# Automotive Unified Diagnostics Engineer

QP Code: ASC/Q1437

Version: 1.0

NSQF Level: 6

Automotive Skills Development Council || 153, GF, Okhla Industrial Area, Phase 3
New Delhi 110020 || email:ayushi@asdc.org.in

# Contents

# ASC/Q1437: Automotive Unified Diagnostics Engineer

## Brief Job Description

The individual in this job roles performs diagnostic reverse engineering for all diagnostics protocol, diagnostic content coverage test and generate reports, vehicle tracing analysis and simulation, vehicle test for diagnostic content development and prepare diagnostic specification, design diagnostics workflow and testing report. The individual also buildup, Commission and Operation of the End2End Test benches, develop Test cases/execute for ECU/HIL system, Mobile app, API, Web services and handle all technical issues and ensure on time delivery of Test requests. He/she also performs feasibility check for Test Automation and Service Operation, Flash and protocol conformance validation of control units, test bench setup for ECUs Diagnostics testing and develop Test Strategy, Test Plan and test execution, test defects analysis and report, Automation tool scripting, verification, and validation.

## Personal Attributes

The person should be result oriented with good technical and analytical skills, should have Excellent Interpersonal Skills, communication and presentation skills and a good team player. They should have ability to manage projects, prioritizing of work and mentoring the budding engineers

## Applicable National Occupational Standards (NOS)

### Compulsory NOS:

1. ASC/N9810: Manage work and resources (Manufacturing)
2. DGT/VSQ/N0103: Employability Skills (90 Hours)
3. ASC/N1468: Carry out diagnosis of vehicle mechanical system
4. ASC/N1469: Carry out diagnosis of vehicle OBD system
5. ASC/N1470: Carry out diagnosis of vehicle electrical and electronic system

## Qualification Pack (QP) Parameters

| | |
|---|---|
| **Sector** | Automotive |
| **Sub-Sector** | Automotive Vehicle Service |
| **Occupation** | Technical Service & Repair |
| **Country** | India |
| **NSQF Level** | 6 |

| | |
|---|---|
| **Credits** | 21 |
| **Aligned to NCO/ISCO/ISIC Code** | NCO-2015/3115.0602 |
| **Minimum Educational Qualification & Experience** | 10th grade pass with 2 year NTC/ CITS/NAC (data management, coding, etc) with 5 Years of experience In relevant field<br>OR<br>Completed 3 year diploma after 10th (Mechanical/Automobile/ Electrical / Electronics) with 5 Years of experience In relevant field<br>OR<br>B.E./B.Tech with 1 Year of experience In relevant field<br>OR<br>Certificate-NSQF (Four-wheeler Service Lead Technician Level 5) with 3 Years of experience in relevant field |
| **Minimum Level of Education for Training in School** | 10th Class |
| **Pre-Requisite License or Training** | Automotive Technician Level 5 Driving License |
| **Minimum Job Entry Age** | 22 Years |
| **Last Reviewed On** | NA |
| **Next Review Date** | NA |
| **NSQC Approval Date** | |
| **Version** | 1.0 |

# ASC/N9810: Manage work and resources (Manufacturing)

## Description

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

## Scope

The scope covers the following :

- Maintain safe and secure working environment
- Maintain Health and Hygiene
- Effective waste management practices
- Material/energy conservation practices

## Elements and Performance Criteria

*Maintain safe and secure working environment*

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

**PC1.** identify hazardous activities and the possible causes of risks or accidents in the workplace

**PC2.** implement safe working practices for dealing with hazards to ensure safety of self and others

**PC3.** conduct regular checks of the machines with support of the maintenance team to identify potential hazards

**PC4.** ensure that all the tools/equipment/fasteners/spare parts are arranged as per specifications/utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions

**PC5.** organise safety drills or training sessions to create awareness amongst others on the identified risks and safety practices

**PC6.** fill daily check sheet to report improvements done and risks identified

**PC7.** ensure that relevant safety boards/signs are placed on the shop floor for the safety of self and others

**PC8.** report any identified breaches in health, safety and security policies and procedures to the designated person

*Maintain Health and Hygiene*

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

**PC9.** ensure workplace, equipment, restrooms etc. are sanitized regularly

**PC10.** ensure team is aware about hygiene and sanitation regulations and following them on the shop floor

**PC11.** ensure availability of running water, hand wash and alcohol-based sanitizers at the workplace

**PC12.** report advanced hygiene and sanitation issues to appropriate authority

**PC13.** follow stress and anxiety management techniques and support employees to cope with stress, anxiety etc

**PC14.** wear and dispose PPEs regularly and appropriately

*Effective waste management practices*

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

**PC15.** ensure recyclable, non-recyclable and hazardous wastes are segregated as per SOP

**PC16.** ensure proper mechanism is followed while collecting and disposing of non-recyclable, recyclable and reusable waste

*Material/energy conservation practices*

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

**PC17.** ensure malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment are resolved effectively

**PC18.** prepare and analyze material and energy audit reports to decipher excessive consumption of material and water

**PC19.** identify possibilities of using renewable energy and environment friendly fuels

**PC20.** identify processes where material and energy/electricity utilization can be optimized

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

**KU1.** organisation procedures for health, safety and security, individual role and responsibilities in this context

**KU2.** the organisation's emergency procedures for different emergency situations and the importance of following the same

