

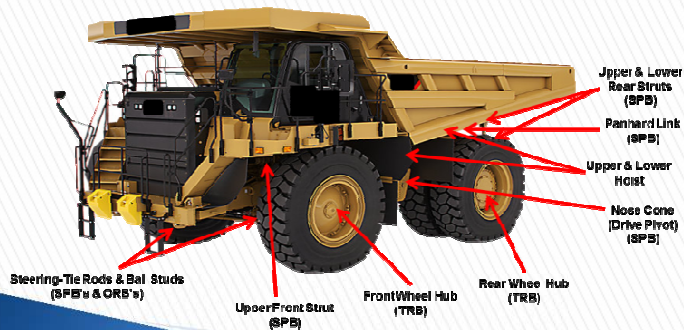


# Mining Industry

Contains RBC Proprietary Information  
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CONFIDENTIAL

# Mining Aftermarket Initiative



# Mining Industry Customers



OEM



# Mining Equipment Served



# RBC - Mining Equipment Products



## SPB - Enhanced Performance Products

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- ▶ RBC Problem Solvers
  - Lubrication Options
  - Sealing Options
  - Materials / Coatings
- ▶ Unique Design Solutions
- ▶ NEW DuraLube™ II Maintenance Free

# SPB - Enhanced Performance Products



## Lubrication Enhancements



QuadLube®



Enhanced QuadLube®



Circumferential Crossing



CrossLube®

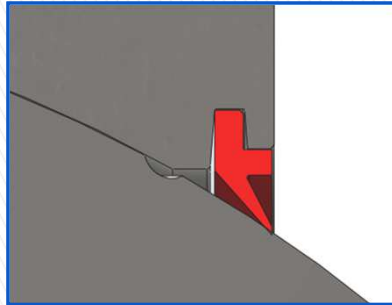


Spiral Bore

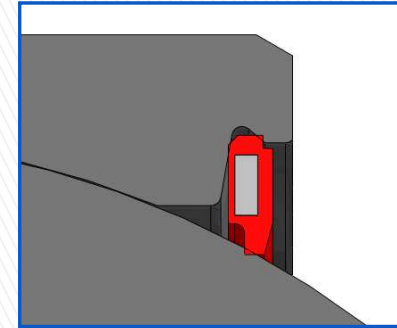
# SPB - Enhanced Performance Products



## Sealing Options



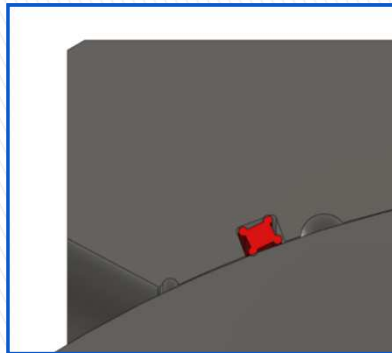
Scraper Seals



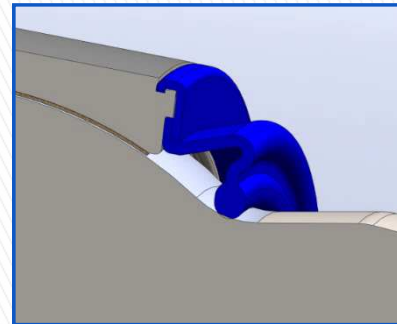
Dust/Oil Seals



SpreadLock® Seal



O-Ring Seals



Boot Seals



# SPB - Enhanced Performance Products



## Material Options

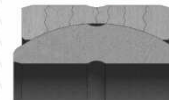
- ▶ 52100 Thru-Hard
- ▶ 8620 Case Carburized
- ▶ 440C Stainless Steel



Excessive impact loads applied to "Thru-Hardened" Spherical Plain Bearings can lead to brittle fracturing of the rings

RBC ImpactTuff® Spherical Plain Bearings have a shock absorbing ductile core. This core absorbs impacts and impedes crack propagation through the ring

Innovative hole and notch designs facilitate fracturing of the ImpactTuff® Outer Ring for bearing assembly



