

2008 NATEF AUTOMOBILE STANDARDS CORRELATIONS

HEATING & AIR CONDITIONING

For every task in Heating & 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.

A. A/C System Diagnosis and Repair	Student Edition	Technical Applications
1. Complete work order to include customer information, vehicle identifying information, customer concern, related service history cause, and correction. (P-1)	HB-48	Job Sheet HA-1
2. Identify and interpret heating and air conditioning concern; determine necessary action. (P-1)	HA-317 through HA-333, HA-386 through HA-397	Job Sheet HA-11
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)	HB-48, HA-272 through HA-291	Job Sheet HB-4
4. Locate and interpret vehicle and major component identification numbers. (P-1)	HB-48	Job Sheets HB-1, HB-2
5. Performance test A/C system; identify A/C system malfunctions. (P-1)	HA-327 through HA-333	Job Sheet HA-11
6. Identify abnormal operating noises in the A/C system; determine necessary action. (P-2)	HA-322 through HA-324	Diagnostic Sheet HA-11 Job Sheets HA-11, HA-21
7. Identify refrigerant type; select and connect proper gauge set; record temperature and pressure readings. (P-1)	HA-325, HA-327 through HA-333, HA-339	Job Sheet HA-11
8. Leak test A/C system; determine necessary action. (P-1)	HA-326 through HA-327	Job Sheet HA-22

A. A/C System Diagnosis and Repair <i>(continued)</i>	Student Edition	Technical Applications
9. Inspect the condition of refrigerant oil removed from the system; determine necessary action. (P-2)	HA-317 through HA-322	Diagnostic Sheet HA-5 Job Sheet HA-12
10. Determine recommended oil and oil capacity for system application. (P-1)	HA-286, HA-346 through HA-347	Job Sheet HA-30
11. Using scan tool, observe and record related HVAC data and trouble codes. (P-1)	HA-388	Job Sheet HA-35
B. Refrigeration System Component Diagnosis and Repair	Student Edition	Technical Applications
1. Diagnose A/C system conditions that cause the protection devices (pressure, thermal, and PCM) to interrupt system operation; determine necessary action. (P-2)	HA-317 through HA-333	Diagnostic Sheet HA-6 Job Sheet HA-18
2. Inspect and replace A/C compressor drive belts, pulleys, and tensioners; determine necessary action. (P-1)	HA-319 through 321, HA-370 through 373	Job Sheet HA-17
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)	HA-321, HA-368 through HA-370	Job Sheet HA-19
4. Remove, inspect, and reinstall A/C compressor and mountings; determine required oil quantity; determine necessary action. (P-1)	HA-368 through HA-370, HA-372	Job Sheet HA-33
5. Identify hybrid vehicle A/C system electrical circuits, service and safety precautions. (P-3)	HA-333, HA-379	
6. Determine the need for an additional A/C system filter; perform necessary action. (P-3)	HA-327 through HA-330	
7. Remove and inspect A/C system mufflers, hoses, lines, fittings, O-rings, seals, and service valves; perform necessary action. (P-2)	HA-322, HA-355, HA-359	Job Sheet HA-20

B. Refrigeration System Component Diagnosis and Repair (continued)	Student Edition	Technical Applications
8. Inspect A/C condenser for airflow restrictions; perform necessary action. (P-1)	HA-318 through HA-322, HA-360 through HA-361	Job Sheets HA-13, HA-14
9. Remove, inspect, and install receiver/drier or accumulator/drier; determine required oil quantity. (P-1)	HA-365 through HA-366	Job Sheet HA-32
10. Remove, inspect, and install expansion valve or orifice (expansion) tube. (P-1)	HA-282, HA-362 through HA-363	Job Sheet HA-31
11. Inspect evaporator housing water drain; perform necessary action. (P-2)	HA-361 through HA-362	Diagnostic Sheet HA-12
12. Remove, inspect, and reinstall evaporator; determine required oil quantity. (P-3)	HA-361 through HA-362	
13. Remove, inspect, and reinstall condenser; determine required oil quantity. (P-3)	HA-360	Job Sheet HA-13
C. Heating, Ventilation, and Engine Cooling Systems Diagnosis and Repair	Student Edition	Technical Applications
1. Diagnose temperature control problems in the heater/ventilation system; determine necessary action. (P-2)	HA-384 through HA-396	Diagnostic Sheet HA-14 Job Sheet HA-4
2. Perform cooling system pressure tests; (check coolant condition, inspect and test radiator, cap (pressure/vacuum), coolant recovery tank, and hoses); determine necessary action. (P-1)	HA-301 through HA-302	Job Sheet HA-5
3. Inspect engine cooling and heater system hoses and belts; perform necessary action. (P-1)	HA-305 through HA-307	Diagnostic Sheet HA-1 Job Sheet HA-6
4. Inspect, test, and replace thermostat and gasket/seal. (P-1)	HA-308 through HA-309	Job Sheet HA-7
5. Determine coolant condition and coolant type for vehicle application; drain and recover coolant. (P-1)	HA-295 through HA-297	Job Sheet HA-3

