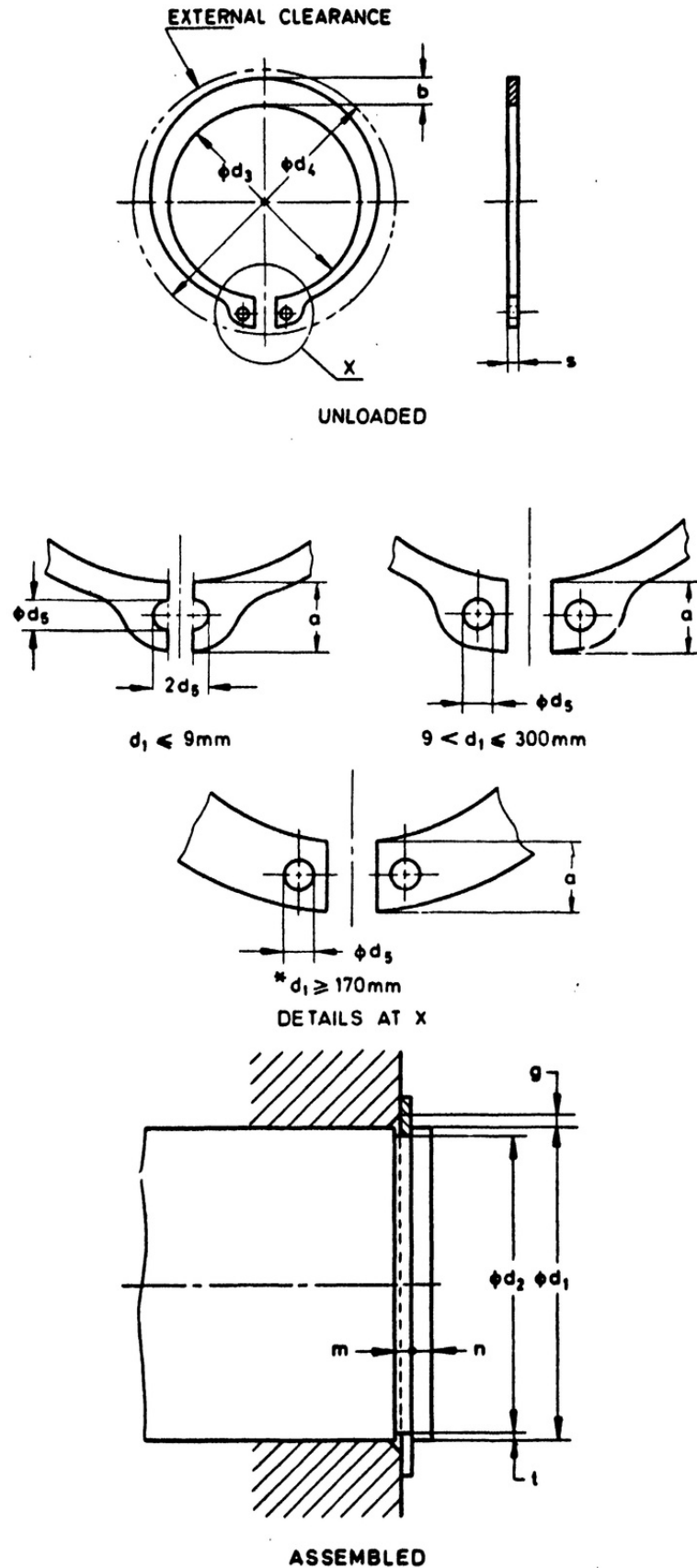


IS : 3075 (Part 1) - 1986

3.2 Dimensions, tolerances and design data for circlips, heavy type shall be as given in Table 2, read with Fig. 1.



Note 1 — Location of the lug hole shall be such that it leaves uniform material all round.

Note 2 — Unloaded shape of ring at manufacturer's discretion.

*At manufacturer's discretion.

FIG. 1 DIMENSIONS FOR CIRCLIPS — FOR SHAFTS

TABLE 1 DIMENSIONS AND DESIGN DATA FOR CIRCLIPS FOR SHAFTS — NORMAL TYPE

(Clause 3.1; and Fig. 1)

All dimensions in millimetres.

