Automotive Service Technician

Guide to Course Content

2025

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Saskatchewan Apprenticeship and Trade Certification Commission

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Recognition:
To promote transparency and consistency, this document has been adapted from the 2016 Automotive Service Technician Red Seal Occupational Standard (Employment and Social Development Canada).

A complete version of the Occupational Standard can be found at www.red-seal.ca

STRUCTURE OF THE GUIDE TO COURSE CONTENT

To facilitate understanding of the occupation, this guide to course content contains the following sections:

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this standard detailing the essential skills and the level of training where the content is covered. The Task Matrix is broken down into the following:

Major Work Activity: the largest division within the standard that is comprised of a distinct set of trade activities.

Task: distinct actions that describe the activities within a major work activity.

Sub-task: distinct actions that describe the activities within a task.

Training Profile Chart: a chart which outlines the model for Saskatchewan Apprenticeship and Trade Certification Commission (SATCC) technical training.

Technical Training Course Content for the Automotive Service Technician trade: a chart which outlines the model for SATCC technical training sequencing.

TRAINING REQUIREMENTS FOR THE AUTOMOTIVE SERVICE TECHNICIAN TRADE

To graduate from each level of the apprenticeship program, an apprentice must successfully complete the required technical training and compile enough on-the-job experience to total at least 1800 hours each year. Total trade time required is 7200 hours and at least 4 years in the trade.

There are four levels of technical training delivered by Saskatchewan Polytechnic in Saskatoon and Moose Jaw. The General Motors Automotive Service Educational Program (ASEP) training is delivered at Saskatchewan Polytechnic in Saskatoon and Regina.

Level One: 8 weeks
Level Two: 8 weeks
Level Three: 8 weeks
Level Four: 8 weeks

The information contained in this guide to course content details the technical training delivered for each level of apprenticeship. An apprentice spends approximately 15% of the apprenticeship term in a technical training institute learning the technical and theoretical aspects of the trade. The hours and percentages of technical and practical training may vary according to class needs and progress.

The content of the technical training components is subject to change without notice.

Entrance Requirements for Apprenticeship Training

Your grade twelve transcripts (with no modified classes) or GED 12 is your guarantee that you meet the educational entrance requirements for apprenticeship in Saskatchewan. In fact, employers prefer and recommend apprentices who have completed high school. This ensures the individual has all of the necessary skills required to successfully complete the apprenticeship program and receive journeyperson certification.

Individuals with “modified” or “general” classes in math or science do not meet our entry requirements. These individuals are required to take an entrance assessment prescribed by the SATCC.

English is the language of instruction in all apprenticeship programs and is the common language for business in Saskatchewan. Before admission, all apprentices and/or “upgraders” must be able to understand and communicate in the English language. Applicants whose first language is not English must have a minimum Canadian Language Benchmark Assessment of six (CLB6).

Note: A CLB assessment is valid for a one-year period from date of issue.

Designated Trade Name	**Math Credit** at the Indicated Grade Level❶	**Science Credit** at Grade Level
Automotive Service Technician	Grade 10	Grade 10

❶ - (One of the following) WA – Workplace and Apprenticeship; or F – Foundations; or P – Pre-calculus, or a Math at the indicated grade level (Modified and General Math credits are not acceptable.).

*Applicants who have graduated in advance of 2015-2016, or who do not have access to the revised Science curricula will require a Science at the minimum grade level indicated by trade.

For information about high school curriculum, including Math and Science course names, please see: http://www.curriculum.gov.sk.ca/#

Individuals not meeting the entrance requirements will be subject to an assessment and any required training.

AUTOMOTIVE SERVICE TECHNICIAN TASK MATRIX CHART

This chart outlines the major work activities, tasks and sub-tasks from the 2016 Automotive Service Technician Red Seal Occupational Standard (RSOS). Each sub-task details the corresponding essential skill and level of training where the content is covered. *

* Sub Tasks with numbers in the boxes is where the content will be delivered in training.

