DT SWISS WHEELS

TRICON®
Technical Manual_english
V2013.03

1 User Information

Validity

This manual describes the component shown on the front page and the footer. It is valid for the construction level of the component on the 2013-03-23. Deviations are possible and all items are subject to technical changes.

Safety

The safety instructions are classified as follows:

NOTE

...characterizes danger for goods.

⚠ CAUTION

...characterizes danger with a high risk, which causes mayhem if it is not being avoided.

⚠ DANGER

...characterizes immediate danger with a high risk, which causes death or mayhem if it is not being avoided.

Target Group

This manual is intended for the end user and dealers.
For experienced users, it offers the possibility to carry out small maintenance works on their own. If there are any doubts concerning the own skills, there should be contacted a DT Swiss service center.
Warranty will expire if works are not done properly.

Layout

The cover page and the footing are providing 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.

This manual is intended for printing as a A5 booklet. Only print this manual if electronical usage is not possible.

DT Swiss Manual Concept

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

- User Manual
  Information for the end user of how to install and use the component.
- Technical Manual
  Detailed information for the end user and the dealer of 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 are beginning with the table «Preparatory Steps» and ending 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, you can click on the text. After clicking you will be automatically redirected to the target of the link.

Example: Click here: chap. 1, p.3 to jump to the beginning of this chapter.

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 electronical usage is not possible.

Disclaimer

The operations described in this manual should only be done by professionals. The user is liable for any damage or consequential damage which is caused by wrong maintained or wrong installed components. If you have doubts, please contact a DT Swiss Service Center.

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 in accordance with European Directive 99/44/EC. 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 Centre. Any defects recognised by DT Swiss AG as a warranty claim will be repaired or replaced by a DT Swiss Service Centre.

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 non-existent 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

We hope you enjoy using your DT Swiss component!

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 Centre. 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.

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 dealer or a DT Swiss Service Center.
- 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 dealer or a DT Swiss Service Center.

DANGER

Risk of death caused by incorrectly assembled or faulty wheels!

- Check that the wheel is connected correctly before each ride.
- Check the wheel for damage before and after each ride.
- Regularly check the spoke tension, rotation and wear of the wheel.

DANGER

Risk of death caused by failure or reduction of the brake performance when using wheels for rim brakes!

- Brake with both brakes!
- When riding down hill only brake briefly with pauses in between.
- Avoid sliding and permanent braking, as the wheel will overheat thus causing the failure of the rim, tyre or inner tube.
- The braking power of carbon rims is generally lower than that of aluminium rims.
- If using new wheels or brake pads, the braking power is also reduced in wet conditions. Adjust the manner of cycling accordingly.
- Do not expose the wheel to temperatures above 90°C during transport or storage.

NOTE

Risk of damaging the wheel by selecting incorrect components or tools!

- Do not use metal tire levers. These can damage the surface of the rim, tyre or inner tube.
- Only use valves with a diameter of 6.5 mm and of an adequate length.
- The maximum tyre pressure of the wheel and of the tyre used must not be exceeded.
- Only use rim tapes, inner tubes and tyres which fit the dimensions of the wheel.
- Carbon rims must not be used with tubeless kits and tubeless tyres.
- Carbon rims must not be used with latex tubes.

3 Description

3.1 TRICON® Rim

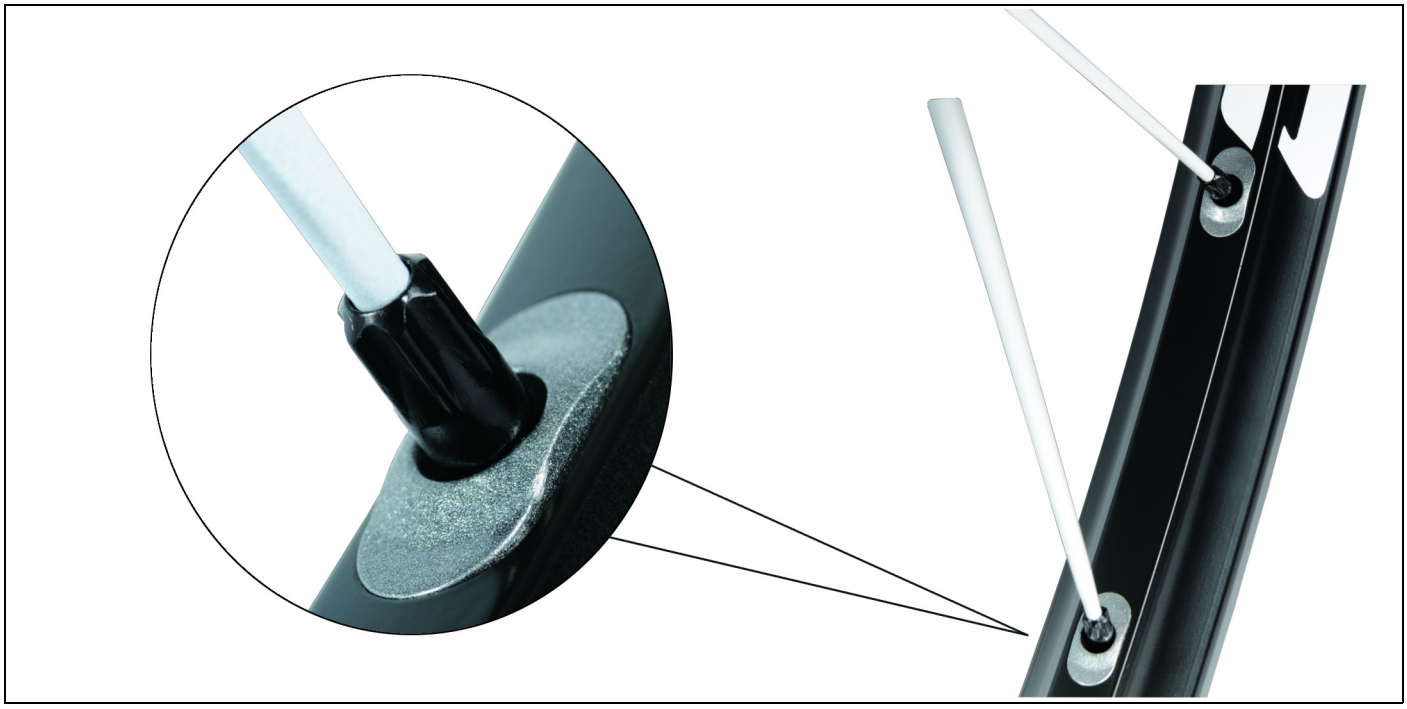

Figure 3-1: TRICON® *Rim Profile and Rim Insert*

Torx nipples

Thanks to the Torx design the truing tool has a better grip on the nipple.

Rim insert

The rim inserts are supported on two sides in the rim creating a big contact surface. The rim can be designed lighter and is airtight for tubeless compatibility.

Concave rim profile

The concave shaped sidewalls counteract the expansion force induced by tire pressure and spoke pull.

3.2 TRICON® Hub

The TRICON® hubshell consists of three parts - two hub flanges and the hub body. By the way, this design is the name giver of the system: **Tri**ple **Con**nection. Only FX1950, M1700 and R1700 are using one piece hubshells.

Due to the separation of the hub body and the hub flange the bearing seat can be hold stressless. The result is a smooth running and a long life cycle of the bearings.

