

BS ISO 11001-1:2016



BSI Standards Publication

# Agricultural wheeled tractors — Three-point hitch couplers

Part 1: U-frame coupler

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**National foreword**

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A list of organizations represented on this committee can be obtained on request to its secretary.

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**Agricultural wheeled tractors —  
Three-point hitch couplers —**

**Part 1:  
U-frame coupler**

*Tracteurs agricoles à roues — Coupleurs rapides trois points —  
Partie 1: Coupleur par cadre en U*





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# Contents

	Page
Foreword .....	iv
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Principle of frame coupler system .....</b>	<b>1</b>
<b>4 Coupler dimensions .....</b>	<b>1</b>
<b>5 Dimensions associated with implement .....</b>	<b>5</b>
<b>6 Requirements .....</b>	<b>6</b>

## Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#).

The committee responsible for this document is ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 4, *Tractors*.

This second edition cancels and replaces the first edition (ISO 11001-1:1993), which has been technically revised.

ISO 11001 consists of the following parts, under the general title *Agricultural wheeled tractors — Three-point hitch couplers*:

- *Part 1: U-frame coupler*
- *Part 2: A-frame coupler*
- *Part 3: Link coupler*
- *Part 4: Bar coupler*

# Agricultural wheeled tractors — Three-point hitch couplers —

## Part 1: U-frame coupler

### 1 Scope

This part of ISO 11001 specifies the essential dimensions for the attachment of three-point hitch implements to agricultural wheeled and track-laying tractors equipped with a three-point free link hitch according to ISO 730 or ISO 8759-1 and a U-frame hitch coupler.

**NOTE** In general the dimensions associated with the tractor and implement for use with hitch couplers are the same as those for the three-point linkage specified in ISO 730 or ISO 8759-1, and those for the clearance zone specified in ISO 2332.

The three-point hitch coupler systems constitute a special method of implement mounting. The hitch couplers are an additional component located between the three-point linkage and the implement, making it possible to hitch and unhitch from the operator's seat. Due to the special construction and function of hitch couplers, it can be necessary to vary the length of the upper and lower links indicated in the referenced standards.

This part of ISO 11001 applies to categories 1, 2N, 2, 3N, 3, 4N, and 4 of agricultural wheeled and track-laying tractors as defined in ISO 730 or ISO 8759-1.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 730, *Agricultural wheeled tractors — Rear-mounted three-point linkage — Categories 1N, 1, 2N, 2, 3N, 3, 4N and 4*

ISO 2332:2009, *Agricultural tractors and machinery — Connection of implements via three-point linkage — Clearance zone around implement*

ISO 8759-1, *Agricultural wheeled tractors — Front-mounted equipment — Part 1: Power take-off and three-point linkage*

### 3 Principle of frame coupler system

A frame coupler system is a one-phase implement coupler where the three-point linkage of the tractor (see ISO 730 or ISO 8759-1) is fitted with a U-frame and the implement has the provisions to be mounted to the frame. Hitching and unhitching can be operated from the tractor operator's seat.

### 4 Coupler dimensions

Coupler dimensions shall comply with [Figure 1](#) and [Table 1](#).

**4.1** The upper hook offset (dimension  $B_5$ ) shall be not more than 15,75 mm greater or 6,35 mm less than the lower socket offset (dimension  $B_1$ ).

**4.2** The implement shall provide a minimum clearance  $h_3$ , (see [Figure 2](#) and [Table 2](#)) when attached to the coupler to permit lowering all elements of the coupler to ensure satisfactory attachment and detachment of the implement from the coupler.

NOTE Older legacy implements may only have clearances of 120,9 mm for categories 1, 2N, 2, 3N, and 3, and 146 mm minimum for categories 4N and 4.

**4.3** The upper hook of the quick coupler shall be centred between the lower sockets within 3 mm.

**4.4** The lower implement attaching point on the quick-attaching coupler shall be located in the vertical position such that the lift range, power range and levelling adjustment, as specified in ISO 730 or ISO 8759-1 are fulfilled.

**4.5** Implement components, other than the hitch pins, that are in alignment with the lower socket width (dimension  $A_1$ ) shall not extend forward of the centreline of the lower socket for a distance of  $h_5$  (see [Figure 2](#) and [Table 2](#)) above the lower socket. Components above this height, extending laterally more than  $l_3$  (see [Figure 2](#) and [Table 2](#)) from the coupler centreline, shall not extend more than 25 mm forward of the vertical centreline through the upper hook opening.

