National Automotive Design and Development Council
(NADDC)

National Vocational Qualifications

National Occupational Standards (NOS)/Framework for Formal and Informal
Automotive Training & Certification
Levels I - V

PREFACE

Vehicle Technology has been changing at a fast pace, while the training of our mechanics had not kept up. The Council accordingly decided to review the curriculum used in teaching mechanics which dates back to the 1960s.

In 2008, the Council conducted nationwide skill gap survey of mechanics preparatory to the curriculum review. This was conducted to ascertain the difference between our mechanics' know-how and the requirements of modern automobile maintenance in Nigeria. From the analysis of data collected, it was undoubtedly clear that Nigerian auto-mechanics have skill deficiencies, some of which were:

- Lack of understanding of the electrical and electronics (mechatronics) systems in modern cars.
- Lack of standard method of fault finding (step by step), instead, trial and error is the most used.
- Improper tools, equipment and materials handling.
- Little or no experience in workshop management and organization.
- Lack of environmental consciousness.
- None adherence to safety standards while performing certain given tasks etc.

To remedy the above scenario, the Council collaborated with Federal ministry of Labour and Productivity, the auto industry practitioners, National Board for Technical Education (NBTE), German Technical Cooperation (GIZ) and other relevant auto stakeholders leading to the production of the curriculum for training automotive mechanics in vehicles mechatronics. The old mechanics Trade test III (Basic), II (Intermediate) and I (Final Level) curriculum was replaced with a competency based automotive mechatronics curriculum using the concept of modularization as enshrined in Competence Based Education and Training (CBET). 51 modular courses in the curriculum were structured for delivery at three levels: **Level III (Basic): 16 modules; Level II (Intermediate): 21 modules; Level I (Final): 14 modules** The Council also developed instructional manuals and teaching materials for the new curriculum.

When National Board for Technical Education (NBTE) commenced efforts to develop the National Occupational Standards (NOS) and institutionalize National Vocational Qualification Framework (NVQF)in Nigeria in 2013, the auto mechatronics curriculum was used as a bedrock for the development of NOS for automotive industry.

The development of the NOS and delivery of the NVQF is aimed at enthroning and institutionalizing competency based Technical Vocational Education and Training (TVET) in

Nigeria. When fully operational, the framework would place out-of-school children, working adults, graduates and apprentices at both formal and non-formal settings in their rightful positions as far as skill acquisition and competency are concerned. The framework is a system designed for the development, classification and recognition of skills, knowledge and competencies acquired by individuals irrespective of where and how the skill was acquired. It gives a clear statement of what the learner must know or be able to do, whether the learning took place in a classroom, on-the-job or less formally.

For the developed NOS to be used for training of learners, it was imperative that they were classified into Qualification Credit Framework (QCF) or levels. A classification workshop was organized in August, 2015 by NBTE in conjunction with relevant stakeholders where the NOS which were developed in 2013 were classified into levels. Happily the auto industry is only sector in Nigeria that have achieved up to level 5.
The Classification of the NOS was done with a view to making the occupational standards fit into the already approved National Vocational Qualification Framework (NVQF) and for ease of implementation of NVQs in Nigeria.

The NVQF requires that all vocational trainings and learning must be quality-checked by qualified assessors and verifiers. In order to ensure the availability of qualified assessors and verifiers in the auto industry, NADDC singed an MoU with NBTE for the training of 26 master trainers as Quality Assurance Assessors (QAA) and eight as Internal Quality Assurance Managers (IQAM)/Verifiers for the Automotive Industry. The trained quality assurance assessors and verifiers will support artisans, technicians to deliver quality and standard training in the auto sector.

The NVQF also stipulates that every sector must set up its Sector Skills Council.
Based on the Act that established the Council and the activities executed by the Council in the development of standards, skills upgrade and training in the automotive industry, NBTE granted approval for NADDC to establish a Sector Skills Council for Automotive industry in Nigeria. The roles of the SSC include:

- Influence how training is delivered in Nigeria;
- Reduce skill gaps and shortages;
- Improve Productivity;
- Increase opportunities for all individuals in the workforce;
- Developing skill competency standards and qualifications;
- An employer-led organization that actively involves trade unions, professional bodies and other key stakeholders;

- Skills and workforce development of all those employed in their sectors;
- Setting up Labour Market Information System (LMIS) to assist planning and delivery of training and skill upgrade;
- Develop a sector skill development plan and maintain skill inventory;
- Identification of skill development needs and preparation of a catalogue of skill types;
- Standardization of accreditation process;
- Participation in accreditation and standardization;
- Plan and execute training of trainers and
- Establish process of coordinating and incorporating emerging trends in skill development.

It is expected that the introduction of NOS and implementation of NVQs in our automotive industry will lead to the following outcomes:

- ❖ Training will be industry- focused, through partnership (links) between the training providers, the Industries and enterprises they serve.
- ❖ Skills and competences obtained at various settings: on the job, at home or in a formal training institution, could be assessed and certified, thus expanding recognition and opportunities for progression.
- ❖ Curriculum will be flexible and could be delivered in a range of settings, presented in modular form so as to provide close guidance to the trainee and facilitator.
- ❖ Training will be competency-based so that employers are clear about what people can do,
- ❖ There will be a consistent system of certification which guarantees quality, as well as transportability of skill.
- ❖ Wide range of skills could significantly increase employability.
- ❖ Assessment process, being practical and work-based, could effectively check certificate racketeering and examination malpractices.

Conclusion

Motor vehicles need periodic maintenance to ensure their utility, reduce down time and ensure safety on our roads. The Council therefore attaches much premium on vocational training in the automotive industry. It is our firm belief that skills promotion and competency based training is germane to unleashing the full potentials of the Nigerian Automotive Industry.

Engr. Aminu Jalal, FNSE, FNAutoEI, FNIMechE
Director General
National Automotive Design and Development Council (NADDC)
February, 2017

FORWARD

I find the development and publication of this book, National Occupational Standards (NOS) for automotive mechanics timely considering the dearth of skills and competencies in our industries and the economy in general.

I am particularly excited about the publication because it goes to show that the project of institutionalizing national vocational qualifications and competency-based training is getting acceptance by the key stakeholders e.g. the industries, training providers, professional associations, regulatory agencies, etc. This clearly shows that we have collectively understood the challenges facing competency and skills development in Nigeria, especially in the ever dynamic automotive industry.

The skills development challenges started immediately after the third National Development Plan, when emphasis was shifted from competency to paper qualifications resulting into over subscription of our institutions. Our educational institutions were disconnected from the industries and tended to place less emphasis on the manpower need of the industry resulting in proliferation of mainly academic programmes. Assessment and evaluation processes in TVET institutions, remain largely 'academic', in spite of global trend towards industry based standard. The training being delivered at the non-formal settings which has positive contributions to the economy is not coordinated, standardized and regulated. Worse still, government at all levels paid lip service to TVET and skills development.

It is based on these and many other TVET and skills challenges that NADDC in partnership with relevant stakeholders and international development partners commenced this drive for the institutionalization of National Vocational Qualification Framework (NVQF) in the Nigerian automotive industry.

A qualification Framework provides descriptions of the knowledge and skills to be demonstrated as well as a common grid of skill levels for all qualifications included within the framework. It allows for "equivalences" to be established between elements of different qualifications. The Framework also facilitates establishment of progression routes between different fields of study, general and vocational education, learning in initial and further education and qualifications obtained through formal and non-formal education and training. The qualification framework is the structure where NVQs will operate.

This publication is a testament to the Council (NADDC)'s commitment towards sustainable and integrated development of the automotive industry in Nigeria. It will ensure that the

Nigerian auto industry is in tandem with current trends globally. The NOS and NVQF is when fully implemented will achieve the following:

- Provide policy guidelines on organizing skills training to improve product quality, productivity and competitiveness in both formal and informal sector
- Provide a coherent structure for vocational qualifications, which are based on employment-led standards of competence
- Increase industry ownership of the traineeship system which enhance stakeholders input to major decisions
- Expand training opportunities so that they are more evenly spread across the workforce meeting the needs of all enterprises more equitably
- Facilitate access to, and mobility and progression within education training and career paths,
- Provide a policy framework for flexible curricula based on National Occupational Standards (NOS) dictated by the industry,
- Determine the levels of award, which enable clear roots of progression, and appropriate awards, which relate to employment,
- Determine convenient systems for recognition of prior achievement and,
- Expand access to education particularly lifelong learning through TVE.
- Provide system for up skilling, reskilling etc. of Nigerian youth and working adult.

I am not surprised that this feat has been achieved by NADDC because it has always exhibited its commitment and drive towards ensuring that the automotive industry develops to its full potentials. The automotive industry is the only sector in Nigeria which has developed and documented NOS up to level five (5).

The Nigerian automotive industry and economy in general would no doubt be highly enriched by this publication as it opens up higher potentials for skills upgrade and competences development. These are potentials much desired in the ever dynamic automotive industry. To achieve the benefits inherent in this publication and leapfrog our industry to the desired level, its implementation requires the collaboration of relevant stakeholders both in the public and private sectors.

Dr. M.A. Kazuare
Executive Secretary
National Board for Technical Education (NBTE)

ACKNOWLEDGEMENT

This undertaking would not have been completed successfully without the collaborative efforts and commitment of relevant stakeholders and experts in the automotive industry, the academia and regulatory agencies. Particularly worthy of mention are the following organizations that ensured that this document is qualitative and in sync with the current trends globally:

- Federal Ministry of Labour and Employment
- National Board for Technical Education (NBTE), Kaduna;
- Nigeria Automobile Technicians Association (NATA);
- Niger State Science & Technical Schools Board (NSSTSB), Minna;
- Bascon Multi-Skills Development Agency Ltd, Enugu;
- National Business and Technical Examinations Board (NABTEB), Benin;
- Industrial Training Fund (ITF); and
- MotorMechs and Technicians Association of Nigeria (MOMTAN).

We are indeed grateful and appreciative of the contributions and zeal exhibited by all stakeholders in accomplishing this national assignment.

We cannot thank them enough.

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THE AUTOMOTIVE INDUSTRY SECTOR SKILLS COUNCIL (SSC): MEMBER ORGANIZATIONS

S/N	ORGANIZATION
1.	PAN Nigeria Ltd, Kaduna
2.	VON Automobile Ltd, Lagos
3.	Innoson(IVM), Nnewi
4.	Toyota Nigeria Ltd, Lagos
5.	Coscharis Group, Lagos
6.	Weststar Ass. Ltd; Abuja
7.	Lady Mechanics Initiative, Lagos
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9.	MotorMechs and Technicians Association of Nigeria (MOMTAN), Abuja
10.	MotorHaul Nig. Ltd, Abuja
11.	Fudons Auto Ltd; Yenegoa
12.	Classic Auto Ltd; Owerri
13.	ASD Motors Ltd, Kaduna
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18.	Industrial Training Fund (ITF), Lagos
19.	Federal Ministry of Labour and Employment, Abuja
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21.	Niger State Science & Technical Schools Board (NSSTSB), Minna
22.	University of Ibadan
23.	Lagos State Polytechnic, Ikorodu
24.	Bola Ige Mechatronics Training Institute, Esa-oke, Osun State
25.	Bascon Multi-skill Agency Ltd; Enugu
26.	Filkmou Ltd; Lagos
27.	Hescorp Auto Institute, Kaduna

CRITIQUE OF AUTO MECHATRONICS CURRICULUM AND NATIONAL OCCUPATIONAL STANDARDS (NOS)

VENUE: *GOLDEN TULIP HOTEL, AIRPORT ROAD, IKEJA, LAGOS STATE*
DATE: *9th – 10th FEBRUARY, 2017*
TIME: *10:00 AM DAILY*

DAY ONE	
OPENING CEREMONY	
9:00–09:30 am	Arrival/Registration of Stakeholders and participants
09:30-10:00 am	Arrival of DG (NADDC)
10:00-10:10 am	Introduction of guests
10:10-10:20 am	Welcome Remarks by **Engr. Aminu Jalal DG (NADDC)**
10:20-10:30 am	Brief presentation on the reviewed documents by **Engr. Francis Udeh**
10:30 -10:40 am	Goodwill remarks by Stakeholders
10:40 –10:50 am	Flag-off of Critique of Curriculum /NOS Developed
10:50 –11:00 am	Interaction with Media/Photographs
11:00-11:30 am	Tea Break
11:30- 3:00 pm	Technical Session (Critique)
3:00-3:30 pm	Lunch
3:30-5:00pm	Technical Session
	DAY TWO
10: 00am	Technical Session (Critique) continues.

ABBREVIATIONS

NVQ	-	National Vocational Qualification
NVQF	-	National Vocational Qualification Framework
NOS	-	National Occupational Standard
LO	-	Learning Outcome
AM	-	Auto Mechatronics
NADDC	-	National Automotive Design and Development Council
DO	–	Direct Observation
QA	–	Question and Answer
WT	-	Witness Testimony
PS	-	Personal Statement
IQA	-	Internal Quality Assurance
EQA	-	External Quality Assurance
HSE	-	Health Safety and Environment
WP	-	Work Product
RPL	-	Recognition of Prior Learning
PD	-	Professional Discussion
ASS	-	Assignment
MET	-	Mechanical and Electrical Trim
PPE	-	Personal Protective Equipment
KPI	-	King Pin Inclination
SAI	-	Steering Angle Inclination
OEM	-	Original Equipment Manufacturers
GDE	-	Generic Diagnostic Equipment
UDE	-	Universal Diagnostic Equipment
CFC	-	Chlorofluorocarbon
CAN	-	Controller Area Network
LIN	-	Local Interconnect Network
BEAN	-	Body Electronic Area Network
DC	-	Direct Current
AC	-	Alternating Current
EV	-	Electronic Vehicle
HEV	-	Hybrid Electric Vehicle

TABLE OF CONTENTS

LEVEL I

Summary of Level I

MANDATORY NOS

S/NO/ UNIT	REFERENCE NO.	NOS TITLE	CREDIT VALUE	GUIDED LEARNING HOURS	REMARKS
1	NADDC/AM/L1/001	**Automotive service tools, equipment**	3	30	
2	NADDC /AM/L1/002	**Health, Safety and Environment In Automotive industry**	2	20	
3	NADDC /AM/L1/003	**Communication Process in an Automotive Environment**	2	20	
4	NADDC /AM/L1/004	**Team Work**	1	10	
5	NADDC /AM/L1/005	**Basic computer skills in Automotive Industry**	2	20	
6	NADDC /AM/L1/006	**Motor vehicle Tyres and wheels**	2	20	
7	NADDC /AM/L1/007	**Periodic maintenance Service**	2	20	
TOTAL CREDIT VALUE/HOURS			**14**	**140**	

NOTE: Learners are required to cover all NOS at this level.

Unit 001: AUTOMOTIVE SERVICE TOOLS AND EQUIPMENT

Unit reference number:	**NADDC/AM/L1/001**
QCF level:	**1**
Credit value:	**3**
Guided learning hours:	**30 HOURS**

Unit Purpose:
This unit is about the basic use of tools, materials and fabrications relevant to the Automotive Sector and for those working in technical support roles. It is also appropriate for workshop planners.

This unit is about;
1. Interpreting information,
2. Adopting safe and healthy working practices,
3. Selecting materials and equipment,
4. Service and maintenance of workshop tools and equipment,
5. Storage of workshop tools and equipment.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 001: AUTOMOTIVE SERVICE TOOLS AND EQUIPMENT

LO (Learning outcome)		Performance Criteria	Evidence Type					Evidence Ref Page number			
LO1: Common Automotive service hand and power tools											
	1.1	Identify basic tools and equipment in the automotive workshop									
	1.2	Carryout operation using hand and power tools in accordance with safe working practices to achieve the work outcome.									
	1.3	Use and maintain; • Hand tools • Ancillary equipment • Safety aids.									
	1.4	Demonstrate work skills to select correct materials and fabrication for project									
	1.5	Demonstrate work skills to measure, mark out, file, fit, tap, thread, cut, drill, finish, position and secure work piece and tools.									
LO2: Common Automotive service workshop equipment											
	2.1	Carry out pre-start preparation inspections on power tools and equipment in accordance with approved procedures									
	2.2	Store and secure workshop tools and equipment in line with workplace procedures									
LO3: Maintenance and servicing of workplace tools and equipment											
	3.1	Identify damaged and worn out tools and equipment									
	3.2	Service, adjust and or maintain tools and equipment as specified by manufacturer's/ and or workshop within the scope of responsibility.									
	3.3	Identify problems associated with power tools and equipment which need to be referred to authorized personnel.									
	3.4	Carry out checks in accordance with manufacturer's/operators guidance, legislation and official guidance and organizational requirements.									
LO4: Workshop Tools And Equipment Storage											
	4.1	Explain different techniques used in automotive workshop tools and equipment storage.									
	4.2	Explain different store documentation procedures in an automotive workshop.									

	4.3	Carryout routine maintenance of automotive service tools and equipment in line with workplace procedures.									
	4.4	Store and secure workshop tools and equipment in line with workplace procedures.									
	4.5	Dispose waste generated as a result of tool/equipment usage in accordance with workplace procedures.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 002: HEALTH, SAFETY AND ENVIRONMENT (HSE) IN AUTOMOTIVE INDUSTRY

Unit reference number:	**NADDC/AM/L1/002**
QCF level:	**1**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose: This unit is about the knowledge and skills needed to competently carryout daily activities in an automotive workshop while observing relevant work ethics and safety. It includes basic first-aid and fire-fighting procedures**.**

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 002: HEALTH, SAFETY AND ENVIRONMENT (HSE) IN AUTOMOTIVE INDUSTRY

LO (Learning outcome)		Performance Criteria	Evidence Type					Evidence Ref Page number			
LO 1: Personal health and hygiene	1.1	Wear clean, smart and appropriate personal protective equipment (wears).									
	1.2	Work safely at all times, complying with health, safety and environmental regulations and guidelines.									
	1.3	Get cuts, grazes and wounds treated by the appropriate personnel.									
	1.4	Report any form of illness promptly to the appropriate personnel.									
LO2: Maintain personal health and hygiene	2.1	State own responsibility in the health and safety Act as it relates to own occupation.									
	2.2	State general rules on hygiene that must be followed.									
	2.3	State correct personal protection equipment (such as Head Protection, Foot Protection, Hand and body protection) and regulatory protection.									
	2.4	State the importance of maintaining good personal hygiene.									
	2.5	Describe how to deal with cuts, grazes and wounds and why it is important to do so.									
LO3: Assist in the maintenance of a hygienic, safe and secure workplace	3.1	State the importance of working in a healthy, safe and hygienic workplace.									
	3.2	Report any accidents or near misses quickly and accurately to the proper personnel.									
	3.3	Follow health, hygiene and safety procedure at work.									
	3.4	Practice emergency procedures during work.									
	3.5	Follow organizational security procedures and measures.									
	3.6	Ensure the disposal of waste and pollution control with organic and inorganic waste disposal methods.									
	3.7	Follow noise control and protection methods.									

LO4: Prevention of hazards in the work place	4.1	Identify any potential hazards/hazards and deal with these correctly.									
	4.2	Explain where information about health, safety and environment in the workplace can be obtained.									
	4.3	Describe the types of hazard in the workplace that may occur and how to deal with them.									
	4.4	Explain hazards that can be dealt with personally and those that should be reported to the appropriate personnel.									
	4.5	Explain how to warn other people about potential hazards/hazards and why this is important.									
	4.6	Explain why accidents and near-accidents should be reported and to whom.									
	4.7	Describe the types of emergencies that may happen in the workplace and how to deal with it.									
	4.8	Explain where to find the first-aid equipment and who the registered first responder is in the work place									
	4.9	Explain safe lifting and handling techniques that should be followed.									
	4.10	Explain other ways of working safely that are relevant to own position and why they are important.									
	4.11	Describe organizational emergency procedures, in particular fire, and how these should be followed.									
	4.12	State the possible causes of fire and how to minimize the possibility of fire in the workplace.									
	4.13	State where to find the alarms and how to set them off.									
	4.14	State the importance of following the fire safety laws and why it should never be approached unless it is safe to do so.									
	4.15	Describe the organizational security procedures and why these are important.									

