



OWNER'S MANUAL

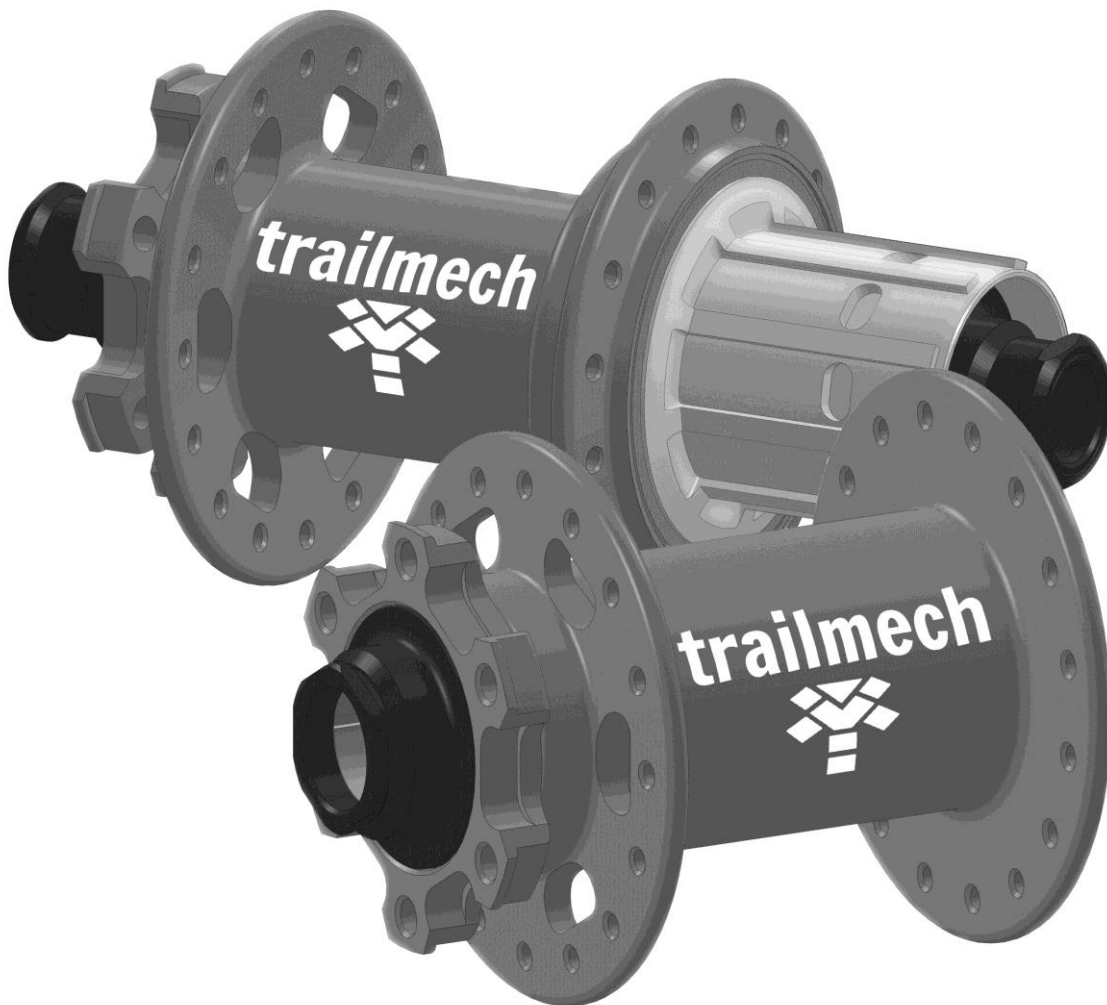


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INTRODUCTION

Thank you for choosing innovative Trailmech XC hubs!

Your hubs use a unique, patented two-conical tooth ring engagement design - Vortex Ring Technology or VRT.

Because of this new design your Trailmech has only six degrees of free movement and so it engages almost instantly. With less free movement than most hub designs, acceleration is more instantaneous and over-all handling is more responsive. The engagement mechanism employs self-reinforced lock-in: the harder you pedal the stronger the engagement! With its simple design this unique rear hub has only one moving part. Such design greatly simplifies necessary steps for cleaning, servicing, disassembling and reassembling the hub.

