# AER 0691 - Electrical and Electronic Systems I

## 2013 NATEF JOB TASKS COMPLETION REQUIREMENT: P1 - 95%  P2 - 80%  P3 - 50%

**Student Name:** _____

## DETAILED COURSE CONTENT

AUTOMOTIVE ELECTRICAL/ELECTRONIC SYSTEM TECHNICIAN

### DEMONSTRATE PROFICIENCY IN GENERAL ELECTRICAL SYSTEM DIAGNOSIS -

| | The student will be able to: | P1 | P2 | P3 | Level | Date | Textbook Ch CDX Tasksheet |
|---|---|---|---|---|---|---|---|
| VI-A-1 | Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins. | ■ | | | | | 37: C286 |
| VI-A-2 | Demonstrate knowledge electrical/electronic series, parallel, and series-parallel circuits using  principles of electricity (Ohm's Law). | ■ | | | | | 37: C951 |
| VI-A-3 | Demonstrate the proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance. | ■ | | | | | 37: C641 |
| VI-A-4 | Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits. | ■ | | | | | 37: C296 |
| VI-A-5 | Check operation of electrical circuits with a test light. | ■ | | | | | 37: C291 |
| VI-A-6 | Check electrical circuits with fused jumper wires. | ■ | | | | | 37: C295 |
| VI-A-7 | Use wiring diagrams during diagnosis (troubleshooting) of electrical circuit problems. | ■ | | | | | 37: C289, C952 |
| VI-A-8 | Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine necessary action. | ■ | | | | | 38: C817, C954 |
| VI-A-9 | Inspect and test fusible links, circuit breakers, and fuses; determine necessary action | ■ | | | | | 37: C298 |
| VI-A-10 | Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits; perform necessary action. | ■ | | | | | 37: C299 |
| VI-A-11 | Replace electrical connectors and terminal ends. | ■ | | | | | 36: C643 |
| VI-A-12 | Repair wiring harness. | | | ■ | | | 36: C955, C559 |
| VI-A-13 | Perform solder repair of electrical wiring. | ■ | | | | | 36: C301 |
| VI-A_14 | Check Electrical Electronic circuit waveforms: interpret readings and determine needed | ■ | | | | | |

### DEMONSTRATE PROFICIENCY IN  BATTERY DIAGNOSIS AND SERVICE –

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| | The student will be able to: | P1 | P2 | P3 | Level | Date | Textbook Ch CDX Task |
|---|---|---|---|---|---|---|---|
| VI-B-1 | Perform battery state-of-charge test; determine necessary action. | ■ | | | | | 38: C302 |
| VI-B-2 | Confirm proper battery capacity for vehicle application; perform battery capacity test; determine necessary action. | ■ | | | | | 38: C818 |
| VI-B-3 | Maintain or restore electronic memory functions. | ■ | | | | | 38: C304 |
| VI-B-4 | Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs. | ■ | | | | | 38: C644 |
| VI-B-5 | Perform slow/fast battery charge according to manufacturer's recommendations. | ■ | | | | | 38: C819 |
| VI-B-6 | Jump-start vehicle using jumper cables and a booster battery or an auxiliary power supply. | ■ | | | | | 38 C820 |
| VI-B-7 | Identify high voltage circuits of electric or hybrid electric vehicle and related safety precautions. | | | ■ | | | 52: C561 |
| VI-B-8 | Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code after following reconnecting vehicle battery. | ■ | | | | | 38: C645 |
| VI-B-9 | Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures. | | | ■ | | | 52: C874 |

## DEMONSTRATE PROFICIENCY IN STARTING SYSTEM DIAGNOSIS AND REPAIR –

| | The student will be able to: | P1 | P2 | P3 | Level | Date | Textbook Ch CDX Task |
|---|---|---|---|---|---|---|---|
| VI-C-1 | Perform starter current draw tests; determine necessary action. | ■ | | | | | 38: C309 |
| VI-C-2 | Perform starter circuit voltage drop tests; determine necessary action. | ■ | | | | | 38 C310 |
| VI-C-3 | Inspect and test starter relays and solenoids; determine necessary action. | | ■ | | | | 38: C311 |
| VI-C-4 | Remove and install starter in a vehicle. | ■ | | | | | 38: C312 |
| VI-C-5 | Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action. | | ■ | | | | 38: C313 |
| VI-C-6 | Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition. | | ■ | | | | 38: C314 |

| | P1 | P2 | P3 |
|---|---|---|---|
| Tasks Completed | 0 | 0 | 0 |
| Total Tasks | 22 | 3 | 3 |
| % of Total Tasks | 0 | 0 | 0 |

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