South Central College

AST 2822  Heating & Advanced A/C

Course Outcome Summary

Course Information

Description
This course covers automatic temperature control systems operation, testing and repairs of vacuum and electrical controls, air flow distribution, and heater system controls. (Prerequisites: Admission into the Automotive Service program and AST 2812 or instructor approval)

Total Credits 2
Total Hours 48

Types of Instruction

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Pre/Corequisites
Admission into the Automotive Service program

Institutional Core Competencies

Critical and Creative Thinking - Students will be able to demonstrate purposeful thinking with the goal of using a creative process for developing and building upon ideas and/or the goal of using a critical process for the analyzing and evaluating of ideas.

Course Competencies

1. Exhibit professionalism
   Learning Objectives
   Identify safety procedures
   Identify air conditioning safety

2. Inspect A/C condenser air flow restrictions; determine necessary action
   Learning Objectives
   Inspect, test, cooling fan, fan clutch, fan shroud, and air dams; perform necessary action
   Inspect and test electric cooling fan, fan control system, and circuits; determine necessary action
   Inspect cooling system, level, coolant condition, hoses, and leaks

3. Diagnose temperature control problems in heater and ventilation system; determine necessary action
Learning Objectives
Identify mechanical heater controls
Identify heater electrical controls
Inspect, test, or replace heater control cable, motors, and linkage; perform necessary action
Inspect and test heater control valves, drainback valves; determine necessary action
Identify coolant control valves/hose routings
Determine procedure to remove, inspect, reinstall, and/or replace heater core

4. Diagnose malfunctions in HVAC system electrical components and controls

Learning Objectives
Inspect / test heater blower / resistors / switch’s / relays / wiring / and protection devices
Replace heater blower components
Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and/or control module) to interrupt system operation; determine needed action
Test and diagnose HVAC compressor clutch control system; determine necessary action

5. Inspect, test, and / or replace A/C compressor clutch components and / or assembly; check compressor clutch air gap and adjust as needed

Learning Objectives
Replace one piece compressor seal
Replace multi-piece compressor seals

6. Diagnose heater / air conditioning system operation

Learning Objectives
Inspect and test HVAC control panel assembly; determine necessary action
Remove / inspect A/C system mufflers / hoses / lines / fittings / O-rings / seals and service valves
Remove, inspect and / or replace evaporator; determine required oil quantity
Remove, inspect and / or replace receiver drier or accumulator; determine correct oil and quantity
Remove, inspect and / or replace A/C condenser; determine required oil quantity
Test, remove, and install expansion valve or orifice tube

7. Diagnose malfunctions in HVAC system vacuum and mechanical components and controls

Learning Objectives
Identify air flow
Explain HVAC vacuum system controls
Inspect HVAC ducts, doors, hoses, cabin filters, and outlets; perform necessary action
Test vacuum components

8. Diagnose malfunctions in the electrical controls of HVAC systems; determine necessary action

Learning Objectives
Diagnose HVAC automatic or semi-automatic control systems; determine necessary action
Using scan tool, observe and record related HVAC data and trouble codes

SCC Accessibility Statement
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Additional information and forms can be found at: www.southcentral.edu/disability

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