

Automotive Technology



Program / Hours: CIP 47.0604 –2 Year Program

Course Description: A program that prepares individuals to apply technical knowledge and skills to repair, service, and maintain all types of automobiles. Includes instruction in brake systems, electrical systems, engine performance, engine repair, suspension and steering, automatic and manual transmissions and drive trains, and heating and air conditioning systems.

Learning Activities / Modes of Assessment:

- Small Group
- Large Group
- Independent Work
- One-on-One
- Classwork Activities
- Technology Use
- Tests and Quizzes

Individual Resources:

- Textbook – Modern Automotive Technology (G-W Publisher)
- Workbook – Modern Automotive Technology (G-W Publisher)
- Schoology for Assignments
- PS2 – Safety Certifications
- AllData
- Mitchel On Demand
- Apollo Snap-On Scan Tool (Diagnostic Equipment)
- John Beam Alignment Equipment
- Computerized Tire Balancing by Hunter
- Snap-On / Hunter Tire Changer

Task #	Year/MP	K (Know)	U (Understand)	D (Do)
101	Y1M1	Explain and follow all lab rules	Why safety rules reduce risk and liability	Demonstrate adherence to lab rules
102	Y1M1–Y2M4	Participate in shop management	Workflow and organization impact efficiency	Assist with shop operations and organization
103	Y1M2	Participate in parts ordering	Inventory systems and part specifications	Identify correct parts and complete orders
104	Y1M1	Demonstrate shop safety and hygiene	Importance of cleanliness and contamination control	Maintain clean workstation and dispose waste properly
106	Y1M2	Customer service communication	Impact of communication on customer trust	Explain repairs to customers (role-play)
107	Y1M1	Identify the vehicle by VIN	Structure and meaning of VIN	Decode VIN and locate ID tags
108	Y1M3	Investigate career paths	Automotive career options and certifications	Research and present a pathway
109	Y1M2	Complete a work order	Importance of documentation	Complete work order accurately
110	Y1M2–Y2M4	Research service information	Use of service manuals and TSBs	Locate repair procedures
111	Y1M1	Interpret ID numbers	Component identification importance	Locate and interpret component numbers
201	Y1M1	Safety rules	Types of shop hazards	Follow all safety procedures
202	Y1M1–Y1M2	Lift operation	Weight distribution principles	Secure vehicle properly on lift
203	Y1M3	Oxy-acetylene equipment	Combustion and pressure safety	Set up/shut down equipment
204	Y1M1	SDS and Right-To-Know	Chemical safety laws	Interpret SDS sheets
205	Y1M1	Hand tools	Tool selection principles	Use hand tools correctly
206	Y1M2	Power tools	Safe power tool operation	Demonstrate safe operation
207	Y1M1	PPE	Purpose of PPE	Select appropriate PPE
208	Y1M1	Fire equipment	Fire classes and suppression	Use fire extinguisher correctly

210	Y1M2	EPA/OSHA	Environmental safety laws	Apply regulations in shop practices
301	Y1M1	Fasteners	Types and torque requirements	Install/remove fasteners properly
302	Y1M2	Re-thread tools	Thread repair concepts	Perform re-threading
303	Y1M2	Measuring tools	Precision and tolerances	Measure accurately
304	Y1M2– Y1M3	Specialty tools	Purpose of specialty tools	Use correctly
305	Y1M3	Thread repair	Causes of damage	Repair threads correctly
401	Y2M1– Y2M2	Prepare to obtain PA Safety Inspection Certification	Understand PA state inspection standards, criteria, and legal requirements for vehicle safety inspections	Conduct a full mock or supervised vehicle safety inspection using PA guidelines and document results accurately
402	Y2M2	Prepare to obtain EPA 609 Refrigerant Recovery and Recycling Certification	Understand environmental laws, refrigerant types, and proper recovery/recycling procedures for HVAC systems	Demonstrate proper refrigerant recovery, recycling, and handling procedures using approved equipment
403	Y2M3	Prepare to obtain Emission Inspection Certification	Understand emission control systems, testing standards, and regulatory compliance requirements	Perform an emissions inspection procedure or simulation including data collection and compliance determination
502	Y1M4	Identify suspension and steering concerns	Understand system operation and how wear or damage affects ride, handling, and safety	Inspect vehicle symptoms and identify likely suspension or steering concerns
507	Y2M1	Inspect rack and pinion gear and mountings	Understand rack and pinion design, mounting, and wear indicators	Inspect rack and pinion system and document condition of components
508	Y2M1	Inspect inner tie rod ends and boots	Understand tie rod function and protection provided by boots	Inspect components for wear, looseness, or damage

