



COMPETENCY STANDARD

Automotive Mechanics

Level: 02

(Light Engineering Sector)

Competency Standard Code: CS-LE-AMech-L2-EN-V1



National Skills Development Authority
Prime Minister's Office
Government of the People's Republic of Bangladesh

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This Competency Standard for **Automotive Mechanics** is a document for the development of curricula, teaching and learning materials, and assessment tools. It also serves as the document for providing training consistent with the requirements of industry in order to meet the qualification of individuals who graduated through the established standard via competency-based assessment for a relevant job.

This document has been developed by NSDA in association with **light engineering sector** ISC, industry representatives, academia, related specialist, trainer and related employee.

Public and private institutions may use the information contained in this standard for activities benefitting Bangladesh.

Introduction

The NSDA aims to enhance an individual's employability by certifying completeness with skills. NSDA works to expand the skilling capacity of identified public and private training providers qualitatively and quantitatively. It also aims to establish and operationalize a responsive skills ecosystem and delivery mechanism through a combination of well-defined set of mechanisms and necessary technical supports.

Key priority economic growth sectors identified by the government have been targeted by NSDA to improve current job skills along with existing workforce to ensure required skills to industry standards. Training providers are encouraged and supported to work with industry to address identified skills and knowledge to enable industry growth and increased employment through the provision of market responsive inclusive skills training program. "**Automotive Mechanics**" is selected as one of the priority occupations of **Light Engineering Sector**. This standard is developed to adopt a demand driven approach to training with effective inputs from Industry Skills Councils (ISC's), employer associations and employers.

Generally, a competency standard informs curriculum, learning materials, assessment and certification of trainees enrolled in Skills Training. Trainees who successfully pass the assessment will receive a qualification in the National Skills Qualification Framework (NSQF) under Bangladesh National Qualification Framework (BNQF) and will be listed on the NSDA's online portal.

This competency standard is developed to improve skills and knowledge in accordance with the job roles, duties and tasks of the occupation and ensure that the required skills and knowledge are aligned to industry requirements. A series of stakeholder consultations, workshops were held to develop this document.

The document also details the format, sequencing, wording and layout of the Competency Standard for an occupation which is comprised of Units of Competence and its corresponding Elements.

Overview

A competency standard is a written specification of the knowledge, skills and attitudes required for the performance of an occupation, trade or job corresponding to the industry standard of performance required in the workplace.

The purpose of a competency standards is to:

- provide a consistent and reliable set of components for training, recognising and assessing people's skills, and may also have optional support materials
- enable industry recognised qualifications to be awarded through direct assessment of workplace competencies
- encourage the development and delivery of flexible training which suits individual and industry requirements
- encourage learning and assessment in a work-related environment which leads to verifiable workplace outcomes

Competency standards are developed by a working group comprised of representative from NSDA, Key Institutions, ISC, and industry experts to identify the competencies required of an occupation in **light engineering sector**.

Competency standards describe the skills, knowledge and attitude needed to perform effectively in the workplace. CS acknowledge that people can achieve technical and vocational competency in many ways by emphasizing what the learner can do, not how or where they learned to do it.

With competency standards, training and assessment may be conducted at the workplace or at training institute or any combination of these.

Competency standards consist of a number of units of competency. A unit of competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of competency are documented in a standard format that comprises of:

- unit title
- nominal duration
- unit code
- unit descriptor
- elements and performance criteria
- variables and range statement
- curricular content guide
- assessment evidence guides

Together, all the parts of a unit of competency:

- describe a work activity
- guide the assessor to determine whether the candidate is competent or not yet competent

The ensuing sections of this document comprise of a description of the relevant occupation, trade or job with all the key components of a unit of competency, including:

- a chart with an overview of all Units of Competency for the relevant occupation, trade or job including the Unit Codes and the Unit of Competency titles and corresponding Elements
- the Competency Standard that includes the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide and Assessment Evidence Guide.

Competency Standards for National Skills Certificate – Level-2 in Automotive Mechanics in Light Engineering Sector


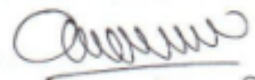



Level Descriptors of NSQF (BNQF 1-6)

Level & Job Classification	Knowledge Domain	Skills Domain	Responsibility Domain
6-Mid-Level Manager/ Sub Assistant Engineer	Comprehensive actual and theoretical knowledge within a specific work or study area with an awareness of the validity and limits of that knowledge, able to analyse, compare, relate and evaluate.	Specialised and wider range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems. Communicate professional issues and solutions to the team and to external partners/users.	Work under broad guidance and self-motivation to execute strategic and operational plan/s. Lead lower-level management. Diagnose and resolve problems within and among work groups.
5-Supervisor	Broad knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to scrutinize and break information into parts by identifying motives or causes.	Broad range of cognitive and practical skills required to generate solutions to specific problems in one or more work or study areas. Communicate practice-related problems and possible solutions to external partners.	Work under guidance of management and self-direction to resolve specific issues. Lead and take responsibility for the work and actions of group/team members. Bridge between management.
4-Highly Skilled Worker	Broader knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to solve problems to new situations by comparing and applying acquired knowledge.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying the full range of methods, tools, materials and information. Communicate using technical terminology and IT technology with partners and users as per workplace requirements.	Work under minimal supervision in specific contexts in response to workplace requirements. Resolve technical issues in response to workplace requirements and lead/guide a team/ group.
3-Skilled Worker	Moderately broad knowledge in a specific work or study area, able to perceive ideas and abstract from drawing and design according to workplace requirements.	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools. Communicate with his team and limited external partners upholding the values, nature and culture of the workplace	Work or study under supervision with considerable autonomy. Participate in teams and responsible for group coordination.
2-Semi Skilled Worker	Basic understanding of underpinning knowledge in a specific work or study area, able to interpret and apply common occupational terms and instructions.	Skills required to carry out simple tasks, communicate with his team in the workplace presenting and discussing results of his work with required clarity.	Work or study under supervision in a structured context with limited scope of manipulation
1 –Basic Skilled Worker	Elementary understanding of ability to interpret the underpinning knowledge in a specific study area, able to interpret common occupational terms and instructions.	Specific Basic skills required to carry out simple tasks. Interpret occupational terms and present the results of own work within guided work environment/ under supervision.	Work under direct supervision in a structured context with limited range of responsibilities.

List of Abbreviations

General	
NSDA	National Skills Development Authority
BMET	Bureau of Manpower Employment and Training
ILO	International Labor Organization
ISC	Industry Skills Council
NPVC	National Pre-Vocation Certificate
NSQF	National Skills Qualifications Framework
PPP	Public Private Partnership
SCVC	Standards and Curriculum Validation Committee
SEIP	Skills for Employment Investment Program
STP	Skills Training Provider
UoC	Unit of Competency
Occupation Specific	
EPS	Electronic Power System
ESD	Electro-static Discharge
LE	Light Engineering
ECU	Electronic Control unit
OSH	Occupational safety and health
PPE	Personal protective equipment
VVTI	variable Valve Timing Injection
ECM	Electronic Control Module

Approval of Competency Standard

Name and Designation	Signature
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Md. Nurul Amin Member (Registration & Certification) Joint Secretary National Skills Development Authority	 17.01.22
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**National Competency Standards for National Skill Certificate – 2 in
Automotive Mechanics**

