
International Standard



2057

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Agricultural tractors — Remote control hydraulic cylinders for trailed implements

Tracteurs agricoles — Vérins de commande hydraulique des instruments traînés

Second edition — 1981-11-15

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Descriptors : agricultural machinery, tractors, central equipment, hydraulic cylinders, specifications, dimensions.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2057 was drawn up by Technical Committee ISO/TC 23, *Agricultural tractors and machinery*, and circulated to the member bodies in September 1973.

It has been approved by the member bodies of the following countries:

| | | |
|---------------------|---------------|-----------------------|
| Australia | Germany, F.R. | Portugal |
| Austria | Hungary | Romania |
| Belgium | India | South Africa, Rep. of |
| Bulgaria | Iran | Spain |
| Canada | Ireland | Sweden |
| Chile | Italy | Switzerland |
| Denmark | Japan | Thailand |
| Egypt, Arab Rep. of | Netherlands | Turkey |
| Finland | New Zealand | United Kingdom |
| France | Poland | USA |

No member body expressed disapproval of the document.

This second edition cancels and replaces the first edition (i.e. ISO 2057-1975). It differs from the latter only by the deletion of the values in inches and some editorial changes.

Agricultural tractors — Remote control hydraulic cylinders for trailed implements

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1 Scope and field of application

This International Standard gives the specifications and dimensions for the assembly and clearances common to hydraulically operated cylinders and to trailing-type farm implements.

The specifications given permit

- the interchangeability of hydraulic operation between tractors equipped with a cylinder and trailing-type implements designed for this purpose, the tractor possessing enough power at its draw-bar to operate the implement;
- the transference of the hydraulic cylinder from one implement to another.

This International Standard applies to three categories of agricultural tractors, as follows :

| Category | Maximum power at the draw-bar |
|----------|-------------------------------|
| 1 | Up to 35 kW |
| 2 | 30 to 75 kW |
| 3 | Over 70 kW |

2 References

ISO 500, *Agricultural tractors — Power take-off and draw-bar — Specification.*

ISO 730/1, *Agricultural wheeled tractors — Three-point linkage — Part 1 : Categories 1, 2 and 3.*

ISO 789/1, *Agricultural tractors — Test procedure — Part 1 : Power tests.*

3 Definitions

3.1 moving end : The yoke of the piston rod.

3.2 anchor end : The closed end of the cylinder.

3.3 attaching pins : Removable pins in the yokes for attaching the cylinder to the implement.

4 Classification and rating

Minimum thrust capacity (extending stroke of the moving end) shall be based on the calculated piston area and on a pressure of 80 % of the relief valve setting.

Implements requiring a cylinder thrust of more than 80 kN shall be provided with 400 mm stroke cylinders.

Table 1 — General characteristics

| Category | Length of stroke | Minimum thrust per kilowatt at the draw-bar | Spherical radius to front attaching pin* |
|----------|---------------------|---------------------------------------------|------------------------------------------|
| | mm | | |
| 1 | 200 + $\frac{5}{0}$ | 924 | 1 500 |
| 2 | 200 + $\frac{5}{0}$ | 924 | 2 100 |
| 3 | 200 + $\frac{5}{0}$ | 924 | 2 500 |
| | 400 + $\frac{5}{0}$ | 924 | 2 500 |

* See figures 5 and 6.

5 Dimensional characteristics

5.1 Hydraulic cylinders

Diagram of clearances and indication of cylinder dimensions :
see figure 2.