509	Y1M4	Inspect power steering fluid	Understand fluid types, purpose, and condition indicators	Check fluid level and condition and determine service need
510	Y2M1	Flush and bleed power steering system	Understand hydraulic system operation and fluid contamination impact	Perform flushing and bleeding procedure correctly
511	Y2M2	Diagnose power steering fluid leaks	Understand sources and causes of hydraulic leaks	Inspect system and determine leak source and corrective action
513	Y2M2	Remove and reinstall power steering pump	Understand pump function and system integration	Safely remove and reinstall power steering pump
514	Y2M2	Remove/install pulley and check alignment	Understand pulley alignment and belt tracking	Install pulley and verify proper alignment
515	Y2M2	Inspect and replace hoses and fittings	Understand pressure lines and failure points	Inspect and replace damaged hoses or fittings
516	Y2M2	Inspect and replace steering linkage components	Understand steering linkage function in system geometry	Inspect and replace linkage components properly
517	Y2M2	Replace tie rod ends and adjust	Understand alignment relationship of tie rods	Replace and adjust tie rod ends to specification
519	Y2M2	Inspect and replace control arms and bushings	Understand suspension articulation and bushing wear	Inspect and replace worn control arms and bushings
520	Y2M2	Inspect and replace strut rods	Understand role of strut rods in suspension stability	Inspect and replace components as needed
521	Y2M2	Inspect and replace ball joints	Understand pivot function and wear indicators	Inspect and replace ball joints safely
522	Y2M3	Inspect and replace steering knuckle assemblies	Understand attachment points and steering geometry	Remove and install steering knuckle components
523	Y2M2	Inspect and replace coil springs and insulators	Understand energy storage and ride height	Safely remove and install springs and insulators
524	Y2M2	Inspect and service torsion bars	Understand torsion bar suspension principles	Inspect and adjust torsion bar systems
525	Y2M2	Inspect and replace stabilizer components	Understand sway control and vehicle stability	Replace stabilizer links and bushings

526	Y2M2	Inspect and replace strut assemblies	Understand strut operation in suspension systems	Remove and install strut assemblies safely
527	Y1M4– Y2M2	Inspect and replace shock absorbers	Understand damping principles and ride quality	Inspect and replace shock absorbers
529	Y1M4	Lubricate suspension and steering systems	Understand lubrication points and maintenance needs	Apply appropriate lubrication procedures
530	Y2M1	Perform pre-alignment inspection	Understand alignment factors affecting tire wear and handling	Conduct inspection and prepare vehicle for alignment
531	Y2M2	Perform four-wheel alignment	Understand alignment angles and specifications	Perform alignment using equipment and verify results
535	Y2M3	Check subframe alignment	Understand frame alignment effects on vehicle geometry	Inspect and measure subframe alignment
536	Y1M3	Inspect tires and wear patterns	Understand causes of tire wear patterns	Evaluate tire condition and recommend action
537	Y2M2	Diagnose vibration and noise	Understand tire/wheel imbalance and alignment effects	Diagnose cause of vibration or noise concern
538	Y1M3	Rotate tires	Understand rotation patterns and maintenance intervals	Perform tire rotation correctly
539	Y2M2	Measure runout	Understand runout and balance issues	Measure and record runout values
542	Y1M3	Mount and balance tires	Understand balancing principles and TPMS integration	Mount and balance tire assemblies
544	Y1M3	Inspect tire for air loss	Understand causes of leaks	Inspect tire and locate source of air loss
545	Y1M3	Repair tire	Understand safe tire repair standards	Perform internal patch repair
546	Y2M1	TPMS systems and calibration	Understand TPMS types and operation	Calibrate and verify TPMS system
547	Y2M2	Replace TPMS sensors	Understand sensor function and relearn procedures	Replace sensors and perform relearn process

548	Y2M2	Identify reset procedures	Understand system reset requirements after service	Perform required reset procedures
549	Y2M3	Diagnose electronic power steering	Understand electronic steering system operation	Diagnose faults using appropriate tools
602	Y1M4	Identify and interpret brake system concerns	Understand brake system purpose, major components (hydraulic, friction, booster/ABS), and how symptoms relate to potential causes	Interview/verify concern, perform basic visual checks, and document initial findings and next diagnostic steps
605	Y1M4	Measure brake pedal height, travel, and free play as applicable	Understand how pedal measurements relate to hydraulic integrity, adjustment, and driver safety	Measure and record pedal height/travel/free play and compare to specifications
606	Y1M4	Check master cylinder for internal/external leaks and proper operation	Understand master cylinder function and signs of internal bypass or external leakage	Inspect for leaks, assess operation, and determine serviceability
607	Y2M1	Remove, bench bleed, and reinstall master cylinder	Understand why bench bleeding removes trapped air and prevents poor braking performance	Remove master cylinder, bench bleed using correct procedure, reinstall, and verify system readiness
608	Y1M4	Inspect brake lines, flexible hoses, and fittings for leaks/damage; tighten supports; determine actions	Understand how line/hoses condition affects hydraulic pressure and braking safety	Inspect components, correct minor issues (tighten/support), and document required repairs
609	Y2M1	Replace brake lines, hoses, fittings, and supports	Understand safe replacement practices and routing requirements to prevent chafing, kinks, or failure	Replace hydraulic lines/hoses/fittings/supports using correct materials and routing, then verify integrity
610	Y2M2	Fabricate brake lines using proper material and flaring procedures (double flare and ISO types)	Understand differences between flare types, material selection, and how improper flares cause leaks	Fabricate a brake line with correct flare type, install it, and verify leak-free operation
611	Y1M3	Select, handle, store, and test brake fluid for contamination and fill to proper level	Understand brake fluid types, hygroscopic nature, contamination risks, and proper handling/storage	Identify correct fluid, test for contamination as applicable, and fill to specification safely

