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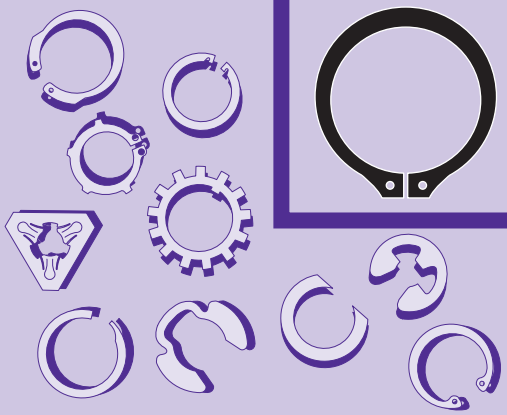
TRADEMARK

G.L.HUYETT

WASHERS • GREASE FITTINGS • NON-THREADED FASTENERS • KEYSTOCK

EST.1906



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RETAINING RINGS

Featuring the World's Most Complete Inventory

CALL NOW FOR FAST SERVICE AND LOW PRICES!!!

We have searched the world over to bring you the most comprehensive and complete inventory in America.

ABOUT THIS SECTION...

G.L. HUYETT is a low overhead manufacturing company centrally located in the great plains of Kansas. We have invested in state of the art technology to bring you the highest quality available, and have carefully selected retaining ring suppliers from all over the world so as to yield the lowest prices. Our machine shop is well equipped to manufacture your short runs and specials. Call for a quote!

"THE PROGRAM"

- We will beat any published distributor price on parts with equal quality
- Friendly people from Kansas answer the phone
- Most orders are shipped the same day they are received
- $2.00 line minimum ($5.00 small order handling fee on orders under $25.00)

OVER TEN MILLION PARTS IN STOCK !!!

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BOX 232 • MINNEAPOLIS, KS • 67467
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HOW TO USE THIS CATALOG

One of the basic principles of our literature is to make information "User Friendly." We believe that our catalog should be an educational tool that assists distributors in the sale of our products. OEMs may use this guide in order to construct, refine, or confirm component selection. Look for this catalog on the World Wide Web and CD-ROM in the near future!

FOR THE TABLE OF CONTENTS FOR THIS CATALOG, SEE PAGES 2-3.

Our part numbers are listed in the far left column on each page; however, feel free to order by the same part numbers you use now. We can cross-reference to most industry nomenclatures, including Rotor Clip™; Waldes Truarc™; IRR™; Anderton™; Spirolox™; Smalley™; Eaton™; and Bossard™. A complete manufacturer cross reference is located on pages 236-237.

Special orders and short runs are gladly welcomed. We have a complete machine shop. Use the back cover to make special order requests. We pledge to return most quotes on a "same day" or "next day" basis. Our parts will be on time and competitively priced.

Metric sizes are on pages 150-221. We are aggressively expanding our metric manufacturing capabilities. Call if you need a commodity that is not listed.

Assortments begin on page 222. We can put together custom arrangements if needed. All products can be shipped in a standard container or with bar codes.

Most parts are available from stock. Generally we can ship orders "same day" until 5:00 P.M. Central Standard Time. There are a myriad of possibilities with tolerance, material, and finish, thus there will be times when we will run your parts to order. Please call in advance when in a crisis situation.

LOW PRICE PROMISE!!

We offer to beat published prices in all of our product groups. We offer low prices to minimize your costs in time, phone, and fax charges. Competition can always "cherry pick" this type of pricing. We hope you consider the cost advantages of doing business with us on a low cost basis all the time, versus the "trick and cherry pick" approach.

This is our statement to you that we will offer the best prices and service available.

We hope your experience with us is pleasant and efficient. G.L. Huyett wants the sale of retaining rings to be more profitable for you. We hope we have accomplished this task.

MasterCard

VISA

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

ABOUT THE COMPANY

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WHO WE ARE

G.L. HUYETT IS A LOW OVERHEAD MANUFACTURER AND DISTRIBUTOR LOCATED IN A WHEAT FIELD IN

MINNEAPOLIS, KANSAS

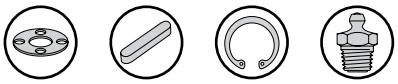
Just a Few Miles from the Geographic Center of the U.S.

FOUNDED IN 1896

WE HAVE A LONG HISTORY OF ***HARDWORKING, FRIENDLY FOLKS*** WITH A **CAN DO** COMPANY CULTURE.

WHAT WE SELL

WASHERS • KEYSTOCK • NON-THREADED FASTENERS • GREASE FITTINGS



Parts that are **HARD TO MANUFACTURE,** Short Runs - Odd Configurations - No Tooling.

Parts that are **HARD TO FIND,** Metric - Stainless Steel - Big or Little Sizes.

Parts that are made by manufacturers that are **HARD TO DO BUSINESS WITH.**

"We are your LOW COST LEADER!"

HOW WE SELL IT

NO ORDER MINIMUM.
($5.00 order fee on any orders under $25.00)

SHIP TODAY from stock.

LOW COST.

MULTIPLE COMMODITIES
(so you can consolidate vendors.)

PACKAGED and sold in the **QUANTITY YOU WANT.**

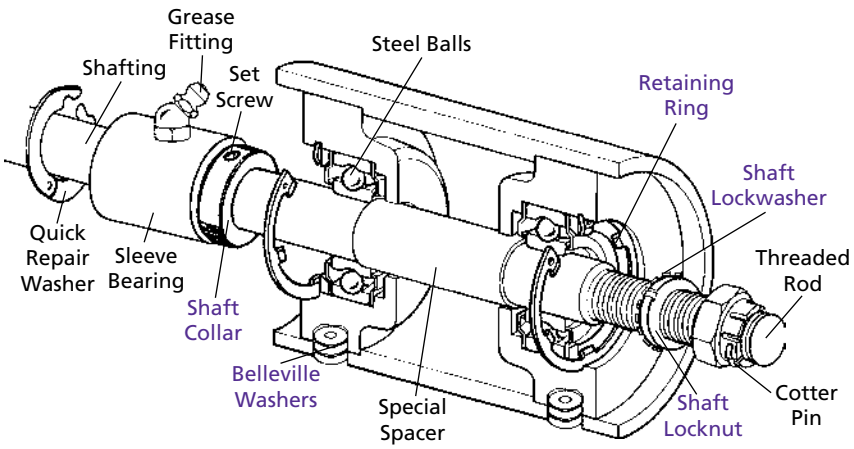
by **FRIENDLY PEOPLE.**

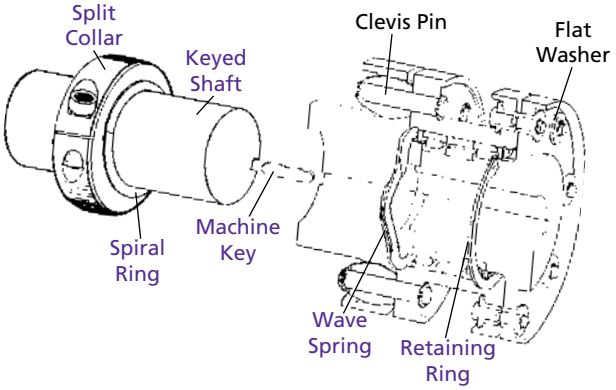
ITEMS IN THIS CATALOG

- Retaining Rings
- Shaft Locknuts
- Lockwashers
- Wave Springs
- Spiral Rings
- Belleville Washers
- Keyed Shafts
- Machine Keys
- Shaft Collars
- Split Collars

ITEMS IN OUR OTHER CATALOGS

- Flat Washers
- Clevis Pins
- Grease Fittings
- Steel Balls
- Sleeve Bearings
- Keystock
- Shafting
- Cotter Pins
- Shims
- Threaded Rod





FOR THE TABLE OF CONTENTS FOR THIS CATALOG, TURN THE PAGE.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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CLIPS

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METRIC SIZES BEGIN ON PAGE 182.

SPIRAL RINGS

BEGINS PAGE 34.

METRIC SIZES BEGIN ON PAGE 190.

EATON™ RINGS

BEGINS PAGE 66.

METRIC SIZES BEGIN ON PAGE 198.

WIRE RINGS

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MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

PUSH-ON RINGS

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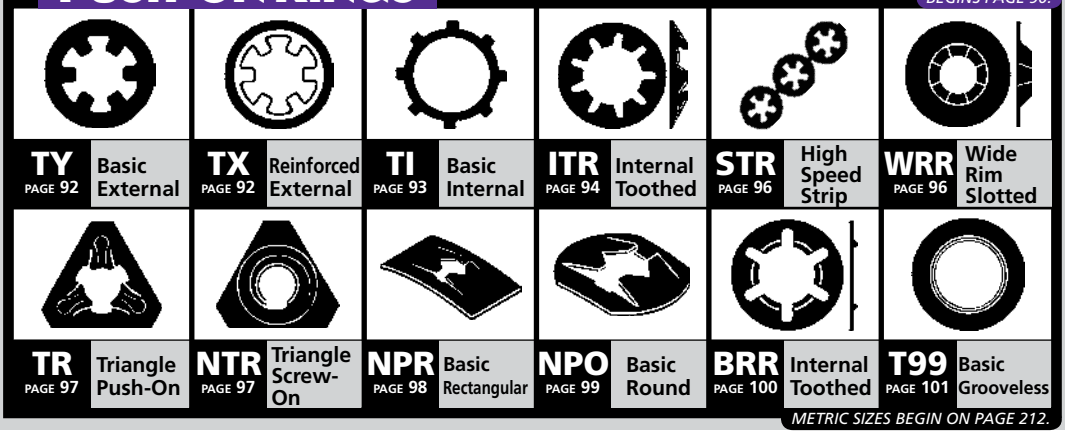

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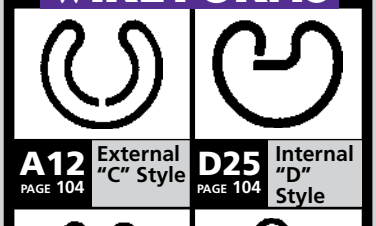
WIRE FORMS



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ASSORTMENTS

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BEGINS PAGE 222.

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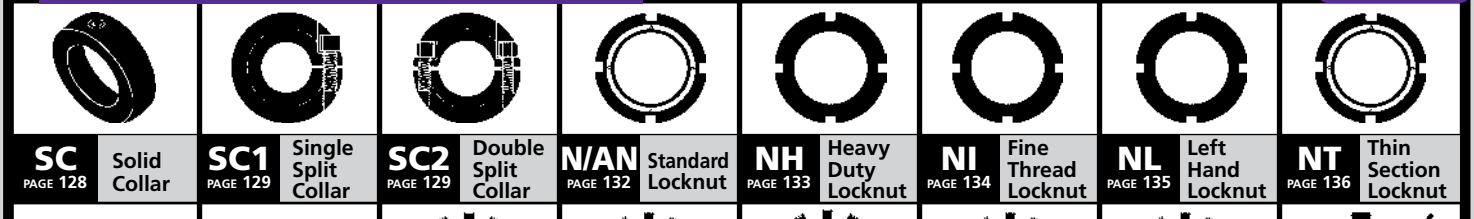

METRIC SIZES BEGIN ON PAGE 218.

METRIC TABLE OF CONTENTS ON PAGE 150.

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MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

SNAP RINGS

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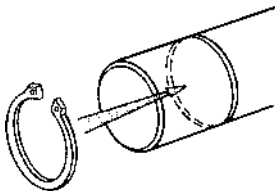
LOW PRICE PROMISE!! See Inside Cover

EXTERNAL

INSTALLED AXIALLY ONTO A SHAFT



USING A PAIR OF PLIERS

TOOLS Pages: 226-229

SH BASIC

IMPERIAL	METRIC	ANSI
Pgs: 6-8	Pgs:152-157	Pg: 178

SHR HEAVY DUTY

IMPERIAL	METRIC	ANSI
Pg: 9	Pgs:158-159	Pg: 179

SHI INVERTED

IMPERIAL	METRIC
Pg: 10	Pg: 160

BSH BOWED

IMPERIAL	METRIC
Pg: 11	Pg: 161

AK TABBED

IMPERIAL	METRIC
N/A	Pg: 162

AL BOWED TABBED

IMPERIAL	METRIC
N/A	Pg: 163

VSH BEVELED

IMPERIAL	METRIC
Pgs: 12-13	N/A

SHF GROOVELESS

IMPERIAL	METRIC
Pg: 14	Pg: 164

SHX OPEN LUG

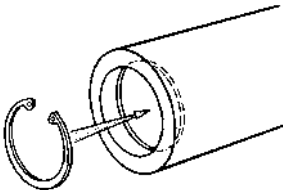
IMPERIAL	METRIC
Pg: 14	Pg: 165

SHM TAMPER PROOF

IMPERIAL	METRIC
Pg: 15	N/A

INTERNAL

INSTALLED AXIALLY INTO A BORE



USING A PAIR OF PLIERS

TOOLS Pages: 226-229

HO BASIC

IMPERIAL	METRIC	ANSI
Pgs: 16-18	Pgs:166-170	Pgs:180-181

HOR HEAVY DUTY

IMPERIAL	METRIC
N/A	Pg: 171

HOI INVERTED

IMPERIAL	METRIC
Pg: 19	Pg: 172

BHO BOWED

IMPERIAL	METRIC
Pg: 20	Pg: 173

JK TABBED

IMPERIAL	METRIC
N/A	Pgs: 175-176

JL BOWED TABBED

IMPERIAL	METRIC
N/A	Pg: 177

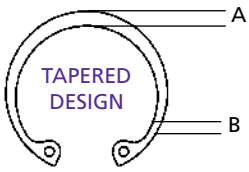
VVH DOUBLE BEVELED

IMPERIAL	METRIC
Pg: 21	N/A

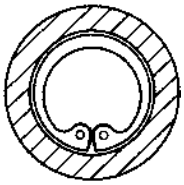
VHO BEVELED

IMPERIAL	METRIC
Pgs: 22-23	Pg: 174

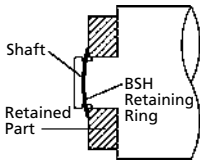
All metric numbers begin with "D," and all ANSI numbers begin with "M."



Notice that wire width decreases from A to B . . .



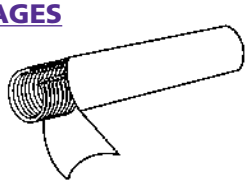
. . . which causes the ring to remain circular when installed . . .



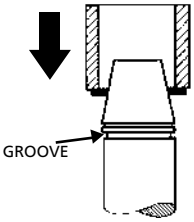
. . . such that a high strength rigid shoulder forms to retain parts like in the external example above!

AUTOMATED INSTALLATION

STACKED ROLL PACKAGES

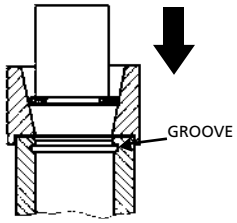


These packages **reduce handling costs**, especially on internal rings which tend to link together in bulk form.



EXTERNAL
Using mandrel and pressure sleeve.

Installation of snap rings can be automated using 6° tapered mandrels and mounting fixtures. In these instances, the ring is "snapped" into place using axial force.



INTERNAL
Using tapered mandrel and pressure sleeve.

LET OUR SHOP MAKE A FIXTURE FOR YOU!

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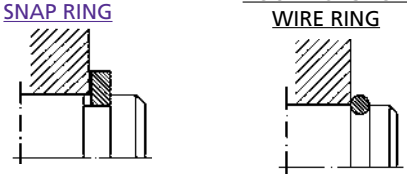
PRODUCT COMPARISONS

SNAP RING

ROUND SECTION WIRE RING



"Which one looks stronger?"

Nearly all retaining rings provide design and engineering benefits versus other fasteners. In particular, retaining rings replace the high cost of machining shoulders, the labor intensive installation of cotter pins and washers, and the uncertainty of collar and screw designs in a vibrating environment. In most cases, machining a groove is cheaper and more resilient than turning threads and using a "nuts and bolts" approach.

"HOW DO SNAP RINGS COMPARE TO OTHER TYPES OF RETAINING RINGS?"

Part of the answer to the question lies in how retaining rings are made. Snap rings are usually stamped or laser cut from coil or strip, while spiral rings are coiled from wire. The differences in manufacturing techniques yield differences in costs and product features. In particular, coiling is slower than stamping, yet coiling does not require high cost tooling. In addition, no material is wasted in coiling as it is with the "break out" on the inside diameter of a stamping. Generally, stamped rings are cheaper than coiled rings on smaller sizes. Snap rings are also in wider distribution and are supported with a full line of automated installation equipment.

THRUST LOAD COMPARISON
SNAP RINGS VS. OTHER STYLES

CARBON SPRING STEEL

EXTERNAL

SHAFT SIZE	SNAP SH Pg 6	SPIRAL WOUND RS Pg 38	SPIRAL WOUND RSN Pg 44	EATON™ STYLE USC Pg 68
	Thrust Load	Thrust Load	Thrust Load	Thrust Load
1"	2100	2150	2950	1200
2"	8050	7110	11,420	4010
5"	37,100	36,050	52,580	17,110
7"	72,700	63,790	103,400	39,920

INTERNAL

BORE SIZE	SNAP HO Pg 16	SPIRAL WOUND RR Pg 52	SPIRAL WOUND RRN Pg 58	EATON™ STYLE UHB Pg 72
	Thrust Load	Thrust Load	Thrust Load	Thrust Load
1"	2800	1910	2310	1470
2"	10,300	7090	10,040	4000
5"	55,000	36,050	65,095	17,110
7"	93,100	63,790	110,410	34,850

Thrust loads are expressed in pounds, based on groove shear with a safety factor of two (2).
Eaton™-style ring thrust loads are based on load times 0.60 when the ring distortion is .005 or greater from bending axially.
Actual results will be based on individual circumstances. These values are for reference only.

MATERIAL

CARBON SPRING STEEL
SAE 1060-1090
(STANDARD)

Temperature Limits
500°F Max
-100°F Min

PH15-7 MO STAINLESS STEEL
AISI 632/AMS 5520
(STANDARD ON MOST SIZES)

Temperature Limits
900°F Max
-100°F Min

BERYLLIUM COPPER
ALLOY #25/CDA #172
(STANDARD ON SMALL SIZES)

Temperature Limits
650°F Max
-300°F Min

OTHER MATERIALS AVAILABLE ON REQUEST.

See page 33 for material comparisons.

FINISHES

PHOSPHATE COATING
(STANDARD)

Inhibits rust during storage.

MECHANICAL ZINC YELLOW
(STANDARD)

96 hour salt spray.

ZINC YELLOW WITH LACQUER
(SPECIAL ORDER)

250 hour salt spray.

OTHER FINISHES, INCLUDING CADMIUM, AVAILABLE ON REQUEST.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

All manufacturer names and numbers are for identification purposes only. In no way are we implying that our parts were made by the manufacturers listed above.
Prices, materials, tolerances, and grades subject to change without notice.

EXTERNAL SNAP RINGS

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BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE

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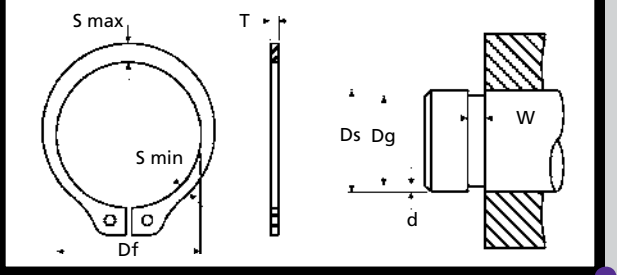
Anderton	N1400	IRR	3100	Waldes	5100
Ellison	9100	Rotor Clip	SH	Military	16624

MOST POPULAR



SH

SHAFT		RING					GROOVE				WEIGHT	MATERIAL		TOOL
Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S) Min	Radial Wall (S) Max	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
SH-012*	.125	1/8	.112	.011	.018	.010 +/-.001	.117	+/-.0015	.004	.012 +.002/-.000	0.0018			-E023-S
-015*	.156	5/32	.142	.016	.026		.146		.005		0.0037			-E023-M
-018*	.188	3/16	.168	.016	.025	.015	.175		.006	.018	0.0059			-E023-L
-019*	.197	5mm	.179	.016	.026		.185		.006		0.0063			
-021*	.219	7/32	.196	.017	.028		.205		.007		0.0074			
-023*	.236	15/64	.215	.019	.030		.222		.007		0.0086			
-025	.250	1/4	.225	.025	.035	.025	.230		.010	.029	0.0210			-E038
-027	.276	7mm	.250	.024	.035		.255		.010		0.0230			
-028	.281	9/32	.256	.025	.038		.261		.010		0.0240			
-031	.312	5/16	.281	.026	.040		.290		.011		0.0270			
-034	.344	11/32	.309	.0265	.042		.321		.011		0.0310			
-035	.354	9mm	.320	.029	.046		.330		.012		0.0350			
-037	.375	3/8	.338	.0305	.050		.352	+/-.002	.012		0.0390			
-039	.394	10mm	.354	.031	.052		.369		.012		0.0420			
-040	.406	13/32	.366	.033	.054		.382		.012		0.0430			
-043	.438	7/16	.395	.033	.055		.412		.013		0.0500			
-046	.469	15/32	.428	.035	.060		.443		.013		0.0540			
-050	.500	1/2	.461	.040	.065	.035 +/-.002	.468		.016	.039 +.003/-.000	0.0910			
-055	.551	14mm	.509	.036	.053		.519		.016		0.0900			
-056	.562	9/16	.521	.041	.072		.530		.016		0.1100			
-059	.594	19/32	.550	.043	.076		.559		.017		0.1200			
-062	.625	5/8	.579	.045	.080		.588		.018		0.1300			
-066	.672	43/64	.621	.043	.082		.631		.020		0.1400			
-068	.688	11/16	.635	.048	.084	.042	.646		.021	.046	0.1800			-E047
-075	.750	3/4	.693	.051	.092		.704		.023		0.2100			
-078	.781	25/32	.722	.052	.094		.733	+/-.003	.024		0.2200			
-081	.812	13/16	.751	.054	.096		.762		.025		0.2500			
-084	.844	21.4mm	.780	.057	.100		.791		.026		0.2700			
-087	.875	7/8	.810	.057	.104		.821		.027		0.2800			
-093	.938	15/16	.867	.063	.110		.882		.028		0.3100			-E070
-098	.984	63/64	.910	.064	.114		.926		.029		0.3500			
-100	1.000	1	.925	.065	.116		.940		.030		0.3600			
-102	1.023	26mm	.946	.066	.118		.961		.031		0.3900			
SH-106	1.062	1-1/16	.982	.069	.122	.050	.998		.032	.056	0.4800			

+.002/-.004 (Df); +.002/-.005 (Df); +.005/-.010 (Df); +.010/-.015 (Df); +.004/-.000 (d); +.003/-.000 (W)

TOOL DESCRIPTIONS ON PAGES 226, 228, & 229.

*May be beryllium copper instead of carbon steel.

SH

DESCRIPTION

Tapered-design ring that is installed into a groove to provide a rigid shoulder for high thrust loads. Installed axially using pliers that expand the part over the shaft.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum (S max) and minimum (S min) cross section of the ring.
4. Find the part in the chart above. If it is too thick, see "SHR" on page 9.

GENERAL USE

COMMON

ZINC / YELLOW

STACKED / ROLL PACK

NOT AVAILABLE

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

SH ⟷ SHI (Page 10) ⟷ RSN (Page 44) ⟷ USH (Page 71) ⟷ SSN (Page 49)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DSH | DIN 471 | METRIC Page 152

SH CONTINUED NEXT PAGE.

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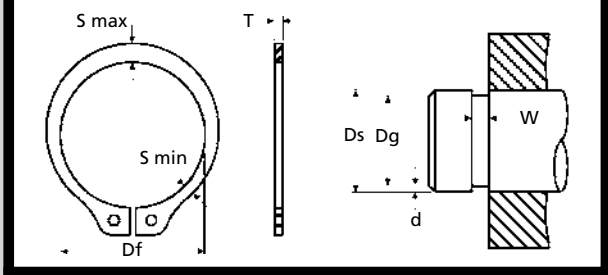
MOST POPULAR



BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	N1400	IRR	3100	Waldes	5100
Ellison	9100	Rotor Clip	SH	Military	16624

SH

	SHAFT		RING					GROOVE				WEIGHT	MATERIAL		TOOL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S) Min	Max	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
SH-112	1.125	1-1/8	1.041	+.010/-.015	.071	.128	.050 +/-.002	1.059	+/-.004	.033	.056 +.004/-.000	0.5100			-E070
-118	1.188	1-3/16	1.098		.072	.132		1.118		.035		0.5600			
-125	1.250	1-1/4	1.156		.076	.140		1.176		.037		0.5900			
-131	1.312	1-5/16	1.214		.076	.146		1.232		.040		0.6800			
-137	1.375	1-3/8	1.272		.082	.152		1.291		.042		0.7200			
-143	1.438	1-7/16	1.333		.086	.160		1.350		.044		0.8100			
-150	1.500	1-1/2	1.387		.091	.168		1.406		.047		0.9000			
-156	1.562	1-9/16	1.446	+.013/-.020	.093	.172	.062 +/-.003	1.468	+/-.005	.047	.068	1.2400			-E115
-162	1.625	1-5/8	1.503		.097	.180		1.529		.048		1.3200			
-168	1.688	1-11/16	1.560		.099	.184		1.589		.049		1.4800			
-175	1.750	1-3/4	1.618		.101	.188		1.650		.050		1.5300			
-177	1.772	45mm	1.637		.102	.190		1.669		.051		1.5400			
-181	1.812	1-13/16	1.675		.102	.192		1.708		.052		1.6200			
-187	1.875	1-7/8	1.735		.104	.196		1.769		.053		1.7300			
-196	1.969	1-31/32	1.819		.106	.200		1.857		.056		1.8000			
-200	2.000	2	1.850		.108	204		1.886		.057		1.9000			
-206	2.062	2-1/16	1.906	+.015/-.025	.111	.208	.078	1.946	+/-.006	.058	.086 +.005/-.000	2.5000			
-212	2.125	2-1/8	1.964		.113	.212		2.003		.061		2.6100			
-215	2.156	2-5/32	1.993		.113	.212		2.032		.062		2.6300			
-225	2.250	2-1/4	2.081		.116	.220		2.120		.065		2.7700			
-231	2.312	2-5/16	2.139		.118	.222		2.178		.067		2.8000			
-237	2.375	2-3/8	2.197		.119	.224		2.239		.068		2.9200			
-243	2.438	2-7/16	2.255		.120	.228		2.299		.069		2.9500			
-250	2.500	2-1/2	2.313		.122	.232		2.360		.070		2.9700			
-255	2.559	65mm	2.377	+.020/-.030	.125	.238	.093	2.419		.070	.103	3.3900			
-262	2.625	2-5/8	2.428		.127	.242		2.481		.072		3.5000			
-268	2.688	2-11/16	2.485		.129	.246		3.541		.073		3.6000			
-275	2.750	2-3/4	2.543		.131	.248		2.602		.074		4.2500			
-287	2.875	2-7/8	2.659		.133	.256		2.721		.077		4.8500			
-293	2.938	2-15/16	2.717		.136	.260		2.779		.079		5.0000			
-300	3.000	3	2.775		.138	.264		2.838		.081		5.2000			
-306	3.062	3-1/16	2.832		.131	.252		2.898		.082		4.7500			
-312	3.125	3-1/8	2.892		.141	.272		2.957		.084		5.8000			
-315	3.156	3-5/32	2.920		.143	.274		2.986		.085		5.9000			
SH-325	3.250	3-1/4	3.006		.145	.300		3.076		.087		6.2000			

TOOL DESCRIPTIONS ON PAGES 226, 228 & 229.

SH

AXIAL ASSEMBLY

DESCRIPTION

Tapered-design ring that is installed into a groove to provide a rigid shoulder for high thrust loads. Installed axially using pliers that expand the part over the shaft.

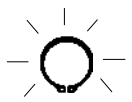
HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum (S max) and minimum (S min) cross section of the ring.
4. Find the part in the chart above. If it is too thick, see "SHR" on page 9.

GENERAL USE

COMMON

ZINC / YELLOW



GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

SH ⟷ SHI (Page 10) ⟷ RSN (Page 44) ⟷ USH (Page 71) ⟷ SSN (Page 49)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DSH DIN 471 METRIC Page 152

SH CONTINUED NEXT PAGE.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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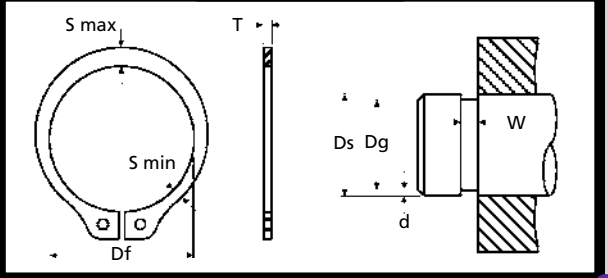
BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	N1400	IRR	3100	Waldes	5100
Ellison	9100	Rotor Clip	SH	Military	16624

MOST POPULAR



SH	SHAFT		RING				GROOVE				WEIGHT	MATERIAL		TOOL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S) Min	Max	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
SH-334	3.346	3-11/32	3.092	+.020/-.030	.147	.300	.093	+/-.003	3.166	+/-.006	.090	.103	+.005/-.000	6.4000			-E115
-343	3.438	3-7/16	3.179		.148	.292			3.257		.090			6.6000			
-350	3.500	3-1/2	3.237		.148	.285	.109		3.316		.092	.120		7.2000			
-354	3.543	90mm	3.277		.149	.288			3.357		.093			7.3000			
-362	3.625	3-5/8	3.352		.153	.296			3.435		.095			7.6000			
-368	3.688	3-11/16	3.410		.156	.302			3.493		.097			8.0000			
-375	3.750	3-3/4	3.468		.160	.310			3.552		.099			8.3000			
-387	3.875	3-7/8	3.584		.163	.318			3.673		.101			8.8000			
-393	3.938	3-15/16	3.642		.163	.318			3.734		.102			9.5000			
-400	4.000	4	3.700		.163	.318			3.792		.104			10.1000			
-425	4.250	4-1/4	3.989		.176	.342			4.065		.092			11.2000			
-437	4.375	4-3/8	4.106		.181	.318			4.190		.092			11.5000			
-450	4.500	4-1/2	4.223		.185	.405			4.310		.095			13.2000			-E120-X
-475	4.750	4-3/4	4.458		.136	.303			4.550		.100			11.3000			
-500	5.000	5	4.692		.194	.360			4.790		.105			14.9000			
-525	5.250	5-1/4	4.927	+.020/-.040	.211	.372	.125	+/-.004	5.030	+/-.007	.110	.139	+.006/-.000	19.0000			
-550	5.500	5-1/2	5.162		.209	.390			5.265		.117			20.2500			
-575	5.750	5-3/4	5.396		.220	.408			5.505		.122			22.0000			
-600	6.000	6	5.631		.171	.381			5.745		.127			21.0000			
-625	6.250	6-1/4	5.866	+.020/-.050	.176	.396	.156	+/-.005	5.985	+/-.008	.132	.174	+.008/-.000	28.2000			
-650	6.500	6-1/2	6.100		.236	.438			6.225		.137			33.0000			
-675	6.750	6-3/4	6.335		.246	.456			6.465		.142			35.6000			
-700	7.000	7	6.570	+.050/-.130	.256	.474			6.705		.147			37.1000			
-725	7.250	7-1/4	6.775		.267	.490	.187		6.942		.154	.209		51.0000			-E170
-750	7.500	7-1/2	7.009		.277	.507			7.180		.160			53.4000			
-775	7.750	7-3/4	7.243		.285	.523			7.420		.165			54.5000			
-800	8.000	8	7.478		.294	.540			7.660		.170			64.0000			
-825	8.250	8-1/4	7.712		.304	.556			7.900		.175			66.5000			
-850	8.500	8-1/2	7.947		.314	.573			8.140		.180			69.2000			
-875	8.750	8-3/4	8.181		.322	.591			8.380		.185			71.2000			
-900	9.000	9	8.415		.333	.609			8.620		.190			73.7000			
-925	9.250	9-1/4	8.650		.341	.625			8.860		.195			76.0000			
-950	9.500	9-1/2	8.885		.350	.642			9.100		.200			78.5000			
-975	9.750	9-3/4	9.120		.358	.658			9.338		.206			84.5000			-E035
SH-1000	10.000	10	9.355		.367	.675			9.575		.212			91.0000			-E045

TOOL DESCRIPTIONS ON PAGES 226, 228 & 229.

SH

DESCRIPTION

Tapered-design ring that is installed into a groove to provide a rigid shoulder for high thrust loads. Installed axially using pliers that expand the part over the shaft.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum (S max) and minimum (S min) cross section of the ring.
4. Find the part in the chart above. If it is too thick, see "SHR" on page 9.

GENERAL USE

COMMON

ZINC / YELLOW

STACKED / ROLL PACK

NOT AVAILABLE

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

SH ⟷ SHI (Page 10) ⟷ RSN (Page 44) ⟷ USH (Page 71) ⟷ SSN (Page 49)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DSH DIN 471 METRIC Page 152

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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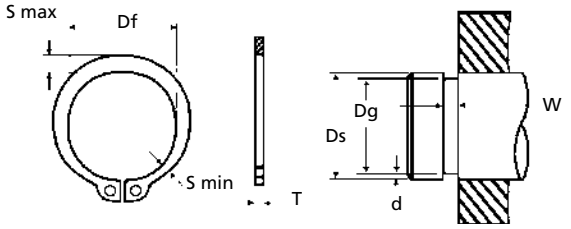
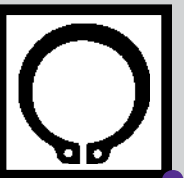
THICKER THAN SH



HEAVY-DUTY EXTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	N1460	Rotor Clip	SHR	Military	3217
IRR	7200	Waldes	5160		



SHR

SHAFT			RING					GROOVE					WEIGHT	MATERIAL		TOOL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S) Min	Max	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
SHR-039	.394	10mm	.362	+.003/-.008	.039	.068	.035	+/-.002	.368	+.001/-.002	.013	.039	+.003/-.000	0.0700			-E038
-042	.428	10.9mm	.394		.043	.076			.402		.013			0.0860			
-047	.473	12mm	.435	+.005/-.010	.053	.088	.042		.444		.015	.046		0.1400			
-050	.500	1/2	.460		.050	.090	.050		.468		.016	.056	+.004/-.000	0.1600			-E047
-059	.591	15mm	.543		.057	.102			.555	+.001/-.003	.018			0.2200			
-062	.625	5/8	.575		.059	.106			.588		.019			0.2300			
-066	.669	17mm	.616		.062	.112			.629		.020			0.2600			
-075	.750	3/4	.689		.077	.127	.078		.704		.023	.086		0.5600			-E070
-075	.787	20mm	.689		.077	.127			.740		.024			0.5600			
-087	.875	7/8	.804		.083	.148			.821		.027			0.7500			
-098	.984	63/64	.906		.084	.151			.925		.030			0.7800			
-098	1.000	1	.906		.084	.151			.938		.031			0.7800			
-106	1.062	1-1/16	.978	+.010/-.015	.090	.161	.093	+/-.003	.998	+.002/-.004	.032	.103	+.005/-.000	1.1500			-E093
-112	1.125	1-1/8	1.036		.095	.169			1.059		.033			1.2500			
-118	1.181	30mm	1.087		.098	.176			1.111		.035			1.3500			
-118	1.188	1-3/16	1.087		.098	.176			1.111		.038			1.3500			
-125	1.250	1-1/4	1.150		.103	.185			1.174		.038			1.4900			
-131	1.312	1-5/16	1.208		.106	.192			1.234		.039			1.6000			
-137	1.375	1-3/8	1.268		.110	.200			1.291		.042			1.7800			
-137	1.378	35mm	1.268		.110	.200			1.291		.044			1.7800			
-150	1.500	1-1/2	1.380		.123	.218	.109		1.406		.047	.120		2.7000			-E108
-156	1.562	1-9/16	1.437	+.013/-.020	.127	.228			1.468	+.003/-.004	.047			3.1000			
-156	1.575	40mm	1.437		.127	.228			1.480		.048			3.1000			
-175	1.750	1-3/4	1.608		.140	.254			1.650		.050			3.3400			
-175	1.772	45mm	1.608		.140	.254			1.669		.052			3.3400			
-193	1.938	1-15/16	1.782		.154	.280	.125	+/-.004	1.826		.056	.139	+.006/-.000	4.8000			-E120-X
-193	1.969	1-31/32	1.782		.154	.280			1.850		.060			4.8000			
SHR-200	2.000	2	1.840		.160	.290			1.880		.060			5.0600			

TOOL DESCRIPTIONS ON PAGES 226, 228 & 229.

SHR

DESCRIPTION

Extra-thick version of the SH that is stronger and yields higher thrust loads. Installed axially using the same tools. Note that the SHR will require a wider groove than the SH.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum (S max) and minimum (S min) cross section of the ring.
4. Find the part in the chart above. If it is too thin, see "SH" beginning on page 6.

GENERAL USE

COMMON

ZINC/YELLOW

STACKED/ROLL PACK

NOT AVAILABLE

DSHR METRIC Page 158

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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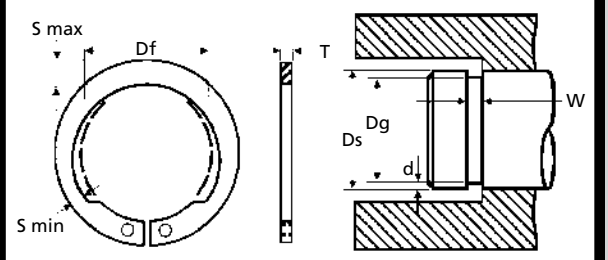
INVERTED EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	N1408	Rotor Clip	SHI	Military	16626
IRR	4100	Waldes	5108		

INVERTED LUGS



SHI

	SHAFT		RING				GROOVE				WEIGHT	MATERIAL		TOOL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S) Min	Max	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
SHI-050	.500	1/2	.461	+.005/-.010	.041	.080	.035	+/-.002	.468	+/-.002	.016	.039	+.003/-.000	0.1000			
-056	.562	9/16	.521		.043	.088			.530		.016			0.1400			
-059	.594	19/32	.550		.046	.092			.559	+/-.003	.017			0.1600			
-062	.625	5/8	.579		.048	.096			.588		.018			0.1600			-E038
-068	.688	11/16	.635		.052	.104	.042		.646		.021	.046		0.2500			
-075	.750	3/4	.693		.056	.112			.704		.023			0.2800			
-078	.781	25/32	.722		.057	.116			.733		.024			0.3100			
-081	.812	13/16	.751		.060	.120			.762		.025			0.3300			
-087	.875	7/8	.810		.064	.128			.821		.027			0.3800			
-093	.938	15/16	.867		.068	.136			.882		.028			0.4500			-E047
-100	.984	63/64	.925		.072	.144			.926		.029			0.4800			
-100	1.000	1	.925		.072	.144			.940		.030			0.4800			
-106	1.062	1-1/16	.982		.073	.147	.050		.998	+/-.004	.032	.056	+.004/-.000	0.6200			
-112	1.125	1-1/8	1.041	+.010/-.015	.075	.150			1.059		.033			0.6700			
-118	1.188	1-3/16	1.098		.076	.153			1.118		.035			0.7200			
-125	1.250	1-1/4	1.156		.079	.157			1.176		.037			0.7600			
-131	1.312	1-5/16	1.214		.080	.161			1.232		.040			0.8200			
-137	1.375	1-3/8	1.272		.082	.165			1.291		.042			0.8400			
-143	1.438	1-7/16	1.333		.085	.169			1.350		.044			0.9100			
-150	1.500	1-1/2	1.387		.086	.173			1.406		.047			0.9800			-E070
-156	1.562	1-9/16	1.446	+.013/-.020	.089	.178	.062	+/-.003	1.468	+/-.005	.047	.068		1.2900			
-162	1.625	1-5/8	1.503		.092	.183			1.529		.048			1.3400			
-177	1.750	1-3/4	1.637		.098	.196			1.650		.050			1.6100			
-177	1.772	45mm	1.637		.098	.196			1.669		.051			1.6100			
-181	1.812	1-13/16	1.675		.100	.199			1.708		.052			1.7300			
-196	1.969	1-31/32	1.819		.106	.212			1.857		.056			2.0500			
-200	2.000	2	1.850		.108	.216			1.886		.057			2.0700			
-215	2.125	2-1/8	1.993	+.015/-.025	.117	.229	.078		2.003	+/-.006	.061	.086	+.005/-.000	3.0000			
-215	2.156	2-5/32	1.993		.117	.229			2.032		.062			3.0000			
-250	2.500	2-1/2	2.313		.130	.250			2.360		.070			4.3500			
-275	2.750	2-3/4	2.543	+.020/-.030	.140	.280	.093		2.602		.074	.103		5.7900			-E115
-287	2.875	2-7/8	2.659		.145	.290			2.721		.077			6.4500			
-315	3.156	3-5/32	2.920		.159	.316			2.986		.085			7.7000			
-325	3.250	3-1/4	3.006		.162	.324			3.076		.087			7.7500			
-350	3.500	3-1/2	3.237		.173	.345	.109		3.316		.092	.120		10.7000			
-393	3.938	3-15/16	3.642		.183	.368			3.734		.102			12.3000			-E120-X
SHI-400	4.000	4	3.700		.185	.371			3.792		---			12.3000			

TOOL DESCRIPTIONS ON PAGES 226, 228 & 229.

SHI

DESCRIPTION

Tapered section ring similar to the SH, except the lugs are inverted (on the ID) to allow use in tight areas with minimal clearance. Less thrust load than SH. Installed axially using pliers.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum (S max) and minimum (S min) cross section of the ring.
4. Find the part in the chart above.

GENERAL USE

COMMON

ZINC / YELLOW

STACKED / ROLL PACK

NOT AVAILABLE

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

SHI ⟷ SH (Page 6) ⟷ RSN (Page 44) ⟷ USH (Page 71) ⟷ SSN (Page 49)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DSHI METRIC Page 160

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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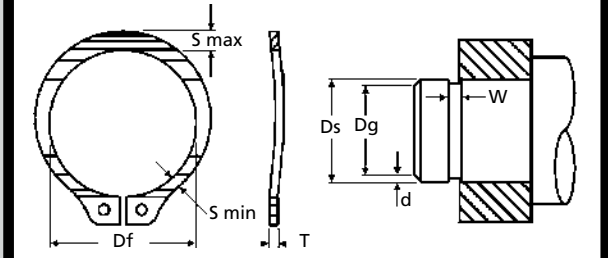
G.L.HUYETT

CURVED SHAPE



BOWED EXTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

IRR	3101	Waldes	5101
Rotor Clip	BSH	Military	16628

BSH

SHAFT		RING				GROOVE			WEIGHT	MATERIAL		TOOL
Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S) Min	Radial Wall (S) Max	Thickness (T)		Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
BSH-018*	.188	3/16	.168	+.002/-.004	.016	.025	.015		.175	+/-.0015	.006	.030	+.002/-.000	0.0059			-E023-L
-021*	.219	7/32	.196		.017	.028			.205		.007			0.0079			
-023*	.236	15/64	.215		.019	.030			.222		.007			0.0086			
-025	.250	1/4	.225		.025	.035			.230		.010			0.0210			-E038
-027	.276	7mm	.250	+.002/-.005	.024	.035			.255		.010			0.0230			
-028	.281	9/32	.256		.0255	.038			.261		.010			0.0240			
-031	.312	5/16	.281		.026	.040			.290		.011			0.0270			
-034	.344	11/32	.309		.0265	.042			.321		.011			0.0310			
-035	.354	9mm	.320		.029	.046	.025		.330	+/-.002	.012	.040		0.0350			
-037	.375	3/8	.338		.0305	.050			.352		.012			0.0390			
-039	.394	10mm	.354		.031	.052			.369		.012			0.0420			
-040	.406	13/32	.366		.033	.054			.382		.012			0.0430			
-043	.438	7/16	.395		.033	.055			.412		.013			0.0500			
-046	.469	15/32	.428		.035	.060			.443		.013			0.0540			
-050	.500	1/2	.461		.040	.065			.468		.016			0.0910			
-055	.551	14mm	.509		.036	.053			.519		.016			0.0900			
-056	.562	9/16	.521		.041	.072	.035	+/-.002	.530		.016	.055	+.003/-.000	0.1100			
-059	.594	19/32	.550		.043	.076			.559		.017			0.1200			
-062	.625	5/8	.579		.045	.080			.588		.018			0.1300			
-066	.669	17mm	.621		.043	.082			.629		.020			0.1400			
-068	.688	11/16	.635	+.005/-.010	.048	.084			.646		.021			0.1800			-E047
-075	.750	3/4	.693		.051	.092			.704		.023			0.2100			
-078	.781	25/32	.722		.052	.094			.733	+/-.003	.024			0.2200			
-081	.812	13/16	.751		.054	.096			.762		.025			0.2500			
-087	.875	7/8	.810		.057	.104	.042		.821		.027	.062		0.2800			
-093	.938	15/16	.867		.063	.110			.882		.028			0.3100			
-098	.984	63/64	.910		.0645	.114			.926		.029			0.3500			
-100	1.000	1	.925		.065	.116			.940		.030			0.3600			
-102	1.023	26mm	.946		.066	.118			.961		.031			0.3900			
-106	1.062	1-1/16	.982	+.010/-.015	.069	.122			.998		.032			0.4800			-E070
-112	1.125	1-1/8	1.041		.071	.128			1.059		.033			0.5100			
-118	1.188	1-3/16	1.098		.072	.132			1.118		.035			0.5600			
-125	1.250	1-1/4	1.156		.076	.140	.050		1.176	+/-.004	.037	.070		0.5900			
-131	1.312	1-5/16	1.214		.0765	.146			1.232		.040			0.6800			
-137	1.375	1-3/8	1.272		.082	.152			1.291		.042			0.7200			
-150	1.500	1-1/2	1.387		.091	.168			1.406		.047			0.9000			
-162	1.625	1-5/8	1.503	+.013/-.020	.097	.180	.062	+/-.003	1.529	+/-.005	.048	.096	+.005/-.000	1.3200			-E115
BSH-175	1.750	1-3/4	1.618		.101	.188			1.650		.050			1.5300			

TOOL DESCRIPTIONS ON PAGES 226, 228 & 229.

** May be beryllium copper instead of carbon steel.*

BSH

DESCRIPTION

Curved design for resilient end-play take-up of rattling in linkages. Provides tension on adjusting screws. Also used to salvage assemblies where grooves have been cut too wide. Install with the *convex* surface abutting the part.

AXIAL ASSEMBLY

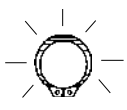
HOW TO IDENTIFY

1. Verify bowed-shape side profile.
2. Measure the shaft diameter (Ds).
3. Determine the ring thickness (T).
4. Measure the maximum (S max) and minimum (S min) cross section of the ring.
5. Find the part in the chart above.

GENERAL USE

UNCOMMON

ZINC / YELLOW



STACKED / ROLL PACK

NOT AVAILABLE

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

EXTERNAL SNAP RINGS

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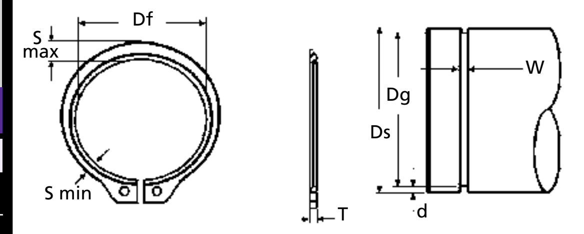


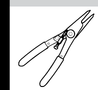
BEVELED EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	1402	Waldes	5102
Rotor Clip	VSH	Military	16630

TOOL DESCRIPTIONS ON PAGES 226, 228 & 229.

VSH	SHAFT		RING						GROOVE					WEIGHT	MATERIAL	TOOL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S) Min	Radial Wall (S) Max	Wall Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	
VSH-100	1.000	1	.925	+.005/-.010	.065	.116	.042	+/-.002	.930	+.000/-.003	.035	.037	+.002/-.000	0.3600		-E070
-102	1.023	26mm	.946		.066	.118			.951		.036	.036		0.3900		
-106	1.062	1-1/16	.982	+.010/-.015	.069	.122	.050		.992	+.000/-.004	.035	.044		0.4800		
-112	1.125	1-1/8	1.041		.071	.128			1.051		.037	.044		0.5100		
-118	1.188	1-3/16	1.098		.072	.132			1.108		.040	.044		0.5600		
-125	1.250	1-1/4	1.156		.076	.140			1.166		.042	.043		0.5900		
-131	1.312	1-5/16	1.214		.0765	.146			1.224		.044	.042		0.6800		
-137	1.375	1-3/8	1.272		.082	.152			1.282		.046	.042		0.7200		
-143	1.438	1-7/16	1.333		.086	.160			1.343		.047	.042		0.8100		
-150	1.500	1-1/2	1.387		.091	.168			1.397		.051	.041		0.9000		
-156	1.562	1-9/16	1.446	+.013/-.020	.093	.172	.062	+/-.003	1.459	+.000/-.005	.051	.053		1.2400		-E115
-162	1.625	1-5/8	1.503		.097	.180			1.516		.054	.053		1.3200		
-168	1.688	1-11/16	1.560		.099	.184			1.573		.057	.052		1.4800		
-175	1.750	1-3/4	1.618		.101	.188			1.631		.059	.052		1.5300		
-177	1.772	45mm	1.637		.102	.190			1.650		.061	.052		1.5400		
-181	1.812	1-13/16	1.675		.102	.192			1.688		.062	.052		1.6200		
-187	1.875	1-7/8	1.735		.104	.196			1.748		.063	.052		1.7300		
-196	1.969	1-31/32	1.819		.106	.200			1.832		.068	.051		1.8000		
-200	2.000	2	1.850		.108	.204			1.863		.068	.051		1.9000		
-206	2.062	2-1/16	1.906	+.015/-.025	.111	.208	.078		1.921	+.000/-.006	.070	.067	+.0025/-.000	2.5000		
-212	2.125	2-1/8	1.964		.113	.212			1.979		.073	.067		2.6100		
-215	2.156	2-5/32	1.993		.113	.212			2.008		.074	.067		2.6300		
-225	2.250	2-1/4	2.081		.116	.220			2.096		.077	.066		2.7700		
-231	2.312	2-5/16	2.139		.118	.222			2.154		.079	.065		2.8000		
-237	2.375	2-3/8	2.197		.119	.224			2.212		.081	.065		2.9200		
-243	2.438	2-7/16	2.255		.120	.228			2.270		.084	.065		2.9500		
-250	2.500	2-1/2	2.313		.122	.232			2.328		.086	.064		2.9700		
-255	2.559	65mm	2.377	+.020/-.030	.125	.238			2.397		.081	.064		3.3900		
-262	2.625	2-5/8	2.428		.127	.242			2.448		.088	.064		3.5000		
-268	2.688	2-11/16	2.485		.129	.246			2.505		.091	.064		3.6000		
-275	2.750	2-3/4	2.543		.131	.248	.093		2.563		.093	.079		4.7000		
-287	2.875	2-7/8	2.659		.133	.256			2.679		.098	.078		4.8500		
-293	2.938	2-15/16	2.717		.136	.260			2.737		.100	.078		5.0000		
VSH-300	3.000	3	2.775		.138	.264			2.795		.102	.077		5.2000		

VSH

DESCRIPTION

A 15° bevel on the inside diameter, when fitted to a 15° bevel on the load-bearing groove wall, yields rigid end-play take-up of manufacturing tolerances or wear on the retained part. Used in greasy and oily environments.

AXIAL ASSEMBLY

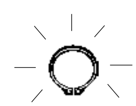
HOW TO IDENTIFY

1. Verify the presence of a bevel along the outside diameter of the part.
2. Measure the shaft diameter (Ds).
3. Determine the ring thickness (T).
4. Measure the maximum (S max) and minimum (S min) cross section of the ring.
5. Find the part in the chart above.

GENERAL USE

COMMON

ZINC/YELLOW



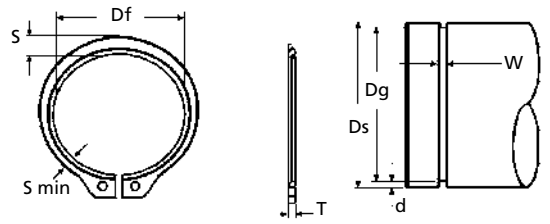
STACKED/ROLL PACK

NOT AVAILABLE

VSH *CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

WEDGES INTO GROOVE



BEVELED EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	1402	Waldes	5102
Rotor Clip	VSH	Military	16630

VSH

SHAFT		RING				GROOVE			WEIGHT	MATERIAL	TOOL
Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S) Min	Radial Wall (S) Max	Wall Thickness (T)		Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	
VSH-306	3-1/16	2.832		.131	.252			2.852	.105	.077	4.7000		
-312	3-1/8	2.892		.141	.272			2.912	.106	.076	5.8000		
-315	3-5/32	2.920		.143	.274	.093		2.940	.108	.076	5.9000		
-325	3-1/4	3.006		.145	.280			3.026	.112	.076	6.2000		-E115
-334	3-11/32	3.092		.147	.300			3.112	.117	.075	6.4000		
-343	3-7/16	3.179		.148	.292			3.199	.119	.075	6.6000		
-350	3.500	3-1/2	3.237	.148	.285			3.257	.121	.091	7.2000		
-354	3.543	90mm	3.277	.149	.288			3.297	.123	.091	7.3000		
-362	3.625	3-5/8	3.352	.153	.296			3.372	.126	.090	7.6000		
-368	3.688	3-11/16	3.410	.156	.302			3.430	.129	.090	8.0000		
-375	3.750	3-3/4	3.468	.160	.310			3.488	.131	.089	8.3000		
-387	3.875	3-7/8	3.584	.163	.318			3.604	.135	.089	8.8000		
-393	3.938	3-15/16	3.642	.163	.318	.109		3.662	.138	.088	9.5000		
-400	4.000	4	3.700	.163	.318			3.720	.140	.088	10.1000		
-425	4.250	4-1/4	3.989	.176	.318			4.009	.120	.094	11.2000		
-437	4.375	4-3/8	4.106	.181	.318			4.126	.124	.094	11.5000		
-450	4.500	4-1/2	4.223	.185	.405			4.243	.128	.094	13.2000		
-475	4.750	4-3/4	4.458	.136	.303			4.478	.136	.092	11.3000		
-500	5.000	5	4.692	.194	.360			4.712	.144	.091	14.9000		
-525	5.250	5-1/4	4.927	.211	.372			4.947	.151	.105	19.0000		
-550	5.500	5-1/2	5.162	.209	.390	.125		5.182	.159	.104	20.1000		
-575	5.750	5-3/4	5.396	.220	.408			5.416	.167	.103	19.9000		
-600	6.000	6	5.631	.171	.381			5.651	.174	.102	21.0000		
-625	6.250	6-1/4	5.866	.176	.396			5.886	.182	.132	28.2000		
-650	6.500	6-1/2	6.100	.236	.438	.156		6.120	.190	.131	33.0000		
-675	6.750	6-3/4	6.335	.246	.456			6.355	.197	.130	35.6000		
-700	7.000	7	6.570	.256	.474			6.590	.205	.129	38.8000		
-750	7.500	7-1/2	7.039	.277	.507			7.059	.220	.158	53.4000		
-800	8.000	8	7.508	.294	.540			7.528	.236	.157	62.8000		-E170
-850	8.500	8-1/2	7.977	.314	.573	.187		7.997	.251	.154	70.0000		
-900	9.000	9	8.445	.333	.609			8.465	.267	.153	75.7000		
-950	9.500	9-1/2	8.915	.350	.642			8.935	.282	.150	82.0000		
VSH-1000	10.000	10	9.385	.367	.675			9.405	.297	.148	96.4000		-E045

+.020/-.030 (Free Inside Dia.) · +/-.003 (Wall Thickness) · +.000/-.006 (Diameter) · +.0025/-.000 (Width)

+.020/-.040 (Free Inside Dia.) · +/-.004 (Wall Thickness) · +.000/-.007 (Diameter) · +.003/-.000 (Width)

+.020/-.050 (Free Inside Dia.) · +/-.005 (Wall Thickness) · +.000/-.008 (Diameter)

+.020/-.060 (Free Inside Dia.)

TOOL DESCRIPTIONS ON PAGES 226, 228 & 229.

VSH

DESCRIPTION

A 15° bevel on the inside diameter, when fitted to a 15° bevel on the load-bearing groove wall, yields rigid end-play take-up of manufacturing tolerances or wear on the retained part. Used in greasy and oily environments.

AXIAL ASSEMBLY

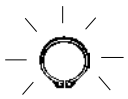
HOW TO IDENTIFY

1. Verify the presence of a bevel along the outside diameter of the part.
2. Measure the shaft diameter (Ds).
3. Determine the ring thickness (T).
4. Measure the maximum (S max) and minimum (S min) cross section of the ring.
5. Find the part in the chart above.

GENERAL USE

COMMON

ZINC/YELLOW



MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

EXTERNAL SNAP RINGS

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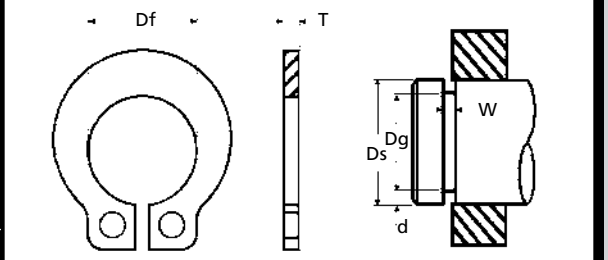
GROOVELESS

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	N1440	Rotor Clip	SHF	Military	
IRR	7100	Waldes	5555		

ADJUSTABLE AND REMOVABLE



SHF	SHAFT From (Ds)	SHAFT To (Ds)	RING Free Inside Dia. (Df)		RING Assembled Diameter	RING Thickness (T)		GROOVE Diameter (Dg)		GROOVE Depth (d)	GROOVE Width (W)		WEIGHT Lbs. per 100 Pieces	MATERIAL Spring Steel	MATERIAL Stainless "-SS"	TOOL
SHF-006	.058	.060	.055	+.002/-.003	.21	.015	+/-.002	Not recommended for use with grooves.					0.0030			-E034
-007	.078	.080	.074		.24	.025							0.0080			
-009	.092	.096	.089		.26	.025							0.0100			
-011	.116	.120	.112		.29	.024							-			
-012	.123	.127	.120		.33	.025							0.0240			-E040
-015	.154	.158	.150	+.002/-.004	.36	.025							0.0300			
-018	.185	.189	.181		.44	.035	+/-.003						0.0550			-E047-X
-019	.195	.199	.187	+/-.003	.43	.032							0.0450			
-023	.234	.238	.224		.48	.035		.228	+.0005/-.0015	.004	.041	+.003/-.000	0.0760			
-025	.248	.252	.238	+.002/-.004	.49	.035		.240		.005	.041		0.0740			
-027	.274	.278	.264	+/-.004	.55	.039		-		-	-		-			
-031	.310	.316	.298	+.003/-.005	.68	.042		.303		.005	.048		0.1390			-E070-X
-037	.373	.379	.354		.74	.042		.361	+.001/-.002	.007	.048	+.004/-.000	0.1720			
-043	.434	.440	.412		.81	.050		.419		.009	.056		0.2610			
-050	.497	.503	.470	+.004/-.006	.90	.050		.478		.011	.056		0.2910			
-059	.587	.593	.570	+/-.005	1.03	.059		-		-	-		-			
-062	.622	.628	.593	+.004/-.006	1.06	.062	+/-.004	.599		.013	.069		0.5700			
SHF-075	.745	.755	.706		1.32	.062		.718	+.002/-.003	.016	.069		0.6880			

TOOL DESCRIPTIONS ON PAGE 226.

SHF

DESCRIPTION

Reusable tapered section ring for grooveless shafts like plastics, tubes, and castings, or where adjustable ring placement is desired (like progressively tightening a compression spring). Installed using pliers. See page 91.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Find the part in the chart above.

GENERAL USE

COMMON

ZINC / YELLOW

STACKED / ROLL PACK

NOT AVAILABLE

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

SHF ⟷ RG (Page 27) ⟷ TX (Page 92) ⟷ TY (Page 92) ⟷ T99 (Page 101)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

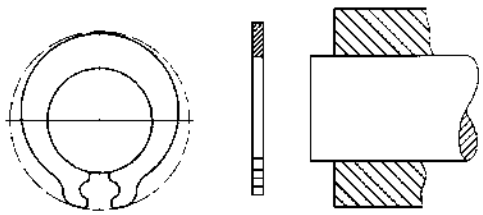
DSHF METRIC Page 164

GROOVELESS - OPEN LUC

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	M1440	Rotor Clip	SHF
IRR	7100	Waldes	5555

AVAILABLE AS A SPECIAL ORDER

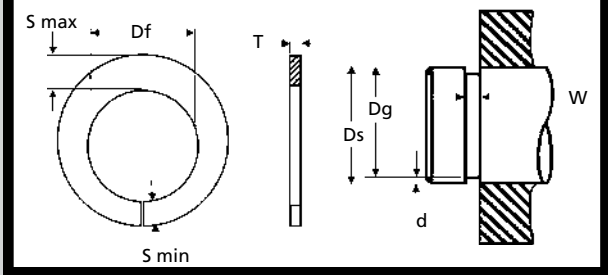


SEE PAGE 165.

DSHX METRIC Page 165

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

REMOVE USING EXPLOSIVES



TAMPER-PROOF

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Rotor Clip	SHM
Waldes	5560

MATERIAL

SHM	SHAFT Decimal (Ds)		SHAFT Fraction (Ds)	RING Free Inside Dia. (Df)		RING Radial Wall (S) Min	RING Radial Wall (S) Max	RING Thickness (T)		GROOVE Diameter (Dg)		GROOVE Depth (d)	GROOVE Width (W)		WEIGHT Lbs. per 100 Pieces	MATERIAL Spring Steel	MATERIAL Stainless "-SS"	TOOL
SHM-010	.101		-	.090		.017	.027			.093		.004			0.0036			
-012	.125		1/8	.112		.018	.028	.020		.115		.005	.024		0.0050			
-013	.134	+/-.001	-	.120	+/-.002	.019	.029			.124	+/-.001			+.002/-.000	0.0059			
-015	.156		5/32	.140		.027	.045			.144		.006			0.0122			
-018	.188		3/16	.168		.032	.052	.025		.174		.007	.029		0.0179			
-020	.203		13/64	.180		.030	.046			.189					0.0167			SEE BE-LOW
-022	.219		7/32	.200		.036	.058			.205					0.0334			
-025	.250		1/4	.224		.037	.063			.232		.009			0.0386			
-026	.266	+/-.0015	17/64	.240	+/-.003	.037	.065	.035	+/-.002	.248	+/-.0015		.039	+.003/-.000	0.0416			
-031	.312		5/16	.284		.050	.078			.292		.010			0.0626			
-032	.328		21/64	.300		.050	.080			.308					0.0688			
SHM-037	.375		3/8	.340		.058	.090	.042		.351	+/-.002	.012	.046		0.1035			

SHM

DESCRIPTION

Miniature tapered section ring without lugs that provides a tamper-proof shoulder. Also known as the "wedding ring," SHM's must be destroyed for removal. Thick cross section.

AXIAL ASSEMBLY

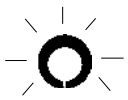
HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum (S max) and minimum (S min) cross section of the ring.
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

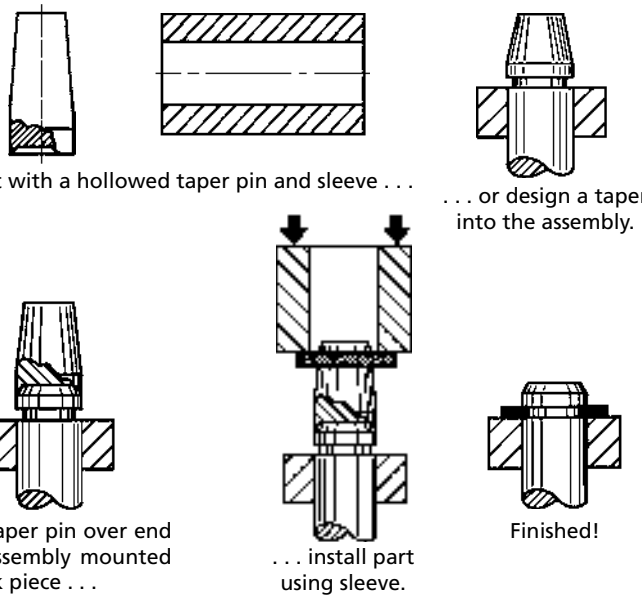
ZINC / YELLOW



STACKED / ROLL PACK

NOT AVAILABLE

SHM INSTALLATION



Start with a hollowed taper pin and sleeve . . .

. . . or design a taper into the assembly.

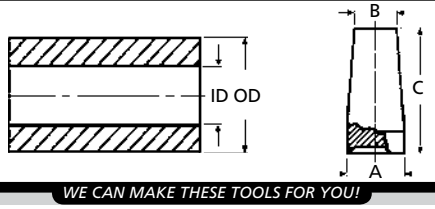
Place taper pin over end with assembly mounted in work piece . . .

. . . install part using sleeve.

Finished!

LET OUR SHOP MANUFACTURE A BUSHING AND TAPERED PIN FOR YOU!

SHM	SLEEVE Inside Dia. (ID)		SLEEVE Outside Dia. (OD)	TAPERED PIN Pin Dia. (A)		TAPERED PIN Tip Dia. Ref. (B)	TAPERED PIN Length (C)	
-010	.104		3/8	.102		.036	.750	
-012	.128			.126		.059		
-013	.137			.135		.069		
-015	.159		1/2	.157		.078	.875	
-018	.191			.189		.110		
-020	.206	+.002/-.000		.204	+.000/-.0015	.125		+/-.005
-022	.223			.221		.129	1.000	
-025	.254		5/8	.252		.101		
-026	.270			.268		.176		
-031	.316			.314		.223		
-032	.332			.330		.238		
-037	.379			.377		.286		



WE CAN MAKE THESE TOOLS FOR YOU!

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

INTERNAL SNAP RINGS

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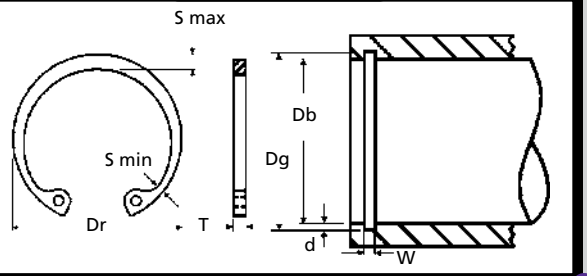
BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	N1300	IRR	3000	Waldes	N5000
Ellison	9000	Rotor Clip	HO	Military	16625

MOST POPULAR



HO

BORE		RING				GROOVE				WEIGHT	MATERIAL		TOOL
Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S) Min	Max	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
.250	1/4	.280	+.010/-.005	.015	.025	.015	+/-.002	.268	+/-.001	.009	.020	+.002/-.000	0.0080			-I025
.312	5/16	.346		.018	.033			.330		.009			0.0110			
.375	3/8	.415		.028	.040	.025		.397	+/-.002	.011	.029		0.0250			-I038
.438	7/16	.482		.029	.049			.461		.012			0.0370			
.453	29/64	.498		.030	.050			.477		.012			0.0430			
.500	1/2	.548		.035	.053	.035		.530		.015	.039	+.003/-.000	0.0700			
.512	13mm	.560		.035	.053			.542		.015			0.0770			
.562	9/16	.620		.035	.053			.596		.017			0.0860			
.625	5/8	.694		.035	.060			.665		.020			0.1000			
.688	11/16	.763		.036	.063			.732		.022			0.1200			
.750	3/4	.831		.040	.070			.796		.023			0.1300			
.777	19.7mm	.859		.044	.074	.042		.825	+/-.003	.024	.046		0.1700			-I047
.812	13/16	.901	+.015/-.010	.044	.077			.862		.025			0.1900			
.866	22mm	.961		.045	.081			.920		.027			0.2000			
.875	7/8	.971		.045	.084			.931		.028			0.2100			
.901	22.9mm	1.000		.047	.087			.959		.029			0.2200			
.938	15/16	1.041		.050	.091			1.000		.031			0.2400			
1.000	1	1.111		.052	.104			1.066		.033			0.2700			
1.023	26mm	1.136		.054	.106			1.091		.034			0.2800			
1.062	1-1/16	1.180	+.025/-.020	.055	.110	.050		1.130	+/-.004	.034	.056	+.004/-.000	0.3700			-I070
1.125	1-1/8	1.249		.057	.116			1.197		.036			0.4000			
1.181	30mm	1.319		.058	.120			1.255		.037			0.4300			
1.188	1-3/16	1.319		.058	.120			1.262		.037			0.4300			
1.250	1-1/4	1.388		.062	.124			1.330		.040			0.4800			
1.259	32mm	1.388		.062	.124			1.339		.040			0.4800			
1.312	1-5/16	1.456		.062	.130			1.396		.042			0.5000			
1.375	1-3/8	1.526		.063	.130			1.461		.043			0.5100			
1.378	35mm	1.526		.063	.130			1.464		.043			0.5100			
1.438	1-7/16	1.596		.065	.133			1.528		.045			0.5800			
1.456	37mm	1.616		.065	.133			1.548		.046			0.6400			
1.500	1-1/2	1.660		.066	.133			1.594		.047			0.6500			
1.562	1-9/16	1.734	+.035/-.025	.078	.157	.062	+/-.003	1.658	+/-.005	.048	.068		0.8900			
1.575	40mm	1.734		.078	.157			1.671		.048			0.8900			
1.625	1-5/8	1.804		.082	.164			1.725		.050			1.0000			
1.653	42mm	1.835		.083	.167			1.755		.051			1.0400			
1.688	1-11/16	1.874		.085	.170			1.792		.052			1.0800			

TOOL DESCRIPTIONS ON PAGES 227, 228 & 229.

HO

DESCRIPTION

Tapered section ring that is installed axially with pliers into a housing or bore. High thrust load rating. Stacked roll pack prevents tangling for ease in handling.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the bore diameter (Db).
2. Determine the ring thickness (T).
3. Measure the maximum (S max) and minimum (S min) cross section of the ring.
4. Find the part in the chart above.

GENERAL USE

COMMON

ZINC / YELLOW

STACKED / ROLL PACK

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

HO ⟷ HOI (Page 19) ⟷ RRN (Page 58) ⟷ UHO (Page 76) ⟷ SRN (Page 63)

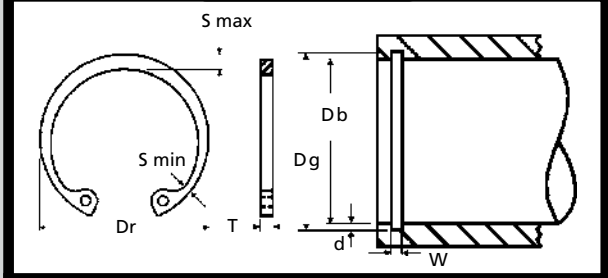
PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DHO DIN 472 METRIC Page 166

HO CONTINUED NEXT PAGE.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

MOST POPULAR



BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	N1300	IRR	3000	Waldes	N5000
Ellison	9000	Rotor Clip	HO	Military	16625

HO

BORE		RING					GROOVE				WEIGHT	MATERIAL		TOOL
Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S) Min	Max	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
1.750	1-3/4	1.942	+.035/-.025	.083	.171	.062	1.858	+/-.005	.054	.068 +.004/-.000	1.0300			-I070
1.812	1-13/16	2.012		.084	.170		1.922		.055		1.1500			
1.850	47mm	2.054		.085	.170		1.962		.056		1.2800			
1.875	1-7/8	2.072		.085	.170		1.989		.057		1.2800			
1.938	1-15/16	2.141		.085	.170		2.056		.059		1.3300			
2.000	2	2.210		.085	.170		2.122		.061		1.4000			
2.047	52mm	2.280	+.040/-.030	.091	.186	.078	2.171	+/-.006	.062	.086 +.005/-.000	1.8000			
2.062	2-1/16	2.280		.091	.186		2.186		.062		1.8000			-I090
2.125	2-1/8	2.350		.096	.195		2.251		.063		1.9400			
2.165	55mm	2.415		.098	.199		2.295		.065		1.9600			
2.188	2-3/16	2.415		.098	.199		2.318		.065		1.9600			
2.250	2-1/4	2.490		.099	.203		2.382		.066		2.1800			
2.312	2-5/16	2.535		.100	.206		2.450		.069		2.2600			
2.375	2-3/8	2.630		.102	.207		2.517		.071		2.3200			
2.440	2-7/16	2.702		.103	.209		2.584		.072		2.5400			
2.500	2-1/2	2.775		.103	.210		2.648		.074		2.5500			
2.531	2-17/32	2.775		.103	.210		2.681		.075		2.5500			
2.562	2-9/16	2.844		.109	.222	.093	2.714		.076	.103	3.4000			
2.625	2-5/8	2.910		.111	.226		2.781		.078		3.4500			
2.677	68mm	2.980		.113	.230		2.837		.080		3.5000			
2.688	2-11/16	2.980		.113	.230		2.848		.080		3.5000			-I108
2.750	2-3/4	3.050		.115	.234		2.914		.082		3.5500			
2.812	2-13/16	3.121		.115	.230		2.980		.084		3.6000			
2.835	72mm	3.121		.115	.230		3.006		.085		3.6000			
2.875	2-7/8	3.191		.120	.240		3.051		.088		4.1000			
2.953	75mm	3.325		.122	.250		3.135		.091		4.2500			
3.000	3	3.325		.122	.250		3.182		.091		4.2500			
3.062	3-1/16	3.418	+/-.055	.126	.254	.109	3.248		.093	.120	5.3000			
3.125	3-1/8	3.488		.129	.259		3.315		.095		5.6000			
3.149	80mm	3.523		.129	.262		3.341		.096		5.7000			
3.156	3-5/32	3.523		.129	.262		3.348		.096		5.7000			
3.250	3-1/4	3.623		.135	.269		3.446		.098		6.0000			-I120
3.346	3-11/32	3.734		.140	.276		3.546		.100		6.5000			
3.469	3-15/32	3.857		.144	.286		3.675		.103		6.9000			
3.500	3-1/2	3.890		.142	.289		3.710		.105		7.1000			
3.543	90mm	3.936		.142	.292		3.755		.106		7.2000			

TOOL DESCRIPTIONS ON PAGES 227, 228 & 229

HO

DESCRIPTION

Tapered section ring that is installed axially with pliers into a housing or bore. High thrust load rating. Stacked roll pack prevents tangling for ease in handling.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the bore diameter (Db).
2. Determine the ring thickness (T).
3. Measure the maximum (S max) and minimum (S min) cross section of the ring.
4. Find the part in the chart above.

GENERAL USE

COMMON

ZINC / YELLOW

STACKED / ROLL PACK

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

HO ⟷ HOI (Page 19) ⟷ RRN (Page 58) ⟷ UHO (Page 76) ⟷ SRN (Page 63)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DHO DIN 472 METRIC Page 166

***HO** CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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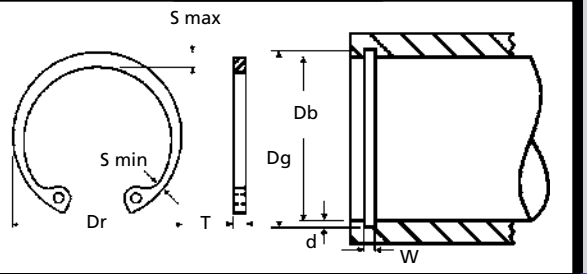
BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	N1300	IRR	3000	Waldes	N5000
Ellison	9000	Rotor Clip	HO	Military	16625

MOST POPULAR



HO

BORE		RING					GROOVE				WEIGHT	MATERIAL		TOOL
Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S) Min	Max	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
3.562	3-9/16	3.936	+/-.055	.142	.292		3.776		.107		7.2000			
3.625	3-5/8	4.024		.150	.299		3.841		.108		7.3000			
3.740	95mm	4.157		.155	.309		3.964		.112		7.8000			
3.750	3-3/4	4.157		.155	.309		3.974		.112		7.8000			-I120
3.875	3-7/8	4.291		.160	.319		4.107		.116		8.7000			
3.938	3-15/16	4.358		.161	.324		4.174		.118		8.8000			
4.000	4	4.424		.166	.330		4.240		.120		9.3000			
4.125	4-1/8	4.558		.171	.330	.109	4.365	+/-.006	.120	.120	9.7000			
4.250	4-1/4	4.691		.180	.335		4.490		.120		10.1000			
4.331	110mm	4.756		.180	.343		4.571		.120		10.5000			
4.500	4-1/2	4.940		.181	.351		4.740		.120		11.1000			
4.625	4-5/8	5.076		.183	.360		4.865		.120		11.7000			
4.724	120mm	5.213		.183	.370		4.969		.122		12.4000			
4.750	4-3/4	5.213		.183	.370		4.995		.122		12.4000			-I120-X
5.000	5	5.485		.186	.390		5.260		.130		13.6000			
5.250	5-1/4	5.770		.198	.408		5.520		.135		17.4000			
5.375	5-3/8	5.910		.198	.408		5.650		.135		17.9000			
5.500	5-1/2	6.066		.198	.408	.125	5.770	+/-.007	.135	.139	18.3000			
5.750	5-3/4	6.336		.198	.408		6.020		.135		19.2000			
6.000	6	6.620		.198	.435		6.270		.135		20.2100			
6.250	6-1/4	6.895		.211	.423		6.530		.140		26.6000			
6.500	6-1/2	7.170		.219	.438		6.790		.145		28.1000			
6.625	6-5/8	7.308		.221	.447	.156	6.925		.150	.174	30.5000			
6.750	6-3/4	7.445		.224	.456		7.055		.152		32.5000			
7.000	7	7.720		.232	.474		7.315		.157		34.4000			
7.250	7-1/4	7.995		.238	.489		7.575		.162		42.8000			
7.500	7-1/2	8.270		.247	.507		7.840		.170		48.5000			
7.750	7-3/4	8.545		.255	.523		8.100		.175		52.0000			
8.000	8	8.820		.262	.540		8.360		.180		55.5000			-I150
8.250	8-1/4	9.095		.270	.558		8.620		.185		60.3000			
8.500	8-1/2	9.285		.277	.573		8.880		.190		63.4000			
8.750	8-3/4	9.558		.286	.591	.187	9.145	+/-.008	.197	.209	65.3000			
9.000	9	9.830		.294	.609		9.405		.202		73.2000			
9.250	9-1/4	10.102		.299	.625		9.668		.109		76.7000			
9.500	9-1/2	10.375		.304	.642		9.930		.215		80.3000			
9.750	9-3/4	10.648		.309	.658		10.190		.220		83.3000			
10.000	10	10.920		.315	.675		10.450		.225		86.3000			

TOOL DESCRIPTIONS ON PAGES 227, 228 & 229

HO

DESCRIPTION

Tapered section ring that is installed axially with pliers into a housing or bore. High thrust load rating. Stacked roll pack prevents tangling for ease in handling.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the bore diameter (Db).
2. Determine the ring thickness (T).
3. Measure the maximum (S max) and minimum (S min) cross section of the ring.
4. Find the part in the chart above.

GENERAL USE

COMMON

ZINC / YELLOW

STACKED / ROLL PACK

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

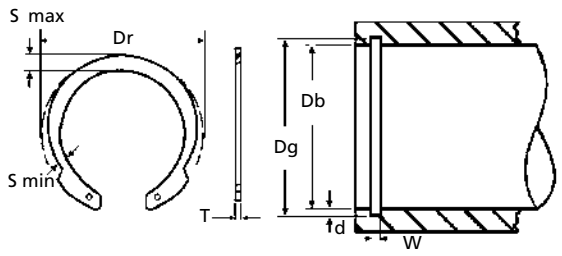
HO ⟷ HOI (Page 19) ⟷ RRN (Page 58) ⟷ UHO (Page 76) ⟷ SRN (Page 63)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DHO DIN 472 METRIC Page 166

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

INVERTED LUGS



INVERTED INTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	N1308	Rotor Clip	HOI	Military	16627
IRR	4000	Waldes	5008		

HOI

BORE		RING					GROOVE			WEIGHT	MATERIAL		TOOL
Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S) Min	Max	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
.625	5/8	.675	+.010/-.005	.036	.072	.025	.665	+/-.002	.020	.029	0.0700			-I025
.750	3/4	.808		.042	.085	.035	.796		.023	.039	0.1300			
.812	13/16	.877		.044	.092	.042	.862	+/-.003	.025	.046	0.2000			-I038
.875	7/8	.944		.047	.099		.931		.028		0.2200			
.938	15/16	1.015		.051	.106		1.000		.031		0.2800			
1.000	1	1.081		.054	.113		1.066		.033		0.2900			
1.062	1-1/16	1.150	+.015/-.010	.057	.120	.050	1.130	+/-.004	.034	.056	0.3800			-I047
1.125	1-1/8	1.217		.059	.123		1.197		.036		0.4400			
1.188	1-3/16	1.283		.060	.126		1.262		.037		0.4900			
1.250	1-1/4	1.351		.061	.129		1.330		.040		0.5000			
1.312	1-5/16	1.418		.063	.132		1.396		.042		0.5300			
1.375	1-3/8	1.486		.065	.135		1.461		.043		0.5900			
1.438	1-7/16	1.552		.069	.144		1.528		.045		0.6300			
1.500	1-1/2	1.622		.070	.148		1.594		.047		0.6800			
1.562	1-9/16	1.688	+.020/-.013	.074	.158	.062	1.658	+/-.005	.048	.068	0.8900			-I070
1.625	1-5/8	1.756		.077	.162		1.725		.050		1.0400			
1.688	1-11/16	1.823		.079	.166		1.792		.052		1.1900			
1.750	1-3/4	1.891		.082	.170		1.858		.054		1.1800			
1.875	1-7/8	2.025		.090	.188		1.989		.057		1.4800			
2.000	2	2.160		.100	.208		2.122		.061		1.7400			
2.062	2-1/16	2.224	+.025/-.015	.106	.218	.078	2.186	+/-.006	.062	.086	2.3200			-I090
2.125	2-1/8	2.295		.108	.223		2.251		.063		2.4300			
2.375	2-3/8	2.567		.115	.243		2.517		.071		2.8600			
2.438	2-7/16	2.634		.117	.248		2.584		.072		3.0600			
2.500	2-1/2	2.700		.120	.254		2.648		.074		3.2100			
2.625	2-5/8	2.840	+.030/-.020	.128	.266	.093	2.781		.078	.103	4.5600			-I108
2.750	2-3/4	2.975		.134	.278		2.914		.082		4.7800			
2.812	2-13/16	3.063		.139	.286		2.980		.084		4.9500			
2.835	72mm	3.063		.139	.286		3.006		.086		4.9500			
2.875	2-7/8	3.105		.139	.290		3.051		.088		5.0100			
3.000	3	3.245		.143	.302		3.182		.091		5.2600			
3.156	3-5/32	3.408		.149	.314	.109	3.348		.096	.120	6.9400			-I120
3.250	3-1/4	3.509		.151	.318		3.446		.098		7.2600			
3.346	3-11/32	3.611		.155	.321		3.546		.100		7.5600			
3.500	3-1/2	3.780		.154	.324		3.710		.105		8.0200			
3.562	3-9/16	3.850		.155	.326		3.776		.107		8.2400			
4.000	4	4.350		.161	.338		4.240		.120		9.7400			

TOOL DESCRIPTIONS ON PAGES 227, 228 & 229

HOI

DESCRIPTION

Inverted lugs seat into the groove for better clearance and a cleaner appearance. Good for shielded bearings that pass tightly through the bore or housing. Installed axially using pliers.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the bore diameter (Db).
2. Determine the ring thickness (T).
3. Measure the maximum (S max) and minimum (S min) cross section of the ring.
4. Find the part in the chart above.

GENERAL USE

COMMON

ZINC / YELLOW

STACKED / ROLL PACK

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

HOI ⟷ HO (Page 19) ⟷ RRN (Page 58) ⟷ UHO (Page 76) ⟷ SRN (Page 63)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DHOI METRIC Page 172

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

INTERNAL SNAP RINGS

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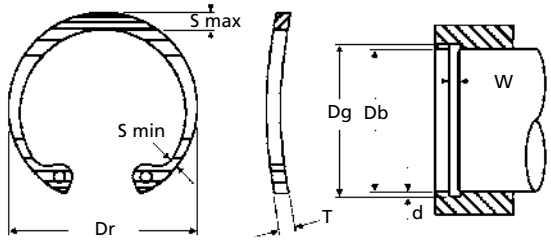
BOWED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

IRR	3001	Waldes	N5001
Rotor Clip	BHO	Military	16629

CURVED SHAPE



BHO	BORE		RING				GROOVE				WEIGHT	MATERIAL		TOOL
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S) Min	Max	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
BHO-025	.250	1/4	.280	+/-.010	.015	.025	.015	+/-.002	.268	+/-.001	.009	.030	+.002/-.000	0.0080			-I025
-031	.312	5/16	.346		.018	.033			.330		.009			0.0110			
-037	.375	3/8	.415		.028	.040	.025		.397	+/-.002	.011	.040		0.0250			-I038
-043	.438	7/16	.482		.029	.049			.461		.012			0.0370			
-045	.453	29/64	.498		.030	.050			.477		.012			0.0430			
-050	.500	1/2	.548		.035	.053	.035		.530		.015	.055		0.0700			
-051	.512	13mm	.560		.035	.053			.542		.015			0.0770			
-056	.562	9/16	.620		.035	.053			.596		.017			0.0860			
-062	.625	5/8	.694		.035	.060			.665		.020			0.1000			
-068	.688	11/16	.763		.036	.063			.732		.022			0.1200			
-075	.750	3/4	.831		.040	.070			.796		.023			0.1300			
-077	.777	19.7mm	.859		.044	.074	.042		.825	+/-.003	.024	.062	+.003/-.000	0.1700			-I047
-081	.812	13/16	.901	+/-.015	.044	.077			.862		.025			0.1900			
-086	.866	22mm	.961		.045	.081			.920		.027			0.2000			
-087	.875	7/8	.971		.045	.084			.931		.028			0.2100			
-090	.901	22.9mm	1.000		.047	.087			.959		.029			0.2200			
-093	.938	15/16	1.041		.050	.091			1.000		.031			0.2400			
-100	1.000	1	1.111		.052	.104			1.066		.033			0.2700			
-102	1.023	26mm	1.136		.054	.106			1.091		.034			0.2800			
-106	1.062	1-1/16	1.180	+/-.025	.055	.110	.050		1.130	+/-.004	.034	.070		0.3700			-I070
-112	1.125	1-1/8	1.249		.057	.116			1.197		.036			0.4000			
-118	1.181	30mm	1.319		.058	.120			1.255		.037			0.4300			
-118	1.188	1-3/16	1.319		.058	.120			1.262		.037			0.4300			
-125	1.250	1-1/4	1.388		.062	.124			1.330		.040			0.4800			
-125	1.259	32mm	1.388		.062	.124			1.339		.040			0.4800			
-131	1.312	1-5/16	1.456		.062	.130			1.396		.042			0.5000			
-137	1.375	1-3/8	1.526		.063	.130			1.461		.043			0.5100			
-137	1.378	35mm	1.526		.063	.130			1.464		.043			0.5100			
-143	1.438	1-7/16	1.596		.065	.133			1.528		.045			0.5800			
-145	1.456	37mm	1.616		.065	.133			1.548		.046			0.6400			
-150	1.500	1-1/2	1.660		.066	.133			1.594		.047			0.6500			
-156	1.562	1-9/16	1.734	+.035/-.025	.078	.157	.062	+/-.003	1.658	+/-.005	.048	.100	+.005/-.000	0.8900			
-156	1.575	40mm	1.734		.078	.157			1.671		.048			0.8900			
-162	1.625	1-5/8	1.804		.082	.164			1.725		.050			1.0000			
BHO-175	1.750	1-3/4	1.942		.083	.171			1.858		.054			1.0300			

TOOL DESCRIPTIONS ON PAGES 227, 228 & 229

BHO

DESCRIPTION

Curved design for resilient end-play take-up of rattling in linkages. Provides tension on adjusting screws. Also used to salvage assemblies where grooves have been cut too wide. Install with the *convex* surface abutting the part.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify bowed-shape side profile.
2. Measure the bore diameter (Db).
3. Determine the ring thickness (T).
4. Measure the maximum (S max) and minimum (S min) cross section of the ring.
5. Find the part in the chart above.

GENERAL USE

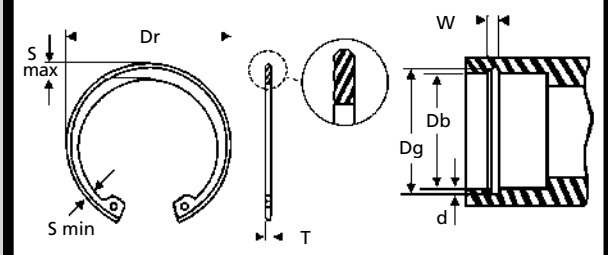
UNCOMMON

ZINC / YELLOW

DBHO METRIC Page 173

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

NO ORIENTATION NEEDED DURING ASSEMBLY



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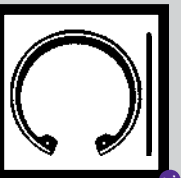
DOUBLE BEVELED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Waldes	N5003		



VVH

BORE		RING						GROOVE					WEIGHT	MATERIAL	TOOL
Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S) Min	Radial Wall (S) Max	Wall Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	
VVH-156	1.562	1-9/16	1.734	+.035/-.025	.078	.157	.053	+/-.003	1.674	+.005/-.000	.056	.052	+.005/-.000	0.7600		-I070
-162	1.625	1-5/8	1.804		.082	.164			1.743		.059			0.8500		
-165	1.653	42mm	1.835		.083	.167			1.773		.060			0.8900		
-168	1.688	1-11/16	1.874		.085	.170			1.810		.061			0.9200		
-175	1.750	1-3/4	1.942		.083	.171	.052		1.878		.064	.050		0.8600		
-181	1.812	1-13/16	2.012		.084	.170			1.944		.066			0.9600		
-187	1.850	47mm	2.054		.085	.170			1.984		.067			1.0700		
-187	1.875	1-7/8	2.054		.085	.170			2.011		.068			1.0700		
-193	1.938	1-15/16	2.141		.085	.170			2.082		.072			1.1200		
-200	2.000	2	2.210		.085	.170			2.144		.072			1.1700		
-206	2.062	2-1/16	2.280	+.040/-.030	.091	.186	.068	+/-.004	2.210	+.006/-.000	.074	.065	+.006/-.000	1.5700		-I090
-212	2.125	2-1/8	2.350		.096	.195			2.279		.077			1.6900		
-218	2.188	2-3/16	2.415		.098	.199			2.350		.081			1.7100		
-225	2.250	2-1/4	2.490		.099	.203			2.420		.085	.062		1.8900		
-231	2.312	2-5/16	2.535		.102	.209			2.484		.086			1.9600		
-237	2.375	2-3/8	2.630		.102	.207			2.552		.089			2.0100		
-244	2.440	2-7/16	2.702		.103	.209			2.618		.089			2.2000		
-250	2.500	2-1/2	2.775		.103	.210			2.684		.092			2.2100		
-250	2.531	2-17/32	2.775		.103	.210			2.717		.093			2.2100		
-256	2.562	2-9/16	2.844		.109	.222	.082		2.750		.094	.076		3.0000		
-262	2.625	2-5/8	2.910		.111	.226			2.820		.097			3.0400		
-268	2.688	2-11/16	2.980		.113	.230			2.887		.099			3.0900		
-275	2.750	2-3/4	3.050		.115	.234			2.955		.102			3.1300		
VVH-281	2.812	2-13/16	3.121		.115	.230			3.020		.104			3.1700		

TOOL DESCRIPTIONS ON PAGE 227.

VVH

DESCRIPTION

Identical to the VHO (pages 22-23), except that the 15° bevel is located on *both sides* of the outside diameter. The double bevel eliminates the need for orienting the ring prior to assembly.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify that a bevel exists on both sides of the outside diameter of the part.
2. Measure the bore diameter (Db).
3. Determine the ring thickness (T).
4. Measure the maximum (S max) and minimum (S min) cross section of the ring.
5. Find the part in the chart above.

GENERAL USE

WEIRD

SPECIAL FINISHES AND PACKAGING AVAILABLE UPON REQUEST.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

VVH ⟷ VHO (Page 22)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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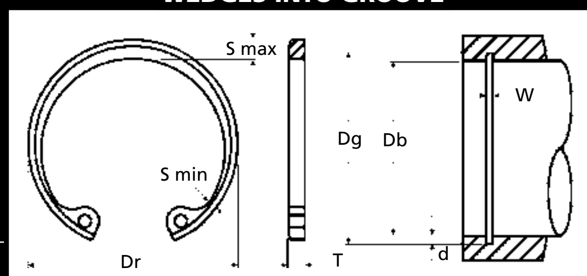


BEVELED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	N1302	Rotor Clip	VHO	Military	16631
Ellison	9002	Waldes	N5002		

VHO

VHO	BORE Decimal (Db)	BORE Fraction (Db)	RING Free Outside Dia. (Dr)	Dr Tol.	RING Radial Wall (S) Min	RING Radial Wall (S) Max	RING Wall Thickness (T)	T Tol.	GROOVE Diameter (Dg)	Dg Tol.	GROOVE Depth (d)	GROOVE Width (W)	W Tol.	WEIGHT Lbs. per 100 Pieces	MATERIAL	TOOL
VHO-100	1.000	1	1.111	+.015/-.010	.052	.104	.042	+/-.002	1.076	+.003/-.000	.038	.036	+.001/-.000	0.2700	Spring Steel	-I047
-102	1.023	26mm	1.136		.054	.106			1.101		.039	.036		0.2800		
-106	1.062	1-1/16	1.180	+.025/-.020	.055	.110	.050		1.138		.038	.044		0.3700		-I070
-112	1.125	1-1/8	1.249		.057	.116			1.205	+.004/-.000	.040	.043		0.4000		
-118	1.181	30mm	1.319		.058	.120			1.265		.042	.043		0.4300		
-118	1.188	1-3/16	1.319		.058	.120			1.272		.042	.043		0.4300		
-125	1.250	1-1/4	1.388		.062	.124			1.342		.046	.042		0.4800		
-125	1.259	32mm	1.388		.062	.124			1.351		.046	.042		0.4800		
-131	1.312	1-5/16	1.456		.062	.130			1.408		.048	.042		0.5000		
-137	1.375	1-3/8	1.526		.063	.130			1.475		.050	.041		0.5100		
-137	1.378	35mm	1.526		.063	.130			1.478		.050	.041		0.5100		
-143	1.438	1-7/16	1.596		.065	.133			1.542		.052	.040		0.5800		
-145	1.456	37mm	1.616		.065	.133			1.562		.053	.040		0.6400		
-150	1.500	1-1/2	1.660		.066	.133		+/-.003	1.604		.052	.040		0.6500		
-156	1.562	1-9/16	1.734	+.035/-.025	.078	.157	.062		1.674	+.005/-.000	.056	.052		0.8900		
-156	1.575	40mm	1.734		.078	.157			1.687		.056	.052		0.8900		
-162	1.625	1-5/8	1.804		.082	.164			1.743		.059	.051		1.0000		
-165	1.653	42mm	1.835		.083	.167			1.773		.060	.051		1.0400		
-168	1.688	1-11/16	1.874		.085	.170			1.810		.061	.050		1.0800		
-175	1.750	1-3/4	1.942		.083	.171			1.878		.064	.050		1.0300		
-181	1.812	1-13/16	2.012		.084	.170			1.944		.066	.050		1.1500		-I090
-185	1.850	47mm	2.054		.085	.170			1.984		.067	.050		1.2800		
-187	1.875	1-7/8	2.054		.085	.170			2.011		.068	.050		1.2800		
-193	1.938	1-15/16	2.141		.085	.170			2.082		.072	.049		1.3300		
-200	2.000	2	2.210		.085	.170			2.144		.072	.048		1.4000		
-206	2.047	52mm	2.280	+.040/-.030	.091	.186	.078		2.195	+.006/-.000	.074	.065	+.0015/-.000	1.8000		
-206	2.062	2-1/16	2.280		.091	.186			2.210		.074	.065		1.8000		
-212	2.125	2-1/8	2.350		.096	.195			2.279		.077	.065		1.9400		
-218	2.165	55mm	2.415		.098	.199			2.327		.081	.064		1.9600		
-218	2.188	2-3/16	2.415		.098	.199			2.350		.081	.064		1.9600		
-225	2.250	2-1/4	2.490		.099	.203			2.420		.085	.064		2.1800		
-231	2.312	2-5/16	2.535		.100	.206			2.484		.086	.063		2.2600		
-237	2.375	2-3/8	2.630		.102	.207			2.552		.089	.063		2.3200		
-244	2.440	2-7/16	2.702		.103	.209			2.618		.089	.062		2.5400		-I108
-250	2.500	2-1/2	2.775		.103	.210			2.684		.092	.062		2.5500		
-250	2.531	2-17/32	2.775		.103	.210			2.717		.093	.062		2.5500		
VHO-256	2.562	2-9/16	2.844		.109	.222	.093		2.750		.094	.078		3.4000		

TOOL DESCRIPTIONS ON PAGES 227, 228 & 229.

VHO

DESCRIPTION

A 15° bevel on the outside diameter, when fitted into a 15° bevel on the load-bearing groove wall, yields rigid end-play take-up of manufacturing tolerances or wear on the retained part. Used in greasy and oily environments.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify the presence of a bevel along the outside diameter of the part.
2. Measure the bore diameter (Db).
3. Determine the ring thickness (T).
4. Confirm the maximum (S max) and minimum (S min) cross section of the ring.
5. Find the part in the chart above.

GENERAL USE

COMMON

ZINC/YELLOW

STACKED/ROLL PACK

GROOVE INTERCHANGE

USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

VHO ⟷ VVH (Page 21)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DVHO METRIC Page 174

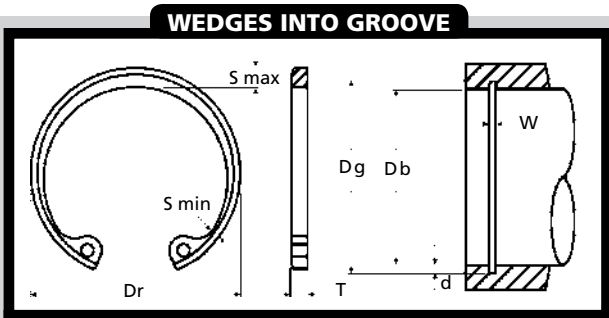
VHO CONTINUED NEXT PAGE.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

BOX 232 • MINNEAPOLIS, KS • 67467

G.L.HUYETT

WEDGES INTO GROOVE



BEVELED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	N1302	Rotor Clip	VHO	Military	16631
Ellison	9002	Waldes	N5002		

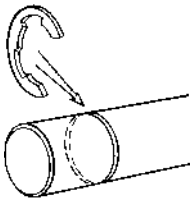
VHO	BORE		RING				GROOVE				WEIGHT	MATERIAL	TOOL
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)	Radial Wall (S) Min	Radial Wall (S) Max	Wall Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	
VHO-262	2.625	2-5/8	2.910 +.040/-.030	.111	.226	.093 +/-.003	2.820 +.006/-.000	.097	.077	+.0015/-.000	3.4500		-I108
-268	2.677	68mm	2.980	.113	.230		2.876	.099			3.5000		
-268	2.688	2-11/16	2.980	.113	.230		2.887	.099			3.5000		
-275	2.750	2-3/4	3.050	.115	.234		2.955	.102	.076		3.5500		
-281	2.812	2-13/16	3.121	.115	.230		3.020	.104			3.6000		
-281	2.835	72mm	3.121	.115	.230		3.043	.104			3.6000		
-287	2.875	2-7/8	3.191	.120	.240		3.085	.105			4.1000		
-295	2.953	75mm	3.325	.122	.250		3.178	.112	.074		4.2500		
-300	3.000	3	3.325	.122	.250		3.225	.112			4.2500		
-306	3.062	3-1/16	3.418 +/-.055	.126	.254		3.290	.114	.089	+.002/-.000	5.3000		-I120
-312	3.125	3-1/8	3.488	.129	.259		3.355	.115			5.6000		
-315	3.149	80mm	3.523	.129	.262		3.381	.116			5.7000		
-315	3.156	3-5/32	3.523	.129	.262		3.388	.116			5.7000		
-325	3.250	3-1/4	3.623	.135	.269		3.489	.119			6.0000		
-334	3.346	3-11/32	3.734	.140	.276		3.591	.122			6.5000		
-347	3.469	3-15/32	3.857	.144	.286		3.726	.128			6.9000		
-350	3.500	3-1/2	3.890	.142	.289		3.760	.130			7.1000		
-354	3.543	90mm	3.936	.142	.292		3.806	.132			7.2000		
-354	3.562	3-9/16	3.936	.142	.292		3.830	.134			7.2000		
-362	3.625	3-5/8	4.024	.150	.299		3.900	.137			7.3000		
-375	3.740	95mm	4.157 +/-.065	.155	.309		4.030	.145			7.8000		-I120-X
-375	3.750	3-3/4	4.157	.155	.309		4.040	.145			7.8000		
-387	3.875	3-7/8	4.291	.160	.319		4.171	.148			8.7000		
-393	3.938	3-15/16	4.358	.161	.324		4.236	.149			8.8000		
-400	4.000	4	4.424	.166	.330		4.302	.151			9.3000		
-412	4.125	4-1/8	4.558	.171	.330		4.433	.154			9.7000		
-425	4.250	4-1/4	4.691	.180	.335		4.562	.156			10.1000		
-433	4.331	110mm	4.756	.180	.343		4.647	.158			10.5000		
-450	4.500	4-1/2	4.940	.181	.351		4.824	.162			11.1000		
-462	4.625	4-5/8	5.076	.183	.360		4.955	.165			11.7000		
-475	4.724	120mm	5.213	.183	.370		5.060	.168			12.4000		
-475	4.750	4-3/4	5.213	.183	.370		5.086	.168			12.4000		
-500	5.000	5	5.485	.186	.390		5.346	.173			13.6000		
-525	5.250	5-1/4	5.770	.198	.408	.125 +/-.004	5.612 +.007/-.000	.181	.102	+.003/-.000	17.4000		-I150
-537	5.375	5-3/8	5.910	.198	.408		5.739	.182			17.9000		
-550	5.500	5-1/2	6.066	.198	.408		5.864	.182			18.3000		
-575	5.750	5-3/4	6.336	.198	.408		6.120	.185			19.2000		
-600	6.000	6	6.620	.198	.435		6.374	.187			20.1000		
-625	6.250	6-1/4	6.895 +/-.080	.211	.423	.156 +/-.005	6.642 +.008/-.000	.196	.129		26.6000		
-650	6.500	6-1/2	7.170	.219	.438		6.908	.204			28.1000		
-662	6.625	6-5/8	7.308	.221	.447		7.042	.208			30.5000		
-675	6.750	6-3/4	7.445	.224	.456		7.174	.212	.128		32.5000		
-700	7.000	7	7.720	.232	.474		7.441	.220			34.4000		
-725	7.250	7-1/4	7.995 +/-.090	.238	.489	.187	7.708	.229	.159		42.8000		
-750	7.500	7-1/2	8.270	.247	.507		7.974	.237			48.5000		
-775	7.750	7-3/4	8.545	.255	.523		8.240	.245			52.0000		
-800	8.000	8	8.820	.262	.540		8.507	.253	.155		55.5000		
-825	8.250	8-1/4	9.095	.270	.558		8.773	.261			60.3000		
-850	8.500	8-1/2	9.285	.277	.573		9.040	.270	.151		63.4000		
-875	8.750	8-3/4	9.558	.286	.591		9.307	.278			65.3000		
-900	9.000	9	9.830	.294	.609		9.573	.286			73.2000		
-925	9.250	9-1/4	10.102	.299	.625		9.838	.294			76.7000		
-950	9.500	9-1/2	10.375	.304	.642		10.106	.303	.147		80.3000		
-975	9.750	9-3/4	10.648	.309	.658		10.372	.311			83.3000		
VHO-1000	10.000	10	10.920	.315	.675		10.639	.319			86.3000		

TOOL DESCRIPTIONS ON PAGES 227, 228 & 229.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

EXTERNAL

INSTALLED RADIALLY ONTO A SHAFT



USING AN APPLICATOR

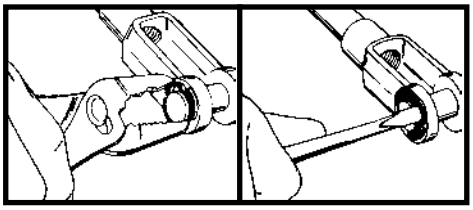
	**E** BASIC E-CLIP	IMPERIAL Pg: 26	METRIC Pg: 182	ANSI Pg: 188	Most common clip. Large shoulder.
	**RE** REINFORCED E-CLIP	IMPERIAL Pg: 27	METRIC Pg: 183	ANSI Pg: 188	Higher strength variation of the Basic E-Clip.
	**RG** RADIAL GRIP RING	IMPERIAL Pg: 27	METRIC N/A		Grooveless for light duty applications.
	**BE** BOWED E-CLIP	IMPERIAL Pg: 28	METRIC N/A		Bowed design for end-play take-up.
	**A15** MUTANTS	IMPERIAL Pg: 29	METRIC N/A		Application specific by special order.
	**PO** POODLE RING	IMPERIAL Pg: 30	METRIC N/A		Heavy duty with highest load ratings.
	**POL** LIGHT DUTY POODLE RING	IMPERIAL Pg: 30	METRIC N/A		Fits in standard E-Clip grooves.
	**ST** SLOTTED E-CLIP	IMPERIAL N/A	METRIC Pg: 183		For easy removal using a screwdriver.
	**JE** JAPANESE E-CLIP	IMPERIAL N/A	METRIC Pg: 184		Japanese Industrial Specification (JIS).
	**EBS** BRITISH STANDARD E-CLIP	IMPERIAL N/A	METRIC Pg: 184		British Specification.
	**LC** INTERLOCKING	IMPERIAL Pg: 31	METRIC Pg: 187		Two-piece balanced design for high rotational speeds.
	**C** BASIC C-CLIP	IMPERIAL Pg: 32	METRIC Pg: 186	ANSI Pg: 189	Low profile. Light duty.
	**EL** PRONG LOCK	IMPERIAL Pg: 33	METRIC Pg: 187		Hybrid design for end-play take-up and high rotational speeds.

TOOLS Pages: 232-234

All metric numbers begin with "D" and all ANSI numbers begin with "M."

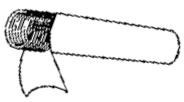
AUTOMATED INSTALLATION

Aftermarket and short runs.



Use common items from your toolbox.

For original equipment manufacturing.

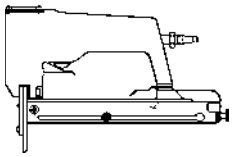


Most types available in a roll pack for **reduced handling costs**. For use with an applicator.

Slide roll pack on rail.

Remove label.

Ready to go!



Automated "staple gun" equipment is available as a special order.

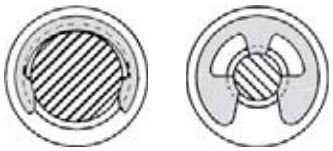
CONTACT PLANT FOR DESIGN AND INSTALLATION ASSISTANCE.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

PRODUCT COMPARISONS

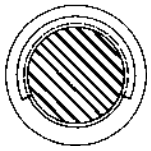
There are no radially-assembled versions of spiral rings, thus in comparing clips to other retaining rings, only wire rings and Eaton™-style rings compare. Radial rings are generally easier to install, complete with market-ready automatic installation options. Clips use tapered sections that tend to maintain circularity or that possess toothlike grip points that yield greater thrust load ratings versus the constant section wire type rings.

Installed C-clip and E-clip with tapered section



Deep toothlike "grip points."

Installed constant section wire ring



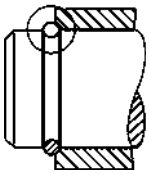
Shallow and inconsistent groove contact.

Note that in the above examples, the clips dig into deeper grooves than the wire ring. Note also how the E-clip "wraps" around the shaft 320° or so, while the wire ring wraps no more than 240°. From a side view, you can see that the high shoulder and rectangular cross-section of the E-clip provide more rigidity than the round wire ring shown.

Installed E-Clip

High collar . . . high thrust load.

Installed round wire ring.

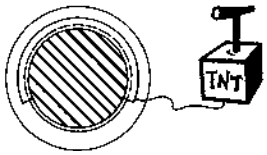


Low profile . . . less thrust load.

Wire rings are made using a coiling technique, while clips are stamped. The stamping process is much faster. As a result, clips tend to be cheaper and more readily available in the marketplace. Finally, wire rings are a pain to install and remove because they have no lug holes or market-ready installation accessories.

Clip Removal

Wire Ring Removal



THRUST LOAD COMPARISON CLIPS VS. OTHER STYLES

CARBON SPRING STEEL

SHAFT SIZE	CLIPS E Pg 26 Thrust Load	CLIPS C Pg 32 Thrust Load	WIRE RINGS XSO Pg 80 Thrust Load
1/4"	115	130	120
1/2"	600	450	640
3/4"	1500	1000	1390

Thrust loads are expressed in pounds, based on groove shear with a safety factor of two (2).
Eaton™-style ring thrust loads are based on load times 0.60 when the groove distortion is .005 or greater from bending axially.
Actual results will be based on individual circumstances. These values are for reference only.

MATERIAL

CARBON SPRING STEEL	PH15-7 MO STAINLESS STEEL	BERYLLIUM COPPER
SAE 1060-1090	AISI 632/AMS 5520	ALLOY #25/CDA #172
(STANDARD)	(STANDARD ON MOST SIZES)	(STANDARD ON SMALL SIZES)
Temperature Limits 500°F Max -100°F Min	**Temperature Limits** 900°F Max -100°F Min	**Temperature Limits** 650°F Max -300°F Min

OTHER MATERIALS AVAILABLE ON REQUEST.

See page 33 for material comparisons.

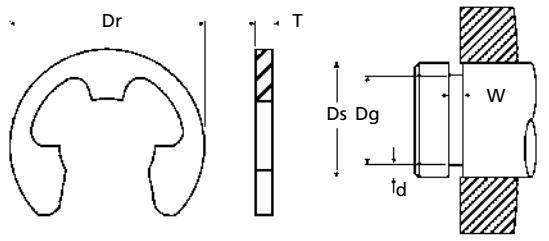
FINISHES

PHOSPHATE COATING (STANDARD)	MECHANICAL ZINC YELLOW (STANDARD)	ZINC YELLOW WITH LACQUER (SPECIAL ORDER)
Inhibits rust during storage.	96 hour salt spray.	250 hour salt spray.

OTHER FINISHES, INCLUDING CADMIUM, AVAILABLE ON REQUEST.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

MOST POPULAR



BASIC E-CLIP

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	N1500	IRR	1000	Waldes	5133
Ellison	E	Rotor Clip	E	Military	16633

E

SHAFT		RING			GROOVE				WEIGHT	MATERIAL		TOOL
Decimal (Ds)	Fraction (Ds)	Free Outside Dia. (Dr)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
E-004*	.040	1mm	.079	.010	+/-.001	.026	+.002/-.000	.007	.012	+.002/-.000	0.0009			-010
E-006	.062	1/16	.156			.052		.005			0.0030			-040
SE-006	.062	1/16	.140			.052		.005			0.0028			-020
YE-006	.062	1/16	.187	.020		.052		.005	.023		0.0094			-030
SE-009	.094	3/32	.230	.015		.074		.010	.020		0.0100			-050
E-009	.094	3/32	.187			.074		.010			0.0058			-510
SE-011	.110	7/64	.375			.079		.015			0.0310			-060
SE-012	.125	1/8	.214	.025		.095		.015	.029		0.0120			-
E-012	.125	1/8	.230	.015		.095		.015	.020		0.0087			-050
SE-014	.140	9/64	.203			.102		.019			0.0060			-080
YE-014	.140	9/64	.250			.110		.015			0.0100			-090
E-014	.140	9/64	.270	.025		.105		.017	.029		0.0210			-070
SE-015	.156	5/32	.375	.042		.118		.019	.046		0.0760			-
E-015	.156	5/32	.282	.025		.116		.020	.029		0.0210			-100
SE-017	.172	11/64	.312			.127		.022			0.0240			-110
SE-018	.188	3/16	.375			.125		.031			0.0450			-130
YE-018	.188	3/16	.470			.147		.020			0.0700			-
ZE-018	.188	3/16	.550			.125		.031			0.1050			-
E-018	.188	3/16	.335			.147		.020			0.0290			-120
SE-021	.219	7/32	.437			.188		.015			0.0470			-140
E-025	.250	1/4	.527			.210	+.003/-.000	.020		+.003/-.000	0.0760			-150
SE-031	.312	5/16	.500			.250		.031			0.0570			-160
YE-031	.312	5/16	.670			.250		.031			0.1220			-
SE-037	.375	3/8	.567	.035		.306		.034	.039		0.1050			-290
E-037	.375	3/8	.660			.303		.036			0.1500			-170
E-043	.438	7/16	.687			.343		.047			0.1500			-180
SE-043	.438	7/16	.600			.380		.029			0.1000			-190
E-050	.500	1/2	.800	.042		.396		.052	.046		0.2500			-200
E-062	.625	5/8	.940			.485		.070			0.3200			-210
SE-074	.750	3/4	1.000	.050		.625		.062	.056		0.4300			-220
E-075	.750	3/4	1.120			.580		.085			0.5800			-230
E-087	.875	7/8	1.300			.675		.100			0.7600			-240
SE-098	.984	63/64	1.500			.835		.074			0.9200			-250
SE-098	1.000	1	1.500			.835		.082			0.9200			-250
SE-118	1.188	1-3/16	1.626	.062	+/-.003	1.079	+.005/-.000	.054	.068	+.004/-.000	1.1300			-260
SE-137	1.375	1-3/8	1.875			1.230		.072			1.5400			-

TOOL DESCRIPTIONS ON PAGE 232.

