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**Assembly tools for screws and nuts —  
Attachments for hand-operated square  
drive socket wrenches — Dimensions  
and tests**

*Outils de manœuvre pour vis et écrous — Adaptateurs pour douilles à  
main à carré conducteur — Dimensions et essais*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 3316 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 10, *Assembly tools for screws and nuts, pliers and nippers*.

This fourth edition cancels and replaces the third edition (ISO 3316:1996), which has been technically revised.

The following main changes have been carried out with respect to the previous edition:

- a) designations according to ISO 1703 have been introduced, replacing the old designation numbers;
- b) references have been updated;
- c) the specification for square drive bits for use with spiral ratchet drivers (former designation number 206) has been deleted.

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# Assembly tools for screws and nuts — Attachments for hand-operated square drive socket wrenches — Dimensions and tests

## 1 Scope

This International Standard applies to attachments for hand-operated square drive socket wrenches listed in ISO 1703 under designations 5 1 00 03 0, 5 1 00 04 0, 5 1 00 04 1 and 5 1 00 05 0.

NOTE 1 The above-mentioned designations correspond to the former designation numbers 203, 204 and 205.

It specifies

- a) the overall dimensions,
- b) the minimum Rockwell hardness value for their driving squares,
- c) the method of torque testing,
- d) the minimum torsional strength values,
- e) designation, and
- f) marking.

NOTE 2 For the specification of square adaptors with a hexagon or cylindrical flat drive, for power socket wrenches, see ISO 3317.

## 2 Normative references

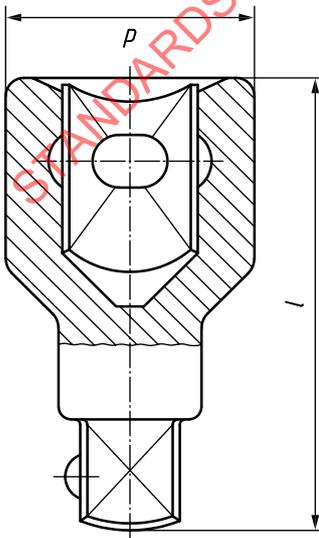
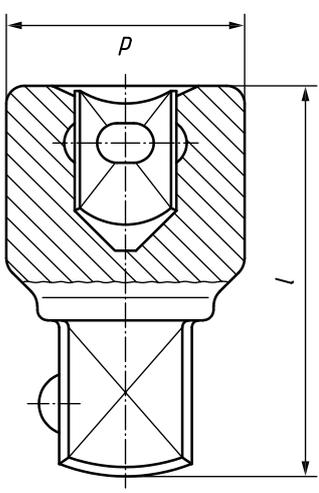
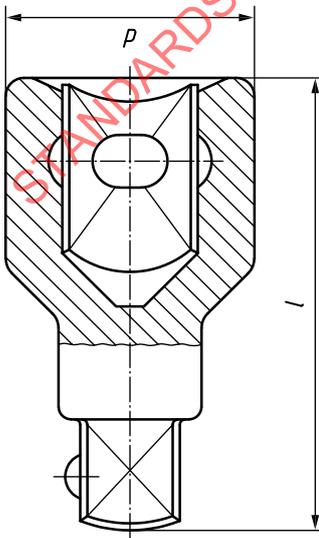
The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1174-1, *Assembly tools for screws and nuts — Driving squares — Part 1: Driving squares for hand socket tools*

## 3 Dimensions

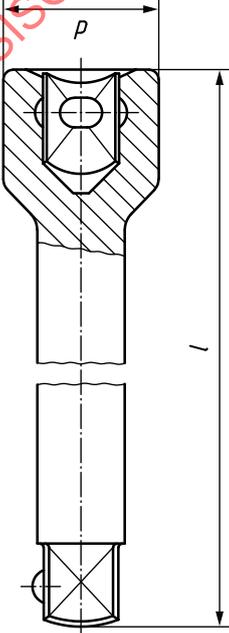
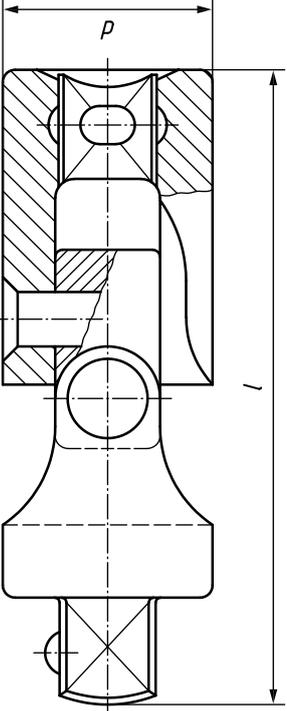
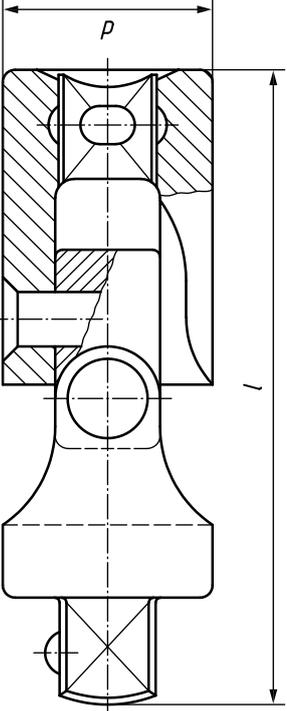
The overall dimensions are given in Table 1.

