Foreword

The formulation of this National Standard was initiated by the Agricultural Machinery Testing and Evaluation Center (AMTEC) with support from the Department of Agriculture (DA).

This standard has been technically prepared in accordance with BPS Directives Part 3: 2003 – Rules for the Structure and Drafting of International Standards.

The word "shall" is used to indicate mandatory requirements to conform to the standard.

The word "should" is used to indicate that among several possibilities one is recommended as particularly suitable without mentioning or excluding others.

In the preparation of this standard, the following documents/publications were considered:

CIGR Handbook of Agricultural Engineering. *Plant Production Engineering.* Volume III. Published by the American Society of Agricultural Engineers (ASAE). USA. 1999. pp 463-465.

Indian Standard (IS) 8213:1976 – Specification for Agricultural Trailer

International Organization for Standardization (ISO/FDIS 17900:2001) Agricultural Trailer – Balanced and semi-mounted trailers – Determination of payload, vertical static load and axle load.

Korean Standard (KS) B 7123:1977 – Trailers for Power Tiller

Republic Act No. 7394 otherwise known as "The Consumer Act of the Philippines" enacted on July 22, 1991.

Agricultural Machinery – Agricultural Trailer – Specifications

1 Scope

This standard specifies the construction and other requirements for agricultural trailer fitted with pneumatic tires and towed by an agricultural tractor at the traveling speed not exceeding 30 kph.

This standard is applicable to trailers with up to 10 metric tons capacity.

2 References

The following normative documents contain provisions, which through reference in this text, constitute provisions of this National Standard:

ISO 4251-1:1994, Tyres (ply rating marked series) and rims for agricultural tractors and machines – Part 1: Tyre designation and dimensions

ISO 4251-2:1994, Tyres (ply rating marked series) and rims for agricultural tractors and machines – Part 2: Tyre loading ratings

ISO 4251-3:1994, Tyres (ply rating marked series) and rims for agricultural tractors and machines – Part 3: Rims

PAES 102:2000, Agricultural Machinery – Operator's Manual – Content and Presentation

PAES 103:2000, Agricultural Machinery – Method of Sampling

PAES 107:2000, Agricultural Machinery – Hitch for Walking-Type Agricultural Tractor – Specifications

PAES 118:2001, Agricultural Machinery – Four-Wheel Tractor – Specifications

PAES 311:2001, Engineering Materials – Bolts and Nuts for Agricultural Machines – Specifications and Applications

PAES 312:2001, Engineering Materials – Rivets for Agricultural Machines – Specifications and Applications

PAES 313:2001, Engineering Materials – Screws for Agricultural Machines – Specifications and Applications

PAES 314:2001, Engineering Materials – Washers for Agricultural Machines – Specifications and Applications

PAES 315:2001, Engineering Materials – Pins for Agricultural Machines – Specifications and Applications

3 Definitions

For the purpose of this standard, the following definitions shall apply:

3.1
agricultural trailer
trailer designed to carry load for agricultural purposes without power of its own

3.1.1
balanced trailer
agricultural trailer whose total load is supported by at least two axles with four or more wheels when detached from the towing tractor (see Figure 1)

3.1.2
semi-trailer
agricultural trailer with one axle and two wheels which, while in use, part of its load is transferred to the towing tractor and the rest of the load is carried on its axle (see Figure 2)

3.2
axle load
total static load supported by the wheels on the respective axle

3.3
gross load
gross weight
sum of payload and unladen mass of the trailer expressed in metric tons

3.4
ground clearance
vertical distance between the ground and the lowest point of the trailer

NOTE In measuring ground clearance, the trailer shall be loaded to its payload and the tires shall be inflated at the recommended pressure.