** May be beryllium copper instead of carbon steel.*

E / RE

RADIAL ASSEMBLY

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
Stamped clips for deep grooves with three prongs that yield high thrust load capacity. RE rings are heavier duty for higher thrust loads and 50% higher RPM's.	1. Determine if you have an E or RE based on shoulder design and appearance. 2. Confirm the diameter of the shaft (Ds). 3. Measure the outside diameter (Dr) of the ring. Determine the ring thickness (T). 4. Find the part in the charts.	COMMON

ZINC / YELLOW

STACKED / ROLL PACK

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

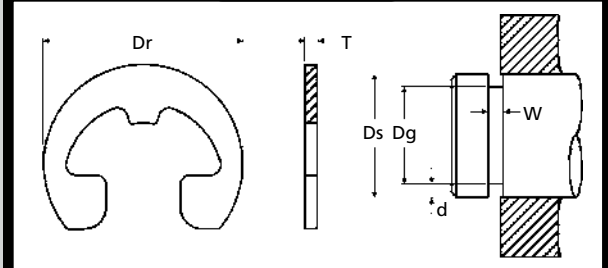
E ⟷ POL (Page 30)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DE METRIC Page 182

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

HEAVY DUTY



REINFORCED E-CLIP

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

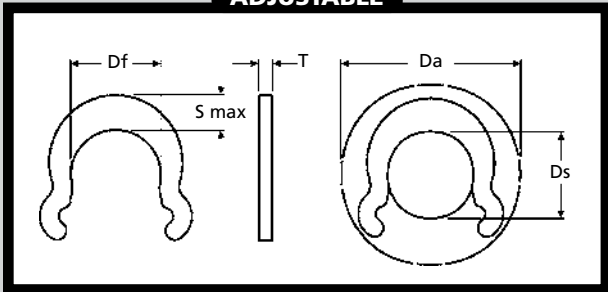
Anderton	N1540	Rotor Clip	RE	Military	3215
IRR	1200	Waldes	5144		

RE	SHAFT		RING			GROOVE				WEIGHT	MATERIAL		TOOL
	Decimal (Ds)	Fraction (Ds)	Free Outside Dia. (Dr)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
RE-009	.094	3/32	.206	.015	+/-.002	.074	+.002/-.000	.010	.020 +.002/-.000	0.0070			-080
-012	.125	1/8	.270			.095		.015		0.0130			-520
-015	.156	5/32	.335	.025		.116		.020	.029 +.003/-.000	0.0310			-120
-018	.188	3/16	.375			.147		.020		0.0390			-130
-021	.219	7/32	.446			.188	+/-.002	.015		0.0540			-140
-025	.250	1/4	.516			.210		.020		0.0710			-160
-031	.312	5/16	.588			.250		.031		0.0850			-500
-031A	.312	5/16	.588	.035		.250	+/-.003	.031	.039	0.0850			-TC-2
-037	.375	3/8	.660			.303		.036		0.1500			-170
-043	.438	7/16	.746			.343		.047		0.1900			-270
-050	.500	1/2	.810	.042		.396		.052	.046	0.3200			-200
RE-056	.562	9/16	.870			.437		.062		0.3500			-280

TOOL DESCRIPTIONS ON PAGE 232.

DRE  METRIC Page 183

ADJUSTABLE



RADIAL GRIP RING

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Rotor Clip	RG		
Waldes	5135		

RG	SHAFT			RING				WEIGHT	MATERIAL	TOOL
	From (Ds)	To (Ds)	Fraction (Ds)	Free Inside Dia. (Df)	Thickness (T)		Max. Radial Wall Width (S)	Assembled Outside Dia. (Da)	Lbs. per 100 Pieces	Spring Steel	
RG-009	.092	.096	3/32	.089	.025	+/-.002	.045	.300	0.0140		-RG009
-012	.123	.127	1/8	.119			.054	.340	0.0190		-RG012
-015	.154	.158	5/32	.149			.078	.380	0.0270		-RG015
-018	.185	.189	3/16	.179	.035		.085	.440	0.0450		-RG018
-025	.248	.252	1/4	.238			.100	.540	0.0740		-RG025
-031	.310	.316	5/16	.298	.042		.114	.660	0.1100		-RG031
RG-037	.373	.379	3/8	.356			.130	.760	0.1500		-RG037

RG

RADIAL ASSEMBLY

DESCRIPTION

Grip rings are stamped grooveless retainers that are radially applied using an applicator. Because there is no groove, the part may be adjusted on the shaft to take up end-play. Load capacity will be reduced if the part is reused.

HOW TO IDENTIFY

1. Confirm the diameter of the shaft (Ds).
2. Measure the free inside diameter (Df) of the part.
3. Calculate the ring thickness (T).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

ZINC/YELLOW

STACKED/ROLL PACK

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

RG ⟷ SHF (Page 14) ⟷ TX (Page 92) ⟷ TY (Page 92) ⟷ T99 (Page 101)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

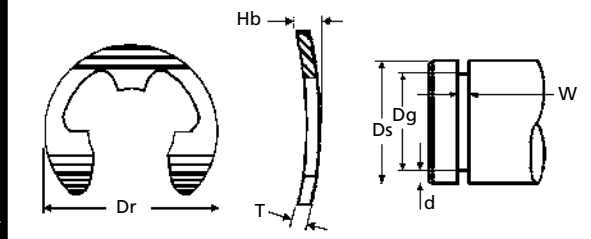
MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

BOWED E-CLIP

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	N1501	Rotor Clip	BE	Military	16634
IRR	1001	Waldes	5131		

CURVED SHAPE



BE

SHAFT		RING					GROOVE					WEIGHT	MATERIAL		TOOL
Decimal (Ds)	Fraction (Ds)	Free Outside Dia. (Dr)	Bow Height (Hb) Min	Bow Height (Hb) Max	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
BE-009	.094	3/32	-	.025	.035	.020	+/-.002	.074		-	.045		-			-
BSE-011	.110	7/64	.375	.025	.035	.010	+/-.001	.079		.015	.022		0.0020			-550
BE-012	.125	1/8	.230	.025	.035			.095		.015	.022		0.0060			-551
BSE-014	.140	9/64	.203	.022	.032			.102	+.002/-.000	.019	.019		0.0040			-553
BE-014	.140	9/64	.270	.028	.038	.015		.105		.017	.025		0.0130			-552
BE-015	.156	5/32	.282	.030	.040			.116		.020	.027		0.0130			-554
BSE-017	.172	11/64	.312	.032	.042			.127		.022	.029		0.0160			-555
BE-018	.188	3/16	.335	.033	.043			.147		.020	.030		0.0170			-556
BSE-018	.188	3/16	.375	.038	.048			.125		.031	.035		0.0270			-557
BSE-021	.219	7/32	.437	.043	.058	.025		.188		.015	.040		0.0280			-558
BE-025	.250	1/4	.527	.050	.065			.210		.020	.047		0.0760			-559
BSE-031	.312	5/16	.500	.050	.065	.035		.250		.031	.047		0.0570			-560
BE-037	.375	3/8	.660	.060	.076		+/-.002	.303		.036	.060	+.003/-.000	0.1500			-561
BE-043	.438	7/16	.687	.060	.076			.343		.047	.060		0.1500			-562
BSE-043	.438	7/16	.600	.060	.076	.042		.380	+.003/-.000	.029	.057		0.1000			-563
BE-050	.500	1/2	.800	.075	.093			.396		.052	.073		0.2500			-564
BE-062	.625	5/8	.940	.080	.098	.050		.485		.070	.077		0.3200			-565
BSE-074	.744	18.9mm	1.000	.090	.110			.625		.060	.085		0.4300			-566
BSE-074	.750	3/4	1.000	.090	.110			.625		.062	.085		0.4300			-566
BE-075	.750	3/4	1.120	.090	.110			.580		.085	.085		0.5800			-567
BE-087	.875	7/8	1.300	.090	.110			.675		.100	.085		0.7600			-568
BSE-098	.984	63/64	1.500	.088	.112			.835		.074	.085		0.9380			-569
BSE-098	1.000	1	1.500	.088	.112			.835		-	.085		0.9380			-569
BSE-118	1.812	1-3/16	1.626	.109	.139	.062	+/-.003	1.079	+.005/-.000	-	.107	+.004/-.000	1.0500			-
BSE-137	1.375	1-3/8	1.875	.109	.139			1.230		-	.107		1.5200			-

TOOL DESCRIPTIONS ON PAGE 233.

BE

RADIAL ASSEMBLY

DESCRIPTION

Curved shape for resilient end-play take-up. Install with the *concave* surface abutting the part. BE's are not recommended for use as a shoulder against rotating parts. For such applications, use the prong-locked EL's on page 33.

HOW TO IDENTIFY

1. Verify bowed shape side profile.
2. Measure the diameter of the shaft (Ds).
3. Measure the outside diameter (Dr) of the ring. Determine the ring thickness (T).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

ZINC / YELLOW

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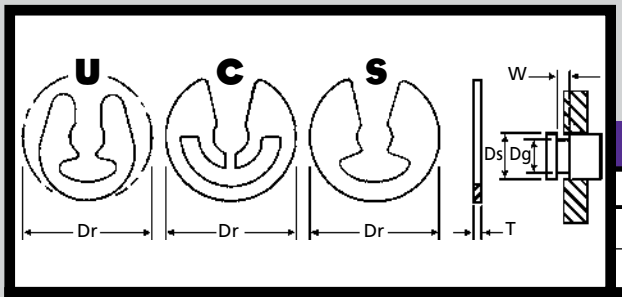

MUTANT E-CLIPS

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	A1500	

A15U

	SHAFT		RING				GROOVE				MATERIAL	TOOL
	Decimal (Ds)		Free Outside Dia. (Dr)	Installed Outside Diameter	Thickness (T)		Diameter (Dg)		Width (W)		Spring Steel	
A15U-078	.110	+.040/ -.000	.426	.430	.020	+/-.0015	.078	+.002/-.000	.023	+.003/-.000		-80
-095	.125		.374	.380			.095					-4B
-125	.172		.500	.510			.125					-6B
-187	.218	+.100/ -.000	.688	.700			.187					-29
A15U-281	.343		.780	.790			.281					-10A

CALL FOR TOOL INFORMATION.

A15C

	SHAFT		RING				GROOVE				MATERIAL	TOOL
	Decimal (Ds)		Free Outside Dia. (Dr)	Installed Outside Diameter	Thickness (T)		Diameter (Dg)		Width (W)		Spring Steel	RRA
A15C-086	.110	+.040/-.000	.282	.297	.022	+/-.002	.086	+.002/-.000	.025	+.002/-.000		-413
-120	.156		.320	.336	.024		.120		.027			-120
-124	.156		.406	.422	.015	+/-.0015	.124		.017			-7A
-175	.218		.500	.517	.015		.175		.017			-9A
-181	.218		.430	.447	.028	+/-.002	.181		.031			-140
A15C-249	.312	+.100/ -.000	.625	.642	.015	+/-.0015	.249		.017			-16A

CALL FOR TOOL INFORMATION.

A15S

	SHAFT		RING				GROOVE				MATERIAL	TOOL
	Decimal (Ds)		Free Outside Dia. (Dr)	Installed Outside Diameter	Thickness (T)		Diameter (Dg)		Width (W)		Spring Steel	RRA
A15S-052	.078	+.030/ -.000	.250	.265	.015	+/-.0015	.052	+.002/-.000	.017	+.002/-.000		-090
-062	.078		.295	.305	.025		.062		.028			-100
-091	.125		.281	.291	.022		.091		.025			-4B
-102	.125	+.060/ -.000	.376	.391	.025		.102		.017			-060
-120	.156		.310	.336	.024		.120		.027			-120
-126	.188	+.075/ -.000	.350	.365	.024	+/-.002	.126	+.003/ -.000	.027	+.003/ -.000		-AM56
A15S-389	.468		.687	.705	.028		.389		.031			-12A

CALL FOR TOOL INFORMATION.

A15U / A15C / A15S

RADIAL ASSEMBLY

DESCRIPTION

Standard E-clips subjected to radioactive waste at a secret government test site that alters the genetic make-up in ways that cause the parts to grow extra limbs and teeth. These extras yield design characteristics that only a mutant engineer can understand.

HOW TO IDENTIFY

1. Look at the silhouette of the part and decide if you have a "C", "U", or "S" version.
2. Get it? It spells CUS.
3. Measure the free outside diameter (Dr).
4. Find the part in the charts above.
5. Verify the correct material thickness.

GENERAL USE

WEIRD

SPECIAL FINISHES AND PACKAGING AVAILABLE UPON REQUEST.

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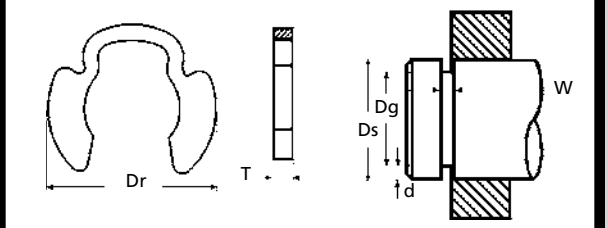
POOLE CLIP RING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Rotor Clip	PO/POL
Waldes	5304/T5304

POL REPLACES E-CLIPS



PO	SHAFT		RING			GROOVE					WEIGHT	MATERIAL		TOOL
	Decimal (Ds)	Fraction (Ds)	Free Outside Dia. (Dr)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
PO-015	.156	5/32	.320	.035		.120	+/-.004	.018	.039		0.0420			-815
-018	.188	3/16	.400	.035		.148	+/-.005	.020	.039		0.0630			-818
-025	.250	1/4	.482	.035		.210		.020	.039		0.0840			-825
-031	.312	5/16	.588	.042	+/-.002	.272	+/-.006	.020	.046	+/-.006	0.1460			-831
-037	.375	3/8	.680	.042		.331		.022	.046		0.1920			-837
-043	.438	7/16	.752	.050		.390		.024	.056		0.2660			-843
-050	.500	1/2	.826	.050		.440	+/-.008	.030	.056		0.3300			-850
-062	.625	5/8	.966	.050		.531		.047	.056		0.4650			-
-075	.750	3/4	1.095	.062		.632		.059	.068		0.6350			-
-100	1.000	1	1.415	.078	+/-.003	.860	+/-.010	.070	.086	+/-.008	1.2650			-
-125	1.250	1-1/4	1.800	.093		1.090		.080	.103		2.5200			-
-150	1.500	1-1/2	2.050	.109		1.317	+/-.015	.091	.120	+/-.010	3.6300			-
-175	1.750	1-3/4	2.300	.125	+/-.004	1.480		.135	.139		5.3000			-
PO-200	2.000	2	2.650	.125		1.730		.135	.139		6.9200			-

TOOL DESCRIPTIONS ON PAGE 233.

POL	SHAFT		RING			GROOVE					WEIGHT	MATERIAL		TOOL
	Decimal (Ds)	Fraction (Ds)	Free Outside Dia.(Dr)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	RRA
POL-015	.156	5/32	-	.025		.120	+/-.004	.018	.029		0.0300			-915
-018	.188	3/16	.400			.148	+/-.005	.020			0.0450			-918
-025	.250	1/4	.482			.210		.020			0.0600			-925
-031	.312	5/16	.588			.272	+/-.006	.020			0.0870			-931
-037	.375	3/8	.680	.035	+/-.002	.331		.022	.039	+/-.006	0.1600			-937
-043	.438	7/16	.752			.390		.024			0.1860			-943
-050	.500	1/2	.826	.042		.440	+/-.008	.030	.046		0.2770			-950
-062	.625	5/8	.966			.531		.047			0.3650			-
-075	.750	3/4	1.095	.050		.632		.059	.056		0.5350			-
POL-100	1.000	1	1.415			.860	+/-.010	.070		+/-.008	0.8600			-

TOOL DESCRIPTIONS ON PAGE 233.

PO / POL

DESCRIPTION

Radially-assembled heavy duty ring with large shoulders ("ears") and thicker material than E-clips. Install using an applicator or standard pliers and screwdriver. The POL will interchange into standard E-clip grooves.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Note that the POL is thinner than the PO.
2. Measure the diameter of the shaft (Ds).
3. Measure the outside diameter (Dr) of the ring. Determine the ring thickness (T).
4. Find the part in the charts above.

GENERAL USE

UNCOMMON

ZINC / YELLOW

STACKED / ROLL PACK

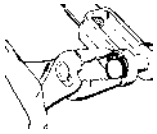
GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

POL ⟷ E (Page 26)

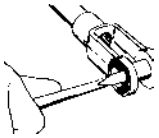
PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

PO / POL ASSEMBLY

PO and POL rings can be assembled quickly and economically with a variety of tools, including the applicators shown on page 233.



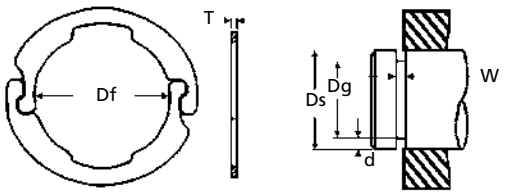
The rings can be installed easily with a pair of pliers . . .



. . . and removed quickly with a screwdriver. The ring is reusable after disassembly.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

BALANCED FOR HIGH SPEED ROTATION



INTERLOCKING RING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Rotor Clip	LC
Waldes	5107

LC

SHAFT		RING				GROOVE				WEIGHT	MATERIAL	TOOL
Decimal (Ds)	Fraction (Ds)	Free Inside Dia.(Df)		Thickness (T)		Assembled Outside Diameter	Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	
LC-046	.469	15/32	.414	+/-.002	.035	+/-.002	.640	.419	+/-.0015	.025	.039	+.003/-.000	0.1360		
-050	.500	1/2	.459				.680	.464		.018			0.1500		
-059	.594	19/32	.538				.766	.544		.025			0.1740		
-062	.625	5/8	.569				.797	.575					0.1820		
-066	.669	17mm	.593	+/-.003	.042		.886	.599	+/-.002	.035	.046		0.3100		
-075	.750	3/4	.673				.967	.680					0.3500		
-078	.781	25/32	.703				.998	.711					0.3600		
-087	.875	7/8	.796				1.092	.805					0.3800		
-098	.984	63/64	.863	+/-.004	.050		1.273	.872	+/-.003	.056	.056	+.004/-.000	0.7300		
-098	1.000	1	.863				1.273	.872		.064			0.7300		
-112	1.125	1-1/8	1.002				1.420	1.013		.056			0.7900		
-118	1.188	1-3/16	1.064				1.480	1.075					0.8500		
-125	1.250	1-1/4	1.126				1.540	1.138					0.8900		
-137	1.375	1-3/8	1.250				1.670	1.263					0.9600		
-150	1.500	1-1/2	1.374				1.790	1.388					1.0600		SEE PAGE 32.
-156	1.562	1-9/16	1.412	+/-.005	.062	+/-.003	1.910	1.427	+/-.005	.068	.068		1.6400		
-162	1.625	1-5/8	1.474				1.970	1.489					1.7500		
-175	1.750	1-3/4	1.597				2.100	1.614					1.8400		
-175	1.772	45mm	1.597				2.100	1.614		.078			1.8400		
-187	1.875	1-7/8	1.721				2.220	1.739		.068			2.0800		
-196	1.969	1-31/32	1.779	+/-.006	.078		2.370	1.797		.086	.086	+.005/-.000	3.1000		
-200	2.000	2	1.809				2.400	1.828					3.1600		
-212	2.125	2-1/8	1.933				2.520	1.953					3.4200		
-212	2.156	2-5/32	1.933				2.520	1.953		.101			3.4200		
-225	2.250	2-1/4	2.057				2.650	2.078		.086			3.7300		
-237	2.375	2-3/8	2.180				2.770	2.203					3.8900		
-250	2.500	2-1/2	2.304				2.900	2.328					3.9700		
-262	2.625	2-5/8	2.428				3.020	2.453					4.3900		
-275	2.750	2-3/4	2.518	+/-.008	.093		3.250	2.544	+/-.006	.103	.103		6.3200		
-287	2.875	2-7/8	2.642				3.370	2.669					6.8400		
-300	3.000	3	2.754				3.500	2.794					7.0400		
-325	3.250	3-1/4	3.013				3.750	3.044					7.7600		
LC-337	3.375	3-3/8	3.114		.109		3.990	3.145		.115	.120		9.4000		

LC

DESCRIPTION

Two-part radially-assembled ring with semicircular halves held together by interlocking prongs. Symmetrical shape "balances" the part to withstand high rotational speeds. Attractive appearance for exposed applications.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm the diameter of the shaft (Ds).
2. Measure the free diameter (Df).
3. Determine the thickness (T).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

ZINC/YELLOW

STACKED/ROLL PACK

NOT AVAILABLE

DLC METRIC Page 187

LC INSTALLATION ON PAGE 32.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

C-CLIPS

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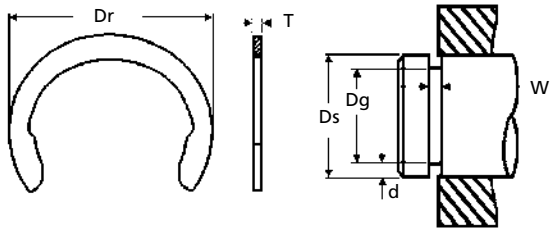
BASIC C-CLIP

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	N1800	IRR	2000	Waldes	5103
Ellison	9103	Rotor Clip	C	Military	16632

LOW PROFILE



C	SHAFT		RING			GROOVE			WEIGHT	MATERIAL		TOOL
	Decimal (Ds)	Fraction (Ds)	Free Outside Dia.(Dr)	Thickness (T)	Assembled Outside Diameter	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"	
C-012	.125	1/8	.165	.015 ±.000/-.002	.18	.106 +.000/-.0015	.0095	.020 +.002/-.000	0.0030			-300
-015	.156	5/32	.205		.22	.135	.0105		0.0052			-080
-018	.188	3/16	.244		.25	.165	.011		0.0062			-090
-021	.219	7/32	.275	.025	.29	.193 +.000/-.002	.013	.029 +.003/-.000	0.0120			-310
-023	.236	15/64	.295		.31	.208	.014		0.0150			-320
-025	.250	1/4	.311		.33	.220	.015		0.0157			-330
-028	.281	9/32	.346		.36	.247	.017		0.0190			-340
-031	.312	5/16	.376		.39	.276	.018		0.0226			-350
-037	.375	3/8	.448		.47	.335	.020		0.0300			-360
-040	.406	13/32	.486		.50	.364	.021		0.0352			-370
-043	.438	7/16	.517		.53	.393	.022		0.0359			-380
-050	.500	1/2	.581	.035	.60	.450 +.000/-.003	.025	.039	0.0671			-290
-056	.562	9/16	.653		.67	.507	.028		0.0710			-390
-062	.625	5/8	.715		.74	.563	.031		0.0937			-400
-068	.688	11/16	.784	.042	.80	.619	.034	.046	0.1300			-410
-075	.750	3/4	.845		.87	.676	.037		0.1500			-280
-081	.812	13/16	.915		.94	.732	.040		0.1700			-420
-087	.875	7/8	.991		1.01	.789	.043		0.2000			-430
-093	.938	15/16	1.058		1.08	.843	.047		0.2300			-440
-100	1.000	1	1.130		1.15	.900	.050		0.2700			-450
-112	1.125	1-1/8	1.267	.050	1.30	1.013 +.000/-.004	.056	.056 +.004/-.000	0.4000			-460
-125	1.250	1-1/4	1.415		1.44	1.126	.062		0.5100			-470
-137	1.375	1-3/8	1.555		1.58	1.237	.069		0.6100			-480
-150	1.500	1-1/2	1.691		1.72	1.350	.075		0.7600			-490
-162	1.625	1-5/8	1.853	.062 +.000/-.003	1.88	1.483 +.000/-.005	.071	.068	1.1000			-
-175	1.750	1-3/4	1.975		2.01	1.576	.087		1.2900			-
C-200	2.000	2	2.257		2.30	1.800	.100		1.6200			-

TOOL DESCRIPTIONS ON PAGE 232.

C

DESCRIPTION

Radially-assembled part that uses circular deformation for retention. Narrow section height provides good clearance capabilities. Absence of teeth and deep set means lower thrust load ratings than E-clips. Install using an applicator.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm the diameter of the shaft (Ds).
2. Measure the outside diameter (Dr) of the ring.
3. Determine the ring thickness (T).
4. Find the part in the chart above.

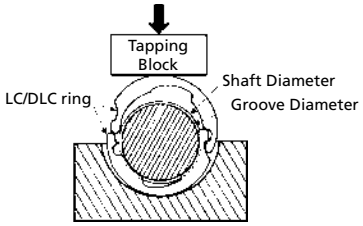
GENERAL USE

COMMON

ZINC / YELLOW

STACKED / ROLL PACK

LC / DLC INSTALLATION



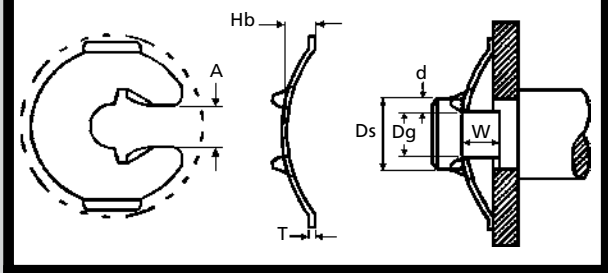
Make LC installation easier by building a V-block fixture like the one at the left, or let our shop build a fixture for you!

CONTINUED FROM PAGE 31.

DC  METRIC Page 186

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

FOR ROTATING PARTS



PRONG LOCKED E-CLIP

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Rotor Clip	EL
Waldes	5139

EL

SHAFT			RING				GROOVE				WEIGHT	MATERIAL	TOOL
Decimal (Ds)		Fraction (Ds)	Gap (A)		Thickness (T)	Bow Height (Hb)	Diameter (Dg)	Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	
.092	+/-.002	3/32	.063	+/-.004	.010 +/-.001	.050	.061	+/-.001	.016	.035	0.0230		-091
.125		1/8	.086			.050	.082	+/-.0015	.021	.035	0.0190		-112
.156	+/-.003	5/32	.108			.055	.104	+/-.002	.026	.040	-		-115
.188		3/16	.130	+/-.005	.015 +/-.002	.060	.124		.032	.045	0.0470		-118
.250		1/4	.172			.070	.165		.042	.055	0.0770		-125
.312		5/16	.234			.095	.228	+/-.003	.042	.080	0.1300		-131
.375		3/8	.280		.020	.130	.270		.052	.095	0.2200		-371
.438		7/16	.340	+/-.010		.130	.327		.055	.105	-		-143

+/-.010 (Bow Height) · +.005/-.000 (Width)

TOOLS ON PAGE 233.

EL

DESCRIPTION

Radially-installed part functions as both a shoulder and spring due to its curved shape and prongs. High thrust load capacity and unique design make this a good retainer against rotating parts. Install using an applicator or screwdriver.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the diameter of the shaft (Ds).
2. Determine the gap size (A).
3. Measure the thickness (T) and bow height (Hb).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

ZINC / YELLOW

DEL METRIC Page 187

HOW TO DETERMINE IF A PART IS SPRING STEEL OR STAINLESS STEEL

The way dorks do it . . .

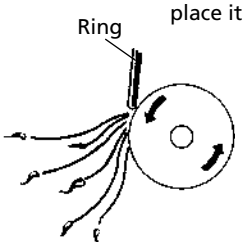
Place a drop of 20% nitric acid solution on a cleaned portion of the ring.

Stainless steel will remain unstained.

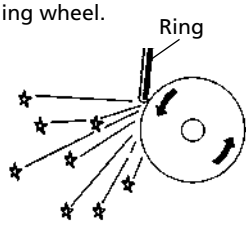
Spring steel will turn dark.

The fun way . . .

Hold the part with a pliers and place it on a grinding wheel.



Stainless steel will make curved tails.



Spring steel will look like fireworks.

WARNING: PLEASE PERFORM THESE TESTS WHILE UNDER ADULT SUPERVISION!

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SPIRAL RINGS

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LOW PRICE PROMISE!! See Inside Cover

EXTERNAL

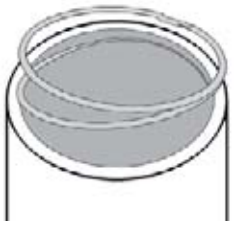
INSTALLED AXIALLY ONTO A SHAFT

BY WINDING THE PART INTO A GROOVE.

	IMPERIAL	METRIC
US LIGHT DUTY	Pgs: 36-37	Pgs: N/A
RS MEDIUM DUTY	Pgs: 38-41	Pgs: N/A
RST MEDIUM HEAVY	Pgs: 42-43	Pgs: N/A
RSN HEAVY DUTY	Pgs: 44-46	Pgs: N/A
KS SELF-LOCKING	Pg: 47	N/A
MS DISHED	Pg: 48	N/A
SSN TABBED	Pg: 49	N/A
AS METRIC AEROSPACE	N/A	Pgs: 192-193

INTERNAL

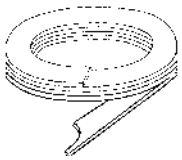
INSTALLED AXIALLY INTO A BORE



BY WINDING THE PART INTO A GROOVE.

	IMPERIAL	METRIC
UR LIGHT DUTY	Pgs: 50-51	Pgs: N/A
RR MEDIUM DUTY	Pgs: 52-55	Pgs: N/A
RRT MEDIUM HEAVY	Pgs: 56-57	Pgs: N/A
RRN HEAVY DUTY	Pgs: 58-60	Pgs: N/A
KR SELF-LOCKING	Pg: 61	N/A
MR DISHED	Pg: 62	N/A
SRN TABBED	Pg: 63	N/A
BR BALANCED	Pgs: 64-65	N/A
AH METRIC AEROSPACE	N/A	Pgs: 196-197

All metric numbers begin with "D".



Spiral rings are coiled from wire with minimal wasted material and using less expensive dies. . .

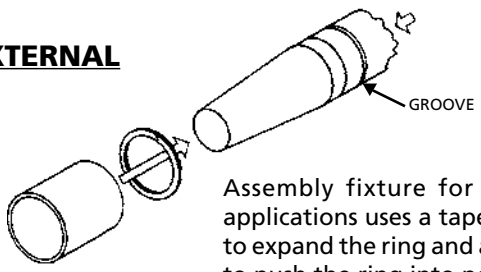
. . . vs. snap rings which are stamped from a sheet using special dies and tooling . . .

. . . which means that spiral rings have a

circular grain structure for high strength with lower tooling costs.

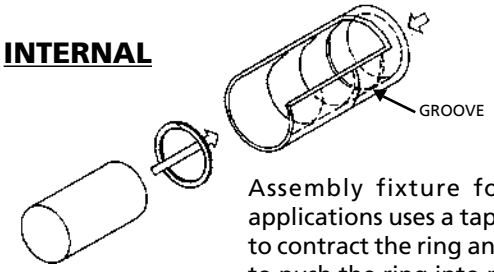
AUTOMATED INSTALLATION

EXTERNAL



Assembly fixture for external applications uses a tapered plug to expand the ring and a plunger to push the ring into position.

INTERNAL



Assembly fixture for internal applications uses a tapered sleeve to contract the ring and a plunger to push the ring into position.

LET OUR SHOP MAKE A FIXTURE FOR YOU!

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

PRODUCT COMPARISONS

LOW PROFILE / HIGH STRENGTH

Retaining rings provide design and engineering benefits versus other fasteners. Spiral rings, in particular, use standard tools and are easier to install than cotter pins and washers. With a 360° abutment, spiral rings are more resilient in vibrating environments than standard threaded fastener combinations. With no lugs, spiral rings achieve these results while maintaining a low profile, such as in the drawing at the left.

"HOW DO SPIRAL RINGS STACK UP AGAINST OTHER RETAINING RING DESIGNS?"

An important element to the answer lies in how spiral rings are made. Spiral rings are coiled from wire, which means that there is no wasted "break out" like you have in stampings. More importantly, there is no special tooling. Each ring is precision cut, end-to end, using dies that are used on many different sizes, thus the cost is amortized over a much wider product line. In short, spiral rings possess cost advantages on large diameter and special material parts and prototypes. While not as common as snap rings, they offer some technical benefits that warrant consideration. The chart below compares an assortment of stainless steel retaining rings.

THRUST LOAD COMPARISON
SPIRAL RINGS VERSUS OTHER TYPES

STAINLESS STEEL

EXTERNAL

	SPIRAL RINGS			SNAP RING	EATON™ RING
SHAFT SIZE	RS Pg 38	RSN Pg 44		SH Pg 6	USC Pg 68
	Thrust Load	Thrust Load		Thrust Load	Thrust Load
1"	2150	2950		2100	1200
2"	7110	11,470		8050	4010
5"	36,050	52,560		37,100	17,110
7"	63,790	103,400		72,700	39,920

INTERNAL

	SPIRAL RINGS		SNAP RING	EATON™ RING
BORE SIZE	RR Pg 52	RRN Pg 58	HO Pg 16	UHB Pg 72
	Thrust Load	Thrust Load	Thrust Load	Thrust Load
1"	1910	2310	2800	1470
2"	7090	10,040	10,300	4000
5"	36,050	65,095	55,000	17,110
7"	63,790	110,410	93,100	34,950

CARBON SPRING STEEL COMPARISON ON PAGE 5.

Thrust loads are expressed in pounds, based on groove shear with a safety factor of two (2).
Eaton™-style ring thrust loads are based on load times 0.60 when the ring distortion is .005 or greater from bending axially.
Actual results will be based on individual circumstances. These values are for reference only.

MATERIAL

CARBON STEEL	STAINLESS STEEL 302	STAINLESS STEEL 316	BERYLLIUM COPPER	INCONEL X-75°	ALLOY A-286
(STANDARD)	(STANDARD)	(SPECIAL ORDER)	(SPECIAL ORDER)	(SPECIAL ORDER)	(SPECIAL ORDER)

OTHER MATERIALS AVAILABLE ON REQUEST.

See page 33 for material comparisons.

FINISHES

OIL DIPPED	BLACK OXIDE	CADMIUM	PHOSPHATE	PASSIVATE
(STANDARD)	(SPECIAL ORDER)	(SPECIAL ORDER)	(SPECIAL ORDER)	(SPECIAL ORDER)

OTHER FINISHES AVAILABLE ON REQUEST.

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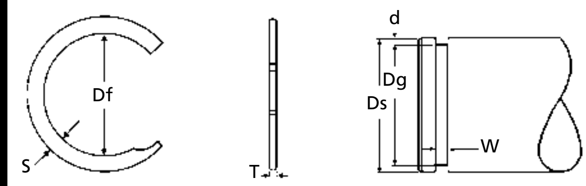
EXTERNAL LIGHT DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Manufacturer	Code	Manufacturer	Code
Assoc. Spring	CE	Smalley	VS
Ramsey	US	Spirolox	US

SINGLE TURN



US	SHAFT Decimal (Ds)	SHAFT Fraction (Ds)	RING Free Inside Dia. (Df)	Df Tol.	RING Radial Wall (S)	S Tol.	RING Thickness (T)	T Tol.	GROOVE Diameter (Dg)	Dg Tol.	GROOVE Depth (d)	GROOVE Width (W)	W Tol.	WEIGHT Lbs. per 100 Pieces	MATERIAL Spring Steel	MATERIAL Stainless "-S02"
US-050	.500	1/2	.467	+.000/-.013	.045	+/-.004	.018	+/-.0015	.472	+/-.002	.014	.022	+.002/-.000	0.0320		
-056	.562	9/16	.529						.534					0.0360		
-062	.625	5/8	.591						.597					0.0400		
-068	.687	11/16	.652						.659					0.0440		
-075	.750	3/4	.715						.722					0.0480		
-081	.812	13/16	.762		.065		.021		.770	+/-.003	.021	.026		0.0900		
-087	.875	7/8	.825						.833					0.0980		
-093	.937	15/16	.886						.895					0.1050		
-100	1.000	1	.949						.958					0.1120		
-106	1.062	1-1/16	1.008	+.000/-.015	.088		.025		1.018	+/-.004	.022	.031		0.1940		
-112	1.125	1-1/8	1.071						1.081					0.2060		
-118	1.187	1-3/16	1.132						1.143					0.2170		
-125	1.250	1-1/4	1.194						1.206					0.2290		
-131	1.312	1-5/16	1.255						1.268					0.2410		
-137	1.375	1-3/8	1.318						1.331					0.2520		
-143	1.437	1-7/16	1.379						1.393					0.2640		
-150	1.500	1-1/2	1.442						1.456					0.2760		
-156	1.562	1-9/16	1.488	+.000/-.020	.118		.031	+/-.002	1.505	+/-.005	.029	.039	+.003/-.000	0.4860		
-162	1.625	1-5/8	1.550						1.568					0.5060		
-168	1.687	1-11/16	1.612						1.630					0.5250		
-175	1.750	1-3/4	1.674						1.693					0.5450		
-181	1.812	1-13/16	1.736						1.755					0.5640		
-187	1.875	1-7/8	1.798						1.818					0.5840		
-193	1.937	1-15/16	1.859						1.880					0.6030		
-200	2.000	2	1.922						1.943					0.6230		
-206	2.062	2-1/16	1.963	+.000/-.025	.158				1.986	+/-.006	.038			0.8600		
-212	2.125	2-1/8	2.026						2.049					0.8860		
-218	2.187	2-3/16	2.087						2.111					0.9120		
-225	2.250	2-1/4	2.149						2.174					0.9380		
-231	2.312	2-5/16	2.211						2.236					0.9640		
-237	2.375	2-3/8	2.273						2.299					0.9900		
-243	2.437	2-7/16	2.335						2.361					1.0170		
-250	2.500	2-1/2	2.397						2.424					1.0430		
US-256	2.562	2-9/16	2.458						2.486					1.0680		

US

DESCRIPTION

Light-duty single turn rings used in low clearance applications. Also used as a positioning point for light loads. Radius notch on one end for removal. Narrow radial wall yields moderate thrust loads.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure the free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

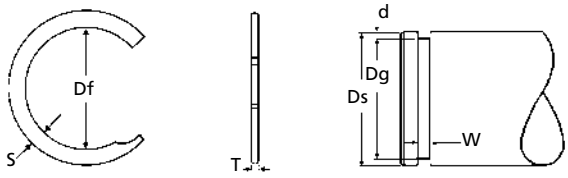
UNCOMMON

NO TOOLS NEEDED TO INSTALL.

RADIUS REMOVAL NOTCH ON END.

US *CONTINUED NEXT PAGE.*

SINGLE TURN



EXTERNAL LIGHT DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	CE	Smalley	VS
Ramsey	US	Spirolox	US

US	SHAFT		RING				GROOVE				WEIGHT	MATERIAL	
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)		Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
US-262	2.625	2-5/8	2.521	+.000/-.025	.158	+/-.004	.031	+/-.002	2.549	+/-.006	.038	.039	+.003/-.000	1.0950		
-268	2.687	2-11/16	2.582						2.611					1.1210		
-275	2.750	2-3/4	2.644						2.674					1.1470		
-281	2.812	2-13/16	2.706						2.736					1.1730		
-287	2.875	2-7/8	2.768						2.799					1.1990		
-293	2.937	2-15/16	2.830						2.861					1.2250		
-300	3.000	3	2.892						2.924		.046	.044		1.2510		
-306	3.062	3-1/16	2.938	+.000/-.030	.188	+/-.005	.039		2.970					1.9340		
-312	3.125	3-1/8	3.001						3.033					1.9750		
-318	3.187	3-3/16	3.062						3.095					2.0130		
-325	3.250	3-1/4	3.125						3.158					2.0530		
-331	3.312	3-5/16	3.186						3.220					2.0920		
-337	3.375	3-3/8	3.248						3.283					2.1310		
-343	3.437	3-7/16	3.310						3.345					2.1710		
-350	3.500	3-1/2	3.372						3.408					2.2100		
-356	3.562	3-9/16	3.433						3.470					2.2490		
-362	3.625	3-5/8	3.496						3.533					2.2890		
-368	3.687	3-11/16	3.557						3.595					2.3280		
-375	3.750	3-3/4	3.620						3.658					2.3680		
-381	3.812	3-13/16	3.681						3.720					2.4060		
-387	3.875	3-7/8	3.743						3.783					2.4460		
-393	3.937	3-15/16	3.805						3.845					2.4850		
-400	4.000	4	3.867						3.908					2.5240		
-412	4.125	4-1/8	3.973	+.000/-.035	.225		.046		4.015		.055	.052		3.7070		
-425	4.250	4-1/4	4.097						4.140					3.8180		
-437	4.375	4-3/8	4.221						4.265					3.9300		
-450	4.500	4-1/2	4.345						4.390					4.0420		
-462	4.625	4-5/8	4.468						4.515					4.1530		
-475	4.750	4-3/4	4.592						4.640					4.2640		
-487	4.875	4-7/8	4.715						4.765					4.3750		
-500	5.000	5	4.839						4.890					4.4860		
-525	5.250	5-1/4	5.067	+.000/-.045			.061		5.119	+/-.007	.066	.067	+.004/-.000	6.2550		
-550	5.500	5-1/2	5.309						5.363		.069			6.5460		
-575	5.750	5-3/4	5.550						5.606		.072			6.8350		
-600	6.000	6	5.792						5.850		.075			7.1260		
-625	6.250	6-1/4	6.033		.265				6.094	+/-.008	.078			8.7900		
-650	6.500	6-1/2	6.275						6.338		.081			9.1320		
-675	6.750	6-3/4	6.515						6.581		.085			9.4710		
-700	7.000	7	6.757						6.825		.088			9.8140		
-725	7.250	7-1/4	6.998	+.000/-.060	.300	+/-.008			7.069		.091			11.5510		
-750	7.500	7-1/2	7.240						7.313		.094			11.9380		
-775	7.750	7-3/4	7.480						7.556		.097			12.3230		
-800	8.000	8	7.722						7.800		.100			12.7100		
-825	8.250	8-1/4	7.964	+.000/-.070	.345		.076		8.044		.103	.082	+.005/-.000	19.1840		
-850	8.500	8-1/2	8.205						8.288		.106			19.7440		
-875	8.750	8-3/4	8.446						8.531		.110			20.3070		
-900	9.000	9	8.687						8.775		.113			20.8690		
-925	9.250	9-1/4	8.929						9.019		.116			21.4330		
-950	9.500	9-1/2	9.170						9.263		.119			21.9960		
-975	9.750	9-3/4	9.411						9.506		.122			22.5570		
US-1000	10.000	10	9.653						9.750		.125			23.1210		

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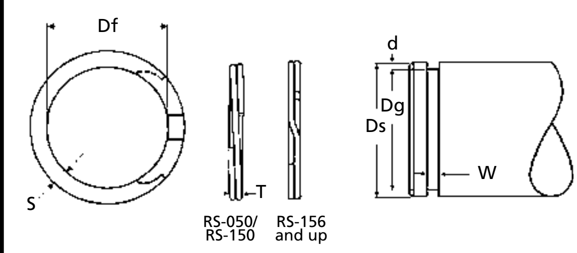
MOST POPULAR



EXTERNAL MEDIUM DUTY

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Assoc. Spring	AE	Smalley	WS	Aerospace	AS3218
Ramsey	RS	Spirolox	RS	Military	MIL-R-27426A1

RS	SHAFT Decimal (Ds)	SHAFT Fraction (Ds)	RING Free Inside Dia. (Df)	Df Tol.	RING Radial Wall (S)	S Tol.	RING Thickness (T)	T Tol.	GROOVE Diameter (Dg)	Dg Tol.	GROOVE Depth (d)	GROOVE Width (W)	W Tol.	WEIGHT Lbs. per 100 Pieces	MATERIAL Spring Steel	MATERIAL Stainless "-S02"
RS-050	.500	1/2	.467	+.000/-.013	.045	+/-.004	.025	+/-.002	.474	+/-.002	.013	.030	+.003/-.000	0.0440		
-053	.531	17/32	.498						.505					0.0480		
-055	.551	14mm	.518						.525					0.0500		
-056	.562	9/16	.529						.536					0.0510		
-059	.594	19/32	.561						.569					0.0540		
-062	.625	5/8	.585		.055				.594	+/-.003	.016			0.0700		
-065	.656	21/32	.617						.625					0.0740		
-066	.669	17mm	.629						.638					0.0750		
-068	.687	11/16	.647						.656					0.0770		
-071	.718	23/32	.679						.687					0.0810		
-075	.750	3/4	.710		.065		.031		.719			.036		0.1270		
-078	.781	25/32	.741						.750					0.1320		
-081	.812	13/16	.771						.781					0.1380		
-084	.843	27/32	.803						.812					0.1430		
-087	.875	7/8	.828						.838		.019			0.1480		
-090	.906	29/32	.860						.869					0.1530		
-093	.937	15/16	.889						.900					0.1570		
-096	.968	31/32	.916		.075		.037		.925		.021	.042		0.2260		
-098	.984	63/64	.930						.941					0.2310		
-100	1.000	1	.946						.957					0.2340		
-102	1.023	26mm	.968						.980					0.2390		
-103	1.031	1-1/32	.978						.988					0.2410		
-106	1.062	1-1/16	1.007	+.000/-.015					1.020	+/-.004				0.2480		
-109	1.093	1-3/32	1.040						1.051					0.2560		
-112	1.125	1-1/8	1.070						1.083					0.2640		
-115	1.156	1-5/32	1.102						1.114					0.2710		
-118	1.188	1-3/16	1.127		.085		.043		1.140		.024	.048	+.004/-.000	0.3520		
-121	1.218	1-7/32	1.159						1.170					0.3620		
-125	1.250	1-1/4	1.188						1.202					0.3710		
-128	1.281	1-9/32	1.221						1.233					0.3800		
-131	1.312	1-5/16	1.251		.095				1.264					0.4350		
-134	1.343	1-11/32	1.282						1.295					0.4460		
-137	1.375	1-3/8	1.308						1.323		.026			0.4550		
-140	1.406	1-13/32	1.340						1.354					0.4660		
-143	1.437	1-7/16	1.370						1.385					0.4760		
-146	1.468	1-15/32	1.402						1.416					0.4870		
RS-150	1.500	1-1/2	1.433						1.448					0.4970		

RS

DESCRIPTION

Very popular series that will accommodate light and medium bearing series thrust loads. Available in military and aerospace specifications.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).

GENERAL USE

COMMON

ROUGHLY TWICE THE THRUST CAPABILITY OF "US" SERIES AND TWO-THIRDS OF "RST" SERIES.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

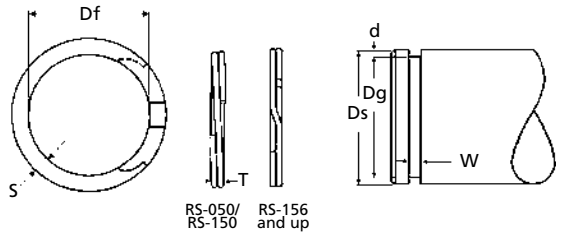
RS — KS (Page 47)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***RS** CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

MOST POPULAR



EXTERNAL MEDIUM DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AE	Smalley	WS	Aerospace	AS3218
Ramsey	RS	Spirolox	RS	Military	MIL-R-27426A1

RS	SHAFT		RING				GROOVE			WEIGHT	MATERIAL	
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RS-156	1.562	1-9/16	1.490	+.000/-.020	.108	+/-.004	1.507	.028	.056 +.004/-.000	0.7110		
-157	1.575	40mm	1.503				1.520			0.7170		
-162	1.625	1-5/8	1.549				1.566	.030		0.7380		
-168	1.687	1-11/16	1.610		.118		1.628			0.8420		
-175	1.750	1-3/4	1.673				1.691	+/-.005		0.8740		
-177	1.771	44.9mm	1.690				1.708	.032		0.8820		
-181	1.813	1-13/16	1.730				1.749			0.9020		
-187	1.875	1-7/8	1.789		.128		1.808	.034		1.0170		
-193	1.938	1-15/16	1.844				1.861			1.0410		
-196	1.969	1-31/32	1.882				1.902			1.0620		
-200	2.000	2	1.909				1.929	.035		1.0770		
-206	2.062	2-1/16	1.971				1.992			1.1110		
-212	2.125	2-1/8	2.029				2.051	.037		1.1420		
-215	2.156	2-5/32	2.060	+.000/-.025	.138		2.082			1.2550		
-216	2.165	55mm	2.070				2.091			1.2610		
-218	2.188	1-3/16	2.092				2.113			1.2740		
-225	2.250	2-1/4	2.153			.049	2.176			1.3100		
-231	2.312	2-5/16	2.211			+/-.003	2.234	.039		1.3450		
-236	2.362	59.9mm	2.261				2.284			1.3740		
-237	2.375	2-3/8	2.273				2.297			1.3810		
-243	2.437	2-7/16	2.331				2.355	.041		1.5250		
-250	2.500	2-1/2	2.394				2.418			1.5640		
-255	2.559	64.9mm	2.449		.148		2.473	.043		1.5990		
-256	2.562	2-9/16	2.452				2.476			1.5970		
-262	2.625	2-5/8	2.514				2.539	+/-.006		1.6370		
-268	2.688	2-11/16	2.572		.158		2.597	.045		1.7930		
-275	2.750	2-3/4	2.635	+.000/-.030			2.660			1.8360		
-281	2.813	2-13/16	2.696		.168	+/-.005	2.722			2.0030		
-287	2.875	2-7/8	2.755				2.781	.047		2.0450		
-293	2.937	2-15/16	2.817				2.843			2.0900		
-295	2.952	74.9mm	2.831				2.858			2.1000		
-300	3.000	3	2.877				2.904	.048	.068 +.005/-.000	2.6660		
-306	3.062	3-1/16	2.938				2.966			2.7210		
-312	3.125	3-1/8	3.000		.178	.061	3.027	.049		2.9510		
-314	3.149	79.9mm	3.023				3.051			2.9720		
-318	3.187	3-3/16	3.061				3.089			3.0090		
RS-325	3.250	3-1/4	3.121				3.150	.050		3.0660		

RS

DESCRIPTION

Very popular series that will accommodate light and medium bearing series thrust loads. Available in military and aerospace specifications.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).

GENERAL USE

COMMON

METRIC AEROSPACE ON PAGE 192.

ASSORTMENTS

PAGE 225

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

RS ⟷ KS (Page 47)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***RS** CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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EXTERNAL MEDIUM DUTY

MANUFACTURER CROSS-REFERENCE

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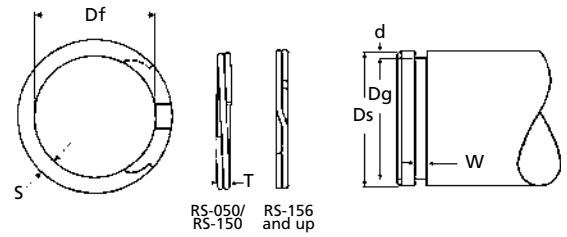
Assoc. Spring	AE	Smalley	WS	Aerospace	AS3218
Ramsey	RS	Spirolox	RS	Military	MIL-R-27426A1

MOST POPULAR



RS	SHAFT		RING				GROOVE				WEIGHT	MATERIAL	
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RS-331	3.312	3-5/16	3.180	+.000/-.030	.188	.061 +/-.003	3.208	+/-.006	.052	.068 +.005/-.000	3.3070		
-334	3.343	3-11/32	3.210				3.239				3.3270		
-337	3.375	3-3/8	3.242				3.271				3.3590		
-343	3.437	3-7/16	3.301				3.331		.053		3.4180		
-350	3.500	3-1/2	3.363	+.000/-.040			3.394				3.4800		
-354	3.543	89.9mm	3.402		.198		3.433		.055		3.7180		
-356	3.562	3-9/16	3.422				3.452				3.7390		
-362	3.625	3-5/8	3.483				3.515				3.8030		
-368	3.687	3-11/16	3.543				3.575		.056		3.8670		
-374	3.740	95.0mm	3.597				3.628				3.9240		
-375	3.750	3-3/4	3.606				3.638				3.9330		
-381	3.812	3-13/16	3.668				3.700				3.9990		
-387	3.875	3-7/8	3.724		.208		3.757		.059		4.2740		
-393	3.938	3-15/16	3.784				3.820				4.3400		
-400	4.000	4	3.842		.218		3.876		.062		4.6280		
-406	4.063	4-1/16	3.906				3.939				4.7030		
-412	4.125	4-1/8	3.967				4.000				4.7620		
-413	4.134	105.0mm	3.975				4.010				4.7710		
-418	4.188	4-3/16	4.030				4.058		.065		4.8350		
-425	4.250	4-1/4	4.084		.228		4.120				5.1350		
-431	4.312	4-5/16	4.147				4.182				5.2120		
-433	4.331	110.0mm	4.164				4.200				5.2320		
-437	4.375	4-3/8	4.208				4.245				5.2860		
-443	4.437	4-7/16	4.271				4.307				5.3620		
-450	4.500	4-1/2	4.326		.238		4.364		.068		5.6800		
-456	4.562	4-9/16	4.384		.250	.072 +/-.004	4.422		.070	.079	7.0700		
-462	4.625	4-5/8	4.447				4.485				7.1680		
-468	4.687	4-11/16	4.508				4.547				7.2630		
-472	4.724	120.0mm	4.546				4.584				7.3220		
-475	4.750	4-3/4	4.571				4.610				7.3610		
-481	4.812	4-13/16	4.633				4.672				7.4570		
-487	4.875	4-7/8	4.695				4.735				7.5380		
-493	4.937	4-15/16	4.757				4.797				7.6350		
-500	5.000	5	4.820				4.856		.072		7.7320		
-511	5.118	130.0mm	4.934				4.974				7.9100		
-512	5.125	5-1/8	4.939				4.981				7.9180		
RS-525	5.250	5-1/4	5.064	+.000/-.050			5.107	+/-.007			8.1130		

RS

DESCRIPTION

Very popular series that will accommodate light and medium bearing series thrust loads. Available in military and aerospace specifications.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

METRIC AEROSPACE ON PAGE 192.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

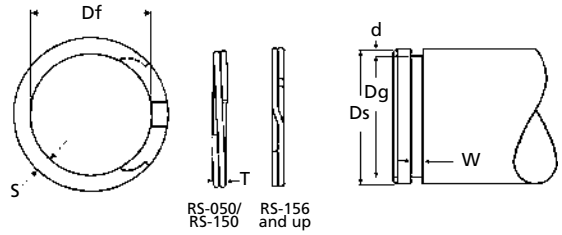
RS ⟷ KS (Page 47)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***RS** CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

MOST POPULAR



EXTERNAL MEDIUM DUTY

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Assoc. Spring	AE	Smalley	WS	Aerospace	AS3218
Ramsey	RS	Spirolox	RS	Military	MIL-R-27426A1

RS

	SHAFT		RING				GROOVE				WEIGHT	MATERIAL	
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RS-537	5.375	5-3/8	5.187	+.000/-.050	.250	+/-.005	.072	5.228	+/-.007	.074	.079	+.005/-.000	8.3040		
-550	5.500	5-1/2	5.308					5.353					8.4920		
-551	5.511	140.0mm	5.320					5.364					8.5100		
-562	5.625	5-5/8	5.433					5.478					8.6940		
-575	5.750	5-3/4	5.550					5.597		.077			8.8690		
-587	5.875	5-7/8	5.674					5.722					9.0610		
-590	5.905	150.0mm	5.705					5.752					9.1100		
-600	6.000	6	5.798					5.847					9.2540		
-612	6.125	6-1/8	5.903	+.000/-.060	.312	+/-.006	.086	5.953	+/-.008	.086	.094	+.006/-.000	14.2490		
-625	6.250	6-1/4	6.026					6.078					14.4460		
-629	6.299	158.8mm	6.076					6.127					14.5640		
-637	6.375	6-3/8	6.152					6.203					14.7400		
-650	6.500	6-1/2	6.274					6.328					15.0240		
-662	6.625	6-5/8	6.390					6.443		.091			15.2930		
-675	6.750	6-3/4	6.513					6.568					15.5800		
-687	6.875	6-7/8	6.638					6.693					15.8700		
-700	7.000	7	6.761					6.818					16.1560		
-712	7.125	7-1/8	6.877					6.933		.096			16.4720		
-725	7.250	7-1/4	6.999					7.058					16.7560		
-737	7.375	7-3/8	7.125					7.183					17.0500		
-750	7.500	7-1/2	7.250	+.000/-.070				7.308					17.3410		
-762	7.625	7-5/8	7.363					7.423		.101			17.6040		
-775	7.750	7-3/4	7.486					7.548					17.8910		
-787	7.875	7-7/8	7.611					7.673					18.1820		
-800	8.000	8	7.734					7.798					18.3760		
-825	8.250	8-1/4	7.972		.375			8.038		.106			22.9290		
-850	8.500	8-1/2	8.220					8.288					23.6240		
-875	8.750	8-3/4	8.459					8.528		.111			24.2930		
-900	9.000	9	8.707					8.778					24.9880		
-925	9.250	9-1/4	8.945					9.018		.116			25.6540		
-950	9.500	9-1/2	9.194					9.268					26.3510		
-975	9.750	9-3/4	9.432					9.508		.121			27.0180		
-1000	10.000	10	9.680					9.758					27.7130		
-1025	10.250	10-1/4	9.918					9.998		.126			28.3790		
-1050	10.500	10-1/2	10.166					10.248					29.0730		
-1075	10.750	10-3/4	10.405					10.488		.131			29.7440		
RS-1100	11.000	11	10.653					10.738					30.4380		

RS

AXIAL ASSEMBLY

DESCRIPTION

Very popular series that will accommodate light and medium bearing series thrust loads. Available in military and aerospace specifications.

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

RS ⟷ KS (Page 47)

ROUGHLY TWICE THE THRUST CAPABILITY OF "US" SERIES AND TWO-THIRDS OF "RST" SERIES.

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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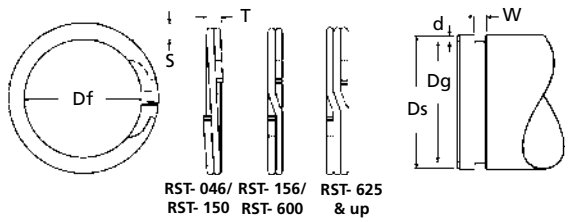
EXTERNAL MEDIUM HEAVY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AME	Smalley	WST
Ramsey	RST	Spirolox	RST

EASIER TO INSTALL



RST	SHAFT		RING			GROOVE			WEIGHT	MATERIAL	
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)	Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RST-046	.469	15/32	.436 +.000/-.013	.045 +/-.004	.024 +/-.002	.443 +/-.002	.013	.028 +.003/-.000	0.0420		
-050	.500	1/2	.469		.035	.474	.013	.039	0.0640		
-055	.551	14.0mm	.518			.524 +/-.003	.014		0.0710		
-056	.562	9/16	.529			.535	.014		0.0720		
-059	.594	19/32	.559			.565	.015		0.0760		
-062	.625	5/8	.590	.055		.596	.015		0.1000		
-066	.669	17.0mm	.630			.638	.016		0.1070		
-068	.688	11/16	.648	.065		.655	.017		0.1550		
-075	.750	3/4	.708			.715	.018		0.1690		
-078	.781	25/32	.738			.745	.018		0.1760		
-081	.812	13/16	.768			.776	.018		0.1830		
-087	.875	7/8	.827	.075	.042 +/-.002	.835	.020	.046	0.2280		
-093	.938	15/16	.886			.894	.022		0.2440		
-098	.984	63/64	.934			.940	.022		0.2560		
-100	1.000	1	.947			.955	.023		0.2600		
-102	1.023	26.0mm	.969			.977	.023		0.2660		
-106	1.062	1-1/16	1.005 +.000/-.015	.088	.050	1.015 +/-.004	.024	.056 +.004/-.000	0.3930		
-112	1.125	1-1/8	1.064			1.075	.025		0.4150		
-118	1.188	1-3/16	1.126			1.135	.027		0.4380		
-125	1.250	1-1/4	1.184	.093		1.195	.028		0.4880		
-131	1.312	1-5/16	1.240	.098		1.250	.031		0.5400		
-137	1.375	1-3/8	1.298	.103		1.310	.033		0.5950		
-143	1.438	1-7/16	1.359			1.370	.034		0.6180		
-150	1.500	1-1/2	1.419			1.430	.035		0.6460		
-156	1.562	1-9/16	1.476 +.000/-.020	.113	.062 +/-.003	1.490 +/-.005	.036	.068	0.8800		
-162	1.625	1-5/8	1.537	.118		1.550	.038		1.0070		
-168	1.687	1-11/16	1.598			1.610	.039		1.0450		
-175	1.750	1-3/4	1.657			1.670	.040		1.0820		
-177	1.771	44.9mm	1.676	.123		1.689	.041		1.1440		
-181	1.812	1-13/16	1.714			1.730	.041		1.1690		
-187	1.875	1-7/8	1.774			1.790	.043		1.2080		
-196	1.969	1-31/32	1.864			1.879	.045		1.2670		
-200	2.000	2	1.894	.128		1.910	.045		1.3430		
-206	2.062	2-1/16	1.955 +.000/-.025	.141	.078	1.970 +/-.006	.046	.086 +.005/-.000	1.9350		
RST-212	2.125	2-1/8	2.012			2.027	.049		1.9890		

RST

DESCRIPTION

Originally designed to fit NAS 50-51 grooves, RST is a common OEM specification. Two and three turn designs are easier to install than the RSN because of multiple turn design.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure the free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

FITS NAS 50-51 GROOVES.

ASSORTMENTS

PAGE 225

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

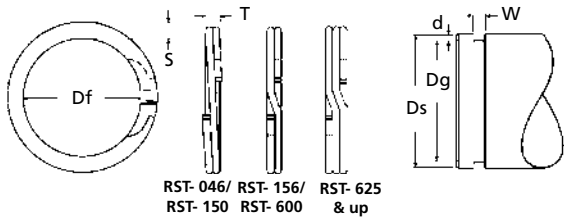
RST ⟷ USC (Page 68)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***RST** CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

EASIER TO INSTALL



BOX 232 • MINNEAPOLIS, KS • 67467

G.L.HUYETT

EXTERNAL MEDIUM HEAVY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AME	Smalley	WST
Ramsey	RST	Spirolox	RST

RST	SHAFT		RING				GROOVE				WEIGHT	MATERIAL	
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)		Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RST-215	2.156	2-5/32	2.041	+.000/-.025	.141	+/-.004	.078	+/-.003	2.057	+/-.006	.050	.086	+.005/-.000	2.0160		
-225	2.250	2-1/4	2.129						2.145		.053			2.1000		
-231	2.312	2-5/16	2.188						2.205		.054			2.1570		
-237	2.375	2-3/8	2.248						2.265		.055			2.2140		
-243	2.437	2-7/16	2.307						2.325		.056			2.2700		
-250	2.500	2-1/2	2.366		.188	+/-.005	.093		2.385		.058	.103		3.1610		
-255	2.559	64.9mm	2.432						2.451		.058			3.2450		
-262	2.625	2-5/8	2.485						2.505		.060			3.3130		
-268	2.687	2-11/16	2.545						2.565		.061			3.3890		
-275	2.750	2-3/4	2.604	+.000/-.030					2.625		.063			4.0790		
-287	2.875	2-7/8	2.722						2.742		.067			4.2570		
-293	2.937	2-15/16	2.780						2.801		.068			4.3440		
-300	3.000	3	2.838						2.860		.070			4.4310		
-306	3.062	3-1/16	2.897						2.920		.071			4.5200		
-312	3.125	3-1/8	2.957						2.980		.073			4.6100		
-315	3.156	3-5/32	2.986						3.010		.073			4.6540		
-325	3.250	3-1/4	3.075						3.100		.075			4.7880		
-334	3.344	3-11/32	3.164						3.190		.077			4.9220		
-343	3.437	3-7/16	3.254						3.280		.079			5.0570		
-350	3.500	3-1/2	3.315	+.000/-.040	.250		.111		3.340		.080	.120		8.3660		
-354	3.543	89.9mm	3.356						3.381		.081			8.4400		
-362	3.625	3-5/8	3.433						3.458		.084			8.6250		
-368	3.687	3-11/16	3.483						3.517		.085			8.7450		
-375	3.750	3-3/4	3.550						3.577		.087			8.9060		
-387	3.875	3-7/8	3.670						3.696		.090			9.1940		
-393	3.938	3-15/16	3.730						3.756		.091			9.3380		
-400	4.000	4	3.787						3.815		.093			9.4750		
-425	4.250	4-1/4	4.037						4.065		.093			10.0750		
-437	4.375	4-3/8	4.162						4.190		.093			10.3750		
-450	4.500	4-1/2	4.280						4.310		.095			10.6580		
-475	4.750	4-3/4	4.515						4.550		.100			11.2230		
-500	5.000	5	4.755						4.790		.105			11.7260		
-525	5.250	5-1/4	4.995	+.000/-.050	.375		.127	+/-.004	5.030	+/-.007	.110	.139	+.006/-.000	21.7050		
-550	5.500	5-1/2	5.229						5.265		.118			22.6730		
-575	5.750	5-3/4	5.466						5.505		.123			23.6520		
-600	6.000	6	5.705						5.745		.128			24.6410		
-625	6.250	6-1/4	5.938	+.000/-.060	.312	+/-.006	.165	+/-.005	5.985	+/-.008	.133	.174	+.008/-.000	26.5930		
-650	6.500	6-1/2	6.182						6.225		.138			27.6940		
-675	6.750	6-3/4	6.420						6.465		.143			28.7680		
-700	7.000	7	6.658						6.705		.148			29.8420		
-725	7.250	7-1/4	6.894						6.942		.154			37.4870		
-750	7.500	7-1/2	7.130	+.000/-.070	.375		.189		7.180		.160	.209		44.5090		
-775	7.750	7-3/4	7.368						7.420		.165			45.9880		
-800	8.000	8	7.607						7.660		.170			47.4740		
-825	8.250	8-1/4	7.845						7.900		.175			48.9540		
-850	8.500	8-1/2	8.083						8.140		.180			50.4330		
-875	8.750	8-3/4	8.321						8.383		.184			51.9100		
-900	9.000	9	8.560						8.620		.190			53.3950		
-925	9.250	9-1/4	8.798						8.860		.195			54.8730		
-950	9.500	9-1/2	9.036						9.100		.200			56.3510		
-975	9.750	9-3/4	9.273						9.338		.206			57.8220		
RST-1000	10.000	10	9.508						9.575		.213			59.2810		

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

EXTERNAL SPIRAL RINGS

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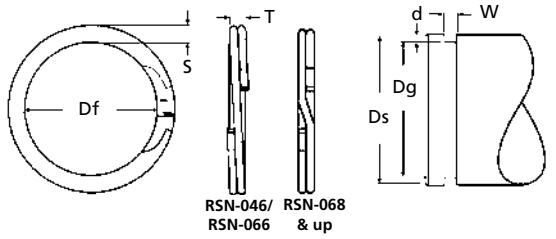
INTERCHANGEABLE WITH SNAP RINGS



EXTERNAL HEAVY DUTY

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Assoc. Spring	AHE	Smalley	WSM	Aerospace	AS3216
Ramsey	RSN	Spirolox	RSN	Military	MIL-R-27426A2

RSN	SHAFT		RING			GROOVE			WEIGHT	MATERIAL	
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)	Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RSN-046	.469	15/32	.439	.045	.025	.443	.013	.029	0.0420		
-050	.500	1/2	.464			.468	.016		0.0710		
-055	.551	14.0mm	.514	.050		.519	.016		0.0780		
-056	.562	9/16	.525		.035	.530	.016	.039	0.0800		
-059	.594	19/32	.554			.559	.018		0.0850		
-062	.625	5/8	.583	.055		.588	.019		0.0990		
-066	.669	17.0mm	.623			.629	.020		0.1060		
-068	.688	11-16	.641			.646	.021		0.1530		
-075	.750	3/4	.698	.065		.704	.023		0.1660		
-078	.781	25/32	.727			.733	.024		0.1730		
-081	.812	13/16	.756			.762	.025		0.1800		
-087	.875	7/8	.814	.075	.042	.821	.027	.046	0.2240		
-093	.938	15/16	.875			.882	.028		0.2410		
-098	.984	63/64	.919			.926	.029		0.2890		
-100	1.000	1	.932	.085		.940	.030		0.2930		
-102	1.023	26.0mm	.953			.961	.031		0.2990		
-106	1.062	1-1/16	.986			.998	.032		0.4580		
-112	1.125	1-1/8	1.047	.103		1.059	.033		0.4850		
-118	1.188	1-3/16	1.105			1.118	.035		0.5110		
-125	1.250	1-14	1.163			1.176	.037	.056	0.5360		
-131	1.312	1-5/16	1.218		.050	1.232	.040		0.6500		
-137	1.375	1-3/8	1.277	.118		1.291	.042		0.6790		
-143	1.438	1-7/16	1.336			1.350	.044		0.7040		
-150	1.500	1-1/2	1.385			1.406	.047		0.7290		
-156	1.562	1-5/16	1.453			1.468	.047		1.0410		
-162	1.625	1-5/8	1.513			1.529	.048		1.0820		
-168	1.687	1-11/16	1.573	.128		1.589	.049		1.1230		
-175	1.750	1-3/4	1.633			1.650	.050		1.1640		
-177	1.771	44.9mm	1.651			1.669	.051	.068	1.1770		
-181	1.812	1-13/16	1.690		.062	1.708	.052		1.2030		
-187	1.875	1-7/8	1.751			1.769	.053		1.5620		
-196	1.969	50mm	1.838	.158		1.857	.056		1.6360		
-200	2.000	2	1.867			1.886	.057		1.6600		
-206	2.062	2-1/16	1.932			1.946	.058		2.3100		
-212	2.125	2-1/8	1.989	.168	.078	2.003	.061	.086	2.3740		
RSN-215	2.156	2-5/32	2.018			2.032	.062		2.4070		

+.000/-.013 (Free Inside Dia.) · +/-.004 (Radial Wall) · +/-.002 (Thickness) · +/-.002 (Diameter) · +/-.003 (Diameter) · +/-.004 (Diameter) · +/-.005 (Diameter) · +/-.006 (Diameter) · +.003/-.000 (Width) · +.004/-.000 (Width) · +.005/-.000 (Width)

+.000/-.020 (Free Inside Dia.)

+.000/-.025 (Free Inside Dia.)

RSN

AXIAL ASSEMBLY

DESCRIPTION

Heavy duty design for use in NAS 669-670 deep grooves in applications like double row and tapered roller bearings. Requires no tools for removal.

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

FITS INTO THE SAME GROOVE AS SNAP RINGS.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

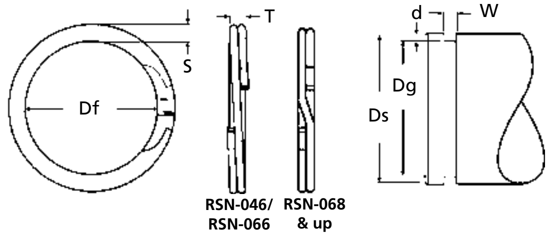
RSN ⟷ SH (Page 6) ⟷ SHI (Page 10) ⟷ USH (Page 71) ⟷ SSN (Page 49)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***RSN** CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

INTERCHANGEABLE WITH SNAP RINGS



BOX 232 • MINNEAPOLIS, KS • 67467

G.L.HUYETT

EXTERNAL HEAVY DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AHE	Smalley	WSM	Aerospace	AS3216
Ramsey	RSN	Spirolox	RSN	Military	MIL-R-27426A2

RSN	SHAFT		RING						GROOVE					WEIGHT	MATERIAL	
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)		Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RSN-225	2.250	2-1/4	2.105	+.000/-.025	.168	+/-.005	.078	+/-.003	2.120	+/-.006	.065	.086	+.005/-.000	2.5060		
-231	2.312	2-5/16	2.163						2.178		.067			2.5720		
-237	2.375	2-3/8	2.223		.200				2.239		.068			3.1860		
-243	2.437	2-7/16	2.283						2.299		.069			3.2670		
-250	2.500	2-1/2	2.343						2.360		.070			3.3490		
-255	2.559	64.9mm	2.402						2.419		.070			3.4280		
-262	2.625	2-5/8	2.464						2.481		.072			3.5120		
-268	2.687	2-11/16	2.523						2.541		.073			3.5920		
-275	2.750	2-3/4	2.584	+.000/-.030	.225		.093		2.602		.074	.103		4.9130		
-287	2.875	2-7/8	2.702						2.721		.077			5.1250		
-293	2.937	2-15/16	2.760						2.779		.079			5.2300		
-300	3.000	3	2.818						2.838		.081			5.3340		
-306	3.062	3-1/16	2.878						2.898		.082			5.4420		
-312	3.125	3-1/8	2.936						2.957		.084			5.5470		
-315	3.156	3-5/32	2.965						2.986		.085			5.5990		
-325	3.250	3-1/4	3.054						3.076		.087			5.7590		
-334	3.344	3-11/32	3.144						3.166		.089			5.9210		
-343	3.437	3-7/16	3.234						3.257		.090			6.0830		
-350	3.500	3-1/2	3.293	+.000/-.035	.270		.111		3.316		.092	.120		9.0300		
-354	3.543	89.9mm	3.333						3.357		.093			9.1080		
-362	3.625	3-5/8	3.411						3.435		.095			9.3100		
-368	3.687	3-11/16	3.469						3.493		.097			9.4600		
-375	3.750	3-3/4	3.527						3.552		.099			9.6100		
-387	3.875	3-7/8	3.647						3.673		.101			9.9220		
-393	3.938	3-15/16	3.708						3.734		.102			10.0800		
-400	4.000	4	3.765						3.792		.104			10.2280		
-425	4.250	4-1/4	4.037						4.065		.093			10.9330		
-437	4.375	4-3/8	4.161						4.190		.093			11.2540		
-450	4.500	4-1/2	4.280						4.310		.095			11.5630		
-475	4.750	4-3/4	4.518						4.550		.100			12.1800		
-500	5.000	5	4.756						4.790		.105			12.7190		
-525	5.250	5-1/4	4.995	+.000/-.050	.350	+/-.006	.127	+/-.004	5.030	+/-.007	.110	.139	+.006/-.000	20.1620		
-550	5.500	5-1/2	5.228						5.265		.118			21.0600		
-575	5.750	5-3/4	5.466						5.505		.123			21.9790		
-600	6.000	6	5.705						5.745		.128			22.9010		
RSN-625	6.250	6-1/4	5.938	+.000/-.060	.418	+/-.007	.156	+/-.005	5.985	+/-.008	.133	.174	+.008/-.000	35.2260		

RSN

DESCRIPTION

Heavy duty design for use in NAS 669-670 deep grooves in applications like double row and tapered roller bearings. Requires no tools for removal.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

FITS NAS 669-670 GROOVES.

ASSORTMENTS

PAGE 225

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

RSN ↔ SH (Page 6) ↔ SHI (Page 10) ↔ USH (Page 71) ↔ SSN (Page 49)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***RSN** CONTINUED NEXT PAGE.*

EXTERNAL SPIRAL RINGS

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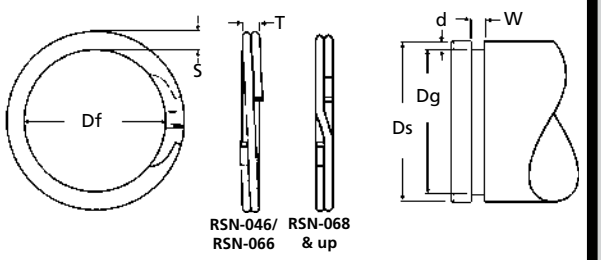
INTERCHANGEABLE WITH SNAP RINGS



EXTERNAL HEAVY DUTY

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Assoc. Spring	AHE	Smalley	WSM	Aerospace	AS3216
Ramsey	RSN	Spirolox	RSN	Military	MIL-R-27426A2

RSN	SHAFT		RING				GROOVE			WEIGHT	MATERIAL	
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RSN-650	6.500	6-1/2	6.181	+.000/-.060	.418	.156	6.225	.138	.174	36.5990		
-675	6.750	6-3/4	6.410				6.465	.143		37.8950		
-700	7.000	7	6.648				6.705	.148		39.2370		
-725	7.250	7-1/4	6.891	+.000/-.070			6.942	.154		42.4520		
-750	7.500	7-1/2	7.130		.437		7.180	.160		53.0980		
-775	7.750	7-3/4	7.368				7.420	.165		54.7990		
-800	8.000	8	7.606				7.660	.170		56.4990		
-825	8.250	8-1/4	7.845				7.900	.175		58.2080		
-850	8.500	8-1/2	8.083				8.140	.180		59.9090		
-875	8.750	8-3/4	8.324				8.383	.184		61.6330		
-900	9.000	9	8.560				8.620	.190		72.9660		
-925	9.250	9-1/4	8.798				8.860	.195		74.9110		
-950	9.500	9-1/2	9.036				9.100	.200		76.8570		
-975	9.750	9-3/4	9.275				9.338	.206		78.8140		
-1000	10.000	10	9.508		.500		9.575	.213		80.7190		
-1025	10.250	10-1/4	9.745	+.000/-.090			9.814	.218		82.0020		
-1050	10.500	10-1/2	9.984				10.054	.223		83.9590		
-1075	10.750	10-3/4	10.221				10.293	.229		85.8970		
-1100	11.000	11	10.459				10.533	.234		88.5790		
-1125	11.250	11-1/4	10.692				10.772	.239	.209	89.7470		
-1150	11.500	11-1/2	10.934		.562		11.011	.245		103.6740		
-1175	11.750	11-3/4	11.171				11.250	.250		105.8520		
-1200	12.000	12	11.410				11.490	.255		108.0480		
-1225	12.250	12-1/4	11.647				11.729	.261		110.2290		
-1250	12.500	12-1/2	11.885				11.969	.266		112.4200		
-1275	12.750	12-3/4	12.124	+.000/-.110			12.208	.271		114.2440		
-1300	13.000	13	12.361		.662		12.448	.276		138.2250		
-1325	13.250	13-1/4	12.598				12.687	.282		140.7940		
-1350	13.500	13-1/2	12.837				12.927	.287		143.3790		
-1375	13.750	13-3/4	13.074				13.166	.292		145.9450		
-1400	14.000	14	13.311				13.405	.298		148.5120		
-1425	14.250	14-1/4	13.548				13.644	.303		151.0810		
-1450	14.500	14-1/2	13.787		.750		13.884	.308		175.1770		
-1475	14.750	14-3/4	14.024				14.123	.314		178.0840		
RSN-1500	15.000	15	14.262				14.363	.319		181.0040		

+/-.007 (Radial Wall) | +/-.005 (Thickness) | +/-.008 (Diameter) | +/-.010 (Diameter) | +/-.012 (Diameter) | +.008/-.000 (Width)

RSN

DESCRIPTION

Heavy duty design for use in NAS 669-670 deep grooves in applications like double row and tapered roller bearings. Requires no tools for removal.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure the free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

FITS INTO THE SAME GROOVE AS SNAP RINGS.

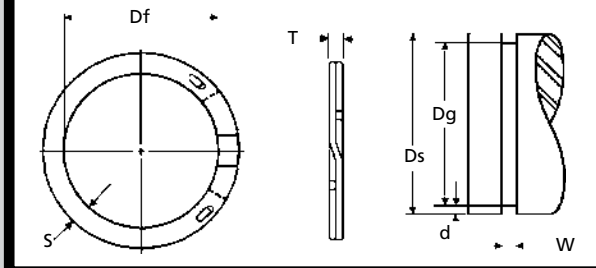
GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

RSN ⟷ SH (Page 6) ⟷ SHI (Page 10) ⟷ USH (Page 71) ⟷ SSN (Page 49)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

TAB-LOCK SYSTEM



EXTERNAL SELF-LOCKING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Ramsey	KS		
Spirolox	KS		

KS

SHAFT		RING				GROOVE			WEIGHT	MATERIAL	
Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
KS-200	2	1.915	+.000/-.020	.128	.049	+/-.003	1.929	+/-.005	.035	.056	+.004/-.000	1.0800		
-212	2-1/8	2.037					2.051	+/-.006	.035			1.1460		
-225	2-1/4	2.161					2.176		.035			1.2140		
-237	2-3/8	2.281					2.297		.039			1.2800		
-250	2-1/2	2.401	+.000/-.023	.148			2.418		.041			1.5090		
-262	2-5/8	2.521					2.539		.043			1.5830		
-275	2-3/4	2.641					2.660		.045			1.6560		
-287	2-7/8	2.761		.158			2.781		.047			1.9210		
-300	3	2.884					2.904		.048	.068	+.005/-.000	2.5040		
-312	3-1/8	3.006	+.000/-.027				3.027		.049			2.6080		
-325	3-1/4	3.127		.178			3.150		.050			3.0710		
-337	3-3/8	3.249					3.271		.052			3.1870		
-350	3-1/2	3.370					3.394		.052			3.3020		
-362	3-5/8	3.490					3.515		.055			3.8210		
-375	3-3/4	3.613		.198	.061		3.638		.056			3.9510		
-387	3-7/8	3.730					3.757		.059			4.0750		
-400	4	3.849	+.000/-.032				3.876		.062			4.6480		
-412	4-1/8	3.972					4.000		.062			4.7910		
-425	4-1/4	4.091		.218			4.120		.065			4.9290		
-437	4-3/8	4.215					4.245		.065			5.0740		
-450	4-1/2	4.333					4.364		.068			5.2110		
-462	4-5/8	4.454					4.484		.070			7.2100		
-475	4-3/4	4.578		.250			4.610		.070			7.4030		
-487	4-7/8	4.702					4.735		.070			7.5960		
-500	5	4.822					4.856		.072			7.7830		
-512	5-1/8	4.946	+.000/-.038				4.981		.072			7.9750		
-525	5-1/4	5.071			.072	+/-.004	5.107	+/-.007	.071	.079		9.0810		
-537	5-3/8	5.192		.265			5.228		.073			9.2910		
-550	5-1/2	5.315					5.353		.073			9.5030		
-562	5-5/8	5.438					5.478		.073			9.7160		
-575	5-3/4	5.558					5.597		.076			9.9240		
-587	5-7/8	5.682					5.722		.076			10.1390		
-600	6	5.806					5.847		.076			11.2140		
-612	6-1/8	5.911		.312			5.953		.086			13.6920		
-625	6-1/4	6.035	+.000/-.042				6.078	+/-.008	.086			13.9690		
-637	6-3/8	6.159					6.203		.086			15.6970		
-650	6-1/2	6.284			.086		6.328		.086	.094	+.006/-.000	16.0050		
-675	6-3/4	6.522		.350			6.568		.091			16.5920		
-700	7	6.770					6.818		.091			18.8480		
KS-725	7-1/4	7.009					7.058		.096			19.4900		

KS

DESCRIPTION

Similar to the RS, except with tab and slot locking system. Used in unstable environments subject to vibration, shockwaves, or high centrifugal forces.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm presence of tab and slot locking system in ring rim.
2. Verify shaft diameter (Ds).
3. Measure the free inside diameter (Df) of the ring.
4. Determine the ring thickness (T) and radial wall (S).
5. Find the part in the chart above.

GENERAL USE

WEIRD

TABS LOCATED ON ONE END LOCK INTO SLOTS ON THE OTHER END.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

KS ⟷ RS (Page 38)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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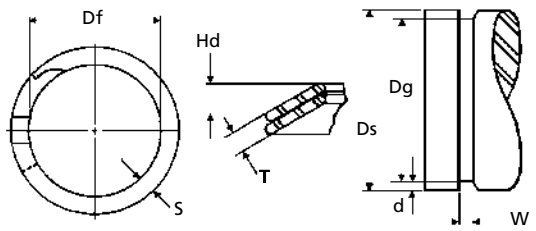
EXTERNAL DISHED

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Ramsey	MS		
Spirolox	MS		

DISHED SHAPE FOR END-PLAY TAKE UP



MS	SHAFT		RING						GROOVE					WEIGHT	MATERIAL	
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)	Thickness (T)		Dish Height (Hd)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
MS-100	1.000	1	.926	+.000/-.013	.095	.043	+/-.002	.020	+/-.003	.940	+/-.003	.030	.048	+/-.004	0.3360		
-112	1.125	1-1/8	1.043		.108	.050		.020	+/-.004	1.059	+/-.004	.033	.056		0.4920		
-125	1.250	1-1/4	1.158		.128			.027		1.176		.037			0.6200		
-137	1.375	1-3/8	1.271		.128			.032		1.291		.042			0.7070		
-150	1.500	1-1/2	1.385		.148			.037		1.406		.047			0.8590		
-162	1.625	1-5/8	1.506	+.000/-.020	.158			.045		1.529	+/-.005	.048			1.0020		
-175	1.750	1-3/4	1.625		.168			.042	+/-.005	1.650		.050			1.4810		
-187	1.875	1-7/8	1.742		.178			.044		1.769		.053			1.6900		
-200	2.000	2	1.858		.188			.047		1.886		.057			1.8960		
-212	2.125	2-1/8	1.973		.198			.057		2.003		.061			2.1180		
-225	2.250	2-1/4	2.088	+.000/-.025	.218	.062		.055		2.120		.065	.068		2.4770		
-237	2.375	2-3/8	2.183		.228			.060		2.239		.068			2.7050		
-250	2.500	2-1/2	2.300		.238			.065		2.360		.070			2.9720		
-262	2.625	2-5/8	2.419		.248			.065		2.481		.072			3.2540		
-275	2.750	2-3/4	2.537		.248			.070		2.602		.074			3.3960		
-287	2.875	2-7/8	2.653	+.000/-.030	.258			.070		2.721		.077			4.4360		
-300	3.000	3	2.790		.312	.072		.098		2.838		.081	.079		5.5610		
-312	3.125	3-1/8	2.905		.312			.098		2.957		.084			5.7640		
-325	3.250	3-1/4	3.020		.312			.105		3.076		.087			6.3480		
-337	3.375	3-3/8	3.135		.312			.105		3.192		.090			6.5630		
-350	3.500	3-1/2	3.255		.350			.086	+/-.006	3.316	+/-.006	.092			8.1730		
-362	3.625	3-5/8	3.372	+.000/-.040	.350			.085		3.435		.095			8.4360		
-375	3.750	3-3/4	3.487		.350			.096		3.552		.099			9.2730		
-387	3.875	3-7/8	3.606		.350			.096		3.673		.101			9.5570		
-400	4.000	4	3.723		.375	.086		.102		3.792		.104	.094		10.6080		
-412	4.125	4-1/8	3.848		.375			.102		3.919		.102			10.9290		
-425	4.250	4-1/4	3.991		.375			.119		4.065		.092			12.1290		
-450	4.500	4-1/2	4.232		.375			.119		4.310		.095			13.4190		
-475	4.750	4-3/4	4.468		.437			.117		4.550		.100			14.7940		
MS-500	5.000	5	4.704		.460			.120		4.790		.105			16.3900		

MS

AXIAL ASSEMBLY

DESCRIPTION

Standard ring formed into a conical shape that is designed to take up end-play. Best results occur when ring is installed in a non-loaded condition.

HOW TO IDENTIFY

1. Verify conical shape of part.
2. Confirm shaft diameter (Ds).
3. Measure the free inside diameter (Df) of the ring.
4. Determine the ring thickness (T) and radial wall (S).
5. Find the part in the chart above.

GENERAL USE

WEIRD

CONICAL SHAPE FOR END-PLAY TAKE-UP.

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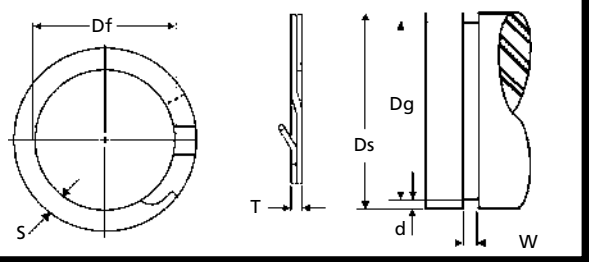
EASY TO REMOVE



EXTERNAL TABBED

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Ramsey	SSN	
Spirolox	SSN	

SSN

SHAFT		RING				GROOVE				WEIGHT	MATERIAL	
Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
SSN-200	2	1.867	+.000/-.020	.158	.062	1.886	+/-.005	.057	.068 +.004/-.000	1.6600		
-212	2-1/8	1.989	+.000/-.025	.168	.078	2.003	+/-.006	.061	.086 +.005/-.000	2.3740		
-225	2-1/4	2.105				2.120		.065		2.5060		
-237	2-3/8	2.223		.200		2.239		.068		3.1860		
-250	2-1/2	2.343				2.360		.070		3.3490		
-262	2-5/8	2.464				2.481		.072		3.5120		
-275	2-3/4	2.584	+.000/-.030	.225	.093	2.602		.074	.103	4.9130		
-287	2-7/8	2.702				2.721		.077		5.1250		
-300	3	2.818				2.838		.081		5.3340		
-312	3-1/8	2.936				2.957		.084		5.5470		
-325	3-1/4	3.054				3.076		.087		5.7590		
-350	3-1/2	3.293	+.000/-.035	.270	.111	3.316		.092	.120	9.0300		
-362	3-5/8	3.411				3.435		.095		9.3100		
-375	3-3/4	3.572				3.552		.099		9.6100		
-387	3-7/8	3.647				3.673		.101		9.9220		
-400	4	3.765				3.792		.104		10.2280		
-425	4-1/4	4.037				4.065		.092		10.9330		
-437	4-3/8	4.161				4.190		.092		11.2540		
-450	4-1/2	4.280				4.310		.095		11.5630		
-475	4-3/4	4.518				4.550		.100		12.1800		
SSN-500	5	4.756				4.790		.105		12.7190		

SSN

AXIAL ASSEMBLY

DESCRIPTION

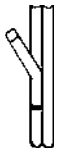
Standard RSN ring with a prong for easy removal using pliers or screwdriver, or for holding it with your teeth.

HOW TO IDENTIFY

1. Verify prong or finger protruding from the ring.
2. Confirm shaft diameter (Ds).
3. Measure the free inside diameter (Df) of the ring.
4. Determine the ring thickness (T) and radial wall (S).
5. Find the part in the chart above.

GENERAL USE

WEIRD



PROTRUDING TAB FOR REMOVAL.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

SSN ⟷ SH (Page 6) ⟷ SHI (Page 10) ⟷ RSN (Page 44) ⟷ USH (Page 71)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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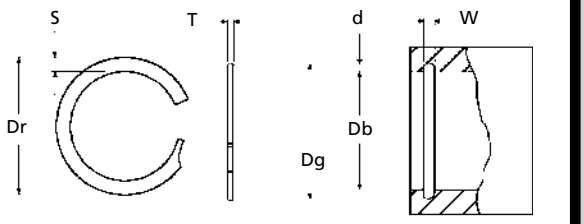
SINGLE TURN



INTERNAL LIGHT DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	CI	Smalley	VH
Ramsey	UR	Spirolox	UR

UR	BORE		RING					GROOVE				WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
UR-050	.500	1/2	.531	+.013/-.000	.045	+.003/-.005	.018	.528	+/-.002	.014	.022	0.0280		
-056	.562	9/16	.593					.590				0.0330		
-062	.625	5/8	.656					.653				0.0370		
-068	.687	11/16	.719					.715				0.0410		
-075	.750	3/4	.783					.779		.015		0.0460		
-081	.812	13/16	.862		.065		.021	.854	+/-.003	.021	.026	0.0820		
-087	.875	7/8	.926					.917				0.0900		
-093	.937	15/16	.989					.979				0.0970		
-100	1.000	1	1.052				+/-.0015	1.042				0.1040		
-106	1.062	1-1/16	1.117	+.015/-.000	.088			1.106	+/-.004	.022	.031	0.1740		
-112	1.125	1-1/8	1.181					1.169				0.1860		
-118	1.187	1-3/16	1.242					1.231				0.1970		
-125	1.250	1-1/4	1.317				.025	1.294				0.2110		
-131	1.312	1-5/16	1.369					1.356				0.2210		
-137	1.375	1-3/8	1.433					1.419				0.2330		
-143	1.437	1-7/16	1.496					1.481				0.2450		
-150	1.500	1-1/2	1.559					1.544				0.2570		
-156	1.562	1-9/16	1.637	+.020/-.000	.118		.031	1.619	+/-.005	.029	.039	0.4400		
-162	1.625	1-5/8	1.701					1.682				0.4600		
-168	1.687	1-11/16	1.763					1.744				0.4790		
-175	1.750	1-3/4	1.827					1.807				0.5000		
-181	1.812	1-13/16	1.890					1.869				0.5190		
-187	1.875	1-7/8	1.953					1.932				0.5390		
-193	1.937	1-15/16	2.016					1.994				0.5590		
-200	2.000	2	2.079					2.057				0.5790		
-206	2.062	2-1/16	2.162	+.025/-.000	.158			2.138	+/-.006	.038		0.7760		
-212	2.125	2-1/2	2.226					2.201				0.8030		
-218	2.187	2-3/16	2.289					2.263				0.8300		
-225	2.250	2-1/4	2.352					2.326				0.8570		
-231	2.312	2-5/16	2.415					2.388				0.8830		
-237	2.375	2-3/8	2.478					2.451				0.9100		
-243	2.437	2-7/16	2.541					2.513				0.9360		
-250	2.500	2-1/2	2.605					2.576				0.9630		
UR-256	2.562	2-9/16	2.667					2.638				0.9890		

UR

AXIAL ASSEMBLY

DESCRIPTION

Light duty single turn rings used in low clearance applications. Also used as a positioning point for light loads. Radius notch on one end for removal. Narrow radial wall yields moderate thrust loads.

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Measure free outside diameter (Dr) of part.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

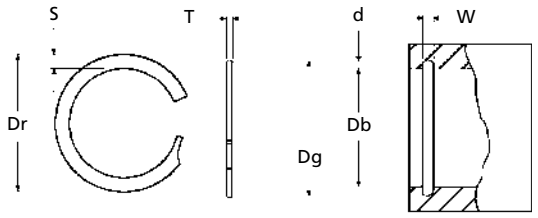
NO TOOLS NEEDED TO INSTALL.

RADIUS REMOVAL NOTCH ON END.

UR CONTINUED NEXT PAGE.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

SINGLE TURN



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INTERNAL LIGHT DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	CI	Smalley	VH
Ramsey	UR	Spirolox	UR

UR	BORE		RING					GROOVE					WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
UR-262	2.625	2-5/8	2.731	+.025/-.000	.158	+/-.004	.031	2.701	+/-.006	.038	.039	+.003/-.000	1.0160		
-268	2.687	2-11/16	2.794					2.763					1.0430		
-275	2.750	2-3/4	2.857					2.826					1.0700		
-281	2.812	2-13/16	2.920					2.888					1.0960		
-287	2.875	2-7/8	2.983					2.951					1.1220		
-293	2.937	2-15/16	3.046					3.013					1.1490		
-300	3.000	3	3.110					3.076					1.1760		
-306	3.062	3-1/16	3.187	+.030/-.000	.188	+/-.005	.039	3.154		.046	.044		1.7770		
-312	3.125	3-1/8	3.251					3.217					1.8180		
-318	3.187	3-3/16	3.314					3.279					1.8580		
-325	3.250	3-1/4	3.377					3.342					1.8980		
-331	3.312	3-5/16	3.440					3.404					1.9380		
-337	3.375	3-3/8	3.504					3.467					1.9790		
-343	3.437	3-7/16	3.566					3.529					2.0180		
-350	3.500	3-1/2	3.630					3.592					2.0580		
-356	3.562	3-9/16	3.692					3.654					2.0980		
-362	3.625	3-5/8	3.766					3.717					2.1450		
-368	3.687	3-11/16	3.819					3.779					2.1790		
-375	3.750	3-3/4	3.892					3.842					2.2250		
-381	3.812	3-13/16	3.945					3.904					2.5590		
-387	3.875	3-7/8	4.009					3.967					2.2980		
-393	3.937	3-15/16	4.071					4.029					2.3390		
-400	4.000	4	4.135					4.092					2.3800		
-412	4.125	4-1/8	4.279	+.035/-.000	.225		.046	4.235		.055	.052	+.004/-.000	3.4330		
-425	4.250	4-1/4	4.405					4.360					3.5460		
-437	4.375	4-3/8	4.531					4.485					3.6600		
-450	4.500	4-1/2	4.658					4.610					3.7740		
-462	4.625	4-5/8	4.784					4.735					3.8880		
-475	4.750	4-3/4	4.910					4.860					4.0010		
-487	4.875	4-7/8	5.036					4.985					4.1060		
-500	5.000	5	5.163					5.110					4.2290		
-525	5.250	5-1/4	5.435	+.045/-.000	.265		.061	5.381	+/-.007	.066	.067		5.8200		
-550	5.500	5-1/2	5.694					5.638		.069			6.1310		
-575	5.750	5-3/4	5.953					5.894		.072			6.4420		
-600	6.000	6	6.212					6.150		.075			7.8970		
-625	6.250	6-1/4	6.470					6.406	+/-.008	.078			8.2620		
-650	6.500	6-1/2	6.730					6.663		.081			8.5150		
-675	6.750	6-3/4	6.988					6.919		.085			8.8800		
-700	7.000	7	7.247					7.175		.088			9.2470		
-725	7.250	7-1/4	7.505	+.060/-.000	.300	+.004/-.008		7.431		.091			9.6120		
-750	7.500	7-1/2	7.765					7.688		.094			9.9790		
-775	7.750	7-3/4	8.023					7.944		.097			11.5900		
-800	8.000	8	8.282					8.200		.100			12.0050		
-825	8.250	8-1/4	8.541					8.456		.103			12.4200		
-850	8.500	8-1/2	8.800					8.713		.106			12.8340		
-875	8.750	8-3/4	9.059	+.070/-.000	.345		.076	8.969		.110	.082	+.005/-.000	19.1940		
-900	9.000	9	9.317					9.225		.113			19.7020		
-925	9.250	9-1/4	9.576					9.481		.116			20.3070		
-950	9.500	9-1/2	9.835					9.738		.119			20.9100		
-975	9.750	9-3/4	10.094					9.994		.122			21.5140		
UR-1000	10.000	10	10.353					10.250		.125			22.1180		

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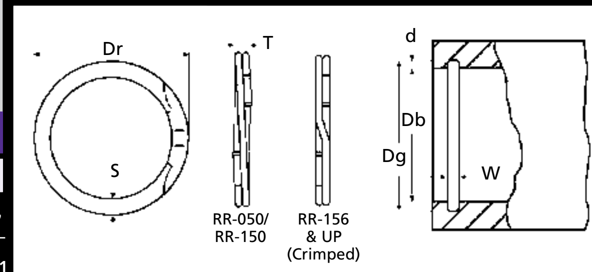

INTERNAL MEDIUM DUTY

MANUFACTURER CROSS-REFERENCE *INDEX PAGE 236.*

Assoc. Spring	AI	Smalley	WH	Aerospace	AS3217
Ramsey	RR	Spirolox	RR	Military	MIL-R-27426B1

RR	BORE		RING						GROOVE					WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)		Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RR-050	.500	1/2	.532						.526					0.0410		
-051	.512	13.0mm	.544						.538					0.0420		
-053	.531	17/32	.564						.557					0.0440		
-056	.562	9/16	.594						.588					0.0460		
-059	.594	19/32	.626		.045		.025		.619		.013	.030		0.0490		
-062	.625	5/8	.658						.651	+/-.002				0.0520		
-065	.656	21/32	.689						.682					0.0550		
068	.687	11/16	.720						.713					0.0580		
-071	.718	23/32	.751						.744					0.0610		
-075	.750	3/4	.790						.782					0.1140		
-077	.777	19.7mm	.817						.808		.016			0.1190		
-078	.781	25/32	.821	+.013/-.000					.812					0.1200		
-081	.812	13/16	.853						.843					0.1250		
-084	.843	27/32	.889		.065		.031		.880			.036	+.003/-.000	0.1320		
-086	.866	22.0mm	.913						.903					0.1350		
-087	.875	7/8	.922						.912		.019			0.1360		
-090	.906	29/32	.949						.939	+/-.003				0.1410		
-093	.938	15/16	.986						.975					0.1480		
-096	.968	31/32	1.025						1.015					0.2110		
-098	.987	25.0mm	1.041			+/-.004		+/-.002	1.030					0.2150		
-100	1.000	1	1.054						1.043					0.2190		
-102	1.023	26.0mm	1.078						1.066					0.2240		
-103	1.031	1-1/32	1.084		.075		.037		1.074		.021	.042		0.2260		
-106	1.062	1-1/16	1.117						1.104					0.2320		
-109	1.093	1-3/32	1.147						1.135					0.2400		
-112	1.125	1-1/8	1.180						1.167					0.2480		
-115	1.156	1-5/32	1.210						1.198					0.2550		
-118	1.188	1-3/16	1.249						1.236					0.3460		
-121	1.218	1-7/32	1.278						1.266					0.3560		
-125	1.250	1-1/4	1.312		.085				1.298		.024			0.3670		
-128	1.281	1-9/32	1.342	+.015/-.000					1.329	+/-.004				0.3760		
-131	1.312	1-5/16	1.374						1.360					0.3830		
-134	1.343	1-11/32	1.408				.043		1.395			.048		0.3930		
-137	1.375	1-3/8	1.442						1.427				+.004/-.000	0.4480		
-140	1.406	1-13/32	1.472						1.458					0.4590		
-143	1.437	1-7/16	1.504		.095				1.489		.026			0.4710		
-145	1.459	37.0mm	1.523						1.508					0.4770		
-146	1.468	1-15/32	1.535						1.520					0.4820		
-150	1.500	1-1/2	1.567						1.552					0.4930		
RR-156	1.562	1-9/16	1.634	+.020/-.000	.108		.049	+/-.003	1.617	+/-.005	.028	.056		0.6580		

RR	DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
	Very popular series that will accommodate light and medium bearing series thrust loads. Available in military and aerospace specifications.	1. Verify bore diameter (Db). 2. Measure free outside diameter (Dr) of the ring. 3. Determine the ring thickness (T) and radial wall (S). 4. Find the part in the chart above.	 COMMON
	AXIAL ASSEMBLY		

ROUGHLY TWICE THE THRUST CAPABILITY OF "UR" SERIES AND TWO-THIRDS OF "RRT" SERIES.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

RR — BR (Page 64) — KR (Page 61)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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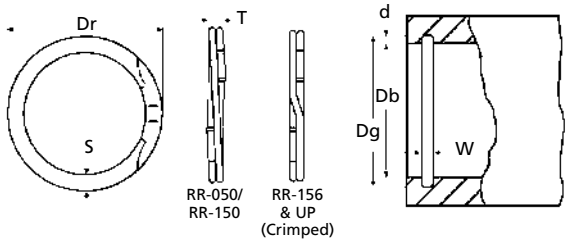
All manufacturer names and numbers are for identification purposes only. In no way are we implying that our parts were made by the manufacturers listed above.
Prices, materials, tolerances, and grades subject to change without notice.

MOST POPULAR



INTERNAL MEDIUM DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AI	Smalley	WH	Aerospace	AS3217
Ramsey	RR	Spirolox	RR	Military	MIL-R-27426B1

RR	BORE		RING				GROOVE			WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RR-157	1.574	40.0mm	1.649	+.020/-.000	.108	+/-.004 / .049 / +/-.003	1.633	+/-.005	.030 / .056 / +.004/-.000	0.6650		
-162	1.625	1-5/8	1.701				1.684			0.6890		
-165	1.653	42.0mm	1.730				1.712			0.7020		
-168	1.687	1-11/16	1.768		.118		1.750		.031	0.7820		
-175	1.750	1-3/4	1.834				1.813			0.8150		
-181	1.813	46.0mm	1.894				1.875			0.8450		
-185	1.850	47.0mm	1.937				1.917		.034	0.8670		
-187	1.875	1-7/8	1.960				1.942			0.8780		
-193	1.938	1-15/16	2.025				2.005			0.9120		
-200	2.000	2	2.091		.128		2.071		.035	1.0160		
-204	2.047	52.0mm	2.138				2.118			1.0420		
-206	2.062	2-1/16	2.154	+.025/-.000			2.132	+/-.006		1.0510		
-212	2.125	2-1/8	2.217				2.195			1.0860		
-216	2.165	55.0mm	2.260		.138		2.239		.037	1.1900		
-218	2.188	2-3/16	2.284				2.262			1.2040		
-225	2.250	2-1/4	2.347				2.324			1.2410		
-231	2.312	2-5/16	2.413				2.390		.039	1.2740		
-237	2.375	2-3/8	2.476				2.453			1.3170		
-243	2.437	2-7/16	2.543		.148		2.519		.041	1.4490		
-244	2.440	62.0mm	2.546				2.522			1.4500		
-250	2.500	2-1/2	2.606				2.582			1.4690		
-253	2.531	2-17/32	2.641				2.617		.043	1.4910		
-256	2.562	2-9/16	2.673				2.648			1.5110		
-262	2.625	2-5/8	2.736				2.711			1.5510		
-267	2.677	68.0mm	2.789		.158		2.767		.045	1.6850		
-268	2.688	2-11/16	2.803				2.778			1.6940		
-275	2.750	2-3/4	2.865				2.841			1.7360		
-281	2.813	2-13/16	2.929				2.903			1.7790		
-283	2.834	71.9mm	2.954		.168	+/-.005 / .061 / +/-.003	2.928		.047	1.9030		
-287	2.875	2-7/8	2.995				2.969			1.9320		
-293	2.937	2-15/16	3.058				3.031			1.9780		
-295	2.952	75.0mm	3.073				3.046			1.9880		
-300	3.000	3	3.122				3.096		.048 / .068 / +.005/-.000	2.5300		
-306	3.062	3-1/16	3.186	+.030/-.000			3.158			2.5870		
-312	3.125	3-1/8	3.251		.178		3.223			2.7930		
-314	3.149	80.0mm	3.276				3.247			2.7870		
-318	3.187	3-3/16	3.311				3.283			2.8200		
-325	3.250	3-1/4	3.379				3.350	.050		2.8850		
-331	3.312	3-5/16	3.446		.188		3.416	.052		3.1050		
RR-334	3.346	84.9mm	3.479				3.450			3.1380		

RR

DESCRIPTION

Very popular series that will accommodate light and medium bearing series thrust loads. Available in military and aerospace specifications.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Measure free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

RR CONTINUED NEXT PAGE.

GROOVE INTERCHANGE
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RR ↔ BR (Page 64) ↔ KR (Page 61)

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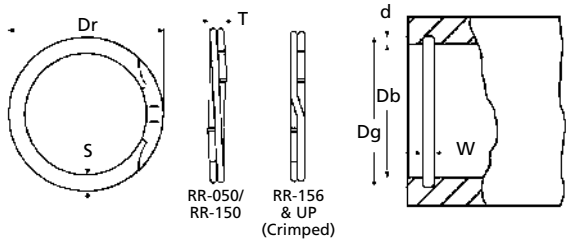
MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AI	Smalley	WH	Aerospace	AS3217
Ramsey	RR	Spirolox	RR	Military	MIL-R-27426B1

MOST POPULAR



RR	BORE		RING				GROOVE			WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RR-337	3.375	3-3/8	3.509	+.030/-.000	.188	.061 +/-.003	3.479	.052	.068 +.005/-.000	3.1680		
-343	3.437	3-7/16	3.574				3.543	.053		3.2330		
-350	3.500	3-1/2	3.636				3.606			3.2950		
-354	3.543	89.9mm	3.684		.198		3.653	.055		3.5100		
-356	3.562	3-9/16	3.703				3.672			3.5310		
-362	3.625	3-5/8	3.769				3.737	.056		3.6010		
-368	3.687	3-11/16	3.832				3.799			3.6670		
-374	3.740	95.0mm	3.885				3.852			3.7230		
-375	3.750	3-3/4	3.894				3.862			3.7330		
-381	3.812	3-13/16	3.963		.208		3.930	.059		3.9870		
-387	3.875	3-7/8	4.025				3.993			4.0210		
-393	3.938	3-15/16	4.089				4.056			4.0930		
-400	4.000	4	4.157		.218		4.124	.062		4.3570		
-406	4.063	4-1/16	4.222				4.187			4.4330		
-412	4.125	4-1/8	4.284	+.035/-.000			4.249			4.5050		
-418	4.188	4-3/16	4.347				4.311			4.5780		
-425	4.250	4-1/4	4.416		.228		4.380 +/-.006	.065		4.8600		
-431	4.312	4-5/16	4.479				4.442			4.9370		
-433	4.330	109.9mm	4.497				4.460			4.9590		
-437	4.375	4-3/8	4.543				4.505			5.0150		
-443	4.437	4-7/16	4.611		.238	+/-.005	4.573	.068		5.3090		
-450	4.500	4-1/2	4.674				4.636			5.3890		
-452	4.527	115.0mm	4.701				4.663			5.4230		
-456	4.562	4-9/16	4.737				4.698			5.4690		
-462	4.625	4-5/8	4.803		.250	.072 +/-.004	4.765	.070	.079	6.7860		
-468	4.687	4-11/16	4.867				7.827			6.8050		
-472	4.724	120.0mm	4.903				4.864			6.8610		
-475	4.750	4-3/4	4.930				4.890			6.9030		
-481	4.812	4-13/16	4.993				4.952			7.0010		
-487	4.875	4-7/8	5.055				5.015			7.0980		
-492	4.921	125.0mm	5.102				5.061			7.1710		
-493	4.937	4-15/16	5.122				5.081			7.2020		
-500	5.000	5	5.185				5.144			7.3000		
-511	5.118	129.9mm	5.304				5.262	.072		7.4860		
-512	5.125	5-1/8	5.311				5.269			7.4970		
-525	5.250	5-1/4	5.436	+.045/-.000			5.393			7.6910		
-537	5.375	5-3/8	5.566				5.522 +/-.007	.074		7.8940		
-550	5.500	5-1/2	5.693				5.647			8.0920		
-551	5.511	139.9mm	5.703				5.658			8.1070		
RR-562	5.625	5-5/8	5.818				5.772			8.2860		

RR

DESCRIPTION

Very popular series that will accommodate light and medium bearing series thrust loads. Available in military and aerospace specifications.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Measure free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

ASSORTMENTS

PAGE 225

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

RR ↔ BR (Page 64) ↔ KR (Page 61)

***RR** CONTINUED NEXT PAGE.*

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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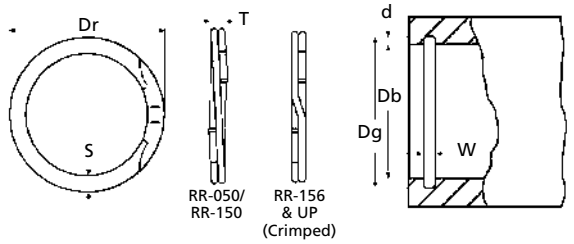

INTERNAL MEDIUM DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AI	Smalley	WH	Aerospace	AS3217
Ramsey	RR	Spirolox	RR	Military	MIL-R-27426B1

RR	BORE		RING			GROOVE			WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)	Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RR-570	5.708	145.0mm	5.909 +.045/-.000	.250 +/-.005	.072 +/-.004	5.861 +/-.007	.077	.079 +.005/-.000	8.3630		
-575	5.750	5-3/4	5.950			5.903			8.4280		
-587	5.875	5-7/8	6.077			6.028			8.6250		
-590	5.905	149.9mm	6.106			6.058			8.6710		
-600	6.000	6	6.202			6.153			8.8200		
-612	6.125	6-1/8	6.349	.312 +/-.006	.086	6.297 +/-.008	.086	.094 +.006/-.000	13.4080		
-625	6.250	6-1/4	6.474 +.055/-.000			6.422			13.6990		
-629	6.299	160.0mm	6.524			6.471			13.8160		
-637	6.375	6-3/8	6.601			6.547			13.9960		
-650	6.500	6-1/2	6.726			6.672			14.2870		
-662	6.625	6-5/8	6.863			6.807	.091		14.6070		
-669	6.692	170.0mm	6.931			6.874			14.7650		
-675	6.750	6-3/4	6.987			6.932			14.8960		
-687	6.875	6-7/8	7.114			7.057			15.1930		
-700	7.000	7	7.239			7.182			15.4840		
-708	7.086	180.0mm	7.337			7.278	.096		15.5440		
-712	7.125	7-1/8	7.376			7.317			15.6350		
-725	7.250	7-1/4	7.501 +.065/-.000			7.442			15.9260		
-737	7.375	7-3/8	7.628			7.567			16.2220		
-748	7.480	190.0mm	7.734			7.672			16.4700		
-750	7.500	7-1/2	7.754			7.692			16.5170		
-762	7.625	7-5/8	7.890			7.827	.101		16.8310		
-775	7.750	7-3/4	8.014			7.952			17.1230		
-787	7.875	7-7/8	8.131			8.077			17.3960		
-800	8.000	8	8.266			8.202			17.7120		
-825	8.250	8-1/4	8.528	.375 +/-.006	.086 +/-.004	8.462 +/-.008	.106	.094 +.006/-.000	21.8450		
-826	8.267	210.0mm	8.546			8.479			21.8970		
-846	8.464	215.0mm	8.744			8.676			22.4510		
-850	8.500	8-1/2	8.780			8.712			22.5520		
-875	8.750	8-3/4	9.041			8.972	.111		23.2840		
-885	8.858	225.0mm	9.151			9.080			23.3300		
-900	9.000	9	9.293			9.222			23.7280		
-905	9.055	230.0mm	9.359			9.287	.116		23.9150		
-925	9.250	9-1/4	9.555			9.482			24.4640		
-944	9.448	240.0mm	9.755			9.680			25.0250		
-950	9.500	9-1/2	9.806			9.732			25.1680		
-975	9.750	9-3/4	10.068			9.992	.121		25.9020		
-1000	10.000	10	10.320			10.242			26.6090		
-1050	10.500	10-1/2	10.834			10.752	.126		28.0500		
RR-1100	11.000	11	11.347			11.262	.131		29.4880		

RR

AXIAL ASSEMBLY

DESCRIPTION

Very popular series that will accommodate light and medium bearing series thrust loads. Available in military and aerospace specifications.

