

Foreword

This standard is a revision of the Philippine National Standard (PNS) 50:1984 "Specification for Hitch for Walking Type Agricultural Tractor". This 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 hitch assembly were included;
- types of hitches based on primemover size were modified; and
- dimensions and materials of the hitch 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:

Japanese Industrial Standard (JIS) B9209:1986 Dimensions of Hitch for Walking Tractors

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 – Hitch for Walking-type Agricultural Tractor - Specifications

1 Scope

This standard specifies the classification, dimensions of hitch and pin, requirements, and materials of hitch for walking-type agricultural tractor (which is commonly known as hand tractor).

2 Definitions

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

2.1**hitch assembly**

structure made for attaching and/or supporting the implement

NOTE It consists of hitch frame, pin sleeve and hitch pin (see figure 1).

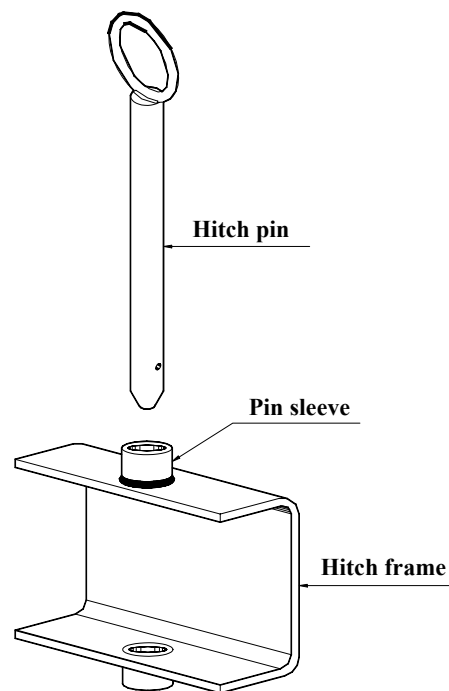


Figure 1 – Hitch Assembly

2.2

size of primemover

rated power rating of the primemover as specified by the manufacturer

2.3

walking-type agricultural tractor

pedestrian controlled tractor

hand tractor

self-propelled machine having a single axle designed primarily to pull and propel trailed or mounted agricultural implements and machinery

3 **Classification**

The hitch for walking-type agricultural tractor shall be classified into the following types:

3.1 One-Hole Hitch

3.2 Three-Hole Hitch

4 **Materials**

4.1 Cold-rolled steel which is commonly known as CRS with 0.37-0.44% carbon content (eg. AISI 1040) shall be used in the manufacture of pin sleeve and hitch pin.

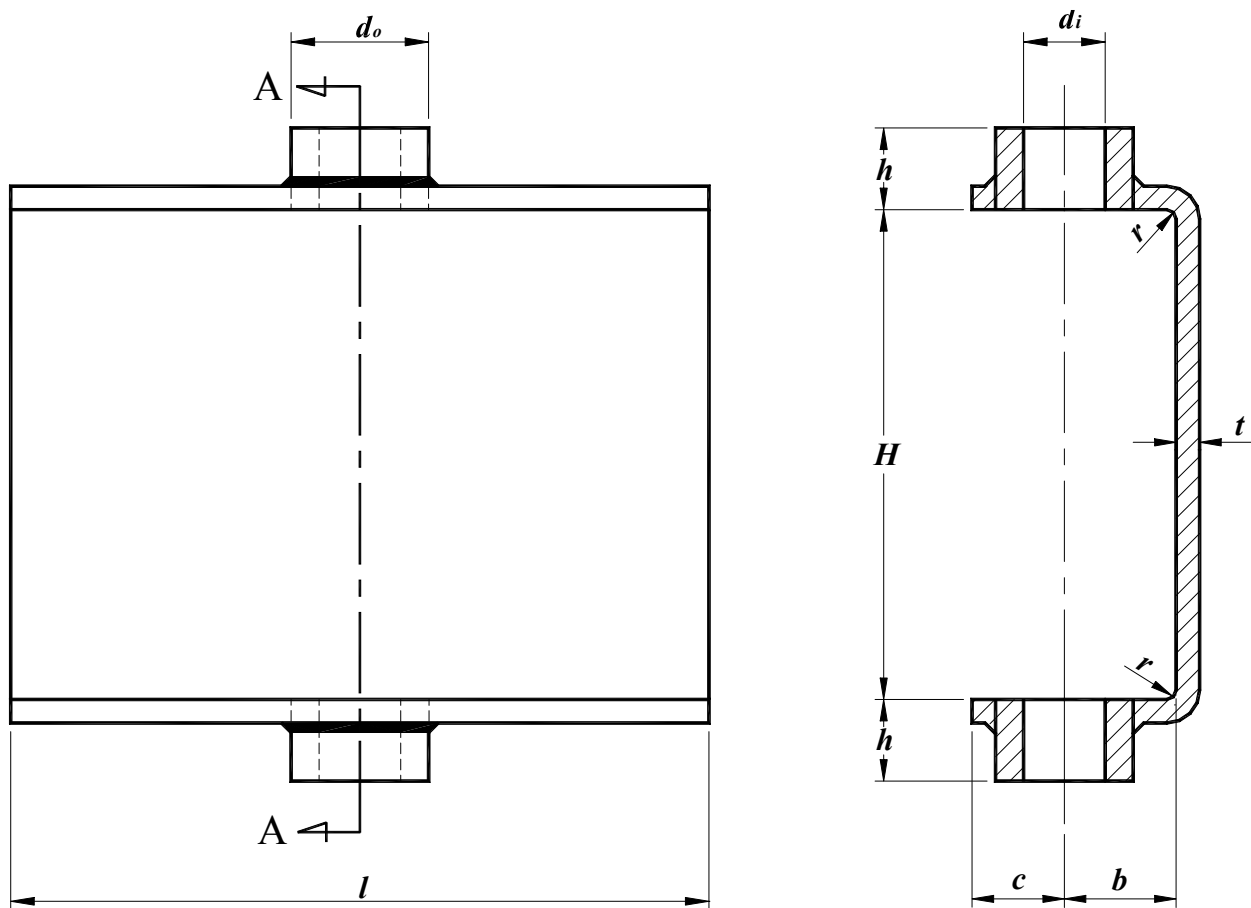
4.2 Mild steel plate with 0.18-0.23% carbon content (eg. AISI 1020) shall be used in the manufacture of hitch frame.