Course Structure

SL	Unit Code and Title		UoC Level	Nominal Hours
Generic Units of Competencies				55
1.	GU-02-L2-V1	Carry Out Workplace Interaction	2	15
2.	GU-04-L1-V1	Work in the Team Environment	2	20
3.	GU-03-L2-V1	Communicate in the Workplace	2	20
Sector Specific Competencies				00
Occupation Specific Units of Competencies				215
4.	OU-LE-AMech-01-L2-V1	Perform Wheels Balancing and Alignment	2	15
5.	OU-LE-AMech-02-L2-V1	Service and Repair Steering System	2	25
6.	OU-LE-AMech-03-L2-V1	Service and Repair Charging system	2	15
7.	OU-LE-AMech-04-L2-V1	Service and Repair Air Induction System	2	20
8.	OU-LE-AMech-05-L2-V1	Service and Repair exhaust system	2	20
9.	OU-LE-AMech-06-L2-V1	Service and Repair Braking Systems	2	35
10.	OU-LE-AMech-07-L2-V1	Service and Repair Clutch System	2	20
11.	OU-LE-AMech-08-L2-V1	Perform Basic Maintenance of Air Conditioning System	2	30
12.	OU-LE-AMech-09-L2-V1	Perform Spark Ignition (SI) Engine Tune-Up	2	15
13.	OU-LE-AMech-10-L2-V1	Perform Diesel Engine Tune-Up	2	20
Total Nominal Learning Hours				270

Units & Elements at a Glance

Generic Units of Competencies

Code	Unit of Competency	Elements of Competency	Duration (Hours)
GU-02-L2-V1	Carryout Workplace Interaction	<ol style="list-style-type: none"> 1. Interpret workplace communication and etiquette 2. Read and understand workplace documents 3. Participate in workplace meetings and discussions 4. Practice professional ethics at workplace 	15
GU-04-L1-V1	Work in the Team Environment	<ol style="list-style-type: none"> 1. Define team role and scope 2. Identify individual role and responsibility 3. Participate in team discussions 4. Work as a team member 	20
GU-03-L2-V1	Communicate in the Workplace	<ol style="list-style-type: none"> 1. Receive verbal instructions 2. Interpret verbal and written information/instruction 3. Convey instructions using verbal and written forms of communication 4. Complete written documentation 5. Participate in workplace meetings and discussions 	20
Total Nominal Hour			55

Occupation Specific Unit of Competencies

Code	Unit of Competency	Elements of Competency	Hours
OU-LE-AMech-01-L2-V1	Perform Wheels Servicing and Balancing	<ol style="list-style-type: none"> 1. 1.Prepare for work 2. Perform wheels servicing 3. Perform wheels Balancing 4. Clean and store tools and equipment 	15
OU-LE-AMech-02-L2-V1	Repair Steering System	<ol style="list-style-type: none"> 1. Diagnose Faults in Steering System 2. Repair steering system 3. Clean and store tools and equipment 	25
OU-LE-AMech-03-L2-V1	Service Charging System	<ol style="list-style-type: none"> 1. Diagnose Faults in Charging System 2. Service Charging system 3. Clean and store tools and equipment 	15
OU-LE-AMech-04-L2-V1	Service and Repair Air Induction System	<ol style="list-style-type: none"> 1. Diagnose Faults in Air induction System 2. Repair Air induction system 3. Clean and store tools and equipment 	20
OU-LE-AMech-05-L2-V1	Service and Repair Exhaust System	<ol style="list-style-type: none"> 1. Diagnose Faults in Exhaust System 2. Repair Exhaust system 3. Clean and store tools and equipment 	20
OU-LE-AMech-06-L2-V1	Service and Repair Braking Systems	<ol style="list-style-type: none"> 1. Diagnose Faults in Braking System 2. Repair Braking system 3. Clean and store tools and equipment 	35
OU-LE-AMech-07-L2-V1	Service and Repair Clutch System	<ol style="list-style-type: none"> 1. Diagnose Faults in Clutch System 2. Repair Clutch system 3. Clean and store tools and equipment 	20
OU-LE-AMech-08-L2-V1	Perform Basic Maintenance of Air Conditioning System	<ol style="list-style-type: none"> 1. Identify components of Air conditioning System 2. Perform maintenance of Air conditioning system 3. Clean and store tools and equipment 	30
OU-LE-AMech-09-L2-V1	Perform Spark Ignition (SI) Engine Tune-Up	<ol style="list-style-type: none"> 1. Tune up air, fuel and ignition 2. Check and test ignition system 3. Check and adjust engine speed 4. Check valve/ tappet clearance 5. Clean and store tools and equipment 	15
OU-LE-AMech-10-L2-V1	Perform Diesel Engine Tune-Up	<ol style="list-style-type: none"> 1. Service fuel injection system 2. Service drive belt. 3. Check engine compression. 4. Check valve tappet clearance. 5. Clean and store tools and equipment 	20
Total Nominal Hour			215

Generic Unit of Competencies

Unit Code and Title	GU-02-L2-V1: Carryout Workplace Interaction
Unit Descriptor	This unit covers the knowledge, skills and attitude required to carry out workplace interaction. It specifically includes interpreting workplace communication and etiquette, reading and understanding workplace documents, participating in workplace meetings and discussions and practicing professional ethics at workplace.
Nominal Hours	15 Hours
Elements of Competency	Performance Criteria <u>Bold underlined</u> terms are elaborated in the Range of Variables
1. Interpret workplace communication and etiquette	<p>1.1 Workplace code of conducts are interpreted as per organizational guidelines</p> <p>1.2 Appropriate lines of communication are maintained with supervisors and colleagues</p> <p>1.3 Workplace interactions are conducted in a <u>courteous manner</u> to gather and convey information</p> <p>1.4 Questions about routine <u>workplace procedures and matters</u> are asked and responded as required</p>
2. Read and understand workplace documents	<p>2.1 Workplace documents are interpreted as per standard.</p> <p>2.2 Assistance is taken to aid comprehension when required from peers / supervisors</p> <p>2.3 Visual information / symbols / signage's are understood and followed</p> <p>2.4 Specific and relevant information are accessed from <u>appropriate sources</u></p> <p>2.5 Appropriate medium is used to transfer information and ideas</p>
3. Participate in workplace meetings and discussions	<p>3.1 Team meetings are attended on time and meeting procedures and etiquette are followed</p> <p>3.2 Own opinions are expressed and others opinions are listened without interruption</p> <p>3.3 Inputs are provided consistent with meeting purpose and meeting outcomes are implemented</p>
4. Practice professional ethics at workplace	<p>4.1 Responsibilities as a team member are demonstrated and kept promises and commitments made to others</p> <p>4.2 Tasks are performed in accordance with workplace procedures</p> <p>4.3 Confidentiality is respected and maintained</p> <p>4.4 Situations and actions considered inappropriate or which present a conflict of interest are avoided</p>
Range of Variables	
Variable	Range (may include but not limited to):

1. Courteous manner	<ul style="list-style-type: none"> 1.1 Effective questioning 1.2 Active listening 1.3 Speaking skills
2. Workplace procedures and matters	<ul style="list-style-type: none"> 2.1 Notes 2.2 Agenda 2.3 Simple reports <ul style="list-style-type: none"> 2.3.1 Progress report 2.3.2 Incident report 2.4 Job sheets 2.5 Operational manuals 2.6 Brochures and promotional material 2.7 Visual and graphic materials 2.8 Standards 2.9 OSH information 2.10 Signs
3. Appropriate sources	<ul style="list-style-type: none"> 3.1 HR Department 3.2 Managers 3.3 Supervisors
<p>Evidence Guide</p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.</p>	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 maintained workplace communication and etiquette 1.2 followed workplace instructions and symbols 1.3 followed team meeting and etiquette
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Workplace communication and etiquette 2.2 Workplace documents, signs and symbols 2.3 Meeting procedure and etiquette
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Maintaining workplace communication and etiquette 3.2 Following workplace instructions and symbols 3.3 Following team meeting and etiquette
4. Underpinning attitude	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers and seniors in workplace

