Work Shop Manual

General Manual for Öhlins shock absorbers

ÖHLINS
ADVANCED SUSPENSION TECHNOLOGY

Introduction

All of Öhlins advanced suspension products are adapted to the make and model. This means that length, travel, and spring-action and damping characteristics, are tested individually just for the vehicle fitted with Öhlins suspension. When servicing be sure to use the correct spare parts.

The information, illustrations and specifications contained in this manual are the latest product information available at the time of publication. This manual is presented to make the service of the Öhlins shock absorbers as easy and as safe as possible with maximum performance out of the serviced shock absorber as possible.

Safety signals

Important information concerning safety is distinguished in this manual by the following notations:

⚠

The Safety alert symbol means:
Caution! Your safety is involved.

⚠ WARNING!

Failure to follow warning instructions could result in ***severe or fatal injury*** *to anyone working with, inspecting or using the suspension, or to bystanders.*

CAUTION!

Caution indicates that special precautions must be taken to avoid damage to the suspension.

NOTE!

This indicates information that is of importance with regard to procedures.

Contents

Before you start

Öhlins Racing AB can not be held responsible for any damage whatsoever to spare parts, suspension or vehicle, or injury to persons, if the instructions for fitting and maintenance are not followed exactly. Similarly, the warranty will become null and void if the instructions are not adhered to.

Make sure you have all the necessary tools before you start working on the Öhlins shock absorber.

⚠ WARNING!

Please study and make certain that you fully understand the work shop manual before handling the shock absorber. If you have any questions regarding proper service procedures, contact an Öhlins dealer or other qualified person.

NOTE!

Öhlins products are subject to continual improvement and development. Consequently, although these instructions include the most up-to-date information available at the time of printing, there may be minor differences between your suspension and this manual. Please consult your Öhlins dealer if you have any questions with regard to the contents of the manual.

⚠ WARNING!

The shock absorber is provided with a separate type reservoir filled with high-pressure nitrogen gas. To prevent danger of explosion, study and make certain that you fully understand the following information before handling the shock absorber.

The manufacturer cannot be held responsible for damage to property or personal injury that may result from improper handling.

1. Never tamper with or attempt to disassemble the cylinder or the reservoir.

2. Never expose the shock absorber to an open flame or other excessive heat. The shock absorber may otherwise explode due to too high pressure.

3. Be careful not to damage any part of the gas reservoir. A damaged gas reservoir will impair the damping performance or cause malfunction.

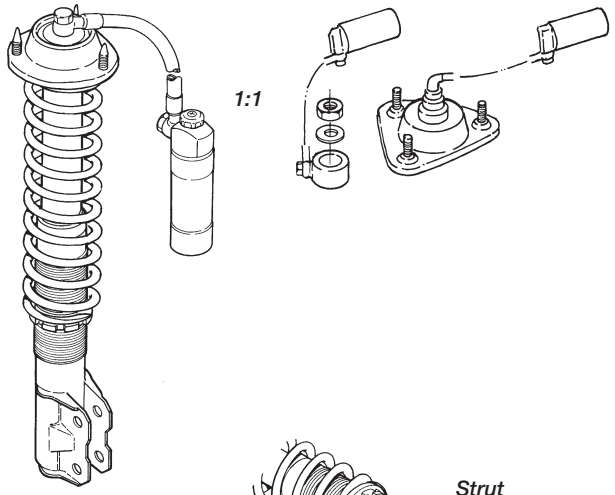
4. Take care not to scratch the contact surface of the piston rod of the cylinder; oil could otherwise leak out.

5. Never attempt to remove the plug at the bottom of the nitrogen gas reservoir. Any attempt to remove the plug implies serious danger.

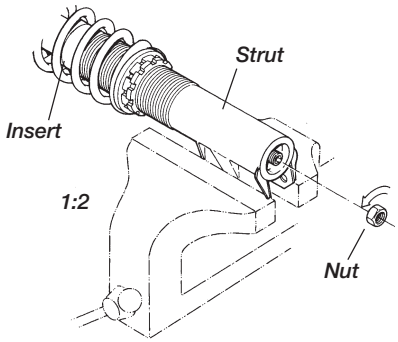
6. When scrapping the shock absorber follow the instructions for disposal.

McPherson 36 and 46

Contents



1:1



1:2

Dismantling the McPherson suspension

1:1

Remove the shock absorber from the vehicle by loosening first the top mount and then the lower bracket. Remove the strut from the vehicle.

NOTE!

To remove and service the shock absorber in McPherson struts it is not necessary to remove the spring seats on the strut, the top mount or the hose connected reservoir.

1:2

Fasten the strut in a vice. Loosen the lock nut at the lower end of the strut.

CAUTION!

On struts without wheel bracket, use soft jaws.

NOTE!

To obtain maximal grip for the allen key, it is advisable to close the rebound adjuster before the insert is removed. Close by turning the adjuster wheel/screw clockwise. Count the steps (clicks) when the wheel is turned.

1:3

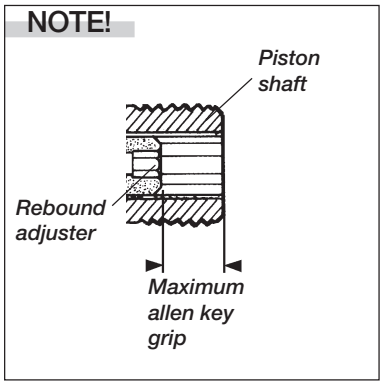
Insert an allen key into the piston shaft and thread the shaft out from the strut bottom. Free the insert by pulling it out from the strut.

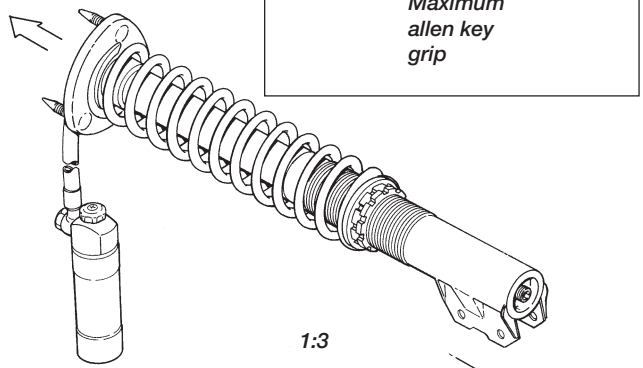
1:4

Remove the spring, clean the shock absorber and strut carefully externally and inspect for damages.

1:5

Fasten the insert in a vice by use of soft jaws 1808-01 (50 mm) or 1808-02 (54 mm).





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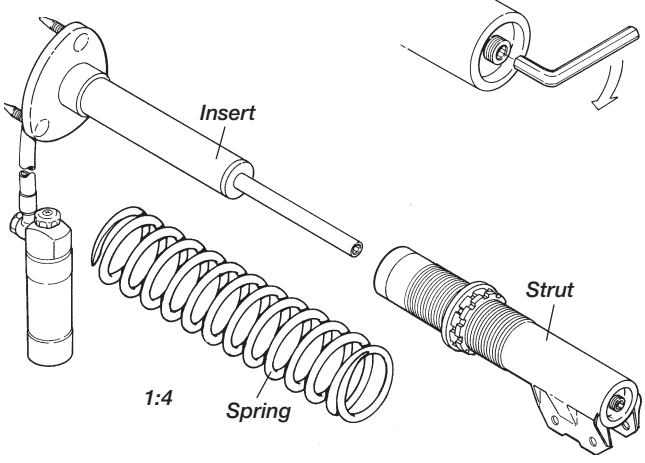

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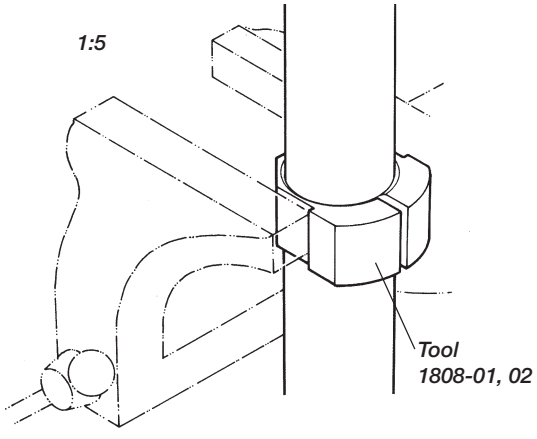

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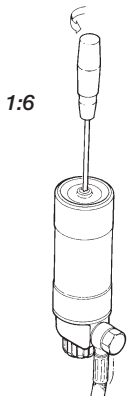
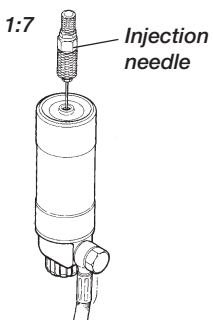




1:6
Remove the screw and o-ring from the reservoir end cap (Shock absorber head on shock absorber models without external reservoir.)

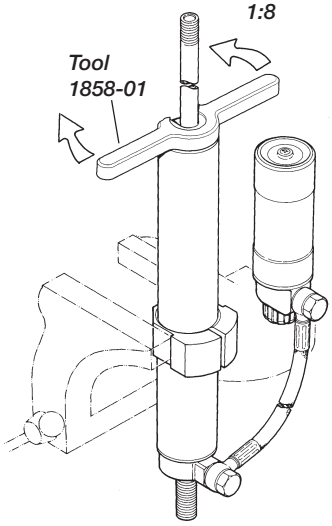
NOTE!

Before the gas pressure is relieved the adjuster settings must be counted and noted. Even check that the gas pressure is correct. Following that, the adjusters should be set in a fully open position.

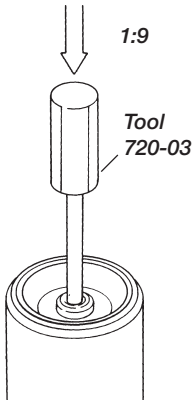
1:7
Relieve the nitrogen gas pressure by inserting an injection needle into the shaft through the rubber valve.

⚠ WARNING

Releasing high pressure gas from the shock absorber can be hazardous. Do not perform any kind of service until gas pressure is completely released.

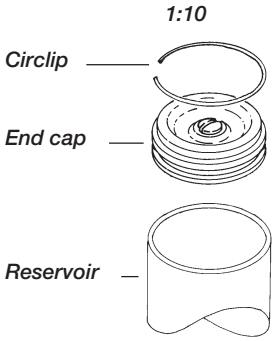


1:8
Use tool 1858-01 to loosen and remove the cylinder end cap. Push the seal head down and remove the circlip.



1:9
Push the end cap of the reservoir down into the reservoir, use tool 720-03.

1:10
Remove the circlip. Remove the end cap.



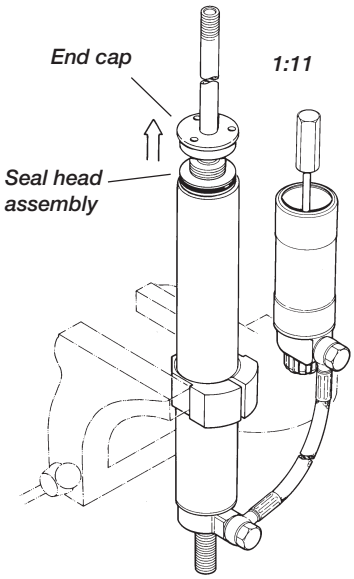
1:11
Pull the shaft assembly up carefully and remove it from the cylinder tube.

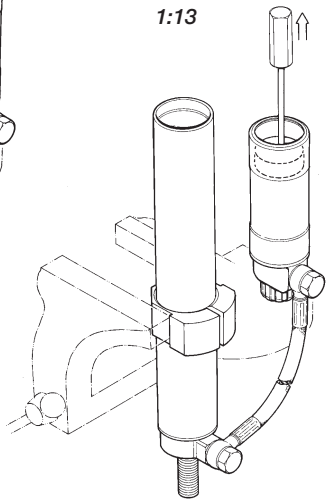
1:12
Drain the shock absorber from oil.

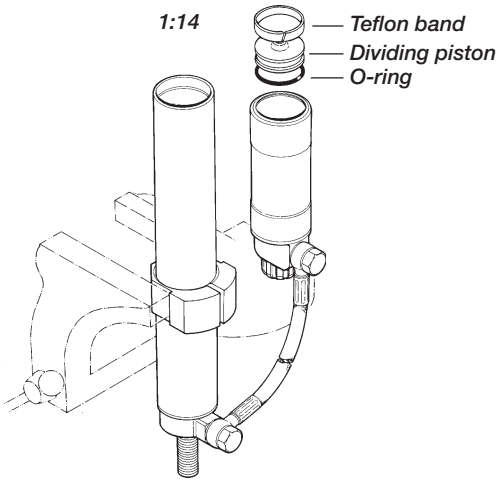
1:13
Remove the dividing piston with tool 720-02 and drain the oil again.

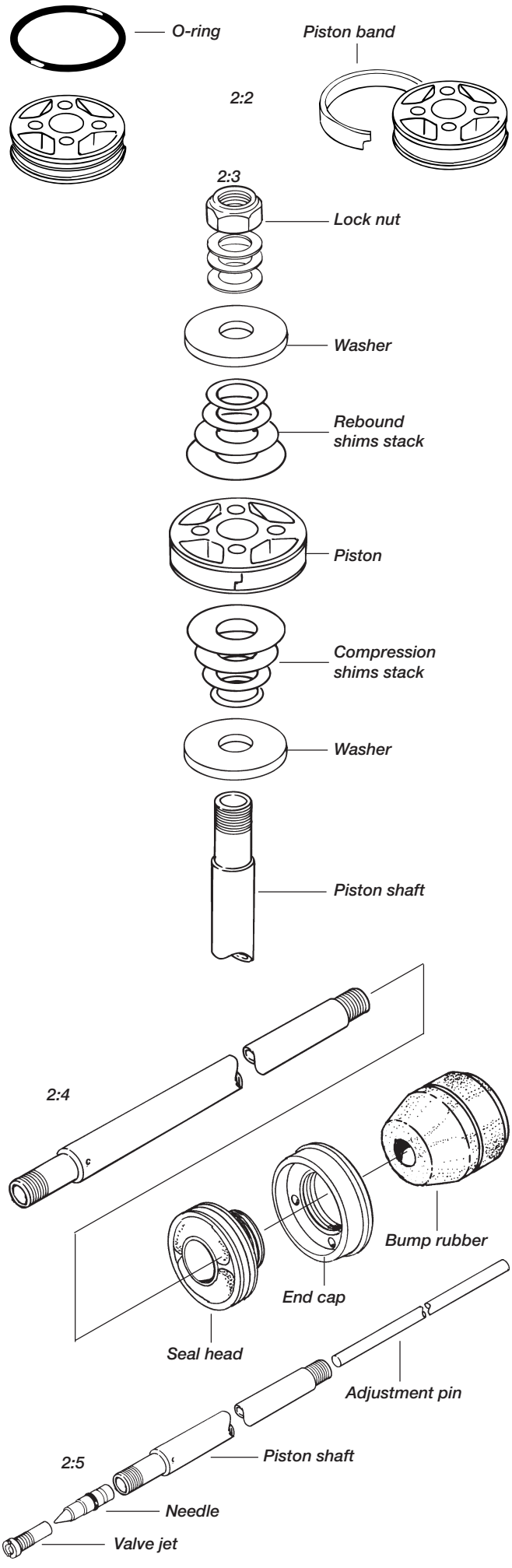
1:14
Remove all o-rings and seals.

1:15
Clean all parts carefully.









Dismantling the piston shaft assembly

2:1
Fasten the shaft assembly in a vice with soft jaws. Use clamping tool (727-xx)

2:2
Remove teflon band from the damper piston

2:3
Remove the lock nut, the rebound shims stack, the damper piston and the compression shim stack.

NOTE!

Put the shim stack aside and place the shims in the same order as they were fitted on shaft.

2:4
Remove all the other parts from the shaft and put them aside in correct order.

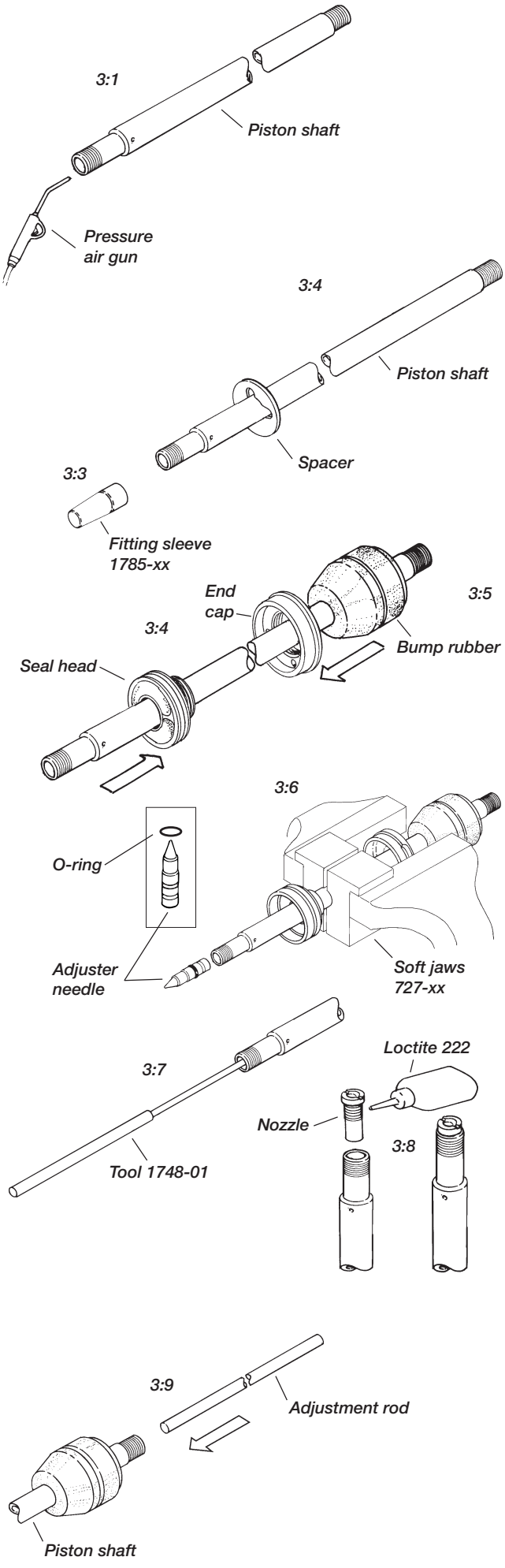
2:5
Remove the adjustment valve jet, the adjustment needle and the adjustment pin.

2:6
Clean all parts carefully and inspect for wear or damage. Check the o-ring of the needle and replace if necessary.

2:7
Inspect the shaft for bends and scratches.

2:8
Replace teflon ring, o-rings and lock nut.

2:9
If necessary replace bump rubber, scraper ring and cap, seal head assembly and eventual other defect parts.



Reassembling the piston shaft

3:1
Blow the piston shaft clean with compressed air.

NOTE!

Apply Öhlins red grease (146-01) to all o-rings and seals.

3:2
Check the spec.card to see whether spacers are to be used on the piston shaft. If so, mount these before fitting the seal head assembly.

3:3
Use fitting sleeve (1785-xx) to protect the seal in the seal head assembly.

3:4
Lubricate the piston shaft with shock absorber fluid so that the seal head assembly slides on easily.

3:5
Put on the end cap and the bump rubber.

3:6
Grip the piston shaft with soft jaws 727-xx.
Fit the O-ring on the adjustment needle. Apply plenty of red grease on the O-ring so that the needle slides easily into the piston shaft.

NOTE!

Always ensure that the correct needle is used in relation to the nozzle.

3:7
Press the needle down, using the tool 1748-01, until it comes to a stop.

NOTE!

If the seating in the nozzle is chamfered, the nozzle must be replaced with one without chamfer.

3:8
Carefully tighten the nozzle. Use Loctite 222.

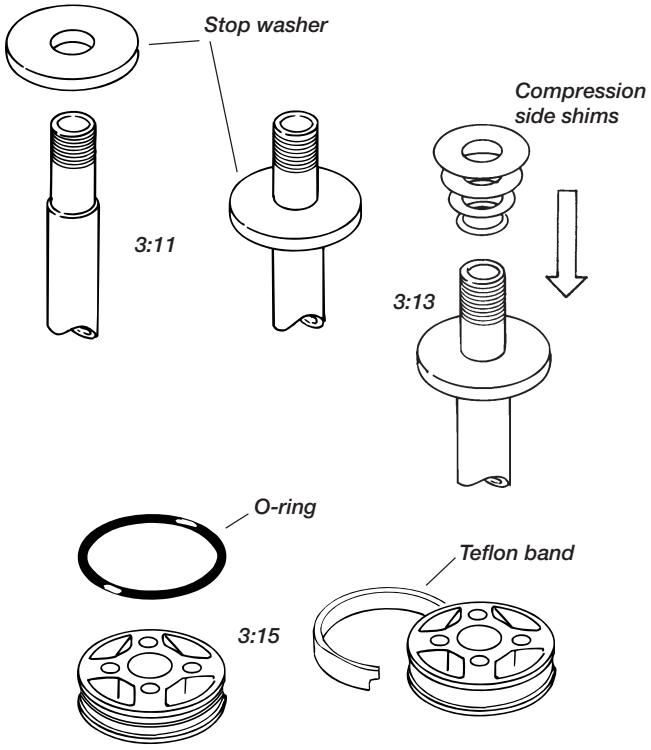
3:9
Apply a little red grease to the adjustment rod and insert it into the piston shaft from the top.

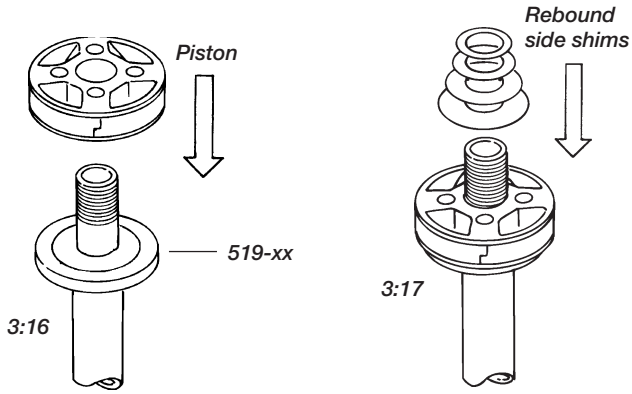
NOTE!

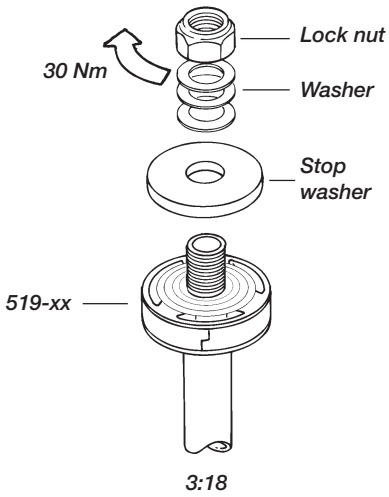
Ensure that the thread on the piston shaft is free from oil.

NOTE!

Regardings 12 mm shaft, see page 27, chapter shock absorber 36.







Mounting of piston on piston shaft and fitting shims

3:10
Grip the end eye in a vice. Use soft jaws.

CAUTION!

The chamfered side of the stop washer must face away from the lock nut.

3:11
Put the stop washer in position.

3:12
Check shims and replace if necessary.

3:13
Place shims on the compression side according to the spec. card.

3:14
Ensure that the correct piston is beeing used. If a flat piston is used face the piston using 1200 abrasive paper to ensure a completely even and flat surface. Ensure that there are no burrs or particels on the piston or in the fluid ducts.

3:15
Where applicable, fit the O-ring underneath the Teflon band on the piston. Mount the piston ring.

3:16
Put the piston on the piston shaft.

NOTE!

Ensure that the piston faces the correct way. The grooved side of the piston must face the nut.

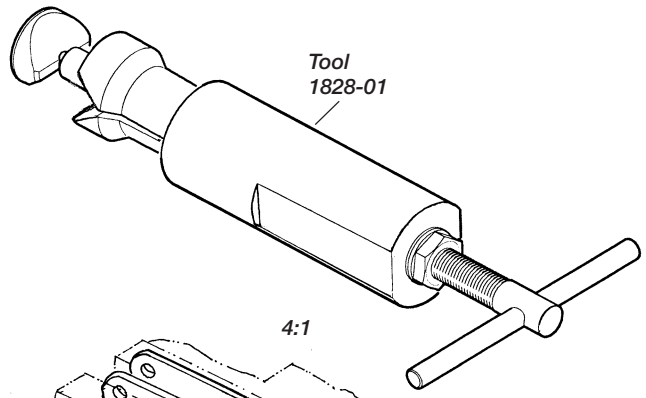
3:17
Fit the shims on the rebound side. Carefully check the spec.card to see which washer (519- *xx*) is to lie on the top shim.

NOTE!

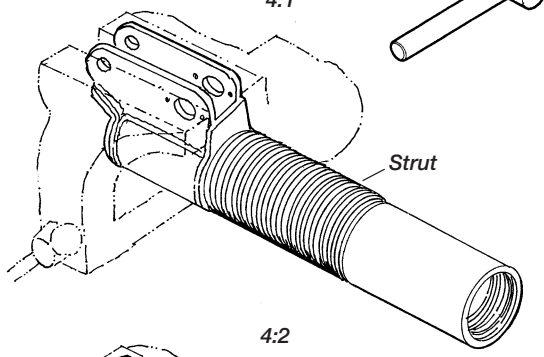
There are several different types of 519-xx washers.

3:18
Refit the stop washer, the washers and the lock nut, torque tighten to 30 Nm.

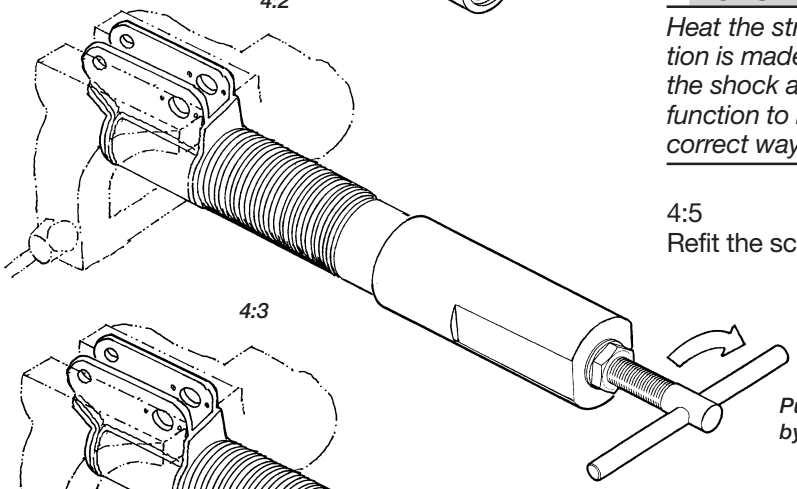
Changing of bushings in the strut.



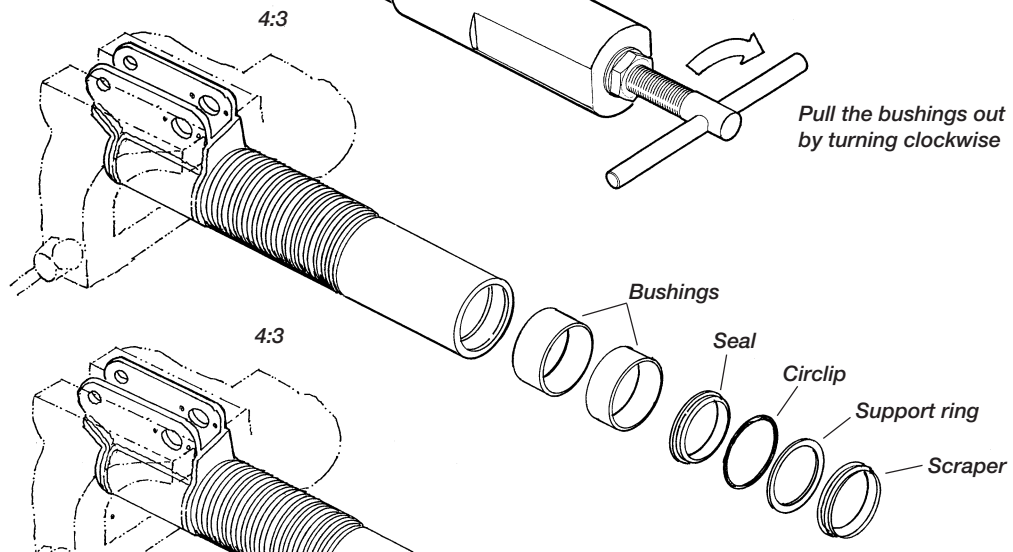
4:1
Fasten the strut in a vice horizontally. Use Bushing removal tool 1828-01 (ø50-ø54 only).



