



**Skilled
Trades**
Ontario

**Métiers
spécialisés**
Ontario

Apprenticeship
Training Standard
Logbook

**Powered Lift
Truck Technician**

282E

2016

Apprenticeship Training Standard

The Apprenticeship Training Standard or herein after referred to as “Logbook” is a document issued to Apprentices who sign a Registered Training Agreement in the Province of Ontario as an official record of training. It is to be used by the Apprentice and Sponsor/trainer to guide the process of skills development in a particular trade.

Training As An Apprentice

- ✓ Ensure you, your sponsor, and your witness sign a Training Agreement with the Ministry of Labour, Immigration, Training and Skills Development. Once it is registered, you will receive a copy of the registered Training Agreement for your records.
- ✓ Notify the local Service Delivery Office **immediately** if any changes to contact information or training agreement, especially if you change sponsors.
- ✓ Review the Logbook regularly with your trainer and sponsor to discuss your progress, ask questions, seek feedback and have the trainer **sign-off on competencies**
- ✓ Keep an accurate record of the hours you work.
- ✓ Attend classroom training when it is offered.
- ✓ Apply for the financial incentives for which you are eligible.



Completing Your Logbook

- ✓ **Complete the Sponsor Record Form** – A form must be completed for each Sponsor/Trainer used during your apprenticeship.
- ✓ **Confirm Skill Sign-off is Complete**
 - **You and your trainer** sign-off each required skill to confirm that you have demonstrated competency in that skill.
 - Shaded boxes in your Logbook mean the skills are optional and do not have to be confirmed by your trainer or sponsor. However, you are encouraged to complete them as part of your training.
- ✓ **Confirm Skill Set Sign-off is Complete**
 - After you and your trainer have signed-off all the required skills in a skill set, your sponsor signs the signature box on the form in **Appendix C – “Skill Set Completion for Sponsors”** to confirm your completion of all competencies within each skill set.

This document is the property of the apprentice named inside and represents the official record of your training. For information about completing your apprenticeship, see inside of back cover.



Apprentice Name: _____

Address: _____

Phone Number: _____

Email Address: _____

Trade: _____

Training Agreement # (for Compulsory and Non-Compulsory trades):

STO Account No. (for Compulsory trades only):

This document is the property of the Apprentice named herein and represents the official record of their training.

If you have questions about the use of this Logbook or about your Apprenticeship program, contact your local Service Delivery Office (see Appendix D in this book) or the Employment Ontario hotline at: 1-800-387-5656.

Apprenticeship Pathway to a Certificate of Qualification

Phase 1: Registration

Submit Application for Apprenticeship Training through the on-line portal or to local Service Delivery Office

For on-line portal, please follow instructions for registration. You will need to create a *My Ontario* account to access online services.

Training agreement signed and registered by both apprentice and sponsor

Access your Apprenticeship Training Standard Logbook**
skilledtradesontario.ca/about-trades/trades-information

** This is the official record of your training progress. You are responsible for keeping it up-to-date.

Complete on-the-job training

Demonstrate and receive sign-off on the competencies/skills in your Apprenticeship Training Standard Logbook

Complete in-school training

Attend and complete the in-class training set out in the Curriculum Training Standard

Apprentices eligible to apply for apprenticeship incentive grants (Red Seal trades) and loans.

Review and finalize your logbook with your sponsor

Submit proof of apprenticeship completion via email, in-person or digital portal

Your Apprenticeship Training Standard Logbook details completion requirements. Submit the following:

- completed Apprenticeship Training Standard Logbook with signatures
- proof of hours

Certificate of Apprenticeship is issued

Trades without examination

CofA is the final step of the program

Trades with examination (compulsory and non-compulsory trades)*

Provisional Certificate of Qualification issued for a 12 month term

To prepare for the CofQ examination download the Provincial and/or Red Seal Exam preparation guides.

Make payment for your Certificate of Qualification examination

Call to make a payment (647-847-3000 or 1-855-299-0028)

Schedule a date to write your Examination

To schedule your examination, contact your local Service Delivery Office.

Pass Certificate of Qualification examination

Apprentices eligible to apply for Apprenticeship Completion Grant (Red Seal trades) or Apprentice Completion Bonus (non-Red Seal)

Certificate of Qualification is issued

Upon completion, Sponsors may be eligible for Apprenticeship grants, incentives, bonuses or tax credits

Phase 2: Apprenticeship

Phase 3: Certification

* For a list of trades subject to a certification examination, visit: skilledtradesontario.ca

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Please Note: This Standard has been revised to reflect the visual identity of Skilled Trades Ontario (STO) which replaced the Ontario College of Trades on January 1, 2022. The content of this Standard may refer to the former organization; however, all trade specific information or content remains relevant and accurate based on the original date of publishing.

Please refer to STO's website: skilledtradesontario.ca for the most accurate and up to date information. For information about BOSTA and its regulations, please visit [Building Opportunities in the Skilled Trades Act, 2021 \(BOSTA\)](#).

Any updates to this publication are available on-line; to download this document in PDF format, please follow the link: Skilled Trades Ontario.ca.

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Maintained with transfer to Skilled Trades Ontario 2016 (V100)

Foreword: Purpose, Terms and Conditions of the registered Training Agreement

Purpose:

- Prior to starting official apprenticeship activities, the apprentice, sponsor and a witness are required to sign a Training Agreement.
- The Training Agreement that you have signed is an important legal document that outlines your responsibilities as an apprentice and the responsibilities of your sponsor.
- Once registered, this training agreement (or contract) marks the start of your formal agreement between the apprentice, the sponsor and the Ministry.
- For compulsory trades, the apprenticeship registration document must be accessible when working.

The Apprentice agrees:

- **To inform the local Service Delivery Office of any change to your contact information or change in sponsor within 7 days;**
- To follow the Sponsor's and Trainer's lawful instructions and make every effort to acquire the skills identified in the Logbook for the Trade which is part of the apprenticeship program established by Skilled Trades Ontario for the trade;
- To obtain written verification from the Sponsor and the Trainer(s) that the requirements in the Logbook for the trade have been met.
- When you receive an "Offer of Classroom Training", confirm your attendance by following the instructions in the offer. Failure to do so may result in losing your opportunity to attend school which delays the completion of your apprenticeship.

The Sponsor agrees:

- To ensure that the Apprentice is provided with the training required as part of the apprenticeship program established by Skilled Trades Ontario for this trade;
- To review the progress of training with the Apprentice, and with the Trainer(s) where the Sponsor and the Trainer are not the same party.
- Release your apprentice from work to attend in-school training without penalty to the apprentice.
- To maintain the journeyperson/apprentice ratio for your trade, if applicable.
- To monitor their apprentice(s) progress
- To ensure that the Trainer(s) verifies, in writing, when each skill identified in the Logbook for the trade has been successfully completed by the Apprentice;
- To contact the Ministry should any changes in your capacity to train, your contact information, or your apprentice's status in the program change.

Trade Specific Resources and Links

Trade Specific Resource	Link
Red Seal Program	red-seal.ca
Apprenticeship in Ontario	ontario.ca/page/apprenticeship-ontario
Employment Ontario	employmentontario.ca
Service Canada	servicecanada.gc.ca
<i>Building Opportunities in the Skilled Trades Act, 2021</i>	Building Opportunities in the Skilled Trades Act, 2021, S.O. 2021, c. 28 - Bill 288 (ontario.ca)
Ministry of Labour, Immigration, Training and Skills Development	Ministry of Labour, Immigration, Training and Skills Development ontario.ca
Exam Preparation Guide	Exam Resources – Skilled Trades Ontario
Skills Zone (Ontario Skills Passport)	http://www.skillszone.ca/

**Please note, all website addresses are current at time of printing*

Methodology-Standard Development

A standard is developed with a broad group of trade representatives who form the initial working group. This includes subject matter experts/ tradespeople/ instructors and employers from a cross section of the sector/industry, with varying years of work experience in the field. The working group reviews, develops and recommends revision to the content of the standard. Their role also involves harmonizing and updating other supporting content for the product.

An essential part of the standard development is the validation process. This is the opportunity to have a broader representation of the sector provide feedback on the content of draft standard. This process is conducted in various ways and may include sending out a survey or the draft document (or both) directly to the sector. The comments received are reviewed by the working group and revisions are made as required based on a consensus model.

Introduction to the Logbook

This “on-the job” Logbook is the training standard for Powered Lift Truck Technician 282E and was developed by Skilled Trades Ontario in consultation with representatives from industry. It identifies all the skills associated with and required to learn the trade.

The Logbook is divided into skill sets, which are further divided into skills. These skill sets and skills are written in statements that describe what the Apprentice must perform and to what standard, in order to be considered competent in that skill.

The successful performance of these skills is tracked in the Logbook. Once achieved, this skills’ sign-off, along with the completion of in-school program requirements or equivalent, is how the apprenticeship program is completed and apprentices receive a Certificate of Apprenticeship.

The Sponsor/trainer and Apprentice are required to sign-off and date each skill after the Apprentice has demonstrated proficiency in these skills. However, if a skill is shaded, it is optional and does not need to be signed-off, though it has been defined as a part of the scope of practice for the trade.

All practices described in this standard must be performed by the apprentice according to the specific criteria identified. In general, the standard of performance for this trade is to be performed according to all applicable jurisdictional codes and standards and all health and safety standards must be respected and observed.

All skills within the Apprenticeship Training Standard are to be performed, as applicable, according to and in compliance with the following:

- Occupational Health and Safety Legislation and Regulations;
- Other applicable legislation, regulation, codes and standards;
- Industry best practices;
- Company policies and procedures.

The information presented in this standard is, to the best of our knowledge, current at time of printing and is intended for general application. Please refer to the Skilled Trades Ontario website for the most accurate and up-to-date information: skilledtradesontario.ca

Roles and Responsibilities

Under the [Building Opportunities in the Skilled Trades Act, 2021 \(BOSTA\)](#)

Skilled Trades Ontario (STO) is responsible for:

- Establishing and maintaining qualifications;
- Establishing Apprenticeship Programs and other training programs including training Standards, curriculum standards and certifying examinations;
- Issuing certificates for the purposes of this Act such as Certificates of Qualification;
- Maintaining a Public Registry for compulsory trades skilledtradesontario.ca/public-register/;
- Determining whether the experience and qualifications obtained by applicants for a certificate of qualification who do not complete an apprenticeship are equivalent to those received through completing an apprenticeship (Trade Equivalency Assessments)
- Promoting the skilled trades and conducting research.
- Conducting research and evaluate whether a trade should be prescribed as a trade for the purposes of this Act and to make recommendations on these matters to the Minister.

Ministry of Labour, Immigration, Training and Skills Development (MLITSD)

is responsible for:

- Classifying trades as compulsory trades;
- Prescribing scopes of practice for trades;
- Approving which persons may provide in-class training for apprenticeship programs (TDAs);
- Registering Training Agreements;
- Providing those who successfully complete an apprenticeship program with a certificate of apprenticeship (CofA);
- Administering examinations, including certifying examinations;
- Promoting the skilled trades and conducting research;
- Exercising such other powers and perform such other duties and functions as are provided for in this Act or the regulations.

For any matter related to your registered Training Agreement or completing your apprenticeship, you must contact your local Service Delivery Office.

Roles and Responsibilities of the Apprentice

An Apprentice is an individual who has entered into a registered Training Agreement (refer to Foreword: *“Purpose, Terms and Conditions of TA” page 1*) with a Sponsor to receive training in a trade as part of an apprenticeship program established by Skilled Trades Ontario. As an Apprentice, you have certain roles and responsibilities to follow throughout your apprenticeship training:

1. As an Apprentice, you signed the Training Agreement and have entered into a contract with the Ministry of Labour, Immigration, Training and Skills Development and your Sponsor.
2. If you are registered as an Apprentice in a compulsory trade, your name will automatically appear in the Skilled Trades Ontario Public Register.
3. You are responsible for informing the staff at your local Service Delivery Office regarding changes to the following:
 - Your Sponsor’s address;
 - Your name and address; and/or,
 - Your Sponsor, including starting employment with a new Sponsor
4. As an Apprentice, you are responsible for completing skills or skill sets in this Logbook (as detailed in the *“Eligibility for Apprenticeship Program Completion”* section of this document) and ensuring that they are dated and signed by both you and your Trainer.
5. Once you have demonstrated competency in all the mandatory skills and received a sign off on each skill by your sponsor/trainer, you must have the Skill Set Completion Form completed and signed by your current Sponsor.
6. Submit your Logbook to your local Service Delivery Office.
7. Present your Apprentice Completion Form (Please refer to Appendix B), along with your authorized Logbook to your local Service Delivery Office.

Roles and Responsibilities of Sponsors and Trainers

Sponsors are responsible for ensuring all terms are met as per the registered Training Agreement. They are named on the registered Training Agreement as the entity responsible for ensuring Apprentices receive the training required as part of an apprenticeship program. As a signatory to this agreement, they are designated as the 'Signing Authority' for the Apprentice's Skill Set Completion Form and are required to attest to successful achievement by signing the appropriate box at the completion of each skill set. Some sponsors may also act as the Trainer.

A **Trainer** is an individual who oversees the performance of a task and sets the workplace expectations and practices for the Apprentice.

In compulsory trades, a Trainer must hold a valid Certificate of Qualification and be registered with Skilled Trades Ontario.

In non-compulsory trades, a Trainer is an individual who holds one of the following:

- A Certificate of Qualification;
- A Certificate of Apprenticeship in the trade; or,
- Has completed both the workplace-based training (competencies and/or hours as applicable) and classroom training components of the trade's apprenticeship program; or,
- Has workplace experience equivalent to the apprenticeship program) and has the skills outlined in the Logbook.

Competency means being able to perform to the required standard (please refer to "*Introduction to the Logbook*"). Trainers/Sponsors and Apprentices are required to sign-off and date the skills in the Logbook following each successful acquisition. The Logbook forms a record of this achievement.

The Trainer must provide their signature based on their assessment and professional judgment that the apprentice is competent in the skills described above. The Trainer's signature is not a general warranty or guarantee of the apprentice's future conduct.

Sponsors participating in this training program will be designated as the Signing Authority and are required to attest to successful achievement by signing the appropriate box included at the end of each skill set.

Health and Safety

Safe working procedures and conditions, accident prevention and the preservation of health are of primary importance for apprenticeship programs in Ontario. These responsibilities are shared and require the joint efforts of government, sponsors, employers, supervisors, workers, apprentices and the public to achieve the goal of making Ontario's workplaces safe and healthy.

The [Occupational Health and Safety Act](#) (OHSA) provides us with the legal framework and the tools to do this. It sets out the rights and duties of all parties in the workplace, placing ultimate responsibility on the employer for the health and safety of workers (in this case apprentices) by ensuring procedures, controls, and training are established for dealing with workplace hazards. Therefore, it is imperative that all parties become aware of circumstances that may lead to injury, illness or harm. Safe learning experiences and environments can be created by controlling the variables and behaviours that may contribute to or cause an accident injury or illness.

A sponsor who is not the employer is reminded that the employer has legal responsibilities respecting health and safety over the apprentice who is their worker. The sponsor should encourage safe work habits and adherence to the employer's occupational health and safety requirements for the workplace.

It is generally recognized that a positive attitude about safety in partnership with health and safety competency contributes to an accident-free environment. Everyone will benefit as a result of a healthy attitude towards the prevention of accidents.

Workers and apprentices can be exposed to a multitude of hazards and, therefore, should be familiar with the Occupational Health and Safety Act and regulations.

The Internal Responsibility System:

One of the primary purposes of the Occupational Health and Safety Act (OHSA) is to facilitate a strong Internal Responsibility System (IRS) in the workplace. To this end, the OHSA lays out the duties of employers, supervisors, workers, apprentices, constructors and workplace owners.

Workplace parties' compliance with their respective statutory duties is essential to the establishment of a strong IRS in the workplace.

Simply put, the IRS means that everyone in the workplace has a role to play in keeping workplaces safe and healthy. Workers and apprentices in the workplace who see a health and safety problem such as a hazard or contravention of the OHSA in the workplace have a statutory duty to report the situation to the employer or a supervisor. Employers and supervisors are, in turn, required to address those situations and acquaint workers with any hazard in the work that they do.

The IRS helps support a safe and healthy workplace. In addition to the workplace parties' compliance with their legal duties, the IRS is further supported by well-defined health and safety policies and programs, including the design, control, monitoring and supervision of the work being performed.

Roles and Responsibilities under the Occupational Health and Safety Act

Employer's Responsibilities include but are not limited to the following:

- Instruct, inform and supervise workers and apprentices to protect their health and safety.
- Appoint competent persons as supervisors.
- Inform a worker, apprentice, or a person in authority, about any hazard in the workplace and train them in the handling, storage, use, disposal and transport of any equipment, substances, tools, material, etc.
- Take every precaution reasonable in the circumstances for the protection of a worker/apprentice.
- In workplaces in which more than five workers are regularly employed, prepare and post a written occupational health and safety policy and set up and maintain a program to implement it.
- Prepare and post policies with respect to workplace violence and workplace harassment and develop programs supporting workplace harassment and workplace violence policies.
- Ensure knowledge of applicable legislative, regulatory, codes and standards so requirements to be followed are clear to all workers/apprentices.

Trainer/Supervisor Responsibilities include but are not limited to the following:

- Ensure that a worker or apprentice works in compliance with the Act and regulations.
- Ensure that any equipment, protective device or clothing required by the employer is used or worn by the worker or apprentice.
- Advise a worker/apprentice of any potential or actual health or safety dangers known by the supervisor.
- Take every precaution reasonable in the circumstances for the protection of workers.

Worker/Apprentice Responsibilities include but are not limited to the following:

- Work in compliance with the Act and regulations.
- Use or wear any equipment, protective devices or clothing required by the employer.
- Report to the employer or supervisor any known missing or defective equipment or protective device that may endanger the worker or another worker.
- Report any hazard or contravention of the Act or regulations to the employer or supervisor.
- Not remove or make ineffective any protective device required by the employer or by the regulations.
- Not use or operate any equipment or work in a way that may endanger any worker.

The Three Rights of Workers/Apprentices

The OHSA gives workers and apprentices three important rights:

1. The right to know about hazards in their work and get information, supervision and instruction to protect their health and safety on the job.
2. The right to participate in identifying and solving workplace health and safety problems either through a health and safety representative or a worker member of a joint health and safety committee.
3. The right to refuse work that they believe is dangerous to their health and safety or that of any other worker in the workplace.