## ImpactTuff®

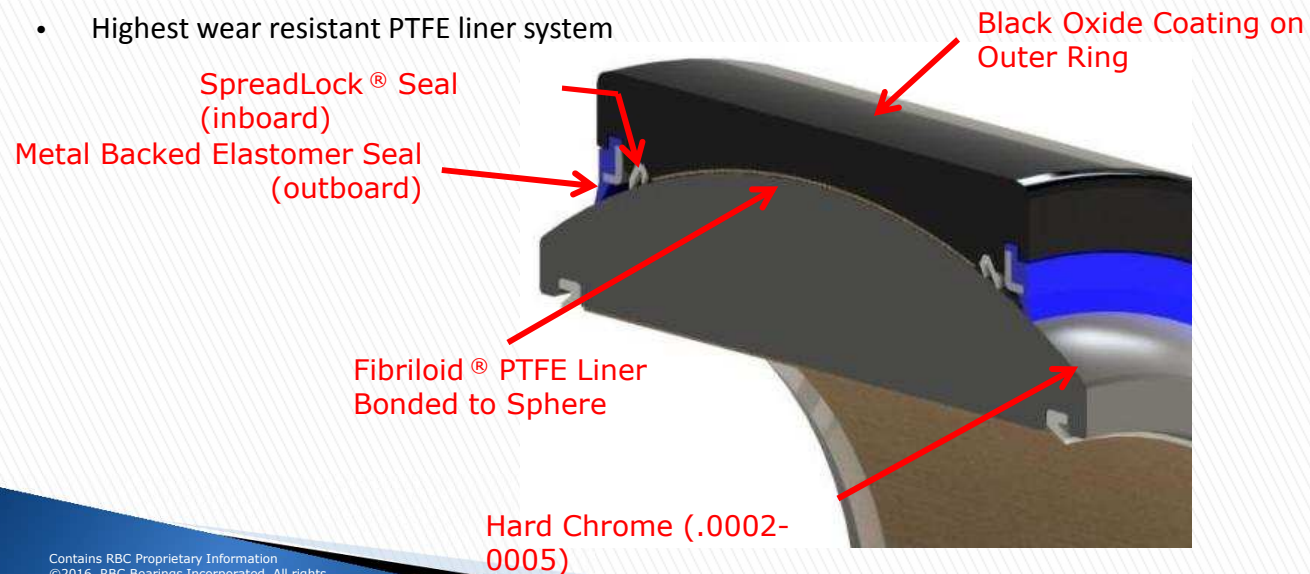
- Hardened case for wear resistance (HRc 60+)
- Ductile core to resist fracture due to impact loading
- >300% improvement in fracture resistance
- Residual surface compressive stress



# DuraLube™ II Maintenance Free



- Duel Sealing Arrangement (RBC US Patent 9,157,480 B2)
  - Redundant two stage sealing system
  - Excellent retention
  - Triple Lip Seal
  - Combines the features of the Spreadlock® scraper & a elastomer seal
  - Enhanced with PTFE grease packed in the Spreadlock® seal I.D. groove & elastomer seal lip
- Fibriloid® PTFE liner bonded to O.R. sphere (and bore for Upper Front Strut)
  - Highest wear resistant PTFE liner system

