



Model Curriculum

QP Name: Four Wheeler Service Lead Technician

QP Code: ASC/Q1403

NSQF Level: 4

Automotive Skills Development Council
E- 113 GF, Okhla Phase III, Okhla Industrial Area, New Delhi, Delhi 110020

Table of Contents

Training Parameters	3
Program Overview	4
Training Outcomes	4
Compulsory Modules.....	4
Module Details	6
Module 1 - Introduction to the Role of a Four Wheeler Service Lead Technician	6
Module 2 - Plan Work Effectively and Implement Safety Practices	7
Module 3-14 – Employability NOS.....	11
Module 15: Diagnose repair requirements of four wheelervehicle.....	13
Module 16: Carry out service, repair and overhauling of mechanical systems in the vehicle.....	15
Module 17: Carry out service, repair and overhauling of electrical and electronic systemsin the vehicle ...	15
Annexure	17
Trainer Requirements.....	17
Assessor Requirements	18
Assessment Strategy	19
References	20
Glossary	20
Acronyms and Abbreviations	21

Training Parameters

Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3115.0602
Minimum Educational Qualification & Experience	<p>10th Class + 2 years I.T.I (Mechanic Auto Electrical and Electronics/Diesel Mechanic/ Mechanic Motor Vehicle (MMV) with 2 years relevant experience</p> <p>OR</p> <p>12th Class with 4 Years of relevant experience</p> <p>OR</p> <p>3 years Diploma from recognized body (Mechanical/Electrical/Electronics/Automobile) after Class 12th</p> <p>OR</p> <p>Certificate-NSQF (Four-Wheeler Service Technician Level 3) with 2 Years of relevant experience</p>
Pre-Requisite License or Training	LMV Driving License
Minimum Job Entry Age	18 Years
Last Reviewed On	18/03/2021
Next Review Date	18/03/2026
NSQC Approval Date	27/05/2021
Model Curriculum Creation Date	18/03/2021
Model Curriculum Valid Up to Date	18/03/2026
Minimum Duration of the Course	540 Hours, 0 Minutes
Maximum Duration of the Course	540 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.

- Work effectively and efficiently as per schedules and timelines.
- Implement safety practices.
- Apply practices for optimal use of resources to ensure less wastage and maximum conservation.
- Communicate effectively and develop interpersonal skills.
- Display sensitivity towards all genders and differently abled people.
- Perform diagnosis of four wheeler vehicles to identify the repair requirements of the vehicle
- Perform routine service/major repairs/overhaul of the vehicle

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 a four-wheeler service lead technician <i>Bridge Module</i>	05:00	00:00	-	-	05:00
ASC/N9813 - Manage work and resources (Service) NOS Version No. 1.0 NSQF Level 4	25:00	30:00	-	-	55:00
Module 2: Plan work effectively, implement safety practices and optimize resources	25:00	30:00	-	-	55:00
DGT/VSQ/N0102 -Employability Skills (60 hours) NOS Version No. – 1.0 NSQF Level – 4	24:00	36:00			60:00
Module 3: Introduction to Employability Skills	0.5:00	1:00			1.5:00
Module 4: Constitutional values - Citizenship	0.5:00	1:00			1.5:00

Module 5: Becoming a Professional in the 21st Century	1:00	1.5:00			2.5:00
Module 6: Basic English Skills	4:00	6:00			10:00
Module 7: Career Development & Goal Setting	1:00	1:00			2:00
Module 8: Communication Skills	2:00	3:00			5:00
Module 9: Diversity & Inclusion	1:00	1.5:00			2.5:00
Module 10: Financial and Legal Literacy	2:00	3:00			5:00
Module 11: Essential Digital Skills	4:00	6:00			10:00
Module 12: Entrepreneurship	3:00	4:00			7:00
Module 13: Customer Service	2:00	3:00			5:00
Module 14: Getting ready for apprenticeship & Jobs	3:00	5:00			8:00
ASC/N1404 Carry out diagnosis on four wheeler vehicle for repair requirements	80:00	130:00	-	-	210:00

