

CT.AUT.Automotive Technology (CTC)

Essential Discipline Goals:

- Develop and apply the technical competency and related academic skills that allow for economic independence and career satisfaction.
- Acquire the essential learnings and values that foster continued education throughout life.
- Demonstrate the ability to communicate, solve problems, work individually and in groups, and apply information effectively.
- Develop technological literacy and the ability to adapt to future change.

For every task associated with this curriculum, the following safety requirements 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.

CT.AUT.20 Steering and Suspension (IV)

CT.AUT.20.10 General Suspension and Steering Systems Diagnosis (IV-A)

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| CT.AUT.20.10.100 | Identify and interpret suspension and steering concern; determine necessary action. (IV-A-1) |
| CT.AUT.20.10.102 | Research applicable vehicle and service information, such as suspension and steering system operation, vehicle service history, service precautions, and technical service bulletins. (IV-A-2) |
| CT.AUT.20.10.104 | Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals). (IV-A-3) |

CT.AUT.20.20 Steering Systems Diagnosis and Repair (IV-B)

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| CT.AUT.20.20.100 | Disable and enable supplemental restraint system (SRS). |
| CT.AUT.20.20.102 | Remove and replace manual or power rack and pinion steering gear; inspect mounting bushings and brackets. |
| CT.AUT.20.20.104 | Inspect and replace manual or power rack and pinion steering gear inner tie rod ends (sockets) and bellows boots. |
| CT.AUT.20.20.106 | Inspect power steering fluid levels and condition.. |
| CT.AUT.20.20.108 | Remove, inspect, replace, and adjust power steering pump belt. (IV-B-13) |
| CT.AUT.20.20.110 | Inspect, replace, and adjust tie rod ends (sockets), tie rod sleeves, and clamps (IV-B-18) |
| CT.AUT.20.20.200 | Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring). |
| CT.AUT.20.20.202 | Diagnose steering column noises, looseness, and binding concerns (including tilt mechanisms); determine necessary action. (IV-B-3) |
| CT.AUT.20.20.204 | Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and fluid leakage concerns; determine necessary action. (IV-B-4) |
| CT.AUT.20.20.206 | Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and fluid leakage concerns; determine necessary action. (IV-B-5) |
| CT.AUT.20.20.208 | Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; perform necessary action. (IV-B-6) |
| CT.AUT.20.20.210 | Adjust manual or power non-rack and pinion worn bearing preload and sectorlash. (IV-B-7) |
| CT.AUT.20.20.212 | Flush, fill, and bleed power steering system. (IV-B-11) |
| CT.AUT.20.20.214 | Diagnose power steering fluid leakage; determine necessary action. (IV-B-12) |
| CT.AUT.20.20.216 | Remove and reinstall power steering pump. (IV-B-14) |
| CT.AUT.20.20.218 | Remove and reinstall power steering pump pulley; check pulley and belt |

- alignment. (IV-B-15)
- CT.AUT.20.20.220 Inspect and replace power steering hoses and fittings. (IV-B-16)
- CT.AUT.20.20.222 Inspect and replace pitman arm, relay (centerlink/intermediate) rod, idle arm and mountings, and steering linkage damper. (IV-B-17)
- CT.AUT.20.20.224 Test and diagnose components of electronically controlled steering systems using a scan tool; determine necessary action. (IV-B-19)

CT.AUT.20.30 Suspension Systems Diagnosis and Repair (IV-C)

CT.AUT.20.30.a Front Suspension (IV-C-1)

- CT.AUT.20.30.a.100 Diagnose short and long arm suspension system noises, body sway, and uneven riding height concerns; determine necessary action. (IV-C-1-1)
- CT.AUT.20.30.a.102 Diagnose strut suspension system noises, body sway, and uneven riding height concerns; determine necessary action. (IV-C-1-2)
- CT.AUT.20.30.a.104 Remove, inspect, and install strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount. (IV-C-1-10)
- CT.AUT.20.30.a.108 Remove, inspect, and service or replace front and rear wheel bearings. (IV-C-3-2)
- CT.AUT.20.30.a.200 Remove, inspect, and install upper and lower control arms, bushings. (IV-C-1-3)
- CT.AUT.20.30.a.202 Remove, inspect, and install upper and/or lower ball joints. (IV-C-1-5)
- CT.AUT.20.30.a.202 Remove, inspect, and install steering knuckle assemblies, springs and spring insulators (IV-C-1-6)
- CT.AUT.20.30.a.204 Remove, inspect, and install stabilizer bar bushings, brackets, and links. (IV-C-1-9)
- CT.AUT.20.30.a.206 Lubricate suspension and steering systems. (IV-C-1-11)

