

DT SWISS

SHOCKS

ABS / SAB

Technical Manual

V2015.08_EN

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1 General

Validity

This manual describes the component specified on the front page and the footer. It is valid for the construction level of the component on the 2015-08-05. Deviations are possible and all items are subject to technical changes.

Safety

The safety instructions are classified as follows:



DANGER

...indicates a hazardous situation that, if not avoided, will result in death or serious injury.



CAUTION

...indicates a hazardous situation that, if not avoided, could result in a minor or moderate injury.

NOTICE

...indicates information considered important, but not hazard-related.



...characterizes further information, or information which supplement the respective steps.

Target Group

This manual is intended for end users and dealers.

It offers the possibility for experienced users to carry out small maintenance works on their own. If there are any doubts concerning the own skills, a DT Swiss service center should be contacted.

Warranty will expire if works are not done properly.

Layout

The cover page and the footing provide information about the type of product and manual as well as the version of the manual.

The backside provides a list of the DT Swiss service centers. A list of all DT Swiss service centers can be found at www.dtswiss.com.

This manual is intended for being printed as an A5 booklet. Only print this manual if electronic usage is not possible.

DT Swiss Manual Concept

The DT Swiss manuals are split into the following types of manuals:

- User Manual
Information for the end user on how to install and use the component.
- Technical Manual
Detailed information for the end user and the dealer on how to maintain the component, spare parts and technical data.

How to Use this Manual

The steps described in this manual must be carried out in the order they are shown. If steps are ignored or executed in a wrong order, the function of the component cannot be guaranteed.

Instructions begin with the table «Preparatory Steps» and end with the table «Closing Steps». The instructions in these tables must be carried out.

Moving parts, threads, O-rings and sealings must be greased before assembling.

Cross References

In order to simplify the use of this manual, some text is edited as hypertext. Whenever the text is formatted blue and underlined, it is a reference to a chapter. If the text is formatted black and underlined, it is a reference to a figure. After clicking you will be automatically redirected to the target of the reference.

Example: Click here: [chap. 1, page 3](#) to jump to the beginning of this chapter.

Warranty (Europe)

In addition to the general guarantee required by law, DT Swiss AG based in Biel/Switzerland, provides a guarantee for 24 months from the date of purchase. DT Swiss AG shall reject any liability for both indirect damage caused by accidents and consequential damage.

Any contradictory or extended national rights of the purchaser are not affected by this warranty. Place of performance and jurisdiction is Biel/Switzerland. Swiss law shall apply.

Submit any warranty claims to your retailer or a DT Swiss service center. Any defects recognized by DT Swiss AG as a warranty claim will be repaired or replaced by a DT Swiss service center.

Warranty and guarantee claims can only be made by the original purchaser with a valid sales receipt.

There shall be no claim under the guarantee for:

- Normal wear and tear caused by use of the components
- Incorrect assembly
- Incorrect or nonexistent maintenance
- Incorrectly completed repairs
- Use of unsuitable products
- Modification of components
- Incorrect use or misuse
- Carelessness
- Leasing, commercial use or use in competitions
- Damage caused by accidents
- Delivery and transport damage
- Modification, defacing or removal of the serial number

Limited Equipment Warranty USA

DT Swiss LTD makes every effort to assure that its product meets high quality and durability standards and warrants to the original retail consumer/purchaser of our product that each product is free from defects in materials and workmanship as follows:

2 YEAR LIMITED WARRANTY ON THIS DT SWISS PRODUCT. This warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities or to a lack of maintenance.

DT SWISS LTD LIMITS ALL IMPLIED WARRANTIES TO THE PERIOD OF TWO YEARS FROM THE DATE OF INITIAL PURCHASE AT RETAIL. EXCEPT AS STATED HEREIN, ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS ARE EXCLUDED. SOME STATES MAY NOT ALLOW LIMITATIONS ON HOW LONG THE IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. DT SWISS LTD SHALL IN NO EVENT BE LIABLE FOR DEATH, INJURIES TO PEOPLE OR PROPERTY OR FOR INCIDENTAL, CONTINGENT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF OUR PRODUCTS. SOME STATES MAY NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

To take advantage of this warranty, the product or part must be returned for examination, postage prepaid, to the dealer where you bought the product or to a DT Swiss service center. Proof of purchase date and an explanation of the complaint must accompany the product. If our inspection discloses a defect, DT Swiss will either repair or replace the product or refund the purchase price, if we cannot readily and quickly provide a repair or replacement. DT Swiss will return repaired product or replacement at DT Swiss expense, but if it is determined there is no defect, or that the defect resulted from causes not within the scope of this warranty, then the user must bear the cost of shipping. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Legal venue and place of performance is Biel (Switzerland). Swiss law shall apply. Subject to technical changes. Please keep the user manual and warranty for future use.

1.1 General Maintenance Information

Cleaning

For an optimal result of the maintenance works, every component that will be disassembled must be cleaned. Only cleaners which do not damage the components may be used. Especially the cleaning of O-rings and sealings requires mild cleaners. Always consider the instructions of the respective cleaner.

DT Swiss recommends the following cleaners:

- Motorex Rex
- Motorex Swissclean
- Motorex OPAL 2400, OPAL 3000, OPAL 5000

Use soap water or similar mild cleaners for external cleaning.

Tools


To ensure a damage-free mounting and dismounting of the components, only use the tools which are mentioned in this manual. The tools must be in good order and condition.

The usage of differing tools is up to the user. If components are being damaged by the usage of differing tools, the user is liable.

DT Swiss special tools are precision tools. Damage-free mounting and dismounting of the components can only be ensured, if the tools are working properly and if the conditions of the tools are perfect.

Always keep the tools in their original packaging or adequate devices to save them from damages.

Expendable Material

If special materials like grease or oil are needed, they will be specified in the table «Required Material» at the beginning of a chapter. The symbol «» refers to the table «Required Material» in the respective steps.

Environmental Protection

Whenever possible, waste has to be avoided. Waste, especially carbon, lubricants, cleaners and any other fluids must be disposed in an environmentally compatible manner.

Only print this manual if electronic usage is not possible.

Disclaimer

The operations described in this manual should only be performed by experts. The user is liable for any damage or consequential damage caused by wrong maintained or wrong installed components. If you have doubts, please contact a DT Swiss service center.

2 Description

2.1 Spring

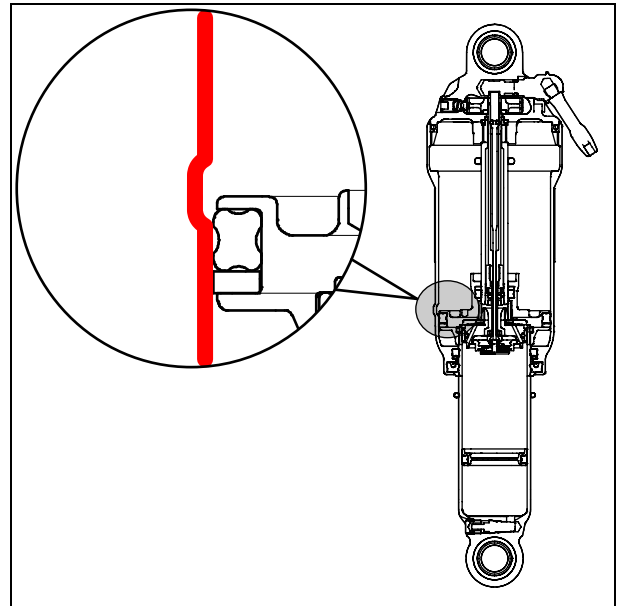
2.1.1 ABS (Auto Balancing Spring)

The ABS (Auto Balancing Spring) system consists of a valve, which is fully opened in the unloaded position of the shock. In this position, the pressure in the positive and negative air chamber is balanced. This improves the response characteristics.

2.1.2 SAB (Smooth Auto Balancing)

The SAB (Smooth Auto Balancing) system only consists of a bypass located in the air chamber. The bypass ensures that the pressure inside the negative air chamber is higher than in the positive air chamber when the shock is fully extended. This reduces the force of the beginning stroke. The shock responds very smooth and offers more comfort and traction.

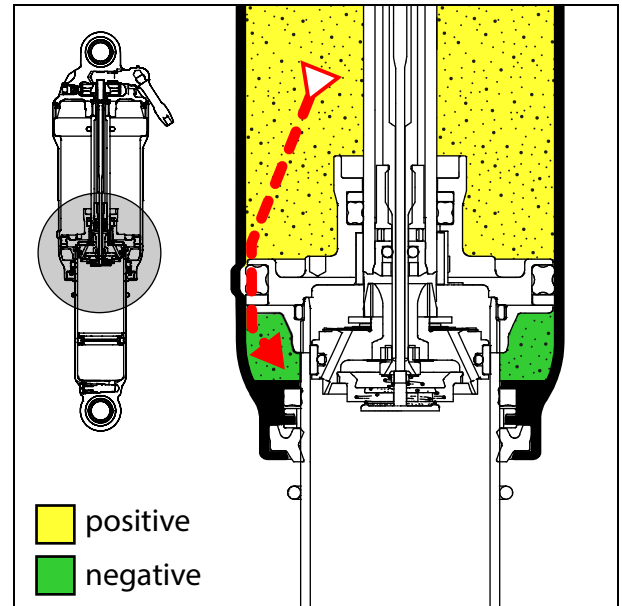
Detailed function, see following chapter.



Detailed Function

After inflating or changing the air pressure:

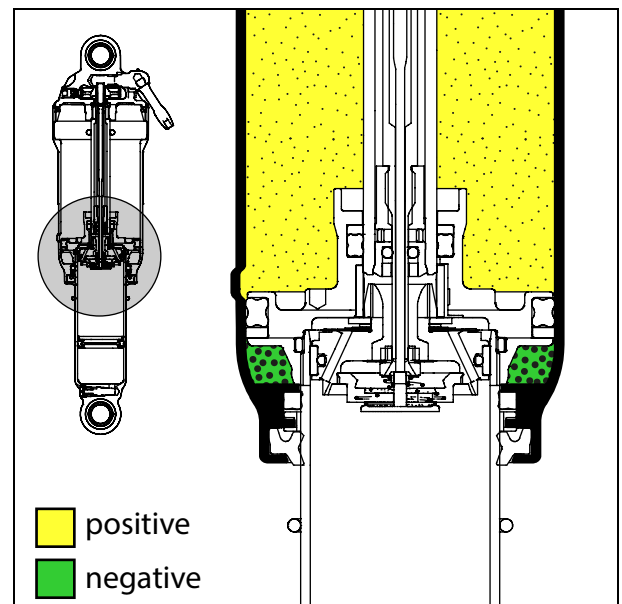
When the shock compresses, the piston moves over the bypass of the air chamber. When the piston is located on top of the bypass, the bypass ensures a pressure equalization of the positive and negative air chamber.



