# 2017 NATEF Correlation Chart

**MLR-** Maintenance & Light Repair

**AST**- Auto Service Technology (Includes MLR)

**MAST**- Master Auto Service Technology (Includes MLR and AST)

**ELECTRICAL/ELECTRONIC (A6)**

| | Task | Priority | MLR | AST | MAST | Text Page # | Task Page # |
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| | | | | | | | |
| | **A. General: Electrical Systems Diagnosis** | | | | | | |
| **1.** | Research vehicle service information including vehicle service history, service precautions, and technical service bulletins. | P-1 | ✓ | ✓ | ✓ | 2–4 | 4–7 |
| **2.** | Demonstrate knowledge of electrical/electronic series, parallel, and series-parallel circuits using principles of electricity (Ohm's Law). | P-1 | ✓ | ✓ | ✓ | 72–96 | 16–24 |
| **3.** | Demonstrate proper use of a digital multimeter (DMM) when measuring source voltage, voltage drop (including grounds), current flow and resistance | P-1 | ✓ | ✓ | ✓ | 100–116 | 25 |
| **4.** | Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits. | P-1 | ✓ | ✓ | ✓ | 65–68 | 15 |
| **5.** | Demonstrate proper use of a test light on an electrical circuit. | P-1 | (P-2) | ✓ | ✓ | 98–99 | 26 |

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| **6.** | Use fused jumper wires to check operation of electrical circuits. | P-1 | (P-2) | ✓ | ✓ | 98 | 27 |
| **7.** | Use wiring diagrams during the diagnosis (troubleshooting) of electrical/electronic circuit problems. | P-1 | | | ✓ | 143–160 | 32–35 |
| **8.** | Diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine needed action. | P-1 | ✓ | ✓ | ✓ | 256–257 | 42 |
| **9.** | Inspect and test fusible links, circuit breakers, and fuses; determine needed action. | P-1 | ✓ | ✓ | ✓ | 131–136 | 29 |
| **10.** | Inspect, test, repair, and/or replace components, connectors, terminals, harnesses, and wiring in electrical/electronic systems (including solder repairs) | P-1 | | ✓ | ✓ | 136–138 149–154 | 30 |
| **11.** | Check electrical/electronic circuit waveforms; interpret readings and determine needed repairs. | P-2 | | | ✓ | 119–125 | 28; 60 |
| **12.** | Repair data bus wiring harness. | P-1 | | | ✓ | 138–140; 229–231 | 31 |
| | **B. Battery Diagnosis and Service** | | | | | | |
| **1.** | Perform battery state-of-charge test; determine needed action. | P-1 | ✓ | ✓ | ✓ | 248–249 | 43 |
| **2.** | Confirm proper battery capacity for vehicle application; perform battery capacity and load test; determine needed action. | P-1 | ✓ | ✓ | ✓ | 249–251 | 44 |
| **3.** | Maintain or restore electronic memory functions. | P-1 | ✓ | ✓ | ✓ | 257–268 | 45 |
| **4.** | Inspect and clean battery; fill battery cells; check battery cables, connectors, clamps, and hold-downs. | P-1 | ✓ | ✓ | ✓ | 247 | 47 |
| **5.** | Perform slow/fast battery charge according to manufacturer's recommendations. | P-1 | ✓ | ✓ | ✓ | 252–254 | 48 |
| **6.** | Jump-start vehicle using jumper | P-1 | ✓ | ✓ | ✓ | 255 | 49 |

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| | cables and a booster battery or an auxiliary power supply. | | | | | | |
| **7.** | Identify safety precautions for high voltage systems on hybrid electric, hybrid electric, and diesel vehicles. | P-2 | ✓ | ✓ | ✓ | 35; 141 | 11–12 |
| **8.** | Identify electrical/electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery. | P-1 | ✓ | ✓ | ✓ | 257–258 | 46 |
| **9.** | Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures. | P-3 | ✓ | ✓ | ✓ | 252–253 | 50 |
| | **C. Starting System Diagnosis and Repair** | | | | | | |
| **1.** | Perform starter current draw tests; determine needed action. | P-1 | ✓ | ✓ | ✓ | 278–279 | 53 |
| **2.** | Perform starter circuit voltage drop tests; determine needed action. | P-1 | ✓ | ✓ | ✓ | 276–277 | 54 |
| **3.** | Inspect and test starter relays and solenoids; determine needed action. | P-2 | ✓ | ✓ | ✓ | 278 | 52 |
| **4.** | Remove and install starter in a vehicle. | P-1 | ✓ | ✓ | ✓ | 279; 282 | 55 |
| **5.** | Inspect and test switches, connectors, and wires of starter control circuits; determine needed action. | P-2 | ✓ | ✓ | ✓ | 278 | 52 |
| **6.** | Differentiate between electrical and engine mechanical problems that cause a slow-crank or a no-crank condition | P-2 | | ✓ | ✓ | 279 | 53 |
| **7.** | Demonstrate knowledge of an automatic idle-stop/start-stop system. | P-2 | ✓ | ✓ | ✓ | 276–278 | NA |
| | **D. Charging System Diagnosis and Repair** | | | | | | |
| **1.** | Perform charging system output test; determine needed action. | P-1 | ✓ | ✓ | ✓ | 311 | 59 |
| **2.** | Diagnose (troubleshoot) charging system for causes of undercharge, no-charge, or overcharge conditions. | P-1 | | ✓ | ✓ | 305 | 58–61 |

