

Automotive Technology II Course Competencies

Demonstrating Workplace Readiness Skills: Personal Qualities and People Skills

1. Demonstrate positive work ethic.
2. Demonstrate integrity.
3. Demonstrate teamwork skills.
4. Demonstrate self-representation skills.
5. Demonstrate diversity awareness.
6. Demonstrate conflict-resolution skills.
7. Demonstrate creativity and resourcefulness.

Demonstrating Workplace Readiness Skills: Professional Knowledge and Skills

8. Demonstrate effective speaking and listening skills.
9. Demonstrate effective reading and writing skills.
10. Demonstrate critical-thinking and problem-solving skills.
11. Demonstrate healthy behaviors and safety skills.
12. Demonstrate an understanding of workplace organizations, systems, and climates.
13. Demonstrate lifelong-learning skills.
14. Demonstrate job-acquisition and advancement skills.
15. Demonstrate time-, task-, and resource-management skills.
16. Demonstrate job-specific mathematics skills.
17. Demonstrate customer-service skills.

Demonstrating Workplace Readiness Skills: Technology Knowledge and Skills

18. Demonstrate proficiency with technologies common to a specific occupation.
19. Demonstrate information technology skills.
20. Demonstrate an understanding of Internet use and security issues.
21. Demonstrate telecommunications skills.

Examining All Aspects of an Industry

22. Examine aspects of planning within an industry/organization.
23. Examine aspects of management within an industry/organization.
24. Examine aspects of financial responsibility within an industry/organization.
25. Examine technical and production skills required of workers within an industry/organization.
26. Examine principles of technology that underlie an industry/organization.
27. Examine labor issues related to an industry/organization.
28. Examine community issues related to an industry/organization.
29. Examine health, safety, and environmental issues related to an industry/organization.

Addressing Elements of Student Life

30. Identify the purposes and goals of the student organization.
31. Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.
32. Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.
33. Identify Internet safety issues and procedures for complying with acceptable use standards.

ENGINE REPAIR

General

34. Install engine covers using gaskets, seals, and sealers as required.
35. Remove and replace timing belt; verify correct camshaft timing.

Cylinder Head and Valve Train

36. Adjust valves (mechanical or hydraulic lifters).

AUTOMATIC TRANSMISSION AND TRANSAXLE

In-Vehicle Transmission/Transaxle

37. Inspect, adjust, and replace external manual valve shift linkage, transmission range sensor/switch, and park/neutral position switch.

Off-Vehicle Transmission and Transaxle

38. Describe the operational characteristics of a continuously variable transmission (CVT).
39. Describe the operational characteristics of a hybrid vehicle drive train.

MANUAL DRIVE TRAIN AND AXLES

Transmission/Transaxle

40. Describe the operational characteristics of an electronically-controlled manual transmission/transaxle.

Drive Shaft, Half Shafts, Universal and Constant-Velocity (CV) Joints

41. Inspect, remove, and replace front wheel drive (FWD) bearings, hubs, and seals.
42. Inspect, service, and replace shafts, yokes, boots, and universal/CV joints.

Differential Case Assembly

43. Clean and inspect differential housing; check for leaks; inspect housing vent.

Four-wheel Drive/All-wheel Drive

44. Inspect front-wheel bearings and locking hubs.
45. Check for leaks at drive assembly seals; check vents; check lube level.

SUSPENSION AND STEERING SYSTEMS

General

46. Disable and enable supplemental restraint system (SRS).

Related Suspension and Steering Service

47. Flush, fill, and bleed power steering system.
48. Inspect and replace power steering hoses and fittings.
49. Replace power steering pump filter(s).
50. Identify hybrid vehicle power steering system electrical circuits and safety precautions.
51. Describe the function of the power steering pressure switch.

Wheel Alignment

52. Perform prealignment inspection and measure vehicle ride height; determine necessary action.

Wheels and Tires

53. Identify and test tire pressure monitoring systems (indirect and direct) for operation; verify operation of instrument panel lamps.
54. Demonstrate knowledge of steps required to remove and replace sensors in a tire pressure monitoring system.

BRAKES

Hydraulic System

55. Measure brake pedal height, travel, and free play (as applicable); determine necessary action.
56. Identify components of brake warning light system.
57. Bleed and/or flush brake system.

Drum Brakes

58. Refinish brake drum and measure final drum diameter; compare with specifications.
59. Inspect wheel cylinders for leaks and proper operation; remove and replace as needed.

Disc Brakes

60. Refinish rotor on vehicle; measure final rotor thickness and compare with specifications.

Power-Assist Units

61. Check brake pedal travel with, and without, engine running to verify proper power booster operation.
62. Check vacuum supply (manifold or auxiliary pump) to vacuum-type power booster.

