



DRAFT TANZANIA STANDARD

MEDC9(5036)P3- AUTOMOTIVE MAINTENANCE WORKSHOP- REQUIREMENTS

FOR STAKEHOLDERS COMMENTS ONLY

AUTOMOTIVE MAINTENANCE WORKSHOP - REQUIREMENTS

1 SCOPE

This draft standard gives general requirement and technical parameters of basic types of garage and its equipment.

2. REFERENCE

In preparation of this draft standard assistance was drawn from the following;

-South African Standard SANS 1037:2010- Automotive maintenance center

-Indian standard IS 13353:1992- Automotive vehicles – Garage Equipment Technical parameters

3. TERMS AND DEFINITIONS

3.1 Garage

Refer to commercial establishment for services, repair and maintenance of motor vehicles.

3.2 Garage supervisor

Refer to a person whose minimum education shall be Full technician certificate.

3.3 Garage Equipment

Technological equipment used for maintenance and routine repair of automotives.

3.4 Material Safety Data Sheet (MSDS)

Refers to information detailing the hazards of each chemical or other substances and the safe use of these chemicals or substances.

3.5 Personal Protective Equipment (PPE)

Refers to protective clothing or equipment used to isolate chemicals, heat, explosion or other hazards in the working environment.

3.6 Registered Vehicle Mechanic

Refers to a person whose education in Vehicle Maintenance has been verified by registered Vocational training college or higher learning Institutions satisfying the requirements for engaging in the provision of vehicle maintenance services.

3.7 Waste Collector

Refers to any person who is granted a license of the Waste Disposal Ordinance and therefore is permitted to provide the service of collection or removal of chemical waste and includes any person collecting or removing such waste in the name of that person.

3.8 LPG Vehicles

Vehicles powered by liquefied petroleum gas (LPG).

3.9 Proprietor

Refers to the owner of any vehicle maintenance workshop.

3.10 Washing Installation with Brushes for Auto- motives

Washing installation for automotives, the working element of which are special brushes.

3.11 Anticorrosive Installation

A device for mechanized treatment of the automotives with anticorrosive materials.

3.12 Automatic Filling System

An installation for centralized mechanized feeding of lubricants, grease and air to the automotive.

3.13 Air Compressor

A specialized compressor for feeding compressed air to the equipment used for maintenance, routine repair and for painting the automotive.

3.14 Grease Pump Unit

Lubricating pump unit for feeding under pressure lubricant grease to the friction surfaces of the automotives.

3.15 Oil Container

A device ensuring a closed supply of lubricants.

3.16 Oil Dispenser

A mobile set for feeding lubricant.

3.17 Pressure guage

A device for controlling the inflation of air pressure in the tyres of automotives.

3.18 Waste lubricant Collector

A device for collecting lubricants which have been taken out from the lubricant tanks of the automotives.

3.19 Trench Hoist

A device mounted on the inspection trench for suspending axles of automotive.

3.20 Hydraulic Jack for Garage Use

A movable jack for suspending the wheels and axles of automotive.

3.21 Hoist for Lifting Assemblies of vehicles

A load lifting device which ensure the required position of the vehicle assemblies, during its mounting and dismounting.

3.22 Impact Wrench

A wrench for unscrewing and screwing –up the nuts and bolts of leaf springs and of the wheels of the automotive.

3.23 Stand for Vehicle Assemblies

A device which is used for moving heavy assemblies of automotives.

3.24 Tool Tyre Removing

A device for mechanized mounting and dismounting of tyres of the automotives.

4.0 REQUIREMENTS

4.1 GENERAL REQUIRMENT

4.1.1 The workshop shall be a registered company and shall be in a possession of a valid permit to operate a business in the location stated on the permits. The permits shall include labour, safety and environmental aspects/factors.

