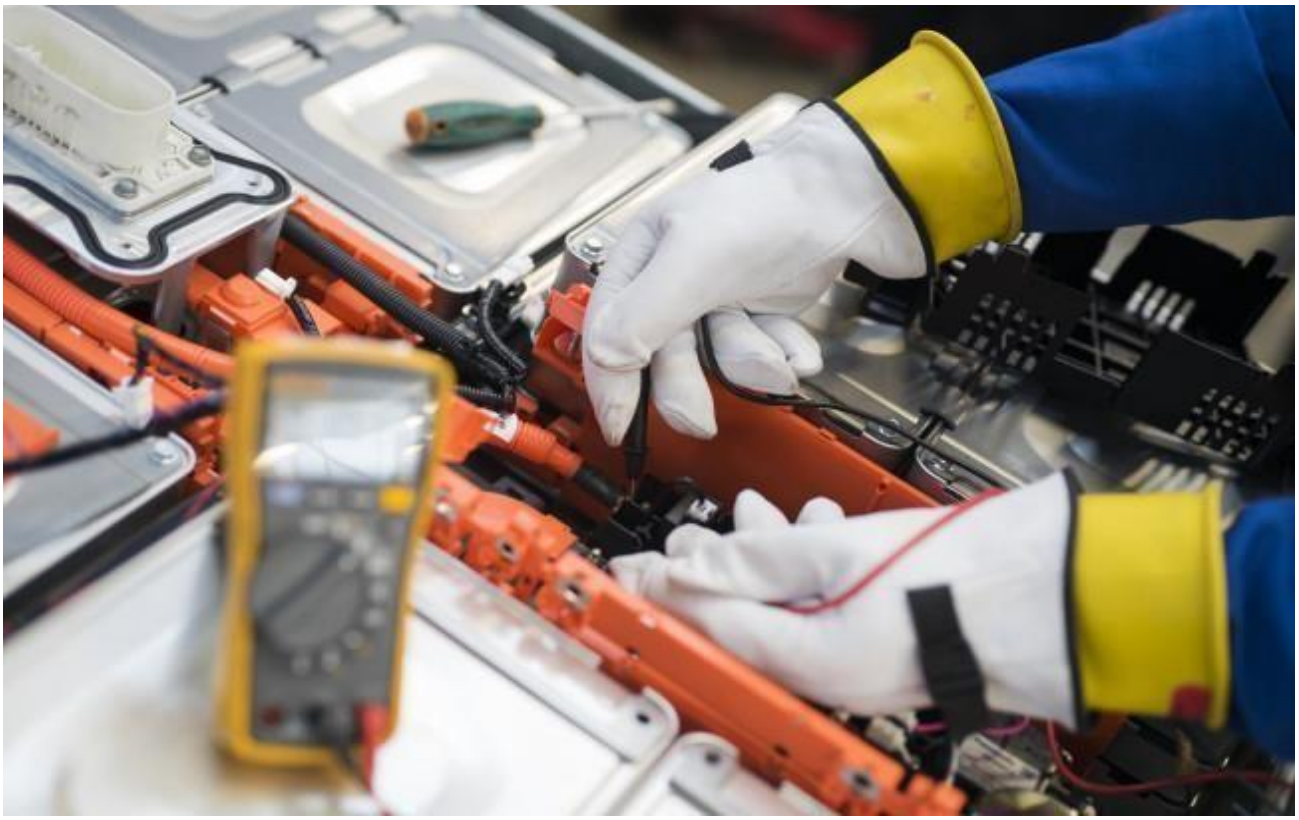

Model Curriculum

QP Name: Electric Vehicle Service Assistant

QP Code: ASC/Q1435

NSQF Level: 2.5

Automotive Skill Development Council
E-113 GF, Okhla Phase III, Okhla Industrial Area, New Delhi, Delhi 110020

