Shock absorber

# 5018 PDS 1999

# Introduction

## General notice

Pay attention to the following notes, when you are working with WP Suspension products as described in this workshop manual.

Always use clean and professional tools.
Regular you need next to the general equipment, the special tools of WP Suspension.
These tools with a unique “T“ number (available by WP Suspension) protect you from damaging the parts.

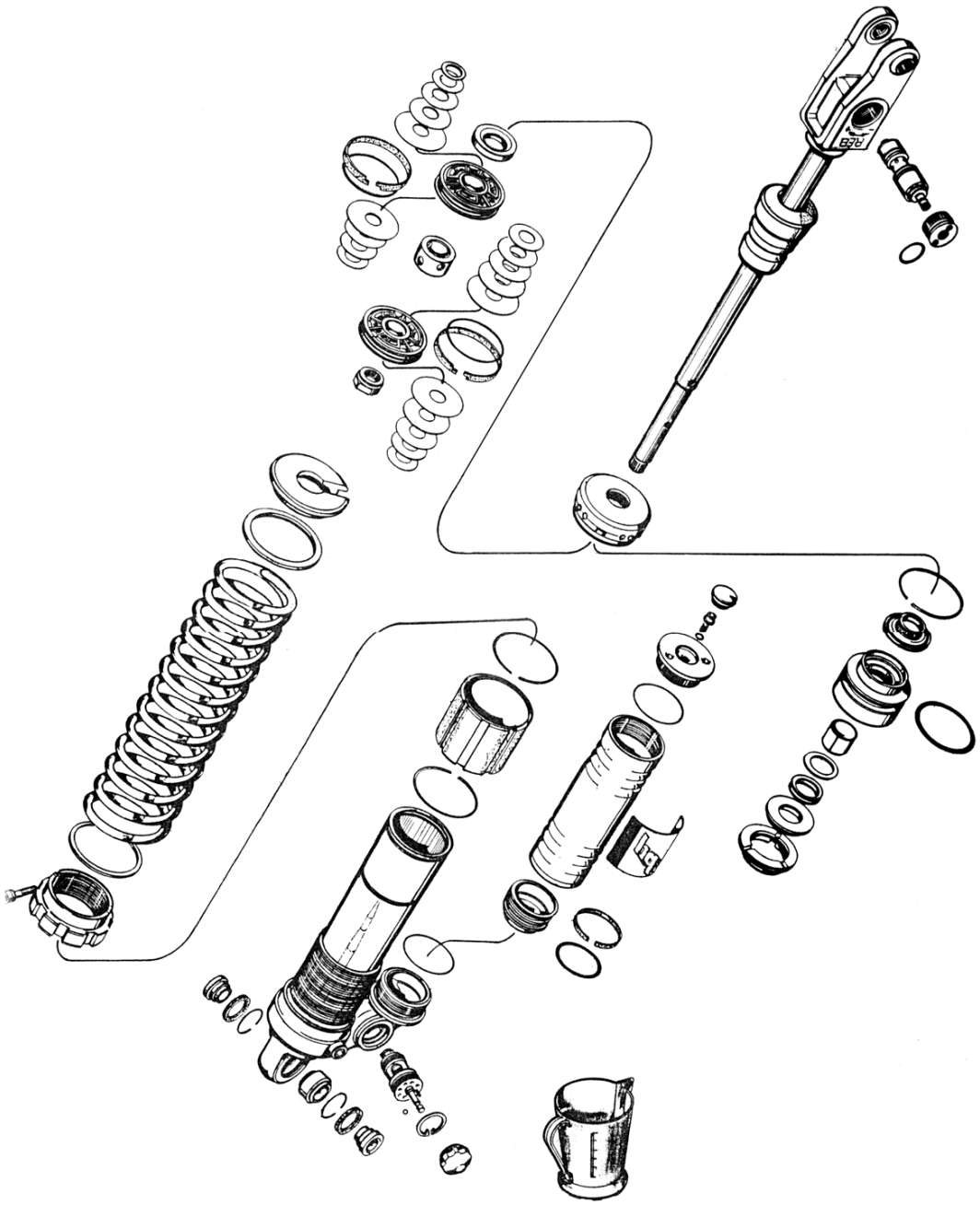
Always use aluminium protector-plates, when clamping
our products or parts in the vice.

Replace always damaged or worn parts.

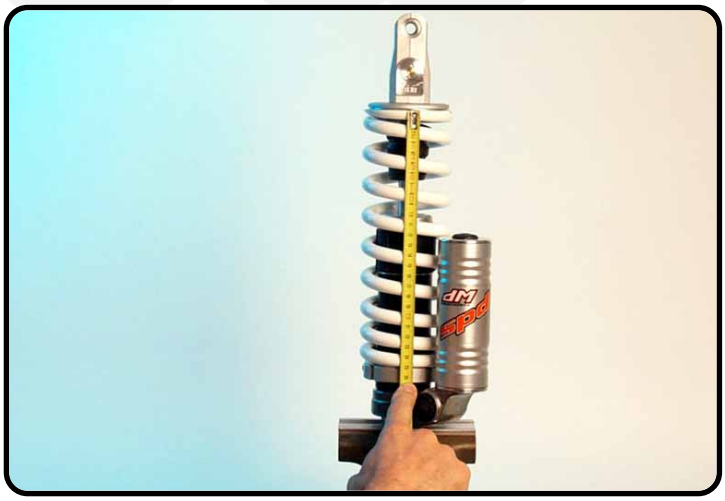
Clean all parts before assembling.

**Caution:**
Many times it is necesarry to assemble parts with T131, T132 and T163.

# Exploded view

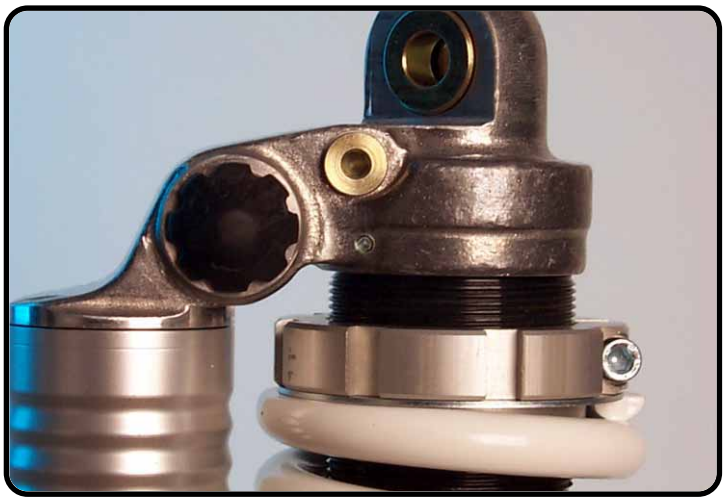


# Disassembly shock absorber



measure the length (preload) of the spring.

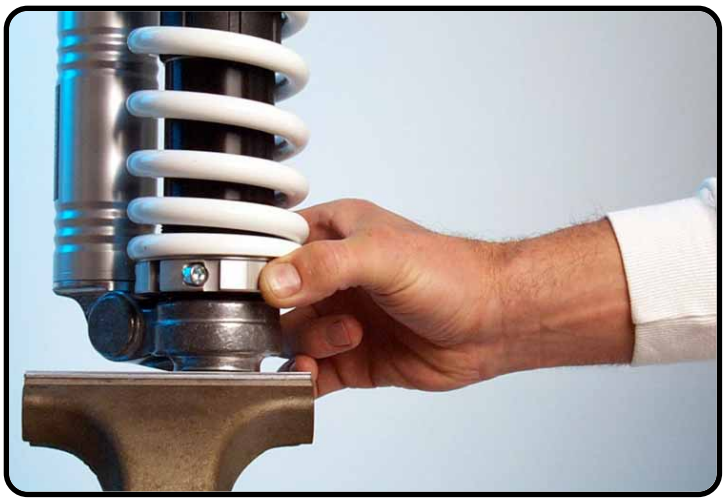

Take note of position rebound.
(1 is closed “**+**” mark)



Take note of position compression, and turn the knob to position 1.
(1 is open “**–**” mark)

Unscrew the spring retainer.

Loosen with T106 the spring retainer.

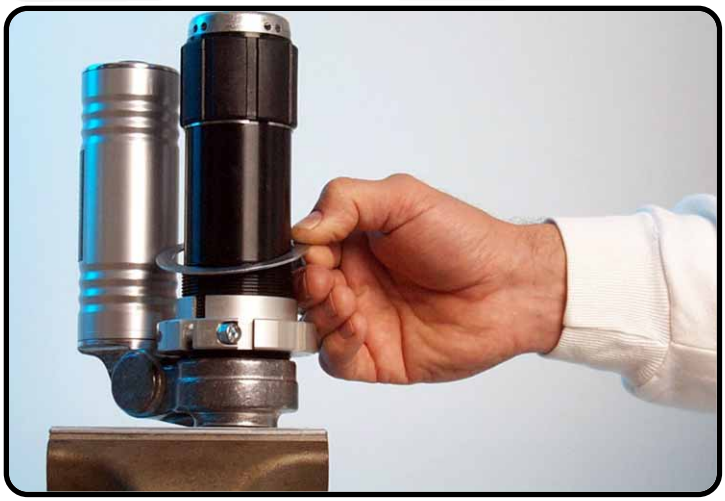


Screw the spring retainer against the bottom.

Pull the spring downwards and take off the open spring retainer.

Remove the spring  washer.

Remove the spring.



Remove the second washer.

Remove the rubber cap of the nitrogen reservior.

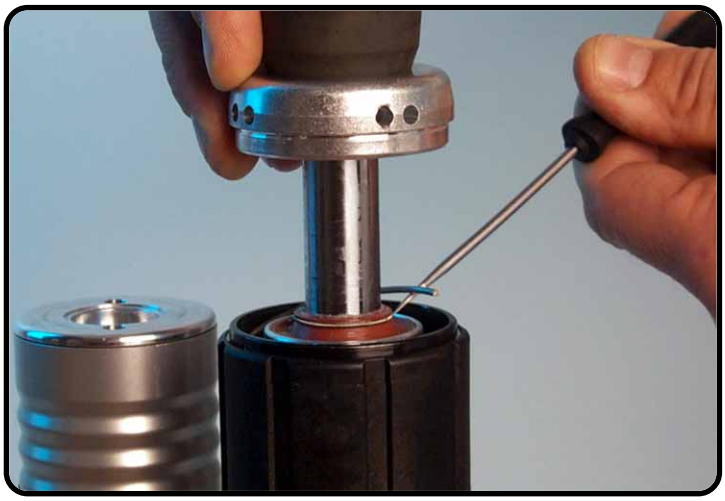
Release slowly the nitrogen pressure.

Tap off the cover on one side with a drift...

...and on the other side.

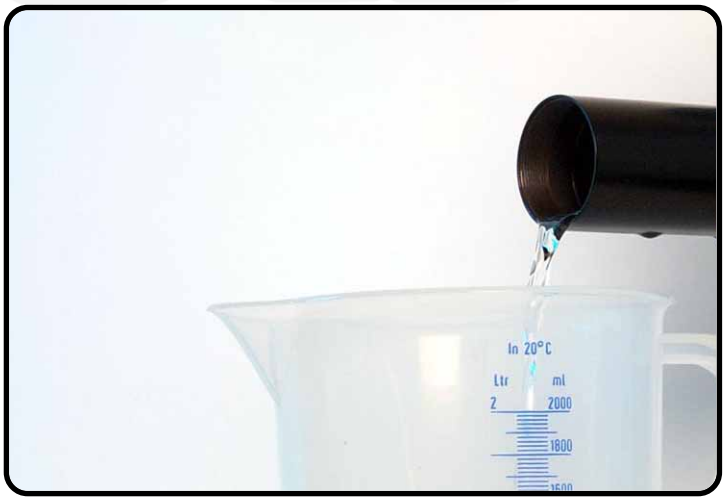
Tap the adaptor DU-bush loose with T1216.

Push the adaptor downwards.



