

Owners Manual

Öhlins motocross front forks 225 TM



Including:

Setting up
your bike

Fine-tuning

Service
the fork

General
handling set-up

Technical info

Spare parts



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.

Introduction

All of Öhlins advanced suspension products are adapted to the brand and model. This means that length, travel springaction and damping characteristics, are tested individually just for the motorcycle that you have decided to fit with Öhlins suspension.

Before installation

Öhlins Racing AB can not be held responsible for any damage whatsoever to shock absorber 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.

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WARNING!

1. Installing a front fork, that is not approved by the vehicle manufacturer, may affect the stability of your vehicle. Öhlins Racing AB cannot be held responsible for any personal injury or damage whatsoever that may occur after fitting the front fork. Contact an Öhlins dealer or other qualified person for advice.

2. Please study and make certain that you fully understand all the mounting instructions and the owners manuals before handling this front fork kit. If you have any questions regarding proper installation procedures, contact an Öhlins dealer or other qualified person.

3. The vehicle service manual must be referred to when installing the Öhlins front fork.

NOTE

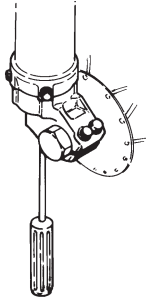
Öhlins products are subject to continual improvement and development. Consequently, although these instructions include the most up-to-date information available at the time of printing, there may be minor differences between your suspension and this manual. Please consult your Öhlins dealer if you have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

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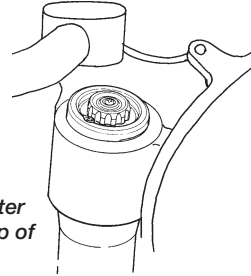
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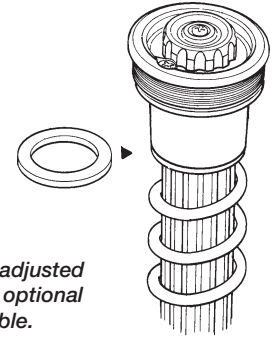
Printed in Sweden.



1.
The compression adjuster is located at the bottom of the fork leg.



2.
The rebound adjuster is located at the top of the fork leg.



3.
Spring preload is adjusted with washers and optional springs are available.

Tuning the suspension

Motorcycle road holding qualities

All motorcycles are designed with a suspension geometry that includes height and fork angle. The changing of components can affect this and it is therefore essential that both the rear and the front ends match each other.

Changing to Öhlins suspension gives optimum performance only when both the front fork and the rear suspension interact properly. It is of the greatest importance that the front and rear loaded height are within the specified values.

In the mounting instruction, see section: Setting the spring preload.

Design

Öhlins new up-side-down (USD) front fork is designed to combine the advantages of comfortable, safe conventional forks and rigid, light USD forks. The result is a unique combination of being rigid, precise in corners and during hard braking yet comfortable, forgiving when “over-landing” and in big bumps.

Your new Öhlins USD front fork has aluminium outer legs and 46 mm steel inner legs, with a polished surface for lowest possible friction.

The new USD fork features the Öhlins cartridge damping system.

The fork is fully adjustable with external adjuster for compression- and rebound damping.

The compression adjuster is located at the bottom of the fork leg, fig 1, the rebound adjuster at the top, fig 2.

Spring preload is adjusted with washers, fig 3, and optional springs are available to suit different tracks and riders.

In the legs there are also “air-springs” (the air

trapped above the oil) that work together with the “real” spring. You adjust the air-spring by raising or lowering the oil level in the legs.

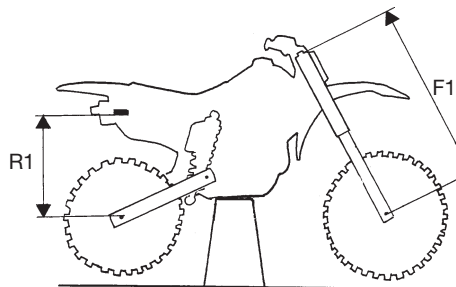
By using different combinations of springs and air-springs you can alter the characteristic of the fork. For example, a soft spring in combination with a small air-spring (high oil level) makes the fork progressive, see “Fine-tuning the bike“.

