Model Curriculum

QP Name: Electric Vehicle Quality Control Inspector

QP Code: ASC/Q6307

QP Version: 1.0

NSQF Level: 4

Model Curriculum Version: 1.0

Automotive Skills Development Council | 153, Gr Floor, Okhla Industrial Area, Phase – III, Leela Building, New Delhi – 110020

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Training Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Automotive Quality Assurance
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3139.5001
Minimum Educational Qualification and Experience	8th Class + 2 years ITI with 2 years of relevant experience OR 10th Class pass with 2 years of relevant experience OR 10th Class + 2 years ITI OR 12th Class with 1 Year of experience OR Certificate-NSQF (Automotive Quality Control Assistant Level 3) with 2 Years of relevant experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 years
Last Reviewed On	25/11/2021
Next Review Date	25/11/2024
NSQC Approval Date	25/11/2021
QP Version	1.0
Model Curriculum Creation Date	25/11/2021
Model Curriculum Valid Up to Date	25/11/2024
Model Curriculum Version	1.0
Minimum Duration of the Course	390 Hours 00 Minutes
Maximum Duration of the Course	390 Hours 00 Minutes

Program Overview

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

Training Outcomes

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

- Carry out quality inspection activities such as inspection of Electric Vehicle (EV) parts, products and processes, measuring dimensions of part and product, etc.
- Work effectively and efficiently as per schedules and timelines.
- Implement safety practices.
- Optimize the use of resources to ensure less wastage and maximum conservation.

Compulsory Modules

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

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	**05:00**	**00:00**			**05:00**
Module 1: Introduction to the role of an Electric Vehicle Quality Control Inspector	5:00	0:00			5:00
ASC/N9803 – Organize work and resources (Manufacturing) **NOS Version No. – 1.0** **NSQF Level – 3**	**15:00**	**30:00**			**45:00**
Module 2: Organize work and resources according to safety and conservation standards	15:00	30:00			45:00
ASC/N9802 – Interact effectively with colleagues, customers and others **NOS Version No. – 1.0** **NSQF Level - 3**	**15:00**	**25:00**			**40:00**
Module 3: Communicate effectively and efficiently	15:00	25:00			40:00
ASC/N6313 – Inspect and maintain the electric vehicle (EV) parts and process quality and implement corrective actions **NOS Version No. – 1.0** **NSQF Level – 4**	**90:00**	**210:00**			**300:00**
Module 4: Inspect and maintain quality of Electric Vehicle (EV) parts and related processes	120:00	210:00			330:00
Total Duration	**125:00**	**265:00**			**390:00**

Module Details

Module 1: Introduction to the role of an Electric Vehicle Quality Control Inspector

Bridge module

Terminal Outcomes:

- Discuss the role and responsibilities of an Electric Vehicle Quality Control Inspector.

Duration: *<05:00>*	**Duration**: *<00:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the role and responsibilities of an Electric Vehicle Quality Control Inspector. • Discuss the job opportunities of an Electric Vehicle Quality Control Inspector. • Explain about Indian automotive manufacturing market. • List various automobile Original Equipment Manufacturers (OEMs) and different products/ models manufactured by them. • Discuss the standards and procedures involved in the different processes of quality inspection.	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 2: Organize work and resources according to safety and conservation standards

Mapped to ASC/N9803, v1.0

Terminal Outcomes:

- Employ appropriate ways to maintain safe and secure working environment.
- Perform work as per the quality standards.
- Apply conservation practices at the workplace.

