

ON-THE-JOB TRAINING GUIDE

Automotive Service Technician

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ON-THE-JOB TRAINING GUIDE

AUTOMOTIVE SERVICE TECHNICIAN



STRUCTURE OF THE ON-THE-JOB TRAINING GUIDE

To help employers align the apprenticeship training with the technical training and inform them of the topics of the technical training at the different levels.

Description of the Automotive Service Technician trade: an overview of the trade's duties, work environment, job requirements, similar occupations and career progression

Essential Skills Summary: an overview of how each of the 9 essential skills is applied in this trade

Task Matrix with Essential Skills: a chart which outlines graphically the Major Work Activities, Tasks and Sub-tasks of this document and their the essential skills that are most important to successfully performing each of the sub-tasks

Sub-tasks by Recommended Training Level: a list of all subtasks of the trade by level of training in which technical training is recommended for apprentices

Appendix A – Tools and Equipment: a non-exhaustive list of tools and equipment used in this trade

IMPORTANT

This guide is derived from the Red Seal Occupational Standard. A complete version of the occupational standard, which provides additional detail for the trade activities, skills and knowledge can be found at www.red-seal.ca

Provinces and territories are responsible for apprenticeship training, and as such, may have adapted this guide for their program. As such, it is important to check with your own province or territory's apprenticeship authority for the version that is in use there.

DESCRIPTION OF THE AUTOMOTIVE SERVICE TECHNICIAN TRADE

Automotive Service Technician is this trade's official Red Seal occupational title approved by the CCDA. This standard covers tasks performed by Automotive Service Technicians whose occupational title has been identified by some provinces and territories of Canada under the following names:

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
Automotive Service Technician	■	■	■	■	■	■	■	■	■	■	■	■	■

Automotive service technicians possess the full range of knowledge and abilities required to perform preventative maintenance, diagnose problems and repair vehicle systems including engines, vehicle management, hybrids, steering, braking, tires, wheels, drivetrains, suspension, electrical, electronics, heating, ventilation and air conditioning (HVAC), restraints, trim and accessories of automotive vehicles and light trucks.

Automotive service technicians may be employed by automotive repair shops, dealerships, automotive specialty repair shops, large organizations that may own a fleet of vehicles and motor vehicle body repair companies.

While the scope of the automotive service technician trade includes many aspects of vehicle service and repair, an increasing number of technicians specialize in specific areas of automotive vehicle repair due to the complexity of today's motor vehicle systems.

Technicians usually work indoors and can expect a work environment that includes noise, fumes, odours, hazardous compounds, drafts, vibrations, and confined spaces. The work often requires considerable standing, bending, crawling, lifting, pulling and reaching.

Some important attributes of automotive service technicians are: good hand-eye coordination, mechanical aptitude, time management skills, logical thinking and decision making skills, excellent communication skills, computer skills and the ability to continue learning as technology advances. It is also imperative to have a valid driver's licence.

With additional training, experienced automotive service technicians may advance to shop supervisor or service manager positions. Also technicians can transfer their skills and knowledge to related occupations such as automotive instructor, truck and transport mechanic, agricultural equipment technician or heavy duty equipment technician. Some technicians may open their own garage or automotive specialty shop.

ESSENTIAL SKILLS SUMMARY

Essential skills are needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.

Through extensive research, the Government of Canada and other national and international agencies have identified and validated nine essential skills. These skills are used in nearly every occupation and throughout daily life in different ways.

A series of CCDA-endorsed tools have been developed to support apprentices in their training and to be better prepared for a career in the trades. The tools can be used independently or with the assistance of a tradesperson, trainer, employer, teacher or mentor to:

- understand how essential skills are used in the trades;
- learn about individual essential skills strengths and areas for improvement; and
- improve essential skills and increase success in an apprenticeship program.

Tools are available online or for order at: <http://www.esdc.gc.ca/eng/jobs/les/tools/index.shtml>.

The application of these skills may be described throughout this document within the competency statements which support each subtask of the trade. The following are summaries of the requirements in each of the essential skills, taken from the essential skills profile. A link to the complete essential skills profile can be found at www.red-seal.ca.

READING

Automotive service technicians must read and comprehend a variety of materials including repair manuals, manufacturers' bulletins and safety documents. They refer to government regulations, vehicle inspection procedures, hazardous material handling and disposal and safety requirements of vehicles.

