

Hydraulic tools

Mounting and dismounting bearings and similar components using hydraulic techniques

SKF pioneered the use of hydraulic techniques for mounting bearings and associated items many years ago. Nowadays, the SKF hydraulic techniques are often the preferred mounting and dismounting method for larger bearings as well as other components. These techniques have helped to simplify bearing arrangements and facilitate correct and easy mounting. Using SKF hydraulic techniques for bearing or component dismounting reduces the risk of damaging the item or its seating. Additionally, greater withdrawal forces can be applied with less effort and maximum control, allowing quick and safe dismounting.

With the SKF hydraulic mounting and dismounting techniques, you can achieve:

- More control, allowing precision, accuracy and repeatability to be maintained
- Lower risk of damaging bearings, components and shafts
- Less manual effort
- Greater operator safety



Easy way to mount and dismount bearings and components

SKF Oil Injection Method

The SKF Oil Injection Method allows bearings and other components with an interference fit to be fitted in a safe, controllable and rapid manner. The method does not require keyways to be machined on the shaft, saving valuable time and money in materials and production. Interference fits have long been recognised for their reliability in transmitting large torsional loads. Very often, interference fits offer the only solution when connecting hubs to shafts with intermittent or fluctuating loads.

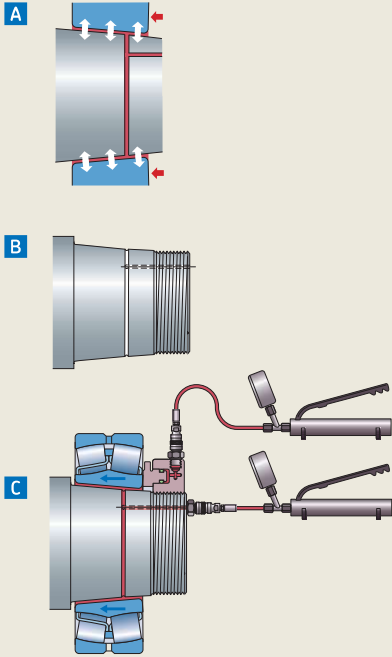
Easy, quick and effortless bearing dismounting

When using the SKF Oil Injection Method, the mating surfaces are separated by a thin film of oil injected under high pressure, thereby virtually eliminating the friction between them. The method is versatile as it can be used for dismounting bearings and other components mounted on either cylindrical or tapered seatings. When dismounting items mounted on cylindrical seatings, the injected oil can reduce the required pulling forces by up to 90%.

When using the SKF Oil Injection Method to dismount bearings and components mounted on tapered seatings, the interference fit is completely overcome by the injected oil. The item is then ejected from the seating with great force, making the use of a puller unnecessary. In this case, a stop-nut must be used to control the ejection of the item. For bearing mounting and dismounting applications, the required oil pressure is typically less than 100 MPa (14 500psi) and SKF hydraulic pumps can usually be used. However for applications such as couplings, gear and railway wheels, pressures of 300 MPa (43 500 psi) are more typical and SKF oil injectors are preferred.

Mounting

Tapered shafts



A The concept

Injecting oil between two tapered surfaces creates a thin oil film, which reduces the friction between them, thereby significantly reducing the mounting force required. The thin oil film also minimises the risk of metallic contact when mounting, reducing the risk of component damage.

B The preparation

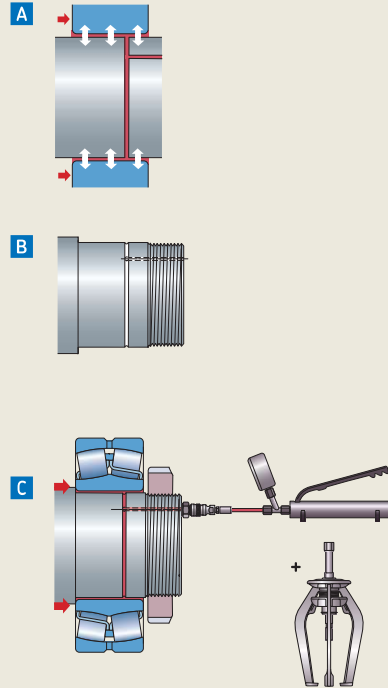
During manufacture, the shafts are prepared with oil ducts and grooves. For technical information on how to prepare the shafts, consult an SKF application engineer.

C The action

Bearings are mounted by pushing them up the shaft with the aid of an SKF HMV .. E nut. The force to mount the bearing is reduced if oil is injected between the shaft and the bearing. This is often done with larger size bearings.