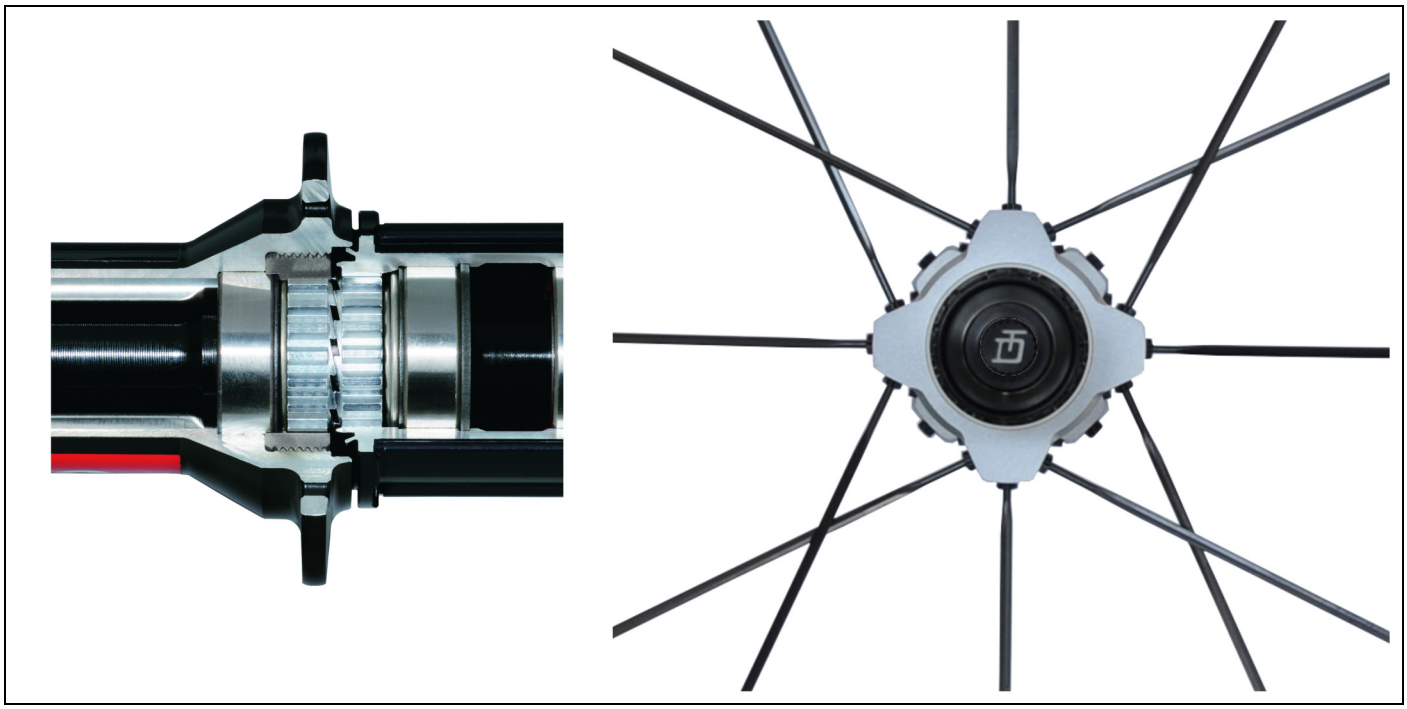

Figure 3-2: TRICON® Hub

Two piece hub

The two piece flange and hub shell design keeps the bearing seat free of tension. This allows the bearings to spin as smoothly as possible.

Open crowfoot

Spoke pattern with combined radial and crossed spokes for high stiffness and perfect transmission of torques.

Straight double threaded spokes

This spoke connection is considerably stronger as it is playfree on both ends and therefore subject to smaller peak loads.

Ratchet System®

Thanks to the proven DT Swiss Ratchet System® the hubs can easily be converted to different axle standards and rotors.

4 Maintenance

This chapter describes activities which are concerning the whole wheel.

- Truing the wheel
- Changing of a single spoke
- Rebuilding the wheel

DT Swiss recommends the following service works:

Action	Interval
Maintenance of the hub.	annually or as required
Check spoke tension, run-out and wear of the wheel.	10 hours of use
Check the wheel for damages.	before and after each ride
Clean the wheel with a soft cloth and a appropriate cleaner. Do not use high pressure cleaners and aggressive cleaners!	after each ride
Check the proper fixation of the wheel.	before each ride
Check the braking surface and the brake pads: • Remove any contaminations (especially oil and traces of grease) from the brake surfaces. • Check the degree of wear of the brake pads. • Remove any entrenched impurities (grit, swarf, etc.). • Check the degree of wear of the rim brake surfaces. In case of any doubts or viewable wear, contact a skilled professional.	before each ride

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.

CAUTION

Risk of injury due to wrong spare parts!

Incorrect spare parts can lead to unpredictable errors!

- Only use original spare parts.

4.1 Special Tools

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Pos.	Description
1*	nipple wrench Torx
2*	spoke holder DT NEW AERO
3*	spoke holder DT NEW AEROLITE
4	spoke holder DT Universal
5	nipple guide plastic
6	tool for hub nipple
7	tensiometer DT Tensio analog
8	screw clamp

* These tools are available as new and old versions. Both version can be used for works on the wheels. In the figures of the following work instructions are only used the old versions.

4.2 Truing the Wheel

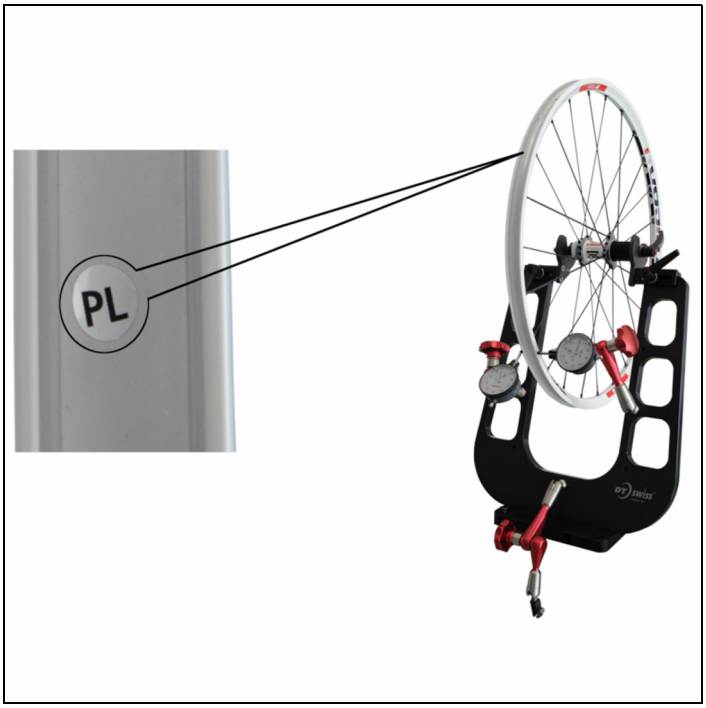
Preparatory Steps
Dismount the wheel.
Dismount the tire and if necessary the tube and the rim tape.
Clean the wheel and check for damages.

NOTE

Functional impairment / risk of damage due to wrong tools!

Only use the special tools intended for TRICON® wheels (see chap. 4.1, p.10).

1. Check, if the nipples are secured with Prolock or if the nipples are glued.
   a) If there's a sticker with the imprint «PL» on the inner side of the rim or the nipple can be turned without a high torque, the nipples are secured with prolock.
   b) If there's no sticker with the imprint «PL» on the inner side of the rim or the nipple can not be turned without a hight torque , the nipples are glued. In this case you have consider the following note.



NOTE

Special procedures for wheels with glued nipples!

Before turning a glued nipple, you have to heaten the nipple for 5 to 10 s with a hot air gun. After heating the nipple can be turned for 5 to 10 s.

Before truing you have to analyze which nipple has to be turned. A normal truing procedure can be very time consuming due to the glued nipples.

In case of any doubt, the service works should be done by a DT Swiss Service Center.

2. Fix the wheel in the truing stand.
3. Check the radial and axial run out.

NOTE

Risk of damage to the spokes and the nipples!

- Whenever possible there should be used the universal spoke holder (see chap. 4.1, p.10, pos. 4) to avoid damages to the spokes. The spoke holder made out of metal (see chap. 4.1, p.10, pos. 2/3) should only be used if the universal spoke holder can't be used due to the high torque.
- There are used two different spokes types (Aerolite and New Aero) (see chap. 5.1, p.25). Ensure that the correct tool is being used.
- To avoid damages to the nipples, slide the nipple wrench as far as possible onto the nipple.

4. Slide the nipple wrench (see chap. 4.1, p.10, pos. 1) onto the nipple.
   To avoid damages to the nipples, slide the nipple wrench as far as possible onto the nipple.

5. Slide the spoke holder (see chap. 4.1, p.10, pos. 2 or pos. 3) onto the spoke.
   To avoid damages of the spoke, slide the spoke holder as far as possible into the nipple wrench.

6. True the wheel.
7. Distress the wheel (see chap. 4.5, p.24).
8. Check the radial and axial run out again. Repeat last steps if necessary.
9. Check the spoke tension (see chap. 5.2, p.27) and increase or decrease it.
10. Distress the wheel again (see chap. 4.5, p.24).
11. Check the radial and axial run out again. Repeat last steps if necessary.

Closing Steps
Mount tire and if necessary rim tape and tube.
Mount the wheel if necessary.

4.3 Changing of a single spoke

Preparatory Steps
Dismount the wheel.
Dismount the tire and if necessary the tube and the rim tape.
Clean the wheel and check for damages.

Amount	Material	Specification
as required	thread locker	Loctite 241 (blue)
as required	grease for star ratchet®	DT Swiss special grease

NOTE

Risk of damage to the spokes and the nipples!

- Whenever possible there should be used the universal spoke holder (see chap. 4.1, p.10, pos. 4) to avoid damages to the spokes. The spoke holder made out of metal (see chap. 4.1, p.10, pos. 2/3) should only be used if the universal spoke holder can't be used due to the high torque.
- There are used two different spokes types (Aerolite and New Aero) (see chap. 5.1, p.25). Ensure that the correct tool is being used.
- To avoid damages to the nipples, slide the nipple wrench as far as possible onto the nipple.

