

INTERNATIONAL  
STANDARD

**ISO**  
**730-1**

Third edition  
1994-12-15

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**Agricultural wheeled tractors —  
Rear-mounted three-point linkage —**

**Part 1:**  
Categories 1, 2, 3 and 4

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*Tracteurs agricoles à roues — Attelage trois points monté à l'arrière —  
Partie 1. Catégories 1, 2, 3 et 4*



Reference number  
ISO 730-1:1994(E)

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 730-1 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 4, *Tractors*.

<https://standards.iso.org/standard/40730-1-1994/> This third edition cancels and replaces the second edition (ISO 730-1:1990) and ISO 730-3:1982, of which it constitutes a combination and a technical revision (see clause 1).

ISO 730 consists of the following parts, under the general title *Agricultural wheeled tractors — Rear-mounted three-point linkage*:

- Part 1: *Categories 1, 2, 3 and 4*
- Part 2: *Category 1 N (Narrow hitch)*

Annexes A and B of this part of ISO 730 are for information only.

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# Agricultural wheeled tractors — Rear-mounted three-point linkage —

## Part 1: Categories 1, 2, 3 and 4

### iTeh STANDARD PREVIEW (standards.iteh.ai)

#### 1 Scope

This part of ISO 730 specifies the dimensions and requirements of the three-point linkage for the attachment of implements or equipment to the rear of agricultural wheeled tractors.

It specifies four categories to be used on different ranges of agricultural tractors as shown in table 1.

**Table 1 — Categories**

Category	PTO power at rated rotational frequency of engine <sup>1)</sup> kW
1	up to 48
2	up to 92
3	80 to 185
4	150 to 350

1) Determined in accordance with ISO 789-1.

Category 4 has been divided into two parts, 4L and 4H, depending on the location of the power take-off (PTO). Category 4L and 4H dimensions apply to tractors with the PTO, respectively, below and above the rear axle centreline.

Dimensions and requirements for the three-point linkage for the attachment of implements or equip-

ment to the front of agricultural tractors are given in ISO 8759-2[3].

#### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 730. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 730 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 789-1:1990, *Agricultural tractors — Test procedures — Part 1: Power tests for power take-off.*

ISO 2332:1993, *Agricultural tractors and machinery — Connection of implements via three-point linkage — Clearance zone around implement.*

#### 3 Definitions

For the purposes of this part of ISO 730, the following definitions apply. General definitions are given in 3.1, and definitions for components and dimensions in 3.2. The last element of the definition number in 3.2 is also the key number for the element or dimension in figures 1, 2 and A.1.

### 3.1 General

**3.1.1 linkage:** Combination of one upper link and two lower links, each articulated to the tractor and the implement at opposite ends, in order to connect the implement to the tractor.

**3.1.2 hitch point:** Articulated connections between link and implement.

NOTE 1 For geometrical purposes the hitch point is the centre of the articulated connection between link and implement.

**3.1.3 link point:** Articulated connection between link and tractor.

NOTE 2 For geometrical purposes the link point is the centre of the articulated connection between link and tractor.

**3.1.4 three-point hitch coupler:** Device which facilitates the connection of the tractor three-point linkage to the implement.<sup>1)</sup>

### 3.2 Linkage components and dimensions

**3.2.1 upper link:** Upper linkage element, fitted with an articulated connection at both ends.

**3.2.2 lower link:** Lower linkage element, fitted with an articulated connection at both ends.

**3.2.3 upper hitch point:** Articulated connection between the upper link and the implement.

**3.2.4 lower hitch point:** Articulated connection between a lower link and the implement.

**3.2.5 upper link point:** Articulated connection between the upper link and the tractor.

**3.2.6 lower link point:** Articulated connection between a lower link and the tractor.

**3.2.7 upper hitch attachment:** Pin, usually detachable and forming part of the upper link assembly, by which an upper link is secured.

**3.2.8 lower hitch attachment:** Pin, or clevis and pin, usually attached to the implement, by which a lower link is secured.

