

Strut bearings

Product Information



INA strut bearings form part of the single-wheel suspension and so belong to the chassis applications.

As a rule, they are installed in the wheel suspension (McPherson strut) between the shock absorber spring and the body.

Strut bearings permit low-friction rotational movements in the shock absorber. They therefore have a positive effect on the steering behavior of the vehicle.

In addition, strut bearings must compensate for uneven road surfaces and muffle the transfer of road surface noises to the body.

In order to fulfil these requirements, all relevant components, such as e.g. shock absorbers, dust protection caps and strut mounts, must be replaced as a system during any changes, because they are subjected to harsh environmental conditions caused by dirt, water, chipping, etc.

Due to INA's competence and experience in the design and production of strut bearings, the company has for a long time been a major partner in terms of initial equipping and also in the spare parts market. With extensive tests in accordance with strictly defined test standards and on specially developed test stands, INA guarantees with its identical parts that all customer requirements in terms of specifications are observed as precisely as possible.

Thanks to strut bearings from INA, we can make crucial contributions in the field of chassis components to overall driving comfort, active and passive safety and the general reliability of cars in road traffic.

Strut bearings

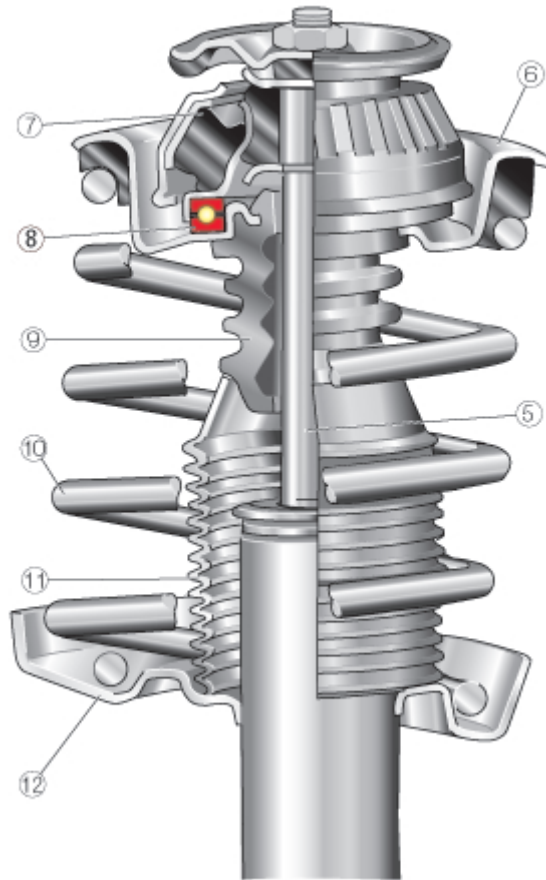
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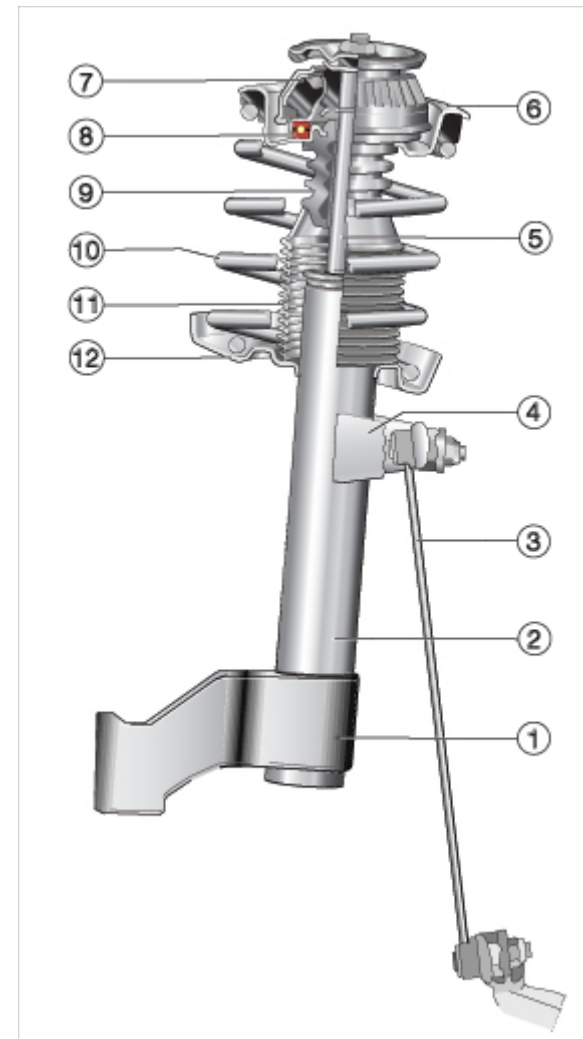
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Strut bearings

