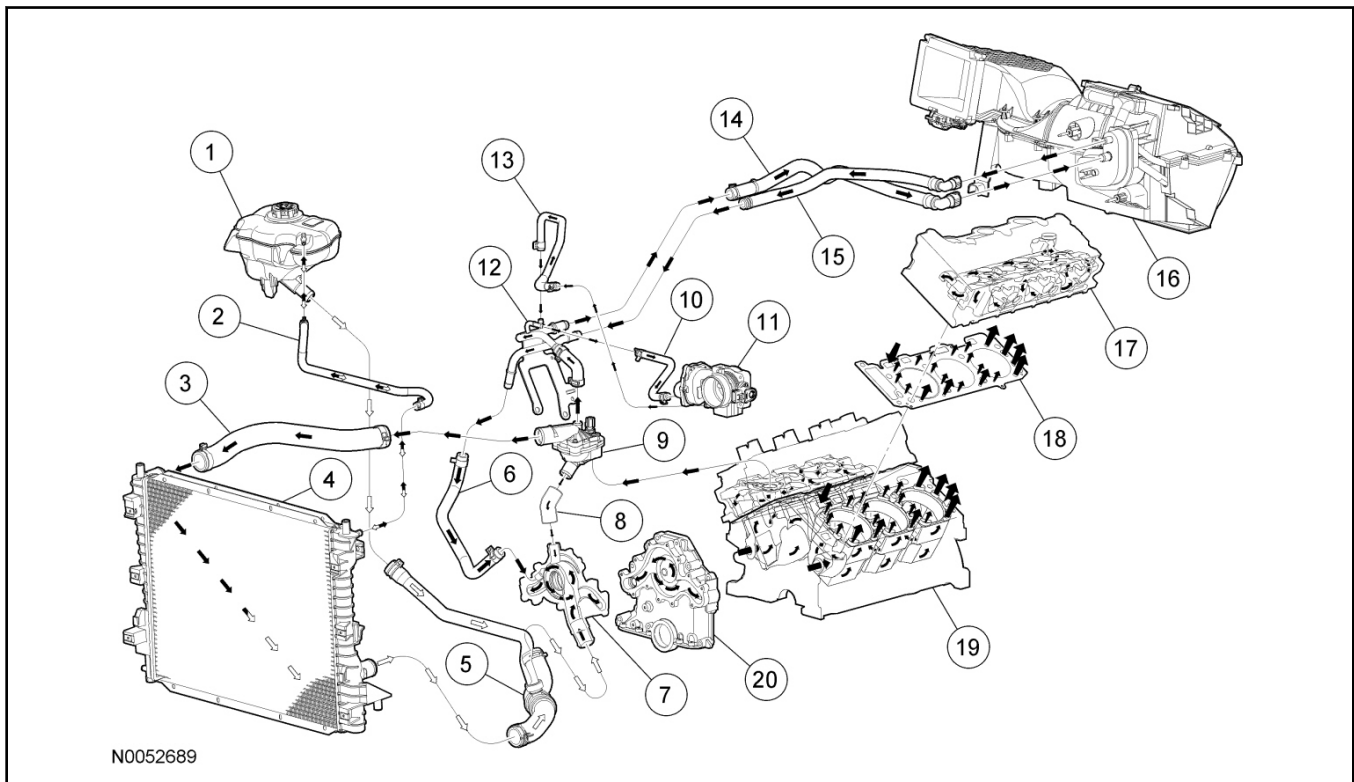
## Coolant Flow Diagram

### 4.0L (SOHC)

#### NOTE:

Black arrows indicate hot, white arrows indicate cold.

