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BRITISH STANDARD : AUTOMOBILE SERIES
SPECIFICATION FOR
SEAT BELT ANCHORAGE POINTS

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FOREWORD

This British Standard has been prepared under the Automobile Industry Standards Committee of the B.S.I. at the request of the Ministry of Transport.

SPECIFICATION

SCOPE

1. This British Standard gives basic requirements for the locations and testing of seat belt anchorage points in motor vehicles for the attachment of seat belt assemblies specified in B.S. 3254*. Also included is the dimension of the threaded hole for securing the seat belt attachment to the anchorage point.

It applies only to anchorage points for seat belts for use by adults in front-facing seats in motor (passenger) cars and their derivatives, and in goods (commercial) vehicles up to 30 cwt unladen capacity weight (Amo+1).

The standard does not apply to anchorage points which are integral with the seat structure.

DEFINITIONS

2. For the purposes of this British Standard the following definitions apply:

Seat belt anchorage point (abb. *anchorage point*). A part of the vehicle designed to receive a threaded member (see Clause 8) which secures a seat belt attachment to the vehicle.

Seat belt attachment. The part or parts of the seat belt designed to be attached to the anchorage point or points provided in a vehicle.

Seat belt. An arrangement, as specified in B.S.3254*, of webbing straps and a buckle, or buckles, firmly secured to the structure of a motor vehicle and designed to prevent or lessen injury to the wearer in the event of certain types of accident.

Floor. The lower part of the bodywork which connects the lateral walls of the vehicle.

NOTE. The floor in this context includes ribs, swages and other reinforcements, e.g. longitudinal and transverse members.

Point A. The reference point (see Fig. 1) used as the datum for determining the locations of seat belt anchorage points.

Retracting or emergency locking seat belt. See Amo+1.
NUMBER OF ANCHORAGE POINTS

3. a. In a vehicle designed to accommodate a passenger as well as a driver in front seats, seat belt anchorage points shall be provided for the driver and for the passenger. In the case of a vehicle having three or more front seat positions, anchorage points shall be provided for the driver and for the seat position farthest from the driver.

* B.S. 3254, 'Seat belt assemblies for motor vehicles'.

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Vehicles designed with a single front seat shall be provided with anchorage points for that seat.

Not less than three anchorage points shall be provided for each seat position specified; one of these points shall be a 'floor' anchorage located in the floor of the vehicle, and one shall be a 'side' anchorage located as follows:

- Amended*
- (i) Motor (passenger) cars and their derivatives: in the side structure, or the roof, positioned so that the shoulder strap of the seat belt passes over the head of the occupant.
 - (ii) Goods (commercial) vehicles: in the side structure, of the roof or rear bulkhead of the cab.

b. Where anchorages are provided for rear seat positions, or for front seat positions additional to those specified in Subclause a, not less than two anchorage points shall be provided for each seat position specified.

c. Any one floor anchorage point may be used for attaching the ends of two adjacent seat belts provided that the test requirements specified in Clause 9 are met.

DETERMINATION OF POINT A

4. The positions of the floor and side anchorages are determined in relation to the reference point A which coincides with the 'HIP' point determined by the use of the S.A.E. 90th percentile three-dimensional manikin specified in SAE Standard J 826*. Other devices for determining point A may be used provided that the results they produce are no less representative of seating conditions than those produced by the S.A.E. 90th percentile manikin.

Where seats have adjustable seat backs the angle of the seat back relative to the seat cushion shall be as near as practicable to 90° when determining point A.

FLOOR ANCHORAGE POINTS—FRONT SEATS

5. a. The floor anchorage points, B₁ and B₂, provided for each seat belt in the front of the vehicle shall be so located that with the seat in all driving positions, angle α (see Fig. 1) shall be within the range 15° to 90°. However, where the geometry of the seating in the vehicle permits, angle α shall be within the range 25° to 75°.

b. The floor anchorage points B₁ and B₂ provided for each seat belt shall be not less than 175 mm from the longitudinal plane of symmetry of the seating position as shown in Fig. 1. However, where structural conditions require, this dimension may be reduced provided arrangements are made that the required minimum transverse spacing of 350 mm is maintained at a point in the seat belt forward of the reduced dimension. In such cases, any spacing device provided for this purpose shall be fitted when carrying out the tests specified in Clause 9.

