

**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**PANEL BEATER**

**KNQF LEVEL 3**

**PROGRAMME CODE: 0716251A**

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# FOREWORD

The provision of quality education and training is fundamental to the government’s overall strategy for social economic development. Quality education and training will contribute to achievement of Kenya’s development blueprint, Vision 2030 and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution of Kenya 2010 and this resulted in the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No. 4 of 2016). A key feature of this policy is the radical change in the design and delivery of the TVET training.

This policy document requires that training in TVET institutions be competency based, curriculum development be industry led, certification be based on demonstration of competence and mode of delivery to allow for multiple entry and exit in TVET programmes. These reforms demand that industry takes a leading role in occupational standards development to ensure it addresses competence needs.

It is against this background that these Occupational Standards have been developed for a competency-based Automotive Engineering standard. These Occupational Standards will also be the basis for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a key role towards development of competent human resource for the engineering sector’s growth and development.

# PREFACE

Kenya Vision 2030 aims to transform the country into “a newly industrializing, middle-income country providing a high-quality life to all its citizens by the year 2030”. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. TVET has a responsibility of facilitating the process of inculcating knowledge, skills and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace competency-based education and training (CBET).

The Technical and Vocational Education and Training (TVET) Act No. 29 of 2013 and Sessional Paper No. 4 of 2016 on Reforming Education and Training in Kenya, emphasized the need to reform curriculum development, assessment and certification. This called for a shift to CBET in order to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

Incumbent Automotive engineering industry experts in conjunction with expert subject trainers and other related stakeholders have developed these Occupational Standards for Panel Beater Level 3. These standards will be the basis for development of competency-based curriculum for Panel Beater Level 3

The Occupational Standards are designed and organized with clear performance criteria for each element of a unit of competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to everyone who participated in the development of these Occupational Standards.

# ACRONYMS

TVETA Technical and Vocational Education Training Authority

NEMA National Environmental Management Authority

OSHA Occupational Health and Safety Act

ICT Information and Communication Technology

KCSE Kenya Certificate of Secondary Education

KNQA Kenya National Qualification Authority

KNQF Kenya National Qualification Framework

TVET Technical and Vocational Education and Training

RAM Random Access Memory

CPU Central processing Unit

HDMI High-Definition multimedia interface

ICT Information and communication technology

USB Universal Serial Bus

PPE Personal Protective Equipment

# KEY TO UNIT CODE



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# OVERVIEW

The Panel Beating Technician Level 3 qualification consists of competencies that a person must achieve to enable him/her to weld vehicle structure, repair vehicle body and perform vehicle fibre works.

The units of competency comprising Panel Beating Technician Certificate Level 3 qualification include the following competencies

**SUMMARY OF UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| 0716 251 01A | Weld Vehicle Structure |
| 0716 251 02A | Repair Vehicle Body |
| 0716 251 03A | Perform Vehicle Fibre Works |

# WELD VEHICLE STRUCTURE

**UNIT CODE: 0716 251 01A**

**Unit description:**

This unit covers competencies required to demonstrate skills to weld vehicle structures. It involves competencies to Gas weld vehicle structure, arc weld vehicle structure and perform housekeeping.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT** | **PERFORMANCE CRITERIA**  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Gas weld vehicle structure | * 1. ***Personal Protective Equipment (PPE)*** are used as per workplace procedures   2. Vehicle body panels are assessed as per work requirements   3. ***Materials, tools and equipment*** are selected as per job specifications   4. Level vehicle structure as per job specifications   5. ***Joints*** are prepared as per work requirements   6. ***Gas welding equipment*** is set up as per job specifications   7. Panels are welded using gas welding process as per job specifications   8. Polishing is performed as per job specifications |
| 1. Arc Weld Vehicle structure | 1. Vehicle body panels are assessed as per work requirements 2. ***Materials, tools and equipment*** are selected as per job specifications 3. Level vehicle structure as per job specifications 4. ***Joints*** are prepared as per work requirements 5. ***Arc Weld welding equipment*** is set up as per job specifications 6. Panels are welded using Arc Weld welding process as per job specifications 7. Polishing is performed as per job specifications |
| Perform House Keeping | 1. Waste is segregated and disposed as per workshop procedures 2. Tools and equipment are cleaned as per workshop procedures 3. Tools and equipment are stored as per workshop procedures 4. Housekeeping is carried out as per workplace requirements |
|  |  |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range**  May include but is not limited to: |
| --- | --- |
| 1. Personal Protective Equipment (PPE) may include but are not limited to. | * Safety Glasses or Goggles * Overalls * Dust Mask * **Welding shield** * **Welding Goggles** |
| 1. Materials, tools and equipment may include but are not limited to. | * Hammer a * Dolly Set * Body File * Grinder * Slide Hammer * Dent Puller * Body Filler * Sandpaper |
| 1. Jointsmay include but are not limited to. | * Spot Weld Joints * Seam Weld joints * Flanged joints * Adhesive Bonded Joints |
| 1. Gas welding equipment may include but are not limited to. | * Oxygen and Acetylene Cylinders * Welding Torch * Welding Goggles/Helmet * Gloves and Protective Clothing * Tongs * Chipping Hammer * Wire Brush |
| 1. Arc Weld welding equipment may include but are not limited to. | * Welding machine (Arc welder) * Electrode holder * Ground clamp * Welding electrodes * Welding cables * Welding helmet (with auto-darkening feature) * Welding gloves * Welding jacket or apron * Safety boots * Welding rods * Wire brush * Chipping hammer * Welding table * Clamps |

