

FINALISED DRAFT

AUTOMOTIVE INDUSTRY STANDARD

**Agricultural Tractors –Rear Mounted Power
Take off Types 1, 2 and 3**

ARAI

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CHECK LIST FOR PREPARING AUTOMOTIVE INDUSTRY STANDARD

AIS-108: Agricultural Tractors –Rear Mounted Power Take off Types 1, 2 and 3

SR. NO.	PARTICULARS	REMARKS
1.	Indicate details of the base reference standard. (eg. ECE / EEC Directive/GTR etc.)	86/297/EEC
2.	Add an explanatory note indicating differences between the above standard and the draft, if any.	none
3.	Specify details of technical specifications to be submitted at the time of type approval relevant to the requirements of this standard covered.	Table-1
4.	Are the details of Worst Case Criteria covered?	NA
5.	Are the performance requirements covered?	NA
6.	Is there a need to specify dimensional requirements?	Yes.
7.	If yes, are they covered?	Yes, Covered under Table-1
8.	Is there a need to specify COP requirements? If yes, are they covered?	NA
9.	Is there a need to specify type approval and routine test separately, as in the case of some of the Indian Standards? If yes, are they covered?	NA
10.	If the standard is for a part/component or sub-system; i) AIS-037 or ISI marking scheme be implemented for this part? ii) Are there any requirements to be covered for this part when fitted on the vehicle? If yes, has a separate standard been prepared?	NA
11.	If the standard is intended for replacing or revising an already notified standard, are transitory provisions for re-certification of already certified parts/vehicles by comparing the previous test result, certain additional test, etc. required? If yes, are they included?	No
12.	Include details of any other international or foreign national standards which could be considered as alternate standard.	NA

13.	Are the details of accuracy and least counts of test equipment/meters required to be specified? If yes, have they been included?	NA
14.	What are the test equipments for establishing compliance?	Dimensions measuring devices
15.	If possible, identify such facilities available in India.	ARAI, CFMT&TI, ICAT, CIRT
16.	Are there any points on which special comments or information is to be invited from members? If yes, are they identified?	No
17.	Does the scope of standard clearly identify vehicle categories?	Yes
18.	Has the clarity of definitions been examined?	Yes
19.	Recommendation for implementation	From April-2014

Status chart of the Standard to be used by the purchaser for updating the record

Sr. No.	Corrigenda	Amendment	Revision	Date	Remark	Misc.

General Remarks :

INTRODUCTION

The Government of India felt the need for a permanent agency to expedite the publication of standards and development of test facilities in parallel when the work on the preparation of the standards is going on, as the development of improved safety critical parts can be undertaken only after the publication of the standard and commissioning of test facilities. To this end, the erstwhile Ministry of Surface Transport (MOST) has constituted a permanent Automotive Industry Standard Committee (AISC) vide order No. RT-11028/11/97-MVL dated September 15, 1997. The standards prepared by AISC will be approved by the permanent CMVR Technical Standing Committee (CTSC). After approval, the Automotive Research Association of India, (ARAI), Pune, being the secretariat of the AIS Committee, will publish this standard.

(Para to be included)

The Automotive Industry Standards Committee responsible for preparation of this standard is given in Annex : 1 **(To be included)**.

Agricultural Tractors –Rear Mounted Power Take off
Types 1, 2 and 3
(Base Council Directive 86/297/EEC)

1. DEFINITION AND SCOPE

- 1.1 ‘**Power take off**’ (PTO) means the projecting part of the tractor drive shaft which transmits motion to a machine.
- 1.2 The provisions of this AIS shall apply only to power take-offs as defined in 1.1 and located at rear of the tractor. However, section 3.2 below shall apply only to the tractors with a minimum fixed or adjustable track at one of the drive axles of at least 1150 mm.

2. TYPES OF POWER TAKE OFF

- 2.1 The characteristics of PTO’s must be one of the types as described in table:1

Table 1

Type	Nominal Diameter (mm)	Number of splines	Nominal PTO rotation speed rpm (‘)
1.	35	6	540 and /or 1000
2.	35	21 Involute Serrations	
3.	45	20 Involute Serrations	

(‘) Except PTO whose rotation speed is linked to the tractor’s ground speed

- 2.2 It must be possible to maintain the rotation speed of the PTO by suitable means
- 2.3 Should more than one ratio between the engine speed & the PTO rotation speed be provided any change in ratio must be perceptible. In addition, specific design measures must be taken to ensure that unintentional changes of ratio – in particular changing to a higher rotation speed – can not occur. This Safety device must operate each time the PTO is engaged.
- 2.4 Means must be provided by which the selected PTO rotation speed is clearly indicated at all times.