CT.AUT.20.30.b Rear Suspension (IV-C-2)

- CT.AUT.20.30.b.200 Remove, inspect, and install transverse links, control arm, bushings, and mounts. (IV-C-2-2)
- CT.AUT.20.30.b.202 Remove, inspect, and install strut cartridge or assembly, strut coil spring, and insulators (silencers). (IV-C-2-4)

CT.AUT.20.30.c Miscellaneous Service(IV-C-3)

- CT.AUT.20.30.c.100 Inspect, remove, and replace shock absorbers. (IV-C-3-1)

CT.AUT.20.40 Wheel Alignment Diagnosis, Adjustment, and Repair (IV-D)

- CT.AUT.20.40.100 Differentiate between steering and suspension concerns using principles of steering geometry (caster, camber, toe, etc). (IV-D-1)
- CT.AUT.20.40.102 Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine necessary action. (IV-D-2)
- CT.AUT.20.40.104 Perform prealignment inspection; perform necessary action. (IV-D-3)
- CT.AUT.20.40.106 Measure vehicle riding height; determine necessary action. (IV-D-4)
- CT.AUT.20.40.118 Check and adjust front and rear wheel camber; perform necessary action. (IV-D-5)
- CT.AUT.20.40.108 Check and adjust caster; perform necessary action. (IV-D-6)
- CT.AUT.20.40.110 Check and adjust front wheel toe; adjust as needed. (IV-D-7)
- CT.AUT.20.40.112 Center steering wheel. (IV-D-8)
- CT.AUT.20.40.200 Check toe-out-on-turns (turning radius); determine necessary action. (IV-D-9)
- CT.AUT.20.40.202 Check SAI (steering axis inclination) and included angle; determine necessary action. (IV-D-10)
- CT.AUT.20.40.204 Check and adjust rear wheel toe. (IV-D-11)
- CT.AUT.20.40.206 Check rear wheel thrust angle; determine necessary action. (IV-D-12)
- CT.AUT.20.40.208 Check for front wheel setback; determine necessary action. (IV-D-13)

CT.AUT.20.50 Wheel and Tire Diagnosis and Repair (IV-E)

- CT.AUT.20.50.100 Diagnose tire wear patterns; determine necessary action. (IV-E-1)
- CT.AUT.20.50.102 Inspect tires; check and adjust air pressure. (IV-E-2)
- CT.AUT.20.50.104 Rotate tires according to manufacturer's recommendations. (IV-E-4)

CT.AUT.20.50.106	Balance wheel and tire assembly (static and dynamic).(IV-E-7)
CT.AUT.20.50.108	Reinstall wheel; torque lug nuts. (IV-E-9)
CT.AUT.20.50.200	Diagnose wheel/tire vibration, shimmy, and noise; determine necessary action. (IV-E-3)
CT.AUT.20.50.202	Measure wheel, tire, axle, and hub runout; determine necessary action. (IV-E-5)
CT.AUT.20.50.204	Diagnose tire pull (lead) problem; determine necessary action. (IV-E-6)
CT.AUT.20.50.205	Dismount, inspect, repair, and remount tire on wheel. (IV-E-8)
CT.AUT.20.50.206	Inspect and repair tire. (IV-E-10)

CT.AUT.30 BRAKES (V)

ACT.AUT.30.10 General Brake Systems Diagnosis (V-A)

CT.AUT.30.10.100	Identify and interpret brake system concern; determine necessary action.(V-A-1)
CT.AUT.30.10.102	Research applicable vehicle and service information, such as brake system operation, vehicle service history, service precautions, and technical service bulletins. (V-A-2)
CT.AUT.30.10.104	Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, calibration decals).(V-A-3)

CT.AUT.30.20 Hydraulic System Diagnosis and Repair (V-B)