Remove the springring.

Pull firmly but carefully the piston-rod “complete” out of the tube.



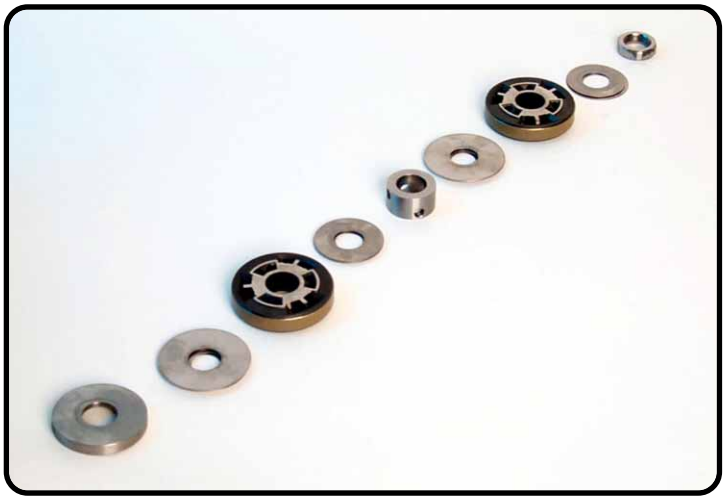

Drain the oil out of the tube.

Push the separation piston with T107S to the bottom and remove the rest of the oil.

# Disassembly piston-rod

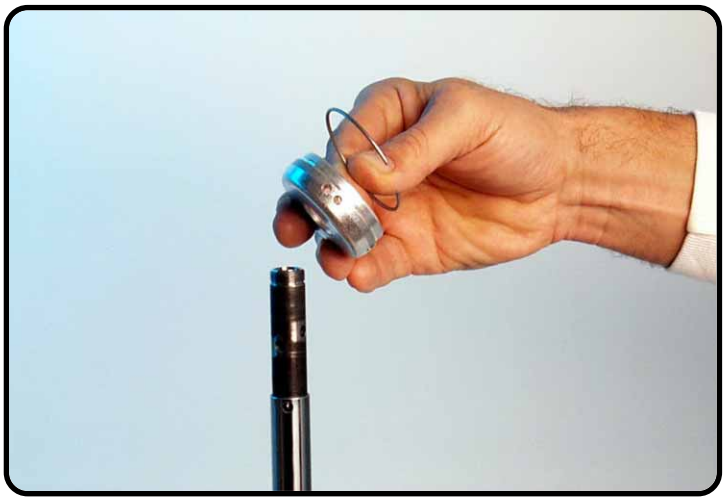
Unscrew the piston-rod nut. (size 22)

Place a screwdriver on top of the piston-rod and lift the entire assemly, consisting of rings, pistons and shims.



- rebound-bush plane
- compression shims piston 1
- piston 1
- rebound shims piston 1
- intermediate bush
- compression shims piston 2
- piston 2
- rebound shims piston 2

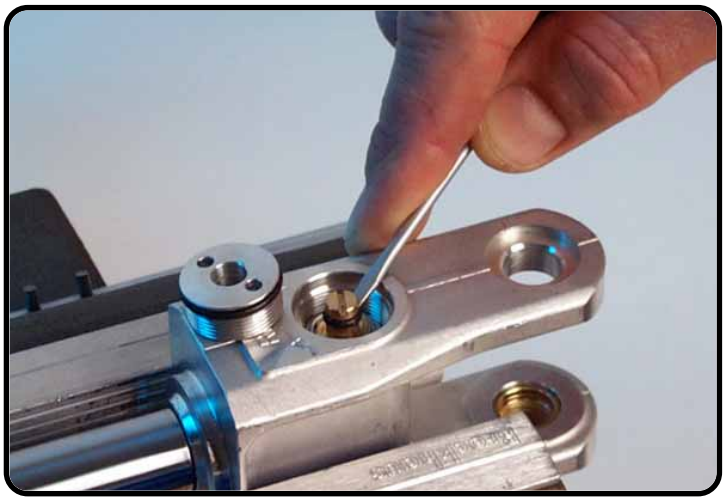
Remove the adaptor DU-bush.



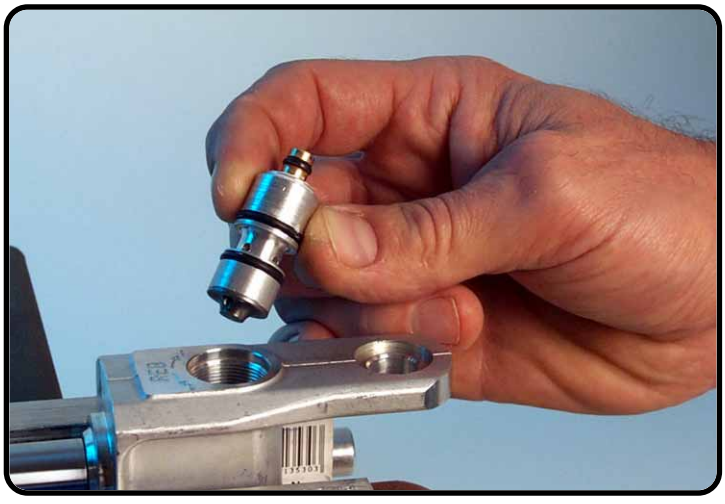
Remove the springring and the cap.

Remove the bump rubber.

Disassemble screw-cap rebound damping holder with T1218.



Disassemble holder out of the housing mounting fork with a screwdriver.



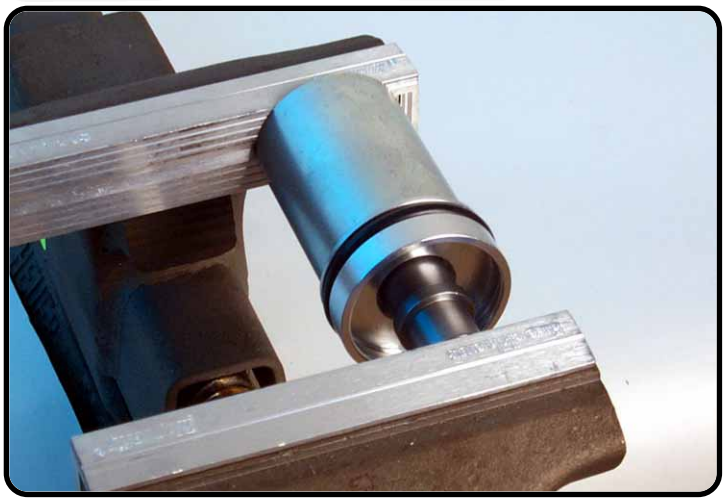
The rebound damping holder.

# Disassembly adaptor DU-bush

Pull the rebound rubber out of the adaptor.

Prise the dirt scraper out of the holder.

Disassemle the DU-bush with T1208 and T1209.

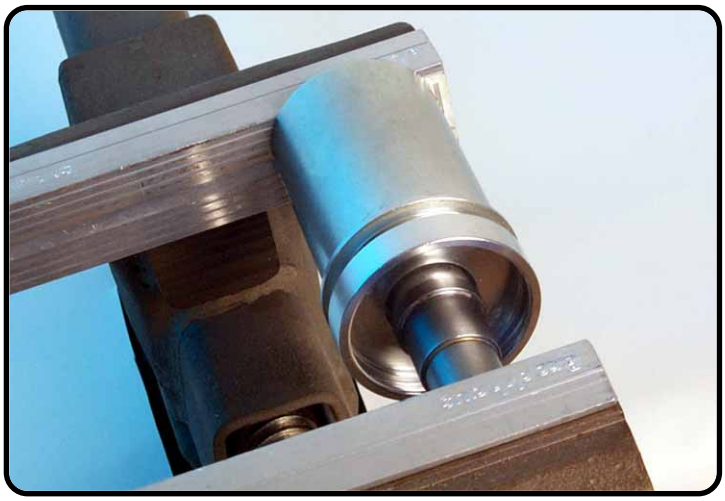


Press the DU-bush out of its adaptor.

- rebound rubber
- disc steel
- quad ring
- back-up ring
- DU-bush
- adaptor
- O-ring
- dirt scraper

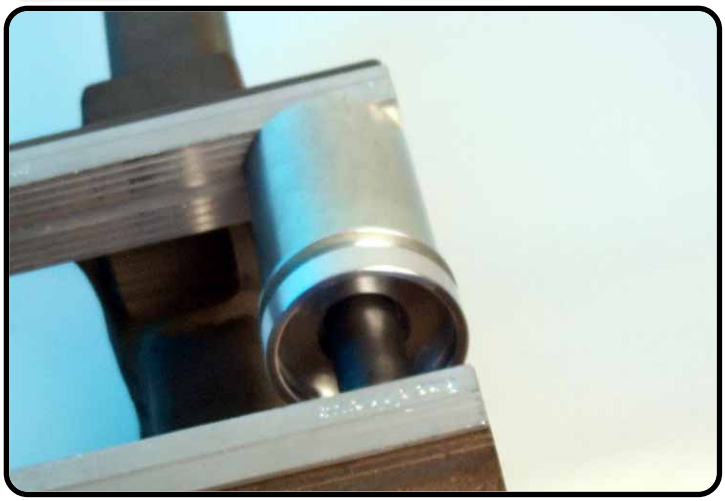
# Assembling adaptor DU-bush

Assemble a new DU-bush with T1208 and T1209.

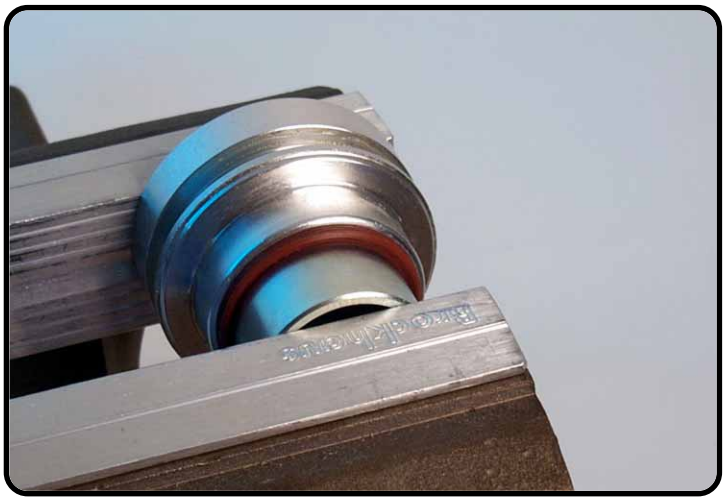


Press the DU-bush into the adaptor.

Calibrate the DU-bush with T1205 and T1209.



Drive the calibration mandrel trough the DU-bush.



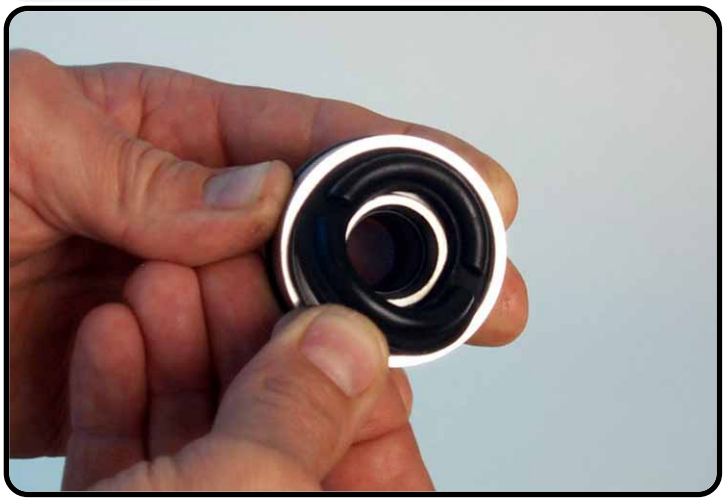
Press with T1204 a new dirt scraper into the adaptor.

Replace the O-ring.

Assemble the back-up ring.

