

16. Bearing Handling

Bearings are precision parts and, in order to preserve their accuracy and reliability, care must be exercised in their handling. In particular, bearing cleanliness must be maintained, sharp impacts avoided, and rust prevented.

16.1 Bearing storage

Most rolling bearings are coated with a rust preventative before being packed and shipped, and if the package remains intact, bearings can be stored for many years. Observe the following precautions:

Bearings should be stored at room temperature with a relatively humidity of less than 60%.

1. If bearings come packed in a wooden box, take them out of the wooden box immediately, and store them on a shelf, at least 20 cm off the ground. (Shown in Fig. 16.1)
2. Do not stack bearings because the protective anti-rust compound may be squeezed out of bottom bearings.

16.2 Installation

When bearings are being installed on shafts or in housings, the bearing rings should never be struck directly with a hammer or a drift, because damage to the bearing may result. Any force applied to the bearing should always be evenly distributed over the entire bearing ring face. Also, when fitting both rings simultaneously, applying pressure to one ring only should be avoided because indentations in the raceway surface may be caused by the rolling elements, or other internal damage may result.

Bearings should be fitted in a clean, dry work area. Especially for small and miniature bearings, a "clean room" should be provided as any dust in the bearing will greatly affect bearing efficiency.

Shaft and housing surfaces should be inspected for the dimensions specified in the drawing. The corners and right angle of the shaft and bearing housing fit the side of the bearing also should be checked. Some other details for bearing installation are stated as follows:

(1) Shaft and housing bore surfaces

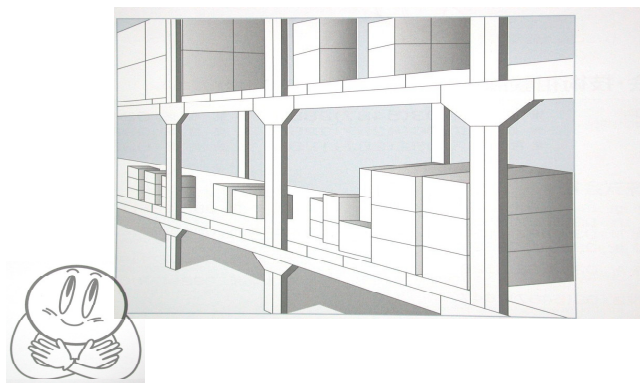


Fig 9.1 Storage of bearings

Before installation, shaft, housings and related parts should be cleaned and any burrs or cutting chips removed if necessary. Several steps for installation preparation as shown in Fig. 16.2.

(2) Mounting tools

It is important that the correct method of mounting is selected and the suitable tools are used. All mounting tools should be cleaned and any burrs or cutting chips removed if necessary.

(3) Bearings

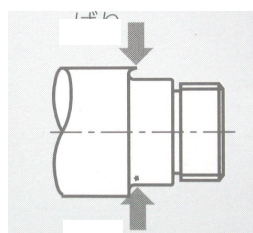
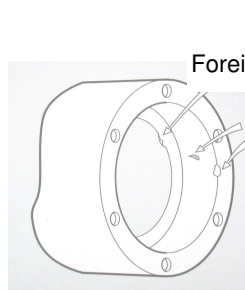
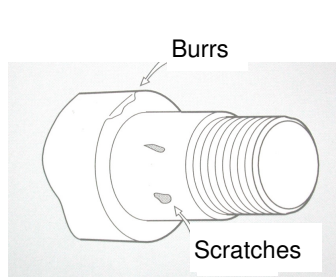
Open the bearing packaging just prior to use. As high precision components, rolling bearings are made and monitored under clean manufacturing environment before packaging. Most bearings may be mounted without washing or removing the rust preventative, unless special care procedures are stated.

(4) Bearings with small interference fits

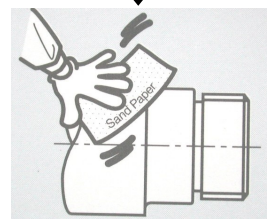
Bearings with relatively small interference fits can be press fit at room temperature by using a sleeve against the inner ring face. Some proper installation and tools for bearings are shown in Fig. 16.3. Usually, bearings are installed by striking the sleeve with a hammer; however, when installing a large number of bearings, a mechanical or hydraulic press should be used. When installing non-separable bearings on a shaft and in a housing simultaneously, a pad which distributes the fitting pressure evenly over the inner and outer rings is used.

