

RATCHET DEG HUBS

TECHNICAL MANUAL

DT SWISS

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1. GENERAL

1.1 VALIDITY

This manual describes the component specified on the front page and the footer. This manual is valid for the design of the product as of 16.12.25. Deviations are possible and all items are subject to technical changes.

1.2 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 hazard with a medium level of risk which, if not avoided, may result in minor or moderate injury.



NOTE

... indicates a potentially hazardous situation that may result in damage to property.

1.3 TARGET GROUP

This manual is intended for the user of the component and dealers. This manual offers experienced users the possibility to carry out minor service work themselves. If you have any doubts about your own abilities, you should definitely contact an expert or a DT Swiss Service Center.

Any warranty claims will lapse if work is not carried out properly.

1.4 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 DT Swiss contact details can be found on the back. 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.

1.5 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.

1.6 GENERAL MAINTENANCE INFORMATION

Unless otherwise specified, moving parts, threads, O-rings and sealings must be greased before assembly.

CLEANING

For an optimal result of the maintenance work, every component that will be disassembled must be cleaned. Only use cleaners and degreasers which do not damage the components. Especially the cleaning of O-rings and sealings requires mild cleaners. Observe the instructions for use of the respective cleaner.

DT Swiss recommends the following cleaners:

- Motorex Rex
- Motorex Swissclean
- Motorex OPAL 2400, 3000 OPAL, 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. Special tools are indicated at the beginning of a chapter in the table "Required material".

The use of different tools is at the discretion of the user. If components are 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 condition of the tools are perfect. Always keep the tools in their original packaging or adequate devices to prevent damage.

1.7 ENVIRONMENTAL PROTECTION

The statutory regulations shall apply. Whenever possible, avoid creating waste. 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.

1.8 EXCLUSION OF LIABILITY

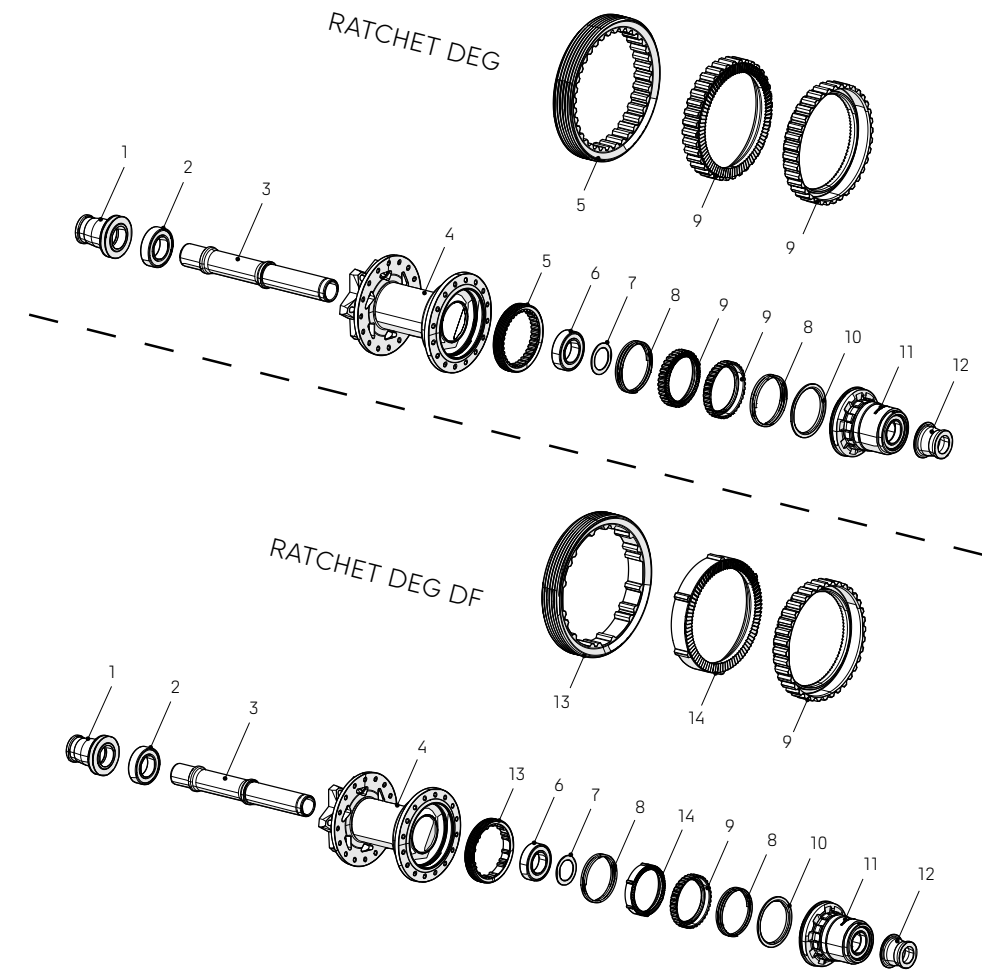
The activities listed in this manual may only be carried out by persons with sufficient specialist knowledge. The user is liable for any damage or consequential damage caused by wrongly maintained or installed components. If you have doubts, please contact an expert or your region's DT Swiss pro level service center.

