Model Curriculum

QP Name: Automotive Maintenance Lead Technician - Mechanical

QP Code: ASC/Q6808

QP Version: 2.0

NSQF Level: 5

Model Curriculum Version: 1.0

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

Table of Contents

Training Parameters

Sector	Automotive
Sub-Sector	Manufacturing
Occupation	Plant and Equipment Maintenance
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3115.0501
Minimum Educational Qualification and Experience	10th Class + 2 years I.T.I (Fitter/Turner) with 3 Years of experience OR Diploma (Mechanical/Automobile) from a recognized body with 2 Years of experience OR Certificate-NSQF (Automotive Maintenance Technician -Mechanical level 4) with 2 Years of experience
Pre-Requisite License or Training	NA
Minimum Job Entry Age	20 years
Last Reviewed On	29/07/2021
Next Review Date	29/07/2026
NSQC Approval Date	29/07/2021
QP Version	2.0
Model Curriculum Creation Date	29/07/2021
Model Curriculum Valid Up to Date	29/07/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	504 Hours 00 Minutes
Maximum Duration of the Course	504 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.

- Identify the various equipment and machinery used in the maintenance process.
- Conduct breakdown maintenance of the mechanical systems of the equipment in the plant by following organizational policies and procedures.
- Maintain records, documents and reports related to the maintenance activities done on the equipment.
- Work effectively and efficiently as per schedules and timelines.
- Implement safety practices.
- Use resources optimally 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					
Module 1: Introduction to the role of an Automotive Maintenance Lead Technician-Mechanical	8:00	0:00			8:00
ASC/N9810: Manage work and resources (Manufacturing) NOS Version No. – 1.0 NSQF Level – 5	**24:00**	**32:00**			**56:00**
Module 2: Manage work and resources according to safety and conservation standards	24:00	32:00			56:00
ASC/N9812 – Interact effectively with team, customers and others NOS Version No. 1.0 NSQF Level 5	**24:00**	**32:00**			**56:00**
Module 3: Communicate effectively and efficiently	24:00	32:00			56:00
ASC/N6814 – Plan and conduct maintenance of mechanical equipment NOS Version No. – 1.0	**128:00**	**256:00**			**384:00**

NSQF Level - 5					
Module 4: Plan for maintenance of mechanical equipment	48:00	80:00			128:00
Module 5: Perform maintenance of mechanical equipment	80:00	176:00			256:00
Total Duration	**184:00**	**320:00**			**504:00**

Module Details

Module 1: Introduction to the role of an Automotive Maintenance Lead Technician - Mechanical

Bridge module

Terminal Outcomes:

- Discuss the role and responsibilities of an Automotive Maintenance Lead Technician - Mechanical.

Duration: *<08:00>*	**Duration**: *<00:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the role and responsibilities of an Automotive Maintenance Lead Technician - Mechanical. • Discuss the job opportunities of an Automotive Maintenance Lead Technician - Mechanical. • Explain about Indian automotive manufacturing market. • List various automobile Original Equipment Manufacturers (OEMs) and different products/ models manufactured by them. • Discuss the maintenance standards and procedures followed in organisation. • Identify the standard checklists and schedules recommended by OEM.	
Classroom Aids:	
Whiteboard, marker pen, projector, standard checklists and schedules	
Tools, Equipment and Other Requirements	

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

Mapped to ASC/N9810, v1.0

Terminal Outcomes:

- Employ appropriate ways to maintain safe and secure working environment
- Apply material and energy conservation practices at the workplace.

Duration: *<24:00>*	**Duration**: *<32:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss organisational procedures for health, safety and security and individual role and responsibilities related to the same. • List the potential workplace related risks, threats and hazards, their causes and preventions. • List personal protective equipment like safety gloves, glasses, shoes and mask used at the workplace. • List various types of fire extinguisher. • Identify various safety boards/ signs placed on the shop floor. • Explain 5S standards, procedures and policies followed at workplace. • Discuss organisational procedures to deal with emergencies and accidents at the workplace and importance of following them. • State the importance of conducting safety drills or training sessions. • Explain the process of filling daily check sheet for reporting to the concerned authorities about improvements done and risks identified. • Discuss how and when to report about potential hazards identified in the workplace and limits of responsibility for dealing with them. • Outline the importance of keeping workplace, equipment, restrooms etc. clean and sanitised. • Explain the importance of following hygiene and sanitation regulations developed by organisation at the workplace. • Discuss the importance of maintaining the availability of running water, hand wash and alcohol-based sanitizers at the	• Apply appropriate ways to implement safety practices to ensure safety of people at the workplace. • Display the correct way of wearing and disposing PPE. • Demonstrate the use of fire extinguisher. • Demonstrate how to provide first aid procedure in case of emergencies. • Demonstrate how to evacuate the workplace in case of an emergency. • Employ various techniques for checking malfunctions in the machines with the support of maintenance team and as per Standard Operating Procedures (SOP). • Demonstrate to arrange tools/ equipment/ fasteners/ spare parts into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions. • Apply appropriate ways to organise safety drills or training sessions for others on the identified risks and safety practices. • Prepare a report about the health, safety and security breaches. • Apply appropriate ways to check that workplace, equipment, restrooms etc. are cleaned and sanitised. • Role play a situation to brief the team about the hygiene and sanitation regulations developed by organisation. • Demonstrate the correct way of washing hands using soap and water and alcohol-based hand rubs. • Apply appropriate methods to support the employees to cope with stress, anxiety etc. • Demonstrate proper waste collection and disposal mechanism depending upon types of waste.

