

*MX & Enduro TTX Front Fork*  
**Cartridge Kit**

Workshop Manual



ADVANCED SUSPENSION TECHNOLOGY

# Safety Precautions

## **Note!**

The front fork is a very important part of the vehicle and will therefore affect the stability of the vehicle.

 Read and make sure that you understand the information in this manual and the mounting instructions before you use this product. If you have any questions regarding installation or maintenance please contact your nearest Öhlins dealer.

 Öhlins Racing AB can not be held responsible for any damage to the cartridge kit, vehicle, other property or injury to persons, if the instructions for installing and maintenance are not followed exactly.

## **Warning!**

This product was developed and designed exclusively for a specific vehicle model and should only be installed on the intended vehicle model in its original condition as delivered from the vehicle manufacturer.

 This product contains pressurized nitrogen gas (N<sub>2</sub>). Do not open, service or modify this product without proper education (authorized Öhlins dealer/distributor) or proper tools.

 After installing this product, take a test ride at low speed to make sure that your vehicle has maintained its stability.

## **Note!**

When working on this product, always consult your Vehicle Service Manual.

 This Manual should be considered as a part of the product and should therefore accompany the product throughout its life cycle.

## Safety Symbols

In this manual, mounting instructions and other technical documents, important information concerning safety is distinguished by the following symbols:



The Safety Alert Symbol means: Warning! Your safety is involved.

### **Warning!**

The Warning Symbol means: Failure to follow warning instructions can result in severe or fatal injury to anyone working with, inspecting or using the cartridge kit, or to bystanders.



### **Caution!**

The Caution Symbol means: Special precautions must be taken to avoid damage to the cartridge kit.

### **Note!**

The Note Symbol indicates information that is important regarding procedures.

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## Service Interval

Rec. service interval for Cartridge kit: every 25 hrs

### At 25 hour service, replace the following:

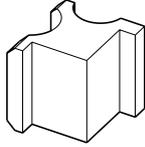
	Part no.
- Top-out rubber	15486-01
- 8 mm seal	15428-01
- Piston ring	15409-01
- Separating piston seal	
years 2010-2011: part no. 00338-96 (2x)	
years 2008-2009: part no. 01027-12 (2x)	

## In This Manual

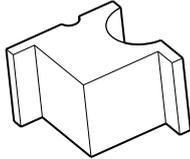
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# Recommended Tools

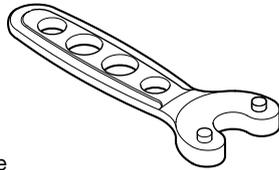
Tool 00727-06  
Soft jaws for cartridge tube



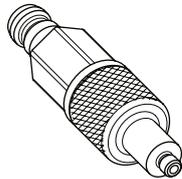
Tool 00727-08  
Soft jaws



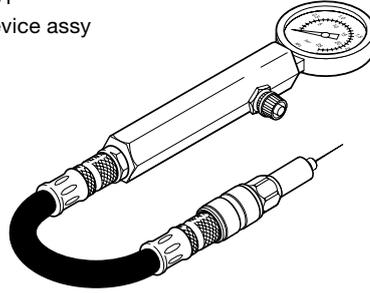
Tool 01761-01  
Peg spanner for top-cap



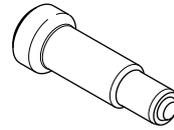
Tool 01820-27  
Adapter for oil filling machine



Tool 01781-01  
Gas filling device assy



Tool 01890-01  
Oil plug tool



Tool 01837-01  
Gas Piston Set Tool



# 1 Remove Cartridge Kit from Fork Leg

## 1.1

Put the motorcycle on a workstand so that the front wheel barely touches the ground and the suspension is unloaded.

### ⚠ Warning!

*Make sure that the vehicle is securely supported so that it will not tip.*

## 1.2

Remove the front wheel and the brake caliper. Consult your Vehicle Service Manual

## 1.3

Measure the position of the front fork. Measure the distance from the top of the fork leg to the top of the upper triple clamp according to the figure.

### 👁 Note!

*Note this dimension as fork height position.*

## 1.4

Loosen the screws that hold the fork legs in the upper triple clamps.

## 1.5

Use a 50 mm fork top cap tool. Loosen the top cap ½ turn. Do not remove the top cap yet.

## 1.6

Loosen the screws that hold the fork legs in the lower triple clamps.

## 1.7

Remove the front fork legs from the vehicle. Clean the fork legs thoroughly. Make sure to clean underneath the fork bottoms.

## 1.8

Remove the security snap-ring at the bottom of the fork with a pair of pliers.

## 1.9

Remove the top cap from the fork leg.

## 1.10

Use a 12 mm socket. Loosen the shaft end of the cartridge kit. *Note, clockwise rotation.*

