Four Wheeler Service Master Technician

QP Code: ASC/Q1404

Version: 2.0

NSQF Level: 6

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

Contents

ASC/Q1404: Four Wheeler Service Master Technician

Brief Job Description

A Four Wheeler Service Master Technician is responsible for managing advanced diagnosis and repairs, also maintains and manages tools and equipment used in the workshop. The individual carries out all types of diagnosis of faults and repairs and is responsible for assisting other technician and supervising their work .

Personal Attributes

The person should be patient, organised, team-oriented and have the ability to work for long hours in adverse conditions. They should be keen observers and have an eye for detail and quality.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. ASC/N9813: Manage work and resources
2. ASC/N9812: Interact effectively with team, customers and others
3. ASC/N1407: Perform advanced fault diagnosis on vehicle
4. ASC/N1409: Assist lead technician in mechanical/electrical/electronic repairs and overhauling
5. ASC/N1444: Maintain the tools and equipment

Qualification Pack (QP) Parameters

Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service and Repair
Country	India
NSQF Level	6
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3115.0602

Minimum Educational Qualification & Experience	I.T.I (Mechanic Auto Electrical and Electronics or Mechanic Diesel/ Mechanic Motor Vehicle (MMV)) with 2 Years of relevant experience Automotive Service OR Certificate-NSQF (Four Wheeler Service Lead Technician Level 5) with 2 Years of relevant experience OR Diploma (Automotive/Mechanical Engineering) with 1 Year of relevant experience Automotive Service from recognized regulatory body
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	Valid Permanent driving Licence
Minimum Job Entry Age	20 Years
Last Reviewed On	30/09/2021
Next Review Date	30/09/2024
NSQC Approval Date	30/09/2021
Version	2.0

ASC/N9813: Manage work and resources

Description

This NOS unit is about implementing safety, planning work, adopting sustainable practices for optimising use of resources.

Scope

The scope covers the following :

- Maintain safe and secure working environment
- Ensure work as per quality standards
- Material/energy/electricity conservation practices
- Effective waste management/recycling practices
- Ensure a healthy and hygienic workplace

Elements and Performance Criteria

Maintain safe and secure working environment

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

PC1. ensure that the team complies with organisation's health, safety, security policies and procedures

PC2. identify the risks and hazards associated with work activities, their causes and prevention as per organisation's policy

PC3. encourage team to report any identified breaches in health, safety, and security policies and procedures to the designated person

Ensure work as per quality standards

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

PC4. ensure work area is kept clean and tidy

PC5. identify individual work requirements and provide necessary instructions to the team

PC6. ensure the team works as per the assigned and agreed requirements

PC7. identify work which fails the requirements, specified quality standards and ensure timely corrective action is taken

PC8. implement ways and guide the team to manage time, resources and cost effectively

PC9. train the team on skill level advancement to develop expertise in their work

PC10. ensure that the team understands accountability for timely completion of tasks

PC11. analyse and validate the problem accurately and communicate different possible solutions to the problem

Material/energy/electricity conservation practices

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

PC12. identify ways to optimize usage of electricity/other source of energy and material including water in various tasks/activities/processes

PC13. ensure that the team uses resources in a responsible manner

PC14. ensure that the team periodically checks for spills/leakages around the work area and take corrective actions or escalate to appropriate authority if unable to rectify

PC15. supervise team to carry out routine cleaning of tools, machine and equipment

PC16. ensure that the team periodically checks if the equipment/machines are maintained and functioning normally before commencing work and take corrective action wherever required

Effective waste management/recycling practices

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

PC17. identify recyclable, non-recyclable and hazardous waste generated

PC18. ensure the team segregates waste into different categories

PC19. ensure proper disposal of non-recyclable waste

PC20. ensure recyclable and reusable material is deposited at identified location

PC21. ensure the team follows processes specified for disposal of hazardous waste

Ensure a healthy and hygienic workplace

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

PC22. ensure workplace, equipment, restrooms etc. are sanitized regularly

PC23. promote awareness about hygiene and sanitation regulations

PC24. check availability of running water, hand wash and alcohol-based sanitizers at workplace

PC25. support employees to cope with stress, anxiety etc.