Table of Contents

Training Parameters

Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
Country	India
NSQF Level	2.5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3115.0602
Minimum Educational Qualification and Experience	8th Class Pass and pursuing continuous regular schooling OR 8th Class with 1 year of relevant experience OR 8th Class Pass + 2 years ITI OR 10th Class OR Certificate-NSQF (Automotive Washer L2) with 2 years of relevant experience, 18 years
Pre-Requisite License or Training	Driving License and Basic Computer Skills
Minimum Job Entry Age	18 years
Last Reviewed On	28th July, 2022
Next Review Date	28th July, 2025
NSQC Approval Date	28th July, 2022
Model Curriculum Creation Date	28th July, 2022
Model Curriculum Valid Up to Date	28th July, 2025
Minimum Duration of the Course	300 Hours 00 Minutes
Maximum Duration of the Course	570 Hours 00 Minutes

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Show how to support in preparatory activities related to service and repairing of an EV.
- Assist the service technician in diagnosing and repairing faults in an electric vehicle.
- Work effectively and efficiently as per schedules and timelines.
- Implement safety practices.
- Optimize the use of resources to ensure less wastage and maximum conservation.

After completing Elective 1, the participants will be able to:

- Assist and perform routine service/maintenance/minor repairs of the four wheeler EV.

After completing Elective 2, the participants will be able to:

- Assist and perform routine service/maintenance/minor repairs of the 2/3 wheeler EV.

After completing Elective 3, the participants will be able to:

- Assist and perform routine service/maintenance/minor repairs of the heavy commercial EV.

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	**05:00**	**00:00**	-	-	**05:00**
Module 1: Introduction to the role of an Electric Vehicle Service Assistant	05:00	00:00	-	-	05:00
ASC/N9801 - Organize Work and Resources (Service) NOS Version No. 1.0 NSQF Level 2.5	**25:00**	**30:00**	-	-	**55:00**
Module 2: Work effectively and efficiently	15:00	15:00	-	-	30:00
Module 3: Optimize resource utilization	10:00	15:00	-	-	25:00
ASC/N1454: Assist in	**30:00**	**100:00**	**80:00**	-	**210:00**

service, maintenance and repair of electric vehicle NOS Version No. – 1.0 NSQF Level – 2.5					
Module 4: Assist in routine service and repair of an Electric Vehicle (EV)	30:00	100:00	80:00	-	210:00
DGT/VSQ/N0101 - Employability Skills (30 hours) NOS Version No. – 1.0 NSQF Level – 2.5	**12:00**	**18:00**			**30:00**
Module 5: Introduction to Employability Skills	0.5:00	0.5:00			1:00
Module 6: Constitutional values - Citizenship	0.5:00	0.5:00			1:00
Module 7: Becoming a Professional in the 21st Century	0.5:00	0.5:00			1:00
Module 8: Basic English Skills	1:00	1:00			2:00
Module 9: Communication Skills	1.5:00	2.5:00			4:00
Module 10: Diversity & Inclusion	0.5:00	0.5:00			1:00
Module 11: Financial and Legal Literacy	1.5:00	2.5:00			4:00
Module 12: Essential Digital Skills	1:00	2:00			3:00
Module 13: Entrepreneurship	2.5:00	4.5:00			7:00
Module 14: Customer Service	1.5:00	2.5:00			4:00
Module 15: Getting ready for apprenticeship & Jobs	1:00	1:00			2:00
Total Duration	**72:00**	**148:00**	**80:00**		**300:00**

Elective Modules

The table lists the modules and their duration corresponding to the optional NOS of the QP.

Elective 1:

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
ASC/N1455 – Automotive Detailer Technician NOS Version No. – 1.0 NSQF Level – 2.5	**30:00**	**36:00**	**24:00**		**90:00**

Module 16: Assist in routine service and repair of a four wheeler EV	30:00	36:00	24:00		90:00
Total Duration	**30:00**	**36:00**	**24:00**		**90:00**

Elective 2:

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
ASC/N1456 – Perform routine service, repair and maintenance of bicycle NOS Version No. – 1.0 NSQF Level – 2.5	**30:00**	**36:00**	**24:00**		**90:00**
Module 17: Assist in routine service and repair of a 2/3 wheeler EV	30:00	36:00	24:00		90:00
Total Duration	**30:00**	**36:00**	**24:00**		**90:00**