NOS Version No. 2.0 NSQF Level 4					
Module 15: Diagnose repair requirements of four wheeler vehicle	80:00	130:00	-	-	210:00
ASC/N1405 Carry out service, repair and overhauling of mechanical systems in four wheeler vehicle NOS Version No. 2.0 NSQF Level 4	30:00	90:00		-	120:00
Module 16: Carry out service, repair and overhauling of mechanical systems in the vehicle	30:00	90:00		-	120:00
ASC/N1438 Carry out service, repair and overhauling of electrical and electronic systems in the four-wheeler vehicle NOS Version No. 1.0 NSQF Level 4	35:00	25:00	30:00	-	90:00
Module 17: Carry out service, repair and overhauling of electrical and electronic systems in the vehicle	35:00	25:00	30:00	-	90:00
Total Duration	199:00	311:00	30:00	-	540:00

Module Details

Module 1: Introduction to the Role of a Four Wheeler Service Lead Technician

Bridge Module

Terminal Outcomes:

- Discuss the role and responsibilities of a Four Wheeler Service Lead Technician.

Duration: 05:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the role and responsibilities of a four wheeler service lead technician. • Explain about automotive industry in India, workshop structure and role and responsibilities of different people in the workshop. • Elaborate standard operating procedures (SOPs) regarding receiving vehicles, opening job card, allocation of work, invoicing, vehicle delivery, handling complaints etc. • Recall the documentation involved in the different processes as specified by OEM/ auto component manufacturer • Discuss the importance of inspection and diagnosis of faults by optimum utilization of tools and equipment as per SOP • Discuss the importance of working as per organisational policies, professional code of ethics and standards of practice • Outline the safety, health and environmental policies and regulations for the work place as well as for automotive trade in general • Discuss occupational health and safety measures (OSH) required for working on vehicles. • Discuss the legal regulations pertaining to hybrid vehicles 	
Classroom Aids:	
Laptop, white board, marker, projector	
Tools, Equipment and Other Requirements	

Module 2: Plan Work Effectively and Implement Safety Practices

Mapped to NOS ASC/N9813, v1.0

Terminal Outcomes:

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

Duration: 25:00	Duration: 30:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the potential workplace related risks and hazards, their causes and preventions. • Outline the organizational structure to be followed to report about health, safety and security breaches to the concerned authorities. • Describe the procedures to report accident and health related issues as per SOP • Identify the importance of standard operating procedures of the company w.r.t. privacy, confidentiality and security. • List and explain work requirements to be followed by the team • List some common practices for efficient utilisation of energy, material and water. • Discuss the specified quality standards for work requirements and corrective action to be taken in case work fails to meet the requirements. • Discuss the importance of conducting trainings to develop work expertise. • Discuss the importance of working as per the agreed and assigned requirement. • Identify the issues with process flow improvements, quality of output, product defects received from previous process, repairs and maintenance of tools and machinery and handle them • Define ways to optimize usage of resources • Discuss different set of problems along with their causes and possible solutions. 	<ul style="list-style-type: none"> • Apply appropriate techniques in the work process to save cost and time . • Employ ways to ensure that the team complies with organisation's health, safety policies and procedures. • Keep a check on the routine cleaning of tools, machine and equipment. • Employ different ways to ensure that the team periodically checks tools, equipment and machines. • Apply appropriate techniques to use the resources judiciously. • Demonstrate checking for malfunctions in equipment and report as per SOP • Employ ways to ensure that the team periodically checks for spills and leaks and plugs the same and keeps work area clean and tidy. • Demonstrate segregation of hazardous waste. • Show how to dispose non-recyclable waste and hazardous waste responsibly. • Demonstrate how to follow the organisation's emergency procedures for different emergencies. • Prepare a sample layout of the workshop depicting the location of all the electrical, hydraulic and thermal equipment used.

- Discuss the concept of waste management and methods of waste disposal
- List the different categories of waste for the purpose of segregation
- State the importance of timely completion of tasks
- Discuss the significance of sanitizing the workplace, equipment etc.
- Summarise hygiene and sanitation regulations.
- Discuss the ways of helping team members deal with stress and anxiety
- Explain various ways of time and cost management
- Discuss the use of proper PPE for maintaining health and hygiene at workplace and the process of wearing/discarding them.
- List some common electrical problems and practices of conserving electricity.
- State the importance of using appropriate colour dustbins for different types of waste.
- Discuss organizational procedures for minimizing waste.
- Discuss the importance of maintaining quality and timely delivery of the services as per the goals set by the manager.
- Discuss the common sources of pollution and ways to minimize it.
- Discuss organisation's policies for maintaining personal health and hygiene at workplace.
- Discuss the significance of greening.
- List the requirements like running water, sanitizers, etc. to be checked beforehand at workplace.
- Recall the key performance indicators for the new tasks.