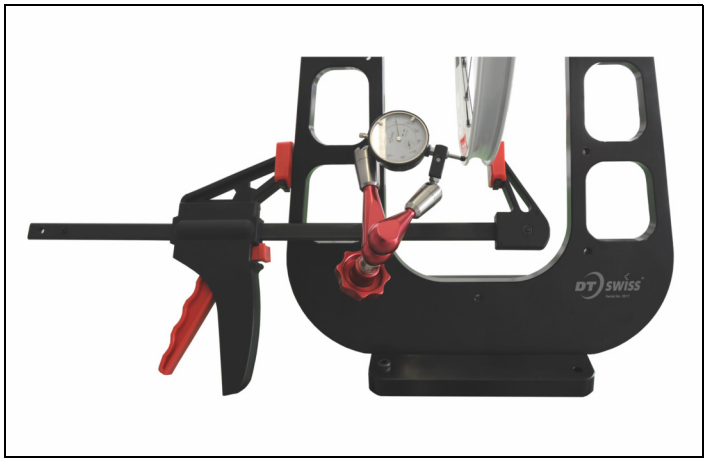
Removing the spoke to be replaced

NOTE

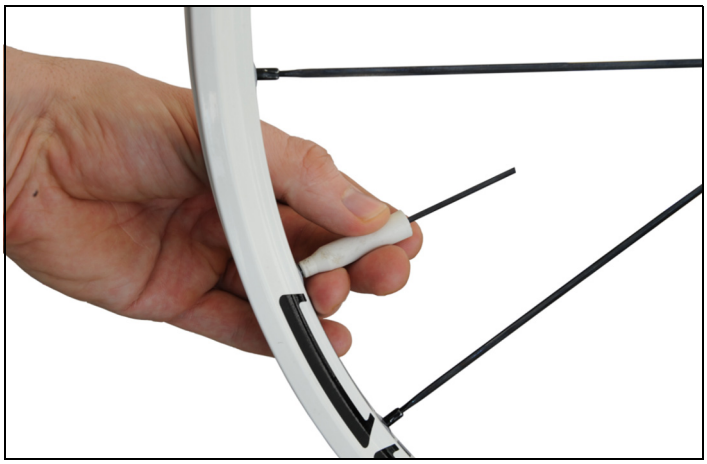
Normally, the spoke has to be replaced because of it is broken. IS the spoke to be replaced still intact, it can be cut with a cutter or s.th. similar.

1. Put the wheel into the truing stand.

2. If necessary, cut the spoke:
a) Release the spoke using a screw clamp (see chap. 4.1, p.10, pos. 9).
b) Cut the spoke.
c) Take off the screw clamp.

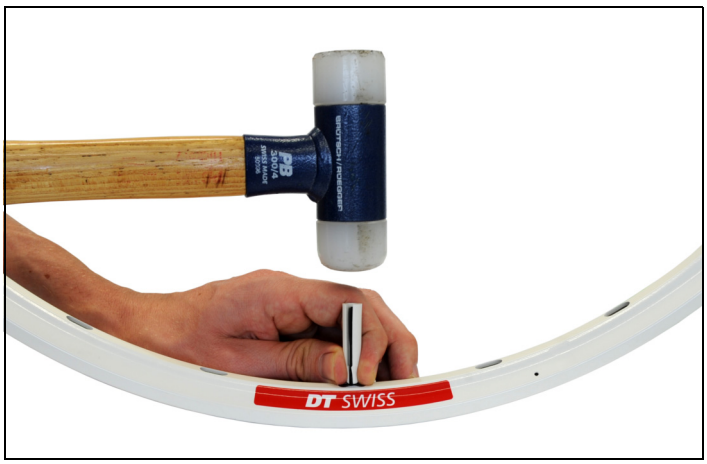


3. Put on the nipple holder (see chap. 4.1, p.10, pos. 5).



4. Remove the rim insert with the nipple and the spoke from the rim.

5. If the rim insert can‘t be removed:
a) Remove the spoke holder.
b) Cut the spoke that short, that the spoke holder is longer than the spoke.
c) Put the spoke holder onto the spoke and the nipple.
d) Hit the spoke holder slightly using a plastic hammer.
e) Remove the rim insert with spoke and nipple from the rim.



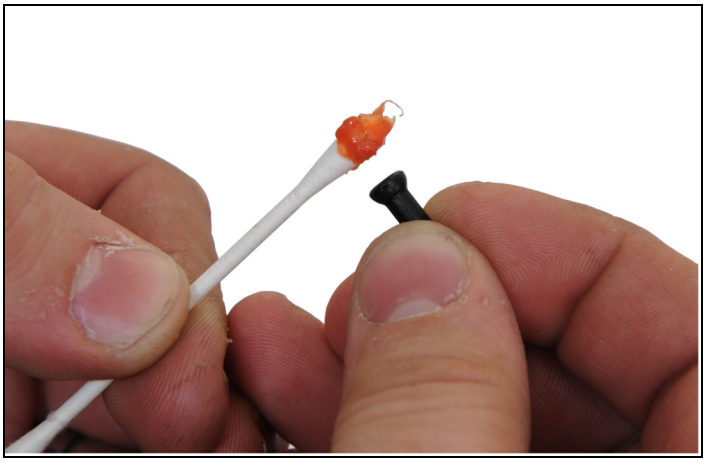
6. Unscrew the spoke from the hub nipple.
   If the spoke can only be turned with a high torque, heat the hub nipple with a hot air gun.

Change the nipple

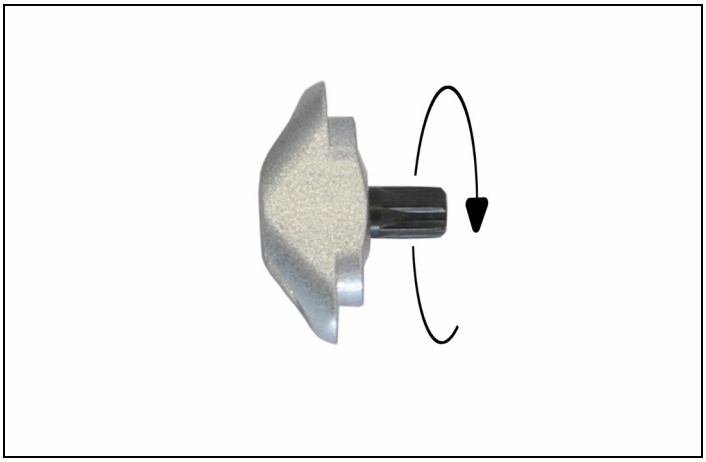
NOTE

The nipple will be replaced preventively.

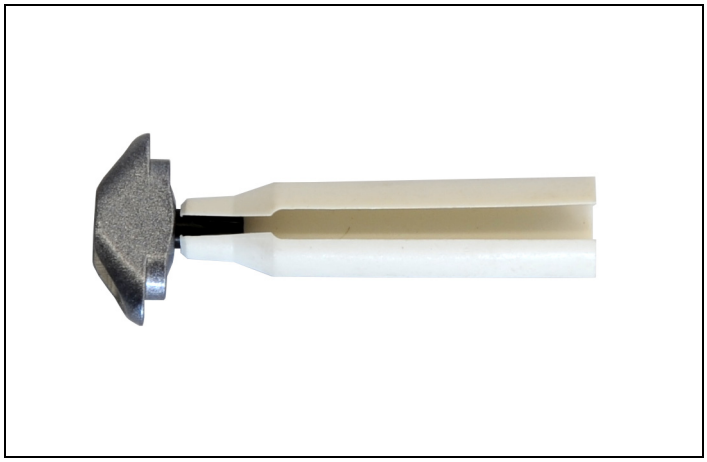
1. Grease the contact surface of the nipple and the rim insert with DT Swiss special grease.



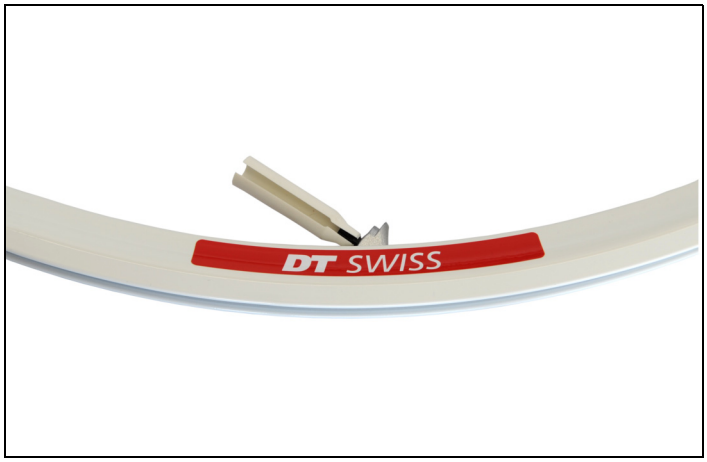
2. Put the new nipple into the rim insert.
3. Check, if the nipple can be turned smoothly.



4. Put the nipple holder (see chap. 4.1, p.10, pos. 5) onto the nipple.



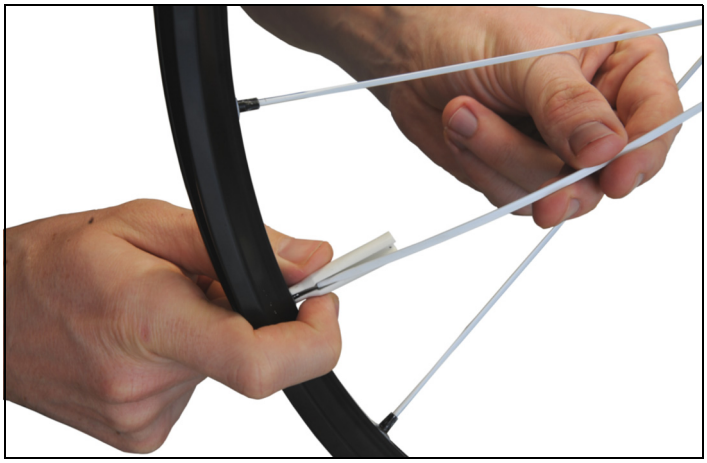
5. Insert the pre-assembled rim insert with the nipple into the rim.



