Grade 12D Applied Automotive Technologies

Course Code	**8703**
Course Credit	**1.0**

Senior Years Technology Education Program

Discipline Overview

An approved technical-vocational education (TVE) program cluster comprises departmentally developed and/or approved courses in one specific trade or trained occupation that facilitates the transition from school to either post-secondary training (such as the training provided through Apprenticeship Manitoba) or entry into the workforce (often at an entry-level position).

When learners pursue their studies in an environment modelled after the workplace, they will acquire not only trade-related skills, but will also develop

- employability skills required to make an effective transition from school to work
- an understanding of career development and planning
- an understanding of the importance of becoming autonomous, lifelong learners who can adapt their skills and knowledge to what they will need in the future
- an awareness of safety in school, in the workplace, and at home
- an awareness of sustainability as it relates to the specific skilled trade and society

Course Overview

This applied course focuses on reinforcing and advancing learners' practical skills in automotive diagnostics and repair. Learners will continue to expand their expertise in the automotive field, including safety practices, tools and equipment, and the selection and use of materials and consumables. They will demonstrate how to safely and properly use procedures to test, diagnose, and repair various systems and components. The course emphasizes accurate interpretation of technical information, effective use of diagnostic equipment, and adherence to standard repair protocols. Learners will also apply advanced mathematical reasoning to support precise system analysis and troubleshooting.

Manitoba

This course focuses on the following units in the Apprenticeship Manitoba Level 1 technical training:

- A1 Learning About Work
- A2 Trade Safety Awareness
- A3 Tools and Equipment
- A4 Trade Related Communications and Documents

The learning outcomes in this course may not follow a fixed sequence, as they are organized to align with Apprenticeship Manitoba standards. Only the outcomes relevant to this course are included. A complete list of learning outcomes can be found in the primary learning outcomes resource.

Global Competencies in Automotive Technology

Critical Thinking

Critical thinking in automotive technology involves the intentional process of synthesizing and analyzing ideas using criteria and evidence, making reasoned decisions and judgments, and reflecting on the outcomes and implications of those decisions and judgments.

When critical thinking as a competency is applied in automotive technology, learners

- **find and use** sources strategically, efficiently, and effectively when making safety, environment, and respectful workplace decisions and choices
- **evaluate** sources for bias, relevance, and reliability in trade communications and documents, as well as for the selection and use of materials and consumables
- analyze and synthesize ideas using **criteria and evidence** that demonstrate awareness of emerging trends and issues
- understand that people (customers) come with **varied perspectives based on their own experience**
- demonstrate **flexibility to reconsider** their thinking when faced with new credible information or resources
- enhance comprehension, clarify meaning, make connections, and expand experiences through questioning
- **make judgments** based on observation, experience, and evidence
- **weigh criteria** to apply safe practices and make ethical decisions

Creativity

Creativity in automotive technology involves exploring and playing with ideas and concepts in order to represent thinking, solve problems, explore opportunities, and innovate in unique ways. It is the interaction between intuition and thinking.

When creativity as a competency is applied in automotive technology, learners

- demonstrate initiative, open-mindedness, inventiveness, flexibility, and a willingness to **take prudent risks** in thinking about various processes and while recognizing safety protocols
- demonstrate **curiosity** by exploring new ideas, possibilities, and emerging trends, as well as by **asking relevant questions**
- **use safe strategies** and procedures to make adaptations and adjustments when solving problems or generating innovative ideas
- enhance innovative ideas **by building on** prior knowledge and **the ideas of others**
- **create a plan** for a procedure or process and **adjust** it as needed to achieve the goal of successfully meeting a learning outcome
- **test and adapt** procedures or processes to **persevere** through obstacles to improve process, efficiency, effectiveness, and customer service
- use **reflective practice** by **welcoming feedback** from others to enhance the process

Citizenship

Citizenship in **automotive technology** involves engaging and working toward a more equitable, compassionate, and sustainable world by developing and valuing relationships to self, others, and the natural world.

