
कृषि ट्रैक्टर — रियर-माउंटेड पावर टेक ऑफ
के प्रकार 1, 2, 3 और 4
भाग 2 संकीर्ण-ट्रैक ट्रैक्टर, मास्टर शील्ड और
क्लीयरेंस ज़ोन के लिए आयाम
(ISO 500-2 : 2004, संशोधित)
(चौथा पुनरीक्षण)

**Agricultural Tractors — Rear-
Mounted Power Take-off Types 1, 2,
3 and 4**

**Part 2 Narrow-Track Tractors,
Dimensions for Master Shield and
Clearance Zone**

(ISO 500-2 : 2004, MOD)

(*Fourth Revision*)

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NATIONAL FOREWORD

This Indian Standard (Part 2) (Fourth Revision) which is a modified adoption of ISO 500-2 : 2014 'Agricultural tractors — Rear-mounted power take-off types 1, 2, 3 and 4 — Part 2: Narrow-track tractors, dimensions for master shield and clearance zone' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Agricultural Machinery and Equipment Sectional Committee and approval of the Food and Agriculture Division Council.

IS 4931 was first published in 1968 and subsequently revised in 1977 and 1984. In the third revision in 1995, the standard was aligned with corresponding ISO standard, ISO 500 : 1991 and the tolerance on diameter of shaft profile of Type 1 PTO shaft, requirements of hardness, location of PTO and dimension of master shield were modified. Also, the safety requirements as per IS 12219 (Part 1) : 1988 'Guide for safety and comfort of operator of agricultural tractors and power tillers Part 1: General requirements' and alternate clearance zone were included.

Subsequently, ISO 500 was revised in 2004 splitting it into three parts under the general title 'Agricultural tractors — Rear-mounted power take-off types 1, 2, and 3'. Further, Part 1 and Part 3 were revised in 2014 with the revision of the general title as 'Agricultural tractors — Rear-mounted power take-off types 1, 2, 3 and 4'. In this fourth revision of IS 4931, the Indian Standard is also being split into three parts as given below:

Part 1 General specifications, safety requirements, dimensions for master shield and clearance zone

Part 2 Narrow-track tractors, dimensions for master shield and clearance zone

Part 3 Main PTO dimensions and spline dimensions, location of PTO

The text of ISO standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'; and
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this standard, 4.2 of ISO 500-1 : 2004 has been modified to align with national practices and particular need of the tractor industry in order to increase the acceptance of the standard in the country. The technical deviation is as under:

<i>Clause/Sub clause of the standard</i>	<i>Modifications from ISO</i>	<i>Justification</i>
4.2	Substitute the following for the existing text under 4.2 : 'The direction of PTO rotation shall be clockwise when viewed from behind the tractor except when a ground-driven PTO is operated with the tractor in reverse direction. However, manufacturer may provide PTO rotation in anticlockwise direction (when viewed from behind the tractor) for special application requirements.'	Provision of ground-driven PTO is kept considering the A-2 categories of higher horsepower (hp) narrow tractors. Reverse PTO option is extensively used in India in threshing/rotavation etc, operations for cleaning the machines.

In this adopted standard, reference appears to the following International Standards for which Indian Standards also exist. The corresponding Indian Standards, which is to be substituted in their respective place, is listed below along with its degree of equivalence for the edition indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 6489-1 Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 1: Dimensions of hitch-hooks	IS 12362 (Part 1) : 2007/ISO 6489-1 : 2001 Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 1: Dimensions of hitch-hooks (<i>second revision</i>)	Identical
ISO 500-1 Agricultural tractors — Rear-mounted power take-off types 1, 2, 3 and 4 — Part 1: General specifications, safety requirements, dimensions for master shield and clearance zone	IS 4931 (Part 1) : 2024 (ISO 500-1 : 2014, MOD) Agricultural tractors — Rear-mounted power take-off types 1, 2 3 and 4 — Part 1: General specifications, safety requirements, dimensions for master shield and clearance zone (<i>fourth revision</i>)	Modified
ISO 5673-2 Agricultural tractors and machinery — Power take-off drive shafts and power-input connection — Part 2: Specification for use of PTO drive shafts, and position and clearance of PTO drive line and PIC for various attachments	IS 10318 (Part 2) : 2021/ISO 5673-2 : 2005 Agricultural tractors and machinery — Power take-off drive shafts and power-input connection — Part 2: Specification for use of PTO drive shafts, and position and clearance of PTO drive line and PIC for various attachments (<i>second revision</i>)	Identical

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 6489-3 Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 3: Tractor drawbar	IS 12362 (Part 3) : 2023/ISO 6489-3 : 2021 Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 3: Tractor drawbar (<i>second revision</i>)	Identical

The technical Committee has reviewed the provisions of the following International Standards referred in this adopted standard and has decided that these are acceptable for use in conjunction with this standard.