Function during operation:

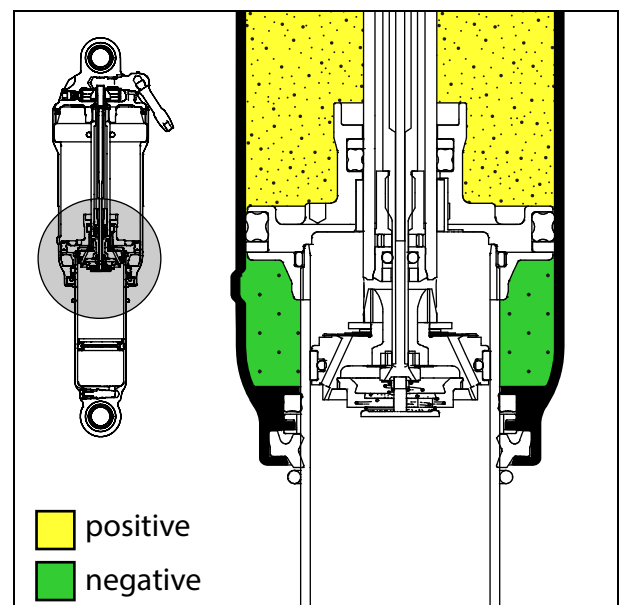
Due to the pressure equalization, the pressure in the negative air chamber is higher than in the positive air chamber when the shock is fully extended.

This increased pressure inside the negative air chamber counteracts to the breakaway torque and improves the response characteristics drastically.



When the shock is compressed further, only the air inside the positive air chamber is compressed.

When the shock extends again, a pressure builds up in the negative air chamber and the cycles starts again.



2.2 Damping

The shock is a closed system. A preloaded floating piston keeps the shock oil under pressure, even if the shock is fully extended. This prevents the oil from foaming and ensures a constant damping performance even on long, rough downhill.

The oil gets in contact with the inner wall of the oil chamber, which leads to a better heat dissipation.

2.2.1 Compression

The low speed compression can be set for different terrain and requirements.

- M 212: «OPEN» und «LOCK»
- X 313: «OPEN», «DRIVE» und «LOCK»

OPEN

Full functionality and sensibility of the shock can be attained in the mode «OPEN». This setup is mostly suitable for downhill, technical and rough uphill and comfortable rides on flat trails.

The low and high speed compression is preset and cannot be changed. The setup of the low speed compression is rather firm. The sporty rider with an active riding style gets more feedback from the ground.

The firm setup of the high speed compression leads to a controlled feeling even on hard hits, jumps or steps.

DRIVE (only X 313)

The «DRIVE» mode sets the shock into a very firm mode. Movements from pedaling are mostly eliminated. This setting is mostly advantageous for sporty and efficient pedaling on flat trails and uphill.

LOCK

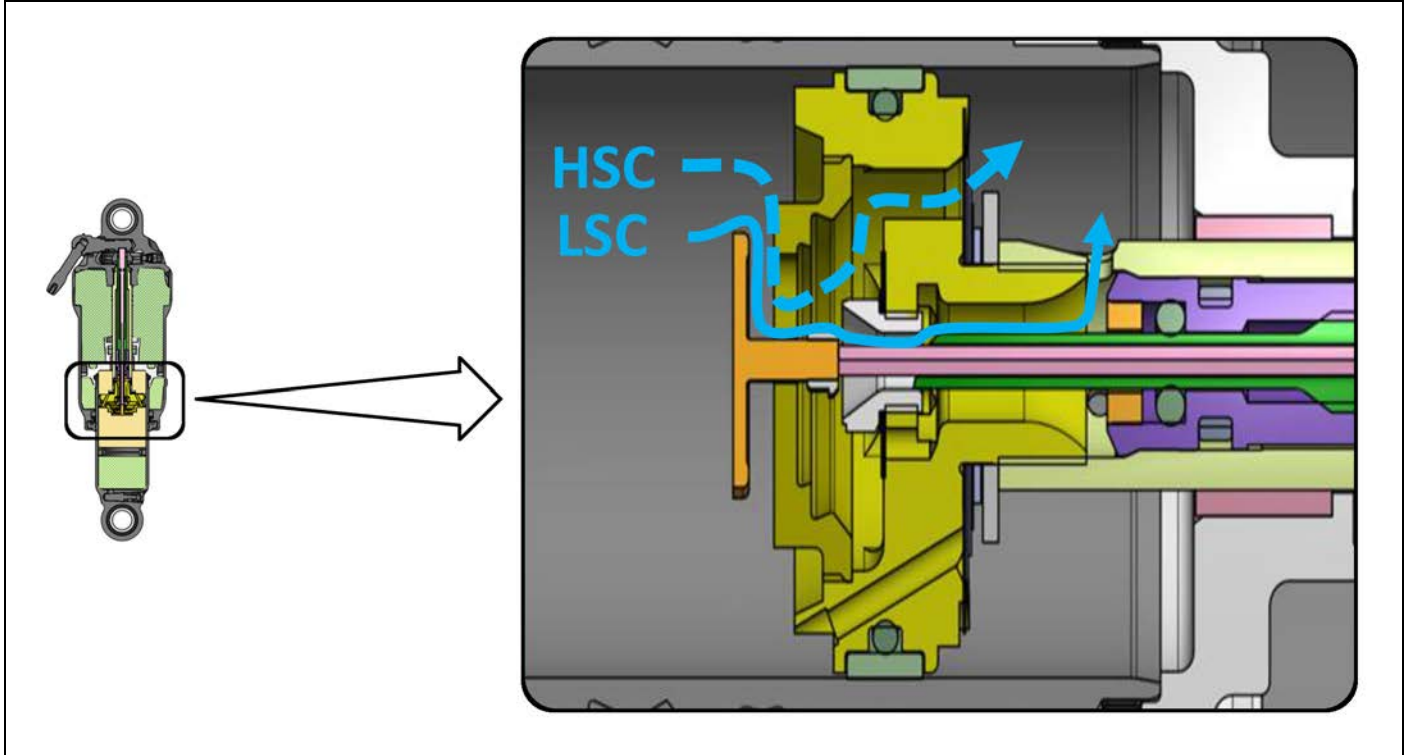
The «LOCK» mode blocks the shock in fully extended position. This is mostly suitable for situations where no suspension is needed (for example riding on the road or connecting trails).

A blow-off valve protects rider and material from unexpected hits.

Detailed Function

The compression damping cannot be set separately. Thus, the oil of the low speed compression (LSC) and rebound flows through the same bore, the setting of the rebound also changes the low speed compression (LSC).

This combined setting of compression and rebound is based on the experience, that the rider, who needs a higher rebound damping, also needs a higher compression damping (based on a higher body weight or individual riding style).



When the shock compresses, the damping piston moves through the oil chamber. Thereby, the oil flows through the damping piston. At slow compression speed, the oil flows through the channel of the low speed compression (LSC). The adjusting needle of the rebound, which position can be adjusted with the red rebound wheel, controls the flowing resistance through the oil channel. The higher the flowing resistance, the higher the rebound damping.

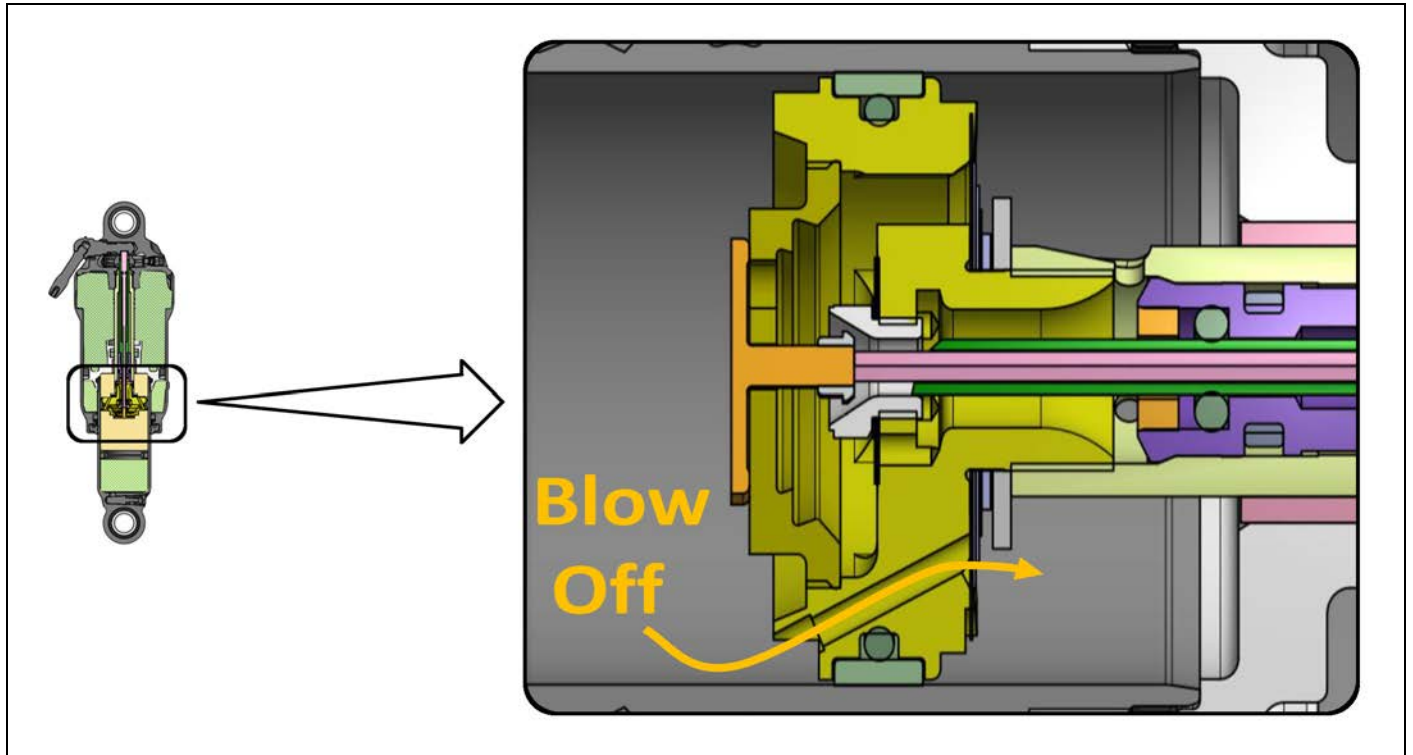
At fast compression speeds, the oil flows through the oil channel of the high speed compression (HSC) additionally. Before the oil flows into the rebound reservoir, it has to pass the shims. These shims can be different, depending on the factory setting and thus affecting the damping characteristics.