Table 2 – Clearance measurements of cylinders
Dimensions in millimetres

| Dimension | Dimensional characteristics | 200 mm stroke | 400 mm stroke |
|---------------|------------------------------------------------------|---------------|---------------|
| Length | | | |
| <i>a</i> | — between pin centre lines, extended (maximum) | 721 | 1 210 |
| <i>b</i> | — between pin centre lines, retracted (minimum) | 514 | 800 |
| <i>c</i> | — overall, extended | 785 | 1 280 |
| <i>d</i> | — anchor pin centre lines to cylinder body | 32 | 32 |
| <i>e</i> | — cylinder end flange | 64 | 89 |
| <i>f</i> | — cylinder body | 394 | 670 |
| <i>g</i> | — moving end pin centre lines to stop mechanism | 114 | 270 |
| <i>h</i> | — moving end pin centre lines to stop collar | 76 | 76 |
| Width | | | |
| <i>j</i> | — overall, stop mechanism | 217 | 241 |
| <i>k</i> | — yoke | 114 | 114 |
| <i>m</i> | — cylinder end flange (diameter) | 152 | 178 |
| <i>n</i> | — cylinder outside diameter | 127 | 152 |
| <i>p</i> | — for pin removal only | 114 | 114 |
| Height | | | |
| <i>q</i> | — overall, cylinder end flange | 190,5 | 216 |
| <i>r</i> | — overall, cylinder body | 178 | 203 |
| <i>s</i> | — stop mechanism | 60 | 60 |
| <i>t</i> | — moving end centre line to bottom of stop mechanism | 30 | 30 |
| <i>u</i> | — yoke | 89 | 89 |
| <i>x</i> | — moving end centre line to bottom of yoke | 38 | 38 |
| <i>y</i> | — stop collar (diameter) | 102 | 102 |