In addition to the proper installation, indentations in the raceways and balls due to dirt intrusion and improper impact load should also be avoided as shown in Fig. 16.4.

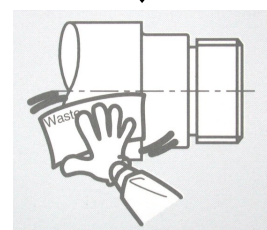
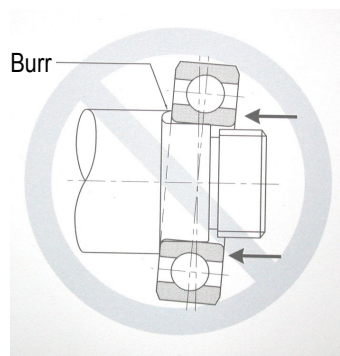
Fig. 16.2 Installation preparations



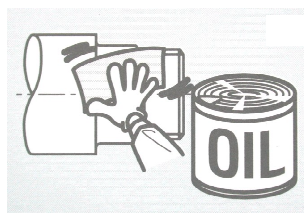
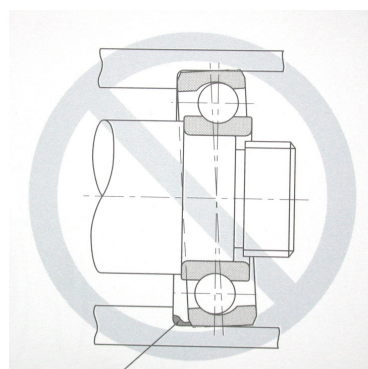
Make sure the fitting surfaces of the shaft and the bearing housing are free from scratches, burrs, dirt, and that no molding sand remains in the housing.



Remove scratches and burrs using fine sandpaper



Remove dirt and sand using clean cloth

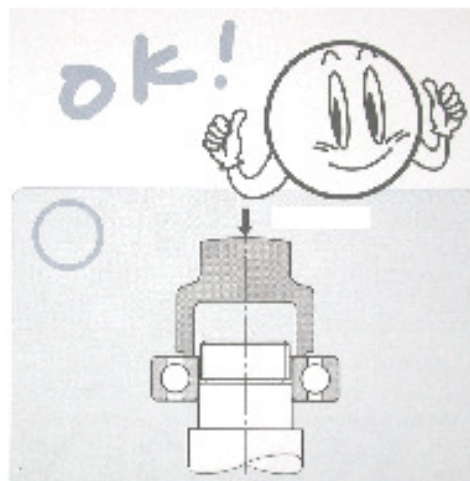


Coat the area with mineral oil

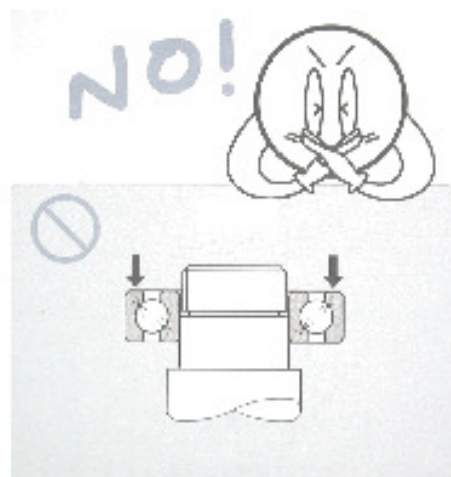
Foreign material

Fig. 16.3 Some proper installation and tools

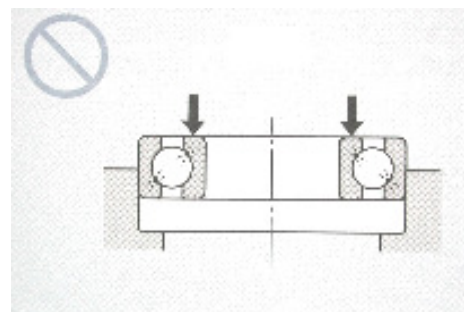
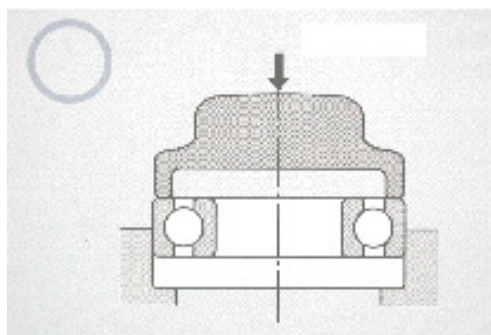
Correct



