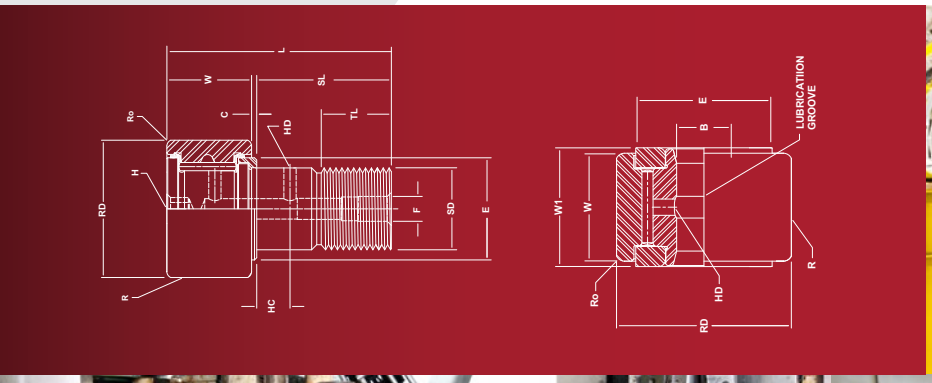
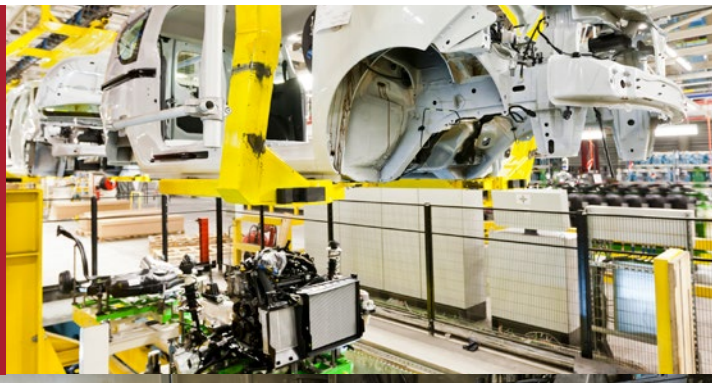
McGILL®





CAM FOLLOWER BEARINGS

RegalRexnord™

A CENTURY OF INNOVATION

A FUTURE IN IMPROVING PRODUCTIVITY

System uptime and operational efficiencies are key to profitable manufacturing in the twenty-first century and McGill® precision bearings play an important role.

Premature bearing failure can dramatically drive up operating costs and increase system maintenance requirements. That's why McGill bearing engineers design bearings to meet a host of different needs – easing installation, reducing maintenance and decreasing equipment downtime.

As our customer base has expanded, we have continued to design unique bearing solutions beyond our standard offerings. By applying years of engineering and manufacturing expertise, our staff of bearing specialists has created a broad array of bearing solutions to meet some of the toughest application requirements.

As we celebrate 100 years of manufacturing excellence, Regal Rexnord looks forward to the next century of working with you to help select and design better, more efficient bearing solutions to reduce costs and positively impact your bottom line.

The McGill brand of bearings was established in 1905 by James H. McGill and is a key part of Regal Rexnord. Since then, McGill bearing products have continued to evolve to meet the needs of an ever expanding list of industries and applications. Regal Rexnord now has 100 years of experience in design and manufacturing, with a long line of "firsts":

1930 - MULTIROL™
cam follower bearings

1937 - CAMROL®
cam follower bearings

1956 - GUIDEROL®
needle bearings

1964 - NYLAPLATE®
seal

1967 - SPHERE-ROL®
spherical roller bearings

1973 - LAMBDA®
seal

1974 - LUBRI-DISC™
seal

1980 - TRAKROL®
cam follower bearings

1992 - LUBRI-DISC™+
seal

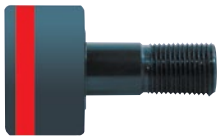
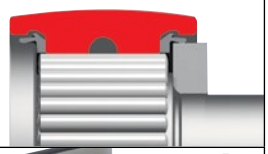
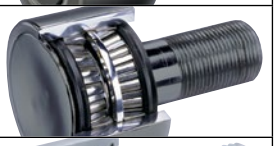
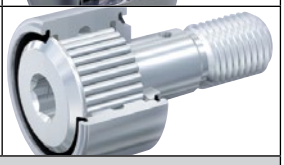
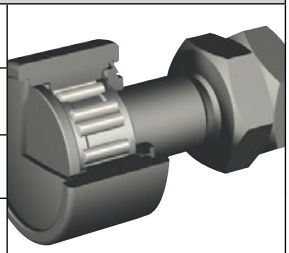
1993 - METRIC CAMROL
liquid metal injection seal bearings

1998 - SPECIAL-DUTY CAMROL
cam follower bearings

1999 - HEAVY-DUTY CAMROL
cam follower bearings

2000 - CRES™
CAMROL stainless steel bearings

CAMROL® CAM FOLLOWER BEARING SELECTION GUIDE

Condition:	How to identify:		Potential solutions	
Difficult Installation	Standard stud type cam followers feature a screwdriver slot to hold bearing during installation which is sometimes not sufficient		**Hex Hole** CF-1-S-**B** Provides superior holding power	
Blind Hole Applications	Stud type cam follower installed into drilled and tapped hole			
Misalignment/ Corner Loading	Wear pattern on roller diameter offset from center		**Crowned OD** **C**CF-1-S Helps to center load	
Thrust	• Thrust loads present • Bearing supports rotating table • Bearing roller develops excessive end play		**Heavy Duty** CF**D**-4 Incidental thrust loads	
			TRAKROL® Bearing **P**CF-3 Higher thrust loads	
Corrosion	• Visible rust • Washdown environment • Bearing lock-up		**CRES™ CAMROL Bearing** CF-1-SB-**CR** Corrosion resistant 440C matrerial	
Contamination	• Dusty or contaminated environment • Bearing lock-up		**Increased sealing protection:**	
			LUBRI-DISC® Bearing CF-1-**S**	
			Heavy Duty CF**D**-4	
			Special Duty **SD**-CF-1	
			TRAKROL Bearing **P**CF-3	
Relubrication is difficult and costly	• Bearing difficult to reach • Relubrication schedule is difficult or costly		**Reduced Maintenance:**	
			Bushing Type **B**CF-1-S	
			Heavy Duty CF**D**-4	
			Special Duty **SD**-CF-1	
			TRAKROL Bearing **P**CF-3	

CAMROL® BEARINGS — THE INDUSTRY STANDARD

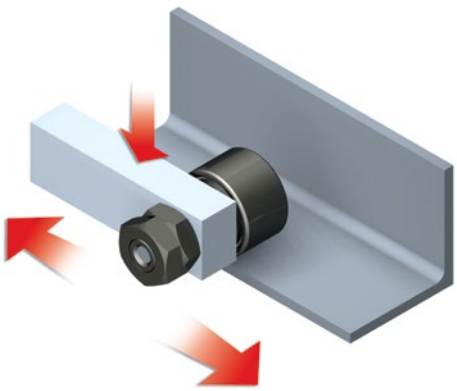
Since 1937, the McGill® brand has maintained its leading position through the continuous development of new features and improvements to the CAMROL bearing product line.

