



Front Fork MC Road & Track
FGRT-series

Owner's Manual



ADVANCED SUSPENSION TECHNOLOGY



Öhlins Headquarters Upplands Väsby, Sweden

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.

Being a careful observer, Kenth's attention was continuously 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 and the search for perfection and new functions is still the main focus of the company.

Congratulations! You are now the owner of an Öhlins product. More than two hundred World Championships and other major world titles are definitive proof that Öhlins products 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 racing history.

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

By installing this product on your vehicle you have made a clear statement... you are a serious rider or driver with a focus on getting the maximal handling ability and outstanding feedback from your vehicle. Along comes the fact that your Öhlins product 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.

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.

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.

Note!

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

Note!

This manual shall be considered as a part of the product and shall accompany the product throughout its life cycle.



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1 INTRODUCTION AND DESIGN

Introduction

The product in your hand is an artwork, prepared by our dedicated craftsmen at our Swedish facility in Upplands Väsby, Sweden. Its predecessors have battled their way on numerous race tracks in MotoGP and World Superbike and the legacy continues in your front fork. Thousands of hours have been spent together with some of the best teams in the world to find the optimal design and functionality to give you as much performance and comfort as possible. You will feel the difference... be sure.

Design

The DNA of this front fork originates in the most prestigious race series in the world and the front fork is weight optimized as a result of that fact. We have used exclusive racing components from our R&D department to increase the performance of the front fork and a lot of work has been done concerning friction and weight reduction.

Our engineers that work on a daily basis with the top riders in the world often hear the word "feeling" and "control" when they debrief after tests and races. We wanted to pour as much of these important factors into your front fork and as a result, the new rigid design with new fork bottoms gives you an unparalleled feedback when riding. For all of you that have your mind set on doing some serious racing we have some really good news. The new front fork is easy to rebuild into a 130 mm stroke which we

recommend if you want to go for the No. 1 spot. We have of course optimized the design so that you can easily have it maintained in a proper way and every single front fork is individually tested with an optimal setting, spring and top-out spring. The new top-cap design will send a signal to all curious spectators when you pull over next to your favourite café or local race track... it's a signal that says that the owner of the bike has made his choice to go straight for the podium. Now we have raised the Road & Track front fork to a new level.



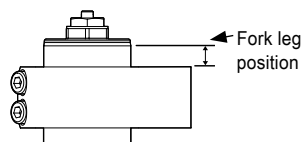
2 SET UP THE FRONT FORK

Basic guidelines

This chapter contains some basic guidelines for setting up your Öhlins front fork. Remember though that the front fork is just one part of your motorcycle and to get it to work properly, the whole motorcycle has to be set up in conformance with its manual.

Fork leg position

Before removing the standard front fork, measure the distance the fork leg is extended above the upper triple clamp (see figure). To obtain a correct ride height with the Öhlins front fork, install the Öhlins fork legs at the same position as the standard fork.



Replacing the spring

The spring installed in your Öhlins front fork is chosen after evaluations performed on a test track according to motorcycle characteristics for your specific motorcycle model. Due to variations in ride style, track conditions, body shape etc the spring is often a subject for additional fine-tuning. Springs are available in 0.5 N/mm intervals from 8.0 N/mm to 11.5 N/mm but the rate can be set to 0.25 N/mm increments by using two different rates. A method used on the race track.

Example:

Using 9.5 N/mm in the right fork leg and 10.0 N in the left fork leg gives an average spring rate of 9.75 N/mm.

Set the spring preload

The spring preload is very important since it affects the height of the motorcycle and the fork angle. Consequently, handling characteristics can be changed, even negatively with an incorrect adjustment. Before setting the preload, the sag shall be measured according to the procedure below:

- Lift up rear end so that the shock absorber is fully extended
- Measure the distance from the wheel axle to a point marked with for example a piece of tape, immediately above the rear wheel (R1)
- Lift up the front of the motorcycle so that the front fork is fully extended
- Measure the distance between the scraper and the fork bottom (F1)
- Make similar measurements with the motorcycle in upright position, without rider (R2+F2)
- Make similar measurements with the motorcycle in an upright position, with rider (R3+F3). It is of great importance that the rider has a correct riding posture and correct riding gear so that the weight is balanced on the suspension same way as when riding.

