

HEATING AND AIR CONDITIONING

For every task in Heating and Air Conditioning, the following safety requirement must be strictly enforced:

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 local, state, and federal safety and environmental regulations.

VII. HEATING AND AIR CONDITIONING

A. A/C System Diagnosis and Repair

1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. P-1
2. Identify and interpret heating and air conditioning concern; determine necessary action. P-1
3. Research applicable vehicle and service information, such as heating and air conditioning system operation, vehicle service history, service precautions, and technical service bulletins. P-1
4. Locate and interpret vehicle and major component identification numbers. P-1
5. Performance test A/C system; identify A/C system malfunctions. P-1
6. Identify abnormal operating noises in the A/C system; determine necessary action. P-2
7. Identify refrigerant type; select and connect proper gauge set; record temperature and pressure readings. P-1
8. Leak test A/C system; determine necessary action. P-1
9. Inspect the condition of refrigerant oil removed from the system; determine necessary action. P-2
10. Determine recommended oil and oil capacity for system application. P-1
11. Using scan tool, observe and record related HVAC data and trouble codes. P-1

VII. HEATING AND AIR CONDITIONING

B. Refrigeration System Component Diagnosis and Repair

1. Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and PCM) to interrupt system operation; determine necessary action. P-2
2. Inspect and replace A/C compressor drive belts, pulleys, and tensioners; determine necessary action. P-1
3. Inspect, test, and/or replace A/C compressor clutch components and/or assembly; check compressor clutch air gap and adjust as needed.. P-2
4. Remove, inspect, and reinstall A/C compressor and mountings; determine required oil quantity. P-1
5. Identify hybrid vehicle A/C system electrical circuits, service and safety precautions. P-3
6. Determine the need for an additional A/C system filter; perform necessary action. P-3
7. Remove and inspect A/C system mufflers, hoses, lines, fittings, O-rings, seals, and service valves; perform necessary action. P-2
8. Inspect A/C condenser for airflow restrictions; perform necessary action. P-1
9. Remove, inspect, and reinstall receiver/drier or accumulator/drier; determine required oil quantity. P-1
10. Remove, inspect, and install expansion valve or orifice (expansion) tube. P-1
11. Inspect evaporator housing water drain; perform necessary action. P-2
12. Remove, inspect, and reinstall evaporator; determine required oil quantity. P-3
13. Remove, inspect, and reinstall condenser; determine required oil quantity. P-3

VII. HEATING AND AIR CONDITIONING

C. Heating, Ventilation, and Engine Cooling Systems Diagnosis and Repair

1. Diagnose temperature control problems in the heater/ventilation system; determine necessary action. P-2

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| 2. | Perform cooling system pressure tests; check coolant condition, inspect and test radiator, cap (pressure/vacuum), coolant recovery tank, and hoses; perform necessary action. | P-1 |
| 3. | Inspect engine cooling and heater system hoses and belts; perform necessary action. | P-1 |
| 4. | Inspect, test, and replace thermostat and gasket/seal. | P-1 |
| 5. | Determine coolant condition and coolant type for vehicle application; drain and recover coolant. | P-1 |
| 6. | Flush system; refill system with recommended coolant; bleed system. | P-2 |
| 7. | Inspect and test cooling fan, fan clutch, fan shroud, and air dams; perform necessary action. | P-1 |
| 8. | Inspect and test electric cooling fan, fan control system and circuits; determine necessary action. | P-1 |
| 9. | Inspect and test heater control valve(s); perform necessary action. | P-2 |
| 10. | Remove, inspect, and reinstall heater core. | P-3 |

VII. HEATING AND AIR CONDITIONING

D. Operating Systems and Related Controls Diagnosis and Repair

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| 1. | Diagnose malfunctions in the electrical controls of heating, ventilation, and A/C (HVAC) systems; determine necessary action. | P-2 |
| 2. | Inspect and test A/C-heater blower, motors, resistors, switches, relays, wiring, and protection devices; perform necessary action. | P-1 |
| 3. | Test and diagnose A/C compressor clutch control systems; determine necessary action. | P-1 |
| 4. | Diagnose malfunctions in the vacuum, mechanical, and electrical components and controls of the heating, ventilation, and A/C (HVAC) system; determine necessary action. | P-2 |
| 5. | Inspect and test A/C-heater control panel assembly; determine necessary action. | P-3 |

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| 6. | Inspect and test A/C-heater control cables, motors, and linkages; perform necessary action. | P-3 |
| 7. | Inspect A/C-heater ducts, doors, hoses, cabin filters and outlets; perform necessary action. | P-2 |
| 8. | Identify the source of A/C system odors. | P-2 |
| 9. | Check operation of automatic or semi-automatic heating, ventilation, and air-conditioning (HVAC) control systems; determine necessary action. | P-2 |

VII. HEATING AND AIR CONDITIONING

E. Refrigerant Recovery, Recycling, and Handling

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| 1. | Perform correct use and maintenance of refrigerant handling equipment according to equipment manufacturer's standards. | P-1 |
| 2. | Identify and recover A/C system refrigerant. | P-1 |
| 3. | Recycle, label, and store refrigerant. | P-1 |
| 4. | Evacuate and charge A/C system; add refrigerant oil as required. | P-1 |

ENGINE PERFORMANCE

For every task in Engine Performance the following safety requirement must be strictly enforced:

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VIII. ENGINE PERFORMANCE

A. General Engine Diagnosis

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| 1. | Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. | P-1 |
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