Qualification Pack

Electric Vehicle Service Technician

Electives: Four Wheeler/ Two Wheeler/ Three Wheeler/ Bus and Heavy Commercial Vehicle

QP Code: ASC/Q1429

Version: 5.0

NSQF Level: 4

Automotive || 153, GF, Okhla Industrial Area, Phase 3
New Delhi 110020 || email:garima@asdc.org.in

Contents

Qualification Pack

ASC/Q1429: Electric Vehicle Service Technician

Brief Job Description

An Electric Vehicle Service Technician is responsible for the repair, routine servicing and maintenance (including electrical and mechanical aggregates) of Electric and Hybrid vehicles and assist the lead technician in identifying the faults

Personal Attributes

An individual in this job must have good communication and interpersonal skills. The person should be patient, organised, team-oriented, customer centric and have the ability to work for long hours in adverse conditions. The individual should be a keen observer and have an eye for detail and quality.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. ASC/N9801: Organize work and resources (Service)
2. DGT/VSQ/N0102: Employability Skills (60 Hours)
3. ASC/N9846: High voltage and fire safety practices

Electives*(mandatory to select at least one):*

Elective 1: Four Wheeler

This NOS unit is about performing all tasks related to service, minor repair and diagnosis of the four wheeler electric or hybrid vehicles.

1. ASC/N1450: Carry out routine service or minor repairs on four wheeler electric/ hybrid vehicle and assist in diagnosis

Elective 2: Two Wheeler

This NOS unit is about an individual who performs all tasks related to service, minor repair and diagnosis on electric two/three wheeler electric vehicle.

1. ASC/N1451: Carry out routine service or minor repairs on 2 wheeler electric vehicle and assist in diagnosis

Elective 3: Three Wheeler

This NOS unit is about an individual who performs all tasks related to service, minor repair and diagnosis

on electric truck/bus.

1. ASC/N1321: Carry out routine service or minor repairs on 3 wheeler electric vehicle and assist in diagnosis

Elective 4: Bus and Heavy Commercial Vehicle

1. ASC/N1452: Carry out routine service or minor repairs on heavy commercial electric vehicle and assist in diagnosis

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
Country	India
NSQF Level	4
Credits	24
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3115.0602
Minimum Educational Qualification & Experience	10th grade pass plus 2-year NTC (NAC) OR 10th grade pass with 3 Years of experience OR 12th grade Pass (or Equivalent) OR Certificate-NSQF (Level 3 (Two Wheeler/Four Wheeler Service Assistant)) with 3 Years of experience OR 11th Class (Pursuing) with 1.5 years of experience
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	NA

Qualification Pack

Next Review Date	18/02/2028
NSQC Approval Date	18/02/2025
Version	5.0
Reference code on NQR	QG-04-AU-03586-2025-V2-ASDC
NQR Version	2.0

ASC/N9801: Organize work and resources (Service)

Description

This NOS unit is about implementing safety, planning work, adopting sustainable practices for optimising use of resources

Scope

The scope covers the following :

- Maintain safe and secure working environment
- Perform work as per quality standards
- Health and hygiene
- Material/energy conservation practices
- Effective waste management practices

Elements and Performance Criteria

Maintain safe and secure working environment

To be competent, the user/individual on the job must be able to:

PC1. organise work as per organisation's current health, safety and security policies and procedures

PC2. report any identified breaches in health, safety, and security policies and procedures to the designated person

PC3. identify the risks and hazards associated with work activities, their causes and prevention

Perform work as per quality standards

To be competent, the user/individual on the job must be able to:

PC4. ensure work area is clean and tidy

PC5. ensure that work is accomplished as per the requirements within the specified timeline

PC6. ensure team goals are given preference over individual goals

Health and hygiene

To be competent, the user/individual on the job must be able to:

PC7. sanitize workstation and equipment regularly

PC8. clean hands with soap, alcohol-based sanitizer regularly

PC9. avoid contact with ill people and self-isolate in a similar situation

PC10. wear and dispose PPEs regularly and appropriately

PC11. report advanced hygiene and sanitation issues to appropriate authority

PC12. follow stress and anxiety management techniques

Material/energy conservation practices

To be competent, the user/individual on the job must be able to:

PC13. identify ways to optimise usage of material in various tasks/activities/processes

PC14. use resources, including water, in a responsible manner

PC15. check for spills/leakages in various tasks/activities/processes
PC16. plug spills/leakages and escalate to appropriate authority if unable to rectify
PC17. carry out routine cleaning of tools, machines and equipment
PC18. check if the equipment/machine is functioning normally before commencing work and rectify wherever required
PC19. report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment
PC20. ensure electrical equipment and appliances are properly connected and turned off when not in use

Effective waste management practices

To be competent, the user/individual on the job must be able to:

PC21. identify recyclable and non-recyclable, and hazardous waste generated
PC22. segregate waste into different categories
PC23. dispose non-recyclable waste appropriately
PC24. deposit recyclable and reusable material at identified location
PC25. follow processes specified for disposal of hazardous waste

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. organisation procedures for health, safety and security, and individual role and responsibilities in this context
KU2. the organisations emergency procedures for different emergency situations and the importance of following the same
KU3. evacuation procedures for workers and visitors
KU4. how and when to report hazards as well as the limits of responsibility for dealing with hazards
KU5. potential hazards, risks and threats based on the nature of work
KU6. the implications of own work on the schedule and work of others
KU7. efficient utilisation of material and water
KU8. basics of electricity and prevalent energy efficient devices
KU9. ways to recognise common electrical problems
KU10. common practices of conserving electricity
KU11. common sources of pollution and ways to minimize it
KU12. categorisation of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics
KU13. usage of different colours of dustbins
KU14. waste management and methods of waste disposal
KU15. significance of greening
KU16. organisation's policies to maintain personal health and hygiene at workplace

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read instructions/guidelines/standard operating procedures
GS2. complete statutory documents relevant to safety and hygiene
GS3. modify work practices to improve them
GS4. ask for clarifications from superior about the job requirement
GS5. work with supervisors/team members to carry out work related tasks
GS6. complete tasks efficiently and accurately within stipulated time
GS7. inform/report to concerned person in case of any problem
GS8. make timely decisions for efficient utilization of resources
GS9. write in at least one language and complete written work with attention to detail
GS10. record data on waste disposal at workplace
GS11. be punctual, utilize time and manage workload efficiently
GS12. evaluate strategies to maintain, enhance or reduce the intensity of heightened emotional response

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Maintain safe and secure working environment	**8**	**4**	**-**	**3**
PC1. organise work as per organisation's current health, safety and security policies and procedures	-	2	-	1
PC2. report any identified breaches in health, safety, and security policies and procedures to the designated person	3	1	-	-
PC3. identify the risks and hazards associated with work activities, their causes and prevention	5	1	-	2
Perform work as per quality standards	**12**	**8**	**-**	**6**
PC4. ensure work area is clean and tidy	4	2	-	-
PC5. ensure that work is accomplished as per the requirements within the specified timeline	6	4	-	2
PC6. ensure team goals are given preference over individual goals	2	2	-	4
Health and hygiene	**12**	**8**	**-**	**5**
PC7. sanitize workstation and equipment regularly	2	2	-	2
PC8. clean hands with soap, alcohol-based sanitizer regularly	2	1	-	-
PC9. avoid contact with ill people and self-isolate in a similar situation	2	1	-	-
PC10. wear and dispose PPEs regularly and appropriately	2	2	-	1
PC11. report advanced hygiene and sanitation issues to appropriate authority	2	2	-	2
PC12. follow stress and anxiety management techniques	2	-	-	-
Material/energy conservation practices	**10**	**4**	**-**	**3**
PC13. identify ways to optimise usage of material in various tasks/activities/processes	2	-	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. use resources, including water, in a responsible manner	2	-	-	-
PC15. check for spills/leakages in various tasks/activities/processes	-	1	-	-
PC16. plug spills/leakages and escalate to appropriate authority if unable to rectify	-	1	-	1
PC17. carry out routine cleaning of tools, machines and equipment	2	-	-	-
PC18. check if the equipment/machine is functioning normally before commencing work and rectify wherever required	-	1	-	1
PC19. report malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment	2	1	-	-
PC20. ensure electrical equipment and appliances are properly connected and turned off when not in use	2	-	-	-
Effective waste management practices	**8**	**6**	**-**	**3**
PC21. identify recyclable and non-recyclable, and hazardous waste generated	2	-	-	1
PC22. segregate waste into different categories	-	2	-	-
PC23. dispose non-recyclable waste appropriately	2	2	-	1
PC24. deposit recyclable and reusable material at identified location	2	1	-	-
PC25. follow processes specified for disposal of hazardous waste	2	1	-	1
NOS Total	**50**	**30**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9801
NOS Name	Organize work and resources (Service)
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	3
Credits	2
Version	2.0
Last Reviewed Date	18/02/2025
Next Review Date	18/02/2028
NSQC Clearance Date	18/02/2025

DGT/VSQ/N0102: Employability Skills (60 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

To be competent, the user/individual on the job must be able to:

PC1. identify employability skills required for jobs in various industries

PC2. identify and explore learning and employability portals

Constitutional values – Citizenship

To be competent, the user/individual on the job must be able to:

PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.