	4.16	Explain the importance of reporting all incidents to the appropriate personnel.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 003: COMMUNICATION PROCESS IN AN AUTOMOTIVE ENVIRONMENT

Unit reference number:	**NADDC/AM/L1/003**
QCF level:	**1**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose: To establish a quality communication system that is responsive and subject to change in meeting workers and employers need, in work environment.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

UNIT 003: COMMUNICATION PROCESS IN AN AUTOMOTIVE ENVIRONMENT

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO1: Non-complex communication system in a work environment	1.1	Use a simple verbal means to pass on necessary information.									
	1.2	Use non-verbal means to pass on necessary information e.g. body language.									
	1.3	Identify and explain symbols and signs appropriately.									
LO2: Information source identification in a work environment.	2.1	Identify the source of information in an organisation and work environment.									
	2.2	Relate appropriately with the source of information.									
	2.3	Use the various information flow systems in a work environment.									
	2.4	Use information sources to address challenges in a work environment.									
	2.5	Communicate findings in accordance to procedure in a work environment.									
LO3: Use of communication methods in a work environment	3.1	Identify the various methods of communication in the work environment.									
	3.2	Use effectively, the various methods of communication in a work environment and communicate effectively to the right personnel.									
	3.3	Observe information effectively using symbols, signs and codes.									
	3.4	Observe instructions in line with ethics of the work environment.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 004: TEAM WORK

Unit reference number:	**NADDC /AM /L1/004**
QCF level:	**1**
Credit value:	**1**
Guided learning hours:	**10**

Unit Purpose:
The purpose of this unit is to impart to the learner, skills, knowledge and understanding required to develop team spirit and positive working relationship.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include:
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 004: TEAM WORK

LO (Learning outcome)		Performance Criteria	Evidence Type					Evidence Ref Page number			
LO1: Positive working relationship with colleagues	1.1	Identify the need for developing positive relationship with colleagues.									
	1.2	Recognize the importance of relating with other people in a way that makes them feel valued and respected.									
	1.3	Assist team members when required.									
	1.4	Report to the appropriate personnel when request/requesting for assistance fall outside area of responsibility.									
	1.5	Communicate information to colleagues about own work that might affect others.									
LO2: Take Responsibilities within the team	2.1	Recognize own role and responsibilities within the team.									
	2.2	Perform individual tasks in line with the team rules and regulations.									
	2.3	Participate effectively in teamwork.									
LO3: Compliance with organisational policies	3.1	Work In line with organizational standard and structure.									
	3.2	Use organizational code of practice.									
	3.3	Explain organizational code of conduct.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 005: BASIC COMPUTER SKILLS IN AUTOMOTIVE INDUSTRY

Unit reference number:	**NADDC/AM/L1/005**
QCF level:	**1**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose:
This unit is to provide the necessary skills and competency required for computer usage in the automotive industry.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)
9. Assignment (ASS)

Unit 005: BASIC COMPUTER SKILLS IN AUTOMOTIVE INDUSTRY

LO (Learning outcome)		Performance Criteria	Evidence Type					Evidence Ref Page number			
LO 1: Computer Classification and operation											
	1.1	Identify computers according to usage, type and size.									
	1.2	Differentiate between analogue, digital and hybrid computers.									
	1.3	Identify and describe the various types of micro-computers.									
	1.4	Carryout a given assignment using the computer.									
LO 2: Use of computers in modern automobile workshops.											
	2.1	Explain the roles of computer in modern motor vehicles.									
	2.2	Explain the various applications of computer in automobile workshop.									
	2.3	Identify the characteristics and benefits of computer in automotive workshop.									
LO 3: Computer Hardware and Software Elements											
	3.1	Identify and explain the functions of various hardware and software components of the computer.									
	3.2	Differentiate between operating system and application software.									
	3.3	Select application software for a particular operation.									
LO4: Basic computer Operation	4.1	Operate the keyboard using function keys, alphanumeric keys, numeric keys and control keys.									
	4.2	Carryout typing exercise on the computer.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 006: MOTOR VEHICLE TYRES AND WHEELS

Unit reference number:	**NADDC /AM/L1/006**
QCF level:	**1**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose:
This unit is about inspecting standard light motor vehicle tyres and wheels to assess their conditions and suitability for repair and carrying out necessary repair, replacement or refitting activities. It includes replacement and repair procedures for wheels, tyres and tubes.

Unit assessment requirements/evidence requirements;
This assessment can only be carried out in a real automotive workshop environment in which replacement and repair procedures for wheels, tyres, and tubes are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 006: MOTOR VEHICLE TYRES AND WHEELS

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Wheels/tyre classification and characteristics											
	1.1	Explain various tyre classification and their characteristics.									
	1.2	Explain and use wheel/tyre data according to manufacturer's specifications.									
LO2: Tools/equipment for wheels/tyre repairs and replacement											
	2.1	Identify and select tools and equipment used in wheels/tyre repairs.									
	2.2	Carry out all inspection, repair and replacement activities using suitable tools and equipment.									
	2.3	Ensure that all tyre/wheel tools and equipment are safe prior to use.									
LO3: Inspect, repair and replace motor vehicle tyres and wheels											
	3.1	Use suitable personal protective equipment and motor vehicle coverings throughout all tyres and wheels inspection, repair and replacement activities.									
	3.2	Use suitable sources of technical information to support your inspection, repair and replacement of tyres and wheels									
	3.3	Operate in a way which minimises the risk of damage to the motor vehicle and its systems.									
	3.4	Perform all inspection, repair and replacement activities following: • manufacturer's instructions • your workplace procedure • health, safety and environment requirements.									
	3.5	Carry out all inspection, repair and replacement activities using • the correct inspection technique • the correct type and size of component • suitable tools and equipment									
	3.6	Dispose of removed components safely to meet legal and your workplace requirements.									
	3.7	Ensure that replaced and refitted tyres and valves are correctly fitted.									
	3.8	Report any anticipated delays in completion and any additional									

		faults identified to the relevant personnel promptly.									
	3.9	Carryout wheel balancing operations.									
	3.10	Carry out appropriate repairs according to manufacturers' specification on wheels with tyre pressure sensor.									
	3.11	Select replacement tyres in accordance with manufacturer's specifications.									
	3.12	Interpret and use wheel data according to manufacturer's specifications.									
	3.13	Store tyres and wheels in line with workplace procedures.									
	3.14	Carryout tyre replacement in accordance with motor vehicle manufacturer's specification.									
	3.15	Complete all activities within the agreed timescale.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 007: PERIODIC MAINTENANCE SERVICE

Unit reference number:	**NADDC /AM/L1/007**
QCF level:	**1**
Credit value:	**2**
Guided learning hours:	**20 HOURS**

Unit Purpose:
This unit is about conducting routine examination, adjustment and replacement activities as part of the periodic servicing of motor vehicles.

Unit assessment requirements/evidence requirements:
This assessment can only be carried in a real workplace environment in which automotive service and repair operation are carried out in a workshop environment effectively. Live engines and functional motor vehicles shall be provided.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 007: PERIODIC MAINTENANCE SERVICE

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Types and application of filters	1.1	List and identify the various types of filters and their components.									
	1.2	Identify different filters and the filtrations system (paper filters, fabric, cyclone, wire-mesh filters etc).									
	1.3	Identify the application of pre-filtration and filtration systems.									
	1.4	Identify and apply correct specifications and tolerances for the motor vehicle when making assessments of system and component performance.									
	1.5	Work in a way which minimises the risk of damage to the motor vehicle filtration and its systems and the surrounding area									
LO2 : Procedures for conducting a lubrication service											
	2.1	Use manufacturer's routine maintenance checklist accurately									
	2.2	Use suitable personal protective equipment and motor vehicle coverings throughout all motor vehicle maintenance activities.									
	2.3	Identify and ensure motor vehicle's systems and components complies with the following; • The manufacturer's approved examination methods • Workplace procedures • Health, Safety and environment requirements.									
	2.4	Use only the correct specifications and tolerances for the motor vehicle when making assessments of system and component performance									
LO 3 Demonstrate procedure for servicing an engine											
	3.1	Use suitable personal protective equipment and motor vehicle coverings throughout all maintenance activities									
	3.2	Use suitable sources of technical information to support all motor vehicle maintenance									

		activities.									
	3.3	Measure the motor vehicle's systems and components following: • The manufacturer's approved examination methods • Workplace procedures • Health, Safety Environment requirements									
	3.4	Identify accurately any motor vehicle system and component problems that falls outside the specified maintenance schedule.									
	3.5	Dismantle and assemble components in a way which minimises the risk of damage to the motor vehicle and its systems.									
	3.6	Use suitable and accurate testing methods to evaluate the performance of all replaced and adjusted components/systems.									
	3.7	Promptly communicate any problems or issues relating to the motor vehicle's condition or conformity to the relevant personnel.									
	3.8	Ensure that maintenance records are accurate, complete and passed to the relevant personnel promptly in the format required.									
	3.9	Identify and use appropriate diagnostic tools and equipment for routine motor vehicle maintenance.									
	3.10	Communicate any anticipated delays in completion to the relevant personnel.									
	3.11	Perform all motor vehicle maintenance activities within the agreed timescale.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

LEVEL II

Summary of Level II

MANDATORY NOS

S/NO/ UNIT NO	REFERENCE NO.	NOS TITLE	CREDIT VALUE	GUIDED LEARNING HOURS	REMARKS
1	NADDC/AM/L1/001	**Communication Process in an Automotive Work Environment**	2	20	*Culled from Level I*
2	NADDC/AM/L1/002	**Health, Safety and Environment In Automotive Industry**	2	20	*Culled from Level I*
3	NADDC/AM/L2/003	**Fastening(Joining) Techniques used in Automotive Services and repair operation**	3	30	
4	NADDC/AM/L2/004	**Identification and fitting of Auxiliary locks and security devices in Motor vehicles**	3	30	
5	NADDC/AM/L2/005	**Removal/Fitting of Mechanical and electrical Trim (MET) components in a motor vehicle.**	3	30	
6	NADDC/AM/L1/006	**Team Work**	1	10	*Culled from Level I*
7	NADDC/AM/L1/007	**Basic Computer Skills in Automotive Industry**	2	20	*Culled from Level I*
TOTAL CREDIT HOURS			**16**	**160**	

OPTIONAL NOS (Specialty)

S/NO	OPTIONAL NOS	NOS TITLE	CREDIT VALUE	GUIDED LEARNING HOURS	REMARKS
8	NADDC/AM/L2/008	**Motor vehicle wheel alignment operations**	2	20	
9	NADDC/AM/L2/009	**Motor vehicle wheel balancing operations**	2	20	
10	NADDC/AM/L2/010	**Periodic Maintenance Service**	2	20	*Culled from Level I*
11	NADDC/AM/L2/011	**Light motor vehicle Periodic Maintenance**	2	20	
12	NADDC/AM/L2/012	**Heavy duty Motor vehicle Periodic Maintenance**	3	30	
TOTAL CREDIT HOURS			**11**	**110**	

NOTE: Learners are required to select four (4) units from the optional units.

Unit 001: COMMUNICATION PROCESS IN AN AUTOMOTIVE ENVIRONMENT

Unit reference number:	**NADDC/AM/L1/003**
QCF level:	**1**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose: To establish a quality communication system that is responsive and subject to change in meeting workers and employers need, in work environment.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 001: COMMUNICATION PROCESS IN AN AUTOMOTIVE ENVIRONMENT

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Non-complex communication system in a work environment	1.1	Use a simple verbal means to pass on necessary information.									
	1.2	Use non-verbal means to pass on necessary information e.g. body language.									
	1.3	Identify and explain symbols and signs appropriately.									
LO2: Information source identification in a work environment.											
	2.1	Identify the source of information in an organisation and work environment.									
	2.2	Relate appropriately with the source of information.									
	2.3	Use the various information flow systems in a work environment.									
	2.4	Use information sources to address challenges in a work environment.									
	2.5	Communicate findings in accordance to procedure in a work environment.									
LO3: Use of communication methods in a work environment											
	3.1	Identify the various methods of communication in the work environment.									
	3.2	Use effectively, the various methods of communication in a work environment and communicate effectively to the right personnel.									
	3.3	Observe information effectively using symbols, signs and codes.									
	3.4	Observe instructions in line with ethics of the work environment.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 002: HEALTH, SAFETY AND ENVIRONMENT (HSE) IN AUTOMOTIVE INDUSTRY

Unit reference number:	**NADDCAM/L1/002**
QCF level:	**2**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose:
This unit is about the knowledge and skills needed to competently carryout daily activities in an automotive workshop while observing relevant work ethics and safety. It includes basic first-aid and fire-fighting procedures.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 002: **HEALTH, SAFETY AND ENVIRONMENT (HSE) IN AUTOMOTIVE INDUSTRY**

LO (Learning outcome)		**Performance Criteria:-**	Evidence Type					Evidence Ref Page number			
LO 1: Personal health and hygiene	1.1	Wear clean, smart and appropriate personal protective equipment (gears)									
	1.2	Work safely at all times, complying with health, safety and environmental regulations and guidelines									
	1.3	Get cuts, grazes and wounds treated by the appropriate personnel (first aid).									
	1.4	Report any form of illness promptly to the appropriate personnel.									
LO2: How to maintain personal health and hygiene											
	2.1	State own responsibility in health and safety Act as it relates to own occupation									
	2.2	State general rules on hygiene that must be followed									
	2.3	State the importance of maintaining good personal hygiene									
	2.4	Describe how to deal with cuts, grazes and wounds and why it is important to do so									
LO3: Assisting to maintain a hygienic, safe and secure workplace											
	3.1	State the importance of working in a healthy, safe and hygienic workplace									
	3.2	Report any accidents or near misses quickly and accurately to the proper personnel									
	3.3	Follow health, hygiene and safety procedure at work									
	3.4	Practice emergency procedures during work									
	3.5	Follow organizational security procedures and measures									
	3.6	Ensure the disposal of waste and pollution control with organic and inorganic waste disposal methods.									
	3.7	Follow noise control and protection methods.									
LO4 Prevention of hazards in the work place											
	4.1	Identify any potential hazards/hazards and deal with these correctly									

	4.2	Explain where information about health, safety and environment in the workplace can be obtained.									
	4.3	Describe the types of hazard in the workplace that may occur and how to deal with them									
	4.4	Explain hazards that can be dealt with personally and those that should be reported to the appropriate personnel									
	4.5	Explain how to warn other people about potential hazards/hazards and why this is important									
	4.6	Explain why accidents and near-accidents should be reported and to whom									
	4.7	Describe the types of emergencies that may happen in the workplace and how to deal with it									
	4.8	Explain where to find the first-aid equipment and who the registered first responder is in the work place									
	4.9	Explain safe lifting and handling techniques that should be followed.									
	4.10	Explain other ways of working safely that are relevant to own position and why they are important.									
	4.11	Describe organizational emergency procedures, in particular fire, and how these should be followed.									
	4.12	State the possible causes of fire and how to minimize the possibility of fire in the workplace									
	4.13	State where to find the alarms and how to set them off									
	4.14	State the importance of following the fire safety laws and why it should never be approached unless it is safe to do so									
	4.15	Describe the organizational security procedures and why these are important									
	4.16	Explain the importance of reporting all incidents to the appropriate personnel.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 003: FASTENING (JOINING) TECHNIQUES USED IN AUTOMOTIVE SERVICES AND REPAIR OPERATIONS

Unit reference number:	**NADDC/AM/L2/003**
QCF level:	**2**
Credit value:	**3**
Guided learning hours:	**30 HOURS**

Unit Purpose:
This unit is about joining materials effectively using metal joining and fastening techniques.

Unit assessment requirements/evidence requirements:
This assessment can only be carried in a real workplace environment in which automotive service, repair, and mechanical joining by fastening operations are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning

Unit 003: FASTENING (JOINING) TECHNIQUES USED IN AUTOMOTIVE SERVICES AND REPAIR OPERATIONS

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Safety precautions required in metal joining and fastening	1.1	State safety precautions required in metal joining and fastening									
	1.2	Explain the procedures involved in metal joining and fastening operations									
	1.3	Use the appropriate Personal Protective Equipment (PPE) when carrying out metal joining operations.									
	1.4	Carry out metal joining and fastening operations following Health and Safety requirements.									
	1.5	Protect the motor vehicle when carrying out metal joining operations.									
	1.6	Ensure that the tools, equipment and PPE required are in a safe working condition.									
	1.7	Work in a way to avoid damage to other components of the motor vehicle while carrying out metal joining and fastening.									
	1.8	Protect the repaired area to prevent corrosion where applicable.									
	1.9	Clean and store PPE and equipment in appropriate manner.									
LO2: Tools and equipment for carrying out metal joining operations	2.1	Select and use correct tools and equipment for carrying out metal joining operations.									
	2.2	Ensure that the tools, equipment and PPE required are in a safe working condition.									
		Ensure stability of tools and material before use.									
LO3: Metal Joining and fastening: Types, materials, applications and techniques.	3.1	Prepare material and align to enable suitable joint to be achieved.									
	3.2	Treat meeting/lapping members before joining.									
	3.3	Set up equipment to carry out metal joining operations: • check suitability of joining technique • check suitability of tooling • check if consumables are									

		correct									
	3.4	Identify and remedy joint defects.									
	3.5	Check integrity of the joint(s). ie visual inspection etc.									
	3.6	Carry out metal joining operations within the agreed timescale.									
	3.7	Identify common fastener failures									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 004: AUXILIARY LOCKS AND SECURITY DEVICES IN MOTOR VEHICLES

Unit reference number:	**NADDC/AM/L2/004**
QCF level:	**2**
Credit value:	**3**
Guided learning hours:	**30**

Unit Purpose:
This unit is about identifying and fitting suitable auxiliary locking and security devices that are permanently fitted to motor vehicles to deter theft.

Unit assessment requirements/evidence requirements:
This assessment can only be carried in a real automotive workplace environment in which fitting and installation of auxiliary locks and security devices are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning

Unit 004: AUXILIARY LOCKS AND SECURITY DEVICES IN MOTOR VEHICLES

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Selection of appropriate materials, tools, and equipment.											
	1.1	Identify the appropriate tools and equipment for fitting auxiliary locks and security devices.									
	1.2	Use the tools and equipment required, correctly and safely throughout all fitting activities.									
	1.3	Wear suitable personal protective equipment and use motor vehicle coverings when fitting auxiliary locks and security devices.									
	1.4	Prepare, connect and test all the required equipment following manufacturers' instructions prior to use.									
	1.5	Collect sufficient information to enable an accurate fitting of auxiliary locking and security devices.									
	1.6	Identify the various methods of automotive electronic key programming.									
LO2: Locks and security devices											
	2.1	Identify types of locks and security devices and their applications.									
	2.2	Support the fitting of auxiliary locks and security systems, by reviewing motor vehicle • technical data and • diagnostic test procedures									
	2.3	Ensure all components and units conform to the motor vehicle operating specification and any legal requirements									
	2.4	Prepare, connect and test all the required equipment following manufacturers' instructions prior to use.									
	2.5	Make cost effective recommendations for the fitting of relevant auxiliary locks and security devices according to the customers' needs and motor vehicle type									
LO3: Installation locations for locks and security devices /systems											
	3.1	Measure and mark out where external locks are to be fitted									
	3.2	Carry out all fitting activities following: • manufacturers' instructions									

		• recognized repair methods									
	3.3	Use fitting techniques (both electrical and mechanical) which are relevant to the systems presented									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 005: MECHANICAL AND ELECTRICAL TRIM (MET) COMPONENTS IN A MOTOR VEHICLE

Unit reference number:	**NADDC/AM/L2/005**
QCF level:	**2**
Credit value:	**3**
Guided learning hours:	**30**

Unit Purpose:
This unit is about the appropriate removal and fitting of basic Mechanical, Electrical and Trim (MET) Components to motor vehicles. It is also about checking the operation (s) of the components fitted

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment in which the removal and fitting of basic mechanical, electrical and trimming of components are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning

Unit 005: MECHANICAL AND ELECTRICAL TRIM (MET) COMPONENTS IN A MOTOR VEHICLE

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Description and selection of MET components	1.1	Identify MET components and their applications									
	1.2	Select the appropriate basic MET components to be fitted									
	1.3	Remove basic MET components following manufacturer's instructions.									
	1.4	Store all removed components safely in the correct location									
	1.5	Fit basic MET components following manufacturer's instructions									
	1.6	Check that the components fitted operate correctly following the manufacturer's specification									
	1.7	Remove and fit basic MET components within the agreed timescale									
LO2: Tools and equipment for dismantling and fitting MET components	2.1	Select and use the correct **tools and equipment** for the components to be remove or fit									
	2.2	Ensure that the tools and equipment required are in a safe working condition									
LO3: Dismantling and fitting of MET components	3.1	Use the appropriate personal protective equipment when removing and fitting basic MET components									
	3.2	Remove and fit basic MET components following; • removal and fitting procedures • manufacturers' instructions • your workplace procedures • Health, Safety and Environment and legal requirements									
	3.3	Work in a way to avoid damage to other components and units on the motor vehicle									
	3.4	Check that the components fitted operate correctly following the manufacturer's specification									
	3.5	Report any additional faults observed during the course of work to the relevant personnel promptly									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 006: TEAM WORK

Unit reference number:	**NADDC /AM /L1/004**
QCF level:	**2**
Credit value:	**1**
Guided learning hours:	**10**

Unit Purpose:
The purpose of this unit is to impart to the learner, skills, knowledge and understanding required to develop team spirit and positive working relationship.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 006: **TEAM WORK**

LO (Learning outcome)	**Performance Criteria:-**		Evidence Type					Evidence Ref Page number			
LO1: Positive working relationship with colleagues	1.1	Identify the need for developing positive relationship with colleagues.									
	1.2	Recognize the importance of relating with other people in a way that makes them feel valued and respected.									
	1.3	Assist team members when required.									
	1.4	Report to the appropriate personnel when request/requesting for assistance fall outside area of responsibility.									
	1.5	Communicate information to colleagues about own work that might affect others.									
LO2: Take Responsibilities within the team	2.1	Recognize own role and responsibilities within the team.									
	2.2	Perform individual tasks in line with the team rules and regulations.									
	2.3	Participate effectively in teamwork.									
LO3: Compliance with organisational policies	3.1	Work In line with organizational standard and structure.									
	3.2	Use organizational code of practice.									
	3.3	Explain organizational code of conduct.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 007: BASIC COMPUTER SKILLS IN AUTOMOTIVE INDUSTRY

Unit reference number:	**NADDC/AM/L1/005**
QCF level:	**2**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose:
This unit is to provide the necessary skills and competency required for computer usage in the automotive industry.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)
9. Assignment (ASS)

