



Supercharger Cooling


Special Tool(s)

 ST1720-A	Coolant/Battery Refractometer 023-00164 or equivalent
 ST1474-A	Pressure Test Kit 014-R1072 or equivalent

Material

Item	Specification
Motorcraft® Premium Gold Engine Coolant with Bittering Agent (bittered in US only) VC-7-B (US); CVC-7-A (Canada); or equivalent (yellow color)	WSS-M97B51-A1

Inspection and Verification

 **WARNING:** Always allow the engine to cool before opening the cooling system. Do not unscrew the coolant pressure relief cap when the engine is operating or the cooling system is hot. The cooling system is under pressure; steam and hot liquid can come out forcefully when the cap is loosened slightly. Failure to follow these instructions may result in serious personal injury.

NOTICE: Check the coolant and engine oil levels. Top off the coolant level if needed. If there is engine coolant in the engine oil, the cause must be corrected and the oil changed or major component damage can occur.

NOTICE: The Supercharger (SC) cooling system is filled with Motorcraft Premium Gold Engine Coolant. Mixing coolant types degrades the corrosion protection of Motorcraft Premium Gold Engine Coolant.

1. Verify the customer's concern by operating the engine to duplicate the condition.
2. Inspect to determine if any of the following mechanical or electrical concerns apply.


Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none"> ● Radiator attachments ● Leaks ● Damaged hoses ● Hose clamps ● Coolant pump 	<ul style="list-style-type: none"> ● Damaged coolant pump wiring

- Radiator
- Degas bottle
- Coolant pump bracket

3. If the inspection reveals an obvious concern that can be readily identified, repair it as necessary.

4. Inspect the coolant condition.

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Allow the engine to cool. Once pressure is released, remove the pressure relief cap.

2. **NOTICE: The Supercharger (SC) cooling system is filled with Motorcraft Premium Gold Engine Coolant. Mixing coolant types degrades the corrosion protection of Motorcraft Premium Gold Engine Coolant.**

Inspect the coolant color:

- If Motorcraft Premium Gold Engine Coolant has a clear or pale yellow color, this indicates higher water content than required.
 - A light or reddish brown color indicates that rust may be present in the cooling system. Flush the system and refill with the correct mixture of water and coolant.
3. If the coolant appearance is acceptable, test the coolant freezing point range with the Coolant/Battery Refractometer. The freezing point should be in the range -45°C (-50°F) to -23°C (-10°F). If the vehicle is driven in cold climates less than -36°C (-34°F), it may be necessary to increase the coolant concentration to get adequate freeze protection.
 - Maximum coolant concentration is 60/40.
 - Minimum coolant concentration is 40/60.
 4. Check the coolant system conditions:
 - If the coolant level is low, add the specified coolant mixture only.
 - If the coolant tests weak, add straight coolant until the readings are within acceptable levels.
 - If the coolant tests strong, remove some of the coolant and add water until readings are within acceptable levels.

5. If the concern remains after the inspection, determine the symptom(s). GO to [Symptom Chart](#).

6. Verify the cooling system is correctly filled and bled. Refer to [Supercharger Cooling System Draining, Filling and Bleeding](#) in this section.


Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
<ul style="list-style-type: none"> • Loss of coolant 	<ul style="list-style-type: none"> • Pressure relief cap • Degas bottle • Coolant hoses • Radiator • Coolant pump • Charge Air Cooler (CAC) 	<ul style="list-style-type: none"> • CARRY OUT the Pressure Test component test.

