

***DT* SWISS**

**RATCHET EXP HUBS**  
FREEWHEEL MAINTENANCE

V2021.04

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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 23.04.21. 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.



### **NOTICE**

... 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 the experienced user the possibility to carry out minor service work himself. If you have any doubts about your own abilities, you should definitely contact a specialist 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](http://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 HOW TO USE THE 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.

## 1.7 GENERAL MAINTENANCE INFORMATION

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

### CLEANING

For an optimal result of the maintenance works, every component that will be disassembled must be cleaned. Only use cleaners which do not damage the components. Especially the cleaning of O-rings and seals 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.

## 1.8 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.

## 1.9 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 your region's DT Swiss pro level service center.

## 1.10 WARRANTY

Warranty conditions, see [www.dtswiss.com](http://www.dtswiss.com)

## 2. MAINTENANCE OF THE FREEWHEEL SYSTEM [RATCHET EXP®]

### Preparatory Steps:

Dismount the brake rotor

Dismount cassette

Clean the hub

### Cross reference / Note

see manufacturer's instructions

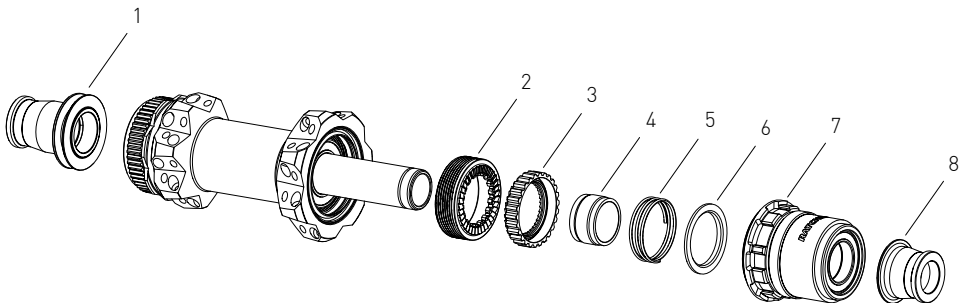
see manufacturer's instructions



### NOTICE

This manual describes a maintenance of the freewheel system. If problems such as a slipping freewheel and thus a failure of the drive system occur, a DT Swiss Service Center or your dealer must be involved!

### 2.1 OVERVIEW



1 | end cap non drive side

2 | threaded ratchet

3 | loose ratchet

4 | spacer

5 | spring

6 | washer

7 | freewheel body

8 | end cap drive side

## 2.2 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
loose ratchet 36 teeth		1	HCDXXX00N2426S
loose ratchet 54 teeth		1	HCDXXX00N3936S

## 2.3 REMOVING END CAPS, FREEWHEEL BODY AND FREEWHEEL SYSTEM

1. Pull off both end caps by hand.

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



2. Pull the freewheel body off the hub.



3. Pull the spacer off the axle.



4. Remove the spring, the ratchet and the washer from the freewheel body.



## 2.4 CLEANING AND CHECKING ALL PARTS

1. Clean all parts of the hub, threaded ratchet, sleeve, spring and end caps. The existing grease must be completely removed from the hub body and from the threaded ratchet.
2. Check the ratchets for wear.

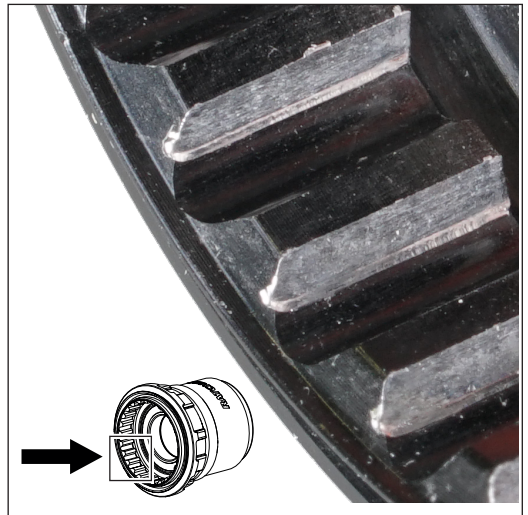
The wear of the ratchets usually starts at the outer circumference and shows itself by strongly flattened edges with uneven wear.

In case of heavy wear, the ratchets must be changed immediately. For more information, please refer to the Ratchet EXP Hub Technical Manual at [www.dtswiss.com](http://www.dtswiss.com). Alternatively, you can contact a DT Swiss Service Center for the exchange of the threaded ratchet.



3. Check the internal teeth of the freewheel body for wear.

If the black surface of the gearing is heavily worn (no longer black but silver), if there are burrs or if material has been removed, the freewheel body must be replaced.





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



2. Apply DT Swiss special grease evenly to the outer and the inner tooting of the ratchets using a fine brush.

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



3. Put the spacer onto the axle.



4. Put the spring onto the washer and put the ratchet onto the spring.



5. Put the washer, spring, and ratchet into the freewheel body.



## 2.6 PUTTING ON THE FREEWHEEL BODY AND THE END CAPS

1. Put the freewheel body onto the hub.
2. Check if the freewheel body can be turned and if the ratchets are engaging.

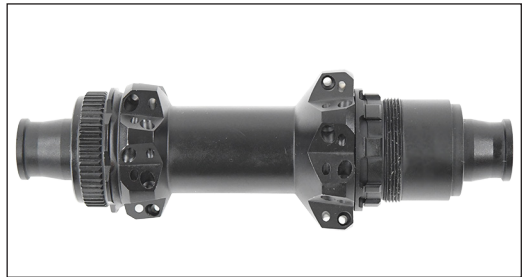


3. Grease both bearings and the inner side of both end caps.
4. Put on the left and the right end cap.  
→ The shorter end cap must be placed on the drive side.



## 2.7 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 tightness of the end caps.  
→ The end caps are firmly seated on the axle and are fully pushed on.



### Closing Steps:

- | Closing Steps:          | Cross reference / Note          |
|-------------------------|---------------------------------|
| Mount the brake rotor   | see manufacturer's instructions |
| Assembling the cassette | see manufacturer's instructions |
| Clean the hub           |                                 |

### Cross reference / Note

### 3. TROUBLE SHOOTING

Issue	Reason	Solution
Freewheel is blocked	Spacer was forgotten during assembly.	Check correct assembly, see “2.1 Overview”, page 5.
	Spacer was compressed by overtightening the thru axle.	Measure the length of the spacer. If the spacer is shorter than 10.7 mm, it must be replaced.
Freewheel does not engage / slips	Loose ratchet is mounted upside down.	Check correct assembly, see “2.1 Overview”, page 5.
	Too much or wrong grease on the ratchets.	Clean and grease the ratchets.
	Ratchets are worn.	Replace ratchets.
	Spring was forgotten during assembly.	Check correct assembly, see “2.1 Overview”, page 5.
	Wear of the internal teeth of the freewheel body	Replace loose ratchet, replace freewheel body. Thoroughly clean the freewheel system.
Hub has axial play	Ball bearings were not mounted correctly.	Check correct assembly, see “2.1 Overview”, page 5.
	Ball bearings are worn out.	Replace ball bearings.
Hub rotates stiffly	Ball bearings are worn out.	Replace ball bearings.
	Ball bearing non drive side too tight.	Check correct assembly, see “2.1 Overview”, page 5.
	Mounting sequence of the ball bearings not observed.	
	Ball bearing pressed too far into the threaded ratchet before assembly.	
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 from the rotor 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. Too much grease, on the other hand, can impair the freewheeling function.	

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