



Correlation of

Modern Automotive Technology, by Duffy

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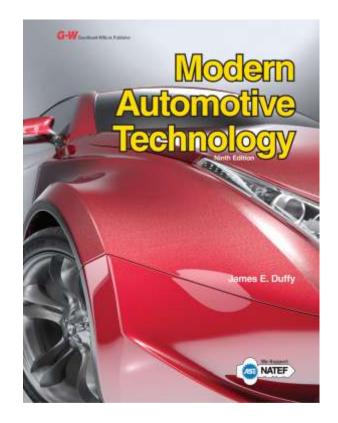
to

NATEF Maintenance and Light Repair (MLR) Task List Correlation Chart

The following chart correlates the *Modern Automotive Technology* Shop Manual (©2017) to the 2017 NATEF Maintenance and Light Repair (MLR) Task List.

The correlation below lists the tasks, priority level, and the corresponding page numbers from the *Modern Automotive Technology* Shop Manual for the Maintenance and Light Repair Task List.

For more information on NATEF standards, including additional information on the ASE Industry Education Alliance, please visit http://www.asealliance.org/.



ENGINE REPAIR

For every task in Engine Repair, the following safety requirement must be strictly enforced:

| Task Number and Description | Priority | Job #s |
|--|----------|--------|
| I. ENGINE REPAIR | | |
| A. General | | |
| 1. Research vehicle service information, including fluid type, | P-1 | 2 |
| vehicle service history, service precautions, and technical | | |
| service bulletins. | | |

| Task Number and Description | Priority | Job #s |
|--|----------|---------------------|
| 2. Verify operation of the instrument panel engine warning | P-1 | 11, 138, 139, 140, |
| indicators. | | 141 |
| 3. Inspect engine assembly for fuel, oil, coolant, and other | P-1 | 7 |
| leaks; determine necessary action. | | |
| 4. Install engine covers using gaskets, seals, and sealers as | P-1 | 3, 4, 27, 28, 34 |
| required. | | |
| 5. Verify engine mechanical timing. | P-2 | 24, 28 |
| 6. Perform common fastener and thread repair, to include: | P-1 | 15 |
| remove broken bolt, restore internal and external threads, and | | |
| repair internal threads with thread insert. | | |
| 7. Identify service precautions related to service of the internal | P-2 | 12, 13 |
| combustion engine of a hybrid vehicle. | | |
| I. ENGINE REPAIR | | · |
| B. Cylinder Head and Valve Train | | |
| 1. Adjust valves (mechanical or hydraulic lifters). | P-3 | 25 |
| 2. Identify components of the cylinder head and valve train. | P-1 | 13, 20, 21, 23, 28 |
| I. ENGINE REPAIR | | |
| C. Lubrication and Cooling System | | |
| 1. Perform cooling system pressure dye tests to identify leaks; | P-1 | 31 |
| check coolant condition and level; inspect and test radiator, | | |
| pressure cap, coolant recovery tank, heater core, and gallery | | |
| plugs; determine necessary action. | | |
| 2. Inspect, replace, and/or adjust drive belts, tensioners, and | P-1 | 31, 33 |
| pulleys; check pulley and belt alignment. | | |
| 3. Remove, inspect, and replace thermostat and gasket/seal. | P-1 | 36 |
| 4. Inspect and test coolant; drain and recover coolant; flush and | P-1 | 2, 31, 32 |
| refill cooling system; use proper fluid type per manufacturer | | |
| specification; bleed air as required. | | |
| 5. Perform engine oil and filter change; use proper fluid type per | P-1 | 2, 6, 136, 138, 141 |
| manufacturer specification; reset maintenance reminder as | | |
| required. | | |
| 6. Identify components of the lubrication and cooling systems. | P-1 | 31, 33, 34, 35, 36 |

