

AUTOMOTIVE INDUSTRY STANDARD

**Permissible Sound Level at Bystander of
Agricultural and Forestry Tractors –
Method of Measurement**

(Revision 1)

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ON BEHALF OF
AUTOMOTIVE INDUSTRY STANDARDS COMMITTEE

UNDER
CENTRAL MOTOR VEHICLE RULES – TECHNICAL STANDING COMMITTEE

SET-UP BY
MINISTRY OF ROAD TRANSPORT & HIGHWAYS
(DEPARTMENT OF ROAD TRANSPORT & HIGHWAYS)
GOVERNMENT OF INDIA

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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 Standards 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, has published this standard. For better dissemination of this information, ARAI may publish this document on their website.

Presently the method of measurement of permissible sound level at bystander position of Agricultural Tractor is as per AIS 115 Part 2 and is in force. In process of aligning our national standards with ECE regulations/EEC Directives, AIS part 2 is aligned with EEC Directive 74/151/EEC. In line with EEC Directive the requirement of inaccuracies in measuring instrument the result obtained from each measurement shall be determined by deducting 1dB(A) from the meter reading included in this standard.

Further, the directive 74/151/EEC has been repealed by regulation (EU) No. 167/2013 of the parliament and of the council of 5 February 2013 and Commission delegated regulation (EU) 2015/96 of 1 October 2014 supplementing Regulation (EU) No 167/2013. Further, Commission delegated regulation (EU) 2015/96 has been repealed by Commission delegated regulation (EU) 2018/985 of 12 February 2018 supplementing regulation (EU) No 167/2013.

Hence it is proposed to align the text in this standard with latest applicable text as per Annex II of Commission Delegated Regulation (EU) 2018/985.

Limits of noise level will be notified in CMVR separately.

While preparing this standard, considerable assistance has been derived from following National /International standards:

<p>EEC Directive – 74/151/EEC as amended by 82/890/EEC, 88/410/EEC, 97/54/EC, 98/38/EC, 2006/26/EC and corrigendum, OJL 226, 18.8.1976, p.16(74/151/EEC)</p> <p>Annex II of Commission Delegated Regulation (EU) 2018/985</p>	<p>on the approximation of the laws of the Member States relating to certain parts and characteristics of wheeled agricultural tractors</p>
<p>IS: 12180 (Part 2): 2000/ISO 7216: 1992</p>	<p>Tractors and Machinery for Agriculture and Forestry - Noise Measurement -</p>

	Method of Test - Part 2: Noise Emitted When in Motion
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The AISC panel responsible for formulation of this standard is given in Annex I. The Automotive Industry Standards Committee (AISC) responsible for approval of this standard is given in Annex II

**Permissible Sound Level at Bystander of
Agricultural and Forestry Tractors - Method of Measurement**

1.0 SCOPE

This standard specifies a method for measuring the A-weighted sound pressure level of the noise emitted by Agricultural & forestry Tractors & its category as defined in AIS- 053 and IS 14272 as Applicable, while in motion.

2.0 REFERENCES

2.1 AIS-053: Automotive Vehicles – Types – Terminology

2.2 Commission Delegated regulation (EU) 2018/985 of 12 February 2018 supplementing Regulation (EU) No 167/2013 of the European Parliament and of the Council as regards environmental and propulsion unit performance requirements for agricultural and forestry vehicles and their engines and repealing Commission Delegated Regulation (EU) 2015/96.

2.3 IS 14272: Automotive Vehicles – Types – Terminology

3.0 DEFINITIONS

For the purpose of this standard, the following definition shall apply:

3.1 Agricultural & forestry Tractors & its categories as defined in 3.9 of AIS-053 and clause 3.8 of IS 14272.

4.0 MEASURING INSTRUMENTS

The instrumentation system, including the microphones, cables and windscreen shall meet the requirements for a Class 1 instrument laid down in IEC 61672-1:2013. The filters shall meet the requirements for a Class 1 instrument given in IEC 61260:1995.

5.0 CONDITIONS OF MEASUREMENT

5.1 Measurements shall be made on unladen tractors in a sufficiently silent and open area (ambient noise and wind noise at least 10 dB (A) below the external sound level being measured).

5.2 This area may take the form, for instance, of an open space of 50 meter radius having a central part of at least 20 meters radius which is practically level; it may be surfaced with concrete, asphalt, or similar material and may not be covered with powdery snow, tall grass, loose soil or ashes.