CT.AUT.30.20.100	Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's Law). (V-B-1)
CT.AUT.30.20.102	Remove, bench bleed, and reinstall master cylinder. (V-B-4)
CT.AUT.30.20.104	Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine necessary action. (V-B-5)
CT.AUT.30.20.106	Select, handle, store, and fill brake fluids to proper level. (V-B-8)
CT.AUT.30.20.108	Bleed (manual, pressure, vacuum or surge) brake system. (V-B-12)
CT.AUT.30.20.200	Measure brake pedal height; determine necessary action. (V-B-2)
CT.AUT.30.20.202	Check master cylinder for internal and external leaks and proper operation; determine necessary action. (V-B-3)
CT.AUT.30.20.204	Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and supports; determine necessary action. (V-B-6)
CT.AUT.30.20.206	Install brake lines (double flare and ISO types); replace hoses, fittings, and supports as needed. (V-B-7)
CT.AUT.30.20.208	Inspect, test, and/or replace metering (hold-off), proportioning (balance), pressure differential, and combination valves. (V-B-9)
CT.AUT.30.20.210	Inspect, test, and adjust height (load) sensing proportioning valve. (V-B-10)
CT.AUT.30.20.212	Inspect, test, and/or replace components of brake warning light system. (V-B-11)
CT.AUT.30.20.214	Flush hydraulic system. (V-B-13)

CT.AUT.30.30 Drum Brake Diagnosis and Repair (V-C)

CT.AUT.30.30.100	Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action. (V-C-1)
CT.AUT.30.30.102	Remove, clean (using proper safety procedures), inspect, and measure brake drums; determine necessary action. (V-C-2)
CT.AUT.30.30.104	Refinish brake drum. (V-C-3)
CT.AUT.30.30.106	Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble. (V-C-4)
CT.AUT.30.30.108	Pre-adjust brake shoes and parking brake before installing brake drums or drum/hub assemblies and wheel bearings. (V-C-6)
CT.AUT.30.30.110	Install wheel, torque lug nuts, and make final checks and adjustments. (V-C-7)
CT.AUT.30.30.200	Remove, inspect, and install wheel cylinders. (V-C-5)

CT.AUT.30.40 Disc Brake Diagnosis and Repair (V-D)

- CT.AUT.30.40.100 Diagnose poor stopping, noise, pulling, grabbing, dragging or pedal pulsation concerns; determine necessary action. (V-D-1)
- CT.AUT.30.40.102 Remove caliper assembly from mountings; clean and inspect for leaks and damage to caliper housing; determine necessary action. (V-D-2)
- CT.AUT.30.40.104 Clean and inspect caliper mounting and slides for wear and damage; determine necessary action. (V-D-3)
- CT.AUT.30.40.106 Remove, clean, and inspect pads and retaining hardware; determine necessary action. (V-D-4)
- CT.AUT.30.40.108 Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads, and inspect for leaks. (V-D-6)
- CT.AUT.30.40.110 Clean, inspect, and measure rotor with a dial indicator and a micrometer; follow manufacturer's recommendations in determining need to machine or replace. (V-D-7)
- CT.AUT.30.40.112 Remove and reinstall rotor. (V-D-8)
- CT.AUT.30.40.114 Refinish rotor according to manufacturer's recommendations. (V-D-9)
- CT.AUT.30.40.116 Install wheel, torque lug nuts, and make final checks and adjustments. (V-D-11)
- CT.AUT.30.40.200 Adjust calipers equipped with an integrated parking brake system. (V-D-10)

CT.AUT.30.50 Power Assist Units Diagnosis and Repair (V-E)

- CT.AUT.30.50.200 Test pedal free travel with and without engine running; check power assist operation. (V-E-1)
- CT.AUT.30.50.202 Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster. (V-E-2)
- CT.AUT.30.50.204 Inspect the vacuum-type power booster unit for vacuum leaks; inspect the check valve for proper operation; determine necessary action. (V-E-3)

CT.AUT.30.60 Miscellaneous Diagnosis and Repair (Wheel Bearings, Parking Brakes, Electrical, Etc.) (V-F)

- CT.AUT.30.60.100 Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action. (V-F-1)
- CT.AUT.30.60.102 Remove, clean, inspect, repack, and install wheel bearings and replace seals; install hub and adjust wheel bearings. (V-F-2)
- CT.AUT.30.60.104 Check parking brake operation; determine necessary action. (V-F-4)
- CT.AUT.30.60.106 Check operation of brake stop light system; determine necessary action. (V-F-6)
- CT.AUT.30.60.108 Replace wheel bearing and race. (V-F-7)
- CT.AUT.30.60.110 Inspect and replace wheel studs. (V-F-8)
- CT.AUT.30.60.200 Check parking brake cables and components for wear, rusting, binding, and corrosion; clean, lubricate, or replace as needed. (V-F-3)
- CT.AUT.30.60.202 Check operation of parking brake indicator light system. (V-F-5)
- CT.AUT.30.60.204 Remove and reinstall sealed wheel bearing assembly. (V-F-9)