Ministry of Labour, Immigration, Training and Skills Development

The Ministry of Labour, Immigration, Training and Skills Development conducts periodic inspections of workplaces to ensure that safety acts and regulations are being followed. Please direct any questions to the Occupational Health and Safety Contact Centre at 1-877-202-0008.

Apprenticeship Program Summary/Guidelines

Scope of Practice

The Scope of Practice for the trade of Powered Lift Truck Technician is set out in section 104 of Ontario Regulation 875/21 under BOSTA and reads as follows:

104. The scope of practice for the trade of powered lift truck technician includes inspecting, diagnosing, repairing and verifying the repair, in respect of powered lift trucks, of any of the following:

1. Manufacturers' specification plate.
2. Electrical systems.
3. Engine systems.
4. Fuel delivery systems.
5. Engine management.
6. Clutches and transmissions.
7. Drive axle and final drive assemblies.
8. Steering systems.
9. Braking systems.
10. Air supply and auxiliary air systems.
11. Suspension systems.
12. Batteries.
13. Electric motor systems.
14. Drive unit — electrical vehicles.
15. Control systems — electric vehicles.
16. Hydraulic systems.
17. Lifting systems.
18. Heating, ventilation and air conditioning systems.
19. Frame and cab systems.
20. Pneumatic tires and wheels.
21. Solid tires and wheels.

*While the Logbook draws on the scope of practice regulation (Section 104 of Ontario Regulation 875/21 under BOSTA). The Logbook does not purport to add to or modify the scope of practice as provided in regulation. *

Program Guidelines

On-the-Job Training Duration

Industry has identified 6280 hours as the benchmark necessary for any Apprentice to become competent in the skills required. There may be circumstances in which the duration varies from this guideline.

In-Class Training Duration

Industry has identified 720 hours of in-school training as the duration necessary for an Apprentice to complete the in-school curriculum for this program.

Total Training Hours

7000 hours

Journeyman to Apprentice Ratio

Industry Recommended Ratios: While some of the trades regulated under BOSTA are subject to Journeyman to Apprentice ratios set out in regulation, this trade is not one of them. Instead, **industry has recommended a Journeyman to Apprentice ratio guideline of 1 Journeyman (or individual who is deemed equivalent to a journeyman) to 1 Apprentice** as the ratio necessary for an Apprentice to be properly trained on the job in this program.

Program Requirements

Compulsory and Non-compulsory Classification

Regulations under the *Building Opportunities in the Skilled Trades Act, 2021*, classify each trade as either “compulsory” or non-compulsory.” This trade is non-compulsory.

It is the responsibility of an Apprentice to maintain a training record in the form of a Logbook. The Sponsor and Trainer are required to sign-off when competencies in the trade are achieved.

Skills for Success Summary

Skills for Success are needed in a quickly changing world for work, learning and life. They are foundational for building other skills and important for effective social interaction. Everyone benefits from having these skills as they help individuals get a job, progress at their current job and change jobs. They also help individuals become active members of their community and succeed in learning.

Through extensive research and consultations, the Government of Canada launched the new Skills for Success model renewing the previous Essential Skills framework to better reflect the needs of the current and future labour market.

The occupational specific Essential Skills profiles are available online. These will be updated over time to align with the new Skills for Success model found here: [Skills for Success model](#)

Standard of Performance

In general, the standard of performance for the trade of Powered Lift Truck Technician are to be performed, as applicable, according to and in compliance with the following:

Industry Safety Standards which are based upon:

- Occupational Health and Safety Legislation and Regulations;
- Jurisdictional legislation and regulations, codes and standards (municipal bylaws etc.)
- Company policies and procedures
- All applicable manufacturers specifications and engineering specifications

Training the Apprentice - Tips for Apprentices, Sponsors and Trainers

Tips for Apprentices

Remember, it takes time to learn. The following is a list of additional tips and tools to help make the most of your apprenticeship training:

- Practice safe work procedures early to create good habits;
- Use your Logbook as a journal to keep track of the skills you have achieved;
- Review your training plan with your Training Consultant, Trainer, or Sponsor;
- Discuss your training needs with your Trainer and/or Sponsor;
- Listen to the suggestions of your Trainer;
- Ask your Trainer questions if you are unsure of any skill you need to perform or any tools or equipment you need to use to perform your duties;
- Show enthusiasm and develop good work habits; and,
- Upon demonstration of competency, ensure that you and your Trainer sign-off the individual skills.

To get the most from this mentoring experience, request exposure to the full scope of the trade; meet regularly with your Sponsor/Trainer to discuss your progress, ask questions and seek feedback.

Tips for Sponsors

- Select Trainers with good communication skills and who work well with others;
- Ensure that the Apprentice always works under the direction of or has access to a qualified Trainer;
- Encourage Trainers to take upgrading courses (e.g. Train the Trainer, Mentor, Coach, etc.);
- Set out clear expectations and involve both the Apprentice and Trainer in developing the training plan
- Encourage safe work habits;
- Allow time for the Trainer to train and demonstrate skills to the Apprentice;
- Provide opportunities and time for the Apprentice to learn the trade;
- Ensure that the Apprentice receives the varied on-the-job trade training experience outlined in this document;
- Recognize good performance;
- Observe frequently;
- Provide constructive feedback and conduct regular performance reviews involving the Apprentice and Trainer;
- Use the Logbook as a monitoring tool and a part of regular performance evaluations; and,
- Complete the Skill Set Completion Form once the Apprentice has demonstrated competency in the skills.

- The detailed content listed for each skill is not intended to represent an inclusive list; rather, it is included to illustrate the intended direction for the skill acquisition.

Tips for Trainers

Trainers are responsible for ensuring the Apprentice is developing the skills outlined in this document. Here is a list of tips and tools to help Trainers in their supervision of Apprentices:

- Demonstrate model safe work habits;
- Provide opportunities and time for the Apprentice to learn the trade;
- Treat Apprentices fairly and with respect;
- Review the Logbook with the Apprentice and develop a training plan;
- Set out clear expectations and recognize good performance;
- Expose Apprentices to the full scope of the trade by providing training on the skills outlined in this document;
- Encourage and respond to all questions;
- Be patient;
- Explain, show and demonstrate the skill;
- **Meet regularly with the Apprentice to discuss the apprentice's progress**
- Provide continuous feedback;
- Sign-off skills when your Apprentice demonstrates competency, and,
- Use the Logbook as a guide to evaluate competence in each skill area. By using the Logbook, Trainers will be able to guide the process to and assist Apprentices to develop skills outlined in this document.

The best mentoring experience is when an Apprentice is given as much training/exposure to the full scope of the trade as possible. If this is not possible, help them to determine other ways this may be possible.

Notice of Collection of Personal Information

1. At any time during your apprenticeship training, you may be required to show this Logbook to the local Service Delivery Office. You will be required to submit the signed Apprenticeship Completion form to the Service Delivery Office in order to complete your program. The Service Delivery Office will use your personal information to administer and finance Ontario's apprenticeship training system, including confirming your completion and issuing your Certificate of Apprenticeship.
2. The Service Delivery Office will disclose information about your program completion and your Certificate of Apprenticeship to Skilled Trades Ontario, as it is necessary for Skilled Trades Ontario to carry out its responsibilities.
3. Your personal information is collected, used and disclosed by the Ministry of Labour, Immigration, Training and Skills Development under the authority of the *Building Opportunities in the Skilled Trades Act, 2021 (BOSTA)*.
4. Questions about the collection, use and disclosure of your personal information by the Ministry may be addressed to the:

Manager, Employment Ontario Contact Centre
Ministry of Labour, Immigration, Training and Skills Development
33 Bloor St. E, 2nd floor, Toronto, Ontario M7A 2S3
Toll-free: 1-800-387-5656; Toronto: 416-326-5656
TTY: 1-866-533-6339 or 416-325-4084

List of Trainers

Trainer's Name (Please Print)	Trainer's Signature	Date of start with Trainer (day/month/year)

Relevant Legislation and Regulations

*Please note that all skills must be performed to industry best practices and relevant legislation and regulations listed below:

1. Occupational Health and Safety Act (OHSA) – **Reg 851 - 45-67 and 71**
2. Underwriter's Laboratories of Canada (UL) – **UL-558 and UL-583**
3. Canadian Standards Association (CSA) – **Standard B335-15 "Safety Standards for Lift Trucks"**
4. Technical Standards & Safety Authority (TSSA) – Technical Standards and Safety Act, 2000 , Ontario Regulation 215/01 Fuel Industry Certifications S.13, 27-28 An Internal Combustion Alternate Fuel Technician-Industrial Equipment = "ICE-IE Certificate"
5. Ontario Ministry of Labour - **Guideline for the Safe Operation and Maintenance of Powered Lift Trucks**
6. American National Standards Institute (ANSI)/The Industrial Truck Standards Development Foundation (ITSDF) - **ANSI/ITSDF B56.1 "Safety Standard for Low Lift and High Lift Trucks"**
7. International Organization for Standardization (ISO) - **53.060: Industrial Truck**
8. The Motive Vehicle Repairer Act
9. The Mining Act
10. Environmental Protection Act

U5860.0 Occupational Health and Safety Procedures

General Performance Objective

Comply with occupational health and safety procedures by: identifying and taking corrective action against potential workplace health and safety hazards; handling, storing and disposing of hazardous workplace materials; wearing and maintaining personal protective equipment; complying with workplace-related legislation relating to highway traffic safety, parts, warranties, occupational health/safety, environmental protection, business and trade practices; interpreting and applying service-related information; practicing good housekeeping in the workplace; complying with Workplace Hazardous Materials Information System (WHMIS) guidelines; according to manufacturer’s specifications, government regulations, company policy and safety requirements.

***Please note that all skills within this standard must be performed according to industry best practices and relevant legislation and regulations as listed on p. 18 of this document.**

Skills

U5860.01 Identify and take corrective action against potential workplace health and safety hazards, such as excessive exhaust and/or explosive fumes, dust, sound levels, electrical and mechanical hazards (i.e., damaged or faulty air lines and/or inadequate ventilation); so that the potential for personal injury, damage to equipment, vehicles, and the environment are minimized; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
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*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice’s Sponsor.**

U5860.02 Handle, store and dispose of hazardous workplace materials, such as solvents, anti-freeze, new and used lubricants and fluids, brake dust, battery acid, refrigerants, and gases; using personal protective equipment and specified handling and storage equipment; so that individuals are protected from injury, the environment from contamination and safety procedures are followed; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5860.03 Wear and maintain personal protective equipment such as eye, ear, hand, head, respiratory, body, and foot protection, and fall arrest/restraints; ensuring that correct fit and optimum protection is provided to the wearer for the specific task performed; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5860.04 Comply with workplace-related legislation relating to highway traffic safety, parts, warranties, occupational health/safety, environmental protection, business and trade practices, such as Occupational Health and Safety Act, Motive Vehicle Repair Act, Mining Act, Highway Traffic Act, Environmental Protection Act, Underwriters Laboratories (UL) Canadian (ULC) Standards, American National Standards Institute (ANSI), Canadian Standards Association (CSA) and International Standards Organization (ISO), Safety Standard for Lift Trucks (ASME B335-15), Safety Standard for Low Lift and High Lift Trucks (ASME B56.1); by identifying the personal and legal liabilities of technicians, and equipment end users, when performing and/or conducting vehicle safety inspections, emissions tests, and repairing and/or replacing defective parts; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5860.05 Interpret and apply service-related information, such as service bulletins, manuals and parts catalogues, by locating and identifying equipment serial number; accessing computerized and data service information systems, so that service/repair is performed; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5860.06 Practice good housekeeping in the workplace, by: applying fire hazard prevention methods, such as maintaining a clean and orderly work area; identifying, removing and disposing of potential fire hazards, cleaning up grease and fluid spills, ensuring work area is free of obstructions and safely using, and storing tools and shop equipment, to minimize accidents/injuries to self and others; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5860.07 Comply with Workplace Hazardous Materials Information System (WHMIS) guidelines, such as reading and interpreting labels and Material Safety Data Sheets (MSDS), ensuring receipt of training in WHMIS regulations and practices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5861.0 Manufacturer’s Specification Plate

General Performance Objective

Diagnose and repair/replace manufacturer’s specification plate, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement of manufacturer’s specification plate; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

Skills

U5861.01 Perform visual inspection, identifying systems type and applications, by ensuring legibility and language; by checking for: worn, fastening, loose, damaged or missing component and data, truck model and serial plate numbers, mast assembly models and serial plate numbers, attachment models and serial plate numbers, multiple attachment data plate, minimum/maximum battery ratings and sizes, truck weights with and without battery, voltage, forward and backward tilt angles, tire sizes and pressures, tread width, load capacities at specific heights; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice’s Sponsor.**

U5861.02 Diagnose and troubleshoot manufacturer’s specification plate, such as equipment model and serial plate numbers, mast assembly models and serial plate numbers, attachment models and serial plate numbers, multiple attachment data plate; checking for conformity between truck and specifications plate, minimum/maximum battery ratings and sizes, truck weights with and without battery, voltage, forward and backward tilt angles, tire sizes and pressures, tread width, load capacities at specific heights; by visually inspecting, testing and analysing performance and function; using hand, power, precision and specialized tools, non-destructive testing equipment, and lifting, rigging, and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5861.03 Repair/replace manufacturer’s specification plate, such as: equipment model and serial plate numbers, mast assembly models and serial plate numbers, attachment models and serial plate numbers, multiple attachment data plate; by exchanging, servicing, adjusting, and calibrating; using precision and specialized tools, non-destructive testing equipment, lifting, rigging, and blocking devices, so that the equipment conforms to the information on the specifications plate; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5861.04 **Verify repair/replacement of manufacturer’s specification plate**, such as equipment model and serial plate numbers, mast assembly models and serial plate numbers, attachment models and serial plate numbers, multiple attachment data plate; by visually inspecting, testing and analysing performance and function; using hand, power, precision and specialized tools, non-destructive testing equipment, and lifting, rigging, and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5862.0 Batteries

General Performance Objective

Diagnose and repair/replace batteries, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement of batteries; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

Skills

U5862.01 **Perform visual inspection, identifying systems type and applications** such as multiple voltage series and parallels, deep cycle, industrial, ratings and weights; by: checking for worn, loose, damaged, missing or defective components, and leakage; such as battery cases, cells, terminals, cell connectors, cell caps, automatic watering systems, fire suppression systems, security devices, approved battery water, electrolyte, wires, cables, battery connectors, data acquisition and battery discharge devices, fasteners, mounting, retention and monitoring devices, battery weight, size and rating; using PPE (Personal Protective Equipment); according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice's Sponsor.**

U5862.02 Diagnose and troubleshoot batteries, such as battery cases, cells, terminals, cell connectors, cell caps, automatic watering systems, approved electrolyte, wires, cables, battery connectors, data acquisition and battery discharge devices, fasteners, mounting, retention and monitoring devices, battery weight, size and rating; visually inspecting, testing, and analysing performance and function; checking for wear, routing of wires / AWG (American Wire Gauge) equalization, opens/shorts/grounds, cracks, fluid level, leaks, odours, distortion, corrosion, contamination, temperature, specific gravity, voltage and amperage; using hand, power, specialized, precision and electronic service tools, hydrometers, refracto-meters, multi-meters, and lifting, rigging and blocking devices; using PPE (Personal Protective Equipment); according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5862.03 Repair/replace batteries, such as battery cases, cells, terminals, cell connectors, cell caps, automatic watering systems, electrolyte, wires, cables, battery connectors, data acquisition and battery discharge devices, fasteners and mounting, retention and monitoring devices, battery weight, size and rating; by exchanging, reconditioning and servicing; using hand, power, specialized, precision and electronic service tools, battery chargers, wash systems, welding and soldering equipment, hydrometers, refracto-meters, multi-meters, and lifting, rigging and blocking devices; using PPE (Personal Protective Equipment); according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5862.04 **Verify repair/replacement of batteries**, such as battery cases, cells, terminals, cell connectors, cell caps, automatic watering systems, electrolyte, wires, cables, battery connectors, data acquisition and battery discharge devices, fasteners and mounting, retention and monitoring devices, battery weight, size and rating; by visually inspecting, testing, and analysing performance and function; using hand, power, specialized, precision and electronic service tools, hydrometers, refracto-meters, multi-meters, and lifting, rigging and blocking devices; using PPE (Personal Protective Equipment); according to manufacturer's specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.0 Starting, Charging and Electrical Systems

General Performance Objective

Diagnose and repair/replace starting, charging and electrical systems, by: performing a visual inspection; diagnosing and troubleshooting, repairing/ replacing and verifying the repair/replacement of starting systems and components; charging systems and components, electrical and electronically-controlled systems and components; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

Skills

U5863.01 Perform visual inspection, identifying systems type and applications, such as multiple voltage and charging and starting systems, by: checking for worn, damaged, missing, corroded, loose, or defective components; such as starter motors, actuators, warning devices, lighting/illumination, security and neutral safety devices, terminal boards/blocks, systems monitors, circuit protection devices, regulators, gauges, alternators, drive mechanisms, belts, batteries, cables, connectors, switches, relays, solenoids, sensors, modules, wiring harnesses, fastening and mounting devices; using PPE; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice's Sponsor.**