<i>International Standard</i>	<i>Title</i>
ISO 789-1 : 2018	Agricultural tractors — Test procedures — Part 1: Power tests for power take-off
ISO 6489-2 : 2002	Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 2: Specifications for clevis coupling 40
ISO 6489-4 : 2004	Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 4: Dimensions of piton-type coupling
ISO 24347 : 2019	Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball coupling device (80 mm)

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

**AGRICULTURAL TRACTORS — REAR-MOUNTED POWER
TAKE-OFF TYPES 1,2 AND 3
PART 2 NARROW-TRACK TRACTORS, DIMENSIONS FOR MASTER
SHIELD AND CLEARANCE ZONE**

(*Fourth Revision*)

1 Scope

This part of ISO 500 specifies the dimensions of the master shield and clearance zones for rear-mounted power take-offs (PTO) of types 1 and 2 on narrow-track (track width 1 150 mm or less) agricultural tractors.

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 500-1:2004, *Agricultural tractors — Rear-mounted power take-off types 1, 2 and 3 — Part 1: General specifications, safety requirements, dimensions for master shield and clearance zone*

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

ISO 5673-2, *Agricultural tractors and machinery — Power take-off drive shafts and power-input connection — Part 2: Specification for use of PTO drive shafts, and position and clearance of PTO drive line and PIC for different attachments¹⁾*

ISO 6489-1, *Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 1: Dimensions of hitch-hooks*

ISO 6489-2, *Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 2: Specifications for clevis coupling 40*

ISO 6489-3, *Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 3: Tractor drawbar*

ISO 6489-4, *Agricultural vehicles — Mechanical connections between towed and towing vehicles — Part 4: Dimensions of piton-type coupling*

ISO 24347, *Agricultural vehicles — Mechanical connections between towed and towing vehicles — Dimensions of ball-type coupling device (80 mm)²⁾*

1) To be published. (Revision of ISO 5673:1993)

2) To be published.

3 Terms and definitions

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

3.1

power take-off shaft

PTO

external shaft on the rear of the tractor to provide rotational power to implements

[ISO 500-1:2004, definition 3.1]

3.2

type A tractor

agricultural tractor with a fixed or adjustable minimum track width on at least one axle of 950 mm or less and tractor PTO power of less than 20 kW as determined in accordance with ISO 789-1

3.3

type B tractor

agricultural tractor with a fixed or adjustable minimum track width on at least one axle of more than 950 mm but not more than 1 150 mm

4 Specifications

- 4.1 The tractor rear PTO shall be of type 1 or type 2, according to ISO 500-1.
- 4.2 The direction of PTO rotation shall be clockwise when viewed from behind the tractor.
- 4.3 The nominal PTO rated rotational frequency may be realized by one or more engine speed ranges.