PC26. wear and dispose PPEs regularly and appropriately

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. different types of health and safety hazards that can be found in the workplace, risks and threats based on the nature of work

KU2. company defined workplace hazards and rules/regulation for maintaining health, safety and security at workplace

KU3. breaches in health, safety and security as well as procedures to report the same

KU4. workshop layout with electrical, hydraulic and thermal equipment used

KU5. the organisation's emergency procedures for different emergency situations and the importance of following the same

KU6. ways of time and cost management

KU7. ways to manage efficient utilisation of energy, material and water in the process

KU8. ways to recognize common electrical problems and common practices of conserving electricity

KU9. usage of different colours of dustbins and categorization of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics

KU10. organisations procedures for minimizing waste

KU11. waste management and methods of waste disposal

KU12. common sources of pollution and ways to minimize it

KU13. different ways for skill level advancement to develop expertise

KU14. key performance indicators for the new tasks

KU15. timelines and goals set by the manager

KU16. importance of quality and timely delivery of the product/service

KU17. organisation's policies to maintain personal health and hygiene at workplace
KU18. significance of greening

Generic Skills (GS)

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

GS1. read instructions/guidelines/procedures
GS2. listen effectively and orally communicate information
GS3. ask for clarification and advice from the concerned person
GS4. maintain positive and effective relationships with colleagues and customers
GS5. evaluate the possible solution(s) to the problem
GS6. complete written work with attention to detail
GS7. modify work practices to improve them
GS8. work with supervisors/team members to carry out work related tasks
GS9. complete tasks efficiently and accurately within stipulated time
GS10. make timely decisions for efficient utilization of resources
GS11. be punctual and utilize time
GS12. evaluate strategies to maintain, enhance or reduce the intensity of heightened emotional response

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Maintain safe and secure working environment	7	5	-	4
PC1. ensure that the team complies with organisation's health, safety, security policies and procedures	2	2	-	1
PC2. identify the risks and hazards associated with work activities, their causes and prevention as per organisation's policy	3	2	-	2
PC3. encourage team to report any identified breaches in health, safety, and security policies and procedures to the designated person	2	1	-	1
Ensure work as per quality standards	15	8	-	5
PC4. ensure work area is kept clean and tidy	2	1	-	-
PC5. identify individual work requirements and provide necessary instructions to the team	2	1	-	1
PC6. ensure the team works as per the assigned and agreed requirements	1	1	-	-
PC7. identify work which fails the requirements, specified quality standards and ensure timely corrective action is taken	3	2	-	2
PC8. implement ways and guide the team to manage time, resources and cost effectively	2	-	-	-
PC9. train the team on skill level advancement to develop expertise in their work	2	1	-	1
PC10. ensure that the team understands accountability for timely completion of tasks	2	-	-	-
PC11. analyse and validate the problem accurately and communicate different possible solutions to the problem	1	2	-	1
Material/energy/electricity conservation practices	10	6	-	4
PC12. identify ways to optimize usage of electricity/other source of energy and material including water in various tasks/activities/processes	2	2	-	2

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. ensure that the team uses resources in a responsible manner	2	1	-	-
PC14. ensure that the team periodically checks for spills/leakages around the work area and take corrective actions or escalate to appropriate authority if unable to rectify	2	1	-	1
PC15. supervise team to carry out routine cleaning of tools, machine and equipment	2	1	-	-
PC16. ensure that the team periodically checks if the equipment/machines are maintained and functioning normally before commencing work and take corrective action wherever required	2	1	-	1
Effective waste management/recycling practices	10	6	-	4
PC17. identify recyclable, non-recyclable and hazardous waste generated	2	2	-	1
PC18. ensure the team segregates waste into different categories	2	1	-	1
PC19. ensure proper disposal of non-recyclable waste	2	1	-	-
PC20. ensure recyclable and reusable material is deposited at identified location	2	1	-	1
PC21. ensure the team follows processes specified for disposal of hazardous waste	2	1	-	1
Ensure a healthy and hygienic workplace	8	5	-	3
PC22. ensure workplace, equipment, restrooms etc. are sanitized regularly	2	1	-	-
PC23. promote awareness about hygiene and sanitation regulations	2	1	-	1
PC24. check availability of running water, hand wash and alcohol-based sanitizers at workplace	1	1	-	-
PC25. support employees to cope with stress, anxiety etc.	1	1	-	1
PC26. wear and dispose PPEs regularly and appropriately	2	1	-	1

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
NOS Total	50	30	-	20

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9813
NOS Name	Manage work and resources
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	5
Credits	TBD
Version	1.0
Next Review Date	30/09/2024

ASC/N9812: Interact effectively with team, customers and others

Description

This unit is about communicating with team members, superior and others.