Shaft Dia, d_1 Nom. Size	Circlip						Groove				Design Data§								
	s		d_2		a	b^*	d_5	d_3		m	t	n	d_4	F_N	F_R	g	F_{Rg}	N_{ds}	Nom. Size of Pliers
	Size	Tolerance	Size	Tolerance	Max	Min	Min	Size	Tolerance	H13	Min	(kN)	(kN)	(kN)	Min ⁻¹				
3	0.4	± 0.02	2.7		1.9	0.8	1	2.8	0 -0.04 (h10)	0.5	0.1	0.3	7	0.15	0.47	0.5	0.27	3 60 000	3
4	0.4	± 0.02	3.7	+0.04 -0.15	2.2	0.9	1	3.8	0 -0.048 (h10)	0.5	0.1	0.3	8.6	0.20	0.50	0.5	0.30	2 11 000	
5	0.6	± 0.03	4.7		2.5	1.1	1	4.8	0	0.7	0.1	0.3	10.3	0.26	1.00	0.5	0.80	1 54 000	
6	0.7	± 0.03	5.6		2.7	1.3	1.2	5.7	0	0.8	0.15	0.5	11.7	0.46	1.45	0.5	0.90	1 14 000	3
7	0.8	± 0.03	6.5		3.1	1.4	1.2	6.7	0	0.9	0.15	0.5	13.5	0.54	2.60	0.5	1.40	1 21 000	
8	0.8	± 0.03	7.4	+0.06 -0.18	3.2	1.5	1.2	7.6	0 (h10)	0.9	0.2	0.6	14.7	0.81	3.00	0.5	2.00	96 000	
9	1	± 0.04	8.4		3.3	1.7	1.2	8.6	0	1.1	0.2	0.6	16	0.92	3.50	0.5	2.40	85 000	10
10	1	± 0.04	9.3		3.3	1.8	1.5	9.6	0	1.1	0.2	0.6	17	1.01	4.00	1	2.40	84 000	
11	1	± 0.04	10.2		3.3	1.8	1.5	10.5	0	1.1	0.25	0.8	18	1.40	4.50	1	2.40	70 000	
12	1	± 0.04	11		3.3	1.8	1.7	11.5	0	1.1	0.25	0.8	19	1.53	5.00	1	2.40	75 000	10
13	1	± 0.04	11.9		3.4	2	1.7	12.4	0	1.1	0.3	0.9	20.2	2.00	5.80	1	2.40	66 000	
14	1	± 0.04	12.9	+0.10 -0.36	3.5	2.1	1.7	13.4	0 -0.11 (h11)	1.1	0.3	0.9	21.4	2.15	6.35	1	2.40	58 000	
15	1	± 0.04	13.8		3.6	2.2	1.7	14.3	0	1.1	0.35	1.1	22.6	2.66	6.90	1	2.40	50 000	10
16	1	± 0.04	14.7		3.7	2.2	1.7	15.2	0	1.1	0.4	1.2	23.6	3.26	7.40	1	2.40	45 000	
17	1	± 0.04	15.7		3.8	2.3	1.7	16.2	0	1.1	0.4	1.2	25	3.46	8.00	1	2.40	41 000	
18	1.2	± 0.05	16.5		3.9	2.4	2	17	0	1.3	0.5	1.5	26.2	4.58	17.0	1.5	3.75	39 000	19
19	1.2	± 0.05	17.5		3.9	2.5	2	18	0	1.3	0.5	1.5	27.2	4.84	17.0	1.5	3.80	35 000	
20	1.2	± 0.05	18.5		4	2.6	2	19	0	1.3	0.5	1.5	28.4	5.06	17.1	1.5	3.85	32 000	
21	1.2	± 0.05	19.5	+0.13 -0.42	4.1	2.7	2	20	0 -0.13 (h11)	1.3	0.5	1.5	29.6	5.36	16.8	1.5	3.75	29 000	19
22	1.2	± 0.05	20.5		4.2	2.8	2	21	0	1.3	0.5	1.5	30.8	5.65	16.9	1.5	3.80	27 000	
24	1.2	± 0.05	22.2		4.4	3	2	22.9	0	1.3	0.55	1.7	33.2	6.75	16.1	1.5	3.65	27 000	
25	1.2	± 0.05	23.2		4.4	3	2	23.9	0	1.3	0.55	1.7	34.2	7.05	16.2	1.5	3.70	25 000	19