**4.6** The lower socket width ( $A_1$ ) shall be maintained within the area defined by dimensions  $B_2$ ,  $H_6$ ,  $H_7$  and  $B_9$ .

**4.7** The lower link to coupler pins may be recessed to provide design freedom to obtain structural integrity in the coupler frame, resulting in a common dimension for  $L_3$  and  $L_6$ , and  $L_4$  and  $L_7$ , respectively.

**4.8** Note that ISO 730 specifies that dimension  $L$  in [Table 2](#) shall have a range of 75 mm for hitch categories 1, 2N, and 2 and a range of 100 mm for hitch categories 3N, 3, 4N, and 4. Dimension  $B_1$  in this part of ISO 11001 allows the lower socket offset to be larger than the range allowed in ISO 730. For tractors designed with U-frame couplers as standard equipment, the lower links should be shortened so that the distance to the lower U-frame coupler jaw falls within the range for dimension  $L$  specified in ISO 730. For tractors that offer U-frame couplers as an option, the lower links should be designed to the minimum  $L$  dimension given in ISO 730 as far as possible to minimize the distance that the combined lower link and U-frame coupler length is over the upper limit of the  $L$  dimension given in ISO 730.

**4.9** For U-frame couplers that by design can be converted to different hitch categories, dimensions  $H_6$ ,  $H_7$ ,  $H_5$ ,  $L_4$ ,  $L_2$ ,  $L_5$  and  $L_3$  may not be achieved in all configurations.