Unit 007: BASIC COMPUTER SKILLS IN AUTOMOTIVE INDUSTRY

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO 1: Computer Classification and operation	1.1	Identify computers according to usage, type and size.									
	1.2	Differentiate between analogue, digital and hybrid computers.									
	1.3	Identify and describe the various types of micro-computers.									
	1.4	Carryout a given assignment using the computer.									
LO 2: Use of computers in modern automobile workshops.	2.1	Explain the roles of computer in modern motor vehicles.									
	2.2	Explain the various applications of computer in automobile workshop.									
	2.3	Identify the characteristics and benefits of computer in automotive workshop.									
LO 3: Computer Hardware and Software Elements	3.1	Identify and explain the functions of various hardware and software components of the computer.									
	3.2	Differentiate between operating system and application software.									
	3.3	Select application software for a particular operation.									
LO4: Basic computer Operation	4.1	Operate the keyboard using function keys, alphanumeric keys, numeric keys and control keys.									
	4.2	Carryout typing exercise on the computer.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 008: MOTOR VEHICLE WHEEL ALIGNMENT OPERATIONS

Unit reference number:	**NADDC/AM/L2/008**
QCF level:	**2**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose:
This unit is about testing and adjusting wheel alignments to meet the required tolerances.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment in which wheel alignment operations are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning

Unit 008: MOTOR VEHICLE WHEEL ALIGNMENT OPERATIONS

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO1: Need for Wheel Alignment Operations	1.1	State the purpose of the steering and suspension system.									
	1.2	State reasons for tyre wear.									
	1.3	State the function of the following • Castor • Camber • (King Pin Inclination/Steering Angle Inclination)KPI/SAI • Toe-in • Toe-out.									
	1.4	Examine a given motor vehicle to ascertain the wheel alignment status.									
LO2: Alignment Pre-Checks	2.1	State the purpose of pre-alignment checks.									
	2.2	List the step-by-step procedures for pre-alignment checks.									
	2.3	Conduct all wheel alignment pre checks and wheel alignment operations following • the correct technical data • the manufacturer's instructions • your workplace procedure • Health, Safety and Environment requirements.									
LO3: Wheel Alignment Tools and Equipment	3.1	Identify and use various wheel alignment tools/equipment correctly.									
	3.2	Ensure that measuring and adjustment tools and equipment are safe and in good working condition.									
	3.3	Carry out all wheel alignment operations using suitable tools and equipment and the correct techniques.									
	3.4	Store tools and equipment according to manufacturer's specification.									
LO4: Wheel Alignment Procedures	4.1	Use suitable personal protective equipment and motor vehicle coverings throughout all wheel alignment operations.									
	4.2	Work in a way which minimises									

		the risk of damage to the motor vehicle and its systems.									
	4.3	Conduct all wheel alignment pre checks and four wheel alignment operations following • the correct technical data • the manufacturer's instructions • Workplace procedure • Health, Safety and environment requirements.									
	4.4	Ensure final adjustment and settings are within tolerance.									
	4.5	Inform relevant personnel when tolerance is not achievable.									
	4.6	Make clear and suitable recommendations for any further action to the relevant authorities clearly and accurately.									
	4.7	Complete all wheel alignment operations within the agreed timescale.									
LO5: Alignment Post Checks											
	5.1	State the purpose of post-alignment checks.									
	5.2	List the step-by-step procedures for post-alignment checks.									
	5.3	Carry out post wheel alignment checks to ensure conformity to specifications.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 009: MOTOR VEHICLE WHEEL BALANCING OPERATIONS

Unit reference number:	**NADDC/AM/L2/009**
QCF level:	**2**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose:
This unit is about testing and adjusting motor vehicle wheels balancing to meet the required rotational specification.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment in which wheel balancing operations are carried out with addition of weights and counter-weights.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning

Unit 009: MOTOR VEHICLE WHEEL BALANCING OPERATIONS

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Wheel alignment and balancing operations	1.1	Differentiate between wheel alignment and balancing.									
	1.2	Define the following • Dynamic unbalance • Static unbalance • Toe-in • Toe-out, etc.									
	1.3	State the effects of: • Tyre under inflation • Tyre over inflation.									
	1.4	State the purpose of the steering and suspension system									
	1.5	Examine a given motor vehicle (while driving) to ascertain the wheel balancing status.									
	1.6	Explain the effects of unbalanced wheel while driving a given motor vehicle.									
LO2: Wheel balancing tools and equipment											
	2.1	Identify and use various wheel balancing tools/equipment correctly.									
	2.2	Ensure that measuring and adjustment tools and equipment are safe and in good working condition.									
	2.3	Carry out wheel balancing activities using suitable tools and equipment and the correct techniques.									
	2.4	Store tools and equipment according to manufacturer's specification.									
LO3: Pre-balancing checks											
	3.1	State the purpose of pre-balancing checks									
	3.2	List the step-by-step procedures for pre-balancing checks									
	3.3	Conduct wheel balancing pre checks operations viz; • the correct technical data • the manufacturer's instructions • workplace procedure • Health, Safety and Environment requirements									
LO4: Wheel balancing											
	4.1	Use suitable personal protective									

procedures		equipment and motor vehicle coverings throughout wheel balancing operations.									
	4.2	Work in a way which minimises the risk of damage to the motor vehicle and its systems.									
	4.3	Conduct wheel balancing pre-checks operations following • the correct technical data • the manufacturer's instructions • workplace procedure • Health, Safety and Environment requirements.									
	4.4	Identify the various values on the tyre for: • Rim size • Width • Tyre classification • Tyre diameter • Tyre direction of rotation mark • Tyre wall • Tyre bead • Tyre liner • Tyre pressure, etc.									
	4.5	Ensure final adjustment and settings are within the tolerance allowed for the motor vehicle and statutory and regulatory requirement.									
	4.6	Inform the relevant personnel when adjustments within the tolerances are not possible.									
	4.7	Make clear and suitable recommendations for any further action to the relevant personnel clearly and accurately.									
	4.8	Complete all four wheel balancing operations within the agreed timescale.									
LO5: Explain post balancing checks											
	5.1	State the purpose of post-balancing checks.									
	5.2	List the step-by-step procedures for post-balancing checks.									
	5.3	Carry out post wheel balancing checks to ensure conformity to specifications.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 010: PERIODIC MAINTENANCE SERVICE

Unit reference number:	**NADDC /AM/L1/007**
QCF level:	**2**
Credit value:	**2**
Guided learning hours:	**20 HOURS**

Unit Purpose:
This unit is about conducting routine examination, adjustment and replacement activities as part of the periodic servicing of motor vehicles.

Unit assessment requirements/evidence requirements:
This assessment can only be carried in a real workplace environment in which automotive service and repair operation are carried out in a workshop environment effectively. Live engines and functional motor vehicles shall be provided.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 010: PERIODIC MAINTENANCE SERVICE

LO (Learning outcome)		Performance Criteria	Evidence Type					Evidence Ref Page number			
LO 1: Types and application of filters	1.1	List and identify the various types of filters and their components.									
	1.2	Identify different filters and the filtrations system (paper filters, fabric, cyclone, wire-mesh filters etc).									
	1.3	Identify the application of pre-filtration and filtration systems.									
	1.4	Identify and apply correct specifications and tolerances for the motor vehicle when making assessments of system and component performance.									
	1.5	Work in a way which minimises the risk of damage to the motor vehicle filtration and its systems and the surrounding area									
LO2 : Procedures for conducting a lubrication service											
	2.1	Use manufacturer's routine maintenance checklist accurately									
	2.2	Use suitable personal protective equipment and motor vehicle coverings throughout all motor vehicle maintenance activities.									
	2.3	Identify and ensure motor vehicle's systems and components complies with the following; • The manufacturer's approved examination methods • Workplace procedures • Health, Safety and environment requirements.									
	2.4	Use only the correct specifications and tolerances for the motor vehicle when making assessments of system and component performance									
LO 3 Demonstrate procedure for servicing an engine											
	3.1	Use suitable personal protective equipment and motor vehicle coverings throughout all maintenance activities									
	3.2	Use suitable sources of technical information to support all motor vehicle maintenance									

		activities.									
	3.3	Measure the motor vehicle's systems and components following: • The manufacturer's approved examination methods • Workplace procedures • Health, Safety Environment requirements									
	3.4	Identify accurately any motor vehicle system and component problems that falls outside the specified maintenance schedule.									
	3.5	Dismantle and assemble components in a way which minimises the risk of damage to the motor vehicle and its systems.									
	3.6	Use suitable and accurate testing methods to evaluate the performance of all replaced and adjusted components/systems.									
	3.7	Promptly communicate any problems or issues relating to the motor vehicle's condition or conformity to the relevant personnel.									
	3.8	Ensure that maintenance records are accurate, complete and passed to the relevant personnel promptly in the format required.									
	3.9	Identify and use appropriate diagnostic tools and equipment for routine motor vehicle maintenance.									
	3.10	Communicate any anticipated delays in completion to the relevant personnel.									
	3.11	Perform all motor vehicle maintenance activities within the agreed timescale.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 011: LIGHT MOTOR VEHICLE PERIODIC MAINTENANCE

Unit reference number:	**NADDC/AM/L2/011**
QCF level:	**2**
Credit value:	**2**
Guided learning hours:	**20 HOURS**

Unit Purpose:
This unit is about conducting routine examination, adjustment and replacement operations as part of the periodic servicing of light motor vehicles.

Unit assessment requirements/evidence requirements:
This assessment can only be carried in a real workplace environment in which automotive service and repair operation are carried out in a workshop environment effectively. Live engines and functional light motor vehicles shall be provided.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 011: LIGHT MOTOR VEHICLE PERIODIC MAINTENANCE

LO (Learning outcome)		Performance Criteria	Evidence Type					Evidence Ref Page number			
LO 1: Types and application of filters	1.1	List and identify the various types of filters and their components.									
	1.2	Identify different filters and the filtrations system (paper filters, fabric, cyclone, wire-mesh filters etc).									
	1.3	Identify the application of pre-filtration and filtration systems.									
	1.4	Identify and apply correct specifications and tolerances for the light motor vehicle when making assessments of system and component performance.									
	1.5	Work in a way which minimises the risk of damage to the light motor vehicle filtration and its systems and the surrounding area.									
LO2 : Lubrication service	2.1	State the purposes of lubrication service									
	2.2	Explain the procedures for conducting a lubrication service on light motor vehicle									
	2.3	Use manufacturer's routine maintenance checklist accurately									
	2.4	Use suitable personal protective equipment and light motor vehicle coverings throughout all light motor vehicle maintenance activities.									
	2.5	Identify and ensure motor vehicle's systems and components complies with the following; • The manufacturer's approved examination methods • Workplace procedures • Health, Safety and workplace requirements.									
	2.6	Use only the correct specifications and tolerances for the light motor vehicle when making assessments of system and component. Performance.									
LO 3: Demonstrate procedure for servicing light motor vehicle engine service	3.1	State the purposes of engine service									
	3.2	Explain the procedures for conducting engine service on light motor vehicle									

	3.3	Use suitable personal protective equipment and light motor vehicle coverings throughout all maintenance activities									
	3.4	Use suitable sources of technical information to support all your light motor vehicle maintenance activities									
	3.5	Measure light motor vehicle's systems and components for tolerance and functionality following: • The manufacturer's approved examination methods • Workplace procedures • Health, Safety and workplace requirements.									
	3.6	Identify accurately any faulty light motor vehicle system and component.									
	3.5	Dis-mantle and assemble components in a way which minimises the risk of damage on the vehicle and its systems.									
	3.6	Use suitable and accurate testing methods to evaluate the performance of all replaced and adjusted components/systems.									
	3.7	Promptly communicate any problems or issues relating to the motor vehicle's condition or conformity to the relevant personnel.									
	3.8	Ensure that maintenance records are accurate, complete and passed to the relevant personnel promptly in the format required.									
	3.9	Identify and use appropriate diagnostic tools and equipment for routine motor vehicle maintenance.									
	3.9.1	Communicate any anticipated delays in completion to the relevant personnel.									
	3.9.2	Perform all motor vehicle maintenance activities within the agreed timescale.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 012: HEAVY DUTY MOTOR VEHICLE PERIODIC MAINTENANCE

Unit reference number:	**NADDC/AM/L2/012**
QCF level:	**2**
Credit value:	**3**
Guided learning hours:	**30 HOURS**

Unit Purpose:
This unit is about conducting routine examination, adjustment and replacement operations as part of the periodic servicing of heavy duty motor vehicle.

Unit assessment requirements/evidence requirements
This assessment can only be carried in a real workplace environment in which automotive service and repairs for trailers are carried out in a workshop environment effectively. Live engines and functional motor vehicles shall be provided.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 012: HEAVY DUTY MOTOR VEHICLE PERIODIC MAINTENANCE

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Types and application of filters	1.1	List and identify the various types of filters and their components.									
	1.2	Identify different filters and the filtrations system (paper filters, fabric, cyclone, wire-mesh filters etc)									
	1.3	Identify the application of pre-filtration and filtration systems.									
	1.4	Identify and apply correct specifications and tolerances for the heavy duty motor vehicle when making assessments of system and component performance.									
	1.5	Work in a way which minimises the risk of damage to the heavy duty motor vehicle, its systems and the environment.									
LO2 : Procedures for conducting a lubrication service											
	2.1	Use manufacturer's routine maintenance checklist accurately									
	2.2	Use suitable personal protective equipment and heavy duty motor vehicle coverings throughout all motor vehicle maintenance activities									
	2.3	Identify and ensure heavy duty motor vehicle's systems and components complies with the following; • The manufacturer's approved examination methods • Workplace procedures • Health, Safety and workplace requirements.									
	2.4	Use only the correct specifications and tolerances for the heavy duty motor vehicle when making assessments of system and component performance.									
LO 3: Engine service procedure											
	3.1	Use suitable personal protective equipment and heavy duty motor vehicle coverings throughout all maintenance activities.									
	3.2	Use suitable sources of technical information to support all your heavy duty motor vehicle maintenance activities.									

	3.3	Measure the motor vehicle's systems and components following: • The manufacturer's approved examination methods • Workplace procedures • Health, Safety and environmental requirements									
	3.4	Identify accurately any faulty light motor vehicle system and component.									
	3.5	Dis-mantle and assemble components in a way which minimises the risk of damage on the vehicle and its systems.									
	3.6	Use suitable and accurate testing methods to evaluate the performance of all replaced and adjusted components/systems.									
	3.7	Promptly communicate any problems or issues relating to the motor vehicle's condition or conformity to the relevant personnel.									
	3.8	Ensure that maintenance records are accurate, complete and passed to the relevant personnel promptly in the format required.									
	3.9	Identify and use appropriate diagnostic tools and equipment for routine motor vehicle maintenance.									
	3.9.1	Communicate any anticipated delays in completion to the relevant personnel.									
	3.9.2	Perform all motor vehicle maintenance activities within the agreed timescale.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

LEVEL III

Summary of Level III

MANDATORY NOS

S/NO/ UNIT NO	REFERENCE NO.	NOS TITLE	CREDIT VALUE	GUIDED LEARNING HOURS	REMARKS
1	NADDC/AM/L1/002	**Health, Safety and Environment In Automotive Industry**	2	20	*Culled from Level 1*
2	NADDC/AM/L1/003	**Communication Process in a Work Environment**	1	10	*Culled from Level 1*
3	NADDC/AM/L1/004	**Team-Work**	1	10	*Culled from Level 1*
4	NADDC/AM/L3/001	**Customer Relations in an Automotive Service & Repair workshop**	4	40	
5	NADDC/AM/L3/002	**Motor vehicle Electrical System Enhancement Installation**	4	40	
6	NADDC/AM/L3/003	**Basic Power-train & Rolling Chassis Diagnostics**	5	50	
TOTAL CREDIT VALUE/ LERANING HOURS			**17**	**170**	

OPTIONAL NOS

S/NO	OPTIONAL NOS	NOS TITLE	CREDIT VALUE	GUIDED LEARNING HOURS	REMARKS
7	NADDC/AM/L3/004	**Automotive Electrical/Electronics Components Rectification**	6	60	
8	NADDC/AM/L3/005	**Motor vehicle Diagnosis**	6	60	
9	NADDC/AM/L3/006	**Motor vehicle Damage Assessment**	5	50	
10	NADDC/AM/L3/007	**Motor vehicle Body Trimming**	5	50	
TOTAL CREDIT VALUE/ LERANING HOURS			**22**	**220**	

NOTE: Learners are required to select four (4) units from the optional units.

Unit 001: HEALTH, SAFETY AND ENVIRONMENT (HSE) IN AUTOMOTIVE INDUSTRY

Unit reference number:	**NADDC/AM/L1/002**
QCF level:	**3**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose: This unit is about the knowledge and skills needed to competently carryout daily activities in an automotive workshop while observing relevant work ethics and safety. It includes basic first-aid and fire-fighting procedures**.**

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 001: **HEALTH, SAFETY AND ENVIRONMENT (HSE) IN AUTOMOTIVE INDUSTRY**

LO (Learning outcome)		**Performance Criteria:-**	Evidence Type					Evidence Ref Page number			
LO 1: Personal health and hygiene	1.1	Wear clean, smart and appropriate personal protective equipment (wears)									
	1.2	Work safely at all times, complying with health, safety and environmental regulations and guidelines									
	1.3	Get cuts, grazes and wounds treated by the appropriate personnel.									
	1.4	Report any form of illness promptly to the appropriate personnel.									
LO2: Maintain personal health and hygiene											
	2.1	State own responsibility in the health and safety Act as it relates to own occupation									
	2.2	State general rules on hygiene that must be followed									
	2.3	State correct personal protection equipment (such as Head Protection, Foot Protection, Hand and body protection) and regulatory protection.									
	2.4	State the importance of maintaining good personal hygiene									
	2.5	Describe how to deal with cuts, grazes and wounds and why it is important to do so									
LO3: Assist in the maintenance of a hygienic, safe and secure workplace											
	3.1	State the importance of working in a healthy, safe and hygienic workplace									
	3.2	Report any accidents or near misses quickly and accurately to the proper personnel									
	3.3	Follow health, hygiene and safety procedure at work									
	3.4	Practice emergency procedures during work									
	3.5	Follow organizational security procedures and measures									
	3.6	Ensure the disposal of waste and pollution control with organic and inorganic waste disposal methods.									
	3.7	Follow noise control and protection methods.									
LO4:											

Prevention of hazards in the work place	4.1	Identify any potential hazards/hazards and deal with these correctly									
	4.2	Explain where information about health, safety and environment in the workplace can be obtained.									
	4.3	Describe the types of hazard in the workplace that may occur and how to deal with them									
	4.4	Explain hazards that can be dealt with personally and those that should be reported to the appropriate personnel									
	4.5	Explain how to warn other people about potential hazards/hazards and why this is important									
	4.6	Explain why accidents and near-accidents should be reported and to whom									
	4.7	Describe the types of emergencies that may happen in the workplace and how to deal with it									
	4.8	Explain where to find the first-aid equipment and who the registered first responder is in the work place									
	4.9	Explain safe lifting and handling techniques that should be followed.									
	4.10	Explain other ways of working safely that are relevant to own position and why they are important.									
	4.11	Describe organizational emergency procedures, in particular fire, and how these should be followed.									
	4.12	State the possible causes of fire and how to minimize the possibility of fire in the workplace									
	4.13	State where to find the alarms and how to set them off									
	4.14	State the importance of following the fire safety laws and why it should never be approached unless it is safe to do so									
	4.15	Describe the organizational security procedures and why these are important									
	4.16	Explain the importance of reporting all incidents to the appropriate personnel.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 002: COMMUNICATION PROCESS IN AN AUTOMOTIVE ENVIRONMENT

Unit reference number:	**NADDC/AM/L1/003**
QCF level:	**3**
Credit value:	**1**
Guided learning hours:	**10**

Unit Purpose: To establish a quality communication system that is responsive and subject to change in meeting workers and employers need, in work environment.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 002: COMMUNICATION PROCESS IN AN AUTOMOTIVE ENVIRONMENT

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Non-complex communication system in a work environment	1.1	Use a simple verbal means to pass on necessary information.									
	1.2	Use non-verbal means to pass on necessary information e.g. body language.									
	1.3	Identify and explain symbols and signs appropriately.									
LO2: Information source identification in a work environment.											
	2.1	Identify the source of information in an organisation and work environment.									
	2.2	Relate appropriately with the source of information.									
	2.3	Use the various information flow systems in a work environment.									
	2.4	Use information sources to address challenges in a work environment.									
	2.5	Communicate findings in accordance to procedure in a work environment.									
LO3: Use of communication methods in a work environment											
	3.1	Identify the various methods of communication in the work environment.									
	3.2	Use effectively, the various methods of communication in a work environment and communicate effectively to the right personnel.									
	3.3	Observe information effectively using symbols, signs and codes.									
	3.4	Observe instructions in line with ethics of the work environment.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 003: TEAM WORK

Unit reference number:	**NADDC /AM /L1/004**
QCF level:	**3**
Credit value:	**1**
Guided learning hours:	**10**

Unit Purpose:
The purpose of this unit is to impart to the learner, skills, knowledge and understanding required to develop team spirit and positive working relationship.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 003: TEAM WORK

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO1: Positive working relationship with colleagues	1.1	Identify the need for developing positive relationship with colleagues.									
	1.2	Recognize the importance of relating with other people in a way that makes them feel valued and respected.									
	1.3	Assist team members when required.									
	1.4	Report to the appropriate personnel when request/requesting for assistance fall outside area of responsibility.									
	1.5	Communicate information to colleagues about own work that might affect others.									
LO2: Take Responsibilities within the team	2.1	Recognize own role and responsibilities within the team.									
	2.2	Perform individual tasks in line with the team rules and regulations.									
	2.3	Participate effectively in teamwork.									
LO3: Compliance with organisational policies	3.1	Work In line with organizational standard and structure.									
	3.2	Use organizational code of practice.									
	3.3	Explain organizational code of conduct.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 004: CUSTOMER RELATIONS IN AN AUTOMOTIVE SERVICE & REPAIR WORKSHOP

Unit reference number:	**NADDC/AM/L3/001**
QCF level:	**3**
Credit value:	**4**
Guided learning hours:	**40 HOURS**

Unit Purpose:
This unit is about gaining information from customers on their perceived needs, ascertain the scope of work, giving advice and information and agreeing a course of action, contracting for the agreed work and completing all necessary records and instructions.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 004: CUSTOMER RELATIONS IN AN AUTOMOTIVE SERVICE & REPAIR WORKSHOP

LO (Learning outcome)		Performance Criteria	Evidence Type					Evidence Ref Page number			
LO1: Customers contact/communication	1.1	Gather relevant information from the customer to make an assessment of perceived motor vehicle needs.									
	1.2	Analyse and clarify customers complaints during conversation.									
	1.3	Document and communicate customer's understanding of the requirement you have made.									
LO2 : Documentation of Motor vehicle Data and customer complaint											
	2.1	Carryout accurate identification and clarification of customer and motor vehicle needs, by referring to; • Motor vehicle data • Operating procedure.									
	2.2	Certify that recording system are complete, accurate, in the required format and signed by the customer where necessary.									
	2.3	Discuss and record the following with the customer before accepting the motor vehicle; • the physical inventory of the car • the extent and nature of the work to be undertaken • the terms and conditions of acceptance • the cost • the timeframe.									
	2.4	Provide customers with accurate, current and relevant information on: • suitable motor vehicle inspection, repair/parts replacement • potential causes of action • the consequences of the action • the estimated cost.									
LO3 : Customer Follow Up Service											
	4.1	Compile further customer approval where the contracted agreement is likely to be exceeded.									

