

MEMORANDUM OF UNDERSTANDING
BETWEEN
THE GEORGIA DEPARTMENT OF EDUCATION
AND
THE TECHNICAL COLLEGE SYSTEM OF GEORGIA
REGARDING
ARTICULATED CREDIT FOR
THE AUTOMOTIVE TECHNICIAN PROGRAM

This Memorandum of Understanding (“MOU” or “Agreement”) is made and entered into by and between the Georgia Department of Education (“GaDOE”) and the Technical College System of Georgia (“TCSG”) (individually a “Party” and collectively as the “Parties”) regarding the Articulation of Credit Agreement for the Automotive Technician Program (“Initiative”).

WHEREAS the purpose of the Initiative is to provide students with the opportunity to receive specified college credit as a result of the successful completion of specified high school courses taken in a pathway and an external assessment or credential; and

WHEREAS this Initiative will allow students to receive credentialing in the specified field more quickly and without duplication of coursework between high school and college curriculum; and

WHEREAS GaDOE and TCSG are the primary providers of these curricula, articulation between the two agencies will facilitate the goals of the Initiative.

NOW, THEREFORE, inconsideration of the mutual promises exchanged herein, the Parties, with acknowledgement that the policies for awarding credit vary from one technical college to another and is within the sole discretion of the technical college, hereby agree as follows:

1. TCSG agrees that colleges, upon the evaluation of a student’s coursework and assessments, may award coursework for the following courses:

A. Automotive Technology Introduction (AUTT 1010), provided that the enrolling student has successfully completed the following:

I. Three (3) GaDOE Automotive courses with a final grade of “C” or better

GaDOE Automotive Course Number	GaDOE Automotive Course Name
47.45000	Automotive Technologies 1
47.45100	Automotive Technologies 2
47.45200	Automotive Technologies

II. A1 ASE Entry Level Certification Exam with a passing score

ASE Exam Number	ASE Exam Title
ASE Entry Level Certification Exam A1	Engine Repair
	<i>And one of the following:</i>
ASE Entry Level Certification Exam A2	Automatic Transmission/ Transaxle
ASE Entry Level Certification Exam A3	Manual Drive Train and Axles
ASE Entry Level Certification Exam A4	Suspension and Steering
ASE Entry Level Certification Exam A5	Brakes

OR

II. ASE Entry Level Certification Exam with a passing score

ASE Entry Level Certification Exam G1	Maintenance and Light Repair
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B. Automotive Electrical Systems I (AUTT 1021), provided that the enrolling student has successfully completed the following:

Criteria AI and AII (SEE above)	
ASE Entry Level Certification Exam A6	Electrical/ Electronic Systems

2. The Parties agree that they shall safeguard the confidentiality of student data as required by the Federal Family Educational Rights and Privacy Act (FERPA, 20 U.S.C. § 1232g, 34 C.F.R. § 99.33(a)) and all other applicable laws and regulations.
3. The Parties acknowledge and agree that neither Party shall be responsible for any loss, injury, or other damage to the person or property of anyone participating in the Initiative unless such loss, injury, or damage results from the negligence or willful conduct of that party, its agents, officers, or employees.
4. This relationship is intended solely for the mutual benefit of the parties hereto, and there is no intention, express or otherwise, to create any rights or interest for any party or person other than the parties; without limiting the generality of the forgoing, no rights are intended to be created for any student, parent, or guardian of any student,

spouse, next of kin, employer, or prospective employer of any participant of the Initiative.

5. Each Party shall designate a single point of contact to address and resolve any issues or concerns with anything related to this Agreement. Each Party shall notify the other party in writing within fourteen (14) calendar days of any change of the point of contact. The following individuals are designated by their respective Party as the initial point of contact:

GaDOE:

Barbara M. Wall, Ed.D.
Director of Career, Technical, and Agricultural Education
Suite 2053 Twin Towers East
205 Jesse Hill, Jr. Drive
Atlanta, Georgia 30334
Cell: 404-387-1666
bwall@doe.k12.ga.us

TCSG:

Name
Title
Street Address
City
Phone #
Email address

6. This Agreement shall become effective upon date of last signature and shall end on August 23, 2022.

7. The Parties may renew this Agreement with a mutually signed written agreement for successive one (1) year terms up to four (4) additional years.