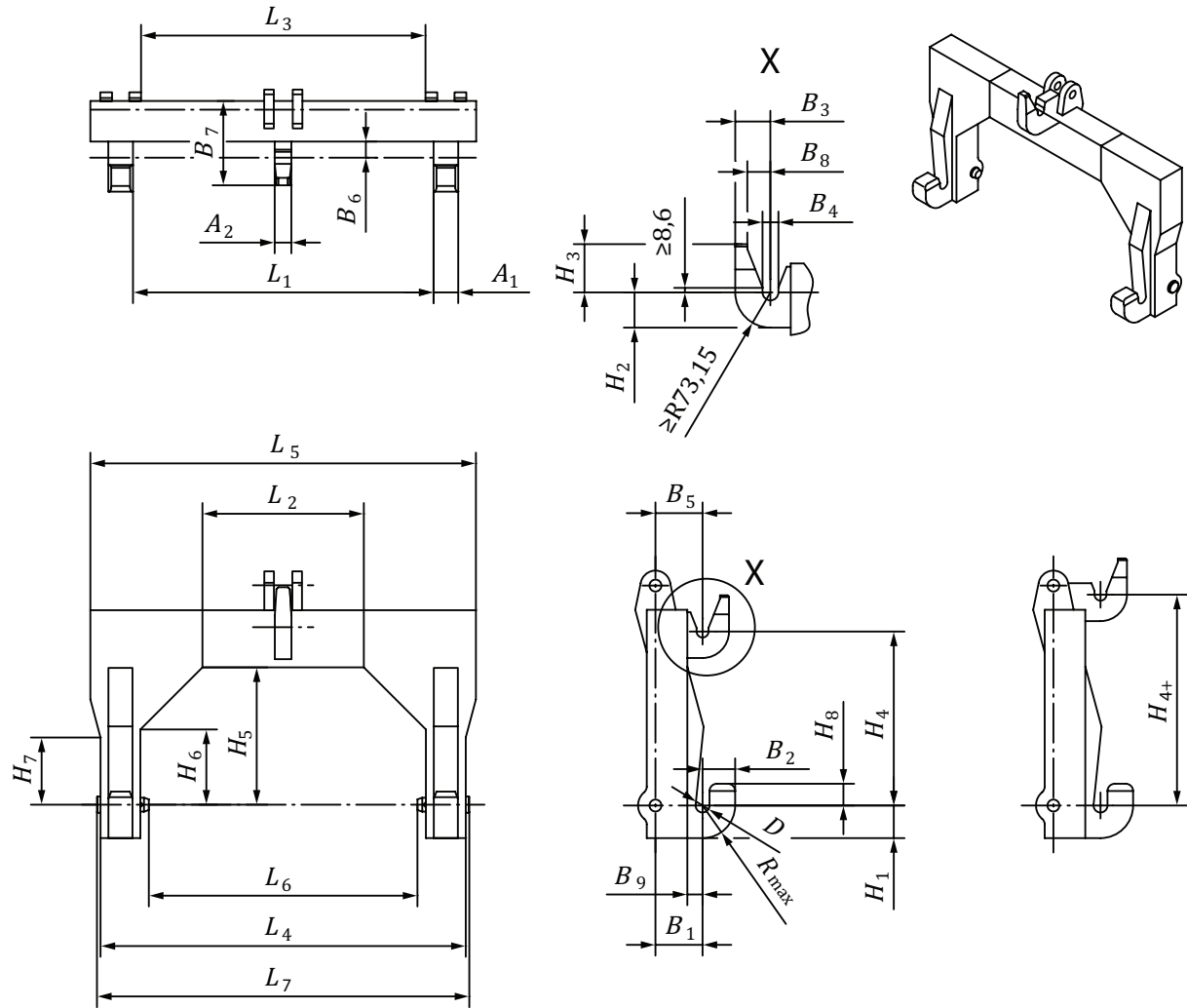


Figure 1 — Coupler dimensions

Table 1 — Coupler dimensions

Dimensions in millimetres

Dimen- sions	Designa- tion	Category													
		1		2N		2		3N		3		4N		4	
		min	max	min	max	min	max	min	max	min	max	min	max	min	max
$L_1$	Lower socket in- side span	686	690	686	690	828	834	828	834	970	975	925	930	1 170	1 175
$A_1$	Lower sock- et width	28	30	63	67	63	67	63	67	63	67	86	89	86	89
$B_1$	Lower sock- et offset	—	104	—	130	—	130	—	130	—	130	—	165	—	165
$D$	Lower sock- et diameter	38,1	38,6	38,1	38,6	38,1	38,6	38,1	38,6	38,1	38,6	52	52,5	52	52,5
$B_2$	Lower sock- et overhang	—	90	—	90	—	90	—	90	—	90	—	130	—	130
$H_1$	Lower sock- et depth	—	90	—	90	—	90	—	90	—	90	—	130	—	130

Table 1 (continued)

Dimen- sions	Designa- tion	Category													
		1		2N		2		3N		3		4N		4	
		min	max	min	max	min	max	min	max	min	max	min	max	min	max
A <sub>2</sub>	Upper hook width	—	36	—	44	—	44	—	44	—	44	—	57	—	57
B <sub>3</sub>	Upper hook overhang	—	73	—	73	—	73	—	73	—	73	—	82	—	82
B <sub>4</sub>	Upper hook opening	32,5	33,3	32,5	33,3	32,5	33,3	32,5	33,3	32,5	33,3	45,7	46,5	45,7	46,5
B <sub>5</sub>	Upper hook offset	—	108,5	—	130	—	130	—	130	—	130	—	165	—	165
H <sub>2</sub>	Upper hook depth	—	92	—	92	—	92	—	92	—	92	—	102	—	102
H <sub>3</sub>	Upper hook height	—	100	—	100	—	100	—	100	—	100	—	120	—	120
H <sub>4</sub>	Upper hook vertical spacing	375	378	375	378	375	378	477	480	477	480	680	683	680	683
H <sub>4+</sub>	Alternate upper hook vertical spacing (optional)	455	458	478	481	478	481	554	557	554	557	—	—	—	—
B <sub>6</sub>	Implement mast clearance	42	—	42	—	42	—	42	—	42	—	54	—	54	—
H <sub>5</sub>	Coupler frame height	283	—	283	—	283	—	365	—	365	—	508	—	508	—
H <sub>6</sub>	Coupler leg clearance height inside	200	—	200	—	200	—	200	—	200	—	330	—	330	—
H <sub>7</sub>	Coupler leg clearance height outside	180	—	180	—	180	—	180	—	180	—	300	—	300	—
H <sub>8</sub>	Lower hook height	—	60	—	60	—	60	—	60	—	60	—	75	—	75
L <sub>2</sub>	Coupler frame clearance width	560	—	560	—	560	—	560	—	560	—	660	—	660	—
L <sub>3</sub>	Coupler frame inside width	657	—	657	—	796	—	796	—	858	—	858	—	1 104	—
L <sub>4</sub>	Coupler frame lower outside width	—	806	—	806	—	1 005	—	1 005	—	1 175	—	1 175	—	1 420
L <sub>5</sub>	Coupler frame upper outside width	—	880	—	880	—	1 065	—	1 065	—	1 175	—	1 420	—	1 420
L <sub>6</sub>	Lower link attaching pin inside	620	—	620	—	760	—	760	—	860	—	860	—	1 104	—
L <sub>7</sub>	Lower link attaching pin outside	—	830	—	830	—	1 020	—	1 020	—	1 220	—	1 220	—	1 420

