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TIMKEN'S GLOBAL LOCATIONS



## TIMKEN. WHERE YOU TURN.

*The world turns to Timken for innovation to move ahead of the competition. Our contributions to advancing work and living standards – through innovations surrounding friction management and power transmission – are invaluable. We have played a role in virtually all major technologies that have shaped our age, from automobile travel to artificial hearts. You'll find our products wherever you turn – on land, sea and in space.*

*When customers turn to us, they are turning to a worldwide team of 26,000 associates. Because of our ability to help their products perform better, customers honor us with more than 300 awards each year. Whether it is a wheel assembly for a family vehicle, bearings for a roller coaster, repair services for rail bearings or steel for an aircraft engine shaft, we supply the products and services that help keep the world turning.*



## FRICITION MANAGEMENT SOLUTIONS – A TOTAL SYSTEM APPROACH

As needs change and advanced motion control systems evolve, Timken is leveraging its knowledge of friction management to offer a broader array of bearings, related products and integrated services to the marketplace. We supply quality products and services that extend beyond bearings to help all systems run smoothly.

We are committed to providing a wide array of friction management solutions. Customers can benefit by having Timken, a trusted name for more than 100 years, evaluate entire systems, not just individual components. This approach provides cost-effective solutions, while also helping to achieve specific objectives.



## RESEARCH & DEVELOPMENT

Our bearing and steel manufacturing is strongly backed by Timken's technology centers. Each year, we commit more than \$50 million to our global technology organization. We invest in people, attracting scholars, engineers and specialists from around the world. We invest in tools – computers, manufacturing equipment and state-of-the-art laboratories. And we invest in the future by identifying new concepts that will help Timken and its customers make their mark for years to come. Innovation is one of our core values.

The return on our technology investment has grown exponentially. Our associates increase the reliability of Timken® products and create designs that can set new performance standards. We refine processes and suggest improvements to enhance performance and reduce costs. We help customers solve their immediate system issues, while developing the systems of tomorrow.

Our teams of engineers and scientists are dedicated to using everything they know about friction management and power transmission. They translate the scientific aspects of metallurgy, bearing operating characteristics, lubrication, torque, noise, heat treatment, advanced processing concepts and application development into friction management solutions.

Because our teams are located at technology centers in North America, Europe and Asia – as well as in our manufacturing facilities and field offices on six continents – customers have access to ideas and resources to transform concepts into reality. Our research focuses on products, materials, processes and emerging technology to create new solutions.





## BRANDS YOU CAN TRUST

Timken has built a strong tradition of quality, technology and innovation. A long list of customer certifications provides solid evidence that our products have earned customer trust. As our founder, Henry Timken, said, “Don’t set your name to anything you will ever have cause to be ashamed of.”

The Timken® brand also reflects the well-known quality of Torrington® and Fafnir® product lines. By leveraging the benefits of these brands – from design to distribution – Timken is giving customers expanded options and the security of knowing that each box contains an industry-trusted product.

## ABOUT THE TIMKEN COMPANY

- Timken is a global Fortune 500 company.
- The company has ranked among the 250 largest U.S. industrial corporations since the 1920s, and it has been listed on the New York Stock Exchange since 1922.
- Timken has 13 technical and engineering centers in North America, Europe and Asia.
- Timken has more than 66 plants and 105 sales offices, customer service centers and distribution centers in 27 countries on six continents.

As a Timken customer, you receive an uncompromising standard of quality across the broadest range of bearings and related products. Brands like Timken, Torrington and Fafnir reflect an extensive line of tapered, needle, spherical, cylindrical, ball bearings and mounted units ideal for virtually every industrial application. Complementing our core products is an ever-growing line of friction management solutions including lubricants, single-point lubricators, maintenance tools, safety equipment, condition monitoring systems and repair services that help keep operations running smoothly.

### SAFETY END CAPS

These easily installed caps offer a high degree of protection to maintenance personnel as well as to the bearings integrated within a housing.

### HOUSED UNITS

Ball and spherical roller bearing pillow block units, featuring a unique sealing design, are easily installed.