8. The terms and conditions of this Agreement shall be periodically reviewed by the Parties. Each Party agrees to inform the other regarding curriculum or assessment changes that may impact the terms of this Agreement.

9. No modifications or alterations of this Agreement will be valid or effective unless each modification or alteration is made as an Amendment to the Agreement and signed by both parties.

10. This Agreement may be terminated by either Party without reason or cause by providing to the other party written notice not less than thirty (30) calendar days in advance of the desired termination date.

11. Each party represents that there is no litigation or proceeding pending, or to its knowledge, threatened against it having a material adverse effect on the right of the Party to secure this Agreement or the ability of the Party to comply with any of its obligations under this Agreement.

12. No Party will be deemed to have waived any provisions of this Agreement unless such waiver is made explicit in writing and signed by the Party waiving such provision. No waiver shall be deemed to be a continuing waiver unless so stated in writing.

13. This Agreement shall not be assigned or transferred unless consented to in writing by the Department.

14. If any provision of the Agreement is determined to be invalid or unenforceable, such determination shall not affect the validity or enforceability of any other part or provision of the Agreement. Further, if any provision of the Agreement is determined to be unenforceable by virtue of its scope but may be made enforceable by a limitation of the provision, the provision shall be deemed to be amended to the minimum extent necessary to render it enforceable under the applicable law.

15. This Agreement shall be governed by, construed, and applied in accordance with the laws of the State of Georgia. Any action brought by one Party to this Agreement against the other shall be brought in the Superior Court of Fulton County.

16. This Agreement may be executed in one or more counterparts which, when taken together, will constitute one agreement. Copies of this Agreement will be equally binding as originals and faxed or scanned and emailed counterpart signatures will be sufficient to evidence execution.

IN WITNESS WHEREOF, the parties state and affirm that they are duly authorized to bind the respected entities designated below as of the day and year indicated.

GEORGIA DEPARTMENT OF EDUCATION

MATT JONES, Chief of Staff and Designee

Date

TECHNICAL COLLEGE SYSTEM OF GEORGIA

GREG DOZIER, Commissioner

Date

Automotive GaDOE/TCSG Crosswalk Form

Information	
Pathway Name	Automobile Service Technology Pathway
TCSG Technical Certificate of Credit	
Credentials of Value	

Alignment Analysis			
TCSG- AUTT 1030 Automotive Brake Systems	GADOE Courses		
	Automobile Service Technology 1 – 47.45000	Automobile Service Technology 2 – 47.45100	Automobile Service Technology 3 – 47.45200
General Brake System Diagnosis			
Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause and correction. P-1	GS-4	GS-4	GS-4
Identify and interpret brake system concern; determine needed action. P-1	TS-5	TS-5	TS-5
Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins. P-1	TS-5	TS-5	TS-5
Describe procedure for performing a road test to check brake system operation including an anti-lock brake system (ABS). P-1	X	TS-5	TS-5
Remove and reinstall wheels and torque lug nuts correctly. P-1	TS-5	TS-4 & 5	TS-4 & 5
Hydraulic System Diagnosis and Repair			
Diagnose pressure concerns in the brake system using hydraulic principles (Pascal's Law). P-1	X	X	TS-5
Measure brake pedal height, travel, and free play (as applicable); determine needed action. P-1	X	TS-5	TS-5
Check master cylinder for internal/external leaks and proper operation; determine needed action. P-1	X	X	TS-5
Remove, bench bleed, and reinstall master cylinder. P-1	X	X	TS-5
Diagnose poor stopping, pulling or dragging concerns caused by malfunctions in the hydraulic system; determine needed action. P-1	X	X	TS-5
Inspect brake lines, flexible hoses, and fittings for leaks, dents, kinks, rust, cracks, bulging or wear; and loose fittings/supports; determine needed action. P-1	X	TS-5	TS-5
Replace brake lines, hoses, fittings, and supports. P-2	X	TS-5	TS-5
Fabricate brake lines using proper material and flaring procedures (double flare and ISO types). P-2	X	X	TS-5