A – Performs Common Occupational Skills — 6%

A-1 Performs safety-related functions	**1.01 Maintains safe work environment** **1**	**1.02 Uses personal protective equipment (PPE) and safety equipment** **1**		
A-2 Uses tools, equipment and documentation	**2.01 Uses tools and equipment** **1** **(2, 3, 4 In-Context)**	**2.02 Uses fasteners, tubing, hoses and fittings** **1** **(2, 3, 4 In-Context)**	**2.03 Uses hoisting and lifting equipment** **1** **(2, 3, 4 In-Context)**	**2.04 Uses technical information** **1** **(2, 3, 4 In-Context)**
A-3 Uses communication and mentoring techniques	**3.01 Uses communication techniques** **1** **(2, 3, 4 In-Context)**	**3.02 Uses mentoring techniques** **4**		

B – Diagnoses and Repairs Engine and Engine Support Systems — 19%

B-4 Diagnoses engine systems	4.01 Diagnoses cooling systems 2	4.02 Diagnoses lubricating systems 2	4.03 Diagnoses engine assembly 2	4.04 Diagnoses accessory drive systems 2
B-5 Repairs engine systems	5.01 Repairs cooling systems 2	5.02 Repairs lubricating systems 2	5.03 Repairs engine assembly 2	5.04 Repairs accessory drive systems 2
B-6 Diagnoses gasoline engine support systems	6.01 Diagnoses gasoline fuel delivery and injection systems 3	6.02 Diagnoses gasoline ignition systems 3	6.03 Diagnoses gasoline intake/ exhaust systems 3	6.04 Diagnoses gasoline emission control systems 3
B-7 Repairs gasoline engine support systems	7.01 Repairs gasoline fuel delivery and injection systems 3	7.02 Repairs gasoline ignition systems 3	7.03 Repairs gasoline intake/ exhaust systems 3	7.04 Repairs gasoline emission control systems 3
B-8 Diagnoses diesel engine support systems	8.01 Diagnoses diesel fuel delivery and injection systems 4	8.02 Diagnoses diesel intake/exhaust systems 4	8.03 Diagnoses diesel emission control systems 4	
B-9 Repairs diesel engine support systems	9.01 Repairs diesel fuel delivery and injection systems 4	9.02 Repairs diesel intake/exhaust systems 4	9.03 Repairs diesel emission control systems 4	

C – Diagnoses and Repairs Vehicle Module Communications Systems

9%

C-10 Diagnoses vehicle networking systems	10.01 Reads diagnostic trouble codes (DTCs) 3 (1, 2, 4 In-Context)	10.02 Monitors data 3 (1, 2, 4 In-Context)	10.03 Interprets tests results 3 (1, 2, 4 In-Context)	10.04 Tests system circuitry and components 3 (1, 2, 4 In-Context)
C-11 Repairs vehicle networking systems	11.01 Updates components software 3 (1, 2, 4 In-Context)	11.02 Replaces components 3 (1, 2, 4 In-Context)	11.03 Verifies vehicle module communications system repair 3 (1, 2, 4 In-Context)	

D – Diagnoses and Repairs Driveline Systems

15%

D-12 Diagnoses driveline systems	12.01 Diagnoses drive shafts and axles 1	12.02 Diagnoses manual transmissions/ transaxles 2	12.03 Diagnoses automatic transmissions/ transaxles 4	12.04 Diagnoses clutches 2	12.05 Diagnoses transfer cases 3
	12.06 Diagnoses final drive assemblies 2				
D-13 Repairs driveline systems	13.01 Repairs drive shafts and axles 1	13.02 Repairs manual transmissions/ transaxles 2	13.03 Repairs automatic transmissions/ transaxles 4	13.04 Repairs clutches 2	13.05 Repairs transfer cases 3
	13.06 Repairs final drive assemblies 2				