System diagram of a McPherson strut



- ① Wheel carrier bar
- ② Shock absorber
- ③ Stabilizer linkage
- ④ Holder
- ⑤ Piston rod
- ⑥ Upper spring seat
- ⑦ Rubber mount – Top Mount
- ⑧ Strut bearing
- ⑨ End stop – Bump Stop
- ⑩ Spring
- ⑪ Protective collar
- ⑫ Lower spring seat



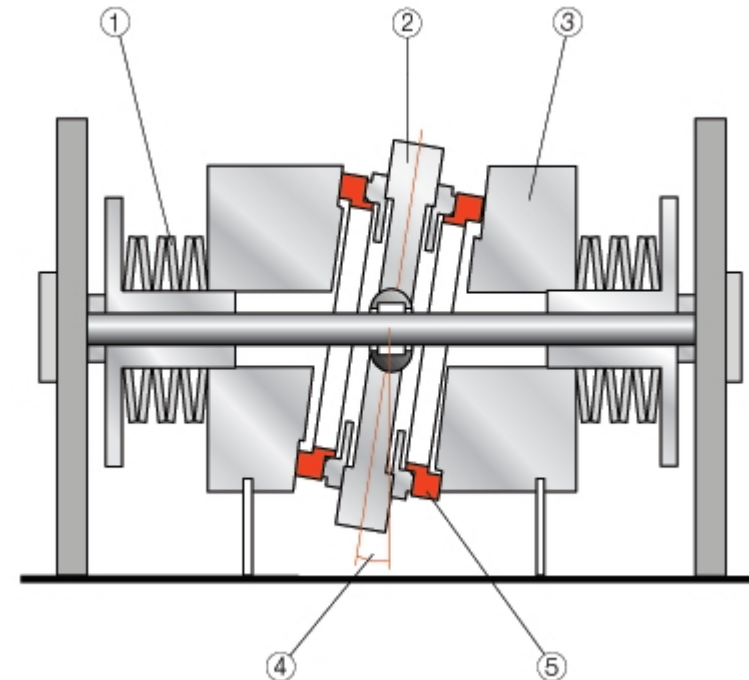
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Simulation, measuring and service life test stands

The strut bearings are subjected to various tests on the service life test stand shown:

- Frictional torque measurements, which provide valuable information about the later steering behavior of a vehicle.
- Tests of the static load carrying capacity, which provide important information about the load carrying capacity of the strut bearing.
- Service life tests, which give indications of the service performance of a strut bearing when used in a vehicle.
- Leakage tests, which provide information about the protection against penetration by water and dirt.



- ① Disk spring
- ② Central part-turn actuator
- ③ Outer housing bore
- ④ Diagonal position
- ⑤ Strut bearing

Strut bearings



Possible causes of failure

Complaint

Noises in the body

Cause

Impermissible reduction in clearance due to distortion of the axial washers in the strut bearing.

Reason: fastening screws have been tightened with excessive tightening torque.

The grease service life of the strut bearing has been reached; the grease is losing viscosity and is failing.

Particles of dirt in the strut bearing, such as sand, dust or similar, is causing a "rattling" sound during steering.

Shock absorber defective.

Steering sluggish

The strut bearing may possibly be blocked by soiling or by grease that has been flushed out of the bearing.