Automotive GaDOE/TCSG Crosswalk Form

Select, handle, store, and fill brake fluids to proper level; use proper fluid type per manufacturer specification. P-1	TS-5	TS-5	TS-5
Inspect, test, and/or replace components of the brake warning light system. P-3	X	X	TS-5
Identify components of hydraulic brake warning light systems. P-2	X	TS-5	TS-5
Bleed and/or flush brake system. P-1	X	TS-5	TS-5
Test brake fluid for contamination. P-1	TS-5	TS-5	TS-5
Drum Brake Diagnosis and Repair			
Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pedal pulsation concerns; determine needed action. P-1	X	TS--5	TS-5
Remove, clean, and inspect brake drum; measure brake drum diameter; determine serviceability. P-1	TS-5	TS-5	TS-5
Refinish brake drum and measure final drum diameter; compare with specifications. P-1	X	TS-5	TS-5
Remove, clean, inspect, and/or replace brake shoes, springs, pins, clips, levers, adjusters/self-adjusters, other related brake hardware, and backing support plates; lubricate and reassemble. P-1	X	TS-5	TS-5
Inspect wheel cylinders for leaks and proper operation; remove and replace as needed. P-2	X	X	TS-5
Pre-adjust brake shoes and parking brake; install brake drums or drum/hub assemblies and wheel bearings. P-1	X	TS-5	TS-5
Perform final checks and adjustments. P-1	X	TS-5	TS-5
Disc Brake Diagnosis and Repair			
Diagnose poor stopping, noise, vibration, pulling, grabbing, dragging or pulsation concerns; determine needed action. P-1	X	X	TS-5
Remove and clean caliper assembly; inspect for leaks, damage, and wear; determine needed action. P-1	X	TS-5	TS-5
Clean and inspect caliper mounting and slides/pins for proper operation, wear, and damage; determine needed action. P-1	X	TS-5	TS-5
Remove, inspect and/or replace brake pads and retaining hardware; determine needed action. P-1	TS-5	TS-5	TS-5
Lubricate and reinstall caliper, brake pads, and related hardware; seat brake pads; and inspect for leaks. P-1	X	TS-5	TS-5
Clean and inspect rotor and mounting surface; measure rotor thickness, thickness variation, and lateral runout; determine needed action. P-1	X	TS-5	TS-5
Remove and reinstall/replace rotor. P-1	X	TS-5	TS-5
Refinish rotor on vehicle; measure final rotor thickness and compare with specifications. P-1	X	X	TS-5
Refinish rotor off vehicle; measure final rotor thickness and compare with specifications. P-1	X	TS-5	TS-5
Retract and re-adjust caliper piston on an integrated parking brake system. P-2	X	TS-5	TS-5
Check brake pad wear indicator; determine needed action. P-1	X	TS-5	TS-5

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Describe importance of operating vehicle to burnish/break in replacement brake pads according to manufacturer's recommendations. P-1	X	TS-5	TS-5
Power Assist Units Diagnosis and Repair			
Check brake pedal travel with and without engine running to verify proper power booster operation. P-2	X	TS-5	TS-5
Identify components of the brake power assist system (vacuum and hydraulic); check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster. P-1	X	TS-5	TS-5
Inspect vacuum-type power booster unit for leaks; inspect the check valve for proper operation; determine needed n. P-1	X	TS-5	TS-5
Inspect and test hydraulically assisted power brake system for leaks and proper operation; determine needed action. P-3	X	X	TS-5
Measure and adjust master cylinder push rod length. P-3	X	X	TS-5
Related Systems (Wheel Bearings, Parking Brakes, Electrical, Etc.) Diagnosis and Repair			
Diagnose wheel bearing noises, wheel shimmy, and vibration concerns; determine needed action. P-1	X	X	TS-5
Remove, clean, inspect, repack, and install wheel bearings; replace seals; install hub and adjust bearings. P-2	X	TS-5	TS-5
Check parking brake system and components for wear, binding, and corrosion; clean, lubricate, adjust and/or replace as needed. P-1	X	X	TS-5
Check parking brake operation and parking brake indicator light system operation; determine needed action. P-1	X	TS-5	TS-5
Check operation of brake stop light system. P-1	TS-5	TS-5	TS-5
Replace wheel bearing and race. P-3	X	TS-5	TS-5
Remove, reinstall, and/or replace sealed wheel bearing assembly. P-1	X	X	TS-5
Inspect and replace wheel studs. P-1	X	TS-5	TS-5
Electronic Brake, Traction, and Stability Control Systems Diagnosis and Repair			
Identify and inspect electronic brake control system components (ABS, TCS, ESC); determine needed action. P-1	X	X	TS-5
Describe the operation of a regenerative braking system. P-3	X	X	TS-5
Diagnose poor stopping, wheel lock-up, abnormal pedal feel, unwanted application, and noise concerns associated with the electronic brake control system; determine needed action. P-2	X	X	X
Diagnose electronic brake control system electronic control(s) and components by retrieving diagnostic trouble codes, and/or using recommended test equipment; determine necessary action. P-2	X	X	X
Depressurize high-pressure components of the electronic brake control system. P-2	X	X	X
Bleed the electronic brake control system hydraulic circuits. P-1	X	X	X

