CONTENT STANDARD 1.0: SAFETY AND TOOLS

Performance Standard 1.1: Demonstrate General Lab Safety Rules and Procedures

1.1.1 Perform a quality job hazard analysis.
1.1.2 Demonstrate the key attributes to contribute to an active safety culture.
1.1.3 Utilize proper ventilation procedures for working within the lab/shop area.
1.1.4 Identify marked safety areas.
1.1.5 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.
1.1.6 Identify the location and use of eye wash stations.
1.1.7 Identify the location of the posted evacuation routes.
1.1.8 Comply with the required use of safety glasses, ear protection, gloves, and shoes during lab/shop activities (i.e., personal protection equipment – PPE).
1.1.9 Identify and wear appropriate clothing for lab/shop activities.
1.1.10 Secure hair and jewelry for lab/shop activities.
1.1.11 Locate and interpret safety data sheets (SDS).
1.1.12 Perform housekeeping duties.
1.1.13 Demonstrate capability to follow verbal and written instructions to complete work assignments.

Performance Standard 1.2: Demonstrate Safe Handling and Usage Of Tools

1.2.1 Identify appropriate tools and their usage in diesel service applications.
1.2.2 Identify standard and metric designation.
1.2.3 Demonstrate safe handling and use of hand and power tools.
1.2.4 Utilize safe procedures for handling of tools and equipment.
1.2.5 Identify and use proper placement of floor jacks and jack stands.
1.2.6 Identify situational tool restrictions.
1.2.7 Identify and use proper lifting procedures and proper use of support equipment (e.g., lifts, hoists, rigging, etc).
1.2.8 Demonstrate proper inspection, cleaning, storage, and maintenance of tools and equipment.
1.2.9 Demonstrate proper use of precision measuring tools (i.e., micrometer, dial-indicator, dial-caliper).

CONTENT STANDARD 2.0: BASIC VEHICLE SERVICE AT A DOT LEVEL

Performance Standard 2.1: Identify and Utilize Vehicle Service Information

2.1.1 Locate and utilize paper and/or electronic service information.
2.1.2 Locate and utilize Technical Service Bulletins (TSBs).
2.1.3 Demonstrate knowledge of special service messages, quotes, service campaigns/recalls, vehicle/service warranty applications, and service interval recommendations.
2.1.4 Locate Vehicle Identification Number (VIN) and production date code.
2.1.5 Analyze Vehicle Identification Number (VIN) information.
2.1.6 Identify other vehicle information labels (such as tire, emissions, etc.).
Performance Standard 2.2: Prepare a Vehicle for Service
2.2.1 Identify information needed and the service requested on a repair order.
2.2.2 Perform a 360° vehicle walk around inspection.
2.2.3 Identify purpose and demonstrate proper use of fender covers, seat covers, and floor mats.
2.2.4 Demonstrate use of the three C’s (concern, cause, and correction).
2.2.5 Locate and review vehicle service history.
2.2.6 Complete work order to include customer information, vehicle identifying information, customer concern, related service history, cause, and correction.

Performance Standard 2.3: Prepare a Vehicle for the Customer
2.3.1 Ensure vehicle is prepared to return to customer per school/company policy (floor mats, steering wheel cover, etc.).

CONTENT STANDARD 3.0: DIESEL ENGINE SERVICE
Performance Standard 3.1: Perform Preliminary Engine Inspection
3.1.1 Inspect fuel, oil, Diesel Exhaust Fluid (DEF) and coolant levels, and condition; determine needed action.
3.1.2 Identify engine fuel, oil, coolant, air, and other leaks; determine needed action.
3.1.3 Observe engine exhaust smoke color and quantity.
3.1.4 Check and record electronic diagnostic codes.

Performance Standard 3.2: Identify Diesel Engine Components
3.2.1 Identify external base engine components related to common diesel engines.
3.2.2 Identify emission system components.

Performance Standard 3.3: Understand Diesel Engine Theory and Operation
3.3.1 Describe the operation of a diesel engine.
3.3.2 Describe the operations of a diesel engine’s subsystems.

CONTENT STANDARD 4.0: PREVENTATIVE MAINTENANCE INSPECTIONS
Performance Standard 4.1: Perform Preventative Maintenance Inspections
4.1.1 Perform a Form A Preventative Maintenance Inspection per the Technology & Maintenance Council standards.
4.1.2 Perform a Form B Preventative Maintenance Inspection per Technology & Maintenance Council standards MC standards.

CONTENT STANDARD 5.0: HYDRAULIC SYSTEMS
Performance Standard 5.1: Understand Hydraulic system Operation and Theory
5.1.1 Identify hydraulic system theory and safety procedures.
5.1.2 Read and interpret system diagrams and schematics.
### Performance Standard 5.2: Identify Base Hydraulic System Components

5.2.1 Identify system fluid type and warning labels.
5.2.2 Identify system type (closed and open) and verify proper operation.
5.2.3 Determine pump type, actuators, and controls.