5 Dimensions and Tolerance

5.1 The principal dimensions of the One-Hole Hitch shall be as specified in Table 1 and shown in Figure 2.

Table 1 – Dimensions of One-Hole Hitch for Walking-type Agricultural Tractor

Dimensions in millimeters									
Size of primemover	H	h	b	c	l	d_i	d_o	t	r
Gasoline : < 3.7 kW (≤ 5.0 hp)	100	16	24 to 26	26 to 36	130	+0.5	28 to 48	4 to 5	9 max
Diesel : < 3.4 kW (≤ 4.5 hp)						0			
Gasoline : 3.8 kW to 11.9 kW (5.1 hp to 16.0 hp)	115	18	24 to 28	28 to 36	130	+0.5	32 to 48	7 to 9	10 max
Diesel : 3.5 kW to 10.8 kW (4.6 hp to 14.5 hp)						0			



Section thru A-A

Figure 2 – One-Hole Hitch

5.2 The principal dimensions of the Three-Hole Hitch shall be as specified in Table 2 and shown in Figure 3.

Table 2 – Dimensions of Three-Hole Hitch for Walking-type Agricultural Tractor

Size of primemover	Dimensions in millimeters											
	<i>H</i>	<i>h</i>	<i>a</i>	<i>a₁</i>	<i>b</i>	<i>c</i>	<i>d_i</i>	<i>d_o</i>	<i>l</i>	<i>l₁</i>	<i>t</i>	<i>r</i>
Gasoline : ≤ 3.7 kW (≤ 5.0 hp)	75	18	60 ± 0.5	30	20 to 26	14 to 22	16.5	26 min	100 min	-	4.5 min	9 max
Diesel : ≤ 3.4 kW (≤ 4.5 hp)												
Gasoline : 3.8 kW to 11.9 kW (5.1 hp to 16.0 hp)	95	18	90 ± 0.5	45	27 to 33	17 to 25	16.5	26 min	130 min	160 min	4.5 min	10 max
Diesel : 3.5 kW to 10.8 kW (4.6 hp to 14.5 hp)												