Elective 3:

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
ASC/N1457 – Carry out routine service or minor repairs on electric bicycles and assist in diagnosis NOS Version No. – 1.0 NSQF Level – 2.5	**30:00**	**36:00**	**24:00**		**90:00**
Module 18: Assist in routine service and repair of a heavy commercial electrical vehicle	30:00	36:00	24:00		90:00
Total Duration	**30:00**	**36:00**	**24:00**		**90:00**

Module Details

Module 1: Introduction to the role of an Electric Vehicle Service Assistant

Bridge module

Terminal Outcomes:

- Discuss the role and responsibilities of an Electric Vehicle Service Assistant.

Duration: *<05:00>*	**Duration**: *<00:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the role and responsibilities of an Electric Vehicle Service Technician. • Discuss the job opportunities for an Electric Vehicle Service Assistant in the automobile industry. • Discuss the job opportunities of an Electric Vehicle Service Assistant. • Explain about Indian EV manufacturing market. • List various types of EV's and different products/ models manufactured by Original Equipment Manufacturers (OEMs). • Illustrate the workshop structure. • Describe role and responsibilities of different people in the workshop. • Discuss the maintenance standards and procedures followed in organisation. • Identify the standard checklists and schedules recommended by OEM.	
Classroom Aids:	
Whiteboard, marker pen, projector, standard checklists and schedules samples	
Tools, Equipment and Other Requirements	

Module 2: Work Effectively and Efficiently

Mapped to ASC/N9801, v1.0

Terminal Outcomes:

- Employ appropriate ways to maintain safe and secure working environment.
- Perform work as per the quality standards.

Duration: *<15:00>*	**Duration**: *<15:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Outline the organizational structure to be followed to report about health, safety and security breaches to the concerned authorities. • List the potential workplace related risks and hazards, their causes and preventions. • State the methods to keep the work area clean and tidy. • Discuss how to complete the given work within the stipulated time period. • Explain how to maintain a proper balance between team and individual goals. • Discuss epidemics and pandemics and their impact on society at large. • Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol-based hand sanitizers. • Discuss the use of proper PPE for maintaining health and hygiene at workplace and the process of wearing/discarding them. • Define self-quarantine or self-isolation. • Discuss the importance of identifying and reporting symptoms to the concerned authorities. • Explain the significance of following prescribed rules and guidelines during an epidemic or a pandemic. • Discuss organizational hygiene and sanitation guidelines and ways of reporting breaches/gaps if any. • Discuss the ways of dealing with stress and anxiety during an epidemic or a pandemic.	• Perform routine cleaning of tools, equipment and machines. • Employ various techniques for checking malfunctions in the equipment as per Standard Operating Procedure (SOP). • Apply basic housekeeping practices to ensure that the work area is clean, such as mopping spills and leaks, cleaning grease stains etc. • Demonstrate how to evacuate the workplace in case of an emergency. • Show how to sanitize and disinfect one's work area regularly. • Demonstrate the correct way of washing hands using soap and water. • Demonstrate the correct way of sanitizing hands using alcohol-based hand rubs. • Display the correct way of wearing and removing PPE such as face masks, hand gloves, face shields, PPE suits, etc. • Demonstrate appropriate social and behavioural etiquette (greeting and meeting people, spitting/ coughing/ sneezing, etc.). • Prepare a list of relevant hotline/ emergency numbers.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• **Personal Protection Equipment:** safety glasses, head protection, rubber gloves, safety	

footwear, warning signs and tapes, fire extinguisher and first aid kit

- Sanitization kit, disinfectants, alcohol-based sanitizers, different types of face masks, shields, suits, etc.

Module 3: Optimize Resource Utilization

Mapped to ASC/N9801, v1.0

Terminal Outcomes:

- Use the resources efficiently.
- Apply conservation practices at the workplace.