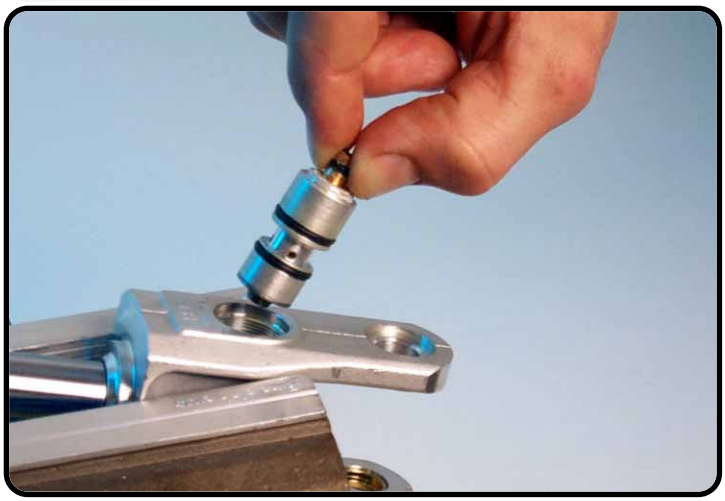
Assemble the quad ring.

Replace the steel disc.

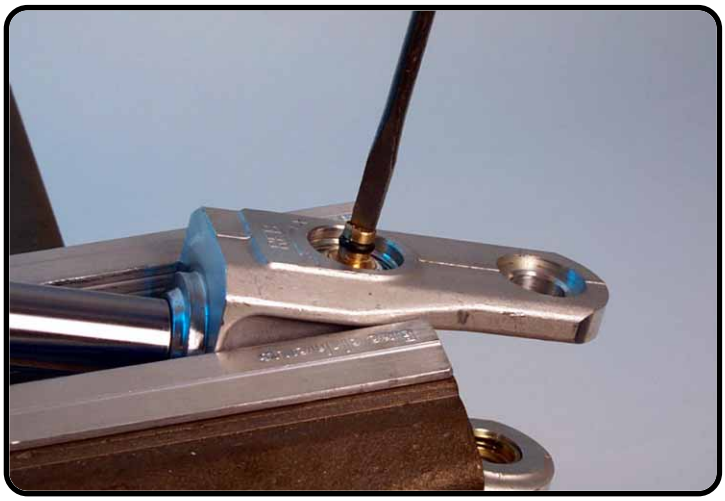


After assembling the rebound rubber check
if the rebound rubber can be rotate in the adaptor.

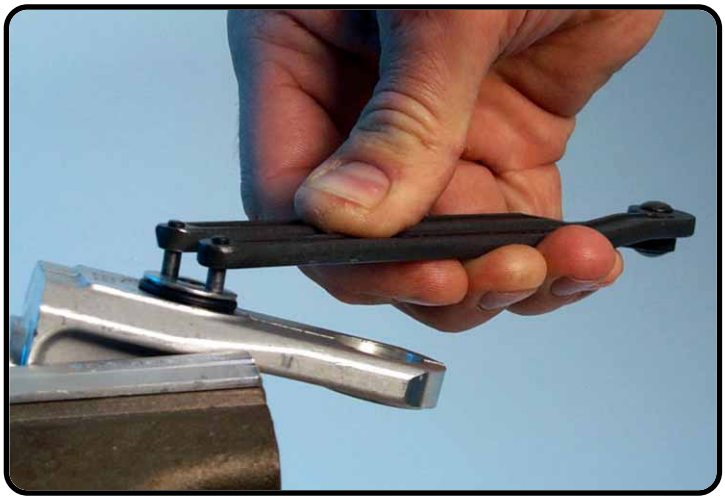
# Assembling piston-rod



After greasing the O-rings with T158, replace the rebound damping holder into the mounting-fork.



Push the damping holder with a screwdriver as far as the bottom.



Tighten the screw-cap with T1218.

Place T1215 on top of the piston-rod.

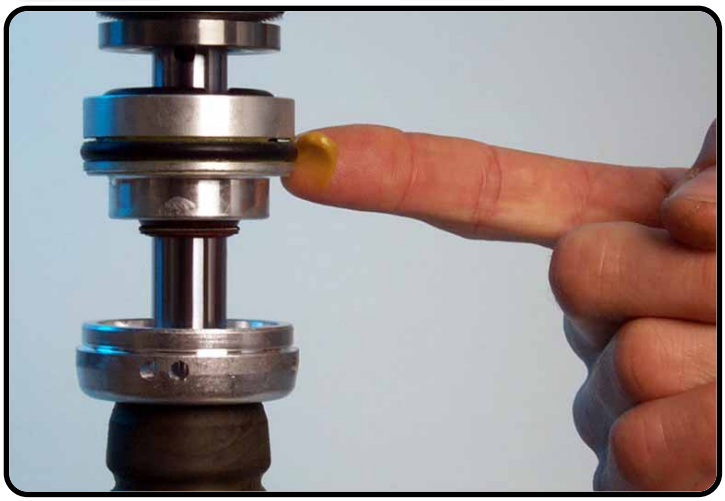
Assemble the bump rubber.

Place cap.

Grease the dirt scraper with T625 and...

...assemble the DU-bush adaptor.

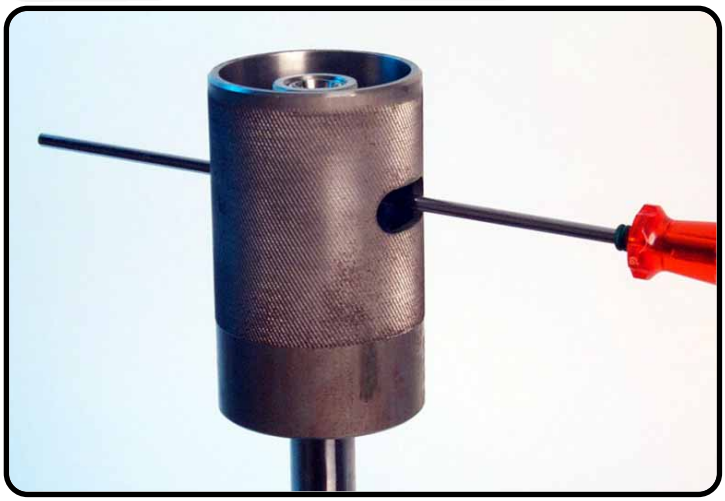
Replace the entire damping packet.



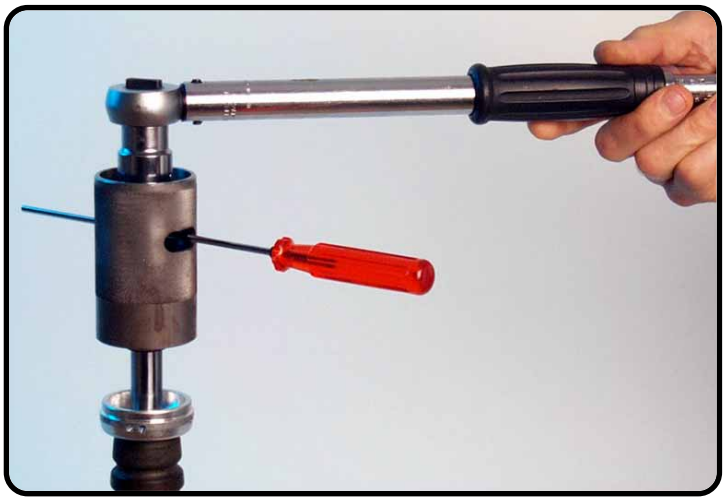
Grease the O-ring of the adaptor with T158.


Drip T163 on the thread of the piston-rod nut.

Slide T1214 over both pistons and the adaptor.

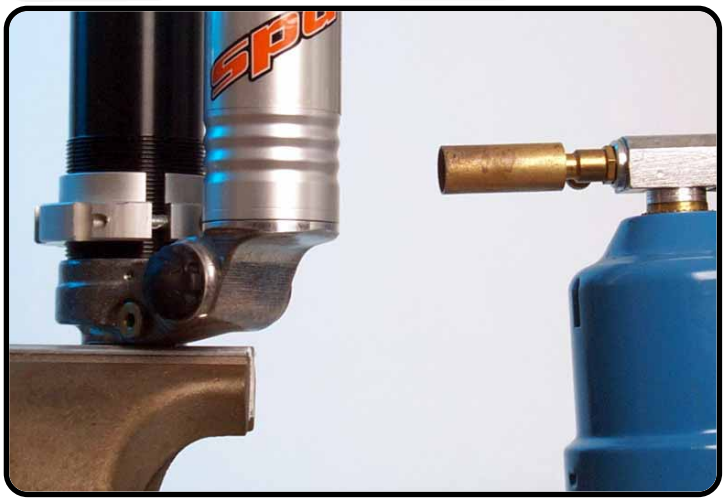


Place T107S through T1214, intermediate bush and piston-rod.



Tighten the nut to a torque of 40Nm.

# Disassembly tube-side

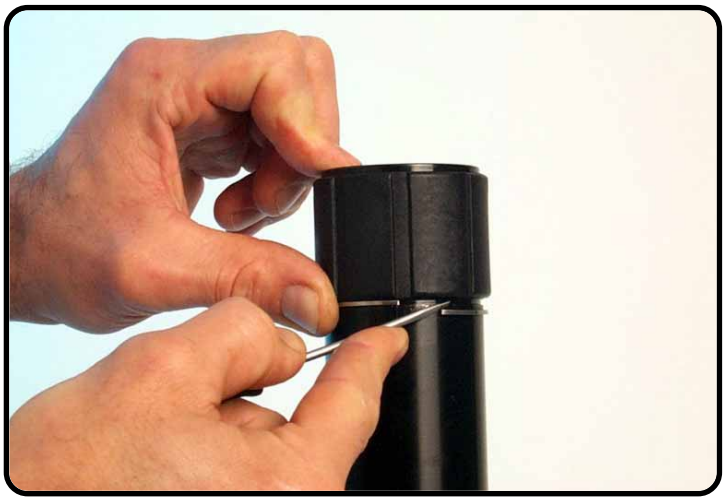


Heat the nitrogen reservoir near the bottom side.

Unscrew the reservoir with T146 and T147.

Clamp the nitrogen reservoir into T146 and T147 and unscrew the screw-cap with T125S and T145S.

Push the separation piston out of the reservoir with T107S.



Remove the springring out of the groove from the tube and place it past the groove.

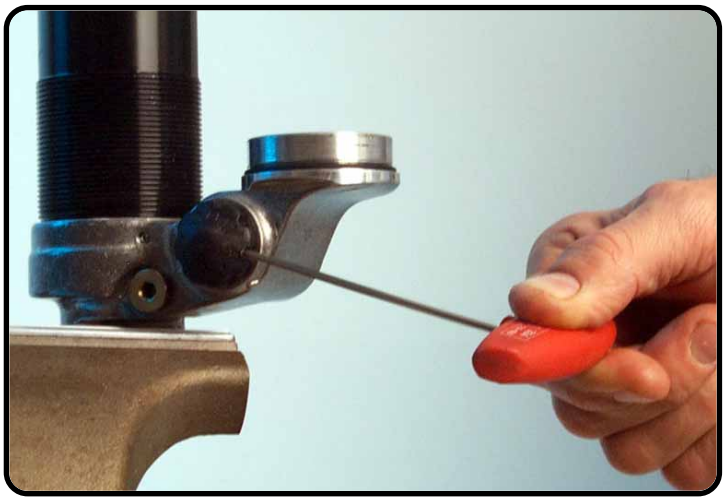
Slide spring guide downwards and...

...remove the upper springring.