3.5
over-run brake
brake actuated by a compressive force in the hitch between a trailer and the towing tractor used to decelerate a moving trailer

3.6
parking brake
brake actuated by a pedal or lever to keep the trailer in stationary or parked position

3.7
payload
net weight
uniformly distributed maximum safe load which can be transported by the trailer expressed in tons

3.8
service brake
brake actuated by a pedal or lever to decelerate and stop a moving trailer

3.9
tow eye
hitch point of the trailer's pullbar to be attached to the towing tractor

3.10
unladen mass
tare weight
mass of a trailer with all its usual fittings but without any load

3.11
wheel base
horizontal distance between foremost and rearmost axles or wheels measured at the center of the ground contact

3.12
wheel tread
wheel track
distance between the outermost wheels at the same axle measured at the center of ground contact

4 Classification

4.1 Balanced Trailer

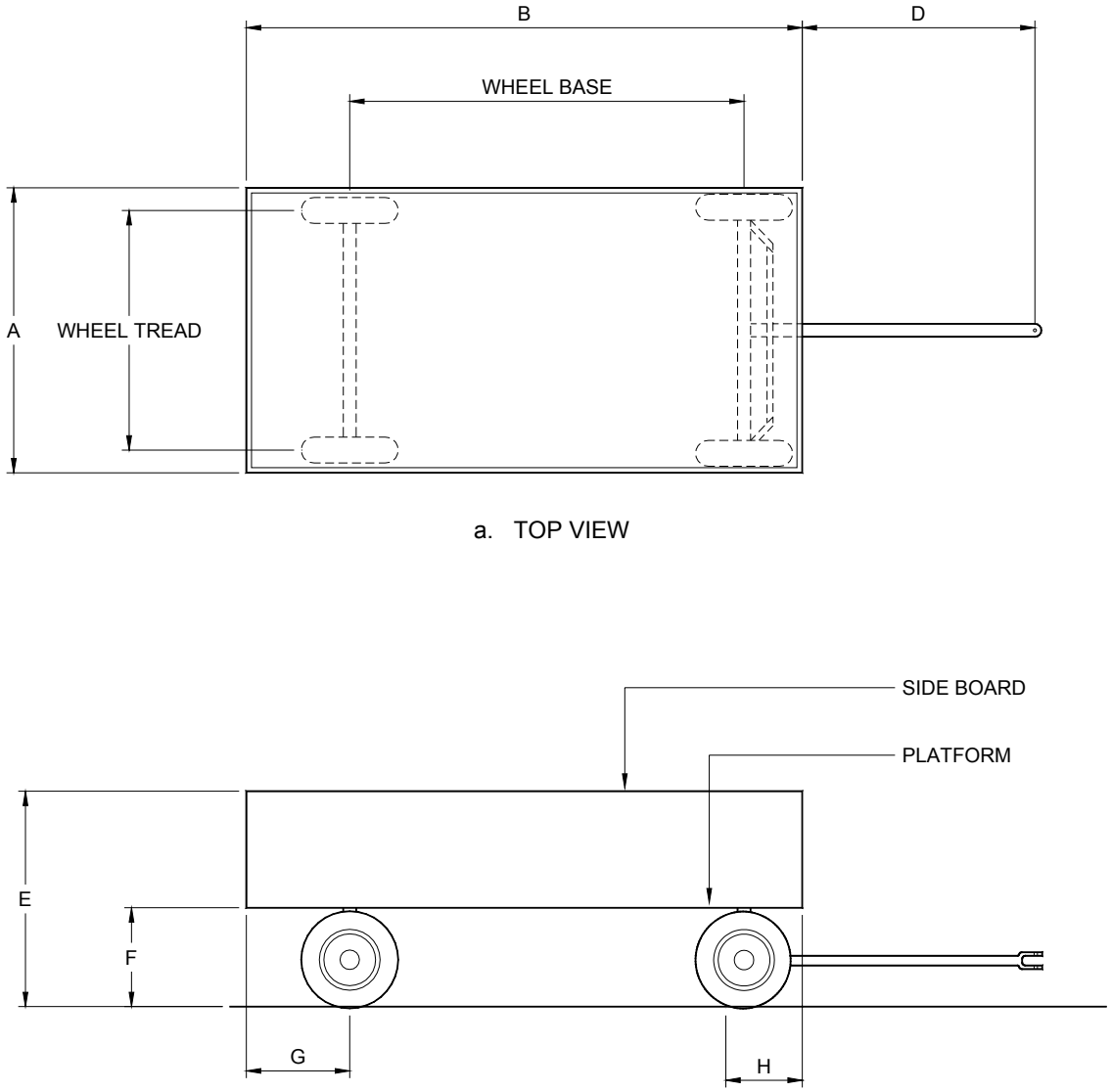
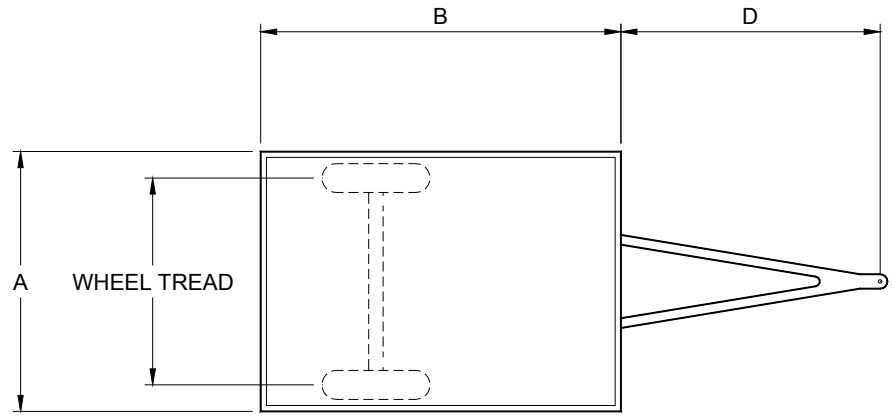
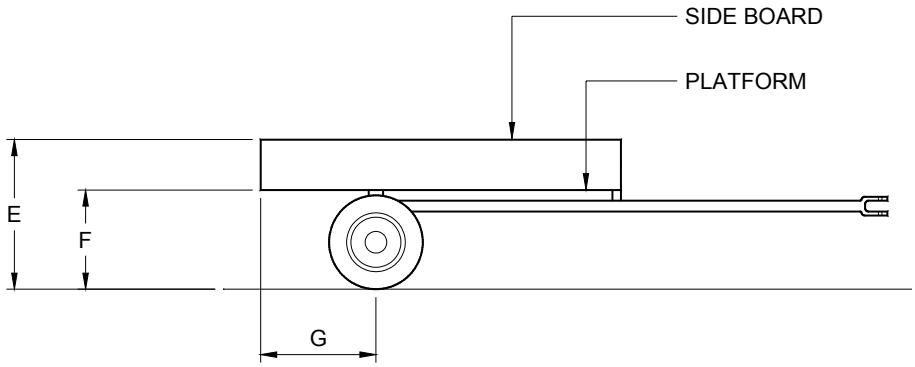