5. Resource implications	<p>The following resources must be provided:</p> <ul style="list-style-type: none"> 5.1 Work place Procedure 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required. 5.4 Relevant specifications or work instructions
6. Methods of assessment	<p>Methods of assessment may include but not limited to:</p> <ul style="list-style-type: none"> 6.1 Written test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of assessment	<ul style="list-style-type: none"> 7.1 Competency assessment must be done in a training center or in an actual or simulated work place after Completion of the training module 7.2 Assessment should be done by NSDA certified assessor
<p>Accreditation Requirements</p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under National Skills Qualification (NSQF). Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

Unit Code and Title	GU-04-L1-V1: Work in a Team Environment
Unit Descriptor	This unit covers the knowledge, skills and attitudes (KSA) required in work in a team environment. It includes defining team role and scope, identifying individual role and responsibility. Participating in team discussions and working as a team member.
Nominal Hours	20 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Define team role and scope	1.1. Role and objectives of the team are defined. 1.2. Team structure, responsibilities and reporting relations are identified from team discussions and other external sources.
2. Identify individual role and responsibility	2.1 Individual roles and responsibilities of <u>team members</u> are identified. 2.2 Reporting relationships among team members are defined and clarified. 2.3 Reporting relationships external to the team are defined and clarified.
3. Participate in team discussions	2.1 Ideas related to team plans are contributed. 2.2 Recommendations for improving team work are put forward.
4. Work as a team member	4.1. Effective forms of communication are used to interact with team members. 4.2. Communication channels are followed. 4.3. OHS practices are followed.
Range of Variables	
Variables	Range (may include but not limited to):
1. Team Members	2.1 Coach/mentor 2.2 Supervisor/Manager 2.3 Peers/Colleagues 2.4 Employee representative
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 demonstrated knowledge in working in a team environment. 1.2 satisfied the requirements mentioned in the Performance Criteria and Range of Variables
2. Underpinning knowledge	2.1 Team Structure, Role and Responsibility 2.2 Individual Members' Roles and Responsibilities 2.3 Communication Flow and Reporting Structures 2.4 Team Planning 2.5 Interpersonal Communication Skills 2.6 Team Meeting Procedures 2.7 OHS Practices

3. Underpinning skills	3.1 Identifying the role and responsibility of the team 3.2 Identifying roles and responsibilities of individual members 3.3 Participating in team discussions 3.4 Working as a team member
4. Underpinning Attitudes	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in Workplace
5. Resource implications	5.1 Pens 5.2 Telephone 5.3 Computer 5.4 Writing materials 5.5 Online communication
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1. Workplace observation 6.2. Demonstration 6.3. Oral questioning 6.4. Written test 6.5. Portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment center 7.2 Assessment should be done by a NSDA certified/nominated assessor
<p>Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under National Skills Qualification (NSQF). Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

Unit code and Title	GU-03-L2-V1: Communicate in the Workplace
Unit Descriptor	This unit covers the knowledge, skills and attitudes (KSAs) required to communicate in the workplace. It includes the use of verbal and written forms of communication to receive, interpret, convey, and document information/ instruction using appropriate communication equipment.
Nominal Hours	20 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables Training Components
1. Receive verbal instructions.	1.1 Instructions are accessed and interpreted 1.2 Questions are asked to clarify understanding or gain more information. 1.3 Information/instruction is recorded.
2. Interpret verbal and written information/ instruction	2.1 <u>Written instructions</u> are interpreted. 2.2 Work <u>signage's</u> are properly responded. 2.3 Routine written instructions are followed in sequence. 2.4 Feedback is given to workplace supervisor.
3. Convey instructions using verbal and written forms of communication	3.1 Relevant <u>communication</u> methods are used to transmit instructions. 3.2 Appropriate non-verbal communication is used. 3.3 Channels of communication are identified and followed 3.4 Communication <u>tools and equipment</u> are operated and faults are identified and reported. 3.5 Information is conveyed using appropriate <u>forms</u> .
4. Complete written documentation	4.1 All required <u>documentation</u> is completed 4.2 Workplace data are recorded 4.3 Written information/instruction is passed to personnel.
5. Participate in work place meetings and discussions	5.1. Meetings are attended regularly and on time. 5.2. Meeting inputs are consistent with the meeting purpose and established protocols. 5.3. Opinions are expressed without interruption. 5.4. Meeting outputs are processed and implemented.
Range of Variables	
Variable	Range (may include but not limited to):
1. Written instructions	1.1 Supervisor's/Manager's Instructions 1.2 Memoranda 1.3 Rules and Regulations 1.4 Signage 1.5 Approved Work Plan 1.6 External communications
2. Signage	2.1 On-site direction signs 2.2 Common site warnings 2.3 Location signs 2.4 Traffic signs

3. Communication	3.1 Verbal instructions 3.2 Written instructions 3.3 Online communication
4. Tools and equipment	5.1 Telephone 5.2 Mobile Phone 5.3 Fax machines 5.4 Two-way radio 5.5 Computers 5.6 Forms 5.7 Memo 5.8 Two-way radio
5. Forms	6.1 Memorandum 6.2 Requisitioning Form 6.3 Personnel Form 6.4 Safety Report Form
6. Documentation	7.1 Reports (Monthly, Quarterly, Half-Yearly, Annual) 7.2 Plans (Strategic Plan, Operational Plan, Monthly Schedule) 7.3 Monitoring and Evaluation Report 7.4 Minutes of Meetings
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency	
1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 demonstrated knowledge of workplace procedures in receiving, interpreting and conveying verbal & written communication. 1.2 satisfied the requirements mentioned in the Performance Criteria and Range of Variables.
2. Underpinning Knowledge	2.1 Workplace Communication Policies, Standards and Procedures 2.2 Verbal and Non-verbal communication 2.3 Modes of Communication 2.4 Communication Equipment: Types, Uses and Faults 2.5 Channels of Communication
3. Underpinning Skills	3.1 Receiving verbal instructions. 3.2 Interpreting verbal and written information/ instruction 3.3 Conveying instructions using verbal and written forms of communication 3.4 Completing written documentation 3.5 Participating in workplace meetings and discussions
4. Underpinning Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in workplace
5. Resource Implications	The following resources must be provided: 5.1 Pens 5.2 Telephone 5.3 Computer 5.4 Writing materials 5.5 Online communication

6. Methods of Assessment	<p>Methods of assessment may include but not limited to:</p> <p>6.1 Workplace observation</p> <p>6.2 Demonstration</p> <p>6.3 Oral questioning</p> <p>6.4 Written test</p> <p>6.5 Portfolio</p>
7. Context of Assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor.</p>
<p>Accreditation Requirements</p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under National Skills Qualification (NSQF). Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

