NATEF Task List - Medium/Heavy Duty Truck Electrical/Electronic

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 Electrical/Electronic Systems is to listen to and verify the operator's concern, review past maintenance and repair documents, and determine necessary action.

V. ELECTRICAL/ELECTRONIC SYSTEMS **A. General Electrical Systems**		**Week**											
		1	2	3	4	5	6	7	8	9	10	11	12
P-1	1. Read and interpret electrical/electronic circuits using wiring diagrams.												
P-1	2. Check continuity in electrical/electronic circuits using appropriate test equipment.												
P-1	3. Check applied voltages, circuit voltages, and voltage drops in electrical/electronic circuits using appropriate test equipment.												
P-1	4. Check current flow in electrical/electronic circuits and components using appropriate test equipment.												
P-1	5. Check resistance in electrical/electronic circuits and components using appropriate test equipment.												
P-1	6. Locate shorts, grounds, and opens in electrical/electronic circuits.												
P-1	7. Identify parasitic (key-off) battery drain problems; perform tests; determine needed action.												
P-1	8. Inspect and test fusible links, circuit breakers, relays, solenoids, and fuses; replace as needed.												
P-3	9. Inspect and test spike suppression devices; replace as needed.												

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V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	A. General Electrical Systems (continued)	1	2	3	4	5	6	7	8	9	10	11	12
P-3	10. Check frequency and pulse width signal in electrical/electronic circuits using appropriate test equipment.												

V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	B. Battery	1	2	3	4	5	6	7	8	9	10	11	12
P-1	1. Identify battery type; perform appropriate battery load test; determine needed action.												
P-1	2. Determine battery state of charge using an open circuit voltage test.												
P-1	3. Inspect, clean, and service battery; replace as needed.												
P-1	4. Inspect and clean battery boxes, mounts, and hold downs; repair or replace as needed.												
P-1	5. Charge battery using appropriate method for battery type.												
P-1	6. Inspect, test, and clean battery cables and connectors; repair or replace as needed.												
P-1	7. Jump start a vehicle using jumper cables and a booster battery or appropriate auxiliary power supply using proper safety procedures.												
P-2	8. Perform battery capacitance test; determine needed action.												
P-2	9. Identify and test low voltage disconnect (LVD) systems; determine needed repair.												

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V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	C. Starting System	1	2	3	4	5	6	7	8	9	10	11	12
P-1	1. Perform starter circuit cranking voltage and voltage drop tests; determine needed action.												
P-2	2. Inspect and test components (key switch, push button and/or magnetic switch) and wires and harnesses in the starter control circuit; replace as needed.												
P-1	3. Inspect and test, starter relays and solenoids/switches; replace as needed.												
P-1	4. Remove and replace starter; inspect flywheel ring gear or flex plate.												

V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	D. Charging System Diagnosis and Repair	1	2	3	4	5	6	7	8	9	10	11	12
P-1	1. Test instrument panel mounted volt meters and/or indicator lamps; determine needed action.												
P-1	2. Identify causes of a no charge, low charge, or overcharge problems; determine needed action.												
P-1	3. Inspect and replace alternator drive belts, pulleys, fans, tensioners, and mounting brackets; adjust drive belts and check alignment.												
P-1	4. Perform charging system voltage and amperage output tests; perform AC ripple test; determine needed action.												
P-1	5. Perform charging circuit voltage drop tests; determine needed action.												

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V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	D. Charging System Diagnosis and Repair (continued)	1	2	3	4	5	6	7	8	9	10	11	12
P-1	6. Remove and replace alternator.												
P-1	7. Inspect, repair, or replace cables, wires, and connectors in the charging circuit.												

V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	E. Lighting Systems	1	2	3	4	5	6	7	8	9	10	11	12
P-1	1. 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.												
P-1	2. Identify causes of brighter than normal, intermittent, dim, or no headlight and daytime running light (DRL) operation.												
P-1	3. Test, aim, and replace headlights.												
P-1	4. Test headlight and dimmer circuit switches, relays, wires, terminals, connectors, sockets, and control components/modules; repair or replace as needed.												
P-1	5. Inspect and test switches, bulbs/LEDs, sockets, connectors, terminals, relays, wires, and control components/modules of parking, clearance, and taillight circuits; repair or replace as needed.												
P-2	6. Inspect and test instrument panel light circuit switches, relays, bulbs/LEDs, sockets, connectors, terminals, wires, and printed circuits/control modules; repair or replace as needed.												