Duration: *<15:00>*	**Duration**: *<30:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the potential workplace related risks and hazards, their causes and preventions. • Identify PPE to be used at workplace. • Identify various warning signs used at the workplace. • Describe appropriate strategies to deal with emergencies and accidents at the workplace. • Outline the organizational structure to be followed to report about health, safety and security breaches to the concerned authorities. • Discuss the importance of keeping work area clean and tidy. • Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol based hand sanitizers or soap. • Discuss organizational hygiene and sanitation guidelines and ways of reporting breaches/gaps if any to the concerned authorities. • Discuss the ways of dealing with stress and anxiety. • Discuss how to complete the given work within the stipulated time period. • Explain how to maintain a proper balance between team and individual goals. • Explain 5S guidelines at workplace. • List the various materials used at the workplace. • Explain organisational recommended procedure for storage of tools, equipment and material after completion of work. • Explain the ways to optimize usage of resources. • Discuss various methods of waste management and its disposal.	• Apply appropriate safety practices to ensure safety of people at the workplace • Display the correct way of wearing and removing PPE such as face masks, hand gloves, face shields, PPE suits, etc. • Demonstrate the use of fire extinguisher. • Apply basic first aid procedure in case of emergencies. • Perform routine cleaning of tools, equipment and machines. • Employ various techniques for checking malfunctions in the equipment as per Standard Operating Procedure (SOP). • Show how to sanitize and disinfect one's work area regularly. • Demonstrate the correct way of washing hands using soap and water. • Demonstrate the correct way of sanitizing hands using alcohol-based hand rubs. • Demonstrate how to evacuate the workplace in case of an emergency. • Demonstrate sorting of materials, tools and equipment and spare parts after completion of work. • Demonstrate the steps involved in storage of tools, equipment and material after completion of work. • Perform basic checks to identify any spills and leaks and that need to be plugged /stopped. • Demonstrate different disposal techniques depending upon types of waste. • Employ different ways to check if equipment/machines are functioning as per requirements and report malfunctioning, if observed. • Employ ways for efficient utilization of material and water.

• List the different categories of waste for the purpose of segregation • Differentiate between recyclable and non-recyclable waste • State the importance of using appropriate colour dustbins for different types of waste. • Discuss common practices for conserving electricity at workplace. • Discuss the common sources of pollution and ways to minimize it.	
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• Housekeeping material: Cleaning agents, cleaning cloth, waste container, dust pan and brush set, liquid soap, hand towel, fire extinguisher • Safety gears: Safety shoes, ear plug, goggles, gloves, helmet, first-aid kit	

Module 3: Communicate Effectively and Efficiently

Mapped to ASC/N9802, v1.0

Terminal Outcomes:

- Use effective communication and interpersonal skills.
- Apply sensitivity while interacting with different genders and people with disabilities.

Duration: *<15:00>*	**Duration**: *<25:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the organizational structure for communicating with colleagues, seniors and others. • Discuss the ways to adjust the communication styles to reflect sensitivity towards gender and persons with disability (PwD). • Explain the importance of respecting personal space of colleagues. • State the procedure to receive work instructions and report problems to the supervisor. • List the various organizational policies and procedures to be followed at the workplace. • Describe different ways to rectify commonly occurring errors. • Explain the importance of complying with the instructions/guidelines and procedures while performing tasks related to the job specifications. • Discuss the importance of PwD and gender sensitization.	• Employ different means of communication depending upon the requirement while interacting with others. • Demonstrate using new ways to maintain good relationships with colleagues and supervisor. • Prepare a sample report to send the work status to the supervisor. • Demonstrate how to communicate with different genders and persons with disability (PwD) in a sensitive manner.
Classroom Aids:	
Whiteboard, marker pen, projector	

Tools, Equipment and Other Requirements
Sample of escalation matrix, organisation structure.

Module 4: Inspect and maintain quality of Electric Vehicle (EV) parts and related processes

Mapped to ASC/N6313, v1.0

Terminal Outcomes:

- Identify testing equipment, measuring instruments, gauges, parts etc. required for quality inspection job.
- Demonstrate methods and techniques for quality inspection of EV parts and related processes.
- Prepare and maintain documents and reports related to quality inspection work.