AUTOMATIC TRANSMISSION AND TRANSAXLE

For every task in Automatic Transmission and Transaxle, the following safety requirement must be strictly enforced:

| Task Number and Description | Priority | Job #s |
|---|----------|---------------------|
| II. AUTOMATIC TRANSMISSION AND TRANSAXLE | | |
| A. General | | |
| 1. Research vehicle service information, including fluid type, | P-1 | 2 |
| vehicle service history, service precautions, and technical | | |
| service bulletins. | | |
| 2. Check fluid level in a transmission or transaxle equipped with | P-1 | 39, 44 |
| a dipstick. | | |
| 3. Check fluid level in a transmission or transaxle not equipped | P-1 | 39, 44 |
| with a dipstick. | | |
| 4. Check transmission fluid condition; check for leaks. | P-2 | 39, 44 |
| 5. Identify drive train components and configuration. | P-1 | 37, 48, 49, 52, 53, |
| | | 54, 55, 57 |
| II. AUTOMATIC TRANSMISSION AND TRANSAXLE | | |
| B. In-Vehicle Transmission/Transaxle | | |
| 1. Inspect, adjust, and/or replace external manual valve shift | P-2 | 39, 45 |
| linkage, transmission range sensor/switch, and/or park/neutral | | |
| position switch. | | |
| 2. Inspect for leakage at external seals, gaskets, and bushings. | P-1 | 3, 4 |
| 3. Inspect, replace, and/or align power train mounts. | P-2 | 37, 38 |
| 4. Drain and replace fluid filter(s); use proper fluid type per | P-1 | 2, 44 |
| manufacturer specification. | | |
| II. AUTOMATIC TRANSMISSION AND TRANSAXLE | | |
| C. Off-Vehicle Transmission/Transaxle | | |
| 1. Describe the operational characteristics of a continuously | P-3 | 39 |
| variable transmission (CVT). | | |
| 2. Describe the operational characteristics of a hybrid vehicle | P-3 | 39 |
| drive train. | | |

MANUAL DRIVE TRAIN AND AXLES

For every task in Manual Drive Train and Axles, the following safety requirement must be strictly enforced:

| Task Number and Description | Priority | Job #s |
|---|------------------------|------------------------|
| III MANUAL DRIVE TRAIN AND AXLES | L | |
| A. General | | |
| 1. Research vehicle service information, including fluid type, | P-1 | 2 |
| vehicle service history, service precautions, and technical | | |
| service bulletins. | | |
| 2. Drain and refill manual transmission/transaxle and final drive | P-1 | 2, 77, 78, 79, 80, 86, |
| unit; use proper fluid type per manufacturer specification. | | 89 |
| 3. Check fluid condition; check for leaks. | P-2 | 60, 65 |
| 4. Identify manual drive train and axle components and | P-1 | 77, 78, 79, 80, 81 |
| configuration. | | |
| III MANUAL DRIVE TRAIN AND AXLES | | |
| B. Clutch | | |
| 1. Check and adjust clutch master cylinder fluid level; use | P-1 | 2, 71, 73 |
| proper fluid type per manufacturer specification. | | |
| 2. Check for hydraulic system leaks. | P-1 | 71, 73 |
| III MANUAL DRIVE TRAIN AND AXLES | | |
| C. Transmission/Transaxle | | |
| 1. Describe the operational characteristics of an electronically- | P-2 | 69 |
| controlled manual transmission/transaxle. | | |
| III MANUAL DRIVE TRAIN AND AXLES | | |
| D. Drive Shaft, Half Shaft, Universal Joints, and Constant-Ve | locity (CV) Joints (Fr | ont, Rear, All, and |
| Four-wheel Drive) | | |
| 1. Inspect, remove, and/or replace bearings, hubs, and seals. | P-2 | 68 |
| 2. Inspect, service, and/or replace shafts, yokes, and | P-2 | 66, 67 |
| universal/CV joints. | | |
| 3. Inspect locking hubs. | P-3 | 67, 68, 83, 92 |
| 4. Check for leaks at drive assembly and transfer case seals; | P-2 | 2, 65, 81 |
| check vents; check fluid level; use proper fluid type per | | |
| manufacturer specification. | | |
| III MANUAL DRIVE TRAIN AND AXLES | • | |
| E. Differential Case Assembly | | |
| 1. Clean and inspect differential case; check for leaks; inspect | P-1 | 7, 65, 87 |
| housing vent. | | |

| Task Number and Description | Priority | Job #s |
|---|----------|--------|
| 2. Check and adjust differential case fluid level; use proper fluid | P-1 | 2, 60 |
| type per manufacturer specification. | | |
| 3. Drain and refill differential housing. | P-1 | 86, 89 |
| 4. Inspect and replace drive axle wheel studs. | P-1 | 108 |