The measurements should be within the following intervals:

Without rider (Free sag):

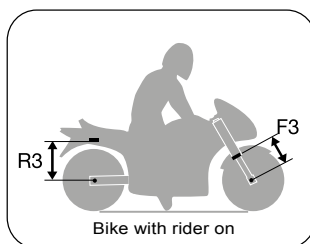
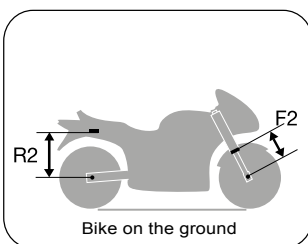
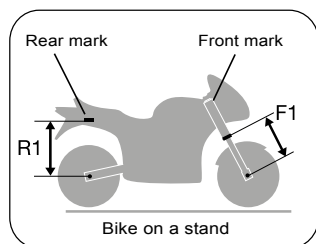
Rear: 10-20 mm (R1-R2)

Front: 15-30 mm (F1-F2)

With rider (Ride height):

Rear: 25-40 mm (R1-R3)

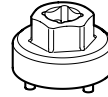
Front: 35-50 mm (F1-F3)



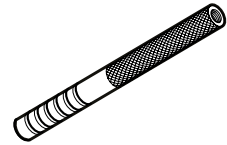
3 TOOLS

Pos	Part No	Description
1	00797-08	Pin sleeve socket
2	01765-03	Pull-up tool
3	01797-07	Seal head tool
4	04705-03	Spanner, top cap
5	00794-01	Hexagon screwdriver
6	00727-02	Clamp tool, soft jaws

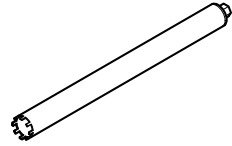
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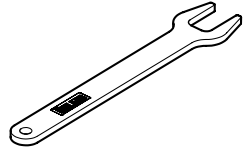
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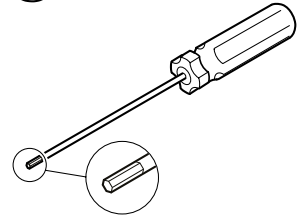
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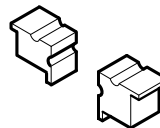
4



5



6



4 SET UP THE FRONT FORK

Extended stroke

The FGRT-series of front forks are delivered with a 120 mm stroke but designed with a possibility to be extended up to 10 mm achieving a 130 mm stroke. A 120 mm stroke suits the regular driver well, but often when running a >1000 cc on the race track a 130 mm stroke is desired.

👁 Note!

When increasing the stroke, the overall length of the front fork increases by up to 10 mm. In order to obtain a correct ride height the fork may need to be raised in the triple clamp. It is of great importance that the clearance between front wheel or fender and radiator or cowlings is examined along the entire stroke. The easiest way to check the free travel is to open both top caps and compress the fork completely while sweeping the handle bar from side to side.

The basic steps for changing the stroke:

- Adjust the configuration of the spacers below the seal head.
- Replace the preload tube.

The procedure is as follows (the front fork can still be installed on the motorcycle while changing the overall length, but removing it will make the modification a little easier):

1

If the fork is installed on the motorcycle, loosen the upper triple clamp.

2

Release the spring preload fully (counter clockwise). Note the number of turns.

3

Open the top cap using pin sleeve socket (00797-08).

