

Truck and Transport Mechanic On-the-Job Training Guide

2019



Online: www.saskapprenticeship.ca

Recognition:

To promote transparency and consistency, portions of this document has been adapted from the 2015 Truck and Transport Mechanic National Occupational Analysis (Employment and Social Development Canada).

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

STRUCTURE OF THE ON-THE-JOB TRAINING GUIDE

To facilitate understanding of the occupation, this on-the-job training guide contains the following sections:

Description of the Truck and Transport Mechanic trade: an overview of the trade's duties and training requirements.

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

Harmonization: a brief description on the pan-Canadian Harmonization Initiative for the Truck and Transport Mechanic trade.

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.

Major Work Activity (MWA): 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.

On-the-Job and In-school Training Content for the Truck and Transport Mechanic Trade: a chart which outlines on-the-job examples for apprentices to achieve relevant work experience to prepare for topics of technical training.

DESCRIPTION OF THE TRUCK AND TRANSPORT MECHANIC TRADE

Truck and Transport Mechanics perform the maintenance, repair, overhaul, inspection, reconditioning, and diagnostic troubleshooting of motorized trucks, buses and road transport vehicles

Truck and transport mechanics inspect, repair and maintain commercial trucks, emergency vehicles, buses and road transport vehicles. In some jurisdictions, they may also work on commercial trailers and recreation vehicles. Truck and transport mechanics work on the structural, mechanical, electrical and electronic vehicle systems and components such as engines, cab, chassis and frames, brakes, steering, suspension, drive train, heating, ventilation and air conditioning (HVAC), emissions, fuel systems and hydraulic systems. In addition, truck and transport mechanics perform preventative maintenance and diagnosis of vehicles.

Truck and transport mechanics use specialized tools including hand tools, test meters, hoisting and lifting equipment, staging equipment, welding and cutting equipment, hydraulic equipment, safety equipment, recycle and recovery equipment, and complex electronics and computer diagnostic test equipment.

Truck and transport mechanics are employed in the agricultural, construction, mining, forestry, petrochemical and transportation sectors. They may be employed in small repair shops, motor vehicle dealers, fleet maintenance companies, public transportation companies, government highway departments, railways and construction companies.

Work environments for truck and transport mechanics differ from one job to another. The truck and transport mechanic frequently works in awkward positions, and must often climb, stoop, crouch and kneel. They also must handle heavy parts and tools. Truck and transport mechanics are sometimes required to work in adverse weather conditions.

There is some risk of injury involved in working with heavy equipment and power tools. Common occupational hazards are exposure to chemicals and harmful materials, repetitive motion, noise and sharp edges.

Key attributes for individuals entering this trade are mechanical aptitude, manual dexterity, good hand-eye coordination and strength. They must also have a good understanding of computerized machinery, good problem-solving and analytical skills, and the ability to read and understand service manuals. Good communication skills and patience are also important. Other assets include good vision, hearing and sense of smell to diagnose problems.

This analysis recognizes similarities or overlaps with the work of automotive service technicians, agricultural equipment technicians, heavy duty equipment technicians, recreation vehicle service technicians and transport trailer technicians.

With experience, truck and transport mechanics act as mentors and trainers to apprentices in the trade. They may also advance to supervisory, service manager and training positions.

Training Requirements: 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.

- 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 their 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 journeyman 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 Level ^❶	Science Credit at Grade Level
Truck and Transport Mechanic	Grade 11	Grade 10
<p>^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.).</p> <p>*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.</p> <p>For information about high school curriculum, including Math and Science course names, please see: http://www.curriculum.gov.sk.ca/#</p> <p>Individuals not meeting the entrance requirements will be subject to an assessment and any required training.</p>		

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.

The tools are available online or for order at: www.esdc.gc.ca/eng/jobs/les/profiles/index.shtml

The application of these skills may be described throughout this document within the skills and knowledge which support each sub-task of the trade. The most important essential skills for each sub-task have also been identified. 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

Truck and transport mechanics read a variety of paper-based and electronic documents for troubleshooting and servicing, including manufacturers' instructions, technical service bulletins and operating procedures. They read and interpret government regulations that specify vehicle inspection procedures and roadworthiness requirements of trucks and transports. They locate information on labels such as part numbers and serial numbers.