U5863.02 Diagnose and troubleshoot starting batteries, by visually inspecting, testing, and analyzing performance and function; checking for: wear, state of charge, cranking capacity, voltage drop, opens/shorts/grounds, electrolyte level, fractures, leaks, hold down retainer, contamination, loose terminals, corrosion and distortion; using hand, power, specialized, precision and electronic service tools, amperage voltage resistance meter (AVR), load testers, chargers, hydrometers and refractometers; using PPE; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.03 Service and boost/charge starting batteries, such as single and multi-battery group; by removing, charging, and/or replacing; using hand tools, booster cables, booster packs, chargers, electrolyte, pullers, cleaning tools and solutions, hydrometers and refractometers; using PPE; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.04 Diagnose and troubleshoot starting systems and components, such as starting motors and drive mechanisms, circuit protection devices, security and neutral safety devices, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; checking for wear, opens/ shorts/grounds, routing of wires, noise/vibration, odour, corrosion, fractures, distortion, contamination, temperature, and alignment; using hand, load testers, specialized, precision and electronic service tools; using PPE; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.05 Repair/replace starting systems and components, such as starting motors and drive mechanisms, circuit protection devices, security and neutral safety devices, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses, fasteners and mounting devices; by exchanging, reconditioning or servicing; using hand, load testers, specialized, precision and electronic service tools; using PPE; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.06 Verify repair/replacement of starting systems and components, such as starting motors and drive mechanisms, circuit protection devices, security and neutral safety devices, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance and function; using hand, load testers, specialized, precision and electronic service tools; using PPE; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.07 Diagnose and troubleshoot charging systems and components, such as alternators, drive mechanisms, voltage regulators, warning devices, circuit protection devices, batteries, cables, connectors, switches, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; checking for wear, system voltage and amperage, opens/grounds/shorts, routing of wires, vibration/noise, odour, corrosion, fractures, distortion, contamination, temperature, and alignment; using amperage voltage resistance (AVR) testers, specialized, precision, and electronic service tools; using PPE; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.08 Repair/replace charging systems and components, such as alternators, drive mechanisms, voltage regulators, warning devices, circuit protection devices, batteries, cables, connectors, switches, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools; using PPE; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.09 **Verify repair/replacement of charging systems and components**, such as alternators, drive mechanisms, voltage regulators, warning devices, circuit protection devices, batteries, cables, connectors, switches, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; using hand, power, specialized, precision and electronic service tools; using PPE; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.10 **Diagnose and troubleshoot electrical systems and components**, such as terminal boards, warning devices, lighting/illumination, circuit protection and electrical accessory devices, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing, analysing performance, checking for wear, opens/shorts/ grounds, routing of wires, temperature, corrosion, fractures, distortion, cleanliness, vibration/noise, colour, and odour; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.11 Repair/replace electrical systems and components, such as: terminal boards, warning devices, lighting/illumination, circuit protection and electrical accessory devices, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, fasteners and mounting devices; by exchanging, reconditioning and servicing ; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5863.12 Verify repair/replacement of electrical systems and components, such as: terminal boards, warning devices, lighting/illumination, circuit protection and electrical accessory devices, batteries, cables, connectors, switches, solenoids, relays, sensors, modules, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing, analyzing performance and function; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.0 Engine Systems

General Performance Objective

Diagnose and repair/replace engine systems, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement of cooling system and components; engine lubricating system and components; cylinder head and components; engine block and components; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

Skills

U5864.01 Perform visual inspection, identifying systems type and applications, such as cooling systems, engine lubricating systems, cylinder heads and engine block by: checking for worn, loose, damaged, missing or defective components, and leakage; such as radiators and reservoirs, pressure caps, shrouds and controls, surge tanks, fans and hubs, coolant pumps, controls and actuators, heat exchangers, o-rings, temperature control devices, drive mechanisms, auxiliary devices, pressure monitoring devices, retainers, rotators, camshafts, piston assemblies, counter-balancers, crankshafts, flywheel assemblies, balance shafts, gear trains, camshafts, follower assemblies, harmonic balancers, pulleys, auxiliary drives, oil pans, connecting rods, housings, lubrication jets, fluids, lubricants, belts, pipes, valves, lines, hoses, fittings, filters, gaskets, seats, guides, springs, expansion plugs, bearings, liners, seals, fasteners and mounting devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice's Sponsor.**

U5864.02 Diagnose and troubleshoot cooling systems and components, such as radiators and reservoirs, pressure caps, shrouds and controls, surge tanks, coolant, fans and hubs, coolant pumps, controls and actuators, belts, lines, hoses, fittings, heat exchangers, gaskets, o- rings, seals, pipes, valves, temperature control devices, drive mechanisms, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; checking for wear, lines and hoses, lubrication, leaks, odour, temperature, distortion, corrosion, contamination, colour, vibration/noise, coolant type, flow, level and pressure; using hand, power, specialized, precision and electronic service tools and manuals, coolant system analysis kit, pressure tester and lifting, rigging, and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.03 Repair/replace cooling systems and components, such as radiators and reservoirs, pressure caps, shrouds and controls, surge tanks, coolant, fans and hubs, coolant pumps, controls and actuators, belts, lines, hoses, fittings, heat exchangers, gaskets, o-rings, seals, pipes, valves, temperature control devices, drive mechanisms, fasteners and mounting devices; by exchanging, reconditioning, or servicing; using, hand, power, specialized, precision and electronic service tools and manuals, coolant system analysis kit, pressure tester and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.04 **Verify repair/replacement of cooling systems and components**, such as radiators and reservoirs, pressure caps, shrouds and controls, surge tanks, coolant, fans and hubs, coolant pumps, controls and actuators, belts, lines, hoses, fittings, heat exchangers, gaskets, o-rings, seals, pipes, valves, temperature control devices, drive mechanisms, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; using hand, power, specialized, precision and electronic service tools and manuals, coolant system analysis kit, pressure tester and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.05 **Diagnose and troubleshoot engine lubricating systems and components**, such as pumps, filters and housings, lines, hoses, fittings, seals, oil, lubrication jets, gaskets, o-rings, heat exchangers, bypass valves and auxiliary devices, pressure monitoring devices, sensors, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; checking for wear, lines and hoses, oil quantity, lubricant flow, leaks, odour, temperature, corrosion, distortion, contamination, colour, vibration/noise, and pressure; using hand, power, specialized, precision and electronic service tools and manuals, pressure gauge, oil analysis kit, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.06 Repair/replace engine lubricating systems and components, such as pumps, filters and housings, lines, hoses, fittings, seals, oil, lubrication jets, gaskets, o-rings, heat exchangers, bypass valves and auxiliary devices, pressure monitoring devices, sensors, fasteners and mounting devices; by exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.07 Verify repair/replacement of engine lubricating systems and components, such as pumps, filters and housings, lines, hoses, fittings, seals, oil, lubrication jets, gaskets, o- rings, heat exchangers, bypass valves and auxiliary devices, pressure monitoring devices, sensors, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance and function; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.08 Diagnose and troubleshoot cylinder head and components, such as cylinder heads, retainers, rotators, valves, actuating and drive mechanisms, camshafts, seats, guides, springs, expansion plugs, seals, gaskets, fluids, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance and function; checking for wear, temperature, lubrication, corrosion, distortion, erosion, vibration/noise, carbon build-up, fractures, leaks, and pressure; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.09 Repair/replace cylinder head and components, such as: cylinder heads, retainers, rotators, valves, actuating and drive mechanisms, camshafts, seats, guides, springs, expansion plugs, seals, gaskets, fluids, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance and function; by exchanging, reconditioning, or servicing; using hand, power, electronic service, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.10 **Verify repair/replacement of cylinder head and components**, such as cylinder heads, retainers, rotators, valves, actuating and drive mechanisms, camshafts, seats, guides, springs, expansion plugs, seals, gaskets, fluids, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance and function; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.11 **Diagnose and troubleshoot engine block and components**, such as engine blocks, piston assemblies, piston rings, connecting rods, bearings, seals, fluids, liners, counter- balancers, crankshafts, flywheel assemblies, balance shafts, gear trains, camshafts, follower assemblies, harmonic balancers, pulleys, auxiliary drives, oil pans, expansion plugs, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; checking for wear, temperature, pressure, corrosion, distortion, contamination, fractures, erosion, vibration/noise, carbon build-up, and leaks; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.12 Repair/replace engine block and components, such as engine blocks, piston assemblies, piston rings, connecting rods, bearings, seals, liners, counter-balancers, crankshafts, flywheel assemblies, balance shafts, gear trains, camshafts and follower assemblies, harmonic balancers, pulleys, auxiliary drives, oil pans, expansion plugs, fasteners and mounting devices; by exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5864.13 Verify repair/replacement of engine block and components, such as engine blocks, piston assemblies, piston rings, connecting rods, bearings, seals, liners, counter- balancers, crankshafts, flywheel assemblies, balance shafts, gear trains, camshafts and follower assemblies, harmonic balancers, pulleys, auxiliary drives, oil pans, expansion plugs, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance and function; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.0 Engine Management, Fuel and Emissions Control Systems

General Performance Objective

Diagnose and repair/replace engine management, fuel and emissions control systems, by: performing a visual inspection; diagnosing and troubleshooting, repairing/repairing, and verifying the repair/replacement of electronically-controlled ignition systems and component; electronically-controlled diesel common rail systems and components; gasoline fuel systems and components; liquefied petroleum gas (LPG) systems and components; compressed natural gas (CNG) systems and components; dual fuel (gasoline and LPG) systems and components; mechanically-controlled diesel fuel systems and components; electronically-controlled diesel fuel systems and components; emissions control systems and components; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

Skills

U5865.01 Perform visual inspection, identifying systems type and applications, such as electronically-controlled ignition and electronically-controlled diesel common rail, gasoline fuel systems, liquefied petroleum gas (LPG) systems, compressed natural gas (CNG) systems, dual fuel (gasoline and LPG) systems, mechanically-controlled and electronically-controlled diesel fuel systems, and emissions systems and emissions control systems; checking for leaks, worn, loose, damaged, missing or defective components; such as fuel, malfunction indicator lights, distributor components, high tension wires, injectors, pumps, actuators, coils, resistors, multiplex, interfaces, warning devices, circuit protection devices, switches, sensors, modules, wiring harnesses, fasteners and mounting devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice’s Sponsor.**

U5865.02 Diagnose and troubleshoot electronically-controlled ignition systems and components, such as distributor components, coils, resistors, control systems, high tension wires, spark plugs, multiplex, switches, oxygen sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming; checking for wear, opens/shorts/grounds, diagnostic codes, routing of wires, system voltage, ignition timing, temperature, leakage, corrosion and vibration/noise; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.03 Repair/replace electronically-controlled ignition systems and components, such as distributor components, coils, resistors, control systems, high tension wires, spark plugs, multiplex, switches, oxygen sensors, modules, wiring harnesses, fasteners and mounting devices; by reprogramming, exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.04 Verify repair/replacement of electronically-controlled ignition systems and components, such as distributor components, coils, resistors, control systems, high tension wires, spark plugs, multiplex, switches, oxygen sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.05 Diagnose and troubleshoot electronically-controlled diesel common rail systems and components, such as circuit protection devices, drivers, multiplex, actuators, sensors, modules, wiring harnesses, waste gates, injectors, boost control devices, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming, pressure and flow, exhaust gas condition, emission and components; checking for wear, opens/shorts/grounds, diagnostic codes, system voltage, routing of wires, temperature, corrosion, contamination, fractures, leaks, vibration/noise, pressure and flow, exhaust gas condition, emission and components; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.06 Repair/replace electronically-controlled diesel common rail systems and components, such as circuit protection devices, drivers, multiplex, actuators, sensors, modules, wiring harnesses, waste gates, injectors, boost control devises, fasteners and mounting devices; by reprogramming, exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.07 Verify repair/replacement of electronically-controlled diesel common rail systems and components, such as circuit protection devices, drivers, multiplex, actuators, sensors, modules, wiring harnesses, waste gates, injectors, boost control devises, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming, pressure and flow, exhaust gas condition and emissions; using specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5866.08 Perform electronically-controlled ignition systems engine tune-ups by testing/checking codes, compression and crankcase pressure, checking vacuum, intake and exhaust systems, and/or replacing spark plugs, high-tension wires, coils, resistors, distributor components, air filters, fuel filters, fuel venting systems, checking and/or adjusting ignition timing, governors, idle speed, emission control devices, sensors, modules, wiring harnesses, multiplex, fasteners and mounting devices; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.09 Perform electronically-controlled diesel common rail engine tune-ups, by testing fuel, compression and crankcase pressure, checking and/or replacing fuel filters, water separators, venting systems, air filter and intake systems, exhaust systems, manifold boost pressure, valve adjustment, modules, sensors, resistors, diagnostic codes, electronic unit injectors (EUI), electronic unit pumps (EUP); checking and/or adjusting injection timing, governors, engine speed, shut down systems, emission control devices, glow plugs, pre-heat systems, wiring harnesses, multiplex, fasteners and mounting devices; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
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U5865.10 Perform visual inspection, identifying systems type and applications, such as gasoline, liquefied petroleum gas (LPG), compressed natural gas (CNG), dual fuel (gasoline and LPG) and diesel fuel systems; checking for fuel condition, worn, loose, damaged, missing, or defective components; such as pumps, carburetors, regulators, vaporizers, tanks/cylinders, mixers, injectors, heaters, coolers, fuel caps, couplers, lines, hoses, fittings, gauges, filters, vents, valves, sensors, mechanical controls modules, warning devices, solenoids, relays, switches, wiring harnesses, fasteners and mounting devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.11 Diagnose and troubleshoot gasoline fuel systems and components, such as fuel, carburetors, regulators, vacuum and pressure switches, tanks, fuel caps, lines, hoses, fittings, gauges, sending units, injectors, throttle bodies, pumps, filters, actuators, mechanical linkages, governors, warning devices, multiplex, interfaces, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming and pressure and flow testing ; checking for wear, opens/shorts/grounds, routing of wires, lines and hoses, odour, temperature, diagnostic codes, corrosion, contamination, colour, pressure, flow and leaks; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.12 Repair/replace gasoline fuel systems and components, such as fuel, carburetors, regulators, vacuum and pressure switches, tanks, fuel caps, lines, hoses, fittings, gauges, sending units, injectors, throttle bodies, pumps, filters, actuators, mechanical linkages, governors, warning devices, multiplex, interfaces, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by reprogramming, exchanging, reconditioning, or servicing and pressure and flow testing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.13 Verify repair/replacement of gasoline fuel systems and components, such as fuel, carburetors, regulators, vacuum and pressure switches, tanks, fuel caps, lines, hoses, fittings, gauges, sending units, injectors, throttle bodies, pumps, filters, actuators, mechanical linkages, governors, warning devices, multiplex, interfaces, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance, function and programming, and pressure and flow testing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.14 Diagnose and troubleshoot liquefied petroleum gas (LPG) systems and components, such as carburetors, regulators, vaporizers, mixers, pressure relief and lock-off valves, vacuum and pressure switches, cylinders, couplers, lines, hoses, fittings, gauges, throttle bodies, filters, actuators, mechanical linkages, cables, governors, multiplex, interfaces, warning devices, switches, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming and pressure and flow testing; checking for wear, opens/shorts/grounds, diagnostic codes, routing of wires, lines and hoses, odour, temperature, distortion, corrosion, contamination, pressure and leaks; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.15 Repair/replace liquefied petroleum gas (LPG) systems and components, such as carburetors, regulators, vaporizers, mixers, pressure relief and lock-off valves, vacuum and pressure switches, cylinders, couplers, lines, hoses, fittings, gauges, throttle bodies, filters, actuators, mechanical linkages, cables, governors, multiplex, interfaces, warning devices, switches, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by reprogramming, exchanging, reconditioning, or servicing and pressure and flow testing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

