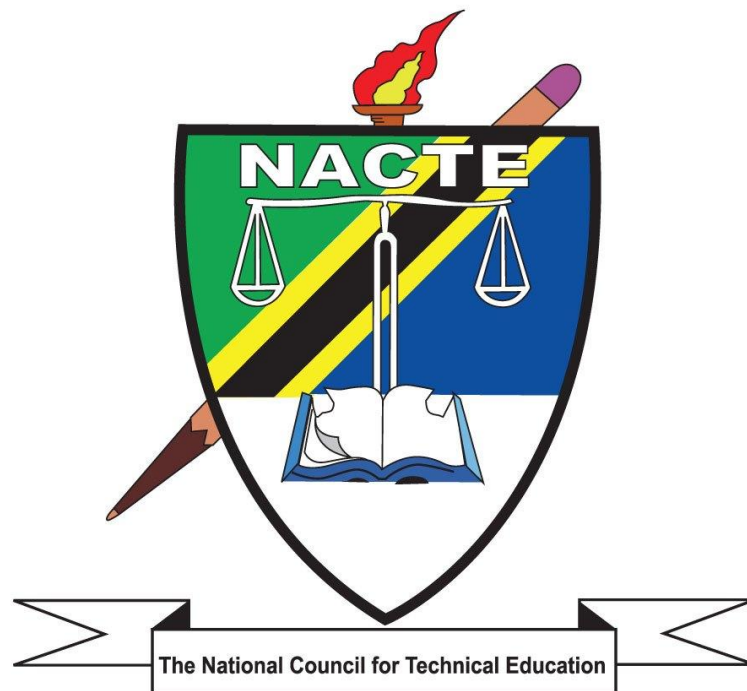


# NATIONAL COUNCIL FOR TECHNICAL EDUCATION



**NOVEMBER 2022**

**OCCUPATIONAL STANDARDS FOR AUTOMOTIVE ENGINEERS**

**LEVEL: NTA 8**

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## FOREWORD

The National Council for Technical Education (NACTE) is a corporate body established by the National Council for Technical Education Act, Cap.129. The Act provides a legal framework for the Council to coordinate the provision of technical education and training in Tanzania. The mandate of NACTE is three-fold, namely; Regulatory, Quality Assurance and Policy Advisory. In discharging its mandate, the Council has been charged with the responsibilities, among others, to:

- (a) assist technical institutions in the transmission of knowledge, principles and training in the field of technical education and training for the benefit of the people of Tanzania;
- (b) assist technical institutions in the overall development of the quality of education they provide and to promote and to maintain approved academic standards;
- (c) establish and make awards in technical education which are consistent in standard and comparable to related awards in Tanzania and internationally; and
- (d) ensure that the quality of education required for the awards is met and maintained throughout the duration of the delivery of the course.

In the course of execution of these responsibilities, the Council has been instituting various measures aiming at advancing the quality of training provided in technical institutions in respect of the changing demands of the labour market, both local and international.

To achieve the above obligation, NACTE, under the Ministry of Education, Science and Technology implemented the East Africa Skills for Transformation and Regional Integration Project (EASTRIP), a project aiming at promoting regional integration through supporting the regional corridors and sector markets, developing common standards and qualifications, and promoting mobility of students, faculty, and graduates. The project supports the Government of Tanzania to address shortage of skills in five sectors namely:

- (a) Energy;
- (b) Construction;
- (c) Information and Communication Technology (ICT);
- (d) Transportation; and
- (e) Agribusiness.

To address the skills miss-match and shortage in the five (5) sectors in the country, the project funded, among others, a component of Development of Occupational Standards for Technical and Vocational Education and Training (TVET). In this regard, NACTE endeavoured to identify

qualified and highly experienced experts in the five sectors from both the industry and training institutions to carry out the development of Occupational Standards. The exercise was carried out at Morogoro Teachers College – Morogoro from 16<sup>th</sup> July to 10<sup>th</sup> August, 2021. The output of the exercise is Occupational Standards for 12 occupations. Occupational standards for Automotive engineers are among the occupational standards for 12 occupations which have been developed.

Since Occupational Standards are statements of work performance reflecting the ability to successfully complete the functions required in an occupation, as well as the application of knowledge, skills, attitudes and understanding in an occupation, it is the Council’s expectations that the developed standards will form a robust base for decision making and provide explicit guidance to policy makers, curriculum developers, educators, employers and other stakeholders in matters related to manpower planning as well as execution of Technical and Vocational Education and Training undertakings.

Prof. J. W. Kondoro  
**Chairman**

Dar es Salaam  
**NOVEMBER 2022**

## **ACKNOWLEDGEMENT**

The National Council for Technical Education (NACTE) is charged with the mandate to be the Quality Assurance organ of the Government in matters related to Technical and Vocational Education and Training (TVET) and production of qualified manpower for both local and international labour markets. In order to realize this obligation, NACTE endeavours to institute policies, guidelines and standards and to set the quality benchmarks for training institutions.

However, this is only possible if there is a strong base, linking the training institutions on one hand and the demands of the industry/labour market for relevant manpower on the other hand. Therefore, the Council undertook a step to develop Occupational Standards in sectors considered to be the engine to steer the country's desire to achieve an industrial economy. This exercise would not be a success without the input and support from our stakeholders. I am indebted to acknowledge some of them here.

I wish to acknowledge and appreciate the support from the Ministry of Education, Science and Technology through the East Africa Skills for Transformation and Regional Integration Project (EASTRIP) for the financial support which facilitated the preparation of this document. I wish also to appreciate Eng. Dr. Simon Bareguand Mrs Leah Lukindo for the tireless efforts and commitment in facilitating and guiding the standards development process, Ms. Eileen Tzamburakis and Ms. Chausiku Yakweli Ibrahim for compiling and type setting the final document; and the NACTE Secretariat for coordinating the whole activity.

In a very special way I wish further to extend my sincere gratitude to this team of wonderful experts who tirelessly dedicated their time and availed their invaluable intellect in the preparation of this document. I would like to recognise the colossal inputs of the following experts:

<b>S/N</b>	<b>Name</b>	<b>Designation</b>	<b>Organization</b>
1	Eng. David S. Mtunguja	Senior Instructor	Arusha Technical College (ATC)
2	Eng. Stembridge Lushatila	Regional Manager	Tanzania Electrical, Mechanical and Service Agencies (TEMESA) – Katavi Region
3	Dr. Amon C. Mwasandube	Lecturer	National Institute of Transport

In addition, NACTE wishes to further enhance the internationalization of occupational standards and promote the modernization and internationalization of industries, thereby facilitating

Tanzania's integration into the international market and expanding its development potential. Therefore, NACTE has invited China-Africa Vocational Education Alliance and China-Africa (Chongqing) Vocational Education Alliance to participate in the development, revision and review of occupational standards documents in collaboration with Chinese vocational institutions, so as to make use of their rich experience in vocational education efforts and rely on China's advanced and complete industrial chain and position in the international market to contribute to the development of vocational education and related industries in Tanzania.

Therefore, I would like to express my sincere gratitude to this specialized team of many Chinese institutions and experts. I thank them for their hard work and dedication, and for contributing their wisdom and experience to the preparation of this document. I would like to thank the following institutions and experts for their support:

<b><u>S/N</u></b>	<b>Institute</b>	<b>Name</b>	<b>Title/area of expertise</b>
1	Zibo Vocational Institute	Zhang Lirong	Professor/Automotive
2		Zhou Weiwei	Associate Professor/Automotive
3		Han Wen	Associate Professor/Automotive
4		Su Yuanbin	Associate Professor/Automotive
5		Song Yiqing	Lecturer/Automotive
6		Xu Jinbin	Lecturer/Automotive
7		Zhang Shaohong	Professor/Automotive
8		Wu Lei	Professor/Automotive
9		Shen Haiyan	Professor/Automotive
10		Zhang Cheng	Lecturer/Automotive
11		Li Yujiao	Lecturer/Automotive
1	Hubei Communications Technical College	Li Jianming	Associate Professor
2		Cao Denghua	Professor
3		Li Yuanjun	Professor
4		Tian Xingzheng	Associate Professor
5		Liu Jungang	Associate Professor

6		Liu Bei	Lecturer/Automotive
7		Jiang Shujun	Lecturer/Automotive
8		Chang Tongzhen	Lecturer/Automotive
9		Bao Qiang	Lecturer/Automotive

Finally, I would like to thank all stakeholders in the project approval process for their strong support and for their expert insight and input regarding the validity of the content and the preparation of this document for the general public.