DOCUMENT USE

Truck and transport mechanics interpret technical drawings and flowcharts to understand and troubleshoot systems. They study graphed data generated by diagnostic equipment to locate information such as duration, speed and revolutions per minute. Truck and transport mechanics also complete a variety of forms including truck inspection forms.

WRITING

Truck and transport mechanics write remarks on the complaint/issue, the cause of a problem and the work completed to correct a problem. They may leave reminder notes for co-workers on other shifts including warnings about defective equipment. Truck and transport mechanics complete pre-job safety checklists. They may also write reports for insurance claims or to report workplace accidents.

ORAL COMMUNICATION

Truck and transport mechanics exchange technical repair and troubleshooting information with apprentices, co-workers and manufacturers. They speak with service managers about topics such as work assignments, repair procedures and the condition of tools and equipment. They may speak with customers to respond to questions, gather information about a problem to be fixed or explain the results of inspections and repairs.

NUMERACY

Truck and transport mechanics analyze and compare a variety of measurements such as energy, dimension, speed, horsepower, temperature and torque to specifications. They calculate the effect that modifications have on vehicle performance. They may use some measurements to determine approximate service life of components.

THINKING

Truck and transport mechanics evaluate the severity of vehicle defects, assess the conditions of parts and decide what repairs or replacements are to be done. They decide on the most efficient course and sequence of actions to complete a job and ensure the vehicle is safe for operation. An understanding of systems is important in completing the work. Truck and transport mechanics coordinate their work with co-workers if needed.

WORKING WITH OTHERS

Truck and transport mechanics may work independently or with others. They are part of a team which includes other mechanics, service managers and parts and warehouse personnel.

DIGITAL TECHNOLOGY

Truck and transport mechanics use diagnostic equipment such as scan tools and analyzers to determine the operational condition of components. They use computer equipment to complete repairs, download data from on-board computers and monitor systems. They may use databases to retrieve repair information and technical drawings or to input information about repairs. Truck and transport mechanics use the Internet to access online manuals, technical service bulletins and recall notices. They also use computers for daily tasks which may include e-mail, file management and using fleet management software.

CONTINUOUS LEARNING

Truck and transport mechanics are continuously learning to keep up with the changes in the industry. They may participate in training seminars to learn about new equipment and how to troubleshoot and perform repairs effectively.

HARMONIZATION

At the request of industry, the Harmonization Initiative was launched in 2013 to *substantively align* apprenticeship systems across Canada by making training requirements more consistent in the Red Seal trades. Harmonization aims to improve the mobility of apprentices, support an increase in their completion rates and enable employers to access a larger pool of apprentices.

As part of this work, the Canadian Council of the Directors of Apprenticeship (CCDA) identified four main harmonization priorities in consultation with industry and training stakeholders:

1. Trade name

The official Red Seal name for this trade is Truck and Transport Mechanic.

2. Number of Levels of Apprenticeship

The number of levels of technical training recommended for the Truck and Transport Mechanic trade is four.

3. Total Training Hours during Apprenticeship Training

The total hours of training, including both on-the-job and in-school training for the Truck and Transport Mechanic trade is 7200.

4. Consistent sequencing of training content (at each level) using the most recent Occupational Standard

Implementation for harmonization will take place progressively. Level one to be implemented in 2017/2018, level two 2018/2019, level three 2019/2020, and level four in 2020/2021.

TRUCK AND TRANSPORT MECHANIC TASK MATRIX CHART

This chart outlines the blocks, tasks and sub-tasks from the 2015 Truck and Transport Mechanic National Occupational Analysis (NOA)*.

*The Task Matrix Chart will be updated every year until Harmonization implementation is complete. Implementation for harmonization will take place progressively. Level one to be implemented in 2017/2018, level two 2018/2019, level three 2019/2020, and level four in 2020/2021.