Miscellaneous (Wheel Bearings, Parking Brakes, Electrical, Etc.)

63. Replace wheel bearing and race.

Electronic Brakes, and Traction and Stability Control Systems

64. Identify traction control/vehicle stability control system components.
65. Describe the operation of a regenerative braking system.

ELECTRICAL/ELECTRONIC SYSTEMS

General

66. Use wiring diagrams to trace electrical/electronic circuits.
67. Demonstrate knowledge of the causes and effects from shorts, grounds, opens, and resistance problems in electrical/electronic circuits.
68. Measure key-off battery drain (parasitic draw).
69. Replace electrical connectors and terminal ends.

Battery Service

70. Identify high-voltage circuits of electric or hybrid electric vehicle and related safety precautions. (**CAUTION:** Students should not work directly with high-voltage sources.)
71. Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.
72. Identify hybrid vehicle auxiliary (12v) battery service, repair, and test procedures.

Starting System

73. Perform starter circuit voltage drop tests; determine necessary action.
74. Inspect and test starter relays and solenoids; determine necessary action.
75. Remove and install starter in a vehicle.
76. Inspect and test switches, connectors, and wires of starter control circuits; determine necessary action.

Charging System

77. Remove, inspect, and re-install generator (alternator).
78. Perform charging circuit voltage drop tests; determine necessary action.

Lighting Systems

79. Aim headlights.
80. Identify system voltage and safety precautions associated with high-intensity discharge headlights.

Accessories

81. Disable and enable airbag system for vehicle service; verify indicator lamp operation.
82. Remove and reinstall door panel.
83. Describe the operation of keyless entry/remote-start systems.

HEATING AND AIR CONDITIONING

Refrigeration System Components

84. Identify hybrid vehicle A/C system electrical circuits and the service/safety precautions.
85. Inspect A/C condenser for airflow restrictions; determine necessary action.

Operating Systems and Related Controls

86. Inspect A/C-heater ducts, doors, hoses, cabin filters, and outlets; perform necessary action.
87. Identify the source of A/C system odors.

ENGINE PERFORMANCE

General

88. Perform engine absolute (vacuum/boost) manifold pressure tests; determine necessary action
89. Perform cylinder power balance test; determine necessary action.
90. Perform cylinder cranking and running compression tests; determine necessary action.
91. Perform cylinder leakage test; determine necessary action.
92. Remove and replace spark plugs; inspect secondary ignition components for wear and damage.

Computerized Engine Controls

93. Retrieve and record diagnostic trouble codes, OBD monitor status, and freeze frame data; clear codes when applicable.
94. Describe the importance of operating all OBDII monitors for repair verification.

Emissions Control Systems

95. Inspect, test, and service positive crankcase ventilation (PCV) filter/breather cap, valve, tubes, orifices, and hoses; perform necessary action.

REQUIRED SUPPLEMENTAL TASKS

Shop and Personal Safety

96. Identify general shop safety rules and procedures.
97. Utilize safe procedures for handling of tools and equipment.
98. Identify and use proper placement of floor jacks and jack stands.

99. Identify and use proper procedures for safe lift operation.
100. Utilize proper ventilation procedures for working within the lab/shop area.
101. Identify marked safety areas.
102. Identify the location and the types of fire extinguishers and other fire safety equipment; demonstrate knowledge of the procedures for using fire extinguishers and other fire safety equipment.
103. Identify the location and use of eye wash stations.
104. Identify the location of the posted evacuation routes.
105. Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities.
106. Identify and wear appropriate clothing for lab/shop activities.
107. Secure hair and jewelry for lab/shop activities.
108. Demonstrate awareness of the safety aspects of supplemental restraint systems (SRS), electronic brake control systems, and hybrid vehicle high voltage circuits.
109. Demonstrate awareness of the safety aspects of high voltage circuits (such as high intensity discharge (HID) lamps, ignition systems, injection systems, etc.).
110. Locate and demonstrate knowledge of material safety data sheets (MSDS).

Tools and Equipment

111. Identify tools and their usage in automotive applications.
112. Identify standard and metric designation.
113. Demonstrate safe handling and use of appropriate tools.
114. Demonstrate proper cleaning, storage, and maintenance of tools and equipment.
115. Demonstrate proper use of precision measuring tools (i.e. micrometer, dial-indicator, dial-caliper).

Preparing Vehicle for Service

116. Identify information needed and the service requested on a repair order.
117. Identify purpose and demonstrate proper use of fender covers, mats.
118. Demonstrate use of the three Cs (i.e., Concern, Cause, and Correction).
119. Review vehicle service history.
120. Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

Preparing Vehicle for Customer

121. Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).