Dr. A. B. Rutayuga  
**Executive Secretary**

Dar es Salaam  
**NOVEMBER 2022**

## **ABBREVIATIONS**

<b>ABS</b>	Anti-locking Braking System
<b>CDI</b>	Capacitor Discharging Ignition
<b>ECM</b>	Electronic Control Module
<b>ESA</b>	Electronic Spark Advance
<b>Ne</b>	Crankshaft Position Sensor Signal or Engine Speed Signal
<b>MOPP</b>	Maintenance Operation and Procedure
<b>NACTE</b>	National Accreditation Council of Technical Education
<b>NOS</b>	National Occupational Standards
<b>OS</b>	Occupational Standards
<b>TET</b>	Technical Education and Training
<b>TVET</b>	Technical and Vocational Education and Training

## GLOSSARY OF TERMS

<b>Circumstantial Knowledge:</b>	Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues.
<b>Competence:</b>	The ability to use knowledge, understanding, practical and thinking skills to perform effectively to the workplace standards required in employment.
<b>Competency:</b>	A description of the ability one possesses when able to perform a given occupational task effectively and efficiently.
<b>Competency-Based Education:</b>	An instructional program that derives its content from validated tasks and bases assessment on the learner's performance.
<b>Curriculum:</b>	A description or composite of statements about "what is to be learned" by the trainee/student in a particular instructional programme; a product that states the "intended learning outcomes".
<b>Educational/Training Programme:</b>	The complete curriculum and instruction (what and how) that is designed to prepare a person for employment in a job or other particular performance situation.
<b>Occupation:</b>	A specific position requiring the performance of specific tasks – essentially the same tasks are performed by all employees having the same title. (Example: baker).
<b>Occupational Analysis:</b>	A process used to identify the tasks that are important to employees in any given occupation.
<b>Occupational Area:</b>	This is a broad grouping of related jobs. Example: auto food service.
<b>Occupational Standards:</b>	Specific requirements of competences people are expected to demonstrate in a particular occupational area, including knowledge and relevant attitudes. They also act as performance tool of assessment of the pre – scribed outcomes.
<b>Performance Criteria:</b>	Indicate the expected end results or outcome in form of evaluative statements.

- Skills:** The ability to perform occupational tasks with a high degree of proficiency within a given occupation. Skill is conceived of as a composite of three completely interdependent components: cognitive, affective, and psychomotor.
- Standards:** It is a set of statement, which if proved true under working conditions, means that an individual is meeting an expected level and type of performance.
- Task Analysis:** The process of analyzing each task to determine the steps, related knowledge, attitudes, performance standards, tools and materials needed, and safety concerns required of employees performing it.
- Tasks:** A work activity that has a definite beginning and ending, is observable or measurable, consists of two or more definite steps, and leads to a product, service, or decision.
- Underpinning Knowledge:** This is crucial knowledge that an individual must acquire in order to demonstrate competences that are associated in performing a given task.
- Verification Process:** The process of having experts review and conform the importance of the task (competency) statements identified through occupational analysis. Other questions, such as the degree of task learning difficulty are also frequently asked. This process is also sometimes referred to as validation.
- Occupational Competence:** The application of knowledge and skills to perform consistently to the standards required in the work context.

## 1.0. INTRODUCTION

Technical Education and Training (TET) is one of the most important education sub-sectors in Tanzania, responsible for developing a skilled workforce to support the country's industrialization economic agenda. Tanzania's Development Vision 2025 intends to raise the country's economy to a middle-income status. This requires a skilled workforce that is aligned with the needs of the public and private sectors of the economy. The National Council for Technical Education has begun the job of drafting Occupational Standards that will eventually be adopted as National Occupational Standards for TET in order to ensure that it meets the needs of the labour market and the country's economic agenda.

National Occupational Standards (NOS) are performance criteria that are matched with labour market demands. Each National Occupation Standard describes functions, performance standards, and knowledge/understanding for one important function or task. They combine skills, knowledge, and attitudes to describe best practice. They are useful tools for establishing job roles, personnel recruiting, supervision, and appraisal, as well as TET standards. They're also helpful for benchmarking and harmonizing qualifications on a national and international level. Standards, in general, provide a solid framework for high-quality TET that is labour market-relevant, current and consistent in delivery across all public and private institutions.

However, it must be noted that, Occupational Standards and Training standards/qualifications standards are different. Occupational standards are defined in terms of activities performed by a person in a selected occupation (e.g., an electrical engineer designs electrical wiring circuits, performs trouble shooting in electrical wiring, etc.) and they are usually defined by employers following procedures agreed upon by all stakeholders. Education and training standards are developed from the activities defined in occupational standards, and they include learning objectives to ensure that the necessary skills and knowledge are developed by a person to enable him or her to function at an agreed level in an occupation. Education and Training standards are used to define curricula in training institutions. It is however critical that there must be a direct link between the occupational standards and the training standards to respond to demands of the labour market.

In TET delivery, Tanzania adopted the Competency-based Education and Training (CBET) approach. The CBET approach focuses on providing learners with the skills and knowledge required to meet the occupational standards. Occupational standards are thus the starting point

for developing Competency-based Education and Training (CBET) programs. TET institutions will be required to benchmark their curricula with relevant occupational standards.

Occupational Standards are developed based on a given occupation's current and future demands. As a result, they serve as a means of bridging the gap between the worlds of employment and technical education and training (TET).

The Automotive Engineer Occupation has its own set of occupational standards. The document explains how the occupational standards were developed, as well as the scope, the occupational profile in the form of DACUM charts, and the Occupational Standards.

## **2.0. OCCUPATIONAL STANDARD DEVELOPMENT PROCESS**

The Occupational standards development process began with an examination of major documents that guide Tanzanian skill development. The 10-year National Skills Development Strategy (2016-2026) was one of the documents reviewed, and it outlined six (6) economic sectors that should be prioritized when developing skills development programmes. These sectors include: Transport and logistics, Tourism and Hospitality, Agribusiness, Construction, Energy and ICT. NACTE labour market reports were also used in the literature review to determine the skills demand in the Tanzanian labour market as a whole.

After the literature review, a workshop comprised of expert workers and educators with substantial knowledge and experience in the occupation conducted an occupational analysis utilizing the DACUM approach to produce the occupational profile. The analysis resulted in DACUM Charts, which are attached as **Appendix 1** to this document.

The occupational standards were then developed. Experts in Occupational Analysis and the Development of Occupational Standards facilitated the workshop. Interviews, online surveys, and a stakeholder forum were used to validate the occupational standards. Engineers, supervisory technicians on the job, and experienced Civil Engineering technicians were key informants in the survey to discover occupational trends. This information was used to gain insight from the workplaces regarding trends and changes in the profession, including how well graduates are prepared for working in the occupation. A total of ..... online surveys were completed by experts from the labour market across the country. Apart from the survey aiding in defining the scope for the occupational analysis, they served to engage a wide cross-section of

experts in the occupation. The stakeholders' forum was attended by ..... participants from different parts of the country representing various companies.

### **3.0. THE SCOPE AND OVERVIEW OF THE OCCUPATION STANDARDS FOR AUTOMOTIVE ENGINEERS**

These standards cover a broad range of duties and tasks that can be performed by an Automotive Engineer. However, the occupational standards are not meant to replace individual job descriptions, they are to be used for guidance in defining skill levels and knowledge for the technician in specific settings or positions. The Automotive engineer may perform tasks in a number of key areas of the occupational standards, but not necessarily in all areas. For example, in large operations other individuals may be employed or designated to perform specific tasks.