5.3 The surface of the test track shall be such as not to cause excessive tyre noise. This condition applies only to measurement of the external sound level made by tractors in motion.

5.4 Meteorological Conditions

The test shall not be carried out in adverse weather conditions which are likely to affect the measurements.

The wind velocity measured at 1.2 m above ground level shall not exceed an average value of 5 m/s average over a 30 s period, or a maximum value of 8 m/s during the test period. For wind speeds in excess of 1 m/s, a microphone windscreen shall be used; appropriate compensation for the effects of its use shall be allowed for in the calibration.

5.5 No person other than the observer taking the readings from the apparatus may remain near the tractor or the microphone, as the presence of spectators near either the tractor or the microphone may considerably affect the readings from the apparatus. Marked fluctuations of the pointer which appear to be unrelated to the characteristics of the general sound level shall be ignored in taking readings.

5.6 Conditions of Tractors

5.6.1 The Tractor being tested shall comply with the manufacturer's specifications and shall be operated in accordance with published instructions. It shall be unladen and unballasted and, except in the case of non-separable machines, be without trailer or semi-trailer.

5.6.2 Immediately before the test, the engine shall be brought to its normal operating temperatures.

5.6.3 If the Tractor is fitted with more than two-wheel drive. It shall be tested in the drive which is intended for normal road use.

5.6.4 The Tractor shall be fitted with tyres in accordance with the manufacturer's specifications. The tyres shall not be more than 50 % worn.

5.6.5 During the test, only those components required for operation on the track shall be in operation.

6.0 METHOD OF MEASUREMENT

6.1 Measurement of external sound level of Tractors in Motion

6.1.1 At least two measurements shall be made on each side of the tractor. Preliminary measurements may be made for adjustment purposes but shall be disregarded.

6.1.2 The microphone shall be situated 1.2 meters above ground level at a distance of 7.5 meters from the path of the tractor's center line, CC, measured along the perpendicular PP' to that line (figure 1).

6.1.3 Two lines AA' and BB', parallel to line PP' and situated respectively 10 meters forward and 10 meters rearward of the line, shall be marked out on the test track. Tractors shall approach line AA' at a steady speed, as

specified below. The throttle shall then be fully opened as rapidly as practicable and held in the fully opened position until the rear of the tractor crosses line BB'; the throttle shall then be closed again as rapidly as possible.

6.1.4 The maximum sound level recorded shall constitute the result of the measurement.

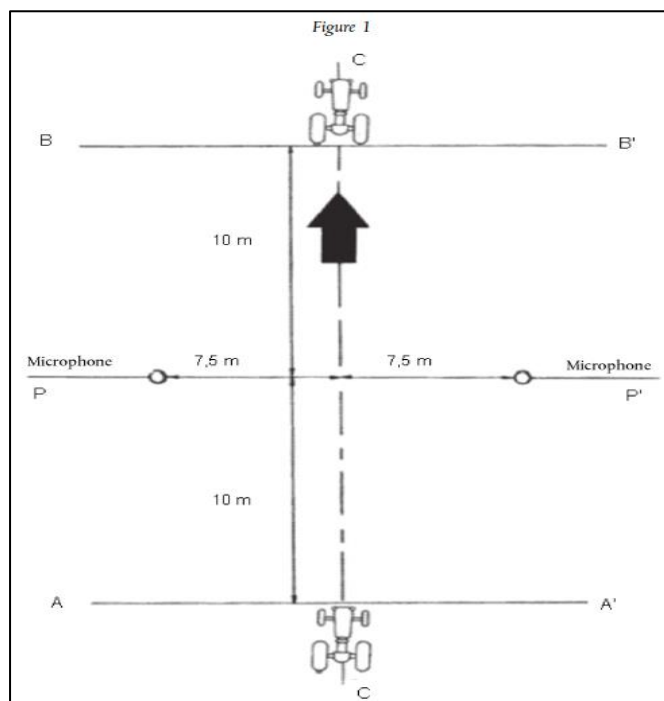
6.1.5 The steady speed before approaching line AA' shall be three quarters of the maximum design speed (v_{max}) as declared by the manufacturer which can be attained in the highest gear used for road movement.

6.1.6 **Interpretation of results**

6.1.6.1 To take account of inaccuracies in the measuring instruments, the result obtained from each measurement shall be determined by deducting 1 dB (A) from the meter reading.