**3.2.9 upper link attachment:** Pin by which the upper link is connected to the tractor.

**3.2.10 linch pin:** Pin, usually fitted with a spring-retaining device, by which an articulated connection is retained in position.<sup>2)</sup>

**3.2.11 lift rods:** Connections that transmit force to the lower links for raising and lowering.

**3.2.12 mast:** Component that provides location of the upper hitch point on the implement.

**3.2.13 mast height:** Vertical distance between the upper hitch point and the common axis of the lower hitch points.

**3.2.14 lower hitch point height:** Height of the centre of the lower hitch points above ground level when they are fully lowered using the full extent of manual adjustment provided in the lift rods in conjunction with the movement range with the lower hitch point axis maintained horizontal to the ground in a transverse plane.

**3.2.15 levelling adjustment:** Movement, measured vertically, of either lower hitch point higher or lower than the other, to allow inclination of the implement, measured with one lower link horizontal.

**3.2.16 lower hitch point span:** Distance between the shoulders of the lower hitch pins against which the sides of the lower link ball joints abut.

**3.2.17 linch pin hole distance:** Distance from the centreline of the linch pin hole to the shoulder of the hitch pin.

**3.2.18 movement range:** Vertical movement of the lower hitch points corresponding to the power travel of the lift, excluding any adjustment in the lift rod linkage.

**3.2.19 transport height:** Total height of the lower hitch points above the ground using the full extent of manual adjustment provided in the lift rods in conjunction with the movement range, with the lower hitch point axis maintained horizontal to the ground in a transverse plane.

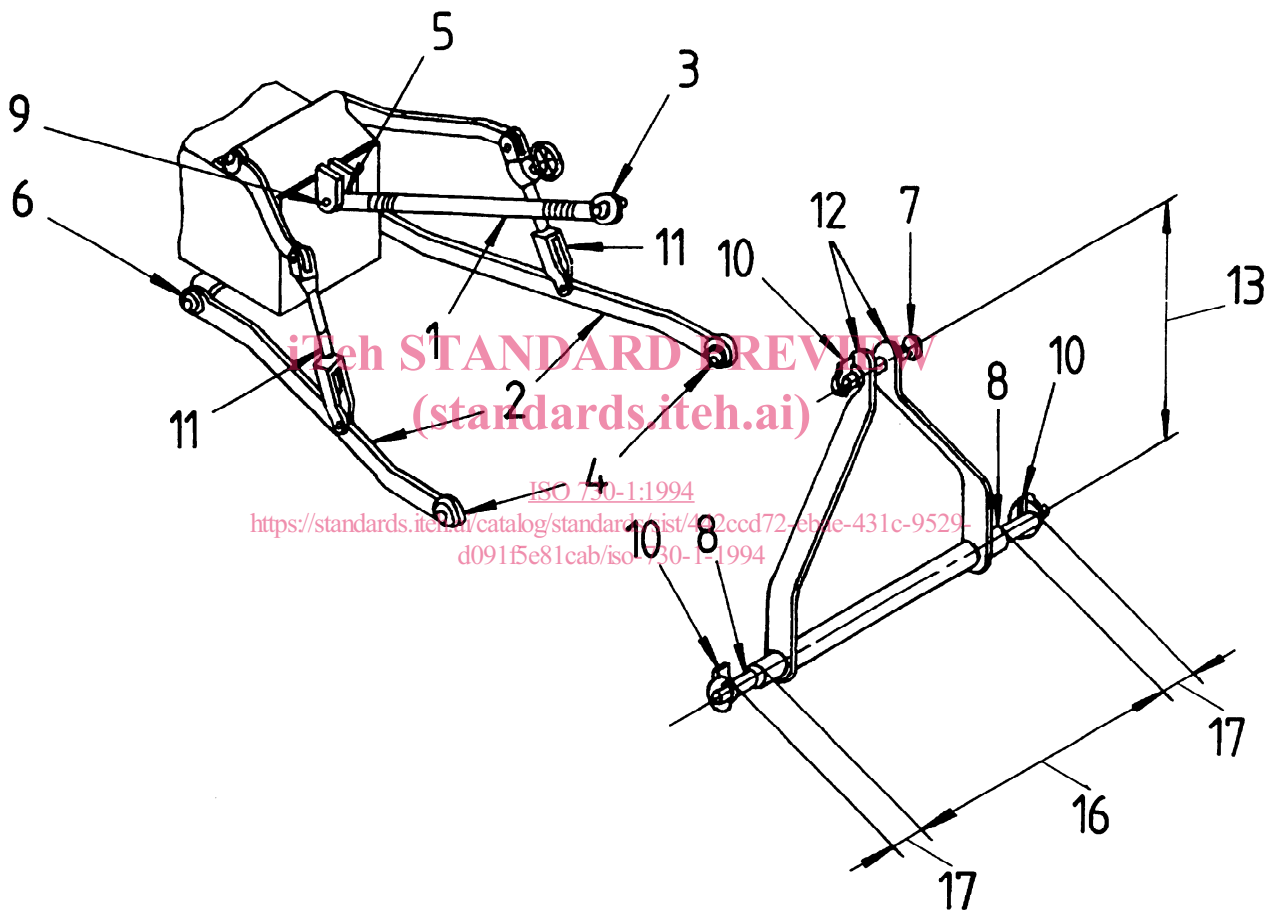
1) For examples, see annex B, [4] to [7].