SUSPENSION AND STEERING

For every task in Suspension and Steering, the following safety requirement must be strictly enforced:

| Task Number and Description | Priority | Job #s |
|---|----------|---------------------|
| IV. SUSPENSION AND STEERING | | |
| A. General | | |
| 1. Research vehicle service information, including fluid type, | P-1 | 2 |
| vehicle service history, service precautions, and technical | | |
| service bulletins. | | |
| 2. Disable and enable supplemental restraint system (SRS); | P-1 | 94, 147 |
| verify indicator lamp operation. | | |
| 3. Identify suspension and steering system components and | P-1 | 90, 93, 95, 96, 98, |
| configurations. | | 101, 102, 104, 105 |
| IV. SUSPENSION AND STEERING | | |
| B. Related Suspension and Steering Service | | |
| 1. Inspect rack and pinion steering gear inner tie rod ends | P-1 | 95 |
| (sockets) and bellows boots. | | |
| 2. Inspect power steering fluid level and condition. | P-1 | 91, 97 |
| 3. Flush, fill, and bleed power steering system; use proper fluid | P-2 | 2, 97 |
| type per manufacturer specification. | | |
| 4. Inspect for power steering fluid leakage. | P-1 | 97 |
| 5. Remove, inspect, replace, and/or adjust power steering pump | P-1 | 33, 97 |
| drive belt. | | |
| 6. Inspect and replace power steering hoses and fittings. | P-2 | 90, 97 |
| 7. Inspect pitman arm, relay (centerlink/intermediate) rod, idler | P-1 | 90, 94, 96 |
| arm, mountings, and steering linkage damper. | | |
| 8. Inspect tie rod ends (sockets), tie rod sleeves, and clamps. | P-1 | 90 |
| 9. Inspect upper and lower control arms, bushings, and shafts. | P-1 | 90 |
| 10. Inspect and replace rebound bumpers. | P-1 | 90, 99 |
| 11. Inspect track bar, strut rods/radius arms, and related mounts | P-1 | 90 |
| and bushings. | | |

| Task Number and Description | Priority | Job #s |
|---|----------|----------|
| 12. Inspect upper and lower ball joints (with or without wear | P-1 | 90 |
| indicators). | | |
| 13. Inspect suspension system coil springs and spring insulators | P-1 | 90 |
| (silencers). | | |
| 14. Inspect suspension system torsion bars and mounts. | P-1 | 90 |
| 15. Inspect and/or replace front/rear stabilizer bar (sway bar) | P-1 | 90, 98 |
| bushings, brackets, and links. | | |
| 16. Inspect, remove, and/or replace strut cartridge or assembly; | P-2 | 90, 101 |
| inspect mounts and bushings. | | |
| 17. Inspect front strut bearing and mount. | P-1 | 90, 101 |
| 18. Inspect rear suspension system lateral links/arms (track | P-1 | 90, 99 |
| bars), control (trailing) arms. | | |
| 19. Inspect rear suspension system leaf spring(s), spring | P-1 | 90, 100 |
| insulators (silencers), shackles, brackets, bushings, center | | |
| pins/bolts, and mounts. | | |
| 20. Inspect, remove, and/or replace shock absorbers; inspect | P-1 | 90, 102 |
| mounts and bushings. | | |
| 21. Inspect electric power steering assist system. | P-2 | 97 |
| 22. Identify hybrid vehicle power steering system electrical | P-2 | 93 |
| circuits and safety precautions. | | |
| 23. Describe the function of suspension and steering control | P-3 | 90 |
| system components (i.e., active suspension and stability | | |
| control). | | |
| IV. SUSPENSION AND STEERING | | |
| C. Wheel Alignment | | |
| 1. Perform prealignment inspection; measure vehicle ride | P-1 | 90, 103 |
| height. | | |
| 2. Describe alignment angles (camber, caster, and toe). | P-1 | 103 |
| IV. SUSPENSION AND STEERING | | |
| D. Wheels and Tires | | |
| 1. Inspect tire condition; identify tire wear patterns; check for | P-1 | 81, 104 |
| correct tire size, application (load and speed ratings), and air | | |
| pressure as listed on the tire information placard/label. | | |
| 2. Rotate tires according to manufacturer's recommendations, | P-1 | 106 |
| including vehicles equipped with tire pressure monitoring | | |
| systems (TPMS). | | |
| 3. Dismount, inspect, and remount tire on wheel; balance wheel | P-1 | 105, 106 |
| and tire assembly. | | |
| 4. Dismount, inspect, and remount tire on wheel equipped with | P-1 | 105, 106 |
| tire pressure monitoring system sensor. | | |

