

British Standard Methods of test for

Footwear and footwear materials

Part 5. Testing of complete footwear

Section 5.9 Strength of top piece attachment to shoe heels

Méthodes d'essai des chaussures et des matériaux entrant dans leur confection

Partie 5. Essai de la chaussure complète

Section 5.9 Résistance de la fixation du dessus aux talons de chaussures

Prüfverfahren für Fussbekleidung und Fussbekleidungswerkstoffe

Teil 5. Prüfen der fertigen Fussbekleidung

Abschnitt 5.9 Stärke der Oberteilbefestigung an Schuhabsätzen

NOTE. It is recommended that this Section should be read in conjunction with the information in the General introduction to BS 5131, published separately.

1. Scope

This Section describes a method for measuring the force required to detach the top piece from the underside of the shoe heel. The test is applicable to heels with the top piece already attached which have been removed from complete shoes, to heels alone with the top piece attached and, in some instances, to heels with separate push-in top pieces. All heels, except reinforced slender heels with top pieces attached by steel spigots and built stacked heels, may be tested by this method.

2. Reference

This Section refers to the following standards publication:

BS 3692	ISO metric precision hexagon bolts, screws and nuts
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3. Principle

The top piece is pulled off by a steadily increasing force which is applied to its centre perpendicular to the top piece/heel interface. The top piece is first to be drilled to receive a bolt which is attached to one jaw of the tensile machine and the heel cut and drilled to attach it to the other jaw. Several heels need to be tested and the results expressed individually as usually it is the lower values, rather than the average, which are the most important.

4. Apparatus and materials

The following apparatus and materials are required.

4.1 Tensile testing machine, with a range of 0 N to 1000 N and a constant-rate-of-loading of 15 ± 5 N/s. A constant-rate-of-traverse tester, for which increase of force produces

an appreciable movement of the load jaw (e.g. a 'pendulum' tester), may be used if the rate of traverse is set to give, on average, the specified rate of force application when a test is carried out. Alternatively, a constant-rate-of-traverse tester for which there is little movement of the load jaw may be used if the top piece is attached to one jaw of the tester via one or more extensible cords which are substantially elastic over the force range of the test and the rate of traverse is adjusted until the specified rate of force application is obtained.

4.2 Drill, with twist drill bits of suitable sizes (see 5.1.3, 5.1.4, 5.2).

4.3 Bolt, of size M4, or size M3 (as defined in BS 3692) for slender heels, and preferably of length 40 mm or more, with a small metal ring or loop attached to its head by brazing. If only low heels are being tested, however, the bolt need not be longer than about 20 mm.

4.4 Rod, of diameter 2 mm and appropriate length, or one or more strong extensible cords, e.g. nylon shoe laces.

5. Preparation of the heel and top piece

The form of the test piece needs to be varied according to the height of the heels. For medium and high heels the type of test piece shown in figure 5.9/1 is convenient, in which the heel is held by one cord or rod. For heels of less than about 20 mm in height this cord is likely to interfere with the bolt attached to the top piece. In such cases the form of attachment shown in figure 5.9/2 should be used.

5.1 Medium and high heels. The prepared test piece is illustrated in figure 5.9/1.

5.1.1 It is permissible to test heels and top pieces supplied separately, provided the top piece can be attached in the laboratory by essentially the same method as in production. Push-in top pieces shall be inserted fully by pneumatic pressure. Some types of these top pieces are additionally attached by short nails inserted through holes moulded in the top piece. These also may be inserted in the laboratory, by hammering or pneumatic pressure, but the correct nail shall be used. The top piece may be attached by staples using a staple gun provided the staples are the same as those used in production.

The attachment of the top piece may precede or follow the other details of the preparation described in 5.1.2, 5.1.3 and 5.1.4.

5.1.2 Cut through the heel stem parallel to the top piece and approximately 30 mm from it, in order to gain access to the cavity and inner side of the top piece or top piece spigot. This may be done with the heel still attached to the shoe or, if preferred, the heel may be detached first by removing the heel attaching pins. For fairly low heels the

amount cut off may be reduced to approximately 20 mm provided there is still enough room for the bolt (see 6.2). Otherwise the procedure for low heels described in 5.2 should be used.