- 4.1.2 Garage should be environmentally safe, clean, tidy and comfortable. Comply with all national legislations including those regulations on Occupational safety and health authority (OSHA), fire and rescue services, hygiene and environmental protection and National Environment Management Council (NEMC)
- 4.1.3 All emergency exits shall be clearly marked and unblocked.
- 4.1.4 For a heavy vehicle maintenance workshop, the cover must not be less than 50 m². For a light vehicle or private car maintenance workshop, the cover must not be less than 20 m², and not less than 10 m² for motorcycle maintenance workshop (excluding offices, warehouses and rest corners).
- 4.1.5 The floor must be level and free from grease and danger of slip. Waste produced from the work, including metal waste, chemical waste and general refuse should be properly separated and cleaned up frequently. Waste oil recycling/storage facilities should be provided and records properly kept of waste oil recycling. Registration as a waste producer is required.
- 4.1.6 Provide adequate lighting. (According to ISO 899)
- 4.1.7 Provide proper first aid equipment
- 4.1.8 The trained vehicle mechanic shall be present during working hours, be a permanent staff member or employed on a fixed term contract and he/she should be conversant with the requirements of this standard.
- 4.1.9 There should "NO SMOKING".
- 4.1.10 Should have effective personal protective equipment, such as goggles, in accordance with applicable regulations/guidelines.
- 4.1.11 There should be no unnecessary intrusion of electrical switch/meter rooms should be prevented.
- 4.1.12 The use of machinery facilities and work processes should be of lower noise level. Ensure that those working under or exposed to high noise level are wearing suitable ear defenders.
- 4.1.13 Handle all potentially dangerous goods should be in accordance with the OSHA regulations.
- 4.1.14 There should be no naked flame (except for body welding or grinding work)
- 4.1.15 Containers for paint and solvent must be tightly sealed to prevent leakage of gas. In case of spillage, clean up the spilled paint and solvent with absorptive materials.
- 4.1.16 All tools shall be stored in a lockable toolbox or cabinet.
- 4.1.17 Measuring equipment that is capable of measuring accurately shall be available in appropriate areas. It shall be checked and calibrated at least twice a year or as per manufacture requirements.
- 4.1.18 There shall be at least one supervisor

4.2 DOCUMENTATION REQUIREMENT

The following records shall be maintained and kept up to date,

- a) a register of all personnel, indicating their level of formal training and education provided by a relevant accredited body (see foreword), and the training courses passed in a specific field;
- b) a register of all equipment, indicating dates of calibration, service and repair;
- c) Job cards or logs that shall be kept for at least three years. A job card or log shall include at least the following information:
 - 1) customer details – name, address, telephone number;

- 2) vehicle details – registration, make, model, odometer reading, VIN number; and
- 3) details of the service provided including any particular request of the customer and the name of the person who did the work; and
- d) a full current set of vehicle component fitment manuals for the classes of vehicle for which the fitment center is equipped.

4.3 REQUIREMENTS FOR EQUIPMENT AND TOOLS

4.3.1 The workshop shall have at least the following equipment:

- a) one hoist; and
- b) one set of drive-on ramps.

4.3.2 Tools required at each fitment centre

The workshop shall have at least the following tools:

4.3.2.1 a hand-held port drilling machine (10 mm chuck) (electric or pneumatic);

4.3.2.2 a hand-held port drilling machine (13 mm chuck) (electric or pneumatic);

4.3.2.3 an impact wrench (½ inch) (pneumatic);

4.3.2.4 air hoses with connections;

4.3.2.5 a ratchet (½ inch);

4.3.2.6 a ratchet extension (medium, 125 mm);

4.3.2.7 a ratchet extension (long, 250 mm);

4.3.2.8 combination spanners of sizes: 6 mm, 7 mm, 8 mm, 9 mm, 10 mm, 11 mm, 12 mm, 13 mm, 14 mm, 15 mm, 16 mm, 17 mm, 18 mm, 19 mm, 20 mm, 21 mm, 22 mm and 24 mm;

4.3.2.9 standard sockets of sizes: 10 mm, 12 mm, 13 mm, 14 mm, 16 mm, 18 mm, 19 mm, 20 mm, 21 mm, 22 mm and 24 mm;

4.3.2.10 impact sockets of sizes: 12 mm, 13 mm, 14 mm, 16 mm, 17 mm, 18 mm, 19 mm, 20 mm, 21 mm and 24 mm; and general tooling such as