### CONDITION MONITORING DEVICES

From wireless units to online systems, condition monitoring devices give you powerful diagnostic tools to help detect potential bearing failure, while helping to maximize machine uptime and lowering maintenance costs.



## LUBRICANTS

Industrial lubricant formulas contain a portfolio of greases, including formulations developed by our tribology experts. These lubricants keep bearings running smoothly in a variety of industrial conditions, including high heat, food processing and high speed. Timken also offers a line of single-point lubricators to simplify the delivery of grease.



## REPAIR AND REPLACEMENT OPTIONS

By choosing to have bearings and other elements remanufactured, customers save money in replacement costs and maintain a steady supply of parts instead of purchasing new parts during downtimes. Timken provides bearing repair services for any type of roller bearing design, regardless of manufacturer.

## MAINTENANCE HANDLING TOOLS

Convenient handling devices give technicians the tools they need to install, remove and service bearings. Products include: impact fitting tools, induction heaters and hydraulic pullers.



## INDUSTRIAL SEALS

Timken industrial seals are available in small-bore sizes, zero- to 13-inches, as well as in metric and high-temperature varieties. We also provide tools to speed installation, deter seal and bearing damage and prevent premature seal leakage. The seals and tools can be applied in a full range of equipment used in thousands of applications, including manufacturing, off-highway, power transmission and oil refineries.



## ABOUT THIS CATALOG

Timken offers an extensive range of bearings in both imperial and metric sizes. For your convenience, size ranges are indicated both in millimeters and inches. Contact your Timken sales representative to learn more about our complete line for the special needs of your application.

## USING THIS CATALOG

We are committed to providing our customers with maximum service and quality. This catalog contains dimensions, tolerances and load ratings, as well as an engineering section describing fitting practices for shafts and housings, internal clearances, materials, and other features of bearings. It can provide valuable assistance in the initial consideration of the type and characteristics of the bearing which may be most suitable for your particular needs.

The data contained in this catalog is intended for reference purposes and will assist you in part number and external bearing dimension identification. Every effort has been made to ensure the accuracy of the information contained, but no liability can be accepted for errors, omissions or any other reason.

## CATALOG FEATURES

Dimension and load rating data for the various types and styles of bearings is organized by size.

ISO, DIN, and ABMA, as used in this catalog, refer to the International Organization for Standardization, Deutsches Institut für Normung EV and the American Bearing Manufacturers Association.



## TERMS AND CONDITIONS OF SALE

All products described in this catalog are sold subject to Timken's Terms and Conditions of Sale, copies of which are available from your Timken sales office.

It is understood that the buyer, in selecting and ordering from this catalog, which supersedes all previous editions, accepts all Terms and Conditions of Sale, outlined on page 8.

**NOTE:** *Product performance is affected by many factors beyond the control of The Timken Company. Therefore, the suitability and feasibility of all designs and product selection should be validated by you. This catalog is provided solely to give you, a customer of The Timken Company or its parent or affiliates, analysis tools and data to assist you in your design. No warranty, expressed or implied, including any warranty of fitness for a particular purpose, is made by Timken. Timken products are sold subject to the Limited Warranty which is set forth in Timken's terms and conditions of sale.*

### **LIMITED WARRANTY**

We warrant for a period of one year from the date of shipment that our products shall be free of defects in material and workmanship, as shall be determined by our manufacturing standards, and shall conform to the description on the face of this acknowledgment. THE WARRANTY DESCRIBED HEREIN SHALL BE IN LIEU OF ANY OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The terms contained herein constitute the entire agreement of the parties and the warranty representations of the seller. There are no other representations, warranties, or guarantees applicable to the sale of our products unless otherwise expressly agreed to by us in writing.