**KU3.** evacuation procedures for workers and visitors

**KU4.** how and when to report hazards as well as the limits of responsibility for dealing with hazards

**KU5.** potential hazards, risks and threats based on the nature of work

**KU6.** various types of fire extinguisher

**KU7.** various types of safety signs and their meaning

**KU8.** appropriate first aid treatment relevant to different condition e.g. bleeding, minor burns, eye injuries etc.

**KU9.** relevant standards, procedures and policies related to 5S followed in the company

**KU10.** the various materials used and their storage norms

**KU11.** importance of efficient utilisation of material and water

**KU12.** basics of electricity and prevalent energy efficient devices

**KU13.** common practices of conserving electricity

**KU14.** common sources and ways to minimize pollution

**KU15.** categorisation of waste into dry, wet, recyclable, non-recyclable and items of single-use plastics

**KU16.** waste management techniques

**KU17.** significance of greening

## 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.** inform/report to concerned person in case of any problem
**GS6.** make timely decisions for efficient utilization of resources
**GS7.** write reports such as accident report, in at least English/regional language

## Assessment Criteria

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| *Maintain safe and secure working environment* | **20** | **13** | **-** | **8** |
| **PC1.** identify hazardous activities and the possible causes of risks or accidents in the workplace | 4 | 2 | - | 2 |
| **PC2.** implement safe working practices for dealing with hazards to ensure safety of self and others | 3 | 1 | - | 2 |
| **PC3.** conduct regular checks of the machines with support of the maintenance team to identify potential hazards | 2 | 2 | - | 1 |
| **PC4.** ensure that all the tools/equipment/fasteners/spare parts are arranged as per specifications/utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/work instructions | 3 | 2 | - | 1 |
| **PC5.** organise safety drills or training sessions to create awareness amongst others on the identified risks and safety practices | 2 | - | - | - |
| **PC6.** fill daily check sheet to report improvements done and risks identified | 2 | 2 | - | - |
| **PC7.** ensure that relevant safety boards/signs are placed on the shop floor for the safety of self and others | 2 | 2 | - | 1 |
| **PC8.** report any identified breaches in health, safety and security policies and procedures to the designated person | 2 | 2 | - | 1 |
| *Maintain Health and Hygiene* | **13** | **7** | **-** | **5** |
| **PC9.** ensure workplace, equipment, restrooms etc. are sanitized regularly | 3 | 2 | - | 1 |
| **PC10.** ensure team is aware about hygiene and sanitation regulations and following them on the shop floor | 2 | 1 | - | - |
| **PC11.** ensure availability of running water, hand wash and alcohol-based sanitizers at the workplace | 2 | 2 | - | 1 |
| **PC12.** report advanced hygiene and sanitation issues to appropriate authority | 1 | 1 | - | 1 |

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| **PC13.** follow stress and anxiety management techniques and support employees to cope with stress, anxiety etc | 2 | 1 | - | 1 |
| **PC14.** wear and dispose PPEs regularly and appropriately | 3 | - | - | 1 |
| *Effective waste management practices* | **6** | **4** | **-** | **1** |
| **PC15.** ensure recyclable, non-recyclable and hazardous wastes are segregated as per SOP | 3 | 2 | - | - |
| **PC16.** ensure proper mechanism is followed while collecting and disposing of non-recyclable, recyclable and reusable waste | 3 | 2 | - | 1 |
| *Material/energy conservation practices* | **11** | **6** | **-** | **6** |
| **PC17.** ensure malfunctioning (fumes/sparks/emission/vibration/noise) and lapse in maintenance of equipment are resolved effectively | 2 | 2 | - | 1 |
| **PC18.** prepare and analyze material and energy audit reports to decipher excessive consumption of material and water | 3 | 2 | - | 1 |
| **PC19.** identify possibilities of using renewable energy and environment friendly fuels | 3 | 1 | - | 2 |
| **PC20.** identify processes where material and energy/electricity utilization can be optimized | 3 | 1 | - | 2 |
| **NOS Total** | **50** | **30** | **-** | **20** |

## National Occupational Standards (NOS) Parameters

| | |
|---|---|
| **NOS Code** | ASC/N9810 |
| **NOS Name** | Manage work and resources (Manufacturing) |
| **Sector** | Automotive |
| **Sub-Sector** | Generic |
| **Occupation** | Generic |
| **NSQF Level** | 5 |
| **Credits** | 2 |
| **Version** | 2.0 |
| **Last Reviewed Date** | 31/08/2021 |
| **Next Review Date** | 31/08/2024 |
| **NSQC Clearance Date** | 31/08/2021 |

# DGT/VSQ/N0103: Employability Skills (90 Hours)

## Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

## Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

## Elements and Performance Criteria

*Introduction to Employability Skills*

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

**PC1.** understand the significance of employability skills in meeting the current job market requirement and future of work

**PC2.** identify and explore learning and employability relevant portals

**PC3.** research about the different industries, job market trends, latest skills required and the available opportunities