Duration: *<10:00>*	**Duration**: *<15:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the ways to optimize usage of resources. • Discuss various methods of waste management and its disposal. • List the different categories of waste for the purpose of segregation • Differentiate between recyclable and non-recyclable waste • State the importance of using appropriate colour dustbins for different types of waste. • Discuss the common sources of pollution and ways to minimize it.	• Perform basic checks to identify any spills and leaks and that need to be plugged/ stopped. • Demonstrate different disposal techniques depending upon different types of waste. • Employ different ways to check if equipment/ machines are functioning as per requirements and report malfunctioning, if observed. • Employ ways for efficient utilization of material and water • Use energy efficient electrical appliances and devices to ensure energy conservation
Classroom Aids:	
White board/black board marker/chalk, duster, computer or Laptop attached to LCD projector	
Tools, Equipment and Other Requirements	
Different type of waste bins to collect and segregate waste for disposal	

Module 4: Assist in routine service and repair of an Electric Vehicle (EV)

Mapped to ASC/N1454, v1.0

Terminal Outcomes:

- Identify tools and equipment required for servicing and repairing.
- Demonstrate preparatory activities for diagnosing faults and repairing of an EV.
- Demonstrate how to assist seniors in repair and maintenance of an EV related tasks.

Duration: *<30:00>*	**Duration**: *<100:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List various components /aggregates and the manufacturer's specifications of an EV. • Discuss basic technology used, functioning and interconnections of various systems and components of an EV. • Recall fundamental terms, laws and principles of electricity used in EV. • Describe various symbols, units and terms used in wiring diagrams associated with electrical/electric systems/components of an EV. • Describe various electrical and electronic signals such as electrical inputs, outputs, voltage, pulsewidth modulation, digital signal (including infra-red and fiber optics) etc. • Explain legal regulations that need to be taken into account for handling electric vehicles. • Elucidate SOP for receiving vehicles, opening job card, allocation of work, invoicing, vehicle delivery, handling complaints, etc. • Discuss various sources of information available for assessing service and repair requirements of the vehicle. • Discuss standard schedules and checklists recommended by the OEM/auto component manufacturer for servicing of electric vehicles. • Discuss the information derived from the instructions received from service technician related to service and maintenance of an EV. • List the types of tools and equipment used in different processes of an EV maintenance. • Discuss the importance of no HV (High Voltage) activity is being conducted around workstation prior to	• Analyse the job card to plan diagnostic activities as per the complaints mentioned in the job card. • Show how to collect workshop tools/ measuring devices/ equipment required for the job. • Apply appropriate ways to check the defects and calibration of tools/ measuring devices/ equipment before use. • Employ appropriate techniques to park the an EV in the workshop's designated service/repair area during electrical work. • Show how to clean the work area and place the tools/equipment properly for service and maintenance tasks. • Demonstrate how to use tools and equipment for inspection and repairing of faults in an EV. • Demonstrate how to use computer, on-line application and OEM technical information/assistance portals. • Demonstrate how to support an Electric Vehicle Service Technician during diagnosing faults in the sub-assemblies and electrical/ electronic components of an EV. • Demonstrate how to support an Electric Vehicle Service Technician during checking of the electric vehicle for service and repair requirements. • Perform steps to report about malfunctions/repairs in the electric vehicle beyond own scope to the concerned person. • Employ various precautions and safety measures to ensure that no damage is caused to the vehicle during service and repairing work. • Apply appropriate ways to dismantle the various components of an EV.

