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JAPANESE INDUSTRIAL STANDARD

Flexible shafts for speedometers and tachographs of automobiles

JIS D 5602—1991

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Flexible shafts for speedometers and tachographs of automobiles

D 5602-1991

1. Scope

This Japanese Industrial Standard specifies the flexible shafts to be used for the driving of the speedometers and tachographs of automobiles (hereafter referred to as the "flexible shafts"). Speedometer and tachograph are referred (hereafter to as the "meters").

Remarks: Applicable Standards to this Standard are as follows:

JIS D 0201-General Rules of Electroplating for Automobile Parts

JIS D 0203-Method of Moisture, Rain and Spray Test for Automobile Parts

JIS D 0204-Method of High and Low Temperature Test for Automobile Parts

JIS D 1601-Vibration Testing Methods for Automobile Parts

JIS Z 8703-Standard Atmospheric Conditions for Testing

2. Classification

The classification of meter side attaching part, driving side attaching part and driving side key of flexible shaft shall be divided as shown in Tables 1 to 3 according to the shapes.

And the classification of flexible shaft shall be divided as shown in Table 4 according to the combination of the above-mentioned types. Where it is impossible to meet Table 4, the classification in Tables 1 to 3 can be combined at option.

Table 1. Classification of meter side attaching part

Classification (symbol)	Shape	Reference figure
A	Screw type M 12 × 1.0	Attached Fig. 1.1
B ₁	Plug in type $\phi 16.1$	Attached Fig. 1.2 (1)
B ₂		Attached Fig. 1.2 (2)
B ₃		Attached Fig. 1.2 (3)
B ₄		Attached Fig. 1.2 (4)
C	Slot in type $\phi 16.1$	Attached Fig. 1.3
D	Slot in type $\phi 19.0$	Attached Fig. 1.4
E ₁	Slot in type $\phi 19.5$	Attached Fig. 1.5 (1)
E ₂		Attached Fig. 1.5 (2)
E ₃		Attached Fig. 1.5 (3)
E ₄		Attached Fig. 1.5 (4)

Table 2. Classification of driving side attaching part

Classification (symbol)	Shape	Reference figure
a	Internal thread type M 11 × 1.0	Attached Fig. 2.1
b ₁	Internal thread type M 12 × 1.0	Attached Fig. 2.2 (1)
b ₂		Attached Fig. 2.2 (2)
c ₁	Internal thread type M 22 × 1.5	Attached Fig. 2.3 (1)
c ₂		Attached Fig. 2.3 (2)
c ₃		Attached Fig. 2.3 (3)
d	External thread type M 22 × 1.5	Attached Fig. 2.4
e	Bayonet type $\phi 9$	Attached Fig. 2.5
f	Bayonet type $\phi 14$	Attached Fig. 2.6
g ₁	Bayonet type $\phi 15$	Attached Fig. 2.7 (1)
g ₂		Attached Fig. 2.7 (2)
h	Bayonet type $\phi 16$	Attached Fig. 2.8
i	Bayonet type $\phi 17$	Attached Fig. 2.9
j	Bayonet type $\phi 18$	Attached Fig. 2.10

Table 3. Classification of driving side key

Classification (symbol)	Shape	Reference figure
1	 2.6	Attached Fig. 3.1
2	6.4 × 2.5	Attached Fig. 3.2
3	$\phi 4.5$	Attached Fig. 3.3
4	$\phi 5.0$	Attached Fig. 3.4
5	$\phi 9.0$	Attached Fig. 3.5

Table 4. Classification of flexible shaft

Classification (symbol)	Classification of meter side attaching part (symbol)	Classification of driving side attaching part (symbol)	Classification of driving side key (symbol)	Nominal diameter of shaft complete (Informative reference) mm
A-a 3	A	a	3	3.2
A-f 1	A	f	1	4.0
A-g ₂ 3	A	g ₂	3	4.5
B ₁ -c ₁ 4	B ₁	c ₁	4	5.0
B ₁ -e 4	B ₁	e	4	6.0
B ₃ -d 2	B ₃	d	2	
B ₃ -h 5	B ₃	h	5	
B ₄ -c ₁ 4	B ₄	c ₁	4	
C-c ₁ 4	C	c ₁	4	
E ₁ -c ₁ 4	E ₁	c ₁	4	
E ₄ -c ₁ 4	E ₄	c ₁	4	

3. Performance

3.1 Needle deflection The flexible shafts shall be that when tested in accordance with the method in 7.2, the needle deflection which appears in the meter is the amplitude corresponding to not more than 1 km/h.

The needle deflection of this flexible shaft straightened after testing shall be of amplitude corresponding to not more than 0.5 km/h.

3.2 Bending The flexible shafts shall be that when tested in accordance with the method in 7.3, the outside of casing complete is free from the occurrence of harmful defect.

Besides, when laid in straight on the plane, after the test, the remarkable permanent deformation shall not be allowed.

3.3 Temperature resistance The flexible shafts shall be that when tested in accordance with 7.4, each part has no abnormality and, after the test, the performance specified in 3.1 and 3.2 is satisfied.

3.4 Water resistance The flexible shafts to be weather-beaten direct shall be that when tested in accordance with the method in 7.5, each part has no abnormality and, after the test, the performance specified in 3.1 and 3.2 is satisfied.

3.5 Vibration durability The flexible shafts shall be that when tested in accordance with the method in 7.6, each part has no abnormality, and the extension of shaft complete is not more than 1 mm per 1 m, and, furthermore, when tested in accordance with 7.2, the needle deflection is the amplitude corresponding to not more than 2 km/h.

4. Construction

The construction of the flexible shaft shall be as given in the following:

- (1) The flexible shaft shall be composed of a shaft complete which transmits rotation to the meters (including the driving side key) and, a casing complete which protects the above.
- (2) The rotational direction of the driving shaft of the flexible shaft shall be counterclockwise direction when viewed from the driving side.

5. Shapes and dimensions

The shapes and dimensions of the flexible shaft shall be as given in Attached Figs. 1, 2 and 3.

Furthermore, the overall length of the shaft complete shall generally be in accordance with Table 5.

Table 5. Overall length of shaft complete

Unit: mm

Length division of shaft complete	Length of shaft complete ⁽¹⁾
Under 1000	At interval of 20 from 100 and upwards
1000 or over up to 2500 excl.	At interval of 50 from 1000 and upwards
2500 or over up to 4000 excl.	At interval of 100 from 2500 and upwards
4000 or over	At interval of 200 from 4000 and upwards

Note ⁽¹⁾ The length of the shaft complete means the overall length including the key.

6. Appearance and plating

The appearance of flexible shafts shall be as follows:

- (1) The zinc-plated attaching metal fittings at both ends of flexible shafts shall conform to MFZn5 specified in JIS D 0201 and shall be free from uneven plating, remarkable flaw, and other harmful defects.