DT SWISS

RATCHET LN
TECHNICAL MANUAL

V2022.03

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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 14.03.22. 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.

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 work, 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.

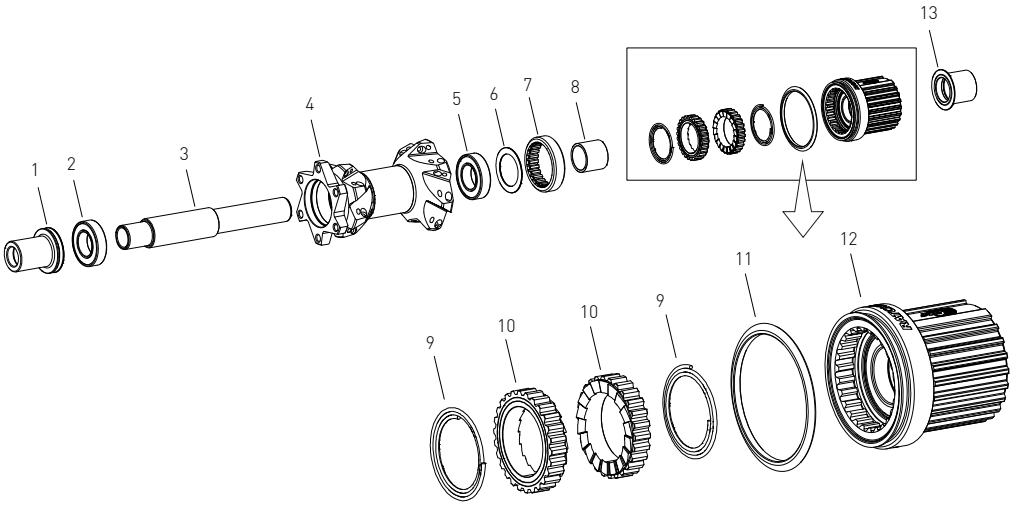
1.10 WARRANTY

Warranty conditions, see www.dtswiss.com

2. RATCHET LN - REAR HUB SERVICE

Preparatory Steps:	Link
Dismount the brake rotor	
Dismount cassette	
Clean the hub	

2.1 OVERVIEW

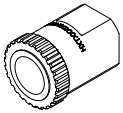
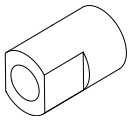


1	end cap non drive side	6	shim ring	11	seal freewheel body
2	ball bearing non drive side	7	ring nut	12	freewheel body
3	axle	8	spacer	13	end cap drive side
4	hub shell	9	spring		
5	ball bearing drive side	10	ratchet		

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

2.3 REQUIRED TOOLS

Tools	Specification	Quantity	Article number
tool for ring nut		1	HXTXXX00N5027S
installation cylinder Ø15 / 28 x 40 mm		2	HXTXXX00N5042S

NOTE

RISK OF DAMAGING THE ADAPTERS!

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

2.4 REMOVING THE END CAPS

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.

2.5 DISMOUNTING THE FREEWHEEL BODY AND THE FREEWHEEL SYSTEM

1. Pull the freewheel body off the hub.

2. Remove both ratchets and both springs from the hub.

3. Remove the spacer from the hub.

2.6 DISMOUNTING THE RING NUT

Due to the torque acting on the ring nut during pedaling, the ring tightens while riding. Therefore, it is possible that the ring nut is very difficult to loosen. We recommend loosening the ring nut only when the wheel is complete as the lever is much larger.