The volume on both sides of the piston is different, only part of the displaced oil can flow into the space behind the piston. This excess oil compresses a chamber filled with nitrogen, which is separated to the damping oil by a floating piston. The compression of the nitrogen chamber is responsible for a high progression at the end of the stroke and prevents the shock from bottoming out.

2.2.2 Blow Off

The blow off function is a safety mechanism for protecting the components of the shock from heavy loads.

Detailed Function



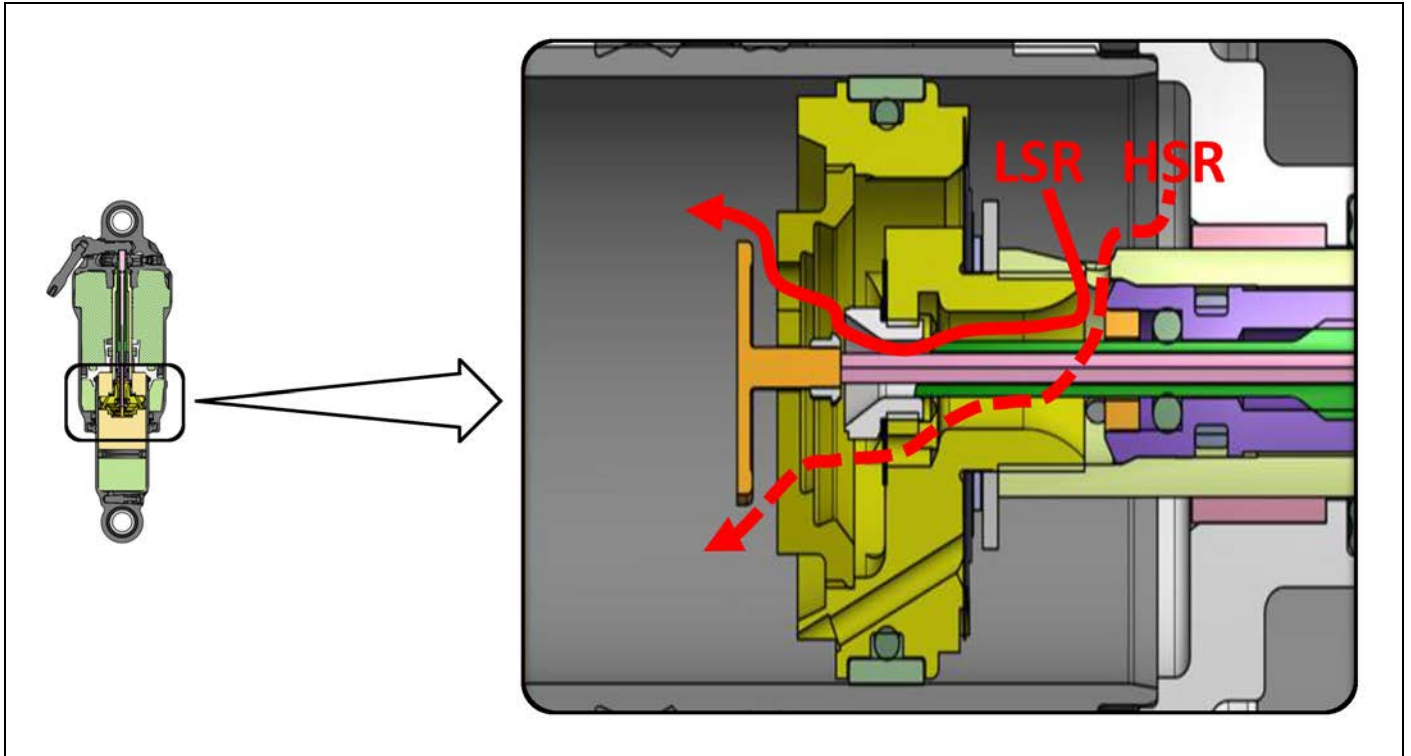
When the shock is blocked, a slider closes the oil channels of the low speed and high speed compression. The damping piston has two channels, which directly connect the compression chamber with the rebound chamber. These channels are blocked by shims. Oil can only flow from the compression chamber into the rebound chamber, when the force of the shims is overcome. Thus the channels have small pressure areas (2x Ø1.5 mm), there must be a high pressure that the oil can flow through the blow off channel.

2.2.3 Rebound

The low speed rebound can be set externally with the red rebound wheel. The rebound pin moves forward and backwards while turning the rebound wheel. According to the position of the rebound pin, more or less oil can flow through the high speed rebound channels.

The setting of the low speed compression also influences the high speed rebound.

Detailed Function



When the shock is released, the damping piston moves through the oil chamber. Thereby, the oil flows from the rebound chamber into the compression chamber. The entire oil flows through the damping piston, where the rebound damping happens.

At slow rebound speeds, the oil flows through the channel of the low speed rebound (LSR). The position of the rebound pin regulates the flowing resistance and thus the intensity of the damping. The higher the flowing resistance, the higher the damping.

Oil which cannot flow through the oil channels of the LSR (because of fast rebound speed and thus big displacement of the oil generated by the piston) flows through the oil channels of the HSR. This ensures separate damping characteristics on small and medium or on fast rebound speeds.

Like the HSC, the HSR is also controlled by preloaded shims. These shims can be different, depending on the factory setting and thus affecting the damping characteristics.

3 Assembly

3.1 Safety

DANGER

Risk of death caused by incorrectly assembled rear shocks!

- Only use fastening screws specified by the frame manufacturer.
- The installation length of the rear shock must be approved by the manufacturer of the frame.
- Only use mounting hardware specified by the frame manufacturer.

DANGER

Incorrect handling, installation, maintenance or servicing can lead to accidents causing severe injuries or death!

- Compliance with the following provisions is a prerequisite for accident-free use and faultless functioning.
- Assembly and maintenance of the component requires a basic knowledge of handling bicycle components. If in any doubt, consult your retailer.
- Components should only be used in accordance with their intended use, otherwise the user shall assume full responsibility.
- The component must be compatible with all parts of the bicycle.
- Only use original spare parts.
- The components must not be changed or modified.
- The component must not be used if it is damaged or there are any signs of damage. If in any doubt, consult your retailer.

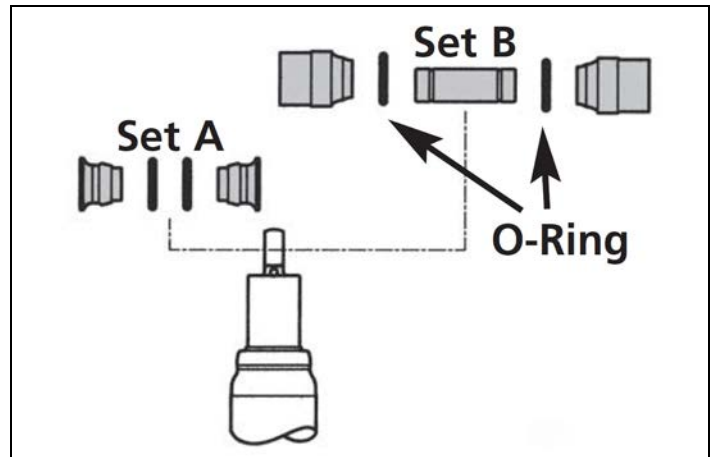
3.2 Mounting the Shock to the Bike Frame

Preparatory Steps

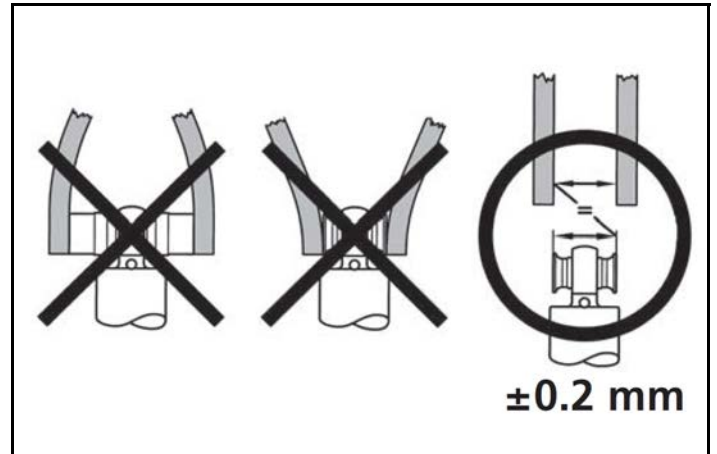
Link

Clean the fixing points on the bicycle frame.

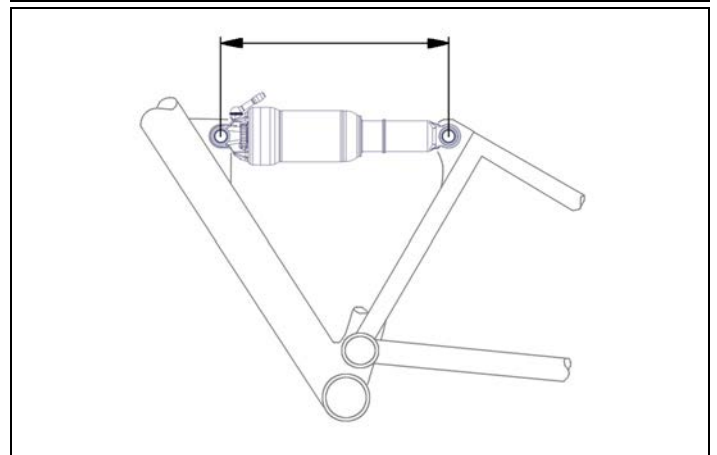
1. Check the mounting hardware.
An A or B set must be provided for the assembly side of the rear shock.



