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| 6. | Inspect and test A/C-heater control cables, motors, and linkages; perform necessary action. | P-3 |
| 7. | Inspect A/C-heater ducts, doors, hoses, cabin filters and outlets; perform necessary action. | P-2 |
| 8. | Identify the source of A/C system odors. | P-2 |
| 9. | Check operation of automatic or semi-automatic heating, ventilation, and air-conditioning (HVAC) control systems; determine necessary action. | P-2 |

VII. HEATING AND AIR CONDITIONING

E. Refrigerant Recovery, Recycling, and Handling

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| 1. | Perform correct use and maintenance of refrigerant handling equipment according to equipment manufacturer's standards. | P-1 |
| 2. | Identify and recover A/C system refrigerant. | P-1 |
| 3. | Recycle, label, and store refrigerant. | P-1 |
| 4. | Evacuate and charge A/C system; add refrigerant oil as required. | P-1 |

ENGINE PERFORMANCE

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

Comply with personal and environmental safety practices associated with clothing; 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.

VIII. ENGINE PERFORMANCE

A. General Engine Diagnosis

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| 1. | Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. | P-1 |
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2. Identify and interpret engine performance concern; determine necessary action. P-1
3. Research applicable vehicle and service information, such as engine management system operation, vehicle service history, service precautions, and technical service bulletins. P-1
4. Locate and interpret vehicle and major component identification numbers. P-1
5. Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action. P-2
6. Diagnose abnormal engine noise or vibration concerns; determine necessary action. P-3
7. Diagnose abnormal exhaust color, odor, and sound; determine necessary action. P-2
8. Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action. P-1
9. Perform cylinder power balance test; determine necessary action. P-2
10. Perform cylinder cranking and running compression tests; determine necessary action. P-1
11. Perform cylinder leakage test; determine necessary action. P-1
12. Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns; determine necessary action. P-1
13. Prepare 4 or 5 gas analyzer; inspect and prepare vehicle for test, and obtain exhaust readings; interpret readings, and determine necessary action. P-3
14. Verify engine operating temperature; determine necessary action. P-1
15. Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses; perform necessary action. P-1
16. Verify correct camshaft timing. P-1

VIII. ENGINE PERFORMANCE

B. Computerized Engine Controls Diagnosis and Repair

1. Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable. P-1
2. Diagnose the causes of emissions or driveability concerns with stored or active diagnostic trouble codes; obtain, graph, and interpret scan tool data. P-1
3. Diagnose emissions or driveability concerns without stored diagnostic trouble codes; determine necessary action. P-1
4. Check for module communication (including CAN/BUS systems) errors using a scan tool. P-2
5. Inspect and test computerized engine control system sensors, powertrain/engine control module (PCM/ECM), actuators, and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO); perform necessary action. P-1
6. Access and use service information to perform step-by-step diagnosis. P-1
7. Diagnose driveability and emissions problems resulting from malfunctions of interrelated systems (cruise control, security alarms, suspension controls, traction controls, A/C, automatic transmissions, non-OEM-installed accessories, or similar systems); determine necessary action. P-3
8. Perform active tests of actuators using a scan tool; determine necessary action. P-1
9. Describe the importance of running all OBDII monitors for repair verification. P-1

VIII. ENGINE PERFORMANCE

C. Ignition System Diagnosis and Repair

1. Diagnose ignition system related problems such as no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emissions concerns; determine necessary action. P-1
2. Inspect and test ignition primary and secondary circuit wiring and solid state components; test ignition coil(s); perform necessary action. P-1

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| 3. | Inspect and test crankshaft and camshaft position sensor(s); perform necessary action. | P-1 |
| 4. | Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram as necessary. | P-2 |

VIII. ENGINE PERFORMANCE

D. Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair

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| 1. | Diagnose hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems; determine necessary action. | P-1 |
| 2. | Check fuel for contaminants and quality; determine necessary action. | P-2 |
| 3. | Inspect and test fuel pumps and pump control systems for pressure, regulation, and volume; perform necessary action. | P-1 |
| 4. | Replace fuel filters. | P-2 |
| 5. | Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air. | P-2 |
| 6. | Inspect and test fuel injectors. | P-1 |
| 7. | Verify idle control operation. | P-1 |
| 8. | Inspect the integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shield(s); perform necessary action. | P-1 |
| 9. | Perform exhaust system back-pressure test; determine necessary action. | P-1 |
| 10. | Test the operation of turbocharger/supercharger systems; determine necessary action | P-3 |

VIII. ENGINE PERFORMANCE

E. Emissions Control Systems Diagnosis and Repair

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| 1. | Diagnose oil leaks, emissions, and driveability concerns caused by the positive crankcase ventilation (PCV) system; determine necessary action. | P-2 |
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| 2. | Inspect, test and service positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; perform necessary action. | P-2 |
| 3. | Diagnose emissions and driveability concerns caused by the exhaust gas recirculation (EGR) system; determine necessary action. | P-1 |
| 4. | Inspect, test, service and replace components of the EGR system, including EGR tubing, exhaust passages, vacuum/pressure controls, filters and hoses; perform necessary action. | P-1 |
| 5. | Inspect and test electrical/electronic sensors, controls, and wiring of exhaust gas recirculation (EGR) systems; perform necessary action. | P-2 |
| 6. | Diagnose emissions and driveability concerns caused by the secondary air injection and catalytic converter systems; determine necessary action. | P-2 |
| 7. | Inspect and test mechanical components of secondary air injection systems; perform necessary action. | P-3 |
| 8. | Inspect and test electrical/electronically-operated components and circuits of air injection systems; perform necessary action. | P-3 |
| 9. | Inspect and test catalytic converter efficiency. | P-1 |
| 10. | Diagnose emissions and driveability concerns caused by the evaporative emissions control system; determine necessary action. | P-1 |
| 11. | Inspect and test components and hoses of the evaporative emissions control system; perform necessary action. | P-1 |
| 12. | Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine necessary action. | P-1 |

VIII. ENGINE PERFORMANCE

F. Engine Related Service

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| 1. | Adjust valves on engines with mechanical or hydraulic lifters. | P-1 |
| 2. | Remove and replace timing belt; verify correct camshaft timing. | P-1 |
| 3. | Remove and replace thermostat and gasket/seal. | P-1 |
| 4. | Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; perform necessary action. | P-1 |

5. Perform common fastener and thread repairs, to include: remove broken bolt, restore internal and external threads, and repair internal threads with a threaded insert. P-1
6. Perform engine oil and filter change. P-1
7. Identify hybrid vehicle internal combustion engine service precautions. P-3