2) See annex B, [2].

**3.2.20 lower hitch point clearance:** Clearance expressed as a radial dimension from the lower hitch point axis to the outside diameter of the tyre, mudguard or other part of the tractor, measured in a

longitudinal vertical plane with the implement raised to transport height and all side-sway prevented.

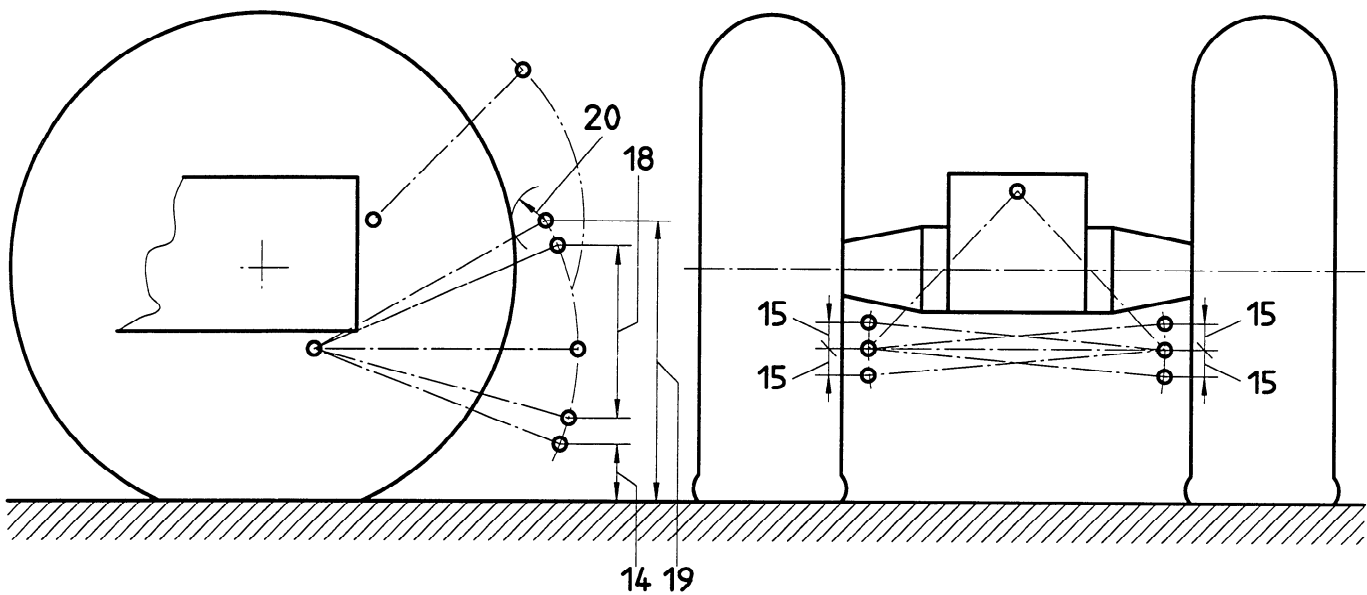
**3.2.21 pitch:** Angle of the mast to the vertical, considered positive when anticlockwise viewed from the left-hand side of the tractor.



