IS 13389 : 1992
ISO 3984 : 1982

(Reaffirmed 1997)

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Indian Standard

ROAD VEHICLES — PASSENGER CARS — MOVING BARRIER REAR COLLISION TEST METHOD

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Price Group 3

Indian Standard

ROAD VEHICLES — PASSENGER CARS — MOVING BARRIER REAR COLLISION TEST METHOD

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 3984 : 1982 'Road vehicles — Passenger cars — Moving barrier rear collision test method' was adopted by the Bureau of Indian Standards on the recommendation of the Automotive Vehicles Testing Performance Evaluation Sectional Committee (TED 8) and approval of the Transport Engineering Division Council.

The text of ISO Standard has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In the adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standard which is to be substituted in its place, is listed below along with its degree of equivalence for the editions indicated:

International Standard	*Correspondence Indian Standard*	*Degree of Equivalence*
ISO 1176 : 1990 Road vehicles — Weights — Vocabulary	IS 9211 : 1979 Dimensions and definitions of weights of road vehicles	Identical

The concerned technical committee has reviewed the provisions of ISO 3784 : 1976 and ISO 6487 : 1987, referred in this adopted standard and has decided that they are acceptable for use in conjunction with this standard.

This Indian Standard is applicable to all types of vehicles other than two and three wheelers.

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1 Scope and field of application

This International Standard specifies a uniform moving barrier rear collision test method for passenger cars, which permits the direct comparison of results obtained in different test laboratories.

2 References

ISO 1176, *Road vehicles — Weights — Vocabulary.*

ISO 3784, *Road vehicles — Measurement of impact velocity in collision tests.*

ISO 6487, *Road vehicles — Techniques of measurement in impact tests — Instrumentation.*

3 Moving barrier collision test method

Even when simplified by the use of moving barriers, vehicle collisions are very complex and careful control of test parameters is required.

3.1 Testing site

The testing site shall be of sufficient area to provide accommodation for the test vehicle, various items of photographic equipment and provision for attaining the desired velocity of the moving barrier.

3.1.1 The actual crash site shall be hard, of a minimum length of 15 m and horizontal (no more than 3 % slope, measured over any 1 m length for at least 15 m in the path of the moving barrier).

3.1.2 Provision shall be made for after-impact displacement of both the test vehicle and the moving barrier so that the test vehicle remains on the hard surface during the total time of its deformation.

3.1.3 Provision shall be made for the proper positioning of photographic equipment, if possible from the side, and above and below the test vehicle.

3.1.4 The approach road shall be straight, level, and of sufficient length to permit the moving barrier to be towed along a rail guidance system with the impact occurring after the moving barrier is released from the tow force and released from guidance.

3.2 Moving barrier test equipment

The specific moving barrier to be used shall be selected from the following configurations :

3.2.1 Barrier total mass : 1 100 ± 20 kg or 1 800 ± 30 kg.

3.2.2 The moving barrier shall be a rigid construction symmetrical about a longitudinal vertical plane, with fixed non-steerable front and rear axles attached directly to the frame rails with no spring or other type of suspension system apart from the tyres on each wheel.

An example of a typical construction is shown in figure 1.

3.2.3 The moving barrier shall have a flat impact surface and the following characteristics :

height : 800 mm (minimum)

width : 2 500 mm (minimum)

mass distribution by axle

front : (60 ± 10) %
rear : (40 ± 10) %

height of centre of gravity :	400 ± 40 mm
track :	1 500 ± 30 mm
wheelbase :	3 050 ± 60 mm

The edges of the surfaces shall be rounded with a radius of curvature of 45 ± 10 mm.

The impact surface shall be covered with plywood 20 ± 2 mm thick.

Ground clearance to the lower edge of the impact surface shall be 175 ± 25 mm.

3.3 Propulsion of moving barrier

3.3.1 At the moment of impact, the moving barrier shall be disconnected from any external propulsion and guidance system.

3.3.2 The attachment to the moving barrier of any external propulsion or guidance system shall not affect the moving barrier characteristics.

3.3.3 The moving barrier shall be prevented from making subsequent impacts with the test vehicle following the initial impact.

3.4 Alignment of moving barrier

3.4.1 The moving barrier shall impact the test vehicle within ± 2° of the intended angle of impact.

3.4.2 The median longitudinal vertical plane of the moving barrier shall be so aligned that, at the moment of impact, it is not more than ± 75 mm from the intended point of impact on the test vehicle.

The measurement shall be made perpendicular to the path of the moving barrier.

4 State of the test vehicle

4.1 The state of the vehicle shall be that specified in the appropriate standard or regulation under assessment, unless otherwise specified.