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Measure free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

RR ↔ BR (Page 64) ↔ KR (Page 61)

ROUGHLY TWICE THE THRUST CAPABILITY OF "UR" SERIES AND TWO-THIRDS OF "RRT" SERIES.

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INTERNAL SPIRAL RINGS

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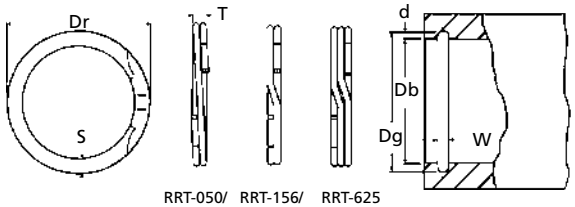
INTERNAL MEDIUM HEAVY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AMI	Smalley	WHT
Ramsey	RRT	Spirolox	RRT

EASIER TO INSTALL



RRT-050/ RRT-150 | RRT-156/ RRT-600 (Crimped) | RRT-625 & UP (Crimped)

RRT	BORE		RING					GROOVE				WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RRT-050	.500	1/2	.529	+.013/-.000	.045	+/-.004	.035	.524	+/-.002	.012	.039	0.0570		
-051	.512	13.0mm	.541					.536		.012		0.0590		
-056	.562	9/16	.597					.592		.015		0.0670		
-062	.625	5/8	.665					.659		.017		0.0760		
-068	.688	11/16	.730		.055			.724		.018		0.1010		
-075	.750	3/4	.796					.790		.020		0.1120		
-077	.777	19.7mm	.825				.042	.819	+/-.003	.021	.046	0.1610		
-081	.812	13/16	.864		.065			.857		.023		0.1700		
-086	.866	22.0mm	.919					.912		.023		0.1830		
-087	.875	7/8	.929					.922		.024		0.1850		
-090	.901	22.9mm	.957					.950		.025		0.1910		
-093	.938	15/16	.997					.989		.026		0.2290		
-100	1.000	1	1.063		.075			1.055		.028		0.2470		
-102	1.023	26.0mm	1.087					1.079		.028		0.2530		
-106	1.062	1-1/16	1.129	+.015/-.000	.078		.050	1.120	+/-.004	.029	.056	0.3260		
-112	1.125	1-1/8	1.195					1.185		.030		0.3470		
-118	1.188	1-3/16	1.260		.088			1.250		.031		0.3910		
-125	1.250	1-1/4	1.330		.093			1.320		.035		0.4620		
-131	1.312	1-5/16	1.395					1.385		.037		0.4880		
-137	1.375	1-3/8	1.461		.098			1.450		.038		0.5360		
-143	1.438	1-7/16	1.526		.103			1.515		.039		0.5890		
-145	1.456	37.0mm	1.546		.108			1.535		.040		0.6250		
-150	1.500	1-1/2	1.591					1.580		.040		0.6460		
-156	1.562	1-9/16	1.659	+.020/-.000	.113		.062	1.647	+/-.005	.043	.068	0.8760		
-162	1.625	1-5/8	1.727					1.715		.045		0.9170		
-165	1.653	42.0mm	1.757		.118			1.745		.046		0.9740		
-168	1.688	1-11/16	1.793					1.780		.046		0.9970		
-175	1.750	1-3/4	1.853					1.845		.048		1.0340		
-181	1.812	1-13/16	1.923		.123			1.910		.049		1.1210		
-185	1.850	47.0mm	1.963					1.949		.050		1.1330		
-187	1.875	1-7/8	1.984		.128			1.975		.050		1.1900		
-193	1.938	1-15/16	2.054					2.040		.051		1.2830		
-200	2.000	2	2.125		.138			2.110		.055		1.3800		
-206	2.062	2-1/16	2.190	+.025/-.000	.141	+/-.005	.078	2.175	+/-.006	.027	.086	1.8450		
-212	2.125	2-1/8	2.255					2.240		.058		1.9070		
-218	2.188	2-3/16	2.321					2.305		.059		1.9170		
-225	2.250	2-1/4	2.386					2.370		.060		2.0330		
-231	2.312	2-5/16	2.457		.188			2.440		.064		2.7410		
-237	2.375	2-3/8	2.522					2.505		.065		2.8230		
RRT-244	2.440	61.9mm	2.588					2.570		.065		2.9070		

RRT

DESCRIPTION

Originally designed to fit NAS 50-51 grooves, RRT is a common OEM specification. Two and three turn designs are easier to install than RRN because of multiple turn design.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Measure the free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

FITS NAS 50-51 GROOVES.

ASSORTMENTS

PAGE 225

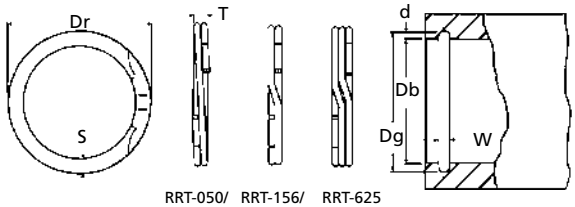
GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

RRT ⟷ UHB (Page 72)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

EASIER TO INSTALL



RRT-050/ RRT-150 | RRT-156/ RRT-600 (Crimped) | RRT-625 & UP (Crimped)

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INTERNAL MEDIUM HEAVY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AMI	Smalley	WHT
Ramsey	RRT	Spirolox	RRT

RRT	BORE		RING					GROOVE					WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)		Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RRT-250	2.500	2-1/2	2.653	+.025/-.000	.188	+/-.005	.078	2.635	+/-.006	.068	.086	+.005/-.000	2.9500		
-253	2.531	2-17/32	2.687					2.668		.069			2.9930		
-256	2.562	2-9/16	2.720				.093	2.700		.069	.103		3.5940		
-262	2.625	2-5/8	2.785					2.765		.070			3.6930		
-268	2.688	2-11/16	2.855					2.834		.073			3.7980		
-275	2.750	2-3/4	2.921					2.900		.075			3.8980		
-281	2.813	2-13/16	2.987					2.965		.076			3.9970		
-283	2.834	71.9mm	3.009					2.987		.077			4.0300		
-287	2.875	2-7/8	3.053					3.030		.078			4.0960		
-300	3.000	3	3.188					3.165		.083			4.3000		
-306	3.062	3-1/16	3.257	+.030/-.000	.250		+/-.003	3.230		.084	.120		6.8030		
-312	3.125	3-1/8	3.318					3.295		.085			6.9500		
-315	3.156	3-5/32	3.354					3.328		.086			7.0370		
-325	3.250	3-1/4	3.450					3.426		.088			7.2680		
-334	3.346	85.0mm	3.550					3.525		.090			7.5080		
-347	3.469	88.0mm	3.683					3.657		.093			7.8280		
-350	3.500	3-1/2	3.716					3.690		.095			7.9070		
-354	3.543	89.9mm	3.761					3.735		.096			8.0160		
-356	3.562	3-9/16	3.783					3.756		.097			8.0680		
-362	3.625	3-5/8	3.849					3.822		.099			8.2270		
-375	3.750	3-3/4	3.982					3.955		.103			8.4460		
-387	3.875	3-7/8	4.115					4.087		.106			8.7660		
-393	3.938	3-15/16	4.178					4.150		.106			8.9170		
-400	4.000	4	4.248					4.220		.110			9.0860		
-412	4.125	4-1/8	4.368	+.035/-.000	.312			4.339		.110			11.5140		
-425	4.250	4-1/4	4.500					4.470		.110			11.9100		
-433	4.330	109.9mm	4.586					4.556		.113			12.1670		
-450	4.500	4-1/2	4.768					4.735		.118			12.7140		
-462	4.625	4-5/8	4.897					4.865		.120			13.1010		
-475	4.750	4-3/4	5.028					4.995		.123			13.4940		
-500	5.000	5	5.295					5.260		.130			14.3560		
-525	5.250	5-1/4	5.559	+.040/-.000	.375		.127	5.520	+/-.007	.135	.139	+.006/-.000	20.6430		
-537	5.375	5-3/8	5.689					5.650		.135			21.1810		
-550	5.500	5-1/2	5.810					5.770		.135			21.6810		
-575	5.750	5-3/4	6.062					6.020		.135			22.7240		
-600	6.000	6	6.314					6.270		.135			23.7660		
-625	6.250	6-1/4	6.576	+.055/-.000	.312	+/-.006	.165	6.530	+/-.008	.140	.174	+.008/-.000	26.6560		
-650	6.500	6-1/2	6.837					6.790		.145			27.8340		
-662	6.625	6-5/8	6.973					6.925		.150			28.4480		
-675	6.750	6-3/4	7.104					7.055		.153			29.0390		
-700	7.000	7	7.366					7.315		.158			30.2210		
-725	7.250	7-1/4	7.628	+.070/-.000	.375		.189	7.575		.163	.209		42.9420		
-750	7.500	7-1/2	7.895					7.840		.170			44.6020		
-775	7.750	7-3/4	8.156					8.100		.175			46.2250		
-800	8.000	8	8.418					8.360		.180			48.4750		
-825	8.250	8-1/4	8.680					8.620		.185			49.4810		
-850	8.500	8-1/2	8.942					8.880		.190			51.1090		
-875	8.750	8-3/4	9.209					9.145		.198			52.7680		
-900	9.000	9	9.471					9.405		.203			54.3950		
-925	9.250	9-1/4	9.736					9.669		.210			56.0410		
-950	9.500	9-1/2	9.999					9.930		.215			57.6730		
-975	9.750	9-3/4	10.260					10.189		.220			59.2930		
-1000	10.000	10	10.552					10.450		.225			61.1050		
RRT-1050	10.500	10-1/2	11.036					10.970		.235			64.1090		

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

INTERNAL SPIRAL RINGS

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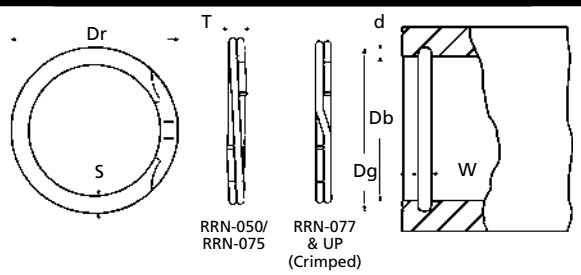
INTERCHANGEABLE WITH SNAP RINGS



INTERNAL HEAVY DUTY

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Assoc. Spring	AHI	Smalley	WHM	Aerospace	AS3215
Ramsey	RRN	Spirolox	RRN	Military	MIL-R-27426B2

RRN	BORE		RING					GROOVE				WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RRN-050	.500	1/2	.538	+.013/-.000	.045	+/-.004	.035	.530	+/-.002	.015	.039	0.0570		
-051	.512	13.0mm	.550					.542		.015		0.0590		
-056	.562	9/16	.605		.055			.596		.017		0.0800		
-062	.625	5/8	.675					.665		.020		0.0920		
-068	.688	11/16	.743		.065			.732		.022		0.1190		
-075	.750	3/4	.807					.796		.023		0.1320		
-077	.777	19.7mm	.836		.075		.042	.825	+/-.003	.024	.046	0.1840		
-081	.812	13/16	.873					.862		.025		0.1940		
-086	.866	22.0mm	.931					.920		.027		0.2100		
-087	.875	7/8	.943		.085			.931		.028		0.2390		
-090	.901	22.9mm	.972					.959		.029		0.2470		
-093	.938	15/16	1.013					1.000		.031		0.2600		
-100	1.000	1	1.080					1.066		.033		0.2790		
-102	1.023	26.0mm	1.105					1.091		.034		0.2860		
-106	1.062	1-1/16	1.138		.103		.050	1.130	+/-.004	.034	.056	0.4230		
-112	1.125	1-1/8	1.205					1.197		.036		0.4520		
-118	1.188	1-3/16	1.271					1.262		.037		0.4820		
-125	1.250	1-1/4	1.339					1.330		.040		0.5110		
-131	1.312	1-5/16	1.406		.118			1.396		.042		0.6120		
-137	1.375	1-3/8	1.471					1.461		.043		0.6450		
-143	1.439	1-7/16	1.539					1.528		.045		0.6740		
-145	1.456	37.0mm	1.559					1.548		.046		0.6840		
-150	1.500	1-1/2	1.605					1.594		.047		0.7070		
-156	1.562	1-9/16	1.675	+.020/-.000	.128	+/-.003	.062	1.658	+/-.005	.048	.068	0.9860		
-162	1.625	1-5/8	1.742					1.725		.050		1.0320		
-165	1.653	42.0mm	1.772					1.755		.051		1.0520		
-168	1.688	1-11/16	1.810					1.792		.052		1.0790		
-175	1.750	1-3/4	1.876					1.858		.054		1.1240		
-181	1.812	1-13/16	1.940					1.922		.055		1.1670		
-185	1.850	47.0mm	1.981		.158			1.962		.056		1.4500		
-187	1.875	1-7/8	2.008					1.989		.057		1.4730		
-193	1.938	1-15/16	2.075					2.056		.059		1.5300		
-200	2.000	2	2.142					2.122		.061		1.5780		
-206	2.062	2-1/16	2.201	+.025/-.000	.168	+/-.005	.078	2.186	+/-.006	.062	.086	2.1810		
-212	2.125	2-1/8	2.267					2.251		.063		2.2560		
-218	2.188	2-3/16	2.334					2.318		.065		2.3320		
-225	2.250	2-1/4	2.399					2.382		.066		2.4060		
RRN-231	2.312	2-5/16	2.467		.200			2.450		.069		2.9130		

RRN

DESCRIPTION

Heavy-duty design for use in NAS 669-670 deep grooves in applications like double row and tapered roller bearings. Requires no tools for removal.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Measure free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

FITS NAS 669-670 GROOVES.

ASSORTMENTS

PAGE 225

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

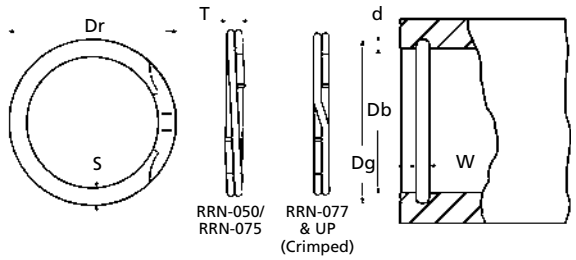
RRN ⟷ HO (Page 16) ⟷ HOI (Page 19) ⟷ UHO (Page 76) ⟷ SRN (Page 63)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***RRN** CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

INTERCHANGEABLE WITH SNAP RINGS



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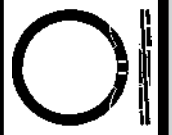
INTERNAL HEAVY DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AHI	Smalley	WHM	Aerospace	AS3215
Ramsey	RRN	Spirolox	RRN	Military	MIL-R-27426B2



RRN	BORE		RING				GROOVE			WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)		Thickness (T)		Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RRN-237	2.375	2-3/8	2.535	+.025/-.000	.200	+/-.005	.078	+/-.003	2.517	.071	.086	3.0050		
-244	2.440	61.9mm	2.602						2.584	.072		3.0960		
-250	2.500	2-1/2	2.667						2.648	.074		3.1410		
-253	2.531	2-17/32	2.700						2.681	.075		3.1860		
-256	2.562	2-9/16	2.733	+.030/-.000	.225		.093		2.714	.076	.103	4.2590		
-262	2.625	2-5/8	2.801						2.781	.078		4.3810		
-268	2.688	2-11/16	2.868						2.848	.080		4.5020		
-275	2.750	2-3/4	2.934						2.914	.082		4.6210		
-281	2.813	2-13/16	3.001						2.980	.084		4.7430		
-283	2.834	71.9mm	3.027						3.006	.086		4.7890		
-287	2.875	2-7/8	3.072						3.051	.088		4.8700		
-300	3.000	3	3.204						3.182	.091		5.1080		
-306	3.062	3-1/16	3.271	+.035/-.000	.281		.111		3.248	.093	.120	7.6010		
-312	3.125	3-1/4	3.338						3.315	.095		7.7820		
-315	3.157	3-5/32	3.371						3.348	.096		7.8710		
-325	3.250	3-1/4	3.470						3.446	.098		8.1390		
-334	3.346	85.0mm	3.571						3.546	.100		8.4120		
-347	3.469	88.0mm	3.701						3.675	.105		8.7640		
-350	3.500	3-1/2	3.736						3.710	.105		8.8580		
-354	3.543	89.9mm	3.781						3.755	.106		8.9800		
-356	3.562	3-9/16	3.802						3.776	.107		9.0370		
-362	3.625	3-5/8	3.868						3.841	.108		9.2150		
-375	3.750	3-3/4	4.002		.312	+/-.006			3.974	.112		10.4140		
-387	3.875	3-7/8	4.136						4.107	.116		10.8170		
-393	3.938	3-15/16	4.203						4.174	.118		11.0180		
-400	4.000	4	4.270						4.240	.120		11.2190		
-412	4.125	4-1/8	4.369						4.339	.120		11.5160		
-425	4.250	4-1/4	4.501						4.470	.120		11.9130		
-433	4.330	109.9mm	4.588						4.556	.120		12.1740		
-450	4.500	4-1/2	4.768						4.735	.120		12.7140		
-462	4.625	4-5/8	4.899						4.865	.120		13.1070		
-475	4.750	4-3/4	5.030						4.995	.123		13.5000		
-500	5.000	5	5.297						5.260	.130		14.0490		
-525	5.250	5-1/4	5.559	+.050/-.000	.350		.127	+/-.004	5.520	.135	.139	18.9630		
-537	5.375	5-3/8	5.690						5.650	.135		19.4690		
-550	5.500	5-1/2	5.810						5.770	.135		19.9330		
-575	5.750	5-3/4	6.062						6.020	.135		20.9070		
RRN-600	6.000	6	6.314						6.270	.135		21.8820		

RRN

AXIAL ASSEMBLY

DESCRIPTION

Heavy-duty design for use in NAS 669-670 deep grooves in applications like double row and tapered roller bearings. Requires no tools for removal.

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Measure free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

FITS INTO THE SAME GROOVE AS SNAP RINGS.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

RRN ⟷ HO (Page 16) ⟷ HOI (Page 19) ⟷ UHO (Page 76) ⟷ SRN (Page 63)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***RRN** CONTINUED NEXT PAGE.*

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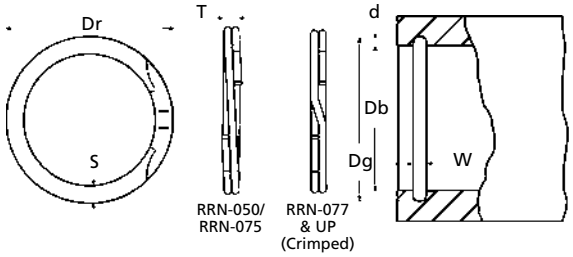
MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Assoc. Spring	AHI	Smalley	WHM	Aerospace	AS3215
Ramsey	RRN	Spirolox	RRN	Military	MIL-R-27426B2

INTERCHANGEABLE WITH SNAP RINGS



RRN	BORE		RING			GROOVE			WEIGHT	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)	Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
RRN-625	6.250	6-1/4	6.576 +.055/-.000	.380 +/-.006	.156 +/-.005	6.530 +/-.008	.140	.174 +.008/-.000	30.3150		
-650	6.500	6-1/2	6.838			6.790	.145		31.6620		
-662	6.625	6-5/8	6.974			6.925	.150		32.3610		
-675	6.750	6-3/4	7.105			7.055	.153		33.0340		
-700	7.000	7	7.366			7.315	.158		33.7850		
-725	7.250	7-1/4	7.628 +.070/-.000	.418 +/-.007	.187	7.575	.163	.209	46.5240		
-750	7.500	7-1/2	7.895			7.840	.170		48.3530		
-775	7.750	7-3/4	8.157			8.100	.175		50.1480		
-800	8.000	8	8.419			8.360	.180		51.9440		
-825	8.250	8-1/4	8.680	.437		8.620	.185		56.0380		
-850	8.500	8-1/2	8.942			8.880	.190		57.9120		
-875	8.750	8-3/4	9.209			9.145	.198		59.8260		
-900	9.000	9	9.471			9.405	.203		61.7000		
-925	9.250	9-1/4	9.737			9.669	.210		63.6030		
-950	9.500	9-1/2	10.000	.500		9.930	.215		73.7330		
-975	9.750	9-3/4	10.260			10.189	.220		75.8620		
-1000	10.000	10	10.523			10.450	.225		78.0160		
-1025	10.250	10-1/4	10.786			10.711	.231		80.1720		
-1050	10.500	10-1/2	11.047			10.970	.235		82.3060		
-1075	10.750	10-3/4	11.313			11.234 +/-.010	.242		84.4890		
-1100	11.000	11	11.575 +.120/-.000			11.495	.248		86.6320		
-1125	11.250	11-1/4	11.838			11.756	.253		88.7840		
-1150	11.500	11-1/2	12.102	.562 +/-.015/-.010		12.018	.259		100.7020		
-1175	11.750	11-3/4	12.365			12.279	.265		103.1220		
-1200	12.000	12	12.628			12.540	.270		105.5430		
-1225	12.250	12-1/4	12.891			12.801	.276		107.9650		
-1250	12.500	12-1/2	13.154			13.063	.282		110.3850		
-1275	12.750	12-3/4	13.417			13.324 +/-.012	.287		112.8060		
-1300	13.000	13	13.680 +.140/-.000	.662		13.585	.293		134.6480		
-1325	13.250	13-1/4	13.943			13.846	.298		137.5010		
-1350	13.500	13-1/2	14.207			14.108	.304		140.3640		
-1375	13.750	13-3/4	14.470			14.369	.310		143.2140		
-1400	14.000	14	14.732			14.630	.315		144.9290		
-1425	14.250	14-1/4	14.995			14.891	.321		147.7820		
-1450	14.500	14-1/2	15.259	.750		15.153	.327		169.5900		
-1475	14.750	14-3/4	15.522			15.414	.332		172.8240		
RRN-1500	15.000	15	15.785			15.675	.338		176.0550		

RRN

AXIAL ASSEMBLY

DESCRIPTION

Heavy duty design for use in NAS 669-670 deep grooves in applications like double row and tapered roller bearings. Requires no tools for removal.

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Measure free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON

FITS NAS 669-670 GROOVES.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

RRN ⟷ HO (Page 16) ⟷ HOI (Page 19) ⟷ UHO (Page 76) ⟷ SRN (Page 63)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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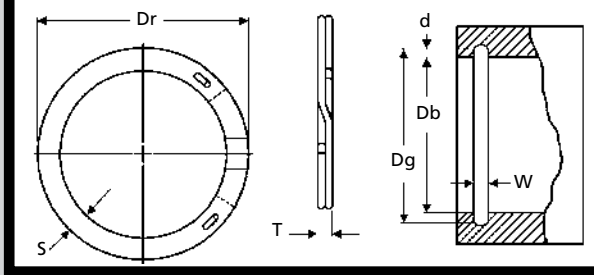
TAB-LOCK SYSTEM



INTERNAL SELF-LOCKING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Ramsey	KR
Spirolox	KR

KR

BORE		RING			GROOVE			WEIGHT	MATERIAL	
Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)	Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
KR-200	2	2.085 +.020/-.000	.128	.049	2.071 +/-.005	.035	.056 +.004/-.000	1.0130		
-212	2-1/8	2.209			2.195	.035		1.0810		
-225	2-1/4	2.339			2.324	.037		1.1520		
-237	2-3/8	2.468			2.453	.039		1.2230		
-250	2-1/2	2.599 +.023/-.000	.148		2.582	.041		1.4370		
-262	2-5/8	2.729			2.711	.043		1.5160		
-275	2-3/4	2.859			2.841	.045		1.5960		
-287	2-7/8	2.989	.158		2.969	.047		1.8410		
-300	3	3.115		.061 +/-.003	3.096 +/-.006	.048	.068 +.005/-.000	2.4070		
-312	3-1/8	3.245 +.027/-.000			3.223	.049		2.5170		
-325	3-1/4	3.373	.178		3.350	.050		2.8800		
-337	3-3/8	3.502			3.479	.052		3.0020		
-350	3-1/2	3.629			3.606	.053		3.1230		
-362	3-5/8	3.762			3.737	.056		3.5930		
-375	3-3/4	3.887	.198		3.862	.056		3.7260		
-387	3-7/8	4.019			3.993	.059		3.8320		
-400	4.000	4	4.150 +.032/-.000	.218	4.124	.062		4.3490		
-412	4.125	4-1/8	4.279		4.249	.062		4.5250		
-425	4.250	4-1/4	4.409		4.380	.065		4.6510		
-437	4.375	4-3/8	4.536		4.505	.065		4.7980		
-450	4.500	4-1/2	4.667		4.636	.068		4.9510		
-462	4.625	4-5/8	4.796	.250	4.765	.070		6.7750		
-475	4.750	4-3/4	4.923		4.890	.070		6.8920		
-487	4.875	4-7/8	5.048		5.015	.070		7.0870		
-500	5.000	5	5.183		5.144	.072		7.2970		
-512	5.125	5-1/8	5.304 +.038/-.000	.072 +/-.004	5.269 +/-.007	.072	.079	7.4860		
-525	5.250	5-1/4	5.429		5.393	.071		8.4920		
-537	5.375	5-3/8	5.561		5.522	.074		8.7210		
-550	5.550	5-1/2	5.686	.265	5.647	.073		8.9370		
-562	5.625	5-5/8	5.818		5.772	.073		9.1660		
-575	5.750	5-1/2	5.942		5.903	.076		9.3090		
-587	5.875	5-7/8	6.069		6.028	.076		9.5290		
-600	6.000	6	6.194		6.153	.076		10.4760		
-612	6.125	6-1/8	6.340	.312	6.297	.086		12.8980		
-625	6.250	6-1/4	6.465 +.042/-.000		6.422	.086		13.1800		
-637	6.375	6-3/8	6.594		6.547	.086		14.7420		
-650	6.500	6-1/2	6.716	.086	6.672 +/-.008	.086	.094 +.006/-.000	15.0430		
-675	6.750	6-3/4	6.978	.350	6.932	.091		15.6890		
-700	7.000	7	7.230		7.182	.091		17.7130		
KR-725	7.250	7-1/4	7.491		7.442	.096		18.2200		

KR

DESCRIPTION

Similar to the RR, except with tab and slot locking system. Used in unstable environments subject to vibration, shockwaves, or high centrifugal forces.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm presence of tab and slot locking system in ring rim.
2. Verify bore diameter (Db).
3. Measure the free outside diameter (Dr) of the ring.
4. Determine the ring thickness (T) and radial wall (S).
5. Find the part in the chart above.

GENERAL USE

TABS LOCATED ON ONE END LOCK INTO SLOTS ON THE OTHER END.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

KR — RR (Page 52) — BR (Page 64)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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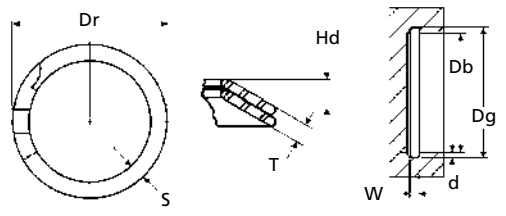
DISHED SHAPE FOR END-PLAY TAKE UP



INTERNAL DISHED

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Ramsey	MR		
Spirolox	MR		

MR

BORE		RING					GROOVE			WEIGHT	MATERIAL	
Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)	Thickness (T)	Dish Height (Hd)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
MR-100	1	1.081	+.013/-.000	.095	.043	.012	1.066	+/-.003	.033	.048	0.3160		
-112	1-1/8	1.215	+.015/-.000	.103	.050 +/-.002	.015	1.197	+/-.004	.036	+.004/-.000	0.4420		
-125	1-1/4	1.349		.118		.016	1.330		.040		0.5400		
-137	1-3/8	1.482		.128		.018	1.461		.043	.056	0.6470		
-150	1-1/2	1.615		.148		.019	1.594		.047		0.8560		
-162	1.625	1-5/8	+.020/-.000	1.750	.148	.022	1.725	+/-.005	.050		0.9190		
-175	1.750	1-3/4		1.884	.158	.062 +/-.003	.020	+/-.003	1.858	.054	+.005/-.000	1.3230		
-187	1.875	1-7/8		2.016	.178		.024		1.989	.057		1.5370		
-200	2.000	2		2.151	.188		.026		2.122	.061		1.7370		
-212	2.125	2-1/8	+.025/-.000	2.282	.198		.029		2.251	.063		1.9910		
-225	2.250	2-1/4		2.416	.198		.029		2.382	.066	.068	2.1210		
-237	2.375	2-3/8		2.553	.208		.028		2.517	.071		2.3710		
-250	2.500	2-1/2		2.685	.218		.029		2.648	.074		2.6170		
-262	2.625	2-5/8		2.820	.228		.029		2.781	.078		2.8790		
-275	2.750	2-3/4		2.954	.238		.028		2.914	.082		3.1510		
-287	2.875	2-7/8		3.093	.248		.029		3.051	.088		3.4400		
-300	3.000	3	+.030/-.000	3.228	.248	.072 +/-.003	.028	+/-.006	3.182	.091	+.005/-.000	4.2300		
-312	3.125	3-1/8		3.361	.265		.029		3.315	.095		4.6900		
-325	3.250	3-1/4		3.486	.265		.029		3.446	.098	.079	5.1700		
-337	3.375	3-3/8		3.621	.265		.032		3.579	.102		5.4930		
-350	3.500	3-1/2		3.753	.312		.033		3.710	.105		5.8580		
-362	3.625	3-5/8		3.885	.312		.032		3.841	.108		6.2720		
-375	3.750	3-3/4	+.035/-.000	4.021	.312	.086 +/-.004	.036	+/-.004	3.974	.112	+.006/-.000	7.9560		
-387	3.875	3-7/8		4.154	.350		.039		4.107	.116		8.6800		
-400	4.000	4		4.290	.350		.039		4.240	.120		8.9900		
-412	4.125	4-1/8		4.388	.350		.045		4.339	.107	.094	9.7170		
-425	4.250	4-1/4		4.522	.350		.044		4.470	.110		10.0440		
-450	4.500	4-1/2		4.779	.375		.047		4.735	.117		11.4930		
-475	4.750	4-3/4		5.044	.375		.048		4.995	.122		12.1530		
MR-500	5.000	5	+.045/-.000	5.313	.375	.047	5.260		.130			12.8920		

MR

DESCRIPTION

Standard ring formed into a conical shape that is designed to take up end-play. Best results occur when ring is installed in a non-loaded condition.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm conical shape of part.
2. Verify bore diameter (Db).
3. Measure the free outside diameter (Dr) of the ring.
4. Determine the ring thickness (T) and radial wall (S).
5. Find the part in the chart above.

GENERAL USE

WEIRD

CONICAL SHAPE FOR END PLAY TAKE-UP.

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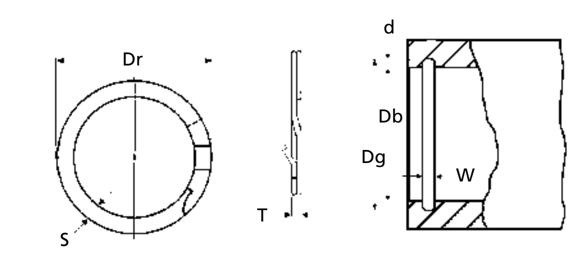
EASY TO REMOVE



INTERNAL TABBED

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Ramsey	SRN
Spirolox	SRN

SRN	BORE Decimal (Db)	BORE Fraction (Db)	RING Free Outside Dia. (Dr)	Dr tol.	RING Radial Wall (S)	RING Thickness (T)	T tol.	GROOVE Diameter (Dg)	Dg tol.	GROOVE Depth (d)	GROOVE Width (W)	W tol.	WEIGHT Lbs. per 100 Pieces	MATERIAL Spring Steel	MATERIAL Stainless "-S02"
SRN-200	2.000	2	2.142	+.020/-.000	.158	.062	+/-.003	2.122	+/-.005	.061	.068	+.004/-.000	1.5780		
-212	2.125	2-1/8	2.267	+.025/-.000	.168	.078		2.251	+/-.006	.063	.086	+.005/-.000	2.2560		
-225	2.250	2-1/4	2.399					2.382		.066			2.4060		
-237	2.375	2-3/8	2.535		.200			2.517		.071			3.0050		
-250	2.500	2-1/2	2.667					2.648		.074			3.1410		
-262	2.625	2-5/8	2.801	+.030/-.000	.225	.093		2.781		.078	.103		4.3810		
-275	2.750	2-3/4	2.934					2.914		.082			4.6210		
-287	2.875	2-7/8	3.072					3.051		.088			4.8700		
-300	3.000	3	3.204					3.182		.091			5.1080		
-312	3.125	3-1/8	3.334	+.035/-.000	.281	.111		3.315		.095	.120		7.7820		
-325	3.250	3-1/4	3.470					3.446		.098			8.1390		
-350	3.500	3-1/2	3.736					3.710		.105			8.8580		
-362	3.625	3-5/8	3.868					3.841		.108			9.2150		
-375	3.750	3-3/4	4.002		.312			3.974		.112			10.4140		
-387	3.875	3-7/8	4.136					4.107		.116			10.8170		
-400	4.000	4	4.270					4.240		.120			11.2190		
-412	4.125	4-1/8	4.369					4.339		.107			11.5160		
-425	4.250	4-1/4	4.501					4.470		.110			11.9130		
-450	4.500	4-1/2	4.768					4.735		.117			12.7140		
-462	4.625	4-5/8	4.899					4.865		.120			13.1070		
-475	4.750	4-3/4	5.030					4.995		.122			13.5000		
SRN-500	5.000	5	5.297					5.260		.130			14.0490		

SRN

DESCRIPTION

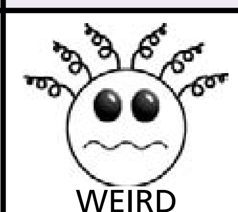
Standard RSN ring with prong for easy removal using pliers or screwdriver, or for holding it with your teeth.

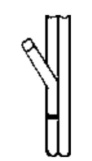
AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify prong or finger protruding from the ring.
2. Confirm bore diameter (Db).
3. Measure the free outside diameter (Dr) of the ring.
4. Determine the ring thickness (T) and radial wall (S).
5. Find the part in the chart above.

GENERAL USE





PROTRUDING TAB FOR REMOVAL.

GROOVE INTERCHANGE

USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

SRN ↔ HO (Page 16) ↔ HOI (Page 19) ↔ RRN (Page 58) ↔ UHO (Page 76)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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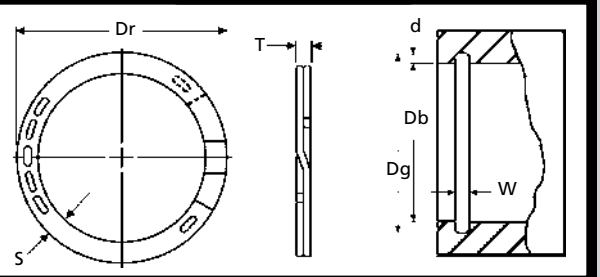
INTERNAL BALANCED

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Ramsey	BR		
Spirolox	BR		

TAB-LOCK SYSTEM



BR	BORE		RING			GROOVE			WEIGHT Lbs. per 100 Pieces	MATERIAL	
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)	Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)		Spring Steel	Stainless "-S02"
BR-200	2.000	2	2.091 +.020/-.000	.128	.049 +/-.003	2.071 +/-.005	.035	.056 +.004/-.000	0.9770		
-206	2.062	2-1/16	2.154			2.132			1.0110		
-212	2.125	2-1/8	2.217			2.195			1.0450		
-218	2.187	2-3/16	2.284	.138		2.262	.037		1.1670		
-225	2.250	2-1/4	2.347			2.324	.036		1.2030		
-231	2.312	2-5/16	2.403			2.390	.039		1.2420		
-237	2.375	2-3/8	2.476			2.453			1.2790		
-243	2.437	2-7/16	2.543	.148		2.519	.041		1.3990		
-250	2.500	2-1/2	2.606			2.582			1.4390		
-256	2.562	2-9/16	2.673			2.684	.043		1.4810		
-262	2.625	2-5/8	2.736			2.711			1.5200		
-268	2.687	2-11/16	2.803	.158		2.778	.045		1.6680		
-275	2.750	2-3/4	2.865			2.841			1.7110		
-281	2.813	2-13/16	2.929			2.903			1.7530		
-287	2.875	2-7/8	2.995	.168		2.969	.047		1.8960		
-293	2.937	2-15/16	3.058			3.031			1.9400		
-300	3.000	3	3.122		.061	3.096	.048	.068	2.4840		
-306	3.062	3-1/16	3.186			3.158			2.5390		
-312	3.125	3-1/8	3.251	.178		3.223	.049		2.7170		
-318	3.187	3-3/16	3.311			3.283	.048		2.7740		
-325	3.250	3-1/4	3.379			3.350	.050		2.8370		
-331	3.312	3-5/16	3.446			3.416	.052		3.0630		
-337	3.375	3-3/8	3.509	.188		3.479			3.1260		
-343	3.437	3-7/16	3.574			3.543	.053		3.1900		
-350	3.500	3-1/2	3.636			3.606			3.2530		
-356	3.562	3-9/16	3.703			3.672	.055		3.4950		
-362	3.625	3-5/8	3.769	.198		3.737	.056		3.5630		
-368	3.687	3-11/16	3.832			3.799			3.6290		
-375	3.750	3-3/4	3.894			3.862			3.6950		
-381	3.812	3-13/16	3.963	.208		3.930	.059		3.9550		
-387	3.875	3-7/8	4.025			3.993			4.0250		
-393	3.937	3-15/16	4.089			4.056			4.0950		
-400	4.000	4	4.157	.218		4.124	.062		4.3680		
-406	4.063	4-1/16	4.222			4.187			4.4410		
-412	4.125	4-1/8	4.284			4.249			4.5130		
-418	4.187	4-3/16	4.347			4.311			4.5850		
-425	4.250	4-1/4	4.416	.228		4.380	.065		4.8060		
-431	4.312	4-5/16	4.479			4.442			4.8820		
-437	4.375	4-3/8	4.543			4.505			4.9590		
BR-443	4.437	4-7/16	4.611	.238		4.573	.068		5.2600		

+.025/-.000 (BR-200 through -293)
+.030/-.000 (-300 through -400)
+.035/-.000 (-406 through BR-443)

BR

DESCRIPTION

Similar to the RR, except a series of slots opposite the ring gap balance the part for high RPM applications. Tab and slot locking system provides locking benefits.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm the presence of slots and tab lock system.
2. Verify bore diameter (Db).
3. Measure the free outside diameter (Dr) of the ring.
4. Determine the ring thickness (T) and radial wall (S).
5. Find the part in the chart above.

GENERAL USE

WEIRD

CONTACT US FOR DESIGN ASSISTANCE.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

BR ↔ RR (Page 52) ↔ KR (Page 61)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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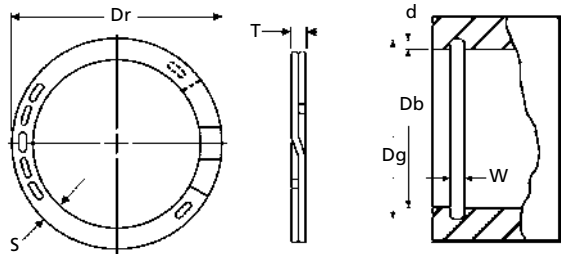
TAB-LOCK SYSTEM



INTERNAL BALANCED

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Ramsey	BR
Spirolox	BR

BR

BORE		RING			GROOVE			WEIGHT	MATERIAL	
Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)	Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel	Stainless "-S02"
BR-450	4-1/2	4.674	.238	.061 +/-.003	4.636	.068	.068	5.3400		
-456	4-9/16	4.737			4.698			5.4190		
-462	4-5/8	4.803			4.765			6.6930		
-468	4-11/16	4.867			4.827			6.7890		
-475	4-3/4	4.930			4.890	.070		6.8870		
-481	4-13/16	4.993			4.952			6.9840		
-487	4-7/8	5.055			5.015			7.0810		
-493	4-15/16	5.122			5.081			7.1840		
-500	5	5.185			5.144	.072		7.2820		
-512	5-1/8	5.311	.250	.072	5.269		.079	7.4770		
-525	5-1/4	5.436			5.393	.071		7.6700		
-537	5-3/8	5.566			5.522			7.8710		
-550	5-1/2	5.693			5.647	.073		8.0650		
-562	5-5/8	5.818			5.772			8.2590		
-575	5-3/4	5.950			5.903			8.4630		
-587	5-7/8	6.077			6.028	.076		8.6580		
-600	6	6.202			6.153			8.8520		
-612	6-1/8	6.349			6.297			13.4220		
-625	6-1/4	6.474			6.422	.086		13.7130		
-637	6-3/8	6.601			6.547			14.0040		
-650	6-1/2	6.726			6.672			14.2960		
-662	6-5/8	6.863			6.807			14.6100		
-675	6-3/4	6.987			6.932	.091		14.9010		
-687	6-7/8	7.114			7.057			15.1920		
-700	7	7.239	.312	.086	7.182		.094	15.4840		
-712	7-1/8	7.376			7.317			15.7980		
-725	7-1/4	7.501			7.442	.096		16.0900		
-737	7-3/8	7.628			7.567			16.3810		
-750	7-1/2	7.754			7.692			16.6730		
-762	7-5/8	7.890			7.827			16.9870		
-775	7-3/4	8.014			7.952	.101		17.2780		
-787	7-7/8	8.131			8.077			17.5690		
-800	8	8.266			8.202			17.8600		
-825	8-1/4	8.528			8.462	.106		21.8230		
-850	8-1/2	8.780			8.712			22.5220		
-900	9	9.293			9.222	.111		23.9510		
-950	9-1/2	9.806	.375		9.732	.116		25.3790		
-1000	10	10.320			10.242	.121		26.8080		
-1050	10-1/2	10.834			10.752	.126		28.2360		
BR-1100	11	11.347			11.262	.131		29.6640		

+.035/-.000 (Dr) · +.045/-.000 (Dr) · +.055/-.000 (Dr) · +.065/-.000 (Dr)

+/-.004 (T) · +/-.006 (Dg) · +/-.007 (Dg) · +/-.008 (Dg) · +.005/-.000 (W) · +.006/-.000 (W)

BR

DESCRIPTION

Similar to the RR, except a series of slots opposite the ring gap balance the part for high RPM applications. Tab and slot locking system provides locking benefits.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm the presence of slots and tab lock system.
2. Verify bore diameter (Db).
3. Measure the free outside diameter (Dr) of the ring.
4. Determine the ring thickness (T) and radial wall (S).
5. Find the part in the chart above.

GENERAL USE

WEIRD

BALANCED AND LOCKED INTO PLACE FOR HIGH RPM APPLICATIONS.

GROOVE INTERCHANGE

USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

BR ⟷ RR (Page 52) ⟷ KR (Page 61)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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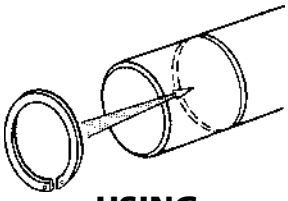
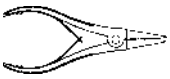
LOW PRICE PROMISE!! See Inside Cover

EXTERNAL

INSTALLED AXIALLY ONTO A SHAFT



USING PLIERS.



	IMPERIAL	METRIC
USC BASIC	Pgs: 68-69	Pg: 198
XD LIGHT DUTY	Pg: 70	N/A
USH NOTCHED	Pg: 71	N/A

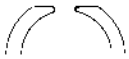
STANDARD GAP STYLES

EXTERNAL

#4 gap STANDARD

#36 gap STANDARD on "USH" rings

INTERNAL

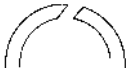


#6 gap STANDARD

#35 gap STANDARD on "UHO" rings

OPTIONAL GAP STYLES AVAILABLE AS A SPECIAL ORDER

EXTERNAL



#11 gap OPTIONAL

#14 gap OPTIONAL

#34 gap OPTIONAL

INTERNAL

#34 gap OPTIONAL

#14 gap OPTIONAL

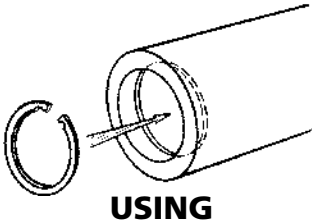
#1 gap OPTIONAL

#11 gap OPTIONAL

TOOLS Pages: 226-231

INTERNAL

INSTALLED AXIALLY INTO A BORE

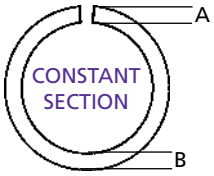


USING PLIERS.

	IMPERIAL	METRIC
UHB BASIC	Pgs: 72-73	Pgs: 200-201
ND LIGHT DUTY	Pg: 74	N/A
UHO NOTCHED	Pgs: 76-77	N/A

TOOLS Pages: 226-231

For special orders, see page 75.



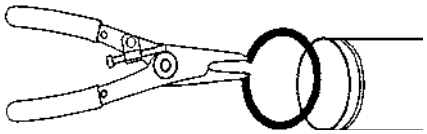
Wire width is the same at A and B . . .

. . . which causes a radial kink so that the part is "out of round" after installation . . .

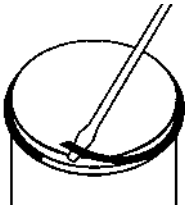
. . . but yields a low profile in the groove versus lug-style snap rings.

AUTOMATED INSTALLATION

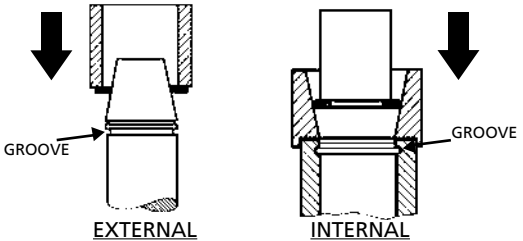
Use pliers . . .



. . . a screwdriver . . .



. . . or a tapered mandrel design depending on your application.



LET OUR SHOP MAKE A FIXTURE FOR YOU!

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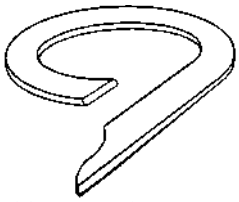
PRODUCT COMPARISONS



COILED FROM WIRE

Eaton™-style rings are a class of retaining rings popularized by the Eaton™ Corporation, a huge industrial conglomerate. These rings are wire formed and based on designs established by the automotive and industrial marketplace. Eaton™ began manufacturing these rings as an attempt at vertical consolidation. Because the ring business was such a small part of the company's total revenues, little attention was paid to marketing and distribution. As a result, these rings are very limited in supply, and prices for the parts tend to be high in comparison to thrust loads. Eaton™ has recently sold off their ring division to concentrate on other markets.

MOST OF THE RINGS IN THIS SECTION HAVE NOT BEEN MANUFACTURED BY THE EATON™ CORPORATION.

Eaton™-style rings are wire formed. Wire forming provides some product benefits on large and specialty rings because tooling costs are lower than for stamped snap rings, and there is minimal material waste from breakout. In addition, the grain of the material is circular, which provides excellent strength with a low profile.

THRUST LOAD COMPARISON
EATON™-STYLE RINGS VS. OTHER RETAINING RINGS

CARBON SPRING STEEL

EXTERNAL

SHAFT SIZE	EATON™ RING USC Pg 68 Thrust Load	SNAP RING SH Pg 6 Thrust Load	SPIRAL RINGS RS Pg 38 Thrust Load	SPIRAL RINGS RSN Pg 44 Thrust Load
1"	1200	2100	2150	2950
2"	4010	8050	7110	11,470
5"	17,110	37,100	36,050	52,580
7"	39,920	72,700	63,790	103,400

INTERNAL

BORE SIZE	EATON™ RING UHB Pg 72 Thrust Load	SNAP RING HO Pg 16 Thrust Load	SPIRAL RINGS RR Pg 52 Thrust Load	SPIRAL RINGS RRN Pg 58 Thrust Load
1"	1470	2800	1910	2310
2"	4000	10,300	7090	10,040
5"	17,110	55,000	36,050	65,095
7"	34,850	93,100	63,790	110,410

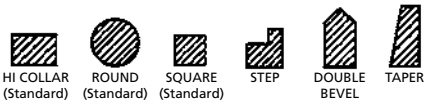
Thrust loads are expressed in pounds, based on groove shear with a safety factor of two (2).
Eaton™-style ring thrust loads are based on load times 0.60 when the ring distortion is .005 or greater from bending axially.
Actual results will be based on individual circumstances. These values are for reference only.

MATERIAL

CARBON SPRING STEEL
SAE 1060-1090
RC 42/53
(STANDARD)

500°F Max
100°F Min

OPTIONAL CROSS SECTIONS AS SPECIAL ORDER:



OTHER MATERIALS AVAILABLE ON REQUEST.

FINISHES

OIL DIPPED
(STANDARD)

Inhibits rust during handling.

ZINC PLATE
(STANDARD)

Up to 96 hours salt spray.

OTHERS PER QUOTE . . .

BLACK OXIDE
BRASS
BRONZE
CADMIUM
CHROME
COPPER
PARKERIZE

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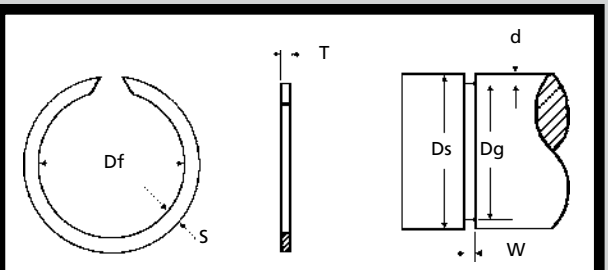


BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	XAN		
Rotor Clip	USC		

USC	SHAFT		RING					GROOVE				MATERIAL	TOOL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Spring Steel	
USC-031	.312	5/16	.281	+.000/-.015	.040	+/-.003	.025	.290	+/-.002	.011	.028		-E015R
-034	.344	11/32	.312					.322		.011			
-035	.354	8.99mm	.320					.330		.012			
-037	.375	3/8	.341					.351		.012			
-039	.393	9.98mm	.359	+.000/-.020				.369		.012			
-040	.406	13/32	.372					.382		.012			
-043	.438	7/16	.402					.412		.013			
-046	.469	15/32	.433					.443		.013			
-050	.500	1/2	.464	+.000/-.025	.048		.035	.474		.013	.039		-E047R
-055	.551	14mm	.514					.524		.013			
-056	.562	9/16	.524					.534		.014			
-059	.594	19/32	.555					.566		.014			
-062	.625	5/8	.586		.062			.597		.014			
-066	.669	17mm	.630					.640		.015			
-068	.688	11/16	.644				.042	.656		.016	.046		
-075	.750	3/4	.703					.716		.017			
-078	.781	15/32	.733					.745		.018			
-081	.812	13/16	.764					.776		.018			
-087	.875	7/8	.820	+.000/-.031	.078			.835	+/-.003	.020			
-093	.938	15/16	.881					.896		.021			
-098	.984	63/64	.925					.940		.022			
-100	1.000	1	.941		.093			.956		.022			
-102	1.023	25.98mm	.962					.977		.023			
-106	1.062	1-1/16	1.000				.050	1.016		.023	.056		
-112	1.125	1-1/8	1.060					1.075		.025			
-118	1.188	1-3/16	1.121					1.136		.026			
-125	1.250	1-1/4	1.179					1.194	+/-.004	.028			
-131	1.312	1-5/16	1.232					1.250		.031			
-137	1.375	1-3/8	1.291		.109			1.309		.033			
-143	1.438	1-7/16	1.351					1.370		.034			
-150	1.500	1-1/2	1.408					1.430		.035			
-156	1.562	1-9/16	1.467	+.000/-.046	.125	+/-.005	.062	1.490		.036	.068		
-162	1.625	1-5/8	1.527					1.551		.038			
-168	1.687	1-11/16	1.581					1.611		.038			
-175	1.750	1-3/4	1.640					1.670		.040			
-177	1.771	44.98mm	1.657		.141			1.687		.042			
-181	1.812	1-13/16	1.698					1.728		.042			
USC-187	1.875	1-7/8	1.759		.156			1.789		.043			

CONTACT PLANT FOR TOOL INFORMATION.

USC

DESCRIPTION

Wire formed spring steel ring installed using special pliers or with tapered plug and bushing (see page 66).

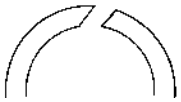
AXIAL ASSEMBLY

HOW TO IDENTIFY

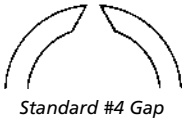
1. Confirm the shaft diameter (Ds).
2. Measure the free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON



This style only on USC-031 through -043.



Standard #4 Gap

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

USC ⟷ RST (Page 42)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***USC** CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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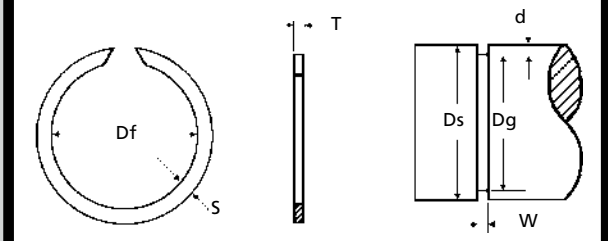

BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	XAN		
Rotor Clip	USC		

USC	SHAFT		RING					GROOVE					MATERIAL	TOOL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)		Spring Steel	
USC-196	1.969	1-31/32	1.849	+.000/-.046	.156	+/-.005	.062	1.879	+/-.004	.045	.068	+.004/-.000		
-200	2.000	2	1.880					1.910		.045				
-206	2.062	2-1/16	1.936					1.966		.048				
-212	2.125	2-1/8	1.997					2.027		.049				
-215	2.156	2-5/32	2.026					2.056		.050				
-225	2.250	2-1/4	2.116					2.146		.052				
-231	2.312	2-5/16	2.174		.187		.078	2.204		.054	.086			-E047R
-237	2.375	2-3/8	2.235					2.265		.055				
-243	2.437	2-7/16	2.295					2.325		.056				
-250	2.500	2-1/2	2.356					2.386		.057				
-255	2.559	65mm	2.413					2.443		.058				
-262	2.625	2-5/8	2.475					2.505		.060				
-268	2.687	2-11/16	2.535					2.565		.061				
-275	2.750	2-3/4	2.594	+.000/-.062	.218		.093	2.624		.063	.103	+.005/-.000		
-287	2.875	2-7/8	2.713					2.743		.066				
-293	2.937	2-15/16	2.771					2.801		.068				
-300	3.000	3	2.830					2.860		.070				
-306	3.062	3-1/16	2.890					2.920		.071				
-312	3.125	3-1/8	2.951					2.981		.072				
-315	3.156	3-5/32	2.980					3.010		.073				
-325	3.250	3-1/4	3.070		.250			3.100	+/-.006	.075				
-334	3.344	3-11/32	3.160					3.190		.077				
-343	3.437	3-7/16	3.251					3.281		.078				
-350	3.500	3-1/2	3.305	+.000/-.078			.109	3.340		.080	.120			-E601R
-354	3.543	90mm	3.346					3.381		.081				
-362	3.625	3-5/8	3.423					3.458		.083				
-368	3.687	3-11/16	3.482					3.517		.085				
-375	3.750	3-3/4	3.541					3.576		.087				
-387	3.875	3-7/8	3.657		.281			3.697		.089				
-393	3.938	3-15/16	3.713					3.758		.090				
-400	4.000	4	3.771	+.000/-.093				3.816		.092				
-425	4.250	4-1/4	4.016					4.066		.092				
-437	4.375	4-3/8	4.141					4.191		.092				
-450	4.500	4-1/2	4.255		.312			4.310		.095				
-475	4.750	4-3/4	4.495					4.550		.100				
-500	5.000	5	4.730					4.790		.105				
-525	5.250	5-1/4	4.970	+.000/-.125	.375		.125	5.030		.110	.139	+.006/-.000		-E602R
-550	5.500	5-1/2	5.206					5.266		.117				
-575	5.750	5-3/4	5.446					5.506		.122				
-590	5.900	149.86mm	5.600					5.656		.122				
-600	6.000	6	5.687					5.746		.127				
-625	6.250	6-1/4	5.916		.437		.156	5.986		.132	.174			
-650	6.500	6-1/2	6.151					6.226		.137				
-675	6.750	6-3/4	6.386					6.466		.142				
-700	7.000	7	6.621					6.706		.147				
-725	7.250	7-1/4	6.840	+.000/-.156	.500		.187	6.930	+/-.008	.160	.209	+.008/-.000		-
-750	7.500	7-1/2	7.090					7.180		.160				
-800	8.000	8	7.560					7.660		.170				
-850	8.500	8-1/2	8.050					8.160		.170				
-900	9.000	9	8.545					8.660		.170				
-925	9.250	9-1/4	8.800					8.910		.170				
-950	9.500	9-1/2	9.040					9.160		.170				
USC-1000	10.000	10	9.535					9.660		.170				

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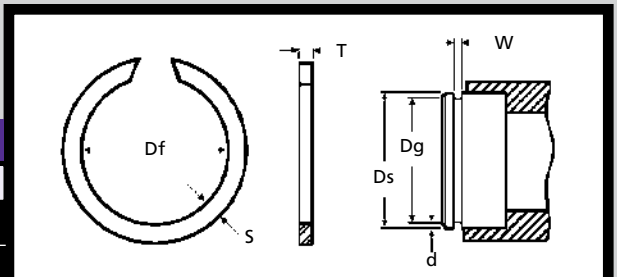


LIGHT-DUTY EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	XD

XD

SHAFT		RING			GROOVE			MATERIAL	TOOL
Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)	Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Spring Steel	
XD-050	.500	1/2	.465 +.000/-.025	.048 +/-.003	.035 +/-.002	.474 +/-.002	.013	.039 +.003/-.000		
-062	.625	5/8	.587	.062		.597	.014			
-075	.750	3/4	.704	.078		.716	.017			
-087	.875	7/8	.823 +.000/-.031	.093		.833 +/-.003	.021			
-100	1.000	1	.944			.954	.023			
-112	1.125	1-1/8	1.065	.125		1.077	.024			
-118	1.187	1-3/16	1.120			1.135	.026			
-125	1.250	1-1/4	1.179			1.194	.028			
-131	1.312	1-5/16	1.232			1.252	.030			
-137	1.375	1-3/8	1.289			1.309 +/-.004	.033			
-143	1.437	1-7/16	1.349			1.369	.034			
-150	1.500	1-1/2	1.410		.042	1.430	.035	.046		
-162	1.625	1-5/8	1.520 +.000/-.062	.156 +/-.005	+/-.002	1.545	.040			-E047R
-168	1.687	1-11/16	1.582			1.607				
-175	1.750	1-3/4	1.645			1.670				
-193	1.937	1-15/16	1.832			1.857				
-200	2.000	2	1.895			1.920				
-218	2.187	2-3/16	2.082			2.107				
-225	2.250	2-1/4	2.145			2.170				
-237	2.375	2-3/8	2.270			2.295				
-250	2.500	2-1/2	2.390			2.420				
-275	2.750	2-3/4	2.596 +.000/-.078	.187	.062	2.626 +/-.006	.062	.068 +.004/-.000		
-293	2.937	2-15/16	2.783			2.813				
-300	3.000	3	2.846			2.876				
-312	3.125	3-1/8	2.965			3.000				
-325	3.250	3-1/4	3.090			3.125				
-337	3.375	3-3/8	3.215			3.250				
-350	3.500	3-1/2	3.340			3.375				
-375	3.750	3-3/4	3.570 +.000/-.093	.218	.078	3.610	.070	.086 +.005/-.000		-E601R
-400	4.000	4	3.820			3.860				
-425	4.500	4-1/4	4.070			4.110				
-450	4.500	4-1/2	4.320			4.360				
-475	4.750	4-3/4	4.560			4.610				
-500	5.000	5	4.800			4.860				
-550	5.500	5-1/2	5.280 +.000/-.125	.250	.093	5.340 +/-.008	.080	.103		
-600	6.000	6	5.775			5.840				
-650	6.500	6-1/2	6.270			6.340				
-700	7.000	7	6.765			6.840				
-750	7.500	7-1/2	7.245	.281	.109	7.320	.090	.120		
XD-800	8.000	8	7.740			7.820				

CONTACT PLANT FOR TOOL INFORMATION.

XD

DESCRIPTION

Generally this part is thinner than the USC but has a wider radial wall. Used in needle bearings and other lighter-weight applications.

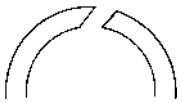
AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm the shaft diameter (Ds).
2. Measure the free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

WEIRD



This style only on XD-050 and -062.

Standard #4 Gap

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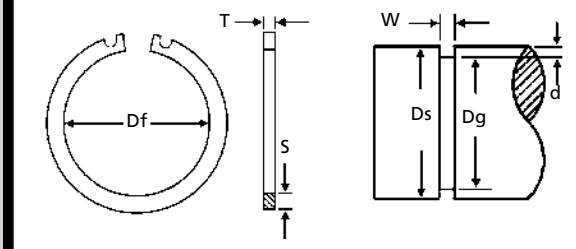

NOTCHED EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	EN
Rotor Clip	USH

USH

SHAFT		RING					GROOVE			MATERIAL	TOOL
Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Spring Steel	
USH-206	2-1/16	1.926	+.000/-.060	.187	+/-.005	.078	1.946	+/-.006	.058	.086 +.005/-.000		-E093
-212	2-1/8	1.983					2.003		.061			
-215	2-5/32	2.012					2.032		.062			
-225	2-1/4	2.100		.203			2.120		.065			
-231	2-5/16	2.158					2.178		.067			
-237	2-3/8	2.219					2.239		.068			
-243	2-7/16	2.279					2.299		.069			
-250	2-1/2	2.340					2.360		.070			-E108
-255	65mm	2.399					2.419		.070			
-262	2-5/8	2.461					2.481		.072			
-268	2-11/16	2.521					2.541		.073			
-275	2-3/4	2.577	+.000/-.080	.218		.093	2.602		.074	.103		
-287	2-7/8	2.696					2.721		.077			
-293	2-15/16	2.754					2.779		.079			
-300	3	2.813					2.838		.081			
-306	3-1/16	2.873					2.898		.082			
-312	3-1/8	2.932					2.957		.084			
-315	3-5/32	2.961					2.986		.085			-E120X
-325	3-1/4	3.051					3.076		.087			
-334	3-11/32	3.141					3.166		.090			
-343	3-7/16	3.232		.250			3.257		.090			
-350	3-1/2	3.286					3.316		.092			
-354	90mm	3.327					3.357		.093			
-362	3-5/8	3.405					3.435		.095			
-368	3-11/16	3.463					3.493		.097			
-375	3-3/4	3.522	+.000/-.093	.281		.109	3.552		.099	.120		
-387	3-7/8	3.643					3.673		.101			
-393	3-15/16	3.704					3.734		.102			
-400	4	3.762					3.792		.104			
-425	4-1/4	4.025					4.065		.092			
-437	4-3/8	4.150					4.190		.092			
-450	4-1/2	4.270		.312			4.310		.095			-E170
-475	4-3/4	4.510					4.550		.100			
USH-500	5	4.750					4.790		.105			

TOOL DESCRIPTIONS ON PAGE 226.

USH

AXIAL ASSEMBLY

DESCRIPTION

Low-profile wire formed ring with notches (instead of lugs) for installation pliers. This design requires no orientation during installation.

HOW TO IDENTIFY

1. Confirm the shaft diameter (Ds).
2. Measure the free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

NOTCHES HELP PREVENT RING FROM FLYING OFF THE PLIERS DURING INSTALLATION.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

USH ⟷ SH (Page 6) ⟷ SHI (Page 10) ⟷ RSN (Page 44) ⟷ SSN (Page 49)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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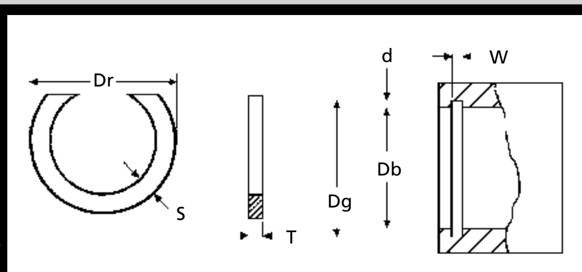


BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	NAN
Rotor Clip	UHB

UHB

UHB	BORE Decimal (Db)	BORE Fraction (Db)	RING Free Outside Dia. (Dr)	Dr tol.	RING Radial Wall (S)	S tol.	RING Thickness (T)	T tol.	GROOVE Diameter (Dg)	Dg tol.	GROOVE Depth (d)	GROOVE Width (W)	W tol.	MATERIAL
UHB-037	.375	3/8	.400	+.020/-.000	.035	+/-.003	.025	+/-.002	.395	+/-.003	.010	.028	+.003/-.000	Spring Steel
-043	.438	7/16	.467						.462		.012			
-050	.500	1/2	.530	+.025/-.000	.040		.035		.524		.012	.039		
-051	.512	13mm	.542						.536		.012			
-056	.562	9/16	.600		.048				.590		.014			
-062	.625	5/8	.670						.657		.016			
-068	.688	11/16	.733						.720		.016			
-075	.750	3/4	.799						.786		.018			
-077	.777	19.74mm	.827		.062		.042		.813		.018	.046		
-081	.812	13/16	.867						.852		.020			
-087	.875	7/8	.934	+.031/-.000					.919		.022			
-090	.901	22.88mm	.961		.078				.945		.022			
-093	.938	15/16	1.003						.986		.024			
-100	1.000	1	1.070						1.052		.024			
-102	1.023	25.98mm	1.094		.093				1.075	+/-.005	.026			
-106	1.062	1-1/16	1.134				.050		1.114		.026	.056		
-112	1.125	1-1/8	1.202						1.181		.028			
-118	1.188	1-3/16	1.270						1.248		.030			
-125	1.250	1-1/4	1.337		.109				1.314		.032			
-131	1.312	1-5/16	1.404						1.380		.034			
-137	1.375	1-3/8	1.472						1.447		.036			
-143	1.438	1-7/16	1.535		.125	+/-.005			1.510		.036			
-145	1.456	36.08mm	1.557						1.532		.038			
-150	1.500	1-1/2	1.607						1.576		.038			
-156	1.562	1-9/16	1.668	+.046/-.000			.062		1.642		.040	.068	+.004/-.000	
-162	1.625	1-5/8	1.736		.141				1.709		.042			
-165	1.653	41.99mm	1.765						1.737		.042			
-168	1.688	1-11/16	1.804		.156				1.776		.044			
-175	1.750	1-3/4	1.870						1.842		.046			
-181	1.812	1-13/16	1.933						1.904		.046			
-185	1.850	47mm	1.975						1.946		.048			
-187	1.875	1-7/8	2.000						1.973		.048			
-193	1.938	1-15/16	2.068						2.038		.050			
-196	1.968	1-31/32	2.098						2.068		.050			
-200	2.000	2	2.131						2.100		.050			
-206	2.062	2-1/16	2.197						2.166	+/-.006	.052	.086	+.005/-.000	
-212	2.125	2-1/8	2.260				.078		2.229		.052			
-218	2.188	2-3/16	2.331		.171				2.296		.054			
-225	2.250	2-1/4	2.393						2.358		.054			
UHB-231	2.312	2-5/16	2.459						2.424		.056			

UHB

DESCRIPTION

Wire formed spring steel ring installed using special pliers or with a plug and tapered bushing (see page 66).

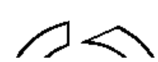
AXIAL ASSEMBLY

HOW TO IDENTIFY

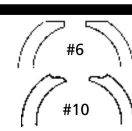
1. Confirm the bore diameter (Db).
2. Measure the free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

COMMON



This style only on UHB-037 through -075.



Standard Gap Profile at Manufacturer's option.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

UHB ⟷ RRT (Page 56)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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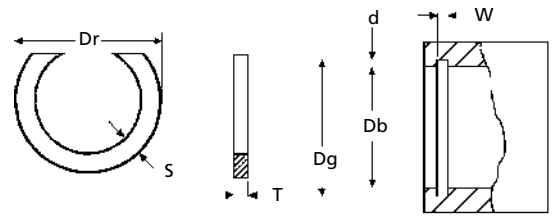

BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	NAN		
Rotor Clip	UHB		

UHB

BORE		RING						GROOVE				MATERIAL
Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)		Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	
UHB-237	2.375	2-3/8	2.523	+.046/-.000	.171	+/-.005	.078	+/-.002	2.487	+/-.006	.056	.086	+.005/-.000	Spring Steel
-244	2.440	61.98mm	2.592		.187				2.556		.058			
-250	2.500	2-1/2	2.653						2.616		.058			
-253	2.531	2-17/32	2.688						2.651		.060			
-256	2.562	2-9/16	2.726				.093		2.686		.062	.103		
-262	2.625	2-5/8	2.790						2.750		.062			
-268	2.688	2-11/16	2.856						2.816		.062			
-271	2.717	68.83mm	2.882						2.842		.064			
-275	2.750	2-3/4	2.918	+.062/-.000					2.878		.064			
-281	2.813	2-13/16	2.985						2.945		.066			
-283	2.834	72mm	3.006						2.966		.066			
-287	2.875	2-7/8	3.056						3.011		.068			
-300	3.000	3	3.181						3.136		.068			
-306	3.062	3-1/16	3.247		.218		.109		3.202		.070	.120		
-312	3.125	3-1/8	3.311						3.265		.070			
-315	3.156	3-5/32	3.342						3.296		.070			
-325	3.250	3-1/4	3.442						3.394		.072			
-334	3.346	85mm	3.539						3.490		.072			
-346	3.469	3-15/32	3.663						3.613		.072			
-350	3.500	3-1/2	3.700	+.078/-.000	.250				3.648		.074			
-354	3.543	90mm	3.745						3.691		.074			
-356	3.562	3-9/16	3.766						3.710		.074			
-362	3.625	3-5/8	3.831						3.773		.074			
-375	3.750	3-3/4	3.962						3.902		.076			
-387	3.875	3-7/8	4.089						4.027		.076			
-393	3.938	3-15/16	4.156						4.094		.078			
-400	4.000	4	4.221	+.093/-.000					4.156		.078			
-412	4.125	4-1/8	4.355						4.285		.080			
-425	4.250	4-1/4	4.485						4.410		.080			
-433	4.330	110mm	4.565						4.490		.080			
-443	4.436	4-7/16	4.670						4.596		.080			
-450	4.500	4-1/2	4.744						4.664		.082			
-462	4.625	4-5/8	4.875						4.795		.085			
-475	4.750	4-3/4	5.011		.281				4.926		.088			
-500	5.000	5	5.265						5.180		.090			
-525	5.250	5-1/4	5.530	+.125/-.000	.312		.125		5.435	+/-.007	.092	.139		
-537	5.375	5-3/8	5.660						5.565		.095			
-550	5.500	5-1/2	5.796						5.696		.098			
-575	5.750	5-3/4	6.050						5.950		.100			
-600	6.000	6	6.309						6.204		.102			
-625	6.250	6-1/4	6.568	+.156/-.000	.343		.156		6.458		.104	.174		
-650	6.500	6-1/2	6.832						6.712		.106			
-662	6.625	6-5/8	6.975						6.845		.110			
-675	6.750	6-3/4	7.100						6.970		.110			
-700	7.000	7	7.350						7.220		.110			
-725	7.250	7-1/4	7.630	+.187/-.000	.375		.187		7.500	+/-.008	.125	.209	+.006/-.000	
-750	7.500	7-1/2	7.890						7.750		.125			
-800	8.000	8	8.400						8.250		.125			
-825	8.250	8-1/4	8.665		.437				8.540		.145			
-850	8.500	8-1/2	8.915						8.790		.145			
-875	8.750	8-3/4	9.205		.500				9.080		.165			
-900	9.000	9	9.455						9.330		.165			
-905	9.055	230mm	9.509						9.384		.165			
-950	9.500	9-1/2	9.955						9.830		.165			
-984	9.840	9-27/32	10.295						10.170		.165			
UHB-1000	10.000	10	10.455						10.330		.165			

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INTERNAL EATON™-STYLE RINGS

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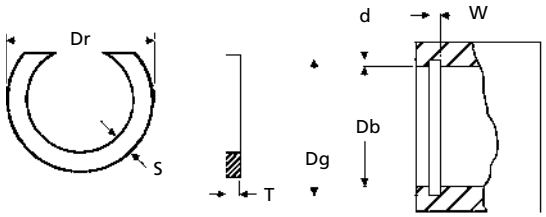


LIGHT-DUTY INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	ND		

ND	BORE		RING				GROOVE			MATERIAL
	Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)		Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Spring Steel
ND-112	1.125	1-1/8	1.196	+.031/-.000	.093	+/-.003	.042	+/-.002	1.181	+/-.005	.028	.046	+.003/-.000	
-125	1.250	1-1/4	1.330						1.310		.030			
-137	1.375	1-3/8	1.460						1.435					
-150	1.500	1-1/2	1.600		.125				1.580		.040			
-162	1.625	1-5/8	1.725	+.062/-.000					1.705					
-175	1.750	1-3/4	1.855						1.830					
-187	1.875	1-7/8	1.990		.156				1.965		.045			
-200	2.000	2	2.115						2.090					
-206	2.062	2-1/16	2.177						2.152	+/-.006				
-218	2.187	2-3/16	2.302						2.277					
-231	2.312	2-5/16	2.432						2.402					
-243	2.437	2-7/16	2.557						2.527					
-256	2.562	2-9/16	2.682						2.652					
-300	3.000	3	3.154	+.078/-.000	.187	+/-.005	.062		3.124		.062	.068	+.004/-.000	
-325	3.250	3-1/4	3.404						3.374					
-350	3.500	3-1/2	3.654						3.624					
-375	3.750	3-3/4	3.904						3.874					
-400	4.000	4	4.155						4.125					
-425	4.250	4-1/4	4.429	+.093/-.000	.218		.078		4.394		.072	.086	+.005/-.000	
-450	4.500	4-1/2	4.679						4.644					
-475	4.750	4-3/4	4.929						4.894					
-500	5.000	5	5.184						5.144					
-525	5.250	5-1/4	5.434						5.394	+/-.007				
-575	5.750	5-3/4	5.934						5.894					
-600	6.000	6	6.220	+.125/-.000	.250		.093		6.160	+/-.008	.080	.103		
-650	6.500	6-1/2	6.730						6.660					
-700	7.000	7	7.240						7.160					
-725	7.250	7-1/4	7.500	+.187/-.000					7.410					
-750	7.500	7-1/2	7.760						7.660					
ND-800	8.000	8	8.285						8.160					

ND

AXIAL ASSEMBLY

DESCRIPTION

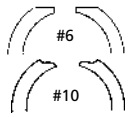
Generally this part is thinner than the UHB but has a wider radial wall. Used in needle bearings and other lighter-weight applications.

HOW TO IDENTIFY

1. Confirm the bore diameter (Db).
2. Measure the free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

WEIRD



Standard Gap Profile at Manufacturer's option.

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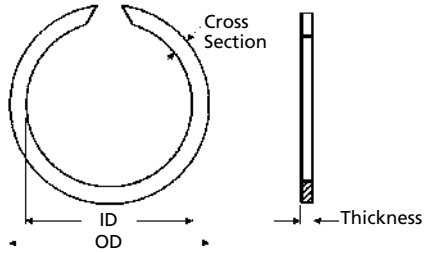
JUST COPY AND FAX TO 785-392-2845



BOX 232 • MINNEAPOLIS, KS • 67467

G.L. HUYETT

SPECIAL "EATON™-STYLE" RINGS

NAME: _____ COMPANY: _____

PHONE: _____ FAX: _____

ZODIAC SIGN: _____ NUMBER OF PETS: _____ ❒ SMOKER ❒ NONSMOKER

APPLICATION

To assist you, we are providing this "Copy and Fax" design sheet. Please fill this page out as completely as possible and fax it to our plant for quotation.

How is the part going to be used? _____

_____

_____

_____

Quantity to Quote:

Q_1: _____

Q_2: _____

Q_3: _____

Q_4: _____

RING

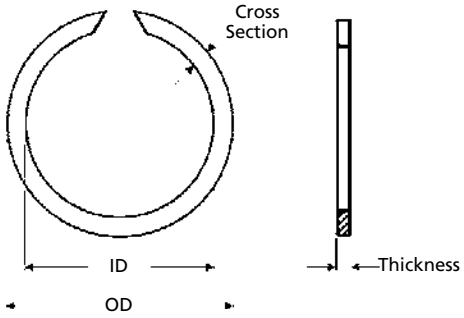
RING DIMENSIONS:

Inside Diameter: _____

Outside Diameter: _____

Cross Section: _____

Thickness: _____



Will the ring be disassembled? ❒ Yes ❒ No

Required thrust load: _____

Rotational speed (RPM): _____

Are you currently using a retaining ring for this application? ❒ Yes ❒ No

If yes, what type? _____

GROOVE

EXTERNAL:

Shaft Dia: _____

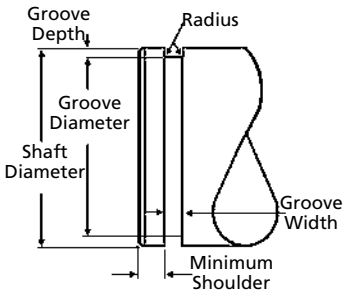
Groove Dia: _____

Groove Depth: _____

Groove Width: _____

Radius: _____

Min. Shoulder: _____



INTERNAL:

Bore Dia: _____

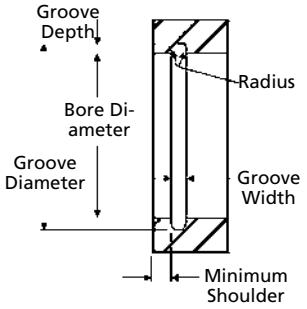
Groove Dia: _____

Groove Depth: _____

Groove Width: _____

Radius: _____

Min. Shoulder: _____



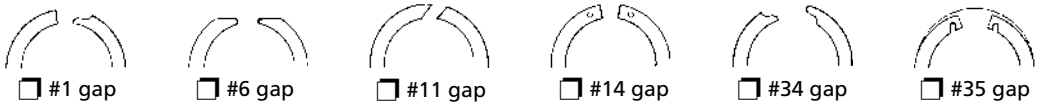
GAP

EXTERNAL:

❒ #4 gap ❒ #11 gap ❒ #14 gap ❒ #34 gap ❒ #36 gap

Check the box that applies.

INTERNAL:



❒ #1 gap ❒ #6 gap ❒ #11 gap ❒ #14 gap ❒ #34 gap ❒ #35 gap

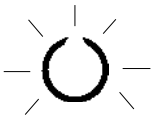
MATERIAL

If you know . . .

MATERIAL

❒ Spring Steel
❒ 302 Stainless Steel
❒ Inconel X-750
❒ 17-7 Ph/C Stainless
❒ 316 Stainless Steel
❒ Other: _____

FINISH



❒ Black Oxide
❒ Phosphate
❒ Zinc
❒ Other: _____

If you don't know, give us some information about the environment:

TEMPERATURE

_____ ° Maximum ❒ F ❒ C

ATMOSPHERE

❒ Corrosive
❒ Non-Corrosive

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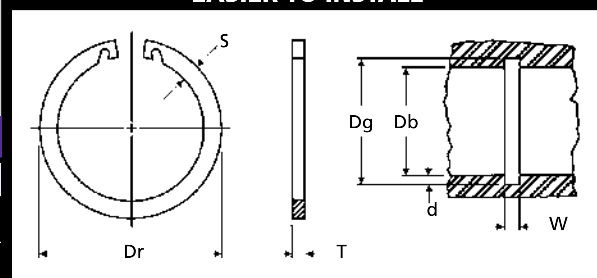


NOTCHED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	IN
Rotor Clip	UHO

UHO	BORE Decimal (Db)	BORE Fraction (Db)	RING Free Outside Dia. (Dr)	Dr Tol.	RING Radial Wall (S)	S Tol.	RING Thickness (T)	T Tol.	GROOVE Diameter (Dg)	Dg Tol.	GROOVE Depth (d)	GROOVE Width (W)	W Tol.	MATERIAL	TOOL
UHO-175	1.750	1-3/4	1.878	+.070/-.000	.156	+/-.005	.062	+/-.002	1.858	+/-.005	.054	.068	+.004/-.000	Spring Steel	-I070
-181	1.812	1-13/16	1.942						1.922		.055				
-185	1.850	47mm	1.982						1.962		.056				
-187	1.875	1-7/8	2.014						1.989		.057				
-193	1.938	1-15/16	2.081						2.056		.059				
-200	2.000	2	2.147						2.122		.061				
-204	2.047	2-3/64	2.201		.171		.078		2.171	+/-.006	.062	.086	+.005/-.000		
-206	2.062	2-1/16	2.201						2.186		.062				
-212	2.125	2-1/8	2.271						2.251		.063				
-216	2.165	55mm	2.338						2.295		.065				
-218	2.188	2-3/16	2.338						2.318		.065				
-225	2.250	2-1/4	2.402						2.382		.066				
-231	2.312	2-5/16	2.470						2.450		.069				
-237	2.375	2-3/8	2.537		.188				2.517		.071				-I090
-244	2.440	61.98mm	2.604						2.584		.072				
-250	2.500	2-1/2	2.673	+.080/-.000					2.648		.074				
-253	2.531	2-17/32	2.706				.093		2.681		.075	.103			
-256	2.562	2-9/16	2.739						2.714		.076				
-262	2.625	2-5/8	2.806						2.781		.078				
-267	2.677	68mm	2.868						2.837		.080				
-268	2.688	2-11/16	2.868						2.848		.080				
-275	2.750	2-3/4	2.944						2.914		.082				
-281	2.812	2-13/16	3.025						2.980		.084				
-283	2.835	72mm	3.025						3.005		.085				
-287	2.875	2-7/8	3.086		.203				3.051		.088				
-295	2.953	75mm	3.175						3.135		.091				
-300	3.000	3	3.222						3.182		.091				
-306	3.062	3-1/16	3.288	+.100/-.000	.218		.109		3.248		.093	.120			-I108
-312	3.125	3-1/8	3.353						3.315		.095				
-314	3.149	79.98mm	3.388						3.341		.096				
-315	3.156	3-5/16	3.388						3.348		.096				
-325	3.250	3-1/4	3.488						3.446		.098				
-334	3.346	3-11/32	3.590						3.546		.100				
-347	3.469	3-15/32	3.721						3.675		.103				-I120
-350	3.500	3-1/2	3.760		.234				3.710		.105				
-354	3.543	90mm	3.805						3.755		.106				
UHO-356	3.562	3-9/16	3.805						3.776		.107				

TOOL DESCRIPTIONS ON PAGE 227 & 228.

UHO

DESCRIPTION

Low-profile wire formed ring with notches (instead of lugs) for installation pliers. This design requires no orientation during installation.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm the bore diameter (Db).
2. Measure the free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

NOTCHES HELP PREVENT RING FROM FLYING OFF THE PLIERS DURING INSTALLATION.

GROOVE INTERCHANGE

USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

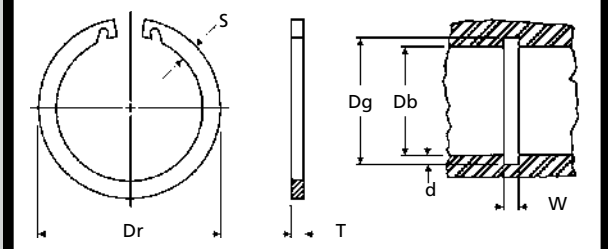
UHO ↔ HO (Page 16) ↔ HOI (Page 19) ↔ RRN (Page 58) ↔ SRN (Page 63)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

UHO *CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

EASIER TO INSTALL



NOTCHED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	IN		
Rotor Clip	UHO		

UHO

BORE		RING				GROOVE			MATERIAL	TOOL
Decimal (Db)	Fraction (Db)	Free Outside Dia. (Dr)		Radial Wall (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)		Spring Steel	
UHO-362	3-5/8	3.895	+.100/-.000	.234	.109	3.841	+/-.006	.108	.120	+.005/-.000		-I120
-374	95mm	4.030		.250		3.964		.112				
-375	3-3/4	4.030				3.974		.112				
-387	3-7/8	4.165				4.107		.116				
-393	3-15/16	4.234				4.174		.118				
-400	4	4.300				4.240		.120				-I120X
-412	4-1/8	4.430				4.365		.120				
-425	4-1/4	4.555				4.490		.120				
-433	110mm	4.641				4.571		.120				
-450	4-1/2	4.815		.281		4.740		.120				
-462	4-5/8	4.940				4.865		.120				
-472	120mm	5.070				4.969		.122				
-475	4-3/4	5.070				4.995		.122				
-500	5	5.340				5.260		.130				
-525	5-1/4	5.600	+.120/-.000	.312	.125	5.520	+/-.007	.135	.139	+.006/-.000		-I150
-537	5-3/8	5.735				5.650		.130				
-550	5-1/2	5.860				5.770		.135				
-575	5-3/4	6.120				6.020		.135				
-600	6	6.380				6.270		.135				
-625	6-1/4	6.640	+.150/-.000	.343	.156	6.530	+/-.008	.140	.174	+.008/-.000		
-650	6-1/2	6.905				6.790		.145				
-662	6-5/8	7.045				6.925		.150				
-675	6-3/4	7.180				7.055		.152				
-700	7	7.445				7.315		.157				
-725	7-1/4	7.705	+.180/-.000	.375	.187	7.575		.162	.209			-I045
-750	7-1/2	7.975				7.840		.170				
-775	7-3/4	8.240				8.100		.175				
-800	8	8.505	+.220/-.000	.437		8.360		.180				
-825	8-1/4	8.770				8.620		.185				
-850	8-1/2	9.035				8.880		.190				
-875	8-3/4	9.305				9.144		.197				
-900	9	9.564				9.404		.202				
-925	9-1/4	9.833		.500		9.668		.209				
-950	9-1/2	10.100				9.930		.215				
-975	9-3/4	10.365				10.190		.220				
UHO-1000	10.000	10.630				10.450		.225				

TOOL DESCRIPTIONS ON PAGE 227 & 228.

UHO

AXIAL ASSEMBLY

DESCRIPTION

Low-profile wire formed ring with notches (instead of lugs) for installation pliers. This design requires no orientation during installation.

HOW TO IDENTIFY

1. Confirm the bore diameter (Db).
2. Measure the free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

GOOD INTERIOR CLEARANCE WITH NO PROTRUSIONS.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

UHO ⟷ HO (Page 16) ⟷ HOI (Page 19) ⟷ RRN (Page 58) ⟷ SRN (Page 63)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

WIRE RINGS

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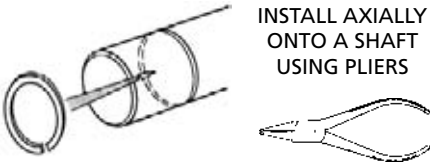
TYPES

SQUARE SECTION

XSO EXTERNAL (RADIAL)
Pgs: 80-81
Open gap for radial installation onto a shaft.

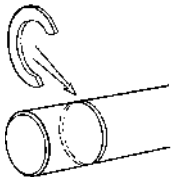
XSC EXTERNAL (AXIAL)
Pgs: 82-83
Closed gap for axial installation onto a shaft.

AXIAL ASSEMBLY



INSTALL AXIALLY ONTO A SHAFT USING PLIERS

RADIAL ASSEMBLY



INSTALL RADIALLY ONTO A SHAFT USING AN APPLICATOR

ROUND SECTION

XRO EXTERNAL (RADIAL)
Pgs: 84-85
Open gap for radial installation onto a shaft.

XRC EXTERNAL (AXIAL)
Pg: 86
Closed gap for axial installation onto a shaft.

A10 EXTERNAL (GALVANIZED)
Pg: 87
Installed axially onto a shaft.

DIN 7993A

DRP EXTERNAL (AXIAL)
Pg: 202
Installed axially onto a shaft. More common in European assemblies.

DIN 7993B

DRB INTERNAL (AXIAL)
Pg: 203
Installed axially into a bore. More common in European assemblies.

METRIC

D17 INTERNAL (AXIAL)
Pg: 204
Installed axially into a bore. For gudgeon pin retention.

RECTANGULAR SECTION

TRC EXTERNAL (AXIAL)
Pg: 88
Closed gap for axial installation onto a shaft.

AAR CRIMPED (AXIAL)
Pg: 88
Ring is installed axially and "crimped" into position using a standard pliers.

METRIC

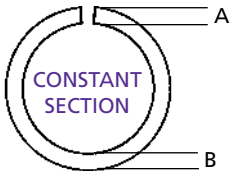
DSP EXTERNAL (RADIUSED EDGE)
Pg: 205
Installed axially onto a shaft. More common in European assemblies.

METRIC

DSW EXTERNAL (AXIAL)
Pgs: 206-207
Installed axially onto a shaft. Used for bearing retention.

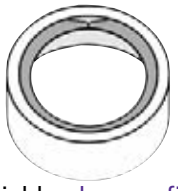
METRIC

DSB INTERNAL (AXIAL)
Pgs: 208-211
Open gap for installation onto a shaft. Used for bearing retention.



Wire width is the same at A and B . . .

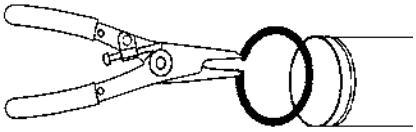
. . . which causes a radial kink so that the part is "out of round" after installation . . .



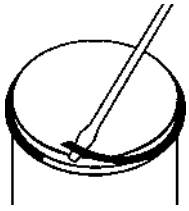
. . . but yields a low profile in the groove versus lug-style snap rings.

AUTOMATED INSTALLATION

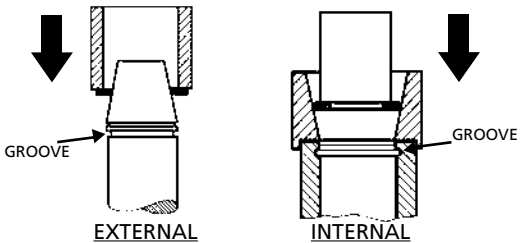
Use pliers . . .



. . . a screwdriver . . .



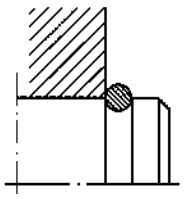
. . . or a tapered mandrel design depending on your application.



LET OUR SHOP MAKE A FIXTURE FOR YOU!

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

PRODUCT COMPARISONS



LOW PROFILE

Shaft locknuts (see pages 132-137) were the dominant form of retaining devices in the early part of the century. Machined from steel and screwed onto shafts, locknuts provided high strength shoulders for heavy-duty and precision applications. Innovators like Henry Ford and Cyrus McCormick began to look for ways to automate the assembly of durable goods so that unit costs could drop to more affordable levels. The locking wire ring emerged as a retaining device during this time. Lock rings were mostly coiled from round cross-sections because mills were unable to roll and shape higher-strength forms that are used today.

During World War II, Allied troops captured a German tank which was disassembled. It was discovered that German engineers had perfected new and innovative ring designs using rectangular-shaped wire, complete with lug holes and curved shapes. These designs were reverse engineered, and production was organized to support the Allied War effort.

New engineering and designs resulted in the successful origination of today's retaining ring manufacturers, including Waldes and Rotor Clip in the United States and Anderton in the United Kingdom. Today's retaining rings have been transformed into "application specific" devices that are generations ahead of their predecessors.

"WHY ARE LOCK RINGS STILL USED?"

It is difficult to get engineers to change old habits. Some engineers continue to use old designs because of corporate inertia. Wire rings do possess a couple of advantages for some applications, including:

- -Low profile for minimal clearance
- -Less precise groove requirements
- -Ready access to a multitude of different materials
- -Permanent retention with no removability
- -Automated assembly

Most wire rings are used in the automotive industry for internal engine and transmission components. Wire rings are found in pistons, on gudgeon pins, and in needle roller bearings where removability is not an important benefit. Automated installation and reduced piece cost prevail as engineering considerations. Upon installation, wire rings are difficult, if not impossible, to remove. Wire rings are not reusable and are difficult to identify because of deformation during use and removal.

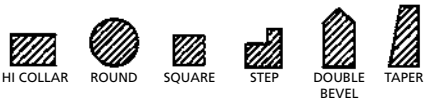
G.L. Huyett has worked to assemble a broad inventory of the more popular styles. We regularly make special parts to print on request. Please feel free to forward your specifications.

MATERIAL

CARBON SPRING STEEL
SAE 1060-1090
RC 42/53
(STANDARD)

500°F Max
100°F Min

OPTIONAL CROSS SECTIONS AS SPECIAL ORDER:



OTHER MATERIALS AVAILABLE ON REQUEST.

FINISHES

OIL DIPPED
(STANDARD)

Inhibits rust during handling.

ZINC PLATE
(STANDARD)

Up to 96 hours salt spray.

OTHERS PER QUOTE . . .

. . . CALL FOR PRICE AND AVAILABILITY.

OTHER FINISHES, INCLUDING CADMIUM, AVAILABLE ON REQUEST.

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SQUARE SECTION WIRE RINGS

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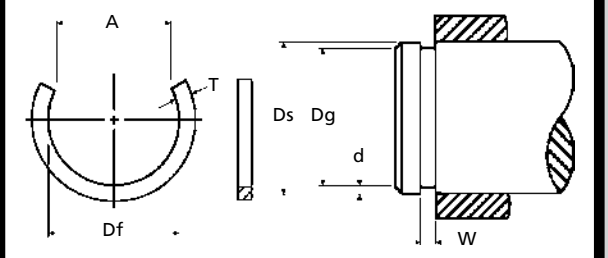
EXTERNAL (RADIAL)

OPEN STYLE



MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	A0600	Eaton	400 Series
Arcon National	XSO		

XSO

SHAFT		RING			GROOVE			WEIGHT	MATERIAL
Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)	Wire Cross Section (T)	Gap (A)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel
XSO-211	1/8	.114 +.000/-.020	.020 +/-.002	.101 +.000/-6%	.115 +.003/-.000	.005	.024 +/-.002	0.0030	
-2125	.156	.145	.020	.128	.146	.005	.024	0.0040	
-212	.188	.175	.020	.154	.178	.005	.024	0.0050	
-213	3/16	.173	.025	.153	.176	.006	.029	0.0070	
-2135	.219	7/32	.203	.025	.179	.207	.006	.029	0.0080
-214	.250	1/4	.236	.025	.208	.238	.006	.030	0.0090
-215			.232	.031	.205	.234	.008	.036	0.0140
-2155	.281	9/32	.261	.031	.230	.265	.008	.036	0.0160
-216	.312	5/16	.293	.031	.258	.296	.008	.036	0.0180
-217			.289	.039	.255	.292	.010	.045	0.0290
-218	.375	3/8	.353	.035	.311	.357	.009	.041	0.0280
-219			.347	.046	.305	.351	.012	.052	0.0490
-220	.438	7/16	.413	.039	.364 +.000/-5%	.417	.010	.045	0.0330
-221			.405	.055	.357	.409	.014	.062	0.0810
-222	.500	1/2	.471 +.000/-.025	.046	.414	.476	.012	.052	0.0640
-223			.463	.062	.408	.468	.016	.069	0.1180
-224	.562	9/16	.525	.062	.463	.530	.016	.069	0.1310
-225			.521	.071	.460	.526	.018	.078	0.1730
-226	.625	5/8	.591	.055	.521	.597	.014	.062	0.1140
-227			.579	.078	.511	.585	.020	.085	0.2320
-228	.688	11/16	.653	.055	.576	.659	.014	.062	0.1240
-229			.641	.078	.565	.647	.020	.085	0.2540
-230	.750	3/4	.712	.062	.628	.718 +/-.003	.016	.069	0.1770
-231			.697	.093	.615	.704	.023	.100	0.3960
-232	.812	13/16	.773 +.000/-.035	.062	.682	.780	.016	.069	0.1860
-233			.759	.093	.669	.766	.023	.100	0.4280
-234	.875	7/8	.831	.071	.732	.839	.018	.078	0.2640
-235			.813	.109	.717	.821	.027	.117	0.6360
-236	.938	15/16	.893	.071	.787	.901	.018	.078	0.2820
XSO-237			.875	.109	.771	.883	.027	.117	0.6790

XSO

DESCRIPTION

Low clearance wire formed ring with limited range. Open gap style allows radial installation. Difficult to remove. Parts are sized for external shaft applications.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify square cross section and open gap style.
2. Measure the shaft diameter (Ds).
3. Determine the wire cross section (T).
4. Find the part in the chart above.

GENERAL USE

COMMON

INSTALLATION TOOLS AVAILABLE AS A SPECIAL ORDER.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

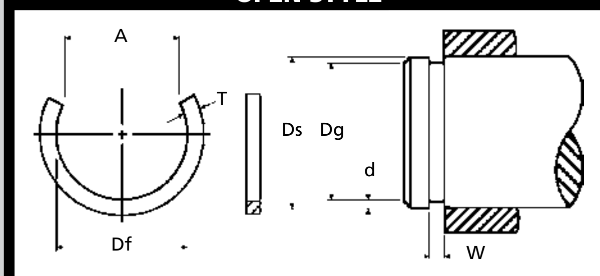
XSO ⟷ XSC (Page 82)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***XSO** CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

OPEN STYLE



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EXTERNAL (RADIAL)

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	A0600	Eaton	400 Series
Arcon National	XSO		

XSO	SHAFT Decimal (Ds)	SHAFT Fraction (Ds)	RING Free Inside Dia. (Df)	Df Tol.	RING Wire Cross Section (T)	T Tol.	RING Gap (A)	A Tol.	GROOVE Diameter (Dg)	Dg Tol.	GROOVE Depth (d)	GROOVE Width (W)	W Tol.	WEIGHT Lbs. per 100 Pieces	MATERIAL
XSO-238	1.000	1	.950	+.000/-.035	.078	+/-.002	.838	+.000/-5%	.960	+/-.003	.020	.085	+/-.002	0.3630	Spring Steel
-239			.929		.125		.819		.938		.031	.133		0.9550	
-240	1.063	1-1/16	1.012		.078		.893	+.000/-4%	1.022		.020	.085		0.3850	
-241			.990		.125		.873		1.000		.031	.133		1.0100	
-242	1.125	1-1/8	1.068		.093		.940		1.079		.023	.100		0.5840	
-243			1.044		.140		.921		1.055		.035	.148		1.3470	
-244	1.188	1-3/16	1.130		.093		.997		1.141		.023	.100		0.6140	
-245			1.106		.140		.975		1.117		.035	.148		1.4180	
-246	1.250	1-1/4	1.184	+.000/-.046	.109	+/-.003	1.044		1.196		.027	.117		0.8920	
-247			1.160		.156		1.023		1.172		.039	.164		1.8600	
-248	1.312	1-5/16	1.246		.109		1.099		1.258		.027	.117		0.9370	
-249			1.222		.156		1.078		1.234		.039	.164		1.8810	
-250	1.375	1-3/8	1.304		.120		1.150		1.315		.030	.128		1.2180	
-251			1.276		.172		1.125		1.289		.043	.180		2.4870	
-252	1.438	1-7/16	1.364		.120		1.203		1.377		.030	.128		1.2400	
-253			1.338		.172		1.180		1.351		.043	.180		2.5930	
-254	1.500	1-1/2	1.424	+.000/-.062	.125		1.256		1.438		.031	.133		1.4040	
-255			1.392		.187		1.228		1.406		.047	.195		3.2050	
-256	1.625	1-5/8	1.547		.125		1.364		1.563		.031	.133		1.5180	
-257			1.516		.187		1.337		1.531		.047	.195		3.4520	
-258	1.750	1-3/4	1.657		.156		1.461		1.672		.039	.164		2.5630	
-259			1.624		.218		1.432		1.640		.055	.227		5.0830	
-260	2.000	2	1.887	+.000/-.078	.187		1.664		1.906	+/-.004	.047	.195		4.2120	
-261			1.855		.250		1.636		1.874		.063	.260		7.6410	
-262	2.250	2-1/4	2.134		.187		1.882		2.156		.047	.195		4.7120	
-263			2.103		.250		1.855		2.124		.063	.260		8.5400	
-264	2.500	2-1/2	2.350		.250		2.073		2.374		.063	.265		9.4310	
-265			2.321		.312		2.047		2.344		.078	.327		14.9400	
-266	3.000	3	2.845		.250		2.510		2.875		.063	.265		11.2300	
XSO-267			2.816		.312		2.483		2.844		.078	.327		17.7400	

XSO

DESCRIPTION

Low clearance wire formed ring with limited range. Open gap style allows radial installation. Difficult to remove. Parts are sized for external shaft applications.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify square cross section and open gap style.
2. Measure the shaft diameter (Ds).
3. Determine the wire cross section (T).
4. Find the part in the chart above.

GENERAL USE

COMMON

AFTER INSTALLATION RING WILL NOT NECESSARILY MAINTAIN CONTACT IN GROOVE DUE TO UNEVEN STRESSES.

GROOVE INTERCHANGE

USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

XSO

XSC (Page 82)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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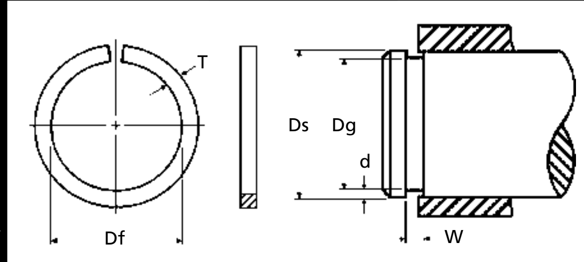
EXTERNAL (AXIAL)

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	A0700	Eaton	300 Series
Arcon National	XSC		

CLOSED STYLE



XSC	SHAFT Decimal (Ds)	SHAFT Fraction (Ds)	RING Free Inside Dia. (Df)	Df Tol.	RING Wire Cross Section (T)	T Tol.	GROOVE Diameter (Dg)	Dg Tol.	GROOVE Depth (d)	GROOVE Width (W)	W Tol.	WEIGHT Lbs. per 100 Pieces	MATERIAL
XSC-111	.125	1/8	.114	+.000/-.020	.020	+/-.002	.115	+.003/-.000	.005	.024	+/-.002	0.0050	Spring Steel
-1125	.156	5/32	.145		.020		.146		.005	.024		0.0060	
-112	.188	3/16	.175		.020		.178		.005	.024		0.0070	
-113			.173		.025		.176		.006	.029		0.0110	
-1135	.219	7/32	.203		.025		.207		.006	.029		0.0120	
-114	.250	1/4	.236		.025		.238		.006	.030		0.0140	
-115			.232		.031		.234		.008	.036		0.0220	
-1155	.281	9/32	.261		.031		.265		.008	.036		0.0240	
-116	.312	5/16	.293		.031		.296		.008	.036		0.0280	
-117			.289		.039		.292		.010	.045		0.0440	
-118	.375	3/8	.353		.035		.357		.009	.041		0.0420	
-119			.347		.046		.351		.012	.052		0.0740	
-120	.438	7/16	.413		.039		.417		.010	.045		0.0510	
-121			.405		.055		.409		.014	.062		0.1230	
-122	.500	1/2	.471	+.000/-.025	.046		.476		.012	.052		0.0970	
-123			.463		.062		.468		.016	.069		0.1790	
-124	.562	9/16	.525		.062		.530		.016	.069		0.2000	
-125			.521		.071		.526		.018	.078		0.2640	
-126	.625	5/8	.591		.055		.597		.014	.062		0.1730	
-127			.579		.078		.585		.020	.085		0.3540	
-128	.688	11/16	.653		.055		.659		.014	.062		0.1890	
-129			.641		.078		.647		.020	.085		0.3870	
-130	.750	3/4	.712		.062		.718	+/-.003	.016	.069		0.2630	
-131			.697		.093		.704		.023	.100		0.6040	
-132	.812	13/16	.773	+.000/-.035	.062		.780		.016	.069		0.2840	
-133			.759		.093		.766		.023	.100		0.6520	
-134	.875	7/8	.831		.071		.839		.018	.078		0.4020	
-135			.813		.109		.821		.027	.117		0.9690	
-136	.938	15/16	.893		.071		.901		.018	.078		0.4300	
XSC-137			.875		.109		.883		.027	.117		1.0340	

XSC

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
Low clearance wire formed ring with limited range. Closed gap style requires axial assembly, with more contact and thrust load ratings versus open style.	1. Verify square cross section and closed gap style. 2. Measure the shaft diameter (Ds). 3. Determine the wire cross section (T). 4. Find the part in the chart above.	COMMON

AXIAL ASSEMBLY

INSTALLATION TOOLS AVAILABLE AS A SPECIAL ORDER.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

XSC ⟷ XSO (Page 80)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***XSC** CONTINUED NEXT PAGE.*

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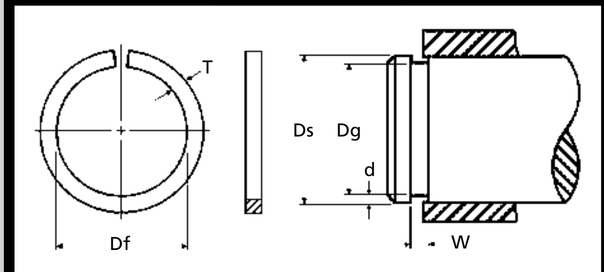
CLOSED STYLE



EXTERNAL (AXIAL)

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	A0700	Eaton	300 Series
Arcon National	XSC		

XSC

Part	SHAFT Decimal (Ds)	SHAFT Fraction (Ds)	RING Free Inside Dia. (Df)	Df Tol.	RING Wire Cross Section (T)	T Tol.	GROOVE Diameter (Dg)	Dg Tol.	GROOVE Depth (d)	GROOVE Width (W)	W Tol.	WEIGHT Lbs. per 100 Pieces	MATERIAL
XSC-138	1.000	1	.950	+.000/-.035	.078	+/-.002	.960	+/-.003	.020	.085	+/-.002	0.5530	Spring Steel
-139			.929		.125		.938		.031	.133		1.4550	
-140	1.063	1-1/16	1.012		.078		1.022		.020	.085		0.5870	
-141			.990		.125		1.000		.031	.133		1.5410	
-142	1.125	1-1/8	1.068		.093		1.079		.023	.100		0.8880	
-143			1.044		.140		1.055		.035	.148		2.0530	
-144	1.188	1-3/16	1.130		.093		1.141		.023	.100		0.9360	
-145			1.106		.140		1.117		.035	.148		2.1610	
-146	1.250	1-1/4	1.184	+.000/-.046	.109		1.196		.027	.117		1.3590	
-147			1.160		.156	+/-.003	1.172		.039	.164		2.8340	
-148	1.312	1-5/16	1.246		.109		1.258		.027	.117		1.4280	
-149			1.222		.156		1.234		.039	.164		2.9670	
-150	1.375	1-3/8	1.304		.120		1.315		.030	.128		1.8560	
-151			1.276		.172		1.289		.043	.180		3.7890	
-152	1.438	1-7/16	1.364		.120		1.377		.030	.128		1.8900	
-153			1.338		.172		1.351		.043	.180		3.9510	
-154	1.500	1-1/2	1.424	+.000/-.062	.125		1.438		.031	.133		2.1400	
-155			1.392		.187		1.406		.047	.195		4.8850	
-156	1.625	1-5/8	1.547		.125		1.563		.031	.133		2.3120	
-157			1.516		.187		1.531		.047	.195		5.2680	
-158	1.750	1-3/4	1.657		.156		1.672		.039	.164		3.9040	
-159			1.624		.218		1.640		.055	.227		7.7440	
-160	2.000	2	1.887	+.000/-.078	.187		1.906	+/-.004	.047	.195		6.4160	
-161			1.855		.250		1.874		.063	.260		11.6400	
-162	2.250	2-1/4	2.134		.187		2.156		.047	.195		7.1810	
-163			2.103		.250		2.124		.063	.260		13.0100	
-164	2.500	2-1/2	2.350		.250		2.374		.063	.265		14.3800	
-165			2.321		.312		2.344		.078	.327		22.7600	
-166	3.000	3	2.845		.250		2.875		.063	.265		17.1100	
XSC-167			2.816		.312		2.844		.078	.327		27.0300	

XSC

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
Low clearance wire formed ring with limited range. Closed gap style requires axial assembly, with more contact and thrust load ratings versus open style.	1. Verify square cross section and closed gap style. 2. Measure the shaft diameter (Ds). 3. Determine the wire cross section (T). 4. Find the part in the chart above.	COMMON

AXIAL ASSEMBLY

AFTER INSTALLATION RING WILL NOT NECESSARILY MAINTAIN CONTACT IN GROOVE DUE TO UNEVEN STRESSES.

GROOVE INTERCHANGE

USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

XSC ⟷ XSO (Page 80)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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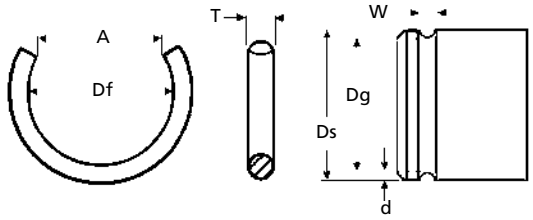
EXTERNAL (RADIAL)

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	200 Series	
Arcon National	XRO	

OPEN STYLE



XRO	SHAFT		RING			GROOVE			WEIGHT	MATERIAL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)	Wire Cross Section (T)	Gap (A)	Diameter (Dg)	Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel
XRO-411	.125	1/8	.110	.022	.097	.111	.007	.024	0.0030	
-412	.156	5/32	.140	.022	.123	.142	.007	.024	0.0040	
-413	.188	3/16	.172	.022	.152	.174	.007	.024	0.0050	
-414	.219	7/32	.202	.022	.178	.205	.007	.024	0.0060	
-415	.250	1/4	.230	.029	.203	.232	.009	.031	0.0100	
-4155	.281	9/32	.260	.029	.229	.263	.009	.031	0.0120	
-416	.312	5/16	.296	.022	.261	.298	.007	.024	0.0070	
-417			.288	.035	.254	.290	.011	.037	0.0180	
-418	.375	3/8	.353	.029	.322	.357	.009	.031	0.0140	
-419			.345	.043	.304	.349	.013	.045	0.0330	
-420	.438	7/16	.412	.035	.363	.415	.011	.037	0.0260	
-421			.402	.051	.355	.405	.016	.053	0.0530	
-422	.500	1/2	.468	.043	.412	.474	.013	.045	0.0430	
-423			.458	.059	.404	.464	.018	.061	0.0820	
-424	.562	9/16	.529	.045	.467	.534	.014	.047	0.0530	
-425			.518	.062	.457	.524	.019	.064	0.1020	
-426	.625	5/8	.587	.051	.518	.593	.016	.053	0.0750	
-427			.575	.071	.507	.581	.022	.073	0.1480	
-428	.688	11/16	.649	.051	.572	.655	.016	.053	0.0830	
-429			.637	.071	.562	.643	.022	.073	0.1680	
-430	.750	3/4	.706	.059	.623	.714	.018	.061	0.1210	
-431			.690	.085	.609	.698	.026	.087	0.2550	
-432	.812	13/16	.769	.059	.678	.776	.018	.061	0.1310	
-433			.753	.085	.664	.760	.026	.087	0.2760	
-434	.875	7/8	.823	.071	.726	.831	.022	.073	0.2050	
-435			.804	.100	.709	.813	.031	.102	0.4120	
-436	.938	15/16	.885	.071	.780	.893	.022	.073	0.2200	
-437			.867	.100	.764	.875	.031	.102	0.4310	
XRO-438	1.000	1	.938	.085	.827	.948	.026	.087	0.3450	

Ring: +.000/-6% (Df); +/-.004 (T); +.000/-6% (A). +.000/-5% (Df); +/-.002 (T); +.000/-5% (A).
Groove: +.003/-.000 (Dg). +/-.003 (Dg).

XRO

DESCRIPTION

Low clearance wire formed ring with limited range. Open gap style allows radial installation. Difficult to remove. Parts are sized for external shaft applications.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify round cross section and open gap style.
2. Measure the shaft diameter (Ds).
3. Determine the wire cross section (T).
4. Find the part in the chart above.