A – 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 and equipment	2.01 Maintains hand, power, measuring, testing, and diagnostic tools 1	2.02 Maintains shop equipment 1	2.03 Uses hoisting and lifting equipment 1	2.04 Uses welding and cutting equipment 1, 2	
A-3 Performs routine trade activities	3.01 Uses documentation and reference materials (1, 2, 3 in context)	3.02 Maintains fluids, lubricants, and coolants (1, 2, 3 in context)	3.03 Services hoses, tubing, and fittings (1, 2, 3 in context)	3.04 Services filters (1, 2,3 in context)	3.05 Services bearings, bushing and seals (1, 2, 3 in context)
	3.06 Uses fasteners, sealing devices, adhesives and gaskets (1, 2, 3 in context)				

B – ENGINES AND SUPPORTING SYSTEMS

B-10 Services, diagnoses and repairs engine retarder systems

10.01 Services and repairs engine retarder systems

3

10.02 Diagnoses engine retarder systems

3

B-11 Services, diagnoses and repairs cooling system

11.01 Services cooling system

3

11.02 Diagnoses cooling system

3

11.03 Repairs cooling system

3

C – AIR SYSTEMS AND BRAKES

C-12 Services, diagnoses and repairs air systems

12.01 Services air systems

1, 2

12.02 Diagnoses air systems

1, 2

12.03 Repairs air systems

1, 2

C-13 Services, diagnoses and repairs brake systems

8.01 Services brake systems

1, 2

8.02 Diagnoses brake system

1, 2

8.03 Repairs brake systems

1, 2

D –ELECTRICAL AND ELECTRONIC SYSTEMS

D-14 Services, diagnoses and repairs batteries

14.01 Performs servicing and repair of batteries

1

14.02 Diagnoses batteries

1

D-15 Services, diagnoses and repairs charging systems

15.01 Services charging systems

1, 2

15.02 Diagnoses charging systems

1, 2

15.03 Repairs charging systems

1, 2

D-16 Services, diagnoses and repairs spark ignition systems

16.01 Performs servicing and repair of spark ignition systems

1

16.02 Diagnoses spark ignition systems

1

D-17 Services, diagnoses and repairs starting systems

17.01 Performs servicing and repairs of starting systems

1, 2

17.02 Diagnoses starting systems

1, 2

D-18 Services, diagnoses and repairs electrical components and accessories

18.01 Performs servicing and repairs of electrical components and accessories

3

18.02 Diagnoses electrical components and accessories

3

D-19 Services, diagnoses and repairs vehicle management systems and electronic components

19.01 Services vehicle management systems and electronic components

3

19.02 Diagnoses vehicle management systems and electronic components

3

19.03 Repairs vehicle management systems and electronic components

3

E – DRIVETRAIN

E-20 Services, diagnoses and repairs clutches

20.01 Services clutches

3

20.02 Diagnoses clutches

3

20.03 Repairs clutches

3

E-21 Services, diagnoses and repairs manual transmission and transfer cases	21.01 Services manual transmission and transfer cases 3	21.02 Diagnoses manual transmission and transfer cases 3	21.03 Repairs manual transmission and transfer cases 3
E-22 Services, diagnoses and repairs automatic transmissions	22.01 Services automatic transmissions 3	22.02 Diagnoses automatic transmissions 3	22.03 Repairs automatic transmissions 3
E-23 Services, diagnoses and repairs automated transmissions	23.01 Services automated transmissions 3	23.02 Diagnoses automated transmission 3	23.03 Repairs automated transmissions 3
E-24 Services, diagnoses and driveline systems	24.01 Services driveline system 3	24.02 Diagnoses driveline systems 3	24.03 Repairs driveline systems 3
E-25 Services, diagnoses and repairs differentials	25.01 Services differentials 3	25.02 Diagnoses differentials 3	25.03 Repairs differentials 3
E-26 Services, diagnoses and repairs drivetrain retarders	26.01 Services drivetrain retarders 3	26.02 Diagnoses drivetrain retarders 3	26.03 Repairs drivetrain retarders 3

F – STEERING, CHASSIS/FRAMES, SUSPENSION, WHEELS, HUBS AND TIRES

F-27 Services, diagnose, and repairs steering systems	27.01 Services steering systems 1, 2	27.02 Diagnoses steering systems 1, 2	27.02 Repairs steering systems 1, 2
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F-28 Services, diagnoses, and repairs chassis/frames

