
**Agricultural vehicles — Mechanical
connections on towed vehicles —**

Part 3:
Swivel hitch rings

*Véhicules agricoles — Liaisons mécaniques sur véhicules
remorqués —*

Partie 3: Anneaux d'attelage rotatifs



Reference number
ISO 5692-3:2011(E)

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Foreword

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ISO 5692-3 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 4, *Tractors*.

ISO 5692 consists of the following parts, under the general title *Agricultural vehicles — Mechanical connections on towed vehicles*:

- *Part 1: Dimensions for hitch rings of 50/30 mm cross section*
- *Part 2: Coupling ring 40 with socket*
- *Part 3: Swivel hitch rings*

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Agricultural vehicles — Mechanical connections on towed vehicles —

Part 3: Swivel hitch rings

1 Scope

This part of ISO 5692 specifies the requirements for hitch rings used for the attachment of agricultural trailers and implements to the rear of self-propelled agricultural vehicles equipped with a non-swivel clevis coupling as specified in ISO 6489-5.

2 Normative references

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

ISO 6489-5:2011, *Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 5: Specifications for non-swivel clevis couplings*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

D value

D

mathematically established representative force for the horizontal component of the force acting on the coupling in the longitudinal axis of the machine

NOTE It is expressed in kilonewtons (kN).

3.2

vertical load on the coupling point

S

load transmitted, under static conditions, on the reference centre of the mechanical coupling

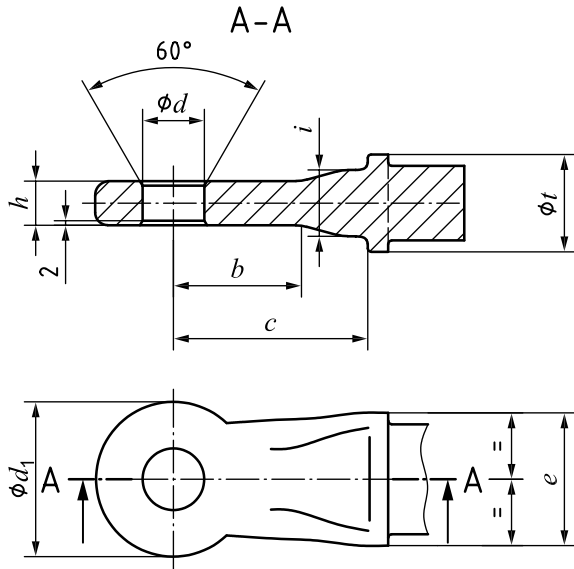
NOTE It is expressed in kilograms (kg).

4 Interchangeability dimensions

4.1 General

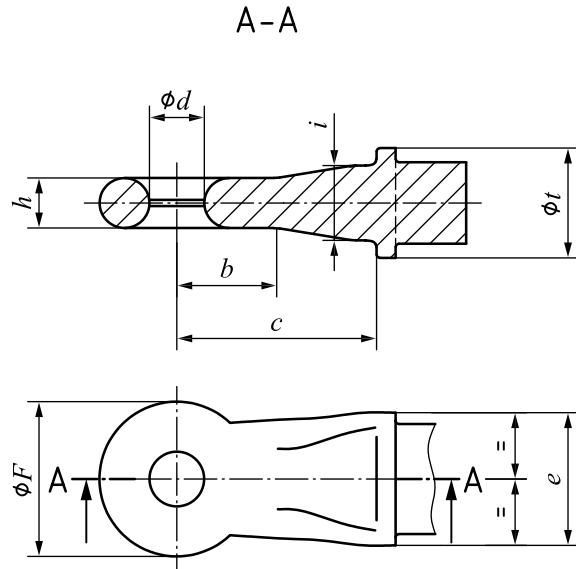
Hitch ring dimensions shall be as shown in Figure 1 or 2 and as specified in Table 1.

Allowable loads are indicated in Table 1.



NOTE Dimensions are given in Table 1.

Figure 1 — Cylindrical eye configuration



$$F = d + 2h$$

NOTE Dimensions are given in Table 1.

