# International Standard 5670

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

# Agricultural trailers — Single-acting telescopic tipping cylinders — 25 MPa (250 bar) series — Types 1, 2 and 3 — Interchangeability dimensions

*Remorques agricoles — Vérins de bennage télescopiques à simple effet — Série* 25 MPa (250 bar) *— Types 1, 2 et 3 — Dimensions d'interchangeabilité*



**First edition — 1984-06-15**



**UDC 621.226 : 631.372** **Ref. No. ISO 5670-1984 (E)**

**Descriptors** : agricultural machinery, trailers, agricultural trailers, agricultural tippers, hydraulic equipment, hydraulic cylinders, classifications, interchangeability, dimensions.

Price based on 5 pages

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (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 authorized 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 5670 was developed by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, and was circulated to the member bodies in November 1982.





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

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# Agricultural trailers — Single-acting telescopic tipping cylinders — 25 MPa (250 bar) series — Types 1, 2 and 3 — Interchangeability dimensions

## 0 Introduction

The aim of this International Standard is to facilitate future projects by simplifying the design, manufacture and stocking of cylinders, reducing replacement costs and increasing the possibilities of interchangeability.



## 1 Scope

This International Standard lays down dimensional characteristics and specifies the test pressure of the types of hydraulic tipping cylinders currently used on agricultural tippers, in order to provide a reasonably limited range from which manufacturers may choose a suitable cylinder to meet current and projected requirements.

## 2 Field of application

This International Standard covers single-acting telescopic hydraulic cylinders for use at a pressure of 25 MPa (250 bar), intended for use exclusively on agricultural trailer tippers.

## 3 References

ISO 228/1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1 : Designation, dimensions and tolerances.*

ISO 965/2, *ISO general purpose metric screw threads — Tolerances — Part 2 : Limits of sizes for general purpose bolt and nut threads — Medium quality.*

ISO 3320, *Fluid power systems and components — Cylinder bores and piston rod diameters — Metric series.*

ISO 6149, *Fluid power systems and components — Metric ports — Dimensions and design.*

## 4 Definitions

**4.1 single-acting cylinder** : A cylinder which provides a positive linear extension movement with a powered stroke.

**4.2 single-acting telescopic cylinder** : A single-acting cylinder which provides positive linear movement obtained in successive stages by a powered stroke in extension.

## 5 Classification

The cylinders are divided into three types : type 1, type 2, type 3; depending on their construction, method of attachment to the trailer and geometric configuration.

Type 1 cylinders are of two stage construction only; types 2 and 3 may be of two or three stage construction.

## 6 Dimensional requirements

### 6.1 Type 1 cylinders

Type 1 cylinders shall in general be constructed in accordance with figure 1 and with the dimensions and tolerances laid down in table 1.

### 6.2 Type 2 cylinders

Type 2 cylinders shall in general be constructed in accordance with figure 2 and with the dimensions and tolerances laid down in table 2.

### 6.3 Type 3 cylinders

Type 3 cylinders shall in general be constructed in accordance with figure 3 and with the dimensions and tolerances laid down in table 3.

## 7 Pressure rating

### 7.1 Service pressure

The cylinder shall be designed for a maximum service pressure of 25 MPa (250 bar).

### 7.2 Test pressure

Every cylinder shall withstand a test pressure equal to 1,5 times the maximum service pressure.

## 8 Oil feed orifice

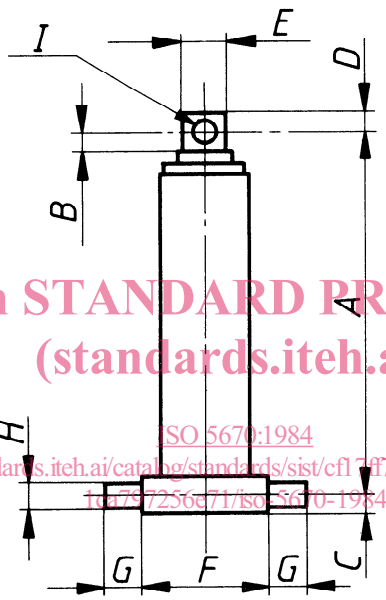
The oil feed orifice shall comply with one of the two dimensions given in 8.1 or 8.2.

### 8.1 Gas thread

The thread shall be G 3/8, in accordance with ISO 228/1.