28.01 Services chassis/frames

1, 2

28.02 Diagnoses chassis/frames

1, 2

28.03 Repairs chassis/frames

1, 2

F-29 Services, diagnoses, and repairs suspension

29.01 Services suspension

1, 2

29.02 Diagnoses suspension

1, 2

29.03 Repairs suspension

1, 2

F-30 Services, diagnoses, and repairs hitches and couplers

30.01 Services hitches and couplers

1, 2

30.02 Diagnoses hitches and couplers

1, 2

30.03 Repairs hitches and couplers

1, 2

F-31 Services, diagnoses, and repairs tires, wheels and hubs

31.01 Services tires, wheels and hubs

1, 2

31.02 Diagnoses tires, wheels and hubs

1, 2

31.03 Repairs tires, wheels and hubs

1, 2

G – CAB

G-32 Services, diagnoses, and repairs interior cab components

32.01 Services interior cab components

2

32.02 Diagnoses interior cab components

2

32.03 Repairs interior cab components

2

G-33 Services, diagnoses and repairs exterior cab components

33.01 Services exterior cab components

1

33.02 Diagnoses exterior cab components

1

33.03 Repairs exterior cab components

1

H – TRAILERS

H-34 Services, diagnoses and repairs trailer components and accessories	34.01 Services trailer components and accessories 2	34.02 Diagnoses trailer components and accessories 2	34.03 Repairs trailer components and accessories 2
H-35 Services, diagnoses and repairs heating refrigeration systems	35.01 Services, heating refrigeration systems 2	35.02 Diagnoses heating refrigeration systems 2	35.03 Repairs heating refrigeration systems 2

I – CLIMATE CONTROL

I-36 Services, diagnoses and repairs heating and ventilation systems	36.01 Services heating and ventilation systems 1	36.02 Diagnoses heating and ventilation systems 1	36.03 Repairs heating and ventilation systems 1
I-37 Services, diagnoses and repairs air conditioning systems	37.01 Services, air conditioning systems 1	37.02 Diagnoses air conditioning systems 1	37.03 Repairs air conditioning systems 1

J – HYDRAULIC SYSTEMS

J-38 Services, diagnoses and repairs hydraulic components	38.01 Services hydraulic components 1, 2	38.02 Diagnoses hydraulic components 1, 2	38.03 Repairs hydraulic components 1, 2
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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. The Training Profile Chart will be updated every year until Harmonization implementation is complete. Implementation for harmonization will take place progressively. Level one to be implemented in 2017/2018, level two 2018/2019, level three 2019/2020, and level four in 2020/2021.

Level One (Harmonized)	Transcript Code	Hours
Basic Tools	TOOL 145 – Theory	12
	TOOL 146 – Shop	12
Brake Systems	BRAK 111 – Theory	24
	BRAK 112 – Shop	36
Electrical	ELCT 100 – Theory	14
	ELCT 101 – Shop	16
Environmental Control Systems	HVAC 100	6
Hydraulics	HYDR 108 – Theory	24
	HYDR 109 – Shop	36
Steering Systems	STER 100 – Theory	12
	STER 101 – Shop	18
Structural Components	MAIN 100 – Theory	12
	MAIN 101 – Shop	18
		240

Level Two (Harmonized)	Transcript Code	Hours
Braking Systems ABS	BRAK 206 – Theory	12
	BRAK 207 – Shop	18
Drivetrain Systems	DRTR 201 – Theory	24
	DRTR 202 – Shop	36
Electrical	ELCT 202 – Theory	12
	ELCT 203 – Shop	18
Hydraulics	HYDR 206 – Theory	12
	HYDR 207 – Shop	18
Steering and Directional Control Systems	STER 204 – Theory	12
	STER 205 – Shop	18
Truck and Trailer Systems	TRLR 200 – Theory	24
	TRLR 201 – Shop	36
		240