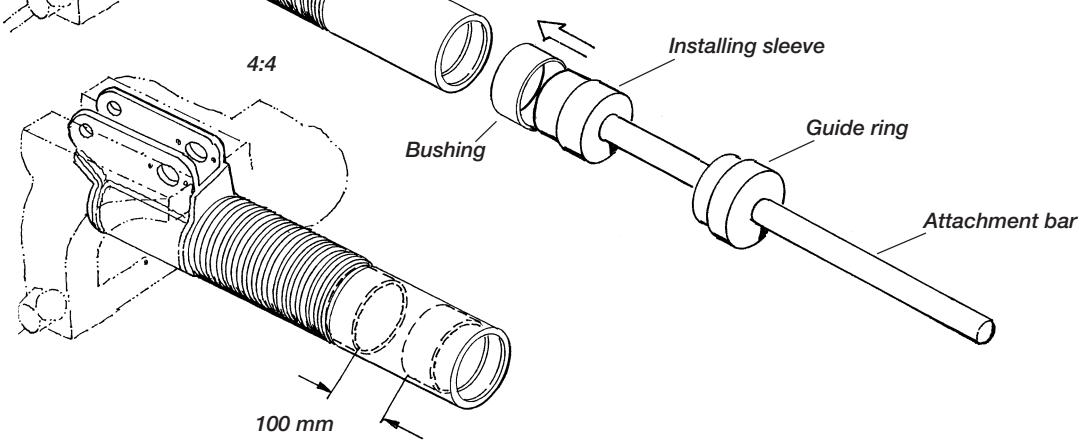
4:2
Push the tool into the lower bushing, fix it and pull the bushing out together with the upper bushing, the scrapers and the support ring. (and o-rings when frequent)



4:3
Clean the strut carefully and reinstall the bushings. Use attachment bar 1757-01, installing sleeve 1759-xx and guide ring 1758-xx. Start with the lower bushing and push it down all the way to the seat.



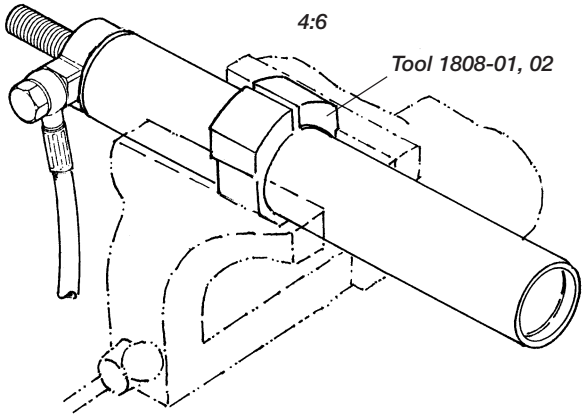
4:4
The upper bushing should be pushed down so it is 100 mm above the lower bushing. Apply some locking fluid Loctite 601 or similar before installing them.

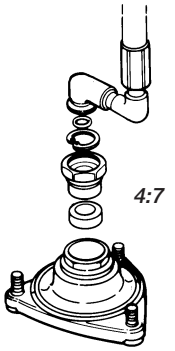


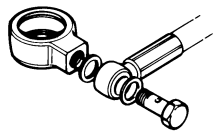
CAUTION

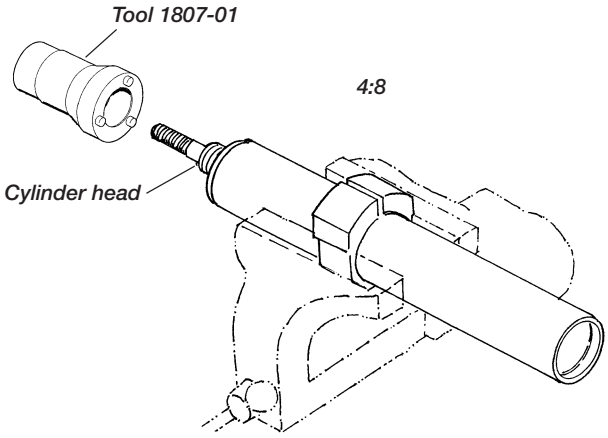
Heat the strut up with a heat air gun, before the installation is made. Be careful to get the bushings straight. Put the shock absorber cylinder into the strut and check the function to make sure that the bushings are installed in a correct way.

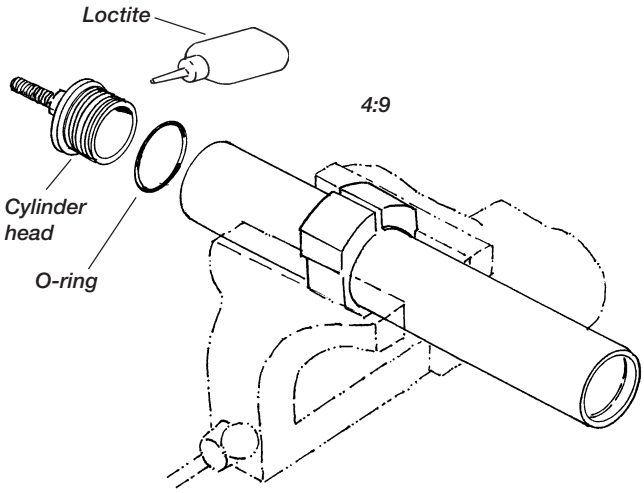
4:5
Refit the scrapers and the support ring.











Removal and refitting of the cylinder head

4:6
Fasten the cylinder body in a vice horizontally. Again use tools 1808-01 or 1808-02.

4:7
Remove the hose connection.

4:8
Loosen and remove the Cylinder head. Use tool 1807-01 and a breaker bar.

NOTE!

The thread on the cylinder head is fixed with Loctite 648. This makes it necessary to use a heat air gun to heat the cylinder head before it is unthreaded.

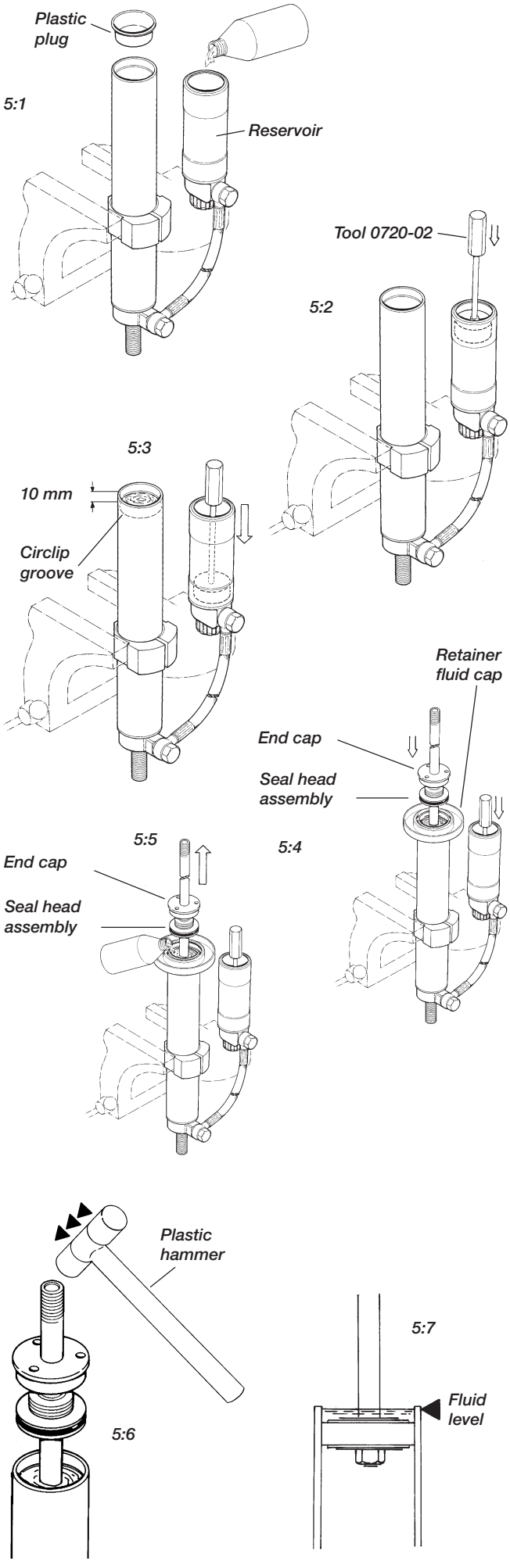
4:9
When refitting the cylinder head it is of vital importance to use Loctite again.

NOTE!

1807-01 for cylinder head 5188 and 5594.

1857-01 for cylinder head Mc Pherson ø40 together with sleeve 5991-01 for cylinder head 5911-03 and 5911-04.

1857-01 for cylinder head Mc Pherson ø40 together with sleeve 5991-02 for cylinder head 5911-01 and 5911-02



Assembling of McPherson shock absorber

5:1
Insert a plastic plug (764-01) in the cylinder tube. Fill up with Öhlins fluid all the way to the edge of the reservoir.

5:2
Push the dividing piston, with teflon band and O-ring fitted, down in to the reservoir without allowing it to be pressed back over the circlip groove, make sure that there is no air between the piston and the oil.

5:3
Push the dividing piston to the bottom, using tool 720-02.

Close the compression adjuster.
Measure the distance from the edge of the reservoir to the upper edge of the dividing piston and make a note of the lenght. Fill the cylinder tube with Öhlins fluid to about 10 mm below the circlip groove.

5:4
Install an fluid retainer cup. Insert the piston shaft into the cylinder tube. Take care, that fluid does not squirt up. When the piston is submerged in the fluid the piston shaft should be pressed down hard, to force out air between the shims and piston.

5:5
Wait a while to allow air bubbles to rise to the surface. Pull the piston shaft up a bit, without allowing the bleed holes to come above the surface. Top up with more fluid if required.

NOTE!

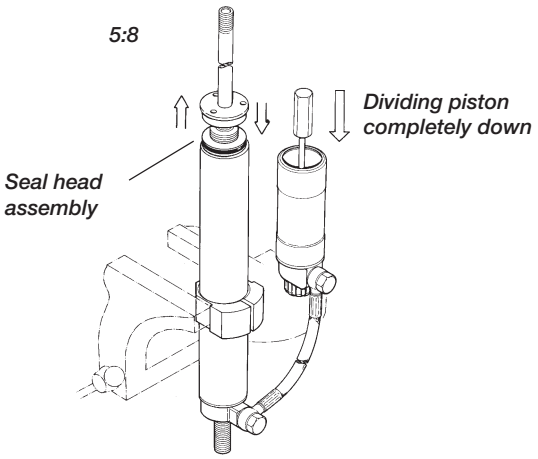
This labour forces fluid through the apertures of the main piston and helps to bleed out all air.

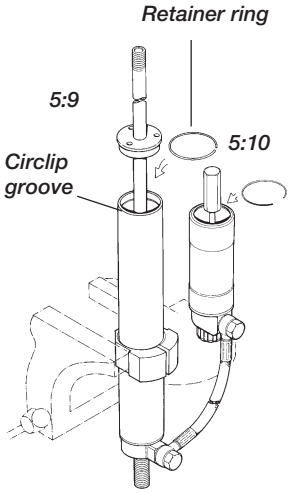
5:6
Repeat this procedure until all air is expelled. If the shims are very hard, a check can be made by pushing down the piston rod very hard. If there is still air remaining the fluid level will move. If so, strike the piston shaft end firmly with a plastic hammer to make the shims open.

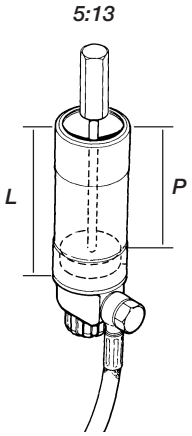
5:7
When all air has been expelled, pull the piston shaft up as far as possible without the bleed holes in the piston shaft coming above the surface of the fluid. Top up with fluid all the way up to the edge of the cylinder tube.

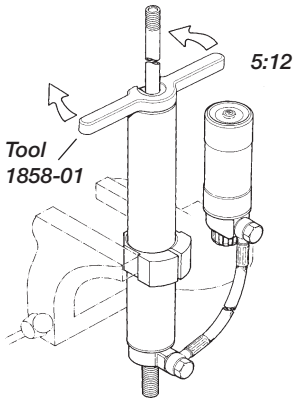
NOTE!

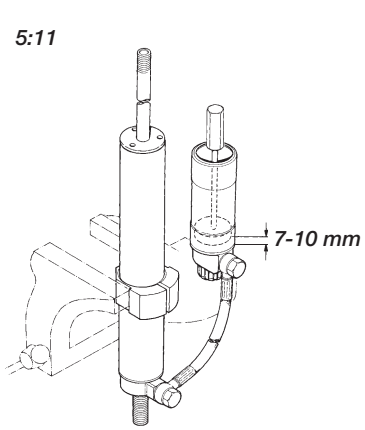
Rotate the piston shaft lightly to seat the teflon band properly against the body tube bore.

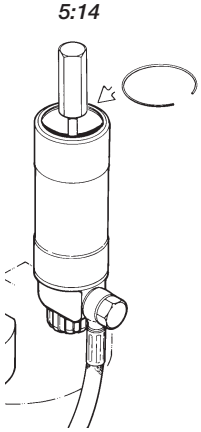












5:8
Push the seal head down against the fluid and carefully down to the O-ring groove make sure that the bleedhole is facing away from you. Then push the piston shaft down halfway. Make sure that the dividing piston is completely down to the bottom of the reservoir.

5:9
Open the compression valve and, using a blunt screw-driver, push the seal head assembly down until the circlip groove is visible.

5:10
Fit the circlip and pull up the piston shaft up, make sure that the circlip is fixed in its groove and in the seal head assembly groove.

5:11
Fit the end cap with tool 1858-01. Apply red grease 146-01. Tighten to 50 Nm.

5:12
With the piston shaft fully out measure again from the edge of the reservoir to the upper edge of the dividing piston. If the value between the first and the second measurement is more than 7 mm or less than 4 mm, open the filling screw and adjust the position of the dividing piston carefully, if the piston is too far in top up with fluid in filling hole. Then screw in the filling screw.

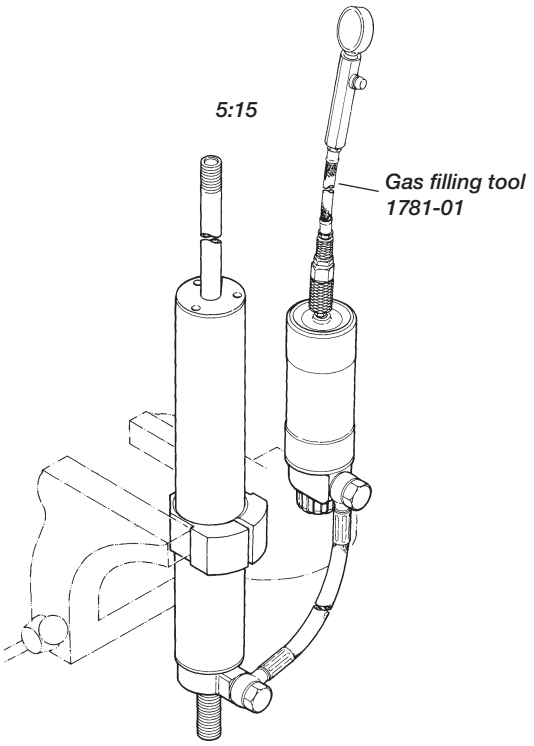
NOTE!

Put the dividing piston in correct position according to table.

5:13

Reservoir length (L)	Position of dividing piston (P)
80	47
90	57
110	77
120	87
133	100
150	117
180	147
220	187

5:14
Fit the O-ring on the reservoir cap assy, apply some red grease on the O-ring and push it into the chamber using tool 720-03. Fit the circlip make certain that it enters its groove properly.



Pressurising and assembling protective cover on the cylinder

NOTE!

Nitrogen (N2) gas . Use pressure gauge (1781-01).

⚠ WARNING!

Use of inflammable gas for pressurising the shock absorber can be hazardous. ***Use nitrogen gas (N2) only****.*

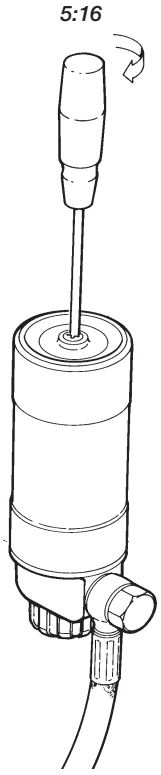
5:15
Check the gas pressure stipulated in the spec.card. Dip the needle of the gas tool (1781-01) in red grease and insert the needle through the gas filler valve.

Charge with gas to the correct pressure, according to the spec.card.

NOTE!

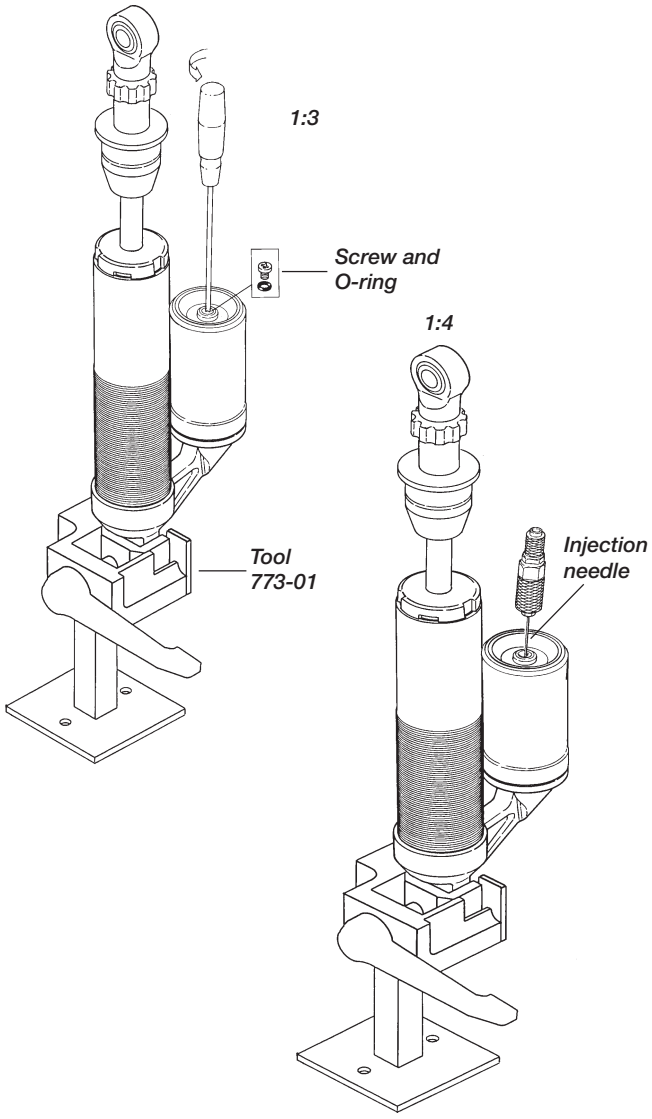
Ensure that there is no leakage of gas or fluid.

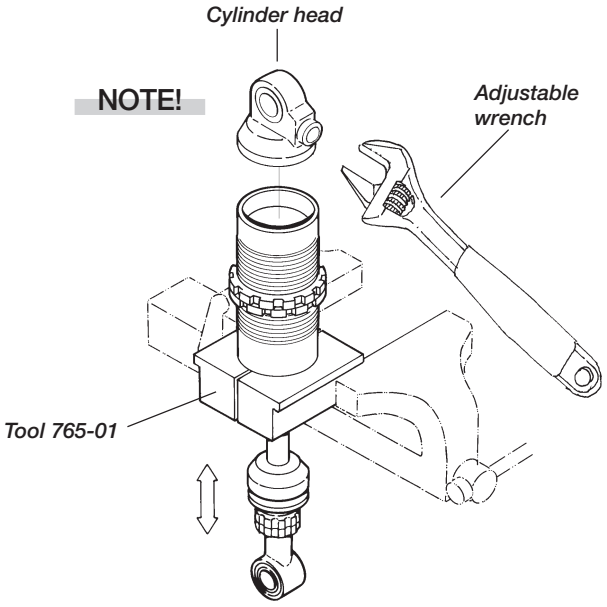
5:16
Screw in the gas filler screw with O-ring.



Shock absorber 46

Contents





Dismantling the shock absorber

1:1
Remove the spring, use tool 747-01.
Use correct tool to avoid damages.

1:2
Clean the shock absorber carefully externally and inspect for damages.

1:3
Fasten the shock absorber use tool 773-01. Remove the screw and o-ring from the reservoir end cap
(Shock absorber head on shock absorber models without external reservoir.)

NOTE!

Before the gas pressure is relieved the adjuster settings must be counted and noted. Even check that the gas pressure is correct. Following that, the adjusters should be set in a fully open position.

1:4
Relieve the nitrogen gas pressure by inserting an injection needle into the shaft through the valve rubber.

⚠ WARNING

Releasing high pressure gas from the shock absorber can be hazardous. Do not perform any kind of service until gas pressure is completely released.

1:5
Remove the end cap from the shock absorber body. Use a chisel and a hammer.

NOTE!

Shock absorbers type D (Internal dividing piston) must have their cylinder head removed. The cylinder tube is fitted in a vice with tool (765-01). Heat the head with a heatgun and use a adjustable wrench to remove it.

1:6
Depress the seal head approximately 15 mm.

1:7
Release and remove the circlip from the cylinder tube with tool 715-01 or a similar tool. If necessary remove burrs from the circlip groove with a riffer.

1:8
Push the end cap of the reservoir down into the reservoir, use tool 720-03, remove the circlip. Remove the end cap.

1:9
Fit a measure pin to the dividing piston.

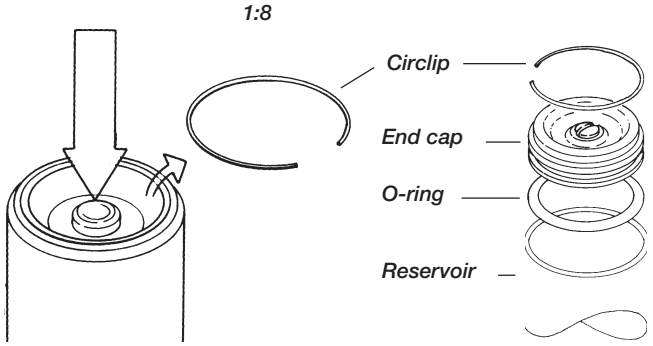
1.10
Lower the oil level by pulling the reservoir dividing piston outwards by help of the measure pin and by pulling the shaft outwards.

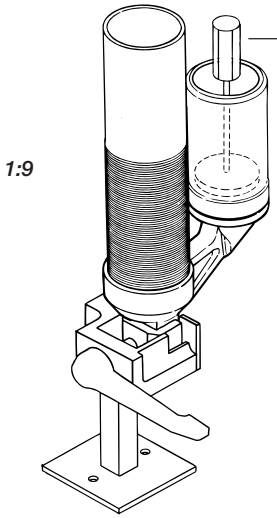
1:11
Pull the shaft assembly up carefully and remove it from the cylinder tube.

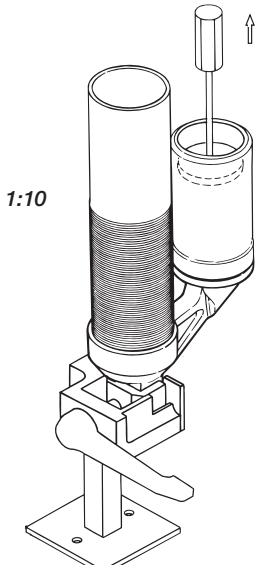
1:12
Remove the dividing piston and drain the shock absorber from oil.

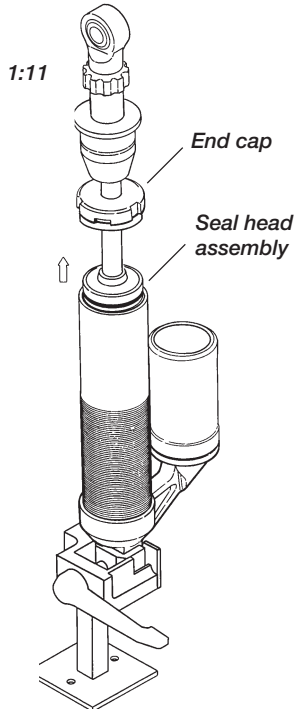
1:13
Remove all o-rings and seals.

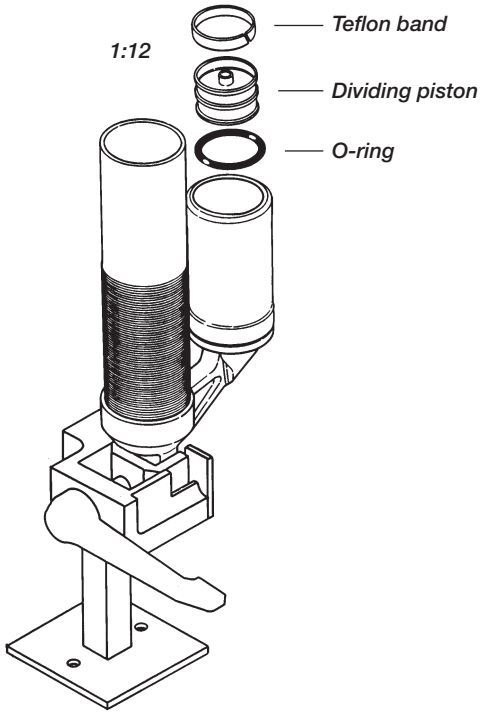
1:14
Clean all parts carefully.

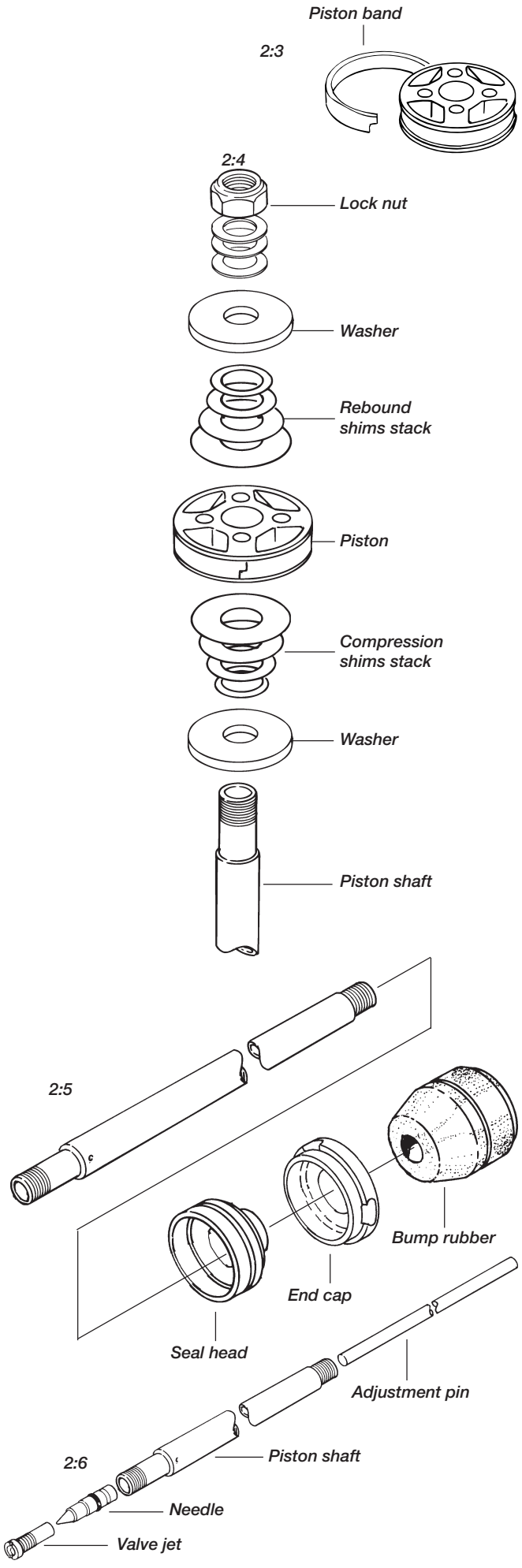












Dismantling the piston shaft assembly

2:1
Fasten the shaft assembly in a vice with soft jaws. Use clamping tool (727-xx)

NOTE!

The following text (2:2 and 2:3) is related to shock absorbers of PDS type only.

2:2
Remove the lock nut (13 mm key)of the PDS piston and remove the washer. Remove the upper shims stack, the piston and the lower shim stack. Remove the stop washer and loosen the PDS piston holder (13 mm key).

NOTE!

Put the shim stack aside and place the shims in the same order as they were fitted on piston holder.

2:3
Remove teflon band of the damper piston

2:4
Remove the lock nut *(already done on PDS model),* the rebound shims stack, the damper piston and the compression shim stack.

NOTE!

Put the shim stack aside and place the shims in the same order as they were fitted on shaft.

2:5
Remove all the other parts from the shaft and put them aside in correct order.

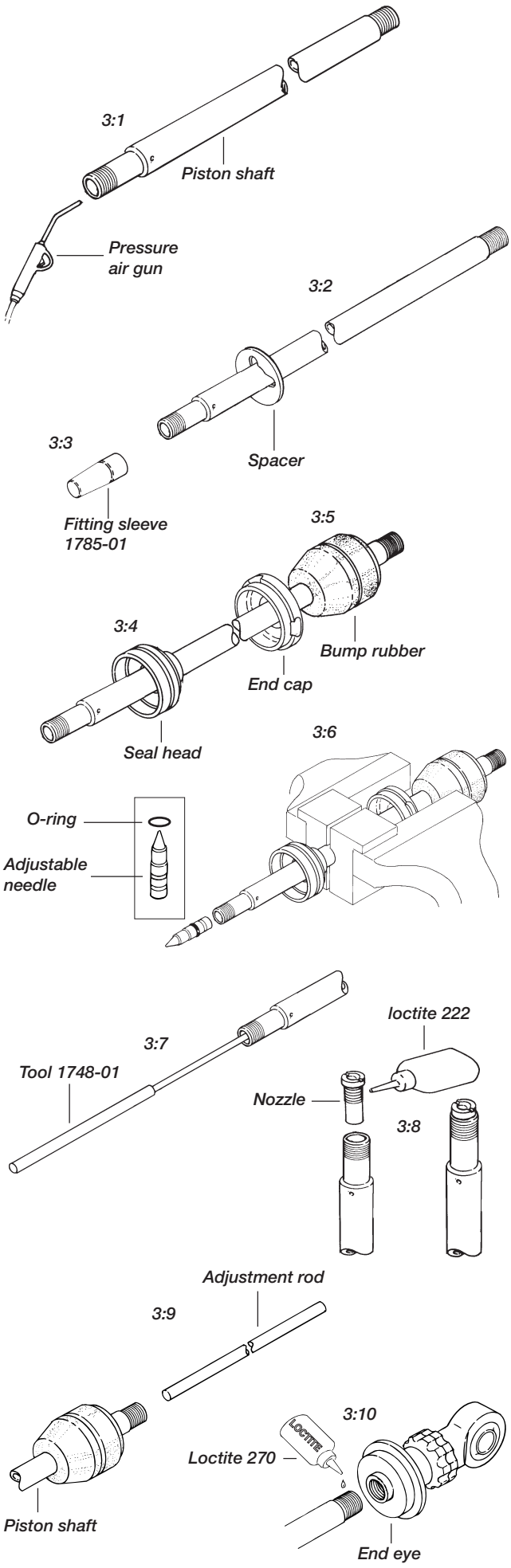
2:6.
Remove the end eye, use a heatgun.
Remove the adjustment valve jet, the adjustment needle and the adjustment pin.