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mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.16 Verify repair/replacement of liquefied petroleum gas (LPG) systems and components, such as carburetors, regulators, vaporizers, mixers, pressure relief and lock-off valves, vacuum and pressure switches, cylinders, couplers, lines, hoses, fittings, gauges, throttle bodies, filters, actuators, interfaces, mechanical linkages, cables, governors, multiplex, interfaces warning devices, switches, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance, function and programming and pressure and flow testing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.17 Diagnose and troubleshoot compressed natural gas (CNG) systems and components, such as carburetors, regulators, vaporizers, mixers, pressure relief and lock-off valves, vacuum and pressure switches, cylinders, quick fill, lines, hoses, fittings, gauges, throttle bodies, filters, actuators, mechanical linkages, cables, governors, multiplex, interfaces, warning devices, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming and pressure and flow testing; checking for wear, opens/shorts/grounds, diagnostic codes, routing of wires, lines and hoses, fractures, temperature, corrosion, contamination, distortion, pressure, and leaks; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.18 Repair/replace compressed natural gas (CNG) systems and components, such as carburetors, regulators, vaporizers, mixers, pressure relief and lock-off valves, vacuum and pressure switches, cylinders, quick fill, lines, hoses, fittings, gauges, throttle bodies, filters, actuators, mechanical linkages, cables, governors, multiplex, interfaces warning devices, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by reprogramming, exchanging, reconditioning, or servicing and pressure and flow testing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.19 Verify repair/replacement of compressed natural gas (CNG) systems and components, such as carburetors, regulators, vaporizers, mixers, pressure relief and lock-off valves, vacuum and pressure switches, cylinders, quick fill, lines, hoses, fittings, gauges, throttle bodies, filters, actuators, interfaces, mechanical linkages, cables, governors, multiplex, interfaces warning devices, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance, function and programming and pressure and flow testing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.20 Diagnose and troubleshoot dual fuel (gasoline and LPG) systems and components, such as carburetors, pumps, injectors, regulators, vaporizers, mixers, pressure relief and lock-off valves, vacuum and pressure switches, tanks/cylinders, fuel fill caps, lines, hoses, fittings, gauges, sending units, throttle bodies, filters, actuators, , mechanical linkages, cables, governors, multiplex, interfaces warning devices, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming and testing for pressure and flow; checking for wear, opens/shorts/grounds, diagnostic codes, routing of wires, lines and hoses, temperature, corrosion, contamination, distortion, fractures, pressure, and leaks; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.21 Repair/replace dual fuel (gasoline and LPG) systems and components, such as carburetors, pumps, injectors, regulators, vaporizers, mixers, pressure relief and lock-off valves, vacuum and pressure switches, tanks/cylinders, fuel fill caps, lines, hoses, fittings, gauges, sending units, throttle bodies, filters, actuators, mechanical linkages, cables, governors, multiplex, interfaces, warning devices, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by reprogramming, exchanging, reconditioning, or servicing and testing for pressure and flow; using hand, power, specialized, precision and electronic service tools, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.22 Verify repair/replacement of dual fuel (gasoline and LPG) systems and components, such as carburetors, pumps, injectors, regulators, vaporizers, mixers, pressure relief and lock-off valves, vacuum and pressure switches, tanks/cylinders, fuel fill caps, lines, hoses, fittings, gauges, sending units, throttle bodies, filters, actuators, mechanical linkages, cables, governors, multiplex, interfaces, warning devices, solenoids, relays, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance, function and programming and pressure and flow; using hand, power, specialized, precision and electronic service tools, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.23 Diagnose and troubleshoot mechanically-controlled diesel fuel systems and components, such as fuel, pre-heaters, injectors, governors and mechanical linkages, cables, lines, hoses, fittings, gauges, sending units, pumps, filters, tanks, fuel fill caps, valves, coolers, water separators, actuators, warning devices, solenoids, relays, wiring harnesses, turbochargers, blowers, drive mechanisms, waste gates, intercooler, piping, lines, fittings, gaskets, seals, oil, manifold boost control devices, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance and function and pressure and flow testing; checking for wear, opens/shorts/grounds, routing of wires, lines and hoses, temperature, exhaust gas condition, odour, corrosion, contamination, fractures, lubrication, distortion, pressure, and leaks; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.24 Repair/replace mechanically-controlled diesel fuel systems and components, such as fuel, pre-heaters, injectors, governors and mechanical linkages, cables, lines, hoses, fittings, gauges, sending units, pumps, filters, tanks, fuel fill caps, valves, coolers, water separators, actuators, warning devices, solenoids, relays, wiring harnesses, turbochargers, blowers, drive mechanisms, waste gates, intercooler, piping, lines, fittings, gaskets, seals, oil, manifold boost control devises, fasteners and mounting devices; by exchanging, reconditioning, or servicing and pressure and flow testing; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.25 Verify repair/replacement of mechanically-controlled diesel fuel systems and components, such as fuel, pre-heaters, injectors, governors and mechanical linkages, cables, lines, hoses, fittings, gauges, sending units, pumps, filters, tanks, fuel fill caps, valves, coolers, water separators, actuators, warning devices, solenoids, relays, wiring harnesses, turbochargers, blowers, drive mechanisms, waste gates, intercooler, piping, lines, fittings, gaskets, seals, oil, manifold boost control devises, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance and function and pressure and flow testing; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.26 Diagnose and troubleshoot electronically-controlled diesel fuel systems and components, such as fuel, pre-heaters, injectors, governors and mechanical linkages, cables, lines, hoses, fittings, gauges, sending units, pumps, filters, tanks, fuel fill caps, valves, coolers, water separators, actuators, multiplex, interfaces, warning devices, solenoids, relays, sensors, modules, wiring harnesses, turbochargers, blowers, drive mechanisms, waste gates, intercooler, piping, lines, fittings, gaskets, seals, oil, manifold boost control devises, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance, function and programming, pressure and flow; checking for wear, opens/shorts/grounds, diagnostic codes, routing of wires, lines and hoses, temperature, exhaust gas condition and emission components, colour, odour, corrosion, contamination, distortion, fractures, lubrication, pressure, and leaks; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.27 Repair/replace electronically-controlled diesel fuel systems and components, such as fuel, pre-heaters, injectors, governors and mechanical linkages, cables, lines, hoses, fittings, gauges, sending units, pumps, filters, tanks, fuel fill caps, valves, coolers, water separators, actuators, multiplex, interfaces, warning devices, solenoids, relays, sensors, modules, wiring harnesses, turbochargers, blowers, drive mechanisms, waste gates, intercooler, piping, lines, fittings, gaskets, seals, oil, manifold boost control devises, fasteners and mounting devices; by reprogramming, exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5865.28 Verify repair/replacement of electronically-controlled diesel fuel systems and components, such as fuel, pre-heaters, injectors, governors and mechanical linkages, cables, lines, hoses, fittings, gauges, sending units, pumps, filters, tanks, fuel fill caps, valves, coolers, water separators, actuators, multiplex, interfaces, warning devices, solenoids, relays, sensors, modules, wiring harnesses, turbochargers, blowers, drive mechanisms, waste gates, intercooler, piping, lines, fittings, gaskets, seals, oil, manifold boost control devices, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance, function and programming, pressure and flow, exhaust gas condition and emission components; using hand, power, specialized, precision and electronic service tools and manuals; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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U5865.29 Diagnose and troubleshoot emissions control systems and components, such as Positive Crankcase Ventilation (PCV), Exhaust Gas Recirculation (EGR), Catalytic Converters and Evaporative Fuel Systems, Diesel Particulate Control (DPC), Diesel Exhaust Fluid (DEF), Selective Catalytic Reduction (SCR), valves, tubing, hoses, evaporative fuel canisters, switches, solenoids, wiring harnesses, sensors, multiplex, interfaces, injector (DEF and HC), monitoring systems, warning devices and codes, and fastening and mounting devices, by: visually inspecting, testing, and analyzing performance, function and programming, analyzing gases, pressure and flow; checking for: opens/shorts/grounds, colour, pressure, temperature, corrosion, wear, leaks, and noise/vibration, using hand, power, specialized, precision and electronic service tools and manuals, exhaust gas analyzing equipment, gauges, precision measuring instruments, and lifting, rigging, and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
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U5865.30 Repair/replace emissions systems and components, such as Positive Crankcase Ventilation (PCV), Exhaust Gas Recirculation (EGR), Catalytic Converters and Evaporative Fuel Systems, Diesel Particulate Control (DPC), Diesel Exhaust Fluid (DEF), Selective Catalytic Reduction (SCR), valves, tubing, hoses, evaporative fuel canisters, switches, solenoids, wiring harnesses, sensors, multiplex, interfaces, injector (DEF and HC), monitoring systems, warning devices and codes, and fastening and mounting devices; by reprogramming, exchanging, reconditioning, servicing and cleaning; using hand, power, specialized, precision and electronic service tools and manuals, exhaust gas analyzing equipment, gauges, precision measuring instruments, and lifting, rigging, and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
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U5865.31 Verify repair/replacement of emissions systems and components, such as Positive Crankcase Ventilation (PCV), Exhaust Gas Recirculation (EGR), Catalytic Converters and Evaporative Fuel Systems, Diesel Particulate Control (DPC), Diesel Exhaust Fluid (DEF), Selective Catalytic Reduction (SCR), valves, tubing, hoses, evaporative fuel canisters, switches, solenoids, wiring harnesses, sensors, multiplex, interfaces, injector (DEF and HC), monitoring systems, warning devices and codes, and fastening and mounting devices; by visually inspecting, testing, and analyzing performance, function and programming; using hand, power, specialized, precision and electronic service tools and manuals, exhaust gas analyzing equipment, gauges, precision measuring instruments, and lifting, rigging, and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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U5866.0 Transmission, Drive Axle and Final Drive Systems and Components

General Performance Objective

Diagnose and repair/replace transmission, drive axle and final drive systems, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement of manual transmission systems and components; power shift transmissions and components; hydrostatic transmission systems and components; drive axle and final drive systems; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

Skills

U5866.01 Perform visual inspection, identifying systems type and applications, such as manual, power shift and hydrostatic transmissions, drive axle and final drive; by checking for worn, loose, damaged, missing, leaking, or defective components; such as housings, reservoirs, air/hydraulic cylinders, clutch discs and plates, flywheel and ring gear assembly, release mechanisms, park lock and shift mechanisms, synchronizers, actuators, accumulators, heat exchangers, transfer cases, torque converter, pilot/release bearings, shafts, atmospheric vents, lubrication systems, lines, hoses, fittings, pumps, lubricants, fluids, valves, seals, gauges, cables, linkages, springs, bearings, filters, interface, multiplex, warning devices, switches, solenoids, sensors, modules, wiring harnesses, drive shafts, universal joint assemblies, flanges, yokes, housings, vents, carriers, axle shaft, gear sets, clutch packs, wheel end assemblies, controls, fasteners and mounting devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice’s Sponsor.**

U5866.02 Diagnose and troubleshoot manual transmission systems and components, such as housings, reservoirs, air/hydraulic cylinders, clutch discs and plates, flywheel and ring gear assembly, release mechanisms, park lock mechanisms, pilot/release bearings, input shafts, gears, synchronizers, cables, linkages, lines, hoses, fittings, gauges, fluids, lubricants, switches, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function and pressure and flow; checking for wear, routing of wires, opens/shorts/grounds, odour, temperature, corrosion, fractures, contamination, vibration/noise, colour, lubrication, fluid level, leaks, pressure, free play, alignment, internal adjustments, slippage, and disengagement; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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U5866.03 Repair/replace manual transmissions and components, such as: housings, reservoirs, air/hydraulic cylinders, clutch discs and plates, flywheel and ring gear assembly, release mechanisms, park lock mechanisms, pilot/release bearings, input shafts gears, synchronizers, cables, linkages, lines, hoses, fittings, gauges, fluids, lubricants, switches, sensors, modules, wiring harnesses, fasteners and mounting devices; by exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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U5866.04 **Verify repair/replacement of manual transmissions and components**, such as: housings, reservoirs, air/hydraulic cylinders, clutch discs and plates, flywheel and ring gear assembly, release mechanisms, park lock mechanisms, pilot/release bearings, input shafts, gears, synchronizers, cables, linkages, lines, hoses, fittings, gauges, fluids, lubricants, switches, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function and pressure and flow; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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U5866.05 **Diagnose and troubleshoot power shift transmissions and components**, such as manual-valve body and electrically/electronically-controlled, transfer case, torque converter, flywheel, housings, shift linkages, lines, hoses, fittings, pump drive mechanisms, shafts, clutch packs, springs, gears, planetary gear sets, inching pedal, valves, accumulators, heat exchangers, park lock and shift mechanisms, actuators, gaskets, bearings, seals, filters, pumps, pressures, fluids, lubrication systems, actuators, systems monitoring devices panels, warning devices, interface, multiplex, controls, switches, solenoids, sensors, electronic control modules (ECM), wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function, and programming and pressure and flow; checking for: wear, opens/shorts/grounds, diagnostic codes, slippage, routing of wires, parameters, system voltage and amperage, odour, oil levels, leaks, pressures, contamination, temperature, corrosion, fractures, distortion, colour, vibration/noise, alignment and clearances; using hand, power, specialized, precision and electronic service tools and manuals, gauges, flow devices, oil analysis and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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U5866.06 Repair/replace power shift transmissions and components, such as manual- valve body and electrically/electronically-controlled, transfer case, torque converter, flywheel, housings, shift linkages, lines, hoses, fittings, pump drive mechanisms, shafts, clutch packs, springs, gears, planetary gear sets, inching pedal, valves, accumulators, heat exchangers, park lock and shift mechanisms, actuators, gaskets, bearings, seals, filters, pumps, pressures, fluids, lubrication systems, actuators, systems monitoring devices panels, warning devices, interface, multiplex, controls, switches, solenoids, sensors, electronic control modules (ECM), wiring harnesses, fasteners and mounting devices; by reprogramming, exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals, gauges, flow devices, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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U5866.07 Verify repair/replacement of power shift transmissions and components, such as manual-valve body and electrically/electronically-controlled, transfer case, torque converter, flywheel, housings, shift linkages, lines, hoses, fittings, pump drive mechanisms, shafts, clutch packs, springs, gears, planetary gear sets, inching pedal, valves, accumulators, heat exchangers, park lock and shift mechanisms, actuators, gaskets, bearings, seals, filters, pumps, pressures, fluids, lubrication systems, actuators, systems monitoring devices panels, warning devices, interface, multiplex, controls, switches, solenoids, sensors, electronic control modules (ECM), wiring harnesses, fasteners and mounting devices; by visually inspecting, testing and analysing performance, function and programming and pressure and flow; using hand, power, specialized, precision and electronic service tools and manuals, gauges, flow devices, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5866.08 Diagnose and troubleshoot hydrostatic transmission systems and components, such as transfer cases, housings, lines, hoses, fittings, pump drive mechanisms, shafts, linkages, valves, servos, accumulators, heat exchangers, park lock and shift mechanisms, bearings, seals, filters, pumps, fluids, lubrication systems, reservoirs, atmospheric vents, actuators, systems monitoring devices panels, interface, multiplex, warning devices, braking controls, switches, solenoids, sensors, electronic control modules (ECM), wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming, and pressure and flow; checking for wear, opens/shorts/grounds, diagnostic codes, slippage, routing of wires, odour, oil levels, leaks, pressures, contamination, fractures, temperature, corrosion, distortion, colour, vibration/noise, pressures, alignment and clearances, routing of lines and hoses; using hand, power, specialized, precision and electronic service tools and manuals, gauges, flow devices, oil analysis, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5866.09 Repair/replace hydrostatic transmission systems and components, such as transfer cases, housings, lines, hoses, fittings, pump drive mechanisms, shafts, linkages, valves, servos, accumulators, heat exchangers, park lock and shift mechanisms, bearings, seals, filters, pumps, fluids, lubrication systems, reservoirs, atmospheric vents, actuators, systems monitoring devices panels, interface, multiplex, warning devices, braking controls, switches, solenoids, sensors, electronic control modules (ECM), wiring harnesses, fasteners and mounting devices; by reprogramming, exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals, gauges, flow devices, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5866.10 Verify repair/replacement of hydrostatic transmission systems and components, such as transfer cases, housings, lines, hoses, fittings, pump drive mechanisms, shafts, linkages, valves, servos, accumulators, heat exchangers, park lock and shift mechanisms, bearings, seals, filters, pumps, fluids, lubrication systems, reservoirs, atmospheric vents, actuators, systems monitoring devices panels, interface, multiplex, warning devices, braking controls, switches, solenoids, sensors, electronic control modules (ECM), wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming, and pressure and flow; using hand, power, specialized, precision and electronic service tools and manuals, gauges, flow devices, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5866.11 Diagnose and troubleshoot drive axle and final drive systems and components such as drive shafts, drive axles, differential assemblies and components, universal joint assemblies, hanger bearings, bearing races, flanges, yokes, housings, vents, lines, fittings, carriers, planetary gear sets, axle shaft, full floating axles, gear sets, clutch packs, bearings, seals, gaskets, belts, chains, sprockets, wheel end assemblies, lubrication systems, lubricants, actuators, controls, sensors, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, and function; checking for wear, routing of wires, damaged or defective components, temperature, colour, tolerances, vibration/noise, lubrication, leaks, corrosion, contamination, distortion, fractures, phasing, gear backlash and alignment; using hand, power, specialized, precision and electronic service tools and manuals, oil analysis, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5866.12 Repair/replace drive axle and final drive systems and components such as drive shafts, drive axles, differential assemblies and components, universal joint assemblies, hanger bearings, bearing races, flanges, yokes, housings, vents, lines, fittings, carriers, planetary gear sets, axle shaft, full floating axles, gear sets, clutch packs, bearings, seals, gaskets, belts, chains, sprockets, wheel end assemblies, lubrication systems, lubricants, actuators, controls, sensors, wiring harnesses, fasteners and mounting devices; by exchanging, reconditioning, servicing or adjusting; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5866.13 Verify repair/replacement of drive axle and final drive systems and components such as drive shafts, drive axles, differential assemblies and components, universal joint assemblies, hanger bearings, bearing races, flanges, yokes, housings, vents, lines, fittings, carriers, planetary gear sets, axle shaft, full floating axles, gear sets, clutch packs, bearings, seals, gaskets, belts, chains, sprockets, wheel end assemblies, lubrication systems, lubricants, actuators, controls, sensors, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; using hand, power, specialized, precision and electronic service tools and manuals, oil analysis, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.0 Steering and Suspension Systems and Tires and Wheels

General Performance Objective

Diagnose and repair/replace steering and suspension systems and tires and wheels, by: performing a visual inspection; diagnosing and troubleshooting, repairing/ replacing, and verifying the repair/replacement of: manual, power and electrical/electronically-controlled steering systems and components; automated vehicle guidance steering systems and components; active suspension systems and components, pneumatic and solid tires, wheels and components; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

Skills

U5867.01 Perform visual inspection, identifying systems type and applications such as manual and power, electrical and electronically-controlled, and automated vehicle guidance steering systems, suspension systems, and pneumatic and solid tires and wheels, by checking for worn, loose, leaking, missing, damaged, or defective components; such as pumps and drive mechanisms, chains, bearings, springs, shackles, hangers, bushings, cables, sprockets, housings, cylinders, reservoirs, valves, controls, lubricants, lines, hoses, fittings, steering units, racks, hydraulic and electric motors, orbitrols, linkages, columns, steering wheels and controls, ball joints, spindles, shims, king pin assemblies, steering and articulating stops, universal and articulating joints, caster assemblies, steering units, accumulators, warning devices, line drivers, guidance wire, receivers, switches, sensors, tires, rims, hubs, caps, tubes, alignment, fasteners and mounting devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice’s Sponsor.**

