

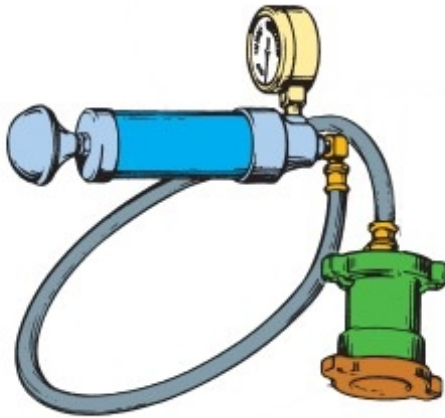
Cooling Systems

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) The weep hole on a water pump is located where? 1) _____
A) Between the bearing and the engine B) Between the impeller and the seal
C) Between the seal and the bearing D) Any of the above, depending on engine
- 2) Which statement is true regarding cooling systems? 2) _____
A) Heat transfer explains how radiators work.
B) Radiators are most effective when the coolant is closer to the temperature of the outside air.
C) Thermostats are rated according to the temperature they are fully open.
D) Removing the thermostat is a good way to solve cooling system problems.
- 3) Permanent antifreeze is mostly _____. 3) _____
A) Kerosene B) Methanol
C) Ethylene glycol D) Glycerin
- 4) The normal operating temperature (coolant temperature) of an engine equipped with a 195 degree F thermostat is _____. 4) _____
A) 175 degree to 195 degree F B) 175 degree to 215 degree F
C) 185 degree to 205 degree F D) 195 degree to 215 degree F
- 5) Technician A says that coolant from the upper radiator hose should be cooler than coolant from the lower radiator hose. Technician B says that many front wheel drive vehicles use a cooling fan mounted to the engine's water pump shaft. Which technician is correct? 5) _____
A) Technician A only B) Technician B only
C) Both Technicians A and B D) Neither Technician A nor B
- 6) The following statements are all correct EXCEPT _____. 6) _____
A) Increasing the surface area of radiator fins will increase its efficiency.
B) Every engine horsepower equals about 42 BTU per minute.
C) Heat transfer from the coolant to the radiator is more efficient than transfer from the radiator to the air.
D) Heat transfer is most efficient from the radiator to the air.
- 7) A cooling system bleeder valve is used to _____. 7) _____
A) Bleed out any brake fluid that may have gotten into the cooling system
B) Control system pressure
C) Release air from the system when refilling
D) Remove excess coolant
- 8) A stuck open thermostat can cause _____. 8) _____
A) Lower fuel economy B) Failure of a State emission test
C) Increased exhaust emissions D) All of the above
- 9) An engine fails to reach normal operating temperature. Which is the most likely fault? 9) _____
A) Partially clogged radiator B) Low coolant level
C) Defective thermostat D) Wrong antifreeze coolant

- 10) All of the following statements are correct EXCEPT _____ 10) _____
- A) The water pump usually connects to the lower radiator hose.
 - B) The thermostat usually connects to the upper radiator hose.
 - C) The radiator inlet is usually at the top of the radiator.
 - D) The radiator outlet is usually at the top of the radiator.

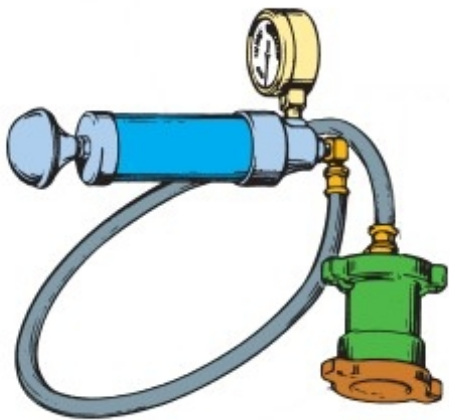
- 11) What test is being performed in this illustration? 11) _____



- A) Radiator cap pressure test
 - B) Filler neck pressure test
 - C) Fuel pressure test
 - D) Radiator pressure test
- 12) Technician A says that a defective thermostat can cause overheating. Technician B says that debris trapped in the radiator fins may cause engine overheating. Which technician is correct? 12) _____
- A) Technician A only
 - B) Technician B only
 - C) Both Technicians A and B
 - D) Neither Technician A nor B

