

Rear wheel drive vehicles

TIP

When replacing front wheel bearings, replace the set (both), even if only one bearing has failed. Why? Because the condition that caused one bearing to fail is likely at work on the other bearing as well.

Most manufacturers recommend lubrication at 24,000 miles for the front wheel bearings on rear wheel drive vehicles.

However, many times the bearings are not lubricated until the brakes are replaced—which means that bearings can go almost twice as long as recommended before being relubricated.

Whenever brakes are replaced, it's a good practice to check the bearings and replace the seals.

Front wheel bearings and hubs

The most popular type of bearing used on the front wheels of rear wheel drive vehicles is the single row taper roller bearing. Tapered bearings have two separate components—a cone and a cup. The inner part or cone has an inner race, rollers, and cage. The outer part of the cup is a piece of hardened steel that gives the rollers a smooth surface to ride on. In wheel end applications, taper roller bearings are usually used in pairs. In some cases, rear wheel drive cars use a hub unit for the front wheel bearing. One of the advantages of the hub unit is that most are sealed and lubricated for life.



Rear wheel bearings and hubs

Although ball, taper, and cylindrical wheel bearings are common for rear wheel applications on older car models, increasingly, hub units are used.



Most rear wheel bearings for rear wheel drive cars are either sealed, lubricated for life, or lubricated by the lubricant in the differential. Therefore, they normally do not have specific service intervals. The need for servicing occurs when the axle seal begins leaking and causes the differential lubricant to soak the brake linings.

Front wheel drive vehicles

Front wheel bearings and hubs

The most popular type of front wheel bearing arrangement for front wheel drive vehicles is some form of unitized hub. The typical hub unit incorporates rings, rolling elements, and cage in an integrated assembly with one or two flanges for mounting. Typically these hubs are sealed for life. When the hub is damaged or shows signs of wear, the entire unit must be replaced.



Rear wheel bearings and hubs

In contrast to front wheel bearings, which are subject to the bearing loads caused by driving or turning requirements, the rear wheels on front wheel drive vehicles are only under radial loads. A variety of bearings, therefore, can be found on the rear wheels of today's front wheel drive vehicles.

There are three SKF hub unit designs in use today around the world. Hub Unit 1, the first generation unitized hub, is made up of a double row angular contact ball bearing.

Installation in the garage is made easier by SKF Hub Unit 2 which includes a flange on the outer ring for mounting on to the wheel. The unit simply slips onto the wheel spindle and is held in place by a nut.

Many of today's global automakers are using the SKF Hub Unit 3 in conjunction with anti-lock braking systems. This hub unit design uses an inner and outer flange. The inner flange bolts onto the knuckle or trailing axle and the tire bolts to the outer flange. A properly torqued axle nut is used to hold the entire assembly in place.

TIP

You will want to tell your customers that regularly scheduled bearing inspections and periodic lubrication are important to automotive safety and dependability. Improperly maintained bearings can affect overall vehicle performance and lead to costly repairs down the road.

General recommendations



The guidelines below can help your garage maximize the efficiency of your wheel bearing work—and avoid some of the typical problems. You might want to copy this page and post it in your garage as a reminder to your mechanics.

- Work with clean tools in clean surroundings.
- Always choose the correct grease.
- Always be sure to check the contact surface for the seal lip. It must be in good condition. Even the smallest mark or rust will damage the seal lip and allow water penetration and eventual corrosion.
- Never use a hammer to hit directly on the bearing. (See “tips” on page 10.)
- Do not try to set clearances on Hub units. They are set at the factory with the correct preload. However, tighten the nut to the correct preload as written in the workshop manual.
- Do not try to set clearances on “set right” arrangements. These bearings are manufactured so that the bearing will have the correct clearance when the locking nut is tightened to the torque specified in the car’s shop manual.
- Always check the condition of the housing and axle when changing wheel bearings. Even the smallest wear will create misalignment, which will result in early failure.
- Never take a Hub Unit apart before mounting. The raceways and seals will be damaged and the bearings destroyed. The unit will fail prematurely.
- Do not try to move or adjust the seal on a hub unit. The seal will be destroyed and water penetration will occur, leading to corrosion and premature failure.

Tips for avoiding bearing failure

Avoiding common mistakes.

On the following three pages, SKF has compiled examples of some of the most common situations where the bearing has not been handled correctly. You will see in these examples that it is easy to make mistakes if you are not following a given set of procedures or not using good work habits.