As today's leading manufacturer of quality cam follower bearings, Regal Rexnord has developed many features to extend bearing life for a variety of operating conditions, lubrication requirements and application environments. The McGill brand offers a broad range of cam follower bearings with over 1,400 standard designs to choose from.

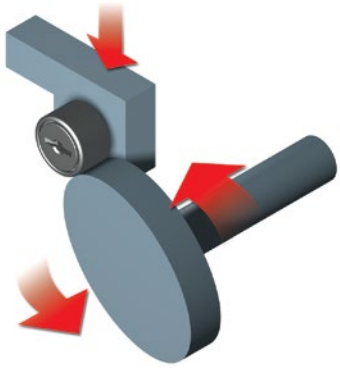
OVERVIEW

The typical functions of a cam follower are to provide anti-friction support of linear movement or to follow the surface of a cam. The CAMROL cam follower bearing from Regal Rexnord was designed to withstand the intermittent shock, loading and precision requirements associated with these applications.

TRACK OR LOAD



EXTERNAL CAM



INDUSTRIES

- Auto plants
- Food and beverage
- Forest products
- Oil drilling
- Printing
- Steel mills
- Textiles

APPLICATIONS

- Automation equipment
- Machine tools
- Packaging equipment
- Unit material handling

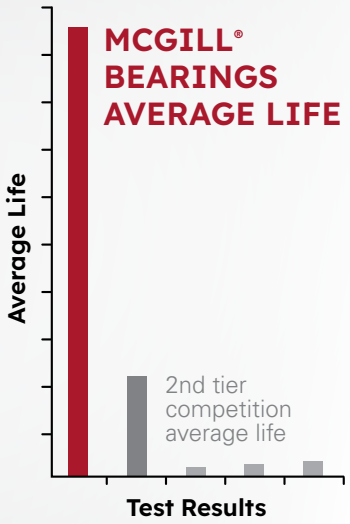
SUPERIOR DESIGN FEATURES PROMOTE LONGER LIFE, LOWER COST

Although others have tried to copy the outward appearance of CAMROL® bearings, our customers find vast differences in performance. In laboratory testing at Regal Rexnord, CAMROL bearings last up to 50 times longer than some competitors' products in a variety of laboratory and customer tests.

PROVEN PERFORMANCE

Eight bearings from each manufacturer were tested at Regal Rexnord under identical laboratory conditions without relubrication.

CF–1-S size tested at 200 lbs and 1,500 RPM.



HEAVY SECTIONED OUTER RACE

The heavy sectioned outer race helps withstand shock loading of cam follower operation.

LUBRICATION GROOVE EXTENDS BEARING LIFE

All inch dimension CAMROL bearings with seals have a lubrication groove that extends lubrication intervals and increases the prelubricated life of the bearing.

BLACK OXIDE FINISH

CAMROL bearings have a black oxide finish on all external surfaces to help inhibit corrosion.

IMPROVED HOLDING POWER

The threads on all inch CAMROL bearing studs meet class 2 tolerances and metric CAMROL bearing stud threads meet class 6G tolerances. These precise geometrics help provide better holding power.

HIGH QUALITY MATERIALS

Although other steels may be less expensive, Regal Rexnord only uses high quality, specialty steel to boost the performance and endurance that is the hallmark of a CAMROL bearing.

SPECIALIZED HEAT TREATMENT

All raceways are heat treated to a minimum of 58 HRC. Inner studs are induction heat treated to McGill bearing specifications to provide a hardened raceway and a ductile stem that provides toughness for absorbing the shocks of cam follower operations.

METRIC CAM FOLLOWER BEARINGS

Regal Rexnord offers metric CAMROL® bearings in metric dimensions equivalent to ISO standard series. Both European and Asian versions are available.

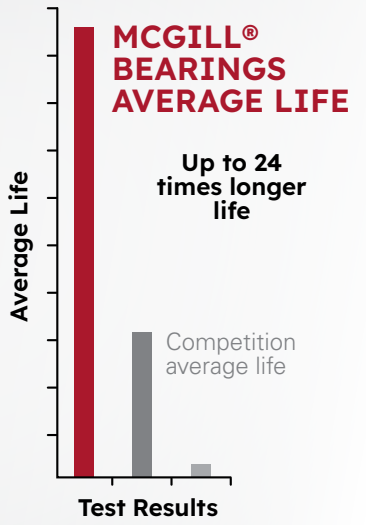
Metric CAMROL bearings are available in stud or yoke type versions. Specifying the type of bearing needed depends upon the preference for either a straddle (yoke) mounting or a cantilever (overhung) mounting.

Metric CAMROL bearings are available with three types of internal construction: full complement needle rollers, retainer type needle rollers or cylindrical rollers.

PROVEN PERFORMANCE

Eight bearings from each manufacturer were tested at Regal Rexnord under identical laboratory conditions without relubrication.

MCF-26-S size tested at 160 lbs and 1,975 RPM.



