

Qualification Pack



Bicycle Mechanic

QP Code: ASC/Q1434

Version: 1.0

NSQF Level: 3

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

Qualification Pack

Contents

| | |
|--|----|
| ASC/Q1434: Bicycle Mechanic | 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/N9801: Organize work and resources (Service) | 5 |
| ASC/N9802: Interact effectively with colleagues, customers and others | 11 |
| ASC/N1456: Perform routine service, repair and maintenance of bicycle | 15 |
| ASC/N1457: Carry out routine service or minor repairs on electric bicycles and assist in diagnosis ... | 21 |
| DGT/VSQ/N0101: Employability Skills (30 Hours) | 28 |
| Assessment Guidelines and Weightage | 33 |
| <i>Assessment Guidelines</i> | 33 |
| <i>Assessment Weightage</i> | 34 |
| Acronyms | 35 |
| Glossary | 36 |

Qualification Pack

ASC/Q1434: Bicycle Mechanic

Brief Job Description

The person is responsible for the assembly, repair and maintenance of bicycles and electric bicycles along with identifying problems and providing optimal solution to the customer.

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. [ASC/N9802: Interact effectively with colleagues, customers and others](#)
3. [ASC/N1456: Perform routine service, repair and maintenance of bicycle](#)
4. [ASC/N1457: Carry out routine service or minor repairs on electric bicycles and assist in diagnosis](#)
5. [DGT/VSQ/N0101: Employability Skills \(30 Hours\)](#)

Qualification Pack (QP) Parameters

| | |
|--------------------------------------|----------------------------|
| Sector | Automotive |
| Sub-Sector | Automotive Vehicle Service |
| Occupation | Technical Service & Repair |
| Country | India |
| NSQF Level | 3 |
| Credits | NA |
| Aligned to NCO/ISCO/ISIC Code | NCO-2015/3115.0602 |

Qualification Pack

| | |
|---|---|
| Minimum Educational Qualification & Experience | 8th Class with 1 Year of experience of relevant experience OR 8th Class (+ ITI) OR 10th Class |
| Minimum Level of Education for Training in School | |
| Pre-Requisite License or Training | NA |
| Minimum Job Entry Age | 14 Years |
| Last Reviewed On | NA |
| Next Review Date | 30/06/2025 |
| NSQC Approval Date | 30/06/2022 |
| Version | 1.0 |
| Reference code on NQR | 2022/AUT/ASDC/06012 |
| NQR Version | 1 |

Qualification Pack

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

Qualification Pack

- 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)

Qualification Pack

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

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Assessment Criteria

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|--------------|-----------------|---------------|------------|
| <i>Maintain safe and secure working environment</i> | 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 |
| <i>Perform work as per quality standards</i> | 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 |
| <i>Health and hygiene</i> | 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 | - | - | - |
| <i>Material/energy conservation practices</i> | 10 | 4 | - | 3 |
| PC13. identify ways to optimise usage of material in various tasks/activities/processes | 2 | - | - | 1 |

Qualification Pack

| 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 | - | - | - |
| <i>Effective waste management practices</i> | 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 |

Qualification Pack

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 | TBD |
| Version | 1.0 |
| Last Reviewed Date | 27/05/2021 |
| Next Review Date | 27/05/2026 |
| NSQC Clearance Date | 27/05/2021 |

Qualification Pack

ASC/N9802: Interact effectively with colleagues, customers and others

Description

This NOS unit is about communicating with customers and colleagues/superiors, either in own work group or in other work groups within organisation.