Occupation Specific Unit of Competencies

Unit Code and Title	OU-LE-AMech-01-L2-V1: Perform Wheels Balancing and Alignment
Unit Descriptor	This unit covers the skills, knowledge and attitudes required to perform wheels servicing and Balancing. It specifically includes preparing for work, perform wheels servicing, and Perform wheels Balancing.
Nominal Hours	15 Hours
Elements of Competency	Performance Criteria Bold and Underlined terms are elaborated in the Range of Variables.
1. Prepare for work	1.1 Specifications and instructions are interpreted 1.2 Identify and select appropriate personal protective equipment (PPE). 1.3 Job specific <u>tools and equipment</u> are Identified and selected 1.4 <u>Materials and consumables</u> are selected as per requirements 1.5 Test drive is performed to verify the servicing requirements of wheels according to set standards
2. Perform wheels servicing	2.1 <u>Components of wheels</u> are identified 2.2 Functions of Components are described 2.3 Components are tested as per standard procedure 2.4 Components are replaced and repair as required
3. Perform wheels Balancing	3.1 Wheel rim and tire condition is Checked according to set standards 3.2 Wheel balancing is carried out using appropriate wheel 3.3 Balancing equipment and fixed weight/s are set as per requirement 3.4 Vehicle is re-test on road to verify correction of wheels balancing according to set standards
4. Perform Wheel Alignment	4.1 Functionality of suspension, steering is Checked and adjust as required 4.2 Camber, caster, toe-in-and toe-out are set according to set standards 4.3 Re-test vehicle on road to verify alignment of wheels according to set standards
5. Clean and store tools and equipment	5.1 Tools and equipment are cleaned and stored 5.2 Waste material are disposed as per workplace procedure 5.3 Workplace is cleaned as per workplace standard
Range of Variables	
Variables	Range (may include but not limited to):

1. Tools and equipment.	<ul style="list-style-type: none"> 1.1 Screw Driver Set 1.2 Allen Key set 1.3 L- Wrench 1.4 Wheel wrench 1.5 Hydraulic Jac 1.6 Car Stand 1.7 Tyre changing Machine 1.8 Wheel balancing Machine 1.9 Tyre lever 1.10 Vulcanizing machine 1.11 Impact Wrench 1.12 Air Compressor 1.13 Air pressure Gauge 1.14 Air Gun 1.15 Pilers hammer 1.16 Nozzle opener 1.17 Rough file 1.18 Torque meter
2. Materials and consumables	<ul style="list-style-type: none"> 2.1 Wheel balancing weight 2.2 Vulcanizing patch 2.3 Vulcanizing Solution 2.4 Waste cotton 2.5 Napkin 2.6 Tissue paper
3. Components of wheel	<ul style="list-style-type: none"> 3.1 Tire 3.2 Rim 3.3 Hub 3.4 Valve system 3.5 Tire pressure sensor
<p>Evidence Guide</p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.</p>	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 test drive is performed to verify the servicing requirements of wheels according to set standards 1.2 perform wheels servicing 1.3 perform wheels balancing 1.4 perform wheel alignment

2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Define wheel 2.2 Components of Wheel 2.3 Functions of components 2.4 Describe wheel size 2.5 Different types of Tires 2.6 Describe Tire size 2.7 Selection criteria of tire 2.8 Wheel balancing 2.9 Wheel alignment 2.10 Vehicle lifting and support procedures 2.11 Wheel balancing Weight 2.12 Run out 2.13 Torque measurement process 2.14 Basic Geometrical Angles 2.15 Camber, caster, toe-in-and toe out 2.16 Method of Wheel Balancing 2.17 Tire nomenclature
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Reading and interpreting specifications and instructions 3.2 Practicing workplace safety 3.3 Handling tools and equipment 3.4 Planning for won activities
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource implications	<ul style="list-style-type: none"> 5.1 Adequate workplaces 5.2 Starting system components 5.3 Service manuals 5.4 Tools and equipment for performing work activities 5.5 Fire extinguisher
6. Methods of assessment	<ul style="list-style-type: none"> 6.1. Workplace observation 6.2. Demonstration 6.3. Oral questioning 6.4. Written test 6.5. Portfolio
7. Context of assessment	<ul style="list-style-type: none"> 7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under National Skills Qualification (NSQF). Accredited providers assessing against

this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	OU-LE-AMech-02-L2-V1: Service and Repair Steering System
Unit Descriptor	This competency standard is developed to provide skills and knowledge to service and repair steering system. It is specially included the task of diagnose faults in steering system, rrepair steering system, clean and store tools and equipment.
Nominal Hours	25 Hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Diagnose Faults in Steering System	<ul style="list-style-type: none"> 1.1 Perform test drive on different types of roads to verify abnormal noise/stability and vibrations 1.2 Check <u>Steering</u> rack and pinion assembly to identify fault. 1.3 Check power steering pump, pipe, joints, tie rod end, connection, belt, steering rack and fluid level of hydraulic power box. 1.4 Wiring steering assembly, (Electronic power steering) EPS module, EPS motor, and electric connection 1.5 Check EPS signal & sensors 1.6 Check all mounting nut and bolts to ensure safety 1.7 Check rack boot cover 1.8 Check Steering column and motor 1.9 Check (High voltage) HV steering rack and motor 1.10 Check Tilt and telescopic system
2. Repair steering system	<ul style="list-style-type: none"> 2.1 Select and collect <u>tools and equipment</u> as per requirements. 2.2 Select and collect <u>material and consumable</u> as per requirements. 2.3 Repair/ replace faulty <u>components of steering system</u> according to set standard. 2.4 Repair/ replace electrical Components and sensors of EPS as required 2.5 Replace rack boot cover as required 2.6 Service Tilt and telescopic system as required.
3. Clean and store tools and equipment	<ul style="list-style-type: none"> 3.1 Tools and equipment are cleaned and stored 3.2 Waste material are disposed as per workplace procedure 3.3 Workplace is cleaned as per workplace standard
Range of Variables	
Variables	Range (may include but not limited to):

1. Steering	<ul style="list-style-type: none"> 1.1 Manual 1.2 Automatic 1.3 EMPS 1.4 Hybrid
2. Tools and equipment.	<ul style="list-style-type: none"> 2.1. Hydraulic jack 2.2. Wheel wrench 2.3. Car stand 2.4. Socket wrench set 2.5. Combination wrench set 2.6. Wire striper pliers 2.7. Tray 2.8. Flat Screw driver 2.9. Philip's screw driver set 2.10. AVO Meter 2.11. OBD Scanner 2.12. Test lamp 2.13. Steering wheel puller. 2.14. Steering hydraulic pressure gauge. 2.15. Ball Joint opener. 2.16. Fluid flashing machine 2.17. Toe in Gauge 2.18. HV tools and equipment
3. Material and consumable	<ul style="list-style-type: none"> 3.1 Power oil 3.2 Waste Cotton 3.3 Kerosene 3.4 Grease 3.5 Fender cover 3.6 Wiring cable 3.7 Insulation Tape
4. Components of Steering system	<ul style="list-style-type: none"> 4.1 Steering wheel 4.2 Steering cover 4.3 Steering Column 4.4 Column Bearing 4.5 Steering Cross 4.6 Steering Gear box 4.7 Idler Arm 4.8 Pitman Arm 4.9 Tie rod 4.10 Track rod 4.11 Relay rod 4.12 Link rod 4.13 Ball Joint 4.14 Knuckle joint 4.15 Knuckle Arm 4.16 Steering damper 4.17 Boot Cover

