

**PROPER HANDLING
PRACTICE
OF BEARINGS**

PROPER PRACTICE FOR THE CLEANING, MOUNTING, AND REMOVAL OF BEARINGS

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Many bearing failures are attributable to improper handling and, therefore, can be prevented by using proper handling procedures.

1. Bearing Advantages / Drawbacks

Advantages:

1. Exceptional power conservation
2. Outstanding lubricating efficiency
3. Clean
4. Low cost operation
5. Ensure high machine accuracy
6. Standardized (Common worldwide)
7. Preloadable
8. Can be lubricated with grease

Drawbacks:

1. Rust easily
2. Sensitive to dirt
3. Require careful handling

2. Bearing Mounting Precautions

The key point in handling a bearing is to keep the bearing clean.

Penetration of dirt or other contaminants is a major cause of early failure. Observe the following precautions:

1. Mount bearing using clean tools in clean work places.
2. Use tools made of wood or light metal to install the bearing. Avoid a tool which will result in chipping of surfaces.
3. Open the bearing packaging just prior to use.
4. Clean hands before handling the bearing.

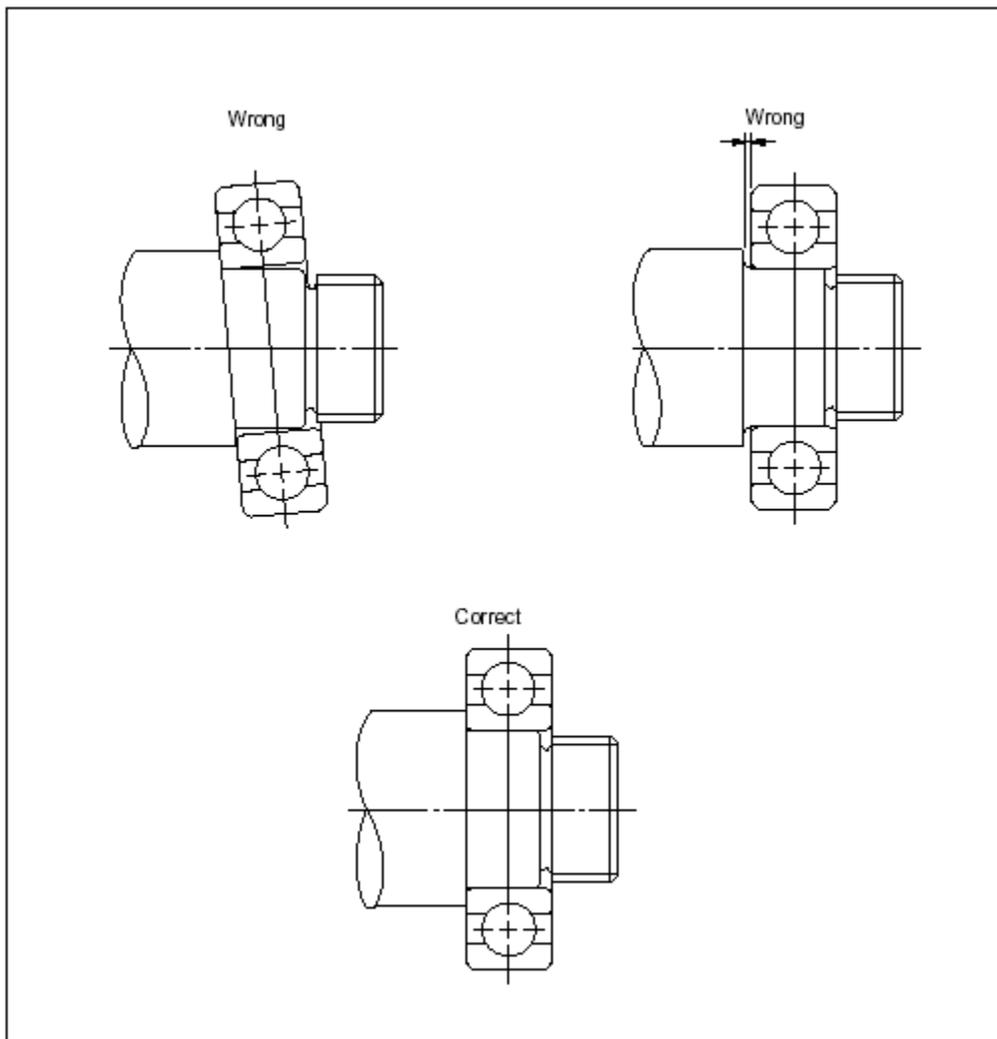
5. Most bearings may be mounted without removing the preventive grease from the bearing.

6. Do not bump or drop bearings. If the geometric precision is damaged, unsatisfactory operation will result.

3. Inspection Before Mounting

Inspect the shaft and the bearing housing to make sure that they have been finished to the dimensions specific in the drawing.