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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). P-2	x	x	x
Diagnose electronic brake control system braking concerns caused by vehicle modifications (tire size, curb height, final drive ratio, etc.) P-1	x	x	x

Automotive GaDOE/TCSG Crosswalk Form

Information	
Pathway Name	Automobile Service Technology Pathway
TCSG Technical Certificate of Credit	
Credentials of Value	

Alignment Analysis			
TCSG- 1040 Automotive Engine Performance	GADOE Courses		
	Automobile Service Technology 1 – 47.45000	Automobile Service Technology 2 – 47.45100	Automobile Service Technology 3 – 47.45200
General Engine Diagnosis			
Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. P-1	GS-4	GS-4	GS-4
Identify and interpret engine performance concerns; determine needed action. P-1	TS-8	TS-8	TS-8
Research vehicle service information including vehicle service history, service precautions, and technical service bulletins. P-1	TS-8	TS-8	TS-8
Diagnose abnormal engine noises or vibration concerns; determine needed action. P-3	X	X	TS-8
Diagnose the cause of excessive oil consumption, coolant consumption, unusual exhaust color, odor, and sound; determine needed action. P-2	X	X	TS-8
Perform engine absolute manifold pressure tests (vacuum/boost); determine needed action. P-1	X	X	TS-8
Perform cylinder power balance test; determine needed action. P-2	X	X	TS-8
Perform cylinder cranking and running compression tests; determine needed action. P-1	X	X	TS-8
Perform cylinder leakage test; determine needed action. P-1	X	X	TS-8
Diagnose engine mechanical, electrical, electronic, fuel, and ignition concerns; determine needed action. P-2	X	X	TS-8
Verify engine operating temperature; determine needed action. P-1	X	X	TS-8
Verify correct camshaft timing including engines equipped with variable valve timing systems (VVT). P-1	X	X	TS-8
Computerized Engine Controls Diagnosis and Repair			TS-8
Retrieve and record diagnostic trouble codes (DTC), OBD monitor status, and freeze frame data; clear codes when applicable. P-1	X	TS-8	TS-8
Access and use service information to perform step-by-step (troubleshooting) diagnosis. P-1	X	X	TS-8

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Perform active tests of actuators using a scan tool; determine needed action. P-1	X	X	TS-8
Describe the use of OBD monitors for repair verification. P-1	X	X	TS-8
Diagnose the causes of emissions or drivability concerns with stored or active diagnostic trouble codes (DTC); obtain, graph, and interpret scan tool data. P-1	X	X	X
Diagnose emissions or drivability concerns without stored diagnostic trouble codes; determine needed action. P-1	X	X	X
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 needed action. P-2	X	X	X
Diagnose drive ability and emissions problems resulting from malfunctions of interrelated systems (cruise control, security alarms, suspension controls, traction controls, HVAC, automatic transmissions, non-OEM-installed accessories, or similar systems); determine needed action. P-2	X	X	X
Ignition System Diagnosis and Repair			
Diagnose (troubleshoot) ignition system related problems such as no-starting, hard starting, engine misfire, poor drivability, spark knock, power loss, poor mileage, and emissions concerns; determine needed action. P-2	X	X	X
Inspect and test crankshaft and camshaft position sensor(s); determine needed action. P-1	X	X	X
Inspect, test, and/or replace ignition control module, powertrain/engine control module; reprogram/initialize as needed. P-3	X	X	X
Remove and replace spark plugs; inspect secondary ignition components for wear and damage. P-1	X	TS-8	X
Fuel, Air Induction, and Exhaust Systems Diagnosis and Repair			
Diagnose (troubleshoot) hot or cold no-starting, hard starting, poor driveability, incorrect idle speed, poor idle, flooding, hesitation, surging, engine misfire, power loss, stalling, poor mileage, dieseling, and emissions problems; determine needed action. P-2	X	X	X
Check fuel for contaminants and quality; determine needed action. P-2	X	X	X
Inspect and test fuel pump(s) and pump control system for pressure, regulation, and volume; perform needed action. P-1	X	X	X
Replace fuel filter(s) where applicable. P-2	TS-8	TS-8	TS-8
Inspect, service, or replace air filters, filter housings, and intake duct work. P-1	TS-8	TS-8	TS-8
Inspect throttle body, air induction system, intake manifold and gaskets for vacuum leaks and/or unmetered air. P-2	X	X	TS-8

