



DRAFT TANZANIA STANDARD

**MEDC9 (5151)P3 - Automotive engineering – Bus body
building – Part 1: Terms and definitions**

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TANZANIA BUREAU OF STANDARDS

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- * Mechanical Engineering Industries Development Agency
- * Ministry of Infrastructure Development
- ALAF
- Weights and Measures Agency
- Tanzania Industrial Research and Development Organization
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- Scania
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0 Foreword

Since independence Tanzania has experienced introduction of different types of buses. These buses came with different terms. Therefore, for the safety purposes these terms were defined in the first Tanzania Standard published in 1999. However, the first edition was concentrating on only one type of buses, which was difficult to apply to the other types. This revision is intended to take into account the different terms used on buses of different sizes, models and capacities.

In preparation of this Tanzania Standard reference was derived from the following publications:

SABS 047: 1995, *Code of practice – The testing of motor vehicle for roadworthiness*, published by the South African Bureau of Standards

ISO 612: 1978, *Road vehicles – Dimensions of motor vehicles and towed vehicles – terms and definitions*, published by International Organization for Standardization

1 Scope

This part of Tanzania Standard defines terms relating to issues of safety for the bus body building. It does not deal with measurement methods, or with the accuracy required, or with the order of magnitude of dimensions defined.

2 Bus

2.1 Any power road bus which has four or more wheel, which is not borne, and which is normally used for

- a) Carrying persons and goods
- b) Towing vehicles used for the carriage of person and goods
- c) Special service

2.2 There are three classes of busses. Any bus may be regarded as belonging in more than one class. In such a case it may be approved for each class to which it corresponds.

For the bus exceeding 22 passengers capacity in addition to the driver, there are three classes of vehicles.

2.2.1 Class I

Buses constructed with areas for standing passengers, to allow frequent passenger movement.

2.2.2 Class II

Buses constructed principally for the carriage of seated passengers, and designed to allow the carriage of standing passengers in the gangway and/or in a standing area which does not exceed the space provided for two double seats.

2.2.3 Class III

Buses constructed exclusively for the carriage of seated passengers.

For the buses not exceeding 22 passengers capacity in addition to the driver, there are two classes of vehicles.

2.2.4 Class A

Buses designated to carry standing passenger; a bus of this class has seats and shall have provision for standing passengers

2.2.5 Class B

Buses not designated to carry standing passenger; a bus of this class has no provision for standing passengers.

2.3 Passenger

This is a person other than the driver or a member of the crew.

2.4 Passenger with reduced mobility

These are passengers who have a special difficulty when using public transport, especially elderly and people with disability. Reduced mobility does not necessarily imply any form of medical impairment.

2.5 Passenger compartment

This is the space intended for passengers' use excluding any space occupied by fixed appliances such as bars, kitchenettes or toilets.

2.6 Manufacturer

This is a company or organization responsible to the approval authority for all aspects of the type approval process and for ensuring conformity of production. It is not essential that the company/organization is directly involved in all stages of the construction of the vehicle(bus), system, component or separate technical unit which is the subject of the approval process.

3 Types of buses

For the purpose of this Tanzania Standard, the following definitions shall apply;

3.1 Bus

This is the bus (see clause 2) which, on account of its design and appointments, is intended for carrying persons and luggage, and which has more than seven (7) seating places including the driving seat. It may have one or more two decks and may also tow a trailer.

3.2 Micro bus

This is the bus (see clause 3.1) designed or adapted solely or principally for the conveyance of more than 9 but not more than 17 persons including the driver.

3.3 Mini bus

This is the bus (see clause 3.1) designed or adapted solely or principally for the conveyance of more than 17 but not more than 22 persons.

3.4 Midi bus

This is the bus (See clause 3.1) designed or adapted solely or principally for the conveyance of more than 22 but not more than 45 persons.

3.5 Large bus

This is the bus (see clause 3.1) designed or adapted solely or principally for the conveyance of more than 45 but not more than 65 persons. The large bus shall include the following:

3.5.1 *Urban bus*

This is the bus which is designed and equipped for urban and sub urban use; this class of vehicle has seats and places intended for standing passengers and allows for movement of passenger corresponding to frequent stops.