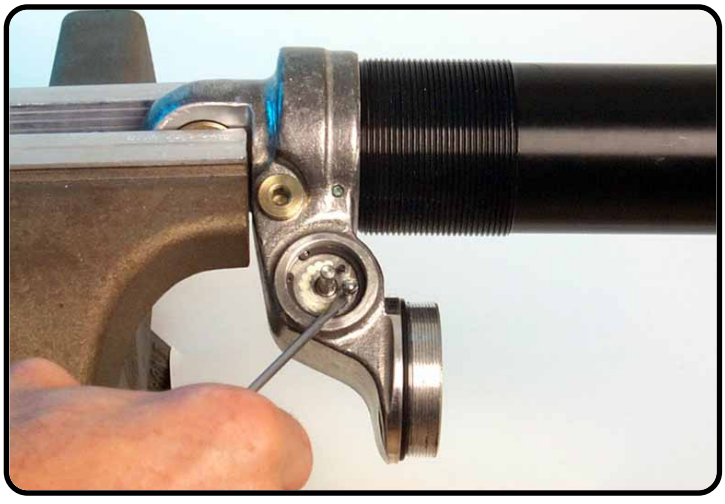
Remove the spring guide.

Disassemble the springring.

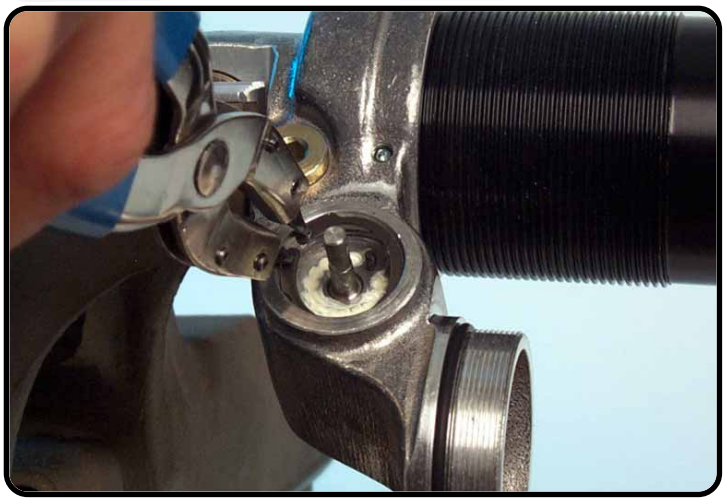
Screw spring retainer from the tube.



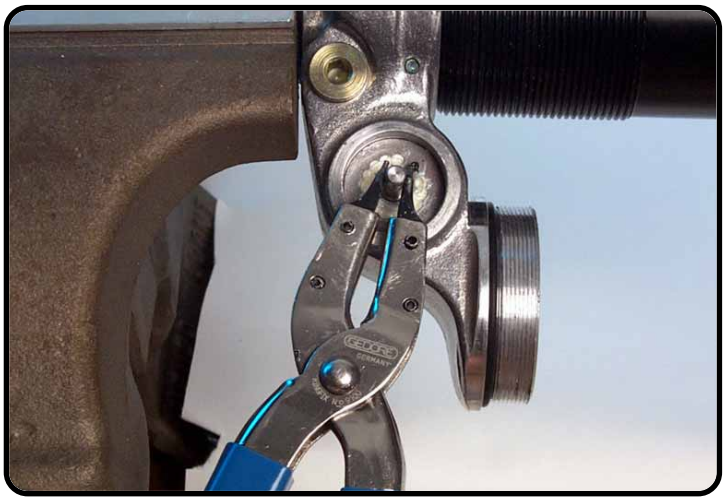
Unscrew (size 2.5) the compression adjusting knob and remove it.



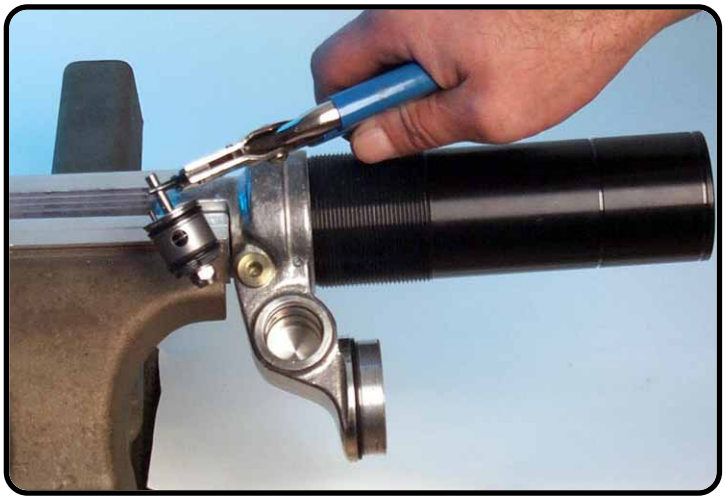
Remove steel ball.



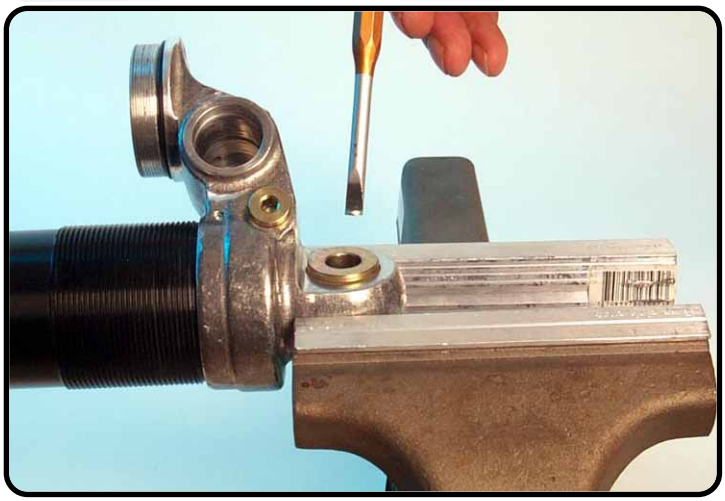
Disassemble the lock washer.



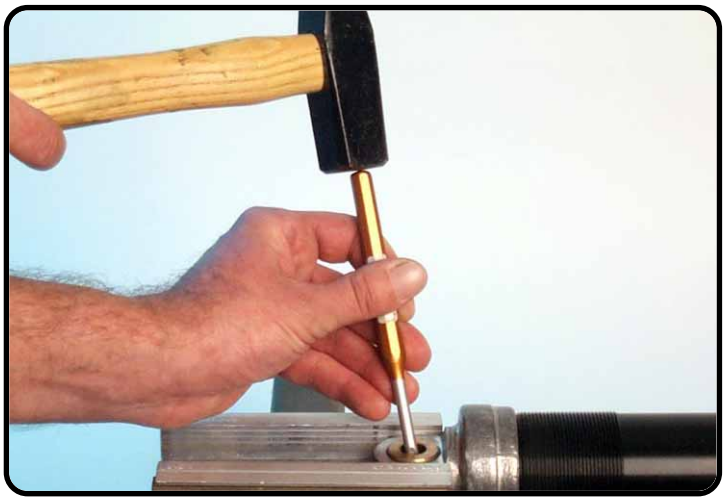
Pull out the compression mechanism.



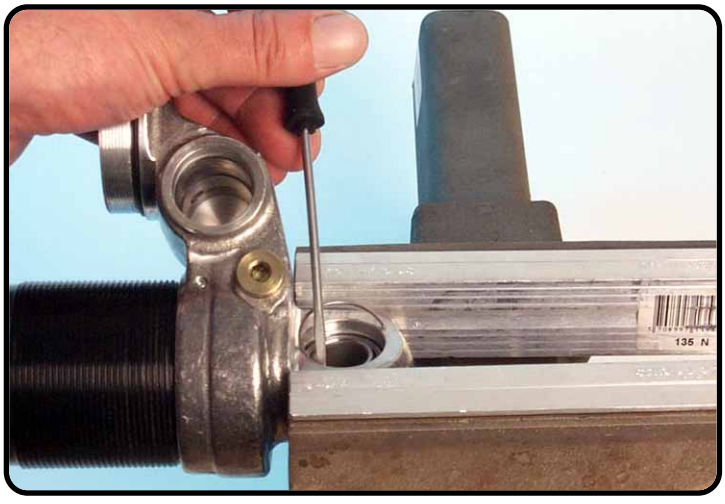
The compression control mechanism.



With T120 removing the adaptor bushes.

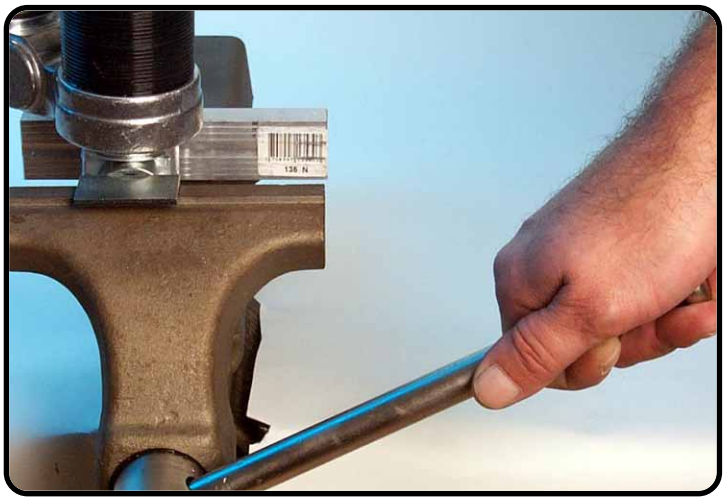


Tap adaptor bushes out the heim-joint KGW and remove the seals.

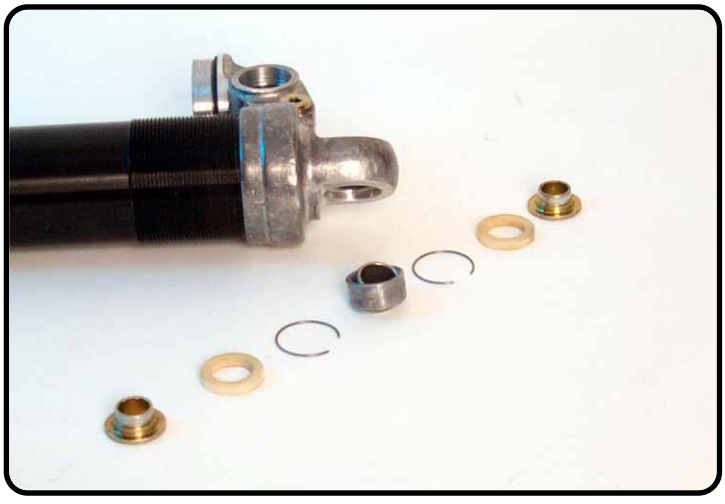



Remove on both sides the springring.

Disassemble heim- joint KGW with T1207S.



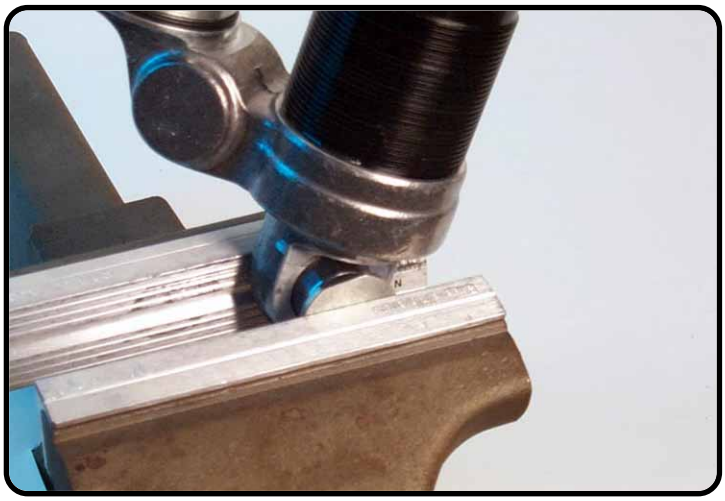
Press with the vice the heim- joint out of the bottom.