### **PURCHASER'S EXCLUSIVE REMEDY/SELLER'S EXPRESS LIMIT OF LIABILITY**

Purchaser's exclusive remedy for any warranty claim, or for any claim arising out of the purchase or use of our products, shall be the replacement of said products. We will replace our products, without charge to the purchaser, f.o.b. our point of shipment. We will not be liable for any consequential, incidental, or other damages sustained by purchaser, including but not limited to, loss of profits or revenue, loss of use of product, cost of capital, cost of substituted product, facilities, services, or claims of purchaser's customers for any damages. Any warranty claim of purchaser must be made within one year of the date of shipment of the product. This exclusive remedy applies regardless of the nature of purchaser's claim, whether in contract, tort, express or implied warranty, negligence or strict liability, upon which damages are claimed and regardless of whether the same is due to our negligence or any defect in our product.

### **SPECIAL APPLICATIONS**

Some products, such as for aerospace applications, are made to special standards, and only the original equipment manufacturer can determine if a particular bearing is suitable for use in their equipment.

## **WARNING**

Proper maintenance and handling practices are critical. Failure to follow installation instructions and to maintain proper lubrication can result in equipment failure creating a risk of serious bodily harm. Never spin a bearing with compressed air. The rollers may be forcefully expelled creating a risk of serious bodily harm.

## SHELF LIFE AND STORAGE OF GREASE-LUBRICATED BEARINGS AND COMPONENTS SHELF LIFE POLICY

The Timken policy for the shelf life of grease lubricated rolling element bearings, components and assemblies is set forth below. The shelf life values are based on test data and experience. Shelf life should be distinguished from lubricated bearing/component service life as follows:

### SHELF LIFE

The shelf life of the grease lubricated bearing/component is a measure of the anticipated aggregate usage (hereinafter referred to as "Service Life"). Variations in lubricant bleed rates, oil migration, operating condition, installation conditions, temperature, humidity and extended storage make it impossible to accurately predict service life.

The bearing shelf life is related primarily to the lubricant's ability to maintain the bearing's original manufactured radial internal clearance and freedom to rotate.

The component shelf life is related to the ability of the component to function as originally intended.

The shelf life values, available from a Timken sales office, represent the period of time prior to use or installation. Due to the broad range of applications, Timken cannot anticipate the performance of the grease lubricant after the bearing or component is installed or placed in service.

These shelf life values are to be used as a maximum limit—assuming adherence to the Timken suggested storage and handling policy. Deviations from Timken's storage and handling policy may reduce shelf life. Any specification or operating practice that defines a shorter shelf life should be used.

## TIMKEN DISCLAIMS RESPONSIBILITY FOR THE SHELF LIFE OF ANY BEARING/COMPONENT LUBRICATED BY ANOTHER PARTY.

### STORAGE POLICY

The Timken policy suggests the following storage guidelines for its finished products (bearings, components, and assemblies, hereinafter referred to as "Products"):

- Unless directed otherwise by Timken, products should be kept in their original packaging until they are ready to be placed into service.
- Do not remove or alter any labels or stencil markings on the packaging.
- Products should be stored in such a way that the packaging is not pierced, crushed or otherwise damaged.
- After a Product is removed from its packaging, it should be placed into service as soon as possible.
- When removing a Product that is not individually packaged from a bulk pack container, the container should be resealed immediately after the Product is removed.
- Do not use Product that has exceeded its shelf life as defined in Timken's shelf life policy statement.
- The storage area temperature should be maintained between 0° C (32° F) and 40° C (104° F); temperature fluctuations should be minimized.
- The relative humidity should be maintained below 60 percent.
- The storage area should be kept free from airborne contaminants such as, but not limited to: dust, dirt, harmful vapors, etc.
- The storage area should be isolated from undue vibration.
- Extreme conditions of any kind should be avoided.

In as much as Timken is not familiar with a customer's particular storage conditions, these guidelines are strongly suggested. However, the customer may very well be required by circumstance or applicable government requirements to adhere to stricter storage requirements.

Most bearing types are typically shipped protected with a corrosion preventive compound that is not a lubricant. Such bearings may be used in oil lubricated applications without removal of the corrosion preventive compound. When using some specialized grease lubrication it is advisable to remove the corrosion preventive compound before packing the bearings with suitable grease.