U5867.02 Diagnose and troubleshoot manual, power and electrical/electronically- controlled steering systems and components, such as pumps and drive mechanisms, chains, cables, sprockets, housings, cylinders, reservoirs, valves, controls, lubricants, lines, hoses, fittings, steering units, racks, hydraulic motors, linkages, columns, ball joints, motor controllers, accumulators, switches, relays, sensors, modules, contactors, multi-function tiller units, wiring harnesses, multiplex, clock springs, king pin assemblies, steering and articulating stops, universal and articulating joints, accumulators, fasteners and mounting devices; by visually inspecting, testing, programming and analysing performance and function; checking for wear, routing of wires, lines and hoses, opens/shorts/grounds, current, diagnostic codes, temperature, fluid level, lubrication, leaks, contamination, pressure, flow, colour, tolerances, vibration/noise, alignment, stability, corrosion, distortion and fractures; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.03 Repair/replace manual, power and electrical/electronically-controlled steering systems and components, such as pumps and drive mechanisms, chains, cables, sprockets, housings, cylinders, reservoirs, valves, controls, lubricants, lines, hoses, fittings, steering units, racks, hydraulic motors, linkages, columns, ball joints, motor controllers, accumulators, switches, relays, sensors, modules, contactors, multi-function tiller units, wiring harnesses, multiplex, clock springs, king pin assemblies, steering and articulating stops, universal and articulating joints, accumulators, fasteners and mounting devices; by exchanging, reconditioning, aligning, servicing or reprogramming; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.04 Verify repair/replacement of manual, power and electrical/electronically- controlled steering systems and components, such as pumps and drive mechanisms, chains, cables, sprockets, housings, cylinders, reservoirs, valves, controls, lubricants, lines, hoses, fittings, steering units, racks, hydraulic motors, linkages, columns, ball joints, motor controllers, accumulators, switches, relays, sensors, modules, contactors, multi-function tiller units, wiring harnesses, multiplex, clock springs, king pin assemblies, steering and articulating stops, universal and articulating joints, accumulators, fasteners and mounting devices; by visually inspecting, testing, analysing and programming performance and function, and pressure and flow; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.05 Diagnose and troubleshoot automated vehicle guidance steering systems and components, such as: pumps and drive mechanisms, chains, cables, sprockets, gears, cylinders, reservoirs, valves, controls, lubricants, lines, hoses, fittings, housings, steering units, racks, motors, linkages, columns, ball joints, king pin assemblies, steering and articulating stops, universal joints, articulating joints, accumulators, contactors, motor controllers, warning devices, line drivers, guidance wire, rail guidance, wheels, receivers, potentiometer, solid state devices, switches, relays, sensors, modules, wiring harnesses, multiplex, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming, pressure and flow; checking for wear, opens/shorts/grounds, current, calibration, diagnostic codes, signal strength and frequency, routing of wires, lines and hoses, temperature, lubrication, leaks, contamination, pressure, flow, colour, tolerances, vibration/noise, alignment, stability, wheels condition, corrosion, and distortion; by using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.06 Repair/replace automated vehicle guidance steering systems and components, such as: pumps and drive mechanisms, chains, cables, sprockets, gears, cylinders, reservoirs, valves, controls, lubricants, lines, hoses, fittings, housings, steering units, racks, motors, linkages, columns, ball joints, king pin assemblies, steering and articulating stops, universal joints, articulating joints, accumulators, contactors, motor controllers, warning devices, line drivers, guidance wire, rail guidance, wheels, receivers, potentiometer, solid state devices, switches, relays, sensors, modules, wiring harnesses, multiplex, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function and programming, pressure and flow; by reprogramming, calibrating, exchanging, reconditioning, aligning, or servicing; by using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.07 Verify repair/replacement of automated vehicle guidance steering systems and components, such as: pumps and drive mechanisms, chains, cables, sprockets, gears, cylinders, reservoirs, valves, controls, lubricants, lines, hoses, fittings, housings, steering units, racks, motors, linkages, columns, ball joints, king pin assemblies, steering and articulating stops, universal joints, articulating joints, accumulators, contactors, motor controllers, warning devices, line drivers, guidance wire, rail guidance, wheels, receivers, potentiometer, solid state devices, switches, relays, sensors, modules, wiring harnesses, multiplex, fasteners and mounting devices; by visually inspecting, testing, calibrating and analysing performance, function and programming, pressure and flow; by using hand, power, specialized, precision and electronic service tools, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.08 Diagnose and troubleshoot active suspension systems and components, such as: springs, shackles, alignment, bushings, articulation plates, caster assemblies, bearings, rubber block, hangers, lines, cylinders, valves, electronic controls, switches, solenoids, potentiometer, contactors, sensors, modules, solid state, wiring harnesses, multiplex, , articulation, tire and wheel condition, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function, programming and codes; checking for wear, routing of wires and lines, , opens/shorts/grounds, lubrication, leaks, pressure and flow, tolerances, vibration/noise, alignment, stability, corrosion, distortion and fractures; by using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.09 Repair/replace active suspension systems and components, such as: springs, shackles, alignment, bushings, articulation plates, caster assemblies, bearings, rubber block, hangers, lines, cylinders, valves, electronic controls, switches, solenoids, potentiometer, contactors, sensors, modules, solid state, wiring harnesses, multiplex, , articulation, tire and wheel condition, fasteners and mounting devices; by reprogramming, exchanging, reconditioning, aligning, or servicing; by using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.10 Verify repair/replacement of active suspension systems and components, such as: springs, shackles, alignment, bushings, articulation plates, caster assemblies, bearings, rubber block, hangers, lines, cylinders, valves, electronic controls, switches, solenoids, potentiometer, contactors, sensors, modules, solid state, wiring harnesses, multiplex, articulation, tire and wheel condition, fasteners and mounting devices; by visually inspecting, testing, and analysing performance, function, and programming; by using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.11 Diagnose and troubleshoot pneumatic and solid tires, wheels and components such as: tires, tubes, flaps, rims, hubs, lock rings, bearings, valves, caps, mounting arrangement and hardware, hub and rim seating, spacers, tire ballast, foam filling, Underwriters Laboratory (UL) rating, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; checking for wear, tire matching, size and condition, chunking, bond failure, corrosion, contamination, pressure, leaks, temperature, noise/vibration, and distortion, cracks/fractures; using hand, power, specialized and precision service tools and manuals, torque wrenches, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.12 Repair/replace pneumatic and solid tires, wheels and components such as: tires, tubes, flaps, rims, hubs, lock rings, bearings, valves, caps, mounting arrangement and hardware, hub and rim seating, spacers, tire ballast, foam filling, Underwriters Laboratory (UL) rating, fasteners and mounting devices; by exchanging, reconditioning, servicing, or calibrating; using hand, power, specialized and precision service tools and manuals, torque wrenches, safety cages, patches, plugs, adhesives, lubricants and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5867.13 Verify repair/replacement of pneumatic and solid tires, wheels and components such as: tires, tubes, flaps, rims, hubs, lock rings, bearings, valves, caps, mounting arrangement and hardware, hub and rim seating, spacers, tire ballast, foam filling, Underwriters Laboratory (UL) rating, fasteners and mounting devices; by visually inspecting, testing, pressure, and analysing performance and function; using hand, power, specialized and precision service tools and manuals, torque wrenches, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5868.0 Braking Systems

General Performance Objective

Diagnose and repair/replace braking systems, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement of: mechanical and hydraulic braking systems and components; pneumatic braking systems and components; electro-magnetic braking systems and components; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

Skills

U5868.01 Perform visual inspection, identifying systems type and applications, such as mechanical and hydraulic, pneumatic and electro-magnetic systems and components, by: checking for adjustment, calibrations, worn, loose, leaks, damaged, defective, or missing components; such as drums, friction materials, cables, master cylinders, calipers, discs, rotors, bands, backing plates, springs, adjusting mechanisms, linkages, dust shields, S-cams and shafts, bushings, slack adjusters, lines, hoses, fittings, accumulators, fluids, pumps, valves, reservoirs, lubricants, cylinders, actuators, boosters (pneumatic and hydraulic), warning devices, switches, solenoids, relays, sensors, modules, wiring harnesses, multiplex, pumps, filters, coolers, Spring Applied-Hydraulic Release (SAHR) brake system and components, Spring Applied-Electric Release (SAER), compressors, air brake chambers, fasteners and mounting devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice's Sponsor.**

U5868.02 Diagnose and troubleshoot mechanical and hydraulic braking systems and components, such as: master cylinders, drums, friction materials, cables, calipers, discs, rotors, bands, backing plates, bearings, pins, cams, clevis joints, springs, adjusting mechanisms, linkages, pedals, levers, dust shields, lines, hoses, fittings, valves, accumulators, fluids, seals, gaskets, reservoirs, lubricants, vacuum boosters, hydraulic and vacuum pumps, cylinders, actuators, warning devices, switches, relays, multiplex, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, adjusting, and analysing performance, pressure and flow, and function; checking for wear, opens/shorts/grounds, routing of wires, lines and hoses, temperature, lubrication, fluid type and level, leaks, contamination, cavitation, colour, tolerances, vibration/noise, runout, alignment, corrosion, distortion and fractures; using hand, power, flowmeters, gauges, specialized, precision and electronic service tools and manuals, lifting, rigging and blocking devices, and PPE and environmental control equipment; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5868.03 Repair/replace mechanical and hydraulic braking systems and components, such as: master cylinders, drums, friction materials, cables, calipers, discs, rotors, bands, backing plates, bearings, pins, cams, clevis joints, springs, adjusting mechanisms, linkages, pedals, levers, dust shields, lines, hoses, fittings, valves, accumulators, fluids, seals, gaskets, reservoirs, lubricants, vacuum boosters, hydraulic and vacuum pumps, cylinders, actuators, warning devices, switches, relays, multiplex, sensors, modules, wiring harnesses, fasteners and mounting devices; by exchanging, reconditioning, adjusting, replacing, programming or servicing; using hand, power, flowmeters, gauges, specialized, precision and electronic service tools and manuals, lifting, rigging and blocking devices, and PPE and environmental control equipment; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5868.04 Verify repair/replacement of mechanical and hydraulic braking systems and components, such as: adjustments, master cylinders, drums, friction materials, cables, calipers, discs, rotors, bands, backing plates, bearings, pins, cams, clevis joints, springs, adjusting mechanisms, linkages, pedals, levers, dust shields, lines, hoses, fittings, valves, accumulators, fluids, seals, gaskets, reservoirs, lubricants, vacuum boosters, hydraulic and vacuum pumps, cylinders, actuators, warning devices, switches, relays, multiplex, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; using hand, power, flowmeters, gauges, specialized, precision and electronic service tools and manuals, lifting, rigging and blocking devices, and PPE and environmental control equipment; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5868.05 Diagnose and troubleshoot pneumatic braking system and components, such as: compressors, air dryer components, reservoirs, drains, governors, gauges, drums, air brake chambers, calipers, rotors, backing plates, dust shields, friction materials, pumps, lines, hoses, fittings, S-cams and shafts, bushings, slack adjusters, valves, actuators, warning devices, switches, solenoids, relays, sensors, electronic control modules (ECM), wiring harnesses, multiplex, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function, and pressure; checking for wear, opens/shorts/grounds, routing of wires, lines and hoses, noise/ vibration, pressure, distortion, corrosion, fractures, odour, colour, leaks, contamination and temperature; using hand, power, gauges, specialized, precision and electronic service tools and manuals, lifting, rigging and blocking devices, and PPE and environmental control equipment; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5868.06 Repair/replace pneumatic braking systems and components, such as compressors, air dryer components, reservoirs, drains, governors, gauges, drums, air brake chambers, calipers, rotors, backing plates, dust shields, friction materials, pumps, lines, hoses, fittings, S-cams and shafts, bushings, slack adjusters, valves, actuators, warning devices, switches, solenoids, relays, sensors, electronic control modules (ECM), wiring harnesses, multiplex, fasteners and mounting devices; by exchanging, reconditioning, adjusting or servicing; using hand, power, gauges, specialized, precision and electronic service tools and manuals, lifting, rigging and blocking devices, and PPE and environmental control equipment; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5868.07 Verify repair/replacement of pneumatic braking systems and components, such as compressors, air dryer components, reservoirs, drains, governors, gauges, drums, air brake chambers, calipers, rotors, backing plates, dust shields, friction materials, pumps, lines, hoses, fittings, S-cams and shafts, bushings, slack adjusters, valves, actuators, warning devices, switches, solenoids, relays, sensors, electronic control modules (ECM), wiring harnesses, multiplex, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; using hand, power, gauges, specialized, precision and electronic service tools and manuals, lifting, rigging and blocking devices, and PPE and environmental control equipment; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5868.08 Diagnose and troubleshoot electro-magnetic braking systems and components, such as: drums, friction materials, cables, coils, switch and sensors, controllers, calipers, discs, rotors, bands, backing plates, bearings, pins, cams, clevis joints, springs, adjusting mechanisms, linkages, pedals, levers, dust shields, actuators, warning devices, switches, relays, multiplex, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, adjusting, analysing and programming performance and functions; checking for programming, wear, opens/shorts/grounds, routing of wires, temperature, vibration/noise, runout, alignment, corrosion, distortion and fractures, and operation of switches and sensors; using hand, power, specialized, precision and electronic service tools and manuals, lifting, rigging and blocking devices, and PPE and environmental control equipment; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5868.09 Repair/replace electro-magnetic braking systems and components, such as: drums, friction materials, cables, coils, switch and sensors, controllers, calipers, discs, rotors, bands, backing plates, bearings, pins, cams, clevis joints, springs, adjusting mechanisms, linkages, pedals, levers, dust shields, actuators, warning devices, switches, relays, multiplex, sensors, modules, wiring harnesses, fasteners and mounting devices; by exchanging, reconditioning, adjusting, replacing, programming, servicing or cleaning; using hand, power, specialized, precision and electronic service tools and manuals, lifting, rigging and blocking devices, and PPE and environmental control equipment; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5868.10 Verify repair/replacement of electro-magnetic braking systems and components, such as: drums, friction materials, cables, coils, switch and sensors, controllers, calipers, discs, rotors, bands, backing plates, bearings, pins, cams, clevis joints, springs, adjusting mechanisms, linkages, pedals, levers, dust shields, actuators, warning devices, switches, relays, multiplex, sensors, modules, wiring harnesses, fasteners and mounting devices; by visually inspecting, testing, adjusting, analysing and programming performance and functions; using hand, power, gauges, specialized, precision and electronic service tools and manuals, lifting, rigging and blocking devices, and PPE and environmental control equipment; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5869.0 Electric Motor Systems

General Performance Objective

Diagnose and repair/replace electric motor systems, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement of direct current (DC) electric motors and components; alternating current (AC) electric motors and components; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

Skills

U5869.01 Perform visual inspection, identifying systems type and applications, by: checking for worn, loose, damaged, missing or defective components; such as terminals, insulators, wires, cables, connectors, frame, brush assemblies, armature assemblies, field assemblies, commutators, encoders, reluctors, drive mechanisms, rotors, bearings, bushings, seals, gaskets, covers, field windings, pole shoes, sensors, modules, wiring harnesses/multiplex, fasteners and mounting devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice’s Sponsor.**

U5869.02 Diagnose and troubleshoot direct current (DC) electric motors and components, such as terminals, insulators, wires, cables, connectors, frame, brush assemblies, armature assemblies, field assemblies, commutators, encoders, reluctors, bearings, bushings, seals, gaskets, covers, field windings, pole shoes, drive mechanisms, sensors, modules, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; checking for wear, opens/shorts/grounds, routing of wires, cracks, leaks, odours, distortion, corrosion, contamination, temperature, voltage and amperage; using hand, power, specialized, precision and electronic service tools and manuals, meters, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5869.03 Repair/replace direct current (DC) electric motors and components, such as terminals, insulators, wires, cables, connectors, frame, brush assemblies, armature assemblies, field assemblies, commutators, encoders, reluctors, bearings, bushings, seals, gaskets, covers, field windings, pole shoes, drive mechanisms, sensors, modules, wiring harnesses/multiplex, fasteners and mounting devices; by exchanging, reconditioning and servicing; using hand, power, specialized, precision and electronic service tools and manuals, meters, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5869.04 Verify repair/replacement of direct current (DC) electric motors and components, such as: terminals, insulators, wires, cables, connectors, frame, brush assemblies, armature assemblies, field assemblies, commutators, encoders, reluctors, bearings, bushings, seals, gaskets, covers, field windings, pole shoes, drive mechanisms, sensors, modules, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; using hand, power, specialized, precision and electronic service tools and manuals, meters, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements* .

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5869.05 Diagnose and troubleshoot alternating current (AC) electric motors and components, such as terminals, insulators, wires, cables, connectors, frame, stator windings, rotor, bushings, seals, gaskets, covers, drive mechanisms, sensors, modules, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; checking for wear, opens/shorts/grounds, routing of wires, cracks, leaks, odours, distortion, corrosion, contamination, temperature, voltage and amperage; using hand, power, specialized, precision and electronic service tools and manuals, meters, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5869.06 Repair/replace alternating current (AC) electric motors and components, such as terminals, insulators, wires, cables, connectors, frame, stator windings, rotor, bushings, seals, gaskets, covers, drive mechanisms, sensors, modules, wiring harnesses/multiplex, fasteners and mounting devices; by exchanging, reconditioning and servicing; using hand, power, specialized, precision and electronic service tools and manuals, meters, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5869.07 **Verify repair/replacement of alternating current (AC) electric motors and components**, such as terminals, insulators, wires, cables, connectors, frame, stator windings, rotor, bushings, seals, gaskets, covers, drive mechanisms, sensors, modules, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; using hand, power, specialized, precision and electronic service tools and manuals, meters, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.0 Control Systems – Electric Vehicles

General Performance Objective

Diagnose and repair/replace control systems – electric vehicles, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement of: resistor systems and components; silicone controlled rectifier (SCR) systems and components; transistor systems and components; alternating current (AC) power systems and components; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

Skills

U5870.01 Perform visual inspection, identifying systems type and applications, by: checking for worn, damaged, missing, corroded, loose, or defective components; such as servos, accumulators, master cylinders, terminal boards/blocks, control and power wiring, transformers, coils, contactors, timers, diodes, suppressors, resistors, transistors, inductors, rectifiers, potentiometers, insulators, capacitors, control modules, hall effect sensors and encoders, DC to AC invertors, DC to DC converters, circuit protection devices, batteries, cables, connectors, switches, solenoids, relays, temperature, speed and current sensors, sensors, wiring harnesses/multiplex, electrodynamic braking function, fasteners and mounting devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice’s Sponsor.**