We never cut corners on quality and use only 7075 grade aluminum and high quality bearings from EZO (Japan). Each component is carefully machined to ensure perfect alignment and symmetry, a tight fit, and smooth rotation.

Trailmech hubs come with a three-year warranty against manufacturing defects and a one-year warranty for the bearings.

With regular maintenance, Trailmech XC hubs will perform for many years. This manual will provide you with necessary information for initial installation, operation and maintenance of your new hubs.

If you have any questions about the hub's performance, its service or warranty, please contact us:

support@trailmech.com

www.facebook.com/trailmech

Trailmech XC. Ride faster with confidence!

IMPORTANT INFORMATION

Trailmech XC hubs are designed for the following cycling disciplines: cross-country, light Enduro, all-mountain, back country, 4-cross and dual slalom.

Trailmech XC hubs are not suitable and their use is not recommended for more aggressive disciplines, such as: downhill, enduro, freeride, street dirt, and trials.

The maximum recommended rider weight for using Trailmech hubs is 110 kg.

PRECAUTIONS

DO NOT cross water obstacles where the hubs are partially or completely submerged. This practice will allow water to leak into the hubs, since the hubs are not completely sealed, resulting in premature failure of the bearings, hub jamming or loss of engagement.

DO NOT use solvents and detergents to wash hubs, in order to avoid damaging the coating. Such chemicals not only affect the aesthetic qualities of the hubs, but also lead to premature corrosion of the parts and components, reducing their longevity.

STANDARDS AND COMPATIBILITY

BRAKES

Trailmech XC hubs are designed to be compatible with ISO 6-bolt standard mount disk brakes.

FRAMES AND FORKS

Supported standards:

Front Trailmech XC hub	100QR
	100x9mm axle
	100x15mm
	100x20mm axle*
Rear Trailmech XC hub	135QR
	135x10mm
	135x12mm
	142x12mm

The hub endcaps must be changed in order to switch to another mounting option.

* In addition to changing endcaps, the hub internal axle also must be replaced.

CASSETTE

The rear Trailmech XC hub is compatible with following cassette types:

Shimano freehub	Standard Shimano MTB** cassette for 8, 9, 10 or 11 speed
XD-compatible freehub	SRAM MTB 11 speed cassette for XD-compatible freehub

We recommend using spider-based cassettes and following tightening torque instructions of the cassette manufacturer in order to lower the risk of freehub damage.

* Converting between different freehubs requires drive side (DS) endcap replacement, even if axle mounting does not change. This is because endcaps for the Shimano freehub have a larger outer diameter as compared to endcaps for the XD-compatible freehub.

** The Shimano ROAD cassette requires a wider freehub body and therefore cannot be mounted on the Trailmech Shimano compatible freehub, which is designed for Shimano MTB cassettes.

BEARINGS

Trailmech XC use standard metric size cartridge bearings of the following types:

Front Trailmech XC hub	2 x 6804-2RS
Rear Trailmech XC hub	3 x 6903-2RS ***, 1 x 6803-2RS

*** Rear hubs manufactured before March 2015 use 2 x 6903-2RS, 2 x 6803-2RS

In summer weather we recommended using 10W synthetic oil. During colder seasons, or when the temperature drops below 10°C, use 5W synthetic oil.

DO NOT USE GREASE. Use only liquid lubricants with Vortex Ring Technology.

General purpose bicycle grease is recommended for seals and bearings seats. Such greases are commonly used for bottom brackets, headsets and other bicycles parts. Grease applied onto bearing seats in hub's shell and freehub before pressing them in will facilitate their replacement in the future.

PREPARATION AND CHECKS

Before using hubs, make sure that the selected axle mounting options match those of the bicycle frame and/or fork. Supported options are listed in FRAMES AND FORKS.

We recommend using only professional wheel building services.

During the first 100 – 200 km of riding, depending on riding style and conditions, you may experience somewhat higher hub rolling resistance. It is a regular occurrence caused while the grease and lube gradually spread throughout the bearings and engagement mechanism. Also, the dust seals need to “wear-in” on their working surfaces between the bearings and endcaps.