	4.2	Describe how to get feedback from customers.									
	4.3	Carryout customer satisfaction survey.									
	4.4	Obtain customer feedback on completed jobs.									
	4.5	Analyze customer feedback.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 005: MOTOR VEHICLE ELECTRICAL SYSTEM ENHANCEMENTS AND INSTALLATION

Unit reference number:	**NADDC/AM/L3/002**
QCF level:	**3**
Credit value:	**4**
Guided learning hours:	**40**

Unit Purpose:
This unit is about fitting electrical features and components to enhance the original motor vehicle features and specification to meet customer requirements.

Unit assessment requirements/evidence requirements
This unit identifies the competences needed to carryout fault diagnosis of motor vehicle electrical and electronic unit and components, in accordance with approved procedures. It involves the application of the following six point's diagnostic techniques;

- Verify the fault
- Collect further information
- Evaluate the evidences
- Carryout further tests in a logical sequence
- Rectify the fault

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 005: MOTOR VEHICLE ELECTRICAL SYSTEM ENHANCEMENTS AND INSTALLATION

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Motor vehicle Electrical System Enhancement and their Operations	1.1	Explain the purpose of electrical enhancements									
	1.2	Identify the already installed electrical enhancements in a motor vehicle									
	1.3	Discuss the advantages and disadvantages of fitting electrical enhancements in a motor vehicle.									
	1.4	Interpret the manufacturers' requirement for properly fitting electrical enhancements in the particular motor vehicle.									
	1.5	Explain the working principle of various electrical enhancements.									
	1.6	Describe the legal requirement for fitting electrical enhancements.									
LO2: Tools And Equipment Used In Motor vehicle Electrical System Enhancement											
	2.1	List and identify types of tools and equipment used.									
	2.2	Describe the enhancement tools and equipment.									
	2.3	Carryout the preparation and testing of all the tools and equipment required, following manufacturers' instructions.									
	2.4	Use tools and equipment in line with manufacturer's specification.									
	2.5	Observe safety in storing and securing.									
LO3: Customer Needs And Requirements											
	3.1	Assemble components which are compatible with the motor vehicle specification and customer requirements.									
	3.2	Monitor to ensure that all enhancements function to specification prior to release to the customer.									
	3.3	Implement all enhancement activities within the agreed timescale.									
	3.4	Communicate any anticipated delays in completion to the appropriate personnel promptly.									
LO4: Motor vehicle Electrical											
	4.1	Observe safety and work ethics with suitable personal protective									

System Enhancements.		equipment and the use of motor vehicle coverings throughout all enhancement activities.									
	4.2	Carry out all electrical enhancement activities following: • manufacturers' instructions • your workplace procedures • Health, Safety and Environment legal requirements									
	4.3	Adopt workshop rules and regulations to minimise the risk of: • damage to other motor vehicle systems • damage to other components and units • contact with leakages • contact with hazardous substances • damage to the environment									
	4.4	Use manufacturer's specification to adjust the components fitted and motor vehicle systems correctly for effective operation.									
	4.5	Inspect to ensure all enhancements function to specification prior to release to the customer									
	4.6	Carryout all enhancement activities within the agreed timescale									
	4.7	Communicate any anticipated delays in completion to the relevant authority promptly									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 006: BASIC POWER-TRAIN & ROLLING CHASSIS DIAGNOSTICS

Unit reference number:	**NADDC/AM/L3/003**
QCF level:	**3**
Credit value:	**5**
Guided learning hours:	**50**

Unit Purpose:
This unit is about identifying and rectifying electrical faults occurring within a variety of electrical systems within the powertrain and rolling chassis. It includes the procedures for inspecting and assessing the conditions and overhauling of the transmission system in line with manufacturers' specifications.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 006: BASIC POWER-TRAIN & ROLLING CHASSIS DIAGNOSTICS

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Motor vehicle Transmission and Chassis System Operations and Principles	1.1	Describe the purpose of transmission systems.									
	1.2	Explain the purpose of chassis system.									
	1.3	Identify the components of the transmission system.									
	1.4	Identify the components of the chassis system.									
	1.5	Differentiate between transmission and chassis system.									
LO2: Chassis and Transmission Tools and Equipment	2.1	Identify chassis and transmission system tools and equipment.									
	2.2	Differentiate between Special Service Tools from other tools (SST).									
	2.3	Use the tools and equipment required, correctly and safely throughout all service or repair activities.									
	2.4	Observe manufacturers specification in storing and securing tools and equipment.									
LO3: Basic Power-Train & Rolling Chassis Diagnostics	3.1	Use suitable personal protective equipment and motor vehicle coverings when applying electrical testing techniques and carrying out repairs.									
	3.2	Support the identification of complex electrical faults, by reviewing motor vehicle: • technical data • diagnostic test procedures.									
	3.3	Use manufacturer's instructional manual to prepare, and test all the required electrical and electronic components.									
	3.4	Carry out all repair activities following: • manufacturers' instructions • recognized repair methods • Health, Safety and Environment requirements.									
	3.5	Use the tools and equipment required, correctly and safely throughout all repair activities									
	3.6	Ensure all repaired and replaced electrical components and units									

		conform to the motor vehicle operating specification and any legal requirements.									
	3.7	Adjust components and units correctly to ensure that they operate to meet system requirements.									
	3.8	Ensure the electrical system repair performs to the motor vehicle operating specification and any legal requirements prior to return to the customer.									
	3.9	Ensure records are accurate, complete and passed to the relevant personnel promptly in the format required.									
	3.10	Assess and apply correct information, tools and equipment for inspecting and assessing the transmission system and its associated components in line with manufacturers' specification.									
	3.11	Demonstrate procedures for dismantling and assembling a transmission system and its associated components.									
	3.12	Demonstrate procedures for repairing and/or replacing component parts of a transmission system and its associated components.									
	3.13	Apply procedures for measuring and evaluating wear on component parts of the transmission system.									
	3.14	Demonstrate procedures for repairing and replacing automatic transmission system.									
	3.15	Demonstrate procedures for operational testing of automatic transmission system components.									
	3.16	Complete all system diagnostic activities within the agreed timescale.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 007: AUTOMOTIVE ELECTRICAL/ELECTRONICS COMPONENTS/SYSTEMS RECTIFICATION

Unit reference number:	**NADDC/AM/L3/004**
QCF level:	**3**
Credit value:	**6**
Guided learning hours:	**60 hours**

Unit Purpose:
This unit identifies the competences needed to carryout fault diagnosis of automotive electrical and electronic components in accordance with approved procedures. It involves the application of the following six point's diagnostic techniques;

- Fault Verification
- Data Compilation
- Data Evaluation
- Testing
- Fault Amendment
- Final testing/amendment confirmation/certification.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 007: AUTOMOTIVE ELECTRICAL/ELECTRONICS COMPONENTS/SYSTEMS RECTIFICATION

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO1: Operational Principles of Automotive Electrical-Electronics Components/ systems	1.1	Identify and access motor vehicle electrical/electronic components/systems.									
	1.2	Differentiate between electrical and electronics components/systems.									
	1.3	Analyze the operations of each of the components/systems.									
LO2: Diagnostic Tools and Equipment											
	2.1	Select and use appropriate diagnostic techniques, tools and aids to locate faults.									
	2.2	Operate motor vehicle diagnostic tools and equipment.									
	2.3	Store diagnostic tools and equipment safely and in line with manufacturer's specification.									
	2.4	Update diagnostic tools/ equipment as at when due and in line with manufacturer's specification.									
LO 3: Safe working practices in Automotive Electrical/ Electronics components Diagnosis											
	3.1	Work safely at all times, complying with health and safety and other relevant regulations and guidelines.									
	3.2	Demonstrate safe handling and storage of the diagnostic tools and equipment.									
	3.3	Work in a way which minimizes the risk of damage to other motor vehicle system, components, units, and the environment.									
LO4: Automotive Electrical / Electronics Systems Faults repair											
	4.1	Troubleshoot to establish the most likely cause(s) of the faults.									
	4.2	Select and use appropriate diagnostic techniques, tools and aids to locate faults.									
	4.3	Rectify the identified faults using appropriate methods and techniques.									
	4.4	Demonstrate procedures for retrieving, interpreting and erasing fault codes.									
	4.5	Demonstrate the procedures for printing a selection of information from a data base.									

	4.6	Apply procedures for interpreting electrical wiring diagrams.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 008: MOTOR VEHICLE DIAGNOSIS

Unit reference number:	**NADDC/AM/L3/005**
QCF level:	**3**
Credit value:	**6**
Guided learning hours:	**60**

Unit Purpose:
This unit is about diagnosing and rectifying faults occurring in the mechanical, electrical/electronics, communication, hydraulic and pneumatic systems of a motor vehicle.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Assessment will require the provision of functional motor vehicles, stationary live engines, as well as assorted engine components.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 008: MOTOR VEHICLE DIAGNOSIS

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Working Principle of an Engine	1.1	Identify different types of engine									
	1.2	Identify the 2 and 4 stroke cycle of engine operation.									
	1.3	Identify and explain the stroke cycle • spark and compression ignition engines, • mechanical and electrical/electronic components of an engine.									
	1.4	Identify and explain hydraulic and engine fluid component.									
	1.5	Identify and explain the differences between hybrid and alternative fuel engines									
LO2: Tools and Equipment Used In Engine Diagnosis and Rectification											
	2.1	Identify various diagnostic tools and equipment.									
	2.2	Differentiate between Original Equipment Manufacturers (OEM) tool from Generic Diagnostic Equipment (GDE).									
	2.3	Use manufacturer's instructions to prepare, connect and test all the required equipment prior to use.									
	2.4	Use the equipment required, correctly and safely throughout all diagnostic and rectification activities.									
	2.5	Observe manufacturer's specification to store and secure all tools and equipment.									
LO3: Engine faults analysis and rectification techniques											
	3.1	Wear suitable personal protective equipment and use motor vehicle coverings when using diagnostic methods and carrying out rectification activities.									
	3.2	Support the identification of faults, by reviewing motor vehicle: • technical data • diagnostic test procedures.									
	3.3	Collect sufficient diagnostic information in a systematic way to enable an accurate diagnosis of engine system									

		faults.									
	3.4	Identify and explain the different communication systems used in motor vehicles.									
	3.5	Identify and record any system deviation from acceptable limits accurately.									
	3.6	Assess to ensure that the dismantled sub-assemblies, components and units are intact. Identify their condition and suitability for repair or replacement.									
	3.7	Carry out all diagnostic and rectification activities following: • manufacturers' instructions • recognized repair methods(see guidance document) • your workplace procedures • Health, Safety and Environment requirements.									
	3.8	Measure and adjust components/units correctly to ensure that they operate to meet system requirements.									
	3.9	Use testing methods which are suitable for assessing the performance of the system rectified.									
	3.10	Determine the procedures for interpreting electrical wiring diagrams.									
	3.11	Determine the procedures for retrieving and erasing fault codes.									
	3.12	Describe procedures for interpreting readings related to direct, indirect and intermittent faults.									
	3.113	Carryout procedures for repairing and replacing electrical and electronically controlled system components.									
	3.14	Ensure the engine system rectified performs to the motor vehicle operating specification and any other legal requirements prior to return to the customer.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 009: MOTOR VEHICLE DAMAGE ASSESSMENT

Unit reference number:	**NADDC/AM/L3/006**
QCF level:	**3**
Credit value:	**5**
Guided learning hours:	**50**

Unit Purpose:
This unit is about performing what is commonly known as an 'estimate strip' done to support the work of Motor vehicle Damage Assessors in order to gain detailed and exact information on the extent and type of damage present within all motor vehicle systems, units and components and trim fitments. The unit also covers the ability to describe and document damage with reference to manufacturer's guidance and make recommendations in order to maintain the integrity of the repair.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Assessment will require the provision of "accidented" functional motor vehicles.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 009: MOTOR VEHICLE DAMAGE ASSESSMENT

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO1: Motor vehicle structure, components and accessories	1.1	Identify types of motor vehicle structures.									
	1.2	Explain various component /accessories location.									
	1.3	Explain the functions of various motor vehicle components and accessories.									
	1.4	Enumerate the merits and de-merits of various motor vehicle structures.									
	1.5	Explain laid down rules and regulations.									
LO2: Tools And Equipment For Motor vehicle Damage Assessment	2.1	Use the correct tools and equipment selection for the motor vehicle stripping and examination activities.									
	2.2	Ensure tools and equipment required are in a safe and proper working condition.									
	2.3	Use the manufacturer's specification as a guide to store diagnostic tools and equipment safely									
LO3: Technical Documentations For Motor vehicle Damage Assessments	3.1	Support motor vehicle stripping, examination and testing activities by referring to: i. Manufacturer's guidance ii. Motor vehicle technical data iii. Initial motor vehicle damage assessor report iv. Removal and replacement procedures v. Legal requirements.									
	3.2	Use suitable examination and testing methods to evaluate the type and extent of damage accurately.									
	3.3	Review and ensure examination and testing of the motor vehicle against specifications identifies; • The type and extent of damage to systems, units and components • Differences from the motor vehicle specification • Motor vehicle appearances and fault condition									

		• Accident related and any non-accident related damage or fault • Safety critical items.									
	3.4	Inspect to ensure your records describe damage with reference to manufacturers' specification for system, unit and component condition.									
LO4: Motor vehicle Damage Assessment.											
	4.1	Use the appropriate personal protective equipment when carrying out motor vehicle stripping, examination and testing									
	4.2	Support and protect the motor vehicle effectively when carrying out motor vehicle stripping, examination and testing									
	4.3	Carry out all motor vehicle stripping, examination and testing activities following; • Manufacturer's instructions • Workplace procedures • Health, Safety and Environmental requirements									
	4.4	Work in a way which minimizes the risk of: • Damage to other motor vehicle systems • Damage to other component and units • Leakage • Contact with hazardous substances • Damage to the environment.									
	4.5	Work in a way commensurate to the level and limit of the damage to the motor vehicle.									
	4.6	Interact to ensure that the extent of motor vehicle stripping is suitable to determine the level and extent of damage.									
	4.7	Compile suitable recommendations for further work that will maintain the integrity of the repair and meet manufacturers' requirements.									
	4.8	Implement all motor vehicle stripping, examination and testing activities within the agreed timescale.									

	4.9	Communicate any expected delays in completing work to relevant personnel. promptly									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 010: MOTOR VEHICLE BODY TRIMMING

Unit reference number:	**NADDC/AM/L3/007**
QCF level:	**3**
Credit value:	**5**
Guided learning hours:	**50**

Unit Purpose:
This unit is to acquire the knowledge and skills needed to improve the physical appeal of a motor vehicle and also to protect it from damages. It includes beautifying both the interior and exterior part of the motor vehicle.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment (PA)
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 010: MOTOR VEHICLE BODY TRIMMING

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Trimming materials											
	1.1	Identify the properties, use and forms of supply of common trimming materials.									
	1.2	Describe the properties, use and forms of supply of common trimming materials.									
	1.3	Identify classes of adhesives and factors to be considered in the selection of trimming materials.									
	1.4	Explain the safety regulations in the selection of trimming materials.									
LO2: Safety regulation and practices in trimming											
	2.1	Explain the responsibilities of employer and employee on environment, health & safety hazards in the automotive workshop.									
	2.2	Describe environmental, health & safety hazards, their causes and preventive measures.									
	2.3	Describe safety regulations in the automotive workshop.									
	2.4	Describe the methods involved in the storage of trimming tools, materials and equipment before and after use.									
LO3: Tools and Equipment used in trimming											
	3.1	Describe the features of tools and equipment used in trimming.									
	3.2	Describe the working principles of tools and equipment used in trimming.									
	3.3	Describe the routine maintenance of tools and equipment used in trimming.									
	3.4	Explain the safety regulations in the selection of tools and equipment used in trimming.									
LO4: Body trimming components and features.											
	4.1	Identify and describe car model materials, interior features/locations.									
	4.2	Describe the design and construction of trimming components.									
	4.3	Describe the function of body trimming materials.									
LO5											

Preparation of Motor vehicle body for trimming.	5.1	Prepare trimming layout, design, working drawings.									
	5.2	Mark out the scale layout for the trimming work.									
	5.3	Prepare estimate of quantities and cost of materials for trimming work.									
	5.4	Use patterns to cut shape of suitable trimming materials.									
LO6: Trimming of motor vehicle	6.1	Explain the operational sequence of trimming on a motor vehicle.									
	6.2	Describe the general planning procedure for floor covering plan.									
	6.3	Describe the methods of dealing with joints on flat floors.									
	6.4	Set out the operational sequence in trimming: • Preparation routine • Working drawings • Personnel.									
	6.5	Observe safety regulations in the automotive workshop.									
	6.6	Carry out all repairs/replacements within the agreed timescale.									
	6.7	Communicate any anticipated delays in completion to the relevant authority.									
	6.8	Inspect that all repairs/replacements are carried out prior to the release of the motor vehicle to the customer.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

LEVEL IV

Summary of Level IV

MANDATORY NOS

S/NO/ UNIT NO	REFERENCE NO.	NOS TITLE	CREDIT VALUE	TOTAL LEARNING HOURS	REMARKS
1	NADDC/AM/L4/001	**Communication Process in an Automotive Work Environment**	1	10	
2	NADDC/AM/L4/002	**Health and Safety in Automotive Industry**	2	20	
3	NADDC/AM/L4/003	**Motor vehicle Air-Conditioning System**	6	60	
4	NADDC/AM/L4/004	**Motor vehicle Breakdown Service and Recovery**	6	60	
5	NADDC/AM/L4/005	**Motor vehicle Enhancement and Installation**	5	50	
6	NADDC/AM/L4/006	**Removal and Re-Installation of Complete Motor vehicle Electro-Mechanical and Electronic Systems in an Accidented Motor vehicle**	5	50	
7	NADDC/AM/L4/007	**Team-Work**	2	20	
8	NADDC/AM/L4/008	**Workshop Organization and Management**	6	60	
9	NADDC/AM/L4/009	**Engine Re-Conditioning**	6	60	
10	NADDC/AM/L4/010	**Basic Computer Skills in Automotive Industry**	2	20	
TOTAL CREDIT VALUE/ LERANING HOURS			**41**	**410**	

OPTIONAL NOS

S/NO	OPTIONAL NOS	NOS TITLE	CREDIT VALUE	TOTAL LEARNING HOURS	REMARKS
11	NADDC/AM/L4/011	**Motor vehicle Electrical Unit And Component Faults Rectification**	6	60	
12	NADDC/AM/L4/012	**Motor vehicle Electrical and Electronics System Faults Rectification**	6	60	
13	NADDC/AM/L4/013	**Motor vehicle Engine and Component Faults Rectification**	5	50	
14	NADDC/AM/L2/003	**Metal Fastening Techniques used in Automotive Services and Repair Operation**	3	30	*Culled from Level 2*
15	NADDC/AM/L2/004	**Identification and Fitting of Auxiliary Locks and Security Devices in Motor vehicles**	3	30	*Culled from Level 2*
16	NADDC/AM/L2/005	**Removal/fitting of metal and electrical trim components in a motor vehicle.**	3	30	*Culled from Level 2*
17	NADDC/AM/L3/004	**Customer Relations in an Automotive Work Environment**	4	40	*Culled from Level 3*
18	NADDC/AM/L3/005	**Motor vehicle Electrical System Enhancement Installation**	4	40	*Culled from Level 3*
19	NADDC/AM/L3/006	**Motor vehicle Transmission And Chassis Electrical Fault Rectification**	5	50	*Culled from Level 3*
20	NADDC/AM/L1/001	**Automotive Service Tools and Equipment**	3	30	*Culled from Level 1*
21	NADDC/AM/L3/011	**Motor vehicle Body Trimming**	5	50	*Culled from Level 3*
22	NADDC/AM/L4/014	**Motor vehicle Body Spray Painting**	6	60	
23	NADDC/AM/L4/015	**Motor vehicle Upholstery**	6	60	
24	NADDC/AM/L4/016	**Panel Beating**	5	50	
TOTAL CREDIT VALUE/ LERANING HOURS			**65**	**650**	

NOTE: Learners are required to select from the (11) optional units.