3.5.2 *Articulated Bus*

This is the bus which is composed of two rigid sections connected by an articulated joint. On this type of vehicle the passenger accommodation spaces situated in the rigid section communicate. The free circulation of passenger from one rigid to section to the other is assured through the articulated joint. It can be equipped as covered in clauses 3.6 to 3.8.

3.5.3 *Inter urban coach*

This is the bus which is designed and equipped for inter urban transport. This bus has no place which is specifically intended for standing passengers, but it can carry standing passengers for short distances in the gangway.

3.5.4 *Long distance coach*

This is the bus which is designed and equipped for long distance journeys; this vehicle is concerned with the comfort of its seated passengers, and standing passengers are not carried.

Connection between the two sections and disconnection of the two sections can be performed in the workshop only.

3.5.4.1 Ordinary Bus

This is a bus designed for basic minimum comfort level

3.5.4.2 Semi luxury bus

This is a bus designed for a slightly higher comfort level and provision for ergonomically design seats

3.5.4.3 Luxury bus

This is a bus designed with a higher comfort level and individual seats and adjustable seats backs, improved ventilation and pleasing interior.

3.6 Trolley bus

This is the bus which is electrically propelled through a trolley line. It can be assigned to the service and equipped as covered under clauses 3.6, 3.7 and 3.9.

3.7 Special bus

This is the bus whose characteristics are included in none of the clauses under 3.2 to 3.10, and include the following;

3.7.1 Trailer

This is the vehicle of which, on account on its design, no substantial part of the total weight is supported by the towing vehicle. A semi – trailer with dolly is considered as a trailer.

3.7.2 Passenger road train

This is the combination of a bus (see clause 3.1) and one or more independent trailers connected by a draw bar. The towing vehicle and the trailer can be either special or not.

3.7.3 Semi trailer

This is the trailer which is designated to be coupled to a semi trailer towing vehicle and to impose a substantial part of its total weight on the towing vehicle.

3.7.4 Low floor bus

This include buses of class I, II or A in which at least 35 % of the area available for standing passengers (or in its forward section in the case of articulated vehicles, or in its lower deck in the case of double-decker buses) forms an area without steps and includes access to at least one service door.

3.7.5 Double deck bus

This is the bus where the provided spaces for passenger are arranged, at least in one part, in two superimposed levels and spaces for standing passengers are not provided in the upper deck

3.7.6 Double-decker articulated buses

This is the bus which consist of two or more rigid sections which articulate relative to one another; the passenger compartments of each section intercommunicate on at least one deck so that passengers can move freely between them; the rigid sections are permanently connected so that they can only be separated by an operation involving facilities which are normally only found in a workshop.

3.8 Bus model

This means a category of power – driven buses which do not differ in such essential respect as the equivalent inertia determined in relation to the reference weight of engine and bus characteristic as have been set by the bus manufacturer.

3.9 Engine capacity

This is the nominal engine swept volume as referred from the reciprocating engines.

4 Bus masses

For the purpose of this Tanzania Standard, the following definitions shall apply:

4.1 Tare weight

The weight of bus unladen inclusive of the body and all parts which are necessary to or ordinarily used with the bus when used on a road, but exclusive of the weight of water, fuel or accumulators used for the purpose of the supply or power for the propulsion of the vehicle and of loose tools and loose equipment

4.2 Unladen mass

The mass of the vehicle in running order without crew, passengers or load, but with the fuel tank 90 % full and the usual set of tools and spare wheel(s) on board where applicable. In case of semitrailer designed for coupling to a semi-trailer, the unladen mass will be that of the drawing vehicle.

4.3 Towable mass

This is the total load exerted on the road surface by the axle(s) of the towed vehicle(s).

4.4 Gross vehicle weight (GVM)

This is means the technically permissible maximum weight declared by the bus manufacturer. In case of bus designed to be coupled to semi trailer, the GVM to be taken into consideration when classifying that bus, shall be the maximum weight of the tractor in running order plus the weight transferred to the tractor by the laden semi trailer (bus) in static condition.