U5870.02 Diagnose and troubleshoot resistor systems and components, such as servos, accumulators, master cylinders, terminal boards/blocks, control and power wiring, coils, contactors, timers, diodes, suppressors, resistors, inductors, rectifiers, potentiometers, temperature, insulators, capacitors, control modules, circuit protection devices, batteries, cables, connectors, switches, solenoids, relays, speed and current sensors, sensors, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; checking for wear, routing, opens/shorts/grounds, temperature, corrosion, distortion, contamination, cleanliness, colour, and odour; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.03 Repair/replace resistor systems and components, such as servos, accumulators, master cylinders, terminal boards/blocks, control and power wiring, coils, contactors, timers, diodes (SCR), suppressors, resistors, inductors, rectifiers, potentiometers, temperature, insulators, capacitors, control modules, circuit protection devices, batteries, cables, connectors, switches, solenoids, relays, speed and current sensors, sensors, wiring harnesses/multiplex, fasteners and mounting devices; by exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.04 Verify repair/replacement of resistor systems and components, such as: servos, accumulators, master cylinders, terminal boards/blocks, control and power wiring, coils, contactors, timers, diodes (SCR), suppressors, resistors, inductors, rectifiers, potentiometers, temperature, insulators, capacitors, control modules, circuit protection devices, batteries, cables, connectors, switches, solenoids, relays, speed and current sensors, sensors, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance and function; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.05 Diagnose and troubleshoot silicone controlled rectifier (SCR) systems and components, such as terminal boards/blocks, control and power wiring, coils, contactors, timers, diodes (SCR), suppressors, hall effect sensors and encoders, resistors, inductors, rectifiers, potentiometers, temperature, speed and current sensors, insulators, capacitors, inductors, transformers, circuit protection devices, control modules, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, electrodynamic braking function, fasteners and mounting devices; by visually inspecting, testing, calibrating and configuring parameters, and analysing performance, function and programming; checking for wear, opens/shorts/grounds, routing of wires, temperature, corrosion, distortion, contamination, colour, and odour; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.06 Repair/replace silicone controlled rectifier (SCR) systems and components, such as terminal boards/blocks, control and power wiring, coils, contactors, timers, diodes (SCR), suppressors, hall effect sensors and encoders, resistors, inductors, rectifiers, potentiometers, temperature, speed and current sensors, insulators, capacitors, inductors, transformers, circuit protection devices, control modules, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, electrodynamic braking function, fasteners and mounting devices; by reprogramming, calibrating and configuring parameters, exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.07 Verify repair/replacement of silicone controlled rectifier (SCR) systems and components, such as terminal boards/blocks, control and power wiring, coils, contactors, timers, diodes, suppressors, hall effect sensors and encoders, resistors, inductors, rectifiers, potentiometers, temperature, speed and current sensors, insulators, capacitors, inductors, transformers, circuit protection devices, control modules, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, electrodynamic braking function, fasteners and mounting devices; by visually inspecting, checking, testing, calibrating and configuring parameters, and analyzing performance, function and programming; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.08 Diagnose and troubleshoot transistor systems and components, such as terminal boards/blocks, control and power wiring, coils, contactors, timers, suppressors, hall effect sensors and encoders, transistors, resistors, capacitors, diodes, rectifiers, potentiometers, temperature, speed and current sensors, insulators, control modules, circuit protection devices, transformers, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, electrodynamic braking function, fasteners and mounting devices; by visually inspecting, testing, calibrating and configuring parameters, and analysing performance, function and programming; checking for wear, routing of wires, opens/shorts/grounds, diagnostic codes, temperature, corrosion, distortion, fractures, contamination, cleanliness, colour, and odour; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.09 Repair/replace transistor systems and components, such as: terminal boards/blocks, control and power wiring, coils, contactors, timers, suppressors, hall effect sensors and encoders, transistors, resistors, capacitors, diodes, rectifiers, potentiometers, temperature, speed and current sensors, insulators, control modules, circuit protection devices, transformers, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, electrodynamic braking functions, fasteners and mounting devices; by reprogramming, calibrating and configuring parameters, exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.10 Verify repair/replacement of transistor systems and components, such as: terminal boards/blocks, control and power wiring, coils, contactors, timers, suppressors, hall effect sensors and encoders, transistors, resistors, capacitors, diodes, rectifiers, potentiometers, temperature, speed and current sensors, insulators, control modules, circuit protection devices, transformers, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, electrodynamic braking functions, fasteners and mounting devices; by visually inspecting, testing, calibrating and configuring parameters, and analyzing performance, function, and programming; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.11 Diagnose and troubleshoot alternating current (AC) power systems and components, such as terminal boards/blocks, control and power wiring, coils, contactors, timers, suppressors, hall effect sensors and encoders, transistors, resistors, capacitors, diodes, rectifiers, potentiometers, temperature, speed and current sensors, insulators, transformers, DC to AC invertors, DC to DC converters, control modules, circuit protection devices, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, electrodynamic braking functions, fasteners and mounting devices; by visually inspecting, testing, calibrating and configuring parameters, and analysing performance, function and programming; checking for wear, routing of wires, opens/shorts/grounds, diagnostic codes, temperature, corrosion, distortion, contamination, cleanliness, colour, odour; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.12 Repair/replace alternating current (AC) power systems and components, such as: terminal boards/blocks, control and power wiring, coils, contactors, timers, suppressors, hall effect sensors and encoders, transistors, resistors, capacitors, diodes, rectifiers, potentiometers, temperature, speed and current sensors, insulators, transformers, DC to AC invertors, DC to DC converters, control modules, circuit protection devices, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, electrodynamic braking functions, fasteners and mounting devices; by reprogramming, calibrating and configuring parameters, exchanging, reconditioning, or servicing; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5870.13 Verify repair/replacement of alternating current (AC) power systems and components, such as terminal boards/blocks, control and power wiring, coils, contactors, timers, suppressors, hall effect sensors and encoders, transistors, resistors, capacitors, diodes, rectifiers, potentiometers, temperature, speed and current sensors, insulators, transformers, DC to AC invertors, DC to DC converters, control modules, circuit protection devices, batteries, cables, connectors, switches, solenoids, relays, sensors, wiring harnesses/multiplex, electrodynamic braking functions, fasteners and mounting devices; by visually inspecting, testing, calibrating and configuring parameters, and analyzing performance, function, and programming; using hand, power, specialized, precision and electronic service tools and manuals, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5871.0 Hydraulic Systems

General Performance Objective

Diagnose and repair/replace hydraulic systems, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement of mechanically and electrically-controlled hydraulic systems and components; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

Skills

U5871.01 Perform visual inspection, identifying systems type and applications, by: checking for worn, loose, damaged, missing, or defective components, oil level and condition; such as pumps, valves and safety valves, actuators, motors, cylinders, accumulators, reservoirs, atmospheric venting devices, controls, display panels, screens, filters, heat exchangers, drive mechanisms, lines, hoses, fittings, oil, seals, gaskets, mechanical and electrical controls, potentiometers, hall effects, sensors and encoders, light emitting diodes, speed control devices, low battery and circuit protection devices, static control devices, switches, solenoids, relays, sensors, modules, wiring harnesses/multiplex, fasteners and mounting devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
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*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice’s Sponsor.**

U5871.02 Diagnose and troubleshoot mechanically-controlled hydraulic systems and components, such as pumps, valves and safety valves, actuators, motors, cylinders, accumulators, reservoirs, display panels, screens, filters, heat exchangers, drive mechanisms, lines, hoses, fittings, atmospheric venting devices, oil, seals, gaskets, mechanical and electrical controls, battery and circuit protection devices, switches, solenoids, relays, sensors, pressure relief valves, modules, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing and analysing performance and function; checking for wear, opens/shorts/grounds, routing of wires, lines and hoses, fluid level, leaks, odour, colour, distortion, corrosion, cavitation, contamination, fractures, pressure, flow, temperature, and noise/vibration; using hand, power, specialized, precision and electronic service tools and manuals, schematics, measuring tools, sight glasses, oil analysis, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5871.03 Repair/replace mechanically-controlled hydraulic systems and components, such as pumps, valves and safety valves, actuators, motors, cylinders, accumulators, reservoirs, display panels, screens, filters, heat exchangers, drive mechanisms, lines, hoses, fittings, atmospheric venting devices, oil, seals, gaskets, mechanical and electrical controls, battery and circuit protection devices, switches, solenoids, relays, sensors, pressure relief valves, modules, wiring harnesses/multiplex, fasteners and mounting devices; by exchanging, reconditioning or servicing; using hand, power, specialized, precision and electronic service tools and manuals, schematics, measuring tools, sight glasses, oil analysis, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5871.04 Verify repair/replacement of mechanically-controlled hydraulic systems and components, such as pumps, valves and safety valves, actuators, motors, cylinders, accumulators, reservoirs, display panels, screens, filters, heat exchangers, drive mechanisms, lines, hoses, fittings, atmospheric venting devices, oil, seals, gaskets, mechanical and electrical controls, battery and circuit protection devices, switches, solenoids, relays, sensors, pressure relief valves, modules, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing and analysing performance and function; using hand, power, specialized, precision and electronic service tools and manuals, schematics, measuring tools, sight glasses, flow meter, oil analysis, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5871.05 Diagnose and troubleshoot electronically-controlled hydraulic systems and components, such as pumps, valves and safety valves, actuators, motors, cylinders, accumulators, reservoirs, display panels, screens, filters, heat exchangers, drive mechanisms, lines, hoses, fittings, atmospheric venting devices, oil, seals, gaskets, mechanical and electrical controls, potentiometers, hall effects sensors and encoders, light emitting diodes, speed control devices, battery and circuit protection devices, static control devices, switches, solenoids, relays, sensors, pressure relief valves, modules, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing, calibrating and configuring parameters, and analysing performance, function and programming; checking for wear, opens/shorts/grounds, diagnostic codes, routing of wires, lines and hoses fluid level, odour, colour, corrosion, cavitation, distortion, contamination, fractures, pressure, flow, temperature, and noise/vibration; using hand, power, specialized precision measuring and electronic service tools and manuals, schematics, oil analysis, sight glasses, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5871.06 Repair/replace electronically controlled hydraulic systems and components, such as pumps, valves and safety valves, actuators, motors, cylinders, accumulators, reservoirs, display panels, screens, filters, heat exchangers, drive mechanisms, lines, hoses, fittings, atmospheric venting devices, oil, seals, gaskets, mechanical and electrical controls, potentiometers, hall effects sensors and encoders, light emitting diodes, speed control devices, battery and circuit protection devices, static control devices, switches, solenoids, relays, sensors, pressure relief valves, modules, wiring harnesses/multiplex, fasteners and mounting devices; by reprogramming, calibrating and configuring parameters, exchanging, reconditioning or servicing; using hand, power, specialized precision measuring and electronic service tools and manuals, schematics, oil analysis, sight glasses, and lifting, rigging and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5871.07 Verify repair/replacement of electronically-controlled hydraulic systems and components, such as pumps, valves and safety valves, actuators, motors, cylinders, accumulators, reservoirs, display panels, screens, filters, heat exchangers, drive mechanisms, lines, hoses, fittings, atmospheric venting devices, oil, seals, gaskets, mechanical and electrical controls, potentiometers, hall effects sensors and encoders, light emitting diodes, speed control devices, battery and circuit protection devices, static control devices, switches, solenoids, relays, sensors, pressure relief valves, modules, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing, calibrating and configuring parameters, and analysing performance, function and programming; using hand, power, specialized precision measuring and electronic service tools and manuals, gauges, flow meters, sight glasses, thermometer, stethoscopes, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5872.0 Lifting Systems

General Performance Objective

Diagnose and repair/replace lifting systems, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement of lifting systems and components; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

Skills

U5872.01 Perform visual inspection, identifying systems type and applications, by: checking for manufacturer’s specification plate; and worn, loose, damaged, missing or defective components, such as mainframe, welds, telescopic channels, base legs, wheels, bearings, axles, affixed carriage, roller bearings, chains, pivots, bushings, auxiliary attachments, lifting forks, safety interlocks, wiring harnesses/multiplex, fasteners and mounting devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice's Sponsor.**

U5872.02 Diagnose and troubleshoot lifting systems and components, such as mainframe, welds, telescopic channels, base legs, wheels, bearings, axles, affixed carriage, roller bearings, chains, pivots, bushings, auxiliary attachments, lifting forks, safety interlocks, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, load testing and analysing performance and function; checking for chain wear and adjustment, mast roller wear, pattern mast sway and backlash, phasing/staging, lubrication, noise/vibration, fractures, metal shavings, corrosion and deflection/distortion; using hand, power, precision and specialized tools and manuals, non-destructive testing equipment, and lifting, rigging, and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5872.03 Repair/replace lifting systems and components, such as mainframe, welds, telescopic channels, base legs, wheels, bearings, axles, affixed carriage, roller bearings, chains, pivots, bushings, auxiliary attachments, lifting forks, safety interlocks, wiring harnesses/multiplex, fasteners and mounting devices; by exchanging, reconditioning, shimming, and servicing; using hand, power, precision and specialized tools and manuals, engineer approved heating, cutting and welding procedures, and lifting, rigging, and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5872.04 **Verify repair/replacement of lifting systems and components**, such as mainframe, welds, telescopic channels, base legs, wheels, bearings, axles, affixed carriage, roller bearings, chains, pivots, bushings, auxiliary attachments, lifting forks, safety interlocks, wiring harnesses/multiplex, fasteners and mounting devices; by visually inspecting, testing and analysing performance and function; using hand, power, precision and specialized tools and manuals, non-destructive testing equipment, and lifting, rigging, and blocking devices; according to manufacturer's specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5873.0 Frame, Overhead Guards and Cab Systems

General Performance Objective

Diagnose and repair/replace frame, overhead guards and cab systems, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement of frame, overhead guard and cab systems and components; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

Skills

U5873.01 Perform visual inspection, identifying systems type and components, such as frame, overhead guards and cab by checking for cracks and fractures, unapproved modifications, worn, loose, damaged, or missing components; such as overhead guards, counter weighting, main frame, exterior body panels and trim, weather- stripping, locks, hinges, latches, window regulator channels, windshield wipers, hood supports, bumpers, hitches and anchoring devices, glass, lenses, housings, mirrors, adhesives, sound suppression paneling, theft deterrent devices, operator lock-out devices, working lights, panels, upholstery, roof lining, seats, flooring, hoods, fenders, doors, reinforced bars, occupant restraint systems, warning and information decals, driver information pouches, operator manual, fire suppression devices, fasteners and mounting devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
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*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice’s Sponsor.**

U5873.02 Diagnose and troubleshoot frame, overhead guards and cab systems and components, such as: overhead guards, counter weighting, main frame, exterior body panels and trim, weather-stripping, locks, hinges, latches, window regulator channels, windshield wipers, hood supports, bumpers, hitches and anchoring devices, glass, lenses, working lights, housings, mirrors, adhesives, sound suppression paneling, theft deterrent devices, operator lock-out devices, warning devices, panels, upholstery, roof lining, seats, flooring, hoods, fenders, doors, reinforced bars, occupant restraint systems, warning and information decals, driver information pouches, operator manual, fire suppression devices, fasteners and mounting devices; by visually inspecting, testing, and analyzing performance and function; checking for unapproved modifications, wear, vibration/noise, temperature, corrosion, distortion, alignment, pressure, leaks, and fractures; using hand, power, specialized, precision and electronic service tools and manuals, non-destructive testing equipment, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5873.03 Repair/replace of frame, overhead guards and cab systems and components, overhead guards, counter weighting, main frame, exterior body panels and trim, weather- stripping, locks, hinges, latches, window regulator channels, windshield wipers, hood supports, bumpers, hitches and anchoring devices, glass, lenses, working lights, housings, mirrors, adhesives, sound suppression paneling, theft deterrent devices, operator lock-out devices, warning devices, panels, upholstery, roof lining, seats, flooring, hoods, fenders, doors, reinforced bars, occupant restraint systems, warning and information decals, driver information pouches, operator manual, fire suppression devices, fasteners and mounting devices; by exchanging, replacing, or servicing; using hand, power, specialized, precision and electronic service tools and manuals, non-destructive testing equipment, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5873.04 Verify repair/replacement of frame, overhead guards and cab systems and components, such as overhead guards, counter weighting, main frame, exterior body panels and trim, weather-stripping, locks, hinges, latches, window regulator channels, windshield wipers, hood supports, bumpers, hitches and anchoring devices, glass, lenses, working lights, housings, mirrors, adhesives, sound suppression paneling, theft deterrent devices, operator lock-out devices, warning devices, panels, upholstery, roof lining, seats, flooring, hoods, fenders, doors, reinforced bars, occupant restraint systems, warning and information decals, driver information pouches, operator manual, fire suppression devices, fasteners and mounting devices; by visually inspecting, testing, and analysing performance and function; using hand, power, specialized, precision and electronic service tools and manuals, non-destructive testing equipment, and lifting, rigging and blocking devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5874.0 Climate Control Systems

General Performance Objective

Diagnose and repair/replace climate control systems, by: performing a visual inspection; diagnosing and troubleshooting, repairing/replacing, and verifying the repair/replacement climate control systems and components; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

Skills

U5874.01 Perform visual inspection, identifying systems type and applications, by: checking for worn, loose, damaged, leaking, missing, or defective components; fluid levels and condition; such as controls, actuators, valves, fuses, resistors, drive mechanisms, motors, pumps, fans, condensers, compressors, evaporators, receivers/dryers, accumulators, filters, heat exchangers, ducting, fluids, lines, hoses, fittings, test ports, seals, gaskets, lubricants, circuit protection devices, warning devices, cables, switches, relays, sensors, modules, wiring harnesses/multiplex, fastening and mounting devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

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*** A Trainer may be a Supervisor or the competent employee designated by the Apprentice’s Sponsor.**

U5874.02 Diagnose and troubleshoot climate control systems and components, such as controls, actuators, valves, fuses, resistors, drive mechanisms, motors, pumps, fans, condensers, compressors, evaporators, receivers/dryers, accumulators, filters, heat exchangers, ducting, fluids, lines, hoses, fittings, test ports, seals, gaskets, lubricants, circuit protection devices, warning devices, cables, switches, relays, sensors, modules, wiring harnesses/multiplex, fastening and mounting devices; by visually inspecting, testing, and analyzing performance, function and programming; checking for wear, opens/shorts/grounds, routing of wires, lines and hoses, diagnostic codes, odour, colour, corrosion, distortion, fractures, temperature, contamination, vibration/noise, lubrication, fluid levels, pressure, and leaks; using hand, power, specialized and electronic service tools and manuals, and leak- detection devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5874.03 Repair/replace climate control systems and components, such as controls, actuators, valves, fuses, resistors, drive mechanisms, motors, pumps, fans, condensers, compressors, evaporators, receivers/dryers, accumulators, filters, heat exchangers, ducting, fluids, lines, hoses, fittings, test ports, seals, gaskets, lubricants, circuit protection devices, warning devices, cables, switches, relays, sensors, modules, wiring harnesses/multiplex, fastening and mounting devices; by recharging, reprogramming, reconditioning, exchanging, replacing and evacuating, or servicing; using hand, power, specialized and electronic service tools and manuals, manifold gauge sets and refrigerant recovery and recharging equipment, and leak-detection devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

U5874.04 **Verify repair/replacement of climate control systems and components,** such as controls, actuators, valves, fuses, resistors, drive mechanisms, motors, pumps, fans, condensers, compressors, evaporators, receivers/dryers, accumulators, filters, heat exchangers, ducting, fluids, lines, hoses, fittings, test ports, seals, gaskets, lubricants, circuit protection devices, warning devices, cables, switches, relays, sensors, modules, wiring harnesses/multiplex, fastening and mounting devices; by visually inspecting, testing, and analysing performance, function and programming; using hand, power, specialized and electronic service tools and manuals, manifold gauge sets and refrigerant recovery and recharging equipment, and leak-detection devices; according to manufacturer’s specifications, government regulations, company policy and safety requirements*.

mm/dd/yy	Trainer Print Name	*Trainer Signature
mm/dd/yy	Apprentice Print Name	Apprentice Signature

Definitions

Apprentice

- An individual who, pursuant to a registered Training Agreement, is receiving or is to receive training in a trade that is required as part of an apprenticeship program
- Holds a Training Agreement in either a compulsory or non-compulsory trade;
- Are subject to any ratios that have been set out in regulation and or recommended by industry for their trade(s);
- Remain as an Apprentice until they receive their Certificate of Apprenticeship

BOSTA

Building Opportunities in the Skilled Trades Act, 2021 (BOSTA)

Certificate of Apprenticeship (C of A)

A certificate issued to individuals who have demonstrated that they have completed an apprenticeship program in Ontario.