2:7
Clean all parts carefully and inspect for wear or damage. Check the o-ring of the needle and replace if necessary.

2:8
Inspect the shaft for bends and scratches.

2:9
Replace piston ring, o-rings and lock nut.

2:10
If necessary replace bump rubber, scraper ring and cap, seal head assembly and eventual other defect parts.



Reassembling the piston shaft

3:1
Blow the piston shaft clean with compressed air.

NOTE!

Apply Öhlins red grease (146-01) to all o-rings and seals.

3:2
Check the spec.card to see whether spacers are to be used on the piston shaft. If so, mount these before fitting the seal head assembly.

3:3
Use fitting sleeve (1785-02) to protect the seal in the seal head assembly.

3:4
Lubricate the piston shaft with shock absorber fluid so that the seal head assembly slides on easily.

3:5
Put on the end cap and the bump rubber.

3:6
Grip the piston shaft with soft jaws 727-xx.
Fit the O-ring on the adjustment needle. Apply plenty of red grease on the O-ring so that the needle slides easily into the piston shaft.

NOTE!

Always ensure that the correct needle is used in relation to the nozzle.

3:7
Press the needle down, using the tool 1748-01, until it comes to a stop.

NOTE!

If the seating in the nozzle is chamfered, the nozzle must be replaced with one without chamfer.

3:8
Carefully tighten the nozzle. Use Loctite 222.

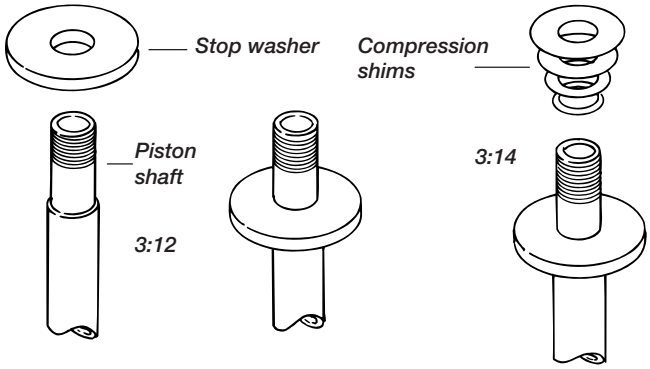
3:9
Apply a little red grease to the adjustment rod and insert it into the piston shaft from the top.

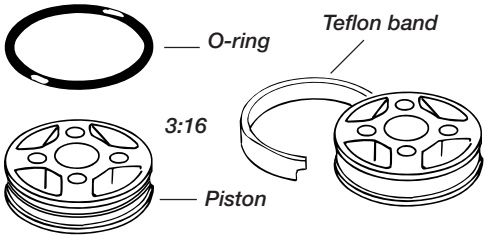
NOTE!

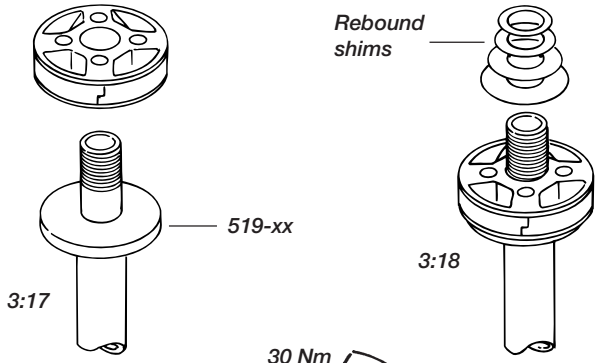
Ensure that the thread on the piston shaft is free from oil.

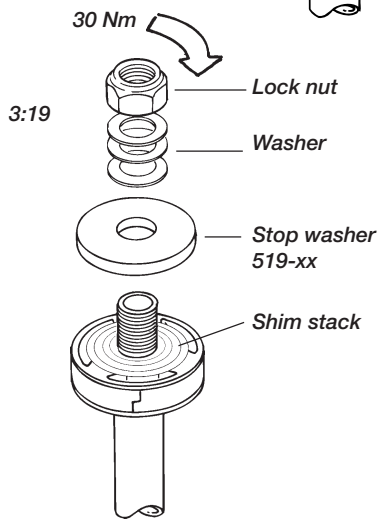
Mounting the end eye.

3:10
Use Loctite 270 on the piston shaft thread, screw the end eye on and tighten using an adjustable wrench.
Tightening torque: See page drawings for correct torque.









3:20
Fit the PDS piston holder and tighten it to 30 Nm. Fit the stop washer, the lower shim stack, the piston and the upper shim stack. Use cleaner to make the shims dry, so they do not rotate during assembly work.

CAUTION!

It is of great importance that the triangular shims are in correct position when the PDS piston assembly is mounted. Check from both sides.

3:21
Put the washer and lock nut back to the PDS holder and tighten to 18 Nm.

Mounting of piston on piston shaft and fitting shims

3:11
Grip the end eye in a vice. Use soft jaws.
Put the “top out” spring in position, if one is beeing used.

NOTE!

Always ensure that the correct spring is used. Check also that the spring does not protrude too far above the sleeve. There is a risk that the sleeve will slide down when tightening the shims nut.

CAUTION!

The chamfered side of the stop washer must face away from the lock nut.

3:12
Put the stop washer in position.

3:13
Check shims and replace if necessary.

3:14
Place shims on the compression side according to the spec. card.

NOTE!

Make sure to put the shims in right order and that the shims are in correct position to the piston. (See spec. card)

3:15
Ensure that the correct piston is beeing used. If a flat piston is used face the piston using 1200 abrasive paper to ensure a completely even and flat surface. Ensure that there are no burrs or particels on the piston or in the fluid ducts.

3:16
Where applicable, fit the O-ring underneath the Teflon band on the piston. Mount the piston ring.

3:17
Put the piston on the piston shaft.

NOTE!

Ensure that the piston faces the correct way. The grooved side of the piston must face the nut.

3:18
Fit the shims on the rebound side. Carefully check the spec.card to see which washer (519- *xx*) is to lie on the top shim.

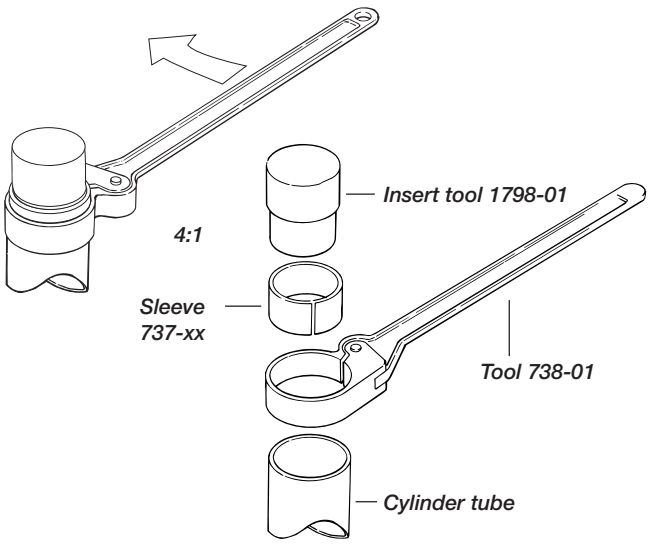
NOTE!

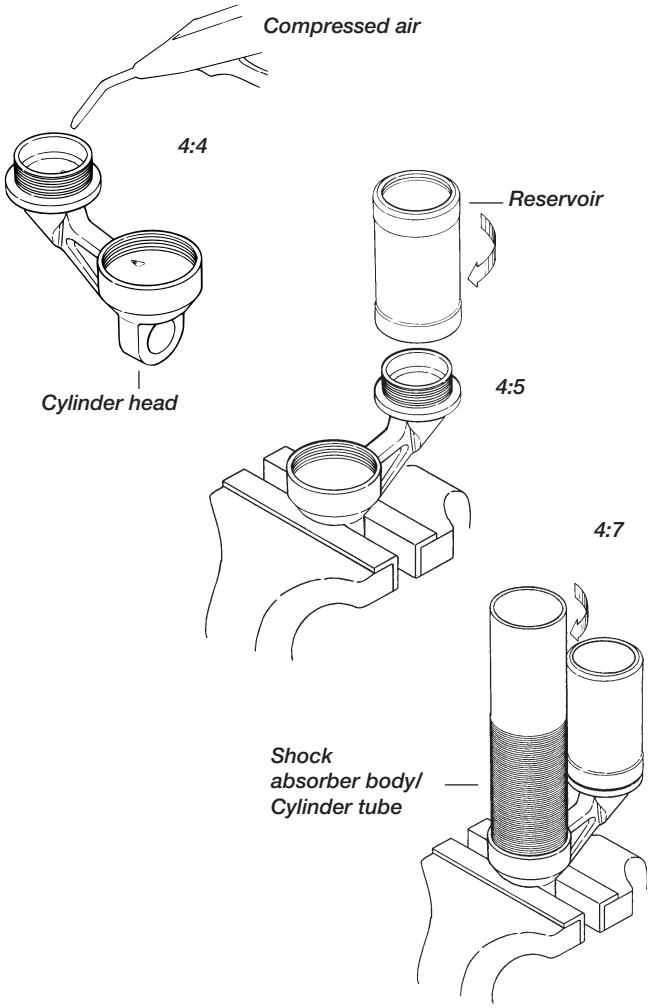
There are several different types of 519-xx washers.

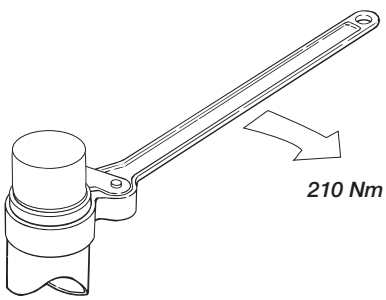
3:19
Refit the lock nut, torque tighten to 30 Nm.

NOTE!

The following text (4.10-4.11) is related to shock absorbers of PDS type only .







Removing and refitting the cylinder head

CAUTION!

Removing the cylinder head is only carried out on shock absorbers with internal dividing piston (D) or when the cylinder tube or reservoir tube must be changed.

4:1
Grip the shock absorber head in the vice with soft jaws. Use tool (738-01) in combination with sleeve (737-xx) and insert tool (1798-01) to loosen the cylinder tube.

NOTE!

The cylinder head is fastened with Loctite. It is necessary to heat the surfaces near the threads to remove the cylinder tube and the reservoir tube. Use a heat air gun.

4:2
Use tool (738-01) in combination with sleeve (737-xx) to loosen the reservoir

4:3
Screw cylinder tube and reservoir out by hand. Remove and waste the O-rings from the cylinder head

4:4
Blow the shock absorber head clean with compressed air. Ensure that there are no particles left in the ducts. Apply red grease to new O-rings. Fit new O-rings.

NOTE!

Ensure that the correct O-rings are beeing used.

4:5
Grip the shock absorber head in the vice with soft jaws, screw the gas reservoir in position by hand. Make certain that the O-ring has not been damaged. Tighten the reservoir using tool 738-01 and sleeve (737-xx).

NOTE!

Tighten using moderate force.

4:6
A retainer ring (533-01) is used on some cylinder tubes. Loctite is not necessary if a retainer ring is used. Otherwise use Loctite 542.

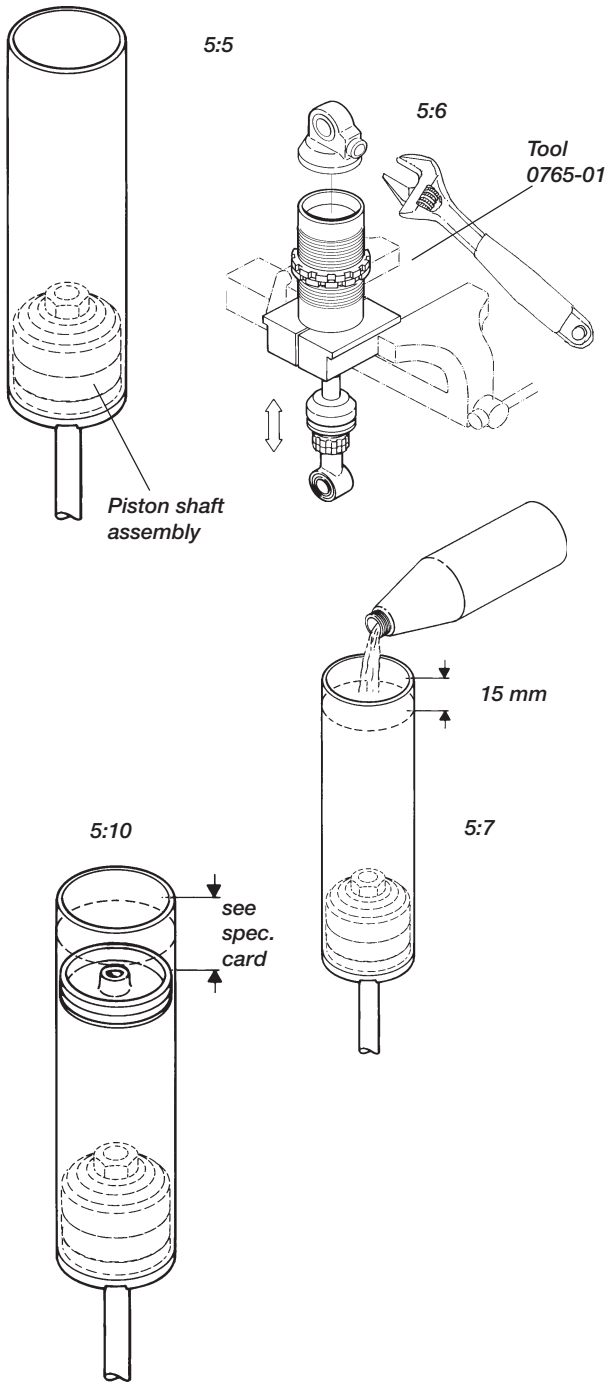
4:7
Screw the cylinder tube to the bottom and check that the O-ring has not been damaged.

4:8
Tighten the cylinder tube using tool 738-01 and sleeve 737-01 insert tool 1798-01 in the cylinder tube to prevent deformation when tightening. Torque tighten to 210 Nm. If a lock nut is used, tighten it with tool 743-01.

4:9
Screw in the filler screw with the O-ring.

NOTE!

If an oil filling machine is beeing used, the O-ring and screw are not to be fitted at this moment.



5:10
Install the dividing piston into the cylinder tube and set the piston position with 757-xx and a vernier.
See spec.card for correct position.

5.11
Install the centre screw and use tool 757-xx to hold the dividing piston when tightening the screw. Wipe off eccesive oil.

5:12
Clean the cylinder tube thread with cleaner and use Loctite 270 on the thread when installing in the cylinder head. Turn the tube body around and fasten the cylinder head in a vice with soft claws. Use tools 737-xx and 738-01 to tighten the body tube

Assembling the shock absorber

5:1
Fasten the shock absorber in tool 773-01

NOTE!

Apply Öhlins red grease 146-01 to all o-rings and seals and a thin layer to the inside of the cylinder tube.

Shock absorber emulsion type only

5:2
Fill the cylinder tube with Öhlins oil to the recommended oil level. See spec.card.

5:3
Make sure that the adjustment needle is fully open before installing the piston shaft. Install the piston shaft assembly into the cylinder tube.

5:4
Install the circlip and make sure it is properly seated before the end cap is fixed by knocking it in with a plastic hammer.

NOTE!

Shock absorbers without dividing piston must be pressurised in upright position. I.e. the shock absorber head facing upwards.

Shock absorber with internal dividing piston type D

5:5
Make sure that the needle is fully open before installing the piston shaft. Install the piston shaft assembly into the cylinder tube. Install the seal head, circlip and and make sure it is properly seated before the end cap is fixed by knocking it in with a plastic hammer.

5:6
Turn the cylinder tube so the piston shaft is facing downwards. Use tool 765-01 to hold the tube in the vice.

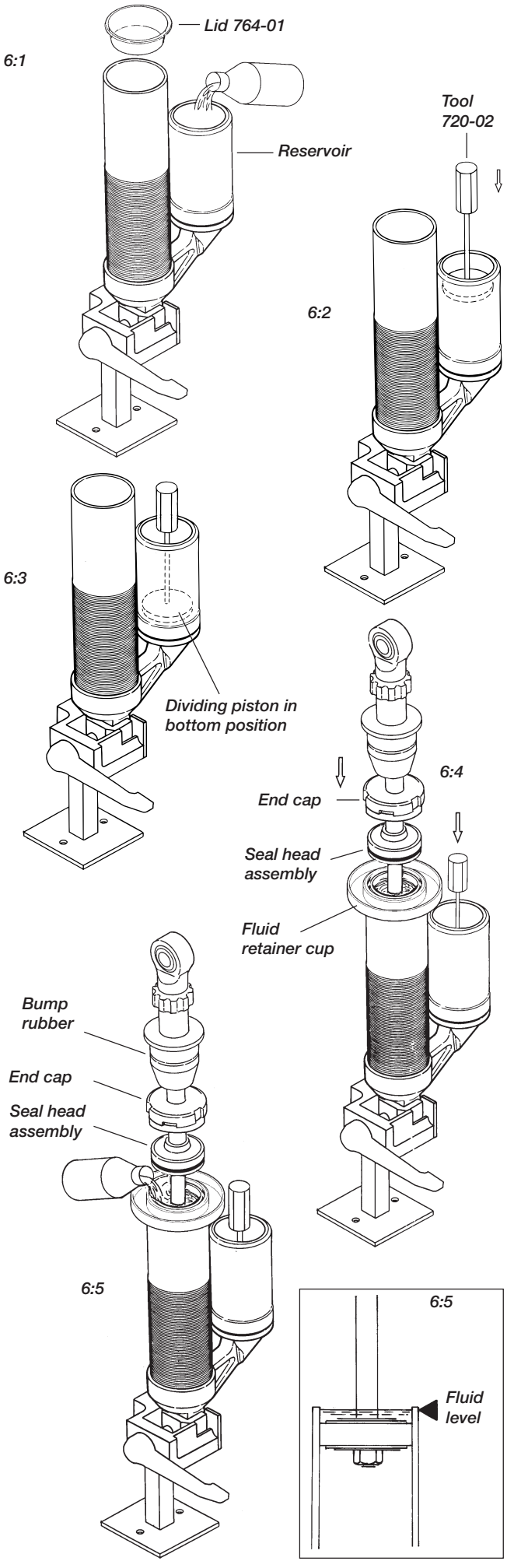
5:7
Fill the cylinder tube with Öhlins oil (to approximately 15 mm from the top of the tube. Bleed out remaining air by slowly moving the piston shaft up and down in the cylinder tube. Do not push hard, just move the the shaft slowly.

NOTE!

To obtain maximum oil volume, pull the shaft out to fully extended length before installing the dividing piston

.
5:8
Inspect the dividing piston for wear or damage.

5:9
Replace o-rings and piston rings with new.
Use Öhlins grease 146-01 on all o-rings and seals.



Shock absorber with external reservoir

6:1
Insert a plastic plug (764-01) in the cylinder tube. Fill up with Öhlins fluid all the way to the edge of the reservoir.

6:2
Push the dividing piston, with teflon band and O-ring fitted, down in to the reservoir without allowing it to be pressed back over the circlip groove, make sure that there is no air between the piston and the oil.

6:3
Push the dividing piston to the bottom, using tool 720-02.

Close the compression adjuster.
Measure the distance from the edge of the reservoir to the upper edge of the dividing piston and make a note of the lenght. Fill the cylinder tube with Öhlins fluid to about 10 mm below the circlip groove.

6:4
Install an fluid retainer cup. Insert the piston shaft into the cylinder tube. Take care, that fluid does not squirt up. When the piston is submerged in the fluid the piston shaft should be pressed down hard, to force out air between the shims and piston.

NOTE!

This labour forces fluid through the apertures of the main piston and helps to bleed out all air.

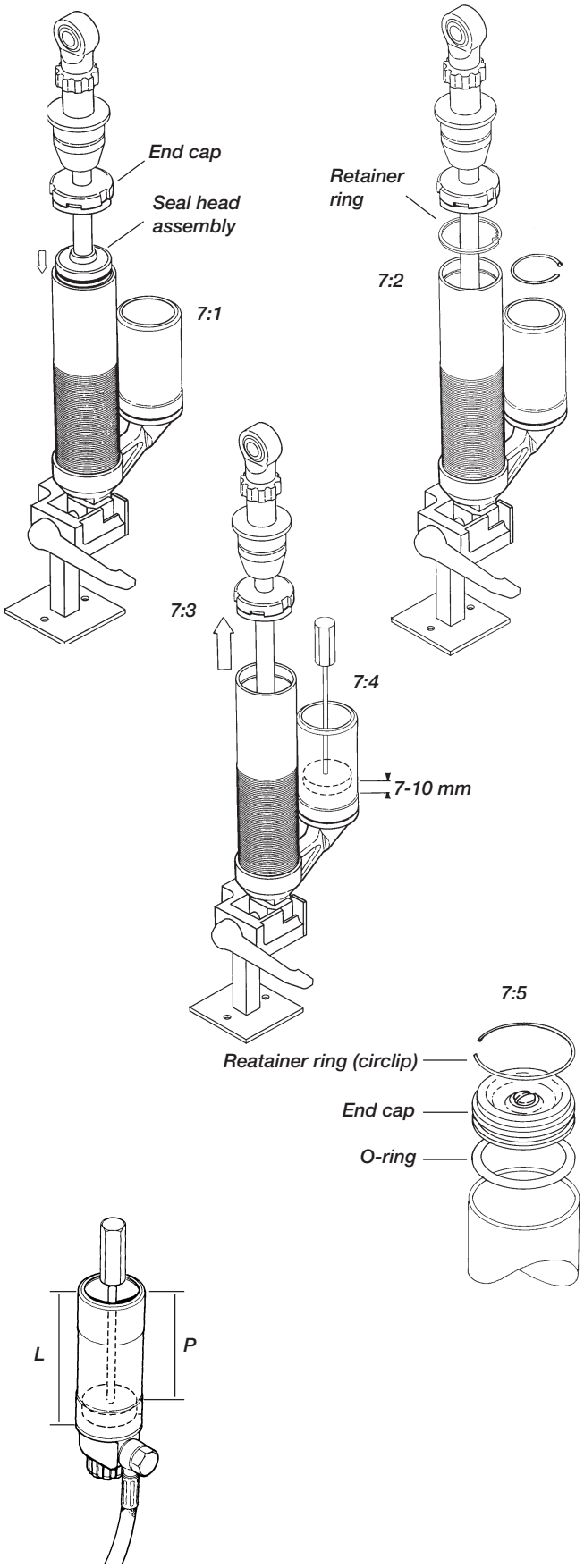
6:5
Wait a while to allow air bubbles to rise to the surface. Pull the piston shaft up a bit, without allowing the bleed holes to come above the surface. Top up with more fluid if required.

6:6
Repeat this procedure until all air is expelled. If the shims are very hard, a check can be made by pushing down the piston rod very hard. If there is still air remaining the fluid level will move. If so, strike the end eye firmly with a plastic hammer to make the shims open.

6:7
When all air has been expelled, pull the piston shaft up as far as possible without the bleed holes in the piston shaft coming above the surface of the fluid. Top up with fluid all the way up to the edge of the cylinder tube.

NOTE!

Rotate the piston shaft lightly to seat the teflon band properly against the body tube bore.



Mounting the seal head assembly and end piece on reservoir

7:1
Push the seal head down against the fluid and carefully down to the O-ring groove make sure that the bleedhole is facing away from you. Then push the piston shaft down halfway. Make sure that the dividing piston is fully down to the bottom of the reservoir.

7:2
Open the compression valve and, using a blunt screw-driver, push the seal head assembly down until the circlip groove is visible.

7:3
Fit the circlip and pull up the piston shaft up, make sure that the circlip is fixed in its groove and in the seal head assembly groove. Fit the end cap by tapping it in with a plastic hammer.

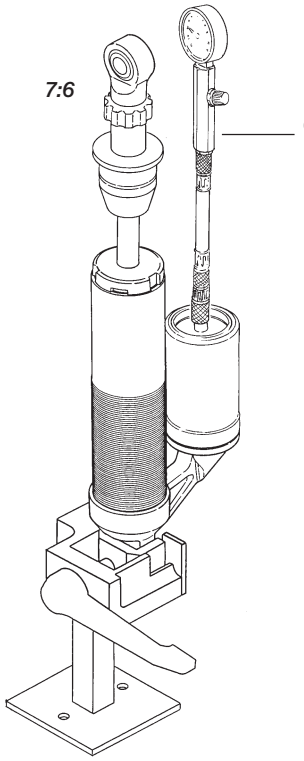
7:4
With the piston shaft fully out measure again from the edge of the reservoir to the upper edge of the dividing piston. If the value between the first and the second measurement is more than 7 mm or less than 4 mm, open the filling screw and adjust the position of the dividing piston carefully, if the piston is too far in top up with fluid in filling hole. Then screw in the filling screw.

NOTE!

Put the dividing piston in correct position according to table.

Reservoir length	Position of dividing piston
80	47
90	57
110	77
120	87
133	100
150	117
180	147
220	187

7:5
Fit the O-ring on the cap assy, with the aid of red grease and push it into the chamber using tool 720-03. Fit the circlip make certain that it enters its groove properly.



7:6

Pressurising and assembling protective cover on the cylinder

7:6
Pressurise the shock absorber according to spec.card.

NOTE!

Nitrogen (N2) gas . Use pressure gauge (1781-01).

⚠ WARNING!

Use of inflammable gas for pressurising the shock absorber can be hazardous. ***Use nitrogen gas (N2) only****.*

7:7
Tap the end cap into the cylinder tube gently with a plastic hammer.

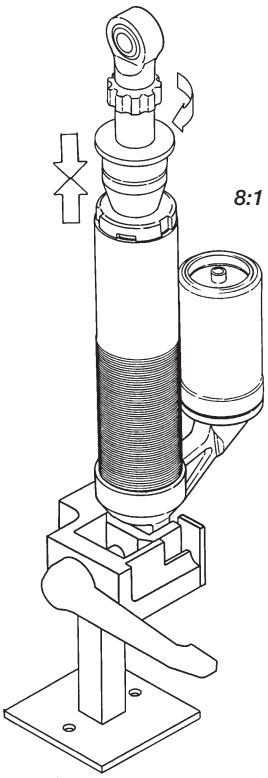
7:8
Check the gas pressure stipulated in the spec.card. Screw out the gas filler screw and O-ring. Dip the needle of the gas tool (1781-01) in red grease and insert the needle through the gas filler valve.

Charge with gas to the correct pressure, according to the spec.card.

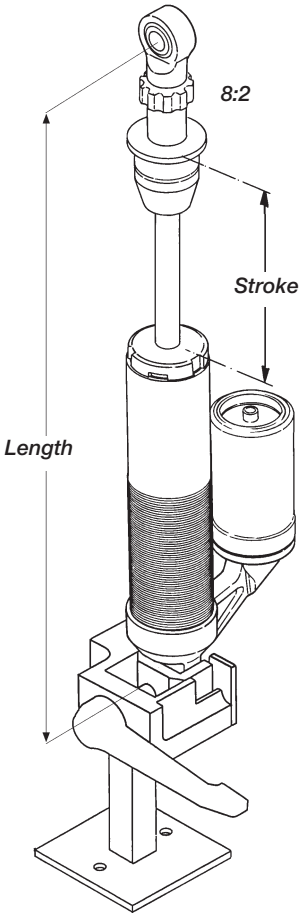
NOTE!

Ensure that there is no leakage of gas or fluid.

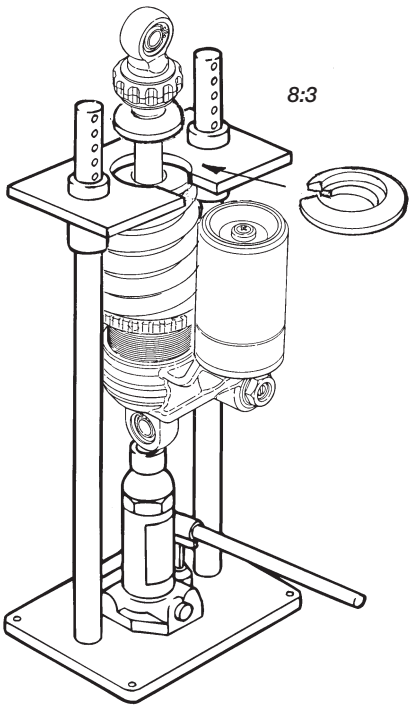
7:10
Screw in the gas filler screw with O-ring.