Some bearing types in this catalog are pre-packed with general purpose grease suitable for their normal application. For instance, yoke and stud type track rollers are pre-packed with medium temperature grease. Frequent replenishment of the grease may be necessary for optimum performance. Care must be exercised in lubricant selection, however since different lubricants are often incompatible.

When specified by the customer, other bearings may be ordered pre-lubricated with suitable greases and oils.

Upon receipt of a bearing shipment, it should be ensured that the bearings are not removed from their packaging until they are ready for mounting so that they do not become corroded or contaminated. Bearings should be store in an appropriate atmosphere in order that they remain protected for the intended period.

Any questions concerning the shelf life or storage policy should be directed to your local sales office.

## HOW TO ORDER A REPLACEMENT BEARING

The ordering of correct replacement bearings is vital to minimizing downtime and assuring the correct interchanges. Timken suggests that you follow these simple steps to identify your bearings and then proceed to the appropriate catalog section for correct bearing catalog number.

If no identification number is legible, measure the following dimensions:

1. Inner ring bore
2. Outer ring outside diameter

3. Inner width and outer width (not always the same dimension)
4. Shape of the outer ring: beveled vs. straight O.D.
5. List the unique features of the bearing or components such as: relubrication holes in the outer ring, wireloc (snap ring) groove in the outer ring O.D. Replacement and nomenclature information for Timken bearings is found under the "Introduction" section for each bearing type.

## BALL BEARINGS

### To identify: RADIAL BALL BEARINGS

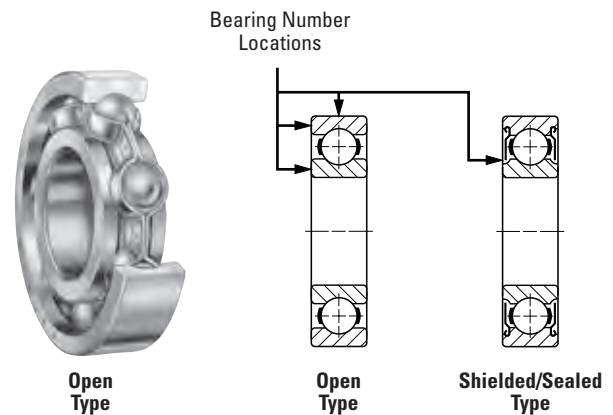
#### OPEN TYPE

The size and type of an open type (unshielded or unsealed) radial ball bearing is identified by the bearing number located on either the inner or outer ring face or bearing O.D. (e.g., 205K).

#### SHIELDED/SEALED TYPE

The size and type of a shielded/sealed type radial ball bearing is identified by the bearing number located on the shield or seal cap (e.g. 205PP).

For a comprehensive description of radial bearing nomenclature, see page D2, and for extra and superprecision ball bearings, see page D144.



### To identify: WIDE INNER RING BALL BEARINGS

#### OPEN TYPE

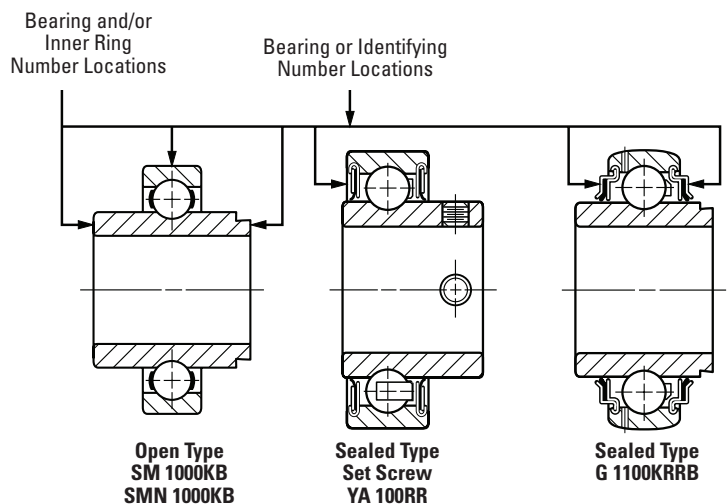
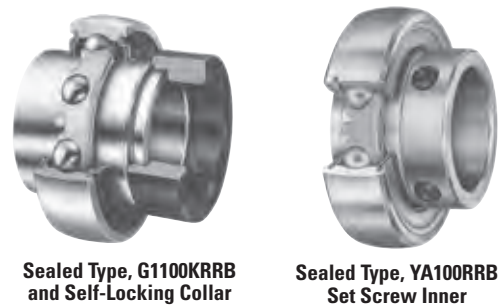
As a general rule, the complete bearing number is either marked on the outside diameter or on the inner ring face (e.g., SM1203K). This number, plus the appropriate suffix letter if applicable, constitutes the full bearing number (e.g., SM 1203KB).

