



*Motocross 85/150cc*

# *Front Fork Cartridge Kit*

**Owner's Manual**



ADVANCED SUSPENSION TECHNOLOGY



# INTRODUCTION



## Öhlins Racing AB - The Story

*It was the 1970's, a young man named Kenth Öhlin spent most of his spare time pursuing his favourite sport: motocross.*

*A careful observer, Kenth's attention was continually drawn to one specific detail - motocross bikes had more engine power than their suspension could handle. It was not long before Kenth realised that better performance could be achieved by improved wheel suspension.*

*Öhlins Racing was established in 1976, and just two years later the company won its first World Championship title. Despite being in the business for 40 years, the search for perfection and new functions is still the main focus of the company.*

*Congratulations! You are now the owner of an Öhlins Shock Absorber. More than two hundred World Championships and other major world titles are definitive proof that Öhlins shock absorbers offer outstanding performance and reliability.*

*Every product has gone through rigorous testing and engineers have spent thousands of hours, doing their very best to use every possible experience from our 40 years within the racing sport.*

*The product that you now have in your possession is pure racing breed that is built to withstand.*

*By installing this shock absorber on your vehicle you have made a clear statement... you are a serious rider with a focus on getting the maximal handling ability and outstanding feedback from your vehicle. Along comes the fact that your shock absorber will be a long lasting friend, delivering the very best of comfort and performance every time you go for a ride. Go explore!*

# SAFETY PRECAUTIONS

## General Warnings

### 👁️ Note!

*The shock absorber/front fork/steering damper is an important part of the vehicle and will affect the stability.*

### 👁️ Note!

*Read and ensure you understand the information in this manual and other technical documents provided by Öhlins, before using the product.*

### 👁️ Note!

*Öhlins Racing AB can not be held responsible for any damage to the shock absorber/front fork/steering damper, vehicle, other property or injury to persons, if the instructions for mounting, usage and maintenance are not followed exactly.*

### ⚠️ Warning!

*After installing the Öhlins product, take a test ride at low speed to ensure your vehicle has maintained stability.*

### ⚠️ Warning!

*If the suspension makes an abnormal noise, or the function is irregular, or if you notice any leakage from the product, stop the vehicle immediately and return the product to an Öhlins dealer.*

### ⚠️ Warning!

*The product warranty shall only apply if the product has been operated and maintained in accordance with recommendations in this manual. If you have any questions regarding usage, service, inspection and/or maintenance please contact Öhlins.*

### 👁️ Note!

*When working with the Öhlins product, always read the vehicle service manual.*

### 👁️ Note!

*This Manual shall be considered a part of the product and shall 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 shock absorber, or to bystanders.*

### 👉 Caution!

*The Caution Symbol means: Special precautions must be taken to avoid damage to the shock absorber.*

### 👁️ Note!

*The Note Symbol indicates information that is important regarding procedures.*

## Product Specific Warnings

### ⚠️ Warning!

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

### ⚠️ Warning!

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

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# ÖHLINS CARTRIDGE KIT

*Congratulations on your excellent choice of purchasing this high performance Öhlins front fork cartridge kit.*

This product is designed for the upcoming, next generation of stars and has been developed by Öhlins' off-road racing department in Sweden, with their experience from the world stars of today.

We recommend you to read this manual thoroughly for proper bike set up to get the best possible performance out of your suspension components.



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# 1 - HOW IT WORKS

To get a front fork work properly, the front fork and shock absorber must be in balance. To obtain this, it is highly important to have sag and ride height correctly installed on the shock absorber. (see chapter 4 - Set-up)

A front fork can roughly be divided into three different systems working in parallel;

## Spring

The main purpose of the spring is to keep the weight of the rider and bike up in the stroke and push it back up after the fork has traveled down in the stroke. The spring will also help to break an upcoming motion as forces are applied to the front wheel or chassis.