Handle with care.

Bearings, despite their rugged construction and solid feel, are actually very sensitive machinery components. They must always be handled with extreme care. Even the smallest mishandling during transport, storage or mounting can damage the internal geometry of the bearing which in turn will result in premature bearing failure and potential damage to other related components.

Dirt is deadly.

The first consideration when working with bearings is that the workplace must be as clean as possible. Even tiny particles of dirt or grit entering a bearing will damage the bearing internally and inevitably shorten its operating life. Bearing failure can result in expensive damage to the vehicle and an unhappy customer—not to mention lost business.

The right tools.

The second consideration is the type of tools that are used for removal and installation of the bearings. The right kinds of tools can be one of your best investments, enabling you to do the job better and faster.

Mounting procedures.

The third area of importance is to follow a correct mounting procedure. Always consult the car manufacturer's workshop manuals. In particular, mounting force applied incorrectly to parts of the bearing will produce indentations in the bearing raceways, which in turn will lead to early bearing failure. If the bearing or the seal are in any way damaged during mounting, early failure will occur. Your customer will hear noise from the bearing after only a short time on the road. This means an unhappy customer in the least case and perhaps even the need to do the job over again at your expense.



Tips for avoiding bearing failure



Fig. 1

Never apply the mounting force over the rolling elements.

Never expect the bearing to stand up to hard blows with a hammer.

The raceways will be damaged which will result in reduced operating life of the bearing.

Never use sharp tools such as screwdrivers. There is always the risk that the screwdriver or any other tool might slip and damage the seal which will cause a leak.

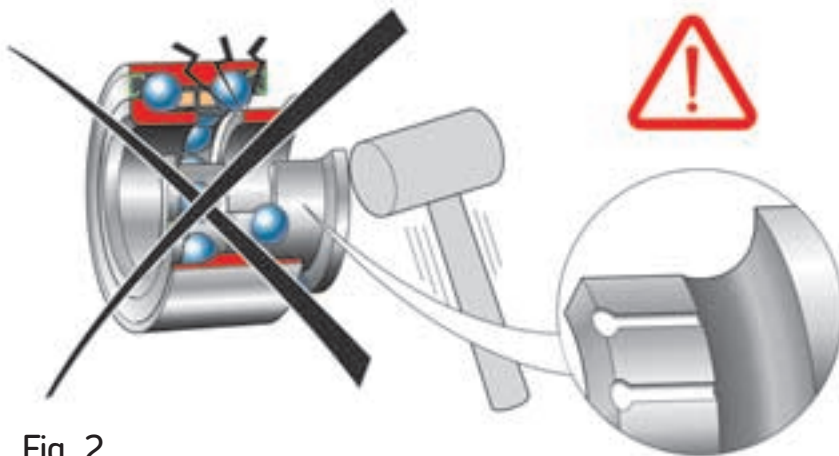


Fig. 2

Never dismount the inner ring from a Hub Unit. These are greased for life. If the inner ring is removed there is no way of replacing it without damaging the raceways and seals. A new bearing will be required.

Tips for avoiding bearing failure

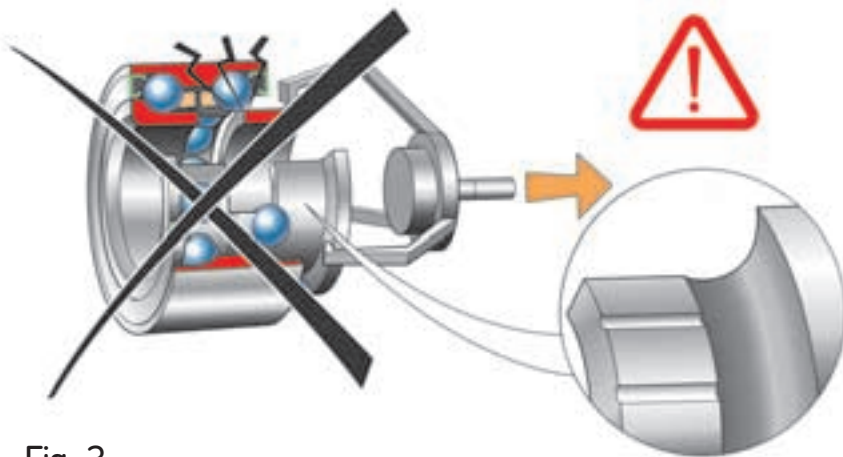


Fig. 3

If the Hub Unit is mounted on the axle, extra care must be taken to avoid forcing one of the inner rings out of position or even causing it to fall out. Once this has happened the bearing will have been damaged and cannot be reused. Both raceways and seals will have been damaged.