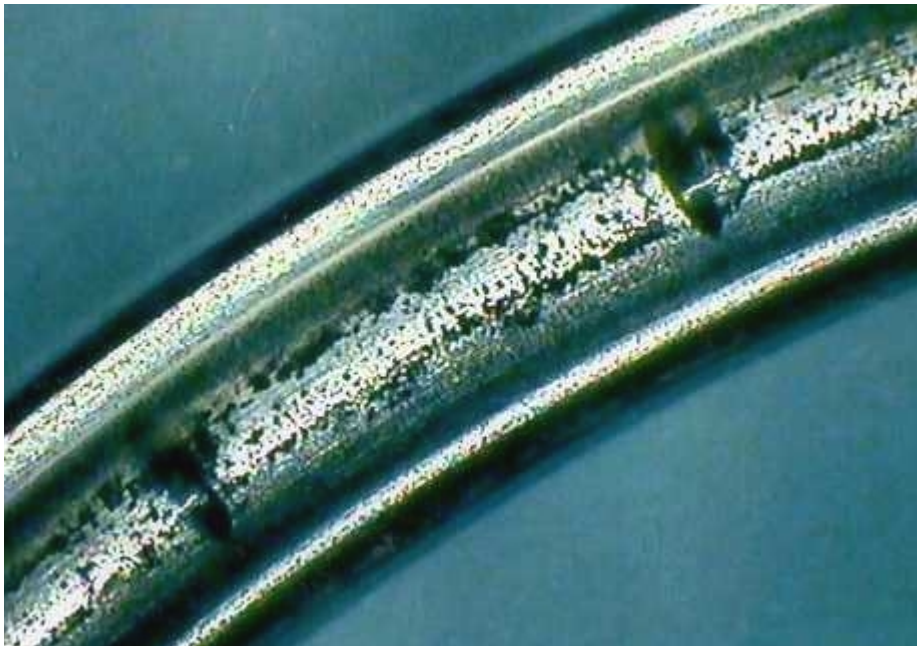
Pitting in the raceways of the axial washers caused by poor road conditions. This may cause the bearing to block.

Excessive frictional torque in the strut bearing due to incorrect installation (incorrect installation position) of the bearing.