**Key**

- |                          |                            |
|--------------------------|----------------------------|
| 1 Upper link             | 9 Upper link attachment    |
| 2 Lower link             | 10 Linch pin               |
| 3 Upper hitch point      | 11 Lift rods               |
| 4 Lower hitch point      | 12 Mast                    |
| 5 Upper link point       | 13 Mast height             |
| 6 Lower link point       | 16 Lower hitch point span  |
| 7 Upper hitch attachment | 17 Linch pin hole distance |
| 8 Lower hitch attachment |                            |

**Figure 1 — Components of three-point hitch**



### Key

- 14 Lower hitch point height
- 15 Levelling adjustment
- 18 Movement range
- 19 Transport height
- 20 Lower hitch point clearance

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NOTE — Some dimensions are shown in figures 1 and A.1 [ISO 730-1:1994](#)

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**Figure 2 — Dimensions of three-point hitch**

**3.2.22 mast adjustment:** Usable range of pitch of the mast from a vertical plane. It is measured at the maximum and minimum height of the lower hitch points above the ground between which the mast (3.2.12), when using the specified mast height, can be adjusted to any inclination between  $+5^\circ$  and  $-5^\circ$  from the vertical.

### NOTES

3 Mast adjustment is not shown in figure 1.

4 Adjustment of the mast controls the pitch of the implement. Specifying the mast adjustment to be provided enables the tractor designer to determine the minimum acceptable adjustment of the length of the top link in relation to the points of attachment of the linkage. It also permits the implement designer to determine the range of operating

depths of the implement over which pitch adjustment can be obtained.

**3.2.23 torsional free float distance:** Vertical distance that either of the lower hitch points can move free relative to the other to allow the implement to roll, with lower links initially horizontal.

**3.2.24 transport pitch:** Pitch reached by the mast when lifted to standard transport height from a position with horizontal lower links and vertical mast.

**3.2.25 horizontal convergence distance:** Horizontal distance from the lower hitch points to the point of convergence of the lower links when the lower links are horizontal and laterally symmetrical, seen in a plan view (see figure A.1).



**3.2.26 vertical convergence distance:** Horizontal distance from the lower hitch points to the point of convergence formed in the vertical longitudinal plane by the top link and the lower links (see figure A.1).

## 4 Tractor

### 4.1 Dimensions

Dimensions apply to the tractor equipped with the normal range of tyre sizes as recommended by the tractor manufacturer.

#### 4.1.1 Hitch points

The dimensions concerning the hitch points shall be as given in figures 3 and 4, and table 2.

#### 4.1.2 Upper link point

Upper link point arrangements shall be provided so that transport pitches of  $-3^\circ$  to  $+3^\circ$  and  $+10^\circ$  to  $+15^\circ$  can be achieved with the standard mast height.

#### 4.1.3 Torsional free float

Torsional free float shall be provided at a distance as given in table 3. It shall be possible to block the torsional free float.

### 4.1.4 Lift, movement range and levelling adjustments

The ranges of lift, movement range and levelling adjustment shall be as specified in table 3.

### 4.1.5 Convergence distances

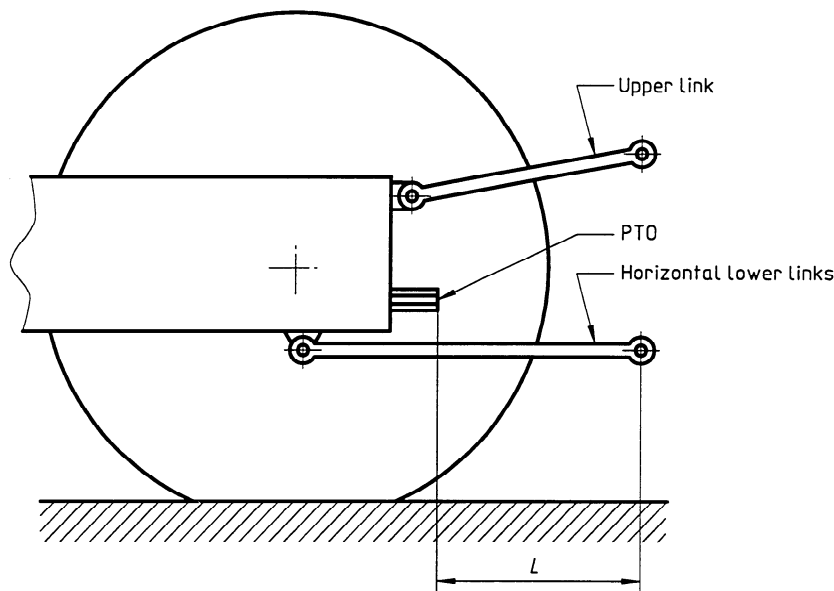
See annex A.