- adaptor bush
- seal
- springring
- heim-joint KGW
- bottom
- springring
- seal
- adaptor bush

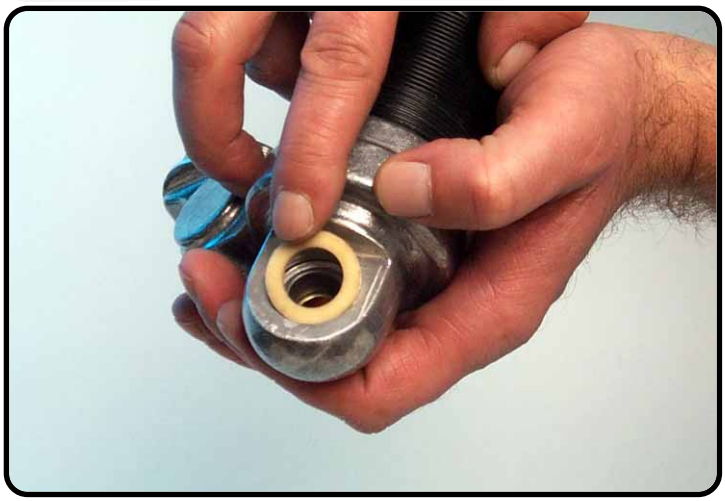
# Assembling tube-side

Drip on the innerside of the bottom-eye T163 and mount heim- joint KGW with T1206.
(With the bevelled edge direction bottom)

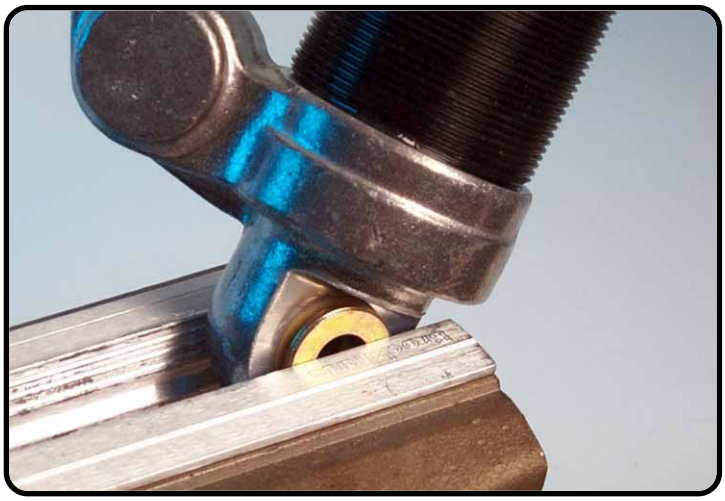


Press heim-joint into the bottom with the vice.

Assemble both springrings.



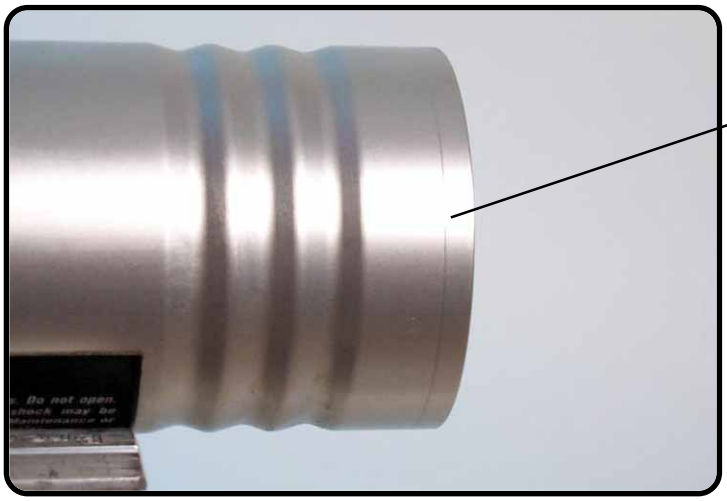
Assemble the seals.



Press one adaptor bush in the heim- joint with T1206. And the other without the tool.

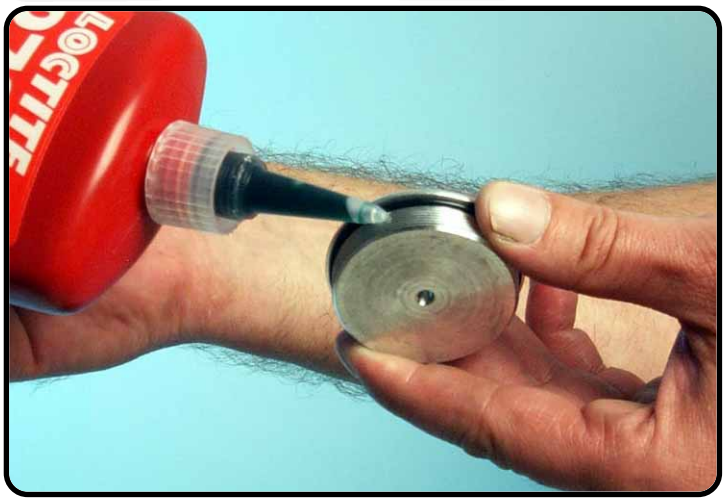
Building up the nitrogen reservoir. Grease the O-ring of the separate piston with T158.


Assemble the separate piston with the spherical surface into the direction of the groove.



"Groove"

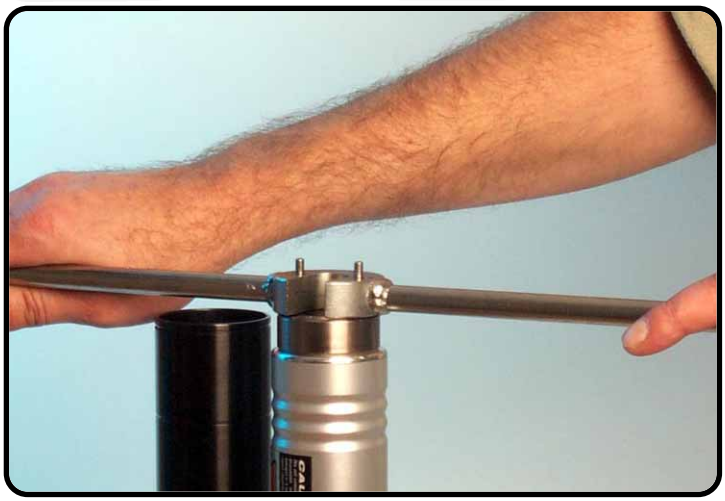

Wetting the thread of the reservoir on both innersides with T132.



Drip T132 on thread screw-cap reservoir.

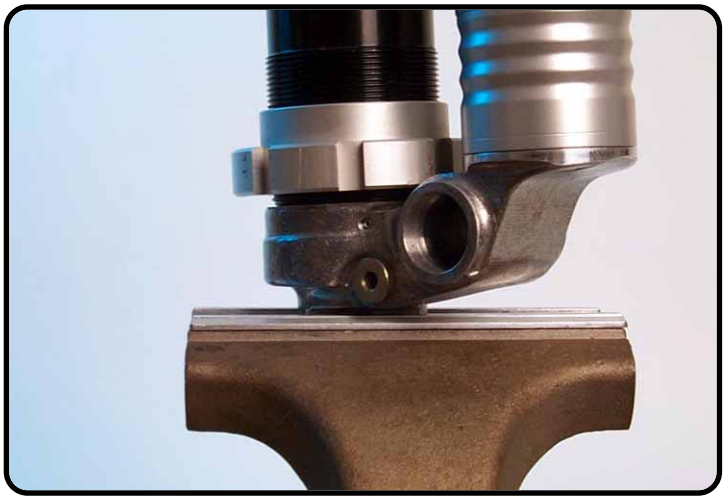
And T132 on thread bottom.

Assemble screw-cap and reservoir.



Tighten screw cap and reservoir on bottom with T125S and T145S.

Assemble the spring retainer.



Screw the retainer until the bottom.

Assemble the springring on the tube past the second groove.

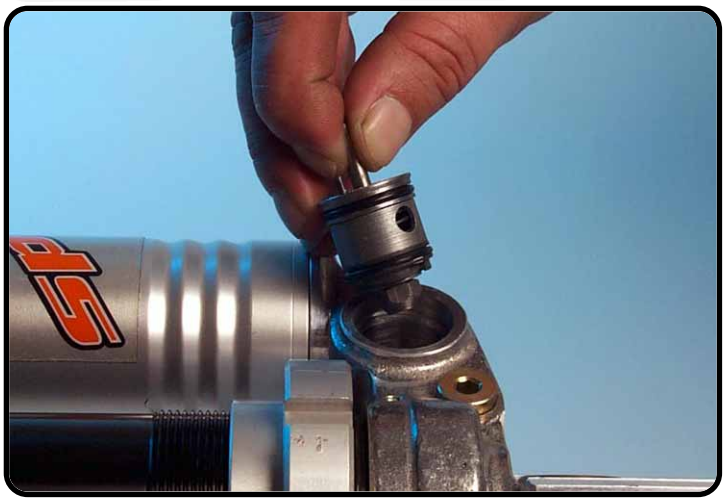
Slide spring guide on the tube with the chamber into the direction of the upper springring groove.

Place upper springring in the groove.

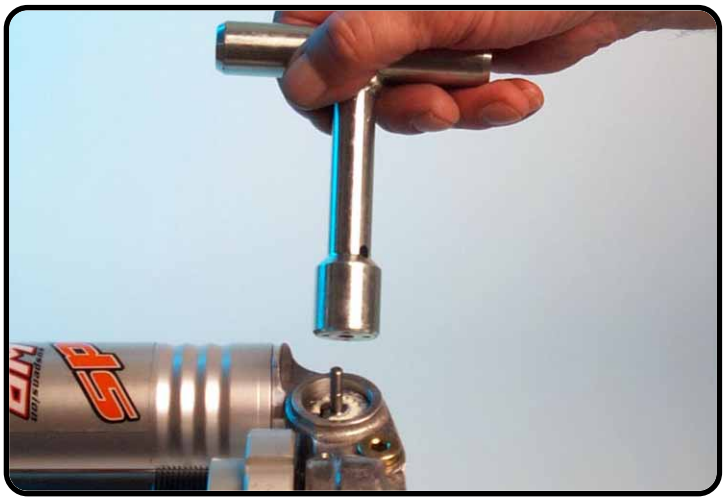
Slide the guide over the springring.

Assemble the springring.

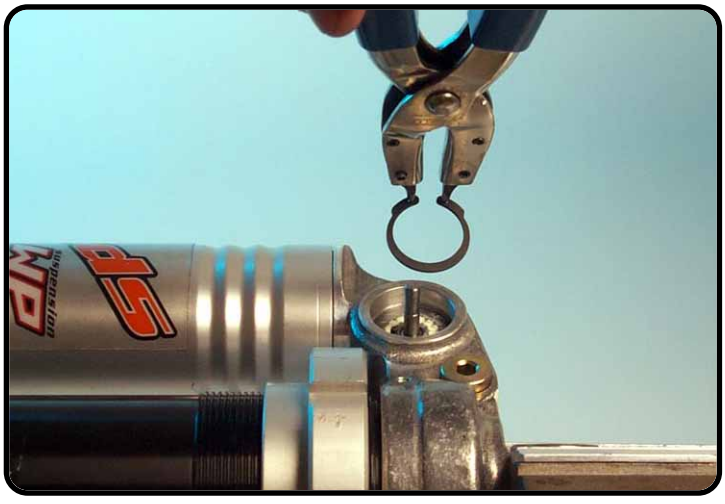
Assembling compression control mechanism.
Grease the O-rings with T158.



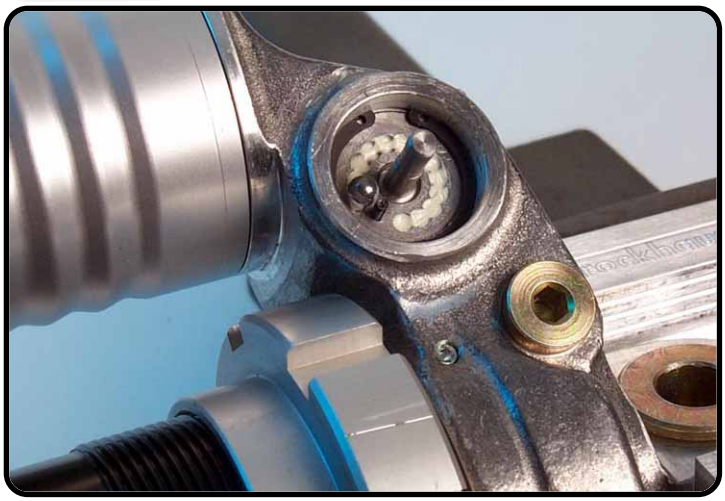
Assemble mechanism so that the hole of this, is facing the hole to the direction of the tube.