Duration: *<90:00>*	**Duration**: *<210:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List various components /aggregates and the manufacturer's specifications of an electric vehicle. • Discuss basic technology used, functioning and interconnections of various systems and components of the vehicle. • Recall fundamental terms, laws and principles of electricity used in EV. • Describe various symbols, units and terms used in wiring diagrams associated with electrical/electric systems/components of the vehicle. • Explain legal regulations that need to be taken into account for handling electric vehicles. • Discuss organisational quality inspection standards and processes. • Discuss the information collected from the inspection check sheet about the inspection tasks and quality check criteria of EV parts and processes and how to confirm it from the superior. • Classify measuring instruments as direct/indirect, precision/non-precision etc, gauges. • List testing equipment, measuring instruments, gauges, parts etc. required during the quality inspection process. • Discuss the organisational process of collecting and arranging the testing equipment, measuring instruments, gauges, parts etc. from the store. • Summarise the steps to be performed for checking the calibration of tools, gauges and measuring instruments before use. • Discuss the safety practices to avoid any	• Demonstrate the standard operating procedures to use the testing equipment, measuring instruments, gauges, parts etc. required during the quality inspection process. • Show how to collect the required testing equipment, measuring instruments, gauges, parts etc. from the store. • Apply appropriate ways of checking the calibration of tools, gauges and measuring instruments before use. • Show how to visually inspect the EV parts for scratches, dents, damages, packing etc. • Perform the steps to inspect the dimensions and function of part or product. • Show how to judge the part or product through feel, touch, sound, smell, etc. • Apply appropriate ways to maintain and preserve the tested samples of EV part or product for future use. • Show how to check the sticker/number/label of the inspected automotive part or product. • Apply appropriate inspection techniques to verify the EV manufacturing related process control items. • Show how to measure and control the quality of EV manufacturing process by using Statistical Process Control (SPC). • Prepare a sample first-off inspection report as per the process inspection standard/process parameter sheet/control plan. • Prepare records, reports and documents related to quality inspection process as

hazard and accident during quality inspection activities. • List QMS system guidelines followed in the organization. • Recall manufacturing process for each automotive part and product. • Explain methods and techniques of inspecting the quality of automotive parts, products and related processes. • List inspection checkpoints for the EV parts, product and process. • Explain ways of measuring the dimensions of automotive part or product. • Elucidate the importance of maintaining and preserving the tested samples of EV part or product as limit samples. • Discuss inspection techniques to verify the quality and effectiveness of EV product and process. • Discuss the records, reports and documents needed to be maintained and updated as per SOP. • Identify different methods for disposing off scrap. • Recall process of operating softwares like SAP, ERP etc. • Describe poka yoke, mould functioning, fixture condition etc. • Describe problem solving & analysis tools like 8Ds, five why analysis etc.	per SOP. • Show how to raise scrap note and dispose scrapped part or product as per organisational guidelines. • Role play a situation on how to coordinate with the team as a CFT member to analyse the problems and identify corrective actions pertaining to the products handled. • Demonstrate ways to collect the data related to problems identified in inspection process. • Role play a situation on how to coordinate with the team to analyse the problems identified in inspection process. • Dramatise how to coordinate with the process line leader/supervisor to identify the corrective actions for discrepancies identified in the inspection report. • Apply appropriate ways to implement the corrective actions for discrepancies identified. • Role play a situation on how to coordinate with the team to identify opportunities for improvements in productivity, quality, cost, safety and morale. • Apply appropriate ways to verify the daily check items for e.g. poka yoke, mould functioning, fixture condition etc.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
NG Parts With Known Dimension, Air Gauge Unit/Plugs/Rings, Apron, Bore Gauge, Centre Bench, Defective Samples, Dial Gauge/With Stand, Fixtures, Gauges, Height Gauge, Labels / Stickers, Sample Inspection Report Format, Limit Samples for Visual Defects, Manuals for SPC, APQP, MSA TS Standards, Micrometer, Ok Parts With Known Dimension, Parts (Within & Out Of Tolerance As Per Drawings), Plug ,Ring & Taper Go/No Go Gauges, Profile Gauge, Sample Parts, Screw Jack, Standard V Block/Magnetic, Surface Plate With Stand, Thread Plug/Ring Gauge, Tools, Vernier Caliper	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Fitter/Electrical/Mechanic Auto Electronical & Electronics/ Electronic Mechanic	5	Quality	1	Quality	NA
ITI	Fitter/Electrical/Mechanic Auto Electronical & Electronics/ Electronic Mechanic	6	Quality	0	Quality	**NA**
Diploma	Electrical/Electronics/ Automobile	3	Quality	1	Quality	**NA**
Diploma	Electrical/Electronics/ Automobile	4	Quality	0	Quality	**NA**