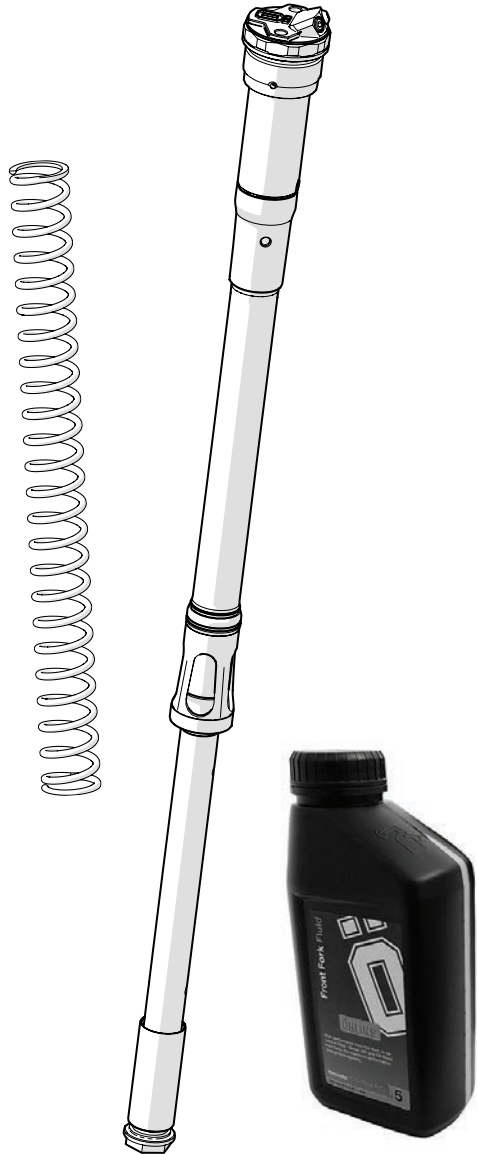
## Hydraulic damping

The main purpose is to slow down upcoming motions, both when the fork is going down and when it is coming back up again. Hydraulic damping is absorbing energy from upcoming motions. Adjust the hydraulic damping character with the adjustment clickers (compression and rebound).

## Oil level

The main purpose is to create a progressive damping curve in the lower part of the stroke.

Remember that each system in the front fork is depending on the shock absorber being correctly set up.



## 2 - HOW TO INSTALL

In this chapter we describe how to install the Öhlins Front Fork Cartridge Kit into the fork legs and how to replace the spring.

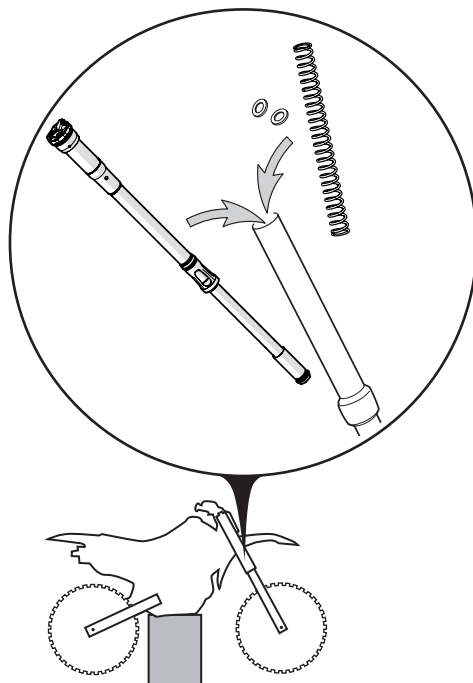
*It is very important that these procedures are performed accurately. If you have any insecurities regarding the procedure or anything regarding the product, please contact an authorized Öhlins dealer.*

### ⚠ Warning!

*We recommend to have an Öhlins dealer install the front fork cartridge kit.*

### ⚠ Warning!

*Before installing this product, read the Öhlins Owner's Manual thoroughly. The front fork is an important part of your vehicle and will affect the stability.*



### Chapter overview

- 2.1 Remove Fork legs
- 2.2 Install Öhlins Front Fork Cartridge Kit
- 2.3 Replace Spring

### Tools

Part No	Description	Notes
01309-XX	Öhlins Front fork fluid	
01890-01	Plug	Oil plug
01892-01	Wrench 44	Top cap
	Contact cleaner	
	Pliers	(for security snapping)
	Screwdriver	(remove/install triple clamps)
	Socket	21 mm (Bottom plug)
	Socket	12 mm (Shaft end Adjuster housing)
	Soft jaws	
	Torque wrench	
	Vise	

# 2.1 - REMOVE FORK LEGS

## ⚠ Warning!

It is advisable to have an Öhlins dealer install the front fork cartridge kit. When installing, see the vehicle service manual.