## 1.11

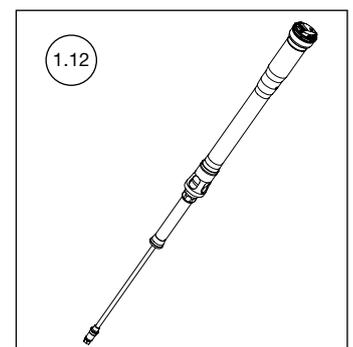
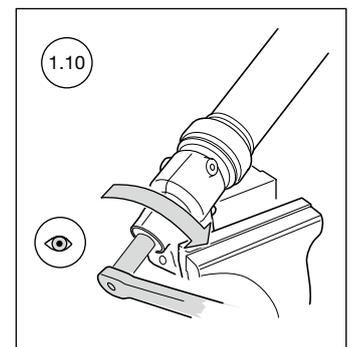
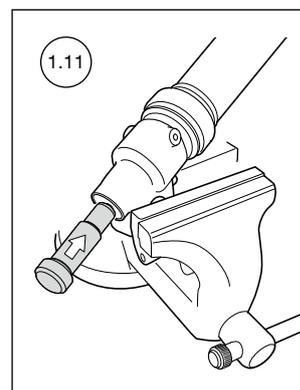
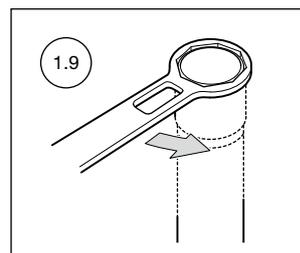
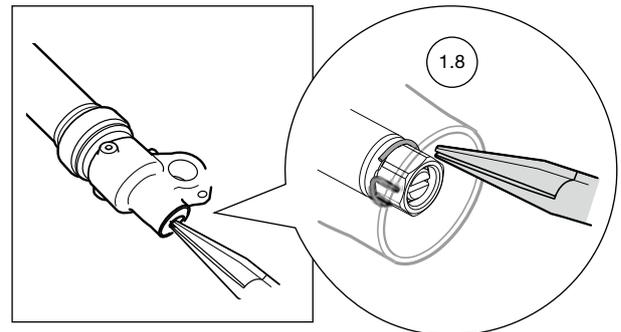
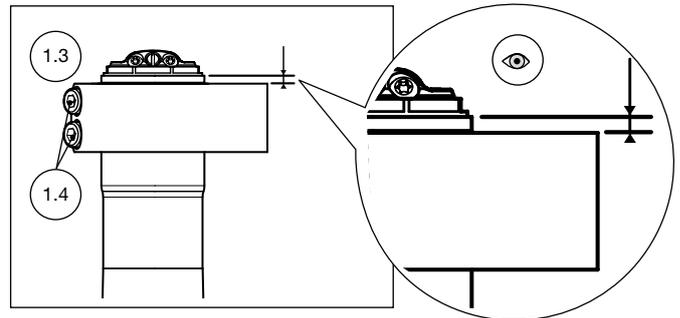
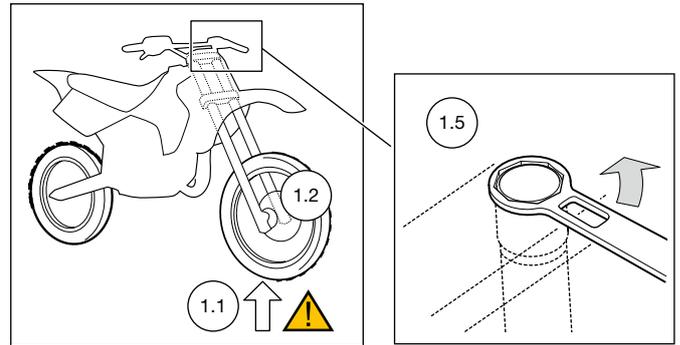
At the same time when pulling the cartridge assembly out of the fork leg, install the tool 01890-01 (oil plug) by pushing the plug into the fork bottom. The plug will keep the oil in the fork while working with the cartridge kit.

## 1.12

Remove the cartridge kit from the fork leg.

## 1.13

Note that spring seat and washer will, depending on cartridge version, stay in fork tube or come out with cartridge.



➡ To replace spring and/or spacers – go to chapter 2

➡ To disassemble Cartridge Kit – go to chapter 4

# 2 Replace Spring and/or Preload Washer

## 👁 Note!

The following procedure requires that you have removed the cartridge kit from the fork leg. See chapter 1.

### 2.1

Remove the spring from the fork leg.

## 👁 Note!

Note that plastic preload washers and/or steel spring support washers may be installed. To remove the washers you must drain the fork tube from oil. Use a solvent (contact cleaner) to clean inside of fork tube, then preload washers will fall out when fork tube is turned up-side down.

## 👁 Note!

To change the spring preload, change the thickness of the preload washers. See figure on the next page for spring preload calculation.

### 2.2

Install the preload washers and the new spring.

## 👁 Note!

The preload washer/s must be below the spring, at the bottom end of the fork leg.

### 2.3

If needed, install washer and spring seat onto cartridge.

### 2.4

Install the cartridge kit into the fork leg. Remove the oil plug tool 01890-01 at the same time when pushing the cartridge kit into the fork bottom.

### 2.5

Tighten the shaft end into the fork bottom.

Tightening torque: 18Nm

Note, counter clockwise rotation.

### 2.6

Install the security snap-ring.

## 👁 Note!

If any oil is needed, use Öhlins Front Fork Fluid only. For recommended oil volume see Mounting Instructions. If you have any questions regarding oil, please contact an Öhlins dealer for advice.