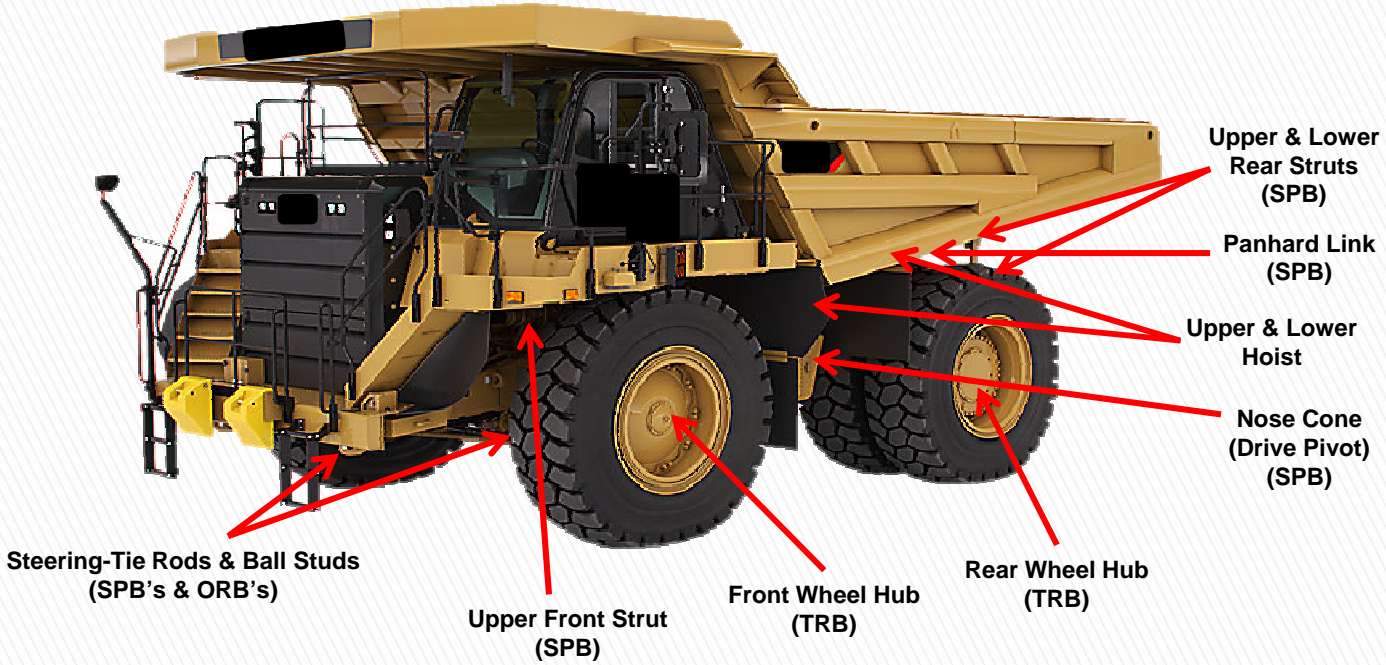


## Best Value on the Market



- **Ease of installation**
  - Drop in replacement for:
    - Steel-on-steel SPBs
    - Other maintenance free designs
  - No need to re-design surrounding components
- **Cut Costs**
  - No need for costly lube lines or auto-lube systems
  - No maintenance labor costs
  - No grease required
- **Better performance**
  - Improved features for longer life (replace bearings less often)
  - Extended maintenance intervals for more productivity (less down time)

# Mining Haul Truck Positions



# Mining Haul Truck Bearing Positions



## Caterpillar 785 Mining Haul Truck

Position	Qty / Truck	Supplier	RBC P/N	Comments
Rear Strut (U & L)	4 pcs.	Timken	B76211	RBC supplies to aftermarket today
Front Strut (Upper)	2 pcs	?		
Steer Cylinder	4 pcs.	RBC	ORB449L15	RBC supply to TRW / Supply ORB449L20 to aftermarket with slant lube groove
Tie Rod	4 pcs.	RBC	ORB449L15	RBC supply to TRW / Supply ORB449L20 to aftermarket with slant lube groove
Hoist Cylinder Upper	2 pcs	?	B64L	RBC supplies to aftermarket today / could upgrade by adding seals & Quadlube
Hoist Cylinder Lower	2 pcs.	?	ORB753549L10	RBC supplies to aftermarket today
Pan Hard Link	2 pcs.	Timken	B75356L11	RBC supplies to aftermarket today / could upgrade by adding seals & Quad
4-Bar Suspension				
Nose Cone (A-Frame)	1 pc.	Timken	B753929L12	RBC supplies to aftermarket today / could upgrade to carb. rings, seals & Quadlube
Rear Wheel Brgs.	4 pcs.	Timken	?	Need to I.D. CAT p/n's / procure samples / reverse engineering / develop cost & pricing
Front Wheel Brgs	4 pcs.	Timken	?	Need to I.D. CAT p/n's / procure samples / reverse engineering / develop cost & pricing

# Mining Haul Truck Bearing Positions



## KOMATSU 830 Mining Haul Truck

Position	Qty / Truck	Supplier	RBC P/N	Comments
Rear Strut	4 pcs.	RBC	B809LSSQ90	supply upgraded B809LSOQ spreadlock seal
Rear Strut Sleeve	8 pcs.	RBC	75701	
Steer Cyl & Tie Rod	6 pcs.	RBC	B40LQ90	supply upgraded PC1687 - B40LQ3090 / supply upgraded sealed B409LSOQ37
Hoist Cylinder Upper	2 pcs	RBC	B64L	supply upgraded B64LSSQ
Hoist Cylinder Lower	2 pcs.	RBC	B809L	supply upgraded B809LSSQ
Pan Hard Link	2 pcs.	RBC	B809L	supply upgraded B809LSSQ
Nose Cone (A-Frame)	1 pc.	RBC	B969LQ1890	supply upgraded BC969LSCQ18 / case carb., double sealed, enhanced Quadlube
Rear Wheel Brgs.	4 pcs.	Timken	TBD	Motorized Wheel - In Design process
Front Wheel Brgs	2 pcs.	Timken	TRB76864	In production / stock available
	2 pcs.	Timken	TRB76865	In production / stock available

