

## Qualification Pack



# Electric Vehicle Service Lead Technician

QP Code: ASC/Q1424

Version: 2.0

NSQF Level: 4.5

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

## Qualification Pack

### Contents

ASC/Q1424: Electric Vehicle Service Lead Technician .....	3
<i>Brief Job Description</i> .....	3
Applicable National Occupational Standards (NOS) .....	3
<i>Compulsory NOS</i> .....	3
<i>Qualification Pack (QP) Parameters</i> .....	3
ASC/N9813: Manage work and resources (Service) .....	5
DGT/VSQ/N0102: Employability Skills (60 Hours) .....	12
ASC/N1435: Carry out diagnosis of electric vehicle for repair requirements .....	20
ASC/N1436: Carry out service, repair and overhauling of mechanical aggregates in vehicle .....	28
ASC/N1437: Carry out service, repair and overhauling of electrical and electronic systems within an aggregate in the vehicle .....	36
Assessment Guidelines and Weightage .....	43
<i>Assessment Guidelines</i> .....	43
<i>Assessment Weightage</i> .....	44
Acronyms .....	45
Glossary .....	46

## Qualification Pack

### ASC/Q1424: Electric Vehicle Service Lead Technician

#### Brief Job Description

The individual in this job is responsible for diagnosis and specialized repairs of mechanical, electrical and electronic faults in electric vehicles.

#### Personal Attributes

The person should be patient, organised, team-oriented and have the ability to work for long hours in adverse conditions. They should be keen observers and have an eye for detail and quality.

#### Applicable National Occupational Standards (NOS)

##### Compulsory NOS:

1. [ASC/N9813: Manage work and resources \(Service\)](#)
2. [DGT/VSQ/N0102: Employability Skills \(60 Hours\)](#)
3. [ASC/N1435: Carry out diagnosis of electric vehicle for repair requirements](#)
4. [ASC/N1436: Carry out service, repair and overhauling of mechanical aggregates in vehicle](#)
5. [ASC/N1437: Carry out service, repair and overhauling of electrical and electronic systems within an aggregate in the vehicle](#)

#### Qualification Pack (QP) Parameters

<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Automotive Vehicle Service
<b>Occupation</b>	Technical Service & Repair
<b>Country</b>	India
<b>NSQF Level</b>	4.5
<b>Credits</b>	17
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/3115.0602

## Qualification Pack

<b>Minimum Educational Qualification &amp; Experience</b>	<p>8th grade pass with 2 years of NTC with 1 Year of experience OR 8th grade pass with 3 Years of experience of relevant experience OR 10th grade pass and pursuing continuous schooling OR 11th grade pass OR Certificate-NSQF (Four Wheeler Service Technician/Automotive Electrician Level 3.5) with 3 Years of experience with minimum education as 8th class pass</p>
<b>Minimum Level of Education for Training in School</b>	
<b>Pre-Requisite License or Training</b>	LMV Driving Licence
<b>Minimum Job Entry Age</b>	18 Years
<b>Last Reviewed On</b>	NA
<b>Next Review Date</b>	29/01/2026
<b>NSQC Approval Date</b>	29/01/2021
<b>Version</b>	2.0
<b>Reference code on NQR</b>	2021/AUT/ASDC/04092
<b>NQR Version</b>	2

## Qualification Pack

### ASC/N9813: Manage 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
- Ensure work as per quality standards
- Material/energy/electricity conservation practices
- Effective waste management/recycling practices
- Ensure a healthy and hygienic workplace

#### Elements and Performance Criteria

##### *Maintain safe and secure working environment*

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

- PC1.** ensure that the team complies with organisation's health, safety, security policies and procedures
- PC2.** identify the risks and hazards associated with work activities, their causes and prevention as per organisation's policy
- PC3.** encourage team to report any identified breaches in health, safety, and security policies and procedures to the designated person

##### *Ensure work as per quality standards*

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

- PC4.** ensure work area is kept clean and tidy
- PC5.** identify individual work requirements and provide necessary instructions to the team
- PC6.** ensure the team works as per the assigned and agreed requirements
- PC7.** identify work which fails the requirements, specified quality standards and ensure timely corrective action is taken
- PC8.** implement ways and guide the team to manage time, resources and cost effectively
- PC9.** train the team on skill level advancement to develop expertise in their work
- PC10.** ensure that the team understands accountability for timely completion of tasks
- PC11.** analyse and validate the problem accurately and communicate different possible solutions to the problem

##### *Material/energy/electricity conservation practices*

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

- PC12.** identify ways to optimize usage of electricity/other source of energy and material including water in various tasks/activities/processes
- PC13.** ensure that the team uses resources in a responsible manner

## Qualification Pack

- PC14.** ensure that the team periodically checks for spills/leakages around the work area and take corrective actions or escalate to appropriate authority if unable to rectify
- PC15.** supervise team to carry out routine cleaning of tools, machine and equipment
- PC16.** ensure that the team periodically checks if the equipment/machines are maintained and functioning normally before commencing work and take corrective action wherever required

### *Effective waste management/recycling practices*

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

- PC17.** identify recyclable, non-recyclable and hazardous waste generated
- PC18.** ensure the team segregates waste into different categories
- PC19.** ensure proper disposal of non-recyclable waste
- PC20.** ensure recyclable and reusable material is deposited at identified location
- PC21.** ensure the team follows processes specified for disposal of hazardous waste

