

Foreword

This standard is a revision of the Philippine National Standard (PNS) 145:1988- "Specification for Hexagonal Axle and Hub for Power Tillers". The revision was initiated by the Agricultural Machinery Testing and Evaluation Center (AMTEC) under the project entitled "Enhancing the Implementation of AFMA Through Improved Agricultural Engineering Standards" which was funded by the Bureau of Agricultural Research (BAR) of the Department of Agriculture (DA).

This revised standard was reviewed by the Technical Committee for Study 1- Development of Standards for Agricultural Production Machinery and was circulated to various private and government agencies/organizations concerned for their comments and reactions. This standard was presented to the Philippine Society of Agricultural Engineers (PSAE) and subjected to a public hearing organized by the National Agriculture and Fisheries Council (NAFC). The comments and reactions received during the presentation and public hearing were taken into consideration in the finalization of this standard.

This standard has been technically revised in accordance with PNS 01:Part 4:1998 - Rules for the Structure and Drafting of Philippine National Standards. The main changes are listed below:

- title of the standard has been modified in conformity to the format of International Standard;
- definitions of axle and wheel hub were included;
- types of axle based on primemover size were modified; and
- dimensions and materials of axle and wheel hub were modified.

In the preparation of this revision, a survey on the specifications of axle and wheel hub was conducted. Major local agricultural machinery manufacturers greatly contributed on the completion of this revised standard. Also, the following documents/publications were consulted/considered:

Marks' Standard Handbook for Mechanical Engineers 10th edition by Eugene Avallone and Theodore Baumeister III.1997.

Philippine Society of Mechanical Engineers (PSME) Code 1993

Agricultural Machinery - Hexagonal Axle and Hub for Walking-type Agricultural Tractor - Specification

1 Scope

This standard specifies the materials and dimensions of hexagonal axle and hub (including their fasteners) for walking-type agricultural tractor (which is commonly known as hand tractor).

2 Classification

Hexagonal axle shall be classified based on primemover size of walking-type agricultural tractor as follows:

2.1

type 1

hexagonal axle for walking-type agricultural tractor with a primemover size of up to 3.4 kW (4.5 hp) using diesel engine and up to 3.7 kW (5.0 hp) using gasoline engine

2.2

type 2

hexagonal axle for walking-type agricultural tractor with a primemover size of 3.5 kW to 10.8 kW (4.6 hp - 14.5 hp) using diesel engine and 3.8 kW to 11.9 kW (5.1 hp - 16.0 hp) using gasoline engine

3 Material

3.1 Hexagonal shaft which is made of cold-rolled steel (also commonly known as CRS) with 0.37-0.44% carbon content (eg. AISI 1040) shall be used for axle of walking-type agricultural tractor.

3.2 Mild steel plate with 0.18-0.23% carbon content (eg. AISI 1020) shall be used in the manufacture of the axle hub.

4 Dimensions

4.1 Axle

The dimensions of the axle for walking-type agricultural tractor shall be as specified in Table 1 and shown in Figure 1.

Table 1 – Dimensions for Hexagonal Axle for Walking-type Agricultural Tractor

Criteria	Dimensions in millimeters	
	Type 1	Type 2
Width across flats (w), minimum	25	32
Overall length of shaft (l), minimum	500	500

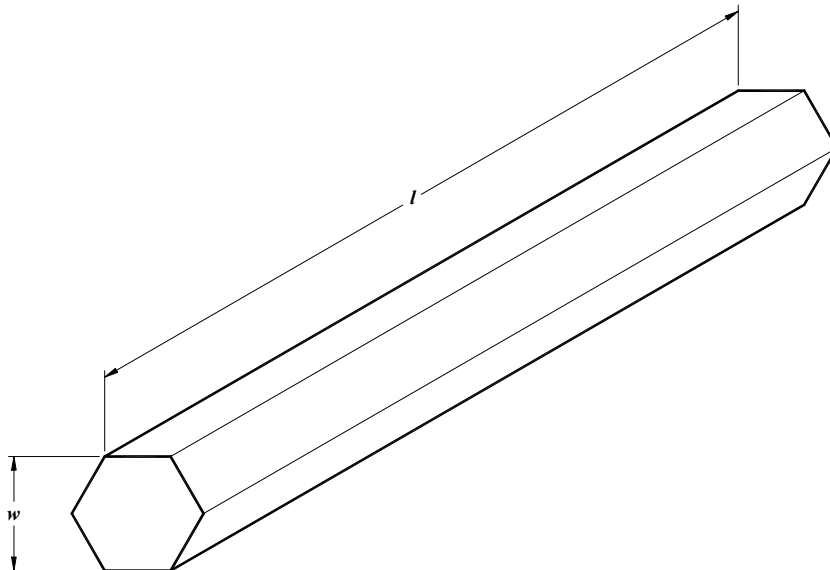
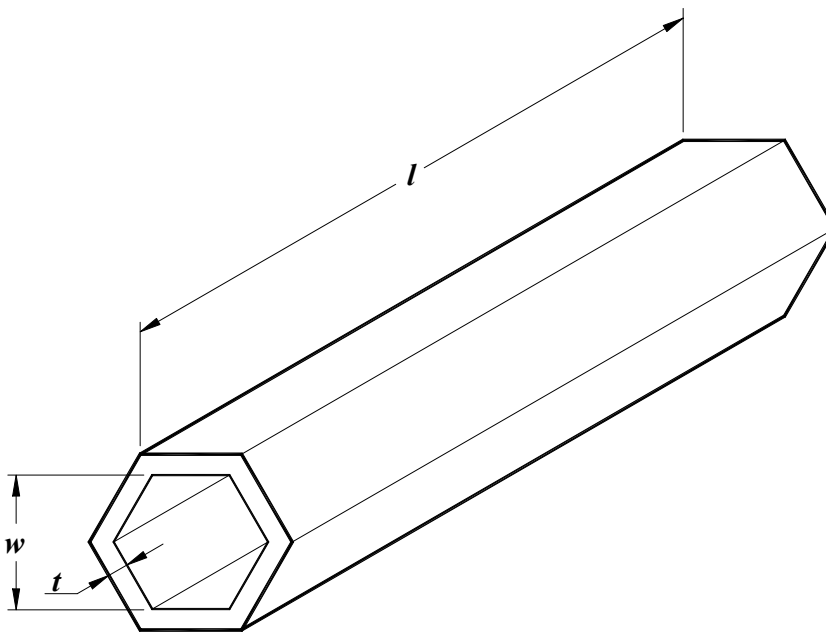