workplace. • Discuss the significance of conforming to basic hygiene practices such as washing hands, using alcohol based hand sanitizers or soap. • Recall ways of reporting advanced hygiene and sanitation issues to the concerned authorities. • Elucidate various stress and anxiety management techniques. • Discuss the significance of greening. • Classify different categories of waste for the purpose of segregation. • Differentiate between recyclable and non-recyclable waste. • Discuss various methods of waste collection and disposal. • List the various materials used at the workplace. • Explain organisational recommended norms for storage of tools, equipment and material. • Discuss the importance of efficient utilisation of material and water. • Explain basics of electricity and prevalent energy efficient devices. • Explain the processes to optimize usage of material and energy/electricity. • Enlist common practices for conserving electricity at workplace.	• Perform the steps involved in storage of tools, equipment and material after completion of work. • Employ appropriate ways to resolve malfunctioning (fumes/ sparks/ emission/ vibration/ noise) and lapse in maintenance of equipment as per requirements. • Perform the steps to prepare a sample material and energy audit reports. • Employ practices for efficient utilization of material and energy/electricity.
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/N9812, v1.0

Terminal Outcomes:

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

Duration: *<24:00>*	**Duration**: *<32:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the importance of complying with organizational requirements to share information with team members. • 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. • Describe the ways to manage and coordinate with team members for work integration. • State the importance of team goals over individual goals, keeping commitment made to team members, and informing them in case of delays. • Discuss the importance of following the organisation's policies and procedures • Discuss the importance of rectifying errors as per feedback and minimizing mistakes. • Discuss gender-based concepts, issues and legislation as well organization standards, guidelines, rights and duties of PwD. • Discuss the importance of PwD and gender sensitization to ensure that team shows sensitivity towards them. • State the importance of following organizational standards and guidelines related to PwD. • Recall the rights and duties at workplace with respect to PwD. • Outline organisation policies and procedures pertaining to written and verbal communication.	• Employ different means and methods of communication depending upon the requirement to interact with the team members. • Employ appropriate ways to maintain good relationships with team members and superiors. • Apply appropriate techniques to resolve conflicts and manage team members for smooth workflow. • Conduct training sessions to train the team members on proper reporting of completed work and receiving feedback. • Employ suitable ways to escalate problems to superiors as and when required. • Prepare a sample report on the progress and team performance . • Role play a situation on how to offer help to people with disability (PwD) if required at work.
Classroom Aids:	
Whiteboard/blackboard, marker/chalk, duster, computer or Laptop attached to LCD projector	
Tools, Equipment and Other Requirements	

Module 4: Plan for maintenance of mechanical equipment

Mapped to ASC/N6814, v1.0

Terminal Outcomes:

- Identify tools and equipment required for maintenance of mechanical equipment.
- Discuss the importance of coordinating with operator for identifying issues in equipment and planning of maintenance activities.
- Read the maintenance schedule and checklist for planning of maintenance activities.

Duration: *<48:00>*	**Duration**: *<80:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Define maintenance. • Classify various types of maintenance. • Discuss the information derived from the job order, equipment drawing and user manual of equipment. • Recall the information mentioned in the maintenance checklist and schedule regarding the maintenance work. • List tools, equipment, accessories, consumables and spare parts required during the maintenance work. • Describe the selection criteria of tools, equipment, accessories, consumables and spare parts required for maintenance work. • Discuss the organisational process of collecting and storing consumables, spare parts, tools etc. from the store. • Discuss the importance of getting information such as process cycle, standard working and running schedule, duty conditions and working principles etc. of equipment.	• Read the job order, equipment drawing, wiring diagrams and user manual for identifying the information about the equipment to be used for service and repairing. • Perform the steps to prepare plan and schedule for maintenance activities on the basis of maintenance schedule, manufacturer's recommendations and history of similar equipment handled. • Show how to select and collect the required tools, equipment, accessories, consumables and spare parts from the store. • Demonstrate the standard operating procedure to use consumables, tools and equipment required during maintenance of mechanical equipment. • Show how to verify that the drawings and other information matches with the current status of the special purpose equipment. • Perform the steps to prepare plan for installation/ shifting of the equipment for maintenance work. • Apply appropriate ways to find out possibilities of impending breakdowns, leakages, failures etc. in the equipment. • Role play a situation on co-ordinating with the operator for getting information about the unusual conditions noticed in equipment.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• Mechanical drawings • **Hand tools**: Hammer, screw driver set, files, torque, wrenches, and spanner.	