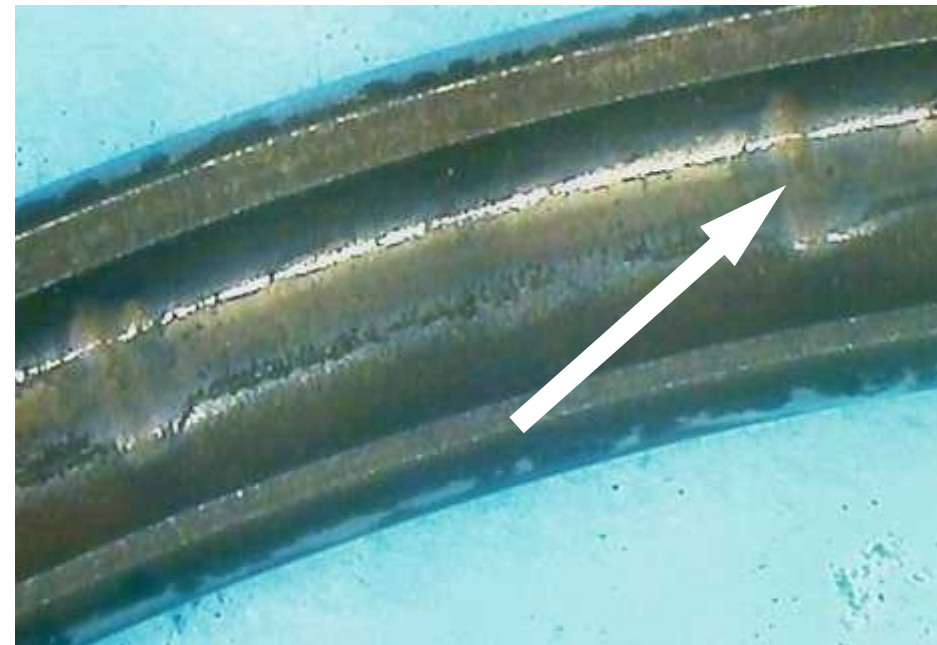
Strut bearings



Possible causes of failure



Particles of dirt and water residue in the ball raceway



Ball pitting in the raceway

Strut bearings



Possible causes of failure



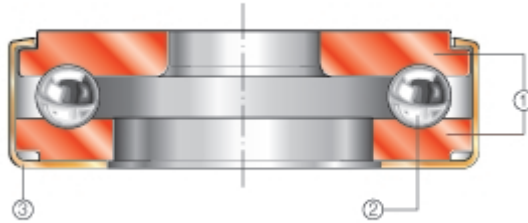
Seal with sand residue



Water has penetrated into the bearing and has caused corrosion

Strut bearings

Products from INA - basic model



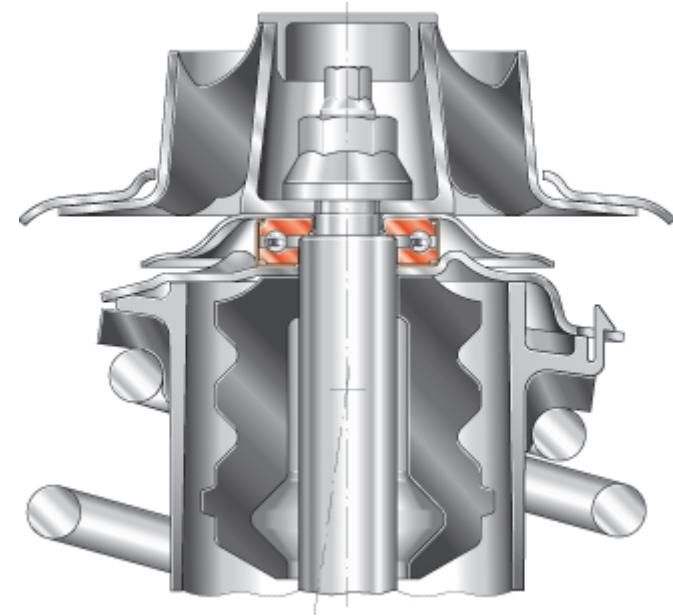
The basic model of a strut bearing from INA consists of

- ① two bearing washers,
- ② a ball complement
- ③ and a sleeve.

When installing the bearing, please note that the larger bore diameter must always be fitted in the direction of the spring seat.

When pressing this bearing into a top mount, make sure that the bearing is inserted in a perfectly axial position. If the bearing is tilted during installation, it will be damaged and this will lead to a failure.

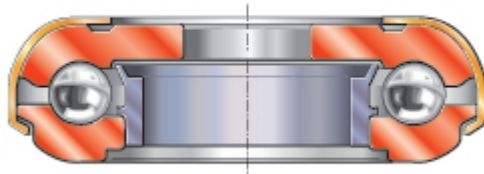
The prescribed tightening torque of the piston rod nut must be observed without fail.



Fitted strut bearing, basic model

Strut bearings

Products from INA model



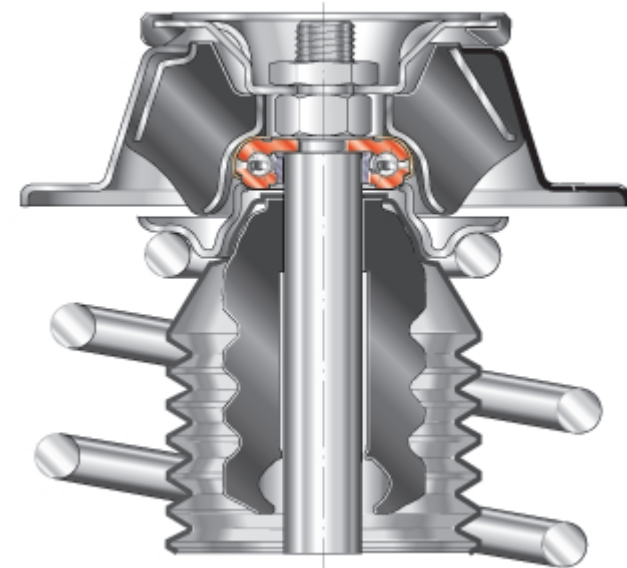
If the INA strut bearing is designed as a thrust angular-contact ball bearing, the bearing can withstand greater lateral forces.

The plastic inner ring protects the bearing additionally from penetrating dirt.

The spherical outer contour of the bearing washers allows for tilting or adjusting the bearing to the neighboring components.

Such an adjustment makes the load distribution in the bearing and the top mount more favorable.

Observe the tightening torque of the piston rod nut!

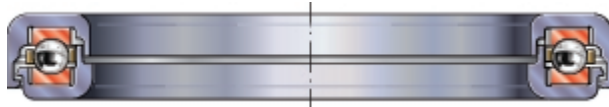


Fitted thrust angular-contact ball bearing

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Products from INA - encapsulated strut bearing



The encapsulated strut bearing helps the conversion from full complement bearings to cage-guided, larger bearings.