Scope

The scope covers the following :

- Communicate effectively with colleagues, customers and others
- Interact with supervisor or superior

Elements and Performance Criteria

Communicate effectively with colleagues, customers and others

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

- PC1.** maintain clear communication with colleagues, customers and others, wherever needed, through all means i.e. face-to-face, telephonic or written
- PC2.** adjust communication styles to reflect gender and persons with disability (PwD) sensitivity
- PC3.** work in a way that shows respect for colleagues and others
- PC4.** follow the organisation's policies and procedures while working in a team
- PC5.** respect personal space of colleagues and customers

Interact with supervisor or superior

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

- PC6.** identify work requirements by receiving instructions from reporting supervisor
- PC7.** escalate problems to supervisors that cannot be handled including repairs and maintenance of machine
- PC8.** report the completed work
- PC9.** rectify errors as per feedback

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** the importance of effective communication and establishing good working relationships with colleagues and supervisor
- KU2.** different methods of communication as per the circumstances
- KU3.** gender based concepts, issues and legislation

Generic Skills (GS)

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

Qualification Pack

- 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.** deliver consistent and reliable service to customers
- GS7.** complete written work with attention to detail
- GS8.** check that the work meets customer requirements

Qualification Pack

Assessment Criteria

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|--------------|-----------------|---------------|------------|
| <i>Communicate effectively with colleagues, customers and others</i> | 36 | 11 | - | 14 |
| PC1. maintain clear communication with colleagues, customers and others, wherever needed, through all means i.e. face-to-face, telephonic or written | 8 | - | - | 4 |
| PC2. adjust communication styles to reflect gender and persons with disability (PwD) sensitivity | 8 | - | - | - |
| PC3. work in a way that shows respect for colleagues and others | 7 | 4 | - | 3 |
| PC4. follow the organisation's policies and procedures while working in a team | 7 | 4 | - | 3 |
| PC5. respect personal space of colleagues and customers | 6 | 3 | - | 4 |
| <i>Interact with supervisor or superior</i> | 14 | 19 | - | 6 |
| PC6. identify work requirements by receiving instructions from reporting supervisor | 7 | 4 | - | - |
| PC7. escalate problems to supervisors that cannot be handled including repairs and maintenance of machine | - | 5 | - | 3 |
| PC8. report the completed work | 7 | 5 | - | - |
| PC9. rectify errors as per feedback | - | 5 | - | 3 |
| NOS Total | 50 | 30 | - | 20 |

Qualification Pack

National Occupational Standards (NOS) Parameters

| | |
|----------------------------|--|
| NOS Code | ASC/N9802 |
| NOS Name | Interact effectively with colleagues, customers and others |
| Sector | Automotive |
| Sub-Sector | Generic |
| Occupation | Generic |
| NSQF Level | 3 |
| Credits | TBD |
| Version | 1.0 |
| Last Reviewed Date | 28/07/2022 |
| Next Review Date | 28/07/2025 |
| NSQC Clearance Date | 28/07/2022 |

Qualification Pack

ASC/N1456: Perform routine service, repair and maintenance of bicycle

Description

This NOS unit is about performing routine service, repair and maintenance activities of various aggregates/systems of a bicycle.

Scope

The scope covers the following :

- Prepare for work
- Perform routine service, repair or maintenance of bicycle
- Perform post service/repair activities

Elements and Performance Criteria

Prepare for work

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

- PC1.** interact with customer to understand their requirement of routine service, minor repairs, maintenance and warranty replacement of bicycle
- PC2.** collect tools/measuring devices/equipment required for the job and check their condition/calibration
- PC3.** prepare the bicycle for service, repair and maintenance as per SOP
- PC4.** wear PPE according to nature of job to be performed
- PC5.** conduct visual inspection of the bicycle to identify defects in systems/components
- PC6.** assess mechanical aggregates of the bicycle for any external impact/bend/incorrect level/wear & tear/fault
- PC7.** provide cost and time estimate to the customer for the service and repair work
- PC8.** get the customer's consent and proceed to the work