When citizenship as a competency is applied in automotive technology, learners

- understand **their own perspective** on issues related to automotive systems and service
- recognize **discrimination, principles of equity, and human rights** in the workplace
- explore the **interconnectedness** of self, the workplace, and the natural world as they make decisions in the workplace and select materials and consumables
- welcome **diverse viewpoints, experiences, and world views,** and appreciate how they contribute to building relationships and practices
- **empathize** with multiple viewpoints to better understand consumers, markets, workplaces, teams, and co-workers
- connect with others in **responsible, respectful, and inclusive ways,** both in person and in digital contexts

- **realize their potential** in contributing to the betterment of both their workplace and the wider community with the decisions they make
- work to support diversity, inclusivity, and human rights by finding **equitable solutions** in the workplace that support well-being for all
- make **ethical choices** to promote healthy and sustainable outcomes

Connection to Self

Connection to self in automotive technology involves awareness of one's identity, the ability to self-regulate, make and reflect on decisions, and the responsibility for personal growth, well-being, and well-becoming.

When connection to self as a competency is applied in automotive technology, learners

- recognize **personal strengths, gifts, and challenges** in automotive systems and service that support their learning and well-being
- come to know the **factors that shape their identity** as automotive technicians, and see themselves as professionals
- use workplace skills and practices to enhance **self-regulation**, personal comfort, sense of well-being, and efficiency
- **reflect** on their own decisions, effort, and experiences, and others' feedback as they improve their skills as automotive technicians
- **set goals** to strengthen their career and personal aspirations as automotive technicians
- create a **personal plan** that reflects their career goals, encompassing strengths and interests
- value and practise resilience as they work through mistakes and **overcome obstacles** in their skills and understanding of automotive technology
- demonstrate the ability **to change or adapt** to new experiences when presented with obstacles or new information
- recognize and **embrace their role** in lifelong learning, well-being, and well-becoming

Collaboration

Collaboration in automotive technology involves learning with and from others and working together with a shared commitment to a common goal.

When collaboration as a competency is applied in automotive technology, learners

- welcome **diverse viewpoints**, experiences, and world views, and appreciate how they contribute to building relationships and practices

- understand that when they **build on each other's ideas** through discussion, sharing practices, ideas, and stories, their understanding is deepened
- **value** and **put trust in others'** contributions when working together to ensure safe practices
- practise **active listening** and formulate **questions** of themselves and others to generate new ideas and deepen understanding
- **work through differences** and show a willingness to **compromise** or change perspective by demonstrating effective conflict-resolution practices/strategies and appropriate workplace etiquette and protocols
- **co-construct** understanding of current practices and emerging technologies
- **commit** to their roles to maintain a safe work environment, to communicate effectively, and to engage in group procedures

Communication

Communication in automotive technology involves interacting with others and allowing for a message to be received, expressed, and understood in multiple ways and for a variety of purposes.

When communication as a competency is applied in automotive technology, learners

- express ideas while using workplace **cues, conventions**, and professionalism, and while being aware of both word choice and body language
- understand context, adapting to different **audiences and purposes** and conveying information clearly and concisely
- understand how their **words and actions** shape their identity or have an impact on their relationships with colleagues and customers
- are aware of workplace **cues, practices, and protocols,** such as word choice and body language, and use them to understand and interpret messages
- **seek to understand** others' ideas and instructions through use observation, active listening, and questioning as they seek to understand and interpret their peers and customers
- recognize that diverse **contexts** (of language, culture, age, etc.) **can impact and influence understanding**
- make meaning and deepen understanding **through their own language and the languages** of clients and colleagues
- **build relationships** through meaningful interactions using inclusive and respectful language, and correct terminology, both in person and in digital contexts
- recognize the benefits of communication to **build community** in their workplace and broader world

Enduring Understandings

Explore career opportunities.

Technical-vocational education supports learners to understand the unique characteristics, scope, working conditions, and career opportunities of various occupations to make informed choices.

Create safe, healthy, and effective workspaces.

Technical-vocational education provides learners with safe and healthy, effective work practices and protocols that meet industry standards for technical competence and professionalism.

Navigate the world.

Technical-vocational education prepares learners with attitudes, skills, and knowledge to successfully navigate complex, competitive, and collaborative environments to develop an awareness of regulations, cultural competence, and ethical practices.

Experience connected and innovative learning.

Technical-vocational education readies learners to be entrepreneurial and innovative thinkers while making cross-curricular connections and transdisciplinary experiences (STEAM), utilizing industry-standard digital tools and technologies and fostering awareness of industry trends.

Promote inclusive and responsive systems.

Technical-vocational education promotes equity, diversity, and inclusion; is responsive to global challenges; and promotes environmental stewardship to prepare learners for an interconnected world.

Prepare for evolving economies.

Technical-vocational education equips learners with relevant and adaptable skills to become lifelong learners in an ever-changing world.