Automotive engineers help with the design of new vehicles as well as the maintenance of vehicle components such as engines, transmissions, brake systems, and safety measures. Mechanical, electrical, and electronic components make up modern automobiles. As a result, an engineer in this sector is responsible for resolving mechanical, electrical and electronic issues in automobiles. These occupational standards are concerned with the vehicle's maintenance and upkeep, which include electrical and electronic diagnosis. The following are the primary responsibilities of an automotive engineer:

- a) Servicing Mechanical, electrical and electronics systems in vehicles
- b) Performing physical and virtual tests
- c) Building prototypes of components to carry out tests on
- d) Interpreting and analysing results and data
- e) Providing technical advice and answering queries from clients
- f) Sourcing vehicle components and selecting the best materials to use
- g) Using specialist computer modelling software to conduct diagnoses in vehicle components
- h) Agreeing and negotiating project budgets, timescales and specifications with clients and managers
- i) Making improvements to vehicles in response to customer feedback
- j) Investigating and solving problems, e.g. mechanical failures
- k) Writing reports and documentation
- l) Undertaking relevant research
- m) Supervising subordinates

The Occupational standards have been clustered into NTA qualification levels i.e. NTA level 7 and 8.

#### **4.0. VALIDITY PERIOD**

The occupational standards will be valid for 3-5 years due to the fast-changing nature of technology. The review will proceed in the same manner as the previous one, with new occupational standards being developed based on current labour market information.

## **5.0. OCCUPATIONAL STANDARDS**

### **5.1. OCCUPATIONAL STANDARDS FOR AUTOMOTIVE ENGINEERS - NTA 8**

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN ELECTRONIC CHASSIS ELECTRONIC CONTROL SYSTEMS	<b>DUTY NO.</b>	801
<b>TASK TITLE</b>	FAULT DIAGNOSIS FOR ANTI-LOCKING BRAKING SYSTEMS (ABS)	<b>TASK NO.</b>	8011
<b>PERFORMANCE CRITERIA</b>	A person performing this task must be able to repair Antilocking Braking Systems (ABS) as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required: 1. Full automotive tool box; 2. Diagnosis machine/decoder; 3. Digital multimeter; 4. Auto tester; 5. Junction box; 6. Working light; 7. Ramp/Inspection Pit/Lifter; 8. Oscilloscope; 9. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
The person performing this task must be able to do the following: 1. Observe health and safety when performing the task; 2. Obtain required resources for the task; 3. Analyze faults code for ABS; 4. Service ABS Wiring Harness; 5. Service ABS sensors; 6. Inspect ABS Electronic Control Unit; 7. Diagnose and Service ABS power supply, fuse, relay and other faults; 8. Erase the Fault codes; 9. Test ABS Performance; 10. Perform as-built inspection according to the factory standard of braking system; 11. Clean tools, equipment and workplace;	<b>Detailed knowledge about:</b> <b>1.0. Methods:</b> This person performing this task must be able to explain how to: 1.1. Explain how to repair Anti-Locking Braking Systems (ABS). <b>2.0. Principles:</b> The person must be able to explain the principles of Anti-locking Braking Systems (ABS). <b>3.0. Theories:</b> The person must be able to explain 3.1. Anti-locking Braking Systems components and operations (ABS); 3.2. Maintenance of ABS. <b>4.0. Essential Skills:</b> 4.1. Communication skills; 4.2. Management skills; 4.3. Data storage skills; 4.4. Customer care skills;		

12. Store tools and equipment.	4.5. Team work skills; 4.6. Report writing skills; 4.7. Computer application skills; 4.8. Data analysis skills.
<b>DESCRIPTION OF END PRODUCTS/SERVICE</b>	Anti-locking Braking Systems (ABS) are repaired and functioning as per technical requirement and Manufacturer's Specifications.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<b>Detailed knowledge about:</b> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN CHASSIS ELECTRONIC CONTROL SYSTEMS	<b>DUTY NO.</b>	801
<b>TASK TITLE</b>	FAULT DIAGNOSIS FOR ELECTRONIC POWER ASSISTED STEERING SYSTEM	<b>TASK NO.</b>	8012
<b>PERFORMANCE CRITERIA</b>	A person performing this task must be able to repair Electronics Power Assisted Steering System as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	<p>This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required:</p> <ol style="list-style-type: none"> <li>1. Full automotive tool box;</li> <li>2. Diagnosis machine/decoder;</li> <li>3. Digital multimeter;</li> <li>4. Auto tester;</li> <li>5. Junction box;</li> <li>6. Working light;</li> <li>7. Ramp/Inspection Pit/Lifter;</li> <li>8. Oscilloscope;</li> <li>9. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.</li> </ol>		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
<p>The person performing this task must be able do the following:</p> <ol style="list-style-type: none"> <li>1. Observe health and safety when performing the task;</li> <li>2. Inspect the Steering Wiring;</li> <li>3. Repair Steering Electronic Control Unit- Three by wires;</li> <li>4. Check electronics Wheel alignment;</li> <li>5. Lock the steering wheel to the specified torque;</li> <li>6. Erase Steering Fault codes;</li> <li>7. Test Performance of electronic steering system;</li> <li>8. Check the electronic power steering system sensor;</li> <li>9. Repair electronic power steering control system power supply fuse, relay and other faults;</li> </ol>	<p><b>Detailed knowledge about:</b></p> <p><b>1.0. Methods:</b> This person performing this task must be able to explain how to repair Electronic Power Assisted Steering System.</p> <p><b>2.0. Principles:</b> The person must be able to explain the principles of repairing Electronics Power Assisted Steering System.</p> <p><b>3.0. Theories:</b> The person must be able to explain</p> <ol style="list-style-type: none"> <li>3.1. Electronics Power Assisted Steering System components and operations;</li> <li>3.2. Maintenance and repair of Electronic power assisted Steering system.</li> </ol> <p><b>4.0. Essential Skills:</b></p> <ol style="list-style-type: none"> <li>4.1. Communication skills;</li> <li>4.2. Management skills;</li> <li>4.3. Data storage skills;</li> </ol>		

<p>10. Perform as-built inspection according to the factory standard of steering system;</p> <p>11. Clean tools, equipment and workplace;</p> <p>12. Store tools and equipment.</p>	<p>4.4. Customer care skills;</p> <p>4.5. Team work skills;</p> <p>4.6. Report writing skills;</p> <p>4.7. Computer application skills;</p> <p>4.8. Data analysis skills.</p>
<p><b>DESCRIPTION OF END PRODUCTS/SERVICE</b></p>	<p>Electronics Power Assisted Steering System is repaired and functioning as per technical requirement and Manufacturer's Specifications.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE</b></p>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN CHASSIS ELECTRONIC CONTROL SYSTEMS	<b>DUTY NO.</b>	801
<b>TASK TITLE</b>	FAULT DIAGNOSIS FOR ELECTRONIC DAMPING CONTROL SYSTEM	<b>TASK NO.</b>	8013
<b>PERFORMANCE CRITERIA</b>	A person performing this task must be able to repair Electronic Damping Control system as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	<p>This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required:</p> <ol style="list-style-type: none"> <li>1. Full automotive tool box;</li> <li>2. Electronic Shock up Tester;</li> <li>3. Diagnosis machine/decoder;</li> <li>4. Digital multimeter;</li> <li>5. Auto tester;</li> <li>6. Junction box;</li> <li>7. Working light;</li> <li>8. Lifter;</li> <li>9. Oscilloscope;</li> <li>10. Tire pressure gauge;</li> <li>11. Steel ruler;</li> <li>12. Special tools;</li> <li>13. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.</li> </ol>		

