AUTOMOTIVE INDUSTRY STANDARD

Permissible Sound Level at Bystander of Agricultural Tractors - Method of Measurement

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ON BEHALF OF
AUTOMOTIVE INDUSTRY STANDARDS COMMITTEE

UNDER
CENTRAL MOTOR VEHICLE RULES – TECHNICAL STANDING COMMITTEE

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

April 2009

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

Sr. No.	Corrigenda.	Amend-ment	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 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 IS: 12180 (Part 2)-2000/ISO-7218-1992 and is in force. In process of aligning our national standards with ECE regulations/EEC Directives, this part 2 of AIS 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 in included in this standard.

Limits of noise level will be notified in CMVR separately.

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

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)	on the approximation of the laws of the Member States relating to certain parts and characteristics of wheeled agricultural tractors
IS: 12180 (Part 2): 2000/ISO 7216 : 1992	Tractors and Machinery for Agriculture and Forestry - Noise Measurement - Method of Test - Part 2 : Noise Emitted When in Motion

The Automotive Industry Standards Committee responsible for preparation of this standard is given in Annex : 1

Permissible Sound Level at Bystander of Agricultural Tractors - Method of Measurement

1. SCOPE

This standard specifies a method for measuring the A-weighted sound pressure level of the noise emitted by Agricultural Tractors as defined in AIS- 053, while in motion.

2. REFERENCES

2.1 AIS-053 : Automotive Vehicles – Types – Terminology

3. DEFINITIONS

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

3.1 **Agricultural Tractor**: As defined in 3.9 of AIS-053.

4. MEASURING INSTRUMENTS

The noise emitted by tractors shall be measured by means of a sound-level meter of the type described in Publication 179, 1st Edition (1965) of the International Electrotechnical Commission.

5. 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 noise being measured).

5.2 This area may take the form, for instance, of an open space of 50 metre radius having a central part of at least 20 metres 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 noise 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 Agricultural Tractor**

5.6.1 The Agricultural 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 Agricultural 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 Agricultural 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 Noise 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 metres above ground level at a distance of 7.5 metres from the path of the tractor's centre 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 metres forward and 10 metres 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 1/ 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.

1/ If the tractor includes a trailer, this shall not be taken into account in determining when line BB' is crossed

6.2 The test speed shall be three-quarters of the maximum speed which can be attained in the highest gear used for road movement.

6.3 Interpretation of results

6.3.1 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

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

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

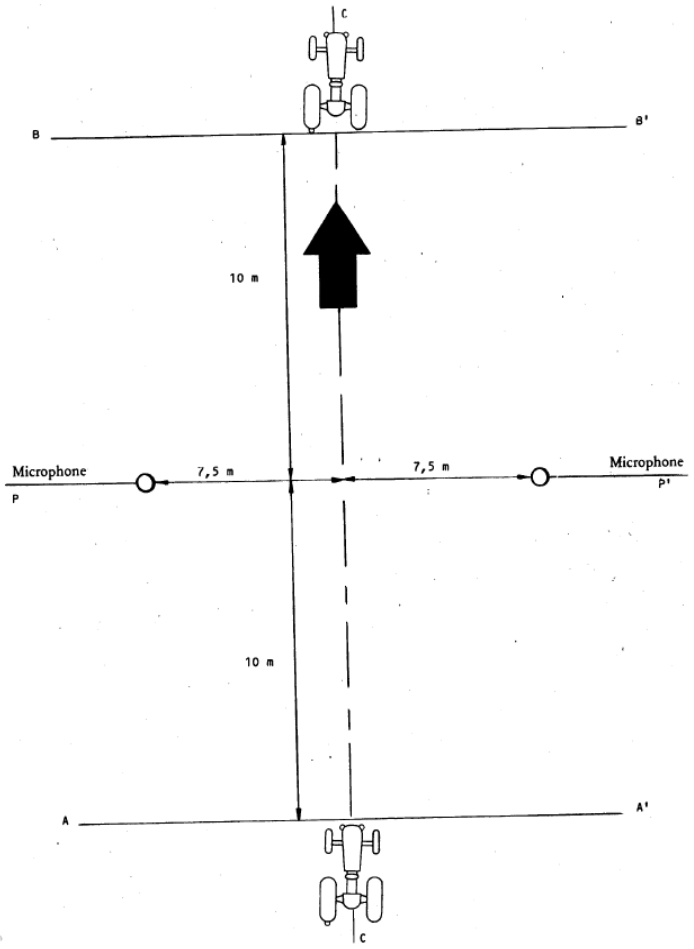

Figure 1

7. EXHAUST SYSTEM (SILENCER)

7.1 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 if 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 1
(See Introduction)

COMMITTEE COMPOSITION *
Automotive Industry Standards Committee

Chairman	
Shri Shrikant R. Marathe	Director The Automotive Research Association of India, Pune
Members	**Representing**
Representative from	Ministry of Shipping, Road Transport & Highways (Dept. of Road Transport & Highways), New Delhi
Representative from	Ministry of Heavy Industries & Public Enterprises (Department of Heavy Industry), New Delhi
Shri S. M. Ahuja	Office of the Development Commissioner, Small Scale Industries, Ministry of Small Scale Industries, New Delhi
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Representatives from	Society of Indian Automobile Manufacturers
Shri T.C. Gopalan	Tractor Manufacturers Association, New Delhi
Shri K.N.D. Nambudiripad	Automotive Components Manufacturers Association of India, New Delhi
Shri Arvind Gupta	Automotive Components Manufacturers Association of India, New Delhi

Member Secretary
Mrs. Rashmi Urdhwareshe
Deputy Director
The Automotive Research Association of India, Pune

* At the time of approval of this Automotive Industry Standard (AIS)