**REQUIRED KNOWLEDGE AND SKLLS**

**Required knowledge**

***The individual needs to demonstrate knowledge of:***

* Legislative and organizational requirements and procedures
* Kenyan legislation and workplace procedures relevant to
* Health, safety, environment and quality
* the environment (including waste oil and spent refrigeration gas disposal
* personal and vehicle protective equipment.
* Vehicle body works principles

**REQUIRED SKILLS**

***The individual needs to demonstrate the following foundation skills***:

* Communications (verbal and written);
* Decision making
* Multitasking
* Time management
* Problem solving
* Planning
* use of vehicle body workshop tools
* Vehicle body panels damages assessment
* Arc and Gas welding process
* set up and operate welding machines.
* First aid

**EVIDENCE GUIDE**

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | ***Assessment requires evidence that the candidate:***  1.1 Worked in a safe and clean environment using appropriate PPEs  1.2 Identified and used vehicle body works tools and equipment as per work requirements  1.2 Prepared joints as per work requirements  1.3 Pulled vehicle body as per work requirements  1.4 Checked and identified vehicle body dents as per work requirements  1.5 Performed vehicle body beating and gas welding as per work requirements  1.6 Performed polishing as per work requirements  1.7 Carried out housekeeping as per work requirements |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant work environments. 3. Resources relevant to the proposed activities or task. |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   * 1. Practical   2. Projects   3. Portfolio of evidence   4. Third party report   3.4 Written tests |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

# REPAIR VEHICLE BODY

**UNIT CODE: 0716 251 02A**

**Unit description:**

This unit covers competencies required to Repair Vehicle Body. It involves competencies in performing vehicle body jacking, performing vehicle body pulling, performing vehicle body panel beating and performing workshop house keeping.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT** | **PERFORMANCE CRITERIA**  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Perform vehicle body jacking | 1. Safety precautions are undertaken as per the workshop requirements 2. Body panel requiring jacking is identified according to work requirements. 3. Body jack is secured on the vehicle panel according to work requirements. 4. Body jack is operated according to manufacturer’s specification |
| 1. Perform vehicle body pulling | 1. Safety precautions are undertaken as per the workshop requirements 2. Body panel requiring pulling is identified according to work requirements. 3. Body puller is secured on the vehicle panels according to workshop procedures 4. Body puller is operated according to manufacturer’s specification. |
| 1. Perform vehicle body panel beating | 1. Dented vehicle body panel is identified according to work requirements. 2. ***Panel beating tools*** are selected according to work requirements. 3. ***Body structures*** are shaped according to manufacturer’s specification 4. ***Vehicle body filler*** is applied according to workshop procedures 5. Spot putty is applied according to workshop procedures. 6. ***Sanding*** is performed according to workshop process. |
| 1. Perform Workshop House Keeping | 1. Waste is segregated and disposed as per workshop procedures 2. Tools and equipment are cleaned as per workshop procedures 3. Tools and equipment are stored as per workshop procedures 4. Housekeepingis carried out as per workplace requirements |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Panel beating tools may include but are not limited to. | * Dinging hammer * Chipping hammer * Soft hammer * Lever * Welding machine * Dollies * Spoons |
| 2. Body filler material may include but are not limited to. | * Compound filler * Hardener * Chemical paste |
| 3. Cleaning materials may include but are not limited to. | * Chemical compounds * Rubbing compounds * Solvents |
| 4**.** Sanding may include but are not limited to. | * Sand paper * File sander * Disc sander * Sanding block |

**REQUIRED KNOWLEDGE AND SKLLS**

**Required knowledge**

***The individual needs to demonstrate***

Kenyan legislation and workplace procedures relevant to

* Health, safety, environment and quality
* the environment (including waste fillers and spent refrigeration gas disposal
* personal and vehicle protective equipment.
* Workplace procedures for:
* recording fault location and correction activities;
* reporting the results of tests;
* the referral of problems;
* reporting delays to the completion of work
* Requirements relating to vehicle body building

Vehicle body works principles

Design and construction of vehicle body.