### 2.7

Tighten the Öhlins fork top cap gently into the fork leg. Use

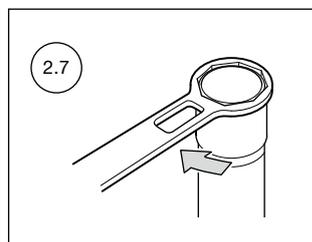
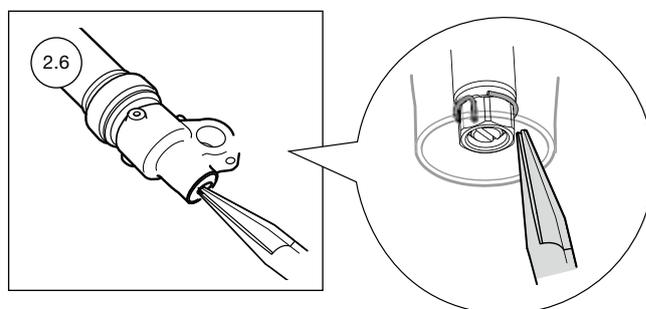
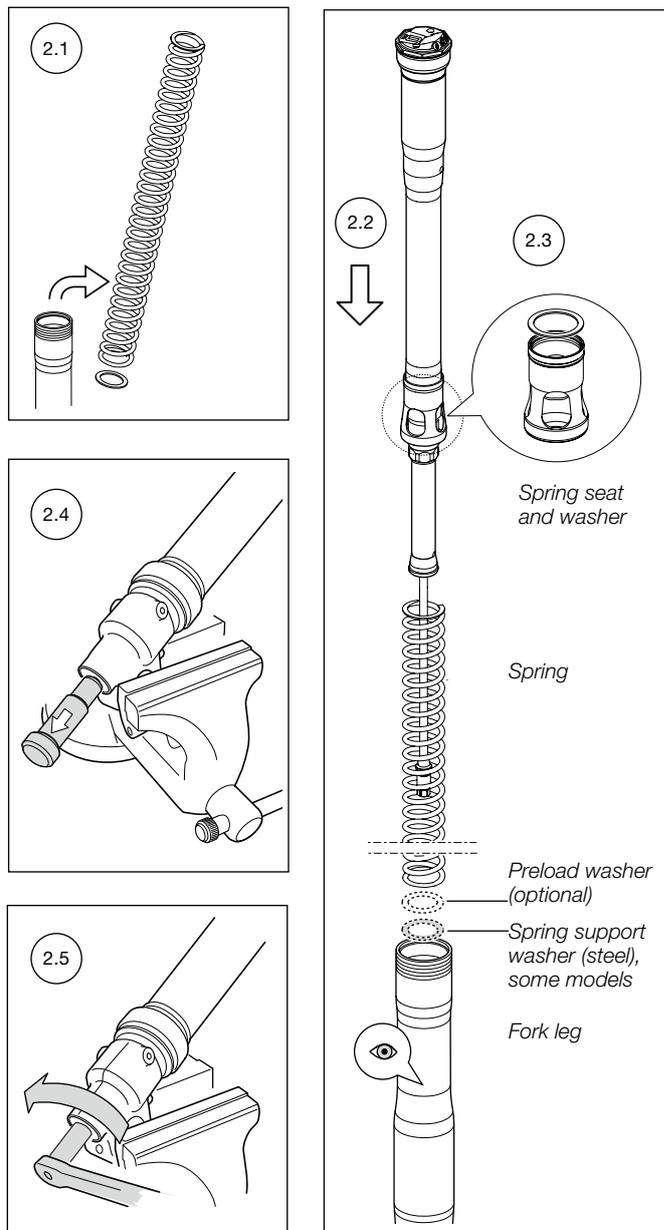
a 50 mm fork top cap tool.

Maximum torque: 10 Nm.

### 2.8

Check and set the rebound and compression valve click positions according to the set-up data in the Mounting Instructions and the Owner's Manual.

➔ To reinstall the front fork legs into the vehicle - go to chapter 7



# 3 - Measure Spring Preload

Measure the spring preload according to the following steps;

## 3.1

Measure A. Fork outer tube should be slid down to stop and cartridge pulled out to distinct stop (requires a force of about 30 kg).

## 3.2

Measure B.

## 3.3

Measure C.