*Constitutional values – Citizenship*

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

**PC4.** recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.

**PC5.** follow environmentally sustainable practices

*Becoming a Professional in the 21st Century*

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

**PC6.** recognize the significance of 21st Century Skills for employment

**PC7.** practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

**PC8.** adopt a continuous learning mindset for personal and professional development

*Basic English Skills*

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

**PC9.** use basic English for everyday conversation in different contexts, in person and over the telephone

**PC10.** read and understand routine information, notes, instructions, mails, letters etc. written in English

**PC11.** write short messages, notes, letters, e-mails etc. in English

*Career Development & Goal Setting*

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

**PC12.** identify career goals based on the skills, interests, knowledge, and personal attributes

**PC13.** prepare a career development plan with short- and long-term goals

*Communication Skills*

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

**PC14.** follow verbal and non-verbal communication etiquette while communicating in professional and public settings

**PC15.** use active listening techniques for effective communication

**PC16.** communicate in writing using appropriate style and format based on formal or informal requirements

**PC17.** work collaboratively with others in a team

*Diversity & Inclusion*

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

**PC18.** communicate and behave appropriately with all genders and PwD

**PC19.** escalate any issues related to sexual harassment at workplace according to POSH Act

*Financial and Legal Literacy*

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

**PC20.** identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc.

**PC21.** carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook

**PC22.** identify common components of salary and compute income, expenses, taxes, investments etc

**PC23.** identify relevant rights and laws and use legal aids to fight against legal exploitation

*Essential Digital Skills*

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

**PC24.** operate digital devices and use their features and applications securely and safely

**PC25.** carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc.

**PC26.** display responsible online behaviour while using various social media platforms

**PC27.** create a personal email account, send and process received messages as per requirement

**PC28.** carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications

**PC29.** utilize virtual collaboration tools to work effectively

*Entrepreneurship*

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

**PC30.** identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research

**PC31.** develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion

**PC32.** identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

*Customer Service*

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

**PC33.** identify different types of customers and ways to communicate with them

**PC34.** identify and respond to customer requests and needs in a professional manner

**PC35.** use appropriate tools to collect customer feedback

**PC36.** follow appropriate hygiene and grooming standards

*Getting ready for apprenticeship & Jobs*

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

**PC37.** create a professional Curriculum vitae (Résumé)

**PC38.** search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

**PC39.** apply to identified job openings using offline /online methods as per requirement

**PC40.** answer questions politely, with clarity and confidence, during recruitment and selection

**PC41.** identify apprenticeship opportunities and register for it as per guidelines and requirements

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

**KU1.** need for employability skills and different learning and employability related portals

**KU2.** various constitutional and personal values

**KU3.** different environmentally sustainable practices and their importance

**KU4.** Twenty first (21st) century skills and their importance

**KU5.** how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

**KU6.** importance of career development and setting long- and short-term goals

**KU7.** about effective communication

**KU8.** POSH Act

**KU9.** Gender sensitivity and inclusivity

**KU10.** different types of financial institutes, products, and services

**KU11.** components of salary and how to compute income and expenditure

**KU12.** importance of maintaining safety and security in offline and online financial transactions

**KU13.** different legal rights and laws

**KU14.** different types of digital devices and the procedure to operate them safely and securely

**KU15.** how to create and operate an e- mail account

**KU16.** use applications such as word processors, spreadsheets etc.
**KU17.** how to identify business opportunities
**KU18.** types and needs of customers
**KU19.** how to apply for a job and prepare for an interview
**KU20.** apprenticeship scheme and the process of registering on apprenticeship portal

## Generic Skills (GS)

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

**GS1.** read and write different types of documents/instructions/correspondence in English and other languages
**GS2.** communicate effectively using appropriate language in formal and informal settings
**GS3.** behave politely and appropriately with all to maintain effective work relationship
**GS4.** how to work in a virtual mode, using various technological platforms
**GS5.** perform calculations efficiently
**GS6.** solve problems effectively
**GS7.** pay attention to details
**GS8.** manage time efficiently
**GS9.** maintain hygiene and sanitization to avoid infection

## Assessment Criteria

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| *Introduction to Employability Skills* | **1** | **1** | **-** | **-** |
| **PC1.** understand the significance of employability skills in meeting the current job market requirement and future of work | - | - | - | - |
| **PC2.** identify and explore learning and employability relevant portals | - | - | - | - |
| **PC3.** research about the different industries, job market trends, latest skills required and the available opportunities | - | - | - | - |
| *Constitutional values – Citizenship* | **1** | **1** | **-** | **-** |
| **PC4.** recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc. | - | - | - | - |
| **PC5.** follow environmentally sustainable practices | - | - | - | - |
| *Becoming a Professional in the 21st Century* | **1** | **3** | **-** | **-** |
| **PC6.** recognize the significance of 21st Century Skills for employment | - | - | - | - |
| **PC7.** practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life | - | - | - | - |
| **PC8.** adopt a continuous learning mindset for personal and professional development | - | - | - | - |
| *Basic English Skills* | **3** | **4** | **-** | **-** |
| **PC9.** use basic English for everyday conversation in different contexts, in person and over the telephone | - | - | - | - |

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| **PC10.** read and understand routine information, notes, instructions, mails, letters etc. written in English | - | - | - | - |
| **PC11.** write short messages, notes, letters, e-mails etc. in English | - | - | - | - |
| *Career Development & Goal Setting* | **1** | **2** | **-** | **-** |
| **PC12.** identify career goals based on the skills, interests, knowledge, and personal attributes | - | - | - | - |
| **PC13.** prepare a career development plan with short- and long-term goals | - | - | - | - |
| *Communication Skills* | **2** | **2** | **-** | **-** |
| **PC14.** follow verbal and non-verbal communication etiquette while communicating in professional and public settings | - | - | - | - |
| **PC15.** use active listening techniques for effective communication | - | - | - | - |
| **PC16.** communicate in writing using appropriate style and format based on formal or informal requirements | - | - | - | - |
| **PC17.** work collaboratively with others in a team | - | - | - | - |
| *Diversity & Inclusion* | **1** | **1** | **-** | **-** |
| **PC18.** communicate and behave appropriately with all genders and PwD | - | - | - | - |
| **PC19.** escalate any issues related to sexual harassment at workplace according to POSH Act | - | - | - | - |
| *Financial and Legal Literacy* | **2** | **3** | **-** | **-** |
| **PC20.** identify and select reliable institutions for various financial products and services such as bank account, debit and credit cards, loans, insurance etc. | - | - | - | - |
| **PC21.** carry out offline and online financial transactions, safely and securely, using various methods and check the entries in the passbook | - | - | - | - |