612	Y2M2	Inspect, test, and replace components of brake warning light system	Understand warning light circuits/sensors and how they indicate system faults	Test the warning light system, identify the faulty component, and replace/verify operation
613	Y2M1	Bleed and flush brake system	Understand how air and contaminated fluid reduce braking performance and how bleeding restores hydraulic function	Bleed/flush system using correct sequence and method and confirm firm pedal
614	Y2M2	Diagnose poor stopping/noise/vibration/pulling/grabbing/dragging/pedal pulsation concerns	Understand common brake fault patterns and how to isolate mechanical vs. hydraulic vs. electronic causes	Perform a structured diagnosis, identify root cause, and recommend/complete corrective action
615	Y1M4	Remove, clean, inspect, and measure brake drums	Understand drum brake wear patterns and measurement specifications	Remove drums, clean safely, measure diameter/condition, and determine serviceability
616	Y2M1	Refinish brake drum and measure final drum diameter	Understand machining limits and how refinishing impacts braking and safety	Refinish drum within limits and record final diameter
617	Y1M4	Remove/inspect drum brake hardware; lubricate and reassemble	Understand drum brake component functions and correct hardware placement/adjustment	Disassemble drum brake, inspect components, lubricate contact points, reassemble correctly
618	Y2M1	Inspect and install wheel cylinders	Understand wheel cylinder function and signs of leakage or failure	Inspect and replace/install wheel cylinder and verify proper operation
619	Y2M1	Pre-adjust brake shoes and parking brake; install drums/drum hubs and wheel bearings	Understand shoe adjustment, parking brake linkage, and how bearing condition affects brake service	Pre-adjust shoes/parking brake, install drum/hub components, and confirm correct adjustment
620	Y2M1	Install wheel, torque lug nuts, and make final checks and adjustments	Understand torque patterns/specs and final safety verification steps after brake service	Install wheel, torque to spec, perform final checks, and document results

622	Y1M4	Remove caliper assembly; inspect for leaks and damage	Understand caliper operation and failure signs (leaks, binding, damage)	Remove caliper correctly and inspect housing/seals and overall condition
623	Y1M4	Clean and inspect caliper mounting and slides/pins for operation, wear, and damage	Understand how slide/pin condition affects pad wear and braking performance	Clean, inspect, lubricate, and verify free movement of slides/pins
624	Y1M4	Reassemble, lubricate, and reinstall caliper/pads/hardware; seat pads; inspect for leaks	Understand correct pad/hardware installation and why seating pads ensures proper contact	Install pads/hardware correctly, seat pads, and verify no leaks/abnormal operation
625	Y1M4	Clean, inspect, and measure rotor thickness, lateral runout, and thickness variation	Understand rotor measurement terms and how they relate to vibration/pulsation	Measure and record rotor specs and determine serviceability
626	Y1M4	Remove and reinstall rotor	Understand rotor mounting and hub interface considerations	Remove and reinstall rotor correctly and verify proper fitment
627	Y2M1	Refinish rotor and measure final rotor thickness	Understand machining limits and the impact of minimum thickness on safety	Refinish rotor within limits and record final thickness
630	Y1M4	Check brake pad wear indicator system operation	Understand mechanical/electrical wear indicators and their purpose	Verify indicator operation and document findings
632	Y2M2	Check vacuum supply to vacuum-type power booster and check power assist operation	Understand booster operation, vacuum supply, and symptoms of assist failure	Test vacuum supply and booster function and determine necessary actions
633	Y2M1	Service wheel bearings and races; replace seals; install hub; adjust bearings	Understand bearing function, lubrication, preload/adjustment, and contamination control	Clean/inspect/repack bearings, replace seals, install hub, adjust bearings to spec
634	Y2M1	Check parking brake cables/components; clean/lubricate/adjust/replace as needed	Understand parking brake system operation and common binding/corrosion issues	Inspect and service parking brake components and verify correct operation