GENERAL USE

COMMON

INSTALLATION TOOLS AVAILABLE AS A SPECIAL ORDER.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

XRO ⟷ XRC (Page 86)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

***XRO** CONTINUED NEXT PAGE.*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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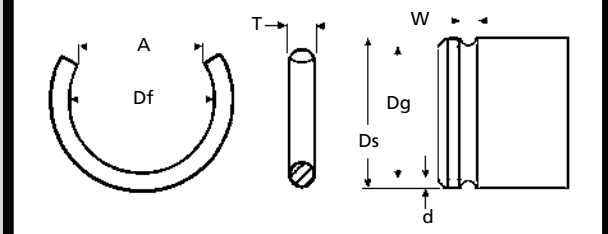
OPEN STYLE



EXTERNAL (RADIAL)

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	200 Series	
Arcon National	XRO	

XRO

	SHAFT		RING					GROOVE				WEIGHT	MATERIAL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Wire Cross Section (T)		Gap (A)		Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel
XRO-439	1.000	1	.917	+.000/-5%	.118	+/-.002	.809	+.000/-5%	.926	+/-.003	.037	.120	0.6570	
-440	1.063	1-1/16	1.000	+.000/-4%	.085		.882		1.010		.026	.087	0.4500	
-441			.979		.118		.863		.988		.037	.120	0.6960	
-442	1.125	1-1/8	1.051		.100		.927		1.063		.031	.102	0.5250	
-443			1.034		.130		.912		1.045		.040	.132	0.8970	
-444	1.188	1-3/16	1.114		.100		.983		1.125		.031	.102	0.5540	
-445			1.096		.130		.967		1.107		.040	.132	0.9450	
-446	1.250	1-1/4	1.164		.118		1.027		1.176		.037	.120	0.7770	
-447			1.150		.140		1.014		1.162		.044	.142	1.1530	
-448	1.312	1-5/16	1.226		.118		1.081		1.238		.037	.120	0.8530	
-449			1.212		.140		1.069		1.224		.044	.142	1.2080	
-450	1.375	1-3/8	1.281		.130		1.130		1.295		.040	.132	1.0870	
-451			1.264		.156		1.115		1.277		.049	.158	1.5750	
-452	1.438	1-7/16	1.344		.130		1.185		1.357		.040	.132	1.1360	
-453			1.326		.156		1.170		1.339		.049	.158	1.6430	
-454	1.500	1-1/2	1.398		.140		1.233		1.412		.044	.142	1.3750	
-455			1.378		.172		1.215		1.392		.054	.174	2.0910	
-456	1.625	1-5/8	1.522		.140		1.342		1.537		.044	.142	1.4850	
-457			1.502		.172		1.325		1.517		.054	.174	2.2580	
-458	1.750	1-3/4	1.626		.172		1.434		1.642		.054	.174	2.4250	
-459			1.608		.203		1.418		1.624		.063	.205	3.4040	
-460	2.000	2	1.855		.203		1.636		1.874	+/-.004	.063	.205	3.8670	
-461			1.837		.232		1.620		1.856		.072	.234	5.0970	
-462	2.250	2-1/4	2.103		.203		1.855		2.124		.063	.205	4.3340	
-463			2.085		.232		1.839		2.106		.072	.234	5.6880	
-464	2.500	2-1/2	2.332		.232		2.057		2.356		.072	.234	6.2890	
-465			2.321		.250		2.047		2.344		.078	.252	7.3220	
-466	3.000	3	2.827		.232		2.494		2.856		.072	.234	7.5090	
XRO-467			2.816		.250		2.483		2.844		.078	.252	8.7320	

XRO

RADIAL ASSEMBLY

DESCRIPTION

Low clearance wire formed ring with limited range. Open gap style allows radial installation. Difficult to remove. Parts are sized for external shaft applications.

HOW TO IDENTIFY

1. Verify round cross section and open gap style.
2. Measure the shaft diameter (Ds).
3. Determine the wire cross section (T).
4. Find the part in the chart above.

GENERAL USE

COMMON

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

XRO ⟷ XRC (Page 86)

AFTER INSTALLATION RING WILL NOT NECESSARILY MAINTAIN CONTACT IN GROOVE DUE TO UNEVEN STRESSES.

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

ROUND SECTION WIRE RINGS

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REVISED 09-04

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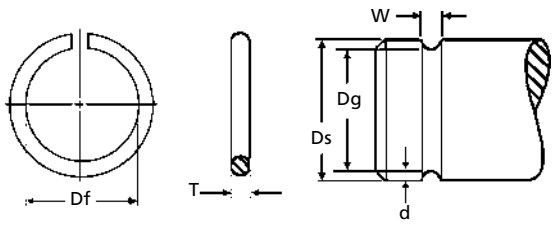
EXTERNAL (AXIAL)

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	A0900	Eaton	100 Series
Arcon National	XRC		

CLOSED STYLE



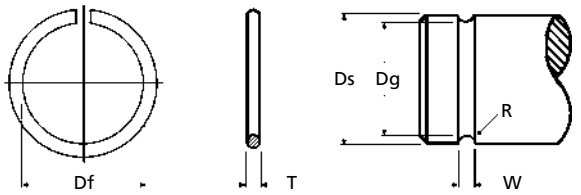
XRC

	SHAFT		RING			GROOVE				WEIGHT	MATERIAL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Wire Cross Section (T)	Diameter (Dg)		Depth (d)	Width (W)	Lbs. per 100 Pieces	Spring Steel
XRC-311	.125	1/8	.110	+.000/-6%	.022	.111	+.003/-.000	.007	.024	0.0040	
-312	.156	5/32	.140		.022	.142		.007	.024	0.0050	
-313	.188	3/16	.172		.022	.174		.007	.024	0.0070	
-314	.219	7/32	.202		.022	.205		.007	.024	0.0090	
-315	.250	1/4	.230		.029	.232		.009	.031	0.0150	
-3155	.281	9/32	.260		.029	.263		.009	.031	0.0170	
-316	.312	5/16	.296		.022	.298		.007	.024	0.0110	
-317	.312	5/16	.288		.035	.290		.011	.037	0.0270	
-318	.375	3/8	.353		.029	.357		.009	.031	0.0220	
-319	.375	3/8	.345		.043	.349		.013	.045	0.0500	
-320	.438	7/16	.412	+.000/-5%	.035	.415		.011	.037	0.0380	
-321	.438	7/16	.402		.051	.405		.016	.053	0.0820	
-322	.500	1/2	.468		.043	.474		.013	.045	0.0660	
-323	.500	1/2	.458		.059	.464		.018	.061	0.1250	
-324	.562	9/16	.529		.045	.534		.014	.017	0.0820	
-325	.562	9/16	.518		.062	.524		.019	.064	0.1550	
-326	.625	5/8	.587		.051	.593		.016	.063	0.1150	
-327	.625	5/8	.575		.071	.581		.022	.073	0.2260	
-328	.688	11/16	.649		.051	.655		.016	.053	0.1270	
-329	.688	11/16	.637		.071	.643		.022	.073	0.2480	
-330	.750	3/4	.706		.059	.714		.018	.061	0.1850	
-331	.750	3/4	.690		.085	.698		.026	.087	0.3890	
-332	.812	13/16	.769		.059	.776		.018	.061	0.2000	
-333	.812	13/16	.753		.085	.760		.026	.087	0.4210	
-334	.875	7/8	.823		.071	.831		.022	.073	0.3130	
-335	.875	7/8	.804		.100	.813		.031	.102	0.6280	
-336	.938	15/16	.885		.071	.893		.022	.073	0.3350	
-337	.938	15/16	.867		.100	.875		.031	.102	0.6720	
-338	1.000	1	.938		.085	.948		.026	.087	0.5260	
-339	1.000	1	.917		.118	.926		.037	.120	1.0010	
-340	1.063	1-1/16	1.000	+.000/-4%	.085	1.010	+/-.003	.026	.087	0.6860	
-341	1.063	1-1/16	.979		.118	.988		.037	.120	1.0610	
-342	1.125	1-1/8	1.051		.100	1.063		.031	.102	0.8000	
-343	1.125	1-1/8	1.034		.130	1.045		.040	.132	1.3670	
-344	1.188	1-3/16	1.114		.100	1.125		.031	.102	0.8440	
-345	1.188	1-3/16	1.096		.130	1.107		.040	.132	1.4400	
-346	1.250	1-1/4	1.164		.118	1.176		.037	.120	1.2400	
-347	1.250	1-1/4	1.150		.140	1.162		.044	.142	1.7570	
-348	1.312	1-5/16	1.226		.118	1.238		.037	.120	1.3000	
-349	1.312	1-5/16	1.212		.140	1.224		.044	.142	1.8410	
-350	1.375	1-3/8	1.281		.130	1.295		.040	.132	1.6560	
-351	1.375	1-3/8	1.264		.156	1.277		.049	.158	2.4010	
-352	1.438	1-7/16	1.344		.130	1.357		.040	.132	1.7310	
-353	1.438	1-7/16	1.326		.156	1.339		.049	.158	2.5060	
-354	1.500	1-1/2	1.398		.140	1.412		.044	.142	2.0950	
-355	1.500	1-1/2	1.378		.172	1.392		.054	.174	3.1860	
-356	1.625	1-5/8	1.522		.140	1.537		.044	.142	2.2630	
-357	1.625	1-5/8	1.502		.172	1.517		.054	.174	3.4410	
-358	1.750	1-3/4	1.626		.172	1.642		.054	.174	3.6960	
-359	1.750	1-3/4	1.608		.203	1.624		.063	.205	5.1850	
-361	2.000	2	1.837		.232	1.856		.072	.234	7.7380	
-363	2.250	2-1/4	2.085		.232	2.106	+/-.004	.072	.234	8.6650	
-365	2.500	2-1/2	2.321		.250	2.344		.078	.252	11.1600	
XRC-367	3.000	3	2.816		.250	2.844		.078	.252	13.3200	

		+/-.004	+/-.002

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

CLOSED STYLE



EXTERNAL LIGHT DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	A1000		

A10

	SHAFT		RING		GROOVE				MATERIAL
	Decimal (Ds)	Fraction (Ds)	Free Inside Diameter (Df)	Wire Cross Section (T)	Diameter (Dg)		Radius (R)	Width (W)	Spring Steel
A10-006	.062	1/16	.051	.0092	.052	+.003/-.000	.0050	.010	
-008	.083	1/12	.072		.073				
-009	.094	3/32	.080	.0108	.082		.0055	.011	
-010	.100	1/10	.087		.089				
-012	.125	1/8	.110	.0124	.113		.0065	.013	
-015	.156	5/32	.138		.143				
-018	.187	3/16	.169		.174				
-021	.219	7/32	.198	.0148	.204		.0075	.015	
-025	.250	1/4	.221	.0220	.228		.0115	.023	
-028	.281	9/32	.251		.259				
-031	.312	5/16	.281		.290				
-034	.344	11/32	.312		.322				
-037	.375	3/8	.329	.0360	.339		.0187	.038	
-040	.406	13/32	.359		.370				
-043	.438	7/16	.390		.402				
-046	.469	15/32	.420		.433				
-050	.500	1/2	.438	.0480	.452		.0250	.050	
-056	.562	9/16	.498		.514	+.004/-.000			+.004/-.000
-062	.625	5/8	.560		.577				
-068	.688	11/16	.621		.640				
-075	.750	3/4	.665	.0640	.686		.0335	.067	
-081	.812	13/16	.726		.748				
-087	.875	7/8	.786		.811				
-093	.938	15/16	.848		.874				
-100	1.000	1	.908		.936				
-106	1.062	1-1/16	.953	.0800	.982		.0415	.083	
-112	1.125	1-1/8	1.012		1.045				
-125	1.250	1-1/4	1.135		1.170				
-137	1.375	1-3/8	1.258		1.295	+.005/-.000			+.005/-.000
-150	1.500	1-1/2	1.380		1.420				
-162	1.625	1-5/8	1.500		1.545				
-175	1.750	1-3/4	1.621		1.670				
-187	1.875	1-7/8	1.720	.1040	1.771		.0545	.109	
-200	2.000	2	1.840		1.896				
-212	2.125	2-1/8	1.960		2.021	+.007/-.000			+.007/-.000
-225	2.250	2-1/4	2.082		2.146				
-237	2.375	2-3/8	2.203		2.271				
-250	2.500	2-1/2	2.324		2.396				
-275	2.750	2-3/4	2.543	.1280	2.622		.0665	.133	
A10-300	3.000	3	2.785		2.872				

XRC / A10

DESCRIPTION

Low clearance wire formed ring with limited range. Closed gap style requires axial assembly, with more contact and thrust load ratings versus open style. XRC is fairly common, while the A10 series is obsolete.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify round cross section and closed gap style.
2. Measure the shaft diameter (Ds).
3. Determine the wire cross section (T).
4. Find the part in the charts.

GENERAL USE

UNCOMMON

DIFFICULT TO REMOVE.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

XRC ⟷ XRO (Page 84)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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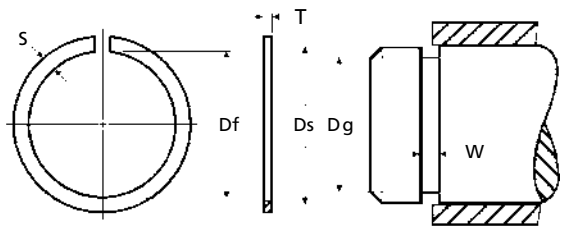
EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	A0500
Arcon National	TRC

CLOSED STYLE



TRC	SHAFT		RING				GROOVE		WEIGHT	MATERIAL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Radial Wall (S)	Thickness (T)	Diameter (Dg)	Width (W)	Lbs. per 100 Pieces	Spring Steel
TRC-018	.188	3/16	.176	+.000/-6%	.025	.015 +/-5%	.226	.017	0.0070	
-021	.219	7/32	.205				.255		0.0080	
-025	.250	1/4	.230		.035	.025 +/-5%	.300	.028	0.0200	
-028	.281	9/32	.261				.331		0.0230	
-031	.312	5/16	.290		.040		.370		0.0290	
-034	.344	11/32	.322				.402		0.0320	
-037	.375	3/8	.351				.431		0.0350	
-040	.406	13/32	.382		.045		.472		0.0420	
-043	.438	7/16	.412	+.000/-5%			.502		0.0450	
-046	.469	15/32	.443				.533		0.0480	
-050	.500	1/2	.474		.048	.035 +/-4%	.570	.039	0.0780	
-056	.562	9/16	.534				.630		0.0900	
-059	.594	19/32	.565		.060		.685		0.1200	
-062	.625	5/8	.596				.716		0.1300	
-068	.688	11/16	.656			.042 +/-4%	.776	.046	0.1700	
-075	.750	3/4	.715		.070		.855		0.2100	
-081	.812	13/16	.776				.916		0.2200	
-087	.875	7/8	.833				.973		0.2300	
-093	.938	15/16	.896		.081		1.058		0.2900	
TRC-100	1.000	1	.955				1.117		0.3000	

TRC

AXIAL ASSEMBLY

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
Rectangular section ring used in place of SH-style snap ring where space is very limited. Same groove width as SH. (See page 6 for SH rings.)	1. Verify rectangular cross section and closed gap style. 2. Measure the shaft diameter (Ds). 3. Determine the ring thickness (T) and radial wall (S). 4. Find the part in the chart above.	 UNCOMMON

REMOVE USING PLASTIC EXPLOSIVES.

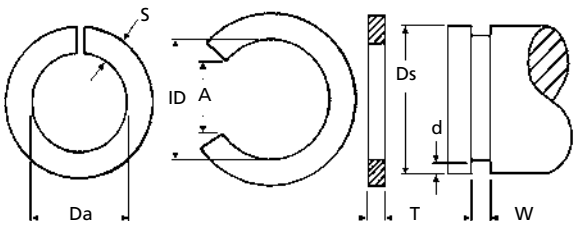
AVAILABLE AS A SPECIAL ORDER

EXTERNAL CRIMPED

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Arcon National	AAR



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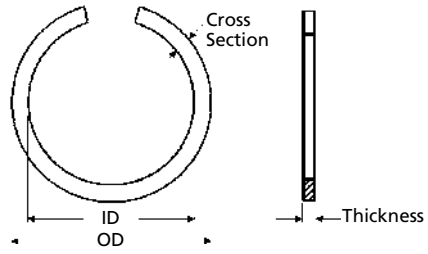
G.L. HUYETT



SPECIAL WIRE RINGS

NAME: _____ COMPANY: _____

PHONE: _____ FAX: _____

ZODIAC SIGN: _____ NUMBER OF PETS: _____ ❒ SMOKER ❒ NONSMOKER

APPLICATION

To assist you, we are providing this "Copy and Fax" design sheet. Please fill this page out as completely as possible and fax it to our plant for quotation.

How is the part going to be used? _____

_____

_____

_____

Quantity to Quote:

Q_1: _____

Q_2: _____

Q_3: _____

Q_4: _____

RING

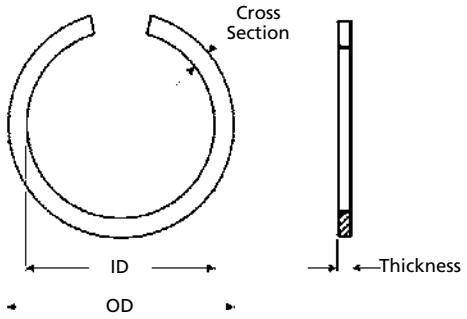
RING DIMENSIONS:

Inside Diameter: _____

Outside Diameter: _____

Cross Section: _____

Thickness: _____



Will the ring be disassembled? ❒ Yes ❒ No

Required thrust load: _____

Rotational speed (RPM): _____

Are you currently using a retaining ring for this application? ❒ Yes ❒ No

If yes, what type? _____

GROOVE

EXTERNAL:

Shaft Dia: _____

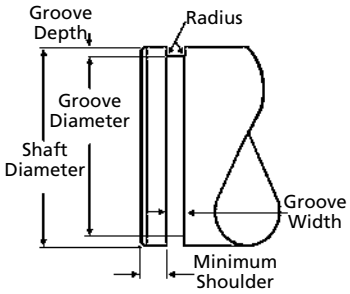
Groove Dia: _____

Groove Depth: _____

Groove Width: _____

Radius: _____

Min. Shoulder: _____



INTERNAL:

Bore Dia: _____

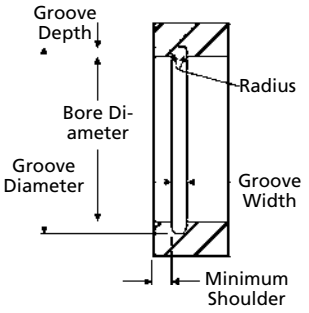
Groove Dia: _____

Groove Depth: _____

Groove Width: _____

Radius: _____

Min. Shoulder: _____



SECTION

MATERIAL CROSS SECTION:

❒ Square ❒ Round ❒ Rectangular ❒ Hi Collar ❒ Step ❒ Double Bevel

❒ Taper ❒ Chamfer ❒ Round Edge Flat ❒ Tongue ❒ Radius Corner ❒ Mill Edge

MATERIAL

If you know . . .

MATERIAL

❒ Spring Steel
❒ 302 Stainless Steel
❒ Inconel X-750
❒ 17-7 Ph/C Stainless
❒ 316 Stainless Steel
❒ Other: _____

FINISH

❒ Black Oxide
❒ Phosphate
❒ Zinc
❒ Other: _____

If you don't know, give us some information about the environment:

TEMPERATURE

_____ ° Maximum ❒ F ❒ C

ATMOSPHERE

❒ Corrosive
❒ Non-Corrosive

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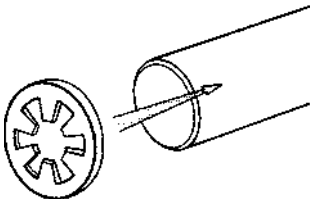
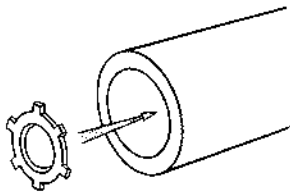
LOW PRICE PROMISE!! See Inside Cover

TYPES

	**TY** BASIC EXTERNAL IMPERIAL Pg: 92 / METRIC N/A	Available in Spring Steel and Stainless Steel.		**TR** TRIANGLE PUSH-ON IMPERIAL Pg: 97 / METRIC Pg: 213	Heavy duty options available in many sizes.
	**TX** REINFORCED EXTERNAL IMPERIAL Pg: 92 / METRIC Pg: 212	Heavier-duty version. Available in metric sizes.		**NTR** TRIANGLE SCREW-ON IMPERIAL Pg: 97 / METRIC N/A	Heavy duty options available in many sizes.
	**TI** BASIC INTERNAL IMPERIAL Pg: 93 / METRIC Pg: 212	Available in Spring Steel and Stainless Steel.		**NPR** BASIC RECTANGULAR IMPERIAL Pg: 98 / METRIC N/A	Available in seven forms. Also in round version (NPO).
	**ITR** INTERNAL TOOTHED IMPERIAL Pgs: 94-95 / METRIC N/A	Bowed shape resists back-off pressure.		**NPO** BASIC ROUND IMPERIAL Pg: 99 / METRIC N/A	Available in five forms. Also in rectangular version (NPR).
	**STR** HIGH SPEED STRIP IMPERIAL Pg: 96 / METRIC N/A	Strip form for quick installation.		**BRR** INTERNAL TOOTHED BEARING RETAINER IMPERIAL Pg: 100 / METRIC N/A	Allow for bearing rotation.
	**WRR** WIDE RIM SLOTTED IMPERIAL Pg: 96 / METRIC N/A	Wide rim for increased peripheral abutment.		**T99** BASIC GROOVELESS IMPERIAL Pg: 101 / METRIC N/A	Available in flat and Belleville styles.

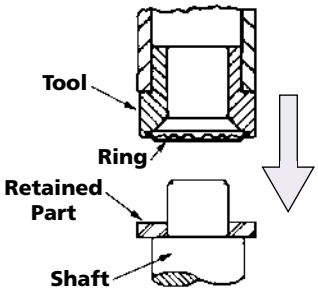


Installed in an axial direction on grooveless shafts or inside bores.

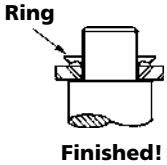


AUTOMATED INSTALLATION

Push-on rings are installed onto grooveless shafts by sliding the ring in an opposite direction from the prongs. The prongs provide resistance to removal by digging into the shaft material. The best way to automate production is to build fixtures that are size and depth preset to the installed product. Tubes work well in external applications, while plugs assist in internal installation.



Place the ring in the tool and push down on the shaft as shown at the left.



LET OUR SHOP MAKE A FIXTURE FOR YOU!

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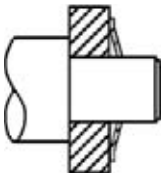
PRODUCT COMPARISONS



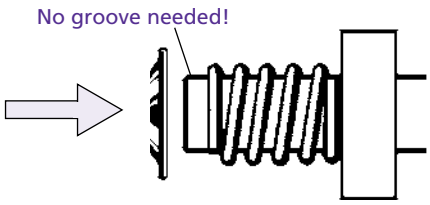
NO NEED TO CUT A GROOVE!

Push-on rings use prongs or teeth that, when installed, "dig" into the circumference of a shaft or inner wall of a bore. The major advantage of push-on rings is that they are grooveless. The cost and precision needed to machine a groove onto the shaft is avoided. In addition, because of the prong design, shaft tolerances can be much wider and less precise; therefore, these rings can be used in tubes and cast parts and on plastic shafts and wood dowels. Finally, push-on rings are adjustable. The ring can be moved progressively to adjust tension to desired levels.

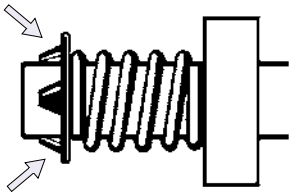
The downside of push-on rings is that with no groove, thrust ratings are lower. Because the ring uses friction to maintain force, anything that reduces friction will inhibit performance. Push-on rings in lubricated environments or on hardened shafts should be avoided. Push-on rings are commonly used in lighter-duty industries including toys, electrical components, housewares, and automotive panels, and are available in external sizes up to 1" and up to 2" for internal applications. Note that they possess excellent design features in miniature components, thus a wide array of small sizes are available down to 3/32".

Most push-on rings are stamped from strip or sheet. Spiral and wire types manufactured from coil are not available. The prevailing features to consider when reviewing push-on rings are thrust load, outside profile, and shaft/bore size. Installation can be automated by manufacturing a tool like the one on page 90 or by using parts in a strip form, where parts are twisted for removal as they are installed.

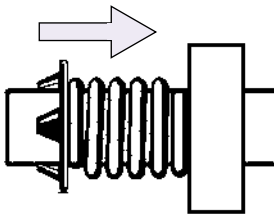
HOW GROOVELESS RINGS CAN WORK FOR YOU



Slide the ring on the shaft in an opposite direction from the prongs.



The prongs dig into the shaft material.



The spring can be progressively compressed by sliding the ring down the shaft.

MATERIAL

CARBON SPRING STEEL	PH15-7 MO STAINLESS STEEL	BERYLLIUM COPPER
SAE 1060-1090	AISI 632/AMS 5520	ALLOY #25/CDA #172
(STANDARD)	(STANDARD ON MOST SIZES)	(STANDARD ON SMALL SIZES)
500°F Max -100°F Min	900°F Max -300°F Min	650°F Max -300°F Min

OTHER MATERIALS AVAILABLE ON REQUEST.

FINISHES

PHOSPHATE COATING	MECHANICAL ZINC YELLOW	ZINC YELLOW WITH LACQUER
(STANDARD)	(STANDARD)	(SPECIAL ORDER)
Inhibits rust during storage.	96 hour salt spray.	250 hour salt spray.

OTHER FINISHES, INCLUDING CADMIUM, AVAILABLE ON REQUEST.

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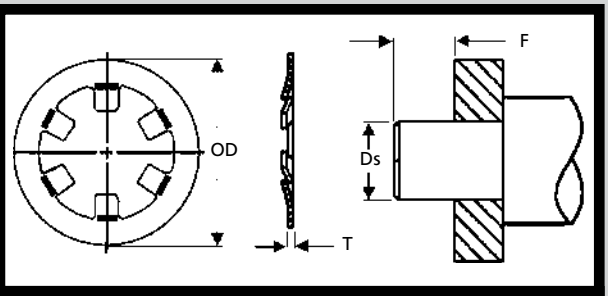
BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

IRR	6100	Waldes	5105
Rotor Clip	TY		



TY	SHAFT			RING					WEIGHT	MATERIAL	
	From (Ds)	To (Ds)	Fraction (Ds)	Outside Diameter (OD)		Thickness (T)		No. of Prongs	min Distance from face of part to end of shaft (F)	Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"
TY-009	.093	.095	3/32	.250	+/-.005	.010	+/-.001	3	.040	0.0090		
-012	.124	.126	1/8	.325				4		0.0140		
-015	.155	.157	5/32	.356						0.0170		
-018	.187	.189	3/16	.387				6		0.0200		
-021	.218	.220	7/32	.418						0.0210		
-024	.239	.241	6.1mm	.460		.015	+/-.002		.060	0.0350		
-025	.249	.251	1/4	.450		.010	+/-.001		.040	0.0230		
-031	.311	.313	5/16	.512						0.0260		
-037	.374	.376	3/8	.575						0.0270		
-043	.437	.439	7/16	.638		.015	+/-.002		.060	0.0470		
-050	.498	.502	1/2	.750						0.0720		
-056	.560	.564	9/16	.812	+/-.010					0.0750		
-062	.623	.627	5/8	.875				7		0.0820		
-075	.748	.752	3/4	1.000				8		0.0970		
-087	.873	.877	7/8	1.125				10		0.1100		
TY-100	.998	1.002	1	1.250						0.1200		

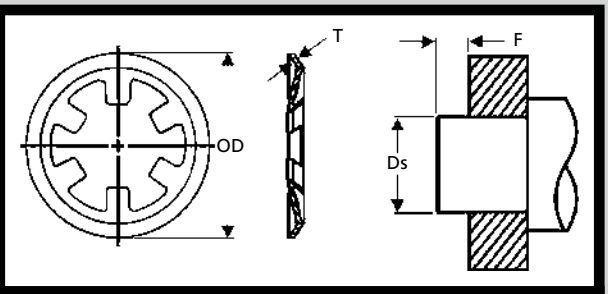
***TY / TX** TECHNICAL INFORMATION NEXT PAGE.*

REINFORCED EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	N1465	Waldes	5115
Rotor Clip	TX		



TX	SHAFT			RING					WEIGHT	MATERIAL	
	From (Ds)	To (Ds)	Fraction (Ds)	Outside Diameter (OD)		Thickness (T)		No. of Prongs	min Distance from face of part to end of shaft (F)	Lbs. per 100 Pieces	Spring Steel	Stainless "-SS"
TX-009	.091	.097	3/32	.326	+/-.005	.010	+/-.001	3	.058	0.0160		
-012	.121	.129	1/8	.366				4		0.0190		
-015	.152	.160	5/32	.397						0.0220		
-018	.184	.192	3/16	.444				6	.062	0.0270		
-025	.246	.254	1/4	.522		.015	+/-.002		.074	0.0550		
-031	.308	.316	5/16	.584				8		0.0640		
-037	.371	.379	3/8	.645						0.0740		
-043	.432	.442	7/16	.737				10	.090	0.0960		
-050	.495	.505	1/2	.828	+/-.010				.108	0.1270		
-056	.557	.567	9/16	.889				12		0.1380		
-062	.620	.630	5/8	.951						0.1470		
-075	.745	.755	3/4	1.076				14		0.1650		
-087	.870	.880	7/8	1.203				16		0.1960		
TX-100	.995	1.005	1	1.327				18		0.2290		

DTX METRIC Page 212

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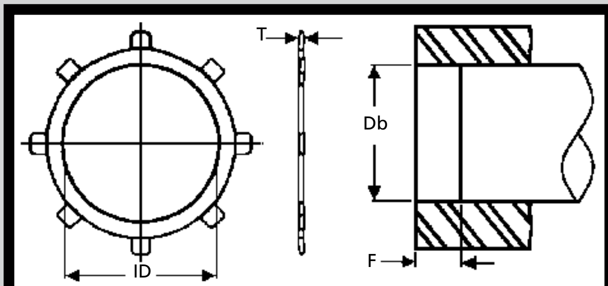


BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	N1305	Rotor Clip	TI
IRR	6000	Waldes	5005

TI	BORE From (Db)	BORE To (Db)	BORE Fraction (Db)	RING Inside Diameter (ID)	ID Tolerance	RING Thickness (T)	T Tolerance	RING No. of Prongs	RING min Distance from face of part to end of bore (F)	WEIGHT Lbs. per 100 Pieces	MATERIAL Spring Steel	MATERIAL Stainless "-SS"
TI-031	.311	.313	5/16	.136	+/-.005	.010	+/-.001	6	.040	0.0110		
-037	.374	.376	3/8	.175						0.0160		
-043	.437	.439	7/16	.237						0.0200		
-044	.440	.442	11.2mm	.258						0.0180		
-050	.498	.502	1/2	.258	+/-.010					0.0240		
-056	.560	.564	9/16	.312						0.0290		
-062	.623	.627	5/8	.390						0.0300		
-063	.638	.640	16.23	.390						0.0320		
-075	.748	.752	3/4	.500		.015	+/-.002	8	.060	0.0620		
-087	.873	.877	7/8	.625						0.0750		
-093	.936	.940	15/16	.687				10		0.0850		
-100	.998	1.002	1	.750						0.0910		
-112	1.123	1.127	1-1/8	.813						0.1300		
-125	1.248	1.252	1-1/4	.938						0.1500		
-137	1.371	1.379	1-3/8	1.050				16		0.2100		
-143	1.436	1.440	1-7/16	1.117				12		0.1730		
-150	1.498	1.502	1-1/2	1.188						0.1800		
-175	1.748	1.752	1-3/4	1.438						0.2100		
TI-200	1.998	2.002	2	1.600				14		0.3000		

TI

DESCRIPTION

Internal self-locking ring for axial application into housings and bores. Low cost design with an easy grooveless installation using a plunger. Not reusable.

AXIAL ASSEMBLY

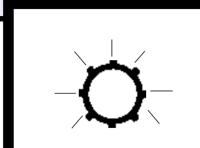
HOW TO IDENTIFY

1. Verify correct bore size (Db).
2. Measure the part thickness (T).
3. Count the number of prongs on the part.
4. Determine the inside diameter (ID) of the part.
5. Find the part in the chart above.

GENERAL USE

COMMON

ZINC/YELLOW



STACKED/ROLL PACK

NOT AVAILABLE

DTI — METRIC Page 212

TY / TX (PAGE 92)

DESCRIPTION

Axially-applied grooveless rings that provide good retention, particularly on parts with dimensional variations. Installed with a tube or plunger. The TX is a heavier-duty version, with a wider and thicker rim, and more prongs.

AXIAL ASSEMBLY

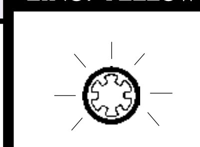
HOW TO IDENTIFY

1. Verify the correct shaft size (Ds).
2. Measure the part thickness (T).
3. Count the number of prongs on the part.
4. Determine the outside diameter (OD) of the part.
5. Find the part in the charts on the previous page.

GENERAL USE

COMMON

ZINC/YELLOW



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GROOVELESS

USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

TY and TX ⟷ SHF (Page 14) ⟷ RG (Page 27) ⟷ T99 (Page 101)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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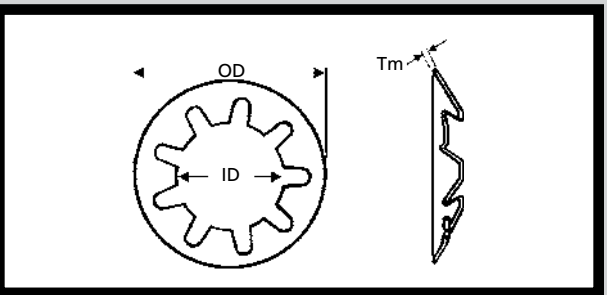

INTERNAL TOOTHED

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

ITW Shakeproof	8063		

ITR	SHAFT	RING				MATERIAL
	Nominal Shaft	Outside Diameter Nominal (OD)	Inside Diameter (ID) Min.	Inside Diameter (ID) Max.	Material Thickness (Tm)	Spring Steel
ITR-00710	.0780	.2200	.0680	.0730	.0100	
-00812	.0870	.1800	.0770	.0800	.0120	
-00910	.0940	.1800	.0810	.0850	.0100	
-00910-01	.0940	.2650	.0810	.0860	.0100	
-00910-T	.0940	.3940	.0850	.0880	.0100	
-01110	.1120	.2580	.1020	.1070	.0100	
-01110-01	.1120	.2580	.1020	.1050	.0100	
-01210	.1200	.2650	.1100	.1150	.0100	
-01210-01	.1250	.2650	.1130	.1180	.0100	
-01310	.1350	.2630	.1220	.1270	.0100	
-01415	.1450	.2810	.1330	.1400	.0150	
-01510	.1560	.3320	.1460	.1510	.0100	
-01510-T	.1560	.3940	.1460	.1500	.0100	
-01512	.1560	.3320	.1460	.1510	.0120	
-01512-01	.1560	.3560	.1470	.1520	.0120	
-01610	.1620	.3320	.1520	.1570	.0100	
-01620	.1620	.3330	.1510	.1550	.0200	
-01710	.1750	.3320	.1640	.1660	.0100	
-01810	.1810	.3330	.1740	.1700	.0100	
-01810-01	.1870	.3320	.1760	.1800	.0100	
-01810-02	.1870	.3320	.1730	.1780	.0100	
-01815-T	.1870	.3940	.1770	.1810	.0150	
-02010	.2050	.3330	.1940	.1980	.0100	
-02113	.2180	.4020	.2020	.2070	.0130	
-02215	.2200	.5310	.2050	.2200	.0150	
-02314	.2360	.5310	.2200	.2260	.0140	
-02315	.2380	.4600	.2280	.2360	.0150	
-02315-01	.2380	.4750	.2280	.2360	.0150	
-02510	.2500	.4720	.2390	.2440	.0100	
-02510-01	.2500	.4730	.2340	.2390	.0100	
-02515-T	.2500	.4620	.2340	.2390	.0150	
-02515	.2500	.4720	.2390	.2440	.0150	
-02520	.2500	.5150	.2380	.2420	.0200	
-02520-01	.2500	.6250	.2390	.2440	.0200	
-02520-02	.2500	.7340	.2390	.2440	.0200	
-02525	.2500	.4720	.2350	.2400	.0250	
-02525-01	.2500	.4770	.2400	.2350	.0250	
-02606	.2650	.3890	.2440	.2500	.0060	
-02613	.2650	.4720	.2500	.2550	.0130	
-02615	.2650	.4720	.2440	.2500	.0150	
ITR-02712	.2760	.6200	.2650	.2700	.0120	

+/-.002

ITR

DESCRIPTION

Grooveless external retainer for axial assembly. Slips over unthreaded shafts for lighter-duty uses like toys, housewares, and plastic applications.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure outside diameter (OD) of the part.
2. Verify shaft size.
3. Confirm material thickness (Tm).
4. Find the part in the charts above.

GENERAL USE

COMMON

UNIQUE TO SPECIFIC APPLICATIONS.

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

ITR ⟷ TX (Page 92) ⟷ TY (Page 92) ⟷ STR (Page 96) ⟷ WRR (Page 96)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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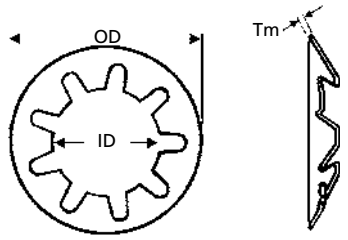

INTERNAL TOOTHED

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

ITW Shakeproof	8063	

ITR	SHAFT		RING				MATERIAL
	Nominal Shaft		Outside Diameter Nominal (OD)	Inside Diameter (ID) Min.	Inside Diameter (ID) Max.	Material Thickness (Tm)	Spring Steel
ITR-03120	.3110	+/-.002	.6260	.2950	.3010	.0200	
-03112	.3120		.4730	.2990	.3040	.0120	
-03115	.3120		.5100	.2950	.3050	.0150	
-03115-T	.3120		.5980	.2880	.2920	.0150	
-03115-01	.3120		.6030	.2990	.3040	.0150	
-03120	.3120		.5400	.2980	.3020	.0200	
-03125	.3120		.5980	.2880	.2920	.0250	
-03224	.3240		.6800	.3120	.3160	.0240	
-03313	.3300		.4720	.3180	.3230	.0130	
-03410	.3430		.6870	.3180	.3330	.0100	
-03715-T	.3750		.6800	.3280	.3550	.0150	
-03715	.3750		.6870	.3600	.3650	.0150	
-03715-01	.3750		.7800	.3340	.3420	.0150	
-04012	.4000		.7810	.3900	.3940	.0120	
-04014	.4030		.6250	.3900	.3940	.0140	
-04214-01	.4210		.7810	.4000	.4100	.0140	
-04310	.4370		.6870	.4270	.4320	.0100	
-04310-01	.4370		.7810	.4270	.4320	.0100	
-04717	.4750		.7810	.4670	.4620	.0170	
-04915	.4950		.6870	.4780	.4840	.0150	
-05010	.5000		.7810	.4930	.4980	.0100	
-05017-T	.5000		.7700	.4830	.4900	.0170	
-05520	.5520		1.0000	.5410	.5460	.0200	
-06215	.6250		.9510	.6100	.6140	.0150	
-06220	.6250		.9680	.6100	.6150	.0200	
-06220-01	.6250		1.0830	.6080	.6180	.0200	
-06240	.6250		.9680	.6100	.6150	.0400	
-06415	.6400		.8750	.6250	.6310	.0150	
-06520	.6590		1.0830	.6470	.6570	.0200	
-06618	.6690		1.0720	.6530	.6600	.0180	
-06729	.6750		1.2990	.6590	.6690	.0295	
-07013	.7030		1.0820	.6810	.6890	.0130	
-07029	.7030		1.2500	.6860	.6930	.0290	
-07510	.7500		.9650	.7350	.7400	.0100	
-07520	.7500		1.2500	.7350	.7400	.0200	
-08025	.8000		1.3750	.7800	.7900	.0250	
-08525	.8500		1.1920	.8350	.8400	.0250	
-10012	1.0000		1.6250	1.0400	1.0450	.0120	
-10015	1.0000		1.3750	.9700	.9800	.0150	
-11215	1.1250		2.0000	1.0750	1.0850	.0150	
ITR-11315	1.1350		1.5730	1.1200	1.1250	.0150	

ITR

AXIAL ASSEMBLY

DESCRIPTION

Grooveless external retainer for axial assembly. Slips over unthreaded shafts for lighter-duty uses like toys, housewares, and plastic applications.

HOW TO IDENTIFY

1. Measure outside diameter (OD) of the part.
2. Verify shaft size.
3. Confirm material thickness (Tm).
4. Find the part in the charts above.

GENERAL USE

COMMON

MINIMUM PRODUCTION RUNS SOMETIMES NECESSARY.

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

ITR ⟷ TX (Page 92) ⟷ TY (Page 92) ⟷ STR (Page 96) ⟷ WRR (Page 96)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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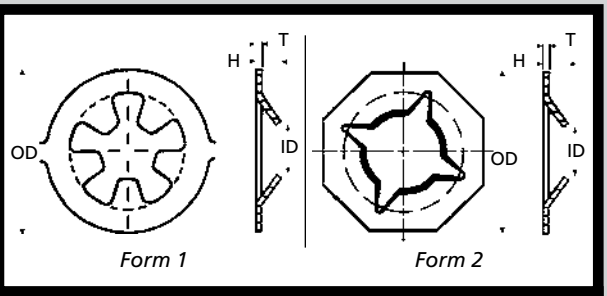


HIGH SPEED STRIP

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

STR

DESIGN		PART DIMENSIONS				STRIP		MATERIAL
Shaft Size Design	Form	Outside Diameter (OD)	Inside Diameter (ID)	Height (H)	Material Thickness (T)	Strip Length	Parts per Strip	Spring Steel
STR-012	.125	1	.365	.116	.048 Ref.	.015	5.500	14	
-018	.187	2	.500	.175	.051 Ref.		13.500	25	
STR-025	.250	2	.500	.234	.063 Ref.		13.500	25	

STR

USES

High speed installation in strip form using automated equipment. Individual parts are twisted or punched for removal.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm that the part is from a strip by finding the "breakout" on the outer rim.
2. Determine the shaft size size design.
3. Find the part in the chart above.

GENERAL USE

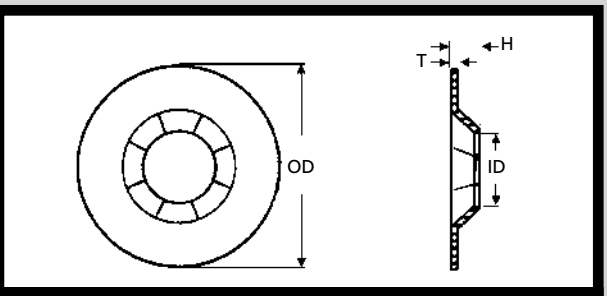
WEIRD

CUSTOM SIZES AVAILABLE PER QUOTE.

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

STR ⟷ ITR (Page 94) ⟷ TX (Page 92) ⟷ TY (Page 92) ⟷ NPR (Page 98)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.



WIDE RIM SLOTTED

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

ITW Shakeproof	8065		

WRR

SHAFT	RING					MATERIAL
Shaft Size Design	Outside Diameter (OD)	Inside Diameter (ID) Min.	Inside Diameter (ID) Max.	Height (H)	Material Thickness (T)	Spring Steel
WRR-015	.158	.472	.142	.148	.055	.012	
-023	.236	.531	.220	.226	.072	.017	
WRR-031	.311	.626	.295	.301	.071	.020	

WRR

DESCRIPTION

Wide rim provides increased peripheral abutment. Large profile eases hand-installation and adjustment.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify the size of the shaft that the part is used on.
2. Measure the material thickness (T).
3. Determine the outside diameter (OD).
4. Find the part in the chart above.

GENERAL USE

WEIRD

HIGHER PRODUCTION MINIMUMS SOMETIMES REQUIRED.

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

WRR ⟷ T99 (Page 101) ⟷ ITR (Page 94)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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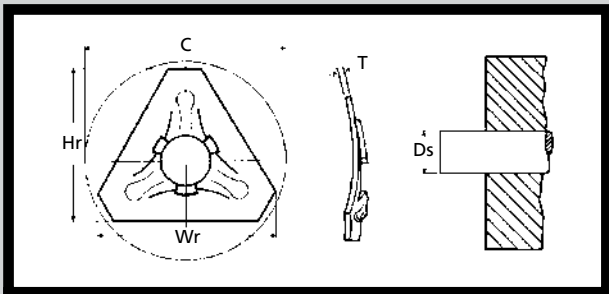

TRIANGLE PUSH-ON

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Waldes	5305		

TR	SHAFT			RING					WEIGHT Lbs. per 100 Pieces	MATERIAL Spring Steel
	From (Ds)	To (Ds)	Fraction (Ds)	Height (Hr)		Width (Wr)		Thickness (T)	Clearance (C)	
TR-006	.060	.064	1/16	.315	+/-.005	.363	+/-.005	.010	.40	0.0130
-006-H								.015		0.0180
-009	.092	.096	3/32	.376		.434		.010	.48	0.0250
-009-H								.015		0.0360
-012	.122	.128	1/8					.010		0.0250
-012-H								.015		0.0360
-013	.132	.138	-					.010		0.0250
-013-H								.015		0.0360
-014	.142	.148		.416		.481		.010	.52	0.0320
-014-H								.015		0.0460
-015	.153	.159	5/32					.010		0.0320
-015-H								.015		0.0460
-018	.185	.191	3/16	.467	+/-.010	.538	+/-.010	.015	.58	0.0540
-025	.246	.254	1/4	.587		.677		.015	.73	0.0870
-031	.308	.316	5/16	.640		.738		.015	.80	0.0920
-037	.371	.379	3/8	.725		.835		.020	.89	0.1660
-043	.434	.442	7/16	.804		.928		.025	.98	0.2320
TR-043Hex								.025		0.2320

DTR METRIC Page 213

If you really need one of these, a production minimum may apply.

TRIANGLE SCREW-ON

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Waldes	5300		

NTR	THREAD	RING						WEIGHT Lbs. per 100 Pieces	MATERIAL Spring Steel
	Thread Series	Height (Hr)		Width (Wr)		Thickness-Light Version (T)	Clearance (C)		
NTR-0632	6-32	.376	+/-.005	.434	+/-.005	.015	.38	0.0380	
-0632-H						.020	.53	0.0530	
-0832	8-32	.416		.481		.015	.46	0.0460	
-0832-H						.020	.64	0.0640	
-1024	10-24	.467		.538		.015	.58	0.0580	
-1024-H						.020	.81	0.0810	
-1420	1/4-20	.587	+/-.010	.677	+/-.010	.020	1.22	0.1220	
-1420-H						.025	1.49	0.1490	
-1032	10-32	.467		.538		.015	.58	0.0580	
-1032-H						.020	.81	0.0810	
-1428	1/4-28	.587		.677		.020	1.18	0.1180	
NTR-1428-H						.025	1.45	0.1450	

TR / NTR

AXIAL ASSEMBLY

DESCRIPTION

Large triangular shoulder grips better than round rings like the TX and TY. NTR is a push nut that is turned onto the shaft. Unusual shape has made the part nearly extinct. Last seen holding a leg tag onto a passenger pigeon.

HOW TO IDENTIFY

1. Find one in existence.
2. Determine if the ring is a push on (TR) or screw on (NTR).
3. Locate the ring in the chart above based on thickness (T), shaft diameter (Ds), and height (Hr).

GENERAL USE

WEIRD

SEE TX AND TY SERIES ON PAGE 92 FOR MORE COMMON VARIATIONS.

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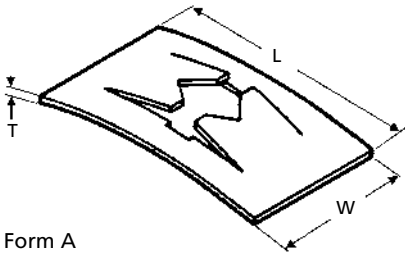
BASIC RECTANGULAR

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

ITW Shakeproof	PO		



Form A

NPR	STUD		RING			STYLE							MATERIAL
						Forms							
	Decimal	Fraction	Length (L)	Width (W)	Material Thickness (T)	A	B	C	D	E	F	G	Spring Steel
NPR-650375	.062	1/16	.391	.187	.012	•	•						
-650400	.062	1/16	.391	.219	.012	•							
-650402	.062	1/16	.391	.219	.018	•							
-650350	.062	1/16	.625	.375	.015	•			•				
-650401	.070	-	.875	.312	.015	•							
-658320	.080 x .250	-	.625	.250	.012	•							
-659850	.080 x .720	-	1.250	.562	.018	•					•		
-650500	.081	-	.391	.219	.018	•	•						
-650850	.081	-	.391	.219	.018	•		•		•			
-650896	.093	3/32	.453	.234	.012	•							
-650897	.093	3/32	.453	.234	.015	•							
-650900	.093	3/32	.453	.234	.018	•							
-650925	.093	3/32	.797	.334	.012	•		•		•			
-651002	.100	-	.453	.234	.015	•	•						
-651050	.100	-	.578	.250	.015	•	•						
-651000	.102	-	.453	.234	.015	•	•						
-651001	.107	-	.453	.234	.015	•	•						
-651410	.125	1/8	.312	.250	.012	•	•						
-651415	.125	1/8	.312	.250	.015	•	•						
-651400	.125	1/8	.906	.250	.015	•	•						
-651455	.125	1/8	.906	.312	.018	•							
-658300	.125	1/8	.578	.344	.012	•							
-651450	.125	1/8	.906	.500	.015	•							
-650365	.156	5/32	.562	.375	.012	•							
-650360	.156	5/32	.562	.375	.015	•			•				
-650361	.156	5/32	.562	.375	.012	•			•				
-652700	.187	3/16	.625	.375	.015	•		•					
-652701	.187	3/16	.625	.375	.022	•		•					
-652900	.187	3/16	.625	.375	.015	•			•				
-653399	.250	1/4	.625	.438	.010	•							
-653445	.250	1/4	.641	.438	.018	•							
-653410	.250	1/4	.984	.625	.018	•	•						
-653425	.250	1/4	1.000	.562	.012	•	•					•	
-653500	.271	-	.625	.438	.012	•	•						
-653550	.308	-	.625	.500	.012	•	•						
-653525	.312	5/16	1.000	.687	.018	•	•			•			
-653555	.365	-	.625	.500	.012	•	•						
-654100	.440	-	1.250	.875	.015	•	•						
-659475	.484	31/64	.922	.750	.012	•	•			•			
NPR-654105	.500	1/2	1.250	.875	.020	•	•						

NPR

DESCRIPTION

Push nuts engage an unthreaded shaft on two sides for greater strength. Notched prongs deflect providing a strut that resists back pressure.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Is the OD round (NPO) or rectangular (NPR)?
2. Confirm the form using the diagram on page 99.
3. Verify the stud size.
4. Find the part in the charts above using length (L) and width (W) dimensions.

GENERAL USE

UNCOMMON

PRODUCTION MINIMUMS MAY APPLY.

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

NPR/NPO ↔ ITR (Page 94) ↔ WRR (Page 96)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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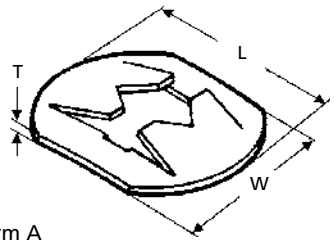


Form A

BASIC ROUND

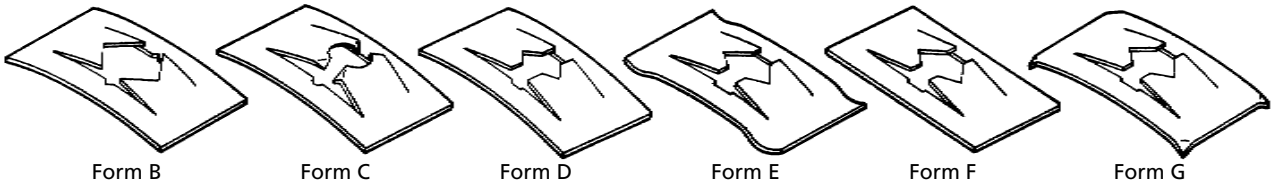
MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

ITW Shakeproof	PO		

NPO

	STUD		RING			STYLE							MATERIAL
						Forms							
	Decimal	Fraction	Length (L)	Width (W)	Material Thickness (T)	A	B	C	D	E	F	G	Spring Steel
NPO-659150	.050	-	.375	.344	.012	•			•				
-658947	.062	1/16	.500	-	.012	•			•				
-659151	.093	3/32	.500	.344	.012	•			•				
-655125	.093	3/32	.500	.344	.012	•	•						
-655100	.102	-	.281	-	.012	•							
-655920	.107	-	.375	.344	.012	•	•						
-655950	.122	-	.375	.344	.012	•	•						
-656000	.125	1/8	.375	.344	.012	•	•						
-656010	.125	1/8	.500	-	.018	•	•						
-656005	.148	-	.375	.344	.012		•						
-656250	.152	-	.375	.344	.012	•	•						
-656300	.164	-	.375	.344	.012	•	•						
-656325	.175	-	.562	-	.012	•	•						
-656440	.187	3/16	.500	-	.012	•	•						
-656442	.187	3/16	.500	-	.015	•	•						
-656800	.218	7/32	.500	-	.012	•	•						
-656450	.225	-	.562	-	.018	•	•						
-656850	.235	-	.562	.437	.012	•	•						
-656900	.250	1/4	.562	-	.012	•	•						
-656910	.250	1/4	.812	.563	.022	•							
-657000	.281	9/32	.875	-	.022	•	•				•		
-657075	.312	5/16	.750	.625	.018	•		•			•		
-657027	.312	5/16	.875	-	.012	•	•				•		
-657029	.312	5/16	.875	-	.018	•	•				•		
-659149	.375	3/8	.875	-	.018	•	•				•		
NPO-659460	.472	-	.906	.625	.012	•		•					


Form B Form C Form D Form E Form F Form G

Note: The form applies to the tooth design on the inside of the part, as well as to ring curvature. If you are uncertain, please ask for a print or submit a sample.

NPO

AXIAL ASSEMBLY

DESCRIPTION

Push nuts engage an unthreaded shaft on two sides for greater strength. Notched prongs deflect providing a strut that resists back pressure.

HOW TO IDENTIFY

1. Is the OD round (NPO) or rectangular (NPR)?
2. Confirm the form using the diagram on page 99.
3. Verify the stud size.
4. Find the part in the charts above using length (L) and width (W) dimensions.

GENERAL USE


UNCOMMON

VERIFY STOCK PRIOR TO ORDER.

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

NPR/NPO ITR (Page 94) WRR (Page 96)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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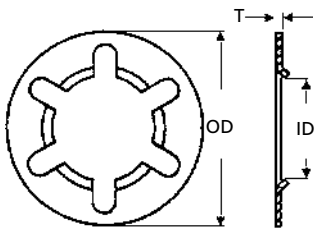
MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

HEAVIER DUTY



BRR	RING					MATERIAL
	Outside Diameter (OD)		Inside Diameter (ID)		Material Thickness (T)	Spring Steel
	Min.	Max.	Min.	Max.		
BRR-092218-1	.558	.568	.217	.221	.018	
-092312-1	.552	.573	.231	.237	.012	
-052406-2	.336	.340	.241	.250	.006	
-102811-2	.624	.628	.278 Ref.	.278 Ref.	.011	
-102808-2	.624	.628	.278 Ref.	.278 Ref.	.008	
-122812-1	.757	.763	.270	.280	.012	
-123210-2	.757	.763	.315	.325	.010	
-163110-1	.969	.975	.328 Ref.	.328 Ref.	.010	
-133410-1	.784	.788	.346 Ref.	.346 Ref.	.010	
-133815-2	.784	.788	.375 Ref.	.375 Ref.	.015	
-133815-1	.784	.788	.375 Ref.	.375 Ref.	.015	
-143815-1	.873	.877	.360	.390	.015	
-144115-1	.867	.870	.406	.410	.015	
-134216-1	.812	.812	.417	.423	.016	
-164515-1	.985	1.015	.465	.475	.015	
-165020-1	.985	.995	.485	.515	.020	
-145118-1	.700	.700	.509	.515	.018	
-187312-1	1.083	1.103	.732	.738	.012	
BRR-227525-1	1.375 Ref.	1.375 Ref.	.750 Ref.	.750 Ref.	.025	

BRR

AXIAL ASSEMBLY

DESCRIPTION

Internal prongs and dished shape provide increased strength, yet allow the bearing to rotate on the shaft.

HOW TO IDENTIFY

1. Verify the size of the shaft that the part is used on and the inside diameter (ID) of the part.
2. Measure the material thickness (T).
3. Determine the outside diameter (OD).
4. Find the part in the chart above.

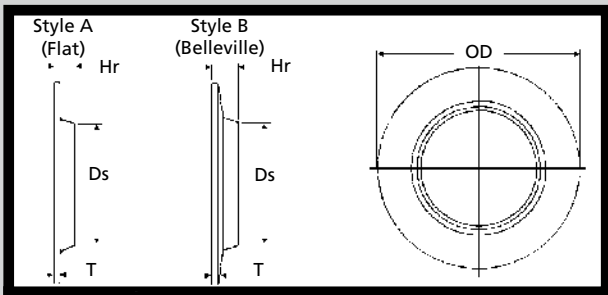
GENERAL USE

UNCOMMON

MINIMUM PRODUCTION RUN MAY APPLY.

GROOVELESS

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



BASIC GROOVELESS

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Eaton	T99220		

T99	SHAFT	RING				MATERIAL
	Decimal (Ds)	Outside Dia. (OD)	Height (Hr)	Thickness (T)	Style	Stainless Steel
T99-125-SS	.046	.088	.017	.006		
-110-SS	.050	.125	.020	.006		
-095-SS	.058	.125	.020	.006		
-156-SS	.060	.178	.020	.006		
-128-SS	.062	.150	.016	.006		
-105-SS	.076	.150	.025	.006		
-136-SS	.076	.375	.025	.006	A	
-093-SS	.078	.178	.025	.006		
-060-SS	.093	.218	.030	.008		
-075-SS	.093	.245	.030	.008		
-085-SS	.093	.250	.030	.008		
-087-SS	.093	.325	.025	.006		
-069-SS	.098	.218	.035	.008	B	
-165-SS	.117	.200	.030	.010		
-083-SS	.117	.245	.030	.010		
-067-SS	.117	.245	.030	.008		
-167-SS	.125	.194	.030	.012		
-094-SS	.125	.210	.025	.006		
-058-SS	.125	.245	.025	.006		
-096-SS	.125	.245	.025	.008		
-107-SS	.125	.250	.025	.008		
-103-SS	.125	.305	.025	.006		
-111-SS	.125	.312	.025	.010		
-074-SS	.125	.325	.025	.006		
-077-SS	.130	.245	.025	.006	A	
-123-SS	.130	.325	.025	.006		
-153-SS	.143	.260	.025	.008		
-066-SS	.156	.260	.025	.008		
-086-SS	.162	.437	.040	.015		
-146-SS	.173	.312	.025	.010		
-073-SS	.175	.312	.025	.008		
-089-SS	.175	.375	.025	.008		
-164-SS	.187	.2875	.025	.006		
-068-SS	.187	.315	.025	.006		
-072-SS	.187	.325	.025	.008		
-126-SS	.187	.375	.030	.012		
-121-SS	.187	.750	.025	.008		
T99-151-SS	.2168	.437	.030	.010		

T99	SHAFT	RING				MATERIAL
	Decimal (Ds)	Outside Dia. (OD)	Height (Hr)	Thickness (T)	Style	Stainless Steel
T99-097-SS	.220	.325	.025	.008		
-079-SS	.234	.375	.020	.006		
-090-SS	.237	.437	.030	.010	A	
-144-SS	.248	.750	.030	.010		
-080-SS	.250	.312	.025	.006		
-082-SS	.250	.312	.025	.010		
-092-SS	.250	.395	.045	.010	B	
-104-SS	.250	.437	.050	.010		
-137-SS	.250	.625	.030	.010		
-147-SS	.265	.437	.030	.010		
-106-SS	.298	.437	.030	.010		
-118-SS	.300	.500	.060	.020		
-145-SS	.309	.437	.030	.008		
-064-SS	.312	.437	.030	.010		
-078-SS	.312	.437	.035	.015		
-158-SS	.312	.437	.040	.017	A	
-131-SS	.312	.500	.030	.010		
-141-SS	.312	.564	.035	.015		
-160-SS	.315	.562	.070	.031		
-161-SS	.315	.500	.035	.010		
-108-SS	.315	.625	.040	.010		
-134-SS	.318	.750	.045	.015		
-132-SS	.343	.562	.030	.010		
-114-SS	.372	.500	.035	.010	B	
-127-SS	.372	.625	.030	.010		
-115-SS	.375	.500	.030	.010		
-091-SS	.375	.625	.030	.010		
-152-SS	.375	.590	.030	.010		
-130-SS	.406	.625	.030	.010		
-122-SS	.430	.625	.030	.010	A	
-150-SS	.437	.655	.040	.020		
-101-SS	.446	.625	.030	.010		
-139-SS	.451	.610	.030	.010		
-129-SS	.462	.625	.025	.010		
-088-SS	.462	.750	.025	.008		
-120-SS	.500	.750	.025	.010		
T99-100-SS	.624	.750	.045	.015		

T99

AXIAL ASSEMBLY

DESCRIPTION

Large surface area for low cost reusable retention on steel, plastic, or ceramic shafts. Especially effective in limited access locations. Production minimum may apply.

HOW TO IDENTIFY

1. Verify style "A" (Flat) or "B" (Belleville).
2. Confirm shaft size (Ds).
3. Find the part in the chart above based on outside diameter (OD), height (Hr), and thickness (T).

GENERAL USE

UNCOMMON

ALSO AVAILABLE IN COIL OR STRIP FORM FOR HIGH SPEED ASSEMBLY.

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

T99 ⟷ TX (Page 92) ⟷ TY (Page 92) ⟷ ITR (Page 94) ⟷ RG (Page 27)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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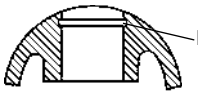
TYPES

	**A12**	C-TYPE	EXTERNAL
		Tangle-free design for external radial application on shafts.	Pg: 104
	**D25**	D-TYPE	INTERNAL
		Tangle-free design for internal axial application in bores.	Pg: 104
 DIN 73123 73130	**S Series**	PISTON RING	INTERNAL
		Specialized form unique to automotive manufacturers. Meets DIN 73123 and 73130.	Pg: 105
	**BPXZ**	HAIR PIN	EXTERNAL
		Radially applied pin for external application on shafts in a wide array of sizes.	Pgs: 106-107



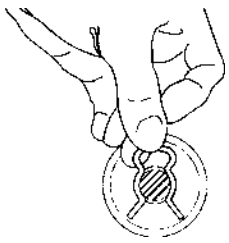
May be custom formed for a specific application like in the piston above . . .

. . . or used to provide increased abutment using less precise grooves.

COMMONLY USED IN SHEAR PINS OR IN U-JOINTS.

AUTOMATED INSTALLATION

Use your hands . . .



. . .pliers . . .

. . . or a screwdriver.

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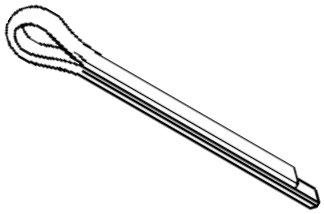
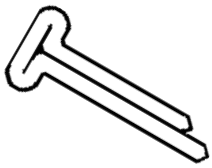
OTHER WIRE FORMS

CONTACT OUR PLANT FOR QUOTATIONS ON OTHER TYPES OF WIRE FORMS.



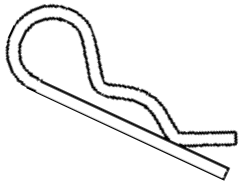
COTTER PINS



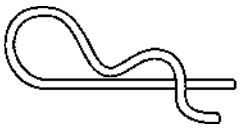
TEE HEAD COTTER PINS

HAMMER LOCK COTTER PINS

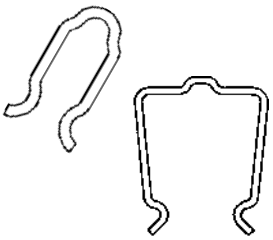
SELF-LOCKING COTTER PINS



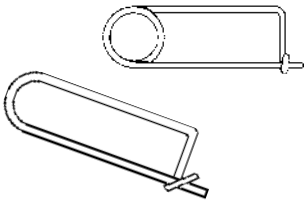
BRIDGE PINS



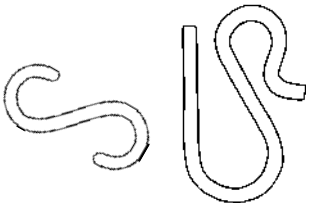
SPECIAL BRIDGE PINS



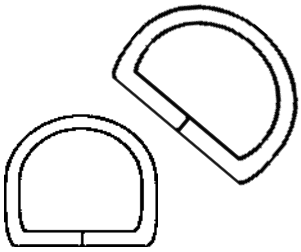
SPECIAL HAIR PINS



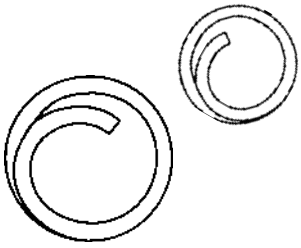
SAFETY PINS



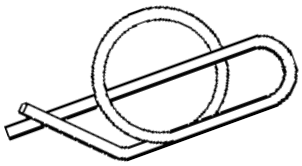
S-HOOKS



D-RINGS

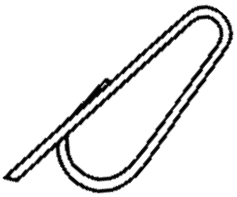


RING COTTERS

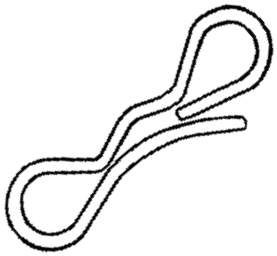


UNIQUE DESIGNS

NOSE RINGS



SPECIAL WIRE FORMS



BOW COTTERS

EARRINGS

WE DO BODY PIERCING!

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WIRE FORMS

785·392·3017 FAX 785.392.2845

REVISED 09-04
www.huyett.com

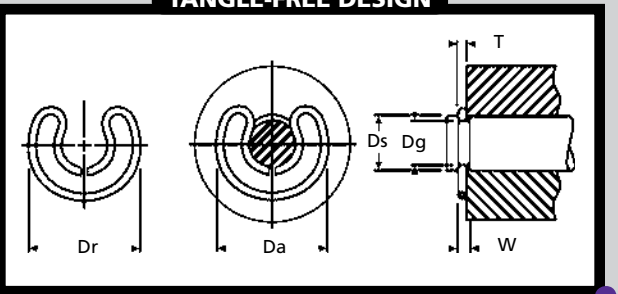
EXTERNAL "C" STYLE

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	A1200

TANGLE-FREE DESIGN



A12	SHAFT	RING			GROOVE				MATERIAL	TOOL
	Decimal (Ds)	Free Outside Diameter (approx.) (Dr)	Thickness (T)	Assembled Outside Dia. (Da)	Diameter (Dg)		Width (W)		Spring Steel	
A12-007	.125	.310	.032 dia.	.340	.075	+.005/-.000	.036	+.003/-.000		-40
-011	.156	.360	.032 sq.	.390	.115		.036			-41
-013	.188	.450	.036 dia.	.490	.130		.040			-42
-014	.188	.400	.032 sq.	.440	.140	+.010/-.005	.036			-43
-015	.219	.510	.048 sq.	.550	.150		.052			-44
-015R	.219	.510	.048 dia.	.550	.150		.052			-44
-017	.219	.480	.032 sq.	.530	.170		.036			-45
-019	.250	.480	.040 sq.	.540	.195		.044			-46
-021	.250	.480	.032 sq.	.540	.200		.036			-47
-021R	.250	.480	.032 dia.	.540	.200		.036			-47
-022	.266	.540	.040 sq.	.590	.210		.044			-48
-023	.281	.560	.048 dia.	.610	.220		.052			-49
-025	.313	.570	.040 sq.	.630	.255		.044			-50
-034	.375	.690	.040 sq.	.740	.330		.044			-51
-043	.500	.870	.056 sq.	.940	.435		.060	+.004/-.000		-52
-052	.563	1.030	.064 sq.	1.100	.500	+.015/-.010	.068			-53A
A12-057	.625	1.120	.064 sq.	1.200	.560		.068			-54A

+/-.002

WIRE SECTION VARIES BY DIAMETER.

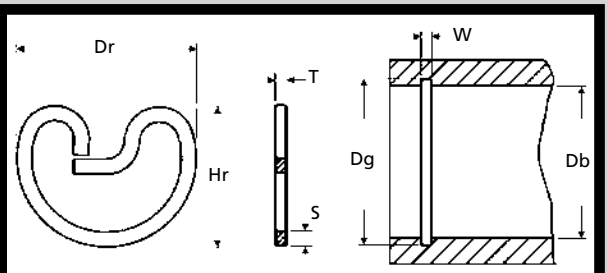
CONTACT PLANT FOR TOOL INFORMATION.

INTERNAL "D" STYLE

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	M2500



D25	BORE	RING					GROOVE				MATERIAL
	MM (Db)	Diameter (approx.) (Dr)	Radial Wall (S)		Thickness (T)		Height (approx.) (Hr)	Diameter (Dg)		Width (W)		Spring Steel
D25-024	24	26.3	2.0	+.060/-.100	1.5	+.000/-.030	21.5	25.2	+.080/-.000	1.6	+.140/-.000	
-027	27	30.1	2.4				24.4	28.2				
D25-030	30	32.7	2.4				27.0	31.2				

A12 / D25

RADIAL / AXIAL ASSEMBLY

DESCRIPTION

Lighter duty radially-installed external (A12) or axially-installed internal (D25) rings that tolerate wide groove tolerances. Easily fitted and removed using a standard hand tool or applicator.

HOW TO IDENTIFY

1. Determine wire cross section (round, square, or rectangle).
2. Measure thickness (T).
3. Measure the ring diameter (Dr).
4. Find the part in the charts above.

GENERAL USE

WEIRD

GENERALLY THESE RINGS ARE INFERIOR IN PERFORMANCE TO THEIR STAMPED COUNTERPARTS (SEE SH ON PAGE 6 AND HO ON PAGE 16).

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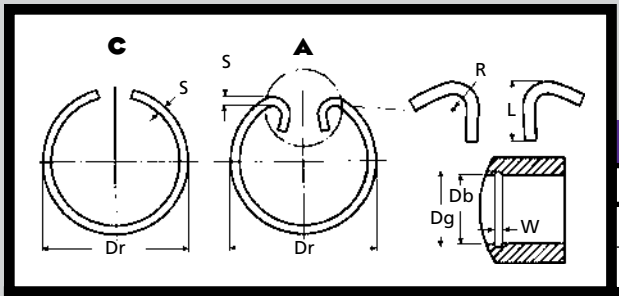


PISTON RINGS

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Seeger	SRA, SRC	SKA, SKC	
DIN	73123	73130	

S

BORE	RING							GROOVE				MATERIAL
MM (Db)	Free Outside Dia. (Dr)		Wire Cross-Section (S)		Radius Max. (R)	Lug Length (L)		Diameter (Dg)		Width (W)		Spring Steel
SKA-010	10	11.3	+.5/-.0	.8	+/-.01	1.2	3	+.0/-1.0	10.8	+.2/-.0	.9	+.1/-.0	
-012	12	13.6							12.8				
-014	14	16.0		1.0	+/-.015	1.3	5		15.1		1.1		
-015	15	17.1							16.1				
-018	18	20.5	+1.0/-.0	1.3	+/-.03	1.6	7		19.5		1.4		
-020	20	22.7		1.5	+/-.02				21.7		1.6		
-022	22	24.8							23.7				
-024	24	27.2							25.7				
-025	25	28.2							26.7				
-026	26	29.4							27.7				
-028	28	31.4							29.7				
-030	30	34.0		2.0	+/-.025	2.1	8		32.4		2.1		
-032	32	36.0							34.4				
SKA-035	35	39.0							37.4				
SRA-010	10	11.8	+.5/-.0	1.0	+/-.015	1.3	3		11.1		1.1		
-012	12	13.9							13.2				
-015	15	17.2		1.2			5		16.3		1.3		
SRA-025	25	27.8	+1.0/-.0	1.6	+/-.02	1.6	7		26.8		1.7		
SKC-010	10	11.3	+.5/-.0	.8	+/-.01	–	–		10.8		.9		
-012	12	13.6							12.8				
-014	14	16.0		1.0	+/-.015				15.1		1.1		
-015	15	17.1							16.1				
-018	18	20.5	+1.0/-.0	1.3	+/-.03				19.5		1.4		
-020	20	22.7		1.5	+/-.02				21.7		1.6		
-022	22	24.8							23.7				
-024	24	27.2							25.7				
-025	25	28.2							26.7				
-026	26	29.4							27.7				
-028	28	31.4							29.7				
-030	30	34.0		2.0	+/-.025				32.4		2.1		
-032	32	36.0							34.4				
SKC-035	35	39.0							37.4				
SRC-010	10	11.8	+.5/-.0	1.0	+/-.015				11.1		1.1		
-012	12	13.9							13.2				
-015	15	17.2		1.2					16.3		1.3		
SRC-025	25	27.8	+1.0/-.0	1.6	+/-.02				26.8		1.7		

S SERIES

DESCRIPTION

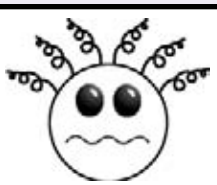
Unique wire-formed rings used in high volume automated assemblies. Generally found in the automotive industry only.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify form (C or A).
2. Determine wire section (S).
3. Measure free outside diameter (Dr).
4. Find the part in the chart above while paying particular attention to section (for SK or SR).

GENERAL USE



WEIRD

S SERIES

WIRE

- K: Standard
- R: Heavy

FORM

- C: Cut Ends
- A: Radiused Ends

"S" is for the series; "K" or "R" is the wire size; "C" or "A" shows end configuration; and the number gives you the bore size in mm. Example: SKA-018 is a standard duty wire with radiused ends for an 18mm bore.

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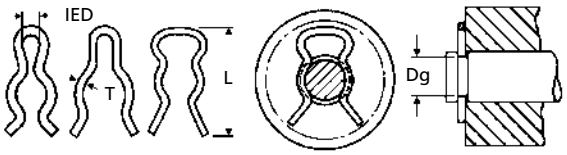


HAIR PIN TYPE

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	A1100	Hubbard	HPC
ITW	23 Series		

BPXZ

	GROOVE	PIN DIMENSIONS			WEIGHT	MATERIAL	
	Diameter (Dg)	Wire Cross-Section (T)	Inside Eye Diameter (IED)	Length (L)	Lbs. per 100 Pieces	Zinc Plated "BPXZ-"	Stainless "BPXS-"
BPXZ-415	.0938	.0260	.0625	.3750	.0130		
-413	.0781	.0280	.0625	.2813	.0130		
-418	.1250	.0280	.0938	.4375	.0330		
-409	.0938	.0280	.0625	.5000	.0330		
-2301	-	.0290	.0625	.3125	.0100		
-2302	.1406	.0310	.1094	.5000	.0200		
-2303	-	.0330	.1250	.6250	.0300		
-401	.1536	.0350	.0938	.4688	.0250		
-405	.1536	.0350	.1250	.5000	.0250		
-411	.2188	.0350	.0938	.6250	.0380		
-419	-	.0420	-	.7500	.0880		
-406	.3125	.0460	.1875	.9375	.2330		
-422	.1250	.0470	.0938	.4375	.0500		
-420	.3125	.0470	-	.5625	.0750		
-416	.1875	.0470	.1094	.5938	.0630		
-421	.3750	.0470	-	.6250	.1000		
-404	.2500	.0470	.1250	.8750	.1000		
-408	.1875	.0470	.1250	1.3125	.1330		
-2304	-	.0480	.1250	.7500	.0600		
-2305	-	.0520	.1875	.9688	.1300		
-2306	-	.0550	.2188	1.1250	.1900		
-403	.2500	.0620	.1250	.6875	.1250		
-412	.3125	.0620	.1563	.7500	.1380		
-402	.3750	.0620	.1875	1.0000	.2000		
-2307	-	.0640	.2500	1.1250	.2200		
-2308	-	.0870	.3125	1.5000	.5600		
-2309	-	.0930	.3750	1.8125	.7500		
-407	.7813	.1050	.4375	2.0625	1.0750		
-2310	-	.1050	.4375	2.0781	1.1300		
-414	.7813	.1250	.4375	2.0625	1.5500		
-2311	-	.1250	.5000	2.2813	2.0000		
-410	.6875	.1770	.7500	2.7500	4.2000		
-2312	-	.1860	.7960	3.0000	5.0000		
BPXZ-417	.7500	.1870	.8750	2.8750	5.0000		

BPXZ

DESCRIPTION

High shoulder design provides increased abutment. Will accommodate wide groove diameter variation. Reusable. Commonly used on clevis pins and shafts.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Find style from chart on page 107.
2. Measure wire cross section (T).
3. Determine the length (L) of the pin.
4. Find the part in the chart above.

GENERAL USE

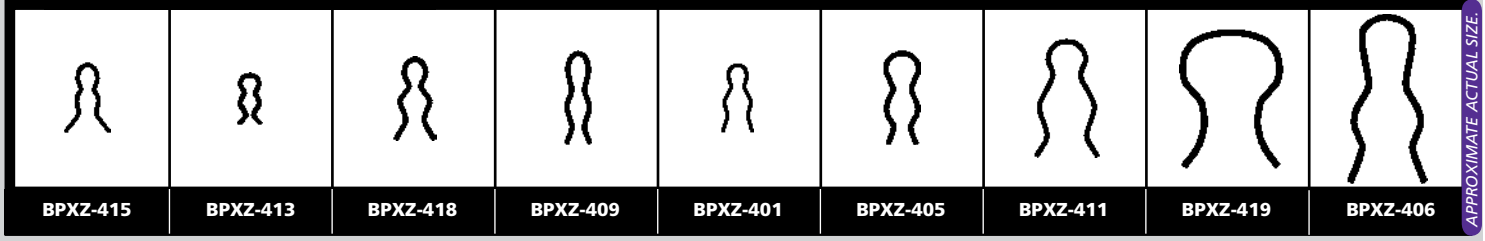
COMMON

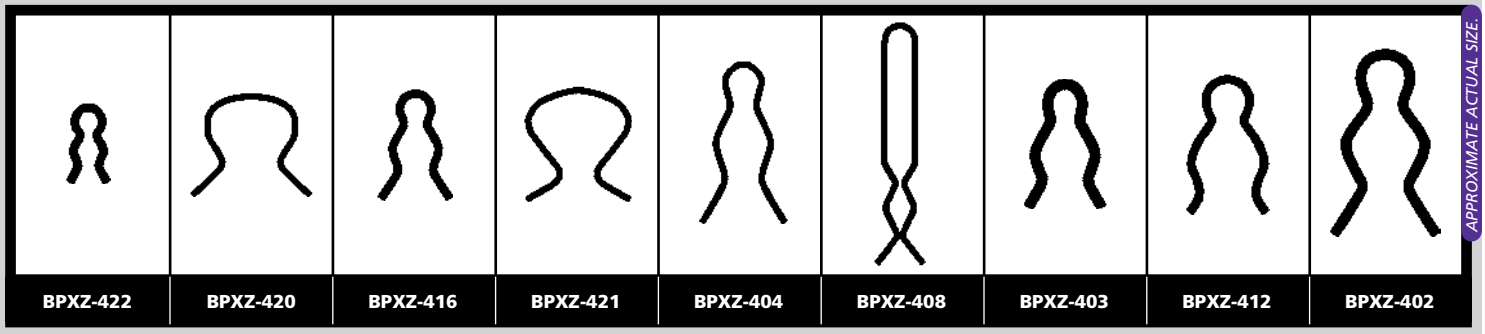
EASILY FITTED AND REMOVED USING A PLIERS OR SCREWDRIVER.

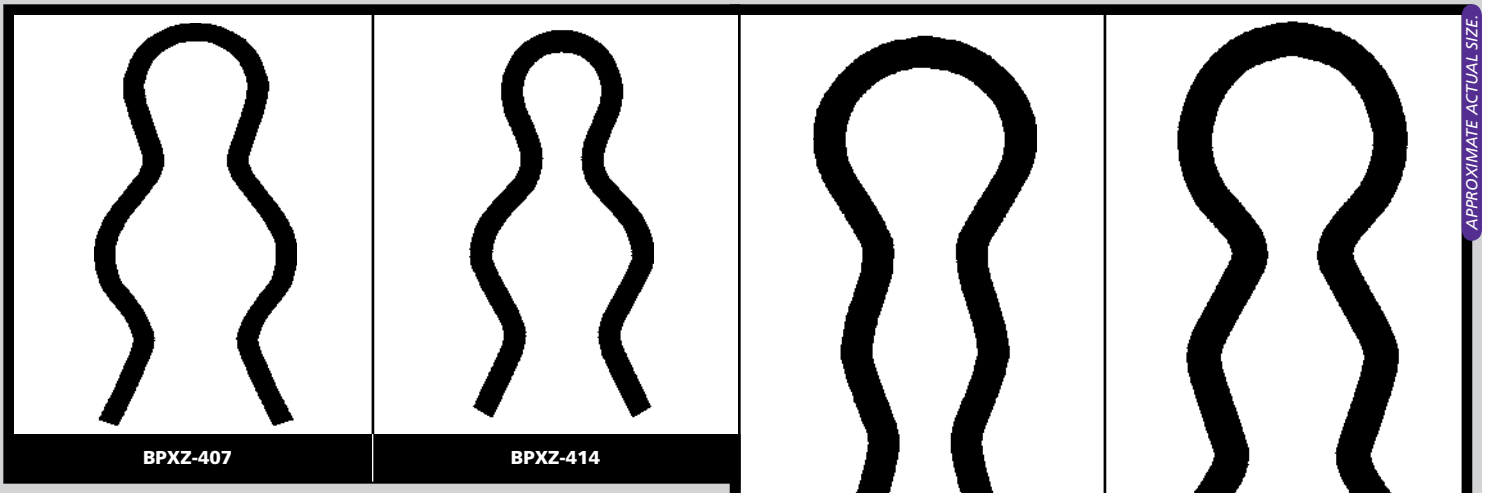
OFTEN USED TO RETAIN WASHERS ON HITCH PINS AND SHAFTS.

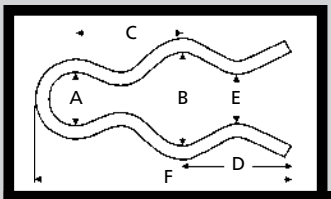
MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

HAIR PIN DESIGNS









DIAGRAMS ARE APPROXIMATE ACTUAL SIZE.

Part #	Shaft Size	Wire Diameter	A Eye Diameter	B	C	D	E	F Overall Length
BPXZ-2301	1/8	.029	1/16	5/64	1/8	1/8	1/32	.352
-2302	3/16	.031	7/64	9/64	7/32	7/32	1/16	.491
-2303	1/4	.033	1/8	7/32	1/4	1/4	1/8	.600
-2304	5/16	.048	1/8	1/4	5/16	5/16	5/32	.838
-2305	3/8	.052	3/16	5/16	3/8	3/8	5/32	.958
-2306	7/16	.055	7/32	3/8	7/16	1/2	3/16	1.140
-2307	1/2	.064	1/4	7/16	1/2	9/16	3/16	1.264
-2308	5/8	.087	5/16	17/32	5/8	5/8	9/32	1.525
-2309	3/4	.093	3/8	21/32	3/4	3/4	5/16	1.808
-2310	7/8	.105	7/16	25/32	7/8	7/8	13/32	2.006
-2311	1	.125	1/2	7/8	1	7/8	1/2	2.243
BPXZ-2312	1	.186	5/64	51/64	-	-	-	3.000

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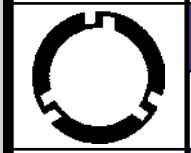
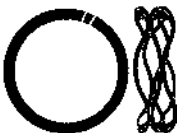
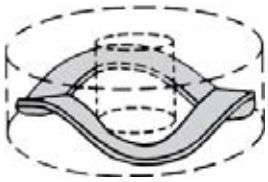
TYPES

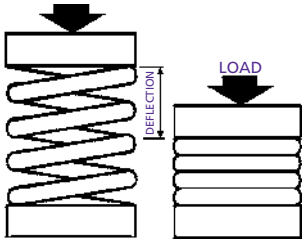
	**BW** BELLEVILLE DISC SPRING	IMPERIAL Pgs: 110-111	METRIC Pgs: 214-215
	**PSW** SHOULDER WASHER	IMPERIAL Pg: 112	METRIC N/A
	**FS** FINGER WASHER	IMPERIAL Pg: 112	METRIC N/A
	**DWS** STANDARD METRIC WAVE SPRING	IMPERIAL N/A	METRIC Pgs: 216-217
	**WSE** WAVE SPRING EXTERNAL	IMPERIAL Pg: 114	METRIC N/A
	**WSI** WAVE SPRING INTERNAL	IMPERIAL Pg: 115	METRIC N/A
	**WSG** STANDARD GAP WAVE SPRING	IMPERIAL Pgs: 116-117	METRIC N/A
	**WSN** NARROW SECTION WAVE SPRING	IMPERIAL Pg: 118	METRIC N/A
	**CML** COMPRESSION SPRING LIGHT DUTY	IMPERIAL Pgs: 120-121	METRIC N/A
	**CMM** COMPRESSION SPRING MEDIUM DUTY	IMPERIAL Pgs: 122-123	METRIC N/A
	**CMH** COMPRESSION SPRING HEAVY DUTY	IMPERIAL Pgs: 124-125	METRIC N/A

When selecting a spring, there are several design issues to consider:



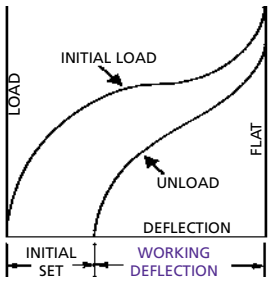
ENVELOPE

This is the "cylinder" of space within which the spring operates. Springs will tend to expand slightly as they compress.



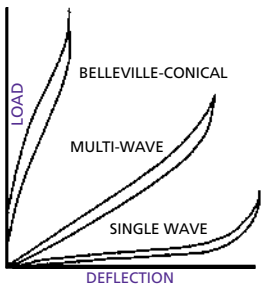
LOAD AND DEFLECTION

Load is the measurement of a spring when flattened, while deflection is the distance the spring compresses.



WORKING DEFLECTION

After initial set, a spring develops working deflection as it expends stored energy from heat and friction.



PERFORMANCE

Different styles of springs will yield different results over time.

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PRODUCT COMPARISONS

Spring washers include a broad range of components with similar but tangential performance characteristics to retaining rings. As a full line manufacturer and distributor of bearing and power transmission components, we are compelled to include springs in our product offering.

Common applications for spring washers include:

1. End-play take-up in assemblies due to cumulative manufacturing tolerances.
2. Compensation for dimensional changes in assemblies.
3. Elimination of rattle.
4. Maintenance of torque and "tightness" in fasteners.
5. Compensation for expansion and contraction in environments with extreme temperature fluctuation.
6. Shock absorption.

Listed below are performance comparisons for several types of springs. The table is designed to give generalized information and cannot be extrapolated to specific applications. The concept behind the table is to give you some ideas of load and work height between styles. See page 108 for additional explanation.

PERFORMANCE COMPARISONS FOR VARIOUS SPRING TYPES

		BELLEVILLE WASHER		STANDARD GAP STYLE		COMPRESSION SPRINGS					
			BW Pg 110		WSG Pg 116		CML Pg 120		CMM Pg 122		CMH Pg 124
SPRINGS		Load	Work Height	Load	Work Height	Load	Work Height	Load	Work Height	Load	Work Height
	5/8"	255-345 lbs.	.053	10 lbs.	.050	6 lbs.	.238	12 lbs.	.454	-	-
	1"	573-777 lbs.	.082	18 lbs.	.062	12 lbs.	.710	18 lbs.	.720	25 lbs.	1.083
	1-1/2"	1190-1610lbs.	.121	26 lbs.	.078	20 lbs.	.866	35 lbs.	.835	60 lbs.	1.119
	2"	2048-2772 lbs.	.160	34 lbs.	.093	25 lbs.	.490	50 lbs.	.800	90 lbs.	1.069

Actual results will be based on individual circumstances. These values are for reference only.

MATERIAL

CARBON STEEL	STAINLESS STEEL 302	STAINLESS STEEL 316	BERYLLIUM COPPER	INCONEL X-75®	ALLOY A-286
(STANDARD)	(STANDARD)	(SPECIAL ORDER)	(SPECIAL ORDER)	(SPECIAL ORDER)	(SPECIAL ORDER)

OTHER MATERIALS AVAILABLE ON REQUEST.

FINISHES

OIL DIPPED	BLACK OXIDE	CADMIUM	PHOSPHATE	PASSIVATE
(STANDARD)	(SPECIAL ORDER)	(SPECIAL ORDER)	(SPECIAL ORDER)	(SPECIAL ORDER)

OTHER FINISHES AVAILABLE ON REQUEST.

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DISC SPRINGS

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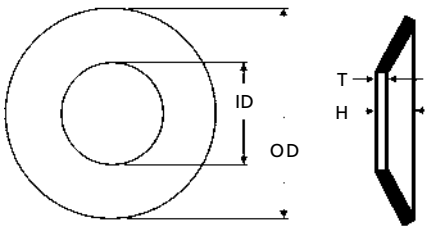
BELLEVILLE DISC SPRING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

* Hypothetical load based on part design. Actual load cannot be guaranteed.

CONICAL SHAPE



BW

FREE FIT		SPRING						MATERIAL	
Over Shaft Fraction or Bolt Size	In Bore Fraction	Minimum Inside Dia. (ID)	Maximum Outside Dia. (OD)	Thickness (T)	Approx. Height (H)	Work Height	Load at Work Height*	Spring Steel	Stainless "S"
BW-0187-0H-007	3/32	3/16	.093	.187	.0065	.0130	.0100	6.1-7.5		
-0187-0H-010					.0100	.0130	.0125	13.7-16.9		
-0250-0G-009	1/8	1/4	.125	.250	.0086	.0172	.0130	10.5-12.9		
-0250-0G-013					.0133	.0200	.0170	23.6-29.0		
-0375-0G-019		3/8		.375	.0185	.0280	.0230	37-46		
-0281-0F-010	#6	9/32	.138	.281	.0100	.0200	.0150	13.5-16.5		
-0281-0F-013					.0130	.0210	.0170	22-27		
-0281-0F-015					.0150	.0230	.0190	30-37		
-0312-0E-011	5/32	5/16	.156	.312	.0108	.0216	0.160	16.7-20.5		
-0312-0E-017					.0166	.0250	0.021	37.2-45.6		
-0343-0D-013	#8	11/32	.164	.343	.0130	.0240	.0180	22.5-27.5		
-0343-0D-016					.0160	.0260	.0210	32-40		
-0343-0D-019					.0185	.0280	.0230	45-65		
-0375-0C-015	3/16	3/8	.190	.375	.0150	.0270	.0210	31.5-38.5		
-0375-0C-018					.0175	.0280	.0230	45-51		
-0375-0C-020					.0200	.0300	.0250	54-66		
-0563-0B-043	#10	37/64	.196	.563	.0430	.0560	-	-		
-0437-0A-016	#12	7/16	.220	.437	.0160	.0310	.0230	36-44		
-0500-A-018	1/4	1/2	.255	.500	.0180	.0340	.0260	40.5-49.5		
-0500-A-022					.0215	.0360	.0290	60-74		
-0500-A-025					.0250	.0380	.0310	85-105		
-0500-A-038					.0380	.0470	.0430	161-219		
-0637-A-032		41/64		.637	.0320	.0480	.0400	106-130		
-0813-A-062		53/64	.258	.813	.0620	.0850	-	-		
-0625-B-022	5/16	5/8	.317	.625	.0220	.0420	.0320	63-77		
-0625-B-032					.0320	.0480	.0400	130-160		
-0625-B-047					.0470	.0590	.0530	255-345		
-0937-B-030		15/16		.937	.0300	.0600	.0450	99-121		
-0937-B-045					.0450	.0670	.0560	196-240		
-0750-C-028	3/8	3/4	.380	.750	.0280	.0510	.0390	99-121		
-0750-C-034					.0340	.0550	.0440	149-183		
-0750-C-040					.0400	.0590	.0490	211-259		
-0750-C-056					.0560	.0700	.0630	365-495		
-1125-C-053		1-1/8		1.125	.0530	.0800	.0660	269-329		
-1125-C-078					.0780	.0970	.0880	515-697		
-0875-D-031	7/16	7/8	.442	.875	.0310	.0590	.0450	121-149		
-0875-D-045					.0450	.0670	.0560	243-297		
-1063-D-082		1-5/64	.450	1.063	.0820	.1080	-	-		
-1188-D-091		1-13/64		1.188	.0910	.1220	-	-		
BW-1000-E-035	1/2	1	.505	1.000	.0350	.0670	.0510	157-193		

BW

AXIAL ASSEMBLY

DESCRIPTION

Very common spring with high load capacity but limited deflection. Will take an initial set when loaded to flat. Also known as conical washers or spring washers.

HOW TO IDENTIFY

1. Measure inside diameter (ID), outside diameter (OD), thickness (T), and height (H).
2. Find the part in the charts above.
3. Fax a quote request if the part is not a standard.

GENERAL USE

COMMON

DBW METRIC Page 214

STACK IN SERIES

OR PARALLEL

TO INCREASE LOAD AND DEFLECTION.

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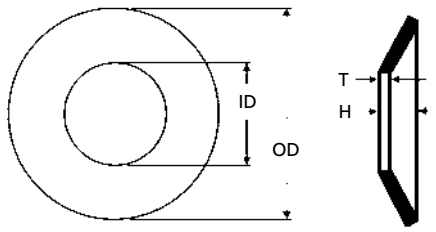
BOX 232 • MINNEAPOLIS, KS • 67467

CONICAL SHAPE



BELLEVILLE DISC SPRING

MANUFACTURER CROSS-REFERENCE

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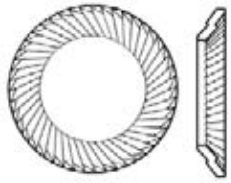
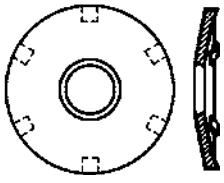
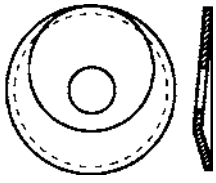
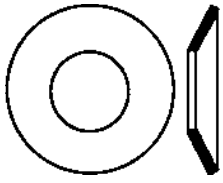
* Hypothetical load based on part design. Actual load cannot be guaranteed.

BW

	FREE FIT		SPRING						MATERIAL	
	Over Shaft Fraction or Bolt Size	In Bore Fraction	Minimum Inside Dia. (ID)	Maximum Outside Dia. (OD)	Thickness (T)	Approx. Height (H)	Work Height	Load at Work Height*	Spring Steel	Stainless "S"
BW-1000-E-043	1/2	1	0.505	1.000	.0430	.0710	.0570	225-275		
-1000-E-050					.0500	.0750	.0620	306-374		
-1000-E-073					.0730	.0910	.0820	573-777		
-1000-E-082					.0820	.0980	-	-		
-1262-E-060		1-17/64		1.262	.0600	.0910	.0750	368-450		
-1500-E-070		1-1/2		1.500	.0700	.1040	.0870	445-544		
-1125-F-038	9/16	1-1/8	0.567	1.125	.0380	.0730	.0550	175.0-215		
-1125-F-056					.0560	.0840	.0700	364-446.0		
-1250-G-040	5/8	1-1/4	0.630	1.250	.0400	.0820	.0610	207-253		
-1250-G-062					.0620	.0920	.0770	427-523		
-1250-G-089					.0890	.1110	.1000	833-1127		
-1875-G-057		1-7/8		1.875	.0570	.1150	.0850	333-407		
-1875-G-086					.0860	.1290	.1070	657-804		
-1875-G-127					.1270	.1580	.1420	1399-1893		
-1375-H-044	11/16	1-3/8	0.692	1.375	.0440	.0880	.0650	283-292		
-1500-I-045	3/4	1-1/2	0.755	1.500	.0450	.0930	.0690	255-313		
-1500-I-060					.0600	.1020	.0810	409-501		
-1500-I-072					.0720	.1070	.0890	598-732		
-1500-I-107					.1070	.1340	.1210	1190-1610		
-2250-I-068		2-1/4		2.250	.0680	.1370	.1030	463-553		
-2250-I-102					.1020	.1530	.1270	910-1113		
-2250-I-150					.1500	.1880	.1690	1853-2509		
-1750-J-057	7/8	1-3/4	0.880	1.750	.0570	.1140	.0850	405-495		
-1750-J-085					.0850	.1280	.1060	819-1001		
-2000-K-065	1	2	1.000	2.000	.0650	.1300	.0980	531-649		
-2000-K-084					.0840	.1360	.1100	769-941		
-2000-K-097					.0970	.1450	.1210	1062-1298		
-2000-K-142					.1420	.1770	.1600	2048-2772		
-3000-K-135		3		3.000	.1350	.2020	.1680	1548-1893		
-2250-L-073	1-1/8	2-1/4	1.125	2.250	.0730	.1480	.1130	657-803		
-2250-L-159					.1590	.1980	.1790	2250-3460		
-2500-M-080	1-1/4	2-1/2	1.250	2.500	.0800	.1600	.1200	783-957		
-2500-M-120					.1200	.1800	.1500	1584-1936		
-3750-M-168		3-3/4		3.750	.1680	.2510	.2090	2348-2870		
-2750-N-087	1-3/8	2-3/4	1.375	2.750	.0870	.1730	.1320	864-1056		
-2750-N-132					.1320	.1960	.1650	1755-2145		
-4000-S-125	2	4	2.000	4.000	.1250	.2500	.1870	1809-2211		
-4250-S-318		4-1/4		4.250	.3180	.4120	-	-		
BW-4500-S-356		4-1/2		4.500	.3560	.4560	-	-		

SPECIAL ORDER DISC SPRINGS

BWS SERRATED	BWT TOOTHED	BWO OFFSET	DBW METRIC (Page 214)
			
VIBRATION RESISTANT	*SHIFT RESISTANT*	*SECONDARY SPRING SYSTEM*	*DIN 2093*

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SHOULDER WASHER

MANUFACTURER CROSS-REFERENCE

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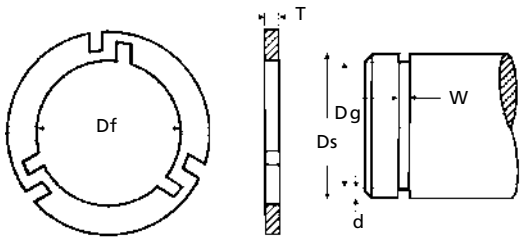
Waldes	5590



PSW	SHAFT		RING				GROOVE				MATERIAL	TOOL
	Decimal (Ds)	Fraction (Ds)	Free Inside Dia. (Df)		Thickness (T)		Diameter (Dg)		Width at Top (W)		Depth (d)	Spring Steel	
PSW-025	.250	1/4	.254	+/-.003	.050	+/-.002	.204	+/-.003	.053	+/-.002	.023		CONTACT PLANT
-037	.375	3/8	.380		.050		.321		.053		.027		
-050	.500	1/2	.505		.062		.434		.065		.033		
PSW-062	.625	5/8	.630		.062	+/-.003	.547		.065		.039		

FINGER WASHER

MANUFACTURER CROSS-REFERENCE

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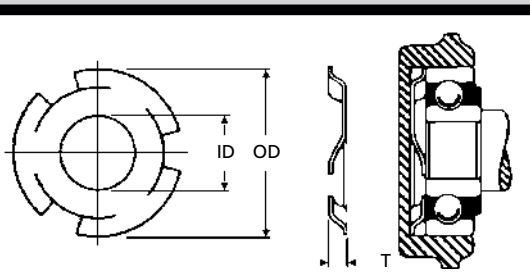

FS	OUTSIDE DIAMETER		INSIDE DIAMETER		LOAD		Material Thickness (T)	For use with Bearing OD		MATERIAL
	Decimal (OD)	MM (OD)	Decimal (ID)	MM (ID)	Load at Height of .062"	Load at Height of 1.57mm		Decimal	MM	Spring Steel
FS-0595-010	.595	15.11	.312	7.92	0.3 to 1.0	1.33-4.45	.010	.6299	16.0	
-0728-006	.728	18.49	.344	7.74	4 to 8	17.79-35.6	.006	.7480	19.0	
-0846-006	.846	21.49	.453	11.51	3 to 7	13.34-31.1	.006	.8661	22.0	
-0846-008	.846	21.49	.453	11.51	9 to 13	40.0-57.8	.008	.8661	22.0	
-0926-007	.926	23.52	.453	11.51	6 to 10	26.7-44.5	.007	.9449	24.0	
-0926-010	.926	23.52	.344	8.74	22 to 28	97.9-124.6	.010	.9449	24.0	
-1004-006	1.004	25.50	.516	13.11	5 to 9	22.2-40.0	.006	1.0236	26.0	
-1004-007	1.004	25.50	.516	13.11	8 to 12	35.6-53.4	.007	1.0236	26.0	
-1164-009	1.164	29.57	.688	17.48	9 to 13	40.0-57.8	.009	1.1811	30.0	
-1164-010	1.164	29.57	.406	10.31	15 to 21	66.7-93.4	.010	1.1811	30.0	
-1164-018	1.164	29.57	.688	17.48	60 to 75	267-334	.018	1.1811	30.0	
-1240-008	1.240	31.50	.688	17.48	10 to 14	44.5-62.3	.008	1.2598	32.0	
-1240-009	1.240	31.50	.563	14.30	15 to 21	66.7-93.4	.009	1.2598	32.0	
-1240-010	1.240	31.50	.688	17.48	15 to 21	66.7-93.4	.010	1.2598	32.0	
-1360-011	1.360	34.54	.814	20.68	11 to 15	48.93-66.72	.011	1.3780	35.0	
-1360-014	1.360	34.54	.814	20.68	17 to 25	75.6-111.2	.014	1.3780	35.0	
-1555-014	1.555	39.50	.971	24.66	15 to 21	66.7-93.4	.014	1.5748	40.0	
-1555-018	1.555	39.50	1.000	25.40	31 to 39	138-174	.018	1.5748	40.0	
-1830-016	1.830	46.48	1.189	30.20	17 to 23	75.6-102	.016	1.8504	47.0	
FS-2022-019	2.022	51.36	1.359	34.52	17 to 23	75.6-102	.019	2.0472	52.0	

PSW / FS

AXIAL ASSEMBLY

DESCRIPTION

The PSW serves as a shoulder on small shafts. Please don't buy it. The FS is more popular. The external fingers balance pressure evenly for use as a ball bearing retainer.

HOW TO IDENTIFY

1. Confirm general format.
2. Determine shaft size.
3. Find the part in the charts above based on material thickness (T).

GENERAL USE

UNCOMMON

MINIMUM PRODUCTION RUNS MAY BE REQUIRED.

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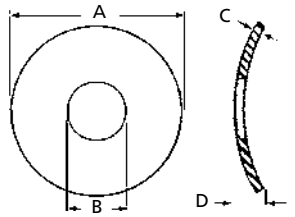
CW CURVED WASHER

TO QUOTE, ENTER THE INFORMATION BELOW:

MATERIAL:

OD (A)	FROM	TO	ID (B)	FROM	TO	Thick (C)	FROM	TO	H (D)	FROM	TO

Most commonly used stamped spring washer. Provides the greatest amount of spring action for its size and gauge compared to any other type. Used as take-up spring for large tolerance variations, anti-rattle applications, play eliminators (electric motors), and for cushioning light loads.



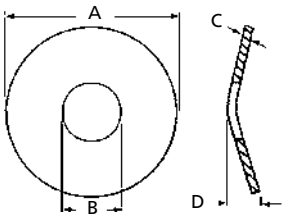
VW "V" WASHER

TO QUOTE, ENTER THE INFORMATION BELOW:

MATERIAL:

OD (A)	FROM	TO	ID (B)	FROM	TO	Thick (C)	FROM	TO	H (D)	FROM	TO

For general use. The "V" form increases load-carrying capacity but reduces spring resilience when compared to CW.



WW3 WAVE WASHER

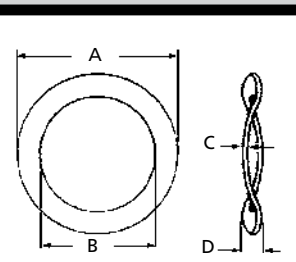
THREE WAVES

TO QUOTE, ENTER THE INFORMATION BELOW:

MATERIAL:

OD (A)	FROM	TO	ID (B)	FROM	TO	Thick (C)	FROM	TO	H (D)	FROM	TO

Provides greater load-bearing capability because of its three-point contact and sharper curves or waves. Used as a take-up spring for a wide range of load-bearing requirements. Popular sizes available from stock in spring steel.



WW4 WAVE WASHER

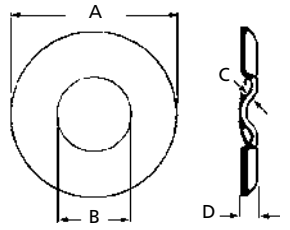
FOUR WAVES

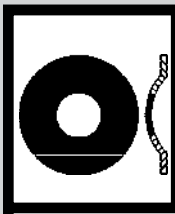
TO QUOTE, ENTER THE INFORMATION BELOW:

MATERIAL:

OD (A)	FROM	TO	ID (B)	FROM	TO	Thick (C)	FROM	TO	H (D)	FROM	TO

Four waves in this washer rim further increase its load-bearing capabilities. The function of the WW4 is similar to the WW3 or CW but under heavier load conditions and with some loss of resiliency.





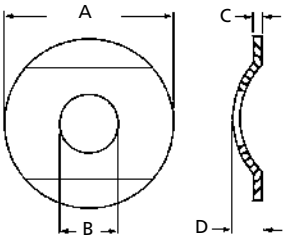
RW RIM WASHER

TO QUOTE, ENTER THE INFORMATION BELOW:

MATERIAL:

OD (A)	FROM	TO	ID (B)	FROM	TO	Thick (C)	FROM	TO	H (D)	FROM	TO

Provides flat contact to eliminate surface scoring. Characteristics similar to CW, but flat rim carries more load with same material thickness.



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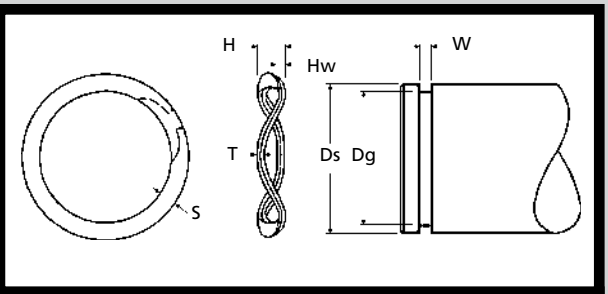

WAVE SPRING - EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	WSW		

WSE	SHAFT	SPRING							GROOVE		MATERIAL	
	Decimal (Ds)	Max. Free Height (H)	Radial Wall (S)	Thickness (T)	Number of Waves	Load at Work Height (Hw)		Theoretical Spring Rate	Diameter (Dg)	Width Min. (W)	Spring Steel	Stainless "-SS"
WSE-075	.750	.115	.065	.042	3	25	@ .085	1250	.704	.120		
-087	.875	.131	.075			30		1304	.821	.136		
-100	1.000	.129	.085			34		1172	.940	.134		
-112	1.125	.137	.128	.050		38	@ .100	1727	1.059	.142		
-125	1.250	.145				40		4000	1.176	.150		
-137	1.375	.130			4	45		3000	1.291	.135		
-150	1.500	.126				50		3333	1.406	.131		
-162	1.625	.138	.158	.062		55	@ .110	4231	1.529	.143		
-175	1.750	.137				60		3529	1.650	.142		
-187	1.875	.140				63		2864	1.769	.145		
-200	2.000	.145				65		2500	1.886	.150		
-212	2.125	.170	.188	.078		70	@ .130	4667	2.003	.175		
-225	2.250	.175				75		3947	2.120	.180		
-237	2.375	.175				80		3333	2.239	.180		
-250	2.500	.171				84		2971	2.360	.176		
-262	2.625	.181				88		2514	2.481	.190		
-275	2.750	.217	.225	.093		94	@ .170	4273	2.602	.222		
-287	2.875	.217				97		3731	2.721	.222		
-300	3.000	.225				100		3333	2.838	.230		
-312	3.125	.230				103		2943	2.957	.235		
-325	3.250	.225				106		2678	3.076	.230		
-350	3.500	.245	.281	.111		115	@ .185	4423	3.316	.250		
-362	3.625	.250				117		4034	3.435	.255		
-375	3.750	.258				121		3667	3.552	.263		
-387	3.875	.255				126		3073	3.673	.260		
-400	4.000	.268				130		3023	3.792	.273		
-412	4.125	.263				134		2735	3.919	.268		
-425	4.250	.248			5	140		8235	4.065	.253		
-450	4.500	.256				150		6818	4.310	.261		
-475	4.750	.253				160		5714	4.550	.258		
WSE-500	5.000	.259				170		5000	4.790	.264		

WSE

DESCRIPTION

Similar to a standard retaining ring, except the axial wave form yields to compressibility. Pressure is applied in two directions to eliminate "play." If the part is stamped, see page 113.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify that the part is for an external application by checking the end per the drawing above.
2. Count the waves "peak to peak."
3. Determine thickness (T).
4. Verify free height (H).
5. Find the part in the chart above.

GENERAL USE

UNCOMMON

TECHNICAL BENEFITS ARE MAKING THIS SPRING MORE POPULAR ALL THE TIME!

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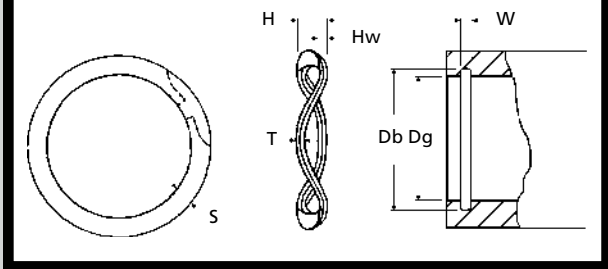

WAVE SPRING - INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	WHW		

WSI	BORE	SPRING						GROOVE		MATERIAL	
	Decimal (Db)	Max. Free Height (H)	Radial Wall (S)	Thickness (T)	Number of Waves	Load at Work Height (Hw)	Theoretical Spring Rate	Diameter (Dg)	Width Min. (W)	Spring Steel	Stainless "-SS"
WSI-075	.750	.114	.065	.035	3	25 @ .080	1042	.796	.119		
-087	.875	.110	.085	.042		30 @ .085	2000	.931	.115		
-100	1.000	.120				34	1360	1.066	.125		
-112	1.125	.125	.128	.050		38	2533	1.197	.130		
-125	1.250	.135				40 @ .100	2000	1.330	.140		
-137	1.375	.125			4	45	3750	1.461	.130		
-150	1.500	.135				50	3333	1.594	.140		
-162	1.625	.135	.158	.062		55	5500	1.725	.140		
-175	1.750	.140				60 @ .110	4286	1.858	.145		
-187	1.875	.141				63	3316	1.989	.146		
-200	2.000	.150				65	2708	2.122	.155		
-212	2.125	.170	.188	.078		70	5385	2.251	.175		
-225	2.250	.175				75 @ .130	4688	2.382	.180		
-237	2.375	.180				80	3810	2.517	.185		
-250	2.500	.183				84	3231	2.648	.188		
-262	2.625	.220	.225	.093		88	5867	2.781	.225		
-275	2.750	.229				94 @ .170	4947	2.914	.234		
-287	2.875	.225				97	4217	3.051	.230		
-300	3.000	.230				100	3704	3.182	.235		
-312	3.125	.250	.281	.111		103	7357	3.315	.255		
-325	3.250	.250				106	6625	3.446	.255		
-350	3.500	.245				115	5000	3.710	.250		
-362	3.625	.250				117	4500	3.841	.250		
-375	3.750	.255	.312			121	4840	3.974	.260		
-387	3.875	.260					4200	4.107	.265		
-400	4.000	.255					3714	4.240	.260		
-412	4.125	.258					3526	4.365	.263		
-425	4.250	.264					3182	4.490	.269		
-450	4.500	.250			5		8333	4.740	.255		
-475	4.750	.252				126	6956	4.995	.257		
WSI-500	5.000	.247				130	6017	5.260	.252		

WSI

AXIAL ASSEMBLY

DESCRIPTION

Similar to a standard retaining ring, except the axial wave form yields to compressibility. Pressure is applied in two directions to eliminate "play." If the part is stamped, see page 113.

HOW TO IDENTIFY

1. Verify that the part is for an internal application by checking the end per the drawing above.
2. Count the waves "peak to peak."
3. Determine thickness (T).
4. Verify free height (H).
5. Find the part in the chart above.

GENERAL USE

UNCOMMON

CIRCUMFERENTIAL MOVEMENT OF ENDS DURING COMPRESSION YIELDS PRECISE ENVELOPE OF MOTION.