### *Ensure a healthy and hygienic workplace*

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

- PC22.** ensure workplace, equipment, restrooms etc. are sanitized regularly
- PC23.** promote awareness about hygiene and sanitation regulations
- PC24.** check availability of running water, hand wash and alcohol-based sanitizers at workplace
- PC25.** support employees to cope with stress, anxiety etc.
- PC26.** wear and dispose PPEs regularly and appropriately

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** different types of health and safety hazards that can be found in the workplace, risks and threats based on the nature of work
- KU2.** company defined workplace hazards and rules/regulation for maintaining health, safety and security at workplace
- KU3.** breaches in health, safety and security as well as procedures to report the same
- KU4.** workshop layout with electrical, hydraulic and thermal equipment used
- KU5.** the organisation's emergency procedures for different emergency situations and the importance of following the same
- KU6.** ways of time and cost management
- KU7.** ways to manage efficient utilisation of energy, material and water in the process
- KU8.** ways to recognize common electrical problems and common practices of conserving electricity
- KU9.** usage of different colours of dustbins and categorization of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics
- KU10.** organisations procedures for minimizing waste
- KU11.** waste management and methods of waste disposal
- KU12.** common sources of pollution and ways to minimize it
- KU13.** different ways for skill level advancement to develop expertise

## Qualification Pack

- KU14.** key performance indicators for the new tasks
- KU15.** timelines and goals set by the manager
- KU16.** importance of quality and timely delivery of the product/service
- KU17.** organisation's policies to maintain personal health and hygiene at workplace
- KU18.** significance of greening

### Generic Skills (GS)

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

- GS1.** read instructions/guidelines/procedures
- GS2.** listen effectively and orally communicate information
- GS3.** ask for clarification and advice from the concerned person
- GS4.** maintain positive and effective relationships with colleagues and customers
- GS5.** evaluate the possible solution(s) to the problem
- GS6.** complete written work with attention to detail
- GS7.** modify work practices to improve them
- GS8.** work with supervisors/team members to carry out work related tasks
- GS9.** complete tasks efficiently and accurately within stipulated time
- GS10.** make timely decisions for efficient utilization of resources
- GS11.** be punctual and utilize time
- GS12.** evaluate strategies to maintain, enhance or reduce the intensity of heightened emotional response

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Maintain safe and secure working environment</i>	<b>7</b>	<b>5</b>	-	<b>4</b>
<b>PC1.</b> ensure that the team complies with organisation's health, safety, security policies and procedures	2	2	-	1
<b>PC2.</b> identify the risks and hazards associated with work activities, their causes and prevention as per organisation's policy	3	2	-	2
<b>PC3.</b> encourage team to report any identified breaches in health, safety, and security policies and procedures to the designated person	2	1	-	1
<i>Ensure work as per quality standards</i>	<b>15</b>	<b>8</b>	-	<b>5</b>
<b>PC4.</b> ensure work area is kept clean and tidy	2	1	-	-
<b>PC5.</b> identify individual work requirements and provide necessary instructions to the team	2	1	-	1
<b>PC6.</b> ensure the team works as per the assigned and agreed requirements	1	1	-	-
<b>PC7.</b> identify work which fails the requirements, specified quality standards and ensure timely corrective action is taken	3	2	-	2
<b>PC8.</b> implement ways and guide the team to manage time, resources and cost effectively	2	-	-	-
<b>PC9.</b> train the team on skill level advancement to develop expertise in their work	2	1	-	1
<b>PC10.</b> ensure that the team understands accountability for timely completion of tasks	2	-	-	-
<b>PC11.</b> analyse and validate the problem accurately and communicate different possible solutions to the problem	1	2	-	1
<i>Material/energy/electricity conservation practices</i>	<b>10</b>	<b>6</b>	-	<b>4</b>



### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC12.</b> identify ways to optimize usage of electricity/other source of energy and material including water in various tasks/activities/processes	2	2	-	2
<b>PC13.</b> ensure that the team uses resources in a responsible manner	2	1	-	-
<b>PC14.</b> ensure that the team periodically checks for spills/leakages around the work area and take corrective actions or escalate to appropriate authority if unable to rectify	2	1	-	1
<b>PC15.</b> supervise team to carry out routine cleaning of tools, machine and equipment	2	1	-	-
<b>PC16.</b> ensure that the team periodically checks if the equipment/machines are maintained and functioning normally before commencing work and take corrective action wherever required	2	1	-	1
<i>Effective waste management/recycling practices</i>	<b>10</b>	<b>6</b>	-	<b>4</b>
<b>PC17.</b> identify recyclable, non-recyclable and hazardous waste generated	2	2	-	1
<b>PC18.</b> ensure the team segregates waste into different categories	2	1	-	1
<b>PC19.</b> ensure proper disposal of non-recyclable waste	2	1	-	-
<b>PC20.</b> ensure recyclable and reusable material is deposited at identified location	2	1	-	1
<b>PC21.</b> ensure the team follows processes specified for disposal of hazardous waste	2	1	-	1
<i>Ensure a healthy and hygienic workplace</i>	<b>8</b>	<b>5</b>	-	<b>3</b>
<b>PC22.</b> ensure workplace, equipment, restrooms etc. are sanitized regularly	2	1	-	-
<b>PC23.</b> promote awareness about hygiene and sanitation regulations	2	1	-	1
<b>PC24.</b> check availability of running water, hand wash and alcohol-based sanitizers at workplace	1	1	-	-

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC25.</b> support employees to cope with stress, anxiety etc.	1	1	-	1
<b>PC26.</b> wear and dispose PPEs regularly and appropriately	2	1	-	1
<b>NOS Total</b>	<b>50</b>	<b>30</b>	<b>-</b>	<b>20</b>

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N9813
<b>NOS Name</b>	Manage work and resources (Service)
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Generic
<b>Occupation</b>	Generic
<b>NSQF Level</b>	5
<b>Credits</b>	2
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	29/01/2026
<b>NSQF Clearance Date</b>	29/01/2021

## Qualification Pack

### 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:

## Qualification Pack

- 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.

