

introduction

WALDES TRUARC pioneered in the development of precision-engineered retaining rings.

Since 1942, when the first two basic types were introduced for aircraft, literally billions of Truarc retaining rings have been used with outstanding success in a wide variety of consumer, industrial and military products. Applications range from tiny camera shutters and delicate instruments to giant trucks and earth-moving equipment...from washing machines, air conditioners and other home appliances to business machines and office equipment. And Truarc rings are designed into such machinery. In short, wherever components must be positioned accurately and fastened securely, Truarc retaining rings can be used for fastening and assembly with substantial savings on costs for materials and labor.

HOW TO USE THIS MANUAL

While all Truarc retaining rings are designed primarily as shoulders for positioning and retaining machine components on shafts and in bores or housings, different ring series have been developed for specific fastening and assembly problems.

To facilitate rings selection for individual product applications, the standard Truarc ring series have been grouped in the "Selector Guide" on Page 4 by basic function: ring types for axial assembly, rings for radial assembly, rings for taking up end-play and self-locking types which do not require any groove. (Special rings are shown in the "Selector Guide" on Page 5.)

Field applications, again grouped by basic ring function, are followed by general information applying to *all* ring series: materials and finishes, load capacities, Government and industry standard, and recommended inspection procedures.

Descriptive text for each ring group precedes data charts with complete engineering dimensions and specifications for each ring series in the group. Packaging and assembly tools – manual, semi-automatic and automatic – complete the manual.

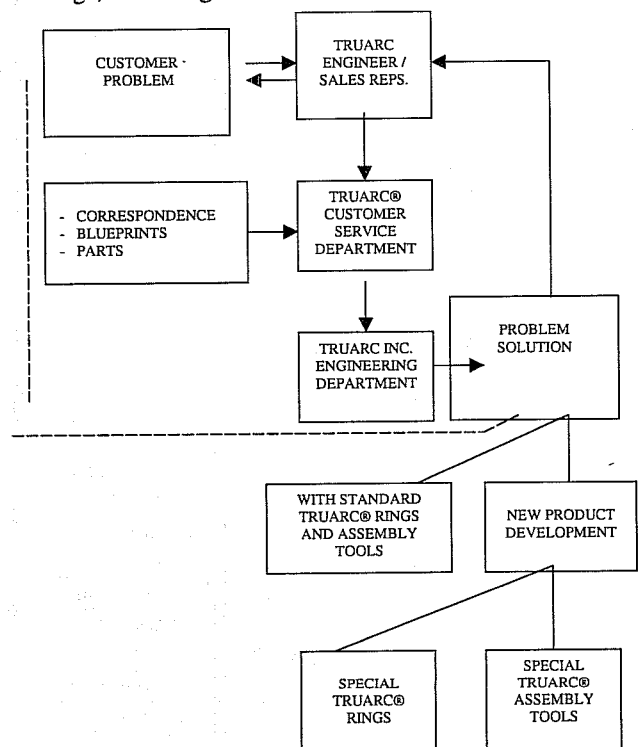
Customer Engineering Service

Truarc offers customers a complete engineering service to assist them in selecting retaining rings and assembly tools for specific designs and production requirements. As the flow chart indicates, customers can contact either Truarc Engineers / Sales Representatives or the Truarc Technical Service Department, and submit blue-prints or parts for evaluation.

The Truarc Engineering Department is experienced in every phase of retaining ring design, application and assembly. It will evaluate a customer's product, *without charge*, on the basis of function, reliability and manufacturing economy and suggest improved designs using either standard or special Truarc retaining rings and assembly tools.

There are more than 1500 distributor representatives available on call to qualified companies and individuals. Truarc distributors maintain more than 650 branches in key industrial locations throughout the U.S. and Canada and carry stock of Truarc retaining rings, assembly tools and accessories. Most branch locations are linked to their headquarters by computer network.

Distributors are listed in leading industrial directories under "Retaining Rings" or "Rings, Retaining."



Selector Guide: Standard Truarc Ring Series

DESIGN FEATURES

RING TYPES FOR AXIAL ASSEMBLY

Series N5000, 5100: Tapered section assures constant circularity and groove pressure. Secure against heavy thrust loads and high rotational speeds.

Series 5008, 5108: Lugs inverted to abut groove bottom. Rings form high circular shoulder, concentric with bore or shaft. Good for parts having large corner radii or chamfers.

Series 5160: Heavy-duty ring resists high thrust, impact loads. Eliminates spacer washers in bearing assemblies.

Series 5560: New miniature, high-strength ring. Forms tamper-proof shoulder on small diameter shafts subject to heavy thrust loads.

Series 5590: Permanent-shoulder ring for small diameter shafts. When compressed into groove, notches deform to close gaps, reducing both I.D. and O.D.

Series 5900: Precision Support Washer for use with Series 5100 and 5108 rings used to secure bearings with large corner break-outs.

RING TYPES FOR RADIAL ASSEMBLY

Series 5103: Forms narrow, uniformly concentric shoulder. Excellent for assemblies where clearance is limited.