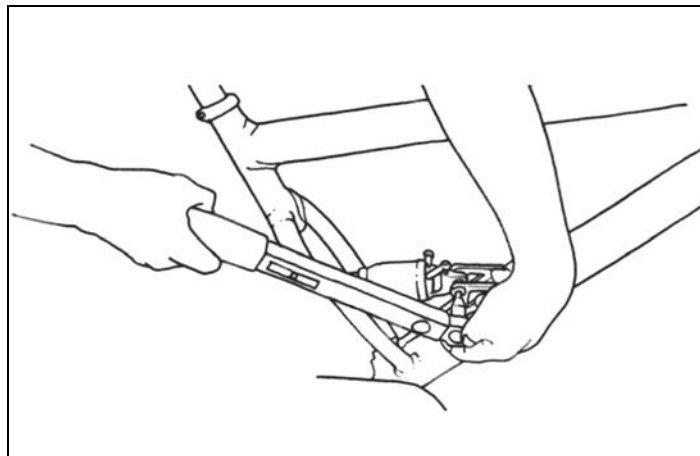
2. Check the bushings. The dimensions (± 0.2 mm) must correspond to the specifications provided by the frame manufacturer.



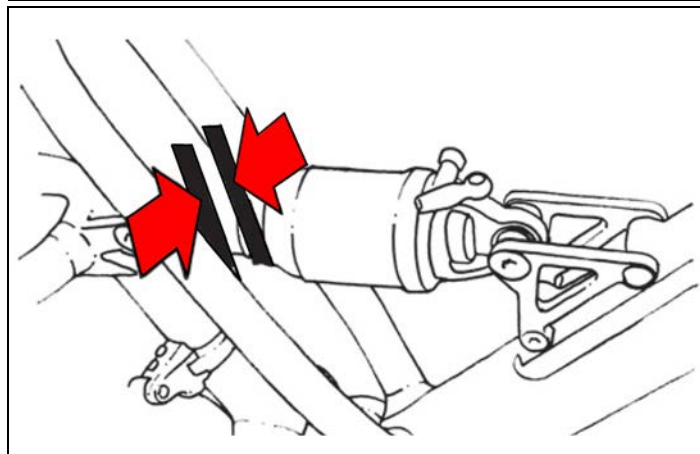
3. Check, if the installation length of the rear shock is approved by the manufacturer of the frame.



- 4. Fully assemble the mounting hardware and the rear shock.
Caution: Only use fixing screws approved by the manufacturer of the frame.
- 5. Tighten the screws according to the torque specified by manufacturer of the frame.



- 6. Check to ensure the rear shock is installed correctly.
Caution: The rear shock must not touch the frame when installed.



Closing Steps

not required

Link

3.3 Installation of the Remote Lever



There are different DT Swiss remote levers available: The lightweight lever and the Two In One lever. The lightweight lever can only operate a single DT Swiss shock, while the Two In One lever can operate a DT Swiss shock and a DT Swiss fork at the same time. Both levers are available as single stage and double stage versions.

Preparatory Steps		Link
not required		
Required Material	Specification	Amount
cable	uncoated	as required
cable housing	Ø4,2 mm, maximum length 90 cm	as required
carbon fitting lubricant		as required

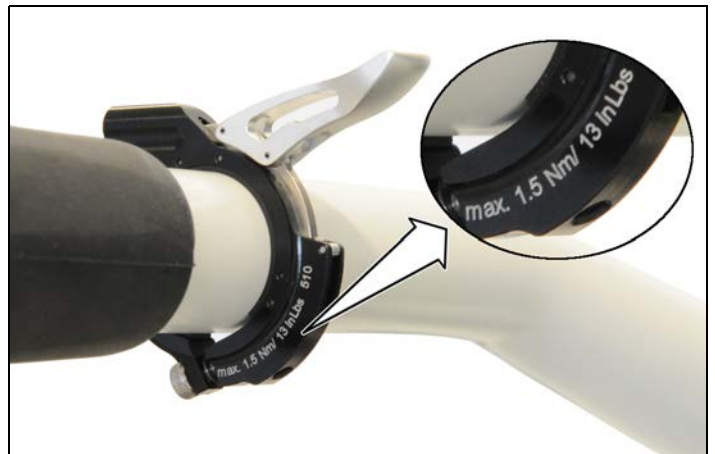
3.3.1 Installation of the Remote Lever [Lightweight]

NOTICE

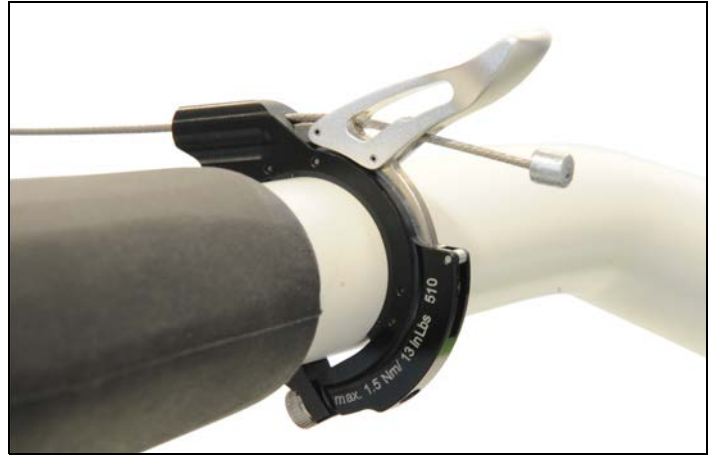
General information: lightweight lever

- The remote lever can only be used for DT Swiss forks.
- The remote lever can be installed on the right side or on the left side of the handlebar.
- The remote lever is designed for a handlebar diameter of 22.2 mm. If the diameter of the handlebar is smaller, the clamp of the remote lever cannot be fixed strong enough.

1. Carbon handlebars: Apply a thin layer carbon fitting lubricant to the contact area of remote lever and handlebar.
2. Put the remote lever onto the handlebar and tighten the fixing screw with a torque of 1.5 Nm.
3. Check the proper function of the remote lever and the control elements next to it. Whether the remote lever nor any other control element may be affected in its proper function.
4. Push the remote lever in the position «open» (see figure).



5. Cut the cable housing to the required length. Check if the handlebar with the installed cable housing can be turned without being affected.
6. Put the cable into the remote lever. Only use uncoated cables!



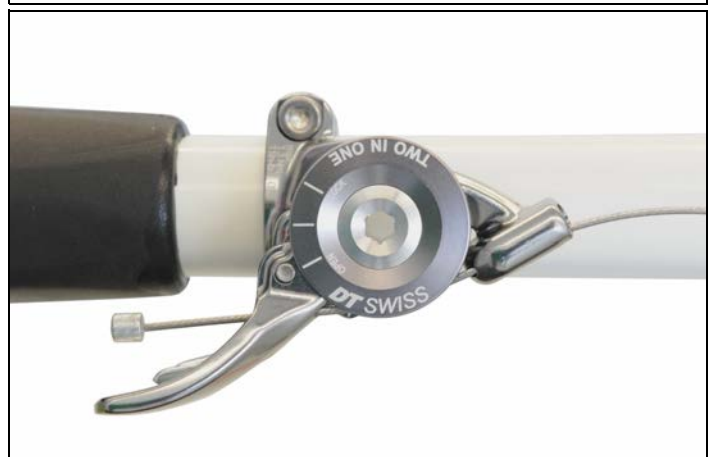
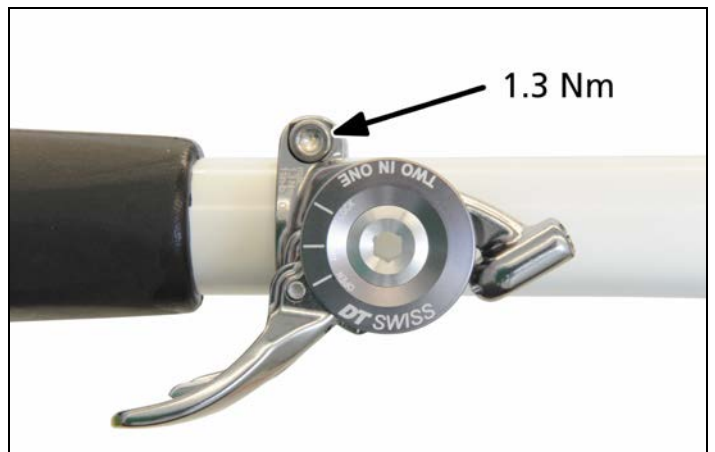
3.3.2 Installation of the Remote Lever [Two In One]

NOTICE

General Information: Two In One Lever

- The remote lever can be used for DT Swiss forks and/or DT Swiss shocks.
- The remote lever must be installed on the left top side of the handlebar.
- The remote lever is designed for a handlebar diameter of 22.2 mm. If the diameter of the handlebar is smaller, the clamp of the remote lever cannot be fixed strong enough.

1. Carbon handlebars: Apply a thin layer carbon fitting lubricant on the contact area of remote lever and handlebar.
2. Put the remote lever onto the handlebar and tighten the fixing screw with a torque of 1.3 Nm.
3. Check the proper function of the remote lever and the control elements next to it. Whether the remote lever nor any other control element may be affected in its proper function.
4. Push the remote lever into position «open» (see figure).
5. Cut the cable housing to the required length. Check if the handlebar with the installed cable housing can be turned without being affected.
6. Put the cable into the remote lever. Only use uncoated cables!