4

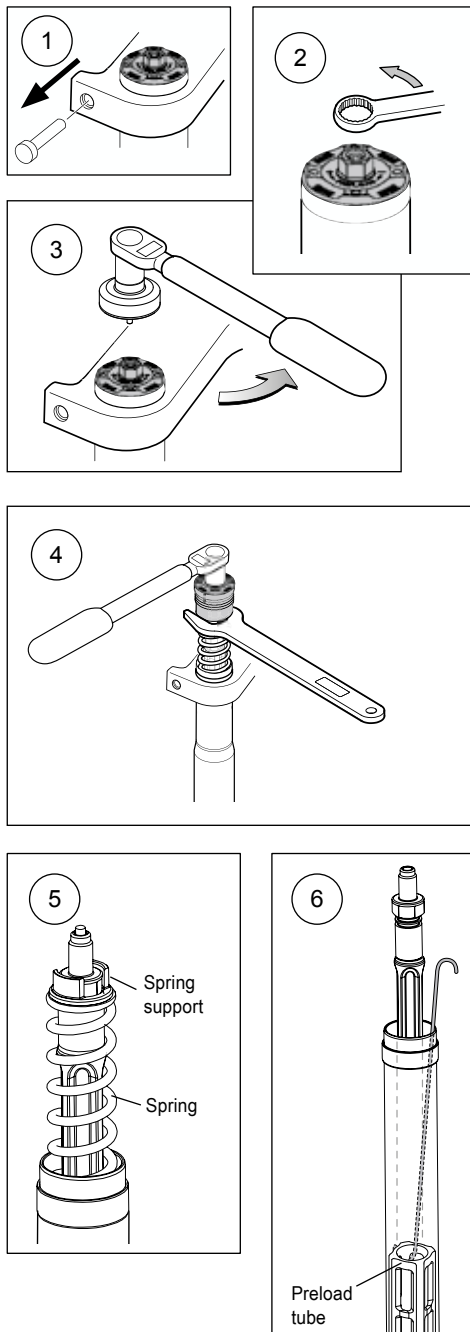
Use the pull up tool (04705-03) to get a grip of the shaft extension and remove the top cap. Carefully remove the pull up tool.

5

Remove the spring support and the spring.

6

Use a wire with a hook to pull out the preload tube.



4 SET UP THE FRONT FORK

7

Loosen and remove the shaft assembly using the seal head tool (01797-07).

8

Push seal head, spacers, and top out spring gently up along the shaft so a space to clamp the shaft assembly appears above the piston holder.

9

Clamp the shaft assembly using soft jaws (00727-02).

10

On the shaft assembly, use a heat gun to warm up the Loctite on the piston holder. Then remove the piston holder using a 14 mm wrench.

11

Loosen the soft jaws and remove the sleeve and the top out spring.

12

Install spacers on the shaft according to the spec.card.

13

Remount the top out spring and the sleeve.

14

Clamp the shaft assembly as in step 9. Ensure that the needle, spring, and the O-ring are still in place.

15

Remount the piston holder with 15 Nm torque and Loctite 243.

16

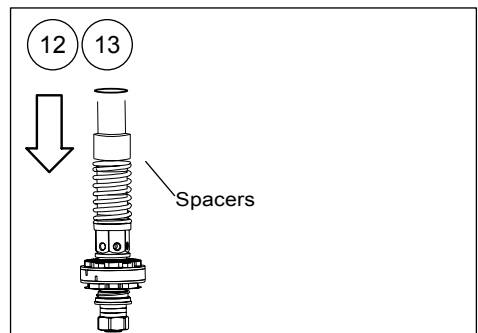
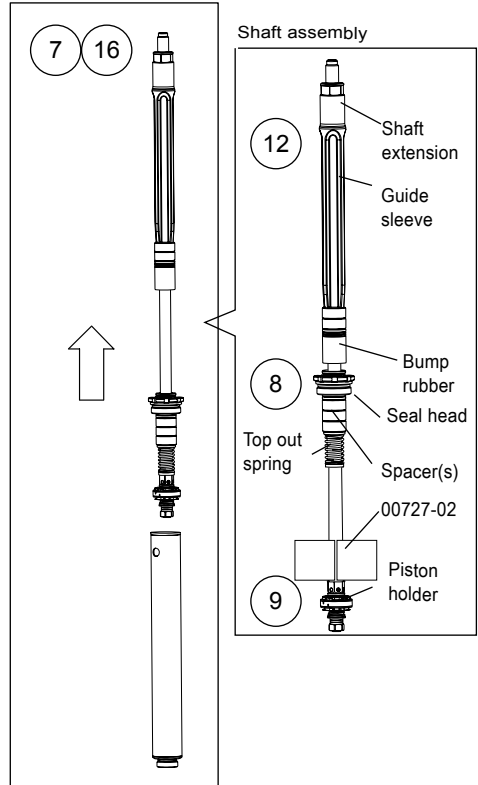
Fill up the cartridge cylinder tube with oil.

17

Apply function grease on seal head thread. Install the shaft assembly back in the cylinder tube using the seal head tool (01797-07). Use tightening torque 20 Nm.

18

Bleed out all air by pumping the shaft up and down until there is damping on the full stroke.



4 SET UP THE FRONT FORK

19

Adjust the oil level according to the "Set up data" chapter in the Mounting Instructions.

20

Install the new preload tube.

21

Install the spring with the marking facing up, then install the spring support.