3. DESIGN AND POSITIONING REQUIREMENTS

- 3.1 Direction of rotation of the rear PTO
Clockwise when PTO is observed in the direction of travel of the tractor

- 3.2 Zone of clearance around the PTO
 The PTO zone of clearance must be in conformity with the drawings in Fig. 1 and the dimensions in Table 2.

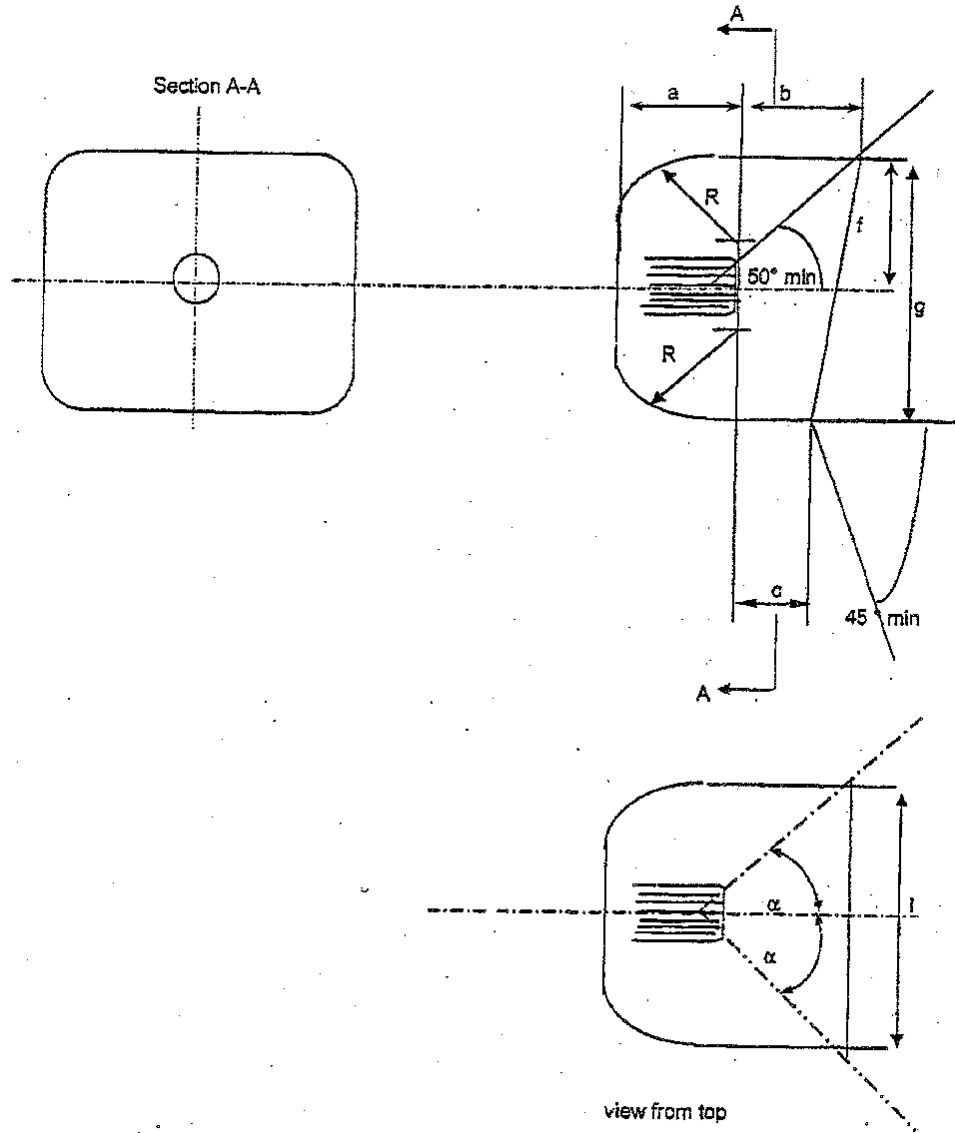


Fig.1
Zone of clearance around PTO

Table 2

Type	a min	b max	c max	f min	g min	i min	R Spheric max	α min
1	76	80	60	120	240	280	76	55°
2								
3	89	100	65	145	290	295	89	51°

3.3 Protection of PTO's

3.3.1 *Protection*

3.3.1.1 The power take off must be protected by a guard mounted on the tractor which covers at least the top part and the two sides of the PTO as shown in fig.2 below, or by other means providing a similar degree of protection such as location of the PTO in a recess that is part of the tractor or is formed by a separate part (tow hook mounts, coupling cover etc.)