Unit 001: COMMUNICATION PROCESS IN AN AUTOMOTIVE WORK ENVIRONMENT

Unit reference number:	**NADDC/AM/L4/001**
QCF level:	**4**
Credit value:	**1**
Guided learning hours:	**10**

Unit Purpose:
This unit is about quality communication system that is responsive to workers, employers and customers need in work environment.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment (PA)
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 001: COMMUNICATION PROCESS IN AN AUTOMOTIVE WORK ENVIRONMENT

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Effective communication system in a work environment	1.1	Ensure proper use of modern communication gadgets in a workplace.									
	1.2	Describe simple non-verbal means of communication.									
	1.3	Read and interpret concept of symbols and signs appropriately.									
LO2: Sources of information in a work environment.											
	2.1	Identify various sources of information in a workplace. .									
	2.2	Access relevant information in a work environment.									
	2.3	Use the information flow system applicable in the work environment.									
	2.4	Ensure proper documentation and retrieval of information in accordance with procedures in a work environment.									
LO3: Means of communication in a work environment.											
	3.1	Ensure the accessibility of the communication equipment in the work environment.									
	3.2	Describe various communication means in a work environment.									
	3.3	Pass relevant information effectively to the right personnel.									
	3.4	Ensure that instructions are obeyed and disseminated in line with ethics of the work environment.									
LO4: Maintenance and accessibility of communication equipment											
	4.1	Ensure the accessibility of the communication equipment in the work environment.									
	4.2	Liaise with the maintenance unit in the event of loss or damage of communication equipment.									
	4.3	Liaise with appropriate authority to replace communication equipment in the event of loss or damage.									
	4.4	Ensure that communication equipment are stored appropriately in a work environment.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 002: HEALTH AND SAFETY IN AUTOMOTIVE INDUSTRY

Unit reference number:	**NADDC/AM/L4/002**
QCF level:	**4**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose:
This unit is about the knowledge and skills needed to competently carryout daily activities in an automotive workshop while observing relevant work ethics and safety. It includes basic first-aid and fire-fighting procedures**.**

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 002: HEALTH AND SAFETY IN AUTOMOTIVE INDUSTRY

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Maintain personal health and hygiene	1.1	State responsibilities within Health and Safety Act as it relates to own occupation.									
	1.2	State general rules on hygiene that must be followed as approved by regulations									
	1.3	State correct personal protection equipment such as Head Protection, Foot Protection, Hand and body protection as approved by regulations.									
	1.4	State the importance of maintaining good personal hygiene.									
	1.5	Describe how to deal with cuts, grazes and wounds and why it is important to do so.									
LO 2: Personal health and hygiene	2.1	Wear clean, smart and appropriate personal protective equipment.									
	2.2	Work safely at all times, complying with health and safety regulations and guidelines.									
	2.3	Demonstrate how cuts, grazes and wounds treated by the appropriate personnel.									
	2.4	Report accidents, illness and infection promptly to the appropriate personnel.									
LO3: Maintain a hygienic, safe and secure workplace	3.1	State the importance of working in a healthy, safe and hygienic workplace									
	3.2	Report and document accidents or near miss quickly and accurately to the appropriate personnel.									
	3.3	Follow health, hygiene and safety procedures during work.									
	3.4	Practice emergency procedures during work.									
	3.5	Follow organizational security procedures.									
	3.6	Ensure effective waste management by proper disposal of organic, inorganic and hazardous waste.									

	3.7	Adhere to sounds and noise control measures.									
LO4 Prevention of hazards in the work place											
	4.1	Identify any hazards or potential hazards and deal with them correctly.									
	4.2	Explain where information about health and safety in your workplace can be obtained.									
	4.3	Describe the types of hazard in workplace that may occur and how to deal with them.									
	4.4	Explain hazards that can be dealt with personally and those that should be reported to appropriate personnel.									
	4.5	Explain how accidents and near misses should be reported..									
	4.6	Describe the types of emergencies that may happen in the workplace and how to deal with them.									
	4.7	Explain where to find the first-aid kits and who the registered first aider is in the work place.									
	4.8	Explain safe lifting and handling techniques that should be followed.									
	4.10	Explain other ways of working safely that are relevant to own position and why they are important.									
	4.11	Describe organizational emergencies procedure, in particular fire, and how these should be followed.									
	4.12	State the possible causes for fire outbreak in the workplace.									
	4.13	Describe how to minimize the possibility of fire outbreak in the workplace.									
	4.14	State where to find fire alarms and how to trigger them.									
	4.15	Identify the location of a muster point in a workplace and state its importance									
	4.16	State why a fire outbreak should never be approached unless it is safe to do so.									
	4.17	State the importance of following the fire safety laws.									

	4.18	Describe the organizational security procedures and why these are important.									
	4.19	Explain the importance of reporting all usual or non-routine incidents to the appropriate personnel.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 003: MOTOR VEHICLE AIR- CONDITIONING SYSTEM

Unit reference number:	**NADDC/AM/L4/003**
QCF level:	**4**
Credit value:	**6**
Guided learning hours:	**60**

Unit Purpose:
This unit provides the needed knowledge and skills to competently test and service motor vehicle air conditioning system. These include procedures for inspecting, evacuating and recharging the air conditioning system of a motor vehicle.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)
9. Assignment (ASS)

Unit 003: MOTOR VEHICLE AIR- CONDITIONING SYSTEM

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO 1: Air-conditioning systems operation	1.1	Discuss the principles and operation of the air-conditioning systems.									
	1.2	Identify and discuss the major components of Air-conditioning systems									
	1.3	Analyze the Air-conditioning Cycle of operation.									
	1.4	Justify the function of Air-conditioning System.									
	1.5	Discuss various types of refrigerants.									
	1.6	Discuss the environmental impact of Chlorofluorocarbon (CFC) used in automotive Air-conditioning Systems.									
LO2: Air-conditioning System Components: Inspection and testing	2.1	Inspect and test Air-conditioning System Components.									
	2.2	Assess and apply correct information, tools and equipment for inspecting and testing Air-conditioning System components.									
	2.3	Store refrigerants in a way that minimizes hazards in a work environment.									
LO 3: Air-conditioning System and Components servicing	3.1	Monitor the use of Personal Protective Equipment (PPE) in the servicing of Air-conditioning System and Components.									
	3.2	Assess and apply correct information, tools and equipment for servicing Air-conditioning System and Components.									
	3.3	Supervise the procedure for discharging and charging Air-condition refrigerant. .									
	3.4	Supervise the procedure for servicing of the heating system									
	3.5	Guide the procedure for servicing Air-conditioning System component in line with the manufacturer's specifications.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 004: MOTOR VEHICLE BREAKDOWN SERVICE AND RECOVERY

Unit reference number:	**NADDC/AM/L4/004**
QCF level:	**4**
Credit value:	**6**
Guided learning hours:	**60**

Unit Purpose:
This unit is to provide the knowledge and skills needed to competently handle motor vehicle breakdown in accordance with legislations.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 004: MOTOR VEHICLE BREAKDOWN SERVICE AND RECOVERY

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Motor Vehicle towing and regulations	1.1	Inspect length of tow rope, chain or tow –bar.									
	1.2	Assess steering control of both motor vehicles.									
	1.3	Inspect defective brakes of both towing and breakdown vehicle									
	1.4	Observe and justify the speed limits.									
	1.5	Observe and interpret traffic rules/signs.									
	1.6	Support motor vehicle towing activities in accordance to legal requirements.									
LO 2: Towing preparation											
	2.1	Identify and select towing equipment.									
	2.2	Analyze the hazards associated with preparing motor vehicles for towing.									
	2.3	Demonstrate procedures for safe handling of towing equipment.									
	2.4	Demonstrate procedures for preparing a motor vehicle for towing.									
	2.5	Observe all safety rules and regulations in carrying out the assignment.									
LO3: Vehicle breakdown analysis											
	3.1	Assess and document vehicle scope of damage									
	3.3	Determine cost implication of damaged vehicle									
	3.4	Initiate repair activities of the damaged vehicle in line with workplace procedures									
	3.5	Carryout functionality tests on the repaired vehicle and related components									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 005: MOTOR VEHICLE ENHANCEMENT AND INSTALLATION

Unit reference number:	**NADDC/AM/L4/005**
QCF level:	**4**
Credit value:	**5**
Guided learning hours:	**50**

Unit Purpose:
This unit is about carrying out consultations with customers to investigate their concerns relating to electrical enhancements for their motor vehicle. It also includes making recommendations to ensure that the customer's concerns are addressed and explaining the outcomes that the enhancements will achieve so that customers fully understand the work that will be undertaken.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 005: MOTOR VEHICLE ENHANCEMENT AND INSTALLATION

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Understand motor vehicle electrical system enhancement and their operation	1.1	Justify the need for vehicular enhancement and installations									
	1.2	Support the identification of suitable motor vehicle enhancement installations, by reviewing motor vehicle technical data.									
	1.3	Evaluate the manufacturer's requirement for motor vehicle enhancement installations.									
LO2 Establish contact with customers and identify customer needs											
	2.1	Respond to customer's concerns in a positive and friendly manner.									
	2.2	Work in a way that will give positive impression on the customer.									
	2.3	Obtain sufficient, detailed information using suitably structured questions.									
	2.4	Carryout a suitable road test to obtain further detailed information on, or clarification of a customer's request.									
	2.5	Identify suitable motor vehicle enhancement installations, by reviewing motor vehicle customer requirements.									
	2.6	Give relevant technical advice and information to the customer.									
	2.7	Ensure that records are complete, accurate, in the format required and signed by the customer, when necessary.									
	2.8	Suggest possible methods for improving the customer care process to your manager, when necessary									
LO3 Legal requirement and workplace procedures											
	3.1	Adhere to legal requirements relating to the motor vehicle (including road and safety requirements).									
	3.2	Record fault locations and correction activities: • reporting the results of tests • the referral of problems • reporting delays to the completion of work..									

	3.3	Analyze existing health and safety legislation and workplace procedure.									
	3.4	Document installation and enhancement information									
	3.5	Report anticipated delays to the relevant personnel.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 006: ELECTRO-MECHANICAL AND ELECTRONIC SYSTEMS IN AN ACCIDENTED MOTOR VEHICLE

Unit reference number:	**NADDC/AM/L4/006**
QCF level:	**4**
Credit value:	**5**
Guided learning hours:	**50**

Unit Purpose:
This unit is about removing and reinstating complete motor vehicle electro- mechanical and electronic systems and assemblies following accident damage. The removal process may be complicated as the units and assemblies involved could be damaged and/or within damaged areas of a motor vehicle. The reinstatement process may involve working within any restrictions caused by the damaged motor vehicle. Ensuring that renewed and refitted units, assemblies and components operate to manufacturers' and legal requirements is included.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Assessment will require the provision of "accidented" functional motor vehicles. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 006: ELECTRO-MECHANICAL AND ELECTRONIC SYSTEMS IN AN ACCIDENTED MOTOR VEHICLE

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Electromechanical and electronic systems	1.1	Analyse the construction and operation of electromechanical, electrical and electronics motor vehicle system and assemblies.									
	1.2	Investigate how electro-mechanical and electronic systems and components interact with other motor vehicle systems via multiplexing (e.g. Controller Area Network – Databus (CAN-DATABUS); Local Interconnect Network (LIN); Body Electronics Area Network (BEAN); Audio Visual Communication.									
LO2: Tools and equipment	2.1	Repair, test and use all relevant tools and equipment required following manufacturer's instruction and to meet any legal requirement.									
	2.2	Store all relevant tools and equipment by adhering to manufacturer's instructions.									
LO 3: Legislative and Organizational Requirements and Procedures.	3.1	Ensure the reinstated electro-mechanical and electronic systems perform to the motor vehicle operating specification and meet statutory requirement.									
LO4: Removal, repair and fitting	4.1	Use the appropriate personal protective equipment when removing, renewing and fitting electro- mechanical and electronic components systems and assemblies.									
	4.2	Protect the motor vehicle and its contents effectively when removing, renewing and fitting electro- mechanical and electronic components systems and assemblies.									
	4.3	Support removal and replacement activities by referring to: • Motor vehicle technical data • Removal and replacement procedures • Legal requirements									

	4.4	Carry out all removal, renewal and refitting activities following: • recognized research methods • manufacturers' instructions • your workplace procedures • health and safety requirements • environmental requirements.									
	4.5	Safely adapt working practices and techniques to suit the needs of the job and motor vehicle.									
	4.6	Store all removed electro-mechanical and electronic unit and components safely in the correct location.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 007: TEAM WORK

Unit reference number:	**NADDC /AM /L3/004**
QCF level:	**3**
Credit value:	**1**
Guided learning hours:	**10**

Unit Purpose:
The purpose of this unit is to impart to the learner, skills, knowledge and understanding required to develop team spirit and positive working relationship.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 007: TEAM WORK

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO1: Positive working relationship with colleagues	1.1	Identify the need for developing positive relationship with colleagues.									
	1.2	Recognize the importance of relating with other people in a way that makes them feel valued and respected.									
	1.3	Assist team members when required.									
	1.4	Report to the appropriate personnel when request/requesting for assistance fall outside area of responsibility.									
	1.5	Communicate information to colleagues about own work that might affect others.									
LO2: Take Responsibilities within the team	2.1	Recognize own role and responsibilities within the team.									
	2.2	Perform individual tasks in line with the team rules and regulations.									
	2.3	Participate effectively in teamwork.									
LO3: Compliance with organisational policies	3.1	Work In line with organizational standard and structure.									
	3.2	Use organizational code of practice.									
	3.3	Explain organizational code of conduct.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 008: WORKSHOP ORGANISATION AND MANAGEMENT

Unit reference number:	**NADDC/AM/L4/008**
QCF level:	**4**
Credit value:	**6**
Guided learning hours:	**60**

Unit Purpose:
This unit is to provide participants with the knowledge and skills to competently carryout effective work planning and administration in an automotive workshop.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 008: WORKSHOP ORGANISATION AND MANAGEMENT

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Workshop Financial Records	1.1	Justify reasons for keeping financial records.									
	1.2	Describe various financial records used in a workshop: • receipts • invoices • work bills.									
	1.3	Differentiate between various financial records use in workshop: • receipts • invoices • work bills.									
	1.4	Manage procedures for preparing various financial records use in workshop.									
	1.5	Discuss procedures for safe and proper financial records keeping.									
LO 2: Workshop job Related Records	2.1	Justify reasons for keeping job related records.									
	2.2	Describe and differentiate various job related records used in the workshop: - job cards - workshop reception forms - requisition forms - purchase order forms - stock cards, - workshop delivery forms, etc.									
	2.3	Manage procedures for preparing various job related records used in the workshop.									
	2.4	Discuss procedures for safe and proper job related records keeping.									
LO 3: Procurement	3.1	Justify reason(s) for procuring									
	3.2	Certify out-of-stock tools, materials and equipment.									
	3.3	Evaluate various storage techniques use in workshop.									

	3.4	Formulate procedures for procuring materials, tools and equipment following: - manuals and reference materials - requests and approvals - order placements - reception of goods and items - payments - storage - use.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 009: ENGINE RECONDITIONING

Unit reference number:	**NADDC/AM/L4/009**
QCF level:	**4**
Credit value:	**6**
Guided learning hours:	**60**

Unit Purpose:
This unit provides the needed knowledge and skill to competently recondition the engine in line with manufacture's requirement. It includes procedures for dismantling, reconditioning, reassembling engine sub-assemblies and components as well as checking engine operation against manufacturer's specification.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)
9. Assignment (ASS)

Unit 009: ENGINE RECONDITIONING

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO 1: General engine dismantling procedure											
	1.1	Initiate good workshop practices applicable to engine dismantling procedure.									
	1.2	Supervise the cleaning and inspection in engine dismantling procedures.									
	1.3	Scrutinize tools and equipment used for dismantling.									
	1.4	Supervise the procedures for working with bolts and other fasteners.									
LO2: Procedures for dismantling and assembling engine sub-assembly.											
	2.1	Certify the correct information, tools and equipment for dismantling and assembling of an engine.									
	2.2	Supervise the procedures for removing and installing auxiliaries, attachments and external mechanical parts prior to engine dismantling and assembly.									
LO 3: Procedures for reconditioning engine sub-assembly											
	3.1	Assess the information, tools and equipment for reconditioning an engine sub-assembly and associated components.									
	3.2	Supervise procedures of dismantling and assembling components parts of an engine sub-assembly.									
	3.3	Analyse the procedure for measuring and evaluating wear on components parts.									
	3.4	Supervise the procedure for repairing or replacing component part of an engine sub-assembly.									
	3.5	Supervise the procedures for rebuilding or reconditioning component parts..									
	3.6	Supervise the procedures for functional performance testing of components.									
LO 4 Engine reconditioning post repair operations.											
	4.1	Assess the information, tools, and equipment for checking engine post repair operation.									
	4.2	Monitor the fluid levels prior to starting.									

	4,3	Supervise the procedure for checking operation of gauges and warning devices prior to starting in line with manufacture's requirement.									
	4.4	Monitor the procedures for checking leaks and abnormal noises.									
	4.5	Verify procedures for performance test, final inspection and adjustments in line with manufacturer's specification.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 010: BASIC COMPUTER SKILLS IN AUTOMOTIVE INDUSTRY

Unit reference number:	**NADDC/AM/L2/007**
QCF level:	**2**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose:
This unit **is to provide the necessary skills and competency required for computer usage in the automotive industry.**

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)
9. Assignment (ASS)

Unit 010: BASIC COMPUTER SKILLS IN AUTOMOTIVE INDUSTRY

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO 1: Computer Classification and operation	1.1	Identify computers according to usage, type and size.									
	1.2	Differentiate between analogue, digital and hybrid computers.									
	1.3	Identify and describe the various types of micro-computers.									
	1.4	Carryout a given assignment using the computer.									
LO 2: Use of computers in modern automobile workshops.	2.1	Explain the roles of computer in modern motor vehicles.									
	2.2	Explain the various applications of computer in automobile workshop.									
	2.3	Identify the characteristics and benefits of computer in automotive workshop.									
LO 3: Computer Hardware and Software Elements	3.1	Identify and explain the functions of various hardware and software components of the computer.									
	3.2	Differentiate between operating system and application software.									
	3.3	Select application software for a particular operation.									
LO4: Principles of operations, capability and system requirement of a computer	4.1	Explain the principles of operation, capability and system requirements of AutoCAD,									
	4.2	Effectively use the AutoCAD software in the automotive sector									
	4.3	Initiate designs using AutoCAD in automotive sector									
LO5: Basic computer Operation	5.1	Operate the keyboard using function keys, alphanumeric keys, numeric keys and control keys.									
	5.2	Carryout typing exercise on the computer.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 011: MOTOR VEHICLE ELECTRICAL UNIT AND COMPONENT FAULTS RECTIFICATION

Unit reference number:	**NADDC/AM/L4/011**
QCF level:	**4**
Credit value:	**6**
Guided learning hours:	**60 Hours**

Unit Purpose:
This unit identifies the competences needed to carryout fault diagnosis of motor vehicle electrical/electronic unit and components, in accordance with approved procedures. It involves the application of the following diagnostic techniques;

- Verify the fault
- Collect further information
- Evaluate the evidences
- Carryout further tests in a logical sequence
- Rectify the fault

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 011: MOTOR VEHICLE ELECTRICAL UNIT AND COMPONENT FAULTS RECTIFICATION

LO (Learning outcome)		Performance Criteria	Evidence Type					Evidence Ref Page number			
LO1: Motor vehicle Electrical/ Electronic Units, Components and Their Operations	1.1	Inspect motor vehicle electrical/electronics units and components.									
	1.2	Differentiate between electrical/ electronic units and components'									
	1.3	Inspect various electrical/ electronics units and components									
	1.4	Explain the operations of each of the units and components									
LO2: Diagnostic Tools and Equipment	2.1	Select and use appropriate diagnostic techniques, tools and aids to locate faults.									
	2.2	Operate motor vehicle diagnostic tools and equipment appropriately.									
	2.3	Store diagnostic tools and equipment safely in line with manufacturer's specification.									
	2.4	Update diagnostic tools/equipment as at when due and in line with manufacturer's specification.									
LO 3: Safe Working Practices In Motor vehicle Electrical / Electronics Units and Components	3.1	Work safely at all times, complying with health and safety and other relevant regulations and guidelines									
	3.2	Demonstrate safe handling and storage of the diagnostic tools and equipment.									
	3.3	Work in a way which minimizes the risk of damage to other motor vehicle system, components, units, and the environment.									
LO 4: Rectification of motor vehicle electrical/electronic systems faults	4.1	Troubleshoot and establish the most likely cause (s) of the faults in the units and components.									
	4.2	Select and use appropriate diagnostic techniques, tools and aids to locate faults.									
	4.3	Rectify the identified faults using appropriate methods and techniques.									
	4.4	Demonstrate procedures for retrieving, interpreting and erasing fault codes in an electronic									

		system.									
	4.5	Demonstrate the procedures for printing a selection of information from a data base.									
	4.6	Apply procedures for interpreting electrical wiring diagrams.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 012: MOTOR VEHICLE ELECTRICAL AND ELECTRONICS SYSTEM FAULTS RECTIFICATION

Unit reference number:	**NADDC/AM/L4/012**
QCF level:	**4**
Credit value:	**6**
Guided learning hours:	**60 hours**

Unit Purpose:
This unit identifies the competences needed to carryout fault diagnosis of motor vehicle electrical and electronic components, in accordance with approved procedures. It involves the application of the following six point's diagnostic techniques;

- Verify the fault
- Collect further information
- Evaluate the evidences
- Carryout further tests in a logical sequence
- Rectify the fault

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 012: MOTOR VEHICLE ELECTRICAL AND ELECTRONICS SYSTEM FAULTS RECTIFICATION

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO1: Motor vehicle Electrical/ Electronics Systems Operations	1.1	Access motor vehicle electrical/electronic systems.									
	1.2	Differentiate electrical components from electronics components.									
	1.3	Discuss the operations of each of the systems.									
LO2 Diagnostic Tools and Equipment											
	2.1	Select and use appropriate diagnostic techniques, tools and aids to locate faults.									
	2.2	Operate motor vehicle diagnostic tools and equipment appropriately.									
	2.3	Store diagnostic tools and equipment safely in line with manufacturer's specification.									
	2.4	Update diagnostic tools/equipment as at when due and in line with manufacturer's specification.									
LO 3 Safe working practices in motor vehicle electrical /electronics diagnosis											
	3.1	Comply with health and safety and other relevant regulations and guidelines.									
	3.2	Demonstrate safe handling and storage of the diagnostic tools and equipment.									
	3.3	Work in a way which minimizes the risk of damage to other motor vehicle systems, components, units, and the environment.									
LO4 Motor vehicle Electrical / Electronics Systems Faults Rectification											
	4.1	Troubleshoot to establish the most likely cause (s) of the faults.									
	4.2	Select and use appropriate diagnostic techniques, tools and aids to locate faults.									
	4.3	Rectify the identified faults using appropriate methods and techniques.									
	4.4	Demonstrate procedures for retrieving, interpreting and erasing fault codes in an electronic system.									
	4.5	Demonstrate the procedures for printing a selection of information from a data base.									