1

Put the motorcycle on a workstand so that the front wheel barely touches the ground.

## ⚠ Warning!

When working on a raised vehicle, ensure that the vehicle is securely supported so that it will not tip.

2

Remove the front wheel and the brake caliper.

3

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.

Fork height position.....

4

Loosen the upper triple clamp by loosening the screws.

5

Loosen (but do not remove) the top cap 1/2 turn.

6

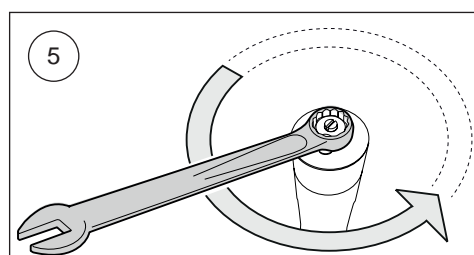
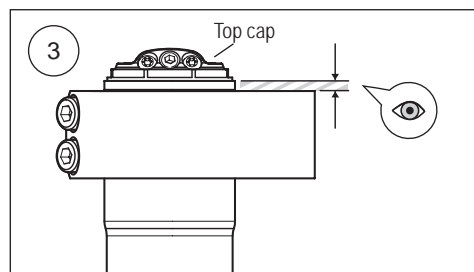
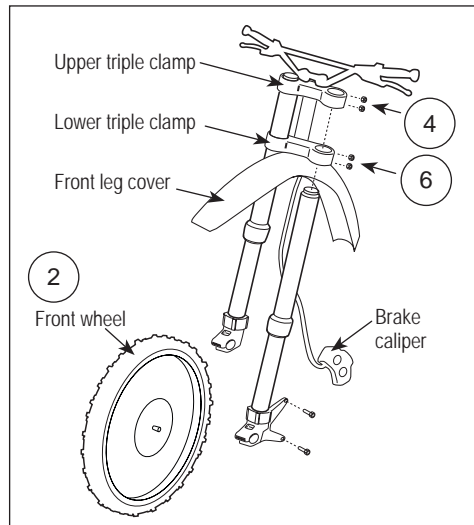
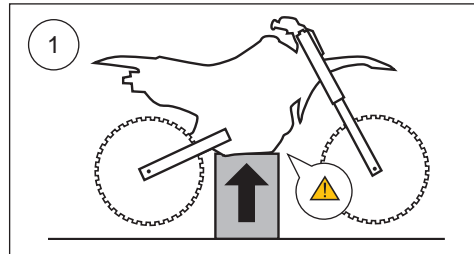
Loosen the lower triple clamp by loosening the screws.

7

Remove the front fork legs from the motorcycle.

8

Clean the fork legs thoroughly. Make sure to clean underneath the fork bottoms.



## 2.2 - INSTALL THE FRONT FORK KIT

### Disassemble the original front fork

9

Follow the vehicle service manual to remove the original front fork kit and spring from the fork leg. Turn the fork leg upside down to pour out the oil. Clean the fork legs thoroughly before installing the Öhlins front fork cartridge kit.

### Install Öhlins front fork cartridge kit

10

Clean the contact surfaces between the hydraulic stop cup and fork bottom with contact cleaner. It is important to clean so that the friction makes the surfaces attach correctly.

11

Install the hydraulic stop cup, into the original fork leg, from the upper end of the fork tube.

### **Caution!**

*Make sure that the hydraulic stop cup is well seated before tightening.*

11

Install and tighten the base plug into the fork bottom. Use a 21 mm socket, tightening torque 45 Nm.

12

See chapter Measure Spring Preload.