Scope

The scope covers the following :

- Communicate effectively with team members
- Interact with superiors
- Respect gender and ability differences

Elements and Performance Criteria

Communicate effectively with team members

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

PC1. implement ways to share information with team members in line with organisational requirements

PC2. ensure that work requirements are clearly communicated to the team members through all means including face-to-face, telephonic and written

PC3. manage and co-ordinate with team members to integrate work as per requirements

PC4. work in a way that show respect for all team members and customers

PC5. carry out commitments made to team members and let them know in good time if there is any discrepancy with reasons

PC6. resolve conflicts within the team members at work to achieve smooth workflow

PC7. guide the team members to follow the organisation's policies and procedures

PC8. ensure team goals are given preference over individual goals

PC9. respect personal space of colleagues and customers

Interact with superiors

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

PC10. report progress on job allocated and team performance to the superiors

PC11. escalate problems to superiors that cannot be handled

PC12. train the team members to report completed work and receive feedback on work done

PC13. encourage team members to rectify errors as per feedback and minimize mistakes in future

Respect gender and ability differences

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

PC14. ensure team shows sensitivity towards all genders and PwD

PC15. adjust communication styles to reflect gender sensitivity and sensitivity towards person with disability

PC16. help PwD team members to overcome the challenges, if asked

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the importance of effective communication and establishing good working relationships with team members and superiors
KU2. different methods of communication as per the circumstances
KU3. gender based concepts, issues and legislation
KU4. organisation standards and guidelines to be followed for PwD
KU5. rights and duties at workplace with respect to PwD
KU6. organisation policies and procedures pertaining to written and verbal communication

Generic Skills (GS)

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

GS1. read safety instructions/guidelines
GS2. modify work practices to improve them
GS3. work with supervisors/team members to carry out work related tasks
GS4. complete tasks efficiently and accurately within stipulated time
GS5. make timely decisions for efficient utilization of resources
GS6. read instructions/guidelines/procedures
GS7. write in English/any one language

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Communicate effectively with team members	20	14	-	8
PC1. implement ways to share information with team members in line with organisational requirements	2	2	-	-
PC2. ensure that work requirements are clearly communicated to the team members through all means including face-to-face, telephonic and written	2	2	-	2
PC3. manage and co-ordinate with team members to integrate work as per requirements	2	1	-	2
PC4. work in a way that show respect for all team members and customers	3	1	-	2
PC5. carry out commitments made to team members and let them know in good time if there is any discrepancy with reasons	2	2	-	-
PC6. resolve conflicts within the team members at work to achieve smooth workflow	3	2	-	-
PC7. guide the team members to follow the organisation's policies and procedures	2	1	-	-
PC8. ensure team goals are given preference over individual goals	2	1	-	-
PC9. respect personal space of colleagues and customers	2	2	-	2
Interact with superiors	18	10	-	7
PC10. report progress on job allocated and team performance to the superiors	4	3	-	2
PC11. escalate problems to superiors that cannot be handled	4	2	-	1
PC12. train the team members to report completed work and receive feedback on work done	5	2	-	2
PC13. encourage team members to rectify errors as per feedback and minimize mistakes in future	5	3	-	2

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Respect gender and ability differences	12	6	-	5
PC14. ensure team shows sensitivity towards all genders and PwD	4	2	-	2
PC15. adjust communication styles to reflect gender sensitivity and sensitivity towards person with disability	4	2	-	2
PC16. help PwD team members to overcome the challenges, if asked	4	2	-	1
NOS Total	**50**	**30**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N9812
NOS Name	Interact effectively with team, customers and others
Sector	Automotive
Sub-Sector	Generic
Occupation	Generic
NSQF Level	5
Credits	TBD
Version	1.0
Next Review Date	30/09/2024

ASC/N1407: Perform advanced fault diagnosis on vehicle

Description

This NOS unit is about advanced fault diagnosis of the vehicle for both mechanical and electrical/electronic repair requirements

Scope

The scope covers the following :

- Inspect and validate faults
- identify the root cause of fault
- Conclude the repair solution for the fault