22

Mount the pull up tool (01765-03) on the top of the shaft extension and pull the shaft to be able to mount the spanner (04705-03).

23

Apply function grease to the top cap O-ring and thread.

24

Open the compression and rebound adjusters fully. Note the click positions. Remove the pull-up tool and install the top cap to the shaft extension. Use torque 15 Nm.

25

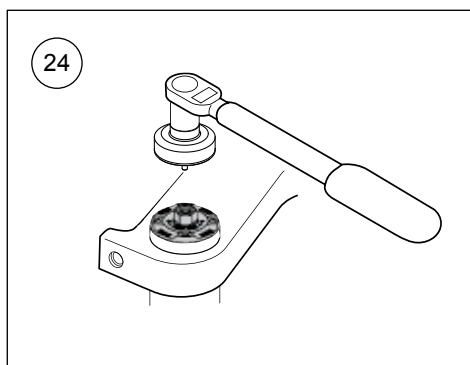
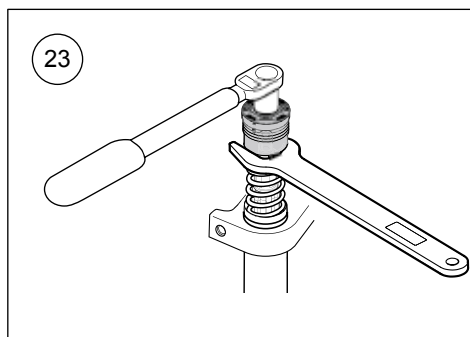
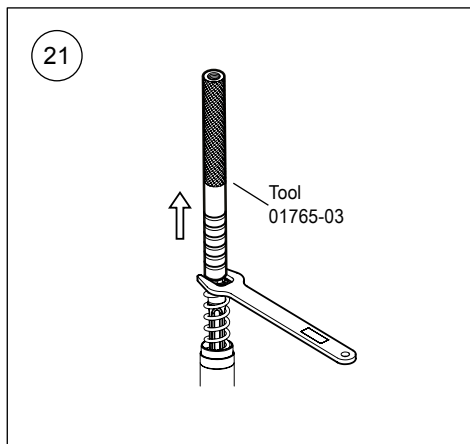
Make sure the front fork leg is in fully extended position when tightening the top cap. Use pin sleeve socket (00797-08). Use torque 10 Nm.

26

If the front fork is installed on the motorcycle, tighten the upper triple clamp to 20 Nm.

27

Set the spring preload, compression adjuster and rebound adjuster according to Set-up data in the Mounting Instructions.



5 ADJUSTMENTS

Adjusters

Spring preload adjuster

Use a 14 mm wrench to turn the upper adjustment screw. Maximum adjustment range is 18 mm. One turn of the adjustment screw will cause 1 mm change in spring preload. Clockwise will increase the spring preload, counter-clockwise will reduce the spring preload.

Compression damping adjuster

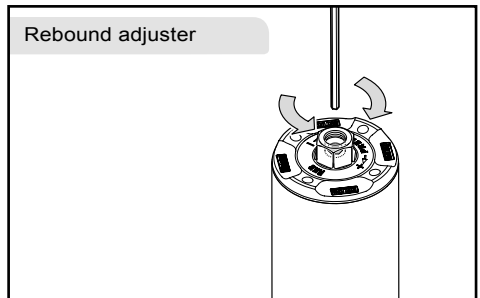
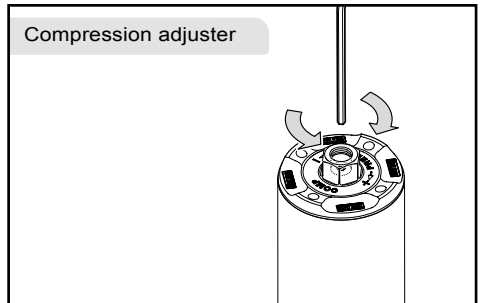
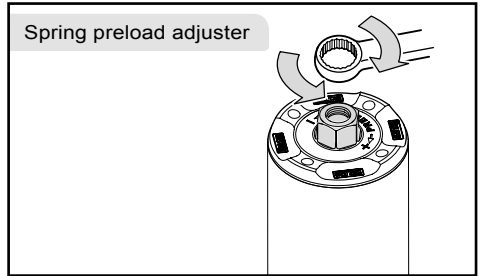
Left front fork leg.