• **Cutting tools**: Hacksaw, grinding machine, shearing tool, drilling machine, chisel etc. • **Measuring equipment**: Vernier calliper, micrometer, feeler gauges, steel ruler, measuring tape, dial gauge etc. • Cables, nuts, bolts, fasteners, connectors. • Hydraulic/ pneumatic / electrical machines • **PPE:** Gloves, safety shoes, goggles, ear plugs, safety helmet • **Workshop safety**: Fire extinguishers, first-aid kit

Module 5: Perform maintenance of mechanical equipment

Mapped to ASC/N6814, v1.0

Terminal Outcomes:

- Demonstrate inspection, testing, maintenance and repairing of mechanical equipment.
- Demonstrate how to conduct trials of the equipment for checking any abnormalities in the functioning of equipment.

Duration: *<80:00>*	**Duration**: *<176:00>*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the necessary precautions to avoid any hazard and accident during maintenance activities. • List the commonly occurring faults/failures in mechanical equipment and corrective actions taken to resolve them. • List the steps to be performed for dismantling the equipment for inspection, cleaning, repairing or replacing the consumables, spare parts and faulty components as per SOP. • Explain the process of evaluating the geometric inaccuracies or internal conditions of the equipment with the specified quality standards. • Discuss breakdown maintenance process. • Explain methods of checking the equipment to find out the root cause of the problems. • List consumables, tools and equipment required during service and repair of the equipment. • Explain the process of assembling back the equipment as per SOP. • Explain the process of evaluating the equipment specified parameters for no abnormalities on increased duty conditions. • Explain the importance of changing maintenance due/status sticker on the equipment after completion of maintenance activities and before handover the equipment to operator. • Discuss the need of taking back replaced parts or components for further process. • Summarise the documents, records and information to be maintained and updated related to the maintenance and repairing done.	• Employ appropriate ways of checking the standard parameters such as vibration, current, temperature, etc. in the equipment and estimating the time period when the parameters will become un-acceptable. • Demonstrate organizational specified procedure of dismantling the equipment and repairing or replacing the consumables, spare parts and faulty components as per SOP. • Employ appropriate ways of checking the geometric inaccuracies or internal conditions of the equipment to test the expected conditions. • Show how to conduct breakdown maintenance and check the equipment to find out the root cause of the problems. • Perform the steps of repairing or replacing the components in the equipment. • Role play a situation to give feedback and suggestions to maintenance/production in charge about actions to avoid such type of breakdown in future. • Demonstrate organizational specified procedure of assembling back the equipment and preparing it for trials as per SOP. • Prepare records and documents related to repairs carried out, time taken and unplanned tasks encountered during maintenance activities. • Employ appropriate ways for conducting trials and running few cycles of equipment on increased duty conditions for checking any abnormalities in its functioning. • Show how to update equipment history sheet and troubleshooting/ maintenance check sheets as per the maintenance and

	repairing done. • Prepare a report for the superiors about the maintenance activity done with the suggestions about modifications, if required in maintenance schedule of equipment.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	
• Mechanical drawings • **Hand tools**: Hammer, screw driver set, files, torque, wrenches, and spanner. • **Cutting tools**: Hacksaw, grinding machine, shearing tool, drilling machine, chisel etc. • **Measuring equipment**: Vernier calliper, micrometer, feeler gauges, steel ruler, measuring tape, dial gauge etc. • Cables, nuts, bolts, fasteners, connectors. • Hydraulic/ pneumatic / electrical machines • **PPE:** Gloves, safety shoes, goggles, ear plugs, safety helmet • **Workshop safety**: Fire extinguishers, first-aid kit	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
M.E/M.Tech	Mechanical/Automobile	3	Maintenance	1	Maintenance	NA
B.E/B.Tech	Mechanical/Automobile	5	Maintenance	1	Maintenance	NA
AMIE	Mechanical/Automobile	5	Maintenance	1	Maintenance	NA
Diploma	Mechanical/Automobile	7	Maintenance	1	Maintenance	NA
ITI	Fitter/Turner	8	Maintenance	1	Maintenance	NA

Trainer Certification	
Domain Certification	**Platform Certification**
"Automotive Maintenance Lead Technician - Mechanical, ASC/Q6808, version 2.0". 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***	
M.E/M.Tech	Mechanical/Automobile	4	Maintenance	1	Maintenance	NA
B.E/B.Tech	Mechanical/Automobile	6	Maintenance	1	Maintenance	NA
AMIE	Mechanical/Automobile	6	Maintenance	1	Maintenance	NA
Diploma	Mechanical/Automobile	8	Maintenance	1	Maintenance	NA
ITI	Fitter/Turner	9	Maintenance	1	Maintenance	NA

Assessor Certification	
Domain Certification	**Platform Certification**
"Automotive Maintenance Lead Technician - Mechanical, ASC/Q6808, version 2.0". 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