6.1.6.2 Measurements shall be considered valid when the difference between two consecutive measurements on the same side of the tractor does not exceed 2 dB (A).

6.1.6.3 The highest sound level measured shall constitute the test result. Should that result exceed the maximum permissible sound level for the category of tractor tested by at least 1 dB(A), two further measurements shall be made. Three of the four measurements thus obtained must fall within the prescribed limits.



7.0 **EXHAUST SYSTEM (SILENCER)**

7.0 If the tractor is fitted with a device designed to reduce the exhaust noise (silencer), the requirements of this clause 7 shall apply. If the inlet of the

engine is fitted with an air filter which is necessary in order to ensure compliance with the permissible sound level, the filter shall be considered to be part of the silencer, and the requirements of this clause 7 shall also apply to that filter.

The exhaust tailpipe shall be positioned in such a way that the exhaust gases cannot penetrate inside the cab.

- 7.2 A drawing of the exhaust system shall be annexed to the tractor type-approval certificate.
- 7.3 The silencer shall be marked with a reference to its make and type which is clearly legible and indelible.
- 7.4 The use of fibrous absorbent material is permitted in the construction of silencers only when the following conditions are fulfilled:
 - 7.4.1 The fibrous absorbent material may not be placed in those parts of the silencer through which gases pass;
 - 7.4.2 Suitable devices shall ensure that the fibrous absorbent material is kept in place for the whole time that the silencer is being used;
 - 7.4.3 The fibrous absorbent material shall be resistant to a temperature at least 20 % higher than the operating temperature (degrees C) which may occur in the region of the silencer where those fibrous absorbent materials are situated.

ANNEX I

(See introduction)

**PERMISSIBLE SOUND LEVEL AT BYSTANDER OF AGRICULTURAL
AND FORESTRY TRACTORS – METHOD OF MEASUREMENT***

Name	Organization
Convener	
Dr. N. H. Walke	The Automotive Research Association of India (ARAI)
Members	
Mr. D. S. Mole	The Automotive Research Association of India (ARAI)
Mr. Pradeep D. Jawale	The Automotive Research Association of India (ARAI)
Mr. Kamallesh Patil	The Automotive Research Association of India (ARAI)
Mr. Kirranpreet Aalag	International Centre for Automotive Technology (ICAT)
Ms. Rupali Lokhande	Central Institute of Road Transport (CIRT)
Mr. C. K. Tijare	Central Farm Machinery Training and Testing Institute (CFMTTI)
Mr. K. Dobrial	Northern Region Farm Machinery Training and Testing Institute (NRFMTTI)
Mr. Philip Koshy	International Tractors Ltd. (TMA)
Mr. Mohit Kumar	International Tractors Ltd. (TMA)
Mr. Mansingh Jagdale	John Deere India Pvt. Ltd. (TMA)
Mr. Ashish Mallarh	Kubota Agricultural Machinery India Pvt. Ltd. (TMA)
Mr. Nitin Jangra	Escorts Kubota Ltd. (TMA)
Mr. Pradeep Shinde	Mahindra & Mahindra Ltd. (TMA)
Mr. V. Venkatesan	Tractors and Farm Equipment Ltd. (TMA)
Mrs. Vasundhara Arde	Cooper Corporation Ltd. (TMA)
Mr. Sanjay Tank	Automotive Component Manufacturers Association (ACMA)

ANNEX II (See introduction)	
COMMITTEE COMPOSITION * Automotive Industry Standards Committee	
Chairperson	
Dr. Reji Mathai	Director, The Automotive Research Association of India
Members	Representing
Representative from	Ministry of Road Transport and Highways
Representative from	Ministry of Heavy Industries
Representative from	Office of the Development Commissioner, MSME, Ministry of Micro, Small and Medium Enterprises
Shri Shrikant R. Marathe	Former Chairman, AISC
Head-TED	Bureau of Indian Standards
Director	Central Institute of Road Transport
Director	Global Automotive Research Centre
Director	International Centre for Automotive Technology
Director	Indian Institute of Petroleum
Director	National Automotive Test Tracks
Director	Vehicles Research and Development Establishment
Director	Indian Rubber Manufacturers Research Association
Representatives from	Society of Indian Automobile Manufacturers
Representatives from	Tractor and Mechanization Association
Representatives from	Automotive Components Manufacturers Association of India
Representative from	Indian Construction Equipment Manufactures' Association
Member Secretary	
Shri Vikram Tandon	The Automotive Research Association of India