Anchorage points B₁ and B₂ may be located in different horizontal planes and one point may be situated to the rear of the other.

SIDE ANCHORAGE POINTS—FRONT SEATS

6. In no case shall a side anchorage be located either (1) above or forward of the 'recommended area' in Fig. 1,

* SAE Standard J826, 'Manikins for use in defining vehicle seating accommodation.'

or (2) both below the level of the line P₂P₃ and forward of a vertical line through the point P₃. Except where there is no suitable structure, side anchorages shall be located within the 'recommended area' shown in Fig. 1.

Side anchorage points provided for front seat belts shall wherever possible be located behind and not lower than shoulder height of a person wearing the seat belt. Where an anchorage point is fitted to the roof or to the rear bulkhead of the cab (see Subclause 3a (ii)) it shall be located not less than 175 mm, measured transversely from the longitudinal plane of symmetry of the seating position.

The position of point A is found as indicated in Clause 4. The location of the 'recommended area' is determined with the seat in the rearmost position.

REAR SEAT ANCHORAGE POINTS

7. Where rear seat anchorage points are fitted the requirements specified in Clauses 5 and 6 shall, wherever practicable, be applied. In the case of anchorage points intended to take lap (waist) belts, they shall be so located that the angle α is as near as practicable to 45°.

DIMENSIONS OF FIXING HOLES

8. Each anchorage point shall be provided with a hole, threaded 7/16-20 UNF-2U to B.S. 1580†, for securing the ends of the seat belt attachments (see Subclause 3c).

TESTS ON ANCHORAGE POINTS

9. The anchorages shall be subjected to the static load tests described in Subclauses a to d below, as appropriate. The test load shall, in each case, be maintained for a period not less than 10 seconds. During the tests the doors of the vehicle may be closed.

Where provision is made for the installation of seat belt locking or retracting devices all necessary intermediate attachments to the vehicle, such as pulleys or additional anchorages, shall be incorporated when carrying out the tests.

a. *Method of testing.* Each pair of floor anchorages, or floor and side anchorages, to be tested is connected by suitable attachments, representative of a seat belt installation, round a body block to SAE Standard J4a‡. The test is made by applying the specified static load to the body blocks.

The load testing two floor anchorages shall be applied forwards in a plane parallel to the longitudinal plane of symmetry of the vehicle at as near an angle of 45° to the horizontal as is practicable.

The load testing one side and one floor anchorage shall be applied forwards in a plane parallel to the longitudinal plane of symmetry of the vehicle and as near horizontal as is practicable, but in no case more than 20° from the horizontal, and at a height as near as is practicable to the mean height of the two anchorage points.

† B.S. 1580, 'Unified screw threads'.

‡ SAE Standard J4a, 'Motor vehicle seat belt assemblies'.