CT.AUT.30.70 Antilock Brake and Traction Control Systems (V-G)

- CT.AUT.30.70.202 Identify and inspect antilock brake system (ABS) components; determine necessary action. (V-G-1)
- CT.AUT.30.70.204 Diagnose poor stopping, wheel lock-up, abnormal pedal feel or pulsation, and noise concerns caused by the antilock brake system (ABS); determine necessary action. (V-G-2)
- CT.AUT.30.70.206 Diagnose antilock brake system (ABS) electronic control(s) and components using self-diagnosis and/or recommended test equipment; determine necessary action. (V-G-3)
- CT.AUT.30.70.208 Depressurize high-pressure components of the antilock brake system (ABS). (V-G-4)
- CT.AUT.30.70.210 Bleed the antilock brake system's (ABS) front and rear hydraulic circuits. (V-G-5)
- CT.AUT.30.70.212 Test, diagnose and service ABS speed sensors, toothed ring (tone wheel), and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO) (includes output signal, resistance, shorts to voltage/ground, and frequency data). (V-G-7)
- CT.AUT.30.70.214 Identify traction control system components. (V-G-8)

CT.AUT.40 ELECTRICAL/ELECTRONIC SYSTEMS (VI)

CT.AUT.40.10 General Electrical System Diagnosis (VI-A)

- CT.AUT.40.10.100 Identify and interpret electrical/electronic system concern; determine necessary action.(VI-A-1)
- CT.AUT.40.10.102 Research applicable vehicle and service information, such as electrical/electronic system operation, vehicle service history, service precautions, and technical service bulletins. (VI-A-2)
- CT.AUT.40.10.104 Locate and interpret vehicle and major component identification numbers(VIN, vehicle certification labels, and calibration decals). (VI-A-3)
- CT.AUT.40.10.106 Diagnose electrical/electronic integrity for series, parallel and series-parallel circuits using principles of electricity (Ohm's Law). (VI-A-4)
- CT.AUT.40.10.108 Use wiring diagrams during diagnosis of electrical circuit problems. (VI-A-5)
- CT.AUT.40.10.110 Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems. (VI-A-6)
- CT.AUT.40.10.112 Measure source voltage and perform voltage drop tests in electrical/electronic circuits using a voltmeter, determine necessary action. (VI-A-8)
- CT.AUT.40.10.114 Measure current flow in electrical/electronic circuits and components using an ammeter; determine necessary action. (VI-A-9)
- CT.AUT.40.10.116 Check continuity and measure resistance in electrical/electronic circuits and components using an ohmmeter; determine necessary action. (VI-A-10)
- CT.AUT.40.10.118 Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits; determine necessary action. (VI-A-12)
- CT.AUT.40.10.120 Measure and diagnose the cause(s) of excessive key-off battery drain (parasitic draw); determine necessary action. (VI-A-13)
- CT.AUT.40.10.122 Inspect and test fusible links, circuit breakers, and fuses; determine necessary action. (VI-A-14)
- CT.AUT.40.10.124 Inspect and test switches, connectors, relays, solid state devices, and wires of electrical/electronic circuits; perform necessary action. (VI-A-15)
- CT.AUT.40.10.126 Repair wiring harnesses and connectors. (VI-A-16)
- CT.AUT.40.10.128 Perform solder repair of electrical wiring. (VI-A-17)
- CT.AUT.40.10.200 Check electrical circuits with a test light; determine necessary action. (VI-A-7)
- CT.AUT.40.10.202 Check electrical circuits using fused jumper wires; determine necessary action. (VI-A-11)

CT.AUT.40.20 Battery Diagnosis and Service (VI-B)