commencement of work. Elaborate ways to work on the HV systems which do not require isolation, troubleshooting and replacing parts on the active HV system. • List the activities need to perform for preparing an EV for fault identification and repairing work. • Discuss the safety precautions need to follow during servicing and repairing of an EV. • Discuss the symptoms of technical faults, their causes and rectification procedures in EV. • Describe organizational/professional code of ethics and standards of practice. • Discuss the documents to be maintained w.r.t inspection, troubleshooting and diagnosis of faults. • Describe five safety rules for electrical work on HV systems before starting the work. • Explain the health and safety measures and regulations w.r.t. equipment and components during fault diagnosis.	• Show how to clean and condition dismantled mechanical and electrical components of an EV. • Demonstrate how to perform routine service, repairing and maintenance activities on the various systems/aggregates of an EV as per SOP. • Demonstrate how to support an Electric Vehicle Service Technician during checking of the performance of an EV/ aggregate post repair. • Apply appropriate ways to check that battery charge, battery water, brake oil, gear oil, engine oil etc. are filled in the vehicle. • Show how to return leftover components and tools to store and dispose waste material after completion of work by following organisational policies and procedures.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• PPT's, teaching aids, job card, Electric vehicle • Vehicle, various body parts, engine, tools and equipment, material, consumables, components/aggregates, lubricants, grease, oil, etc. • Pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc., pullers: ball joint separators, bearing pullers, gear puller tools, slide hammers etc., trim or moulding tools: carbon scrapers, gasket scrapers, scrapers, spoons etc., measuring equipment: vernier calipers, micrometre, feeler gauges, multi-metre, flow metre, temp gauge, dial gauge etc., other tools: hand tools, power tools, lifting/jacking equipment, tensioning equipment, security activator etc., tools for other tasks such as cleaning of vehicles, brake bleeding, wheel alignment, AC gas charging etc. • **Safety materials**: Fire extinguisher, safety gloves, aprons, safety glasses, helmet, safety shoe and first-aid kit • **Cleaning material**: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel	

Module 5: Introduction to Employability Skills

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Discuss about Employability Skills in meeting the job requirements

Duration: *<0.5:00>*	**Duration**: *<0.5:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the importance of Employability Skills in meeting the job requirements	• Demonstrate Employability Skills
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 6: Constitutional values - Citizenship

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Discuss about constitutional values to be followed to become a responsible citizen

Duration: *<0.5:00>*	**Duration**: *<0.5:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.	• Show how to practice different environmentally sustainable practices
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 7: Becoming a Professional in the 21st Century

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Demonstrate professional skills required in 21st century

Duration: *<0.5:00>*	**Duration**: *<0.5:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss 21st century skills.	• Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 8: Basic English Skills

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Practice basic English speaking.

Duration: *<1:00>*	**Duration**: *<1:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss need of basic English skills.	• Use appropriate basic English sentences/phrases while speaking
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 9: Communication Skills

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Practice basic communication skills.

Duration: *<1.5:00>*	**Duration**: *<2.5:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss need of communication skills • Describe importance of team work	• Demonstrate how to communicate in a well -mannered way with others. • Demonstrate working with others in a team
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 10: Diversity & Inclusion

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Describe PwD and gender sensitisation.

Duration: *<0.5:00>*	**Duration**: *<0.5:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the significance of reporting sexual harassment issues in time	• Show how to conduct oneself appropriately with all genders and PwD
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 11: Financial and Legal Literacy

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Describe ways of managing expenses, income, and savings.

Duration: *<1.5:00>*	**Duration**: *<2.5:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the significance of using financial products and services safely and securely. • Explain the importance of managing expenses, income, and savings. • Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws	• Demonstrate ways of managing expenses, income, and savings.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 12: Essential Digital Skills

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Demonstrate procedure of operating digital devices and associated applications safely.

Duration: *<1:00>*	**Duration**: *<2:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely	• Show how to operate digital devices and use the associated applications and features, safely and securely
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 13: Entrepreneurship

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Describe opportunities as an entrepreneur.

Duration: *<2.5:00>*	**Duration**: *<4.5:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges	• Demonstrate ways for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 14: Customer Service

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Describe ways of maintaining customer.

Duration: *<1.5:00>*	**Duration**: *<2.5:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Differentiate between types of customers. • Explain the significance of identifying customer needs and addressing them. • Discuss the significance of maintaining hygiene and dressing appropriately.	• Show how to maintain hygiene and dressing appropriately.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 15: Getting ready for apprenticeship & Jobs

Mapped to DGT/VSQ/N0101

Terminal Outcomes:

- Describe ways of preparing for apprenticeship & Jobs appropriately.