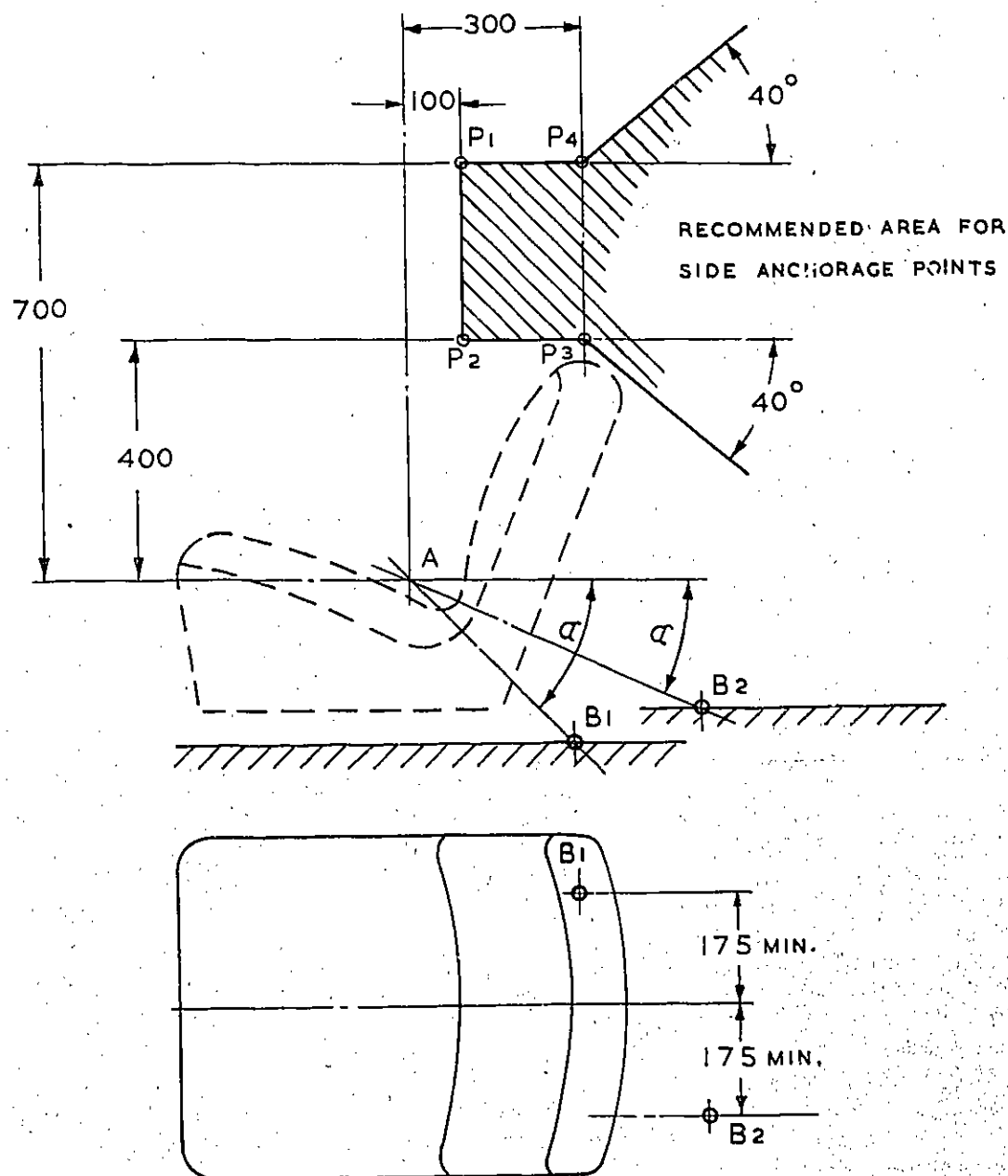


Fig. 1. Areas of locations

Dimensions are in millimetres

b. Front seats with provision for two seat belts.

- (i) The floor anchorages for one seat position together with the side anchorage and the floor anchorage towards the centre of the vehicle for the other seat position shall be tested simultaneously. A static load of 2265 kg (5000 lb) shall be applied to each body block attached to the anchorages for each seat position.
- (ii) Alternatively, at the discretion of the vehicle manufacturer and applying the same test loads, the test shall be carried out simultaneously on the two pairs of floor anchorages and subsequently, using the same or another body shell, the test shall be carried out simultaneously on the two pairs of floor and side anchorages.

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c. Front seats with provision for three seat belts. If seat belt anchorages are provided for three seat positions in the front of the vehicle the anchorages shall be tested as described in (i) or (ii) below, at the discretion of the vehicle manufacturer:

- (i) A simultaneous test on the anchorages for the three seat positions.

The floor anchorages for the centre seat position and for one of the outer seat positions, together with the side anchorage and the floor anchorage towards the centre of the vehicle for the other outer seat position shall be tested simultaneously.

The static test load shall be 6795 kg (15 000 lb) divided equally between the three pairs of anchorage points being tested.

- or (ii) Two separate tests.

The floor anchorages for both the centre seat position and for one of the outer seat positions

shall be tested simultaneously. Subsequently, using the same or another body shell, the floor anchorages for the centre seat position together with the side anchorage and the floor anchorage towards the centre of the vehicle for the other outer position shall be tested simultaneously.

The static test load for each of these two tests shall be 4530 kg (10 000 lb) divided equally between the two seat positions being tested.

d. Rear seats. If seat belt anchorages are provided for the rear seats in a vehicle the tests specified in Subclauses *b* and *c* above shall be applied as appropriate.

e. Results of test. After the tests specified above have been carried out the anchorage points shall be examined. Appreciable permanent deformation of any anchorage point or its surrounding area is permissible provided there is no evidence of fracture or breakage. Failure of the spacing device, where fitted, shall not occur.

