

Rollway Bearings



Outline

- Overview
- Features & Benefits
- Competition
- Product Selection
- Markets & Applications
- Summary
- Key Contacts



Overview – Products

Aerospace

Small Radials(<6 inch OD)

Small Journals(<6 inch OD)

Large Radials & Journals(>6 inch OD)

Thrust Bearings

Valparaiso, IN

Valparaiso, IN

Monticello, IN

Ithaca, NY

Ithaca, NY

Cylindrical



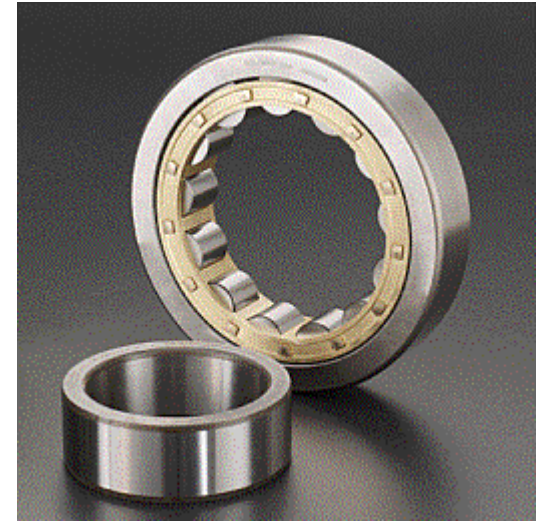
Journal

Thrust



Radial (Cylindrical) Roller Bearings

- Metric series standard
- Extra capacity design available
- Size range
 - Bore diameters from 15 to 736mm (29")
 - Outside diameters from 40 to 1,016mm (40")
- Several retainer types available



Radial (Cylindrical) Roller Bearings

Unmounted Internal Clearances - Standard C3 Additional internal clearances available

Races - manufactured from Vacuum Degassed Through Hardened Bearing Grade Steel. Surfaces are precision ground to RBEC 1 tolerances

3 Standard Retainer options

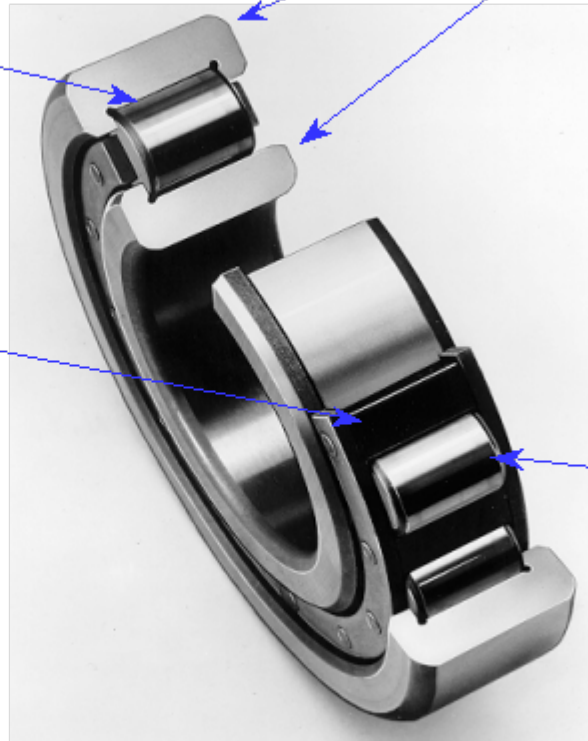
Segmented steel retainer



2 piece machined brass retainer



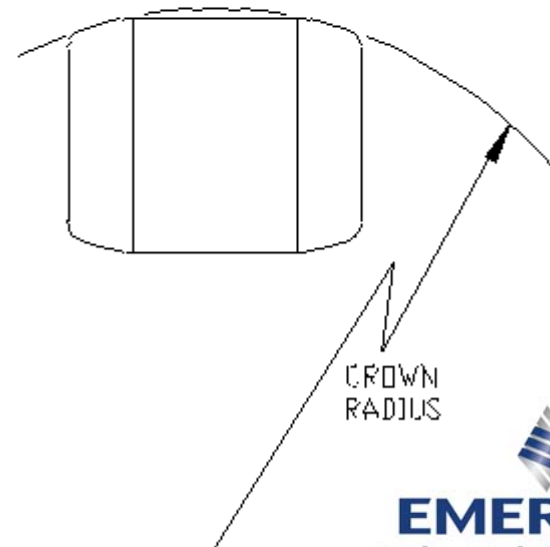
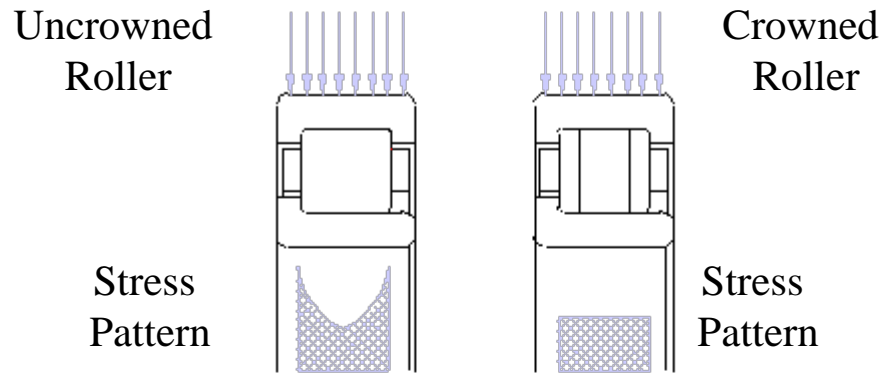
1 piece Stamped Steel



Crowned rollers. Extra capacity bearing designs have larger rollers, maximizing the load carrying potential of the bearing's cross sectional area.

Crowned Rollers

- Crowned rollers yield a more evenly distributed load pattern on the races, resulting in longer life.
- All Rollway cylindrical and tapered bearings feature crowned rollers.



Cylindrical Roller Retainers

- The retainer separates & holds the rollers in a determined location to evenly distribute the load.
- 4 Types:
 - None - Full Compliment - Low speed, high load.
 - Steel (stamped or segment type) - standard retainer type.
 - Brass (bronze) - Higher speed than steel, may have lower load rating due to the number of rollers in the brass retainer.
 - Land Riding (brass or steel) - Very high speed applications / special design required.

Retainers

- Low Carbon Stamped Steel
- Rides below pitch circle
- Low Speed
- Used only with Outer Race or Retaining
- Rollers guided by raceway flanges
- Well suited for volume production
- Most widely used



One Piece
Stamped Steel

Retainers

- Formed steel segments held between two steel end plates
- Good roller guidance with minimizing friction
- Flexible – accommodates different widths
- Retainer design is well adapted for volume production



Segments and
End Plates

Retainers

- Accurate roller guidance
- Machined Pockets to minimize skewing
- Typically made of brass, cast iron is available for applications where brass cannot be used
- Higher speed applications
- Available with most radial roller bearing designs



Two Piece Drilled
Brass

Retainers

- High speed applications.
- Made of brass or silver plated steel
- Land riding, minimizing friction between the rollers & the retainer
- MTO only



One Piece
Machined

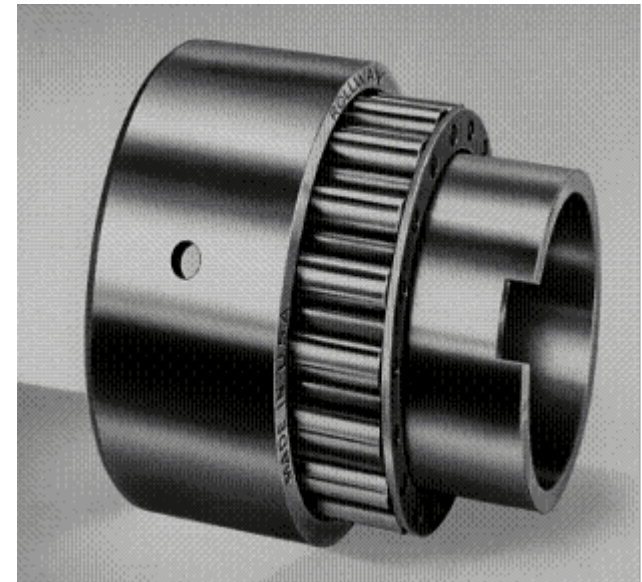
Journal Bearings



- The Journal Roller Bearing is a needle roller bearing defined by the construction of the roller assembly.
- The roller assembly is constructed such that the rollers are held in the steel cage by trunions machined on the end of the rollers.

Journal Bearings

- Needle roller bearing
- Metric Bore/OD
- Sizes
 - Bore diameters from 25mm to 220mm (8.661")
 - Outside diameters from 62mm to 380mm (14.960")
- Sold complete or as components
- Trunion style rollers
- Steel cage

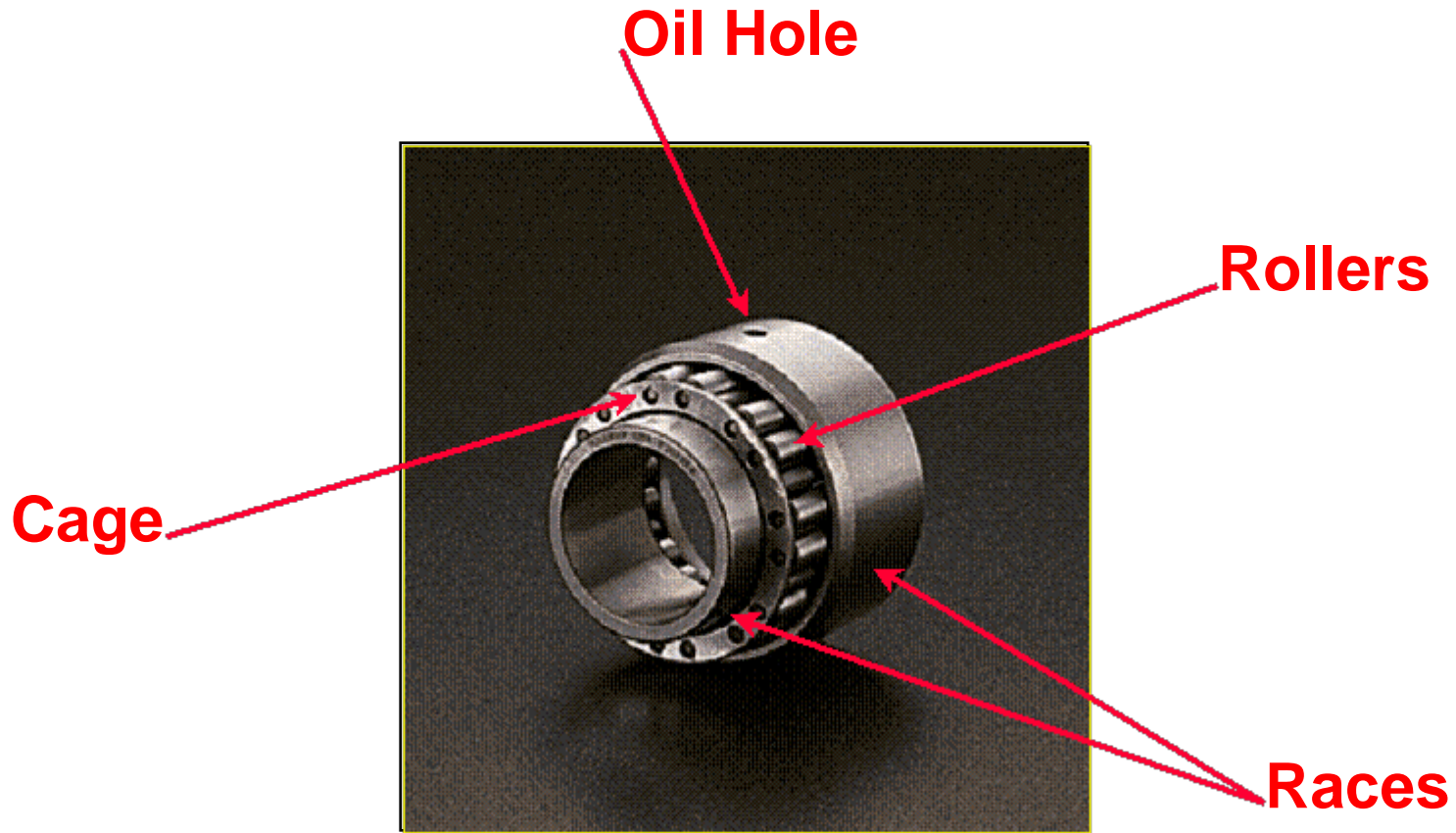


Journal Bearings

- Sold as components or as complete assemblies:
 - Outer race only
 - Inner race only
 - Roller assembly only
 - Outer race with roller assembly
 - Complete bearing assembly
- Interchangeable with other manufacturers parts
- For a given size, multiple lengths are available
- Special inner races are available:
 - With locating notches
 - Extra wide



Construction



Roller Thrust Bearing

- The Rollway Options - we have one of the broadest thrust bearing offerings.
- Specializing in heavy duty types.
- Types, styles & series differ

– Cylindrical Thrust -----



– Tapered Thrust -----

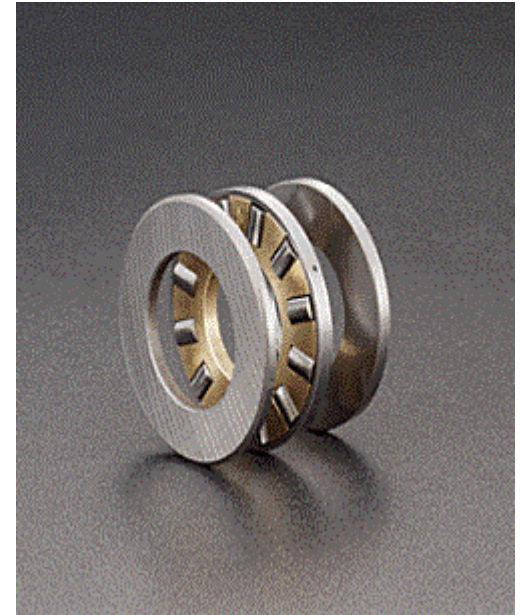


– Tandem Thrust ---



Cylindrical Thrust

- Medium Duty - 600 Series
 - 1" to 3" Bore (26 sizes)
 - One row of rollers
- Heavy Duty - 700 Series
 - Over 3" Bore (48 sizes)
 - Sizes in 1 inch increments
 - Multiple OD sizes for a given bore diameter
- Styles include: Aligning, Crane Hook, Double Act

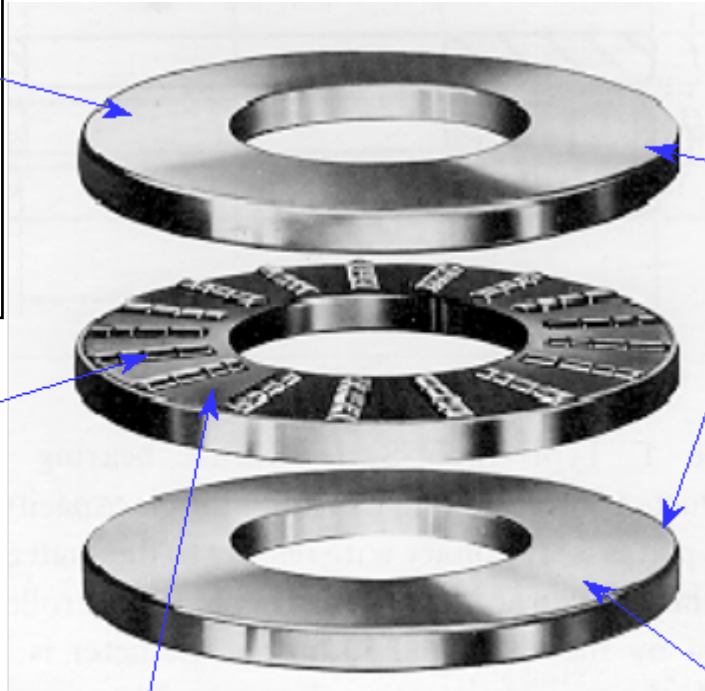


Cylindrical Thrust

Shaft Plates manufactured to conform to ABMA size & tolerance specifications. Bore is ground to easily accept the shaft while the outside diameter will typically have a turned finish & be smaller than the outside diameter of the housing plate

Rollers manufactured from Vacuum Degassed Through Hardened Bearing Grade Steel. Surfaces are ground and superfinished. Outside diameters are crowned. Ends have a large machined radius designed to reduce friction between the roller & the retaining ring. Larger bearings use multiple rollers per pocket to minimize slippage

Retainers manufactured from centrifugally cast brass/bronze. Roller slots are accurately machined to provide smooth operation of the roller assembly. Rollers are retained by a steel band placed over the outside diameter of the retainer.