5 Bus dimensions

For the purpose of this Tanzania Standard, the following definitions shall apply;

5.1 Type of dimension

A capital letter, which denotes the type of dimension, shall be given as follows:

L	means length
H	means height
W	means width
D	means diameter
V	means volume

L,H,or W shall also be used for angles according to whether they are along zero X -, Z-, or Y-planes respectively (see fig 1 and fig 2)

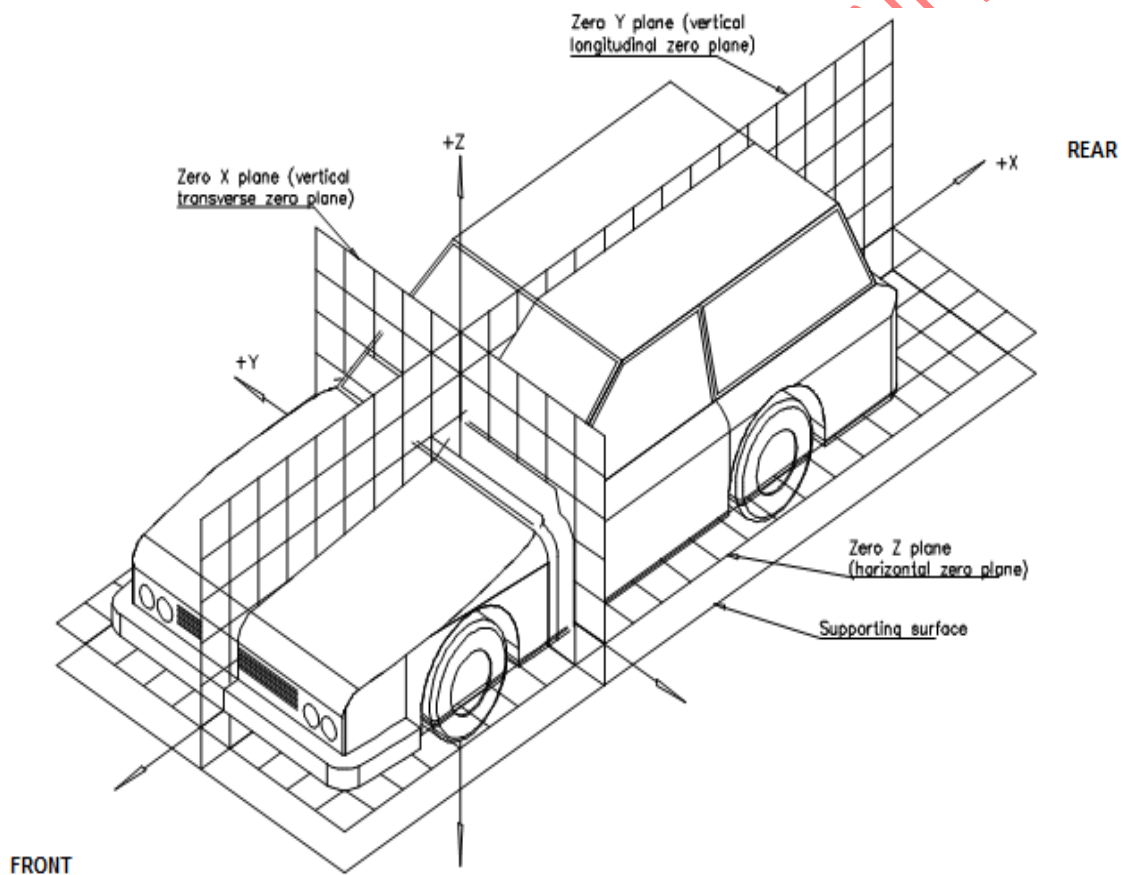


Figure – Three dimensional reference system

Figure 1: Three dimensional reference system of a motor vehicle

5.2 Daylight opening

This is a maximum unobstructed opening through any glass aperture, including reveal or garnish –mouldings adjoining the glass, according to a given direction or projection. If not specified, the dimension is the horizontal dimension.