## Qualification Pack

**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

## Qualification Pack

- 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

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Introduction to Employability Skills</i>	<b>1</b>	<b>1</b>	-	-
<b>PC1.</b> identify employability skills required for jobs in various industries	-	-	-	-
<b>PC2.</b> identify and explore learning and employability portals	-	-	-	-
<i>Constitutional values - Citizenship</i>	<b>1</b>	<b>1</b>	-	-
<b>PC3.</b> 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.	-	-	-	-
<b>PC4.</b> follow environmentally sustainable practices	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	<b>2</b>	<b>4</b>	-	-
<b>PC5.</b> recognize the significance of 21st Century Skills for employment	-	-	-	-
<b>PC6.</b> 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	-	-	-	-
<i>Basic English Skills</i>	<b>2</b>	<b>3</b>	-	-
<b>PC7.</b> use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
<b>PC8.</b> read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
<b>PC9.</b> write short messages, notes, letters, e-mails etc. in English	-	-	-	-
<i>Career Development &amp; Goal Setting</i>	<b>1</b>	<b>2</b>	-	-



## Qualification Pack

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

## Qualification Pack

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

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	DGT/VSQ/N0102
<b>NOS Name</b>	Employability Skills (60 Hours)
<b>Sector</b>	Cross Sectoral
<b>Sub-Sector</b>	Professional Skills
<b>Occupation</b>	Employability
<b>NSQF Level</b>	4
<b>Credits</b>	2
<b>Version</b>	1.0
<b>Last Reviewed Date</b>	31/01/2024
<b>Next Review Date</b>	31/01/2027
<b>NSQC Clearance Date</b>	31/01/2024

## Qualification Pack

### ASC/N1435: Carry out diagnosis of electric vehicle for repair requirements

#### Description

This NOS unit is about diagnosing the mechanical and electrical/electronic aggregates in an electric vehicle and proposing repair to be carried out.

#### Scope

The scope covers the following :

- Inspect the vehicle and identify/validate faults
- Prepare to perform diagnostic tests
- Perform tests to identify the root cause of fault
- Conclude the repair solution for the fault

#### Elements and Performance Criteria

##### *Inspect the vehicle and identify/validate faults*

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

- PC1.** review the job card, obtain required information from customer/service advisor to assess service and repair requirements
- PC2.** identify the auto components related to the various aggregates in the vehicle
- PC3.** check the functioning of vehicle systems such as lighting system, air conditioning system etc.
- PC4.** conduct test drive to check vehicle performance and identify/validate the faults
- PC5.** conduct visual inspection of the vehicle to identify defects in HV (High Voltage) components
- PC6.** assess mechanical components/aggregates such as brake pad/shoe, wheel cylinder, mountings, bushes, control arms etc. of the vehicle for any external impact/bend/leak/incorrect level/wear & tear
- PC7.** determine the precise location of faults in vehicle systems

##### *Prepare to perform diagnostic tests*

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

- PC8.** ensure no HV activity is being conducted around workstation prior to commencement of work
- PC9.** prepare the 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
- PC10.** mark the vehicle and safeguard the working area during electrical work
- PC11.** collect workshop tools/measuring device/equipment required for fault diagnosis in vehicle systems and check their condition/calibration
- PC12.** report the malfunctions if any, in the tools/equipment to the person concerned for rectification

##### *Perform tests to identify the root cause of fault*

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

## Qualification Pack

- PC13.** take precautions to avoid damage to the vehicle and its components during diagnosis or troubleshooting the faults
- PC14.** use checklists and OEM Standard Operating Procedures (SOPs) to understand if the fault is because of improper charging, loose/poor contacts of pins in wiring harness connectors and their connection, improper driving style etc.
- PC15.** select and apply the appropriate device/equipment to make inspection and diagnose deficiencies/faults in various systems such as Body management systems, Braking and stability control systems, Drive line systems, Battery management system, Telematics system, etc.
- PC16.** use manufacturer's and component supplier's specifications to identify duplicate or defective component/parts which cannot be detected during visual inspection
- PC17.** follow SOP set out for troubleshooting and perform tests using various mechanical, electrical/electronic measuring devices/tester/diagnostic tools/software to identify/isolate a fault
- PC18.** perform diagnostic task on the HV system as per following stages: general and mechanical tasks on the vehicle which do not require isolation of the HV systems, electrical work in non-live state of the HV systems, troubleshoot and replace parts in live state of the HV system
- PC19.** diagnose indirect faults if any, in vehicle's mechanical, electrical and electronic systems as per OEM SOP
- PC20.** report the malfunctions in the vehicle where solution is not available or in case of new premature failures, to the concerned person along with preliminary diagnostic details
- PC21.** dismantle and reassemble aggregates of a vehicle for fault diagnosis

