

## Lovejoy Junior Lab Off-Site Learning Packet Day 3

Instructor Michael Lovejoy

Date 2019-2020

Program/Class JR AST

Period 1 - 4

### State Indicator/Competency

- 3.5. Lubrication and Cooling Systems: Inspect lubrication and cooling systems operation.
- 3.5.2. Perform lubrication, cooling system, and pressure and sensor tests.

### Instructional Objective(s)

- 1. Student will be able to identify the engine cooling components with 80 percent accuracy.

### Materials

Handout: Activity Sheet #36: Engine Cooling

### Method of Instruction

Individual Work

### Activities

#### **1. Individual Work**

Student will use internet to look up and match the vocabulary words with the definitions on Activity sheet #36.

Student will be able to identify all vocabulary words.

Down flow radiator is designed where coolant flows from top to bottom.

Crossflow radiator is designed where coolant flows from side to side.

Heat exchanger is made of iron or aluminum.

Oil cooler is found in radiator to cool transmission.

Thermostat bypass allows coolant to circulate when the thermostat is closed.

Sending unit is a sensing device for gauges.

Fan clutch is temperature or torque sensitive clutch attached to a belt-driven cooling fan.

Bimetal coil spring thermostatic coil consisting of two types of metal wound together.

Heater core is a small radiator for passenger heat.

Ethylene glycol is automotive coolant

Cylinder block is another name for heat exchanger.

Electrolysis is the result of 2 dissimilar metals in a liquid.

Silicate is a coolant additive that protects aluminum.

180 to 220 is normal operating temperature of an engine.

3 degrees F is amount boiling point of coolant increases under 1 psi of pressure.

Vacuum valve is a small valve in the center of a radiator pressure cap.

Wax is expands to open the thermostat.

Fan pulls the air through the radiator when the engine is warm.

Thermostat is controls engine temperature.

### Assessment

Informal: Students will receive 10 points for completing assignment.

-This assignment will be graded and count for a homework grade.



## Activity Sheet #36

### ENGINE COOLING

Name \_\_\_\_\_ Class \_\_\_\_\_

**Directions:** Match the words on the left to the descriptions on the right. Write the letter for the correct word on the line provided. For the terms that you are not certain of, use the glossary in your textbook.

- |                        |       |  |
|------------------------|-------|--|
| A. Down-flow radiator  | _____ | Temperature or torque sensitive clutch attached to a belt-driven cooling fan |
| B. Cross-flow radiator | _____ | Amount boiling point of coolant increases under 1 PSI of pressure            |
| C. Heat exchanger      | _____ | Thermostatic coil consisting of two types of metal wound together            |
| D. Oil cooler          | _____ | Result of two dissimilar metals in a liquid                                  |
| E. Thermostat bypass   | _____ | Controls engine temperature  |
| F. Sending unit        | _____ | Normal operating temperature of an engine                                    |
| G. Fan clutch          | _____ | Automotive coolant   |
| H. Bimetal coil spring | _____ | Found in the radiator to cool the transmission                               |
| I. Heater core         | _____ | Pulls air through the radiator when the engine is warm                       |
| J. Ethylene glycol     | _____ | Radiator design where coolant flows from top to bottom                       |
| K. Cylinder blocks     | _____ | Small radiator for passenger heat  |
| L. Electrolysis        | _____ | Another name for a heat exchanger  |
| M. Silicate            | _____ | Expands to open the thermostat   |
| N. 180–212°F           | _____ | Sensing device for gauges  |
| O. 3°F                 | _____ | Radiator design where coolant flows from side to side                        |
| P. Vacuum valve        | _____ | Allows coolant to circulate when the thermostat is closed                    |



- Q. Wax \_\_\_\_\_ Made of iron or aluminum
- R. Fan \_\_\_\_\_ Coolant additive that protects aluminum
- S. Thermostat \_\_\_\_\_ Small valve in the center of a radiator pressure cap