### 8.2 Metric thread

The thread shall be M18 × 1,5, in accordance with ISO 965/2 and ISO 6149.






$A$ = Effective closed length
$B$ = Cylinder head clearance
$C$ = Length beyond mounting centre — cylinder casing
$D$ = Length beyond mounting centre — piston rod
$E$ = Piston rod diameter, i.e. the effective diameter at the point of attachment of the cylinder assembly to the vehicle (see ISO 3320)
$F$ = Pivot pin separation
$G$ = Pivot pin length
$H$ = Pivot pin diameter
$I$ = Diameter of hole in piston rod for attachment of cylinder assembly to vehicle.

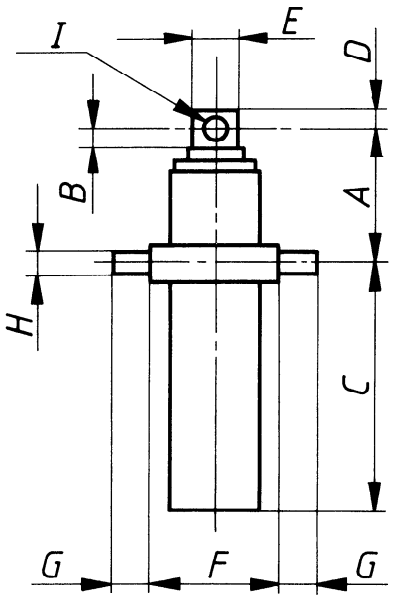
**Figure 1 — Type 1 cylinders**

**Table 1 — Dimensional requirements of type 1 cylinders**

Dimensions in millimetres

| Designation[1] | Stroke(s) min. | $A$ max. | $B$ min. | $C$ max. | $D$ max. | $E$ + 5 − 5 | $F$ 0 − 5 | $G$ min. | $H$ d10 | $I$ H12 |
|---|---|---|---|---|---|---|---|---|---|---|
| **70 × 90** | 900 | 670 | 37 | 25 | 28 | 70 | 130 | 45 | 45 | 37 |
| **90 × 110** | 900<br>1 050<br>1 200 | 690<br>765<br>840 | 37 | 25 | 28 | 90 | 160 | 45 | 45 | 37 |
| **110 × 130** | 1 050<br>1 200<br>1 350<br>1 500 | 800<br>875<br>950<br>1 025 | 52 | 30 | 35 | 110 | 180 | 50 | 50 | 52 |

1) The designation is purely for reference purposes. The figures in this column do not relate to dimensional requirements.






$A$ = Effective closed length
$B$ = Cylinder head clearance
$C$ = Length beyond mounting centre — cylinder casing
$D$ = Length beyond mounting centre — piston rod
$E$ = Piston rod diameter, i.e. the effective diameter at the point of attachment of the cylinder assembly to the vehicle (see ISO 3320)
$F$ = Pivot pin separation
$G$ = Pivot pin length
$H$ = Pivot pin diameter
$I$ = Diameter of hole in piston rod for attachment of cylinder assembly to vehicle.