*Conclude the repair solution for the fault*

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

- PC22.** maintain the documentation related to inspections and troubleshooting performed on the vehicle
- PC23.** interpret results as required
- PC24.** compare results of diagnostic inspections/tests with vehicle specifications and regulatory requirements
- PC25.** validate the options for repair or replacement
- PC26.** prepare final proposal regarding repair or replacement requirements with justification

## 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 for the same

## Qualification Pack

- KU4.** basic technology used in and functioning of various systems and components of the vehicle such as 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 EV 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 (including infra red and fiber optics) etc.
- KU9.** symbols, units and terms used in wiring diagrams associated with electrical/electric systems/components of the 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 vehicle including diagnostic displays, visual inspections, test drives, vehicle/equipment manufacturer specifications, and tolerance limits of components
- KU12.** typical symptoms of common faults and failures in vehicle mechanical, electrical and electronic systems
- KU13.** safety, health and environmental policies and regulations for the work place 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 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.** different types of errors or defects in the tools/equipment
- 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 an electrical car, 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 equipment /vehicle components during diagnosis, troubleshooting and root cause analysis on various aggregates
- KU23.** legal regulations that need to be taken into account for handling electric vehicles in the workshop
- KU24.** Occupational Safety and Health (OSH) measures required for working on electric vehicle

## Qualification Pack

### Generic Skills (GS)

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

- GS1.** read and interpret workplace related documentation
- GS2.** communicate using terms, names, grades and other nomenclature pertaining to the automotive trade
- GS3.** analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently
- GS4.** identify potential workplace problem and take suitable action
- GS5.** read various sources of information available for assessing service and repair requirements
- GS6.** write in English/regional language
- GS7.** read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates
- GS8.** communicate effectively at the workplace
- GS9.** plan work according to the required schedule and location

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Inspect the vehicle and identify/validate faults</i>	<b>5</b>	<b>10</b>	-	<b>5</b>
<b>PC1.</b> review the job card, obtain required information from customer/service advisor to assess service and repair requirements	-	1	-	-
<b>PC2.</b> identify the auto components related to the various aggregates in the vehicle	1	1	-	1
<b>PC3.</b> check the functioning of vehicle systems such as lighting system, air conditioning system etc.	2	1	-	1
<b>PC4.</b> conduct test drive to check vehicle performance and identify/validate the faults	-	2	-	-
<b>PC5.</b> conduct visual inspection of the vehicle to identify defects in HV (High Voltage) components	-	2	-	1
<b>PC6.</b> assess mechanical components/aggregates such as brake pad/shoe, wheel cylinder, mountings, bushes, control arms etc. of the vehicle for any external impact/bend/leak/incorrect level/wear & tear	-	2	-	-
<b>PC7.</b> determine the precise location of faults in vehicle systems	2	1	-	2
<i>Prepare to perform diagnostic tests</i>	<b>5</b>	<b>10</b>	-	<b>4</b>
<b>PC8.</b> ensure no HV activity is being conducted around workstation prior to commencement of work	1	2	-	1
<b>PC9.</b> prepare the 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	2	-	2
<b>PC10.</b> mark the vehicle and safeguard the working area during electrical work	-	2	-	-
<b>PC11.</b> collect workshop tools/measuring device/equipment required for fault diagnosis in vehicle systems and check their condition/calibration	2	2	-	1



### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC12.</b> report the malfunctions if any, in the tools/equipment to the person concerned for rectification	1	2	-	-
<i>Perform tests to identify the root cause of fault</i>	<b>15</b>	<b>20</b>	-	<b>7</b>
<b>PC13.</b> take precautions to avoid damage to the vehicle and its components during diagnosis or troubleshooting the faults	2	1	-	1
<b>PC14.</b> use checklists and OEM Standard Operating Procedures (SOPs) to understand if the fault is because of improper charging, loose/poor contacts of pins in wiring harness connectors and their connection, improper driving style etc.	2	2	-	-
<b>PC15.</b> select and apply the appropriate device/equipment to make inspection and diagnose deficiencies/faults in various systems such as Body management systems, Braking and stability control systems, Drive line systems, Battery management system, Telematics system, etc.	2	3	-	2
<b>PC16.</b> use manufacturer's and component supplier's specifications to identify duplicate or defective component/parts which cannot be detected during visual inspection	2	2	-	-
<b>PC17.</b> follow SOP set out for troubleshooting and perform tests using various mechanical, electrical/electronic measuring devices/tester/diagnostic tools/software to identify/isolate a fault	1	2	-	1
<b>PC18.</b> perform diagnostic task on the HV system as per following stages: general and mechanical tasks on the vehicle which do not require isolation of the HV systems, electrical work in non-live state of the HV systems, troubleshoot and replace parts in live state of the HV system	2	2	-	1
<b>PC19.</b> diagnose indirect faults if any, in vehicle's mechanical, electrical and electronic systems as per OEM SOP	2	2	-	1