	4.6	Apply procedures for interpreting electrical wiring diagrams.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 013: MOTOR VEHICLE ENGINE AND COMPONENENT FAULTS RECTIFICATION

Unit reference number:	**NADDC/AM/L4/013**
QCF level:	**4**
Credit value:	**5**
Guided learning hours:	**50**

Unit Purpose:
This unit is about diagnosing and rectifying faults occurring in the mechanical, electrical/electronics, communication, hydraulic and pneumatic systems of a motor vehicle.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Assessment will require the provision of functional motor vehicles, stationary live engines, as well as assorted engine components.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 013: MOTOR VEHICLE ENGINE AND COMPONENENT FAULTS RECTIFICATION

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Working Principle of an Engine											
	1.1	Identify different types of engine									
	1.2	Identify the 2 and 4 stroke cycle of engine operation.									
	1.3	Identify and explain the stroke cycle • spark and compression ignition engines, • mechanical and electrical/electronic components of an engine.									
	1.4	Identify and explain hydraulic and engine fluid component.									
	1.5	Identify and explain the differences between hybrid and alternative fuel engines									
LO2: Tools and Equipment Used In Engine Diagnosis and Rectification											
	2.1	Identify various diagnostic tools and equipment.									
	2.2	Differentiate between Original Equipment Manufacturers (OEM) tool from Generic Diagnostic Equipment (GDE).									
	2.3	Use manufacturer's instructions to prepare, connect and test all the required equipment prior to use.									
	2.4	Use the equipment required, correctly and safely throughout all diagnostic and rectification activities.									
	2.5	Observe manufacturer's specification to store and secure all tools and equipment.									
LO3: Engine faults analysis and rectification techniques											
	3.1	Wear suitable personal protective equipment and use motor vehicle coverings when using diagnostic methods and carrying out rectification activities.									
	3.2	Support the identification of faults, by reviewing motor vehicle: • technical data • diagnostic test procedures.									
	3.3	Collect sufficient diagnostic information in a systematic way									

		to enable an accurate diagnosis of engine system faults.									
	3.4	Identify and explain the different communication systems used in motor vehicles.									
	3.5	Identify and record any system deviation from acceptable limits accurately.									
	3.6	Assess to ensure that the dismantled sub-assemblies, components and units are intact. Identify their condition and suitability for repair or replacement.									
	3.7	Carry out all diagnostic and rectification activities following: • manufacturers' instructions • recognized repair methods(see guidance document) • your workplace procedures • Health, Safety and Environment requirements.									
	3.8	Measure and adjust components/units correctly to ensure that they operate to meet system requirements.									
	3.9	Use testing methods which are suitable for assessing the performance of the system rectified.									
	3.10	Determine the procedures for interpreting electrical wiring diagrams.									
	3.11	Determine the procedures for retrieving and erasing fault codes.									
	3.12	Describe procedures for interpreting readings related to direct, indirect and intermittent faults.									
	3.113	Carryout procedures for repairing and replacing electrical and electronically controlled system components.									
	3.14	Ensure the engine system rectified performs to the motor vehicle operating specification and any other legal requirements prior to return to the customer.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 014: MECHANICAL FASTENING TECHNIQUES USED IN AUTOMOTIVE SERVICES AND REPAIR OPERATION

Unit reference number:	**NADDC/AM/L2/003**
QCF level:	**2**
Credit value:	**2**
Guided learning hours:	**20 HOURS**

Unit Purpose:
This unit is about joining materials effectively using metal joining and fastening techniques.

Unit assessment requirements/evidence requirements:
This assessment can only be carried in a real workplace environment in which automotive service, repair, and mechanical joining by fastening operations are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning

Unit 014: MECHANICAL FASTENING TECHNIQUES USED IN AUTOMOTIVE SERVICES AND REPAIR OPERATION

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Safety precautions required in metal joining and fastening	1.1	State safety precautions required in metal joining and fastening									
	1.2	Explain the procedures involved in metal joining and fastening operations									
	1.3	Use the appropriate Personal Protective Equipment (PPE) when carrying out metal joining operations.									
	1.4	Carry out metal joining and fastening operations following Health and Safety requirements.									
	1.5	Protect the motor vehicle when carrying out metal joining operations.									
	1.6	Ensure that the tools, equipment and PPE required are in a safe working condition.									
	1.7	Work in a way to avoid damage to other components of the motor vehicle while carrying out metal joining and fastening.									
	1.8	Protect the repaired area to prevent corrosion where applicable.									
	1.9	Clean and store PPE and equipment in appropriate manner.									
LO2: Tools and equipment for carrying out metal joining operations	2.1	Select and use correct tools and equipment for carrying out metal joining operations.									
	2.2	Ensure that the tools, equipment and PPE required are in a safe working condition.									
		Ensure stability of tools and material before use.									
LO3: Metal Joining and fastening: Types, materials, applications and techniques.	3.1	Prepare material and align to enable suitable joint to be achieved.									
	3.2	Treat meeting/lapping members before joining.									
	3.3	Set up equipment to carry out metal joining operations: • check suitability of joining technique • check suitability of tooling • check if consumables are									

		correct									
	3.4	Identify and remedy joint defects.									
	3.5	Check integrity of the joint(s). i.e. visual inspection etc.									
	3.6	Carry out metal joining operations within the agreed timescale.									
	3.7	Identify common fastener failures									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 015: IDENTIFCATION AND FITTING OFAUXILIARY LOCKS AND SECURITY DEVICES IN MOTOR VEHICLES

Unit reference number:	**NADDC/AM/L2/004**
QCF level:	**2**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose:
This unit is about identifying and fitting suitable auxiliary locking and security devices that are permanently fitted to motor vehicles to deter theft.

Unit assessment requirements/evidence requirements:
This assessment can only be carried in a real automotive workplace environment in which fitting and installation of auxiliary locks and security devices are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning

Unit 015: IDENTIFCATION AND FITTING OFAUXILIARY LOCKS AND SECURITY DEVICES IN MOTOR VEHICLES

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Selection of appropriate materials, tools, and equipment.	1.1	Identify the appropriate tools and equipment for fitting auxiliary locks and security devices.									
	1.2	Use the tools and equipment required, correctly and safely throughout all fitting activities.									
	1.3	Wear suitable personal protective equipment and use motor vehicle coverings when fitting auxiliary locks and security devices.									
	1.4	Prepare, connect and test all the required equipment following manufacturers' instructions prior to use.									
	1.5	Collect sufficient information to enable an accurate fitting of auxiliary locking and security devices.									
	1.6	Identify the various methods of automotive electronic key programming.									
LO2: Locks and security devices											
	2.1	Identify types of locks and security devices and their applications.									
	2.2	Support the fitting of auxiliary locks and security systems, by reviewing motor vehicle • technical data and • diagnostic test procedures									
	2.3	Ensure all components and units conform to the motor vehicle operating specification and any legal requirements									
	2.4	Prepare, connect and test all the required equipment following manufacturers' instructions prior to use.									
	2.5	Make cost effective recommendations for the fitting of relevant auxiliary locks and security devices according to the customers' needs and motor vehicle type									
LO3: Installation locations for locks and security devices /systems											
	3.1	Measure and mark out where external locks are to be fitted									
	3.2	Carry out all fitting activities following:									

		• manufacturers' instructions • recognized repair methods									
	3.3	Use fitting techniques (both electrical and mechanical) which are relevant to the systems presented									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 016: REMOVAL/REFITTING OF MECHANICAL AND ELECTRICAL TRIM COMPONENTS IN A MOTOR VEHICLE

Unit reference number:	**NADDC/AM/L2/005**
QCF level:	**2**
Credit value:	**3**
Guided learning hours:	**30**

Unit Purpose:
This unit is about the appropriate removal and fitting of basic mechanical, electrical and trim (MET) Components to motor vehicles. It is also about checking the operation (s) of the components fitted

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment in which the removal and fitting of basic mechanical, electrical and trimming of components are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning

Unit 016: REMOVAL/REFITTING OF MECHANICAL AND ELECTRICAL TRIM COMPONENTS IN A MOTOR VEHICLE

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1. Description and selection of MET components	1.1	Select the appropriate basic MET components to be fitted									
	1.2	Check that the components you have fitted operate correctly following the manufacturer's specification									
	1.3	remove and fit basic MET components within the agreed timescale									
	1.4	Remove and fit basic MET components following manufacturer's instructions.									
	1.5	Store all removed components safely in the correct location									
LO2: Tools and equipment for dismantling and fitting MET components	2.1	Select and use the correct tools and equipment for the components you are going to remove or fit									
	2.2	Ensure that the tools and equipment you require are in a safe working condition									
LO3: Dismantling and fitting of MET components	3.1	Use the appropriate personal protective equipment when removing and fitting basic MET components									
	3.2	Remove and fit basic MET components following; • removal and fitting procedures • manufacturers' instructions • your workplace procedures • health, safety and legal requirements									
	3.3	Avoid damaging other components and units on the motor vehicle									
	3.4	Check that the components you have fitted operate correctly following the manufacturer's specification									
	3.5	Report any additional faults you find during the course of your work to the relevant person(s) promptly									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 017: CUSTOMER RELATIONS IN AN AUTOMOTIVE SERVICE REPAIR WORK ENVIRONMENT

Unit reference number:	**NADDC/AM/L3/004**
QCF level:	**3**
Credit value:	**4**
Guided learning hours:	**40 HOURS**

Unit Purpose: To establish a quality communication system that is responsive and subject to change in meeting workers and employers need, in work environment.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 017: CUSTOMER RELATIONS IN AN AUTOMOTIVE SERVICE REPAIR WORK ENVIRONMENT

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO1: Non-complex communication system in a work environment	1.1	Use a simple verbal means to pass on necessary information.									
	1.2	Use non-verbal means to pass on necessary information e.g. body language.									
	1.3	Identify and explain symbols and signs appropriately.									
LO2: Information source identification in a work environment.											
	2.1	Identify the source of information in an organisation and work environment.									
	2.2	Relate appropriately with the source of information.									
	2.3	Use the various information flow systems in a work environment.									
	2.4	Use information sources to address challenges in a work environment.									
	2.5	Communicate findings in accordance to procedure in a work environment.									
LO3: Use of communication methods in a work environment											
	3.1	Identify the various methods of communication in the work environment.									
	3.2	Use effectively, the various methods of communication in a work environment and communicate effectively to the right personnel.									
	3.3	Observe information effectively using symbols, signs and codes.									
	3.4	Observe instructions in line with ethics of the work environment.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 018: MOTOR VEHICLE ELECTRICAL SYSTEM ENHANCEMENTS INSTALLATION

Unit reference number:	**NADDC/AM/L3/005**
QCF level:	**3**
Credit value:	**4**
Guided learning hours:	**40**

Unit Purpose:
This unit is about fitting electrical features and components to enhance the original motor vehicle features and specification to meet customer requirements.

Unit assessment requirements/evidence requirements
This unit identifies the competences needed to carryout fault diagnosis of motor vehicle electrical and electronic unit and components, in accordance with approved procedures. It involves the application of the following six point's diagnostic techniques;

- Verify the fault
- Collect further information
- Evaluate the evidences
- Carryout further tests in a logical sequence
- Rectify the fault

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 018: MOTOR VEHICLE ELECTRICAL SYSTEM ENHANCEMENTS INSTALLATION

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Motor vehicle Electrical System Enhancement and their Operations	1.1	Explain the purpose of electrical enhancements									
	1.2	Identify the already installed electrical enhancements in a motor vehicle									
	1.3	Discuss the advantages and disadvantages of fitting electrical enhancements in a motor vehicle.									
	1.4	Interpret the manufacturers' requirement for properly fitting electrical enhancements in the particular motor vehicle.									
	1.5	Explain the working principle of various electrical enhancements.									
	1.6	Describe the legal requirement for fitting electrical enhancements.									
LO2: Tools And Equipment Used In Motor vehicle Electrical System Enhancement											
	2.1	List and identify types of tools and equipment used.									
	2.2	Describe the enhancement tools and equipment.									
	2.3	Carryout the preparation and testing of all the tools and equipment required, following manufacturers' instructions.									
	2.4	Use tools and equipment in line with manufacturer's specification.									
	2.5	Observe safety in storing and securing.									
LO3: Customer Needs And Requirements											
	3.1	Assemble components which are compatible with the motor vehicle specification and customer requirements.									
	3.2	Monitor to ensure that all enhancements function to specification prior to release to the customer.									
	3.3	Implement all enhancement activities within the agreed timescale.									
	3.4	Communicate any anticipated delays in completion to the appropriate personnel promptly.									
LO4: Motor vehicle Electrical System											
	4.1	Observe safety and work ethics with suitable personal protective equipment and the use of motor									

Enhancements.		vehicle coverings throughout all enhancement activities.									
	4.2	Carry out all electrical enhancement activities following: • manufacturers' instructions • your workplace procedures • Health, Safety and Environment legal requirements									
	4.3	Adopt workshop rules and regulations to minimise the risk of: • damage to other motor vehicle systems • damage to other components and units • contact with leakages • contact with hazardous substances • damage to the environment									
	4.4	Use manufacturer's specification to adjust the components fitted and motor vehicle systems correctly for effective operation.									
	4.5	Inspect to ensure all enhancements function to specification prior to release to the customer									
	4.6	Carryout all enhancement activities within the agreed timescale									
	4.7	Communicate any anticipated delays in completion to the relevant authority promptly									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 019: MOTOR VEHICLE TRANSMISSION AND CHASSIS ELECTRICAL FAULTS RECTIFICATION

Unit reference number:	**NADDC/AM/L4/019**
QCF level:	**4**
Credit value:	**5**
Guided learning hours:	**50**

Unit Purpose:
This unit is about identifying and rectifying electrical faults occurring within a variety of electrical systems within the motor vehicle and chassis areas. It includes the procedures of inspecting and assessing the conditions and overhauling of the transmission system in line with manufacturers' specifications.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 019: MOTOR VEHICLE TRANSMISSION AND CHASSIS ELECTRICAL FAULTS RECTIFICATION

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Motor vehicle Transmission and Chassis System Operations and Principles	1.1	Describe the purpose of transmission systems									
	1.2	Explain the purpose of chassis system									
	1.3	indicate the components of the transmission system									
	1.4	Identify the components of the chassis system									
	1.5	Differentiate between transmission and chassis system									
LO2: Chassis and Transmission Tools and Equipment	2.1	Identify chassis and transmission system tools and equipment.									
	2.2	Differentiate between special purpose tools from other tools.									
	2.3	Use the tools and equipment required, correctly and safely throughout all rectification activities.									
	2.4	Observe manufacturer's specification in storing and securing tools and equipment.									
LO3: Transmission/ Chassis Electrical Faults diagnoses and rectification.	3.1	Use suitable personal protective equipment and motor vehicle coverings when applying electrical testing techniques and carrying out rectification									
	3.2	Support the identification of complex electrical faults, by reviewing motor vehicle: • technical data • diagnostic test procedures.									
	3.3	Use manufacturer's instructions to prepare, connect and test all the required electrical and electronic testing equipment.									
	3.4	Use tools and equipment required, correctly and safely throughout all rectification activities.									
	3.5	Ensure all repaired and replaced electrical components and units conform to the motor vehicle operating specification and legal requirements.									
	3.6	Adjust components and units correctly to ensure that they operate to meet system requirements.									
	3.7	Ensure the electrical system rectified performs to the motor vehicle operating specification and legal requirements									

		prior to delivery to the customer.									
	3.8	Ensure records are accurate, complete and passed to the relevant personnel promptly in the format required.									
	3.9	Complete all system diagnostic activities within the agreed timescale.									
	3.10	Assess and apply correct information, tools and equipment for inspecting and assessing the transmission system and its associated components in line with manufacturers' specification.									
	3.11	Demonstrate procedures for dismantling and assembling a gear box and its associated components.									
	3.12	Demonstrate procedures for repairing and/or replacing component parts of a gear box and its associated components.									
	3.13	Apply procedures for measuring and evaluating wear on component parts of the transmission system.									
	3.14	Demonstrate procedures for servicing automatic transmission system.									
	3.16	Demonstrate procedures for operational testing of automatic transmission system components.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 020: AUTOMOTIVE SERVICE TOOLS AND EQUIPMENT

Unit reference number:	**NADDC/AM/L1/001**
QCF level:	**1**
Credit value:	**3**
Guided learning hours:	**30 HOURS**

Unit Purpose:
This unit is about the basic use of tools, materials and fabrications relevant to the Automotive Sector and for those working in technical support roles. It is also appropriate for workshop planners.

This unit is about;
1. Interpreting information
2. Adopting safe and healthy working practices
3. Selecting materials and equipment
4. Service and maintenance of workshop tools and equipment
5. Storage of workshop tools and equipment

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 020: AUTOMOTIVE SERVICE TOOLS AND EQUIPMENT

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Common Automotive service hand and power tools											
	1.1	Identify basic tools and equipment in the automotive workshop									
	1.2	Carryout operation using hand and power tools in accordance with safe working practices to achieve the work outcome.									
	1.3	Use and maintain; • Hand tools • Ancillary equipment • Safety aids.									
	1.4	Demonstrate work skills to select correct materials and fabrication for project									
	1.5	Demonstrate work skills to measure, mark out, file, fit, tap, thread, cut, drill, finish, position and secure work piece and tools.									
LO2: Common Automotive service workshop equipment											
	2.1	Carry out pre-start preparation inspections on power tools and equipment in accordance with approved procedures									
	2.2	Store and secure workshop tools and equipment in line with workplace procedures									
LO3: Maintenance and servicing of workplace tools and equipment											
	3.1	Identify damaged and worn out tools and equipment									
	3.2	Service, adjust and or maintain tools and equipment as specified by manufacturer's/ and or workshop within the scope of responsibility.									
	3.3	Identify problems associated with power tools and equipment which need to be referred to authorized personnel									
	3.4	Carry out checks in accordance with manufacturer's/operators guidance, legislation and official guidance and organizational requirements.									
LO4: Workshop Tools And Equipment Storage											
	4.1	Explain different techniques used in automotive workshop tools and equipment storage									
	4.2	Explain different store documentation procedures in an automotive workshop									

	4.3	Carryout routine maintenance of automotive service tools and equipment in line with workplace procedures									
	4.4	Store and secure workshop tools and equipment in line with workplace procedures.									
	4.5	Dispose waste generated as a result of tool/equipment usage in accordance with workplace procedures.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 021: MOTOR VEHICLE BODY TRIMMING

Unit reference number:	**NADDC/AM/L3/010**
QCF level:	**4**
Credit value:	**5**
Guided learning hours:	**50**

Unit Purpose:
This unit is to acquire the knowledge and skills needed to improve the physical appeal of a motor vehicle and also to protect it from damages. It includes beautifying both the interior and exterior part of the motor vehicle.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment (PA)
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 021: MOTOR VEHICLE BODY TRIMMING

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Trimming materials											
	1.1	Identify the properties, use and forms of supply of common trimming materials.									
	1.2	Describe the properties, use and forms of supply of common trimming materials.									
	1.3	Identify classes of adhesives and factors to be considered in the selection of trimming materials.									
	1.4	Explain the safety regulations in the selection of trimming materials.									
LO2: Safety regulation and practices in trimming											
	2.1	Explain the responsibilities of employer and employee on environment, health & safety hazards in the automotive workshop.									
	2.2	Describe environmental, health & safety hazards, their causes and preventive measures.									
	2.3	Describe safety regulations in the automotive workshop.									
	2.4	Describe the methods involved in the storage of trimming tools, materials and equipment before and after use.									
LO3: Tools and Equipment used in trimming											
	3.1	Describe the features of tools and equipment used in trimming.									
	3.2	Describe the working principles of tools and equipment used in trimming.									
	3.3	Describe the routine maintenance of tools and equipment used in trimming.									
	3.4	Explain the safety regulations in the selection of tools and equipment used in trimming.									
LO4: Body trimming components and features.											
	4.1	Identify and describe car model materials, interior features/locations.									
	4.2	Describe the design and construction of trimming components.									
	4.3	Describe the function of body trimming materials.									
LO5											

Preparation of Motor vehicle body for trimming.	5.1	Prepare trimming layout, design, working drawings.									
	5.2	Mark out the scale layout for the trimming work.									
	5.3	Prepare estimate of quantities and cost of materials for trimming work.									
	5.4	Use patterns to cut shape of suitable trimming materials.									
LO6: Trimming of motor vehicle											
	6.1	Explain the operational sequence of trimming on a motor vehicle.									
	6.2	Describe the general planning procedure for floor covering plan.									
	6.3	Describe the methods of dealing with joints on flat floors.									
	6.4	Set out the operational sequence in trimming: • Preparation routine • Working drawings • Personnel.									
	6.5	Observe safety regulations in the automotive workshop.									
	6.6	Carry out all repairs/replacements within the agreed timescale.									
	6.7	Communicate any anticipated delays in completion to the relevant authority.									
	6.8	Inspect that all repairs/replacements are carried out prior to the release of the motor vehicle to the customer.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 022: MOTOR VEHICLE SPRAY PAINTING

Unit reference number:	**NADDC/AM/L4/015**
QCF level:	**4**
Credit value:	**6**
Guided learning hours:	**60 HOURS**

Unit Purpose:
This unit provides necessary knowledge, skills and attitudes (competency) required in carrying out spray painting using relevant tools, materials and operational sequence in the Automotive Sector.