Closing Steps

not required

[Link](#)

3.3.3 Assembling the Cable and the Cable Housing

Preparatory Steps

Link

not required

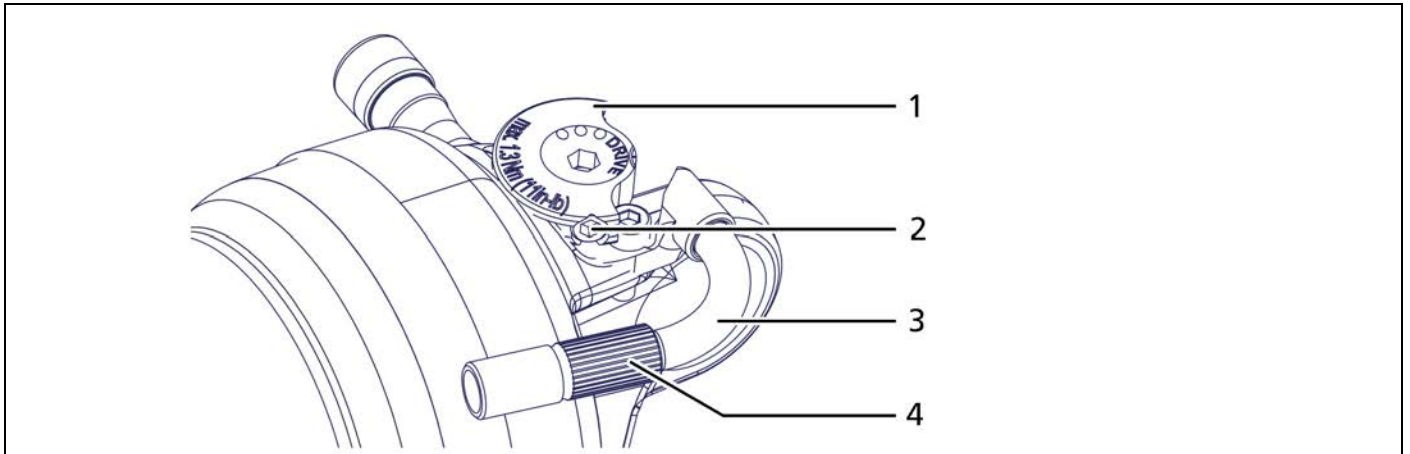
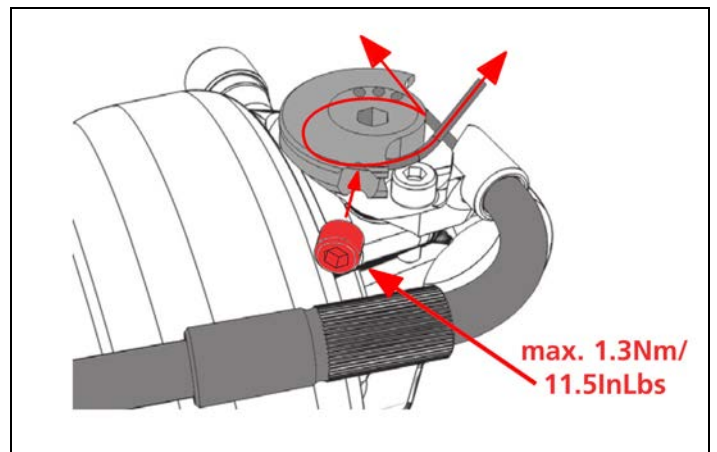


Figure 3-1: Remote-Unit

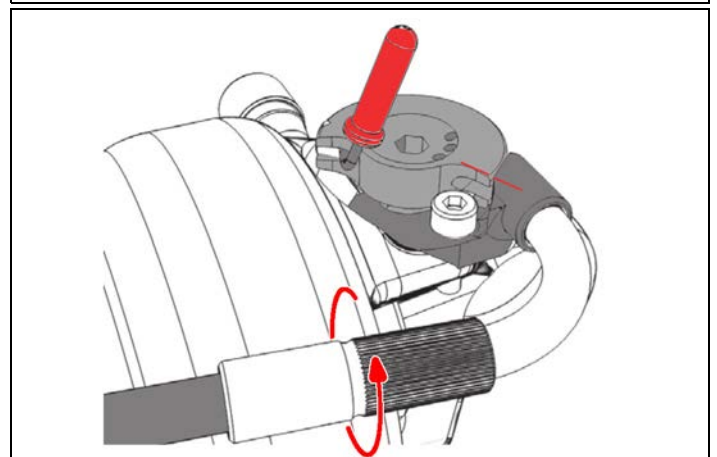
- | | |
|----------------|---------------|
| 1 remote wheel | 3 cable guide |
| 2 fixing screw | 4 adjuster |

1. Put the cable into the cable guide (see [Abb.3-1/3](#)) like shown in the figure.
2. Put the cable housing into the cable guide.
3. Screw out the fixing screw (see [fig. 3-1/2](#)) of the remote wheel (see [fig. 3-1/1](#)).
4. Put the cable around the remote wheel and tighten it.
5. Fix the cable with the fixing screw. Tighten the fixing screw with a maximum torque of 1.3 Nm.



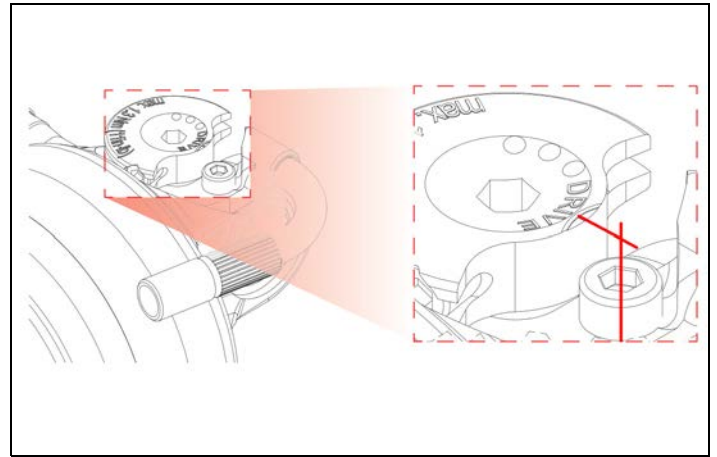
Only M212:

6. Press the end cap onto the cable and bend the cable upwards.
7. Put the remote lever into the position «LOCK».
8. Adjust the position «LOCK» using the adjuster (see [fig. 3-1/4](#)).



Only X313:

- 9. Press the end cap onto the cable and bend the cable upwards.
- 10. Put the remote lever into the position «LOCK».
- 11. Adjust the position «LOCK» using the adjuster (see [fig. 3-1/2](#)).



Closing Steps

not required

Link

4 Operation and Setting

4.1 Setting the SAG (Negative Travel)

The SAG is the amount of travel of which the shock will be compressed by the weight of the rider with full equipment. If the SAG is adjusted correctly, the rear wheel can follow the ground during the ride much better.

The setting of the SAG depends on the riding style. If you prefer a firm suspension for cross country or marathon use, you should choose a low SAG value.

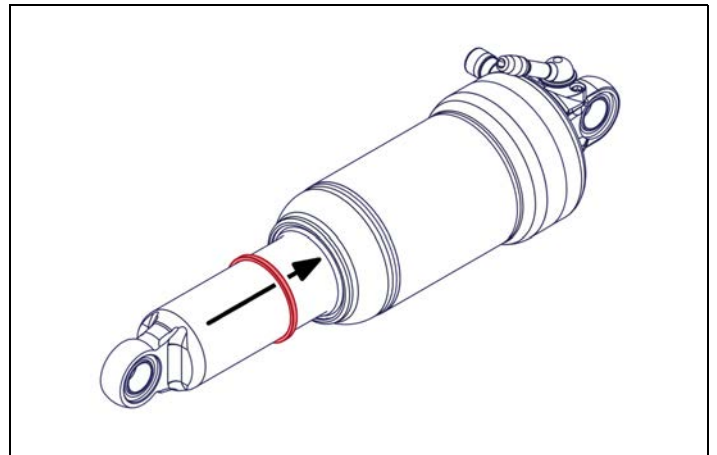
If you ride all mountain or enduro, a higher SAG value should be chosen. The stroke of the shock will be used more efficient and the rear wheel will follow the bumps much better.

The following values can be used for setting the SAG:

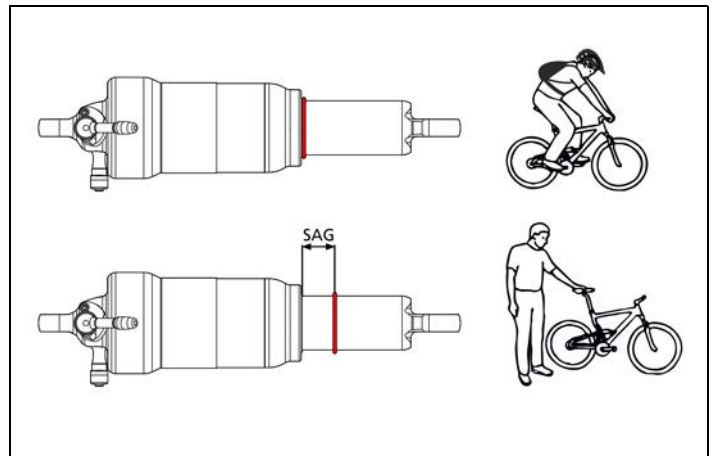
Built-In-Length / Stroke	SAG-Value
165 mm / 37.5 mm	8 - 13 mm
190 mm / 50 mm	10 - 18 mm
200 mm / 50 mm	
200 mm / 55 mm	11 - 20 mm

To set the SAG, you should use the help of a second person.

1. Inflate the shock to approx. 8 bar (see [chap. 4.2, page 21](#)). Based on this pressure, the SAG can be set.
2. Deactivate the lockout: Turn the remote lever on the shock or on the handlebar in position «OPEN».
3. Push the O-ring to the bottom, until it touches the wiper seal.



4. Sit on the bike with full equipment (backpack, helmet, shoes...).
5. Sit on the bike as you would sit during the ride.
 - The shock compresses because of your own weight.
 - Avoid impact loads.
6. Get off your bike and measure the distance between O-ring and wiper seal.
 - This measurement is called SAG.
 - The SAG should be between 20% and 35% of the full travel and can be adjusted depending on the riding style and use.