- CT.AUT.40.20.100 Perform battery state-of-charge test; determine necessary action. (VI-B-1)
- CT.AUT.40.20.102 Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action. (VI-B-2)
- CT.AUT.40.20.104 Maintain or restore electronic memory functions. (VI-B-3)
- CT.AUT.40.20.106 Inspect and clean battery cables, connectors, clamps, and hold-downs; repair or replace as needed. (VI-B-6)
- CT.AUT.40.20.108 Start a vehicle using jumper cables and a battery or auxiliary power supply. (VI-B-7)
- CT.AUT.40.20.200 Inspect, clean, fill, and replace battery. (VI-B-4)
- CT.AUT.40.20.202 Perform slow/fast battery charge. (VI-B-5)

CT.AUT.40.30 Starting System Diagnosis and Repair (VI-C)

- CT.AUT.40.30.100 Perform starter current draw tests; determine necessary action. (VI-C-1)
- CT.AUT.40.30.102 Perform starter circuit voltage drop tests; determine necessary action. (VI-C-2)
- CT.AUT.40.30.104 Remove and install starter in a vehicle. (VI-C-4)
- CT.AUT.40.30.200 Inspect and test starter relays and solenoids; determine necessary action(VI-C-3)
- CT.AUT.40.30.202 Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action. (VI-C-5)
- CT.AUT.40.30.204 Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition. (VI-C-6)

CT.AUT.40.40 Charging System Diagnosis and Repair (VI-D)

- CT.AUT.40.40.100 Perform charging system output test; determine necessary action. (VI-D-1)
- CT.AUT.40.40.102 Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions. (VI-D-2)
- CT.AUT.40.40.104 Remove, inspect, and install generator (alternator). (VI-D-4)
- CT.AUT.40.40.106 Perform charging circuit voltage drop tests; determine necessary action. (VI-D-5)
- CT.AUT.40.40.200 Inspect, adjust, or replace generator (alternator) drive belts, pulleys, and tensioners; check pulley and belt alignment. (VI-D-3)

CT.AUT.40.50 Lighting Systems Diagnosis and Repair (VI-E)

- CT.AUT.40.50.100 Diagnose the cause of brighter than normal, intermittent, dim, or no light operation; determine necessary action. (VI-E-1)
- CT.AUT.40.50.200 Inspect replace, and aim headlights and bulbs. (VI-E-2)
- CT.AUT.40.50.202 Inspect and diagnose incorrect turn signal or hazard light operation; perform necessary action. (VI-E-3)

CT.AUT.40.60 Gauges, Warning Devices, and Driver Information Systems Diagnosis and Repair (VI-F)

- CT.AUT.40.60.200 Inspect and test gauges and gauge sending units for cause of intermittent, high, low, or no gauge readings; determine necessary action. (VI-F-1)
- CT.AUT.40.60.202 Inspect and test connectors, wires, and printed circuit boards of gauge circuits; determine necessary action. (VI-F-2)
- CT.AUT.40.60.204 Diagnose the cause of incorrect operation of warning devices and other driver information systems; determine necessary action. (VI-F-3)
- CT.AUT.40.60.206 Inspect and test sensors, connectors, and wires of electronic instrument circuits; determine necessary action. (VI-F-4)

CT.AUT.40.70 Horn and Wiper/Washer Diagnosis and Repair (VI-G)

- CT.AUT.40.70.215 Diagnose incorrect horn operation; perform necessary action. (VI-G-1)
- CT.AUT.40.70.216 Diagnose incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action. (VI-G-2)
- CT.AUT.40.70.217 Diagnose incorrect washer operation; perform necessary action. (VI-G-3)

CT.AUT.40.80 Accessories Diagnosis and Repair (VI-H)

- CT.AUT.40.80.200 Diagnose incorrect operation of motor-driven accessory circuits; determine necessary action. (VI-H-1)
- CT.AUT.40.80.202 Diagnose incorrect electric lock operation; determine necessary action. (VI-H-3)
- CT.AUT.40.80.204 Disarm and enable the airbag system for vehicle service. (VI-H-6)
- CT.AUT.40.80.206 Diagnose radio static and weak, intermittent, or no radio reception; determine necessary action. (VI-H-7)
- CT.AUT.40.80.208 Remove and reinstall door panel. (VI-H-8)
- CT.AUT.40.80.210 Check for module communication errors using a scan tool. (VI-H-10)

CT.AUT.50 ENGINE PERFORMANCE (VIII)

CT.AUT.50.10 General Engine Diagnosis (VIII-A)

