INTERNATIONAL STANDARD

ISO 3315

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

Outils de manœuvre pour vis et écrous — Pièces de commande pour douilles à main à carré conducteur — Dimensions et essais

Reference number
ISO 3315:1996(E)

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.

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.

International Standard ISO 3315 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 10, *Assembly tools for screws and nuts, pliers and nippers*.

This third edition cancels and replaces the second edition (ISO 3315:1988), which has been technically revised.

Annex A of this International Standard is for information only.

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

1 Scope

This International Standard applies to driving parts for hand-operated square drive socket wrenches listed under numbers 253, 255, 256, 257, 251, 252 and 254 in ISO 1703. It specifies

a) the overall dimensions;

b) the minimum Rockwell hardness value for their squares;

c) the method of torque testing;

d) the minimum torsional strength values;

e) the method endurance of testing for ratchet handles;

f) designation;

g) marking.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

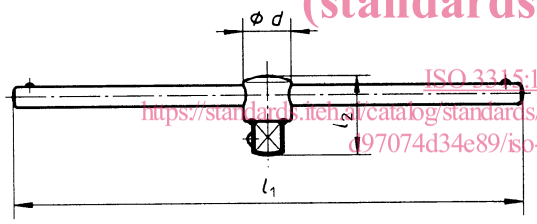
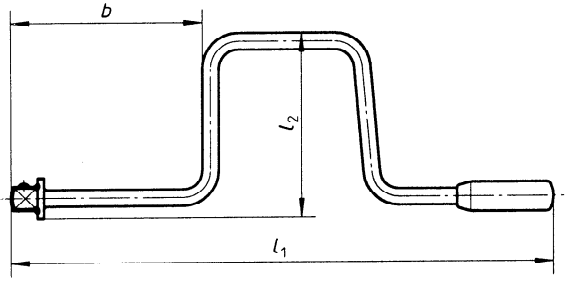
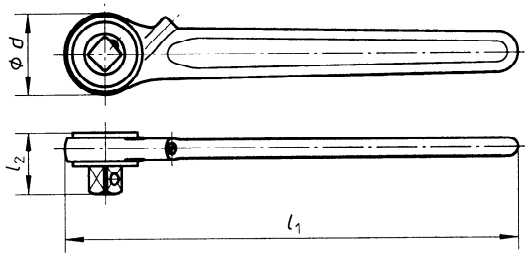
ISO 1174-1:1996, *Assembly tools for screws and nuts — Driving squares — Part 1: Driving squares for hand socket tools.*

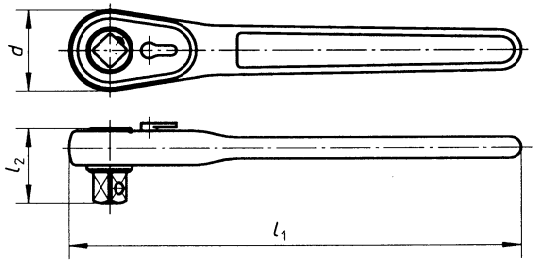
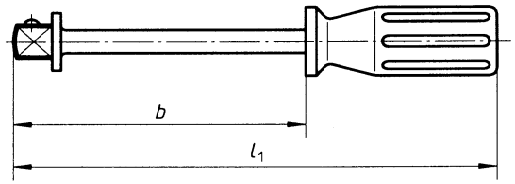
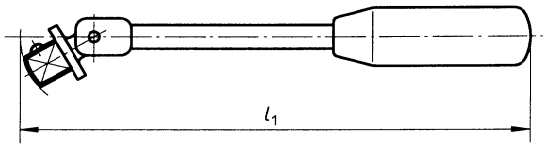
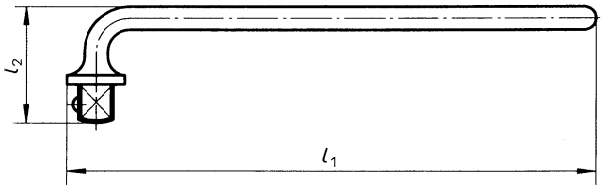
ISO 1711-1:1996, *Assembly tools for screws and nuts — Technical specifications — Part 1: Hand-operated wrenches and sockets.*

3 Dimensions

The overall dimensions are given in table 1.

