



BAKER COLLEGE STUDENT LEARNING OUTCOMES

DSL 1420 Diesel Electrical/Electronic Systems II 4 Semester Hours

Student Learning Outcomes & Enabling Objectives

1. Evaluate Lighting Systems related to heavy-duty truck and trailer repair
 - a. Communicate with vehicle's on-board computer.
 - i. Perform diagnostic procedures using recommended electronic service tool(s) (including PC based software and/or data scan tools).
 - ii. Determine needed action.
 - b. Identify causes of brighter than normal, intermittent, dim, or no headlight and daytime running light (DRL) operation.
 - c. Test headlights.
 - i. Aim headlights.
 - ii. Replace headlights.
 - d. Test headlight and dimmer circuit switches, relays, wires, terminals, connectors, sockets, and control components/modules.
 - i. Service as needed.
 - e. Test switches, bulbs/LEDs, sockets, connectors, terminals, relays, wires, and control components/modules of parking, clearance, and taillight circuits.
 - i. Service as needed.
 - f. Test instrument panel light circuit switches, relays, bulbs/LEDs, sockets, connectors, terminals, wires, and printed circuits/control modules.
 - i. Service as needed.
 - g. Test interior cab light circuit switches, bulbs/LEDs, sockets, low voltage disconnect (LVD), connectors, terminals, wires, and control components/modules.
 - i. Service as needed.
 - h. Test tractor-to-trailer multi-wire connector(s).
 - i. Service as needed.
 - i. Test stoplight circuit switches, bulbs/LEDs, sockets, connectors, terminals, wires and control components/modules.

- i. Adjust stoplight circuit switches.
 - ii. Service as needed.
 - j. Test turn signal and hazard circuit flasher(s), switches, relays, bulbs/LEDs, sockets, connectors, terminals, wires and control components/modules.
 - i. Service as needed.
 - k. Test reverse lights and warning device circuit switches, bulbs/LEDs, sockets, horns, buzzers, connectors, terminals, wires and control components/modules.
 - i. Service as needed.
- 2. Analyze Gauges and Warning Devices related to heavy-duty truck and trailer repair.
 - a. Communicate with vehicle's on-board computer.
 - i. Perform diagnostic procedure.
 - ii. Examine instrument cluster operations using recommended electronic service tool(s) (including PC based software and/or data scan tools).
 - iii. Determine needed action.
 - b. Identify causes of intermittent, high, low, or no gauge readings.
 - i. Determine needed action.
 - c. Identify causes of data bus-driven gauge malfunctions.
 - i. Determine needed action.
 - d. Test gauge circuit sensor/sending units, gauges, connectors, terminals, and wires.
 - i. Service as needed.
 - e. Test warning devices (lights and audible) circuit sensor/sending units, bulbs/LEDs, sockets, connectors, wires, and control components/modules.
 - i. Service as needed.
 - f. Test electronic speedometer, odometer, and tachometer systems.
 - i. Replace electronic speedometer, odometer, and tachometer systems.
 - ii. Calibrate (if applicable) electronic speedometer, odometer, and tachometer systems.
- 3. Assess Related Electrical Systems found on heavy-duty trucks and trailers.
 - a. Communicate with vehicle's on-board computer.
 - i. Perform diagnostic procedures using recommended electronic service tool(s) (including PC based software and/or data scan tools).
 - ii. Determine needed action.
 - b. Identify causes of constant, intermittent, or no horn operation.
 - i. Determine needed action.
 - c. Test horn circuit relays, horns, switches, connectors, wires, clock springs, and control components/modules.
 - i. Determine needed action.

- d. Identify causes of constant, intermittent, or no wiper operation; diagnose the cause of wiper speed control and/or park problems.
 - i. Determine needed action.
 - e. Test wiper motor, resistors, park switch, relays, switches, connectors, wires and control components/modules.
 - i. Service as needed.
 - f. Inspect wiper motor transmission linkage, arms, and blades.
 - i. Service as needed.
 - g. Test windshield washer motor or pump/relay assembly, switches, connectors, terminals, wires, and control components/modules.
 - i. Service as needed.
 - h. Test side view mirror motors, heater circuit grids, relays, switches, connectors, terminals, wires and control components/modules.
 - i. Service as needed.
 - i. Test heater and A/C electrical components including: A/C clutches, motors, resistors, relays, switches, connectors, terminals, wires and control components/modules.
 - i. Service as needed.
 - j. Test auxiliary power outlet, integral fuse, connectors, terminals, wires, and control components/modules.
 - i. Service as needed.
 - k. Identify causes of slow, intermittent, or no power window operation.
 - i. Determine needed action.
 - l. Test motors, switches, relays, connectors, terminals, wires, and control components/modules of power window circuits.
 - i. Service as needed.
 - m. Test block heaters.
 - i. Determine needed repairs.
 - n. Test cruise control electrical components. l
 - i. Service as needed.
 - o. Test switches, relays, controllers, actuator/solenoids, connectors, terminals, and wires of electric door lock circuits.
 - p. Check operation of keyless and remote lock/unlock devices.
 - i. Determine needed action.
 - q. Test engine cooling fan electrical control components/modules, wiring.
 - i. Service as needed.
 - r. Identify causes of data bus communication problems.
 - i. Determine needed action.
4. Evaluate Charging System Diagnosis and Repair related to heavy-duty truck and trailer repair.

- a. Test instrument panel mounted volt meters and/or indicator lamps.
 - i. Determine needed action.
- b. Identify causes of a no charge, low charge, or overcharge problems.
 - i. Determine needed action.
- c. Service alternator drive belts, pulleys, fans, tensioners, and mounting brackets.
 - i. Inspect alternator drive belts, pulleys, fans, tensioners, and mounting brackets.
 - ii. Replace alternator drive belts, pulleys, fans, tensioners, and mounting brackets.
 - iii. Adjust drive belts.
 - iv. Check alignment.
- d. Perform charging system voltage and amperage output tests.
 - i. Perform AC ripple test.
 - ii. Determine needed action.
- e. Perform charging circuit voltage drop tests.
 - i. Determine needed action.
- f. Service alternator.
 - i. Remove alternator.
 - ii. Replace alternator.
- g. Service cables, wires, and connectors in the charging circuit.
 - i. Determine needed action.

Big Ideas and Essential Questions

Big Ideas

- Lighting systems
- Gauges and warning devices
- Related electrical systems
- Charging system
- Network communication

Essential Questions

1. How does information travel in the truck and how do you as a technician retrieve, scan and interoperate electronic signals?
2. How does the charging system maintain proper system voltage from the alternator to the battery bank?

These SLOs are approved for experiential credit.

Effective: Fall 2017