- CT.AUT.50.10.100 Identify and interpret engine performance concern; determine necessary action. (VIII-A-1)
- CT.AUT.50.10.102 Research applicable vehicle and service information, such as engine management system operation, vehicle service history, service precautions, and technical service bulletins. (VIII-A-2)
- CT.AUT.50.10.104 Locate and interpret vehicle and major component identification numbers (VIN, vehicle certification labels, and calibration decals). (VIII-A-3)
- CT.AUT.50.10.106 Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action. (VIII-A-7)

CT.AUT.50.10.108	Perform cylinder power balance test; determine necessary action. (VIII-A-8)
CT.AUT.50.10.110	Perform cylinder compression tests; determine necessary action. (VIII-A-9)
CT.AUT.50.10.112	Perform cylinder leakage test; determine necessary action. (VIII-A-10)
CT.AUT.50.10.114	Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns with an oscilloscope and/or engine diagnostic equipment; determine necessary action. (VIII-A-11)
CT.AUT.50.10.116	Prepare 4 or 5 gas analyzer; inspect and prepare vehicle for test, and obtain exhaust readings; interpret readings, and determine necessary action. (VIII-A-12)
CT.AUT.50.10.118	Verify engine operating temperature; determine necessary action. (VIII-A-13)
CT.AUT.50.10.120	Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank and hoses; perform necessary action. (VIII-A-14)
CT.AUT.50.10.200	Inspect engine assembly for fuel, oil, coolant, and other leaks; determine necessary action. (VIII-A-4)
CT.AUT.50.10.202	Diagnose abnormal engine noise or vibration concerns; determine necessary action. (VIII-A-5)
CT.AUT.50.10.204	Diagnose abnormal exhaust color, odor, and sound; determine necessary action. (VIII-A-6)
CT.AUT.50.10.206	Verify correct camshaft timing. (VIII-A-15)

CT.AUT.50.20 Computerized Engine Controls Diagnosis and Repair (VIII-B)

CT.AUT.50.20.200	Retrieve and record stored OBD I diagnostic trouble codes; clear codes. (VIII-B-1)
CT.AUT.50.20.202	Retrieve and record stored OBD H diagnostic trouble codes; clear codes. (VIII-B-2)
CT.AUT.50.20.204	Diagnose the causes of emissions or driveability concerns resulting from malfunctions in the computerized engine control system with stored diagnostic trouble codes. (VIII-B-3)
CT.AUT.50.20.206	Diagnose emissions or driveability concerns resulting from malfunctions in the computerized engine control system with no stored diagnostic trouble codes; determine necessary action. (VIII-B-4)
CT.AUT.50.20.208	Check for module communication errors using a scan tool. (VIII-B-5)
CT.AUT.50.20.210	Inspect and test computerized engine control system sensors, powertrain control module (PCM), actuators, and circuits using a graphing multimeter (GMM)/digital storage oscilloscope (DSO); perform necessary action. (VIII-B-6)
CT.AUT.50.20.212	Obtain and interpret scan tool data. (VIII-B-7)
CT.AUT.50.20.214	Access and use service information to perform step-by-step diagnosis. (VIII-B-8)

CT.AUT.50.30 Ignition System Diagnosis and Repair (VIII-C)

CT.AUT.50.30.100	Diagnose ignition system related problems such as no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emissions concerns on vehicles with electronic ignition (distributorless) systems; determine necessary action. (VIII-C-1)
CT.AUT.50.30.102	Diagnose ignition system related problems such as no-starting, hard starting, engine misfire, poor driveability, spark knock, power loss, poor mileage, and emissions concerns on vehicles with distributor ignition (DI) systems; determine necessary action. (VIII-C-2)
CT.AUT.50.30.104	Inspect and test ignition primary circuit wiring and solid state components; perform necessary action. (VIII-C-3)
CT.AUT.50.30.106	Inspect, test and service distributor. (VIII-C-4)
CT.AUT.50.30.108	Inspect and test ignition system secondary circuit wiring and components; perform necessary action. (VIII-C-5)
CT.AUT.50.30.110	Inspect and test ignition coil(s); perform necessary action. (VIII-C-6)
CT.AUT.50.30.112	Check and adjust ignition system tin-fing and timing advance/retard (where applicable). (VIII-C-7)
CT.AUT.50.30.114	Inspect and test ignition system pick-up sensor or triggering devices; perform necessary action. (VIII-C-8)

CT.AUT.50.40 Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair (VIII-D)