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Inspect test, and/or replace fuel injectors. P-2	X	X	X
Verify idle control operation. P-1	X	TS-8	TS-8
Inspect the integrity of the exhaust manifold, exhaust pipes, muffler(s), catalytic converter(s), resonator(s), tail pipe(s), and heat shield(s); perform needed action. P-1	X	X	TS-8
Inspect condition of exhaust system hangers, brackets, clamps, and heat shields; determine needed action. P-1	X	X	TS-8
Perform exhaust system back-pressure test; determine needed action. P-2	X	X	X
Check and refill diesel exhaust fluid (DEF). P-2	X	TS-8	TS-8
Test the operation of turbocharger/supercharger systems; determine needed action. P-2	X	X	X
Emissions Control Systems Diagnosis and Repair			
Diagnose oil leaks, emissions, and drive ability concerns caused by the positive crankcase ventilation (PCV) system; determine needed action. P-3	X	X	X
Inspect, test, service and/or replace positive crankcase ventilation (PCV) filter/breather, valve, tubes, orifices, and hoses; perform needed action. P-2	X	X	X
Diagnose emissions and drive ability concerns caused by the exhaust gas recirculation (EGR) system; determine needed action. P-2	X	X	X
Diagnose emissions and drive ability concerns caused by the secondary air injection system; determine needed action. P-2	X	X	X
Diagnose emissions and drive ability concerns caused by the evaporative emissions control (EVAP) system; determine needed action. P-1	X	X	X
Inspect, test, service and/or replace electrical/electronic sensors, controls, wiring, tubing, exhaust passages, vacuum/pressure controls, filters, and hoses of exhaust gas recirculation (EGR) systems; perform needed action. P-2	X	X	X
Inspect, test, service and replace components of the EGR system, including EGR tubing, exhaust passages, vacuum/pressure controls, filters and hoses; perform necessary action. P-2	X	X	X
Inspect, test, repair and/or replace electrical/electronically-operated components and circuits of secondary air injection systems; determine needed action. P-2	X	X	X
Diagnose emission and drivability concerns caused by catalytic converter system; determine needed action. P-2	X	X	X
Interpret diagnostic trouble codes (DTCs) and scan tool data related to the emissions control systems; determine needed action. P-2	X	X	X

Automotive GaDOE/TCSG Crosswalk Form

Information	
Pathway Name	Automobile Service Technology Pathway
TCSG Technical Certificate of Credit	
Credentials of Value	

Alignment Analysis			
TCSG-AUTT 1050 Automotive Suspension and Steering	GADOE Courses		
	Automobile Service Technology 1 – 47.45000	Automobile Service Technology 2 – 47.45100	Automobile Service Technology 3 – 47.45200
General Suspension and Steering Systems Diagnosis			
Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause and correction. P-1	GS-4	GS-4	GS-4
Research vehicle service information including fluid type, vehicle service history, service precautions, and technical service bulletins. P-1	TS-4	TS-4	TS-4
Identify and interpret suspension and steering system concerns; determine needed action. P-1	TS-4	TS-4	TS-4
Steering Systems Diagnosis and Repair			
Disable and enable supplemental restraint system (SRS); verify indicator lamp operation. P-1	X	X	GS-4
Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring). P-1	X	X	X
Diagnose steering column noises, looseness, and binding concerns (including tilt/telescoping mechanisms); determine needed action. P-2	X	X	X
Diagnose power steering gear (non-rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action. P-2	X	X	X
Diagnose power steering gear (rack and pinion) binding, uneven turning effort, looseness, hard steering, and noise concerns; determine needed action. P-2	X	X	X
Inspect steering shaft universal-joint(s), flexible coupling(s), collapsible column, lock cylinder mechanism, and steering wheel; perform needed action. P-2	X	TS-4	TS-4
Remove and replace rack and pinion steering gear; inspect mounting bushings and brackets. P-2	X	X	X
Inspect and replace rack and pinion steering gear inner tie rod ends (sockets) and bellows boots; replace as needed. P-1	X	X	TS-4