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| **3.** | Inspect, adjust, and/or replace generator (alternator) drive belts; check pulleys and tensioners for wear; check pulley and belt alignment | P-1 | ✓ | ✓ | ✓ | 306–307 | 62 |
| **4.** | Remove, inspect, and/or replace generator (alternator). | P-1 | (P-2) | ✓ | ✓ | 312–313; 317 | 62 |
| **5.** | Perform charging circuit voltage drop tests; determine needed action. | P-1 | ✓ | ✓ | ✓ | 309–310 | 61 |
| | **E. Lighting Systems Diagnosis and Repair** | | | | | | |
| **1.** | Diagnose (troubleshoot) the causes of brighter-than-normal, intermittent, dim, or no light operation; determine needed action. | P-1 | ✓ | ✓ | ✓ | 327 | 68 |
| **2.** | Inspect interior and exterior lamps and sockets including headlights and auxiliary lights (fog lights/driving lights); replace as needed. | P-1 | | ✓ | ✓ | 328–329 | 68, 69 |
| **3.** | Aim headlights. | P-2 | ✓ | ✓ | ✓ | 340 | 70 |
| **4.** | Identify system voltage and safety precautions associated with high-intensity discharge headlights | P-2 | ✓ | ✓ | ✓ | 338–339 | 71 |
| | **F. Instrument Cluster and Driver Information Systems Diagnosis and Repair** | | | | | | |
| **1.** | Inspect and test gauges and gauge sending units for causes of abnormal readings; determine needed action. | P-2 | | ✓ | ✓ | 357–358 | 72 |
| **2.** | Diagnose (troubleshoot) the causes of incorrect operation of warning devices and other driver information systems; determine needed action. | P-2 | | ✓ | ✓ | 354–369 | 74 |
| **3.** | Reset maintenance indicators as required. | P-2 | ✓ | ✓ | ✓ | 377 | 74 |
| | **G. Repair Body Electrical Systems Diagnosis and Repair** | | | | | | |
| **1.** | Diagnose operation of comfort and convenience accessories and related circuits (such as: power window, power seats, pedal height, power locks, trunk | P-2 | | ✓ | ✓ | 406-423 | 78,79, 81 |

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| | locks, remote start, moon roof, sun roof, sun shade, remote keyless entry, voice activation, steering wheel controls, back-up camera, park assist, cruise control, and auto dimming headlamps); determine needed repairs | | | | | | |
| **2.** | Diagnose operation of security/anti-theft systems and related circuits (such as: theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine needed repairs. | P-2 | | ✓ | ✓ | 424-429 | 81, 84, 85 |
| **3.** | Diagnose operation of entertainment and related circuits (such as: radio, DVD, remote CD changer, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed repairs. | P-3 | | ✓ | ✓ | 454 | 87 |
| **4.** | Diagnose operation of safety systems and related circuits (such as: horn, airbags, seat belt pretensioners, occupancy classification, wipers, washers, speed control/collision avoidance, heads-up display, park assist, and back-up camera); determine needed repairs | P-1 | | ✓ | ✓ | 361-375 383–391; 400, 440–443 | 74,76, 77, |
| **5.** | Diagnose body electronic systems circuits using a scan tool; check for module communication errors (data bus systems); determine needed action. | P-2 | | ✓ | ✓ | 229–231 | 84 |
| **6.** | Describe the process for software transfer, software updates, or reprogramming of electronic modules | P-2 | | ✓ | ✓ | 229 | 84 |