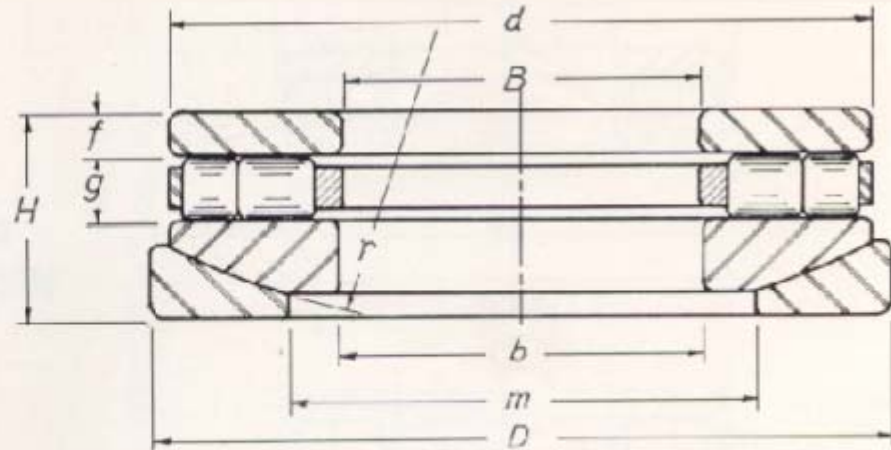


Plates manufactured from Vacuum Degassed Through Hardened Bearing Grade Steel. Surfaces are ground & superfinished.

Housing Plates manufactured to conform to ABMA size & tolerance specifications. Outside diameter is ground to easily fit into the housing while the bore will typically have a turned finish & be larger than the bore of the shaft plate

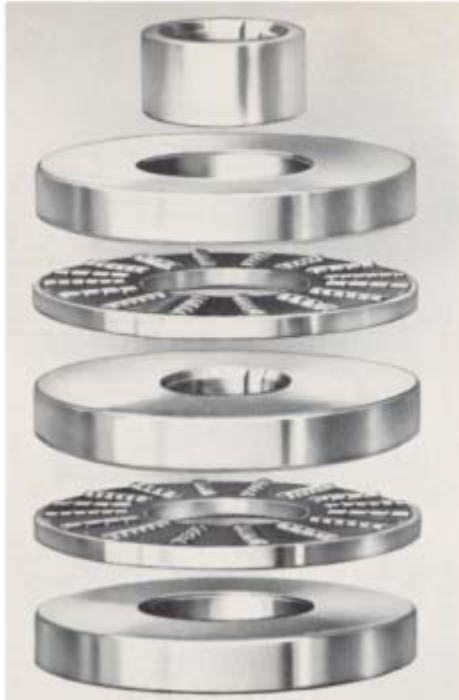
Aligning Thrust Bearings

- Accommodate static misalignment

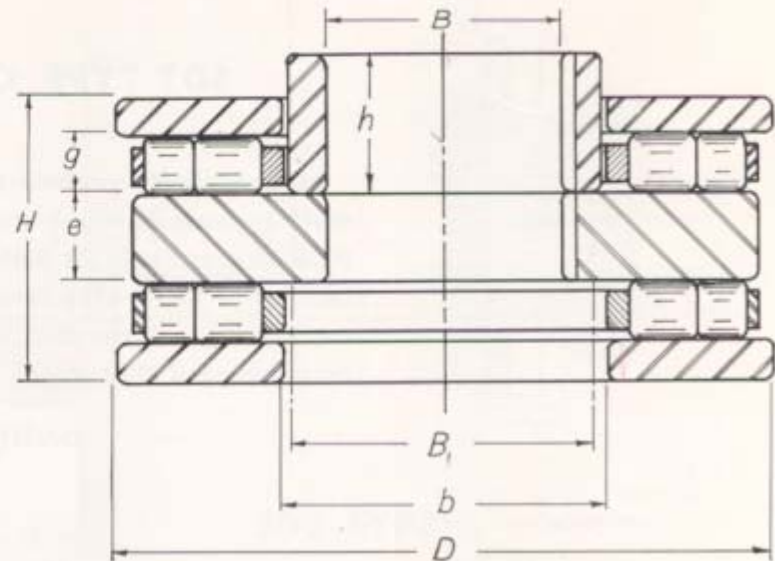


Double Acting Thrust Bearings

- Carry thrust loads in both directions

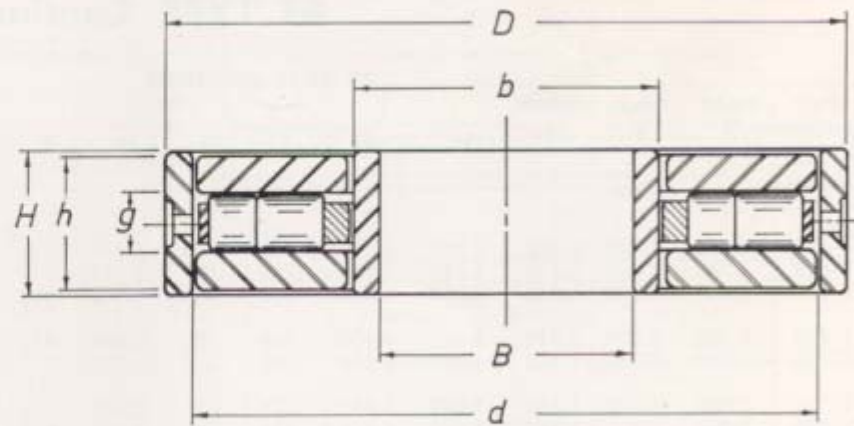


DT TYPE



Simplified Double Acting Thrust Bearings

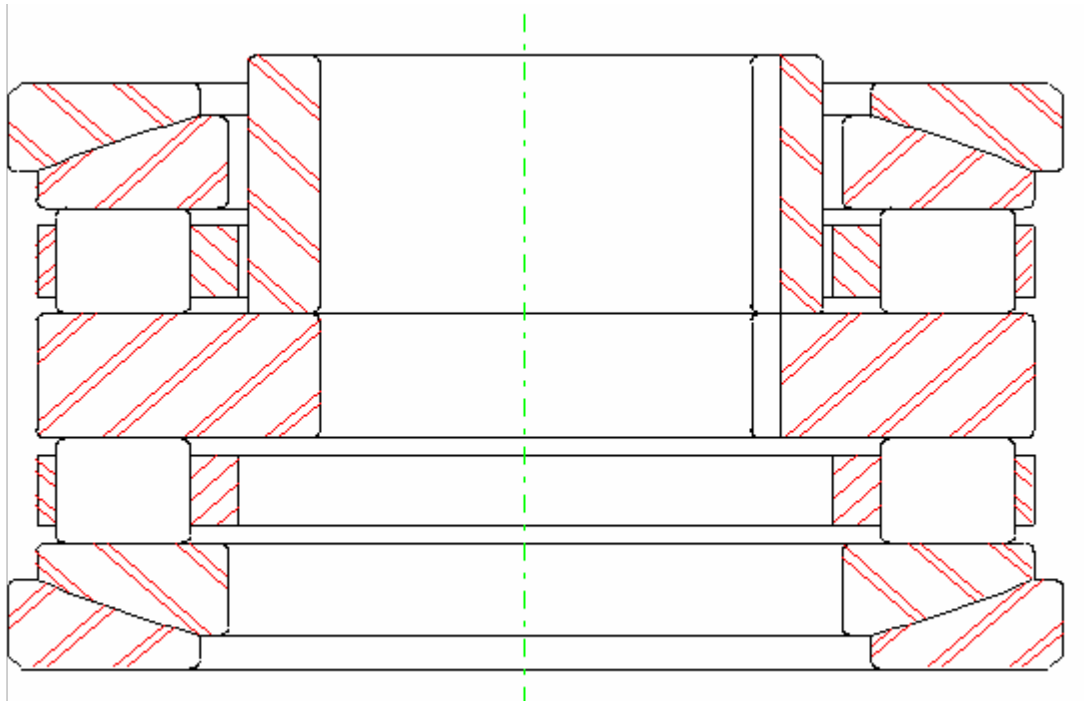
- Carry thrust loads in both directions



SDT TYPE

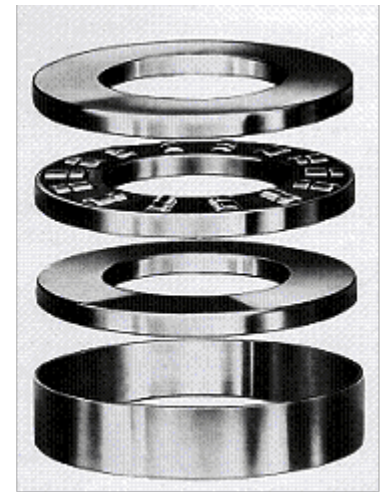
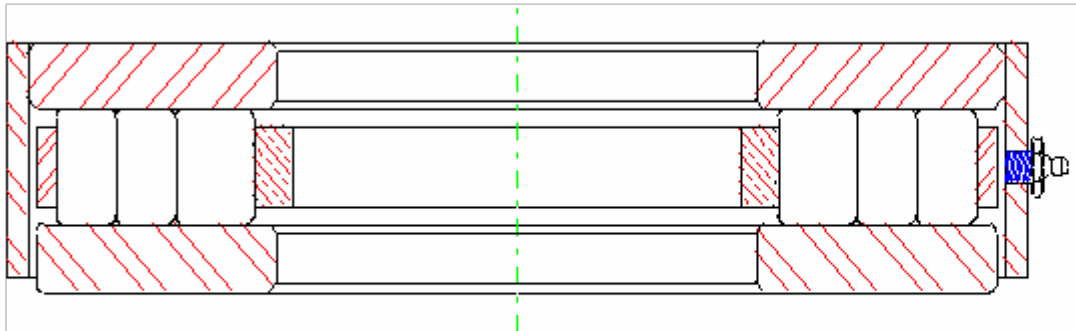
Cylindrical Thrust Bearings

- Self aligning, double acting, cylindrical thrust
 - Allows for static misalignment of up to 3°



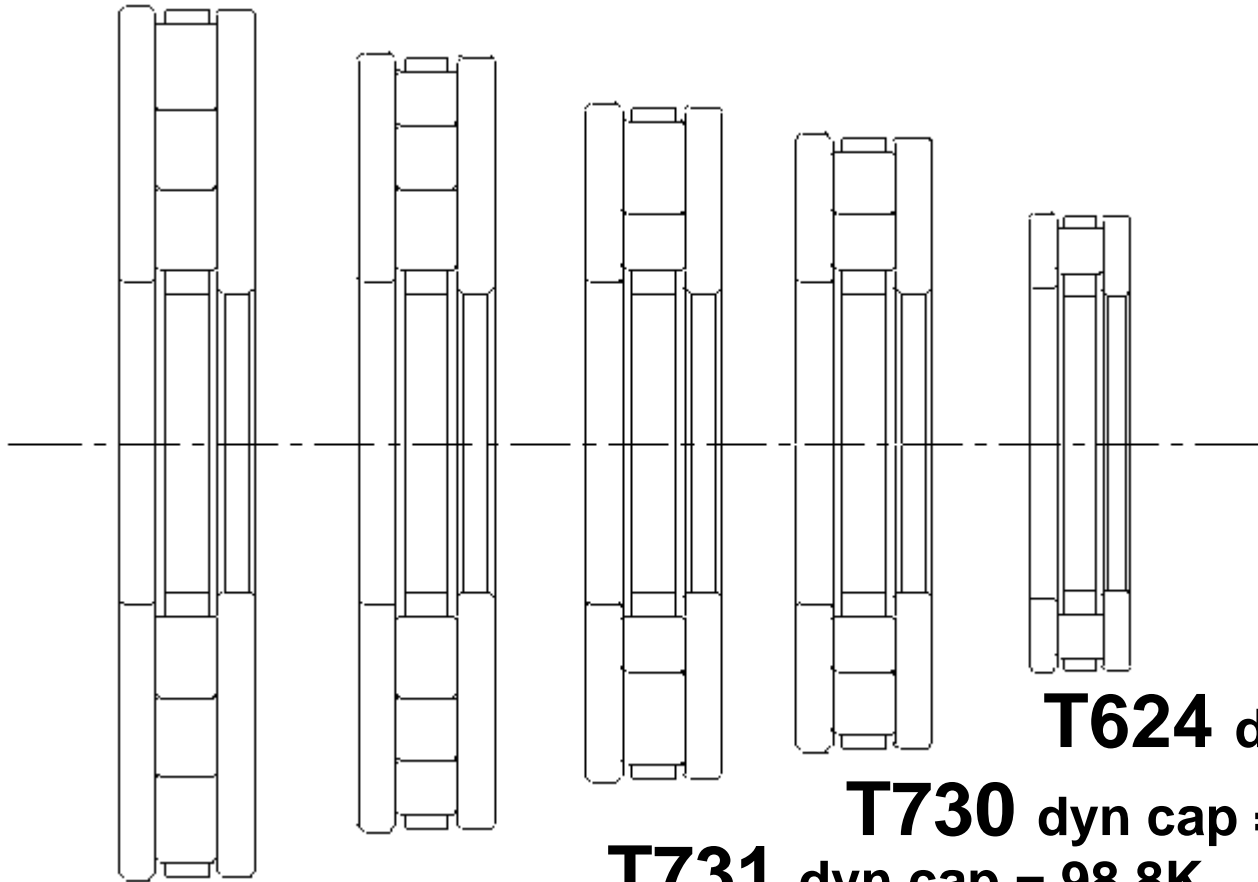
Crane Hook Cylindrical Thrust

- Crane hook applications
- “Weathershed” shield
- With or without grease fittings



Cylindrical Thrust

- 3" bore



T624 dyn cap = 40.5K

T730 dyn cap = 82.2K

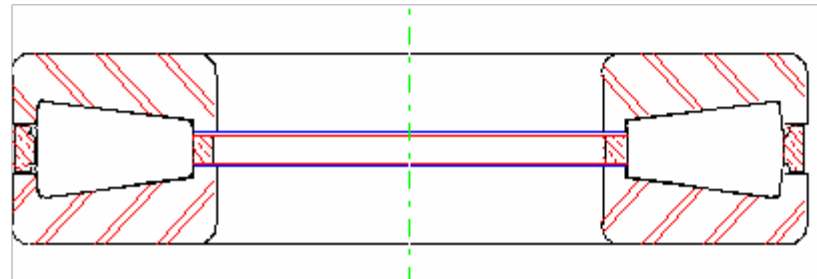
T731 dyn cap = 98.8K

T732 dyn cap = 126.2K

T733 dyn cap = 147.5K

Tapered Thrust

- TTHD and TTVF styles
- Tapered roller produce true rolling motion
- Carburized components
- Sizes
 - Bore diameters from 4" to 16"
 - Outside diameters from 8.5 to 34"



Tapered Thrust

Rollers manufactured from Vacuum Degassed Carburizing Bearing Grade Steel. Surfaces are precision ground & crowned to ensure evenly distributed stresses on the plates.

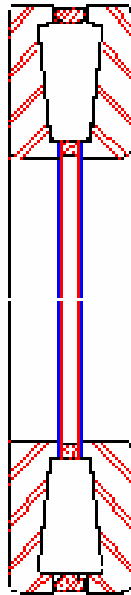


Plates manufactured from Vacuum Degassed Carburizing Bearing Grade Steel. Surfaces are precision ground to ABMA standards. Unlike the cylindrical thrust, these plates can be used as either the shaft or housing plate.

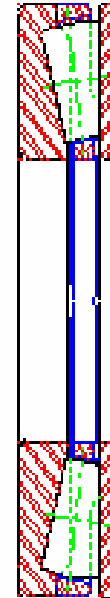
Outboard ends of the *rollers* have precision ground & superfinished contours to reduce friction.

Retainers are machined from a single piece of centrifugally cast brass.