#### SEALED TYPE

In some cases, the complete bearing number is marked on the seal cap. In others, an identifying number is marked on the seal cap. Although not the full bearing number, this marking will help identify the bearing type (e.g., RA100/R indicates the (G)RA-RR(B) Series; 1100/R indicates the (G)1100KRR(B) Series).

**Note:** On bearings with self-locking collars, only the collar number is stamped on the collar (e.g., S1008K). This is not a bearing number and is used only to order the collar. It is not used when ordering replacement bearings.

For a comprehensive description of wide inner ring bearing nomenclature, see page D48.



## ROLLER BEARINGS

### To identify: SPHERICAL ROLLER BEARINGS

The basic bearing number, plus any applicable modification codes, is marked on the outer ring face (e.g., 22315 CJ W33).

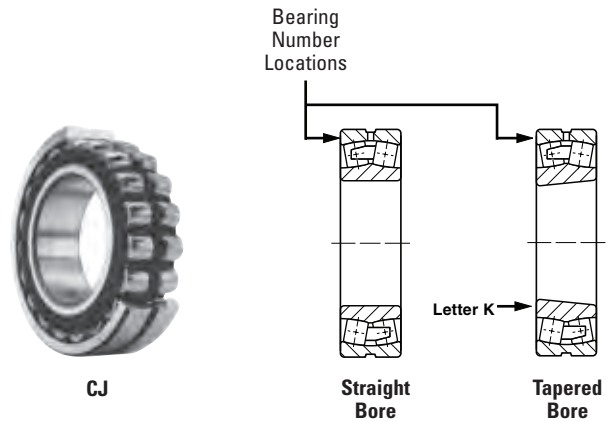
If the bearing has a tapered inner ring bore, the letter K is marked on the inner ring face (in addition to the above outer ring face marking).

Replacement bearings, if straight bore, should be ordered by specifying bearing number plus the suffix nomenclature marked on outside face (e.g., 22315 CJ W33).

Replacement bearings, if a tapered bore, should be ordered as described above, except include the suffix "K" following basic bearing number (e.g., 22315 CJ W33).

**Note:** Letter symbols marked on recessed pads on ring faces are not part of bearing nomenclature and therefore not relevant to replacement bearing number identification.

For a comprehensive description of spherical roller bearing nomenclature, see page B352.



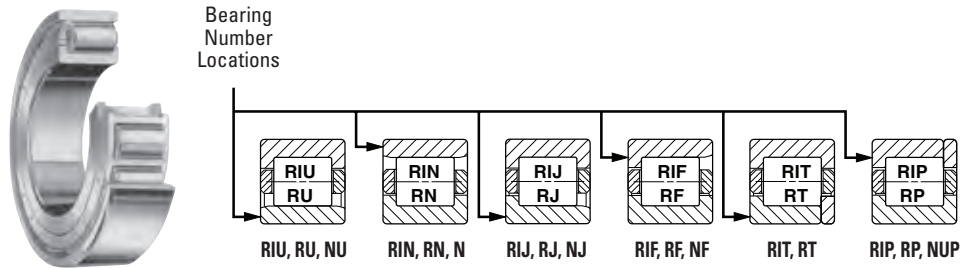
### To identify: CYLINDRICAL ROLLER BEARINGS

The bearing number, plus radial clearance symbol and other applicable modification codes, is marked on the outer or inner ring faces as follows:

For types NU, NIU, NJ, NIJ, NT, NIT Series, the inner ring is marked (e.g. 160NIU92R3).