PC4. follow environmentally sustainable practices

Becoming a Professional in the 21st Century

To be competent, the user/individual on the job must be able to:

PC5. recognize the significance of 21st Century Skills for employment

PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

Basic English Skills

To be competent, the user/individual on the job must be able to:

PC7. use basic English for everyday conversation in different contexts, in person and over the telephone

PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English

PC9. write short messages, notes, letters, e-mails etc. in English

Career Development & Goal Setting

To be competent, the user/individual on the job must be able to:

PC10. understand the difference between job and career

PC11. prepare a career development plan with short- and long-term goals, based on aptitude

Communication Skills

To be competent, the user/individual on the job must be able to:

PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings

PC13. work collaboratively with others in a team

Diversity & Inclusion

To be competent, the user/individual on the job must be able to:

PC14. communicate and behave appropriately with all genders and PwD

PC15. escalate any issues related to sexual harassment at workplace according to POSH Act

Financial and Legal Literacy

To be competent, the user/individual on the job must be able to:

PC16. select financial institutions, products and services as per requirement

PC17. carry out offline and online financial transactions, safely and securely

PC18. identify common components of salary and compute income, expenses, taxes, investments etc

PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation

Essential Digital Skills

To be competent, the user/individual on the job must be able to:

PC20. operate digital devices and carry out basic internet operations securely and safely

PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively

PC22. use basic features of word processor, spreadsheets, and presentations

Entrepreneurship

To be competent, the user/individual on the job must be able to:

PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research

PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion

PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

Customer Service

To be competent, the user/individual on the job must be able to:

PC26. identify different types of customers

PC27. identify and respond to customer requests and needs in a professional manner.

PC28. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

To be competent, the user/individual on the job must be able to:

PC29. create a professional Curriculum vitae (Résumé)

PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

PC31. apply to identified job openings using offline /online methods as per requirement

PC32. answer questions politely, with clarity and confidence, during recruitment and selection

PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills and different learning and employability related portals

KU2. various constitutional and personal values

KU3. different environmentally sustainable practices and their importance

KU4. Twenty first (21st) century skills and their importance

KU5. how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

KU6. importance of career development and setting long- and short-term goals

KU7. about effective communication

KU8. POSH Act

KU9. Gender sensitivity and inclusivity

KU10. different types of financial institutes, products, and services

KU11. how to compute income and expenditure

KU12. importance of maintaining safety and security in offline and online financial transactions

KU13. different legal rights and laws

KU14. different types of digital devices and the procedure to operate them safely and securely

KU15. how to create and operate an e- mail account and use applications such as word processors, spreadsheets etc.

KU16. how to identify business opportunities

KU17. types and needs of customers

KU18. how to apply for a job and prepare for an interview

KU19. apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and write different types of documents/instructions/correspondence

GS2. communicate effectively using appropriate language in formal and informal settings

GS3. behave politely and appropriately with all
GS4. how to work in a virtual mode
GS5. perform calculations efficiently
GS6. solve problems effectively
GS7. pay attention to details
GS8. manage time efficiently
GS9. maintain hygiene and sanitization to avoid infection

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. identify employability skills required for jobs in various industries	-	-	-	-
PC2. identify and explore learning and employability portals	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC4. follow environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**2**	**4**	**-**	**-**
PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
Basic English Skills	**2**	**3**	**-**	**-**
PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
Career Development & Goal Setting	**1**	**2**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
Communication Skills	**2**	**2**	**-**	**-**
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**2**	**-**	**-**
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
Financial and Legal Literacy	**2**	**3**	**-**	**-**
PC16. select financial institutions, products and services as per requirement	-	-	-	-
PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-
PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
Essential Digital Skills	**3**	**4**	**-**	**-**
PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Entrepreneurship	**2**	**3**	**-**	**-**
PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
Customer Service	**1**	**2**	**-**	**-**
PC26. identify different types of customers	-	-	-	-
PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
PC28. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**2**	**3**	**-**	**-**
PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC31. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	**20**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0102
NOS Name	Employability Skills (60 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	18/02/2025
Next Review Date	18/02/2028
NSQC Clearance Date	18/02/2025

ASC/N9846: High voltage and fire safety practices

Description

This NOS unit is about following high voltage and fire safety practices at the workplace.

Scope

The scope covers the following :

- Hight voltage safety practices
- Fire safety practices

Elements and Performance Criteria

Hight voltage safety practices

To be competent, the user/individual on the job must be able to:

PC1. make sure to wear personal safety equipment and that it fits properly, is worn correctly and is not damaged in any way

PC2. consult the common and manufacturer specific instructions where available

PC3. examine the high voltage battery visually for physical, mechanical damage, intrusion and leakage

PC4. if the high voltage battery is identified as damaged handle, inform the relevant person in accordance with manufacturer specific instruction and applicable national legislation and guideline

PC5. ensure the area around the EV is restricted and marked, before removal of high voltage battery

PC6. use only the test instruments, and insulated tools rated for the voltage and current specified

PC7. don't wear any jewelry or other articles that could accidentally contact circuitry and conduct current, or get caught in moving parts

PC8. set up your work area away from possible grounds that you may accidentally contact

PC9. use a grounded safety chain or cable when working with high voltage

PC10. never touch, cut or open high voltage power cable or high voltage components without personal protective equipment

PC11. do not allow open flames near, apply heat to the EV battery or do not expose to high temperature, e.g. long period in direct sunlight

Fire safety practices

To be competent, the user/individual on the job must be able to:

PC12. before starting work, use a non-contact infrared thermometer to check if the battery is heating up. If so, move the vehicle to a safe isolation area and call the fire department.

PC13. don't overload circuits and check cords & extensions before starting work

PC14. use warning signage and cordon off the area. Lock the remote key to prevent the vehicle from moving or the electrical systems from accidentally operating

PC15. unplug the service plug to disconnect the battery from the high voltage (HV) lines. Wait 5–10 minutes after the supercapacitors have discharged before working on the vehicle

PC16. use appropriate fire extinguisher (ABC, BC) incase of any fire

PC17. evacuate to a safe place and do not let other people approach the site incase of fire accident

PC18. when a vehicle fire occurs due to the battery, there is a risk of a second fire. Contact your local fire emergency responders when towing the vehicle

PC19. report any electrical faults to appropriate person to avoid any accident

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. various ways that can make accidents while working on high voltage area or working near high voltage equipment

KU2. PPE required for high voltage and fore safety

KU3. common and manufacturer specific instructions for high voltage and fire safety

KU4. need of the high voltage battery is identified as damaged handle in accordance with manufacturer specific instruction and applicable national legislation and guidelines

KU5. effect of wearing any jewelry or other articles while working near high voltage equipment

KU6. various ways to avoid accidents due to high voltage and fire while working

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read instructions/guidelines/standard operating procedures

GS2. complete statutory documents relevant to safety

GS3. modify work practices to improve them

GS4. ask for clarifications from superior about the job requirement

GS5. inform/report to concerned person in case of any problem

GS6. evaluate strategies to maintain, enhance or reduce the intensity of heightened emotional response