Rebound damping adjuster

Right front fork leg.

Adjust Compression and Rebound;

Use a hexagon screwdriver (00794-01) or a 3 mm Allen key. Adjustment range from fully closed valve (clockwise) to fully open valve (counter-clockwise) is about 20 "clicks". Recommended "clicks" from closed position according to your mounting instruction. Normal adjustment range from normal position is +/- 4 "clicks".



5 ADJUSTMENTS

Oil Level

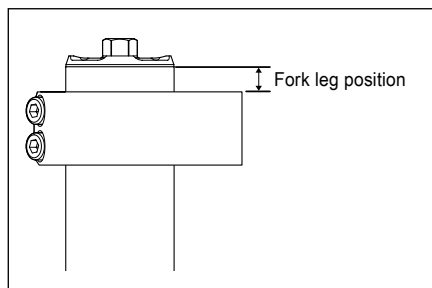
For more information, see the Adjust Oil Level-section on page 15 in this document.

Fork Leg Position

The Fork Leg Position changes the ride height at the front. To measure the Fork Leg Position; measure the distance between the outer tube and the upper triple clamp. For recommended Fork Leg Position, see the Mounting Instructions.

⚠ Warning!

If you change the fork leg position from original settings, ensure there is clearance for the front fender/wheel when fork is fully compressed.



6 CHANGE SPRING

The springs can easily be changed/replaced with the front fork installed on the motorcycle.

Change Spring

1

Loosen the upper triple clamp.

2

Release the spring preload fully (counter clockwise). Note the number of turns.

3

Use a front stand. Loosen the top cap assembly from both the outer fork legs, using the pin sleeve socket (00797-08). Remove the front stand. Carefully slide the outer fork leg down completely.

4

Remove each top cap assembly from the shaft, using the spanner (04705-03).

Note!

Work on one side at the time!

5

Remove the tool, the spring support and finally the spring.

Note!

We recommend you to check the oil level since the removal of a spring often affects the oil level. The oil level is measured without spring and preload tube according to chapter "Oil level adjustments".

6

Use the pull up tool (01765-03) to grab the shaft extension and pull it up.

7

Mount the new spring with the marking facing up.

8

Mount the spring support on top of the spring.

9

Contract the top-out spring and the main spring using the pull up tool (01765-03). Maintain the contraction by placing the spanner (04705-03) between the spring support and the shaft extension.

10

Replace the pull up tool (01765-05) with the top cap.

11

Tighten the top cap with tightening torque 15 Nm.

12

Apply some function grease on the top cap thread and the O-ring.

13

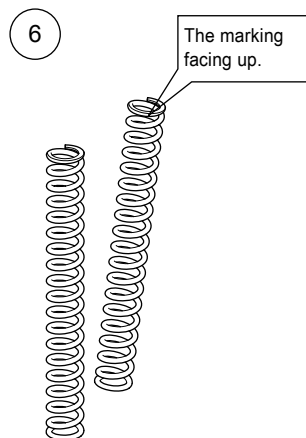
Use a front stand. Make sure both fork legs are fully extended when tightening the top caps. Use tightening torque 10 Nm.

14

Tighten the upper triple clamp. Use tightening torque 20 Nm.

15

Set the spring preload according to chapter "Set up data" in the Mounting Instruction.



7 TECHNICAL INFORMATION

Stroke

120 mm with possibility to extend to 130 mm.
Free spring length: 260 mm.

Rebound adjustment

+/- 4 "clicks" from recommended position.

Compression adjustment

+/- 4 "clicks" from recommended position.

Spring preload adjustment

0-18 mm (0-18 turns).

Spring rate

Please see the Mounting Instruction.

Optional springs:

08790-80/04744-80	8.0 N/mm
08790-85/04744-85	8.5 N/mm
08790-90/04744-90	9.0 N/mm
08790-95/04744-95	9.5 N/mm
08790-10/04744-10	10.0 N/mm
08790-05/04744-05	10.5 N/mm
08790-11/04744-11	11.0 N/mm
08790-15/04744-15	11.5 N/mm

Note!

The 08790 products are a set of springs (2 pcs) and the 04744 products is one spring only.

Oil Level

Please see the mounting instruction for your specific front fork.

Caution!

Use only Öhlins high performance front fork fluid (01309-01).

