BAKER COLLEGE
STUDENT LEARNING OUTCOMES

DSL1410 Diesel Electrical/Electronic Systems I

Student Learning Outcomes and Enabling Objectives

1. Test general electrical systems related to heavy-duty truck and diesel repair.
    a. Interpret electrical/electronic circuits using wiring diagrams.
    b. Check continuity in electrical/electronic circuits using appropriate test equipment.
    c. Check applied voltages, circuit voltages, and voltage drops in electrical/electronic circuits using appropriate test equipment.
    d. Check current flow in electrical/electronic circuits and components using appropriate test equipment.
    e. Check resistance in electrical/electronic circuits and components using appropriate test equipment.
    f. Locate shorts, grounds, and opens in electrical/electronic circuits
    g. Identify parasitic (key-off) battery drain problems.
        i. Perform tests.
        ii. Determine needed action.
    h. Test fusible links, circuit breakers, relays, solenoids, and fuses.
        i. Replace as needed.
    i. Test spike suppression devices.
        i. Replace as needed.
    j. Check frequency and pulse width signal in electrical/electronic circuits using appropriate test equipment.
2. Evaluate the battery related to heavy-duty truck and diesel repair.
    a. Identify battery type.
        i. Perform appropriate battery load test.
        ii. Determine needed action.
    b. Determine battery state of charge using an open circuit voltage test.
    c. Service battery.
        i. Inspect battery.
        ii. Clean battery.

iii. Replace as needed.

d. Inspect battery boxes, mounts, and hold downs.
    i. Clean battery boxes, mounts, and hold downs.
    ii. Service as needed.
e. Charge battery using appropriate method for battery type.
f. Inspect battery cables and connectors.
    i. Test battery cables and connectors.
    ii. Clean battery cables and connectors.
    iii. Service as needed.
g. Jump start a vehicle using jumper cables and a booster battery or appropriate auxiliary power supply using proper safety procedures.
h. Perform battery capacitance tests.
    i. Determine needed action.
i. Test low voltage disconnect (LVD) systems
    i. Determine needed action.

3. Evaluate the starting system related to heavy-duty truck and diesel repair.
    a. Perform starter circuit cranking voltage and voltage drop tests.
        i. Determine needed action.
    b. Test components (key switch, push button and/or magnetic switch) and wires and harness in the starter control circuit.
        i. Replace as needed.
    c. Test starter relays and solenoids/switches.
        i. Replace as needed.
    d. Service starter.
        i. Remove starter.
        ii. Replace starter.
        iii. Inspect flywheel ring gear or flex plate.
4. Evaluate charging system diagnosis and repair related to heavy-duty truck and diesel repair.
    a. Test instrument panel mounted volt meters and/or indicator lamps.
    b. Identify causes of a no charge, low charge, or overcharge problems.
    c. Service alternator drive belts, pulleys, fans tensioners, and mounting brackets.
    d. Perform charging system voltage and amperage output tests.
    e. Perform charging circuit voltage drop tests.
    f. Service alternator.
    g. Service cables, wires, and connectors in the charging circuit.

Big Ideas and Essential Questions

Big Ideas

Basic electrical theory
Battery systems
Charging systems
Starting systems

Essential Questions

1. How do the types of energy that are the sources of electricity, create electricity in heavy duty vehicles?
2. What is the relationship between voltage, amperage, power, and resistance in electrical circuits?
3. How does electrical energy transform into mechanical energy in heavy-duty truck electrical systems?

These SLOs are approved for experiential credit.

Effective: Fall 2021