Figure 2 — Round eye configuration

Table 1 — Shapes, dimensions and allowable loads

Vertical load <i>S</i> kg	D value <i>D</i> kN	Shape	Coupling ring mm														
			Cylindrical eye configuration							Round eye configuration							
			<i>d</i>	<i>b</i>	<i>c</i>	<i>e</i>	<i>i</i>	<i>h</i>	<i>d</i> ₁	<i>t</i>	<i>d</i>	<i>b</i>	<i>c</i>	<i>e</i>	<i>i</i>	<i>t</i>	<i>h</i>
≤ 1 000	≤ 35	W	±0,5	min.	min.	max.	max.	±1	±3	min.	±0,5	min.	min.	max.	max.	min.	±1
≤ 2 000	≤ 90	X	45	70	100	60	40	32	105	63	35	50	100	60	40	63	30
≤ 3 000	≤ 120	Y	62	90	120		55	40	132	73	50	55	140		55	73	35
≤ 3 000	≤ 120	Z	73	100	140	75	60	42	157	78	68	60	160	75	60	78	42

4.2 Trailer shank travel angles

When the trailer shank, fitted with the specified hitch ring, is fixed to the towing vehicle, the shank shall be free to turn so that the angles formed with the horizontal situated in the towing vehicle's plane of symmetry and passing through the coupling point have the following minimum values.

- a) Angle of yaw: rotation around a vertical axis passing through the coupling point, with a minimum value of 60° on both sides (see Figure 3).
- b) Angle of pitch: rotation around a horizontal axis passing through the coupling point and perpendicular to the machine's longitudinal plane of symmetry, with a minimum value of 20° top and bottom (see Figure 4).

Allowance should be made for the towing machine being up to $\pm 3^\circ$ from horizontal, due to front/rear tyre sizes.

- c) Angle of roll: rotation around a horizontal axis passing through the coupling point and located in the machine's plane of symmetry, with a minimum value of 20° top and bottom (see Figure 5).