E – Diagnoses and Repairs Electrical and Comfort Control Systems 17%

E-14 Diagnoses electrical systems and components	**14.01 Diagnoses basic wiring and electrical systems** 1	**14.02 Diagnoses starting/charging systems and batteries** 1, 2	**14.03 Diagnoses lighting and wiper systems** 2	**14.04 Diagnoses entertainment systems** 4	**14.05 Diagnoses electrical options** 3
	14.06 Diagnoses instrumentation and information displays 4	**14.07 Diagnoses electrical accessories** 2, 3			
E-15 Repairs electrical systems and components	**15.01 Repairs basic wiring and electrical systems** 1	**15.02 Repairs starting/charging systems and batteries** 1, 2	**15.03 Repairs lighting and wiper systems** 2	**15.04 Repairs entertainment systems** 4	**15.05 Repairs electrical options** 3
	15.06 Repairs instrumentation and information displays 4	**15.07 Installs electrical accessories** 3	**15.08 Repairs electrical accessories** 2		
E-16 Diagnoses heating, ventilation and air conditioning (HVAC) and comfort control systems	**16.01 Diagnoses air flow control systems** 4	**16.02 Diagnoses refrigerant systems** 4	**16.03 Diagnoses heating systems** 4		
E-17 Repairs heating, ventilation and air conditioning (HVAC) and comfort control systems	**17.01 Repairs air flow control systems** 4	**17.02 Repairs refrigerant systems** 1, 4	**17.03 Repairs heating systems** 4		

F – Diagnoses and Repairs Steering and Suspension, Braking, Control Systems, Tires, Hubs and Wheel Bearings — 21%

F-18 Diagnoses steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings	18.01 Diagnoses steering, suspension and control systems 1, 2	18.02 Diagnoses braking and control systems 1, 2	18.03 Diagnoses tires, wheels, hubs and wheel bearings 1
F-19 Repairs steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings	19.01 Repairs steering, suspension and control systems 1, 2	19.02 Repairs braking and control systems 1, 2	19.03 Repairs tires, wheels, hubs and wheel bearings 1

G – Diagnoses and Repairs Restraint Systems, Body Components, Accessories and Trim — 8%

G-20 Diagnoses restraint systems, body components, accessories and trim	20.01 Diagnoses restraint systems 1, 4	20.02 Diagnoses wind noises, rattles and water leaks 1 (2, 3, 4 In-Context)	20.03 Diagnoses interior and exterior components, accessories and trim 1 (2, 3, 4 In-Context)	20.04 Diagnoses latches, locks and movable glass 1 (2, 3, 4 In-Context)
G-21 Repairs restraint systems, body components, accessories and trim	21.01 Repairs restraint systems 4	21.02 Repairs wind noises, rattles and water leaks 1 (2, 3, 4 In-Context)	21.03 Repairs interior and exterior components, accessories and trim 1 (2, 3, 4 In-Context)	21.04 Repairs latches, locks and movable glass 1 (2, 3, 4 In-Context)

H – Diagnoses and Repairs Hybrid and Electric Vehicles (EV) 5%

H-22 Diagnoses hybrid and electric vehicles (EV)	**22.01 Implements specific safety protocols for hybrid and electric vehicles (EV)** 1, 4	**22.02 Diagnoses hybrid and electric vehicle (EV) systems** 4
H-23 Repairs hybrid and electric vehicles (EV)	**23.01 Repairs hybrid vehicle systems** 4	**23.02 Repairs electric vehicle (EV) systems** 4

TRAINING PROFILE CHART

This Training Profile Chart represents Saskatchewan Apprenticeship and Trade Certification Commission (SATCC) apprenticeship technical training at the topic level.

Level One	Transcript Code	Hours
Automotive Shop Fundamentals	SHOP 123	30
Body Components and Service Inspection	ATBD 120	12
Braking Systems	BRAK 122 – Theory	30
	BRAK 123 – Shop	30
Driveline Systems	DRTR 122	30
Electrical System and Components	ELCT 120 – Theory	30
	ELCT 121 – Shop	18
Engine Systems	ENGN 124	30
Steering, Suspension and Control Systems	STER 120	30
		240

Level Two	Transcript Code	Hours
Braking and Stability Control Systems	BRAK 205 – Theory/Shop	18
Engine Systems	ENGN 208 – Theory	30
	ENGN 209 – Shop	48
Steering, Suspension and Control Systems	STER 200 – Theory	18
	STER 201 – Shop	24
Starting, Charging, Lighting and Wipers	ELCT 200 – Theory	20
	ELCT 201 – Shop	22
Transmission and Final Drive Systems	TRNM 206 – Theory	30
	TRNM 207 – Shop	30
		240

