



NATEF Task List - Medium/Heavy Duty Truck Heating and Air Conditioning

Name: _____

Date: _____

For every task in *Electrical/Electronic* the following safety requirements must be strictly enforced: Comply with personal and environmental safety practices associated with clothing and the use of gloves; respiratory protection; 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.

The first task in Heating, Ventilation, & Air Conditioning is to listen to and verify the operator's concern, review past maintenance and repair documents, and determine necessary action.

All practices and procedures must be performed according to current mandates, standards, and regulations.

VI. HEATING, VENTILATION, & AIR CONDITIONING		Week											
		1	2	3	4	5	6	7	8	9	10	11	12
A. HVAC Systems													
P-1	1. Verify the need for service or repair of HVAC systems based on unusual operating noises; determine needed action.												
P-1	2. Verify the need for service or repair of HVAC systems based on unusual visual, smell, and touch conditions; determine needed action.												
P-1	3. Identify system type and components (cycling clutch orifice tube – CCOT, expansion valve) and conduct performance test(s) on HVAC systems; determine needed action.												
P-3	4. Retrieve diagnostic codes; determine needed action.												
B. A/C System and Components													
1. A/C System - General													
P-1	1. Identify causes of temperature control problems in the A/C system; determine needed action.												
P-1	2. Identify refrigerant and lubricant types; check for contamination; determine needed action.												
P-1	3. Identify A/C system problems indicated by pressure gauge and temperature readings; determine needed action.												



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B. A/C System and Components 1. A/C System - General (continued)		Week											
		1	2	3	4	5	6	7	8	9	10	11	12
P-1	4. Identify A/C system problems indicated by visual, audible, smell, and touch procedures; determine needed action.												
P-1	5. Perform A/C system leak test; determine needed action.												
P-1	6. Recover, evacuate, and recharge A/C system using appropriate equipment.												
P-3	7. Identify contamination in the A/C system components; determine needed action.												
P-2	8. Interface with vehicle's on-board computer; perform diagnostic procedures using recommended electronic service tool(s) (including PC based software and/or data scan tools); determine needed action.												

B. A/C System and Components 2. Compressor and Clutch		Week											
		1	2	3	4	5	6	7	8	9	10	11	12
P-1	1. Identify A/C system problems that cause protection devices (pressure, thermal, and electronic) to interrupt system operation; determine needed action.												
P-2	2. Inspect, test, and replace A/C system pressure, thermal, and electronic protection devices.												



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B. A/C System and Components 2. Compressor and Clutch (continued)		Week											
		1	2	3	4	5	6	7	8	9	10	11	12
P-1	3. Inspect and replace A/C compressor drive belts, pulleys, and tensioners; adjust belt tension and check alignment.												
P-2	4. Inspect, test, adjust, service, or replace A/C compressor clutch components or assembly.												
P-2	5. Inspect and correct A/C compressor lubricant level (if applicable).												
P-1	6. Inspect, test, or replace A/C compressor.												
P-2	7. Inspect, repair, or replace A/C compressor mountings and hardware.												

B. A/C System and Components 3. Evaporator, Condenser, and Related Components		Week											
		1	2	3	4	5	6	7	8	9	10	11	12
P-1	1. Correct system lubricant level when replacing the evaporator, condenser, receiver/drier or accumulator/drier, and hoses.												
P-1	2. Inspect A/C system hoses, lines, filters, fittings, and seals; determine needed action.												
P-1	3. Inspect and test A/C system condenser. Check for proper airflow and mountings; determine needed action.												



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B. A/C System and Components 3. Evaporator, Condenser, and Related Components (continued)		Week											
		1	2	3	4	5	6	7	8	9	10	11	12
P-1	4. Inspect and replace receiver/drier or accumulator/drier.												
P-3	5. Inspect and test cab/sleeper refrigerant solenoid, expansion valve(s); check placement of thermal bulb (capillary tube); determine needed action.												
P-1	6. Remove and replace orifice tube.												
P-3	7. Inspect and test cab/sleeper evaporator core; determine needed action.												
P-1	8. Inspect, clean, or repair evaporator housing and water drain; inspect and service/replace evaporator air filter.												
P-1	9. Identify and inspect A/C system service ports (gauge connections); determine needed action.												
P-2	10. Identify the cause of system failures resulting in refrigerant loss from the A/C system high pressure relief device; determine needed action.												

