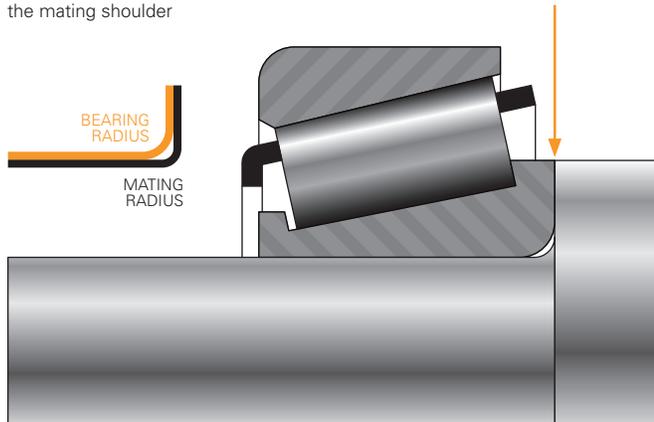


Understanding the Impact of Corner Radii on Commercial Vehicle Wheel Bearings

The corner radius on a wheel bearing is a small – and often overlooked – detail. However, a bearing's corner radius directly affects bearing setting, ring shoulder support or shoulder seating, plus seal lip and bearing location along the spindle. Corner radii is critical to hub performance.

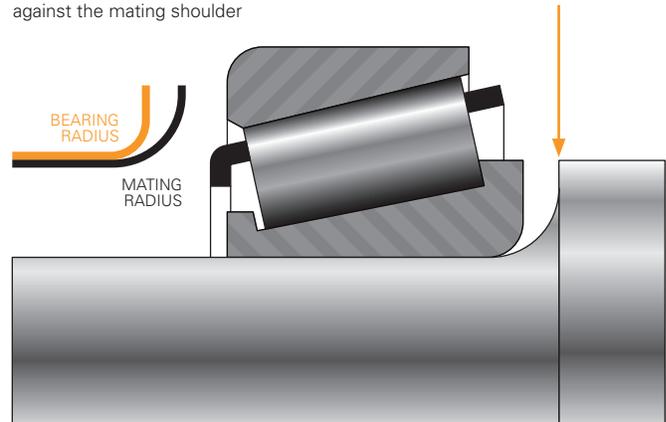
Many truck wheel bearing sets have unique corner radii which is identified by the letter at the end of the part number: 598A or HM516449C.

Fig.1: Correct bearing radius – bearing inner ring seated fully against the mating shoulder



BEARING INNER RING CORNER RADIUS > MATING RADIUS

Fig.2: Incorrect bearing radius – bearing inner ring cannot seat fully against the mating shoulder



BEARING INNER RING CORNER RADIUS < MATING RADIUS

To help ensure proper hub performance, follow these guidelines when selecting bearings:

1. Always replace bearings as a SET to prevent incorrect or mixed components.
2. Use additional caution with sets having unique radii so you have the correct mating radius (directly affects the position of the bearing on the spindle seat).
3. Check the bearing inner ring to make certain it seats fully against the mating shoulder (see Fig.1 above).
4. If purchasing individual components (cones and cups), verify that you have the proper components. Bearing radius is identified by the letter at the end of the part number as shown in the two examples below:

HM516449A with 0.240" shaft radius (SET421)

HM516449C with 0.140" shaft radius (SET422)

There is a significant difference of 0.100" in the shaft radii between these two part number examples.



Visit www.timken.com/techseriespro to enroll in free technical training.

POTENTIAL RISK: BEARING DAMAGE OR POOR PERFORMANCE

Some truck applications require bearings with unique radii. Six common bearing SETs with unique radii are: SET421, SET422, SET404, SET423, SET424 and SET403.

If the incorrect component is used – the wrong letter at the end of the part number – the bearing inner ring (cone) will not seat against the shaft shoulder. It is critical to seat the bearing inner rings fully against the shaft shoulder, otherwise there is the risk of bearing damage or poor bearing performance:



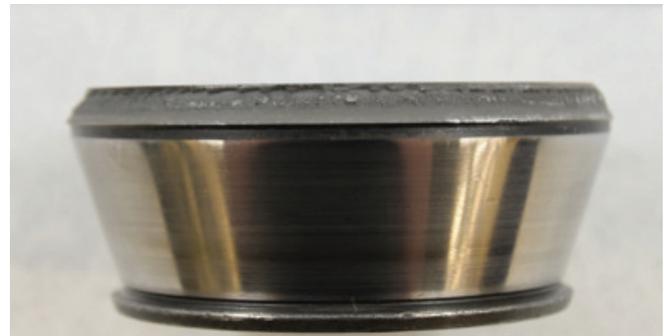
Fracturing the large rib



Loss of bearing setting



Scoring and/or Rib



Cone Spinning

POTENTIAL RISK: UNWANTED BEARING MOVEMENT

If the bearing inner ring is not seated against the shaft shoulder, it is possible, under heavy loads, for the ring to move after achieving proper bearing setting (via RP618 guidelines).