Functions of vehicle body components

**REQUIRED SKILLS**

***The individual needs to demonstrate the following foundation skills***:

* Communications
* Decision making
* Multitasking
* Time management
* Problem solving
* Planning
* First aid
* vehicle body jacking
* vehicle body pulling
* vehicle body panel beating

**EVIDENCE GUIDE**

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | ***Assessment requires evidence that the candidate:***   * 1. Identified and used vehicle body works tools and equipment   2. Performed vehicle body jacking as per task requirement   3. Pulled vehicle body as per task requirement   4. Performed vehicle body beating and gas welding   5. Applied spot putty as per task requirement   6. Performed sanding as per task requirement   7. Performed housekeeping as per workshop procedures |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant work environments. 3. Resources relevant to the proposed activities or task. |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   1. Practical 2. Projects 3. Portfolio of evidence 4. Third party report 5. Written tests |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |

# PERFORM VEHICLE FIBRE WORKS

**UNIT CODE: 0716 251 03A**

**Unit description:**

This unit covers competencies required to Perform Vehicle Fibre Works. It involves competencies in reinforcing vehicle fibre structure, repairing vehicle fibre structure and performing housekeeping.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT** | **PERFORMANCE CRITERIA**  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Reinforce vehicle fibre structure | 1. ***Personal Protective Equipment*** are used as per workplace procedures 2. Vehicle body panels are assessed as per work requirements 3. ***Materials, tools and equipment*** are selected as per job specifications 4. Vehicle Body fibres are reinforced as per work requirements |
| 1. Repair vehicle fibre structure | 1. Safety precautions are taken as per workshop requirements 2. Damaged vehicle fibre panel is identified according to work requirements. 3. ***Fibre work materials*** are selected according to work requirements. 4. ***Vehicle fibre structure*** are shaped according to manufacturer’s specification 5. ***Vehicle body filler*** is applied according to workshop procedures 6. Spot putty is applied according to workshop procedures. 7. Sanding is performed according to workshop process. |
| 1. Perform House Keeping | * 1. Waste is segregated and disposed as per workshop procedures   2. Tools and equipment are cleaned as per workshop procedures   3. Tools and equipment are stored as per workshop procedures   4. Housekeeping is carried out as per workplace requirements |

**RANGE**

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

| **Variable** | **Range** |
| --- | --- |
| 1. Personal Protective Equipment (PPE) may include but are not limited to. | * Dollies * Spoons * Fibre glass |
| 1. Materials, tools and equipment may include but are not limited to. | * Dinging hammer * Chipping hammer * Soft hammer * Lever * Welding machine |
| 1. Fibre work materials may include but are not limited to. | * Resin * Hardener * Fiberglass mat * Carbon fiber fabric * Epoxy resin * Polyester resin * Catalyst |
| 1. Vehicle fibre structure may include but are not limited to. | * Bumper * Hood * Dashboard * Trunk lid * Body panels |
| 1. Vehicle body filler material may include but are not limited to. | * Compound filler * Hardener * Chemical paste |

**REQUIRED KNOWLEDGE AND SKLLS**

**Required knowledge**

***The individual needs to demonstrate***

Kenyan legislation and workplace procedures relevant to

* Health, safety, environment and quality
* the environment (including waste oil and spent refrigeration gas disposal
* personal and vehicle protective equipment.
* Workplace procedures for:
* reporting the results of tests;
* the referral of problems;
* reporting delays to the completion of work
* Requirements relating to vehicle body building

**Use of technical information**

How to find, interpret and use sources of information applicable to units

The importance of using the correct sources of technical information.

Vehicle body fibre works principles

Design and construction of vehicle body structures.

**REQUIRED SKILLS**

***The individual needs to demonstrate the following foundation skills***:

* Communications (verbal and written);
* Decision making;
* Multitasking;
* Time management;
* Problem solving;
* Planning;
* First aid
* Vehicle fibre structure reinforcement
* Vehicle fibre structure repair
* use of vehicle body workshop tools

**EVIDENCE GUIDE**

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency. | ***Assessment requires evidence that the candidate:***   1. Identified and used vehicle body fibre works tools and equipment 2. Selected fibre works materials as per work requirements 3. Reinforced vehicle Body fibres as per work requirements 4. Identified damaged vehicle fibre panel as per work requirements 5. Shaped vehicle fibre structure as per work requirements 6. Applied vehicle body filler as per work requirements 7. Performed sanding as per work requirements |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant work environments. 3. Resources relevant to the proposed activities or task. |
| 1. Methods of Assessment. | ***Competency may be assessed through:***   1. Practical 2. Projects 3. Portfolio of evidence 4. Third party report 5. Written tests |
| 1. Context of Assessment. | Competency may be assessed individually in an actual workplace or in work-simulated conditions within accredited institutions. |
| 1. Guidance information for assessment. | This unit may be assessed on an integrated basis with others within this occupational sector. |