Marking

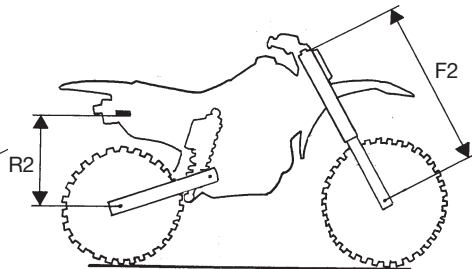
All Öhlins front forks are marked. You will find the part number on the inside of the fork bottom.

Recommended settings

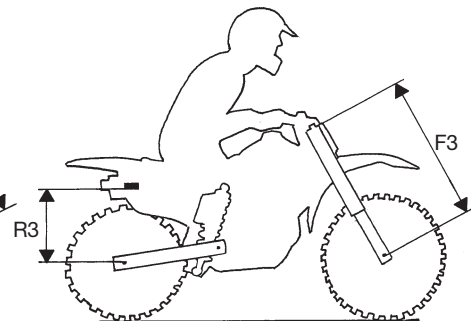
The front fork in your kit is adjusted to the Öhlins recommended setting for your bike, see “Making adjustments“. We advise you to use this as your start setting.



Bike on a stand.



Bike on the ground.



Bike with rider on.

Settings

Basic settings

Always ensure that the basic setting made by Öhlins is correct. It is adapted to the make and model (in its original state) and for a rider of average weight.

⚠ WARNING

Incorrect spring action can give a fork angle that is too steep or too flat. This in turn will give a tendency for oversteering or understeering, which could seriously affect the handling characteristics of the motorcycle.

The original setting of the shock absorber, when delivered from Öhlins, should always be a base when the settings are changed by use of the adjustment devices.

Setting the spring preload

1. Measuring:

Preload on the spring/springs is very important, because it affects the height of the motorcycle and the fork angle. Consequently, handling characteristics can be changed, even negatively. Proceed as follows (it will be much easier if done by two persons):

- Place the motorcycle on a stand, so the front fork and the rear end are in fully extended position.
- Measure the distance, eg, from the lower edge of the rear mudguard or from a point marked by a piece of tape, immediately above the rear wheel axle, to the wheel axle (R1).
- Make a similar measurement on the front axle, e.g., from the bottom of the upper fork crown to the front wheel axle (F1).

- Allow the motorcycle (without rider) to apply load on the springs and repeat the measuring procedure (R2, F2).
- Then take the same measurements with the rider and equipment on the motorcycle (R3, F3). It is important that the rider has a correct riding posture, so that the weight is balanced on the front and rear wheel in the same way as when riding.

Recommendations:

The difference should not deviate from the following sizes, if no other recommended settings are given in the Mounting instructions:

Free sag: (R1-R2), (F1-F2)

Rear: MX/Off-Road 30±5 mm

Front: MX/Off-Road 30±5 mm

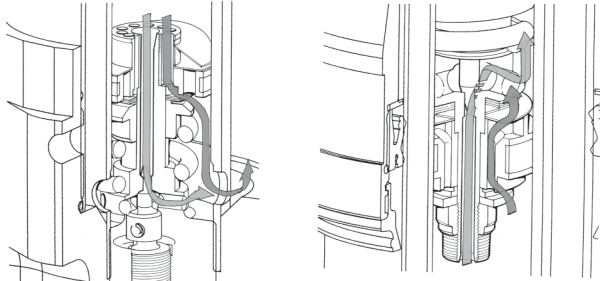
Ride height: (R1-R3), (F1-F3)

Rear: MX 100±5 mm

Off Road 30% of the total stroke

Front: MX/Off-Road 80±5 mm

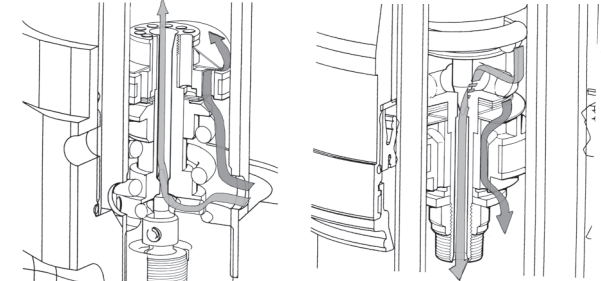
Compression stroke



Flow in compression valve

Flow in rebound valve

Rebound stroke



Flow in compression valve

Flow in rebound valve

Fine-tuning the bike

Learning how to use the adjusters will take time but you quickly appreciate them once you know the tricks. Even the specialists sometimes need a specialist!

With the adjusters you optimize the suspension for your riding style and the track you are competing on.