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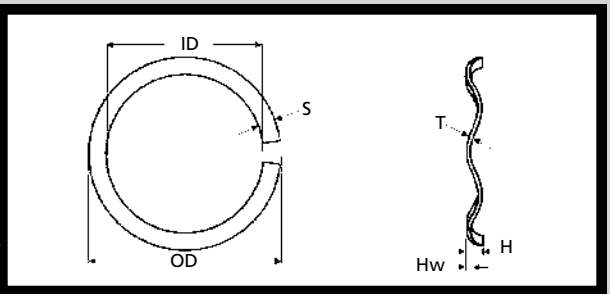

STANDARD GAP WAVE SPRING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	SSR		
Spirolox	TR		

WSG	SIZE		WAVE SPRING						MATERIAL	
	Bore Ø Min. (OD)	Shaft Ø Max. (ID)	Load (Lbs.)	Work Height (Hw)	Free Height (H)	Number of Waves	Thickness (T)	Radial Wall (S)	Spring Steel	Stainless "-SS"
WSG-050*	.50	.40	7	.050	.085	3	.008	.040		
-062*	.62	.48	10		.095		.010	.058		
-075*	.75	.50	14	.062	.160			.078		
-087*	.87	.62	16		.130		.012	.094		
-100*	1.00	.78	18		.160					
-112*	1.12	.84	20	.078	.130		.016	.133		
-125*	1.25	.96	22		.150					
-137*	1.37	1.09	24		.190					
-150*	1.50	1.17	26		.170		.018	.143		
-162*	1.62	1.31	28		.200					
-175	1.75	1.44	30		.140	4				
-187	1.87	1.56	32		.150					
-200	2.00	1.68	34	.093	.140		.024	.150		
-212	2.12	1.80	36		.150					
-225	2.25	1.93	38		.170					
-237	2.37	1.99	40		.160			.178		
-250	2.50	2.12	42		.170					
-262	2.62	2.24	44		.190					
-275	2.75	2.34	46	.109	.170		.030	.188		
-287	2.87	2.47	48		.180					
-300	3.00	2.59	50		.190					
-312	3.12	2.71	52		.210					
-325	3.25	2.75	54		.200			.233		
-337	3.37	2.84	56		.220					
-350	3.50	3.00	58		.230					
-362	3.62	3.12	60		.240					
-375	3.75	3.25	62		.260					
-387	3.87	3.37	64		.300					
-400	4.00	3.50	66		.190	5				
-412	4.12	3.62	67		.200					
-425	4.25	3.74	69		.210					
-437	4.37	3.86	70		.210					
-450	4.50	3.99	72		.230					
-462	4.62	4.11	73	.125	.270					
-475	4.75	4.24	75		.310					
-487	4.87	4.37	76		.290					
WSG-500	5.00	4.49	78		.310					

* *WSG-050 through WSG-162 overlap slightly at the ends rather than having a gap.*

WSG

AXIAL ASSEMBLY

DESCRIPTION

Flat wire design yields many benefits vs. compression springs: reduced operating height, precise load deflections, and lower cost. Precise envelope of motion.

HOW TO IDENTIFY

1. Count the waves "peak to peak."
2. Measure the thickness (T) and radial wall (S).
3. Determine free height (H).
4. Find the part in the chart above.

GENERAL USE

COMMON

NICE COMPACT DESIGN!

WSG *CONTINUED NEXT PAGE.*

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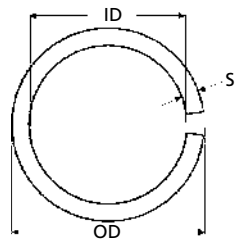

STANDARD GAP WAVE SPRING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	SSR		
Spirolox	TR		

WSG	SIZE		WAVE SPRING						MATERIAL	
	Bore Ø Min. (OD)	Shaft Ø Max. (ID)	Load (Lbs.)	Work Height (Hw)	Free Height (H)	Number of Waves	Thickness (T)	Radial Wall (S)	Spring Steel	Stainless "-SS"
WSG-512	5.12	4.61	80	.125	.340	5	.030	.233		
-525	5.25	4.74	82		.370					
-537	5.37	4.86	84		.380					
-550	5.50	4.99	86		.250	6				
-562	5.62	5.11	88		.270					
-575	5.75	5.24	90		.280					
-587	5.87	5.36	92		.300					
-600	6.00	5.49	94		.300					
-612	6.12	5.61	96		.310					
-625	6.25	5.73	98		.340					
-637	6.37	5.86	100		.350					
-650	6.50	5.98	102		.390					
-675	6.75	6.23	104		.420					
-700	7.00	6.16	106		.320		.032	.375		
-725	7.25	6.44	108		.350					
-750	7.50	6.69	110		.360					
-775	7.75	6.94	114		.380					
-800	8.00	7.19	118		.390					
-825	8.25	7.44	122		.430					
-850	8.50	7.68	126		.340	7				
-875	8.75	7.93	130		.340					
-900	9.00	8.18	134		.290	8				
-950	9.50	8.68	142		.240	9				
-1000	10.00	9.17	150		.290					
-1050	10.50	9.67	158		.310					
-1100	11.00	10.17	166		.350					
-1150	11.50	10.66	174		.360					
-1200	12.00	11.16	182		.440					
-1250	12.50	11.66	190		.350	10				
-1300	13.00	12.16	198		.410					
-1350	13.50	12.65	206		.430					
-1400	14.00	13.15	214		.300	12				
-1450	14.50	13.65	221		.320					
-1500	15.00	14.13	230		.350					
-1550	15.50	14.64	239		.310	13				
WSG-1600	16.00	15.14	248		.340					

WSG

DESCRIPTION

Flat wire design yields many benefits vs. compression springs: reduced operating height, precise load deflections, and lower cost. Precise envelope of motion.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Count the waves "peak to peak."
2. Measure the thickness (T) and radial wall (S).
3. Determine free height (H).

GENERAL USE

COMMON

PRECISE LOAD DEFLECTION CHARACTERISTICS!

NARROW SECTION NEXT PAGE.

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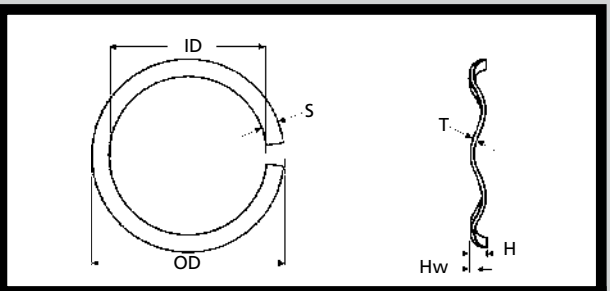


NARROW SECTION - SPLIT

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	SSR-N		

WSN	SIZE		WAVE SPRING						MATERIAL	
	Bore Ø Min. (OD)	Shaft Ø Max. (ID)	Load (Lbs.)	Work Height (Hw)	Free Height (H)	Number of Waves	Thickness (T)	Radial Wall (S)	Spring Steel	Stainless "-SS"
WSN-325	3.25	2.82	54	.109	.20	4	.030	.188		
-337	3.37	2.94	56		.22					
-350	3.50	3.07	58		.26					
-362	3.62	3.19	60		.27					
-375	3.75	3.32	62		.28					
-387	3.87	3.44	64		.31					
-400	4.00	3.57	66		.20	5				
-412	4.12	3.69	67		.20					
-425	4.25	3.82	69		.24					
-437	4.37	3.94	70		.21					
-450	4.50	4.07	72		.28					
-462	4.62	4.19	73	.125	.27					
-475	4.75	4.32	75		.32					
-487	4.87	4.44	76		.32					
-500	5.00	4.57	78		.35					
-512	5.12	4.69	80		.35					
-525	5.25	4.82	82		.36					
-537	5.37	4.94	84		.44					
-550	5.50	5.07	86		.28	6				
-562	5.62	5.19	88		.29					
-575	5.75	5.32	90		.34					
-587	5.87	5.44	92		.34					
-600	6.00	5.57	94		.34					
-612	6.12	5.69	96		.28	7				
-625	6.25	5.82	98		.28					
-637	6.37	5.94	100		.30					
-650	6.50	6.07	102		.30					
-675	6.75	6.32	104		.30					
-700	7.00	6.48	106	.156	.32			.233		
-725	7.25	6.73	108		.33					
-750	7.50	6.98	110		.36					
WSN-775	7.75	7.23	114		.38					

WSN

AXIAL ASSEMBLY

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
Precision narrow wire section (S) with gap to eliminate binding and minimize radial expansion. Compact working envelope.	1. Count the waves "peak to peak." 2. Measure the thickness (T) and radial wall (S). 3. Determine free height (H). 4. Find the part in the chart above.	 WEIRD

NARROW DESIGN FOR TIGHTER WORKING SPACES.

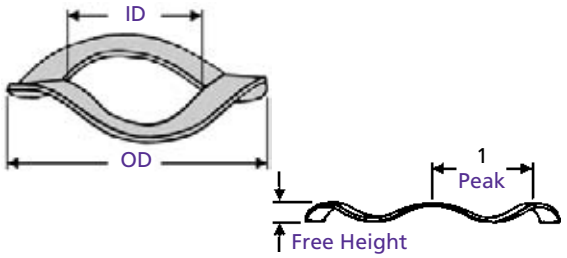
COPY AND FAX *SPECIAL SPRING QUOTATION NEEDS*

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

JUST COPY AND FAX TO 785-392-2845

BOX 232 • MINNEAPOLIS, KS • 67467

G.L. HUYETT



SPECIAL WAVE SPRINGS

NAME: _____ COMPANY: _____

PHONE: _____ FAX: _____

ZODIAC SIGN: _____ NUMBER OF PETS: _____ ❒ SMOKER ❒ NONSMOKER

APPLICATION

There are thousands of wave spring applications, the peculiarities of which are limited only by your imagination. Wave springs are manufactured using an edge winding process, which is a precise method that requires minimal tooling modifications. As a result, we can offer customized parts, even in prototype or repair quantities, at a fairly reasonable cost. To assist you, we are providing this "Copy and Fax" design sheet. Please fill this page out as completely as possible and fax it to our plant for quotation.

How is the part going to be used? _____

_____

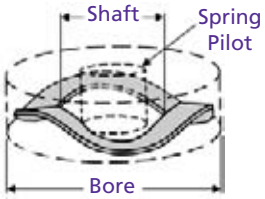
_____

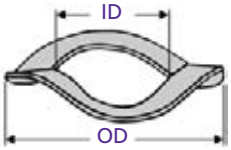
Quantity to Quote:

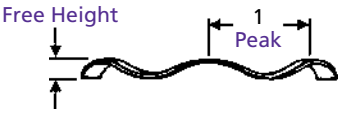
Q_1: _____ Q_3: _____

Q_2: _____ Q_4: _____

SIZING







ENVELOPE

Operates in _____ Bore (size) to Clear _____ Shaft (size)

Spring Pilot: ❒ Bore ❒ Shaft

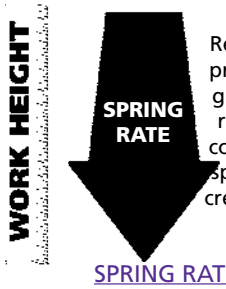
_____ O.D. Maximum

_____ I. D. Minimum

# of Waves "Peak to Peak" _____

Maximum Free Height _____

USAGE

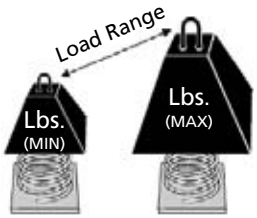


Refers to the progressively greater load required to compress the spring at decreasing work heights.

SPRING RATE

_____ Lbs./In. at

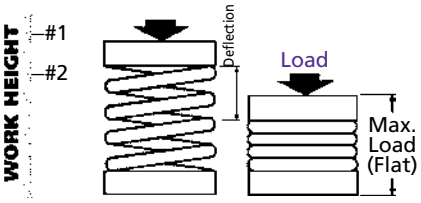
_____ Work Height



PERMITTED LOAD RANGE
(Tolerances of Spring Rate)

Min: _____ Lbs. to Max: _____ Lbs.

At Work Height: _____ Inches



Minimum Load (1): _____

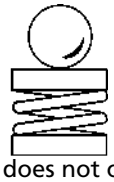
At Work Height of _____ Inches

Minimum Load (2): _____

At Work Height of _____ Inches

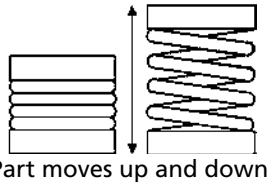
LOAD

❒ Fixed Load



Part does not cycle.

❒ Cyclical Load



Check One:
❒ Up To 10,000 Cycles
❒ Up To 100,000 Cycles
❒ Up To 1 Million Cycles
❒ Above 1 Million Cycles

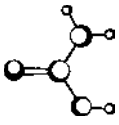
Part moves up and down.

❒ I'm Loaded

Call us for assistance.

MATERIAL

If you know . . .



MATERIAL
❒ Spring Steel
❒ 302 Stainless Steel
❒ Inconel X-750
❒ 17-7 Ph/C Stainless
❒ 316 Stainless Steel
❒ Other: _____

FINISH
❒ Black Oxide
❒ Phosphate
❒ Other: _____

If you don't know, give us some information about the environment:

TEMPERATURE

_____ ° Maximum ❒ F ❒ C

ATMOSPHERE
❒ Corrosive
❒ Non-Corrosive

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

WAVE SPRINGS

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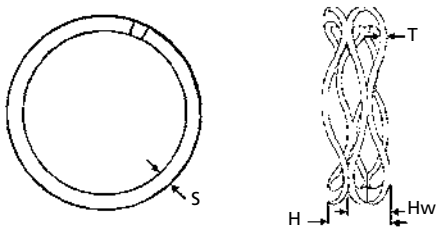
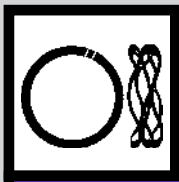




COMPRESSION - LIGHT DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	C-L		
Spirolox	CML		

CML

SPRING									
Operates in Bore Dia.	Clears Shaft Dia.	Load	Work Height (Hw)	Free Height (H)	Number of Turns	Number of Waves	Thickness (T)	Radial Wall (S)	Spring Rate
CML-06203	5/8"	.450	6	.055	.160	3	2-1/2	.010	.058	48
-06204				.068	.210	4				35
-06205				.085	.260	5				28
-06206				.106	.320	6				24
-06207				.128	.370	7				21
-06209				.165	.480	9				16
-06211				.202	.590	11				13
-06213				.238	.690	13				11
-07503	3/4"	.550	7	.142	.220	3	3-1/2	.008	.071	65
-07504				.187	.290	4				48
-07505				.246	.370	5				41
-07506				.285	.440	6				33
-07507				.348	.520	7				30
-07509				.446	.670	9				23
-07512				.580	.880	12				17
-08703	7/8"	.600	12	.117	.190	3		.010	.086	90
-08704				.158	.250	4				69
-08705				.207	.320	5				57
-08706				.242	.380	6				47
-08707				.287	.450	7				41
-08709				.378	.590	9				32
-08712				.498	.780	12				24
-10003	1"	.730		.084	.190	3				72
-10004				.108	.260	4				53
-10005				.145	.330	5				44
-10006				.165	.390	6				36
-10007				.201	.470	7				31
-10009				.258	.600	9				24
-10012				.342	.800	12				18
-10015				.445	1.010	15				15
-10018				.519	1.200	18				12
-10021				.633	1.430	21				11
-10024				.710	1.620	24				9
-11203	1-1/8"	.850		.146	.240	3		.012	.094	78
-11204				.186	.320	4				56
-11205				.250	.410	5				48
-11206				.295	.490	6				39
-11207				.344	.570	7				34
CML-11208				.392	.650	8				29

SPECIFY CARBON STEEL OR STAINLESS STEEL "-SS."

CONTACT PLANT FOR PRICING.

CML

AXIAL ASSEMBLY

DESCRIPTION

Compact size, low operating height, and precise design yield superior product benefits versus round wire springs.

HOW TO IDENTIFY

1. Confirm end style.

Standard (CML) Shimmed (CMLS)

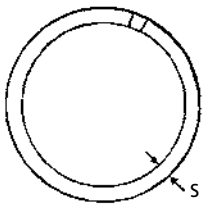
2. Find part in the charts based on radial wall (S), thickness (T), and heights (H and Hw).

GENERAL USE

WEIRD

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

SPECIAL ORDER ONLY



BOX 232 • MINNEAPOLIS, KS • 67467

COMPRESSION - LIGHT DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	C-L		
Spirolox	CML		

CML

CML	Operates in Bore Dia.	Clears Shaft Dia.	Load	Work Height (Hw)	Free Height (H)	Number of Turns	Number of Waves	Thickness (T)	Radial Wall (S)	Spring Rate
				SPRING						
CML-11210	1-1/8"	.850	12	.488	.810	10	3-1/2	.012	.094	23
-11213				.659	1.080	13				19
-11216				.807	1.330	16				15
-11220				1.017	1.670	20				12
-12503	1-1/4"	1.000		.084	.230	3				56
-12504				.113	.310	4				42
-12505				.149	.400	5				34
-12506				.172	.460	6				28
-12507				.207	.550	7				24
-12508				.227	.620	8				21
-12510				.301	.790	10				17
-12513				.395	1.030	13				13
-12516				.467	1.250	16				11
-12520				.591	1.570	20				9
-13703	1-3/8"	1.030	15	.075	.250	3			.122	67
-13704				.099	.330	4				50
-13705				.129	.420	5				40
-13706				.155	.510	6				34
-13707				.179	.590	7				29
-13708				.206	.680	8				25
-13710				.256	.840	10				20
-13713				.341	1.110	13				16
-13716				.424	1.360	16				13
-13720				.530	1.710	20				10
-15003	1-1/2"	1.140	20	.129	.250	3		.016	.133	117
-15004				.164	.320	4				85
-15005				.213	.410	5				70
-15006				.247	.490	6				57
-15007				.301	.580	7				50
-15008				.337	.660	8				43
-15010				.430	.830	10				35
-15013				.565	1.090	13				27
-15016				.694	1.340	16				22
-15020				.866	1.670	20				18
-17503	1-3/4"	1.340	25	.155	.310	3		.018	.143	114
-17504				.200	.410	4				83
-17505				.265	.520	5				69
-17506				.310	.620	6				57
-17507				.367	.730	7				50
-17508				.415	.830	8				43
-17510				.523	1.040	10				34
-17512				.638	1.260	12				29
-17514				.737	1.460	14				25
-17516				.844	1.680	16				22
-20003	2"	1.600		.094	.340	3				89
-20004				.120	.450	4				66
-20005				.158	.570	5				54
-20006				.179	.680	6				44
-20007				.217	.800	7				38
-20008				.243	.910	8				33
-20010				.306	1.140	10				26
-20012				.365	1.360	12				22
-20014				.433	1.590	14				19
CML-20016				.490	1.820	16				17

SPECIFY CARBON STEEL OR STAINLESS STEEL "-SS."

CONTACT PLANT FOR PRICING.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

WAVE SPRINGS

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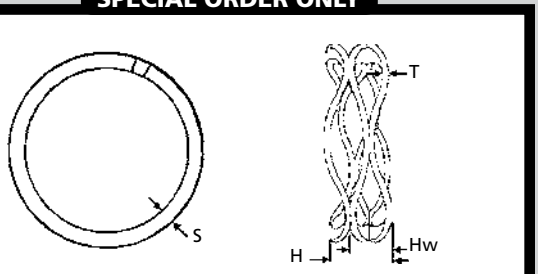
COMPRESSION - MEDIUM DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	C-M		
Spirolox	CMM		

SPECIAL ORDER ONLY



CMM

	SPRING									
	Operates in Bore Dia.	Clears Shaft Dia.	Load	Work Height (Hw)	Free Height (H)	Number of Turns	Number of Waves	Thickness (T)	Radial Wall (S)	Spring Rate
CMM-06203	5/8"	.450	12	.104	.150	3	3-1/2	.010	.058	158
-06204				.130	.190	4				109
-06205				.175	.250	5				96
-06206				.206	.300	6				78
-06207				.246	.350	7				69
-06209				.317	.450	9				54
-06211				.386	.550	11				44
-06213				.454	.650	13				37
-07503	3/4"	.550	13	.159	.220	3			.078	143
-07504				.203	.290	4				100
-07505				.270	.380	5				88
-07506				.314	.440	6				70
-07507				.381	.520	7				64
-07509				.489	.670	9				50
-07512				.649	.900	12				37
-08703	7/8"	.600	18	.124	.190	3		.012	.094	148
-08704				.164	.250	4				108
-08705				.214	.320	5				89
-08706				.252	.380	6				76
-08707				.296	.450	7				66
-08709				.385	.580	9				50
-08712				.509	.770	12				38
-10003	1"	.730		.087	.190	3				110
-10004				.113	.250	4				82
-10005				.148	.320	5				67
-10006				.175	.380	6				55
-10007				.212	.450	7				49
-10009				.276	.580	9				38
-10012				.360	.770	12				28
-10015				.452	.970	15				23
-10018				.549	1.170	18				19
-10021				.650	1.370	21				16
-10024				.720	1.540	24				14
-11203	1-1/8"	.850	20	.160	.260	3		.015		143
-11204				.202	.340	4				101
-11205				.270	.440	5				87
-11206				.318	.520	6				71
-11207				.381	.620	7				63
CMM-11208				.427	.700	8				54

SPECIFY CARBON STEEL OR STAINLESS STEEL "-SS."

CONTACT PLANT FOR PRICING.

CMM

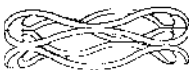
AXIAL ASSEMBLY

DESCRIPTION

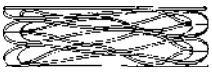
Heavier gauge wire with 2-3 times the spring rate versus CML. Nice compact design, complete with precise design yield characteristics.

HOW TO IDENTIFY

1. Confirm end style.



Standard (CMM)



Shimmed (CMMS)

2. Find part in the charts based on radial wall (S), thickness (T), and heights (H and Hw).

GENERAL USE

UNCOMMON

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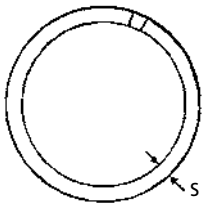
SPECIAL ORDER ONLY



BOX 232 • MINNEAPOLIS, KS • 67467

COMPRESSION - MEDIUM DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	C-M		
Spirolox	CMM		

CMM

	Operates in Bore Dia.	Clears Shaft Dia.	Load	Work Height (Hw)	Free Height (H)	Number of Turns	Number of Waves	Thickness (T)	Radial Wall (S)	Spring Rate
				SPRING						
CMM-11210	1-1/8"	.850	20	.536	.880	10	3-1/2	.015	.094	43
-11213				.708	1.150	13				34
-11216				.861	1.410	16				27
-11220				1.088	1.770	20				22
-12503	1-1/4"	1.000		.124	.280	3				114
-12504				.165	.370	4				85
-12505				.215	.470	5				70
-12506				.253	.560	6				58
-12507				.303	.660	7				50
-12508				.341	.750	8				44
-12510				.427	.940	10				35
-12513				.577	1.240	13				28
-12516				.692	1.510	16				22
-12520				.866	1.890	20				18
-13703	1-3/8"	1.030	25	.142	.260	3		.016	.133	158
-13704				.186	.340	4				117
-13705				.240	.430	5				96
-13706				.281	.510	6				78
-13707				.340	.610	7				69
-13708				.384	.690	8				60
-13710				.486	.870	10				49
-13713				.632	1.130	13				37
-13716				.788	1.400	16				31
-13720				.982	1.740	20				25
-15003	1-1/2"	1.140	35	.122	.260	3		.018		197
-15004				.158	.340	4				145
-15005				.206	.430	5				119
-15006				.241	.520	6				97
-15007				.291	.610	7				86
-15008				.324	.690	8				74
-15010				.409	.870	10				59
-15013				.540	1.140	13				46
-15016				.657	1.390	16				37
-15020				.835	1.750	20				30
-17503	1-3/4"	1.340	50	.188	.290	3	4-1/2		.143	267
-17504				.244	.380	4				195
-17505				.315	.480	5				161
-17506				.374	.570	6				133
-17507				.452	.680	7				120
-17508				.505	.770	8				101
-17510				.629	.960	10				81
-17512				.768	1.160	12				68
-17514				.899	1.360	14				59
-17516				1.026	1.550	16				51
-20003	2"	1.600		.140	.300	3	3-1/2			213
-20004				.184	.390	4				158
-20005				.245	.510	5				132
-20006				.278	.590	6				106
-20007				.345	.710	7				95
-20008				.395	.810	8				83
-20010				.498	1.020	10				66
-20012				.593	1.220	12				55
-20014				.694	1.430	14				47
CMM-20016				.800	1.640	16				42

SPECIFY CARBON STEEL OR STAINLESS STEEL "-SS."

CONTACT PLANT FOR PRICING.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

WAVE SPRINGS

785·392·3017 FAX 785.392.2845

REVISED 09-04
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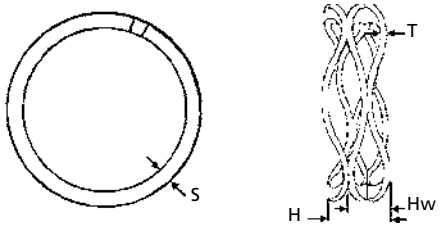
COMPRESSION - HEAVY DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	C-H		
Spirolox	CMH		

SPECIAL ORDER ONLY



CMH

	SPRING									
	Operates in Bore Dia.	*Clears Shaft Dia.*	*Load*	*Work Height (Hw)*	*Free Height (H)*	*Number of Turns*	*Number of Waves*	*Thickness (T)*	*Radial Wall (S)*	*Spring Rate*
CMH-07503	3/4″	.550	22	.169	.220	3	3-1/2	.013	.079	272
-07504				.215	.280	4				186
-07505				.291	.370	5				175
-07506				.335	.430	6				133
-07507				.405	.510	7				124
-07509				.526	.670	9				98
-07512				.699	.890	12				73
-08703	7/8″	.600	25	.166	.220	3		.015	.094	298
-08704				.214	.290	4				210
-08705				.278	.370	5				180
-08706				.327	.440	6				145
-08707				.395	.530	7				133
-08709				.510	.680	9				104
-08712				.670	.890	12				78
-10003	1″	.730		.131	.220	3				210
-10004				.174	.290	4				157
-10005				.227	.380	5				132
-10006				.266	.450	6				107
-10007				.319	.530	7				95
-10009				.406	.680	9				73
-10012				.541	.900	12				54
-10015				.688	1.140	15				45
-10018				.813	1.350	18				36
-10021				.957	1.590	21				32
-10024				1.083	1.800	24				27
-11203	1-1/8″	.850	30	.178	.250	3		.018		246
-11204				.229	.330	4				175
-11205				.303	.420	5				152
-11206				.350	.500	6				120
-11207				.421	.590	7				108
-11208				.470	.660	8				91
-11210				.593	.830	10				74
-11213				.787	1.100	13				58
-11216				.956	1.340	16				47
CMH-11220				1.103	1.830	20				38

SPECIFY CARBON STEEL OR STAINLESS STEEL "-SS."

CONTACT PLANT FOR PRICING.

CMH

AXIAL ASSEMBLY

DESCRIPTION

Nearly twice the spring rate of CMM. Nice compact design, complete with precise design yield characteristics.

HOW TO IDENTIFY

1. Confirm end style.

Standard (CMH) Shimmed (CMHS)

2. Find part in the charts based on radial wall (S), thickness (T), and heights (H and Hw).

GENERAL USE

UNCOMMON

GETTING MORE POPULAR ALL THE TIME!

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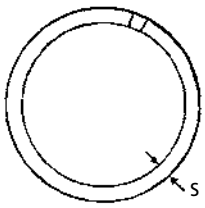
SPECIAL ORDER ONLY



COMPRESSION - HEAVY DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	C-H		
Spirolox	CMH		

CMH

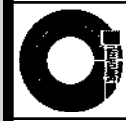
CMH	SPRING: Operates in Bore Dia.	Clears Shaft Dia.	Load	Work Height (Hw)	Free Height (H)	Number of Turns	Number of Waves	Thickness (T)	Radial Wall (S)	Spring Rate
CMH-12503	1-1/4"	1.000	30	1.202	1.690	20	3-1/2	.019	.094	210
-12504				.158	.270	3				158
-12505				.210	.350	4				132
-12506				.272	.453	5				107
-12507				.320	.540	6				95
-12508				.384	.640	7				82
-12510				.433	.720	8				65
-12513				.538	.900	10				51
-12516				.717	1.190	13				42
-12520				.878	1.460	16				33
-13703	1-3/8"	1.030	35	.149	.250	3		.018	.133	232
-13704				.189	.330	4				166
-13705				.247	.420	5				138
-13706				.287	.500	6				112
-13707				.343	.590	7				98
-13708				.390	.670	8				85
-13710				.490	.840	10				69
-13713				.646	1.100	13				54
-13716				.793	1.350	16				43
-13720				1.000	1.700	20				35
-15003	1-1/2"	1.140	60	.166	.240	3	4-1/2			448
-15004				.216	.310	4				326
-15005				.278	.400	5				270
-15006				.329	.480	6				221
-15007				.390	.560	7				194
-15008				.443	.640	8				168
-15010				.555	.800	10				135
-15013				.726	1.050	13				105
-15016				.890	1.290	16				85
-15020				1.119	1.610	20				68
-17503	1-3/4"	1.340	90	.232	.300	3		.024	.148	629
-17504				.314	.410	4				484
-17505				.409	.530	5				417
-17506				.482	.630	6				336
-17507				.577	.740	7				307
-17508				.651	.840	8				258
-17510				.813	1.050	10				206
-17512				.980	1.270	12				173
-17514				1.147	1.480	14				149
-17516				1.317	1.700	16				132
-20003	2"	1.600		.197	.310	3	3-1/2			506
-20004				.258	.410	4				372
-20005				.332	.520	5				307
-20006				.389	.620	6				249
-20007				.465	.730	7				222
-20008				.525	.830	8				189
-20010				.661	1.040	10				153
-20012				.781	1.240	12				125
-20014				.941	1.480	14				111
CMH-20016				1.069	1.680	16				97

SPECIFY CARBON STEEL OR STAINLESS STEEL "-SS."

CONTACT PLANT FOR PRICING.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

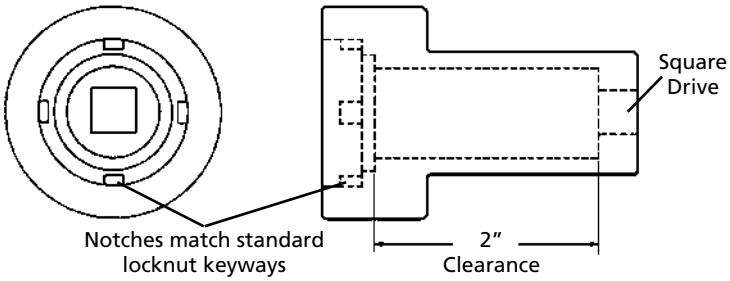
TYPES

	**SC** SOLID SHAFT COLLAR	IMPERIAL Pg: 128, 130	METRIC Pg: 218	Black Oxide, Zinc Plated, Stainless, or Nylon.		**W** STANDARD LOCKWASHER	IMPERIAL Pg: 141	METRIC Pg: 221 (MB)	Most common lockwasher.
	**SC1** SINGLE SPLIT SHAFT COLLAR	IMPERIAL Pg: 129, 131	METRIC N/A	Black Oxide, Stainless, Aluminum, Threaded.		**WS** STAINLESS LOCKWASHER	IMPERIAL Pg: 142	METRIC N/A	Stainless version of "W" Series.
	**SC2** DOUBLE SPLIT SHAFT COLLAR	IMPERIAL Pg: 129-130	METRIC N/A	Black Oxide, Stainless, or Nylon.		**WH** HEAVY DUTY LOCKWASHER	IMPERIAL Pg: 143	METRIC N/A	Thicker version.
	**N/AN** STANDARD LOCKNUT	IMPERIAL Pg: 132	METRIC Pg: 220 (KM)	NS - Stainless KM - Metric		**WI** FINE THREAD LOCKWASHER	IMPERIAL Pg: 144	METRIC N/A	Imperial dimensions.
	**NH** HEAVY DUTY LOCKNUT	IMPERIAL Pg: 133	METRIC N/A	Thicker and more precise.		**WT** THIN SECTION LOCKWASHER	IMPERIAL Pg: 144	METRIC N/A	Smaller OD than "W" Series.
	**NI** FINE THREAD LOCKNUT	IMPERIAL Pg: 134	METRIC N/A	All imperial dimensions.		**ETR** EXTERNAL TOOTH RETAINER	IMPERIAL Pg: 145	METRIC N/A	For light duty bearing retention.
	**NL** LEFT HAND LOCKNUT	IMPERIAL Pg: 135	METRIC N/A	For high rotational speeds.		**SS** SUPPORT WASHER DIN 988	IMPERIAL Pg: 146	METRIC N/A	Wide bearing abutment surface.
	**NT** THIN SECTION LOCKNUT	IMPERIAL Pg: 136	METRIC N/A	Light-weight version.		**PS** SHIM RING DIN 988	IMPERIAL Pg: 147	METRIC N/A	For taking up slack on shafts.
	**30/70** MACHINE KEYS	IMPERIAL Pg: 138-139	METRIC Pg: 219	Also available in stainless.		**TW** THRUST WASHER	IMPERIAL Pg: 148	METRIC N/A	Equalize load on bearing.
	**KF** KEYED SHAFTS	IMPERIAL Pg: 140	METRIC Pg: 218	Partial keyways also available.		**SR** SLITTED SHIM	IMPERIAL Pg: 149	METRIC N/A	For taking up slack on shafts.

AUTOMATED INSTALLATION

SHAFT LOCKNUTS

Use assembly sockets coupled with powered drive wrenches to automate locknut assembly.



CONTACT PLANT FOR SOCKET INFORMATION.

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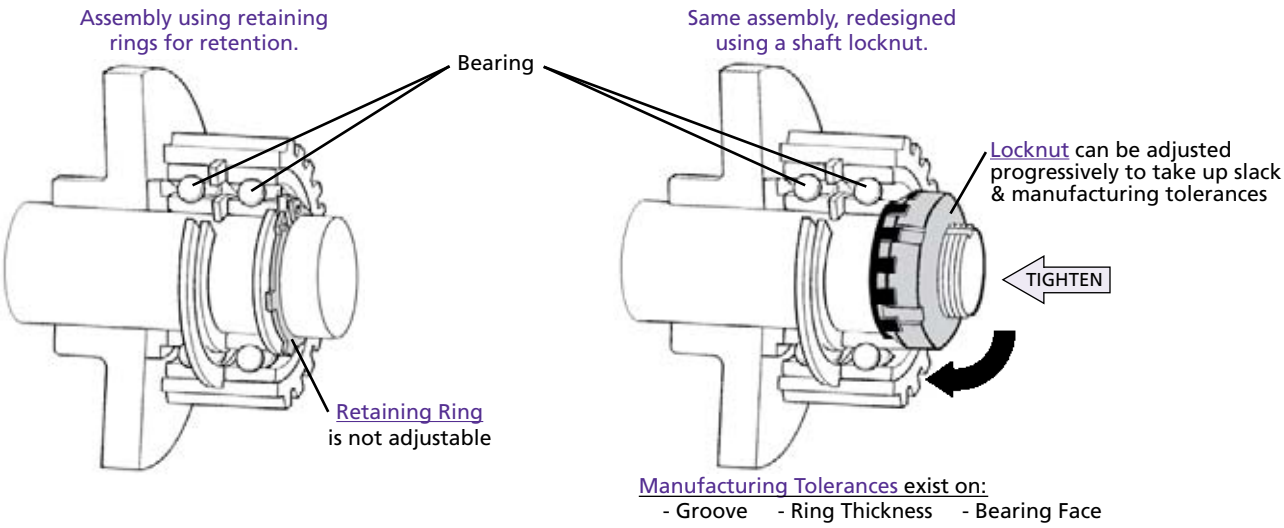
PRODUCT COMPARISONS

LOCKNUTS
"THE VERY BEST IN BEARING RETENTION"

Locknuts were the original and most popular form of bearing retention in the early part of the century. As wire forming technology improved, retaining rings gradually replaced locknuts because of their lower unit cost and reduced manufacturing costs. Locknuts also require more time during assembly.

Retaining rings are less precise and have less holding power than shaft locknuts, so in certain applications, there is still a place for locknuts. Locknuts are manufactured to very close and exacting tolerances, particularly when you consider their heavy duty design. In addition, locknuts are adjustable so that manufacturing tolerances for adjacent components can be compensated for by loosening or tightening the locknut.



The most common causes of bearing failure are poorly fitted parts from the sum total of allowable manufacturing tolerances; shock loading as the components are used; misalignment; and excessive vibration which amplifies these factors. In the example above, proper fit and alignment are very important because two bearings must be assembled properly together. Locknuts possess precision threads and ground faces. The locknut can be torqued correctly against the bearing wall, with perfect alignment from precision threading. The retaining ring design magnifies manufacturing tolerances that exist in groove, shaft, and ring construction. Retaining rings do not allow you to adjust torque. The result is that the ring design introduces several potential causes of bearing failure.

Locknuts are much more expensive; however, if the application requires precision and shock resistance, a designer may elect to use higher cost locknuts that extend bearing life. Examples of these applications are machine tools, medical and technological instruments, and other durable goods exposed to harsh and unstable environments. The next time you are in a machine shop that is still using Bridgeport™ mills from 1942, you'll know why -- shaft locknuts!

SHAFT COLLARS

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SOLID COLLAR

MANUFACTURER CROSS-REFERENCE

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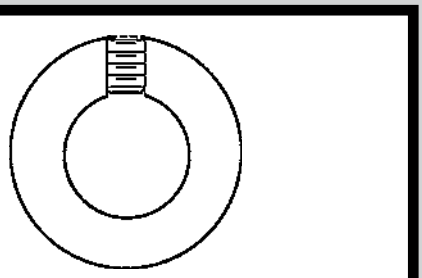
Am. Colliars	ASC
Climax	C

PART NUMBER CONFIGURATION

Style + Size # + Material Code

EXAMPLE: For 1/8" zinc shaft collars, ask for SC-0125-ZC.



SC	SHAFT COLLAR DIMENSIONS			WEIGHT	MATERIAL		
	Inside Diameter	Outside Diameter	Thickness (Width)	Lbs. per Piece	Black Oxide "-BO"	Zinc Plated "-ZC"	Stainless "-SS"
SC-0125	1/8"	3/8"	1/4"	.0063			
-0187	3/16"	7/16"		.0125			
-0250	1/4"	1/2"	5/16"	.0125			
-0312	5/16"	5/8"		.0188			
-0375	3/8"	3/4"	3/8"	.0313			
-0437	7/16"	7/8"	7/16"	.0500			
-0500	1/2"	1"		.0688			
-0562	9/16"			.0625			
-0625	5/8"	1-1/8"	1/2"	.0938			
-0687	11/16"	1-1/4"	9/16"	.1250			
-0750	3/4"			.1188			
-0812	13/16"	1-5/16"		.1313			
-0875	7/8"	1-1/2"		.1500			
-0937	15/16"	1-5/8"		.2063			
-1000	1"		5/8"	.2313			
-1062	1-1/16"	1-3/4"		.2500			
-1125	1-1/8"			.2438			
-1187	1-3/16"	2"	11/16"	.3750			
-1250	1-1/4"			.3625			
-1312	1-5/16"	2-1/8"		.4063			
-1375	1-3/8"		3/4"	.4063			
-1437	1-7/16"	2-1/4"		.4750			
-1500	1-1/2"			.4625			
-1562	1-9/16"	2-1/2"	13/16"	.6563			
-1625	1-5/8"			.6500			
-1687	1-11/16"			.6313			
-1750	1-3/4"	2-3/4"	7/8"	.8500			
-1812	1-13/16"			.8000			
-1875	1-7/8"			.7813			
-1937	1-15/16"	3"		1.0250			
-2000	2"			1.0000			
-2125	2-1/8"			1.0000			
-2187	2-3/16"	3-1/4"	15/16"	1.1250			
-2250	2-1/4"			1.1250			
-2312	2-5/16"			1.0625			
-2375	2-3/8"			1.3750			
-2437	2-7/16"	3-1/2"	1"	1.3125			
-2500	2-1/2"			1.2500			
-2562	2-9/16"	3-3/4"	1-1/8"	1.8750			
-2625	2-5/8"	4"		2.2500			
-2687	2-11/16"			2.1875			
-2750	2-3/4"			2.1250			
-2875	2-7/8"	4-1/4"		2.3750			
-2937	2-15/16"			2.3125			
-3000	3"			2.2500			
-3187	3-3/16"			2.1875			
SC-3437	3-7/16"	4-1/2"		2.7500			

SC	DESCRIPTION	GENERAL USE
	Standard-style ("SC") shaft collars use a hardened set screw to penetrate the shaft so as to achieve grip. This penetration yields light-duty benefits for applications like thrust collars, arbor spacers, sprocket hubs, bearing holders, and shaft protectors. SC collars do not work well when the shaft is harder than the set screw or when penetration marks on the shaft are not desirable. Black oxide coating will slightly increase friction and holding power in some applications.	COMMON

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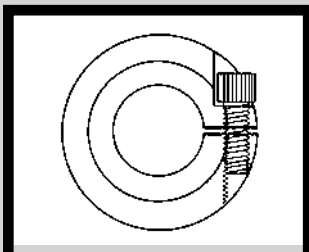
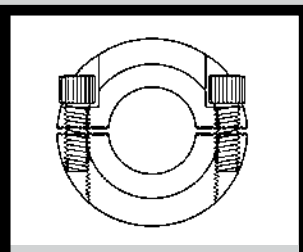


SC1



SC2

SPLIT COLLAR

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Am. Collars	ASP
Climax	1C/2C

PART NUMBER CONFIGURATION

Style + Size # + Material Code

EXAMPLE: For 1/8" stainless double split collars, ask for SC2-0125-SS.

SC1 / SC2	SHAFT COLLAR DIMENSIONS			SINGLE SPLIT			DOUBLE SPLIT		
				WEIGHT	MATERIAL		WEIGHT	MATERIAL	
	Inside Diameter	Outside Diameter	Thickness (Width)	Lbs. per Piece	Black Oxide "-BO"	Stainless "-SS"	Lbs. per Piece	Black Oxide "-BO"	Stainless "-SS"
-0125*	1/8"	5/8"	5/16"	0.0188			0.0269		
-0187*	3/16"			0.0188			0.0244		
-0250*	1/4"			0.0188			0.0238		
-0312	5/16"	11/16"		0.0313			0.0213		
-0375	3/8"	7/8"	3/8"	0.0500			0.0444		
-0437	7/16"	15/16"		0.0500			0.0475		
-0500	1/2"	1-1/8"	13/32"	0.0813			0.0788		
-0562	9/16"	1-5/16"	7/16"	0.1313			0.1250		
-0625	5/8"			0.1188			0.1125		
-0687	11/16"	1-1/2"	1/2"	0.1813			0.1750		
-0750	3/4"			0.1813			0.1625		
-0812	13/16"	1-5/8"		0.2000			0.1938		
-0875	7/8"			0.2000			0.1769		
-0937	15/16"	1-3/4"		0.2125			0.2125		
-1000	1"			0.2000			0.1938		
-1062	1-1/16"	1-7/8"		0.2375			0.2294		
-1125	1-1/8"			0.2375			0.2188		
-1187	1-3/16"	2-1/16"		0.2313			0.2813		
-1250	1-1/4"			0.2688			0.2638		
-1312	1-5/16"	2-1/4"	9/16"	0.3688			0.3688		
-1375	1-3/8"			0.3688			0.3563		
-1437	1-7/16"			0.3500			0.3269		
-1500	1-1/2"	2-3/8"		0.4000			0.3788		
-1562	1-9/16"			0.4000			0.3506		
-1625	1-5/8"	2-5/8"	11/16"	0.3750			0.5819		
-1687	1-11/16"	2-3/4"		0.6688			0.6163		
-1750	1-3/4"			0.6688			0.6875		
-1875**	1-7/8"	3"		0.7000			0.6538		
-1937	1-15/16"			0.7000			0.7231		
-2000	2"			0.7313			0.6875		
-2125	2-1/8"	3-1/4"	3/4"	0.9375			0.9375		
-2187	2-3/16"			0.8688			0.8750		
-2250	2-1/4"			0.8375			0.8188		
-2375	2-3/8"	3-1/2"		1.0125			0.9500		
-2437	2-7/16"			0.9813			0.9563		
-2500	2-1/2"	3-3/4"	7/8"	1.5188			1.3938		
-2625	2-5/8"	3-7/8"		1.6125			1.5000		
-2687	2-11/16"	4"		1.6500			1.5625		
-2750	2-3/4"			1.6625			1.5000		
-2875	2-7/8"	4-1/4"		1.8500			1.8125		
-2937	2-15/16"			1.7688			1.6563		
-3000	3"			1.7125			1.6125		
-3187	3-3/16"	4-1/2"		1.8250			1.7688		
-3437	3-7/16"	4-3/4"		1.7500			1.9375		

** Stainless Steel sizes 012 through 025 have an 11/16" O.D. (Single and Double split)*
*** Stainless Steel size 187 has a 2-7/8" O.D. (Double split only)*

SC1 / SC2

DESCRIPTION

Single split collars (SC1) use friction to provide grip on bars and shafts. This method is generally considered to be more sturdy than the set screw design of SC collars.

Double split collars (SC2) allow installation without disassembling machinery. SC2 collars provide superior grip action.

GENERAL USE

COMMON

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NYLON SOLID COLLAR

MANUFACTURER CROSS-REFERENCE

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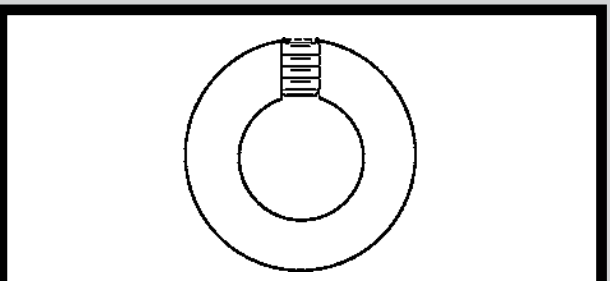
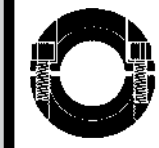
Boston Gear	NSC



SC	SHAFT COLLAR DIMENSIONS			MATERIAL
	Inside Diameter	Outside Diameter	Thickness (Width)	Nylon "-NY"
SC-0250	1/4	1/2	5/16	
-0312	5/16	5/8		
-0375	3/8	3/4	3/8	
-0437	7/16	7/8	7/16	
-0500	1/2	1		
-0562	9/16	1		
-0625	5/8	1-1/8	1/2	
-0750	3/4	1-1/4	9/16	
-0875	7/8	1-1/2		
-1000	1	1-5/8	5/8	
-1187	1-3/16	2	11/16	
-1250	1-1/4	2		
SC-1375	1-3/8	2-1/8	3/4	

SC	SHAFT COLLAR DIMENSIONS			MATERIAL
	Inside Diameter	Outside Diameter	Thickness (Width)	Nylon "-NY"
SC-1437	1-7/16	2-1/4	3/4	
-1500	1-1/2	2-1/4		
-1625	1-5/8	2-1/2	13/16	
-1750	1-3/4	2-5/8	7/8	
-1875	1-7/8	2-3/4		
-1937	1-15/16	3		
-2000	2	3		
-2187	2-3/16	3-1/4	15/16	
-2250	2-1/4	3-1/4		
-2437	2-7/16	3-1/2	1	
-2500	2-1/2	3-1/2		
SC-2750	2-3/4	4	1-1/8	

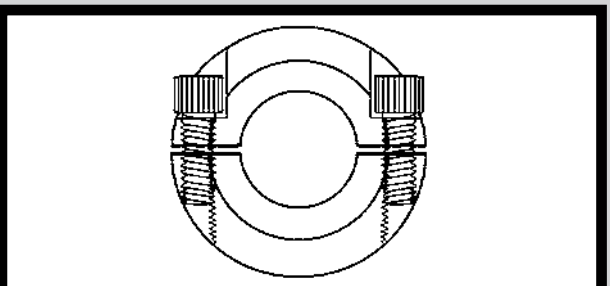


NYLON DOUBLE SPLIT COLLAR

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

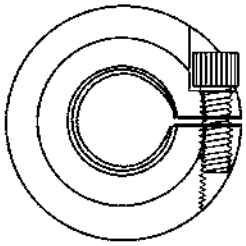
Boston Gear	2NSC



SC2	SHAFT COLLAR DIMENSIONS			MATERIAL
	Inside Diameter	Outside Diameter	Thickness (Width)	Nylon "-NY"
SC2-0250	1/4	1	3/8	
-0312	5/16	1		
-0375	3/8	1-1/4	1/2	
-0437	7/16	1-1/4		
-0500	1/2	1-3/8	9/16	
-0562	9/16	1-3/8		
-0625	5/8	1-5/8	5/8	
-0750	3/4	1-3/4		
-0875	7/8	2	3/4	
-1000	1	2-1/8		
-1187	1-3/16	2-5/16		
-1250	1-1/4	2-3/8		
SC2-1375	1-3/8	2-1/2		

SC2	SHAFT COLLAR DIMENSIONS			MATERIAL
	Inside Diameter	Outside Diameter	Thickness (Width)	Nylon "-NY"
SC2-1437	1-7/16	2-5/8	3/4	
-1500	1-1/2	2-5/8		
-1625	1-5/8	3	15/16	
-1750	1-3/4	3-1/8		
-1875	1-7/8	3-1/4		
-1937	1-15/16	3-1/4		
-2000	2	3-3/8		
-2187	2-3/16	3-5/8		
-2250	2-1/4	3-5/8		
-2437	2-7/16	4-1/8	1-1/8	
-2500	2-1/2	4-1/8		
-2750	2-3/4	4-3/8		
SC2-3000	3	4-1/2		

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



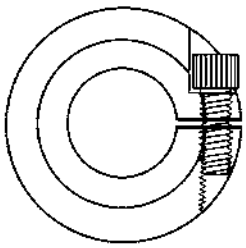
SPLIT THREADED COLLAR

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Boston Gear	CSC		
Climax	ISTC		

SCT

	SHAFT COLLAR DIMENSIONS			WEIGHT	MATERIAL	
	Inside Diameter	Outside Diameter	Thickness	Lbs. per 100 Pieces	Black Oxide "-BO"	Stainless "-SS"
SCT1-0010-32	10-32	5/8	5/16	-		
-0250-20	1/4-20	11/16		0.0250		
-0250-28	1/4-28			0.0256		
-0312-18	5/16-18			0.0250		
-0312-24	5/16-24			0.0250		
-0375-16	3/8-16	7/8	3/8	0.0031		
-0375-24	3/8-24			0.0029		
-0500-13	1/2-13	1-1/8	13/32	0.0055		
-0500-20	1/2-20			0.0055		
-0625-11	5/8-11	1-5/16	7/16	-		
-0625-18	5/8-18			0.0078		
-0750-10	3/4-10	1-1/2	1/2	0.0113		
-0750-16	3/4-16			0.0109		
-0875-09	7/8-9	1-5/8		0.2000		
-0875-14	7/8-14			0.1950		
-1000-08	1-8	1-3/4		0.2150		
-1000-14	1-14			0.2188		
-1125-12	1-1/8-12	1-7/8		0.2375		
-1250-07	1-1/4-7	2-1/16		0.2938		
-1250-12	1-1/4-12			0.2875		
-1375-12	1-3/8-12	2-1/4	9/16	-		
-1500-06	1-1/2-6	2-3/8		0.4188		
-1500-12	1-1/2-12	2-1/2	1/2	0.4125		
SCT1-2000-12	2-12	3	11/16	0.7375		



ALUMINUM SPLIT COLLAR

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Boston Gear	CAS		
Climax	H1C		

SC1

	SHAFT COLLAR DIMENSIONS			WEIGHT	MATERIAL
	Inside Dia.	Outside Dia.	Thickness (Width)	Lbs. per 100 Pieces	Aluminum "-AL"
SC1-0125	1/8	1/2	1/4	-	
-0187	3/16	5/8	5/16	-	
-0250	1/4	11/16		0.0250	
-0312	5/16	11/16		0.0225	
-0375	3/8	7/8	3/8	0.0438	
-0500	1/2	1-1/8	13/32	0.0813	
-0625	5/8	1-5/16	7/16	0.1125	
-0750	3/4	1-1/2	1/2	0.1688	
-0875	7/8	1-5/8		0.1850	
-1000	1	1-3/4		0.2063	
-1125	1-1/8	1-7/8		-	
-1250	1-1/4	2-1/16		0.2750	
SC1-1375	1-3/8	2-1/4	9/16	-	

SC1

	SHAFT COLLAR DIMENSIONS			WEIGHT	MATERIAL
	Inside Dia.	Outside Dia.	Thickness (Width)	Lbs. per 100 Pieces	Aluminum "-AL"
SC1-1500	1-1/2	2-3/8	9/16	0.3938	
-1625	1-5/8	2-5/8	11/16	-	
-1750	1-3/4	2-3/4		0.6375	
-1875	1-7/8	2-7/8		0.6813	
-2000	2	3		0.7250	
-2125	2-1/8	3-1/4	3/4	-	
-2250	2-1/4	3-1/4		-	
-2375	2-3/8	3-1/2		-	
-2500	2-1/2	3-3/4	7/8	-	
-2625	2-5/8	3-7/8		-	
-2750	2-3/4	4		-	
-2875	2-7/8	4-1/4		-	
SC1-3000	3	4-1/4		-	

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SHAFT LOCKNUTS

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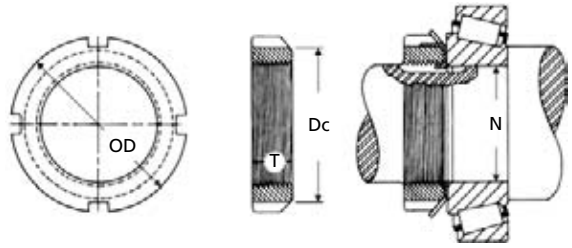
AVAILABLE IN STAINLESS STEEL



STANDARD

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Standard Locknut	N/AN
Whittet-Higgins	N/AN

N/AN	BORE		LOCKNUT DIMENSIONS					WEIGHT	MATERIAL		
	Bearing Bore Nominal (N) Decimal	MM	Threads per Inch	Outside Dia. (OD) +.005/-.015	Thickness (T) Min.	Thickness (T) Max.	Nut Face Diameter (Dc) Min.	Nut Face Diameter (Dc) Max.	Lbs. per 100 Pieces	Low Carbon	Stainless (NS-)	Mating Lockwasher
N-00	.3937	10	32	3/4	.209	.229	.605	.625	1.2500			W-00
-01	.4724	12		7/8	.303	.323	.699	.719	3.1250			-01
-02	.5906	15		1	.303	.323	.793	.813	3.7500			-02
-03	.6693	17		1-1/8	.334	.354	.918	.938	5.6250			-03
-04	.7874	20		1-3/8	.365	.385	1.105	1.125	8.7500			-04
-05	.9843	25		1-9/16	.396	.416	1.261	1.281	11.2500			-05
-06	1.1811	30	18	1-3/4	.396	.416	1.480	1.500	13.7500			W-06
-065	1.3125	33-1/3		2-1/16	.428	.448	1.793	1.813	22.5000			WH-065
-07	1.3780	35		2-1/16	.428	.448	1.793	1.813	20.0000			W-07
-08	1.5748	40		2-1/4	.428	.448	1.980	2.000	23.1250			-08
-09	1.7717	45		2-17/32	.428	.448	2.261	2.281	28.7500			-09
-10	1.9685	50		2-11/16	.490	.510	2.418	2.438	33.7500			-10
-11	2.1654	55		2-31/32	.490	.510	2.636	2.656	41.2500			-11
-12	2.3622	60		3-5/32	.521	.541	2.824	2.844	46.8750			-12
-13	2.5591	65		3-3/8	.553	.573	3.043	3.063	53.7500			-13
N-14	2.7559	70		3-5/8	.553	.573	3.283	3.313	62.5000			-14
AN-15	2.9528	75	12	3-7/8	.584	.604	3.533	3.563	77.5000			-15
-16	3.1496	80		4-5/32	.584	.604	3.814	3.844	92.5000			-16
-17	3.3465	85		4-13/32	.615	.635	4.001	4.031	105.0000			-17
-18	3.5433	90		4-21/32	.678	.698	4.251	4.281	130.0000			-18
-19	3.7402	95		4-15/16	.709	.729	4.533	4.563	155.0000			-19
-20	3.9370	100		5-3/16	.735	.760	4.783	4.813	181.2500			-20
-21	4.1339	105		5-7/16	.735	.760	4.970	5.000	190.0000			-21
-22	4.3307	110		5-23/32	.766	.791	5.251	5.281	223.7500			-22
-24	4.7244	120		6-1/8	.798	.823	5.658	5.688	260.0000			-24
-26	5.1181	130		6-3/4	.860	.885	6.158	6.188	350.0000			-26
-28	5.5118	140		7-3/32	.923	.948	6.501	6.531	387.5000			-28
-30	5.9055	150		7-11/16	.954	.979	7.033	7.063	487.5000			-30
-32	6.2992	160	8	8-1/16	1.016	1.041	7.398	7.438	550.0000			-32
-34	6.6929	170		8-21/32	1.048	1.073	7.991	8.031	687.5000			-34
-36	7.0866	180		9-1/16	1.079	1.104	8.335	8.375	725.0000			-36
-38	7.4803	190		9-15/32	1.110	1.135	8.741	8.781	787.5000			-38
AN-40	7.8740	200		9-27/32	1.173	1.198	9.116	9.156	868.7500			-40
N-44	8.6614	220		11	1.230	1.260	9.803	9.841	1175.0000			W-44

MATING LOCKWASHER DESCRIPTIONS ON PAGE 141.

N/AN

AXIAL ASSEMBLY

DESCRIPTION

Most commonly used locknuts. Require a lockwasher and keyway in the shaft. "AN" series were for an old specification (11 threads per inch) and should be avoided.

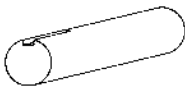
HOW TO IDENTIFY

1. Confirm the outside diameter (OD) of the part.
2. Measure the thickness (T) of the part.
3. Verify the nut face diameter (Dc).
4. Find the part in the chart above.

GENERAL USE

COMMON

REQUIRES A KEYWAY.



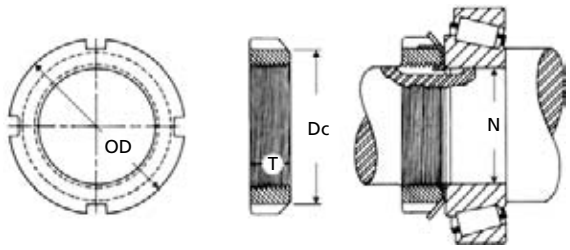
LET OUR SHOP CUT IT FOR YOU!

SEE PAGE 140.

FOR TAPERED ROLLER BEARINGS IT IS BEST TO USE OUR HIGHER PRECISION "PN" SERIES ***(SEE PAGE 137).***

W LOCKWASHER Page 143

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



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G.L. HUYETT

HEAVY DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Standard Locknut	NHE
Whittet-Higgins	NH

NH

BORE		LOCKNUT DIMENSIONS						WEIGHT	MATERIAL	
Bearing Bore Nominal (N)		Threads per Inch	Outside Dia. (OD) +.005/-.015	Thickness (T)		Nut Face Diameter (Dc)		Lbs. per 100 Pieces	Low Carbon	Mating Lockwasher
Decimal	MM			Min.	Max.	Min.	Max.			
NH-08	1.5748	40	18	2-1/4	.5525	.5725	1.980	2.000	30.0000		WH-08
-09	1.7717	45		2-17/32	.5525	.5725	2.261	2.281	37.5000		-09
-10	1.9685	50		2-11/16	.6150	.6350	2.418	2.438	42.5000		-10
-11	2.1654	55		2-31/32	.6150	.6350	2.636	2.656	52.5000		-11
-12	2.3622	60		3-5/32	.6462	.6663	2.824	2.844	57.5000		-12
-13	2.5591	65		3-3/8	.7087	.7287	3.043	3.063	72.5000		-13
-14	2.7559	70		3-5/8	.7087	.7287	3.283	3.313	82.5000		-14
-15	2.9528	75	12	3-7/8	.7400	.7600	3.533	3.563	100.0000		-15
-16	3.1496	80		4-5/32	.7400	.7600	3.814	3.844	117.5000		-16
-17	3.3465	85		4-13/32	.7712	.7913	4.001	4.031	135.0000		-17
-18	3.5433	90		4-21/32	.8650	.8850	4.251	4.281	175.0000		-18
-19	3.7402	95		4-15/16	.8962	.9163	4.533	4.563	200.0000		-19
-20	3.9370	100		5-3/16	.9275	.9475	4.783	4.813	237.5000		-20
-21	4.1339	105		5-7/16	.9275	.9475	4.970	5.000	250.0000		-21
-22	4.3307	110		5-23/32	.9587	.9788	5.251	5.281	287.5000		-22
-24	4.7244	120		6-1/8	1.0212	1.0413	5.658	5.688	337.5000		-24
-26	5.1181	130		6-3/4	1.0837	1.1038	6.158	6.188	437.5000		-26
-28	5.5118	140		7-3/32	1.1775	1.1975	6.501	6.531	500.0000		-28
-30	5.9055	150		7-11/16	1.2400	1.2600	7.033	7.063	637.5000		-30
-32	6.2992	160	8	8-1/16	1.2712	1.2913	7.398	7.438	693.7500		-32
-34	6.6929	170		8-21/32	1.3337	1.3538	7.991	8.031	881.2500		-34
-36	7.0866	180		9-1/16	1.3962	1.4163	8.335	8.375	956.8750		-36
-38	7.4803	190		9-15/32	1.3962	1.4163	8.741	8.781	1000.0000		-38
NH-40	7.8740	200		9-27/32	1.4900	1.5100	9.116	9.156	1125.0000		WH-40

MATING LOCKWASHER DESCRIPTIONS ON PAGE 143.

NH

AXIAL ASSEMBLY

DESCRIPTION

Designed with greater thread length for greater strength. Tighter tolerances make this a common part for tapered roller bearings.

HOW TO IDENTIFY

1. Confirm the outside diameter (OD) of the part.
2. Measure the thickness (T) of the part.
3. Verify the nut face diameter (Dc).
4. Find the part in the chart above.

GENERAL USE

COMMON

EXTREMELY PRECISE RUNOUT AND PARALLELISM ON THE SURFACES.

THE OBSOLETE NE SERIES (11 THREADS PER INCH) IS AVAILABLE AS A SPECIAL ORDER FOR FIELD REPLACEMENT AND REPAIR APPLICATIONS.

WH LOCKWASHER Page 143

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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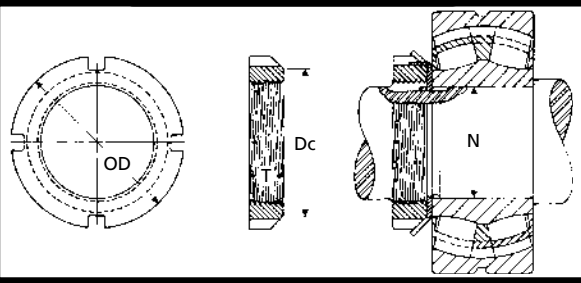
FINE THREAD

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Standard Locknut	NIN
Whittet-Higgins	NI

FRACTIONAL INCH BORES



NI

BORE			LOCKNUT DIMENSIONS						WEIGHT	MATERIAL	
	Bearing Bore Nominal (N)			Outside	Thickness (T)		Nut Face Diameter (Dc)				
	Decimal	Fraction	Threads per Inch	Dia. (OD) +.005/-.015	Min.	Max.	Min.	Max.	Lbs. per 100 Pieces	Spring Steel	Mating Lockwasher
NI-01	.750	3/4	16	1-1/2	.365	.385	1.168	1.188	11.2500		WI-01
-02	.875	7/8		1-5/8			1.293	1.313	12.5000		-02
-03	1.000	1		1-3/4			1.418	1.438	13.7500		-03
-04	1.125	1-1/8		1-7/8			1.543	1.563	15.6250		-04
-05	1.250	1-1/4		2	.490	.510	1.668	1.688	23.7500		-05
-06	1.375	1-3/8		2-1/4			1.918	1.938	31.2500		-06
-07	1.500	1-1/2		2-1/4			1.918	1.938	26.8750		-07
-08	1.625	1-5/8		2-1/2			2.168	2.188	35.0000		-08
-09	1.750	1-3/4		2-5/8			2.293	2.313	38.1250		-09
-10	1.875	1-7/8		2-3/4			2.418	2.438	40.0000		-10
-11	2.000	2		3			2.668	2.688	48.7500		-11
-12	2.250	2-1/4		3-1/4	.615	.635	2.855	2.875	68.1250		-12
-13	2.500	2-1/2		3-1/2			3.105	3.125	75.0000		-13
NI-14	2.750	2-3/4		3-3/4			3.345	3.375	80.6250		WI-14

MATING LOCKWASHER DESCRIPTIONS ON PAGE 144.

NI

DESCRIPTION

Used by manufacturers who prefer not to use SAE-AFBMA metric modified series. These babies are "all English." Dimensions are based on the good king's foot.

AXIAL ASSEMBLY

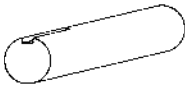
HOW TO IDENTIFY

1. Confirm the outside diameter (OD) of the part.
2. Measure the thickness (T) of the part.
3. Verify the nut face diameter (Dc).
4. Find the part in the chart above, which is based entirely on an old king's foot.

GENERAL USE

UNCOMMON

REQUIRES A KEYWAY.



LET OUR SHOP CUT IT FOR YOU!

SEE PAGE 140.

WI LOCKWASHER Page 144

WE HAVE A COMPLETE MACHINE SHOP

STAMPING | CUTTING | TURNING | HARD CHROME | LASER | BENDING | CENTERLESS GRINDING | THREADING | MILLING | GRINDING

FAX YOUR QUOTE REQUEST!!!

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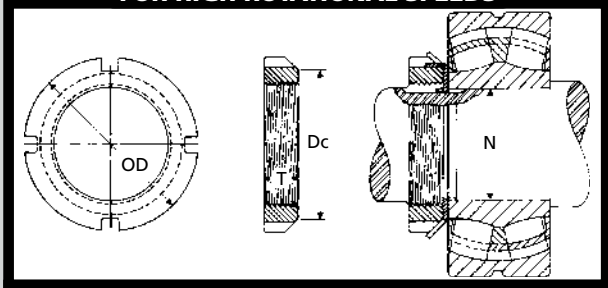

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LEFT-HAND THREAD

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236

Standard Locknut	NL
Whittet-Higgins	NL

NL

BORE		LOCKNUT DIMENSIONS						WEIGHT	MATERIAL	
Bearing Bore Nominal (N)		Threads per Inch	Outside Dia. (OD) +.005/-.015	Thickness (T)		Nut Face Diameter (Dc)		Lbs. per 100 Pieces	Spring Steel	Mating Lockwasher
Decimal	MM			Min.	Max.	Min.	Max.			
NL-00	.3937	10	32	3/4	.209	.229	.605	.625	1.8750		W-00
-01	.4724	12		7/8	.303	.323	.699	.719	3.1250		-01
-02	.5906	15		1	.303	.323	.793	.813	3.7500		-02
-03	.6693	17		1-1/8	.334	.354	.918	.938	5.6250		-03
-04	.7874	20		1-3/8	.365	.385	1.105	1.125	8.7500		-04
-05	.9843	25		1-9/16	.396	.416	1.261	1.281	11.2500		-05
-06	1.1811	30	18	1-3/4	.396	.416	1.480	1.500	13.1250		-06
-07	1.3780	35		2-1/16	.428	.448	1.793	1.813	20.6250		-07
-08	1.5748	40		2-1/4	.428	.448	1.980	2.000	22.5000		-08
-09	1.7717	45		2-17/32	.428	.448	2.261	2.281	28.7500		-09
-10	1.9685	50		2-11/16	.490	.510	2.418	2.438	33.7500		-10
-11	2.1654	55		2-31/32	.490	.510	2.636	2.656	41.2500		-11
-12	2.3622	60		3-5/32	.521	.541	2.824	2.844	46.2500		-12
-13	2.5591	65		3-3/8	.553	.573	3.043	3.063	55.0000		-13
-14	2.7559	70		3-5/8	.553	.573	3.283	3.313	62.5000		-14
-15	2.9528	75	12	3-7/8	.584	.604	3.533	3.563	77.5000		-15
-16	3.1496	80		4-5/32	.584	.604	3.814	3.844	90.0000		-16
-17	3.3465	85		4-13/32	.615	.635	4.001	4.031	103.7500		-17
-18	3.5433	90		4-21/32	.678	.698	4.251	4.281	133.7500		-18
-19	3.7402	95		4-15/16	.709	.729	4.533	4.563	153.7500		-19
-20	3.9370	100		5-3/16	.735	.760	4.783	4.813	177.5000		-20
-21	4.1339	105		5-7/16	.735	.760	4.970	5.000	192.5000		-21
NL-22	4.3307	110		5-23/32	.766	.791	5.251	5.281	226.2500		W-22

MATING LOCKWASHER DESCRIPTIONS ON PAGE 141.

NL

AXIAL ASSEMBLY

DESCRIPTION

Left-hand threads for high rotational speeds or as an opposite to a standard right-hand part for ease in tightening and loosening.

HOW TO IDENTIFY

1. Confirm the outside diameter (OD) of the part.
2. Measure the thickness (T) of the part.
3. Verify the nut face diameter (Dc).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

USED IN RACING VEHICLES AND EQUIPMENT DRIVES.

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W LOCKWASHER Page 144

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

SHAFT LOCKNUTS

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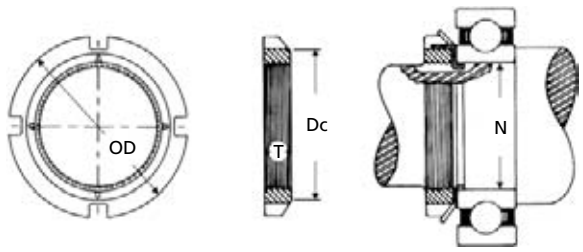
THIN SECTION

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Standard Locknut	NTH
Whittet-Higgins	NT

LIGHTWEIGHT



NT	BORE		LOCKNUT DIMENSIONS						WEIGHT	MATERIAL	
	Bearing Bore Nominal (N)		Threads per Inch	Outside Dia. (OD) +.005/-.015	Thickness (T)		Nut Face Diameter (Dc)		Lbs. per 100 Pieces	Low Carbon	Mating Lockwasher
	Decimal	MM			Min.	Max.	Min.	Max.			
NT-00	.3937	10	32	23/32	.178	.198	.511	.531	1.2500		WT-00
-01	.4724	12		13/16			.605	.625	1.8750		-01
-02	.5906	15		15/16	.209	.229	.730	.750	1.8750		-02
-03	.6693	17		1-1/16			.855	.875	3.1250		-03
-04	.7874	20		1-3/16	.240	.260	.980	1.000	3.7500		-04
-05	.9843	25		1-3/8			1.168	1.188	4.3750		-05
-06	1.1811	30	18	1-11/16			1.418	1.438	6.2500		-06
-07	1.3780	35		1-29/32	.271	.291	1.636	1.656	8.7500		-07
-08	1.5748	40		2-3/32			1.824	1.844	10.0000		-08
-09	1.7717	45		2-5/16			2.042	2.062	11.8750		-09
-10	1.9685	50		2-1/2	.302	.322	2.230	2.250	14.3750		-10
-11	2.1654	55		2-3/4			2.480	2.500	18.1250		-11
-12	2.3622	60		2-15/16			2.668	2.688	18.7500		-12
-13	2.5591	65		3-1/8	.334	.354	2.855	2.875	22.5000		-13
-14	2.7559	70		3-11/32			3.074	3.094	24.3750		-14
-15	2.9528	75	12	3-11/16			3.355	3.375	32.5000		-15
-16	3.1496	80		3-29/32	.365	.385	3.574	3.594	40.0000		-16
-17	3.3465	85		4-1/8			3.792	3.812	43.7500		-17
NT-18	3.5433	90		4-5/16			3.980	4.000	45.0000		WT-18

MATING LOCKWASHER DESCRIPTIONS ON PAGE 144.

NT

DESCRIPTION

Provides necessary holding power in less space. Smaller OD and 50-75% less thickness result in dramatic weight reduction. Used in aircraft, electronics, and machine tools with small bearings.

AXIAL ASSEMBLY

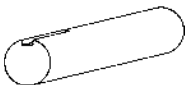
HOW TO IDENTIFY

1. Confirm the outside diameter (OD) of the part.
2. Measure the thickness (T) of the part.
3. Verify the nut face diameter (Dc).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

REQUIRES A KEYWAY.

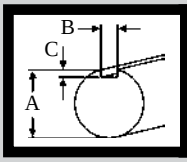


LET OUR SHOP CUT IT FOR YOU!

SEE PAGE 140.

WT LOCKWASHER Page 144

KEYED SHAFTS SPECIAL ORDERS GUIDE



To Order, We Need To Know:

- Diameter "A"
- Keyway Size "B" x "C"
- Keyway Length
- Overall Length
- Material

PARTIAL KEYWAYS AVAILABLE. WE CAN CUT KEYWAYS UP TO 12 FEET LONG.

KEYED SHAFTS LISTED ON PAGE 140.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

BASE TYPE		SPECIAL ORDER HIGH PRECISION VERSION		SPECIAL ORDER HIGH PRECISION WITH SELF-LOCKING FEATURES	
IN THIS CATALOG		*CONTACT PLANT FOR PRICING*		*CONTACT PLANT FOR PRICING*	
N/AN	Standard	**PN**	STANDARD HIGH PRECISION	**BH**	STANDARD SELF-LOCKING
	Pg: 132		Better surfaces, closer tolerances, and more locking positions. Fully interchangeable with N and AN series locknuts.		Uses a bone fibre collar with better machine tolerances for self-locking nuts. No keyway or lockwasher needed.
NS	Stainless Steel	**PS**	STAINLESS HIGH PRECISION	**BHSS**	STAINLESS SELF-LOCKING
	Pg: 132		Special order only. All stainless steel locknuts are passivated for uncontaminated installation.		303 stainless with nylon insert for self-locking (up to 250°F). Passivated to remove impurities.
NH	Heavy Duty			**BHH**	HEX WITH NYLON COLLAR
	Pg: 133				Has a hex configuration with a nylon collar. Provides some advantages in automated assembly.
NI	Fine Thread			**BHI**	FINE THREAD SELF-LOCKING
	Pg: 134				"All new" self-locking version of the NI with all imperial dimensions.
NL	Left-Hand Thread	**PL**	LEFT-HAND HIGH PRECISION	**BHL**	LEFT-HAND SELF-LOCKING
	Pg: 135		Fully interchangeable with left-hand threaded NL series. Precision manufacturing assures longer life and extra security.		Bone fibre collar for self-locking eliminates the need for a keyway or lockwasher. Left-hand threads.
NT	Thin Section	**PT**	THIN SECTION HIGH PRECISION		
	Pg: 136		Super high precision version to replace NT in aircraft, computer, and electronics industries.		
KM	Metric			**BM**	METRIC SELF-LOCKING
	Pg: 220				Manufactured in accordance with ISO-2982 as an all-metric, self-locking nut.

OTHER TYPES AND STYLES

BHM		HARDENED SELF-LOCKING	Hardened self-locking variation for Government and Military uses (like $500 toilet seats).
N-000		LIGHTWEIGHT	Lightweight small dimensional series to AFBMA standard for large shafts and adaptor sleeves (up to 37").
MS-172236/259		AERONAUTIC SPECIFICATION	Hardened phosphate coated parts that are subjected to magnetic particle inspection to aeronautical standards.
MS-19068		MILITARY STANDARD	Manufactured of low-carbon steel and inspected using magnetic particle inspection for compliance to Department of Defense MS-19068-001.
ISO-2982		METRIC STANDARD	Metric standard listed in the metric section of this catalog on page 220.

LOCKWASHERS Pages 141-144

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KEYED SHAFTS

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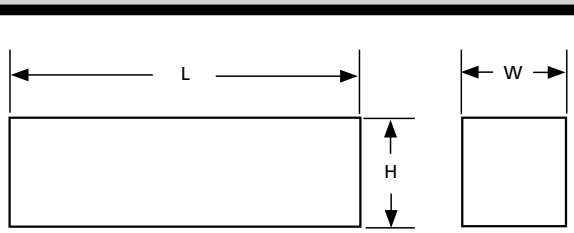
SQUARE MACHINE KEY

MANUFACTURER CROSS-REFERENCE

ITW/Bee-Leitzke	501	Stanho
See ANSI B17.1-1967		See also DIN 6885



LENGTH ↓	HEIGHT & WIDTH									
	1/16	3/32	1/8	5/32	3/16	1/4	5/16	3/8	7/16	1/2
1/2	•	•	•	•	•	•	•	•	•	•
3/4	•	•	•	•	•	•	•	•	•	•
1	•	•	•	•	•	•	•	•	•	•
1-1/4	•	•	•	•	•	•	•	•	•	•
1-1/2	•	•	•	•	•	•	•	•	•	•
1-3/4	•	•	•	•	•	•	•	•	•	•
2	•	•	•	•	•	•	•	•	•	•
2-1/4	•	•	•	•	•	•	•	•	•	•
2-1/2	•	•	•	•	•	•	•	•	•	•
2-3/4	•	•	•	•	•	•	•	•	•	•
3	•	•	•	•	•	•	•	•	•	•
3-1/4	•	•	•	•	•	•	•	•	•	•
3-1/2	•	•	•	•	•	•	•	•	•	•
3-3/4	•	•	•	•	•	•	•	•	•	•
4	•	•	•	•	•	•	•	•	•	•
4-1/4	---	---	---	---	---	•	•	•	•	•
4-1/2	---	---	---	---	---	•	•	•	•	•
4-3/4	---	---	---	---	---	•	•	•	•	•
5	---	---	---	---	---	•	•	•	•	•
5-1/4	---	---	---	---	---	•	•	•	•	•
5-1/2	---	---	---	---	---	•	•	•	•	•
5-3/4	---	---	---	---	---	•	•	•	•	•
6	---	---	---	---	---	•	•	•	•	•
6-1/4	---	---	---	---	---	---	---	---	---	---
6-1/2	---	---	---	---	---	---	---	---	---	---
6-3/4	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---
7-1/4	---	---	---	---	---	---	---	---	---	---
7-1/2	---	---	---	---	---	---	---	---	---	---
7-3/4	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---
8-1/4	---	---	---	---	---	---	---	---	---	---
8-1/2	---	---	---	---	---	---	---	---	---	---
8-3/4	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---
9-1/4	---	---	---	---	---	---	---	---	---	---
9-1/2	---	---	---	---	---	---	---	---	---	---
9-3/4	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---

• Indicates a stock item.

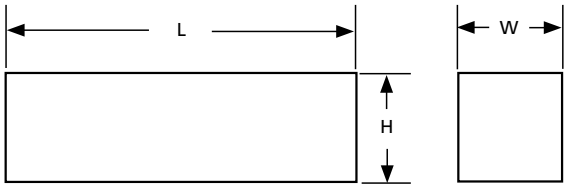
MK

DESCRIPTION	*HOW TO IDENTIFY*	*GENERAL USE*
Machine keys are used to hold machinery parts in place or align components. They are specifically designed to fail as a safety mechanism to save more expensive components. Standard sizes are ready to use without any cutting or filing.	1. Determine material by application usage. 2. Measure height (H) and width (W). 3. Verify length (L). 4. Find the part in the chart above.	COMMON

AVAILABLE IN MOST SIZES WITH SQUARED, ROUNDED, OR CHAMFERED ENDS. CALL, E-MAIL, OR FAX FOR A QUOTE!

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

BOX 232 • MINNEAPOLIS, KS • 67467



SQUARE MACHINE KEY

MANUFACTURER CROSS-REFERENCE

ITW/Bee-Leitzke	501	Stanho
See ANSI B17.1-1967		See also DIN 6885

LENGTH ↓	HEIGHT & WIDTH								
	9/16	5/8	3/4	7/8	1	1-1/4	1-1/2	1-3/4	2
1/2	•	---	---	---	---	---	---	---	---
3/4	•	•	•	---	---	---	---	---	---
1	•	•	•	•	•	---	---	---	---
1-1/4	•	•	•	•	•	•	---	---	---
1-1/2	•	•	•	•	•	•	•	---	---
1-3/4	•	•	•	•	•	•	•	•	---
2	•	•	•	•	•	•	•	•	•
2-1/4	•	•	•	•	•	•	•	•	•
2-1/2	•	•	•	•	•	•	•	•	•
2-3/4	•	•	•	•	•	•	•	•	•
3	•	•	•	•	•	•	•	•	•
3-1/4	•	•	•	•	•	•	•	•	•
3-1/2	•	•	•	•	•	•	•	•	•
3-3/4	•	•	•	•	•	•	•	•	•
4	•	•	•	•	•	•	•	•	•
4-1/4	•	•	•	•	•	•	•	•	•
4-1/2	•	•	•	•	•	•	•	•	•
4-3/4	•	•	•	•	•	•	•	•	•
5	•	•	•	•	•	•	•	•	•
5-1/4	•	•	•	•	•	•	•	•	•
5-1/2	•	•	•	•	•	•	•	•	•
5-3/4	•	•	•	•	•	•	•	•	•
6	•	•	•	•	•	•	•	•	•
6-1/4	---	---	•	•	•	•	•	•	•
6-1/2	---	---	•	•	•	•	•	•	•
6-3/4	---	---	•	•	•	•	•	•	•
7	---	---	•	•	•	•	•	•	•
7-1/4	---	---	•	•	•	•	•	•	•
7-1/2	---	---	•	•	•	•	•	•	•
7-3/4	---	---	•	•	•	•	•	•	•
8	---	---	•	•	•	•	•	•	•
8-1/4	---	---	---	---	•	•	•	•	•
8-1/2	---	---	---	---	•	•	•	•	•
8-3/4	---	---	---	---	•	•	•	•	•
9	---	---	---	---	•	•	•	•	•
9-1/4	---	---	---	---	•	•	•	•	•
9-1/2	---	---	---	---	•	•	•	•	•
9-3/4	---	---	---	---	•	•	•	•	•
10	---	---	---	---	•	•	•	•	•

• Indicates a stock item.

METRIC Page 219

STANDARD MATERIALS & TOLERANCES

Standard material is undersized negative tolerance bar stock made from C1018, 4045, C1095, 1215 and 303/304 stainless.

SIZE	CARBON STEEL	STAINLESS STEEL
1/16" through 3/4"	+.000/-.002	---
1/16" through 1/4"	---	+.000/-.002
7/8" through 1-1/2"	+.000/-.003	---
5/16" through 7/16"	---	+.000/-.003
1-3/4"throught 2"	+.000/-.004	---
1/2"	---	+.000/-.004

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

KEYED SHAFTS

MANUFACTURER CROSS-REFERENCE

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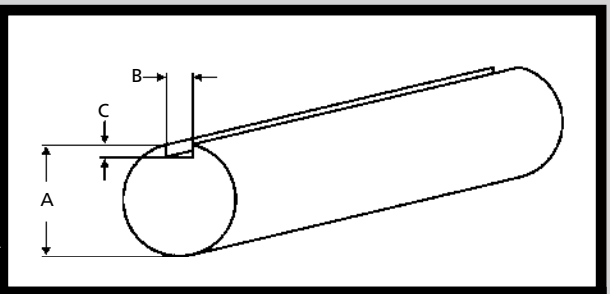


KF	BAR	KEYWAY		WEIGHT	MATERIAL			
					Carbon Steel		Stainless Steel	
	Diameter (A)	Width (B)	Depth (C)	Lbs. per Foot	3′	6′	3′	6′
KF-0500	1/2″	1/8″	1/16″	0.6700				
-0625	5/8″	3/16″	3/32″	1.0400				
-0687	11/16″			1.2500				
-0750	3/4″			1.5000				
-0875	7/8″			2.0400				
-0937	15/16″	1/4″	1/8″	2.3500				
-1000	1″			2.6700				
-1062	1-1/16″			3.0100				
-1125	1-1/8″			3.3800				
-1187	1-3/16″			3.7700				
-1250	1-1/4″			4.1700				
-1312	1-5/16″	5/16″	5/32″	4.6000				
-1375	1-3/8″			5.0500				
-1437	1-7/16″	3/8″	3/16″	5.5200				
-1500	1-1/2″			6.0100				
-1625	1-5/8″			7.0500				
-1687	1-11/16″			7.6000				
-1750	1-3/4″			8.1800				
-1875	1-7/8″	1/2″	1/4″	9.3900				
-1937	1-15/16″			10.0200				
-2000	2″			10.6800				
-2187	2-3/16″			12.7800				
-2437	2-7/16″	5/8″	5/16″	15.8700				
-2500	2-1/2″			16.6900				
-2937	2-15/16″	3/4″	3/8″	23.0400				
-3000	3″			24.0400				
-3125	3-1/8″			26.0400				
-3187	3-3/16″			27.1200				
-3250	3-1/4″			28.2000				
-3375	3-3/8″	7/8″	7/16″	30.3600				
-3437	3-7/16″			31.5600				
-3500	3-1/2″			32.6400				
-3625	3-5/8″			35.0400				
-3750	3-3/4″			37.5600				
-3937	3-15/16″	1″	1/2″	41.4000				
-4000	4″			42.7200				
-4250	4-1/4″			48.1200				
-4375	4-3/8″			51.0000				
-4437	4-7/16″			52.5600				
KF-4500	4-1/2″			54.0000				

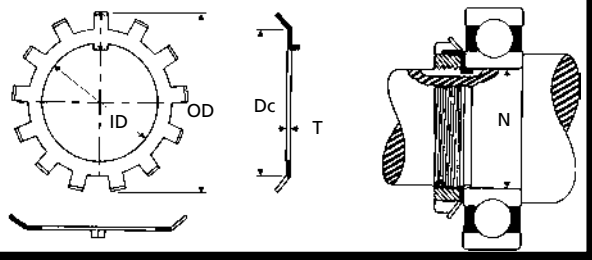
KF

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
Fully keyed shafting that provides a good fit between the key and the keyway. Partial keyways and other materials are available, including turned and polished, and medium carbon steel (suitable to heat treat). See the special orders guide on page 136.	1. Confirm the diameter of the shaft (A). 2. Determine the keyway width (B) and depth (C). 3. Choose a length of 3′ or 6′. Other lengths are available. Contact plant for quote. 4. Find the part in the chart above.	 COMMON

Note: ***There is some variance in length on this product (+/- 2″) due to the nature of its manufacture. Please specify "Exact Size" if you need a precise length.***

LENGTHS OVER 3′ MAY BE SUBJECT TO A PACKAGING CHARGE.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



STANDARD

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Standard Locknut	W
Whittet-Higgins	W

W

BORE		LOCKWASHER DIMENSIONS					WEIGHT	MATERIAL	
Bearing Bore Nominal (N)		Free Outside Dia. +0/-1/16" (OD)	Inside Dia. (ID) Min./Max.	Thickness (T) Min./Max.	Face Dia. (Dc) Min./Max.	Number of Tangs	Lbs. per 100 Pieces	Spring Steel	Mating Locknut
Decimal	MM								
W-00	.3937	10	7/8	.406/.421	.038/.046	.625/.640	9	0.3750		N-00
-01	.4724	12	1-1/64	.484/.499		.719/.734		0.5000		-01
-02	.5906	15	1-5/32	.601/.616		.813/.827	11	0.6250		-02
-03	.6693	17	1-21/64	.679/.694		.938/.953		0.8750		-03
-04	.7874	20	1-17/32	.801/.816		1.125/1.140		1.1250		-04
-05	.9843	25	1-23/32	.989/1.009	.046/.054	1.281/1.296	13	1.5625		-05
-06	1.1811	30	1-59/64	1.193/1.213		1.500/1.515		1.8750		-06
-07	1.3780	35	2-1/4	1.396/1.416		1.813/1.827	15	2.5000		-07
-08	1.5748	40	2-15/32	1.583/1.603	.053/.063	2.000/2.030		3.7500		-08
-09	1.7717	45	2-47/64	1.792/1.817		2.281/2.311	17	4.3750		-09
-10	1.9685	50	2-59/64	1.992/2.017		2.438/2.468		4.3750		-10
-11	2.1654	55	3-7/64	2.182/2.207	.058/.064	2.656/2.686		5.3125		-11
-12	2.3622	60	3-11/32	2.400/2.425		2.844/2.874		5.4690		-12
-13	2.5591	65	3-37/64	2.588/2.613		3.063/3.093	19	6.2500		-13
-14	2.7559	70	3-53/64	2.791/2.816		3.313/3.343		6.8750		N-14
-15	2.9528	75	4-7/64	2.973/3.003	.067/.077	3.563/3.593		10.6250		AN-15
-16	3.1496	80	4-3/8	3.177/3.207		3.844/3.874		12.1875		-16
-17	3.3465	85	4-5/8	3.395/3.425		4.031/4.061		12.8125		-17
-18	3.5433	90	4-15/16	3.582/3.612	.088/.100	4.281/4.326		18.4375		-18
-19	3.7402	95	5-7/32	3.800/3.830		4.563/4.607		20.3125		-19
-20	3.9370	100	5-1/2	3.988/4.018		4.813/4.858		21.8750		-20
-21	4.1339	105	5-45/64	4.192/4.222		5.000/5.045		24.0625		-21
-22	4.3307	110	6-1/16	4.395/4.425	.118/.132	5.281/5.326		34.3750		-22
-24	4.7244	120	6-15/32	4.801/4.831		5.688/5.733		40.0000		-24
-26	5.1181	130	7-1/32	5.191/5.226		6.188/6.233		50.0000		-26
-28	5.5118	140	7-7/16	5.582/5.617		6.531/6.576		51.2500		-28
-30	5.9055	150	8-1/16	5.983/6.018	.148/.164	7.063/7.123		75.0000		-30
-32	6.2992	160	8-7/16	6.389/6.424		7.438/7.498		77.5000		-32
-34	6.6929	170	9-1/16	6.764/6.799		8.031/8.091		92.5000		-34
-36	7.0866	180	9-7/16	7.171/7.206		8.375/8.435		100.0000		-36
-38	7.4803	190	9-7/8	7.577/7.612		8.781/8.841		102.5000		-38
-40	7.8740	200	10-5/16	7.982/8.017		9.156/9.216		110.0000		AN-40
W-44	8.6614	220	11-7/16	8.701/8.736		9.875/9.930		131.2500		N-44

MATING LOCKNUT DESCRIPTIONS ON PAGE 132.

W

AXIAL ASSEMBLY

DESCRIPTION

Most commonly used and least expensive. Note that the key is bent in the opposite direction of the tangs.

HOW TO IDENTIFY

1. Verify the face diameter (Dc) of the part.
2. Confirm the (ID) of the part.
3. Measure the thickness (T).
4. Find the part in the chart above.

GENERAL USE

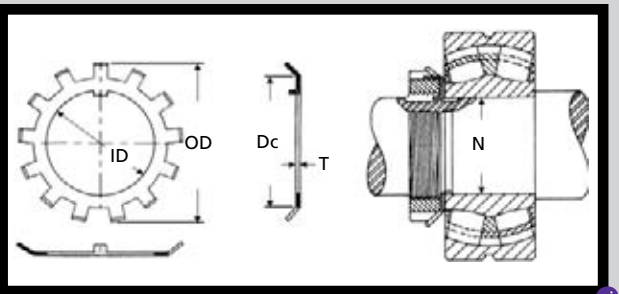
COMMON

USE WITH N/AN AND NL LOCKNUTS.

FOR THICKER VERSION, SEE "WH" ON PAGE 143.

N LOCKNUT Page 132

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



STANDARD STAINLESS STEEL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Standard Locknut	WS
Whittet-Higgins	WS

WS

BORE		LOCKWASHER DIMENSIONS					WEIGHT	MATERIAL	
Bearing Bore Nominal (N) Decimal	MM	Free Outside Dia. +0/-1/16"(OD)	Inside Dia. (ID) Min./Max.	Thickness (T) Min./Max.	Face Dia. (Dc) Min./Max.	Number of Tangs	Lbs. per 100 Pieces	Stainless Steel	Mating Locknut
WS-00	.3937	10	7/8	.406/.421	.038/.046	.625/.640	9	0.3750		NS-00
-01	.4724	12	1-1/64	.484/.499		.719/.734		0.5000		-01
-02	.5906	15	1-5/32	.601/.616		.813/.827	11	0.6250		-02
-03	.6693	17	1-21/64	.679/.694		.938/.953		0.7500		-03
-04	.7874	20	1-17/32	.801/.816		1.125/1.140		1.2500		-04
-05	.9843	25	1-23/32	.989/1.009	.046/.054	1.281/1.296	13	1.5625		-05
-06	1.1811	30	1-59/64	1.193/1.213		1.500/1.515		1.8750		-06
-07	1.3780	35	2-1/4	1.396/1.416		1.813/1.827	15	2.6563		-07
-08	1.5748	40	2-15/32	1.583/1.603	.053/.063	2.000/2.030		3.9063		-08
-09	1.7717	45	2-47/64	1.792/1.817		2.281/2.311	17	4.5313		-09
-10	1.9685	50	2-59/64	1.992/2.017		2.438/2.468		4.6875		-10
-11	2.1654	55	3-7/64	2.182/2.207	.058/.068	2.656/2.686		4.8438		-11
-12	2.3622	60	3-11/32	2.400/2.425		2.844/2.874		5.4690		-12
-13	2.5591	65	3-37/64	2.588/2.613		3.063/3.093	19	6.2500		-13
-14	2.7559	70	3-53/64	2.791/2.816		3.313/3.343		6.8750		-14
-15	2.9528	75	4-7/64	2.973/3.003	.067/.077	3.563/3.593		10.9380		-15
-16	3.1496	80	4-3/8	3.177/3.207		3.844/3.874		12.5000		-16
-17	3.3465	85	4-5/8	3.395/3.425		4.031/4.061		12.8130		-17
-18	3.5433	90	4-15/16	3.582/3.612	.088/.100	4.281/4.326		17.8125		-18
-19	3.7402	95	5-7/32	3.800/3.830		4.563/4.607		19.3750		-19
-20	3.9370	100	5-1/2	3.988/4.018		4.813/4.858		22.0000		-20
-21	4.1339	105	5-45/64	4.192/4.222		5.000/5.045		23.1250		-21
-22	4.3307	110	6-1/16	4.395/4.425	.118/.132	5.281/5.326		34.0000		-22
WS-24	4.7244	120	6-15/32	4.801/4.831		5.688/8.733		40.0000		NS-24

MATING LOCKNUT DESCRIPTIONS ON PAGE 132.

WS

AXIAL ASSEMBLY

DESCRIPTION

Stainless steel version of "W" Series. Passivated to remove impurities.

HOW TO IDENTIFY

1. Verify the face diameter (Dc) of the part.
2. Confirm the (ID) of the part.
3. Measure the thickness (T).
4. Find the part in the chart above.

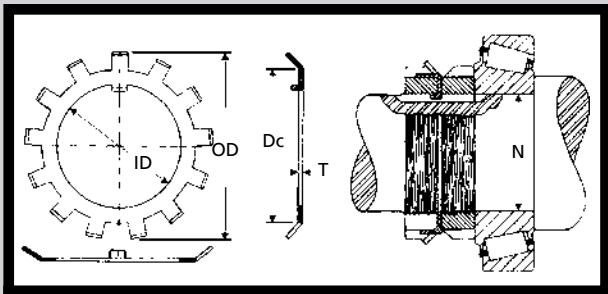
GENERAL USE

COMMON

USE WITH NS AND ANS LOCKNUTS.

NS LOCKNUT Page 132

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

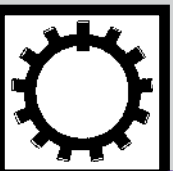


HEAVY DUTY

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Standard Locknut	TW
Whittet-Higgins	WH



WH

Bearing Bore Nominal (N) Decimal	MM	LOCKWASHER DIMENSIONS: Free Outside Dia. +0/-1/16"(OD)	Inside Dia. (ID) Min./Max.	Thickness (T) Min./Max.	Face Dia. (Dc) Min./Max.	Number of Tangs	WEIGHT Lbs. per 100 Pieces	MATERIAL: Spring Steel	Mating Locknut
WH-00	.3937	10	57/64	.406/.421	.038/.046	.625/.640	9	0.3750		NH-00
-01	.4724	12	1-1/32	.484/.499		.719/.734		0.5000		-01
-02	.5906	15	1-5/32	.601/.616	.053/.063	.813/.827	11	0.9375		-02
-03	.6693	17	1-11/32	.679/.694		.938/.953		1.2500		-03
-04	.7874	20	1-9/16	.801/.816		1.125/1.140		1.7190		-04
-05	.9843	25	1-45/64	.989/1.009	.057/.067	1.281/1.296	13	2.1429		-05
-06	1.1811	30	1-61/64	1.193/1.213		1.500/1.515		2.1875		-06
-065	1.3125	33-1/3	2-15/64	1.333/1.353		1.813/1.827	15	3.3929		-065
-07	1.3780	35	2-1/4	1.396/1.416		1.813/1.827		3.2143		-07
-08	1.5748	40	2-31/64	1.583/1.603	.067/.077	2.000/2.030		4.4440		-08
-09	1.7717	45	2-23/32	1.792/1.817		2.281/2.311	17	5.2083		-09
-10	1.9685	50	2-59/64	1.992/2.017		2.438/2.468		5.3570		-10
-11	2.1654	55	3-3/32	2.182/2.207		2.656/2.686		5.7143		-11
-12	2.3622	60	3-21/64	2.400/2.425	.077/.087	2.844/2.874		6.9640		-12
-13	2.5591	65	3-9/16	2.588/2.613		3.063/3.093	19	8.2143		-13
-14	2.7559	70	3-13/16	2.791/2.816		3.313/3.343		9.1667		-14
-15	2.9528	75	4-3/64	2.973/3.003	.089/.101	3.563/3.593		12.1875		-15
-16	3.1496	80	4-25/64	3.177/3.207		3.844/3.874		15.6250		-16
-17	3.3465	85	4-5/8	3.395/3.425		4.031/4.061		16.5630		-17
-18	3.5433	90	4-61/64	3.582/3.612	.118/.132	4.281/4.326		24.5830		-18
-19	3.7402	95	5-15/64	3.800/3.830		4.563/4.607		27.0830		-19
-20	3.9370	100	5-31/64	3.988/4.018		4.813/4.858		30.0000		-20
-21	4.1339	105	5-45/64	4.192/4.222		5.000/5.045		31.3889		-21
-22	4.3307	110	6	4.395/4.425	.133/.147	5.281/5.326		38.7500		-22
-24	4.7244	120	6-17/32	4.801/4.831	.157/.173	5.688/5.733		51.2500		-24
-26	5.1181	130	7-3/64	5.191/5.226		6.188/6.233		66.2500		-26
-28	5.5118	140	7-7/16	5.582/5.617		6.531/6.576		67.5000		-28
-30	5.9055	150	8-1/16	5.983/6.018	.194/.212	7.063/7.123		96.8750		-30
-32	6.2992	160	8-29/64	6.389/6.424		7.438/7.498		100.0000		-32
-34	6.6929	170	9-5/64	6.764/6.799		8.031/8.091		120.0000		-34
-36	7.0866	180	9-7/16	7.171/7.206		8.375/8.435		127.5000		-36
-38	7.4803	190	9-55/64	7.577/7.612		8.781/8.841		132.5000		-38
WH-40	7.8740	200	10-13/32	7.982/8.017		9.156/9.216		140.0000		NH-40

MATING LOCKNUT DESCRIPTIONS ON PAGE 133.

WH

AXIAL ASSEMBLY

DESCRIPTION

Heavier duty, thicker version with the key bent in the same direction as the tangs.

HOW TO IDENTIFY

1. Verify the face diameter (Dc) of the part.
2. Confirm the (ID) of the part.
3. Measure the thickness (T).
4. Find the part in the chart above.

GENERAL USE

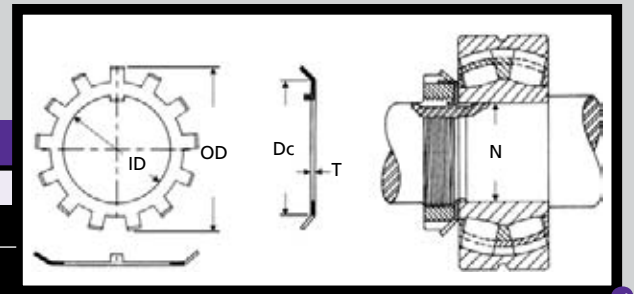
UNCOMMON

USE WITH NH LOCKNUTS.

FOR THINNER VERSION, SEE "W" ON PAGE 141.

NH LOCKNUT Page 133

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



FINE THREAD

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

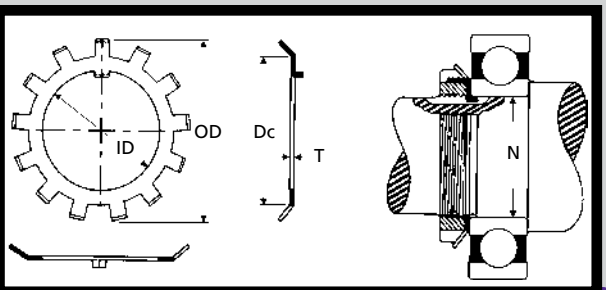
Standard Locknut	WIN	
Whittet-Higgins	WI	

WI

BORE Bearing Bore Nom. (N)	LOCKWASHER DIMENSIONS Free Outside Diameter +0/-1/16"(OD)	Inside Dia. (ID) Min./Max.	Thickness (T) Min./Max.	Face Dia. (Dc) Min./Max.	Number of Tangs	WEIGHT Lbs. per 100 Pieces	MATERIAL Spring Steel	Mating Locknut
WI-01	.750	1.563	.797/.828		1.188/1.203	9	1.2500		NI-01
-02	.875	1.688	.922/.953		1.313/1.328		1.8750		-02
-03	1.000	1.813	1.047/1.078		1.438/1.453		1.8750		-03
-04	1.125	2.000	1.172/1.203	.046/.054	1.563/1.578	11	2.5000		-04
-05	1.250	2.125	1.297/1.328		1.688/1.703		2.5000		-05
-06	1.375	2.375	1.422/1.453		1.938/1.953		2.5000		-06
-07	1.500	2.375	1.547/1.578		1.938/1.953	13	2.5000		-07
-08	1.625	2.625	1.672/1.703		2.188/2.203		4.3750		-08
-09	1.750	2.750	1.797/1.828		2.313/2.328		5.0000		-09
-10	1.875	2.875	1.922/1.953		2.438/2.453	15	5.0000		-10
-11	2.000	3.125	2.047/2.078	.058/.068	2.688/2.703		5.6250		-11
-12	2.250	3.438	2.297/2.328		2.875/2.890		6.2500		-12
-13	2.500	3.688	2.547/2.578		3.125/3.140	17	6.8750		-13
WI-14	2.750	3.938	2.797/2.828		3.375/3.390		7.5000		NI-14

MATING LOCKNUT DESCRIPTIONS ON PAGE 134.

NI LOCKNUT Page 134



THIN SECTION

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Standard Locknut	WTH	
Whittet-Higgins	WT	

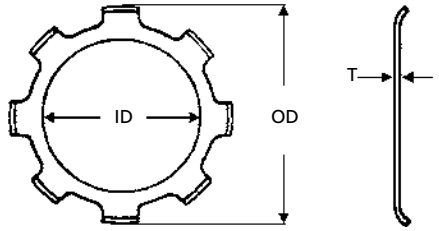
WT

BORE Bearing Bore Nominal (N) Decimal	BORE MM	LOCKWASHER DIMENSIONS Free Outside Dia. +0/-1/16"(OD)	Inside Dia. (ID) Min./Max.	Thickness (T) Min./Max.	Face Dia. (Dc) Min./Max.	Number of Tangs	WEIGHT Lbs. per 100 Pieces	MATERIAL Spring Steel	Mating Locknut
WT-00	.3937	10	53/64	.406/.421		.531/.551	9	0.62500		NT-00
-01	.4724	12	59/64	.484/.499		.625/.645		0.62500		-01
-02	.5906	15	1-3/32	.601/.616	.036/.044	.750/.770		0.62500		-02
-03	.6693	17	1-13/64	.679/.694		.875/.895	11	0.62500		-03
-04	.7874	20	1-3/8	.801/.816		1.000/1.020		1.25000		-04
-05	.9843	25	1-9/16	.989/1.009		1.188/1.208		1.25000		-05
-06	1.1811	30	1-55/64	1.193/1.213	.046/.054	1.438/1.458	13	1.87500		-06
-07	1.3780	35	2-5/64	1.396/1.416		1.656/1.676		1.87500		-07
-08	1.5748	40	2-1/4	1.583/1.603		1.844/1.864	15	2.50000		-08
-09	1.7717	45	2-1/2	1.792/1.817		2.062/2.082		3.12500		-09
-10	1.9685	50	2-11/16	1.992/2.017		2.250/2.270		3.12500		-10
-11	2.1654	55	2-61/64	2.182/2.207		2.500/2.520	17	3.75000		-11
-12	2.3622	60	3-3/16	2.400/2.425		2.688/2.708		4.37500		-12
-13	2.5591	65	3-3/8	2.588/2.613	.058/.068	2.875/2.895		4.37500		-13
-14	2.7559	70	3-19/32	2.791/2.816		3.094/3.114		5.00000		-14
-15	2.9528	75	3-59/64	2.973/3.003		3.375/3.395		6.87500		-15
-16	3.1496	80	4-9/64	3.177/3.207		3.594/3.614	19	7.50000		-16
-17	3.3465	85	4-23/64	3.395/3.425		3.812/3.832		7.50000		-17
WT-18	3.5433	90	4-35/64	3.582/3.612		4.000/4.020		8.12500		NT-18

MATING LOCKNUT DESCRIPTIONS ON PAGE 136.

NT LOCKNUT Page 136

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



EXTERNAL TOOTH RETAINER

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

ETR

DESIGN	DIMENSIONS				MATERIAL
Hole Size Design	Outside Diameter (OD) Min.	Outside Diameter (OD) Max.	Inside Diameter Nominal (ID)	Material Thickness (T)	Spring Steel
ETR-03712	.3750	.3780	.3830	.1900	.0120
-05812	.5800	.5960	.6040	.3540	.0120
-06210	.6250	.6360	.6400	.3940	.0100
-06515	.6500	.6690	.6730	.4250	.0150
-07415	.7400	.7500	.7600	.5560	.0150
-07515	.7500	.7530	.7630	.5050	.0150
-07515-01	.7500	.7630	.7680	.5420	.0150
-07536	.7500	.7630	.7680	.5430	.0360
-08110	.8120	.8250	.8350	.5400	.0100
-08130	.8120	.8180	.8310	.1970	.0300
-08915	.8950	.9050	.9150	.7090	.0150
-09015	.9000	.9080	.9200	.6250	.0150
-10915	1.0950	1.2680	1.2720	.8660	.0150
-11215	1.1250	1.1300	1.1370	.8750	.0150
-13315	1.3350	1.3600	1.3700	1.0630	.0150
-21115	2.1150	2.1300	2.1460	1.6530	.0150
-23715	2.3750	2.3820	2.3870	1.8800	.0150
ETR-30020	3.0000	3.0100	3.0180	2.3850	.0200

+/-.002

ETR

AXIAL ASSEMBLY

DESCRIPTION

Serves as spacer or retaining collar when used in bores. Teeth flex and resist pullout pressure.

HOW TO IDENTIFY

1. Determine the outside diameter (OD) of the part.
2. Confirm the inside diameter (ID).
3. Measure the material thickness (T).
4. Find the part in the chart above.

GENERAL USE

WEIRD

FOR OTHER VERSIONS, SEE PAGES 90-101.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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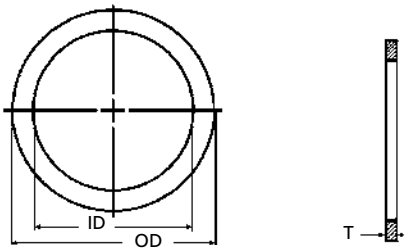
SUPPORT WASHER DIN 988

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	R	Seeger	SS	DIN	988
Ellison	988SS	Waldes	5900		

HARDENED



SS	RING Inside Diameter (ID)	RING Outside Diameter (OD)	RING Thickness (T)		MATERIAL Spring Steel
SS-003006	3	6	1.0	+.000/-.050	
-004008	4	8			
-005010	5	10			
-006012	6	12	1.2		
-007013	7	13			
-008014	8	14			
-009015	9	15			
-010016	10	16			
-011017	11	17			
-012018	12	18			
-013019	13	19	1.5		
-014020	14	20			
-015021	15	21			
-015022	15	22			
-016022	16	22			
-017024	17	24			
-018025	18	25			
-019026	19	26			
-020028	20	28	2.0		
-022030	22	30			
-022032	22	32			
-025035	25	35			
-025036	25	36			
-026037	26	37			
-028040	28	40			
-030042	30	42	2.5		
-032045	32	45			
-035045	35	45			
-036045	36	45			
SS-037047	37	47			

SS	RING Inside Diameter (ID)	RING Outside Diameter (OD)	RING Thickness (T)		MATERIAL Spring Steel
SS-040050	40	50	2.5	+.000/-.050	
-042052	42	52			
-045055	45	55	3.0	+.000/-.060	
-045056	45	56			
-048060	48	60			
-050062	50	62			
-050063	50	63			
-052065	52	65			
-055068	55	68			
-056070	56	70			
-056072	56	72			
-060075	60	75			
-063080	63	80			
-065085	65	85	3.5	+.000/-.080	
-070090	70	90			
-075095	75	95			
-080100	80	100			
-085105	85	105			
-090110	90	110			
-095115	95	115			
-100120	100	120			
-100125	100	125			
-105130	105	130			
-110140	110	140			
-120150	120	150			
-130160	130	160			
-140170	140	170			
-150180	150	180			
-160190	160	190			
SS-170200	170	200			

SS / PS

AXIAL ASSEMBLY

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
These support washers (SS) and shim rings (PS) conform to the DIN 988 standards.	1. Determine the inside diameter (ID) and outside diameter (OD) of the part. 2. Measure the thickness (T) of the part. 3. Find the part in the charts.	COMMON

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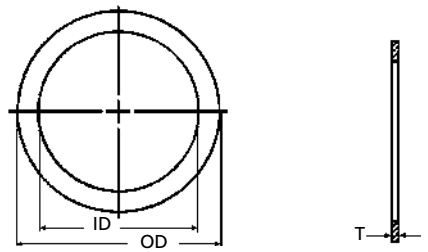
BOX 232 • MINNEAPOLIS, KS • 67467



SHIM RING DIN 988

MANUFACTURER CROSS-REFERENCE

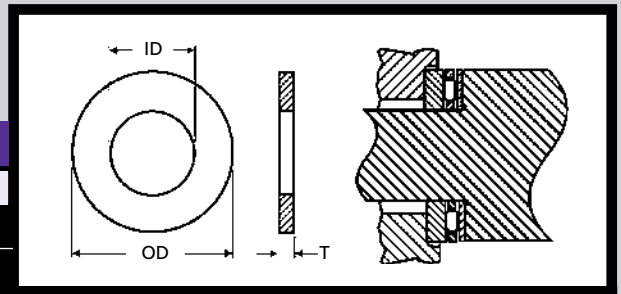
INDEX PAGE 236.