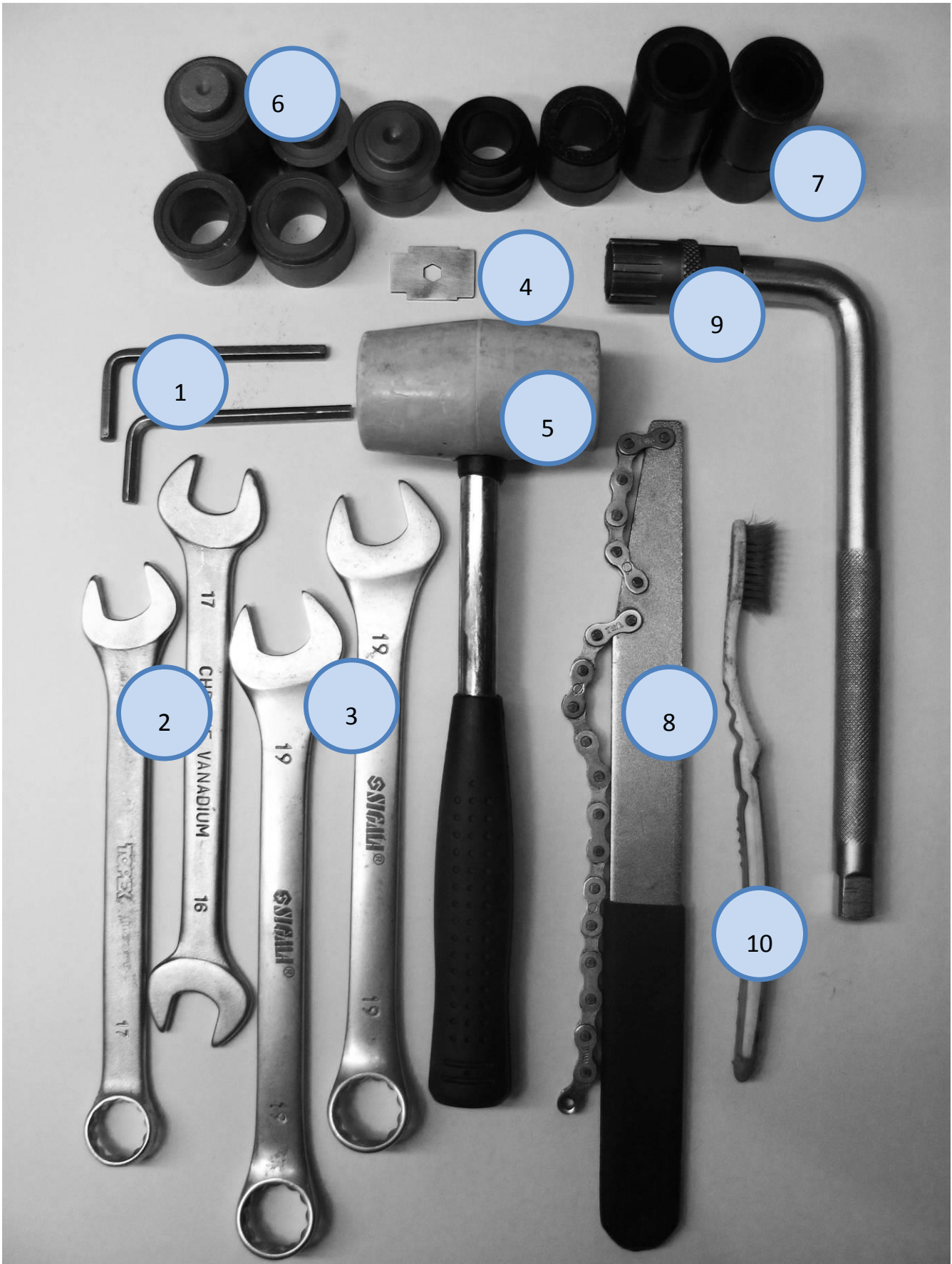
TECHNICAL MAINTENANCE

For technical maintenance use following tools and accessories:

№	Description	Quantity
1	S=5 or S=6 hex wrench	2
2	S=17 spanner wrench	2
3	S=19 spanner wrench	2
4	Trailmech axle wrench	1
5	Rubber mallet	1
6	Toolset for bearings replacement, front hub*	1
7	Toolset for bearings replacement, rear hub*	1
8	Cassette chain whip	1
9	Shimano CS cassette removal tool	1
10	Large brush	1
11	Small brush	1
12	Synthetic oil**	-
13	Grease**	-

* For bearing toolsets contact your local dealer or Trailmech

** See also – OILS & LUBES



We also recommend using: a metal rod 150-200 mm long with a diameter between 8-15 mm, vice grips, a hand press (if available), a hard rubber (e.g. hockey puck) or a wooden stand, a metal disc or a coin, and cloth or rags.