Tightening torque

Upper triple clamp 20 Nm
Lower triple clamp 10 Nm
Top caps, to outer tube 10 Nm
Top caps, to shaft extension 15 Nm
Piston holder 15 Nm
Shaft assembly 20 Nm

Grease

Function grease

8 INSPECTION AND MAINTENANCE

Preventive maintenance and periodic inspection procedures help to keep the front fork in proper condition. For additional service, please contact an authorized Öhlins service center.

⚠ Caution!

Do not use strong detergents that can damage the front fork surfaces. Thinner and brake cleaner will dry out seals, increase the risk of friction, oil leakage and poor function.

⚠ Caution!

Use Öhlins High Performance Front Fork fluid 01309-xx.

Inspection points

1. Examine the fork leg for external oil leakage.
2. Examine the inner fork leg for scratches, dents or other defects that can damage the seal and/or bushing.
3. Examine the fender brackets and the brake calliper attachments.
4. Examine the front fork attachments to the vehicle.

Inspection intervals

Normal use: Once a year or every 5 000 km

Racing use: Every 10 hours

Service intervals

Normal use: Every third year or every 30 000 km

Racing use: Once a year or every 30 hours

Service at an authorized Öhlins service center.

Disposal

Hand over your discarded Öhlins products to an authorized Öhlins service center for proper disposal.

9 ADJUST OIL LEVEL

Compared to conventional type of front forks, the upside down front forks are very sensitive to variations in oil level. Therefore, adjust the oil level with special care. A change in the fork oil level will not affect damping force in the early stage of fork travel, but will have a great effect in the later stage.

When the oil level is raised:

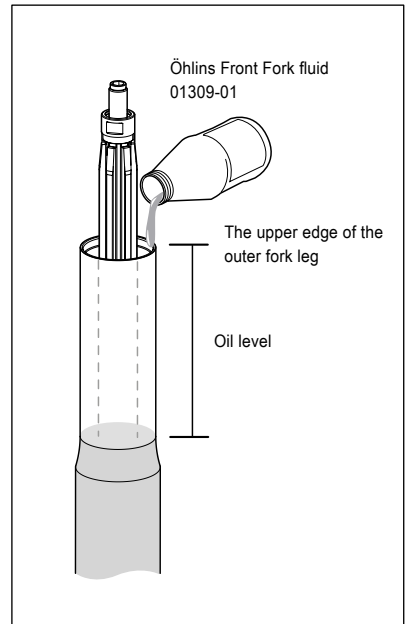
The air spring in the later half stage of travel is stronger, and thus the front fork harder (more progressive).

When the oil level is lowered:

The air spring in the later half stage of travel is lessened, and thus the front fork is softer (less progressive).

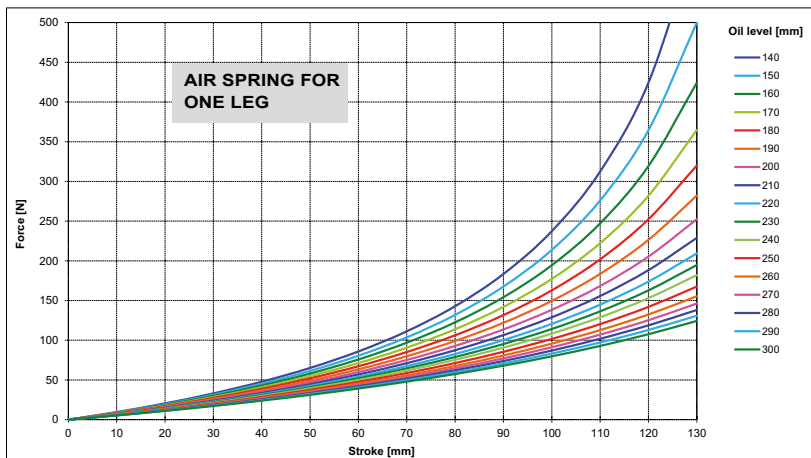
Oil level diagram

Adjust the oil level in mm according to the diagram here beside, with the spring and the preload tube removed. For the recommended oil level, see the mounting instruction for your specific front fork.



👁 Note!

When measuring oil level; remove spring and preload tube, make sure the shaft assembly is in the bottom of the fork leg and that the outer tube is in its bottom position. Measure the oil level with a ruler. See set-up data and oil level-force diagram in the Mounting Instruction.



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