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC20.</b> report the malfunctions in the vehicle where solution is not available or in case of new premature failures, to the concerned person along with preliminary diagnostic details	2	3	-	1
<b>PC21.</b> dismantle and reassemble aggregates of a vehicle for fault diagnosis	-	3	-	-
<i>Conclude the repair solution for the fault</i>	<b>5</b>	<b>10</b>	-	<b>4</b>
<b>PC22.</b> maintain the documentation related to inspections and troubleshooting performed on the vehicle	-	2	-	-
<b>PC23.</b> interpret results as required	2	2	-	1
<b>PC24.</b> compare results of diagnostic inspections/tests with vehicle specifications and regulatory requirements	2	2	-	2
<b>PC25.</b> validate the options for repair or replacement	1	2	-	1
<b>PC26.</b> prepare final proposal regarding repair or replacement requirements with justification	-	2	-	-
<b>NOS Total</b>	<b>30</b>	<b>50</b>	-	<b>20</b>

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N1435
<b>NOS Name</b>	Carry out diagnosis of electric vehicle for repair requirements
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Automotive Vehicle Service
<b>Occupation</b>	Technical Service & Repair
<b>NSQF Level</b>	4.5
<b>Credits</b>	5
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	29/01/2026
<b>NSQC Clearance Date</b>	29/01/2021

## Qualification Pack

# ASC/N1436: Carry out service, repair and overhauling of mechanical aggregates in vehicle

## Description

This unit describes the knowledge and skills required in an individual to carry out service, repair and overhauling of mechanical system of an electric vehicle.

## Scope

The scope covers the following :

- Prepare to carry out routine service and repairs
- Perform routine service and repairs
- Perform post service/repair routine

## Elements and Performance Criteria

### *Prepare to carry out routine service and repairs*

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

- PC1.** review the job card, obtain sufficient information from customer/service advisor to assess service and repair needs of the vehicle
- PC2.** identify the auto components related to the various aggregates in the vehicle
- PC3.** collect workshop tools/measuring devices/equipment required for the job and check their condition/calibration
- PC4.** report the malfunctions if any, in the tools/equipment to the person concerned for rectification
- PC5.** ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work
- PC6.** prepare the 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
- PC7.** mark the vehicle and safeguard the working area during electrical work
- PC8.** conduct visual inspection of the vehicle to identify defects in HV components
- PC9.** assess mechanical components/aggregates such as brake pad/shoe, wheel cylinder, mountings, bushes, control arms etc. of the vehicle for any external impact/bend/leak/incorrect level/wear & tear
- PC10.** prepare final proposal regarding repair or replacement requirements with justification

### *Perform routine service and repairs*

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

- PC11.** report the malfunctions/repairs in the vehicle beyond own scope to the concerned person
- PC12.** take precautions to avoid damage to the vehicle and its components while working on various aggregates

## Qualification Pack

- PC13.** perform task on the HV system as per following stages: general and mechanical tasks on the 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.** use workshop tools/measuring devices/equipment required for the job as per OEM Standard Operating Procedure (SOP)
- PC15.** remove parts relevant to various mechanical aggregates and place them securely as specified by OEM
- PC16.** dismantle mechanical aggregates, if required and report additional repair requirement
- PC17.** clean and condition dismantled components, including mechanical and electrical aggregates, prior to assembly
- PC18.** perform repair/replacement/calibration/overhauling of mechanical system/aggregate such as drive line, running systems, etc. including power assisted braking & steering systems
- PC19.** maintain the documentation related to inspection, servicing and repair of the vehicle

### *Perform post service/repair routine*

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

- PC20.** check the performance of vehicle/aggregate post repair and report to supervisor/service advisor if further inspection is required by another specialist
- PC21.** ensure completeness of tasks assigned before releasing the vehicle for the next procedure
- PC22.** dispose off materials such as waste oil, scrap of failed parts/aggregates, as per organisation's policies
- PC23.** ensure all tools, auxiliary material and other equipment must be removed from the work site
- PC24.** perform scheduled checks, calibration and timely repairs for workshop tools, equipment and workstations

## 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.** Standard Operating Procedures (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 for the same
- KU4.** basic technology used in and functioning of various mechanical systems and components of the vehicle such as power train, running system, various lubrication system, hydraulic/pneumatic systems, cooling system, etc.
- KU5.** interconnection of systems with each other and one system's effect on the other
- KU6.** SOP recommended by OEM for using diagnostic and troubleshooting tools/equipment related to mechanical component/aggregate such as special service tools, measuring instrument, pressure indicators/gauges, volt meters, ammeters, ohmmeters, battery tester, dedicated and computer based diagnostic air bleeding equipment, etc.

## Qualification Pack

- KU7.** various sources of information available for assessing service and repair requirements of the vehicle including diagnostic displays, visual inspections, test drives, vehicle/equipment manufacturer specifications, tolerance limits of components and options for repair or replacement
- KU8.** OEM's SOPs for service, repair and overhauling of mechanical aggregate of the vehicle
- KU9.** how to work on the HV systems which do not require isolation, troubleshooting and replacing parts on the active HV system
- KU10.** standard schedules and checklists recommended by the OEM/auto component manufacturer for servicing of mechanical component/aggregate in the vehicle
- KU11.** various methods for removal, dismantling, cleaning, adjusting, reassembling and testing of mechanical components for proper functioning
- KU12.** type and quality of consumables/materials used for the job such as seals, sealant, fasteners, lubricants etc.
- KU13.** safety precautions for equipment and components as prescribed by the OEM
- KU14.** specific precautions to ensure that no damage is caused to the vehicle, including its electrical and mechanical aggregates, while carrying out the work
- KU15.** electrical hazards, protective measures and first aid in case of electric shock, electrical arc in public grid or in an electrical car, impact of electric current/arc, secondary accidents, etc.
- KU16.** 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
- KU17.** organisational/professional code of ethics and standards of practice
- KU18.** documentation requirements for each procedure carried out as part of roles and responsibilities as specified by OEM/auto component manufacturer
- KU19.** various methods to dispose-off replaced failed components/parts in accordance with safety, health and environmental policies and regulation
- KU20.** safety, health and environmental policies and regulations for the work place as well as for automotive trade in general
- KU21.** legal regulations that need to be taken into account for handling electric vehicles in the workshop
- KU22.** Occupational Safety and Health (OSH) measures required for working on 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