Figure 1 – Balanced Trailer for Four-Wheel Tractor

4.2 Semi-Trailer

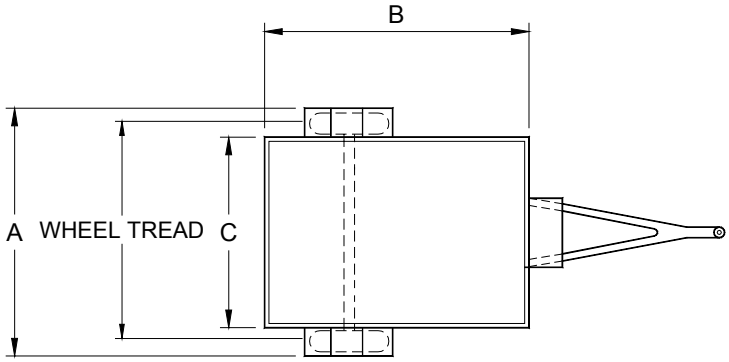


a. TOP VIEW

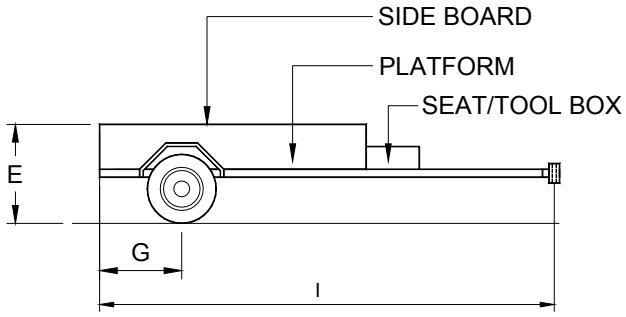


b. SIDE VIEW

Figure 2 – Semi -Trailer for Four-Wheel Tractor



a. TOP VIEW



b. SIDE VIEW

Figure 3 – Semi -Trailer for Two-Wheel Tractor

5 Dimensions

5.1 Trailer Attached to a Four-Wheel Tractor

5.1.1 The overall width of the trailer (see A in Figures 1 and 2) measured between the extreme points shall not exceed 2.5 m. For this type of trailer, the overall width of the trailer is equal to the overall width of the platform.