Certificate of Qualification (C of Q)

A certificate issued to an individual who has completed an apprenticeship or equivalent AND passed the Certificate of Qualification examination.

Competence

The ability of an individual to perform a skill, consistently without assistance, in the workplace as set out in the Logbook.

Competency Analysis Profile (CAP Chart)

A chart that identifies the training needs of an individual trade and details the skills/skill sets that must be demonstrated during an apprenticeship program.

Journeyperson

Journeyperson means an individual who holds a certificate of qualification (in a compulsory or non-compulsory trade) and/or an individual who practices as a journeyperson in a non-compulsory trade who does not hold a certificate of qualification and has equivalent experience in that trade.

Mandatory Skill

Status assigned to unshaded individual skills, skill sets or general performance objectives which must be signed-off for the Apprentice to complete their program.

Optional Skill

Status assigned to shaded individual skills, skills sets or general performance objectives for which sign-off is not required for the Apprentice to complete the program.

Provisional Certificates of Qualification

- A Provisional Certificate of Qualification is issued to an individual who has obtained a Certificate of Apprenticeship (in both compulsory and non-compulsory trades) in a program that has a Certificate of Qualification examination, to which the individual has not yet passed the Certificate of Qualification examination.
- A Provisional Certificate of Qualification shall have the prescribed term or, if no term is prescribed, a term of one year.
- In a compulsory trade, the Provisional Certificate of Qualification allows a person to continue working legally in the trade for up to 12 months while they work to pass the certifying exam.
- Individuals with a Provisional Certificate of Qualification are subject to any ratios that have been set out for their trade(s).

Ratios

For the purpose of an Apprenticeship program, a ratio is the maximum number of Journeypersons to Apprentices. The purpose of ratios is to provide consistent supervision, training and continuity of work.

Sign-off

Signature of the Sponsor of record, or an individual to whom that Sponsor has delegated signing authority, (e.g. Trainer) indicating an Apprentice's demonstration of competence.

Skill

Individual competency/task described in the Logbook.

Skill Sets

Group or selection of individual skills found in the Logbook.

Skill Set Completion for Sponsors

Listing for all skill sets and includes space for sign-off by Sponsor of record.

Sponsor

Means a person that has entered into a registered Training Agreement under which the person is required to ensure that an individual is provided with workplace-based training in a trade as part of an apprenticeship program.

Sponsor of Record

Refers to the Sponsor documented as being signatory to the registered Training Agreement or Contract of Apprenticeship. In order for a Sponsor to be considered for the training of Apprentices, they must identify that the workplace has qualified persons or the equivalent on site, and can identify that the workplace has the tools, equipment, materials, and processes which have been identified by the Industry representatives for the trade.

Trainer

An individual who oversees the performance of a task and sets the workplace expectations and practices for the Apprentice. For a compulsory trade, a qualified Trainer is an individual who holds a Certificate of Qualification. In a non-compulsory trade, a Trainer is an individual who either holds a CofQ, CofA, or is considered equivalent.

Ready to Write Your Exam?

Many of the skilled trades in Ontario have a final certification examination that you must pass to become certified in your trade. Passing the examination gives you the right to hold yourself out as a Journeyperson and receive a Certificate of Qualification in your trade.

There are two types of trade certification examinations in Ontario:

1. Provincial (Ontario) examinations - which lead to a Certificate of Qualification.
2. Red Seal examinations – which lead to a Certificate of Qualification with an Interprovincial Red Seal endorsement.

If a trade is designated as Red Seal in Ontario, you will be writing the Red Seal examination. To access the Red Seal preparation guide please visit: red-seal.ca

Ontario's Exam Preparation Guide

[Exam Resources – Skilled Trades Ontario](#)

Basic Examination Details for You to Know

- You will have **up to four hours to write your examination.**
- Accommodations must be requested and approved prior to scheduling your examination.
- You can leave the examination centre if you complete the examination in less than four hours.
- Exam questions are multiple choice with four options from which you must choose the correct answer. Your examination may have between 90 and 150 multiple choice questions.
- You need a mark of 70% to pass.

Scheduling Your Examination

The examination scheduling process is currently outlined in detail on the Skilled Trades Ontario website: [Exam Scheduling – Skilled Trades Ontario](#)

Remember these 3 basic steps:

1. Confirm your eligibility to write the examination with Skilled Trades Ontario.
2. Contact Client Services at Skilled Trades Ontario to pay your examination fee.
3. Contact the local Service Delivery Office to schedule your examination in their examination centre: <https://www.ontario.ca/page/employment-ontario-apprenticeship-offices>

Instructions for Recording a Change in Sponsor

1. Record your first sponsor's information in Sponsor Record #1 – this would be the sponsor who has signed your initial apprenticeship Training Agreement for this trade.
2. If you do change sponsors prior to completing this apprenticeship, please contact your local Service Delivery Office immediately to update your sponsor record.
3. Please make sure you record all the information regarding any additional sponsors of record towards your apprenticeship using the Sponsor Records on the following pages (if applicable).

You must fill out a Change of Sponsor Record each time you change your sponsor.

Sponsor Record #1

Sponsor Information		
Apprentice Name		
Training Agreement #		Date (mm/dd/yy)
Sponsor Name		
Address		
Telephone		
E-mail Address		

Summary of Training	
Employment Start Date	
Employment End Date	
Total hours of training & instruction between dates of employment.	
Skill Sets Completed	

As the Sponsor, I hereby confirm that the above information is true and accurate to the best of my knowledge.

Signature: _____ Date: (mm/dd/yy) _____

The Sponsor is required to sign-off and date the skills after the Apprentice has proven competence in those skills. However, if a skill is shaded, it is optional and does not need to be signed-off.

***If you need additional copies of the Sponsor Record, visit SkilledTradesOntario.ca and search Sponsor Record Form.**

Change of Sponsor Record #2

Sponsor Information		
Apprentice Name		
Training Agreement #		Date (mm/dd/yy)
Sponsor Name		
Address		
Telephone		
E-mail Address		

Summary of Training	
Employment Start Date	
Employment End Date	
Total hours of training & instruction between dates of employment.	
Skill Sets Completed	

As the Sponsor, I hereby confirm that the above information is true and accurate to the best of my knowledge.

Signature: _____ Date: (mm/dd/yy) _____

The Sponsor is required to sign-off and date the skills after the Apprentice has proven competence in those skills. However, if a skill is shaded, it is optional and does not need to be signed-off.

***If you need additional copies of the Sponsor Record, visit SkilledTradesOntario.ca and search Sponsor Record Form.**

Change of Sponsor Record #3

Sponsor Information		
Apprentice Name		
Training Agreement #		Date (mm/dd/yy)
Sponsor Name		
Address		
Telephone		
E-mail Address		

Summary of Training	
Employment Start Date	
Employment End Date	
Total hours of training & instruction between dates of employment.	
Skill Sets Completed	

As the Sponsor, I hereby confirm that the above information is true and accurate to the best of my knowledge.

Signature: _____ Date: (mm/dd/yy) _____

The Sponsor is required to sign-off and date the skills after the Apprentice has proven competence in those skills. However, if a skill is shaded, it is optional and does not need to be signed-off.

***If you need additional copies of the Sponsor Record, visit SkilledTradesOntario.ca and search Sponsor Record Form.**

Change of Sponsor Record #4

Sponsor Information		
Apprentice Name		
Training Agreement #		Date (mm/dd/yy)
Sponsor Name		
Address		
Telephone		
E-mail Address		

Summary of Training	
Employment Start Date	
Employment End Date	
Total hours of training & instruction between dates of employment.	
Skill Sets Completed	

As the Sponsor, I hereby confirm that the above information is true and accurate to the best of my knowledge.

Signature: _____ Date: (mm/dd/yy) _____

The Sponsor is required to sign-off and date the skills after the Apprentice has proven competence in those skills. However, if a skill is shaded, it is optional and does not need to be signed-off.

***If you need additional copies of the Sponsor Record, visit SkilledTradesOntario.ca and search Sponsor Record Form.**

Appendix A — Instructions for Apprenticeship Program Completion

Once an Apprentice has completed all the classroom training and benchmark on-the-job hours specified for the trade and has acquired all the mandatory skills included in this Logbook.

The Apprentice and the Sponsor complete the Apprentice Completion Form and the Skill Set Completion for Sponsors Form located on the following pages.

1. They sign the forms and submit them to their local Service Delivery Office. To find the closest office, check the contact information at ontario.ca/page/employment-ontario-apprenticeship-offices or call the Employment Ontario toll free number at (1-800-387-5656).
2. For All Trades: All mandatory skills (or the combination indicated in the completion requirements for the trade) in the Logbook must be signed-off. The recommended hours are a benchmark. If the Sponsor is completing the Apprentice before the industry recommended training hours are done, staff may request further information regarding the Apprentice's on-the-job training. An example of a request would be a letter from the Sponsor confirming the Apprentice worked for some time in the trade before the initial Training Agreement was registered, thereby acquiring some skills beforehand.

If Apprentices are submitting the completion request form and supporting documentation to their local Service Delivery Office by mail, fax, or email (as a scanned document), they should not include their Logbook; if they are presenting this form in person at the local Service Delivery Office, they should bring their Logbook with them.

After staff verifies all the information in the completion request, they may contact either the Apprentice or the Sponsor for further information or documentation. Once the completion has been confirmed, the local Service Delivery Office will issue a Certificate of Apprenticeship to the Apprentice.

Skilled Trades Ontario will receive notification of this completion.

- If the Apprentice has completed a program in a **compulsory trade**, Skilled Trades Ontario will automatically register the Apprentice for a Provisional Certificate of Qualification to continue to work legally for one year while preparing for the certification examination.
- If an Apprentice completes their apprenticeship in a **non-compulsory trade** and there is a Certificate of Qualification exam, they must write and pass the exam to receive a Certificate of Qualification from Skilled Trades Ontario.

For permission to schedule an exam once completion is confirmed, the individual must first contact the Skilled Trades Ontario Client Services Department at 647-847-3000 or toll free at 1-855-299-0028 to pay the certification examination fee. Once you have paid your exam fee with Skilled Trades Ontario, book your exam by contacting your nearest Employment Ontario local Service Delivery Office.

Appendix B — Apprentice Completion Form

Please fill out both sides of this form, including the Skill Set Completion for Sponsors (see back of form). Once both sides are completed, submit the form to your local Service Delivery Office (find contact information at ontario.ca/page/employment-ontario-apprenticeship-offices or by calling Employment Ontario at (1-800-387-5656).

Apprentice Information	
Name (print)	
Client ID # Issued by Ministry	
Telephone Number(s)	

Sponsor Information	
Legal Name	
Address	
Telephone Number(s)	
Sponsor's Signing Authority <i>(print name)</i>	
E-mail Address	

Program Information	
Trade Name	
Number of hours required as per Training Agreement <i>(hours-based trades only)</i>	
Hours completed? <i>(documentation attached)</i>	Yes () No () Not applicable ()
Classroom training completed or exempt?	Yes () No () Not applicable ()

I hereby confirm that the information submitted on both sides of this form is true and accurate.

X _____
Apprentice's Signature Date

X _____
Signature of Sponsor's Signing Authority Date

Appendix C — Skill Set Completion for Sponsors

You will find the skill set numbers and titles in the Logbook's Table of Contents. By signing off each skill set in the table below, you are providing final confirmation, as the Apprentice's Sponsor, that the Apprentice has demonstrated competency in all the mandatory skills included in the skill set.

Skill Set #	Skill Set Title	Signing Authority Signature
U5860.0	Occupational Health and Safety Procedures	
U5861.0	Manufacturer's Specification Plate	
U5862.0	Batteries	
U5863.0	Starting, Charging and Electrical Systems	
U5864.0	Engine Systems	
U5865.0	Engine Management, Fuel and Emission Control Systems	
U5866.0	Transmission, Drive Axle and Final Drive Systems and Components	
U5867.0	Steering and Suspension Systems and Tires and Wheels	
U5868.0	Braking Systems	
U5869.0	Electric Motor Systems	
U5870.0	Control Systems-Electric Vehicles	
U5871.0	Hydraulic Systems	
U5872.0	Lifting Systems	
U5873.0	Frame, Overhead Guards and Cab Systems	
U5874.0	Climate Control Systems	

Ministry of Labour, Immigration, Training and Skills Development use only:

Sponsor verified as most recent sponsor of record: Yes () No ()

Documentation to support completion of hours attached: Yes () No ()

Completion of classroom training verified: Yes () No ()

Staff Name _____ Signature _____

Date _____

Appendix D — Local Service Delivery Offices in Ontario

For current office listings visit: ontario.ca/page/employment-Ontario-apprenticeship-offices

Location	Contact	Location	Contact
Barrie 705-737-1431	55 Cedar Pointe Dr Unit 609, Barrie, ON L4N 5R7	Marathon 807-346-1550	52 Peninsula Road, Suite 103 Marathon, Ontario, P0T 2E0
Belleville 613-968-5558 1-800-953-6885	135 North Front St, Belleville, ON K8P 3B5	Markham 905-513-2695	140 Allstate Parkway, Suite 505, Markham, Ontario L3R 5Y8
Brantford 519-756-5197	505 Park Rd North Suite 201, Brantford, ON N3R 7K8	North Bay 705-495-8515 1-800-236-0744	200 First Ave West, North Bay, ON P1B 3B9
Chatham 519-354-2766 1-800-214-8284	870 Richmond St West 1st Floor, Chatham, ON N7M 5J5	Ottawa 613-731-7100 1-877-221-1220	Preston Square, 347 Preston Street, Suite 310, Ottawa, ON K1S 3H8
Cornwall 613-938-9702 1-877-668-6604	132 Second St East Ste 202, Cornwall, ON K6H 1Y4	Owen Sound 519-376-5790 1-800-838-9468	1450 1st Ave West, Suite 100, Owen Sound, ON N4K 6W2
Dryden 807-456-2665 1-800-734-9572	Provincial Government Building, 479 Government St, Dryden, ON P8N 3K9	Peel 905-279-7333 1-800-736-5520	The Emerald Centre, 10 Kingsbridge Garden Circle, Suite 404, Mississauga, ON L5R 3K6
Durham 905-433-0595 1-800-461-4608	78 Richmond Street West, Oshawa, ON L1G 1E1	Pembroke 613-735-3911 1-800-807-0227	615 Pembroke St East, Pembroke, ON K8A 3L7
Elliot Lake 1-800-236-8817	50 Hillside Dr North, Elliot Lake, ON P5A 1X4	Peterborough 705-745-1918 1-877-433-6555	901 Lansdowne St West, Peterborough, ON K9J 1Z5
Fort Frances 807-274-8634	922 Scott St 2nd Flr, Fort Frances, ON P9A 1J4	Sarnia 519-542-7705 1-800-363-8453	Bayside Mall, 150 Christina St North, Sarnia, ON N7T 7W5
Geraldton 807-854-1966	208 Beamish Avenue West Geraldton, Ontario P0T 1M0	Sault Ste. Marie 705-945-6815 1-800-236-8817	477 Queen St East 4th Flr, Sault Ste Marie, ON P6A 1Z5
Halton 905-842-5105 1-844-901-5105	700 Dorval Dr., Suite 201, Oakville, ON L6K 3V3	St Catharines 905-704-2991 1-800-263-4475	Garden City Tower, 301 St Paul St East, 10th Flr, St Catharines, ON L2R 7R4
Hamilton 905-521-7764 1-800-668-4479	Ellen Fairclough Bldg, 119 King St West 8th Flr, Hamilton, ON L8P 4Y7	Sudbury 705-564-3030 1-800-603-5999	159 Cedar St Ste 506, Sudbury, ON P3E 6A5
Kapuskasing 705-465-5785 705-235-1950	Ontario Government Complex, 122 Government Rd West, Kapuskasing, ON P5N 2X8	Thunder Bay 807-346-1550 1-800-439-5493	189 Red River Rd Suite 103, Thunder Bay, ON P7B 1A2
Kenora 807-468-2879 1-800-734-9572	227 1/2 Second St South, Kenora, ON P9N 1G4	Timmins 705-235-1950 1-877-275-5139	Ontario Government Complex, 5520 Highway 101 East Wing B, South Porcupine, ON P0N 1H0
Kingston 613-548-1151 1-866-973-4043	Alliance Business Centre, 299 Concession St Ste 201, Kingston, ON K7K 2B9	Toronto Centre 416-927-7366 1-800-387-5656	2 St Clair West, 11 th floor Toronto, ON M4A 1L5
Kitchener 519-653-5758 1-866-877-0099	4275 King St East, Kitchener, ON N2P 2E9	Toronto South 416-326-5800	625 Church St 1st Fl, Toronto, ON M7A 2B5
London 519-675-7788 1-800-265-1050	1200 Commissioners Rd E, Unit 72, London, ON N5Z 4R3	Windsor 519-973-1441	Roundhouse Centre, 3155 Howard Ave 2nd Fl, Suite 200, Windsor, ON N8X 4Y8