635	Y1M4	Check parking brake and indicator light system operation	Understand indicator operation and how it communicates parking brake status	Verify parking brake engagement and indicator lamp function
636	Y1M3	Check operation of brake stop light system	Understand stop lamp circuit purpose and safety/legal implications	Test stop lamp operation and correct basic faults as appropriate
638	Y2M1	Inspect and replace wheel studs	Understand fastener integrity, torque retention, and safety risks of damaged studs	Replace wheel studs using correct procedures and verify wheel installation safety
639	Y2M1	Remove and reinstall sealed wheel bearing assembly	Understand sealed bearing design and common failure symptoms	Remove and install sealed bearing assembly and verify proper operation
640	Y2M2	Identify and inspect electronic brake control system components	Understand ABS/EBC component roles (sensors, modulators, controllers) and basic inspection points	Identify system components on a vehicle and perform visual/connection inspections
641	Y2M3	Diagnose electronic brake control system using DTCs and recommended test equipment	Understand diagnostic process using scan tools, DTCs, and electrical testing for ABS/EBC faults	Retrieve DTCs, perform guided tests, and document diagnosis and corrective action
643	Y2M3	Bleed the electronic brake control system hydraulic circuits	Understand why ABS modulator circuits may require special bleeding procedures	Perform electronic/ABS bleed procedure using proper tools and verify pedal feel
644	Y2M3	Identify traction control/vehicle stability control system components	Understand how traction/stability systems integrate braking, sensors, and control logic	Identify components and explain their function using a system diagram
645	Y2M4	Describe operation of a regenerative braking system	Understand how regenerative braking uses electric motor/generator operation to recover energy and how it blends with friction brakes	Explain regenerative braking operation using examples/data and identify safety considerations during service

702	Y1M3	Identify and interpret electrical/electronic system concerns.	Understand how electrical/electronic systems operate and how symptoms relate to likely circuit faults (open, short, high resistance, failed component).	Gather concern details, perform a basic inspection, and outline an initial diagnostic plan (tests to run and what each test will confirm).
705	Y1M4– Y2M1	Use wiring diagrams during diagnosis of electrical circuit problems.	Understand wiring diagram conventions (symbols, connectors, grounds, splices) and how to trace power/ground paths through a circuit.	Use a wiring diagram to identify test points and verify power/ground/continuity to isolate the fault in a given circuit.
706	Y1M3	Check electrical circuits with a test light.	Understand what a test light indicates about circuit power/ground and limitations compared to a meter.	Use a test light safely to verify power/ground presence and record results.
707	Y1M4	Check electrical circuits using fused jumper wires.	Understand when and why to use fused jumpers (bypassing components safely) and the risks of unfused bypassing.	Use fused jumper wires to bypass a component/circuit section to confirm a diagnosis without damaging the circuit.
708	Y2M1	Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits.	Understand common fault types and which tests (voltage drop, continuity, resistance) best identify each.	Perform targeted tests to locate a short/open/high resistance and document evidence supporting the conclusion.
709	Y2M2	Measure and diagnose the cause(s) of excessive parasitic draw.	Understand parasitic draw theory, normal draw ranges (conceptually), and how modules/sleep modes affect readings.	Set up an ammeter correctly, measure draw, isolate the source using fuses/strategic disconnects, and report findings.
710	Y1M4	Inspect and test fusible links, circuit breakers, and fuses.	Understand overcurrent protection devices and how failures present (open circuit, intermittent connection).	Inspect and test fuses/links/breakers using correct methods and determine serviceability.
711	Y2M1	Inspect and test switches, connectors, relays, solenoid solid state devices,	Understand how control devices and connections affect circuit operation,	Test switches/relays/solenoids/connectors with appropriate

		and wires of electrical/electronic circuits.	including voltage drop across contacts and connector integrity.	tools and determine whether to repair/replace.
712	Y2M1	Remove and replace terminal end from connector, replace connectors, and terminal ends.	Understand proper terminal/connector repair standards (crimping, pin fit, weather sealing) and why poor repairs cause repeat failures.	Repair a connector/terminal using correct tools and verify circuit integrity after repair.
713	Y2M1	Repair wiring harness and solder repair.	Understand acceptable harness repair practices (splicing, strain relief, insulation, routing) and when soldering is appropriate.	Complete a harness repair that meets shop standards and verify operation of the affected circuit.
715	Y2M3	Identify location of electric hybrid vehicle high voltage circuit disconnect (service plug) location and safety procedures.	Understand high-voltage hazards, required PPE/procedures, and why service disconnect verification is essential before work.	Locate the service disconnect on a vehicle/trainer and demonstrate safe disable/verify steps per procedure.
716	Y1M4	Perform battery state-of-charge test.	Understand state-of-charge concept and how SOC impacts starting/charging diagnosis.	Test battery SOC using approved method/tool and interpret results to determine next steps.
717	Y2M1	Perform battery capacity test and confirm proper battery capacity for vehicle application.	Understand capacity vs SOC, load testing principles, and battery rating requirements for applications.	Perform a capacity/load test, compare to spec, and determine serviceability.
718	Y2M2	Maintain and restore electronic memory functions.	Understand how memory keep-alive functions work and what systems may reset after battery disconnect.	Use memory saver procedures/tools as appropriate and restore settings/functions after service.
719	Y1M4	Inspect, clean, fill, and replace battery, battery cables, connectors, clamps, and hold-downs.	Understand causes/effects of corrosion, loose connections, and improper retention on electrical performance.	Service or replace battery/cables/terminals and verify secure, clean connections.

