International Standard 3984

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Road vehicles — Passenger cars — Moving barrier rear collision test method

Véhicules routiers — Voitures particulières — Essai de collision arrière sur barrière mobile

Second edition — 1982-02-01

UDC 629.113 : 531.66 **Ref. No. ISO 3984-1982 (E)**

Descriptors : road vehicles, passenger vehicles, tests, impact tests, collisions.

Price based on 4 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3984 was developed by Technical Committee ISO/TC 22, *Road vehicles*.

The first edition (ISO 3984-1977) had been approved by the member bodies of the following countries :

Australia	Germany, F.R.	South Africa, Rep. of
Austria	Hungary	Spain
Belgium	Iran	Sweden
Bulgaria	Japan	Switzerland
Canada	Mexico	Turkey
Chile	Netherlands	USA
Czechoslovakia	New Zealand	USSR
Egypt, Arab Rep. of	Poland	Yugoslavia
France	Romania	

The member bodies of the following countries had expressed disapproval of the document on technical grounds :

Italy
United Kingdom

This second edition, which cancels and replaces ISO 3984-1977, incorporates draft amendment 1, which was circulated to the member bodies in November 1980 and has been approved by the member bodies of the following countries :

Austria	Iran	Romania
Belgium	Italy	South Africa, Rep. of
Brazil	Japan	Spain
Canada	Korea, Dem. P. Rep. of	Sweden
China	Korea, Rep. of	Switzerland
Czechoslovakia	Netherlands	United Kingdom
Egypt, Arab Rep. of	New Zealand	USA
Germany, F.R.	Poland	USSR

No member body expressed disapproval of the document.

Road vehicles — Passenger cars — Moving barrier rear collision test method

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/dm³.

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.