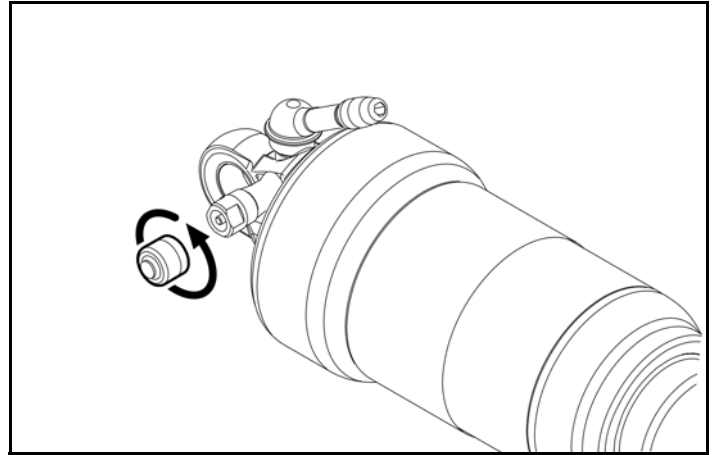


7. Adjust the air pressure if necessary (see following). Repeat steps above until the correct SAG is set.

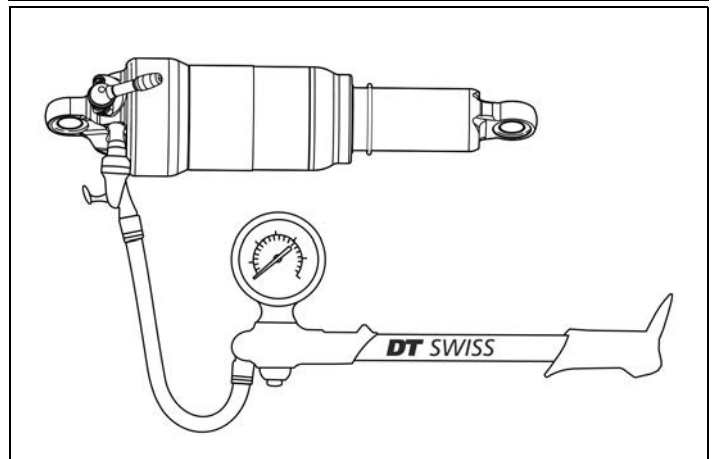
4.2 Setting the Air Pressure

By adjusting the air pressure, the spring rate will be affected. The higher the air pressure, the harder the spring. Adjustment is possible by changing the air pressure. Adjusting the air pressure to the weight of the rider can slightly change the total length of the shock.

1. Remove the valve cap from the valve housing.



2. Mount a suitable shock pump on to the valve housing.
3. Adjust the air pressure by in- or deflating.
→ Check, if the correct SAG is set (see [chap. 4.1, page 20](#)).
4. Remove the shock pump and screw the valve cap onto the valve housing.



4.3 Setting the Damping

4.3.1 Setting the Rebound

The rebound controls the speed of the decompression movement of the shock.

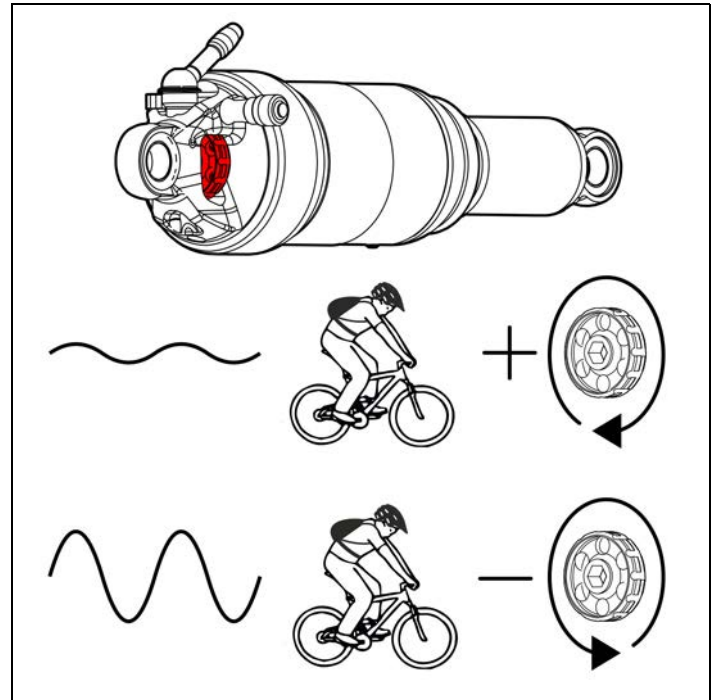
To adjust the rebound damping, turn the red wheel.

- Turn clockwise to increase the rebound damping.
- Turn anti-clockwise to decrease the rebound damping.

If the rebound damping is too low, the rear wheel decompresses too fast which leads to an unstable rear suspension.

If the rebound damping is too high, the rear wheel can't follow fast impacts and the suspension hardens.

The aim of setting the rebound damping is to achieve the best setting possible, which meets the requirements of the terrain best. Rough, fast downhill require a low rebound damping, while flowy downhill without big hits require a higher damping.



4.3.2 Compression

OPEN:

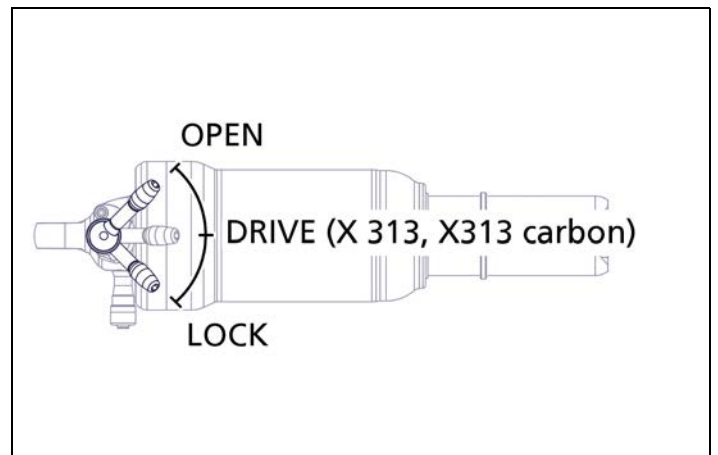
When the «open mode» is active, the compression of the damping is in the most sensible setting. The shock reacts very sensible to small bumps.

DRIVE:

X 313 and X 313 carbon provide an additional drive mode. When the lever is in the middle position, the compression is closed partially. This leads to a firm suspension and supports effective pedaling in situations where no full performance of the shock is needed (for example riding uphill on tarmac or firm trails).

LOCK:

All DT Swiss shocks provide a lock out function. When the lever is in the position «LOCK», the oil flow through the damping piston is closed. A blow-off valve opens the oil circuit when hitting big bumps to avoid damages to the shock.



5 Service and Care

5.1 Safety



DANGER

Incorrect handling, installation, maintenance or servicing can lead to accidents causing severe injuries or death!

- Compliance with the following provisions is a prerequisite for accident-free use and faultless functioning.
- Assembly and maintenance of the component requires a basic knowledge of handling bicycle components. If in any doubt, consult your retailer.
- Components should only be used in accordance with their intended use, otherwise the user shall assume full responsibility.
- The component must be compatible with all parts of the bicycle.
- Only use original spare parts.
- The components must not be changed or modified.
- The component must not be used if it is damaged or there are any signs of damage. If in any doubt, consult your retailer.



DANGER

Danger to life due to wrong maintenance!

Incorrect maintenance or assembly can lead to unpredictable errors!

- Maintenance and assembly may only be done by a skilled professional.
- In case of any doubt, contact a DT Swiss service center.

5.2 Care

To ensure a long product life, follow the instructions below:

- Clean the shock with a damp cloth after each ride.
- Never use aggressive cleaners that damage the wiper seals!
- Never use high pressure cleaners. Water and dirt can get into the system and damage it!
- Remove all visible, dried dirt from the area of the wiper seals. This will prevent dirt from getting into the shock.
- It is not necessary to grease the wiper seals.
- After cleaning, lubricate the sliding surface of the remote lever on the handlebar.

5.3 Service Intervals



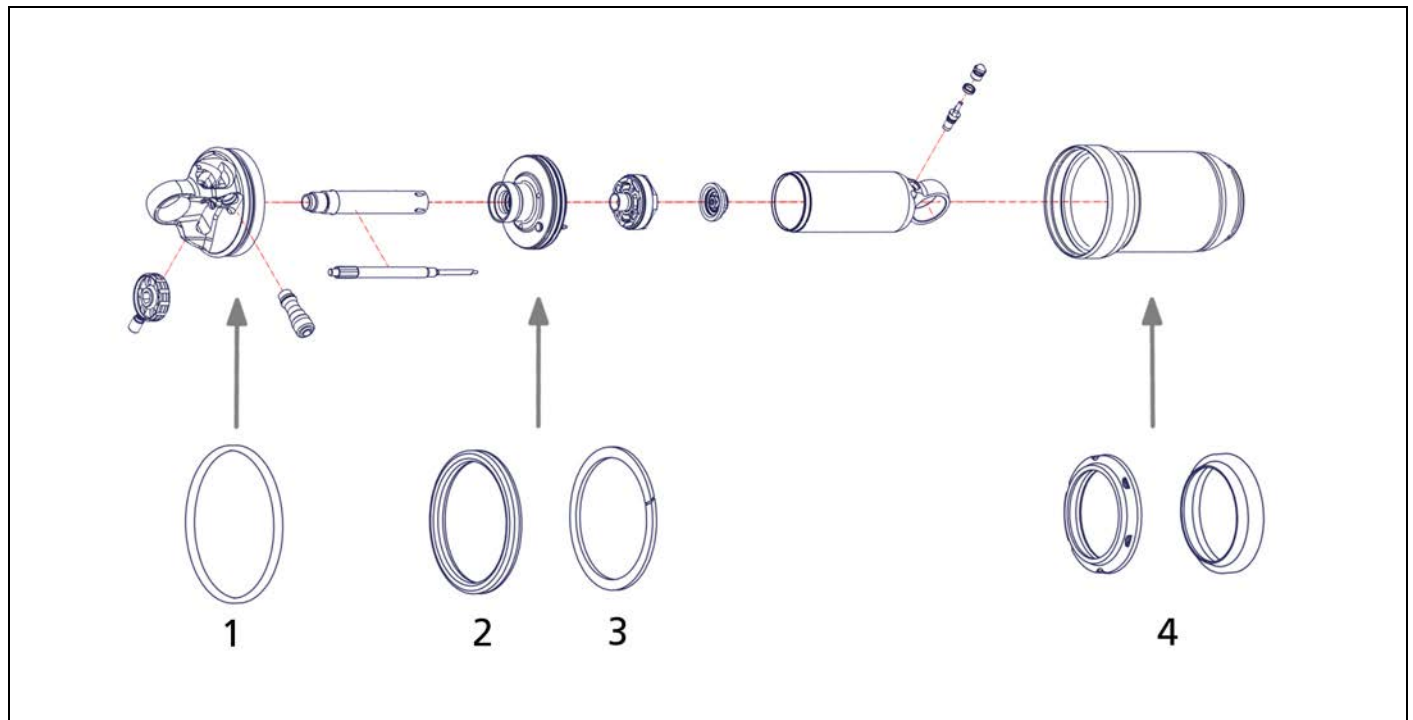
If service intervals are not respected, any warranty claims can be denied.