CO-OPERATING ORGANIZATIONS

The Automobile Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

British Road Services
*D.S.I.R.—Road Research Laboratory
Electric Lamp Industry Council
Institution of Mechanical Engineers
Institution of Mechanical Engineers (Automobile Division)
Institution of Production Engineers

London Transport Board
Ministry of Defence, Army Department
*Ministry of Transport
Municipal Passenger Transport
Association (Incorporated)
Public Transport Association (Incorporated)
*Society of Motor Manufacturers and Traders Ltd.

The Government departments and the industrial organization marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

Motor Agents' Association Ltd.
Motor Industry Research Association

National Automobile Safety Belt Association
Royal Society for the Prevention of Accidents

This British Standard, having been approved by the Automobile Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council of the Institution on 14th June, 1965.

The Institution desires to call attention to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

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The following B.S.I. reference relates to the work on this standard:
Committee reference AUE/-2. Draft for comment D64/10007.

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Seat belt anchorage points

Revision

Clause 1. Scope. Delete the fourth line of the second paragraph and substitute: 'vehicles up to 30 cwt unladen weight'.

Clause 2. Definitions. Insert the following new term and definition after the definition for 'seat belt':

'Retracting or emergency locking seat belt. A seat belt, as defined above, and incorporating a webbing storage device, automatic length adjusting device or an emergency locking retractor which may require an additional anchorage or anchorages and which may also include intermediate attachments to the vehicle such as pulleys, etc'.

Clause 3. Number of anchorage points. *Subclause 3a.* Delete the second line of Subclause 3a(i) and substitute:

'the side structure or the roof, positioned so that the shoulder strap of the seat belt passes over the out-board side of the wearer'.

Subclause 3c. Delete Subclause 3c and substitute:

c. Any one floor anchorage point may be used for attaching the ends of two seat belts provided that it is tested simultaneously in accordance with the requirements specified in Clause 9.'

Clause 9. Tests on anchorage points. Delete this clause entirely and substitute the following:

TESTS ON ANCHORAGE POINTS

9. The anchorages shall be subjected to the static load tests described in Subclauses a to f below, as appropriate. The test load shall, in each case, be maintained for a period not less than 0.5 second. During the tests the doors of the vehicle may be closed.

a. *Method of testing.* Each pair of floor anchorages, or floor and side anchorages, to be tested is connected by suitable attachments, representative of a seat belt installation, round a body block conforming to Fig. 2. The test is made by applying the specified static load to the body blocks.

The load testing two floor anchorages shall be applied forwards in a plane parallel to the longitudinal plane of symmetry of the vehicle at as near an angle of 45° to the horizontal as is practicable.

The load testing one side and one floor anchorage shall be applied forwards in a plane parallel to the longitudinal plane of symmetry of the vehicle and as near horizontal as is practicable; but in no case more than 20° from the horizontal, and at a height as near as is practicable to the mean height of the two anchorage points.

b. *Single front seats only.* The two floor anchorages and subsequently on the same or another body shell, the side anchorage and the opposite floor anchorage shall be tested. A static load of 2265 kg (5000 lb) shall be applied to the body block for each test.

c. *Front seats with provision for two seat belts.*

(i) The floor anchorages for one seat position together with the side anchorage and the floor anchorage towards the centre of the

vehicle for the other seat position shall be tested simultaneously. A static load of 2265 kg (5000 lb) shall be applied to the body block attached to the anchorages for each seat position.

(ii) Alternatively, at the discretion of the vehicle manufacturer and applying the same test loads, the test shall be carried out simultaneously on the two pairs of floor anchorages and subsequently, using the same or another body shell, the test shall be carried out simultaneously, on the two pairs of floor and side anchorages.

d. *Front seats with provision for three seat belts.* If seat belt anchorages are provided for three seat positions in the front of the vehicle the anchorages shall be tested as described in (i) to (iv) below, at the discretion of the vehicle manufacturer:

(i) A simultaneous test on the anchorages for the three seat positions.

The floor anchorages for the centre seat position and for one of the outer seat positions, together with the side anchorage and the floor anchorage towards the centre of the vehicle for the other outer seat position shall be tested simultaneously.

The static test load shall be 6795 kg (15 000 lb) divided equally between the three pairs of anchorage points being tested.

or (ii) Two separate tests.

The floor anchorages for both the centre seat position and for one of the outer seat positions are tested simultaneously. Subsequently, using the same or another body