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| **PC22.** identify common components of salary and compute income, expenses, taxes, investments etc | - | - | - | - |
| **PC23.** identify relevant rights and laws and use legal aids to fight against legal exploitation | - | - | - | - |
| *Essential Digital Skills* | **3** | **5** | **-** | **-** |
| **PC24.** operate digital devices and use their features and applications securely and safely | - | - | - | - |
| **PC25.** carry out basic internet operations by connecting to the internet safely and securely, using the mobile data or other available networks through Bluetooth, Wi-Fi, etc. | - | - | - | - |
| **PC26.** display responsible online behaviour while using various social media platforms | - | - | - | - |
| **PC27.** create a personal email account, send and process received messages as per requirement | - | - | - | - |
| **PC28.** carry out basic procedures in documents, spreadsheets and presentations using respective and appropriate applications | - | - | - | - |
| **PC29.** utilize virtual collaboration tools to work effectively | - | - | - | - |
| *Entrepreneurship* | **2** | **3** | **-** | **-** |
| **PC30.** identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research | - | - | - | - |
| **PC31.** develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion | - | - | - | - |
| **PC32.** identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity | - | - | - | - |
| *Customer Service* | **1** | **2** | **-** | **-** |
| **PC33.** identify different types of customers and ways to communicate with them | - | - | - | - |

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| **PC34.** identify and respond to customer requests and needs in a professional manner | - | - | - | - |
| **PC35.** use appropriate tools to collect customer feedback | - | - | - | - |
| **PC36.** follow appropriate hygiene and grooming standards | - | - | - | - |
| *Getting ready for apprenticeship & Jobs* | **2** | **3** | **-** | **-** |
| **PC37.** create a professional Curriculum vitae (Résumé) | - | - | - | - |
| **PC38.** search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively | - | - | - | - |
| **PC39.** apply to identified job openings using offline /online methods as per requirement | - | - | - | - |
| **PC40.** answer questions politely, with clarity and confidence, during recruitment and selection | - | - | - | - |
| **PC41.** identify apprenticeship opportunities and register for it as per guidelines and requirements | - | - | - | - |
| **NOS Total** | **20** | **30** | **-** | **-** |

## National Occupational Standards (NOS) Parameters

| | |
|---|---|
| **NOS Code** | DGT/VSQ/N0103 |
| **NOS Name** | Employability Skills (90 Hours) |
| **Sector** | Cross Sectoral |
| **Sub-Sector** | Professional Skills |
| **Occupation** | Employability |
| **NSQF Level** | 5 |
| **Credits** | 3 |
| **Version** | 1.0 |
| **Last Reviewed Date** | 31/01/2024 |
| **Next Review Date** | 31/01/2027 |
| **NSQC Clearance Date** | 31/01/2024 |

# ASC/N1468: Carry out diagnosis of vehicle mechanical system

## Description

This NOS unit is about performing diagnosis of faults and failures in vehicle mechanical system/aggregates such as engine, clutch, gearbox, brakes, steering and suspension system etc. to identify their causes and preventive measures.

## Scope

The scope covers the following :

- Prepare for diagnosis process
- Perform diagnosis of vehicle mechanical system/aggregates
- Perform post-diagnosis activities

## Elements and Performance Criteria

*Prepare for diagnosis process*

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

**PC1.** obtain the details of faults/failures in vehicle through field reports and DMS data received from dealership/OEM/Area office

**PC2.** • interpret the vehicle drawings, work instruction's, fault reports etc. to plan the diagnosis tasks need
• to be conducted

**PC3.** • identify and select the diagnostic tools, testing tools, simulation tools, software testing tools, hand
• tools, measuring tools, measuring instruments, gauges, etc. required during the diagnosis process

**PC4.** • ensure that tools, gauges and diagnosis apparatus are cleaned properly and free from any dust and
• impurities

**PC5.** identify the testing parameters which need to be measured during the diagnosis procedure

**PC6.** • set the diagnostic apparatus and connect the various data capturing meters and gauges, data collection
• systems and data loggers to capture the required failure data as per the diagnosis process and SOPs/WI

**PC7.** • dismantle and reassemble aggregates of vehicle for fault diagnosis as per the Drawing/Standard
• Operating Procedure/Work Instruction

*Perform diagnosis of vehicle mechanical system/aggregates*

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

**PC8.** perform root cause analysis to identify the cause of faults in the vehicle

**PC9.** carry out diagnosis of noise in engine

**PC10.** use compression tester and cylinder leakage tester to detect any leakage in cylinder

**PC11.** use engine fault diagnosis table of symptom to identify possible causes and remedies for the identified faults/failures in engine

**PC12.** conduct cooling system leakage test, antifreeze content test and operating temperature test by using cooling fault diagnosis tables

**PC13.** conduct lubrication system diagnosis with oil pressure testing kit and by using lubrication fault diagnosis tables

**PC14.** conduct brake fluid diagnosis with brake fluid tester, brake roller test, disc runout test by using brake fluid diagnosis table

**PC15.** conduct steering and wheels diagnosis with tire pressure, tread depth, wheel balancer, four-wheel alignment machine by using steering fault diagnosis table and tire fault diagnostic table

**PC16.** conduct suspension diagnosis with damper operation test, trim height test by using suspension fault diagnosis table