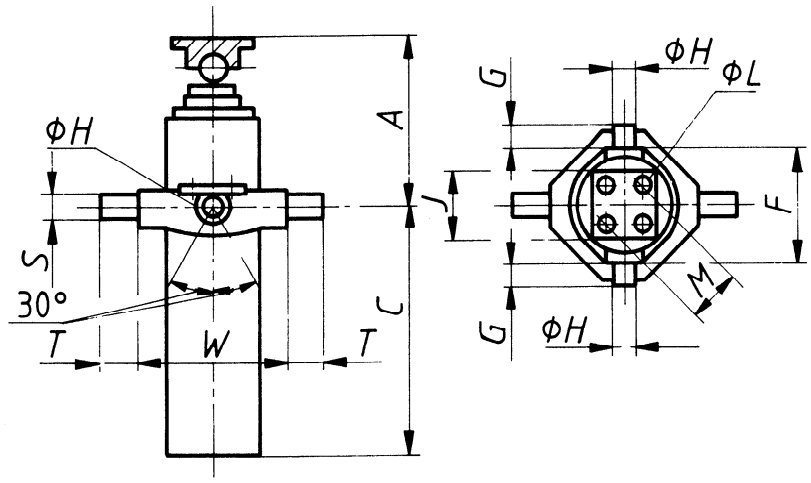
**Figure 2 — Type 2 cylinders**

**Table 2 — Dimensional requirements of type 2 cylinders**

Dimensions in millimetres

| Designation[1] | Stroke(s) min. | $A$ max. | $B$ min. | $C$ max. | $D$ max. | $E$ + 5 − 5 | $F$ 0 − 5 | $G$ min. | $H$ d10 | $I$ H12 |
|---|---|---|---|---|---|---|---|---|---|---|
| **70 × 90** | 900 | 250 | 37 | 425 | 28 | 70 | 155 | 45 | 45 | 37 |
| **90 × 110** | 900<br>1 050<br>1 200 | 250 | 37 | 465<br>540<br>615 | 28 | 90 | 170 | 45 | 45 | 37 |
| **110 × 130** | 1 050<br>1 200<br>1 350<br>1 500 | 250 | 52 | 580<br>655<br>730<br>805 | 35 | 110 | 185 | 50 | 50 | 52 |
| **70 × 90 × 110** | 900<br>1 050<br>1 200<br>1 350<br>1 500 | 300 | 37 | 280<br>330<br>380<br>430<br>480 | 28 | 70 | 170 | 45 | 45 | 37 |
| **90 × 110 × 130** | 1 200<br>1 350<br>1 500<br>1 700<br>2 000 | 300 | 52 | 420<br>470<br>520<br>570<br>630 | 35 | 90 | 185 | 50 | 50 | 52 |

1) The designation is purely for reference purposes. The figures in this column do not relate to dimensional requirements.




**Cylinder**



$A$ = Effective closed length
$C$ = Length beyond mounting centre — cylinder casing
$F$ = Pivot pin separation
$G$ = Pivot pin length
$H$ = Pivot pin diameter



**Attachment flange**

$J$ = Side length of flange face
$L$ = Diameter of mounting holes
$M$ = Pitch circle diameter

**Optional trunnion mounting**

$S$ = Pivot pin diameter
$T$ = Pivot pin length
$W$ = Pivot pin separation

**Figure 3 — Type 3 cylinders**

**Table 3 — Dimensional requirements of type 3 cylinders**

Dimensions in millimetres

| Designation[1] | Stroke(s) min. | *A* max. | *C* max. | *F* 0 − 5 | *G* min. | *H* d10 | *J*[2) 3)] max. | *L*[4)] H11 | *M*[4)] | *S*[5)] d10 | *T* d10 | *W* 0 − 5 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **70 × 90** | 900 | 275 | 460 | 155 | 45 | 45 | 125 | 14,5 | 125 | 45 | 45 | 230 |
| **90 × 110** | 900<br>1 050<br>1 200 | 275<br>275<br>275 | 480<br>555<br>630 | 170 | 45 | 45 | 125 | 14,5 | 125 | 45 | 45 | 230 |
| **110 × 130** | 1 050<br>1 200<br>1 350<br>1 500 | 315<br>315<br>315<br>315 | 540<br>615<br>690<br>765 | 185 | 50 | 50 | 125 | 14,5 | 125 | 50 | 50 | 280 |
| **70 × 90 × 110** | 900<br>1 050<br>1 200<br>1 350<br>1 500 | 280<br>280<br>280<br>280<br>280 | 340<br>390<br>440<br>490<br>540 | 170 | 45 | 45 | 125 | 14,5 | 125 | 45 | 45 | 230 |
| **90 × 110 × 130** | 1 200<br>1 350<br>1 500<br>1 700<br>2 000 | 340<br>340<br>340<br>340<br>340 | 405<br>455<br>505<br>555<br>645 | 185 | 50 | 50 | 125 | 14,5 | 125 | 50 | 50 | 280 |

1) The designation is purely for reference purposes. The figures in this column do not relate to dimensional requirements.

2) The flange face shall be contained wholly within the square of side length *J*.

3) The attachment of the flange to the cylinder piston rod shall be so as to permit the flange face to articulate at least 30° in any plane from its nominal position perpendicular to the axis of the cylinder.

4) There shall be four mounting holes equally spaced on a pitch circle of diameter *M*, nominally located on the diagonals of the square flange face and within 0,2 mm of the true position.

5) The design and method of mounting the trunnion shall be such that the axis of pins reference *S* can articulate at least ± 30° from its nominal position perpendicular to the axis of the cylinder.

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