Perform routine service, repair or maintenance of bicycle

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

- PC9.** perform routine service/maintenance of various parts and aggregates including drive chain ring, steering system, brakes, suspension, pedals etc.
- PC10.** collect the correct spare parts and appropriate grade of lubricants, coolant, oils and grease for routine maintenance and service
- PC11.** inspect the components requiring adjustment or replacement due to continuous wear and tear such as bell, tires, reflectors, brake pads, chain ring, cassettes and freewheels etc.
- PC12.** check that tire pressure is as per the manufacturer's specifications by using pressure gauge, refill the air (if required)
- PC13.** check that brake is tightly gripping the wheel when the brake levers are squeezed, adjust the brake pads as per the requirement
- PC14.** adjust spoke tension and replace any damaged spokes/ true up the wheel
- PC15.** check the socket and bolt for rust and worn out threads, replace the sockets if required

Qualification Pack

- PC16.** clean and condition dismantled parts/components, prior to reassembly
- PC17.** overhaul hub, steering system (handlebars, stem and headset), headrest, pedals, crank arm and bottom bracket as per the need
- PC18.** perform lubrication or greasing of chain, freewheel or cassette and other parts as per the requirement
- PC19.** carry out re-assembling of bicycle parts/ aggregates as per SOP
- PC20.** adjust the saddle fore, aft and height as per the requirement
- PC21.** seek assistance from the specialist in case of structural repairs

Perform post service/repair activities

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

- PC22.** check the performance of bicycle/aggregate post repair before releasing it to customer
- PC23.** dispose-off materials such as waste oil, scrap of failed parts/aggregates, as per environmental policies
- PC24.** perform scheduled checks, calibration and timely repairs for workshop tools and equipment after completion of work

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.** various brands of bicycles available in the market
- KU3.** types of bicycles
- KU4.** different components/aggregates and systems i.e. drive train, steering system, suspension system, brakes, wheels, structural members as well as component manufacturer's specifications of the bicycle
- KU5.** basic technology used in and functioning of various systems and components of the bicycle
- KU6.**
 - different types of braking system
 - Types of brakes: Rod actuated brakes, caliper brake, cantilever brake, V brake safety features provided in a bicycle Band brake, Drum or hub brake, Backpedal or coaster brake, Disc brake and Roller brake
- KU7.**
 - safety features provided in a bicycle
 - Safety Features: Bell, reflector, brake, chain guard etc.
- KU8.** standard schedules and checklists recommended by the OEM/auto component manufacturer for servicing of bicycles
- KU9.** typical symptoms of common faults and failures in bicycle
- KU10.** Standard Operating Procedures (SOPs) for inspection and diagnosis of faults in a bicycle as prescribed by the OEM/components manufacturer
- KU11.** SOP recommended by OEM for using tools/equipment for diagnosis or troubleshooting
- KU12.** how to replace tire and tube
- KU13.** how to install front and rear wheels
- KU14.** how to find a puncture, patch the tube and attach the wheel
- KU15.** method of wheel truing

Qualification Pack

- KU16.** how to repair dents in the rim
- KU17.** types of head rest i.e. Threaded and thread less
- KU18.** types of suspension i.e. Coil and air suspension system
- KU19.** chain and sprocket mechanism- drive mechanism
- KU20.** how to calculate Mechanical Advantage or Velocity Ratio
- KU21.** how to remove / replace/ reassemble a chain
- KU22.** how to clean the freewheel or cassette
- KU23.** styles of hub i.e. cup and cone, sealed bearing
- KU24.** how to adjust a hub centering and tensioning of brakes
- KU25.** how to replace brake cables
- KU26.** how to angle the saddle
- KU27.** names of structural members of a frame i.e. Head tube, Top tube, Down tube, Seat tube, bottom
- KU28.** use and application of bearings
- KU29.** types of frame materials
- KU30.** Occupational Safety and Health (OSH) measures required for working on bicycles