**PC17.** conduct clutch diagnosis with clutch tests by using clutch fault diagnosis table

**PC18.** conduct automatic gearbox diagnosis with stall test and kickdown test using automatic gear box fault diagnosis table

*Perform post-diagnosis activities*

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

**PC19.** record and collate all the results in the required formats

**PC20.** analyse and compare the results with the standard values, regulatory norms and benchmarked values to identify causes of faults and suggest remedies and preventing actions to repair or avoid them

**PC21.** submit the report to concerned department for rectification of faults in vehicle

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

**KU1.** company's diagnostic standards and processes

**KU2.** diagnostic terminology in automobile industry

**KU3.** how to write precise report

**KU4.** various repairing and diagnostic techniques for vehicle mechanical system

**KU5.** Root cause analysis and Fishbone diagram

**KU6.** different types of noises and possible source of them

**KU7.** difference between noise vibration and harshness

**KU8.** use of different mechanical gauges, tools, and instruments

**KU9.** working of different mechanical, hydraulic and pneumatic system

**KU10.** working of mechanicals in engine and its subsystems, clutch, transmission, and final drive, brakes, steering, and suspension system

**KU11.** different steering and suspension geometry angles

**KU12.** different tread wear pattern and causes of it

**KU13.** various national and international regulations, norms and standards on vehicles

**KU14.** how to read and interpret sketches and engineering drawings

**KU15.** potential health and safety hazards and related safety precautions

## Generic Skills (GS)

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

**GS1.** read 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.** inform/report to concerned person in case of any problem
**GS6.** make timely decisions for efficient utilization of resources
**GS7.** write reports such as accident report, in at least English/regional language

## Assessment Criteria

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| *Prepare for diagnosis process* | **6** | **17** | **6** | **2** |
| **PC1.** obtain the details of faults/failures in vehicle through field reports and DMS data received from dealership/OEM/Area office | 1 | 3 | 1 | - |
| **PC2.**<br>• interpret the vehicle drawings, work instruction's, fault reports etc. to plan the diagnosis tasks need<br>• to be conducted | 1 | 3 | - | 1 |
| **PC3.**<br>• identify and select the diagnostic tools, testing tools, simulation tools, software testing tools, hand<br>• tools, measuring tools, measuring instruments, gauges, etc. required during the diagnosis process | 1 | 3 | 1 | 1 |
| **PC4.**<br>• ensure that tools, gauges and diagnosis apparatus are cleaned properly and free from any dust and<br>• impurities | 1 | 2 | 1 | - |
| **PC5.** identify the testing parameters which need to be measured during the diagnosis procedure | 1 | 2 | 1 | - |
| **PC6.**<br>• set the diagnostic apparatus and connect the various data capturing meters and gauges, data collection<br>• systems and data loggers to capture the required failure data as per the diagnosis process and SOPs/WI | - | 2 | 1 | - |
| **PC7.**<br>• dismantle and reassemble aggregates of vehicle for fault diagnosis as per the Drawing/Standard<br>• Operating Procedure/Work Instruction | 1 | 2 | 1 | - |
| *Perform diagnosis of vehicle mechanical system/aggregates* | **11** | **26** | **11** | **5** |
| **PC8.** perform root cause analysis to identify the cause of faults in the vehicle | 1 | 2 | 1 | 1 |
| **PC9.** carry out diagnosis of noise in engine | 1 | 2 | 1 | 1 |
| **PC10.** use compression tester and cylinder leakage tester to detect any leakage in cylinder | 1 | 3 | 1 | - |

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| **PC11.** use engine fault diagnosis table of symptom to identify possible causes and remedies for the identified faults/failures in engine | 1 | 2 | 1 | 1 |
| **PC12.** conduct cooling system leakage test, antifreeze content test and operating temperature test by using cooling fault diagnosis tables | 1 | 2 | 1 | 1 |
| **PC13.** conduct lubrication system diagnosis with oil pressure testing kit and by using lubrication fault diagnosis tables | 1 | 2 | 1 | - |
| **PC14.** conduct brake fluid diagnosis with brake fluid tester, brake roller test, disc runout test by using brake fluid diagnosis table | 1 | 3 | 2 | 1 |
| **PC15.** conduct steering and wheels diagnosis with tire pressure, tread depth, wheel balancer, four-wheel alignment machine by using steering fault diagnosis table and tire fault diagnostic table | 1 | 3 | - | - |
| **PC16.** conduct suspension diagnosis with damper operation test, trim height test by using suspension fault diagnosis table | 1 | 2 | 1 | - |
| **PC17.** conduct clutch diagnosis with clutch tests by using clutch fault diagnosis table | 1 | 2 | 1 | - |
| **PC18.** conduct automatic gearbox diagnosis with stall test and kickdown test using automatic gear box fault diagnosis table | 1 | 3 | 1 | - |
| *Perform post-diagnosis activities* | **3** | **7** | **3** | **3** |
| **PC19.** record and collate all the results in the required formats | 1 | 2 | 1 | 1 |
| **PC20.** analyse and compare the results with the standard values, regulatory norms and benchmarked values to identify causes of faults and suggest remedies and preventing actions to repair or avoid them | 1 | 2 | 1 | 1 |
| **PC21.** submit the report to concerned department for rectification of faults in vehicle | 1 | 3 | 1 | 1 |
| **NOS Total** | **20** | **50** | **20** | **10** |

## National Occupational Standards (NOS) Parameters

| | |
|---|---|
| **NOS Code** | ASC/N1468 |
| **NOS Name** | Carry out diagnosis of vehicle mechanical system |
| **Sector** | Automotive |
| **Sub-Sector** | Automotive Vehicle Service |
| **Occupation** | Technical Service & Repair |
| **NSQF Level** | 6 |
| **Credits** | 6 |
| **Version** | 1.0 |
| **Next Review Date** | NA |

# ASC/N1469: Carry out diagnosis of vehicle OBD system

## Description

This NOS unit is about diagnosis of vehicle On Board Diagnostics (OBD) system used in modern vehicles for diagnosis of faults in it.