This unit is about:
1. Adopting safe and healthy work practices
2. Selecting tools, materials and equipment
3. Following the Right sequence for the task
4. Applying the appropriate methodology

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 022: MOTOR VEHICLE SPRAY PAINTING

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Personal/ environmental Safety											
	1.1	Identify and use required Personal Protective Equipment (PPE • Nose mask • Hand glove (latex) • Safety Boot • Goggle • Overall • Helmet etc.									
	1.2	Prepare: • Environment for the task, • Check hose line for leakage, • Check tools for defect.									
	1.3	Ensure the following are secured from paints: • Wiring, • Light bulbs, • Part of fixtures that get excessively hot, • Windscreen, • Tyre, etc.									
	1.4	Ensure proper storage of tools, relevant vehicle components and facilities used.									
LO2: Customer Relation and Job Evaluation											
	2.1	Identify customer needs and requirements.									
	2.2	Assess the scope of work									
	2.3	Evaluate quantity and cost of materials required									
	2.4	Estimate Time Required to accomplish the job									
LO3: Spray tools, equipment and materials											
	3.1	Identify the appropriate tools to be used: • Spray gun • Tag cloth • Air Compressor • Dolly block • Sanders, etc.									
	3.2	Verify Paint specification by: • Color matching, • Color number, • Color correction, • Color separation.									
LO4 : Motor vehicle Body											
	4.1	Carry out Filling according to specification.									

spray preparation	4.2	Carry out smoothening according to specification.										
	4.3	Carry out washing according to specification.										
	4.4	Carry out protective masking of windscreen, glass, locks, etc.										
LO5: Application of paint on the Motor vehicle Body.												
	5.1	Carry out Priming (first coat); • Cleaning, • Washing, • Drying based on specification.										
	5.2	Mix paint according to specification.										
	5.3	Apply paint (second coat) based on; • Manufacturer specification • Work place procedure.										
	5.4	Apply vanish (final coat).										
	5.5	Bake to the required temperature and duration.										
	5.6	Carryout detailing, buffing/waxing.										
	5.7	Complete all activities within the agreed time frame.										
	5.8	Carryout assessment of the finished job.										

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 023: MOTOR VEHICLE UPHOLSTERY WORK

Unit reference number:	**NADDC/AM/L4/023**
QCF level:	**4**
Credit value:	**6**
Guided learning hours:	**60**

Unit Purpose:
This unit is to acquire the knowledge, skills and attitude (competency) needed to carryout motor vehicle upholstery work competently in an automotive workshop.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 023: MOTOR VEHICLE UPHOLSTERY WORK

LO (Learning outcomes)		Performance Criteria	Evidence Type					Evidence Ref Page number			
LO 1: Basic components in motor vehicle interior works	1.1	Adhere to safety precautions necessary in carrying out upholstery work.									
	1.2	Identify basic motor vehicle interior components e.g. doors, dash-boards, sun visor etc.									
	1.3	Identify location of basic interior components in motor vehicle.									
	1.4	Determine problems associated with motor vehicle interior.									
LO2: Upholstery tools and equipment	2.1	Identify different types of upholstery tools/equipment and their applications.									
	2.2	Demonstrate the ability to use sewing machines and other tools appropriately.									
	2.3	Demonstrate the ability to maintain sewing machines and other tools appropriately.									
	2.4	State step-by-step procedures for maintaining sewing machines and other tools.									
LO3: Motor vehicle interior upholstery estimation	3.1	Determine the quantity/quality of materials required.									
	3.2	Estimate the cost implication									
	3.3	Determine duration of work to be carried out and inform the customer accordingly									
LO4: Sewing layout and designs	4.1	Explain procedures in developing layouts.									
	4.2	Demonstrate ability to sketch layout of interior									
	4.3	Demonstrate ability to sew without the original seat cover, head-rest, arm-rest, door-mats, etc.									
	4.4	Select appropriate material/ leather or wool claddings and threads suitable for motor vehicle interior components.									
	4.5	Explain precautions to be observed in developing layout for sewing									
LO 5: Cushions and frames repairs	5.1	Demonstrate ability to use the required tools for carrying out repairs on cushions.									
	5.2	Select the tools required in carrying									

		out repairs on frames e.g. spanners, screwdrivers.									
	5.3	Demonstrate the ability to adjust Mechanism which allows free movement of the seats.									
	5.4	Demonstrate the skill required for fixing damaged cushions.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 024: PANEL BEATING

Unit reference number:	**NADDC/AM/L4/024**
QCF level:	**4**
Credit value:	**5**
Guided learning hours:	**50**

Unit Purpose:
This unit is about acquiring knowledge, skills and attitudes (competency) required for correcting dents and mis-alignment on motor vehicle body.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment (PA)
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 024: PANEL BEATING

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Body surface assessment											
	1.1	Differentiate between smooth and rough body surfaces.									
	1.2	Describe tools for correcting rough surfaces.									
	1.3	Use appropriate tools for body surface assessment.									
	1.4	Remove, repair and replace body sub-assembly.									
	1.5	Demonstrate removal and replacement of body trims.									
LO 2: Body frame alignment equipment											
	2.1	Identify various types of equipment used in body-frame alignment • Anchor pot • Frame clamps • Frame racks • Frame puller, etc.									
	2.2	Demonstrate the use of the equipment listed in 2.1 above.									
	2.3	Store tools and equipment correctly after use.									
	2.4	Observe safety precautions while using tools and equipment listed in 2.1 above.									
LO 3: Motor vehicle body repair materials											
	3.1	Differentiate between ferrous and non-ferrous metals.									
	3.2	Identify various types of body fillers, hardness, adhesives, sealants and their uses.									
	3.3	Demonstrate the use of the materials stated in 3.2 above.									
LO 4: Joining methods in body repairs											
	4.1	Differentiate between temporary and permanent methods of joining									
	4.2	Demonstrate the use of mechanical fasteners in body work.									
	4.3	Explain the principles of oxy-acetylene welding.									
	4.4	Demonstrate the use of flux in oxy-acetylene welding.									
	4.5	Identify the use of different types of flames in welding and cutting.									
	4.6	Observe safety precautions in the use of oxy-acetylene welding.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

LEVEL V

Summary of Level V

MANDATORY NOS

S/NO/ UNIT NO	REFERENCE NO.	NOS TITLE	CREDIT VALUE	TOTAL LEARNING HOURS	REMARKS
1	NADDC/AM/L1/001	**Communication Process in an Automotive Work Environment**	**1**	**10**	*Culled from Level 1*
2	NADDC/AM/L1/004	**Teamwork**	**2**	**20**	*Culled from Level 1*
3	NADDC/AM/L1/002	**Health, Safety and Environment**	**2**	**20**	*Culled from Level 1*
4	NADDC/AM/L5/001	**Design and Innovation**	**7**	**70**	
5	NADDC/AM/L5/002	**Motor vehicle Spare parts & Management**	**4**	**40**	
6	NADDC/AM/L5/003	**Electrical/Electronic measurement (Auto Electrical)**	**6**	**60**	
TOTAL CREDIT HOURS			**22**	**220**	

OPTIONAL NOS

S/NO	OPTIONAL NOS	NOS TITLE	CREDIT VALUE	TOTAL LEARNING HOURS	REMARKS
8	NADDC/AM/L5/004	**Tyre and Wheel Services**	**6**	**60**	
9	NADDC/AM/L5/005	**Computerized Diagnosis**	**6**	**60**	
10	NADDC/AM/L5/006	**Petrol, Engine Injection Services and Maintenance**	**6**	**60**	
11	NADDC/AM/L5/007	**Diesel Engine Services and Maintenance**	**6**	**60**	
12	NADDC/AM/L5/008	**Hybrid Motor Vehicle Maintenance**	**6**	**60**	
13	NADDC/AM/L5/009	**Electric Motor Vehicle Maintenance**	**6**	**60**	
TOTAL CREDIT HOURS			**24**	**240**	

NOTE: Learners are required to select four (4) units from the optional units.

Unit 001: COMMUNICATION PROCESS IN AN AUTOMOTIVE ENVIRONMENT

Unit reference number:	**NADDC/AM/L1/003**
QCF level:	**5**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose: To establish a quality communication system that is responsive and subject to change in meeting workers and employers need, in work environment.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 001: COMMUNICATION PROCESS IN AN AUTOMOTIVE ENVIRONMENT

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Non-complex communication system in a work environment	1.1	Use a simple verbal means to pass on necessary information.									
	1.2	Use non-verbal means to pass on necessary information e.g. body language.									
	1.3	Identify and explain symbols and signs appropriately.									
LO2: Information source identification in a work environment.											
	2.1	Identify the source of information in an organisation and work environment.									
	2.2	Relate appropriately with the source of information.									
	2.3	Use the various information flow systems in a work environment.									
	2.4	Use information sources to address challenges in a work environment.									
	2.5	Communicate findings in accordance to procedure in a work environment.									
LO3: Use of communication methods in a work environment											
	3.1	Identify the various methods of communication in the work environment.									
	3.2	Use effectively, the various methods of communication in a work environment and communicate effectively to the right personnel.									
	3.3	Observe information effectively using symbols, signs and codes.									
	3.4	Observe instructions in line with ethics of the work environment.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 002: TEAM WORK

Unit reference number:	**NADDC /AM /L1/004**
QCF level:	**5**
Credit value:	**1**
Guided learning hours:	**10**

Unit Purpose:
The purpose of this unit is to impart to the learner, skills, knowledge and understanding required to develop team spirit and positive working relationship.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include:
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 002: TEAM WORK

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO1: Positive working relationship with colleagues	1.1	Identify the need for developing positive relationship with colleagues.									
	1.2	Recognize the importance of relating with other people in a way that makes them feel valued and respected.									
	1.3	Assist team members when required.									
	1.4	Report to the appropriate personnel when request/requesting for assistance fall outside area of responsibility.									
	1.5	Communicate information to colleagues about own work that might affect others.									
LO2: Take Responsibilities within the team	2.1	Recognize own role and responsibilities within the team.									
	2.2	Perform individual tasks in line with the team rules and regulations.									
	2.3	Participate effectively in teamwork.									
LO3: Compliance with organisational policies	3.1	Work In line with organizational standard and structure.									
	3.2	Use organizational code of practice.									
	3.3	Explain organizational code of conduct.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 003: HEALTH AND SAFETY IN AUTOMOTIVE INDUSTRY

Unit reference number:	**NADDC/AM/L4/002**
QCF level:	**5**
Credit value:	**2**
Guided learning hours:	**20**

Unit Purpose:
This unit is about the knowledge and skills needed to competently carryout daily activities in an automotive workshop while observing relevant work ethics and safety. It includes basic first-aid and fire-fighting procedures**.**

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 003: HEALTH AND SAFETY IN AUTOMOTIVE INDUSTRY

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Maintain personal health and hygiene	1.1	State responsibilities within Health and Safety Act as it relates to own occupation.									
	1.2	State general rules on hygiene that must be followed as approved by regulations									
	1.3	State correct personal protection equipment such as Head Protection, Foot Protection, Hand and body protection as approved by regulations.									
	1.4	State the importance of maintaining good personal hygiene.									
	1.5	Describe how to deal with cuts, grazes and wounds and why it is important to do so.									
LO 2: Personal health and hygiene	2.1	Wear clean, smart and appropriate personal protective equipment.									
	2.2	Work safely at all times, complying with health and safety regulations and guidelines.									
	2.3	Demonstrate how cuts, grazes and wounds treated by the appropriate personnel.									
	2.4	Report accidents, illness and infection promptly to the appropriate personnel.									
LO3: Maintain a hygienic, safe and secure workplace	3.1	State the importance of working in a healthy, safe and hygienic workplace									
	3.2	Report and document accidents or near miss quickly and accurately to the appropriate personnel.									
	3.3	Follow health, hygiene and safety procedures during work.									
	3.4	Practice emergency procedures during work.									
	3.5	Follow organizational security procedures.									
	3.6	Ensure effective waste management by proper disposal of organic, inorganic and hazardous waste.									

	3.7	Adhere to sounds and noise control measures.									
LO4 Prevention of hazards in the work place											
	4.1	Identify any hazards or potential hazards and deal with them correctly.									
	4.2	Explain where information about health and safety in your workplace can be obtained.									
	4.3	Describe the types of hazard in workplace that may occur and how to deal with them.									
	4.4	Explain hazards that can be dealt with personally and those that should be reported to appropriate personnel.									
	4.5	Explain how accidents and near misses should be reported..									
	4.6	Describe the types of emergencies that may happen in the workplace and how to deal with them.									
	4.7	Explain where to find the first-aid kits and who the registered first aider is in the work place.									
	4.8	Explain safe lifting and handling techniques that should be followed.									
	4.10	Explain other ways of working safely that are relevant to own position and why they are important.									
	4.11	Describe organizational emergencies procedure, in particular fire, and how these should be followed.									
	4.12	State the possible causes for fire outbreak in the workplace.									
	4.13	Describe how to minimize the possibility of fire outbreak in the workplace.									
	4.14	State where to find fire alarms and how to trigger them.									
	4.15	Identify the location of a muster point in a workplace and state its importance									
	4.16	State why a fire outbreak should never be approached unless it is safe to do so.									
	4.17	State the importance of following the fire safety laws.									

	4.18	Describe the organizational security procedures and why these are important.									
	4.19	Explain the importance of reporting all usual or non-routine incidents to the appropriate personnel.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 004: DESIGN AND INNOVATIONS IN AUTOMOTIVE INDUSTRY

Unit reference number:	**NADDC/AM/L5/001**
QCF level:	**5**
Credit value:	**7**
Guided learning hours:	**70**

Unit Purpose:
The purpose of this unit is to enable the learner acquire the knowledge and skills needed to add value to the existing technology and innovations in the automotive sector while considering environmental and social challenges.

Unit assessment requirements/evidence requirements
Assessment can be carried out in real workplace environment in which automotive services and repair operations are carried out. However, simulation is allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work Product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 004: DESIGN AND INNOVATIONS IN AUTOMOTIVE INDUSTRY

LO		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Concepts and principles of design and innovations											
	1.1	Define the key concepts of design and innovation as they find application into automotive industry.									
	1.2	Explain principles of design and innovations using examples.									
	1.4	Identify the needs for carrying out design and innovation.									
	1.5	Describe qualities of good design and innovations.									
	1.6	Explain the characteristics of a good design.									
LO 2: Emerging design and innovations											
	2.1	Identify major areas of innovations taking place in automobile industry.									
	2.2	Describe major new developments in automotive design and innovations.									
	2.3	Enumerate the challenges of new technologies locally and beyond in design and innovations.									
	2.4	Justify the need for innovations.									
	2.5	Discuss the factors militating against design and innovations.									
LO3: Design process, analysis and experimental testing											
	3.1	Identify problems with the product or customer requirements.									
	3.2	Obtain relevant information for the design of the product and its functional specifications.									
	3.3	Carry out survey regarding the availability of similar products in the market.									
LO4: Preliminary and scale models, prototypes design solution, descriptions and final report											
	4.1	Make simple sketches and drawings of the product.									
	4.2	Construct prototype of a chosen design.									
	4.3	Construct a prototype of the design.									
	4.4	Test the prototype and make improvements									
	4.5	Perform functional tests to verify and possibly modify the design									
	4.6	Make final report about the design									

Learners Signature:	**Date:**
Assessors Signature:	**Date:**
IQA Signature (if sampled)	**Date:**
EQA Signature (if sampled)	**Date:**

Unit 005: MOTOR VEHICLE SPARE PARTS SALES AND MANAGEMENT

Unit reference number:	**NADDC/AM/L5/002**
QCF level:	**5**
Credit value:	**4**
Guided learning hours:	**40**

Unit Purpose:
This unit is for the acquisition of knowledge, skills and attitudes (competency) needed to competently carryout sales and merchandising of motor vehicles and spare parts..

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive activities/sales are carried out.

Assessment method will include
1. Direct Observation / Oral Questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Recognition of Prior Learning (RPL)
7. Professional Discussion (PD)
8. Work Product (WP)

Unit 005: MOTOR VEHICLE SPARE PARTS SALES AND MANAGEMENT

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Health, Safety and Environment	1.1	Maintain a healthy and safe work environment									
	1.2	Discuss security/safety measures for motor vehicles to be sold.									
	1.3	Discuss security/safety measures for spare parts to be sold.									
	1.4	Carryout motor vehicle and spareparts sales in accordance with workplace policy.									
LO 2: Motor vehicle and Spare Parts Preliminary Assessment											
	2.1	Interact with customers and Assess their motor vehicle and spare part needs.									
	2.2	Identify and differentiate motor vehicle models and genuine Spare Parts specification.									
	2.3	Compare motor vehicles and Spare Parts prices from suppliers.									
	2.4	Initiate a business plan.									
	2.5	Carry out motor vehicle and spareparts quality pre-check									
LO3: Motor vehicle and Spare Parts Supplies											
	3.1	Discuss pricing requirements with Suppliers and buyers.									
	3.2	Discuss legal and operational requirements with Suppliers.									
	3.3	Describe Supplier OEM and equivalent part number.									
	3.4	Maintain sales quality pre-checks on motor vehicles and spare parts.									
LO4: Motor vehicle and Spare Parts Sales Business Strategy											
	4.1	Propose a motor vehicle and Spare Parts sales structure									
	4.2	Plan purchase of Motor vehicles and Spare Parts									
	4.3	Supervise the operations of Motor vehicle and Spare Parts Sales.									
	4.4	Describe marketing techniques on Motor vehicles and Spare Parts sales. • Flyers • Radio Advert • Promo, etc									

	4.5	Evaluate and Maintain Motor vehicle and Spare Parts stock and inventory									
LO5: Customer Service and After Sales Follow Up											
	5.1	Communicate with Customer to Guide and Propose motor vehicle/spare parts options.									
	5.2	Describe ways to provide After Sales Service to Customers.									
	5.3	Perform Customer Satisfaction survey and feedback.									
	5.4	Develop related services to customers satisfaction: • Wheel Alignment • Wheel balancing • Tyre changing • Car Wash, etc									
	5.5	Adapt effective quality assurance/control processes									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 006: ELECTRICAL/ELECTRONIC MEASUREMENTS (AUTO ELECTRICAL)

Unit reference number:	**NADDC/AM/L5/003**
QCF level:	**5**
Credit value:	**6**
Guided learning hours:	**60**

Unit Purpose:
This unit is for the acquisition of knowledge, skills and attitudes (competency) needed to competently carryout electrical DC and AC measurements in motor motor vehicles during maintenance and repairs.

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment where automotive maintenance activities are carried out.

Assessment method will include:
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work Product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 006: ELECTRICAL/ELECTRONIC MEASUREMENTS (AUTO ELECTRICAL)

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Health, Safety and Environment in Automotive Electrical Measurements	1.1	Observe the approved standard of health, safety and environment. .									
	1.2	Observe safety measures (electrical).									
	1.3	Review safety practices periodically.									
	1.4	Discuss the dangers associated with working on high voltage components.									
LO2: Principles and Terminologies in Automotive Electrical Measurement	2.1	Describe the principles of electric generation.									
	2.2	Define the different terms involved in Automotive electrical Measurements.									
	2.3	Interpret electric variables – voltage, current and resistance.									
	2.4	Define Ohms Law.									
	2.5	Describe characteristics of electrical circuit components and state their application.									
	2.6	Explain the characteristics of parallel and series circuits.									
	2.7	Differentiate between DC and AC current.									
	2.8	Describe basic magnetism terms.									
LO3: Electrical Schematics and Symbols.	3.1	Interpret wiring diagrams and symbols (schematics).									
	3.2	Identify colour codes and wire gauges.									
LO4: Tools and Equipment in Automotive Electrical/Electronics Measurement	4.1	Identify and select appropriate tools and equipment for electrical/electronics measurements.									
	4.2	Test tools and equipment for defects and accuracy before carrying out measurements.									
	4.3	Ensure periodic calibration of electrical/electronics measurement tools and equipment.									
	4.4	Store electrical/electronics tools in line with manufacturer's specification									

		and other learning requirement.									
LO5: Automotive Electrical/Electronics Measurement Procedure and Practice.											
	5.1	Describe procedures for faults tracing in electrical/electronics circuits.									
	5.2	Demonstrate appropriately, the procedures for carrying out measurements using relevant test equipment.									
	5.3	Carryout electrical measurement in a motor vehicle according to specification.									
	5.4	Apply procedures for locating faults.									
	5.5	Compile and analyze data from e lectrical/electronics Measurement on a motor vehicle.									
	5.6	Rectify electrical faults using appropriate tools and equipment.									
LO 6: Multiplexing and Networking in Motor vehicles											
	6.1	Explain the principles of multiplexing and networking in motor vehicles.									
	6.2	Discuss the benefits of multiplexing and networking in motor vehicle.									
	6.3	Discuss the challenges associated with multiplexing and networking in motor vehicle.									
	6.4	Identify various types of multiplexing and networking e.g. CAN, BUS, MOST, etc									
	6.5	Use proper diagnostic methods in multiplexing and network troubleshooting									
	6.6	Discuss the operations of sensors and actuators									
LO7: Motor vehicle Instrument Cluster											
	7.1	Demonstrate how to use cluster in checking fluid levels.									
	7.2	Demonstrate how to use cluster in checking charging system.									
	7.3	Demonstrate how to use cluster in monitoring ambient and cooling system temperature.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:

Unit 007: TYRE AND WHEEL CARE

Unit reference number:	**NADDC/AM/L5/004**
QCF level:	**5**
Credit value:	**6**
Guided learning hours:	**60 HOURS**

Unit Purpose:
This unit is about competency in the supervision of tyres and wheel care (vulcanizing, wheel balancing, wheel alignment, sales of tyres and wheels).