The same basic guide lines goes for both the front fork and the rear shock absorber.

Too much compression damping will give you a harsh ride as your bike “jumps” along the track.

With too much rebound damping your bike will have difficulties with several bumps in a row. The suspension will not extend fast enough between bumps, your bike will ride lower and lower and eventually the suspension will bottom!

External adjusters

On the Öhlins front fork the adjusters are bleed valves, totally separated from each other.

The compression bleed valve controls the flow in the cartridge tube during the compression

stroke, the rebound bleed valve the flow during the rebound stroke.

CAUTION!

Using too much force when closing the adjusters will destroy important sealing surfaces.

Both the adjusters have a normal *right-hand* thread.

Click position zero (0) is when the adjusters are turned *clockwise* to fully closed.

The adjustment range, from fully closed until maximum open valve (anticlockwise), is 20 clicks. In order not to click in the wrong direction; always first close the adjuster, then dial-in the new setting.

Making adjustments

To make improvements using the adjusters, it is important to understand the function of the front fork and the shock absorber and through testing learn how they effect the handling of your bike.

Make sure that you have the correct springs and the correct spring preload before making any adjustments. And always start with the Öhlins recommended settings:

NOTE!

See mounting instruction for recommended settings.

NOTE!

Higher click numbers give less damping force.

When making adjustments; keep notes, make adjustments one at a time... and in small steps.

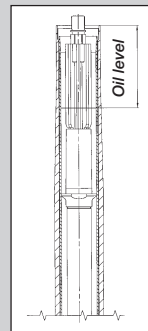
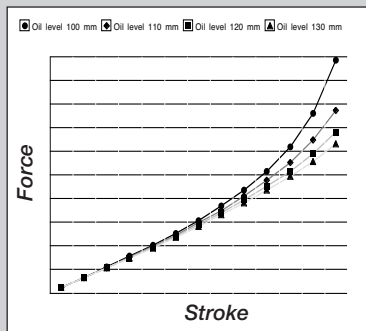
The adjusters should normally not be adjusted in steps of more than 2 clicks at a time and not outside the usable click range.

When you think you have made an improvement, go back to what you started with and double check to be sure. Pay attention to changes in

Air spring

5.

A change in oil level will effect the damping forces, not in the early stage of fork travel but a great deal in the later stage.



Oil level

6.

Oil level is measured from the top of the outer leg, with the top nut off, the fork fully compressed and no preload washer nor spring installed.

conditions like tires, temperatures etc.

In general, compression damping changes should be used to influence the bike's stability and response, while rebound damping changes should be used to influence comfort and traction.

When you need more damping force, you should mainly try to increase compression damping and use as little rebound damping as possible.

This usually means that you gain comfort and performance in handling.

Oil level adjustment

As the air trapped between the oil and the top nut acts as an air-spring, a change in oil level will effect the damping forces. Not in the early stage of fork travel, but a great deal in the later stage.

A general description of how the oil level/air-spring effects the damping forces are shown in fig 5.

The air-spring gives the Öhlins USD fork a progressive spring rate, preventing it from bottoming out hard.

By using different combinations of springs and oil levels/air-springs you can alter the characteristic of the fork and tailor it to suit different tracks and conditions.

CAUTION!

The oil level must be the same in both front fork legs.

Riding a bike with different oil levels will cause instability.

When the oil level is raised:

The air-spring in the later half of travel is strong, and thus the front fork hard.

When the oil level is lowered:

The air-spring in the later half of travel is soft, and thus the front fork soft.

CAUTION!

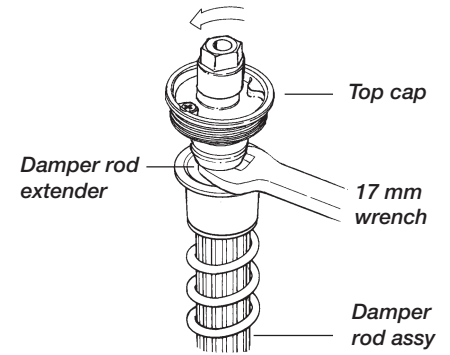
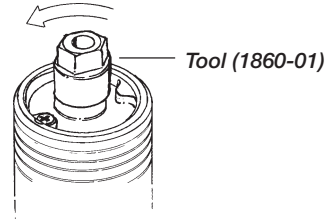
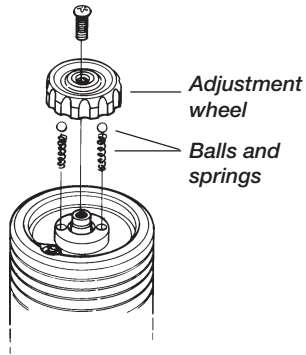
Adjust the oil level with the fork leg fully compressed and no preload washer nor spring installed.

