Texas CTE

Automotive Technology II: Automotive Service (Two Credits)(2015)

Knowledge and skills. D

1 The student relates core academic skills to the requirements of automotive technology. The student is expected to: D.1

- A demonstrate effective written communication skills throughout the course, including documenting on a repair order customer concern/compliant, root cause of the failure, and corrective action to complete the repair; D.1.A
- B estimate the cost of parts and labor operations on repair orders throughout the course, including the flat rate system; D.1.B
- C demonstrate mathematical skills in performing addition, subtraction, multiplication, division, and measurements using decimals and fractions in the metric and U.S. standard systems as appropriate; and D.1.C
- D research applicable vehicle and service information, vehicle service history, service precautions, and technical service bulletins. D.1.D

2 The student demonstrates the technical knowledge and skills that form the core of knowledge of automotive service. The student is expected to: D.2

- A diagnose the major components of powered vehicles; D.2.A
- B diagnose automotive chassis and driveline components; D.2.B
- C locate, read, and interpret documents such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair information and technical bulletins; D.2.C
- D locate the manufacturer recommended preventative maintenance schedule; D.2.D
- E perform a preventative maintenance inspection; D.2.E
- F perform common fastener and thread repair, including removing broken bolt, restoring internal and external threads, and repairing internal threads with thread insert; D.2.F
- G perform precision measurements and use published specifications to diagnose component wear and determine necessary repairs; and D.2.G
- H employ critical-thinking skills and structured problem-solving skills to diagnose vehicle malfunctions, solve problems, and make decisions. D.2.H

3 The student knows the functions and applications of the tools, equipment, technologies, and materials used in automotive technology. The student is expected to: D.3

- A demonstrate the proper and safe use of hand and power tools and equipment commonly employed in the maintenance and repair of vehicles; D.3.A
- B discuss and demonstrate the proper handling and disposal of environmentally hazardous materials used in servicing vehicles; D.3.B
- C demonstrate proper use of diagnostic tools and equipment; and D.3.C
- D locate, read, and interpret service repair information such as schematics, charts, diagrams, graphs, parts catalogs, and service-repair bulletins. D.3.D

4 The student applies the technical knowledge and skills related to suspension in simulated or actual work situations. The student is expected to: D.4

- A inspect and replace power steering hoses and fittings; D.4.A
- B remove, clean, inspect, repack, and install wheel bearings; replace seals; install hubs; and adjust bearings; D.4.B
- C replace wheel bearing and race; D.4.C
- D disable and enable supplemental restraint system (SRS); D.4.D
- E inspect, remove, and replace shock absorbers and struts and inspect mounts and bushings; D.4.E
- F dismount, inspect, and remount tire on wheel equipped with tire pressure monitoring system (TPMS); D.4.F
- G inspect rear suspension system lateral links/arms, trailing arms, leaf springs, spring insulators, shackles, brackets, center pins, and mounting bolts; D.4.G
- H inspect tire condition and wear patterns, check for correct size and application based on load and speed rating, and adjust air pressure; D.4.H
- I perform pre-alignment inspection and measure vehicle ride height; D.4.I
- J inspect tire and wheel assembly for air loss; D.4.J
- K identify and test indirect and direct TPMSs and operation of the instrument panel lamps; D.4.K
- L demonstrate knowledge of steps required to remove and replace sensors in a TPMS; and D.4.L
- M inspect, remove, and replace front wheel drive (FWD) bearings, hubs, seals, shafts, boots, and universal/constant velocity (CV) joints. D.4.M

5 The student applies the technical knowledge and skills related to electrical systems in simulated or actual work situations. The student is expected to: D.5

- A demonstrate knowledge of the causes and effects from shorts, opens, and resistance in electrical/electronic circuits; D.5.A
- B measure key-off battery drain/parasitic draw; D.5.B
- C perform solder repair of electrical wiring; D.5.C
- D replace electrical connectors and terminal ends; D.5.D
- E demonstrate the ability to maintain or restore electronic memory functions; D.5.E
- F perform slow and fast battery charges according to manufacturer recommendations; D.5.F
- G identify electronic modules, security systems, radios, and other accessories that require re-initialization or code entry after reconnecting a vehicle battery; D.5.G
- H perform starter current draw test and starter circuit voltage drop tests and inspect and test starter relays and solenoids; D.5.H
- I remove and install a starter in a vehicle; D.5.I
- J inspect and test switches, connectors, and wires of starter control circuits; D.5.J
- K perform charging system output test; D.5.K
- L remove, inspect, and re-install alternator; D.5.L
- M identify system voltage and safety precautions associated with highintensity discharge headlights; D.5.M
- N disable and enable airbag system for vehicle service and verify indicator lamp operation; D.5.N
- O remove and reinstall a door panel; and D.5.O
- P describe the operation of keyless entry and remote-start systems. D.5.P

6 The student applies the technical knowledge and skills related to brakes in simulated or actual work situations. The student is expected to: D.6

- A describe procedure for performing a road test to check brake system operation, including an anti-lock brake system (ABS); D.6.A
- B measure brake pedal height, reserve distance, travel, and free play; D.6.B
- C identify components of brake warning light system; D.6.C
- D bleed and flush brake system; D.6.D
- E identify and check the operation of brake stop light system; and D.6.E
- F identify traction control and vehicle stability control system components. D.6.F

7 **The student applies the technical knowledge and skills related to engine performance in simulated or actual work situations. The student is expected to:** D.7

- A describe the importance of operating all on board diagnostics II (OBDII) monitors for repair verification; D.7.A
- B perform cylinder power balance test; D.7.B
- C perform cylinder cranking and running compression tests; D.7.C
- D perform cylinder leakage test; D.7.D
- E verify engine operating temperature; D.7.E
- F remove and replace spark plugs and inspect secondary ignition components for wear and damage; and D.7.F
- G retrieve and record diagnostic trouble codes and OBD II monitor status, freeze frame data, and clear trouble codes when applicable. D.7.G

8 **The student applies the technical knowledge and skills related to engines in simulated or actual work situations. The student is expected to:** D.8

- A install engine covers using gaskets, seals, and sealers as required; D.8.A
- B remove and replace timing belt and verify correct camshaft timing; D.8.B
- C perform cooling system pressure and dye tests to identify leaks, check coolant condition and level, and inspect and test radiator, pressure cap, coolant recovery tank, and heater core; and D.8.C
- D remove, inspect, and replace thermostat and gasket or seal. D.8.D

9 **The student applies the technical knowledge and skills related to heating ventilation and air conditioning (HVAC) in simulated or actual work situations. The student is expected to:** D.9

- A identify, locate, and replace cabin air filters; D.9.A
- B inspect air conditioning (A/C) condenser for airflow restrictions; D.9.B
- C identify the source of A/C system odors; and D.9.C
- D identify hybrid vehicle A/C system electrical circuits and safety precautions. D.9.D