Tapered Thrust



Tapered Thrust
TTHD Style



T-Flat Thrust
TTVF Style

Cylindrical Vs Tapered Thrust

- For a given inch bore size the tapered thrust offer a high capacity option
- Tapered thrust have other inherent advantages
 - Tapered rollers travel with true rolling motion, no skidding
 - Superior in horizontal shaft applications, no roller assembly slippage
- For a given envelope the tapered thrust can cost 2X more than a cylindrical thrust



Cylindrical vs. Tapered Thrust

700 Series

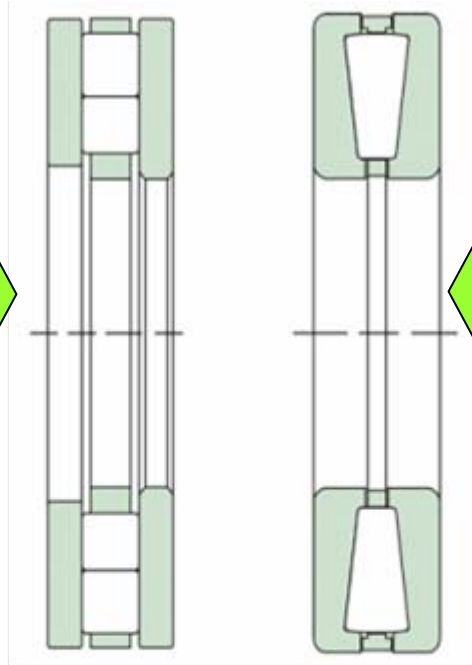
Cylindrical Thrust

T-753

8" x 16" x 3"

Dyn.Cap. = 516,400 lbs.

\$1873.30 – Dist Cost



Tapered Thrust

T-811

8" x 16.5" x 3.625"

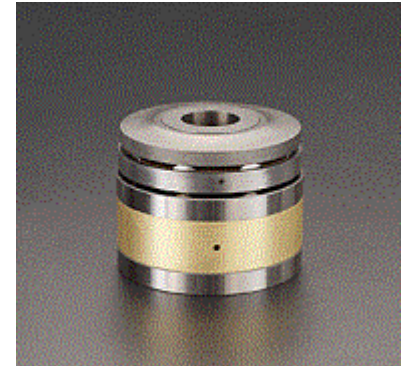
Dyn.Cap. = 752,120 lbs.

\$3069.53 – Dist Cost



Tandem Thrust

- Inch and Metric design
- Provide high load carrying capability in small OD envelope
- Sizes
 - Bore diameters from under 1” to 22”
 - Outside diameters from 3 to 42”
- Number of stages - 2 to 8
- Applications include; Extruder Drives, Down Hole Drills

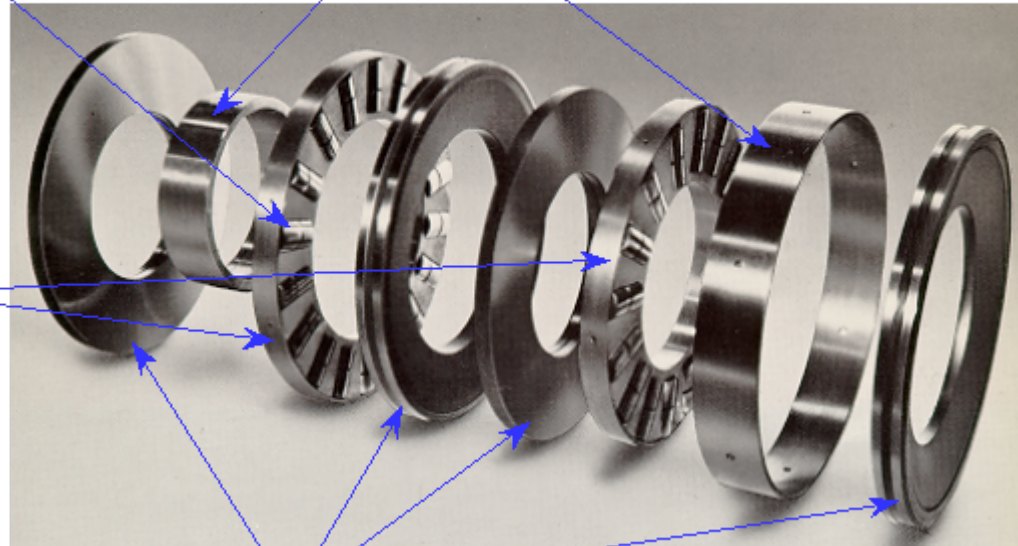


Tandem Thrust

Rollers manufactured from Vacuum Degassed Carburized Bearing Grade Steel. Surfaces are ground & superfinished. Outside diameters are heavily crowned. Ends have large machined radius designed to reduce friction between the roller & the retaining ring. Larger bearings use multiple rollers per pocket to minimize slippage

Compression Sleeves manufactured from various materials designed to provide controlled deflection. Components are match ground with the plates.

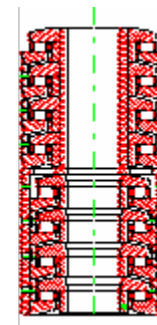
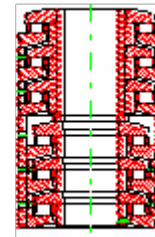
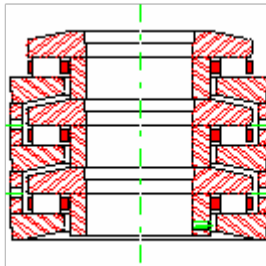
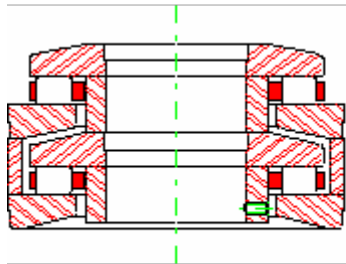
Retainers manufactured from centrifugally cast bass. Roller slots are accurately machined to provide smooth operation of the roller assembly. Rollers are retained by a steel band placed over the outside diameter of the retainer.



Plates manufactured from Vacuum Degassed Carburizing Bearing Grade Steel. Surfaces are precision ground & superfinished.

Maximizing Envelope

- Rollway's Tandem thrust bearing is a problem solver
- Provides for very high thrust carrying capability in a small radial space
- Applied into
 - twin screw extruders
 - oilfield swivels



Maximizing Envelope

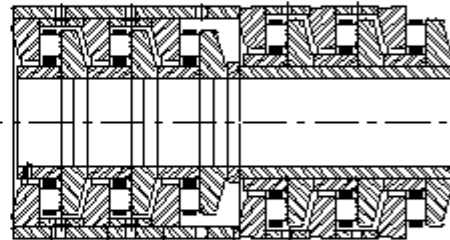
T752 Cylindrical
Dyn Cap = 374,500 lb
OD = 14"



T-511 Tapered
Dyn Cap = 322,500 lb
OD = 10.5"



TMF-030127-201
6 stage Tandem
Dyn Cap = 329,900 lb
OD = 5"



Spherical Bearings

- Rollway Sphericals are Romanian sourced from ISO certified facilities
- RBNV is ISO Certified
- Series available: 22200, 22300, 23000, 23100, 23200, 23900, 24000 and 24100
- RBEC 1 / PO tolerances standard
- W33 standard
- Machined brass cages
- Shaker screen style



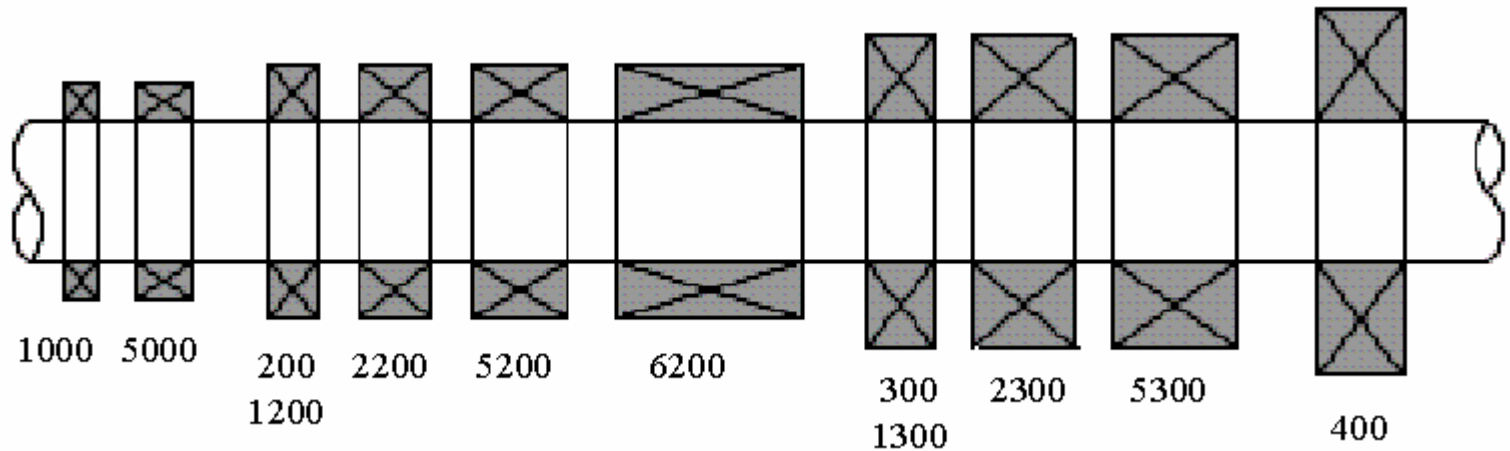
Journal Bearing Competitors

| | Manufactured in Past | Current Manufacture |
|----------------|-------------------------------------|-------------------------------------|
| Rollway | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| ARB | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Berliss | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| RBC | <input checked="" type="checkbox"/> | |
| Hyatt | <input checked="" type="checkbox"/> | |

RBC & Hyatt interchange opportunities still exist

Rollway Radial “Product Line”

- 39 Bore sizes cataloged
- 12 different dimensional series available

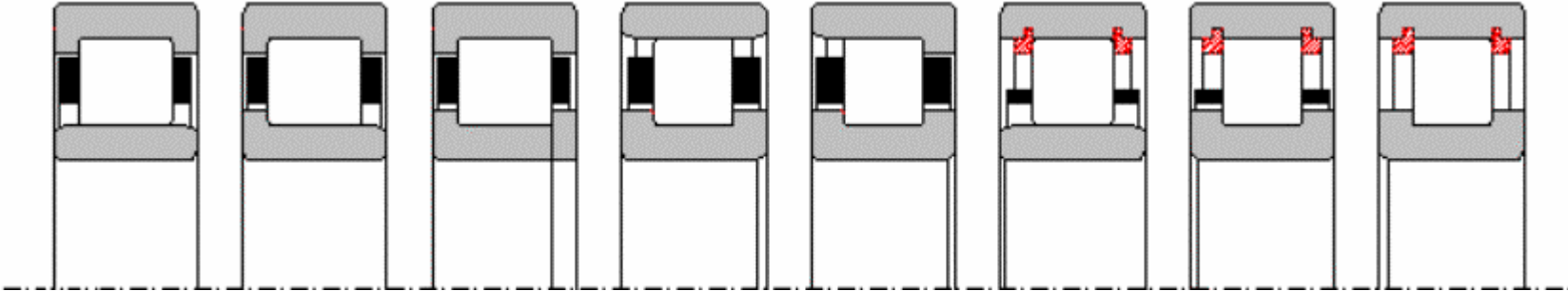


Cylindrical Numbering Systems

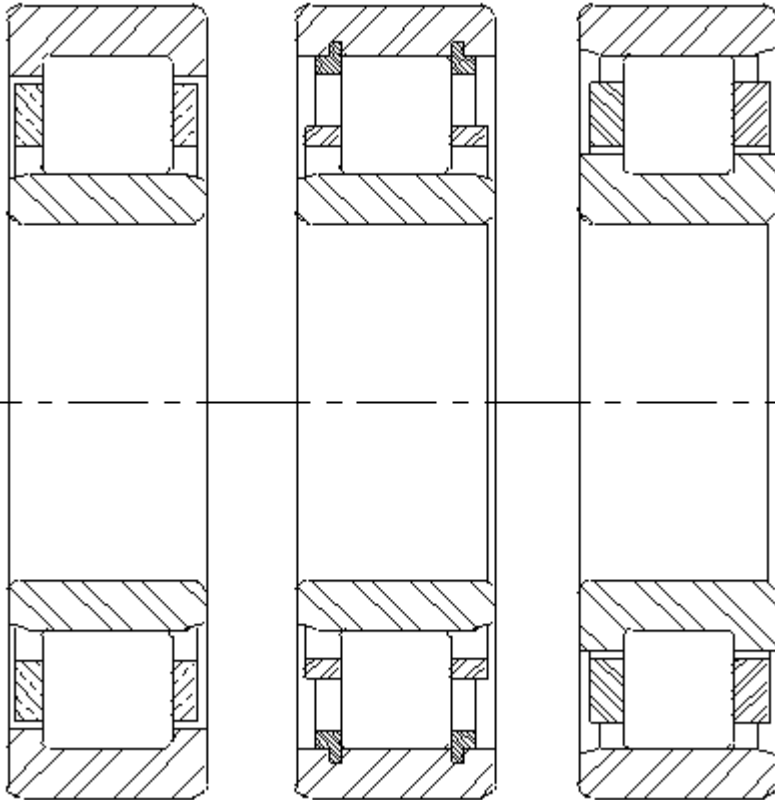
- Rollway uses 3 different number systems for radial roller bearings:
 - “MAX” numbering system
 - “Tru-Rol” numbering system
 - “ISO” numbering system

Rollway Radial Race Configurations

Many Possible Design Configurations



Separable



Inner or outer race is separable, both directions. Rollers are retained in the non-separable race.

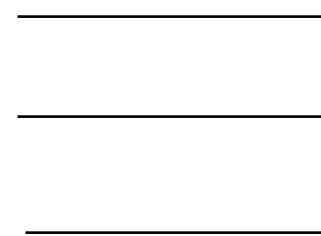
E ---- U
MUC ---
NU ---

E ---- B

U ---- E

MCS ---

N ---

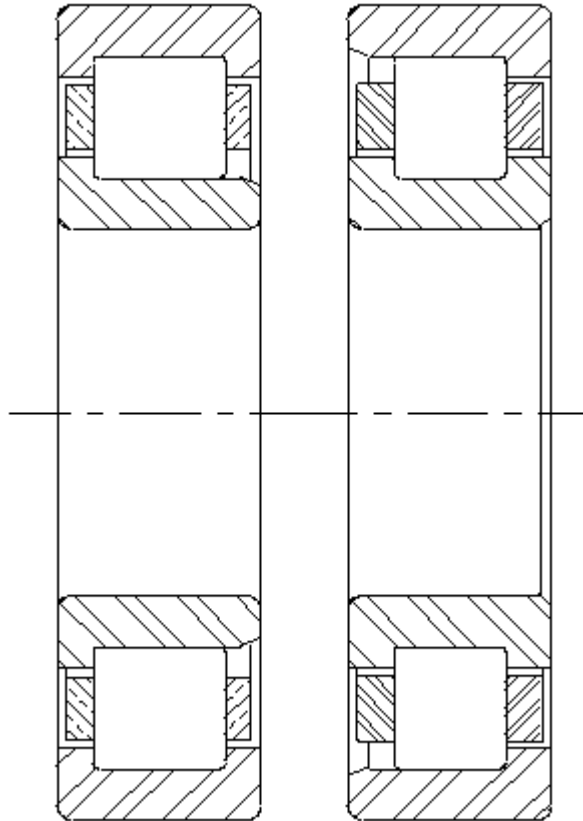


“Tru-Rol”

“MAX”

“ISO”

Separable One Direction



Inner or outer race is separable in one direction, the rollers are retained in the non-separable race.

L ---- U

U ---- L

“Tru-Rol”

MUL ---

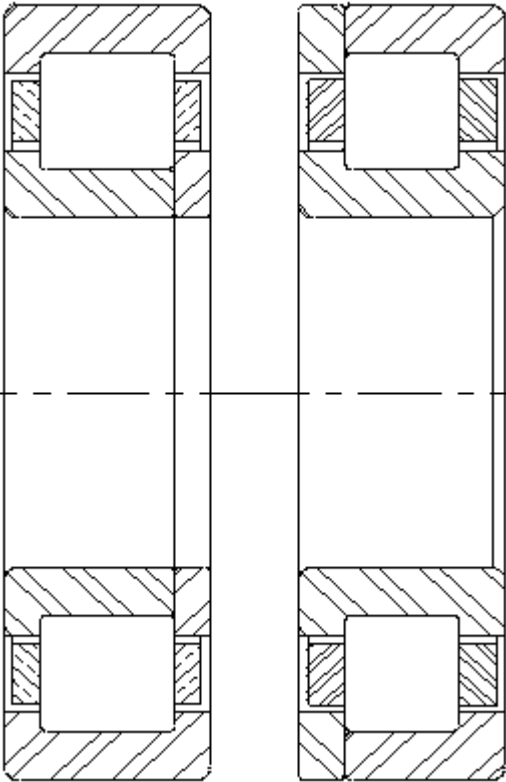
ML ---

“MAX”

NJ ---

“ISO”

4 Flange Design



Inner or outer race is 2 pieces, creating a double flanged race. The rollers are retained by the other race.