NOTE!

See mounting instruction for recommended oil level.

The oil level is measured from the top of the outer leg, with the top nut off, see fig 6.

A change in oil level should be made in small steps. We recommend a change of 5 mm at a time and not outside the range of 90-130 mm.



Preload adjustment

1

Put the bike on a stand and loosen the screws in the fork top crown that hold the fork legs.

NOTE!

On most MX-bikes you have to take off the handle bar before you can unscrew the top cap.

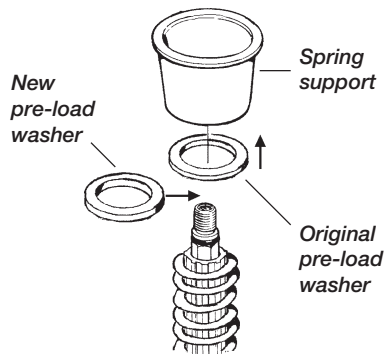
Remove the adjustment wheel and the springs and balls of the adjuster.

2

Unscrew the top cap, use tool. (1860-01). Put a box under the front wheel so that the springs are visible.

3

Remove the top cap from the damper rod extender. Use a 17mm wrench, and tool (1860-01).



4

Remove the spring support and the original spring preload washer.

Install a new preload spacer to achieve the right static sag.

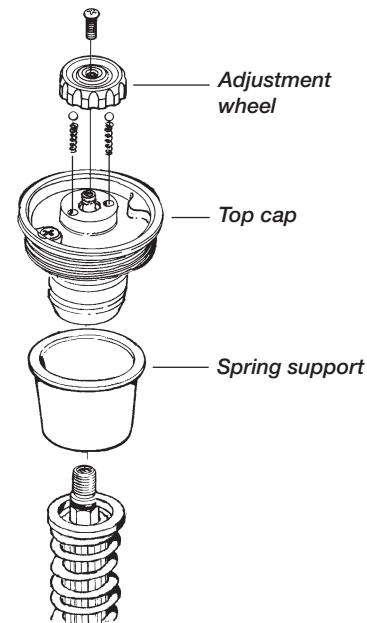
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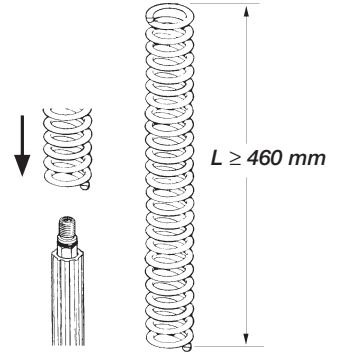
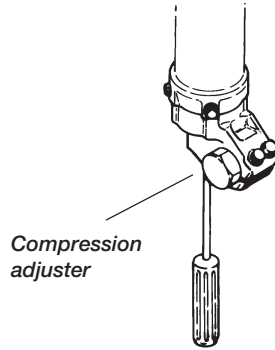
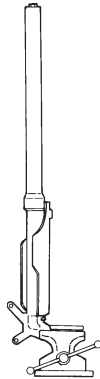
Fit the spring support and the top cap and refit the adjustment wheel.

For tightening torques, please see your bike's work shop manual.

NOTE!

The top nut only have to be tightened by hand without extending tool.





Changing springs

6

Loosen the screws that hold the fork legs in the upper fork crown.

With the fork leg still tightened in the lower fork crown unscrew the top cap, tool (xxxxx-xx).

Loosen the screws that hold the fork legs in the lower fork crown.

Remove the fork legs from the motorcycle and fasten it in vice with soft jaws.

Follow instructions 1-4 * on previous side and remove the spring.

* But do not install the spring support spacer.

7

NOTE!

Closing the compression- and the rebound valves will keep the damper rod extended making it easier to install the new spring.

Pull out the damper rod as far as possible.

Close the compression and the rebound valve (clockwise).

8

Install the new spring*.

