

Operating Systems and Related Controls–Air/Mechanical

Student/intern information:

Name _____ Date _____ Class _____

Vehicle used for this activity:

Year _____ Make _____ Model _____

Odometer _____ VIN _____

Learning Objective/Task (General Electrical Systems)	2007 NATEF Reference Number	2007 NATEF Priority Level
• Identify causes of HVAC air and mechanical control problems; determine needed action.	6D2-1	P-3
• Inspect and test HVAC system air and mechanical control panel assemblies; determine needed action.	6D2-2	P-3
• Inspect, test, and adjust HVAC system air and mechanical control cables and linkages; determine needed action.	6D2-3	P-3
• Inspect and test HVAC system actuators and hoses; determine needed action.	6D2-4	P-3
• Inspect, test, and adjust HVAC system ducts, doors, and outlets; determine needed action.	6D2-5	P-3

Time off _____

Time on _____

Total time _____

Recommended Resource Materials

- CDX Automotive program
- CDX eTextbook
- Technical service bulletins, shop manuals, and any other information applicable to the specific vehicle or components
- Class notes

Materials Required

- Vehicles or simulators with HVAC faults in operating systems and controls
- Vehicle manufacturer's workshop manual including HVAC information
- Thermometer, DVOM, PC-based software, and/or data scan tools
- Specialized HVAC tools
- Automotive hand tools
- HVAC spare parts
- Manufacturer-specific tools depending on the concern
- Vehicle lifting equipment if applicable

Some Safety Issues to Consider

- Activities will require you to work with the HVAC system. It will contain refrigerant under pressure. Show caution around high pressure refrigerant hoses.
- You may be required to handle refrigerant. Use extreme caution: refrigerant is pressurized and very cold. Always wear eye protection and appropriate clothing when working with refrigerant. Never inhale refrigerant.
- Do not release refrigerant to the atmosphere; always use a recycling system to reclaim refrigerant.
- Activities may require test driving the vehicle on the school grounds or on a hoist, both of which carry severe risks. Attempt this task only with full permission from your supervisor/instructor and follow all the guidelines exactly.

- Comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with federal, state, and local regulations.
- Always wear the correct protective eyewear and clothing and use the appropriate safety equipment, as well as fender covers, seat protectors, and floor mat protectors.
- Make sure you understand and observe all legislative and personal safety procedures when carrying out practical assignments. If you are unsure of what these are, ask your supervisor/instructor.

Performance Standard

0–No exposure: No information or practice provided during the program; complete training required

1–Exposure only: General information provided with no practice time; close supervision needed; additional training required

2–Limited practice: Has practiced job during training program; additional training required to develop skill

3–Moderately skilled: Has performed job independently during training program; limited additional training may be required

4–Skilled: Can perform job independently with no additional training

▶ TASK Identify causes of HVAC air and mechanical control problems; determine needed action.

6D2-1

1. Research how to identify causes of HVAC air and mechanical control problems and list findings below:

2. Ask your supervisor/instructor for a vehicle or simulator to check.

3. Using the appropriate service information, identify causes of HVAC air and mechanical control problems in the vehicle or simulator.

4. List the customer concern:

5. Write a short description of the purpose and operation of the suspected component(s):

6. Determine and list any necessary action(s):

Time off _____

Time on _____

Total time _____

7. Return the vehicle to beginning condition and return any tools that you may have used to their proper locations.
8. Discuss the findings with the instructor.

Performance Rating

2007 NATEF Reference Number: 6D2-1

0	1	2	3	4
Supervisor/instructor signature _____				Date _____

▶ TASK Inspect and test HVAC system air and mechanical control panel assemblies; determine needed action. **6D2-2**

1. Research how to inspect and test HVAC system air and mechanical control panel assemblies in an appropriate service information for the vehicle you are working on and list the procedure below:

2. Check your documented procedures with your supervisor/instructor.

Supervisor/instructor's initials: _____

3. Ask your supervisor/instructor for a vehicle or simulator to check.

4. Using the appropriate service information, inspect and test HVAC system air and mechanical control panel assemblies.

5. List the results of conducting your inspection and tests:

6. Determine and list any necessary action(s):

7. Return the vehicle to beginning condition and return any tools that you may have used to their proper locations.

Time off _____

Time on _____

Total time _____

8. Discuss the findings with the instructor.

Performance Rating

2007 NATEF Reference Number: 6D2-2

0

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2

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Supervisor/instructor signature _____ Date _____

TASK Inspect, test, and adjust HVAC system air and mechanical control cables and linkages; determine needed action.

6D2-3

Time off _____

Time on _____

Total time _____

1. Research how to inspect, test and adjust HVAC system air and mechanical control cables and linkages in an appropriate service information for the vehicle you are working on and list the procedure below:

2. Check your documented procedures with your supervisor/instructor.
Supervisor/instructor's initials: _____

3. Ask your supervisor/instructor for a vehicle or simulator to check.

4. Using the appropriate service information, inspect, test, and adjust HVAC system air and mechanical control cables and linkages.

5. Operate all the controls for the HVAC system.

6. List the results of conducting your inspection, tests, and adjustments. Are all the system air and mechanical control cables and linkages operating in accordance with the manufacturer's specification?

7. Determine and list any necessary action(s):

8. Return the vehicle to beginning condition and return any tools that you may have used to their proper locations.

9. Discuss the findings with the instructor.

Performance Rating

2007 NATEF Reference Number: 6D2-3

0

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Supervisor/instructor signature _____ Date _____

▶ TASK Inspect and test HVAC system actuators and hoses; determine needed action.

6D2-4

Time off _____

Time on _____

Total time _____

1. Research how to inspect and test HVAC system actuators and hoses in an appropriate service information for the vehicle you are working on and list the procedure below:

2. Check your documented procedures with your supervisor/instructor.
Supervisor/instructor's initials: _____

3. Ask your supervisor/instructor for a vehicle or simulator to check.

4. Using the appropriate service information, inspect and test HVAC system actuators and hoses.

5. Operate the HVAC system.

6. List the results of conducting your inspection and test of HVAC system actuators and hoses. Are all the system actuators and hoses operating in accordance with the manufacturer's specification?

7. Determine and list any necessary action(s):

8. Return the vehicle to beginning condition and return any tools that you may have used to their proper locations.

9. Discuss the findings with the instructor.

Performance Rating

2007 NATEF Reference Number: 6D2-4

0

1

2

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4

Supervisor/instructor signature _____ Date _____

▶ TASK Inspect, test, and adjust HVAC system ducts, doors, and outlets; determine needed action.

6D2-5

Time off _____

Time on _____

Total time _____

1. Research how to inspect, test, and adjust HVAC system ducts, doors, and outlets in an appropriate service information for the vehicle you are working on and list the procedure below:

a. How to inspect test, and adjust HVAC system ducts:

b. How to inspect, test, and adjust HVAC system doors:

c. How to inspect, test, and adjust HVAC system outlets:

2. Check your documented procedures with your supervisor/instructor.

Supervisor/instructor's initials: _____

3. Ask your supervisor/instructor for a vehicle or simulator to check.

4. Using the appropriate service information, inspect test, and adjust HVAC system ducts, doors, and outlets.

5. List the results of conducting your inspection, test, and adjustment of HVAC system ducts, doors, and outlets. Are all the system actuators and hoses operating in accordance with the manufacturer's specification?

6. Determine and list any necessary action(s):

7. Return the vehicle to beginning condition and return any tools that you may have used to their proper locations.

8. Discuss the findings with the instructor.

Performance Rating

2007 NATEF Reference Number: 6D2-5

0

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Supervisor/instructor signature _____ Date _____