For types NN, NIN, NF, NIF, NP, NIP Series, the outer ring is marked (e.g., 160NN92R3).

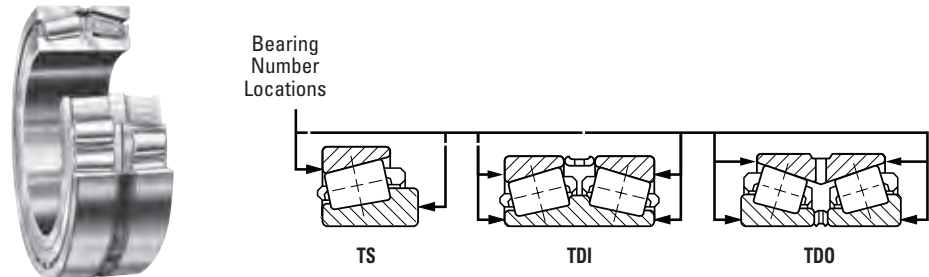
For a comprehensive description of radial cylindrical roller bearing nomenclature, see page B326.



### To identify: TAPERED ROLLER BEARINGS

Inner ring (cone) part numbers are marked on a face, and outer ring (cup) part numbers on a face or the outside diameter surface.

For a comprehensive description of tapered roller bearings, see pages B15, B195, B237, B297 and B311.



The term "modification code" refers to additional information, describing details and requirements, for specific bearing applications. A basic Timken bearing part number may be produced in a variety of special modifications to meet different application needs. The word "modification" in this context refers to all changes from standard for both commercial and non-commercial applications. This meaning is different from the term "modified for use in military applications" referred to in the ITAR regulations.

## NEEDLE ROLLER BEARINGS

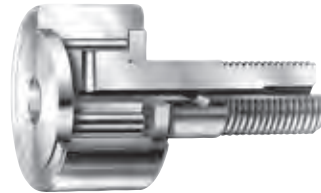
### To identify: NEEDLE ROLLER AND CAGE RADIAL ASSEMBLY

As general rule, there are no identifiable markings on needle roller and cage radial assemblies to indicate the bearing part number. Parts are specified by bore diameter, outside diameter, and width (e.g. K24x28x10H).



### To identify: STUD TYPE TRACK ROLLERS

The complete bearing part number is marked on the stud face or stamped on the face of the outer ring (e.g. KRE22.2RS). Yoke type track rollers (without stud, not shown) have the part stamped on the face of the inner or outer ring.



### To identify: NEEDLE ROLLER THRUST BEARINGS

As general rule, there are no identifiable markings on needle roller and cage radial assemblies to indicate the bearing part number. Parts are specified by bore diameter and outside diameter (e.g. AXK1024).



### To identify: COMBINATION BEARINGS

As general rule, there are no identifiable markings on combination bearings to indicate the bearing part number. Parts are specified by the product series and bore diameter (e.g. RAXZ510).



### To identify: DRAWN CUP NEEDLE ROLLER BEARINGS AND DRAWN CUP ROLLER CLUTCHES

The complete bearing part number is stamped on the face of the outer ring (e.g. HK1412, FCL-10-K). Also, on clutch assemblies, the mounted clutch assembly engages when the housing is rotated relative to the shaft in the direction of the arrow and the word LOCK stamped on the outer ring.



### To identify: NEEDLE/CYLINDRICAL ROLLERS

As general rule, there are no identifiable markings on loose rollers to indicate the part number. They are packaged in bulk or in strips. Loose rollers are specified by the product series, end geometry, diameter, and nominal length (e.g. NRO.B 1.5x11.8 G2).