LP ---- U U ---- LP

MU --- MN ---

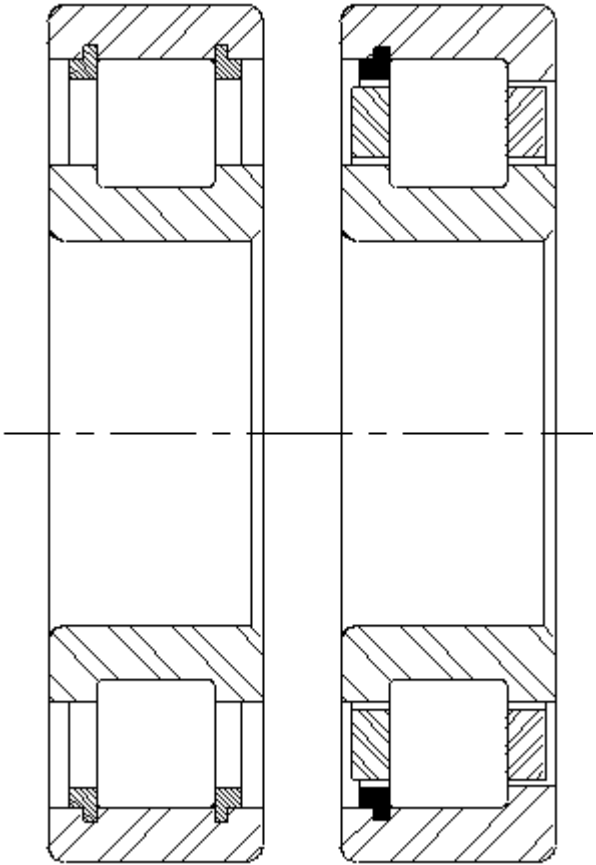
NUP ---

“Tru-Rol”

“MAX”

“ISO”

Non-separable



U ---- B
M ---

U ---- J

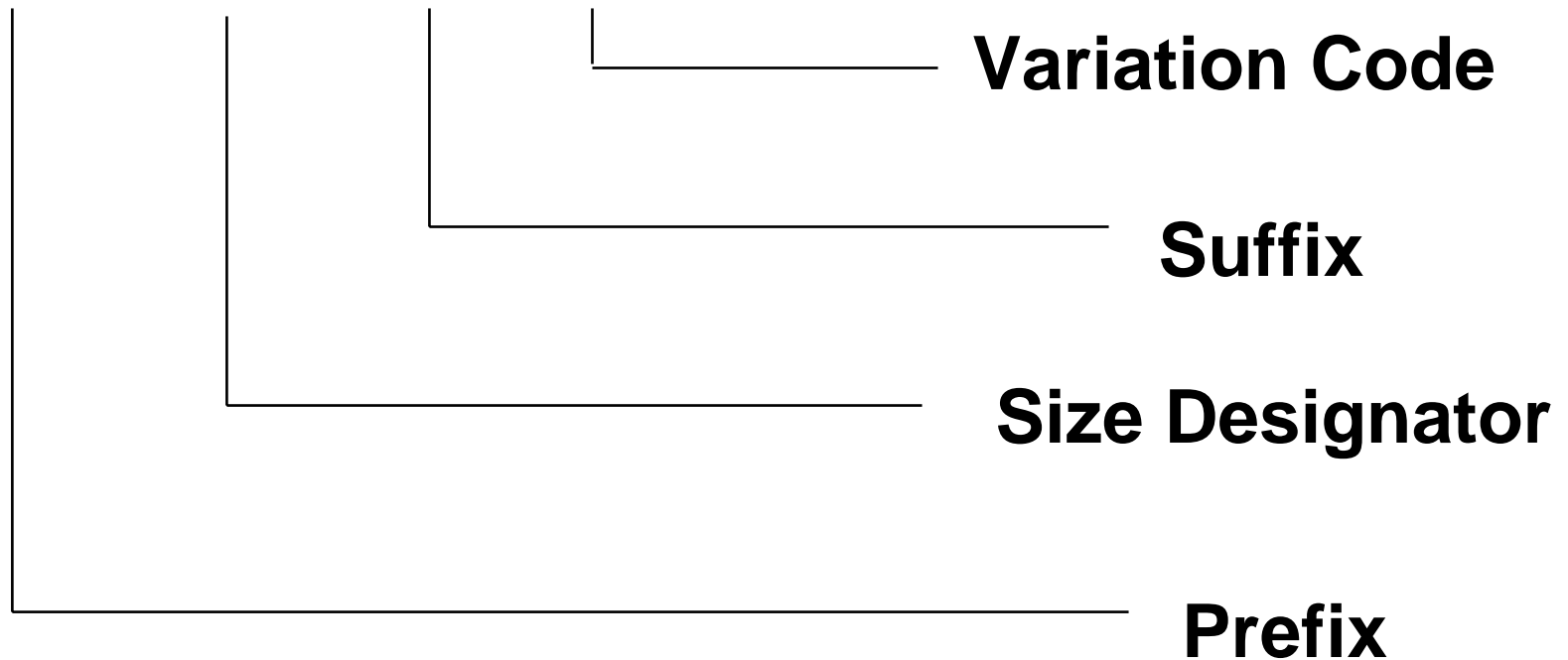
- _____
- _____
- _____

“Tru-Rol”
“MAX”
“ISO”

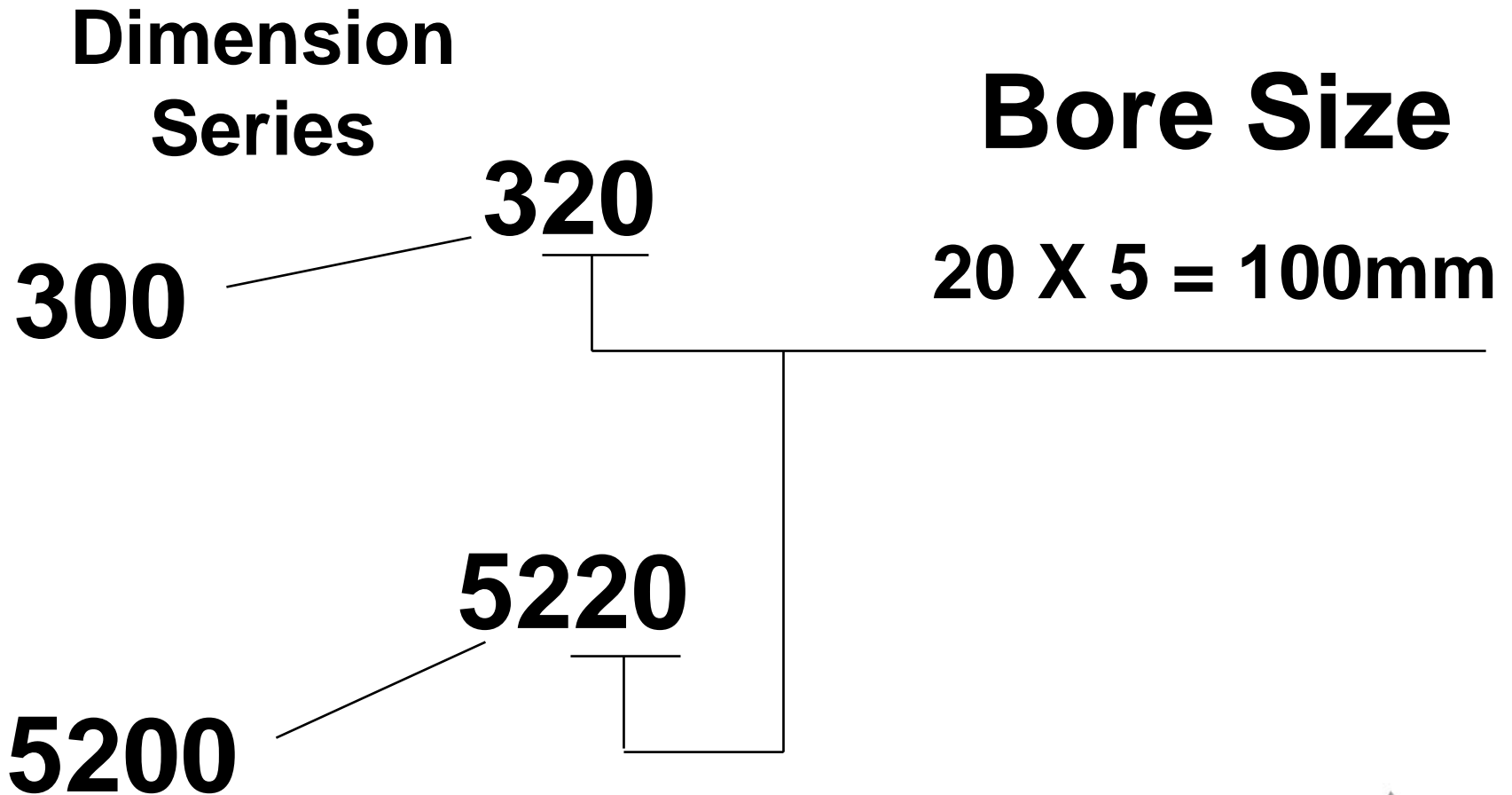
The bearing is non-separable.
Snaprings hold the assembly together.

“Tru-Rol” Numbering System

E-1212-U-199

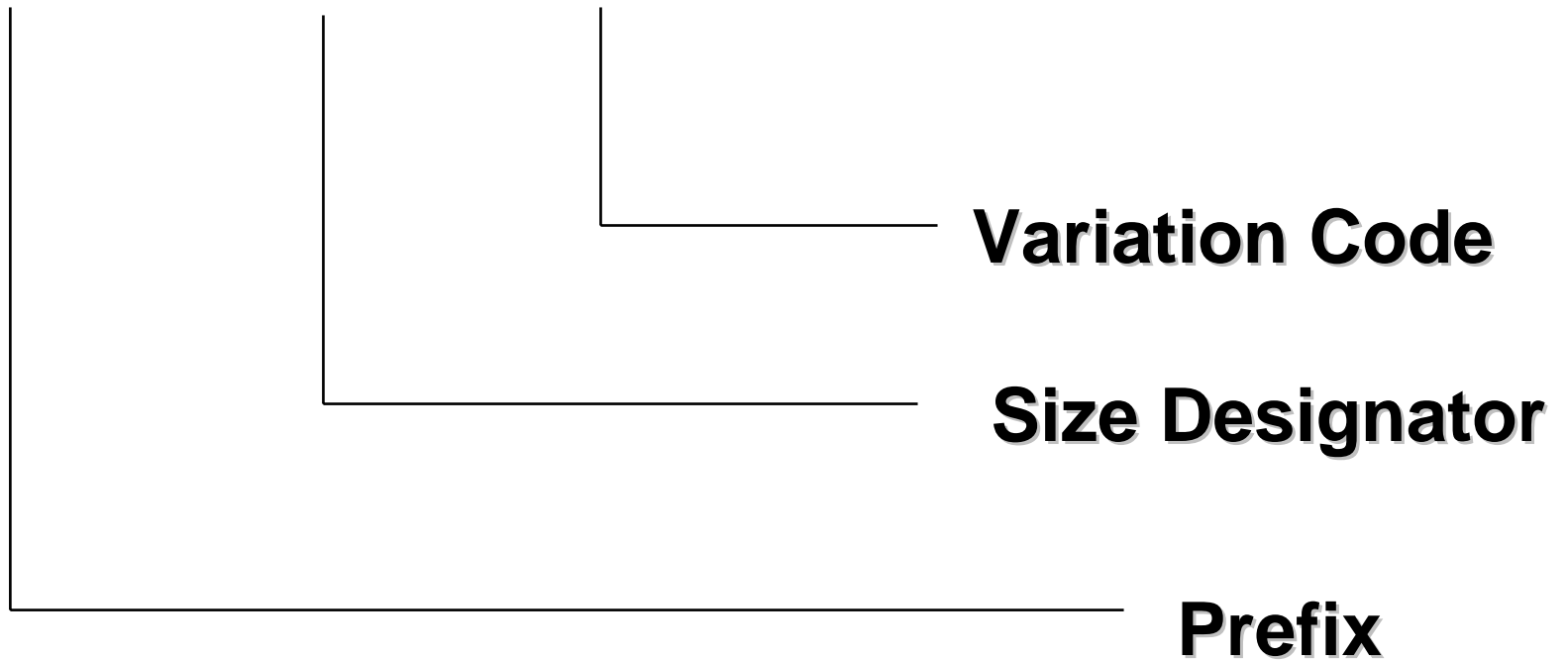


Bearing Size Designators



“Max” Numbering System

MCS-5222-103



“ISO” Numbering System

NU-320-VAB

NU-320-EMC3

V = Variation

AA = 1st variation

AB = 2nd variation

AC = 3rd variation, etc.

E = Extra Capacity

M = Machined Ret.

Variation Code

Size Designator

Prefix



Retainer Option Codes

E-1212-U

E-1212-UMR

E-1212-UM

“Tru-Rol” (and “Max-Rol”) Numbering:

- Steel - no code applied, standard
- Brass - “MR” added to suffix
- No-Retainer - “M” added to suffix

MUL-5222

RUL-5222

“Max” Numbering:

- Brass - “M” 1st letter in prefix
- Cast Iron - “R” 1st letter in prefix

NU-320-EM

“ISO” Numbering:

- Brass - “M” added to Suffix



Internal Clearance Code

Tru-Rol:

E-1212-U-005

MAX:

MCS-5222-007

ISO:

NU-320-EMC3

“Tru-Rol” and “MAX” Numbering Systems:

- Standard clearance “006” has no code
- Special clearance is specified by adding a clearance code
- Tighter: 003, 005
- Looser: 007, 009
- Rollway standard clearances differ from competitors and ABMA standard.