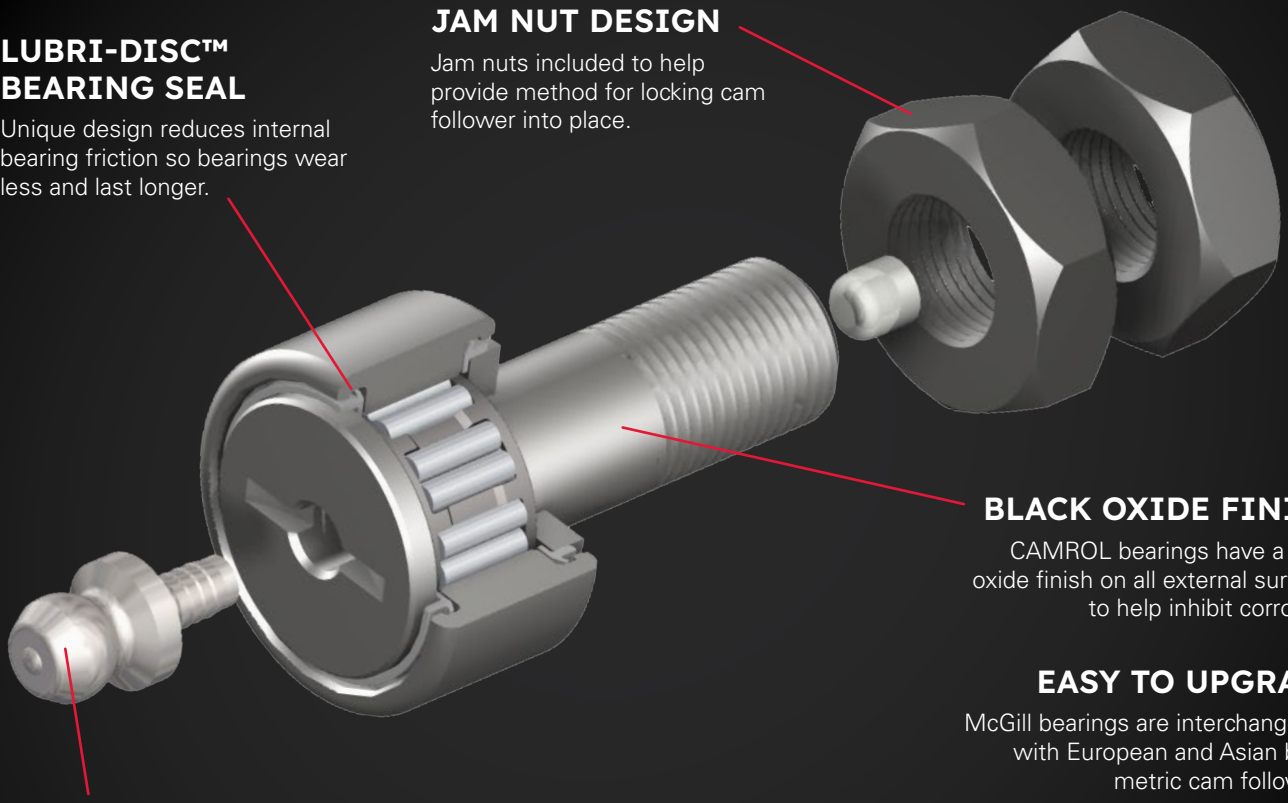
With a proven track record on inch cam followers, Regal Rexnord brings many key features and manufacturing practices to the metric CAMROL bearings series that outlast the competition. In test laboratories, McGill CAMROL bearings last up to 24 times longer than some competitors' bearings.

LUBRI-DISC™ BEARING SEAL

Unique design reduces internal bearing friction so bearings wear less and last longer.

JAM NUT DESIGN

Jam nuts included to help provide method for locking cam follower into place.



BLACK OXIDE FINISH

CAMROL bearings have a black oxide finish on all external surfaces to help inhibit corrosion.

EASY TO UPGRADE

McGill bearings are interchangeable with European and Asian brand metric cam followers.

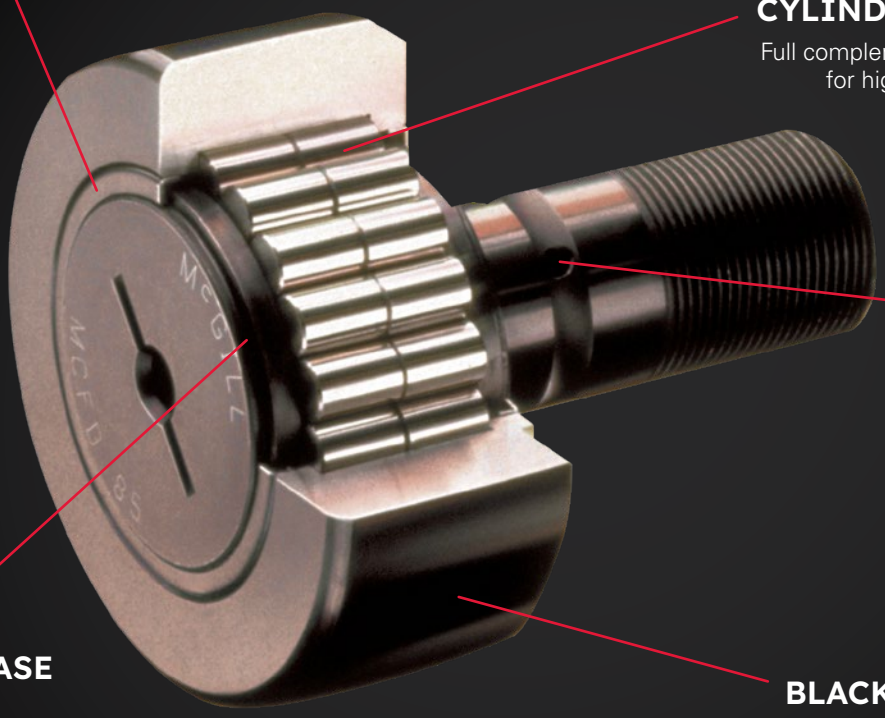
GREASE FITTING

Fitting included to provide easy relubrication with standard, hydraulic grease gun.

HEAVY DUTY METRIC CAMROL® BEARINGS

This series provides greater dynamic load ratings by using cylindrical rollers in place of standard needle rollers. This construction allows the bearings to support radial loading, as well as some axial loading.

MCFD® SERIES BEARINGS



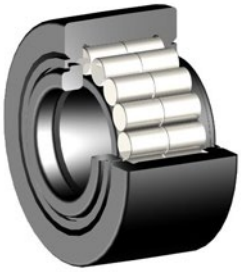
LABYRINTH TYPE SEALING

TWO-ROWS OF CYLINDRICAL ROLLERS
Full complement design, engineered for higher dynamic load rating.

ANNULAR LUBRICATION GROOVE
The groove provides a circumferential path to direct lubricant to the oil hole.

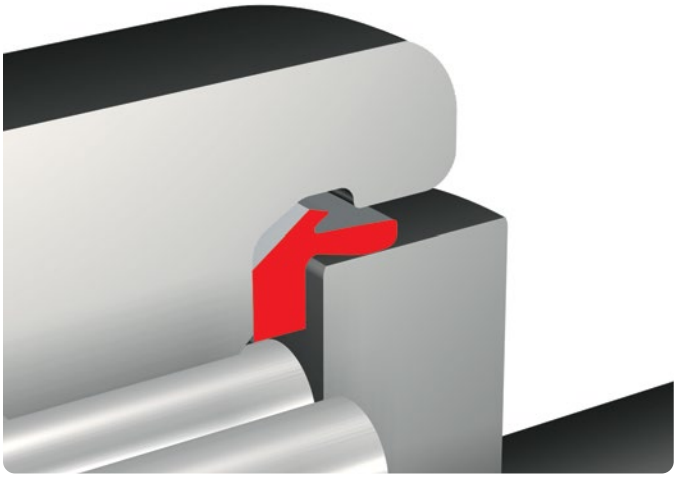
LARGE GREASE RESERVOIR
As compared to a full complement needle bearing.

BLACK OXIDE FINISH
CAMROL bearings have a black oxide finish on all external surfaces to help inhibit corrosion.



MCYRD® SERIES BEARINGS

Yoke type heavy-duty metric CAMROL bearings are designed for yoke (straddle) mounting on a shaft.



Note: The LUBRI-DISC bearing seal is rated up to 250°F maximum.

