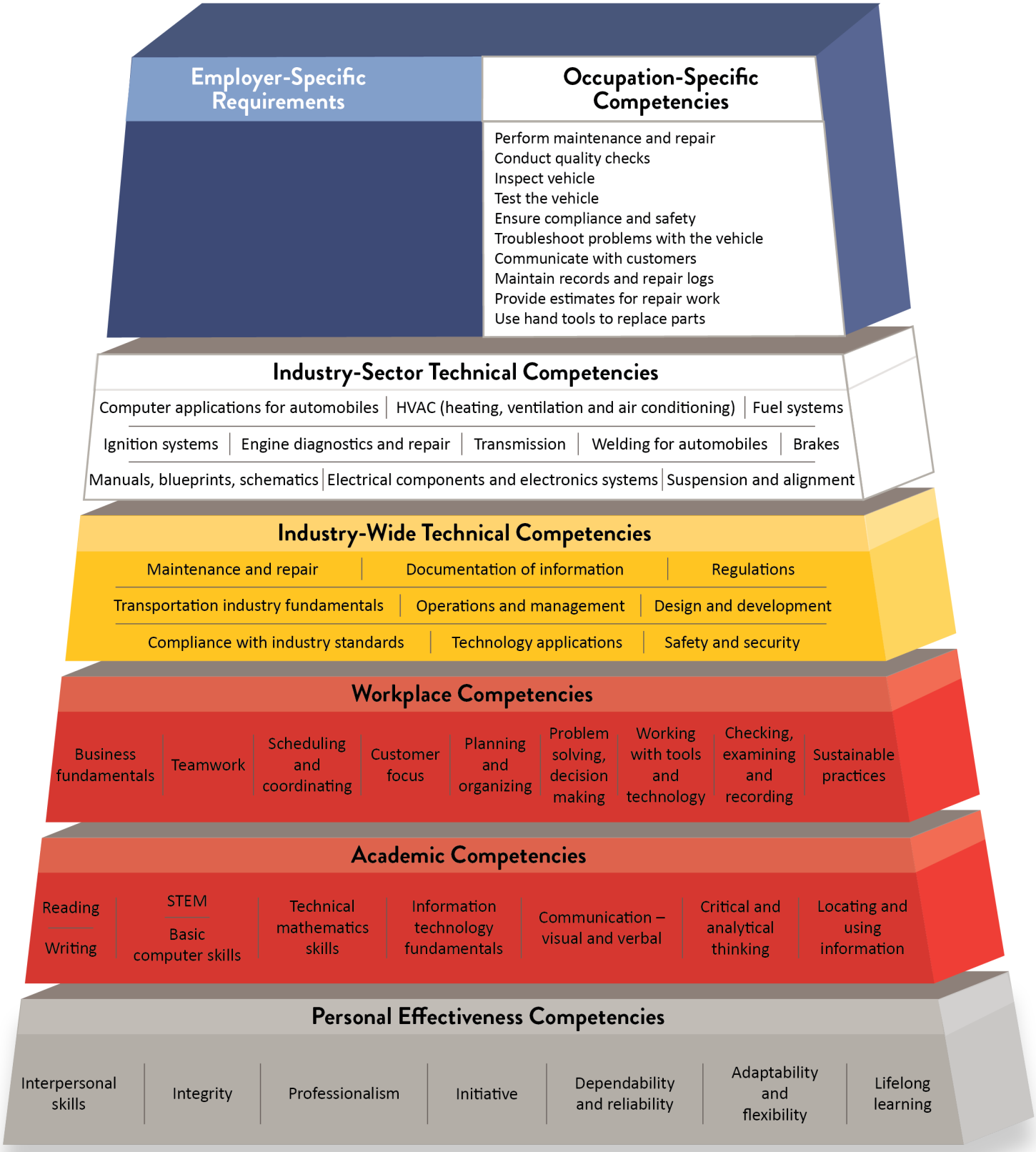
Minnesota Dual-Training Pipeline
Competency Model for Transportation Occupation: Automotive Mechanic



Based on: Transportation, Distribution and Logistics Competency Model, Employment and Training Administration, United States Department of Labor, February 2025. For more detailed information about competency model creation and sources, visit dli.mn.gov/business/workforce/transportation.

Competency Model for Automotive Mechanic

Automotive Mechanic – An automotive mechanic performs repairs and orders diagnostic tests on vehicles such as cars, vans, and small trucks. They possess a deep understanding of various vehicle systems, including engines, transmissions, brakes, electrical systems, and more. They use their expertise and technical knowledge to identify mechanical issues, perform repairs or replacements of faulty components, and ensure that vehicles are in proper working condition.

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

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.

- **Suspension and alignment** – Understand two- and four-wheel alignment suspension systems, tire balance and service. Ensure vehicle is properly aligned and to be able to adjust alignment.
- **Brakes** – Perform troubleshooting, maintenance, and repair of standard and anti-lock braking systems.
- **HVAC (heating, ventilation and air conditioning)** – Discern the principles of air conditioning types, diagnosis, testing, and repair of air conditioning systems for the vehicle.
- **Electrical components and electronics systems** – Demonstrate proper and safe electrical testing and identify circuit wiring diagrams to recognize procedures for repairing wiring harnesses, connectors, and terminals.
- **Transmission** – Understand basic theory of automotive transmission, including torque converter, planetary gear sets, clutch assemblies, and hydraulic systems.
- **Fuel systems** – Understand the engine fuel delivery and injection system, analyze symptoms related to engine management components, and determine necessary actions.

- **Engine diagnostics and repair** – Understand how to distinguish between the general mechanical properties of the engine and the other potential impacts on engine performance and vehicle drivability.
- **Ignition systems** – Understand how the ignition system operates, and basic skills required to be able to repair and maintain the system, including electric vehicles.
- **Computer applications for automobiles** – Know the basics of the computer systems that operate in automobiles and how to fix and/or adjust those systems to the manufacturer standards of safe vehicle operation.
- **Welding for automobiles** – Understand how to perform basic welds to fix and/or maintain items on an automobile.
- **Manuals, blueprints, schematics** – Understand how to read technical information found in manuals, blueprints and schematics relating to the machinery.

Occupation-Specific Competencies

On-the-Job Training 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** – Know how to 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.
- **Conduct quality checks** – Be able to test and adjust repaired systems to meet manufacturers' performance specifications.
- **Inspect vehicle** – Know how to inspect vehicles for damage and record findings so that necessary repairs can be made.
- **Test the vehicle** – Be able to 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** – Understand how to perform all responsibilities in compliance with regulations, standards, and procedures to ensure safety of all.
- **Troubleshoot problems with the vehicle** – Utilize foundational knowledge of subsystems to review 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.
- **Maintain records and repair logs** – Review service and maintenance checks previously performed to inform repair work and continue documentation of all preventative and corrective maintenance.
- **Provide estimates for repair work** – Know how to provide quotes for work to be done/repaired and then present that information to the customer.
- **Use hand tools to replace parts** – Know how to safely use hand tools to perform repairs and replace parts to fix the automobile.

Updated October 2025