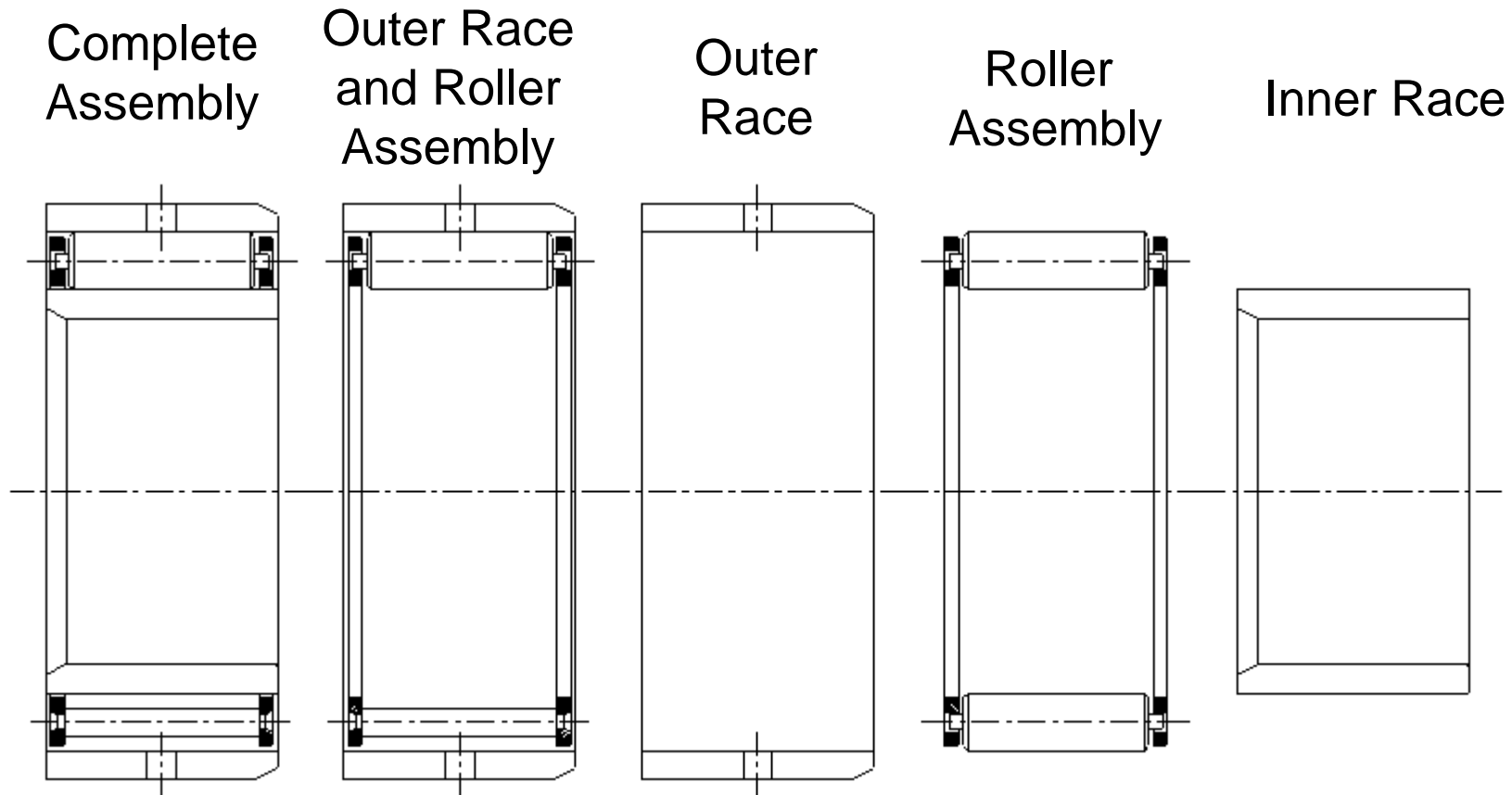
“ISO” Numbering System:

- No suffix indicates “C0” clearance.
- Tighter: C2
- Looser: C3, C4
- Rollway “standard” is “C3”



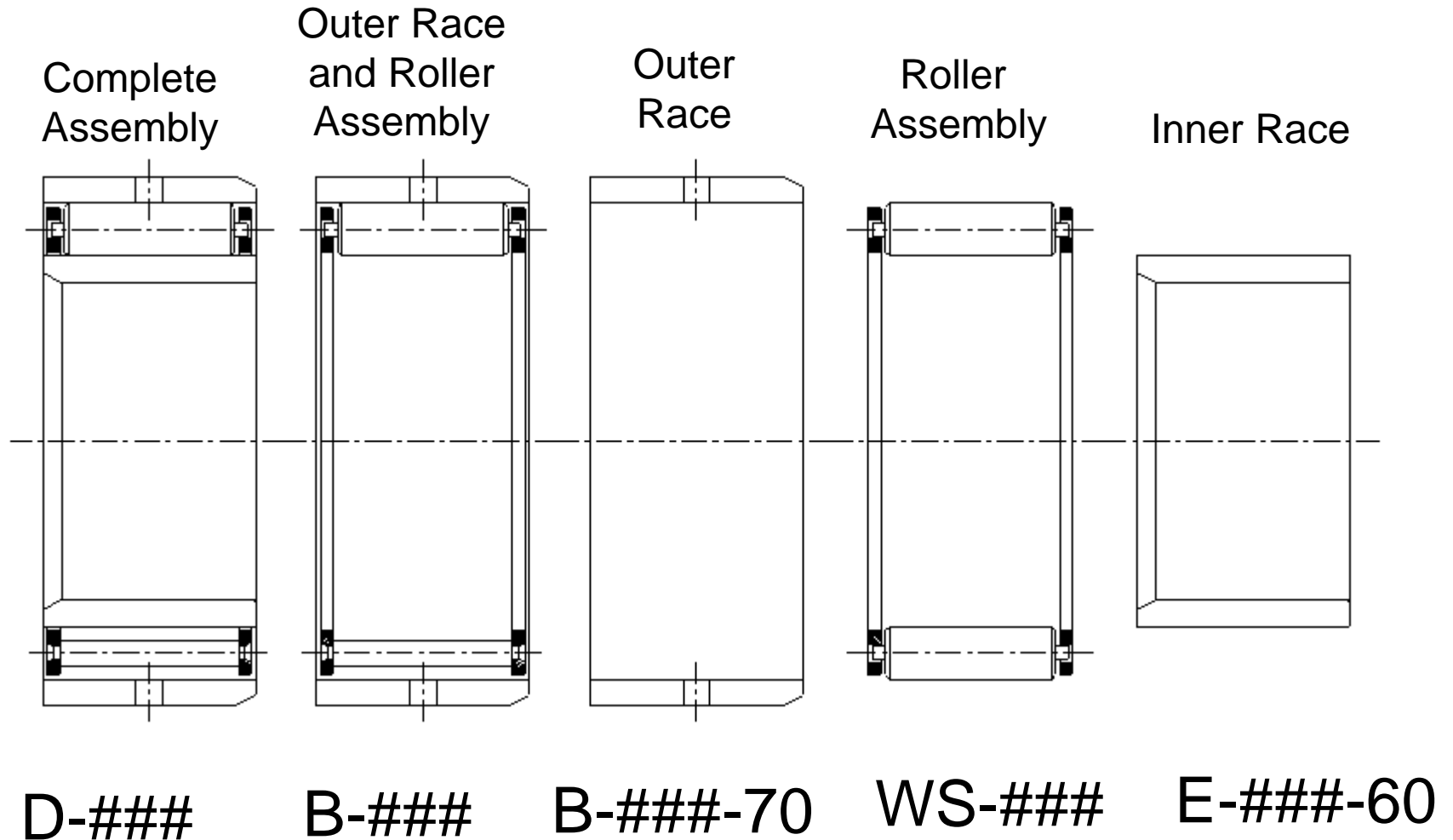
Journal Bearing Nomenclature

- Journal Bearings are sold as complete units or as components



Journal Bearing Nomenclature

Component Codes



Journal Bearing Nomenclature

Bearing Size Designators

D-211-29

Length variation code
length in 1/16"
 $29 \times 1/16 = 1-13/16''$

Series Codes

- 200
- 300

$11 \times 5 = 55\text{mm}$
Bore Size



Cylindrical Thrust Nomenclature

T622-201

Variation Code

Indicates non standard features present

Size Designator

600 or 700 series codes

- Second 2 digits indicate the size

Prefix

Prefix identifies the bearing configuration



Cylindrical Thrust Nomenclature

- T – Standard Cylindrical thrust.
- AT – Aligning thrust.
- DT - Standard double acting thrust
- DAT - Double acting, aligning thrust
- SDT - Simplified double acting thrust
- CT – Crane Hook, no fitting
- WCT – Crane Hook, with fitting

Tapered Thrust Nomenclature

T-811-201

Variation Code

2 types of variation codes

- Standard variations
- Special MTO variations from standard use sequential numbers starting from 201

Size Designator

Series and size code

- 1st (1st & 2nd) digit is bore size in inches
- other digits are space holders

Prefix

Prefix identifies the bearing design.
Note the hyphen “-” is significant.



Tapered Thrust Nomenclature

TAB-120240-201



Variation Code

2 types of variation codes

- Standard variations
- Special MTO variations from standard use sequential numbers starting from 201

Size Designator

Series and size code

- 1st 3 digits is bore size in inches or mm
- 2nd 3 digits is the OD size in inches or mm

Prefix

Prefix identifies the bearing design

TAB, TAC, TAD, TAF - Inch sizes where “B” is 2 stage, “C” is 3 stage, etc.

TMB, TMC, TMD, TMF, TMH - metric sizes where “B” is 2 stage, “C” is 3 stage, etc.

Caution

There is an overlap in part numbers between the Cylindrical & Tapered thrust bearings:

T611 = 600 series cylindrical

T-611 = Tapered thrust

Markets & Applications

- Extruders
- Overhead Cranes
- Motors
- Pumps / Compressors
- Machine Tools
- Corrugators
- Coal Pulverizers



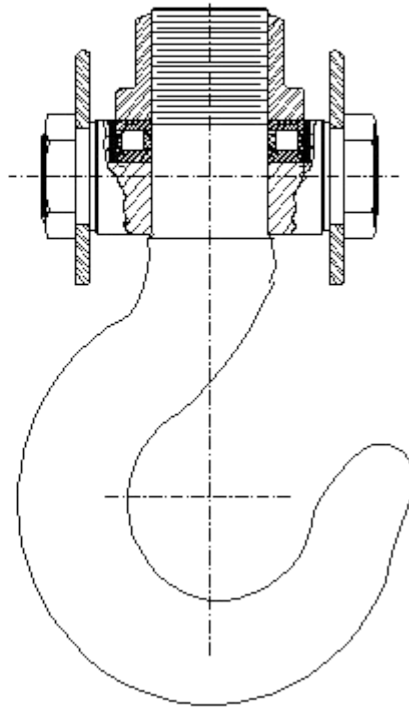
Overhead Cranes

- Radial roller bearings
- Journal roller bearings



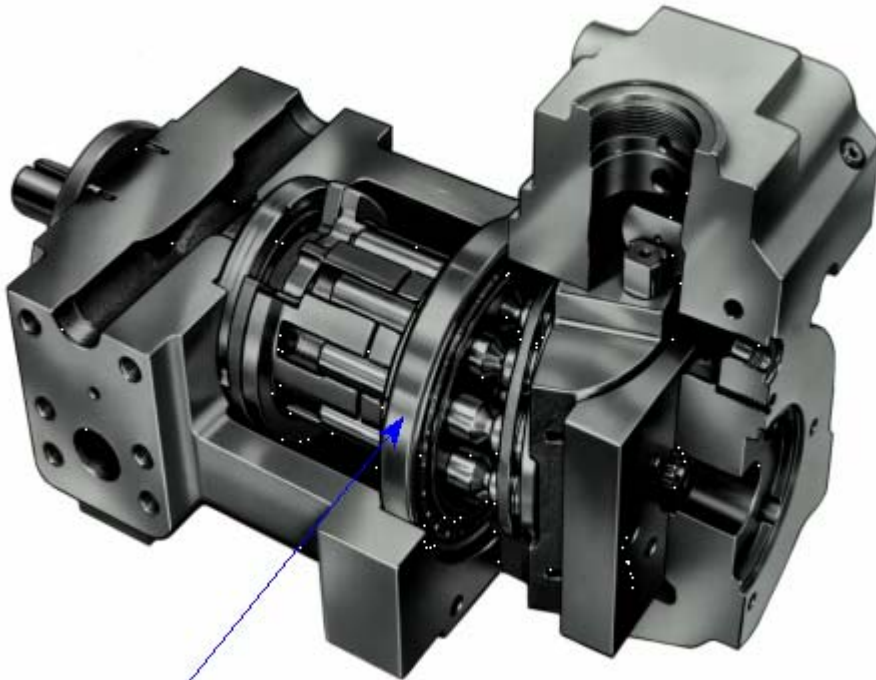
Overhead Cranes

- Crane hook bearings
- Cylindrical thrust bearings



Axial Piston Pumps

- Engineered radial roller bearings
- Engineered cylindrical thrust bearings



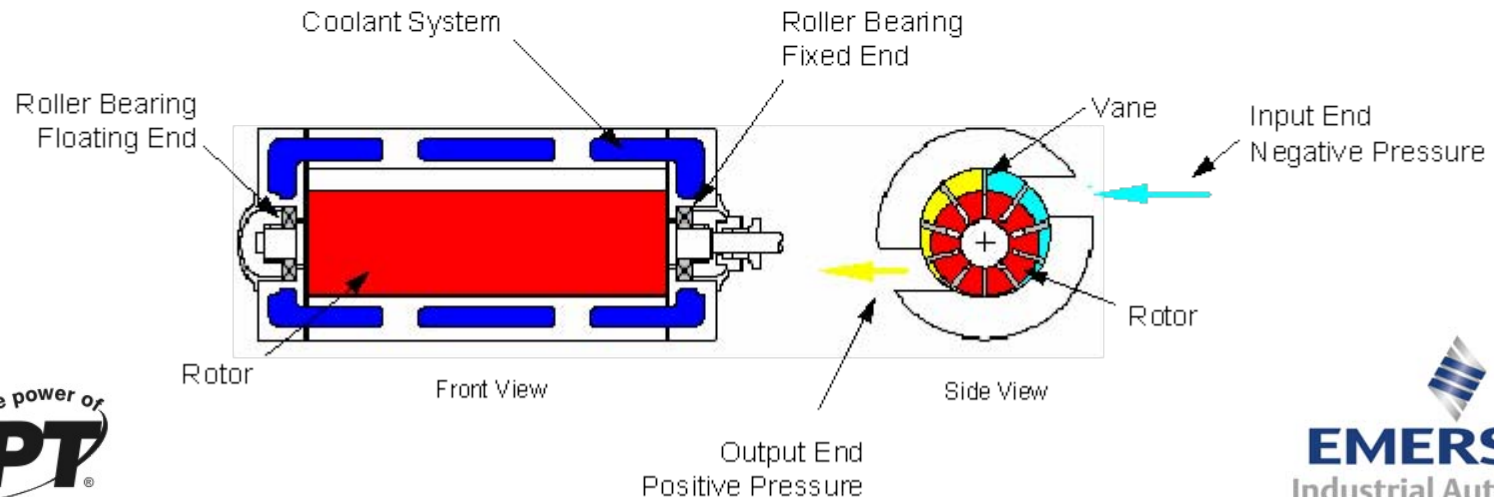
Barrel Support Bearing

Rotary Compressors

- 400 series radial roller bearings



Single Stage Rotary Vane Compressor



DC Electric Motors

- Radial roller bearings
- Journal bearings

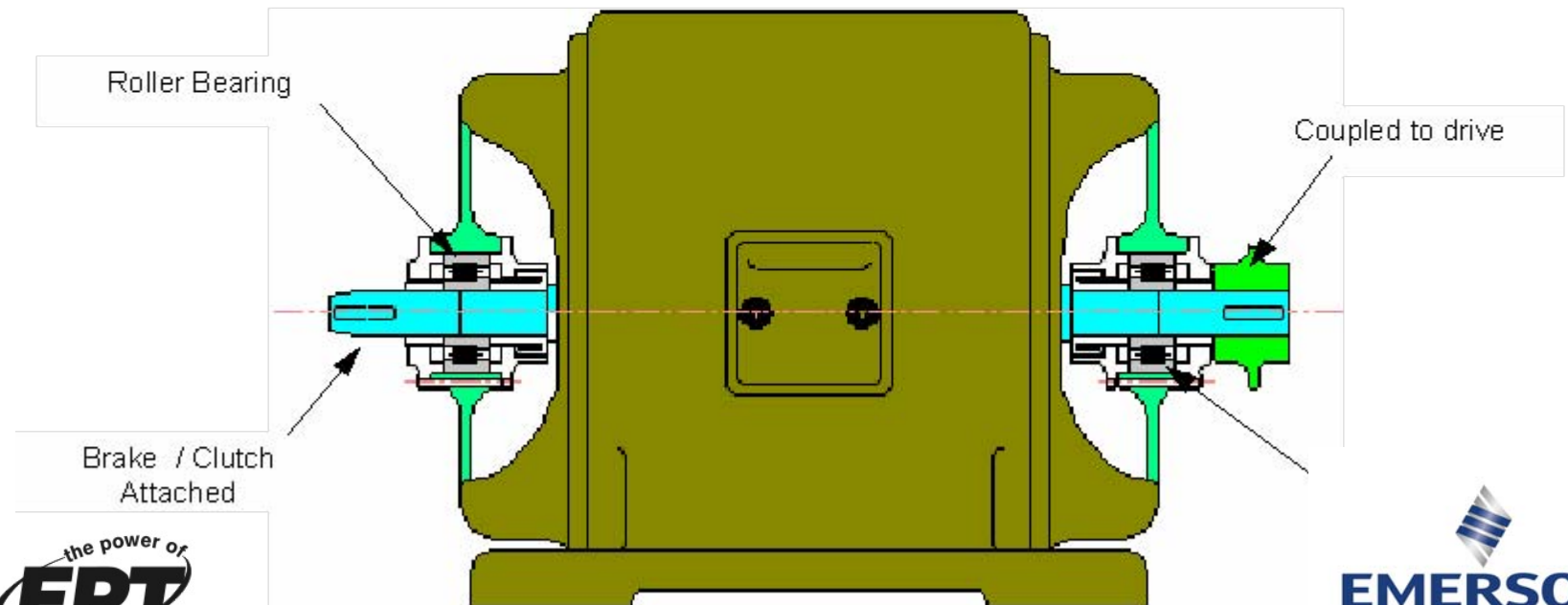
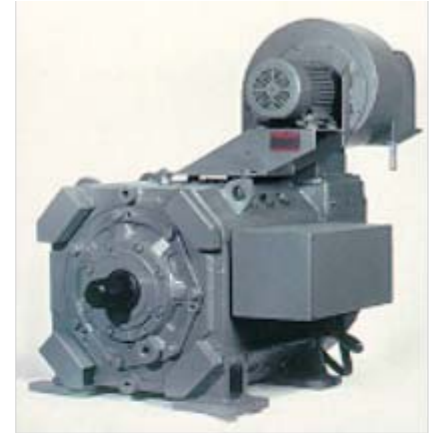