## 3.4

Calculate preload:  $\text{Preload} = B - A - C$

## 3.5

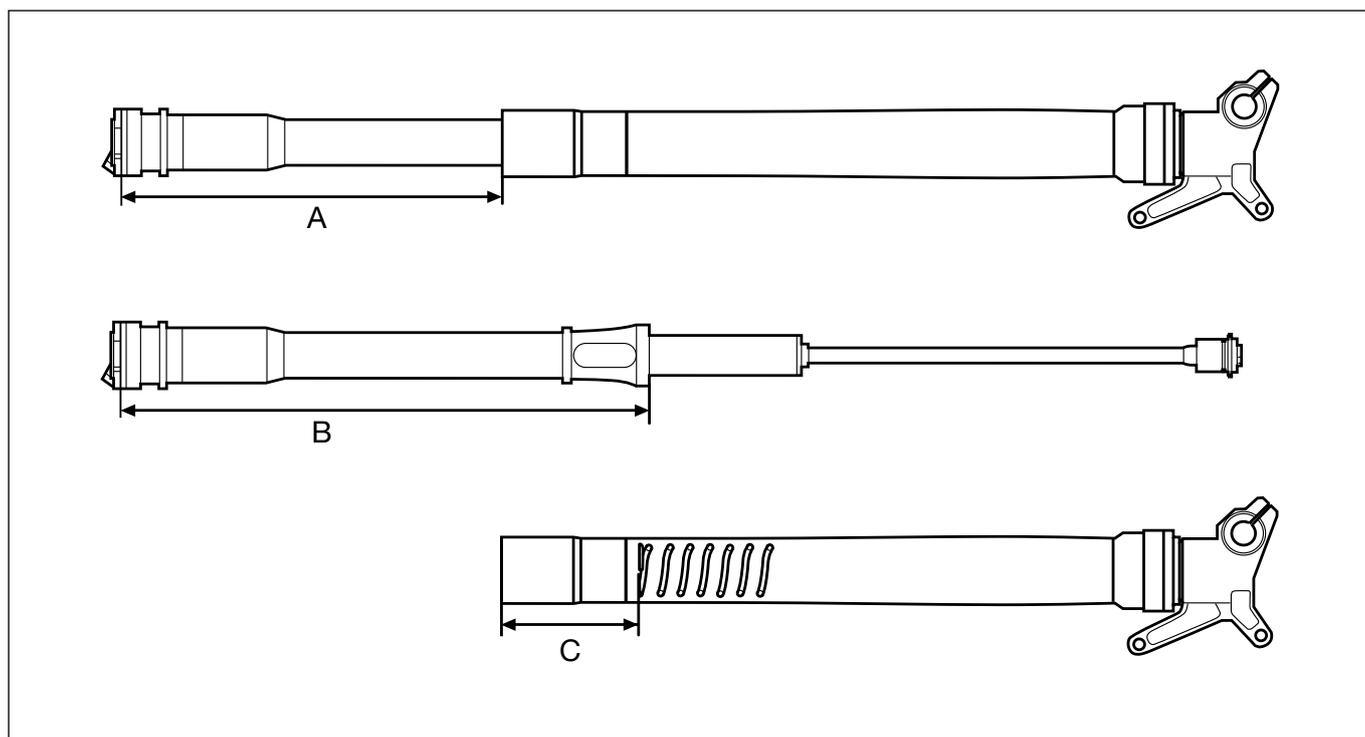
Adjust preload according to the desired value according to set-up data, by adding/removing preload washers below the spring.

Fork springs may differ in length. Therefore we recommend you to check the preload on each fork leg and, if necessary, install preload washers to get the correct value. A negative preload of up to minus 2 mm is possible, since the top-out spring still gives a small compression on the main spring.

Preload less than -2 mm will make the fork spring loose when the front wheel is off the ground, which increases wear inside the fork.

### **Caution!**

*Preload washers must be placed below the spring, otherwise they will restrict oil flow and the fork may break.*



# 4 Disassemble Cartridge Kit

## 👁 Note!

The following procedure requires that you have removed the cartridge kit from the fork leg. See chapter 1.

### 4.1

Remove the spring seat and washer.

## 👁 Note!

The Compression and Rebound adjusters should be set at fully open position.

### 4.2

Fasten the cartridge in a horizontal position in a vice. Use soft jaws 00727-08 to clamp shaft.

### 4.3

Use a heat gun to warm up the Loctite. Use a 12 mm socket and remove the shaft end.

### 4.4

Remove the rebound adjuster pin.

### 4.5

Fasten the damper tube in a vertical position in a vice. Use soft jaws 00727-08 to clamp around bottom cap.

### 4.6

Remove the right torx screw and o-ring at the top of the reservoir.

## ⚠ Warning!

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

### 4.7

Insert Pressure gas tool 01781-01. Release the gas pressure.

### 4.8

Use tool 01761-01. Remove the end-cap assembly.

### 4.9

Push the damper shaft end all the way in. Make sure the shaft end goes into the plastic hydraulic stop tube. Then, use appropriate tool to keep pushing shaft until reservoir piston, compression valve and compression valve come off. Place all parts in correct order on the work bench. Clean all parts thoroughly.

## 👋 Caution!

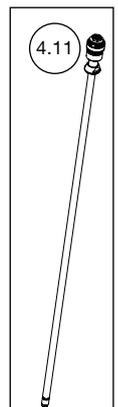
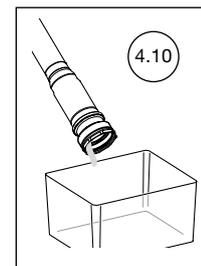
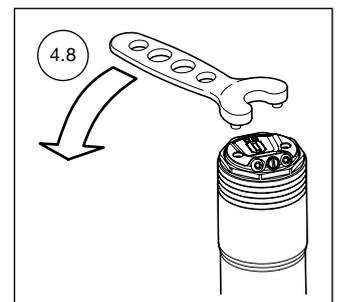
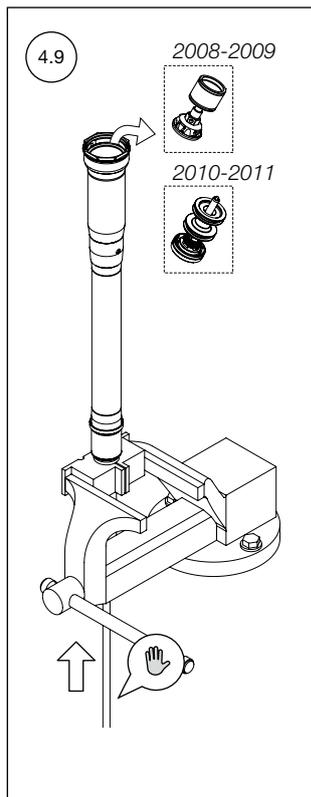
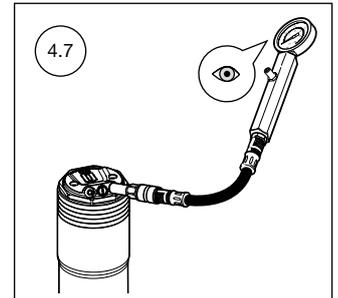
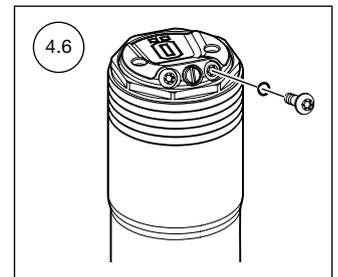
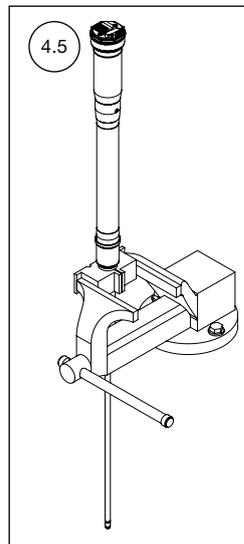
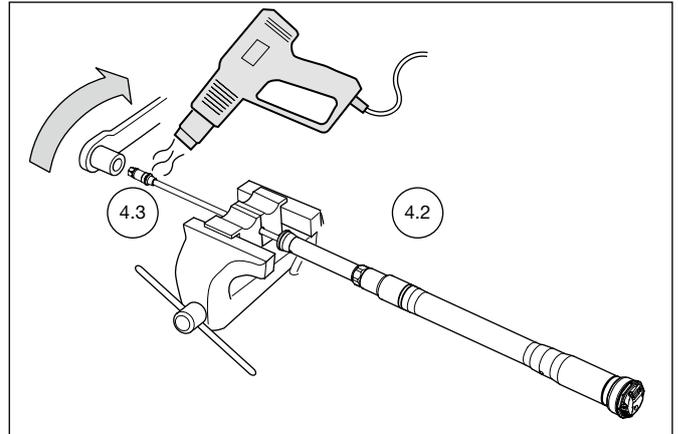
Make sure you do not damage the shaft seal. Wrap some Teflon tape around the thread before pulling out the shaft.