#### **EVIDENCE REQUIREMENTS**

<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>
<p>The person performing this task must be able do the following:</p> <ol style="list-style-type: none"> <li>1. Observe health and safety when performing the task;</li> <li>2. Select proper tools, equipment and safety for the task;</li> <li>3. Obtain resources required for the task;</li> <li>4. Analyze electronic damping control system fault codes;</li> <li>5. Diagnose electronic damper control systems;</li> <li>6. Diagnose electronic spring control systems;</li> <li>7. Replace electronic Controlled springs;</li> <li>8. Erase Suspension fault codes;</li> </ol>	<p><b>Detailed knowledge about:</b></p> <p><b>1.0. Methods:</b> This person performing this task must be able to explain how to repair Electronic Damping Control system.</p> <p><b>2.0. Principles:</b> The person must be able to explain the principles of repairing Electronic Damping Control system.</p> <p><b>3.0. Theories:</b> The person must be able to explain</p> <ol style="list-style-type: none"> <li>3.1. Electronics Damping Control system components and operations;</li> <li>3.2. Maintenance and repair of Electronic Damping;</li> <li>3.3. Control system diagnosis and repair.</li> </ol> <p><b>4.0. Essential skills:</b></p> <ol style="list-style-type: none"> <li>4.1. Communication skills;</li> </ol>

<p>9. Test Electronic suspension;  10. Perform as-built inspection according to the suspension system delivery standard;  11. Clean tools, equipment and workplace;  12. Store tools and equipment.</p>	<p>4.2. Management skills;  4.3. Data storage skills;  4.4. Customer care skills;  4.5. Team work skills;  4.6. Report writing skills;  4.7. Computer application skills;  4.8. Data analysis skills.</p>
<p><b>DESCRIPTION OF END PRODUCTS/SERVICE</b></p>	<p>Electronic Damping Control system is repaired and functioning as per technical requirement and Manufacturer's Specifications.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE</b></p>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN ADVANCED ELECTRICAL AND ELECTRONIC SYSTEMS	<b>DUTY NO.</b>	802
<b>TASK TITLE</b>	SERVICE AUTOMOTIVE BATTERIES	<b>TASK NO.</b>	8021
<b>PERFORMANCE CRITERIA</b>	A person performing this task must be able to service Automotive Batteries as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	<p>This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required:</p> <ol style="list-style-type: none"> <li>1. Full automotive tool box;</li> <li>2. High rate discharger;</li> <li>3. Battery charger;</li> <li>4. Hydrometer;</li> <li>5. Battery acid;</li> <li>6. Distilled water;</li> <li>7. Electronic battery tester;</li> <li>8. Diagnosis machine/decoder;</li> <li>9. Digital multimeter;</li> <li>10. Auto tester;</li> <li>11. Freezing point tester;</li> <li>12. Working light;</li> <li>13. Ramp/Inspection Pit/Lifter;</li> <li>14. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices;</li> <li>15. P.P.E. (goggles, anti-corrosion gloves, etc.).</li> </ol>		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
<p>The person must do the following:</p> <ol style="list-style-type: none"> <li>1. Observe health and safety when performing the task;</li> <li>2. Select proper tools, equipment and safety gear for the task;</li> <li>3. Service 12V batteries;</li> <li>4. Check current drain;</li> <li>5. Check Battery Capacity;</li> <li>6. Check battery for Cracks;</li> <li>7. Test Battery Performance;</li> <li>8. Clean tools, equipment and workplace;</li> <li>9. Store tools and equipment;</li> <li>10. Battery charging and maintenance.</li> </ol>	<p><b>Detailed knowledge about:</b></p> <p><b>1.0. Methods:</b> This person performing this task must be able to explain how to service Automotive Batteries.</p> <p><b>2.0. Principles:</b> The person must be able to explain the principles of servicing Automotive Batteries.</p> <p><b>3.0. Theories:</b> The person must be able to explain</p> <ol style="list-style-type: none"> <li>3.1. Automotive batteries type;</li> <li>3.2. Maintenance and Repair Automotive batteries.</li> </ol> <p><b>4.0. Essential skills:</b></p> <ol style="list-style-type: none"> <li>4.1. Communication skills;</li> </ol>		

	<ul style="list-style-type: none"> <li>4.2. Management skills;</li> <li>4.3. Computer Programming skills;</li> <li>4.4. Customer care skills;</li> <li>4.5. Chemistry skills;</li> <li>4.6. Team work skills;</li> <li>4.7. Report writing skills;</li> <li>4.8. Computer application skills.</li> </ul>
<b>DESCRIPTION OF END PRODUCTS/SERVICE</b>	Automotive Batteries is serviced and functioning as per technical requirement and Manufacturer's Specifications.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ul style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ul>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN ADVANCED ELECTRICAL AND ELECTRONIC SYSTEMS	<b>DUTY NO.</b>	802
<b>TASK TITLE</b>	SERVICE ADVANCED STARTING SYSTEM	<b>TASK NO.</b>	8022
<b>PERFORMANCE CRITERIA</b>	A person performing this task must be able to service advanced starting system as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	<p>This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required:</p> <ol style="list-style-type: none"> <li>1. Full automotive tool box;</li> <li>2. Starter/battery booster;</li> <li>3. Charger;</li> <li>4. Diagnosis machine/decoder;</li> <li>5. Digital multimeter;</li> <li>6. Starter tester;</li> <li>7. Junction box;</li> <li>8. Working light;</li> <li>9. Ramp/Inspection Pit/Lifter;</li> <li>10. Vernier calipers;</li> <li>11. Scale;</li> <li>12. Magnetic meter holder;</li> <li>13. V-iron;</li> <li>14. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.</li> </ol>		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
<p>The person performing this task must be able do the following:</p> <ol style="list-style-type: none"> <li>1. Observe health and safety when performing the task;</li> <li>2. Select proper tools, equipment and safety gear for the task;</li> <li>3. Inspect the starting circuit;</li> <li>4. Replace starter fuse;</li> <li>5. Service Neutral Start switch;</li> <li>6. Replace Starter relay;</li> <li>7. Replace Starter solenoid;</li> <li>8. Repair 30, 50, and C terminals;</li> <li>9. Disassemble the starter motor;</li> <li>10. Test the armature;</li> <li>11. Test the commutator;</li> <li>12. Test field winding;</li> </ol>	<p><b>Detailed knowledge about:</b></p> <p><b>1.0. Methods:</b> This person performing this task must be able to explain how to service advanced Starting System.</p> <p><b>2.0. Principles:</b> The person must be able to explain the principles of servicing advanced Starting System.</p> <p><b>3.0. Theories:</b> The person must be able to explain</p> <ol style="list-style-type: none"> <li>3.1. Starting System components and operation;</li> <li>3.2. Maintenance and Repair of advanced Starting System.</li> </ol> <p><b>4.0. Essential skills:</b></p> <ol style="list-style-type: none"> <li>4.1. Communication skills;</li> </ol>		