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

Qualification Pack

Assessment Criteria

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|--|--------------|-----------------|---------------|------------|
| <i>Prepare for work</i> | 5 | 14 | - | 7 |
| PC1. interact with customer to understand their requirement of routine service, minor repairs, maintenance and warranty replacement of bicycle | - | 1 | - | 1 |
| PC2. collect tools/measuring devices/equipment required for the job and check their condition/calibration | 1 | 2 | - | 1 |
| PC3. prepare the bicycle for service, repair and maintenance as per SOP | 1 | 2 | - | 1 |
| PC4. wear PPE according to nature of job to be performed | - | 1 | - | 1 |
| PC5. conduct visual inspection of the bicycle to identify defects in systems/components | 1 | 1 | - | 1 |
| PC6. assess mechanical aggregates of the bicycle for any external impact/bend/incorrect level/wear & tear/fault | - | 3 | - | 1 |
| PC7. provide cost and time estimate to the customer for the service and repair work | 1 | 3 | - | 1 |
| PC8. get the customer's consent and proceed to the work | 1 | 1 | - | - |
| <i>Perform routine service, repair or maintenance of bicycle</i> | 21 | 31 | - | 11 |
| PC9. perform routine service/maintenance of various parts and aggregates including drive chain ring, steering system, brakes, suspension, pedals etc. | 1 | 2 | - | - |
| PC10. collect the correct spare parts and appropriate grade of lubricants, coolant, oils and grease for routine maintenance and service | 2 | 2 | - | 1 |
| PC11. inspect the components requiring adjustment or replacement due to continuous wear and tear such as bell, tires, reflectors, brake pads, chain ring, cassettes and freewheels etc. | 2 | 3 | - | 2 |

Qualification Pack

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|--|--------------|-----------------|---------------|------------|
| PC12. check that tire pressure is as per the manufacturer's specifications by using pressure gauge, refill the air (if required) | 2 | 3 | - | - |
| PC13. check that brake is tightly gripping the wheel when the brake levers are squeezed, adjust the brake pads as per the requirement | 1 | 2 | - | - |
| PC14. adjust spoke tension and replace any damaged spokes/ true up the wheel | 2 | 3 | - | 1 |
| PC15. check the socket and bolt for rust and worn out threads, replace the sockets if required | 1 | 2 | - | 1 |
| PC16. clean and condition dismantled parts/components, prior to reassembly | 1 | 1 | - | - |
| PC17. overhaul hub, steering system (handlebars, stem and headset), headrest, pedals, crank arm and bottom bracket as per the need | 3 | 5 | - | 1 |
| PC18. perform lubrication or greasing of chain, freewheel or cassette and other parts as per the requirement | - | 2 | - | - |
| PC19. carry out re-assembling of bicycle parts/ aggregates as per SOP | 2 | 2 | - | 2 |
| PC20. adjust the saddle fore, aft and height as per the requirement | 2 | 2 | - | 2 |
| PC21. seek assistance from the specialist in case of structural repairs | 2 | 2 | - | 1 |
| <i>Perform post service/repair activities</i> | 4 | 5 | - | 2 |
| PC22. check the performance of bicycle/aggregate post repair before releasing it to customer | 1 | 1 | - | - |
| PC23. dispose-off materials such as waste oil, scrap of failed parts/aggregates, as per environmental policies | 1 | 1 | - | - |
| PC24. perform scheduled checks, calibration and timely repairs for workshop tools and equipment after completion of work | 2 | 3 | - | 2 |
| NOS Total | 30 | 50 | - | 20 |

Qualification Pack

National Occupational Standards (NOS) Parameters

| | |
|----------------------------|--|
| NOS Code | ASC/N1456 |
| NOS Name | Perform routine service, repair and maintenance of bicycle |
| Sector | Automotive |
| Sub-Sector | Automotive Vehicle Service |
| Occupation | Technical Service & Repair |
| NSQF Level | 3 |
| Credits | TBD |
| Version | 1.0 |
| Last Reviewed Date | 28/07/2022 |
| Next Review Date | 28/07/2025 |
| NSQC Clearance Date | 28/07/2022 |

Qualification Pack

ASC/N1457: Carry out routine service or minor repairs on electric bicycles and assist in diagnosis

Description

This NOS unit is about performing all tasks related to service, minor repair and diagnosis of electric bicycles.