### 4.10

Drain the oil from the damper tube.

### 4.11

Pull out the shaft from the damper tube.



# 4 Disassemble Cartridge Kit

## Note!

Steps 4.12 - 4.15 describe how to remove the hydraulic stop tube. If the tube is in good condition you do not need to remove it.

## Note!

Depending of version, the hydraulic stop tube can be of type with two plastic halves kept together with two circlips. This type should be removed and replaced by one-piece plastic 15408-02/03/04 with nut 15455-01 and bushing 01056-09.

### 4.12

If the 5 mm hole in the plastic tube is only on one side, we recommend drilling in order to achieve a 5 mm through hole.

### 4.13

Use a heat gun to gently heat the aluminium tube end and nut.

## Caution!

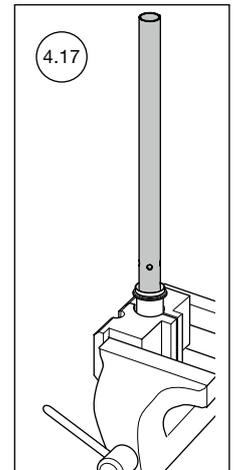
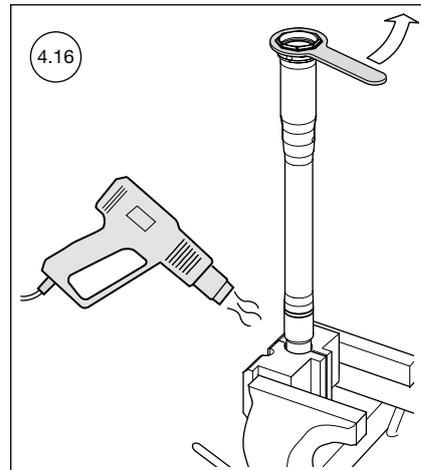
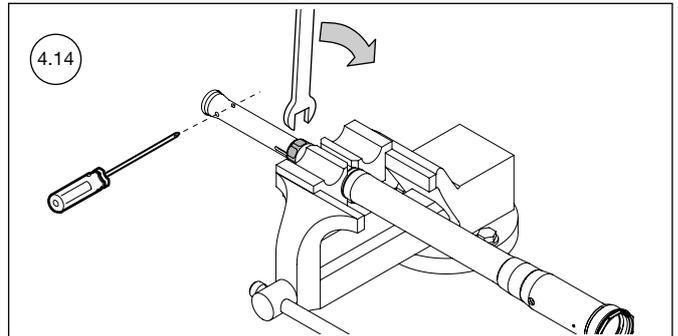
Avoid heating the plastic more than necessary.

### 4.14

Use an appropriate tool through the 5 mm plastic tube hole to keep it from rotating while loosening the nut with a spanner.

### 4.15

Unthread the nut completely and move it away past the slot end. Use a flat screwdriver to open the slot and remove hydraulic stop tube.



### 4.16

Use a heat gun to warm up the Loctite on bottom cap thread. Remove the outer cartridge tube, use standard OEM top cap tool.