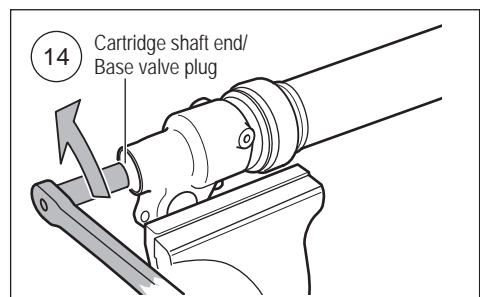
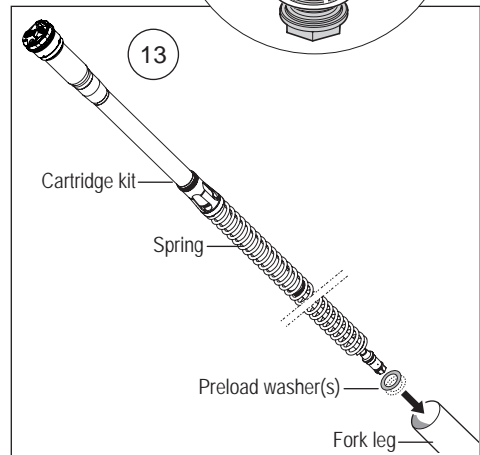
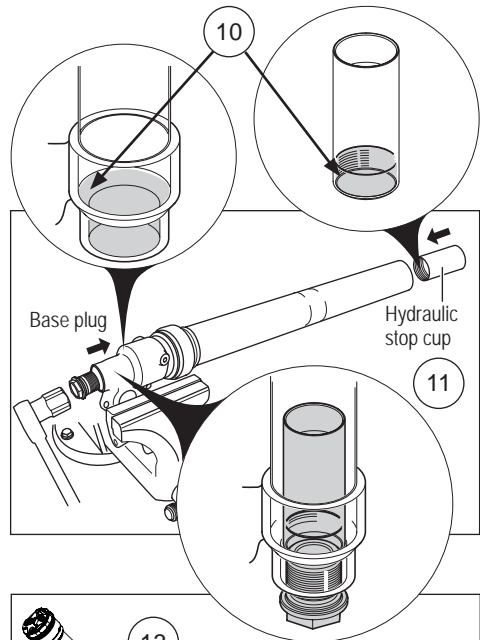
Install preload washer(s) 15482-xx, the recommended Öhlins spring (see Spring guide) and the cartridge kit into the original fork leg. Minimum one preload washer must be installed for spring support.

### **Note!**

*The preload washers shall be below the spring, at the bottom end of the fork leg.*

13

Tighten the cartridge shaft end into the base plug by turning counter clockwise. Use a 12 mm socket, tightening torque 18 Nm.





## 2.2 - INSTALL THE FRONT FORK KIT

### 14

Install the security snapping at the shaft end groove according to figure.

### 15

Pour Öhlins Front fork fluid in the fork leg according to the recommended settings.

### 16

Make sure the front fork is fully extended and tighten the Öhlins fork top cap. Use Wrench (01892-01).

Tightening torque maximum 10 Nm.

### 17

Check and set the rebound and compression valves click positions according to the recommended settings in Set-up data.

### 18

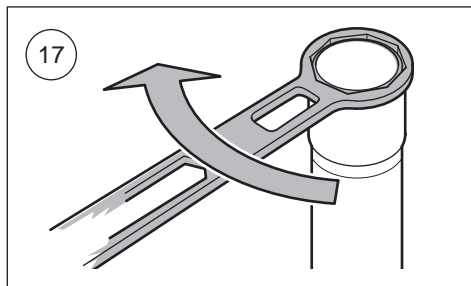
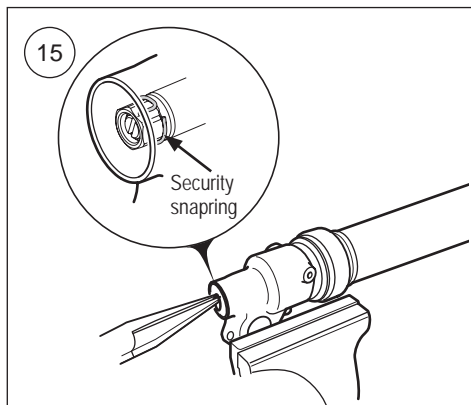
Install the front fork legs into the triple clamps. Use, to begin with, the same height position as before. Tightening torque - see the vehicle service manual.

