

INTERNATIONAL STANDARD

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Passenger cars — Wiper systems — Shaft ends and arm-holes

*Voitures particulières — Dispositifs d'essuie-glace — Bouts d'axes de
fixation et trou de fixation sur le porte-balai*



Reference number
ISO 9704:1990(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 9704 was prepared by Technical Committee ISO/TC 22, *Road vehicles*.

Annex A forms an integral part of this International Standard.

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Passenger cars — Wiper systems — Shaft ends and arm-holes

1 Scope

This International Standard specifies the main dimensions and general requirements for wiper arm to shaft end connections of wiper systems used on passenger cars. It also applies to wiper arm to shaft end connections of other vehicles where no specific International Standard exists.

Type 1 is the preferred type. Type 2, which is given in annex A, is still used in some countries.

2 Type 1: Tapered, knurled shaft ends and connections

Shaft ends for wiper systems shall meet the requirements specified in 2.1 to 2.5. Details not specified are left to the manufacturer's choice.

2.1 Tapered, knurled shaft end dimensions

Shaft end dimensions shall meet the requirements shown in figure 1 and table 1.

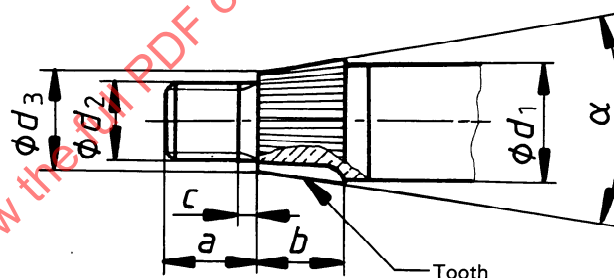


Figure 1

Table 1

Nominal diameter d_1 mm	Thread d_2 	a min. mm	b min. mm	c max. mm	Tip diameter d_3 0 -0,15 mm	Number of teeth ¹⁾		Nominal taper	Cone angle ²⁾ α +2° 0
							tol.		
6	M5	5,8	2,4	1,2	5,3	29	± 2	1 : 4	14°15'
8	M6	6,8	3,9	1,7	6,6	33		1 : 3	18°55'
10	M8	8,8		2	8,6	41	± 3		
12	M8		5			37			
	M10	9,8	3,9		10,6	50			

1) The profile of the teeth on the manufacturing tool shall have a tip angle of 90°.

2) Measured at the top of the teeth.

2.2 Material of tapered, knurled shaft ends

The material shall be steel with a surface hardness of 135 HB minimum.

2.3 Arm fixing hole dimensions

Arm fixing hole dimensions shall meet the requirements shown in figure 2 and table 2.

2.4 Material of arm heads

The material used shall have a surface hardness of 110 HB max.

2.5 Tightening torques

Tightening torques, values for which apply to zinc-coated nuts and washers, shall be in accordance with table 3.

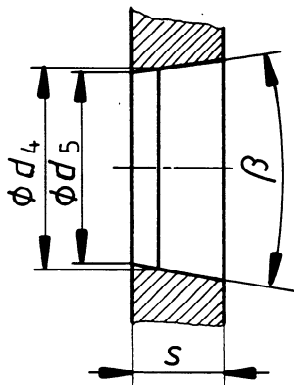


Figure 2

Table 2

Nominal diameter d_1 mm	d_4 +0,15 -0,2 mm	d_5 +0,1 0 mm	s min. mm	Nominal taper	Cone angle β 0° - 0° 30'
6	5,3	4,5	4,8	1 : 4	14°15'
8	6,3	5,8	6	1 : 3	18°55'
10	8,3	7,6	6,5		
12		7,6	7,5		
	10,3	9,6	6,5		

Table 3

Thread d_2	Nut tightening torque M_t N·m
M5	$4 \leq M_t \leq 6$
M6	$6 \leq M_t \leq 9$
M8	$13 \leq M_t \leq 17$
M10	$13 \leq M_t \leq 20$

Annex A (normative)

Type 2: Knurled driver type (non-preferred)

The knurled driver type of shaft end for wiper systems is non-preferred; it is however, still used in some countries.

A.1 Knurled driver dimensions

Knurled driver dimensions shall meet the requirements shown in figure A.1 and table A.1.

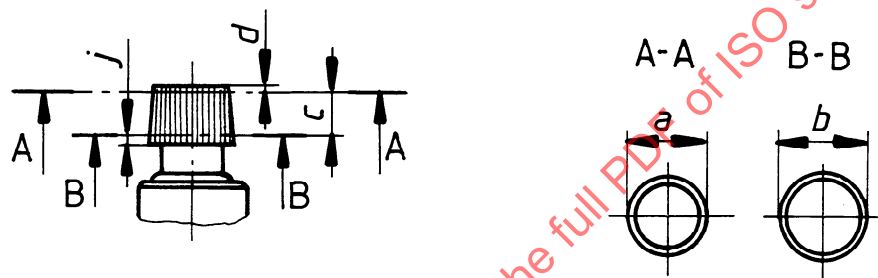


Figure A.1

Table A.1

Dimensions in millimetres

Nominal diameter	<i>a</i>		<i>b</i>		<i>c</i> ± 0,1	<i>d</i> ± 0,1	<i>j</i> ± 0,1	Number of teeth
	max.	min.	max.	min.				
12,7	13,74	13,59	14,00	13,84	5,56	0,92	0,5	72
15,9	15,60	15,44	15,85	15,70	9,07	1,57	1,9	84
17,5	17,04	16,89	17,38	17,23				
25,4	25,60	25,45	25,48	25,34				120

A.2 Material of driver

The material used for the knurled driver shall be a zinc-based alloy or a sintered iron.

A.3 Arm head hole dimensions

Arm head hole dimensions shall meet the requirements shown in figure A.2 and table A.2.

A.4 Material of arm head

The material used for the arm head shall be a zinc-based alloy or aluminium.

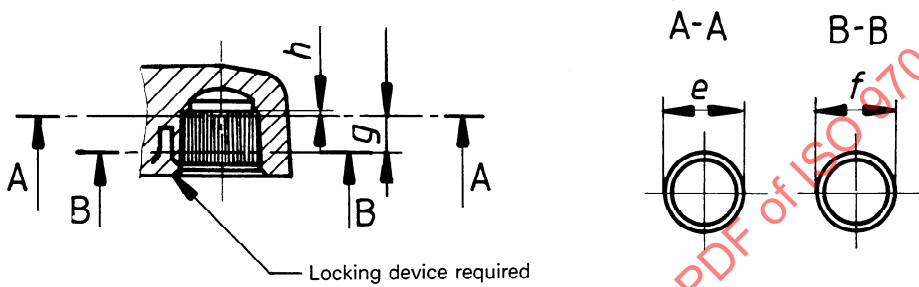


Figure A.2

Table A.2

Dimensions in millimetres

Nominal diameter	<i>e</i>		<i>f</i>		<i>g</i>	<i>h</i>	Number of teeth
	max. 1)	min.	max. 1)	min.	± 0,1	± 0,1	
12,7	14,1	14,0	14,35	14,25	6,58	0,66	36
15,9	15,95	15,85	16,23	16,13	9,07	1,57	42
17,5	17,30	17,21	17,65	17,56			
25,4	25,78	25,69	26,11	26,02			60
1) Diameters are prior to painting or plating. An allowance of 0,025 may be added to allow for maximum thickness of paint or plating.							