Table 1 (continued)

Dimen- sions	Designa- tion	Category													
		1		2N		2		3N		3		4N		4	
		min	max	min	max	min	max	min	max	min	max	min	max	min	max
$B_7$	Coupler frame over- all span	—	225	—	225	—	225	—	225	—	305	—	305	—	305
$B_8$	Upper hook reach	48	—	48	—	48	—	48	—	48	—	63	—	63	—
$B_9$	Implement lower frame clearance	42	—	42	—	42	—	42	—	42	—	54	—	54	—
$R$	Lower hitch cou- pler radius	—	90	—	90	—	90	—	100	—	100	—	130	—	130

+ A second alternative upper hook position may be provided as an option. This position matches the North American practice for mast height for categories 1, 2N, 2, 3N and 3 for three-point free-link attachment

## 5 Dimensions associated with implement

Dimensions associated with the implement shall comply with [Figure 2](#) and [Table 2](#).

**5.1** For implements with cantilever-mounted lower hitch pins, special quick coupler hitch pins shall be supplied to dimensions  $d_1$ ,  $l_1$ ,  $l_2$  and  $d_2$ . Adapter bushings may be supplied which convert existing three-point hitch pins to dimensions  $d_1$ ,  $l_1$ ,  $l_2$  and  $d_2$  instead of special quick coupler hitch pins.

For three-point hitch implements on which the lower hitch points consist of clevis style mounting pins, no additional thrust surfaces are required, provided that the pin diameter and support dimensions conform to dimensions  $d_1$ ,  $l_1$ ,  $l_2$  and  $b_1$ .

The method used and dimensions related to attaching the pins or adapter bushings to the implement are at the discretion of the implement manufacturer.

**5.2** The lower implement attaching point on the U-frame coupler shall be located in the vertical position such that the lift range, power range and levelling adjustment, as specified in ISO 730 or ISO 8759-1, are fulfilled.

**5.3** Implement components, other than the hitch pins and clevis, that are in alignment with the lower socket width [dimension  $A_1$  (see [Figure 1](#) and [Table 1](#))] shall not extend forward of the centreline of the lower socket for a distance of  $h_5$  (see [Figure 2](#) and [Table 2](#)) above the lower socket.

Components above this height extending laterally more than  $l_3$  (see [Figure 2](#) and [Table 2](#)) from the coupler centreline shall not extend more than 25 mm forward of the vertical centreline through the upper hook opening.

**5.4** The adapter or lower hitch pin shall be in line within 0,015 mm per 1 mm of pin length.

**5.5** The implement shall provide a minimum clearance  $h_3$  (see [Figure 2](#) and [Table 2](#)) when attached to the coupler to permit lowering all elements of the coupler, for satisfactory attachment and detachment of the implement from the coupler.