| Task Number and Description | Priority | Job #s |
|--|----------|----------|
| 5. Inspect tire and wheel assembly for air loss; determine | P-1 | 104 |
| necessary action. | | |
| 6. Repair tire following vehicle manufacturer approved | P-1 | 2, 105 |
| procedure. | | |
| 7. Identify indirect and direct tire pressure monitoring systems | P-1 | 105 |
| (TPMS); calibrate system; verify operation of instrument panel | | |
| lamps. | | |
| 8. Demonstrate knowledge of steps required to remove and | P-1 | 105, 161 |
| replace sensors in a tire pressure monitoring system (TPMS), | | |
| including relearn procedure. | | |

BRAKES

For every task in Brakes, the following safety requirement must be strictly enforced:

| Task Number and Description | Priority | Job #s |
|--|----------|---------------------|
| V. BRAKES | | |
| A. General | | |
| 1. Research vehicle service information, including fluid type, | P-1 | 2 |
| vehicle service history, service precautions, and technical | | |
| service bulletins. | | |
| 2. Describe procedure for performing a road test to check brake | P-1 | 107 |
| system operation, including anti-lock brake system (ABS). | | |
| 3. Install wheel and torque lug nuts. | P-1 | 105, 116, 118 |
| 4. Identify brake system components and configuration. | P-1 | 107, 108, 109, 110, |
| | | 112, 116, 118, 121 |
| V. BRAKES | | |
| B. Hydraulic System | | |
| 1. Describe proper brake pedal height, travel, and feel. | P-1 | 107 |
| 2. Check master cylinder for external leaks and proper | P-1 | 107 |
| operation. | | |
| 3. Inspect brake lines, flexible hoses, and fittings for leaks, | P-1 | 107, 111 |
| dents, kinks, rust, cracks, bulging, wear, and loose | | |
| fittings/supports. | | |
| 4. Select, handle, store, and fill brake fluids to proper level; use | P-1 | 2, 113, 115 |
| proper fluid type per manufacturer specification. | | |
| 5. Identify components of hydraulic brake warning light system. | P-3 | 111, 136, 138 |
| 6. Bleed and/or flush brake system. | P-1 | 115 |

