भारतीय मानक

कृषि ट्रैक्टर एवं मशीनरी — सार्वजनिक मार्गों पर यात्रा के लिए प्रकाशीय युक्तियाँ

Indian Standard

AGRICULTURAL TRACTORS AND MACHINERY — LIGHTING DEVICES FOR TRAVEL ON PUBLIC ROADS

ICS 65.060.10; 43.040.20

BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

June 1999

Price Group 2

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards after the draft finalized by the Agricultural Tractors and Power Tillers Sectional Committee had been approved by the Food and Agriculture Division Council.

In the preparation of this standard due consideration has been given to *Central Motor Vehicles Act,* 1988 and Rules framed thereunder, and Safety Standard (SS-15) of Automotive Research Association of India. However, it is subject to restrictions imposed under these as amended from time to time wherever applicable.

In preparation of this Indian Standard considerable assistance has been derived from ASAE (*American Society of Agricultural Engineers*) Standard, S 279.9 July 1993.

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 shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. 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 AND MACHINERY — LIGHTING DEVICES FOR TRAVEL ON PUBLIC ROADS

1 SCOPE

1.1 This standard provides specifications for lighting of agricultural tractors and farm equipment whenever such equipment is operated or traveling on a highway.

2 REFERENCES

The Indian Standards listed below contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated:

IS No.	*Title*
3563 : 1993	Automobile headlights (replaceable lamp type) (*first revision*)
3628 : 1966	Sidelights, tail-lights, parking lights, stop lights and direction indicators for automobile use
4060 : 1994	Flashers for direction indicators for automobiles (*first revision*)
8213 : 1987	Agricultural trailer (*second revision*)
13135 : 1991	Automotive vehicles — Electronic flashers

3 DEFINITIONS

3.1 Highway

The entire width between the boundary lines of every way publicly maintained, when any part thereof is open to the use of the public for purposes of vehicular travel.

3.2 Reflex Reflectors

An assembly ready for use and comprising one or more reflecting optical units. Reflectors shall be visible at night from all distances within 31 m to 183 m when directly in front of lawful lower beams of headlamps.

3.3 Lamp Location

Dimensions in this standard, unless specified otherwise, are based on measurements to the lamp filament.

3.4 Head Light

Illuminating light of a vehicle intended to illuminate the road ahead.

3.5 Stop Light

A brake operated lighting device which emits red or amber light at the rear of the vehicle intended to give warning of the slowing down or the stopping of the vehicle.

3.6 Direction Indicator

A lighting device to show in which direction, the driver intends to turn by giving a flashing light on the side of the vehicle towards which the turn will be made.

3.7 Tail Light

A lighting device which emits red light indicating the presence of the vehicle when seen from the rear and intended to show the width.

3.8 Parking Light

A lighting device showing a white or amber light to the front and a red light to the rear to give warning of the presence of the vehicle when parked.

3.9 Flood Light Lamp

A lamp projecting a general flood pattern of light to provide illumination close to the machine over a sufficient area.

3.10 Reversing Light

A device used to provide a warning signal to pedestrians and other drivers, when the vehicle is reversing or is about to reverse. The light shall be white in colour.