C. Heating and Engine Cooling Systems		Week											
		1	2	3	4	5	6	7	8	9	10	11	12
P-1	1. Identify causes of outlet air temperature control problems in the HVAC system; determine needed action.												



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C. Heating and Engine Cooling Systems (continued)		Week												
		1	2	3	4	5	6	7	8	9	10	11	12	
P-2	2. Identify window fogging problems; determine needed action.													
P-1	3. Perform engine cooling system tests for leaks, protection level, contamination, coolant level, coolant type, temperature, and conditioner concentration; determine needed action.													
P-1	4. Inspect engine cooling and heating system hoses, lines, and clamps; determine needed action.													
P-1	5. Inspect and test radiator, pressure cap, and coolant recovery system (surge tank); determine needed action.													
P-1	6. Inspect water pump; determine needed action.													
P-2	7. Inspect and test thermostats, by-passes, housings, and seals; determine needed repairs.													
P-1	8. Recover, flush, and refill with recommended coolant/additive package; bleed cooling system.													
P-2	9. Inspect thermostatic cooling fan system (hydraulic, pneumatic, and electronic) and fan shroud; replace as needed.													
P-2	10. Inspect and test heating system coolant control valve(s) and manual shut-off valves; determine needed action.													



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C. Heating and Engine Cooling Systems (continued)		Week												
		1	2	3	4	5	6	7	8	9	10	11	12	
P-3	11. Inspect and flush heater core; determine needed action.													

D. Operating Systems and Related Controls 1. Electrical		Week												
		1	2	3	4	5	6	7	8	9	10	11	12	
P-1	1. Identify causes of HVAC electrical control system problems; determine needed action.													

P-2	2. Inspect and test HVAC blower motors, resistors, switches, relays, modules, wiring, and protection devices; determine needed action.													
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P-2	3. Inspect and test A/C compressor clutch relays, modules, wiring, sensors, switches, diodes, and protection devices; determine needed action.													
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P-2	4. Inspect and test A/C related electronic engine control systems; determine needed action.													
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P-2	5. Inspect and test engine cooling/condenser fan motors, relays, modules, switches, sensors, wiring, and protection devices; determine needed action.													
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P-2	6. Inspect and test electric actuator motors, relays/modules, switches, sensors, wiring, and protection devices; determine needed action.													
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D. Operating Systems and Related Controls 1. Electrical (continued)		Week											
		1	2	3	4	5	6	7	8	9	10	11	12
P-2	7. Inspect and test HVAC system electrical/electronic control panel assemblies; determine needed action.												
P-2	8. Interface with vehicle's on-board computer; perform diagnostic procedures using recommended electronic service tool(s) (including PC based software and/or data scan tools); determine needed action.												

D. Operating Systems and Related Controls 2. Air/ Mechanical		Week											
		1	2	3	4	5	6	7	8	9	10	11	12
P-3	1. Identify causes of HVAC air and mechanical control problems; determine needed action.												
P-3	2. Inspect and test HVAC system air and mechanical control panel assemblies; determine needed action.												
P-3	3. Inspect, test, and adjust HVAC system air and mechanical control cables and linkages; determine needed action.												
P-3	4. Inspect and test HVAC system actuators and hoses; determine needed action.												
P-3	5. Inspect, test, and adjust HVAC system ducts, doors, and outlets; determine needed action.												



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NOTE: Tasks 1 through 5 should be accomplished in accordance with appropriate EPA regulations and SAE "J" standards.

E. Refrigerant Recovery, Recycling, and Handling		Week												
		1	2	3	4	5	6	7	8	9	10	11	12	
P-1	1. Maintain and verify correct operation of certified equipment.													
P-1	2. Identify and recover A/C system refrigerant.													
P-1	3. Recycle or properly dispose of refrigerant.													
P-1	4. Handle, label, and store refrigerant.													
P-1	5. Test recycled refrigerant for non-condensable gases.													