| Task Number and Description | Priority | Job #s |
|--|------------|----------|
| 7. Test brake fluid for contamination. | P-1 | 115 |
| V. BRAKES | | |
| C. Drum Brakes | | |
| 1. Remove, clean, and inspect brake drum; measure brake drum | P-1 | 107, 116 |
| diameter; determine serviceability. | | |
| 2. Refinish brake drum and measure final drum diameter; | P-1 | 117 |
| compare with specification. | | |
| 3. Remove, clean, inspect, and/or replace brake shoes, springs, | P-1 | 116 |
| pins, clips, levers, adjusters/self-adjusters, other related brake | | |
| hardware, and backing support plates; lubricate and reassemble. | | |
| 4. Inspect wheel cylinders for leaks and proper operation; | P-2 | 116 |
| remove and replace as needed. | | |
| 5. Pre-adjust brake shoes and parking brake; install brake drums | P-1 | 116 |
| or drum/hub assemblies and wheel bearings; make final checks | | |
| and adjustments. | | |
| V. BRAKES | | |
| D. Disc Brakes | | |
| 1. Remove and clean caliper assembly; inspect for leaks and | P-1 | 107, 118 |
| damage/wear; determine necessary action. | | |
| 2. Inspect caliper mounting and slides/pins for proper operation, | P-1 | 118 |
| wear, and damage; determine necessary action. | | |
| 3. Remove, inspect, and/or replace brake pads and retaining | P-1 | 118 |
| hardware; determine necessary action. | | |
| 4. Lubricate and reinstall caliper, brake pads, and related | P-1 | 118 |
| hardware; seat brake pads and inspect for leaks. | | |
| 5. Clean and inspect rotor and mounting surface, measure rotor | P-1 | 118 |
| thickness, thickness variation, and lateral runout; determine | | |
| necessary action. | | |
| 6. Remove and reinstall/replace rotor. | P-1 | 118 |
| 7. Refinish rotor on vehicle; measure final rotor thickness and | P-1 | 120 |
| compare with specification. | | 120 |
| 8. Refinish rotor off vehicle; measure final rotor thickness and | P-1 | 120 |
| compare with specification. | | 110 |
| 9. Retract and readjust caliper piston on an integral parking | P-2 | 110 |
| brake system. | | 110 |
| 10. Check brake pad wear indicator; determine necessary | P-1 | 118 |
| action. | D 1 | 110 |
| 11. Describe the importance of operating a vehicle to | P-1 | 118 |
| burnish/break in replacement brake pads according to | | |
| manufacturer's recommendation. | | |

| Task Number and Description | Priority | Job #s |
|--|-----------|--------|
| V. BRAKES | | |
| E. Power-Assist Units | | |
| 1. Check brake pedal travel with and without engine running to | P-2 | 114 |
| verify proper power booster operation. | | |
| 2. Identify components of the brake power assist system | P-1 | 114 |
| (vacuum and hydraulic); check vacuum supply (manifold or | | |
| auxiliary pump) to vacuum-type power booster. | | |
| V. BRAKES | | |
| F. Related Systems (i.e., Wheel Bearings, Parking Brakes, Ele | ectrical) | |
| 1. Remove, clean, inspect, repack, and install wheel bearings; | P-1 | 5, 109 |
| replace seals; install hub and adjust bearings. | | |
| 2. Check parking brake system components for wear, binding, | P-2 | 110 |
| and corrosion; clean, lubricate, adjust, and/or replace as needed. | | |
| 3. Check parking brake operation and parking brake indicator | P-1 | 110 |
| light system operation; determine necessary action. | | |
| 4. Check operation of brake stop light system. | P-1 | 136 |
| 5. Replace wheel bearing and race. | P-2 | 5, 109 |
| 6. Inspect and replace wheel studs. | P-1 | 108 |
| V. BRAKES | | |
| G. Electronic Brake, Traction Control, and Stability Control | Systems | |
| 1. Identify traction control/vehicle stability control system | P-3 | 121 |
| components. | | |
| 2. Describe the operation of a regenerative braking system. | P-3 | 111 |

ELECTRICAL/ELECTRONIC SYSTEMS

For every task in Electrical/Electronic Systems, the following safety requirement must be strictly enforced:

| Task Number and Description | Priority | Job #s |
|---|----------|---------------|
| VI. ELECTRICAL/ELECTRONIC SYSTEMS | | |
| A. General | | |
| 1. Research service information, including vehicle service | P-1 | 2 |
| history, service precautions, and technical service bulletins. | | |
| 2. Demonstrate knowledge of electrical/electronic series, | P-1 | 136 |
| parallel, and series-parallel circuits using principles of | | |
| electricity (Ohm's Law). | | |
| 3. Using wiring diagrams to trace electrical/electronic circuits. | P-1 | 130, 136, 138 |