4 LIGHTING REQUIREMENTS

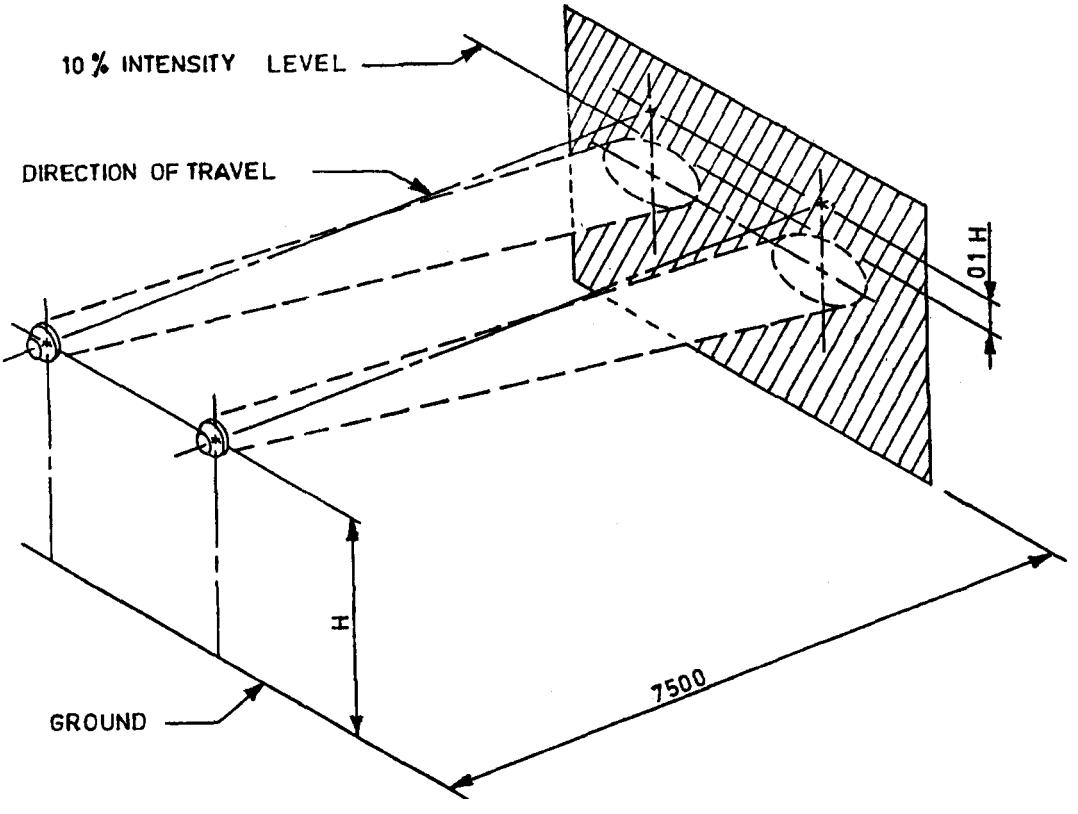
4.1 Lighting of Tractors and Self-Propelled Machines

4.1.1 At least two headlamps generally conforming to IS 3563, mounted at the same height not exceeding 1 600 mm above the ground to the centre of the head lamp and spaced laterally as widely as practicable. Headlamps or the low beams of headlamps, if so equipped, shall be aligned such that when measured at a distance of 7.5 m from the lamp, the horizontal

line separating the upper edge of the lighted zone (line at which the intensity is decreased to 10 percent or less of the peak intensity) is 0.1 × H minimum below the center of the lamp, where H is the height of the lamp from the ground. The headlamp beams shall be centered laterally (*see* Fig. 1). Flood lamps or general service lamps shall be aimed downward to provide illumination close to the machine and shall not project rearward.

to keep this figure (that is 1 500 mm). The height of warning lamp may be raised to 1 800 mm.

4.1.3.1 On machines over 4 metre wide, at least two amber flashing warning lamps conforming to IS 4060 or IS 13135, visible from front and rear shall be provided. The lamps shall be placed a minimum of 1 m high and within 400 mm of the lateral extremities of the machine, and shall flash in unison with warning lamps described



All dimensions in millimetres.

FIG. 1 ILLUSTRATION OF HEADLAMP AIMING PROCEDURE

4.1.2 Every tractor shall be provided with two tail lights of red colour at the rear and conforming to IS 3628. The point on the illuminating surface farthest from the median longitudinal plane of tractor shall be not more than 400 mm from the extreme outer edge of the vehicle. The distance between the inner edge of the two illuminating surface shall be not less than 600 mm. This distance may be reduced to 400 mm, where the overall width of the vehicle is less than 1 300 mm. The height of tail lights above the ground shall not be less than 350 mm and not more than 1 600 mm.

4.1.3 At least two amber flashing warning lamps conforming to IS 4060 or IS 13135 as symmetrically mounted and as widely spaced laterally as practicable, visible from both front and rear, mounted at least 1 000 mm height but not more than 1 500 mm. Lamps shall flash in unison at a rate of 60 to 120 flashes per minute. If structure of the vehicle makes it impossible

in **4.1.3**. The extremity dimension includes such items as dual wheels, wide axles, headers, etc. These lamps may be used in addition to, or in place of, the lamps prescribed in **4.1.3**.