3.3.1.2 The dimensions of the protective guard are laid down, as a function of the type of PTO. In table 3 below

3.3.1.3 An additional non rotating protective device which fully covers the PTO must also be supplied with the tractor to protect the PTO when the latter is not in use.

3.3.2 *Characteristics of Protective guards*

3.3.2.1 The protective guard must be designed so as not to impede (or in order to facilitate) the use and maintenance of the tractor.

It must be possible to carry out maintenance operations without removing the protective guards.

3.3.2.2 The materials used must be able to withstand bad weather, must retain their mechanical properties in cold/hot weather and must be sufficiently sturdy.

3.3.2.3 The protective guard must have no points or sharp edges; it must contain no orifices exceeding 8 mm diameter or side of a square or rectangle other than that necessary for attaching the chain of the protective device for the universal joint drive shaft and must be able to bear a weight of 120daN, unless it is designed in such a way that it can not be used as a step.

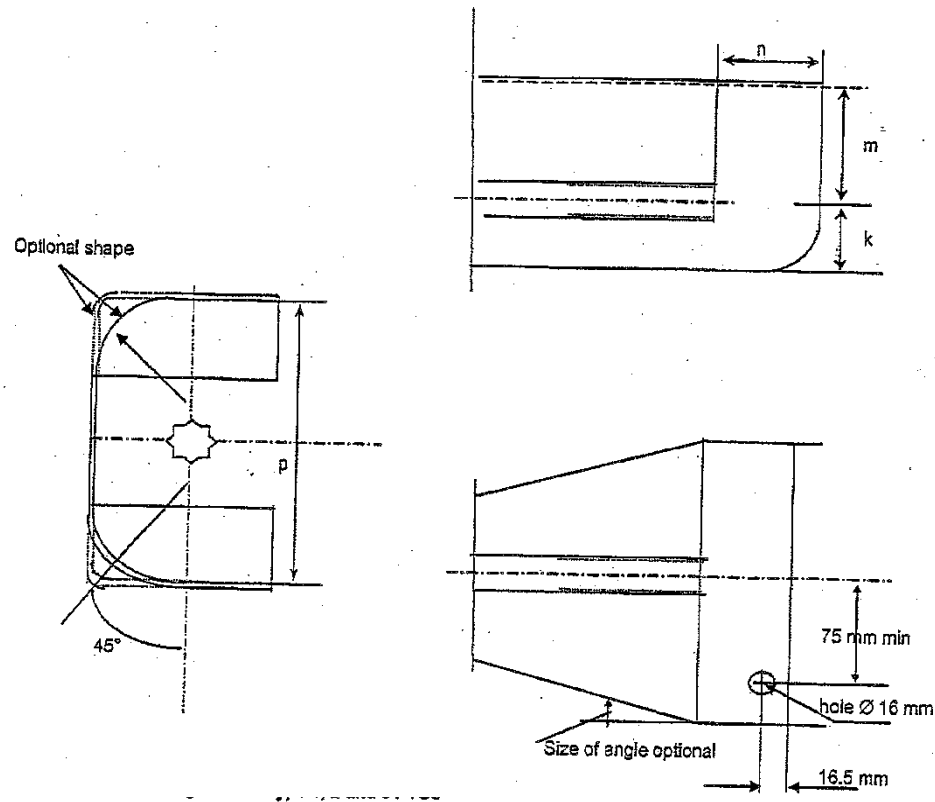


Fig.2
Protective guard for type 1,2 and 3 PTOs

Table 3

Type	Dimensions of protective guard (°) mm			
	k (min)	m ± 5	n ± 5	p ± 5
1	70	125	85	285
2	70	125	85	285
3	80	150	100	355

(°) In the case of tractors having two rear PTO shafts, the dimensions m and / or p may be adjusted in order to maintain equivalent clearance areas between the shafts and the protective guard.

Annex : 1
Committee of composition
(To be included)