| Task Number and Description | Priority | Job #s |
|---|----------|---------------------|
| 4. Demonstrate proper use of a digital multimeter (DMM) when | P-1 | 130, 136, 142 |
| measuring source voltage, voltage drop (including grounds), | | |
| current flow, and resistance. | | |
| 5. Demonstrate knowledge of the causes and effects from | P-1 | 130, 138, 142 |
| shorts, grounds, opens, and resistance problems in | | |
| electrical/electronic circuits. | | |
| 6. Use a test light to check operation of electrical circuits. | P-2 | 130, 136 |
| 7. Use fused jumper wires to check operation of electrical | P-2 | 125, 138 |
| circuits. | | |
| 8. Measure key-off battery drain (parasitic draw). | P-1 | 125 |
| 9. Inspect and test fusible links, circuit breakers, and fuses; | P-1 | 125, 130, 138, 139 |
| determine necessary action. | | |
| 10. Repair and/or replace connectors, terminal ends, and wiring | P-1 | 126 |
| of electrical/electronic systems (including solder repair). | | |
| 11. Identify electrical/electronic system components and | P-1 | 126, 130, 134, 141, |
| configuration. | | 142, 143, 144, 145, |
| | | 146, 147, 150, 157 |
| VI. ELECTRICAL/ELECTRONIC SYSTEMS | | · |
| B. Battery Service | | |
| 1. Perform battery state-of-charge test; determine necessary | P-1 | 127 |
| action. | | |
| 2. Confirm proper battery capacity for vehicle application; | P-1 | 127 |
| perform battery capacity and load test; determine necessary | | |
| action. | | |
| 3. Maintain or restore electronic memory functions. | P-1 | 125, 128 |
| 4. Inspect and clean battery; fill battery cells; check battery | P-1 | 127, 128 |
| cables, connectors, clamps, and hold-downs. | | |
| 5. Perform slow/fast battery charge according to manufacturer's | P-1 | 128 |
| recommendations. | | |
| 6. Jump-start vehicle using jumper cables and booster battery or | P-1 | 129 |
| an auxiliary power supply. | | |
| 7. Identify safety precautions for high voltage systems on | P-2 | 127, 128 |
| electric, hybrid-electric, and diesel vehicles. | | |
| 8. Identify electrical/electronic modules, security systems, | P-1 | 128 |
| radios, and other accessories, that require reinitialization or | | |
| code entry after reconnecting vehicle battery. | | |
| 9. Identify hybrid vehicle auxiliary (12v) battery service, repair, | P-2 | 127, 128 |
| and test procedures. | | |

| Task Number and Description | Priority | Job #s |
|--|--------------------|---------------------|
| VI. ELECTRICAL/ELECTRONIC SYSTEMS | | |
| C. Starting System | | |
| 1. Perform starter current draw test; determine necessary action. | P-1 | 130 |
| 2. Perform starter circuit voltage drop tests; determine necessary | P-1 | 130 |
| action. | | |
| 3. Inspect and test starter relays and solenoids; determine | P-2 | 130, 131 |
| necessary action. | | |
| 4. Remove and install starter in a vehicle. | P-1 | 133 |
| 5. Inspect and test switches, connectors, and wires of starter | P-2 | 130 |
| control circuits; determine necessary action. | | |
| 6. Demonstrate knowledge of an automatic idle-stop/start-stop | P-3 | _ |
| system. | | |
| VI. ELECTRICAL/ELECTRONIC SYSTEMS | | |
| D. Charging System | | |
| 1. Perform charging system output test; determine necessary | P-1 | 134 |
| action. | | |
| 2. Inspect, adjust, and/or replace generator (alternator) drive | P-1 | 33, 134 |
| belts; check pulleys and tensioners for wear; check pulley and | | |
| belt alignment. | | |
| 3. Remove, inspect, and/or replace generator (alternator). | P-2 | 134, 135 |
| 4. Perform charging circuit voltage drop test; determine | P-2 | 134 |
| necessary action. | | |
| VI. ELECTRICAL/ELECTRONIC SYSTEMS | | |
| E. Lighting, Instrument Cluster, Driver Information, and Body | Electrical Systems | |
| 1. Inspect interior and exterior lamps and sockets including | P-1 | 136 |
| headlights and auxiliary lights (for lights/driving lights); replace | | |
| as needed. | | |
| 2. Aim headlights. | P-2 | 137 |
| 3. Identify system voltage and safety precautions associated | P-2 | 137 |
| with high-intensity discharge headlights. | | |
| 4. Disable and enable supplemental restraint system (SRS); | P-1 | 147 |
| verify indicator lamp operation. | | |
| 5. Remove and reinstall door panel. | P-1 | 144 |
| 6. Describe the operation of keyless entry/remote start systems. | P-3 | 151 |
| 7. Verify operation of instrument panel gauges and | P-1 | 136, 138, 139, 140, |
| warning/indicator lights; reset maintenance indicators. | | 141 |
| 8. Verify windshield wiper and washer operation; replace wiper | P-1 | 143 |
| blades. | | |