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

Module 3: Introduction to Employability Skills

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Discuss about Employability Skills in meeting the job requirements

Duration: <0.5:00>	Duration: <1:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> Discuss the importance of Employability Skills in meeting the job requirements 	<ul style="list-style-type: none"> List different learning and employability related GOI and private portals and their usage
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 4: Constitutional values - Citizenship

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Discuss about constitutional values to be followed to become a responsible citizen

Duration: <0.5:00>	Duration: <1:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen. 	<ul style="list-style-type: none"> Show how to practice different environmentally sustainable practices
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 5: Becoming a Professional in the 21st Century

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Demonstrate professional skills required in 21st century

Duration: <1:00>	Duration: <1.5:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss 21st century skills. • Describe the benefits of continuous learning 	<ul style="list-style-type: none"> • Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 6: Basic English Skills

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Practice basic English speaking.

Duration: <4:00>	Duration: <6:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe basic communication skills • Discuss ways to read and interpret text written in basic English 	<ul style="list-style-type: none"> • Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone • Read and interpret text written in basic English • Write a short note/paragraph / letter/e - mail using basic English
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 7: Career Development & Goal Setting

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Demonstrate Career Development & Goal Setting skills.

Duration: <1:00>	Duration: <1:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss need of career development plan 	<ul style="list-style-type: none"> • Demonstrate how to communicate in a well-mannered way with others. • Create a career development plan with well-defined short- and long-term goals
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 8: Communication Skills

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Practice basic communication skills.

Duration: <2:00>	Duration: <3:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the importance of active listening for effective communication • Discuss the significance of working collaboratively with others in a team 	<ul style="list-style-type: none"> • Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 9: Diversity & Inclusion

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Describe PwD and gender sensitisation.

Duration: <1:00>	Duration: <1.5:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> Discuss the significance of reporting sexual harassment issues in time 	<ul style="list-style-type: none"> Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 10: Financial and Legal Literacy

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Describe ways of managing expenses, income, and savings.

Duration: <2:00>	Duration: <3:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> List the common components of salary and compute income, expenditure, taxes, investments etc. Discuss the legal rights, laws, and aids 	<ul style="list-style-type: none"> Outline the importance of selecting the right financial institution, product, and service Demonstrate how to carry out offline and online financial transactions, safely and securely
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 11: Essential Digital Skills

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Demonstrate procedure of operating digital devices and associated applications safely.

Duration: <4:00>	Duration: <6:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> Describe the role of digital technology in today's life Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely 	<ul style="list-style-type: none"> Show how to operate digital devices and use the associated applications and features, safely and securely Create sample word documents, excel sheets and presentations using basic features Utilize virtual collaboration tools to work effectively
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 12: Entrepreneurship

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Describe opportunities as an entrepreneur.

Duration: <3:00>	Duration: <4:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> Explain the types of entrepreneurship and enterprises Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement 	<ul style="list-style-type: none"> Create a sample business plan, for the selected business opportunity
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 13: Customer Service

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Describe ways of maintaining customer.

Duration: <2:00>	Duration: <3:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes

<ul style="list-style-type: none"> Explain the significance of identifying customer needs and addressing them. Explain the significance of identifying customer needs and responding to them in a professional manner. Discuss the significance of maintaining hygiene and dressing appropriately. 	<ul style="list-style-type: none"> Demonstrate how to maintain hygiene and dressing appropriately.
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 14: Getting ready for apprenticeship & Jobs

Mapped to DGT/VSQ/N0102

Terminal Outcomes:

- Describe ways of preparing for apprenticeship & Jobs appropriately.