- pliers – heavy duty with cutter,
- a vice grip,
- a side cutter
- a hammer (900 g ball pein),
- a circuit tester (12/24 V),
- a screwdriver set,
- a centre punch,
- a lead lamp,
- a screw head key set,
- a utility knife,
- a torque wrench (range 125 Nm),
- a hole saw and an arbor hole saw (40 mm and 60 mm),
- a vacuum cleaner,

- a set of engineer's hand files,
- a torch,
- a set of hexagon keys,
- safety spectacles,
- scrapers,
- a die and tap set,
- a cut-off saw,
- a low level lift,
- a steel bench,
- a bench grinder,
- a bench vice,
- an air compressor,
- a pipe bending machine,
- a wheel (tyre) changer,
- a wheel balancing machine,
- a wheel alignment machine, and
- a welding machine.

5.0 WORKSHOP EQUIPMENT - QUALITY REQUIREMENTS

The quality requirements for individual groups of garage equipment shall be as given below.

5.1 Equipment for Cleaning and Washing Operations

5.1.1 Functional Requirements

5.1.1.1 Classification of requirements

- a. Type (stationary, movable);
- b. Purpose (cars, buses, trucks, two wheelers);
- c. Type of the working component (brush, jet, combination of brush and jet, etc);
- d. Pump capacity (for washing with a hose) litres/minute and pressure; and
- e. Presence of heater for the washing compound.

5.1.1.2 Requirements of technical efficiency

- a. Rated power, kW
- b. Number of the modes of operation;
- c. Area and volume occupied by the installation, m² and m³; and
- d. Mass, kg.

5.1.2 Reliability Requirements

5.1.2.1 Requirement of Trouble-free

Rated trouble-free accrued operating time, h.

5.1.2.2 Requirement of Longevity

Service life till it is written off, hours of operation.

5.1.2.3 Maintainability Requirement

Mean effective man-hours per servicing job, man-hours.

5.2 Equipment for Lifting Auto motives

5.2.1 Functional Requirements

5.2.1.1 Classification of Requirements

- a. Type (stationary, movable);
- b. Type of drive;
- c. Lifting capacity, tons; and
- d. Picking up system (or gripping system).

5.2.1.2 Requirements of Technical Electiveness

- a. Rated power, kW;
- b. Speed of lifting, m/s;
- c. Minimum height of the pick-up/grip mm;
- d. Working air pressure used, MPa;
- e. Mass, kg; and
- f. Overall dimensions, mm.

5.2.2 Reliability Requirements

5.2.2.1 Requirement of Trouble-free Operation

Rated trouble free accrued operating time, h.

5.2.2.2 Requirement of Longevity

Service life till it written off, hours of operation.

5.2.2.3 Maintainability Requirements

Mean effective man-hours per servicing job, man-hours.

5.2.3 Ergonomics Requirements

- a. Moving force, N.
- b. Force on the lever (pedal) of the driver N.

5.3 Equipment for Lubrication and Refueling

5.3.1 Functional Requirements

5.3.2 Classification of Requirements

- a. Type (stationary, movable, portable > ,
- b. Type of the drive,
- c. Presence of lubrication tank (included in the structure, not available),
- d. Presence of heater for the lubricant, and
- e. Number of lubricating guns.

5.3.2 Requirements of Technical Effectiveness

- a. Nominal pressure, MPa
- b. Maximum pressure, MPa
- c. Delivery (under rated conditions), g/mm, l
- d. Capacity of the lubricating (refueling) tank:
- e. Rated power, kW;
- f. Working air pressure used, MPa
- g. Air consumption, m³/min;
- h. Number of the modes of operation,
- i. Fineness of filtration micrometers
- k. Specific air consumption

$$\frac{\text{m}^3/\text{min}}{\text{g}/\text{min MPa}} \text{ or } \frac{\text{m}^3/\text{min}}{\text{l}/\text{min MPa}}$$

m. Specific power, $\frac{\text{rated power}}{\text{delivery}}$; and

n. Overall dimensions, mm

5.3.2 Reliability requirements

5.3.2.1 Requirement of Trouble – free Operation

Rated trouble-free accrued operating time, hours of cycles.