- 13) The coolant bypass circuit _____ 13) _____
- A) Eliminates hot spots during engine warm up
 - B) Prevents excessive coolant pressure when the thermostat is closed
 - C) Both A and B
 - D) Neither A nor B

14) While performing the above test shown below, the pressure is increased to 15 psi and then held. The pressure bleeds down to zero after about 5 seconds. What does this indicate? 14) _____



- A) That the component being tested is OK.
- B) That the fuel pump check valve is leaking
- C) That the radiator is leaking
- D) That the component being tested is leaking.

15) Used coolant should be _____. 15) _____
A) Reused
B) Recycled
C) Disposed of properly
D) Either B or C

16) Low engine operating temperatures will cause all of the following EXCEPT _____. 16) _____
A) Rust formation.
B) Accumulation of water in oil.
C) Cylinder wall wear.
D) All of these are symptoms of low operating temperatures.

17) Which statement is true about thermostats? 17) _____
A) The temperature marked on the thermostat is the temperature at which the thermostat should be fully open
B) Thermostats often cause overheating
C) The temperature marked on the thermostat is a temperature at which the thermostat should start to open.
D) Both A and B

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

18) An engine that does not reach operating temperature always indicates a faulty or missing thermostat. 18) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

19) Technician A says that a bleeder valve is located on many engines to allow air to escape when refilling the cooling system. Technician B says that a hose should be attached to the bleeder valve to allow any escaping coolant to be directed to a suitable container. Which technician is correct? 19) _____
A) Technician A only
B) Technician B only
C) Both Technicians A and B
D) Neither Technician A nor B

20) All of these are functions of antifreeze EXCEPT _____. 20) _____
A) Rust inhibitor B) Cooling system lubricant
C) Corrosion inhibitor D) All of these are functions of antifreeze.

21) Technician A says that hotter than recommended operating temperatures break down engine oil additives. Technician B says that hotter than recommended operating temperatures create varnish and hard deposits. Which technician is correct? 21) _____
A) Technician A only B) Technician B only
C) Both Technicians A and B D) Neither Technician A nor B

22) For every one PSI increase in cooling system pressure, the coolant's boiling point is raised how many degrees F? 22) _____
A) Five B) Three C) One D) Two

23) When testing thermostats, technician A uses a pyrometer and says the engine side of the thermostat should be the hottest spot in the cooling system. Technician B says that incorrect ignition timing on older vehicles may be the cause of engine overheating. Which technician is correct? 23) _____
A) Technician A only B) Technician B only
C) Both Technicians A and B D) Neither Technician A nor B

24) High cylinder wall wear rates occur when coolant temperature remains below _____. 24) _____
A) 212 deg F B) 170 deg F C) 160 deg F D) 150 deg F

25) Which mixture of antifreeze/ water solution below is generally recommended for general automotive use? 25) _____
A) 100/ 0 B) 70/ 30 C) 30/ 70 D) 50/ 50

26) Technician A says that you must completely drain coolant before replacing the thermostat. Technician B says that a defective thermostat is always the cause of an engine not getting hot enough. Which technician is correct? 26) _____
A) Technician A only B) Technician B only
C) Both Technicians A and B D) Neither Technician A nor B

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.

27) A water pump is a positive displacement -type pump. 27) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

28) As the percentage of antifreeze in the coolant increases, _____. 28) _____
A) The heat transfer increases
B) The boiling point decreases
C) The freeze point decreases (up to a point)
D) All of the above occurs

29) Technician A says that the thermostat is most often placed in the engine coolant outlet. Technician B says that the thermostat is most often located on the bottom of the engine. Which technician is correct? 29) _____
A) Technician A only B) Technician B only
C) Both Technicians A and B D) Neither Technician A nor B

30) What is the purpose of the vacuum valve in the radiator cap?

- A) Maintains 15" of vacuum in the cooling system
- B) Keeps dust out of the radiator
- C) Allows coolant to return when the engine cools
- D) Restricts coolant flow in the engine

30) _____