
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

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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	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	U.S.A.

No Member Body expressed disapproval of the document.

Agricultural tractors – Remote control hydraulic cylinders for trailed implements

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/R 500, *Power take-off and draw-bar for agricultural tractors.*

ISO 730, *Agricultural wheeled tractors – Three-point linkage.*¹⁾

ISO/R 789, *Test code for agricultural tractors.*

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 (18 000 lbf) shall be provided with 400 mm (16 in) 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	in	N	lbf	mm	in
1	200 ⁺⁵ / ₀	8 ^{+0.125} / ₀	924	204	1 500	60
2	200 ⁺⁵ / ₀	8 ^{+0.125} / ₀	924	204	2 100	84
3	200 ⁺⁵ / ₀	8 ^{+0.125} / ₀	924	204	2 500	96
	400 ⁺⁵ / ₀	16 ^{+0.125} / ₀	924	204	2 500	96

* See figures 5 and 6.

1) At present at the stage of draft. (Revision of ISO/R 730-1968.)

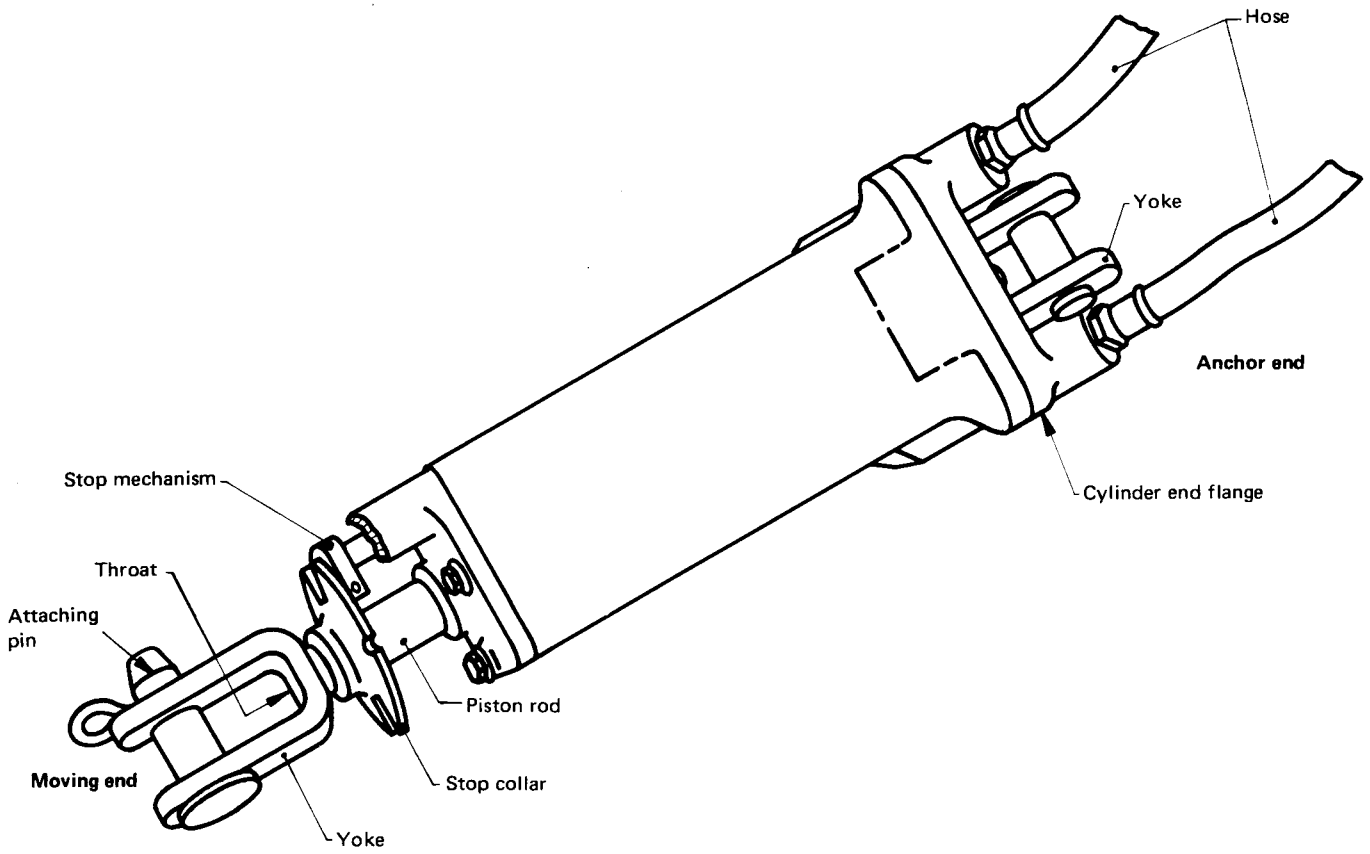


FIGURE 1 – Hydraulic cylinder – General view

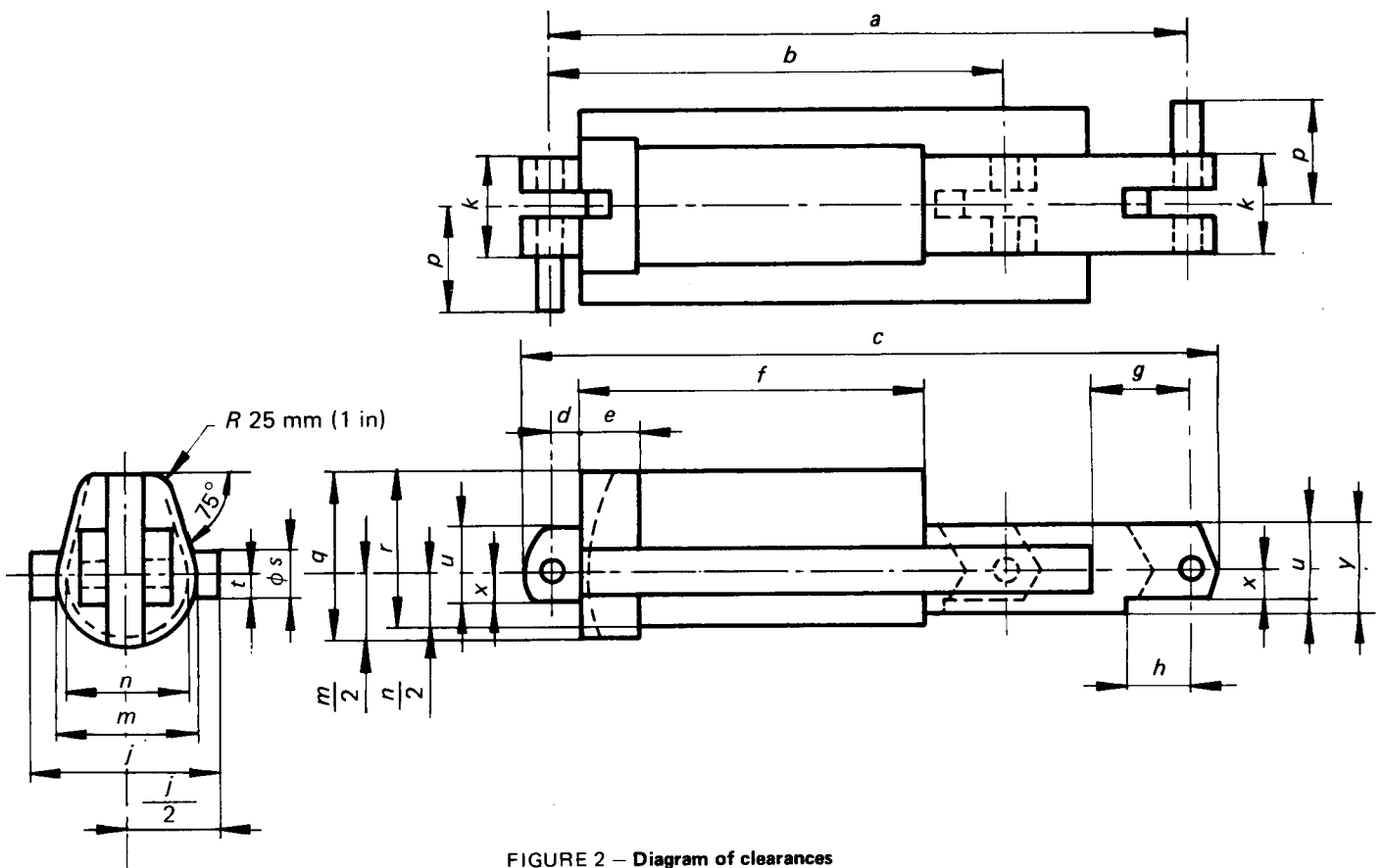


FIGURE 2 – Diagram of clearances

5 DIMENSIONAL CHARACTERISTICS