Action	Interval
Small Service (see chap. 5.5, page 25)	<ul style="list-style-type: none"> intensive use: 40 operating hours normal use: 100 operating hours or as required
Big service carried out by a DT Swiss service center	annual or after 200 operating hours
Check the shock for damages	before and after each ride
Check for proper fixation	before each ride
Check the function	before each ride
Clean with a soft cloth and a suitable cleaner, especially in the area of the wiper seals. Do not use high pressure cleaners and aggressive cleaners!	after each ride

5.4 Seal Kits

For a small service, there are different seal kits available for each shock. Each seal kit includes wiper, quadring, support ring and the O-ring for the air chamber.

The seal kit for XM 180 and XR carbon includes a dual wiper and a single wiper. The different model years require one of both wipers. The seal kits for M 212, X 313 and X 313 carbon only contain the sealings which are needed.



1 O-ring air chamber
2 quadring

3 support ring
4 dual wiper or single wiper

5.5 Small Service

This chapter describes a small service. Further service works will be executed by a DT Swiss service center.

A small service should be carried out in the following cases:

- The interval for a small service is expired (see table at the beginning of this chapter).
- The shock loses air and must be inflated regularly.
- Other defects or malfunctions.

Preparatory Steps	Link
Dismount the shock from the bike.	
Dismount the bushings.	
Clean the surface of the shock.	

NOTICE

Risk of damaging the shock!

To avoid damages, always clamp the shock or parts of the shock into ground clamping jaws, aluminum clamping jaws oder plastic clamping jaws.

5.5.1 Releasing the Air

DANGER

Shock oil may be fatal if swallowed and enters airways!

Oil mist might escape through the valve while releasing the air.

- Always put a cloth onto the valve while releasing the air.
- The valve must face down, away from your body while releasing the air.
- Immediately call a doctor if shock oil was swallowed or entered airways.

DANGER

Risk of injury due to high air pressure!

Air with high pressure can escape suddenly while dismounting the shock!

- Always release the air before starting any works.

1. Remove the valve cap.
2. Release the air pressure of the air chamber.
 - a) Put a cloth onto the valve.
 - b) Hold the valve down, away from your body and press the valve insert carefully.

If there is oil coming out of the air valve, the sealing of the oil chamber tap is broken. In this case, a big service has to be executed by a DT Swiss service center.



5.5.2 Removing the Air Chamber

1. Clamp the shock into a vice vertically.
2. Unscrew the air chamber by hand.





3. If the air chamber can't be loosened by hand, unscrew the air chamber using a strap wrench.



4. Slide off the air chamber.
5. Take the shock out of the vice.



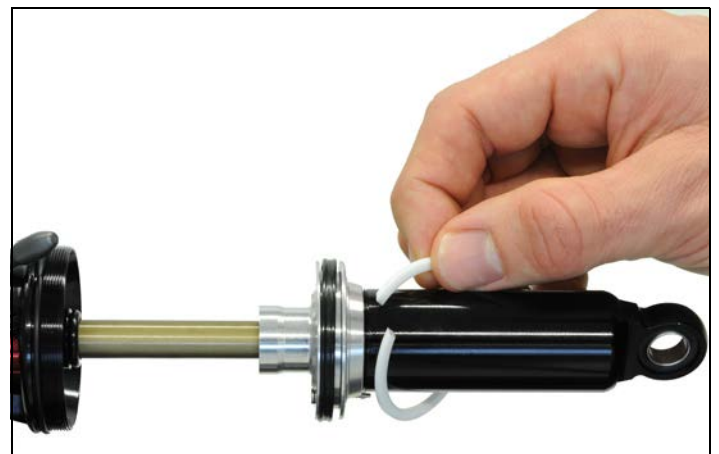
5.5.3 Replacing the O-Ring between of the Air Chamber, Quadring and Support Ring

✂ Required Material	Specification	Amount
O-Ring air chamber Quadring support ring	part of seal kit air chamber XM 180 / XM 180 ABS: CWKXXXXX86200S XR Carbon / XR Carbon ABS: CWKXXXXX86201S M 212 / X 313 ABS: CWKXXXXX86202S X 313 Carbon: CWKXXXXX86203S M 212 / X 313 SAB: CWXXXXXX86217S	1
grease	 Buzzy's Slick Honey 4.7 dl: 40341000AD02000001 OR  20 ml: TZXXXXXNSLICKS	as required

1. Remove the O-ring from the end cap.
2. Clean the end cap.
3. Check if there are any damages.
4. Grease the new O-ring and put it on the end cap.
✂ Required grease: see table on page 28



5. Remove the support ring from the oil chamber tab.



6. Remove the quadring from the oil chamber tab.
7. Clean the seat of quadring and support ring.



8. Slightly grease the new quadring and put the quadring onto the oil chamber tab.
→Ensure, the quadring is not twisted.
✘ Required grease, see table on page 28.



9. Put the support ring onto the oil chamber tab on the side of the oil chamber.





5.5.4 Changing the Wiper

This chapter describes the replacement of the following wiper versions:

Shock-Model	Link
M 212 SAB X 313 SAB	section „Changing the Wiper of a SAB Shock“, page 30
XR Carbon ABS XM 180 ABS M 212 ABS X 313 ABS / X 313 Carbon ABS	section „Changing the Dual Wiper“, page 33
XR Carbon (non ABS) XM 180 (non ABS) SSD 210 / SSD 225	section „Changing the Single Wiper“, page 36

Changing the Wiper of a SAB Shock

✂ Required Material	Specification	Amount
wiper seal quadring support ring	part of seal kit air chamber M212 / X313 SAB: CWXXXXXX86217S	1
grease	 Buzzy's Slick Honey 4.7 dl: 40341000AD02000001 OR  20 ml: TZXXXXXNSLICKS	as required

- Carefully remove the wiper seal using long nose pliers.
 →The air chamber must not be damaged!
 →Do not re-use the wiper seal!



2. Remove the support ring from the air chamber by hand.
→Do not re-use the support ring!



3. Remove the quadring from the air chamber by hand.
→Do not re-use the quadring!

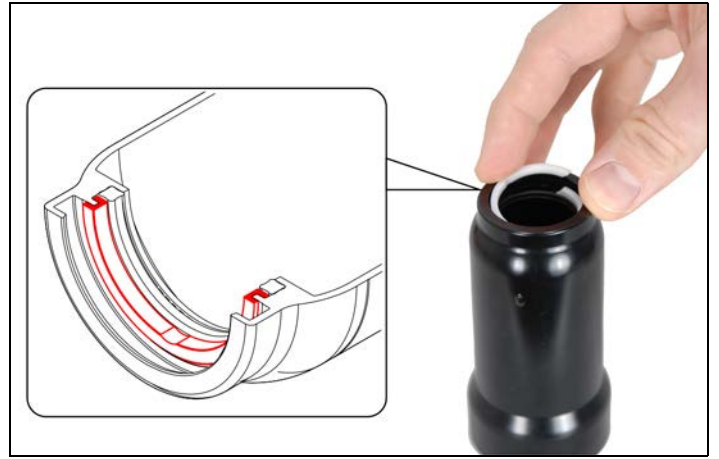


4. Clean the air chamber housing with a clean, lint-free and dry cloth.
There must be no lint and no residuals of grease after cleaning!

5. Slightly grease the new quadring and put it into the inner groove of the air chamber (see figure).
→Ensure, the quadring is not twisted.
✘ Required grease, see table on page 30.

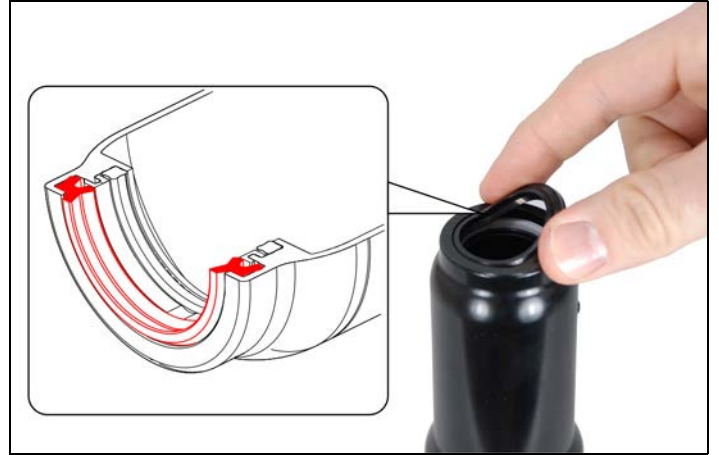


6. Put a new support-ring onto the web between both grooves of the air chamber (see figure).



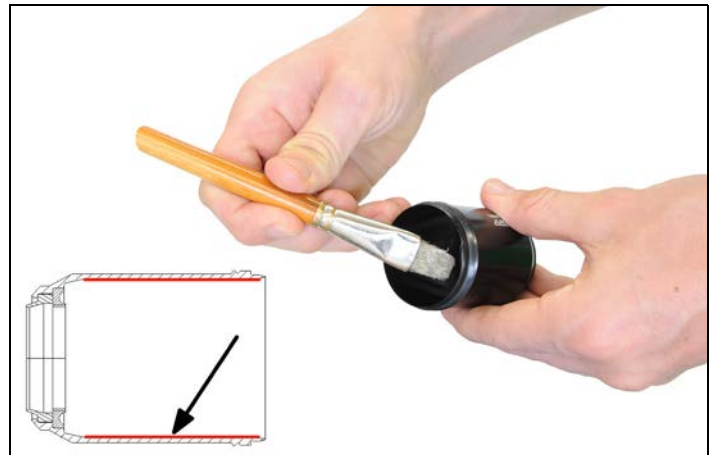
7. Slightly grease the new wiper seal and put it into the outer groove of the air chamber (see figure).
→Ensure, the wiper seal lays evenly all around the groove.

