

Unit/Standard Number	<u>High School Graduation Years 2022, 2023 and 2024</u> Automobile/Automotive Mechanics Technology/Technician CIP 47.0604 Task Grid	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
	Secondary Competency Task List	
100	ORIENTATION	
101	Explain and follow all lab rules.	
102	Participate in basic shop management.	
103	Participate in parts ordering.	
104	Demonstrate auto shop safety and hygiene.	
105	Demonstrate the use of service information.	
106	Demonstrate proper telephone courtesy.	
107	Identify a vehicle by sight, vehicle identification number (VIN) and ID tag.	
108	Identify career paths within the automotive technology profession.	
109	Complete a work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.	
110	Research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins.	
111	Locate and interpret vehicle and major component identification numbers.	
200	SAFETY	
201	Identify and follow all safety rules.	
202	Demonstrate the ability to secure vehicles on jack stands and hydraulic lifts.	
203	Demonstrate the ability to set-up/shut-down oxygen acetylene welding equipment.	
204	Identify chemical safety, Right-To-Know laws and Safety Data Sheets (SDS).	
205	Identify and use hand tools.	
206	Identify and use power tools.	
207	Wear personal protective equipment (PPE).	
208	Follow guidelines for use of fire protection equipment.	
209	RESERVED	
210	Follow EPA and OSHA regulations.	
300	TOOLS/FASTENERS	
301	Identify and use fasteners and bolts.	
302	Drill and use re-threading tools.	
303	Read and interpret precision automotive measuring tools.	
304	Identify and use automotive specialty tools.	
305	Perform common fastener and thread repairs, including remove broken bolt, restore internal and external threads, and repair internal threads with a threaded insert.	

Unit/Standard Number	<u>High School Graduation Years 2022, 2023 and 2024</u>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
	Automobile/Automotive Mechanics Technology/Technician CIP 47.0604 Task Grid	
400	CERTIFICATIONS	
401	Prepare to obtain PA Safety Inspection Certification.	
402	Prepare to obtain EPA 609 Refrigerant Recovery and Recycling Certification.	
403	Prepare to obtain Emission Inspection Certification.	
460	Obtain PA Emissions Certification	
500	SUSPENSION AND STEERING	
501	RESERVED	
502	Identify and interpret suspension and steering system concerns and determine necessary actions.	
503	RESERVED	
504	RESERVED	
505	RESERVED	
506	RESERVED	
507	Inspect rack and pinion steering gear and mounting bushings and brackets.	
508	Inspect rack and pinion steering gear inner tie rod ends (sockets) and bellows boots.	
509	Determine proper power steering fluid type and inspect fluid level and condition.	
510	Flush, fill, and bleed power steering system.	
511	Diagnose power steering fluid leakage and determine necessary actions.	
512	RESERVED	
513	Remove and reinstall power steering pump.	
514	Remove and reinstall press fit power steering pump pulley and check pulley and belt alignment.	
515	Inspect and replace power steering hoses and fittings.	
516	Inspect and replace pitman arm, relay (centerlink/intermediate) rod, idler arm and mountings, and steering linkage damper.	
517	Inspect, replace, and adjust tie rod ends (sockets), tie rod sleeves, and clamps.	
518	RESERVED	
519	Inspect, and replace upper and lower control arms, bushings, shafts, and rebound bumpers.	
520	Inspect and replace strut rods and bushings.	
521	Inspect and replace upper and lower ball joints.	
522	Inspect and replace steering knuckle assemblies.	
523	Inspect and replace short and long arm suspension system coil springs and spring insulators.	
524	Inspect, replace, and adjust suspension system torsion bars and inspect mounts.	
525	Inspect and replace stabilizer bar bushings, brackets, and links.	
526	Inspect and replace strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount.	
527	Inspect, remove, and replace shock absorbers.	
528	RESERVED	
529	Lubricate suspension and steering systems.	
530	Perform pre-alignment inspection and measure vehicle ride height and; perform necessary actions.	
531	Perform four-wheel alignment.	
532	RESERVED	
533	RESERVED	
534	RESERVED	
535	Check front and rear cradle (subframe) alignment.	
536	Inspect tire condition, identify tire wear patterns, and check and adjust air pressure.	
537	Diagnose wheel/tire vibration, shimmy, and noise.	
538	Rotate tires according to manufacturer's recommendations.	
539	Measure wheel, tire, axle flange, and hub runout.	
540	RESERVED	