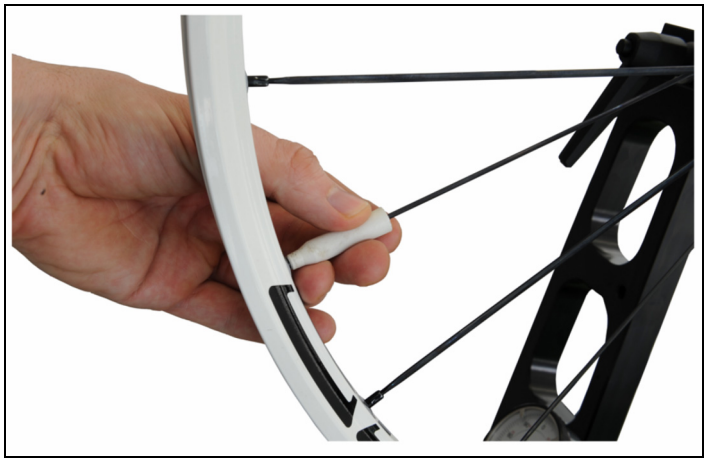
Attach the new spoke

1. Put Loctite into the thread of the hub nipple.
2. Screw the end with the short thread of the spoke into the hub nipple until the thread disappears.
3. Align the spoke.

4. Put the spoke (long thread) into the rim nipple.



5. Screw the nipple as far as possible onto the spoke using the nipple holder (see chap. 4.1, p.10, pos. 5).
6. Remove the nipple holder.



7. Slide the nipple wrench (see chap. 4.1, p.10, pos. 4) onto the nipple.
   To avoid damages to the nipples, slide the nipple wrench as far as possible onto the nipple.

8. Slide the spoke holder (see chap. 4.1, p.10, pos. 2 or pos. 3) onto the spoke.
   To avoid damages of the spoke, slide the spoke holder as far as possible into the nipple wrench.
9. True the wheel (see chap. 4.2, p.11).
10. Remove the wheel from the truing stand.

Closing Steps
Mount tire and if necessary rim tape and tube.
Mount the wheel if necessary.

4.4 Rebuilding the Wheel

The wheel should be rebuilt if:

- four or more spokes has to be replaced
- the rim has to be replaced
- the hubshell has to be replaced

Preparatory Steps
All hub nipples are fully screwed into the hub.
All spokes are available in the correct lengths.

Amount	Material	Specification
as required	thread locker	Loctite 241 (blue)
as required	grease for star rachet®	DT Swiss special grease

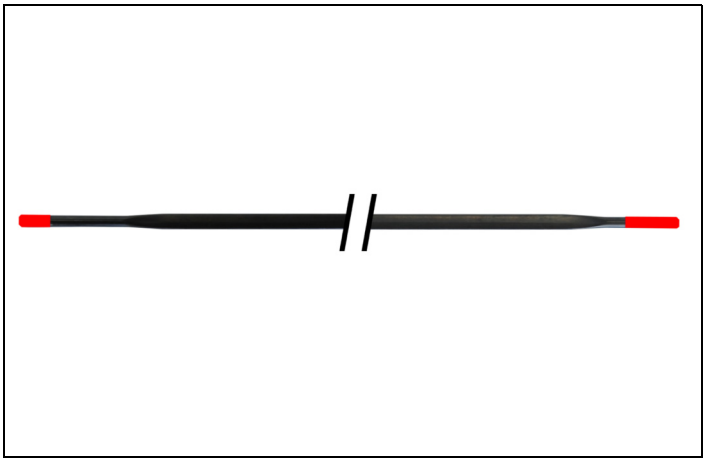
NOTE

Watch for the thread lengths of the spokes!

The ends of the spokes have two different thread lengths. The short thread has to be screwed into the hub nipple and has to be secured with Loctite 241.
The long thread is automatically secured by the Prolock nipple.

General information for applying the spokes.

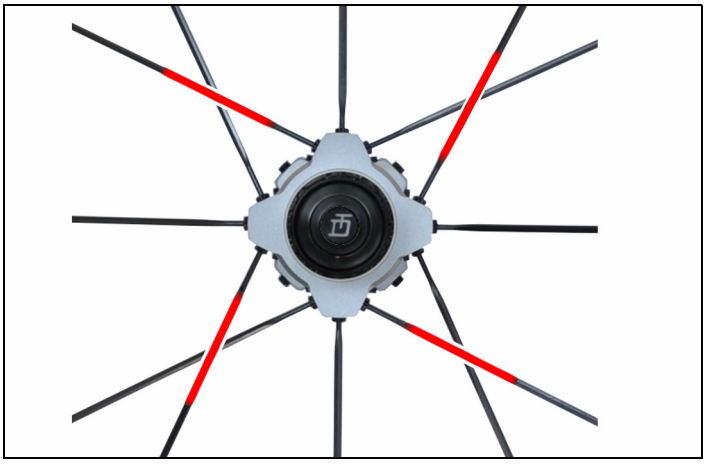
- Screw the spokes into the hub nipple until the torque rises noticeable.
- Align the spokes in drive direction (max. 180°)



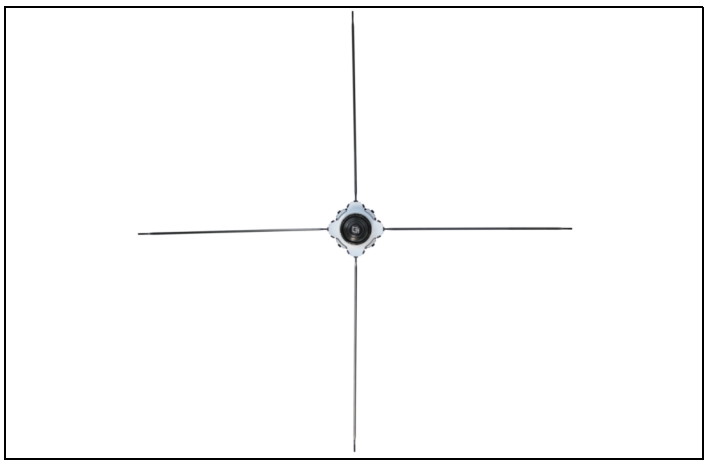
Attach the spokes to the hub

General:

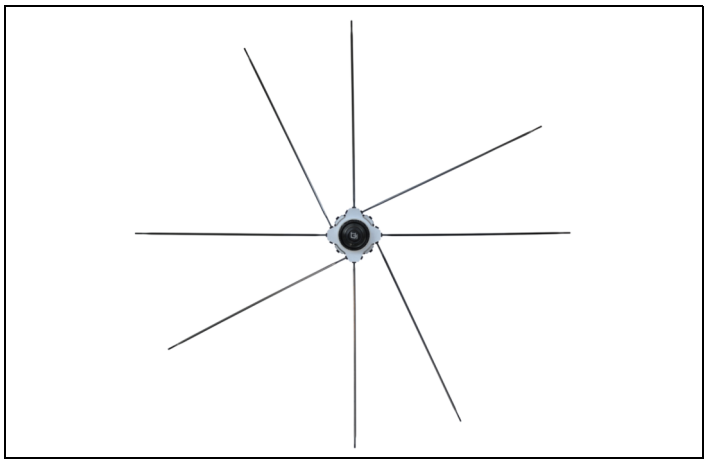
The crossing of the spokes must always be like shown in the picture.



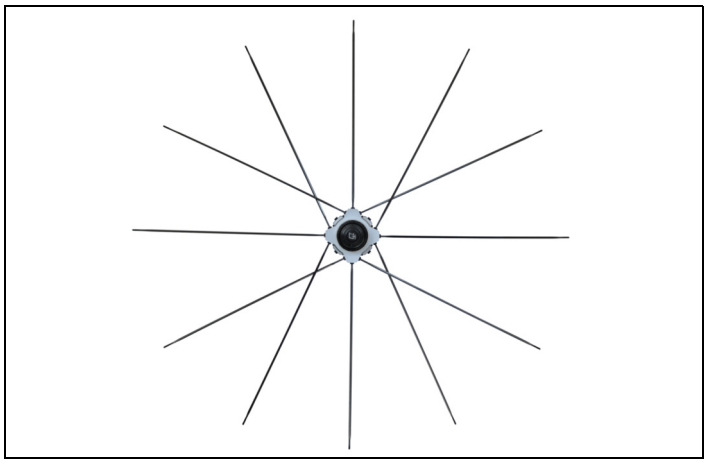
1. Screw in the four radial spoke on the first side.