Elements and Performance Criteria

Inspect and validate faults

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

PC1. review the job card, vehicle service history, customer verbatim, probing sheet and obtain required information about the fault, note ambient condition of the vehicle during the fault, in case fault is not permanent

PC2. check the functioning of vehicle systems for abnormal behaviour or other malfunctioning due to reported fault

PC3. conduct vehicle inspection for visual defects such external impact/bend/rust/leak/incorrect fluid level/wear & tear etc. which can lead to reported fault

PC4. conduct vehicle inspection/test drive according to nature of fault or vehicle ambient condition to reproduce/simulate the fault and validate

PC5. determine symptoms and precise location of faults in vehicle systems and collect evidences such as photographs audio/video recording, environmental data of electronic control units (ECUs) etc.

identify the root cause of fault

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

PC6. record the observations and suggest diagnostic test/measurement require to evaluate suspected aggregate/component/vehicle system performance

PC7. ensure lead technician follows SOP set out for troubleshooting and perform tests using various mechanical, electrical/electronic measuring devices/testers/diagnostic tools/software to identify/isolate faulty component or the root cause of fault

PC8. use vehicle or component specification, checklists, service/repair/diagnostic manual, technical information, etc. and find the possible repair solution

PC9. report any new premature failure/malfunctions/repair where no known solution provided by respective OEM or component manufacturer

Conclude the repair solution for the fault

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

PC10. interpret inspection, measurement and test results as required

PC11. compare results of diagnostic inspections/tests with vehicle specifications and regulatory requirements

PC12. ensure lead technician maintain the documentation related to inspections and troubleshooting performed on the vehicle

PC13. validate final proposal regarding repair/replacement, repairing process and time requirements with justification

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the automotive industry in India, workshop structure and role and responsibilities of different people in the workshop

KU2. SOP for receiving vehicles, opening job card, allocation of work, invoicing, vehicle delivery, handling complaints etc.

KU3. different components/aggregates as well as auto component manufacturer's specifications for the same

KU4. technology used in functioning of various electrical, mechanical systems of the vehicle and their integration such as engine management systems (petrol, diesel, gas and hybrid), engine mechanical systems, forced induction, emission and exhaust systems, body electrical and electronic system, transmission system, brake and stability control system, air-conditioning systems, active & passive safety system, media and other systems self-starter, alternator, charging systems etc.

KU5. interconnection of systems with each other and effect of one system on other systems

KU6. fundamental terms, laws and principles used in vehicles such as: voltage, current (AC/DC/HV), resistance, power, capacitance, inductance, discrete electronic components, radio frequency, torque, traction, OHM's law, pascal's law, law of levers etc., automotive communication protocols such as Controller Area Network (CAN), Local Interconnect Network(LIN), Media Oriented Systems Transport(MOST) etc.

KU7. use of relevant measuring device/equipment and interpretation of all relevant mathematical calculations

KU8. various electrical and electronic signals such as electrical inputs, outputs, voltage, pulse-width modulation, digital signal (including infrared and fiber optics) etc.

KU9. symbols, units and terms used in wiring diagrams associated with electrical/electric systems/components of the vehicle

KU10. how to use computer, on-line application and OEM technical information/assistance portals

KU11. various sources of information available for assessing service and repair requirements of the vehicle including diagnostic displays, visual inspections, test drives, vehicle/equipment manufacturer specifications, and tolerance limits of components

KU12. industry standards required for inspection and fault reporting in oral, written, and electronic formats

KU13. typical symptoms of common faults and failures in vehicle mechanical, electrical and electronic systems

KU14. various types of health and safety hazards commonly present in the work environment such as physical hazards, electrical hazards, chemical hazards, fire hazards, equipment related hazards, health hazards, etc.

KU15. safety, health and environmental policies and regulations for the work place as well as for automotive trade in general

KU16. safety requirements recommended by the OEM for handling tool/equipment, hazardous substances and while working in hazardous environments

KU17. legal regulations that need to be considered for handling hybrid vehicles in the workshop

KU18. occupational Safety and Health (OSH) measures required for working on vehicles

KU19. various methods to dispose-off replaced failed components/parts, fluids and hazardous substances

KU20. Standard Operating Procedures (SOPs) of the organization/ dealership for inspection and diagnosis of faults in a vehicle as prescribed by the OEM/components manufacturer

KU21. SOP recommended by OEM for using tools/equipment for diagnosis or troubleshooting such as special service tools, measuring instrument, volt meters, ammeters, ohmmeters, battery tester, dedicated and computer based diagnostic equipment, oscilloscopes etc.