Duration: <3:00>	Duration: <5:00>
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> Discuss the significance of maintaining hygiene and confidence during an interview List the steps for searching and registering for apprenticeship opportunities 	<ul style="list-style-type: none"> Create a professional Curriculum Vitae (CV) Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively Perform a mock interview
Classroom Aids:	
Whiteboard, marker pen, projector	
Tools, Equipment and Other Requirements	

Module 15: Diagnose repair requirements of four wheeler vehicle

Mapped to NOS ASC/N1404, v2.0

Terminal Outcomes:

- Demonstrate how to use different techniques for diagnosing the repair requirements of the vehicle

Duration: 80:00	Duration: 130:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes

- | | |
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| <ul style="list-style-type: none"> • Explain the fundamental terms, laws and principles used in vehicles. • Identify various electrical and electronic signals as well as symbols, units and terms used in wiring diagrams associated with electrical/electric systems/components of the vehicle. • Discuss the importance of reviewing the job card to understand service and repair requirements. • List the auto components related to various aggregates of the vehicle along with the manufacturer specifications. • Discuss the process of collecting and using tools/ measuring devices/equipment required for the job along with interpretation of all relevant mathematical calculations. • Explain the use of technology in the functioning of various mechanical, electrical, electronic systems/ components/aggregates of the vehicle. • Discuss the interconnection of systems and effect of a system on other systems • Discuss the typical symptoms of common faults and failures in mechanical, electrical and electronic systems. • Explain the industry standards for reporting about inspection and faults in different formats • Recall the checklist and standard operating procedures for diagnosing the causes of fault w.r.t lubricants, servicing, maintenance, etc. • Explain the standard operating procedures for using tools/equipment, performing diagnostic tests and troubleshooting faults. • Discuss the organization structure for reporting malfunctions in vehicle or any | <ul style="list-style-type: none"> • Perform the steps to place the vehicle on an appropriate platform as per work requirement. • Demonstrate doing test drive of the vehicle to identify/validate the faults informed by the customer. • Show how to carry out visual inspection of vehicle to assess defects such as dent, leak, wear and tear, etc. • Demonstrate how to inspect the functioning of tools/equipment and their calibration status. • Apply suitable techniques to inspect the functioning of various systems (mechanical and electrical systems, etc.) of the vehicle to diagnose the faults and determine the location of faults. • Demonstrate using appropriate device and equipment required for inspection and diagnosis in various systems. • Employ various precautions and safety measures to ensure that no damage is caused to the vehicle during diagnosis or troubleshooting faults • Apply appropriate techniques to identify common/possible defects in tools and equipment used for diagnosis to be reported for rectification. • Show how to identify the defective or duplicate components of manufacturer/supplier specifications, which are not identifiable during visual inspection. • Demonstrate how to perform tests to identify faults and troubleshoot using various mechanical, electrical/electronic measuring devices/testers/diagnostic tools/software |
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<p>discrepancies beyond own scope to the concerned person</p> <ul style="list-style-type: none"> • List the various sources of information available for assessing service and repair requirements. • Identify the documents to be maintained w.r.t inspection and diagnosis of faults • Draw a comparison between results based on inspection, measurement, and test with vehicle specifications as well as regulatory requirements. • Explain the validation process for options of repairs/replacement. • Recall various methods to dispose-off replaced failed components/parts, fluids and hazardous substances. • Discuss OEM standard operating procedures, safety procedures and safety requirements w.r.t. tool/equipment, vehicle component, fluids, hazardous substances and while working in hazardous environments. 	<ul style="list-style-type: none"> • Apply appropriate methods to diagnose indirect faults in vehicle's mechanical, electrical and electronic systems. • Demonstrate how to dismantle and reassemble the aggregates of the vehicle for fault diagnosis. • Prepare a sample report consisting of preliminary diagnostic details while reporting premature failures • Show how to use various PPE and how to prepare work area by cleaning and placing tools/equipment in an organised manner. • Prepare a proposal regarding repair/replacement requirements with justification. • Demonstrate how to use computer or online application and access OEM portals for technical information and assistance
Classroom Aids:	
<p>Laptop, white board, marker, projector</p>	
Tools, Equipment and Other Requirements	
<p>Diagnostic tools, equipment and other sources of information such as diagnostic displays, etc., computer, vehicle, job card</p> <p>Vehicle, various body parts, engine, sub-assemblies, material, mechanical and electrical components / aggregates</p> <p>Organic light emitting displays, anti-lock braking system (abs)/air bag scan tools, automotive scanners, modular diagnostic information systems, brake, suspension and side slip tester</p> <p>Pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc; measuring equipment: vernier calipers, micrometre, feeler gauges, multi-metre, flow metre, temp gauge, dial gauge etc; electrical and electronic testing equipment: volt meters, ammeters, ohmmeters, digital multi-metre, battery testing equipment, dedicated and computer based diagnostic equipment, etc.</p>	

Module 16: Carry out service, repair and overhauling of mechanical systems in the vehicle Mapped to NOS ASC/N1405, v2.0

Terminal Outcomes:

- Perform steps to carry out the preparatory activities for service.
- Demonstrate how to carry out post service/repair routine.