Level Three	Transcript Code	Hours
Electrical Accessories and Options	ELCT 300	30
Gasoline Engine Performance	FUEL 300 – Theory	45
	FUEL 301 – Shop	45
Ignition Systems	IGNS 300 – Theory/Shop	30
Transfer Cases and Manual Transmissions	TRNM 304 – Theory	30
	TRNM 305 – Shop	30
Vehicle Networking Systems	CNET 300 – Theory/Shop	30
		240

Level Four	Transcript Code	Hours
Automatic transmissions and Automated AWD/4WD Systems	TRNM 402 – Theory	30
	TRNM 403 – Shop	42
Diesel Engine Support Systems	FUEL 406 – Theory	18
	FUEL 407 – Shop	30
Entertainment Systems, Instrumentation and Information Displays	INST 403 – Theory/Shop	24
HVAC and Comfort Control Systems	HVAC 402 – Theory/Shop	30
Hybrid and Electric Vehicles (EV)	TECH 402 – Theory	18
Mentoring Techniques	MENT 400 – Theory	30
Restraint Systems	ATMC 400 – Theory/Shop	18
		240

TECHNICAL TRAINING COURSE CONTENT

This chart outlines the model for Saskatchewan Apprenticeship and Trade Certification Commission (SATCC) technical training sequencing. For the harmonized level of training, a cross reference to the Red Seal Occupational Standard (RSOS) apprenticeship technical training sequencing, at the learning outcome level, is provided.

The Red Seal Automotive Service Technician Curriculum Outline, which provides additional detail of the Harmonized technical training, can be found at www.red-seal.ca

Level One — 8 weeks — 240 hours

Automotive Shop Fundamentals — **30 hours**

- describe occupation related safety procedures
- describe safe handling of refrigerants
- describe restraint systems safety precautions
- describe hybrid and electric vehicle safety
- describe occupation related tools and equipment
- describe road test procedures
- demonstrate knowledge of trade documents
- apply trade documents to vehicle repair
- prepare trade documents

RSOS topics covered in this section of training:

A-1 Performs safety-related functions
A-1.01 Maintains safe work environment
A-1.02 Uses personal protective equipment (PPE) and safety equipment

A-2 Uses and maintains tools, equipment 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

A-3 Uses communication and mentoring techniques
3.01 Uses communication techniques

E-17 Repairs heating, ventilation and air conditioning (HVAC) and comfort control systems
E-17.02 Repairs refrigerant systems

G-20 Diagnoses restraint systems, body components, accessories and trim
G-20.01 Diagnoses restraint systems

H-22 Diagnoses hybrid and electric vehicles (EV)
H-22.01 Implements specific safety protocols for hybrid and electric vehicles (EV)

Brake Systems – Theory — 30 hours

- describe the operation, diagnosis and repair procedures for brake system operation
- describe brake system hydraulic component evaluation and replacement
- describe the evaluation and repair of drum brake, disc brake and park brake assemblies
- describe power assist brake system operation and evaluation

Brake Systems – Shop — 30 hours

- demonstrate brake system hydraulic component evaluation and replacement
- demonstrate brake system flushing and bleeding procedures
- demonstrate the evaluation and repair of drum brake, disc brake and park brake assemblies (oxy-fuel safety, setup and shutdown)
- diagnose power assist brake system operation (hybrid brake safety)
- diagnose brake system operation
- apply trade documents to vehicle repair
- prepare trade documents

RSOS topics covered in this section of training:

A-3 Uses communication and mentoring techniques
A-3.01 Uses communication techniques

F-18 Diagnoses steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings
F-18.02 Diagnoses braking and control systems

F-19 Repairs steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings
F-19.02 Repairs braking and control systems

Body Components and Service Inspection — 12 hours

- describe adjustment of doors, lids and moveable glass
- describe diagnosis and repair of body leaks and noises
- describe basic service inspections

RSOS topics covered in this section of training:

G-20 Diagnoses restraint systems, body components, accessories and trim
G-20.02 Diagnoses wind noises, rattles and water leaks
G-20.03 Diagnoses interior and exterior components, accessories and trim
G-20.04 Diagnoses latches, locks and movable glass