### CONTENT STANDARD 6.0: BRAKE SYSTEM

#### Performance Standard 6.1: Understand Brake Theory and Operation

6.1.1 Identify brake safety procedures per system manufacturer and type.
6.1.2 Identify brake components for air or hydraulic brake systems.
6.1.3 Verbally describe friction material maintenance.
6.1.4 Identify wear limits in brake linings, drums and rotators.

#### Performance Standard 6.2: Assess Air Brakes – Mechanical/Foundation Brakes

6.2.1 Inspect and measure brake shoes or pads; replace friction lining.
6.2.2 Inspect and measure brake drums or rotors; replace friction lining.

#### Performance Standard 6.3: Perform Wheel Bearing Service and Repair

6.3.1 Inspect and service wheel bearings according to manufacturer’s specifications.

### CONTENT STANDARD 7.0: ELECTRIC/ELECTRONIC SYSTEMS

#### Performance Standard 7.1: Understand General Electrical Systems

7.1.1 Identify safety procedures related to electrical system service.
7.1.2 Describe the distinctions between series, parallel, series-parallel circuits.
7.1.3 Calculate total resistance in series, parallel, series-parallel circuits.
7.1.4 Read and interpret electrical/electronic circuits using wiring diagrams.
7.1.5 Check continuity in electrical/electronic circuits using appropriate test equipment.
7.1.6 Check applied voltages, circuit voltages, and voltage drops in electrical/electronic circuits using appropriate test equipment.
7.1.7 Check current flow in electrical/electronic circuits and components using appropriate test equipment.
7.1.8 Check resistance in electrical/electronic circuits and components using appropriate test equipment.
7.1.9 Locate shorts, grounds, and opens in electrical/electronic circuits.
7.1.10 Inspect and test fusible links, circuit breakers, relays, solenoids, and fuses; replace as needed.

#### Performance Standard 7.2: Perform Battery Service

7.2.1 Identify battery type; perform appropriate battery load test; determine needed action.
7.2.2 Determine battery state of charge using an open circuit voltage test.
7.2.3 Inspect, clean, and service battery; replace as needed.
7.2.4 Inspect and clean battery boxes, mounts, and hold downs; repair or replace as needed.
7.2.5 Charge battery using appropriate method for battery type.
7.2.6 Inspect, test, and clean battery cables and connectors; repair or replace as needed.
7.2.7 Jump start a vehicle using jumper cables and a booster battery or appropriate auxiliary power supply using proper safety procedures.
7.2.8 Identify series and parallel systems. Perform battery capacitance test; determine needed action.
Performance Standard 7.3: Perform Starting System Service

7.3.1 Perform starter circuit cranking voltage and voltage drop tests; determine needed action.
7.3.2 Inspect and test components (key switch, push button and/or magnetic switch) and wires and harnesses in the starter control circuit; replace as needed.
7.3.3 Inspect and test, starter relays and solenoids/switches; replace as needed.
7.3.4 Remove and replace starter; inspect flywheel ring gear or flex plate.
7.3.5 Perform starter current draw test; determine needed action.

Performance Standard 7.4: Perform Charging System Diagnosis and Repair

7.4.1 Test instrument panel mounted volt meters and/or indicator lamps; determine needed action.
7.4.2 Identify causes of a no charge, low charge, or overcharge problems; determine needed action.
7.4.3 Inspect and replace alternator drive belts, pulleys, fans, tensioners, and mounting brackets; adjust drive belts and check alignment.
7.4.4 Perform charging system voltage and amperage output tests; perform AC ripple test; determine needed action.
7.4.5 Perform charging circuit voltage drop tests; determine needed action.
7.4.6 Remove and replace alternator.
7.4.7 Inspect, repair, or replace cables, wires, and connectors in the charging circuit.

Performance Standard 7.5: Perform Lighting Systems Diagnosis and Repair

7.5.1 Identify causes of brighter than normal, intermittent, dim, or no headlight.
7.5.2 Test, replace, and aim headlights.
7.5.3 Test headlight and dimmer circuit switches, relays, wires, terminals, connectors, sockets, and control components/modules; repair or replace as needed.
7.5.4 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.
7.5.5 Inspect and test tractor-to-trailer multi-wire connector(s); repair or replace as needed.
7.5.6 Inspect, test, and adjust stoplight circuit switches, bulbs/LEDs, sockets, connectors, terminals, wires and control components/modules; repair or replace as needed.
7.5.7 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.
7.5.8 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.

CONTENT STANDARD 8.0: TRANSPORTATION CAREERS

Performance Standard 8.1: Explore Transportation Careers

8.1.1 Describe the history of the transportation industry and the effects on society.
8.1.2 Investigate new and emerging technologies in the transportation industry.
8.1.3 Research the different career opportunities in the transportation career path.
8.1.4 Describe personal decisions that impact career options.
8.1.5 Establish short-term and long-term career goals.

Performance Standard 8.2: Explore Industry Ethics and Standards

8.2.1 Describe behaviors consistent with OSHA safety standards.
8.2.2 Describe good environmental practices.
8.2.3 Identify Department of Labor Federal Employment Laws.
8.2.4 Demonstrate personal accountability and responsibility for your career and safety.