

Cooling System - Check

SMCS - 1350-535

This engine has a pressurized cooling system. A pressurized cooling system has two advantages. The cooling system can be operated in a safe manner at a temperature higher than the normal boiling point (steam) of water.

This type of system prevents cavitation in the water pump. Cavitation is the forming of low-pressure bubbles in liquids that are caused by mechanical forces. The formation of an air pocket or a steam pocket in this type of cooling system is difficult.

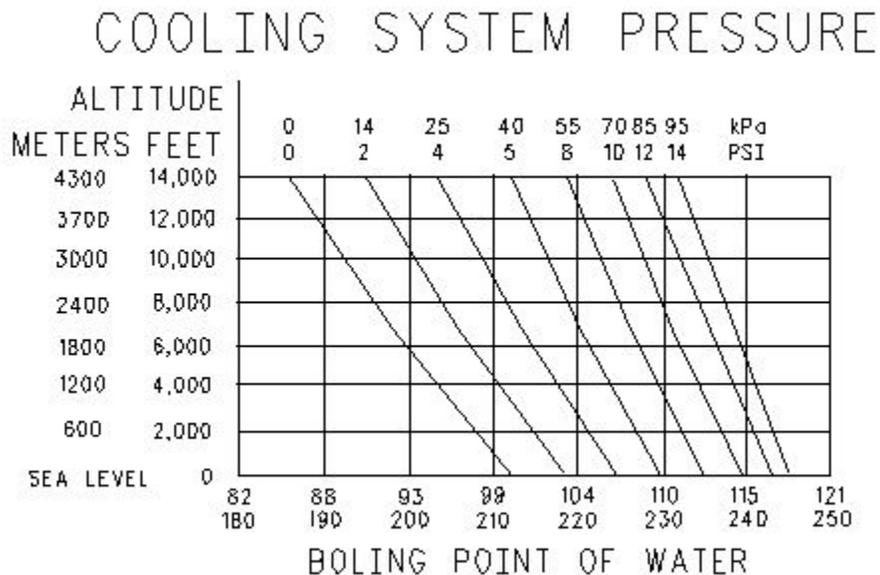


Illustration 1
 Boiling point of water

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Temperature and pressure work together. When a diagnosis is made of a cooling system problem, temperature and pressure must be checked. Cooling system pressure affects the cooling system

temperature. For an example, refer to Illustration 1. The illustration shows the effect of pressure on the boiling point (steam) of water and also shows the effect of height above sea level.



Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove filler cap slowly to relieve pressure only when engine is stopped and radiator cap is cool enough to touch with your bare hand.

Cooling System Conditioner contains alkali. Avoid contact with skin and eyes.

The coolant level must be to the correct level in order to check the coolant system. The engine must be cold and the engine must not be running.

After the engine is cool, loosen the pressure cap in order to relieve the pressure out of the cooling system. Then remove the pressure cap.

The level of the coolant should not be more than 13 mm (0.5 inch) from the bottom of the filler pipe. If the cooling system is equipped with a sight glass, the coolant should be to the proper level in the sight glass.

Testing The Radiator And Cooling System For Leaks

Table 1

| Tools Needed | | |
|--------------|-------------------|----------|
| Part Number | Part Name | Quantity |
| 9S-8140 | Pressurizing Pump | 1 |

Use the following procedure in order to check the cooling system for leaks:



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1. After the engine is cool, loosen the filler cap slowly and allow pressure out of the cooling system. Then remove the filler cap from the radiator.
 2. Ensure that the coolant level is above the top of the radiator core.
 3. Install the **9S-8140** Pressurizing Pump onto the radiator.
 4. Take the pressure reading on the gauge to 100 kPa (14.5 psi).
 5. Check the radiator for leakage on the outside.
 6. Check all connection points for leakage, and check the hoses for leakage.

The cooling system does not have leakage only if the following conditions exist:

- You do not observe any outside leakage.
- The reading remains steady after 5 minutes.

The inside of the cooling system has leakage only if the following conditions exist:

- The reading on the gauge goes down.
- You do not observe any outside leakage.

Make any repairs, as required.

Checking the Filler Cap

Table 2

| Tools Needed | | |
|--------------|-------------------|----------|
| Part Number | Part Name | Quantity |
| 9S-8140 | Pressurizing Pump | 1 |

One cause for a pressure loss in the cooling system can be a damaged seal on the radiator filler cap.

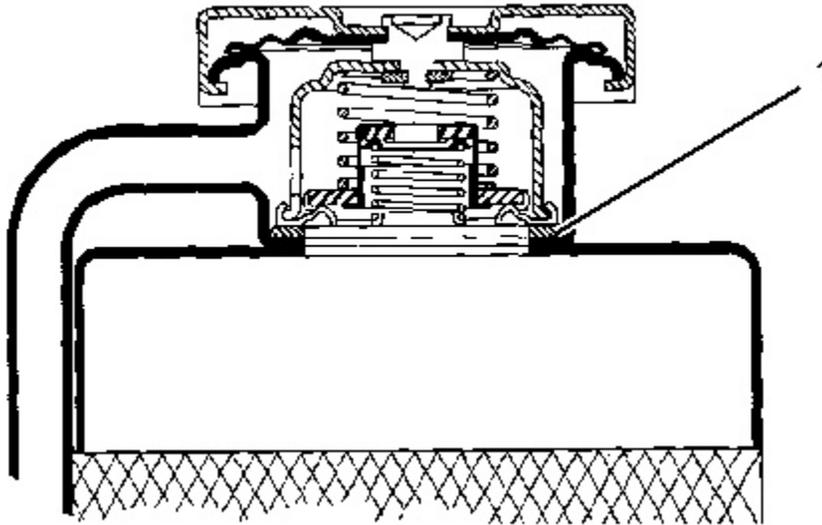


Illustration 2

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Typical schematic of filler cap

(1) Sealing surface of both filler cap and radiator

WARNING

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Remove filler cap slowly to relieve pressure only when engine is stopped and radiator cap is cool enough to touch with your bare hand.

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To check for the amount of pressure that opens the filler cap, use the following procedure:

1. After the engine cools, carefully loosen the filler cap. Slowly release the pressure from the cooling system. Then, remove the filler cap.

Carefully inspect the filler cap. Look for any damage to the seals and to the sealing surface. Inspect the following components for any foreign substances:

- Filler cap
- Seal

- Surface for seal

Remove any deposits that are found on these items, and remove any material that is found on these items.

2. Install the filler cap on the **9S-8140** Pressurizing Pump.
 3. Take the pressure reading on the gauge to 100 kPa (14.5 psi).
 4. Compare the gauge reading with the opening pressure that is listed on the filler cap.
 5. If the filler cap is damaged, replace the filler cap.
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