Figure 2

AC Electric Motors

- Radial roller bearings

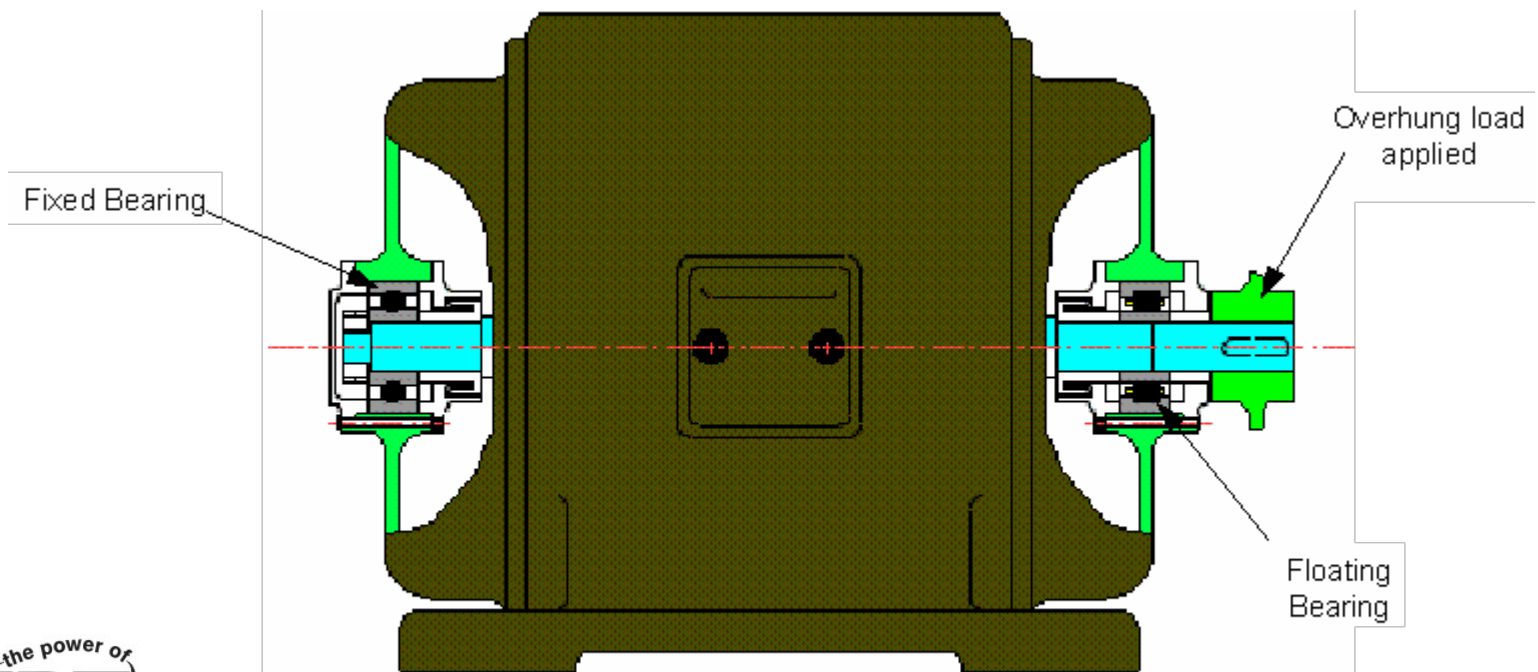
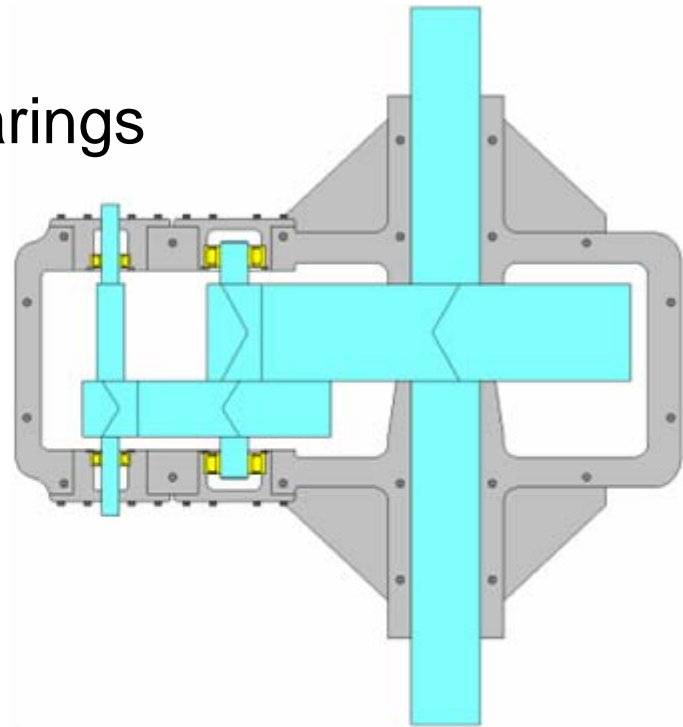
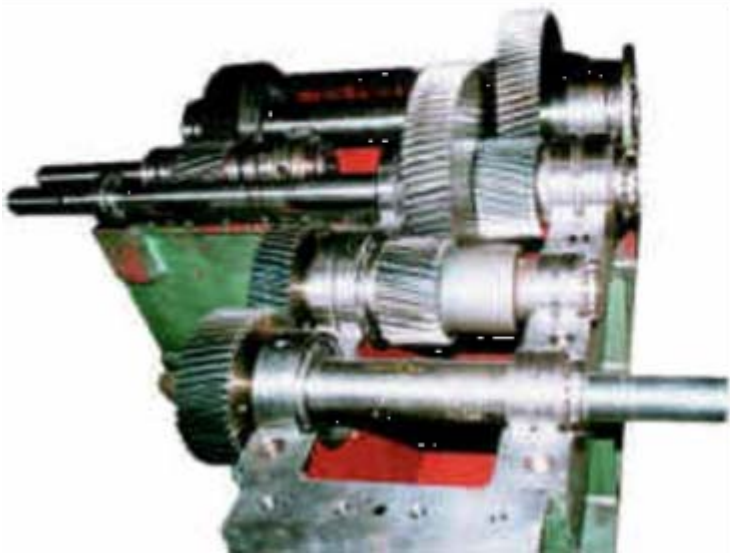


Figure 1

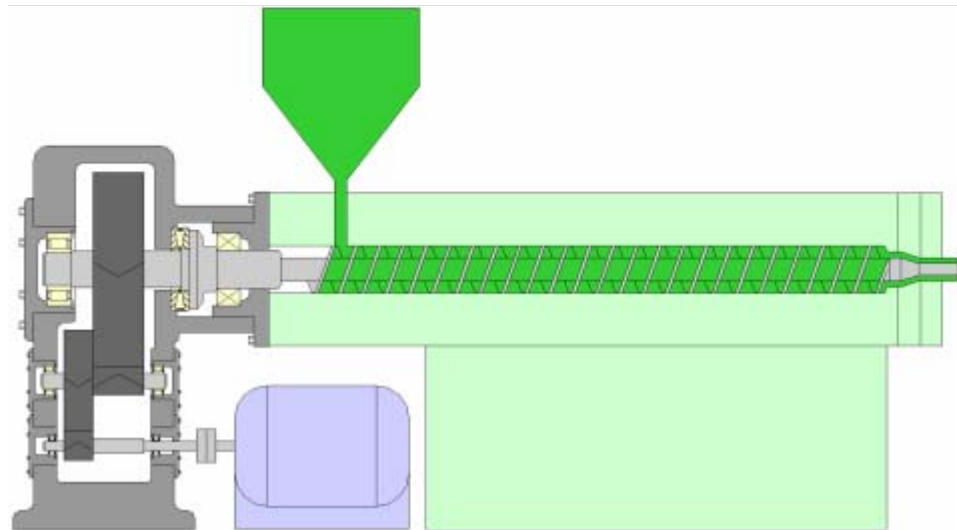
Gear Drives

- Radial roller bearings
- 5200 series radial roller bearings

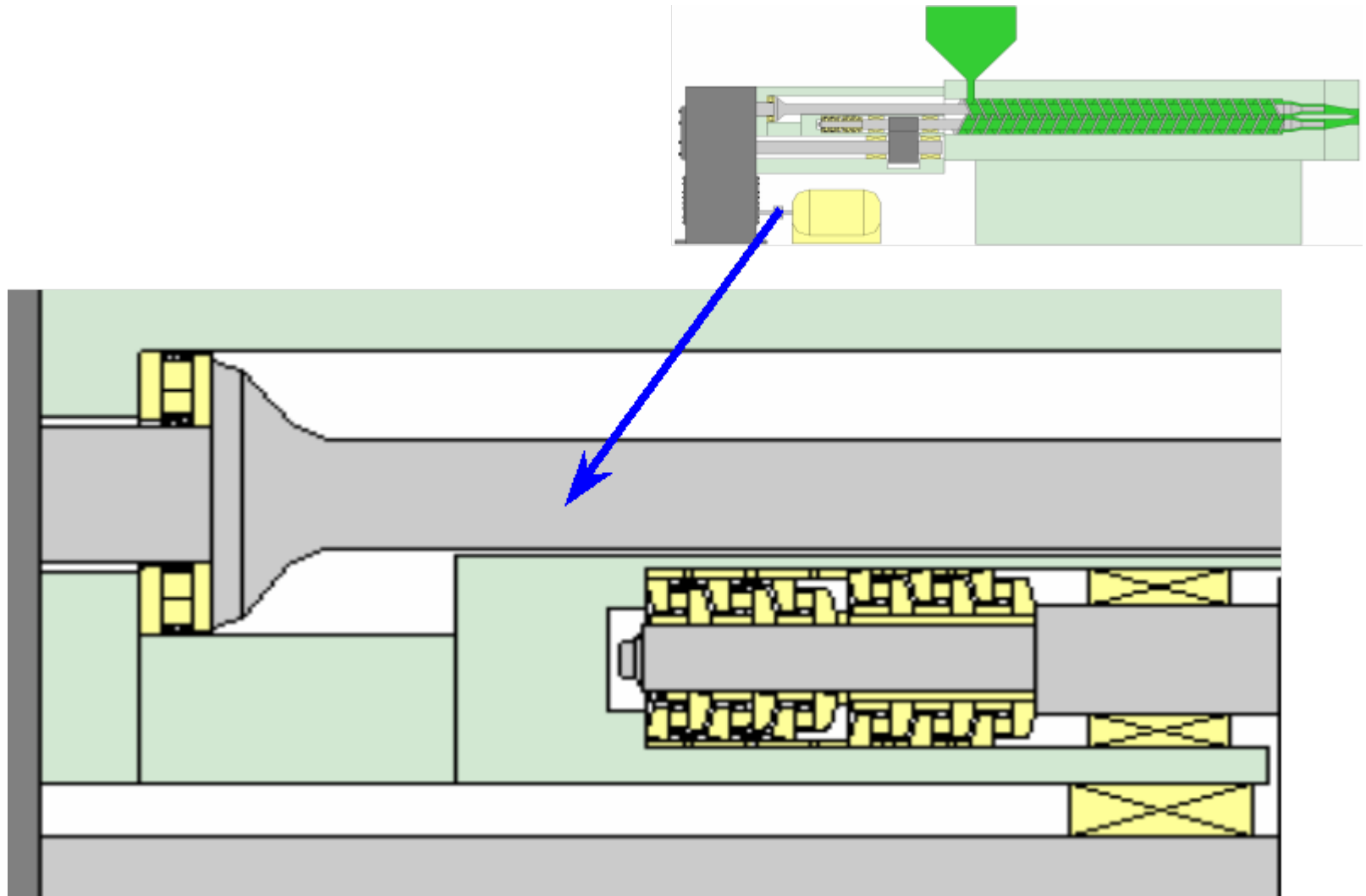


Single Screw Extruders

- Cylindrical roller thrust bearings
- Tapered roller thrust bearings
- Tandem thrust bearings
- Radial roller bearings

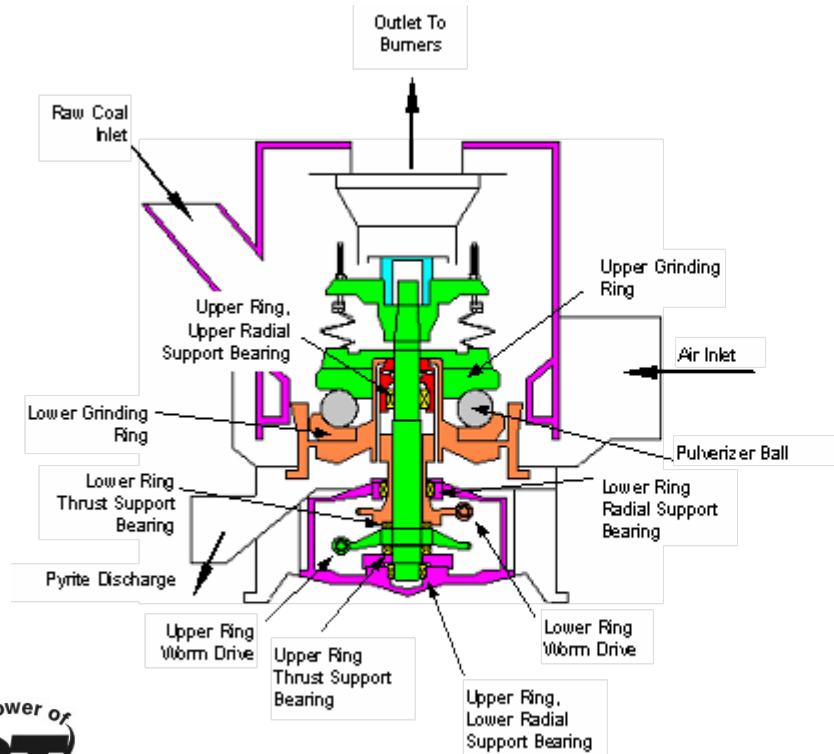


Twin Screw Extruders



Power Generation

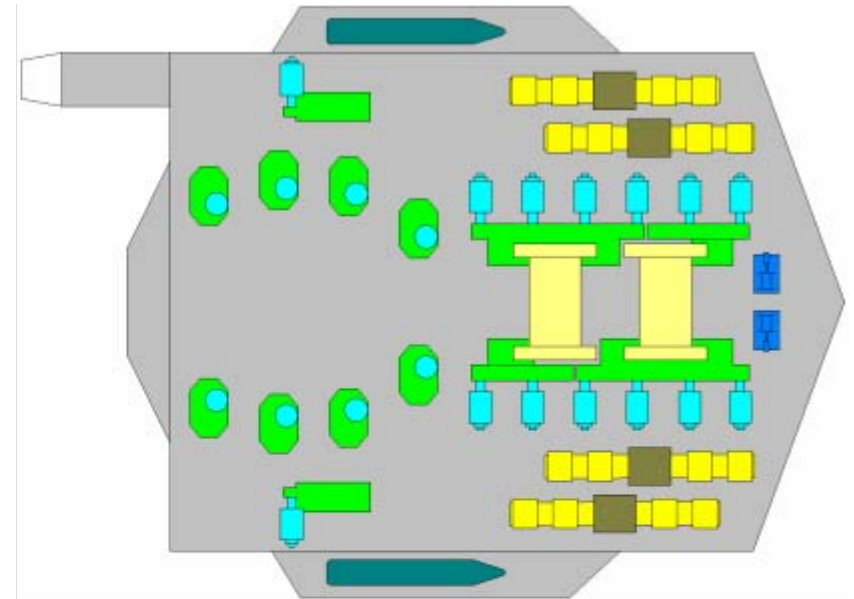
- Radial roller bearings
- Cylindrical thrust bearings
- Tapered thrust bearings