KU22. different types of errors or defects in the tools/equipment

KU23. documentation requirements for each procedure carried out as part of roles and responsibilities as specified by OEM/auto component manufacturer

KU24. organizational/professional code of ethics and standards of practice

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. identify potential workplace problem and take suitable action

GS6. write in English/regional language

GS7. plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Inspect and validate faults	15	15	-	7
PC1. review the job card, vehicle service history, customer verbatim, probing sheet and obtain required information about the fault, note ambient condition of the vehicle during the fault, in case fault is not permanent	-	2	-	2
PC2. check the functioning of vehicle systems for abnormal behaviour or other malfunctioning due to reported fault	3	3	-	1
PC3. conduct vehicle inspection for visual defects such external impact/bend/rust/leak/incorrect fluid level/wear & tear etc. which can lead to reported fault	3	3	-	1
PC4. conduct vehicle inspection/test drive according to nature of fault or vehicle ambient condition to reproduce/simulate the fault and validate	5	3	-	1
PC5. determine symptoms and precise location of faults in vehicle systems and collect evidences such as photographs audio/video recording, environmental data of electronic control units (ECUs) etc.	4	4	-	2
identify the root cause of fault	15	15	-	7
PC6. record the observations and suggest diagnostic test/measurement require to evaluate suspected aggregate/component/vehicle system performance	3	3	-	2
PC7. ensure lead technician follows SOP set out for troubleshooting and perform tests using various mechanical, electrical/electronic measuring devices/testers/diagnostic tools/software to identify/isolate faulty component or the root cause of fault	4	4	-	2
PC8. use vehicle or component specification, checklists, service/repair/diagnostic manual, technical information, etc. and find the possible repair solution	4	4	-	2

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC9. report any new premature failure/malfunctions/repair where no known solution provided by respective OEM or component manufacturer	4	4	-	1
Conclude the repair solution for the fault	10	10	-	6
PC10. interpret inspection, measurement and test results as required	3	3	-	2
PC11. compare results of diagnostic inspections/tests with vehicle specifications and regulatory requirements	3	3	-	2
PC12. ensure lead technician maintain the documentation related to inspections and troubleshooting performed on the vehicle	2	2	-	1
PC13. validate final proposal regarding repair/replacement, repairing process and time requirements with justification	2	2	-	1
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1407
NOS Name	Perform advanced fault diagnosis on vehicle
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
NSQF Level	6
Credits	TBD
Version	2.0
Next Review Date	30/09/2024

ASC/N1409: Assist lead technician in mechanical/electrical/electronic repairs and overhauling

Description

This NOS unit is about an individual carrying out repairs and overhauling of mechanical/electronic/electrical systems of a vehicle.

Scope

The scope covers the following :

- Prepare to assist for repair and overhauling in mechanical/electrical/electronic systems of the vehicle
- Assist for repair and overhauling in mechanical/electrical/electronic systems of the vehicle
- Perform post service/repair activities

Elements and Performance Criteria

Prepare to assist for repair and overhauling in mechanical/electrical/electronic systems of the vehicle

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

PC1. review the job card, vehicle service history, inspection report, etc. to verify repair requirement

PC2. conduct visual inspection to assess defects such as any external impact/bend/leak/incorrect level/wear & tear etc.

PC3. ensure correct service/repair manual is collected and lead technician has gone through the required SOP

PC4. ensure workshop tools/measuring devices/equipment/spare parts/consumable required for the job are collected and their condition/calibration is as specified by respective OEM

PC5. ensure tools/equipment are placed in an organised manner for maintaining safe and tidy workstation

PC6. wear PPE according to nature of job to be performed

Assist for repair and overhauling in mechanical/electrical/electronic systems of the vehicle

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

PC7. take precautions to avoid damage to the vehicle and its components while working on various aggregates

PC8. follow OEM SOP and standard safety procedures while handling tool/equipment, vehicle component, fluids, hazardous substances and while working in hazardous environments

PC9. remove parts relevant to various aggregates and place them securely as specified by OEM

PC10. remove parts relevant to various aggregates and place them securely as specified by OEM