LUBRI-DISC™ BEARING SEAL OPTION

The LUBRI-DISC seal option increases bearing life up to 10 times longer than unsealed bearings:

- Labyrinth and contact sealing help protect against loss of lubrication and help prevent entrance of contaminants while providing low drag operation.
- Vents help prevent seal blow-out during relubrication.
- Integral backplate design reduces internal friction by eliminating metal-on-metal contact. Less friction lowers the operating temperature, which extends grease life and allows for higher operating speeds.

HEX HOLE OPTION FOR EASE OF INSTALLATION

The hex hole option reduces costs by speeding installation or removal of stud type cam followers. During typical installation or removal, the bearing must be held in place while torque is applied to the mounting nuts. The optional hex hole increases secure holding power over the standard screwdriver slot in the face of the bearing. The hex hole option is standard for stud type Heavy-Duty, Special-Duty and CRES™ corrosion resistant CAMROL® bearings and is an option for standard CAMROL bearings.

The hex hole option is ideal for:

- Difficult to reach assemblies
- Blind hole mounting
- Equipment with many bearings

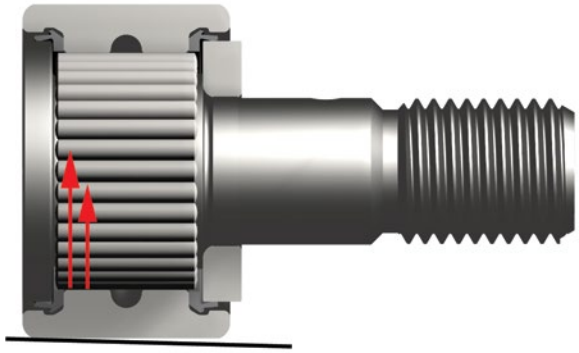
Note: The hex hole option does not allow for relubrication from the roller end of the bearing on most sizes. (All metric versions and inch sizes below 3" OD.)

CROWNED OD OPTION FOR LONG LIFE

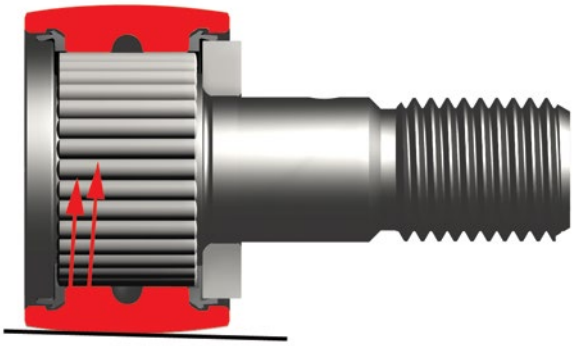
A slight crown on the OD of a cam follower bearing can increase bearing life up to three times longer than the standard, cylindrical OD bearing. The crown helps more evenly distribute stresses for the following conditions:

- Heavy loading
- Misalignment of track or housing
- Turntable or rotary cams

Note: The crowned O.D. is an option for standard CAMROL® and heavy-duty CAMROL bearings.



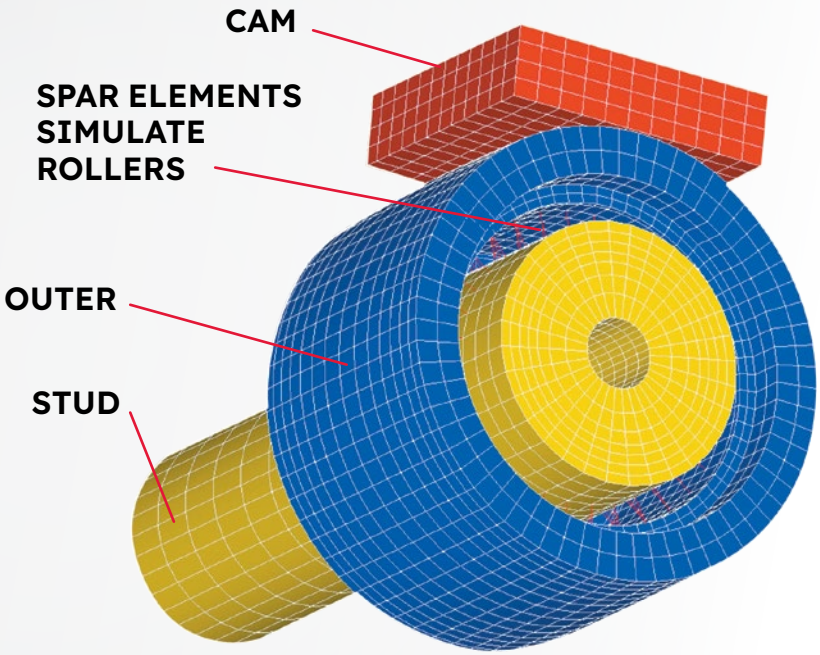
CYLINDRICAL OD:
MISALIGNMENT CAN CAUSE CORNER LOADING



CROWNED OD:
CORNER LOADING IS REDUCED.

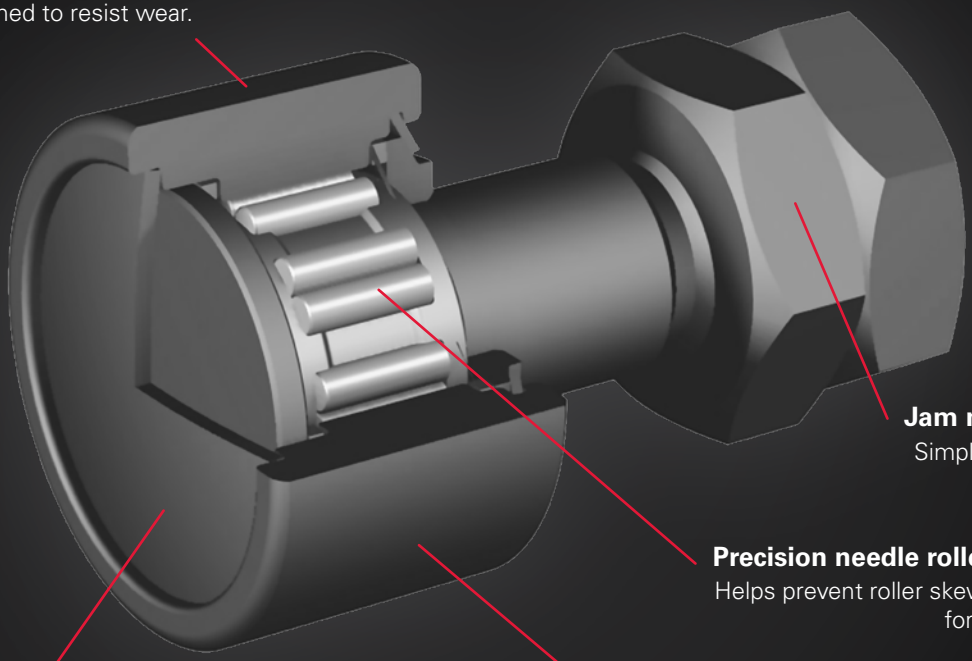
COMPUTER ANALYSIS SHOWS CROWNED OD CAN INCREASE LIFE THREE TIMES LONGER.