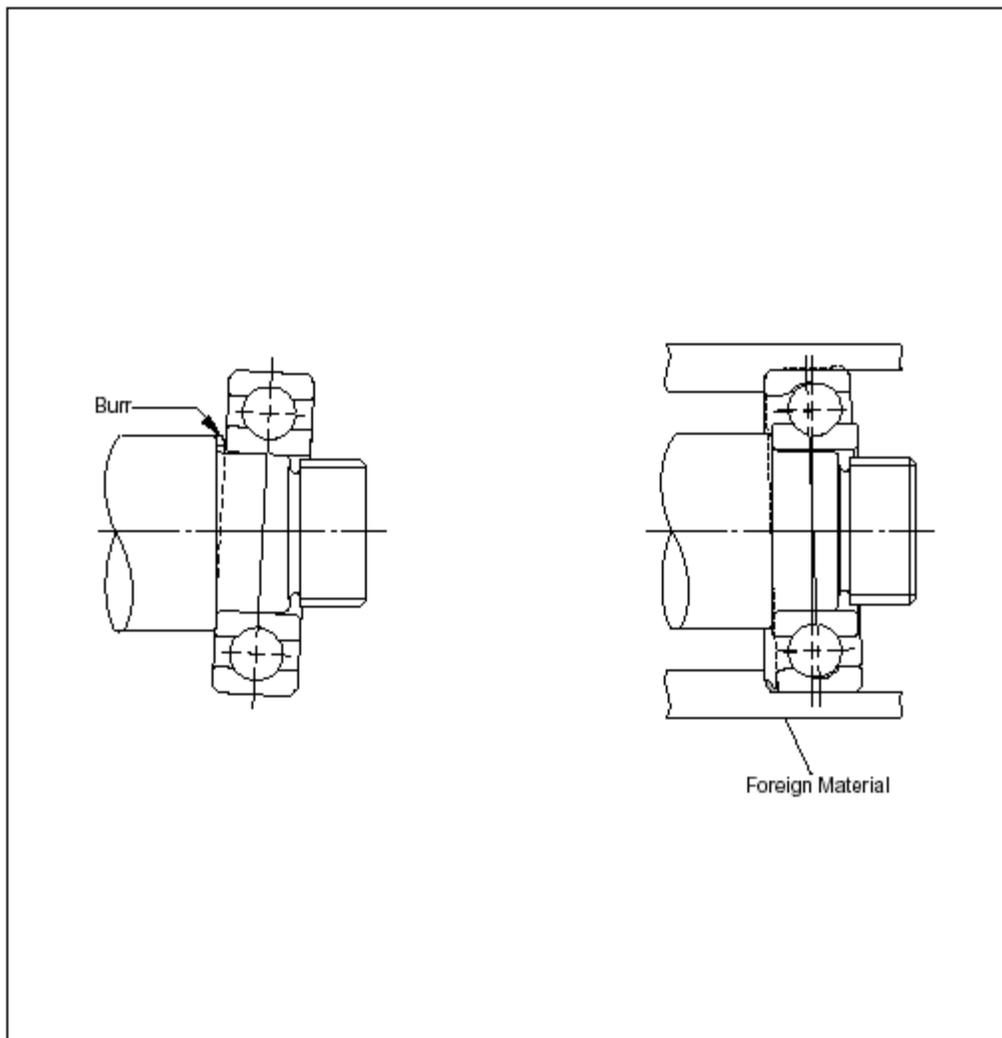
Check also that the corners and the right angle of the shaft and bearing housing fit the side of the bearing.



4. Preparations for Mounting

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

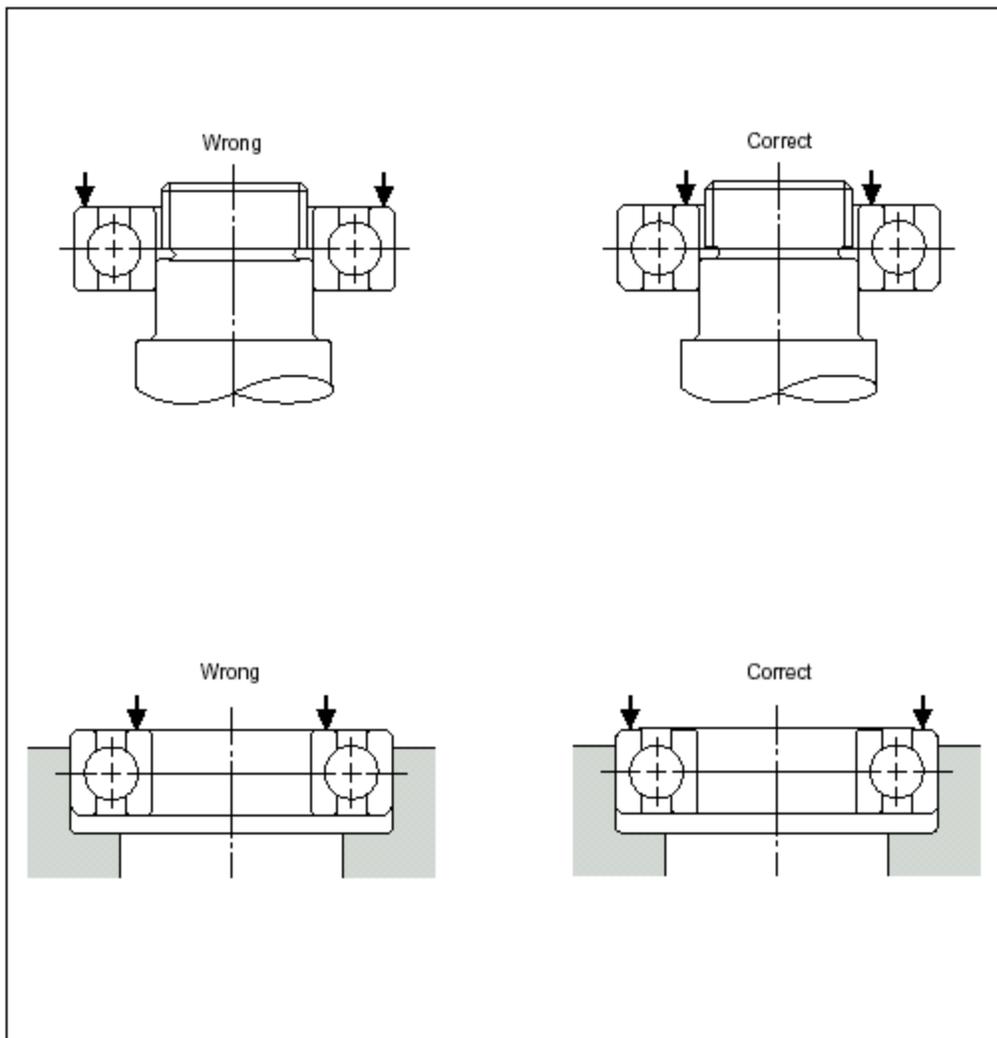
small they are, using oilstone or fine sandpaper. Coat the area where the shaft and bearing housing meet with mineral oil to facilitate mounting of the bearing and prevent the area of contact from being scratched.