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Inspect power steering fluid level and condition. P-1	TS-4	TS-4	TS-4
Flush, fill, and bleed power steering system; use proper fluid type per manufacturer specification. P-2	X	X	TS-4
Inspect for power steering fluid leakage; determine needed action. P-1	TS-4	TS-4	TS-4
Remove, inspect, replace, and/or adjust power steering pump drive belt. P-1	X	TS-4	TS-4
Remove and reinstall power steering pump. P-2	X	X	TS-4
Remove and reinstall press fit power steering pump pulley; check pulley and belt alignment. P-2	X	X	TS-4
Inspect, remove, and/or replace power steering hoses and fittings. P-2	X	TS-4	TS-4
Inspect, remove, and/or replace pitman arm, relay (center link/intermediate) rod, idler arm, mountings, and steering linkage damper. P-2	X	X	TS-4
Inspect, replace, and/or adjust tie rod ends (sockets), tie rod sleeves, and clamps. P-1	X	X	TS-4
Inspect, test and diagnose electronically-assisted power steering systems (including using a scan tool); determine needed action. P-2	X	X	X
Identify hybrid vehicle power steering system electrical circuits and safety precautions. P-2	X	X	TS-4
Test power steering pressure; determine needed action. P-2	X	X	X
Suspension Systems Diagnosis and Repair			
Diagnose short and long arm suspension system noises, body sway, and uneven ride height concerns; determine needed action. P-1	X	X	X
Diagnose strut suspension system noises, body sway, and uneven ride height concerns; determine needed action. P-1	X	X	X
Inspect, remove, and/or replace upper and lower control arms, bushings, shafts, and rebound bumpers. P-3	X	X	X
Inspect, remove, and/or replace strut rods and bushings. P-3	X	X	X
Inspect, remove, and/or replace upper and/or lower ball joints (with or without wear indicators). P-2	X	X	X
Inspect, remove, and/or replace steering knuckle assemblies. P-3	X	X	X
Inspect, remove, and/or replace short and long arm suspension system coil springs and spring insulators. P-3	X	X	X
Inspect, remove, and/or replace torsion bars and mounts. P-3	X	X	X
Inspect, remove, and/or replace front/rear stabilizer bar (sway bar) bushings, brackets, and links. P-3	X	X	TS-4
Inspect, remove, and/or replace strut cartridge or assembly, strut coil spring, insulators (silencers), and upper strut bearing mount. P-3	X	X	TS-4
Inspect, remove and/or replace track bar, strut rods/radius arms, and related mounts and bushings. P-3	X	X	X
Inspect rear suspension leaf spring(s), spring insulators (silencers), shackles, brackets, bushings, center pins/bolts and mounts. P-1	X	TS-4	TS-4
Related Suspension and Steering Service			

