

Unit Standard **30479**

Service an automotive cooling system

Level 3 Credit 3 v1

Student Name:

School:

Date:

Marked By: _____ **Mark** _____ **%**

Feedback: **Excellent work**

Good work

Please attempt all questions

Please resubmit

USEFUL WEBLINKS

Cooling System Principles

<http://youtu.be/V7inC4lOpGs>

<http://youtu.be/x0MVjsHnHQa>

<http://youtu.be/7HYBwkwH7TQ>

<http://youtu.be/QOFoqJdyJpA>

Coolant Mixture

<http://youtu.be/HnyIPFukJe8>

<http://youtu.be/mHTM3dvpD1M>

Heat Transfer

http://youtu.be/Atnjo7dD_bA

Changing Coolant

http://youtu.be/9rdwD9bx_us

http://youtu.be/32ChpsR_dfo

http://youtu.be/TINJDy_bZDE

<http://youtu.be/u5U9uFcWk3I>

Pressure Testing

<http://youtu.be/zxu59b4zS8s>

<http://youtu.be/96aQ5DD5y78>

<http://youtu.be/h82C2CO-M8M>

Water Pump Checks

<http://youtu.be/4tRWhrPKhiE>

Testing a Thermostat

<http://youtu.be/Yh5mGyeN4MY>

Checking Frost Plugs

<http://youtu.be/ouxbxE-BMNY>

Drive Belts Checks

<http://youtu.be/GXkKY30LJY4>

System Bleeding

<http://youtu.be/tldWequ4t4>

REVIEW QUESTIONS ONE

- Q1 Explain the purpose of an engine's cooling system?
- Q2 What is the main difference between direct and indirect cooling systems?
- Q3 Explain each of the following:
- Conduction

 - Convection

 - Radiation
- Q4 List three of the basic laws of physics that apply to heat.
- Q5 Describe how air is used to cool a direct air-cooled engine.

- Q6 Name the two ways in which temperature can be measured.
- Q7 What is the purpose of using shrouds in an engine cooling system?
- Q8 What is the purpose of a Bellows type thermostat?
- Q9 Name the two most common types of direct air cooling fans.
- Q10 Explain why it is necessary to clean cylinder fins?
- Q11 What are the disadvantages of the direct air cooling system?

Q12 Complete the following sentence:

The cylinder _____ and cylinder _____ on air cooled engines
_____ cooling fins in their _____. The cooling fins are
_____ to _____ heat _____ in the engine
during _____, and to be exposed to an _____ from the
_____ to remove heat.

Q13 Explain how the cooling fins of a direct air-cooled engine should be cleaned.

REVIEW QUESTIONS TWO

- Q14 What is the purpose of the radiator in the cooling system?
- Q15 What is the purpose of a pressure relief valve on a radiator cap?
- Q16 Explain how the coolant is transferred to and from the reservoir tank.
- Q17 Explain how a water pump is driven.
- Q18 Where is the water pump usually located?
- Q19 Name the two main parts that enable a thermostatic fan clutch to operate?

Q20 Name four types of fans that may be fitted to an indirect cooled vehicle.

Q21 Explain why the thermostat remains closed during engine warm up.

Q22 Complete the following sentence:

A thermostat is a _____ sensitive _____ that
_____ opens and _____ according to the
_____ temperature.

Q23 Describe how a wax element type thermostat operates.

Q24 Name the three main types of radiator hoses used in the cooling system.

Q25 Explain the purpose of the v-shaped construction of drive belts.

Q26 Where are water jackets normally located in an engine?

Q27 Complete the following sentence.

Vehicles _____ with automatic transmissions are generally fitted
with an _____. The _____ of an oil cooler is to
_____ the _____ of the automatic
transmission.

Q28 List four warning signs of indirect cooling system failure.

Q29 Explain the purpose of a temperature sender unit.

Q30 Explain the functions of the following cooling system components

Frost plugs

Reservoir tank

Water jackets

Water pump

Drive belt

Radiator cap

REVIEW QUESTIONS THREE

Q31 Complete the following sentence:

It is necessary to _____ the manufacturer's _____ when replacing the _____ mixture. The reason for this is that vehicles _____ in _____ climate _____ and the _____ of anti-freeze that is used is _____ on the temperature at which the vehicle operates.

Q32 Explain how you should check the operation of a thermostatic fan clutch.

Q33 What is the purpose of carrying out a cooling system pressure test?

Q34 Name six common leak sources from the cooling system

Q35 What do the manufacturer's recommended pressure ratings indicate for a radiator?

Q36 Complete the following sentence:

Attach the pressure testing equipment to the _____ filler neck.
_____ up the pressure tester to the _____ recommended
pressure _____ .

Q37 List four engine faults that may occur if the thermostat is stuck in the open position.

Q38 Outline the test procedure to follow when testing a thermostat.

Q39 In which direction should a thermostat be placed into a cylinder head?

Q40 Why should corrosion inhibitor be added to coolant?

Q41 Where is the heater temperature control lever normally located on a vehicle?

- Q42 Name four conditions that will require a radiator hose to be replaced.
- Q43 How should a radiator hose be checked for signs of internal crumbling?
- Q44 How should dirt build up be removed from radiator fins?
- Q45 What are the likely results of a loose drive belt?
- Q46 What would a fan blade movement of more than 5 millimetres indicate?
- Q47 Why is it necessary to bleed the cooling system?

Q48 Explain in your own words the procedure to follow when flushing the cooling system.

Q49 What does the specific gravity of coolant indicate?

Q50 Explain how you should test the specific gravity of coolant.

Q51 Complete the following sentence:

With the engine switched off _____ the fan blades
each other (3 o'clock and _____ positions), and try to
the fan blades from side to side. Movement of more than
would _____ a worn water pump _____ .

Q52 Name three effects over cooling can have on an engine.