Anderton	R	Ellison	988SS	DIN	988
Bossard		Seeger	SS		

PS

RING		THICKNESS / THICKNESS TOLERANCE MM									
Inside Diameter MM (ID)	Outside Diameter MM (OD)	0.1 -0.03	0.15 -0.04	0.2 -0.04	0.25 -0.04	0.3 -0.05	0.5 -0.05	1.0 -0.05	1.2 -0.07	1.5 -0.07	2.0 -0.07
PS-003006	3	6	•	•	•	---	•	•	•	---	---	---
-004008	4	8	•	•	•	---	•	•	•	---	---	---
-005010	5	10	•	•	•	---	•	•	•	---	---	---
-006012	6	12	•	•	•	---	•	•	•	---	---	---
-007013	7	13	•	•	•	•	•	•	•	---	---	---
-008014	8	14	•	•	•	•	•	•	•	---	---	---
-009015	9	15	•	•	•	•	•	•	•	---	---	---
-010016	10	16	•	•	•	•	•	•	•	---	---	---
-011017	11	17	•	•	•	---	•	•	•	---	---	---
-012018	12	18	•	•	•	•	•	•	•	---	---	---
-013019	13	19	•	•	•	---	•	•	•	•	---	---
-014020	14	20	•	•	•	•	•	•	•	•	---	---
-015021	15	21	•	•	•	•	•	•	•	•	---	---
-015022	15	22	•	•	•	•	•	•	•	•	---	---
-016022	16	22	•	•	•	•	•	•	•	•	---	---
-017024	17	24	•	•	•	•	•	•	•	•	---	---
-018025	18	25	•	•	•	•	•	•	•	•	---	---
-019026	19	26	•	•	•	•	•	•	•	•	---	---
-020028	20	28	•	•	•	•	•	•	•	•	•	---
-022032	22	32	•	•	•	•	•	•	•	•	•	---
-025035	25	35	•	•	•	•	•	•	•	•	•	---
-026037	26	37	•	•	•	•	•	•	•	•	•	---
-028040	28	40	•	•	•	•	•	•	•	•	•	---
-030042	30	42	•	•	•	•	•	•	•	•	•	•
-032045	32	45	•	•	•	•	•	•	•	•	•	•
-035045	35	45	•	•	•	•	•	•	•	•	•	•
-036045	36	45	•	•	•	•	•	•	•	•	•	•
-037047	37	47	•	•	•	•	•	•	•	•	•	•
-040050	40	50	•	•	•	•	•	•	•	•	•	•
-042052	42	52	•	•	•	•	•	•	•	•	•	•
-045055	45	55	•	•	•	•	•	•	•	•	•	•
-048060	48	60	•	•	•	•	•	•	•	•	•	•
-050062	50	62	•	•	•	•	•	•	•	•	•	•
-050063	50	63	•	•	•	•	•	•	•	•	•	•
-052065	52	65	•	•	•	•	•	•	•	•	•	•
-055068	55	68	•	•	•	•	•	•	•	•	•	•
-056072	56	72	•	•	•	•	•	•	•	•	•	•
-060075	60	75	•	•	•	•	•	•	•	•	•	•
-063080	63	80	•	---	•	---	•	•	•	•	•	•
-065085	65	85	•	---	•	•	•	•	•	•	•	•
-070090	70	90	•	•	•	•	•	•	•	•	•	•
-075095	75	95	•	•	•	•	•	•	•	•	•	•
-080100	80	100	•	•	•	•	•	•	•	•	•	•
-085105	85	105	•	•	•	•	•	•	•	•	•	•
-090110	90	110	•	•	•	•	•	•	•	•	•	•
-095115	95	115	•	•	•	•	•	•	•	•	•	•
-100120	100	120	•	•	•	•	•	•	•	•	•	•
-105130	105	130	•	•	•	•	•	•	•	---	---	---
-110140	110	140	•	•	•	•	•	•	•	---	---	---
-120150	120	150	•	•	•	•	•	•	•	---	---	---
-130160	130	160	•	•	•	•	•	•	•	---	---	---
-140170	140	170	•	•	•	•	•	•	•	---	---	---
-150180	150	180	•	•	•	•	•	•	•	---	---	---
-160190	160	190	•	•	•	•	•	•	•	---	---	---
PS-170200	170	200	•	•	•	•	•	•	•	---	---	---

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



THRUST WASHER

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

TW	RING Inside Dia. (ID)	RING Outside Dia. (OD)	RING Thickness (T)	MATERIAL Spring Steel	MATERIAL Stainless "-SS"
TW-01802806	3/16	9/32	1/16		
-01802809			3/32		
-01803706		3/8	1/16		
-01803709			3/32		
-01804306		7/16	1/16		
-02505006	1/4	1/2	1/16		
-02505009			3/32		
-02505606		9/16	1/16		
-03106206	5/16	5/8	1/16		
-03106207			5/64		
-03106212			1/8		
-03706206	3/8		1/16		
-03706212			1/8		
-03706809		11/16	3/32		
-04308109	7/16	13/16	3/32		
-04308706		7/8	1/16		
-04308715			5/32		
-05007506	1/2	3/4	1/16		
-05007512			1/8		
-05008712		7/8	1/8		
05011206		1-1/8	1/16		
-05011215			5/32		
-05012518		1-1/4	3/16		
-05613709	9/16	1-3/8	3/32		
-05613718			3/16		
-06207806	5/8	25/32	1/16		
-06207812			1/8		
-06212509		1-1/4	3/32		
-06212518			3/16		
-06213718		1-3/8	3/16		
-06215009		1-1/2	3/32		
06215018			3/16		
-06217518		1-3/4	3/16		
TW-07510009	3/4	1	3/32		
TW-07513109	3/4	1-5/16	3/32		
-07513118			3/16		
-07516212		1-5/8	1/8		
-07516218			3/16		
-07517518		1-3/4	3/16		
-07520018		2	3/16		
-08711809	7/8	1-3/16	3/32		
-08720012		2	1/8		
-08720018			3/16		
-08722518		2-1/4	3/16		
-10015612	1	1-9/16	1/8		
-10015618			3/16		
-10020012		2	1/8		
-10020018			3/16		
-10022514		2-1/4	9/64		
-10022518			3/16		
-10025025		2-1/2	1/4		
-10625025	1-1/16		1/4		
-11225025	1-1/8		1/4		
-11820018	1-3/16	2	3/16		
-12520014	1-1/4		9/64		
-12520018			3/16		
-12524314		2-7/16	9/64		
-12524325			1/4		
-12527514		2-3/4	9/64		
-12530025		3	1/4		
-13127525	1-5/16	2-3/4	1/4		
-13730015	1-3/8	3	5/32		
-13730025			1/4		
-15030015	1-1/2		5/32		
-15030025			1/4		
-15032512		3-1/4	1/8		
-20040015	2	4	5/32		
TW-20040031			5/16		

TW

DESCRIPTION

Used for bearing surfaces. Parts are hardened and ground flat and parallel to minimize wear on bearing surfaces. Most of these parts are made to order.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm inside diameter (ID) and outside diameter (OD) of the part.
2. Measure the thickness (T).
3. Find the part in the chart above.

GENERAL USE

UNCOMMON

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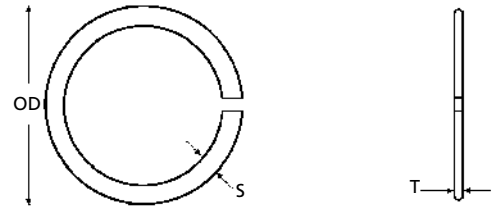

SLITTED SHIM

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	SSRS		

SR	RING Outside Diameter (OD)		RING Radial Wall (S)	RING Thickness (T)	MATERIAL Spring Steel	MATERIAL Stainless "-SS"
SR-075	.750	+.000/-.015	.093	.024		
-087	.875					
-100	1.000		.103			
-112	1.125		.138			
-125	1.250					
-137	1.375					
-150	1.500		.150			
-162	1.625	+.000/-.020				
-175	1.750					
-187	1.875					
-200	2.000					
-212	2.125					
-225	2.250	+.000/-.025	.178			
-237	2.375					
-250	2.500					
-262	2.625					
-275	2.750		.188	.030		
-287	2.875					
-300	3.000					
-312	3.125					
-325	3.250	+.000/-.030	.233			
-337	3.375					
-350	3.500					
-362	3.625					
-375	3.750					
-387	3.875					
-400	4.000					
-412	4.125					
-425	4.250					
-437	4.375	+.000/-.035				
-450	4.500					
-462	4.625					
-475	4.750					
-487	4.875					
-500	5.000					
SR-512	5.125					

SR	RING Outside Diameter (OD)		RING Radial Wall (S)	RING Thickness (T)	MATERIAL Spring Steel	MATERIAL Stainless "-SS"
SR-525	5.250	+.000/-.035	.233	.030		
-537	5.375					
-550	5.500	+.000/-.045				
-562	5.625					
-575	5.750					
-587	5.875					
-600	6.000					
-612	6.125					
-625	6.250					
-637	6.375					
-650	6.500					
-675	6.750					
-700	7.000		.375	.032		
-725	7.250					
-750	7.500	+.000/-.060				
-775	7.750					
-800	8.000					
-825	8.250					
-850	8.500					
-875	8.750					
-900	9.000					
-950	9.500	+.000/-.070				
-1000	10.000					
-1050	10.500					
-1100	11.000					
-1150	11.500					
-1200	12.000	+.000/-.080				
-1250	12.500					
-1300	13.000					
-1350	13.500					
-1400	14.000					
-1450	14.500	+.000/-.090				
-1500	15.000					
-1550	15.500					
SR-1600	16.000					

SR

AXIAL ASSEMBLY

DESCRIPTION

Often used with wave springs to adjust load or as a backup plate for soft metal housings.

HOW TO IDENTIFY

1. Determine the outside diameter (OD) of the part.
2. Measure the radial wall (S) and thickness (T) of the part.
3. Find the part in the chart above.

GENERAL USE

UNCOMMON

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

METRIC TABLE OF CONTENTS

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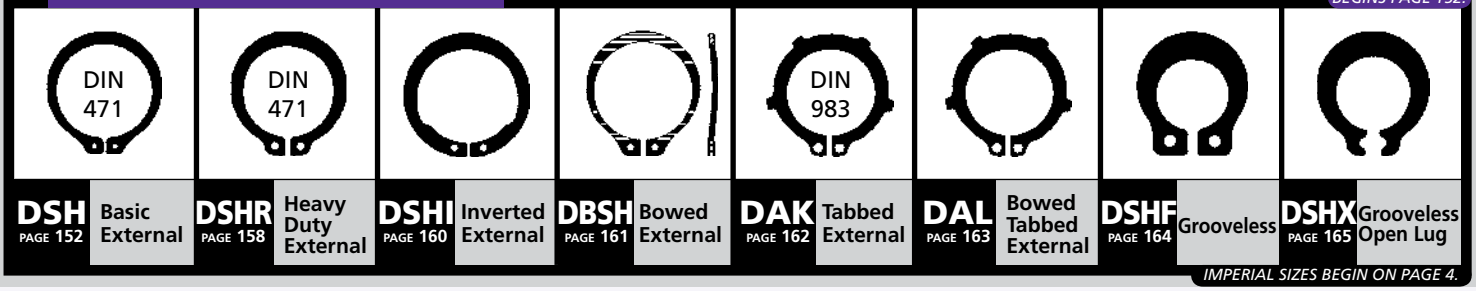
LOW PRICE PROMISE!! See Inside Cover.

EXTERNAL SNAP RINGS

BEGINS PAGE 152.



IMPERIAL SIZES BEGIN ON PAGE 4.

INTERNAL SNAP RINGS

BEGINS PAGE 166.

IMPERIAL SIZES BEGIN ON PAGE 16.

ANSI SNAP RINGS

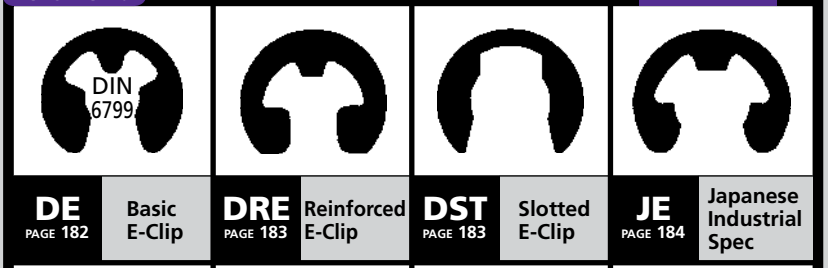
BEGINS PAGE 178.

ANSI CLIPS

BEGINS PAGE 188.

CLIPS

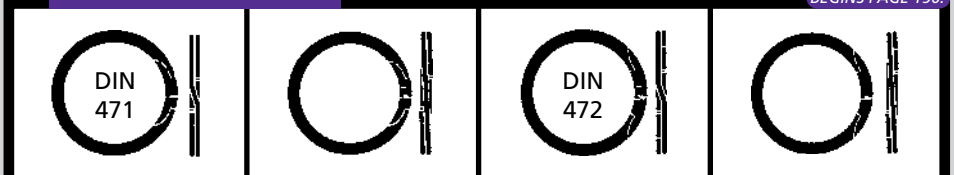
BEGINS PAGE 182.



IMPERIAL SIZES BEGIN ON PAGE 24.

SPIRAL RINGS

BEGINS PAGE 190.



IMPERIAL SIZES BEGIN ON PAGE 34.

EATON™ RINGS

BEGINS PAGE 198.

IMPERIAL SIZES BEGIN ON PAGE 66.

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WIRE RINGS

BEGINS PAGE 202.

DRP PAGE 202 — Round Section External

DRB PAGE 203 — Round Section Internal

D17 PAGE 204 — Round Section Internal

DSP PAGE 205 — External Radiused Edge

DSW PAGE 206 — Rectangular Section External

DSB PAGE 208 — Rectangular Section Internal

IMPERIAL SIZES BEGIN ON PAGE 78.

PUSH-ON RINGS

BEGINS PAGE 212.

DTX PAGE 212 — Reinforced External

DTI PAGE 212 — Basic Internal

DKS PAGE 213 — Shaft Retention Washer

DTR PAGE 213 — Triangular Push-On

IMPERIAL SIZES BEGIN ON PAGE 90.

SPRINGS

BEGINS PAGE 214.

DBW PAGE 214 — Belleville Disc Spring

DWS PAGE 216 — Standard Wave Spring

IMPERIAL SIZES BEGIN ON PAGE 108.

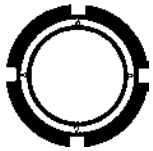
ASSEMBLY COMPONENTS

BEGINS PAGE 218.

SCM PAGE 218 — Shaft Collar

KFM PAGE 218 — Keyed Shafts

32 PAGE 219 — Shaft Keys



KM PAGE 220 — Standard Locknut

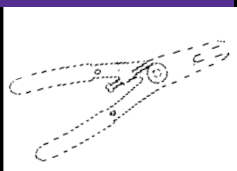
MB PAGE 221 — Standard Lockwasher

IMPERIAL SIZES BEGIN ON PAGE 126.

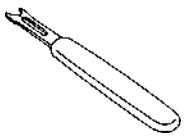
ASSORTMENTS / TOOLS

BEGINS PAGE 222.

DISP PAGE 224 — Standard, Custom



PRS PAGE 226 — Pliers



RRA PAGE 232 — Applicators

IMPERIAL SIZES BEGIN ON PAGE 222.

DIN CROSS REFERENCE

DIN #	Huyett Part #	Page #
471	DSH	152
471 Heavy Duty	DSHR	158
983	DAK	162
472	DHO	166
472 Heavy Duty	DHOR	171
984	DJK	175
6799	DE	182
9133	DE9	185
471	DS	190
472	DH	194
7993A	DRP	202
7993B	DRB	203
2093	DBW	214
6885	Machine Keys	219

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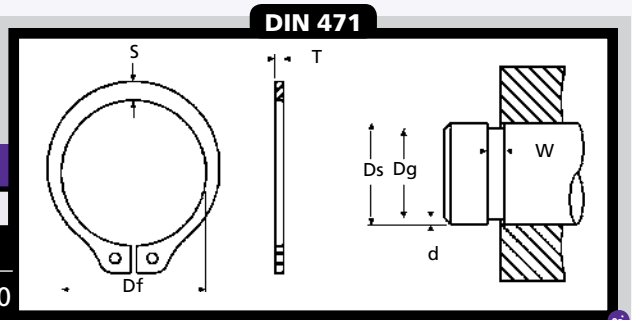


BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D1400	Ellison	471	Seeger	A
Bossard	BN818-820	Rotor Clip	DSH	Waldes	D1400

DSH	SHAFT	RING				GROOVE				WEIGHT	MATERIAL		TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DSH-003	3	2.7	+.04/-.15	.8	.40	2.8	+.00/-.04	.10	.50	0.0017			-E009
-004	4	3.7		.9		3.8				0.0022			
-005	5	4.7		1.1	.60	4.8			.70	0.0066			
-006	6	5.6		1.3	.70	5.7		.15	.80	0.0084			
-007	7	6.5	+.06/-.18	1.4	.80	6.7	+.00/-.06		.90	0.0121			
-008	8	7.4		1.5		7.6		.20		0.0158			
-009	9	8.4		1.7	1.00	8.6			1.10	0.0300			
-010	10	9.3	+.10/-.36	1.8		9.6	+.00/-.11			0.0340			-E013
-011	11	10.2		1.8		10.5		.25		0.0410			
-012	12	11.0		1.8		11.5				0.0500			
-013	13	11.9		2.0		12.4		.30		0.0530			
-014	14	12.9		2.1		13.4				0.0640			
-015	15	13.8		2.2		14.3		.35		0.0670			
-016	16	14.7		2.2		15.2		.40		0.0700			
-017	17	15.7		2.3		16.2				0.0820			
-018	18	16.5		2.4	1.20	17.0		.50	1.30	0.1110			
-019	19	17.5		2.5		18.0				0.1220			
-020	20	18.5	+.13/-.42	2.6		19.0	+.00/-.13			0.1300			
-021	21	19.5		2.7		20.0				0.1420			
-022	22	20.5		2.8		21.0				0.1500			
-023	23	21.5		2.9		22.0	+.00/-.15			0.1630			
-024	24	22.2	+.21/-.42	3.0		22.9	+.00/-.21	.55		0.1770			
-025	25	23.2		3.0		23.9				0.1900			
-026	26	24.2		3.1		24.9				0.1960			
-027	27	24.9		3.1		25.6		.70		0.2080			
-028	28	25.9		3.2	1.50	26.6			1.60	0.2920			-E018
-029	29	26.9		3.4		27.6				0.3200			
-030	30	27.9		3.5		28.6				0.3320			
-031	31	28.6		3.5		29.3		.85		0.3450			
-032	32	29.6		3.6		30.3				0.3540			
-033	33	30.5	+.25/-.50	3.7		31.3	+.00/-.25			0.3690			
-034	34	31.5		3.8		32.3				0.3800			
-035	35	32.2		3.9		33.0				0.4000			
-036	36	33.2		4.0	1.75	34.0		1.00	1.85	0.5000			
-037	37	34.2		4.1		35.0				0.5370			
-038	38	35.2		4.2		36.0				0.5620			
DSH-039	39	36.0		4.3		37.0				0.5850			

TOOL DESCRIPTIONS ON PAGES 226 & 228

DSH

DESCRIPTION

Tapered-design ring to DIN 471 that is installed into a groove to provide a rigid shoulder for high thrust loads. Installed axially using pliers that expand the part over the shaft.

AXIAL ASSEMBLY

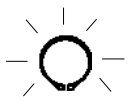
HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above. If it is too thick, see "DSHR" on page 158.

GENERAL USE

COMMON

ZINC PLATED



STACKED / ROLL PACK

NOT AVAILABLE

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

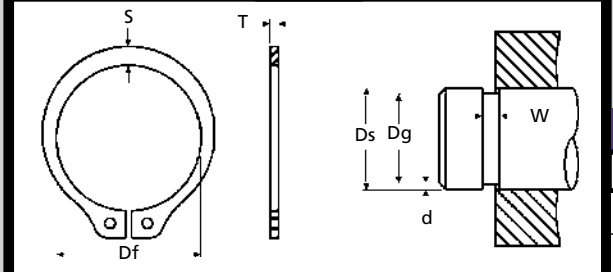
DSH ⟷ DSHI (Page 160) ⟷ DAK (Page 162) ⟷ DAL (Page 163) ⟷ DS (Page 190)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

SH IMPERIAL Page 6

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

DIN 471



BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	D1400	Ellison	471	Seeger	A
Bossard	BN818-820	Rotor Clip	DSH	Waldes	D1400

DIN 471

DSH

	SHAFT	RING				GROOVE				WEIGHT	MATERIAL		TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DSH-040	40	36.5		4.4			37.5				0.6030			
-041	41	37.5		4.5			38.5				0.6215			
-042	42	38.5		4.5			39.5				0.6500			
-044	44	40.5		4.6			41.5				0.7000			
-045	45	41.5		4.7	1.75		42.5		1.25	1.85	0.7500			
-046	46	42.5		4.8			43.5				0.7600			
-047	47	43.5		4.9			44.5				0.7500			
-048	48	44.5	+.39/-.90	5.0		+.00/-.06	45.5	+.00/-.25			0.7900			
-050	50	45.8		5.1			47.0				1.0200			
-052	52	47.8		5.2			49.0				1.1100			
-054	54	49.8		5.3			51.0				1.1300			
-055	55	50.8		5.4			52.0				1.1400			
-056	56	51.8		5.5			53.0				1.1800			
-057	57	52.8		5.5	2.00		54.0			2.15	1.2200			-E023
-058	58	53.8		5.6			55.0				1.2600			
-060	60	55.8		5.8			57.0				1.2900			
-062	62	57.8		6.0			59.0		1.50		1.4300			
-063	63	58.8		6.2			60.0				1.5900			
-065	65	60.8		6.3			62.0				1.8200			
-067	67	62.5		6.4			64.0				2.0300			
-068	68	63.5		6.5			65.0				2.1800			
-070	70	65.5	+.46/-1.10	6.6		+.00/-.07	67.0	+.00/-.30			2.2000			
-072	72	67.5		6.8	2.50		69.0			2.65	2.2500			
-075	75	70.5		7.0			72.0				2.4600			
-077	77	72.5		7.2			74.0				2.5700			
-078	78	73.5		7.3			75.0				2.6200			
-080	80	74.5		7.4			76.5				2.7300			
-082	82	76.5		7.6			78.5				3.1200			
-085	85	79.5		7.8			81.5		1.75		3.6400			
-087	87	81.5		7.9			83.5				3.9800			
-088	88	82.5		8.0			84.5				4.1200			
-090	90	84.5		8.2			86.5				4.4500			
-092	92	86.5	+.54/-1.30	8.4	3.00	+.00/-.08	88.5	+.00/-.35		3.15	4.6000			-E032
-095	95	89.5		8.6			91.5				4.9000			
-097	97	91.5		8.8			93.5				5.0200			
-098	98	91.5		8.8			94.5				5.0200			
DSH-100	100	94.5		9.0			96.5				5.3700			

TOOL DESCRIPTIONS ON PAGES 226 & 228

DSH

AXIAL ASSEMBLY

DESCRIPTION

Tapered-design ring to DIN 471 that is installed into a groove to provide a rigid shoulder for high thrust loads. Installed axially using pliers that expand the part over the shaft.

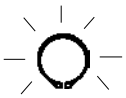
HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above. If it is too thick, see "DSHR" on page 158.

GENERAL USE

COMMON

ZINC PLATED



STACKED / ROLL PACK

NOT AVAILABLE

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DSH ⟷ DSHI (Page 160) ⟷ DAK (Page 162) ⟷ DAL (Page 163) ⟷ DS (Page 190)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

SH IMPERIAL Page 6

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

METRIC SNAP RINGS

785·392·3017 FAX 785.392.2845

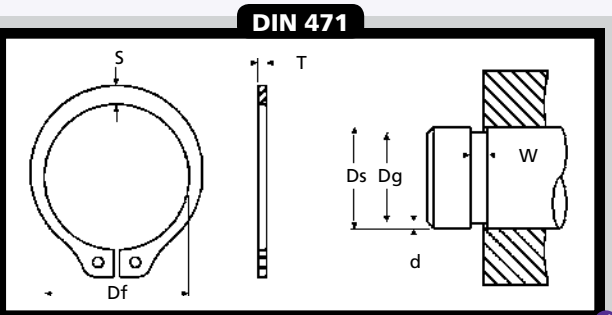
REVISED 09-04
www.huyett.com

BASIC EXTERNAL

DIN 471

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	D1400	Ellison	471	Seeger	A
Bossard	BN818-820	Rotor Clip	DSH	Waldes	D1400



DSH	SHAFT	RING				GROOVE			WEIGHT	MATERIAL		TOOL
	MM (Ds)	Free Inside Dia. (Df)	Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)	Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DSH-102	102	95.0	9.2			98.0			7.8000			
-105	105	98.0	9.3			101.0			8.0000			
-107	107	100.0	9.5			103.0			8.1000			
-108	108	100.0	9.5			104.0			8.1000			
-110	110	103.0	9.6			106.0			8.2000			
-112	112	105.0	9.7			108.0			8.3000			-E032
-115	115	108.0	9.8			111.0			8.4000			
-117	117	110.0	10.0			113.0			8.5000			
-118	118	110.0	10.0			114.0			8.5000			
-120	120	113.0	10.2			116.0			8.6000			
-122	122	115.0	10.3			118.0			8.8000			
-125	125	118.0	10.4			121.0			9.0000			
-127	127	120.0	10.5			123.0			9.5000			
-128	128	120.0	10.5			124.0			9.5000			
-130	130	123.0	10.7			126.0			10.0000			
-132	132	125.0	10.8			128.0			10.3000			
-135	135	128.0	11.0			131.0			10.4000			
-137	137	130.0	11.0			133.0			10.7000			
-138	138	130.0	11.0	4.00		134.0		4.15	10.7000			
-140	140	133.0	11.2			136.0			11.0000			
-142	142	135.0	11.3			138.0			11.2000			
-145	145	138.0	11.5			141.0			11.5000			
-147	147	140.0	11.6			143.0			11.6000			
-148	148	140.0	11.6			144.0			11.6000			-E035
-150	150	142.0	11.8			145.0			12.0000			
-152	152	143.0	11.9			147.0			12.8000			
-155	155	146.0	12.0			150.0			13.5000			
-157	157	148.0	12.0			152.0			14.0000			
-158	158	148.0	12.0			153.0			14.0000			
-160	160	151.0	12.2			155.0			15.0000			
-162	162	152.5	12.3			157.0			15.5000			
-165	165	155.5	12.5			160.0			16.0000			
-167	167	157.5	12.9			162.0			16.3000			
-168	168	157.5	12.9			163.0			16.3000			
-170	170	160.5	12.9			165.0			17.0000			
-172	172	160.5	12.9			167.0			17.0000			
DSH-175	175	165.5	12.9			170.0			18.0000			

+.54/-1.30 (Free Inside Dia.) · +.63/-1.50 (Free Inside Dia.) · +.00/-.10 (Thickness) · +.00/-.54 (Diameter) · +.00/-.63 (Diameter) · 2.00 (Depth) · 2.50 (Depth)

TOOL DESCRIPTIONS ON PAGES 226 & 228

DSH

DESCRIPTION

Tapered-design ring to DIN 471 that is installed into a groove to provide a rigid shoulder for high thrust loads. Installed axially using pliers that expand the part over the shaft.

AXIAL ASSEMBLY

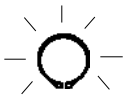
HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above. If it is too thick, see "DSHR" on page 158.

GENERAL USE

COMMON

ZINC PLATED



STACKED / ROLL PACK

NOT AVAILABLE

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DSH ⟷ DSHI (Page 160) ⟷ DAK (Page 162) ⟷ DAL (Page 163) ⟷ DS (Page 190)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

SH IMPERIAL Page 6

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

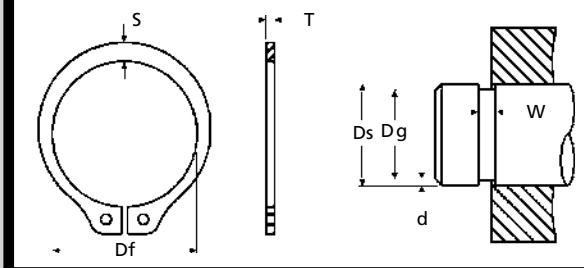
BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	D1400	Ellison	471	Seeger	A
Bossard	BN818-820	Rotor Clip	DSH	Waldes	D1400

DIN 471

DIN 471



DSH

	SHAFT	RING				GROOVE				WEIGHT	MATERIAL		TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DSH-177	177	167.5	+.63/-1.50	13.5	4.00	+.00/-.10	172.0	+.00/-.63	2.50	4.15	18.3000			-E035
-178	178	167.5					173.0				18.3000			
-180	180	170.5					175.0				19.0000			
-182	182	170.5					177.0				19.0000			
-185	185	175.5					180.0				20.0000			
-187	187	177.5		14.0			182.0	+.00/-.72			20.3000			
-188	188	177.5					183.0				20.3000			
-190	190	180.5	+.72/-1.70				185.0				21.0000			
-192	192	180.5					187.0				21.0000			
-195	195	185.5					190.0				22.0000			
-197	197	187.5					192.0				22.3000			
-198	198	187.5					193.0				22.3000			
-200	200	190.5					195.0				23.0000			
-202	202	190.0			5.00	+.00/-.12	196.0		3.00	5.15	23.5000			
-205	205	193.0					199.0				24.3000			
-207	207	193.0					201.0				24.3000			
-208	208	193.0					202.0				24.3000			
-210	210	198.0					204.0				24.8000			
-212	212	198.0					206.0				24.8000			
-215	215	203.0					209.0				26.0000			
-217	217	203.0					211.0				26.0000			
-218	218	203.0					212.0				26.0000			
-220	220	208.0					214.0				26.5000			
-222	222	208.0					216.0				26.5000			
-225	225	213.0					219.0				28.0000			
-227	227	213.0					221.0				28.0000			
-228	228	213.0					222.0				28.0000			
-230	230	218.0					224.0				29.0000			
-232	232	218.0					226.0				29.0000			
-235	235	223.0					229.0				30.5000			
-237	237	223.0					231.0				30.5000			
-238	238	223.0					232.0				30.5000			
-240	240	228.0					234.0				31.0000			
-242	242	228.0					236.0				31.0000			
-245	245	233.0					239.0				32.5000			
-247	247	233.0					241.0				32.5000			
DSH-248	248	233.0					242.0				32.5000			

TOOL DESCRIPTIONS ON PAGES 226 & 228.

DSH

DESCRIPTION

Tapered-design ring to DIN 471 that is installed into a groove to provide a rigid shoulder for high thrust loads. Installed axially using pliers that expand the part over the shaft.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above. If it is too thick, see "DSHR" on page 158.

GENERAL USE

COMMON

ZINC PLATED

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DSH ⟷ DSHI (Page 160) ⟷ DAK (Page 162) ⟷ DAL (Page 163) ⟷ DS (Page 190)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

SH IMPERIAL Page 6

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

METRIC SNAP RINGS

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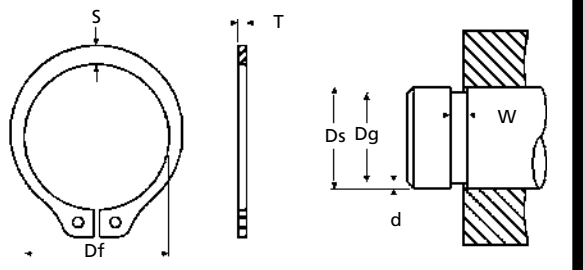
DIN 471



DIN 471

BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D1400	Ellison	471	Seeger	A
Bossard	BN818-820	Rotor Clip	DSH	Waldes	D1400

DSH

	SHAFT	RING				GROOVE			WEIGHT	MATERIAL		TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DSH-250	250	238.0	+.72/-1.70	14.0	5.00	+.00/-.12	244.0	+.00/-.72	3.00	5.15	33.5000			-E035
-252	252	238.0		16.0			244.0		4.00		33.5000			-E045
-255	255	240.0					247.0				34.8000			
-257	257	240.0					249.0				34.8000			
-258	258	240.0					250.0				34.8000			
-260	260	245.0					252.0	+.00/-.81			35.5000			
-262	262	245.0					254.0				35.5000			
-265	265	250.0					257.0				37.0000			
-267	267	250.0					259.0				37.0000			
-268	268	250.0					260.0				37.0000			
-270	270	255.0	+.81/-2.00				262.0				37.5000			
-272	272	255.0					264.0				37.5000			
-275	275	260.0					267.0				39.0000			
-277	277	260.0					269.0				39.0000			
-278	278	260.0					270.0				39.0000			
-280	280	265.0					272.0				39.8000			
-282	282	265.0					274.0				39.8000			
-285	285	270.0					277.0				41.0000			
-287	278	270.0					279.0				41.0000			
-288	288	270.0					280.0				41.0000			
-290	290	275.0					282.0				41.8000			
-292	292	275.0					284.0				41.8000			
-295	295	280.0					287.0				43.0000			
-297	297	280.0					289.0				43.0000			
-298	298	280.0					290.0				43.0000			
-300	300	285.0					292.0				44.0000			
-305	305	288.0		20.0	6.00	+.00/-.15	295.0		5.00	6.20	73.8000			
-310	310	293.0					300.0				75.0000			
-315	315	298.0					305.0				76.0000			
-320	320	303.0					310.0				77.0000			
-325	325	308.0					315.0				78.7000			
-330	330	313.0					320.0	+.00/-.89			80.0000			
-335	335	318.0	+.90/-2.00				325.0				82.6000			
-340	340	323.0					330.0				84.0000			
-345	345	328.0					335.0				84.5000			
-350	350	333.0					340.0				85.0000			
DSH-355	355	338.0					345.0				86.5000			

TOOL DESCRIPTIONS ON PAGES 226 & 228.

DSH

DESCRIPTION

Tapered-design ring to DIN 471 that is installed into a groove to provide a rigid shoulder for high thrust loads. Installed axially using pliers that expand the part over the shaft.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above. If it is too thick, see "DSHR" on page 158.

GENERAL USE

COMMON

ZINC PLATED

STACKED/ROLL PACK

NOT AVAILABLE

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

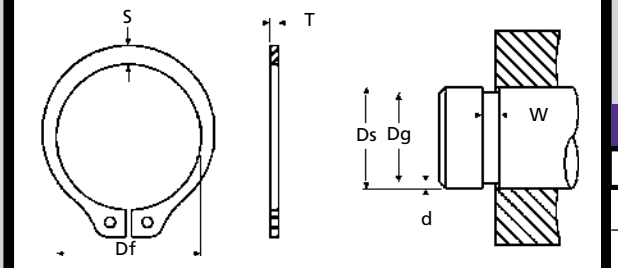
DSH ⟷ DSHI (Page 160) ⟷ DAK (Page 162) ⟷ DAL (Page 163) ⟷ DS (Page 190)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

SH IMPERIAL Page 6

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

DIN 471



BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	D1400	Ellison	471	Seeger	A
Bossard	BN818-820	Rotor Clip	DSH	Waldes	D1400

DIN 471

DSH

SHAFT	RING				GROOVE			WEIGHT	MATERIAL		TOOL
MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DSH-360	360	343.0	+.90/-2.00	20.0	6.00	+.00/-.15	350.0	+.00/-.89	5.00	6.20	88.0000			-E045
-365	365	348.0					355.0				88.5000			
-370	370	353.0					360.0				89.0000			
-375	375	358.0					365.0				91.0000			
-380	380	363.0					370.0				93.0000			
-385	385	368.0					375.0				94.0000			
-390	390	373.0					380.0				95.0000			
-395	395	378.0					385.0				99.0000			
-400	400	383.0					390.0				104.0000			
-410	410	390.0		26.0	7.00		398.0	+.00/-1.00	6.00	7.20	132.0000			-048
-420	420	400.0					408.0				136.0000			
-430	430	410.0	+1.00/-2.00				418.0				139.0000			
-440	440	420.0					428.0				142.0000			
-450	450	430.0					438.0				145.0000			
-460	460	440.0					448.0				152.0000			
-470	470	450.0					458.0				159.0000			
-480	480	460.0					468.0				166.0000			
-490	490	470.0					478.0				172.5000			
-500	500	480.0					488.0				179.0000			
-510	510	485.0			8.00		496.0		7.00	8.20	230.0000			
-520	520	495.0					506.0				235.0000			
-530	530	505.0	+1.50/-3.00				516.0				240.0000			
-540	540	515.0					526.0				244.5000			
-550	550	525.0					536.0				249.0000			
-560	560	535.0					546.0				258.0000			
-570	570	545.0					556.0				267.0000			
-580	580	555.0					566.0				276.0000			
-590	590	565.0					576.0				284.0000			
-600	600	575.0					586.0				292.0000			
-650	650	620.0		34.0	9.00	+.00/-.20	634.0	8.00	9.20		377.0000			
-700	700	670.0					684.0				407.0000			
-750	750	715.0					732.0	9.00			464.0000			
-800	800	765.0					782.0				533.0000			
-850	850	810.0	+2.00/-4.00				830.0	10.00			603.0000			
-900	900	860.0					880.0				664.0000			
-950	950	900.0					928.0	11.00			726.0000			
DSH-1000	1000	950.0					978.0				813.0000			

TOOL DESCRIPTIONS ON PAGES 226 & 228.

DSH

DESCRIPTION

Tapered-design ring to DIN 471 that is installed into a groove to provide a rigid shoulder for high thrust loads. Installed axially using pliers that expand the part over the shaft.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above. If it is too thick, see "DSHR" on page 158.

GENERAL USE

COMMON

ZINC PLATED

STACKED/ROLL PACK

NOT AVAILABLE

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DSH ⟷ DSHI (Page 160) ⟷ DAK (Page 162) ⟷ DAL (Page 163) ⟷ DS (Page 190)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

SH IMPERIAL Page 6

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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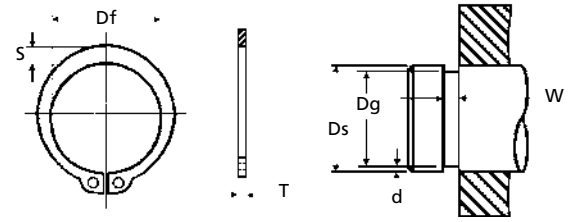
DIN 471 - HEAVY DUTY TYPE



DIN 471

HEAVY DUTY EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D1460	Ellison	EXT
Bossard	BN821	Seeger	AS

DSHR	SHAFT	RING				GROOVE				WEIGHT	MATERIAL	TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	
DSHR-012	12	11.0	+.10/-.36	1.8	1.50 +.00/-.06	11.5	+.00/-.11	.25	1.60	0.0750		-E013
-015	15	13.8		2.4		14.3		.35		0.1200		-E018
-015B	15	13.8		2.0		14.2		.40		0.1200		-E013
-015C	15	13.7		2.4		14.2		.40		0.1140		-E018
-016	16	14.7		2.5		15.2		.40		0.1200		-E013
-016A	16	14.7		2.3		15.2		.40		0.1200		
-016B	16	14.6		2.5		15.1		.45		0.1080		-E018
-017	17	15.7		2.6		16.2		.40		0.1240		
-017B	17	15.7		2.3		16.0		.50		0.1240		-E023
-018	18	16.5		2.7		17.0		.50		0.1540		
-018A	18	16.3		2.4		16.8		.60		0.1540		
-019	19	17.5	+.21/-.42	2.8		18.0		.50		0.1450		
-019B	19	17.5		2.5		17.8		.60		0.1450		
-020	20	18.5		3.0	1.75	19.0	+.00/-.15	.50	1.85	0.2250		
-020B	20	18.3		3.0		18.8		.60		0.2310		
-020C	20	18.4		2.6		18.9		.55		0.2250		
-022	22	20.5		3.1		21.0		.50		0.2300		
-022A	22	20.3		3.2		20.8		.60		0.2400		
-023	23	21.3		3.2		21.8		.60		0.2600		
-024	24	22.2		3.2		22.9	+.00/-.21	.55		0.2700		
-024A	24	22.0		3.2		22.7		.65		0.2700		-E018
-025	25	23.2		3.4	2.00 +.00/-.07	23.7		.65	2.15	0.3350		
-025A	25	23.0		3.4	1.50	23.7		.65		0.2400		
-026	26	23.6		3.3	2.00	24.4		.80		0.3650		
-027	27	24.7		3.4		25.5		.75		0.3850		
-028	28	25.9		3.5		26.6		.70		0.3900		
-028A	28	25.5		3.5		26.4		.80		0.3900		
-029	29	26.9		3.8		27.6		.70		0.4300		
-029A	29	26.9		3.5		27.6		.70		0.4070		
-030	30	27.9		4.1		28.6		.70		0.5000		
-030B	30	27.6		3.7		28.3		.85		0.4500		
-032	32	29.6		4.1		30.3		.85		0.5400		
-033	33	31.3	+.25/-.50	4.0		31.3	+.00/-.25	.85		0.5200		
-033A	33	30.5		4.0		31.3		.85		0.5200		
-034	34	31.5		4.2	2.50	32.1		.95	2.65	0.6800		
-034A	34	31.3		4.2		32.1		.95		0.6800		-E023
-035	35	32.2		4.2		33.0		1.00		0.7100		
-035A	35	32.0		4.1		32.8		1.10		0.7000		
-036	36	33.2		4.2		34.0		1.00		0.7500		
DSHR-036A	36	33.0		4.2		33.8		1.10		0.7500		

TOOL DESCRIPTIONS ON PAGE 226 & 228

DSHR

AXIAL ASSEMBLY

DESCRIPTION

Extra-thick version of the DIN 471 DSH that is stronger and yields higher thrust loads. Installed axially using the same tools. Note that the DSHR will require a wider groove than the DSH.

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above. If it is too thin, see "DSH" on page 152.

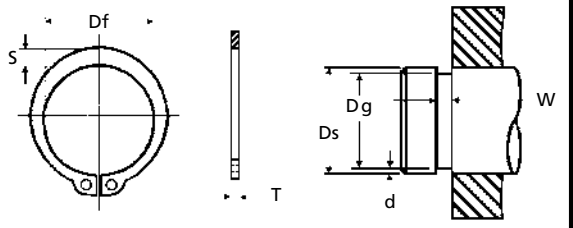
GENERAL USE

UNCOMMON

DSHR CONTINUED NEXT PAGE.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

DIN 471 - HEAVY DUTY TYPE



HEAVY DUTY EXTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	D1460	Ellison	EXT
Bossard	BN821	Seeger	AS

DIN 471

DSHR

SHAFT	RING				GROOVE			WEIGHT	MATERIAL	TOOL
MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	
DSHR-038	38	35.2	+.25/ -.50	4.3	2.50 +.00/-.07	36.0	+.00/-.25	1.00	2.65	0.8000	-E023
-038A	38	35.0		4.5		35.8		1.10		0.8000	
-040	40	36.5	+.39/-.90	4.4		37.5		1.25		0.8200	
-042	42	38.5		4.5		39.5				0.9600	
-044	44	40.5		4.5		41.5				1.0400	
-045	45	41.5		4.7		42.5				1.0800	
-048	48	44.5		5.0		45.5				1.2200	
-050	50	45.8		5.1	3.00 +.00/-.08	47.0		1.50	3.15	1.4800	
-052	52	47.8		5.2		49.0				1.5400	
-055	55	50.8	+.46/-1.10	5.4		52.0	+.00/-.30			1.7000	
-058	58	53.8		5.6		55.0				1.9400	
-060	60	55.8		5.8		57.0				2.0000	
-065	65	60.8		6.3	4.00 +.00/-.10	62.0			4.15	3.1000	
-070	70	65.5		6.6		67.0				3.2200	
-075	75	70.5		7.0		72.0				3.9800	
-080	80	74.5		7.4		76.5		1.75		4.2400	
-085	85	79.5		7.8		81.5	+.00/ -.35			4.7000	-E032
-090	90	84.5	+.54/-1.30	8.2		86.5				5.5600	
-095	95	89.5		8.6		91.5				6.1200	
-100	100	94.5		9.0		96.5				7.2000	
-105	105	98.0		9.3	5.00 +.00/-.12	101.0	+.00/-.54	2.00	5.15	10.0000	-E035
-110	110	103.0		9.6		106.0				10.2000	
-115	115	108.0		9.8		111.0				10.5000	
-120	120	113.0		10.2		116.0				10.7000	
-125	125	118.0		10.4		121.0	+.00/-.63			11.2000	
-130	130	123.0	+.63/-1.50	10.7		126.0				12.5000	
-135	135	128.0		11.0		131.0				13.0000	
-140	140	133.0		11.2		136.0				13.7000	
-145	145	138.0		11.5		141.0				14.3000	
-150	150	142.0		11.8		145.0		2.50		15.0000	
-155	155	146.0		12.0		150.0				16.9000	
-160	160	151.0		12.2		155.0				18.7000	
-165	165	155.5		12.5		160.0				20.0000	
-170	170	160.5		12.9		165.0				21.3000	
-175	175	165.5		12.9		170.0				22.5000	
-180	180	170.5		13.5		175.0				23.8000	
-185	185	175.5		13.5		180.0				25.0000	
-190	190	180.5	+.72/ -1.70	14.0		185.0	+.00/ -.72			26.3000	
-195	195	185.5		14.0		190.0				27.5000	
DSHR-200	200	190.5		14.0		195.0				28.8000	

TOOL DESCRIPTIONS ON PAGE 226 & 228.

DSHR

AXIAL ASSEMBLY

DESCRIPTION

Extra-thick version of the DIN 471 DSH that is stronger and yields higher thrust loads. Installed axially using the same tools. Note that the DSHR will require a wider groove than the DSH.

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above. If it is too thin, see "DSH" on page 152.

GENERAL USE

UNCOMMON

SHR
IMPERIAL Page 9

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

METRIC SNAP RINGS

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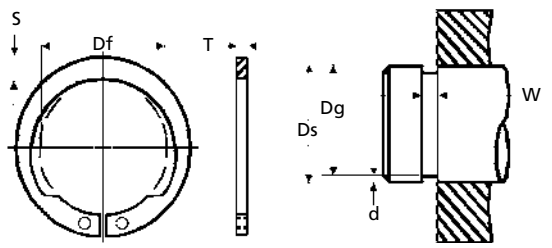
INVERTED EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	M1408	Ellison	EXTV
Bossard	BN829	Seeger	AV

INVERTED LUGS



DSHI	SHAFT	RING					GROOVE			WEIGHT	MATERIAL	TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	
DSHI-010	10	9.2	+.10/-.36	1.8	+/-.1	.60	9.5	+.00/-.11	.25	.70	0.0250		-E009
-012	12	11.0		2.1		1.00	11.5			1.10	0.0500		
-013	13	11.9		2.1			12.4		.30		0.0560		
-014	14	12.9		2.1			13.4				0.0580		
-015	15	13.8		2.2			14.3		.35		0.0660		
-016	16	14.7		2.3			15.2		.40		0.0720		
-017	17	15.7		2.4			16.2				0.0810		
-018	18	16.5		2.6		1.20	17.0		.50	1.30	0.1140		-E013
-020	20	18.5	+.13/-.42	2.8			19.0	+.00/-.15			0.1430		
-021	21	19.35		2.8			20.0				0.1530		
-022	22	20.5		3.0			21.0				0.1630		
-023	23	21.5		3.1			22.0				0.1780		
-024	24	22.2	+.21/-.42	3.2			22.9	+.00/-.21	.55		0.1900		
-025	25	23.2		3.4			23.9				0.2100		
-026	26	24.2		3.5			24.9				0.2180		
-028	28	25.9		3.8		1.50	26.6		.70	1.60	0.3180		-E018
-030	30	27.9		3.9			28.6				0.3580		
-032	32	29.6		4.0			30.3	+.00/-.25	.85		0.3880		
-034	34	31.5	+.25/-.50	3.5			32.3				0.3600		
-035	35	32.2		4.2			33.0		1.00		0.4530		
-038	38	34.5		4.5			35.8		1.10		0.5500		
-040	40	36.5	+.39/-.90	4.7	+/-.2	1.75	37.5		1.25	1.85	0.6490		
-042	42	38.5		4.7			39.5				0.6510		
-045	45	41.5		4.7			42.5				0.7800		
-047	47	43.5		5.0			44.5				0.8090		
-048	48	44.5		5.2			45.5				0.8480		
-050	50	45.8		5.2		2.00	47.0		1.50	2.15	0.9840		-E023
-055	55	50.8	+.46/-1.10	5.8			52.0	+.00/-.30			1.1420		
-058	58	53.8		5.8			55.0				1.3000		
-060	60	55.8		5.8			57.0				1.3800		
-065	65	60.8		6.0	+/-.3	2.50	62.0		2.65		2.0750		
-070	70	65.5		6.5			67.0				2.3700		
-072	72	67.5		6.5			69.0				2.4700		
-075	75	70.5		6.5			72.0				2.7500		
-080	80	74.5		7.0			76.5		1.75		2.8900		
-082	82	76.5		7.0			78.5	+.00/-.35			2.9650		
-085	85	79.5		7.4		3.00	81.5			3.15	3.9500		-E032
-087	87	81.5	+.54/-1.30	7.4			83.5				4.0000		
-090	90	84.5		7.4			86.5				4.1920		
DSHI-100	100	94.5		8.0			96.5				4.9920		

TOOL PRICES AND DESCRIPTIONS ON PAGE 226.

DSHI

AXIAL ASSEMBLY

DESCRIPTION

Tapered section ring similar to the DSH, except the lugs are inverted (on the ID), to allow use in tight areas with minimal clearance. Less thrust load than DSH. Installed axially using pliers.

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DSHI ⟷ DSH (Page 152) ⟷ DAK (Page 162) ⟷ DAL (Page 163) ⟷ DS (Page 190)

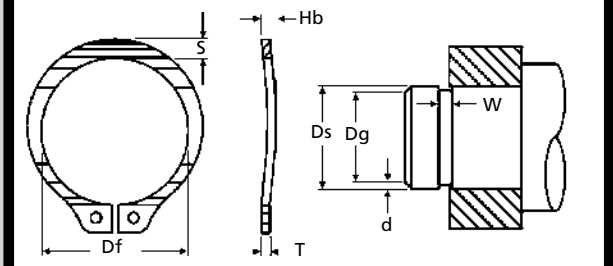
SHI

IMPERIAL Page 10

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

CURVED SHAPE



BOWED EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Seeger	AW		

TOOL DESCRIPTIONS ON PAGE 226 & 228.

DBSH	SHAFT	RING						GROOVE		WEIGHT	MATERIAL	TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Thickness (T)	Bow Height (Hb)		Diameter (Dg)	Width (Min.) (W)	Kg per 100 Pieces	Spring Steel	
DBSH-040	40	36.5	+.39/-.90	4.4	1.75	3.5	+.80/-.00	37.3	+.00/-.25	0.6030		
-042	42	38.5		4.5		3.5		39.3		0.6500		
-045	45	41.5		4.7		3.6		42.3		0.7500		
-047	47	43.5		4.9		3.7		44.3		0.7500		
-048	48	44.5		5.0		3.7		45.3		0.7900		
-050	50	45.8		5.1	2.00	4.0	+1.00/-.00	46.7		1.0200		
-052	52	47.8		5.2		4.1		48.7		1.1100		
-055	55	50.8	+.46/-1.10	5.4		4.2		51.7	+.00/-.30	1.1400		
-057	57	52.8		5.5		4.2		53.7		1.2200		
-058	58	53.8		5.6		4.3		54.7		1.2600		
-060	60	55.8		5.8		4.3		56.7		1.2900		
-062	62	57.8		6.0		4.4		58.7		1.4300		-E023
-063	63	58.8		6.2		4.4		59.7		1.5900		
-065	65	60.8		6.3	2.50	5.0	+1.30/-.00	61.7		1.8200		
-067	67	62.8		6.4		5.0		63.7		2.0300		
-068	68	63.8		6.5		5.1		64.7		2.1800		
-070	70	65.8		6.6		5.1		66.7		2.2000		
-072	72	67.5		6.8		5.2		68.7		2.2500		
-075	75	70.5		7.0		5.2		71.7		2.4600		
-077	77	72.5		7.2		5.3		73.7		2.5700		
-078	78	73.5		7.3		5.3		74.7		2.6200		
-080	80	74.5		7.4		5.4		76.0		2.7300		
-082	82	76.5		7.6		5.4		78.0		3.1200		
-085	85	79.5	+.54/-1.30	7.8	3.00	6.0	+1.50/-.00	81.0	+.00/-.35	3.6400		
-087	87	81.5		7.9		6.1		83.0		3.9800		
-088	88	82.5		8.0		6.2		84.0		4.1200		
-090	90	84.5		8.2		6.3		86.0		4.4500		
-092	92	86.5		8.4		6.4		88.0		4.6000		
-095	95	89.5		8.6		6.6		91.0		4.9000		
-097	97	91.5		8.8		6.7		93.0		5.0200		-E032
-098	98	92.5		9.0		6.8		94.0		5.0200		
-100	100	94.5		9.0		6.9		96.0		5.3700		
-105	105	98.0		9.3	4.00	8.0	+2.00/-.00	100.5	+.00/-.54	7.6		
-110	110	103.0		9.6		8.1		105.5		7.7		
-115	115	108.0		9.8		8.2		110.5		7.7		
-120	120	113.0		10.2		8.2		115.5		7.8		8.6000
-125	125	118.0		10.4		8.2		120.5	+.00/-.63	7.9		9.0000
-130	130	123.0	+.63/-1.50	10.7		8.3		125.5		7.9		10.0000
-140	140	133.0		11.2		8.4		135.5		8.0		11.0000
DBSH-150	150	142.0		11.8		8.5		144.5		8.1		12.0000

DBSH

DESCRIPTION

Curved design for resilient end-play take-up of rattling in linkages provides tension on adjusting screws. Also used to salvage assemblies where grooves have been cut too wide.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify bowed-shape side profile.
2. Measure the shaft diameter (Ds).
3. Determine the ring thickness (T).
4. Measure the maximum radial wall (S) of the ring.
5. Find the part in the chart above.

GENERAL USE

WEIRD

BSH
IMPERIAL Page 11

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

METRIC SNAP RINGS

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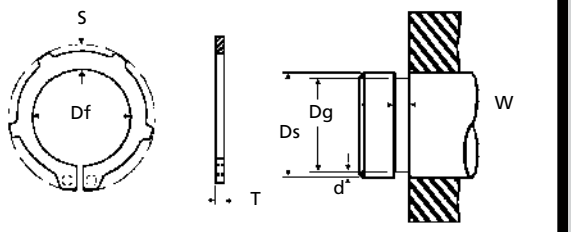
DIN 983



DIN 983

TABBED EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D2100	Seeger	AK
Ellison	983	DIN	983

DAK

	SHAFT	RING				GROOVE				WEIGHT	MATERIAL	TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	
DAK-016	16	14.7	+.10/-.36	2.3	1.00	15.2	+.00/-.11	.40	1.10	0.0820		-E013
-017	17	15.7		2.4		16.2				0.0930		
-018	18	16.5		2.5	1.20	17.0		.50	1.30	0.1240		-E018
-019	19	17.5		2.6		18.0				0.1350		
-020	20	18.5	+.13/-.42	2.6		19.0	+.00/-.15			0.1450		
-022	22	20.5		2.8		21.0				0.1770		
-023	23	21.5		2.9		22.0				0.1840		
-024	24	22.2	+.21/-.42	3.0		22.9	+.00/-.21	.55		0.1980		
-025	25	23.2		3.0		23.9				0.2120		
-026	26	24.2		3.1		24.9				0.2180		
-028	28	25.9		3.3	1.50	26.6		.70	1.60	0.3150		
-029	29	26.9		3.4		27.6				0.3350		
-030	30	27.9		3.4		28.6				0.3650		
-032	32	29.6		3.6		30.3	+.00/-.25	.85		0.4000		
-034	34	31.5		3.8		32.3				0.4150		
-035	35	32.2	+.25/-.50	3.8		33.0		1.00		0.4380		
-037	37	34.2		4.0	1.75	35.0			1.85	0.6300		
-038	38	35.2		4.1		36.0				0.6500		
-040	40	36.5	+.39/-.90	4.2		37.5		1.25		0.7000		-E023
-042	42	38.5		4.5		39.5				0.7500		
-045	45	41.5		4.6		42.5				0.8500		
-047	47	43.5		4.8		44.5				0.8700		
-048	48	44.5		4.9		45.5				0.8900		
-050	50	45.8	+.46/-1.10	5.0	2.00	47.0	+.00/-.30	1.50	2.15	1.1550		
-055	55	50.8		5.4		52.0				1.2990		
-057	57	52.8		5.6		54.0				1.4000		
-058	58	53.8		5.7		55.0				1.4300		
-060	60	55.8		5.8		57.0				1.4800		
-062	62	57.8		5.9		59.0				1.5900		
-065	65	60.8		6.2	2.50	62.0			2.65	2.1700		
-067	67	62.5		6.4		64.0				2.2600		
-068	68	63.5		6.5		65.0				2.3500		
-070	70	65.5		6.6		67.0				2.5100		
-080	80	74.5		7.4		76.5				3.0750		
-090	90	84.5	+.54/-1.30	8.2	3.00	86.5	+.00/-.35	1.75	3.15	4.7700		-E032
-100	100	94.5		9.0		96.5				5.6600		
-110	110	103.0		9.6	4.00	106.0	+.00/-.54	2.00	4.15	8.4600		
-120	120	113.0		10.1		116.0				8.9700		
-130	130	123.0		10.7		126.0	+.00/-.63			10.5000		-E035
DAK-140	140	133.0		11.2		136.0				11.5000		

TOOL DESCRIPTIONS ON PAGES 226 & 228

DAK

AXIAL ASSEMBLY

DESCRIPTION

External tabs are concentrically positioned for positioning in a concealed assembly. Tabs act as spacers for securing machine components. Conforms to DIN 983.

HOW TO IDENTIFY

1. Verify the presence of tabs on the ring periphery.
2. Measure the shaft diameter (Ds).
3. Determine the ring thickness (T).
4. Measure the maximum radial wall (S) of the ring.
5. Find the part in the chart above.

GENERAL USE

UNCOMMON

SAME SIZING AS DSH, BUT WITH EXTERNAL TABS.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DAK ⟷ DSH (Page 152) ⟷ DSHI (Page 160) ⟷ DAL (Page 163) ⟷ DS (Page 190)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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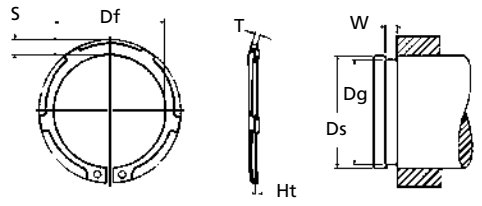
CURVED SHAPE



BOWED TABBED EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Seeger	AL		

DAL

	SHAFT	RING					GROOVE			WEIGHT	MATERIAL	TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Wall Thickness (T)	Tab Height (Ht)	Diameter (Dg)		Width (W)	Kg per 100 Pieces	Spring Steel	
DAL-016	16	14.7	+.10/-.36	2.3	.60	.35	15.2	+.00/-.11	.70	0.0820		-E013
-017	17	15.7		2.4			16.2			0.0930		
-018	18	16.5		2.5	.80		17.0		.90	0.1240		
-019	19	17.5		2.6			18.0			0.1350		
-020	20	18.5	+.13/-.42	2.6	1.20		19.0	+.00/-.15	1.30	0.1450		-E018
-022	22	20.5		2.8			21.0			0.1770		
-023	23	21.5		2.9			22.0			0.1840		
-024	24	22.2	+.21/-.42	3.0		.40	22.9	+.00/-.21		0.1980		
-025	25	23.2		3.0			23.9			0.2120		
-026	26	24.2		3.1			24.9			0.2180		
-028	28	25.9		3.3	1.50		26.6		1.60	0.3150		
-029	29	26.9		3.4			27.6			0.3350		
-030	30	27.9		3.4			28.6			0.3650		
-032	32	29.6		3.6		.45	30.3	+.00/-.25		0.4000		
-034	34	31.5		3.8			32.3			0.4150		
-035	35	32.2	+.25/-.50	3.8		.50	33.0			0.4380		
-037	37	34.2		4.0			35.0			0.6300		
-038	38	35.2		4.1	1.75		36.0		1.85	0.6500		
-040	40	36.5	+.39/-.90	4.2		.60	37.5			0.7000		-E023
-042	42	38.5		4.5			39.5			0.7500		
-045	45	41.5		4.6			42.5			0.8500		
-047	47	43.5		4.8			44.5			0.8700		
-048	48	44.5		4.9			45.5			0.8900		
-050	50	45.8	+.46/-1.10	5.0	2.00	.80	47.0	+.00/-.30	2.15	1.1550		
-055	55	50.8		5.4			52.0			1.2990		
-057	57	52.8		5.6			54.0			1.4000		
-058	58	53.8		5.7			55.0			1.4300		
-060	60	55.8		5.8			57.0			1.4800		
-062	62	57.8		5.9			59.0			1.5900		
-065	65	60.8		6.2	2.50	1.00	62.0		2.65	2.1700		
-067	67	62.5		6.4			64.0			2.2600		
-068	68	63.5		6.5			65.0			2.3500		
-070	70	65.5		6.6			67.0			2.5100		
-075	75	70.5		7.0			72.0			2.8200		
-080	80	74.5		7.4			76.5			3.0750		
-085	85	79.5		7.8	3.00		81.5	+.00/-.54	3.15	3.9500		-E032
-090	90	84.5	+.54/-1.30	8.2			86.5			4.7700		
-095	95	89.5		8.6			91.5			5.3000		
DAL-100	100	94.5		9.0			96.5			5.6600		

TOOL DESCRIPTIONS ON PAGES 226 & 228

DAL

AXIAL ASSEMBLY

DESCRIPTION

Bowed version of DIN 983 for concealed assemblies requiring end-play take-up.

HOW TO IDENTIFY

1. Verify bowed-shape side profile, with tabs on the ring periphery.
2. Measure the shaft diameter (Ds).
3. Determine the ring thickness (T).
4. Confirm the maximum radial wall (S) of the ring.
5. Find the part in the chart above.

GENERAL USE

WEIRD

CURVED SHAPE WITH EXTERNAL TABS. SIMILAR IN SIZE TO DSH.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DAL ⟷ DSH (Page 152) ⟷ DSHI (Page 160) ⟷ DAK (Page 162) ⟷ DS (Page 190)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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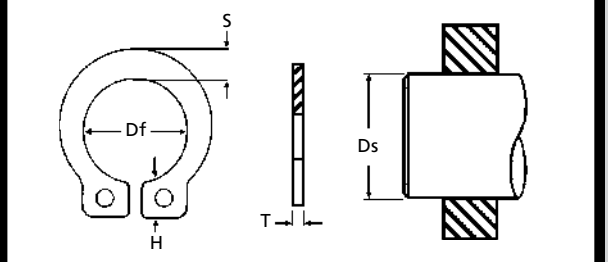
GROOVELESS

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Seeger	GA		

ADJUSTABLE AND REMOVABLE



DSHF

SHAFT	RING						WEIGHT	MATERIAL	TOOL
MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Lug Height Max. (H)	Thickness (T)	Assembled Outside Diameter	Kg per 100 Pieces	Spring Steel	
DSHF-006	6	5.70	+/-.130	2.5	3.0	1.00	12.2	0.0410		-ZGG1
-008	8	7.70	+/-.090	3.0	3.9		16.0	0.0530		-ZGG2
-009	9	8.65		3.3	3.6	1.20	16.4	0.0794		-ZGG1
-011	11	10.60		4.2	4.3		19.8	0.1230		
-012	12	11.60		4.6	4.3		21.4	0.1484		
-013	13	12.55	+/-.130	5.0	4.7		23.2	0.1726		-ZGG2
-015	15	14.50		5.6	5.3	1.50	26.4	0.2836		
-016	16	15.40		5.9	5.5		28.0	0.3110		
DSHF-017	17	16.35		6.3	6.5	1.75	30.2	0.4350		-ZGG3

TOOLS ON PAGE 226.

DSHF

DESCRIPTION

Reusable tapered section ring for grooveless shafts like plastics, tubes, and castings, or where adjustable ring placement is desired (like progressively tightening a compression spring). Installed using pliers.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Find the part in the chart above.

Note: In metric applications, the DSHX (page 165) seems to be more popular.

GENERAL USE

WEIRD

METRIC VERSION OF AMERICAN DESIGN.

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

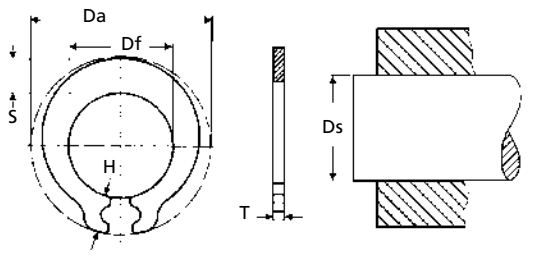
DSHF ⟷ DSHX (Page 165) ⟷ DTX (Page 212) ⟷ DTR (Page 213) ⟷ DKS (Page 213)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

SHF IMPERIAL Page 14

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

ADJUSTABLE AND REMOVABLE



GROOVELESS / OPEN LUC

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	M1440	Ellison	GR
Bossard	BN832	Seeger	G

DSHX

SHAFT	RING						WEIGHT	MATERIAL	TOOL
MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Lug Height Max. (H)	Thickness (T)	Assembled Outside Dia. (Da)	Kg per 100 Pieces	Spring Steel	
DSHX-0015	1.5	1.40	+/-.020	.7	1.7	.40	5.1	0.0013		
-002	2.0	1.90		1.0	1.9		6.0	0.0036		
-0022	2.2	2.05	+/-.025	1.1	1.9		6.2	0.0038		-ZGG0
-0025	2.5	2.35	+/-.030	1.2	1.9	.60	6.5	0.0045		
-0028	2.8	2.65	+/-.035	1.3	2.0		7.0	0.0057		
-003	3.0	2.85	+/-.040	1.4	2.1		7.4	0.0065		
-0035	3.5	3.30	+/-.050	1.6	2.3		8.3	0.0081		
-004	4.0	3.80	+/-.060	1.8	2.7		9.6	0.0154		
-0045	4.5	4.25		2.0	2.9	.80	10.5	0.0173		
-005	5.0	4.75	+/-.075	2.2	2.9		11.0	0.0200		-ZGG1
-0055	5.5	5.20		2.2	3.0		11.7	0.0216		
-006	6.0	5.70		2.4	3.2		12.6	0.0402		
-007	7.0	6.70	+/-.090	2.7	3.4	1.00	14.0	0.0428		
-008	8.0	7.70		3.0	3.5		15.2	0.0524		
-009	9.0	8.65		3.3	4.7		18.6	0.0808		-ZGG2
-010	10.0	9.65		3.5	4.7		19.6	0.0944		
-0105	10.5	10.20		3.8	4.0		18.7	0.1100		-ZGG1
-011	11.0	10.60		4.2	4.8	1.20	20.8	0.1208		
-012	12.0	11.60		4.6	4.8		21.8	0.1454		
-013	13.0	12.55		5.0	5.3		23.8	0.1750		-ZGG2
-0138	13.8	13.30	+/-.110	5.4	5.1		24.8	0.2492		
-014	14.0	13.50		5.4	5.1		25.0	0.2456		
-015	15.0	14.50		5.6	5.1	1.50	26.4	0.2716		
-016	16.7	15.40		5.8	5.6		27.8	0.2940		
-017	17.0	16.35		6.2	6.0		29.5	0.4010		
-018	18.0	17.30		6.6	6.1		31.4	0.4460		
-020	20.0	19.30		7.1	6.1		34.4	0.5270		-ZGG3
-022	22.0	21.20	+/-.130	7.4	6.6	1.75	37.0	0.6060		
-024	24.0	23.15		7.8	6.6		39.8	0.7000		
-025	25.0	24.15		8.2	6.6		41.6	0.7450		
DSHX-030	30.0	29.00		9.0	9.0		48.2	1.0000		

TOOL DESCRIPTIONS ON PAGE 226.

DSHX

DESCRIPTION

Reusable tapered section ring for grooveless shafts like plastics, tubes, and castings, or where adjustable ring placement is desired (like progressively tightening a compression spring). Installed using pliers.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the shaft diameter (Ds).
2. Determine the ring thickness (T).
3. Find the part in the chart above.

GENERAL USE

COMMON

THIS DESIGN IS MORE COMMON IN EUROPE AND INTERNATIONALLY.

GROOVELESS
USE ANY OF THESE PARTS ON THE SAME SIZED SHAFT.

DSHX ⟷ DSHF (Page 164) ⟷ DTX (Page 212) ⟷ DTR (Page 213) ⟷ DKS (Page 213)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

SHX IMPERIAL Page 14

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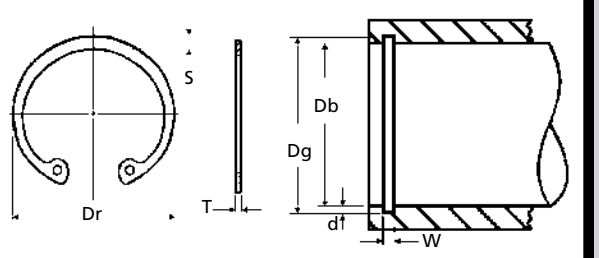
DIN 472



BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D1300	Ellison	472	Seeger	J
Bossard	BN822-823	Rotor Clip	DHO	Waldes	D1300

DHO

BORE	RING				GROOVE			WEIGHT	MATERIAL		TOOL
MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DHO-008	8	8.7	1.1	.80 +.00/-.05	8.4	+.09/-.00	.20	.90	0.0100			-I009
-009	9	9.8	1.3		9.4				0.0130			
-010	10	10.8	1.4	1.00 +.00/-.06	10.4	+.11/-.00		1.10	0.0260			-I011
-011	11	11.8	1.5		11.4				0.0310			
-012	12	13.0	1.7		12.5		.25		0.0370			
-013	13	14.1	1.8		13.6		.30		0.0420			
-014	14	15.1	1.8		14.6				0.0520			
-015	15	16.2	2.0		15.7		.35		0.0560			
-016	16	17.3	2.0		16.8		.40		0.0600			
-017	17	18.3	2.1		17.8				0.0650			
-018	18	19.5	2.2		19.0	+.13/-.00	.50		0.0740			-I018
-019	19	20.5	2.2		20.0				0.0830			
-020	20	21.5	2.3		21.0				0.0900			
-021	21	22.5	2.4		22.0				0.1000			
-022	22	23.5	2.5		23.0				0.1100			
-023	23	24.6	2.5	1.20 +.00/-.06	24.1	+.21/-.00	.55	1.30	0.1340			
-024	24	25.9	2.6		25.2		.60		0.1420			
-025	25	26.9	2.7		26.2				0.1500			
-026	26	27.9	2.8		27.2				0.1600			
-027	27	29.1	2.9		28.4		.70		0.1750			
-028	28	30.1	2.9		29.4				0.1800			
-029	29	31.1	3.0		30.4	+.25/-.00			0.1880			
-030	30	32.1	3.0		31.4				0.2060			
-031	31	33.4	3.1		32.7		.85		0.2100			
-032	32	34.4	3.2		33.7				0.2210			
-033	33	35.5	3.3		34.7				0.2400			
-034	34	36.5	3.3	1.50	35.7			1.60	0.3200			
-035	35	37.8	3.4		37.0		1.00		0.3540			
-036	36	38.8	3.5		38.0				0.3700			
-037	37	39.8	3.6		39.0				0.3740			
-038	38	40.8	3.7		40.0				0.3900			
-039	39	42.0	3.8		41.0				0.4000			
-040	40	43.5	3.9	1.75	42.5		1.25	1.85	0.4700			-I023
-041	41	44.5	4.0		43.5				0.5100			
-042	42	45.5	4.1		44.5				0.5400			
-043	43	46.5	4.2		45.5				0.5600			
-044	44	47.5	4.2		46.5				0.5800			
DHO-045	45	48.5	4.3		47.5				0.6000			

+.36/-.10 | +.42/-.13 | +.42/-.21 | +.50/-.25 | +.90/-.39

TOOL DESCRIPTIONS ON PAGES 227 & 228.

DHO

DESCRIPTION

Tapered section ring to DIN 472 that is installed axially with pliers into a housing or bore. High thrust load rating. Stacked roll pack prevents tangling for ease in handling.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the bore diameter (Db).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above.

GENERAL USE

COMMON

ZINC PLATED

STACKED/ROLL PACK

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DHO ⟷ DHOI (Page 172) ⟷ DJK (Page 175) ⟷ DH (Page 194) ⟷ DJL (Page 177)

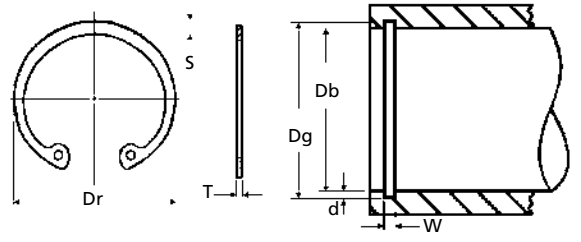
PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

IMPERIAL Page 16

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

G.L.HUYETT

DIN 472



BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	D1300	Ellison	472	Seeger	J
Bossard	BN822-823	Rotor Clip	DHO	Waldes	D1300

DHO	BORE	RING				GROOVE			WEIGHT	MATERIAL		TOOL
	MM (Db)	Free Outside Dia. (Dr)	Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DHO-046	46	49.5 +.90/-.39	4.4	1.75	+.00/-.06	48.5	+.25/-.00	1.25	1.85	0.6050			-I023
-047	47	50.5	4.4			49.5				0.6100			
-048	48	51.5	4.5			50.5	+.30/-.00			0.6700			
-050	50	54.2	4.6	2.00	+.00/-.07	53.0		1.50	2.15	0.7300			
-051	51	55.2	4.7			54.0				0.7750			
-052	52	56.2	4.7			55.0				0.8200			
-053	53	57.2	4.9			56.0				0.8220			
-054	54	58.2	5.0			57.0				0.8250			
-055	55	59.2	5.0			58.0				0.8300			
-056	56	60.2	5.1			59.0				0.8800			
-057	57	61.2	5.1			60.0				0.9400			
-058	58	62.2	5.2			61.0				1.0500			
-060	60	64.2	5.4			63.0				1.1100			
-062	62	66.2	5.5			65.0				1.1200			
-063	63	67.2	5.6			66.0				1.2400			
-064	64	68.2	5.7			67.0				1.2450			
-065	65	69.2	5.8	2.50		68.0			2.65	1.4300			
-067	67	71.5	6.0			70.0				1.6000			
-068	68	72.5	6.1			71.0				1.6000			
-070	70	74.5	6.2			73.0				1.6500			
-072	72	76.5	6.4			75.0				1.8100			
-075	75	79.5	6.6			78.0				1.8800			
-077	77	82.5	6.8			80.0				2.0400			
-078	78	82.5	6.8			81.0				2.0400			
-080	80	85.5	7.0			83.5				2.2000			
-081	81	86.5	7.0			84.5				2.3000			
-082	82	87.5	7.0			85.5				2.4000			
-083	83	88.5	7.0			86.5				2.5000			
-085	85	90.5	7.2	3.00	+.00/-.08	88.5	+.35/-.00	1.75	3.15	2.5300			-I032
-087	87	93.5	7.4			90.5				3.1000			
-088	88	93.5	7.4			91.5				3.1000			
-090	90	95.5	7.6			93.5				3.3000			
-092	92	97.5	7.8			95.5				3.5000			
-095	95	100.5	8.1			98.5				3.7000			
-097	97	103.5	8.3			100.5				4.1000			
-098	98	103.5	8.3			101.5				4.1000			
-100	100	105.5	8.4			103.5				4.2000			
-102	102	108.0	8.5	4.00	+.00/-.10	106.0	+.54/-.00	2.00	4.15	5.5000			
-105	105	112.0	8.7			109.0				5.6000			
-107	107	115.0	8.9			111.0				6.0000			
-108	108	115.0	8.9			112.0				6.0000			
-110	110	117.0	9.0			114.0				6.4500			
-112	112	119.0	9.1			116.0				7.2000			
-115	115	122.0	9.3			119.0				7.4500			
-117	117	125.0	9.6			121.0				7.5500			
-118	118	125.0	9.6			122.0				7.5500			
-120	120	127.0	9.7			124.0				7.7000			
-122	122	129.0	9.8			126.0				7.8000			
-125	125	132.0	10.0			129.0				7.9000			
-127	127	135.0	10.0			131.0				8.1100			
-128	128	135.0	10.2			132.0				8.1100			-I035
-130	130	137.0	10.2			134.0				8.2000			
-132	132	139.0	10.3			136.0				8.3000			
DHO-135	135	142.0	10.5			139.0				8.4000			

TOOL DESCRIPTIONS ON PAGES 227 & 228.

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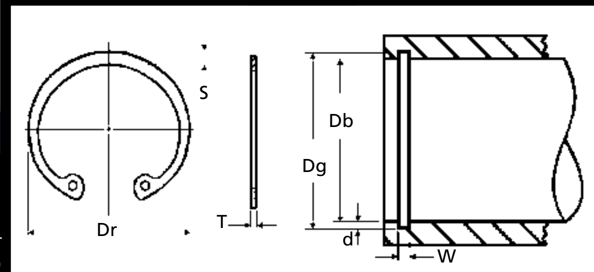
REVISED 09-04

DIN 472



BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D1300	Ellison	472	Seeger	J
Bossard	BN822-823	Rotor Clip	DHO	Waldes	D1300

TOOL DESCRIPTIONS ON PAGES 227 & 228.

DHO	BORE MM (Db)	RING Free Outside Dia. (Dr)		RING Radial Wall Max. (S)	RING Thickness (T)		GROOVE Diameter (Dg)		GROOVE Depth (d)	GROOVE Width (W)	WEIGHT Kg per 100 Pieces	MATERIAL Spring Steel	MATERIAL Stainless "-SS"	TOOL
DHO-137	137	145.0	+1.50/-.63	10.6	4.00	+.00/-.10	141.0	+.63/-.00	2.00	4.15	8.6000			-I035
-138	138	145.0		10.6			142.0				8.6000			
-140	140	147.0		10.7			144.0				8.7500			
-142	142	149.0		10.8			146.0				8.9000			
-145	145	152.0		10.9			149.0				9.3000			
-147	147	155.0		11.1			151.0				10.0000			
-148	148	155.0		11.1			152.0				10.0000			
-150	150	158.0		11.2			155.0		2.50		10.5000			
-152	152	161.0		11.3			157.0				10.6000			
-155	155	164.0		11.4			160.0				10.7000			
-157	157	167.0		11.5			162.0				10.9000			
-158	158	167.0		11.5			163.0				10.9000			
-160	160	169.0		11.6			165.0				11.0000			
-162	162	171.5		11.7			167.0				11.8000			
-165	165	174.5		11.8			170.0				12.5000			
-167	167	177.5		12.1			172.0				13.5000			
-168	168	177.5		12.1			173.0				13.5000			
-170	170	179.5		12.2			175.0				14.0000			
-172	172	181.5	+1.70/-.72	12.5			177.0				14.5000			
-175	175	184.5		12.7			180.0				15.0000			
-177	177	187.5		12.9			182.0	+.72/-.00			16.2000			
-178	178	187.5		12.9			183.0				16.2000			
-180	180	189.5		13.2			185.0				16.5000			
-182	182	191.5		13.5			187.0				16.8000			
-185	185	194.5		13.7			190.0				17.0000			
-187	187	197.5		13.8			192.0				17.4000			
-188	188	197.5		13.8			193.0				17.4000			
-190	190	199.5		13.8			195.0				17.5000			
-192	192	201.5		13.8			197.0				17.8000			
-195	195	204.5		13.8			200.0				18.3000			
-197	197	207.5		14.0			202.0				19.0000			
-198	198	207.5		14.0			203.0				19.0000			
-200	200	209.5		14.0			205.0				19.5000			
-202	202	214.0		14.0	5.00	+.00/-.12	208.0		3.00	5.15	21.0000			
-205	205	217.0		14.0			211.0				22.5000			
-207	207	217.0		14.0			213.0				22.5000			
-208	208	222.0		14.0			214.0				27.0000			
DHO-210	210	222.0		14.0			216.0				27.0000			

DHO

DESCRIPTION

Tapered section ring to DIN 472 that is installed axially with pliers into a housing or bore. High thrust load rating. Stacked roll pack prevents tangling for ease in handling.

AXIAL ASSEMBLY

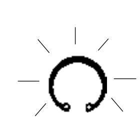
HOW TO IDENTIFY

1. Measure the bore diameter (Db).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above.

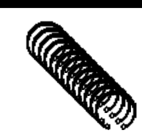
GENERAL USE

COMMON

ZINC PLATED



STACKED/ROLL PACK



GROOVE INTERCHANGE

USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

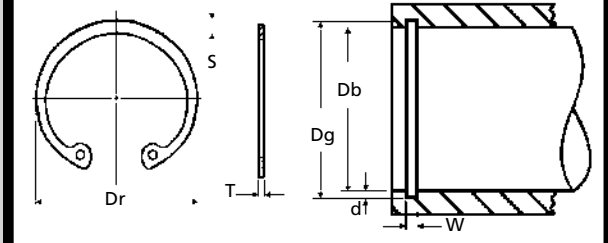
DHO ⟷ DHOI (Page 172) ⟷ DJK (Page 175) ⟷ DH (Page 194) ⟷ DJL (Page 177)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

HO IMPERIAL Page 16

BASIC INTERNAL

DIN 472



MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D1300	Ellison	472	Seeger	J
Bossard	BN822-823	Rotor Clip	DHO	Waldes	D1300

DHO	BORE	RING				GROOVE			WEIGHT	MATERIAL		TOOL
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DHO-212	212	222.0	+1.70/-.72	14.0	5.00	218.0	+.72/-.00	3.00	5.15	27.0000			-I035
-215	215	227.0				221.0				30.0000			
-217	217	227.0				223.0				30.0000			
-218	218	232.0				224.0				31.5000			
-220	220	232.0				226.0				31.5000			
-222	222	232.0				228.0				31.5000			
-225	225	237.0				231.0				32.3000			
-227	227	237.0				233.0				32.3000			
-228	228	242.0				234.0				33.0000			
-230	230	242.0				236.0				33.0000			
-232	232	242.0	+2.00/-.81			238.0				33.0000			
-235	235	247.0				241.0				33.8000			
-237	237	247.0				243.0				33.8000			
-238	238	252.0				244.0				34.5000			
-240	240	252.0				246.0				34.5000			
-242	242	252.0				248.0				34.5000			
-245	245	257.0				251.0				35.3000			
-247	247	257.0				253.0				35.3000			
-248	248	262.0				254.0				36.0000			
-250	250	262.0				256.0				36.0000			
-252	252	262.0		16.0		260.0	+.81/-.00	4.00		36.0000			-I045
-255	255	270.0				263.0				36.8000			
-257	257	270.0				265.0				36.8000			
-258	258	275.0				266.0				37.5000			
-260	260	275.0				268.0				37.5000			
-262	262	275.0				270.0				37.5000			
-265	265	280.0				273.0				38.3000			
-267	267	280.0				275.0				38.3000			
-268	268	285.0				276.0				38.8000			
-270	270	285.0				278.0				38.8000			
-272	272	285.0				280.0				38.8000			
-275	275	290.0				283.0				39.3000			
-277	277	290.0				285.0				39.3000			
-278	278	295.0				286.0				40.0000			
-280	280	295.0				288.0				40.0000			
-282	282	295.0				290.0				40.0000			
-285	285	300.0				293.0				40.8000			
-287	287	300.0				295.0				40.8000			
-288	288	305.0				296.0				41.5000			
-290	290	305.0				298.0				41.5000			
-292	292	305.0				300.0				41.5000			
-295	295	310.0				303.0				42.6000			
-297	297	310.0				305.0				42.6000			
-298	298	315.0				306.0				43.5000			
-300	300	315.0				308.0				43.5000			
-305	305	322.0	+2.00/-.90	20.0	6.00	315.0	+.89/-.00	5.00	6.20	75.5000			
-310	310	327.0				320.0				77.0000			
-315	315	332.0				325.0				78.5000			
-320	320	337.0				330.0				80.0000			
-325	325	342.0				335.0				81.0000			
-330	330	347.0				340.0				82.0000			
-335	335	352.0				345.0				83.0000			
-340	340	357.0				350.0				84.0000			
DHO-345	345	362.0				355.0				85.5000			

TOOL DESCRIPTIONS ON PAGES 227 & 228

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

METRIC SNAP RINGS

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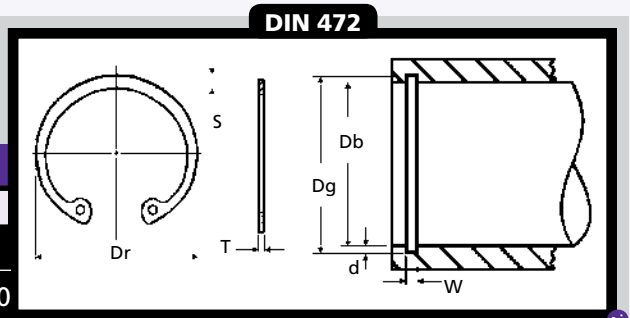


BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D1300	Ellison	472	Seeger	J
Bossard	BN822-823	Rotor Clip	DHO	Waldes	D1300

DHO

BORE	RING				GROOVE			WEIGHT	MATERIAL		TOOL
MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DHO-350	350	367.0	+2.00/-.90	20.0	6.00	+.00/-.15	360.0	+.89/-.00	5.00	6.20	87.0000			-I045
-355	355	372.0					365.0				88.0000			
-360	360	377.0					370.0				89.0000			
-365	365	382.0					375.0				90.6000			
-370	370	387.0					380.0				92.0000			
-375	375	392.0					385.0				93.2000			
-380	380	397.0					390.0				94.0000			
-385	385	402.0	+2.00/-1.00				395.0				95.0000			
-390	390	407.0					400.0				96.0000			
-395	395	412.0					405.0				97.2000			
-400	400	417.0					410.0				98.0000			
-410	410	430.0		26.0	7.00		422.0	+1.00/-.00	6.00	7.20	138.0000			-048
-420	420	440.0					432.0				141.0000			
-430	430	450.0					442.0				144.0000			
-440	440	460.0					452.0				147.0000			
-450	450	470.0					462.0				151.0000			
-460	460	480.0					472.0				155.0000			
-470	470	490.0					482.0				159.5000			
-480	480	500.0					492.0				164.0000			
-490	490	510.0	+3.00/-1.50				502.0				168.5000			
-500	500	520.0					512.0				173.0000			
-510	510	535.0			8.00		524.0		7.00	8.20	225.0000			
-520	520	545.0					534.0				229.0000			
-530	530	555.0					544.0				233.5000			
-540	540	565.0					554.0				238.0000			
-550	550	575.0					564.0				243.0000			
-560	560	585.0					574.0				249.5000			
-570	570	595.0					584.0				256.0000			
-580	580	605.0					594.0				262.5000			
-590	590	615.0					604.0				270.0000			
-600	600	625.0					614.0				277.0000			
-650	650	680.0	+4.00/-2.00	34.0	9.00	+.00/-.20	666.0	8.00	9.30		360.0000			
-700	700	730.0					716.0				412.0000			
-750	750	785.0					768.0	9.00			454.0000			
-800	800	835.0					818.0				545.0000			
-850	850	890.0					870.0	10.00			599.0000			
-900	900	940.0					920.0				674.0000			
-950	950	1000.0					972.0	11.00			793.0000			
DHO-1000	1000	1050.0					1022.0				888.0000			

TOOL DESCRIPTIONS ON PAGES 227 & 228

DHOR

(PAGE 171)

DESCRIPTION

Extra-thick version of the DIN 472 DHO that is stronger and yields higher thrust loads. Installed axially using the same tools. Note that the DHOR will require a wider groove than the DHO.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Measure the bore diameter (Db).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above. If it is too thin, see "DHO."

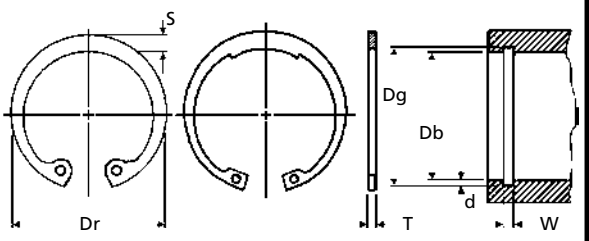
GENERAL USE

WEIRD

SEE PAGE 171

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

DIN 472 - HEAVY DUTY TYPE



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G.L.HUYETT

HEAVY DUTY INTERNAL

MANUFACTURER CROSS-REFERENCE *INDEX PAGE 236.*

Bossard	BN824	Seeger	JS
Ellison	INT		

DIN 472

DHOR	BORE	RING				GROOVE			WEIGHT	MATERIAL	TOOL
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width Min (W)	Kg per 100 Pieces	Spring Steel	
DHOR-020	20	21.5	+.42/-.21	2.4	1.50 +.00/-.06	21.0	+.15/-.00	.50	1.60	0.1400		-I018
-022	22	23.5		2.8		23.0				0.1900		
-024	24	25.9		3.0		25.2	+.21/-.00	.60		0.2000		
-025	25	26.9		3.1		26.2				0.2100		
-026	26	27.9		3.1		27.2				0.2300		
-027	27	29.1	+.50/-.25	3.2		28.4		.70		0.2400		
-028	28	30.1		3.2		29.4				0.2500		
-030	30	32.1		3.3		31.4	+.25/-.00			0.2700		
-032	32	34.4		3.4		33.7		.85		0.2900		
-034	34	36.5		3.7	1.75	35.7			1.85	0.4100		
-035	35	37.8		3.8		37.0		1.00		0.4500		
-037	37	39.8		3.9		39.0				0.4700		
-038	38	40.8		3.9		40.0				0.4800		
-040	40	43.5	+.90/-.39	3.9	2.00 +.00/-.07	42.5		1.25	2.15	0.5100		-I023
-042	42	45.5		4.1		44.5				0.5600		
-045	45	48.5	+1.10/-.46	4.3		47.5				0.6300		
-047	47	50.5		4.4		49.5				0.6700		
-050	50	54.2		4.6	2.50	53.0	+.30/-.00	1.50	2.65	0.8800		
-052	52	56.2		4.7		55.0				0.9900		
-055	55	59.2		5.0		58.0				1.0400		
-060	60	64.2		5.4	3.00 +.00/-.08	63.0			3.15	1.5900		
-062	62	66.2		5.5		65.0				1.6100		
-064	64	68.2		5.6		67.0				1.6500		
-065	65	69.2		5.8		68.0				1.6600		
-068	68	72.5		6.1		71.0				1.7200		
-070	70	74.5		6.2		73.0				1.8000		
-072	72	76.5		6.4		75.0				2.1700		
-075	75	79.5		6.6		78.0				2.2600		
-080	80	85.5	+1.30/-.54	7.0	4.00 +.00/-.10	83.5	+.35/-.00	1.75	4.15	3.3200		-I032
-085	85	90.5		7.2		88.5				3.3800		
-090	90	95.5		7.6		93.5				4.1300		
-095	95	100.5		8.1		98.5				4.6700		
-100	100	105.5		8.4		103.5				5.0700		
-105	105	112.0		8.7	5.00 +.00/-.12	109.0	+.54/-.00	2.00	5.15	7.0000		-I035
-110	110	117.0		9.0		114.0				8.1000		
-115	115	122.0	+1.50/-.63	9.3		119.0				9.4000		
-120	120	127.0		9.7		124.0				9.8000		
-125	125	132.0		10.0		129.0	+.63/-.00			10.2000		
-130	130	137.0		10.2		134.0				10.5000		
-135	135	142.0		10.5		139.0				10.7000		
-140	140	147.0		10.7		144.0				11.0000		
-145	145	152.0		10.9		149.0				11.6000		
-150	150	158.0		11.2		155.0		2.50		13.1000		
-155	155	164.0		11.4		160.0				13.4000		
-160	160	169.0		11.6		165.0				13.8000		
-165	165	174.5		11.8		170.0				15.6000		
-170	170	179.5		12.2		175.0				17.5000		
-175	175	184.5	+1.70/-.72	12.7		180.0				18.8000		
-180	180	189.5		13.2		185.0	+.72/-.00			20.7000		
-185	185	194.5		13.7		190.0				21.3000		
-190	190	199.5		13.8		195.0				21.9000		
-195	195	204.5		13.8		200.0				22.9000		
DHOR-200	200	209.5		14.0		205.0				24.3000		

TOOL DESCRIPTIONS ON PAGES 227 & 228.

***DHOR** TECHNICAL INFORMATION ON PREVIOUS PAGE.*

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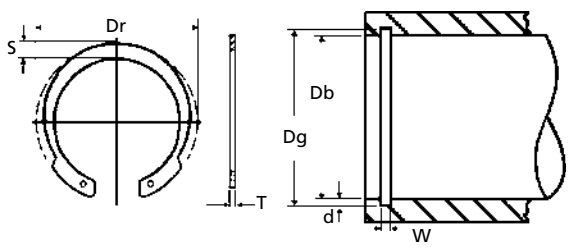
INVERTED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	M1308	Ellison	INTV
Bossard	BN830	Seeger	JV

INVERTED LUGS



DHOI	BORE	RING					GROOVE			WEIGHT	MATERIAL	TOOL
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)		Thickness (T)		Diameter (Dg)		Depth (d)	Width Min. (W)	Kg per 100 Pieces	Spring Steel	
DHOI-010	10	10.9	+.42/-.13	1.5	+/-.1	.60	+.00/-.05	10.5	+.11/-.00	.25	.70	0.0150		-I009
-012	12	13.1		1.8				12.6		.30		0.0250		
-015	15	16.1		2.0		.80		15.7		.35	.90	0.0410		
-016	16	17.3		2.1		1.00	+.00/-.06	16.8		.40	1.10	0.0530		-I011
-017	17	18.3		2.1				17.8				0.0580		
-018	18	19.5		2.2				19.0	+.15/-.00	.50		0.0620		
-019	19	20.5		2.2				20.0				0.0660		
-020	20	21.5		2.3				21.0				0.0800		
-021	21	22.5		2.4				22.0				0.0810		
-022	22	23.5		2.4				23.0				0.0830		
-024	24	25.9	+.42/-.21	2.8				25.2	+.21/-.00	.60		0.1300		
-025	25	26.9		2.8				26.2				0.1400		
-026	26	27.9		3.0				27.2				0.1500		
-027	27	29.1		3.0		1.20		28.4		.70	1.30	0.1530		
-028	28	30.1	+.50/-.25	3.1				29.4				0.1800		
-030	30	32.1		3.2				31.4	+.25/-.00			0.2030		
-032	32	34.4		3.3				33.7		.85		0.2050		
-033	33	35.5		3.3				34.7				0.2350		
-035	35	37.8		3.4		1.50		37.0		1.00	1.60	0.3200		
-036	36	38.8		3.6				38.0				0.3230		
-038	38	40.8		3.8				40.0				0.3680		
-040	40	43.5	+.90/-.39	4.2	+/-.2	1.75	+.00/-.07	42.5	+.30/-.00	1.25	1.85	0.4750		-I018
-042	42	45.5		4.2				44.5				0.5200		
-045	45	48.5		4.2				47.5				0.6000		
-047	47	50.5	+1.10/-.46	4.7				49.5				0.6500		
-048	48	51.5		4.7				50.5				0.7000		
-050	50	54.2		5.2		2.00		53.0		1.50	2.15	0.8500		
-052	52	56.2		5.2				55.0				0.9000		
-055	55	59.2		5.2				58.0				1.0000		
-057	57	61.2		5.2				60.0				1.0250		
-058	58	62.2		5.2				61.0				1.0500		
-060	60	64.2		5.2				63.0				1.1250		
-062	62	66.2		5.2				65.0				1.1750		
-065	65	69.2		5.7		2.50		68.0		1.75	2.65	1.6250		-I023
-067	67	71.5		5.7	+/-.3			70.0				1.7300		
-068	68	72.5		5.7				71.0				1.7750		
-072	72	76.5		6.0				75.0				1.9600		
-080	80	85.5	+1.30/-.54	6.0				83.5	+.35/-.00			2.2900		
-090	90	95.5		6.6		3.00	+.00/-.08	93.5			3.15	3.3000		
DHOI-100	100	105.5		7.4				103.5				4.1900		

TOOL DESCRIPTIONS ON PAGE 227.

DHOI

AXIAL ASSEMBLY

DESCRIPTION

Inverted lugs seat into the groove for better clearance and cleaner appearance. Good for shielded bearings that pass tightly through the bore or housing. Installed axially using pliers.

HOW TO IDENTIFY

1. Measure the bore diameter (Db).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DHOI ⟷ DHO (Page 166) ⟷ DJK (Page 175) ⟷ DH (Page 194) ⟷ DJL (Page 177)

HOI
IMPERIAL Page 19

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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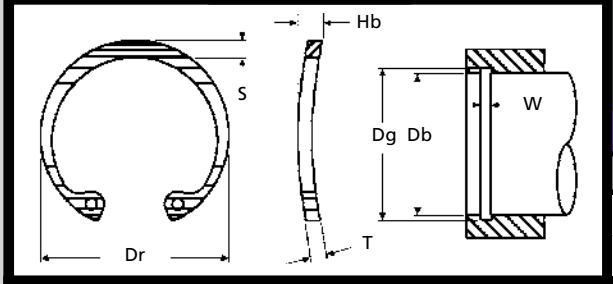
CURVED SHAPE



BOWED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Seeger	JW		

DBHO	BORE	RING				GROOVE		WEIGHT	MATERIAL	TOOL
	MM (Db)	Free Outside Dia. (Dr)	Radial Wall Max. (S)	Thickness (T)	Bow Height (Hb)	Diameter (Dg)	Width (W)	Kg per 100 Pieces	Spring Steel	
DBHO-040	40	43.5 +.90/-.39	3.9	1.75	3.5 +.8/-.0	42.7 +.25/-.00	3.4	0.4700		-I023
-042	42	45.5	4.1		3.5	44.7	3.4	0.5400		
-045	45	48.5	4.3		3.6	47.7	3.5	0.6000		
-047	47	50.5 +1.10/-.46	4.4		3.7	49.7	3.5	0.6100		
-048	48	51.5	4.5		3.7	50.7 +.30/-.00	3.6	0.6700		
-050	50	54.2	4.6	2.00	4.0 +1.0/-.0	53.3	3.9	0.7300		
-052	52	56.2	4.7		4.1	55.3	3.9	0.8200		
-055	55	59.2	5.0		4.2	58.3	4.1	0.8300		
-057	57	61.2	5.1		4.2	60.3	4.1	0.9400		
-058	58	62.2	5.2		4.3	61.3	4.2	1.0500		
-060	60	64.2	5.4		4.3	63.3	4.2	1.1100		
-062	62	66.2	5.5		4.4	65.3	4.2	1.1200		
-063	63	67.2	5.6		4.4	66.3	4.8	1.2400		
-065	65	69.2	5.8	2.50	5.0 +1.3/-.0	68.3	4.8	1.4300		
-067	67	71.5	6.0		5.0	70.3	4.9	1.5300		
-068	68	72.5	6.1		5.1	71.3	4.9	1.6000		
-070	70	74.5	6.2		5.1	73.3	5.0	1.6500		
-072	72	76.5	6.4		5.2	75.3	5.0	1.8100		
-075	75	79.5	6.6		5.2	78.3	5.0	1.8800		
-077	77	81.5 +1.30/-.54	6.7		5.3	80.3 +.35/-.00	5.1	2.0400		
-078	78	82.5	6.8		5.3	81.3	5.1	2.0400		
-080	80	85.5	7.0		5.4	84.0	5.1	2.2000		
-082	82	87.5	7.0		5.4	86.0	5.8	2.4000		
-085	85	90.5	7.2	3.00	6.0 +1.5/-.0	89.0	5.9	2.5300		-I032
-087	87	92.5	7.3		6.1	91.0	5.9	3.1000		
-088	88	93.5	7.4		6.2	92.0	6.0	3.1000		
-090	90	95.5	7.6		6.3	94.0	6.1	3.3000		
-092	92	97.5	7.8		6.4	96.0	6.2	3.5000		
-095	95	100.5	8.1		6.6	99.0	6.2	3.7000		
-097	97	102.5	8.2		6.7	101.0	6.8	4.1000		
-098	98	103.5	8.3		6.8	102.0	6.9	4.1000		
-100	100	105.5	8.4		6.9	104.0	8.0	4.2000		
-105	105	112.0	8.7	4.00	8.0 +2.0/-.0	109.5 +.54/-.00	8.1	5.6000		-I035
-110	110	117.0	9.0		8.1	114.5	8.1	6.4500		
-115	115	122.0	9.3		8.1	119.5	8.2	7.4500		
-120	120	127.0 +1.50/-.63	9.7		8.2	124.5 +.63/-.00	8.2	7.7000		
-130	130	137.0	10.2		8.3	134.5	8.3	8.2000		
-140	140	147.0	10.7		8.4	144.5	8.4	8.7500		
-145	145	152.0	10.9		8.4	149.5	8.4	9.3000		
DBHO-150	150	158.0	11.2		8.5	155.5	8.5	10.5000		

TOOL DESCRIPTIONS ON PAGES 227 & 228

DBHO

AXIAL ASSEMBLY

DESCRIPTION

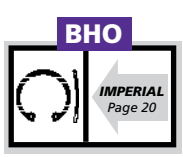
Curved design for resilient end-play take-up of rattling in linkages. Provides tension on adjusting screws. Also used to salvage assemblies where grooves have been cut too wide. Install with the *convex* surface abutting the part.

HOW TO IDENTIFY

1. Verify bowed-shape side profile.
2. Measure the bore diameter (Db).
3. Determine the ring thickness (T).
4. Measure the maximum radial wall (S) of the ring.
5. Find the part in the chart above.

GENERAL USE

WEIRD



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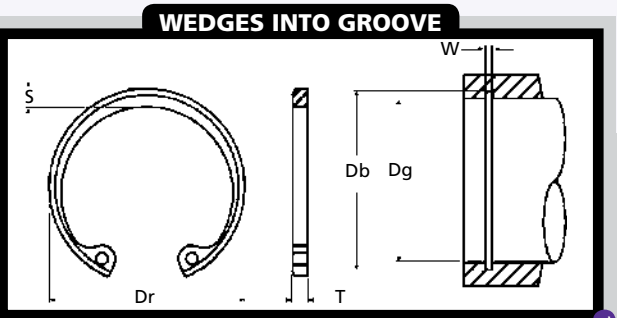
BEVELED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Ellison	EJB		
Seeger	JB		

WEDGES INTO GROOVE



DVHO	BORE	RING					GROOVE				WEIGHT	MATERIAL	TOOL
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)		Width (W)		Kg per 100 Pieces	Spring Steel	
DVHO-040	40	44.0		4.0			42.8				0.0180		
-041	41	45.8		4.0			44.0		1.30		0.0200		
-042	42	46.6		4.2			45.0				0.0200		
-043	43	47.6	+.9/-.6	4.3			46.0				0.0200		
-044	44	49.3		4.3	1.65		47.2	+.13/-.00	1.27	+.025/-.000	0.0200		
-046	46	51.1		4.3			49.4				0.0230		
-047	47	52.2		4.3			50.4				0.0230		
-048	48	52.6		4.3			51.5				0.0230		-I018
-051	51	56.1		4.3			54.6		1.22		0.0230		
-052	52	57.9		4.7			55.7		1.65		0.0230		
-054	54	59.7		4.9			57.9				0.0250		
-056	56	61.3		5.0			60.1		1.63		0.0250		
-057	57	63.2		5.2	2.05		61.5				0.0250		
-060	60	66.8	+1.00/-.75	5.3			64.5		1.60		0.0280		
-062	62	68.6		5.2			66.5		1.57	+.038/-.000	0.0300		
-063	63	70.5		5.3			67.7				0.0300		
-065	65	72.2		5.6			69.8		1.98		0.0300		
-067	67	73.9		5.7			71.9		1.96		0.0330		
-068	68	75.7		6.0	2.45	+.00/-.15	73.1				0.0330		
-070	70	77.5		5.9			75.2		1.93		0.0360		
-072	72	79.3		5.8			77.3				0.0360		
-078	78	86.8		6.5			83.7				0.0380		
-080	80	89.5		6.7			86.0				0.0380		
-082	82	92.0	+/-1.4	6.8			88.1				0.0410		
-085	85	94.8		7.0			91.2				0.0410		
-088	88	98.0		7.4			94.6				0.0430		
-090	90	100.0		7.4			96.8				0.0460		
-092	92	102.2		7.7			99.0				0.0400		-I023
-095	95	105.6		7.8			102.1				0.0480		
-098	98	109.0		8.1	2.85		105.5	+.15/-.00	2.26	+.051/-.000	0.0510		
-100	100	110.7		8.1			107.6				0.0530		
-102	102	112.4		8.4			109.7				0.0530		
-105	105	115.8		8.4			112.8				0.0530		
-108	108	119.2	+/-1.65	8.5			116.1				0.0530		
-110	110	120.8		8.6			118.0				0.0530		
-115	115	125.5		8.9			123.2				0.0560		
-118	118	128.9		8.9			126.3				0.0560		
-120	120	132.4		9.1			128.6				0.0580		-I032
-127	127	139.3		9.9			135.8				0.0580		
DVHO-140	140	154.1		10.4	3.25	+.0/-.2	149.2		2.59		0.0610		

TOOL DESCRIPTIONS ON PAGE 227.

DVHO

AXIAL ASSEMBLY

DESCRIPTION

A 15° bevel on the outside diameter, when fitted into a 15° bevel on the load-bearing groove wall, yields rigid end-play take-up of manufacturing tolerances or wear on the retained part. Used in greasy and oily environments.

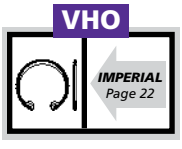
HOW TO IDENTIFY

1. Verify the presence of a bevel along the outside diameter of the part.
2. Measure the bore diameter (Db).
3. Determine the ring thickness (T).
4. Confirm the maximum radial wall (S) of the ring.
5. Find the part in the chart above.

GENERAL USE

WEIRD

VHO



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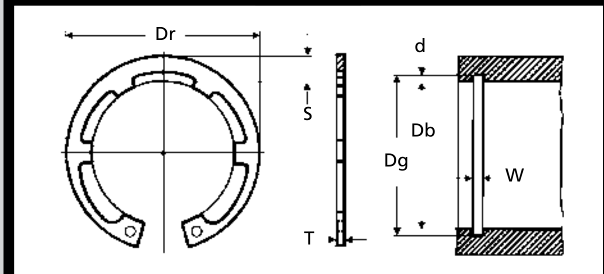

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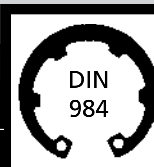
TABBED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D2000	Seeger	JK
Ellison	984	DIN	984



TOOL DESCRIPTIONS ON PAGES 227 & 228.

DJK	BORE	RING					GROOVE				WEIGHT	MATERIAL	TOOL
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width Min. (W)	Kg per 100 Pieces	Spring Steel	
DJK-016	16	17.3	+.42/-.13	2.1	1.00	+.00/-.06	16.8	+.11/-.00	.40	1.10	0.0720		-I011
-017	17	18.3		2.2			17.8				0.0800		
-018	18	19.5		2.3			19.0	+.15/-.00	.50		0.0900		
-019	19	20.5		2.3			20.0				0.0990		-I018
-020	20	21.5		2.4			21.0				0.1060		
-021	21	22.5		2.4			22.0				0.1170		
-022	22	23.5		2.6			23.0				0.1280		
-023	23	24.6		2.6	1.20		24.1		.55	1.30	0.1480		
-024	24	25.9	+.42/-.21	2.6			25.2	+.21/-.00	.60		0.1600		
-025	25	26.9		2.8			26.2				0.1720		
-026	26	28.5		2.8			27.2				0.2000		
-027	27	29.1		2.9			28.4		.70		0.2000		
-028	28	30.1	+.50/-.25	3.0			29.4				0.2100		
-030	30	32.1		3.2			31.4	+.25/-.00			0.2350		
-031	31	33.4		3.2			32.7		.85		0.2420		
-032	32	34.4		3.3			33.7				0.2500		
-033	33	35.5		3.3			34.7				0.2650		
-034	34	36.5		3.4	1.50		35.7			1.60	0.3800		
-035	35	37.8		3.6			37.0		1.00		0.4000		
-036	36	38.8		3.6			38.0				0.4150		
-038	38	40.8		3.8			40.0				0.4400		
-040	40	43.5	+.90/-.39	4.0	1.75		42.5		1.25	1.85	0.5300		-I023
-042	42	45.5		4.1			44.5				0.6000		
-044	44	47.5		4.2			46.5				0.6450		
-045	45	48.5		4.3			47.5				0.6600		
-047	47	50.5		4.5			49.5				0.6900		
-048	48	51.5	+1.10/-.46	4.5			50.5	+.30/-.00			0.7500		
-050	50	54.2		4.7	2.00	+.00/-.07	53.0		1.50	2.15	0.8500		
-052	52	56.2		4.7			55.0				0.9400		
-055	55	59.2		5.1			58.0				0.9750		
-057	57	61.2		5.2			60.0				1.1650		
-058	58	62.2		5.3			61.0				1.2000		
-060	60	64.2		5.5			63.0				1.2700		
-062	62	66.2		5.6			65.0				1.2750		
-065	65	69.2		5.8	2.50		68.0			2.65	1.6700		
-067	67	71.5		6.0			70.0				1.8600		
-068	68	72.5		6.1			71.0				1.9300		
-070	70	74.5		6.2			73.0				2.0200		
-072	72	76.5		6.4			75.0				2.1200		
DJK-075	75	79.5		6.6			78.0				2.2600		

DJK

DESCRIPTION

Internal tabs are concentrically positioned for a concealed assembly. Tabs act as spacers for securing machine components. Conforms to DIN 984.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify the presence of tabs on the inside rim of the ring.
2. Measure the bore diameter (Db).
3. Determine the ring thickness (T).
4. Confirm the maximum radial wall (S) of the ring.
5. Find the part in the chart above.

GENERAL USE

UNCOMMON

SAME SIZING AS DHO, BUT WITH INTERNAL TABS.

DJK CONTINUED NEXT PAGE.

GROOVE INTERCHANGE

USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DJK ⟷ DHO (Page 166) ⟷ DHOI (Page 172) ⟷ DH (Page 194) ⟷ DJL (Page 177)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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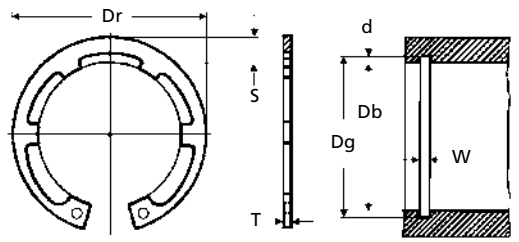
DIN 984



TABBED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D2000	Seeger	JK
Ellison	984	DIN	984

DJK	BORE	RING				GROOVE				WEIGHT	MATERIAL	TOOL
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width Min. (W)	Kg per 100 Pieces	Spring Steel	
DJK-080	80	85.5	+1.30/-.54	7.0	2.50 +.00/-.07	+.00/-.08	83.5	+.35/-.00	1.75	2.65	2.5000		-I023
-085	85	90.5		7.4	3.00		88.5			3.15	3.0100		
-090	90	95.5		7.7			93.5				3.5500		
-095	95	100.5		8.1			98.5				4.0000		-I032
-100	100	105.5		8.5			103.5				4.3500		
-110	110	117.0		9.0	4.00	+.00/-.10	114.0	+.54/-.00	2.00	4.15	7.3000		
-115	115	122.0	+1.50/-.63	9.3			119.0	+.63/-.00			8.2000		
-120	120	127.0		9.6			124.0				8.7000		
-125	125	132.0		9.9			129.0				9.2000		
-130	130	137.0		10.2			134.0				10.2000		-I035
-140	140	148.0		10.7			144.0				11.2000		
-150	150	158.0		11.1			155.0		2.50		12.3000		
-160	160	169.0		11.8			165.0				13.3000		
DJK-170	170	179.5		12.3			175.0				14.5000		

TOOL DESCRIPTIONS ON PAGES 227 & 228

DJK

DESCRIPTION

Internal tabs are concentrically positioned for a concealed assembly. Tabs act as spacers for securing machine components. Conforms to DIN 984.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify the presence of tabs on the inside rim of the ring.
2. Measure the bore diameter (Db).
3. Determine the ring thickness (T).
4. Confirm the maximum radial wall (S) of the ring.
5. Find the part in the chart above.

GENERAL USE

UNCOMMON

SAME SIZING AS DHO, BUT WITH INTERNAL TABS.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DJK ⟷ DHO (Page 166) ⟷ DHOI (Page 172) ⟷ DH (Page 194) ⟷ DJL (Page 177)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

DJL (PAGE 177)

DESCRIPTION

Bowed version of DIN 984 for concealed assemblies requiring end-play take-up.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify bowed shape side profile, with tabs on the inside diameter.
2. Measure the bore diameter (Db).
3. Determine the ring thickness (T).
4. Confirm the maximum radial wall (S) of the ring.
5. Find the part in the chart on page 177.