1.9 WARRANTY

Warranty conditions, see www.dtswiss.com

2. MAINTENANCE OF THE REAR WHEEL HUB WITH RATCHET DEG SYSTEM

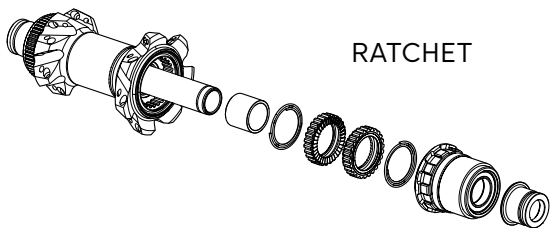
2.1 OVERVIEW



1	end cap non drive side	6	ball bearing drive side	11	freewheel body
2	ball bearing non drive side	7	shim ring / spacer	12	end cap drive side
3	axle	8	spring	13	ring nut DEG DF
4	hub shell	9	ratchet DEG	14	ratchet DEG DF
5	ring nut DEG	10	washer		

A Ratchet DEG hub can be equipped with or without a DF ratchet (14) and DF ring nut (13). The service does not differ in this case. However, make sure you select the right spare parts.

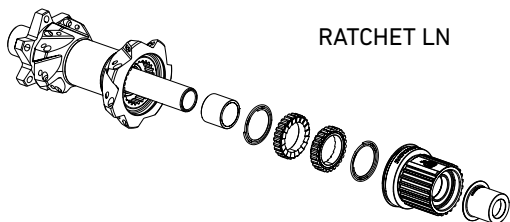
ATTENTION: There are four different types of DT Swiss hubs with ratchet freewheel. The hub types essentially differ in the following features:



RATCHET

The **Ratchet** system is essentially characterized by two loose ratchets. The seal between the hub and freewheel body is located on the hub.

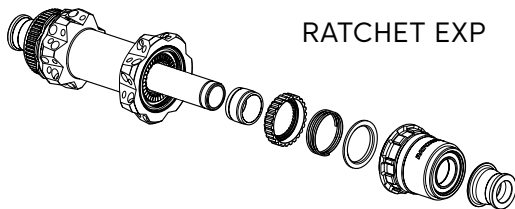
All maintenance activities for this hub can be found in the technical manual at www.dtswiss.com.



RATCHET LN

The **Ratchet LN** system is essentially characterized by two loose ratchets. The seal between the hub and freewheel body is located on the freewheel body.

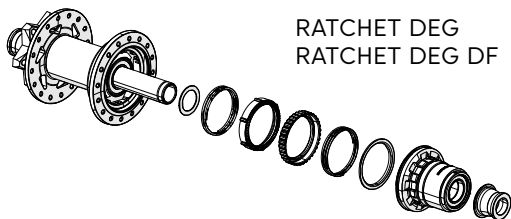
All maintenance activities for this hub can be found in the technical manual at www.dtswiss.com.



RATCHET EXP

The **Ratchet EXP** system is essentially characterized by one loose and one threaded ratchet.

All maintenance activities for this hub can be found in the technical manual at www.dtswiss.com.

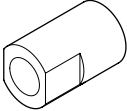
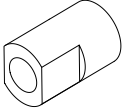
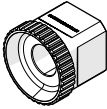


RATCHET DEG
RATCHET DEG DF

The **Ratchet DEG / Ratchet DEG DF** system is essentially characterized by two loose ratchets. The ratchets have a larger diameter than those of the other DT Swiss hub systems.

All maintenance activities for this hub can be found in this manual.