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Hight voltage safety practices	**27**	**16**	**-**	**12**
PC1. make sure to wear personal safety equipment and that it fits properly, is worn correctly and is not damaged in any way	2	2	-	1
PC2. consult the common and manufacturer specific instructions where available	2	1	-	-
PC3. examine the high voltage battery visually for physical, mechanical damage, intrusion and leakage	3	2	-	1
PC4. if the high voltage battery is identified as damaged handle, inform the relevant person in accordance with manufacturer specific instruction and applicable national legislation and guideline	3	2	-	2
PC5. ensure the area around the EV is restricted and marked, before removal of high voltage battery	3	1	-	1
PC6. use only the test instruments, and insulated tools rated for the voltage and current specified	3	2	-	2
PC7. don't wear any jewelry or other articles that could accidentally contact circuitry and conduct current, or get caught in moving parts	2	1	-	1
PC8. set up your work area away from possible grounds that you may accidentally contact	2	1	-	1
PC9. use a grounded safety chain or cable when working with high voltage	3	2	-	1
PC10. never touch, cut or open high voltage power cable or high voltage components without personal protective equipment	2	1	-	1
PC11. do not allow open flames near, apply heat to the EV battery or do not expose to high temperature, e.g. long period in direct sunlight	2	1	-	1
Fire safety practices	**23**	**14**	**-**	**8**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. before starting work, use a non-contact infrared thermometer to check if the battery is heating up. If so, move the vehicle to a safe isolation area and call the fire department.	3	2	-	1
PC13. don't overload circuits and check cords & extensions before starting work	3	1	-	1
PC14. use warning signage and cordon off the area. Lock the remote key to prevent the vehicle from moving or the electrical systems from accidentally operating	3	1	-	1
PC15. unplug the service plug to disconnect the battery from the high voltage (HV) lines. Wait 5–10 minutes after the supercapacitors have discharged before working on the vehicle	3	2	-	1
PC16. use appropriate fire extinguisher (ABC, BC) incase of any fire	3	2	-	1
PC17. evacuate to a safe place and do not let other people approach the site incase of fire accident	3	2	-	1
PC18. when a vehicle fire occurs due to the battery, there is a risk of a second fire. Contact your local fire emergency responders when towing the vehicle	3	2	-	1
PC19. report any electrical faults to appropriate person to avoid any accident	2	2	-	1
NOS Total	**50**	**30**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9846
NOS Name	High voltage and fire safety practices
Sector	Automotive
Sub-Sector	
Occupation	Generic
NSQF Level	4
Credits	3
Version	1.0
Last Reviewed Date	18/02/2025
Next Review Date	18/02/2028
NSQC Clearance Date	18/02/2025

ASC/N1450: Carry out routine service or minor repairs on four wheeler electric/ hybrid vehicle and assist in diagnosis

Description

This NOS unit is about performing all tasks related to service, minor repair and diagnosis of the four wheeler electric/ hybrid vehicle.

Scope

The scope covers the following :

- Prepare to carry out routine service or minor repair and assist in fault diagnosis
- Perform routine service and minor repairs
- Assist lead technician in diagnosis or troubleshooting the faults
- Post service/repair/diagnostic activities

Elements and Performance Criteria

• Prepare to carry out routine service or minor repair and assist in fault diagnosis

To be competent, the user/individual on the job must be able to:

PC1. review the job card and understand work to be carried out on the four wheeler electric/ hybrid vehicle

PC2. identify the auto components related to the various aggregates in the four wheeler electric/ hybrid vehicle

PC3. ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work on four wheeler electric/ hybrid vehicle

PC4. collect workshop tools/measuring devices/equipment required to carry out job on the four wheeler electric/ hybrid vehicle and check their condition/calibration

PC5. prepare the four wheeler electric/ hybrid vehicle according to nature of job to be performed: general and mechanical job on the vehicle/electrical work in non-live state/troubleshoot and replace parts in live state of HV system

PC6. mark the four wheeler electric/ hybrid vehicle and safeguard the working area during electrical work

PC7. wear PPE according to nature of job to be performed on the four wheeler electric/ hybrid vehicle

PC8. conduct visual inspection of the four wheeler electric/ hybrid vehicle to identify defects in HV components and identify indirect faults in electrical/electronic aggregate due to other system/component

PC9. assess mechanical aggregates such as engine/traction motor, transmission, axles, brakes etc. of the four wheeler electric/ hybrid vehicle for any external impact/bend/leak/incorrect level/wear & tear

PC10. report the malfunctions/repairs in the four wheeler electric/ hybrid vehicle beyond own scope to the concerned person

Perform routine service and minor repairs

To be competent, the user/individual on the job must be able to:

PC11. take precautions to avoid damage to the four wheeler electric/ hybrid vehicle and its components while working on various aggregates

PC12. use appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organization

PC13. perform task on the HV system as per following stages: general and mechanical tasks on the four wheeler electric/ hybrid vehicle which do not require isolation of the HV systems, mechanical work in non live state of the HV systems and replace parts in live state of the HV system

PC14. test the four wheeler electric/ hybrid vehicle's electrical/electronic components performance wherever applicable as per OEM SOP

PC15. remove parts relevant to various mechanical aggregates of the four wheeler electric/ hybrid vehicle and place them securely as specified by OEM

PC16. clean and condition dismantled mechanical and electrical components of the four wheeler electric/ hybrid vehicle prior to assembly

PC17. perform minor repair/replacement/calibration/ of mechanical system/aggregate of the four wheeler electric/ hybrid vehicle such as drive line, running systems, etc. including HVAC, power assisted braking & steering systems

PC18. refill/replace, as required quantity and appropriate grade of coolants, engine oil, other lubricant/fluids in the four wheeler electric/ hybrid vehicle as per OEM guidelines

PC19. maintain the documentation related to inspection, servicing and minor repair perform on the four wheeler electric/ hybrid vehicle

Assist lead technician in diagnosis or troubleshooting the faults

To be competent, the user/individual on the job must be able to:

PC20. conduct test drive of the four wheeler electric/ hybrid vehicle to assist the lead technician in assessing the service/repair requirement or calibration/adjustments, if any

PC21. follow lead technician instructions to choose and use the appropriate device/equipment to inspect/test the four wheeler electric/ hybrid vehicle/system/component performance to diagnose defect or faults in the electric/hybrid vehicle

PC22. carry out inspection or test on the four wheeler electric/ hybrid vehicle mechanical and electrical systems according to lead technician instructions

PC23. interpret and compare results of diagnostic inspections/tests with four wheeler electric/ hybrid vehicle specifications and regulatory requirements

PC24. maintain the documentation related to inspections and troubleshooting performed on the four wheeler electric/ hybrid vehicle

PC25. report the results to lead technician and seek assistance if further tests or inspections are required to conclude the diagnosis or troubleshooting

Post service/repair/diagnostic activities

To be competent, the user/individual on the job must be able to:

PC26. check the performance of four wheeler electric/ hybrid vehicle/aggregate post repair and report to supervisor/service advisor if further inspection is required by another specialist

PC27. ensure completeness of tasks assigned before releasing the four wheeler electric/ hybrid vehicle for the next procedure

PC28. dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization’s policies

PC29. return leftover consumable/parts, tools/equipment, and report if any malfunctions are observed to the person concerned

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the automotive industry in India, workshop structure and role and responsibilities of different people in the workshop

KU2. SOP for receiving vehicles, opening job card, allocation of work, invoicing, vehicle delivery, handling complaints, etc.

KU3. different components/aggregates as well as auto component manufacturer's specifications of the vehicle

KU4. basic technology used in and functioning of various systems and components of the four wheeler electric/ hybrid vehicle such as engine, transmission, batteries, body management system, telematics, brake system, air-conditioning systems, active & passive safety system, media and other systems (including electrical machines and devices used in electric vehicles such as: generator, DC/AC and DC/DC converters, AC motor, DC motor, charging systems etc.)

KU5. interconnection of systems with each other and effect of one system on other system

KU6. fundamental terms, laws and principles of electricity used in four wheeler electric/ hybrid vehicle such as: principles of storing electrical voltage, ohms law, voltage, current (AC/DC/HV), resistance, power, capacitance, electrostatics, magnetic, inductance, discrete electronic components, and radio frequency (automotive digital computers, automotive communication protocols such as CAN, LIN, MOST, etc.)

KU7. use of relevant measuring device/equipment and interpretation of all relevant mathematical calculations

KU8. various electrical and electronic signals such as electrical inputs, outputs, voltage, pulse width modulation, digital signal (including infra-red and fiber optics) etc.

KU9. symbols, units and terms used in wiring diagrams associated with electrical/electric systems/components of the four wheeler electric/ hybrid vehicle

KU10. how to use computer, on-line application and OEM technical information/assistance portals

KU11. various sources of information available for assessing service and repair requirements of the four wheeler electric/ hybrid vehicle including diagnostic displays, visual inspections, test drives, vehicle/equipment manufacturer specifications, and tolerance limits of components

KU12. standard schedules and checklists recommended by the OEM/auto component manufacturer for servicing of four wheeler electric/ hybrid vehicle

KU13. typical symptoms of common faults and failures in four wheeler electric/ hybrid vehicle mechanical, electrical and electronic systems

KU14. safety, health and environmental policies and regulations for the workplace as well as for automotive trade in general

KU15. Standard Operating Procedures (SOPs) of the organization/ dealership for inspection and diagnosis of faults in a four wheeler electric/ hybrid vehicle as prescribed by the OEM/components manufacturer

KU16. how to work on the HV systems which do not require isolation, troubleshooting and replacing parts on the active HV system

KU17. SOP recommended by OEM for using tools/equipment for diagnosis or troubleshooting such as special service tools, measuring instrument, volt meters, ammeters, ohmmeters, battery tester, dedicated and computer based diagnostic equipment, oscilloscopes etc.