Scope

The scope covers the following :

- Prepare for service and repair work
- 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 for service and repair work

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
- PC2.** identify the auto components related to the various aggregates in the electric bicycle
- PC3.** collect workshop tools/measuring devices/equipment required for the job and check their condition/calibration
- PC4.** prepare the electric bicycle according to nature of job to be performed: general, mechanical or electrical job on the electric bicycle
- PC5.** wear PPE according to nature of job to be performed
- PC6.** conduct visual inspection of the electric bicycle to identify defects and indirect faults in electrical/electronic aggregate due to other system/component
- PC7.** assess mechanical aggregates such as gear shifter, handle, axles, paddles brakes, wheels, etc. of the electric bicycle for any external impact/bend/incorrect fitment/wear & tear
- PC8.** report the malfunctions/repairs in the electric bicycle 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:

- PC9.** take precautions to avoid damage to the electric bicycle and its components while working on various aggregates
- PC10.** use appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organization
- PC11.** test electrical/electronic components performance of electric bicycle wherever applicable as per OEM SOP
- PC12.** remove parts relevant to various mechanical aggregates and place them securely as specified by OEM
- PC13.** clean and condition dismantled mechanical and electrical components prior to assembly

Qualification Pack

- PC14.** perform minor repair/replacement/calibration of mechanical system/aggregate such as brake lever free play, drive chain, braking & steering systems adjustments, etc. as per SOP
- PC15.** apply appropriate grade of oil or other lubricant on the mechanical components of electric bicycle wherever applicable as per OEM guidelines
- PC16.** maintain the documentation related to inspection, servicing and minor repair of the electric bicycle

Assist lead technician in diagnosis or troubleshooting the faults

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

- PC17.** conduct test ride of the e-bike to assist the lead technician in assessing the service/repair requirement or calibration/adjustments, if any
- PC18.** follow lead technician instructions to choose and use the appropriate device/equipment to inspect/test electric bicycle/system/component performance to diagnose defects or faults in it
- PC19.** carry out inspection or test on electric bicycle mechanical and electrical systems according to lead technician instructions
- PC20.** interpret and compare results of diagnostic inspections/tests with vehicle specifications and regulatory requirements
- PC21.** maintain the documentation related to inspections and troubleshooting performed on the vehicle
- PC22.** report the results to lead technician and seek assistance if further tests or inspections are required to conclude the diagnosis or troubleshooting

Perform post service/repair/diagnostic activities

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

- PC23.** check the performance of electric bicycle post repair and report to supervisor/service advisor if further inspection is required by another specialist
- PC24.** ensure completeness of tasks assigned before releasing the electric bicycle for the next procedure
- PC25.** dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization's policies
- PC26.** 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.** different components/aggregates as well as auto component manufacturer's specifications of the electric bicycle
- KU2.** road licensing requirements for electric bicycles in India
- KU3.** basic technology used in and functioning of various systems and components of the electric bicycle such as: brakes, suspension, steering, hub drive/chain drive, etc. including electrical machines and devices used in electric vehicles such as: charging system, charger, batteries, etc.
- KU4.** interconnection of systems with each other and effect of one system on other system
- KU5.** how to use computer, on-line application and OEM technical information/assistance portals