	4.18 King Pin 4.19 EMPS , EPS,PS motor 4.20 Sensors 4.21 ECU 4.22 Oscilloscope
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 diagnosed faults in steering system 1.2 repair steering system 1.3 clean and store tools and equipment
2. Underpinning knowledge	2.1 Define Steering system 2.2 Function of Steering system 2.3 Classification of Steering system 2.4 Component of Steering system 2.5 Functions of components 2.6 Electrical controls and switches 2.7 Describe High voltage (HV) components 2.8 Precautionary measures to handle HV components
3. Underpinning skills	3.1 Reading and interpreting specifications and instructions 3.2 Practicing workplace safety 3.3 Handling tools and equipment 3.4 Planning for work activities
4. Underpinning attitudes	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource implications	5.1 Adequate workplaces 5.2 Steering system components 5.3 Service manuals 5.4 Tools and equipment for performing work activities 5.5 Fire extinguisher
6. Methods of assessment	6.1 Demonstration 6.2 Oral questioning 6.3 Written test 6.4 Portfolio

7. Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor</p>
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Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under National Skills Qualification (NSQF). Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	OU-LE-AMech-03-L2-V1: Service and Repair Charging System
Unit Descriptor	This unit of competency is developed to provide skills and knowledge and uphold positive attitude to Service and Repair Charging system in accordance with the Manufacturer Manual. This unit specially includes diagnose faults in charging system, service charging system, clean and store tools and equipment.
Nominal Hours	15 Hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Rang of Variables.
1. Diagnose Faults in Charging System	<ul style="list-style-type: none"> 1.1 Battery charging is checked as per manufacturer's instruction 1.2 Battery signal is checked as per standard procedure 1.3 Tension of alternator belt is checked and faults are identified as per standard procedure 1.4 Electric circuit is checked and faults are identified as per standard operating procedure 1.5 HV electrical system is checked and faults are identified as per standard operating procedure
2. Service Charging system	<ul style="list-style-type: none"> 2.1 Select and collect <u>tools and equipment</u> as per requirements. 2.2 Select and collect <u>material and consumable</u> as per requirements. 2.3 Repair/ replace faulty <u>components of charging system</u> according to set standard.
3. Clean and store tools and equipment	<ul style="list-style-type: none"> 3.1 Tools and equipment are cleaned and stored 3.2 Waste material are disposed as per workplace procedure 3.3 Workplace is cleaned as per workplace standard
Range of Variables	
Variables	Range (may include but not limited to):

1. Tools and equipment.	<ul style="list-style-type: none"> 1.1 Socket wrench set 1.2 Combination wrench set 1.3 Wire striper pliers 1.4 Circlip pliers 1.5 Tray 1.6 Flat Screw driver 1.7 Philip’s screw driver set 1.8 AVO Meter 1.9 OBD Scanner 1.10 Test lamp 1.11 Battery load tester/ battery test scanner 1.12 Hydrometer 1.13 Battery terminal cleaner 1.14 Battery charger 1.15 Jumper cable
2. Material and consumable	<ul style="list-style-type: none"> 2.1 Waste Cotton 2.2 Kerosene 2.3 Grease 2.4 De-mineral water 2.5 Electrolyte 2.6 Flexible cable
3. Components of charging system	<ul style="list-style-type: none"> 3.1 Batteries 3.2 Fuse 3.3 Ignition switch 3.4 Relay 3.5 Regulator 3.6 Alternator 3.7 Belt 3.8 Belt adjuster 3.9 Battery Load sensor 3.10 Charging Indicator lamp 3.11 electronic control module ECM
<p>Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.</p>	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 diagnose faults in charging system 1.2 service charging system 1.3 clean and store tools and equipment
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Define Charging system 2.2 Function of Charging system 2.3 Classification of Charging system 2.4 Component of Charging system 2.5 Functions of components

3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Reading and interpreting specifications and instructions 3.2 Practicing workplace safety 3.3 Handling tools and equipment 3.4 Planning for won activities 3.5 Working with others
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource implications	<ul style="list-style-type: none"> 5.1 Adequate workplaces 5.2 Charging system components 5.3 Service manuals 5.4 Tools and equipment for performing work activities 5.5 Fire extinguisher
6. Methods of assessment	<ul style="list-style-type: none"> 6.1 Workplace observation 6.2 Demonstration 6.3 Oral questioning 6.4 Written test 6.5 Portfolio
7. Context of assessment	<ul style="list-style-type: none"> 7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

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Unit Code and Title	OU-LE-AMech-04-L2-V1: Service and Repair Air Induction System
Unit Descriptor	This unit covers the knowledge, skills and attitudes required of a worker to Service Air induction system. It specifically includes the tasks of Diagnose Faults in Air induction System, Repair Air induction system and Clean and store tools and equipment.
Nominal Hours	20 Hours
Elements of Competency	Performance Criteria Bold and Underlined terms are elaborated in the Range of Variables.
1. Diagnose Faults in Air induction System	1.1 <u>Components of Air induction system</u> are identified 1.2 Components of Air induction system are checked 1.3 Faults in air induction system is identified and ensured
2. Repair Air induction system	2.1. Select and collect <u>tools and equipment</u> as per requirements. 2.2. Select and collect <u>material and consumable</u> as per requirements. 2.3. Repair/ replace faulty components of Air induction system according to set standard.
3. Clean and store tools and equipment	3.1 Tools and equipment are cleaned and stored 3.2 Waste material are disposed as per workplace procedure 3.3 Workplace is cleaned as per workplace standard
Range of Variables	
Variables	Range (may include but not limited to):
1. Components of Air induction system	1.1 Air filter assembly 1.2 Idle speed control Valve (ISCV) 1.3 Air valve 1.4 Throttle body 1.5 Air intake chamber 1.6 Intake valve 1.7 Air Temperature sensor 1.8 Air Flow meter 1.9 Throttle position sensor 1.10 Turbocharger/Supercharger 1.11 Intercooler 1.12 (Pressure intake manifold) PIM/ (manifold absolute pressure) MAP sensor 1.13 Intercooler/ Preheater 1.14 PCV (Positive crankcase Ventilation) 1.15 EGR (Exhaust gas recirculation) 1.16 VSV (Variable solenoid Valve)

2. Tools and equipment.	<ul style="list-style-type: none"> 2.1 Socket wrench set 2.2 Combination wrench set 2.3 Tray 2.4 Flat Screw driver 2.5 Philip’s screw driver set 2.6 AVO Meter 2.7 OBD Scanner 2.8 Air Compressor 2.9 Test lamp
3. Material and consumable	<ul style="list-style-type: none"> 3.1 Waste Cotton 3.2 Kerosene 3.3 Octane 3.4 Rust remover
<p>Evidence Guide</p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.</p>	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 diagnose faults in air induction system 1.2 repair air induction system 1.3 clean and store tools and equipment
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Define Charging system 2.2 Function of Charging system 2.3 Classification of Charging system 2.4 Component of Charging system 2.5 Functions of components
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Reading and interpreting specifications and instructions 3.2 Practicing workplace safety 3.3 Handling tools and equipment 3.4 Planning for work activities 3.5 Working with others
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource implications	<ul style="list-style-type: none"> 5.1 Adequate workplaces 5.2 Charging system components 5.3 Service manuals 5.4 Tools and equipment for performing work activities 5.5 Fire extinguisher