DOCUMENT USE

Automotive service technicians interpret technical drawings and flowcharts. They locate data such as classifications, product and material specifications, identification numbers, quantities and costs. Automotive service technicians often use specification tables. They scan a variety of manufacturers' labels for part numbers, serial numbers, sizes, colours and other information and adhere to hazard and safety icons.

WRITING

Automotive service technicians complete workplace documents such as written explanations to the client, work orders, inspection reports and incident reports.

ORAL COMMUNICATION

Automotive service technicians gather information from different sources about vehicle faults and needed repairs, explain the results of inspections and repairs, and discuss maintenance procedures. They exchange technical repair and troubleshooting information with others such as service managers, apprentices, co-workers, colleagues and suppliers.

NUMERACY

Automotive service technicians take a variety of measurements using digital and analog equipment. They estimate the amount of time required to complete repairs. Automotive service technicians compare measurements of energy, dimension, speed, horsepower, temperature and torque to specifications. They analyze pressure, power, torque, compression and electrical readings to assess vehicle performance and troubleshoot faults.

THINKING

Automotive service technicians use thinking skills and visual analysis to diagnose and repair problems. They evaluate the severity of vehicle defects and deficiencies and the quality of repairs. Automotive service technicians decide the most efficient course of action to complete a job.

WORKING WITH OTHERS

Most automotive service technicians work independently on jobs outlined in work orders. They may assist others with jobs that require two people or are within their specific area of expertise. They collaborate effectively with colleagues including salespersons, partspersons and management to resolve concerns, situations and problems.

DIGITAL TECHNOLOGY









Automotive service technicians use computerized scanning equipment, onboard vehicle diagnostics and hand-held diagnostic tools to gain operational information about vehicles. They access the Internet and databases to retrieve repair information. Automotive service technicians use digital technology to exchange information with other technicians, service managers, colleagues in other locations and manufacturer support specialists. Keyboarding and basic computer skills are an asset.

CONTINUOUS LEARNING




















Constant change in the industry makes it vital for automotive service technicians to stay current with the latest technology. They learn on the job, in organized information activities and in work discussion groups. Their training is provided by vehicle manufacturers, parts suppliers, employers and associations. They also advance skills by reading work-related magazines, periodicals and automotive websites.

AUTOMOTIVE SERVICE TECHNICIAN TASK MATRIX AND ESSENTIAL SKILLS

A – PERFORMS COMMON OCCUPATIONAL SKILLS


<p>Task A-1 Performs safety-related functions</p>	<p>A-1.01 Maintains safe work environment</p> 	<p>A-1.02 Uses personal protective equipment (PPE) and safety equipment</p> 	
<p>Task A-2 Uses tools, equipment and documentation</p>	<p>A-2.01 Uses tools and equipment</p> 	<p>A-2.02 Uses fasteners, tubing, hoses and fittings</p> 	<p>A-2.03 Uses hoisting and lifting equipment</p> 
	<p>A-2.04 Uses technical information</p> 		
<p>Task A-3 Uses communication and mentoring techniques</p>	<p>A-3.01 Uses communication techniques</p> 	<p>A-3.02 Uses mentoring techniques</p> 	

B – DIAGNOSES AND REPAIRS ENGINE AND ENGINE SUPPORT SYSTEMS

Task B-4 Diagnoses engine systems	B-4.01 Diagnoses cooling systems 	B-4.02 Diagnoses lubricating systems 	B-4.03 Diagnoses engine assembly 
	B-4.04 Diagnoses accessory drive systems 		
Task B-5 Repairs engine systems	B-5.01 Repairs cooling systems 	B-5.02 Repairs lubricating systems 	B-5.03 Repairs engine assembly 
	B-5.04 Repairs accessory drive systems 		
Task B-6 Diagnoses gasoline engine support systems	B-6.01 Diagnoses gasoline fuel delivery and injection systems 	B-6.02 Diagnoses gasoline ignition systems 	B-6.03 Diagnoses gasoline intake/exhaust systems 
	B-6.04 Diagnoses gasoline emission control systems 		
Task B-7 Repairs gasoline engine support systems	B-7.01 Repairs gasoline fuel delivery and injection systems 	B-7.02 Repairs gasoline ignition systems 	B-7.03 Repairs gasoline intake/exhaust systems 
	B-7.04 Repairs gasoline emission control systems 		
Task B-8 Diagnoses diesel engine support systems	B-8.01 Diagnoses diesel fuel delivery and injection systems 	B-8.02 Diagnoses diesel intake/exhaust systems 	B-8.03 Diagnoses diesel emission control systems 