Duration: *<1:00>*	**Duration**: *<1:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the significance of dressing up neatly and maintaining hygiene for an interview • Discuss how to search and register for apprenticeship opportunities	• Create a biodata • Use various sources to search and apply for jobs
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 16: Assist in routine service and repair of a four wheeler EV

Mapped to ASC/N1455, v1.0

Terminal Outcomes:

- Demonstrate preparatory activities for diagnosing faults and repairing of a four wheeler EV.
- Demonstrate how to assist seniors in repair and maintenance of a four wheeler EV related tasks.

Duration: *<30:00>*	**Duration**: *<36:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List various components /aggregates and the manufacturer's specifications of a four wheeler EV. • Discuss basic technology used, functioning and interconnections of various systems and components of a four wheeler EV. • Discuss the information derived from the instructions received from service technician related to service and maintenance of a four wheeler EV. • List the types of tools and equipment used in different processes of a four wheeler EV maintenance. • List the activities need to perform for preparing a four wheeler EV for fault identification and repairing work. • Discuss the symptoms of technical faults, their causes and rectification procedures in a four wheeler EV. • Explain the health and safety measures and regulations w.r.t. equipment and components during fault diagnosis.	• Employ appropriate techniques to park a four wheeler EV in the workshop's designated service/repair area during electrical work. • Demonstrate how to support an Electric Vehicle Service Technician during diagnosing faults in the sub-assemblies and electrical/ electronic components of a four wheeler EV. • Demonstrate how to support an Electric Vehicle Service Technician during checking of a four wheeler EV for service and repair requirements. • Apply appropriate ways to dismantle the various components of a four wheeler EV. • Show how to clean and condition dismantled mechanical and electrical components of a four wheeler EV. • Demonstrate how to perform service and repairing activities on the various systems/aggregates of a four wheeler EV. • Demonstrate how to support an Electric Vehicle Service Technician during checking of the performance of a four wheeler EV/ aggregate post repair.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• PPT's, teaching aids, job card, four wheeler electric vehicle • Vehicle, various body parts, engine, tools and equipment, material, consumables, components/aggregates, lubricants, grease, oil, etc. • Pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc., pullers: ball joint separators, bearing pullers, gear puller tools, slide hammers etc., trim or moulding tools: carbon scrapers, gasket scrapers, scrapers, spoons etc., measuring equipment: vernier calipers, micrometre, feeler gauges, multi-metre, flow metre, temp gauge, dial gauge etc., other tools: hand tools, power tools, lifting/jacking equipment, tensioning equipment, security activator etc., tools for other tasks such as cleaning of vehicles, brake bleeding, wheel alignment, AC gas charging etc. • **Safety materials**: Safety gloves, aprons, safety glasses, helmet, safety shoe and first-aid kit • **Cleaning material**: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel	

Module 17: Assist in routine service and repair of a 2/3 wheeler EV

Mapped to ASC/N1456, v1.0

Terminal Outcomes:

- Demonstrate preparatory activities for diagnosing faults and repairing of a 2/3 wheeler EV.
- Demonstrate how to assist seniors in repair and maintenance of a 2/3 wheeler EV related tasks.