Learning Outcomes

With independence and an emerging ability to guide others, learners can achieve the following learning outcomes.

Strand A: Trade Safety (A2)

AUT-12D-A1 Define Manitoba safety and health requirements.

AUT-12D-A1-1   Define Manitoba safety and health requirements under The Workplace Safety and Health Act and Regulations for **workers' rights,** including

- the right to know
- the right to participate
- the right to refuse
- the right to protection from reprisal

AUT-12D-A1-2   Define Manitoba safety and health requirements under The Workplace Safety and Health Act and Regulations for **workers' responsibilities,** including

- taking reasonable care to protect themselves and others
- using safety equipment properly
- following safety rules and procedures
- cooperating with safety representatives and supervisors

AUT-12D-A1-3   Define and explain Manitoba safety and health requirements under The Workplace Safety and Health Act and Regulations for

- the rights and responsibilities of **supervisors**
- the rights and responsibilities of **employers**

AUT-12D-A1-4   Define and explain workplace **safety and health programs** and the roles of workers, including

- safety and health committee
- participation in investigation and inspection process

AUT-12D-A1-5   Define and explain the Manitoba safety and health requirements for various **public agencies**, including

- Workplace Safety and Health (Enforcement)
- SAFE Work Manitoba (Prevention)

AUT-12D-A2 Recognize, explain, and demonstrate personal protective equipment (PPE) requirements and standards in the workplace.

AUT-12D-A2-1   Recognize various **personal protective equipment** (PPE), including

- eye protection
- face protection
- hearing protection
- foot protection
- head protection
- hand protection
- skin protection
- respiratory protection
- protective clothing
- fall protection (trade-specific)

AUT-12D-A2-2   Explain various **personal protective equipment** (PPE), including

- selection of the appropriate PPE
- characteristics and key features
- application (i.e., role or utility in specific scenarios)
- limitations in scope or performance

AUT-12D-A2-3   Demonstrate how to use the required **personal protective equipment** (PPE), ensuring

- a proper fit
- a proper seal
- it is worn properly
- an understanding of the procedures for reporting any damage or malfunctions

AUT-12D-A2-4   Recognize **hierarchy of control measures,** and explain the requirements and standards, including

- elimination
- substitution
- engineering controls
- administrative controls
- personal protective equipment (PPE)

AUT-12D-A2-5 Explain each individual's responsibilities when using and managing **personal protective equipment** (PPE) at work or in training for **various roles**, including the

- employer
- supervisor
- worker
- teacher
- student

AUT-12D-A2-6 Explain requirements for **personal protective equipment** (PPE), including

- the name of the provider
- its proper maintenance
- required training
- the different types of gear
- procedures in place to guarantee regulations are upheld

AUT-12D-A3 Recognize and explain the Workplace Hazardous Material Information System (WHMIS) and procedures.

AUT-12D-A3-1 Explain how various hazardous materials are **identified**, including

- classification
- safety data sheets (SDS)
- labelling
- training
- access to information

AUT-12D-A3-2 Explain what **suppliers and workplaces** must do when labelling hazardous products, including

- using safety symbols
- classifying chemicals

AUT-12D-A3-3 Recognize various **safety data sheets** (SDS).

AUT-12D-A3-4 Recognize various **chemical and biological hazards.**

AUT-12D-A3-5 Explain how to deal with **chemical and biological hazards** safely, including

- how to wash off spills
- moving dangerous materials
- storing them properly

AUT-12D-A4 Recognize and explain safe work procedures (SWP).

AUT-12D-A4-1   Recognize a **safe work procedure** (SWP) that outlines specific steps to safely perform a task, including
- hazard identification
- risk assessment
- control measures

AUT-12D-A4-2   Explain a **safe work procedure** (SWP), including
- purpose
- scope
- procedure
- training

AUT-12D-A4-3   Recognize a hazard and explain the procedures to follow for **managing various uncontrolled risks**, including
- unsecured tools or equipment
- improper use of machinery
- electrical hazards
- chemical exposure
- lack of personal protective equipment (PPE)

AUT-12D-A4-4   Describe the **process of developing** a safe work procedure (SWP), including
- gathering information
- identifying hazards
- implementing controls
- documenting steps
- training workers

AUT-12D-A5 Recognize and explain injury prevention.

