



Western Technical College

32404358 Chassis Electrical and Electronic Systems

Course Outcome Summary

Course Information

Description	Diagnose, test, repair and replace chassis electrical and electronic system circuits and components. Systems covered include supplemental restraint (SRS), wiper/washer, steering columns, power accessories (windows, locks, seats, mirrors, sun roofs) and instrumentation.
Career Cluster	Transportation, Distribution and Logistics
Instructional Level	Technical Diploma Courses
Total Credits	3
Total Hours	108

Pre/Corequisites

Prerequisite	32404357 Drive Systems 1
Prerequisite	32404382 Automotive Climate Control
Prerequisite	32404386 Intro to Hybrid & alt Fuel Vehicles

Textbooks

Fundamentals of Automotive Technology. 2nd Edition. Copyright 2018. CDX Automotive. Publisher: Jones & Bartlett Publishers. **ISBN-13:** 978-1-2842-0995-5. Required.

Learner Supplies

Uniform: Three short sleeve, black/red shirts with embroidered name. **Vendor:** Campus Shop. Required.

Safety glasses with side eye protection that meet Z87 OSHA guidelines. **Vendor:** To be discussed in class. Required.

Six inch ankle high, quality leather work shoes - \$75.00-100.00. **Vendor:** To be discussed in class. Required.

Pocket knife, six inch metal pocket ruler (English/metric measurement), small pocket flashlight, and pocket flat head screwdriver - \$20.00. **Vendor:** To be discussed in class. Required.

Program Outcomes

1. Demonstrate professionalism appropriate for the auto service industry
2. Perform diagnosis, service, and repair of automotive electrical and electronic systems

Course Competencies

1. Diagnose gauges, warning devices, and driver information system

Assessment Strategies

- 1.1. Written Product
- 1.2. Skill Demonstration

Criteria

You will know you are successful when:

- 1.1. you select the correct [TOOLS, EQUIPMENT, INSTRUMENTS, MATERIALS, SUPPLIES]
- 1.2. you verify, inspect and test gauges, gauge sending units, sensors, switches and warning indicators.
- 1.3. you diagnose incorrect operation of warning indicators and information systems.

Learning Objectives

- 1.a. Inspect and test gauges and gauge sending units for causes of abnormal gauge readings; determine needed action.
- 1.b. Diagnose (troubleshoot) the causes of incorrect operation of warning devices and other driver information systems; determine needed action.
- 1.c. Verify operation of the instrument panel engine warning indicators.
- 1.d. Inspect, test, and replace oil temperature and pressure switches and sensors.

2. Diagnose Wiper/Washer System

Assessment Strategies

- 2.1. Skill Demonstration
- 2.2. Written Product

Criteria

You will know you are successful when:

- 2.1. you select the correct [TOOLS, EQUIPMENT, INSTRUMENTS, MATERIALS, SUPPLIES]
- 2.2. you diagnose wiper, washer and wiper park concerns.
- 2.3. you replace wiper blades and verify operation.

Learning Objectives

- 2.a. Diagnose (troubleshoot) causes of incorrect wiper operation; diagnose wiper speed control and park problems; perform necessary action.
- 2.b. Diagnose (troubleshoot) windshield washer problems; perform necessary action.
- 2.c. Verify windshield wiper and washer operation, replace wiper blades.

3. Examine Power Accessories Systems

Assessment Strategies

- 3.1. Skill Demonstration
- 3.2. Written Product

Criteria

You will know you are successful when:

- 3.1. you select the correct [TOOLS, EQUIPMENT, INSTRUMENTS, MATERIALS, SUPPLIES]
- 3.2. you use wiring diagrams to diagnose power accessory concerns.
- 3.3. you use wiring diagram to diagnose theft deterrent systems.
- 3.4. you diagnose speed control systems.
- 3.5. you diagnose infotainment systems.
- 3.6. you remove and reinstall door panel.

Learning Objectives

- 3.a. Diagnose operation of comfort and convenience accessories and related circuits (such as: power window, power seats, pedal height, power locks, truck locks, remote start, moon roof, sun roof, sun shade, remote keyless entry, voice activation, steering wheel controls, back-up camera, park assist, cruise control, and auto dimming headlamps); determine needed repairs.
- 3.b. Diagnose operation of security/anti-theft systems and related circuits (such as: theft deterrent, door locks, remote keyless entry, remote start, and starter/fuel disable); determine needed repairs.
- 3.c. Diagnose (troubleshoot) incorrect operation of cruise control systems; determine necessary action.
- 3.d. Remove and reinstall door panel.
- 3.e. Diagnose operation of entertainment and related circuits (such as: radio, DVD, remote CD changer, navigation, amplifiers, speakers, antennas, and voice-activated accessories); determine needed repairs.
- 3.f. Use wiring diagrams during the diagnosis (troubleshooting) of electrical/electronic circuit problems.

4. Explore Supplemental Restraint Systems

Assessment Strategies

- 4.1. Skill Demonstration
- 4.2. Written Product

Criteria

You will know you are successful when:

- 4.1. you select the correct [TOOLS, EQUIPMENT, INSTRUMENTS, MATERIALS, SUPPLIES]
- 4.2. you research vehicle service information.
- 4.3. you diagnose safety related systems.
- 4.4. you disable airbag system to remove, center and reinstall clockspring.

Learning Objectives

- 4.a. Diagnose operation of safety systems and related circuits (such as: horn, airbags, seat belt pretensioners, occupancy classification, wipers, washers, speed control/collision avoidance, heads-up display, park assist, and back-up camera); determine needed repairs.
- 4.b. Disable and enable an airbag system for vehicle service; verify indicator lamp operation.
- 4.c. Remove and replace steering wheel; center/time supplemental restraint system (SRS) coil (clock spring).
- 4.d. Research vehicle service information including vehicle service history, service precautions, and technical service bulletins.

5. Evaluate Electronic Modules

Assessment Strategies

- 5.1. Skill Demonstration
- 5.2. Written Product

Criteria

You will know you are successful when:

- 5.1. you select the correct [TOOLS, EQUIPMENT, INSTRUMENTS, MATERIALS, SUPPLIES]
- 5.2. you summarize module reprogramming.
- 5.3. you use a scan tool to diagnose module communication concerns.
- 5.4. you identify modules that need reinitialization.

Learning Objectives

- 5.a. Identify electronic modules, security systems, radios, and other accessories that require reinitialization or code entry after reconnecting vehicle battery.

- 5.b. Diagnose body electronic systems circuits using a scan tool; check for module communication errors (data communication bus systems); determine needed action.
- 5.c. Describe the process for software transfer, software updates, or reprogramming of electronic modules.