5.3 Longitudinal median planes (of the vehicle)

This is vertical plane Y plane (see fig 1) being defined as follows:

- a) For each wheel, the vertical plane passing through its axis cuts the mid planes of wheel (see note 1) following a straight line which meets the supporting surface of the vehicle at one point.
- b) For the two wheels both of which are either steering or powered wheels, situated respectively at the two ends of the same real or imaginary axle.

NOTE:

1. The expression "mid – plain of wheel" designates the plane equidistant from the inner edges of the rim.
2. The longitudinal median plane (of the vehicle) is also called the 'the longitudinal plane of symetry' or Zero Y plane
3. Case of dual wheels
The mid-plane of the dual wheel is equidistant from the inner edge of one wheel and outer edge of the other. The straight line is in this particular case the intersection of the mid-plane of the dual wheels and the vertical plane passing through the axis of the axle pin.

5.4 Bus length

This is the distance between two vertical planes perpendicular to longitudinal media plane (of the bus) and touching the front and rear of the bus respectively.

NOTE – All parts of the vehicle, including any parts projecting from front or rear (towing-hooks, bumpers, etc) are contained between these two planes.

5.5 Bus width

The distance between two planes parallel to the longitudinal median planes (of the bus) and touching the vehicle on either side of the said plane

NOTE – All parts of the bus including any lateral projections of fixed parts (wheel hubs, door handles, bumpers etc) are contained between these two planes, except the rear view mirrors, side marker lamps, tyre pressure indicators etc.

5.6 Bus height

This is the distance between supporting surface and a horizontal plane touching the top most part of a bus.

5.7 Front overhang

This is the distance between vertical plane passing through the centres of the front wheels and the foremost point of the bus, taking into consideration lashing hooks, registration plate etc. and any part rigidly attached to the bus.

5.8 Rear overhang

This is the distance between the vertical plane passing through centres of the rearmost wheels and the rearmost point of the bus taking into consideration the towing attachment, registration number plate etc.

5.9 Ground clearance

This is the distance between the ground and the lowest point of the centre part of the bus. The centre- part is that part contained between two planes parallel to and equidistant from the longitudinal median plane (of the bus).

5.10 Departure angle

The greatest angle between the horizontal plane and planes tangential to the static loaded rear wheel tyres, such that no point of the vehicle behind the axle lies below these plane and that no part rigidly attached to the vehicle lies below these planes.

5.11 Wheel base

The distance between the perpendicular lines constructed to the longitudinal median plane (of the vehicle) (see 5.3) corresponding to the two consecutive wheels situated on the same side of the vehicle.

NOTE

1. If the values of the right and left wheel spaces are different, both dimensions are stated separated by a dash, the first corresponding to the left wheel.
2. For vehicle with three or more axles, the wheel spaces between consecutive wheel are indicated, going from the foremost to the rearmost wheel: the total wheel space for right or for left is the sum of these distance.

6 Bus design and construction

For the purpose of this Tanzania Standard, the following definitions shall apply;

6.1 Function

This is the role for which an item is suited.

6.2 Body work

This is separate technical unit comprising all the special internal and external equipment of vehicle.

6.3 Separate technical unit

This is a device intended to be part of a vehicle, which may be type-approved separately but only in relation to one or more specified types of vehicle.

6.4 Design consideration

These are the requirements of function and safety for which technical solutions must be found.

6.5 Structure

These are parts that contribute to the strength of a motor vehicle including the chassis, if any.

6.6 Approval of seat type

This is an approval in relation to the protection of the occupants of forward facing seats, the strength of the seats structure and supports.

6.7 Approval of bus type

This is an approval with regard to the strength of the parts of the bus structure to which seats are to be secured, and with regard to the installation of seats.

6.8 Seat type

This is a category of seats which do not differ essentially with respect to the following characteristics likely to affect their strength and their aggressivity:

- a) Structure, shape, dimensions and materials of the load bearing parts;
- b) Types and dimensions of the seat back adjustment and locking system;
- c) Dimensions, structure and materials of the attachments and supports (e.g. legs);

6.9 Bodywork type

The vehicles for which the purpose of type-approval as a separate technical unit refers to a category of bodywork which do not essentially differ in the following aspects;

- a) Bodywork manufacturer
- b) Vehicle concept(number of passengers)
- c) Bodywork concept (single/double deck, articulated, low floor)
- d) Body work type if the bodywork has been approved as a separate technical unit.
- e) Mass of the completely equipped vehicle bodywork, differing by 10%
- f) Specified types of vehicle on which the type of the bodywork can be installed.

