

Name \_\_\_\_\_

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

1) Why is a cooling system pressurized?

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2) What is the purpose of the coolant system bypass?

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3) What is normal operating coolant temperature?

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4) What is the difference between galvanic activity and electrolysis?

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5) How does the flow of coolant move through the engine and radiator?

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6) What are the differences among IAT, OAT, and HOAT coolants?

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7) Why is a 50/50 mixture of antifreeze and water commonly used as a coolant?

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## Answer Key

Testname: LVDE1\_SHORT5

- 1) Engine cooling systems are pressurized to raise the boiling temperature of the coolant. The boiling temperature will increase by approximately 3°F (1.6°C) for each pound of increase in pressure.  
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- 2) A bypass around the closed thermostat allows a small part of the coolant to circulate within the engine, past the thermostat during warm-up. It is a small passage that leads from the engine side of the thermostat to the inlet side of the water pump. It allows some coolant to bypass the thermostat even when the thermostat is open. The bypass opening may be cast or drilled into the engine and/or water pump parts.  
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- 3) The rated temperature of the thermostat indicates the temperature at which the thermostat starts to open. The thermostat is fully open at about 20°F higher than its opening temperature usually between 180 and 200°F.  
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- 4) Galvanic activity is the flow of an electrical current as the result of two different metals in an acidic or alkaline liquid, which acts like a battery. Galvanic activity does not require an outside source of voltage. Electrolysis requires the use of an outside voltage source.  
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- 5) The coolant flow rate may be as high as 1 gallon (4 liters) per minute for each horsepower the engine produces. Hot coolant comes out of the thermostat housing on the top of the engine on most engines. The engine coolant outlet is connected to the radiator by the upper radiator hose and clamps. The coolant in the radiator is cooled by air flowing through the radiator. The lower temperature coolant leaves the radiator through the lower radiator hose, and then flows to the inlet side of the water pump, where it is recirculated through the engine.  
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- 6) Organic acid technology (OAT) coolant contains ethylene glycol, but does not contain silicates or phosphates. The color of this type of coolant is usually orange. Hybrid organic acid technology (HOAT) is similar to the OAT-type antifreeze as it uses organic acid salts (carboxylates) that are not abrasive to water pumps. HOAT coolants can be green, orange, yellow, gold, pink, red, or blue.  
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- 7) The normal mixture is 50% antifreeze and 50% water. The 50/50 mix of antifreeze and water is used to improve heat transfer, which water does better than antifreeze, and freezing protection.  
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