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Inspect, remove, and/or replace shock absorbers; inspect mounts and bushings. P-1	X	TS-4	TS-4
Remove, inspect, and service and/or replace front and rear wheel bearings. P-1	X	TS-4	TS-4
Describe the function of suspension and steering control systems and components (i.e. active suspension and stability control). P-3	X	X	TS-4
Wheel Alignment Diagnosis, Adjustment and Repair			
Diagnose vehicle wander, drift, pull, hard steering, bump steer, memory steer, torque steer, and steering return concerns; determine needed action. P-1	X	X	TS-4
Perform pre-alignment inspection; measure vehicle ride height; determine necessary action. P-1	X	TS-4	TS-4
Prepare vehicle for wheel alignment on the alignment machine. P-1	X	X	TS-4
Perform four wheel alignment by checking and adjusting front and rear wheel castor, camber and toe as required. P-1	X	X	TS-4
Center steering wheel. P-1	X	X	TS-4
Check toe-out-on-turns (turning radius); determine needed action. P-2	X	X	TS-4
Check SAI (steering axis inclination) and included angle; determine needed action. P-2	X	X	TS-4
Check rear wheel thrust angle; determine needed action. P-1	X	X	TS-4
Check for front wheel setback; determine needed action. P-2	X	X	TS-4
Check front and/or rear cradle (subframe) alignment; determine needed action. P-3	X	X	TS-4
Reset steering angle sensor. P-2	X	X	TS-4
Wheel and Tire Diagnosis and Repair			
Inspect tire condition; identify tire wear patterns; check for correct tire size, application (load and speed ratings), and air pressure as listed on the tire information placard/label. P-1	TS-4	TS-4	TS-4
Diagnose wheel/tire vibration, shimmy, and noise; determine needed action. P-2	X	TS-4	TS-4
Rotate tires according to manufacturer's recommendation including vehicles equipped with tire pressure monitoring systems (TPMS). P-1	TS-4	TS-4	TS-4
Measure wheel, tire, axle flange, and hub runout; determine needed action. P-2	X	X	X
Diagnose tire pull problems; determine needed action. P-1	X	X	TS-4
Dismount, inspect, and remount tire on wheel; balance wheel and tire assembly. P-1	TS-4	TS-4	TS-4
Dismount, inspect, and remount tire on wheel equipped with the tire pressure monitoring system sensor. P-1	X	TS-4	TS-4
Reinstall wheel; torque lug nuts. P-1	X	TS-5	TS-5
Inspect tire and wheel assembly for air loss; perform needed action. P-1	TS-4	TS-4	TS-4
Repair tire following manufacturer approved procedure. P-1	X	TS-4	TS-4

Automotive GaDOE/TCSG Crosswalk Form

Identify and indirect and direct tire pressure monitoring systems (TPMS); calibrate systems; verify operation of instrument panel lamps. P-1	X	TS-4	TS-4
Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system (TPMS) including relearn procedure. P-1	X	TS-4	TS-4

Automotive GaDOE/TCSG Crosswalk Form

Information	
Pathway Name	Automobile Service Technology Pathway
TCSG Technical Certificate of Credit	
Credentials of Value	

Alignment Analysis			
TCSG-AUTT 2010 Automotive Engine Repair	GADOE Courses		
	Automobile Service Technology 1 – 47.45000	Automobile Service Technology 2 – 47.45100	Automobile Service Technology 3 – 47.45200
General Engine Diagnosis; Removal and Reinstallation (R & R)			
Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction. P-1	GS-4	GS-4	GS-4
Research applicable vehicle and service information including fluid type, internal engine operation, vehicle service history, service precautions, and technical service bulletins. P-1	TS-1	TS-1	TS-1
Verify operation of the instrument panel engine warning indicators. P-1	TS-1	X	TS-1
Inspect engine assembly for fuel, oil, coolant, and other leaks, determine needed action. P-1	TS-1	X	TS-1
Install engine covers using gaskets, seals, and sealers as required. P-1	X	TS-1	TS-1
Verify engine mechanical timing. P-1	X	TS-1	TS-1
Perform common fastener and thread repair, to include: remove broken bolt, restore internal and external threads, and repair internal threads with thread inserts. P-1	X	TS-1	TS-1
Inspect, remove, and/or replace engine mounts. P-2	X	X	TS-1
Identify service precautions related to service of the internal combustion engine of a hybrid vehicle. P-2	X	X	TS-1
Remove and reinstall engine in an OBD; reconnect all attaching components and restore the vehicle to running condition. P-3	X	X	X
Cylinder Head and Valve Train Diagnosis and Repair			
Remove cylinder head; inspect gasket condition; install cylinder head and gasket; tighten according to manufacturer's specifications and procedures. P-1	X	X	X
Clean and visually inspect a cylinder head for cracks; check gasket surface areas for warpage and surface finish; check passage condition. P-1	X	X	X