### 19

Reinstall the brake caliper and front wheel. Make sure that all removed parts are reinstalled as they were before the installation of the Öhlins Front Fork Cartridge Kit.

### **Note!**

*It is very important that the triple clamps are tightened to the correct torque. See the vehicle service manual.*



## 2.3 - REPLACE SPRING

1

Follow steps 1-8 in Chapter Remove Fork Legs.

2

Remove the security snapping in the bottom of the fork with a pair of pliers.

3

Loosen the bottom end of the cartridge kit, turn clockwise, according to image.

4

Install the Plug (01890-01) by pushing it into the fork bottom. The plug will keep the oil in the fork while replacing the spring.

5

Remove the cartridge kit from the fork leg, replace the spring. Note the plastic preload washer(s).

### **Note!**

*The preload washers must be below the spring, at the bottom end of the fork leg.*

6

Install the cartridge kit into the fork leg and push out the Plug (01890-01).

7

Tighten the shaft end (counter clockwise) into the fork bottom, tightening torque 18 Nm.

8

Install the security snapping.

9

Make sure the front fork is fully extended and tighten the Öhlins fork top cap. Use Wrench (01892-01), tightening torque maximum 10 Nm.

### **Caution!**

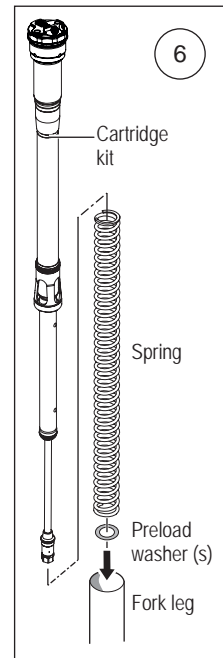
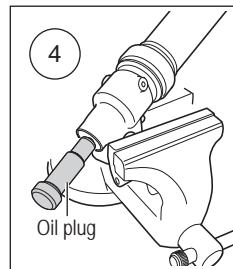
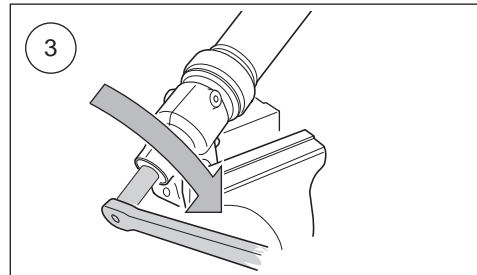
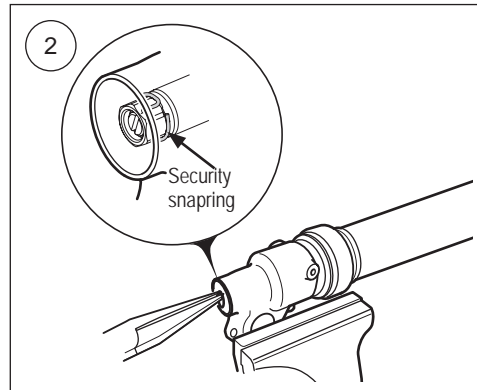
*Do not tighten to more than 10Nm.*

10

Install the front fork legs into the triple clamps. Use, to begin with, the same height position as before. Tightening torque - see the vehicle service manual.

11

Reinstall the brake caliper and front wheel - make sure that all removed parts are reinstalled as they were before installing the Öhlins Kit.

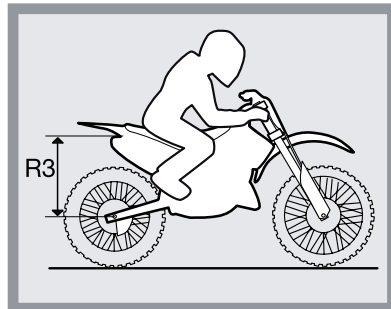
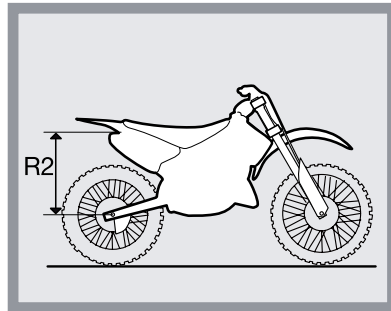
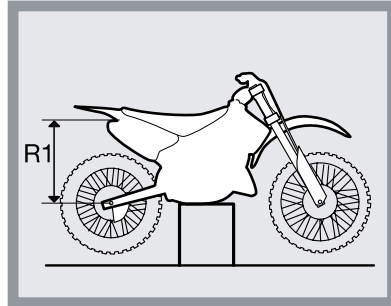