720	Y1M3	Perform battery charge.	Understand charging safety, charger settings, and why proper charging prevents battery damage.	Charge a battery using correct charger type/settings and confirm charge completion.
721	Y1M3	Start a vehicle using jumper cables or an auxiliary power supply.	Understand safe jump-start procedures, polarity risks, and connection order.	Perform a jump-start safely using correct connection/disconnection sequence.
722	Y2M2	Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry following battery disconnect.	Understand which systems may require relearn/reinitialization and how battery service can affect customer convenience/security features.	Identify affected systems on a given vehicle and document required reinitialization of steps/resources.
723	Y2M1	Perform starter current draw tests.	Understand how current draw relates to starter load, circuit condition, and mechanical resistance.	Measure starter current draw and interpret results to determine likely fault area.
724	Y2M1	Perform starter circuit voltage drop tests.	Understand voltage drop testing and why it is preferred for loaded circuit diagnosis.	Perform voltage drop tests on starter circuits and identify excessive drops.
725	Y2M1	Inspect and test starter relays and solenoids.	Understand relay/solenoid operation and common failure modes.	Test relay/solenoid function and determine serviceability.
726	Y2M1	Remove and install starter in a vehicle.	Understand safe removal/installation practices and proper fastening/electrical connection standards.	Remove and install a starter and verify proper operation.
727	Y2M2	Inspect and test switches, connectors, and wires of starter control circuits and perform necessary action.	Understand control side vs power side of starter circuits and how faults prevent engagement.	Diagnose a starter control circuit issue and complete the required repair.
728	Y2M2	Differentiate between electrical and engine mechanical problems that	Understand symptom patterns that separate electrical supply/starting	Use test results (voltage, current, cranking speed) to determine whether the

		cause a slow-crank or no-crank condition.	issues from mechanical engine resistance problems.	cause is electrical or mechanical.
729	Y2M1	Perform charging system output test and determine necessary action.	Understand alternator/generator output basics and how to evaluate system performance under load.	Test charging output and identify needed service actions based on results.
730	Y2M2	Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions.	Understand common charging faults (belt drive, wiring, regulator/control, component failure) and their symptoms.	Perform a structured diagnosis to identify the root cause and document corrective action.
732	Y2M1	Remove, inspect, and install generator (alternator).	Understand alternator mounting/drive considerations and inspection points (connections, pulley, belt alignment).	Remove and install alternator correctly and verify charging system operation.
735	Y1M3	Inspect, replace, and aim headlights and bulbs.	Understand lighting circuit basics and why proper aim is a safety requirement.	Replace bulbs as needed and aim headlights to specification.
739	Y2M2	Diagnose the cause of incorrect operation of warning devices and other driver information systems.	Understand how inputs (switches/sensors/modules) and outputs (indicators/chimes/displays) interact.	Diagnose an inoperative/malfunctioning warning or info system using diagrams and testing.
740	Y2M2	Diagnose incorrect horn operation.	Understand horn circuit operation (switch, relay, power/ground).	Diagnose horn circuit faults and verify repair.
741	Y2M2	Diagnose incorrect wiper operation and diagnose wiper speed control and park problems.	Understand wiper motor/control circuits including park function and speed control.	Diagnose wiper system faults (speed/park) and verify proper operation.
742	Y2M2	Diagnose incorrect washer operation.	Understand washer system operation (pump, switch, power/ground, fluid path).	Diagnose washer faults and verify system operation.
743	Y2M2	Diagnose incorrect operation of motor-driven accessory circuits.	Understand typical motor circuit control and protection	Diagnose a motor-driven accessory fault using diagrams