Counter Rotating Ball Type Pulverizer

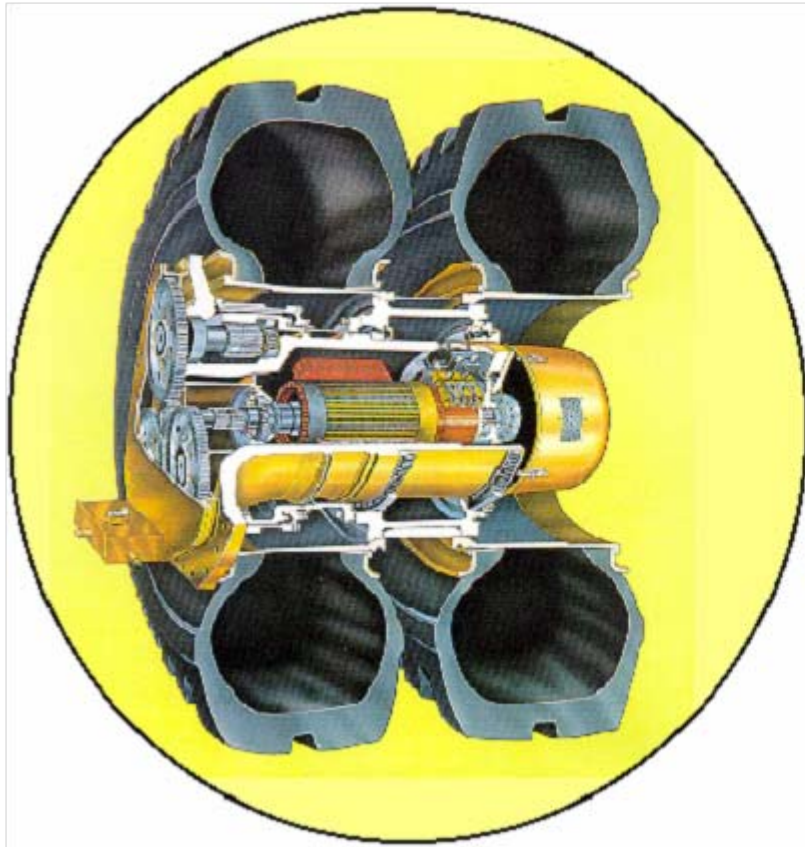
Draglines & Shovels

- Large diameter radial roller bearings



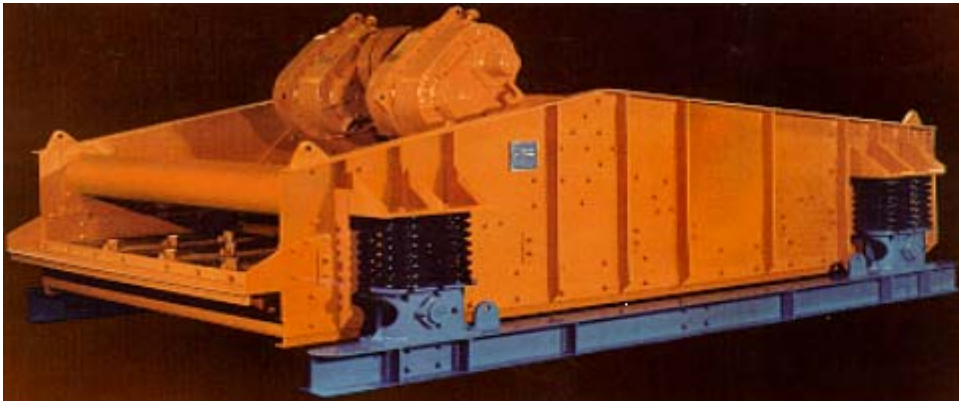
Haul Trucks

- Radial roller bearings

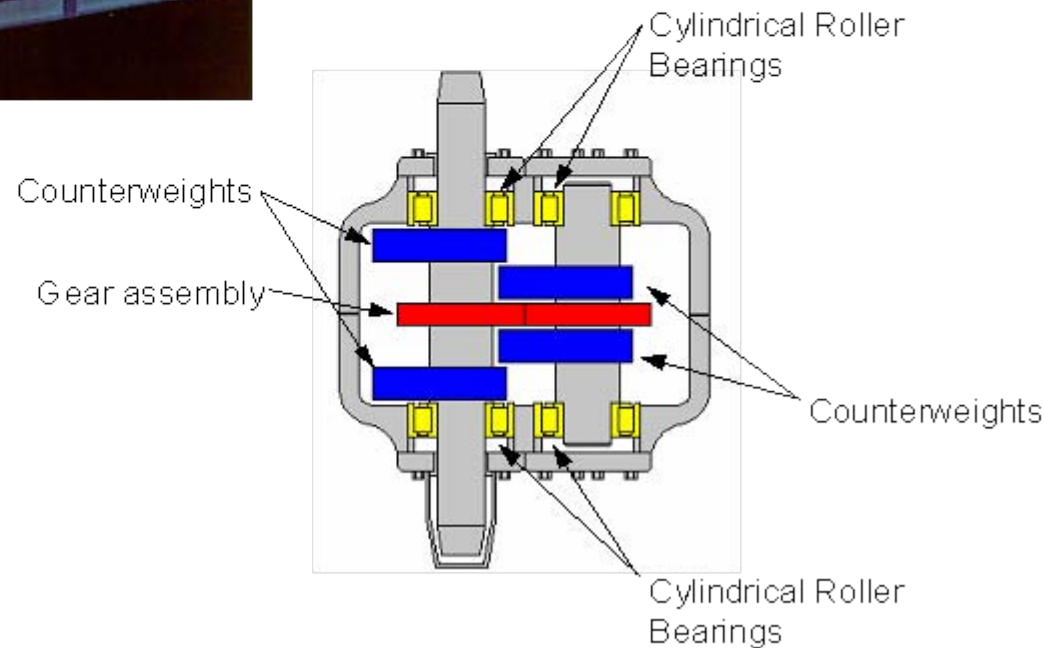


Shaker Screens

- Engineered radial roller bearings



Shaker Mechanism for Horizontal Screen



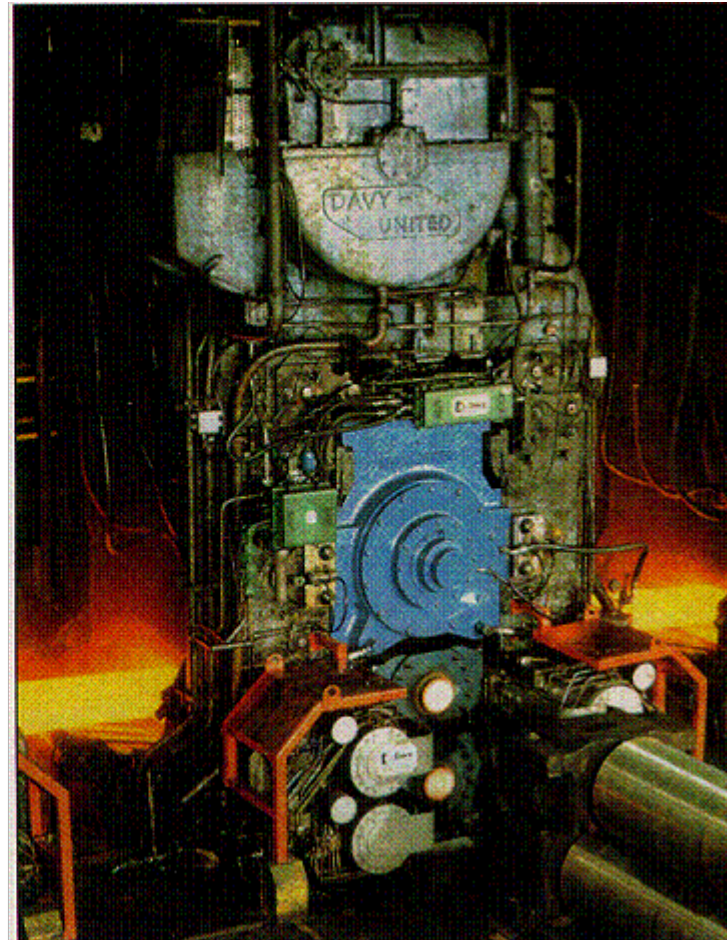
Rock Crushers

- Large diameter radial roller bearings
- Large diameter cylindrical thrust bearings
- Large diameter tapered thrust bearings



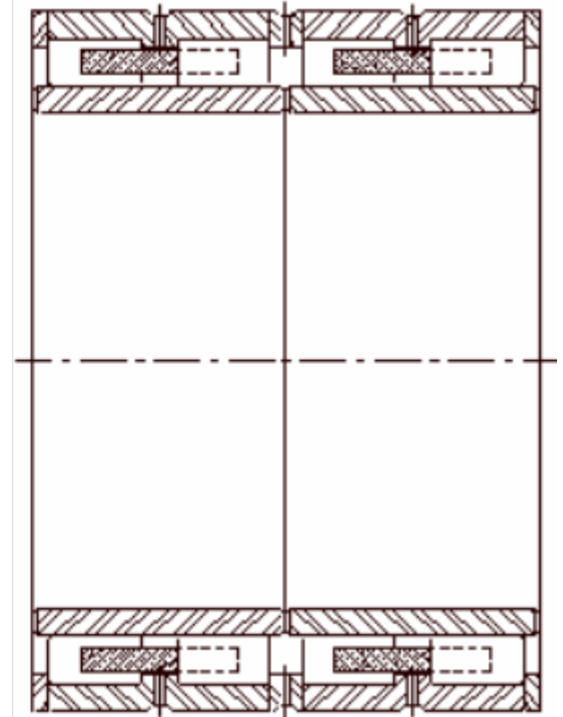
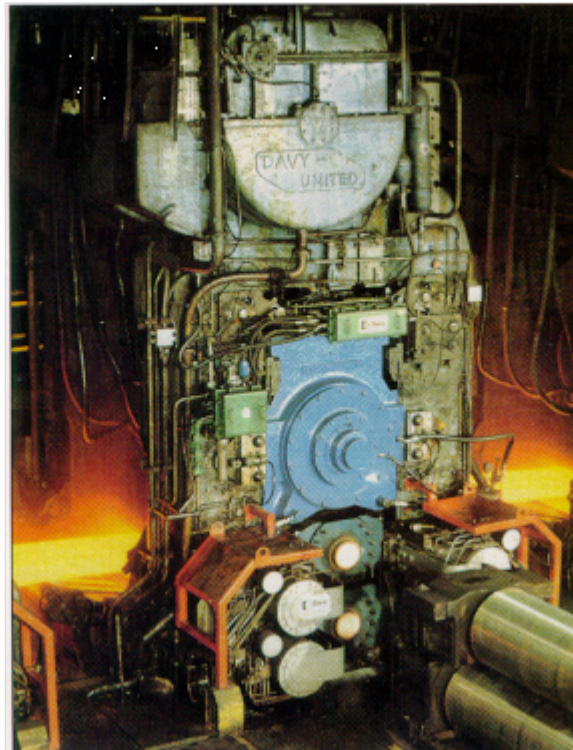
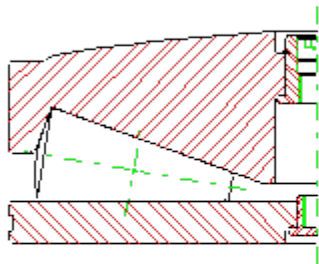
Rolling Mills

- Mill Stands
- Runout table rolls
- Furnace cars
- Mill motors
- Over head cranes



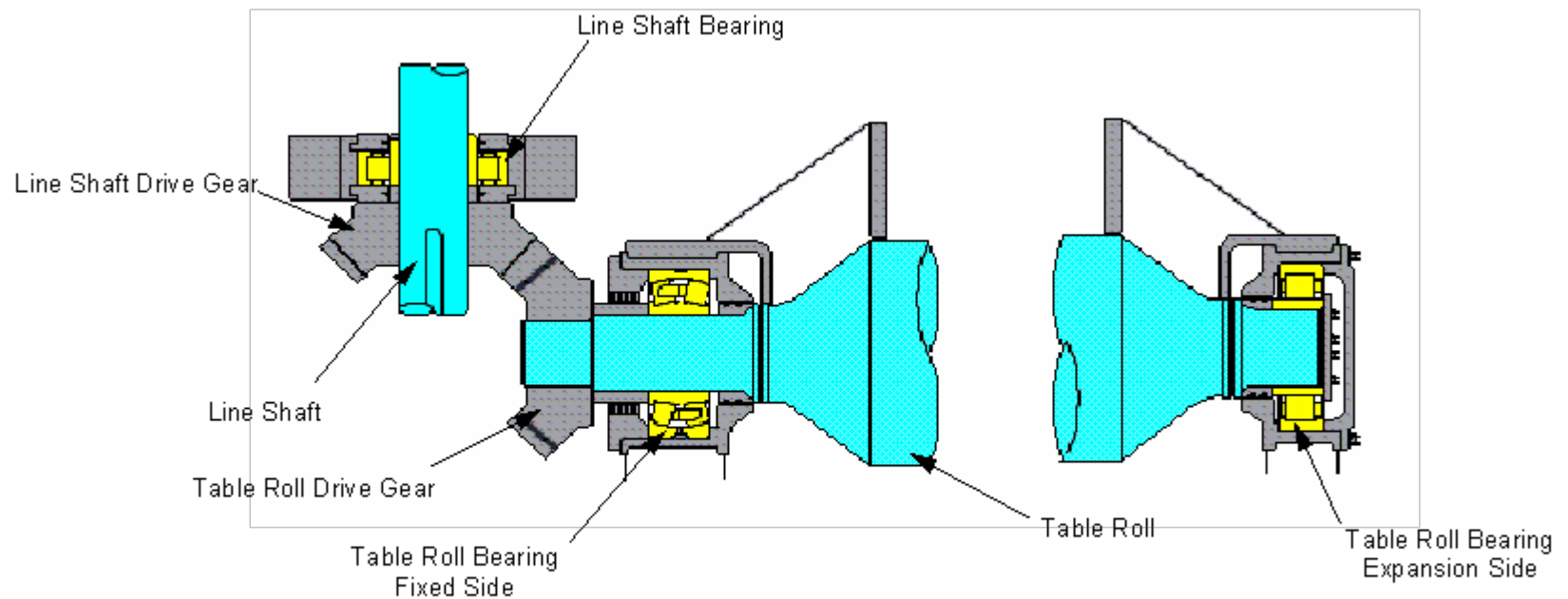
Mill Stands

- Engineered / large diameter radial roller bearings
- Engineered thrust bearings
- Engineered / high speed radial roller bearings