AUT-12D-A5-1   Recognize, explain, and demonstrate the **SAFE acronym**.
- **S**pot the hazard
- **A**ssess the risk
- **F**ind a safer way
- **E**very day

AUT-12D-A5-2   Recognize various **mental health risks** at work and school, such as
- stress
- bullying
- violence

AUT-12D-A5-3   Explain how to prevent various **mental health risks**, including

- respectful communication
- implementation of clear policies
- access to support systems

AUT-12D-A5-4   Demonstrate how to reduce various **mental health risks** at work and school, such as by

- promoting respect
- offering support
- proactively recognizing and managing issues such as stress or bullying

AUT-12D-A5-5   Recognize various methods to prevent injuries among **young workers**, such as through

- completion of the Young Worker Readiness Certificate Course
- mandatory safety orientation and training
- supervision by experienced workers
- implementation of SAFE Work Manitoba's Young Worker Injury Prevention Strategy
- use of personal protective equipment (PPE)
- encouraging reporting of unsafe conditions
- promoting awareness of workers' rights

AUT-12D-A5-6   Explain various methods to prevent injuries among **young workers**, including

- selection of the appropriate method
- its characteristics and key features
- its application (i.e., role or utility in specific scenarios)
- its limitations in scope or performance

AUT-12D-A5-7   Recognize various **chemical and biological hazards**, including

- dust
- fumes
- gases

AUT-12D-A5-8   Explain how to prevent various **chemical and biological hazards**, such as by

- using proper ventilation
- using safety gear
- using personal protective equipment (PPE)
- implementing safe handling procedures

AUT-12D-A5-9   Explain how to prevent various injuries related to **electrical safety**, including

- using proper tools
- turning off power before repairs
- following lockout/tagout steps to make sure machines cannot be turned on accidentally

AUT-12D-A5-10   Demonstrate how to safely shut off and lock electrical equipment using a **lockout/tagout** procedure.

AUT-12D-A5-11   Recognize how to prevent various types of **fires and injuries from fire,** including

- recognizing different types of fires
- recognizing different kinds of fire extinguishers
- describing how to use fire extinguishers safely

AUT-12D-A5-12   Demonstrate knowledge of the **locations of various fire emergency safety equipment** and evacuation safety measures, including

- fire extinguisher
- alarm pull stations
- emergency exits
- muster points

AUT-12D-A5-13   Recognize various work-related **diseases and illness** and explain how to prevent them, such as

- asbestosis
- hearing loss
- carpal tunnel syndrome
- tendonitis
- lead poisoning

AUT-12D-A5-14   Recognize various **muscle and joint injuries** and explain how to prevent them by using ergonomics prevention methods, including

- good posture
- proper workplace setup

AUT-12D-A5-15   Recognize various **confined spaces**.

AUT-12D-A5-16   Explain methods to prevent injuries during **confined space** entry.

AUT-12D-A6 Recognize and explain injury response.

AUT-12D-A6-1   Explain how to **manage a scene** when responding to an injury, such as by

- staying calm
- keeping the area safe
- providing support until trained help arrives

AUT-12D-A6-2   Explain how to **report an injury**, including reporting the injury to

- a teacher or supervisor
- Workers Compensation Board of Manitoba (WCB)

AUT-12D-A6-3   Demonstrate knowledge of the **locations of emergency safety equipment**, including

- first aid kit
- eyewash station
- automated external defibrillator (AED)

AUT-12D-A7 Demonstrate navigation of SAFE work Manitoba website.

AUT-12D-A7-1   Demonstrate how to navigate SAFE Work Manitoba's website, and retrieve and apply resources from key content, including

- legislation
- bulletins
- templates
- shop talk
- other resources

Strand B: Career Education (A1)

AUT-12D-B1 Explain the structure and scope of the automotive service technician trade.

AUT-12D-B1-1   Explain opportunities and future **career paths** in the trade, including

- becoming a specialist
- moving into leadership
- working in different locations
- growing with new technology

AUT-12D-B1-2   Explain **The Apprenticeship and Certification Act**, including

- support training
- the board
- trade committees
- rules for each trade
- policies about attendance
- continuing training

AUT-12D-B1-3   Explain the **Red Seal Occupational Standard (RSOS)**, including

- how it helps with training
- tracking work hours
- preparing for tests in a trade

AUT-12D-B2 Explain the levels of workplace competency.