PC11. test mechanical/electrical/electronic components post removal wherever applicable as per OEM SOP

PC12. ensure cleanliness and condition dismantled components, including mechanical and electrical aggregates, prior to assembly

PC13. assist lead technician to perform repair/replacement/calibration/overhauling of mechanical/electrical and electronic system/aggregate such as engine, transmission, running systems, etc. including power assisted braking & steering systems

PC14. repair indirect faults in mechanical aggregate due to other system/component

PC15. ensure the documentation related to repair/overhaul of the vehicle are maintained

Perform post service/repair activities

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

PC16. check the performance of vehicle/aggregate post repair and report to supervisor/service advisor if further inspection/repair required

PC17. ensure completeness of tasks assigned before releasing the vehicle for the next procedure

PC18. ensure dispose off materials such as waste oil, scrap of failed parts/aggregates, as per organisation's policies

PC19. ensure all tools, auxiliary material and other equipment is removed from the work site

PC20. ensure scheduled checks, calibration and timely repairs for workshop tools, equipment and workstations

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the automotive industry in India, workshop structure and role and responsibilities of different people in the workshop

KU2. Standard Operating Procedures (SOP) for receiving vehicles, opening job card, allocation of work, invoicing, vehicle delivery, handling complaints, etc.

KU3. different components/aggregates as well as auto component manufacturer's specifications for the same

KU4. technology used in functioning of various electrical, mechanical systems of the vehicle and their integration such as engine management systems (petrol, diesel, gas and hybrid), engine mechanical systems, forced induction, emission and exhaust systems, body electrical and electronic system, transmission system, brake and stability control system, air-conditioning systems, active & passive safety system, media and other systems self-starter, alternator, charging systems etc.

KU5. interconnection of vehicle's systems with each other and one system effect on other

KU6. fundamental terms, laws and principles used in vehicles such as: voltage, current (AC/DC/HV), resistance, power, capacitance, inductance, discrete electronic components, radio frequency, torque, traction, OHM's law, pascal's law, law of levers etc., automotive communication protocols such as Controller Area Network (CAN), Local Interconnect Network(LIN), Media Oriented Systems Transport(MOST) etc.

KU7. SOP recommended by OEM for using tools/equipment related to mechanical electrical/electronic systems such as special service tools, measuring instrument, pressure indicators/gauges, air bleeding equipment, volt meters, ammeters, ohmmeters, battery tester, dedicated and computer based diagnostic equipment, etc.

KU8. different types of errors or defects in the tools/equipment

KU9. various sources of information available for vehicle/equipment manufacturer specifications, tolerance limits of components and options for repair or replacement.

KU10. OEM SOPs for service, repair and overhauling of mechanical, electrical/electronics aggregate of the vehicle

KU11. standard schedules and checklists recommended by the OEM/auto component manufacturer for servicing of mechanical, electrical/electronics component/aggregate in the vehicle

KU12. various methods for removal, dismantling, cleaning, adjusting, reassembling and testing of mechanical, electrical/electronics components for proper functioning

KU13. type and quality of consumables/materials used for the job such as seals, sealant, fasteners, lubricants etc.

KU14. various types of health and safety hazards commonly present in the work environment such as physical hazards, electrical hazards, chemical hazards, fire hazards, equipment related hazards, health hazards, etc.

KU15. safety, health and environmental policies and regulations for the work place as well as for automotive trade in general

KU16. safety requirements recommended by the OEM for handling tool/equipment, hazardous substances and while working in hazardous environments

KU17. legal regulations that need to be considered for handling hybrid vehicle in the workshop KU18. Occupational Safety and Health (OSH) measures required for working on vehicles KU19. various methods to dispose-off replaced failed components/parts, fluids and hazardous substances

KU18. organisational/professional code of ethics and standards of practice

KU19. documentation requirements for each procedure carried out as part of roles and responsibilities as specified by OEM/auto component manufacturer

Generic Skills (GS)

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

GS1. read and interpret workplace related documentation

GS2. interpret the needs of customers by understanding the key issues

GS3. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. write in English/regional language