Unit assessment requirements/evidence requirements
This assessment can only be carried out in a real automotive workplace environment in which sales and services of wheels and tyres, vulcanizing, wheel balancing and wheel alignment operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation/Oral Questions (DO)
2. Question and Answer (QA)
3. Practical Assessment
4. Witness Testimony (WT)
5. Personal Statement (PS)
6. Project
7. Work Product

Unit 007: TYRE AND WHEEL CARE

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Health, safety and environment in tyres and wheels.	1.1	Supervise and use the correct personal protective equipment (PPE) when carrying out tyre repairs.									
	1.2	Develop safety routine activities in the tyre shop.									
	1.3	Design accident free workshop plan/layout.									
	1.4	Supervise and work in accordance with approved safety acts in tyre and wheel service and repairs.									
LO2: Wheel Balancing											
	2.1	Demonstrate the use of wheel balancing tools and equipment, e.g. • caliper • key valve • weight hammer • lever • weight (adhesive and lead), etc									
	2.2	Monitor the pre-inspection process in wheel balancing									
	2.3	Certify post balancing checks on wheels.									
LO3: Wheel Alignment											
	3.1	Monitor the pre-inspection procedures in alignment operations									
	3.2	Demonstrate competence in wear and damage detection on: • Tyres • ball joints • bearings • track arm • track rod • coil spring, etc									
	3.3	Demonstrate competence in pre alignment checks on: • two-wheel drive • four- wheel drive									
	3.4	Supervise wheel alignment operations on: • two-wheel drive • four-wheel drive.									
	3.5	Demonstrate competence in post alignment checks on : • two-wheel drive • four- wheel drive									
LO4: Vulcanizing Operation											
	4.1	Select rims based on construction types:									

		• Drop center, • Semi drop center, • Alloyed/metal rims, etc.									
	4.2	Select rims for light and heavy duty motor vehicles based on rim size. e.g., 13, 14, 15 rims, etc.									
	4.3	Supervise and inspect the maintenance of tyres/rims.									
	4.4	Demonstrate competence in the identification/selection of vulcanizing tools and equipment that conforms to current practice.									
	4.5	Demonstrate competence to supervise the vulcanizing processes: • Dismounting • Rim and tyre separation • Patching (cold, quick, vulcanizing) for tube and tubeless tyres • Mounting, etc									
	4.6	Supervise tyre replacement and rotation in accordance to manufacturer's specification.									
	4.7	Demonstrate competence on tyre pressure.									
	4.8	Ensure timely job completion.									
LO5 : Maintenance of Tyre and Wheel											
	5.1	Initiate, develop and monitor routine maintenance for tools and equipment before carrying out tyre and wheel operation.									
	5.2	Demonstrate competence in the identification of: • worn out tools and equipment • damaged tools and equipment.									
	5.3	Refer identified problems associated with tools and equipment which needs repair to authorized service personnel.									
	5.4	Demonstrate competence in the selection of tyres based on construction: • tyre thread • tyre liner • tyre wall • tyre bead • tyre pressure, etc.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 008: COMPUTERIZED DIAGNOSTICS

Unit reference number:	**NADDC/AM/L5/005**
QCF level:	**5**
Credit value:	**6**
Guided learning hours:	**60 HOURS**

Unit Purpose:
This unit is about the demonstration of knowledge, skills and attitudes (competency) in carrying out fault finding in motor vehicle with the in-depth knowledge of mechanical, electrical and electronics system by application of computerized diagnostic equipment.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Recognition of Prior Learning (RPL)
8. Work product
9. Professional Discussion

Unit 008: COMPUTERIZED DIAGNOSTICS

LO (Learning outcome)		Performance Criteria	Evidence Type					Evidence Ref Page number			
LO1: Health, Safety and environment	1.1	Comply with organisational health, safety and security policies and procedures.									
	1.2	Ensure the safe usage of tools and equipment.									
	1.3	Utilize available resources to ensure a healthy, safe and secure environment.									
	1.4	Review existing health, safety, and security practices in the work environment periodically.									
LO2 : Tools and Equipment Used For Computerized Diagnosis	2.1	Demonstrate the use of the following diagnostic tools: • Digital multimeter, • On-Board diagnostics, • Digital Stroboscope, • Gas Analysers, • Key programmer • OEM and generic diagnostic equipment, etc.									
	2.2	Store all diagnostic tools and equipment in line with workplace procedures.									
LO3 : Operational Principles of computerized diagnosis	3.1	Demonstrate knowledge of various automobile components related to the mechanical and electronic units.									
	3.2	Follow standard operating procedures to input and retrieve data through: • diagnostic displays • visual inspections • test drives • motor vehicle/equipment manufacturer specifications.									
	3.3	Obtain sufficient information from customer/ service advisor to make an assessment towards the given task.									
	3.4	Store diagnostic tools and equipment safely according to manufacturer specification.									
	3.5	Update Diagnostic software and equipment as at when due.									

LO4 : Carrying out Computerized diagnosis											
	4.1	Identify and a fault codes and code reading through: • Diagnostic link connector • Fault code reading • Retrieval of preset code stored in the motor vehicle memory(freeze frame) • Manufacturer's fault code									
	4.2	Perform diagnosis on Supplementary Restraint Systems (SRS) and Anti-lock Braking System (ABS)									
	4.3	Perform diagnosis on transmission systems (manual and automatic motor vehicle)									
	4.4	Perform diagnosis on Air-Conditioning systems									
	4.5	Perform diagnosis on Electronic control units.									
	4.6	Perform diagnosis on energy recuperation systems, if applicable (e.g. in electric, gas and hybrid motor vehicles).									
	4.7	Perform diagnosis on Power-generating systems (including charging systems especially for electrical and hybrid motor vehicles).									
LO5: Final checks of diagnosed components											
	5.1	Check that all components are in conformity with manufacturer's specification: • Moving parts • Circuits (open/short) • Lightening • Noisy components • Sensor heated elements, etc.									
LO6: Repair and replacement activities											
	6.1	Carryout repairs on all identified defective components in line with Manufacturer's specifications.									
	6.2	Replace all worn-out/damage components in line with manufacturer's specifications.									
	6.3	Test all repaired components for functionality.									
	6.4	Test all replaced components for functionality.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 009: PETROL ENGINE INJECTION SERVICE AND MAINTENANCE

Unit reference number:	**NADDC/AM/L5/006**
QCF level:	**5**
Credit value:	**6**
Guided learning hours:	**60 hours**

Unit Purpose:
This unit identifies the competences needed to carryout maintenance services on Petrol Injection Engine system.

- Verify the fault
- Collect further information
- Evaluate the evidences
- Carryout further tests in a logical sequence
- Rectify the fault

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Work product (WP)
7. Recognition of Prior Learning (RPL)
8. Professional Discussion (PD)

Unit 009: PETROL ENGINE INJECTION SERVICE AND MAINTENANCE

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Petrol Engine Injection System Operations	1.1	Identify petrol engine injection components and their functions.									
	1.2	Discuss petrol engine injection system operations.									
	1.3	Discuss the various types of fuel injection system (electronically controlled and mechanically controlled).									
LO2: Use Of Diagnostic Tools and Equipment	2.1	Select and apply appropriate diagnostic tools, materials and equipment.									
	2.2	Operate motor vehicle diagnostic tools and equipment according to specification									
	2.3	Update diagnostic tools/ equipment as at when due and in line with manufacturer's specification.									
	2.4	Store diagnostic tools and equipment safely and in line with manufacturer's specification.									
LO 3 Safe working practices in petrol engine injection system diagnosis	3.1	Demonstrate safe handling of the diagnostic tools and equipment.									
	3.2	Work in a way which minimizes the risk of damage to other motor vehicle system and components									
	3.3	Observe safety at all times, complying with health safety and other relevant regulations and guidelines.									
LO4 Petrol Engine Injection Services and Maintenance	4.1	Select and use appropriate diagnostic techniques and tools to locate faults.									
	4.2	Troubleshoot to establish the most likely cause(s) of the faults.									
	4.3	Rectify the identified faults using appropriate methods and techniques.									
	4.4	Demonstrate procedures for checking, servicing and maintenance of injection components.									
	4.5	Apply procedures for interpreting electrical wiring diagrams.									

	4.6	Store diagnostic tools and equipment safely and in line with manufacturer's specification.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 010: DIESEL ENGINE SERVICE AND MAINTENANCE

Unit reference number:	**NADDC/AM/L5/007**
QCF level:	**5**
Credit value:	**6**
Guided learning hours:	**60 HOURS**

Unit Purpose:
This unit is about knowledge, skills and attitudes (competency) required in conducting services, maintenance, adjustment and replacement operations as part of the regular servicing of diesel engine.

Unit assessment requirements/evidence requirements
This assessment can only be carried in a real workplace environment in which automotive service and repairs for diesel engines are carried out live engines and functional motor vehicles shall be provided.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product (WP)

Unit 010: DIESEL ENGINE SERVICE AND MAINTENANCE

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO 1: Safety, Health and Environmental regulations at workplace.	1.1	Discuss health and safety precautions to be applied during the overhaul procedure.									
	1.2	Analyse the hazards associated with carrying out overhaul activities such as: • lifting and handling equipment, • handling oils, greases, • release of stored pressure/force, • misuse of tools, used of damaged or badly maintained tools and equipment, • not following laid-down maintenance procedures.									
	1.3	Determine the organisational procedure to be adopted for the safe disposal of waste of all types.									
	1.4	Determine the health and safety legislation and workplace procedures relevant to motor vehicle and engine maintenance activities.									
LO2: Principles of operation of a diesel engine.											
	2.1	Identify different types of engines • Vee • Straight • Flat									
	2.2	Differentiate between spark ignition and compression ignition engines.									
	2.3	Differentiate between two-stroke and four-stroke cycle engines.									
	2.4	Enumerate merits and demerits of diesel over petrol engine.									
	2.5	Discuss the importance of turbo charging in a diesel engine									
LO3: Diesel engine service and maintenance.											
	3.1	Explain the procedures involved in the dismantling and assembling of various types of diesel engines.									
	3.2	Discuss the procedure for obtaining replacement parts, materials and other consumables necessary for the diesel engine overhaul.									
	3.3	Determine the methods of checking that replacement components are fit for use.									
	3.4	Identify defects and wear characteristics and the need to replace `lifted' items (such as seals, belts and									

		gaskets).									
	3.5	Discuss the use of lifting and handling equipment during overhauling activities.									
	3.6	Determine the problems associated with diesel engine overhauling activities and how they can be overcome.									
LO4: Injector pump and nozzles servicing.											
	4.1	Carry out injector pump calibration and phasing.									
	4.2	Explain the sequence of operation of fuel injection system in diesel engine.									
	4.3	Check fuel injector pump timing according to manufacturer's specification.									
	4.4	Discuss bleeding process during engine routine servicing.									
LO5: Basic engine servicing, repairs and maintenance.											
	5.1	Examine to ensure the following components conform to manufacturers specifications prior to use: • Fuel pump • Heater plugs • Radiator • Oil filters • Engine oil.									
	5.2	Select and use appropriate tools/equipment while servicing a diesel engine.									
	5.3	Demonstrate the ability to dismantle engine and assess parts for re-use and/or replacement.									
LO:6 Maintenance records keeping in workplace.											
	6.1	Initiate the generation of technical documentation and/or reports following completion of the engine repair activities.									
	6.2	Initiate the report of any problems or issues relating to the motor vehicle's condition or conformity to the relevant personnel.									
	6.3	Update and ensure that maintenance records are accurate, complete and passed to the relevant personnel.									
	6.4	Investigate any anticipated delays in completion and report to the relevant personnel									
LO 7 Operational checks and											
	7.1	Describe means of maintaining and storing tools and equipment during and									

maintenance of tools and equipment.		after use.									
	7.2	Discuss the demerits of misusing tools and equipment									
	7.3	Demonstrate the use of torque wrenches and other measuring equipment such as: • micrometers, • vernier caliphers, • Filler gauges • Expansion indicators and other measuring devices in carrying out diesel engine overhauling according to manufacturers' specification.									
	7.4	Ensure that tools and equipment are safe and in usable condition and are configured correctly for the intended purpose.									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 011: HYBRID MOTOR VEHICLE MAINTENANCE

Unit reference number:	**NADDC/AM/L5/008**
QCF level:	**5**
Credit value:	**6 CREDITS**
Guided learning hours:	**60 HOURS**

Unit Purpose:
This unit is about establishing the fundamental knowledge/skills required to carry out servicing and maintenance of hybrid motor vehicles. It also involves replacement activity procedures.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 011: HYBRID MOTOR VEHICLE MAINTENANCE

LO (Learning outcome)		Performance Criteria:-	Evidence Type					Evidence Ref Page number			
LO1: Hybrid motor vehicle systems, Components and operation	1.1	Identify Hybrid motor vehicle engine types (Diesel or Petrol/gas)									
	1.2	Describe the types of Hybrid motor vehicles (fully hybrid, mild hybrid, plug-in hybrid)									
	1.3	Identify components that make up a hybrid system (batteries, motor, cabling, control unit, circuit protector, etc)									
	1.4	Describe the construction and function of battery modules (types, capacities, housings, materials, connections, charging process)									
	1.5	Describe the construction and function of hybrid motors (types, connection, power rating, etc)									
	1.6	Explain the construction and function of associated hybrid components (cabling, circuit protectors, control unit, etc)									
	1.7	Enumerate merits and demerits of hybrid motor vehicles (environmental friendly, fuel efficiency, regenerative braking system, built from light materials, etc; and less power output, expensive, high maintenance cost, presence of high voltage in batteries, cannot be used for heavy duty motor vehicles, etc respectively).									
LO2: Health, Safety and Environment in hybrid motor vehicle maintenance											
	2.1	State safety precautions to be taken before carrying out routine maintenance (overall, gloves, protective footwear, etc)									
	2.2	State safety precautions to be carried out before carrying out any repair procedures on hybrid motor vehicles									
	2.3	Identify high voltage cabling and associated components									
	2.4	Describe the precautions required when working with hybrid components (awareness of high voltage component, etc)									
	2.5	Describe the safe procedures for									

		towing hybrid motor vehicles (adherence to manufacturer's specifications).									
LO3 : Hybrid motor vehicle special tools and equipment											
	3.1	Select appropriate tools and equipment to carry out hybrid motor vehicle repairs and maintenance (hand tools, code readers,, specialist tools, electrical meters, etc)									
	3.2	Ensure that equipment has been calibrated to meet manufacturers requirements (multimeter, torque wrenches, etc)									
	3.3	Identify additional tools and equipment required to carry out work on hybrid motor vehicles									
	3.4	Use specified tools and equipment in the correct way									
	3.5	Store tools and equipment in accordance with manufacturers specification									
LO4: Carry out Maintenance and repairs on hybrid motor vehicles											
	4.1	Identify the possibility of the hybrid system affecting repairs on other motor vehicle systems									
	4.2	Describe the procedures required to ensure safety of the hybrid system before carrying out repair activities									
	4.3	Describe the precautions taken prior to removing and replacing high voltage components									
	4.4	Describe appropriate methods to re-instate motor vehicles after repairs affecting hybrid systems									
	4.5	Identify additional tools and equipment required to carry out work on hybrid motor vehicles									
	4.6	Describe how to connect an additional 12volts power source to a hybrid motor vehicle									
	4.7	Demonstrate the correct procedures to disconnect and reconnect a high voltage battery pack									
	4.8	Demonstrate the correct procedures to remove and refit a hybrid system component									
	4.9	Demonstrate appropriate procedures to confirm repairs are successfully carried out.									
	4.10	Demonstrate the correct methods to reset motor vehicle									

		systems post-repair e.g. clear fault codes (using scan tools, specialist equipment, etc)									
	4.11	Carryout all hybrid maintenance activities in a manner that reduces risks to both motor vehicles, personnel and the environment									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**

Unit 012: ELECTRIC MOTOR VEHICLE MAINTENANCE

Unit reference number:	**NADDC/AM/L5/009**
QCF level:	**5**
Credit value:	**6**
Guided learning hours:	**60 HOURS**

Unit Purpose:
This unit is to enable the learner to demonstrate in a practical way, the knowledge of electric motor vehicles and their repairs/maintenance procedures. It also involves replacement activities on electric motor vehicles.

Unit assessment requirements/evidence requirements
Assessment must be carried out in real workplace environment in which automotive services and repair operations are carried out. Simulation is not allowed in this unit and level.

Assessment method will include
1. Direct Observation / oral questions (DO)
2. Question and Answer (QA)
3. Practical assessment
4. Witness Testimony (WT)
5. Personal statement (PS)
6. Project
7. Work product

Unit 012: ELECTRIC MOTOR VEHICLE MAINTENANCE

LO (Learning outcome)	Performance Criteria:-		Evidence Type					Evidence Ref Page number			
LO1: Electric motor vehicle systems, Components and operations	1.1	Discuss (briefly) the history of Electric Motor vehicles (EV)									
	1.2	Describe the types of electric motor vehicles (plug-in electric, Hybrid electric motor vehicle (HEV), etc)									
	1.3	Enumerate application of the concept of electric motor vehicles in other areas (land, sea & air)									
	1.4	Identify electric motor vehicle major components (controller, motor, charger, battery, converter, etc)									
	1.5	State the functions and principles of operation of major components of electric motor vehicles									
	1.6	Enumerate merits and demerits of electric motor vehicles (reduces dependence on oil and gasoline, pollutants and noise free, recyclable batteries, etc; and high price, high recharge time, silence may be fatal, etc respectively).									
LO2: Health, Safety and Environment in electric motor vehicle maintenance											
	2.1	Use suitable Personal Protective Equipment (PPE) throughout all motor vehicle inspection activities (overalls, gloves, protective footwear, etc)									
	2.2	Demonstrate and work in a way which minimizes the risk of damage to the motor vehicle and its systems, other people and the environment									
	2.3	State safety precautions to be taken before and after carrying out routine maintenance									
	2.4	State safety precautions to be observed before carrying out any repair procedures on electric motor vehicles									
	2.5	Describe the precautions required when working with electric components (awareness of high voltage components, etc)									
	2.6	Describe the safety procedures for towing electric motor vehicles (adherence to manufacturer's specifications).									
LO3 : Electric motor vehicle special											
	3.1	Select appropriate tools and equipment to carry out electric motor									

tools and equipment		vehicle repairs and maintenance (hand tools, code readers, specialist tools, multimeters, etc)									
	3.2	Demonstrate that equipment has been calibrated to meet manufacturer's requirements (multimeter, torque wrenches, etc)									
	3.3	Identify additional tools and equipment required to carry out work on electric motor vehicles									
	3.4	Use correct tools and equipment in the correct way									
	3.5	Store tools and equipment in accordance with manufacturers specification									
LO4: Carry out Maintenance and repairs activities on electric motor vehicles											
	4.1	Explain the correct procedures required when removing and replacing electric motor vehicle components									
	4.2	Explain how to disconnect high voltage supplies correctly e.g. batteries, capacitors									
	4.3	Identify the possibility of the electric system affecting repairs on other motor vehicle systems									
	4.4	Describe the procedures required to ensure safety of the electric system before carrying out repair activities									
	4.5	Describe the precautions taken prior to removing and replacing high voltage components									
	4.6	Describe appropriate methods to synchronize and adapt replaced components after replacement									
	4.7	Identify specialized tools and equipment required to carry out repairs and maintenance on electric motor vehicles									
	4.8	Describe the correct procedure of recharging electric motor vehicle									
	4.9	Demonstrate the correct procedures to disconnect and reconnect a high voltage battery pack									
	4.10	Demonstrate appropriate procedures to confirm that repairs are successfully carried out (repair checklist, test running, post repair diagnosis, etc)									
	4.11	Carry out all electric maintenance activities in a manner that reduces risks to both motor vehicles, personnel and the environment.									

LO5: Introduction to Hybrid Electric motor vehicle											
	5.1	Discuss (briefly) the history of hybrid Electric Motor vehicle (HEV)									
	5.2	Describe the various types of HEV • Plug-in HEV • Solar HEV, etc									
	5.3	Identify HEV major components									
	5.4	State the functions and principles of operations of major components of HEV • Battery • Control unit, • Cabling, • Converters, • Circuit protector, etc.									
	5.5	State basic HEV safety procedures									
	5.6	Describe the basic HEV safety procedures and precautions									
	5.7	Enumerate merits and demerits of HEV									

Learners Signature:	**Date:**
Assessors Signature:	Date:
IQA Signature (if sampled)	Date:
EQA Signature (if sampled)	**Date:**