

Amendment No. 1 16 May 2014

To

AIS-095: 2007 Requirements for Metallic Fuel Tanks of Automotive Vehicles

1. Page 2/6, clause 3.9.1.3:

Add following text at the end:

“In case of M2 category vehicles having fuel filler cover for accessing fuel cap, tethered or chained fuel cap is sufficient, provided, fuel filler cover has locking mechanism which can be opened either with key or with the control located inside the vehicle.”

PRINTED BY

THE AUTOMOTIVE RESEARCH ASSOCIATION OF INDIA

P. B. NO. 832, PUNE 411 004

ON BEHALF OF

AUTOMOTIVE 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

16 May 2014

AIS-095

AUTOMOTIVE INDUSTRY STANDARD

**Requirements for Metallic Fuel
Tanks of Automotive Vehicles**

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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

August 2007

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.

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.

Based on deliberations in the CMVR-TSC and AISC it has been decided to create a suite of standards related to Passive Safety which are founded on dynamic (or crash) testing of passenger cars and utility vehicles. These standards would then form the basis of the notification and implementation of advanced passive safety norms in the latter part of this decade as per the Safety Road Map adopted for India.

The behaviour of fuel tanks has a significant role in the overall safety and fire avoidance performance of the vehicles. Therefore a need was felt to upgrade the currently notified IS 12056 : 1987/1998 to higher performance levels. Accordingly this new AIS-095 has been created.

While preparing this standard considerable assistance has been taken from following ECE regulation and EEC Directive:

ECE R 34	Uniform Provisions concerning the approval of vehicles with regard to the prevention of fire risks
EEC Directive 70/221/EEC	Fuel tanks and rear underrun protection of motor vehicles and their trailers

The Automotive Industry Standards Committee (AISC) responsible for preparation of this standard is given in Annex : II

Requirements for Metallic Fuel Tanks of Automotive Vehicles

0. SCOPE

This standard applies to metallic tanks intended for use with liquid fuel and fitted on vehicles of categories M, N and T.

1.0 REFERENCES

- 1.1 IS 12056: 1987 Recommendations for Safety requirements for Fuel Tank Assembly of Automotive Vehicles
- 1.2 AIS-053 Automotive Vehicles – Types – Terminology

2.0 DEFINITIONS

For the purpose of the standard

- 2.1 **“Vehicle Type with regard to fuel tanks”** means vehicles which do not differ essentially in such respect as.
 - 2.1.1 The structure, shape, dimensions and materials of the tank (s)
 - 2.1.2 In vehicles of category M1 the position of the tank(s) in the vehicle in so far as it has a negative effect on the requirements of section 3.10 of this standard.
- 2.2 **“Occupant compartment”** means the space for occupant accommodation bounded by the roof, floor, side walls, doors, outside glazing, front bulkhead and rear bulkhead.
- 2.3 (Paragraph Reserved)
- 2.4 **“Tank”** means the metallic tank(s) designed to contain the liquid fuel, as defined in section 2.6 used primarily for the propulsion of 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.
- 2.5 **“Capacity of the tank”** means the tank capacity as specified by the manufacturer.
- 2.6 **“Liquid fuel”** means a fuel which is liquid in normal ambient conditions.

3.0 GENERAL SPECIFICATIONS

- 3.1 Tanks must be made so as to be corrosion-resistant.
- 3.2 Tanks must satisfy, when equipped with all accessories, which are normally attached to them, the leakage tests carried out according to section 4.1 at a relative internal pressure equal to double the working pressure, but in any event not less than an excess pressure above atmosphere of 0.3 bar.
- 3.3 Any excess pressure or any pressure exceeding the working pressure must be compensated automatically by suitable devices (vents, safety valves etc.)
- 3.4 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.

- 3.5 The tank(s) must not be situated in, or form, a surface (floor, wall, bulkhead) of the occupant compartment or any other compartment integral with it.
- 3.6 A partition must be provided to separate the occupant compartment from the tank(s). The partition may contain apertures (e.g. to accommodate cables) provided they are so arranged that fuel cannot flow freely from the tank(s) into the occupant compartment or any other compartment integral with it during normal conditions of use.
- 3.7 Every tank must be securely fixed and so placed as to ensure that any fuel leaking from the tank or its accessories will escape to the ground and not into the occupant compartment during normal conditions of use.
- 3.8 The filler hole must not be situated in the occupant compartment, in the luggage compartment or in the engine compartment.
- 3.9 The fuel must not escape through the tank cap or through the devices provided to compensate excess pressure during foreseeable course of operation of the vehicles. In the case of overturning of the vehicle, a drip may be tolerated provided that it does not exceed 30 g/min; this requirement must be verified during the test prescribed in section 4.2.
- 3.9.1 The fuel filler cap must be fixed to the filler pipe. .
The requirements of Paragraph 3.9.1 will be deemed to be satisfied if provision is made to prevent excess evaporative emissions and fuel spillage caused by a missing fuel filler cap. This may be achieved using one of the following:
- 3.9.1.1 An automatically opening and closing, non-removable fuel filler cap.
- 3.9.1.2 Design features, which avoid excess evaporative emissions and fuel spillage in the case of a missing fuel filler cap.
- 3.9.1.3 Any other provision which has the same effect. Examples may include, but are not limited to a tether filler cap, a chained filled cap or one utilizing the same locking key for the filler cap and for the vehicle's ignition. In this case, the key shall be removable from the filler cap only in the locked condition. However, the use of tethered or chained filler cap by itself is not sufficient for vehicles other than those of Categories M1 and N1.
- 3.9.2 The seal between the cap and the filler pipe must be retained securely in place. The cap must latch securely in place against the seal and filler pipe when closed.
- 3.10 Tanks must be installed in such a way as to be protected from the consequences of an impact to the front or the rear of the vehicle; there shall be no protruding parts, sharp edges, etc. near the tank.
- 3.11 The fuel tank and the filler neck shall be designed and installed in the vehicles in such a way as to avoid any accumulation of static electricity charges on their entire surface. If necessary, they shall be discharged into the metallic structure of the chassis or any major metallic mass by means of a good conductor.