2.2 REQUIRED TOOLS

Tools	Specification	Quantity	Article number
installation cylinder for 180/240 hubs Ø15 / 26 x 40 mm		2	HXTXXX00N5314S
installation cylinder for 350 hubs Ø15 / 28 x 40 mm		2	HXTXXX00N5024S
tool for ring nut		1	HXTXXX00N2612S
tool for ring nut ratchet DEG DF		1	HXTXXX00N3091S

2.3 REQUIRED WEARING PARTS AND MATERIALS

Wearing parts / Materials	Specification	Quantity	Article number
DT Swiss universal grease		20 g	HXTXXX00NMG20S
DT Swiss special grease		20 g	HXT10032508S
ball bearing for 180 hubs 1526 Ø15 x 26 x 7 mm ceramic		2	HSBXXX00N6522S
ball bearing for 240 hubs: 1526 Ø15 x 26 x 7 mm		2	HSBXXX00N3741S
ball bearing for 350 hubs 6902 Ø15 x 28 x 7 mm		2	HSBXXX00N2336S

Wearing parts / Materials	Specification	Quantity	Article number
service kit Ratchet DEG 90T 2x ratchet, 2x spring, washer, DT Swiss special grease		1	HWYXXX00N2504S
service kit Ratchet DEG 72T 2x ratchet, 2x spring, washer, DT Swiss special grease		1	HWYXXX00N6599S
service kit Ratchet DEG DF 2x ratchet, 2x spring, DT Swiss special grease		1	HWYXXX00N6976S
service kit Ratchet DEG DF 2x ratchet, 2x spring, DT Swiss special grease, tool for ring nut		1	HWYXXX00N6322S
ring nut DEG M45X2 mm, steel		1	HXDXXX00N9037S
shim ring for 180/240 hubs DIN988 Ø15/Ø21/0.5 mm		1	HSDXXX00N8101S
spacer for 350 hubs 2.95 mm aluminum			HCD14200N9313S
washer Ø35.8/30.1X2.5 mm		1	HCD14200N6000S
spring		2	HXDXXX00N6775S

At <https://www.dtswiss.com/en/support/product-support> you will find all suitable spare parts after selecting your components.

2.4 IDENTIFICATION OF YOUR WHEEL/HUB

IDENTIFICATION OF YOUR WHEEL

The DT Swiss ID can be used to uniquely identify your wheel and thus the spare parts for your hub. The sticker with the ID is located either between the spokes, in the rim well or on the tubeless tape.



IDENTIFICATION OF YOUR HUB

Every DT Swiss hub has a unique serial number. Note the number and contact a service center for further information.



2.5 REMOVING END CAP, FREEWHEEL BODY AND FREEWHEEL SYSTEM



NOTE

RISK OF DAMAGING THE ADAPTERS!

To avoid damages, only use grind clamping jaws, aluminum clamping jaws or special tools to clamp the adapters.

1. Pull off the end cap on the drive side by hand.

If the end cap cannot be pulled off by hand, clamp the end cap carefully into a vise with ground clamping jaws and pull the hub / wheel upwards.

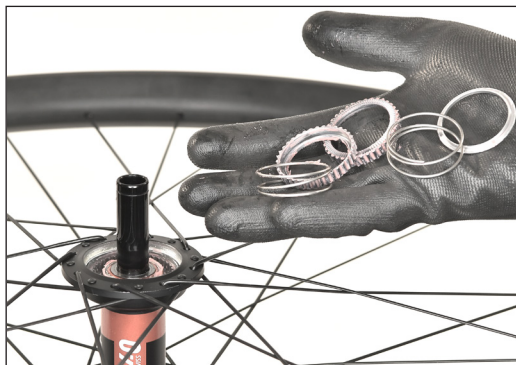
2. Pull off the end cap on the non drive side.



3. Pull the freewheel body off the hub.



4. Remove the springs, ratchets and washer from the hub.



5. Remove the shim ring (180/240) / the spacer (350).



2.6 DISMOUNTING THE RING NUT

Due to the torque acting on the ring nut during pedaling, the ring tightens while riding. Therefore, loosening the ring nut requires a high force.

The ring nut can only be loosened when the wheel is complete, as the lever is many times larger and the correspondingly high torque is transmitted evenly to the hub shell via both flanges and the spokes.

The ring nut does not need to be removed as part of a normal service.