Series 5133: Provides large shoulder on small diameter shafts. Installed in deep groove for added thrust capacity.

Series 5144: Reinforced to provide five times greater gripping strength, 50% higher rpm limits than conventional E-rings. Secure against rotation.

Series 5107: Two-part ring balanced to withstand high rpm's, heavy thrust loads, relative rotation between parts.

Series 5304: New high-strength ring for large bearing surface. Can be installed quickly with pliers or mallet, removed with ordinary screw driver.

Series T5304: Thinner model of 5304. Can be seated in same width grooves as E-rings, has more gripping power. Good for cast or molded grooves.

diameter shafts. Bowed for resilient end-play take-up.

Series 5139: Bowed ring designed for use as shoulder against rotating parts. Prongs lock against shaft, prevent ring from being forced from groove.

SELF-LOCKING TYPE RINGS (No groove required)

Series 5115: Push-on type fastener for un-grooved shafts and studs. Has arched rim for extra strength, long prongs for wide shaft tolerances.

Series 5105, 5005: Flat rim, shorter prongs, smaller O.D. than 5115. For flat contact surface, better clearance.

Series 5135: Radially-assembled. Cuts indentations in shaft during installation for increased resistance to axial displacement. (See Page 1.)

Series 5555: Axially-assembled. Exerts frictional hold against displacement from either axial direction. Adjustable, reusable.

Series 5305: Dished body, three heavy prongs lock on shaft under spring tension. Withstands heavy thrust loads.





























Series 5300: Free-spinning nut. Dished body flattens under torque, eliminating need for separate lock washers.

RING TYPES FOR TAKING UP END-PLAY

Series N5001, 5101: Bowed cylindrically to accommodate large tolerances, provide resilient end-play take-up.

Series N5002, 5102: Rings beveled 15° on groove-engaging edge for use in groove with similar bevel. Wedge action provides rigid end-play take-up. **Series N5003** is beveled on both sides of outer edge to assure proper seating against beveled groove wall.












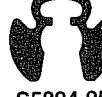












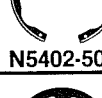


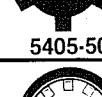
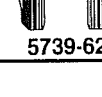
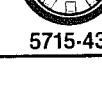
Series 5131: Provides large shoulder on small

 INTERNAL	BASIC N5000 For housings and bores Size Range: .250—10.0 in. 6.4—254.0 mm.	 EXTERNAL	BOWED 5101* For shafts and pins Size Range: .188—1.750 in. 4.8—44.4 mm.	 EXTERNAL	BOWED E-RING 5131 For shafts and pins Size Range: .110—1.375 in. 2.8—34.9 mm.	 EXTERNAL	KLIPRING® 5304 For shafts and pins Size Range: .156—2.00 in. 4.0—50.8 mm
 INTERNAL	BOWED N5001* For housings and bores Size Range: .250—1.750 in. 6.4—44.4 mm.	 EXTERNAL	BEVELED 5102 For shafts and pins Size Range: 1.0—10.0 in. 25.4—254.0 mm.	 EXTERNAL	E-RING 5133 For shafts and pins Size Range: .040—1.375 in. 1.0—34.9 mm.	 EXTERNAL	KLIPRING® T5304 For shafts and pins Size Range: .156—1.00 in. 4.0—25.4 mm
 INTERNAL	BEVELED N5002 For housings and bores Size Range: 1.0—10.0 in. 25.4—254.0 mm	 EXTERNAL	CRESCENT® 5103 For shafts and pins Size Range: .125—2.0 in. 3.2—50.8 mm.	 EXTERNAL	RADIAL GRIPRING® 5135 for shafts and pins Size Range: .094—.375 in. 2.4—9.5 mm.	 EXTERNAL	TRIANGULAR 5305* For shafts and pins Size Range: .062—438 in. •
 INTERNAL	DOUBLE-BEVELED N5003 For housings and bores Size Range: 1.56—2.81 in. 39.7—71.4 mm	 EXTERNAL	CIRCULAR 5105 For shafts and pins Size Range: .094—1.0 in. •	 EXTERNAL	PRONG-LOCK® 5139* For shafts and pins Size Range: .092—.438 in. •	 EXTERNAL	GRIPRING® 5555 For shafts and pins Size Range: .079—.750 in. 2.0—19.0 mm.
 INTERNAL	CIRCULAR 5005 For housings and bores Size Range: .312—2.0 in. •	 EXTERNAL	INTERLOCKING 5107* For shafts and pins Size Range: .469—3.375 in. 11.9—85.7 mm.	 EXTERNAL	REINFORCED E-RING 5144 For shafts and pins Size Range: .094—.562 in. 2.4—14.3 mm.	 EXTERNAL	HIGH-STRENGTH 5560* For shafts and pins Size Range: .101—.328 in. •
 INTERNAL	INVERTED 5008 For housings and bores Size Range: .750—4.0 in. 19.0—101.6 mm.	 EXTERNAL	INVERTED 5108 For shafts and pins Size Range: .500—4.0 in. 12.7—101.6 mm.	 EXTERNAL	HEAVY-DUTY 5160 For shafts and pins Size Range: .394—2.0 in. 10.0—50.8 mm.	 EXTERNAL	PERMANENT SHOULDER 5590* For shafts and pins Size Range: .250-.750 6.4 19.0 mm
 EXTERNAL	BASIC 5100 For shafts and pins Size Range: .125—10.0 in. 3.2—254.0 mm.	 EXTERNAL	REINFORCED 5115 For shafts and pins Size Range: .094—1.0 in. •	 EXTERNAL	TRIANGULAR NUT 5300* For threaded parts Size Range: 6-32 and 8-32 10-24 and 10-32 1/4-20 and 1/4-28	 EXTERNAL	PRECISION SUPPORT WASHER 5900* For shafts and pins Size Range: .157-3.937 in. 4-100 mm