5. Bearing Mounting - Pressing Surfaces

Press the inner ring to mount the bearing on the shaft. Likewise, press the outer ring to mount it in the housing. DO NOT press the outer ring to mount the bearing on the shaft,

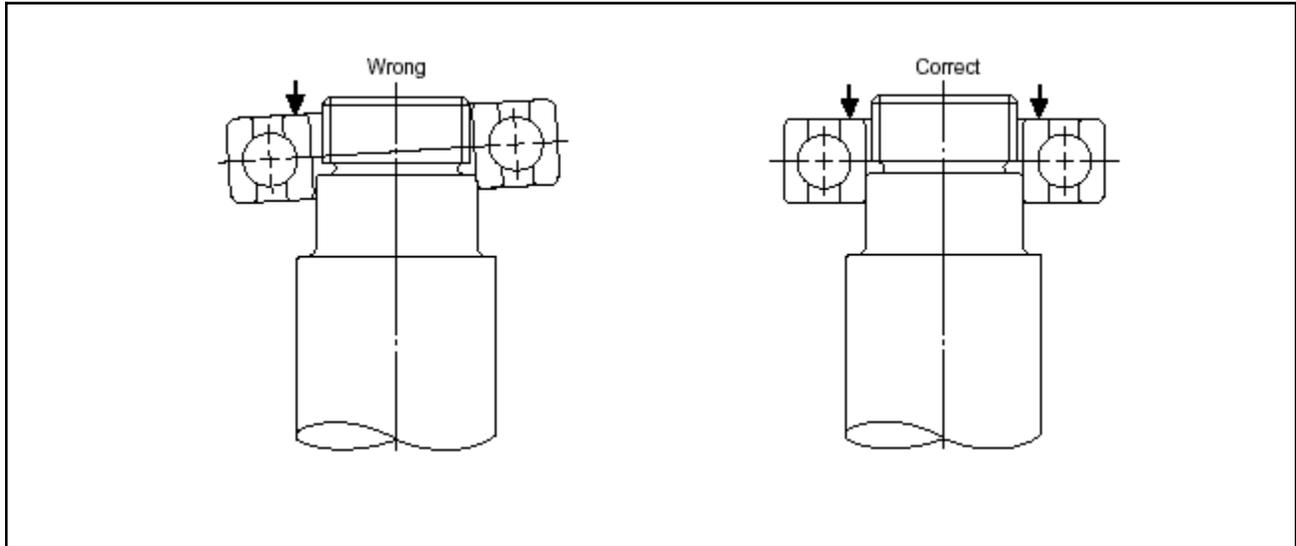
nor the inner ring to mount in the housing; the raceway may be scratched and noise or early failure will result.



6. Bearing Mounting - Press Method

Apply even force to the bearing at a right angle. Avoid driving on only one side as this

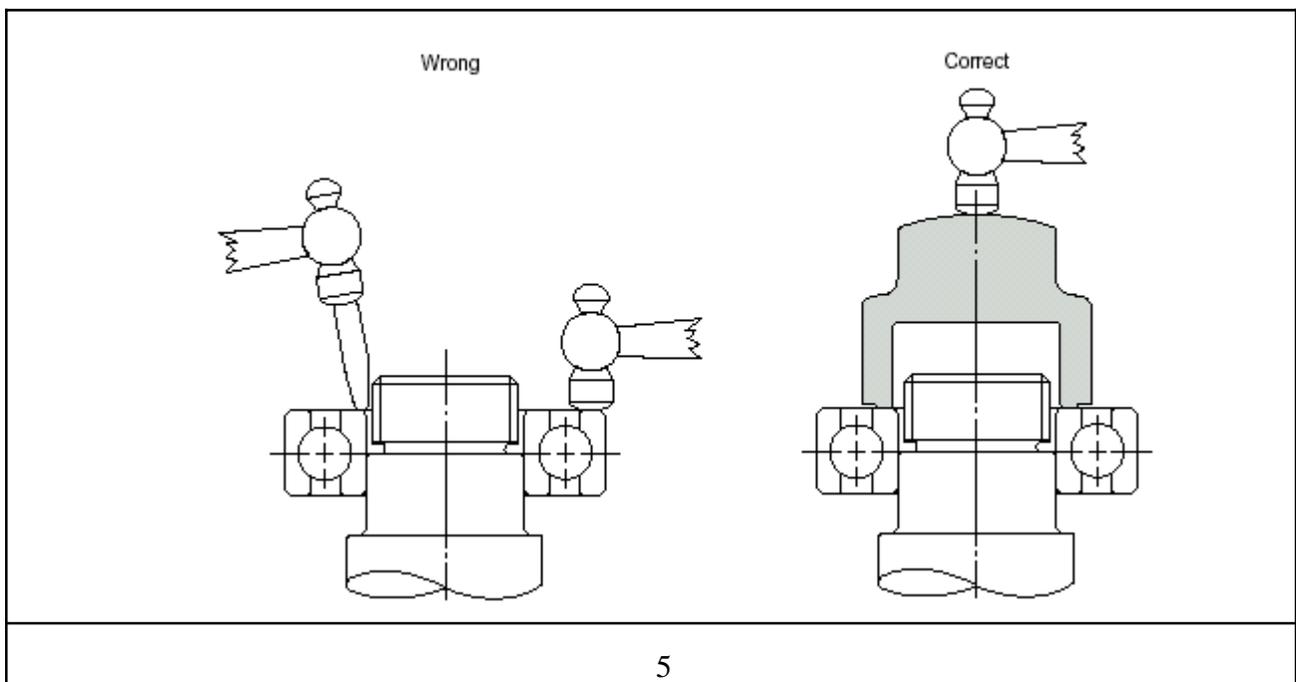
can damage the bearing. NEVER apply force to the bearing retainer or seal.