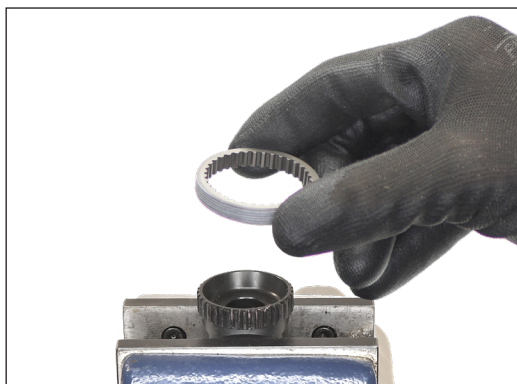
1. Clamp the tool for the ring nut in the vise.
2. Push the hub onto the tool with the drive side first.



3. Loosen the ring nut by turning the wheel counterclockwise.
4. Remove the hub from the tool.



5. Remove the ring nut.



2.7 DISMOUNTING THE BALL BEARING ON THE NON DRIVE SIDE

1. Tap out the ball bearing on the non drive side with slight hammer strokes onto the axle.



2. Remove the ball bearing from the axle.



2.8 DISMOUNTING THE BALL BEARING AT THE DRIVE SIDE

1. Insert the short side of the axle through the second ball bearing on the drive side.
2. Put the installation cylinder onto the axle.
→ By using the installation cylinder, the ball bearing cannot tilt during disassembly. Damage to the bearing seat is not possible.
3. Tap out the ball bearing with slight hammer strokes on the axle.
4. Remove the installation cylinder from the hub.



5. Remove the ball bearing from the axle.



2.9 CLEANING AND CHECKING ALL PARTS

1. Thoroughly clean all parts of the hub. The existing grease must be completely removed from the hub body and from the ratchets.
2. Check the ratchets for wear.

The wear of the ratchets usually starts at the outer circumference and shows itself by strongly flattened edges with uneven wear.

In case of heavy wear, the ratchets must be changed immediately.



3. Check the freewheel body for damage such as cracks.
→ Grooves from the cassette are no damages. These are normal signs of usage.
4. Remove bad notches on the freewheel body using a file.
5. Clean the freewheel body. Metal chips and metal particles must be removed completely.

2.10 MOUNTING THE BALL BEARING AT THE DRIVE SIDE

Always mount the ball bearing on the drive side first.

1. Grease the bearing seat with universal grease.
→ When the ring nut is fitted, no grease must get onto the toothing of the ring nut!



2. Put the installation cylinder into the vise.
3. Insert the long side of the axle into the installation cylinder.
4. Place the hub shell onto the tool and the axle.
5. Push a new bearing on the hub shell with the colored side facing outwards.



6. Put the second installation cylinder onto the bearing.
7. Tap in the ball bearing carefully with slight hammer strokes.
8. Remove the installation cylinder and the axle from the hub.



9. Remove the wheel from the installation cylinder in the vise and tap the bearing with a installation cylinder and the axle as a guide until stop (approx. 0.2 mm).



2.11 MOUNTING THE BALL BEARING AT THE NON DRIVE SIDE

1. Grease the bearing seat with universal grease.



2. Put the installation cylinder into the vise.
3. Place the hub / wheel with the drive side on the installation cylinder.
4. Push the axle with the long side first into the ball bearing on the drive side.
5. Put on a new bearing on the non drive side with the colored side facing outwards.



6. Put the installation cylinder onto the bearing.
7. Tap in the ball bearing carefully with slight hammer strokes.



8. Check the ball bearings.
 - The hub must turn smoothly.
 - The hub must not have axial play.
9. If necessary, drive in the bearing on the non drive side or loosen the bearing.
10. Repeat previous steps until the hub is turning smoothly.

2.12 FITTING THE RATCHET DEG DF RING NUT

1. Lightly grease the thread of the ring nut with universal grease.
2. Push the ring nut onto the hub with the chamfer facing upwards.
3. Place the tool on the ring nut and carefully turn the ring nut a few turns into the hub.
 - Turn the ring nut a little bit counterclockwise and then carefully clockwise.
 - While screwing in, make sure that the ring nut is screwed in straight and does not cant!
 - The ring nut must be able to be screwed in freely. As soon as greater resistance occurs, stop screwing in immediately.
4. Clamp the tool and place the wheel with the ring nut screwed in onto the tool.



