



Model Curriculum

QP Name: Automotive Electrician

QP Code: ASC/Q1408

QP Version: 2.0

NSQF Level: 4

Model Curriculum Version: 1.0

Automotive Skill Development Council
Leela Building, 153 GF, Okhla Phase III, Okhla Industrial Area, New Delhi, Delhi 110020

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Training Parameters

Sector	Automotive Skills Development Council
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7412.0701
Minimum Educational Qualification & Experience	10th Class + 2 years ITI (Mechanic Motor Vehicle/Diesel Mechanic/Mechanic Auto Electrical and Electronics) OR 10th Class pass with 2 years relevant experience OR 12th Class pass with 1 year relevant experience OR Certificate-NSQF (Four Wheeler Service Assistant Level 3) with 2 Years of Experience
Pre-Requisite License or Training	Driving License and Basic Computer Skills
Minimum Job Entry Age	18 Years
Last Reviewed On	20/11/2020
Next Review Date	20/11/2025
NSQC Approval Date	20/11/2020
Version	2.0
Model Curriculum Creation Date	20/11/2020
Model Curriculum Valid Up to Date	20/11/2025
Model Curriculum Version	1.0
Minimum Duration of the Course	390 Hours, 0 Minutes
Maximum Duration of the Course	390 Hours, 0 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.

- Analyse the faults in the electrical and electronic systems of a vehicle.
- Perform service and repair of faulty electrical and electronic components in a vehicle.
- Work effectively and efficiently as per schedules and timelines.
- Implement safety practices.
- Optimize the use of resources to ensure less wastage and maximum conservation.
- Communicate effectively and develop interpersonal skills.

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 Automotive Electrician <i>Bridge Module</i>	05:00	00:00	-	-	05:00
ASC/N9804 - Organize Work and Resources (Service) NOS Version No. 1.0 NSQF Level 4	15:00	30:00	-	-	45:00
Module 2: Work effectively and efficiently	09:00	15:00	-	-	24:00
Module 3: Optimize resource utilization	06:00	15:00	-	-	21:00
ASC/N9805 – Interact Effectively with Colleagues, Customers and others (Service) NOS Version No. 1.0 NSQF Level 4	15:00	25:00	-	-	40:00
Module 4: Communicate effectively and efficiently	15:00	25:00	-	-	40:00
ASC/N1406 – Carry out service, repair and overhaul	90:00	210:00	-	-	300:00

of electrical and electronic aggregates of vehicle NOS Version No. 1.0 NSQF Level 4					
Module 5: Service, repair and overhaul of electrical and electronic faults in a vehicle	90:00	210:00	-	-	300:00
Total Duration	125:00	265:00	-	-	390:00

Module Details

Module 1: Introduction to the Role of an Automotive Electrician

Bridge Module

Terminal Outcomes:

- Discuss how to work as per the defined role and responsibilities of an Automotive Electrician.
- Discuss the scope of work of an Automotive Electrician.

Duration: 05:00	Duration: 0:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the role and responsibilities of an automotive electrician • Outline the workshop structure and role of other people in the workshop with whom the electrician would need to coordinate • Explain the basics of driving and parking a four-wheeler vehicle. • Identify the various parts/components of the vehicle. • Describe the activities to be performed for maintaining/managing the workshop, including tools and equipment. • List the standard operating procedures (SOP) w.r.t. handling complaints, allocation of work, invoicing, inspection, diagnosis, repair etc. 	
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	

Module 2: Work Effectively and Efficiently

Mapped to NOS ASC/N9804, v1.0

Terminal Outcomes:

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

Duration: 09:00	Duration: 15:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> ● Outline the organizational structure to be followed to report about health, safety and security breaches to the concerned authorities. ● List the potential workplace related risks and hazards, their causes and preventions. ● State the methods to keep the work area clean and tidy. ● Discuss how to complete the given work within the stipulated time period. ● Explain how to maintain a proper balance between team and individual goals. ● Discuss epidemics and pandemics and their impact on society at large. ● Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol-based hand sanitizers. ● Discuss the use of proper PPE for maintaining health and hygiene at workplace and the process of wearing/discarding them. ● Define self-quarantine or self-isolation. ● Discuss the importance of identifying and reporting symptoms to the concerned authorities. ● Explain the significance of following prescribed rules and guidelines during an epidemic or a pandemic. ● Discuss organizational hygiene and sanitation guidelines and ways of reporting breaches/gaps if any. ● Discuss the ways of dealing with stress and anxiety during an epidemic or a pandemic. ● Discuss alternate ways of carrying out different tasks in everyday life (use of e-payment gateways/online learning/virtual meetings, etc.). 	<ul style="list-style-type: none"> ● Perform routine cleaning of tools, equipment and machines. ● Employ various techniques for checking malfunctions in the equipment as per Standard Operating Procedure (SOP). ● Apply basic housekeeping practices to ensure that the work area is clean, such as mopping spills and leaks, cleaning grease stains etc. ● Demonstrate how to evacuate the workplace in case of an emergency. ● Show how to sanitize and disinfect one's work area regularly. ● Demonstrate the correct way of washing hands using soap and water. ● Demonstrate the correct way of sanitizing hands using alcohol-based hand rubs. ● Display the correct way of wearing and removing PPE such as face masks, hand gloves, face shields, PPE suits, etc. ● Demonstrate appropriate social and behavioural etiquette (greeting and meeting people, spitting/coughing/sneezing, etc.). ● Prepare a list of relevant hotline/emergency numbers.

Classroom Aids:
White board/black board marker/chalk, duster, computer or Laptop attached to LCD projector
Tools, Equipment and Other Requirements
Personal Protection Equipment: safety glasses, head protection, rubber gloves, safety footwear, warning signs and tapes, fire extinguisher and first aid kit Sanitization kit, disinfectants, alcohol-based sanitizers, different types of face masks, shields, suits,

Module 3: Optimize Resource Utilization

Mapped to NOS ASC/N9804, v1.0

Terminal Outcomes:

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

Duration: 06:00	Duration: 15:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the ways to optimize usage of re-sources. • Discuss various methods of waste management and its disposal. • List the different categories of waste for the purpose of segregation • Differentiate between recyclable and non-recyclable waste • State the importance of using appropriate colour dustbins for different types of waste. • Discuss the common sources of pollution and ways to minimize it. 	<ul style="list-style-type: none"> • Perform basic checks to identify any spills and leaks and that need to be plugged /stopped. • Demonstrate different disposal techniques depending upon different types of waste. • Employ different ways to check if equipment/machines are functioning as per requirements and report malfunctioning, if observed. • Employ ways for efficient utilization of material and water • Use energy efficient electrical appliances and devices to ensure energy conservation
Classroom Aids:	
White board/black board marker/chalk, duster, computer or Laptop attached to LCD projector	
Tools, Equipment and Other Requirements	
Different type of waste bins to collect and segregate waste for disposal	

Module 4: Communicate Effectively and Efficiently

Mapped to NOS ASC/N9805, 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
<ul style="list-style-type: none"> • 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 and customers. • 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. 	<ul style="list-style-type: none"> • 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:	
White board/black board marker/chalk, duster, computer or Laptop attached to LCD projector	
Tools, Equipment and Other Requirements	
Sample of escalation matrix, organisation structure.	

Module 5: Service, Repair and Overhaul of Electrical and Electronic Faults in a Vehicle

Mapped to NOS ASC/N1406, v1.0

Terminal Outcomes:

- Demonstrate how to perform service and repair of faulty electrical and electronic systems in a vehicle.

Duration: 90:00	Duration: 210:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the work requirements mentioned in the job card • Describe the basic electronics and electrical concepts including common symbols, units and terms used in wiring diagrams associated with vehicle 's electrical/electric systems/components. • Describe the operation of electrical and electronic systems and different types of faults/failures in engine/components/systems • List specifications related to the various systems/components/aggregates in the vehicle. • Discuss the working of various systems such as different types of engine management system, body control system, electronic hydraulic control system and cooling systems, active & passive safety system, air conditioning system etc. for the vehicle. • Differentiate between the different sources of information for assessing service and repair requirements of the vehicle • Explain the process of checking the condition of tools and equipment, calibration status, and procedure to report the defects, if any. • Outline the safety precautions to be taken while working with various tools and equipment for repairing/servicing and replacement of components • Describe how to diagnose direct and indirect faults in electrical/electronic 	<ul style="list-style-type: none"> • Apply basic maintenance techniques to ensure that the tools and equipment are functioning as per standard operating procedures (SOP) • Demonstrate how to do a test drive of the vehicle for assessment of work requirement w.r.t. calibration, repair etc. • Show how to use tools and equipment such as organic light emitting displays, measuring equipment, electrical and electronic testing equipment, hand tools, power tools, computer based diagnostic tools/equipment, etc. as per SOP. • Perform visual inspection to identify the direct or indirect faults and their precise location in the electrical and electronic systems of a vehicle. • Demonstrate how to dismantle and reassemble the components as per SOP. • Perform the steps to analyse the faults in the components to identify the components to be repaired or replaced • Demonstrate the steps to service/repair/overhaul/test electrical and electronic systems as per SOP • Apply suitable techniques for cleaning and conditioning the dismantled aggregates • Demonstrate how to repair indirect faults in electrical/electronic aggregate caused due to other system/component