5.1.2 The overall length of the platform (see B in Figures 1 and 2) shall not exceed 6.0 m.

5.1.3 The distance from the foremost end of the platform to the center of the hitch point of the pullbar (see D in Figures 1 and 2) shall range from 0.9 m to 1.4 m.

5.1.4 The total height of the trailer, with tires inflated at the recommended pressure, shall not exceed 2.2 m when measured from the ground to the top of the sideboard without any extension (see E in Figures 1 and 2).

5.1.5 The height of the platform, with tires inflated at the recommended pressure, shall not exceed 1.2 m when measured from the ground to the top of the flooring (see F in Figures 1 and 2).

5.1.6 For the balanced trailer, the distance from the rearmost end of the platform to the center of rear wheel (see G in Figure 1) and from the foremost end of the platform to the center of front wheel (see H in Figure 1) shall be ½ of the wheel base but not to exceed 0.8 m.

5.1.7 For the semi-trailer, the distance from the rearmost end of the platform to the center of the wheel (see G in Figure 2) shall be ⅓ of the platform's length but not to exceed 1.2 m.

5.1.8 The wheel tread, wheel base and ground clearance shall be declared by the manufacturer.

5.2 Semi-Trailer Attached to a Two-Wheel Tractor

5.2.1 The overall width of the trailer (see A in Figure 3) measured between the extreme points shall not exceed 1.7 m.

5.2.2 The overall length of the platform (see B in Figure 3) shall not exceed 2 m.

5.2.3 The overall width of the platform (see C in Figure 3) measured between the extreme points shall not exceed 1 m.

5.2.4 The total height of the trailer, with tires inflated at the recommended pressure, shall not exceed 2 m when measured from the ground to the top of the sideboard or its extension (see E in Figure 3).

5.2.5 The distance from the rearmost end of the platform to the center of the wheel shall be ½ to ⅓ of the platform's length (see G in Figure 3).

5.2.6 The overall length of the trailer (see I in Figure 3) shall not exceed 3.5 m.

5.2.7 The overall length of the semi-trailer and the two-wheel tractor shall not exceed 5 m.

5.2.8 The wheel tread, wheel base and ground clearance shall be declared by the manufacturer.

6 Capacity

The capacity of the trailer shall be its payload. The gross load and the payload shall be declared by the manufacturer.

7 Construction Requirements

7.1 The loading platform may be bare or provided with hinged or fixed sideboards.

7.2 The trailer shall be provided with lashing hooks for tying down the load.

7.3 The trailer shall be provided with safety chain to match the trailer's gross load.

7.4 When the trailer is fully loaded and hitched to the tractor, the platform shall be parallel to the ground.

7.5 The hitch point of the trailer shall be designed in accordance with the tractor drawbar requirements of four-wheel tractor given in PAES 118 for and with the hitch of two-wheel tractor given in PAES 107.

7.6 The trailer shall be fitted with suitable pneumatic wheels of adequate load carrying capacity.

7.7 The trailer should be provided with spring loaded axles, if desired by the purchaser.

7.8 The trailer may be provided with oscillating pullbar.

7.9 Trailer attached to a four-wheel tractor designed for more than 6 metric tons gross load shall be fitted with over-run brake. The over-run brake along with the tractor service brake shall be able to decelerate and stop the fully loaded tractor-trailer combination within a distance of 12 m when traveling at a maximum speed of 20 kph.

7.10 Trailer attached to a two-wheel tractor designed for more than 0.5 metric tons gross load shall be fitted with a service brake. The trailer service brake along with the tractor service brake, if fitted, shall be able to decelerate and stop the fully loaded tractor-trailer combination within a distance of 5 m when traveling at a maximum speed of 10 kph.

7.11 A parking brake shall be provided for all types of trailers. The parking brake shall hold a fully laden trailer on a 15° slope uphill or downhill. The maximum force to operate a hand brake lever shall not exceed 400 N. The parking brake should operate on the same drum and shoe or disc and pad as the service brake.

8 Other Requirements

8.1 The trailer shall be fitted with six amber (yellow) reflectors of not less than 75 mm diameter placed at a distance of not more than 150 mm inwards from extreme ends of rear and sides.