✘ Required grease, see table on page 30.








8. Slightly grease the inner surface of the air chamber housing.

✘ Required grease, see table on page 30.



Changing the Dual Wiper

✂ Required Material	Specification	Amount
wiper seal quadring support ring	part of seal kit air chamber XM 180 / XM 180 ABS: CWKXXXXX86200S XR Carbon / XR Carbon ABS: CWKXXXXX86201S M 212 / X 313 ABS: CWKXXXXX86202S X 313 Carbon ABS: CWKXXXXX86203S	1
dual wiper mounting tool	 CWTXXXXX12687S	1
pushing tool for guide bushing	 CXTXXXXS11164S	1
counterholder for punshing tool	 CXTXXXXS11163S	1
grease	 Buzzy's Slick Honey 4.7 dl: 40341000AD02000001 OR  20 ml: TZXXXXXNSLICKS	as required

1. Push out the sealing and the bushing using a tire lever (or s.th. similar).



NOTICE

Risk of damage due to cleaners!

Aggressive cleaners cause damages to the wiper. Damaged wipers are the reason for air leakages of the shock.

- Only use Motorex Swissclean or mild cleaners like soap water.

2. Clean the new wiper.
→ There must be no lint, dust or any other dirt on the wiper.
3. Put the new wiper onto the special tool.
4. Slide the air chamber onto the tool.



5. Press in the new wiper by hand.
6. Take the air chamber off the tool.



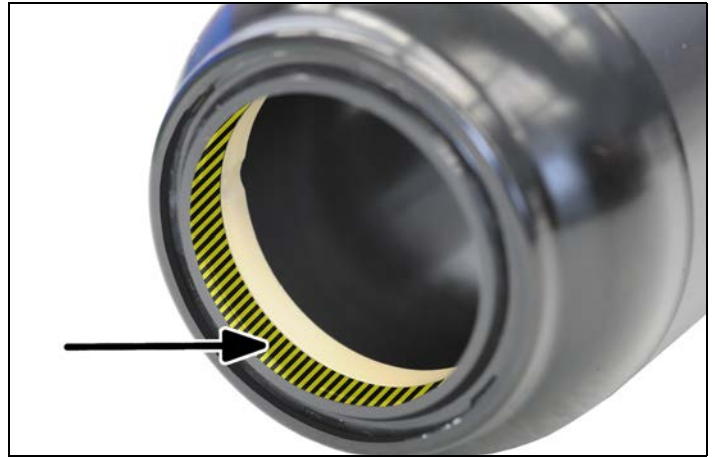
7. Put the bushing onto the special tool.
8. Slide the air chamber onto the tool.



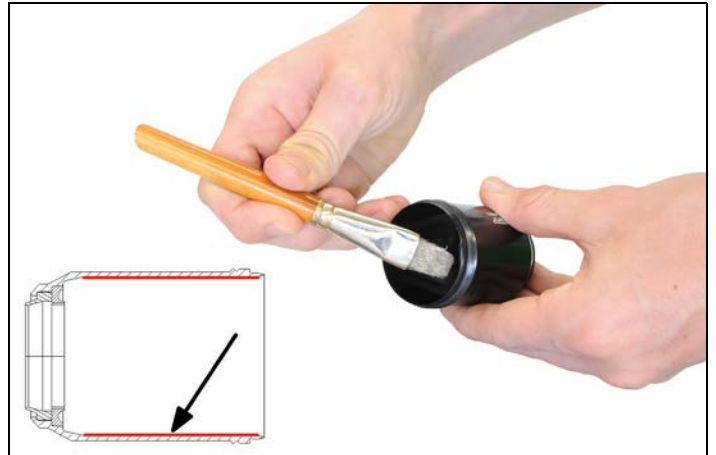
- 9. Put the counterholder onto the air chamber.
- 10. Press the bushing into the air chamber while performing slight hammer strokes onto the counterholder.



- 11. Check, if the wiper is clean of lint, dust or any other dirt.
- 12. Slightly grease the inner surface of the wiper.
 ✘ Required grease, see table on page 33.



- 13. Slightly grease the inner surface of the air chamber housing.
 ✘ Required grease, see table on page 33.



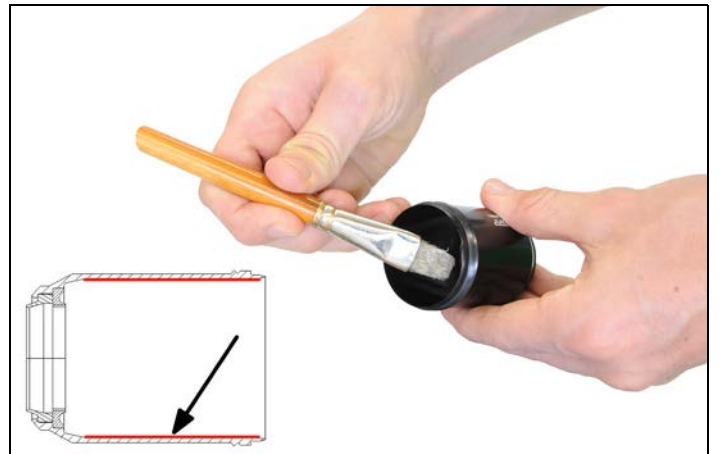
Changing the Single Wiper

✂ Required Material	Specification	Amount
wiper seal	part of seal kit air chamber XM 180 XR Carbon SSD 210 / 225: CWKXXXXX861985	1
grease	 Buzzy's Slick Honey 4.7 dl: 40341000AD02000001 OR  20 ml: TZXXXXXNSLICKS	as required

1. Take out the wiper by hand.
2. Check the guide bushing.
→If the guide bushing is damaged, contact a DT Swiss service center.
3. Put a new wiper into the air chamber housing.



4. Slightly grease the inner surface of the air chamber housing.
✂ Required grease, see table on page 36.



5.5.5 Assembling the Shock

1. Clamp the shock into the vice.



CAUTION

Risk of injury due to damaged carbon air chambers!

While sliding on the air chamber, a pressure is build in the negative air chamber. If a carbon air chamber is not screwed on fully, the threads could crack and the air chamber could be thrown away.

- Slide on the carbon air chamber and screw it on for min. 1.5 turns without releasing it.

2. Slide on the air chamber and tighten it by hand.



3. Put the SAG O-ring onto the oil chamber.



5.5.6 Inflating the Shock

1. Inflate the air chamber with 8 bar.
2. Put on the valve cap.



Closing Steps

Set the SAG.

Link

[chap. 4.1, page 20](#)

6.6 Trouble Shooting

Problem	Cause	Action
Air loss after long term storage or riding.	Normal effect. The shock loses about 1-2 bar per month.	
Air loss after short time.	Damaged sealing or damaged air chamber.	Perform a small service (see chap. 5.5, page 25) or contact your dealer or a DT Swiss service center to solve this problem.
Tiny amounts of oil or grease on the outside.	Normal residue from installation or operation.	
Shock loses oil instantly.	Sealing of the piston rod is damaged.	Contact your local dealer or a DT Swiss service center to solve this problem.
Noticeable loss of oil at the oil chamber.	Sealings are at their wear limits.	Contact your dealer or a DT Swiss service center to solve this problem.
Shock makes slight flowing sound (effect gets worse when rebound is closed).	Normal damping effect of oil and bores.	
The pressure indicated on the pressure gauge rises rapidly while pumping.	The pump is not screwed on properly or the pump is damaged.	Check the positioning of the pump on the shock or change the pump (the valve doesn't open).
	Damaged valves or valve inserts.	The valve inserts should be changed or retightened by your dealer or a DT Swiss service center.
The shock can't be inflated (the air instantly leaks out the shock again).	Incorrect handling of the pump or the pump is defect.	
	Damaged valves or valve inserts.	The valve inserts should be changed or retightened by your dealer or a DT Swiss service center.
Shock has noticeable play at the spherical bearings.	Check whether the correct mounting hardware was used or the screws are tightened correctly. If necessary, the spherical bearings should be changed by your dealer or a DT Swiss service center.	
Shock makes loud «smacking» sound.	Air in the oil.	Contact your dealer a DT Swiss service center to solve this problem.
The lockout is not working properly.	The remote is not adjusted correctly.	Adjust the remote.
	The sealing of the damping piston is worn or damaged.	Contact your dealer a DT Swiss service center to solve this problem.
The Remote Lockout function works correctly, but the lever does not stay in the desired position.	The tension of the remote lockout cable is too high.	Turn the knurled cable adjusting screw clockwise, so that the cable tension is reduced. At the same time, check whether the lever now stays in the desired position.
	The lever-index is worn out.	Change the remote lever or contact your dealer or a DT Swiss service center to solve this problem.
The Remote Lockout cable is defective.	This can have several causes for example: crashes, dirt, wear, etc.	
		Contact your dealer or a DT Swiss service center, to have the remote lockout cable replaced.

Problem	Cause	Action
Only X313 with remote: Whistling sounds in the «DRIVE»- position.	The adjustment of the remote cable is not correct.	Turn the shock into the «DRIVE»- mode and adjust the tension of the remote cable using the knurled disc. The marking «DRIVE MODE» on the remote wheel must be on the cylinder head screw.
	The damping piston is damaged.	Contact your dealer or a DT Swiss service center to solve this problem.

If you have further questions or your problem is not solved by this list, please contact your dealer or a DT Swiss service center.

DT Swiss AG

Längfeldweg 101
CH - 2504 Biel/Bienne
E-mail: mail@dtswiss.com

DT Swiss, Inc.

2493 Industrial Blvd.
USA - Grand Junction, CO 81505
E-mail: info@dtswiss-us.com

DT Swiss (France) S.A.S.

Parc d'Activites de la SARREE
Route de Gourdon
F - 06620 Le Bar sur Loup
E-Mail: service.fr@dtswiss.com

DT Swiss (Asia) Ltd.

No. 26, 21st Road Industrial Park
Taichung City
E-mail: info@dtswiss-asia.com

www.dtswiss.com

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