6. Methods of assessment	6.1 Demonstration 6.2 Oral questioning 6.3 Written test 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under National Skills Qualification (NSQF). Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	OU-LE-AMech-05-L2-V1: Service and Repair Exhaust System
Unit Descriptor	This unit covers the knowledge, skills and attitudes required of a worker to service and repair exhaust system. It specifically includes the tasks of Diagnose Faults in exhaust system, repair exhaust system and clean and store tools and equipment.
Nominal Hours	20 Hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Diagnose Faults in Exhaust System	1.1 <u>Components of Exhaust system</u> are identified 1.2 Components of exhaust system are checked 1.3 Faults in exhaust system is identified and ensured
2. Repair Exhaust System	2.1 Select and collect <u>tools and equipment</u> as per requirements 2.2 Select and collect <u>material and consumable</u> as per requirements 2.3 Repair/ replace faulty components of exhaust system according to set standard
3. Clean and store tools and equipment	3.1 Tools and equipment are cleaned and stored 3.2 Waste material are disposed as per workplace procedure 3.3 Workplace is cleaned as per workplace standard
Range of Variables	
Variables	Range (may include but not limited to):
1. Components of exhaust system	1.1 Exhaust valve 1.2 Exhaust manifold 1.3 Oxygen sensor 1.4 Catalytic converter 1.5 Exhaust temperature sensor 1.6 Silencer box (muffler) 1.7 Tail pipe 1.8 EGR valve 1.9 Air Valve 1.10 Resonator 1.11 Heat stopper 1.12 Mounting

2. Tools and equipment.	<ul style="list-style-type: none"> 2.1 Socket wrench set 2.2 Combination wrench set 2.3 Tray 2.4 Flat Screw driver 2.5 Philip's screw driver set 2.6 Multi Meter 2.7 OBD Scanner 2.8 Test lamp 2.9 Exhaust gas analyzer 2.10 Car stand 2.11 Hydraulic Jac
3. Material and consumable	<ul style="list-style-type: none"> 3.1 Waste Cotton 3.2 Kerosene
<p>Evidence Guide</p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.</p>	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 diagnose faults in exhaust system 1.2 repair exhaust system 1.3 clean and store tools and equipment
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Define exhaust system 2.2 Function of exhaust system 2.3 Classification of exhaust system 2.4 Component of exhaust system 2.5 Functions of components
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Reading and interpreting specifications and instructions 3.2 Practicing workplace safety 3.3 Handling tools and equipment 3.4 Planning for won activities
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource implications	<ul style="list-style-type: none"> 5.1 Adequate workplaces 5.2 Cooling system components 5.3 Service manuals 5.4 Tools and equipment for performing work activities 5.5 Fire extinguisher
6. Methods of assessment	<ul style="list-style-type: none"> 6.1 Demonstration 6.2 Oral questioning 6.3 Written test

	6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor
<p>Accreditation Requirements</p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under National Skills Qualification (NSQF). Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

Unit Code and Title	OU-LE-AMech-06-L2-V1: Service and Repair Braking Systems
Unit Descriptor	This unit covers the knowledge, skills and attitudes required of a worker to Service and Repair Braking Systems. It specifically includes the tasks of Diagnose Faults in Braking System, Repair Braking system and Clean and store tools and equipment.
Nominal Hours	35 Hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Diagnose Faults in Braking System	<ul style="list-style-type: none"> 1.1 Test drive is performed to verify the faults (noise, wear, operation) of <u>brake system</u> according to SOP 1.2 Standard brake fluid level and quality/aging is checked 1.3 Brake lines and hose is checked for leakage 1.4 <u>Components of Braking system</u> are checked and faults are identified
2. Repair Braking system	<ul style="list-style-type: none"> 2.1 Select and collect <u>tools and equipment</u> as per requirements. 2.2 Select and collect <u>material and consumable</u> as per requirements. 2.3 Dismantle brake system components as per manufacturer specification. 2.4 Repair/replace/adjust faulty components of braking system according to set standard. 2.5 Assemble braking system components as per manufacturer specifications and instruction 2.6 Refill brake fluid according to workplace standard. 2.7 After repair test drive is performed to ensure proper working of brake system. 2.8 Function of braking system is checked and adjusted as required.
3. Clean and store tools and equipment	<ul style="list-style-type: none"> 3.1 Tools and equipment are cleaned and stored 3.2 Waste material are disposed as per workplace procedure 3.3 Workplace is cleaned as per workplace standard
Range of Variables	
Variables	Range (may include but not limited to):
1. Braking system	<ul style="list-style-type: none"> 1.1 Mechanical 1.2 Hydraulic 1.3 Pneumatic

	<ul style="list-style-type: none"> 1.4 Electromagnetic 1.5 Antilock 1.6 Servo 1.7 Electrical
2. Components of Brake system	<ul style="list-style-type: none"> 2.1 Brake paddle 2.2 Parking brake components 2.3 Master cylinder 2.4 Wheel cylinder 2.5 Vacuum buster units 2.6 Air buster 2.7 Brake indicator switch 2.8 Equalizer Cables 2.9 Wheel speed sensors 2.10 Brake shoe 2.11 Brake drum 2.12 Calliper washer 2.13 Dust boots 2.14 Wheel cylinder washer 2.15 Master cylinder washer 2.16 Brake disc rotor 2.17 Brake stop light switch 2.18 Fluid reservoir 2.19 Lines and Hoses 2.20 ABS pump 2.21 ABS Controller 2.22 Impulse sensor 2.23 Electrical connectors 2.24 Distribution block 2.25 Brake light and switch 2.26 Brake Servo/ motor 2.27 Actuators 2.28 Sensors 2.29 ECM 2.30 Parking brake motor
3. Tools and equipment.	<ul style="list-style-type: none"> 3.1 Hydraulic Jack 3.2 Wheel wrench 3.3 Impact wrench 3.4 Car stand 3.5 Socket wrench set 3.6 Combination wrench set 3.7 Circlip pliers 3.8 Nose pliers 3.9 Tray

	<ul style="list-style-type: none"> 3.10 Flat Screw driver set 3.11 Philip's screw driver set 3.12 Multi Meter 3.13 OBD Scanner 3.14 Test lamp 3.15 Rivet punch 3.16 Transparent Pipe 3.17 Air compressor 3.18 Brake hose clamp 3.19 Funnel 3.20 Brake air bleeding machine 3.21 Verner calliper 3.22 Disk/Shoe/Pad thickness gauge
4. Material and consumable	<ul style="list-style-type: none"> 4.1 Waste Cotton 4.2 Kerosene 4.3 Grease 4.4 Brake fluid (DOT-3, DOT-4) 4.5 Emery cloth
<p>Evidence Guide</p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.</p>	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 diagnosed faults in braking system 1.2 repaired braking system 1.3 cleaned and stored tools and equipment
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Define Braking system 2.2 Function of Braking system 2.3 Classification of Braking system 2.4 Describe different types braking system 2.5 Component of Braking system 2.6 Functions of components 2.7 Brake assist system
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Reading and interpreting specifications and instructions 3.2 Practicing workplace safety 3.3 Handling tools and equipment 3.4 Planning for won activities
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace

5. Resource implications	5.1 Adequate workplaces 5.2 Cooling system components 5.3 Service manuals 5.4 Tools and equipment for performing work activities 5.5 Fire extinguisher
6. Methods of assessment	6.1 Demonstration 6.2 Oral questioning 6.3 Written test 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor
<p>Accreditation Requirements</p> <p>Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under National Skills Qualification (NSQF). Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