Do not try to put the inner ring back by using force while tightening the nut. The bearing has already been damaged. A new bearing is required.



Fig. 4

Do not forget to lubricate the tapers during mounting. If not, the rolling elements will come in contact with the raceways, creating friction, and the life of the bearings will be reduced. The raceway will show signs of serious damage after only a short running period. Use only grease recommended by manufacturer. Make sure that the grease used is not contaminated by dirt or grit. Even the smallest particle of contamination in the grease will shorten the life of the bearings.

Tips for avoiding bearing failure

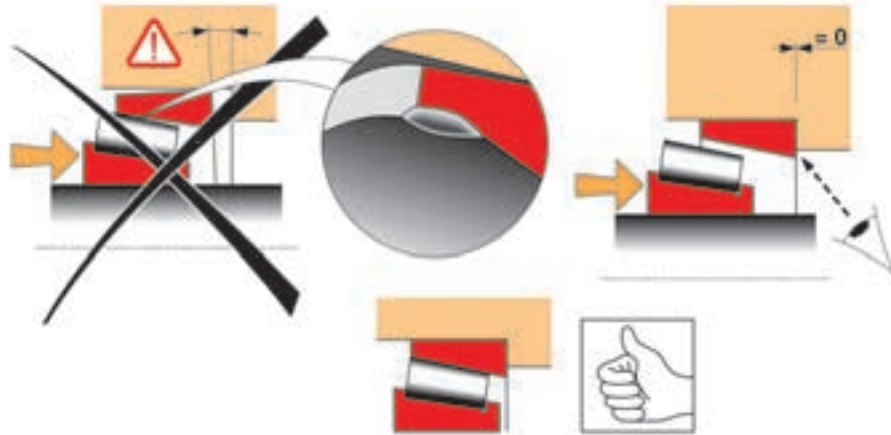


Fig. 5

Always check that the rings of the bearings are correctly positioned in the housing. Even the smallest extraneous particle, for instance from the dismantling procedure, can cause bearing misalignment. Then the bearing will have an incorrect load zone, which will result in early failure.

Damaged cages and rollers and also incorrect path patterns noticeable in the raceways indicate that the bearings have been misaligned. Note that even the smallest misalignment will lead to early failure. If the housing is not in good condition, it is a waste of time to change only the bearings.

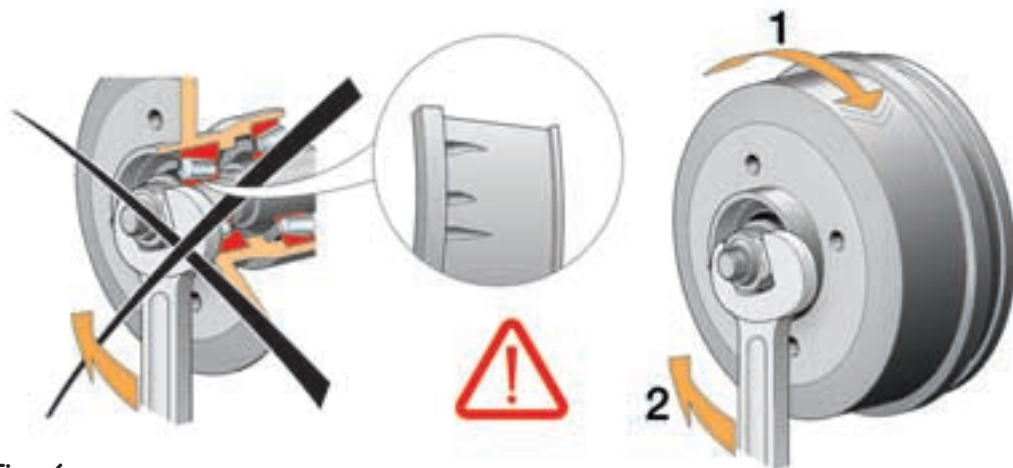


Fig. 6

Do not forget to rotate the bearings while tightening the hub and setting the clearance. If you do not, the rollers will make indentations in the raceways, which will emit noise and result in shorter operating life of the set. The mounting torque for tightening the hub varies from one car to another. Always consult the workshop manual.