CT.AUT.50.40.100	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 on vehicles with injection-type fuel systems; determine necessary action. (VIII-D-2)
CT.AUT.50.40.102	Inspect and test mechanical and electrical fuel pumps and pump control systems for pressure, regulation and volume; perform necessary action. (VIII-D-4)
CT.AUT.50.40.104	Replace fuel filters. (VIII-D-5)
CT.AUT.50.40.106	Perform exhaust system back-pressure test; determine necessary action. (VIII-D-12)
CT.AUT.50.40.200	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 on vehicles with carburetor-type fuel systems; determine necessary action. (VIII-D-1)
CT.AUT.50.40.202	Check fuel for contaminants and quality; determine necessary action. (VIII-D-3)
CT.AUT.50.40.204	Inspect and test cold enrichment system and components; perform necessary action. (VIII-D-6)
CT.AUT.50.40.206	Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air. (VIII-D-7)
CT.AUT.50.40.208	Inspect and test fuel injectors. (VIII-D-8)
CT.AUT.50.40.210	Check idle speed and fuel mixture. (VIII-D-9)
CT.AUT.50.40.212	Adjust idle speed and fuel mixture. (VIII-D-10)
CT.AUT.50.40.214	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. (VIII-D-11)

CT.AUT.50.50 Emissions Control Systems Diagnosis and Repair (VIII-E)

CT.AUT.50.50.a	Positive Crankcase Ventilation.(VIII-E-1)
CT.AUT.50.50.a.200	Diagnose oil leaks, emissions, and driveability problems resulting from malfunctions in the positive crankcase ventilation (PCV) system; determine necessary action.(VIII-E-1-1)
CT.AUT.50.50.a.202	Inspect, test and service positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; perform necessary action. .(VIII-E-1-2)
CT.AUT.50.50.b	Exhaust Gas Recirculation.(VIII-E-2)
CT.AUT.50.50.b.100	Diagnose emissions and driveability problems caused by malfunctions in the exhaust gas recirculation (EGR) system; determine necessary action.(VIII-E-2-1)
CT.AUT.50.50.b.200	Inspect test, service and replace components of the EGR system, including EGR tubing, exhaust passages, vacuum/pressure controls, filters and hoses; perform necessary action.(VIII-E-2-2)
CT.AUT.50.50.b.202	Inspect and test electrical/electronic sensors, controls, and wiring of exhaust gas recirculation (EGR) systems; perform necessary action.(VIII-E-2-3)
CT.AUT.50.50.c	Exhaust Gas Treatment.(VIII-E-3)
CT.AUT.50.50.c.100	Inspect and test catalytic converter performance.(VIII-E-3-4)
CT.AUT.50.50.c.200	Inspect and test mechanical components of secondary air injection systems; perform necessary action. (VIII-E-3-2)
CT.AUT.50.50.d	Intake Air Temperature Controls .(VIII-E-4)
CT.AUT.50.50.d.200	Diagnose emissions and driveability problems resulting from malfunctions in the intake air temperature control system; determine necessary action.(VIII-E-4-1)
CT.AUT.50.50.d.202	Inspect and test components of intake air temperature control system; perform necessary action.(VIII-E-4-2)
CT.AUT.50.50.e	Early Fuel Evaporation (Intake Manifold Temperature)Controls .(VIII-E-5)
CT.AUT.50.50.e.200	Inspect and test components of early fuel evaporation control system; perform necessary action.(VIII-E-5-2)

- CT.AUT.50.50.f Evaporative Emissions Controls.(VIII-E-6)
- CT.AUT.50.50.f.100 Diagnose emissions and driveability problems resulting from malfunctions in the evaporative emissions control system; determine necessary action. .(VIII-E-6-1)
- CT.AUT.50.50.f.102 Interpret evaporative emission related diagnostic trouble codes (DTCs); determine necessary action. .(VIII-E-6-3)
- CT.AUT.50.50.f.200 Inspect and test components and hoses of evaporative emissions control system; perform necessary action. .(VIII-E-6-2)

CT.AUT.50.60 Engine Related Service (VIII-F)

- CT.AUT.50.60.100 Remove and replace timing belt; verify correct camshaft timing. (VIII-F-2)
- CT.AUT.50.60.102 Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices; perform necessary action. (VIII-F-4)
- CT.AUT.50.60.200 Remove and replace thermostat. (VIII-F-3)