4.1.4 Every tractor or self propelled machine shall be fitted with four turn indicators (Direction indicators) lamps, two on the rear side, two on the front side. The direction indicator shall be of amber colour and shall flash in unison at a rate of 60 to 120 flashes per minute. The light emitted by lamps when in operation shall be clearly visible from both front and rear of the vehicle. The direction indicator shall be so designed and fitted that the operator is aware that it is operating correctly.

4.1.4.1 The rear amber flashing warning lamps may be used as the turn indicators.

4.1.4.2 The height of turn indicators on the front

side shall be between 500 mm to 1 500 mm. If structure of vehicle makes it impossible to keep the figure (that is 1 500 mm) height of turn indicators may be raised to 1 800 mm.

4.1.5 At least two red reflectors visible to the rear and mounted to indicate, as nearly as practicable, the extreme left and extreme right projections. Reflectors may be incorporated as part of lensing in tail lamps described in **4.1.2**.

4.1.6 Two brake operated stop light shall be provided at the rear of the vehicle which emit red light intended to give warning of the slowing down or stopping of the vehicle. The stop lights may be provided as a part of tail lamps.

4.1.7 For operation in the field during night, at least one lamp projecting a general flood pattern of light shall be provided at the rear which shall be aimed downward so as provide to illumination close to the machine over a sufficient area.

4.1.8 Parking lights, two numbers each, showing a white (uncoloured) light at the front and a red light to the rear as widely spaced as practicable, to indicate the width, shall be provided to give warning of the presence of the vehicle when parked. These lights may be provided as part of head lamp at the front and tail lamp at the rear. Parking lights can also be mounted on the mudguards at a height not exceeding 1.6 m visible from front and also from the rear.

4.1.9 Adequate provision shall be made to illuminate the dash board instruments. Provision shall be made to illuminate number plate on rear right hand side with uncoloured light.

4.1.10 One seven-terminal receptacle shall be mounted on the machine and located as shown in Fig. 2. Tractors and self propelled machines not primarily used with agricultural implements described in **4.2.1** and **4.2.2** are excluded. (Examples are small garden and compact utility tractors, self-propelled windrowers, and high clearance sprayers.)

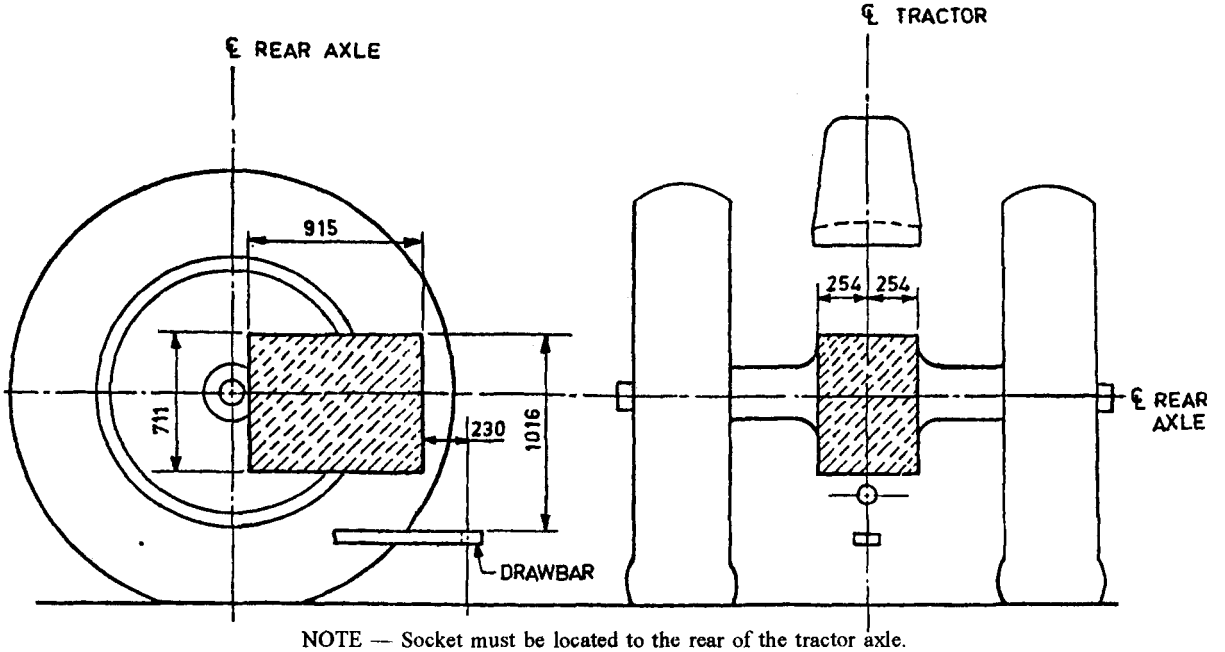
4.1.10.1 As a minimum the receptacle terminal numbers 1, 3, 5 and 6 (ground, flashing and turn signals, and taillights), shall be wired for service.