Level Three (Harmonized)	Transcript Code	Hours
Alternate Fuels	FUEL 304 – Theory	10
	FUEL 305 – Shop	20
Electrical	ELCT 301 – Theory	14
	ELCT 302 – Shop	16
Engine and Engine Support Systems	ENGN 306 – Theory	55
	ENGN 307 – Shop	65
Powertrain Systems	TRNM 308 – Theory	26
	TRNM 309 – Shop	34
		240

Level Four	Transcript Code	Hours
Diesel Fuel Systems	FUEL 484 – Theory	60
	FUEL 485 – Shop	30
Electrical and Electronics	ELEC 488 – Theory	60
	ELEC 489 – Shop	30
Fuel Ignition Systems and Auxiliary Equipment	HYDR 488 – Theory	40
	HYDR 489 – Shop	20
		240

ON-THE-JOB AND IN-SCHOOL TRAINING

CONTENT FOR THE TRUCK AND TRANSPORT MECHANIC TRADE

This chart outlines on-the-job examples for apprentices to achieve relevant work experience to prepare for the topics of technical training. Topics of technical training are provided with the associated learning outcomes.

Level One	8 weeks	240 hours
Basic Tools – Theory <ul style="list-style-type: none"> • safety rules and regulations • purpose and care of shop and hand tools • types of fasteners, adhesives and sealing devices 		12 hours
Basic Tools – Shop <ul style="list-style-type: none"> • safety rules and regulations • purpose and care of shop and hand tools • types of fasteners, adhesives and sealing devices 		12 hours
Mentors can assist the apprentice to prepare for this section of technical training by: <ul style="list-style-type: none"> • <i>providing instruction on the safety rules and regulations</i> • <i>providing instruction on the purpose, use and care of shop and hand tools</i> • <i>describing the various types of fasteners, adhesives and sealing devices</i> • <i>providing opportunities to demonstrate shop safety</i> • <i>explaining legislative regulations</i> • <i>providing opportunities to demonstrate the use and care of hand tools and shop equipment</i> 		
Brake Systems – Theory <ul style="list-style-type: none"> • hydraulic brake system operation • air brake system operation • types of park brake systems • hydraulic brake system operation • air brake system operation • park brake systems 		24 hours
Brake Systems – Shop <ul style="list-style-type: none"> • final adjustments and performance tests • system faults 		36 hours
Mentors can assist the apprentice to prepare for this section of technical training by: <ul style="list-style-type: none"> • <i>providing instruction on hydraulic brake system operation</i> • <i>providing instruction on air brake system operation</i> • <i>providing instruction on various types of park brake systems</i> • <i>providing opportunities to evaluate hydraulic brake system operation</i> • <i>providing opportunities to evaluate air brake system operation</i> • <i>providing opportunities to evaluate various park brake systems</i> • <i>providing opportunities to conduct final adjustments and performance tests</i> 		

- *providing opportunities to repair faults*

Electrical – Theory **14 hours**

- electrical theory and magnetism.
- electrical circuit types and faults utilizing test equipment.
- lead acid batteries

Electrical – Shop **16 hours**

- electrical values and check circuit operation
- lead acid batteries
- system faults.

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on the fundamentals of electrical theory and magnetism*
- *providing instruction on interpreting electrical symbol diagrams*
- *providing instruction on electrical system maintenance and testing procedures*
- *providing instruction on electrical circuit types and faults utilizing test equipment*
- *providing opportunities to measure electrical values and check circuit operation*
- *providing opportunities to evaluate a lead acid battery*
- *providing opportunities to repair faults*

Environmental Control Systems – Theory **6 hours**

- Heating, Refrigeration and Air Conditioning Institute’s course on ozone depleting substances

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on Heating, Refrigeration and Air Conditioning (HVAC) safety and systems*

Hydraulics – Theory **24 hours**

- fundamentals of a basic hydraulic system and related components
- hydraulic symbol diagrams

Hydraulics – Shop **36 hours**

- hydraulic system maintenance and testing procedures
- open and closed center hydraulic systems
- hydraulic systems various components
- hydraulic systems tools and procedures