			strategies (relays, fuses, modules).	and testing and document the fix.
746	Y1M4	Remove and reinstall door panel.	Understand basic trim fasteners, connectors, and safe removal to prevent damage.	Remove and reinstall a door panel without damage and verify reconnected components operate.
747	Y1M3– Y1M4	Use a digital multimeter (DMM).	Understand meter functions (voltage, resistance, current), proper settings, and safe connection methods.	Use a DMM to perform voltage/continuity/resistance checks and accurately interpret readings.
748	Y2M3	Demonstrate knowledge of an automatic idle start/stop system.	Understand start/stop system purpose, major components, and conditions that enable/disable operation.	Explain start/stop operation on a specific vehicle/trainer and identify key components and safety considerations.
802	Y1M4	Identify and interpret engine performance concern.	Understand how engine performance symptoms relate to possible mechanical, fuel, ignition, air, and emissions causes.	Verify the concern (symptom description + basic checks) and document an initial diagnostic plan and safety precautions.
806	Y1M4	Diagnose abnormal engine noise or vibration concerns.	Understand common sources of engine noise/vibration and how operating conditions affect diagnosis.	Use a structured approach (listen/feel/inspect) to identify likely source(s) and document findings.
807	Y1M4	Diagnose abnormal exhaust color, odor, and sound.	Understand what exhaust color/odor/sound can indicate about combustion, oil/coolant entry, or exhaust leaks.	Observe exhaust symptoms, identify likely causes, and document recommended next diagnostic steps.
808	Y2M1	Perform engine absolute (vacuum/boost) manifold pressure tests.	Understand manifold pressure/vacuum as an indicator of engine load, sealing, and air intake conditions.	Perform manifold pressure/vacuum/boost testing using appropriate tools and interpret results.
809	Y2M2	Perform cylinder power balance test.	Understand how cylinder contribution affects engine	Conduct a power balance test and identify weak/non-

			smoothness and performance.	contributing cylinders using approved methods.
810	Y2M1	Perform cylinder cranking and running compression tests.	Understand compression principles and how results indicate engine mechanical condition.	Perform compression testing (cranking and running as applicable), record results, and compare to specifications.
811	Y2M2	Perform cylinder leakage test.	Understand leak-down testing and how leakage location identifies the fault path (intake, exhaust, rings, head gasket).	Perform a leak-down test, identify leakage source(s), and document conclusions.
812	Y2M2	Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns.	Understand how multiple systems interact and how to isolate root causes using evidence-based testing.	Apply a step-by-step diagnostic routine to identify the root cause and document the test results supporting the diagnosis.
813	Y1M4	Verify engine operating temperature.	Understand why correct operating temperature is required for performance, emissions control, and accurate diagnosis.	Verify operating temperature using appropriate tools and determine whether temperature is within specification.
816	Y2M1	Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data and clear codes when applicable.	Understand what DTCs, freeze frame data, and monitor status indicate about operating conditions and fault detection.	Retrieve and record DTCs/monitor status/freeze frame, clear codes when appropriate, and document results.
817	Y2M2	Diagnose emissions or drivability concerns with stored/active DTCs; obtain, graph, and interpret scan tool data.	Understand scan tool data (PIDs), graphing, and how data trends support diagnosis.	Use scan tool data to isolate the fault, graph relevant parameters, and document interpretation and conclusion.
818	Y2M1	Access and use service information to perform step-by-step diagnosis.	Understand how to follow OEM/service procedures, TSBs, and diagnostic flowcharts to ensure accurate repairs.	Locate correct service information and follow a diagnostic procedure, documenting each step and outcome.

819	Y2M2	Perform active tests of actuators using a scan tool.	Understand how bi-directional controls validate actuator and circuit operation.	Command actuators with a scan tool safely and interpret responses to confirm or rule out faults.
820	Y2M2	Describe the importance of running all OBDII monitors for repair verification.	Understand readiness monitors and why completed monitors confirm repair effectiveness and compliance.	Explain monitor completion requirements and verify readiness status after a repair scenario.
822	Y2M2	Inspect and test ignition primary and secondary circuit wiring and solid-state components and test ignition coil(s).	Understand ignition system operation and how primary/secondary faults impact misfire and drivability.	Inspect/test ignition circuits and coils using appropriate equipment and document results.
823	Y2M2	Inspect and test crankshaft and camshaft position sensor(s).	Understand sensor role in timing and engine control and how failures affect starting and performance.	Test CKP/CMP sensors and related circuits and determine serviceability.
824	Y2M3	Inspect, test, and replace ignition control module and powertrain/engine control module and reprogram as necessary.	Understand module functions, verification steps, and why reprogramming may be required after replacement.	Verify module fault, replace as appropriate, and complete required reprogramming/setup steps per procedure.
825	Y2M3	Diagnose hot/cold no-start, hard start, poor drivability, idle/misfire/power loss/stall/mileage/dieseling/emissions problems.	Understand drivability symptom patterns and how to prioritize tests to efficiently isolate root causes.	Diagnose a drivability/no-start concern using a structured workflow and document evidence and corrective action.
826	Y2M2	Inspect and test fuel pumps and pump control systems for pressure, regulation, and volume.	Understand fuel delivery requirements and how pressure/volume/regulation issues affect performance.	Test fuel pump output/pressure/volume and control operation and interpret results.
827	Y1M4	Replace fuel filters.	Understand filtration purpose, service intervals, and safety procedures for fuel system service.	Replace a fuel filter safely and verify no leaks and proper operation.