# Electric Rope Shovel Diagram



## CAT 7495



# Caterpillar 7495 Electric Rope Shovel

## Parts List by Application



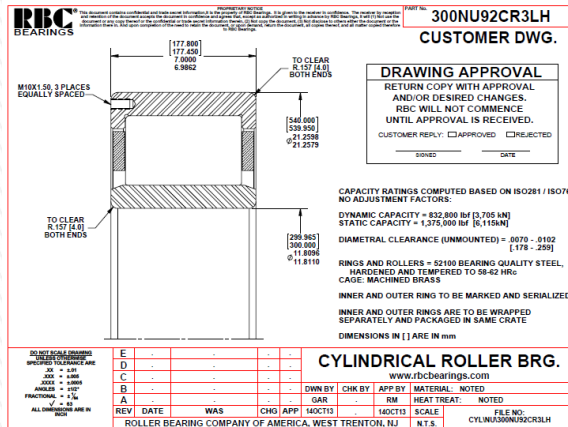
Principal Application	Position	495B	495B1	Manufacturer P/N	Supplier	Industry Part	Comments	
Boom	Boom Point Sheave	2	2	26960645	Timken	163TDOC8663 DB1254 G6		
Crowd Main Machinery	1st Intermediate Shaft L.H.	1	1	26644645	Timken/ARB	A-5230-WM-R6		
	2nd Intermediate Shaft	1	1	26960759	Timken	23238 YMW33W45A		
	Crowd Drum		1	1	26960725	Timken	23148 YMW507C08	
					26930344	Timken	23156 YMBW45AW46W848	
	Input Shaft	1	1	26960695	Timken	24056 YMBW33W45A		
		1	1	26760803	Timken	685		
		1	1	26966211		A5220WMR6		
				26644646		A-5230-WM R6		
Crowd Motor	Radial Bearing-DE		1	62027648	FAG	NU220E.M1		
	Radial Bearing-NDE		1	62027648	FAG	NU220E.M1		
	Thrust Bearing-NDE		1	62027649	FAG	6220.C3		
Gear Box	Gear Box L&S GFA355K/1001		1	62029532	Timken	239/600YMBW507C08		
			3	62029533		22232YMW33C3		
			6	62029534	FAG	F-553778.RN		
			1	62029535	FAG	QJ226N2.MPA		
			2	62029536	FAG	6040M		
			1	62029537	FAG	NJ224E.M1.C3		
			1	62029538	FAG	NJ226E.M1.C3		
		PEM Gear Box DOWH-1A		1	62037458 & 62037459	FAG	K67786.67720.W209C	
				1	62037463 & 62037464	FAG	KLM844049.LM844010.W209C	
					62037476 & 62037478	FAG	518983	
			6203748 & 62037489	FAG	515684			
			62037482 & 62037483	FAG	KLM654649.LM654610			
			62037488 & 62037489	FAG	804653			
		1	62037494 & 62037495		100TS461			
Hoist	1st Intermediate Shaft	2	2	26960831	Timken	23272 YMBW33W45A		
				26122050		6213		
	Hoist Drum	1	1	26960645		163TDOC8663 DB1254 G6		
	Input Shaft		2	26966210	FAG	548406		
			2	26966212	FAG	548406		
			26960457	Timken	23152K YMBW507C08W8I			
Hoist Motor	Radial Bearing-DE		1	62027635	FAG	NU230E.M1		
	Radial Bearing-NDE		1	62027635	FAG	NU230E.M1		
	Thrust Bearing-NDE		1	62027636	FAG	6230.C3		
Main Machinery	Hoist Intermediate Shaft	1	1	26960828	Timken	23156 YMBW507C08		
Propel Machinery	Crawler - Drive Tumbler Shaft	1	1	26961031		B-9472-A		
Propel Motor	Radial Bearing-DE		2	62027648	FAG	NU220E.M1		
	Radial Bearing-NDE		2	62027648	FAG	NU220E.M1		
	Thrust Bearing-NDE		2	62027649	FAG	6220.C3		
Saddle	Saddle Block / Shipper Shaft	1	1	26960700		220TDOC747 DB1254 G3		
Swing Machinery	Input Shaft / Upper Bearing			26849262		140TD0580 AA1254 G4		
	Interm. Shaft Upper			26960733	FAG	604545		
	Intermediate Shaft Lower			26960456		82TDO421 G4		
	Intermediate Shaft Upper			26960635		150RU91 O0771 R3		
	Pinion Shaft / Lower Bearing		4	26960457	Timken	23152K YMBW507C08W8I		
	Vertical Swing Shaft Lower		2	2	26960760	Timken	23260K YMBW507W8AC02	
					26960760	Timken	23260K YMBW507W8AC02	
	Vertical Swing Shaft Upper			26849262		140TD0580 AA1254 G4		
Swing Motor	Radial Bearing-DE		2	62029125	FAG	NU320E.M1		
	Thrust Bearing Ass-NDE		2	62029603	FAG	7220B.MP.UA		