Unit/Standard Number	<u>High School Graduation Years 2022, 2023 and 2024</u>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
	Automobile/Automotive Mechanics Technology/Technician CIP 47.0604 Task Grid	
541	Dismount, inspect, and remount tire on wheel and balance wheel and tire assembly (static and dynamic).	
542	Dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system sensor.	
543	RESERVED	
544	Inspect tire and wheel assembly for air loss.	
545	Repair tire using internal patch.	
546	Identify indirect and direct tire pressure monitoring systems (TPMS), calibrate system, and verify operation of instrument panel lamps.	
547	Identify steps required to remove and replace sensors in a tire pressure monitoring system (TPMS) including relearn procedure.	
548	Identify the need for reset procedures post wheel alignment.	
560	Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; perform necessary action.	
561	Adjust non-rack and pinion worm bearing preload and sector lash.	
562	Diagnose short and long arm suspension system noises, body sway, and uneven ride height concerns; determine necessary action.	
563	Diagnose strut suspension system noises, body sway, and uneven ride height concerns; determine necessary action.	
564	Describe the function of the idle speed compensation switch.	
565	Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine necessary action.	
600	BRAKES	
601	RESERVED	
602	Identify and interpret brake system concerns.	
603	RESERVED	
604	RESERVED	
605	Measure brake pedal height, travel, and free play as applicable.	
606	Check master cylinder for internal/external leaks and proper operation.	
607	Remove, bench bleed, and reinstall master cylinder.	
608	Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; tighten loose fittings and supports; and determine necessary actions.	
609	Replace brake lines, hoses, fittings, and supports.	
610	Fabricate brake lines using proper material and flaring procedures (double flare and ISO types).	
611	Select, handle, store, and test brake fluid for contamination and fill to proper level.	
612	Inspect, test, and replace components of brake warning light system.	
613	Bleed and flush brake system.	
614	Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging, or pedal pulsation concerns.	
615	Remove, clean, inspect, and measure brake drums.	
616	Refinish brake drum and measure final drum diameter.	
617	Remove, clean, and inspect brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates then lubricate and reassemble.	
618	Inspect and install wheel cylinders.	
619	Pre-adjust brake shoes and parking brake, install brake drums or drum/hub assemblies, and wheel bearings.	
620	Install wheel, torque lug nuts, and make final checks and adjustments.	
621	RESERVED	
622	Remove caliper assembly, inspect for leaks, and damage to caliper housing.	
623	Clean and inspect caliper mounting and slides/pins for operation, wear, and damage.	
624	Reassemble, lubricate, and reinstall caliper, pads, and related hardware; seat pads; and inspect for leaks.	
625	Clean, inspect, and measure rotor thickness, lateral runout, and thickness variation.	
626	Remove and reinstall rotor.	
627	Refinish rotor on vehicle and measure final rotor thickness.	
628	Refinish rotor off vehicle and measure final rotor thickness.	

Unit/Standard Number	<u>High School Graduation Years 2022, 2023 and 2024</u>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
	Automobile/Automotive Mechanics Technology/Technician CIP 47.0604 Task Grid	
629	RESERVED	
630	Check brake pad wear indicator system operation.	
631	RESERVED	
632	Check vacuum supply to vacuum-type power booster and check power assist operation.	
633	Remove, clean, inspect, repack, and install wheel bearings, RACES and replace seals; install hub; and adjust bearings.	
634	Check parking brake cables and components including integral parking brake system for wear, binding, and corrosion then clean, lubricate, adjust, or replace as needed.	
635	Check parking brake and indicator light system operation.	
636	Check operation of brake stop light system.	
637	RESERVED	
638	Inspect and replace wheel studs.	
639	Remove and reinstall sealed wheel bearing assembly.	
640	Identify and inspect electronic brake control system components.	
641	Diagnose electronic brake control system, electronic control(s), and components by retrieving diagnostic trouble codes and using recommended test equipment.	
642	RESERVED	
643	Bleed the electronic brake control system hydraulic circuits.	
644	Identify traction control/vehicle stability control system components.	
645	Describe the operation of a regenerative braking system.	
660	Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's Law).	
661	Test brake fluid for contamination.	
662	Remove, inspect and replace pads and retaining hardware; determine necessary action.	
663	Disassemble and clean caliper assembly; inspect parts for wear, rust, scoring, and damage. Replace seal, boot and damaged or worn parts.	
664	Inspect the vacuum-type power booster unit for leaks; inspect the check valve for proper operation; determine necessary action.	
665	Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine necessary action.	
666	Remove and install electronic brake control system electrical/electronic and hydraulic components.	
667	Test, diagnose, and service electronic brake control system speed sensors (digital and analog), 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).	
700	ELECTRICAL/ELECTRONIC SYSTEMS -	
701	RESERVED	
702	Identify and interpret electrical/electronic system concerns.	
703	RESERVED	
704	RESERVED	
705	Use wiring diagrams during diagnosis of electrical circuit problems.	
706	Check electrical circuits with a test light.	
707	Check electrical circuits using fused jumper wires.	
708	Locate shorts, grounds, opens, and resistance problems in electrical/electronic circuits.	
709	Measure and diagnose the cause(s) of excessive parasitic draw.	
710	Inspect and test fusible links, circuit breakers, and fuses.	
711	Inspect and test switches, connectors, relays, solenoid solid state devices, and wires of electrical/electronic circuits.	
712	Remove and replace terminal end from connector, replace connectors, and terminal ends.	
713	Repair wiring harness and solder repair.	
714	RESERVED	
715	Identify location of electric hybrid vehicle high voltage circuit disconnect (service plug) location and safety procedures.	
716	Perform battery state-of-charge test.	
717	Perform battery capacity test and confirm proper battery capacity for vehicle application.	
718	Maintain and restore electronic memory functions.	