## DESCRIPTION AND OPERATION (Continued)

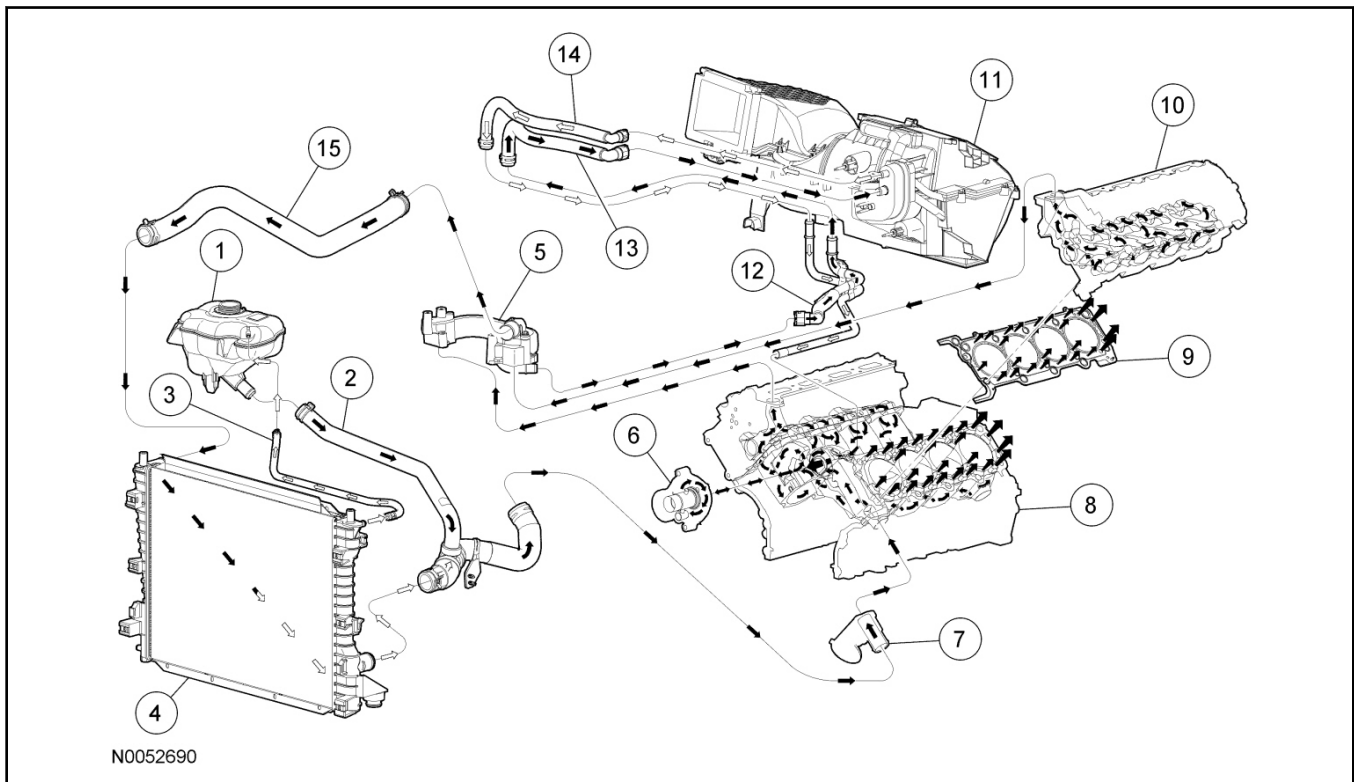


Item	Part Number	Description
1	8A080	Degas bottle
2	8276	Upper degas bottle hose
3	8B274	Upper radiator hose
4	8005	Radiator
5	8B273	Lower radiator hose
6	18C266	Coolant inlet tube-to-coolant pump hose
7	8501	Coolant pump
8	8548	Coolant pump-to-thermostat housing hose
9	8A586	Thermostat housing
10	18465	Coolant inlet tube-to-Throttle Body (TB) hose
11	9F991	TB
12	18696	Coolant inlet tube
13	18465	Coolant inlet tube-to-TB hose
14	18K579	Heater inlet hose
15	18K580	Heater outlet hose
16	19B555	Heater assembly
17	6C064	Cylinder head
18	6083	Cylinder head gasket
19	6015	Engine block
20	6019	Engine front cover

**4.6L (3V)****NOTE:**

Black arrows indicate hot, white arrows indicate cold.

DESCRIPTION AND OPERATION (Continued)



Item	Part Number	Description
1	8A080	Degas bottle
2	8B273	Lower radiator hose
3	8276	Upper degas bottle hose
4	8005	Radiator
5	8C369	Coolant crossover manifold assembly
6	8501	Coolant pump
7	6881	Oil filter adapter
8	6015	Engine block
9	6083	Cylinder head gasket
10	6050	Cylinder head
11	19B555	Heater assembly
12	18B402	Coolant tube heater assembly
13	18K580	Heater inlet hose
14	18K579	Heater outlet hose
15	8B274	Upper radiator hose