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on the fundamentals of a basic hydraulic system and related components*
- *providing instruction on interpreting hydraulic symbol diagrams*
- *providing instruction on hydraulic system maintenance and testing procedures*
- *providing instruction on open and closed center hydraulic systems*
- *providing opportunities to service hydraulic system and various components*
- *providing opportunities to test hydraulic systems using correct tools and procedures*

Steering Systems – Theory **12 hours**

- basic wheel and frame alignment angles
- manual and integral steering system operation

Steering Systems – Shop **18 hours**

- tires, rims and hubs
- wheel alignments

- manual and integral power steering systems
- system faults

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on basic wheel and frame alignment angles*
- *providing instruction on manual and integral steering system operation*
- *providing instruction on mounting procedures for tires, rims and hubs*
- *providing opportunities to perform a basic wheel alignment*
- *providing opportunities to evaluate manual and integral power steering systems*
- *providing opportunities to perform mounting procedures for tires, rims and hubs*
- *providing opportunities to repair system faults*

Structural Components and Accessories – Theory **12 hours**

- describe preventative maintenance programs
- identify hoisting and rigging techniques
- describe tractor frame construction and suspension systems
- describe truck and trailer coupling and docking systems

Structural Components and Accessories – Shop **18 hours**

- perform preventative maintenance checks
- perform hoisting and rigging techniques
- repair various hitching and docking systems
- inspect frame and suspension systems

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on preventative maintenance programs*
- *providing instruction on hoisting and rigging techniques*
- *providing instruction on tractor frame construction and suspension systems*
- *providing instruction on truck and trailer coupling and docking systems*
- *providing opportunities to perform preventative maintenance checks*
- *providing opportunities to perform hoisting and rigging techniques*
- *providing opportunities to repair various hitching and docking systems*
- *providing opportunities to inspect frame and suspension systems*

Level Two **8 weeks** **240 hours**

Braking Systems ABS – Theory **12 hours**

- antilock braking system components
- electric braking system components

Braking Systems ABS – Shop **18 hours**

- antilock braking systems
- electric braking systems
- system faults

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on antilock braking system components*
- *providing instruction on electric braking system components*
- *providing opportunities to evaluate antilock braking systems*
- *providing opportunities to evaluate an electric braking system*
- *providing opportunities to repair system faults*

Drivetrain Systems – Theory <ul style="list-style-type: none"> • seal and bearing types • clutch types • manual transmission operation • differential operation • planetary and final drives 	24 hours
Drivetrain Systems – Shop <ul style="list-style-type: none"> • driveline operation • system faults 	36 hours
Mentors can assist the apprentice to prepare for this section of technical training by: <ul style="list-style-type: none"> • <i>providing instruction on various seals and bearing types</i> • <i>providing instruction on various clutch types electric braking system components</i> • <i>providing instruction on manual transmission operation</i> • <i>providing instruction on differential operation</i> • <i>providing instruction on planetary and final drives</i> • <i>providing instruction on driveline operation</i> • <i>providing opportunities to perform the removal and replacement of various seals and bearings</i> • <i>providing opportunities to evaluate various clutch types</i> • <i>providing opportunities to evaluate manual transmission operation</i> • <i>providing opportunities to evaluate differential operation</i> • <i>providing opportunities to evaluate planetary and final drive systems</i> • <i>providing opportunities to evaluate driveline systems</i> • <i>providing opportunities to repair faults</i> 	
Electrical – Theory <ul style="list-style-type: none"> • cranking system and related components • alternating current (AC) charging system and related components 	12 hours
Electrical – Shop <ul style="list-style-type: none"> • cranking and charging systems • system faults 	18 hours
Mentors can assist the apprentice to prepare for this section of technical training by: <ul style="list-style-type: none"> • <i>providing instruction on the operation of a cranking system and related components</i> • <i>providing instruction on the operation of an alternating current (AC) charging system and related components</i> • <i>providing opportunities to evaluate cranking and charging systems</i> • <i>providing opportunities to repair faults</i> 	
Hydraulics – Theory <ul style="list-style-type: none"> • types of flow control valves • power-beyond hydraulic systems • open and closed loop hydraulic systems • load sensing hydraulic systems 	12 hours
Hydraulics – Shop <ul style="list-style-type: none"> • hydrostatic drive systems • types of hydraulic systems and flow control valves • system faults 	18 hours
Mentors can assist the apprentice to prepare for this section of technical training by: <ul style="list-style-type: none"> • <i>providing instruction on the operation of the different types of flow control valves</i> 	