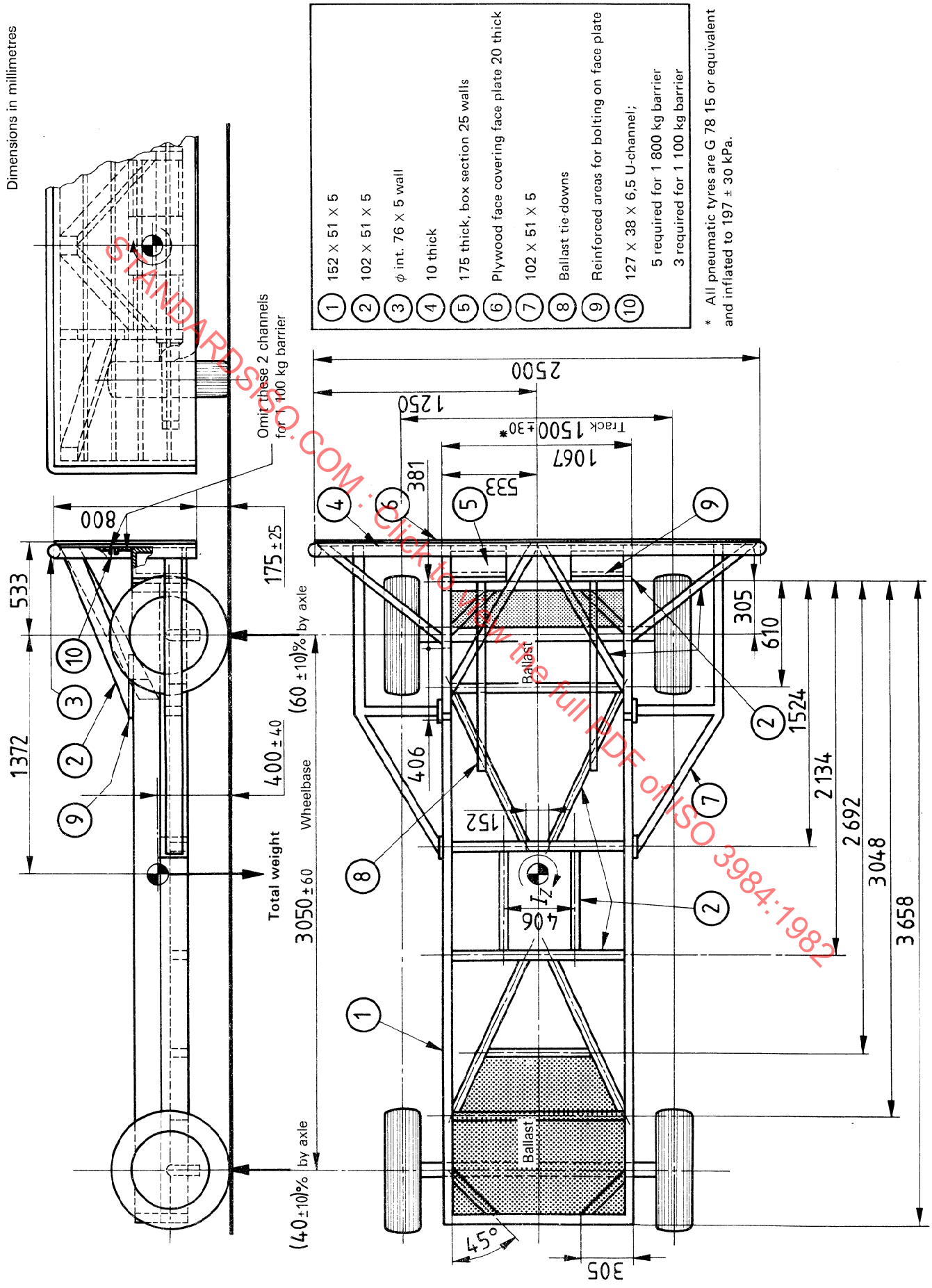

Figure 1 — Typical barrier construction

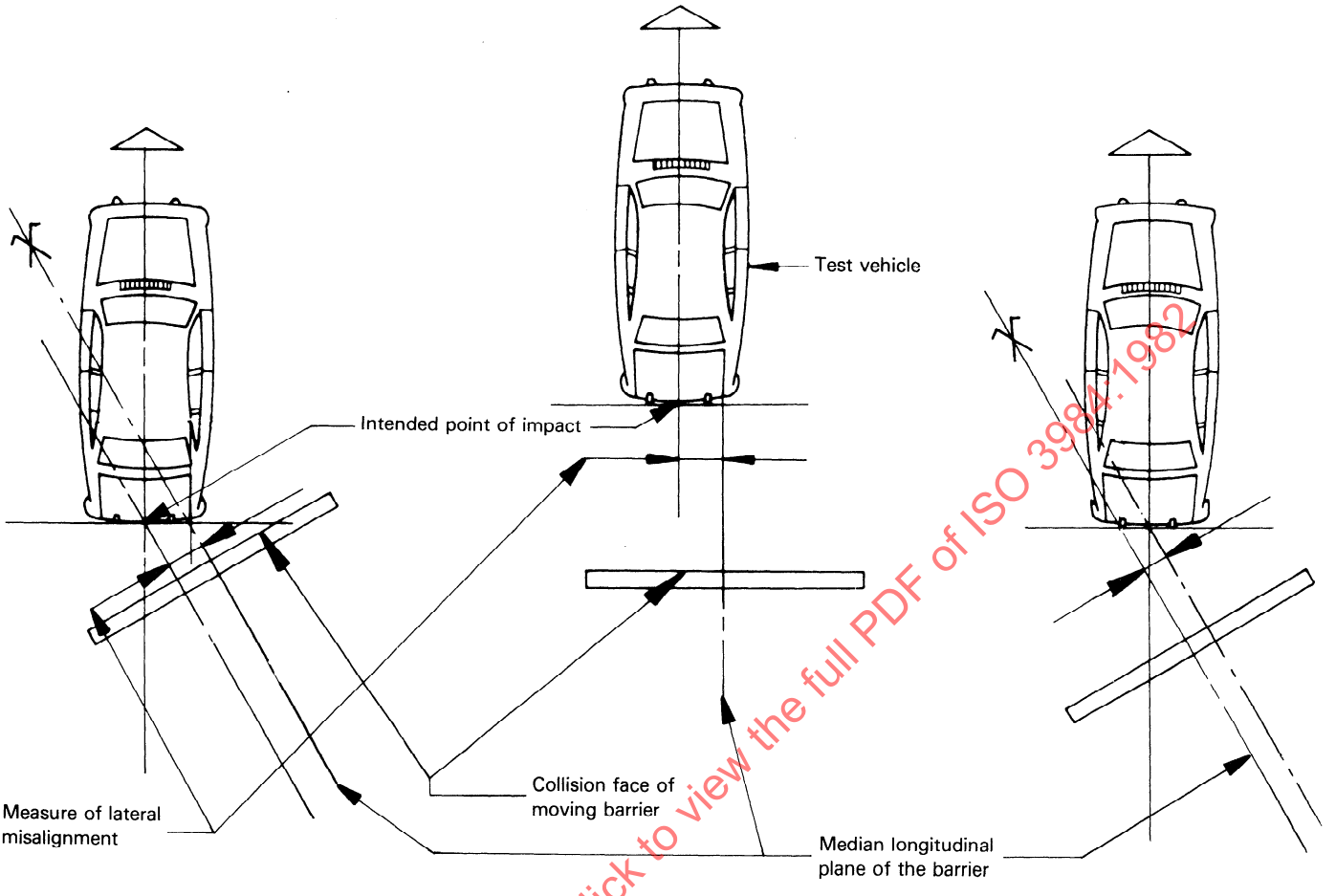

Figure 2 — Lateral misalignment — Method of measurement