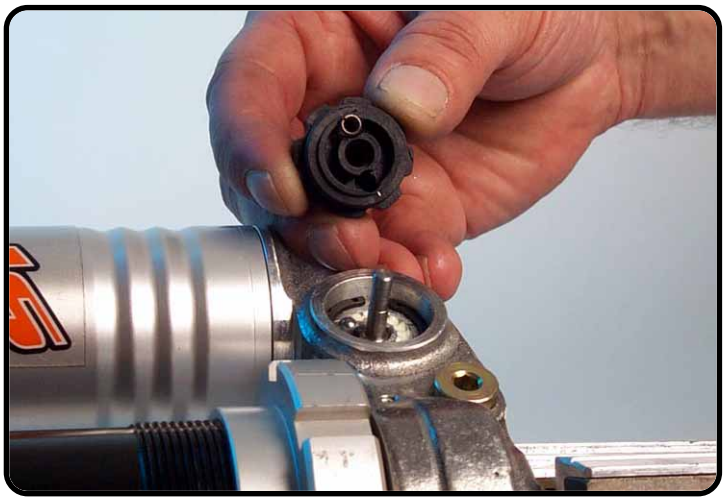
Push the mechanism with T160 past lock washer groove.



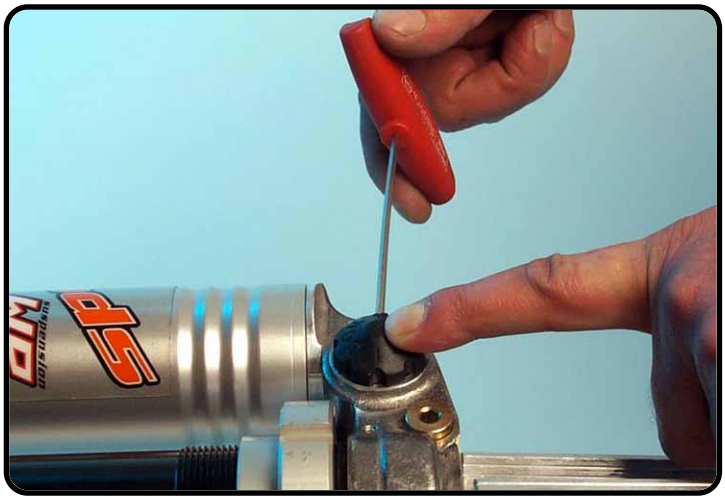
Assemble lock washer with flat side above.



Grease the upper side of compression mechanism with T159 and place steel ball next to the pin.

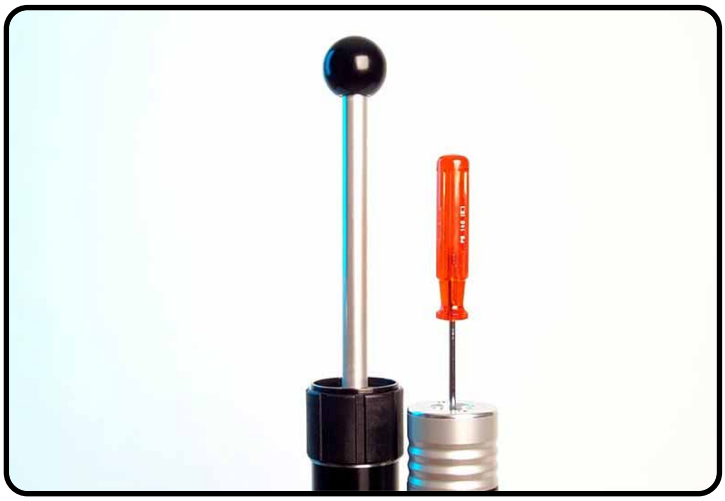


Mount adjusting knob with the spring directly on the steel ball.

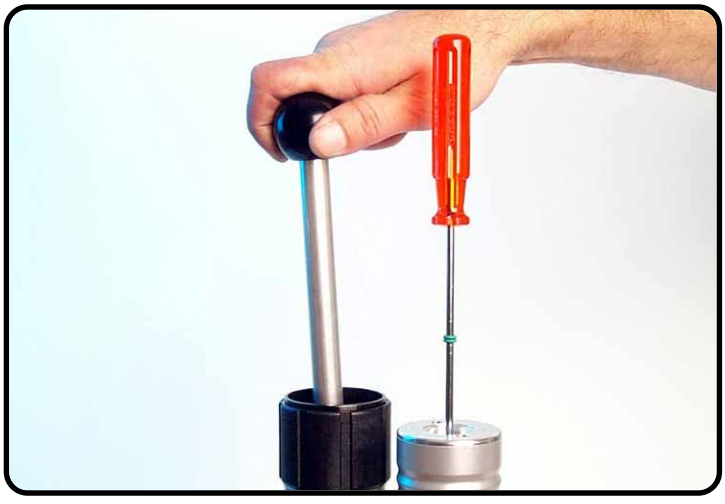


Push the knob and tighting it.
Adjust knob to position 1.
(“–” mark)

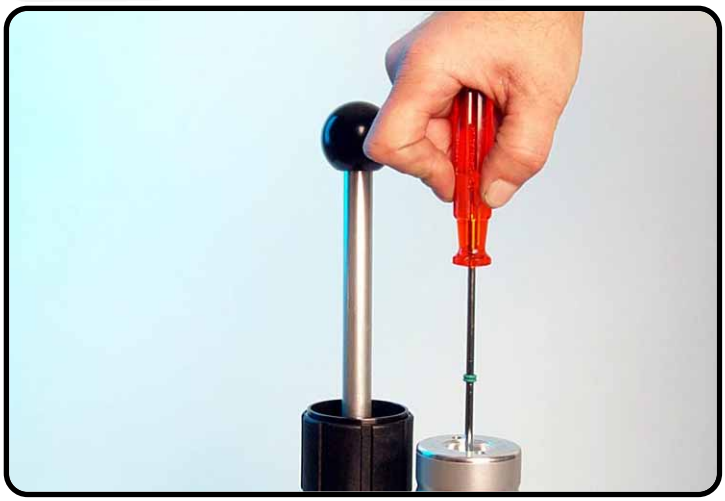
Fill the tube with oil about 10mm under the springring groove.



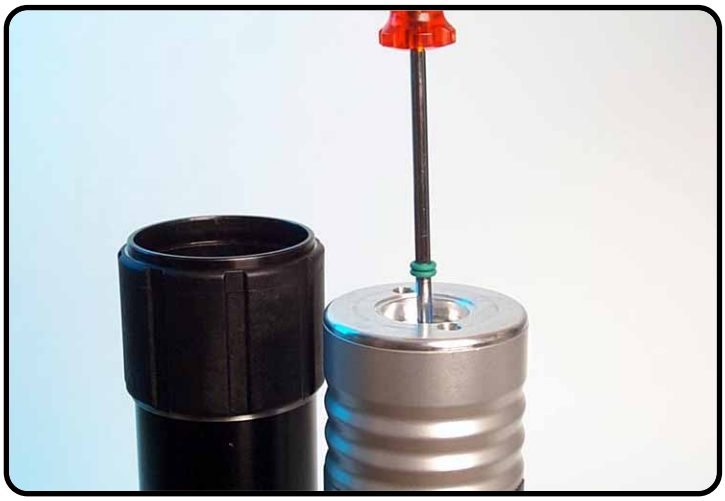
Place T1210S into the tube and T107S into the nitrogen reservoir, slide the O-ring as far as the screw-cap.



Push the plunger downwards.

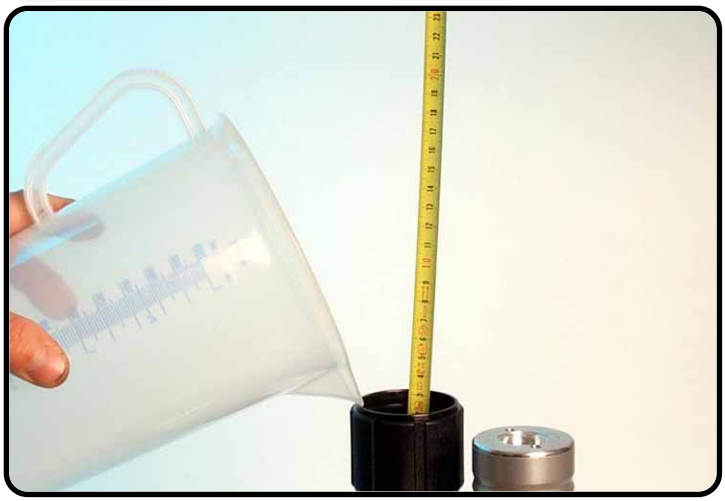


Push T107S downwards, (separation piston) repeat those two handlings several times.

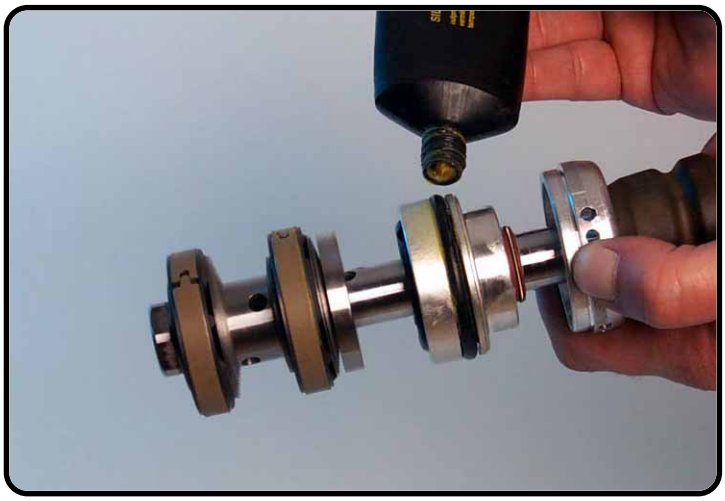


Adjust the separation piston about 10mm from bottom, also the O-ring on the shaft of T107S will be 10mm above the screw-cap.

Adjust the compression mechanism to position 13.
("**+**" mark).



Fill up oil 35mm beneath the edge of the tube.



Assembling piston-rod “complete”. Grease O-ring on the DU-bush adaptor with T158.

Assemble piston-rod “complete” into the tube.

Push the adaptor into the tube...

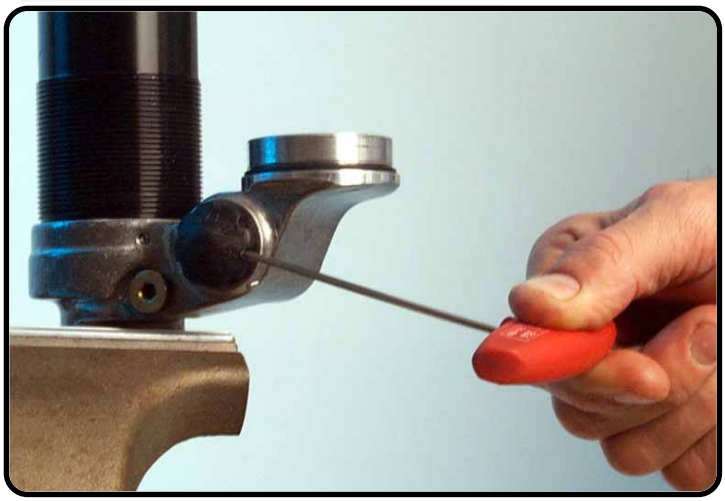
...past springring groove.

Assemble the springring in the groove.