Qualification Pack

- KU6.** various sources of information available for assessing service and repair requirements of the electric bicycle including diagnostic displays, visual inspections, test rides, vehicle/equipment manufacturer specifications, and tolerance limits of components
- KU7.** standard schedules and checklists recommended by the OEM/auto component manufacturer for servicing of electric bicycle
- KU8.** typical symptoms of common faults and failures in electric bicycle mechanical, electrical and electronic systems
- KU9.** Standard Operating Procedures (SOPs) of the organization/ dealership for inspection and diagnosis of faults in an electric bicycle as prescribed by the OEM/components manufacturer
- KU10.** different types of errors or defects in the tools/equipment
- KU11.** documentation requirements for each procedure carried out as part of roles and responsibilities as specified by OEM/ auto component manufacturer
- KU12.** safety requirements recommended by the OEM for equipment/vehicle components during diagnosis, troubleshooting and root cause analysis on various aggregates
- KU13.** legal regulations that need to be taken into account for handling an electric bicycle in the workshop
- KU14.** precautions need to follow during charging of electric bicycle battery
- KU15.** Occupational Safety and Health (OSH) measures are 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
- GS7.** write any work-related information
- GS8.** write in English/regional language

Qualification Pack

Assessment Criteria

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|--------------|-----------------|---------------|------------|
| <i>Prepare for service and repair work</i> | 5 | 14 | - | 7 |
| PC1. review the job card and understand work to be carried out | - | 1 | - | 1 |
| PC2. identify the auto components related to the various aggregates in the electric bicycle | 1 | 2 | - | 1 |
| PC3. collect workshop tools/measuring devices/equipment required for the job and check their condition/calibration | 1 | 2 | - | 1 |
| PC4. prepare the electric bicycle according to nature of job to be performed: general, mechanical or electrical job on the electric bicycle | - | 1 | - | 1 |
| PC5. wear PPE according to nature of job to be performed | 1 | 1 | - | 1 |
| PC6. conduct visual inspection of the electric bicycle to identify defects and indirect faults in electrical/electronic aggregate due to other system/component | - | 3 | - | 1 |
| PC7. assess mechanical aggregates such as gear shifter, handle, axles, paddles brakes, wheels, etc. of the electric bicycle for any external impact/bend/incorrect fitment/wear & tear | 1 | 3 | - | 1 |
| PC8. report the malfunctions/repairs in the electric bicycle beyond own scope to the concerned person | 1 | 1 | - | - |
| <i>Perform routine service and minor repairs</i> | 12 | 18 | - | 5 |
| PC9. take precautions to avoid damage to the electric bicycle and its components while working on various aggregates | 1 | 2 | - | - |
| PC10. use appropriate tools, equipment, and consumables as per nature of job and Standard Operating Procedure (SOP) recommended by the organization | 2 | 2 | - | 1 |

Qualification Pack

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|--------------|-----------------|---------------|------------|
| PC11. test electrical/electronic components performance of electric bicycle wherever applicable as per OEM SOP | 2 | 3 | - | 2 |
| PC12. remove parts relevant to various mechanical aggregates and place them securely as specified by OEM | 2 | 3 | - | - |
| PC13. clean and condition dismantled mechanical and electrical components prior to assembly | 1 | 2 | - | - |
| PC14. perform minor repair/replacement/calibration of mechanical system/aggregate such as brake lever free play, drive chain, braking & steering systems adjustments, etc. as per SOP | 2 | 3 | - | 1 |
| PC15. apply appropriate grade of oil or other lubricant on the mechanical components of electric bicycle wherever applicable as per OEM guidelines | 1 | 2 | - | 1 |
| PC16. maintain the documentation related to inspection, servicing and minor repair of the electric bicycle | 1 | 1 | - | - |
| <i>Assist lead technician in diagnosis or troubleshooting the faults</i> | 8 | 10 | - | 5 |
| PC17. conduct test ride of the e-bike to assist the lead technician in assessing the service/repair requirement or calibration/adjustments, if any | - | 2 | - | - |
| PC18. follow lead technician instructions to choose and use the appropriate device/equipment to inspect/test electric bicycle/system/component performance to diagnose defects or faults in it | 2 | 2 | - | 2 |
| PC19. carry out inspection or test on electric bicycle mechanical and electrical systems according to lead technician instructions | 2 | 2 | - | 2 |
| PC20. interpret and compare results of diagnostic inspections/tests with vehicle specifications and regulatory requirements | 2 | 2 | - | 1 |
| PC21. maintain the documentation related to inspections and troubleshooting performed on the vehicle | 1 | 1 | - | - |