Finite element analysis of cam followers under heavy loads shows crowned OD increases L10 life. More detailed results available in Motion System Design magazine, August 2003.



SPECIAL-DUTY CAMROL® BEARINGS FOR TOUGH ENVIRONMENTS

Select special-duty CAMROL bearings for tough applications such as automotive production, metal forming assembly and welding environments.



Heavy walled outer race
Through hardened to resist wear.

Jam nuts included
Simplifies installation process.

Precision needle rollers with cage
Helps prevent roller skewing and allows for higher speeds.

End plug seal
Helps seal out contamination and seals in grease at the roller end.

Black oxide finish
CAMROL bearings have a black oxide finish on all external surfaces to help inhibit corrosion.

RESIST CONTAMINATION

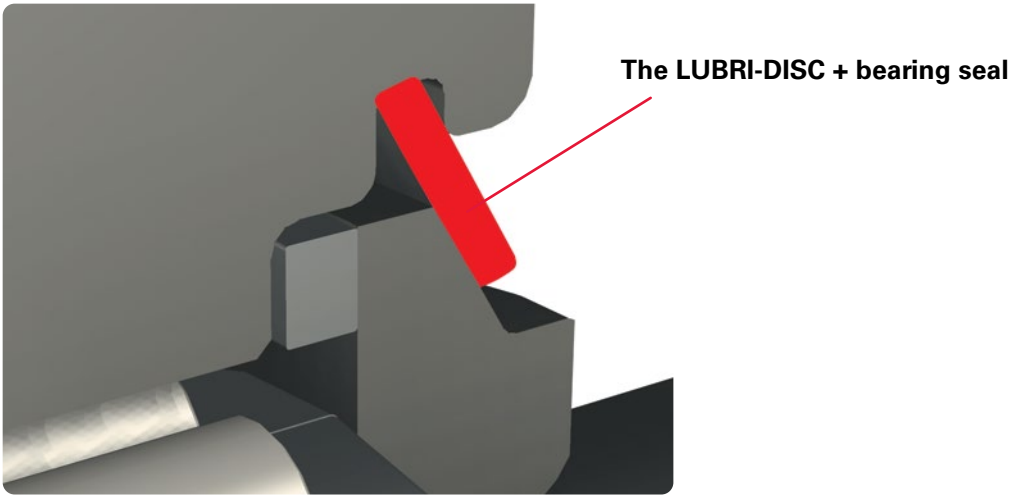
Special-duty CAMROL bearings are specifically designed to resist contaminated environments. A metal end plug seal on the roller face helps block out contamination and resists welding spatter.

MAINTENANCE FREE

Special-duty CAMROL bearings extend bearing life up to six times without lubrication maintenance by using synthetic grease and caged needle rollers. Caged needle rollers allow for a larger grease reservoir than standard needle bearing cam followers, a beneficial feature when relubrication is not possible.

IMPROVED PROTECTION

On the stud side of the Special-duty CAMROL® bearing, the LUBRI-DISC™+ bearing seal offers improved protection over standard sealing.



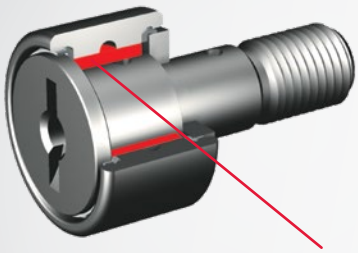
BUSHING TYPE CAMROL BEARINGS CAM FOLLOWER BEARINGS

ELIMINATES RELUBRICATION

This bearing series eliminates the need for lubrication by utilizing a non-metallic bushing instead of needle rollers. Save relubrication time and inconvenience. This is ideal when relubrication is not desired and grease contamination must be avoided.

The bushing type is appropriate for:

- Light loads and slow speeds
- Not for food applications



HEAVY-DUTY CAMROL® BEARINGS FOR INCIDENTAL THRUST APPLICATIONS

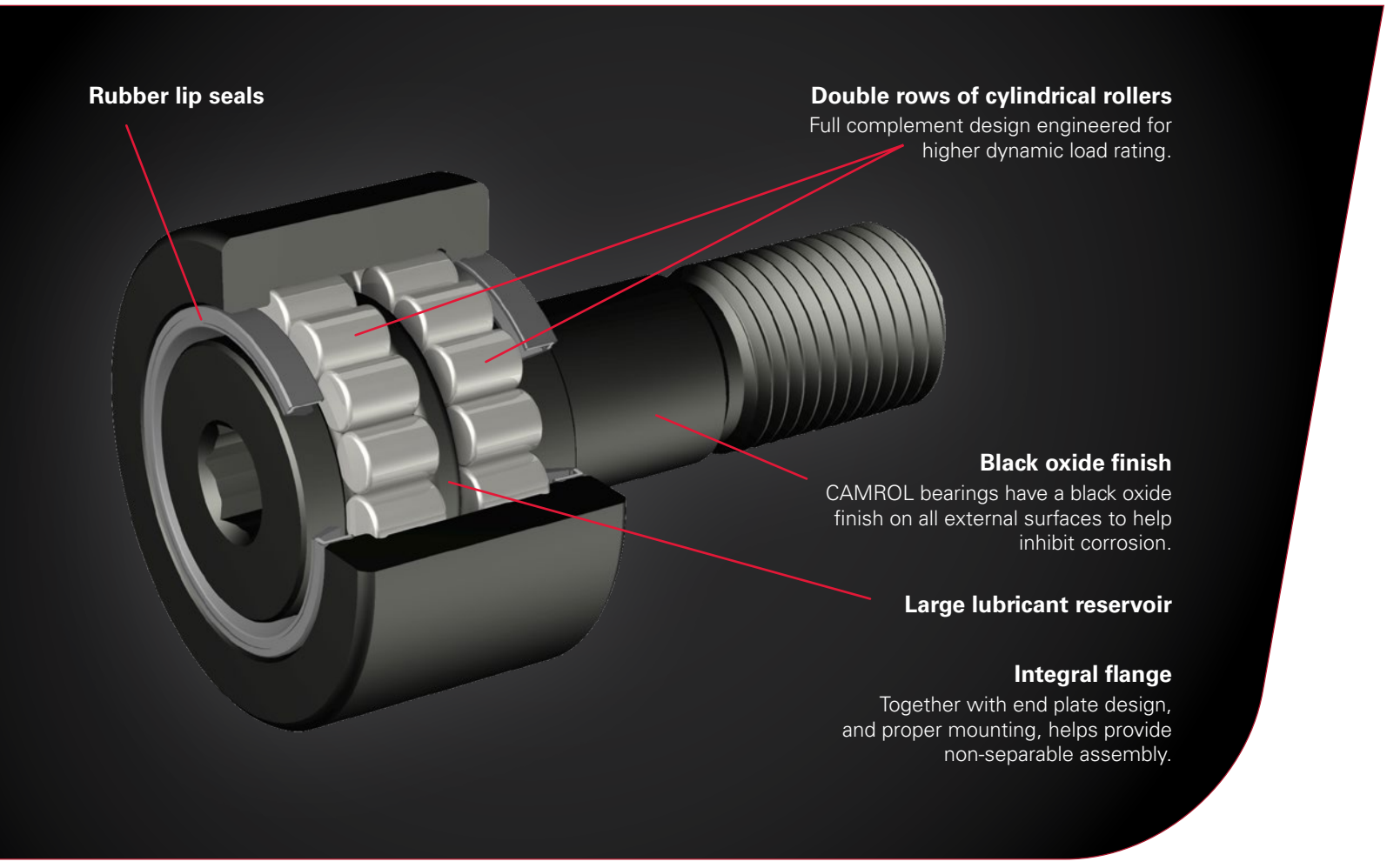
While standard needle bearing cam followers are the economical choice for most applications, incidental thrust loads make Heavy-duty CAMROL bearings a better choice. Primary causes of incidental thrust are misalignment of housing or track, high loading causing stud deflection and rotary tracks or cams. Heavy-duty CAMROL bearings employ a unique internal construction, consisting of two rows of cylindrical rollers designed to manage much of the thrust.