<p>13. Replace the new brushes;  14. Assemble the starter motor;  15. Test on bench the starter motor;  16. Repair the smart start/stop function switch;  17. Replace the smart start/stop starter fuse;  18. Replace the smart start/stop starter relay;  19. Repair the smart start/stop circuit;  20. Troubleshoot smart start/stop system;  21. Test start operation;  22. Perform on-board Vehicle testing;  23. Clean tools, equipment and workplace;  24. Store tools and equipment.</p>	<p>4.2. Customer care skills;  4.3. Chemistry skills;  4.4. Team work skills;  4.5. Report writing skills;  4.6. Computer application skills.</p>
<p><b>DESCRIPTION OF END PRODUCTS/SERVICE</b></p>	<p>Advanced starting system is serviced and functioning as per technical requirement and Manufacturer's Specifications.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE</b></p>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN ADVANCED ELECTRICAL AND ELECTRONIC SYSTEMS	<b>DUTY NO.</b>	802
<b>TASK TITLE</b>	REPAIR ELECTRONIC SPARK ADVANCE (ESA)	<b>TASK NO.</b>	8023
<b>PERFORMANCE CRITERIA:</b>	A person performing this task must be able to service Electronic Spark Advance (ESA) as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	<p>This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required:</p> <ol style="list-style-type: none"> <li>1. Full automotive tool box;</li> <li>2. Timing light;</li> <li>3. Diagnosis machine/decoder;</li> <li>4. Digital multimeter;</li> <li>5. Auto tester;</li> <li>6. Junction box;</li> <li>7. Working light;</li> <li>8. Ramp/Inspection Pit/Lifter;</li> <li>9. Oscilloscope;</li> <li>10. Spark plug gap gauge;</li> <li>11. Magnetic rod;</li> <li>12. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.</li> </ol>		
<b>EVIDENCE REQUIREMENTS</b>			
<b>Practical Performance</b>	<b>Underpinning knowledge</b>		
<p>The person performing this task must be able do the following:</p> <ol style="list-style-type: none"> <li>1. Observe health and safety when performing the task;</li> <li>2. Select proper tools and equipment;</li> <li>3. Service distributor segment;</li> <li>4. Service igniter;</li> <li>5. Check IGT Signal;</li> <li>6. Check IGF confirmation;</li> <li>7. Check Ne signal;</li> <li>8. Service Distributorless circuit;</li> <li>9. Service Capacitor Discharge Ignition (CDI);</li> <li>10. Inspect spark plugs;</li> <li>11. Replace spark plugs;</li> <li>12. Test Electronic spark Advance operation;</li> </ol>	<p><b>Detailed knowledge about:</b></p> <p><b>1.0. Methods:</b> This person performing this task must be able to explain how to service Electronic Spark Advance (ESA).</p> <p><b>2.0. Principles:</b> The person must be able to explain the principles of servicing Electronic Spark Advance (ESA).</p> <p><b>3.0. Theories:</b> The person must be able to explain</p> <ol style="list-style-type: none"> <li>3.1. Electronic Spark Advance (ESA) components and operation;</li> <li>3.2. Maintenance and Repair of Electronic Spark Advance (ESA).</li> </ol> <p><b>4.0. Essential skills:</b></p> <ol style="list-style-type: none"> <li>4.1. Communication skills;</li> </ol>		

<p>13. Clean tools, equipment and workplace;  14. Store tools and equipment;  15. Perform as-built inspection according to the delivery standard;  16. Replace timing belt.</p>	<p>4.2. Customer care skills;  4.3. Chemistry skills;  4.4. Team work skills;  4.5. Report writing skills;  4.6. Computer application skills;  4.7. Data analysis skills.</p>
<p><b>DESCRIPTION OF END PRODUCTS/SERVICE</b></p>	<p>Electronic Spark Advance (ESA) is serviced and functioning as per technical requirement and Manufacturer's Specifications.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE</b></p>	<p>Detailed knowledge about:</p> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN AUTOMOTIVE ELECTRICAL VEHICLES	<b>DUTY NO.</b>	803
<b>TASK TITLE</b>	REPAIR ELECTRICAL VEHICLE POWER PRODUCTION SYSTEM	<b>TASK NO.</b>	8031
<b>PERFORMANCE CRITERIA:</b>	A person performing this task must be able to repair power production system in a vehicle as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	<p>This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required:</p> <ol style="list-style-type: none"> <li>1. Full automotive tool box;</li> <li>2. Electrical Vehicle insulation tools;</li> <li>3. Diagnosis machine/decoder;</li> <li>4. Digital multimeter;</li> <li>5. Junction box;</li> <li>6. Working light;</li> <li>7. Insulation resistance tester;</li> <li>8. Ramp/Inspection Pit/Lifter;</li> <li>9. P.P.E. for high-voltage operation (insulated shoes, goggles, insulated gloves, etc.);</li> <li>10. Oscilloscope;</li> <li>11. Fire extinguisher;</li> <li>12. Sand for emergency use;</li> <li>13. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.</li> </ol>		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able do the following:</p> <ol style="list-style-type: none"> <li>1. Observe health and safety when performing the task;</li> <li>2. Select proper tools, equipment and safety gear for the task;</li> <li>3. Repair power converter;</li> <li>4. Repair power generation system high voltage harness;</li> <li>5. Repair power generation system control harness;</li> <li>6. Repair ECU of power generation system;</li> <li>7. Check the power generation system fuse and relay faults;</li> <li>8. Test power generation system</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0. Methods:</b> This person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1. Repair electrical vehicle power production system;</li> <li>1.2. Store Electrical power.</li> </ol> <p><b>2.0. Principles:</b> The person must be able to explain the principles of repairing electrical vehicle power production system.</p> <p><b>3.0. Theories:</b> The person must be able to explain</p> <ol style="list-style-type: none"> <li>3.1. Automotive electrical vehicle components and operation;</li> <li>3.2. Maintenance and Repair Automotive electrical vehicle.</li> </ol>	

<p>performance;</p> <p>9. Clean tools, equipment and workplace;</p> <p>10. Store tools and equipment.</p>	<p><b>4.0. Essential skills:</b></p> <p>4.1. Communication skills;</p> <p>4.2. Customer care skills;</p> <p>4.3. Computer programming skills;</p> <p>4.4. Team work skills;</p> <p>4.5. Report writing skills;</p> <p>4.6. Computer application skills;</p> <p>4.7 High voltage normative operation skills.</p>
<p><b>DESCRIPTION OF END PRODUCTS/SERVICE</b></p>	<p>Electrical vehicle power production system repaired and functioning as per technical requirement and Manufacturer's Specifications.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE</b></p>	<p>Detailed knowledge about:</p> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN AUTOMOTIVE ELECTRICAL VEHICLES	<b>DUTY NO.</b>	803
<b>TASK TITLE</b>	REPAIR ELECTRONIC CONTROL MODULE (ECM)	<b>TASK NO.</b>	8032
<b>PERFORMANCE CRITERIA</b>	A person performing this task must be able to repair Electronic Control Module (ECM) as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	<p>This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required:</p> <ol style="list-style-type: none"> <li>1. Full automotive tool box;</li> <li>2. Electrical Vehicle special tools;</li> <li>3. Diagnosis machine/decoder;</li> <li>4. Digital multimeter;</li> <li>5. AC Tester;</li> <li>6. Junction box;</li> <li>7. Working light;</li> <li>8. Programmer;</li> <li>9. Insulation resistance tester;</li> <li>10. Auto tester;</li> <li>11. Ramp/Inspection Pit/Lifter;</li> <li>12. P.P.E. for high-voltage operation (insulated shoes, goggles, insulated gloves, etc.);</li> <li>13. Oscilloscope;</li> <li>14. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.</li> </ol>		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Observe health and safety when performing the task;</li> <li>2. Select proper tools, equipment and safety gear for the task;</li> <li>3. Service Integrated circuit;</li> <li>4. Service serial ports;</li> <li>5. Program the electronic control module (ECM);</li> <li>6. Test ECM performance;</li> <li>7. Compare the output;</li> <li>8. Clean tools, equipment and workplace;</li> <li>9. Store tools and equipment.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0. Methods:</b> This person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1. Repair electronic control Module (ECM).</li> </ol> <p><b>2.0. Principles:</b> The person must be able to explain the principles of:</p> <ol style="list-style-type: none"> <li>2.1. Repairing electronic control Module (ECM).</li> </ol> <p><b>3.0. Theories:</b> The person must be able to explain</p> <ol style="list-style-type: none"> <li>3.1. Automotive electrical vehicle components and operation;</li> <li>3.2. Maintenance and Repair of electronic control Module (ECM).</li> </ol>	