8:1



8:2



8:3

Settings and spring assembly

8:1
Push the piston shaft down to its bottom position and close the rebound adjustment fully.

NOTE!

Use your fingers only. No tools may be used.

If everything is correct, the piston shaft should stay down.

NOTE!

Certain shock absorbers are provided with an integrated "bleed", causing the piston shaft to move up slowly.

Open the adjustment the number of clicks stated in the spec.card.

8:2
Measure the length, stroke and compare to spec.card. Check the free length of the spring.

NOTE!

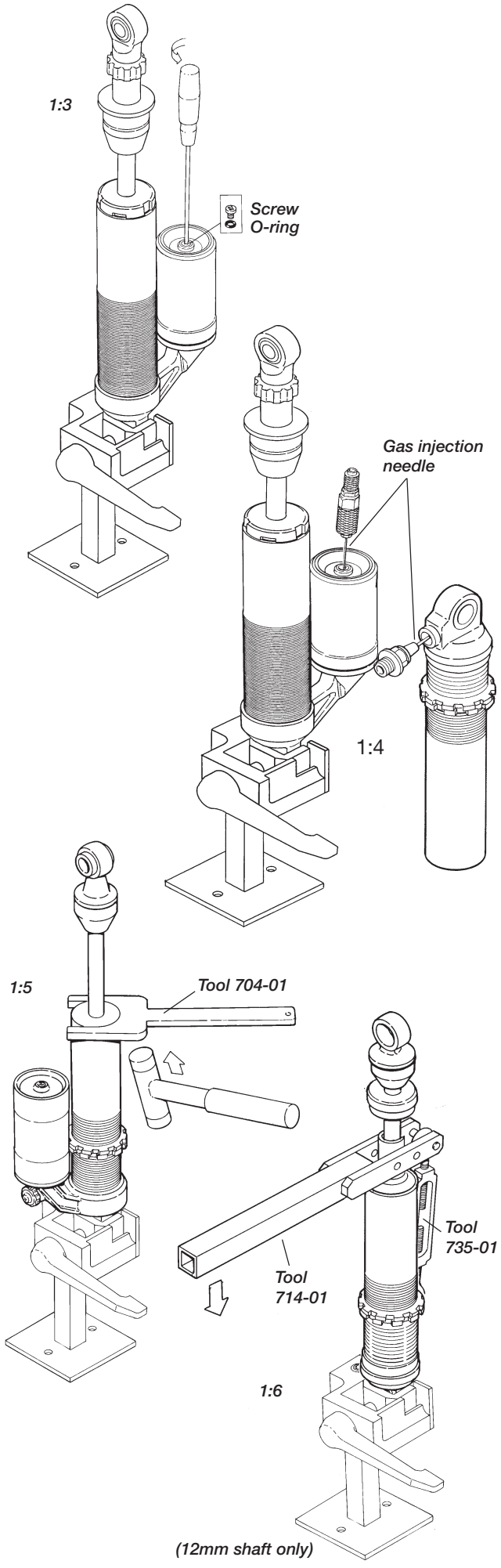
Shock absorbers with top-out spring will be 3 - 4 mm shorter than specified length on the spec.card, before the main spring is fitted.

8:3
Mount the spring and spring-clip and adjust the preload rings to the correct preload. See spec. card.

8:4
Measure the overall length and check it against the spec.card.

Shock absorber 36

Contents



Dismantling the shock absorber

1:1
Remove the spring, use tool 747-01.
Use correct spacer to avoid damages.

1:2
Clean the shock absorber carefully externally and inspect for damages.

1:3
Fasten the shock absorber use tool 773-01. Remove the screw and o-ring from the reservoir end cap
(Shock absorber head on shock absorber models without external reservoir.)

NOTE!

Before the gas pressure is relieved the adjuster settings must be counted and noted. Even check that the gas pressure is correct. Following that, the adjusters should be set in a fully open position.

1:4
Relieve the nitrogen gas pressure by inserting an injection needle into the shaft through the valve rubber.

⚠ WARNING

Releasing high pressure gas from the shock absorber can be hazardous. Do not perform any kind of service until gas pressure is completely released.

1:5
Remove the end cap from the shock absorber body. Use cap remover tool (704-01).

CAUTION!

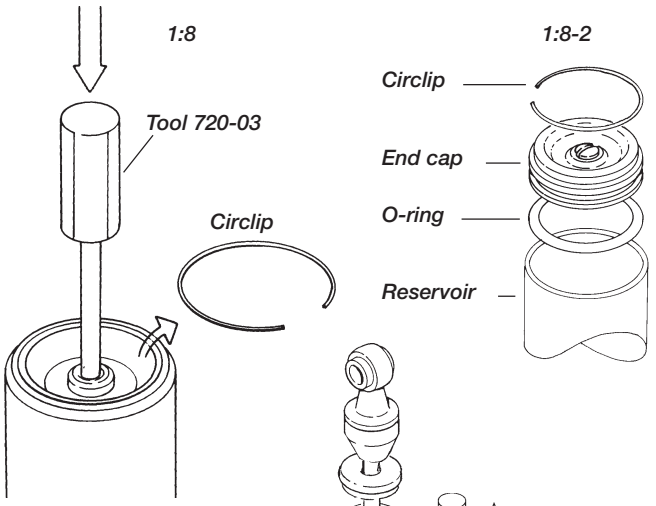
36 mm shock absorbers have two circlips that must be removed. Check carefully and avoid asratching the inner surface of the shock absorber to avoid leaks.

1:6
Depress the seal head approximately 15 mm. Use (714-01) and turnbuckle (735-01) on 12 mm shaft. Use a flat screwdriver on 14 mm shaft.

1:7
Release and remove the circlip from the cylinder tube with tool 715-01 or a similar tool. If necessary remove burrs from the circlip groove with a riffer.

NOTE!

Shock absorbers type D (Internal dividing piston) must have their cylinder head removed. The cylinder tube is fitted in a vice with tool (791-01). Heat the head with a heatgun and use a adjustable wrench to remove it.



1:8
Push the end cap of the reservoir down into the reservoir, use tool 720-03, remove the circlip. Remove the end cap.
(Shock absorbers with external reservoir only).

1:9
Lift up the seal head assembly.

1.10
Lower the oil level by pulling the reservoir dividing piston outwards by help of the measure pin and by pulling the shaft outwards.
(Shock absorbers with external reservoir only).

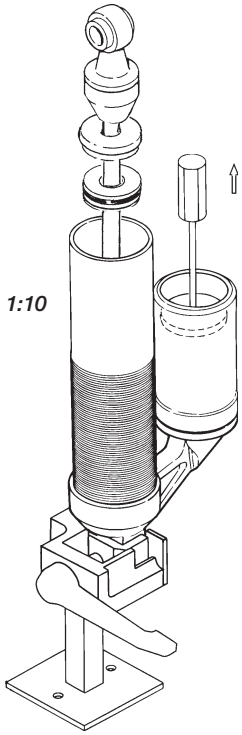
1:11
Remove the lower circlip of the cylinder tube.

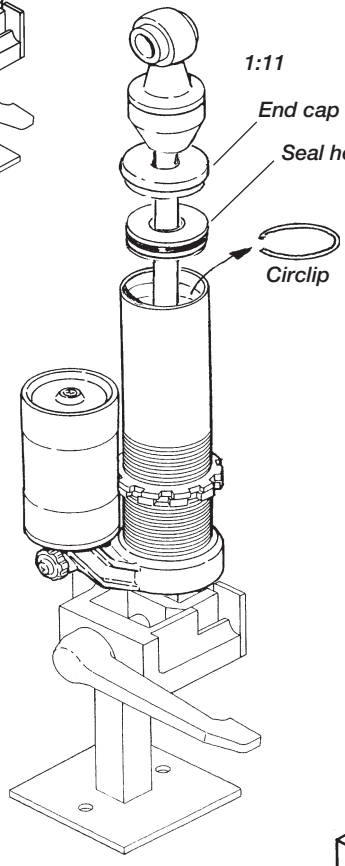
1:12
Pull the shaft assembly up carefully and remove it from the cylinder tube.

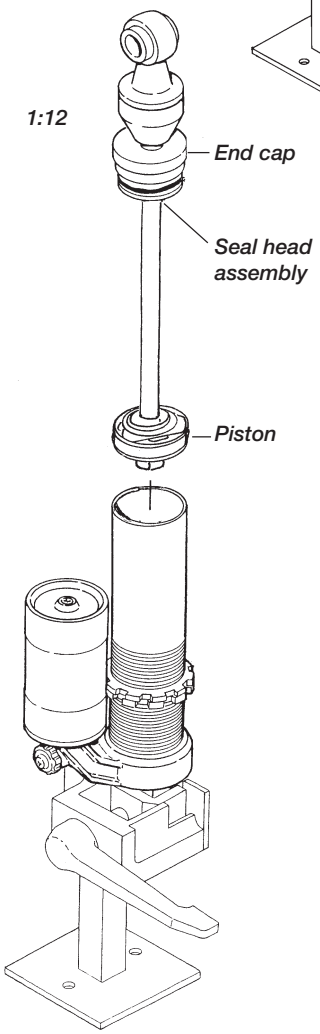
1:13
Drain the shock absorber from oil.

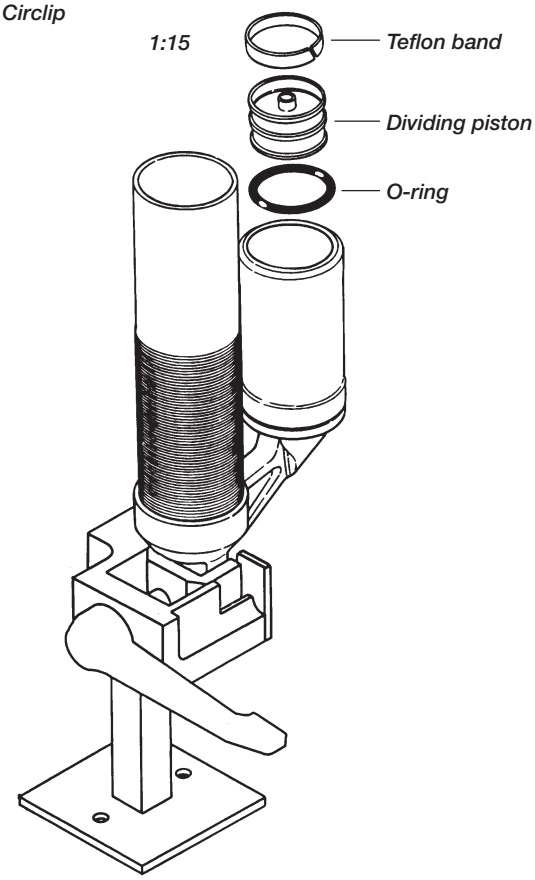
1:14
Remove all o-rings and seals.

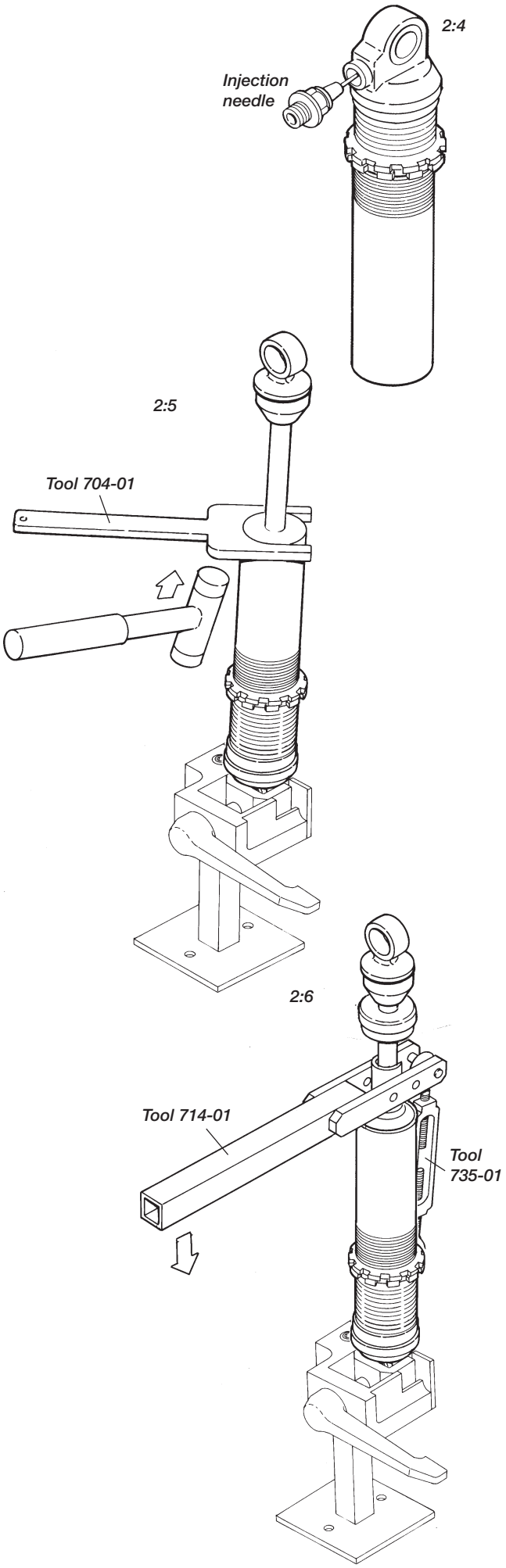
1:15
Clean all parts carefully.











Dismantling the shock absorber type D with ø12 shaft

2:1
Remove the spring, use tool 747-01.
Use correct tool to avoid damages.

2:2
Clean the shock absorber carefully externally and inspect for damages.

2:3
Fasten the shock absorber use tool 773-01. Remove the screw and o-ring from the reservoir end cap
(Shock absorber head on shock absorber models without external reservoir.)

NOTE!

Before the gas pressure is relieved the adjuster settings must be counted and noted. Even check that the gas pressure is correct. Following that, the adjusters should be set in a fully open position.

2:4
Relieve the nitrogen gas pressure by inserting an injection needle into the shaft through the valve rubber.

⚠ WARNING

Releasing high pressure gas from the shock absorber can be hazardous. Do not perform any kind of service until gas pressure is completely released.

2:5
Remove the end cap from the shock absorber body. Use cap remover tool (704-01).

CAUTION!

A few shock absorbers have two circlips that must be removed. Check carefully and avoid scratching the inner surface of the shock absorber to avoid leaks.

2:6
Depress the seal head approximately 15 mm. Use (714-01) and turnbuckle (735-01)

2:7
Release and remove the circlip from the cylinder tube with tool 715-01 or a similar tool. If necessary remove burrs from the circlip groove with a riffer.

2:8
Lift up the seal head assembly.

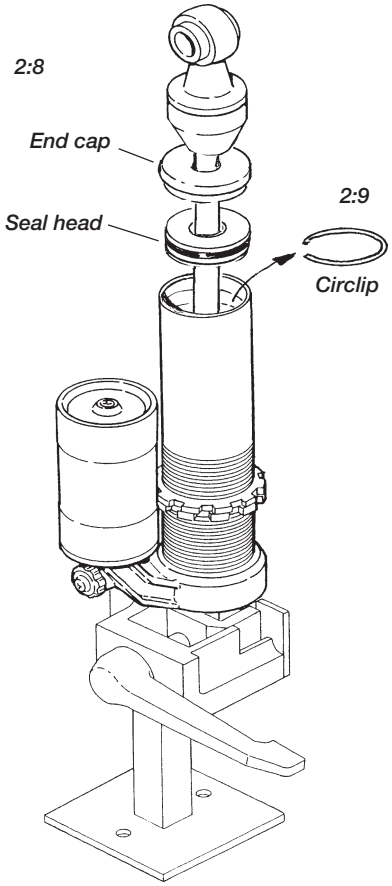
2:9
Remove the lower circlip of the cylinder tube.

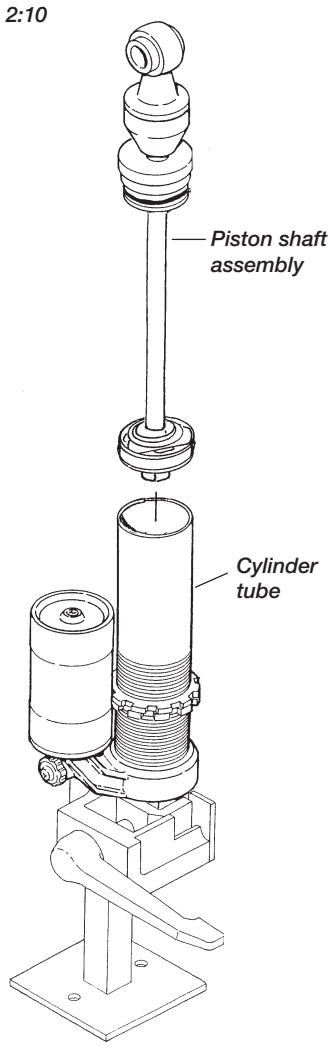
2:10
Pull the shaft assembly up carefully and remove it from the cylinder tube. Use tool 1706-01.

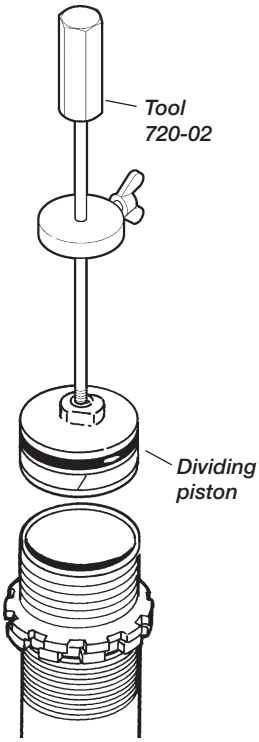
2:11
Drain the shock absorber from oil, and clean all parts carefully.

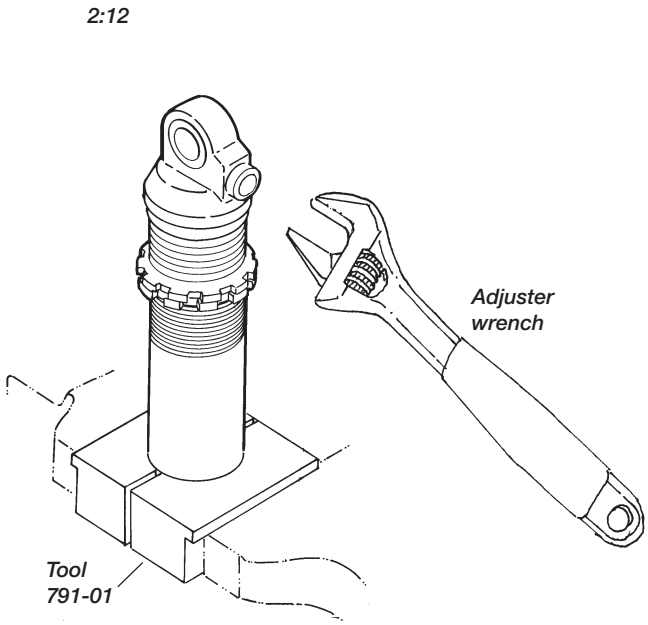
2:12
Remove the cylinder head with a adjustable wrench, use clamping tool 791-01 in a vice to hold the tube.

2:13
Remove the dividing piston, use tool 720-02.









Dismantling the piston shaft assembly

3:1
Fasten the shaft assembly in a vice with soft jaws. Use clamping tool (727-xx)

3:2
Remove the lock nut, the rebound shims stack, the damper piston and the compression shim stack.

NOTE!

Put the shim stack aside and place the shims in the same order as they were fitted on shaft.

3:3
Remove all the other parts from the shaft and put them aside in correct order.

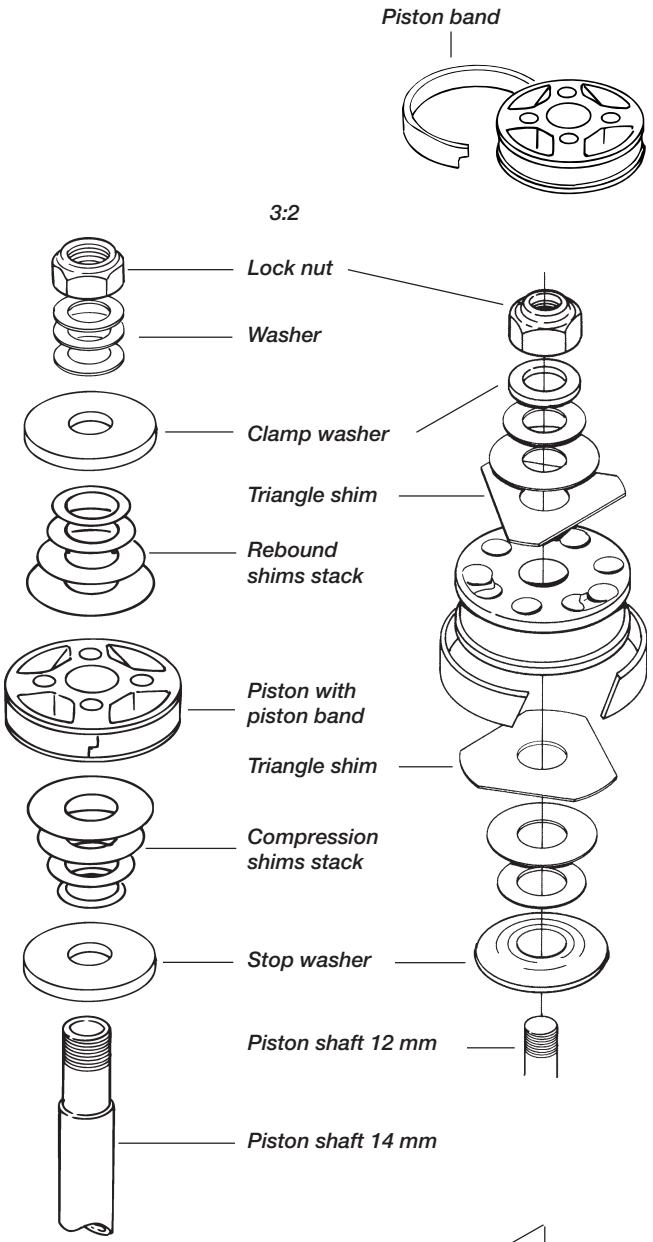
3:4.
Remove the end eye, use a heatgun.
Remove the adjustment valve jet, the adjustment needle and the adjustment pin.

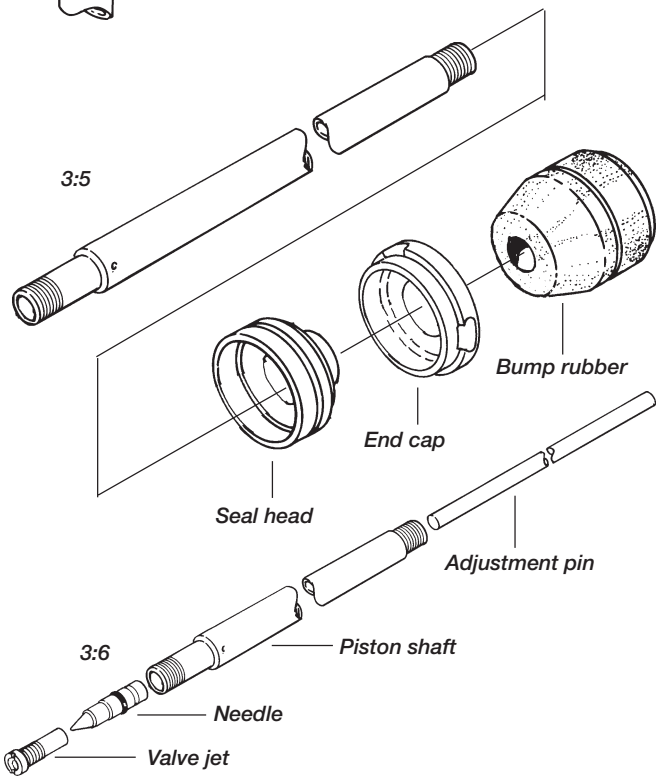
3:5
Clean all parts carefully and inspect for wear or damage. Check the o-ring of the needle and replace if necessary.

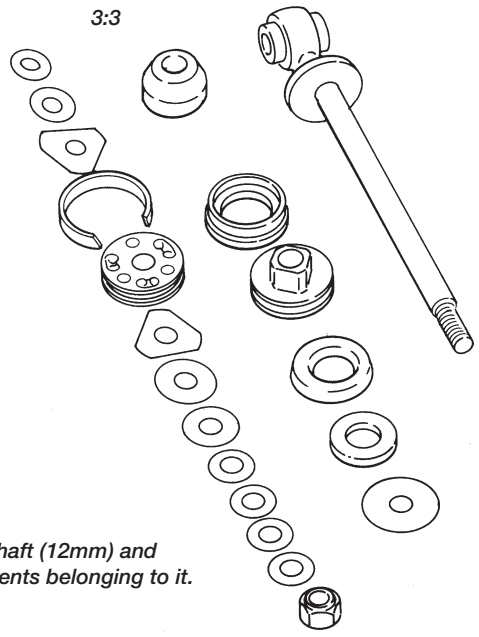
3:6
Inspect the shaft for bends and scratches.

3:7
Replace piston ring, o-rings and lock nut.

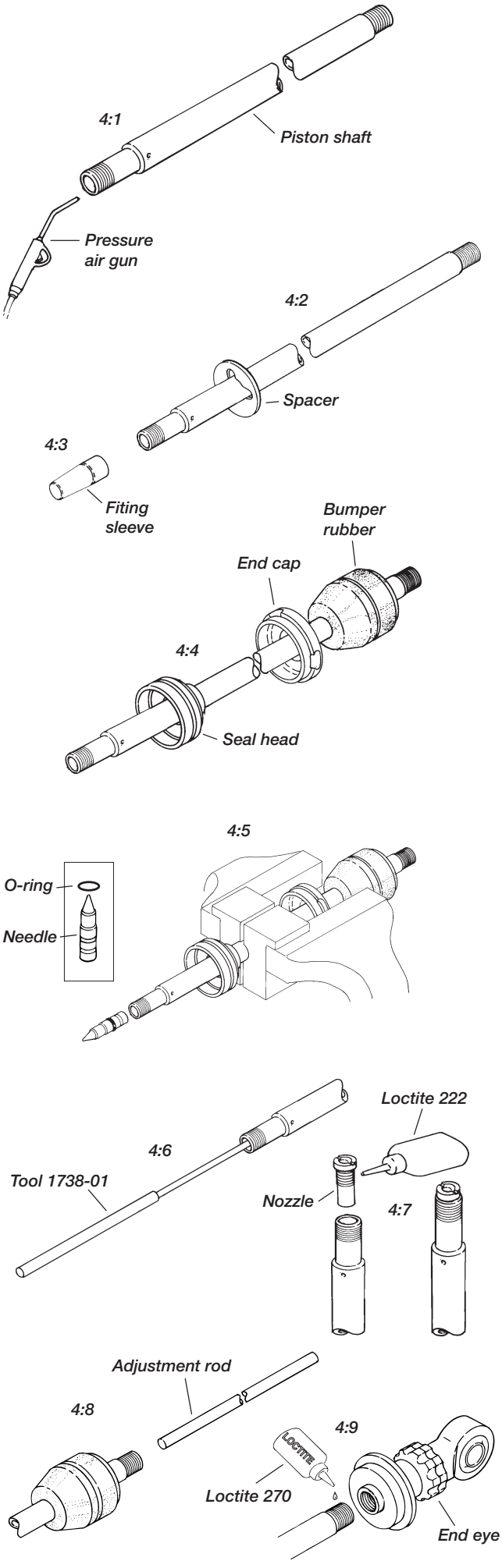
3:8
If necessary replace bump rubber, scraper ring and cap, seal head assembly and eventual other defect parts.







Piston shaft (12mm) and components belonging to it.



Reassembling the piston shaft

4:1
Blow the piston shaft clean with compressed air.

NOTE!

Apply Öhlins red grease (146-01) to all o-rings and seals.

4:2
Check the spec.card to see whether spacers are to be used on the piston shaft. If so, mount these before fitting the seal head assembly.

4:3
Use fitting sleeve (739-01) to protect the seal in the seal head assembly.

Lubricate the piston shaft with shock absorber fluid so that the seal head assembly slides on easily.

4:4
Put on the end cap and the bump rubber.

4:5 - 4:8 14 mm shaft only

4:5
Grip the piston shaft with soft jaws 727-xx.
Fit the O-ring on the adjustment needle. Apply plenty of red grease on the O-ring so that the needle slides easily into the piston shaft.

NOTE!

Always ensure that the correct needle is used in relation to the nozzle.

4:6
Press the needle down, using the tool 1748-01, until it comes to a stop.

NOTE!

Check to see if the seating in the nozzle is chamfered, the nozzle must be replaced with one without chamfer.

4:7
Carefully tighten the nozzle. Use Loctite 222.

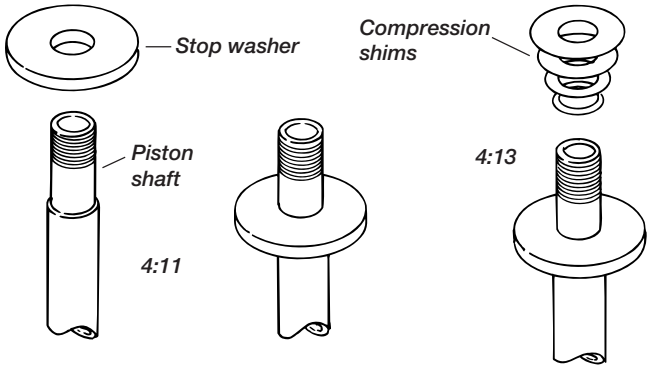
4:8
Apply a little red grease to the adjustment rod and insert it into the piston shaft from the top.