4.1.10.2 The circuit designations for the breakaway connector defined in **4.1.10** are given in Table 1.

4.1.11 Provisions for lighting of agricultural tractor trailer as given in IS 8213 shall be provided on the tractor. These lights shall be controlled by the tractor operator.

4.2 Lighting of Agricultural Implements

4.2.1 Implements which obscure the effective illumination of any flashing warning lamp or extremity lamp on the propelling machine shall have lighting as described in **4.2.3** and **4.2.4**. If the tail lamps on the propelling machine are obscured, at least one tail lamp conforming IS 3628, shall be mounted to the rear of the implement and positioned to the left of the implement center. If two tail lamps are used, the second shall be placed to the right of the implement centre and should be symmetrical with the left tail lamp location.



NOTE — Socket must be located to the rear of the tractor axle.

All dimensions in millimetres.

FIG. 2 LOCATION ZONE FOR SEVEN-TERMINAL CONNECTOR

Table 1 Tractor Receptacle

(*Clause* 4.1.10.2)

Conductor Identification	Wire Colour	Terminal Number	Circuit
(1)	(2)	(3)	(4)
Wht	White	1	Ground
Blk	Black	2	Work lights
Yel	Yellow	3	Left-hand flashing and turn signals
Red	Red	4	Auxiliary
Grn	Green	5	Right -hand flashing and turn signals
Brn	Brown	6	Tail lamp
Blu	Blue	7	Auxiliary

4.2.2 Implements which are more than 4 m wide or extend over 2 m to the left or right of the centerline and beyond the left or right extremity of the propelling machine, or extend more than 10 m to the rear of the hitch point shall have lighting as described in **4.2.3** and **4.2.4**.

4.2.3 At least two amber flashing warning lamps conforming to IS 4060, visible from front and rear shall be provided. The lamps shall be spaced to within 400 mm of the lateral extremities of the machine, preferably mounted at least 1 m but not over 3 m in height, and shall flash in unison with warning lamps described in **4.1.3**. On non-symmetrical implements extending only to the left or right, such as mouldboard plows or windrowers, one flashing warning lamp shall be provided spaced laterally to within 400 mm of the left or right extremity.

4.2.4 When turn signals are provided on the propelling machine, the amber flashing warning lamps of the implement shall be used as turn indicators as described in **4.1.4**.

4.2.5 A seven-terminal plug shall be provided for operating remote flashing warning lamps, turn indictors, and tail lamp(s). The plug location and cable length shall be compatible with the location of the seven-terminal receptacle on the tractor or selfpropelled machine (*see* **4.1.10**) as shown in Fig. 2.

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

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(*Page* 2, *clause* **4.1.2**, *last sentence*) — Insert the following at the end:

'If the structure of the vehicle makes it impossible to maintain this maximum height (that is 1 600 mm), the height of warning lamps may be raised to 1800 mm.'

(*Page* 2, *clause* **4.1.3**) — Substitute the following for the existing text:

'At least two amber flashing warning lamps conforming to IS 4060 or 13135 symmetrically mounted and as widely spaced laterally as practicable, visible from both front and rear, mounted at least 1 000 mm height but not more than 1 500 mm. If the structure of the vehicle makes it impossible to maintain this maximum height (that is 1 500 mm), the height of warning lamps may be raised to 1 800 mm. Lamps shall flash in unison at a rate of 60 to 120 flashes per minute.'

(*Page* 3, *clause* **4.1.8**, *last sentence*) — Substitute the following for the existing sentence:

'The parking lights can also be mounted on the mudguards at a height not exceeding 1 600 mm. If the structure of the vehicle makes it impossible to maintain this maximum height (that is 1 600 mm), the height of parking light may be raised to 1 800 mm.'

(FAD 32)

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