Table 1 — Overall dimensions

No.	Tool	Description [1]	Nominal dimension of square drive mm	Dimensions mm				Torque [2] M_{min} N·m
				d_{max}	$l_{1\,min}$	$l_{1\,max}$	$l_{2\,max}$	
253		**Tee handle** square drive	6,3	14	100	160	24	55
			10	23	150	250	35	180
			12,5	27	220	320	50	455
			20	40	430	510	62	1 255
			25	52	500	760	80	2 236
				b_{min}	$l_{1\,max}$	$l_{2\,min}$	$l_{2\,max}$	
255		**Speed brace**	6,3	30	420	60	115	24
			10	40	470	70	125	79
			12,5	50	510	85	145	199
				d_{max}	$l_{1\,min}$	$l_{1\,max}$	$l_{2\,max}$	
256		**Ratchet handle**	6,3	25	110	150	27	62
			10	35	140	220	36	202
			12,5	50	230	300	45	512
			20	70	430	630	62	1 412

257		**Reversible ratchet handle**	6,3	d_{max} 25	$l_{1\,min}$ 110	$l_{1\,max}$ 150	$l_{2\,max}$ 27	62
			10	35	140	220	36	202
			12,5	50	230	300	45	512
			20	70	430	630	62	1 412
			25	90	500	900	80	2 515
251		Male square **spin type handle**	6,3	b_{min} 30		$l_{1\,max}$ 165		10
			10	40		190		34
252		**Flex head** nut spinner	6,3	$l_{1\,max}$ 165				62
			10	270				202
			12,5	490				512
			20	600				1 412
			25	850				2 515
254		**Offset handle** square drive	6,3	$l_{1\,max}$ 110		$l_{2\,max}$ 35		62
			10	210		45		202
			12,5	250		60		512
			20	500		120		1 412

1) The abbreviated description for use in the designation of a driving part is shown in bold-face.

2) Torques M have been calculated using the maximum values from series E of ISO 1711-1 multiplied by the following coefficients:
   - No. 253: 0,8
   - No. 255: 0,35
   - Nos. 256, 257, 252 and 254: 0,9
   - No. 251: 0,15

4 Driving squares

Driving squares shall be in accordance with ISO 1174-1, and 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.

Do not jerk or strike the tool when testing and apply the load gradually 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 not less than hardness 55 HRC.

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

Following the application of the minimum test torsion torque, any possible damage or deformation shall not affect usability of the tool.

5.2 Special requirements

5.2.1 Test of tee handle square drive

Draw out the handle completely at one end and apply the load to the end farthest from the test square.

5.2.2 Test of speed brace

Apply the load in the middle of the part on which the operator's hand normally rests.

5.2.3 Test of ratchet handle and reversible ratchet handle

Apply the load as near as possible to the end of the handle.

For tools having a reversible ratchet, type 257, the test shall be carried out in both directions.

5.2.4 Test of male square spin type handle

An appropriate appliance shall allow the load to be applied to the handle without clamping the handle on the rod, which could alter the test result.

5.2.5 Test of flex head nut spinner

Apply the load as near as possible to the end of the handle, which is placed at right angles to the axis of the square.

5.2.6 Test of offset handle square drive

Apply the load as near as possible to the end of the handle.

6 Endurance test for ratchet handles

After the torque testing specified in 5, an endurance test shall be carried out for ratchet handles and reversible ratchet handles (listed under numbers 256 and 257). The test conditions are given in table 2.

Table 2 — Values for endurance test

Driving square mm	**Number of cycles**	**Cycle test torque** N·m	**Frequency** max. cycles per minute
6,3	50 000	15	30
10	50 000	50	30
12,5	50 000	128	30

The test shall be carried out for one direction of rotation, by smoothly applying the specified torque.

During the test, all the teeth shall be involved.

No intervention of maintenance is allowed during the test.

After the test, the tool shall not show any physical damage and shall still withstand the torque testing specified in 5.2.3.

7 Designation

A driving part for hand-operated square drive socket wrenches in accordance with this International Standard shall be designated by

a) abbreviated description as shown in table 1 followed by its identity number;

b) reference to this International Standard;

c) dimension of the square drive, in millimetres.

EXAMPLE

Ratchet handle (No. 256) with nominal dimension of the square drive 12,5 mm:

Ratchet Handle No. 256 ISO 3315 - 12,5

8 Marking

Driving parts 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 distributor).

Annex A
(informative)

Bibliography

[1] ISO 1703:1983, *Assembly tools for screws and nuts — Nomenclature.*

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