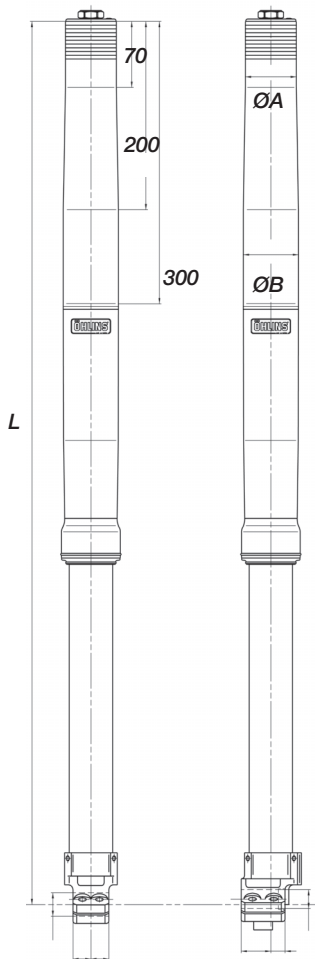
* Check the free length of the spring. Original length is 487 mm. If the spring length is under 460 mm the spring must be changed.

Follow instruction 5 on previous side.

Adjust the compression- and the rebound valves according to specification card.

Fit the fork legs on the motorcycle.

For tightening torques, please see your bike's work shop manual.



Technical specifications

Fork lengths and diameters

| Front fork | Motorcycle | Length (L) |
|------------|------------|------------|
| ØA | ØB | |
| FG 225 | TM | 938 mm |
| 53,9 mm | 58,4mm | |

Rebound and compression adjustment

Refer to mounting instruction for set-up data.

Maximum open rebound and compression valve:
20 clicks.

Free Spring Length:

All forks: 467 mm (service limit 460 mm).

Spring preload:

Maximum allowed adjustment
range 3-13 mm (with washers).

Spring rate:

All forks: 2328-41 4,1 N/mm.
2328-43 4,3 N/mm supplied

Optional spring rate:

2328-39: 3,9 N/mm.
2328-45: 4,5 N/mm.
2328-47: 4,7 N/mm

Oil level:

See mounting instruction for recommended oil level.

Adjustment range 90-130 mm.

CAUTION!

Use only Öhlins high performance front fork fluid No. 5 (1305-01).

Tighten torque:

Triple clamp bolt: See your bike's work shop manual.

Compression valve: 65 Nm (Base valve).

Cylinder tube lid (cartridge tube): 65 Nm

Compression valve, 8 mm nut 8 Nm.

Rebound valve, 8 mm nut 8 Nm.

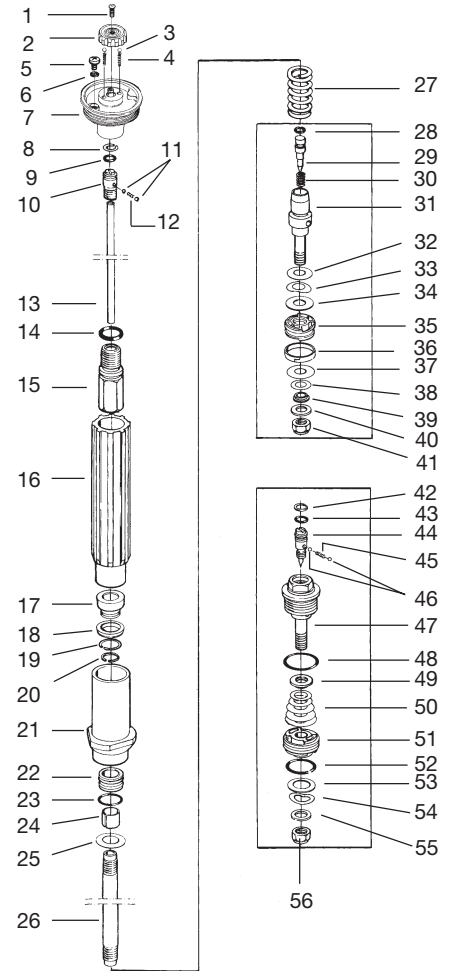
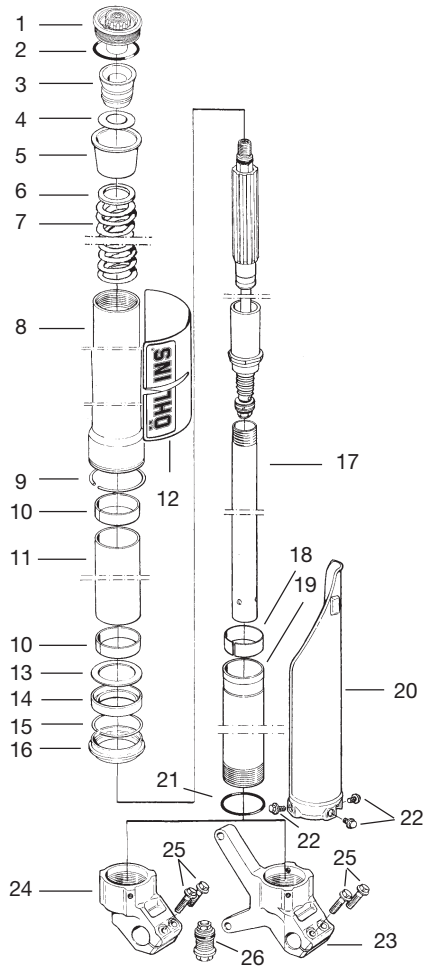
Grease:

Öhlins Front Fork grease 00146-01
(Red grease).

Service intervals:

Every 20 hours.

Front fork components



General handling set-up

Front end falls into the curves (oversteering) especially in sand.

Steep front fork angle. Front end too low in comparison to rear end.

- Increase the front fork compression damping.
- Change to harder springs.
- Lower fork leg approximately 5 mm in the triple clamp.

Front end "ploughs", understeers.

Shallow front fork angle. Front end too high in comparison to rear end.

- Decrease the front fork compression damping.
- Raise the fork legs approximately 5 mm in the triple clamp.
- Change to softer fork springs.

Front end unstable at high speed, unstable when accelerating out of curves.

Front fork angle too steep. Front end too low in comparison to rear end.

- Lower the fork legs approximately 5 mm in triple clamp.
- Change the front fork springs to harder ones.

Front end unstable during deceleration.

Front fork angle too steep during braking. Front end too low or rear end too high.

- Increase the oil level in the front fork.
- Change to harder fork springs.
- Increase the front fork compression damping.

Front suspension.

Front fork travel is not used to its full capacity. Harsh feeling, front wheel grip is not satisfactory in bumpy turns.

Suspension too hard.

- Decrease the front fork compression damping.
- Change to softer springs.

Suspension bottoming, too soft during entire travel.

Spring too weak or compression damping too soft.

- Increase oil level 5 mm.
- Increase compression damping.
- Change to stiffer springs.

Suspension bottoming, but can handle smaller bumps.

Damping force not progressive enough.

- Increase the oil level.

Can handle smaller bumps but is too hard during the last part of the travel.

Damping force is too progressive.

- Decrease the oil level.

Front end feels low, initially feels soft, but is not bottoming.

The initial spring rate is too soft or spring preload is too low.

- Increase the spring preload.

Feels harsh over small bumps, but using full wheel travel.

Too much spring preload or too much compression damping.

- Increase the oil level or change to softer springs.
- Decrease the compression damping.
- Decrease the spring preload.
- Clean the oil seals and scrapers. Use Öhlins grease 148-01 for regreasing.

Can handle the first in a series of bumps but feels hard after a few more bumps. Frontal grip insufficient in rough and bumpy turns.

Too much rebound damping.

- Decrease the rebound damping.

Front end rebound too fast after a bump. Front wheel grip insufficient in bumpy curves.

Not enough rebound damping, or too much spring preload

- Increase the rebound damping.
- Decrease the spring preload.

Maintenance

Telescopic front forks depend on a smooth, friction free action.

Make sure your forks are regularly serviced.

Do not use strong solvents, such as brake cleaner, to clean the front forks. This will dry out the seals and the steel tubes and cause friction or leakage.

After every race:

Clean externally and spray with an all-purpose oil after washing with detergent.

Check externally for damage.

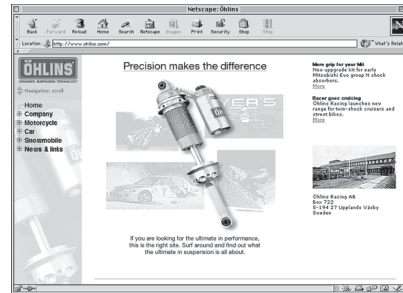
Put a little Öhlins green grease (148-01) on the steel tubes and work it in by pushing the fork up and down.

Every 20 hours:

Dismantle the fork and check all parts for wear and damage, replace if necessary, see page 10.

More info

www.ohlins.com



The ultimate suspension site.
Find out everything about your suspension.
Download mounting instructions, manuals and brochures.
And a lot more.



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