## Qualification Pack

- GS7.** read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates
- GS8.** write in English/regional language
- GS9.** communicate effectively at the workplace
- GS10.** plan work according to the required schedule and location

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare to carry out routine service and repairs</i>	<b>10</b>	<b>20</b>	-	<b>8</b>
<b>PC1.</b> review the job card, obtain sufficient information from customer/service advisor to assess service and repair needs of the vehicle	-	1	-	-
<b>PC2.</b> identify the auto components related to the various aggregates in the vehicle	1	2	-	2
<b>PC3.</b> collect workshop tools/measuring devices/equipment required for the job and check their condition/calibration	2	2	-	2
<b>PC4.</b> report the malfunctions if any, in the tools/equipment to the person concerned for rectification	-	1	-	-
<b>PC5.</b> ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work	2	2	-	-
<b>PC6.</b> prepare the 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	2	-	-
<b>PC7.</b> mark the vehicle and safeguard the working area during electrical work	-	1	-	-
<b>PC8.</b> conduct visual inspection of the vehicle to identify defects in HV components	2	2	-	2
<b>PC9.</b> assess mechanical components/aggregates such as brake pad/shoe, wheel cylinder, mountings, bushes, control arms etc. of the vehicle for any external impact/bend/leak/incorrect level/wear & tear	2	4	-	2
<b>PC10.</b> prepare final proposal regarding repair or replacement requirements with justification	-	3	-	-
<i>Perform routine service and repairs</i>	<b>15</b>	<b>20</b>	-	<b>7</b>
<b>PC11.</b> report the malfunctions/repairs in the vehicle beyond own scope to the concerned person	-	2	-	-



### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC12.</b> take precautions to avoid damage to the vehicle and its components while working on various aggregates	2	2	-	2
<b>PC13.</b> perform task on the HV system as per following stages: general and mechanical tasks on the 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	3	4	-	2
<b>PC14.</b> use workshop tools/measuring devices/equipment required for the job as per OEM Standard Operating Procedure (SOP)	2	3	-	1
<b>PC15.</b> remove parts relevant to various mechanical aggregates and place them securely as specified by OEM	1	2	-	-
<b>PC16.</b> dismantle mechanical aggregates, if required and report additional repair requirement	-	2	-	-
<b>PC17.</b> clean and condition dismantled components, including mechanical and electrical aggregates, prior to assembly	2	1	-	-
<b>PC18.</b> perform repair/replacement/calibration/overhauling of mechanical system/aggregate such as drive line, running systems, etc. including power assisted braking & steering systems	3	2	-	2
<b>PC19.</b> maintain the documentation related to inspection, servicing and repair of the vehicle	2	2	-	-
<i>Perform post service/repair routine</i>	<b>5</b>	<b>10</b>	-	<b>5</b>
<b>PC20.</b> check the performance of vehicle/aggregate post repair and report to supervisor/service advisor if further inspection is required by another specialist	-	3	-	2
<b>PC21.</b> ensure completeness of tasks assigned before releasing the vehicle for the next procedure	-	1	-	-
<b>PC22.</b> dispose off materials such as waste oil, scrap of failed parts/aggregates, as per organisation's policies	2	3	-	2
<b>PC23.</b> ensure all tools, auxiliary material and other equipment must be removed from the work site	1	3	-	-

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC24.</b> perform scheduled checks, calibration and timely repairs for workshop tools, equipment and workstations	2	-	-	1
<b>NOS Total</b>	<b>30</b>	<b>50</b>	<b>-</b>	<b>20</b>

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N1436
<b>NOS Name</b>	Carry out service, repair and overhauling of mechanical aggregates in vehicle
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Automotive Vehicle Service
<b>Occupation</b>	Technical Service & Repair
<b>NSQF Level</b>	4.5
<b>Credits</b>	4
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	29/01/2026
<b>NSQC Clearance Date</b>	29/01/2021

## Qualification Pack

# ASC/N1437: Carry out service, repair and overhauling of electrical and electronic systems within an aggregate in the vehicle

## Description

This unit describes the knowledge and skills required in an individual to carry out service, repair and overhauling of electrical and electronic system of an electric vehicle.