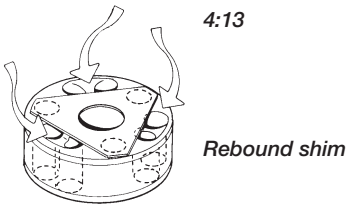
NOTE!

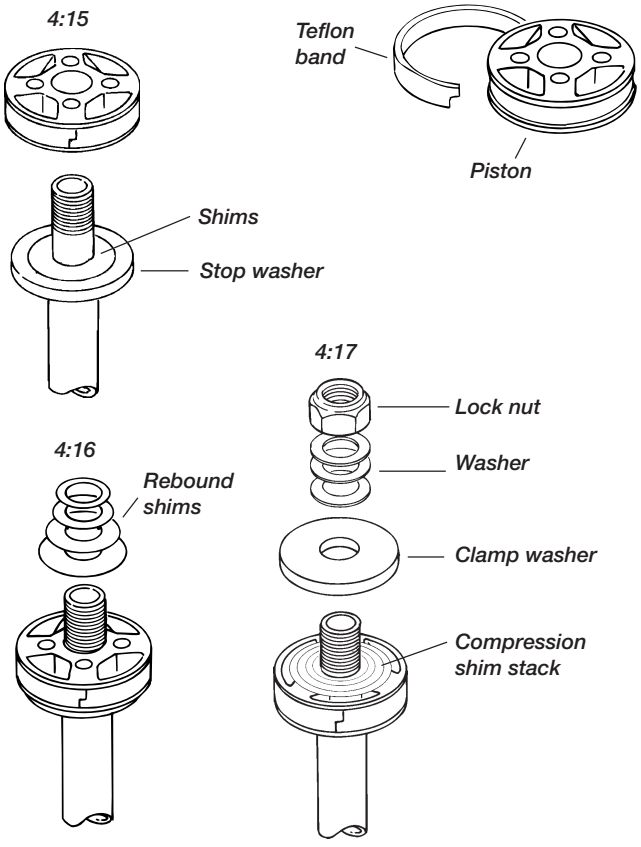
Ensure that the thread on the piston shaft is free from oil.

Mounting the end eye.

4:9
Use Loctite 270 on the piston shaft thread, screw the end eye on and tighten using an adjustable wrench.
Tightening torque: See page xx, xx, xx







Mounting of piston on piston shaft and fitting shims

4:10
Grip the end eye in a vice. Use soft jaws.
Put the “top out” spring in position, if one is beeing used.

NOTE!

Always ensure that the correct spring is used. Check also that the spring does not protrude too far above the sleeve. There is a risk that the sleeve will slide down when tightening the shims nut.

CAUTION!

The chamfered side of the stop washer must face away from the lock nut.

4:11
Put the stop washer in position.

4:12
Check shims and replace if necessary.

4:13
Place shims on the compression side according to the spec. card.

NOTE!

Make sure to put the shims in right order and that the shims are in correct position to the piston. (See spec. card)

CAUTION!

When a triangular shim (12mm shaft) are beeing used it is of vital importance that they are in correct position according to illustration.

4:14
Ensure that the correct piston is beeing used. If a flat piston is used face the piston using 1200 abrasive paper to ensure a completely even and flat surface. Ensure that there are no burrs or particels on the piston or in the fluid ducts.

4:15
Put the piston on the piston shaft.

NOTE!

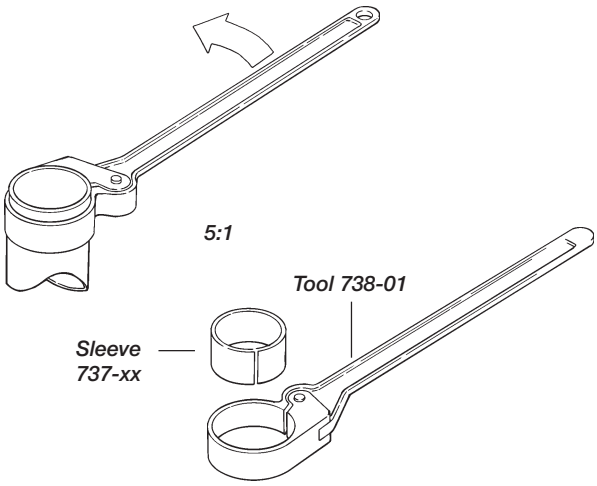
Ensure that the piston faces the correct way. The grooved side of the piston must face the nut.

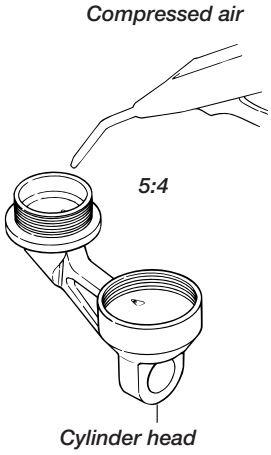
4:16
Fit the shims on the rebound side. Carefully check the spec.card to see which clamp washer is to lie on the top shim.

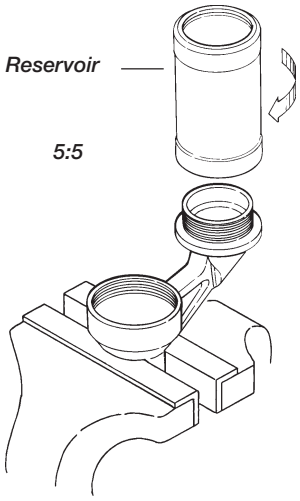
NOTE!

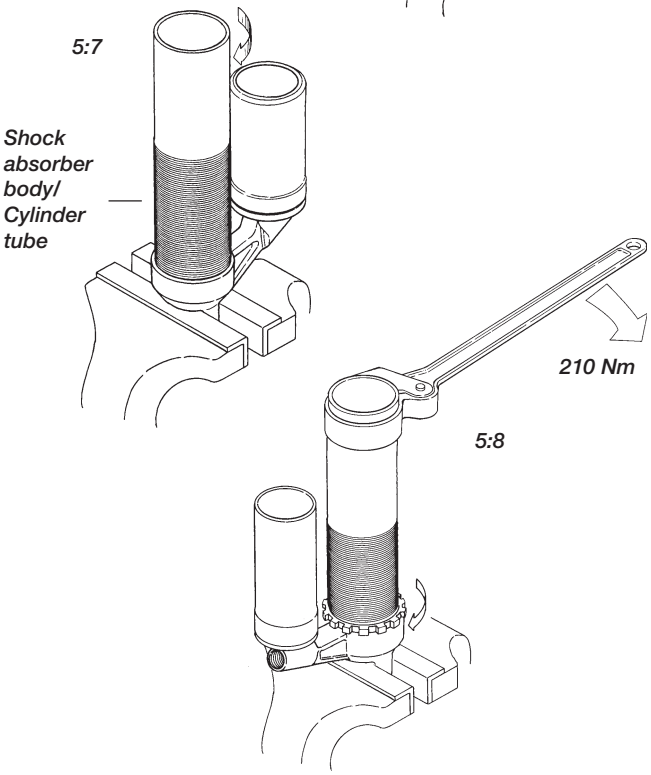
There are several different types of clamp washers.

4:17
Refit the washer and the lock nut. 14 mm shaft tighten to 30 Nm and 12 mm shaft to 20 Nm.









Removing and refitting the cylinder head

CAUTION!

Removing the cylinder head is only carried out on shock absorbers with internal dividing piston or when the cylinder tube or reservoir tube must be changed.

5:1
Grip the shock absorber head in the vice with soft jaws. Use tool (738-01) in combination with sleeve (737-xx) to loosen the cylinder tube.

NOTE!

The cylinder head is fastened with Loctite. It is necessary to heat the surfaces near the threads to remove the cylinder tube and the reservoir tube.

5:2
Use tool (738-01) in combination with sleeve (737-xx) to loosen the reservoir

5:3
Screw cylinder tube and reservoir out by hand. Remove and waste the O-rings from the cylinder head

5:4
Blow the shock absorber head clean with compressed air. Ensure that there are no particles left in the ducts. Apply red grease to new O-rings. Fit new O-rings.

NOTE!

Ensure that the correct O-rings are beeing used.

5:5
Grip the shock absorber head in the vice with soft jaws, screw the gas reservoir in place by hand. Make certain that the O-ring has not been damaged. Tighten the reservoir using tool 738-01 and sleeve (737-xx).

NOTE!

Tighten using moderate force, see drawing page.

5:6
A retainer ring is used on some cylinder tubes. Loctite is not necessary if a retainer ring is used. Otherwise use Loctite 542.

5:7
Screw the cylinder tube to the bottom and check that the O-ring has not been damaged.

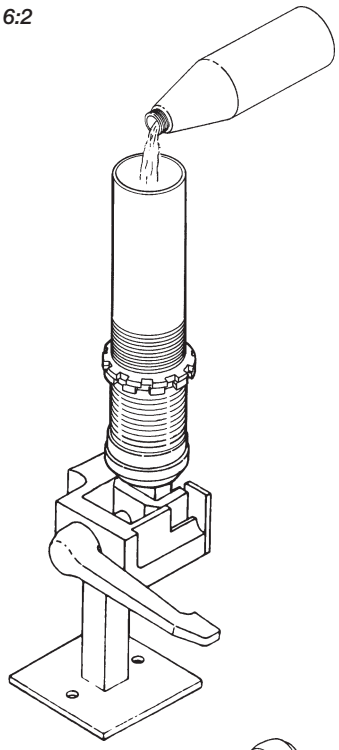
5:8
Tighten the cylinder tube using tool 738-01 and sleeve 737-01 insert tool 1798-01 in the cylinder tube to prevent deformation when tightening. Torque tighten to 210 Nm. If a lock nut is used, tighten it with tool 743-01.

5:9
Screw in the filler screw with the O-ring.

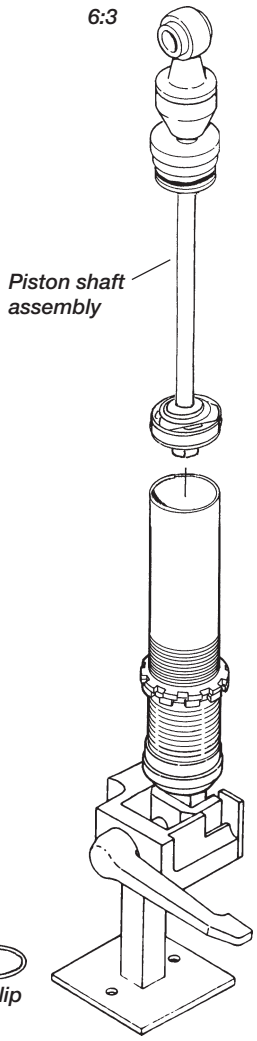
NOTE!

If a oil filling machine is beeing used, the O-ring and screw are not to be fitted at this moment.

6:2



6:3



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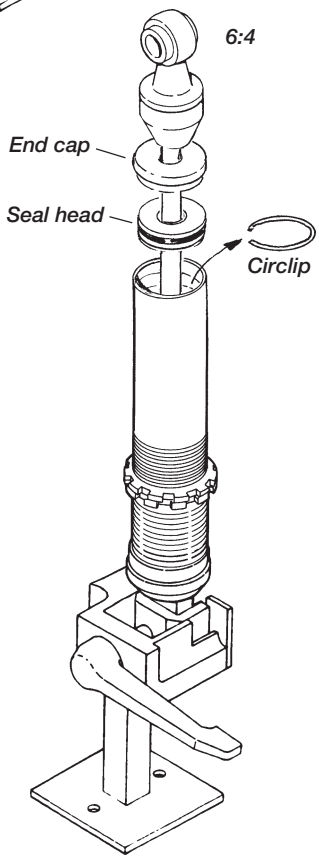
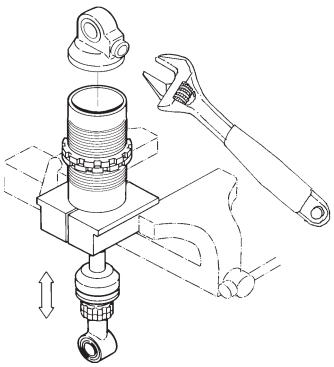
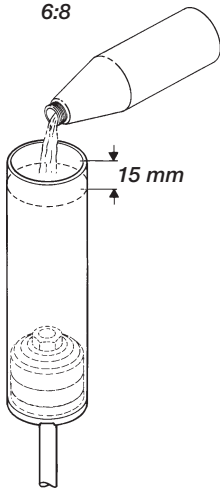


6:7



6:8



Assembling the shock absorber type E and D

Shock absorber emulsion type E only

6:1
Fasten the shock absorber in tool 773-01

NOTE!

Apply Öhlins red grease 146-01 to all o-rings and seals and a thin layer to the inside of the cylinder tube.

6:2
Fill the cylinder tube with Öhlins oil to the recommended oil level. See spec.card.

6:3
Make sure that the adjustment needle is fully open before installing the piston shaft. Install the piston shaft assembly into the cylinder tube.

NOTE!

12 mm shock absorbers have two circlips. The lower circlip must be fitted before the stop rubber and rthe seal head are installed.

6:4
Install the circlip and make sure it is properly seated before the end cap is fixed by knocking it in with a plastic hammer.

NOTE!

Shock absorbers without dividing piston must be pressurised in upright position. I.e. the shock absorber head facing upwards.

Shock absorber with internal dividing piston type D only

6:5
fasten in tool 791-01

6:6
Make sure that the needle is fully open before installing the piston shaft. Install the piston shaft assembly into the cylinder tube. Install the seal head, circlip and and make sure it is properly seated before the end cap is fixed by knocking it in with a plastic hammer.

6:7
Turn the cylinder tube so the piston shaft is facing downwards.

6:8
Fill the cylinder tube with Öhlins oil (to approximately 15 mm from the top of the tube. Bleed out remaining air by slowly moving the piston shaft up and down in the cylinder tube. Do not push hard, just move the the shaft slowly.

NOTE!

To obtain maximum oil volume, pull the shaft out to fully extended length before installing the dividing piston

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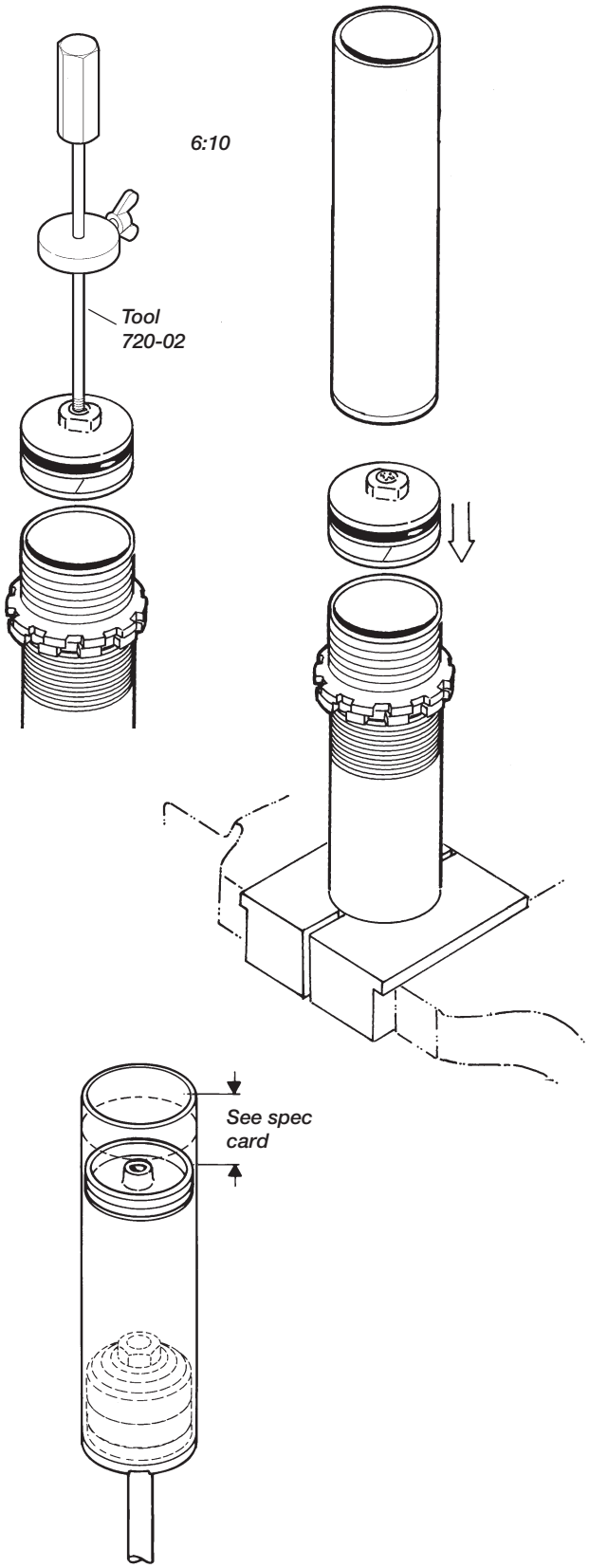


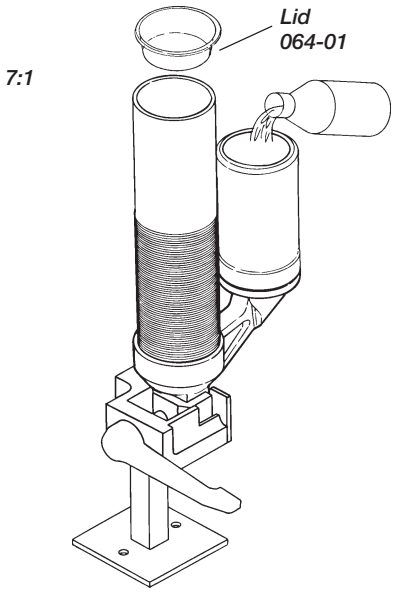
6:8
Inspect the dividing piston for wear or damage.

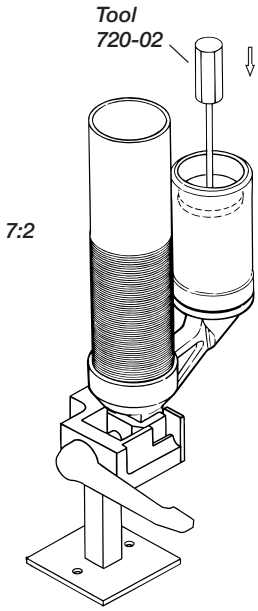
6:9
Replace o-rings and piston rings with new.
Use Öhlins grease 146-01 on all o-rings and seals.

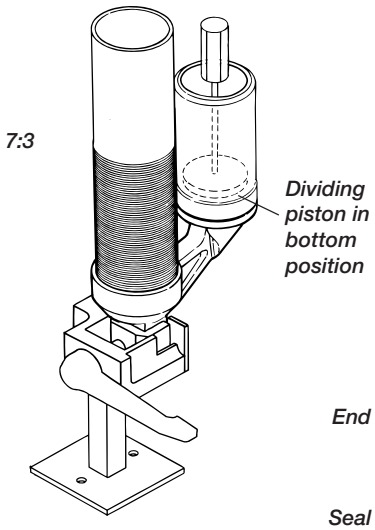
6:10
Install the dividing piston into the cylinder tube and set the piston position with 757-xx and a vernier or tool 720-02 to set the dividing piston depth.
See spec. card for correct position and illustration.

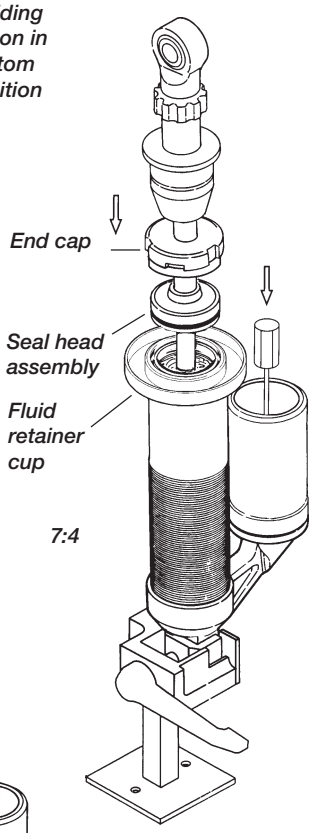
6.11
Install the centre screw and use tool 757-xx to hold the dividing piston when tightening the screw. Wipe off eccesive oil.

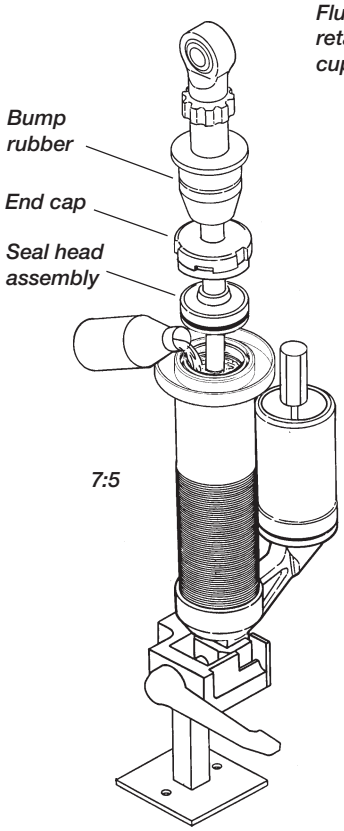
6:12
Clean the cylinder tube thread with cleaner and use Loctite 542 or 270 on the thread when installing in the cylinder head. Turn the tube body around and fasten the cylinder head in a vice with clamping tool 791-01.
Use tools 737-xx and 738-01 to tighten the body tube.

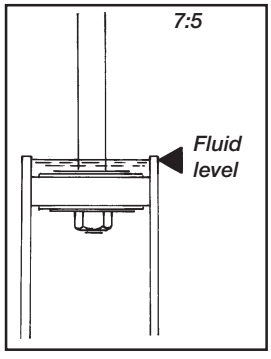












Assembling the shock absorber with external reservoir type P and H

7:1
Insert a plastic lid (764-01) in the cylinder tube. Fill up with Öhlins fluid all the way to the edge of the reservoir.

7:2
Push the dividing piston, with teflon band and O-ring fitted, down in to the reservoir without allowing it to be pressed back over the circlip groove, make sure that there is no air between the piston and the oil.

7:3
Push the dividing piston to the bottom, using tool 720-02.

Close the compression adjuster.
Measure the distance from the edge of the reservoir to the upper edge of the dividing piston and make a note of the lenght. Fill the cylinder tube with Öhlins fluid to about 10 mm below the circlip groove.

7:4
Install an fluid retainer cup. Insert the piston shaft into the cylinder tube. Take care, that fluid does not squirt up. When the piston is submerged in the fluid the piston shaft should be pressed down hard, to force out air between the shims and piston.

NOTE!

This labour forces fluid through the apertures of the main piston and helps to bleed out all air.

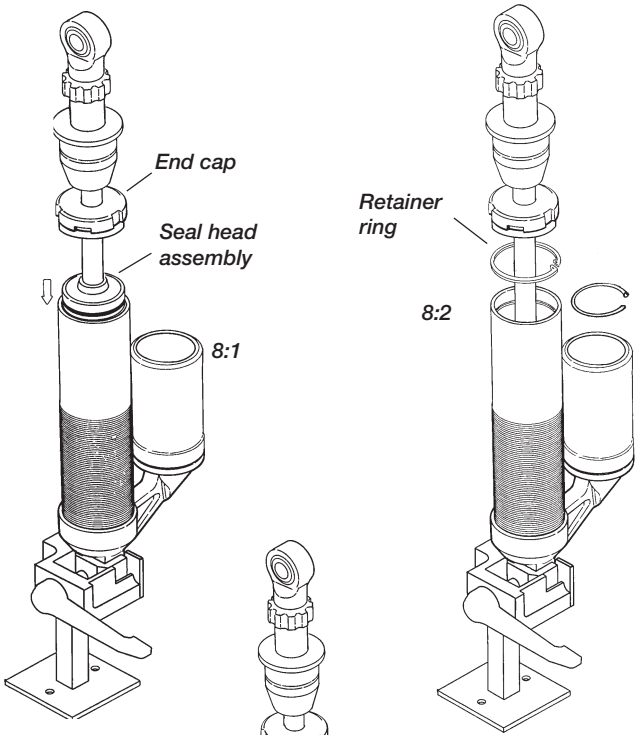
7:5
Wait a while to allow air bubbles to rise to the surface. Pull the piston shaft up a bit, without allowing the bleed holes to come above the surface. Top up with more fluid if required.

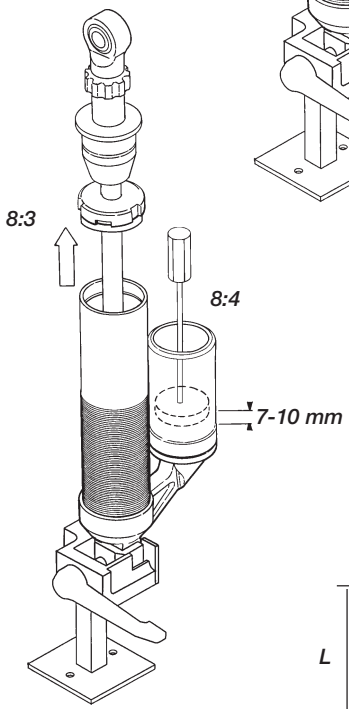
7:6
Repeat this procedure until all air is expelled. If the shims are very hard, a check can be made by pushing down the piston rod very hard. If there is still air remaining the fluid level will move. If so, strike the end eye firmly with a plastic hammer to make the shims open.

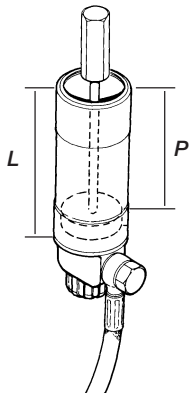
7:7
When all air has been expelled, pull the piston shaft up as far as possible without the bleed holes in the piston shaft coming above the surface of the fluid. Top up with fluid all the way up to the edge of the cylinder tube.

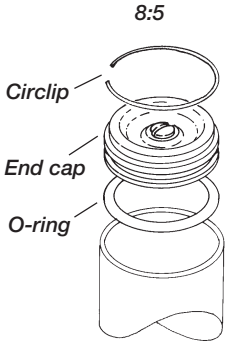
NOTE!

Rotate the piston shaft lightly to seat the teflon band properly against the body tube bore.









Mounting the seal head assembly and end piece on reservoir

8:1
Push the seal head down against the fluid and carefully down to the O-ring groove make sure that the bleedhole is facing away from you. Then push the piston shaft down halfway. Make sure that the dividing piston is fully down to the bottom of the reservoir.

8:2
Open the compression valve and, using a blunt screw-driver, push the seal head assembly down until the circlip groove is visible.

8:3
Fit the circlip and pull up the piston shaft up, make sure that the circlip is fixed in its groove and in the seal head assembly groove. Fit the end cap by tapping it in with a plastic hammer.

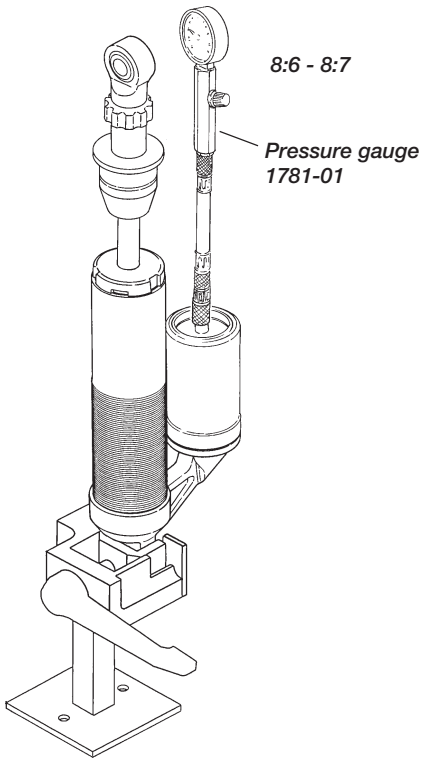
8:4
With the piston shaft fully out measure again from the edge of the reservoir to the upper edge of the dividing piston. If the value between the first and the second measurement is more than 7 mm or less than 4 mm, open the filling screw and adjust the position of the dividing piston carefully, if the piston is too far in top up with fluid in filling hole. Then screw in the filling screw.

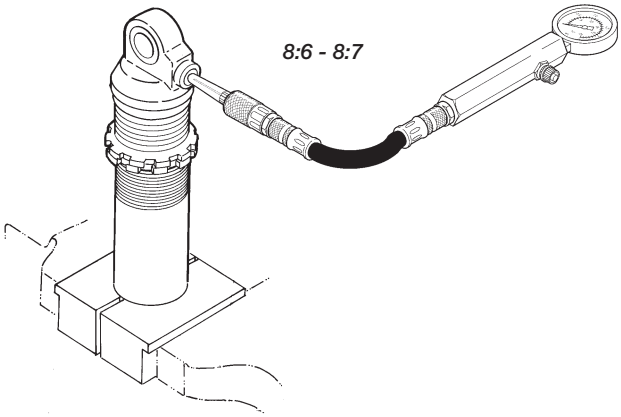
NOTE!

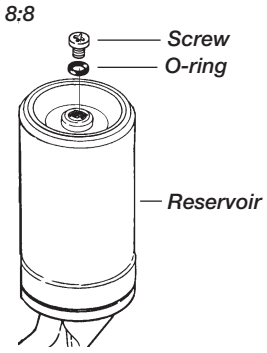
Put the dividing piston in correct position according to table.