### 4.2 Restriction of transport height

Tractors shall have means by which the operator can easily restrict the transport height by, for example an adjustable stop, particularly to avoid damage to the PTO-shafts of the machine.

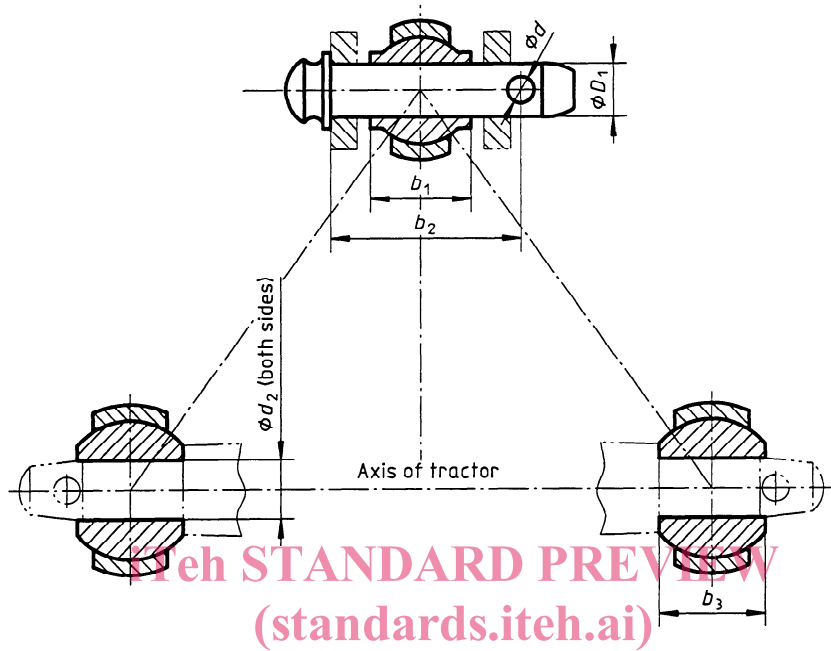
### 4.3 Interchangeability

Provisions shall be made in the design of the lower links, or by the use of double-ended hitch attachments, to enable implements based on the dimensions of category 1 to be fitted to linkages made in accordance with category 2 or vice versa. The same applies in the case of categories 2 and 3.

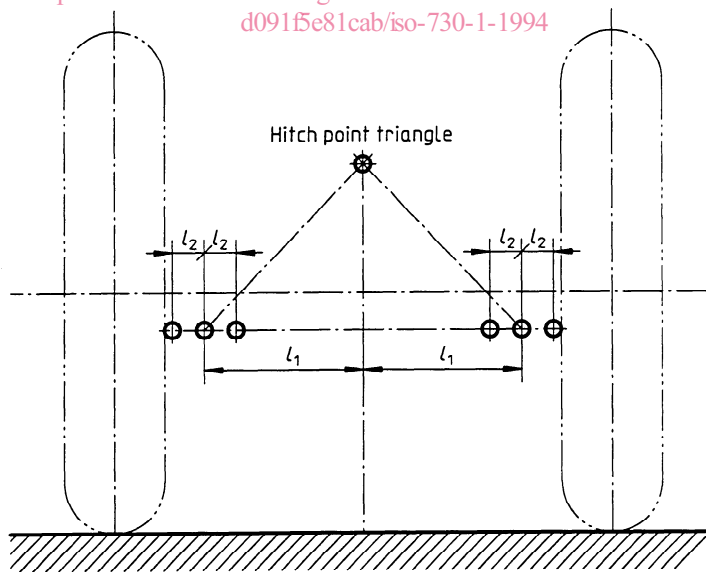


NOTE — Dimension  $L$  is given in table 2.

Figure 3 — Distance from PTO to lower link points



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NOTE — Dimensions are given in table 2, except  $d$ , in table 4.

