COMPETENCY PROFILE:

ELECTRONICS ASSEMBLER

ROLE OVERVIEW

As an electronics assembler in the electric vehicle battery supply chain, you are at the forefront of the green transportation revolution. Your primary duties involve assembling battery modules and packs, thereby creating the power source for electronic vehicles.

You should have astute skills in soldering, wiring, and securing electronic components. In addition to rigorous attention to detail to follow specific engineering blueprints, you should also be able to apply knowledge of electrical systems to assemble individual cells and modules into a cohesive unit that ensures functionality and safety. You test the assembled battery units, employing diagnostic equipment to verify their performance against specifications and record errors that inform continuous improvement.

Collaborating with engineers, you discuss design enhancements and apply their feedback to refine assembly processes. You adapt to new methods and technologies that emerge within the industry, maintaining the cutting edge of assembly techniques. Your contribution to the supply chain is technical and strategic, as the components you craft are integral to the propulsion of electric vehicles. Through your expertise, you maintain the integrity of the manufacturing process, assuring the delivery of high-quality battery systems for the electric vehicle market.

ALSO KNOWN AS:

- Battery Pack Assembler
- Electronics Fabricator
- Circuit Board Assembler

NATIONAL OCCUPATIONAL CLASSIFICATION:

- 94201 – Electronics assemblers, fabricators, inspectors, and testers

EDUCATION AND EXPERIENCE

- A high school diploma is often required, specifically completing Grade 12 in Alberta, to start a career as an electronic assembler.
- A two-year trade certification in electronics assembly may be required to improve knowledge of electronic components and assembly techniques.
- Most employers provide on-the-job training, essential for gaining hands-on experience, understanding employer-specific processes and standards, and developing the skills necessary to assemble electronic devices and systems efficiently.

TECHNICAL

Electronics Assembly

Contributes to assembling and commissioning component assemblies, equipment, and systems to produce electronics and ensure electronic functionality.

- Use hand tools to align and adjust parts, components, and harnesses on assemblies according to blueprints to ensure functionality.
- Install components and adjust voltages to specified values to determine the operational accuracy of instruments.
- Accurately assemble high-voltage battery packs and management systems, ensuring optimal performance and safety.
- Implement wiring and connector systems for high-voltage components, reducing resistance and ensuring secure connections.
- Apply insulation and protective measures to high-voltage systems, preventing electrical hazards.
- Conduct pre-assembly checks on components to ensure compatibility and safety for high-voltage applications.

Precision Soldering and Circuit Board Assembly

Solder various electronic components to printed circuit boards (PCBs) used in EV control systems to ensure accurate and reliable connections.

- Execute fine-pitch soldering on PCBs, minimizing the risk of cold solder joints and ensuring long-term reliability.
- Use rework stations to replace defective components on circuit boards without damaging adjacent parts.
- Apply conformal coatings to protect electronic assemblies from moisture, dust, and temperature extremes.
- Assemble multi-layer PCBs with attention to thermal management and signal integrity.

Quality Assurance and Control

Follows appropriate processes, as directed by organizational best practices, to ensure quality is maintained throughout operations.

- Perform electrical testing on assembled PCBs using multimeters, oscilloscopes, and automated test equipment to verify component functionality.
- Apply rigorous quality control checks to identify any assembly issues and ensure assemblies conform to specifications.
- Identifies defective materials to remove them from the production line to ensure final production quality.
- Document testing procedures and outcomes, providing clear feedback for continuous improvement.
- Maintain records and forms to report defective manufacturing materials to ensure quality control throughout manufacturing.

Interprets Blueprints and Specifications

Reads work orders and blueprints to understand technical aspects of electronics to ensure batteries are assembled to appropriate specifications and requirements.

- Inspect wiring installations, assemblies, or circuits for resistance and operational effectiveness.
- Read work orders or other instructions to determine product specifications or materials requirements.
- Document production data meticulously to maintain accurate records of specifications and procedures.
- Adheres to blueprints and technical plans to create subassemblies and finished products.

Machinery and Equipment Operation

Operates equipment using established processes to ensure outcomes are within allowable variances and maximizes safety and efficiency.

- Monitor and adjust process equipment to fabricate electronic components, ensuring precision and quality.
- Use appropriate tools to fabricate parts according to specifications for custom requirements.
- Operates measurement instruments according to manufacturer's specifications to measure parts of manufactured objects.
- Adjust electrical flow to tools or equipment to maintain operational accuracy and safety.

PERSONAL & PROFESSIONAL

Communication

Positively directs outcomes by delivering communication that better understands goals and objectives and gains support for immediate action.

- Share knowledge of assembly procedures with other team members to improve collective expertise in the organization.
- Discuss tasks with supervisors and engineers to streamline workflow and troubleshoot issues for improved production.
- Guide best repair methods to optimize functionality and ensure adherence to technical specifications.

Attention to Detail

Review completed work by monitoring and checking manufacturing specifications, organizing tasks and resources efficiently, or examining all areas involved in achieving an objective.

- Accurately completes documents and report logs to ensure safe and efficient operations.
- Catches and corrects own errors or omissions, where applicable, to ensure efficiency and safety.
- Follows process steps as outlined in standard operating procedures when completing routine tasks.
- Correctly interprets specifications to integrate all components and ensure the final product is high quality.
- Inspects and tests completed components and assemblies, wiring installations, and circuits to remove and replace faulty components and ensure the final product works as intended.
- Identifies operating errors in existing equipment, processes, or systems to notify supervisors of any areas of improvement and generate potential solutions.

LEGAL, POLICY, AND REGULATORY

Health and Safety Procedures

Adheres to and advocates specific workplace safe operating procedures and occupational health and safety requirements within a defined jurisdiction to ensure the health and safety of others.

- Wears the appropriate personal protective equipment (PPE) and other measures for personal safety to prevent personal harm when working with dangerous materials and/or equipment.
- To perform service, adhere to lockout/tagout procedures to secure machines, equipment, and processes in a zero-energy state.
- Identifies and reports risks associated with project tasks and communicates these with the team and supervisor to develop risk management policies and procedures, if not already in place, to contribute to a safer workspace.
- Exemplifies safe workplace practices to uphold the practices of the HSE program, set an example for co-workers, and keep everyone safe.

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Electrostatic Discharge Protection

Implement electrostatic discharge (ESD) protection measures during assembly to prevent damage to sensitive electronic components.

- Consistently use ESD protective gear and follow protocols to minimize the risk of component damage.
- Maintain an ESD-safe workstation, including anti-static mats and grounding equipment.
- Conduct regular ESD safety checks and equipment maintenance to ensure a safe working environment.
- Educate team members on ESD risks and proper handling techniques to foster a culture of safety.

This profile is a living document. If you have any feedback or would like to help us improve the profile, please reach out to research@eco.ca.

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