Reservoir length (L)	Position of dividing piston (D)
80	47
90	57
110	77
120	87
133	100
150	117
180	147
220	187

8:5
Fit the O-ring on the cap assy, with the aid of red grease and push it into the chamber using tool 720-03. Fit the circlip make certain that it enters its groove properly.







Pressurising and assembling protective cover on the cylinder

NOTE!

Nitrogen (N2) gas . Use pressure gauge (1781-01).

⚠ WARNING!

Use of inflammable gas for pressurising the shock absorber can be hazardous. ***Use nitrogen gas (N2) only****.*

Tap the end cap into the cylinder tube gently with a plastic hammer.

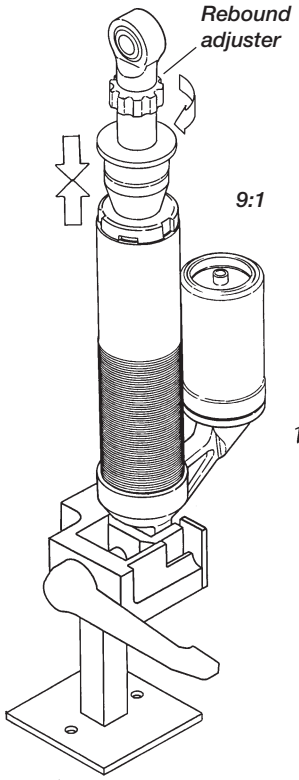
8:6
Check the gas pressure stipulated in the spec.card. Screw out the gas filler screw and O-ring. Dip the needle of the gas tool (1781-01) in red grease and insert the needle through the gas filler valve.

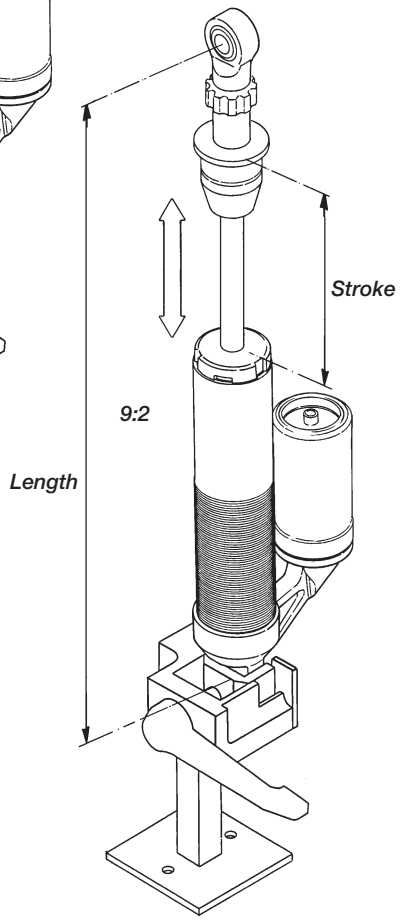
8:7
Charge with gas to the correct pressure, according to the spec.card.

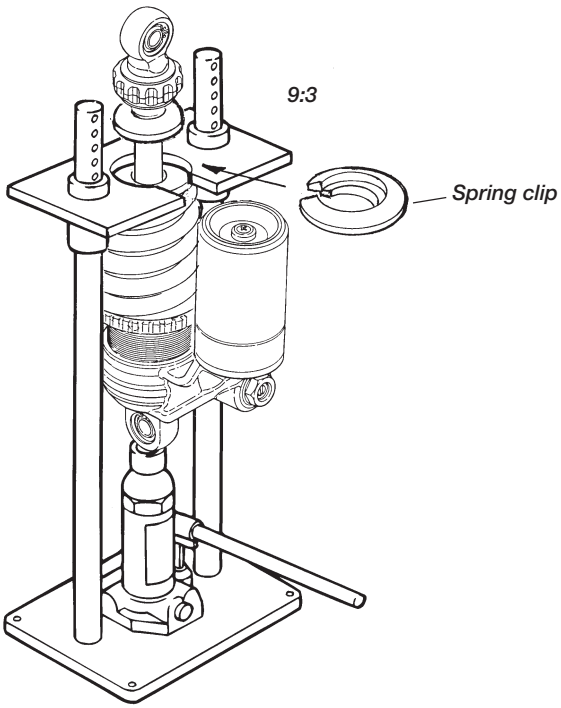
NOTE!

Ensure that there is no leakage of gas or fluid.

8:8
Screw in the gas filler screw with O-ring.







Settings and spring assembly

9:1
Push the piston shaft down to its bottom position and close the rebound adjustment fully.

NOTE!

Use your fingers only. No tools may be used.

If everything is correct, the piston shaft should stay down.

NOTE!

Certain shock absorbers are provided with an integrated "bleed", causing the piston shaft to move up slowly.

Open the adjustment the number of clicks stated in the spec.card.

9:2
Measure the length, stroke and compare to spec.card. Check the free length of the spring.

NOTE!

Shock absorbers with top-out spring will be 3 - 4 mm shorter than specified length on the spec.card, before the main spring is fitted.

9:3
Mount the spring and spring-clip and adjust the pre-load rings according to the spec. card.

9:4
Measure the overall length and check it against the spec.card.

General

Contents

Honing of cylinder bore

1:1
Hone the cylinder tube and the gas reservoir.

1:2
Use black/grey honing brush (01726- 01, 01727- 01, 01728- 01, 01741- 01) for steel tube and white brush (01727- 02, 01727- 03, 01728- 02, 01728- 03), for aluminium tube.

1:3
Remove burrs from end of cylinder tube by using a file, or replace it.

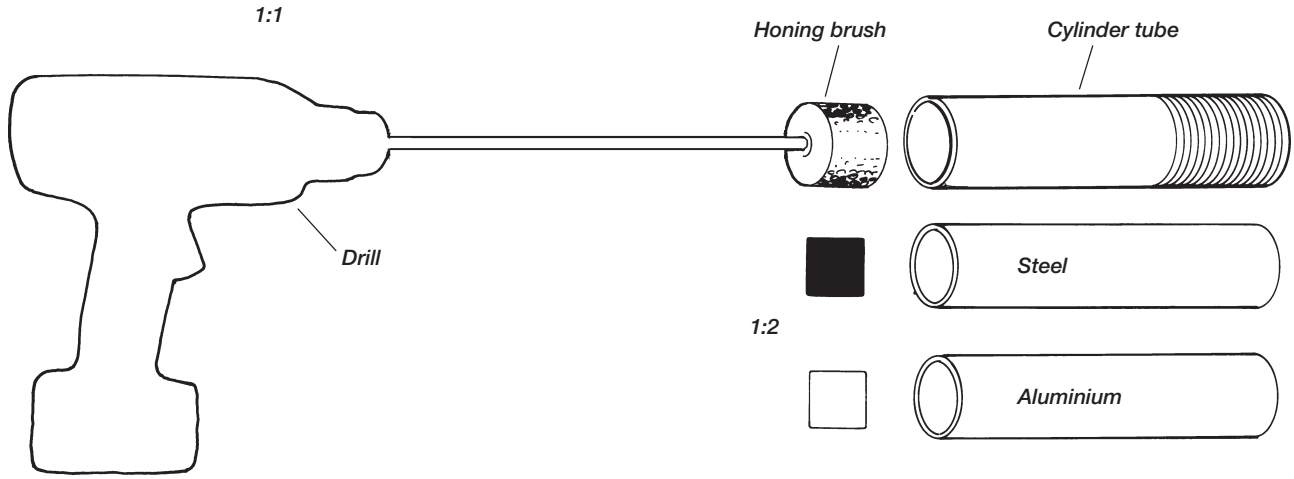
1:4
Clean the tubes very careful, use a degreasing detergent and blow dry with compressed air.

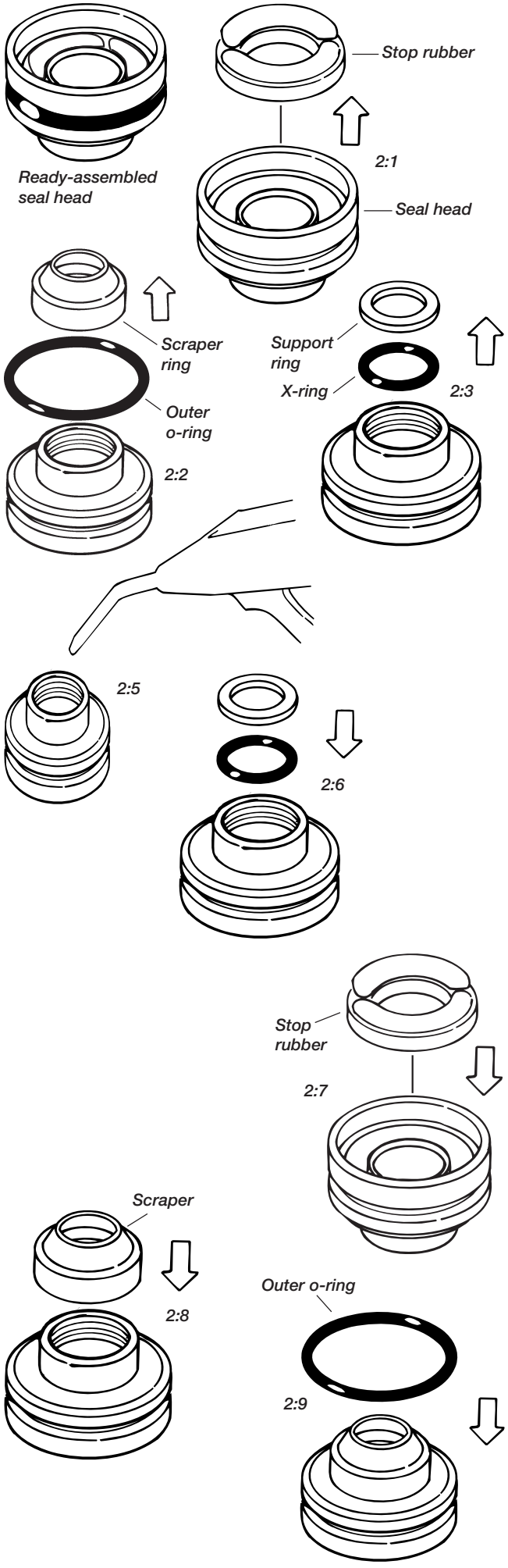
CAUTION!

After honing, the tubes must be throughly cleaned, to avoid damages from remaining metal particles.

CAUTION!

When a brand new tube is installed it is necessary to hone it, as this is normally not a step in the manufacturing process.





Dismantling and assembling seal head assembly

CAUTION!

The seal head should if possible be mounted as a ready-assembled piece The x-ring, the support ring, the scraper ring and the outer o-ring can be changed, however this is a very difficult procedure and should be avoided if not absolutely necessary. Seal head for 12 mm shaft available only as assembled part.

2:1
Lift the internal stop rubber out

2:2
Remove the outer o-ring and the scraper ring

2:3
Remove the support ring and the x-ring.

2:4
Clean the seal head.

NOTE!

It is not possible to remove the bushing. If the bushing is damages a brand new ready-assembled seal head should be mounted.

2:5
Blow clean with compressed air where the x-ring is to be fitted. Ensure that there are no foreign particles left inside.

2:6
First fit the support ring in place, then the x- ring. The x-ring shall be nearest to the bushing.

NOTE!

Take care not to twist the x-ring when fitting.

2:7
Press the stop rubber into place.

2:8
Press on the scraper ring. Pack with white grease (0147-01) in the space between scraper ring and the seal head assembly.

2:9
Fit the outer O-ring with the aid of red grease.

Dismantling and assembling the compression adjuster unit

3:1
Remove the screw of the adjustment wheel and remove the wheel if fitted.

3:2
Loosen the adjuster with a 17 mm key. Remove the adjuster from the reservoir and clean them exterally.

3:3
Clean the reservoir carefully. Inspect reservoir hose for leaks or damages.

3:4
Disassembly the adjusters. Remove the outer O-ring, remove the circlip and screw the needle out.

NOTE!

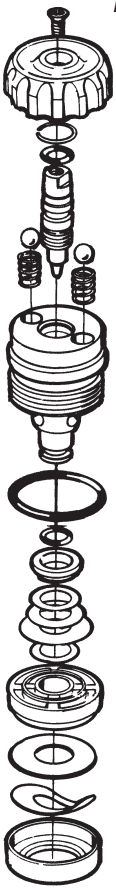
Be careful not to lose the small steel balls and/or the spring inside the needle.

3:5
Dissassemble the compression valve and the check valve

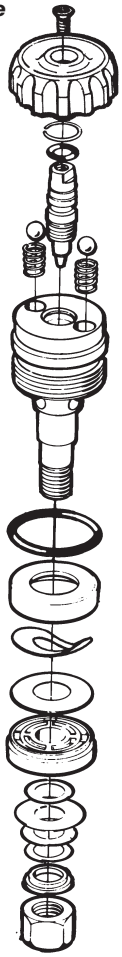
3:6
Inspect for damages and replace eventual damaged parts.

Öhlins compression valves

Bob - compression valve



Piggyback reservoir



Hose connected reservoir

Assembling the compression adjuster needle and housing.

4:1
Blow the parts clean with compressed air.

4:2
Grease O-rings and end pieces. Red grease (0146-01).

NOTE!

Check to see if the seating in the nozzle is chamfered. If it is, the nozzle must be replaced.

4:3
Fit the O-ring on needle.

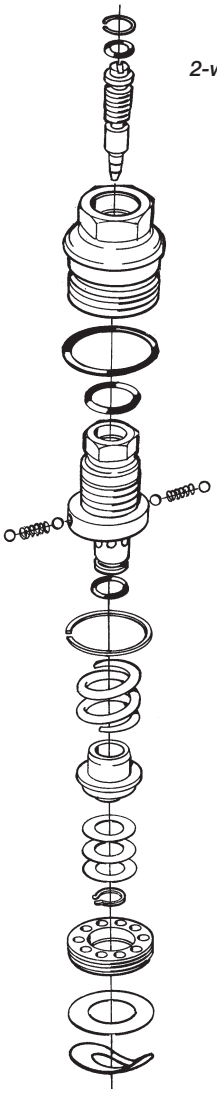
NOTE!

Always ensure that the correct needle is beeing used.

4:4
Insert the ball 1, spring and ball 2, in that order, and then insert the whole needle with balls and spring into the end piece.

4:5
Turn the needle to the bottom position and feel that the click positions are distinct.

2-way compression valve



MC R&T Car

MX-Enduro

4:6
Blow with your mouth into the bleed hole to check that it is closed.

4:7
Fit the circlip. Fit the outer O-ring (338- 27).
Assemble the compression valve.
Always check the spec.card to see which compression valve is to be used. If a pre-loaded valve is used, the pre-load depth must be calibrated.

NOTE!

All valves are to be faced using 1200 abrasive paper to ensure a completely even and flat surface.

4:8
Assemble the compression valve and check valve. Put the wave washer and then the shim in position.

NOTE!

The wave washer is to be fitted with the convex side facing the shim.

4:9
Carefully press these together. Carefully check with a pin that the non return valve moves easily.

NOTE!

Ensure that there is no chamfer on the clamp washer. If there is, it must be replaced.

4:10
Fit shims according to the spec.card. Fit and tighten the threaded end of the nozzle at 5 Nm.

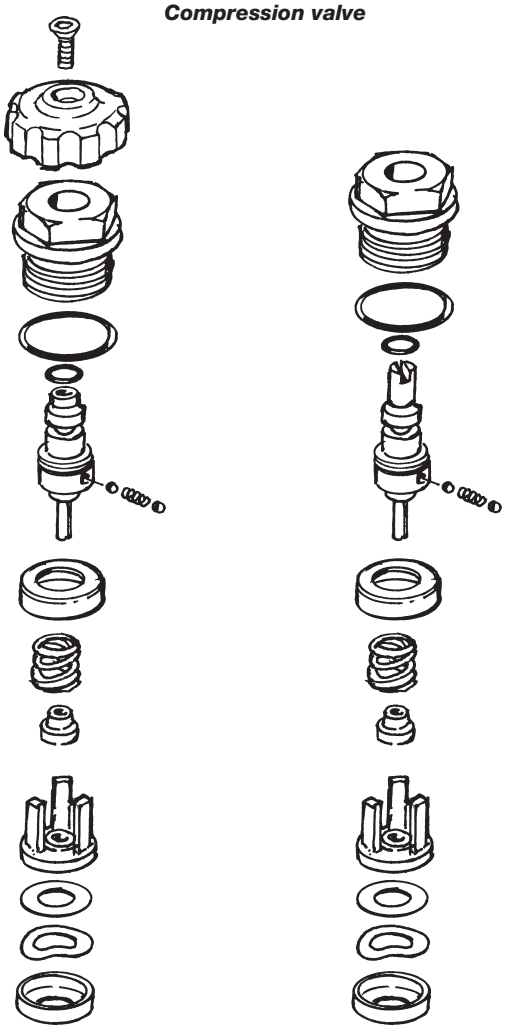
Mounting the compression adjuster in cylinder head/ reservoir top

4:12
Apply a little red grease where the compression valve is to fit in the shock absorber head.

4:13
Put the valve in position and tighten using moderate force. Piggyback 18 Nm, hose damper 15 Nm.

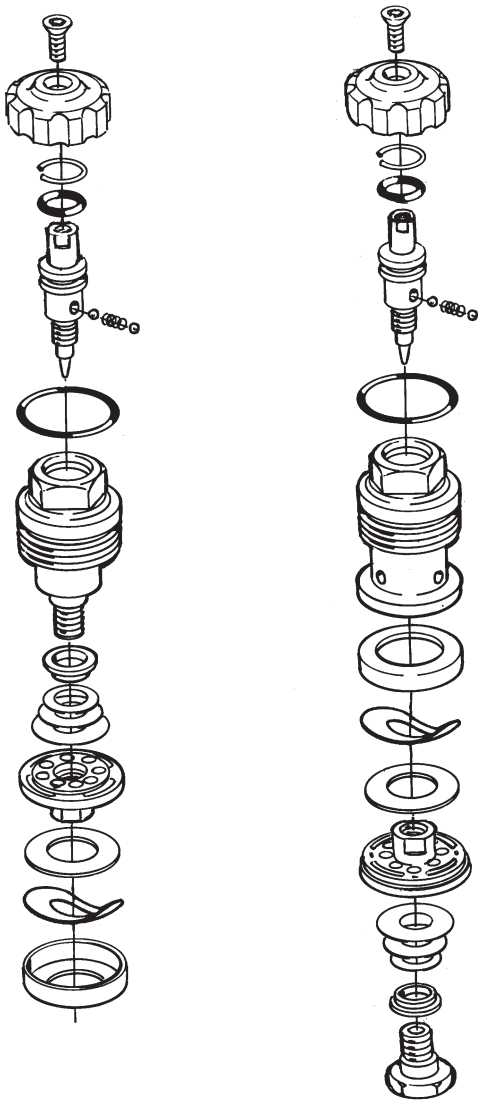
Refit adjustment wheel and screw. Open the compression valve fully by turning the adjustment wheel anticlockwise.

Compression valve



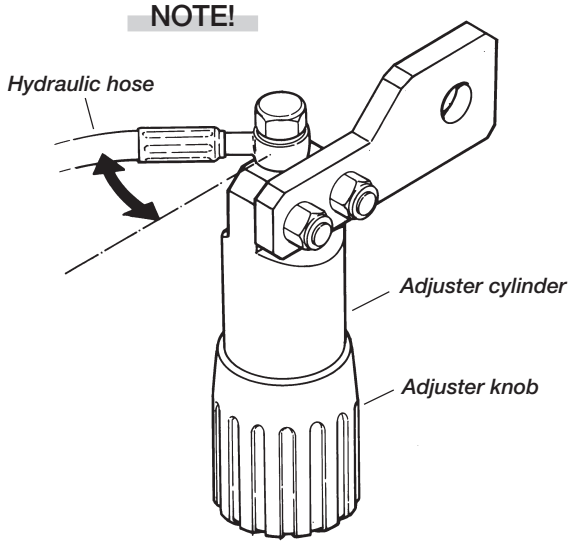
Snowmobile

Early model compression valve

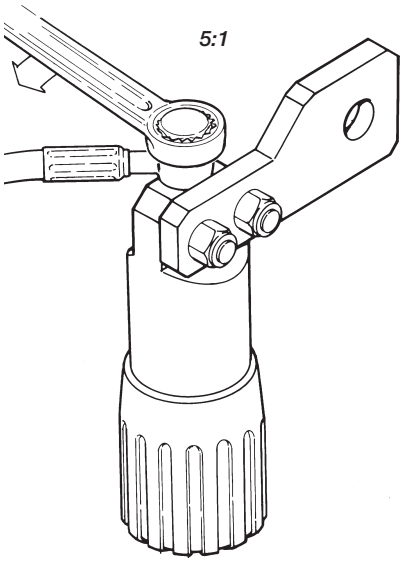


Piggyback reservoir *Hose connected reservoir*

NOTE!



5:1



Dismantling
hydraulic spring pre-load adjuster

NOTE!

Before taking off the spring pre-load adjuster from the shock absorber, make a note of the hydraulic hose angle on releation to the adjuster.

5:1
Remove the hydraulic hose from the adjuster cylinder and drain oil.

5:2
Remove the adjuster knob and fasten the cylinder in a vice with soft jaws.

5:3
Remove the end cap, use tool 1754-01.

5:4
Remove the shaft assembly, use a suitable drift to pree it out from the piston side.

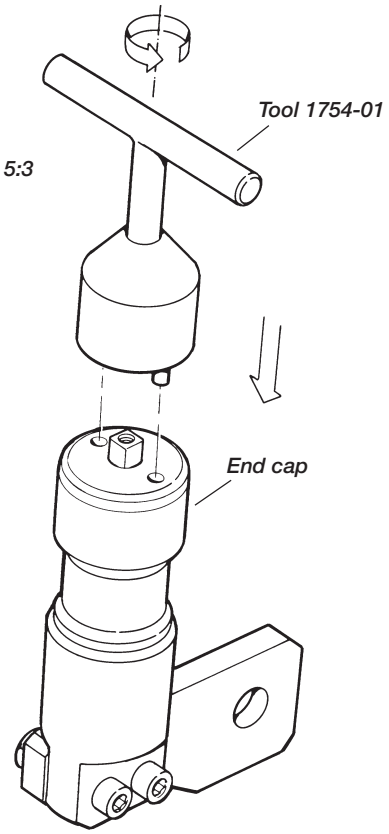
Remove all o-rings and replace them with new ones.

5:5
Remove the inner sleeve from the outer housing.

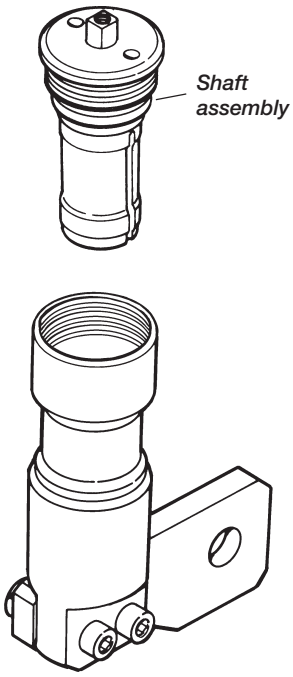
Remove and replace the two white guiding rings and all o-rings with new ones.

Clean all parts thoroughly.

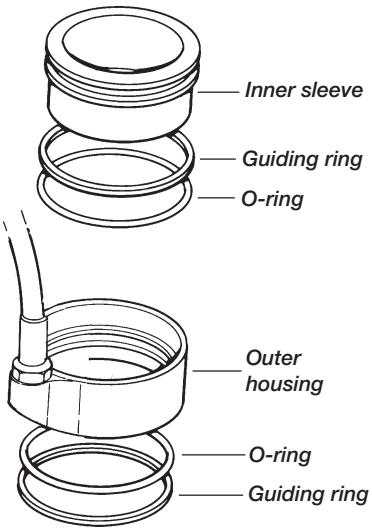
5:3

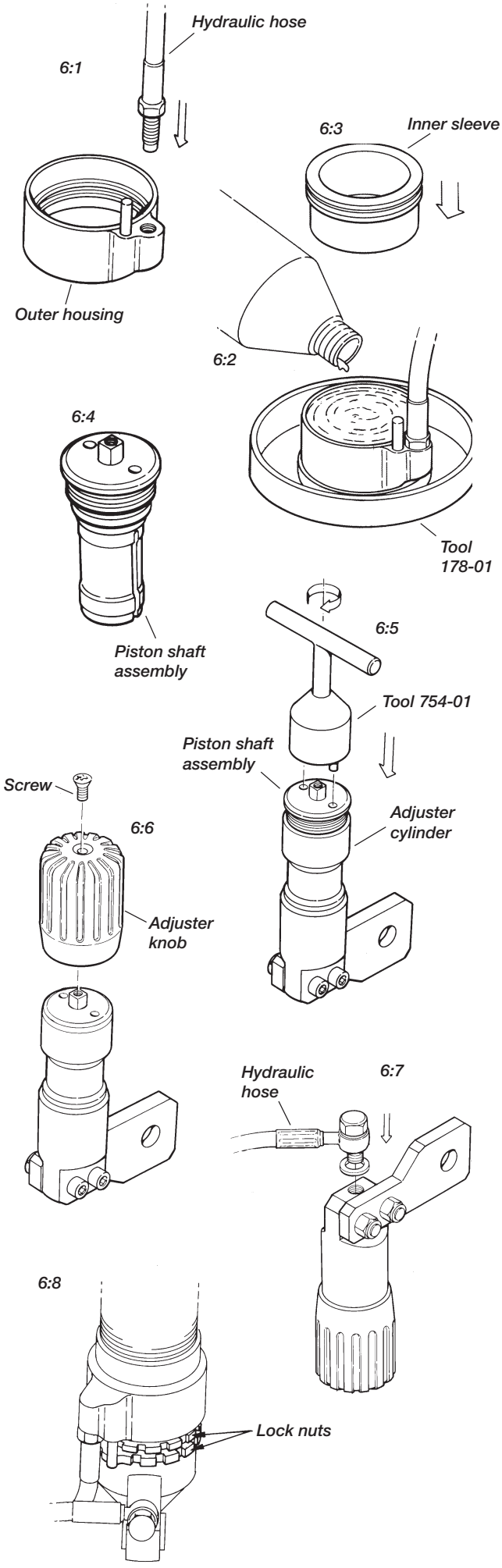


5:4



5:5





Assembling
hydraulic spring pre-load adjuster

NOTE!

Use Öhlins shock oil, 105-01 in the hydraulic adjuster. Use Öhlins red grease, 146-01 on all o-rings during assembling.

6:1
Fit the hydraulic hose on to the outer housing.
Tightening torque 30 Nm.

6:2
Fit the outer housing on tool 1786-01 and fill oil up to the top of the housing.

6:3
Install the inner sleeve into the outer housing.
Push the inner sleeve all way down to the bottom of the outer housing.
The air will bleed out through the hydraulic housing.

6:4
Use Öhlins red grease 146-01 on the adjustment screw, the o-rings and the bearing.
Assemble all the parts to one unit (the adjustment screw, the piston, the bearing and all the o-rings).

6:5
Install the piston shaft assembly into the adjusting cylinder.
Make sure it is the right position for the guiding sleeve.
Tighten the cylinder end cap with tool 754-01.

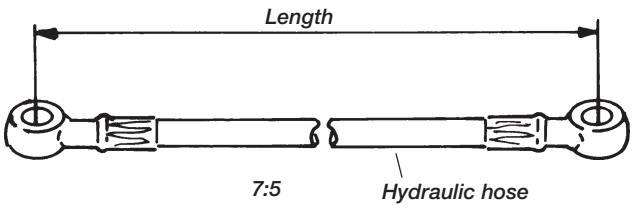
6:6
Do not force the adjustment knob in to position, just put it gently in place and tighten it with the centre screw.

Tightening torque: 1.5 Nm.
Use loctite 242 on the centre screw to secure it.

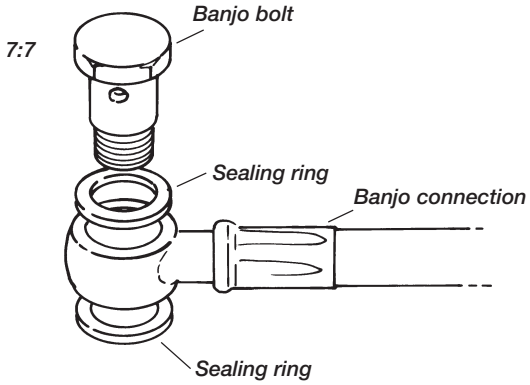
6:7
Turn the adjuster knob anti-clockwise until the piston stops in its bottom position (maximum oil contents).
Fill up the adjustment cylinder with oil and screw the two components (the adjustment cylinder and the outer housing) together with the banjo bolt.
Tightening torque: 8 Nm.
Make sure there is no air left, check by opening the small hexagon screw on the adjuster cylinder body.
Fill up with oil if necessary and tighten the screw.

6:8
Fit the compltete hydraulic adjuster on the shock absorber.
Make sure that the guide pin is in the correct position on the two lock nuts on the body tube.
Fit the spring and set the initial spring pre-load.

Removing and refitting the hose



7:5



7:7

7:1
Check and note or mark witch side of the banjo nipple that is turned against the cylinder head respectively the reservoir head.

7:2
Note or mark the angles that the banjo connections have in relation to the shock absorber and the reservoir.

7:3
Loosen the banjo connections and remove the hose.

7:4
Check the hose and the connections for damages. Change parts if necessary.