KU18. various workshop tools/measuring devices/equipment required to carry out job on four wheeler electric/ hybrid vehicle and their common errors or defects

KU19. documentation requirements for each procedure carried out as part of roles and responsibilities as specified by OEM/auto component manufacturer

KU20. organizational/professional code of ethics and standards of practice

KU21. electrical hazards, protective measures and first aid: in case of electric shock, electrical arc in public grid or in the four wheeler electric/ hybrid vehicle, impact of electric current/arc, secondary accidents

KU22. five safety rules for electrical work on HV systems before starting the work i.e. isolate, safeguard reconnection, verify the non-live state, earth or short-circuit and shroud or safeguard adjacent live parts

KU23. safety requirements recommended by the OEM for equipment /four wheeler electric/ hybrid vehicle components during diagnosis, troubleshooting and root cause analysis on various aggregates

KU24. legal regulations that need to be taken into account for handling four wheeler electric/ hybrid vehicle in the workshop

KU25. Occupational Safety and Health (OSH) measures required for working on four wheeler electric/hybrid vehicle

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. read various sources of information available for assessing service and repair requirements

GS7. write any work-related information

GS8. write in English/regional language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
• Prepare to carry out routine service or minor repair and assist in fault diagnosis	**5**	**14**	**-**	**6**
PC1. review the job card and understand work to be carried out on the four wheeler electric/ hybrid vehicle	-	1	-	1
PC2. identify the auto components related to the various aggregates in the four wheeler electric/ hybrid vehicle	1	2	-	1
PC3. ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work on four wheeler electric/ hybrid vehicle	1	1	-	-
PC4. collect workshop tools/measuring devices/equipment required to carry out job on the four wheeler electric/ hybrid vehicle and check their condition/calibration	1	2	-	1
PC5. prepare the four wheeler electric/ hybrid vehicle according to nature of job to be performed: general and mechanical job on the vehicle/electrical work in non-live state/troubleshoot and replace parts in live state of HV system	-	1	-	-
PC6. mark the four wheeler electric/ hybrid vehicle and safeguard the working area during electrical work	-	1	-	-
PC7. wear PPE according to nature of job to be performed on the four wheeler electric/ hybrid vehicle	1	1	-	1
PC8. conduct visual inspection of the four wheeler electric/ hybrid vehicle to identify defects in HV components and identify indirect faults in electrical/electronic aggregate due to other system/component	-	2	-	1
PC9. assess mechanical aggregates such as engine/traction motor, transmission, axles, brakes etc. of the four wheeler electric/ hybrid vehicle for any external impact/bend/leak/incorrect level/wear & tear	1	2	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. report the malfunctions/repairs in the four wheeler electric/ hybrid vehicle beyond own scope to the concerned person	-	1	-	-
Perform routine service and minor repairs	**12**	**18**	**-**	**5**
PC11. take precautions to avoid damage to the four wheeler electric/ hybrid vehicle and its components while working on various aggregates	1	2	-	-
PC12. use appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organization	1	2	-	1
PC13. perform task on the HV system as per following stages: general and mechanical tasks on the four wheeler electric/ hybrid vehicle which do not require isolation of the HV systems, mechanical work in non live state of the HV systems and replace parts in live state of the HV system	2	2	-	-
PC14. test the four wheeler electric/ hybrid vehicle's electrical/electronic components performance wherever applicable as per OEM SOP	2	3	-	2
PC15. remove parts relevant to various mechanical aggregates of the four wheeler electric/ hybrid vehicle and place them securely as specified by OEM	1	2	-	-
PC16. clean and condition dismantled mechanical and electrical components of the four wheeler electric/ hybrid vehicle prior to assembly	1	1	-	-
PC17. perform minor repair/replacement/calibration/ of mechanical system/aggregate of the four wheeler electric/ hybrid vehicle such as drive line, running systems, etc. including HVAC, power assisted braking & steering systems	2	3	-	1
PC18. refill/replace, as required quantity and appropriate grade of coolants, engine oil, other lubricant/fluids in the four wheeler electric/ hybrid vehicle as per OEM guidelines	1	2	-	1
PC19. maintain the documentation related to inspection, servicing and minor repair perform on the four wheeler electric/ hybrid vehicle	1	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Assist lead technician in diagnosis or troubleshooting the faults	**8**	**10**	**-**	**5**
PC20. conduct test drive of the four wheeler electric/ hybrid vehicle to assist the lead technician in assessing the service/repair requirement or calibration/adjustments, if any	-	2	-	-
PC21. follow lead technician instructions to choose and use the appropriate device/equipment to inspect/test the four wheeler electric/ hybrid vehicle/system/component performance to diagnose defect or faults in the electric/hybrid vehicle	2	2	-	2
PC22. carry out inspection or test on the four wheeler electric/ hybrid vehicle mechanical and electrical systems according to lead technician instructions	2	2	-	2
PC23. interpret and compare results of diagnostic inspections/tests with four wheeler electric/ hybrid vehicle specifications and regulatory requirements	2	2	-	1
PC24. maintain the documentation related to inspections and troubleshooting performed on the four wheeler electric/ hybrid vehicle	1	1	-	-
PC25. report the results to lead technician and seek assistance if further tests or inspections are required to conclude the diagnosis or troubleshooting	1	1	-	-
Post service/repair/diagnostic activities	**5**	**8**	**-**	**4**
PC26. check the performance of four wheeler electric/ hybrid vehicle/aggregate post repair and report to supervisor/service advisor if further inspection is required by another specialist	2	3	-	2
PC27. ensure completeness of tasks assigned before releasing the four wheeler electric/ hybrid vehicle for the next procedure	1	2	-	1
PC28. dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization's policies	1	2	-	1
PC29. return leftover consumable/parts, tools/equipment, and report if any malfunctions are observed to the person concerned	1	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	**30**	**50**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1450
NOS Name	Carry out routine service or minor repairs on four wheeler electric/ hybrid vehicle and assist in diagnosis
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
NSQF Level	4
Credits	4
Version	2.0
Last Reviewed Date	18/02/2025
Next Review Date	18/02/2028
NSQC Clearance Date	18/02/2025

ASC/N1451: Carry out routine service or minor repairs on 2 wheeler electric vehicle and assist in diagnosis

Description

This NOS unit is about an individual who performs all tasks related to service, minor repair and diagnosis on two wheeler electric vehicle.

Scope

The scope covers the following :

- Prepare to carry out routine service or minor repair and assist in fault diagnosis
- Perform routine service and minor repairs
- Assist lead technician in diagnosis or troubleshooting the faults
- Post service/repair/diagnostic activities

Elements and Performance Criteria

Prepare to carry out routine service or minor repair and assist in fault diagnosis

To be competent, the user/individual on the job must be able to:

PC1. review the job card and understand work to be carried out on two wheeler electric vehicle

PC2. identify the auto components related to the various aggregates in the two wheeler electric vehicle

PC3. ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work on two wheeler electric vehicle

PC4. collect workshop tools/measuring devices/equipment required to carry out job on two wheeler electric vehicle and check their condition/calibration

PC5. prepare two wheeler electric vehicle according to nature of job to be performed: general and mechanical/electrical work in non-live state/troubleshoot and replace parts in live state HV system

PC6. mark the two wheeler electric vehicle and safeguard the working area during electrical work

PC7. wear PPE according to nature of job to be performed on the two wheeler electric vehicle

PC8. conduct visual inspection of the two wheeler electric vehicle to identify defects in HV components and identify indirect faults in electrical/electronic aggregate due to other system/component

PC9. assess mechanical aggregates such as brakes, suspension, axles etc. of the two wheeler electric vehicle for any external impact/bend/leak, incorrect level, wear & tear

PC10. report the malfunctions/repairs in the two wheeler electric vehicle beyond own scope to the concerned person

Perform routine service and minor repairs

To be competent, the user/individual on the job must be able to:

PC11. take precautions to avoid damage to the two wheeler electric vehicle and its components while working on various aggregates

PC12. use appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organisation

PC13. perform task on the HV system as per following stages: general and mechanical tasks on the two wheeler electric vehicle which do not require isolation of the HV systems, mechanical work in non-live state of the HV systems and replace parts in live state of the HV system

PC14. test the two wheeler electric vehicle's electrical/electronic system functioning of two/three wheeler vehicle wherever applicable as per OEM SOP

PC15. remove parts relevant to various mechanical aggregates of two wheeler electric vehicle and place them securely as specified by OEM

PC16. clean and condition dismantled mechanical and electrical components of two wheeler electric vehicle prior to assembly

PC17. perform minor repair/replacement/calibration of mechanical components/aggregates of the two wheeler electric vehicle such as brake pedal/lever free play adjustment, headlight beam alignment, etc.