5.3.2.2 Maintainability Characteristics

Mean repair time, hours

5.3.3 Ergonomics Characteristics

a. Force on the lever (pedal) of the driver N

b. Moving force

5.4 Garage compressor

5.4.1 Functional Characteristics

5.4.1.1 Classification of Requirements

a. Type of compressor (Movable, stationary)

b. Nominal discharge m^3/min

c. Suction volume m^3/min

d. Pressure, MPa

5.4.1.2 Requirements of Technical Effectiveness

a. Rated power kW

b. Mass, Kg

c. Overall dimensions, mm

5.4.2 Reliability Requirements

5.4.2.1. Requirement of Trouble-free operation

Rated trouble-free accrued operating time, hours.

5.4.2.2 Requirement of Longevity

Service life till first major repair (hours).

5.4.3 Maintainability Requirements

Mean repair time, hours.

5.3 Ergonomics Requirements

Moving force, N

5.5 Garage Power Operated Wrenches

5.5.1 Functional Requirements

5.5.1.1 Classification Requirements

- a. Type (floor-type, channel-type)
- b. Working principle (power, inertia)
- c. Purpose (nuts for the V-bolts of leaf springs, wheel nuts, etc).

5.5.1.2 Requirements of Technical Effectiveness

- a. Maximum torque, Nm;
- b. Maximum torque in one engagement, Nm;
- c. Maximum diameter of the thread, mm;
- d. Torque range, kg.m;
- e. Rated power, kW;
- f. Specific power, $\frac{\text{Rated Power}}{\text{Maximum torque}}$
- g. Presence of the mechanism for adjusting the height of the working component;
- h. The area which it occupies (for channel type power operated wrenches);
- j. Mass, kg; and

k. Overall dimensions, mm.

5.5.2 Reliability Requirements

5.5.2.1 Requirements of Trouble-free Operation

Rated trouble-free accrued operating time, hours.

5.5.3 Ergonomics Requirements

- a. Force for moving the power operated wrenches, N
- b. Force for fixing the spindle of the power operated wrenches in the working position, N

5.6 Tool Removal Equipment

5.6.1 Functional Requirements

5.6.1.1 Classification Requirements

- a. Type (stationary, movable),
- b. Dimensions of the tyres to be mounted or dismounted, mm; and
- c. Number of operations to be carried out.

5.6.1.2 Requirements of Technical Effectiveness

- a. Rated power, kW; (if applicable)
- b. Specific power, $\frac{\text{Rated Power}}{\text{efficiency}}$
- c. Mass, kg; and
- d. Overall dimensions, mm.

5.6.2 Reliability Requirements

5.6.2.1 Requirements of Longevity

Maintenance schedule.

5.6.3 Ergonomics Requirements

- a. Force for moving the jig, N.

6. Groups of Garage Equipment

According to Applicability of the Quality Requirements

6.1 Groups of the garage equipment, which are formed according to applicability of their quality requirement are given below

Applicability Groups	Nomenclature of the Equipment
Equipment for cleaning and washing operations	Washing installations for automobiles
Equipment for lifting the automobiles	Garage Hoists Garage Jacks
Lubricating and refueling equipment	Forced lubricating equipment for garages
Garage compressors	Garage compressors
Power driven wrenches garage	Power driven wrenches for garages
Tool removing equipment	Tyre – mounting jigs

7. Applicability of Quality Requirements

7.1 The requirements given in this standard may be used in repair jobs, technical specification of the garage equipment of specific models etc.

7.2 The classification of the technical parameters appropriate to the particular type of equipments are given in Annex A to F.