5.1 Hydraulic cylinder

Diagram of clearances (see figure 2).

TABLE 2 – Clearance measurements of the cylinder

Reference figure 2	Dimensional characteristics	200 mm (8 in) stroke		400 mm (16 in) stroke	
		mm	in	mm	in
	LENGTH				
<i>a</i>	– between pin centre lines, extended (maximum) . . .	721	28.38	1 210	47.62
<i>b</i>	– between pin centre lines, retracted (minimum) . . .	514	20.25	800	31.50
<i>c</i>	– overall, extended	785	30.88	1 280	50.38
<i>d</i>	– anchor pin centre lines to cylinder body	32	1.25	32	1.25
<i>e</i>	– cylinder end flange	64	2.50	89	3.50
<i>f</i>	– cylinder body	394	15.50	670	26.38
<i>g</i>	– moving end pin centre lines to stop mechanism . . .	114	4.50	270	10.62
<i>h</i>	– moving end pin centre lines to stop collar	76	3.00	76	3.00
	WIDTH				
<i>j</i>	– overall, stop mechanism	217	8.56	241	9.50
<i>k</i>	– yoke	114	4.50	114	4.50
<i>m</i>	– cylinder end flange (diameter)	152	6.00	178	7.00
<i>n</i>	– cylinder outside diameter	127	5.00	152	6.00
<i>p</i>	– for pin removal only	114	4.50	114	4.50
	HEIGHT				
<i>q</i>	– overall, cylinder end flange	190	7.50	216	8.50
<i>r</i>	– overall, cylinder body	178	7.00	203	8.00
<i>s</i>	– stop mechanism	60	2.38	60	2.38
<i>t</i>	– moving end centre line to bottom of stop mechanism	30	1.19	30	1.19
