

JOB ROLE – AUTOMOTIVE SERVICE TECHNICIAN

Sector: Automotive
(Qualification Pack Code : **ASC/Q01402**)



PSS Central Institute of Vocational Education
Shyamla Hills, Bhopal – 462013, Madhya Pradesh, India

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Unit – 2 : Serviceability, Replacement or Repair of Engine Components

Session 4: Testing of cooling system and replacement of defective components

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Session Objectives

1. The student will be able to understand and explain the working of cooling system in the engine.
2. Able to understand and identify common faults in cooling system.
3. Able to identify cause of faults and suggest remedies.
4. Able to identify components of cooling system

Introduction

In I.C. engine during power stroke, the engine temperature reaches between 700–900°C. The 30% heat is released during exhaust stroke. The cooling system removes approximately 30% of heat. (In a vehicle, most of the energy of fuel (approx. 7–10%) is converted into heat, and it is the job of the cooling system to take care of that heat. The primary job of the cooling system is to keep the engine from overheating by transferring this heat to the air). Cooling is necessary because high temperature damages engine components and changes the viscosity of lubricants. The cooling system protects the engine components by circulating coolant through the passages provided in cylinder block, cylinder head.

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The heat is collected by the coolant and the coolant will be sent to radiator. The radiator radiates the heat and cools down the coolant temperature. The air circulated around the engine also disperse the heat and allows the engine to maintain optimum temperature. .

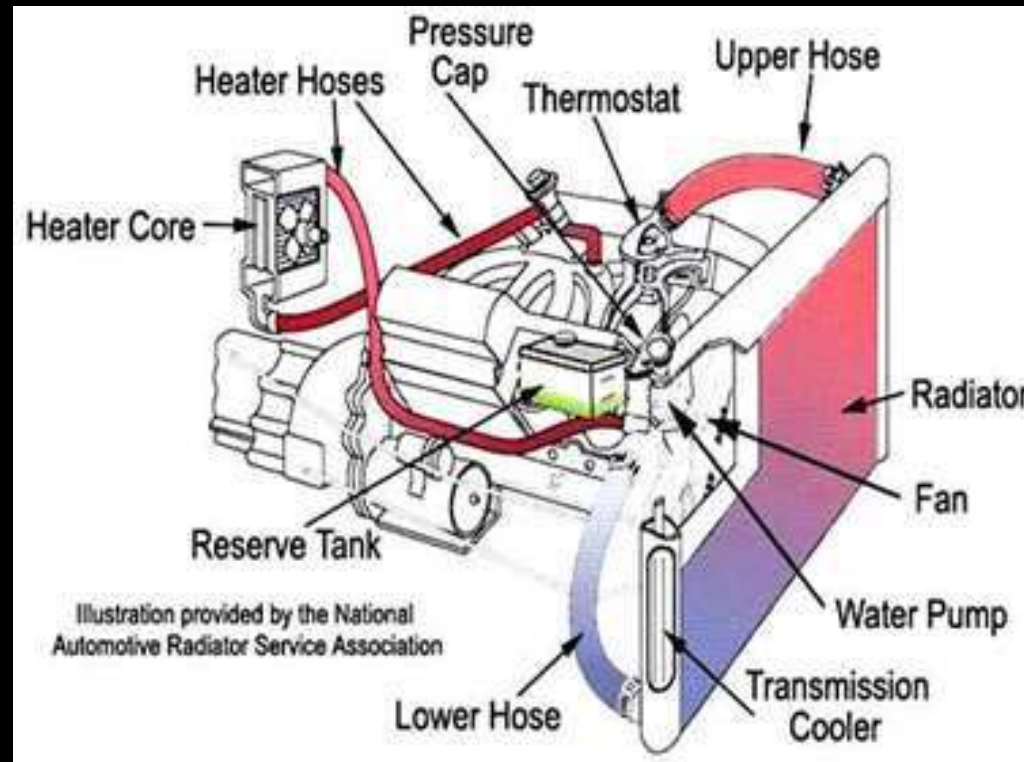


Fig2.12: Automobile Cooling

Common faults in cooling system

- Loose or broken water pump pulley belt
- Low level of coolant
- Faulty thermostat
- Faulty water pump
- Dirty or bend radiator fins
- Broken water pump fan
- Coolant leakage on cooling system
- Defective cooling fan motor
- Plugged radiator
- Faulty radiator cap
- Improper ignition timing

Inspection of Coolant Temperature Sensor

Temperature (°C)	Resistance (ohms)	Voltage
0	6000	4.5
20	2500	3.2
30	1400	3.1
60	800	2.4
80	280	1.2



Causes and remedy for Cooling System

Reasons	Remedy
Loose or broken water pump pulley belt	Adjust / replace
Low level of coolant	Check coolant level and add as necessary
Faulty thermostat	Replace
Faulty water pump	Replace
Dirty or bend radiator fins	Clean or remedy
Broken water pump fan	Replace
Coolant leakage on cooling system	Repair
Defective cooling fan motor	Check and Replace
Plugged radiator and defective rubber hoses	Check and Replace radiator
Faulty radiator cap	Check the upper hole on the radiator cap and also check rubber sealing and replace it if found defective
Faulty thermostatic switch	Replace switch
Improper ignition timing	Adjust

Summary

In this session you have learnt about , In I.C. engine during power stroke, the engine temperature reaches between 700–900oC. The 30% heat is released during exhaust stroke. The cooling system removes approximately 30% of heat.

Common faults in cooling system

- Loose or broken water pump pulley belt
- Low level of coolant
- Faulty thermostat
- Faulty water pump
- Dirty or bend radiator fins

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