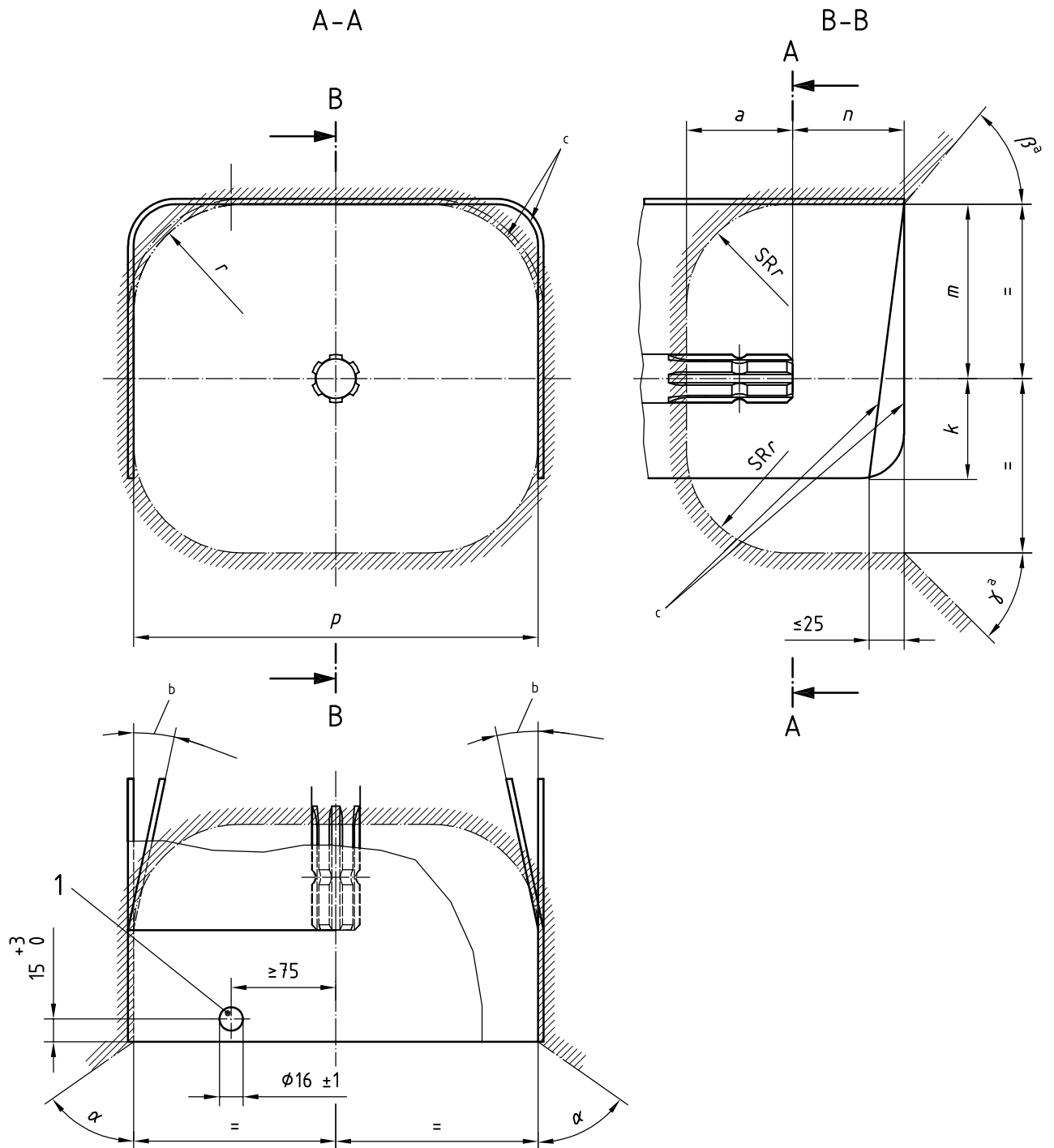
5 General requirements

Safety and PTO speed requirements shall be according to ISO 500-1.

6 Dimensions for tractor master shield aperture and clearance zone of PTO

The tractor master shield aperture and the clearance zone around the PTO shall be in accordance with Figure 1 and Table 1.

Dimensions in millimetres



Key

- 1 hole for coupling up the restraining member of the PTO drive shaft guard preventing guard rotation
- clearance zone
- master shield aperture

a The clearance may be restricted by movable and/or detachable devices. The clearance zone on towing vehicles shall be in accordance with ISO 6489, ISO 5673-2 and ISO 24347.

b Angle optional under consideration of clearance zone.

c Shape optional.

Figure 1 — Tractor master shield aperture and clearance zone around PTO

Table 1 — Tractor master shield controlling dimensions for the aperture and dimensions for clearance zone

Dimension (see Figure 1)	PTO types 1 and 2	
	Tractor type A	Tractor type B
a min.	76 mm	76 mm
α min.	60°	60°
β min.	50°	50°
γ min.	45°	45°
SR _r max.	76 mm	76 mm
k min.	70 mm	70 mm
m $\begin{smallmatrix} +20 \\ -5 \end{smallmatrix}$	110 mm	110 mm
n $\begin{smallmatrix} +5 \\ -20 \end{smallmatrix}$	80 mm	80 mm
p	180 mm + 120 mm ^a	220 mm + 80 mm ^a
r max.	76 mm	76 mm

^a If $p \leq 250$ mm, the master shield should be partly or completely movable to facilitate coupling and uncoupling the PTO drive shaft (see ISO 500-1:2004, 6.2).

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Amendments Issued Since Publication

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