## Scope

The scope covers the following :

- Prepare for diagnosis process
- Perform diagnosis of vehicle OBD system
- Perform post-diagnosis activities

## Elements and Performance Criteria

*Prepare for diagnosis process*

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

**PC1.** obtain the details of faults/failures in vehicle OBD system through field reports and DMS data received from dealership/OEM/Area office

**PC2.** interpret the vehicle drawings, work instruction’s, fault reports etc. to plan the diagnosis tasks need to be conducted

**PC3.** identify the testing parameters which need to be measured during the diagnosis procedure

**PC4.** set the diagnostic apparatus and connect the various data capturing meters and gauges, data collection systems and data loggers to capture the required failure data as per the diagnosis process and SOPs/WI

*Perform diagnosis of vehicle OBD system*

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

**PC5.** conduct diagnosis process on various sensors i.e., crank and cam sensor, wheel speed sensor, Throttle position sensor, Accelerator pedal position sensor, hot film air mass sensor, temperature sensor, knock sensor, oxygen/ lambda sensor, strain gauge, common rail fuel pressure sensor, MAP sensor, rain sensor, yaw rate and acceleration sensor etc. available in the vehicle

**PC6.** analyse and compare the signal of faulty sensor with the recommended input signal of correct sensor to identify the deviations in signal, cause and preventive measures of the fault in the sensor

**PC7.** conduct diagnosis process on various actuators i.e. rotary idle control valve, stepper motor, single point injector, multipoint injector, common rail diesel injector, carbon canister, glow plug etc. available in the vehicle

**PC8.** analyse and compare the signal of faulty actuator with the recommended signal of correct actuator to identify the deviations in signal, cause and preventive measures of the fault in the actuator

**PC9.** conduct diagnosis process on communication network systems i.e. CAN, LIN and FLEXRAY available in the vehicle

**PC10.** analyse and compare the signal of faulty network system with the recommended signal of correct network signal to identify the deviations in signal, cause and preventive measures of the fault in the network system

**PC11.** record and collate all the results in the required formats

**PC12.** analyse and compare the results with the standard values, regulatory norms and benchmarked values to identify causes of faults and suggest remedies and preventing actions to repair or avoid them

**PC13.** submit the report to concerned department for rectification of faults in vehicle

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

**KU1.** system in system representation

**KU2.** open loop and closed loop system

**KU3.** different types of data sources used by OEMs

**KU4.** categories of different sensors used in modern automobile according to working principle

**KU5.** different types of generic Oscilloscopes used in Automotive market

**KU6.** different Oscilloscope graphical user interface

**KU7.** how to find correct result of sensors and actuator testing

**KU8.** how to find correct waveform of sensors and actuator testing

**KU9.** source code component implementation

**KU10.** vehicle emission control strategies

**KU11.** classification of Diagnostic Trouble Codes (DTC)

**KU12.** DTC code composition

**KU13.** features and technology of current systems

**KU14.** European Driving cycles, USA Driving cycles and Indian Driving Cycle

**KU15.** EURO Pollution norms and Indian Pollution norms

**KU16.** CAFE Norms

**KU17.** functioning of OBD3 and EOBD

**KU18.** pinout diagram of OBD2 connector

**KU19.** process of component monitoring

**KU20.** process of rationality testing

**KU21.** use of catalyst monitor and evaporative system monitor

## Generic Skills (GS)

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

**GS1.** read 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.** inform/report to concerned person in case of any problem
**GS6.** make timely decisions for efficient utilization of resources
**GS7.** write reports such as accident report, in at least English/regional language

## Assessment Criteria

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| *Prepare for diagnosis process* | **4** | **19** | **5** | **2** |
| **PC1.** obtain the details of faults/failures in vehicle OBD system through field reports and DMS data received from dealership/OEM/Area office | 1 | 5 | 1 | - |
| **PC2.** interpret the vehicle drawings, work instruction's, fault reports etc. to plan the diagnosis tasks need to be conducted | 1 | 5 | 2 | 1 |
| **PC3.** identify the testing parameters which need to be measured during the diagnosis procedure | 1 | 5 | 2 | 1 |
| **PC4.** set the diagnostic apparatus and connect the various data capturing meters and gauges, data collection systems and data loggers to capture the required failure data as per the diagnosis process and SOPs/WI | 1 | 4 | - | - |
| *Perform diagnosis of vehicle OBD system* | **16** | **31** | **15** | **8** |
| **PC5.** conduct diagnosis process on various sensors i.e., crank and cam sensor, wheel speed sensor, Throttle position sensor, Accelerator pedal position sensor, hot film air mass sensor, temperature sensor, knock sensor, oxygen/ lambda sensor, strain gauge, common rail fuel pressure sensor, MAP sensor, rain sensor, yaw rate and acceleration sensor etc. available in the vehicle | 2 | 3 | 2 | - |
| **PC6.** analyse and compare the signal of faulty sensor with the recommended input signal of correct sensor to identify the deviations in signal, cause and preventive measures of the fault in the sensor | 2 | 3 | 2 | 1 |
| **PC7.** conduct diagnosis process on various actuators i.e. rotary idle control valve, stepper motor, single point injector, multipoint injector, common rail diesel injector, carbon canister, glow plug etc. available in the vehicle | 2 | 4 | 2 | 1 |
| **PC8.** analyse and compare the signal of faulty actuator with the recommended signal of correct actuator to identify the deviations in signal, cause and preventive measures of the fault in the actuator | 1 | 3 | 2 | 1 |