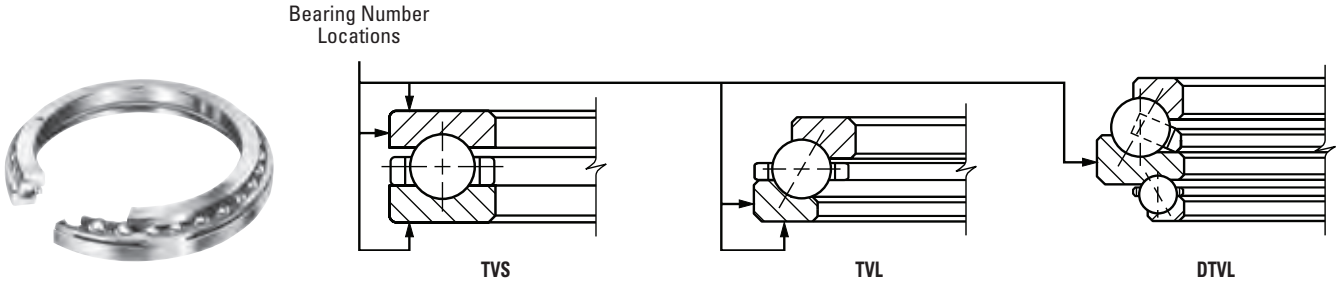
## THRUST BEARINGS

### To identify: THRUST BEARINGS

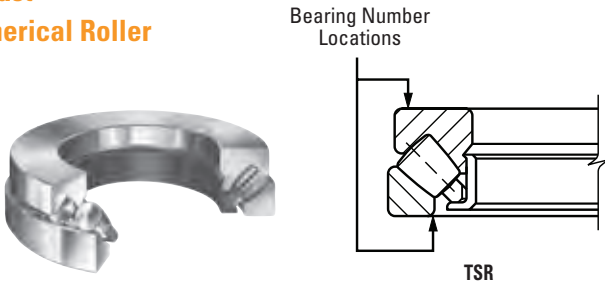
There are four basic designs of thrust bearings: ball, spherical roller, cylindrical roller and tapered roller.

All have assembly numbers marked on one or more components of the bearing.