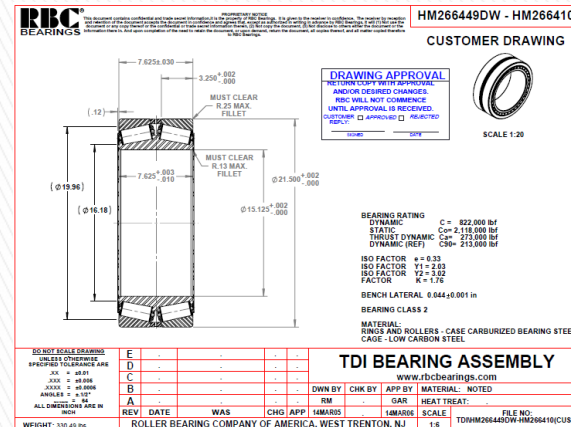
# Mining Shovel – Propel Drive



- ▶ Application
  - B-E 495 Electric Rope Shovel drive unit
  - Tapered Roller Bearing
  - Cylindrical Roller Bearing
- ▶ Sold through Motion Gillette to L&H

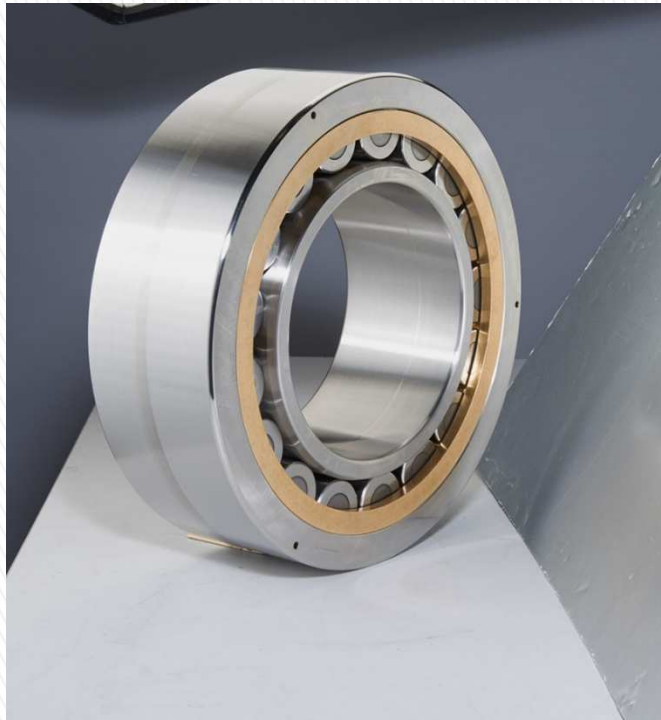


Cylindrical Roller Bearing



Double Row Taper Roller Bearing

# Mining Shovel – Propel Drive – CRB & TRB



Cylindrical Roller Bearing



Double Row Taper Roller Bearing

# RBC - Large Roller Bearings Offering



CRB



- Up to 40" Outside Diameter
- One-piece Bronze, steel pin-type, full complement
- N, NU, NUP, NP styles

TRB



- Up to 40" Outside Diameter
- Steel pin-type max. capacity, Stamped Steel & One-piece Bronze
- Single and Double Row

TRTB



- Up to 40" Outside Diameter
- One piece Bronze, steel pin type, full complement
- V-flat

TP



- Up to 40" Outside Diameter
- Domed rollers
- Bronze cage / steel band

# RBC – Large Roller Bearings

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## Material Options

**52100 Thru-Hard**

**8620 Case Carburized**

- **Standard specification**
- **Para-premium - improved cleanliness**
- **RBC MAX3<sup>®</sup> - Ultra cleanliness**

## RBC Value Proposition

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- ▶ Manufacturing in North America
- ▶ Experienced engineering design & production teams
- ▶ Special designs for demanding/problematic applications
- ▶ MAX3<sup>®</sup> material for increased fatigue life
- ▶ Broad range of maintenance-free bearing solutions to reduce total cost of ownership
- ▶ Production capability for small manufacturing runs
- ▶ In house application testing capabilities
- ▶ Inventory support for strategic customers