4.0 TESTS

4.1 Hydraulic Test

The tank must be subjected to a hydraulic internal pressure test, which must be carried out on an isolated unit complete with all its accessories. The tank must be completely filled with a nonflammable liquid (water, for example). After all communication with the outside has been cut off, the pressure must be gradually increased, through the pipe connection through which fuel is fed to the engine, to a relative internal pressure equal to double the working pressure used and in any case not less than a gauge pressure of 0.3 bar, which must be maintained for one minute. During this time the tank shell must not crack or leak; however, it may be permanently deformed.

- 4.1.1 Fuel tanks which have been demonstrated to comply with the requirements of IS 12056: 1987/1998 Para 4.3 shall be deemed to comply with the requirement of Para 4.1 of this standard.

4.2 Overturn Test

- 4.2.1 The tank and all its accessories must be mounted on to a test fixture in a manner corresponding to the mode of installation on the vehicle for which the tank is intended; this also applies to a system for the compensation of the interior excess pressure.
- 4.2.2 The test fixture shall rotate about an axis lying parallel to the longitudinal vehicle axis.
- 4.2.3 The test shall be carried out with the tank filled to 90% of its capacity and also 30% of its capacity with a non-flammable liquid having a density and a viscosity close to those of the fuel normally used (water may be accepted)
- 4.2.4.1 The tank must be turned from its installed position 90° to the right. The tank must remain in this position, for at least five minutes.
- 4.2.4.2 The tank must then be turned 90° further in the same direction. The tank must be held in this position, in which it is completely inverted, for at least another 5 minutes.
- 4.2.4.3 The tank must be rotated back to its normal position. Testing liquid which has not flowed back from the venting system into the tank must be drained and replenished if necessary.
- 4.2.4.4 The tank must be rotated 90° in the opposite direction and left for at least 5 minutes in this position.
- 4.2.4.5 The tank must be rotated 90° further in the same direction. This completely inverted position must be maintained for at least 5 minutes. Afterwards, the tank must be rotated back to its normal position.

5.0 APPLICATION FOR APPROVAL

- 5.1 The application for approval must be accompanied with the information listed in Annex : 1.
- 5.2 Two sets of fuel tanks and required accessories shall be offered to the test agency for checking compliance to this standard.

6.0 CONFORMITY OF PRODUCTION PROCEDURE

For ensuring conformity of production one fuel tank shall be demonstrated to comply with the requirements of clause 3.2 Hydraulic Test once in every two years.

7.0 CRITERIA FOR EXTENSION OF APPROVAL

As existing approval for a liquid fuel tank system shall be deemed as being extendable to another system without evaluation if the change between the systems is limited to

- 7.1 Fitment of the same fuel tank (with respect to structure, shape, dimensions and material of tank) on another vehicle or at another location on the same vehicle. However, these relocations must not adversely affect the requirements of section 3.10 of this standard on vehicles of category M1.
- 7.2 Corrosion protection on the tank or its accessories is changed from one type to another.

ANNEX : I
(see 5.1)

- 1.0 Information to be furnished by the fuel tank manufacturer :
- 1.1 Name and address of the fuel tank manufacturer
- 1.2 Type of fuel stored in the tank
- 1.3 Fuel Tank Capacity
- 1.4 Material of the Tank
- 1.5 Detailed engineering drawing and technical specifications of the fuel tank with all connections and details of breathing / venting arrangement
- 1.6 Working pressure of the tank.

- 2.0 Information to be furnished by the vehicle manufacturer :
- 2.1 Name and address of the vehicle manufacturer
- 2.2 Category of the vehicle(s) (As per AIS-053)
- 2.3 Vehicle model / Variants
- 2.4 Sketch showing location and mounting of the fuel tank on the vehicle

ANNEX II
(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
Shri Sushil Kumar	Ministry of Heavy Industries & Public Enterprises (Department of Heavy Industry), New Delhi
Shri J. K. Arya	Office of the Development Commissioner, Small Scale Industries, Ministry of Small Scale Industries, New Delhi
Shri S. M. Bhatia Shri Rakesh Kumar (Alternate)	Bureau of Indian Standards, New Delhi
Prof. A. V. Sardesai Shri D. P. Saste (Alternate)	Central Institute of Road Transport, Pune
Dr. M. O. Garg	Indian Institute of Petroleum, Dehra Dun
Dr. C. L. Dhamejani	Vehicles Research & Development Establishment, Ahmednagar
Representatives from	Society of Indian Automobile Manufacturers
Shri T.C. Gopalan Shri Ramakant Garg (Alternate)	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)