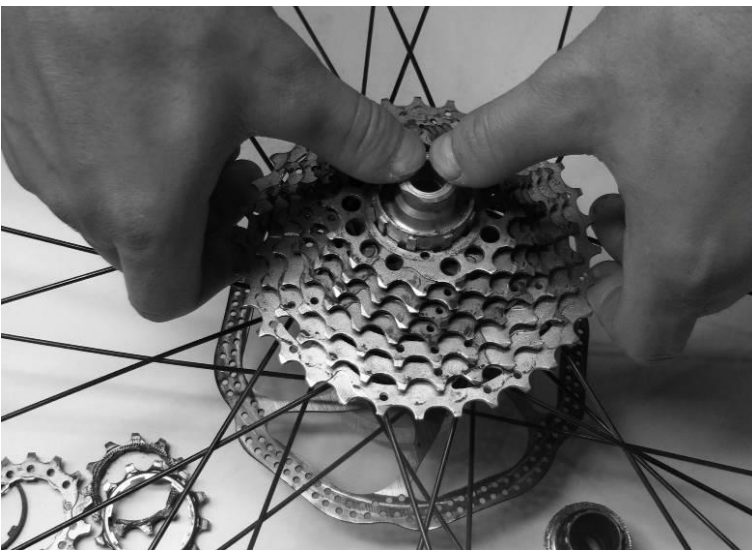
If a Trailmech bearings toolset is not available, you will need several metal cylinders with outer diameters of: 23-25 mm, 26 mm and 30 mm, a section of metal pipe with an outer diameter of 30mm and inner diameter of 17.2-18 mm.



1. Remove the rear wheel from the bike.
2. Use cassette chain whip and cassette removal tool to unscrew cassette's lockring.



3. With rubber mallet lightly tap the cassette in the counter-clockwise direction.

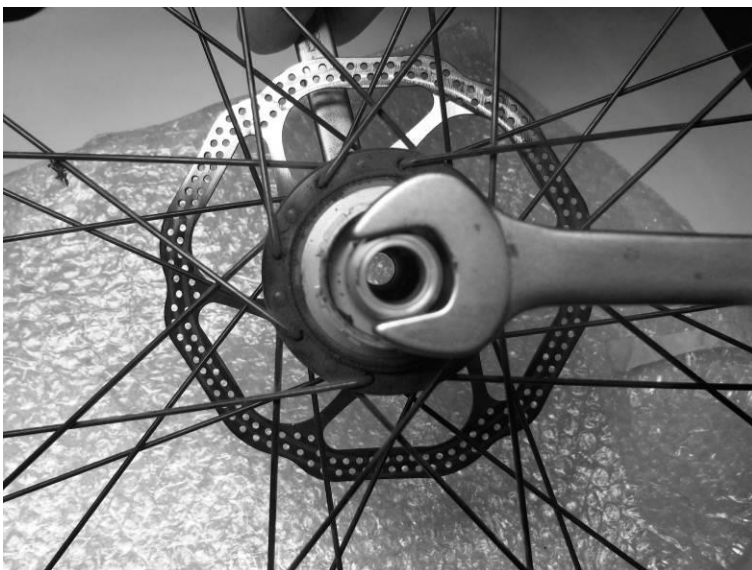


4. Carefully remove the cassette.



Small dents or marks from cassette sprockets may be present on freehub's splines.

If these marks do not exceed $\frac{1}{4}$ of the spline's width, it is considered to be a normal wear. Otherwise, for safety reasons, it is recommended to replace the freehub.



5. Use two 17mm spanner wrenches to remove (unscrew) one of the endcaps.



6. In order to remove the other endcap use a Trailmech axle wrench¹. Firmly and fully insert the axle wrench into receiving slots in the axle.



7. Place a 5 or 6mm hex wrench into the axle wrench hole or use pliers to firmly hold it in place. Keeping the axle from rotating, remove the endcap on the opposite side with 17mm spanner wrench.