AUT-12D-B2-1   Explain **job competencies** workers and learners need to know related to **workplace culture**, including

- understanding tools and materials
- using the right skills to do the job well

AUT-12D-B2-2   Explain the **social competencies** workers and learners need to know related to **workplace culture**, including

- working well with others
- using appropriate language
- respecting different beliefs
- understanding workplace rules
- supporting fairness and inclusion

AUT-12D-B3 Explain accommodation for apprentices with accessibility requirements.

AUT-12D-B3-1   Explain **The Accessibility for Manitobans Act** and how it supports apprentices with accessibility, including

- customer service
- communication
- buildings
- transportation
- training at work

Strand C: Trade Related Communications (A4)

AUT-12D-C1 Explain and demonstrate techniques for effective verbal and non-verbal communication.

AUT-12D-C1-1	Explain how to communicate clearly and respectfully with various people at school and/or work, using both **words and body language**.
AUT-12D-C1-2	Demonstrate how to communicate clearly and respectfully with various people at school and/or work, using both **words and body language**.

AUT-12D-C2 Recognize workplace behaviours and communication that constitute bullying, as defined by the Canadian Human Rights Act and jurisdictional human rights laws.

AUT-12D-C2-2	Recognize what **respectful workplace** values look like and what kinds of behaviour are considered bullying, harassment, or discrimination under Canadian law.

AUT-12D-C3 Demonstrate effective communication skills, and practise active listening and response.

AUT-12D-C3-1	Demonstrate **effective communication and active listening,** including • listening carefully • responding clearly • using appropriate body language • asking questions • being open to feedback

AUT-12D-C4 Recognize types of communication devices, and explain their purpose and operation.

AUT-12D-C4-1	Recognize various types of **communication devices**, including • telephones • two-way radios • computers • smartphones • tablets
AUT-12D-C4-2	Explain various purposes and operation of **communication devices**, such as their use for • speaking

- sending messages
- sharing information

AUT-12D-C5 Demonstrate communication techniques using various communication devices.

AUT-12D-C5-1 Demonstrate good **communication skills** when using various communication devices to speak, send messages, or share information, including
- keeping the message concise
- articulating ideas precisely to avoid confusion
- remaining polite and professional

AUT-12D-C6 Recognize types of trade-related documents and explain their applications.

AUT-12D-C6-1 Recognize various **documents** used in trade, including
- codes and standards
- company policies
- vehicle identification number (VIN)
- schematics, service information, and manufacturers' specifications
- technical service bulletins (TSB)
- industry standard labour guides

AUT-12D-C6-2 Explain various **documents** used in trade, including
- selection of the appropriate document
- its characteristics and key features
- its application (i.e., role or utility in specific scenarios)
- its limitations in scope

AUT-12D-C7 Explain the procedures used to prepare and/or complete trade-related documents.

AUT-12D-C7-1 Explain the procedures used to prepare and/or complete trade-related documents, such as
- work and repair orders
- pre-delivery inspection
- preventative maintenance
- estimates

AUT-12D-C8 Explain the importance of communicating job requirements.

AUT-12D-C8-1 Explain the importance of clearly defining what a job entails so that each team member understands exactly what is expected of them.

Strand D: Trade-Related Mathematics (A5)

AUT-12D-D2 Demonstrate how to communicate measurements.

AUT-12D-D2-1   Demonstrate how to **measure.**

AUT-12D-D2-2   Demonstrate how to **measure** using both **metric and customary** (imperial) measurement systems, such as when

- measuring length
- measuring materials

AUT-12D-D2-3   Demonstrate how to provide **measurements,** including how much the measurements can vary (e.g., torque specs).

Strand E: Tools and Equipment (A3)

AUT-12D-E1 Recognize, explain, and demonstrate an understanding of terminology associated with tools and equipment.

AUT-12D-E1-1   Recognize **key terms** and **names** of various tools and equipment.

AUT-12D-E1-2   Explain the **names** and **purposes** of various tools and equipment.

AUT-12D-E1-3   Demonstrate an understanding of the **names** and **purposes** of various tools and equipment.

AUT-12D-E2 Recognize the various hazards associated with tools and equipment, and explain and demonstrate the related safe work practices.