4.2 The vehicle weight during the test shall be "the complete vehicle kerb weight" defined in ISO 1176.

It is permissible to substitute for the fuel a non-flammable liquid having a density of from 0,7 to 1,0 kg/dm^3.

4.3 The vehicle may be drained of all or some of its lubricants, coolant, battery acid or other fluids not essential to the test.

4.4 The test vehicle shall be stationary, the parking brake may be on or off, and the transmission may be in neutral.

5 Velocity

5.1 The velocity of the moving barrier shall be measured prior to impact in the manner specified in ISO 3784.

5.2 The velocity at the moment of impact shall be that specified in the appropriate test requirement and shall be approximately constant.

6 Instrumentation

The instrumentation used for the test shall be as specified in ISO 6487.

7 Test report

The test report shall include, as a minimum, the following information :

a) description of test vehicle;

b) moving barrier mass and axle loading;

c) total test vehicle weight and axle loading;

d) impact velocity;

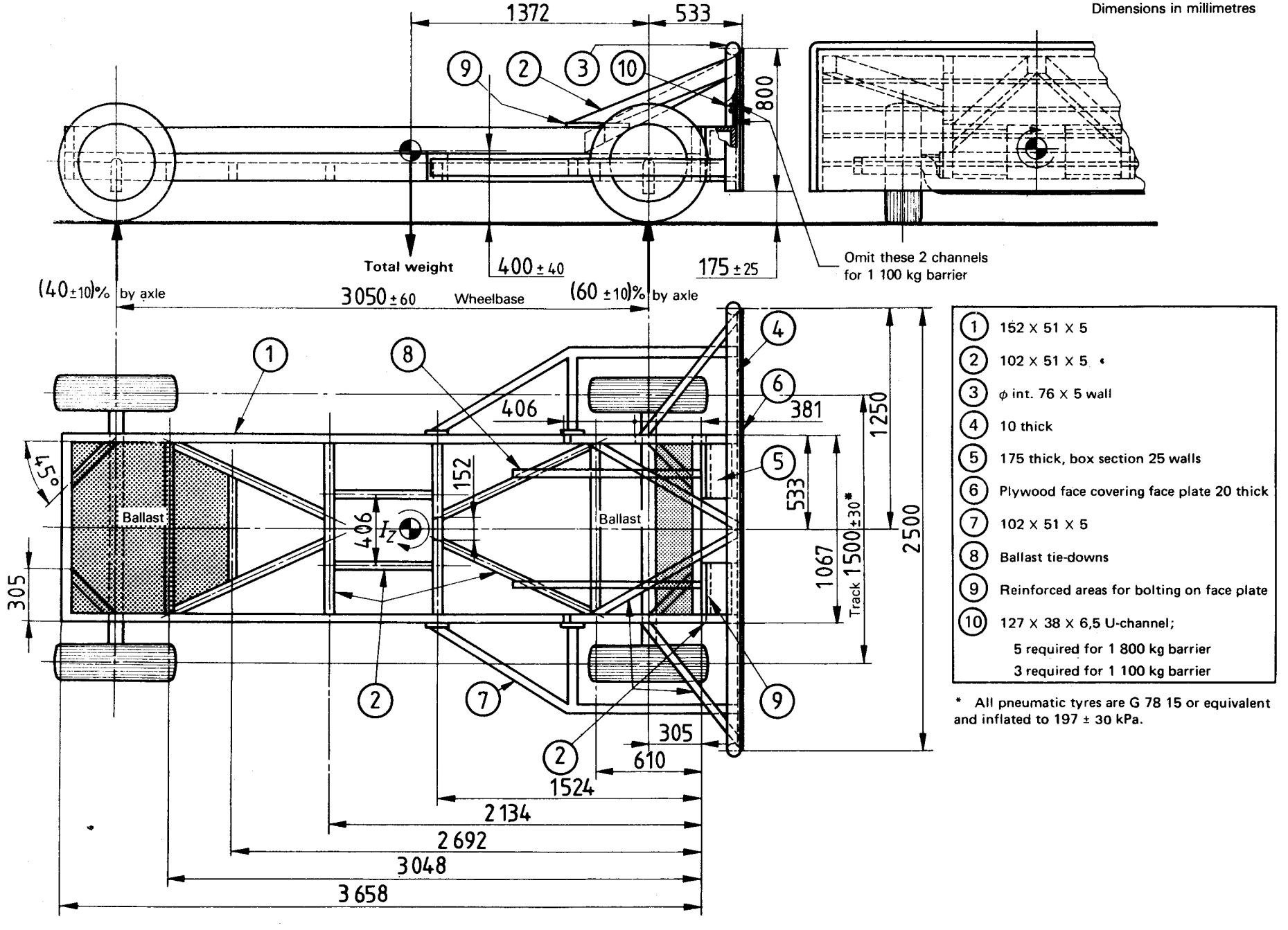
e) location of test devices (dummies), if used;

f) date of test;

g) angle of impact;

h) lateral alignment of moving barrier.