6.10 Belt anchorages

This is the parts of the vehicle structure or the seat structure or any other part of the vehicle to which the safety belt assemblies are to be secured.

6.11 Seat

This is a structure likely to be anchored to the vehicle structure, including its trim and attachment fittings, intended to be used in a vehicle, and to seat one or more adult persons. The term covers either an individual seat or part of a bench seat intended to seat one person.

6.12 Individual seat

This is a seat designed and constructed for the accommodation of one seated passenger.

6.13 Double seat

This is a seat designed and constructed for the accommodation of two seated passengers side by side; two seats side by side and having no interconnection shall be regarded as two individual seats.

6.14 Row of seats

This is a seat designed and constructed for the accommodation of three or more seated passengers side by side; several individual or double seats arranged side by side shall not be regarded as a row of seats.

6.15 Seat cushion

This is the part of the seat which is arranged almost horizontally and designed to support a seated passenger.

6.16 Seat back

This is the part of the seat that is almost vertical, designed to support the passenger's back, shoulders and, possibly, his head.

6.17 Folding seat

This is an auxiliary seat intended for occasional use which is normally folded.

6.18 Fixed system

This is the device by which the seat or its parts can be adjusted to a position suited to the seated occupant.

6.19 Displacement system

This is a device enabling the seat or one of its parts to be displaced angularly, laterally or longitudinally without a fixed intermediate position of the seat or one of its parts, to facilitate access by passengers.

6.20 Locking system

This is a device ensuring that the seat and its parts are maintained in the position of use.

6.21 Anchorage

This is a part of the floor or of the body of a vehicle to which a seat may be fixed;

6.22 Attachment fittings

This are bolts or other components used to attach the seat to the vehicle.

6.23 Service door

This is a door used by passengers in normal circumstances with the driver seated.

6.24 Double door

This refers to a door affording two, or the equivalent of two, access passages.

6.25 Emergency door

This is an additional door to the service door(s) intended for use by passengers as an exit only exceptionally and, in particular, in an emergency.

6.26 Emergency window

This is a window not necessarily glazed, intended for use as an exit by passengers in an emergency only.

6.27 Double window

This is an emergency window which, when divided into two by an imaginary vertical line (or plane), exhibits two parts each of which complies as to dimensions and access with the requirements applicable to a normal emergency window.

6.28 Escape hatch

This is an opening in the roof intended for use as an exit by passengers in an emergency only.

6.29 Emergence exit

This is an emergency door, emergency window or escape hatch.

6.30 Exit

This is a service door or emergency exit.

6.31 Floor or deck

This part of the bodywork whose upper surface supports standing passengers, the feet of seated passengers and the driver, and the seat mountings.

6.32 Gangway

This is the space providing access by passengers from any seat or row of seats to any other seat or row of seats or to any access passage from or to any service door and any area for standing passengers; it does not include:

- a) the space extending 30 cm in front of any seat.
- b) the space above the surface of any step or staircase at the doors; or
- c) any space which affords access solely to one seat or one row of seats

7 Bus control

For the purpose of this Tanzania Standard, the following definitions shall apply;

7.1 Control device

This is a manual or automatic part of a device that enables the driver to bring about a change in the state or functioning of a vehicle or vehicle's subsystem.

7.2 Device

This is an element or an assembly of elements used to perform one or more functions.

7.3 Indicator

This is a device that shows the magnitude of the physical characteristics that the instrument is designed to sense.

7.4 Common space

This is an area on which two or more information functions (e.g. symbol) may be displayed but not simultaneously.

7.5 Tell-Tale






This is an optical signal that, when alight, indicates the actuation of a device, a correct or defective functioning or condition, or a failure to function.









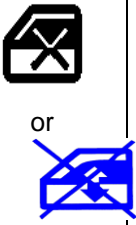



NOTE: A tell-tale shall not emit light except when identifying the malfunction or vehicle condition for whose indication it is designed or during a bulb check.