G-21 Repairs restraint systems, body components, accessories and trim
G-21.02 Repairs wind noises, rattles and water leaks
G-21.03 Repairs interior and exterior components, accessories and trim
G-21.04 Repairs latches, locks and movable glass

Driveline Systems — 30 hours

- describe operation, diagnosis and repair of driveshafts and axles
- repair drive shafts and axles
- describe operation, diagnosis and repair procedures for wheels and tires
- describe operation, diagnosis and repair of wheel bearings and seals
- repair wheels and tires
- service wheel bearings and seals
- perform the evaluation and repair of tire pressure monitor systems

RSOS topics covered in this section of training:

F-18 Diagnoses steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings
F-18.03 Diagnoses tires, wheels, hubs and wheel bearings

F-19 Repairs steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings
F-19.03 Repairs tires, wheels, hubs and wheel bearings

G-20 Diagnoses restraint systems, body components, accessories and trim
G-20.02 Diagnoses wind noises, rattles and water leaks
G-20.03 Diagnoses interior and exterior components, accessories and trim
G-20.04 Diagnoses latches, locks and movable glass

G-21 Repairs restraint systems, body components, accessories and trim
G-21.02 Repairs wind noises, rattles and water leaks
G-21.03 Repairs interior and exterior components, accessories and trim
G-21.04 Repairs latches, locks and movable glass

Electrical Systems and Components – Theory — 30 hours

- describe types of electrical circuits
- construct electrical circuits
- use electrical test equipment
- describe battery operation, diagnosis and repair
- describe schematics and flowcharts
- describe conductors and insulators
- describe solid state components
- describe the operation, diagnosis and repair of computer control systems

Electrical Systems and Components – Shop — 18 hours

- repair conductors and connectors
- construct electrical circuits
- use electrical test equipment
- diagnose batteries

RSOS topics covered in this section of training:

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-15 Repairs electrical systems and components
E-15.01 Repairs basic wiring and electrical systems
E-15.02 Repairs starting/charging systems and batteries

Engine Systems — 30 hours

- describe the operation of engine types
- describe the operation and diagnosis of engine cooling and lubrication systems
- describe the operation and diagnosis of engine induction and exhaust systems
- test engine cooling and lubrication system
- inspect induction and exhaust systems

This section of training exceeds RSOS scope of work in Level One and exceeds the minimum sequencing as set out in the Automotive Service Technician RSOS. Its purpose is mainly to assist in the understanding of the topic Body Components and Service Inspection

Steering, Suspension and Control Systems – Theory/Shop — 30 hours

- describe the operation and diagnosis of suspension systems
- describe the operation and diagnosis of steering systems
- perform the evaluation of suspension systems
- perform the evaluation of steering systems

RSOS topics covered in this section of training:

F-18 Diagnoses steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings
F-18.01 Diagnoses steering, suspension and control systems

F-19 Repairs steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings
F-19.01 Repairs steering, suspension and control systems

Level One topics taught In-Context:

A-2 Tools, Equipment, Materials and Documentation
C-10 Vehicle Networking Systems
G-20 Maintenance Inspection

For details regarding the In-Context Topics, see page 24

Level Two — 8 weeks — 240 hours

Braking and Stability Control Systems — 18 hours

- describe the operation, diagnoses and repair of anti-lock, traction and stability control systems
- perform the evaluation and repair of anti-lock brake, traction and stability control systems

RSOS topics covered in this section of training:

F-18 Diagnoses steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings
F-18.02 Diagnoses braking and control systems

F-19 Repairs steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings
F-19.02 Repairs braking and control systems

Engine Systems – Theory — 30 hours

- describe the operation, diagnosis and construction of cylinder head and block assembly
- describe the types and use of automotive engine measuring tools
- describe the engine assembly procedures
- describe the diagnosis and repair of an engine
- describe engine replacement procedures
- describe the diagnoses and repair of induction and exhaust systems
- describe the diagnoses and repair of lubrication and cooling systems

Engine Systems – Shop — 48 hours

- perform the evaluation and repair of cylinder head and block assemblies
- use precision measuring tools
- assemble engine
- diagnose engine faults
- replace engine
- perform the evaluation and repair of induction and exhaust systems
- perform the evaluation and repair of engine lubrication and cooling systems