7. Mounting With Hammer and Mounting Device

The bearing is frequently mounted with a hammer and mounting device. Do not strike the bearing directly; this can damage the

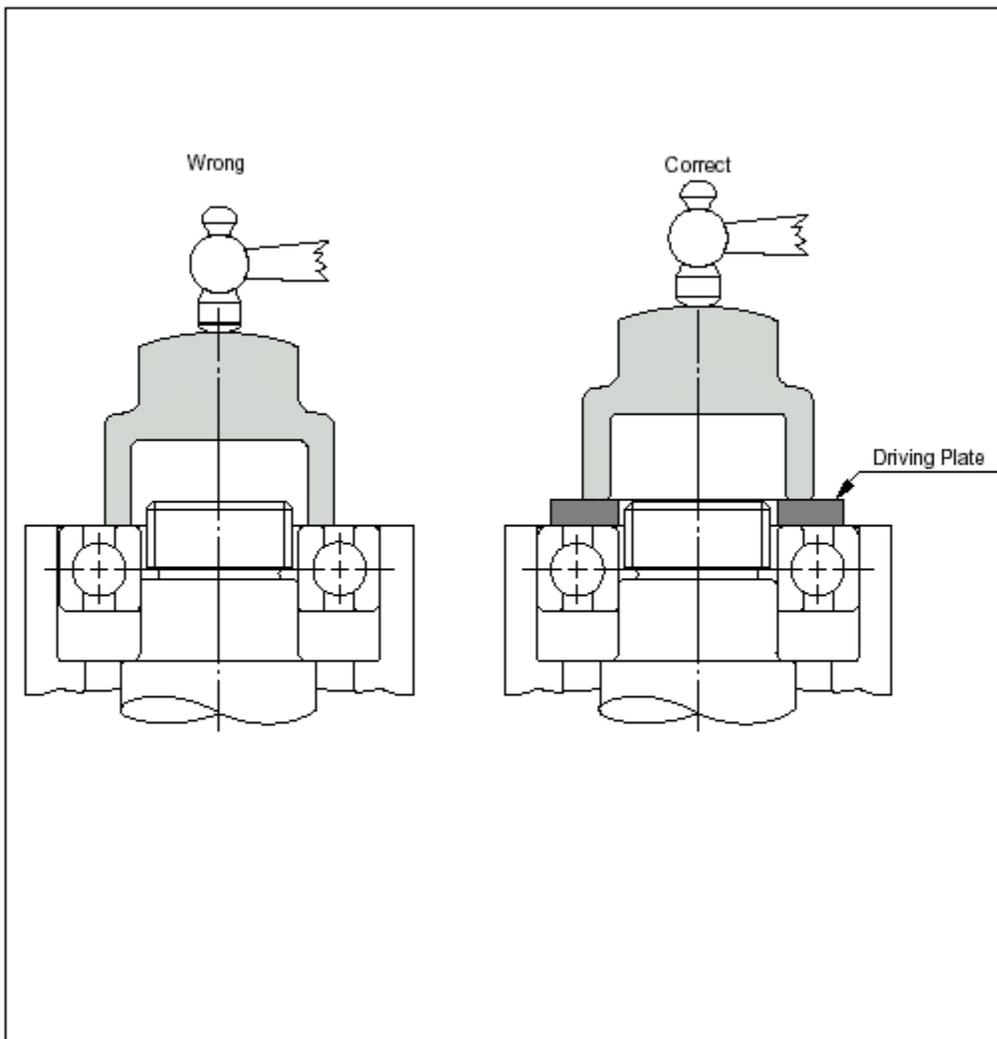
bearing. Hit the mounting device with a hammer, as illustrated below. Tap the mounting device lightly, using many strokes.



8. Mounting Inner and Outer Rings Together

If both the inner and outer rings must be mounted in an interference fit because of machine construction, then use a driving plate as illustrated below.

The driving force must be applied uniformly to the inner and the outer rings. If force is applied only to the inner ring, then damage to the bearing can result.