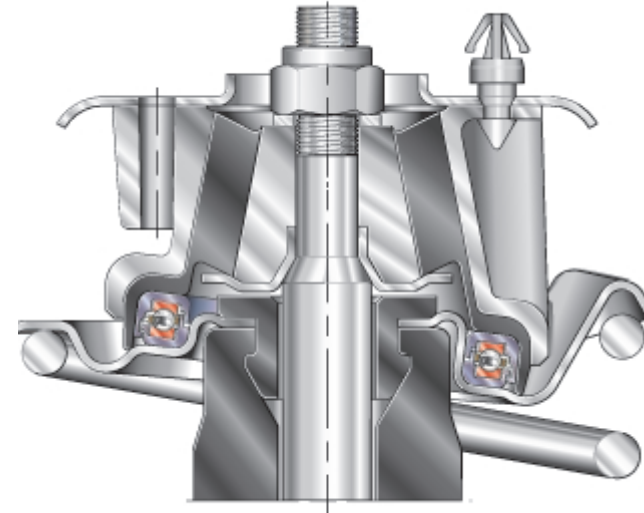
Such bearings are encapsulated with plastic housing parts and so are better protected against penetrating dirt.

Depending on the rigidity of the lower housing, it may be possible to rest the spring directly on the bearing. The support plate can be omitted.

If the installation position is not unequivocal, the upper and lower housing parts of the bearing are differentiated with different plastic colors.

You can find relevant notes on the installation in the workshop manuals of the car manufacturer.

Observe the tightening torque of the piston rod nut!



Spring supported by spring seat - strut bearing encapsulated

Strut bearings



Products from INA - strut bearing with spring support 1



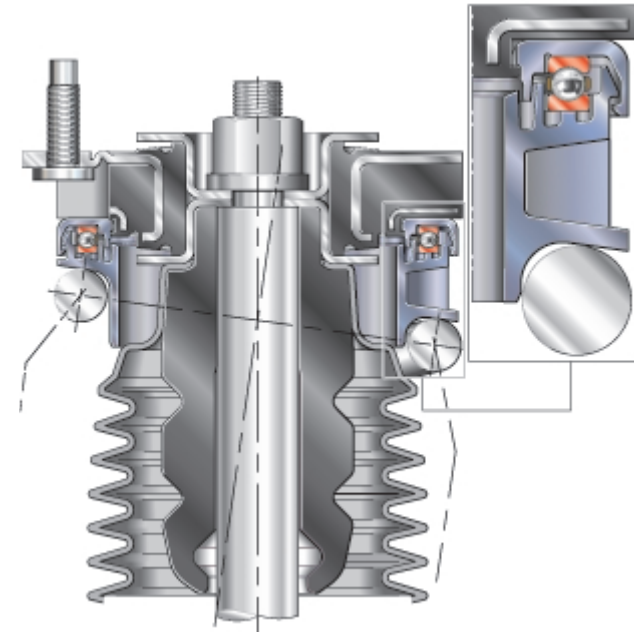
This strut bearing makes it possible to rest the spring directly on the bearing without an additional spring seat.

At the same time, it is possible to adjust the inclination of the spring in relation to the bearing housing.

In this case, it is necessary when installing one of these bearings to position the end of the spring precisely at the bearing housing stop.

As the bearing housing is made of plastic, it provides additional protection against penetrating dirt.

Pay attention to the recommended tightening torques for the piston rod nut.

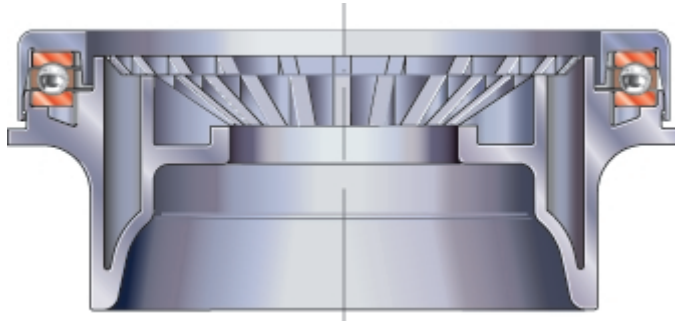


Strut bearing with simulated spring inclination

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Products from INA - strut bearing with spring support 2