## ⚠ Warning!

Before riding, always ensure that the basic settings set by Öhlins are intact. Take notes, adjust in small steps, make only one adjustment at a time.

### Step 1 - Check Sag and Ride Height

1. Put the motorcycle on a workstand so that both wheels are off the ground and the suspension is unloaded. Ensure you are working on a flat surface.
2. Mark, for example with a piece of tape, a point immediately above the rear wheel axle.
3. Measure the distance from the marked point to a fixed point, for example the wheel axle. (See figure: R1)
4. Put the motorcycle on the ground so that the front and the rear suspensions are slightly compressed. Repeat the measuring procedures. (R2)
5. Sit on the motorcycle in normal riding position, properly outfitted in your riding gear. Repeat the measuring procedures. (R3)



Recommended sag and ride height;

If no other recommendations are given in the Vehicle Manual follow the measures below:

R1 - R2            20±10 mm

R1 - R3            85±10 mm

### Step 2 - Adjust spring preload

1. If your measurements differ significantly from the recommendations from the table above, adjust the spring preload. (See section Spring Preload in this manual).
2. If the ride height still differs from the recommendations, you may need to change spring. Contact an Öhlins dealer for advise.

## ⚠ Warning!

Incorrect spring rate may produce a fork angle that is too steep or too flat. This in turn can lead to a tendency for over- and understeering, which could seriously affect the handling characteristics of the motorcycle.

	Note measures
R1	
R2	
R3	

# 5 - MEASURE SPRING PRELOAD

Fork springs may differ in length. Therefore we recommend to check the preload on each fork leg and install the required preload washers to get the correct value.

A negative preload of up to minus 1 mm is possible, since the top-out spring still gives a small compression on the main spring.

Preload less than -1 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.

Measure the spring preload according to the following steps;

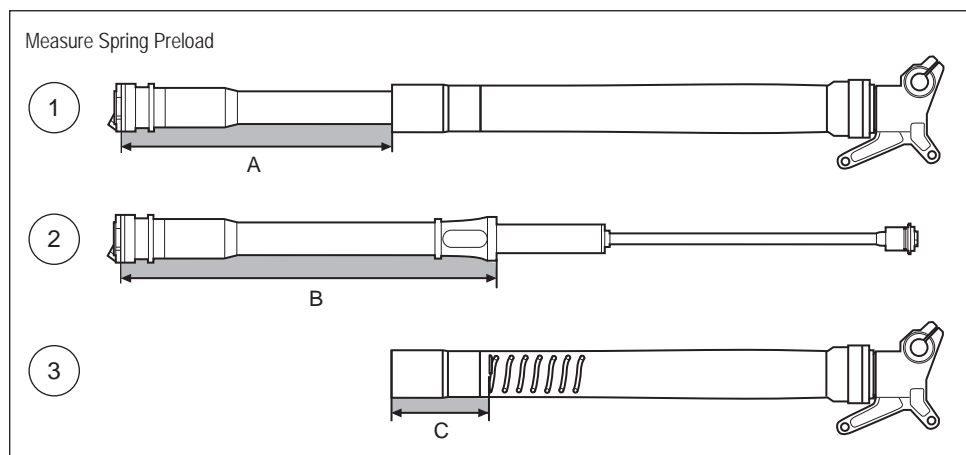
1. Measure A. Fork outer tube slid down to stop
2. Measure B.
3. Measure C.