5. Tighten the ring nut firmly with both hands.



2.13 MOUNTING THE FREEWHEEL SYSTEM



DANGER

RISK OF INJURY DUE TO LIMITED FREEWHEEL FUNCTION DUE TO INCORRECT LUBRICATION!

If too much grease is applied on the ratchets, the actuation of the ratchets may not work. The ratchets may slip during pedaling.

- Only apply a thin, even layer of grease.
- Only use the red DT Swiss special grease.

1. Apply DT Swiss special grease evenly to the outer and the inner toothings of both ratchets using a fine brush.

→ For an optimal functionality of the freewheel system, a thin layer of grease is sufficient.



2. Lightly grease the teeth of the freewheel body with DT Swiss special grease.

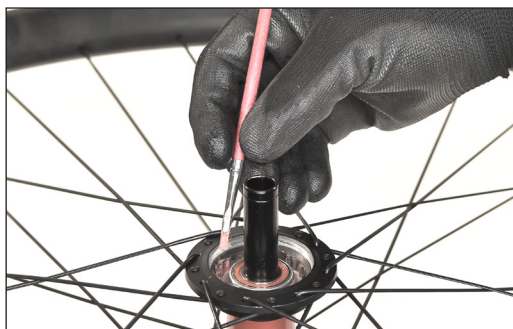
→ A thin layer of grease is sufficient for optimum function.

→ Excess grease in the recesses of the toothings should be removed with a brush.

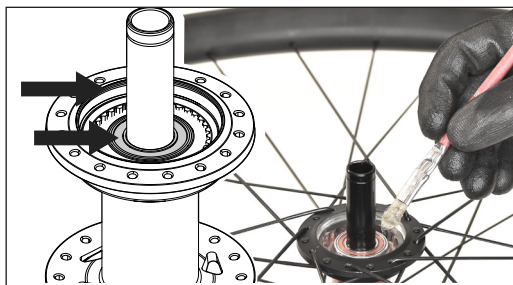


3. Lightly grease the teeth of the ring nut with DT Swiss special grease.

→ Excess grease in the recesses of the toothing should be removed with a brush.



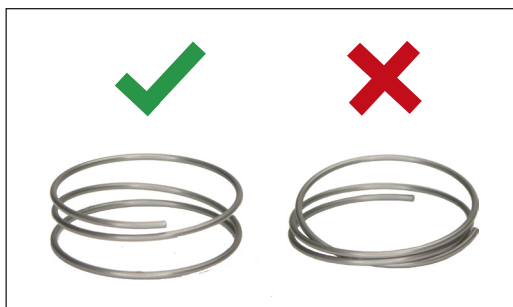
4. Grease the outer surface of the ball bearing and the sealing surface of the rotor seal on the hub with universal grease.



5. Place the shim ring (180/240) / the spacer (350) on the axle.



6. Make sure that both springs are not twisted.



7. Fit the DEG DF ratchet and the first spring.

The DEG DF ratchet can be mounted in various positions. Choose the right position for your riding style and your bike. You can find more information about the DEG DF system and how to choose the right position here:



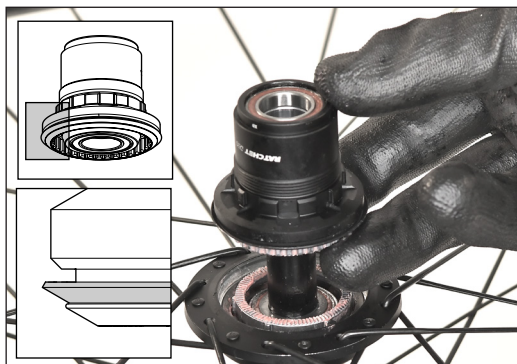
8. Insert the second ratchet and the second spring with washer into the freewheel body.



9. Put the freewheel body onto the hub.

→ Make sure that the seal on the freewheel body is fitted the right way round and is not twisted.