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| **PC9.** conduct diagnosis process on communication network systems i.e. CAN, LIN and FLEXRAY available in the vehicle | 2 | 3 | - | 1 |
| **PC10.** analyse and compare the signal of faulty network system with the recommended signal of correct network signal to identify the deviations in signal, cause and preventive measures of the fault in the network system | 2 | 4 | 2 | 1 |
| **PC11.** record and collate all the results in the required formats | 1 | 3 | 2 | 1 |
| **PC12.** analyse and compare the results with the standard values, regulatory norms and benchmarked values to identify causes of faults and suggest remedies and preventing actions to repair or avoid them | 2 | 4 | 2 | 1 |
| **PC13.** submit the report to concerned department for rectification of faults in vehicle | 2 | 4 | 1 | 1 |
| **NOS Total** | **20** | **50** | **20** | **10** |

## National Occupational Standards (NOS) Parameters

| | |
|---|---|
| **NOS Code** | ASC/N1469 |
| **NOS Name** | Carry out diagnosis of vehicle OBD system |
| **Sector** | Automotive |
| **Sub-Sector** | Automotive Vehicle Service |
| **Occupation** | Technical Service & Repair |
| **NSQF Level** | 6 |
| **Credits** | 4 |
| **Version** | 1.0 |
| **Next Review Date** | NA |

# ASC/N1470: Carry out diagnosis of vehicle electrical and electronic system

## Description

This NOS unit is about performing diagnosis of faults and failures in vehicle electrical and electronic system/aggregates such as lighting system, ABS, HAVC system etc. to identify their causes and preventive measures.

## Scope

The scope covers the following :

- Prepare for diagnosis process
- Perform diagnosis of vehicle electrical and electronic system/aggregates
- Perform post-diagnosis activities

## Elements and Performance Criteria

*Prepare for diagnosis process*

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

**PC1.** obtain the details of faults/failures in vehicle OBD system through field reports and DMS data received from dealership/OEM/Area office

**PC2.** interpret the vehicle drawings, wiring diagrams, work instruction’s, fault reports etc. to plan the diagnosis tasks need to be conducted

**PC3.** identify the testing parameters which need to be measured during the diagnosis procedure

**PC4.** identify color codes and terminal numbers of the wires through wiring diagram

**PC5.** set the diagnostic apparatus and connect the various data capturing meters and gauges, data collection systems and data loggers to capture the required failure data as per the diagnosis process and SOPs/WI

*Perform diagnosis of vehicle electrical system/aggregates*

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

**PC6.** use analogue meters or multimeter to check voltage, resistance and current in the vehicle circuit and test lighting system of the vehicle

**PC7.** diagnose lighting system fault by using lighting system diagnosis chart

**PC8.** diagnose auxiliaries’ system fault by using auxiliaries’ system diagnosis chart

**PC9.** diagnose security and communication system fault with security and communication system diagnosis chart

**PC10.** diagnose body electrical system fault with body electrical system diagnosis chart

**PC11.** diagnose HVAC system fault with HVAC system diagnosis chart

**PC12.** diagnose SRS system fault with SRS system diagnosis chart

**PC13.** check flashing and calibration changes in ECU of the vehicle

*Perform diagnosis of vehicle electronic system/aggregates*

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

**PC14.** use available scanner and exhaust gas analyzer to diagnose fuel system by using fuel fault

**PC15.** use oscilloscope to diagnose ignition system by using ignition fault diagnosis table

**PC16.** use available scanner, smoke meter and gas analyzer to diagnose fuel injection system by using fuel injection fault diagnosis table

**PC17.** construct component aspect that provides more detailed description of the timing behavior of atomic software component

**PC18.** check health of battery health by using multimeter, hydrometer, and intelligent battery testers

**PC19.** diagnose starting system fault with starting system diagnosis chart

**PC20.** diagnose charging system fault with charging system diagnosis chart

**PC21.** diagnose ESP system fault with ESP system diagnosis chart

**PC22.** use suitable scanner to diagnose Active suspension with diagnostic chart

*Perform post-diagnosis activities*

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

**PC23.** record and collate all the results in the required formats

**PC24.** analyse and compare the results with the standard values, regulatory norms and benchmarked values to identify causes of faults and suggest remedies and preventing actions to repair or avoid them

**PC25.** submit the report to concerned department for rectification of faults in vehicle

## Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

**KU1.** process of voltage drop test and short circuit to earth test

**KU2.** how to measure voltage, current and resistance

**KU3.** components and functioning of various electrical and electronic systems of vehicle

**KU4.** different conditions of spark plug according to the symptoms

**KU5.** working of glove plug system

**KU6.** functioning of closed loop lambda system

**KU7.** air intake systems and exhaust system for Gasoline and Diesel

**KU8.** type of batteries and its specification

**KU9.** components and working of Starter and charging circuits

**KU10.** gasoline engine management fault finding chart

**KU11.** different battery charging methods

**KU12.** how to read wiring diagram

**KU13.** symbols used in wiring diagram

**KU14.** different bus systems such as drive train, multimedia, ADAS, Body bus etc

## Generic Skills (GS)

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

**GS1.** read 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.** inform/report to concerned person in case of any problem
**GS6.** make timely decisions for efficient utilization of resources
**GS7.** write reports such as accident report, in at least English/regional language

