



Automotive Service Technician Course Outline

2021

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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 OUTLINE

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.

| Level One | 8 weeks | 240 hours |
|---|----------------|------------------|
| Automotive Shop Fundamentals – Theory/Shop | | 30 hours |
| <ul style="list-style-type: none"> • describe occupation related safety procedures <ul style="list-style-type: none"> • Safety Related Functions (refrigerant, restraints, hybrid and electric vehicles): <ul style="list-style-type: none"> ○ 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 <ul style="list-style-type: none"> • Communication Techniques: <ul style="list-style-type: none"> ○ demonstrate knowledge of trade documents ○ apply trade documents to vehicle repair • prepare trade documents | | |
| Brake Systems – Theory | | 30 hours |
| <ul style="list-style-type: none"> • 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 |
| <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> ○ (oxy-fuel safety, setup and shutdown) • diagnose power assist brake system operation <ul style="list-style-type: none"> ○ (hybrid brake safety) • diagnose brake system operation <ul style="list-style-type: none"> • Communication Techniques: <ul style="list-style-type: none"> ○ apply trade documents to vehicle repair ○ prepare trade documents | | |
| Body Components and Service Inspection – Theory/Shop | | 12 hours |
| <ul style="list-style-type: none"> • describe adjustment of doors, lids and moveable glass • describe diagnosis and repair of body leaks and noises • describe basic service inspections | | |

Driveline Systems – Theory/Shop**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
 - **Tires, Wheels, Hubs and Wheel Bearings:**
 - repair wheels and tires
 - service wheel bearings and seals
 - perform the evaluation and repair of tire pressure monitor systems

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

Engine Systems – Theory/Shop**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

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

Level Two

8 weeks

240 hours

Braking and Stability Control Systems – Theory/Shop

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
-

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
-

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
-

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
-

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

Level Three

8 weeks

240 hours

Electrical Accessories and Options – Theory/Shop

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
-

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
-

Ignition Systems – Theory/Shop

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
-

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

Vehicle Networking Systems – Theory/Shop

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

| Level Four | 8 weeks | 240 hours |
|--|----------------|------------------|
| Automatic Transmissions and Automated AWD/4WD Systems – Theory <ul style="list-style-type: none"> 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 | | 30 hours |
| Automatic Transmissions and Automated AWD/4WD Systems – Shop <ul style="list-style-type: none"> perform the evaluation and repair of automatic transmissions perform the evaluation and repair of Intelligent/computer controlled AWD/4WD systems | | 42 hours |
| Diesel Engine Support Systems – Theory <ul style="list-style-type: none"> 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 | | 18 hours |
| Diesel Engine Support Systems – Shop <ul style="list-style-type: none"> 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 | | 30 hours |
| Entertainment Systems, Instrumentation and Information Displays – Theory/Shop <ul style="list-style-type: none"> 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 | | 24 hours |
| HVAC and Comfort Control Systems – Theory/Shop <ul style="list-style-type: none"> 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 | | 30 hours |
| Hybrid and Electric Vehicles (EV) – Theory <ul style="list-style-type: none"> describe hybrid vehicles describe electric vehicles | | 18 hours |

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

Restraint Systems – Theory/Shop**18 hours**

- describe occupant restraint systems
- repair occupant restraint systems



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 (apprenticeship year) where the content is delivered in training.

A - PERFORMS COMMON OCCUPATIONAL SKILLS

| | | | | |
|--|--|---|--|---|
| 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 and maintains 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 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

| | | | | |
|--|---|---|--|--|
| 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 COMMUNICATION SYSTEMS

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

D – DIAGNOSES AND REPAIRS DRIVELINE SYSTEMS

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

13.06 Repairs final drive assemblies

2

E – DIAGNOSES AND REPAIRS ELECTRICAL AND COMFORT CONTROL SYSTEMS

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 Diagnoses heating systems 4 |
|--|--|--|---|

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

| | | | |
|---|---|--|--|
| 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 |
|---|---|--|--|