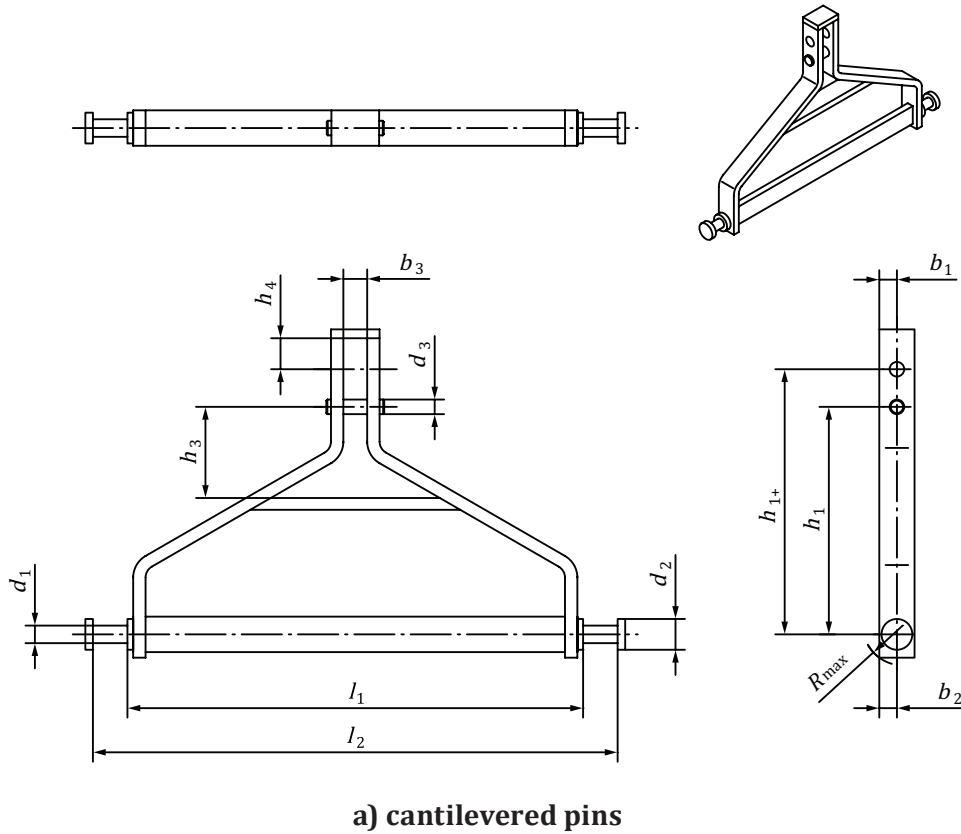
NOTE Older legacy implements may only have clearances of 120,9 mm for categories 1, 2N, 2, 3N, and 3, and 146 mm minimum for categories 4N and 4.

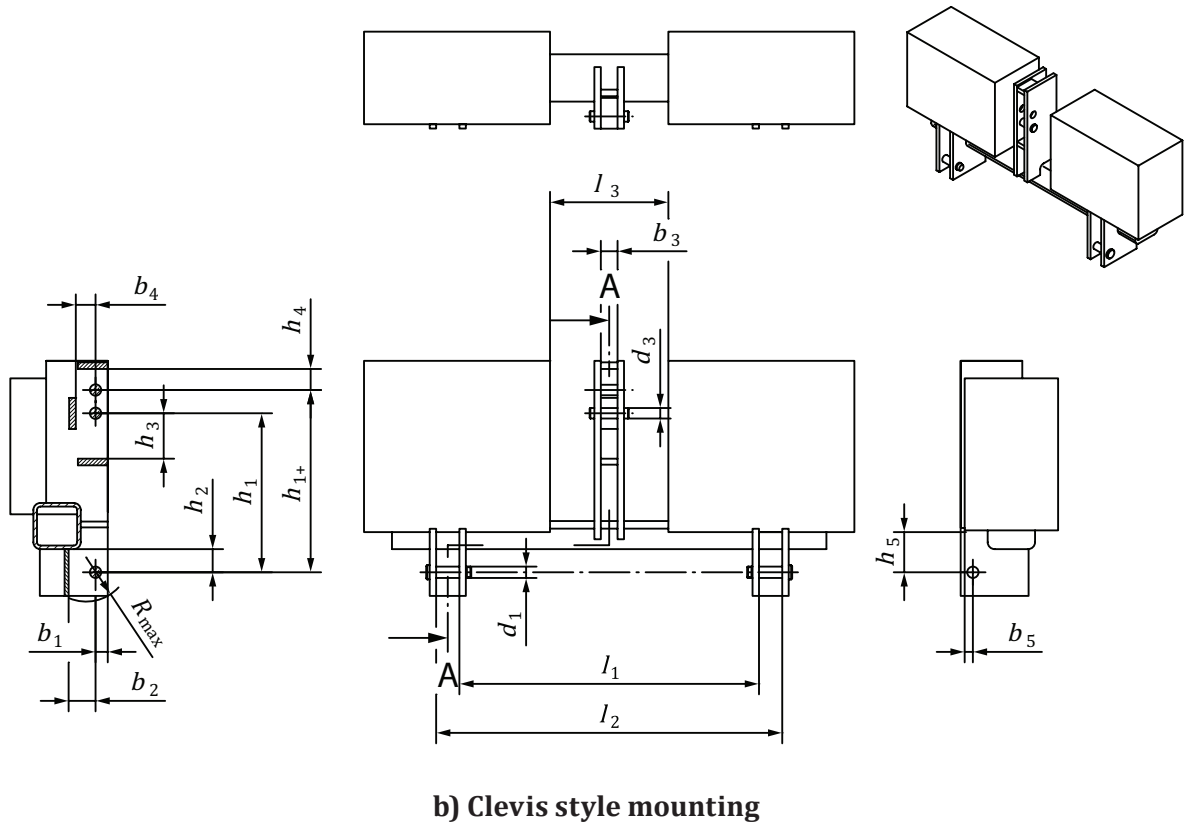
**5.6** The upper hook opening on the implement shall be located central to the lower hitch pin shoulders within 3 mm.