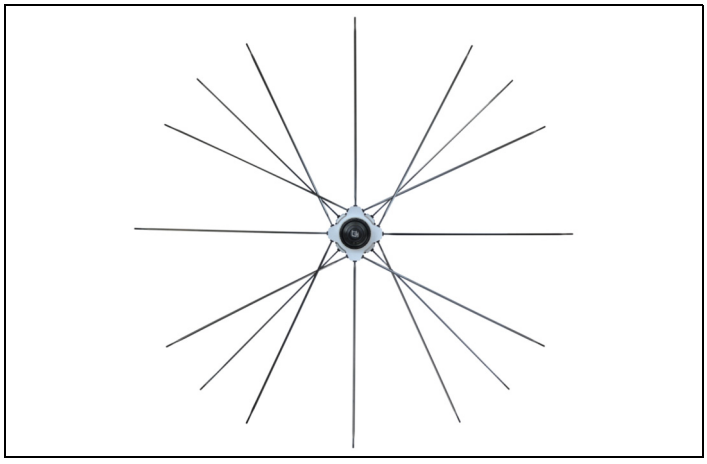
2. Screw in the four crossed spokes to the left of the radial ones.



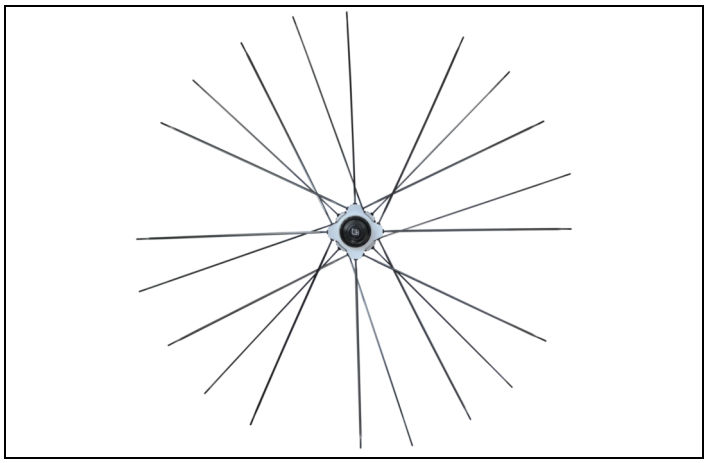
3. Screw in the remaining spokes on the first side (on top of the crossed spokes).



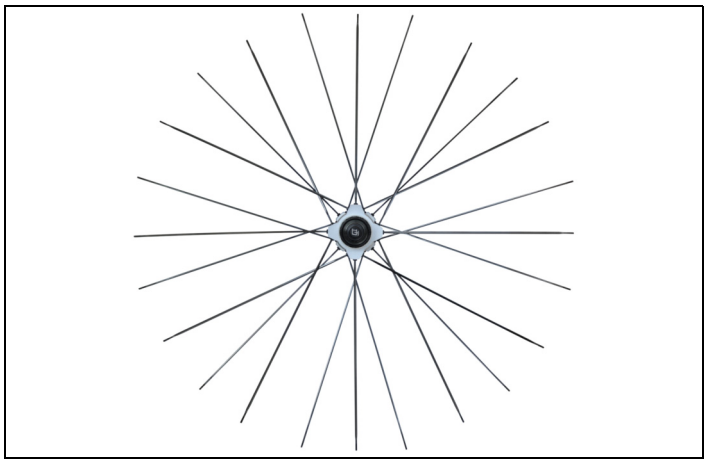
4. Screw in the radial spokes on the second side.



5. Screw in the four crossed spokes to the left of the radial ones.

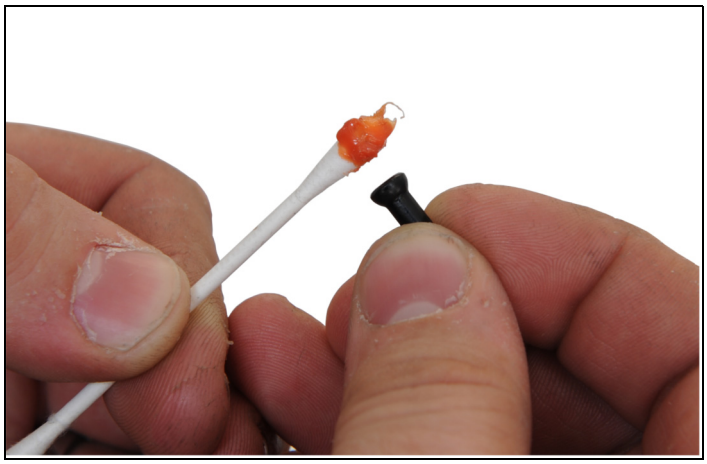


6. Screw in the remaining spokes on the second side (on top of the crossed spokes).

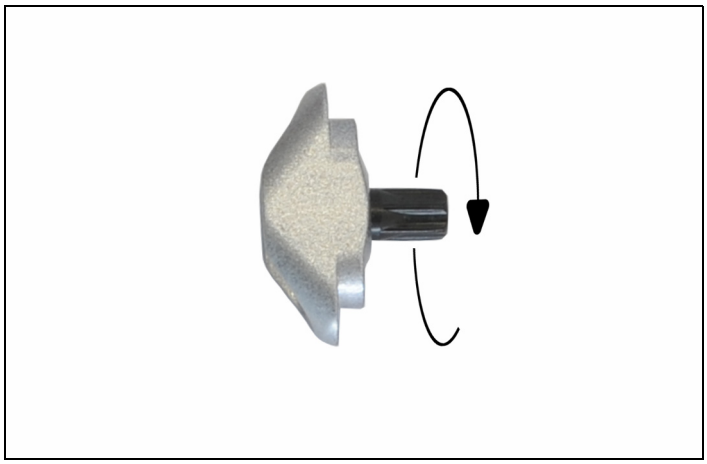


Prepare the rim

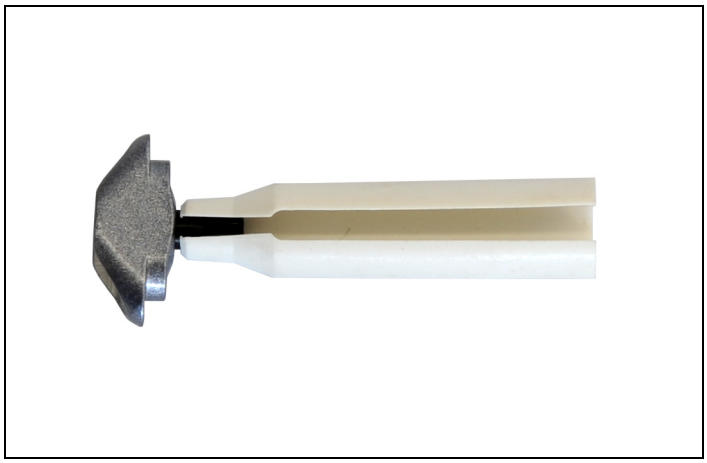
1. Grease the contact surface of the nipple and the rim insert with DT Swiss special grease.



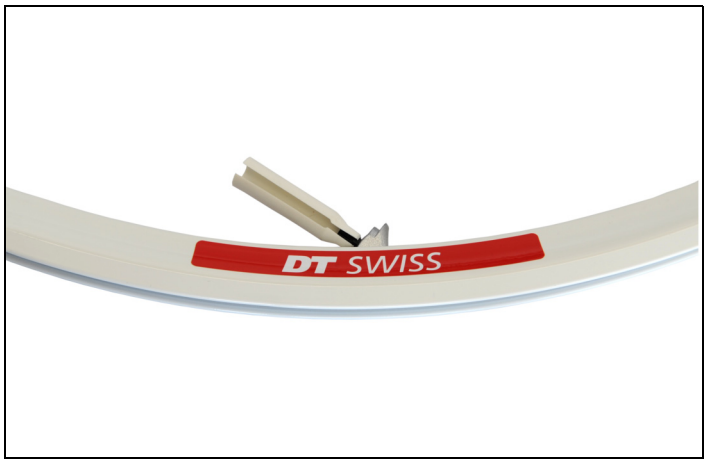
2. Put the new nipple into the rim insert.
3. Check, if the nipple can be turned smoothly.



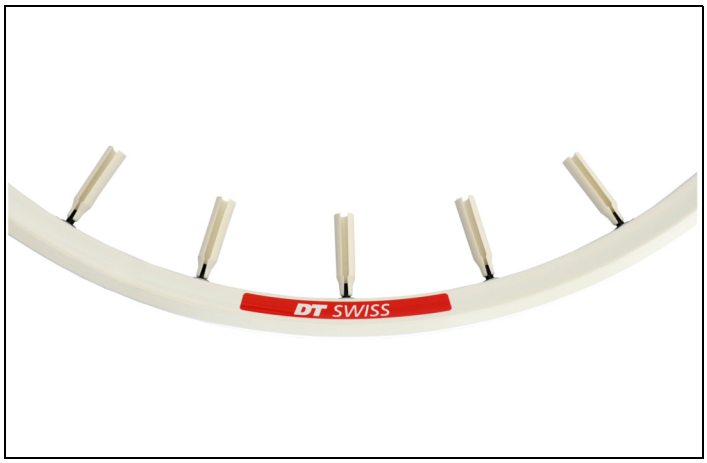
4. Put the nipple holder (see chap. 4.1, p.10, pos. 5) onto the nipple.