### 4.17

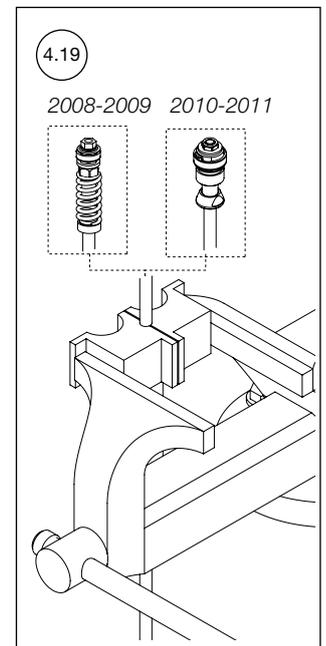
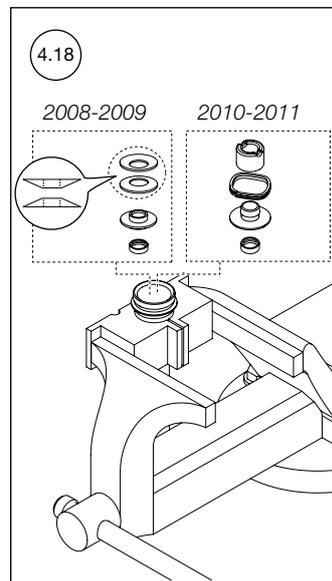
Remove the inner tube from the bottom cap.

### 4.18

Remove the parts according to figure. Check all parts for wear or damage. Replace parts if necessary.

## Note!

We recommend you to replace all x-rings and o-rings.



## Disassemble Shaft

### 4.19

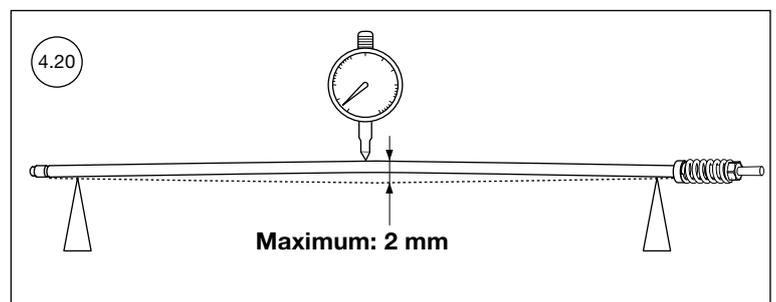
Put the shaft in a vice, use soft jaws (00727-08). Remove the nut, rebound shim stack, piston, sleeve and compression shim stack from the shaft. Place all parts in correct order on the workbench. Clean all parts thoroughly.

### 4.20

Check the shafts. The shafts may be slightly deformed when used. This will not affect the safety or function of the product as long as the run-out is within the tolerance. See figure.

## Note!

If the run-out is outside the tolerance, the piston rod must be replaced.



# 5 Assemble Cartridge Kit

## 5.1

Fasten the shaft in a vice. Use soft jaws (00727-08). Install parts according to figure. Tighten the nut according to assembly drawing.

### Note!

To measure compression shim stack play:

- Install sleeve into piston without any spacer shims.
- Measure how much sleeve extends (x).

This dimension (x) minus compression shim stack thickness (all the shims and wave washers with inner diameter 8 mm) is the play.

Recommended play: 0.4 mm

Adjust by adding spacer shims between sleeve and piston.

## 5.2

If hydraulic stop plastic tube has been removed: Install lock nut all the way past the thread and the slit end. Keep the nut from sliding back towards the thread. Push or tap, with plastic hammer, hydraulic stop tube against bottom cap until it snaps in place. Tightening torque according to assembly drawing.

## 5.3

Clamp bottom cap in a vice using soft jaw tool (00727-08). Install parts according to figure.

### Caution!

Make sure the main seal is correctly positioned. Also make sure to fit the bell washers in correct position (convex sides facing each other).

## 5.4

Install the inner tube into the bottom cap.

## 5.5

Mount the cartridge outer tube on the bottom cap. Tightening torque according to assembly drawing.