5.7 Provisions shall be made for adequate upper hook clearance  $b_4$  (see Figure 2 and Table 2) in those implements which require landing or levelling.

## 6 Requirements

A locking device on both lower sockets with a positive latch shall be provided to prevent an unintentional separation of the implement (see Figure 1).





b) Clevis style mounting

Figure 2 — Dimensions associated with implement

Table 2 — Dimensions associated with implement

Dimensions in millimetres

Dimensions	Designation	Category													
		1		2N		2		3N		3		4N		4	
		min	max	min	max	min	max	min	max	min	max	min	max	min	max
$d_1$	Lower hitch pin or adapter outside diameter	See ISO 730													
$l_1$	Lower hitch pin inner shoulder spread	See ISO 730													
$l_2$	Lower hitch pin outer shoulder spread	811	819	811	819	953	961	953	961	1 108	1 116	1 108	1 116	1 358	1 365
$l_3$	Lateral implement clearance	270	—	310	—	310	—	310	—	310	—	390	—	390	—
$d_2$	Lower hitch pin inner and outer shoulder diameter	50	65	50	65	50	65	50	65	50	65	65	—	65	—
$d_3$	Coupler mast pin diameter	See ISO 730													

**Table 2** (continued)

Dimensions	Designation	Category													
		1		2N		2		3N		3		4N		4	
		min	max	min	max	min	max	min	max	min	max	min	max	min	max
$h_1$	Coupler mast pin vertical spacing	379	382	379	382	379	382	481	484	481	484	684	687	684	687
$h_{1+}$	Alternative coupler mast pin vertical spacing (optional)	459	461	482	484	482	484	558	560	558	560	—	—	—	—
$h_2$	Lower hook tip clearance	85	—	85	—	85	—	85	—	85	—	100	—	100	—
$h_3$	Upper hook lowering clearance	See ISO 2332:2009, Table 1, Dimension A													
$h_4$	Upper hook tip clearance	120	—	120	—	120	—	120	—	120	—	140	—	140	—
$h_5$	Implement vertical clearance	200	—	200	—	200	—	200	—	200	—	200	—	200	—
$b_1$	Coupler mast pin horizontal spacing	—	38	—	38	—	38	—	38	—	38	—	51	—	51
$b_2$	Lower socket clearance (see 5.5)	115	—	115	—	115	—	115	—	115	—	150	—	150	—
$b_3$	Width between inner faces of mast	52	—	52	—	52	—	52	—	52	—	65	—	65	—
$b_4$	Upper hitch attachment longitudinal clearance	80	—	80	—	80	—	90	—	90	—	120	—	120	—
$b_5$	Implement forward longitudinal clearance	—	25	—	25	—	25	—	25	—	25	—	25	—	25
$R$	Lower hitch attachment radius	—	43	—	43	—	43	—	43	—	43	—	57	—	57

+ A second alternative upper hook position may be provided as an option. This position matches the North American practice for mast height for categories 1, 2N, 2, 3N and 3 for three-point free-link attachment.









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