RSOS topics covered in this section of training:

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

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

Starting, Charging, Lighting and Wipers – Theory **20 hours**

- describe the operation, diagnoses and repair of starting systems
- describe the operation, diagnoses and repair of charging systems
- describe the operation, diagnoses and repair of wiper systems

describe the operation, diagnoses and repair of lighting systems

Starting, Charging, Lighting and Wipers – Shop **22 hours**

- perform the evaluation and repair of a starting system
- replace a starter
- perform the evaluation and repair of a charging system
- replace a generator
- perform the evaluation and repair of lighting systems
- perform the evaluation and repair of wiper systems

RSOS topics covered in this section of training:

E-14 Diagnoses electrical systems and components
E-14.02 Diagnoses starting/charging systems and batteries
E-14.03 Diagnoses lighting and wiper systems
E-14.07 Diagnoses electrical accessories

E-15 Repairs electrical systems and components
E-15.02 Repairs starting/charging systems and batteries
E-15.03 Repairs lighting and wiper systems
E-15.08 Repairs electrical accessories

Steering, Suspension and Control Systems – Theory **18 hours**

- describe the diagnoses and repair of steering systems
- describe the diagnoses and repair of suspension systems
- describe the principles of wheel alignment

Steering, Suspension and Control Systems – Shop **24 hours**

- perform the diagnoses and repair of steering systems
- perform the diagnoses and repair of suspension systems
- perform wheel alignment procedures

RSOS topics covered in this section of training:

F-18 Diagnoses steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings
F-18.01 Diagnoses steering, suspension and control systems

F-19 Repairs steering and suspension, braking, control systems, tires, wheels, hubs and wheel bearings
F-19.01 Repairs steering, suspension and control systems

Transmission and Final Drive Systems – Theory **30 Hours**

- describe the operation, diagnoses and repair of differential assemblies
- describe the evaluation and repair of clutch assemblies
- describe transmission, transaxle, transfer case removal and installation procedures
- describe maintenance procedure for transmission, transaxle, transfer case, differential and engine

Transmission and Final Drive Systems – Shop **30 Hours**

- perform the evaluation and repair of differential systems
- perform the evaluation and repair of clutch assemblies
- replace manual transmission and automatic transmissions
- perform maintenance procedures on differential assemblies, transfer case, automatic transmission and engine

RSOS topics covered in this section of training:

D-12 Diagnoses driveline systems
D-12.02 Diagnoses manual transmissions/transaxles
D-12.04 Diagnoses clutches
D-12.06 Diagnoses final drive assemblies

D-13 Repairs driveline systems
D-13.02 Repairs manual transmissions/transaxles
D-13.04 Repairs clutches
D-13.06 Repairs final drive assemblies

Level Two topics taught In-Context:

A-2 Tools, Equipment, Materials and Documentation
C-10 Vehicle Networking Systems
G-20 Maintenance Inspection

For details regarding the In-Context Topics, see page 24

Level Three — 8 weeks — 240 hours

Electrical Accessories and Options — 30 hours

- describe the operation, diagnoses and repair of electrical accessories
- describe the operation, diagnoses and repair of electrical options
- perform the evaluation and repair of electrical accessories
- perform the evaluation and repair of electrical options

RSOS topics covered in this section of training:

E-14 Diagnoses electrical systems and components
14.05 Diagnoses electrical options
14.07 Diagnoses electrical accessories

E-15 Repairs electrical systems and components
15.05 Repairs electrical options
15.07 Installs electrical accessories

Gasoline Engine Performance – Theory — 45 hours

- describe vehicle emission legislation
- describe types of engine management systems
- describe the operation, diagnoses and repair of electronic fuel injection (EFI) systems
- describe the operation, diagnoses and repair of On Board Diagnostics (OBD) engine management systems
- describe the operation, diagnoses and repair of emission systems
- describe maintenance procedures for fuel delivery, emission and injection systems
- describe diagnostic tools for on-board diagnostic (OBD) systems
- describe the operation, diagnoses and repair of alternative fuel systems
- describe the operation, diagnoses and repair of turbochargers and superchargers