PC18. refill/replace, as required quantity and appropriate grade of brake or other fluid/lubricant in the two wheeler electric vehicle as per OEM guidelines

PC19. maintain the documentation related to inspection, servicing and minor repair performed on the two wheeler electric vehicle

Assist lead technician in diagnosis or troubleshooting the faults

To be competent, the user/individual on the job must be able to:

PC20. conduct test drive of the two wheeler electric vehicle to assist the lead technician in assessing the service/repair requirement or calibration/adjustments, if any

PC21. follow lead technician instructions to choose and use the appropriate device/equipment to inspect/test the two wheeler electric vehicle/system/component performance to diagnose defect or faults

PC22. carry out inspection or tests on the two wheeler electric vehicle mechanical and electrical systems according to lead technician instructions

PC23. interpret and compare results of diagnostic inspections/tests with two wheeler electric vehicle specifications or regulatory requirements

PC24. maintain the documentation related to inspections and troubleshooting performed on the two wheeler electric vehicle

PC25. report the results to lead technician and seek assistance if further tests or inspections are required to conclude the diagnosis or troubleshooting

Post service/repair/diagnostic activities

To be competent, the user/individual on the job must be able to:

PC26. check the performance of the two wheeler electric vehicle/aggregate post repair and report to lead technician/supervisor if further inspection is required by another specialist

PC27. ensure completeness of tasks assigned before releasing the two wheeler electric vehicle for the next procedure

PC28. dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization's policies

PC29. return leftover consumable/parts, tools/equipment, and report if any malfunctions are observed to the person concerned

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the automotive industry in India, workshop structure and role and responsibilities of different people in the workshop

KU2. SOP for receiving two wheeler electric vehicle, opening job card, allocation of work, invoicing, vehicle delivery, handling complaints, etc.

KU3. different components/aggregates as well as auto component manufacturer's specifications for the same

KU4. basic technology used in and functioning of various systems and components of the two wheeler electric vehicle system such as: brakes, suspension, steering, hub drive/chain drive, etc. including electrical machines and devices used in electric vehicles such as: generator, DC/AC and DC/DC converters, Drive motor/hub, charging systems, regenerative braking, etc.

KU5. interconnection of systems with each other and effect of one system on other system

KU6. fundamental terms, laws and principles of electricity used in two wheeler electric vehicles such as: principles of storing electrical voltage, ohms law, voltage, current (AC/DC/HV), resistance, power, capacitance, electrostatics, magnetic, inductance, discrete electronic components, and radio frequency (automotive digital computers, automotive communication protocols such as CAN, LIN, etc.)

KU7. use of relevant measuring device/equipment and interpretation of all relevant mathematical calculations

KU8. various electrical and electronic signals such as electrical inputs, outputs, voltage, pulse width modulation, digital signal, etc.

KU9. symbols, units and terms used in wiring diagrams associated with electrical/electric systems/components of the two wheeler electric vehicle

KU10. how to use computer, on-line application and OEM technical information/assistance portals

KU11. various sources of information available for assessing service and repair requirements of the two wheeler electric vehicle including diagnostic displays, visual inspections, test drives, vehicle/equipment manufacturer specifications, and tolerance limits of components

KU12. standard schedules and checklists recommended by the OEM/auto component manufacturer for servicing of two wheeler electric vehicle or components

KU13. typical symptoms of common faults and failures in vehicle mechanical, electrical and electronic systems of two wheeler electric vehicle

KU14. safety, health and environmental policies and regulations for the workplace as well as for automotive trade in general

KU15. Standard Operating Procedures (SOPs) of the organization/ dealership for inspection and diagnosis of faults in a two wheeler electric vehicle as prescribed by the OEM/components manufacturer

KU16. how to work on the HV systems which do not require isolation, troubleshooting and replacing parts on the active HV system

KU17. SOP recommended by OEM for using tools/equipment for diagnosis or troubleshooting such as special service tools, measuring instrument, volt meters, ammeters, ohmmeters, battery tester, dedicated and computer based diagnostic equipment, oscilloscopes etc.

KU18. various workshop tools/measuring devices/equipment required to carry out job on two wheeler electric vehicle and their common errors or defects

KU19. documentation requirements for each procedure carried out as part of roles and responsibilities as specified by OEM/ auto component manufacturer

KU20. organizational/professional code of ethics and standards of practice

KU21. electrical hazards, protective measures and first aid: in case of electric shock, electrical arc in public grid or in two wheeler electric vehicle, impact of electric current/arc, secondary accidents

KU22. five safety rules for electrical work on HV systems before starting the work i.e. isolate, safeguard reconnection, verify the non-live state, earth or short-circuit and shroud or safeguard adjacent live parts

KU23. safety requirements recommended by the OEM for two wheeler electric vehicle components during diagnosis, troubleshooting and root cause analysis on various aggregates

KU24. legal regulations that need to be taken into account for handling two wheeler electric vehicle in the workshop

KU25. Occupational Safety and Health (OSH) measures required for working on two wheeler electric vehicle

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. read various sources of information available for assessing service and repair requirements

GS7. write any work-related information

GS8. write in English/regional language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare to carry out routine service or minor repair and assist in fault diagnosis	**5**	**14**	**-**	**6**
PC1. review the job card and understand work to be carried out on two wheeler electric vehicle	-	1	-	1
PC2. identify the auto components related to the various aggregates in the two wheeler electric vehicle	1	2	-	1
PC3. ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work on two wheeler electric vehicle	1	1	-	-
PC4. collect workshop tools/measuring devices/equipment required to carry out job on two wheeler electric vehicle and check their condition/calibration	1	2	-	1
PC5. prepare two wheeler electric vehicle according to nature of job to be performed: general and mechanical/electrical work in non-live state/troubleshoot and replace parts in live state HV system	-	1	-	-
PC6. mark the two wheeler electric vehicle and safeguard the working area during electrical work	-	1	-	-
PC7. wear PPE according to nature of job to be performed on the two wheeler electric vehicle	1	1	-	1
PC8. conduct visual inspection of the two wheeler electric vehicle to identify defects in HV components and identify indirect faults in electrical/electronic aggregate due to other system/component	-	2	-	1
PC9. assess mechanical aggregates such as brakes, suspension, axles etc. of the two wheeler electric vehicle for any external impact/bend/leak, incorrect level, wear & tear	1	2	-	1
PC10. report the malfunctions/repairs in the two wheeler electric vehicle beyond own scope to the concerned person	-	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform routine service and minor repairs	**12**	**18**	**-**	**5**
PC11. take precautions to avoid damage to the two wheeler electric vehicle and its components while working on various aggregates	1	2	-	-
PC12. use appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organisation	1	2	-	1
PC13. perform task on the HV system as per following stages: general and mechanical tasks on the two wheeler electric vehicle which do not require isolation of the HV systems, mechanical work in non-live state of the HV systems and replace parts in live state of the HV system	2	2	-	-
PC14. test the two wheeler electric vehicle's electrical/electronic system functioning of two/three wheeler vehicle wherever applicable as per OEM SOP	2	3	-	2
PC15. remove parts relevant to various mechanical aggregates of two wheeler electric vehicle and place them securely as specified by OEM	1	2	-	-
PC16. clean and condition dismantled mechanical and electrical components of two wheeler electric vehicle prior to assembly	1	1	-	-
PC17. perform minor repair/replacement/calibration of mechanical components/aggregates of the two wheeler electric vehicle such as brake pedal/lever free play adjustment, headlight beam alignment, etc.	2	3	-	1
PC18. refill/replace, as required quantity and appropriate grade of brake or other fluid/lubricant in the two wheeler electric vehicle as per OEM guidelines	1	2	-	1
PC19. maintain the documentation related to inspection, servicing and minor repair performed on the two wheeler electric vehicle	1	1	-	-
Assist lead technician in diagnosis or troubleshooting the faults	**8**	**10**	**-**	**5**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. conduct test drive of the two wheeler electric vehicle to assist the lead technician in assessing the service/repair requirement or calibration/adjustments, if any	-	2	-	-
PC21. follow lead technician instructions to choose and use the appropriate device/equipment to inspect/test the two wheeler electric vehicle/system/component performance to diagnose defect or faults	2	2	-	2
PC22. carry out inspection or tests on the two wheeler electric vehicle mechanical and electrical systems according to lead technician instructions	2	2	-	2
PC23. interpret and compare results of diagnostic inspections/tests with two wheeler electric vehicle specifications or regulatory requirements	2	2	-	1
PC24. maintain the documentation related to inspections and troubleshooting performed on the two wheeler electric vehicle	1	1	-	-
PC25. report the results to lead technician and seek assistance if further tests or inspections are required to conclude the diagnosis or troubleshooting	1	1	-	-
Post service/repair/diagnostic activities	**5**	**8**	**-**	**4**
PC26. check the performance of the two wheeler electric vehicle/aggregate post repair and report to lead technician/supervisor if further inspection is required by another specialist	2	3	-	2
PC27. ensure completeness of tasks assigned before releasing the two wheeler electric vehicle for the next procedure	1	2	-	1
PC28. dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization's policies	1	2	-	1
PC29. return leftover consumable/parts, tools/equipment, and report if any malfunctions are observed to the person concerned	1	1	-	-
NOS Total	**30**	**50**	**-**	**20**

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1451
NOS Name	Carry out routine service or minor repairs on 2 wheeler electric vehicle and assist in diagnosis
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
NSQF Level	4
Credits	4
Version	3.0
Last Reviewed Date	18/02/2025
Next Review Date	18/02/2028
NSQC Clearance Date	18/02/2025

ASC/N1321: Carry out routine service or minor repairs on 3 wheeler electric vehicle and assist in diagnosis

Description

This NOS unit is about an individual who performs all tasks related to service, minor repair and diagnosis on three wheeler electric vehicle.

