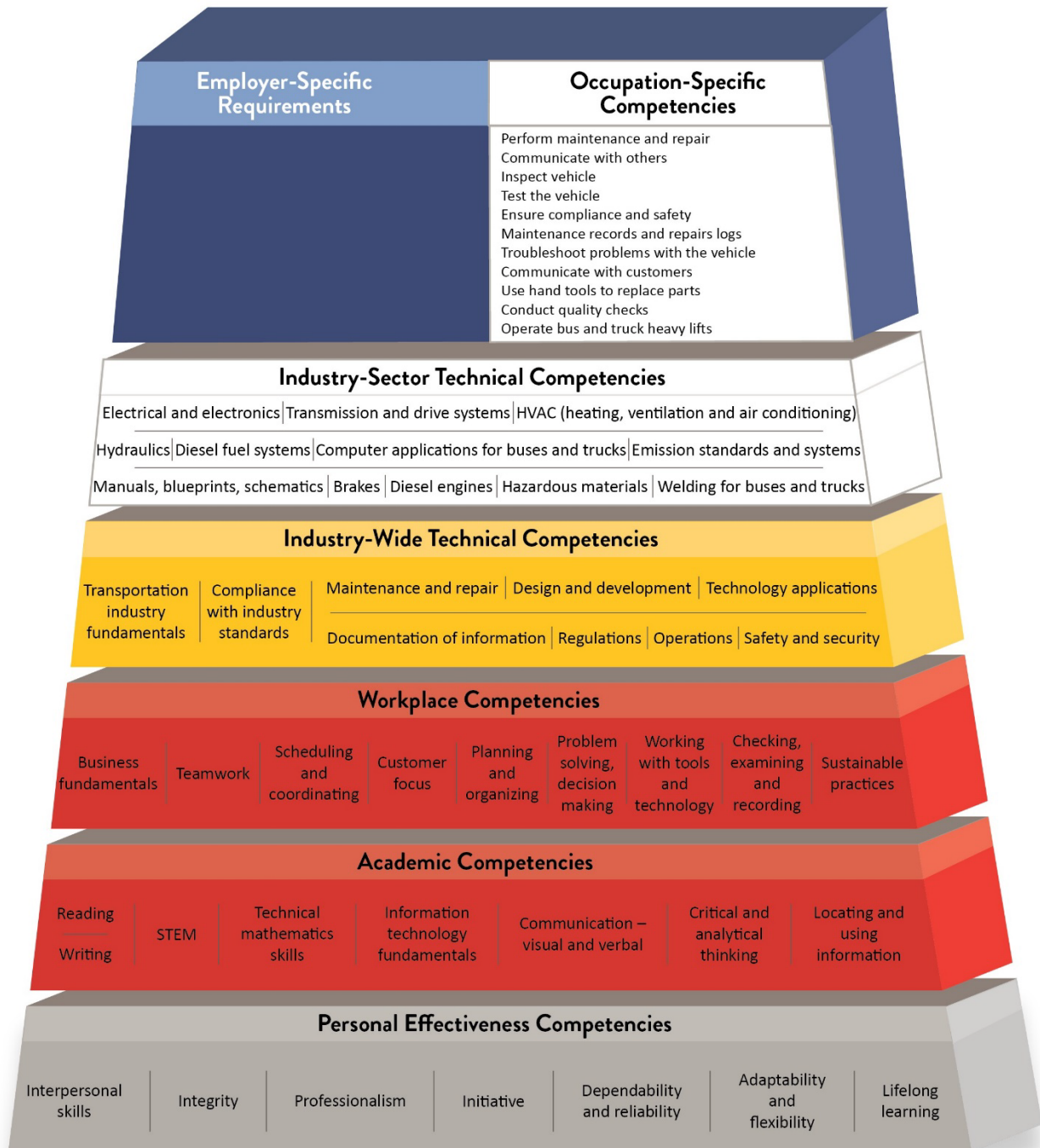


# Minnesota Dual-Training Pipeline

## Competency Model for Transportation

### Occupation: Bus and Truck Diesel Mechanic



Based on: Transportation, Distribution and Logistics Competency Model, Employment and Training Administration, United States Department of Labor, August 2018

Pipeline recommends the Industry-Sector Technical Competencies as formal training opportunities (provided through related instruction) and the Occupation-Specific Competencies as on-the-job training opportunities.