Unit Code and Title	OU-LE-AMech-07-L2-V1: Service and Repair Clutch System
Unit Descriptor	This unit covers the knowledge, skills and attitudes required of a worker to Service and Repair Clutch System. It specifically includes the tasks of diagnose faults in clutch system, repair clutch system and clean and store tools and equipment.
Nominal Hours	20 Hours
Elements of Competency	<u>Performance Criteria</u> <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Diagnose Faults in Clutch System	1.1 Test drive is performed to verify the faults (noise, slip, operation) of clutch system according to SOP 1.2 <u>Components of clutch</u> system are checked 1.3 Faults in clutch system is identified and ensured
2. Repair Clutch system	2.1 Select and collect <u>tools and equipment</u> as per requirements. 2.2 Select and collect <u>material and consumable</u> as per requirements. 2.3 Repair/ replace faulty components of clutch system according to set standard
3. Clean and store tools and equipment	3.1 Tools and equipment are cleaned and stored 3.2 Waste material are disposed as per workplace procedure 3.3 Workplace is cleaned as per workplace standard
Range of Variables	
Variables	Range (may include but not limited to):
1. Components of Clutch system	1.1 Clutch paddle 1.2 Clutch master cylinder 1.3 Clutch booster 1.4 Clutch hydraulic lines 1.5 Sleeve cylinder 1.6 Clutch fork 1.7 Release bearing 1.8 Pressure plate 1.9 Clutch disc 1.10 Clutch plate 1.11 Clutch Cable 1.12 Bleeding nipple 1.13 Dust cover 1.14 Flywheel 1.15 Throughout bearing
2. Tools and equipment.	2.1 Hydraulic Jack 2.2 Wheel wrench

	<ul style="list-style-type: none"> 2.3 Impact wrench 2.4 Crane 2.5 Transmission Jack 2.6 Car stand 2.7 Socket wrench set 2.8 Combination wrench set 2.9 Circlip pliers 2.10 Nose pliers 2.11 Tray 2.12 Flat Screw driver 2.13 Philip's screw driver set 2.14 Rivet punch 2.15 Transparent Pipe
3. Material and consumable	<ul style="list-style-type: none"> 3.1 Waste Cotton 3.2 Kerosene 3.3 Grease 3.4 Clutch fluid (DOT-3, DOT-4) 3.5 Emery cloth
Evidence Guide	
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 diagnosed faults in clutch system 1.2 repaired clutch system 1.3 cleaned and stored tools and equipment
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Define Clutch system 2.2 Function of Clutch system 2.3 Classification of Clutch system 2.4 Component of Clutch system 2.5 Functions of components
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Reading and interpreting specifications and instructions 3.2 Practicing workplace safety 3.3 Handling tools and equipment 3.4 Planning for work activities
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource implications	<ul style="list-style-type: none"> 5.1 Adequate workplaces 5.2 Cooling system components 5.3 Service manuals

	<p>5.4 Tools and equipment for performing work activities</p> <p>5.5 Fire extinguisher</p>
6. Methods of assessment	<p>6.1 Workplace observation</p> <p>6.2 Demonstration</p> <p>6.3 Oral questioning</p> <p>6.4 Written test</p> <p>6.5 Portfolio</p>
7. Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor</p>

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under National Skills Qualification (NSQF). Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	OU-LE-AMech-08-L2-V1: Perform Basic Maintenance of Air Conditioning System
Unit Descriptor	This unit covers the knowledge, skills and attitudes required of a worker to Perform basic maintenance of air conditioning system. It specifically includes the tasks of perform basic maintenance of air conditioning system, perform maintenance of air conditioning system and Clean and store tools and equipment.
Nominal Hours	30 Hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Identify components of Air conditioning System	1.1 <u>Major Components of air conditioning system</u> are identified 1.2 Function of Major Components of air conditioning system are demonstrated.
2. Perform maintenance of Air conditioning system	2.1 Select and collect <u>tools and equipment</u> as per requirements. 2.2 Select and collect <u>material and consumable</u> as per requirements. 2.3 <u>Basic maintenance</u> of components of air conditioning system is performed according to set standard.
3. Clean and store tools and equipment	3.1 Tools and equipment are cleaned and stored 3.2 Waste material are disposed as per workplace procedure 3.3 Workplace is cleaned as per workplace standard
Range of Variables	
Variables	Range (may include but not limited to):
1. Major components of air conditioning system	1.1 Compressor 1.2 Belt 1.3 Condenser 1.4 Receiver / Drier 1.5 High pressure line 1.6 Low pressure line 1.7 Cooling fan 1.8 Expansion valve 1.9 Evaporator 1.10 Blower 1.11 Air duct 1.12 AC switch 1.13 AC Filter

2. Tools and equipment.	<ul style="list-style-type: none"> 2.1 Socket wrench set 2.2 Combination wrench set 2.3 Flat Screw driver 2.4 Philip's screw driver set 2.5 Oil can
3. Material and consumable	<ul style="list-style-type: none"> 3.1 Waste Cotton 3.2 Kerosene 3.3 Grease 3.4 Water 3.5 AC Filter
4. Basic Maintenance of Air conditioning system	<ul style="list-style-type: none"> 4.1 Tightening screw and bolt 4.2 Lubricating 4.3 Adjust belt tension 4.4 Check AC switch 4.5 Cleaning Air duct 4.6 Clean AC filter 4.7 Clean condenser
<p>Evidence Guide</p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.</p>	
1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 identified components of air conditioning system 1.2 performed maintenance of air conditioning system 1.3 cleaned and stored tools and equipment
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Define Vehicle Air conditioning system 2.2 Function of Air conditioning system 2.3 Classification of Air conditioning system 2.4 Component of Air conditioning system 2.5 Functions of components
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Reading and interpreting specifications and instructions 3.2 Practicing workplace safety 3.3 Handling tools and equipment 3.4 Planning for won activities 3.5 Communicating with others
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 4.5 Respect for rights of peers and seniors in workplace

5. Resource implications	5.1 Adequate workplaces 5.2 AC system components 5.3 Service manuals 5.4 Tools and equipment for performing work activities 5.5 Fire extinguisher
6. Methods of assessment	6.1 Demonstration 6.2 Oral questioning 6.3 Written test 6.4 Portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

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Unit Code and Title	OU-LE-AMech-09-L2-V1: Perform Spark Ignition (SI) Engine Tune-Up.
Unit Descriptor	This unit covers the skills, knowledge and attitudes required to Perform spark ignition (SI) engine tune-up. It specifically includes the task of Tune up air, fuel and ignition, check and test ignition system, check and adjust engine speed and check valve/ tappet clearance
Nominal Hours	15 Hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Tune up air, fuel and ignition	<ul style="list-style-type: none"> 1.1 <u>Tools and equipment</u> are selected and collected 1.2 <u>Materials and consumable</u> are selected and collected 1.3 Check fuel pressure by fuel pressure gauge and check carburetor system as per standard procedures. 1.4 Service <u>fuel system components</u> following standard procedures. 1.5 Service <u>air system components</u> following standard procedures 1.6 Check air-fuel ratio as per standard procedure. 1.7 Check compression pressure. 1.8 Check catalytic converter function.
2. Check and test ignition system	<ul style="list-style-type: none"> 2.1. Inspect distributor and CB point for wear, service or replace as necessary. 2.2. Test HT cable and ignition coil for required resistance. 2.3. Service <u>ignition system components</u> following standard procedures.
3. Check and adjust engine speed	<ul style="list-style-type: none"> 3.1 Check idle speed following standard procedures. 3.2 Adjust/learning idle speed (rpm) following standard procedures. 3.3 Service Throttle body and wash CNC/LPG regulator
4. Check valve/ tappet clearance	<ul style="list-style-type: none"> 4.1 Check and adjust valve/tappet clearance as per service specification. 4.2 Check auto valve lash/lifter as per service manual. 4.3 Check VVTI functioning as per specification.
5. Clean and store tools and equipment	<ul style="list-style-type: none"> 5.1 Tools and equipment are cleaned and stored 5.2 Waste material are disposed as per workplace procedure 5.3 Workplace is cleaned as per workplace standard
Range of Variables	
Variables	Range (may include but not limited to):