RESIST CONTAMINATION

Rubber lip seals are standard in Heavy-duty CAMROL bearings. Although standard cam followers do well in most conditions, the rubber lip seals in Heavy-duty CAMROL bearings increase protection against contamination.

MAINTENANCE FREE

Standard bearing has no relubrication feature. Seals are pointed inward for improved grease retention. The large lubricant reservoir and rubber lip seals keep more grease in the bearing for maintenance free operation.



CRES™ CAMROL® CAM FOLLOWER BEARINGS

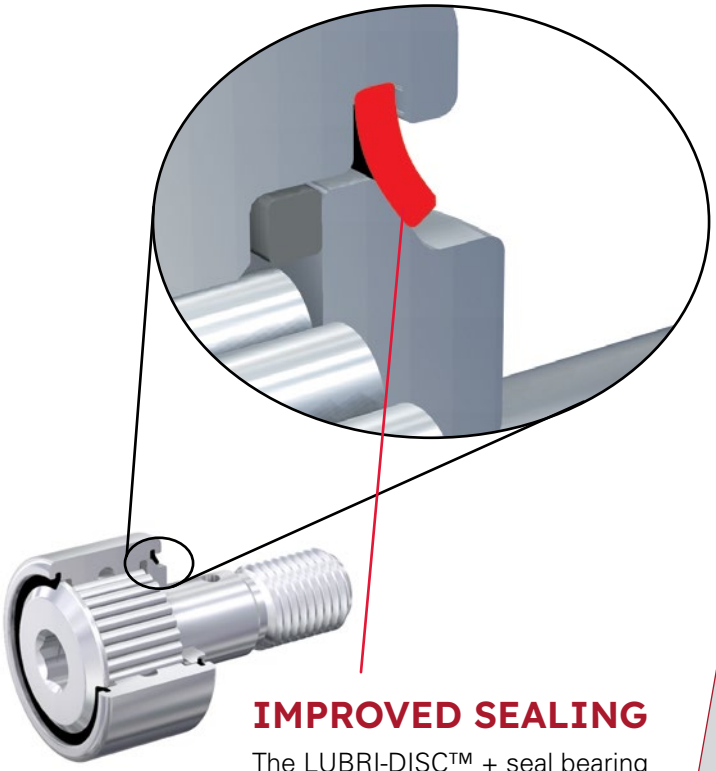
Corrosion-Resistant CAMROL Bearings for Food and Beverage Applications

GREATER CORROSION RESISTANCE

Whether equipment is exposed to the elements or to extreme washdown in food and beverage applications, the CRES corrosion resistant CAMROL bearing extends bearing life in wet or corrosive environments compared to standard cam followers. The CRES CAMROL bearing features 400 series stainless steel to help prevent corrosion.

FDA COMPLIANT GREASE

CRES CAMROL bearings utilize H1 FDA compliant grease for food applications.

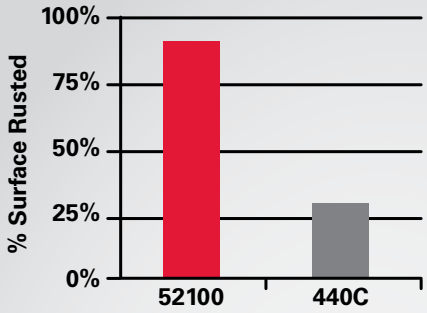


IMPROVED SEALING

The LUBRI-DISC™ + seal bearing provides up to five times better protection against washdown than standard seals. This seal is featured in CRES CAMROL bearings 1" OD and larger.

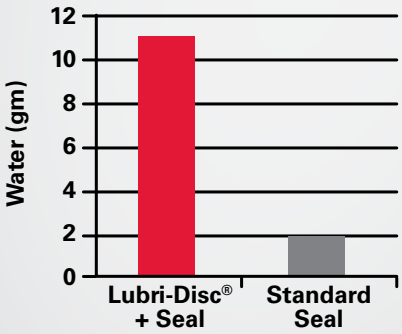
Standard cam followers rust quickly.

RUST COMPARISON



Tested per ASTM B117 salt fog test, 5% saline solution, 100°F, 100% humidity.