Trainer Certification	
Domain Certification	**Platform Certification**
"Electric Vehicle Quality Control Inspector, ASC/Q6307, version 1.0". Minimum accepted score is 80%.	"Trainer, MEP/Q2601 v1.0" Minimum accepted score is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
ITI	Fitter/Electrical/Mechanic Auto Electronical & Electronics/ Electronic Mechanic	6	Quality	1	Quality	NA
ITI	Fitter/Electrical/Mechanic Auto Electronical & Electronics/ Electronic Mechanic	7	Quality	0	Quality	**NA**
Diploma	Electrical/Electronics/ Automobile	4	Quality	1	Quality	**NA**
Diploma	Electrical/Electronics/ Automobile	5	Quality	0	Quality	**NA**

Assessor Certification	
Domain Certification	**Platform Certification**
"Electric Vehicle Quality Control Inspector, ASC/Q6307, version 1.0". Minimum accepted score is 80%.	"Assessor; MEP/Q2701 v1.0" Minimum accepted score is 80%.

Assessment Strategy

1. Assessment System Overview:
    - Batches assigned to the assessment agencies for conducting the assessment on SDMS/SIP or email
    - Assessment agencies send the assessment confirmation to VTP/TC looping SSC
    - Assessment agency deploys the ToA certified Assessor for executing the assessment
    - SSC monitors the assessment process & records

2. Testing Environment:
    - Confirm that the centre is available at the same address as mentioned on SDMS or SIP
    - Check the duration of the training.
    - Check the Assessment Start and End time to be as 10 a.m. and 5 p.m.
    - If the batch size is more than 30, then there should be 2 Assessors.
    - Check that the allotted time to the candidates to complete Theory & Practical Assessment is correct.
    - Check the mode of assessment—Online (TAB/Computer) or Offline (OMR/PP).
    - Confirm the number of TABs on the ground are correct to execute the Assessment smoothly.
    - Check the availability of the Lab Equipment for the particular Job Role.

3. Assessment Quality Assurance levels / Framework:
    - Question papers created by the Subject Matter Experts (SME)
    - Question papers created by the SME verified by the other subject Matter Experts
    - Questions are mapped with NOS and PC
    - Question papers are prepared considering that level 1 to 3 are for the unskilled & semi-skilled individuals, and level 4 and above are for the skilled, supervisor & higher management
    - Assessor must be ToA certified & trainer must be ToT Certified
    - Assessment agency must follow the assessment guidelines to conduct the assessment

4. Types of evidence or evidence-gathering protocol:
    - Time-stamped & geotagged reporting of the assessor from assessment location
    - Centre photographs with signboards and scheme specific branding
    - Biometric or manual attendance sheet (stamped by TP) of the trainees during the training period
    - Time-stamped & geotagged assessment (Theory + Viva + Practical) photographs & videos

5. Method of verification or validation:
    - Surprise visit to the assessment location
    - Random audit of the batch
    - Random audit of any candidate

6. Method for assessment documentation, archiving, and access
    - Hard copies of the documents are stored
    - Soft copies of the documents & photographs of the assessment are uploaded / accessed from Cloud Storage
    - Soft copies of the documents & photographs of the assessment are stored in the Hard Drives

References

Glossary

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

Acronyms and Abbreviations

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