GS6. plan work according to the required schedule and location

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare to assist for repair and overhauling in mechanical/electrical/electronic systems of the vehicle	15	15	-	7
PC1. review the job card, vehicle service history, inspection report, etc. to verify repair requirement	-	2	-	1
PC2. conduct visual inspection to assess defects such as any external impact/bend/leak/incorrect level/wear & tear etc.	5	4	-	2
PC3. ensure correct service/repair manual is collected and lead technician has gone through the required SOP	3	3	-	-
PC4. ensure workshop tools/measuring devices/equipment/spare parts/consumable required for the job are collected and their condition/calibration is as specified by respective OEM	3	2	-	2
PC5. ensure tools/equipment are placed in an organised manner for maintaining safe and tidy workstation	2	2	-	1
PC6. wear PPE according to nature of job to be performed	2	2	-	1
Assist for repair and overhauling in mechanical/electrical/electronic systems of the vehicle	15	15	-	7
PC7. take precautions to avoid damage to the vehicle and its components while working on various aggregates	1	1	-	-
PC8. follow OEM SOP and standard safety procedures while handling tool/equipment, vehicle component, fluids, hazardous substances and while working in hazardous environments	2	2	-	1
PC9. remove parts relevant to various aggregates and place them securely as specified by OEM	1	1	-	-
PC10. remove parts relevant to various aggregates and place them securely as specified by OEM	1	1	-	1
PC11. test mechanical/electrical/electronic components post removal wherever applicable as per OEM SOP	3	3	-	2

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. ensure cleanliness and condition dismantled components, including mechanical and electrical aggregates, prior to assembly	1	1	-	-
PC13. assist lead technician to perform repair/replacement/calibration/overhauling of mechanical/electrical and electronic system/aggregate such as engine, transmission, running systems, etc. including power assisted braking & steering systems	3	3	-	2
PC14. repair indirect faults in mechanical aggregate due to other system/component	2	2	-	1
PC15. ensure the documentation related to repair/overhaul of the vehicle are maintained	1	1	-	-
Perform post service/repair activities	10	10	-	6
PC16. check the performance of vehicle/aggregate post repair and report to supervisor/service advisor if further inspection/repair required	2	2	-	2
PC17. ensure completeness of tasks assigned before releasing the vehicle for the next procedure	2	2	-	-
PC18. ensure dispose off materials such as waste oil, scrap of failed parts/aggregates, as per organisation's policies	2	2	-	2
PC19. ensure all tools, auxiliary material and other equipment is removed from the work site	2	2	-	-
PC20. ensure scheduled checks, calibration and timely repairs for workshop tools, equipment and workstations	2	2	-	2
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1409
NOS Name	Assist lead technician in mechanical/electrical/electronic repairs and overhauling
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
NSQF Level	6
Credits	TBD
Version	2.0
Next Review Date	30/09/2024

ASC/N1444: Maintain the tools and equipment

Description

This NOS unit is about maintaining tools and equipment as well as their records for efficient running of the workshop

Scope

The scope covers the following :

- Carry out tools and equipment maintenance activity
- Monitor special purpose tools/equipment usage

Elements and Performance Criteria

Carry out tools and equipment maintenance activity

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

PC1. prepare a list of tools and equipment available in the workshop as specified by respective OEM

PC2. inspect tools and equipment to detect losses, defects, wear or breakage

PC3. document the required timelines within which the tools/equipment need calibration

PC4. ensure re-calibration of the tools and equipment as per the requirement

PC5. maintain budget and expenditure records of tools and equipment, within the prescribed limit sanctioned for maintenance

PC6. report tools or equipment shortfall due to workload, new product launch, missing/damage tools/equipment and vehicular population in the workshop

PC7. label each special purpose tool/equipment location with details such as tool/equipment number, application and total items/child parts of the tools/equipment, etc.

PC8. ensure tools and equipment are kept clean and safe at specified location

Monitor special purpose tools/equipment usage

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

PC9. ensure out of order tools/equipment are marked/labeled and reported to the concern person

PC10. ensure correct special purpose tools/equipment issued w.r.t vehicle model/aggregate and nature of the job

PC11. ensure documentation of the special purpose tools/equipment usage is maintained on daily basic

PC12. report if noticed any discrepancy in tools usage or in and out record

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. documentation requirements for each procedure carried out as part of roles and responsibilities

KU2. Standard Operating Procedures (SOPs) of the organisation/dealership to operate the various tools and equipment within the specified tolerance levels and inspection of tools and equipment

KU3. the maintenance of various tools and equipment such as hand and power tools, specialist tool for removal/adjustment, storage racks, protective covers, measuring devices, welding equipment, vehicle cleaning equipment, service workshop manuals, product manuals, line oilers, filters and gauges, multi-meters, load testers, fuel injector cleaners, etc.