Gasoline Engine Performance – Shop — 45 hours

- perform the diagnoses and repair of engine management systems
- perform the diagnoses and repair of electronic fuel injection (EFI) systems
- perform the diagnoses and repair of emission systems
- perform maintenance procedures on fuel delivery, emission and injection systems
- perform the diagnoses and repair of alternative fuel systems

RSOS topics covered in this section of training:

B-6 Diagnoses gasoline engine support systems
6.01 Diagnoses gasoline fuel delivery and injection systems
6.03 Diagnoses gasoline intake/exhaust systems
6.04 Diagnoses gasoline emission control systems

B-7 Repairs gasoline engine support systems
7.01 Repairs gasoline fuel delivery and injection systems
7.03 Repairs gasoline intake/exhaust systems
7.04 Repairs gasoline emission control systems

Ignition Systems — 30 hours

- describe the operation, diagnoses and repair of ignition systems
- describe the use of ignition system testing equipment
- perform the diagnoses and repair of ignition systems
- use ignition system testing equipment

RSOS topics covered in this section of training:

B-6 Diagnoses gasoline engine support systems
6.02 Diagnoses gasoline ignition systems

B-7 Repairs gasoline engine support systems
7.02 Repairs gasoline ignition systems

Transfer Cases and Manual Transmissions – Theory — 30 hours

- describe the operation, diagnoses and repair of manual transmissions and transaxles
- describe the operation, diagnoses and repair of transfer cases
- describe All Wheel Drive (AWD) and Four Wheel Drive (4WD) systems

Transfer Cases and Manual Transmissions – Shop — 30 hours

- perform the evaluation and repair of manual transmissions and transaxles
- perform the evaluation and repair of transfer cases
- perform the evaluation and repair of All Wheel Drive and Four Wheel Drive systems

RSOS topics covered in this section of training:

D-12 Diagnoses driveline systems
12.05 Diagnoses transfer cases

D-13 Repairs driveline systems
13.05 Repairs transfer cases

Vehicle Networking Systems — 30 hours

- describe the diagnostic code types and formats
- describe the various types of networks
- utilize diagnostic code protocols and actions to identify open, short and ground faults
- describe the various types, operation and the interrelationship of modules
- perform computer programming procedure

RSOS topics covered in this section of training:

C-10 Diagnoses 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

C-11 Repairs vehicle networking systems
11.01 Updates component software
11.02 Replaces components
11.03 Verifies vehicle module communications system repair

Level Three topics taught In-Context:

A-2 Tools, Equipment, Materials and Documentation
C-10 Vehicle Networking Systems
G-20 Maintenance Inspection

See In-Context Topics for details, page 24

Level Four — 8 weeks — 240 hours

Automatic Transmissions and Automated AWD/4WD Systems – Theory — **30 hours**

- describe operation, diagnoses and repair of automatic transmissions
- describe alternate types of transmissions
- describe operation, diagnoses and repair of Intelligent/computer controlled AWD/4WD systems

Automatic Transmissions and Automated AWD/4WD Systems – Shop — **42 hours**

- perform the evaluation and repair of automatic transmissions
- perform the evaluation and repair of Intelligent/computer controlled AWD/4WD systems

RSOS topics covered in this section of training:

D-12 Diagnoses driveline systems
12.03 Diagnoses automatic transmissions/transaxles

D-13 Repairs driveline systems
13.03 Repairs automatic transmissions/transaxles

Diesel Engine Support Systems – Theory — **18 hours**

- describe operation, diagnoses and repair of the diesel fuel injection systems
- describe operation, diagnoses and repair of the turbo charged systems
- describe the operation, diagnoses and repair of the supercharged systems

Diesel Engine Support Systems – Shop — **30 hours**

- perform the evaluation and repair of diesel fuel injection systems
- perform the evaluation and repair of turbo charged systems
- perform the evaluation and repair of supercharged systems

RSOS topics covered in this section of training:

B-8 Diagnoses 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

B-9 Repairs diesel engine support systems
9.01 Repairs diesel fuel delivery and injection systems
9.02 Repairs diesel intake/exhaust systems
9.03 Repairs diesel emission control systems