* Available on special order only

Selector Guide: Special Rings

The Truarc retaining rings illustrated below were developed by Waldes Truarc Inc. for special customer requirements. Most have been manufactured and used successfully in actual product applications; others are conceptual solutions to design problems. Truarc special rings are available for general use *only* in the sizes indicated. Availability of these and other special rings is subject to prior inquiry and quotation.

 N5400-98	RINGS FOR AXIAL ASSEMBLY, Internal	 5790-47	RINGS FOR AXIAL ASSEMBLY, External
 5400-106	N5400-98: Piston pin retainer designed to be seated in extra deep grooves. Increased ring thickness provides for heavy duty service.	 5700-64	5790-47: Protruding "ears" provide high shoulder to create large abutting surface. Ring is used as safety device on threaded shaft, preventing nut from backing off.
 5400D-106	5400-106: Internal ring without lugs. Provides larger clearance diameter in housing while remaining firmly seated in groove. Ring may be assembled and disassembled with screwdriver.	 5700-92	5700-64: Small available clearance eliminates use of holes in lugs. Used in automotive distributor assembly. Ring is removed by prying out inner gap edges.
 N5400-44	5400D-106: Variation of 5400-106. Acts as a precision detent spring. Notches facilitate assembly and disassembly.	 S5160-75	5700-92: Ring applies lateral pressure against electrical component board. Assures that circuit remains intact if board cracks.
 S5304-66	N5400-44: Variation of Series N5000. Rod is pushed through ring prongs to couple rod to bore.	 5733-12	S5160-75: Variation of Series 5160. Reduced lug and maximum section fit within small clearance diameter in automotive disc brake.
 5503-50	RINGS FOR RADIAL ASSEMBLY	 S5304-25	RINGS FOR RADIAL ASSEMBLY
 5503D-50	S5304-66: Ring provides positive drive for detent in thrust runner of electric motor. Flats added to prevent rotation.	 5703-100	5733-12: Double sided E-ring used to couple welded studs on core and treadle bars of car radio.
 5177-18,25	5503-50: Variation of Series 5103. Extended center prong used for key stop in lock cylinder.	 5703-37	S5304-25: Variation of Series 5304. Flat in neck portion sits against flat on grooved shaft. Used to prevent rotation in telephone dial assembly.
 N5402-125	5503D-50: Designed for use with square shaft or shaft having two parallel slots.	 5415-147	5703-100: Special notched ring, made of 301 stainless steel, couples spout of swivel faucet to body.
 N5402-500	5177-18,25: Variation of Series 5107. Heavy-duty two-part ring designed to provide uninterrupted shoulder on small-diameter shafts. Withstands high thrust and impact loads. U.S. Pat. No. 3,162,084.	 5505-125	5703-37: Variation of Series 5103. Ring forms friction coupling, securing stem in housing of furniture caster.
 5531-50	RINGS FOR TAKING-UP END-PLAY	 5405-50	SELF-LOCKING RINGS
 5739-62	N5402-125: Variation of Series N5002. Enlarged lug aids in bevel orientation during assembly.	 5715-43	5415-147: Special internal ring with pressure prongs for retaining ball bushing in windshield wiper motor.
 N5402-500	N5402-500: Variation of Series N5002. Scallops make ring more flexible, ease compression.	 5505-125	5505-125: Special external ring is shaped spherically to conform to ball contour of retained part.
 5531-50	5531-50: Variation of Series 5131. Tab in center sits in groove's slot, preventing ring rotation.	 5405-50	5405-50: Variation of Series 5005 internal ring, without hole. Used in assemblies with light loads where abutting part has a diameter smaller than hole in standard ring.
 5739-62	5739-62: Variation of Series 5139. Used to retain automotive brake hose to bracket. Extended legs prevent ring from being turned for disassembly. Saw-tooth rim digs into bracket to assure tamper-proof design.	 5715-43	5715-43: Variation of Series 5115 external ring. Serves as a thrust-washer for bicycle pedal bearing assembly. Ring permits balls to run freely on its outer rim.