Task B-9
Repairs diesel engine support systems


B-9.01 Repairs diesel fuel delivery and injection systems



B-9.02 Repairs diesel intake/exhaust systems



B-9.03 Repairs diesel emission control systems


C – DIAGNOSES AND REPAIRS VEHICLE MODULE COMMUNICATIONS SYSTEMS

Task C-10
Diagnoses vehicle networking systems

C-10.01 Reads diagnostic trouble codes (DTCs)


C-10.02 Monitors data



C-10.03 Interprets test results


C-10.04 Tests system circuitry and components


Task C-11
Repairs vehicle networking systems


C-11.01 Updates component software



C-11.02 Replaces components



C-11.03 Verifies vehicle module communications system repair



D – DIAGNOSES AND REPAIRS DRIVELINE SYSTEMS


Task D-12
Diagnoses driveline systems


D-12.01 Diagnoses drive shafts and axles


D-12.02 Diagnoses manual transmissions/transaxles



D-12.03 Diagnoses automatic transmissions/transaxles


D-12.04 Diagnoses clutches



D-12.05 Diagnoses transfer cases



D-12.06 Diagnoses final drive assemblies



Task D-13
Repairs driveline systems


D-13.01 Repairs drive shafts and axles


D-13.02 Repairs manual transmissions/transaxles






















D-13.03 Repairs automatic transmissions/transaxles


D-13.04 Repairs clutches








D-13.05 Repairs transfer cases


D-13.06 Repairs final drive assemblies










E – DIAGNOSES AND REPAIRS ELECTRICAL AND COMFORT CONTROL SYSTEMS

Task E-14 Diagnoses electrical systems and components	E-14.01 Diagnoses basic wiring and electrical systems 	E-14.02 Diagnoses starting/charging systems and batteries 	E-14.03 Diagnoses lighting and wiper systems 	
	E-14.04 Diagnoses entertainment systems 	E-14.05 Diagnoses electrical options 	E-14.06 Diagnoses instrumentation and information displays 	
	E-14.07 Diagnoses electrical accessories 			
	Task E-15 Repairs electrical systems and components	E-15.01 Repairs basic wiring and electrical systems 	E-15.02 Repairs starting/charging systems and batteries 	E-15.03 Repairs lighting and wiper systems 
		E-15.04 Repairs entertainment systems 	E-15.05 Repairs electrical options 	E-15.06 Repairs instrumentation and information displays 
		E-15.07 Installs electrical accessories 	E-15.08 Repairs electrical accessories 	
		Task E-16 Diagnoses heating, ventilation and air conditioning (HVAC) and comfort control systems	E-16.01 Diagnoses air flow control systems 	E-16.02 Diagnoses refrigerant systems 
Task E-17 Repairs HVAC and comfort control systems	E-17.01 Repairs air flow control systems 		E-17.02 Repairs refrigerant systems 	E-17.03 Repairs heating systems 





F – DIAGNOSES AND REPAIRS STEERING AND SUSPENSION, BRAKING, CONTROL SYSTEMS, TIRES, HUBS AND WHEEL BEARINGS

<p>Task F-18 Diagnoses steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings</p>	<p>F-18.01 Diagnoses steering, suspension and control systems</p> 	<p>F-18.02 Diagnoses braking and control systems</p> 	<p>F-18.03 Diagnoses tires, wheels, hubs and wheel bearings</p> 
<p>Task F-19 Repairs steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings</p>	<p>F-19.01 Repairs steering, suspension and control systems</p> 	<p>F-19.02 Repairs braking and control systems</p> 	<p>F-19.03 Repairs tires, wheels, hubs and wheel bearings</p> 

G – DIAGNOSES AND REPAIRS RESTRAINT SYSTEMS, BODY COMPONENTS, ACCESSORIES AND TRIM

<p>Task G-20 Diagnoses restraint systems, body components, accessories and trim</p>	<p>G-20.01 Diagnoses restraint systems</p> 	<p>G-20.02 Diagnoses wind noises, rattles and water leaks</p> 	<p>G-20.03 Diagnoses interior and exterior components, accessories and trim</p> 
	<p>G-20.04 Diagnoses latches, locks and movable glass</p> 		
<p>Task G-21 Repairs restraint systems, body components, accessories and trim</p>	<p>G-21.01 Repairs restraint systems</p> 	<p>G-21.02 Repairs wind noises, rattles and water leaks</p> 	<p>G-21.03 Repairs interior and exterior components, accessories and trim</p> 
	<p>G-21.04 Repairs latches, locks and movable glass</p> 		