Scope

The scope covers the following :

- Prepare to carry out routine service or minor repair and assist in fault diagnosis
- Perform routine service and minor repairs
- Assist lead technician in diagnosis or troubleshooting the faults
- Post service/repair/diagnostic activities

Elements and Performance Criteria

Prepare to carry out routine service or minor repair and assist in fault diagnosis

To be competent, the user/individual on the job must be able to:

PC1. review the job card and understand work to be carried out on three wheeler electric vehicle

PC2. identify the auto components related to the various aggregates in the three wheeler electric vehicle

PC3. ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work on three wheeler electric vehicle

PC4. collect workshop tools/measuring devices/equipment required to carry out job on three wheeler electric vehicle and check their condition/calibration

PC5. prepare three wheeler electric vehicle according to nature of job to be performed: general and mechanical/electrical work in non-live state/troubleshoot and replace parts in live state HV system

PC6. mark the three wheeler electric vehicle and safeguard the working area during electrical work

PC7. wear PPE according to nature of job to be performed on the three wheeler electric vehicle

PC8. conduct visual inspection of the three wheeler electric vehicle to identify defects in HV components and identify indirect faults in electrical/electronic aggregate due to other system/component

PC9. assess mechanical aggregates such as brakes, suspension, axles etc. of the three wheeler electric vehicle for any external impact/bend/leak, incorrect level, wear & tear

PC10. report the malfunctions/repairs in the three wheeler electric vehicle beyond own scope to the concerned person

Perform routine service and minor repairs

To be competent, the user/individual on the job must be able to:

PC11. take precautions to avoid damage to the three wheeler electric vehicle and its components while working on various aggregates

PC12. use appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organisation

PC13. perform task on the HV system as per following stages: general and mechanical tasks on the three wheeler electric vehicle which do not require isolation of the HV systems, mechanical work in non-live state of the HV systems and replace parts in live state of the HV system

PC14. test the three wheeler electric vehicle's electrical/electronic system functioning of two/three wheeler vehicle wherever applicable as per OEM SOP

PC15. remove parts relevant to various mechanical aggregates of three wheeler electric vehicle and place them securely as specified by OEM

PC16. clean and condition dismantled mechanical and electrical components of three wheeler electric vehicle prior to assembly

PC17. perform minor repair/replacement/calibration of mechanical components/aggregates of the three wheeler electric vehicle such as brake pedal/lever free play adjustment, headlight beam alignment, etc.

PC18. refill/replace, as required quantity and appropriate grade of brake or other fluid/lubricant in the three wheeler electric vehicle as per OEM guidelines

PC19. maintain the documentation related to inspection, servicing and minor repair performed on the three wheeler electric vehicle

Assist lead technician in diagnosis or troubleshooting the faults

To be competent, the user/individual on the job must be able to:

PC20. conduct test drive of the three wheeler electric vehicle to assist the lead technician in assessing the service/repair requirement or calibration/adjustments, if any

PC21. follow lead technician instructions to choose and use the appropriate device/equipment to inspect/test the three wheeler electric vehicle/system/component performance to diagnose defect or faults

PC22. carry out inspection or tests on the three wheeler electric vehicle mechanical and electrical systems according to lead technician instructions

PC23. interpret and compare results of diagnostic inspections/tests with three wheeler electric vehicle specifications or regulatory requirements

PC24. maintain the documentation related to inspections and troubleshooting performed on the three wheeler electric vehicle

PC25. report the results to lead technician and seek assistance if further tests or inspections are required to conclude the diagnosis or troubleshooting

Post service/repair/diagnostic activities

To be competent, the user/individual on the job must be able to:

PC26. check the performance of the three wheeler electric vehicle/aggregate post repair and report to lead technician/supervisor if further inspection is required by another specialist

PC27. ensure completeness of tasks assigned before releasing the three wheeler electric vehicle for the next procedure

PC28. dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization's policies

PC29. return leftover consumable/parts, tools/equipment, and report if any malfunctions are observed to the person concerned

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. SOP for receiving three wheeler electric vehicle, opening job card, allocation of work, invoicing, vehicle delivery, handling complaints, etc.

KU2. different components/aggregates as well as auto component manufacturer's specifications for the same

KU3. basic technology used in and functioning of various systems and components of the three wheeler electric vehicle system such as: brakes, suspension, steering, hub drive/chain drive, etc. including electrical machines and devices used in electric vehicles such as: generator, DC/AC and DC/DC converters, Drive motor/hub, charging systems, regenerative braking, etc.

KU4. interconnection of systems with each other and effect of one system on other system

KU5. fundamental terms, laws and principles of electricity used in three wheeler electric vehicles such as: principles of storing electrical voltage, ohms law, voltage, current (AC/DC/HV), resistance, power, capacitance, electrostatics, magnetic, inductance, discrete electronic components, and radio frequency (automotive digital computers, automotive communication protocols such as CAN, LIN, etc.)

KU6. use of relevant measuring device/equipment and interpretation of all relevant mathematical calculations

KU7. various electrical and electronic signals such as electrical inputs, outputs, voltage, pulse width modulation, digital signal, etc.

KU8. symbols, units and terms used in wiring diagrams associated with electrical/electric systems/components of the three wheeler electric vehicle

KU9. how to use computer, on-line application and OEM technical information/assistance portals

KU10. various sources of information available for assessing service and repair requirements of the three wheeler electric vehicle including diagnostic displays, visual inspections, test drives, vehicle/equipment manufacturer specifications, and tolerance limits of components

KU11. standard schedules and checklists recommended by the OEM/auto component manufacturer for servicing of three wheeler electric vehicle or components

KU12. typical symptoms of common faults and failures in vehicle mechanical, electrical and electronic systems of three wheeler electric vehicle

KU13. safety, health and environmental policies and regulations for the workplace as well as for automotive trade in general

KU14. Standard Operating Procedures (SOPs) of the organization/ dealership for inspection and diagnosis of faults in a three wheeler electric vehicle as prescribed by the OEM/components manufacturer

KU15. how to work on the HV systems which do not require isolation, troubleshooting and replacing parts on the active HV system

KU16. SOP recommended by OEM for using tools/equipment for diagnosis or troubleshooting such as special service tools, measuring instrument, volt meters, ammeters, ohmmeters, battery tester, dedicated and computer based diagnostic equipment, oscilloscopes etc.

KU17. various workshop tools/measuring devices/equipment required to carry out job on three wheeler electric vehicle and their common errors or defects

KU18. documentation requirements for each procedure carried out as part of roles and responsibilities as specified by OEM/ auto component manufacturer

KU19. organizational/professional code of ethics and standards of practice

KU20. electrical hazards, protective measures and first aid: in case of electric shock, electrical arc in public grid or in three wheeler electric vehicle, impact of electric current/arc, secondary accidents

KU21. five safety rules for electrical work on HV systems before starting the work i.e. isolate, safeguard reconnection, verify the non-live state, earth or short-circuit and shroud or safeguard adjacent live parts

KU22. safety requirements recommended by the OEM for three wheeler electric vehicle components during diagnosis, troubleshooting and root cause analysis on various aggregates

KU23. legal regulations that need to be taken into account for handling three wheeler electric vehicle in the workshop

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. read various sources of information available for assessing service and repair requirements