	<p><b>4.0. Essential skills:</b></p> <p>4.1. Communication skills;</p> <p>4.2. Customer care skills;</p> <p>4.3. Computer programming skills;</p> <p>4.4. Team work skills;</p> <p>4.5. Report writing skills;</p> <p>4.6. Data analysis skills;</p> <p>4.7. Computer application skills.</p>
<b>DESCRIPTION OF END PRODUCTS/SERVICE</b>	Electronic control Module (ECM) is repaired and functioning as per technical requirement and Manufacturer's Specifications.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN AUTOMOTIVE ELECTRICAL VEHICLES	<b>DUTY NO.</b>	803
<b>TASK TITLE</b>	REPAIR ELECTRICAL VEHICLE CONTROL SYSTEMS	<b>TASK NO.</b>	8033
<b>PERFORMANCE CRITERIA</b>	A person performing this task must be able to repair Electrical vehicle control systems as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	<p>This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required:</p> <ol style="list-style-type: none"> <li>1. Full automotive tool box;</li> <li>2. Electrical vehicle special tools;</li> <li>3. Diagnosis machine/decoder;</li> <li>4. Digital multimeter;</li> <li>5. AC tester;</li> <li>6. Auto tester;</li> <li>7. Ramp/Inspection Pit/Lifter;</li> <li>8. Insulation resistance tester;</li> <li>9. Oscilloscope;</li> <li>10. Fire extinguisher;</li> <li>11. Sand for emergency use;</li> <li>12. P.P.E. for high-voltage operation (insulated shoes, goggles, insulated gloves, etc.);</li> <li>13. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.</li> </ol>		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
<p>The person performing this task must be able do the following:</p> <ol style="list-style-type: none"> <li>1. Observe health and safety when performing the task;</li> <li>2. Select proper tools, equipment and safety gear for the task;</li> <li>3. Service electrical vehicle sensors;</li> <li>4. Service Electrical Vehicle Controllers;</li> <li>5. Service Instrument cluster;</li> <li>6. Service Charging circuit;</li> <li>7. Test electrical Vehicle Control System performance;</li> <li>8. Clean tools, equipment and workplace;</li> <li>9. Store tools and equipment;</li> <li>10. Check the electric vehicle control</li> </ol>	<p><b>Detailed knowledge about:</b></p> <p><b>1.0. Methods:</b> This person performing this task must be able to explain how to repair Electrical vehicle control systems.</p> <p><b>2.0. Principles:</b> The person must be able to explain the principles of repairing Electrical vehicle control systems.</p> <p><b>3.0. Theories:</b> The person must be able to explain</p> <ol style="list-style-type: none"> <li>3.1. Automotive electrical vehicle components and operation;</li> <li>3.2. Maintenance and Repair Electrical vehicle control systems.</li> </ol> <p><b>4.0. Essential skills:</b></p> <ol style="list-style-type: none"> <li>4. 1. Communication skills;</li> </ol>		

system power supply fuse, relay and other faults.	<p>4.2. Customer care skills;</p> <p>4.3. Computer programming skills;</p> <p>4.4. Team work skills;</p> <p>4.5. Report writing skills;</p> <p>4.6. Computer application skills;</p> <p>4.7 High voltage normative operation skills;</p> <p>4.8 Data analysis skills.</p>
<b>DESCRIPTION OF END PRODUCTS/SERVICE</b>	Electrical vehicle control systems are repaired and functioning as per technical requirement and Manufacturer's Specifications.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN AUTOMOTIVE ELECTRICAL VEHICLES	<b>DUTY NO.</b>	803
<b>TASK TITLE</b>	REPAIR NEW ENERGY VEHICLE CHARGING SYSTEM	<b>TASK NO.</b>	8034
<b>PERFORMANCE CRITERIA</b>	A person performing this task must be able to repair new energy vehicle charging systems as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	<p>This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required:</p> <ol style="list-style-type: none"> <li>1. Full automotive tool box;</li> <li>2. Electrical Vehicle special tools;</li> <li>3. Diagnosis machine/decoder;</li> <li>4. Digital multimeter;</li> <li>5. AC Tester;</li> <li>6. Auto tester;</li> <li>7. Ramp/Inspection Pit/Lifter;</li> <li>8. Insulation resistance tester;</li> <li>9. Oscilloscope;</li> <li>10. Fire extinguisher;</li> <li>11. Sand for emergency use;</li> <li>12. P.P.E. for high-voltage operation (insulated shoes, goggles, insulated gloves, etc.);</li> <li>13. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.</li> </ol>		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
<p>The person performing this task must be able do the following:</p> <ol style="list-style-type: none"> <li>1. Observe health and safety when performing the task;</li> <li>2. Select proper tools, equipment and safety gear for the task;</li> <li>3. Disassemble and replace chargers;</li> <li>4. Test the charger for emergency unlocking;</li> <li>5. Test charging control signals;</li> <li>6. Service charging circuits;</li> <li>7. Test electronic equipment;</li> <li>8. Clean tools, equipment and workplace;</li> <li>9. Store tools and equipment.</li> </ol>	<p><b>Detailed knowledge about:</b></p> <p><b>1.0. Methods:</b>  This person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1. Repair charging circuits;</li> <li>1.2. Demonstrate charging circuit operation;</li> <li>1.3. Troubleshoot charging circuits;</li> <li>1.4. Correct faults;</li> <li>1.5. Test circuit performance.</li> </ol> <p><b>2.0. Principles:</b>  The person must be able to explain the principles of repairing new energy vehicle charging systems.</p> <p><b>3.0. Theories:</b>  The person must be able to explain</p> <ol style="list-style-type: none"> <li>3.1. New energy vehicle charging system components and operations;</li> <li>3.2. Possible faults in the charging system and their</li> </ol>		

	<p>causes;</p> <p>3.3 Troubleshooting the charging system.</p> <p><b>4.0. Essential skills:</b></p> <p>4. 1. Communication skills;</p> <p>4.2. Customer care skills;</p> <p>4.3. Entrepreneurial skills;</p> <p>4.4. Team work skills;</p> <p>4.5. Report writing skills;</p> <p>4.6. Computer application skills;</p> <p>4.7 High voltage normative operation skills;</p> <p>4.8 Data analysis skills.</p>
<b>DESCRIPTION OF END PRODUCTS/SERVICE</b>	New energy vehicle charging systems are serviced as per technical requirement and Manufacturer's Specifications
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN VEHICLE SAFETY AND COMFORT SYSTEMS	<b>DUTY NO.</b>	804
<b>TASK TITLE</b>	REPAIR AUTOMOTIVE TELEVISION AND RADIO SYSTEMS	<b>TASK NO.</b>	8041
<b>PERFORMANCE CRITERIA</b>	A person performing this task must be able to repair Automotive Television and Radio Systems as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required: 1.Full automotive tool box; 2.Automotive television; 3.Car radio; 4. Digital multimeter; 5. Auto tester; 6. Junction box; 7. Working light; 8. Ramp/Inspection Pit/Lifter; 9. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
The person performing this task must be able do the following: 1. Observe health and safety when performing the task; 2. Select proper tools, equipment and safety gear for the task; 3. Service Radio system; 4. Install Radio system; 5. Service Television System; 6. Install Television System; 7. Test Radio operation; 8. Test on-board Television operation; 9. Clean tools, equipment and workplace; 10. Store tools and equipment.	<b>Detailed knowledge about:</b> <b>1.0. Methods:</b> This person performing this task must be able to explain how to repair Automotive Television and Radio Systems  <b>2.0. Principles:</b> The person must be able to explain the principles of repairing Automotive Television and Radio Systems.  <b>3.0. Theories:</b> The person must be able to explain 3.1. Automotive comfort and safety components and operation; 3.2. Maintenance and Repair of automotive comfort and safety systems.  <b>4.0. Essential skills:</b> 4.1. Communication skills; 4.2. Customer care skills; 4.3. Computer programming skills; 4.4. Computer application skills; 4.5. Team work skills;		

	<p>4.6. Report writing skills;</p> <p>4.7. Computer application skills.</p>
<b>DESCRIPTION OF END PRODUCTS/SERVICE</b>	Automotive Television and Radio Systems is repaired and functioning as per technical requirement and Manufacturer's Specifications.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p>Knowledge about:</p> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN VEHICLE SAFETY AND COMFORT SYSTEMS	<b>DUTY NO.</b>	804
<b>TASK TITLE</b>	REPAIR AUTOMOTIVE SAFETY BELT AND AIRBAG SYSTEMS	<b>TASK NO.</b>	8042
<b>PERFORMANCE CRITERIA:</b>	A person performing this task must be able to repair automotive safety belt and airbag systems as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required: 1.Full automotive tool box; 2. Digital multimeter; 3. Analog Circuit (AC) tester; 4. Auto tester; 5. Ramp/Inspection Pit/Lifter; 6. Wheel fender cloth and four-piece set and other vehicle maintenance and protection devices.		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
The person performing this task must be able do the following: 1. Observe health and safety when performing the task; 2. Select proper tools and equipment; 3. Inspect safety belt mechanisms; 4. Service Safety belt system; 5. Check the airbag system; 6. Service the airbag system; 7. Test safety belt and airbag systems; 8. Clean tools, equipment and workplace; 9. Store tools and equipment.	<b>Detailed knowledge about:</b> <b>1.0. Methods:</b> This person performing this task must be able to explain how to repair Automotive Safety belt and airbag systems.  <b>2.0. Principles:</b> The person must be able to explain the principles of repairing Automotive Safety belt and airbag systems.  <b>3.0. Theories:</b> The person must be able to explain 3.1. Automotive comfort and safety components and operation; 3.2. Maintenance and Repair of automotive comfort and safety systems. 3.3. Air bag restraint system  <b>4.0. Essential skills:</b> 4.1. Communication skills; 4.2. Customer care skills; 4.3. Computer programming skills; 4.4. Team work skills; 4.5. Report writing skills; 4.6. Computer application skills; 4.7 Data analysis skills.		

