



Shock Absorber for Automotive

ORQ16/46 & ORQ18/50

Owner's Manual



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 30 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 30 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 Service Centre.

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 contains pressurized nitrogen gas (N₂). Do not open, service or modify this product without proper education (authorized Öhlins dealer/distributor) and proper tools.

Note!

This manual covers two types of shock absorbers and the graphics inside are not always showing both styles.

© Öhlins Racing AB. All rights reserved. Any reprinting or unauthorized use without the written permission of Öhlins Racing AB is prohibited.

CONTENTS

1 Safety Precaution.....	2
2 Design and Functioning	4
3 Spring Preload	5
4 How to Adjust.....	6
5 Spring Setup	7
6 Setting Up Your Vehicle	8
7 Inspection and Maintenance	9



DESIGN AND FUNCTIONING

Congratulations on choosing the Öhlins ORQ Off-Road shock absorber - the damper which has proven success in all kind of Off Road and Rally Raid events. Both ORQ 16/46 and 18/50 are single tube type shocks with external gas reservoir. The 16/46 is available with a hose connected reservoir and 18/50 with both piggyback and hose connected reservoir. The ORQ 16/46 is 2 way adjusted, low speed compression and rebound. The ORQ 18/50 is 3 way adjusted, high and low speed compression and low speed rebound. The 16/46 has our standard Progressive Damping System (PDS) and 18/50 features the new updated 34mm PDS which has been used very successfully in our Rally Dampers.

This shock absorber draws on all the expertise developed by Öhlins while winning more than a hundred World Championships.

The ORQ shock absorbers are designed to handle the demanding damping characteristics needed for all types of roads that you can be exposed for during an Off-Road and Rally Raid event. For best performance, the shock absorber must be adjusted to different conditions; for sand dunes in Dakar, rough rocky roads in any Rally Raid competition or closed circuit events with everything that involves. The outer adjusters give the possibility for fast efficient adjustment but for bigger change in damping force or changing the characteristics of the damping curve the shim stacks inside the damper must be changed. The Öhlins shim system offers infinite combinations of shim stacks with a wide spectrum of different characteristics with one and the same piston. Your Öhlins dealer has access to a setting bank which contains settings for all conditions mentioned above. Contact your Öhlins dealer to get your ORQ dampers adapted for exactly the setting you need for your type of usage.

The temperature stability is maintained by using a flow restriction design in the bleed valves

that create a turbulent flow at very low piston velocities. Also, materials with different thermal expansion rates are used to compensate for the viscosity change of the fluid caused by changes in temperature.

The Öhlins ORQ shock absorbers are racer friendly shock absorbers, easy to set up, dial in and rebuild. Support is always available from the Öhlins distributors worldwide.