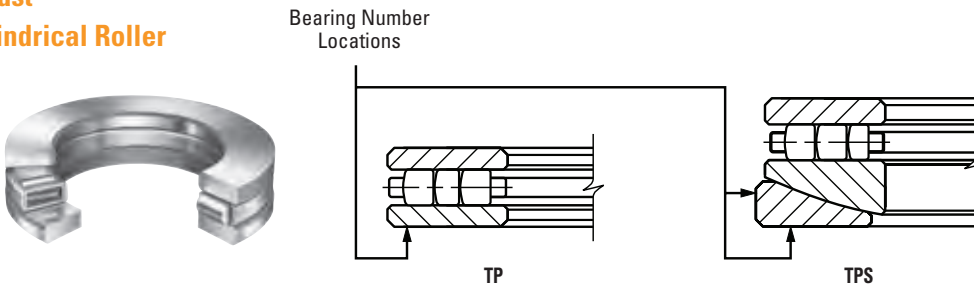
### Thrust Ball



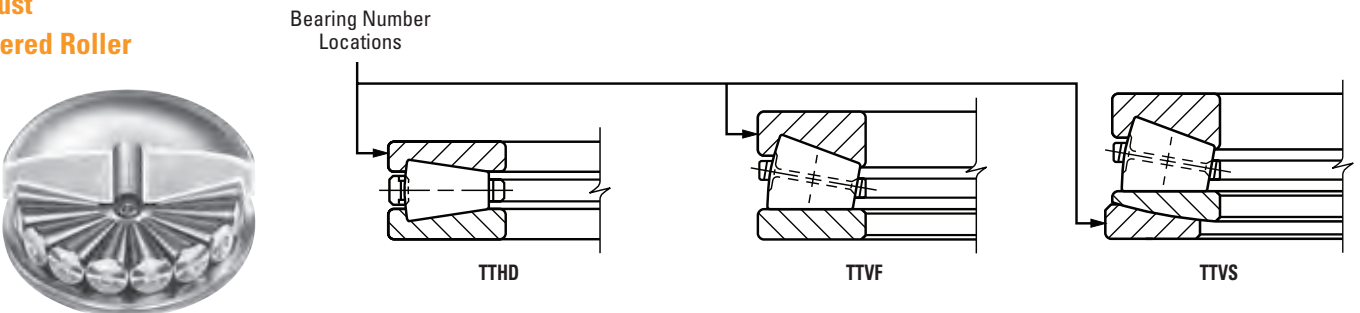
### Thrust Spherical Roller



### Thrust Cylindrical Roller



### Thrust Tapered Roller



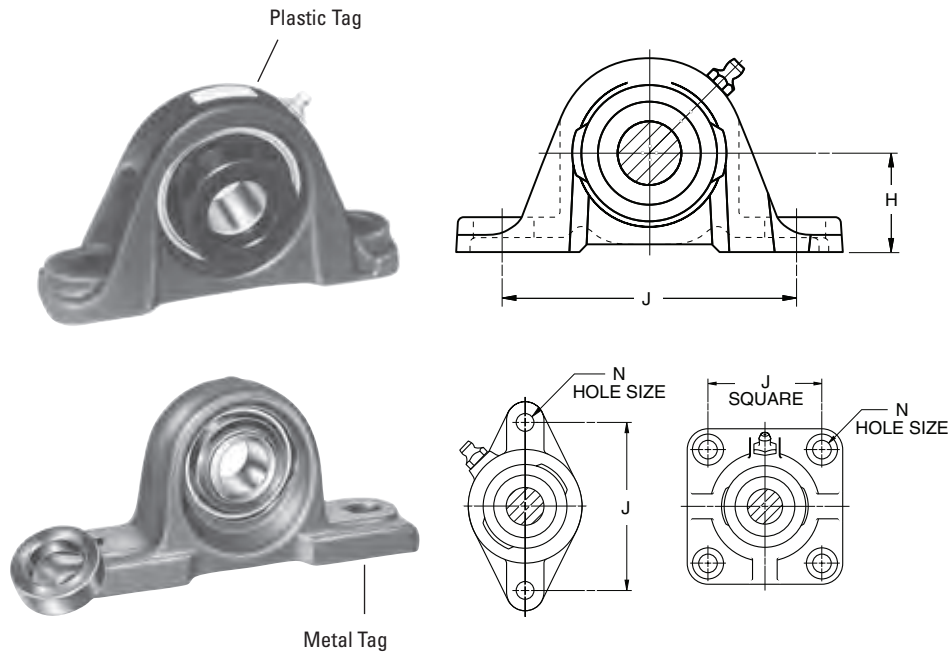
## HOUSED UNITS

### To identify: BALL BEARING PILLOW BLOCKS AND FLANGED UNITS

The housed unit is identified by a plastic or metal tag on the unit. All housed units are factory equipped with this tag. This identification number is the bearing housing assembly number which can be ordered from this catalog (e.g., RAK 1).

If the tag is removed from the housed unit, measure the bolt hole center dimensions (J), and (on pillow blocks) base to center height (H). Also, note any number cast or stamping on the housing. On some sizes, check the bottom of the unit for this number. This is the "housing only" number and can be used along with the bearing number (see ball bearing description) to identify the two parts that make up the housed unit.

For a comprehensive description of pillow block and flanged unit nomenclature, see page B384.



### To identify: SPHERICAL ROLLER BEARING PILLOW BLOCK

The end cap and/or base housing is marked with a pillow block housing number (e.g., SAF517). The pillow block assembly number is closely affiliated with the housing number (e.g., SAF 22517). Here, pillow block assembly uses the pillow block housing SAF517.

For a comprehensive description of spherical roller bearing pillow block nomenclature, see page B384.



**A** *ENGINEERING*

**B** *ROLLER BEARINGS*

**C** *NEEDLE BEARINGS*

**D** *BALL BEARINGS*