5. Insert the pre-assembled rim insert with the nipple into the rim.

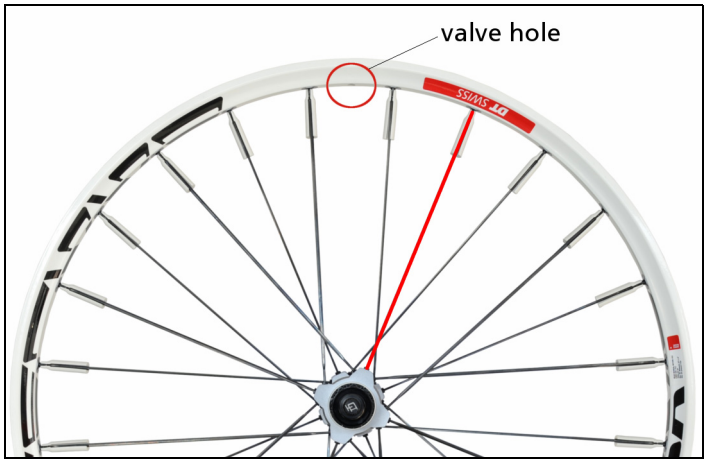


6. Repeat the previous step on every spoke hole or at least on the maximum number of nipple holders you have.



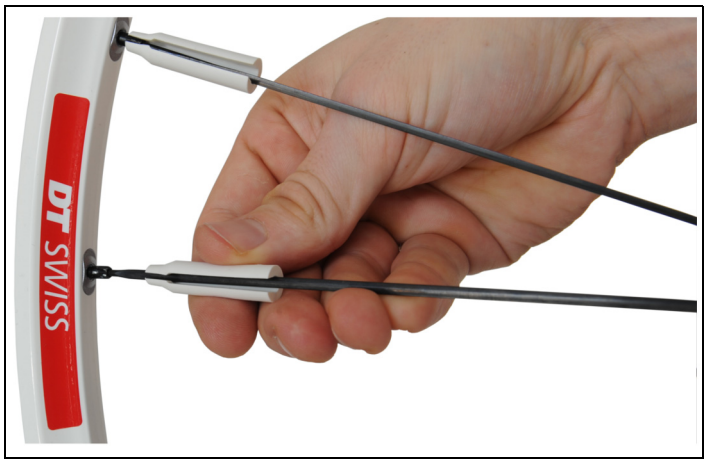
Connect the «spoke tree» to the rim

1. Position the «spoke tree» in the way that a radial spoke is aligned to the second spoke hole on the right side of the valve hole



2. Insert the spoke into the nipple.
3. Using the nipple holder, screw the nipple as far as possible onto the spoke.

4. Take off the nipple holder.
5. Repeat step 2 to step 4 with all spokes.



NOTE

Risk of damage to the spokes and the nipples!

- Whenever possible there should be used the universal spoke holder (see chap. 4.1, p.10, pos. 4) to avoid damages to the spokes. The spoke holder made out of metal (see chap. 4.1, p.10, pos. 2/3) should only be used if the universal spoke holder can't be used due to the high torque.
- There are used two different spokes types (Aerolite and New Aero) (see chap. 5.1, p.25). Ensure that the correct tool is being used.
- To avoid damages to the nipples, slide the nipple wrench as far as possible onto the nipple.

6. Increase the spoke tension steadily by using the special tools (see chap. 4.1, p.10).
7. Check that the rim is centered correctly as well as the radial and axial run out get within their limits (see chap. 5.3, p.27).

4.5 Distressing the wheel

Basically, TRICON® wheels should be distressed minimum four times during the building process. First time at approximately 50% of the maximum spoke tension.
After finishing truing, the wheel should be distressed once again. There should be no more changes in the settings (spoke tension, radial and axial run out).

After distressing the wheel should be within the following limits:

- Centering: Deflection less than 0.20 mm
- Radial run out: less than 0.25 mm
- Axial run out: less than 0.30 mm
  directly at the rim joint a leap of 0.35 mm can be tolerated

5 Technical Data

5.1 Spoke Lengths

ROAD	Side	Spoke Type	Lacing	Length	Amount	pos.
RR1450 100 mm front wheel	left	Aerolite	radial	280	3	3.2
			crossed	294	6	3.1
	right	Aerolite	radial	280	3	3.2
			crossed	294	6	3.1
RR1450 130 mm rear wheel	left	Aerolite	radial	279	4	3.2
			crossed	289	8	3.1
	right	New Aero	radial	272	4	3.1
			crossed	284	8	3.3
R1700 100 mm front wheel	left	New Aero	radial	279	3	3.2
			crossed	293	6	3.1
	right	New Aero	radial	279	3	3.2
			crossed	293	6	3.1
R1700 130 mm rear wheel	left	New Aero	radial	279	4	3.2
			crossed	287	8	3.1
	right	New Aero	radial	272	4	3.4
			crossed	283	8	3.3

MTB	Side	Spoke Type	Lacing	Length	Amount	pos.
XM1550 100 mm front wheel	left	Aerolite	radial	247	4	3.4
			crossed	256	8	3.2
	right	Aerolite	radial	248	4	3.3
			crossed	258	8	3.1
XM1550 lefty front wheel	left	Aerolite	radial	244	4	3.4
			crossed	255	8	3.2
	right	Aerolite	radial	248	4	3.3
			crossed	257	8	3.1
XM1550 29“ lefty	left	Aerolite	radial	274	5	3.4
			crossed	281	10	3.2
	right	Aerolite	radial	279	5	3.3
			crossed	285	10	3.1

MTB	Side	Spoke Type	Lacing	Length	Amount	pos.
XM1550 29“ 100 mm front wheel	left	Aerolite	radial	277	5	3.4
			crossed	284	10	3.2
	right	New Aero	radial	280	5	3.3
			crossed	286	10	3.1
XM1550 100 mm front wheel #2075*	left	Aerolite	radial	247	4	3.4
			crossed	256	8	3.2
	right	Aerolite	radial	250	4	3.3
			crossed	259	8	3.1
XM1550 135/142 mm rear wheel	left	Aerolite	radial	248	4	3.4
			crossed	257	8	3.3
	right	New Aero	radial	243	4	3.1
			crossed	255	8	3.2
XM1550 29“ 135 mm rear wheel	left	Aerolite	radial	279	5	3.4
			crossed	286	10	3.3
	right	New Aero	radial	274	5	3.1
			crossed	283	10	3.2
M1700 100 mm front wheel	left	New Aero	radial	247	4	3.4
			crossed	256	8	3.2
	right	New Aero	radial	249	4	3.3
			crossed	258	8	3.1
M1700 135 mm rear wheel	left	New Aero	radial	249	4	3.4
			crossed	257	8	3.3
	right	New Aero	radial	244	4	3.1
			crossed	255	8	3.2
FX1950 100/110 mm front wheel	left	Aero Comp	radial	243	5	3.4
			crossed	251	10	3.2
	right	Aero Comp	radial	244	5	3.3
			crossed	252	10	3.1
FX1950 135/142 mm rear wheel	left	Aero Comp	radial	245	5	3.4
			crossed	253	10	3.3
	right	Aero Comp	radial	244	5	3.1
			crossed	252	10	3.2

MTB	Side	Spoke Type	Lacing	Length	Amount	pos.
FX1950 150 mm rear wheel	left	Aero Comp	radial	245	5	3.4
			crossed	253	10	3.3
	right	Aero Comp	radial	245	5	3.1
			crossed	253	10	3.2

5.2 Spoke Tension

NOTE: All values in the following table are only valid in combination with DT Swiss Tensio 2. If you are using the DT Swiss Tensio old, the N-values must be converted into the according Tensio value. Therefore you have to use the table which is attached to the Tensio.

maximum tolerated tension difference per wheelside			max tolerated spoke tension difference per wheelside		min. tolerated spoke tension of the higher tightened wheelside		average spoke tension of the higher tightened wheelside	
		[N]	[N]	Tensio-Value	[N]	Tensio-Value	[N]	Tensio-Value
RR1450	FW	250	1150	0.53	900	0.31	1100 - 950	0.49 - 0.36
	RW	250	1450	1.3	1200	1.13	1400-1250	1.27 - 1.16
R1700	FW	250	1150	1.09	900	0.86	1100 - 950	1.05 - 0.91
	RW	250	1450	1.3	1200	1.13	1400 - 1250	1.27 - 1.16
XM1550 white	FW	250	1300	0.64	1050	0.45	1250 - 1100	0.60 - 0.49
	RW	250	1450	1.3	1200	1.13	1400 - 1250	1.27 - 1.16
XM1500 black	FW	250	1300	0.68	1050	0.48	1250 - 1100	0.64 - 0.53
	RW	250	1450	1.36	1200	1.18	1400 - 1250	1.33 - 1.22
M1700	FW	250	1350	1.23	1100	1.05	1300 - 1150	1.20 - 1.09
	RW	250	1450	1.3	1200	1.13	1400 - 1250	1.27 - 1.16
FX1950	FW	250	1350	1.27	1100	1.07	1300 - 1150	1.23 - 1.12
	RW	250	1450	1.34	1200	1.16	1400 - 1250	1.30 - 1.19

5.3 Tolerance

	Toleranz [mm]	Bemerkung
dish	< 0.3	
axial run-out	< 0.25	
radial run-out	< 0.3	at the rim joint a run-out of 0.35 mm can be tolerated