<i>u</i>	– yoke	89	3.50	89	3.50
<i>x</i>	– moving end centre line to bottom of yoke	38	1.50	38	1.50
<i>y</i>	– stop collar (diameter)	102	4.00	102	4.00

5.2 Yokes

YOKE CLEARANCES

Anchor end : see figure 3.

Moving end : see figure 4.

TABLE 3 – Clearance measurements of yokes

Reference figures 3 and 4	Dimensional characteristics	200 mm (8 in) stroke		400 mm (16 in) stroke	
		mm	in	mm	in
A	Yoke throat clearance, minimum	27,0	1.06	27,0	1.06
	maximum	28,5	1.12	28,5	1.12
B	Thickness of bar cleared, maximum	26,0	1.02	26,0	1.02
	minimum recommended	22,0	0.86	22,0	0.86
C	Pin diameter, nominal	25,0	1.000	31,75	1.250
	maximum	25,0	1.005	31,75	1.255
D	Length, pin centre line to end of yoke (maximum)	32,0	1.25	35,0	1.38
E	Length, pin centre line to bottom of throat (minimum) (anchor end)	41,0	1.62	45,0	1.75
F	Radius of yoke end (moving end)	32,0	1.25	35,0	1.38
G	Radius of throat clearance (moving end)	35	1.38	41,0	1.62
H	Length, pin centre line to bottom of throat (minimum) (moving end)	41	1.62	57,0	2.25
J	Radius of yoke end (anchor end)	66,5	2.62	66,5	2.62
K	Radius of throat clearance (anchor end)	35,0	1.38	38,0	1.50
L	Clearance angle (moving end)	30°		35°	
M	Pin hole diameter (minimum)	25,5	1.01	32	1.26