1. Tools and equipment.	<ul style="list-style-type: none"> 1.1 Socket wrench set 1.2 Combination wrench set 1.3 Tray 1.4 Flat Screw driver 1.5 Philip’s screw driver set 1.6 OBD Scanner 1.7 AVO meter/Oscilloscope 1.8 Fuel pressure Tester 1.9 Timing gun 1.10 Alen Key set 1.11 Injector Tester 1.12 Emission analyser 1.13 Filler Gauge 1.14 Ratchet Handle
2. Materials and consumables	<ul style="list-style-type: none"> 2.1 Waste cotton 2.2 Kerosine oil 2.3 Octane 2.4 Insulation Tape 2.5 Emery cloth
3. Fuel system components	<ul style="list-style-type: none"> 3.1 Fuel injection pumps (electrical and mechanical pump) 3.2 Fuel injector 3.3 Fuel filter 3.4 Primary pump 3.5 Carburetor 3.6 Regulator 3.7 Actuator and sensors.
4. Air system components	<ul style="list-style-type: none"> 4.1 Air filter 4.2 air flow sensors 4.3 MAP and MAF 4.4 Throttle unit
5. Ignition system components	<ul style="list-style-type: none"> 5.1 Distributor 5.2 Ignition coil 5.3 HT cable 5.4 Spark plug 5.5 Igniter and sensors
<p>Evidence Guide</p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.</p>	

1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 serviced air / fuel system 1.2 checked and test ignition system 1.3 checked and adjust drive belt 1.4 checked engine compression 1.5 checked and adjust engine speed 1.6 checked valve tappet clearance
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1 Process of engine tune up. 2.2 Basic auto electrical and electronics 2.3 Exhaust Gas parameter. 2.4 Understanding Service procedure as per manual. 2.5 Cleaning methods 2.6 Principle of engine operation 2.7 Define Tune-up system 2.8 Function of Tune-up system 2.9 Component of Tune-up system 2.10 Functions of components
3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Reading, interpreting and applying service manual instruction. 3.2 Practicing workplace safety 3.3 Using tools and equipment 3.4 Planning for work activities 3.5 Applying maintenance procedures 3.6 Communicating with clients and team members 3.7 Reading and interpreting specifications and instructions 3.8 Practicing workplace safety
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for rights of peers and seniors in workplace
5. Resource implications	<ul style="list-style-type: none"> 5.1 Adequate workplaces 5.2 Suspension components 5.3 Service manuals 5.4 Tools and equipment for performing work activities 5.5 Fire extinguisher
6. Methods of assessment	<ul style="list-style-type: none"> 6.1 Workplace observation 6.2 Demonstration 6.3 Oral questioning 6.4 Written test 6.5 Portfolio

7. Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor</p>
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Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under National Skills Qualification (NSQF). Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	OU-LE-AMech-10-L2-V1: Perform Diesel Engine Tune-up
Unit Descriptor	This unit covers the skills, knowledge and attitudes required to perform diesel engine tune-up in order to keep the vehicle in good running condition and optimum engine performance, and to prevent serious engine trouble
Nominal Hours	20 Hours
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Service fuel injection system	1.1 <u>Tools and equipment</u> are selected and collected 1.2 <u>Materials and consumable</u> are selected and collected 1.3 <u>Fuel injection system</u> is checked following standard procedures 1.4 Fuel injection system is serviced following standard procedures 1.5 Injection timing is set in accordance with service manuals.
2. Service drive belt	2.1 Drive belt for tension and wear are checked following standard procedures. 2.2 Drive belt tension is adjusted to specified tension as per requirement 2.3 Worn out drive belt is Replaced following standard procedures
3. Check engine compression	3.1 Compression test is Conducted following standard procedures. 3.2 Compression test result is interpreted as per standard procedure 3.3 Compression test result is reported to appropriate personal for necessary action following standard procedures
4. Check valve tappet clearance.	4.1 Valve tappet clearance is checked as per service manual. 4.2 Valve tappet clearance is set as per the service manual
5. Clean and store tools and equipment	5.1 Tools and equipment are cleaned and stored 5.2 Waste material are disposed as per workplace procedure 5.3 Workplace is cleaned as per workplace standard
Range of Variables	
Variables	Range (may include but not limited to):

1. Tools and equipment.	1.1 Hydraulic jack 1.2 Wheel wrench 1.3 Car stand 1.4 Socket wrench set 1.5 Combination wrench set 1.6 Coil spring compressor 1.7 Ball peen hammer 1.8 Tray 1.9 Tyre lever 1.10 Flat Screw driver 1.11 Philip’s screw driver set 1.12 Cold chisel 1.13 Impact wrench 1.14 Table vice
2. Materials and consumables	2.1 Waste cotton 2.2 Kerosine oil 2.3 Suspension fluid 2.4 Emery cloth
3. Fuel injection system	3.1 Common Rail Direct Injection (CRDI) system, 3.2 Fuel Injection Pump (FIP) system 3.3 Fuel filter 3.4 Air cleaner 3.5 Injectors, 3.6 Fuel feed pump.
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 serviced fuel injection system. 1.2 serviced drive belt 1.3 checked engine compression 1.4 checked valve tappet clearance
2. Underpinning knowledge	2.1 Types of fuel injection system. 2.2 Basic electrical and electronics 2.3 Procedure of engine tune up. 2.4 Types of lubricants and fluids. 2.5 Equipment safety requirements. 2.6 Personal safety requirements. 2.7 Cleaning methods and materials. 2.8 Principle of engine operation. 2.9 Interpretation of manual and specification.

3. Underpinning skills	<ul style="list-style-type: none"> 3.1 Reading, interpreting and applying service manual instruction. 3.2 Practicing workplace safety 3.3 Using tools and equipment safely 3.4 Planning for work activities 3.5 Applying maintenance procedures 3.6 Communicating with clients and team members 3.7 Ability to work in a team
4. Underpinning attitudes	<ul style="list-style-type: none"> 4.1. Commitment to occupational health and safety 4.2. Environmental concerns 4.3. Eagerness to learn 4.4. Tidiness and timeliness 4.5. Respect for rights of peers and seniors in workplace
5. Resource implications	<ul style="list-style-type: none"> 5.1 Adequate workplaces 5.2 Suspension components 5.3 Service manuals 5.4 Tools and equipment for performing work activities 5.5 Fire extinguisher
6. Methods of assessment	<ul style="list-style-type: none"> 6.1 Demonstration 6.2 Oral questioning 6.3 Written test 6.4 Portfolio
7. Context of assessment	<ul style="list-style-type: none"> 7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor
<p>Accreditation Requirements</p> <p>Training Providers must be accredited by NSDA, the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any NSQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	

Development of Competency Standard

The Competency Standards for National Skills Certificate in **Automotive Mechanics, Level-2** is Developed by NSDA on 22– 25 November, 2021.

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Validation of Competency Standard by Standard and Curriculum Validation Committee (SCVC)

The Competency Standards for National Skills Certificate in **Automotive Mechanics** Level-2 is validated by SCVC on 2-5 January, 2022.

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