828	Y2M2	Inspect throttle body, air induction system, intake manifold, and gaskets for vacuum leaks and unmetered air.	Understand how unmetered air/vacuum leaks affect fuel trim, idle, and drivability.	Inspect/test for vacuum leaks/unmetered air and document findings and corrective actions.
829	Y2M2	Inspect and test fuel injectors.	Understand injector operation and how faults cause misfire/lean/rich conditions.	Test injector operation using appropriate procedures/tools and determine serviceability.
830	Y2M2	Verify idle control operation.	Understand idle control strategies and how faults affect idle speed and stability.	Verify idle control operation and identify needed service actions based on test results.
831	Y1M4	Inspect integrity of exhaust manifold/pipes/muffler(s)/catalytic converter(s)/resonator(s)/tail pipe(s)/heat shield(s).	Understand exhaust system routing, sealing, and the impact of leaks/restrictions on performance and safety.	Inspect exhaust components for leaks/damage/restrictions and document required repairs.
833	Y2M2	Inspect, test, and service PCV filter/breather cap, valve, tubes, orifices, and hoses.	Understand crankcase ventilation purpose and how restrictions/leaks affect oil control and drivability.	Service/test PCV components and verify proper system operation.
835	Y2M3	Inspect/test/service/replace EGR system components (sensors, controls, wiring, tubing, passages, vacuum/pressure controls, filters, hoses).	Understand EGR purpose, typical failure modes, and how EGR faults affect drivability and emissions.	Test EGR system operation, service/replace components as needed, and verify repair.
837	Y2M3	Inspect and test mechanical components of secondary air injection systems.	Understand secondary air injection purpose and mechanical component operation (valves, pumps, passages).	Inspect/test mechanical components and document condition and required service.
838	Y2M3	Inspect and test electrical/electronically operated components and circuits of air injection systems.	Understand how electronic controls and circuits operate the air injection system and how faults present.	Test electrical components/circuits and verify correct operation after repair.

839	Y2M3	Inspect and test catalytic converter efficiency.	Understand converter function and how efficiency is evaluated using sensor data and test procedures.	Evaluate converter efficiency using approved methods and document results.
841	Y2M3	Inspect and test components and hoses of the evaporative emissions control system.	Understand EVAP purpose, sealing requirements, and common leak/failure points.	Inspect/test EVAP components/hoses for leaks and determine necessary actions.
842	Y2M3	Interpret DTCs and scan tool data related to emissions control systems.	Understand how emissions-related DTCs map to system operation and how scan data supports diagnosis.	Interpret emissions DTCs/scan data, identify likely root cause, and document the diagnostic conclusion.
847	Y1M4	Remove, inspect and install spark plugs. Measure spark plug gap.	Understand spark plug function, heat range/gap effects, and signs of abnormal combustion or wear.	Remove/inspect/install spark plugs, measure/set gap as applicable, and verify proper engine operation.
902	Y1M3	Verify operation of the instrument panel engine warning indicators.	Understand purpose and meaning of engine warning indicators and how they relate to system monitoring.	Verify indicator operation during key cycles or diagnostic test and identify abnormal behavior.
903	Y1M3	Install engine covers using gaskets, seals, and sealers.	Understand sealing surfaces, gasket function, and importance of proper sealant use.	Install engine covers with correct gaskets/sealers and verify leak-free fitment.
905	Y2M2	Identify valve adjustment procedures.	Understand valve train design and why proper adjustment affects engine performance and longevity.	Locate procedures/specifications and outline steps to correctly adjust valves.
906	Y1M4	Inspect, replace, and adjust drive belts, tensioners, and pulleys and check alignment.	Understand belt drive systems, tensioning methods, and alignment impact on wear and performance.	Inspect and replace belts/tensioners, set proper tension, and verify alignment.
907	Y1M3	Inspect and test coolant, drain and recover coolant, and flush and refill cooling system.	Understand coolant properties, contamination effects, and service procedures.	Test, drain, flush, and refill system with correct coolant and verify proper operation.