¹ A Trailmech axle wrench is supplied with each Trailmech hub. Contact your dealer or our team support@trailmech.com if you do not have one or need a replacement.



8. Slowly pull the freehub to remove it from the axle.



9. If you cannot pull the freehub by hand, screw in a cassette lock-ring up to 2-3 threads into the freehub. Use a 3-jaw puller. Place metal disk or a coin between the puller and the hub axle. Using the puller, remove the freehub.



10. Completely remove the freehub from the axle.



11. Carefully remove the Vortex floating part and the tension spring from the hub shell.



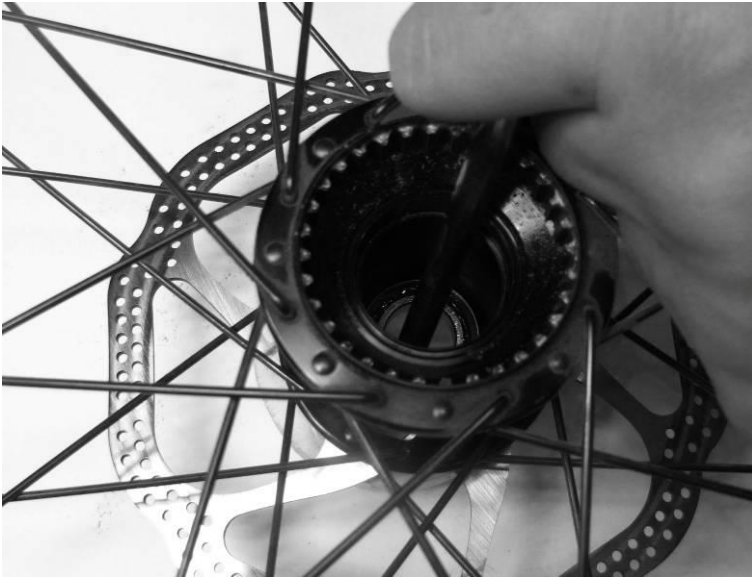
12. Remove the axle spacer.



13. With the rubber mallet carefully tap the hub axle from the non-drive side.



14. Carefully pull the axle from the drive side and remove it together with one of the hub shell bearings.



15. Carefully remove the hub shell bearing from the opposite (non-drive) side. Use a rubber mallet and a metal rod 150-200mm long and 8-15mm in diameter. **DO NOT USE A SCREWDRIVER!** Press the rod against bearing's inner race and tap it with the mallet from the drive side. Do not press the rod over the bearing seals, in order to avoid damaging them.



16. Remove the bearing from the non-drive side of the hub shell.



17. With a cloth or a rag remove dust, oil and other contaminants from the inside of the hub shell.



18. Use a small brush to clean the splines inside the hub shell.



19. Thoroughly clean the floating Vortex ring surface and outer splines.



20. Thoroughly clean the surface of the fixed Vortex ring, mounted on the freehub.



21. With the rubber mallet and the metal rod carefully tap the inner race of the freehub outer (smaller) bearing, in order to remove it.



22. Remove the smaller freehub bearing and the freehub spacer.



23. Using a Trailmech bearing replacement toolset or a metal cylinder 23-25mm in diameter, press the cylinder against the inner race of the bearing. Carefully tap the cylinder with the mallet to remove the bearing.



24. Remove the larger freehub bearing.



25. Using a cloth or rag, thoroughly clean the bearing seats of the freehub.



26. Inspect both Vortex rings for damage to the toothed surfaces. If dents or burrs are found, these parts may need to be replaced.