Entertainment Systems, Instrumentation and Information Displays — **24 hours**

- describe the operation, diagnoses and repair of entertainment systems
- describe the operation, diagnoses and repair of instrumentation and information displays
- perform the evaluation and repair of entertainment systems
- perform the evaluation and repair of instrumentation and information displays

RSOS topics covered in this section of training:

E-14 Diagnoses electrical systems and components
14.04 Diagnoses entertainment systems
14.06 Diagnoses instrumentation and information displays

E-15 Repairs electrical systems and components
15.04 Repairs entertainment systems
15.06 Repairs instrumentation and information displays

HVAC and Comfort Control Systems — 30 hours

- explain physical properties of gases, liquids and solids
- describe operation, diagnoses and repair of heating system
- describe operation, diagnoses and repair of air conditioning systems and components
- describe operation, diagnoses and repair of air conditioning control systems
- perform the evaluation and repair of the heating systems
- perform the evaluation and repair of the air conditioning systems and components
- perform the evaluation and repair of the air conditioning control systems

RSOS topics covered in this section of training:

E-16 Diagnoses heating, ventilation and air conditioning (HVAC) and comfort control systems
16.01 Diagnoses air flow control systems
16.02 Diagnoses refrigerant systems
16.03 Diagnoses heating systems

E-17 Repairs heating, ventilation and air conditioning (HVAC) and comfort control systems
17.01 Repairs air flow control systems
17.02 Repairs refrigerant systems
17.03 Repairs heating systems

Hybrid and Electric Vehicles (EV) – Theory — 18 hours

- describe hybrid vehicles
- describe electric vehicles
- explain hybrid electrical vehicle operation
- describe hybrid electrical vehicle service procedures
- describe hybrid electric vehicle brakes systems

RSOS topics covered in this section of training:

H-22 Diagnoses hybrid and electric vehicles (EV)
22.01 Implements specific safety protocols for hybrid and electric vehicles (EV)
22.02 Diagnoses hybrid and electric vehicle (EV) systems

H-23 Repairs hybrid and electric vehicles (EV)
23.01 Repairs hybrid vehicle systems
23.02 Repairs electric vehicles (EV) systems

Mentoring Techniques – Theory — 30 hours

- research trends and innovations in the automotive industry
- present research findings
- identify and explain strategies for learning skills in the workplace
- demonstrate strategies for learning skills in the workplace

- identify and explain strategies for teaching workplace skills
- demonstrate strategies for teaching workplace skills

RSOS topics covered in this section of training:

A-3 Uses communication and mentoring techniques
3.02 Uses mentoring techniques

Restraint Systems — 18 hours

- describe occupant restraint systems
- repair occupant restraint systems

RSOS topics covered in this section of training:

G-20 Diagnoses restraint systems, body components, accessories and trim
20.01 Diagnoses restraint systems

G-21 Repairs restraint systems, body components, accessories and trim
21.01 Repairs restraint systems

Level Four topics taught In-Context:

A-2 Tools, Equipment, Materials and Documentation
C-10 Vehicle Networking Systems
G-20 Maintenance Inspection

See In-Context Topics for details, page 24

IN-CONTEXT TOPICS

In-Context means learning that has already taken place and is being applied to the applicable task. Learning outcomes for In-Context topics are accomplished in other topics in that level.

Tools, Equipment, Materials and Documentation

A-2 Uses and maintains tools, equipment and documentation
A-2.01 Uses tools and equipment
A-2.02 Uses fasteners, tubing, hoses and fittings
A-2.03 Uses hoisting and lifting equipment
A-2.04 Uses technical information

Vehicle Networking Systems

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

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

Maintenance Inspection

G-20 Diagnoses restraint systems, body components, accessories and trim
G-20.02 Diagnoses wind noises, rattles and water leaks
G-20.03 Diagnoses interior and exterior components, accessories and trim
G-20.04 Diagnoses latches, locks and movable glass

G--21 Repairs restraint systems, body components, accessories and trim
G-21.02 Repairs wind noises, rattles and water leaks
G-21.03 Repairs interior and exterior components, accessories and trim
G-21.04 Repairs latches, locks and movable glass