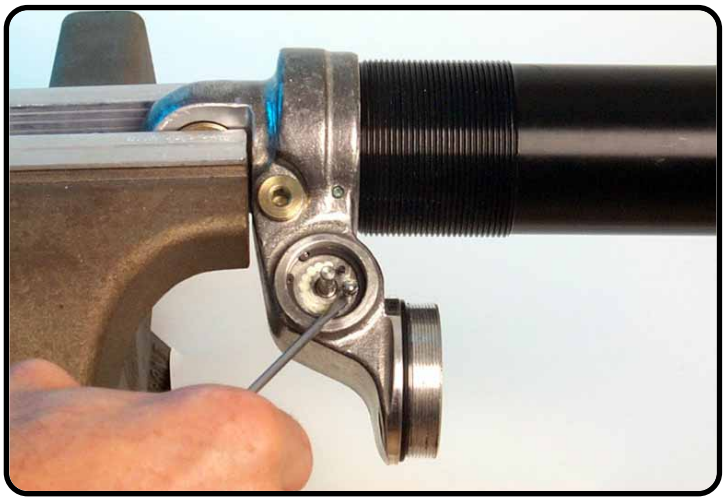
Pull up the piston-rod.

Tap the cap back into position.

## Bleeding

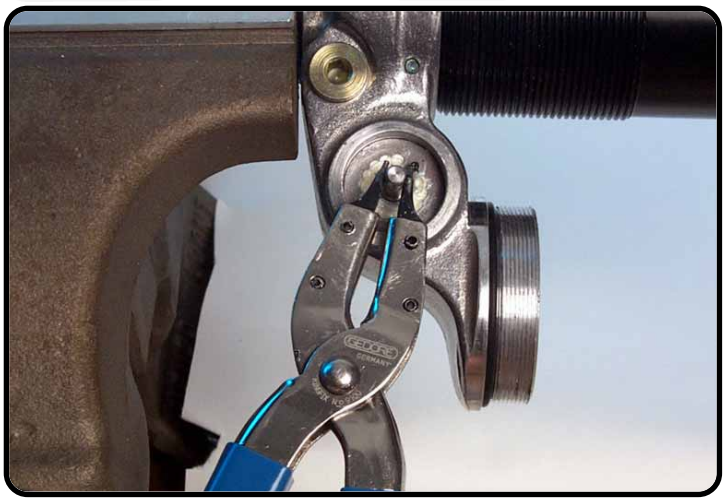


Remove compression adjusting knob.

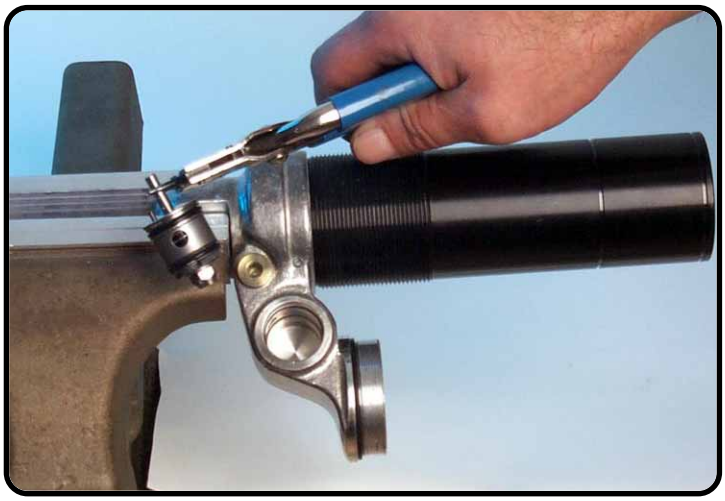


Remove the ball-steel.

Remove the lock washer.



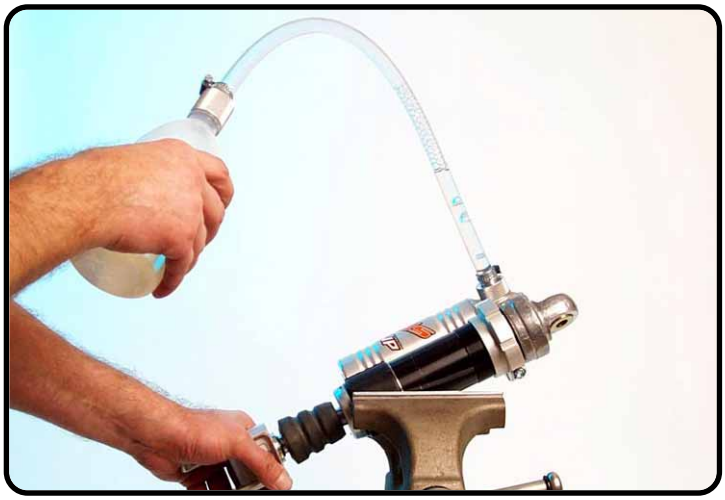
Remove the compression control mechanism.



Clamp the shock absorber (not to tide on the spring guide) into a vice at an angle of approximately 45 degrees with the housing of the compression mechanism at the highest level.

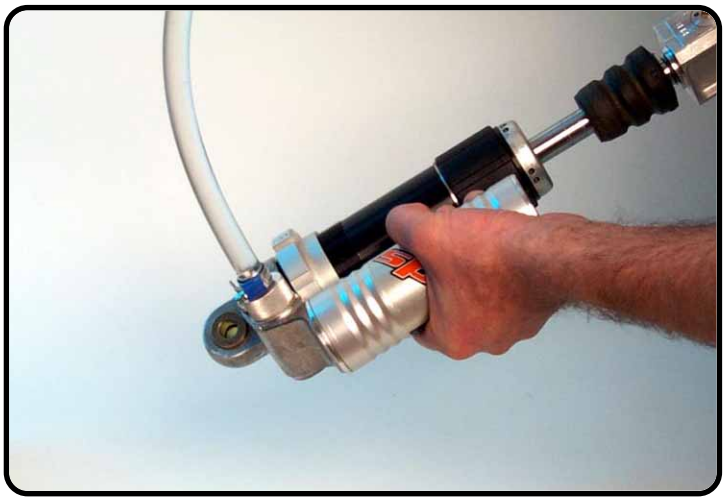
Connect the adaptor of T144S into the housing.

Ensure that there is sufficient oil in the bottle and that the hose is also full with oil.
You will see air bubbles rising up through the hose.

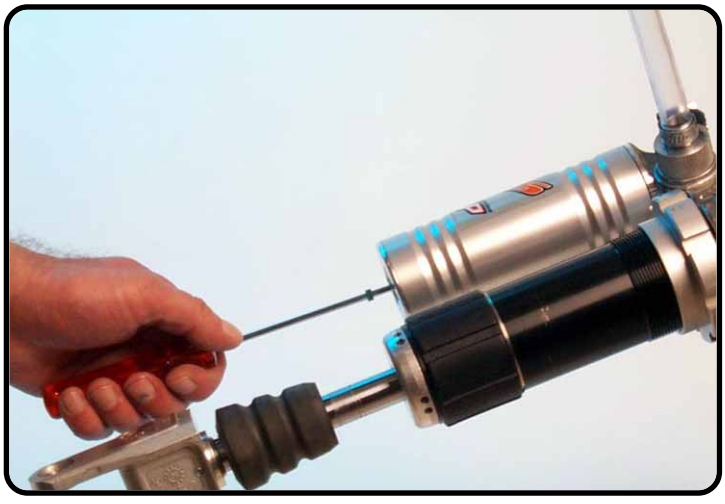


Push the piston-rod slowly in.

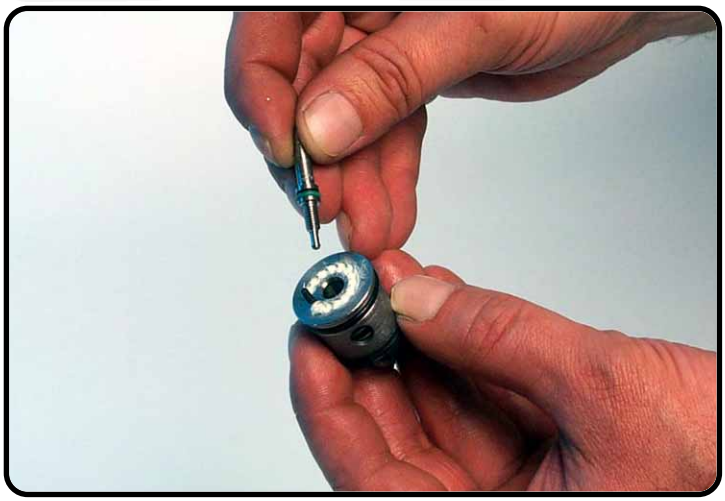
Pull the piston-rod out.



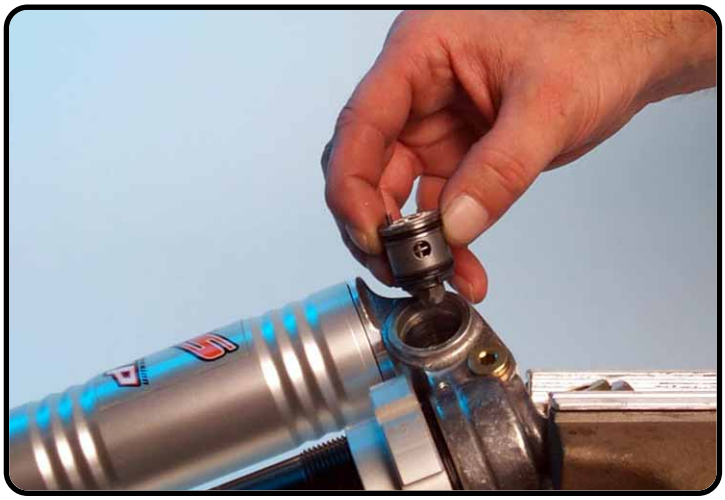
Remove the shock absorber out from the vice and turn it 45 degrees to the right and left several times.
Repeate the procedures until all air is bled out.



Pull the piston-rod completely out.
Check the position of the separation piston with T107S. (O-ring on shaft tool)

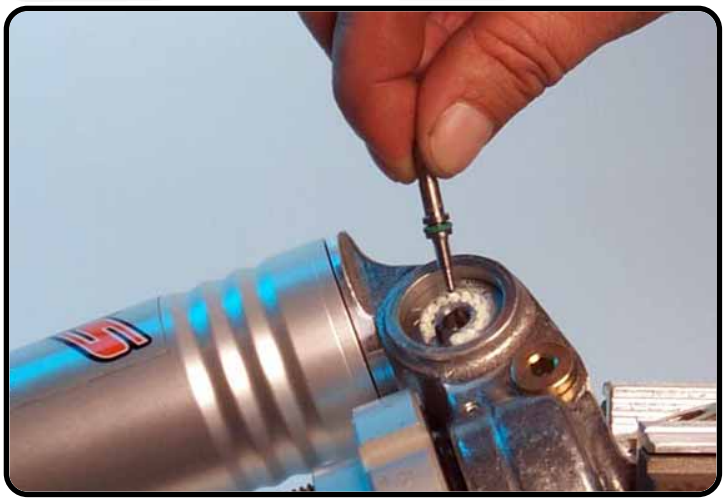


Unscrew adjusting needle clockwise out of the compression mechanism.

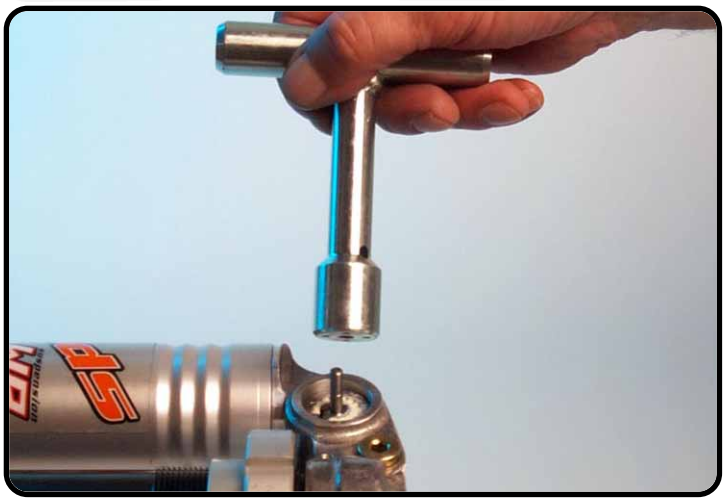


Assemble the mechanism without needle.
Note: hole of mechanism must face the hole into the direction of the tube.