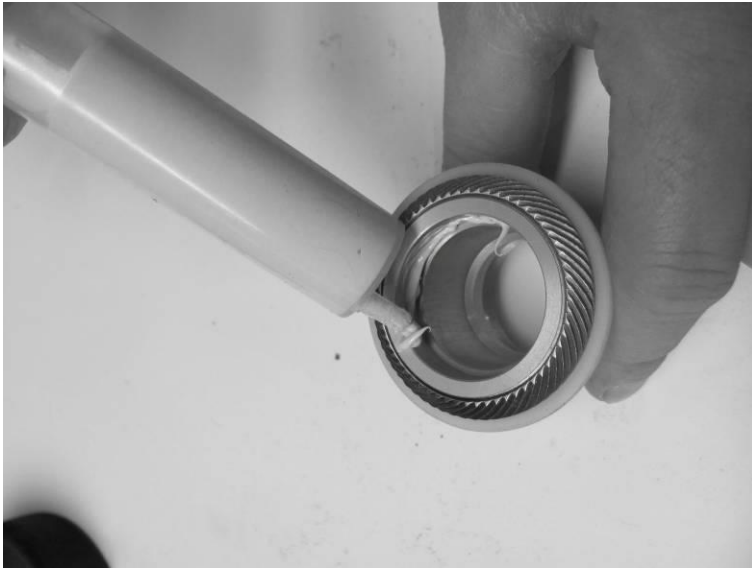
27. In order to remove the bearing that remained on the hub axle, place the axle in such way that bearing outer race is pressed against a fixed surface e.g. vice grip, then carefully tap the axle with a mallet (on axle's shorter side) - be careful not to damage the axle or its threads.



28. Clean the axle with a cloth or a rag.



29. With a small brush clean the threads on both ends of the axle.



30. Apply grease to the bearing seat inside the freehub.



31. Using a Trailmech bearing replacement toolset, or a metal cylinder 30mm in diameter pressed against the outer race of the larger freehub bearing, install it into the freehub. Use a hand press or a rubber mallet to push/tap the bearing until it is seated. Place a hockey puck or a wooden stand under the opposite end of the freehub in order to avoid damaging it.



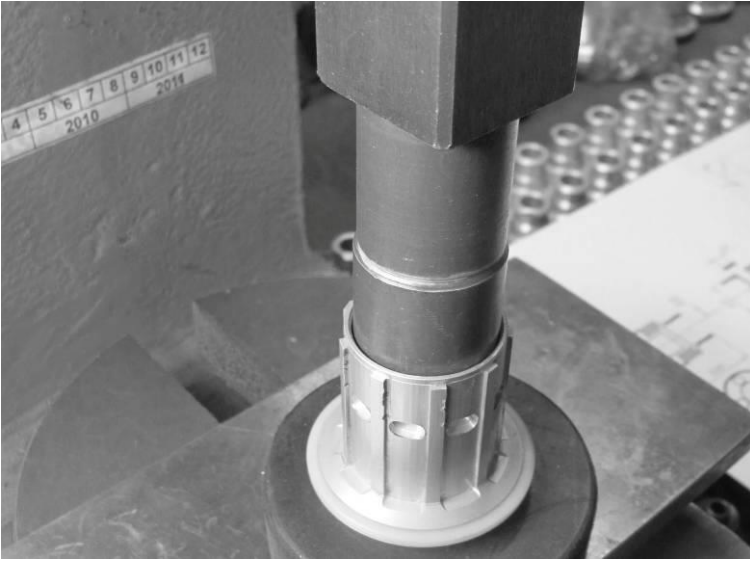
32. Install the freehub spacer.



33. Apply grease to the bearing seat of the outer (smaller) freehub bearing.



34. Place the bearing into the freehub.



35. Using a Trailmech bearing replacement toolset or a metal cylinder of 26mm in diameter pressed against the outer race of the bearing, install it into the freehub. Use a hand press or the rubber mallet to push/tap the bearing until it is seated. **Place a hockey puck or a wooden stand under the opposite end of the freehub in order to avoid damaging it.**



36. Apply grease to the bearing seat from the non-drive side of the hub shell.



37. Please the bearing into the hub shell.



38. Using a Trailmech bearing replacement toolset or a metal cylinder of 30mm in diameter pressed against the outer race of the bearings install it into the hub's shell. Use a hand press or the rubber mallet to push/tap the bearing until it is **fully seated.**



39. Apply grease to the drive side bearing seat inside the hub shell.



40. Fully insert the hub axle from the drive side into the mounted bearing on the opposite side of the hub shell.



41. Slide the second hub shell bearing onto the axle.



42. Using a Trailmech bearing replacement toolset, or a section of a metal pipe (cylinder) of 30mm in outer diameter and 17.2 – 18mm in inner diameter, slide it onto the axle over the bearing outer race.