6 Spare Parts

6.1 Spare Part Kits

Spokes are available in three different kits:

- pack of 20 of each length
- small spare part kit wheel: set contains 2 spokes of each required length, 8 rim nipples, 2 rim inserts and 8 hub nipples (one set per wheel set FW + RW)
- rebuild kit front or rear wheel: contains all spokes for the respective wheel as well as spokes and rim nipples

Wheel	Description
XM1550	
wheel set	small spare part kit
front wheel	rebuild kit
rear wheel	rebuild kit
XM1550 29“	
wheel set	small spare part kit
M1700	
wheel set	small spare part kit
front wheel	rebuild kit
rear wheel	rebuild kit
RR1450	
wheel set	small spare part kit
front wheel	rebuild kit
rear wheel	rebuild kit
R1700	
wheel set	small spare part kit
front wheel	rebuild kit
rear wheel	rebuild kit
FX1950	
wheel set	small spare part kit

all	rim insert kit grey
all	rim insert kit black
all	rim insert green (1 piece)
all	hub nipple M5 black

6.2 Sticker Sets

Wheel	Article
XM1550	
front wheel 26“	sticker set rim and hub black
rear wheel 26“	sticker set rim and hub black
front wheel and rear wheel 26“	sticker set rim and hub white
front wheel and rear wheel 29“	sticker set rim and hub black
M1700	
front wheel silber	sticker set rim and hub
rear wheel silber	sticker set rim and hub
front wheel and rear wheel	sticker set rim and hub
FX1950*	
front wheel	sticker hub
rear wheel	sticker hub 135/142 mm
rear wheel	sticker hub 150 mm
RR1450	
front wheel	sticker set rim and hub
rear wheel	sticker set rim and hub
R1700	
front wheel	sticker set rim and hub
rear wheel	sticker set rim and hub

* The rim stickers are waterslide stickers which can not be replaced. Replacement rims are delivered with attached stickers.

6.3 Spare Parts MTB front wheel

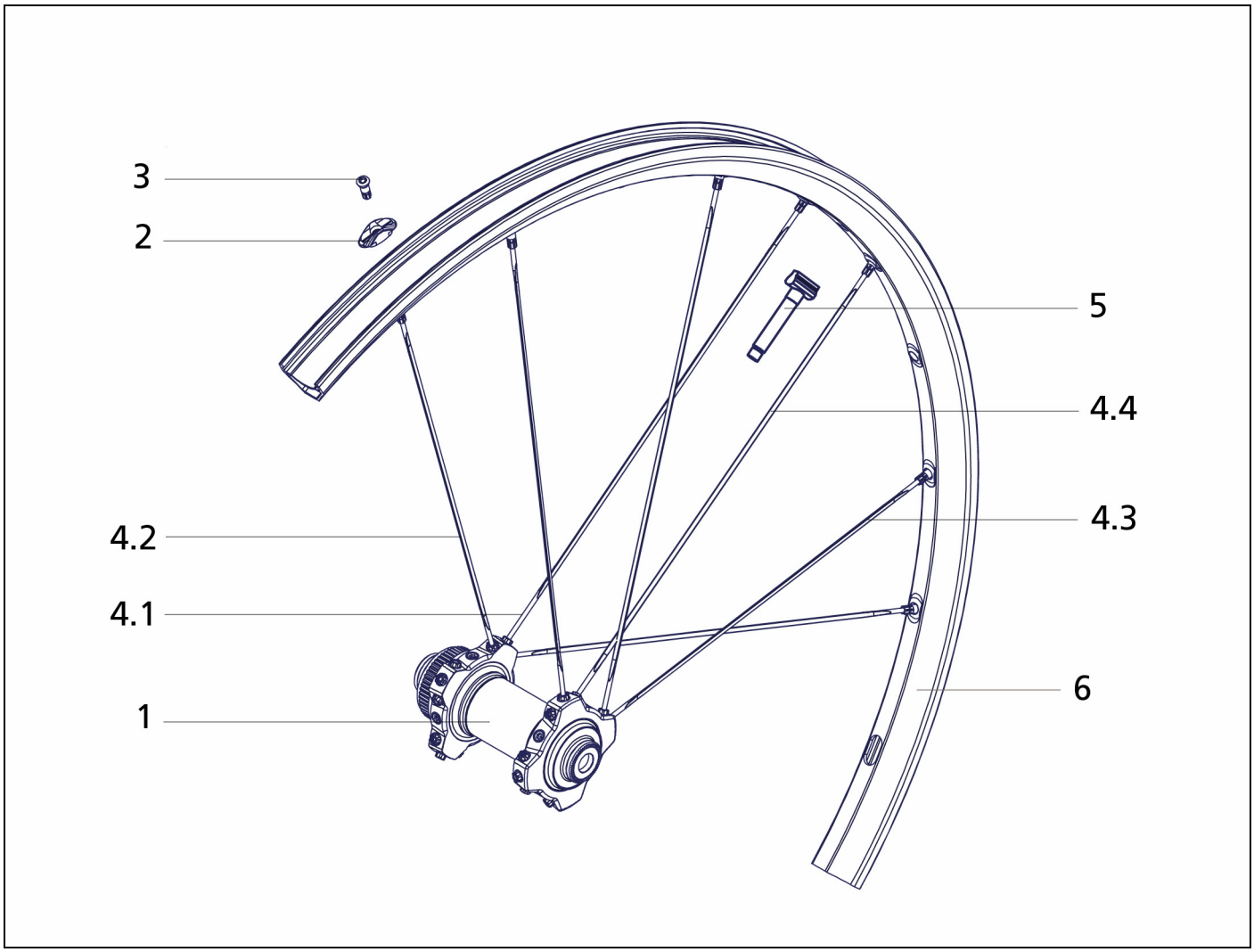


Figure 6-1: MTB front wheel

Pos.	Article
1	hub
2	rim insert
3	aluminium nipple
4.1	spoke left radial
4.2	spoke left crossed
4.3	spoke right radial
4.4	spoke right crossed
5	tubeless valve
6	replacement rim

6.4 Spare Parts MTB rear wheel

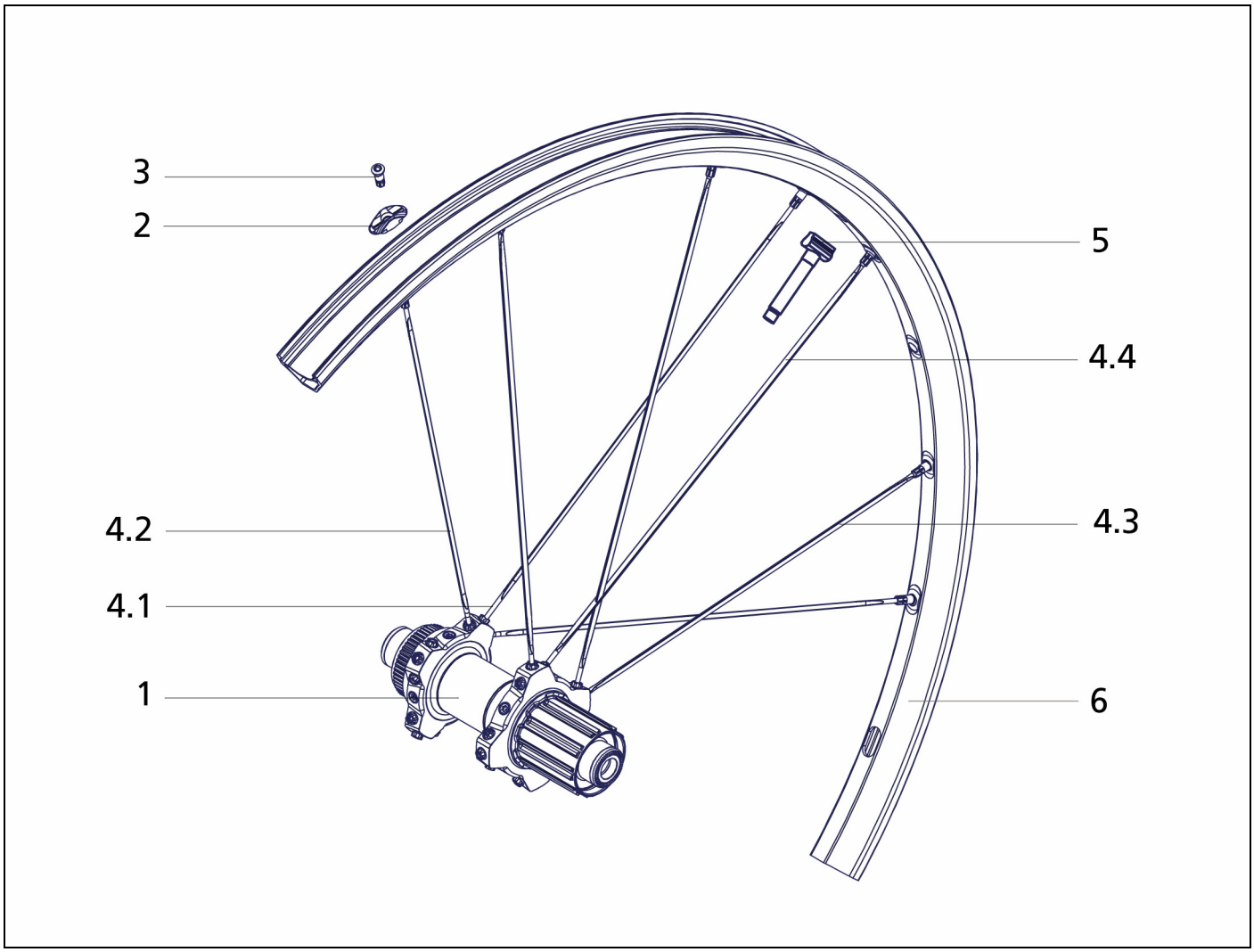


Figure 6-2: MTB rear wheel

Pos.	Article
1	hub
2	rim insert
3	aluminium nipple
4.1	spoke left radial
4.2	spoke left crossed
4.3	spoke right radial
4.4	spoke right crossed
5	tubeless valve
6	replacement rim