Qualification Pack

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|--------------|-----------------|---------------|------------|
| PC22. report the results to lead technician and seek assistance if further tests or inspections are required to conclude the diagnosis or troubleshooting | 1 | 1 | - | - |
| <i>Perform post service/repair/diagnostic activities</i> | 5 | 8 | - | 3 |
| PC23. check the performance of electric bicycle post repair and report to supervisor/service advisor if further inspection is required by another specialist | 2 | 3 | - | 1 |
| PC24. ensure completeness of tasks assigned before releasing the electric bicycle for the next procedure | - | 1 | - | 1 |
| PC25. dispose of materials such as old batteries, scrap of failed parts/aggregates as per organization's policies | 1 | 2 | - | 1 |
| PC26. return leftover consumable/parts, tools/equipment, and report if any malfunctions are observed to the person concerned | 2 | 2 | - | - |
| NOS Total | 30 | 50 | - | 20 |

Qualification Pack

National Occupational Standards (NOS) Parameters

| | |
|----------------------------|---|
| NOS Code | ASC/N1457 |
| NOS Name | Carry out routine service or minor repairs on electric bicycles and assist in diagnosis |
| Sector | Automotive |
| Sub-Sector | Automotive Vehicle Service |
| Occupation | Technical Service & Repair |
| NSQF Level | 3 |
| Credits | TBD |
| Version | 1.0 |
| Last Reviewed Date | 28/07/2022 |
| Next Review Date | 28/07/2025 |
| NSQC Clearance Date | 28/07/2022 |

Qualification Pack

DGT/VSQ/N0101: Employability Skills (30 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
- 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. understand the significance of employability skills in meeting the job requirements

Constitutional values – Citizenship

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

PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices

Becoming a Professional in the 21st Century

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

PC3. explain 21st Century Skills such as Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and cultural awareness, emotional awareness, continuous learning mindset etc.

Basic English Skills

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

PC4. speak with others using some basic English phrases or sentences

Communication Skills

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

PC5. follow good manners while communicating with others

PC6. work with others in a team

Qualification Pack

Diversity & Inclusion

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

PC7. communicate and behave appropriately with all genders and PwD

PC8. report any issues related to sexual harassment

Financial and Legal Literacy

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

PC9. use various financial products and services safely and securely

PC10. calculate income, expenses, savings etc.

PC11. approach the concerned authorities for any exploitation as per legal rights and laws

Essential Digital Skills

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

PC12. operate digital devices and use its features and applications securely and safely

PC13. use internet and social media platforms securely and safely

Entrepreneurship

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

PC14. identify and assess opportunities for potential business

PC15. identify sources for arranging money and associated financial and legal challenges

Customer Service

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

PC16. identify different types of customers

PC17. identify customer needs and address them appropriately

PC18. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

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

PC19. create a basic biodata

PC20. search for suitable jobs and apply

PC21. identify and register apprenticeship opportunities as per requirement

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills

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 basic spoken English language

KU6. Do and dont of effective communication

KU7. inclusivity and its importance

KU8. different types of disabilities and appropriate communication and behaviour towards PwD

KU9. different types of financial products and services

Qualification Pack

- KU10.** how to compute income and expenses
- KU11.** importance of maintaining safety and security in financial transactions
- KU12.** different legal rights and laws
- KU13.** how to operate digital devices and applications safely and securely
- KU14.** ways to identify business opportunities
- KU15.** types of customers and their needs
- KU16.** how to apply for a job and prepare for an interview
- KU17.** apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