**Figure 4 — Dimensions concerning tractor hitch points**

**Table 2 — Dimensions concerning tractor hitch points**

Dimensions in millimetres

Dimension	Description	See figure	Category				
			1	2	3	4L	4H
<b>Upper hitch points</b>							
$D_1$	Diameter of hitch pin	4	19 $\begin{smallmatrix} 0 \\ -0,08 \end{smallmatrix}$	25,5 $\begin{smallmatrix} 0 \\ -0,13 \end{smallmatrix}$	31,75 $\begin{smallmatrix} 0 \\ -0,2 \end{smallmatrix}$	45 $\begin{smallmatrix} 0 \\ -0,8 \end{smallmatrix}$	45 $\begin{smallmatrix} 0 \\ -0,8 \end{smallmatrix}$
$b_1$	Width of ball	4	44 max.	51 max.	51 max.	64 max.	64 max.
$b_2$	Linch pin hole distance	4	76 min.	93 min.	102 min.	140 min.	140 min.
<b>Lower hitch points</b>							
$d_2$	Diameter of hitch pin hole	4	22,4 $\begin{smallmatrix} +0,25 \\ 0 \end{smallmatrix}$	28,7 $\begin{smallmatrix} +0,3 \\ 0 \end{smallmatrix}$	37,4 $\begin{smallmatrix} +0,35 \\ 0 \end{smallmatrix}$	51 $\begin{smallmatrix} +0,5 \\ 0 \end{smallmatrix}$	51 $\begin{smallmatrix} +0,5 \\ 0 \end{smallmatrix}$
$b_3$	Width of ball	4	35 $\begin{smallmatrix} 0 \\ -0,2 \end{smallmatrix}$	45 $\begin{smallmatrix} 0 \\ -0,2 \end{smallmatrix}$	45 $\begin{smallmatrix} 0 \\ -0,2 \end{smallmatrix}$	57,5 $\begin{smallmatrix} 0 \\ -0,5 \end{smallmatrix}$	57,5 $\begin{smallmatrix} 0 \\ -0,5 \end{smallmatrix}$
$l_1$	Lateral distance from lower hitch point to centreline of tractor <sup>1)</sup>	4	359	435	505	610 or 612	610 or 612
$l_2$	Lateral movement of lower hitch point	4	100 min.	125 min.	125 min.	130 min.	130 min.
$L$	Distance from end of power take-off to centre of lower hitch point, with the lower link horizontal <sup>2) 3)</sup>	3	500 to 575	550 to 625	575 to 675	575 to 675	610 to 670
<p>1) It may be necessary to vary these dimensions in the case of specialized implements. Where a shorter distance between the lower hitch points appears necessary, the following values are preferred:</p> <p>218 mm for category 1;                      364 mm for category 2;                      435 mm for category 3;                      489 mm for category 4.</p> <p>2) If a three-point hitch coupler is used, dimension <math>L</math> may be shortened accordingly, so that the distance between PTO and power input connection (PIC) remains the same.</p> <p>3) Dimensions apply only to nominal diameter [1] 35 mm PTO-shafts and shall be increased by 100 mm if a nominal diameter [1] 45 mm PTO-shaft is used.</p>							

**Table 3 — Lift, movement range and levelling adjustments**

Dimensions in millimetres

Definition	Subclause	Category				
		1	2	3	4L	4H
Lower hitch point height	3.2.14	200 max.	200 max.	230 max.	230 max.	230 max.
Levelling adjustment	3.2.15	100 min.	100 min.	125 min.	150 min.	150 min.
Movement range	3.2.18	610 min.	650 max. <sup>1)</sup>	735 min.	760 min.	900 min.
Transport height point (lower point axis to be horizontal throughout)	3.2.19	820 min.	950 min.	1 065 min.	1 200 min.	1 200 min.
Lower hitch point clearance	3.2.20	100 min.	100 min.	100 min.	100 min.	100 min.
Mast adjustment height	3.2.22					
highest position		508 min.	610 min.	660 min.	710 min.	710 min.
lowest position		200 max.	200 max.	230 max.	255 max.	255 max.
Torsional free float	3.2.23	60 min.	60 min.	75 min.	75 min.	75 min.
1) For tractors with PTO power above 65 kW, this dimension shall be 700 mm minimum.						