## Scope

The scope covers the following :

- Prepare to carry out routine service and repairs
- Perform service and repairs
- Perform post service/repair routine

## Elements and Performance Criteria

### *Prepare to carry out routine service and repairs*

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

- PC1.** review the job card, obtain sufficient information from customer/service advisor to assess service and repair needs of the vehicle
- PC2.** identify the auto components related to the various aggregates in the vehicle
- PC3.** collect workshop tools/measuring devices/equipment required for the job and check their condition/calibration
- PC4.** report the malfunctions if any, in the tools/equipment to the person concerned for rectification
- PC5.** ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work
- PC6.** prepare the 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
- PC7.** mark the vehicle and safeguard the working area during electrical work
- PC8.** conduct visual inspection of the vehicle to identify defects in HV components
- PC9.** prepare final proposal regarding repair or replacement requirements with justification, post inspection or testing

### *Perform service and repairs*

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

- PC10.** report the malfunctions/repairs in the vehicle beyond own scope to the concerned person
- PC11.** take precautions to avoid damage to the vehicle and its components while working on various aggregates
- PC12.** perform task on the HV system as per following stages: general and electrical tasks on the vehicle which do not require isolation of the HV systems, electrical work in non live state of the HV systems, and replace parts in live state of the HV system

## Qualification Pack

- PC13.** use workshop tools/measuring devices/equipment required for the job as per OEM Standard Operating Procedure (SOP)
- PC14.** remove parts relevant to various electrical/electronics and place them securely as specified by OEM
- PC15.** dismantle electrical aggregate, if required and report additional repair requirement
- PC16.** test electrical/electronic components post removal wherever applicable as per OEM SOP
- PC17.** clean and condition dismantled components, including mechanical and electrical aggregates, prior to assembly
- PC18.** perform repair of all electrical and electronic faults including direct faults in input sensors, output actuators, wiring harnesses, computer systems, calibration/adjustment specifications, component specifications, component assembly, system modifications
- PC19.** repair indirect faults in electrical/electronic aggregate due to other system/component
- PC20.** maintain the documentation related to inspection, servicing and repair of the vehicle

### *Perform post service/repair routine*

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

- PC21.** check the performance of vehicle/aggregate post repair and report to supervisor/service advisor if further inspection is required by another specialist
- PC22.** ensure completeness of tasks assigned before releasing the vehicle for the next procedure
- PC23.** dispose off materials such as old batteries, scrap of failed parts/aggregates as per organization's policies
- PC24.** ensure all tools, auxiliary material and other equipment must be removed from the work site
- PC25.** perform scheduled checks, calibration and timely repairs for workshop tools, equipment and workstations

## 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.** Standard Operating Procedures (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 for the same
- KU4.** fundamental terms, laws and principles of electricity used in EV 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.)
- KU5.** basic technology used in and functioning of various systems and components of the vehicle such as batteries, body management system, telematics, 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.)
- KU6.** interconnection of systems with each other and effect of one system on another

## Qualification Pack

- KU7.** SOP recommended by OEM for using tools and /equipment for diagnosis or troubleshooting related to electrical/electronic systems such as special service tools, measuring instrument, volt meters, ammeters, ohmmeters, battery tester, dedicated and computer based diagnostic equipment, etc.
- KU8.** various sources of information available for assessing service and repair requirements of the vehicle including diagnostic displays, visual inspections, test drives, vehicle/equipment manufacturer specifications, tolerance limits of components and options for repair or replacement
- KU9.** SOP for service, repair and overhauling of electrical/electronics aggregate of the vehicle as prescribed by the OEM
- KU10.** various methods to remove, dismantle, cleaning, adjusting, reassemble and test electrical/electronic components
- KU11.** type and quality of consumables/materials used for the job such as seals, sealant, fasteners, lubricants etc.
- KU12.** how to work on the HV systems which do not require isolation, troubleshooting and replacing parts on the active HV system
- KU13.** safety precautions for equipment and components prescribed by the OEM
- KU14.** specific precautions to ensure that no damage is caused to the vehicle, including its electrical and mechanical aggregates, while carrying out the work
- KU15.** electrical hazards, protective measures and first aid in case of electric shock, electrical arc in public grid or in an electrical car, impact of electric current/arc, secondary accidents, etc.
- KU16.** 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
- KU17.** organisational/professional code of ethics and standards of practice
- KU18.** documentation requirements for each procedure carried out as part of roles and responsibilities as specified by OEM/auto component manufacturer
- KU19.** various methods to dispose-off replaced failed components/parts in accordance with safety, health and environmental policies and regulation
- KU20.** safety, health and environmental policies and regulations for the work place as well as for automotive trade in general
- KU21.** legal regulations that need to be taken into account for handling electric vehicles in the workshop
- KU22.** Occupational Safety and Health (OSH) measures required for working on 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

## Qualification Pack

- GS5.** identify potential workplace problem and take suitable action
- GS6.** read various sources of information available for assessing service and repair requirements
- GS7.** read policies and regulations pertinent to the job, including OEM guidelines, Health and Safety instructions etc. while working on the Electric Vehicle and its aggregates
- GS8.** write in English/regional language
- GS9.** communicate effectively at the workplace
- GS10.** plan work according to the required schedule and location