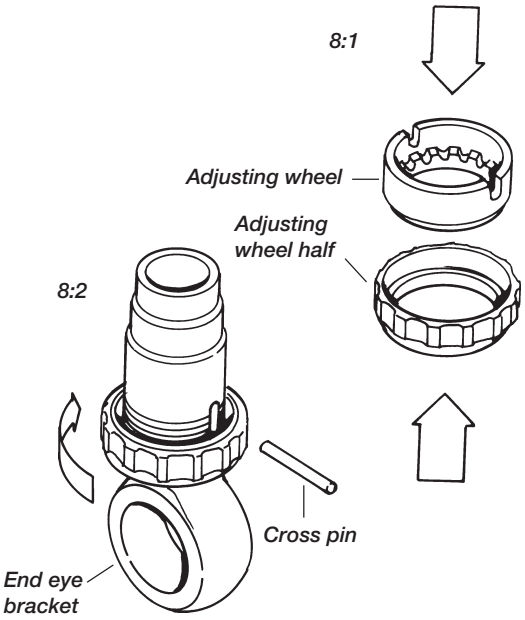
7:5
Ensure that the hose has the correct length.

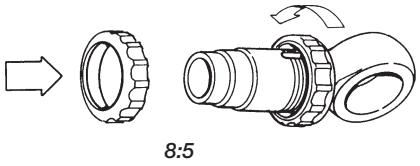
7:6
Use compressed air to blow the inside of the hose clean before fitting.

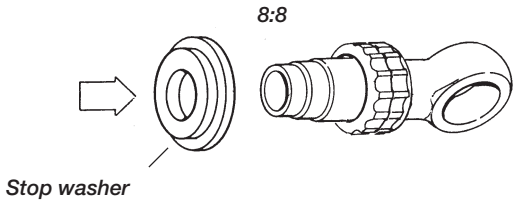
7:7
Use new sealing rings to the banjo connections and refit the connections exately as they were fitted before disassembling.

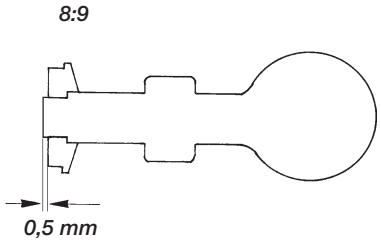
7:8
Torque tighten the banjo connections as recommended for the respective screw dimensions.

7:9
See separate instructions and assembly codes (page xx).









Dismantling and assembling the end eye bracket

Dismantling

8:1
Fasten the end eye in a vice with soft jaws.

NOTE!

On some models the stop washer is pressed off the end eye before the piston shaft is removed.

8:2
Pull the adjustment wheel upper half off.

8:3
Turn the lower adjustment wheel half downwards. Raise the cross pin and remove it.

8:4
Remove the lower wheel half from the end eye.

Assembling

8:5
Press together the adjustment wheel in the closed half of the adjustment knob. Use a vice with soft jaws.

8:6
Grease the thread on the end eye. Screw in the adjustment wheel on the end piece so that the adjustment pin can be fitted in its hole.

8:7
Screw the adjustment wheel maximum against the adjustment pin. Press on the other half of the adjustment knob with the aid of a sleeve 723-xx in a vice.

Then screw down the adjustment wheel about 5-6 turns so that the adjustment shaft is not damaged when fitting the end piece on the piston shaft.

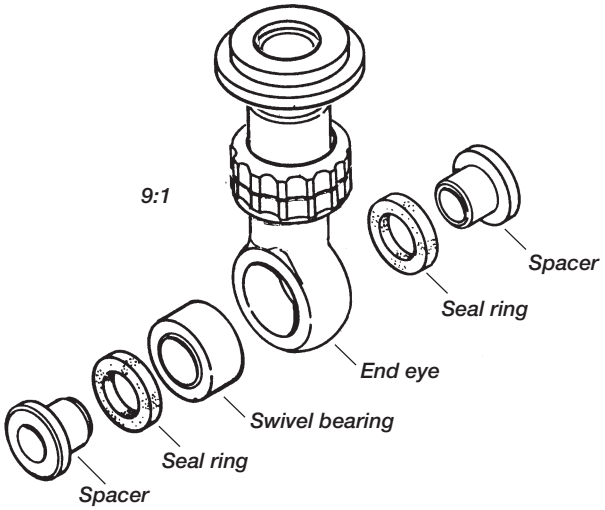
NOTE!

On some models the stop washer is pressed into position after the end eye has been fitted on the piston shaft.

8:8
Press the stop washer on the end eye using sleeve 723-xx.

8:9
Make certain that the stop washer bottoms properly. The end piece should protrude about 0.5 mm above the washer.

8:10
Then mount the swivel bearing. Use Loctite 601 and drift (721- xx). Press it in with the help of a vice. Measure to ensure that the bearing is centered.



Dismantling swivel bearings and spacers

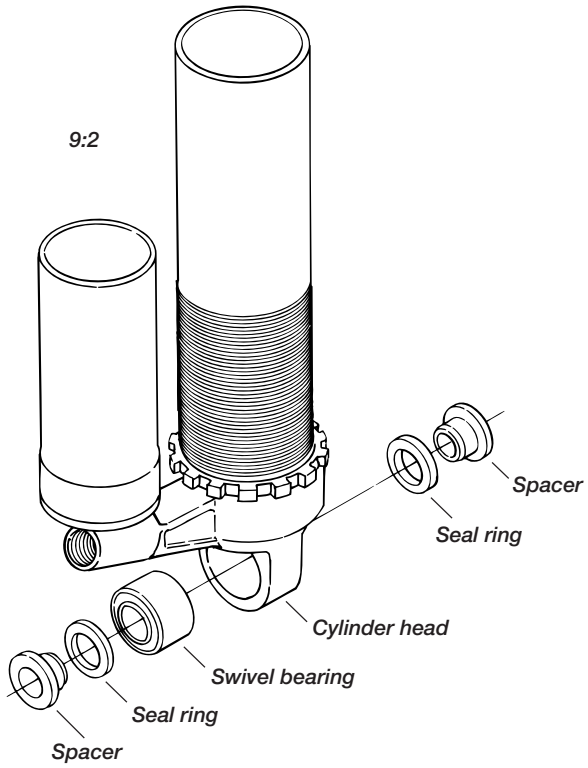
9:1
Remove the spacers with a hammer and a drift. Remove the seal rings.

9:2
Press the swivel bearing out. Use tools (721-xx) and (723-xx).

Mounting swivel bearing and spacers

10:1
Apply loctite 601 if the bearing is fitted without circlips. Press the swivel bearing into position. Use tool (721-xx).

10:2
Apply a little red grease 0146-01 or airfilter oil on the seal rings. Place the seal rings in position and press in the spacers Ensure that size of the spacers conforms to the spec.card.



Final inspection

11:1
Make a final visual inspection of the assembled shock absorber. Ensure that there is no leakage and that all surfaces are clean and undamaged.

Fitting decals

12:1
See separate instructions and fitting codes.

Tightening torque and greasing

13:1
See separate instructions.

Information Öhlins Oil and Grease

Part No.	*Description*	*Type/remarks*	*Quantity*
00105-01	Öhlins shock absorber fluid No 131	In shock absorbers	1 Litre
00105-10	Öhlins shock absorber fluid No 131	In shock absorbers	10 Litre
01306-01	Öhlins shock absorber fluid No 309	In shock absorbers and MX & Enduro steering damper	1 Litre
01306-10	Öhlins shock absorber fluid No 309	In shock absorbers and MX & Enduro steering damper	1 Litre
01305-01	Öhlins front fork fluid No 5	In cartridge type of front forks and Street steering dampers	1 Litre
01305-10	Öhlins front fork fluid No 5	In cartridge type of front forks and Street steering dampers	10 Litre
01310-01	Öhlins front fork fluid No 10	In cartridge and conventional type of front forks	1 Litre
01315-01	Öhlins front fork fluid No 15	In conventional type of front forks	1 Litre
01309-01	Öhlins front fork fluid	In 43 mm R&T front forks	1 Litre
00146-01	Öhlins red grease	Multi purpose grease	100 g
00146-02	Öhlins red grease	Multi purpose grease	400 g
00147-01	Öhlins white grease	When overhauling shock absorbers	100 g
00147-02	Öhlins white grease	When overhauling shock absorbers	500 g

Disposal of Shock absorbers

The most efficient way to scrap a shock absorber is to leave it to a metal waste treatment company. They have resources for separating oil, plastic and different metals.

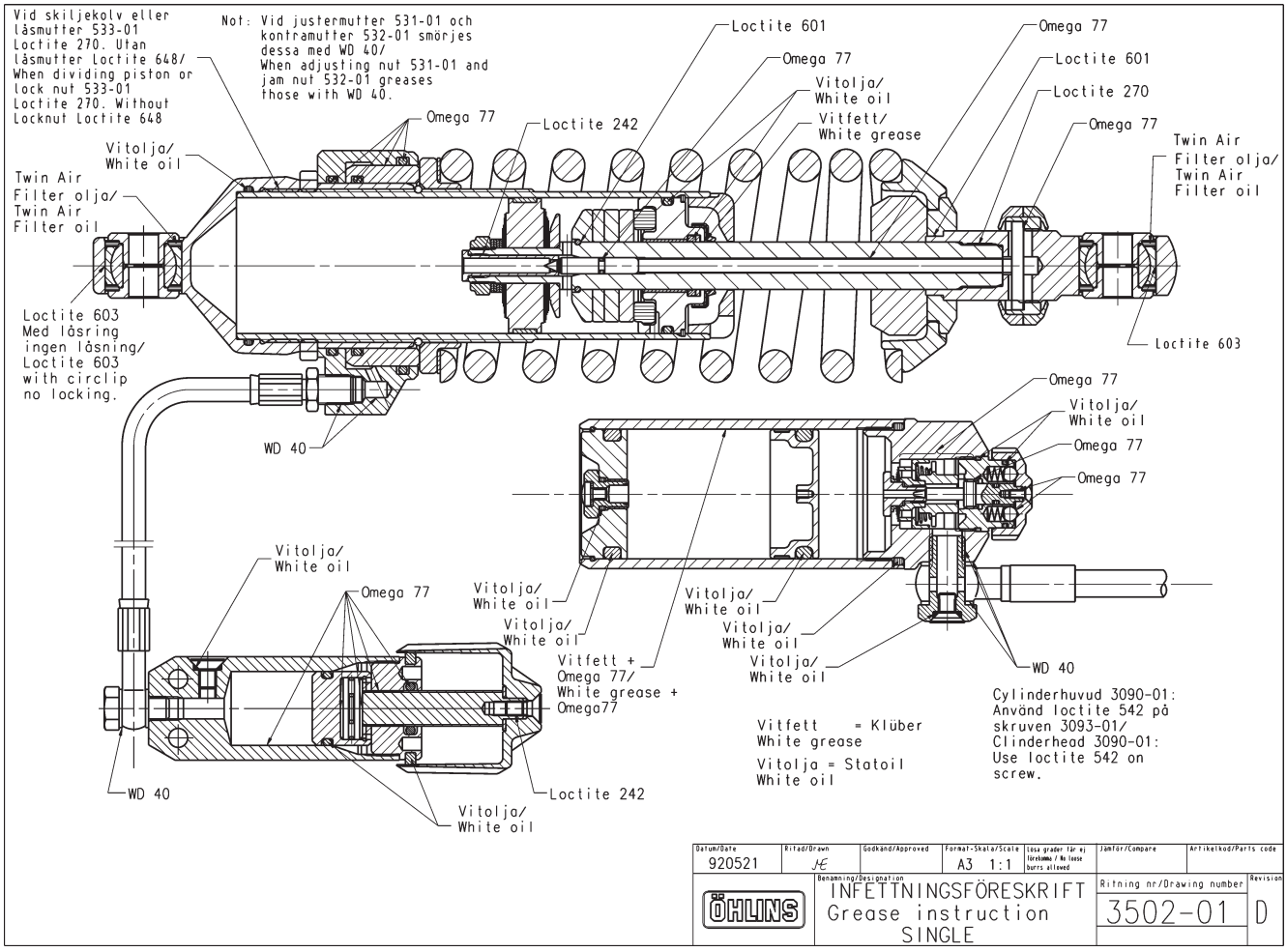
If you intend to do it yourself, follow the instructions for disassembling of the shock absorber.

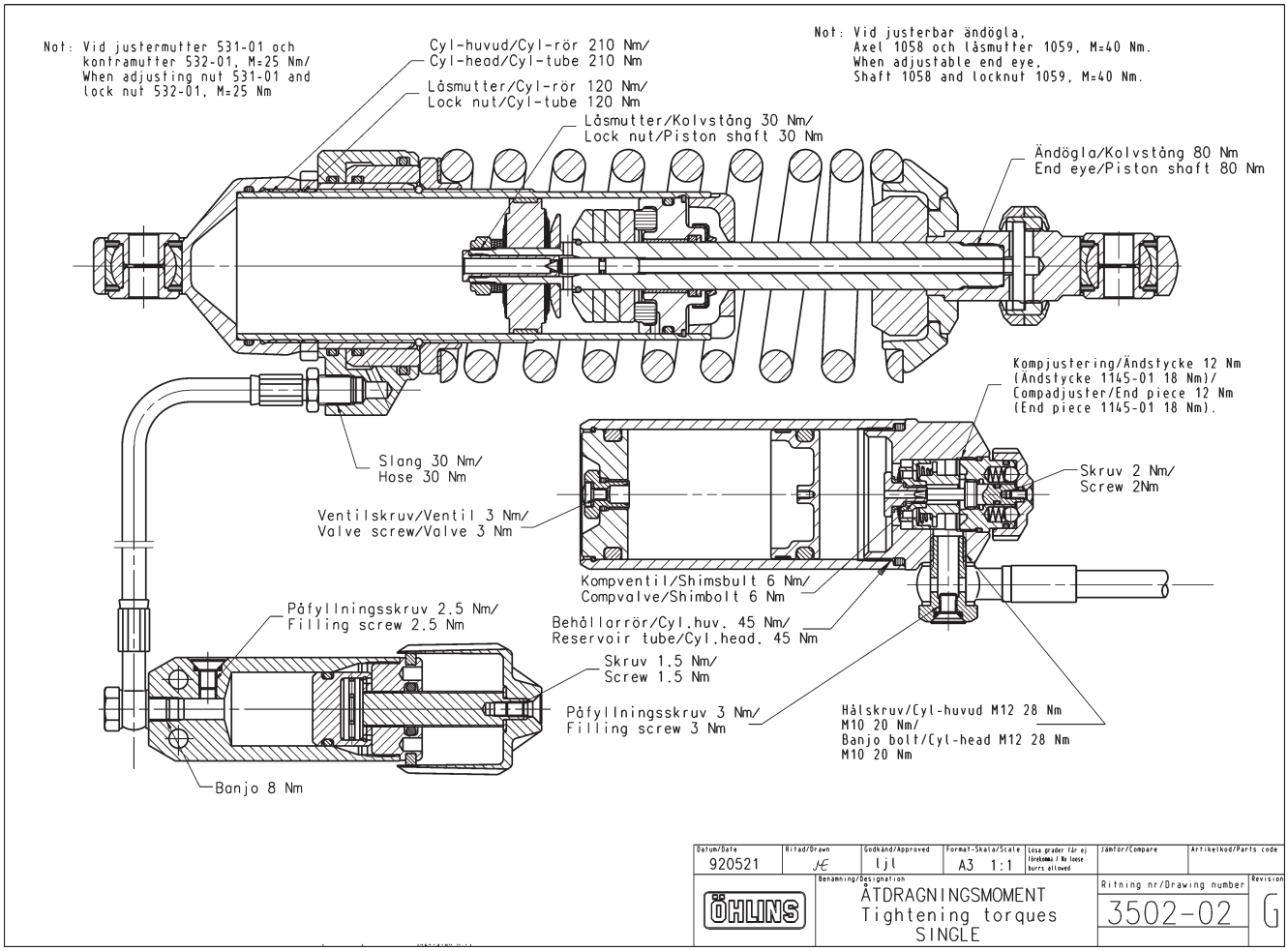
- The pressurized gas is N2 (Nitrogen) and can be re leased into the air (air composed of 78% nitrogen).
- The oil must be poured out into a separate vessel and handed over for destruction.
- Rubber and plastic details should be removed.
- The metal parts should be separated into two fractions; aluminum and steel

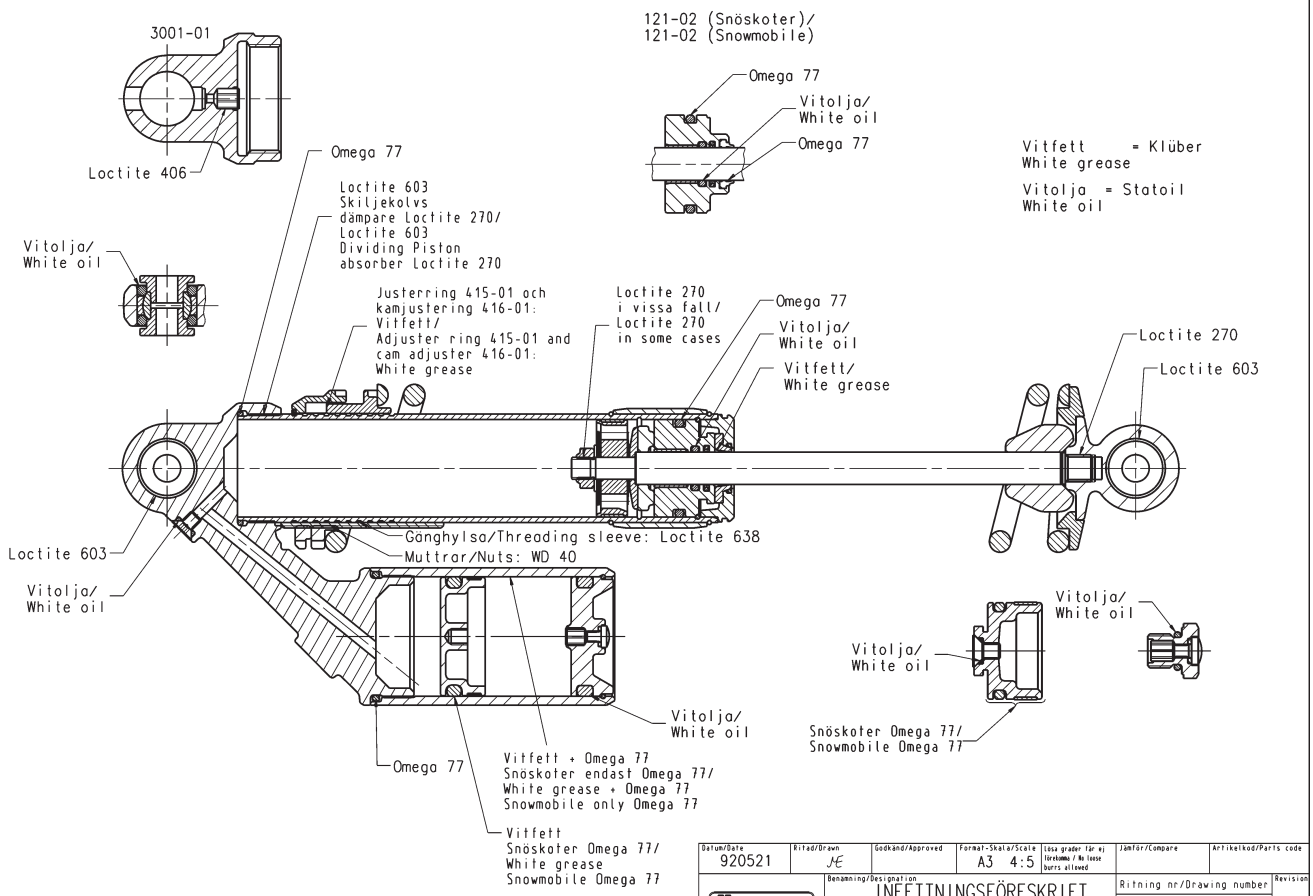
Hand over the separated components to a waste treatment operator for further treatment and recycling.

Drawings

Contents


Vid skiljekolv eller låsmutter 533-01 Loctite 270. Utan låsmutter Loctite 648/ When dividing piston or lock nut 533-01 Loctite 270. Without Locknut Loctite 648
Not: Vid justermutter 531-01 och kontramutter 532-01 smörjes dessa med WD 40/ When adjusting nut 531-01 and jam nut 532-01 greases those with WD 40.
Loctite 601
Omega 77
Vitolja/ White oil
Vitfett/ White grease
Loctite 242
Loctite 270
Twin Air Filter olja/ Twin Air Filter oil
Loctite 603 Med låsring ingen låsning/ Loctite 603 with circlip no locking.
WD 40
Vitolja/ White oil
Omega 77
Vitfett + Omega 77/ White grease + Omega77
Vitolja = Statoil White oil
Cylinderhuvud 3090-01: Använd loctite 542 på skruven 3093-01/ Clinderhead 3090-01: Use loctite 542 on screw.
Datum/Date 920521
Ritad/Drawn JE
Format-Skala/Scale A3 1:1
Jämför/Compare
Artikelkod/Parts code
Benämning/Designation
INFETTNINGSFÖRESKRIFT
Grease instruction
SINGLE
Ritning nr/Drawing number
3502-01
Revision
D


Not: Vid justermutter 531-01 och kontramutter 532-01, M=25 Nm/ When adjusting nut 531-01 and lock nut 532-01, M=25 Nm
Not: Vid justerbar ändögla, Axel 1058 och låsmutter 1059, M=40 Nm. When adjustable end eye, Shaft 1058 and locknut 1059, M=40 Nm.
Cyl-huvud/Cyl-rör 210 Nm/ Cyl-head/Cyl-tube 210 Nm
Låsmutter/Cyl-rör 120 Nm/ Lock nut/Cyl-tube 120 Nm
Låsmutter/Kolvstång 30 Nm/ Lock nut/Piston shaft 30 Nm
Ändögla/Kolvstång 80 Nm End eye/Piston shaft 80 Nm
Kompjustering/Ändstycke 12 Nm (Ändstycke 1145-01 18 Nm)/ Compadjuster/End piece 12 Nm (End piece 1145-01 18 Nm).
Slang 30 Nm/ Hose 30 Nm
Skruv 2 Nm/ Screw 2Nm
Ventilskruv/Ventil 3 Nm/ Valve screw/Valve 3 Nm
Kompventil/Shimsbult 6 Nm/ Compvalve/Shimbolt 6 Nm
Behållarrör/Cyl.huv. 45 Nm/ Reservoir tube/Cyl.head. 45 Nm
Påfyllningsskruv 2.5 Nm/ Filling screw 2.5 Nm
Skruv 1.5 Nm/ Screw 1.5 Nm
Påfyllningsskruv 3 Nm/ Filling screw 3 Nm
Hålskruv/Cyl-huvud M12 28 Nm M10 20 Nm/ Banjo bolt/Cyl-head M12 28 Nm M10 20 Nm
Banjo 8 Nm
Datum/Date 920521
Ritad/Drawn JE
Godkänd/Approved ljl
Format-Skala/Scale A3 1:1
Jämför/Compare
Artikelkod/Parts code
Benämning/Designation
ÅTDRAGNINGSMOMENT
Tightening torques
SINGLE
Ritning nr/Drawing number
3502-02
Revision
G



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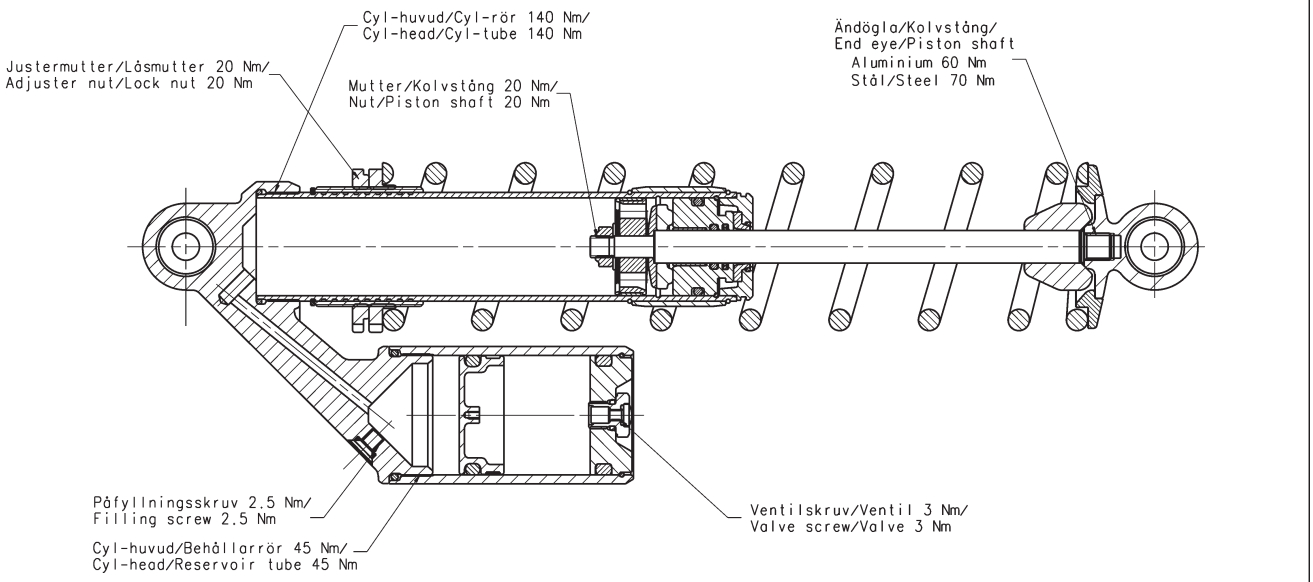
920521	ÅE		A3 4:5			

ÖHLINS

Benämning/Designation: INFETTNINGSFÖRESKRIFT
Grease instruction
TWIN

Ritning nr/Drawing number: 3503-01 | Revision: C

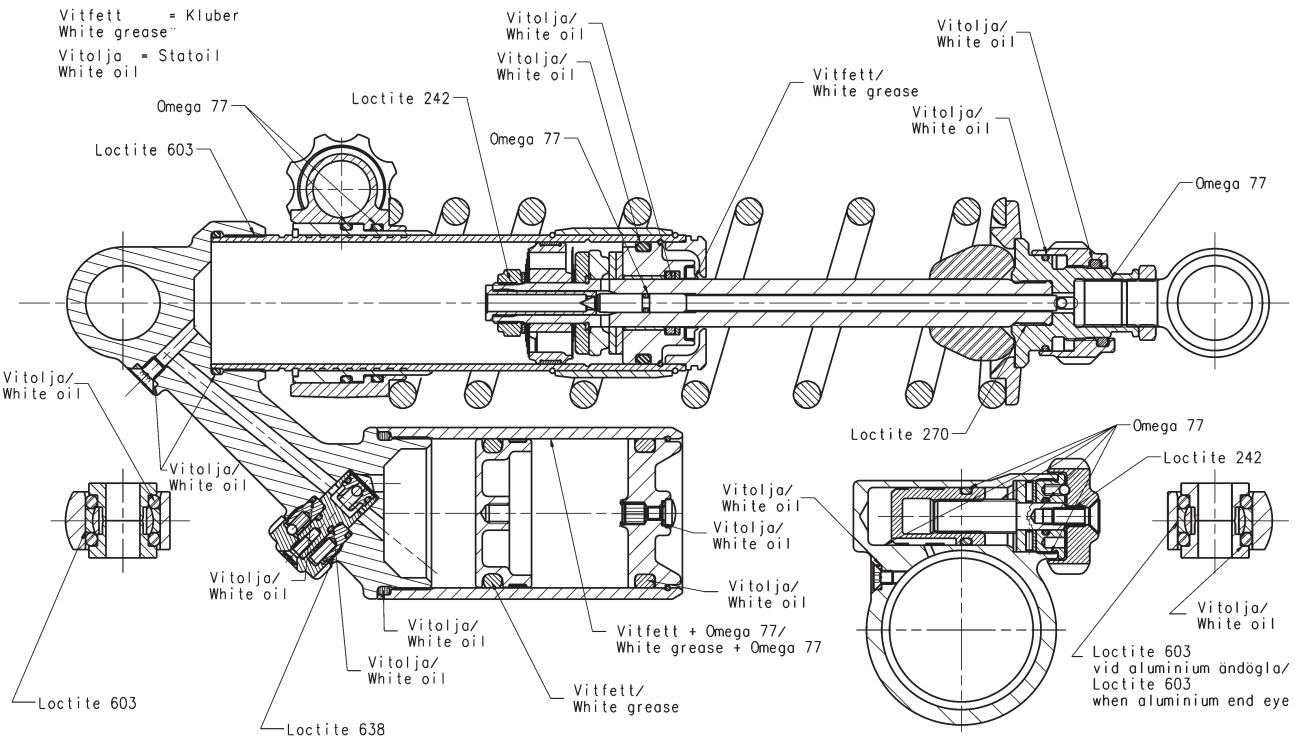


Datum/Date	Ritad/Drawn	Godkänd/Approved	Format-Skala/Scale	Lösa grader får ej förekomma / No loose burrs allowed	Jämför/Compare	Artikelkod/Parts code
920521	ÅE		A3 1:1			