Duration: 30:00	Duration: 90:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Elucidate Standard Operating Procedures for receiving vehicles, opening job card, allocation of work, invoicing, vehicle delivery, handling complaints, etc. • List the sources of information required to assess service and repair requirements. • Recall various auto components of the vehicle. • Discuss the importance of maintaining safe and tidy workstation. • List the precautions to be taken to avoid damages to the vehicle and its components while working on them. • Elucidate OEM SOP and standard safety procedures to be followed handling tools/equipment, components and while working in hazardous environments. • Discuss the importance of maintaining documentation related to inspection, servicing and repair of the vehicle. • Discuss the organisational policies for cleaning work site and disposing off materials such as waste oil, etc. • Explain the specifications of various auto components/aggregates of the vehicle. • Explain the basic technologies used in functioning of various systems and components of the vehicle such as drive train, etc. • Discuss the various interconnections in the system and their effect on each other. • Summarise the fundamental terms, laws and principles such as Pascal law, etc. • Discuss various SOPs recommended by OEM for using tools/equipment for diagnosis or troubleshooting such as special service tools. • List the type of errors/defects in the tools/equipment. 	<ul style="list-style-type: none"> • Demonstrate how to place the vehicle on a platform according to the nature of the job. • Perform visual inspection of the vehicle to assess defects such as external impact, etc. • Apply appropriate techniques to check if equipment/tools are functioning as per requirements and report malfunctioning, if observed. • Employ appropriate ways to report malfunctions/repairs in the vehicle/tools beyond own scope to the concerned person. • Draft a sample proposal regarding repair/replacement requirements with justifications. • Perform the steps to wear PPE according to the nature of job. • Demonstrate how to dismantle the relevant parts/mechanical aggregates for repairing and cleaning. • Perform steps how to test the mechanical components post removal as per OEM SOP. • Perform steps for servicing/repairing/calibration/overhauling of mechanical system/aggregate including power assisted braking and steering systems. • Demonstrate how to repair indirect faults due to other system/component. • Show how to check the completed tasks and performance of the vehicle post repair and report if further inspection required. • Demonstrate the process of carrying out scheduled checks, calibration and timely repairs for workshop tools, equipment and workstations.

- List various sources of information available for vehicle/equipment manufacturer specifications, tolerance limits of components.
- Discuss standard schedules and checklists recommended by the OEM/auto component manufacturer for servicing.
- List the type of consumables/materials used for the job such as seals, sealant, fasteners, lubricants etc.
- State the legal regulations that need to be taken into account for handling hybrid vehicle in the workshop.
- Explain Occupational Safety and Health (OSH) measures required for working on vehicles.
- Outline organizational/professional code of ethics and standards of practice.

Classroom Aids:

White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector

Tools, Equipment and Other Requirements

Diagnostic tools, equipment and other sources of information such as diagnostic displays, etc., computer, vehicle, job card

Vehicle, various body parts, engine, sub-assemblies, material, mechanical and electrical components / aggregates

Organic light emitting displays, anti-lock braking system (abs)/air bag scan tools, automotive scanners, modular diagnostic information systems, brake, suspension and side slip tester.