## Competency Model for Bus and Truck Diesel Mechanic

**Bus and Truck Diesel Mechanic** – A bus and truck diesel mechanic is a technician who works on diesel-powered vehicles. They inspect buses and trucks, identify problems, and repair them, along with performing routine maintenance.

### Industry-Sector Technical Competencies

**Related Instruction** for dual training means the organized and systematic form of education resulting in the enhancement of skills and competencies related to the dual trainee's current or intended occupation.

- **Brakes** – Perform troubleshooting, maintenance, and repair of air and hydraulic brake systems.
- **HVAC (heating, ventilation, and air conditioning)** – Discern the principles of air conditioning types, diagnosis, testing, and repair of air conditioning systems.
- **Electrical and electronics** – Demonstrate proper and safe electrical testing and identify circuit wiring diagrams to recognize procedures for repairing wiring harnesses, connectors, and terminals for the vehicle.
- **Transmission and drive systems** – Understand theory, operation and repair of medium and heavy-duty truck and diesel engine-based transmissions, differential and driveline components.
- **Hydraulics** – Know how to safely operate hydraulics as well as fix, repair, analyze and design simple hydraulic systems.
- **Diesel fuel systems** – Know how to program engine computers, diagnose engine failures and how fuel is impacting the failure, and understand a variety of fuel management systems.
- **Emission standards and systems** – Understand emission controls on modern diesel engines and diagnose emission system problems.
- **Diesel engines** – Understand basic operation of diesel engines as well as disassembly, inspection, measurement, assembly, and how to alter diesel engines.

- **Hazardous materials** – Utilize safety and environmental information to interpret shop safety hazards, reducing and eliminating waste during travel, and knowledge of agencies enforcing rules and laws.
- **Manuals, blueprints, schematics** – Understand how to read technical information found in manuals, blueprints and schematics relating to the machinery to interpret diagnostic output.
- **Computer applications for buses and trucks** – Know the basics of the computer systems that operate in buses and trucks and how to fix and/or adjust those systems to the manufacturer standards of safe vehicle operation.
- **Welding for buses and trucks** – Understand how to perform basic welds to fix and/or maintain items on a bus or truck.

## Occupation-Specific Competencies

**On-the-Job Training (OJT)** is hands-on instruction completed at work to learn the core competencies necessary to succeed in an occupation. Common types of OJT include job shadowing, mentorship, cohort-based training, assignment-based project evaluation, and discussion-based training.

- **Perform maintenance and repair** – Follow checklists to ensure all important parts are examined, including belts, hoses, steering systems, spark plugs, brake and fuel systems, wheel bearings, and other potentially troublesome areas.
- **Communicate with others** – Confer with fellow staff about vehicle problems, to discuss the work to be performed, and how to repair the vehicle.
- **Conduct quality checks** – Be able to test and adjust repaired systems to meet manufacturers' performance specifications.
- **Inspect vehicle** – Know how to inspect equipment, structures, or materials to identify and record findings. Perform necessary repairs and review work to ensure problem is fixed and vehicle is in safe driving condition.
- **Test the vehicle** – Test drive vehicles and test components and systems, using equipment such as infrared engine analyzers, compression gauges, and computerized diagnostic devices.
- **Ensure compliance and safety** – Know how to perform all responsibilities in compliance with regulations, standards, and procedures to ensure safety of all.

- **Maintain records and repairs logs** – Understand how to review service and maintenance checks previously performed to inform repair work and continue documentation of all preventative and corrective maintenance.
- **Troubleshoot problems with the vehicle** – Know how to think through what might be causing problems with the vehicle and then develop ideas and solutions to address those problems.
- **Communicate with customers** – Understand how to communicate with customers about the repairs, processes, cost, etc. in a manner that ensures high quality customer service.
- **Use hand tools to replace parts** – Know how to safely use hand tools to perform repairs and replace parts to fix the bus or truck.
- **Operate bus and truck heavy lifts** – Know how to safely operate lift systems that are large enough and have enough capacity to safely lift buses and trucks off the ground to be able to do work underneath the vehicle.

Updated March 2024