Transfer & Runout Tables

- 5200 series radial roller bearings
- Journal roller bearings



Typical line shaft / table roll application

Support Applications

- Cranes
- Mill motors
- Furnace cars

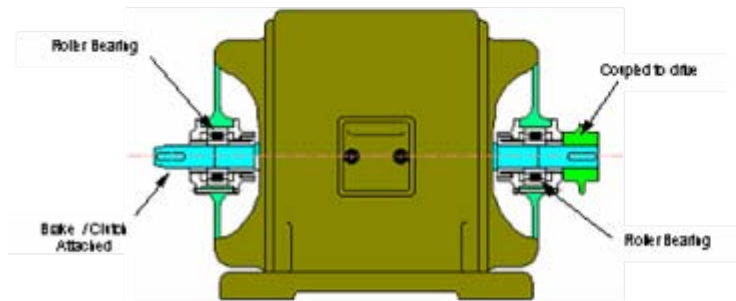
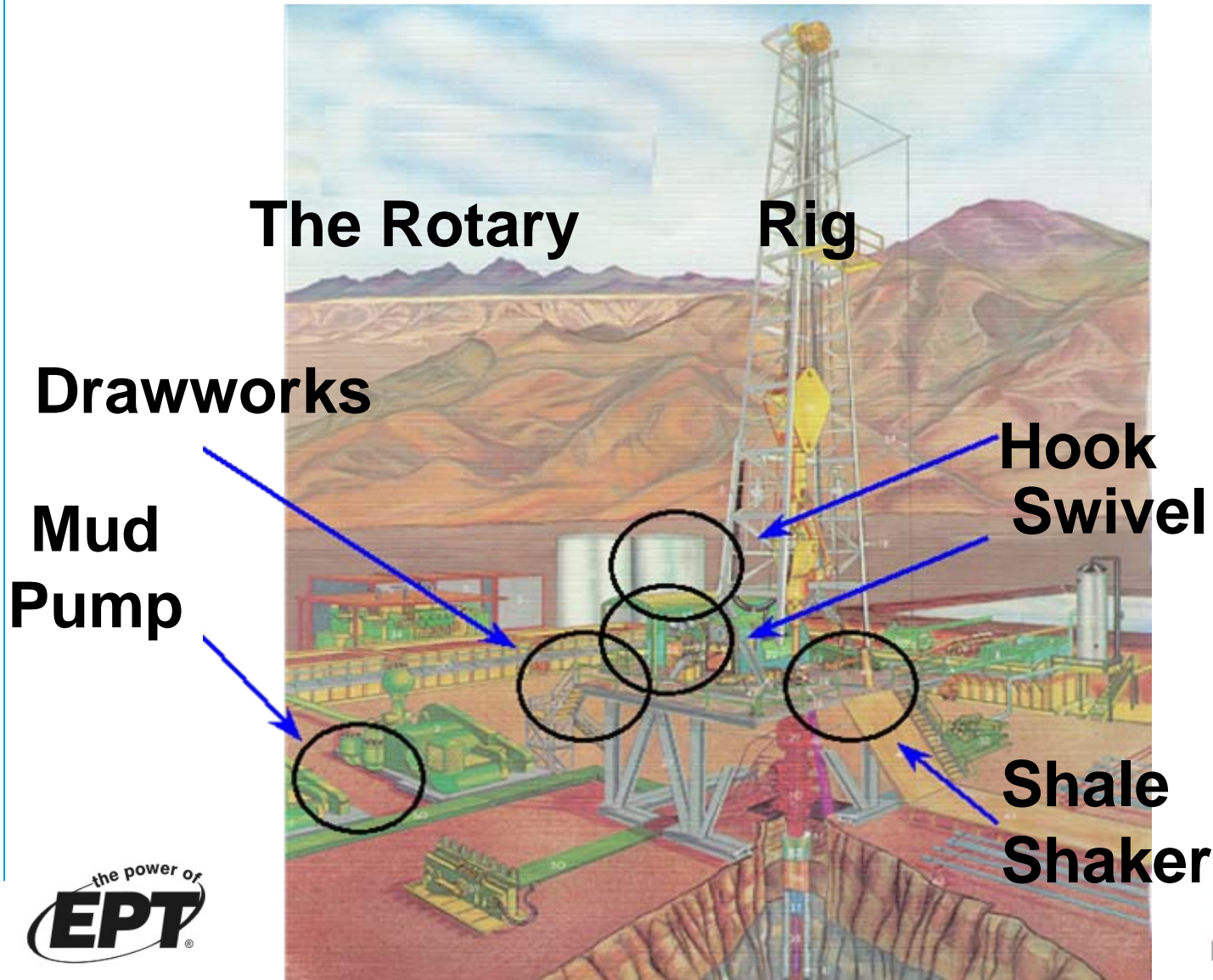


Figure 2

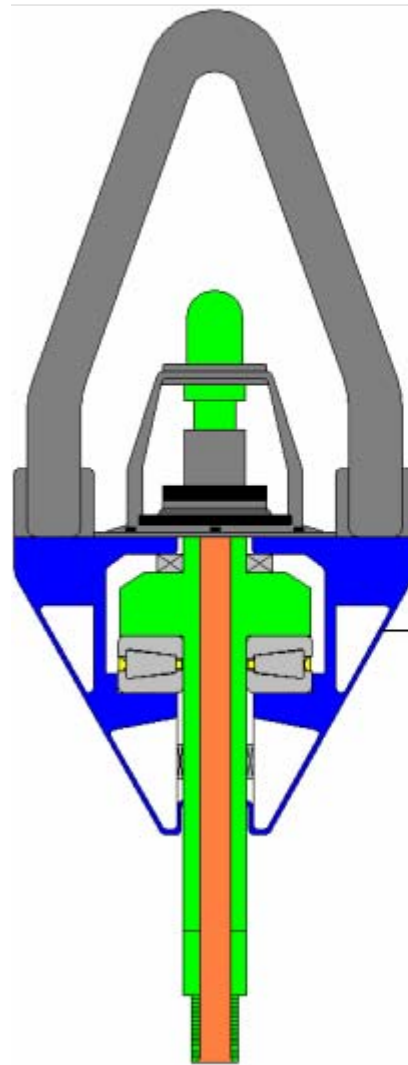


Oil & Gas Discovery



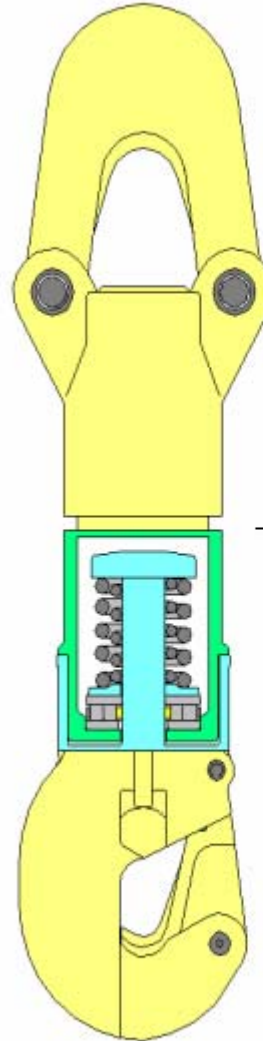
Swivels

- Tapered thrust bearings



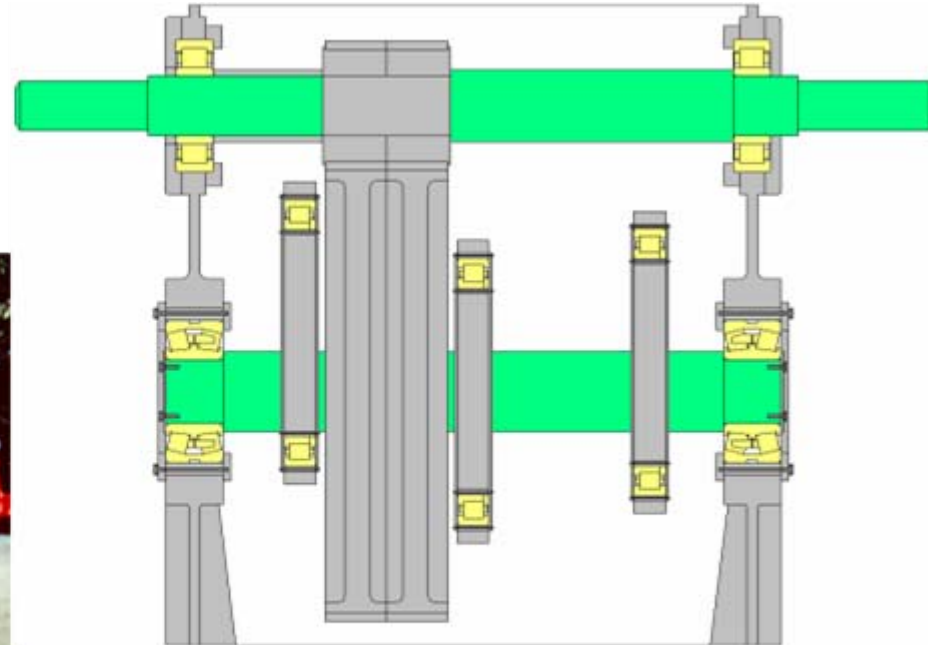
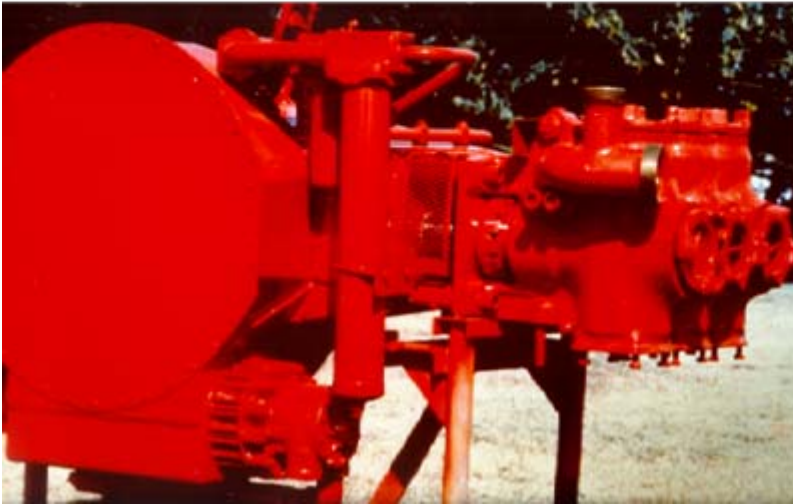
Hooks

- Cylindrical thrust bear



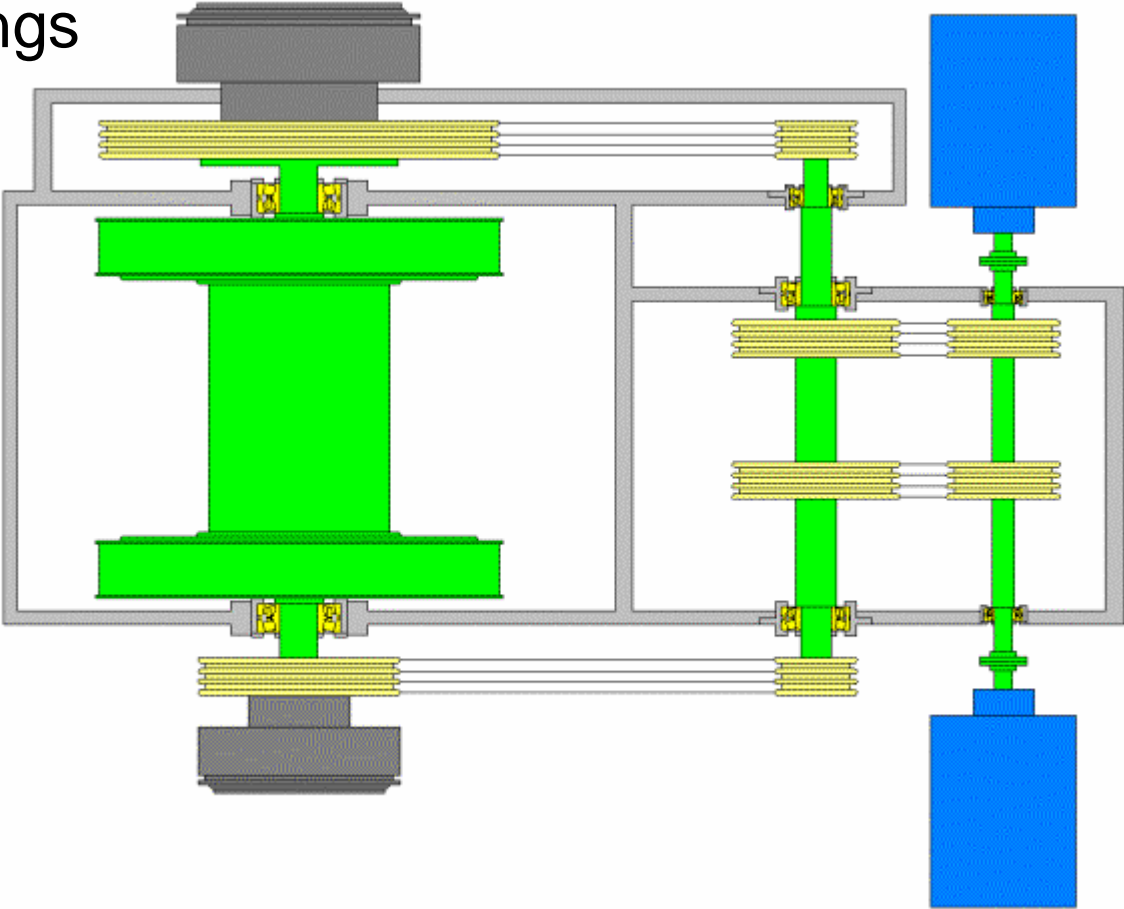
Mud Pumps

- Engineered / large diameter radial roller bearings



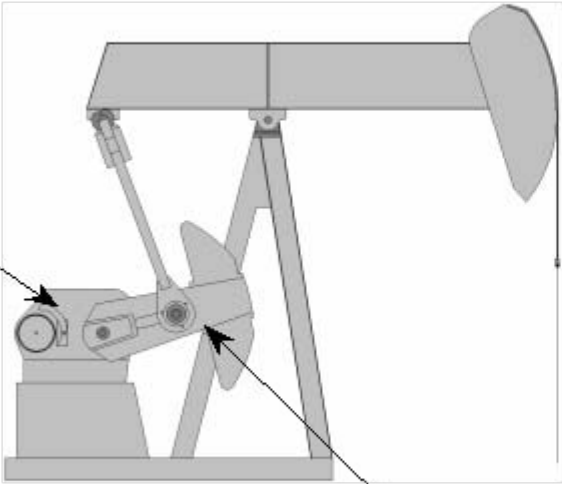
Drawworks

- Radial roller bearings



Pumping Units

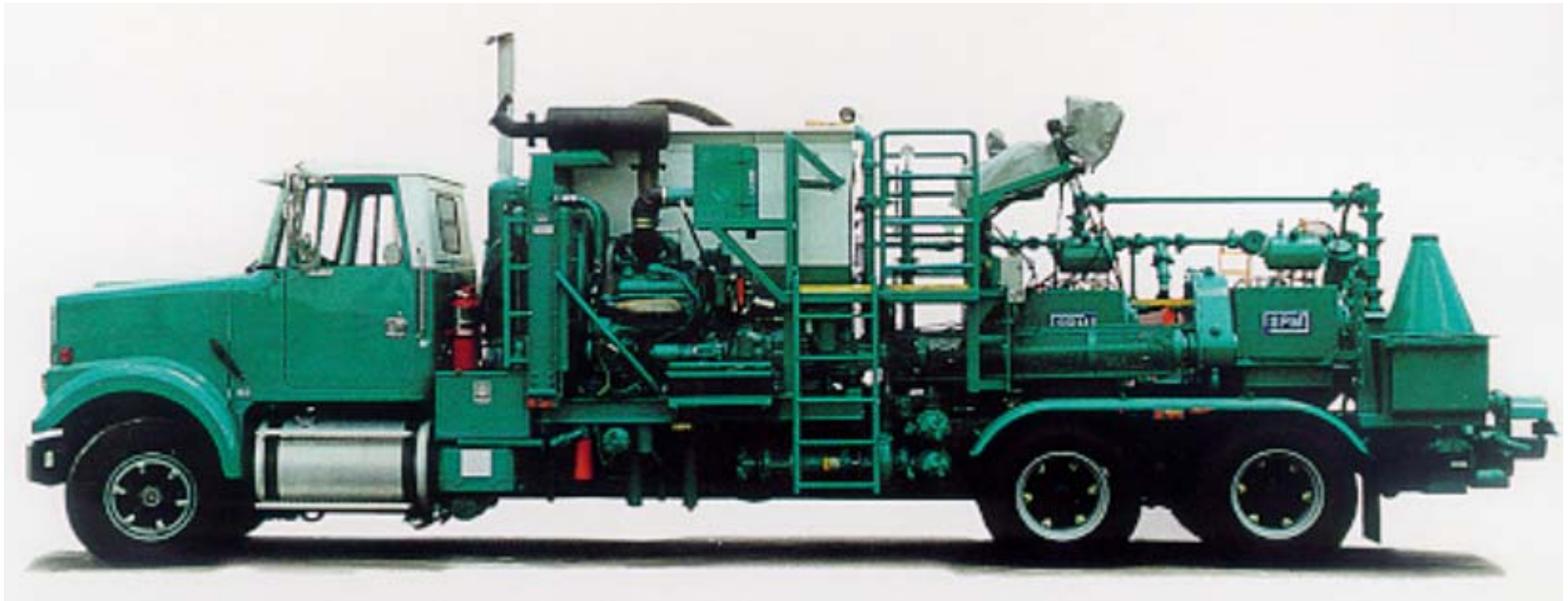
Gear Drive



Crank Pin



Well Servicing



Cementing & Fracturing trucks



Summary

- Rollway manufactures a complete line of standard and special order roller bearings
- Sizes range from 2" to 42" and through precision class RBEC 5
- Product Summary
 - Cylindrical Roller
 - Journal Roller
 - Thrust
 - Cylindrical
 - Tapered
 - Tandem
 - Specials



Key Contacts

- Visit us at www.emerson-ept.com
- EPT Customer Service (800-626-2120)
 - Price
 - Availability
 - ATO Eligibility
 - Order Entry
- Technical Customer Service (219-465-2211)
 - Technical product questions
 - Application & interchange assistance