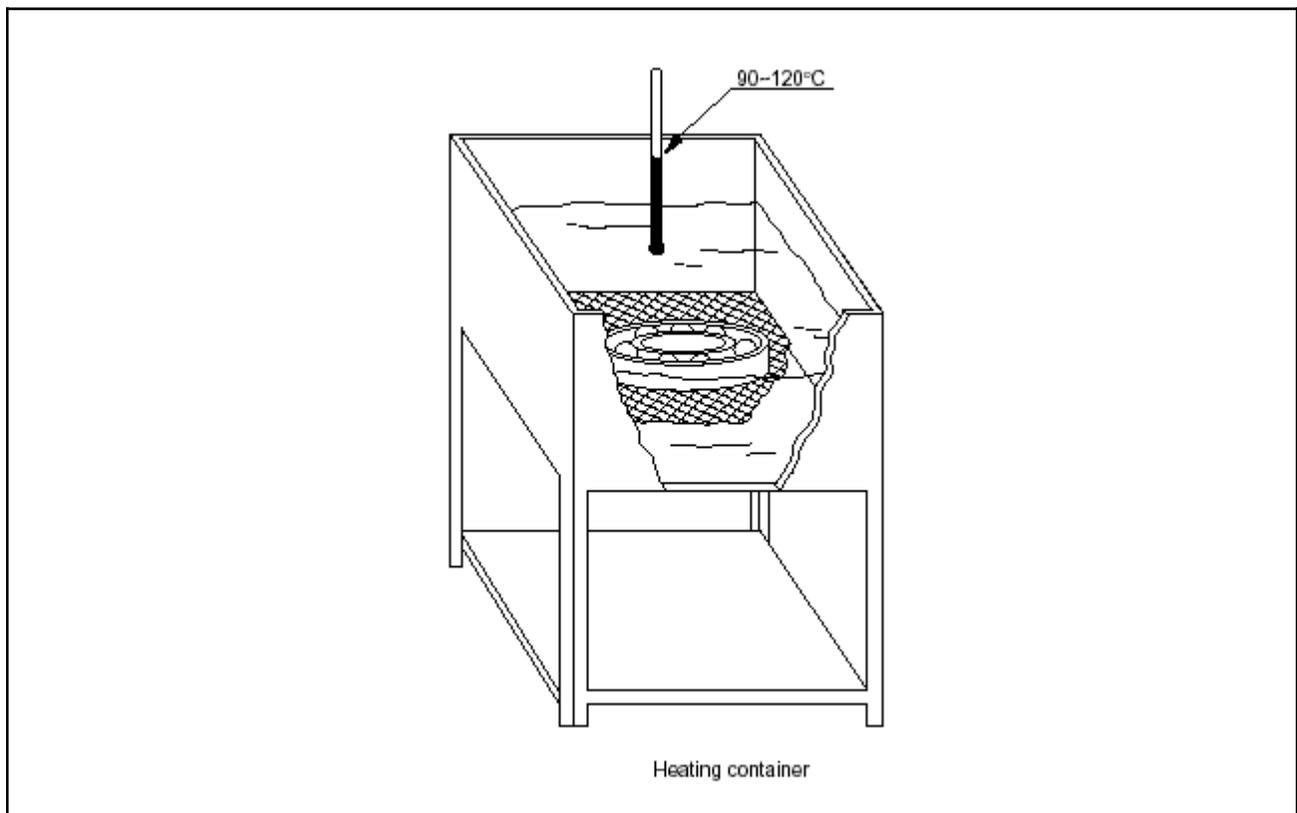
9. Temperature Mounting

A popular method of mounting bearings to obtain a high interference fit is to heat the bearing in clean mineral oil to between 90°C and 120°C. This will expand the bore diameter and facilitate mounting on the shaft. DO NOT HEAT THE BEARING ABOVE 120°C BECAUSE THIS MAY REDUCE THE HARDNESS OF THE BEARING.

Suspend the bearing in the oil with a wire, or

support it on a screen; DO NOT place the bearing on the bottom of the container. When the temperature of the bearing reaches the desired level (120°C or less), mount it rapidly. The bearing will contract when cooled and a gap may occur between the shoulder of the shaft and the side of the bearing.

If this should occur, press the bearing against the shoulder using a mounting device.



10. Bearing Removal - Precautions

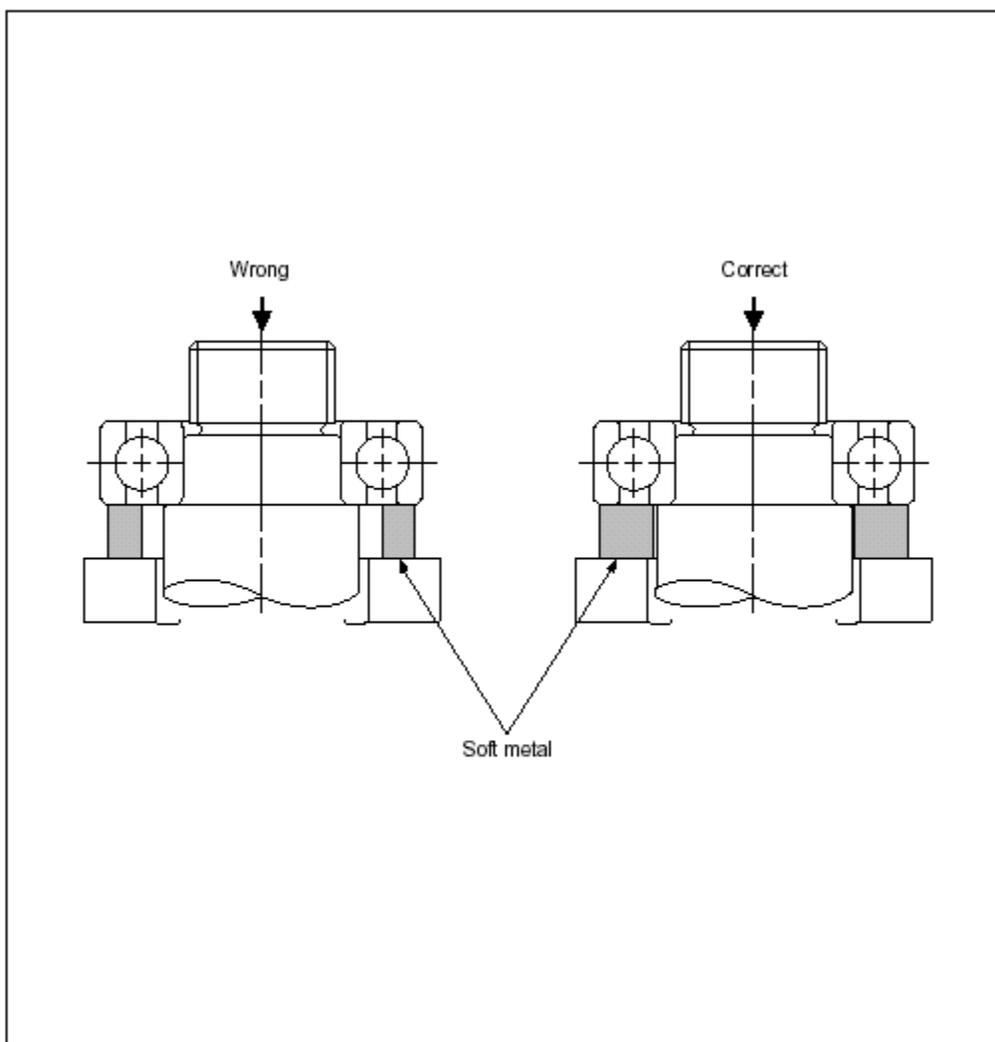
1. Apply the force for removal to the inner ring when removing the bearing from the shaft, and to the outer ring when removing it from the housing.