26	1.2	± 0.05	24.2		4.5	3.1	2	24.9	0	1.3	0.55	1.7	35.5	7.34	16.1	1.5	3.70	24 000	
28	1.5	± 0.05	25.9	+0.41 -0.42	4.7	3.2	2	26.6	0 -0.21 (h12)	1.6	0.7	2.1	37.9	10.00	32.1	1.5	7.50	21 200	
29	1.5	± 0.05	26.9		4.8	3.4	2	27.6	0	1.6	0.7	2.1	39.1	10.37	31.8	1.5	7.45	20 000	19
30	1.5	± 0.05	27.9		5	3.5	2	28.6	0	1.6	0.7	2.1	40.5	10.73	32.1	1.5	7.65	18 900	
32	1.5	± 0.05	29.6		5.2	3.6	2.5	30.3	0	1.6	0.85	2.6	43	13.85	31.2	2	5.55	16 900	
34	1.5	± 0.05	31.5		5.4	3.8	2.5	31.3	0	1.6	0.85	2.6	45.4	14.72	31.3	2	5.60	16 100	40
35	1.5	± 0.05	32.2	+0.25 -0.5	5.6	3.9	2.5	33	0	1.6	1	3	46.8	17.80	30.8	2	5.55	15 500	
36	1.75	± 0.05	33.2		5.6	4	2.5	34	0	1.85	1	3	47.8	18.33	49.4	2	9.00	14 500	
38	1.75	± 0.05	35.2		5.8	4.2	2.5	36	0	1.85	1	3	50.2	19.30	49.5	2	9.10	13 600	40
40	1.75	± 0.05	36.5		6	4.4	2.5	37.5	0	1.85	1.25	3.8	52.6	25.30	51.0	2	9.50	14 300	
42	1.75	± 0.05	38.5		6.5	4.5	2	39.5	0 -0.25 (h12)	1.85	1.25	3.8	55.7	26.70	50.0	2	9.45	13 000	
45	1.75	± 0.05	41.5		5.7	4.7	2.5	42.5	0	1.85	1.25	3.8	59.1	28.60	49.0	2	9.35	11 400	40
48	1.75	± 0.05	44.5	+0.39 -0.9	6.9	5	2.5	45.5	0	1.85	1.25	3.8	62.5	30.70	49.4	2	9.55	10 300	
50	2	± 0.06	45.8		6.9	5.1	2.5	47	0	2.15	1.5	4.5	64.5	38.00	73.3	2	14.4	10 500	
52	2	± 0.06	47.8		7	5.2	2.5	49	0	2.15	1.5	4.5	66.7	39.70	73.1	2.5	11.5	9 850	40
55	2	± 0.06	50.8		7.2	5.4	2.5	52	0	2.15	1.5	4.5	70.2	42.00	71.4	2.5	11.4	8 960	
56	2	± 0.06	51.8		7.3	5.5	2.5	53	0	2.15	1.5	4.5	71.6	42.80	70.8	2.5	11.35	8 670	
58	2	± 0.06	53.8		7.3	5.6	2.5	55	0	2.15	1.5	4.5	73.6	44.30	71.1	2.5	11.5	8 200	40
60	2	± 0.06	55.8		7.4	5.8	2.5	57	0	2.15	1.5	4.5	75.6	46.00	69.2	2.5	11.3	7 620	
62	2	± 0.06	57.8	+0.46 -1.1	7.5	6	2.5	59	0 -0.30 (h12)	2.15	1.5	4.5	77.8	47.50	69.3	2.5	11.45	7 240	
63	2	± 0.06	58.8		7.6	6.2	2.5	60	0	2.15	1.5	4.5	79	48.30	70.2	2.5	11.6	7 050	40
65	2.5	± 0.06	60.8		7.8	6.3	3	62	0	2.65	1.5	4.5	81.4	49.80	135.6	2.5	22.7	6 640	
68	2.5	± 0.06	63.5		8	6.5	3	65	0	2.65	1.5	4.5	84.8	52.25	135.9	2.5	23.1	6 910	
70	2.5	± 0.06	65.5		8.1	6.6	3	67	0	2.65	1.5	4.5	87	53.80	134.2	2.5	23.0	6 530	