8.2 The trailer shall be fitted with tail lights and, when possible, with stop and turn signal lights.

8.3 The semi-trailer for four-wheel tractors shall be provided with a park stand to keep it level when detached from the towing tractor.

8.4 A suitable unobstructed location shall be made available on the trailer chassis for fixing a lift jack when carrying out necessary repairs.

8.5 Agricultural trailer tires shall conform to ISO 4251 Parts 1 to 3.

8.6 All fasteners used in the trailer shall conform to PAES 311, PAES 312, PAES 313, PAES 314 and PAES 315.

8.7 All parts requiring lubrication shall be provided with suitable fittings.

8.8 The trailer shall be fitted with slow-moving vehicle (SMV) emblem. The emblem shall be located at the rear of the trailer with dimensional requirement as shown in Figure 4.

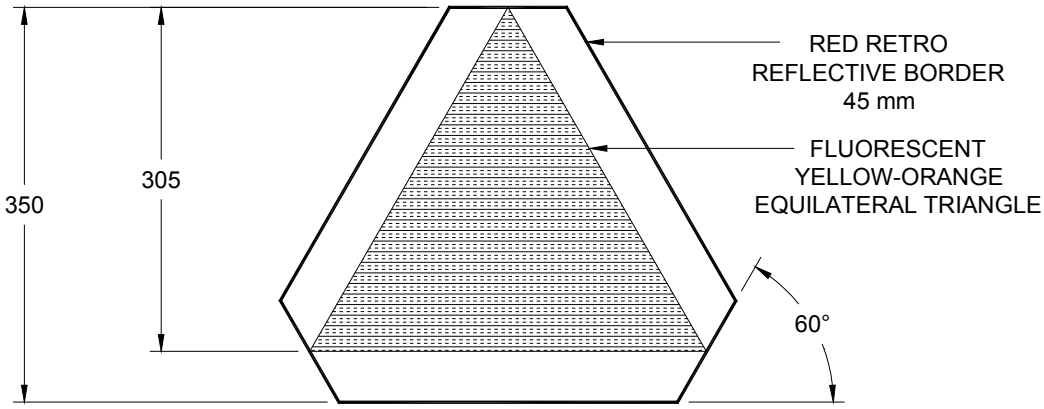


Figure 4 – Slow-Moving Vehicle (SMV) Emblem

9 Workmanship and Finish

9.1 The trailer shall be free from manufacturing defects that may be detrimental to its operation.

9.2 The trailer shall be free from sharp edges and surfaces that may injure the operator.

9.3 All wood or metal surfaces shall be covered with a coat of suitable preservative and an appropriate primer before painting.

10 Warranty for Construction and Durability

10.1 Warranty against defective materials and workmanship shall be provided for parts and services within six months from the purchase of the trailer.

10.2 The trailer shall not show any sign of breakage or deformation in any part when loaded with 125% of its payload and operated for a minimum of three hours at a maximum speed of 30 kph. The construction shall be rigid and durable without breakdown of its major components within six months from purchase by the first buyer.

11 Maintenance and Operation

11.1 A set of manufacturer's standard tools required for maintenance shall be provided.

11.2 The trailer shall not be loaded beyond the height of 3.8 m when measured from the ground.

12 Marking and Labeling

12.1 Each trailer shall be marked in English with the following information using a plate, stencil or by directly punching it at the most conspicuous place:

12.1.1 Registered trademark of the manufacturer

12.1.2 Brand

12.1.3 Model

12.1.4 Type

12.1.5 Gross load, metric tons

12.1.6 Payload, metric tons

12.1.7 Maximum tire pressure, kPa

12.1.8 Production date (optional)

12.1.9 Serial number

12.1.10 Name and address of manufacturer

12.1.11 Name and address of the importer, if imported

12.1.12 Country of manufacture (if imported) / "Made in the Philippines" (if manufactured in the Philippines)

12.2 Safety/precautionary markings shall be provided when appropriate. Markings shall be stated in English and Filipino and shall be printed in red color with a white background.

12.3 The markings shall have a durable bond with the base surface material.

12.4 The markings shall be weather resistant and under normal cleaning procedures, it shall not fade, discolor, crack or blister and shall remain legible.