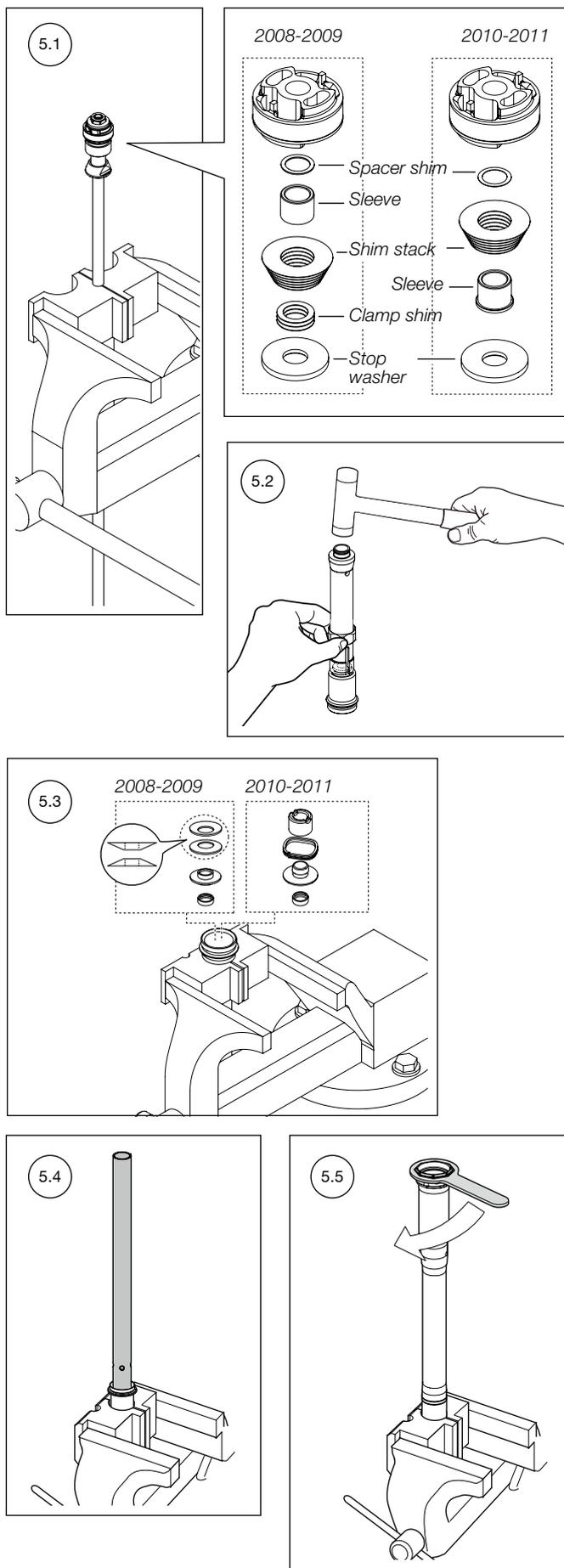
## 5.6

Wrap some Teflon tape around the thread on the shaft end to protect the seal from damages. Apply some red grease on top of the Teflon tape. Mount the shaft assembly into the cartridge tube.

### Note!

For best result, use the Öhlins Oil Filling Machine.

- Go to step 5.12.



# 5 Assemble Cartridge Kit

Steps 5.7 - 5.11 - Manual Filling

## 5.7

Fill up the cartridge tube with Öhlins Front Fork fluid to the top of the inner tube. Move the shaft up and down slowly to bleed out the air underneath the piston.

## 5.8

Reinstall the compression valve unit, compression valve shims and shaft. Fill up with more fork oil to the small bleed hole.

### 👁 Note!

Compression valve shim stack thickness:

2008-2009	4.0 - 4.5 mm
2010-2011	4.5 - 5.0 mm

### 👁 Note!

Make sure there is no air left by moving the shaft up and down a few times. Also, make sure that there is no air left in the outer chamber by pushing the rebound check valve shim open with a suitable tool.

## 5.9

Install the gas reservoir piston. Apply some Öhlins Red Grease on to the seals. Push the reservoir piston down as far as possible.

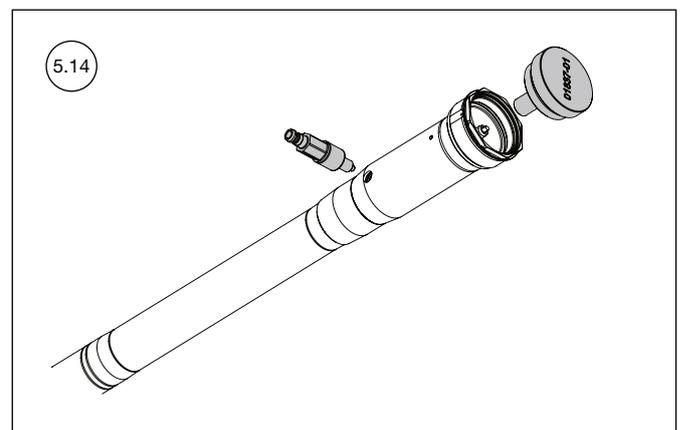
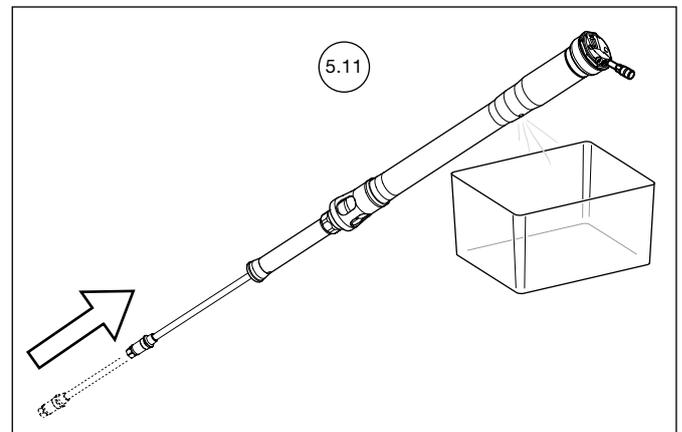
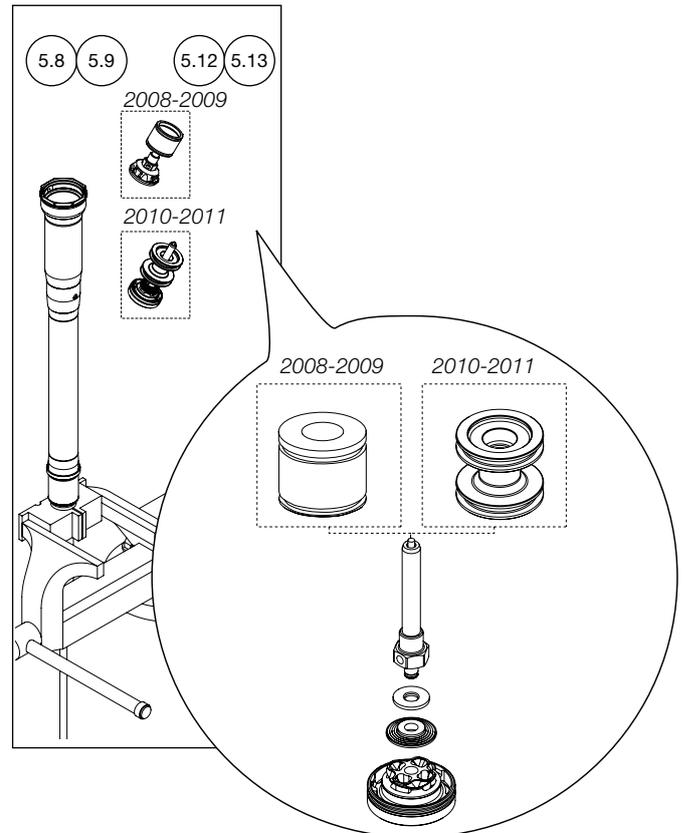
## 5.10

Make sure the compression adjuster is fully open. Install the top-cap, and tighten. Use tool (01761-01). Tightening torque according to assembly drawing.