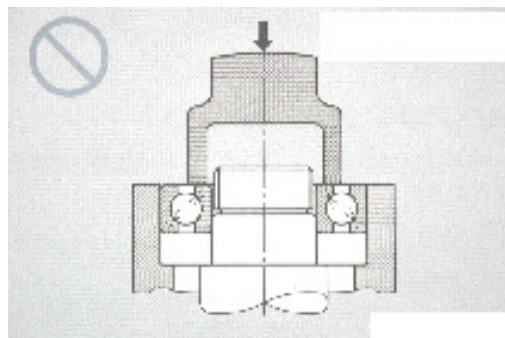
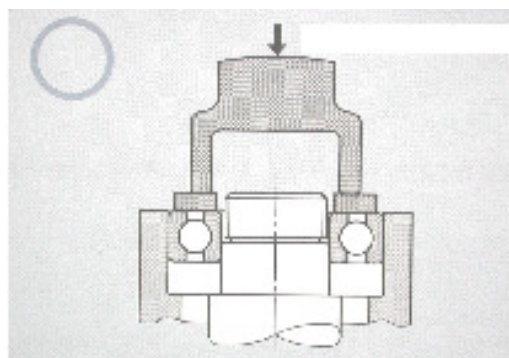
Wrong



Press the inner ring to mount the bearing on the shaft



Press the outer ring to mount it in the housing

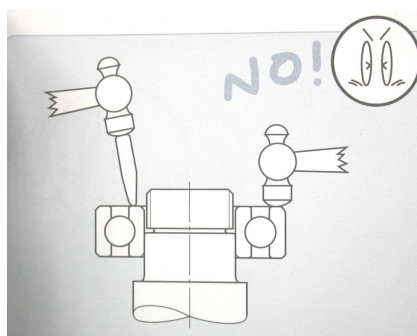
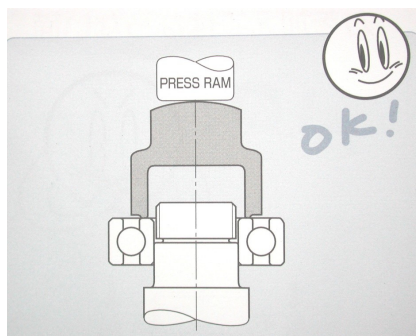


Apply even force to the bearing at a right angle

Fig. 16.4 Proper installation and tools, indentation due to improper impact load and dirt

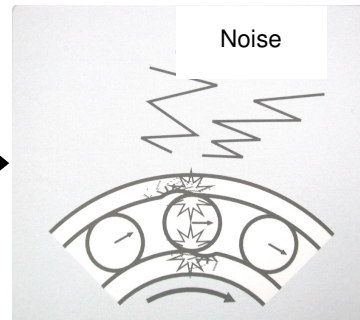
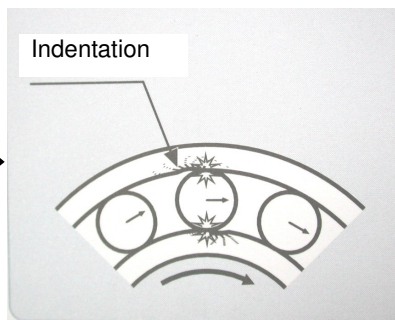
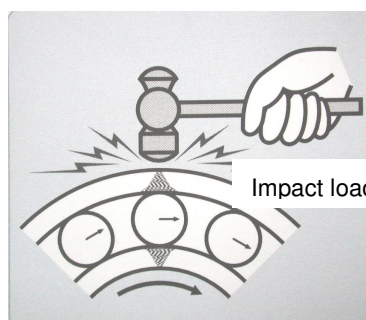
※Select proper installation and tools

The bearing rings should never be struck directly with a hammer or a drift, because damage to the bearing may result.



※Bearings are subject to damage due to impact load

Excessive and impact load may indent the contact surfaces. Therefore, Care needs to be taken from bumping or dropping bearings.



※Dirt is harmful for bearings

Intrusion of dirt or other contaminants is a major cause of early bearing failure.