<p>aggregate caused due to other system/component</p> <ul style="list-style-type: none"> • Discuss how to protect the vehicle, it systems and other parked vehicles from any damage. • Explain how to perform repair/replacement of electrical/electronic components. • Discuss the procedure to seek approval for technically and economically infeasible repairs. • Discuss the procedure to escalate repair issues beyond one's scope to the supervisor. • Discuss the importance of completing the assigned task before releasing vehicle for the next procedure. • Explain the importance of proper disposal of replaced defective components. • List the documents to be maintained pertaining to the repairs of the components. 	<ul style="list-style-type: none"> • Employ various precautions and safety measures to ensure that no damage is caused to the vehicle during work processes • Perform necessary checks before releasing the vehicle for next procedure and other post-repair activities such as returning tools etc. • Employ appropriate methods to dispose replaced defective components properly. • Demonstrate how to maintain records and documentation of the repair process.
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	
<p>Vehicle, various body parts, engine, tools and equipment, material, mechanical and electrical components / aggregates, lubricants, grease, oil, refrigerant, etc.</p> <p>Feeler gauges, torque wrench, multimeter, engineering rule (scale), battery charger, tester, hydrometer, tachometer etc. Fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc., and ball joint separators, bearing pullers, gear puller tools, slide hammers etc.</p> <p>DC motors and alternators, Battery, Organic light emitting displays, pressure indicators, speciality wrenches, measuring equipment, electrical and electronic testing equipment, hand tools, power tools, lifting and jacking equipment.</p>	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	4	Four Wheeler Service	1	Four Wheeler Service	NA
ITI	Mechanic Motor Vehicle/ Mechanic Auto Electrical and Electronics	5	Four Wheeler Service	0	Four Wheeler Service	NA
Diploma	Automobile/Mechanical /Electrical/ Electronics Engineering	3	Four Wheeler Service	1	Four Wheeler Service	NA
Diploma	Automobile/Mechanical /Electrical/ Electronics Engineering	4	Four Wheeler Service	0	Four Wheeler Service	NA
Certificate- NSQF Level 6	Four Wheeler Master Technician	3	Four Wheeler Service	1	Four Wheeler Service	NA

Trainer Certification	
Domain Certification	Platform Certification
"Automotive Electrician", QP: "ASC/Q1408", minimum accepted score is 80%	"Trainer", "MEP/Q2601" with scoring of minimum 80%

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI	Mechanic Motor Vehicle/Mechanic Auto Electrical and Electronics	5	Four Wheeler Service	1	Four Wheeler Service	NA
ITI	Mechanic Motor Vehicle/Mechanic Auto Electrical and Electronics	6	Four Wheeler Service	0	Four Wheeler Service	NA
Diploma	Automobile/Mechanical /Electrical/ Electronics Engineering	4	Four Wheeler Service	1	Four Wheeler Service	NA
Diploma	Automobile/Mechanical /Electrical/ Electronics Engineering	5	Four Wheeler Service	0	Four Wheeler Service	NA
Certificate- NSQF Level 6	Four Wheeler Master Technician	4	Four Wheeler Service	1	Four Wheeler Service	NA

Assessor Certification	
Domain Certification	Platform Certification
“Automotive Electrician”, QP: “ASC/Q1408”, minimum accepted score is 80%	“Assessor”, “MEP/Q2701” with scoring of minimum 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:

The assessor should:

- 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 are created by the Subject Matter Experts (SME)
- Question papers created by the SME are 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
PwD	Persons with Disability