10. Check if the freewheel body can be turned and if the ratchets are engaging.



2.14 MOUNTING THE END CAP

1. Grease the ball bearing and the inside of the end cap with universal grease.



2. Place the end cap on the hub.
3. Press in the end cap by hand.

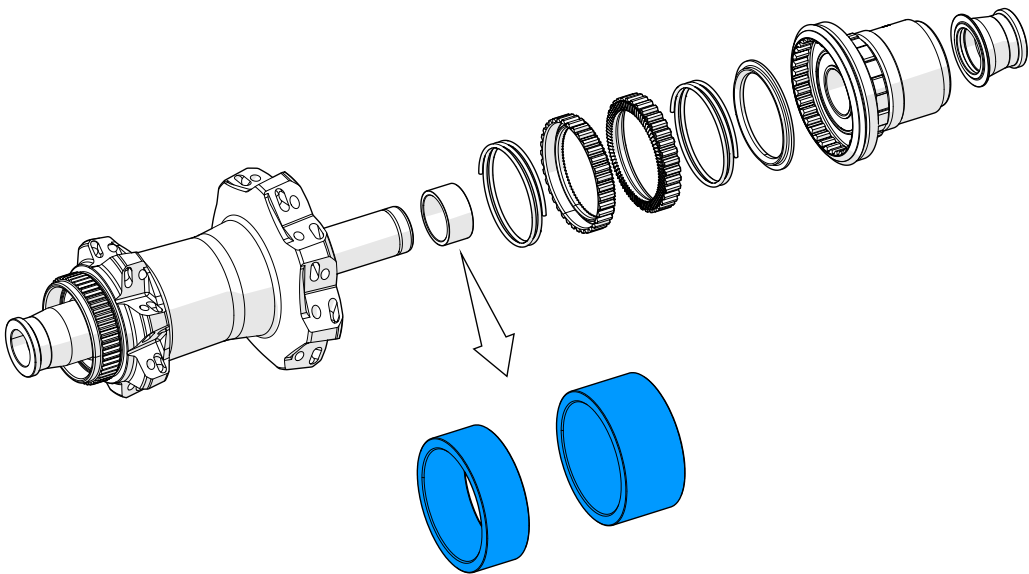


2.15 CHECK THE FUNCTIONALITY

1. Turn the freewheel body in both directions.
 - The freewheel body can be turned counterclockwise easily.
The ratchets engage audibly and perceptibly.
 - The freewheel body cannot be turned clockwise.
2. Check the tight fit of the end caps.
 - The end caps are firmly seated on the axle and are fully pushed on.

3. REPLACING THE FREEWHEEL BODY

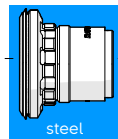
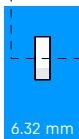
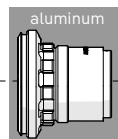
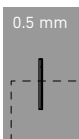
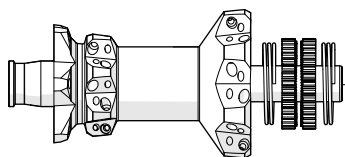
3.1 FREEWHEEL BODY/SPACER COMBINATIONS



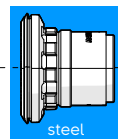
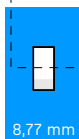
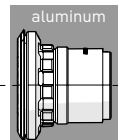
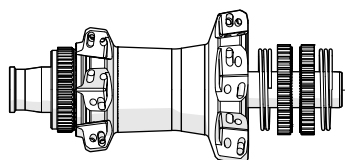
Hub	Freewheel body aluminum	Freewheel body steel
240 DEG	Washer 0.5 mm	Spacer 6.32 mm
350 DEG	Spacer 2.95 mm	Spacer 8.77 mm
240 DEG HYBRID	Spacer 2.95 mm	Spacer 8.77 mm
350 DEG HYBRID	Spacer 2.95 mm	Spacer 8.77 mm

The freehub body kits contain different spacers to ensure compatibility with all hub variants. The steel freehub body includes the 6.32 and 8.77 mm spacer.

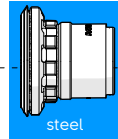
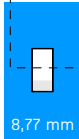
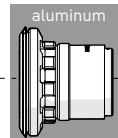
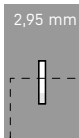
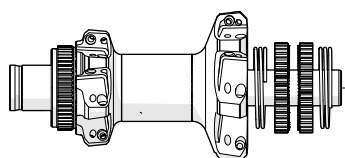
240



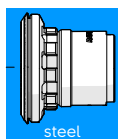
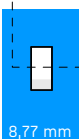
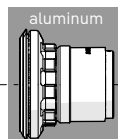
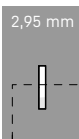
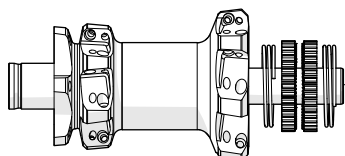
240 HYBRID



350



350 HYBRID



3.2 REMOVING END CAP, FREEWHEEL BODY AND FREEWHEEL SYSTEM



NOTE

RISK OF DAMAGING THE ADAPTERS!