In the case of heels having the 'Autoloc' type of top piece attachment which do not have a full height centre cavity in the stem, it is necessary to drill a hole down the centre of the stem from the cut surface to the 'Autoloc' cavity or recess on the underside of the heel. The diameter of this hole should be not less than 10 mm.

5.1.3 Drill a hole vertically through the centre of the top piece just large enough to accommodate a suitable bolt of the type described in 4.3.

5.1.4 Drill the heel stem horizontally from one side to the other approximately 5 mm above the cut surface, as shown in figure 5.9/1, so that the drilled hole, which should be large enough to take the rod or cord described in 4.4, is parallel to the heel breast and passes through the vertical centreline of the top piece.

5.2 Low heels. The prepared test piece is shown in figure 5.9/2.

Where the heel is attached to a shoe, remove it by extracting the heel attaching pins.

Cut out any rib or ribs across the centre cavity in the heel, taking care not to damage the top piece when doing this.

Drill a hole vertically through the centre of the top piece just large enough to accommodate a suitable bolt of the type described in 4.3.

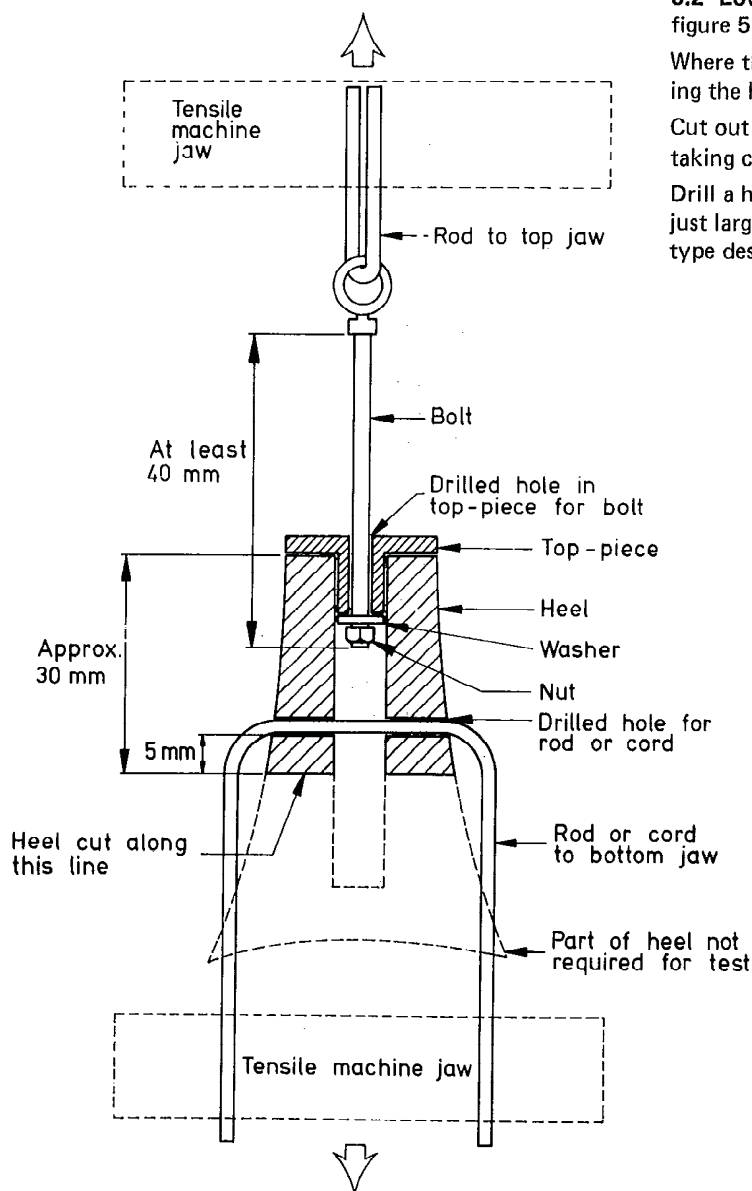


Figure 5.9/1. Testing of high and medium heels. Side view of test assembly and section through heel