HEATING AND AIR CONDITIONING

For every task in Heating and Air Conditioning, the following safety requirement must be strictly enforced:

| Task Number and Description | Priority | Job #s |
|--|----------|---------------------|
| VII. HEATING, VENTILATION, AND AIR CONDITIONING | G (HVAC) | |
| A. General | | |
| 1. Research vehicle service information, including refrigerant/oil | P-1 | 2 |
| type, vehicle service history, service precautions, and technical | | |
| service bulletins. | | |
| 2. Identify heating, ventilation, and air conditioning (HVAC) | P-1 | 152, 156, 157, 158, |
| components and configuration. | | 159 |
| VII. HEATING, VENTILATION, AND AIR CONDITIONING | G (HVAC) | |
| B. Refrigeration System Components | | |
| 1. Inspect and replace A/C compressor drive belts, pulleys, and | P-1 | 33 152, 155 |
| tensioners; visually inspect A/C components for signs of leaks; | | |
| determine necessary action. | | |
| 2. Identify hybrid vehicle A/C system electrical circuits and the | P-2 | 152 |
| service/safety precautions. | | |
| 3. Inspect A/C condenser for airflow restrictions; determine | P-1 | 152 |
| necessary action. | | |
| VII. HEATING, VENTILATION, AND AIR CONDITIONIN | G (HVAC) | |
| C. Heating, Ventilation, and Engine Cooling Systems | | |
| 1. Inspect engine cooling and heater systems hoses and pipes; | P-1 | 31, 33, 158, 159 |
| determine necessary action. | | |
| VII. HEATING, VENTILATION, AND AIR CONDITIONING | G (HVAC) | |
| D. Operating Systems and Related Controls | | |
| 1. Inspect A/C-heater ducts, doors, hoses, cabin filters, and | P-1 | |
| outlets; determine necessary action. | | |
| 2. Identify the source of A/C system odors. | P-2 | |

ENGINE PERFORMANCE

For every task in Engine Performance, the following safety requirement must be strictly enforced:

| Task Number and Description | Priority | Job #s |
|--|----------|---------------|
| VIII. ENGINE PERFORMANCE | | |
| A. General | | |
| 1. Research vehicle service information, including fluid type, | P-1 | 2 |
| vehicle service history, service precautions, and technical | | |
| service bulletins. | | |
| 2. Perform engine absolute manifold pressure test | P-2 | 8 |
| (vacuum/boost); document results. | | |
| 3. Perform cylinder power balance test; document results. | P-2 | 8 |
| 4. Perform cylinder cranking and running compression test; | P-2 | 9 |
| document results. | | |
| 5. Perform cylinder leakage test; document results. | P-2 | 9 |
| 6. Verify engine operating temperature. | P-1 | 31 |
| 7. Remove and replace spark plugs; inspect secondary ignition | P-1 | 164, 165 |
| components for wear and damage. | | |
| VIII. ENGINE PERFORMANCE | | |
| B. Computerized Controls | | |
| 1. Retrieve and record diagnostic trouble codes (DTC), OBD | P-1 | 11, 161 |
| monitor status, and freeze frame data; clear codes when | | |
| applicable. | | |
| 2. Describe the use of the OBD monitors for repair and | P-1 | 161 |
| verification. | | |
| VIII. ENGINE PERFORMANCE | | |
| C. Fuel, Air Induction, and Exhaust Systems | | |
| 1. Replace fuel filter(s) where applicable. | P-2 | 167 |
| 2. Inspect, service, or replace air filters, filter housings, and | P-1 | 168 |
| intake ductwork. | | |
| 3. Inspect integrity of the manifold, exhaust pipes, muffler(s), | P-1 | 173, 174, 177 |
| catalytic converter(s), resonator(s), tailpipe(s), and heat shields; | | |
| determine necessary action. | | |
| 4. Inspect condition of exhaust system hangers, brackets, | P-1 | 173, 174, 177 |
| clamps, and heat shields; determine necessary action. | | |
| 5. Check and refill diesel exhaust fluid (DEF). | P-2 | 173 |