(Continued)

TABLE 1 DIMENSIONS AND DESIGN DATA FOR CIRCLIPS FOR SHAFTS — NORMAL TYPE — Contd

All dimensions in millimetres.

Shaft Dia, d_1 Nom. Size	Circlip				Groove				Design Data§							Nom. Size of Pliers			
	s		d_s		d_4 †		m†		t		n		d_4	F_N	F_R		g	F_{RG}	Nd_b
	Size	Tolerance	Size	Tolerance	Max	R	Min	Size	Tolerance	H13	Min		(kN)	(kN)			(kN)	Min ⁻¹	
72	2.5	± 0.06	67.5	+ 0.46 - 1.1	8.2	6.8	3	69	0 - 0.3 (h 12)	2.65	1.5	4.5	89.2	55.30	131.8	2.5	22.8	6 190	40
75	2.5		70.5		8.4	7	3	72		2.65	1.5	4.5	92.7	57.60	130.0	2.5	22.8	5 740	
78	2.5		73.5		8.6	7.3	3	75		2.65	1.5	4.5	96.1	60.00	131.3	3	19.75	5 450	
80	2.5		74.5		8.6	7.4	3	76.5		2.65	1.75	5.3	98.1	71.60	128.4	3	19.5	6 100	
82	2.5	± 0.07	76.5	+ 0.54 - 1.3	8.7	7.6	3	78.5	0 - 0.35 (h 12)	2.65	1.75	5.3	100.3	73.50	128.0	3	19.6	5 860	85
85	3		79.5		8.7	7.8	3.5	81.5		3.15	1.75	5.3	103.3	76.20	215.4	3	33.4	5 710	
88	3		82.5		8.8	8	3.5	84.5		3.15	1.75	5.3	106.5	79.00	221.8	3	34.85	5 200	
90	3		84.5		8.8	8.2	3.5	86.5		3.15	1.75	5.3	108.5	80.80	217.2	3	34.4	4 980	
95	3	± 0.08	89.5	+ 0.63 - 1.5	9.4	8.6	3.5	91.5	0 - 0.54 (h 13)	3.15	1.75	5.3	114.8	85.50	212.2	3.5	29.25	4 550	125
100	3		94.5		9.6	9	3.5	96.5		3.15	1.75	5.3	120.2	90.00	206.4	3.5	29.0	4 180	
105	4		98		9.9	9.3	3.5	101		4.15	2	6	125.8	107.6	471.8	3.5	67.7	4 740	
110	4		103		10.1	9.6	3.5	106		4.15	2	6	131.2	113.0	457.0	3.5	66.9	4 340	
115	4	± 0.09	108	+ 0.72 - 1.7	10.6	9.8	3.5	111	0 - 0.54 (h 13)	4.15	2	6	137.3	118.2	438.6	3.5	65.5	3 970	125
120	4		113		11	10.2	3.5	116		4.15	2	6	143.1	123.5	424.6	3.5	64.5	3 685	
125	4		118		11.4	10.4	4	121		4.15	2	6	149	128.7	411.5	4	56.5	3 420	
130	4		123		11.6	10.7	4	126		4.15	2	6	154.4	134.0	395.5	4	55.2	3 180	
135	4	± 0.08	128	+ 0.63 - 1.5	11.8	11	4	131	0 - 0.63 (h 13)	4.15	2	6	159.8	139.2	389.5	4	55.4	2 950	125