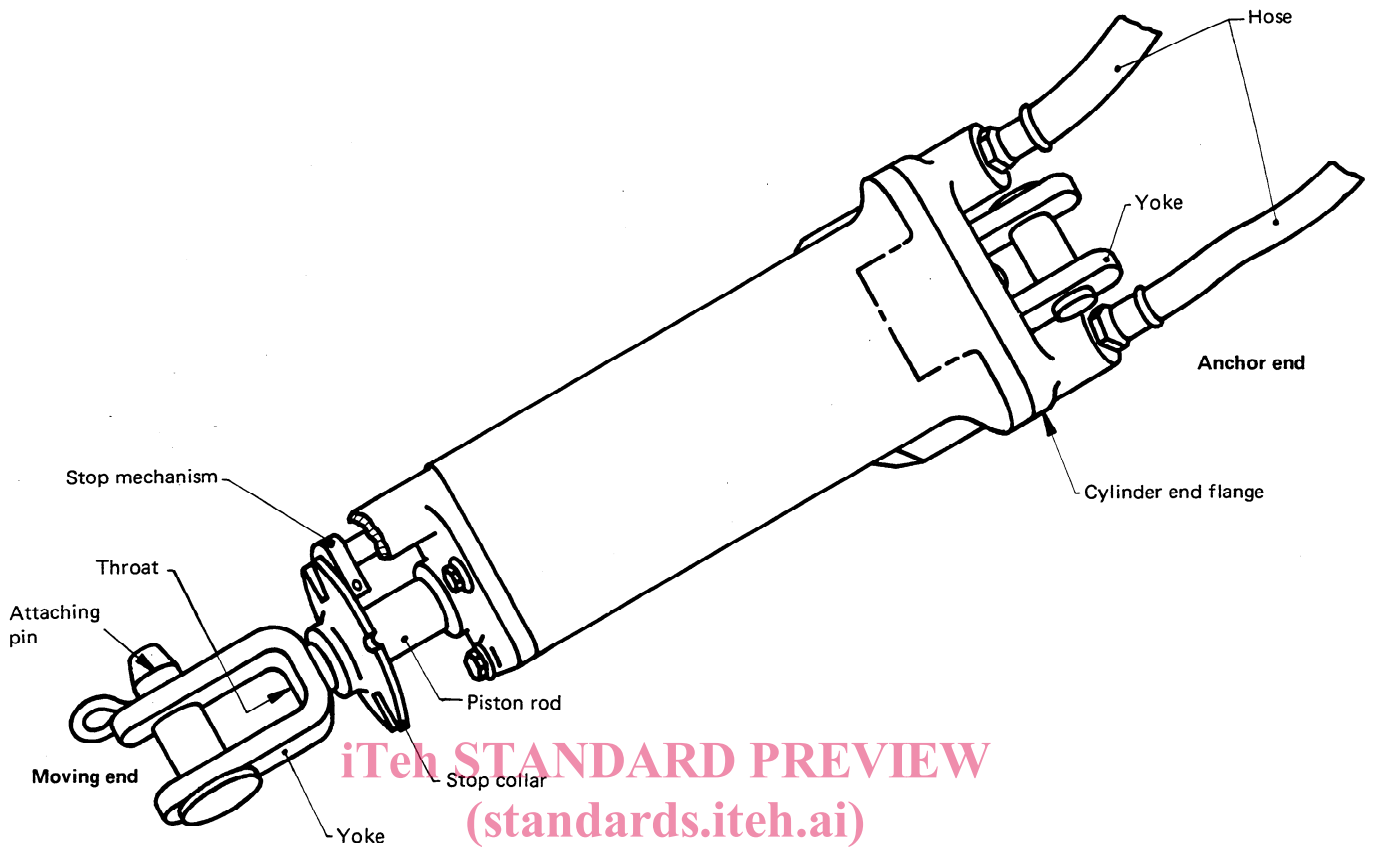


Figure 1 – Hydraulic cylinder – General view

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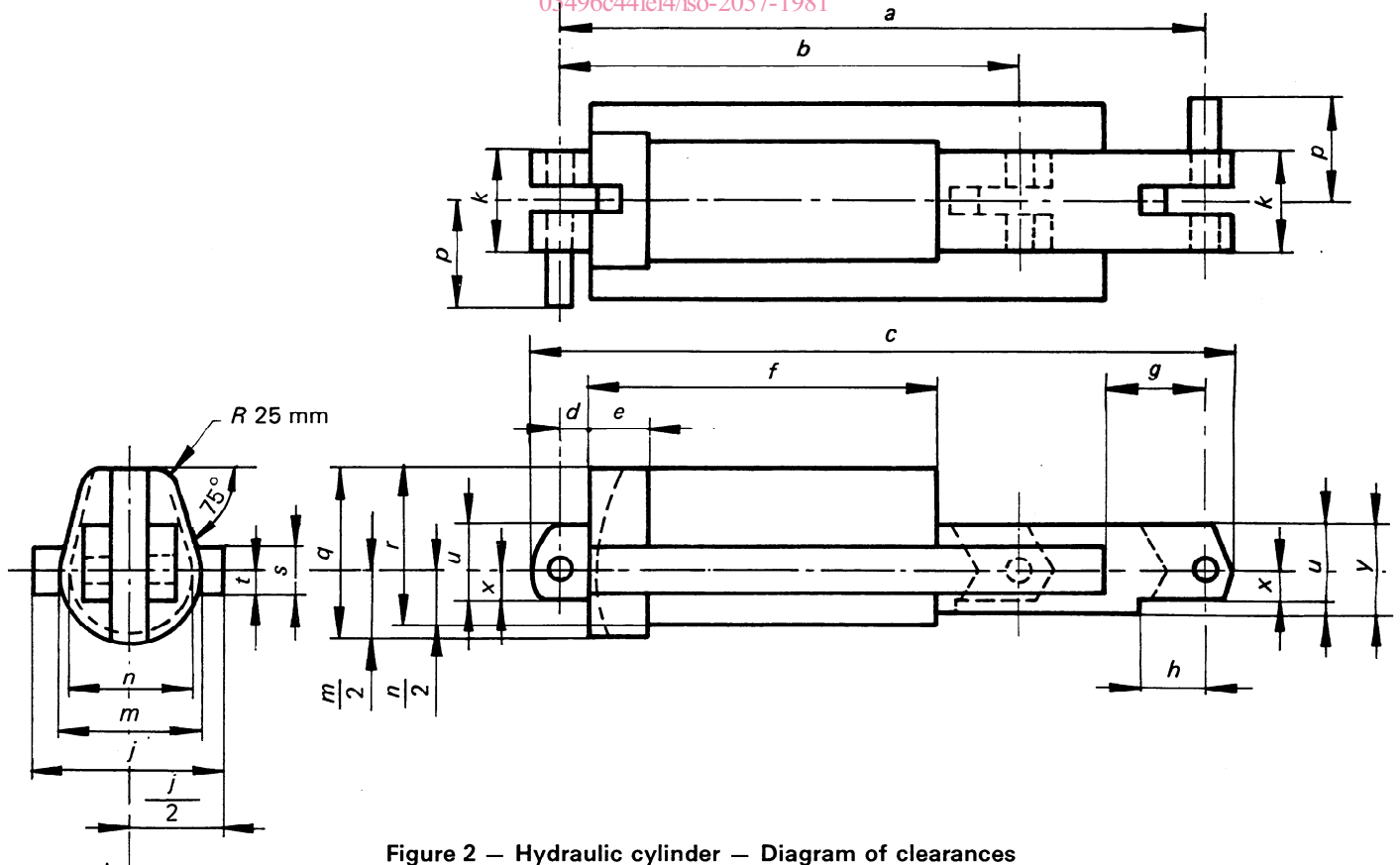