H – DIAGNOSES AND REPAIRS HYBRID AND ELECTRIC VEHICLES (EV)

Task H-22 Diagnoses hybrid and EV	H-22.01 Implements specific safety protocols for hybrid and EV 	H-22.02 Diagnoses hybrid and EV systems 
Task H-23 Repairs hybrid and EV	H-23.01 Repairs hybrid vehicle systems 	H-23.02 Repairs EV systems 

SEQUENCING OF APPRENTICESHIP TRAINING TOPICS AND RELATED SUBTASKS

These Topic Titles are accompanied by the subtasks and their reference number contained in this Curriculum Outline. The topics in the shaded cells represent those that are covered “in context” with other training.

Level 1	Level 2	Level 3	Level 4
Tools, Equipment, Materials and Documentation	Tools, Equipment, Materials and Documentation	Tools, Equipment, Materials and Documentation	Tools, Equipment, Materials and Documentation
Maintenance Inspection	Maintenance Inspection	Maintenance Inspection	Maintenance Inspection
Vehicle Networking Systems	Vehicle Networking Systems	Vehicle Networking Systems	Vehicle Networking Systems

Level 1	Level 2	Level 3	Level 4
<p>Safety-Related Functions 1.01 Maintains safe work environment 1.02 Uses personal protective equipment (PPE) and safety equipment 17.02 Repairs refrigerant systems 22.01 Implements specific safety protocols for hybrid and electric vehicles (EV)</p>			
<p>Fundamentals of Tools, Equipment, Materials and Documentation 2.01 Uses tools and equipment 2.02 Uses fasteners, tubing, hoses and fittings 2.03 Uses hoisting and lifting equipment 2.04 Uses technical information</p>			
<p>Communication Techniques 3.01 Uses communication techniques</p>			<p>Mentoring Techniques 3.02 Uses mentoring techniques</p>
<p>Tires, Wheels, Hubs and Wheel Bearings 18.03 Diagnoses tires, wheels, hubs and wheel bearings 19.03 Repairs tires, wheels, hubs and wheel bearings</p>			
<p>Body Components, Accessories and Trim 20.02 Diagnoses wind noises, rattles and water leaks 20.03 Diagnoses interior and exterior components, accessories and trim 20.04 Diagnoses latches, locks and movable glass 21.02 Repairs wind noises, rattles and water leaks 21.03 Repairs interior and exterior components, accessories and trim 21.04 Repairs latches, locks and movable glass</p>			

<p>Steering, Suspension and Control Systems 18.01 Diagnoses steering, suspension and control systems 19.01 Repairs steering, suspension and control systems</p>	<p>Steering, Suspension and Control Systems 18.01 Diagnoses steering, suspension and control systems 19.01 Repairs steering, suspension and control systems</p>		
<p>Braking and Control Systems 18.02 Diagnoses braking and control systems 19.02 Repairs braking and control systems</p>	<p>Braking and Control Systems 18.02 Diagnoses braking and control systems 19.02 Repairs braking and control systems</p>		
<p>Electrical Systems and Components 14.01 Diagnoses basic wiring and electrical systems 14.02 Diagnoses starting/charging systems and batteries 15.01 Repairs basic wiring and electrical systems 15.02 Repairs starting/charging systems and batteries</p>	<p>Electrical Systems and Components 14.02 Diagnoses starting/charging systems and batteries 14.03 Diagnoses lighting and wiper systems 15.02 Repairs starting/charging systems and batteries 15.03 Repairs lighting and wiper systems 15.08 Repairs electrical accessories</p>	<p>Electrical Systems and Components 14.05 Diagnoses electrical options 14.07 Diagnoses electrical accessories 15.05 Repairs electrical options 15.07 Installs electrical accessories</p>	<p>Electrical Systems and Components 14.04 Diagnoses entertainment systems 14.06 Diagnoses instrumentation and information displays 15.04 Repairs entertainment systems 15.06 Repairs instrumentation and information displays</p>
		<p>Vehicle Networking Systems 10.01 Reads diagnostic trouble codes (DTCs) 10.02 Monitors data 10.03 Interprets test results 10.04 Tests system circuitry and components 11.01 Updates component software 11.02 Replaces components 11.03 Verifies vehicle module communications system repair</p>	
<p>Driveline Systems 12.01 Diagnoses drive shafts and axles 13.01 Repairs drive shafts and axles</p>	<p>Driveline Systems 12.02 Diagnoses manual transmissions/transaxles 12.04 Diagnoses clutches 12.06 Diagnoses final drive assemblies 13.02 Repairs manual transmissions/transaxles 13.04 Repairs clutches 13.06 Repairs final drive assemblies</p>	<p>Driveline Systems 12.05 Diagnoses transfer cases 13.05 Repairs transfer cases</p>	<p>Driveline Systems 12.03 Diagnoses automatic transmissions/transaxles 12.05 Diagnoses transfer cases 13.03 Repairs automatic transmissions/transaxles 13.05 Repairs transfer cases</p>