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V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	E. Lighting Systems (continued)	1	2	3	4	5	6	7	8	9	10	11	12
P-2	7. Inspect and test interior cab light circuit switches, bulbs/LEDs, sockets, low voltage disconnect (LVD), connectors, terminals, wires, and control components/modules; repair or replace as needed.												
P-1	8. Inspect and test tractor-to-trailer multi-wire connector(s); repair or replace as needed.												
P-1	9. Inspect, test, and adjust stoplight circuit switches, bulbs/LEDs, sockets, connectors, terminals, wires and control components/modules; repair or replace as needed.												
P-1	10. Inspect and test turn signal and hazard circuit flasher(s), switches, relays, bulbs/LEDs, sockets, connectors, terminals, wires and control components/modules; repair or replace as needed.												
P-1	11. Inspect and test reverse lights and warning device circuit switches, bulbs/LEDs, sockets, horns, buzzers, connectors, terminals, wires and control components/modules; repair or replace as needed.												

V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	F. Gauges and Warning Devices	1	2	3	4	5	6	7	8	9	10	11	12
P-1	1. Interface with vehicle's on-board computer; perform diagnostic procedure, verify instrument cluster operations using recommended electronic service tool(s) (including PC based software and/or data scan tools); determine needed action.												
P-2	2. Identify causes of intermittent, high, low, or no gauge readings; determine needed action.												

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V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	F. Gauges and Warning Devices (continued)	1	2	3	4	5	6	7	8	9	10	11	12
P-3	3. Identify causes of data bus-driven gauge malfunctions; determine needed action.												
P-2	4. Inspect and test gauge circuit sensor/sending units, gauges, connectors, terminals, and wires; repair or replace as needed.												
P-1	5. Inspect and test warning devices (lights and audible) circuit sensor/sending units, bulbs/LEDs, sockets, connectors, wires, and control components/modules; repair or replace as needed.												
P-2	6. Inspect, test, replace, and calibrate (if applicable) electronic speedometer, odometer, and tachometer systems.												

V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	G. Related Electrical Systems	1	2	3	4	5	6	7	8	9	10	11	12
P-1	1. 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.												
P-2	2. Identify causes of constant, intermittent, or no horn operation; determine needed action.												
P-2	3. Inspect and test horn circuit relays, horns, switches, connectors, wires, clock springs, and control components/modules; repair or replace as needed.												
P-2	4. Identify causes of constant, intermittent, or no wiper operation; diagnose the cause of wiper speed control and/or park problems; determine needed action.												

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V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	G. Related Electrical Systems (continued)	1	2	3	4	5	6	7	8	9	10	11	12
P-2	5. Inspect and test wiper motor, resistors, park switch, relays, switches, connectors, wires and control components/modules; repair or replace as needed.												
P-2	6. Inspect wiper motor transmission linkage, arms, and blades; adjust or replace as needed.												
P-3	7. Inspect and test windshield washer motor or pump/relay assembly, switches, connectors, terminals, wires, and control components/modules; repair or replace as needed.												
P-3	8. Inspect and test side view mirror motors, heater circuit grids, relays, switches, connectors, terminals, wires and control components/modules; repair or replace as needed.												
P-3	9. Inspect and test heater and A/C electrical components including: A/C clutches, motors, resistors, relays, switches, connectors, terminals, wires, and control components/modules; repair or replace as needed.												
P-3	10. Inspect and test auxiliary power outlet, integral fuse, connectors, terminals, wires, and control components/modules; repair or replace as needed.												
P-3	11. Identify causes of slow, intermittent, or no power window operation; determine needed action.												
P-3	12. Inspect and test motors, switches, relays, connectors, terminals, wires, and control components/modules of power window circuits; repair or replace as needed.												

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V. ELECTRICAL/ELECTRONIC SYSTEMS		**Week**											
	G. Related Electrical Systems (continued)	1	2	3	4	5	6	7	8	9	10	11	12
P-2	13. Inspect and test block heaters; determine needed repairs.												
P-3	14. Inspect and test cruise control electrical components; repair or replace as needed.												
P-3	15. Inspect and test switches, relays, controllers, actuator/solenoids, connectors, terminals, and wires of electric door lock circuits.												
P-3	16. Check operation of keyless and remote lock/unlock devices; determine needed action.												
P-2	17. Inspect and test engine cooling fan electrical control components/modules, wiring; repair or replace as needed.												
P-2	18. Identify causes of data bus communication problems; determine needed action.												