- *providing instruction on a power-beyond hydraulic system*
- *providing instruction on open and closed loop hydraulic systems*
- *providing instruction on the operation of a load sensing hydraulic system*
- *providing instruction on various hydrostatic drive systems*
- *providing opportunities to evaluate various types of hydraulic systems and flow control valves*
- *providing opportunities to evaluate a power beyond system*
- *providing opportunities to evaluate open and closed loop hydraulic systems*
- *providing opportunities to a load sensing hydraulic system*
- *providing opportunities to evaluate various hydrostatic drive systems*
- *providing opportunities to repair faults*

Steering and Directional Control Systems – Theory

12 hours

- operating principles of tandem steering systems
- operating principles of an auxiliary steering systems
- pilot control and orbital steering systems

Steering and Directional Control Systems – Shop

18 hours

- tandem steering system.
- auxiliary steering systems.
- pilot control and orbital steering systems.
- system faults.

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on the operating principles of tandem steering systems*
- *providing instruction on the operating principles of auxiliary steering systems*
- *providing instruction on pilot control and orbital steering systems*
- *providing opportunities to evaluate tandem steering systems*
- *providing opportunities to evaluate auxiliary steering systems*
- *providing opportunities to evaluate pilot control and orbital steering systems*

Truck and Trailer Systems – Theory

24 hours

- trailer frame and suspension systems
- operational fundamentals of trailer heat, ventilation and air conditioning systems
- SGI safety inspection procedures for truck and trailers
- cab and engine heaters and auxiliary power generation units

Truck and Trailer Systems – Shop

36 hours

- trailer frame and suspension systems
- trailer heating, ventilation and air conditioning systems
- SGI safety Inspection
- engine and cab heating and auxiliary power generation units
- system defects

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on trailer frame and suspension systems*
- *providing instruction on the operational fundamentals of trailer heat, ventilation and air conditioning systems*
- *providing instruction on SGI safety inspection procedures for truck and trailers*
- *providing instruction on the operation of cab and engine heaters and auxiliary power generation units*
- *providing opportunities to identify trailer frame and suspension systems*
- *providing opportunities to identify trailer heating, ventilation and air conditioning systems*

- *providing opportunities to perform SGI safety Inspection procedures for truck and trailers*
- *providing opportunities to evaluate engine and cab heating and auxiliary power generation units*
- *providing opportunities to repair system defects*

Level Three	8 weeks	240 hours
Alternative Fuels – Theory		10 hours
<ul style="list-style-type: none"> • ignition process of a spark ignition engine • fuel delivery process for various fuel types 		
Alternative Fuels – Shop		20 hours
<ul style="list-style-type: none"> • spark ignition components • components related to fuel delivery 		
Mentors can assist the apprentice to prepare for this section of technical training by:		
<ul style="list-style-type: none"> • <i>providing instruction on the ignition process of a spark ignition engine</i> • <i>providing instruction on the fuel delivery process for various fuel types</i> • <i>providing opportunity to perform servicing, diagnoses and replacement of spark ignition components</i> • <i>providing opportunity to perform servicing, diagnosing and replacement of components related to fuel delivery</i> 		
Electrical – Theory		14 hours
<ul style="list-style-type: none"> • electrical components and their applications • wiring diagrams • common electrical faults 		
Electrical – Shop		16 hours
<ul style="list-style-type: none"> • electrical circuits • electrical values • circuit operation 		
Mentors can assist the apprentice to prepare for this section of technical training by:		
<ul style="list-style-type: none"> • <i>providing instruction on the common electrical components and their applications</i> • <i>providing instruction on the fuel delivery process for various fuel types</i> • <i>providing direction constructing electrical circuits</i> • <i>providing direction on measuring electrical values</i> • <i>providing direction on analyzing circuit operation</i> 		
Engine and Engine Support Systems – Theory		55 hours
<ul style="list-style-type: none"> • operational characteristics of a diesel engine • metallurgy and fluid analysis • operational characteristics of various diesel engine support systems • diesel engine overhaul • determine component serviceability • diesel engine failure diagnosis 		
Engine and Engine Support Systems – Shop		65 hours
<ul style="list-style-type: none"> • evaluate a diesel engine • disassembly • evaluate engine serviceability 		