2. Apply even force around the side of the bearing ring at a right angle

11. Removal with Hand Press

The most appropriate tool for removing a bearing is a hand press. when using the press, be sure that the arbor center and the bearing center are aligned; and that the inner ring is supported by a bearing support plate.

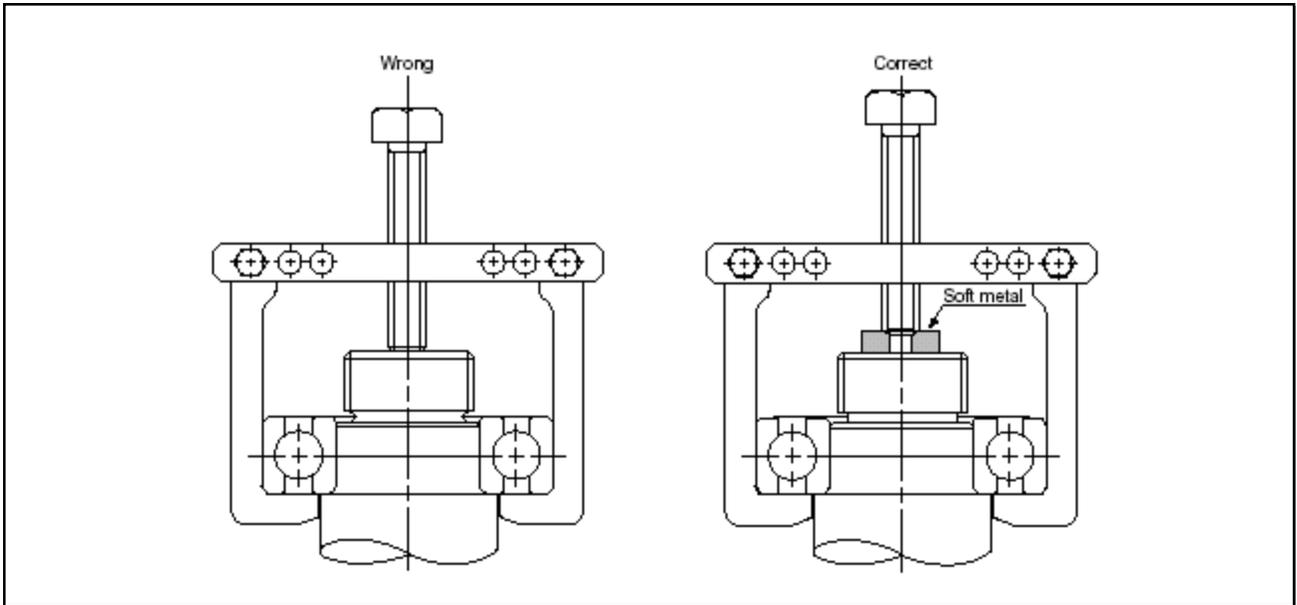
If the plate supports the outer ring only, a driving force passes from the outer ring to the inner ring through the balls, causing brinell dents on the outer ring, which will lead to premature failure.



12. Removal using Bearing Puller and Soft Metal Device

When removing the bearing with a bearing puller, use a piece of soft metal to protect

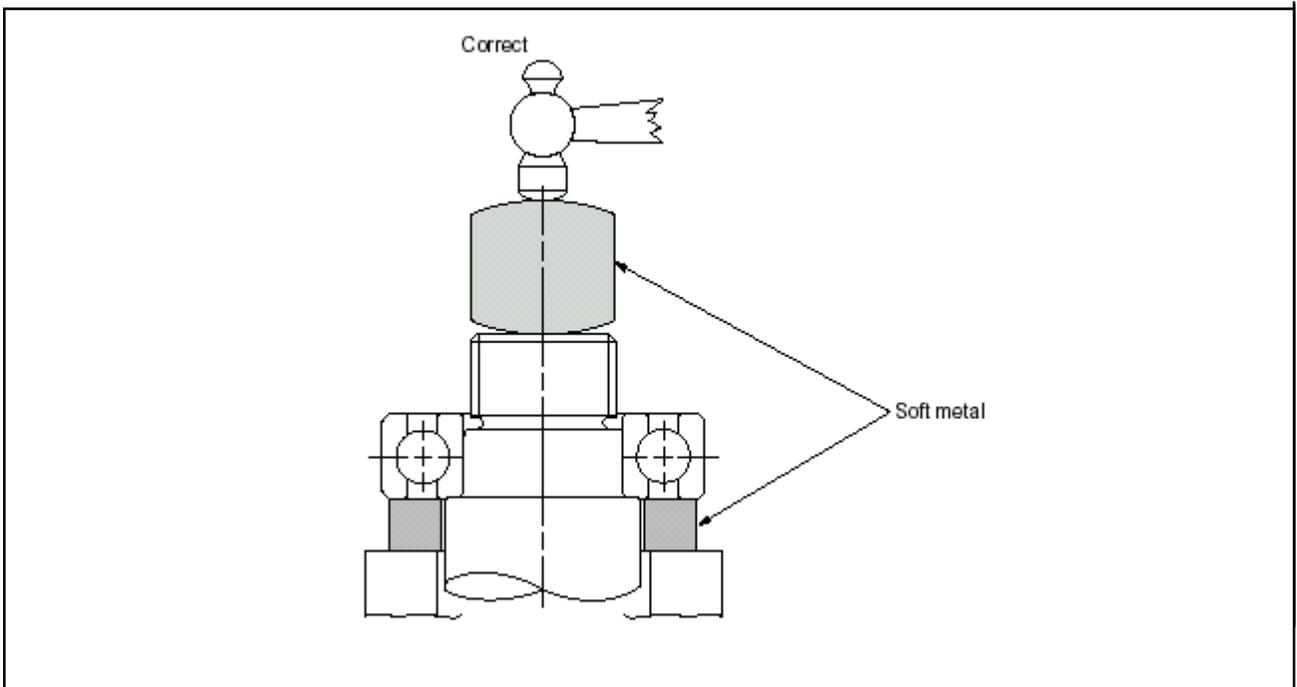
the shaft from being scratched.