GENERAL USE

WEIRD

FROM PAGE 177

CURVED SHAPE WITH INTERNAL TABS. SIMILAR IN SIZE TO DHO.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DJL ⟷ DHO (Page 166) ⟷ DHOI (Page 172) ⟷ DJK (Page 175) ⟷ DH (Page 194)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

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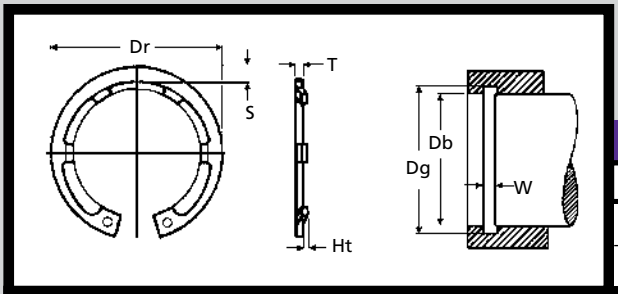

BOWED TABBED INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Seeger	JL		

DJL

DJL	BORE	RING					GROOVE			WEIGHT	MATERIAL	TOOL
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)	Wall Thickness (T)	Tab Height (Ht)	Diameter (Dg)		Width (W)	Kg per 100 Pieces	Spring Steel	
DJL-016	16	17.3	+.42/-.13	2.1	.60	.25	16.8	+.11/-.00	.70	0.0720		-I011
-017	17	18.3		2.2			17.8			0.0800		
-018	18	19.5		2.3	.80		19.0	+.15/-.00	.90	0.0900		-I018
-019	19	20.5		2.3			20.0			0.0990		
-020	20	21.5		2.4	1.00		21.0		1.10	0.1060		
-021	21	22.5		2.4			22.0			0.1170		
-022	22	23.5		2.6		.35	23.0			0.1280		
-023	23	24.6		2.6	1.20		24.1		1.30	0.1480		
-024	24	25.9	+.42/-.21	2.6			25.2	+.21/-.00		0.1600		
-025	25	26.9		2.8			26.2			0.1720		
-026	26	28.5		2.8			27.2			0.2000		
-027	27	29.1		2.9			28.4			0.2000		
-028	28	30.1	+.50/-.25	3.0			29.4			0.2100		
-030	30	32.1		3.2			31.4	+.25/-.00		0.2350		
-031	31	33.4		3.2			32.4			0.2420		
-032	32	34.4		3.3			33.7			0.2500		
-033	33	35.5		3.3			34.7			0.2650		
-034	34	36.5		3.4	1.50	.45	35.7		1.60	0.3800		
-035	35	37.8		3.6			37.0			0.4000		
-036	36	38.8		3.6			38.0			0.4150		
-038	38	40.8		3.8			40.0			0.4400		
-040	40	43.5	+.90/-.39	4.0	1.75	.55	42.5		1.85	0.5300		-I023
-042	42	45.5		4.1			44.5			0.6000		
-044	44	47.5		4.2			46.5			0.6450		
-045	45	48.5		4.3			47.5			0.6600		
-047	47	50.5	+1.10/-.46	4.5			49.5			0.6900		
-048	48	51.5		4.5			50.5			0.7500		
-050	50	54.2		4.7	2.00	.65	53.0	+.30/-.00	2.15	0.8500		
-052	52	56.2		4.7			55.0			0.9400		
-055	55	59.2		5.1			58.0			0.9750		
-057	57	61.2		5.2			60.0			1.1650		
-058	58	62.2		5.3			61.0			1.2000		
-060	60	64.2		5.5			63.0			1.2700		
-062	62	66.2		5.6			65.0			1.2750		
-065	65	69.2		5.8	2.50	.90	68.0		2.65	1.6700		
-067	67	71.5		6.0			70.0			1.8600		
-068	68	72.5		6.1			71.0			1.9300		
-070	70	74.5		6.2			73.0			2.0200		
-072	72	76.5		6.4			75.0			2.1200		
-075	75	79.5		6.6			78.0			2.2600		
-080	80	85.5	+1.30/-.54	7.0			83.5	+.35/-.00		2.5000		
-085	85	90.5		7.4	3.00		88.5		3.15	3.0100		-I032
-090	90	95.5		7.7			93.5			3.5500		
-095	95	100.5		8.1			98.5			4.0000		
DJL-100	100	105.5		8.5			103.5			4.3500		

TOOL DESCRIPTIONS ON PAGES 227 & 228.

DJL *TECHNICAL INFORMATION ON PREVIOUS PAGE.*

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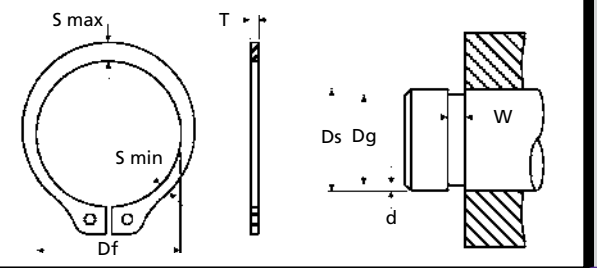
ANSI METRIC DIMENSIONS



BASIC EXTERNAL - ANSI

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Rotor Clip	MSH	
ANSI	B27.7-	

MSH	SHAFT	RING						GROOVE					WEIGHT	MATERIAL	TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall (S) Min.	Radial Wall (S) Max.	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Kg per 100 Pieces	Spring Steel	
MSH-004*	4	3.60	+.05/-.10	.40	.65	.25	+/-.05	3.80	+.00/-.08	.10	.32	+.05/-.00	0.0017		-E023-M
-005*	5	4.55		.40	.65	.40		4.75		.13	.50	+.10/-.00	0.0029		-E023-L
-006*	6	5.45		.50	.75			5.70		.15			0.0040		
-007	7	6.35	+.05/-.15	.60	.90	.60		6.60	+.00/-.10	.20	.70		0.0100		-E038
-008	8	7.15		.65	1.00			7.50		.25			0.0120		
-009	9	8.15		.75	1.15			8.45		.28			0.0150		
-010	10	9.00		.80	1.30			9.40		.30			0.0190		
-011	11	10.00		.85	1.40			10.35	+.00/-.12	.33			0.0230		
-012	12	10.85		.90	1.50			11.35		.33			0.0240		
-013	13	11.90	+.15/-.25	.95	1.60	.90		12.30		.35	1.00		0.0440		
-014	14	12.90		1.00	1.70			13.25		.38			0.0490		
-015	15	13.80		1.05	1.80			14.15		.43			0.0540		
-016	16	14.70		1.15	2.05			15.10	+.00/-.15	.45			0.0590		
-017	17	15.75		1.15	2.10			16.10		.45			0.0640		
-018	18	16.65		1.25	2.25	1.10		17.00		.50	1.20		0.0920		-E047
-019	19	17.60		1.30	2.35			17.95		.53			0.0950		
-020	20	18.35		1.35	2.40			18.85		.58			0.1000		
-021	21	19.40		1.40	2.50			19.80		.60			0.1100		
-022	22	20.30		1.50	2.70			20.70		.65			0.1300		
-023	23	21.25		1.60	2.80			21.65		.67			0.1400		
-024	24	22.20		1.60	2.90			22.60		.70			0.1500		-E070
-025	25	23.10		1.70	2.90			23.50		.75			0.1600		
-026	26	24.05		1.70	3.00			24.50		.75			0.1800		
-028	28	25.80	+.25/-.40	1.80	3.20	1.30		26.40	+.00/-.20	.80	1.40		0.2300		
-030	30	27.90		1.80	3.30			28.35		.83			0.2500		
-032	32	29.60		1.90	3.60			30.20		.90			0.2800		
-034	34	31.40		2.00	3.80			32.00		1.00			0.3100		
-035	35	32.30		2.10	3.90			32.90		1.05			0.3300		
-036	36	33.25		2.20	4.10			33.85		1.06			0.3600		
-038	38	35.20		2.30	4.30			35.80		1.10			0.4000		-E115
-040	40	36.75	+.35/-.65	2.30	4.40	1.60	+/-.08	37.70	+.00/-.30	1.15	1.75	+.20/-.00	0.5600		
-042	42	38.80		2.40	4.60			39.60		1.20			0.6300		
-043	43	39.65		2.50	4.70			40.50		1.25			0.6700		
-045	45	41.60		2.60	4.80			42.40		1.30			0.7000		
-046	46	42.55		2.60	4.90			43.30		1.35			0.7300		
-048	48	44.40		2.60	5.00			45.20		1.40			0.7700		
-050	50	46.20		2.70	5.10			47.20		1.40			0.8200		
-054	54	49.90		2.90	5.40	2.00		51.00		1.50	2.15		1.1800		
-055	55	50.60		2.90	5.40			51.80		1.60			1.1900		
-058	58	53.60		3.00	5.60			54.70		1.65			1.2600		
-060	60	55.80		3.00	5.70			56.70		1.65			1.3200		
-062	62	57.30		3.00	5.80			58.60		1.70			1.3400		
-065	65	60.40	+.50/-.75	3.10	6.00			61.60		1.70			1.5400		
-068	68	63.10		3.30	6.20			64.50		1.75			1.6300		
-070	70	64.60		3.30	6.30	2.40		66.40	+.00/-.40	1.80	2.55		1.9300		
-072	72	66.60		3.30	6.40			68.30		1.85			2.0600		
-075	75	69.00		3.40	6.60			71.20		1.90			2.2600		
-078	78	72.00		3.40	6.60			74.00		2.00			2.1500		
-080	80	74.20		3.60	7.00			75.90		2.05			2.6800		
-082	82	76.40		3.70	7.10			77.80		2.10			2.8100		
-085	85	78.60		3.80	7.30			80.60		2.20			2.9000		
-088	88	81.40		3.90	7.50	2.80		83.50		2.25	2.95		3.2200		
-090	90	83.20		3.90	7.50			85.40		2.30			3.3100		
-095	95	88.10		4.10	7.90			90.20		2.40			3.7600		
MSH-100	100	92.50		4.10	8.00			95.20		2.42			4.3100		

TOOL DESCRIPTIONS ON PAGE 226.

*May be beryllium copper instead of carbon

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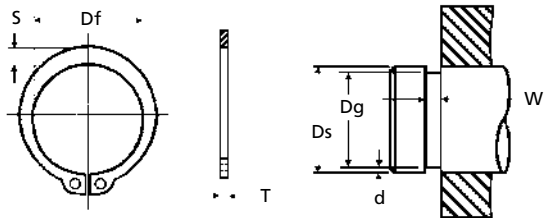
ANSI METRIC DIMENSIONS



HEAVY DUTY EXTERNAL - ANSI

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Rotor Clip	MSR	
ANSI	B27.8M-3DM1	

MSHR	SHAFT	RING				GROOVE				WEIGHT	MATERIAL	TOOL
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall Max. (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Kg per 100 Pieces	Spring Steel	
MSHR-010	10	9.20	+.08/-.20	1.7	.9	+/-.06	9.40	+.00/-.08	.30	1.00	+.15/-.00	0.0320		-E038
-011	11	10.00		1.9			10.30		.35			0.0390		
-012	12	11.05	+.13/-.25	2.2	1.1		11.30		.35	1.20		0.0630		
-013	13	11.80		2.3	1.3		12.20	+.00/-.10	.40	1.40		0.0720		-E047
-014	14	12.80		2.4			13.15		.43			0.0800		
-015	15	13.80		2.6			14.10		.45			0.1000		
-016	16	14.70		2.7			15.00		.50			0.1040		
-017	17	15.65		2.8			15.95		.53			0.1200		
-018	18	16.55		3.0	1.6	+/-.08	16.85		.58	1.75		0.1900		-E070
-019	19	17.50		3.2	2.0		17.80		.60	2.15	+.20/-.00	0.2500		
-020	20	18.45		3.4			18.75		.63			0.2800		
-022	22	20.40		3.8			20.70		.65			0.3400		
-025	25	23.10		3.8			23.50		.75			0.3500		
-027	27	24.85		4.1	2.4		25.40	+.00/-.15	.80	2.55		0.5200		-E093
-028	28	25.70	+.25/-.40	4.3			26.30		.85			0.5600		
-030	30	27.60		4.5			28.20		.90			0.6100		
-032	32	29.35		4.7			30.00		1.00			0.6800		
-035	35	32.20		5.1			32.80		1.10			0.8100		
-038	38	35.05		5.5	2.8		35.60	+.00/-.20	1.20	2.95		1.2200		-E108
-040	40	36.70	+.35/-.50	5.8			37.50		1.25			1.4100		
-045	45	41.10		6.5			42.20		1.40			1.5100		
MSHR-050	50	45.50		7.1	3.2	+/-.10	47.00		1.50	3.40	+.25/-.00	2.1800		-E120-X

TOOL DESCRIPTIONS ON PAGES 226 & 228.

MSHR

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
Extra-thick version of the ANSI metric MSH that is stronger and yields higher thrust loads. Installed axially using the same tools. Note that the MSHR will require a wider groove than the MSH.	1. Measure the shaft diameter (Ds). 2. Determine the ring thickness (T). 3. Measure the radial wall (S) of the ring. 4. Find the part in the chart above. If it is too thin, see "MSH" on page 178.	 WEIRD

AXIAL ASSEMBLY

SPECIAL FINISHES AND PACKAGING AVAILABLE UPON REQUEST.

MSH (PAGE 178)

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
Tapered-design ring to ANSI metric dimensions that is installed into a groove to provide a rigid shoulder for high thrust loads. Installed axially using pliers that expand the part over the shaft.	1. Measure the shaft diameter (Ds). 2. Determine the ring thickness (T). 3. Measure the radial wall (S) of the ring. 4. Find the part in the chart on page 178. If it is too thick, see "MSHR" above.	 WEIRD

AXIAL ASSEMBLY

DIN 471 PAGES 152-157.

MSH ON PREVIOUS PAGE.

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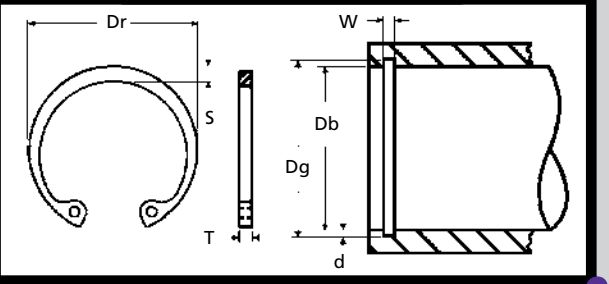
BASIC INTERNAL - ANSI

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Rotor Clip	MHO	
ANSI	B27.7-	

ANSI METRIC DIMENSIONS



MHO	BORE	RING				GROOVE				WEIGHT	MATERIAL	TOOL
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width Min. (W)	Kg per 100 Pieces	Spring Steel	
MHO-008	8	8.80	+.25/-.13	0.85	.4	8.40	+.06/-.00	.20	.50	0.0050		-I025
-009	9	10.00		1.25		9.45		.23		0.0110		
-010	10	11.10		1.30	.6	10.50	+.10/-.00	.25	.70	0.0140		-I038
-011	11	12.20		1.30		11.60		.30		0.0170		
-012	12	13.30		1.35		12.65		.33		0.0190		
-013	13	14.25		1.35	.9	13.70		.35	1.00	0.0350		
-014	14	15.45		1.60		14.80		.40		0.0390		
-015	15	16.60		1.65		15.85		.43		0.0420		
-016	16	17.70		1.70		16.90		.45		0.0470		
-017	17	18.90		1.70		18.00		.50		0.0520		
-018	18	20.05		1.80		19.05		.53		0.0580		
-019	19	21.10		1.80		20.10		.55		0.0590		
-020	20	22.25		2.00		21.15		.57		0.0700		-I047
-021	21	23.30	+.40/-.25	2.10	+/-.06	22.20		.60		0.0820		
-022	22	24.40		2.10		23.30	+.15/-.00	.65		0.0900		
-023	23	25.45		2.20		24.35		.67		0.1000		
-024	24	26.55		2.30	1.1	25.40		.70	1.20	0.1090		
-025	25	27.75		2.60		26.60		.80		0.1260		
-026	26	28.85		2.70		27.70		.85		0.1300		
-027	27	29.95	+.65/-.50	2.80		28.80		.90		0.1700		
-028	28	31.10		2.90		29.80		.90		0.1800		
-030	30	33.40		3.00		31.90		.95		0.2000		
-032	32	35.35		3.10		33.90		.95		0.2200		
-034	34	37.75		3.20	1.3	36.10		1.05	1.40	0.2300		-I070
-035	35	38.75		3.30		37.20		1.10		0.2300		
-036	36	40.00		3.40		38.30		1.15		0.2600		
-037	37	41.05		3.40		39.30		1.15		0.2900		
-038	38	42.15		3.40		40.40		1.20		0.3000		
-040	40	44.25	+.90/-.65	4.00		42.40	+.20/-.00	1.20		0.4000		
-042	42	46.60		4.20		44.50		1.25		0.4700		
-045	45	49.95		4.30		47.60		1.30		0.5100		
-046	46	51.05		4.30	1.6	48.70		1.35	1.75	0.5200		
-047	47	52.15		4.30		49.80		1.40		0.5800		
-048	48	53.30		4.50		50.90		1.45		0.6100		
-050	50	55.35		4.60		53.10		1.55		0.6200		
-052	52	57.90	+1.00/-.75	4.70	+/-.08	55.30	+.30/-.00	1.65	+.20/-.00	0.8100		-I090
-055	55	61.10		5.10		58.40		1.70		0.8900		
-057	57	63.25		5.20	2.0	60.50		1.75	2.15	0.9900		
-058	58	64.40		5.30		61.60		1.80		1.0100		
MHO-060	60	66.80		5.30		63.80		1.90		1.0500		

TOOL DESCRIPTIONS ON PAGE 227.

MHO

AXIAL ASSEMBLY

DESCRIPTION

Tapered section ring to ANSI metric dimensions that is installed axially with pliers into a housing or bore. High thrust load rating.

HOW TO IDENTIFY

1. Measure the bore diameter (Db).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above.

GENERAL USE

WEIRD

SPECIAL FINISHES AND PACKAGING AVAILABLE UPON REQUEST.

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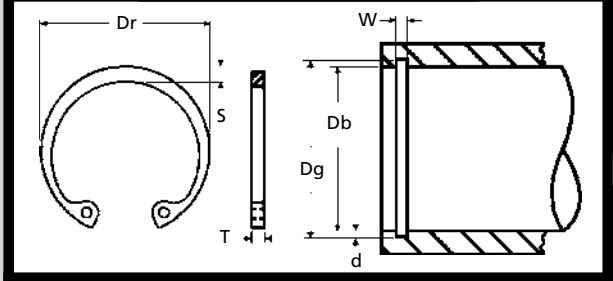
ANSI METRIC DIMENSIONS



BASIC INTERNAL - ANSI

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Rotor Clip	MHO	
ANSI	B27.7-	

MHO	BORE	RING				GROOVE				WEIGHT	MATERIAL	TOOL
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall Max. (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width Min. (W)	Kg per 100 Pieces	Spring Steel	
MHO-062	62	68.60		5.30	2.0	65.80		1.90	2.15	1.1500		
-063	63	69.90	+1.00/-.75	5.40		66.90		1.95		1.1600		
-065	65	72.20		5.60		69.00		2.00		1.5400		
-068	68	75.70		5.80		72.20		2.10		1.5900		
-070	70	77.50		5.80	2.4	74.40		2.20	2.55	1.6100		-I090
-072	72	79.60		5.80		76.50		2.25		1.6300		
-075	75	83.30		6.20		79.70		2.35		1.9300		
-078	78	86.80		6.50		82.80	+.30/-.00	2.40		2.4000		
-080	80	89.10		6.70		85.00		2.50		2.5900		
-082	82	91.10	+/-1.40	6.90		87.20		2.60		2.7200		
-085	85	94.40		7.00		90.40		2.70		2.9500		
-088	88	97.90		7.30		93.60		2.80		3.1300		
-090	90	100.00		7.40		95.70		2.85		3.2600		
-092	92	102.20		7.60		97.80		2.90		3.3100		-I108
-095	95	105.60		7.80		101.00		3.00		3.5400		
-098	98	109.00		8.10	2.8	104.20		3.10	2.95	3.9400		
-100	100	110.70		8.20		106.30		3.15		3.9900		
-102	102	112.40		8.40		108.40		3.20		4.2200		
-105	105	115.80		8.40		111.50		3.25		4.4000		
-108	108	119.20		8.50		114.60		3.30		4.5800		
-110	110	120.80		8.70		116.70		3.35		4.7600		
-115	115	126.00	+/-1.65	8.90		121.90		3.45		5.0300		
-120	120	132.40		9.40		127.00	+.40/-.00	3.50		5.6200		
-125	125	137.10		9.50		132.10		3.55		6.0000		
-130	130	142.50		9.80		137.20		3.60		6.3500		-I035
-135	135	148.50		10.40		142.30		3.65		7.9000		
-140	140	154.10		10.40		147.40		3.70		8.3000		
-145	145	159.50		10.60	3.2	152.50		3.75	3.40	8.7000		
-150	150	164.50		10.80		157.60		3.80		8.9000		
-155	155	168.80		10.80		162.70		3.85		9.1000		
-160	160	175.10	+/-2.05	10.90		167.80		3.90		12.1000		
-170	170	185.60		11.40	4.0	178.00		4.00	4.25	13.8000		
-180	180	196.60		12.00		188.40		4.20		15.6000		
-190	190	207.70		12.90		198.80		4.40		22.0000		
-200	200	217.80		13.30		209.00		4.50		23.5000		
-210	210	230.30		14.20		219.40		4.70		27.5000		-I045
-220	220	240.50	+/-2.30	15.00	4.8	230.00	+.50/-.00	5.00	5.10	28.5000		
-230	230	251.40		15.50		240.60		5.30		33.0000		
-240	240	262.30		16.30		251.00		5.50		36.5000		
MHO-250	250	273.30		16.70		261.40		5.70		37.5000		

TOOL DESCRIPTIONS ON PAGE 227.

MHO

AXIAL ASSEMBLY

DESCRIPTION

Tapered section ring to ANSI metric dimensions that is installed axially with pliers into a housing or bore. High thrust load rating._

HOW TO IDENTIFY

1. Measure the bore diameter (Db).
2. Determine the ring thickness (T).
3. Measure the maximum radial wall (S) of the ring.
4. Find the part in the chart above.

GENERAL USE

WEIRD

DIN 472 PAGES 166-170.

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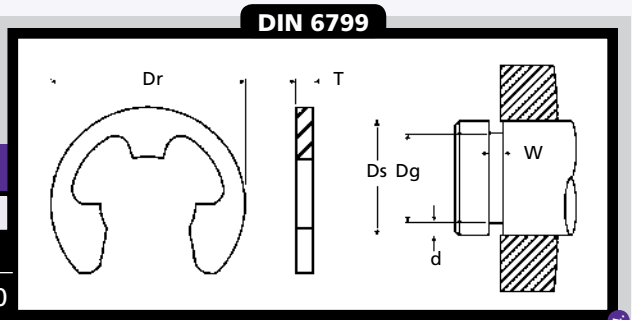


BASIC E-CLIP

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	D1500	Ellison	6799	Seeger	RA
Bossard	BN809-812	Rotor Clip	DE	Waldes	D1500

DE

SHAFT		RING			GROOVE				WEIGHT	MATERIAL		TOOL
From	To	Free Outside Dia. (Dr)	Thickness (T)		Diameter (Dg)		Nominal Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SS"	
DE-008	1.0	1.4	1.95	.20	+/-.02	.8	+.00/-.04	.20	.24	+.04/-.00	0.0003			-708
-012	1.4	2.0	2.90	.30		1.2	+.00/-.06	.25	.34		0.0009			-712
-015	2.0	2.5	3.90	.40		1.5		.38	.44		0.0021			-715
-019	2.5	3.0	4.40	.50		1.9		.43	.54	+.05/-.00	0.0040			-719
-023	3.0	4.0	5.90	.60		2.3		.60	.64		0.0069			-723
-032	4.0	5.0	6.90	.60		3.2	+.000/-.075	.65	.64		0.0088			-310
-040	5.0	7.0	8.85	.70		4.0		1.00	.74		0.0158			-340
-050	6.0	8.0	10.85	.70		5.0		1.00	.74		0.0236			-605
-060	7.0	9.0	11.80	.70		6.0		1.00	.74		0.0255			-606
-070	8.0	11.0	13.80	.90		7.0		1.25	.94		0.0474			-607
-080	9.0	12.0	15.75	1.00	+/-.03	8.0	+.000/-.090	1.25	1.05	+.08/-.00	0.0660			-608
-090	10.0	14.0	18.20	1.10		9.0		1.50	1.15		0.1090			-609
-100	11.0	15.0	19.70	1.20		10.0		1.50	1.25		0.1250			-610
-120	13.0	18.0	22.70	1.30		12.0	+.000/-.110	1.75	1.35		0.1630			-612
-150	16.0	24.0	28.70	1.50		15.0		2.50	1.55		0.3370			-615
-190	20.0	31.0	36.50	1.75		19.0	+.000/-.130	3.25	1.80		0.6420			-619
-240	25.0	38.0	43.50	2.00		24.0		3.75	2.05		0.8550			-
DE-300	32.0	42.0	51.30	2.50		30.0		-	2.55		1.3500			-

TOOL DESCRIPTIONS ON PAGE 234.

DE / DRE

RADIAL ASSEMBLY

DESCRIPTION

Stamped clips to DIN 6799 with three prongs for deep grooves that yield high thrust load capacity. DRE rings are heavier duty for higher thrust loads and 50% higher RPMs.

HOW TO IDENTIFY

1. Determine if you have a DE or DRE based on the shoulder design and appearance.
2. Measure the diameter of the shaft (Ds).
3. Confirm the outside diameter (Dr) of the ring.
4. Determine the ring thickness (T).
5. Find the part in the charts.

GENERAL USE

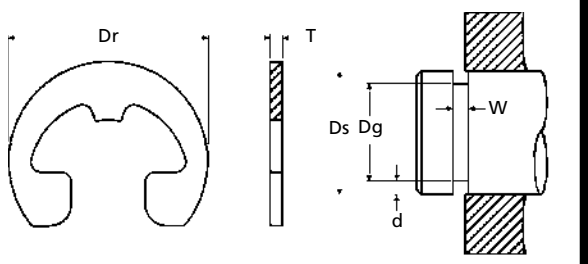
COMMON

ZINC PLATED

STACKED/ROLL PACK

E IMPERIAL Page 26

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



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REINFORCED E-CLIP

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Rotor Clip	MRE		

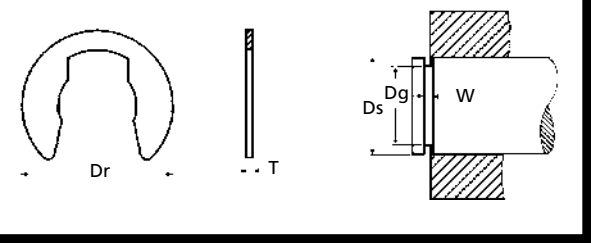
DRE

	SHAFT	RING			GROOVE				WEIGHT	MATERIAL	TOOL
	MM (Ds)	Free Outside Dia. (Dr)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	
DRE-004	4	8.50	.6	+/-.06	3.00	+.00/-.05	.50	.7	0.0140		-120
-005	5	9.50			3.85		.57		0.0180		-130
-006	6	11.35			4.85	+.00/-.10	.57		0.0240		-140
-007	7	13.10			5.40		.80		0.0320		-160
-008	8	14.95			6.40		.80		0.0360		-500
-009	9	15.70	.9		7.10	+.00/-.15	.95	1.0	0.0600		-
-010	10	16.75			7.80		1.10		0.0680		-170
-011	11	18.95			8.80		1.10		0.0860		-270
-012	12	19.60	1.1		9.50		1.25	1.2	0.1200		-
-013	13	20.55			10.2		1.40		0.1450		-200
-014	14	22.10			11.2		1.40		0.1600		-280
DRE-015	15	23.20			11.8		1.60		0.1750		-

TOOL DESCRIPTIONS ON PAGE 234.

DRE TECHNICAL INFORMATION ON PREVIOUS PAGE.

RE IMPERIAL Page 27



SLOTTED E-CLIP

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

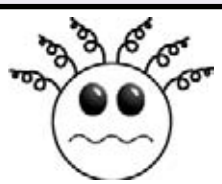
Seeger	ST		

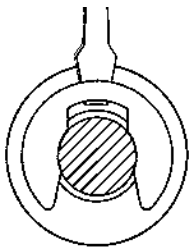
DST

	SHAFT		RING			GROOVE			WEIGHT	MATERIAL
	From (Ds)	To (Ds)	Free Outside Dia. (Dr)	Thickness (T)		Diameter (Dg)		Width Min. (W)	Kg per 100 Pieces	Spring Steel
DST-003	3	4	5.0	.6	+.00/-.05	2.3	+.000/-.075	.64	0.0070	
-004	4	5	7.0			3.2			0.0100	
-005	5	6	8.5			4.0			0.0150	
-006	6	7	10.0	.7		5.0		.74	0.0200	
-007	7	8	11.0	.8		6.0		.85	0.0290	
-008	8	9	13.0			7.0	+.000/-.090		0.0410	
-009	9	10	14.0	1.0	+.00/-.06	8.0		1.05	0.0540	
DST-010	10	11	17.0			9.0			0.0900	

DST

RADIAL ASSEMBLY

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
Variant of standard DIN 6799 E-clip with a slotted ID. Slot yields a pivot point for removal using a screwdriver.	1. Confirm the presence of a slot on inside diameter of the ring. 2. Measure the diameter of the shaft (Ds). 3. Measure the free outside diameter (Dr) of the ring. 4. Determine the ring thickness (T). 5. Find the part in the chart above.	 WEIRD



Slot yields a pivot point for removal using a screwdriver.

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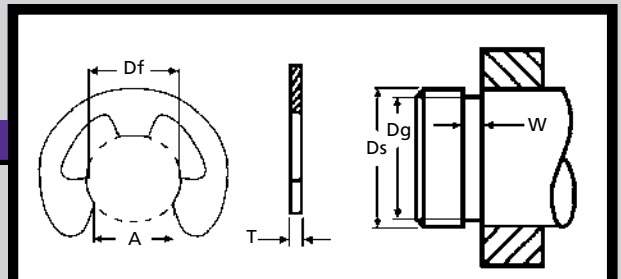


JAPANESE INDUSTRIAL SPEC (JIS)

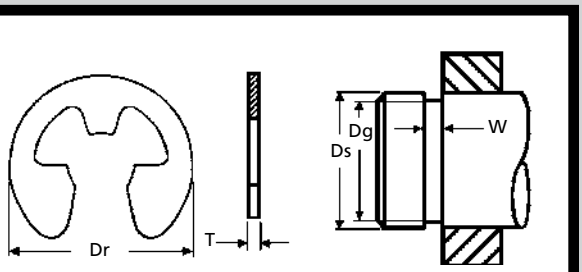
MANUFACTURER CROSS-REFERENCE

Rotor Clip	JE	

JE

SHAFT		RING							GROOVE				MATERIAL	TOOL
From (Ds)	To (Ds)	Free Inside Dia. (Df)		Thickness (T)		Gap (A)		Installed Outside Diameter	Diameter (Dg)		Width (W)		Spring Steel	
JE-0008	1.0	1.4	.8	+/-.05	.2	+/-.02	.7	+.00/-.25	2	+/-.1	.8	+.00/-.08	.30	+/-.05		-
-0012	1.4	2.0	1.2	+/-.06	.3	+/-.025	1.0		3		1.2	+.00/-.09	.40			-
-0015	2.0	2.5	1.5		.4	+/-.03	1.3		4	+/-.2	1.5		.50			-
-002	2.5	3.2	2.0		.4		1.7		5		2.0		.50			-
-0025	3.2	4.0	2.5		.4		2.1		6		2.5		.50			-050
-003	4.0	5.0	3.0		.6	+/-.04	2.6		7		3.0		.70	+/-.10		-070
-004	5.0	7.0	4.0	+/-.075	.6		3.5	+.00/-.30	9		4.0	+.00/-.12	.70			-340
-005	6.0	8.0	5.0		.6		4.3		11		5.0		.70			-605
-006	7.0	9.0	6.0		.8		5.2		12		6.0		.90			-606
-007	8.0	11.0	7.0	+/-.09	.8		6.1	+.00/-.35	14		7.0	+.00/-.15	.90			-607
-008	9.0	12.0	8.0		.8		6.9		16	+/-.3	8.0		.90			-608
-009	10.0	14.0	9.0		.8		7.8		18		9.0		.90			-
-010	11.0	15.0	10.0		1.0	+/-.05	8.7		20		10.0		1.15			-
-012	13.0	18.0	12.0	+/-.11	1.0		10.4	+.00/-.45	23		12.0	+.00/-.18	1.15	+/-.14		-612
-015	16.0	24.0	15.0		1.5	+/-.06	13.0		29		15.0		1.65			-
-019	20.0	31.0	19.0	+/-.13	1.5	+/-.07	16.5		37		19.0	+.00/-.21	1.65			-
JE-024	25.0	38.0	24.0		2.0		20.8	+.00/-.50	44		24.0		2.20			-

CONTACT PLANT FOR TOOL INFORMATION



BRITISH SPECIFICATION

MANUFACTURER CROSS-REFERENCE

Anderton	B1500	

EBS

SHAFT		RING			GROOVE				MATERIAL	TOOL
Decimal (Ds)		Free Outside Dia. (Dr)	Thickness (T)	Installed Outside Diameter	Diameter (Dg)		Width (W)		Spring Steel	
EBS-052	.062 +.030/-.000	.156	.015	.165	.052	+.002/-.0005	.019	+.0025/-.0000		-021A
-074	.094	.187	.020	.200	.074		.024			-002B
-079	.110	.375	.020	.390	.079		.024			-006B
-095	.125 +.040/-.000	.230	.020	.240	.095		.024			-003B
-095A	.125	.230	.025	.240	.095		.029			-003D
-102	.140	.203	.020	.215	.102		.024			-017B
-116	.156 +.050/-.000	.282	.020	.295	.116		.024			-004B
-125	.188	.310	.015	.330	.125	+.002/-.001	.019			-004A
-125A	.188	.310	.020	.330	.125		.024			-004D
-125B	.188	.375	.020	.395	.125		.024			-006B
-125C	.188	.375	.015	.395	.125		.019			-060
-147	.188 +.060/-.000	.335	.020	.350	.147		.024	+.004/-.000		-005A
-147A	.188	.335	.032	.350	.147		.037			-005C
-188	.219	.437	.030	.450	.188		.034			-008B
-210	.250 +.100/-.000	.527	.035	.540	.210		.040			-009C
EBS-250	.312	.500	.035	.520	.250		.040			-009C

CONTACT PLANT FOR TOOL INFORMATION

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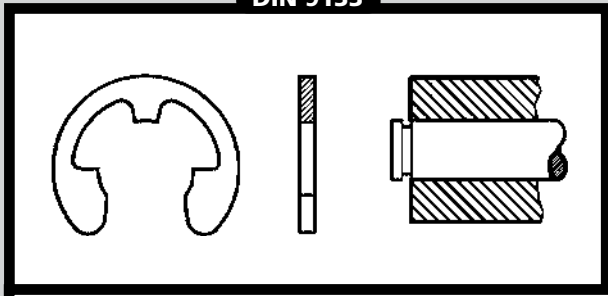
DIN 9133



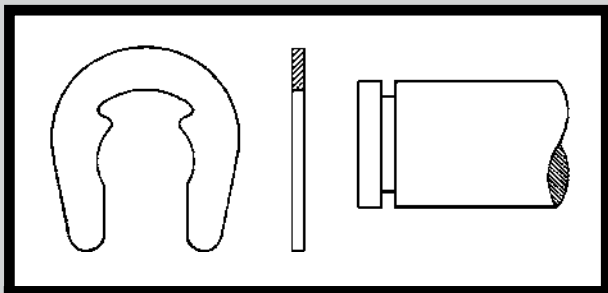
GERMAN STANDARD

MANUFACTURER CROSS-REFERENCE

Ellison	9133		

German-engineered e-clip that conforms to DIN 9133. Used for various applications, including automotive engineering, electrical engineering, and precision mechanical devices.

DE9



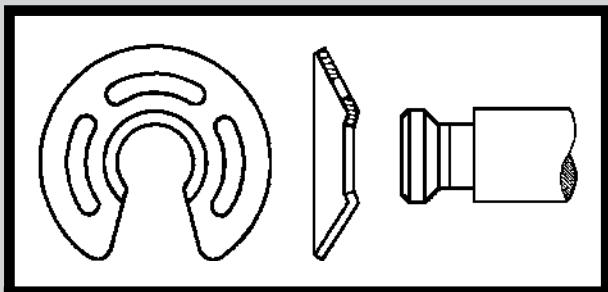
U-CLIP

MANUFACTURER CROSS-REFERENCE *INDEX PAGE 236.*

Benzing	U		
Bossard	BN815		

U-shaped clips for radial application into grooves on shafts. Slot yields a pivot point for removal using a screwdriver. Some sizes available in a stacked roll pack for automated installation.

DU



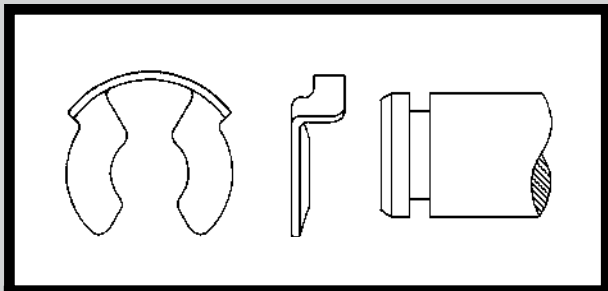
BOWED SLOTTED E-CLIP

MANUFACTURER CROSS-REFERENCE *INDEX PAGE 236.*

Benzing	AS		
Bossard	BN814		

Bowed slotted e-clips with curved shape for resilient end-play take-up. Install with the *concave* surface abutting the part. Slots in the ring serve to make the part lighter, decrease stiffness, and aid in removal.

DBS



CLIP WASHER

MANUFACTURER CROSS-REFERENCE *INDEX PAGE 236.*

Benzing	STS		

Clip washer for radial assembly into grooves on shafts. Bevel allows for take-up of play on axial tolerances. Easily installed by hand using the perpendicular tab at the top of the ring.

DSTS

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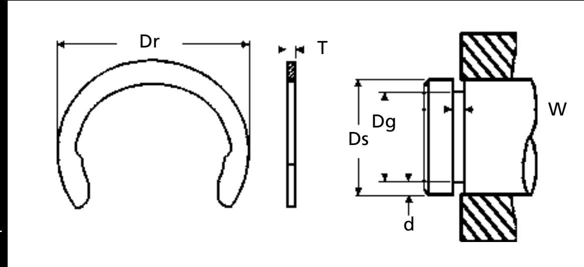
BASIC C-CLIP

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	M1800	Ellison	H	Seeger	H
Bossard	BN831	Rotor Clip	DC		

LOW PROFILE



TOOL DESCRIPTIONS ON PAGE 234.

DC	SHAFT MM (Ds)	RING Free Outside Dia. (Dr)	RING Thickness (T)	RING Thickness Tolerance	RING Installed Outside Diameter	GROOVE Diameter (Dg)	GROOVE Diameter Tolerance	GROOVE Depth (d)	GROOVE Width Min. (W)	WEIGHT Kg per 100 Pieces	MATERIAL Spring Steel	TOOL
DC-003	3	3.98	.40	+.00/-.05	4.1	2.3	+.00/-.07	.35	.44	0.0020		-03
-004	4	5.00			5.2	3.2		.40		0.0040		-04
-005	5	6.20	.60		6.4	4.0		.50	.64	0.0080		-05
-006	6	7.40	.70		7.6	5.0		.50	.74	0.0110		-06
-0065	6.5	8.20			8.4	5.8		.35	.85	0.0120		-
-007	7	8.60	.80		8.8	6.0	+.00/-.09	.50		0.0130		-07
-008	8	10.00			10.2	7.0		.50		0.0170		-08
-009	9	11.20	1.00	+.00/-.06	11.4	8.0		.50	1.10	0.0220		-09
-010	10	12.15			12.4	9.0		.50		0.0260		-10
-011	11	13.20			13.6	10.0	+.00/-.11	.50		0.0290		-11
-012	12	14.35			14.7	10.9		.55		0.0320		-12
-013	13	15.40			15.8	11.8		.60		0.0360		-13
-014	14	16.30			16.7	12.7		.65		0.0400		-14
-015	15	17.40			17.8	13.6		.70		0.0460		-15
-016	16	18.50			18.9	14.5		.75		0.0540		-16
-017	17	19.40			19.9	15.4		.80		0.0640		-17
-018	18	20.40	1.20		20.9	16.3		.85	1.30	0.0720		-18
-019	19	21.50			22.0	17.2		.90		0.0800		-19
-020	20	22.65			23.2	18.1	+.00/-.21	.95		0.0870		-20
-022	22	25.00			25.5	19.9		1.05		0.1100		-22
-023	23	26.00			26.6	20.8		1.10		0.1150		-23
-024	24	27.10			27.7	21.7		1.15		0.1520		-24
-025	25	28.30			28.9	22.6		1.20		0.1740		-25
-026	26	29.40			30.0	23.5		1.25		0.1880		-26
-028	28	31.60	1.50		32.2	25.2		1.40	1.60	0.2320		-
-030	30	33.70			34.4	27.0		1.50		0.2430		-
-032	32	36.10			36.8	28.8		1.60		0.3020		-
-035	35	39.40			40.1	31.5	+.00/-.25	1.75		0.3300		-
-036	36	40.50	1.75		41.2	32.4		1.80	1.85	0.4400		-
-038	38	42.60			43.4	34.2		1.90		0.4620		-
-040	40	45.00			45.8	36.0		2.00		0.5050		-
-042	42	47.20			48.0	37.8		2.10		0.5460		-
-045	45	50.60			51.5	40.5		2.25		0.5980		-
-048	48	54.10			55.0	43.2		2.40		0.7820		-
-050	50	56.40	2.00	+.00/-.07	57.4	45.0		2.50	2.15	0.8850		-
-052	52	58.60			59.6	47.0		2.50		0.9330		-
DC-055	55	61.50			63.0	50.0		2.50		1.0400		-

DC

DESCRIPTION

Radially-assembled part that uses circular deformation for retainage. Narrow section height provides good clearance capabilities. Absence of teeth and deep set mean less thrust load ratings than E-clips. Install using an applicator.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm the diameter of the shaft (Ds).
2. Measure the outside diameter (Dr) of the ring.
3. Determine the ring thickness (T).
4. Find the part in the chart above.

GENERAL USE

COMMON

ZINC PLATED

STACKED/ROLL PACK

IMPERIAL Page 32

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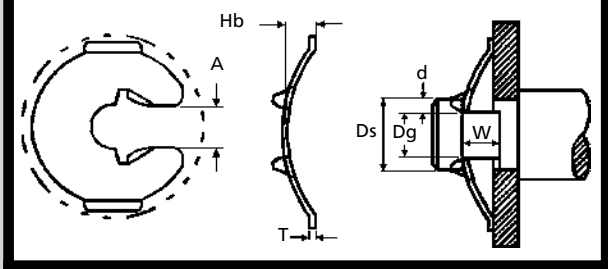
FOR ROTATING PARTS



PRONG LOCKED E-CLIP

MANUFACTURER CROSS-REFERENCE

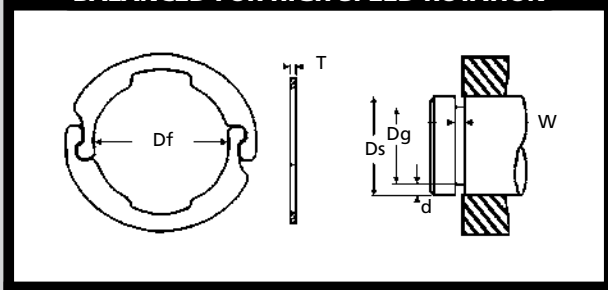
INDEX PAGE 236.

Seeger	SL		

DEL

	SHAFT	RING			GROOVE				WEIGHT	MATERIAL
	MM (Ds)	Gap (A)	Thickness (T)	Bow Height Min. (Hb)	Diameter (Dg)		Depth (d)	Width Min. (W)	Kg per 100 Pieces	Spring Steel
DEL-003	3	2.1	.25	1.2	2.0	+.00/-.10	.50	1.1	0.0070	
-004	4	2.9	.25	1.3	2.8		.60	1.1	0.0090	
-005	5	3.6	.40	1.5	3.5	+.00/-.12	.75	1.3	0.0250	
-006	6	4.2	.40	1.8	4.2		.90	1.5	0.0330	
-008	8	6.2	.40	2.4	6.0		1.00	1.9	0.0530	
-010	10	7.7	.50	3.1	7.5	+.00/-.15	1.25	2.5	0.1000	
-012	12	9.4	.60	3.3	9.2		1.40	2.8	0.1250	
DEL-015	15	12.2	.60	3.8	12.0	+.00/-.18	1.50	3.2	0.1520	

BALANCED FOR HIGH SPEED ROTATION



EL IMPERIAL Page 33

LC IMPERIAL Page 31

INTERLOCKING RING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Seeger	S		

	SHAFT		RING			GROOVE					WEIGHT	MATERIAL	TOOL
	From (Ds)	To (Ds)	Free Inside Dia. (Df)	Thickness (T)	Assembled Outside Diameter	Diameter (Dg)		Depth (d)	Width (W)		Kg per 100 Pieces	Spring Steel	
DLC-010	10	12	8.9	1.00	14.1	9.0	+.00/-.11	.50	1.05	+.05/-.00	0.0640		SEE PAGE 32.
-012	12	14	10.7		16.0	10.9		.55			0.0750		
-014	14	16	12.5		18.0	12.7		.65			0.0850		
-016	16	18	14.3		20.0	14.5		.75			0.0960		
-018	18	20	16.0	1.20	22.7	16.3	+.00/-.21	.85	1.25		0.1500		
-020	20	22	17.8		24.7	18.1		.95			0.1750		
-022	22	24	19.6		26.7	19.9		1.05			0.1900		
-024	24	26	21.4		28.7	21.7		1.15			0.2100		
-026	26	28	23.1		30.6	23.5		1.25			0.2600		
-028	28	30	24.8	1.50	34.1	25.2		1.40	1.60		0.4250		
-030	30	32	26.6		36.1	27.0		1.50			0.4600		
-032	32	35	28.4		38.0	28.8		1.60			0.5000		
-035	35	38	31.0		41.0	31.5	+.00/-.25	1.75			0.5400		
-038	38	40	33.7	1.75	44.7	34.2		1.90	1.85		0.7500		
-040	40	42	35.5		46.7	36.0		2.00			0.8200		
-042	42	45	37.3		48.7	37.8		2.10			0.9000		
-045	45	48	40.0		51.7	40.5		2.25			0.9750		
-048	48	50	42.7		54.7	43.2		2.40			1.0500		
-050	50	55	44.4	2.00	57.9	45.0		2.50	2.10	+.10/-.00	1.4200		
-055	55	60	49.4		62.9	50.0	+.00/-.30	2.50			1.5000		
-060	60	65	54.2		67.9	54.8		2.60			1.7300		
-065	65	70	58.9		72.9	59.5		2.75			2.0000		
-070	70	75	63.7	2.50	79.7	64.3		2.85	2.60		2.9000		
-075	75	80	68.5		84.7	69.1		2.95			3.3000		
-080	80	85	73.3		89.7	73.9		3.05			3.7500		
-085	85	90	78.0		95.0	78.7		3.15			4.9000		
-090	90	95	82.8		101.2	83.5	+.00/-.35	3.25			5.2000		
-095	95	100	87.5		106.7	88.2		3.40			5.4000		
DLC-100	100	105	92.3		112.3	93.0		3.50			5.6000		

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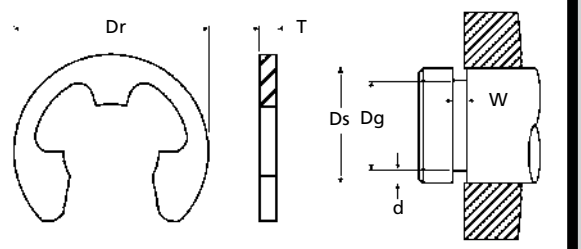
BASIC E-CLIP - ANSI

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Rotor Clip	ME
ANSI	B27.7-3CM1

ANSI METRIC DIMENSIONS



ME

SHAFT		RING			GROOVE				WEIGHT	MATERIAL	TOOL
MM (Ds)	Decimal (Ds)	Free Outside Dia. (Dr)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	
ME-002	.079	4.0	.25	+/-.05	1.45	+.00/-.05	.28	.32	0.0014		-040
-003	3	.118	5.6	.40		2.30		.35	.50	+.10/-.00	0.0036		-050
-004	4	.157	7.2	.60	+/-.06	3.10	+.00/-.08	.45	.70	+.15/-.00	0.0095		-100
-005	5	.197	8.5			3.90		.55			0.0130		-120
-006	6	.236	11.1			4.85		.58			0.0210		-140
-008	8	.315	14.6			6.40		.80			0.0350		-290
-009	9	.354	15.8	.90		7.20	+.00/-.10	.90	1.00		0.0580		-608
-010	10	.393	16.8			8.00		1.00			0.0680		-290
-012	12	.472	18.6	1.10		9.60	+.00/-.15	1.20	1.20		0.1000		-609
-015	15	.591	22.8			11.80		1.60			0.1400		-612
-016	16	.630	23.8			12.50		1.75			0.1450		-210
-020	20	.787	30.0	1.30		16.00	+.00/-.20	2.00	1.40		0.2800		-
ME-025	25	.984	37.1			20.00		2.50			0.4200		-

CONTACT PLANT FOR TOOL INFORMATION.

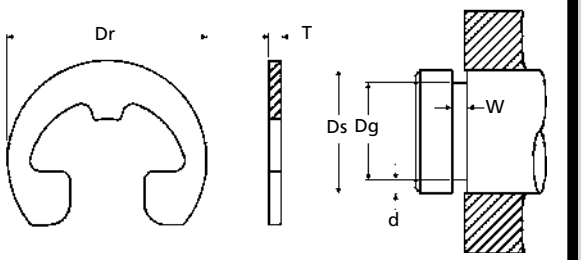
REINFORCED E-CLIP - ANSI

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Rotor Clip	MRE
ANSI	B27.8M-3EM1

ANSI METRIC DIMENSIONS



MRE

SHAFT	RING			GROOVE				WEIGHT	MATERIAL	TOOL
MM (Ds)	Free Outside Dia. (Dr)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	
MRE-004	4	8.50	.6	+/-.06	3.00	+.00/-.05	.50	.7	+.15/-.00	0.0140		-120
-005	5	9.50			3.85		.57			0.0180		-130
-006	6	11.35			4.85	+.00/-.10	.57			0.0240		-140
-008	8	14.95			6.40	+.00/-.15	.80			0.0360		-500
-009	9	15.70	.9		7.10		.95	1.0		0.0600		-
-010	10	16.75			7.80		1.10			0.0680		-170
-012	12	19.60	1.1		9.50		1.25	1.2		0.1200		-
MRE-015	15	23.20			11.8		1.60			0.1750		-

CONTACT PLANT FOR TOOL INFORMATION.

ME / MRE

DESCRIPTION

Stamped clips to ANSI metric dimensions with three prongs for deep grooves that yield high thrust load capacity. MRE rings are heavier duty for higher thrust loads, and 50% higher RPM's.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Determine if you have a ME or MRE based on the shoulder design and appearance.
2. Measure the diameter of the shaft (Ds).
3. Confirm the free outside diameter (Dr) of the ring. Determine the ring thickness (T).
4. Find the part in the charts above.

GENERAL USE

WEIRD

DIN 6799 PAGE 182.

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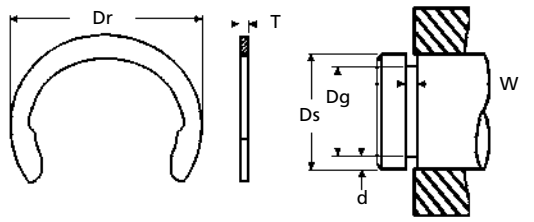
ANSI METRIC DIMENSIONS



BASIC C-CLIP - ANSI

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Rotor Clip	MC		
ANSI	B27.8M-3SM1		

MC

SHAFT	RING			GROOVE				WEIGHT	MATERIAL	TOOL
MM (Ds)	Free Outside Dia. (Dr)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	
MC-003	3	3.98	+/-.06	.4	2.3	+.00/-.05	.35	.50	+.10/-.00	0.0019		-
-004	4	5.00			3.2		.40			0.0025		-080
-005	5	6.20	+/-.08		4.0	+.00/-.07	.50			0.0055		-
-006	6	7.40			5.0		.50			0.0072		-320
-007	7	8.60			6.0		.50			0.0090		-
-008	8	10.00	+/-.09	.6	7.0		.50	.70		0.0120		-350
-009	9	11.20			8.0		.50			0.0130		-
-010	10	12.15			9.0		.50			0.0150		-
-011	11	13.20	+/-.18		10.0	+.00/-.10	.50			0.0170		-
-012	12	14.35			10.9		.55			0.0200		-
-013	13	15.40		1.0	11.8		.60	1.10		0.0390		-
-014	14	16.30			12.7		.65			0.0420		-
-015	15	17.40			13.6		.70			0.0500		-
-016	16	18.50			14.5		.75			0.0510		-400
-017	17	19.40			15.4		.80			0.0550		-
-018	18	20.40		1.2	16.3		.85	1.30		0.0670		-
-019	19	21.50			17.2		.90			0.0850		-280
-020	20	22.65			18.1		.95			0.0850		-
-022	22	25.00	+/-.21		19.9	+.00/-.20	1.05			0.1070		-
-023	23	26.00			20.8		1.10			0.1150		-
-024	24	27.10			21.7		1.15			0.1200		-
-025	25	28.30			22.6		1.20			0.1400		-
-026	26	29.40			23.5		1.25			0.1500		-
-028	28	31.60		1.6	25.2		1.40	1.75		0.2500		-
-030	30	33.70			27.0		1.50			0.2600		-
-032	32	36.10			28.8		1.60			0.3200		-
-035	35	39.40	+/-.25		31.5	+.00/-.25	1.75			0.3500		-480
-036	36	40.50			32.4		1.80			0.4100		-
-038	38	42.60			34.2		1.90			0.4300		-
-040	40	45.00	+/-.39		36.0		2.00			0.4700		-
-042	42	47.20			37.8		2.10			0.5000		-
-045	45	50.60			40.5		2.25			0.5400		-
-048	48	54.10			43.2		2.40			0.7100		-
-050	50	56.40		2.0	45.0		2.50	2.15		0.8900		-
-052	52	58.60			47.0		2.50			0.9300		-
MC-055	55	61.50			50.0		2.50			1.0400		-

CONTACT PLANT FOR TOOL INFORMATION.

MC

DESCRIPTION

Radially-assembled part to ANSI metric dimensions that uses circular deformation for retainage. Narrow section height provides good clearance capabilities. Absence of teeth and deep set mean less thrust load ratings than E-clips. Install using an applicator.

RADIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm the diameter of the shaft (Ds).
2. Measure the free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T).
4. Find the part in the chart above.

GENERAL USE

WEIRD

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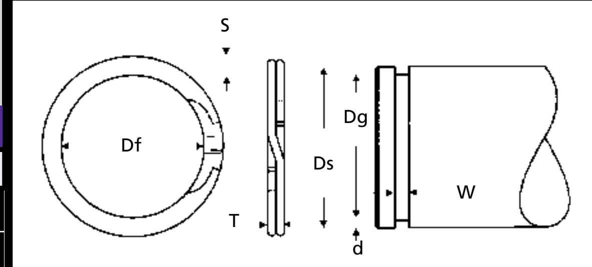
BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	DNS

DIN METRIC SERIES



DS	SHAFT MM (Ds)	RING Free Inside Dia. (Df)		RING Radial Wall (S)	RING Thickness (T)		GROOVE Diameter (Dg)		GROOVE Depth (d)	GROOVE Width (W)		WEIGHT Kg per 100 Pieces	MATERIAL Spring Steel	MATERIAL Stainless "-SO2"
DS-013	13	12.27	+.00/-.33	1.27-1.48	.99	+/-.05	12.4	+.00/-.11	.3	1.10	+.14/-.00	0.0470		
-014	14	13.26					13.4					0.0500		
-015	15	14.15					14.3		.4			0.0530		
-016	16	15.04		1.52-1.73			15.2					0.0670		
-017	17	16.04					16.2					0.0710		
-018	18	16.83		1.78-1.98	1.14		17.0		.5	1.30		0.1000		
-019	19	17.83					18.0					0.1060		
-020	20	18.82					19.0	+.00/ -.13				0.1110		
-021	21	19.79					20.0					0.1160		
-022	22	20.78					21.0					0.1210		
-023	23	21.77					22.0					0.1270		
-024	24	22.66		2.03-2.24			22.9	+.00/-.21	.6			0.1500		
-025	25	23.65					23.9					0.1560		
-026	26	24.64					24.9					0.1620		
-027	27	25.34					25.6		.7			0.1670		
-028	28	26.34	+.00/-.38	2.26-2.46	1.44		26.6			1.60		0.2430		
-029	29	27.33					27.6					0.2520		
-030	30	28.32					28.6					0.2600		
-032	32	30.00		3.12-3.33			30.3	+.00/-.25	.9			0.3840		
-033	33	30.99					31.3					0.3950		
-034	34	31.98					32.3					0.4060		
-035	35	32.66					33.0		1.0			0.4140		
-036	36	33.65		3.89-4.09	1.69		34.0			1.85		0.6290		
-038	38	35.64					36.0					0.6630		
-040	40	37.11	+.00/-.51				37.5		1.3			0.6870		
-042	42	39.09					39.5					0.7200		
-045	45	42.06					42.5					0.7700		
-046	46	43.05					43.5					0.7860		
-047	47	44.04					44.5					0.8030		
-048	48	45.03					45.5					0.8190		
-050	50	46.53	+.00/-.63	4.93-5.18	1.93	+/-.08	47.0		1.5	2.15		1.2470		
-052	52	48.51					49.0					1.2940		
-054	54	50.50					51.0	+.00/-.30				1.3420		
-055	55	51.49					52.0					1.3660		
-056	56	52.48					53.0					1.3900		
-058	58	54.43					55.0					1.4370		
-060	60	56.42					57.0					1.4850		
-062	62	58.42					59.0					1.5340		
-063	63	59.39					60.0					1.5570		
DS-065	65	61.39			2.41		62.0			2.65		2.0050		

DS

DESCRIPTION

Popular series for metric applications that will accommodate light and medium bearing series thrust loads. For aerospace, see page 192. Fits same grooves but does not conform to DIN 471.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure the free inside diameter (Df) of the ring.
3. Determine thickness (T) and radial wall (S).
4. Find the part in the charts.

GENERAL USE

UNCOMMON

FITS INTO THE SAME GROOVE AS DIN 471

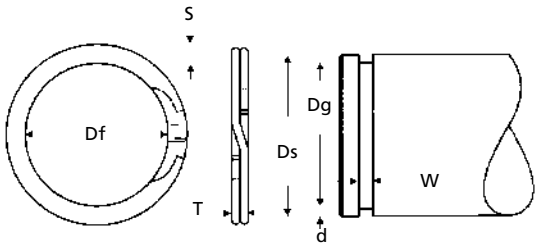
GROOVE INTERCHANGE

USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DS ↔ DSH (Page 152) ↔ DSHI (Page 160) ↔ DAK (Page 162) ↔ DAL (Page 163)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



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BASIC EXTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Smalley	DNS		

DS

SHAFT	RING				GROOVE			WEIGHT	MATERIAL	
MM (Ds)	Free Inside Dia. (Df)		Radial Wall (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SO2"
DS-067	67	63.37	+.00/-.63	4.93-5.18	2.41	+/-.08	64.0	+.00/-.30	1.5	2.65	+.14/-.00	2.0650		
-068	68	64.34	+.00/-.76				65.0					2.0940		
-070	70	66.34					67.0					2.1540		
-072	72	68.33					69.0					2.2140		
-075	75	71.33					72.0					2.3050		
-077	77	73.33					74.0					2.3650		
-078	78	74.33					75.0					2.3950		
-080	80	75.81		5.89-6.15			76.5		1.8			2.9380		
-082	82	77.81					78.5					3.0100		
-085	85	80.80		6.15-6.40	2.91		81.5	+.00/-.35		3.15		3.9330		
-088	88	83.80	+.00/-.89				84.8					4.0690		
-090	90	85.80					86.5					4.1590		
-095	95	90.80					91.5					4.3850		
-098	98	93.79					94.5					4.5200		
-100	100	95.79					96.5					4.6100		
-105	105	100.28	+.00/-1.30	6.58-6.83	3.89	+/-.10	101.0	+.00/-.54	2.0	4.15	+.18/-.00	6.9030		
-108	108	103.25					104.0					7.0940		
-110	110	105.23					106.0					7.2220		
-115	115	110.19					111.0					7.5420		
-120	120	115.16					116.0					7.8630		
-125	125	120.12					121.0	+.00/-.63				8.1830		
-130	130	125.07					126.0					8.5020		
-135	135	130.02					131.0					8.8210		
-140	140	134.98					136.0					9.1410		
-145	145	139.93					141.0					9.4600		
-150	150	143.91	+.00/-1.52	7.72-8.03			145.0		2.5			11.5310		
-155	155	148.89					150.0					11.9090		
-160	160	153.85					155.0					12.2860		
-165	165	158.80					160.0					12.6620		
-170	170	163.75					165.0					13.0380		
-175	175	168.73					170.0					13.4160		
-180	180	173.69					175.0					13.7930		
-185	185	178.66	+.00/-1.78				180.0					14.1700		
-190	190	183.59					185.0					14.5450		
-200	200	193.54					195.0					15.3000		
-210	210	202.54		10.90-11.20	4.86		204.0	+.00/-.72	3.0	5.15		28.3920		
-220	220	212.47					214.0					29.7120		
-230	230	222.40					224.0					31.0320		
-240	240	232.33					234.0					32.3510		
-250	250	242.24	+.00/-2.30	12.45-12.83			244.0					33.6680		
-260	260	250.19					252.0	+.00/-.81	4.0			39.9740		
-270	270	260.15					262.0					41.4890		
-280	280	270.08					272.0					42.9990		
-290	290	279.98					282.0					44.5040		
-300	300	289.92					292.0					46.0160		
-310	310	297.84	+.00/-2.80	15.62-16.00	5.87	+/-.13	300.0	+.00/-.89	5.0	6.20	+.22/-.00	72.0200		
-320	320	307.84					310.0					74.3160		
-330	330	317.75					320.0					76.5910		
-340	340	327.69					330.0					78.8730		
-350	350	337.64					340.0					81.1570		
-360	360	347.57					350.0					83.4370		
-370	370	357.48					360.0					85.7120		
-380	380	367.41					370.0					87.9920		
-390	390	377.34					380.0					90.2710		
DS-400	400	387.25					390.0					92.5460		

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

METRIC SPIRAL RINGS

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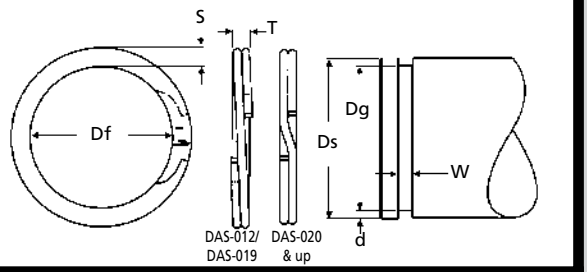
EXTERNAL AEROSPACE

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	ES		
Aerospace	MA4016		

METRIC AEROSPACE



DAS

SHAFT	RING				GROOVE				WEIGHT	MATERIAL	
MM (Ds)	Free Inside Dia. (Df)		Radial Wall (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Kg per 100 Pieces	Spring Steel	Stainless "-SO2"
DAS-012	11.18	+.000/-.330	1.02-1.22	.60	+/-.050	11.29	+/-.060	.36	.70	+.080/-.000	0.0310		
-013	12.13		1.14-1.35	.89		12.24		.38	1.00		0.0330		
-014	13.06					13.19		.41			0.0350		
-015	13.98					14.09		.46			0.0380		
-016	14.90		1.27-1.48			15.02	+/-.075	.49			0.0400		
-017	15.82					16.02		.49			0.0430		
-018	16.80		1.52-1.73	1.07		16.92		.54	1.20		0.0740		
-019	17.73					17.87		.57			0.0780		
-020	18.62					18.77		.62			0.0820		
-021	19.57					19.72		.64			0.0860		
-022	20.45		1.78-1.98			20.62		.69			0.1050		
-023	21.39					21.57		.72			0.1100		
-024	22.35					22.52		.74			0.1150		
-025	23.25		2.03-2.24			23.42		.79			0.1380		
-026	24.21					24.42		.79			0.1420		
-027	25.04		2.49-2.69	1.27		25.35	+/-.100	.83	1.40	+.100/-.000	0.2160		
-028	26.00					26.30		.85			0.2240		
-029	26.95					27.27		.87			0.2320		
-030	27.92					28.25		.88			0.2390		
-031	28.84					29.17		.92			0.2470		
-032	29.77					30.09		.96			0.2540		
-034	31.54		2.87-3.07			31.90		1.05			0.3130		
-035	32.44					32.80		1.10			0.3210		
-036	33.40					33.75		1.13			0.3290		
-037	34.24					34.67		1.17			0.3380		
-038	35.18					35.66		1.17			0.3450		
-040	37.15	+.000/-.510	3.12-3.33	1.57	+/-.075	37.55	+/-.150	1.23	1.75		0.4920		
-042	39.02					39.45		1.28			0.5160		
-045	41.77					42.25		1.38			0.5510		
-046	42.67					43.15		1.43			0.5630		
-047	43.81		3.89-4.09			44.31		1.35			0.7260		
-048	44.48					45.05		1.48			0.7410		
-050	46.69					47.05		1.48			0.7690		
-052	49.62	+.000/-.630	3.12-3.33	1.25	+/-.080	50.15		.93	1.42		0.4620		
-053	50.62					51.15		.93			0.4790		
-054	51.62					52.15		.93			0.4960		
DAS-055	52.62		3.38-3.58			53.15		.93			0.5200		

DAS

DESCRIPTION

Standard metric series produced to metric aerospace specifications. Fits into grooves designed for two turn spiral rings in light and medium duty applications.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Measure the free inside diameter (Df) of the ring.
3. Determine thickness (T) and radial wall (S).
4. Find the part in the charts.

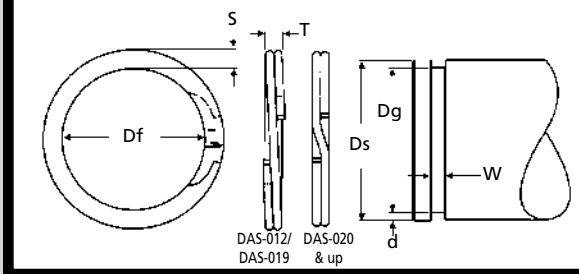
GENERAL USE

WEIRD

FOR METRIC SERIES FOR DIN 471 GROOVES, SEE PAGES 190-191.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

METRIC AEROSPACE



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G.L. HUYETT

EXTERNAL AEROSPACE

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	ES		
Aerospace	MA4016		

DAS	SHAFT	RING				GROOVE				WEIGHT	MATERIAL	
	MM (Ds)	Free Inside Dia. (Df)		Radial Wall (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SO2"
DAS-056	56	53.62	+.000/-.630	3.38-3.58	1.25 +/-.080	54.15	+/-.150	.93	1.42 +.100/-.000	0.5300		
-058	58	55.43				56.01		1.00		0.5800		
-059	59	56.43				57.01		1.00		0.5820		
-060	60	57.43				58.01		1.00		0.5850		
-061	61	58.36				58.91		1.05		0.6050		
-062	62	59.30		3.63-3.84		59.91		1.05		0.6250		
-063	63	60.30				60.91		1.05		0.6450		
-064	64	61.25				61.91		1.05		0.6680		
-065	65	62.20				62.81		1.10		0.6900		
-066	66	63.16				63.79		1.11		0.7070		
-067	67	64.16				64.71		1.15		0.7240		
-068	68	65.08		3.89-4.09		65.71		1.15		0.7400		
-069	69	66.06	+.000/-.760			66.71		1.15		0.7500		
-070	70	67.08				67.71		1.15		0.7600		
-071	71	68.04				68.71		1.15		0.7800		
-072	72	69.00		4.11-4.37		69.65		1.18		0.8000		
-075	75	71.93				72.61		1.20		0.8700		
-078	78	74.84		4.37-4.62	1.55	75.55		1.23	1.73 +.130/-.000	1.1300		
-080	80	76.80				77.51		1.25		1.2100		
-082	82	78.72				79.45		1.28		1.2700		
-085	85	81.62		4.62-4.88		82.35		1.33		1.3400		
-088	88	84.53				85.31		1.35		1.4300		
-090	90	86.43		4.88-5.13		87.21		1.40		1.4900		
-095	95	91.37	+.000/-1.000			92.15		1.43		1.6200		
-100	100	96.10		5.13-5.38		97.01		1.50		1.7800		
-105	105	100.94		5.38-5.64		101.85		1.58		1.9700		
-110	110	105.75		5.64-5.89		106.69		1.66		2.1400		
-115	115	110.59		5.89-6.15		111.55		1.73		2.3200		
-120	120	115.49		6.20-6.45	1.83	116.45		1.78	2.00	3.3500		
-125	125	120.44				121.45		1.78		3.5000		
-130	130	125.34				126.35		1.83		3.6400		
-135	135	130.20	+.000/-1.300			131.27	+/-.175	1.87		3.8000		
-140	140	135.14				136.25		1.88		3.9000		
-145	145	140.00				141.17		1.92		4.0600		
-150	150	145.00				146.17		1.92		4.2000		
-155	155	149.33	+.000/-1.520	7.72-8.03	2.18 +/-.100	150.60	+/-.200	2.20	2.40 +.150/-.000	6.5000		
-160	160	154.31				155.60		2.20		6.7500		
-165	165	159.23				160.60		2.20		6.9200		
-170	170	164.00				165.40		2.30		7.1500		
-175	175	169.00				170.40		2.30		7.3400		
-180	180	173.78				175.20		2.40		7.5700		
-185	185	178.70				180.20		2.40		7.7000		
-190	190	183.70				185.20		2.40		8.0000		
-195	195	188.43	+.000/-1.780			190.00		2.50		8.2000		
-200	200	193.43				195.00		2.50		8.3500		
-210	210	202.93		9.32-9.63		204.60		2.70		10.6000		
-220	220	212.65				214.40		2.80		11.3000		
-230	230	222.60				224.40		2.80		11.5000		
-240	240	232.32				234.20		2.90		12.1000		
-250	250	241.83				243.80		3.10		12.4000		
-260	260	251.57				253.60		3.20		13.1000		
-270	270	261.30				263.40		3.30		13.6000		
DAS-280	280	271.04				273.20		3.40		14.0000		

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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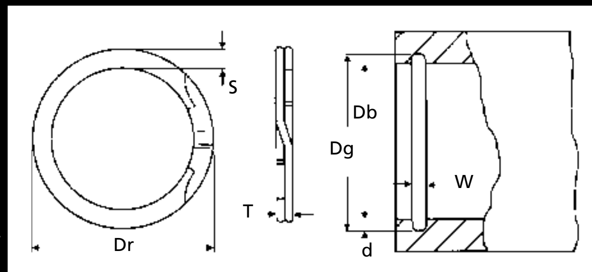
DIN METRIC SERIES



BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	DNH

DH

Part	BORE MM (Db)	RING Free Outside Dia. (Dr)	Dr Tolerance	RING Radial Wall (S)	RING Thickness (T)	T Tolerance	GROOVE Diameter (Dg)	Dg Tolerance	GROOVE Depth (d)	GROOVE Width (W)	W Tolerance	WEIGHT Kg per 100 Pieces	MATERIAL Spring Steel	MATERIAL Stainless "-SO2"
DH-013	13	13.72	+.33/-.00	1.27-1.48	.99	+/-.05	13.6	+.11/-.00	.3	1.10	+.14/-.00	0.0420		
-014	14	14.75					14.6					0.0450		
-015	15	15.85					15.7		.4			0.0490		
-016	16	16.97		1.52-1.73			16.8					0.0620		
-017	17	17.98					17.8					0.0660		
-018	18	19.18		1.78-1.98			19.0	+.13/-.00	.5			0.0800		
-019	19	20.19					20.0					0.0850		
-020	20	21.21					21.0					0.0900		
-021	21	22.23					22.0					0.0940		
-022	22	23.23					23.0					0.0990		
-023	23	24.33	+.38/-.00	2.03-2.24	1.14		24.1	+.21/-.00	.6	1.30		0.1470		
-024	24	25.45					25.2					0.1550		
-025	25	26.45					26.2					0.1610		
-026	26	27.48					27.2					0.1680		
-027	27	28.68		2.26-2.46			28.4		.7			0.1950		
-028	28	29.69					29.4					0.2020		
-029	29	30.71					30.4	+.25/-.00				0.2100		
-030	30	31.71					31.4					0.2180		
-031	31	33.02					32.7		.9			0.2270		
-032	32	34.04					33.7					0.2350		
-033	33	35.05					34.7					0.2430		
-034	34	36.07		3.12-3.33	1.44		35.7			1.60		0.3790		
-035	35	37.38					37.0		1.0			0.3940		
-036	36	38.39					38.0					0.4050		
-037	37	39.40					39.0					0.4170		
-038	38	40.41					40.0					0.4290		
-040	40	42.93	+.51/-.00	3.89-4.09	1.69		42.5		1.3	1.85		0.6500		
-041	41	43.94					43.5					0.6670		
-042	42	44.96					44.5					0.6840		
-045	45	47.98					47.5					0.7350		
-047	47	49.99					49.5					0.7680		
-048	48	51.00					50.5	+.30/-.00				0.7850		
-050	50	53.54	+.63/-.00	4.93-5.18	1.93	+/-.08	53.0		1.5	2.15		1.1070		
-051	51	54.54					54.0					1.1300		
-052	52	55.55					55.0					1.1530		
-055	55	58.57					58.0					1.2210		
-056	56	59.59					59.0					1.2450		
-057	57	60.60					60.0					1.2670		
-058	58	61.62					61.0					1.2910		
DH-060	60	63.63					63.0					1.3360		

DH

DESCRIPTION

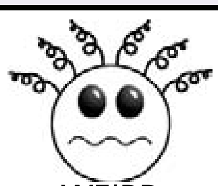
Popular series for metric applications that will accommodate light and medium bearing series thrust loads. For aerospace, see page 196. Fits into same grooves but does not conform to DIN 472.

AXIAL ASSEMBLY

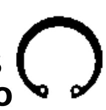
HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Measure the free outside diameter (Dr) of the ring.
3. Determine thickness (T) and radial wall (S).
4. Find the part in the charts.

GENERAL USE



WEIRD



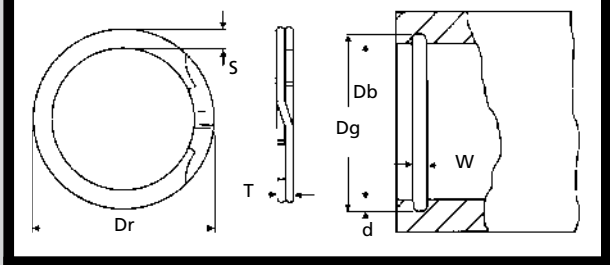
FITS INTO THE SAME GROOVE AS DIN 472 SNAP RINGS.

GROOVE INTERCHANGE
USE ANY OF THESE PARTS IN THE SAME SIZED GROOVE.

DH ↔ DHO (Page 166) ↔ DHOI (Page 172) ↔ DJK (Page 175) ↔ DJL (Page 177)

PERFORMANCE RESULTS VARY. YOUR RING SELECTION SHOULD BE MADE BASED ON INDIVIDUAL APPLICATION.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS



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G.L.HUYETT

BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Smalley	DNH		

DIN 472 GROOVES

DH	BORE	RING				GROOVE				WEIGHT	MATERIAL	
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SO2"
DH-062	62	65.66	+.63/-.00	4.93-5.18	1.93	65.0	+.30/-.00	1.5	2.15	1.3820		
-063	63	66.67				66.0				1.4050		
-064	64	67.67				67.0				1.4200		
-065	65	68.67	+.76/-.00		2.41	68.0			2.65	1.8120		
-068	68	71.67				71.0				1.8970		
-070	70	73.67				73.0				1.9530		
-072	72	75.67				75.0				2.0100		
-075	75	78.68				78.0				2.0950		
-078	78	81.69				81.0	+.35/-.00			2.1810		
-080	80	84.19		5.89-6.15		83.5		1.8		2.8050		
-082	82	86.20				85.5				2.8770		
-085	85	89.20	+0.89/-.00		2.91	88.5			3.15	3.6040		
-088	88	92.21				91.5				3.7340		
-090	90	94.21				93.5				3.8210		
-092	92	96.22				95.5				3.9080		
-095	95	99.24				98.5				4.0390		
-098	98	102.26				101.5				4.1700		
-100	100	104.29				103.5				4.2580		
-102	102	106.79	+1.30/-.00	6.58-6.83	3.89	106.0	+.54/-.00	2.0	4.15	6.4540		
-105	105	109.79				109.0				6.6480		
-108	108	112.80				112.0				6.8420		
-110	110	114.83				114.0				6.9730		
-112	112	116.84				116.0				7.1030		
-115	115	119.86				119.0				7.2970		
-120	120	124.92				124.0	+.63/-.00			7.6240		
-125	125	129.97				129.0				7.9500		
-127	127	131.97				131.0				8.0790		
-130	130	135.00				134.0				8.2740		
-140	140	145.11				144.0				8.9260		
-150	150	156.13	+1.40/-.00	7.72-8.03		155.0		2.5		11.2560		
-160	160	166.22				165.0				12.0220		
-170	170	176.33				175.0				12.7900		
-180	180	186.39				185.0	+.72/-.00			13.5540		
-190	190	196.47	+1.78/-.00			195.0				14.3190		
-200	200	206.58				205.0				15.0870		
-210	210	217.58		9.32-9.63	4.86	216.0		3.0	5.15	23.7270		
-220	220	227.66				226.0				24.8770		
-230	230	237.72				236.0				26.0240		
-240	240	247.80				246.0				27.1740		
-250	250	257.89				256.0	+.81/-.00			28.3240		
-260	260	269.93		10.90-11.20		268.0		4.0		34.3980		
-270	270	280.01				278.0				35.7380		
-280	280	290.09	+3.05/-.00			288.0				37.0770		
-290	290	300.15				298.0				38.4140		
-300	300	310.24				308.0				39.7550		
-310	310	322.25	+3.56/-.00	12.45-12.83	5.87	320.0	+.89/-.00	5.0	6.20	56.8510		
-320	320	332.33				330.0				58.7030		
-330	330	342.42				340.0				60.5560		
-340	340	352.50				350.0				62.4070		
-350	350	362.56				360.0				64.2550		
-360	360	372.64				370.0				66.1060		
-370	370	382.73				380.0				67.9590		
-380	380	392.79				390.0				69.8070		
-390	390	402.84				400.0				71.6520		
DH-400	400	412.93				410.0				73.5050		

+/-.08 (Thickness) · +/-.10 (Thickness) · +/-.13 (Thickness) · +.14/-.00 (Width) · +.18/-.00 (Width) · +.22/-.00 (Width)

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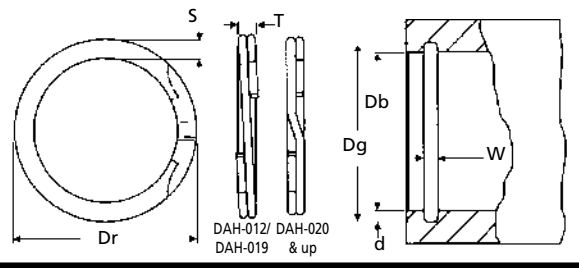
INTERNAL AEROSPACE

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley Aerospace	EH MA4017

METRIC AEROSPACE



DAH

BORE	RING				GROOVE				WEIGHT	MATERIAL	
MM (Db)	Free Outside Dia. (Dr)		Radial Wall (S)	Thickness (T)		Diameter (Dg)		Depth (d)	Width (W)		Kg per 100 Pieces	Spring Steel	Stainless "-SO2"
DAH-012	12	12.89		1.02-1.22	.60		12.70		.35	.70		0.0300		
-013	13	13.95					13.75		.38			0.0330		
-014	14	15.07		1.27-1.47			14.85		.43			0.0400		
-015	15	16.14					15.90		.45			0.0430		
-016	16	17.15					16.95		.48			0.0460		
-017	17	18.32		1.52-1.73	.89		18.05	+/-.050	.53	1.00		0.0580		
-018	18	19.39					19.10		.55			0.0620		
-019	19	20.48					20.17		.59			0.0660		
-020	20	21.51		1.78-1.98			21.22		.61			0.0940		
-021	21	22.56					22.27		.64			0.1000		
-022	22	23.65					23.37		.69			0.1050		
-023	23	24.69		2.03-2.24	1.07		24.42		.71			0.1240		
-024	24	25.73					25.47	+/-.075	.74	1.20		0.1300		
-025	25	27.03					26.67		.84			0.1360		
-026	26	28.07	+.350/-.000			+/-.050	27.77		.89		+.080/-.000	0.1420		
-027	27	29.11		2.49-2.69			28.87		.94			0.2090		
-028	28	30.10					29.87		.94			0.2180		
-029	29	31.21					30.95		.98			0.2270		
-030	30	32.28					32.00		1.00			0.2360		
-031	31	33.32					33.05		1.03			0.2440		
-032	32	34.23			1.27		34.00		1.00	1.40		0.2530		
-034	34	36.46		2.87-3.07			36.20		1.10			0.3060		
-035	35	37.55					37.30		1.15			0.3160		
-036	36	38.68					38.40		1.20			0.3240		
-037	37	39.60					39.40	+/-.100	1.20			0.3350		
-038	38	40.77					40.50		1.25			0.3450		
-040	40	42.91		3.12-3.33			42.50		1.25			0.4870		
-042	42	45.01	+.510/-.000				44.60		1.30			0.5130		
-045	45	48.13			1.57	+/-.075	47.70		1.35			0.5530		
-046	46	49.28					48.80		1.40	1.75		0.5670		
-047	47	50.32		3.89-4.09			49.90		1.45			0.7070		
-048	48	51.46					51.00		1.50			0.7250		
-050	50	53.66					53.20		1.60			0.7590		
-052	52	54.30	+.500/-.000	3.12-3.33			53.79	+/-.125	.90			0.4600		
-053	53	55.32					54.79		.90			0.4800		
-055	55	57.38			1.25		56.85		.93	1.42		0.5200		
-056	56	58.40	+.630/-.000	3.38-3.58		+/-.080	57.85	+/-.150	.93			0.5300		
-058	58	60.43					59.85		.93			0.5400		
DAH-059	59	61.54					60.93		.97			0.5550		

DAH

DESCRIPTION

Standard metric series produced to metric aerospace specifications. Fits into grooves designed for two turn spiral rings in light and medium duty applications.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Measure the free outside diameter (Dr) of the ring.
3. Determine thickness (T) and radial wall (S).
4. Find the part in the charts.

GENERAL USE

WEIRD

FOR METRIC SERIES DIN 472 GROOVES, SEE PAGES 194-195.

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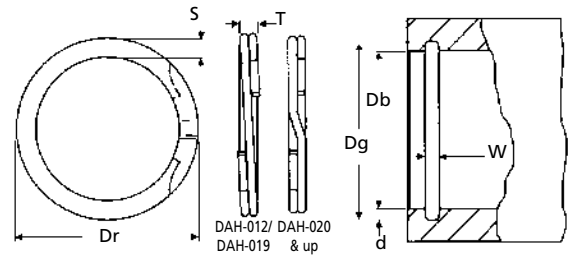

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INTERNAL AEROSPACE

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	EH		
Aerospace	MA4017		

DAH	BORE	RING				GROOVE				WEIGHT	MATERIAL	
	MM (Db)	Free Outside Dia. (Dr)		Radial Wall (S)	Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)	Kg per 100 Pieces	Spring Steel	Stainless "-SO2"
DAH-060	60	62.57	+.630/-.000	3.38-3.58	1.25	61.99	+/-.150	1.00	1.42	0.5700		
-061	61	63.65		3.63-3.84		63.09		1.05		0.5900		
-062	62	64.70				64.09		1.05		0.6100		
-063	63	65.70				65.09		1.05		0.6250		
-064	64	66.77				66.19		1.10		0.6420		
-065	65	67.82				67.19		1.10		0.6600		
-066	66	68.80				68.19		1.10		0.6770		
-067	67	69.90				69.25		1.13		0.6940		
-068	68	70.94		3.89-4.09		70.29		1.15		0.7100		
-069	69	71.94				71.29		1.15		0.7200		
-070	70	72.94				72.29		1.15		0.7300		
-071	71	73.99				73.29		1.15		0.7700		
-072	72	75.04		4.11-4.39		74.39		1.20		0.8100		
-075	75	78.07				77.39		1.20		0.8500		
-078	78	81.21	+.760/-.000		1.55	80.45		1.23	1.73	1.1000		
-080	80	83.22		4.37-4.62		82.49		1.25		1.1600		
-082	82	85.28				84.55		1.28		1.2300		
-085	85	88.38		4.62-4.88		87.65		1.33		1.3000		
-088	88	91.45				90.69		1.35		1.3700		
-090	90	93.58		4.88-5.13		92.79		1.40		1.4500		
-092	92	95.66				94.85		1.43		1.4900		
-095	95	98.69				97.85		1.43		1.5600		
-098	98	101.83		5.13-5.38		100.99		1.50		1.7100		
-100	100	103.83				102.99		1.50		1.7500		
-102	102	106.00		5.38-5.64		105.15		1.58		1.8500		
-105	105	109.00				108.15		1.58		1.9600		
-108	108	112.22	+.900/-.000	5.64-5.89		111.31		1.66		2.0600		
-110	110	114.25				113.31		1.66		2.1000		
-112	112	116.44		5.89-6.15		115.45		1.73		2.2200		
-115	115	119.44				118.45		1.73		2.3000		
-120	120	124.54		6.20-6.45	1.83	123.55		1.78	2.00	3.3000		
-125	125	129.59				128.55		1.78		3.5000		
-130	130	134.71				133.65		1.83		3.6000		
-135	135	139.74	+1.140/-.000			138.62	+/-.180	1.81		3.7000		
-140	140	144.87				143.72		1.86		3.8000		
-145	145	150.04				148.82		1.91		4.0000		
-150	150	155.07				153.82		1.91		4.1000		
-155	155	160.72	+1.400/-.000	7.72-8.03	2.18	159.40	+/-.200	2.20	2.40	6.3000		
-160	160	165.74				164.40		2.20		6.5000		
-165	165	170.77				169.40		2.20		6.7000		
-170	170	176.05				174.60		2.30		7.0000		
-175	175	181.05				179.60		2.30		7.2000		
-180	180	186.38				184.88		2.44		7.4000		
-185	185	191.10	+1.650/-.000			189.88		2.44		7.6000		
-190	190	196.45				194.88		2.44		7.8000		
-195	195	201.74				200.14		2.57		8.0000		
-200	200	206.76				205.14		2.57		8.2000		
-210	210	217.10		9.32-9.63		215.40		2.70		10.4000		
-220	220	227.40				225.64		2.82		11.0000		
-230	230	237.73				235.90		2.95		11.4000		
-240	240	247.80				245.90		2.95		11.9000		
-250	250	258.10				256.16		3.08		12.3000		
-260	260	268.43				266.40		3.20		13.0000		
-270	270	278.50				276.40		3.20		13.3000		
DAH-280	280	288.82				286.66		3.33		13.9000		

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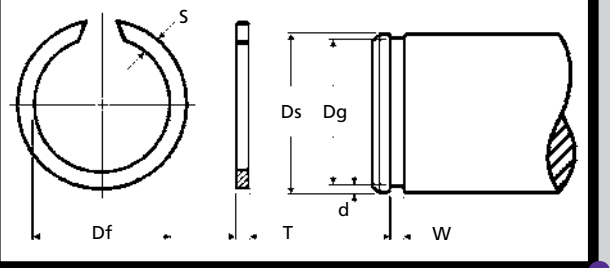

EXTERNAL METRIC

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

DUSC	SHAFT		RING					GROOVE					MATERIAL	TOOL
	Decimal (Ds)	MM (Ds)	Free Inside Dia. (Df)		Radial Wall (S)		Thickness (T)	Diameter (Dg)		Depth (d)	Width (W)		Spring Steel	
DUSC-0584	.4724	12	.421	+.000/-.020	.062	+/-.003	.042	.436	+/-.002	.018	.046	+.003/-.000		-E015R
-0594	.5906	15	.538	+.000/-.025	.078		.047	.550		.020	.053	+.004/-.000		
-0614	.6693	17	.616		.078			.629						
-0639R	.7874	20	.710		.093		.062	.731		.028	.068			
-0698R	.9843	25	.910	+.000/-.031	.109			.924		.030				-E047R
-0740R	1.1811	30	1.093		.125	+/-.005	.075	1.111	+/-.004	.035	.085			
-0823	1.3780	35	1.265		.156		.093	1.288		.045	.108	+.005/-.000		
-0916R	1.5748	40	1.452		.156			1.465		.055				
-0974R	1.7717	45	1.625	+.000/-.046	.188			1.648		.062				
-1065R	1.9685	50	1.820		.188			1.844						
-1129R	2.1654	55	1.995		.218		.109	2.015		.075	.120			
-1185	2.3622	60	2.187		.218			2.212						
-1258	2.5591	65	2.359		.250		.125	2.389		.085	.139	+.006/-.000		-E601R
-1308R	2.7559	70	2.556	+.000/-.062	.250			2.586						
-1378	2.9528	75	2.750		.250			2.783						
-1407R	3.1496	80	2.946		.250			2.979	+/-.006					
-1468R	3.3465	85	3.139		.250			3.176						
-1517R	3.5433	90	3.308	+.000/-.078	.312			3.343		.100				
-1551R	3.7402	95	3.500		.312			3.540						
-1572R	3.9370	100	3.697		.312		.156	3.737			.174	+.008/-.000		-E602R
-2919R	4.1339	105	3.888		.312			3.934						
DUSC-1625R	4.3307	110	4.080		.312			4.131						

CONTACT PLANT FOR TOOL INFORMATION.

DUSC

AXIAL ASSEMBLY

DESCRIPTION

Metric wire formed external retaining ring for use with SAE standard bearings. See the bearing cross reference chart on page 199 for bearing numbers.

HOW TO IDENTIFY

1. Confirm the shaft diameter (Ds).
2. Measure the free inside diameter (Df) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

SEE BEARING CROSS REFERENCE CHART ON PAGE 201.

USC IMPERIAL Page 68

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BEARING CROSS REFERENCE

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EXTERNAL

DUSC	BASIC BEARING NUMBER		
	Light	Medium	Heavy
DUSC-0584	201	301	-
-0594	202	302	-
-0614	203	303	403
-0639R	204	304	404
-0698R	205	305	405
-0740R	206	306	406
-0823	207	307	407
-0916R	208	308	408
-0974R	209	309	409
-1065R	210	310	410
DUSC -1129R	211	311	411

DUSC	BASIC BEARING NUMBER		
	Light	Medium	Heavy
DUSC-1185	212	312	412
-1258	213	313	413
-1308R	214	314	414
-1378	215	315	415
-1407R	216	316	416
-1468R	217	317	417
-1517R	218	318	418
-1551R	219	319	419
-1572R	220	320	420
-2919R	221	321	421
DUSC-1525R	222	322	422

DUSC ON PAGE 198.

INTERNAL

DUHB	BASIC BEARING NUMBER		
	Light	Medium	Heavy
DUHB-0738-1	200	-	-
-0721-1	-	-	-
-0725-1R	-	-	-
-0775	201	-	-
-0744	-	-	-
-2884-R	-	-	-
-0837	202	-	-
-0801	-	300	-
-0793-R	-	-	-
-0866	-	-	-
-0846-1	-	301	-
-0836-R	-	-	-
-0913-1	203	-	-
-0886	-	-	-
-0887	-	-	-
-1880-4	-	-	-
-0932-1	-	302	-
-3068-1	-	-	-
-1026-1	204	-	-
-0992-1	-	303	-
-0981-R	-	-	-
-1080-2	205	-	-
-1080-2A	-	304	-
-1069-R	-	-	-
-1208-1	206	-	-
-1208-1A	-	305	-
-1198	-	-	403
-1343-3	207	-	-
-1331	-	306	-
-1336	-	-	404
-1433-1	208	-	-
-1410	-	307	-
-1415-R	-	-	405
-1483-1	209	-	-
-1469-2	-	-	-
-1472-5R	-	-	-
-1526-1	210	-	-
DUHB-1521	-	308	-

DUHB	BASIC BEARING NUMBER		
	Light	Medium	Heavy
DUHB-1504	-	-	406
-1581-5	211	-	-
-1573-1	-	309	-
-2230	-	-	407
-1634-3	212	-	-
-1626-3	-	310	-
-1627-2	-	-	408
-2104	213	-	-
-1661	-	311	-
-2103	-	-	409
-1924	214	-	-
-1683-2	-	-	-
-1678-1	-	-	-
-1701-1	215	-	-
-1699-2	-	312	-
-2008	-	-	410
-1720	216	-	-
-1719	-	313	-
-3033-1	-	-	411
-2790-1	217	-	-
-1739	-	314	-
-2013	-	-	412
-1759-1	218	-	-
-1754-2	-	315	-
-2117-2	-	-	413
-2656-1	219	-	-
-1767-2	-	316	-
-2581	-	-	-
-1956	220	-	-
-3222	-	317	-
-4570	-	-	414
-2331-1	221	-	-
-3960-2	-	318	-
-2246-2	-	-	-
-2034-6	222	-	-
-1801	-	319	-
DUHB-2127-1	-	-	416

DUHB ON PAGE 200.

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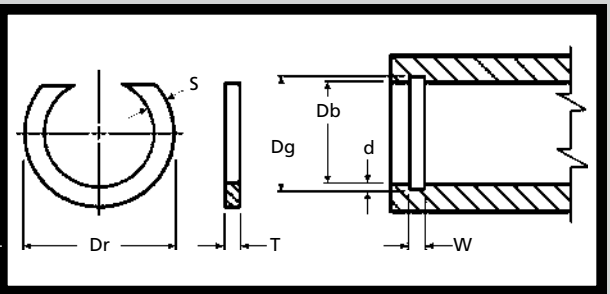

METRIC SAE BEARINGS

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

DUHB

BORE		RING			GROOVE			MATERIAL
Decimal (Db)	MM (Db)	Free Outside Dia. (Dr)	Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Spring Steel
DUHB-0738-1	29.93	1.265	.100	.031	1.243	.031	.035	
-0721-1	1.1811	1.265	.125	.042	1.253	.036	.046	
-0725-1R		1.271	.109	.062	1.251	.035	.068	
-0775	31.93	1.349	.100	.031	1.321	.031	.035	
-0744	1.2598	1.343	.125	.042	1.331	.036	.046	
-2884-R		1.365	.109	.062	1.329	.035	.068	
-0837	34.92	1.468	.100	.031	1.440	.031	.035	
-0801	1.3780	1.468	.125	.042	1.450	.036	.046	
-0793-R		1.486	.140	.062	1.458	.040	.068	
-0866	36.92	1.546	.100	.031	1.518	.031	.035	
-0846-1	1.4567	1.546	.125	.042	1.528	.036	.046	
-0836-R		1.564	.140	.062	1.536	.040	.068	
-0913-1	39.91	1.687	.125	.042	1.654	.040	.046	
-0886	1.5748	1.703	.156	.042	1.668	.047	.046	
-0887		1.703	.156	.062	1.668	.047	.068	
-1880-4	41.90	1.765	.125	.042	1.733	.040	.046	
-0932-1	1.6535	1.781	.156	.042	1.747	.047	.046	
-3068-1		1.781	.156	.062	1.747	.047	.062	
-1026-1	46.89	1.968	.125	.042	1.930	.040	.046	
-0992-1	1.8504	1.968	.156	.042	1.944	.047	.046	
-0981-R		1.976	.172	.062	1.951	.050	.068	
-1080-2	51.88	2.171	.156	.042	2.137	.045	.046	
-1080-2A	2.0472	2.171	.156	.042	2.141	.047	.046	
-1069-R		2.179	.172	.062	2.148	.050	.068	
-1208-1	61.86	2.562	.156	.062	2.530	.045	.068	
-1208-1A	2.4409	2.562	.156	.062	2.544	.052	.068	
-1198		2.593	.187	.093	2.565	.062	.103	
-1343-3	71.83	2.968	.156	.062	2.934	.050	.068	
-1331	2.8346	2.984	.187	.062	2.959	.062	.068	
-1336		3.000	.187	.093	2.959	.062	.103	
-1433-1	79.82	3.281	.156	.062	3.249	.050	.068	
-1410	3.1496	3.296	.187	.062	3.274	.062	.068	
-1415-R		3.312	.218	.093	3.274	.062	.103	
-1483-1	84.81	3.484	.156	.062	3.446	.050	.068	
-1469-2	3.3465	3.500	.187	.062	3.471	.062	.068	
-1472-5R		3.500	.218	.093	3.471	.062	.103	
-1526-1	89.79	3.687	.156	.093	3.643	.050	.103	
DUHB-1521	3.5433	3.703	.187	.093	3.668	.062	.103	

+.031/-.000 (Dr) · +.046/-.000 (Dr) · +.062/-.000 (Dr) · +.093/-.000 (Dr) · +/-.005 (S) · +/-.002 (T) · +/-.005 (Dg) · +/-.006 (Dg) · +.004/-.000 (W)

DUHB

AXIAL ASSEMBLY

DESCRIPTION

Metric wire formed internal retaining ring for use with SAE standard bearings. See the bearing cross reference chart on page 199 for bearing numbers.

HOW TO IDENTIFY

1. Confirm the bore diameter (Db).
2. Measure the free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the charts above.

GENERAL USE

UNCOMMON

SEE BEARING CROSS REFERENCE CHART ON PAGE 199.

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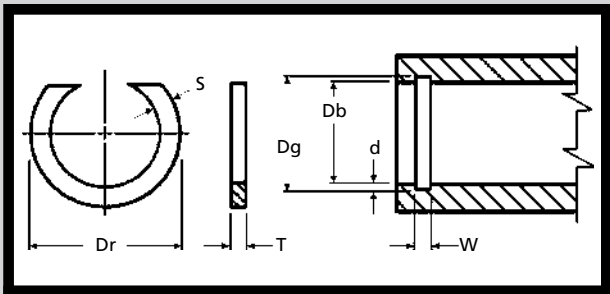

METRIC SAE BEARINGS

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

DUHB

	BORE		RING			GROOVE			MATERIAL
	Decimal (Db)	MM (Db)	Free Outside Dia. (Dr)	Radial Wall (S)	Thickness (T)	Diameter (Dg)	Depth (d)	Width (W)	Spring Steel
DUHB-1504	3.5433	89.79	3.750	.250	.125	3.713	.085	.103	
-1581-5	3.9370	100.00	4.093	.187	.093	4.062	.062	.103	
-1573-1			4.140	.250	.093	4.107	.085	.103	
-2230			4.140	.250	.125	4.107	.085	.139	
-1634-3	4.3307	110.00	4.500	.187	.093	4.455	.062	.103	
-1626-3			4.531	.250	.093	4.500	.085	.103	
-1627-2			4.531	.250	.125	4.500	.085	.139	
-2104	4.7244	120.00	4.937	.250	.109	4.884	.080	.120	
-1661			4.953	.281	.109	4.912	.094	.120	
-2103			4.937	.250	.125	4.894	.085	.139	
-1924	4.9213	125.00	5.125	.250	.109	5.081	.080	.120	
-1683-2			5.156	.281	.109	5.109	.094	.120	
-1678-1			5.151	.312	.156	5.121	.100	.174	
-1701-1	5.1181	130.00	5.312	.250	.109	5.278	.080	.120	
-1699-2			5.343	.281	.109	5.306	.094	.120	
-2008			5.355	.312	.156	5.318	.100	.174	
-1720	5.5118	140.00	5.703	.250	.109	5.671	.080	.120	
-1719			5.750	.281	.109	5.699	.094	.120	
-3033-1			5.750	.312	.156	5.711	.100	.174	
-2790-1	5.9055	150.00	6.093	.250	.109	6.065	.080	.120	
-1739			6.125	.281	.109	6.093	.094	.120	
-2013			6.156	.312	.156	6.105	.100	.174	
-1759-1	6.2992	160.00	6.500	.250	.109	6.459	.080	.120	
-1754-2			6.550	.281	.109	6.497	.094	.120	
-2117-2			6.550	.312	.156	6.500	.100	.174	
-2656-1	6.6929	170.00	6.937	.312	.125	6.872	.100	.139	
-1767-2			6.982	.375	.125	6.942	.125	.139	
-2581			6.937	.312	.156	6.892	.100	.174	
-1956	7.0866	180.00	7.343	.312	.125	7.286	.100	.139	
-3222			7.380	.375	.125	7.336	.125	.139	
-4570			7.380	.375	.187	7.336	.125	.209	
-2331-1	7.4803	190.00	7.718	.312	.125	7.680	.100	.139	
-3960-2			7.781	.375	.125	7.730	.125	.139	
-2246-2			7.782	.375	.187	7.730	.125	.209	
-2034-6	7.8740	200.00	8.125	.312	.125	8.074	.100	.139	
-1801			8.187	.375	.125	8.125	.125	.139	
DUHB-2127-1			8.187	.375	.187	8.125	.125	.209	

RING: Free Outside Dia. (Dr) +.093/-.000; Radial Wall (S) +/-.005; Thickness (T) +/-.002
GROOVE: Diameter (Dg) +/-.006; Depth (d) +/-.007; Width (W) +.004/-.000

DUHB

DESCRIPTION

Metric wire formed internal retaining ring for use with SAE standard bearings. See the bearing cross reference chart on page 199 for bearing numbers.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Confirm the bore diameter (Db).
2. Measure the free outside diameter (Dr) of the ring.
3. Determine the ring thickness (T) and radial wall (S).
4. Find the part in the charts above.

GENERAL USE

UNCOMMON

UHB
IMPERIAL Page 72

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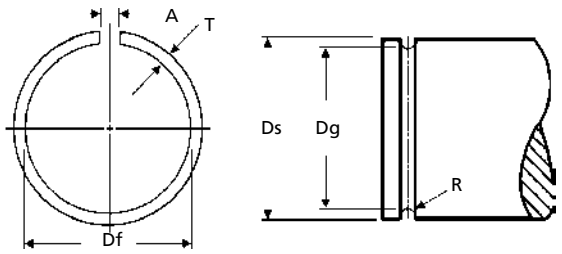

DIN 7993A

ROUND SECTION - EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Bossard	BN825	Seeger	RW
Ellison	7993A	DIN	7993A

DRP	SHAFT	RING				GROOVE			WEIGHT	MATERIAL
	MM (Ds)	Free Inside Dia. (Df)		Wire Cross Section (T)	Gap (A)	Diameter (Dg)		Radius (R)	Kg per 100 Pieces	Spring Steel
DRP-004	4	3.1	+.0/-.2	.8	1	3.2	+/-.05	.5	0.0044	
-005	5	4.1				4.2			0.0057	
-006	6	5.1				5.2			0.0069	
-007	7	6.1	+.0/-.3		2	6.2			0.0077	
-008	8	7.1				7.2			0.0090	
-010	10	9.1				9.2			0.0115	
-012	12	10.8	+.0/-.4	1.0	3	11.0		.6	0.0210	
-014	14	12.8				13.0			0.0250	
-016	16	14.2		1.6		14.4		.9	0.0740	
-018	18	16.2				16.4			0.0830	
-020	20	17.7	+.0/-.5	2.0		18.0	+/-.10	1.1	0.1450	
-022	22	19.7				20.0			0.1600	
-024	24	21.7				22.0			0.1780	
-025	25	22.7				23.0			0.1840	
-026	26	23.7				24.0			0.1910	
-028	28	25.7				26.0			0.2070	
-030	30	27.7				28.0			0.2220	
-032	32	29.1	+.0/-.6	2.5	4	29.5		1.4	0.3670	
-035	35	32.1				32.5			0.3980	
-038	38	35.1				35.5			0.4400	
-040	40	37.1				37.5			0.4640	
-042	42	39.0	+.0/-.8			39.5			0.4870	
-045	45	42.0				42.5			0.5230	
-048	48	45.0				45.5			0.5600	
-050	50	47.0				47.5			0.5830	
-055	55	51.1		3.2		51.8	+/-.15	1.8	1.0510	
-060	60	56.1				56.8			1.1500	
-065	65	61.1				61.8			1.2490	
-070	70	66.0	+.0/-1.0		5	66.8			1.3400	
-075	75	71.0				71.8			1.4390	
-080	80	76.0				76.8			1.5380	
-085	85	81.0				81.8			1.6380	
-090	90	86.0				86.8			1.7370	
-095	95	91.0				91.8			1.8360	
-100	100	95.8	+.0/-1.2			96.8			1.9310	
-105	105	100.8				101.8			2.0300	
-110	110	105.8				106.8			2.1290	
-115	115	110.8				111.8			2.2290	
-120	120	115.8				116.8			2.3280	
DRP-125	125	120.8				121.8			2.4270	

DRP

AXIAL ASSEMBLY

DESCRIPTION

Round section wire rings mostly used in semicircular grooves. Applications include gear systems, automotive engineering, and retaining gudgeon pins.

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Confirm free diameter (Df), wire cross-section (T), and gap (A) of the part.
3. Find the part in the chart above.

GENERAL USE

UNCOMMON

CLOSED GAP DESIGN

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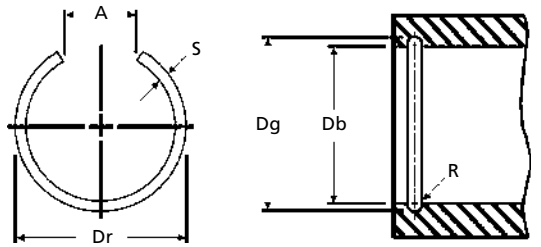
DIN 7993B



ROUND SECTION - INTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Bossard	BN826	Seeger	RB
Ellison	7993B	DIN	7993B

DIN 7993B

DRB

BORE	RING				GROOVE			WEIGHT	MATERIAL
MM (Db)	Free Outside Diameter (Dr)		Wire Cross Section (S)	Gap (A)	Diameter (Dg)		Radius (R)	Kg per 100 Pieces	Spring Steel
DRB-007	7	7.9	+.3/-.0	.8	4	7.8	+/-.05	.5	0.0071	
-008	8	8.9				8.8			0.0083	
-010	10	10.9				10.8			0.0108	
-012	12	13.2	+.4/-.0	1.0	6	13.0		.6	0.0196	
-014	14	15.2				15.0			0.0234	
-016	16	17.8		1.6	8	17.6		.9	0.0706	
-018	18	19.8				19.6			0.0804	
-020	20	22.3	+.5/-.0	2.0	10	22.0	+/-.10	1.1	0.1320	
-022	22	24.3				24.0			0.1470	
-024	24	26.3				26.0			0.1630	
-025	25	27.3				27.0			0.1700	
-026	26	28.3				28.0			0.1790	
-028	28	30.3				30.0			0.1940	
-030	30	32.3				32.0			0.2100	
-032	32	34.9	+.6/-.0	2.5	12	34.5		1.4	0.3470	
-035	35	37.9				37.5			0.3850	
-038	38	40.9				40.5			0.4200	
-040	40	42.9				42.5			0.4430	
-042	42	45.0	+.8/-.0		16	44.5			0.4540	
-045	45	48.8				47.5			0.4890	
-048	48	51.0				50.5			0.5240	
-050	50	53.0				52.5			0.5510	
-055	55	58.9	+1.0/-.0	3.2	20	58.2	+/-.15	1.8	0.9770	
-060	60	63.9				63.2			1.0760	
-065	65	68.9				68.2			1.1750	
-070	70	74.0			25	73.2			1.2440	
-075	75	79.0				78.2			1.3430	
-080	80	84.0				83.2			1.4420	
-085	85	89.0				88.2			1.5410	
-090	90	94.0				93.2			1.6400	
-095	95	99.0	+1.2/-.0		32	98.2			1.7390	
-100	100	104.2				103.2			1.7980	
-105	105	109.2				108.2			1.8980	
-110	110	114.2				113.2			1.9970	
-115	115	119.2				118.2			2.0960	
-120	120	124.2				123.2			2.1950	
DRB-125	125	129.2				128.2			2.2940	

Tolerance per B DIN 2076.

DRB

AXIAL ASSEMBLY

DESCRIPTION

Round section wire rings mostly used in semicircular grooves. Applications include gear systems, automotive engineering, and retaining gudgeon pins.

HOW TO IDENTIFY

1. Verify bore diameter (Ds).
2. Confirm free diameter (Df), wire cross-section (T), and gap (A) of the part.
3. Find the part in the chart above.

GENERAL USE

UNCOMMON

OPEN GAP DESIGN

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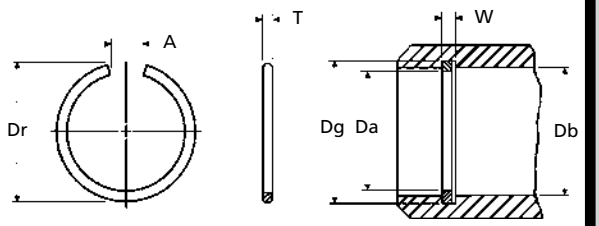
ROUND SECTION - INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	M1700

FOR GUDGEON PIN RETENTION



D17	BORE	RING					GROOVE			MATERIAL
	MM (Db)	Free Outside Diameter Min. (Dr)	Wire Cross Section (T)		Gap Min. (A)	Assembled Inside Dia. (Da)	Diameter (Dg)		Width (W)		Spring Steel
D17-010	10	11.8	.9	+.08/-.04	7.0	8.9	11.05	+.15/-.00	1.0	+.08/-.00	
-012	12	13.9	1.0			10.8	13.13		1.1		
-0125	12.5	14.4				11.3	13.64				
-013	13	14.9				11.8	14.15				
-014	14	16.1	1.2		7.5	12.6	15.34		1.3		
-015	15	17.1				13.6	16.36				
-016	16	18.1				14.6	17.35				
-017	17	19.3	1.4		8.0	15.3	18.54		1.5		
-0175	17.5	20.0			9.0	15.8	19.05				
-018	18	20.5				16.3	19.56				
-019	19	21.5				17.3	20.55				
-020	20	22.5				18.3	21.54				
-021	21	23.7	1.6		9.5	19.1	22.76		1.7		
-022	22	24.7				20.1	23.75				
-024	24	27.0	1.8		10.0	21.9	25.96		1.9		
-025	25	27.9				22.9	26.95				
-028	28	31.1	2.0	+.10/-.05	11.0	25.7	30.15		2.1	+.10/-.00	
-030	30	33.1				27.7	32.15				
-032	32	35.1				29.7	34.15				
D17-034	34	37.1				31.7	36.17				

D17

AXIAL ASSEMBLY

DESCRIPTION

Round section wire formed ring for internal application. Used to retain gudgeon pins. This ring type is gradually becoming obsolete.

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Confirm free diameter (Df), wire cross-section (T), and gap (A) of the part.
3. Find the part in the chart above.

GENERAL USE

WEIRD

SPECIAL ORDER ONLY.

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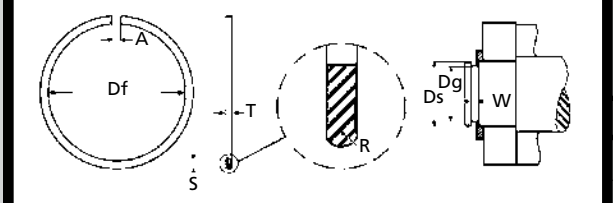

EXTERNAL - RADIUSED EDGE

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	M3200	Peterson	R Series
Ellison	ESP	Seeger	SP

DSP

	SHAFT		RING							GROOVE			WEIGHT	MATERIAL
	MM (Ds)	Decimal (Ds)	Free Inside Dia. (Df)		Radial Wall (S)		Thickness (T)		Gap (approx.) (A)	Radius min. (R)	Diameter (Dg)		Width (W)		Kg per 100 Pieces	Spring Steel
DSP-022	22	.8661	20.3		2.39		1.07				20.64		1.30		0.2700	
-030	30	1.1811	27.4								28.17				0.2800	
-032	32	1.2598	29.4	+.4/-.0							30.15				0.3000	
-035	35	1.3780	32.4		3.25				3		33.17				0.3200	
-037	37	1.4567	34.0								34.77				0.3400	
-040	40	1.5748	37.3								38.10				0.3600	
-042	42	1.6535	38.9								39.75				0.3800	
-044	44	1.7323	40.9	+.5/-.0			1.12			.4	41.75	+.00/-.25	1.35		0.4000	
-047	47	1.8504	43.7								44.60				0.5300	
-050	50	1.9685	46.7								47.60				0.5800	
-052	52	2.0472	48.8								49.73				0.5900	
-055	55	2.1654	51.7		4.04				4		52.60				0.6200	
-056	56	2.2047	52.4								53.60				0.6500	
-058	58	2.2835	54.4								55.60				0.6700	
-062	62	2.4409	58.2	+.8/-.0							59.61				1.0500	
-065	65	2.5591	61.2								62.60				1.1000	
-068	68	2.6772	63.4				1.70			.6	64.82		1.90		1.2600	
-072	72	2.8346	67.4								68.81				1.4700	
-075	75	2.9528	70.4								71.83				1.5300	
-080	80	3.1496	75.4		4.85				5		76.81				1.6300	
-090	90	3.5433	85.4								86.79				2.6600	
-100	100	3.9370	95.2				2.46				96.80		2.70		2.9200	
-110	110	4.3307	105.2	+1.0/-.0							106.81				3.2800	
-120	120	4.7244	113.6								115.21				6.0600	
-125	125	4.9213	118.6								120.22				6.3000	
-130	130	5.1181	123.6		7.21		2.82		7	.7	125.22	+.00/-.50	3.10		6.5600	
-150	150	5.9005	142.9	+1.6/-.0							145.24				7.7200	
-160	160	6.2992	152.9								155.22				8.1000	
-180	180	7.0866	171.2		9.60		3.10				173.66		3.50		12.8000	
-200	200	7.8740	191.0	+1.8/-.0							193.65				14.8000	
-225	225	8.8583	214.3								217.00				19.6000	
-240	240	9.4488	229.2								232.00				20.9000	
-250	250	9.8425	239.2		10.00		3.50			1.2	242.00		4.50	+.4/-.0	22.0000	
-260	260	10.2362	247.5	+2.5/-.0					10		252.00				23.0000	
-280	280	11.0236	267.5			+.00/-.30					272.00				25.0000	
-300	300	11.8110	284.5								290.00				40.0000	
-320	320	12.5984	304.0	+3.0/-.0							310.00				42.0000	
-340	340	13.3858	324.0		12.00		4.50	+.0/-.2		1.5	330.00		5.50	+.5/-.0	44.6000	
-370	370	14.5669	353.0								360.00				48.5000	
DSP-400	400	15.7480	383.0								390.00				52.5000	

DSP

AXIAL ASSEMBLY

DESCRIPTION

Used to secure roller bearings. Unique radiused edge makes these parts very application-specific.