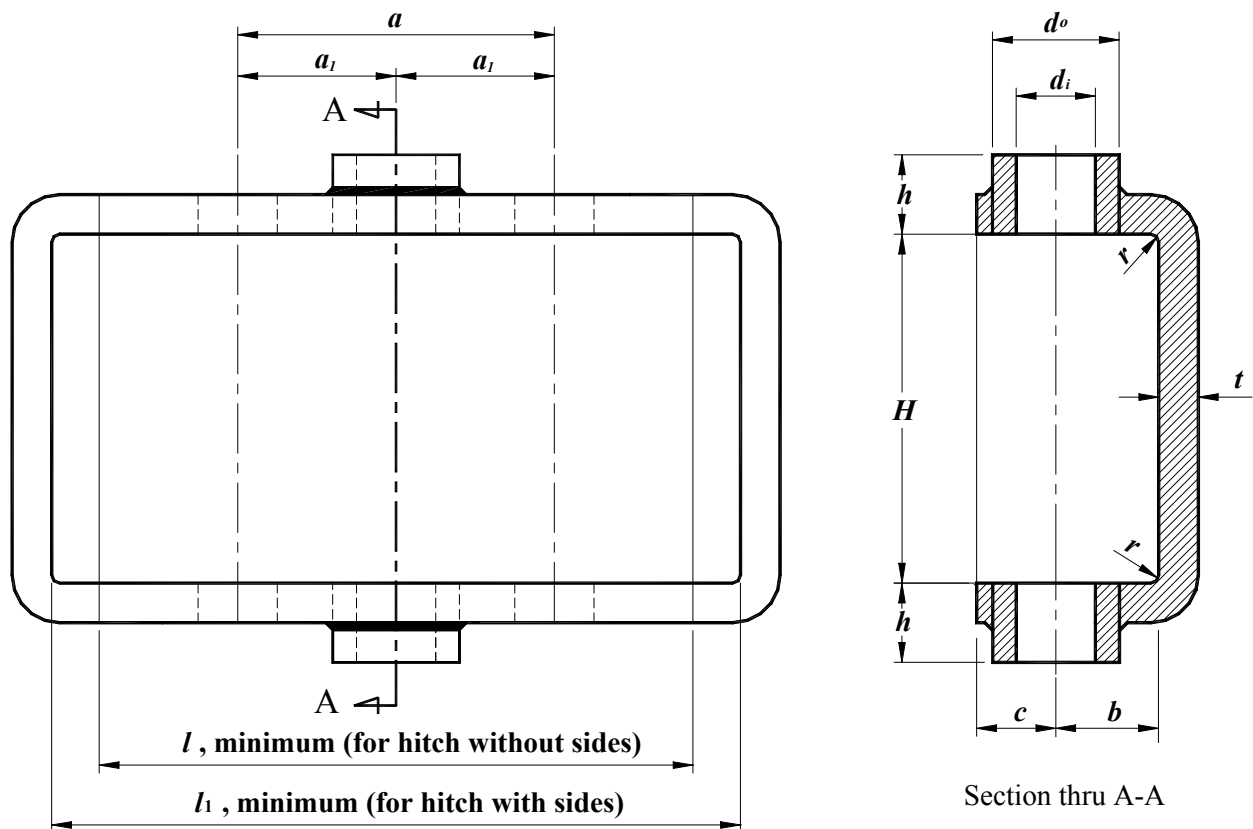


Figure 3 – Three-Hole Hitch

6 Hitch Pin

6.1 Hitch pin for both types of hitch shall have dimensions as specified in Table 3 and shown in Figure 4.

Table 3 – Dimensions for Hitch Pins for the Two Types of Hitches

Dimensions in millimeters

Size of primemover	One-Hole Hitch			Three-Hole Hitch		
	d_p	l_p	l_s	d_p	l_p	l_s
Gasoline : ≤ 3.7 kW (≤ 5.0 hp)	16 ± 0.2	145 minimum	138	0	125 minimum	117
Diesel : ≤ 3.4 kW (≤ 4.5 hp)				-0.2		
Gasoline : 3.8 kW to 11.9 kW (5.1 hp to 16.0 hp)	19 ± 0.2	165 minimum	157	0	145 minimum	137
Diesel : 3.5 kW to 10.8 kW (4.6 hp to 14.5 hp)				-0.2		

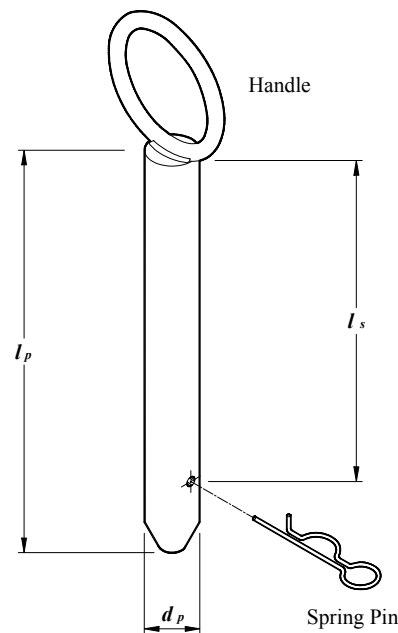


Figure 4 – Hitch Pin

6.2 The bottom end of the pin shall be slightly tapered to facilitate insertion.

6.3 An ample space shall be provided above or below the hitch so that insertion of the pin is not obstructed.

6.4 Spring pin (with nominal size of 5 x 105 mm) shall be used as locking device for hitch pin.

6.5 A hitch pin handle shall be provided to facilitate in inserting and pulling out the hitch pin from the pin sleeve.