AUT-12D-E2-1   Recognize various **hazards of tools and equipment**, including

- harmful noise levels
- lacerations caused by sharp tools or materials
- crush injury hazards
- moving parts on machines that can catch and trap hands or garments
- flying debris hazards

AUT-12D-E2-2   Explain **safe work practices** for various tools and equipment, including

- wearing appropriate personal protective equipment (PPE)
- inspecting tools and equipment before use
- using the correct tool for the job
- keeping the work area clean and organized
- following manufacturer instructions and safety guidelines
- disconnecting power tools when not in use or during maintenance

- reporting and removing damaged tools from service
- staying alert and avoiding distractions while working
- using guards and safety devices as intended
- storing tools properly after use

AUT-12D-E2-3   Demonstrate **safe work practices** related to tools and equipment.

AUT-12D-E3 Recognize, explain, and demonstrate tools and equipment, including their selection, characteristics, applications, and limitations.

AUT-12D-E3-1   Recognize various **hand tools**.

AUT-12D-E3-2   Explain various **hand tools**, including
- selection of the appropriate hand tool
- characteristics and key features
- application (i.e., role or utility in specific scenarios)
- limitations in scope or performance
- procedures for conducting a thorough inspection
- procedures for regular maintenance
- guidelines for proper storage

AUT-12D-E3-3   Demonstrate how to safely and properly use various **hand tools**.

AUT-12D-E3-4   Recognize various **portable power tools**, including
- electric power tools
- hydraulic power tools
- pneumatic power tools

AUT-12D-E3-5   Explain various **portable power tools**, including
- selection of the appropriate tool
- characteristics and key features
- application (i.e., role or utility in specific scenarios)
- limitations in scope or performance
- procedures for conducting a thorough inspection
- procedures for regular maintenance
- guidelines for proper storage

AUT-12D-E3-6   Demonstrate how to safely and properly use various **portable power tools**.

AUT-12D-E3-7   Recognize various **measuring tools**, including
- micrometers
- vernier caliper

AUT-12D-E3-8   Explain various **measuring tools**, including
- selection of the appropriate tool
- characteristics and key features
- application (i.e., role or utility in specific scenarios)
- limitations in scope or performance
- procedures for conducting a thorough inspection
- procedures for regular maintenance
- guidelines for proper storage

AUT-12D-E3-9   Demonstrate how to safely and properly use various **measuring tools**.

AUT-12D-E3-10   Recognize various **stationary power tools**.

AUT-12D-E3-11   Explain various **stationary power tools**, including
- selection of the appropriate tool
- characteristics and key features
- application (i.e., role or utility in specific scenarios)
- limitations in scope or performance
- procedures for conducting a thorough inspection
- procedures for regular maintenance
- guidelines for proper storage

AUT-12D-E3-12   Demonstrate how to safely and properly use various **stationary power tools**.

AUT-12D-E3-13   Recognize various types of **facility equipment**.

AUT-12D-E3-14   Explain various types of **facility equipment**, including
- selection of the appropriate equipment
- characteristics and key features
- application (i.e., role or utility in specific scenarios)
- limitations in scope or performance
- procedures for conducting a thorough inspection
- procedures for regular maintenance
- guidelines for proper storage

AUT-12D-E3-15   Demonstrate how to safely and properly use various types of **facility equipment**.

AUT-12D-E3-16   Recognize various types of **hoisting and lifting equipment**.

AUT-12D-E3-17   Explain various types of **hoisting and lifting equipment**, including
- selection of the appropriate equipment
- characteristics and key features
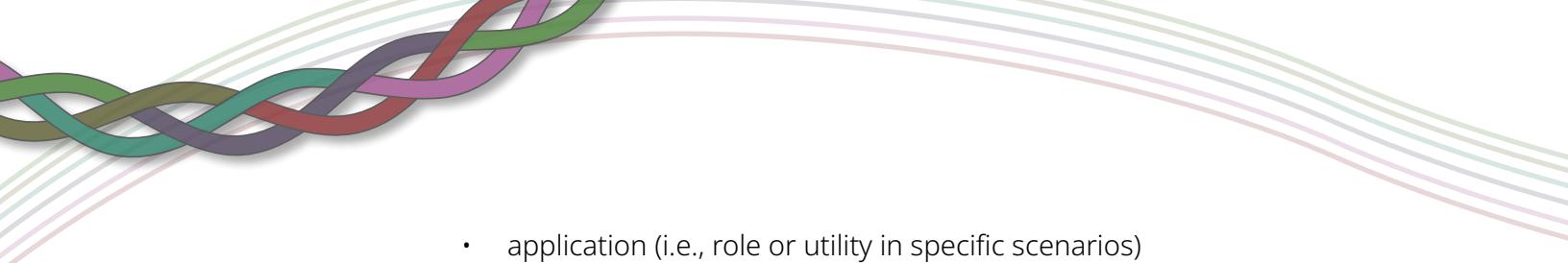
- application (i.e., role or utility in specific scenarios)
- limitations in scope or performance
- procedures for conducting a thorough inspection
- procedures for regular maintenance
- guidelines for proper storage

AUT-12D-E3-18   Demonstrate how to safely and properly use various types of **hoisting and lifting equipment**.