Unit/Standard Number	<u>High School Graduation Years 2022, 2023 and 2024</u>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
	Automobile/Automotive Mechanics Technology/Technician CIP 47.0604 Task Grid	
719	Inspect, clean, fill, and replace battery, battery cables, connectors, clamps, and hold-downs.	
720	Perform battery charge.	
721	Start a vehicle using jumper cables or an auxiliary power supply.	
722	Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry following battery disconnect.	
723	Perform starter current draw tests.	
724	Perform starter circuit voltage drop tests.	
725	Inspect and test starter relays and solenoids.	
726	Remove and install starter in a vehicle.	
727	Inspect and test switches, connectors, and wires of starter control circuits and perform necessary action.	
728	Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition.	
729	Perform charging system output test and determine necessary action.	
730	Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions.	
731	RESERVED	
732	Remove, inspect, and install generator (alternator).	
733	RESERVED	
734	RESERVED	
735	Inspect, replace, and aim headlights and bulbs.	
736	RESERVED	
737	RESERVED	
738	RESERVED	
739	Diagnose the cause of incorrect operation of warning devices and other driver information systems.	
740	Diagnose incorrect horn operation.	
741	Diagnose incorrect wiper operation and diagnose wiper speed control and park problems.	
742	Diagnose incorrect washer operation.	
743	Diagnose incorrect operation of motor-driven accessory circuits.	
745	RESERVED	
746	Remove and reinstall door panel.	
747	Use a digital multimeter (DMM).	
748	Demonstrate knowledge of an automatic idle start/stop system.	
760	Diagnose electrical/electronic integrity of series, parallel and series-parallel circuits using principles of electricity (Ohm's Law).	
761	Demonstrate the proper use of a digital multimeter (DMM) during diagnosis of electrical circuit problems, including: source voltage, voltage drop, current flow, and resistance.	
762	Identify high voltage circuits of electric or hybrid electric vehicle and related safety precautions.	
763	Identify hybrid vehicle auxiliary (12v) battery service, repair and test procedures.	
764	Identify system voltage and safety precautions associated with high intensity discharge headlights.	
765	Inspect and test sensors, connectors, and wire of electronic (digital) instrument circuits; determine necessary action.	
766	Diagnose incorrect electric lock operation (including remote keyless entry); determine necessary action.	
767	Diagnose supplemental restraint system (SRS) concerns; determine necessary action.	
768	Describe the operation of keyless entry/remote-start systems.	
800	ENGINE PERFORMANCE	
801	RESERVED	
802	Identify and interpret engine performance concern.	
803	RESERVED	
804	RESERVED	
805	RESERVED	