To avoid damages, only use grind clamping jaws, aluminum clamping jaws or special tools to clamp the adapters.

1. Pull off the end cap on the drive side by hand.

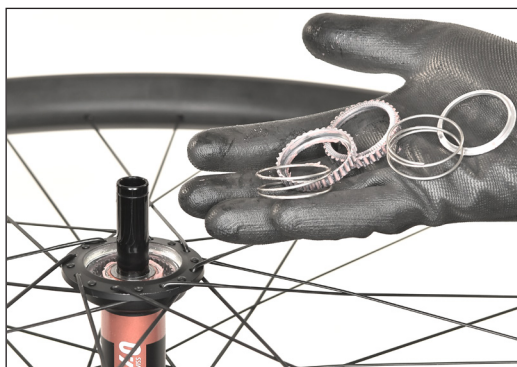
If the end cap cannot be pulled off by hand, clamp the end cap carefully into a vise with ground clamping jaws and pull the hub / wheel upwards.



2. Pull the freewheel body off the hub.



3. Remove the springs, ratchets and washer from the hub.



4. Remove the shim ring (180/240) / the spacer (350).



3.3 MOUNTING THE FREEWHEEL SYSTEM



DANGER

RISK OF INJURY DUE TO LIMITED FREEWHEEL FUNCTION DUE TO INCORRECT LUBRICATION!

If too much grease is applied on the ratchets, the actuation of the ratchets may not work. The ratchets may slip during pedaling.

- Only apply a thin, even layer of grease.
- Only use the red DT Swiss special grease.

1. Apply DT Swiss special grease evenly to the outer and the inner toothing of both ratchets using a fine brush.

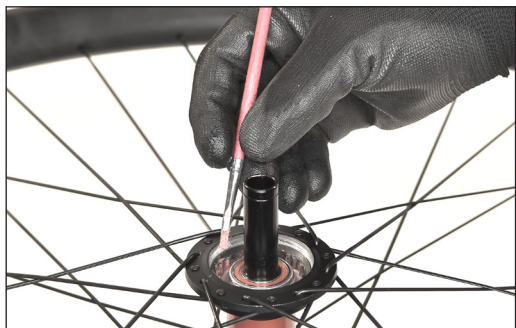
→ For an optimal functionality of the freewheel system, a thin layer of grease is sufficient.



2. Lightly grease the teeth of the freewheel body with DT Swiss special grease.
- A thin layer of grease is sufficient for optimum function.
 - Excess grease in the recesses of the tothing should be removed with a brush.



3. Lightly grease the teeth of the ring nut with DT Swiss special grease.
- Excess grease in the recesses of the tothing should be removed with a brush.



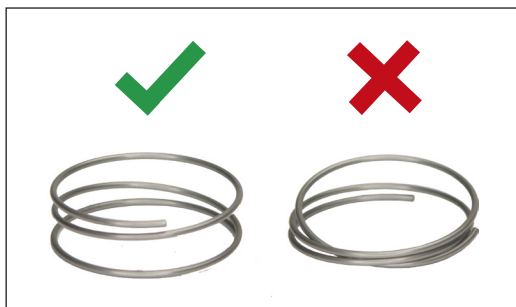
4. Grease the outer surface of the ball bearing and the sealing surface of the rotor seal on the hub with universal grease.



5. Place the shim ring (180/240) / the spacer (350) on the axle.



6. Make sure that both springs are not twisted.



7. Fit the DEG DF ratchet and the first spring.

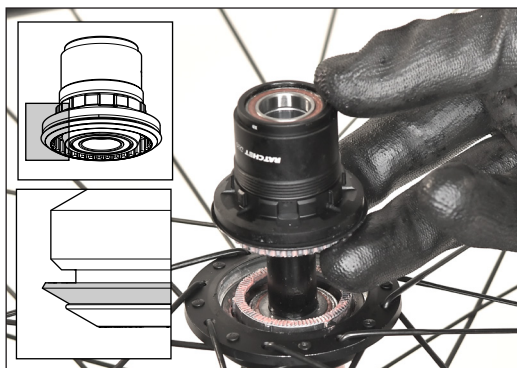
The DEG DF ratchet can be mounted in various positions. Choose the right position for your riding style and your bike. You can find more information about the DEG DF system and how to choose the right position here:



8. Insert the second ratchet and the second spring with washer into the freewheel body.

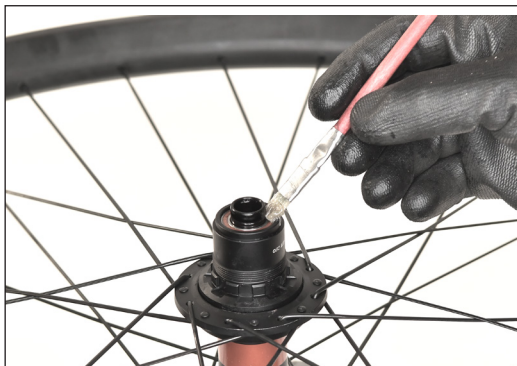


9. Put the freewheel body onto the hub.
→ Make sure that the seal on the freewheel body is fitted the right way round and is not twisted.
10. Check if the freewheel body can be turned and if the ratchets are engaging.



3.4 MOUNTING THE END CAP

1. Grease the ball bearing and the inside of the end cap with universal grease.
2. Place the end cap on the hub.
3. Press in the end cap by hand.



3.5 CHECK THE FUNCTIONALITY

1. Turn the freewheel body in both directions.
 - The freewheel body can be turned counterclockwise easily.
The ratchets engage audibly and perceptibly.
 - The freewheel body cannot be turned clockwise.
2. Check the tight fit of the end caps.
 - The end caps are firmly seated on the axle and are fully pushed on.

4. TROUBLE SHOOTING

Issue	Reason	Solution
Freewheel jammed / blocked	Shim was forgotten during assembly.	Check correct assembly, see "2.13 Freilaufsystem anbringen", page 20.
	The ring nut has been fitted the wrong way round or has not been screwed in far enough.	Check the correct assembly of the ring nut, see .
	A non-fitting end cap has been fitted.	Shimano end caps on a SRAM XD freewheel body can cause jamming.
	Defects on the hub body, on the freewheel body or on one of the end caps.	Check all parts for defects and replace parts as necessary.
	Spacer was compressed by overtightening the thru axle.	Measure the length of the spacer, see "3.1 Freilaufkörper-Spacer-Kombinationen", page 24 If the spacer is shorter than 15.4 mm, it must be replaced.
	Hub is too narrow	Check the compatibility of the spacer, see "3. Freilaufkörper tauschen", page 24
Freewheel does not engage / slips	One or both ratchets are mounted upside down.	Check correct assembly, see "2.1 Übersicht", page 6.
	Too much or wrong grease on the ratchets.	Clean and grease ratchets, see "2.13 Freilaufsystem anbringen", page 20.
	Ratchets are worn.	Replace ratchets.
	Hub is too wide	Check the compatibility of the spacer, see "3. Freilaufkörper tauschen", page 24
	One or both springs were forgotten during assembly.	Check correct assembly, see "2.1 Übersicht", page 6.
	Washer was forgotten during assembly	Check correct assembly, see "2.1 Übersicht", page 6.
Anti-pedal kickback function is not provided	DEG DF ratchet was mounted in the 0° position.	Mount the ratchet in a position with a degree of freedom.
	DEG and DEG DF ratchets have been interchanged.	Check correct assembly, see "2.1 Übersicht", page 6.
Hub has axial play	Ball bearings were not mounted correctly.	Check correct assembly, see "2.1 Übersicht", page 6.
	Ball bearings are worn out.	Replace ball bearings.

Issue	Reason	Solution
Hub rotates stiffly	Ball bearings are worn out.	Replace ball bearings.
	Ball bearing non drive side too tight.	Check correct assembly, see "2.1 Übersicht", page 6.
	Mounting sequence of the ball bearings not observed.	
Hub makes noise	Ball bearings are worn out.	Replace ball bearings.
Notches from the cassette on the freewheel body.	The steel cassette works itself into the alloy web of the freewheel body.	Remove bad notches on the freewheel body using a file.
Freewheel body rotates with difficulty.	Ball bearings in the freewheel body are worn out.	Replace freewheel body.
Freewheel is too noisy / too quiet.	The perception of the freewheel sound is very subjective. While some riders prefer a loud freewheel sound, other riders want a quiet freewheel. In principle, the freewheeling sound can be influenced by the amount of grease between the ratchets. Less grease increases the freewheeling sound, but at the same time leads to higher wear.	

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