<b>DESCRIPTION OF END PRODUCTS/SERVICE</b>	Automotive Safety belt and airbag systems are repaired and functioning as per technical requirement and Manufacturer's Specifications.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTAIN VEHICLE SAFETY AND COMFORT SYSTEMS	<b>DUTY NO.</b>	804
<b>TASK TITLE</b>	REPAIR COLLISION AVOIDANCE SYSTEMS	<b>TASK NO.</b>	8043
<b>PERFORMANCE CRITERIA:</b>	A person performing this task must be able to repair collision Avoidance systems as per technical requirements and Manufacturer's Manual specifications.		
<b>RANGE STATEMENT</b>	<p>This task can be performed in the automotive workshop under the supervision of Automotive/Mechanical Engineer. The following tools and equipment will be required:</p> <ol style="list-style-type: none"> <li>1. Full automotive tool box;</li> <li>2. Digital multimeter;</li> <li>3. AC tester;</li> <li>4. Auto tester;</li> <li>5. Ramp/Inspection Pit/Lifter;</li> <li>6. Wheel fender cloth and four-piece set and other on-board vehicle maintenance and protection devices.</li> </ol>		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able do the following:</p> <ol style="list-style-type: none"> <li>1. Observe health and safety when performing the task;</li> <li>2. Select proper tools, equipment and safety gear for the task;</li> <li>3. Inspect Collision avoidance system;</li> <li>4. Service collision avoidance system;</li> <li>5. Test collision avoidance systems;</li> <li>6. Clean tools, equipment and workplace;</li> <li>7. Store tools and equipment.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0. Methods:</b> This person performing this task must be able to explain how to repair collision Avoidance systems.</p> <p><b>2.0. Principles:</b> The person must be able to explain the principles of repairing collision Avoidance systems.</p> <p><b>3.0. Theories:</b> The person must be able to explain</p> <ol style="list-style-type: none"> <li>3.1. Automotive comfort and safety components and operation;</li> <li>3.2. Maintenance and Repair of collision avoidance systems.</li> </ol> <p><b>4.0. Essential skills:</b></p> <ol style="list-style-type: none"> <li>4.1. Communication skills;</li> <li>4.2. Customer care skills;</li> <li>4.3. Computer programming skills;</li> <li>4.4. Chemistry skills;</li> <li>4.5. Team work skills;</li> <li>4.6. Report writing skills;</li> <li>4.7. Computer application skills.</li> </ol>	
<b>DESCRIPTION OF END</b>		Collision Avoidance systems are repaired and functioning	

<b>PRODUCTS/SERVICE</b>	as per technical requirement and Manufacturer's Specifications.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<b>Detailed knowledge about:</b> <ol style="list-style-type: none"> <li>1. Safe handling of working tools;</li> <li>2. Safe handling of measuring instruments;</li> <li>3. Occupational health and safety;</li> <li>4. Maintenance Operating Policy and Procedure (MOPP);</li> <li>5. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MANAGE AUTOMOTIVE WORKSHOP	<b>DUTY NO.</b>	805
<b>TASK TITLE</b>	MANAGE SUBORDINATES	<b>TASK NO.</b>	8051
<b>PERFORMANCE CRITERIA:</b>	A person performing this task must be able to Manage Subordinates as per technical requirements and Authority policies.		
<b>RANGE STATEMENT</b>	This task can be performed in the automotive workshop under the supervision of Admiration authority. The following tools and equipment will be required: 1. Manager's Office; 2. Tools and Equipment; 3. Production and finance facilities; 4. Transport equipment.		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
The person performing this task must be able do the following: 1. Observe health and safety when performing the task; 2. Select proper tools, equipment and safety gear for the task; 3. Assign specific duties and responsibilities to specific person; 4. Organise activities of achieving objectives; 5. Supervise the assigned duties; 6. Evaluate the results; 7. Conduct staff meeting; 8. Prepare training needs; 9. Carry out subordinates training; 10. Influence team work; 11. Create welfare environments; 12. Train on customer care; 13. Motivate subordinates.	<b>Detailed knowledge about:</b> <b>1.0. Methods:</b> This person performing this task must be able to explain how to manage subordinates  <b>2.0. Principles:</b> The person must be able to explain the principles of: 2.1. Managing subordinates.  <b>3.0. Theories:</b> The person must be able to explain 3.1. Automotive Workshop management; 3.2. Duties and responsibilities of workshop manager.  <b>4.0. Essential skills:</b> 4.1. Communication skills; 4.2. Customer care skills; 4.3. Computer application skills; 4.4. Team work skills; 4.5. Report writing skills.		
<b>DESCRIPTION OF END PRODUCTS/SERVICE</b>	Management of subordinates is performed as per approved rules and regulations.		

**CIRCUMSTANTIAL  
KNOWLEDGE**

**Detailed knowledge about:**

1. Safe handling of working tools;
2. Safe handling of measuring instruments;
3. Occupational health and safety;
4. Maintenance Operating Policy and Procedure (MOPP);
5. Waste disposal methods.

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MANAGE AUTOMOTIVE WORKSHOP	<b>DUTY NO.</b>	805
<b>TASK TITLE</b>	MANAGE WORKSHOP FACILITIES	<b>TASK NO.</b>	8052
<b>PERFORMANCE CRITERIA:</b>	A person performing this task must be able to manage workshop facilities as per approved rules and regulations		
<b>RANGE STATEMENT</b>	This task can be performed in the automotive workshop. The following tools and equipment will be required: 1. Manager's Office; 2. Workshop facilities; 3. Tools and Equipment; 4. Production and finance facilities; 5. Transport equipment.		
<b>EVIDENCE REQUIREMENTS</b>			
<b>Practical Performance</b>	<b>Underpinning knowledge</b>		
The person performing this task must be able do the following: 1. Observe health and safety when performing the task; 2. Select proper tools, equipment and safety gear for the task; 3. Manage workshop Buildings; 4. Supervise Building repairs; 5. Manage Tools and equipment; 6. Supervise stores of tools, Materials, Equipment and spare parts; 7. Supervise maintenance of workshop tools and equipment.	<b>Detailed knowledge about:</b> <b>1.0. Methods:</b> This person performing this task must be able to explain how to manage workshop Facilities.  <b>2.0. Principles of:</b> This person performing this task must be able to explain the principle of managing workshop Facilities.  <b>3.0. Theories:</b> 3.1. Automotive Workshop management; 3.2. Duties and responsibilities of workshop manager.  <b>4.0. Essential skills:</b> 4.1. Communication skills; 4.2. Customer care skills; 4.3. Computer application skills; 4.4. Team work skills; 4.5. Report writing skills.		
<b>DESCRIPTION OF END PRODUCTS/SERVICE</b>	Workshop Facilities are managed as per technical requirement and Authorities policy.		

**CIRCUMSTANTIAL  
KNOWLEDGE**

Knowledge about:

1. Safe handling of working tools;
2. Safe handling of measuring instruments;
3. Occupational health and safety;
4. Maintenance Operating Policy and Procedure (MOPP);
5. Waste disposal methods.