908	Y1M4	Perform cooling system pressure tests; inspect radiator, cap, tank, and hoses.	Understand cooling system pressure principles and how leaks or component failure affect operation.	Perform pressure test, inspect components, and document findings.
909	Y1M3	Identify components and inspect engine for fuel, oil, coolant, and other leaks.	Understand common leak sources and impact on performance and safety.	Inspect engine for leaks and determine source and corrective action.
910	Y2M3	Remove and replace timing belt or chain and verify camshaft timing.	Understand timing relationships between crankshaft and camshaft and consequences of incorrect timing.	Replace timing belt/chain and verify correct timing alignment.
911	Y1M4	Remove and replace thermostat and gasket/seal.	Understand thermostat function in regulating engine temperature.	Remove and replace thermostat and verify proper operation.
912	Y1M4	Inspect and test mechanical/electrical fans, fan clutch, shroud/ducting, and fan controls.	Understand airflow management and control of cooling fans.	Test fan operation and inspect components to determine serviceability.
913	Y1M2	Perform engine oil and filter change.	Understand lubrication system function and importance of routine maintenance.	Perform oil and filter change and verify correct level and no leaks.
1002	Y2M1	Check fluid level and fluid condition in a transmission or transaxle equipped with a dipstick.	Understand fluid purpose, correct fluid types, and how fluid condition/level relates to transmission operation and symptoms.	Check fluid level/condition using correct procedure and document findings and required actions.
1003	Y2M1	Check fluid level and fluid condition in a transmission or transaxle not equipped with a dipstick.	Understand manufacturer-specific level-check procedures and risks of incorrect level (overfill/underfill).	Verify fluid level/condition using the correct fill/level port procedure and document results.
1004	Y2M1	Drain, replace, and exchange fluid and filter(s).	Understand service intervals, filter purpose, and how proper service impacts durability and performance.	Perform transmission fluid and filter service/exchange following procedure and verify no leaks.

1005	Y2M1	Identify drivetrain components and configuration.	Understand drivetrain layouts (FWD/RWD/AWD/4WD) and how component configuration affects service and diagnosis.	Identify drivetrain components on a vehicle and describe the drivetrain configuration accurately.
1006	Y2M2	Inspect, adjust, and replace external manual valve shift linkage, transmission range sensor/switch, and park/neutral switch.	Understand how shift linkage and range/park-neutral inputs affect shifting, starting, and safety interlocks.	Inspect/adjust linkage and test/replace range or park/neutral components and verify correct operation.
1007	Y2M2	Inspect for leakage at external seals, gaskets, and bushings.	Understand common leak points and how leaks affect fluid level, operation, and customer concerns.	Inspect for leaks, identify source, and document recommended repair.
1008	Y2M2	Inspect, replace, and align powertrain mounts.	Understand mount purpose (support, vibration control) and how misalignment affects driveline angles and NVH.	Inspect mounts, replace as needed, align powertrain correctly, and verify improved operation.
1102	Y2M1	Drain and refill manual transmission/transaxle and final drive unit.	Understand lubricant types, service intervals, and how proper lubrication prevents wear and overheating.	Drain and refill with correct lubricant to specification and verify no leaks.
1103	Y2M1	Check and adjust clutch master cylinder fluid level.	Understand hydraulic clutch operation and how fluid level/condition affects engagement and shifting.	Inspect fluid level/condition, top off with correct fluid, and document findings.
1104	Y2M1	Check for system leaks.	Understand common leak sources in clutch/drivetrain systems and impacts on operation and safety.	Inspect for leaks, identify source(s), and recommend corrective actions.
1105	Y2M1	Check and adjust differential housing fluid level.	Understand differential lubrication needs and how low/contaminated fluid causes noise and damage.	Check fluid level/condition and adjust to specification safely.
1106	Y2M2	Drain and refill differential housing.	Understand drain/fill procedures, gasket/seal considerations, and contamination control.	Drain and refill differential with correct lubricant and verify proper fill and no leaks.

1107	Y2M2	Identify, inspect, and replace manual drivetrain and axle components and configuration.	Understand axle/driveline component functions (CV joints, U-joints, shafts) and wear indicators.	Inspect drivetrain/axle components, replace defective parts as assigned, and verify proper operation.
1203	Y2M2	Inspect A/C condenser for airflow restrictions.	Understand condenser role in heat transfer and how airflow restrictions reduce A/C performance.	Inspect condenser area for restriction/damage and document corrective actions (cleaning/repair).
1204	Y2M2	Inspect engine cooling and heating systems hoses.	Understand hose routing, pressure/temperature effects, and signs of deterioration or leakage.	Inspect hoses for condition/fit/leaks and determine serviceability.
1205	Y2M3	Inspect A/C heating ducts, doors, hoses, cabin filters, and outlets.	Understand HVAC air distribution components and how restrictions/door failures affect comfort and performance.	Inspect HVAC distribution components, replace/service as appropriate, and verify airflow/operation.
1206	Y2M2	Check for A/C leaks.	Understand common A/C leak points and why leak detection is required before recharging.	Perform leak check using appropriate method(s) and document leak location and next steps.
1207	Y2M2	Identify refrigerant type and recovery procedure.	Understand refrigerant identification, safety/environmental requirements, and approved recovery procedures.	Identify refrigerant type and demonstrate correct recovery/recycling setup and procedure (simulation or equipment).