43. Tap carefully with the rubber mallet to press the bearing until it is fully seated.



44. Install the axle spacer.



45. Place the floating Vortex ring together with its loading spring back into the hub shell. **Make sure that the spring is correctly mounted into the groove of the Vortex ring.**



46. Install the freehub back onto the axle.



47. Lightly lubricate both Vortex rings (use only liquid lubricants as specified above).



48. Rotate the freehub counterclockwise to ensure correctness of the assembly. If assembled correctly you should hear a distinctive and uniform “clicking” sound of the Vortex mechanism working in freewheeling mode.



49. Apply grease to the inner side of the drive side endcap seal and its threads.



50. Apply grease to the threads of the freehub.



51. Twist on the drive side endcap.



52. Apply grease to the inner side of the non-drive side endcap seal and its threads.



53. Lightly grease the non-drive side bearing.



54. Twist on the non-drive side endcap.



55. Tighten both endcaps with two 17mm spanner wrenches. **The tightening torque should not exceed 5 Nm².**

² To measure tightening torque a special torque wrench is required.



56. Slide on the cassette sprockets.



57. All splines on the freehub have identical width. As there is no wider spline for alignment of cassette sprockets, install sprockets in such way so that all of the wide splines align with each other. **Ensure that all individual sprockets are installed face up and not face down. Facing down installation of a cassette sprocket will lead to chain skipping.**



Properly installed individual sprockets will have marks (identification), such as number of teeth, on the face side.



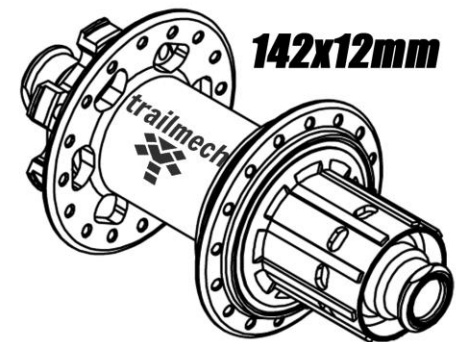
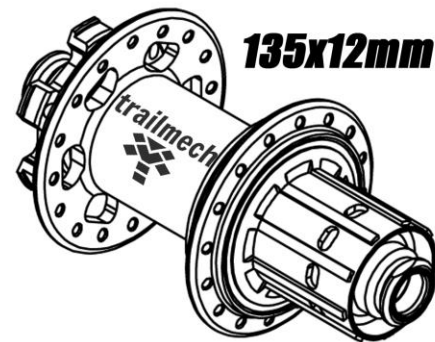
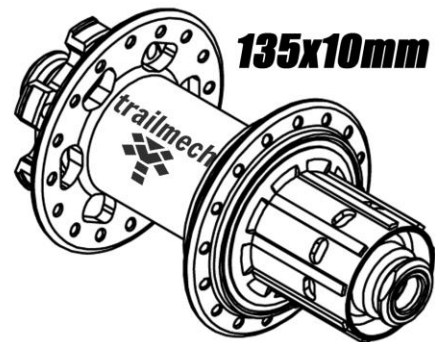
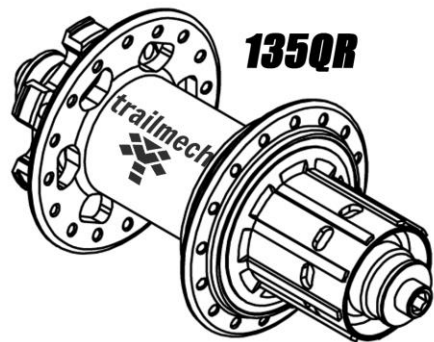
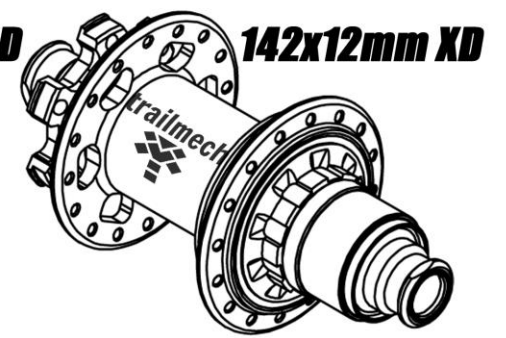
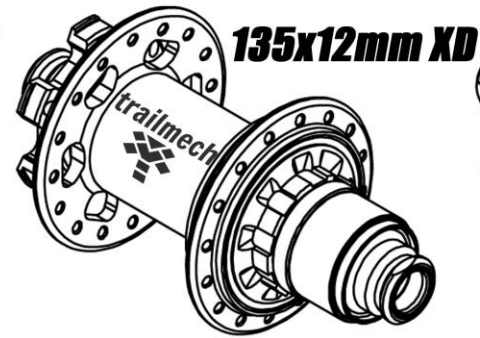
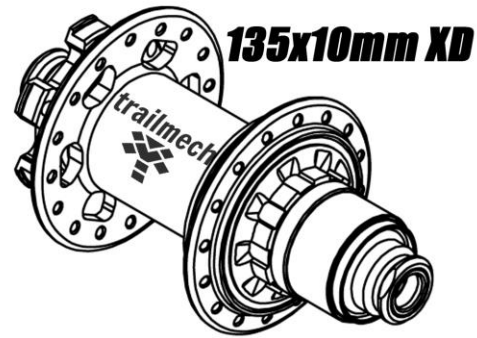
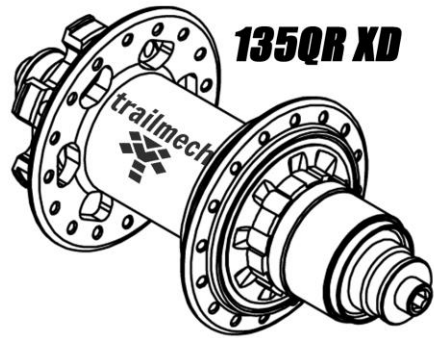
58. Lightly grease the threads of the freehub.