## 5.11

Release cartridge from vice and hold it over a container while pushing on the shaft end so that full stroke is achieved. Excessive oil will exit through the bleed hole. *Keep the top cap as the "high" end while pushing to remove excessive oil. This will make any trapped air to also be removed.*

➡ Go to step 5.15



Steps 5.12 - 5.14 - Oil Filling Machine

## 5.12

Reinstall the compression valve unit, compression valve shims and shaft.

### 👁 Note!

Compression valve shim stack thickness:

2008-2009	4.0 - 4.5 mm
2010-2011	4.5 - 5.0 mm

## 5.13

Install the gas reservoir piston. Apply some Öhlins Red Grease on to the seals. Push the reservoir piston down as far as possible.

## 5.14

Install Gas piston set tool 01837-01 and Oil filling adapter 01820-27. Use Öhlins Oil Filling Machine and fill oil. Remove oil filling tools, and install screw and washer in oil filling hole.

# 5 Assemble Cartridge Kit

## 5.15

Make sure the compression adjuster is fully open. Install the top-cap, and tighten. Use tool (01761-01).

Tightening torque according to assembly drawing.

### ⚠ Warning!

*Working with gas pressure can be hazardous. Only perform this operation if you are an authorized service centre.*

## 5.16

Pressurize the cartridge to 5 bar.

## 5.17

Install the screw for the gas valve.

## 5.18

Install the rebound adjuster pin. Apply red grease according to assembly drawing.

### 👉 Caution!

*Apply generously with red grease. This will prevent adjuster pin from moving/spinning due to vibrations when in use.*

## 5.19

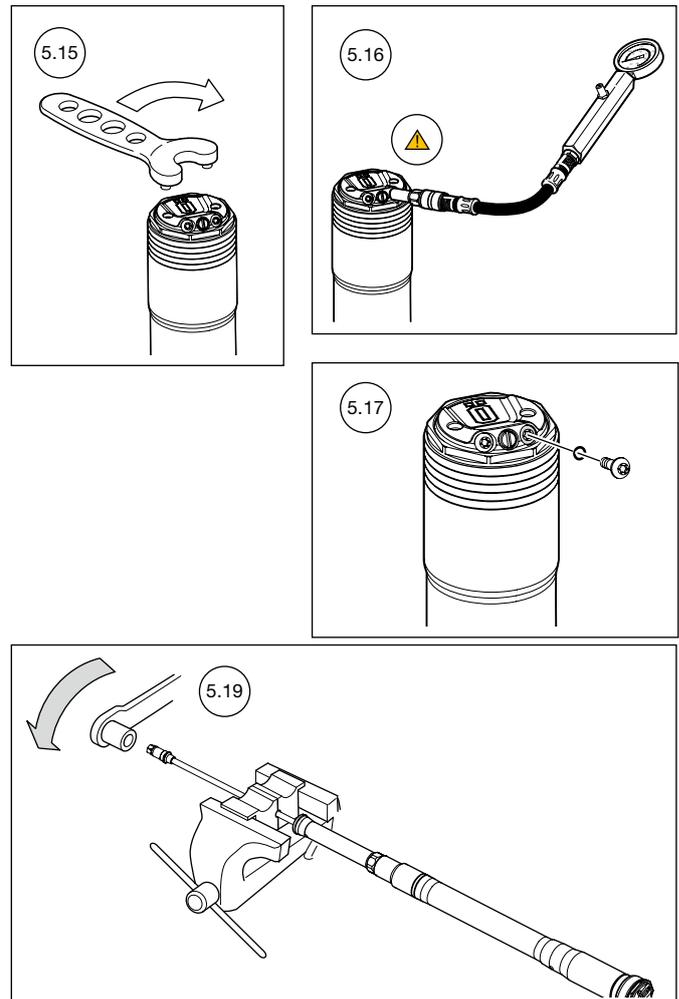
Remove the Teflon tape from shaft and clean shaft thread with contact cleaner. Make sure the rebound adjuster is fully open.

Install and tighten the shaft end.

Tightening torque according to assembly drawing.

## 5.20

Set the adjusters to recommended settings according to the Mounting Instructions.



## 6 Reinstall Cartridge Kit into Fork Leg

### 6.1

Follow chapter 2 to reinstall the cartridge kit into the fork leg.

## 7 Reinstall Fork Leg on the Vehicle

### 7.1

Install the front fork legs into the triple clamps. Note the position of the front fork, see measured distance in chapter 1, step 3.

### 7.2

Tighten the screws that hold the fork legs in the upper and lower triple clamps. Consult your Vehicle Service Manual for correct tightening torques.

### 7.3

Install brake caliper and front wheel. For further instructions, consult your Vehicle Service Manual.

Your Öhlins retailer:



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