Dismounting

Cylindrical shafts



A The concept

By injecting oil of a certain viscosity between two shrink fitted surfaces, the mating surfaces will become separated by a thin oil film. The dismounting force required is thus greatly reduced. The thin oil film also minimises the risk of metallic contact when dismounting, reducing the risk of component damage.

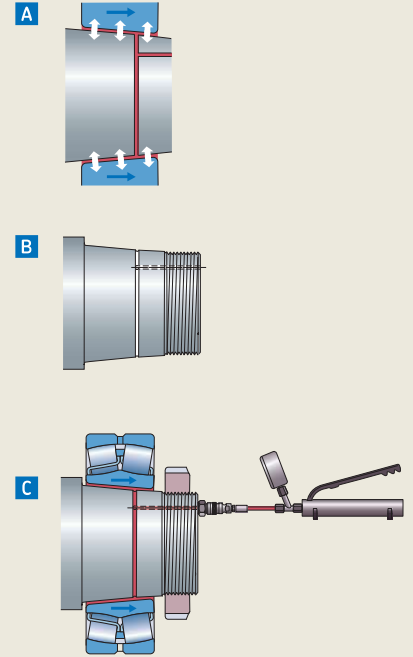
B The preparation

During manufacture, the shafts are prepared with oil ducts and grooves. For technical information on how to prepare the shafts, consult an SKF application engineer.

C The action

Dismounting the bearing is made easier by pumping oil under pressure between the mating surfaces. Once the oil pressure has built up, the component can be removed from the shaft with a minimum of effort.

Tapered shafts



A The concept

Injecting the oil between two tapered surfaces will create a reaction force which could be quite substantial as the oil will also act as a "hydraulic cylinder" which can push the outer component off.

B The preparation

During manufacture, the shafts are prepared with oil ducts and grooves. For technical information on how to prepare the shafts, consult an SKF application engineer.

C The action

Bearings are dismounted by injecting oil between the mating surfaces and when sufficient pressure is reached, the bearing will be pushed off. A nut is required to keep the bearing from sliding off the shaft.

Hydraulic tools



Accurate mounting of SKF spherical roller and CARB toroidal roller bearings on tapered shafts and sleeves

SKF Drive-up Method

The SKF Drive-up Method is a well-proven method, unique to SKF, of accurately achieving the adjustment of SKF spherical roller and CARB toroidal roller bearings mounted on tapered seatings. The method incorporates the use of an SKF HMV ..E hydraulic nut fitted with a dial indicator, and a high accuracy digital pressure gauge, mounted on the selected pump.

The correct fit is achieved by controlling the axial drive-up of the bearing from a pre-determined starting position, defined by the pressure in the SKF HMV..E hydraulic nut. The second stage is monitored by driving the bearing up a calculated distance on the taper seating.

The starting position pressure and the drive-up distance for many SKF bearings can be determined by using the SKF Drive-up Method PC program, available at skf.com or by downloading the iOS or Android app for smartphones and tablets. In addition, SKF's unique information service for mounting and dismount bearings, skf.com/mount, also features the SKF Drive-up Method.

- More accurate and easier than using feeler gauges
- Greatly reduces the time to mount spherical roller and CARB toroidal roller bearings
- The only suitable way to mount SKF sealed spherical roller and CARB bearings

The SKF Drive-up Method



Products for the SKF Drive-up Method

Designation	Description
HMV ..E (e.g. HMV 54E)	Metric thread hydraulic nut
HMVC ..E (e.g. HMVC 54E)	Inch thread hydraulic nut
729124 DU (for nuts ≤ HMV 54E)	Pump with digital gauge (MPa/psi)
TMJL 100DU (for nuts ≤ HMV 92E)	Pump with digital gauge (MPa/psi)
TMJL 50DU (all sizes HMV ..E nuts)	Pump with digital gauge (MPa/psi)
THGD 100	Digital gauge only (MPa/psi)
TMCD 10R	Horizontal dial indicator (0–10 mm)
TMCD 5P	Vertical dial indicator (0–5 mm)
TMCD 1/2R	Horizontal dial indicator (0–0.5 in.)

Technical data – Hydraulic pumps

Designation	729124 DU	TMJL 100DU	TMJL 50DU
Max. pressure	100 MPa (14 500 psi)	100 MPa (14 500 psi)	50 MPa (7 250 psi)
Volume/stroke	0,5 cm ³ (0.03 in. ³)	1,0 cm ³ (0.06 in. ³)	3,5 cm ³ (0.21 in. ³)
Oil container capacity	250 cm ³ (15 in. ³)	800 cm ³ (48 in. ³)	2 700 cm ³ (165 in. ³)
Digital pressure gauge unit	MPa/psi	MPa/psi	MPa/psi

Note: All above pumps are supplied complete with digital pressure gauge, high pressure hose and quick connect coupling.