Duration: *<30:00>*	**Duration**: *<36:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List various components /aggregates and the manufacturer's specifications of a 2/3 wheeler EV. • Discuss basic technology used, functioning and interconnections of various systems and components of a 2/3 wheeler EV. • Discuss the information derived from the instructions received from service technician related to service and maintenance of a 2/3 wheeler EV. • List the types of tools and equipment used in different processes of a 2/3 wheeler EV maintenance. • List the activities need to perform for preparing a 2/3 wheeler EV for fault identification and repairing work. • Discuss the symptoms of technical faults, their causes and rectification procedures in a 2/3 wheeler EV. • Explain the health and safety measures and regulations w.r.t. equipment and components during fault diagnosis.	• Employ appropriate techniques to park a 2/3 wheeler EV in the workshop's designated service/repair area during electrical work. • Demonstrate how to support an Electric Vehicle Service Technician during diagnosing faults in the sub-assemblies and electrical/ electronic components of a 2/3 wheeler EV. • Demonstrate how to support an Electric Vehicle Service Technician during checking of a 2/3 wheeler EV for service and repair requirements. • Apply appropriate ways to dismantle the various components of a 2/3 wheeler EV. • Show how to clean and condition dismantled mechanical and electrical components of a 2/3 wheeler EV. • Demonstrate how to perform service and repairing activities on the various systems/aggregates of a 2/3 wheeler EV. • Demonstrate how to support an Electric Vehicle Service Technician during checking of the performance of a 2/3 wheeler EV/ aggregate post repair.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• PPT's, teaching aids, job card, 2/3 wheeler electric vehicle • Vehicle, various body parts, engine, tools and equipment, material, consumables, components/aggregates, lubricants, grease, oil, etc. • Pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc., pullers: ball joint separators, bearing pullers, gear puller tools, slide hammers etc., trim or moulding tools: carbon scrapers, gasket scrapers, scrapers, spoons etc., measuring equipment: vernier calipers, micrometre, feeler gauges, multi-metre, flow metre, temp gauge, dial gauge etc., other tools: hand tools, power tools, lifting/jacking equipment, tensioning equipment, security activator etc., tools for other tasks such as cleaning of vehicles, brake bleeding, wheel alignment, AC gas charging etc. • **Safety materials**: Safety gloves, aprons, safety glasses, helmet, safety shoe and first-aid kit • **Cleaning material**: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel	

Module 18: Assist in routine service and repair of a heavy commercial electricvehicle

Mapped to ASC/N1457, v1.0

Terminal Outcomes:

- Demonstrate preparatory activities for diagnosing faults and repairing of a heavy commercial electric vehicle.
- Demonstrate how to assist seniors in repair and maintenance of a heavy commercial electric vehicle related tasks.

Duration: *<30:00>*	**Duration**: *<36:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List various components /aggregates and the manufacturer's specifications of a heavy commercial EV. • Discuss basic technology used, functioning and interconnections of various systems and components of a heavy commercial EV. • Discuss the information derived from the instructions received from service technician related to service and maintenance of a heavy commercial EV. • List the types of tools and equipment used in different processes of a heavy commercial EVmaintenance. • List the activities need to perform for preparing a heavy commercial EV for fault identification and repairing work. • Discuss the symptoms of technical faults, their causes and rectification procedures in a heavy commercial EV. • Explain the health and safety measures and regulations w.r.t. equipment and components during fault diagnosis.	• Employ appropriate techniques to park a heavy commercial EV in the workshop's designated service/repair area during electrical work. • Demonstrate how to support an Electric Vehicle Service Technician during diagnosing faults in the sub-assemblies and electrical/ electronic components of a heavy commercial EV. • Demonstrate how to support an Electric Vehicle Service Technician during checking of a heavy commercial EV for service and repair requirements. • Apply appropriate ways to dismantle the various components of a heavy commercial EV. • Show how to clean and condition dismantled mechanical and electrical components of a heavy commercial EV. • Demonstrate how to perform service and repairing activities on the various systems/aggregates of a heavy commercial EV. • Demonstrate how to support an Electric Vehicle Service Technician during checking of theperformance of a heavy commercial EV/aggregate post repair.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• PPT's, teaching aids, job card, heavy commercial electric vehicle • Vehicle, various body parts, engine, tools and equipment, material, consumables, components/aggregates, lubricants, grease, oil, etc. • Pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc., pullers: ball joint separators, bearing pullers, gear puller tools, slide hammers etc., trim or moulding tools: carbon scrapers, gasket scrapers, scrapers, spoons etc., measuring equipment: vernier calipers, micrometre, feeler gauges, multi-metre, flow metre, temp gauge, dial gauge etc., other tools: hand tools, power tools, lifting/jacking equipment,	

tensioning equipment, security activator etc., tools for other tasks such as cleaning of vehicles, brake bleeding, wheel alignment, AC gas charging etc.