140	4		133		12	11.2	4	136		4.15	2	6	165.2	144.5	376.5	4	54.4	2 760	
145	4		138		12.2	11.5	4	141		4.15	2	6	170.6	149.6	367.0	4	53.8	2 600	
150	4		142		13	11.8	4	145		4.15	2.5	7.5	177.3	193.0	357.5	4	53.4	2 480	
155	4	± 0.08	146	+ 0.63 - 1.5	13	12	4	150	0 - 0.63 (h 13)	4.15	2.5	7.5	182.3	199.6	352.9	4	52.6	2 710	125
160	4		151		13.3	12.2	4	155		4.15	2.5	7.5	188	206.1	349.2	4	52.2	2 540	
165	4		155.5		13.5	12.5	4	160		4.15	2.5	7.5	193.4	212.5	345.3	5	41.4	2 520	
170	4		160.5		13.5	12.9	4	165		4.15	2.5	7.5	198.4	219.1	349.2	5	41.9	2 440	
175	4	± 0.09	165.5	+ 0.72 - 1.7	13.5	12.9	4	170	0 - 0.72 (h 13)	4.15	2.5	7.5	203.4	225.5	340.1	5	40.7	2 300	125
180	4		170.5		14.2	13.5	4	175		4.15	2.5	7.5	210	232.2	345.3	5	41.4	2 180	
185	4		175.5		14.2	13.5	4	180		4.15	2.5	7.5	215	238.6	336.7	5	40.4	2 070	
190	4		180.5		14.2	14	4	185		4.15	2.5	7.5	220	245.1	333.8	5	40.0	1 970	
195	4	± 0.09	185.5	+ 0.8 - 2	14.2	14	4	190	0 - 0.72 (h 13)	4.15	2.5	7.5	225	251.8	325.4	5	39.0	1 835	125
200	4		190.5		14.2	14	4	195		4.15	2.5	7.5	230	258.3	319.2	5	38.3	1 770	
210	5		198		14.2	14	4	204		5.15	3	9	240	325.1	598.2	6	59.9	1 835	
220	5		208		14.2	14	4	214		5.15	3	9	250	340.8	572.4	6	57.3	1 620	
230	5	± 0.09	218	+ 0.8 - 2	14.2	14	4	224	0 - 0.81 (h 13)	5.15	3	9	260	356.6	548.9	6	55.0	1 445	125
240	5		228		14.2	14	4	234		5.15	3	9	270	372.6	530.3	6	53.0	1 305	
250	5		238		14.2	14	4	244		5.15	3	9	280	388.3	504.3	6	50.5	1 180	
260	5		245		16.2	16	5	252		5.15	4	12	294	535.8	540.6	6	54.6	1 320	
270	5	± 0.09	255	+ 0.8 - 2	16.2	16	5	262	0 - 0.81 (h 13)	5.15	4	12	304	556.6	525.3	6	52.5	1 215	125
280	5		265		16.2	16	5	272		5.15	4	12	314	576.6	508.2	6	50.9	1 100	
290	5		275		16.2	16	5	282		5.15	4	12	324	599.1	490.8	6	49.2	1 005	
300	5		285		16.2	16	5	292		5.15	4	12	334	619.1	475.0	6	47.5	930	