Module 17: Carry out service, repair and overhauling of electrical and electronic systems in the vehicle

Mapped to NOS ASC/N1438, v1.0

Terminal Outcomes:

- Perform steps to prepare for carrying out service, repair and overhauling
- Demonstrate how to carry out post service/repair routine

Duration: 35:00	Duration: 25:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Elucidate Standard Operating Procedures for receiving vehicles, opening job card, allocation of work, invoicing, vehicle delivery, handling complaints, etc. • List the sources of information required to assess service and repair requirements. • Recall various auto components of the vehicle. • Discuss environmental policies and regulations along with the importance of maintaining safe and tidy workstation. • List the precautions to be taken to avoid damages to the vehicle and its components while working on them. • Elucidate OEM SOP and standard safety procedures to be followed handling tools/equipment, components and while working in hazardous environments. • Discuss the importance of maintaining documentation related to inspection, servicing and repair of the vehicle. • Discuss the organisational policies for cleaning work site and disposing off materials such as waste oil, etc. • Explain the various auto components/aggregates of the vehicle. • State the fundamental terms, laws and principles of electricity used in electrical & electronic systems. • Explain basic technology and functioning of different management system such as engine, body, etc. • Discuss the various interconnections in the system and their effect on each other. • Discuss various SOPs recommended by OEM for using tools/equipment for diagnosis or troubleshooting such as special service tools. 	<ul style="list-style-type: none"> • Demonstrate how to place the vehicle on a platform according to the nature of the job. • Perform visual inspection of the vehicle to assess defects such as external impact, etc. • Employ different ways to check if equipment/tools are functioning as per requirements and report malfunctioning, if observed. • Employ appropriate ways to report malfunctions/repairs in the vehicle beyond own scope to the concerned person. • Draft a sample proposal regarding repair/replacement requirements with justification. • Perform steps to wear PPE according to the nature of job. • Demonstrate how to dismantle the relevant parts/electrical aggregates for repairing, cleaning. • Perform steps how to test the electrical/electronic components post removal as per OEM SOP. • Perform steps for repairing/calibration/overhauling of electrical system/aggregate including direct faults. • Demonstrate how to repair indirect faults due to other system/component. • Check the completed tasks and performance of the vehicle post repair and report if further inspection required. • Perform steps for scheduled checks, calibration and timely repairs for workshop tools, equipment and workstations.

- List the type of consumables/materials used for the job such as seals, sealant, fasteners, lubricants etc.
- State the legal regulations that need to be taken into account for handling hybrid vehicle in the workshop.
- Explain Occupational Safety and Health (OSH) measures required for working on vehicles.
- Outline organizational/professional code of ethics and standards of practice.

Classroom Aids:

White board/ black board marker / chalk, duster, computer or Laptop attached to LCD projector

Tools, Equipment and Other Requirements

Diagnostic tools, equipment and other sources of information such as diagnostic displays, etc., computer, vehicle, job card

Vehicle, various body parts, engine, sub-assemblies, material, mechanical and electrical components / aggregates

Organic light emitting displays, anti-lock braking system (abs)/air bag scan tools, automotive scanners, modular diagnostic information systems, brake, suspension and side slip tester

Pressure indicators: fuel pressure testers, manifold gauge sets, oil pressure gauges, tire pressure gauges etc; measuring equipment: vernier calipers, micrometre, feeler gauges, multi-metre, flow metre, temp gauge, dial gauge etc; electrical and electronic testing equipment: volt meters, ammeters, ohmmeters, digital multi-meter, battery testing equipment, dedicated and computer based diagnostic equipment, etc.

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI (Mechanic Motor Vehicle)	Four Wheeler Service	4	Four Wheeler Service	1	Four Wheeler Service	NA
Diploma (Automobile Engineering/ Mechanical Engineering)	Four Wheeler Service	3	Four Wheeler Service	1	Four Wheeler Service	NA

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: "Four Wheeler Service Lead Technician " "ASC/Q1403, v1.0", Minimum accepted score is 80%	Recommended that the trainer is certified for the job role "Trainer (VET and Skills)", Mapped to Qualification Pack: MEP/Q2601, V2.0" Minimum accepted score is 80%

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI (Mechanic Motor Vehicle)	Four Wheeler Service	5	Four Wheeler Service	1	Four Wheeler Service	NA
Diploma (Automobile Engineering/ Mechanical Engineering)	Four Wheeler Service	4	Four Wheeler Service	1	Four Wheeler Service	NA

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: "Four Wheeler Service Lead Technician " "ASC/Q1403, v1.0", Minimum accepted score is 80%	Recommended that the Accessor is certified for the job role "Assessor (VET and Skills)", Mapped to Qualification Pack: MEP/Q2701, V2.0" Minimum accepted score is 80%

Assessment Strategy

1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SDSM/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
- Center 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
OEM	Original Equipment Manufacturer