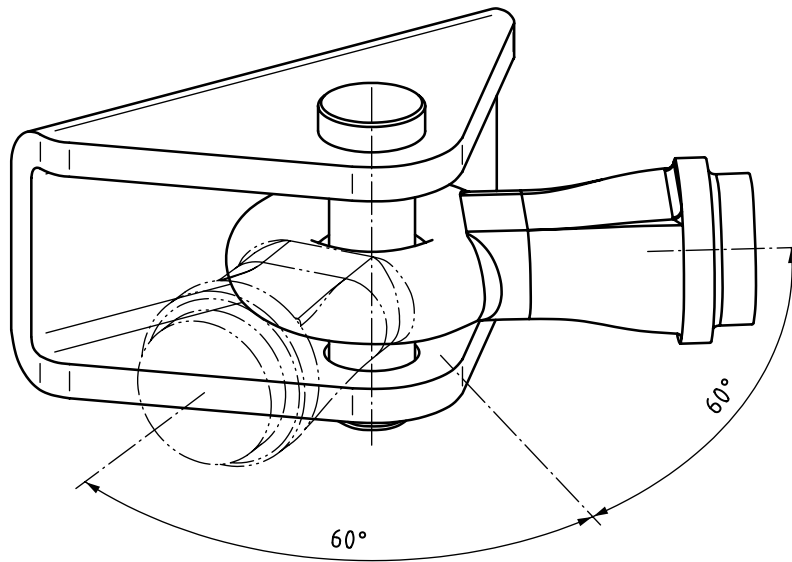


Figure 3 — Angle of yaw

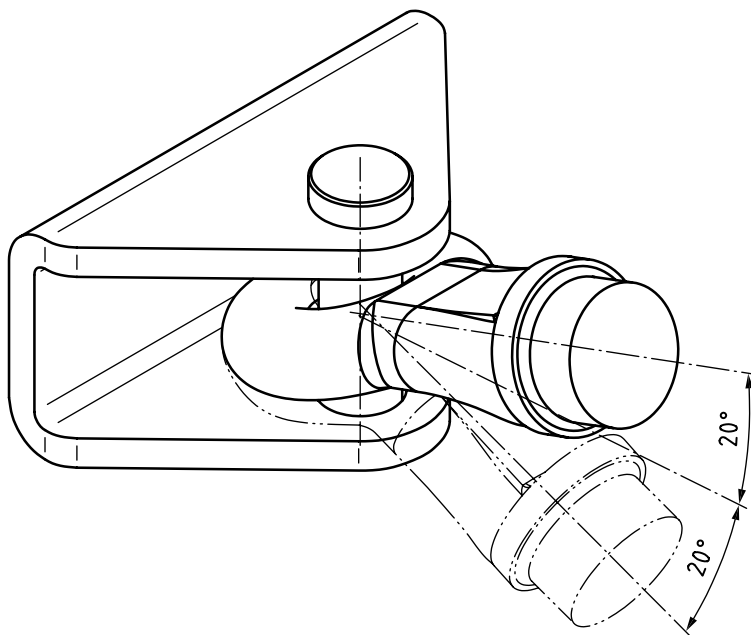


Figure 4 — Angle of pitch

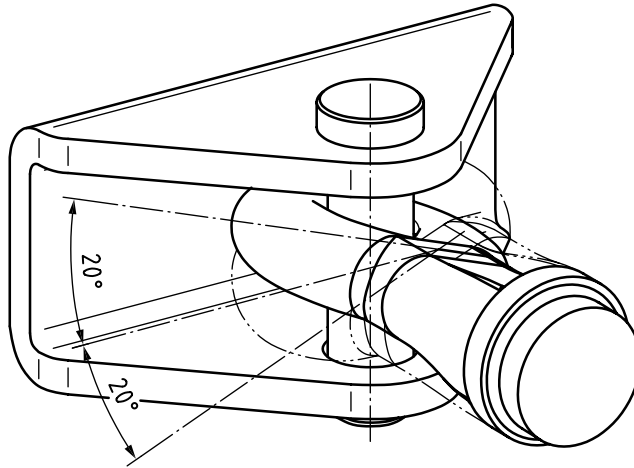


Figure 5 — Angle of roll

5 Constructional requirements

Hitch rings in accordance with this part of ISO 5692 shall be substantially toroidal or cylindrical and shall be manufactured by forging. The removable hitch ring shall be jointed to a sleeve fixed on the trailer drawbar.

6 Permissible mechanical connections between rings and couplings

The permissible mechanical connections between rings and couplings are given in Table 2.

Table 2 — Permissible mechanical connections between rings and couplings

Ring	Coupling
ISO 5692-3 Shape W	ISO 6489-5 Shape w
ISO 5692-3 Shape X	ISO 6489-5 Shape x
ISO 5692-3 Shape Y	ISO 6489-5 Shape y
ISO 5692-3 Shape Z	ISO 6489-5 Shape z

7 Marking

The swivel hitch ring shall have a permanent and visible ring shape letter marking for identification.

Annex A (informative)

Recommended mechanical connection combinations between towing and towed vehicles

Towing vehicle	Towed vehicle
ISO 6489-1:1991, hook type	ISO 5692:1979/ISO 5692-1:2004, hitch ring (50 mm hole centre, 30 mm ring diameter)
ISO 6489-1:2001, hook type ^a	ISO 5692:1979/ISO 5692-1:2004, hitch ring (50 mm hole centre, 30 mm ring diameter)
	ISO 20019:2001, hitch ring (50 mm hole centre, 30 to 41 mm ring diameter)
ISO 6489-2:2002, bolt type	ISO 5692-2:2002, coupling ring (40 mm socket)
	ISO 8755:1986, 40 mm drawbar coupling ^b
	ISO 1102:1986, 50 mm drawbar coupling ^b
ISO 6489-4:2004, piton type	ISO 5692:1979/ISO 5692-1:2004, hitch ring (50 mm hole centre, 30 mm ring diameter)
ISO 6489-5:2011, non-swivel clevis coupling	ISO 5692-3:2011, swivel hitch rings
ISO 24347:2005, ball type	ISO 24347 (80 mm ball diameter)
Only these combinations are recommended.	
<p>^a Connecting an ISO 6489-1:2001 hook, manufactured in accordance with the maximum sizes permitted, to hitch rings in accordance with ISO 5692-1 and of minimum dimensions (30 mm ring diameter) according to ISO 20019 could result in a "jerky" connection between the tractor and the trailer and less driving comfort.</p> <p>^b Primarily used on trailers towed behind trucks (on-road).</p>	

Bibliography

- [1] ISO 1102:1986, *Commercial road vehicles — Mechanical connections between towing vehicles and trailers — 50 mm drawbar couplings*
- [2] ISO 5692:1979, *Agricultural vehicles — Mechanical connections on towed vehicles — Hitch-rings — Specifications*
- [3] ISO 5692-1:2004, *Agricultural vehicles — Mechanical connections on towed vehicles — Part 1: Dimensions for hitch rings of 50/30 mm cross section*
- [4] ISO 5692-2:2002, *Agricultural vehicles — Mechanical connections on towed vehicles — Part 2: Coupling ring 40 with socket*
- [5] ISO 6489-1:1991, *Agricultural vehicles — Mechanical connections on towing vehicles — Part 1: Hook type*
- [6] ISO 6489-1:2001, *Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 1: Dimensions of hitch-hooks*
- [7] ISO 6489-2:2002, *Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 2: Specifications for clevis coupling 40*
- [8] ISO 6489-4:2004, *Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 4: Dimensions of piton-type coupling*
- [9] ISO 8755:1986, *Commercial road vehicles — Mechanical connections between towing vehicles and trailers — 40 mm drawbar coupling*
- [10] ISO 20019:2001, *Agricultural vehicles — Mechanical connections on towed vehicles — Dimensions for hitch rings*
- [11] ISO 24347:2005, *Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm)*

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