## Assessment Criteria

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| *Prepare for diagnosis process* | **5** | **15** | **5** | **2** |
| **PC1.** obtain the details of faults/failures in vehicle OBD system through field reports and DMS data received from dealership/OEM/Area office | 1 | 3 | 1 | - |
| **PC2.** interpret the vehicle drawings, wiring diagrams, work instruction's, fault reports etc. to plan the diagnosis tasks need to be conducted | 1 | 3 | 1 | 1 |
| **PC3.** identify the testing parameters which need to be measured during the diagnosis procedure | 1 | 3 | 1 | 1 |
| **PC4.** identify color codes and terminal numbers of the wires through wiring diagram | 1 | 3 | 1 | - |
| **PC5.** set the diagnostic apparatus and connect the various data capturing meters and gauges, data collection systems and data loggers to capture the required failure data as per the diagnosis process and SOPs/WI | 1 | 3 | 1 | - |
| *Perform diagnosis of vehicle electrical system/aggregates* | **8** | **18** | **9** | **4** |
| **PC6.** use analogue meters or multimeter to check voltage, resistance and current in the vehicle circuit and test lighting system of the vehicle | 1 | 2 | 2 | - |
| **PC7.** diagnose lighting system fault by using lighting system diagnosis chart | 1 | 2 | 1 | - |
| **PC8.** diagnose auxiliaries' system fault by using auxiliaries' system diagnosis chart | 1 | 2 | 1 | 1 |
| **PC9.** diagnose security and communication system fault with security and communication system diagnosis chart | 1 | 3 | 1 | 1 |
| **PC10.** diagnose body electrical system fault with body electrical system diagnosis chart | 1 | 2 | 1 | - |
| **PC11.** diagnose HVAC system fault with HVAC system diagnosis chart | 1 | 2 | 1 | 1 |
| **PC12.** diagnose SRS system fault with SRS system diagnosis chart | 1 | 2 | 1 | 1 |

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| **PC13.** check flashing and calibration changes in ECU of the vehicle | 1 | 3 | 1 | - |
| *Perform diagnosis of vehicle electronic system/aggregates* | **6** | **14** | **6** | **3** |
| **PC14.** use available scanner and exhaust gas analyzer to diagnose fuel system by using fuel fault | 1 | 2 | 1 | - |
| **PC15.** use oscilloscope to diagnose ignition system by using ignition fault diagnosis table | 1 | 3 | 1 | 1 |
| **PC16.** use available scanner, smoke meter and gas analyzer to diagnose fuel injection system by using fuel injection fault diagnosis table | 1 | 2 | 1 | - |
| **PC17.** construct component aspect that provides more detailed description of the timing behavior of atomic software component | 1 | 2 | 1 | - |
| **PC18.** check health of battery health by using multimeter, hydrometer, and intelligent battery testers | - | 1 | - | 1 |
| **PC19.** diagnose starting system fault with starting system diagnosis chart | 1 | 1 | - | - |
| **PC20.** diagnose charging system fault with charging system diagnosis chart | - | 1 | 1 | 1 |
| **PC21.** diagnose ESP system fault with ESP system diagnosis chart | 1 | 1 | 1 | - |
| **PC22.** use suitable scanner to diagnose Active suspension with diagnostic chart | - | 1 | - | - |
| *Perform post-diagnosis activities* | **1** | **3** | **-** | **1** |
| **PC23.** record and collate all the results in the required formats | - | 1 | - | 1 |
| **PC24.** analyse and compare the results with the standard values, regulatory norms and benchmarked values to identify causes of faults and suggest remedies and preventing actions to repair or avoid them | 1 | 1 | - | - |

| Assessment Criteria for Outcomes | Theory Marks | Practical Marks | Project Marks | Viva Marks |
|---|---|---|---|---|
| **PC25.** submit the report to concerned department for rectification of faults in vehicle | - | 1 | - | - |
| **NOS Total** | **20** | **50** | **20** | **10** |

### National Occupational Standards (NOS) Parameters

| | |
|---|---|
| **NOS Code** | ASC/N1470 |
| **NOS Name** | Carry out diagnosis of vehicle electrical and electronic system |
| **Sector** | Automotive |
| **Sub-Sector** | Automotive Vehicle Service |
| **Occupation** | Technical Service & Repair |
| **NSQF Level** | 6 |
| **Credits** | 6 |
| **Version** | 1.0 |
| **Next Review Date** | NA |

## 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/N9810.Manage work and resources (Manufacturing) | 50 | 30 | - | 20 | 100 | 15 |
| DGT/VSQ/N0103.Employability Skills (90 Hours) | 20 | 30 | - | - | 50 | 10 |
| ASC/N1468.Carry out diagnosis of vehicle mechanical system | 20 | 50 | 20 | 10 | 100 | 25 |
| ASC/N1469.Carry out diagnosis of vehicle OBD system | 20 | 50 | 20 | 10 | 100 | 25 |
| ASC/N1470.Carry out diagnosis of vehicle electrical and electronic system | 20 | 50 | 20 | 10 | 100 | 25 |
| **Total** | **130** | **210** | **60** | **50** | **450** | **100** |

## Acronyms

| | |
|---|---|
| **NOS** | National Occupational Standard(s) |
| **NSQF** | National Skills Qualifications Framework |
| **QP** | Qualifications Pack |
| **TVET** | Technical and Vocational Education and Training |

## 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. |