Western Technical College

32412407 Diesel Electricity Troubleshooting

Course Outcome Summary

Course Information

Description	This course is a practical study in performing diagnosis and repair of cab and chassis accessories, and other electrical components.
Career Cluster	Transportation, Distribution and Logistics
Instructional Level	Technical Diploma Courses
Total Credits	3
Total Hours	108

Pre/Corequisites

Pre/Corequisite 32412406 Diesel Electricity Fundamentals

Textbooks

Fundamentals of Medium/Heavy Duty Commercial Vehicle Systems. 2nd Edition. Copyright 2020. Wright, Gus and Owen C. Duffy. Publisher: Jones & Bartlett Publishers. **ISBN-13**: 978-1-284-15093-3. Required.

Student Workbook Part #H-WB111A Vehicle Electrical-Electronics Troubleshooting Training/Programming Starter Kit. 9th Edition. Fischelli, Vince. Publisher: Veejer Enterprises. **ISBN-13:** 978-1-934161-22-7. Required.

Student Workbook Part #H-WB113 Troubleshooting DC Motor Circuit Module. 9th Edition. Fischelli, Vince. Publisher: Veejer Enterprises. **ISBN-13:** 978-1-934161-07-4. Required.

Learner Supplies

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.

Uniform: Four black/grey shirts with embroidered name. **Vendor:** Campus Shop. Required.

Success Abilities

1. Cultivate Passion: Enhance Personal Connections
2. Cultivate Passion: Expand a Growth-Mindset
3. Cultivate Passion: Increase Self-Awareness
4. Live Responsibly: Develop Resilience
5. Live Responsibly: Embrace Sustainability
6. Live Responsibly: Foster Accountability
7. Refine Professionalism: Act Ethically
8. Refine Professionalism: Improve Critical Thinking
9. Refine Professionalism: Participate Collaboratively
10. Refine Professionalism: Practice Effective Communication

High Impact Practices

1. Learning Community: these courses are designed to enhance your learning experience in which a cohort of peers complete two or more courses that are linked through projects, themes, or program emphasis.

Program Outcomes

1. Diagnose, repair and service electrical/electronic systems
2. Diagnose, repair and service HVAC systems

Course Competencies

1. Perform general direct current electrical system troubleshooting.

Assessment Strategies

1.1. Written product
1.2. Skill demonstration
1.3. Written Objective tests

Criteria

You will know you are successful when:

1.1. you wear personal protective equipment
1.2. you follow safety procedures
1.3. you select the correct tools, equipment, instruments, materials and supplies
1.4. you perform critical steps in the right order from start to finish
1.5. you are able to verbalize sound reasoning for the decisions made throughout the process
1.6. you attend class regularly
1.7. you arrive for class on time
1.8. you listen attentively during class

1.9. you pass written exams at level indicated by the instructor
1.10. you meet criteria for successful completion of written products; lab sheets, presentations, case studies, etc…

Learning Objectives

1.a. Identify parasitic (key-off) battery drain problems; perform tests; determine needed action.
1.b. Inspect and test fusible links, circuit breakers, relays, solenoids, and fuses; replace as needed.
1.c. Inspect and test spike suppression devices; replace as needed.

2. Perform lighting system troubleshooting.

Assessment Strategies

2.1. Written product
2.2. Skill demonstration
2.3. Written Objective tests

Criteria

You will know you are successful when:

2.1. you wear personal protective equipment
2.2. you follow safety procedures
2.3. you select the correct tools, equipment, instruments, materials and supplies
2.4. you perform critical steps in the right order from start to finish
2.5. you are able to verbalize sound reasoning for the decisions made throughout the process
2.6. you attend class regularly
2.7. you arrive for class on time
2.8. you listen attentively during class
2.9. you pass written exams at level indicated by the instructor
2.10. you meet criteria for successful completion of written products; lab sheets, presentations, case studies, etc…

Learning Objectives

2.a. Identify causes of brighter than normal, intermittent, dim, or no headlight and daytime running light (DRL) operation.
2.b. Test headlight and dimmer circuit switches, relays, wires, terminals, connectors, sockets, and control components/modules; repair or replace as needed.
2.c. Inspect and test switches, bulbs/LEDs, sockets, connectors, terminals, relays, wires, and control components/modules of parking, clearance, and taillight circuits; repair or replace as needed.
2.d. Inspect and test instrument panel light circuit switches, relays, bulbs/LEDs, sockets, connectors, terminals, wires, and printed circuits/control modules; repair or replace as needed.
2.e. Inspect and test interior cab light circuit switches, bulbs/LEDs, sockets, low voltage disconnect (LVD), connectors, terminals, wires, and control components/modules; repair or replace as needed.
2.f. Inspect, test, and adjust stoplight circuit switches, bulbs/LEDs, sockets, connectors, terminals, wires and control components/modules; repair or replace as needed.
2.g. Inspect and test turn signal and hazard circuit flasher(s), switches, relays, bulbs/LEDs, sockets, connectors, terminals, wires and control components/modules; repair or replace as needed.
2.h. Inspect and test reverse lights and warning device circuit switches, bulbs/LEDs, sockets, horns, buzzers, connectors, terminals, wires and control components/modules; repair or replace as needed.