KU4. SOPs of the tool or equipment manufacturer/dealership for maintenance of tools and equipment

KU5. the methods of gauging and assessing faults in tools and equipment

KU6. specific timelines for recalibration of various tools and service schedules of the various equipment

KU7. how to recalibrate various tools either in the workshop or from external vendors as per the manufacturer guidelines

KU8. the operating procedure and usage of equipment and tools at appropriate place

KU9. the type of personal protective equipment required to carry out the repair/maintenance safely

KU10. the procedure and workshop protocols to be followed to order any tools and equipment or to carry out schedule maintenance

KU11. how to store tools and equipment safely to avoid physical hazards

KU12. safety and health policies and regulations for the workplace as well as for automotive trade in general (e.g. safe practices while working in pits/under vehicles)

KU13. organisational and professional code of ethics and standards of practice

Generic Skills (GS)

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

GS1. plan work according to the required schedule and location

GS2. write in English/regional language

GS3. identify potential workplace problem and take suitable action

GS4. analyse and apply the information gathered from observation, experience, reasoning or communication to act efficiently

GS5. read and interpret workplace related documentation

GS6. communicate using terms, names, grades and other nomenclature pertaining to the automotive trade

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out tools and equipment maintenance activity	30	30	-	12
PC1. prepare a list of tools and equipment available in the workshop as specified by respective OEM	2	2	-	2
PC2. inspect tools and equipment to detect losses, defects, wear or breakage	5	5	-	2
PC3. document the required timelines within which the tools/equipment need calibration	2	2	-	-
PC4. ensure re-calibration of the tools and equipment as per the requirement	3	3	-	2
PC5. maintain budget and expenditure records of tools and equipment, within the prescribed limit sanctioned for maintenance	5	5	-	2
PC6. report tools or equipment shortfall due to workload, new product launch, missing/damage tools/equipment and vehicular population in the workshop	5	5	-	2
PC7. label each special purpose tool/equipment location with details such as tool/equipment number, application and total items/child parts of the tools/equipment, etc.	5	5	-	-
PC8. ensure tools and equipment are kept clean and safe at specified location	3	3	-	2
Monitor special purpose tools/equipment usage	10	10	-	8
PC9. ensure out of order tools/equipment are marked/labeled and reported to the concern person	2	2	-	2
PC10. ensure correct special purpose tools/equipment issued w.r.t vehicle model/aggregate and nature of the job	3	3	-	2
PC11. ensure documentation of the special purpose tools/equipment usage is maintained on daily basic	2	2	-	2

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. report if noticed any discrepancy in tools usage or in and out record	3	3	-	2
NOS Total	**40**	**40**	**-**	**20**

National Occupational Standards (NOS) Parameters

NOS Code	ASC/N1444
NOS Name	Maintain the tools and equipment
Sector	Automotive
Sub-Sector	Automotive Vehicle Service
Occupation	Technical Service & Repair
NSQF Level	6
Credits	TBD
Version	1.0
Next Review Date	30/09/2024

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down the proportion of marks for Theory and Skills Practical for each PC.

2. The assessment for the theory part will be based on the knowledge bank of questions created by the SSC.

3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.

4. Individual assessment agencies will create unique question papers for the theory part for each candidate at each examination/training center (as per assessment criteria below).

5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.

6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Minimum Aggregate Passing % at QP Level : 70

(**Please note:** Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ASC/N9813.Manage work and resources	50	30	-	20	100	15
ASC/N9812.Interact effectively with team, customers and others	50	30	-	20	100	10
ASC/N1407.Perform advanced fault diagnosis on vehicle	40	40	-	20	100	35
ASC/N1409.Assist lead technician in mechanical/electrical/electronic repairs and overhauling	40	40	-	20	100	20
ASC/N1444.Maintain the tools and equipment	40	40	-	20	100	20
Total	**220**	**180**	**-**	**100**	**500**	**100**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
ECU	Electronic Control Units
SOP	Standard Operating Procedure
OEM	Original Equipment Manufacturer
CAN	Controller Area Network
LIN	Local Interconnect Network
SOP	Standard Operating Procedure

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.
Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.

Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.