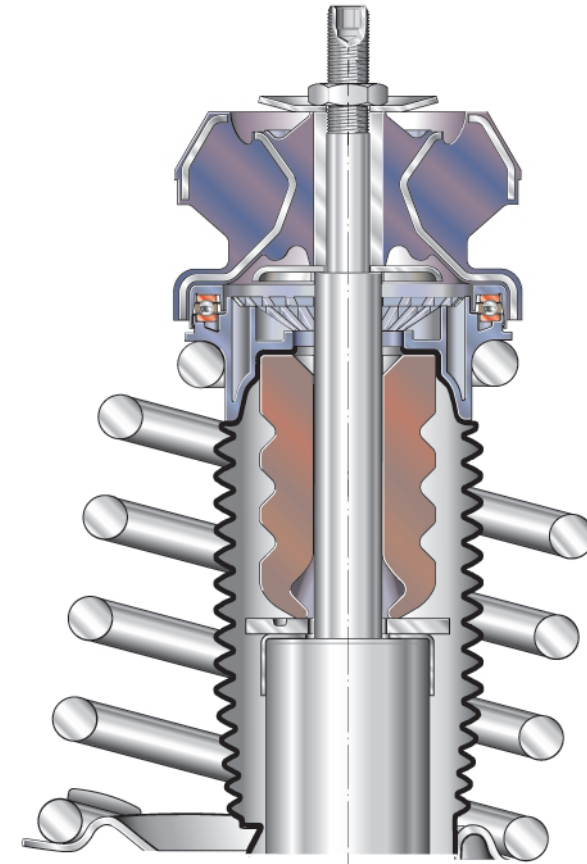


This strut bearing also makes it possible to rest the spring directly on the bearing without an additional spring seat.

The plastic housing of the bearing has been reinforced to be able to withstand spring and end stop forces.

The bearing housing is again made of plastic and so protects against penetrating dirt.

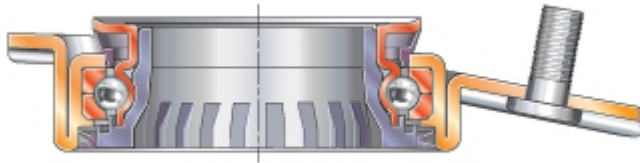
Pay attention to the recommended tightening torques for the piston rod nut, as with all bearings.



Strut bearing with reinforced plastic housing for withstanding spring and end stop forces

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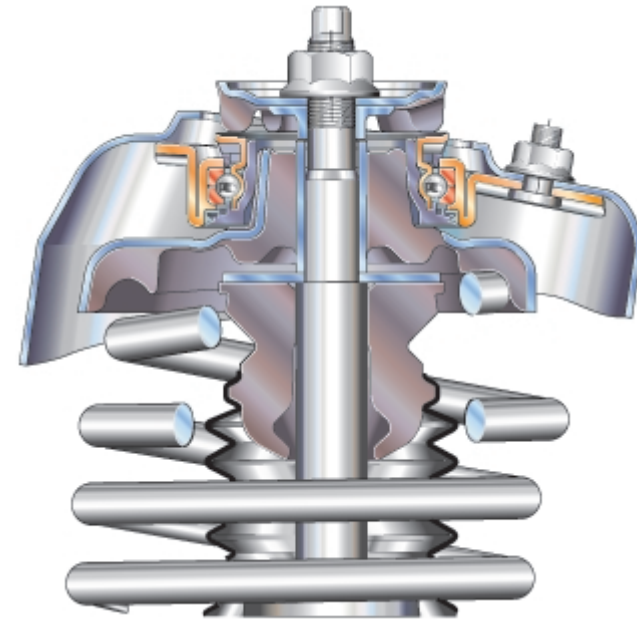
Products from INA - strut bearing with flange



This strut bearing permits tensile loads as well as pressure loads, because it is designed as a four point contact ball bearing.

In this design, the piston rod of the shock absorber is also supported.

As a result, bearing parts of the top mount are also integrated at the same time as the actual strut bearing itself, such as e.g. screws. This means that the complete strut bearing unit can be screwed directly to the body of the vehicle during installation.



Strut bearing with base plate, fully installed

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Tips for the assembly of strut bearings

1. During installation, always use the special tools prescribed by the car manufacturer.
2. Never treat the strut bearings with caustic solvents, as this may damage the seals of the bearings and may "flush out" the grease and so cause a failure.
3. Regardless of which part components need to be replaced, the complete strut together with the components (shock absorber, strut mount and dust protection caps) must be replaced. This is the only way to guarantee the reliable functioning of the components!
4. Take care when installing encapsulated strut bearings!
As the installation position in this case is not always unequivocally defined (top and bottom), always observe the installation instructions of the car manufacturer.
5. When screwing components, always observe the prescribed tightening torque.
6. When installing a strut bearing with integrated spring support, it is necessary to position the end of the spring precisely in relation to the stop of the bearing housing (because of turning!).
7. Only use original or identical parts, because only these parts have been passed through the prescribed tests and experiments and have been approved by the vehicle manufacturers.
Only these parts will provide the desired level of safety!
8. Always observe the installation regulations of the car manufacturers!

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Further Information



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