3. Perform gauges and warning devices troubleshooting.

Assessment Strategies

3.1. Written product
3.2. Skill demonstration
3.3. Written Objective tests

Criteria

You will know you are successful when:

3.1. you wear personal protective equipment
3.2. you follow safety procedures
3.3. you select the correct tools, equipment, instruments, materials and supplies
3.4. you perform critical steps in the right order from start to finish
3.5. you are able to verbalize sound reasoning for the decisions made throughout the process

3.6. you attend class regularly
3.7. you arrive for class on time
3.8. you listen attentively during class
3.9. you pass written exams at level indicated by the instructor
3.10. you meet criteria for successful completion of written products; lab sheets, presentations, case studies, etc…

Learning Objectives

3.a. Inspect and test warning devices (lights and audible) circuit sensor/sending units, bulbs/LEDs, sockets, connectors, wires, and control components/modules; repair or replace as needed.

3.b. Identify causes of intermittent, high, low, or no gauge readings; determine needed action.
3.c. Inspect and test gauge circuit sensor/sending units, gauges, connectors, terminals, and wires; repair or replace as needed.
3.d. Inspect, test, replace, and calibrate (if applicable) electronic speedometer, odometer, and tachometer systems.

4. Perform related electrical systems troubleshooting.

Assessment Strategies

4.1. Written product
4.2. Skill demonstration
4.3. Written Objective tests

Criteria

You will know you are successful when:

4.1. you wear personal protective equipment
4.2. you follow safety procedures
4.3. you select the correct tools, equipment, instruments, materials and supplies
4.4. you perform critical steps in the right order from start to finish
4.5. you are able to verbalize sound reasoning for the decisions made throughout the process
4.6. you attend class regularly
4.7. you arrive for class on time
4.8. you listen attentively during class
4.9. you pass written exams at level indicated by the instructor
4.10. you meet criteria for successful completion of written products; lab sheets, presentations, case studies, etc…

Learning Objectives

4.a. Identify causes of constant, intermittent, or no horn operation; determine needed action.
4.b. Inspect and test horn circuit relays, horns, switches, connectors, wires, clock springs, and control components/modules; repair or replace as needed.
4.c. Identify causes of constant, intermittent, or no wiper operation; diagnose the cause of wiper speed control and/or park problems; determine needed action.
4.d. Inspect and test wiper motor, resistors, park switch, relays, switches, connectors, wires and control components/modules; repair or replace as needed.
4.e. Inspect wiper motor transmission linkage, arms, and blades; adjust or replace as needed.
4.f. Inspect and test windshield washer motor or pump/relay assembly, switches, connectors, terminals, wires, and control components/modules; repair or replace as needed.
4.g. Inspect and test side view mirror motors, heater circuit grids, relays, switches, connectors, terminals, wires and control components/modules; repair or replace as needed.
4.h. Inspect and test heater and A/C electrical components including: A/C clutches, motors, resistors, relays, switches, connectors, terminals, wires, and control components/modules; repair or replace as needed.
4.i. Inspect and test auxiliary power outlet, integral fuse, connectors, terminals, wires, and control components/modules; repair or replace as needed.
4.j. Identify causes of slow, intermittent, or no power window operation; determine needed action.
4.k. Inspect and test motors, switches, relays, connectors, terminals, wires, and control components/modules of power window circuits; repair or replace as needed.
4.l. Inspect and test switches, relays, controllers, actuator/solenoids, connectors, terminals, and wires of electric door lock circuits.

5. Perform ABS and ATC electrical component diagnosis and repair.

Assessment Strategies

5.1. Written product
5.2. Skill demonstration
5.3. Written Objective tests

Criteria

You will know you are successful when:

5.1. you wear personal protective equipment
5.2. you follow safety procedures
5.3. you select the correct tools, equipment, instruments, materials and supplies
5.4. you perform critical steps in the right order from start to finish
5.5. you are able to verbalize sound reasoning for the decisions made throughout the process
5.6. you attend class regularly
5.7. you arrive for class on time
5.8. you listen attentively during class
5.9. you pass written exams at level indicated by the instructor
5.10. you meet criteria for successful completion of written products; lab sheets, presentations, case studies, etc…

Learning Objectives

5.a. Diagnose antilock brake system (ABS) electronic control(s) and components using self-diagnosis and/or electronic service tool(s); determine needed action.
5.b. Test and check operation of antilock brake system (ABS) air, hydraulic, electrical, and mechanical components; perform needed action.
5.c. Test antilock brake system (ABS) wheel speed sensors and circuits ; adjust or replace as needed.
5.d. Observe automatic traction control (ATC) warning light operation; determine needed action.
5.e. Diagnose automatic traction control (ATC) electronic control(s) and components using self-diagnosis and/or specified test equipment (scan tool, PC computer); determine needed action.
5.f. Verify power line carrier (PLC) operations.

6. Perform HVAC electrical troubleshooting.

Assessment Strategies

6.1. Written product
6.2. Skill demonstration
6.3. Written Objective tests

Criteria

You will know you are successful when:

6.1. you wear personal protective equipment
6.2. you follow safety procedures
6.3. you select the correct tools, equipment, instruments, materials and supplies
6.4. you perform critical steps in the right order from start to finish
6.5. you are able to verbalize sound reasoning for the decisions made throughout the process
6.6. you attend class regularly
6.7. you arrive for class on time
6.8. you listen attentively during class
6.9. you pass written exams at level indicated by the instructor
6.10. you meet criteria for successful completion of written products; lab sheets, presentations, case studies, etc…

Learning Objectives

6.a. Identify causes of HVAC electrical control system problems; determine needed action.
6.b. Inspect and test HVAC blower motors, resistors, switches, relays, modules, wiring, and protection devices; determine needed action.
6.c. Inspect and test A/C related electronic engine control systems; determine needed action.
6.d. Inspect and test electric actuator motors, relays/modules, switches, sensors, wiring, and protection devices; determine needed action.