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

3. Loosen the ring nut by turning the hub / the wheel counterclockwise.

4. Remove the hub from the tool.
5. Remove the ring nut.

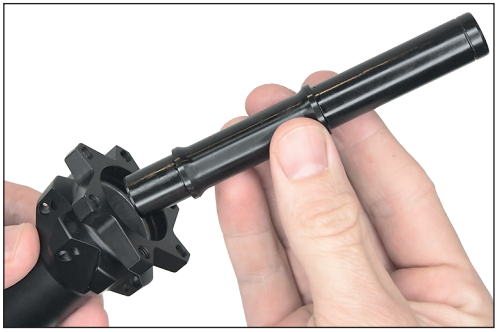
2.7 DISMOUNTING THE BALL BEARING ON THE NON DRIVE SIDE

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

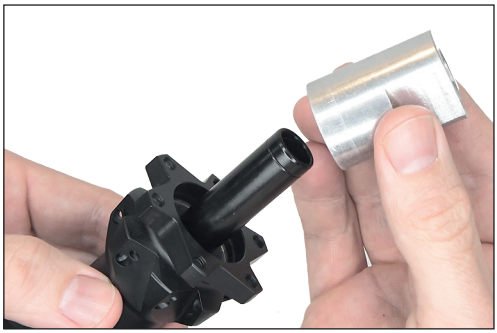
2. Remove the ball bearing from the axle.

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 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.

2.10 MOUNTING THE BALL BEARING AT THE DRIVE SIDE

1. Grease the bearing seats and the thread of the ring nut with universal grease.

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 on the tool and the axle with the non-drive side facing down.
5. Push a new bearing on the hub shell 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. Remove the installation cylinder and the axle from the hub.

2.11 MOUNTING THE RING NUT

1. Clamp the tool for ring nut in the deep position in the vise.
2. Slide the ring nut onto the tool with the recess facing upwards.
3. Insert the shim ring in the recess of the ring nut.

4. Insert the axle, long side first, from the non drive side through the ball bearing on the drive side.
5. Grease the ball bearings on the drive side with universal grease.

6. Place the hub with the axle on the tool.
7. Put the installation cylinder onto the axle.
   → By using the installation cylinder, the ring nut cannot tilt when screwed in.

8. Screw on the ring nut approx. 2 turns clockwise.
9. Remove the hub from the tool.
10. Remove the installation cylinder from the hub.

11. Unclamp the ring nut tool, turn it 90° and clamp it back into the vise in the high position.
12. Put the hub back on the tool with the ring nut screwed in.

13. Tighten the ring nut as firmly as possible by hand.

2.12 MOUNTING THE BALL BEARING AT THE NON DRIVE SIDE

1. Clamp the tool for the ring nut in the vise.
2. Push the hub shell with the drive side onto the tool for the ring nut.
3. Push the axle with the long side first into the ball bearing on the drive side.
4. Put on a new bearing on the non drive side with the colored side facing outwards.

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

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

2.13 ASSEMBLING THE FREEWHEEL SYSTEM AND THE FREEWHEEL BODY

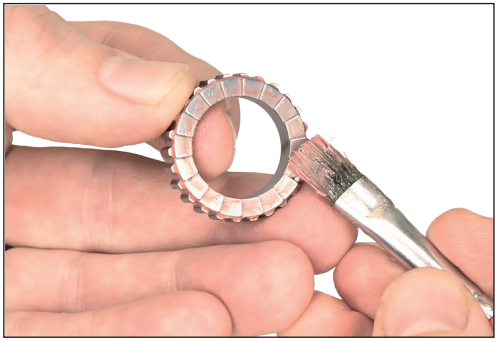
DANGER

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



2. Grease the teeth of the freewheel body and the ring nut with DT Swiss special grease.

3. Put the spacer onto the axle.

4. Put on the first spring.
   → The spring must rest on the hub with its large diameter.
5. Attach both ratchets and the second spring.
   → The spring must rest with its small diameter on the ratchet.

6. Put the freewheel body onto the hub.
7. 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. Put on the end cap by hand.

Closing Steps:	Link
Mount the brake rotor	
Assembling the cassette	

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 15.4 mm, it must be replaced.
Freewheel does not engage / slips	One or both ratchets are mounted upside down.	Check correct assembly, see "2.1 Overview", page 5.
	Too much or wrong grease on the ratchets.	Clean and grease ratchets, see "2.13 Assembling the freewheel system and the freewheel body", page 16.
	Ratchets are worn.	Replace ratchets.
	One or both springs were forgotten during assembly.	Check correct assembly, see "2.1 Overview", page 5.
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 driven in too tight.	Check correct assembly, see "2.1 Overview", page 5.
	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 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.	

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