Table 1 — Overall dimensions

Tool	Description and designation according to ISO 1703a	Nominal dimension of square drive		Dimensions		Torque <sup>b</sup> <i>M</i> <sub>min</sub> N·m
		Female	Male	<i>l</i> <sub>max</sub>	<i>d</i> <sub>max</sub>	
	Adaptor socket wrench 5 1 00 03 0	10	6,3	32	20	62
		12,5	10	44	25	202
	Adaptor socket wrench 5 1 00 03 0	20	12,5	58	38	512
		25	20	85	52	1 412
	Adaptor socket wrench 5 1 00 03 0	6,3	10	27	16	62
		10	12,5	38	23	202
		12,5	20	50	30	512
		20	25	68	40	1 412

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Table 1 (continued)

Tool	Description and designation according to ISO 1703 <sup>a</sup>	Nominal dimension of square drive mm	Dimensions mm		Torque <sup>b</sup> $M_{min}$ N·m	
		Male and female	$l$	$d_{max}$		
	<b>Extension bar</b> 5 1 00 04 0 5 1 00 04 1	6,3	55 ± 3	12,5	62	
			100 ± 5			
			150 ± 8			
			75 ± 4	20		202
			125 ± 6			
			250 ± 12			
	<b>Universal joint, square drive</b> 5 1 00 05 0	12,5	75 ± 4	25	512	
			125 ± 6			
			250 ± 12			
			200 ± 10	38		1 412
			400 ± 20			
			200 ± 10	52		2 515
	<b>Universal joint, square drive</b> 5 1 00 05 0	20	400 ± 20	42	784	
			45			
			68			
			80			
			110			
			14			

<sup>a</sup> The abbreviated descriptor for use in the designation of an attachment is shown in bold-face.

<sup>b</sup> Torques,  $M$ , have been calculated using the maximum values from series E of ISO 1711-1, multiplied by the following coefficients:

- adaptor and extension bar: 0,9;
- universal joint: 0,5.

## 4 Driving squares

Driving squares shall be in accordance with ISO 1174-1 and shall have a minimum hardness of 39 HRC.

## 5 Torque testing

### 5.1 Method

Place the tool in a female test square and apply the corresponding torque.

Smoothly apply an increasing load until the minimum testing torque (see Table 1) is reached.

The across-flats dimension of the female test square shall be equal to the minimum dimension of the corresponding female square (see ISO 1174-1) with a tolerance of H8; the female test square shall be hardened to a hardness of not less than 55 HRC.

A device in which the female test square can be rotated at a certain torque, determined with an accuracy of  $\pm 2,5\%$ , may also be used for this test.

Following the application of the minimum test torsion torque, no damage or deformation shall affect the usability of the tool.

### 5.2 Test of adaptor socket wrench and extension bar as universal joint, square drive

The torque shall be achieved by applying a load using a driving part, the square drive of which has been treated for a minimum hardness of 55 HRC and whose across-flats dimension is equal to the maximum dimension of the corresponding male square (see ISO 1174-1) with a tolerance of h8.

The universal joint shall be tested in the position in which the two squares are on the same axis.

## 6 Designation

An attachment for hand-operated square drive socket wrenches in accordance with this International Standard shall be designated by

- a) an abbreviated description/descriptor as shown in Table 1,
- b) a reference to this International Standard, i.e. ISO 3316:—,
- c) the dimension of the female square drive and the male square drive, in millimetres, for the adaptor, or
- d) the dimension of the male-female square drive, in millimetres, and the overall length,  $l$ , in millimetres, for the extension bar, or
- e) the dimension of the male-female square drive, in millimetres, for the universal joint.

EXAMPLE 1 An adaptor socket wrench 5 1 00 03 0 with a nominal dimension of 10 mm, a female square drive and a 6,3 mm male square drive is designated as follows:

**Adaptor ISO 3316 - 10 × 6,3**

EXAMPLE 2 An extension bar 5 1 00 04 0 and 5 1 00 04 1 with a nominal dimension of 10 mm, a square drive and an overall length  $l = 125$  mm is designated as follows:

**Extension bar ISO 3316 - 10 × 125**

## 7 Marking

Attachments for hand-operated square drive socket wrenches shall be marked, permanently and legibly, with at least the following information:

- the name or trademark of the manufacturer, or
- the name or trademark of the distributor.

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