| Task Number and Description | Priority | Job #s |
|---|----------|--------|
| VIII. ENGINE PERFORMANCE | | |
| D. Emissions Control Systems | | |
| 1. Inspect, test, and service positive crankcase ventilation | P-2 | 178 |
| (PCV) filter/breather, valve, tubes, orifices, and hoses; perform | | |
| necessary action. | | |

REQUIRED SUPPLEMENTAL TASKS

| | Job #s |
|---|--------------------|
| Task Number and Description | |
| Shop and Personal Safety | |
| 1. Identify general shop safety rules and procedures. | 1 |
| 2. Utilize safe procedures for handling of tools and equipment. | 1 |
| 3. Identify and use proper placement of floor jacks and jack stands. | 1 |
| 4. Identify and use proper procedures for safe lift operation. | 1 |
| 5. Utilize proper ventilation procedures for working within the lab/shop | 1 |
| area. | |
| 6. Identify marked safety areas. | 1 |
| 7. Identify the location and the types of fire extinguishers and other fire | 1 |
| safety equipment; demonstrate knowledge of the procedures for using fire | |
| extinguishers and other fire safety equipment. | |
| 8. Identify the location and use of eyewash stations. | 1 |
| 9. Identify the location of the posted evacuation routes. | 1 |
| 10. Comply with the required use of safety glasses, ear protection, gloves, | 1 |
| and shoes during lab/shop activities. | |
| 11. Identify and wear appropriate clothing for lab/shop activities. | 1 |
| 12. Secure hair and jewelry for lab/shop activities. | 1 |
| 13. Demonstrate awareness of the safety aspects of supplemental restraint | 1 |
| systems (SRS), electronic brake control systems, and hybrid vehicle high | |
| voltage circuits. | |
| 14. Demonstrate awareness of the safety aspects of high voltage circuits | 1, 137 |
| (such as high intensity discharge (HID) lamps, ignition systems, injection | |
| systems, etc.). | |
| 15. Locate and demonstrate knowledge of material safety data sheets | 1, 2 |
| (MSDS). | |
| Tools and Equipment | |
| 1. Identify tools and their usage in automotive applications. | 1, 11 |
| 2. Identify standard and metric designation. | 2, 28, 31, 40, 172 |
| 3. Demonstrate safe handling and use of appropriate tools. | 1 |

| | Job #s |
|--|----------------|
| Task Number and Description | |
| 4. Demonstrate proper cleaning, storage, and maintenance of tools and | 1 |
| equipment. | |
| 5. Demonstrate proper use of precision measuring tools (i.e., micrometer, | 16, 18, 21, 27 |
| dial-indicator, dial-caliper). | |
| Preparing Vehicle for Service | |
| 1. Identify information needed and the service requested on a repair order. | 2 |
| 2. Identify purpose and demonstrate proper use of fender covers, mats. | 6 |
| 3. Demonstrate use of the three Cs (concern, cause, and correction). | 160 |
| 4. Review vehicle service history. | 2 |
| 5. Complete work order to include customer information, vehicle identifying | 2 |
| information, customer concern, related service history, cause, and correction. | |
| Preparing Vehicle for Customer | |
| 1. Ensure vehicle is prepared to return to customer per school/company | 6 |
| policy (floor mats, steering wheel cover, etc.). | |