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**ANNEX A
(Clause 7.2)**

Equipment for cleaning and washing operations

Nomenclature of the Quality Characteristics	Groups of Equipment				
	Washing installations provided with brushes	Installations provided with a jet and with brushes	Installations provided with a hose	Installations for automatic drying	Washing lines for automobiles combined installations for washing and drying
Efficiency	+	+	-	+	+
Washing consumption for washing one automobile	+	+	-	-	+
Area occupied by the installation	+	+	-	+	+
Water pressure	-	±	+	-	-
Number of modes of operation	+	+	-	-	+
Specific power	+	+	+	+	+
Rated trouble-free accrued operating time	+	+	+	+	+
Operating life till it is written off	+	+	+	+	+
Mean effective man – hours for maintainance	+	+	+	+	+

- + Indicates applicability
- Indicates non - applicability
- ± Indicates limited applicability

**ANNEX B
(Clause 7.2)**

Equipment for lifting

Nomenclature of the Quality Requirement	Groups of Equipment		
	Hoists for Garage	Garage Jacks with Mechanised Drive	Garage Jacks with band or Foot Drive
Maximum lifting height	+	±	±
Rate of lifting	+	-	-
Minimum height of the grip	-	+	+
Specific power capacity	+	+	-
Rated trouble-free accrued operating time	+	+	+
Service life till it is written off	+	+	+
Mean effective man – hours for maintenance	+	+	+
Moving force	-	+	+
Force at the handle (pedal) of the drive	-	-	+

- + Indicates applicability
- Indicates non - applicability
- ± Indicates limited applicability

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**ANNEX C
(Clause 7.2)**

Equipment for cleaning and washing operations

group of equipment											
Nomenclature of the Quality Characteristics	Stationary		Movable			Portable			Tanks for filling oil or brake fluid		
	With electric drive	With pneumatic drive	With electric drive	With pneumatic drive	With hand or foot drive	With electric drive	With pneumatic drive	With hand or foot drive	With electric drive	With pneumatic drive	With hand or pedal drive
Maximum pressure	+	+	+	+	+	+	+	+	-	-	-
Delivery (under specified conditions)	+	+	+	+	+	+	+	+	+	+	+
Capacity of the tank (provided it is there)	+	+	+	+	+	+	+	+	+	+	+
Number of modes of operation	+	+	+	+	+	-	-	-	-	-	-
Fineness of filtration	+	-	+	+	+	+	+	+	+	-	-
Specific air consumption	-	+	-	+	-	-	+	-	-	-	-
Specific power rated	+	-	+	-	-	+	-	-	+	-	-
Rated trouble-free accrued operating time	+	+	+	+	+	+	+	+	+	-	+
Operating life till medium repair	+	+	+	+	+	+	+	+	+	-	+
Mean repair time	+	+	+	+	+	+	+	+	+	+	+
Force on the levers (pedals) of the drive	-	-	-	-	+	-	-	+	-	-	+
Force on the	+	+	+	+	+	+	+	+	+	+	+

control levers											
Moving force	-	-	+	+	+	-	-	-	+	+	-
Mass	-	-	+	+	+	-	-	-	+	+	-

- + Indicates applicability
- Indicates non - applicability
- ± Indicates limited applicability

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**ANNEX D
(Clause 7.2)**

Garage compressors

Nomenclature of the Quality Requirement	Groups of the Equipment Garage compressors	
	Stationary	Movable
Specific power	+	+
Rated trouble-free accrued	+	+
Maintenance	+	+
Mean repair time	+	+
Moving force	-	+

+ Indicates applicability
 - Indicates non - applicability
 ± Indicates limited applicability

**ANNEX E
(Clause 7.2)**

Power driven wrenches for garage use

Nomenclature of the Quality Requirement	Groups of the Equipment Power Driven Wrenches for Garage use	
	Power type	Inertia Type
Maximum torque	+	-
Maximum torque in one switching on	-	-
Maximum diameter of the thread	+	±
Torque adjustment range	+	-
Specific power	+	-
Presence of the mechanism for adjusting the position of the height control	+	-
Area occupied	+	+
Rated trouble-free accrued operating time	+	-
Force for moving the power wrenches	+	+
Force for setting the spindle of the power wrenches driver in the working position	+	+

+ Indicates applicability
 - Indicates non - applicability
 ± Indicates limited applicability

**ANNEX F
(Clause 7.2)**

Tool tyre removing equipment

Nomenclature of the Quality Requirement	Groups of the Equipment Type – mounting Jigs	
	Stationary	Movable
Efficiency	+	+
Specific power	+	+
Operating life till medium repair	+	+
Force for moving the jig	-	+

+ Indicates applicability

- Indicates non - applicability

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