Figure 1 – Hexagonal Axle

4.2 The dimensions of the hub to fit the hexagonal axle specified in this standard shall be as specified in Table 2 and shown in Figure 2.

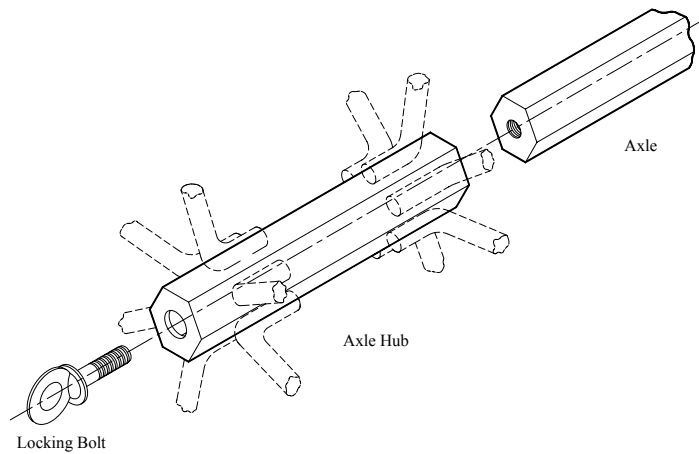
Table 2 – Dimension of Axle Hub for Walking-type Agricultural Tractor

Dimensions in millimeters		
Criteria	Type 1	Type 2
Width across flats (w), minimum	27	34
Length of hub (l), minimum	150	150
Thickness of hub (t)	3 ± 0.2	5 ± 0.2

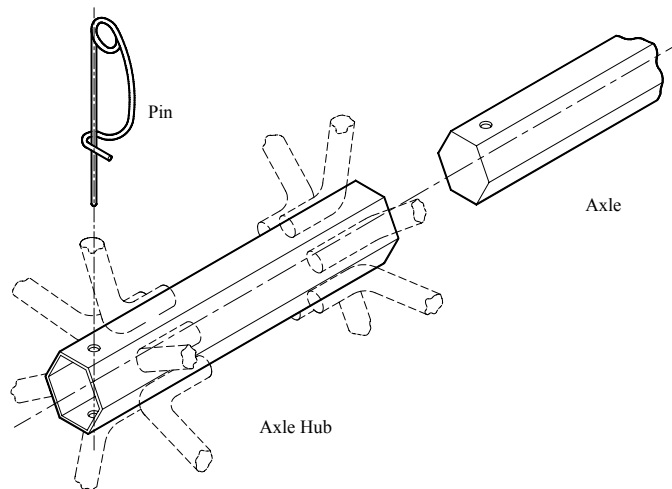
**Figure 2 – Axle Hub**

5 Fasteners

The fastening of hexagonal axle and wheel hub shall be made using either locking bolt or pin as shown in Figure 3.



a) Using locking bolt



b) Using pin

Figure 3 – Fasteners for Axle and Hub

5.1 Locking bolt with size M 10 x 1.25 or pin made of 3 mm diameter spring wire shall be used as fasteners for axle and hub.

5.2 The clearance between the hole and the pin shall be 1 mm.

5.3 The hole of the hub for pin fastener in Figure 3b shall be located 24 mm from its outermost side.

6 Other Requirements

6.1 Hexagonal axle and hub shall be free from sharp edges which may cause harm or serious injury.

6.2 The ends of the hexagonal axle shall be chamfered to facilitate insertion of the hub.

6.3 The head of locking bolt shall be designed for manual fastening.