Figure 2 – Hydraulic cylinder – Diagram of clearances

5.2 Yokes

Diagram of clearances and indication of anchor end dimensions : see figure 3.

Diagram of clearances and indication of moving end dimensions : see figure 4.

Table 3 — Clearance measurements of yokes
Dimensions in millimetres

| Dimension | Dimensional characteristics | 200 mm stroke | 400 mm stroke |
|-----------|--------------------------------------------------------------------|---------------|---------------|
| A | Yoke throat clearance | | |
| | — minimum | 27,0 | 27,0 |
| | — maximum | 28,5 | 28,5 |
| B | Thickness of bar cleared | | |
| | — maximum | 26,0 | 26,0 |
| | — minimum recommended | 22,0 | 22,0 |
| C | Pin diameter | | |
| | — nominal | 25,0 | 31,75 |
| | — maximum | 25,0 | 31,75 |
| D | Length, pin centre line to end of yoke (maximum) | 32,0 | 35,0 |
| E | Length, pin centre line to bottom of throat (minimum) (anchor end) | 41,0 | 45,0 |
| F | Radius of yoke end (moving end) | 32,0 | 35,0 |
| G | Radius of throat clearance (moving end) | 35,0 | 41,0 |
| H | Length, pin centre line to bottom of throat (minimum) (moving end) | 41,0 | 57,0 |
| J | Radius of yoke end (anchor end) | 66,5 | 66,5 |
| K | Radius of throat clearance (anchor end) | 35,0 | 38,0 |
| L | Clearance angle (moving end) | 30° | 35° |
| M | Pin hole diameter (minimum) | 25,5 | 32,0 |

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5.3 Length of hoses for hydraulic control

The hose length shall be sufficient for the cylinder to be operated at a distance when the front attaching pin is positioned in accordance with the dimensions in table 1.

5.3.1 For tractors with a power take-off, the disengagement area around the power take-off and the position of the draw-bar shall be in accordance with ISO 500 (see figure 5).

5.3.2 For an implement coupled to the tractor by means of a three-point linkage as specified in ISO 730/1, the maximum spherical radius (which determines the position of the front anchor pin on the implement) shall be measured from a point situated in the horizontal plane between the two lower coupling points and at 178 mm ahead of them, the two lower bars being horizontal (see figure 6).

5.3.3 For implements coupled to a tractor by means of a three-point linkage as specified in ISO 730/1, the length of the hoses attached to the hydraulic cylinder shall permit moving the implement 100 mm rearward.