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Inspect pushrods, rocker arms, rocker arm pivots and shafts for wear, bending, cracks, looseness and blocked oil passages (orifices); determine needed action. P-2	X	X	X
Adjust valves (mechanical or hydraulic lifters). P-1	X	TS-1	TS-1
Inspect and replace camshaft and drive belt/chain (includes checking drive gear wear and backlash, end play, sprocket and chain wear, overhead cam drive sprocket(s), drive belt(s), belt tension, tensioners, camshaft reluctor ring/tonewheel, and valve timing components; verify correct camshaft timing. P-1	X	X	X
Establish camshaft position sensor indexing. P-1	X	X	TS-1
Inspect valve springs for squareness and free height comparison; determine needed action. P-3	X	X	X
Replace valve stem seals on an assembled engine; inspect valve spring retainers, locks/keepers, and valve lock/keeper grooves; determine needed action. P-3	X	X	X
Inspect valve guides for wear; check valve stem-to-guide clearance; determine needed action. P-3	X	X	X
Inspect valves and valve seats; determine needed action. P-3	X	X	X
Check valve spring assembled height and valve stem height; determine needed action. P-3	X	X	X
Inspect valve lifters; determine needed action. P-2	X	X	X
Inspect and/or measure camshaft for runout, journal wear and lobe wear. P-3	X	X	X
Inspect camshaft bearing surface for wear, damage, out-of-round, and alignment; determine needed action. P-3	X	X	X
Engine Block Assembly Diagnosis and Repair			
Remove, inspect, and/or replace crankshaft vibration damper (harmonic balancer). P-1	X	X	X
Disassemble engine block; clean and prepare components for inspection and reassembly. P-1	X	X	X
Inspect engine block for visible cracks, passage condition, core and gallery plug condition, and surface warpage; determine needed action. P-2	X	X	X
Inspect and measure cylinder walls/sleeves for damage, wear, and ridges; determine needed action. P-2	X	X	X
Deglaze and clean cylinder walls. P-2	X	X	X
Inspect and measure camshaft bearings for wear, damage, out-of-round, and alignment; determine needed action. P-3	X	X	X
Inspect crankshaft for straightness, journal damage, keyway damage, thrust flange and sealing surface condition, and visual surface cracks; check oil passage condition; measure end play and journal wear; check crankshaft position sensor reluctor ring (where applicable); determine needed action. P-1	X	X	X

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Inspect main and connecting rod bearings for damage and wear; determine needed action. P-2	X	X	X
Identify piston and bearing wear patterns that indicate connecting rod alignment and main bearing bore problems; determine needed action. P-3	X	X	X
Inspect and measure piston skirts and ring lands; determine needed action. P-2	X	X	X
Determine piston-to-bore clearance. P-2	X	X	X
Inspect, measure, and install piston rings. P-2	X	X	X
Inspect auxiliary shaft(s) (balance, intermediate, idler, counterbalance and/or silencer); inspect shaft(s) and support bearings for damage and wear; determine needed action; reinstall and time. P-2	X	X	X
Assemble engine block. P-1	X	X	X
Lubrication and Cooling Systems Diagnosis and Repair			
Perform cooling system pressure and dye tests; check coolant condition and level; inspect and test radiator, pressure cap, coolant recovery tank, heater core and galley plugs; determine needed action. P-1	X	TS-1	TS-1
Identify causes of engine overheating. P-1	X	TS-1	TS-1
Inspect, replace, and/or adjust drive belts, tensioners, and pulleys; check pulley and belt alignment. P-1	TS-1	TS-1	TS-1
Inspect and test coolant; drain and recover coolant; flush and refill cooling system; use proper fluid type per manufacturer specification; bleed air as required. P-1	X	X	TS-1
Inspect, remove and replace water pump. P-2	X	X	X
Remove and replace radiator. P-2	X	X	X
Remove, inspect, and replace thermostat and gasket/seal. P-1	X	TS-1	TS-1
Inspect, and test fan(s), fan clutch (electrical or mechanical), fan shroud, and air dams; determine needed action. P-1	X	TS-1	TS-1
Perform oil pressure tests; determine needed action. P-1	X	X	X
Perform engine oil and filter change; use proper fluid type per manufacturer specification. P-1	TS-1	X	X
Inspect auxiliary coolers; determine needed action. P-3	TS-1	X	X
Inspect, test, and replace oil temperature and pressure switches and sensors. P-2	X	X	X
Inspect oil pump gears or rotors, housing, pressure relief devices, and pump drive; perform needed action. P-2	X	X	X