Dimensions in millimetres



1	152 × 51 × 5
2	102 × 51 × 5
3	ϕ int. 76 × 5 wall
4	10 thick
5	175 thick, box section 25 walls
6	Plywood face covering face plate 20 thick
7	102 × 51 × 5
8	Ballast tie-downs
9	Reinforced areas for bolting on face plate
10	127 × 38 × 6,5 U-channel; 5 required for 1 800 kg barrier 3 required for 1 100 kg barrier

* All pneumatic tyres are G 78 15 or equivalent and inflated to 197 ± 30 kPa.

Figure 1 — Typical barrier construction

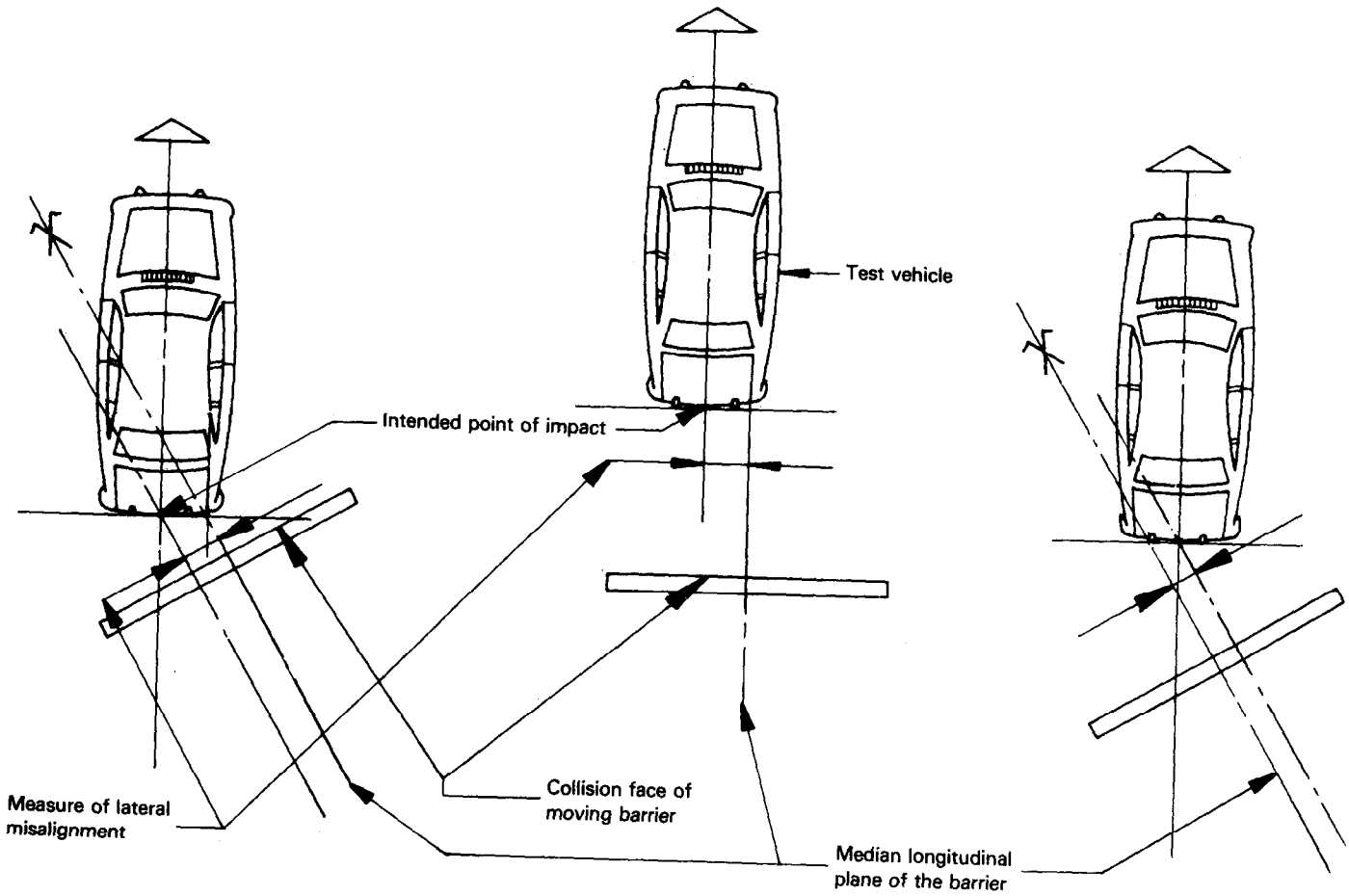


Figure 2 — Lateral misalignment — Method of measurement

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