

**Amendment No. 1**  
**To**  
**AIS-104**  
**Technical Requirements of Fuel Tanks for Agricultural Tractors**

1. Page 2/5, clause 4.1.2

“Delete entire clause no. 4.1.2 and renumber subsequent clauses.”

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THE AUTOMOTIVE RESEARCH ASSOCIATION OF INDIA  
P.BO.NO.832, PUNE 411 004

ON BEHALF OF  
AUTOMTIVE INDUSTRY STANDARDS COMMITTEE

UNDER  
CENTRAL MOTOR VEHICLES RULES – TECHNICAL STANDING COMMITTEE

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

February 2012

**AUTOMOTIVE INDUSTRY STANDARD**

**Technical Requirements of  
Fuel Tanks for Agricultural Tractors**

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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

January 2008

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

Sr. No.	Corr- igenda.	Amend- ment	Revision	Date	Remark	Misc.
<b>General remarks :</b>						

## 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.

The fuel tank is an important safety critical item, the Bureau of Indian Standards has already come out with the Indian Standard IS: 12056 – 1987 for the metallic fuel tanks and IS: 14681 – 1999 for fuel tanks for 2 and 3 wheelers. Considerable assistance is taken from these standards as far as metallic fuel tanks are concerned. With the advancement of technology and availability of this standard substitute plastic material more and more vehicle manufacturers have started using plastic fuel tanks. As far as Plastic fuel tanks are concerned considerable assistance has been taken from AIS:033, ECE R-34 “Uniform Provisions concerning the Approval of Vehicle with regard to the Prevention of Fire risk” and EEC Directive 2000/8/EC on “the approximation of laws of the members states relating to the liquid fluid tanks and rear under run protection of motor vehicles and their trailers”.

Few general requirements & the requirements of the under run, resistance to fire and also the frontal and rear impact crash tests are excluded in this standard, as they are not relevant for Agricultural tractors because of their construction, application and slow moving nature.

The Automotive Industry Standards Committee responsible for preparation of this standard is given in Annexure : II.

## Technical Requirements of Fuel Tanks for Agricultural Tractors

### 1.0 SCOPE

- 1.1 This standard applies to technical requirements fuel tanks used on Agricultural Tractors.

### 2.0 DEFINITIONS

For the purpose of this standard

- 2.1 **“Agricultural Tractor”** A power-driven vehicle, either wheeled or track-laying, which has at least two-axes, whose function depends essentially on its tractive power, and which is specially designed to pull, push, carry or actuate certain implements, machines or trailers. Such a tractor may be arranged to carry a load and attendants.
- 2.2 **“Unballasted mass”** means the mass of the tractor in running order.
- 2.3 **“Tank”** means the tank(s) designed to contain the liquid fuel, as defined in cl. 2.5 used primarily for the vehicle excluding its accessories (filler pipe (if it is a separate element), gauge, connections to the engine or to compensate interior excess pressure etc.)
- 2.4 **“Capacity of the tank”** means the tank capacity as specified by the manufacturer.
- 2.5 **“Liquid fuel”** means a fuel, which is liquid in normal ambient conditions.

### 3.0 GENERAL SPECIFICATIONS

- 3.1 The fuel tank shall be capable of withstanding without leakage, when tested out according to cl. 4.1.1 / cl. 4.2.2.
- 3.2 To release excess pressure or any pressure exceeding the working pressure must be compensated automatically by suitable devices (vents, safety valves etc.) in the fuel system.
- 3.3 The vents must be designed in such a way as to prevent any fire risk. In particular, any fuel which may leak when the tank(s) is (are) being filled must not be able to fall on the exhaust system. It shall be channeled to the ground.
- 3.4 The tank cap must be fixed to the filler pipe; the seal must be retained securely in place, the cap must latch securely in place against the seal and filler pipe when closed.
- 3.5 No safety vent shall discharge into an enclosed compartment.
- 3.6 The tank / tractor manufacturer should submit the details and drawing specified in Annexure : I to testing agency.