13. Removal with Hammer and Soft Metal Protector

When removing the bearing with a hammer, use a soft metal protector, as illustrated

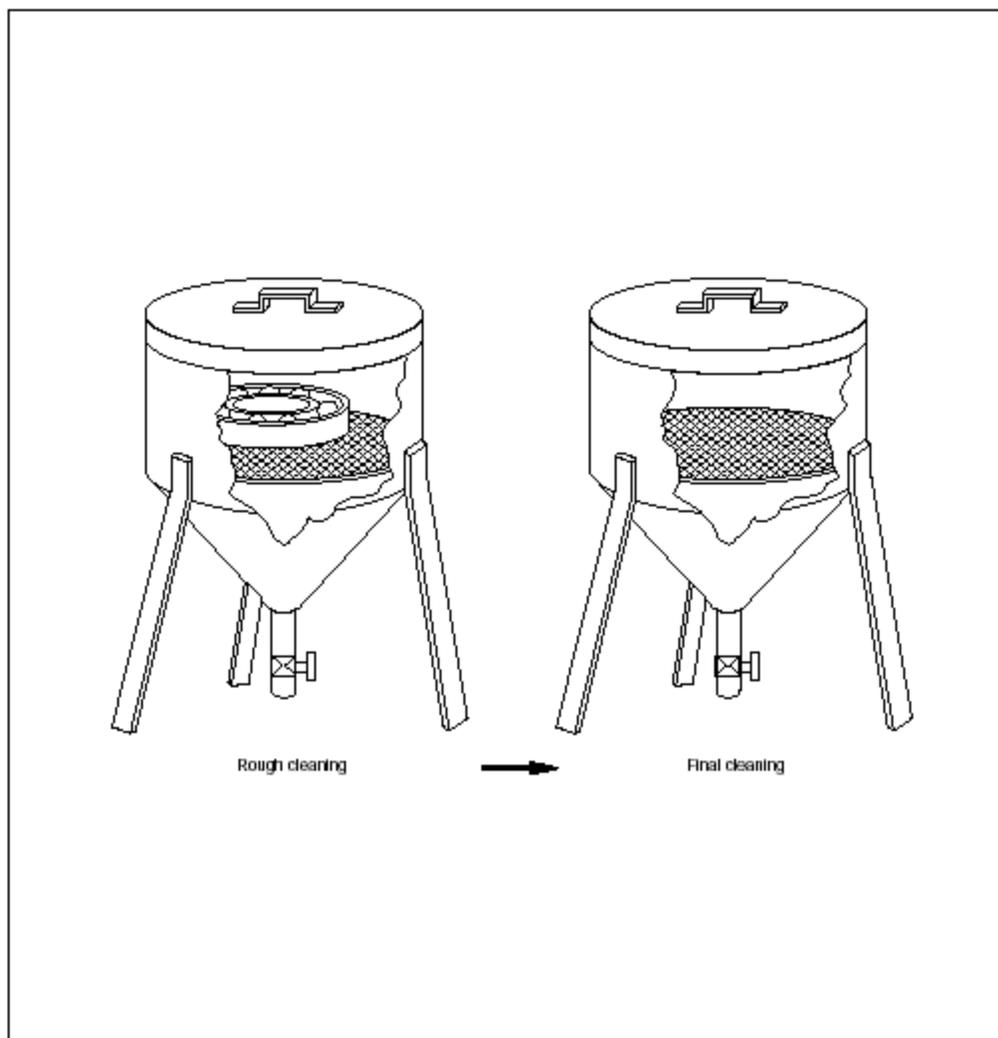
below, to protect the shaft from being damaged.



14. Bearing Cleaning-Containers and Oil

Use separate containers for rough cleaning and final cleaning, and provide a screen to support a bearing in both steps. Containers like those illustrated below are desirable.