WATER SPRAY COMPARISON



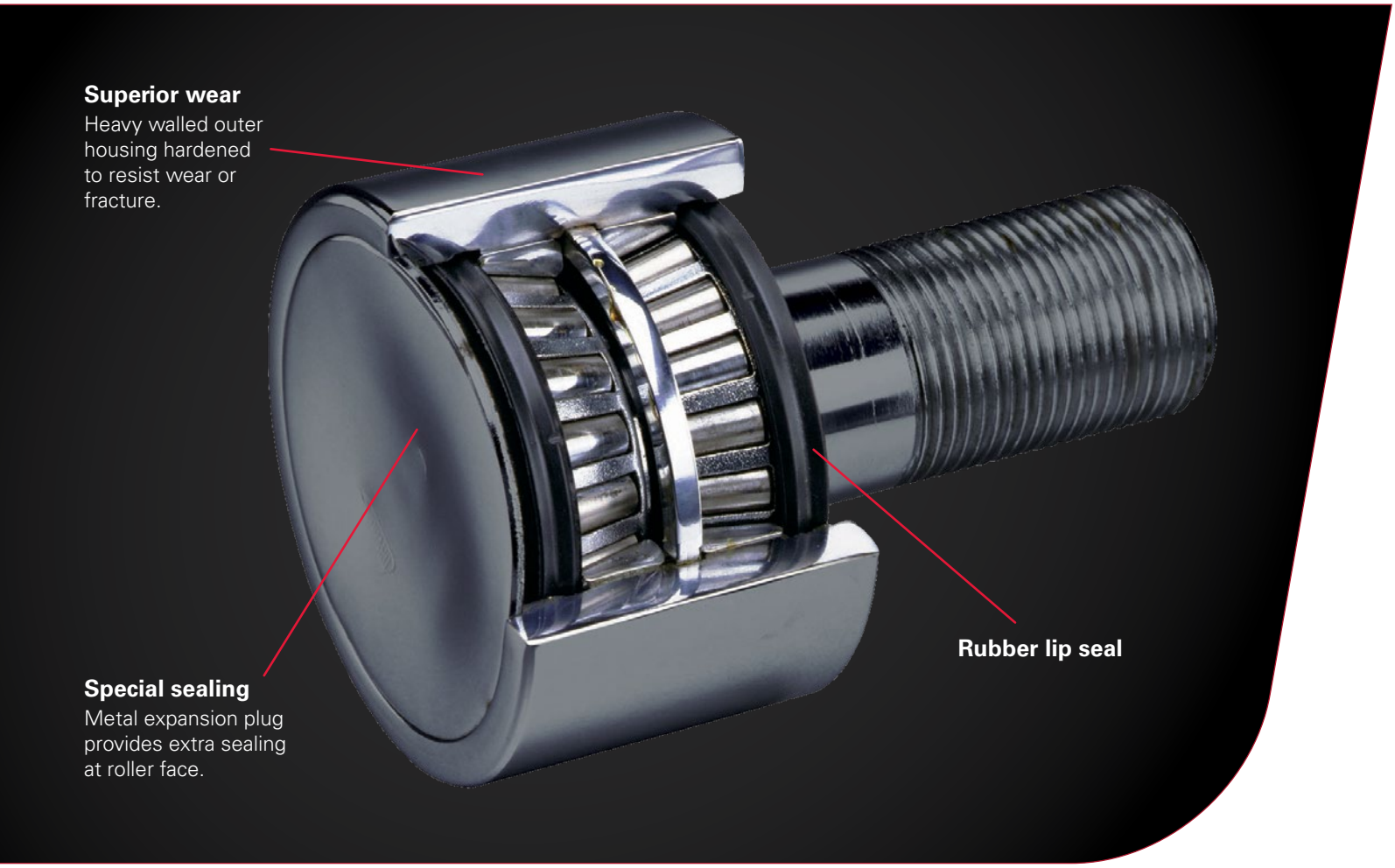
In a test originally performed to meet exacting aerospace standards, CRES CAMROL bearings were tested with a high pressure spray aimed at the bearing face. This graph shows how each seal held-up – the LUBRI-DISC + bearing seal featured in CRES CAMROL bearings was the obvious winner.

For part nomenclature, see page 19.

TRAKROL® CAM FOLLOWER BEARINGS

FOR THRUST AND CONTAMINATION

TRAKROL bearings feature a different design than CAMROL® bearings to allow for heavier thrust loads. Smaller sizes (< 3" OD or point diameter) use ball bearing inserts and larger sizes use tapered roller bearings to accept thrust loads.



RESISTS CONTAMINATION

Rubber lip seals help keep out contamination on the stud side of the bearing and a metal end plug seal helps protect the roller face.

THRUST APPLICATIONS

Tapered roller bearing or ball bearing inserts allow for the heavier thrust capabilities of the TRAKROL bearing.

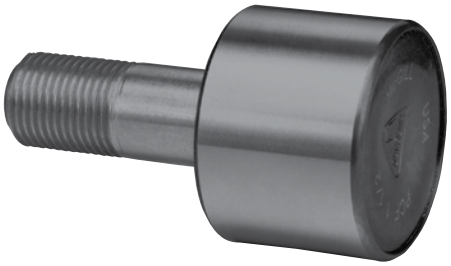
MAINTENANCE FREE

A large grease reservoir allows for longer life without relubrication.

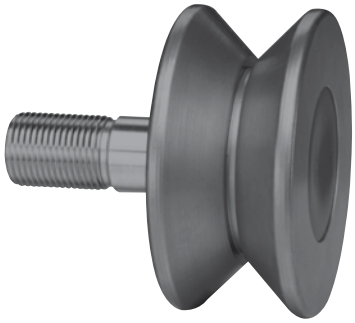
WIDE SELECTION

- Three OD types (plain, flanged and V-groove)
- Stud and yoke types
- Eccentric stud option available

Note: TRAKROL® bearings are not always dimensionally interchangeable with CAMROL® bearings.



PCF SERIES



VCF SERIES

FCF SERIES

YOKE TRAKROL BEARINGS

Yoke TRAKROL bearings are designed for yoke (straddle) mounting on a shaft and utilize tapered roller bearings.

Available in three configurations.

VCYR SERIES

FCYR SERIES

PCYR SERIES

For part nomenclature, see page 19.

A HISTORY OF INNOVATION… A FUTURE IN HELPING YOU STAY COMPETITIVE

PRECISION MANUFACTURING

Because there are no industry-wide standards for tolerances on cam follower bearings, Regal Rexnord has set its own demanding tolerances for McGill CAMROL bearings. Regal Rexnord uses statistical process control to help provide cam followers that are manufactured according to these exacting standards.

Regal Rexnord was one of the first bearing manufacturers to receive ISO 9001 certification. ISO certification and the process it encompasses help Regal Rexnord design and manufacture bearings to uniform quality standards. While others have tried to imitate the McGill bearing design, Regal Rexnord has the precision, quality and performance that leads the industry.

ADVANCED TOOLS

Regal Rexnord engineers use a wide variety of tools, such as computer analysis and sophisticated laboratory testing, to anticipate and design new solutions.

As applications push the limits of bearing performance, Regal Rexnord engineers analyze and help prevent problems through failure analysis. Physical analysis, including scanning electron microscopy and internal and third party testing facilities, are available to help understand and diagnose problems, leading to cost effective solutions.

ENGINEERING EXCELLENCE

Leveraging experience gained from developing high performance aerospace and industrial applications. Regal Rexnord routinely designs and manufactures McGill® bearings up to Class 5 precision levels with exotic materials or coatings.

As developers of the first cam follower bearing, Regal Rexnord's engineering team leads the industry in cam follower design. Extreme operating environments, changing size requirements, high temperature differentials, and caustic chemicals – Regal Rexnord engineers respond with a complete selection of standard offerings and customized bearing solutions for your application challenges.

PROFESSIONAL TIMELY SERVICE

Regal Rexnord is known for a commitment to customer service:

- Inventories optimized to achieve excellent service fill rates
- Standard box, bulk and special packaging available to meet your needs
- Trained personnel to help solve problems quickly and accurately
- A comprehensive distribution network and a focus on quick delivery, enabling us to serve you efficiently
- A technical customer service group for technical issues and a general customer service group for all other concerns so you always have the right resources to help you resolve issues

MCGILL® NEEDLE BEARINGS

McGill machined race needle bearings are manufactured from bearing quality steel and available with multiple seal configurations. McGill needle bearings have a lubrication groove with radial holes on both the inner and outer rings for relubrication through the housing or shaft. Custom designs, lubricants and diametrical matching (-DS Suffix) are available.