Engine Systems

4.01 Diagnoses cooling systems
4.02 Diagnoses lubricating systems
4.03 Diagnoses engine assembly
4.04 Diagnoses accessory drive systems
5.01 Repairs cooling systems
5.02 Repairs lubricating systems
5.03 Repairs engine assembly
5.04 Repairs accessory drive systems

Gasoline Engine Support Systems

6.01 Diagnoses gasoline fuel delivery and injection systems
6.02 Diagnoses gasoline ignition systems
6.03 Diagnoses gasoline intake/exhaust systems
6.04 Diagnoses gasoline emission control systems
7.01 Repairs gasoline fuel delivery and injection systems
7.02 Repairs gasoline ignition systems
7.03 Repairs gasoline intake/exhaust systems
7.04 Repairs gasoline emission control systems

Diesel Engine Support Systems

8.01 Diagnoses diesel fuel delivery and injection systems
8.02 Diagnoses diesel intake/exhaust systems
8.03 Diagnoses diesel emission control systems
9.01 Repairs diesel fuel delivery and injection systems
9.02 Repairs diesel intake/exhaust systems
9.03 Repairs diesel emission control systems

HVAC and Comfort Control Systems

16.01 Diagnoses air flow control systems
16.02 Diagnoses refrigerant systems
16.03 Diagnoses heating systems
17.01 Repairs air flow control systems
17.02 Repairs refrigerant systems
17.03 Repairs heating systems

**Hybrid and Electrical
Vehicle (EV)**

22.01 Implements specific safety protocols for hybrid and electric vehicles (EV)
22.02 Diagnoses hybrid and electric vehicle (EV) systems
23.01 Repairs hybrid vehicle systems
23.02 Repairs electric vehicles (EV) systems

Restraint Systems

20.01 Diagnoses restraint systems
21.01 Repairs restraint systems

APPENDIX A

TOOLS AND EQUIPMENT

Standard Tool Kit

air die grinder
air hammer/chisel
air ratchet
antifreeze tester
axle boot clamp tools
battery post service and reshape tool
belt tension release tool
blow gun
bolt and nut extractor set (easy-outs)
brake service tools (adjusters, spring removal and installation tools, caliper tools)

caulking gun
compression testers

creeper
crowfoot wrenches

dial indicator set
drill and bits
drill gauge
feeler gauges – SAE and metric
fender covers
filter wrenches
flare nut wrenches – SAE and metric
flaring tool (SAE, metric and ISO)
flashlights
fuel injector noid lights
fuel/transmission/air conditioning line disconnect set
hacksaw
hammers – ball peen, dead blow, rubber mallet, softface
hex keys and sockets – SAE and metric
impact driver and bits
impact wrench and impact socket set – SAE and metric

inspection mirror
jumper lead
locking pliers
magnetic pick-up tool
mechanic's pick set
metal files
micrometer – SAE and metric
digital multimeter (DMM)
nut driver set – SAE and metric
pliers – slip joint, needle nose, multipurpose adjustable, side cutter, snap ring, inside pliers
pry bars
pullers – gear, pulley, battery terminal and steering wheel
punches and chisels
ratchet and sockets – SAE and metric, swivel, spark plug, extensions and adapters
refractometer
rivet gun
scraper (gasket and carbon)
screwdriver set
seal drivers and extractors
soldering tools
spark plug gapper
spark tester
standard test leads and probes
stethoscope
straight edge
stud extractor
tap and die set – SAE, metric and pipe thread
tape and ruler
terminal remover tools
test lamp

