

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.
- 4.1.3 Perform a CSA Safety Inspection per Department of Transportation standards.
Electronic copy of form available at <http://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/part-396form6.pdf>
For more information, please see: <http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol5/xml/CFR-2011-title49-vol5-part396.xml>.

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.

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- 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.