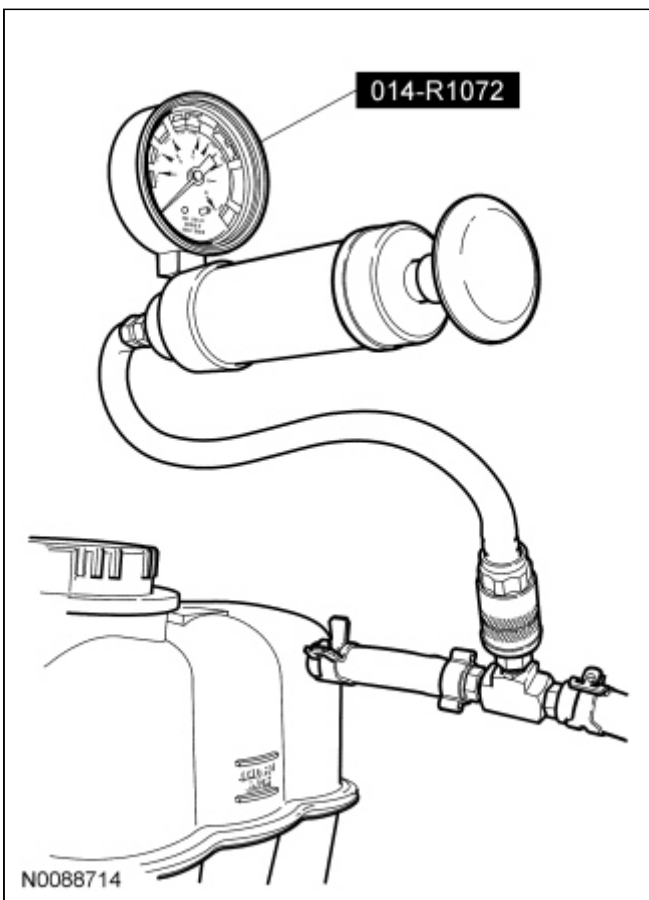
Component Tests

Pressure Test

1. Turn the engine OFF.
2.  **WARNING:** Always allow the engine to cool before opening the cooling system. Do not unscrew the coolant pressure relief cap when the engine is operating or the cooling system is hot. The cooling system is under pressure; steam and hot liquid can come out forcefully when the cap is loosened slightly. Failure to follow these instructions may result in serious personal injury.

Check the coolant level. Refer to [Supercharger Cooling System Draining, Filling and Bleeding](#) in this section.

3. Connect the Radiator/Heater Core Pressure Tester to the degas bottle nipple. Install a pressure test pump to the quick connect fitting of the test adapter.



4. **NOTE:** If the plunger of the pump is depressed too fast, an erroneous pressure reading will result.

Slowly depress the plunger of the pressure test pump until the pressure gauge reading stops increasing and note the highest pressure reading obtained.

5. If the pressure relief cap does not hold pressure, remove and wash the pressure relief cap in clean water to dislodge all foreign particles from the gaskets. Check the sealing surface in the filler neck.
6. If 110 kPa (16 psi) cannot be reached, install a new pressure relief cap. If more than 165 kPa (24 psi) shows on the gauge, install a new pressure relief cap.
7. **NOTE:** If the pressure drops, check for leaks at the Charge Air Cooler (CAC) hoses or other system components and connections. Any leaks which are found must be corrected and the system rechecked.

NOTE: The Supercharger (SC) system is not connected to the main engine cooling system.

Pressurize the [SC](#) cooling system as described in Step 4 (using a pressure relief cap that operates within

the specified upper and lower pressure limits). Observe the gauge reading for approximately 2 minutes; refer to General Specifications. Pressure should not drop during this time.

- If the pressure drops and no external leak is found, the [CAC](#) may be the cause. Remove and inspect the [CAC](#). Install a new [CAC](#) if necessary.
8. Release the system pressure by loosening the pressure relief cap. Check the coolant level and replenish, if necessary, with the correct coolant mixture. Refer to [Supercharger Cooling System Draining, Filling and Bleeding](#) in this section.

Radiator Leak Test, Removed From the Vehicle

NOTICE: Never leak test an aluminum radiator or Charge Air Cooler (CAC) in the same water that copper/brass radiators are tested in. Flux and caustic cleaners may be present in the cleaning tank and they will damage aluminum components.

NOTE: Clean the radiator or [CAC](#) before leak testing to avoid contamination of tank.

1. Leak test the radiator or [CAC](#) in clean water with pressurized air to the maximum pressure listed in the Specifications.
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