## 4.0 TESTS AND REQUIREMENTS

### 4.1. Metallic Fuel Tanks

- 4.1.1 From a tank equipped with all accessories, which are normally attached to it, filled with non-inflammable liquid (Water for example) to the specified capacity, the rate of leakage from a fuel tank and fittings shall not exceed 50 g/min for tractors having PTO power up to 75 kW and 75 g/min for tractors having PTO power more than 75 kW, when inverted for five minutes relative to its installed position on the vehicle. The fuel outlet pipe connection shall be plugged while carrying out the test.
- 4.1.2 Each fuel tank shall be fitted with a safety vent of size not less than the diameter given below:
- a) Agricultural tractors of PTO power up to 75kW - 1.6 mm
  - b) Agricultural tractors of PTO power above 75kW - 2.0mm.
- 4.1.3 Pressure Test - the fuel tank equipped with all accessories, which are normally attached to it, with all the openings plugged shall be capable of withstanding without leakage an internal pressure of 130 kPa (1.3 atmosphere absolute) when tested for 5 minutes. However, permanent deformation may be permitted.

### 4.2 Non Metallic Fuel Tanks

#### 4.2.1 Overturn test

From a tank equipped with all accessories, which are normally attached to it, filled with liquid fuel, the rate of leakage from a fuel tank and fittings shall not exceed 50 g/min for tractors having PTO power up to 75kW and 75 g/min for tractors having PTO power more than 75kW when inverted for five minutes relative to its installed position on the vehicle. The fuel outlet pipe connection shall be plugged while carrying out the test.

#### 4.2.2 Mechanical strength

The fuel tank equipped with all accessories, which are normally attached to it, installed as in a tractor filled with water to its capacity at  $53^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and all openings plugged shall be capable of withstanding without leakage an internal pressure of 130 kPa (1.3 atmosphere absolute) when tested for 5 minutes. However, permanent deformation may be permitted.

#### 4.2.3 Resistance to high temperature test

- 4.2.3.1 The fixture used for the test must match the manner of installation of the tank on the tractors, including the way in which the tank vent works.
- 4.2.3.2 The tank equipped with all accessories, which are normally attached to it, filled to 50 percent of its capacity with water at 293 K (20 °C), must be subjected for one hour to an ambient temperature of 338 K  $\pm$  2 K (65°C  $\pm$  2°C).
- 4.2.3.3 The results of the test shall be considered satisfactory if, after the test, the tank is not leaking or deformed to an extent that it should be possible to fit into the provision provided in the tractor.

**5.0 NUMBER OF SAMPLES**

Total 3 nos. of samples are required for carrying out all the above tests. However, different tests may be done on one and the same sample or less samples, if the manufacturer requests so.

**6.0 CONFORMITY OF PRODUCTION PROCEDURE**

6.1 The conformity of production will be carried out as per the batch testing procedure of tractors.

**ANNEXURE : I**

(See 3.6)

**TECHNICAL SPECIFICATION TO BE SUBMITTED BY TANK /  
VEHICLE MANUFACTURER**

<b>Sr. No.</b>	<b>Description</b>
1.	Name of the tractors manufacturer
2.	Address of the tractors manufacturer
3.	Tractors model / variants
4.	Manufacturer of Fuel Tank
5.	Type of Fuel
6.	Sketch showing mounting and location of Fuel Tank with respect to overall width
7.	Material of the tank, Trade name with Mark
8.	Capacity of Fuel Tank
9.	Engineering drawing of fuel tank assembly
10.	Engineering drawing of fuel tank cap
11.	A declaration mentioning that the fitment of fuel tank is as per general requirement mentioned in cl.3 of this standard.

**ANNEXURE : II**

(See Introduction)

**COMMITTEE COMPOSITION****Automotive Industry Standards Committee**

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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
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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)