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

- GS1.** communicate effectively using appropriate language
- GS2.** behave politely and appropriately with all
- GS3.** perform basic calculations
- GS4.** solve problems effectively
- GS5.** be careful and attentive at work
- GS6.** use time effectively
- GS7.** maintain hygiene and sanitisation 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> | 1 | 1 | - | - |
| PC1. understand the significance of employability skills in meeting the job requirements | - | - | - | - |
| <i>Constitutional values – Citizenship</i> | 1 | 1 | - | - |
| PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices | - | - | - | - |
| <i>Becoming a Professional in the 21st Century</i> | 1 | 3 | - | - |
| PC3. explain 21st Century Skills such as Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and cultural awareness, emotional awareness, continuous learning mindset etc. | - | - | - | - |
| <i>Basic English Skills</i> | 2 | 3 | - | - |
| PC4. speak with others using some basic English phrases or sentences | - | - | - | - |
| <i>Communication Skills</i> | 1 | 1 | - | - |
| PC5. follow good manners while communicating with others | - | - | - | - |
| PC6. work with others in a team | - | - | - | - |
| <i>Diversity & Inclusion</i> | 1 | 1 | - | - |
| PC7. communicate and behave appropriately with all genders and PwD | - | - | - | - |
| PC8. report any issues related to sexual harassment | - | - | - | - |
| <i>Financial and Legal Literacy</i> | 3 | 4 | - | - |
| PC9. use various financial products and services safely and securely | - | - | - | - |

Qualification Pack

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|--------------|-----------------|---------------|------------|
| PC10. calculate income, expenses, savings etc. | - | - | - | - |
| PC11. approach the concerned authorities for any exploitation as per legal rights and laws | - | - | - | - |
| <i>Essential Digital Skills</i> | 4 | 6 | - | - |
| PC12. operate digital devices and use its features and applications securely and safely | - | - | - | - |
| PC13. use internet and social media platforms securely and safely | - | - | - | - |
| <i>Entrepreneurship</i> | 3 | 5 | - | - |
| PC14. identify and assess opportunities for potential business | - | - | - | - |
| PC15. identify sources for arranging money and associated financial and legal challenges | - | - | - | - |
| <i>Customer Service</i> | 2 | 2 | - | - |
| PC16. identify different types of customers | - | - | - | - |
| PC17. identify customer needs and address them appropriately | - | - | - | - |
| PC18. follow appropriate hygiene and grooming standards | - | - | - | - |
| <i>Getting ready for apprenticeship & Jobs</i> | 1 | 3 | - | - |
| PC19. create a basic biodata | - | - | - | - |
| PC20. search for suitable jobs and apply | - | - | - | - |
| PC21. identify and register apprenticeship opportunities as per requirement | - | - | - | - |
| NOS Total | 20 | 30 | - | - |

Qualification Pack

National Occupational Standards (NOS) Parameters

| | |
|----------------------------|---------------------------------|
| NOS Code | DGT/VSQ/N0101 |
| NOS Name | Employability Skills (30 Hours) |
| Sector | Cross Sectoral |
| Sub-Sector | Professional Skills |
| Occupation | Employability |
| NSQF Level | 2 |
| Credits | 1 |
| Version | 1.0 |
| Last Reviewed Date | 29/09/2023 |
| Next Review Date | 29/09/2026 |
| NSQC Clearance Date | 29/09/2023 |

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

Minimum Aggregate Passing % at QP Level : 65

Qualification Pack

(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 |
| ASC/N9802.Interact effectively with colleagues, customers and others | 50 | 30 | - | 20 | 100 | 10 |
| ASC/N1456.Perform routine service, repair and maintenance of bicycle | 30 | 50 | - | 20 | 100 | 35 |
| ASC/N1457.Carry out routine service or minor repairs on electric bicycles and assist in diagnosis | 30 | 50 | - | 20 | 100 | 35 |
| DGT/VSQ/N0101.Employability Skills (30 Hours) | 20 | 30 | 0 | 0 | 50 | 5 |
| Total | 180 | 190 | 0 | 0 | 450 | 100 |

Qualification Pack

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 |

Qualification Pack

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. |

Qualification Pack

| | |
|---|--|
| 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. |