Unit/Standard Number	<u>High School Graduation Years 2022, 2023 and 2024</u>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
	Automobile/Automotive Mechanics Technology/Technician CIP 47.0604 Task Grid	
806	Diagnose abnormal engine noise or vibration concerns.	
807	Diagnose abnormal exhaust color, odor, and sound.	
808	Perform engine absolute (vacuum/boost) manifold pressure tests.	
809	Perform cylinder power balance test.	
810	Perform cylinder cranking and running compression tests.	
811	Perform cylinder leakage test.	
812	Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns.	
813	Verify engine operating temperature.	
814	RESERVED	
815	RESERVED	
816	Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data and clear codes when applicable.	
817	Diagnose the causes of emissions or drivability concerns with stored or active diagnostic trouble codes and obtain, graph, and interpret scan tool data.	
818	Access and use service information to perform step-by-step diagnosis.	
819	Perform active tests of actuators using a scan tool.	
820	Describe the importance of running all OBDII monitors for repair verification.	
821	RESERVED	
822	Inspect and test ignition primary and secondary circuit wiring and solid-state components and test ignition coil(s).	
823	Inspect and test crankshaft and camshaft position sensor(s).	
824	Inspect, test, and replace ignition control module and powertrain/engine control module and reprogram as necessary.	
825	Diagnose hot or cold no-starting, hard starting, poor drivability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems.	
826	Inspect and test fuel pumps and pump control systems for pressure, regulation, and volume.	
827	Replace fuel filters.	
828	Inspect throttle body, air induction system, intake manifold, and gaskets for vacuum leaks and unmetered air.	
829	Inspect and test fuel injectors.	
830	Verify idle control operation.	
831	Inspect the integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shield(s).	
832	RESERVED	
833	Inspect, test, and service positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses.	
834	RESERVED	
835	Inspect, test, service, and replace components of the EGR system, including electrical/electronic sensors, controls, and wiring, EGR tubing, exhaust passages, vacuum/pressure controls, filters, and hoses.	
836	RESERVED	
837	Inspect and test mechanical components of secondary air injection systems.	
838	Inspect and test electrical/electronically operated components and circuits of air injection systems.	
839	Inspect and test catalytic converter efficiency.	
840	RESERVED	
841	Inspect and test components and hoses of the evaporative emissions control system.	
842	Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems.	
843	RESERVED	
844	RESERVED	
845	RESERVED	
846	RESERVED	
860	Diagnose emissions or drivability concerns without stored diagnostic trouble codes; determine necessary action.	
861	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.	

Unit/Standard Number	<u>High School Graduation Years 2022, 2023 and 2024</u>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
	Automobile/Automotive Mechanics Technology/Technician CIP 47.0604 Task Grid	
862	Check fuel for contaminants and quality; determine necessary action.	
863	Perform exhaust system back-pressure test; determine necessary action.	
864	Adjust valves on engines with mechanical or hydraulic lifters.	
865	Perform common fastener and thread repairs, to include: remove broken bolt, restore internal and external threads, and repair internal thread with a threaded insert.	
866	Identify hybrid vehicle internal combustion engine service precautions.	
900	ENGINE REPAIR	
901	RESERVED	
902	Verify operation of the instrument panel engine warning indicators.	
903	Install engine covers using gaskets, seals, and sealers.	
904	RESERVED	
905	Adjust valves (mechanical or hydraulic lifters).	
906	Inspect, replace, and adjust drive belts, tensioners, and pulleys and check pulley and belt alignment.	
907	Inspect and test coolant, drain and recover coolant, and flush and refill cooling system with recommended coolant.	
908	Perform cooling system pressure tests; check coolant condition; inspect and test radiator, pressure cap, coolant recovery tank, and hoses.	
909	Identify components and inspect engine assembly for fuel, oil, coolant, and other leaks.	
910	Remove and replace timing belt and verify correct camshaft timing.	
911	Remove and replace thermostat and gasket/seal.	
912	Inspect and test mechanical/electrical fans, fan clutch, fan shroud/ducting, air dams, and fan control devices.	
913	Perform engine oil and filter change.	