*Dimension b shall not exceed dimension a Max.

†See A-3.1.

‡See A-3.2.

§The design data apply only to circlips of spring steel as per IS : 2507-1975 'Specification for cold rolled steel strips for spring (first revision)', d_4 is calculated from $d_4 = d_1 + 2.1 a$.

||Pliers conforming to IS : 7990-1976 'Specification for pliers for external circlips'.

TABLE 2 DIMENSIONS AND DESIGN DATA FOR CIRCLIPS FOR SHAFTS — HEAVY TYPE

(Clause 3.2 and Fig. 1)

All dimensions in millimetres.

Shaft Dia. d_1 Nom. Size	Circlip						Groove				Design Data§							Nom. Size of Pliers	
	s		d_s		a	b^*	d_5	d_3 †		m †	t	n	d_4	F_N	F_R	g	F_{RG}		N_{ds}
	Size	Tolerance	Size	Tolerance	Max	R	Min	Size	Tolerance	H13	Min		(kN)	(kN)	(kN)	Min ⁻¹			
15	1.5	± 0.05	13.8		4.8	2.4	2	14.3	0	1.6	0.35	1.1	25.1	2.66	15.5	1	6.40	57 000	10
16	1.5		14.7	+0.10	5	2.5	2	15.2	-0.11	1.6	0.4	1.2	26.5	3.26	16.6	1	6.35	44 000	
17	1.5		15.7	-0.36	5	2.6	2	16.2	(h 11)	1.6	0.4	1.2	27.5	3.46	18.0	1	6.70	46 000	
18	1.5		16.5		5.1	2.7	2	17		1.6	0.5	1.5	28.7	4.58	26.6	1.5	5.85	42 750	
20	1.75		18.5	+0.13	5.5	3	2	19	0	1.85	0.5	1.5	31.6	5.06	36.3	1.5	8.20	36 000	
22	1.75	± 0.06	20.5	-0.42	6	3.1	2	21	-0.13	1.85	0.5	1.5	34.6	5.65	36.0	1.5	8.10	29 000	19
24	1.75		22.2		6.3	3.2	2	22.9	(h 11)	1.85	0.55	1.7	37.3	6.75	34.2	1.5	7.60	29 200	
25	2		23.2		6.4	3.4	2	23.9	0	2.15	0.55	1.7	38.5	7.05	45.0	1.5	10.3	25 000	
28	2		25.9	+0.21	6.5	3.5	2	26.6	-0.21	2.15	0.7	2.1	41.7	10.0	57.0	1.5	13.4	22 200	
30	2		27.9	-0.42	6.5	4.1	2	28.6	(h 12)	2.15	0.7	2.1	43.7	10.7	57.0	1.5	13.6	21 100	
32	2	± 0.06	29.6		6.5	4.1	2.5	30.3		2.15	0.85	2.6	45.7	13.8	55.5	2	10.0	18 400	40
34	2.5		31.5		6.6	4.2	2.5	32.3		2.65	0.85	2.6	47.9	14.7	87.0	2	15.6	17 800	
35	2.5		32.2	+0.25	6.7	4.2	2.5	33		2.65	1	3	49.1	17.8	86.0	2	15.4	16 500	
38	2.5		35.2	-0.5	6.8	4.3	2.5	36		2.65	1	3	52.3	19.3	101	2	18.6	14 500	
40	2.5		36.5		7	4.4	2.5	37.5	0	2.65	1.25	3.8	54.7	25.3	104	2	19.3	14 300	
42	2.5	± 0.07	38.5		7.2	4.5	2.5	39.5	-0.25	2.65	1.25	3.8	57.2	26.7	102	2	19.2	13 000	85
45	2.5		41.5	+0.39	7.5	4.7	2.5	42.5	(h 12)	2.65	1.25	3.8	60.8	28.6	100	2	19.1	11 400	
48	2.5		44.5	-0.9	7.8	5	2.5	45.5		2.65	1.25	3.8	64.4	30.7	101	2	19.5	10 300	
50	3		45.8		8	5.1	2.5	47		3.15	1.5	4.5	66.8	38.0	165	2	32.4	10 500	
52	3		47.8		8.2	5.2	2.5	49		3.15	1.5	4.5	69.3	39.7	165	2.5	26.0	9 850	
55	3	± 0.08	50.8		8.5	5.4	2.5	52		3.15	1.5	4.5	72.9	42.0	161	2.5	25.6	8 960	85
58	3		53.8		8.8	5.6	2.5	55		3.15	1.5	4.5	76.5	44.3	160	2.5	26.0	8 200	
60	3		55.8		9	5.8	2.5	57	0	3.15	1.5	4.5	78.9	46.0	156	2.5	25.4	7 620	
65	4		60.8	+0.46	9.3	6.3	3	62	-0.30	4.15	1.5	4.5	84.5	49.8	346	2.5	58.0	6 640	
70	4		65.5	-1.1	9.5	6.6	3	67	(h 12)	4.15	1.5	4.5	90	53.8	343	2.5	59.0	6 530	
75	4	± 0.08	70.5		9.7	7	3	72		4.15	1.5	4.5	95.4	57.6	333	2.5	58.0	5 740	85
80	4		74.5		9.8	7.4	3	76.5		4.15	1.75	5.3	100.6	71.6	328	3	59.4	6 100	
85	4		79.5		10	7.8	3.5	81.5	0	4.15	1.75	5.3	106	76.2	383	3	59.4	5 710	
90	4		84.5	+0.54	10.2	8.2	3.5	86.5	-0.35	4.15	1.75	5.3	111.5	80.8	386	3	61.0	4 980	
100	4		94.5	-1.3	10.5	9	3.5	96.5	(h 12)	4.15	1.75	5.3	122.1	90.0	368	3.5	51.6	4 180	

*Dimension b shall not exceed dimension a Max.

†See A-3.1.

‡See A-3.2.

§The design data apply to circlips of spring steel as per IS : 2507-1975, b_4 is calculated from $d_4 = d_1 + 2.1 a$.

||Pliers conforming to IS : 7990-1976.