6.5 Spare Parts ROAD front wheel

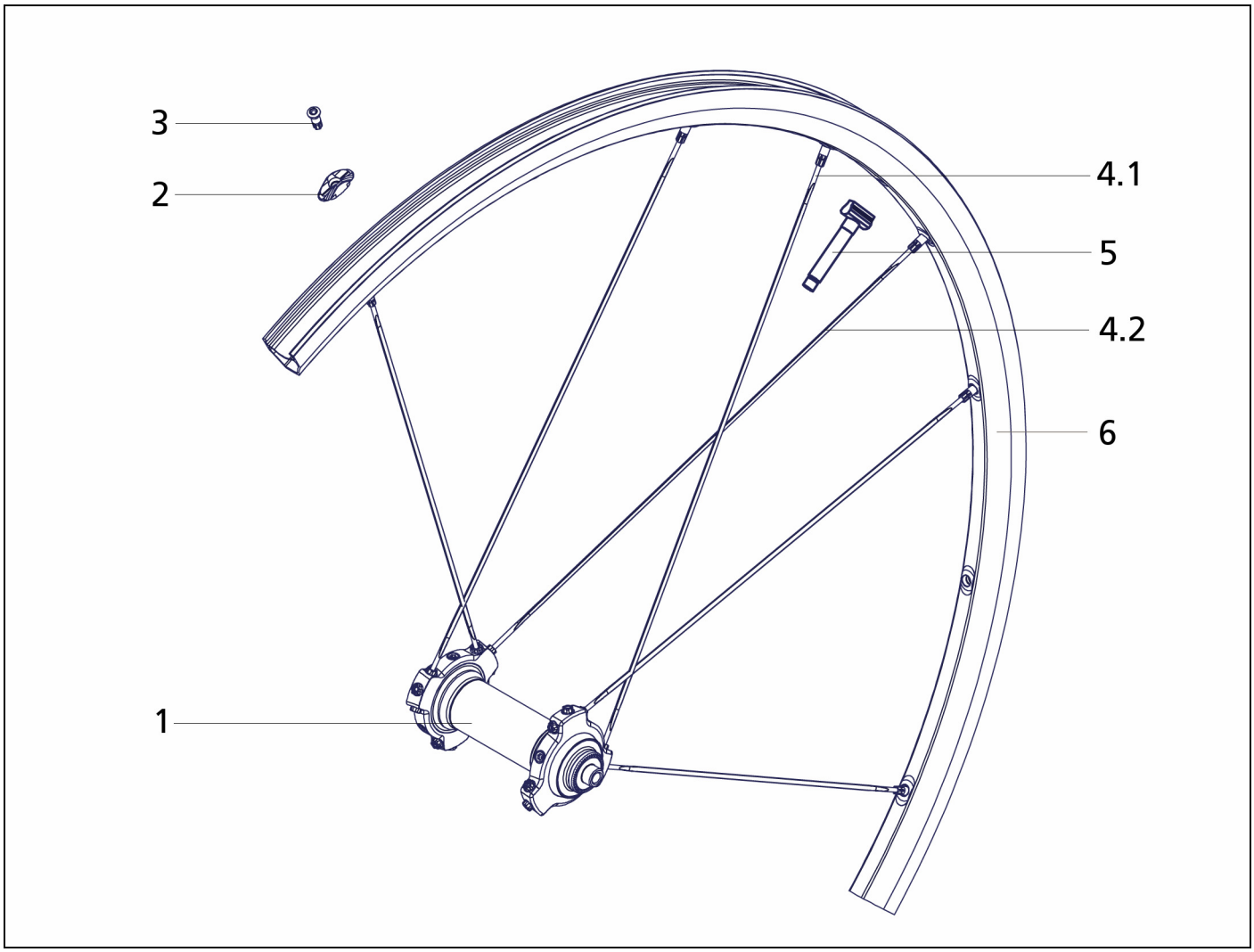


Figure 6-3: ROAD front wheel

Pos.	Article
1	hub
2	rim insert
3	aluminium nipple
4.1	spoke crossed
4.2	spoke radial
5	tubeless valve
6	replacement rim

6.6 Spare Parts ROAD rear wheel

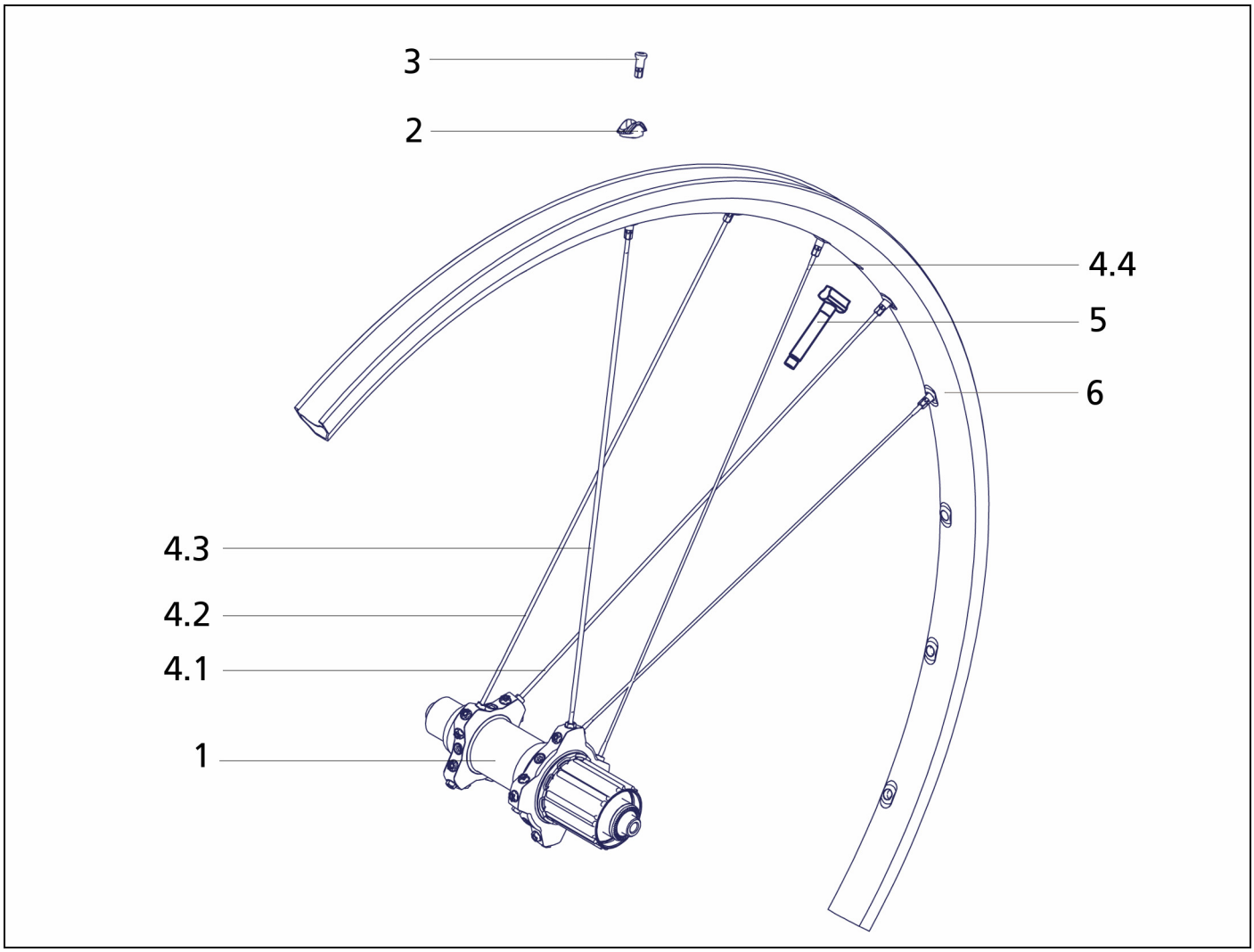


Figure 6-4: ROAD rear wheel

Pos.	Article
1	hub
2	rim insert
3	aluminium nipple
4.1	spoke left radial
4.2	spoke left crossed
4.3	spoke right radial
4.4	spoke right crossed
5	tubeless valve
6	replacement rim

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