7.6 Symbols illumination and colours













For the purpose of this Tanzania Standard, the following symbols, illumination and colours used in motor vehicles (see table 1) shall apply.

Table 1 – Display indicators

	Item	Symbol	Function	Illumination	Colour
1.	Master lighting switch Tell-tale may not act as the tell-tale for the position (side) lamps.		Control	No	-
			Tell-tale	Yes	Green
2.	Headlamp dipped beams		Control	No	-
			Tell-tale	Yes	Green
3.	Headlamp high beams		Control	No	-
			Tell-tale	Yes	Blue
4.	Headlamp cleaning device (with separate operating control)		Control	No	
5.	Direction indicator		Control	No	

	Item	Symbol	Function	Illumination	Colour
			Tell-tale	Yes	Green
6.	Hazard warning signal		Control	Yes	
			Tell-tale	Yes	Red
7.	Front fog lamps		Control	No	
			Tell-tale	Yes	Green
8.	Rear fog lamp		Control	No	
			Tell-tale	Yes	Yellow
9.	Fuel level		Tell-tale	Yes	Yellow
			Indicator	Yes	
10.	Engine oil pressure		Tell-tale	Yes	Red
			Indicator	Yes	
11.	Engine coolant temperature		Tell-tale	Yes	Red
			Indicator	Yes	
12.	Electrical charging Condition		Tell-tale	Yes	Red
			Indicator	Yes	
13.	Windscreen wiping system (continuous)		Control	Yes	
14.	Power window lock		Control	No	
15.	Windscreen washing system		Control	Yes	
16.	Windscreen washing and wiping system		Control	Yes	
17.	Windscreen defrosting and defogging system (with separate operating control)		Control	Yes	
			Tell-tale	Yes	Yellow

	Item	Symbol	Function	Illumination	Colour
18.	Rear window defrosting and defogging system (with separate operating control)		Control	Yes	
			Tell-tale	Yes	Yellow
19.	Position, side marker, and/or end-outline marker lamps		Control	No	
			Tell-tale	Yes <u>6/</u>	Green
20.	Parking lamps		Control	No	
			Tell-tale	Yes	Green
21.	Seat belt	 or 	Tell-tale	Yes	Red
22.	Airbag malfunction		Tell-tale	Yes	Yellow and/or Red
23.	Side airbag malfunction		Tell-tale	Yes	Yellow and/or Red
24.	Passenger Air bag off		Tell-tale	Yes	Yellow
25.	Brake system malfunction		Tell-tale	Yes	see brake Reg.
26.	Antilock brake system malfunction		Tell-tale	Yes	Yellow
27.	Speedometer	km/h, if kilometres are shown or mph, if miles are shown	Indicator	Yes	
28.	Parking brake applied		Tell-tale	Yes	Red
29.	Horn		Control	No	
30.	Engine on-board diagnostics or engine malfunction		Tell-tale	Yes	Yellow

	Item	Symbol	Function	Illumination	Colour
31.	Diesel pre-heat		Tell-tale	Yes	Yellow
32.	Choke (cold starting device)		Control	No	
			Tell-tale		Yellow
33.	Air Conditioning System	 or A/C	Control	Yes	
34.	Automatic (park) transmission (reverse) control (neutral) position (drive)	P R N D	Indicator	Yes	
35.	Engine Start		Control	No	
36.	Engine Stop		Control	Yes	
37.	Brake lining wear-out condition		Tell-tale	Yes	Yellow
38.	Heating system		Control	Yes	
39.	Heating and/or air conditioning fan		Control	Yes	
40.	Headlamp levelling	 or  and 	Control	No	
41.	Odometer	Km, if kilometres are shown or miles, if miles are shown	Indicator	Yes	
42.	Low Tire Pressure		Tell-tale	Yes	Yellow

Annex A
(Informative)

Pictorial presentations

The following pictorial presentation (see figures 2 and 3) should be used in addressing the passengers with reduced mobility.



Figure 2: Pictorial presentation for wheel chair users



Figure 3: Pictogram for passengers with reduced mobility others than wheelchair users

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