## Qualification Pack

### Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Prepare to carry out routine service and repairs</i>	<b>10</b>	<b>20</b>	-	<b>8</b>
<b>PC1.</b> review the job card, obtain sufficient information from customer/service advisor to assess service and repair needs of the vehicle	-	1	-	-
<b>PC2.</b> identify the auto components related to the various aggregates in the vehicle	1	2	-	2
<b>PC3.</b> collect workshop tools/measuring devices/equipment required for the job and check their condition/calibration	2	2	-	2
<b>PC4.</b> report the malfunctions if any, in the tools/equipment to the person concerned for rectification	-	1	-	-
<b>PC5.</b> ensure no HV (High Voltage) activity is being conducted around workstation prior to commencement of work	2	2	-	-
<b>PC6.</b> prepare the 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	2	4	-	1
<b>PC7.</b> mark the vehicle and safeguard the working area during electrical work	-	2	-	-
<b>PC8.</b> conduct visual inspection of the vehicle to identify defects in HV components	2	2	-	2
<b>PC9.</b> prepare final proposal regarding repair or replacement requirements with justification, post inspection or testing	1	4	-	1
<i>Perform service and repairs</i>	<b>15</b>	<b>20</b>	-	<b>7</b>
<b>PC10.</b> report the malfunctions/repairs in the vehicle beyond own scope to the concerned person	-	2	-	-
<b>PC11.</b> take precautions to avoid damage to the vehicle and its components while working on various aggregates	2	2	-	2



### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC12.</b> perform task on the HV system as per following stages: general and electrical tasks on the vehicle which do not require isolation of the HV systems, electrical work in non live state of the HV systems, and replace parts in live state of the HV system	3	3	-	2
<b>PC13.</b> use workshop tools/measuring devices/equipment required for the job as per OEM Standard Operating Procedure (SOP)	2	2	-	1
<b>PC14.</b> remove parts relevant to various electrical/electronics and place them securely as specified by OEM	-	2	-	-
<b>PC15.</b> dismantle electrical aggregate, if required and report additional repair requirement	1	2	-	-
<b>PC16.</b> test electrical/electronic components post removal wherever applicable as per OEM SOP	-	2	-	-
<b>PC17.</b> clean and condition dismantled components, including mechanical and electrical aggregates, prior to assembly	2	1	-	-
<b>PC18.</b> perform repair of all electrical and electronic faults including direct faults in input sensors, output actuators, wiring harnesses, computer systems, calibration/adjustment specifications, component specifications, component assembly, system modifications	3	2	-	2
<b>PC19.</b> repair indirect faults in electrical/electronic aggregate due to other system/component	1	1	-	-
<b>PC20.</b> maintain the documentation related to inspection, servicing and repair of the vehicle	1	1	-	-
<i>Perform post service/repair routine</i>	<b>5</b>	<b>10</b>	-	<b>5</b>
<b>PC21.</b> check the performance of vehicle/aggregate post repair and report to supervisor/service advisor if further inspection is required by another specialist	-	3	-	2
<b>PC22.</b> ensure completeness of tasks assigned before releasing the vehicle for the next procedure	-	1	-	-

### Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<b>PC23.</b> dispose off materials such as old batteries, scrap of failed parts/aggregates as per organization's policies	2	3	-	2
<b>PC24.</b> ensure all tools, auxiliary material and other equipment must be removed from the work site	1	3	-	-
<b>PC25.</b> perform scheduled checks, calibration and timely repairs for workshop tools, equipment and workstations	2	-	-	1
<b>NOS Total</b>	<b>30</b>	<b>50</b>	<b>-</b>	<b>20</b>

## Qualification Pack

### National Occupational Standards (NOS) Parameters

<b>NOS Code</b>	ASC/N1437
<b>NOS Name</b>	Carry out service, repair and overhauling of electrical and electronic systems within an aggregate in the vehicle
<b>Sector</b>	Automotive
<b>Sub-Sector</b>	Automotive Vehicle Service
<b>Occupation</b>	Technical Service & Repair
<b>NSQF Level</b>	4.5
<b>Credits</b>	4
<b>Version</b>	2.0
<b>Last Reviewed Date</b>	NA
<b>Next Review Date</b>	29/01/2026
<b>NSQC Clearance Date</b>	29/01/2021

## 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) (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training centre based on these criteria.
5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.
6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

## 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/N9813.Manage work and resources (Service)	50	30	-	20	100	15
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	10
ASC/N1435.Carry out diagnosis of electric vehicle for repair requirements	30	50	-	20	100	30
ASC/N1436.Carry out service, repair and overhauling of mechanical aggregates in vehicle	30	50	-	20	100	20
ASC/N1437.Carry out service, repair and overhauling of electrical and electronic systems within an aggregate in the vehicle	30	50	-	20	100	25
<b>Total</b>	<b>160</b>	<b>210</b>	<b>-</b>	<b>80</b>	<b>450</b>	<b>100</b>

## Qualification Pack

### Acronyms

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

## Qualification Pack

### Glossary

<b>Sector</b>	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.
<b>Sub-sector</b>	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
<b>Occupation</b>	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
<b>Job role</b>	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
<b>Occupational Standards (OS)</b>	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.
<b>Performance Criteria (PC)</b>	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
<b>National Occupational Standards (NOS)</b>	NOS are occupational standards which apply uniquely in the Indian context.
<b>Qualifications Pack (QP)</b>	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.
<b>Unit Code</b>	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
<b>Unit Title</b>	Unit title gives a clear overall statement about what the incumbent should be able to do.
<b>Description</b>	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.
<b>Scope</b>	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.

## Qualification Pack

<b>Knowledge and Understanding (KU)</b>	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.
<b>Organisational Context</b>	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.
<b>Technical Knowledge</b>	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
<b>Core Skills/ Generic Skills (GS)</b>	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.
<b>Electives</b>	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.
<b>Options</b>	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.