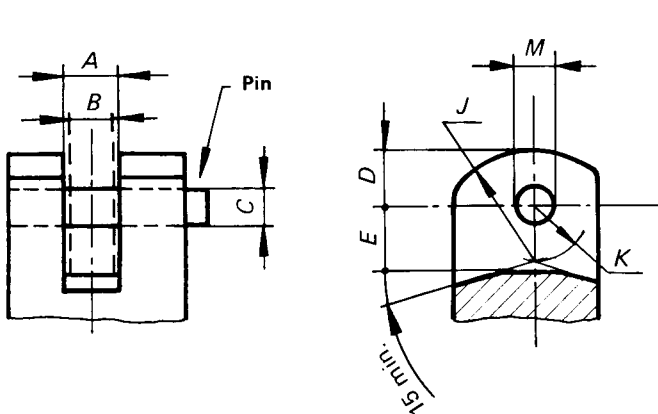


FIGURE 3 – Yoke clearances – Anchor end

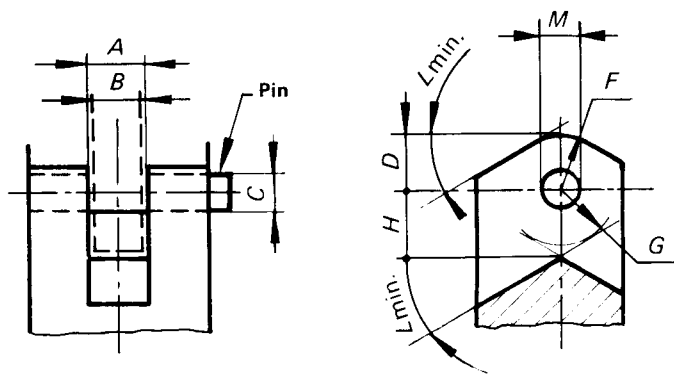


FIGURE 4 – Yoke clearances – Moving end

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/R 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, 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 (7 in) 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 (ISO 730) and a quick coupler (ISO...¹⁾) the length of the hoses attached to the hydraulic cylinder shall permit moving the implement 100 mm (4 in) rearward.

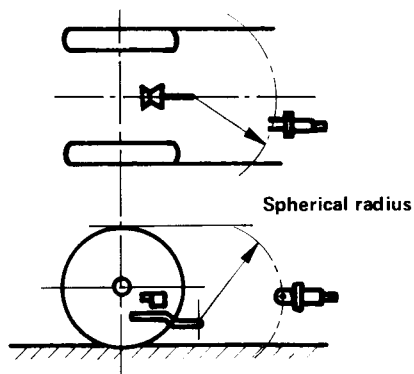


FIGURE 5 – Diagram of the length of the hoses for the coupling of tractors to implements

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/R 789), 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.

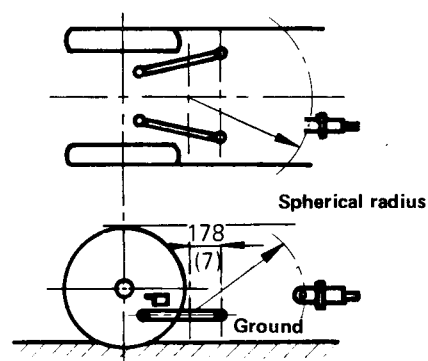


FIGURE 6 – Diagram of the length of the hoses for three-point hitch implements

1) In preparation