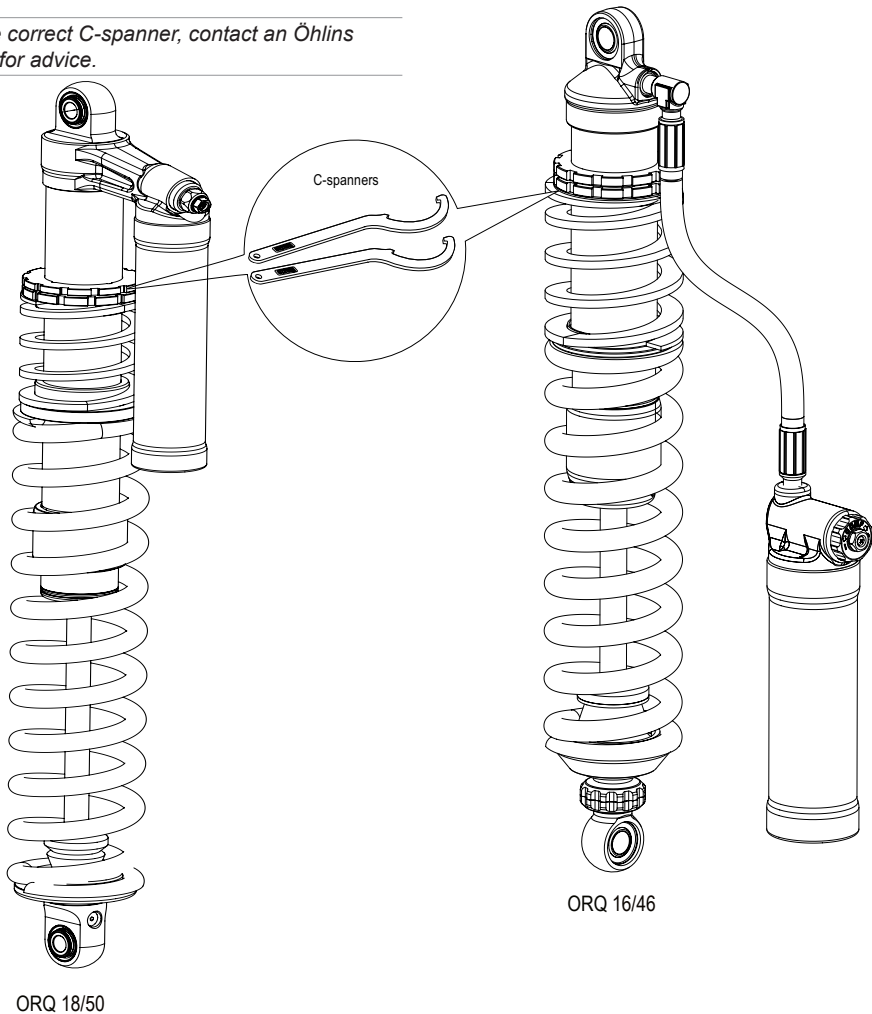
SPRING PRELOAD

When adjusting the spring preload you move the spring seat. This will lower or raise the vehicle ride height. The ride height is an important criteria for the behavior of your vehicle.

Set the Spring Preload

Use two C-spanners to undo the lock nut.
Turn the spring platform to the desired position.
After adjusting, make sure to lock the lock nut.

For the correct C-spanner, contact an Öhlins dealer for advice.



HOW TO ADJUST

Rebound Damping Adjuster

Both ORQ 16/46 and 18/50 have a low speed rebound adjustment located in the end eye.

To adjust rebound damping

The 18/50 rebound is adjusted using a 3 mm allen key or Öhlins tool 01822-02 and the 16/46 by turning the knob. We recommend you to adjust the rebound in steps of 2-3 clicks at a time. The 16/46 rebound adjuster has approximately 45 clicks and the 18/50 50 clicks.

To reset

Turn the adjuster clockwise to fully closed position (position zero [0]). Do not apply force when position 0 is reached, sealing surfaces or adjustment mechanism can be damaged.

Then, turn counter clockwise to open, and count the clicks until you reach the recommended number of clicks. Ask your dealer for recommended clicks for your vehicle/setting.

The temperature compensation system of the rebound adjuster reduces the number of clicks (due to the elongation of the aluminium shaft) when the shock absorber is hot. Therefore, always let the shock absorber cool down to ambient temperature before you reset the clicks.

Useful adjustment range

ORQ 16/46: 5-35 clicks

ORQ 18/50: 8-45 clicks

⚠ Warning!

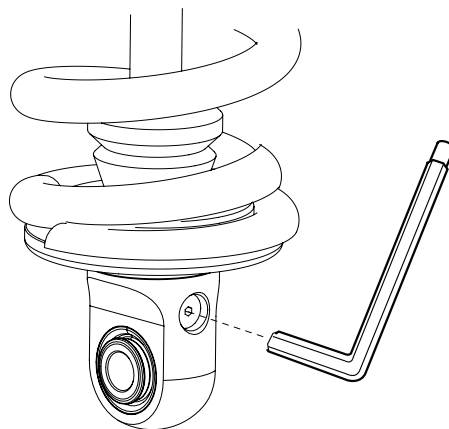
On ORQ 18/50 there is no stop telling when the adjuster is fully open. It is possible to unscrew the rebound adjuster if more clicks than useful adjustment range is used.

🖐 Caution!

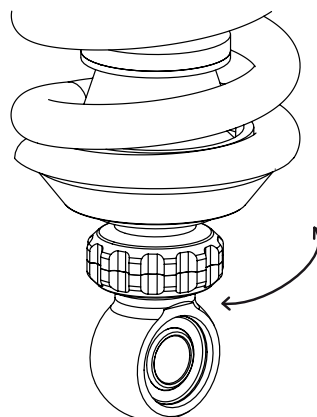
Higher click numbers give less damping force.

⚠ Caution!

Do not use force, delicate sealing surfaces can be damaged. Handtighten only.



ORQ 18/50



ORQ 16/46

HOW TO ADJUST

Compression Damping Adjuster

ORQ 16/46 has a one way adjusted compression valve located in the reservoir end and 18/50 a two way adjustment compression valve located in the cylinder head (piggyback version) or reservoir end (hose version).

To adjust compression damping

The 18/50 low speed compression is adjusted using a 3 mm allen key or Öhlins tool 01822-02 and the 16/46 by turning the knob. High speed compression (only 18/50) is adjusted with a 12 mm wrench. We recommend you to adjust low speed compression in steps of 2-3 clicks and high speed 3-5 clicks to fine tune the set up. The 16/46 low speed adjuster has approximately 25 clicks and the 18/50 40 clicks. The high speed adjuster has approximately 50 clicks.

To reset

Turn the adjuster clockwise to fully closed position (position zero [0]).

Then, turn counter clockwise to open, and count the clicks until you reach the recommended number of clicks. Ask your dealer for recommended clicks for your vehicle/setting.

SPRING SET-UP

A number of springs in different lengths and stiffnesses are available for both ORQ 16/46 and 18/50 to fit different suspension strokes and vehicle weights. 16/46 requires springs with ID 57 mm and 18/50 ID 70 mm. Contact your Öhlins dealer to get a recommendation for which springs that fits your vehicle and demands. The Öhlins dealers also have access to a spring calculation software that makes it easier to find the optimal spring setup. The following vehicle parameters are required to calculate spring rate: vehicle mass, weight distribution, unsprung mass and motion ratio wheel to spring.