- diesel engine assembly
- post-assembly inspection and testing
- evaluate operating engine
- repair defects

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on the operational characteristics of a diesel engine*
- *providing instruction on metallurgy and fluid analysis*
- *providing instruction on operational characteristics of various diesel engine support systems*
- *providing instruction on diesel engine overhaul procedures*
- *providing instruction on the processes involved in determining component serviceability*
- *providing instruction on diesel engine failure diagnosis*
- *providing opportunity to evaluate a diesel engine for potential faults prior to disassembly*
- *providing opportunity to disassemble engine using correct procedures and shop practices*
- *providing opportunity to evaluate engine components for serviceability*
- *providing direction to assemble a diesel engine using proper procedures and serviceable components*
- *providing direction to evaluate engines after assembly and inspect for potential faults*
- *providing direction on engine start-up and break-in procedures*
- *providing direction to evaluate operating engine for faults*
- *providing direction to repair defects as required*

Powertrain Systems – Theory

24 hours

- manual transmission principles
- automatic transmission principles

Powertrain Systems – Shop

36 hours

- manual transmissions evaluation
- automatic transmissions evaluation
- defects

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on the operating principles of a manual transmission*
- *providing instruction on the operating principles of a automatic transmission*
- *providing advanced direction on manual transmission disassembly, inspection, and repair procedures*
- *providing advanced direction on automatic transmission disassembly, inspection, and repair procedures*
- *providing direction on the repair of defects on maual and automatic transmissons*

Level Four

8 weeks

240 hours

Diesel Fuel Systems – Theory

60 hours

- fuel supply systems
- fuel injection systems

Diesel Fuel Systems – Shop

30 hours

- governors and tune-up
- electronics
- emission control systems

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing instruction on governor controls, adjustments, and engine tune up procedures*
- *providing advanced direction on diagnosing and repairing fuel supply systems, injectors, and injection pumps, and electronic fuel control systems*

Electrical and Electronics – Theory

60 hours

- hydraulic controls
- engine controls
- transmission controls

Electrical and Electronics – Shop

30 hours

- multiplex wiring

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing advanced direction on the use of service manuals, wiring diagrams, hydraulic schematics, and flow charts*
- *providing advanced direction on the use of specialized testing equipment to troubleshoot hydraulic, engine, and transmission controls, circuits, and electronically controlled systems and devices*

Fuel Ignition Systems and Auxillary Equipment – Theory

40 hours

- fuel delivery and injection systems
- engine management systems
- emission control systems
- ignition systems
- propane and alternate fuel systems

Fuel Ignition Systems and Auxillary Equipment – Shop

20 hours

- fuel delivery and injection systems
- engine management systems
- emission control systems
- ignition systems
- propane and alternate fuel systems
- engine heaters
- electronic controls
- generator sets

Mentors can assist the apprentice to prepare for this section of technical training by:

- *providing direction on diagnosis, service, and repair of fuel delivery and fuel injection systems*
- *providing instruction on troubleshooting engine management and emission control systems*
- *providing direction on diagnosis and service procedures for various types of ignition systems*
- *providing direction on service and repair of alternate fuel systems*
- *providing direction on the service and repair of engine heaters*
- *providing direction on troubleshooting electronic controls*
- *providing direction on the service and repair of generator sets*

Consider apprenticeship training as an investment in the future of your company and in the future of your workforce. Ultimately, skilled and certified workers increase your bottom line.

Get involved in the apprenticeship training system. Your commitment to training helps to maintain the integrity of the trade.

Do you have employees who have been working in the trade for a number of years but don't have trade certification? Contact your local apprenticeship office for details on how they might obtain the certification they need.

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