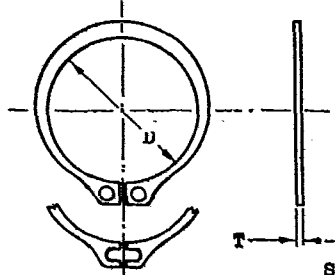


NATIONAL AIRCRAFT STANDARDS COMMITTEE

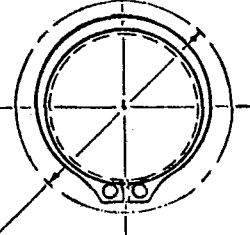
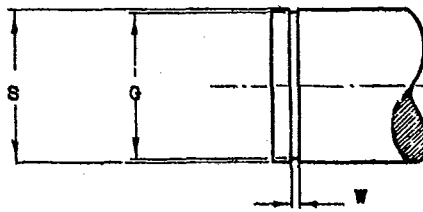
610 SHOREHAM BUILDING, WASHINGTON, D. C.

② INACTIVE FOR DESIGN AFTER 7-31-56 SEE DRAWING NAS 670



LUGS-NO. 12-23 INCL

MAX. BOTTOM RAD.
 SHARP, RINGS -12 TO -23 INCL.
 .003, RINGS -25 TO -35 INCL.
 .005, RINGS -37 TO -100 INCL.
 .010, RINGS -102 & LARGER.



C = CLEARANCE WHEN
 RING IS SPRUNG OVER
 SHAFT DIA. S.

DASH NO.	SHAFT		RING DIMENSIONS					ENGINEERING INFORMATION			
	DIAMETER		FREE DIAM.		THICKNESS		C	GROOVE DIAM.		GROOVE WIDTH	
	S IN.	S MM.	D IN.	TOL. IN.	T IN.	TOL. IN.	MIN. IN.	G IN.	TOL. IN.	W IN.	TOL. IN.
12	.125	3.2	.112		.010		.40	.117		.012	
15	.156	4	.140		.010	±.0005	.44	.146		.012	
18	.188	4.7	.168	+.002	.015		.47	.175	±.0015	.017	+.002
19	.197	5	.179	-.004	.015		.48	.185	.0015 T.I.R.	.017	-.000
21	.219	5.5	.196		.015	±.001	.50	.205		.017	
23	.236	6	.215		.015		.52	.222		.017	
25	.250	6.5	.225		.025		.54	.230		.028	
27	.275	7	.250		.025		.56	.255		.028	
31	.312	8	.281		.025		.61	.290		.028	
35	.354	9	.320		.025		.66	.330		.028	
37	.375	9.5	.338	+.002	.025	±.0015	.68	.352	±.002	.028	
39	.393	10	.354	-.005	.025		.70	.359	.002 T.I.R.	.028	
40	.406	10.5	.366		.025		.71	.382		.028	
43	.438	11	.395		.025		.75	.412		.028	
46	.469	12	.428		.025		.77	.443		.028	
50	.500	13	.461		.035		.80	.474		.039	
55	.551	14	.509		.035		.87	.524		.039	+.003
56	.562	14.5	.521		.035		.89	.535		.039	-.000
59	.594	15	.550		.035		.93	.565		.039	
62	.625	16	.579		.035		.97	.596		.039	
66	.669	17	.618		.035		1.00	.638	±.003	.039	
68	.688	17.5	.635	+.005	.042		1.03	.655	.002 T.I.R.	.046	
75	.750	19	.693	-.010	.042		1.10	.715		.046	
78	.781	20	.722		.042		1.14	.745		.046	
81	.812	21	.751		.042		1.16	.776		.046	
87	.875	22	.810		.042		1.24	.835		.046	
93	.938	24	.867		.042		1.31	.894		.046	
98	.984	25	.910		.042		1.36	.940		.046	
100	1.000	25.5	.925		.042	±.002	1.38	.955		.046	
102	1.023	26	.946		.042		1.41	.977		.046	
106	1.062	27	.982		.050		1.45	1.015		.056	
112	1.125	28.5	1.041		.050		1.52	1.075	±.004	.056	
118	1.188	30	1.098	+.010	.050		1.63	1.135	.003 T.I.R.	.056	
125	1.250	32	1.156	-.015	.050		1.73	1.195		.056	
131	1.312	33	1.214		.050		1.80	1.250		.056	
137	1.375	35	1.272		.050		1.87	1.310		.056	
143	1.438	36.5	1.333		.050		1.94	1.370		.056	
150	1.500	38	1.387		.050		2.00	1.430		.056	+.004
156	1.562	40	1.446		.062		2.08	1.490		.068	-.000
162	1.625	41	1.503		.062		2.14	1.550		.068	
175	1.750	44.5	1.618		.062		2.28	1.670		.068	
177	1.771	45	1.637	+.013	.062	±.003	2.33	1.689	±.005	.068	
181	1.812	46	1.675	-.020	.062		2.34	1.730	.003 T.I.R.	.068	
187	1.875	47.5	1.735		.062		2.41	1.790		.068	
196	1.969	50	1.819		.062		2.50	1.879		.068	
200	2.000	51	1.850		.062		2.54	1.910		.068	
206	2.062	52.5	1.906		.072		2.62	1.970		.086	
212	2.125	54	1.964	+.015	.078	±.003	2.68	2.027	±.006	.086	+.005
215	2.156	55	1.993	-.025	.078		2.72	2.057	.004 T.I.R.	.086	-.000
225	2.250	57	2.081		.078		2.82	2.145		.086	