AUT-12D-E3-19   Recognize, explain, and demonstrate **service information** from drawings and specifications associated with hoisting and lifting equipment.

Strand F: Materials and Consumables

AUT-12D-F1 Share and discuss Indigenous perspectives and environmental impacts.

AUT-12D-F1-1   Share and discuss an **Indigenous perspective** on material selection, emphasizing sustainability, respect for natural resources, and cultural significance, such as
- principles of the honourable harvest
- four sacred elements (earth, wind, water, fire)
- inviting an Elder to teach sustainability

AUT-12D-F1-2   Share and discuss the **environmental impact** of selecting and disposing of various materials.

AUT-12D-F2 Recognize the various hazards associated with consumables and materials, and explain and demonstrate the related safe work practices.

AUT-12D-F2-1   Recognize various **hazards** of consumables and materials, including
- harmful noise levels
- lacerations caused by sharp tools or materials
- crush injury hazards
- moving parts on machines that can catch and trap hands or garments
- flying debris hazards

AUT-12D-F2-2   Explain **safe work practices** for various consumables and materials, including
- wearing appropriate personal protective equipment (PPE)
- inspecting consumables and materials before use
- using the correct consumables and materials for the job
- keeping the work area clean and organized

- following manufacturer instructions and safety guidelines
- reporting and removing damaged consumables and materials from service
- staying alert and avoiding distractions while working
- storing consumables and materials properly after use

AUT-12D-F2-3   Demonstrate safe work practices related to **consumables and materials**.

AUT-12D-F3 Recognize and explain organizing materials, including their characteristics, applications, and procedures.

AUT-12D-F3-1   Recognize various types of **materials and consumables**.

AUT-12D-F3-2   Explain various **materials and consumables**, including
- selection of the appropriate materials or consumables
- characteristics and key features
- application (i.e., role or utility in specific scenarios)
- limitations in scope or performance
- procedures for conducting a thorough inspection
- procedures for regular maintenance
- guidelines for proper storage

AUT-12D-F3-3   Demonstrate how to safely and properly use various types of **materials and consumables**.

Strand G: Driveline Systems (A6)

AUT-12D-G7 Demonstrate how to safely and properly use procedures to test, diagnose, and repair driveshaft and axle systems.

AUT-12D-G7-1   Demonstrate how to safely and properly use procedures to test, diagnose and repair various **driveshaft and axle systems**, including
- driveshaft angle/runout measurements
- universal joint/constant velocity (CV) joint replacement
- multiple piece driveshaft phasing and indexing

Strand H: Engine Fundamentals (A7)

AUT-12D-H13 Demonstrate how to safely and properly use procedures to test, diagnose, and repair engine systems.

AUT-12D-H13-1   Demonstrate how to safely and properly use procedures to test, diagnose, and repair various **engine systems**, such as
- visual inspection
- OBD-II scan
- compression test
- leak-down test
- fuel system test
- vacuum test
- cooling system test
- exhaust/emissions test

Strand I: Electrical Systems (A8)

AUT-12D-I12 Demonstrate how to safely and properly use procedures to test, diagnose, and repair electrical and electronic systems.

AUT-12D-I12-1   Demonstrate how to safely and properly use procedures to test, diagnose, and repair various **electrical and electronic** systems, including
- resistance measurements
- current measurements
- voltage measurements
- voltage drops

Strand J: Starting and Charging Systems, and Low Voltage Batteries (A9)

AUT-12D-J6 Demonstrate how to safely and properly use procedures to test, diagnose, and repair starting and charging systems, and low voltage batteries.

AUT-12D-J6-1   Demonstrate how to safely and properly use procedures to test, diagnose, and repair various starting and charging systems, and low voltage batteries, including
- resistance measurements
- current measurements
- voltage measurements
- voltage drops

Strand K: Steering and Suspension (A10)

AUT-12D-K8 Demonstrate how to safely and properly use procedures to test, diagnose, and repair steering and suspension systems.