HOW TO IDENTIFY

1. Confirm that the ring has radiused edges.
2. Verify shaft diameter (Ds).
3. Determine free diameter (Df), radial wall (S), and thickness (T) of the part.
4. Find the part in the chart above.

GENERAL USE

UNCOMMON

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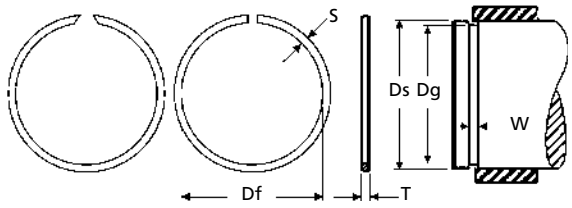
FOR BEARING RETENTION



MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	M2400	Seeger	SW
Ellison	ESW		

DSW

SHAFT	RING				GROOVE			WEIGHT	MATERIAL
MM (Ds)	Max. Free Inside Dia. (Df)	Radial Wall (S)		Thickness (T)	Diameter (Dg)		Width min. (W)	Kg per 100 Pieces	Spring Steel
DSW-004	4	3.7	.80	.5	3.8	+.00/-.09	.6	0.0020	
-005	5	4.7	1.00		4.8			0.0050	
-006	6	5.6	1.10	.7	5.7		.8	0.0090	
-007	7	6.5	1.20		6.7			0.0120	
-008	8	7.4	1.30	1.0	7.6		1.1	0.0200	
-009	9	8.4			8.6			0.0240	
-010	10	9.4			9.6			0.0250	
-011	11	10.2			10.5	+.00/-.11		0.0290	
-012	12	11.2			11.5			0.0300	
-013	13	12.2			12.5			0.0340	
-014	14	13.1	1.50	1.2	13.5		1.3	0.0500	
-015	15	14.0	1.75		14.4			0.0660	
-016	16	15.0			15.4			0.0690	
-017	17	16.0			16.4			0.0720	
-018	18	17.0			17.4			0.0750	
-019	19	17.9			18.4	+.00/-.13		0.0800	
-020	20	18.7			19.2			0.0840	
-021	21	19.7			20.2			0.0870	
-022	22	20.7			21.2			0.0910	
-024	24	22.5			23.0			0.0990	
-025	25	23.5			24.0			0.1000	
-026	26	24.5			25.0			0.1100	
-027	27	25.5	2.30	1.5	26.0		1.6	0.2000	
-028	28	26.5			27.0			0.2110	
-029	29	27.5			28.0			0.2200	
-030	30	28.5			29.0			0.2330	
-032	32	30.2			30.8	+.00/-.16		0.2410	
-035	35	33.2			33.8			0.2510	
-037	37	35.2			35.8			0.2720	
-038	38	36.2			36.8			0.2830	
-040	40	37.8			38.5			0.2910	
-042	42	39.8			40.5			0.3100	
-043	43	40.8			41.5			0.3250	
-045	45	42.8			43.5			0.3390	
-047	47	44.8			45.5			0.3480	
-048	48	45.8			46.5			0.3600	
-050	50	47.8			48.5			0.3730	
-052	52	49.8			50.5	+.00/-.19		0.3920	
-055	55	52.6			53.5			0.4110	
DSW-058	58	55.6			56.5			0.4400	

+.0/-.1 (S) +.0/-.1 (T)

DSW

AXIAL ASSEMBLY

DESCRIPTION

Small radial width. Applications include gear systems, securing needle bearings, and use as spacers.

HOW TO IDENTIFY

1. Verify shaft diameter (Ds).
2. Determine free diameter (Df), radial wall (S), and thickness (T) of the part.
3. Find the part in the chart above.

GENERAL USE

UNCOMMON

SEE DIN 7993 ON PAGES 202-203

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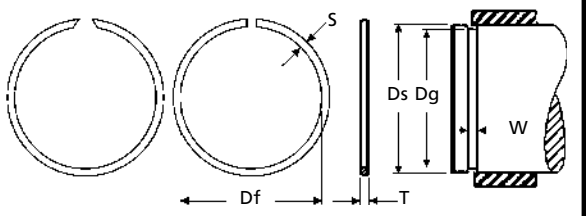

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RECTANGULAR SECTION - EXTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	M2400	Seeger	SW
Ellison	ESW		

DSW	SHAFT	RING				GROOVE			WEIGHT	MATERIAL
	MM (Ds)	Max. Free Inside Dia. (Df)	Radial Wall (S)		Thickness (T)		Diameter (Dg)		Width min. (W)	Kg per 100 Pieces	Spring Steel
DSW-060	60	57.6	2.3	+.0/-.1	1.5	+.0/-.1	58.5	+.00/-.19	1.6	0.4550	
-063	63	60.6					61.5			0.4580	
-065	65	62.6					63.5			0.4640	
-068	68	65.4	2.8		2.0		66.2		2.2	0.8590	
-070	70	67.4					68.2			0.8710	
-072	72	69.4					70.2			0.8800	
-073	73	70.4					71.2			0.8900	
-075	75	72.4					73.2			0.9320	
-080	80	77.4					78.2			0.9670	
-085	85	82.0	3.4		2.5		83.0	+.00/-.22	2.7	1.6000	
-090	90	87.0					88.0			1.6000	
-095	95	92.0					93.0			1.8200	
-100	100	97.0					98.0			1.8900	
-105	105	101.7					102.7			2.0700	
-110	110	106.6					107.7			2.0900	
-115	115	111.6					112.7			2.2100	
-120	120	116.5					117.7			2.4100	
-125	125	121.5					122.7	+.00/-.25		2.5100	
-130	130	126.4					127.7			2.6600	
-135	135	131.1	4.0				132.4			3.0200	
-140	140	136.0					137.4			3.1100	
-145	145	141.0					142.4			3.2600	
-150	150	145.9					147.4			3.2800	
-155	155	150.9					154.4			3.4700	
-160	160	155.8					157.4			3.6600	
-165	165	160.8					162.4			3.7400	
-170	170	165.7					167.4			3.8500	
-175	175	170.7					172.4			3.9400	
-180	180	175.2	5.0		3.0		177.0	+.00/-.29	3.2	6.1200	
-185	185	180.2					182.0			6.3900	
-190	190	185.1					187.0			6.5900	
-195	195	190.1					192.0			6.7500	
-200	200	196.0					197.0			6.8400	
-210	210	204.9					207.0			7.2000	
-220	220	214.8					217.0			7.6300	
-230	230	224.7					227.0			7.9800	
-240	240	234.6					237.0			8.1700	
-250	250	244.5					247.0			8.6500	
-260	260	252.4	7.5		4.0		255.0	+.00/-.32	4.2	17.9000	
-265	265	257.4					260.0			18.5200	
-270	270	262.3					265.0			19.7700	
-280	280	272.2					275.0			19.8700	
-285	285	277.2					280.0			19.9500	
-290	290	282.1					285.0			20.5300	
-300	300	292.1					295.0			21.4200	
-305	305	297.1					300.0			21.9400	
-310	310	302.0					305.0			22.3100	
-320	320	311.9					315.0			22.5300	
-330	330	321.8					325.0	+.00/-.36		22.8600	
-340	340	331.7					335.0			23.9300	
-350	350	341.6					345.0			25.1200	
-360	360	351.5					355.0			25.3100	
-380	380	371.4					375.0			26.5800	
-400	400	391.2					395.0			28.1100	
DSW-460	460	449.5	12.0		4.5		455.0		4.8	58.2000	

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RECTANGULAR SECTION - INTERNAL

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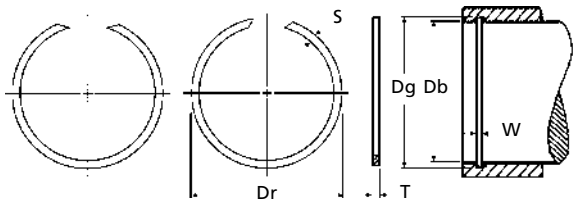

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	M2300	Seeger	SB
Ellison	ESB		

DSB

BORE	RING					GROOVE			WEIGHT	MATERIAL
MM (Db)	Free Outside Diameter Max. (Dr)	Radial Wall (S)		Thickness (T)		Diameter (Dg)		Width Min. (W)	Kg per 100 Pieces	Spring Steel
DSB-007	7	7.5	1.00	+.00/-.10	.8	+.00/-.10	7.3	+.09/-.00	.9	0.0090	
-008	8	8.5					8.3			0.0100	
-009	9	9.5	1.10				9.3			0.0130	
-010	10	10.6	1.20				10.4			0.0150	
-011	11	11.6	1.30		1.0		11.4	+.11/-.00	1.1	0.0210	
-012	12	12.7					12.4			0.0250	
-013	13	13.8					13.5			0.0280	
-014	14	14.8					14.5			0.0310	
-015	15	15.8					15.5			0.0340	
-016	16	16.8	1.75		1.2		16.5		1.3	0.0530	
-017	17	17.8					17.5			0.0550	
-018	18	18.9					18.5	+.13/-.00		0.0680	
-019	19	19.9					19.6			0.0720	
-020	20	21.0					20.6			0.0760	
-021	21	22.0					21.6			0.0790	
-022	22	23.0					22.6			0.0810	
-023	23	24.0					23.6			0.0880	
-024	24	25.2					24.8			0.0900	
-025	25	26.2					25.8			0.0910	
-026	26	27.2					26.8			0.0980	
-027	27	28.2					27.8			0.1110	
-028	28	29.2					28.8			0.1130	
-029	29	30.2					29.8			0.1150	
-030	30	31.4	2.30		1.5		31.0	+.16/-.00	1.6	0.2000	
-031	31	32.4					32.0			0.2030	
-032	32	33.4					33.0			0.2110	
-033	33	34.4					34.0			0.2260	
-034	34	35.4					35.0			0.2340	
-035	35	36.4					36.0			0.2360	
-037	37	38.8					38.2			0.2530	
-038	38	39.8					39.2			0.2610	
-039	39	40.8					40.2			0.2670	
-040	40	41.8					41.2			0.2800	
-042	42	43.8					43.2			0.2920	
DSB-043	43	44.8					44.2			0.3030	

DSB

DESCRIPTION

Small radial width. Applications include gear systems, securing needle bearings, and use as spacers.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Determine free diameter (Df), radial wall (S), and thickness (T) of the part.
3. Find the part in the chart above.

GENERAL USE

UNCOMMON

CLOSED GAP DESIGN

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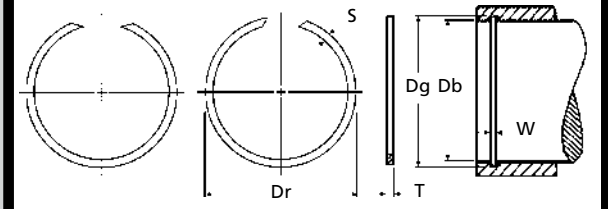

RECTANGULAR SECTION - INTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	M2300	Seeger	SB
Ellison	ESB		

DSB	BORE	RING				GROOVE			WEIGHT	MATERIAL
	MM (Db)	Free Outside Diameter Max. (Dr)	Radial Wall (S)		Thickness (T)		Diameter (Dg)		Width Min. (W)	Kg per 100 Pieces	Spring Steel
DSB-044	44	45.8	2.30	+.00/-.10	1.5	+.00/-.10	45.2	+.16/-.00	1.6	0.3110	
-045	45	46.8					46.2			0.3250	
-046	46	47.8					47.2			0.3280	
-047	47	48.8					48.2			0.3290	
-048	48	49.8					49.2			0.3450	
-050	50	51.8					51.2	+.19/-.00		0.3570	
-052	52	54.3					53.5			0.3580	
-053	53	55.3					54.5			0.3820	
-055	55	57.3					56.5			0.3930	
-057	57	59.3					58.5			0.4120	
-058	58	60.3					59.5			0.4130	
-060	60	62.3					61.5			0.4280	
-062	62	64.3					63.5			0.4420	
-063	63	65.3					64.5			0.4500	
-065	65	67.3					66.5			0.4720	
-068	68	70.3					69.5			0.4900	
-070	70	72.3					71.5			0.4930	
-072	72	74.6	2.80		2.0		73.8		2.2	0.8490	
-073	73	75.6					74.8			0.8520	
-074	74	76.6					75.8			0.8600	
-076	76	78.6					77.8			0.8890	
-078	78	80.6					79.8			0.9050	
-079	79	81.6					80.8	+.22/-.00		0.9070	
-080	80	82.6					81.8			0.9220	
-081	81	83.6					82.8			0.9310	
-082	82	84.6					83.8			0.9450	
-083	83	85.6					84.8			0.9630	
-085	85	87.6					86.8			0.9810	
-086	86	88.6					87.8			0.9910	
-088	88	91.0	3.40		2.5		90.0		2.7	1.5400	
-090	90	93.0					92.0			1.5600	
-092	92	95.0					94.0			1.6600	
-093	93	96.0					95.0			1.6800	
-095	95	98.0					97.0			1.6900	
DSB-097	97	100.0					99.0			1.7100	

DSB

DESCRIPTION

Small radial width. Applications include gear systems, securing needle bearings, and use as spacers.

AXIAL ASSEMBLY

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Determine free diameter (Df), radial wall (S), and thickness (T) of the part.
3. Find the part in the chart above.

GENERAL USE

UNCOMMON

SEE DIN 7993 ON PAGES 202-203

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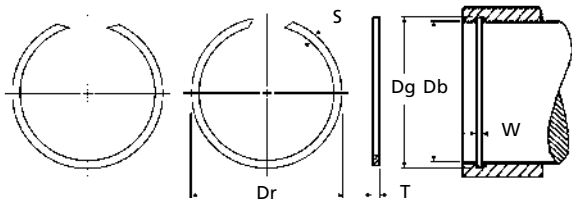
RECTANCULAR SECTION - INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Anderton	M2300	Seeger	SB
Ellison	ESB		

FOR BEARING RETENTION



DSB

BORE	RING				GROOVE			WEIGHT	MATERIAL
MM (Db)	Free Outside Diameter Max. (Dr)	Radial Wall (S)		Thickness (T)		Diameter (Dg)		Width Min. (W)	Kg per 100 Pieces	Spring Steel
DSB-098	101.0	3.4	+.00/-.10	2.5	+.00/-.10	100.0	+.22/-.00	2.7	1.7500	
-100	103.0					102.0			1.7900	
-102	105.3					104.3			1.8400	
-103	106.3					105.3			1.8500	
-105	108.3					107.3			1.8700	
-107	110.3					109.3			1.9100	
-108	111.3					110.3			1.9300	
-110	113.4					112.3			1.9800	
-112	115.4					114.3			2.0300	
-113	116.4					115.3			2.0500	
-115	118.4					117.3			2.0600	
-117	120.4					119.3			2.0800	
-118	121.4					120.3	+.25/-.00		2.1100	
-120	123.5					122.3			2.1400	
-123	126.5					125.3			2.2000	
-125	128.5					127.3			2.2500	
-127	130.5					129.3			2.3000	
-130	133.6					132.3			2.3400	
-133	136.6					135.3			2.4400	
-135	138.6					137.3			2.5000	
-137	140.6					139.3			2.5300	
-140	144.0	4.0				142.6			2.9300	
-143	147.0					145.6			3.0100	
-150	154.1					152.6			3.1900	
-153	157.1					155.6			3.2600	
-160	164.2					162.6			3.4400	
-163	167.2					165.6			3.4600	
-165	169.2					167.6			3.4900	
-170	170					172.6			3.6200	
-173	173					175.6			3.7100	
-175	175					177.6			3.7300	
-180	180					182.6			3.8300	
-183	183					185.6	+.29/-.00		4.1000	
DSB-190	190	194.9	5.0		3.0	193.0		3.2	6.1300	

DSB

DESCRIPTION	HOW TO IDENTIFY	GENERAL USE
Small radial width. Applications include gear systems, securing needle bearings, and use as spacers.	1. Verify bore diameter (Db). 2. Determine free diameter (Df), radial wall (S), and thickness (T) of the part. 3. Find the part in the chart above.	UNCOMMON

AXIAL ASSEMBLY

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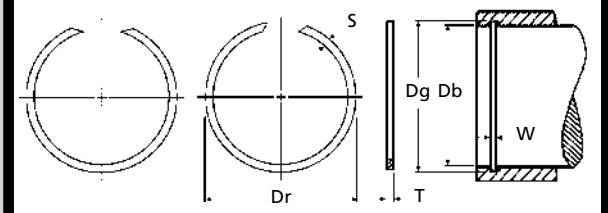
FOR BEARING RETENTION



RECTANGULAR SECTION - INTERNAL

MANUFACTURER CROSS-REFERENCE INDEX PAGE 236.

Anderton	M2300	Seeger	SB
Ellison	ESB		

DSB	BORE	RING				GROOVE			WEIGHT	MATERIAL
	MM (Db)	Free Outside Diameter Max. (Dr)	Radial Wall (S)		Thickness (T)		Diameter (Dg)		Width Min. (W)	Kg per 100 Pieces	Spring Steel
DSB-195	195	199.9	5.0	+.00/-.10	3.0	+.00/-.10	198.0	+.29/-.00	3.2	6.1600	
-200	200	205.0					203.0			6.4500	
-205	205	210.0					208.0			6.6400	
-210	210	215.1					213.0			6.8800	
-215	215	220.1					218.0			6.9500	
-220	220	225.2					223.0			7.2400	
-225	225	230.2					228.0			7.2900	
-230	230	235.3					233.0			7.5200	
-240	240	245.4					243.0			8.0900	
-250	250	255.5					253.0			8.4200	
-260	260	267.6	7.5		4.0		265.0	+.32/-.00	4.2	16.5000	
-270	270	277.7					275.0			17.4000	
-280	280	287.8					285.0			18.4000	
-290	290	297.9					295.0			19.0000	
-300	300	307.9					305.0			19.6000	
-310	310	318.0					315.0			20.0000	
-320	320	328.1					325.0	+.36/-.00		20.3000	
-325	325	333.1					330.0			20.6000	
-330	330	338.2					335.0			20.9000	
-340	340	348.3					345.0			21.9000	
-350	350	358.4					355.0			22.9000	
-355	355	363.4					360.0			23.1000	
-360	360	368.5					365.0			23.3000	
-370	370	378.5					375.0			23.6000	
-375	375	383.5					380.0			24.0000	
-380	380	388.6					385.0			24.2000	
-390	390	398.7					395.0			25.3000	
-395	395	403.7					400.0			25.7000	
-400	400	408.9					405.0	+.40/-.00		26.0000	
-410	410	419.0					415.0			26.6000	
-415	415	424.0					420.0			27.3000	
-420	420	429.1					425.0			27.7000	
-430	430	439.2					435.0			28.5000	
DSB-440	440	449.3					445.0			29.4000	

DSB

AXIAL ASSEMBLY

DESCRIPTION

Small radial width. Applications include gear systems, securing needle bearings, and use as spacers.

HOW TO IDENTIFY

1. Verify bore diameter (Db).
2. Determine free diameter (Df), radial wall (S), and thickness (T) of the part.
3. Find the part in the chart above.

GENERAL USE

UNCOMMON

SEE DIN 7993 ON PAGES 202-203

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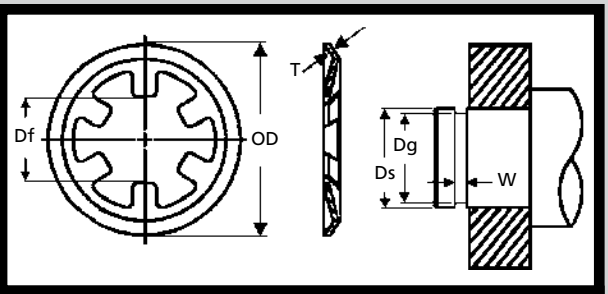


REINFORCED EXTERNAL

MANUFACTURER CROSS-REFERENCE

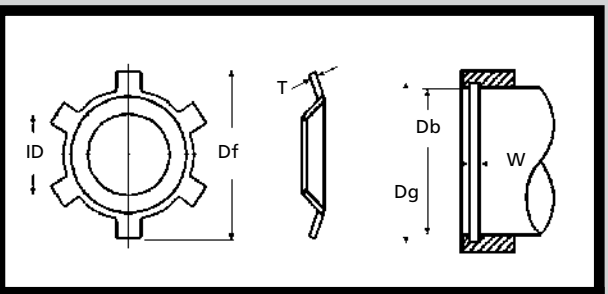
INDEX PAGE 236.

Anderton	M1465	Seeger	ZA
Rotor Clip	DTX		

DTX

SHAFT	RING				GROOVE			MATERIAL
MM (Ds)	Free Inside Dia. (Df)	Outside Diameter (OD)	Thickness (T)	No. of Prongs	Diameter (Dg)		Width min. (W)	Spring Steel
DTX-0015	1.5	1.40	6.0	.25	3	1.40	+.000/-.060	.40	
-002	2	1.85	6.5			1.90			
-003	3	2.80	8.0		4	2.90			
-0035	3.5	3.30	8.2	.40		3.40	+.000/-.075	.50	
-004	4	3.80	9.0	.25		3.90		.40	
-005	5	4.80	10.0			4.90			
-006	6	5.80	11.0			5.90			
-007	7	6.80	12.0		4-5	6.90			
-008	8	7.75	13.0		4	7.85	+.000/-.090		
-009	9	8.75	14.0	.30	5-6	8.85		.60	
-010	10	9.75	16.0		6	9.85			
-012	12	11.70	18.0			11.85			
-015	15	14.60	23.0	.50	8	14.80	+.000/-.110	1.00	
-016	16	15.60	24.5	.40		15.80			
-018	18	17.60	27.0			17.80			
-019	19	18.60	28.0	.50		18.80	+.000/-.130		
-020	20	19.50	29.0			19.75			
-022	22	21.50	31.0			21.75			
-025	25	24.50	34.0			24.75			
-030	30	29.50	40.0			29.75			
-035	35	34.50	46.0			34.75			
DTX-045	45	44.50	60.0			44.75		1.50	

TX IMPERIAL Page 92
TI IMPERIAL Page 92



BASIC INTERNAL

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Rotor Clip	DTI		
Seeger	ZJ		

DTI

BORE	RING				GROOVE			MATERIAL
MM (Db)	Free Outside Dia. (Df)	Inside Diameter (ID)	Thickness (T)	No. of Prongs	Diameter (Dg)		Width Min. (W)	Spring Steel
DTI-008	8	8.25	4.0	.25	6	8.10	+.060/-.000	.40	
-010	10	10.20	5.0			10.10	+.075/-.000		
-012	12	12.25	6.0			12.10			
-015	15	15.25	9.0	.30		15.10		.50	
-017	17	17.30	11.0		8	17.15			
-018	18	18.30	10.5	.40		18.15	+.110/-.000	.80	
-020	20	20.35	11.0			20.20			
-025	25	25.35	16.0	.50	8-10	25.20	+.130/-.000	1.00	
-026	26	26.40	17.0			26.20			
-028	28	28.40	19.0			28.20			
-030	30	30.40	21.0		8	30.20			
-035	35	35.40	25.0		12	35.20			
-040	40	40.40	30.0			40.20			
-045	45	45.40	35.0			45.20			
DTI-050	50	50.50	39.0			50.20			

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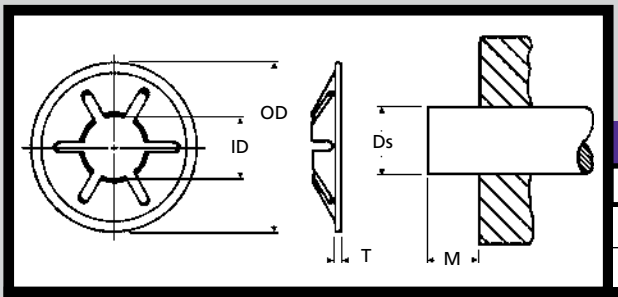


SHAFT RETENTION WASHER

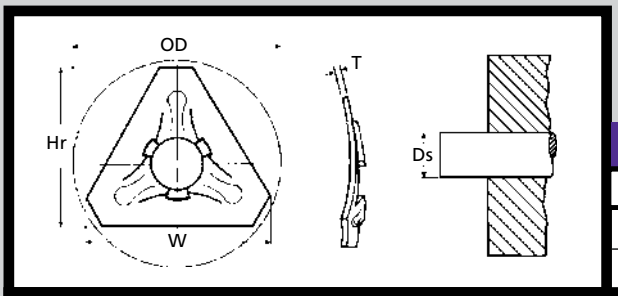
MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Seeger	KS		

DKS

	SHAFT		RING					MATERIAL
	MM (Ds)		Free Inside Dia. (ID)	Thickness (T)	Free Outside Dia. (OD)	No. of Prongs	Edge Margin Min. (M)	Spring Steel
DKS-0015	1.5	+.000/ -.025	1.30	.25	6.00	3	2.5	
-002	2.0		1.80	.30	7.00			
-0025	2.5		2.30		8.25			
-003	3.0		2.80	.40	10.00		3.0	
-0035	3.5	+.000/ -.030	3.25		11.50	5		
-004	4.0		3.75	.50	13.00	4	3.5	
-005	5.0		4.75		15.00	5		
-006	6.0		5.75	.60	16.50	6	4.0	
-007	7.0	+.000/ -.036	6.75		18.00			
-008	8.0		7.75	.70	19.50			
-009	9.0		8.75		21.00		4.5	
DKS-010	10.0		9.75	.80	22.00			



TR  IMPERIAL Page 97

TRIANGULAR PUSH-ON

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Seeger	D		

DTR

	SHAFT	RING					MATERIAL
	MM (Ds)	Outside Diameter (OD)	Thickness (T)	Height (Hr)	Width (W)	Edge Margin Min.	Spring Steel
DTR-0015	1.5	9.8	.25	8	9.3	2.8	
-002	2.0	11.0		9	10.5	2.9	
-003	3.0						
-004	4.0	14.7		12	14.0	3.5	
-005	5.0		.40				
-006	6.0	17.2		14	16.2	4.5	
-007	7.0						
-008	8.0	20.8		17	19.6	5.0	
-009	9.0						
DTR-011	11.0	23.2	.50	19	22.0	6.0	

DTX / DTI

(PAGE 212)

AXIAL ASSEMBLY

DESCRIPTION

Axially-applied grooveless rings installed with a tube or plunger. Available for external (DTX) and internal (DTI) applications.

HOW TO IDENTIFY

1. Determine whether you need an external (DTX) or internal (DTI) ring.
2. Confirm the shaft diameter (Ds) or bore diameter (Db).
3. Measure the thickness (T) of the part.
4. Verify the number of prongs.
5. Find the part in the charts on page 212.

GENERAL USE

UNCOMMON

GROOVELESS DESIGN MAKES THESE RINGS MORE POPULAR ALL THE TIME.

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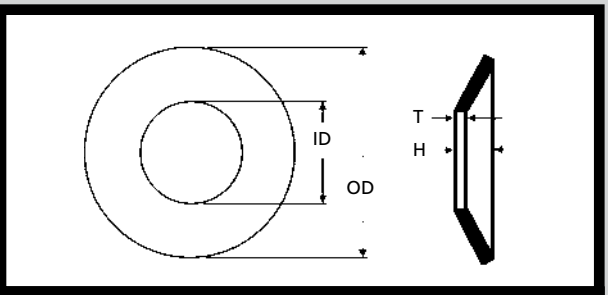

BELLEVILLE DISC SPRING

DIN 2093

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

DBW	SPRING				MATERIAL	
	Minimum Inside Diameter (ID)	Maximum Outside Diameter (OD)	Thickness (T)	Approximate Height (H)	Spring Steel	Stainless "S"
-0080A-003	3.2	8.0	.30	.55		
-0100A-004		10.0	.40	.70		
-0080B-002	4.2	8.0	.20	.45		
-0080B-004			.40	.60		
-0100C-0025	5.2	10.0	.25	.55		
-0100C-004			.40	.70		
-0100C-005			.50	.75		
-0150C-005		15.0	.50	1.00		
-0150C-006			.60	1.05		
-0125D-0035	6.2	12.5	.35	.80		
-0125D-005			.50	.85		
-0125D-007			.70	1.00		
-0140E-0035	7.2	14.0	.35	.80		
-0140E-005			.50	.90		
-0140E-008			.80	1.10		
-0160F-004	8.2	16.0	.40	.90		
-0160F-006			.60	1.05		
-0160F-009			.90	1.25		
-0180F-005		18.0	.50	1.10		
-0180G-0045	9.2		.45	1.05		
-0180G-007			.70	1.20		
-0180G-01			1.00	1.40		
-0200H-005	10.2	20.0	.50	1.15		
-0200H-008			.80	1.35		
-0200H-011			1.10	1.55		
-0230H-0125		23.0	1.25	1.90		
-0225I-008	11.2	22.5	.80	1.45		
-0225I-0125			1.25	1.75		
-0230K-015	12.2	23.0	1.50	2.00		
-0250K-007		25.0	.70	1.60		
-0250K-009			.90	1.60		
-0250K-015			1.50	2.05		
-0280M-008	14.2	28.0	.80	1.80		
-0280M-01			1.00	1.80		
-0280M-015			1.50	2.15		
-0315O-008	16.3	31.5	.80	1.85		
-0315O-0125			1.25	2.15		
-0315O-0175			1.75	2.45		
-0355P-009	18.3	35.5	.90	2.05		
-0355P-0125			1.25	2.25		

DBW

AXIAL ASSEMBLY

DESCRIPTION

Very common spring with high load capacity but limited deflection. Will take an initial set when loaded to flat. Also known as conical washers or spring washers.

HOW TO IDENTIFY

1. Measure inside diameter (ID), outside diameter (OD), thickness (T), and height (H).
2. Find the part in the charts above.
3. Fax a quote request if the part is not a standard.

GENERAL USE

COMMON

STACK IN SERIES

OR PARALLEL

TO INCREASE LOAD AND DEFLECTION.

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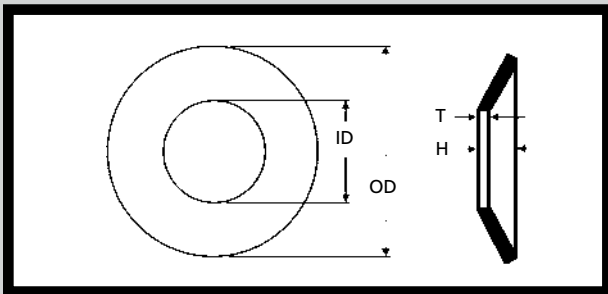

BELLEVILLE DISC SPRING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

DIN 2093

DBW	SPRING				MATERIAL	
	Minimum Inside Diameter (ID)	*Maximum Outside Diameter (OD)*	*Thickness (T)*	*Approximate Height (H)*	*Spring Steel*	*Stainless "S"*
-0355P-02	18.3	35.5	2.00	2.80		
-0500Q-03	18.4	50.0	3.00	4.00		
-0400R-01	20.4	40.0	1.00	2.30		
-0400R-015			1.50	2.65		
-0400R-0225			2.25	3.15		
-0600S-025	20.5	60.0	2.50	4.30		
-0450T-0125	22.4	45.0	1.25	2.85		
-0450T-0175			1.75	3.05		
-0450T-025			2.50	3.50		
-0500V-0125	25.4	50.0	1.25	2.85		
-0500V-02			2.00	3.40		
-0500V-025			2.50	3.90		
-0500V-03			3.00	4.10		
-0560Y-015	28.5	56.0	1.50	3.45		
-0560Y-02			2.00	3.60		
-0560Y-03			3.00	4.30		
-0630AA-018	31.0	63.0	1.80	4.15		
-0630AA-025			2.50	4.25		
-0630AA-035			3.50	4.90		
-0800AA-025		80.0	2.50	5.20		
-0800AA-03			3.00	5.50		
-0710CC-02	36.0	71.0	2.00	4.60		
-0710CC-025			2.50	4.50		
-0710CC-04			4.00	5.60		
-0800DD-0225	41.0	80.0	2.25	5.20		
-0800DD-03			3.00	5.30		
-0800DD-04			4.00	6.20		
-0800DD-05			5.00	6.70		
-1250DD-04		125.0	4.00	8.20		
-0900EE-025	46.0	90.0	2.50	5.70		
-0900EE-035			3.50	6.00		
-0900EE-05			5.00	7.00		
-1000FF-027	51.0	100.0	2.70	6.20		
-1000FF-035			3.50	6.30		
-1000FF-05			5.00	7.80		
-1000FF-06			6.00	8.20		
-1250FF-04		125.0	4.00	8.50		
-1250FF-05			5.00	8.90		
-1250FF-06			6.00	9.40		
-1120GG-03	57.0	112.0	3.00	6.90		
-1120GG-04			4.00	7.20		
-1120GG-06			6.00	8.50		
-1250HH-05	61.0	125.0	5.00	9.00		
-1250HH-06			6.00	9.60		
-1250HH-08			8.00	10.90		
-1250II-05	64.0		5.00	8.50		
-1250II-08			8.00	10.60		
-1250JJ-06	71.0		6.00	9.30		
-1250JJ-08			8.00	10.40		
-1250JJ-10			10.00	11.80		
-1400KK-05	72.0	140.0	5.00	9.00		
-1400KK-08			8.00	11.20		
-1600MM-06	82.0	160.0	6.00	10.50		
-1600MM-10			10.00	13.50		
-1800NN-06	92.0	180.0	6.00	11.10		

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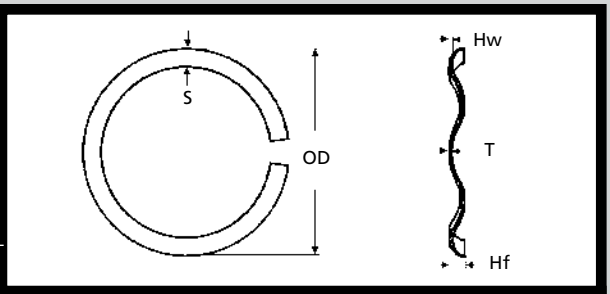

STANDARD WAVE SPRING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	SSB		
Spirolox	TB		

DWS

BEARING	BEARING PRE-LOAD SPRING							MATERIAL	
Bearing Outside Dia. (OD)	Load Newtons	Work Height (Hw)	Free Height (Hf)	Number of Waves	Thickness (T)	Radial Wall (S)	Theoretical Spring Rate N/MM	Spring Steel	Stainless "-SS"
DWS-0063	16	44.5	1.57	2.29	3	.25	1.98	65		
-0075	19	53.4		3.05				35		
-0087	22	62.3		2.79		.30	2.39	48		
-0095	24	66.7		3.56				35		
-0102	26	71.2	1.98	2.54		.41	3.38	111		
-0110	28	75.6		2.79				85		
-0118	30	84.5		3.30				66		
-0126	32	89.0		3.81				52		
-0138	35	97.9		4.57				38		
-0146	37	102.3		3.81		.46	3.63	58		
-0158	40	111.2		5.08				37		
-0165	42	115.7		3.05	4			99		
-0185	47	129.0		3.81				68		
-0205	52	142.4	2.36	3.56		.61	3.81	121		
-0217	55	151.3		3.81				100		
-0244	62	169.1		4.32			4.52	85		
-0268	68	186.9	2.77	4.32		.76	4.78	131		
-0276	70	191.3		4.32				119		
-0284	72	195.8		4.57				108		
-0295	75	204.7		5.08				94		
-0315	80	218.0		5.59				76		
-0335	85	231.4		5.59			5.92	83		
-0354	90	249.2		6.35				68		
-0374	95	262.5		7.37				57		
-0394	100	275.9		4.57	5			157		
-0413	105	289.2		5.08				134		
-0433	110	302.6		5.33				115		
-0453	115	315.9	3.18	6.35				99		
-0472	120	329.3		7.11				86		
-0492	125	342.6		7.62				76		
-0512	130	356.0		8.64				67		
-0532	135	369.3		9.40				59		
-0551	140	382.7		6.86	6			108		
-0571	145	396.0		7.37				97		
-0591	150	404.9		7.87				87		
-0630	160	440.5		9.40				71		
-0650	165	453.9		10.41				64		
DWS-0669	170	467.2		11.18				58		

DWS

AXIAL ASSEMBLY

DESCRIPTION

Flat wire design yields many benefits vs. compression springs: reduced operating height, precise load deflections, lower cost.

HOW TO IDENTIFY

1. Count the waves "peak to peak."
2. Measure the thickness (T) and radial wall (S).
3. Determine free height (Hf).
4. Find the part in the chart above.

GENERAL USE

WEIRD

NICE COMPACT DESIGN.

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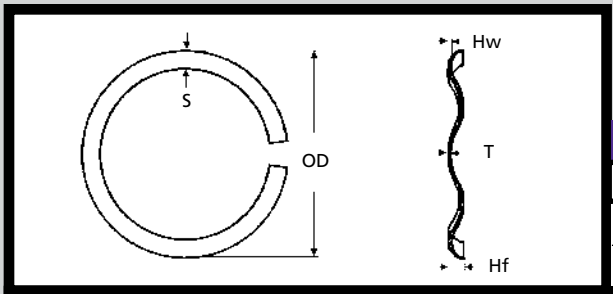


STANDARD WAVE SPRING

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Smalley	SSB		
Spirolox	TB		

DWS

BEARING	BEARING PRE-LOAD SPRING							MATERIAL	
Bearing Outside Dia. (OD)	Load Newtons	Work Height (Hw)	Free Height (Hf)	Number of Waves	Thickness (T)	Radial Wall (S)	Theoretical Spring Rate N/MM	Spring Steel	Stainless "-SS"
DWS-0689	175	480.6	3.96	8.13	6	.81	9.53	116		
-0709	180	493.9		8.64				105		
-0728	185	507.3		9.14				97		
-0748	190	520.6		9.91				88		
-0787	200	547.3		7.11	7			174		
-0807	205	560.7		7.37				161		
-0827	210	578.5		7.87				149		
-0847	215	591.8		8.38				138		
-0866	220	605.2		8.64				128		
-0886	225	618.5		7.11	8			203		
-0906	230	631.9		6.10	9			303		
-0925	235	645.2		6.35				283		
-0945	240	658.6		6.35				265		
-0984	250	685.3		6.86				232		
-1024	260	712.0		7.37				205		
-1043	265	725.3		7.62				193		
-1063	270	743.1		8.13				182		
-1102	280	769.8		8.64				162		
-1142	290	796.5		9.40				144		
-1181	300	823.2		10.41				129		
-1221	310	849.9		7.11		1.07		264		
-1260	320	876.6		7.62				239		
-1339	340	934.5		8.64				198		
-1378	350	961.1		9.40				180		
-1417	360	987.9		7.62	10			271		
-1457	370	1014.6		8.13				249		
-1496	380	1041.3		8.64				229		
-1535	390	1072.4		9.14				211		
-1575	400	1099.1		9.65				196		
-1614	410	1125.8		8.38		12.70		251		
-1654	420	1152.5		8.89				233		
-1693	430	1179.2		7.62	11			317		
-1732	440	1205.9		8.13				295		
-1811	460	1263.7		8.89				256		
-1890	480	1317.1		8.13	12			318		
-1969	500	1370.5		8.89				280		
-2126	540	1481.8		8.89	13			303		
DWS-2284	580	1593.0		8.89	14			327		

DWS

AXIAL ASSEMBLY

DESCRIPTION

Flat wire design yields many benefits vs. compression springs: reduced operating height, precise load deflections, lower cost.

HOW TO IDENTIFY

1. Count the waves "peak to peak."
2. Measure the thickness (T) and radial wall (S).
3. Determine free height (Hf).
4. Find the part in the chart above.

GENERAL USE

WEIRD

PRECISE LOAD DEFLECTION CHARACTERISTICS

WSG

IMPERIAL Page 116

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

METRIC ASSEMBLY COMPONENTS

785·392·3017 FAX 785.392.2845

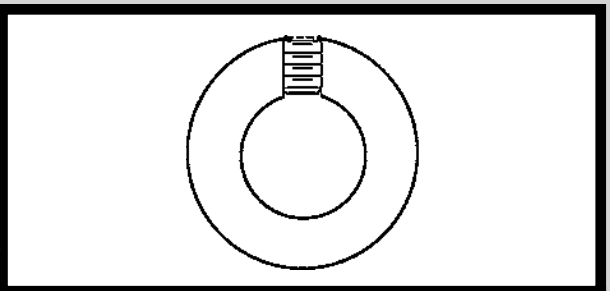
REVISED 09-04
www.huyett.com

METRIC SHAFT COLLAR

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

DIN	6885
Bossard	BN 868

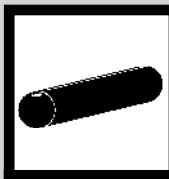


SCM	SHAFT COLLAR Inside Dia. (Bore)	Outside Dia.	Thickness (Width)	MATERIAL Black Oxide "-BO"	Zinc Plated "-ZC"	Stainless "-SS"
SCM-002	2	6	2.5			
-0025	2.5	7	4			
-003	3		5			
-0035	3.5	8				
-004	4					
-0045	4.5	10	6			
-005	5					
-0055	5.5	12				
-006	6		8			
-007	7					
-008	8	16				
-009	9	18	10			
-010	10	20				
-011	11					
-012	12	22	12			
-013	13					
-014	14	25				
-015	15					
-016	16	28				
SCM-018	18	32	14			

SCM	SHAFT COLLAR Inside Dia. (Bore)	Outside Dia.	Thickness (Width)	MATERIAL Black Oxide "-BO"	Zinc Plated "-ZC"	Stainless "-SS"
SCM-020	20	32	14			
-022	22	36				
-024	24	40	16			
-025	25					
-026	26					
-028	28	45				
-030	30					
-032	32	50				
-034	34					
-035	35	56				
-036	36					
-038	38					
-040	40	63	18			
-042	42					
-045	45	70				
-048	48					
-050	50	80				
-052	52					
SCM-055	55					

KF IMPERIAL Page 140

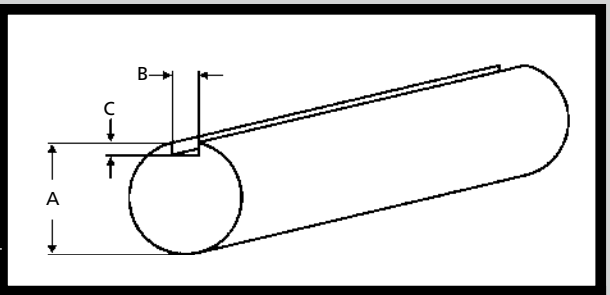
SC IMPERIAL Page 128



METRIC KEYED SHAFTS

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

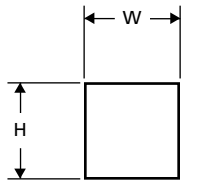


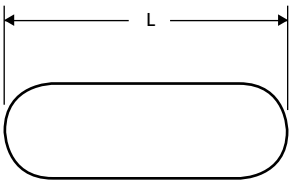
KFM	BAR Diameter (A)	KEYWAY Width (B)	KEYWAY Depth (C)	LENGTH 3' "-914"	LENGTH 6' "-1829"
KFM-013	13	5	3.0		
-014	14				
-015	15				
-016	16				
-017	17				
-018	18	6	3.5		
-019	19				
-020	20				
-021	21				
-022	22				
-023	23	8	4.0		
-024	24				
KFM-025	25				

KFM	BAR Diameter (A)	KEYWAY Width (B)	KEYWAY Depth (C)	LENGTH 3' "-914"	LENGTH 6' "-1829"
KFM-026	26	8	4.0		
-027	27				
-028	28				
-030	30				
-032	32	10	5.0		
-033	33				
-035	35				
-036	36				
-040	40	12			
-045	45	14	5.5		
-050	50				
-060	60	18	7.0		
KFM-065	65				

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

BOX 232 • MINNEAPOLIS, KS • 67467





CARBON STEEL SHAFT KEYS

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

DIN	6885
Bossard	BN870

DIN 6885

Width x Height (W) x (H)	LENGTH (L) 8mm	(L) 10mm	(L) 12mm	(L) 14mm	(L) 16mm	(L) 20mm	(L) 25mm	(L) 30mm	(L) 36mm	(L) 40mm	(L) 45mm	(L) 50mm
2 x 2	•	•	•	•	•	•	---	---	---	---	---	---
3 x 3	•	•	•	•	•	•	•	•	•	•	---	---
4 x 4	•	•	•	•	•	•	•	•	•	•	•	•
5 x 3	---	•	•	•	•	•	•	•	•	•	•	•
5 x 5	---	•	•	•	•	•	•	•	•	•	•	•
6 x 4	---	•	•	•	•	•	•	•	•	•	•	•
6 x 6	---	•	•	•	•	•	•	•	•	•	•	•
8 x 5	---	•	•	•	•	•	•	•	•	•	•	•
8 x 7	---	•	•	•	•	•	•	•	•	•	•	•
10 x 6	---	---	---	---	•	•	•	•	•	•	•	•
10 x 8	---	---	---	---	•	•	•	•	•	•	•	•
12 x 6	---	---	---	---	---	•	•	•	•	•	•	•
12 x 8	---	---	---	---	---	•	•	•	•	•	•	•
14 x 6	---	---	---	---	---	---	•	•	•	•	•	•
14 x 9	---	---	---	---	---	•	•	•	•	•	•	•
16 x 7	---	---	---	---	---	---	---	•	•	•	•	•
16 x 10	---	---	---	---	---	---	---	•	•	•	•	•

Width x Height (W) x (H)	LENGTH (L) 56mm	(L) 63mm	(L) 70mm	(L) 80mm	(L) 90mm	(L) 100mm	(L) 110mm	(L) 120mm	(L) 130mm	(L) 140mm	(L) 150mm
2 x 2	---	---	---	---	---	---	---	---	---	---	---
3 x 3	---	---	---	---	---	---	---	---	---	---	---
4 x 4	•	•	•	•	---	•	---	---	---	---	---
5 x 3	•	•	---	---	---	---	---	---	---	---	---
5 x 5	•	•	•	•	---	•	---	---	---	---	---
6 x 4	•	•	•	---	---	---	---	---	---	---	---
6 x 6	•	•	•	•	•	•	•	---	---	•	---
8 x 5	•	•	•	•	•	---	---	---	---	---	---
8 x 7	•	•	•	•	•	•	•	•	•	•	•
10 x 6	•	•	•	•	•	•	•	---	---	---	---
10 x 8	•	•	•	•	•	•	•	•	•	•	•
12 x 6	•	•	•	•	•	•	•	•	•	•	---
12 x 8	•	•	•	•	•	•	•	•	•	•	•
14 x 6	•	•	•	•	•	•	•	•	•	•	---
14 x 9	•	•	•	•	•	•	•	•	•	•	•
16 x 7	•	•	•	•	•	•	•	•	•	•	•
16 x 10	•	•	•	•	•	•	•	•	•	•	•

IMPERIAL Page 138-139

OTHER TYPES OF SHAFT KEYS A V AILABLE

DIN 6885

Form C	Form D	Form E	Form F	Form G	Form H	Form J	Please Call Plant For Details.

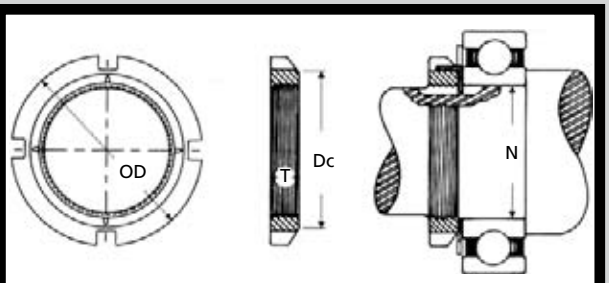
MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

METRIC LOCKNUT

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Whittet-Higgins KM



KM	BORE	LOCKNUT DIMENSIONS					WEIGHT	MATERIAL	
	Bearing Bore Nominal (N)	Pitch Length	Major Diameter	Outside Diameter Max. (OD)	Thickness (T)	Nut Face Diameter Max. (Dc)	Kg per 100 Pieces	Low Carbon	Mating Lockwasher
KM-00	10	.75	10	18	4	13.5	0.5682		MB-00
-01	12	1.00	12	22	4	17.0	0.8523		-01
-02	15		15	25	5	21.0	1.1364		-02
-03	17		17	28	5	24.0	1.4205		-03
-04	20		20	32	6	26.0	1.9886		-04
-045	22		22	34	6	28.0	2.2727		-045
-05	25	1.50	25	38	7	32.0	3.1250		-05
-055	28		28	42	7	36.0	3.6932		-055
-06	30		30	45	7	38.0	4.5455		-06
-065	32		32	48	8	40.0	5.6818		-065
-07	35		35	52	8	44.0	6.5341		-07
-08	40		40	58	9	50.0	9.0909		-08
-09	45		45	65	10	56.0	12.2159		-09
-10	50		50	70	11	61.0	14.7727		-10
-11	55	2.00	55	75	11	67.0	16.4773		-11
-12	60		60	80	11	73.0	17.8977		-12
-13	65		65	85	12	79.0	21.0227		-13
-14	70		70	92	12	85.0	25.0000		-14
-15	75		75	98	13	90.0	15.3409		-15
-16	80		80	105	15	95.0	19.8864		-16
-17	85		85	110	16	102.0	46.0227		-17
-18	90		90	120	16	108.0	56.8182		-18
-19	95		95	125	17	113.0	64.7727		-19
-20	100		100	130	18	120.0	72.7273		-20
-21	105		105	140	18	126.0	87.5000		-21
-22	110		110	145	19	133.0	97.7273		-22
-23	115		115	150	19	137.0	90.9091		-23
-24	120		120	155	20	138.0	107.9545		-24
-25	125		125	160	21	148.0	119.0000		-25
-26	130		130	165	21	149.0	125.0000		-26
-27	135		135	175	22	160.0	155.0000		-27
-28	140		140	180	22	160.0	159.0909		-28
-29	145		145	190	24	171.0	200.0000		-29
-30	150		150	195	24	171.0	207.3864		-30
-31	155	3.00	155	200	25	182.0	221.0000		-31
-32	160		160	210	25	182.0	255.6818		-32
-33	165		165	210	26	193.0	284.0909		-33
-34	170		170	220	26	193.0	280.0000		-34
-36	180		180	230	27	203.0	305.1136		-36
KM-40	200		200	250	29	226.0	373.2955		MB-40

MATING LOCKWASHER DESCRIPTIONS ON PAGE 221.

KM

AXIAL ASSEMBLY

DESCRIPTION

These metric locknuts fall under ISO-2982. Fully interchangeable with most standard metric locknuts.

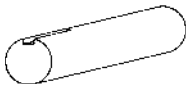
HOW TO IDENTIFY

1. Verify the bearing bore nominal (N).
2. Determine the major diameter (Dm), outside diameter (OD), and thickness (T) of the part.
3. Find the part in the chart above.

GENERAL USE

UNCOMMON

REQUIRES A KEYWAY.



LET OUR SHOP CUT IT FOR YOU!

SEE PAGE 218.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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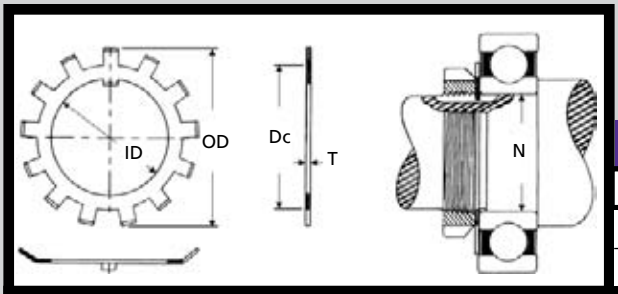
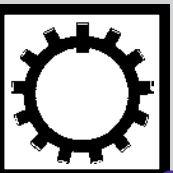


METRIC LOCKWASHER

MANUFACTURER CROSS-REFERENCE

INDEX PAGE 236.

Whittet-Higgins	MB		



MB

BORE	LOCKWASHER DIMENSIONS					WEIGHT	MATERIAL	
Bearing Bore Nominal (N)	Free Outside Diameter (OD)	Inside Diameter Min. (ID)	Thickness (T)	Face Diameter Min. (Dc)	Number of Tangs	Kg per 100 Pieces	Spring Steel	Mating Locknut
MB-00	10	21	10	1.00	13.5	9	0.1136		KM-00
-01	12	25	12		17.0	11	0.2273		-01
-02	15	28	15		21.0		0.2273		-02
-03	17	32	17		24.0		0.1705		-03
-04	20	36	20		26.0		0.3409		-04
-045	22	38	22		28.0		0.3409		-045
-05	25	42	25	1.25	32.0	13	0.7102		-05
-055	28	46	28		36.0		-		-055
-06	30	49	30		38.0		0.8523		-06
-065	32	52	32		40.0		-		-065
-07	35	57	35		44.0		1.0654		-07
-08	40	62	40		50.0		1.2784		-08
-09	45	69	45		56.0		1.4205		-09
-10	50	74	50		61.0		1.7045		-10
-11	55	81	55	1.50	67.0	17	2.2727		-11
-12	60	86	60		73.0		2.4148		-12
-13	65	92	65		79.0		2.8409		-13
-14	70	98	70		85.0		3.2670		-14
-15	75	104	75		90.0		3.5511		-15
-16	80	112	80	1.80	95.0		4.5455		-16
-17	85	119	85		102.0		5.1136		-17
-18	90	126	90		108.0		6.3636		-18
-19	95	133	95		113.0		6.5341		-19
-20	100	142	100		120.0		7.6705		-20
-21	105	145	105		126.0		9.0909		-21
-22	110	154	110		133.0		10.7955		-22
-23	115	159	115	2.00	137.0		10.2273		-23
-24	120	164	120		138.0		10.2273		-24
-25	125	170	125		148.0		11.8000		-25
-26	130	175	130		149.0		10.7955		-26
-27	135	185	135		160.0		13.6364		-27
-28	140	192	140		160.0		12.5000		-28
-29	145	202	145		171.0		15.9091		-29
-30	150	205	150		171.0		14.7727		-30
-31	155	212	155	2.50	182.0	19	22.7273		-31
-32	160	217	160		182.0		23.8636		-32
-33	165	222	165		193.0		25.5682		-33
-34	170	232	170		193.0		26.1364		-34
-36	180	242	180		203.0		28.9773		-36
MB-40	200	262	200		226.0		30.6818		KM-40

MATING LOCKNUT DESCRIPTIONS ON PAGE 220.

MB

AXIAL ASSEMBLY

DESCRIPTION

These metric lockwashers fall under ISO-2982. Key is shorter and is not bent.

HOW TO IDENTIFY

1. Verify the bearing bore nominal (N).
2. Determine the free outside diameter (OD), inside diameter (ID), thickness (T), and number of tangs.
3. Find the part in the chart above.

GENERAL USE

UNCOMMON

USE WITH KM LOCKNUTS.

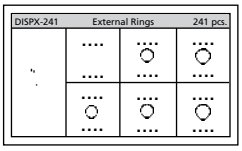
MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

ASSORTMENTS

DISP — STANDARD PACKS

Pre-selected boxes of our most popular rings with convenient packaging and labels to help increase your profits.

Pgs: 224-225

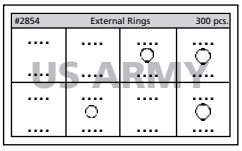


DISPX — COMBINATION PACKS

We make these boxes on a special order basis only. Combos contain part families and tools as a complete retaining solution for your customers.

KIT — MAINTENANCE KITS

Available as a special order, these boxes are organized unique to a particular situation or equipment model. These kits are often used to support planned maintenance.

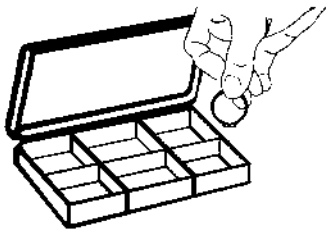


DISPC — CUSTOM PACKS

We can assemble packages complete to your requirements, including labels, logos, and special art work.

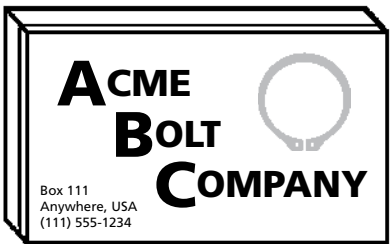
HOW ASSORTMENTS HELP YOU

Sell "from the box"



to minimize your inventory.

Sell "by the box"

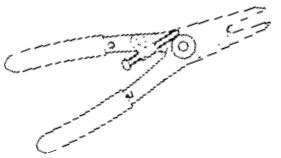


to spread your advertising message and yield greater transaction value.

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

TOOLS

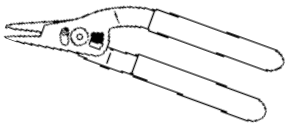
BEGINS PAGE 226



PRS STANDARD PLIERS

Permanent tip pliers with separate tools for internal and external rings. Available with straight, 45°, or 90° tips.

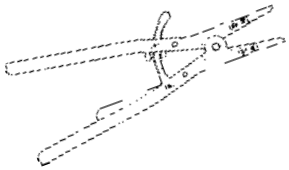
Pgs: 226-227



PRE ERGONOMIC PLIERS

Similar to PRS pliers, with a longer curved grip that yields more force, which minimizes operator fatigue. Permanent tips come in straight, 45°, and 90° angles.

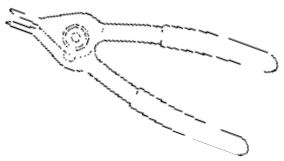
Pgs: 226-227



PRR RATCHET PLIERS

Ratchet pliers feature removable tips so that one pliers may be used on many different rings (providing that you have the tips). Must have separate tools for internal and external applications.

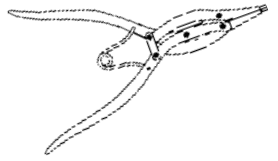
Pg: 228



PRC CONVERTIBLE PLIERS

Permanent tip pliers that can be used on both external and internal rings. As a special order item, we offer quarter turn convertible pliers, which make the conversion process even easier.

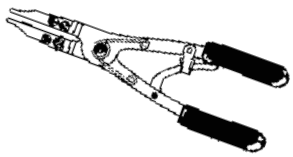
Pg: 229



PRS STANDARD PLIERS - WIRE RINGS

Eight basic wire ring pliers designs that have knurled tips or indentions to hold lugless wire rings more securely; *however, safety glasses should always be worn when using these pliers.*

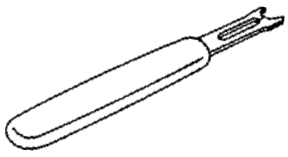
Pg: 230



PRR RATCHET PLIERS - WIRE RINGS

Removable tip wire ring pliers with ratchet action for large-sized rings. Additional "horseshoe" tips can be purchased to expand the pliers capabilities.

Pg: 231

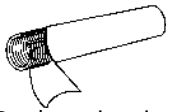


RRA APPLICATORS

Applicators come in a variety of sizes and angles that are uniquely dedicated to a very limited number of clip ring sizes.

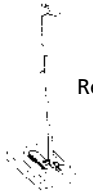
Pgs: 232-234

HOW TO USE APPLICATORS

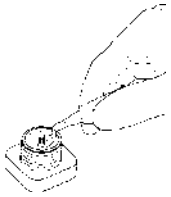


Purchase rings in a stacked roll pack.

Mount on a rail dispenser.



Remove ring from rail using applicator.



Use the correct tip design for the job, such as this offset example.

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ASSORTMENTS

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NOTHING HAS OUR NAME ON IT!

SH — EXTERNAL "SNAP"

SEE DISP-SH300 BELOW.

DISP-SH125	125 Pcs.
Shaft Dia.	Qty
1/4"	30
5/16"	25
3/8"	20
1/2"	20
3/4"	20
1"	10

Carbon Steel

HO — INTERNAL HOUSING

SEE DISP-HO300 BELOW.

DISP-HO125	125 Pcs.
Housing Dia.	Qty
1/4"	25
5/16"	25
3/8"	25
1/2"	25
3/4"	15
1"	10

Carbon Steel

SHI — INVERTED EXTERNAL

PAGE 10.

DISP-SHI125	125 Pcs.
Shaft Dia.	Qty
1/2"	30
9/16"	25
5/8"	20
3/4"	20
7/8"	20
1"	10

Carbon Steel

HOI — INVERTED INTERNAL

DISP-HOI125	125 Pcs.
Housing Dia.	Qty
5/8"	25
3/4"	25
7/8"	25
1"	25
1-1/4"	15
1-1/2"	10

Carbon Steel

SHR — HEAVY DUTY "SNAP"

PAGE 9.

DISP-SHR125	125 Pcs.
Shaft Dia.	Qty
1/2"	30
5/8"	25
3/4"	20
7/8"	20
63/64"	20
1-1/16"	10

Carbon Steel

SHF — EXTERNAL GRIP

PAGE 14.

DISP-SHF125	125 Pcs.
Shaft Dia.	Qty
3/16"	30
1/4"	25
5/16"	20
3/8"	20
1/2"	20
3/4"	10

Carbon Steel

E — E-CLIP

PAGE 26.
SEE DISP-E300 BELOW.

DISP-E125	125 Pcs.
Shaft Dia.	Qty
1/8"	30
3/16"	25
1/4"	20
3/8"	20
1/2"	20
5/8"	10

Carbon Steel

RE — REINFORCED E-CLIP

PAGE 27.

DISP-RE125	125 Pcs.
Shaft Dia.	Qty
1/8"	30
3/16"	25
1/4"	20
5/16"	20
3/8"	20
1/2"	10

Carbon Steel

C — CRESCENT

PAGE 32.

DISP-C125	125 Pcs.
Shaft Dia.	Qty
1/4"	25
5/16"	25
3/8"	25
1/2"	25
5/8"	15
3/4"	10

Carbon Steel

SH — EXTERNAL "SNAP" LARGE SIZE

PAGE 6.

DISP-SH300			300 Pcs.
Shaft Dia.	Qty	Shaft Dia.	Qty
1/4"	25	1-3/8"	5
5/16"	25	1-7/16"	3
3/8"	25	1-1/2"	3
7/16"	25	1-5/8"	3
1/2"	30	1-3/4"	3
9/16"	25	1-7/8"	2
5/8"	25	2"	2
3/4"	25	2-1/4"	2
13/16"	10	2-1/2"	2
7/8"	15	2-5/8"	1
1"	20	2-3/4"	1
1-1/4"	16	2-7/8"	1
1-5/16"	5	3"	1

Carbon Steel

HO — INTERNAL HOUSING LARGE SIZE

PAGE 16.

DISP-HO300			300 Pcs.
Housing Dia.	Qty	Housing Dia.	Qty
3/8"	25	1-1/2"	8
7/16"	25	1-5/8"	3
1/2"	25	1-3/4"	3
5/8"	25	1-7/8"	3
11/16"	25	2"	3
3/4"	25	2-1/4"	2
13/16"	25	2-3/8"	2
7/8"	25	2-1/2"	2
1"	20	2-5/8"	1
1-1/16"	10	2-3/4"	1
1-1/8"	15	2-7/8"	1
1-1/4"	15	3"	1
1-3/8"	10		

Carbon Steel

SH/HO — EXTERNAL/INTERNAL MIX

PAGES 6,16.

DISP-SHHO220			220 Pcs.
External	Qty	Internal	Qty
1/4"	10	3/8"	5
5/16"	10	7/16"	10
3/8"	15	1/2"	15
7/16"	15	9/16"	15
1/2"	15	5/8"	15
5/8"	15	3/4"	15
11/16"	15	7/8"	10
3/4"	10	1"	10
7/8"	5	1-1/8"	5
1"	5	1-1/4"	5

Carbon Steel

All assortments are packaged in a compartmentalized polypropylene box with an identification card. Identification cards can be printed with your company name and logo. Call today!

E — E-CLIP LARGE SIZE

PAGE 26.

DISP-E300					300 Pcs.
Shaft Dia.	Qty	Shaft Dia.	Qty	Shaft Dia.	Qty
1/8"	30	5/16"	30	3/4"	10
5/32"	20	3/8"	35	7/8"	5
3/16"	40	7/16"	25	Carbon Steel	
7/32"	20	1/2"	30		
1/4"	40	5/8"	15		

DE — METRIC E-CLIP

PAGE 182.

DIN 6799

DISP-DE300			300 Pcs.
Shaft Dia.	Qty	Shaft Dia.	Qty
1.2mm	20	5.0mm	30
1.5mm	20	6.0mm	30
1.9mm	20	7.0mm	30
2.3mm	20	8.0mm	30
3.2mm	30	9.0mm	20
4.0mm	30	10.0mm	20

Carbon Steel

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SH

PAGE 6.

STAINLESS STEEL EXTERNAL "SNAP"

DISP-SH100SS	100 Pcs.	DISP-SH50SS	50 Pcs.
Shaft Dia.	Qty	Shaft Dia.	Qty
1/4"	10	1/4"	5
5/16"	10	5/16"	5
3/8"	10	3/8"	5
7/16"	10	7/16"	5
1/2"	10	1/2"	5
9/16"	10	9/16"	5
5/8"	10	5/8"	5
3/4"	10	3/4"	5
7/8"	10	7/8"	5
1"	10	1"	5

HO

PAGE 16.

STAINLESS STEEL INTERNAL HOUSING

DISP-HO100SS	100 Pcs.	DISP-HO50SS	50 Pcs.
Housing Dia.	Qty	Housing Dia.	Qty
1/4"	6	1/4"	4
5/16"	6	5/16"	3
3/8"	6	3/8"	3
7/16"	6	7/16"	3
1/2"	20	1/2"	10
9/16"	6	9/16"	3
5/8"	8	5/8"	4
3/4"	10	3/4"	5
7/8"	7	7/8"	3
1"	15	1"	7
1-1/4"	10	1-1/4"	5

E

PAGE 26.

STAINLESS STEEL E-CLIPS

DISP-E100SS	100 Pcs.	DISP-E50SS	50 Pcs.
Shaft Dia.	Qty	Shaft Dia.	Qty
1/8"	10	1/8"	5
5/32"	6	5/32"	3
3/16"	10	3/16"	5
7/32"*	6	7/32"*	3
1/4"	12	1/4"	6
3/8"	20	3/8"	10
7/16"	6	7/16"	3
1/2"	20	1/2"	10
5/8"	10	5/8"	5

*This size only conforms to SE type ring.

RS,RR,RST,RRT

PAGES 38,52,42,56.

SPIRAL

Diameter	Qty	Diameter	Qty
1/2"	30	1-5/8"	3
5/8"	30	1-3/4"	3
11/16"	25	1-7/8"	3
3/4"	30	2"	3
13/16"	25	2-1/4"	2
7/8"	25	2-3/8"	2
1"	30	2-1/2"	2
1-1/16"	12	2-5/8"	1
1-1/8"	20	2-3/4"	1
1-1/4"	25	2-7/8"	1
1-3/8"	12	3"	1
1-1/2"	12	Total	298

DISP-RS298	Ext. Medium
DISP-RR298	Int. Medium
DISP-RST298	Ext. Heavy
DISP-RRT298	Int. Heavy

RS/RR,RST/RRT

PAGES 38,52,42,56.

SPIRAL MIX

External	Qty	Internal	Qty
1/2"	12	1/2"	12
5/8"	12	5/8"	12
3/4"	12	3/4"	12
7/8"	12	7/8"	12
1"	12	1"	12
1-1/8"	12	1-1/8"	12
1-1/4"	12	1-1/4"	12
1-3/8"	12	1-3/8"	12
1-1/2"	12	1-1/2"	12
		Total Pieces	216

DISP-MDSPI216	Carbon Medium
DISP-MDSPI216SS	Stainless Medium
DISP-MHSPI216	Carbon Med Hvy
DISP-MHSPI216SS	Stainless Med Hvy

DSH/DHO/DE

PAGES 152,166,182.

DIN 471 472 6799

METRIC MIX

DISP-MET300 — 300 Pcs.

Diameter	Qty	Diameter	Qty
External Rings		35mm	10
20mm	20	40mm	8
25mm	15	50mm	5
30mm	15	60mm	3
35mm	10	70mm	2
40mm	8	80mm	2
50mm	5	E-Clip Rings	
60mm	3	3.2mm	30
70mm	2	4.0mm	30
80mm	2	5.0mm	30
Internal Rings		6.0mm	30
20mm	20	7.0mm	20
25mm	15	8.0mm	20
30mm	15		

Carbon Steel

DSH

PAGE 152.

DIN 471

METRIC EXTERNAL

DISP-DSH150 — 150 Pcs.

Shaft Dia.	Qty	Shaft Dia.	Qty
8mm	15	22mm	8
10mm	15	24mm	8
12mm	15	25mm	5
14mm	15	28mm	5
15mm	10	30mm	4
16mm	10	32mm	4
17mm	10	35mm	4
18mm	10	40mm	2
20mm	8	45mm	2

Carbon Steel

DHO

PAGE 166.

DIN 472

METRIC INTERNAL

DISP-DHO150 — 150 Pcs.

Housing Dia.	Qty	Housing Dia.	Qty
15mm	20	30mm	5
16mm	20	32mm	5
18mm	15	34mm	4
20mm	15	35mm	4
22mm	10	38mm	4
24mm	10	40mm	3
25mm	10	45mm	3
26mm	10	50mm	2
28mm	8	60mm	2

Carbon Steel

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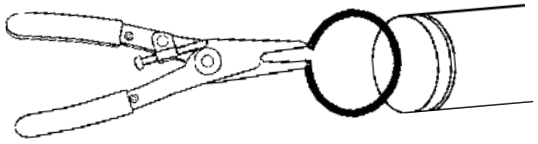
PERMANENT TIPS



FOR AXIAL ASSEMBLY OF SNAP RINGS

EXTERNAL RETAINING RINGS

RING STYLE AND SIZE								TIP ANGLE			PLIERS STYLES	
SH, BSH, VSH		SHI		SHR		USH						
								Part #				
From	To	From	To	From	To	From	To	Straight	45°	90°	Standard "PRS"	Ergonomic "PRE"
-012	-	-	-	-	-	-	-	-E023-S	-E023-45S	-E023-90S		
-015	-	-	-	-	-	-	-	-E023-M	-E023-45M	-E023-90M		
-018	-023	-	-	-	-	-	-	-E023-L	-E023-45L	-E023-90L		
-025	-066	-050	-078	-039	-047	-	-	-E038	-E038-45	-E038-90		
-068	-087	-081	-100	-050	-066	-	-	-E047	-E047-45	-E047-90		
-093	-143	-106	-200	-075	-098	-	-	-E070	-E070-45	-E070-90		
-150	-350	-215	-325	-	-	-206	-312	-E115	-E115-45	-E115-90		

SHF	From	To	Straight	45°	90°	Standard "PRS"	Ergonomic "PRE"
	-006	-011	-E034	-E034-45	-E034-90		
	-012	-015	-E040	-E040-45	-E040-90		
	-018	-027	-E047-X	-E047-45X	-E047-90X		
	-031	-075	-E070-X	-E070-45X	-E070-90X		

METRIC

DSH, DBSH, DAK, DAL		DSHI		DSHR		Part #		Part #		METRIC
From	To	From	To	From	To	Straight	Standard "PRS"	90°	Standard "PRS"	
-003	-010	-010	-017	-	-	-E009		-E009-90		
-010	-025	-018	-026	-012	-016	-E013		-E013-90		
-019	-060	-028	-048	-017	-030	-E018		-E018-90		
-040	-100	-050	-082	-032	-080	-E023		-E023-90		
-085	-165	-085	-100	-085	-100	-E032		-E032-90		

DSHF	From	To	Straight	Standard "PRS"	90°	Standard "PRS"
	-006	-	-ZGG1		-ZGG1-90	
	-008	-	-ZGG2		-ZGG2-90	
	-009	-012	-ZGG1		-ZGG1-90	
	-013	-016	-ZGG2		-ZGG2-90	
	-017	-	-ZGG3		-ZGG3-90	

DSHX	From	To	Straight	Standard "PRS"	90°	Standard "PRS"
	-0015	-003	-ZGG0		-ZGG0-90	
	-0035	-008	-ZGG1		-ZGG1-90	
	-009	-010	-ZGG2		-ZGG2-90	
	-0105	-	-ZGG1		-ZGG1-90	
	-011	-015	-ZGG2		-ZGG2-90	
	-016	-030	-ZGG3		-ZGG3-90	

Contact plant for price and availability of 45° metric pliers (PRS).

CONTACT PLANT FOR PRICE AND AVAILABLITY OF 45° METRIC PLIERS.

ALL RINGS IN A GIVEN ROW USE THE SAME PLIERS.

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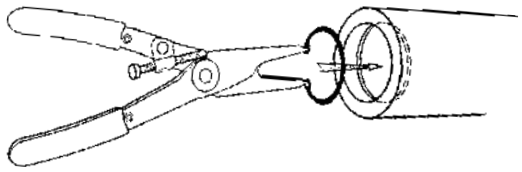
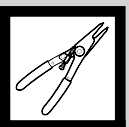
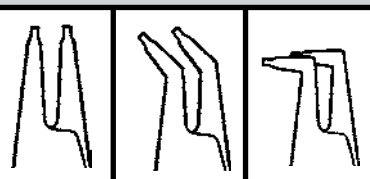
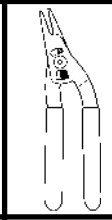
PERMANENT TIPS



FOR AXIAL ASSEMBLY OF SNAP RINGS

INTERNAL RETAINING RINGS



RING STYLE AND SIZE						TIP ANGLE			PLIERS TYPES	
HO, BHO, VHO, VVH		HOI		UHO						
						Part #				
From	To	From	To	From	To	Straight	45°	90°	Standard "PRS"	Ergonomic "PRE"
-025	-031	-062	-	-	-	-I025	-I025-45	-I025-90		
-037	-056	-075	-100	-	-	-I038	-I038-45	-I038-90		
-062	-102	-106	-137	-	-	-I047	-I047-45	-I047-90		
-106	-175	-143	-200	-175	-231	-I070	-I070-45	-I070-90		
-181	-300	-206	-300	-237	-300	-I090	-I090-45	-I090-90		

DHO, DBHO, DJK, DJL		DHOI, DVHO		DHOR						METRIC
						Part #		Part #		
From	To	From	To	From	To	Straight	Standard "PRS"	90°	Standard "PRS"	
-008	-010	-010	-015	-	-	-I009		-I009-90		
-010	-025	-016	-040	-	-	-I011		-I011-90		
-019	-060	-040	-070	020	-032	-I018		-I018-90		
-040	-100	-050	-108	-034	-080	-I023		-I023-90		
-085	-165	-110	-140	-085	-100	-I032		-I032-90		

CONTACT PLANT FOR 45° METRIC PLIERS.

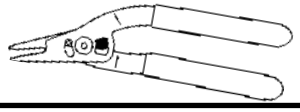
ALL RINGS IN A GIVEN ROW USE THE SAME PLIERS.

PLIERS TYPES

PRS STANDARD

Spring-loaded handles, air-cushioned grips, and presets make these the ideal tool for work situations where similar-sized rings are used. The dedicated design requires separate pliers for internal and external rings. These pliers are made of heat-treated, high carbon steel for a long life.

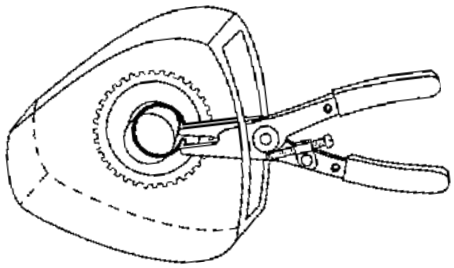
PRE ERGONOMIC



Longer, curved, air-cushioned grip design yields 30% more force. Higher force minimizes fatigue and reduces incidence of carpal tunnel syndrome. Adjustable stops prevent stressful overexpansion of external rings and allow presets that align with the lug holes of internal rings.

TIP ANGLES

Use a tip angle that maximizes operator comfort and production efficiency.



Application using 90° tip angle.

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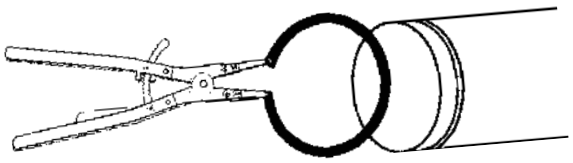
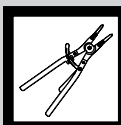
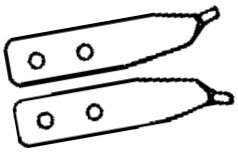
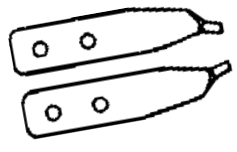
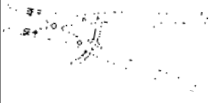
SWITCH FROM INTERNAL TO EXTERNAL

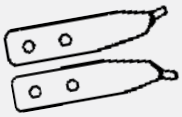
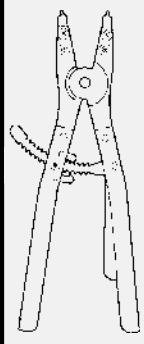
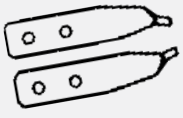


FOR AXIAL ASSEMBLY OF SNAP RINGS



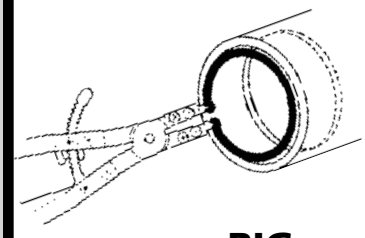
REPLACEABLE TIP RATCHET PLIERS

RING STYLE AND SIZE						TIP ANGLE				PLIERS
SH, BSH, VSH		SHI		SHR						
						Part #				Standard Ratchet Pliers come with straight tips.
From	To	From	To	From	To	Straight	15°	45°	90°	Part # "PRR"
-	-	-	-	-106	-137	-T093	-T093-15	-T093-45	-T093-90	-E093
-	-	-	-	-150	-175	-T108-X	-T108-15X	-T108-45X	-T108-90X	-E108
-150	-375	-215	-325	-	-	-T120	-T120-15	-T120-45	-T120-90	-E120
-354	-650	-350	-393	-193	-200	-T120-X	-	-T120-45X	-T120-90X	-E120-X
-675	-950	-	-	-	-	-T170	-T170-15	-T170-45	-T170-90	-E170
-975	-	-	-	-	-	-	-	-	-	-E035
-1000	-	-	-	-	-	-	-	-	-	-E045
HO, BHO, VHO		HOI		UHO						
						Part #				Standard Ratchet Pliers come with straight tips.
From	To	From	To	From	To	Straight	15°	45°	90°	Part # "PRR"
-181	-237	-206	-250	-	-	-T093	-T093-15	-T093-45	-T093-90	-I093
-244	-300	-262	-300	-306	-334	-T108	-T108-15	-T108-45	-T108-90	-I108
-306	-400	-315	-400	-346	-400	-T120	-T120-15	-T120-45	-T120-90	-I120
-306	-600	-315	-400	-413	-500	-T120-X	-	-T120-45X	-T120-90X	-I120-X
-625	-1000	-	-	-525	-700	-T150	-T150-15	-T150-45	-T150-90	-I150
-	-	-	-	-725	-1000	-	-	-	-	-I045

DSH, DBSH, DAK, DAL		DSHR			
				Part #	
From	To	From	To	Straight	90°
-122	-250	-105	-200	PRR-E035	PRR-E035-90
-252	-400	-	-	PRR-E045	PRR-E045-90
-400	-1000	-	-	PRR-048	PRR-048-90
DHO, DBHO, DJK, DJL		DHOR			
				Part #	
From	To	From	To	Straight	90°
-122	-250	-105	-200	PRR-I035	PRR-I035-90
-252	-400	-	-	PRR-I045	PRR-I045-90
-400	-1000	-	-	PRR-048	PRR-048-90

RATCHET PLIERS

Ratchet mechanism compresses or expands rings gradually.



Work best on really **BIG** rings.

METRIC

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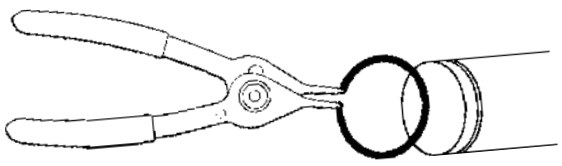
SWITCH FROM INTERNAL TO EXTERNAL



FOR AXIAL ASSEMBLY OF SNAP RINGS

CONVERTIBLE PLIERS

USE THE SAME PLIERS FOR ALL PARTS IN ONE ROW.

EXTERNAL						PLIERS	INTERNAL			
SH, BSH, VSH		SHI		SHR			HO, BHO, VHO, VVHO		HOI	
From	*To*	*From*	*To*	*From*	*To*	*Tip Dia.*	*From*	*To*	*From*	*To*
-025	-066	-050	-078	-039	-047	.038	-037	-043	-075	-100
-067	-087	-079	-100	-048	-066	.047	-044	-102	-101	-137
-088	-143	-101	-200	-067	-098	.070	-103	-175	-138	-200
-144	-200	-	-	-	-	.090	-175	-206	-201	-212

Identify correct tool by tip diameter.

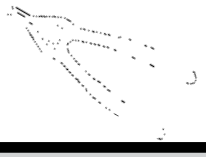
PART # PRC-			
Tip Dia.	*Straight*	*45°*	*90°*
.038	-038	-038-45	-038-90
.047	-047	-047-45	-047-90
.070	-070	-070-45	-070-90
.090	-090	-090-45	-090-90

CONVERTIBLE PLIERS

Convertible pliers are great for small quantity applications of similar size external and internal retaining rings. Switch the placement of the pliers halves to go from external to internal and vice versa. See the convertible pliers interchange chart above for an easy overview of external/internal convertibility.

QUARTER TURN PLIERS

AVAILABLE AS A SPECIAL ORDER: Quarter turn convertible pliers make pliers adjustment fast and easy. Twist the pivot a quarter turn to go from external to internal and vice versa. Contact plant for price and availability.

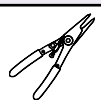


ASSORTMENTS

REPLACEABLE TIP PLIERS

DISP-RRPK1 — 10 Pcs.

CONTAINS:

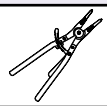
-  #PRS-EXT-NT External, #PRS-INT-NT Internal
-  (External and Internal) .038" .047" .070"

Good for snap rings 3/8" to 2"

RATCHET PLIERS

DISP-RRPK2 — 10 Pcs.

CONTAINS:

-  #PRR-E108-NT External, #PRR-I093-NT Internal
-  .018" (straight, 15°, 45°, 90°), .120" (straight, 15°, 45°, 90°)

For bigger rings!

CONVERTIBLE PLIERS

DISP-RRPK3 — 12 Pcs.

CONTAINS:

-  .038" (straight, 45°, 90°), .047" (straight, 45°, 90°), .070" (straight, 45°, 90°), .090" (straight, 45°, 90°)

Does the work of 24 tools!

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WIRE RING PLIERS

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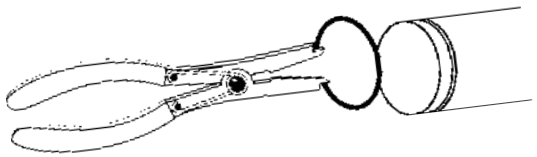
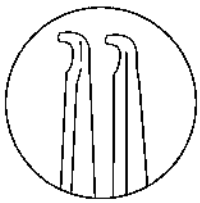
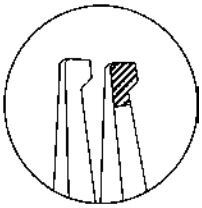
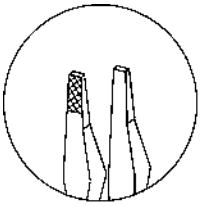
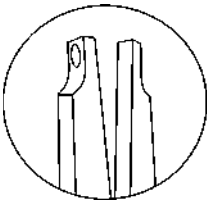
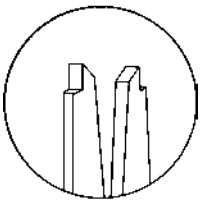
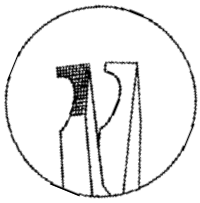
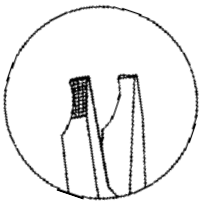
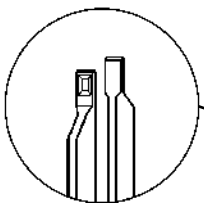


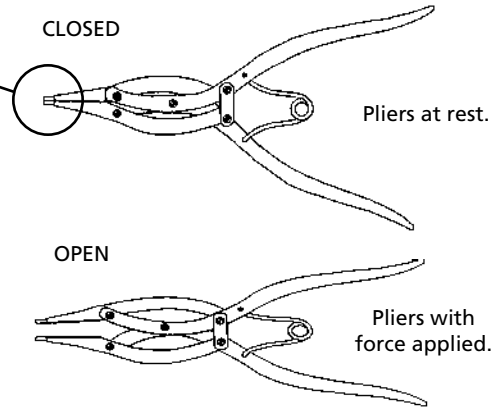
FOR AXIAL ASSEMBLY OF WIRE RINGS

PERMANENT TIP WIRE RING PLIERS

PRS-E015R	PRS-E047R	PRS-E048R	PRS-E601R	PRS-E602R
				
Small fixed tip pliers with a torsion spring and plastic grips. Ideal for small light duty external rings with minimal gaps. Knurled, shaped tip ensures a positive grip.	Standard fixed tip pliers with a torsion spring and plastic grips. L-shaped knurled tips make this pliers practical for many applications of external rings.	Thin nose fixed tip pliers with a torsion spring and plastic grips. "Needle nose" knurled tips make these pliers useful for installing rings where little clearance around the shaft exists.	Heavier duty "needle nose" pliers with a torsion spring, plastic grips, and an indentation in each tip. Jaws open 1-1/2". Work well in low clearance areas for installation and removal of spear tipped rings with a wall thickness up to .128" (3.25mm).	Heavy duty fixed tip pliers with a torsion spring and plastic grips. Heavier duty pliers with a .16" high and .18" wide abutment behind the tips. Capable of expanding thicker walled rings from .27" up to 1.4".

PRS-EG404	PRS-EG704	PRS-EG705
		
Fixed tip pliers with right angled tips to spread, remove, and install rings with a wide range of gap forms. Knurled tips hold rings securely in a variety of positions. Require at least .37" clearance for effective use of these pliers.	Fixed tip pliers with knurled tips to spread, remove and install rings without lug holes. Jaws open 1-1/2". Similar to the PRS-E601R with its narrow tips, but capable of handling a greater variety of gap forms. Works best where the minimum clearance is .21" to a depth of .43"	Fixed tip pliers with parallel action jaws notched to hold rings securely as they open in a parallel plane. Spring action closes jaws automatically. Notches can accommodate a wide variety of gap forms in rings with a cross section of up to .185".

PARALLEL ACTION



Parallel action jaws open the ring with less chance of the ring buckling or twisting that can occur with regular wire ring pliers.

SAFETY CONCERNS

Application of wire rings can be dangerous. With no lug holes and the absence of sophisticated ring design, there is a greater risk of operator injury when installing or removing wire rings. Parts can fly off the tips when overstressed or when mismatched. Always wear safety glasses when using retaining ring pliers.

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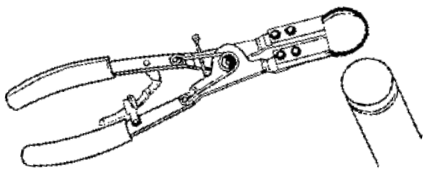
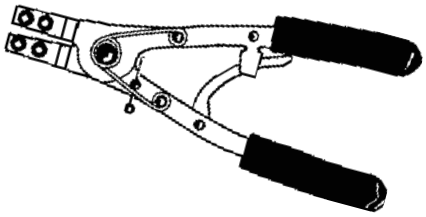
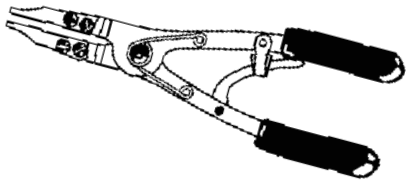
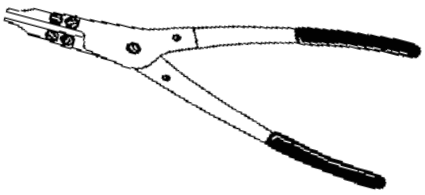
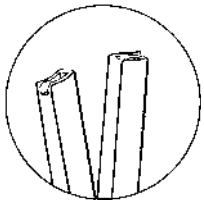
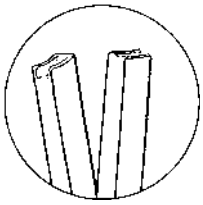
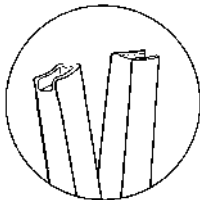
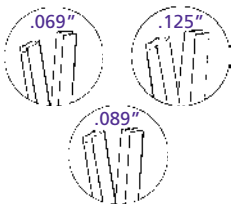
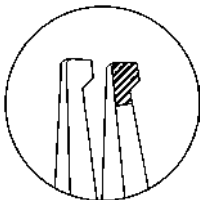


FOR AXIAL ASSEMBLY OF WIRE RINGS

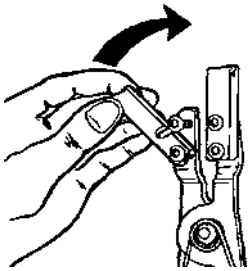
REMOVABLE TIP WIRE RING PLIERS

PRR-E038R	PRR-2836R	PRR-4936R
		
External pliers with a rachet lock and spring return. Pliers do not come with tips. To purchase tips, see PRR-T069, PRR-T089, and PRR-T125 below.	These pliers come with tips similar to those on our PRS-E047R. Tips can also be purchased separately (see PRR-T5036 below). Overall length is 10-1/2".	These pliers come with tips similar to those on our PRS-E047R. Tips can also be purchased separately (see PRR-T5036 below). Overall length is 14".

TIPS

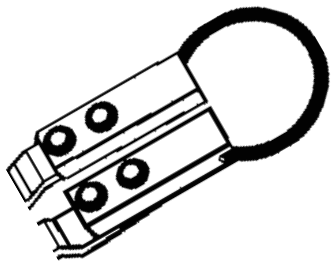
PRR-T069	PRR-T089	PRR-T125	PRR-TSET	PRR-T5036R
			 COMPLETE SET	
0.069" wide groove tips for use with PRR-E038R pliers on 0.46" to 1.40" diameter wire rings.	0.089" wide groove tips for use with PRR-E038R pliers on 1.46" to 4.73" diameter wire rings.	0.125" wide groove tips for use with PRR-E038R pliers on 2.59" to 3.71" diameter wire rings.	Set including PRR-T069, PRR-T089, and PRR-T125 tips for use with PRR-E038R pliers.	L-shaped knurled tips for use with PRR-2836R and PRR-4936R pliers.

TIP INSTALLATION



1. Fit the notch in the bottom of the tip onto the lower screw.
2. Swing the tip up and fit the second notch onto the upper screw.
3. Tighten the screws slightly to hold the tips in place.

SLOTTED DESIGN



Ring is stabilized from slotted design which diminishes the chance of the ring ejecting from pliers.

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APPLICATORS

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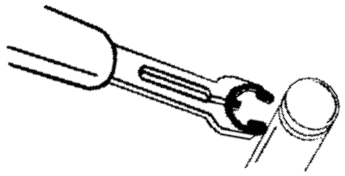

FOR RADIAL ASSEMBLY OF SNAP RINGS

INCH SIZES

TOOL	RING STYLE AND SIZE					APPLICATOR STYLES			
RRA	E	SE	YE	RE	C		45°	90°	OFFSET
-010	-004	-	-	-	-	•	•	•	•
-020	-	-006	-	-	-	•	•	•	•
-030	-	-	-006	-	-	•	•	•	•
-040	-006	-	-	-	-	•	•	•	•
-050	-012	-009	-	-	-	•	•	•	•
-060	-	-011	-	-	-	•	•	•	•
-070	-014	-	-	-	-	•	•	•	•
-080	-	-014	-	-009	-015	•	•	•	•
-090	-	-	-014	-	-018	•	•	•	•
-100	-015	-	-	-	-	•	•	•	•
-110	-	-017	-	-	-	•	•	•	•
-120	-018	-	-	-015	-	•	•	•	•
-130	-	-018	-	-018	-	•	•	•	•
-140	-	-021	-	-021	-	•	•	•	•
-150	-025	-	-	-	-	•	•	•	•
-160	-	-031	-	-025	-	•	•	•	•
-170	-037	-	-	-037	-	•	•	•	•
-180	-043	-	-	-	-	•	•	•	•
-190	-	-043	-	-	-	•	•	•	•
-200	-050	-	-	-050	-	•	•	•	•
-210	-062	-	-	-	-	•	•	•	•
-220	-	-074	-	-	-	•	•	•	•
-230	-075	-	-	-	-	•	•	•	•
-240	-087	-	-	-	-	•	•	•	•
-250	-	-098	-	-	-	•	•	•	•
-260	-	-118	-	-	-	•	•	•	•
-270	-	-	-	-043	-	•	•	•	•
-280	-	-	-	-056	-075	•	•	•	•
-290	-	-037	-	-	-050	•	•	•	•
-300	-	-	-	-	-012	•	•	•	•
-310	-	-	-	-	-021	•	•	•	•
-320	-	-	-	-	-023	•	•	•	•
-330	-	-	-	-	-025	•	•	•	•
-340	-	-	-	-	-028	•	•	---	---
-350	-	-	-	-	-031	•	•	•	•
-360	-	-	-	-	-037	•	•	•	•
-370	-	-	-	-	-040	•	•	•	•
-380	-	-	-	-	-043	•	•	•	•
-390	-	-	-	-	-056	•	•	•	•
-400	-	-	-	-	-062	•	•	•	•
-410	-	-	-	-	-068	•	•	•	•
-420	-	-	-	-	-081	•	•	•	•
-430	-	-	-	-	-087	•	•	•	•
-440	-	-	-	-	-093	•	•	•	•
-450	-	-	-	-	-100	•	•	•	•
-460	-	-	-	-	-112	•	•	•	•
-470	-	-	-	-	-125	•	•	•	•
-480	-	-	-	-	-137	•	•	•	•
-490	-	-	-	-	-150	•	•	•	•
-500	-	-	-	-031	-	•	•	•	•
-510	-009	-	-	-	-	•	•	•	•
-520	-	-	-	-012	-	•	•	•	•

ALL RINGS IN A GIVEN ROW USE THE SAME APPLICATOR.

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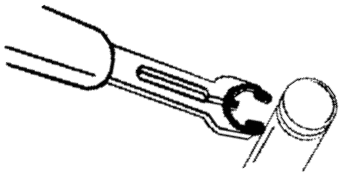
BOX 232 • MINNEAPOLIS, KS • 67467



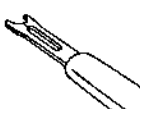
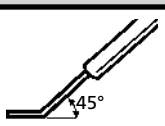
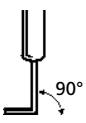
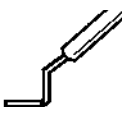
FOR RADIAL ASSEMBLY OF SNAP RINGS

INCH SIZES

TOOL	RING STYLE AND SIZE					APPLICATOR STYLES				
RRA	BE	BSE	PO	POL	EL		30°	45°	90°	OFFSET
-091	-	-	-	-	-009	---	•	•	---	---
-112	-	-	-	-	-012	---	•	---	---	---
-115	-	-	-	-	-015	---	•	---	---	---
-118	-	-	-	-	-018	---	•	---	---	---
-125	-	-	-	-	-025	---	---	---	---	---
-131	-	-	-	-	-031	---	---	---	---	---
-143	-	-	-	-	-043	---	---	---	---	---
-371	-	-	-	-	-037	---	---	---	---	---
-550	-	-011	-	-	-	---	•	---	---	---
-551	-012	-	-	-	-	---	•	---	---	---
-552	-014	-	-	-	-	---	---	---	---	---
-553	-	-014	-	-	-	---	---	---	---	---
-554	-015	-	-	-	-	---	---	---	---	---
-555	-	-017	-	-	-	---	---	---	---	---
-556	-018	-	-	-	-	---	•	---	---	---
-557	-	-018	-	-	-	---	•	---	---	---
-558	-	-021	-	-	-	---	---	---	---	---
-559	-025	-	-	-	-	---	•	---	---	---
-560	-	-031	-	-	-	---	---	---	---	---
-561	-037	-	-	-	-	---	•	---	---	---
-562	-043	-	-	-	-	---	---	---	---	---
-563	-	-043	-	-	-	---	---	---	---	---
-564	-050	-	-	-	-	---	•	---	---	---
-565	-062	-	-	-	-	---	•	---	---	---
-566	-	-074	-	-	-	---	---	---	---	---
-567	-075	-	-	-	-	---	---	---	---	---
-568	-087	-	-	-	-	---	---	---	---	---
-569	-	-098	-	-	-	---	---	---	---	---
-815	-	-	-015	-	-	•	---	•	•	•
-818	-	-	-018	-	-	•	---	•	•	•
-825	-	-	-025	-	-	•	---	•	•	•
-831	-	-	-031	-	-	•	---	•	•	•
-837	-	-	-037	-	-	•	---	•	•	•
-843	-	-	-043	-	-	•	---	•	•	•
-850	-	-	-050	-	-	•	---	•	•	•
-915	-	-	-	-015	-	•	---	•	•	•
-918	-	-	-	-018	-	•	---	•	•	•
-925	-	-	-	-025	-	•	---	•	•	•
-931	-	-	-	-031	-	•	---	•	•	•
-937	-	-	-	-037	-	•	---	•	•	•
-943	-	-	-	-043	-	•	---	•	•	•
-950	-	-	-	-050	-	•	---	•	•	•

ALL RINGS IN A GIVEN ROW USE THE SAME APPLICATOR.

TIP DESIGN

STRAIGHT	45°	90°	OFFSET	30°
				*ONLY STYLE AVAILABLE ON BE/BSE/EL SERIES.*

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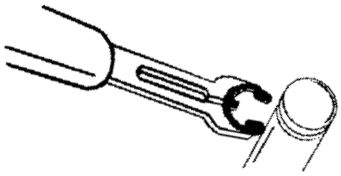
METRIC SIZES



FOR RADIAL ASSEMBLY OF SNAP RINGS

TOOL	RING STYLE AND SIZE			APPLICATOR STYLES			
RRA	DE	DRE	DC		45°	90°	OFFSET
-120	-	-004	-	•	•	•	•
-130	-	-005	-	•	•	•	•
-140	-	-006	-	•	•	•	•
-160	-	-007	-	•	•	•	•
-170	-	-010	-	•	•	•	•
-200	-	-013	-	•	•	•	•
-270	-	-011	-	•	•	•	•
-280	-	-014	-	•	•	•	•
-310	-032	-	-	•	•	•	•
-340	-040	-	-	•	•	---	---
-500	-	-008	-	•	•	•	•
-605	-050	-	-	•	---	---	---
-606	-060	-	-	•	---	---	---
-607	-070	-	-	•	---	---	---
-608	-080	-	-	•	---	---	---
-609	-090	-	-	•	---	---	---
-610	-100	-	-	•	---	---	---
-612	-120	-	-	•	---	---	---
-615	-150	-	-	•	---	---	---
-619	-190	-	-	•	---	---	---
-708	-008	-	-	•	---	---	---
-712	-012	-	-	•	---	---	---
-715	-015	-	-	•	---	---	---
-719	-019	-	-	•	---	---	---
-723	-023	-	-	•	---	---	---
-03	-	-	-003	---	---	---	---
-04	-	-	-004	---	---	---	---
-05	-	-	-005	---	---	---	---
-06	-	-	-006	---	---	---	---
-07	-	-	-007	---	---	---	---
-08	-	-	-008	---	---	---	---
-09	-	-	-009	---	---	---	---
-10	-	-	-010	---	---	---	---
-11	-	-	-011	---	---	---	---
-12	-	-	-012	---	---	---	---
-13	-	-	-013	---	---	---	---
-14	-	-	-014	---	---	---	---
-15	-	-	-015	---	---	---	---
-16	-	-	-016	---	---	---	---
-17	-	-	-017	---	---	---	---
-18	-	-	-018	---	---	---	---
-19	-	-	-019	---	---	---	---
-20	-	-	-020	---	---	---	---
-22	-	-	-022	---	---	---	---
-23	-	-	-023	---	---	---	---
-24	-	-	-024	---	---	---	---
-25	-	-	-025	---	---	---	---
-26	-	-	-026	---	---	---	---

ALL RINGS IN A GIVEN ROW USE THE SAME APPLICATOR.

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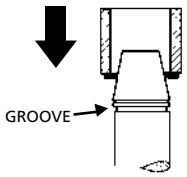
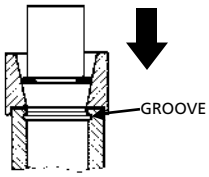
SPECIAL TOOLING APPLICATIONS

SNAP RINGS



EXTERNAL
Using mandrel and pressure sleeve.

Installation of snap rings can be automated using 6° tapered mandrels and mounting fixtures. In these instances, the ring is "snapped" into place using axial force.



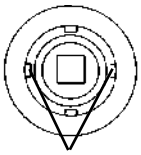
INTERNAL
Using tapered mandrel and pressure sleeve.

Page 4

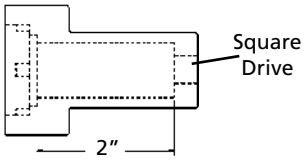
LOCKNUTS

SHAFT LOCKNUTS

Use assembly sockets coupled with powered drive wrenches to automate locknut assembly.



Notches match standard locknut keyways

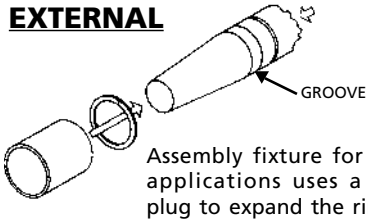


Clearance

Page 126

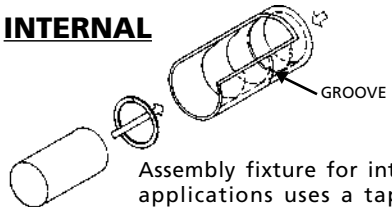
SPIRAL RINGS

EXTERNAL



Assembly fixture for external applications uses a tapered plug to expand the ring and a plunger to push the ring into position.

INTERNAL



Assembly fixture for internal applications uses a tapered sleeve to contract the ring and a plunger to push the ring into position.

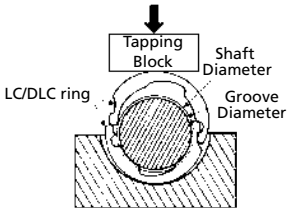
Page 34

CLIPS

Automated "staple gun" equipment is available as a special order.

Page 24

INTERLOCKING RINGS

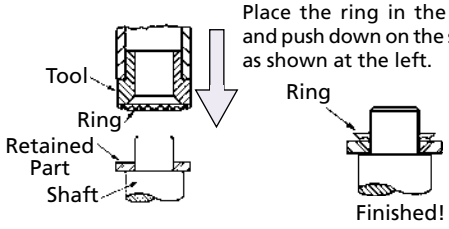


Make LC installation easier by building a V-block fixture like the one at the left, or let our shop build a fixture for you!

Page 32

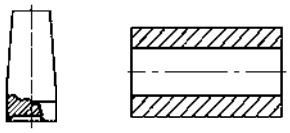
PUSH-ON RINGS

Place the ring in the tool and push down on the shaft as shown at the left.

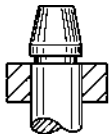


Page 90

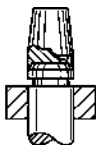
TAMPER-PROOF RINGS



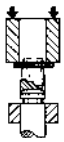
Start with a hollowed taper pin and sleeve . . .



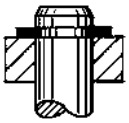
. . . or design a taper into the assembly.



Place taper pin over end with assembly mounted in work piece . . .



. . . install part using sleeve.



Finished!

See page 15 for sleeve and pin dimensions.

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PART NUMBER CROSS REFERENCE

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Part #	Mfg.	Huyett Part #	Page #
471	DIN	DSH	152
472	DIN	DHO	166
983	DIN	DAK	162
984	DIN	DJK	175
988	DIN	SS/PS	146/147
988PS	Ellison	PS	147
988SS	Ellison	SS	146
1000	IRR	E	26
1001	IRR	BE	28
1200	IRR	RE	27
2000	IRR	C	32
3000	IRR	HO	16
3001	IRR	BHO	20
3100	IRR	SH	6
3101	IRR	BSH	11
3215	Military	RE	27
3217	Military	SHR	9
4000	IRR	HOI	19
4100	IRR	SHI	10
5005	Waldes	TI	93
5008	Waldes	HOI	19
5100	Waldes	SH	6
5101	Waldes	BSH	11
5102	Waldes	VSH	12
5103	Waldes	C	32
5105	Waldes	TY	92
5107	Waldes	LC	31
5108	Waldes	SHI	10
5115	Waldes	TX	92
5131	Waldes	BE	28
5133	Waldes	E	26
5135	Waldes	RG	27
5139	Waldes	EL	33
5144	Waldes	RE	27
5160	Waldes	SHR	9
5300	Waldes	NTR	97
5304	Waldes	PO	30
5305	Waldes	TR	97
5555	Waldes	SHF	14
5560	Waldes	SHM	15
5590	Waldes	PSW	112
5900	Waldes	SS	146
6000	IRR	TI	93
6100	IRR	TY	92
6799	DIN	DE	182
7100	IRR	SHF	14
7200	IRR	SHR	9
7993A	DIN	DRP	202
7993B	DIN	DRB	203
9000	Ellison	HO	16
9002	Ellison	VHO	22
9100	Ellison	SH	6
9103	Ellison	C	32
9133	Ellison	DE9	185
16624	Military	SH	6
16625	Military	HO	16
16626	Military	SHI	10
16627	Military	HOI	19
16628	Military	BSH	11
16629	Military	BHO	20
16630	Military	VSH	12
16631	Military	VHO	22
16632	Military	C	32
16633	Military	E	26
16634	Military	BE	28
73123/73130	DIN	S	105
90707	Military	SHF	14
100 SERIES	Eaton	XRC	86
200 SERIES	Eaton	XRO	84
23 SERIES	ITW	BPX	106
300 SERIES	Eaton	XSC	82
400 SERIES	Eaton	XSO	80
A	Seeger	DSH	152
A0500	Anderton	TRC	88
A0600	Anderton	XSO	80
A0700	Anderton	XSC	82
A0900	Anderton	XRC	86
A1000	Anderton	A10	87
A1100	Anderton	BPXZ	106
A1200	Anderton	A12	104
A1500	Anderton	A15	29
AK	Seeger	DAK	162
AL	Seeger	DAL	163
AN	Whittet-Higgins	AN	132
AS (Clip)	Benzing	DBS	185
AS (Snap)	Seeger	DSHR	158
AS3215	Aerospace	RRN	58
AS3216	Aerospace	RSN	44
AS3217	Aerospace	RR	52
AS3218	Aerospace	RS	38
AV	Seeger	DSHI	160
AW	Seeger	DBSH	161
B1500	Anderton	EBS	184
BE	Rotor Clip	BE	28
BHO	Rotor Clip	BHO	20
BN809-812	Bossard	DE	182
BN814	Bossard	DBS	185
BN815	Bossard	DU	185
BN818-820	Bossard	DSH	152
BN821	Bossard	DSHR	158
BN822-823	Bossard	DHO	166
BN824	Bossard	DHOR	171
BN829	Bossard	DSHI	160
BN830	Bossard	DHOI	172
BN831	Bossard	DC	186
BN832	Bossard	DSHX	165
BR	Spirolox	BR	64
BSH	Rotor Clip	BSH	11
C	Rotor Clip	C	32
C-H	Smalley	CMH	124
C-L	Smalley	CML	120
C-M	Smalley	CMM	122
CMH	Spirolox	CMH	124
CML	Spirolox	CML	120
CMM	Spirolox	CMM	122
D	Seeger	DTR	213
D1300	Anderton	DHO	166
D1400	Anderton	DSH	152
D1460	Anderton	DSHR	158
D1500	Anderton	DE	182
D2000	Anderton	DJK	175
D2100	Anderton	DAK	162
DC	Rotor Clip	DC	186
DE	Rotor Clip	DE	182
DHO	Rotor Clip	DHO	166
DNH	Smalley	DH	194
DNS	Smalley	DS	190
DSH	Rotor Clip	DSH	152
DTI	Rotor Clip	DTI	212
DTX	Rotor Clip	DTX	212
E	Rotor Clip	E	26
EH	Smalley	DAH	196
EJB	Ellison	DVHO	174
EL	Rotor Clip	EL	33
EN	Eaton	USH	71
ES	Smalley	DAS	192
ESB	Ellison	DSB	208
ESP	Ellison	DSP	205
ESW	Ellison	DSW	206
EXT	Ellison	DSHR	158
EXTV	Ellison	DSHI	160
G	Seeger	DSHX	165
GA	Seeger	DSHF	164
GR	Ellison	DSHX	165
H	Ellison	DC	186
HO	Rotor Clip	HO	16
HOI	Rotor Clip	HOI	19
HPC	Hubbard	BPX	106
IN	Eaton	UHO	76
INT	Ellison	DHOR	171

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Part #	Mfg.	Huyett Part #	Page #
INTV	Ellison	DHOI	172
J	Seeger	DHO	166
JB	Seeger	DVHO	174
JE	Rotor Clip	JE	184
JK	Seeger	DJK	175
JL	Seeger	DJL	177
JS	Seeger	DHOR	171
JV	Seeger	DHOI	172
JW	Seeger	DBHO	173
KR	Spirolox	KR	61
KS (Push-On)	Seeger	DKS	213
KS (Spiral)	Spirolox	KS	47
LC	Rotor Clip	LC	31
M1308	Anderton	DHOI	172
M1408	Anderton	DSHI	160
M1440	Anderton	DSHX	165
M1465	Anderton	DTX	212
M1700	Anderton	D17	204
M1800	Anderton	DC	186
M2300	Anderton	DSB	208
M2400	Anderton	DSW	206
M2500	Anderton	D25	104
M3200	Anderton	DSP	205
MA4016	Aerospace	DAS	192
MA4017	Aerospace	DAH	196
MC	Rotor Clip	MC	189
ME	Rotor Clip	ME	188
MHO	Rotor Clip	MHO	180
MIL-R-27426A1	Military	RS	38
MIL-R-27426A2	Military	RSN	44
MIL-R-27426B1	Military	RR	52
MIL-R-27426B2	Military	RRN	58
MR	Spirolox	MR	62
MRE	Rotor Clip	MRE	188
MS	Spirolox	MS	48
MSH	Rotor Clip	MSH	178
MSR	Rotor Clip	MSHR	179
N	Whittet-Higgins	N	132
N1300	Anderton	HO	16
N1302	Anderton	VHO	22
N1305	Anderton	TI	93
N1308	Anderton	HOI	19
N1400	Anderton	SH	6
N1408	Anderton	SHI	10
N1440	Anderton	SHF	14
N1460	Anderton	SHR	9
N1465	Anderton	TX	92
N1500	Anderton	E	26
N1501	Anderton	BE	28

Part #	Mfg.	Huyett Part #	Page #
N1540	Anderton	RE	27
N1800	Anderton	C	32
N5000	Waldes	HO	16
N5001	Waldes	BHO	20
N5002	Waldes	VHO	22
N5003	Waldes	VVH	21
NAN	Eaton	UHB	72
ND	Eaton	ND	74
NH	Whittet-Higgins	NH	133
NHE	Std. Locknut	NH	133
NI	Whittet-Higgins	NI	134
NIN	Std. Locknut	NI	134
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RST	Spirolox	RST	42
RW	Seeger	DRP	202
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SHF	Rotor Clip	SHF	14
SHI	Rotor Clip	SHI	10
SHM	Rotor Clip	SHM	15
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SKA	Anderton	SKA	105
SKC	Anderton	SKC	105
SL	Seeger	DEL	187
SP	Seeger	DSP	205
SRA	Anderton	SRA	105
SRC	Anderton	SRC	105
SRN	Spirolox	SRN	63
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SSB	Smalley	DWS	216
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TB	Spirolox	DWS	216
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WH (Spiral)	Smalley	RR	52
WHM	Smalley	RRN	58
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WIN	Std. Locknut	WI	144
WS (Lockwasher)	Whittet-Higgins	WS	142
WS (Spiral)	Smalley	RS	38
WSM	Smalley	RSN	44
WST	Smalley	RST	42
WSW	Smalley	WSE	114
WT	Whittet-Higgins	WT	144
WTH	Std. Locknut	WT	144
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XSC	Arcon Ntl	XSC	82
XSO	Arcon Ntl	XSO	80
ZA	Seeger	DTX	212
ZJ	Seeger	DTI	212

MOST SIZES AVAILABLE IMMEDIATELY • $2 LINE REQUESTED • CALL PLANT FOR QUANTITY DISCOUNTS

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INQUIRY # _____ DATE: _____
CUSTOMER _____ REQUESTED BY _____
LOCATION _____ PHONE _____ FAX _____
SPECIAL INSTRUCTIONS _____

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YES	NO				

We make every attempt to quote special orders "same-day" or "next-day."

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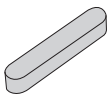

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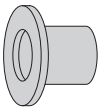
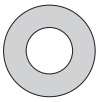


BEARINGS
Complete line of sleeves, flanges, thrust washers, and bar stock.



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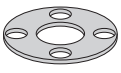

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Complete line of special washers and spacers ready for immediate shipment.

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Cotter, coiled, rolled, grooved, wirelock... you name it!

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