Unit/Standard Number	<u>High School Graduation Years 2022, 2023 and 2024</u>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
	Automobile/Automotive Mechanics Technology/Technician CIP 47.0604 Task Grid	
1000	AUTOMATIC TRANSMISSION AND TRANSAXLE	
1001	RESERVED	
1002	Check fluid level and fluid condition in a transmission or a transaxle equipped with a dip-stick.	
1003	Check fluid level and fluid condition in a transmission or a transaxle not equipped with a dip-stick.	
1004	Drain, replace, and exchange fluid and filter(s).	
1005	Identify drivetrain components and configuration.	
1006	Inspect, adjust, and replace external manual valve shift linkage, transmission range sensor/switch, and park/neutral switch.	
1007	Inspect for leakage at external seals, gaskets, and bushings.	
1008	Inspect, replace, and align powertrain mounts.	
1100	MANUAL DRIVE TRAIN AND AXLES	
1101	RESERVED	
1102	Drain and refill manual transmission/transaxle and final drive unit.	
1103	Check and adjust clutch master cylinder fluid level.	
1104	Check for system leaks.	
1105	Check and adjust differential housing fluid level.	
1106	Drain and refill differential housing.	
1107	Identify, inspect, and replace manual drivetrain and axle components and configuration.	
1200	HEATING AND AIR CONDITIONING - This whole section is taught in 5	
1201	RESERVED	
1202	RESERVED	
1203	Inspect air conditioning (A/C) condenser for airflow restrictions.	
1204	Inspect engine cooling and heating systems hoses.	
1205	Inspect A/C heating ducts, doors, hoses, cabin filters, and outlets.	
1206	Check for A/C leaks.	
3000	HEATING & AIR CONDITIONING DIAGNOSIS & REPAIR - This whole section is atught in section 5	
3060	Identify and interpret heating and air conditioning concern; determine necessary action	
3061	Research applicable service information, locate and interpret identification numbers, certification, and calibration decals	
3062	Diagnose and performance test the A/C system using principles of refrigeration; determine necessary action	
3063	Diagnose and repair A/C compressor and clutch components	
3064	Diagnose and repair evaporator, condenser, and related components	
3065	Diagnose the heating system; determine necessary action	
3066	Repair or replace the heating system components	
3067	Operating Systems and related controls diagnosis and repair.	
3068	Diagnose the automatic and electrical temperature controls	
3069	Repair or replace the automatic and electrical temperature controls	
3070	Demonstrate the proper use and maintenance of refrigerant handling equipment	
3071	Identify, recover, recycle, label, and store refrigerant	
3072	Evacuate and charge the A/C system	

Unit/Standard Number	<u>High School Graduation Years 2022, 2023 and 2024</u>	Proficiency Level Achieved: (X) Indicates Competency Achieved to Industry Proficiency Level
	Automobile/Automotive Mechanics Technology/Technician CIP 47.0604 Task Grid	
3100	GENERAL ENGINE DIAGNOSIS; REMOVAL AND REINSTALLATION - This whole section is taught in 2	
3160	Identify and interpret engine concern; determine necessary action	
3161	Remove and replace engine in front-wheel drive vehicle (OBD I or newer)	
3162	Remove and replace engine in rear-wheel drive vehicle (OBD I or newer)	
3163	Remove, inspect, and test the cylinder head(s)	
3164	Install, torque, and adjust the cylinder head(s)	
3165	Recondition the cam in block cylinder head(s)	
3166	Recondition the OHV cylinder head(s)	
3167	Disassemble the engine block	
3168	Inspect and clean the engine block components; determine necessary action	
3169	Inspect, check, and record the short block measurements; determine necessary action	
3170	Assemble the engine according to the manufacturer's specifications	
3200	LUBRICATION AND COOLING SYSTEMS DIAGNOSIS AND REPAIR - This whole section is taught in 2	
3260	Inspect, test, and repair the oil systems and components	
3261	Perform cooling system tests; determine necessary action	
3262	Inspect, replace and adjust the drive belts and hoses	
3263	Inspect, test, and replace cooling system components	
3264	Test coolant, drain, flush, and refill cooling system with recommended coolant; bleed air as required	
3300	GENERAL TRANSMISSION AND TRANSAXLE DIAGNOSIS - This whole section will be taught in 6	
3360	Identify and interpret transmission / transaxle concern; assure proper engine operation; determine necessary action	
3361	Research applicable service information; locate and interpret identification numbers, certification, and calibration decals.	
3362	Diagnosis and performance test transmission / transaxle; determine necessary action	
4000	TRANSMISSION AND TRANSAXLE MAINTENANCE AND ADJUSTMENT - This whole section will be taught in 6	
4060	Inspect, adjust, or replace the throttle valve linkages or cables; manual shift linkages or cables; transmission range sensor; check gear select indicator	
4061	Service transmission; perform visual inspection; replace fluids and filters	
4062	Inspect, adjust, and replace sensors, cables, and actuators	
4063	Inspect and replace external bushings, seals, and gaskets	
4064	Inspect, leak test, flush, and replace cooler, lines, and fittings	
4065	Diagnose electronic transmission control systems using a scan tool; determine necessary action	
4066	Inspect, replace, and align powertrain mounts	
4067	Remove and reinstall transmission / transaxle and torque converter	
4068	Identify and interpret drive train concern; determine necessary action	
4069	Determine proper fluids and fluid levels	
4070	Drain and refill transmission / transaxle and final drive unit	