Useful adjustment range

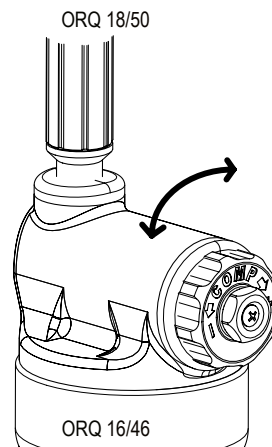
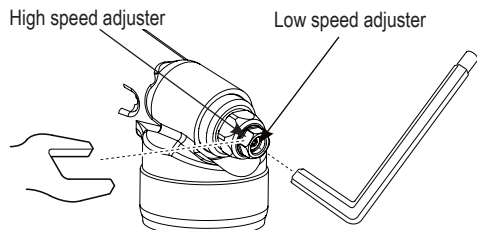
The useful adjustment range depends on which setting that is used. If a too large compression valve adjustment range is used the performance of the damper is reduced due to incorrect pressure balance in the damper. If the compression valve is too hard (low clicks) there will be high pressure and flex in the damper often experienced as a hard and harsh suspension. If the compression valve is too soft (high clicks) there will be cavitation in the damper often experienced as fading. If large change in compression clicks compared to the recommended is used and the appearances mentioned above is experienced contact your Öhlins dealer for changing the shim setting in the damper.

⚠ Caution!

Higher click numbers give less damping force.

⚠ Caution!

Do not use force, delicate sealing surfaces can be damaged. Handtighten only.



SETTING UP YOUR VEHICLE

Installing new shock absorbers may alter ride height, wheel angles etc. on your vehicle. Therefore is wise to do a complete check of the vehicle after you installed the Öhlins shock absorber.

Perform the following steps and always take notes before using the shock absorber.

1. Check ride height, front and rear. Adjust if necessary.
2. If scales are available, check corner weight, front and rear. Adjust if necessary.

NOTE!

Always consult your Öhlins dealer if you have any questions regarding settings of the shock absorber.

Making Adjustments

Suspension settings are dependent on your vehicles weight, you're driving style, road conditions etc. If you are not happy with our recommended settings, here are a few guidelines and ground rules how to make adjustments.

To make improvements, it is important to understand the function of the shock absorbers and through testing learn how they affect the handling of your vehicle.

NOTE!

Always start with the settings recommended by Öhlins.

NOTE!

Higher click numbers give less damping force.

When Making Adjustments

Take notes, make the adjustments in small steps (2-3 at the 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 conditions like tires or temperatures, etc. In general, compression damping changes should be used to influence the vehicle'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 handling performance.

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 authorized Öhlins workshop.

Cleaning

Clean the shock absorber externally with a soft detergent. Use compressed air. Be careful that all dirt is removed. Lift the bump rubber and clean the area below. Keep the shock absorber clean and spray it with oil (WD40, CRC 5-56 or equivalent) after washing. Wipe off excessive oil with a cloth.

Caution!

Never spray water directly into the adjuster knobs and/or the ball joints.

Inspection

1. Check ball joints for possible excessive play or stiction.
2. Check the piston shaft for leakage and damage.
3. Check the shock absorber body for external damage.
4. Check the reservoir for external damage that can restrict the floating piston from moving freely.
5. Check for excessive wear of rubber components.
6. Check the attachment points of the shock absorber to the vehicle.
7. Check the hose equipped models for leaks in the hose and inlet plugs.
8. Check that the hose is properly attached and will not interfere with anything.

Disposal

Discarded Öhlins products shall be handed over to an authorized Öhlins workshop or distributor for proper disposal.

Maintenance

Service your damper(s) at an Öhlins service center according to the following recommendations;

Rough usage	
Max working temp up to 120° C	8000km
Very rough usage	
Max working temp over 120° C	4000km

At temperatures over 140° C the oil start to de-grade rapidly and seals starts to deform. In these conditions the performance of the damper cannot be kept over a longer time, service the damper as often as possible.

Note!

This is just a recommendation, the mileage that could be run between services and fully remain the function of the damper depends on a lot of factors like vehicle weight, type of track, damper installation etc. Hence it is impossible to make service recommendations that cover all different types of usage the dampers will be exposed for.

Note!

The Öhlins shock absorber shall only be filled with Öhlins High Performance Shock Absorber Fluid. Contact an Öhlins dealer for advice.

Warning!

Never change gas pressure. Special purpose charging equipment, access to nitrogen and special knowledge is required.





Öhlins Owner's Manual ORQ/TTX44 | Part No. 07440-06 | Issued 2012-08-14 | © Öhlins Racing AB

Your Öhlins retailer:

Öhlins Racing AB
Box 722
SE-194 27, Upplands Väsby
Sweden

Phone: +46 (0)8 590 025 00
Fax: +46 (0)8 590 025 80
www.ohlins.com



www.ohlins.com