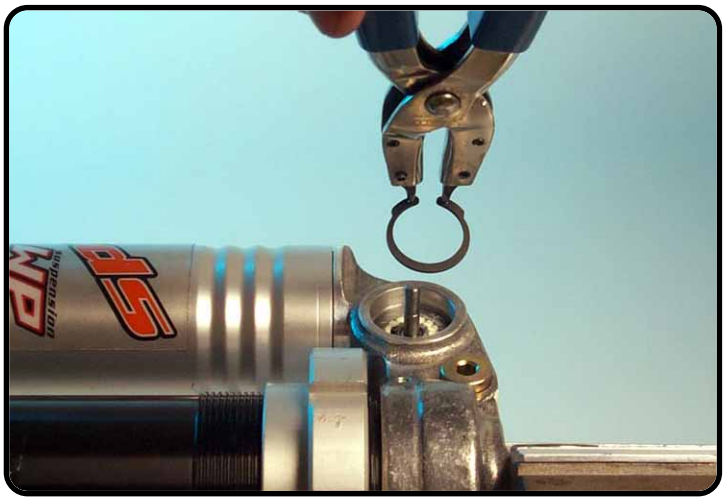
Assembled compression control mechanism.



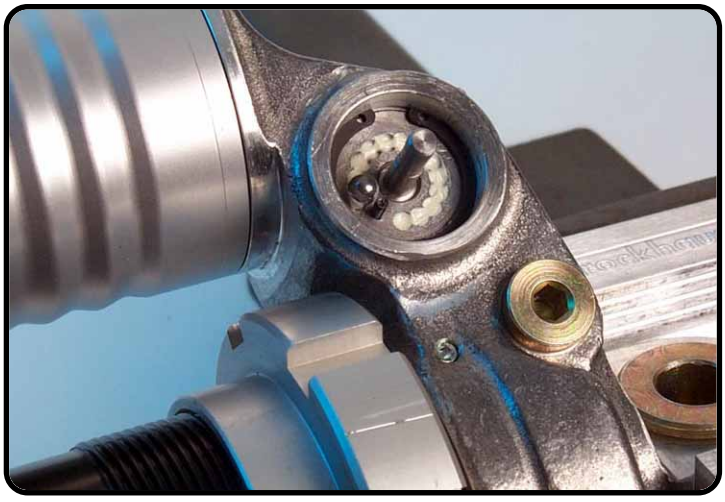
Screw the adjusting needle hand tight into the mechanism.



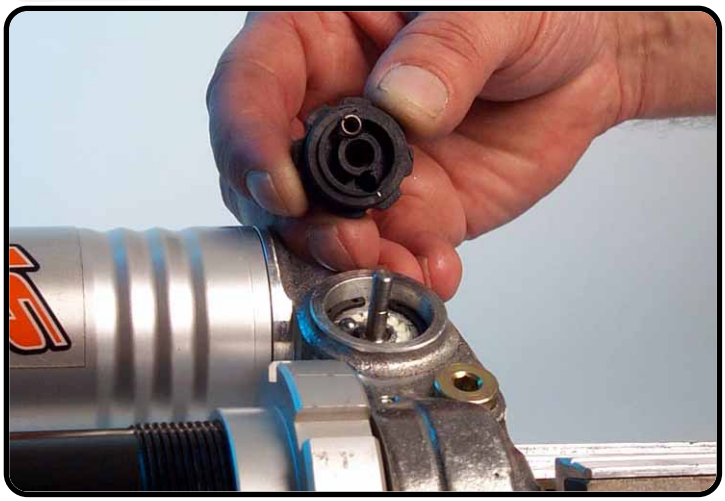
Push mechanism with T160 past lock washer groove.



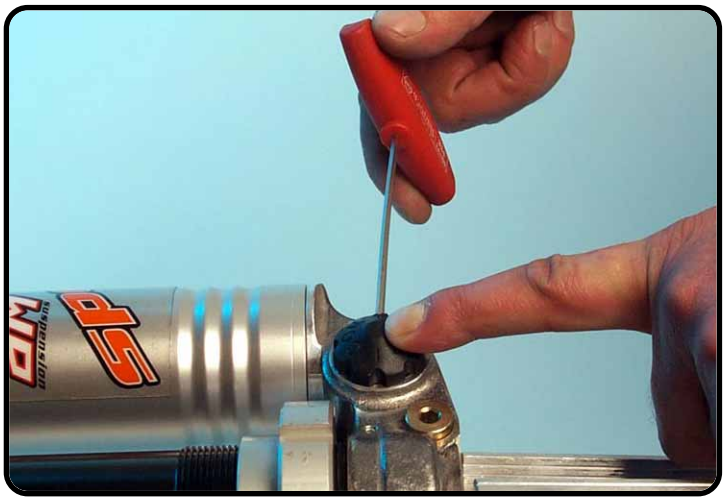
Assemble the lock washer with the flat side above.



Place steel ball next to pin.



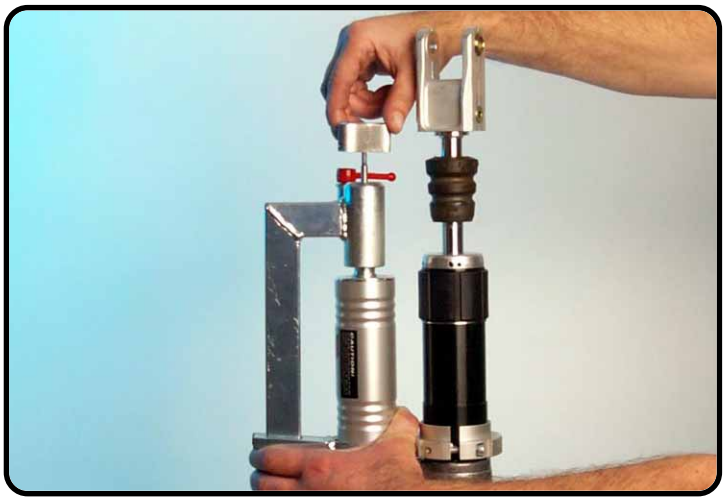
Assemble the adjusting knob with spring on the steel ball.



Push the knob against the housing and tighten it.

# On pressure with nitrogen

Screw the nitrogen plug with O-ring several turns into the nitrogen reservoir screw-cap.



Place the shock absorber in T170S and fill the reservior with nitrogen (±20 sec.) and tighten the bolt under pressure.

Replace the rubber dop “do not open”.

# Mounting the spring

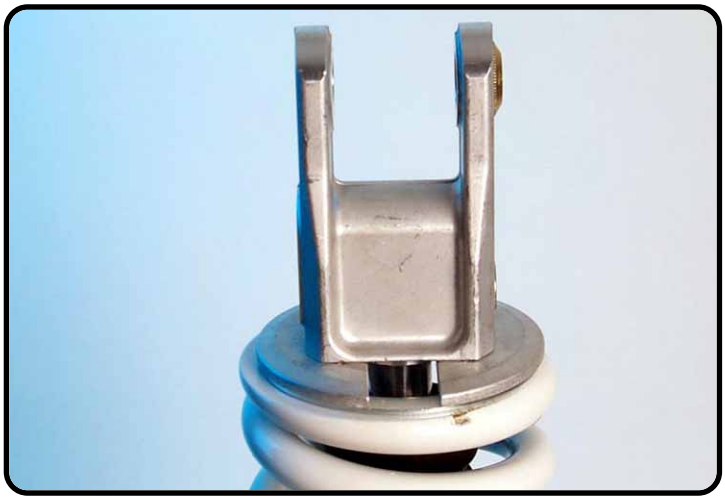
Turn mounting fork parallel with bottom eye.
Rebound and compression mechanism in the same direction.

Replace washer on the screw spring retainer.

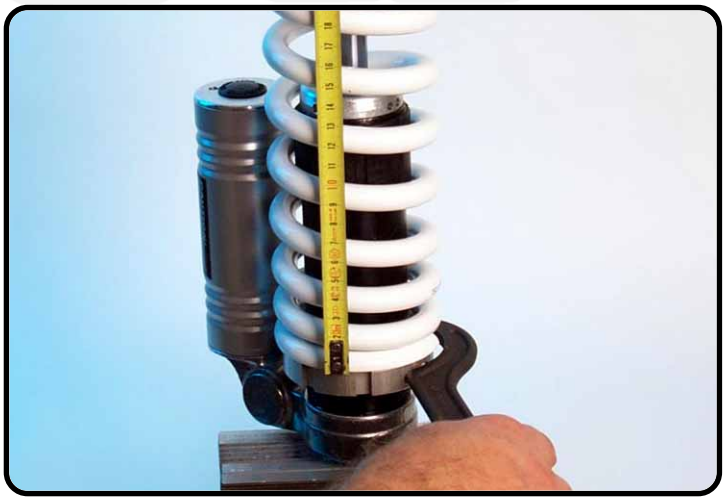
Replace the spring with the progressive coiles into the direction of the bottom.

Replace the second washer.

Assemble open spring retainer with the closed side on the end of the coil.

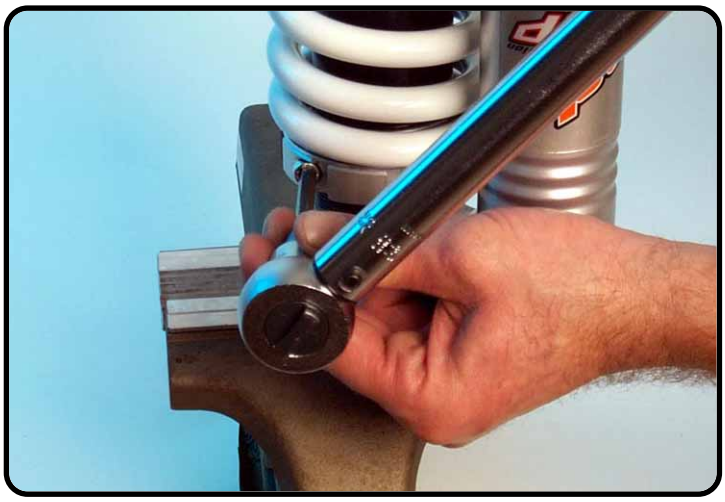


Move the spring and retainer in this position.



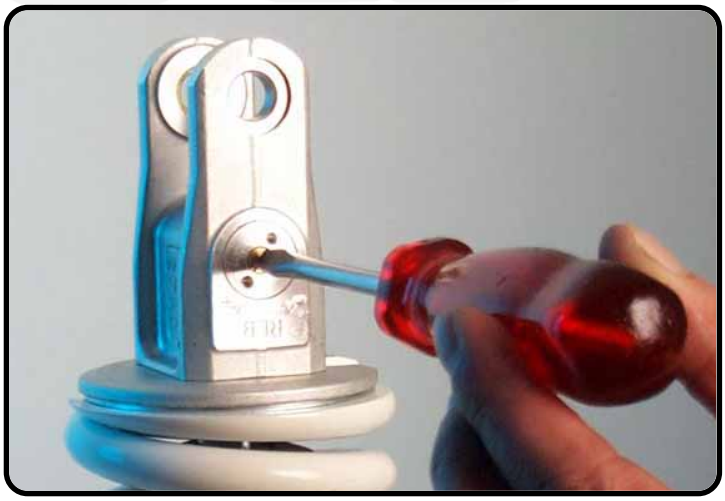
Adjust the preload of the spring.

Tighten the screw spring retainer to...



...a torgue of 5Nm.

# Adjusting



Rebound position!

Compression position!