C. Heating, Ventilation, and Engine Cooling Systems Diagnosis and Repair <i>(continued)</i>	Student Edition	Technical Applications
6. Flush system; refill system with recommended coolant; bleed system. (P-2)	HA-303 through HA-304	Job Sheet HA-3
7. Inspect and test cooling fan, fan clutch, fan shroud, and air dams; perform necessary action. (P-1)	HA-311 through HA-313	Diagnostic Sheet HA-3 Job Sheet HA-9
8. Inspect and test electric cooling fan control system and circuits; determine necessary action. (P-1)	HA-311 through HA-313	Diagnostic Sheet HA-4 Job Sheet HA-10
9. Inspect and test heater control valve(s); perform necessary action. (P-2)	HA-310	Diagnostic Sheet HA-2 Job Sheet HA-8
10. Remove, inspect, and reinstall heater core. (P-3)	HA-310, HA-361 through HA-362	
D. Operating Systems and Related Controls Diagnosis and Repair	Student Edition	Technical Applications
1. Diagnose malfunctions in the electrical controls of heating, ventilation, and A/C (HVAC) systems; determine necessary action. (P-2)	HA-384 through HA-391	Job Sheet HA-34
2. Inspect and test A/C-heater blower, motors, resistors, switches, relays, wiring, and protection devices; perform necessary action. (P-1)	HA-392 through HA-393	Job Sheet HA-36
3. Test and diagnose A/C compressor clutch control systems; determine necessary action. (P-1)	HA-321, HA-367 through HA-373	Diagnostic Sheet HA-10 Job Sheet HA-2
4. Diagnose malfunctions in the vacuum and mechanical, and electrical components and controls of the heating, ventilation, and A/C (HVAC) system; determine necessary action. (P-2)	HA-318 through HA-324, HA-386 through HA-397	Job Sheets HA-15, HA-16

D. Operating Systems and Related Controls Diagnosis and Repair (continued)	Student Edition	Technical Applications
5. Inspect and test A/C-heater control panel assembly; determine necessary action. (P-3)	HA-318 through HA-324, HA-386 through HA-397	Diagnostic Sheet HA-7
6. Inspect and test A/C-heater control cables, motors, and linkages; perform necessary action. (P-3)	HA-318 through HA-324, HA-386 through HA-397	Diagnostic Sheet HA-8
7. Inspect and test A/C-heater ducts, doors, hoses, cabin filters and outlets; perform necessary action. (P-2)	HA-318 through HA-322, HA-386 through HA-397	Diagnostic Sheet HA-9
8. Identify the source of A/C system odors. (P-2)	HA-283, HA-324, HA-397	
9. Check operation of automatic or semi-automatic heating, ventilation, and air-conditioning (HVAC) control systems; determine necessary action. (P-2)	HA-384 through HA-391	Diagnostic Sheet HA-13
E. Refrigerant Recovery, Recycling, and Handling	Student Edition	Technical Applications
1. Perform correct use and maintenance of refrigerant handling equipment according to equipment manufacturer's standards. (P-1)	HA-337 through HA-351	Job Sheet HA-24
2. Identify and recover A/C system refrigerant. (P-1)	HA-337 through HA-342	Job Sheet HA-23
3. Recycle, label, and store refrigerant. (P-1)	HA-342 through HA-343	Job Sheets HA-26, HA-27
4. Evacuate and charge A/C system; add refrigerant oil as required. (P-1)	HA-345 through HA-348	Job Sheets HA-26, HA-28, HA-29, HA-30