AUT-12D-K8-1   Demonstrate how to safely and properly use procedures to test, diagnose, and repair various **steering and suspension** systems, including

- maintenance
- inspection
- adjustment procedures
- component repair and/or replacement, such as
  – ball joint
  – bushing
  – tie rods/steering linkage
  – sway bar linkages

Strand L: Braking (A11)

AUT-12D-L7 Demonstrate how to safely and properly use procedures to test, diagnose, and repair braking systems.

AUT-12D-L7-1   Demonstrate how to safely and properly use procedures to test, diagnose, and repair various braking systems, including

- maintenance and inspection, such as
  – measuring components
- adjusting procedures
- component repair and or replacement, such as
  – flushing and bleeding hydraulic brakes
  – flaring and bending metal lines
  – repairing or replacing machine components
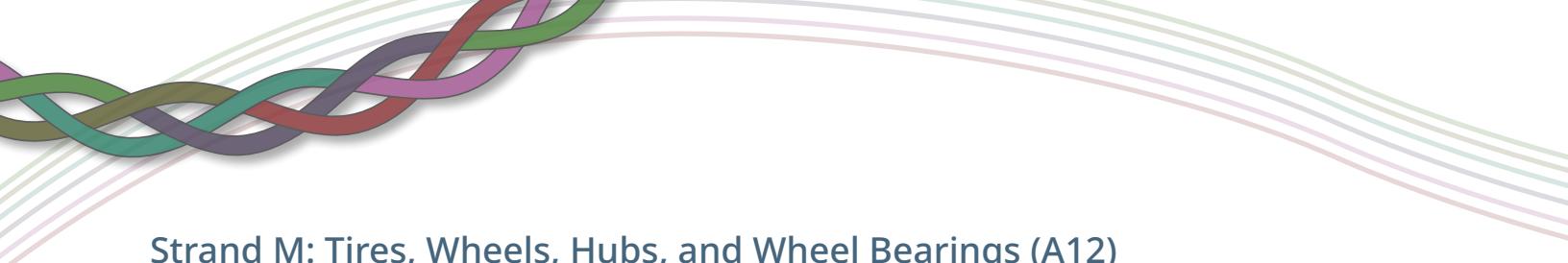
Strand M: Tires, Wheels, Hubs, and Wheel Bearings (A12)

AUT-12D-M8 Demonstrate how to safely and properly use procedures to test, diagnose, and repair various tires, wheels, hubs, and wheel bearing systems.

AUT-12D-M8-1 Demonstrate how to safely and properly use procedures to test, diagnose, and repair various tires, wheels, hubs, and wheel bearing systems, including
- tires
  - remove and install
  - index and balance
  - tire rotation
  - measure radial and lateral runout
  - tire pressure monitoring systems (TPMS) servicing, diagnosing, and resetting/programming procedures
- wheels
  - measure radial and lateral runout
- hubs and wheel bearings
  - service and inspection of bearing assembly

Strand N: Body Components, Accessories, and Trim (A13)

AUT-12D-N5 Demonstrate how to safely and properly use procedures to test, diagnose, and repair various body components, accessories, and trim systems.

AUT-12D-N5-1 Demonstrate how to safely and properly use procedures to test, diagnose, and repair various body components, accessories and trim systems, including
- adjusting
  - doors
  - windows
  - trunk lids
  - hoods
- interior trim panel removal and installation

Strand P: Advanced Technology

AUT-12D-P1 Identify and describe advanced technology and automotive systems, and demonstrate how to safely and properly use procedures for repairing.

AUT-12D-P1-1　Identify various **advanced** technology and automotive systems, such as

- anti-lock braking systems (ABS)
- fuel management
- ignition systems
- supplementary restraint systems (SRS)
- advanced driver assistance systems (ADAS)

AUT-12D-P1-2　Describe various **advanced** technology and automotive systems, such as

- anti-lock braking systems (ABS)
- fuel management
- ignition systems
- supplementary restraint systems (SRS)
- advanced driver assistance systems (ADAS)

AUT-12D-P1-3　Demonstrate how to safely and properly use procedures for repairing various **advanced** technology and automotive systems, such as

- anti-lock braking systems (ABS)
- fuel management
- ignition systems
- supplementary restraint systems (SRS)
- advanced driver assistance systems (ADAS)

Curriculum Implementation Resources

Curriculum implementation resources are frequently added. You are encouraged to visit the website regularly.