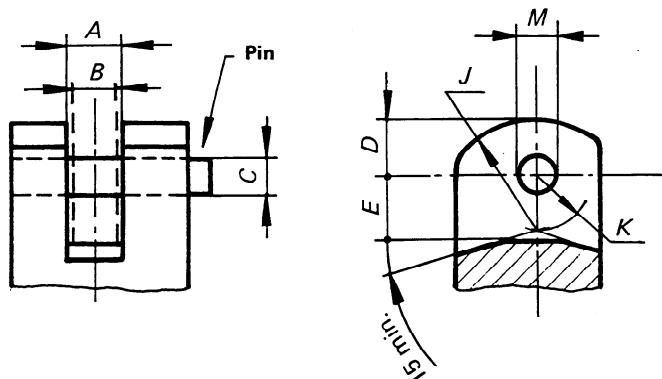


Figure 3 — Anchor end — Diagram of yoke clearances

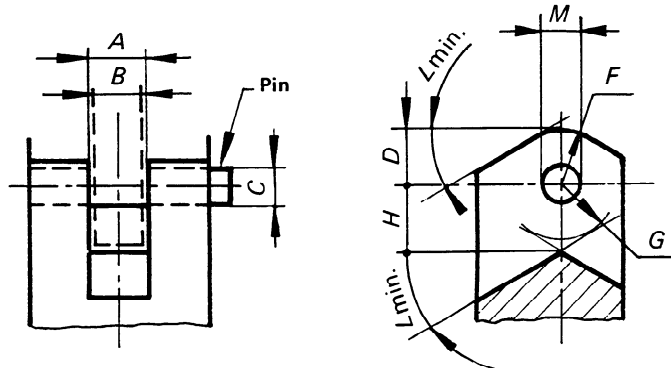


Figure 4 — Moving end — Diagram of yoke clearances

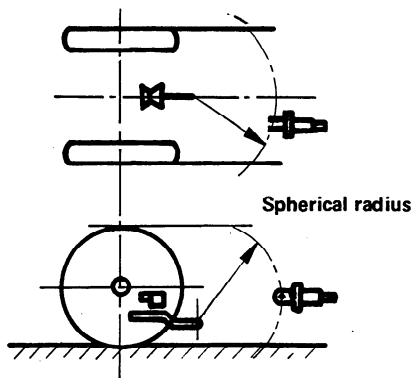


Figure 5 – Coupling of tractors to implements –
Diagram of the length of the hoses

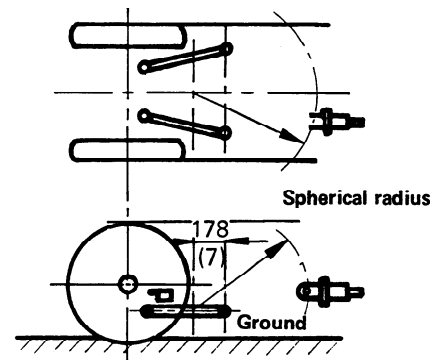


Figure 6 – Three-point hitch implements –
Diagram of the length of the hoses

6 Other specifications

6.1 Both single and double acting cylinders shall operate to raise the implement on their extending stroke.

6.2 Variable stroke control, necessary in the application of hydraulic control to some implements, shall be incorporated in the cylinder or hydraulic system and applied to the retracting stroke. Provision shall be made on the implement to accommodate the fully extended moving end.

6.3 Operating time, at maximum full load engine speed (see ISO 789/1), for moving end extension, shall be 1,5 to 2,5 s for categories 1 and 2, and 3 to 4 s for category 3.

6.4 Hose support, as required for remote cylinder hose, shall be considered a part of the implement.

6.5 Hose connections to cylinders shall be such that the hose does not interfere with bars extending through the yoke on either end of the cylinder.

6.6 Attaching pins shall be considered a part of the cylinder. They shall be easily removed and attached.

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