GS7. write any work-related information

GS8. write in English/regional language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare to carry out routine service or minor repair and assist in fault diagnosis	**5**	**14**	**-**	**6**
PC1. review the job card and understand work to be carried out on three wheeler electric vehicle	-	1	-	1
PC2. identify the auto components related to the various aggregates in the three wheeler electric vehicle	1	2	-	1
PC3. ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work on three wheeler electric vehicle	1	1	-	-
PC4. collect workshop tools/measuring devices/equipment required to carry out job on three wheeler electric vehicle and check their condition/calibration	1	2	-	1
PC5. prepare three wheeler electric vehicle according to nature of job to be performed: general and mechanical/electrical work in non-live state/troubleshoot and replace parts in live state HV system	-	1	-	-
PC6. mark the three wheeler electric vehicle and safeguard the working area during electrical work	-	1	-	-
PC7. wear PPE according to nature of job to be performed on the three wheeler electric vehicle	1	1	-	1
PC8. conduct visual inspection of the three wheeler electric vehicle to identify defects in HV components and identify indirect faults in electrical/electronic aggregate due to other system/component	-	2	-	1
PC9. assess mechanical aggregates such as brakes, suspension, axles etc. of the three wheeler electric vehicle for any external impact/bend/leak, incorrect level, wear & tear	1	2	-	1
PC10. report the malfunctions/repairs in the three wheeler electric vehicle beyond own scope to the concerned person	-	1	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Perform routine service and minor repairs	**12**	**18**	**-**	**5**
PC11. take precautions to avoid damage to the three wheeler electric vehicle and its components while working on various aggregates	1	2	-	-
PC12. use appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organisation	1	2	-	1
PC13. perform task on the HV system as per following stages: general and mechanical tasks on the three wheeler electric vehicle which do not require isolation of the HV systems, mechanical work in non-live state of the HV systems and replace parts in live state of the HV system	2	2	-	-
PC14. test the three wheeler electric vehicle's electrical/electronic system functioning of two/three wheeler vehicle wherever applicable as per OEM SOP	2	3	-	2
PC15. remove parts relevant to various mechanical aggregates of three wheeler electric vehicle and place them securely as specified by OEM	1	2	-	-
PC16. clean and condition dismantled mechanical and electrical components of three wheeler electric vehicle prior to assembly	1	1	-	-
PC17. perform minor repair/replacement/calibration of mechanical components/aggregates of the three wheeler electric vehicle such as brake pedal/lever free play adjustment, headlight beam alignment, etc.	2	3	-	1
PC18. refill/replace, as required quantity and appropriate grade of brake or other fluid/lubricant in the three wheeler electric vehicle as per OEM guidelines	1	2	-	1
PC19. maintain the documentation related to inspection, servicing and minor repair performed on the three wheeler electric vehicle	1	1	-	-
Assist lead technician in diagnosis or troubleshooting the faults	**8**	**10**	**-**	**5**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC20. conduct test drive of the three wheeler electric vehicle to assist the lead technician in assessing the service/repair requirement or calibration/adjustments, if any	-	2	-	-
PC21. follow lead technician instructions to choose and use the appropriate device/equipment to inspect/test the three wheeler electric vehicle/system/component performance to diagnose defect or faults	2	2	-	2
PC22. carry out inspection or tests on the three wheeler electric vehicle mechanical and electrical systems according to lead technician instructions	2	2	-	2
PC23. interpret and compare results of diagnostic inspections/tests with three wheeler electric vehicle specifications or regulatory requirements	2	2	-	1
PC24. maintain the documentation related to inspections and troubleshooting performed on the three wheeler electric vehicle	1	1	-	-
PC25. report the results to lead technician and seek assistance if further tests or inspections are required to conclude the diagnosis or troubleshooting	1	1	-	-
Post service/repair/diagnostic activities	**5**	**8**	**-**	**4**
PC26. check the performance of the three wheeler electric vehicle/aggregate post repair and report to lead technician/supervisor if further inspection is required by another specialist	2	3	-	2
PC27. ensure completeness of tasks assigned before releasing the three wheeler electric vehicle for the next procedure	1	2	-	1
PC28. dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization's policies	1	2	-	1
PC29. return leftover consumable/parts, tools/equipment, and report if any malfunctions are observed to the person concerned	1	1	-	-
NOS Total	**30**	**50**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1321
NOS Name	Carry out routine service or minor repairs on 3 wheeler electric vehicle and assist in diagnosis
Sector	Automotive
Sub-Sector	
Occupation	Automotive Service & Repair
NSQF Level	4
Credits	3
Version	1.0
Last Reviewed Date	18/02/2025
Next Review Date	18/02/2028
NSQC Clearance Date	18/02/2025

ASC/N1452: Carry out routine service or minor repairs on heavy commercial electric vehicle and assist in diagnosis

Description

This NOS unit is about an individual who performs all tasks related to service, minor repair and diagnosis on electric truck/bus.

Scope

The scope covers the following :

- Prepare to carry out routine service or minor repair and assist in fault diagnosis
- Perform routine service and minor repairs
- Assist lead technician in diagnosis or troubleshooting the faults
- Post service/repair/diagnostic activities

Elements and Performance Criteria

Prepare to carry out routine service or minor repair and assist in fault diagnosis

To be competent, the user/individual on the job must be able to:

PC1. review the job card and understand work to be carried out on electric truck/bus

PC2. identify the auto components related to the various aggregates in the electric truck/bus

PC3. ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work on the electric truck/bus

PC4. collect workshop tools/measuring devices/equipment required to carry out job on the electric truck/bus and check their condition/calibration

PC5. prepare the electric truck/bus according to nature of job to be performed: general and mechanical job on the vehicle/electrical work in non-live state/troubleshoot and replace parts in live state HV system

PC6. mark the electric truck/bus and safeguard the working area during electrical work

PC7. wear PPE according to nature of job to be performed on the electric truck/bus

PC8. conduct visual inspection of the electric truck/bus to identify defects in HV components and identify indirect faults in electrical/electronic aggregate due to other system/component

PC9. assess mechanical aggregates such as brakes, suspension, axles, transmission, steering etc. of the electric truck/bus for any external impact/bend/leak, incorrect level, wear & tear

PC10. report the malfunctions/repairs in the electric truck/bus beyond own scope to the concerned person

Perform routine service and minor repairs

To be competent, the user/individual on the job must be able to:

PC11. take precautions to avoid damage to the electric truck/bus and its components while working on various aggregates

PC12. use appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organisation

PC13. perform task on the HV system as per following stages: general and mechanical tasks on the electric truck/bus which do not require isolation of the HV systems, mechanical work in non-live state of the HV systems and replace parts in live state of the HV system

PC14. test the heavy commercial electric vehicle's electrical/electronic system functioning of electric truck/bus wherever applicable as per OEM SOP

PC15. remove parts relevant to various mechanical aggregates of electric truck/bus and place them securely as specified by OEM

PC16. clean and condition dismantled mechanical and electrical components of electric truck/bus prior to assembly

PC17. perform minor repair/replacement/calibration on electric truck/bus, systems such as drive line, mechanical/air suspension systems, air brakes & steering systems etc. including HVAC, etc.

PC18. refill/replace, as required quantity and appropriate grade of fluid/lubricant in the electric truck/bus as per OEM guidelines

PC19. maintain the documentation related to inspection, servicing and minor repair performed on the electric truck/bus

Assist lead technician in diagnosis or troubleshooting the faults

To be competent, the user/individual on the job must be able to:

PC20. conduct test drive of the electric truck/bus to assist the lead technician in assessing the service/repair requirement or calibration/adjustments, if any

PC21. follow lead technician instructions to choose and use the appropriate device/equipment to inspect/test system/component of electric truck/bus performance to diagnose defect or faults in electric vehicle

PC22. carry out inspection or test on mechanical and electrical systems of electric truck/bus according to lead technician instructions

PC23. interpret and compare results of diagnostic inspections/tests with electric truck/bus specifications or regulatory requirements

PC24. maintain the documentation related to inspections and troubleshooting performed on the electric truck/bus

PC25. report the results to lead technician and seek assistance if further tests or inspections are required to conclude the diagnosis or troubleshooting

Post service/repair/diagnostic activities

To be competent, the user/individual on the job must be able to:

PC26. check the performance of electric truck/bus aggregate post repair and report to lead technician/supervisor if further inspection is required by another specialist

PC27. ensure completeness of tasks assigned before releasing the electric truck/bus for the next procedure

PC28. dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization's policies

PC29. return leftover consumable/parts, tools/equipment, and report if any malfunctions are observed to the person concerned

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the automotive industry in India, workshop structure and role and responsibilities of different people in the workshop

KU2. SOP for receiving electric truck/bus, opening job card, allocation of work, invoicing, vehicle delivery, handling complaints, etc.

KU3. different components/aggregates as well as auto component manufacturer's specifications for the same

KU4. basic technology used in and functioning of various systems of the electric truck/bus such as brakes, suspension, steering, body management system, telematics, air- conditioning systems, active & passive safety system, media and other systems brakes, suspension, steering, etc. including electrical devices used in electric vehicles such as: generator, DC/AC and DC/DC converters, AC motor, DC motor, regenerative brakes, etc.