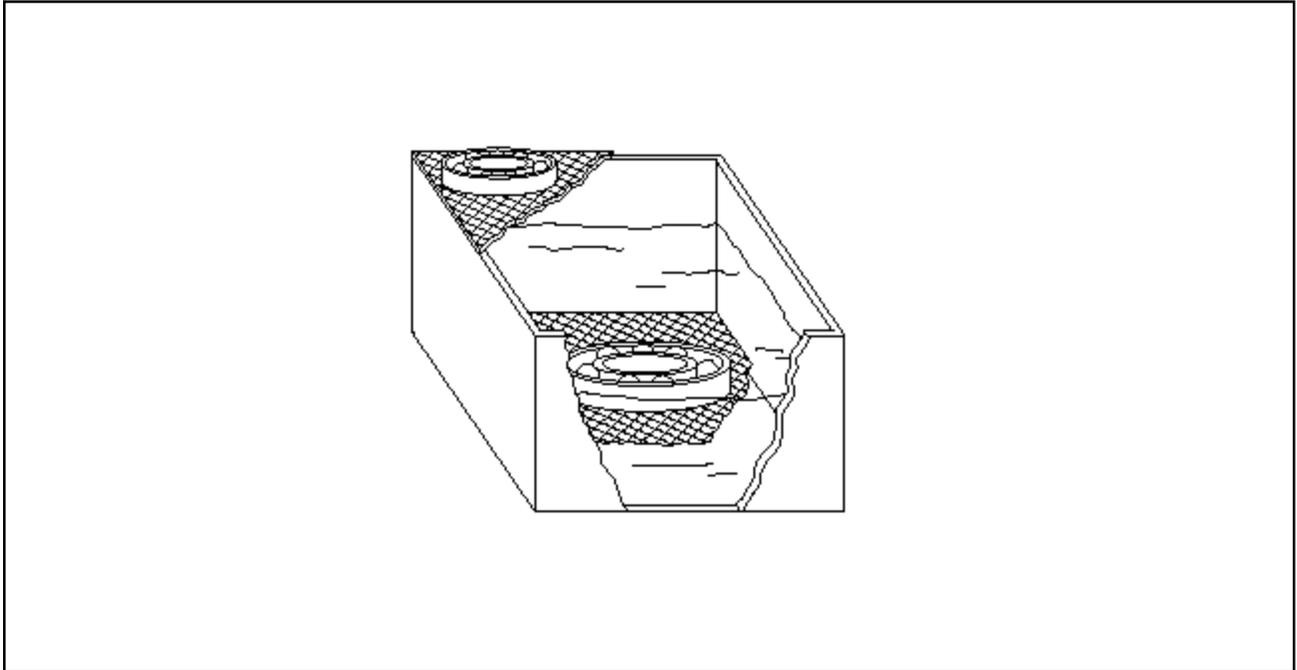
Clean paraffin is appropriate for cleaning bearings. If bearings are very dirty, gasoline may be used. Care should be taken, however, to prevent gasoline from igniting and to prevent rusting after cleaning.



15. Rough Cleaning

Do not revolve the inner or outer rings of a dirty bearing after immersing it in oil because the inside surfaces are easily scratched.

Leave it in the oil until dirt or grease separate from the bearing. If the oil is heated it cleans the bearing effectively. However, never heat the oil above 120°C.



16. Final Cleaning

After washing off the dirty grease in the rough cleaning process, place the bearing in the final cleaning container. While the bearing is submerged in clean oil, rotate the inner or outer ring so that the inside of the bearing will also be cleansed.

After cleaning, carefully wipe the bearing with a clean cloth, apply a coat of rust preventive oil to the bearing, and wrap it in rust preventive paper if the bearing will not be used immediately.

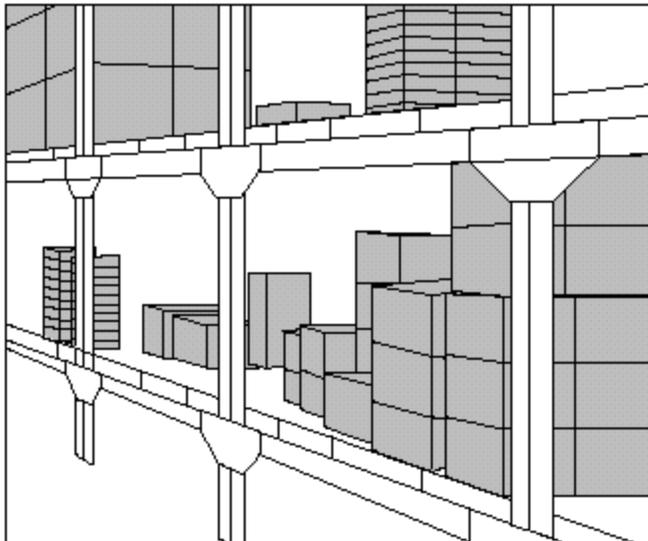
17. Inspection After Cleaning

To check the bearing after cleaning, hold the inner ring horizontally with one hand and spin

the outer ring. If the bearing is faulty, a vibration will be felt in the hand.

18. Storage of Bearings

- ◆ Avoid storing bearings in places with high humidity.
- ◆ Store bearings in a cool place.
- ◆ If bearings come packed in a wooden box, take them out of the wooden box immediately, and store them on a shelf.
- ◆ Do not take bearings out of the cardboard boxes or protective wrappings.
- ◆ Do not stack bearings because the protective anti-rust compound may be squeezed out of bottom bearings.



KEEP BEARINGS CLEAN ————— DIRT MEANS DAMAGE

THINGS TO REMEMBER

DON'TS

1. Don't work in dirty surroundings.
2. Don't use wooden mallets or work on rough or dirty bench tops.
3. Don't use dirty, brittle or chipped tools.
4. Don't handle bearings with dirty, moist hands.
5. Don't spin uncleaned bearings.
6. Don't spin any bearings with compressed air.
7. Don't use same container for clearing and final rinsing of bearings.
8. Don't use cotton waste or dirty clothes to wipe bearings.
9. Don't expose bearings to moisture or dirt at any time.
10. Don't scratch or nick bearing surfaces.
11. Don't remove grease or oil from new bearings.
12. Don't use incorrect kind or amount of lubricant.

DO'S

1. Work with clean tools, in clean surroundings.
2. Remove all outside dirt from housing before exposing bearings.
3. Handle with clean, dry hands.
4. Treat a used bearing as carefully as a new one.
5. Use clean solvents and flushing oils.
6. Lay bearings out on clean paper.
7. Protect disassembled bearings from dirt and moisture.
8. Use clean, lint-free rags if bearings are wiped.
9. Keep bearings wrapped in oil-proof paper when not in use.
10. Clean inside of housing before replacing bearings.
11. Install new bearings as removed from packages, without washing.
12. Keep bearing lubricants clean when applying and cover containers when not in use.