POTENTIAL RISK: PREMATURE SEAL LEAKAGE

Seals tend to wear into a location on the spindle. Over time, this actually helps keep oil in and contamination out. If you use the wrong bearings, they can move, causing the seal lip position to change. When the seal lip moves to a new position, it doesn't seal quite as well, resulting in premature leakage.



APPLICATION INTERCHANGE

Application	Popular SETs	Cone	Cup	454-Series	Timken Seal	COMPETITOR SEALS				
						Guardian	Voyager	Discover	National	Seal (2 Yrs)
Mack 50K & 60K Drive Axle	SET125	780	772		11S52500	309-0948	393-0148		N/A	
34K 38K Mack Drive	SET401	580	572	SET442	11S45002	309-0903			370022A	
34K 38K Mack Drive	SET402	582	572		11S45002	309-0903	393-0103	393-0203	370022A	
Mack Classic P/N 62AX486 64AX88	SET403	594A	592A	SET443	11S47671	309-0960			370005A	
38K Mack Drive GMC, Eaton, Meritor Heavy Duty Truck Bearing Set - Manually Adjusted Wheel Ends: Potential R Drive Axle - Inner Bearing	SET404	598A	592A		11P38750					
38K Mack Drive GMC, Eaton, Meritor Manually Adjusted Wheel Ends: Potential R Drive Axle - Inner Bearing	SET404	598A	592A		11S47671	309-0960			370005A	
44K Drive Mack	SET405	663			11S42500	309-0904	393-0104		370031A	
Mack Classic P/N 62ax321 64AX16	SET406	3782	3720	SET496	10P35000					
Manually Adjusted Wheel Ends: Front Steer Axle - Outer Bearing (Mack)	SET409	45280	45220	SET495	10S38750	383-0139			370033A	
Mack Classic P/N 62AX467 / 64AX286	SET413	HM212049			10S45000	308-0853				
12K Mack Steer, Navistar Front (FA309, FA329) Heavy Duty Truck Bearing Set - Manually Adjusted Wheel Ends: Front Steer Axle - Inner Bearing	SET420	H715345	H715311		10S45000	308-0853				10S45000
Manually Adjusted Wheel Ends: Rear Axle - Inner Bearing (Mack)	SET421	HM516449A	HM516410		11S42500	309-0904	383-0139			
Manually Adjusted Wheel Ends: Rear Axle - Inner Bearing (Mack)	SET422	HM516449C	HM516410		11S42500	309-0904	393-0104	393-0204	370031A	
16K Front Ford, Nav, Mack, Meritor, White, KW, Western Star, PB, Volvo, GM Heavy Duty Truck Bearing Set - Manually Adjusted Wheel Ends: Industry Standard	SET423	6461A			10P43750	308-0864				
16K Front Ford, Nav, Mack, Meritor, White, KW, Western Star, PB, Volvo GM FW-RWD ISU MD (2004-12), Heavy Duty Truck Bearing Set - Manually Adjusted Wheel Ends: Industry Standard	SET424	555-S	552A		10P43750					
Manually Adjusted Wheel Ends: Rear Axle - Outer Bearing (Mack)	SET426	47679	47620		11S42500	309-0904				
Mack 50K & 60K Drive Axle	SET508	687			11S52500	309-0948	393-0148		N/A	



Visit www.timken.com/techseriespro to enroll in free technical training.

Get more TechTips online at www.timken.com/techtips

ALWAYS replace wheel bearings as a SET, rather than replacing components individually. Problems can occur by replacing individual components – adversely affecting your maintenance costs.

You might save money or time at the beginning, but in the long run, you could find your truck back in the shop for premature repairs.



⚠ WARNING

Failure to observe the following warnings could create a risk of death or serious injury.

Never spin a bearing with compressed air. The components may be forcefully expelled. Proper maintenance and handling practices are critical. Always follow installation instructions and maintain proper lubrication.

A bearing/component should not be put into service if its shelf life has been exceeded.

CAUTION

Failure to follow these cautions may result in property damage

Use of improper bearing fits may cause damage to equipment.

Do not use damaged bearings.

TechTips is not intended to substitute for the specific recommendations of your equipment suppliers.

Every reasonable effort has been made to ensure the accuracy of the information contained in this writing, but no liability is accepted for errors, omissions or for any other reason.

TIMKEN

The Timken team applies their know-how to improve the reliability and performance of machinery in diverse markets worldwide. The company designs, makes and markets bearings, gear drives, automated lubrication systems, belts, brakes, clutches, chain, couplings, linear motion products and related industrial motion rebuild and repair services.

Stronger. By Design.

www.timken.com/aftermarket