ÖHLINS

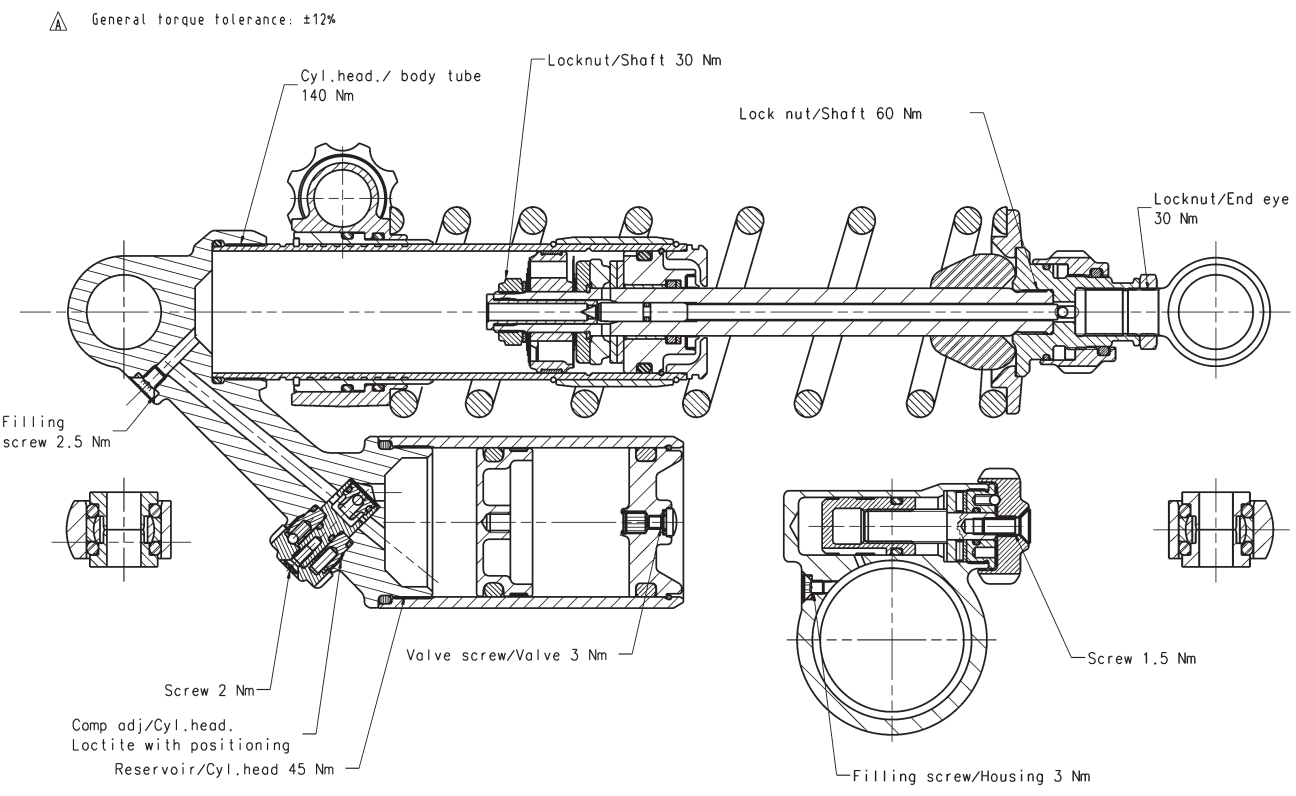
Benämning/Designation: ÅTDRAGNINGSMOMENT
Tightening torques
TWIN

Ritning nr/Drawing number: 3503-02 | Revision: D



Datum/Date	Ritad/Drawn	Godkänd/Approved	Format-Skala/Scale	Lösa grader får ej förekomma / No loose burrs allowed	Jämför/Compare	Artikelkod/Parts code
960814	Ø		A3 1:1			

Benämning/Designation	Ritning nr/Drawing number	Revision
ÖHLINS INFETTNING, TWIN JUSTERBAR Greasing, Twin adjustable	3504-01	B



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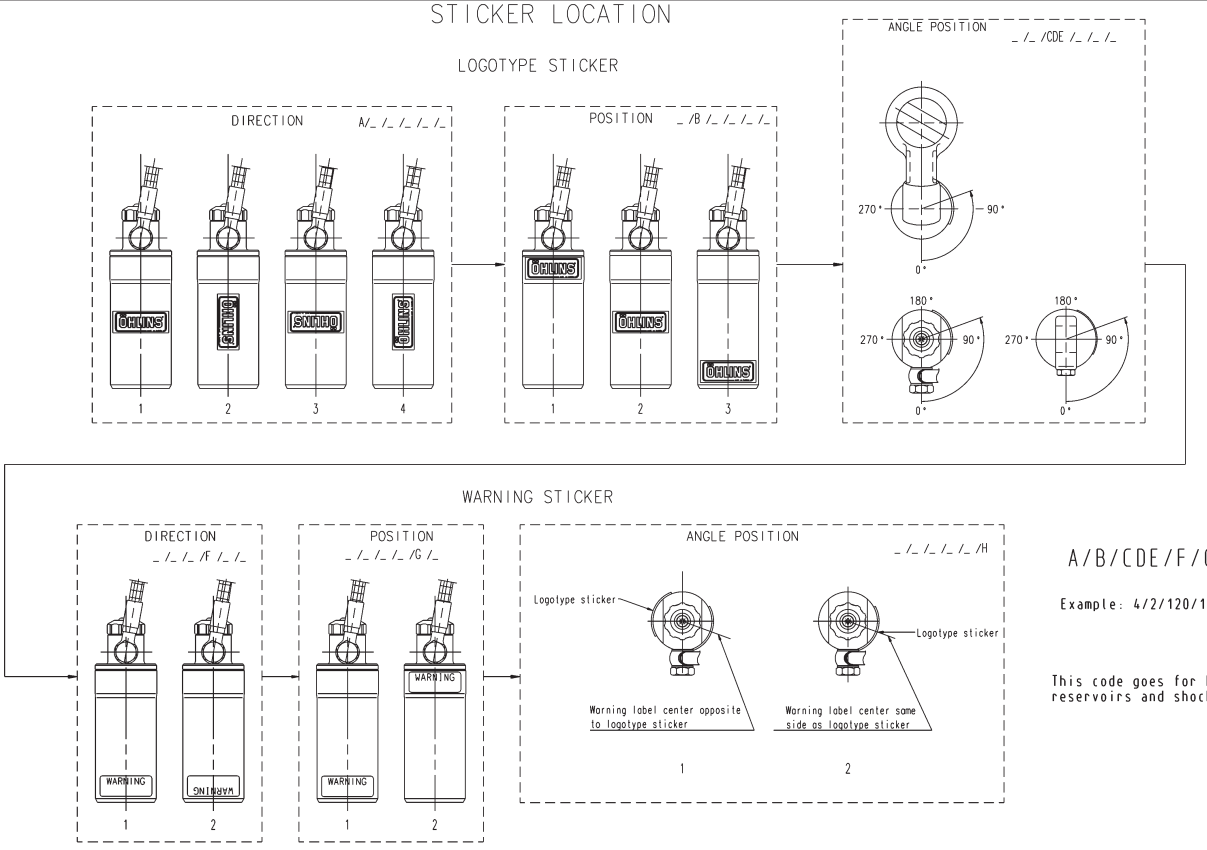
960813	Ø		A3 1:1			

Benämning/Designation	Ritning nr/Drawing number	Revision
ÖHLINS MOMENT/Torques TWIN JUSTERBAR	3504-02	A

STICKER LOCATION



A/B/CDE/F/G/H

Example: 4/2/120/1/2/1

This code goes for both reservoirs and shock bodies

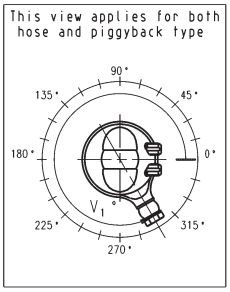
Datum/Date	Ritad/Drawn	Godkänd/Approved	Format-Skala/Scale	Lösa grader får ej förekomma / No loose burrs allowed	Jämför/Compare	Artikelkod/Parts code
980116	LJL		A3 1:1			

Benämning/Designation: Sticker location code

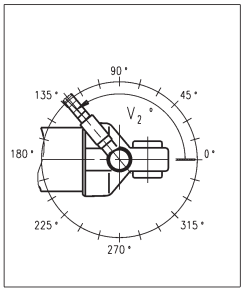
Ritning nr/Drawing number: 3505-01 B

The hose/TT44 mounting is defined as follows:

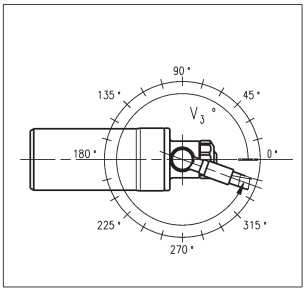
V1 = Reservoir ring angle. (This applies only to TT44-shocks. Standard shocks have "-" in this position)
V2 = Hose angle to the shock body.
V3 = Hose angle to the reservoir.
A/B = Which side to mount the reservoir.
C/D = Which direction to point the reservoir (This applies only to TT44-piggyback-shocks. Standard shocks have "-" in this position)



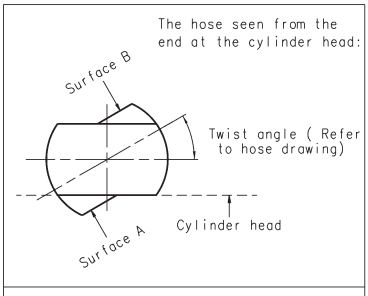
Position 1
Angle V1



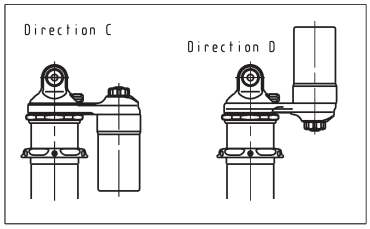
Position 2
Angle V2



Position 3
Angle V3



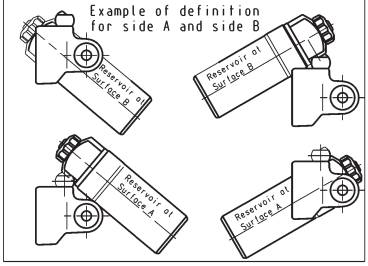
Position 4
Surface A or B



Position 5
Direction C or D

Examples of marking:
Example 1: 300 , 135 , 340 , A , -
Example 2: 300, - , - , -, D
Example 3: - , 135 , 340 , A, -

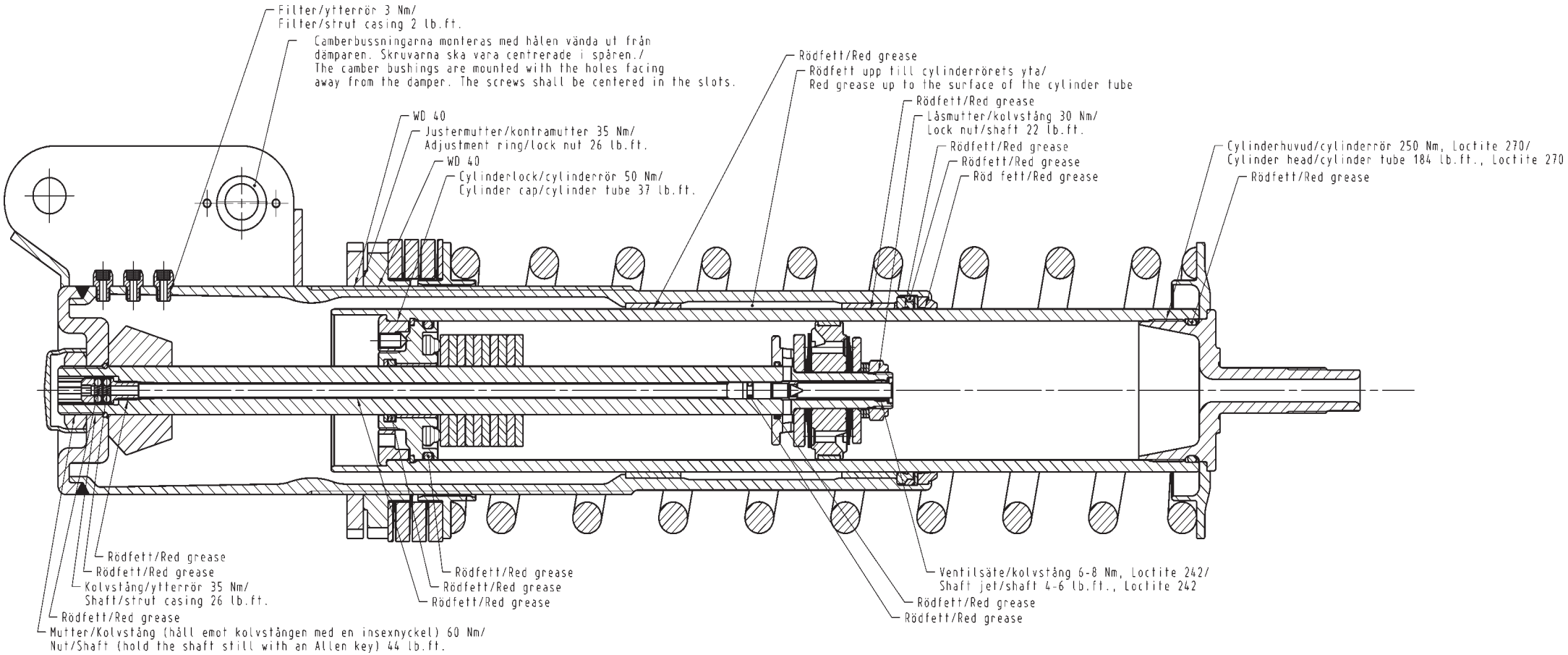
Tolerance on all angles is ±5°



Datum/Date	Ritad/Drawn	Godkänd/Approved	Format-Skala/Scale	Lösa grader får ej förekomma / No loose burrs allowed	Jämför/Compare	Artikelkod/Parts code
980116	LJL		A3 1:1			4100

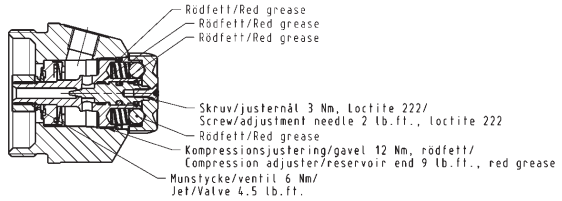
Benämning/Designation: SLANG/TT44 MONTERINGSKOD
Hose/TT44 mounting code

Ritning nr/Drawing number: 3506-01 A

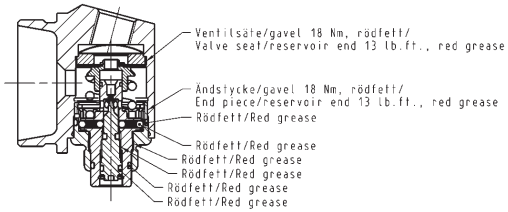

Filter/ytterrör 3 Nm/
Filter/strut casing 2 lb.ft.
Camberbussningarna monteras med hålen vända ut från dämparen. Skruvarna ska vara centrerade i spåren./
The camber bushings are mounted with the holes facing away from the damper. The screws shall be centered in the slots.
WD 40
Justermutter/kontramutter 35 Nm/
Adjustment ring/lock nut 26 lb.ft.
WD 40
Cylinderlock/cylinderrör 50 Nm/
Cylinder cap/cylinder tube 37 lb.ft.
Rödfett/Red grease
Rödfett upp till cylinderrörets yta/
Red grease up to the surface of the cylinder tube
Rödfett/Red grease
Låsmutter/kolvstång 30 Nm/
Lock nut/shaft 22 lb.ft.
Rödfett/Red grease
Rödfett/Red grease
Röd fett/Red grease
Cylinderhuvud/cylinderrör 250 Nm, Loctite 270/
Cylinder head/cylinder tube 184 lb.ft., Loctite 270
Rödfett/Red grease
Rödfett/Red grease
Rödfett/Red grease
Kolvstång/ytterrör 35 Nm/
Shaft/strut casing 26 lb.ft.
Rödfett/Red grease
Mutter/Kolvstång (håll emot kolvstången med en insexnyckel) 60 Nm/
Nut/Shaft (hold the shaft still with an Allen key) 44 lb.ft.
Rödfett/Red grease
Rödfett/Red grease
Rödfett/Red grease
Ventilsäte/kolvstång 6-8 Nm, Loctite 242/
Shaft jet/shaft 4-6 lb.ft., Loctite 242
Rödfett/Red grease
Rödfett/Red grease

Komp. justeringar slangdämpare/
Comp adjusters hose style

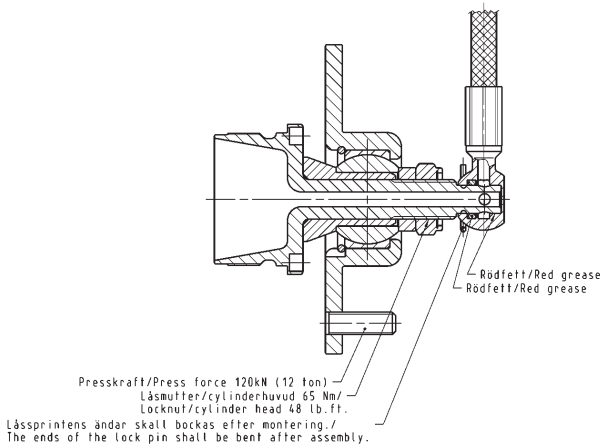
(1250)

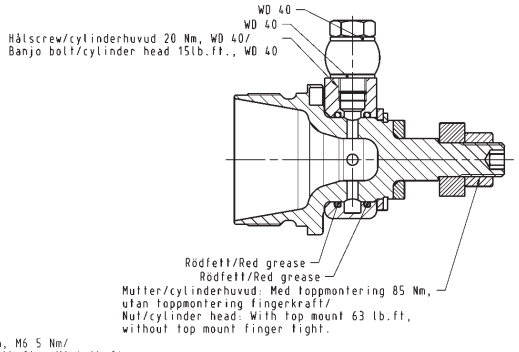


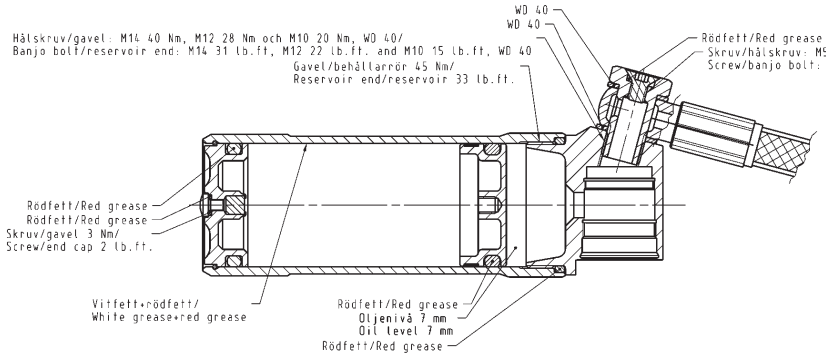
2-way comp.adjuster (5946)

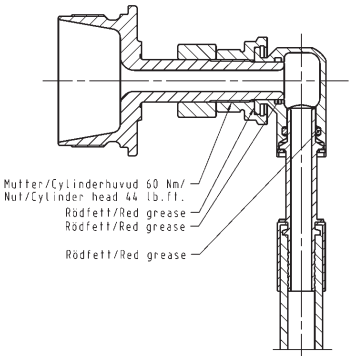


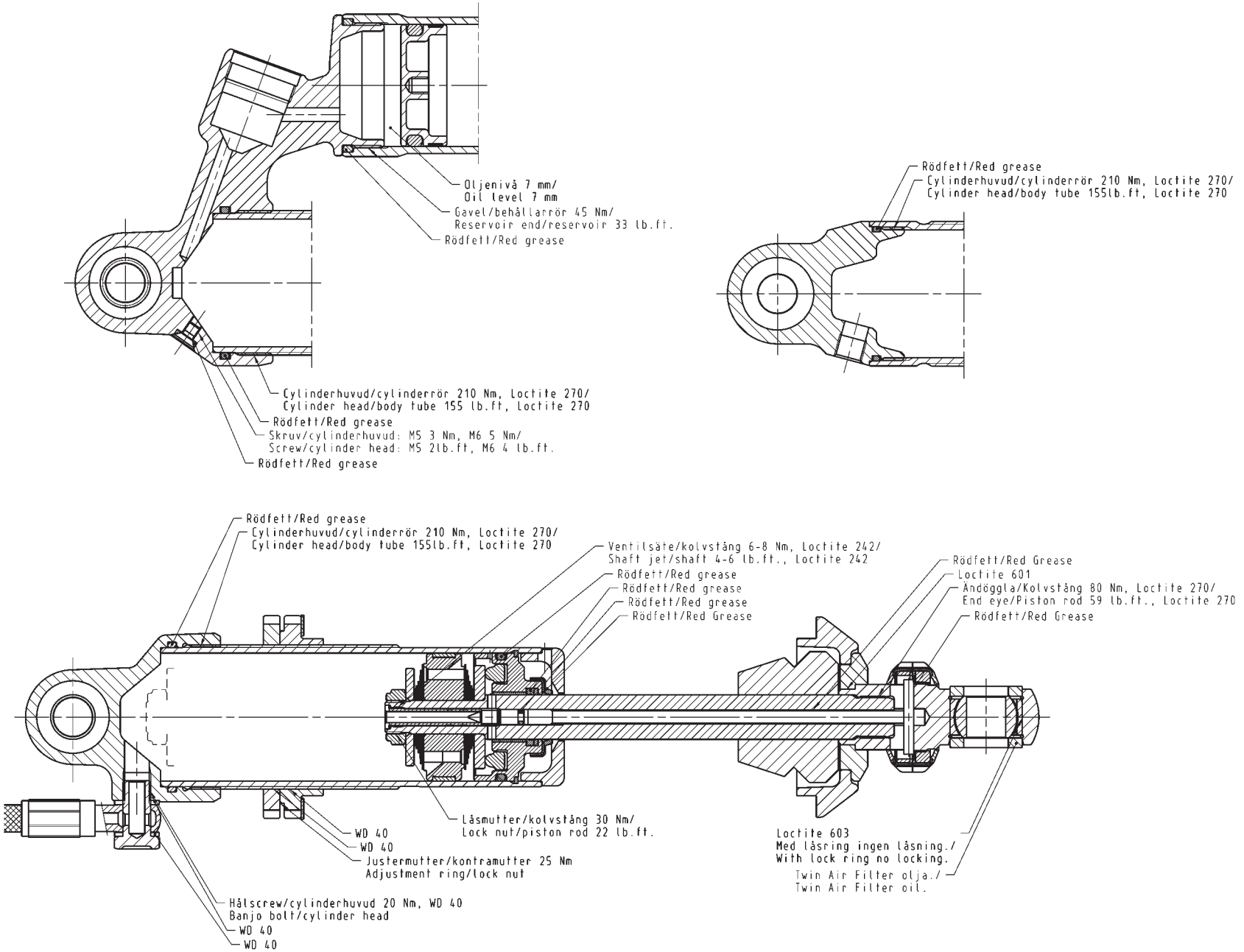
Cylinderhuvuden/
Cylinder heads





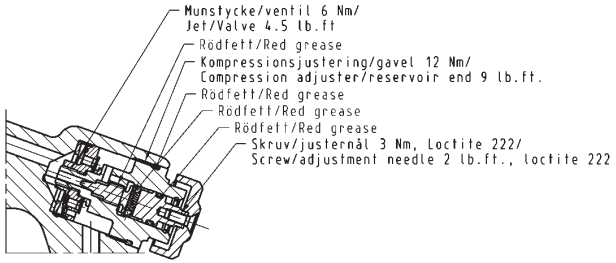




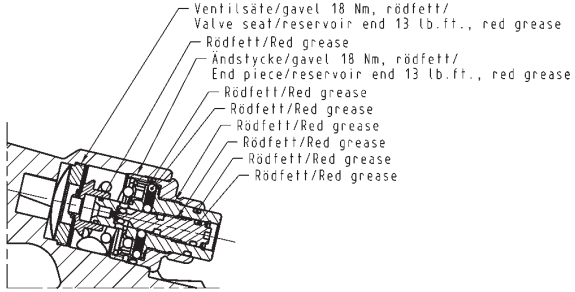

Oljenivå 7 mm/
Oil level 7 mm
Gavel/behållarrör 45 Nm/
Reservoir end/reservoir 33 lb.ft.
Rödfett/Red grease
Cylinderhuvud/cylinderrör 210 Nm, Loctite 270/
Cylinder head/body tube 155 lb.ft, Loctite 270
Rödfett/Red grease
Skruv/cylinderhuvud: M5 3 Nm, M6 5 Nm/
Screw/cylinder head: M5 2lb.ft, M6 4 lb.ft.
Rödfett/Red grease
Rödfett/Red grease
Cylinderhuvud/cylinderrör 210 Nm, Loctite 270/
Cylinder head/body tube 155lb.ft, Loctite 270
Rödfett/Red grease
Cylinderhuvud/cylinderrör 210 Nm, Loctite 270/
Cylinder head/body tube 155lb.ft, Loctite 270
Ventilsäte/kolvstång 6-8 Nm, Loctite 242/
Shaft jet/shaft 4-6 lb.ft., Loctite 242
Rödfett/Red grease
Rödfett/Red grease
Rödfett/Red grease
Rödfett/Red Grease
Rödfett/Red Grease
Loctite 601
Ändöggla/Kolvstång 80 Nm, Loctite 270/
End eye/Piston rod 59 lb.ft., Loctite 270
Rödfett/Red Grease
Låsmutter/kolvstång 30 Nm/
Lock nut/piston rod 22 lb.ft.
WD 40
WD 40
Justermutter/kontramutter 25 Nm
Adjustment ring/lock nut
Loctite 603
Med låsring ingen låsning./
With lock ring no locking.
Twin Air Filter olja./
Twin Air Filter oil.
Hålscrew/cylinderhuvud 20 Nm, WD 40
Banjo bolt/cylinder head
WD 40
WD 40

Komp. justeringar piggybackdämpare/Comp adjusters piggyback style

(1249)

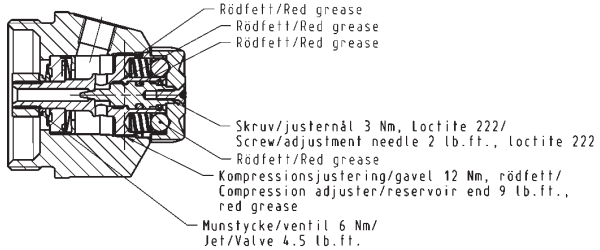


2-way comp.adjuster (5946)

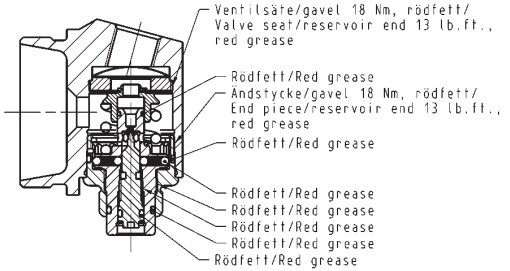


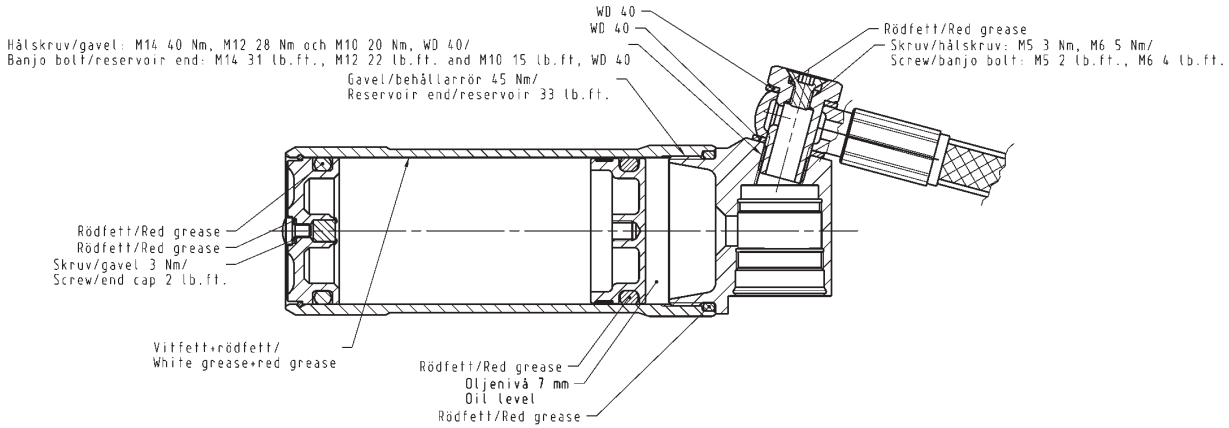
Komp. justeringar slangdämpare/Comp adjusters hose style

(1250)

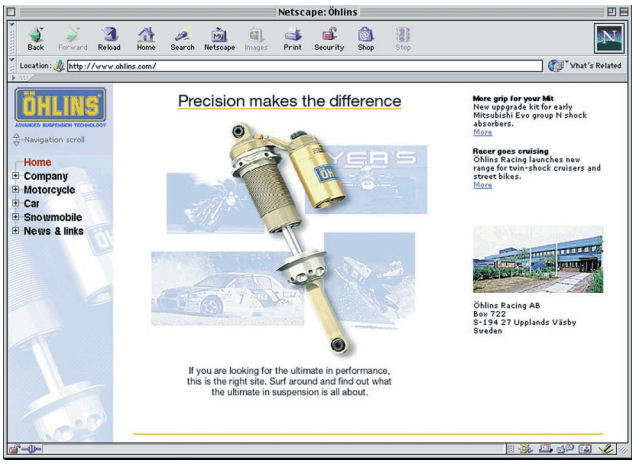


2-way comp.adjuster (5946)





More info



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