Standard Tool Kit (continued)

thermometer

thread files

timing light

tin snips – centre, left and right cut

tire pressure gauge

torque angle meter/indicator

torque limited sockets (torque sticks)

torque wrenches – various sizes and ranges

torx bits and sockets

tread depth gauge (for tires and brakes)

trouble light

tube bending tool

tube cutters

upholstery tools – trim panel tools, hog ring pliers

utility knife

vacuum pump

vacuum/pressure gauge

vernier caliper – SAE and metric

wire brush

wire stripper/crimping tool

wrench set – SAE and metric/various designs

Shop Tools and Equipment

acetylene torches

air compressor – hoses, inline filter and water separators

air conditioning flushing equipment

air conditioning leak detection and inspection equipment

air conditioning recovery/recycle/recharge station

air conditioning service and repair tools

airbag removal tools

airbag simulators

anti-static devices

ball joint press and adapters

battery chargers/boosting equipment

battery, alternator and starter tester (AVR)

battery power supply

bearing remover

belt tension gauge

bench grinders

bench vises

black light

borescope

brake cylinder hone

brake drum gauge

brake lathe

brake pressure tester

brake rotor gauge

brake system bleeder

CAT-IV meter (for hybrid vehicles)

camshaft bearing tools (removal and installation)

chassis ears

clutch alignment tools

clutch installers and removers

compression leak-down tester

computer – laptop, PC

coolant drain pans

cooling system pressure tester

cooling system recovery and flushing station

core plug/expansion plug installation tool

cylinder ridge reamer

drill press

electrical short detector

engine and transmission supports

engine cylinder hone

engine hanging supports; engine hoisting equipment

engine stand – portable

EVAP test equipment (smoke generator)

exhaust fan, ventilation hoses

exhaust pipe bender

Shop Tools and Equipment (continued)

floor jack
fuel injector flushing kit
fuel quality tester
fuel recovery and storage station
funnels
gear puller set

grease gun – oil dispensing system, fluid suction pump
hydraulic press
hydraulic transmission jack
insulated tools (for hybrid vehicles)
jack stands and supports
leak detection tank (tires)
lock pick set – lock out tools
manometer
oil drain barrels and disposal system
opacity meter
oscilloscope
parts washers/steam cleaners and blaster
piston ring compressor

piston ring installer
power steering pressure tester
pressure washer
propane enrichment tools

shop vacuum
slide hammer
specialized tools for air conditioning systems
specialized tools for engines and transmission
spreaders
spring compressors – coil spring and strut spring
tire changing machine

tire pressure monitoring systems (TPMS)
tire repair equipment
transmission fixtures
transmission flushing equipment
transmission pressure test kit
vacuum fill tools
valve grinding equipment
valve spring compressor
vehicle hoist
vehicle service information system
water hose
welding equipment – TIG, GMAW, GTAW, MIG welder and oxy-fuel
wheel alignment equipment
wheel balancer
wheel chocks
wheel ramps

Measuring Tools and Equipment

air conditioning pressure gauge
ammeter
AVR (alternator voltage regulator)
back pressure gauge
ball joint dial indicator set
battery load tester
coolant system pressure tester
cylinder bore gauges – small bore gauge, telescoping gauge
electronic vibration analyzer
fuel pressure gauges
headlight aiming equipment
hole gauge

inclinometer
infrared temperature gun
micrometer – SAE and metric
oil pressure gauge set – engine/transmission
opacity meter
plastic precision clearance gauge
power steering pressure tester
pyrometer

refractometer
refractor
scan tools
spring scale

Safety and Personal Protective Equipment

body protection – shop apron/heat resistant arm protectors

CSA approved safety foot wear

eye protection – face shield/goggles/safety glasses/welding goggles

eye wash station

fire extinguisher

first aid kits and station

hand protection – chemical/heat resistant, abrasion/leather, disposable latex gloves, gloves (for hybrid vehicles and EV)

hearing protection – ear muffs, ear plugs

respiratory protection – dust and particle masks, chemical filtered mask

safety hook (for hybrid and electric vehicles)

safety pylons (for hybrid and electric vehicles)