IFI
512-S
1982

METRIC SPRING PINS

SPRING PINS

IFI Note:

As yet there are no ISO standards for metric spring pins. However, such standards are under development by a Working Group of ISO/TC2 and IFI-512S is one of the documents being considered.

Notes.

1. All dimensions are in millimeters unless noted.

2. **Diameter.** The maximum diameter shall be inspected using a GO ring gage. The gage shall have a length of hole not greater than 3.0 mm. The full length of the pin shall pass through the GO ring gage. The minimum diameter shall be determined by averaging the diameters D_1, D_2 and D_3. These diameters shall be measured at the mid length of pins with lengths 25 mm or shorter; and at a distance of approximately 6 mm from each end of pins with lengths longer than 25 mm.

3. **Slot.** Slot design shall be in accordance with the practice of the manufacturer, except that the slot width shall be narrow enough to prevent nesting or interlocking of pins and wide enough to permit satisfactory installation in a hole of the minimum diameter as recommended in Table 1.

4. **Straightness.** Straightness of pins shall be within the limits necessary to permit pins

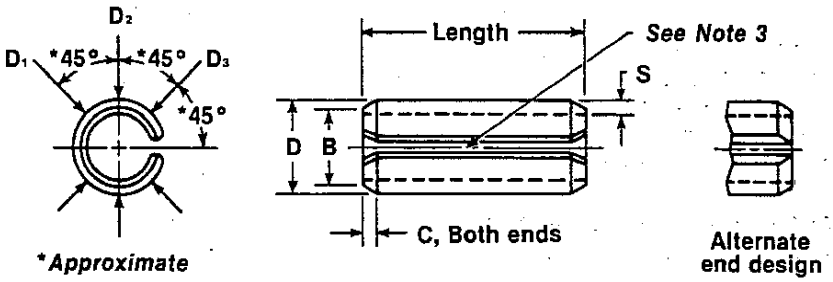

Table 1 Slotted Spring Pin Dimensions

Nom Pin Size	D		B	C		S	Recommended Hole Size	
	Dia		Chamfer Dia	Chamfer Length		Stock Thickness		
	Max	Min	Max	Max	Min	Nom	Max	Min
1.5	1.68	1.60	1.4	0.7	0.15	0.3	1.60	1.50
2	2.20	2.12	1.9	0.8	0.2	0.4	2.10	2.00
2.5	2.72	2.63	2.4	0.9	0.2	0.5	2.60	2.50
3	3.25	3.15	2.9	1.0	0.2	0.6	3.10	3.00
4	4.28	4.15	3.9	1.2	0.3	0.8	4.12	4.00
5	5.33	5.17	4.8	1.4	0.3	1.0	5.12	5.00
6	6.36	6.20	5.8	1.6	0.4	1.2	6.12	6.00
8	8.40	8.22	7.8	2.0	0.4	1.6	8.15	8.00
10	10.43	10.25	9.7	2.4	0.5	2.0	10.15	10.00
12	12.48	12.28	11.7	2.8	0.6	2.5	12.18	12.00
See Notes	2, 4						3, 9	

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Table 2 Recommended Slotted Spring Pin Lengths

Nom Length	Length Tol Plus and Minus	Nom Pin Size 1.5	2	2.5	3	4	5	6	8	10	12
4	0.40 for all lengths thru 25 mm	X	X								
5		X	X	X							
6		X	X	X	X						
8		X	X	X	X	X					
10		X	X	X	X	X	X				
12		X	X	X	X	X	X	X			
14		X	X	X	X	X	X	X	X		
16		X	X	X	X	X	X	X	X		
18		X	X	X	X	X	X	X	X	X	
20		X	X	X	X	X	X	X	X	X	X
25		X	X	X	X	X	X	X	X	X	X
30	0.50 for all lengths over 25 mm thru 50 mm		X	X	X	X	X	X	X	X	X
35			X	X	X	X	X	X	X	X	X
40			X	X	X	X	X	X	X	X	X
45				X	X	X	X	X	X	X	X
50					X	X	X	X	X	X	X
55	0.60 for all lengths over 50 mm thru 75 mm					X	X	X	X	X	X
60						X	X	X	X	X	X
65								X	X	X	X
70								X	X	X	X
75								X	X	X	X
80	0.75 for all lengths over 75 mm								X	X	X
90									X	X	X
100									X	X	X

NOTE: The lengths shown between the heavy lines for each pin size are considered standard and are generally available. Spring pins of lengths, shorter, longer, or intermediate to those listed may require special manufacture.

to fall through a ring gage by their own weight. Ring gage dimensions shall be as specified in Table 3.

5. **Lengths.** Length of pins is the distance measured parallel to the axis of the pin between the extreme ends. Length tolerances are given in Table 2.

6. **Material.** Carbon steel pins shall be made of analyses AISI 1070-1095. Corrosion resistant steel pins shall be made of AISI 420. Pins shall be heat treated as necessary to meet the mechanical and performance requirements.

7. **Hardness.** Carbon steel pins shall have a hardness of Rockwell C 46-53. Corrosion resistant steel pins shall have a hardness of Rockwell C 43-52. Hardness may be determined using any acceptable method with Tukon or Rockwell testing equipment provided deflection of the pin under load is prevented. The proper Rockwell Scale should be selected when testing pins of different wall thickness. Equivalencies to the Rockwell C scale shall be in accordance with SAE J417.

Table 3 Straightness Limits

Pin Length mm	Gage Length mm Max	Gage Length mm Min	Gage Hole Dia, mm Min	Gage Hole Dia, mm Max
			Specified Pin Dia, Max plus	Specified Pin Dia, Max plus
to and incl 25	25.15	24.85	0.20	0.21
over 25 to 50	50.15	49.85	0.40	0.42
over 50	75.15	74.85	0.60	0.63

8. Finish. Pins shall be furnished plain unless otherwise specified. When pins are electroplated or phosphate coated, appropriate plating or coating processes should be employed to avoid hydrogen embrittlement. If necessary, pins shall be suitably treated as soon as practicable after plating or coating to remove detrimental hydrogen embrittlement.

9. Performance. Pins shall be capable of withstanding the double shear loads specified in Table 4.

The shear test shall be performed in a fixture (see Fig. 1, page I—4, for typical fixtures) in which the pin support members and the member for applying the load shall have holes with diameters conforming to the recommended minimum hole sizes specified in Table 1, and shall have a hardness of Rockwell C58 minimum. The clearance between the supporting members and the loading member shall not exceed 0.15 mm, and the shear plane shall be at least one pin diameter away from each end. Pins shall be located in the fixture so that the slot is approximately at right angles to the line of applied load. Pins too short to be tested in double shear shall be tested by shearing two pins simultaneously in single shear. Speed of testing shall not exceed 13 mm per minute.

Table 4 Double Shear Strengths of Slotted Spring Pins

Nom Pin Size mm	Double Shear Strength Min kN
1.5	1.7
2	3.0
2.5	4.4
3	7.1
4	13.2
5	20.3
6	29.2
8	52.8
10	84.0
12	106

Pins shall be tested to failure. The maximum load applied to the pin coincident with or prior to pin failure shall be recorded as the double shear strength of the pin. Pins, tested for shear strength, shall show a ductile shear without longitudinal cracks.

10. Workmanship. Pins shall be free from burrs, loose scale, seams, notches, sharp edges and corners and any other defects affecting their serviceability.