KU5. interconnection of systems with each other and effect of one system on other system

KU6. fundamental terms, laws and principles of electricity used in electric truck/bus such as: principles of storing electrical voltage, ohms law, voltage, current (AC/DC/HV), resistance, power, capacitance, electrostatics, magnetic, inductance, discrete electronic components, and radio frequency (automotive digital computers, automotive communication protocols such as CAN, LIN, MOST, etc.)

KU7. use of relevant measuring device/equipment and interpretation of all relevant mathematical calculations

KU8. various electrical and electronic signals such as electrical inputs, outputs, voltage, pulse width modulation, digital signal, etc.

KU9. symbols, units and terms used in wiring diagrams associated with electrical/electric systems/components of the electric truck/bus

KU10. how to use computer, on-line application and OEM technical information/assistance portals

KU11. various sources of information available for assessing service and repair requirements of the electric truck/bus including diagnostic displays, visual inspections, test drives, vehicle/equipment manufacturer specifications, and tolerance limits of components

KU12. standard schedules and checklists recommended by the OEM/auto component manufacturer for servicing of electric truck/bus or components

KU13. typical symptoms of common faults and failures in vehicle mechanical, electrical and electronic systems

KU14. safety, health and environmental policies and regulations for the workplace as well as for automotive trade in general

KU15. Standard Operating Procedures (SOPs) of the organization/ dealership for inspection and diagnosis of faults in a electric truck/bus as prescribed by the OEM/components manufacturer

KU16. how to work on the HV systems which do not require isolation, troubleshooting and replacing parts on the active HV system

KU17. SOP recommended by OEM for using tools/equipment for diagnosis or troubleshooting such as special service tools, measuring instrument, volt meters, ammeters, ohmmeters, battery tester, dedicated and computer based diagnostic equipment, oscilloscopes etc.

KU18. various workshop tools/measuring devices/equipment required to carry out job on electric vehicle and their common errors or defects

KU19. documentation requirements for each procedure carried out as part of roles and responsibilities as specified by OEM/ auto component manufacturer

KU20. organizational/professional code of ethics and standards of practice

KU21. electrical hazards, protective measures and first aid: in case of electric shock, electrical arc in public grid or in an electric truck/bus, impact of electric current/arc, secondary accidents

KU22. five safety rules for electrical work on HV systems before starting the work i.e. isolate, safeguard reconnection, verify the non-live state, earth or short-circuit and shroud or safeguard adjacent live parts

KU23. safety requirements recommended by the OEM for equipment /electric truck/bus components during diagnosis, troubleshooting and root cause analysis on various aggregates

KU24. legal regulations that need to be taken into account for handling electric truck/bus in the workshop

KU25. Occupational Safety and Health (OSH) measures required for working on electric truck/bus

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. read various sources of information available for assessing service and repair requirements

GS7. write any work-related information

GS8. write in English/regional language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare to carry out routine service or minor repair and assist in fault diagnosis	**5**	**14**	**-**	**6**
PC1. review the job card and understand work to be carried out on electric truck/bus	-	1	-	1
PC2. identify the auto components related to the various aggregates in the electric truck/bus	1	2	-	1
PC3. ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work on the electric truck/bus	1	1	-	-
PC4. collect workshop tools/measuring devices/equipment required to carry out job on the electric truck/bus and check their condition/calibration	1	2	-	1
PC5. prepare the electric truck/bus according to nature of job to be performed: general and mechanical job on the vehicle/electrical work in non-live state/troubleshoot and replace parts in live state HV system	-	1	-	-
PC6. mark the electric truck/bus and safeguard the working area during electrical work	-	1	-	-
PC7. wear PPE according to nature of job to be performed on the electric truck/bus	1	1	-	1
PC8. conduct visual inspection of the electric truck/bus to identify defects in HV components and identify indirect faults in electrical/electronic aggregate due to other system/component	-	2	-	1
PC9. assess mechanical aggregates such as brakes, suspension, axles, transmission, steering etc. of the electric truck/bus for any external impact/bend/leak, incorrect level, wear & tear	1	2	-	1
PC10. report the malfunctions/repairs in the electric truck/bus beyond own scope to the concerned person	-	1	-	-
Perform routine service and minor repairs	**12**	**18**	**-**	**5**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. take precautions to avoid damage to the electric truck/bus and its components while working on various aggregates	1	2	-	-
PC12. use appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organisation	1	2	-	1
PC13. perform task on the HV system as per following stages: general and mechanical tasks on the electric truck/bus which do not require isolation of the HV systems, mechanical work in non-live state of the HV systems and replace parts in live state of the HV system	2	2	-	-
PC14. test the heavy commercial electric vehicle's electrical/electronic system functioning of electric truck/bus wherever applicable as per OEM SOP	2	3	-	2
PC15. remove parts relevant to various mechanical aggregates of electric truck/bus and place them securely as specified by OEM	1	2	-	-
PC16. clean and condition dismantled mechanical and electrical components of electric truck/bus prior to assembly	1	1	-	-
PC17. perform minor repair/replacement/calibration on electric truck/bus, systems such as drive line, mechanical/air suspension systems, air brakes & steering systems etc. including HVAC, etc.	2	3	-	1
PC18. refill/replace, as required quantity and appropriate grade of fluid/lubricant in the electric truck/bus as per OEM guidelines	1	2	-	1
PC19. maintain the documentation related to inspection, servicing and minor repair performed on the electric truck/bus	1	1	-	-
Assist lead technician in diagnosis or troubleshooting the faults	**8**	**10**	**-**	**5**
PC20. conduct test drive of the electric truck/bus to assist the lead technician in assessing the service/repair requirement or calibration/adjustments, if any	-	2	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC21. follow lead technician instructions to choose and use the appropriate device/equipment to inspect/test system/component of electric truck/bus performance to diagnose defect or faults in electric vehicle	2	2	-	2
PC22. carry out inspection or test on mechanical and electrical systems of electric truck/bus according to lead technician instructions	2	2	-	2
PC23. interpret and compare results of diagnostic inspections/tests with electric truck/bus specifications or regulatory requirements	2	2	-	1
PC24. maintain the documentation related to inspections and troubleshooting performed on the electric truck/bus	1	1	-	-
PC25. report the results to lead technician and seek assistance if further tests or inspections are required to conclude the diagnosis or troubleshooting	1	1	-	-
Post service/repair/diagnostic activities	**5**	**8**	**-**	**4**
PC26. check the performance of electric truck/bus aggregate post repair and report to lead technician/supervisor if further inspection is required by another specialist	2	3	-	2
PC27. ensure completeness of tasks assigned before releasing the electric truck/bus for the next procedure	1	2	-	1
PC28. dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization's policies	1	2	-	1
PC29. return leftover consumable/parts, tools/equipment, and report if any malfunctions are observed to the person concerned	1	1	-	-
NOS Total	**30**	**50**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1452
NOS Name	Carry out routine service or minor repairs on heavy commercial electric vehicle and assist in diagnosis
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
NSQF Level	4
Credits	4
Version	2.0
Last Reviewed Date	18/02/2025
Next Review Date	18/02/2028
NSQC Clearance Date	18/02/2025

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down the proportion of marks for Theory and Skills Practical for each PC.

2. The assessment for the theory part will be based on the knowledge bank of questions created by the SSC.

3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.

4. Individual assessment agencies will create unique question papers for the theory part for each candidate at each examination/training center (as per assessment criteria below).

5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.

6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Minimum Aggregate Passing % at QP Level : 70

(**Please note**: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N9801.Organize work and resources (Service)	50	30	-	20	100	15
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	10
ASC/N9846.High voltage and fire safety practices	50	30	-	20	100	25
Total	**120**	**90**	**-**	**40**	**250**	**50**

Elective: 1 Four Wheeler

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N1450.Carry out routine service or minor repairs on four wheeler electric/ hybrid vehicle and assist in diagnosis	30	50	-	20	100	50
Total	**30**	**50**	**-**	**20**	**100**	**50**

Elective: 2 Two Wheeler

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N1451.Carry out routine service or minor repairs on 2 wheeler electric vehicle and assist in diagnosis	30	50	-	20	100	50
Total	**30**	**50**	**-**	**20**	**100**	**50**

Elective: 3 Three Wheeler

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N1321.Carry out routine service or minor repairs on 3 wheeler electric vehicle and assist in diagnosis	30	50	-	20	100	50
Total	**30**	**50**	**-**	**20**	**100**	**50**

Elective: 4 Bus and Heavy Commercial Vehicle

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N1452.Carry out routine service or minor repairs on heavy commercial electric vehicle and assist in diagnosis	30	50	-	20	100	50
Total	**30**	**50**	**-**	**20**	**100**	**50**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
PwD	Persons with Disability

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.