	Note measure
A	
B	
C	
Preload ((B-A-C)-2=	

4. Calculate preload:

$$\text{Preload} = (B - A - C) - 2$$

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



# 6 - RECOMMENDED SET-UP

Rebound damping	15 click
Compression damping	15 click
Spring preload	0 mm
Oil volume	0,200 litre
Spring preload range	0-4 mm*
Oil volume range	0,180-0,240 litre
Öhlins Front Fork fluid	01309-xx

\*can be adjusted by adding/ removing washers 15482-xx

## **Note!**

Öhlins products are subject to continuous improvement and development, therefore, although these instructions include the most up-to-date information available at the time of printing, minor updates may occur. To find the latest information contact an Öhlins dealer. Please contact Öhlins if you have any questions.

# 7 - OIL LEVEL VS. DAMPING FORCE

## To set the oil level

Proper oil level is a balance between sufficient bottoming resistance and comfort. Higher oil level will give better bottoming resistance, but might reduce comfort over smaller bumps.

## Bottoming issues

Increase oil level in 10ml steps until unpleasant bottoming no longer occurs, or until comfort on rest of the track becomes too harsh.

## Harsh fork

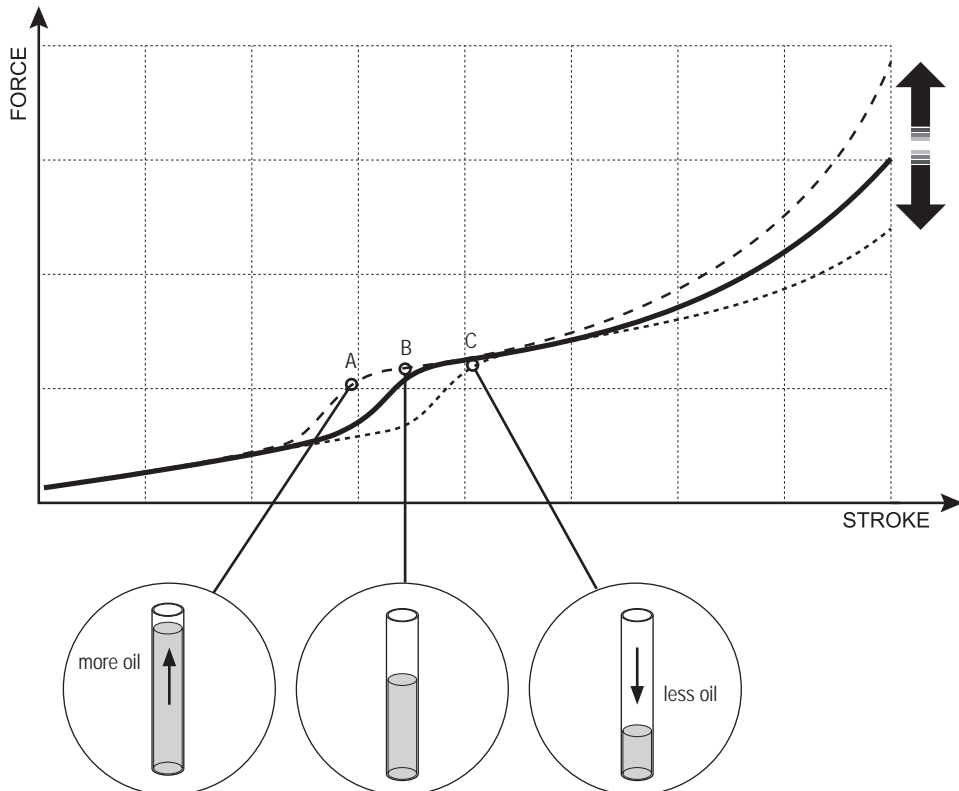
Try to decrease oil level in steps of 10ml to gain comfort until harshness no longer occurs or bottoming resistance gets too low.

Additionally, lower oil level will let the fork dive longer into the stroke during braking before additional damping effect stiffens up the stroke (see figure below, position C). Very fast riders

might appreciate the additional damping from a higher oil level on all parts of the track, as this keeps the fork running higher in the stroke, withstanding their additional forces due to their higher velocities.