Competency Analysis Profile (CAP) Chart

<p>U5860.0 Occupational Health and Safety Procedures</p>	<p>5860.01 Identify and take corrective action against potential workplace health and safety hazards</p>	<p>5860.02 Handle, store and dispose of hazardous workplace materials</p>	<p>5860.03 Wear and maintain personal protective equipment</p>	<p>5860.04 Comply with workplace-related legislation</p>	<p>5860.05 Interpret and apply service-related information</p>
	<p>5860.06 Practice good housekeeping in the workplace</p>	<p>5860.07 Comply with Workplace Hazardous Materials Information System (WHMIS) guidelines</p>			
<p>U5861.0 Manufacturer's Specification Plate</p>	<p>5861.01 Perform visual inspection, identifying systems type and applications</p>	<p>5861.02 Diagnose and troubleshoot manufacturer's specification plate</p>	<p>5861.03 Repair/replace manufacturer's specification plate</p>	<p>5861.04 Verify repair/replacement of manufacturer's specification plate</p>	
<p>U5862.0 Batteries</p>	<p>5862.01 Perform visual inspection identifying systems type and applications</p>	<p>5862.02 Diagnose and troubleshoot batteries</p>	<p>5862.03 Repair/replace batteries</p>	<p>5862.04 Verify repair/replacement of batteries</p>	

U5863.0
Starting,
Charging and
Electrical
Systems

5863.01
Perform visual inspection, identifying systems type and applications

5863.02
Diagnose and troubleshoot starting batteries

5863.03
Service and boost/charge starting batteries

5863.04
Diagnose and troubleshoot starting systems and components

5863.05
Repair/replace starting systems and components

5863.06
Verify repair/replacement of starting systems and components

5863.07
Diagnose and troubleshoot charging systems and components

5863.08
Repair/replace charging systems and components

5863.09
Verify repair/replacement of charging systems and components

5863.10
Diagnose and troubleshoot electrical systems and components

5863.11
Repair/replace electrical systems and components

5863.12
Verify repair/replacement of electrical systems and components

U5864.0
Engine Systems

5864.01
Perform visual inspection, identifying systems type and applications

5864.02
Diagnose and troubleshoot cooling systems and components

5864.03
Repair/replace cooling systems and components

5864.04
Verify repair/replacement of cooling systems and components

5864.05
Diagnose and troubleshoot engine lubricating systems and components

5864.06
Repair/replace engine lubricating systems and components

5864.07
Verify repair/replacement of engine lubricating systems and components

5864.08
Diagnose and troubleshoot cylinder head and components

5864.09
Repair/replace cylinder head and components

5864.10
Verify repair/replacement of cylinder head and components

5864.11
Diagnose and troubleshoot engine block and components

5864.12
Repair/replace engine block and components

5864.13
Verify repair/replacement of engine block and components

**U5865.0
Engine
Management,
Fuel and
Emission Control
Systems**

5865.01
Perform visual inspection identifying systems type and applications

5865.02
Diagnose and troubleshoot electronically-controlled ignition systems and components

5865.03
Repair/replace electronically-controlled ignition systems and components

5865.04
Skill description
Verify repair/replacement of electronically-controlled ignition systems and components

5865.05
Diagnose and troubleshoot electronically-controlled diesel common rail systems and components

5865.06
Repair/replace electronically-controlled diesel common rail systems and components

5865.07
Verify repair/replacement of electronically-controlled diesel common rail systems and components

5865.08
Perform electronically-controlled ignition systems engine tune-ups

5865.09
Perform electronically-controlled diesel common rail engine tune-ups

5865.10
Perform visual inspection identifying systems type and applications

5865.11
Diagnose and troubleshoot gasoline fuel systems and components

5865.12
Repair/replace gasoline fuel systems and components

5865.13
Verify repair/replacement of gasoline fuel systems and components

5865.14
Diagnose and troubleshoot liquefied petroleum gas (LPG) systems and component

5865.15
Repair/replace liquefied petroleum gas (LPG)

(Continued on the next page)

Competency Analysis Profile: Powered Lift Truck Technician 282E (all unshaded skill sets must be completed)

U5865.0
Engine
Management,
Fuel and
Emission Control
Systems
(continued)

5865.16
Verify repair/
replacement of
liquefied
petroleum gas
(LPG)

5865.17
Diagnose and
troubleshoot
compressed
natural gas
(CNG)

5865.18
Repair/replace
compressed
natural gas
(CNG)

5865.19
Verify repair/
replacement of
compressed
natural gas
(CNG)

5865.20
Diagnose and
troubleshoot dual
fuel (gasoline
and LPG)
systems and
components

5865.21
Repair/replace
dual fuel
(gasoline and
LPG) systems
and components

5865.22
Verify the repair/
replacement of
dual fuel
(gasoline and
LPG) systems
and components

5865.23
Diagnose and
troubleshoot
mechanically-
controlled diesel
fuel systems and
components

5865.24
Repair/replace
mechanically-
controlled diesel
fuel systems and
components

5865.25
Verify repair/
replacement of
mechanically-
controlled diesel
fuel systems and
components

5865.26
Diagnose and
troubleshoot
electronically-
controlled diesel
fuel systems and
components

5865.27
Repair/replace
electronically-
controlled diesel
fuel systems and
components

5865.28
Verify repair/
replacement of
electronically-
controlled diesel
fuel systems and
components

5865.29
Diagnose and
troubleshoot
emissions
systems and
components

5865.30
Repair/replace
emissions
systems and
components

5865.31
Verify repair/
replacement of
emissions
systems and
components

Competency Analysis Profile: Powered Lift Truck Technician 282E (all unshaded skill sets must be completed)

U5866.0
**Transmission,
Drive Axle and
Final Drive
Systems and
Components**

5866.01
Perform visual inspection identifying systems type and applications

5866.02
Diagnose and troubleshoot manual transmissions and components

5866.03
Repair/replace manual transmissions and components

5866.04
Verify repair/replacement of manual transmissions and components

5866.05
Diagnose and troubleshoot power shift transmissions and components

5866.06
Repair/replace power shift transmissions and components

5866.07
Verify repair/replacement of power shift transmissions and components

5866.08
Diagnose and troubleshoot hydrostatic transmissions and components

5866.09
Repair/replace hydrostatic transmissions and components

5866.10
Verify repair/replacement of hydrostatic transmissions and components

5866.11
Diagnose and troubleshoot drive axle and final drive systems and components

5866.12
Repair/replace drive axle and final drive systems and components

5866.13
Verify repair/replacement of drive axle and final drive systems and components

U5867.0
Steering and
Suspension
Systems and
Tires and Wheels

5867.01
Perform visual inspection identifying systems type and applications

5867.02
Diagnose and troubleshoot manual, power, electrical/ electronically-controlled steering systems and components

5867.03
Repair/replace manual, power, electrical/ electronically-controlled steering systems and components

5867.04
Verify repair/ replacement of manual, power, electrical/ electronically-controlled steering systems and components

5867.05
Diagnose and troubleshoot automated vehicle guidance steering systems and components

5867.06
Repair/replace automated vehicle guidance steering systems and components

5867.07
Verify repair/ replacement of automated vehicle guidance steering systems and components

5867.08
Diagnose and troubleshoot active suspension systems and components

5867.09
Repair/replace active suspension systems and components

5867.10
Verify repair/ replacement of active suspension systems and components

5867.11
Diagnose and troubleshoot pneumatic and solid tires, wheels and components

5867.12
Repair/replace pneumatic and solid tires, wheels and components

5867.13
Verify repair/ replacement of pneumatic and solid tires, wheels and components

Competency Analysis Profile: Powered Lift Truck Technician 282E (all unshaded skill sets must be completed)

U5868.0 Braking Systems	5868.01 Perform visual inspection identifying systems type and applications	5868.02 Diagnose and troubleshoot mechanical and hydraulic braking systems and components	5868.03 Repair/replace mechanical and hydraulic braking systems and components	5868.04 Verify repair/ replacement of mechanical and hydraulic braking systems and components	5868.05 Diagnose and troubleshoot pneumatic braking systems and components	
	5868.06 Repair/replace pneumatic braking systems and components	5868.07 Verify repair/ replacement of pneumatic braking systems and components	5868.08 Diagnose and troubleshoot electro- magnetic braking systems and components	5868.09 Repair/replace electro-magnetic braking systems and components	5868.10 Verify repair/ replacement of electro-magnetic braking systems and components	
	U5869.0 Electric Motor Systems	5869.01 Perform visual inspection identifying systems type and applications	5869.02 Diagnose and troubleshoot direct current (DC) electric motors and components	5869.03 Repair/replace direct current (DC) electric motors and components	5869.04 Verify repair/ replacement of direct current (DC) electric motors and components	5869.05 Diagnose and troubleshoot alternating current (AC) electric motors and components
		5869.06 Repair/replace alternating current (AC) electric motors and components	5869.07 Verify repair/ replacement of alternating current (AC) electric motors and components			

U5870.0
Control Systems-
Electric Vehicles

5870.01
Perform visual inspection identifying systems type and applications

5870.02
Diagnose and troubleshoot resistor systems and components

5870.03
Repair/replace resistor systems and components

5870.04
Verify repair/ replacement of resistor systems and components

5870.05
Diagnose and troubleshoot silicone controlled rectifier (SCR) systems and components

5870.06
Repair/replace silicone controlled rectifier (SCR) systems and components

5870.07
Verify repair/ replacement of silicone controlled rectifier (SCR) systems and components

5870.08
Diagnose and troubleshoot transistor systems and components

5870.09
Repair/replace transistor systems and components

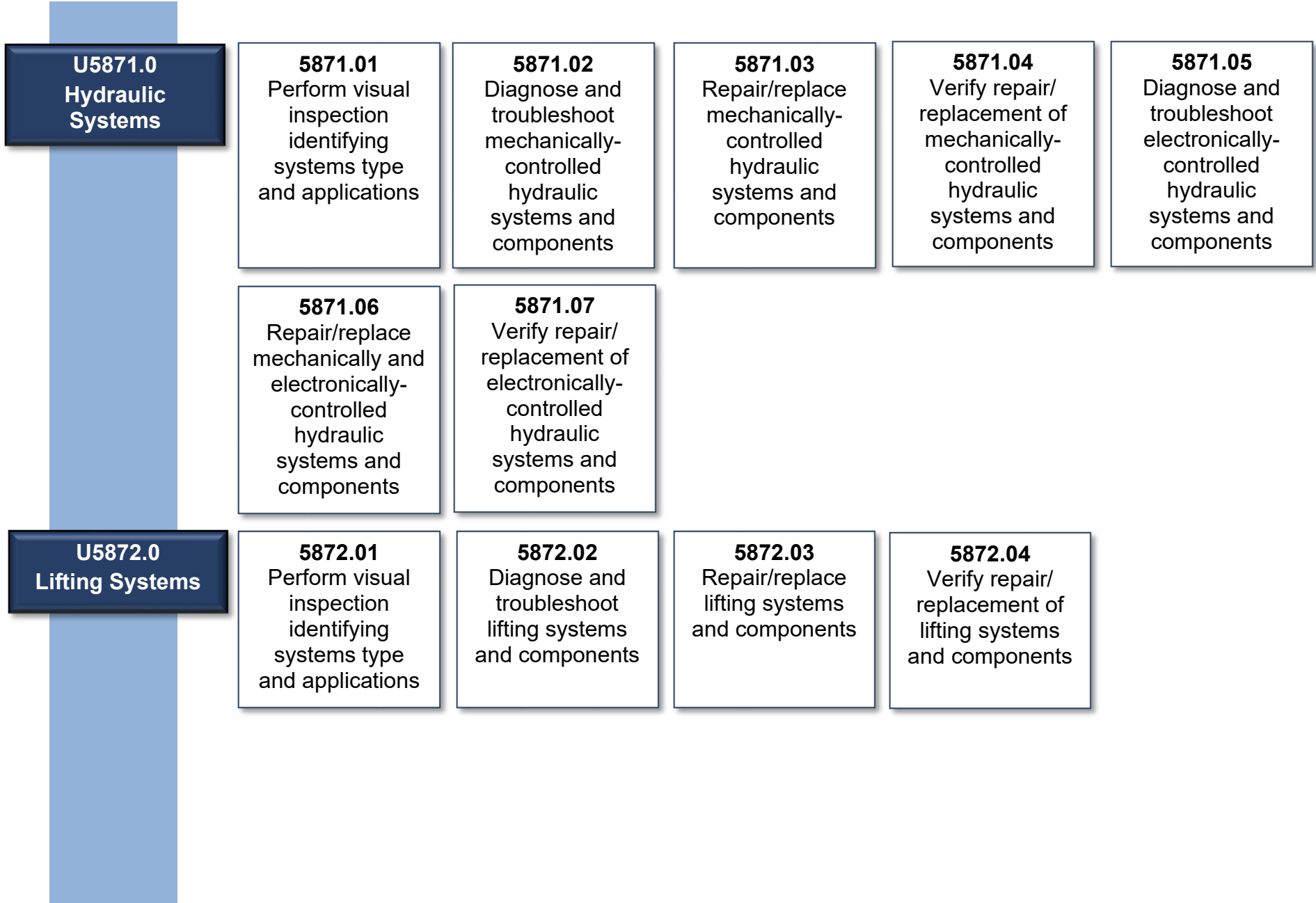
5870.10
Verify repair/ replacement of transistor systems and components

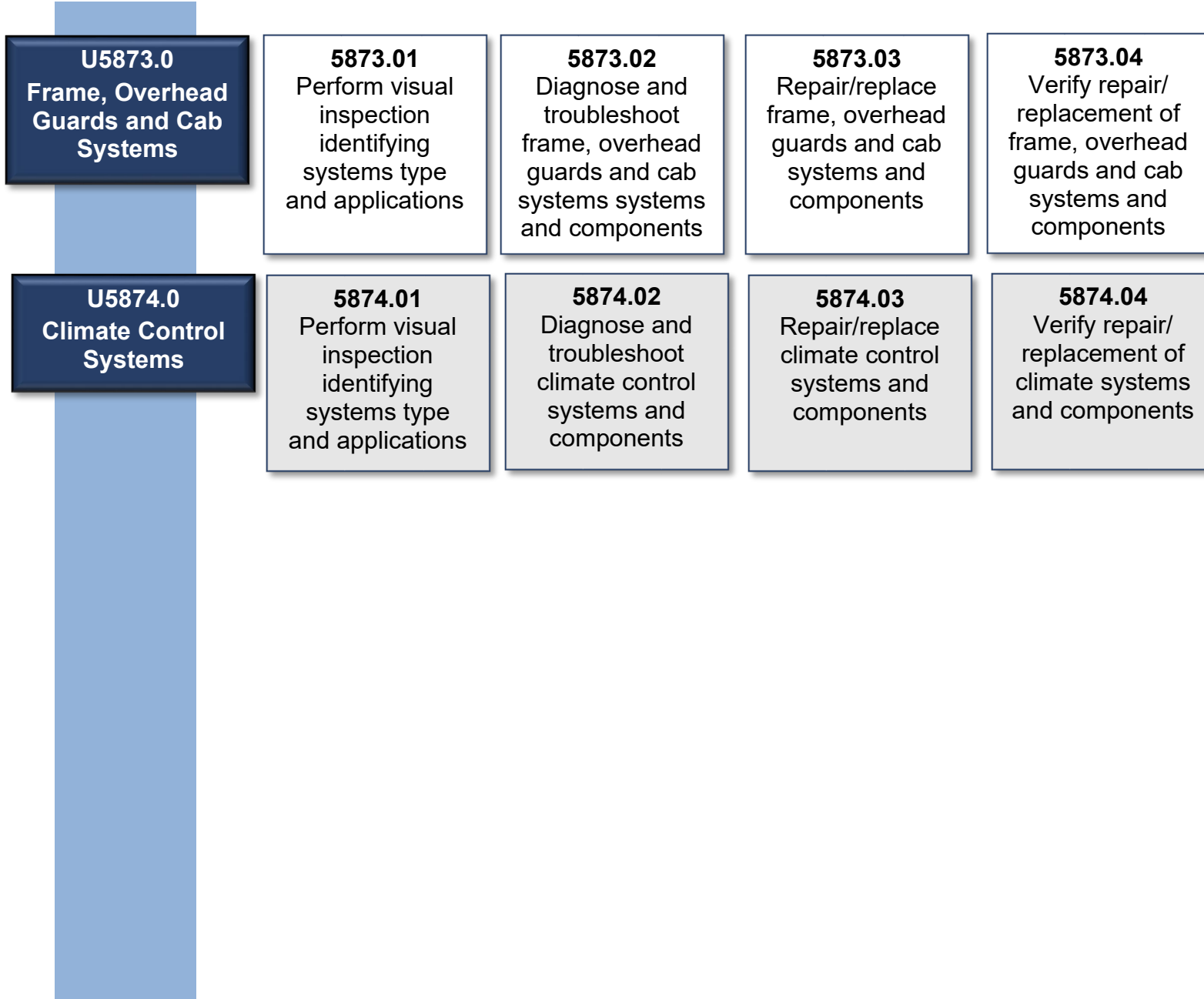
5870.11
Diagnose and troubleshoot alternating current (AC) power systems and components

5870.12
Repair/replace alternating current (AC) power systems and components

5870.13
Verify repair/ replacement of alternating current (AC) power systems and components

Competency Analysis Profile: Powered Lift Truck Technician 282E (all unshaded skill sets must be completed)





Completing Your Apprenticeship Program

Once your sponsor agrees you are competent in the required skills, your hours are complete and you have completed all the levels of classroom training required for your trade:

- ✓ Follow the completion instructions on the Completion Form (Appendix A) in the Logbook.
- ✓ Answer any questions that MLITSD staff may have and provide any additional completion documentation that may be required.
- ✓ Once completion is confirmed, MLITSD will issue you a Certificate of Apprenticeship and notify Skilled Trades Ontario.

After Your Apprenticeship

If you are in a trade with a certification exam, Skilled Trades Ontario will receive notice of your completion.

For compulsory trades, you will be issued a Provisional Certificate of Qualification which will allow you to work legally for up to 12 months until you write and pass your examination.

For a non-compulsory trade, once you pass your examination, you will be issued a Certificate of Qualification for your trade.

Preparing For Your Exam

- **To pay for a Certificate of Qualification examination, contact Skilled Trades Ontario** Client Services Department at: 647-847-3000 or toll free at 1-855-299-0028
- **To schedule your exam:** Once you have paid, contact your local Service Delivery Office to book your exam.
- **Download Skilled Trades Ontario exam preparation guide at:** [Exam Resources – Skilled Trades Ontario](#) and/or view the exam preparation guide for Red Seal trades at: red-seal.ca



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