- **Safety materials**: Safety gloves, aprons, safety glasses, helmet, safety shoe and first-aid kit
- **Cleaning material**: Tip cleaner, wire brush (M.S.), cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	3	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	1	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	NA
ITI	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	4	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	0	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	**NA**
Diploma	Automobile Engineering/ Mechanical Engineering	2	Automobile Engineering/ Mechanical Engineering	1	Automobile Engineering/ Mechanical Engineering	**NA**
Diploma	Automobile Engineering/ Mechanical Engineering	3	Automobile Engineering/ Mechanical Engineering	0	Automobile Engineering/ Mechanical Engineering	**NA**
Bachelor of Engineering	Automobile/ Mechanical / Electrical/ Engineering	1	Automobile/ Mechanical / Electrical/ Engineering	1	Automobile Engineering/ Mechanical Engineering	**NA**
Bachelor of Engineering	Automobile/ Mechanical / Electrical/ Engineering	2	Automobile/ Mechanical / Electrical/ Engineering	0	Automobile/ Mechanical / Electrical/ Engineering	**NA**

Trainer Certification	
Domain Certification	**Platform Certification**
"Electric Vehicle Service Assistant, ASC/Q1435, version 1.0". Minimum accepted score is 80%.	Recommended that the trainer is certified for the job role "Trainer (VET and Skills)", Mapped to Qualification Pack: MEP/Q2601, V2.0" Minimum accepted score is 80%

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	4	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	1	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	NA ```
ITI	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	5	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	0	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	**NA**
Diploma	Automobile Engineering/ Mechanical Engineering	3	Automobile Engineering/ Mechanical Engineering	1	Automobile Engineering/ Mechanical Engineering	**NA**
Diploma	Automobile Engineering/ Mechanical Engineering	4	Automobile Engineering/ Mechanical Engineering	0	Automobile Engineering/ Mechanical Engineering	**NA**
Bachelor of Engineering	Automobile/ Mechanical / Electrical/ Engineering	2	Automobile/ Mechanical / Electrical/ Engineering	1	Automobile Engineering/ Mechanical Engineering	**NA**
Bachelor of Engineering	Automobile/ Mechanical / Electrical/ Engineering	3	Automobile/ Mechanical / Electrical/ Engineering	0	Automobile/ Mechanical / Electrical/ Engineering	**NA**

Assessor Certification	
Domain Certification	**Platform Certification**
"Electric Vehicle Service Assistant, ASC/Q1435, version 1.0". Minimum accepted score is 80%.	Recommended that the Accessor is certified for the job role "Assessor (VET and Skills)", Mapped to Qualification Pack: MEP/Q2701, V2.0" Minimum accepted score is 80%.

Assessment Strategy

1. Assessment System Overview:
    - Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
    - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
    - Assessment agency deploys the ToA certified Assessor for executing the assessment
    - SSC monitors the assessment process & records
2. Testing Environment:
    - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
    - Check the duration of the training.
    - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
    - If the batch size is more than 30, then there should be 2 Assessors.
    - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
    - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
    - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
    - Check the availability of the Lab Equipment for the particular Job Role.
3. Assessment Quality Assurance levels / Framework:
    - Question papers created by the Subject Matter Experts (SME)
    - Question papers created by the SME verified by the other subject Matter Experts
    - Questions are mapped with NOS and PC
    - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
    - Assessor must be ToA certified & trainer must be ToT Certified
    - Assessment agency must follow the assessment guidelines to conduct the assessment
4. Types of evidence or evidence-gathering protocol:
    - Time-stamped & geotagged reporting of the assessor from assessment location
    - Centre photographs with signboards and scheme specific branding
    - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
    - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos
5. Method of verification or validation:
    - Surprise visit to the assessment location
    - Random audit of the batch
    - Random audit of any candidate
6. Method for assessment documentation, archiving, and access
    - Hard copies of the documents are stored
    - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
    - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training.
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module. A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
SOP	Standard Operating Procedure
WI	Work Instructions
PPE	Personal Protective equipment