TITLE

RINGS - EXTERNAL RETAINER

STANDARD PART

NAS 51

SHEET 1 OF 2

NATIONAL AIRCRAFT STANDARDS COMMITTEE

810 SHOREHAM BUILDING, WASHINGTON, D. C.

② INACTIVE FOR DESIGN AFTER 7-31-56 SEE DRAWING NAS 670

DASH NO.	SHAFT		RING DIMENSIONS					ENGINEERING INFORMATION			
	DIAMETER		FREE DIAM.		THICKNESS		C	GROOVE DIAM.		GROOVE WIDTH	
	S IN.	S MM.	D IN.	TOL. IN.	T IN.	TOL. IN.	MIN. IN.	G IN.	TOL. IN.	W IN.	TOL. IN.
231	2.312	59	2.139		.078		2.88	2.205		.086	
237	2.375	60.5	2.197	+.015	.078		2.95	2.265		.086	
250	2.500	63.5	2.313	-.025	.078		3.08	2.385		.086	
255	2.559	65	2.377		.078		3.16	2.451		.086	
262	2.625	66.5	2.428		.078		3.21	2.505		.086	
275	2.750	70	2.543		.093		3.35	2.625		.103	
287	2.875	73	2.659		.093		3.48	2.742		.103	
293	2.938	74.5	2.717		.093		3.55	2.801		.103	
300	3.000	76	2.775		.093		3.62	2.860		.103	
306	3.062	78	2.832		.093		3.69	2.920		.103	
312	3.125	79.5	2.892		.093		3.75	2.980		.103	
315	3.156	80	2.920		.093		3.79	3.010		.103	
325	3.250	82.5	3.006		.093		3.90	3.100		.103	
334	3.344	85	3.092		.093		4.01	3.190		.103	
350	3.500	89	3.237		.109		4.16	3.340		.120	
354	3.543	90	3.277		.109		4.21	3.381		.120	
362	3.625	92	3.352		.109		4.31	3.458		.120	
375	3.750	95	3.468		.109		4.46	3.577		.120	
387	3.875	98.5	3.584		.109		4.60	3.696		.120	
393	3.938	100	3.642		.109		4.67	3.756		.120	
400	4.000	102	3.700		.109		4.75	3.815		.120	

PART NUMBER: NAS 51-231N: RING FOR 2.312 NOM. DIA. SHAFT, OILED OR GREASED ONLY, NO PLATING.
 EXAMPLE: DASH NUMBER INDICATES SHAFT NOM. DIA. IN HUNDREDTHS.

MATERIAL: SIZES DASH 12 TO DASH 23 INCL. ONLY, BERYLLIUM COPPER, H. T. 180,000 - 200,000 PSI. TENSILE. NOTE: THESE SIZES WERE FORMERLY STEEL AND ARE INTERCHANGEABLE.
 SIZES DASH 25 AND LARGER, STEEL, S.A.E. 1065 - 1090, H. T. 238,000 - 280,000 PSI. TENSILE.

CORROSION PROTECTION: UNPLATED: COAT WITH CORROSION PREVENTION COMPOUND, SPEC. AN-C-52. SUFFIX "N" TO DASH NUMBER.

PARKERIZE: SPEC. ARMY 57-0-2. SUFFIX "P" TO DASH NUMBER.

CADMIUM PLATE: SPEC. AN-P-61; NO SUFFIX "P" DASH NUMBER.

MANUFACTURING NOTES: 1. WITH ALLOWANCE FOR INITIAL SET, MINIMUM DIAMETRAL EXPANSION WITHOUT PERMANENT SET SHALL BE:

SIZES SMALLER THAN DASH 50: 18% OF FREE DIA.

SIZES DASH 50 AND LARGER: 13% OF FREE DIA.

2. MINIMUM DIAMETRAL EXPANSION WITHOUT FAILURE BY CRACKING SHALL BE:

SIZES SMALLER THAN DASH 50: 21% OF FREE DIA.

SIZES DASH 50 AND LARGER: 15% OF FREE DIA.

3. RINGS MUST BE FLAT AND FREE OF BURRS.

INSTALLATION: USE LONG-NOSE OR INSTALLATION PLIERS.

TITLE

RINGS - EXTERNAL RETAINER

STANDARD PART

NAS 51

SHEET 2 OF 2