MR 32 Shown

CAGEROL® BEARING

Bearings are available in two series.
Standard width MR 5/8" to 9 ¼" bore sizes
Narrow width MR-N 5/8" to 6 ½" bore sizes

- Steel cage construction allowing for higher-speed operation, while providing roller guidance and a lubricant reservoir.
- Crowned rollers, available on most sizes, reduce end stresses.
- Available with optional inner ring (MI) which provides a hardened raceway for the rollers when used with an unhardened shaft.

GUIDEROL® BEARING

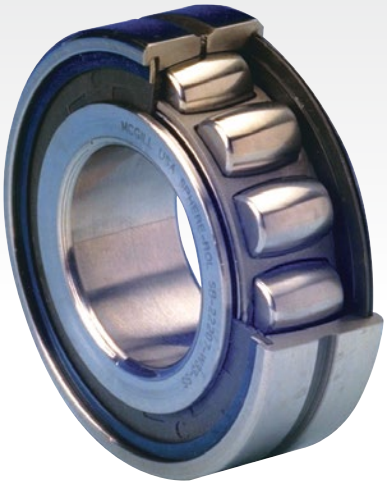
Bearings are available in two series.
Standard width GR sizes 5/8" to 9 ¼" bore sizes
Narrow width GR-N sizes 5/8" to 6 ½" bore sizes

- Full complement needle bearing allowing for higher static load rating, rigidity, and shock resistance.
- Available with optional inner ring (MI) which provides a hardened raceway for the rollers when used with an unhardened shaft.

GR 32 SS with Inner Ring Shown

MCGILL SPHERICAL ROLLER BEARINGS

The McGill spherical bearing's single row of spherical rollers provides a wide variety of advantages. The bearing design allows for higher capacities, higher-limiting speeds, longer life under more misalignment and protection from contaminant within the same envelope of ordinary two-row designs.



SB-22207-W33-SS Shown

SPHERE-ROL® BEARING

Bearings are available in two series (tapered bore optional):
22200 series - 20mm to 150mm bore sizes
22300 series - 40mm to 100mm bore sizes

- Sealed SPHERE-ROL bearing dimensions meet ABMA/ISO specifications. Choose from three seal types:
  - NYLAPLATE® seal
  - NYLAPLATE high temperature seal
  - LAMBDA® seal
- Dimensionally interchangeable with conventional double row spherical roller bearings.
- Spherical rollers increase dynamic load capacity and misalignment of conventional double row spherical roller bearings.

CAM FOLLOWER NOMENCLATURE CHART

Series	Type	Internal construction	Size specification	Seal	Mounting method	O.D. Configuration
Camrol® bearings						
CF	Standard stud	Full complement needle rollers	Roller diameter in inches	Unsealed	Screwdriver slot	Cylindrical
CF-S				Lubri-Disc™		
CCF-S						Crowned
CF-B				Unsealed	Hex hole	Cylindrical
CF-SB				Lubri-Disc		
CCF-SB						Crowned
CFE-B	Eccentric stud			Unsealed		Cylindrical
CFE-SB				Lubri-Disc		
CCFE-SB						Crowned
CFH	Heavy stud			Unsealed	Screwdriver slot	Cylindrical
CFH-S				Lubri-Disc		
CCFH-S						Crowned
CFH-B				Unsealed	Hex hole	Cylindrical
CFH-SB				Lubri-Disc		
CCFH-SB						Crowned
CYR	Yoke			Unsealed	Yoke	Cylindrical
CYR-S				Lubri-Disc		
CCYR-S						Crowned
Bushing Camrol bearings						
BCF-S	Standard stud	Bushing	Roller diameter in inches	Lubri-Disc	Screwdriver slot	Cylindrical
BCF-SB					Hex hole	
BCCF-SB						Crowned
BCYR-S	Yoke				Yoke	Cylindrical
CRES™ Camrol bearings						
CF-SB CR	Standard stud	Full complement needle rollers	Roller diameter in inches	Lubri-Disc or Lubri-Disc +	Hex hole	Cylindrical
CFE-SB CR	Eccentric stud					
CYR-S CR	Yoke				Yoke	
Heavy-Duty Camrol bearings						
CFD	Standard stud	Double row cylindrical rollers	Roller diameter in inches	Rubber lip	Hex hole	Cylindrical
CCFD						Crowned
CYRD	Yoke				Yoke	Cylindrical
CCYRD						Crowned
Special-Duty Camrol bearings						
SDCF	Standard stud	Caged needle rollers	Roller diameter in inches	End plug and Lubri-disc +	Hex hole	Cylindrical
Metric Camrol bearings						
MCF®	Standard stud	Full complement needle rollers	Roller diameter in millimeters	Unsealed	Screwdriver slot	Crowned
MCF-S				Lubri-Disc		
MCF-SX						Cylindrical
MCFR®		Caged needle rollers		Unsealed		Crowned
MCFR-S				Lubri-Disc		Cylindrical
MCFR-SX						Crowned
MCF-SB		Full complement needle rollers			Hex hole	Cylindrical
MCF-SBX						Crowned
MCFR-SB		Caged needle rollers				Cylindrical
MCFR-SBX						Crowned
MCFE-SB	Eccentric stud	Full complement needle rollers				
MCFRE-SB		Caged needle rollers				
MCYR®	Yoke	Full complement needle rollers	Bore diameter in millimeters	Unsealed	Yoke	Crowned
MCYR-S				Lubri-Disc		
MCYR-SX						Cylindrical
MCYRR®		Caged needle rollers		Unsealed		Crowned
MCYRR-S				Lubri-Disc		
MCYRR-SX						Cylindrical
Metric heavy-duty Camrol bearings						
MCFD®	Standard stud	Double row cylindrical rollers	Roller diameter in millimeters	Metal shield	Screwdriver slot	Crowned
MCFD-X						Cylindrical
MCYRD®	Yoke		Bore diameter in millimeters		Yoke	Crowned
MCYRD-X						Cylindrical
Metric special-duty Camrol bearings						
SDMCF	Standard stud	Caged needle rollers	Roller diameter in millimeters	End plug and Lubri-Disc +	Hex hole	Cylindrical
Trakrol® bearings						
PCF	Standard stud	Ball or tapered roller bearings	Roller diameter in inches	Rubber lip and end plug	Hex hole	Cylindrical
PCFE	Eccentric stud					
FCF	Standard stud					Flanged
FCFE	Eccentric stud					
VCF	Standard stud		Point diameter in inches			V-Grove
VCFE	Eccentric stud					
PCYR	Yoke	Tapered roller bearings	Roller diameter in inches	Rubber lip	Yoke	Cylindrical
FCYR						Flanged
VCYR			Point diameter in inches			V-Grove

McGILL®

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