<b>OCCUPATION</b>	AUTOMOTIVE ENGINEER	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MANAGE AUTOMOTIVE WORKSHOP	<b>DUTY NO.</b>	805
<b>TASK TITLE</b>	MANAGE WORKSHOP PRODUCTION AND FINANCE	<b>TASK NO.</b>	8053
<b>PERFORMANCE CRITERIA</b>	A person performing this task must be able to Manage workshop production and finance as per approved rules and regulations.		
<b>RANGE STATEMENT</b>	This task can be performed in the automotive workshop. The following tools and equipment will be required: 1. Manager's Office; 2. Workshop facilities; 3. Tools and Equipment; 4. Production and finance facilities; 5. Transport equipment.		
<b>EVIDENCE REQUIREMENTS</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
The person performing this task must be able do the following: 1. Observe health and safety when performing the task; 2. Select proper tools equipment and safety gears for the task; 3. Advertise workshop production activities; 4. Maintain production quality; 5. Respond to customers' feedbacks; 6. Develop and implement records; 7. Review maintenance cost; 8. Control revenue and expenditure; 9. Prepare annual budget; 10. Prepare annual report; 11. Adopt market demand.		<b>Detailed knowledge about:</b> <b>1.0. Methods:</b> This person performing this task must be able to explain how to manage workshop Production and finance  <b>2.0. Principles:</b> The person must be able to explain the principles of: 2.1. Managing workshop production and finance 2.2. Financial management; 2.3. Manpower management.  <b>3.0. Theories:</b> The person must be able to explain 3.1. Automotive Workshop management; 3.2. Duties and responsibilities of workshop manager.  <b>4.0. Essential skills:</b> 4.1. Communication skills; 4.2. Customer care skills; 4.3. Computer application skills; 4.4. Team work skills; 4.5. Report writing skills; 4.6. Costing skills; 4.7. Management skills.	
<b>DESCRIPTION OF END PRODUCTS/SERVICE</b>		Workshop production and finance are managed as per technical requirement and Authorities policy.	

**CIRCUMSTANTIAL KNOWLEDGE****Detailed Knowledge about:**

1. Safe handling of working tools;
2. Safe handling of measuring instruments;
3. Occupational health and safety;
4. Maintenance Operating Policy and Procedure (MOPP);
5. Waste disposal methods.

**TABLE 1: DACUM CHARTS FOR AUTOMOTIVE ENGINEERS - LEVEL 8**

DUTIES	TASKS	ENABLERS
<p>1.0.Maintain Electronic Chassis Electronic Control Systems.</p>	<p>1.1. Fault diagnosis for Anti-Locking Braking Systems (ABS).                      1.2.Fault diagnosis for Electronic Power Assisted Steering System.                      1.3.Fault diagnosis for Electronic Damping Control System.</p>	<p><b>Generic skills and knowledge</b></p> <ul style="list-style-type: none"> <li>• Using communication skills to work with others, reporting to superiors</li> <li>• Use of manufacturer’s manual</li> <li>• skills and knowledge on-board Vehicle Electrical and electronics Systems</li> <li>• Machine elements</li> <li>• Interpretation of technical drawing</li> <li>• Basic Material science</li> </ul> <p><b>Tools and Equipment</b></p> <ul style="list-style-type: none"> <li>• PPE such as Safety Shoes, Goggles, Gloves, Hearing Protection, Hard Hats.</li> <li>• Full automotive tool box</li> <li>• Vehicle maintenance and protection devices</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• ECM</li> <li>• Wire harnesses</li> <li>• Laptop computers, etc.</li> </ul> <p><b>worker behaviours</b>                      Team spirit, trustworthy, time management and commitment</p>
<p>2.0.Maintain Advanced Electrical and Electronic Systems</p>	<p>2.1. Service automotive batteries                      2.2. Service Advanced Starting System.                      2.3. Repair Electronic Spark Advance (ESA).</p>	<p><b>Generic skills and knowledge</b></p> <ul style="list-style-type: none"> <li>• Using communication skills to work with others, reporting to superiors</li> <li>• Use of manufacturer’s manual</li> <li>• skills and knowledge on-board Vehicle Electrical and electronics Systems</li> <li>• Machine elements</li> <li>• Interpretation of technical data</li> <li>• Basic Material science</li> </ul> <p><b>Tools and Equipment</b></p>

DUTIES	TASKS	ENABLERS
		<ul style="list-style-type: none"> <li>● PPE such as Safety Shoes, Goggles, Gloves, Hearing Protection, Hard Hats.</li> <li>● Full automotive tool box</li> <li>● Vehicle maintenance and protection devices</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>● ECM</li> <li>● Wire harnesses</li> <li>● Laptop computers, etc.</li> </ul> <p><b>worker behaviours</b> Team spirit, trustworthy, time management and commitment</p>
3.0.Maintain Automotive Electrical Vehicles.	3.1.Repair Electrical Vehicle Power Production System. 3.2.Repair Electronic Control Module (ECM). 3.3.Repair electrical vehicle control systems. 3.4.Repair new energy vehicle charging system.	<p><b>Generic skills and knowledge</b></p> <ul style="list-style-type: none"> <li>● Using communication skills to work with others, reporting to superiors</li> <li>● Use of manufacturer’s manual</li> <li>● skills and knowledge on Electrical vehicles</li> <li>● Charging Systems Components</li> <li>● Interpretation of technical data</li> <li>● Basic Material science</li> </ul> <p><b>Tools and Equipment</b></p> <ul style="list-style-type: none"> <li>● PPE such as Safety Shoes, Goggles, Gloves, Hearing Protection, Hard Hats.</li> <li>● Full Automotive tool box.</li> <li>● Vehicle maintenance and protection devices</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>● ECM</li> <li>● Wiring Harness</li> <li>● Laptops,</li> <li>● Software for programing, etc.</li> </ul> <p><b>Worker behaviours</b> Team spirit, trustworthy, time management and commitment</p>

DUTIES	TASKS	ENABLERS
<p>4.0.Maintain Vehicle Safety and Comfort Systems.</p>	<p>4.1.Repair automotive television and radio systems.</p> <p>4.2.Repair safety belt and airbag systems.</p> <p>4.3.Repair collision avoidance systems.</p>	<p><b>Generic skills and knowledge</b></p> <ul style="list-style-type: none"> <li>● Using communication skills to work with others, reporting to superiors</li> <li>● Use of manufacturer’s manual</li> <li>● skills and knowledge on-board Vehicle safety and comfort systems</li> <li>● Components of Lighting Systems</li> <li>● Interpretation of technical data</li> <li>● Basic Material science</li> </ul> <p><b>Tools and Equipment</b></p> <ul style="list-style-type: none"> <li>● PPE such as Safety Shoes, Goggles, Gloves, Hearing Protection, Hard Hats.</li> <li>● Full automotive Tool Box</li> <li>● Vehicle maintenance and protection devices</li> </ul> <p><b>Materials</b></p> <p>Automotive television Automotive radio Safety belts Airbag system</p> <p><b>Worker behaviours</b></p> <p>Team spirit, trustworthy, time management and commitment</p>

<b>DUTIES</b>	<b>TASKS</b>	<b>ENABLERS</b>
5.0. Manage Automotive Workshop.	5.1. Manage subordinates. 5.2. Manage workshop facilities. 5.3. Manage workshop production and finance.	<p><b>Generic skills and knowledge</b></p> <ul style="list-style-type: none"> <li>• Using communication skills to work with others, reporting to superiors</li> <li>• Knowledge and skills of customer service</li> <li>• Basic management skills</li> <li>• Costing skills</li> </ul> <p><b>Tools and Equipment</b></p> <ul style="list-style-type: none"> <li>• Manager's office</li> <li>• Workshop facilities</li> <li>• Tools and equipment</li> <li>• Production and financial facilities</li> </ul> <p><b>Materials</b></p> <p><b>Worker behaviours</b> Team spirit, trustworthy, time management and commitment</p>