## Note!

*Since small amounts of oil have great influence on the performance, make sure to service a leaking fork immediately. We highly recommend to have an Öhlins dealer service the fork. When draining a fork, it is very important to let all oil drain out to obtain a proper oil level in the fork after service.*



# 8 - ADJUSTERS

## Compression damping adjuster

The compression adjuster is located at the top of the fork leg. Adjust by turning the adjuster screw with a 3 mm Allen key.

## Rebound damping adjuster

The rebound adjuster is located at the bottom of the fork leg. Adjust by turning the adjuster screw with a 3 mm Allen key.

## To Set

The adjusters have a normal right hand thread. Turn the damping adjusters gently clockwise to fully closed (pos. zero [0]). To open, turn counter clockwise, and count the clicks until you reach the recommended number. For recommended clicks see Set-up data. Static sag can only be changed with softer or harder spring rate.

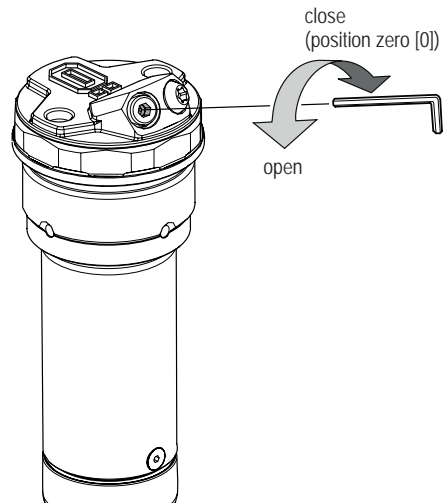
## Caution!

*When adjusting, turn carefully not to damage delicate sealing surfaces.*

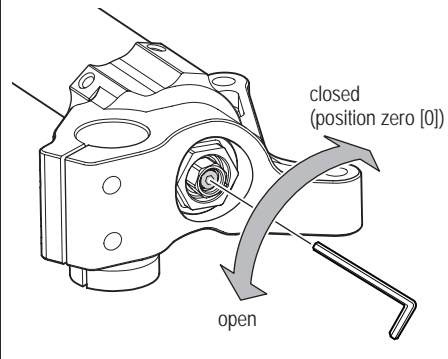
## Note!

*The total front fork stroke may differ from the original stroke, so that more or less of the steel tube will be visible when the fork is fully compressed.*

## Compression damping adjuster



## Rebound damping adjuster



# 9 - INSPECTION AND MAINTENANCE

*Preventive maintenance and regular inspection reduces the risk of functional disturbance. If there is any need for additional service, please contact an Öhlins dealer.*

## **After every ride**

1. Put the motorcycle on a workstand so that the wheels barely touch the ground (suspension unloaded).
2. Let the bike cool off.
3. Aerate the front fork; Loosen the Breather plug to release excessive pressure in the front fork. Make sure to tighten the Breather plug after aerating.

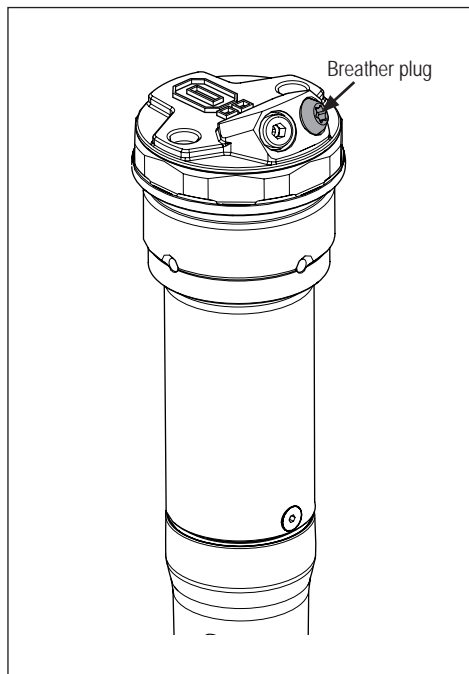
## **Recommended Service Intervals**

Rec.service every 20 hours

*Contact an authorized Öhlins dealer for service.*

## **Disposal**

Discarded Öhlins products shall be handed over to an Öhlins dealer for proper disposal.



Your Öhlins retailer:

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Box 722  
SE-194 27, Upplands Väsby  
Sweden

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