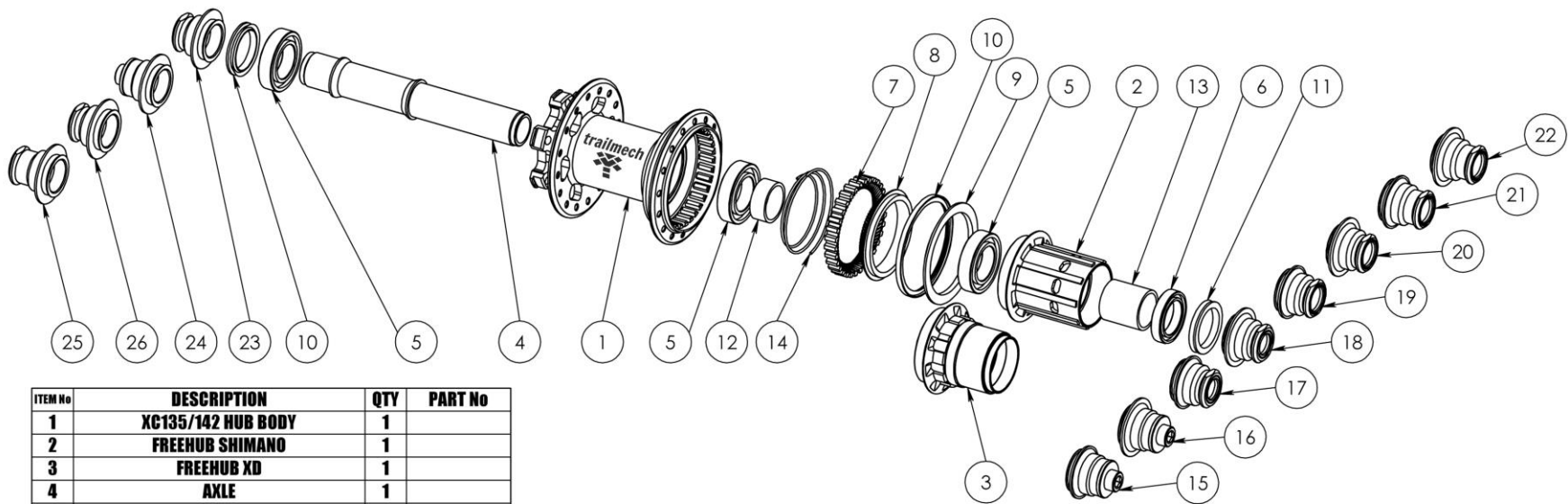


59. Thread the lock-ring into the freehub. Tighten it to a torque recommended by the cassette manufacturer.

For MTB Shimano/SRAM cassettes the most common tighten torque is 40 Nm.

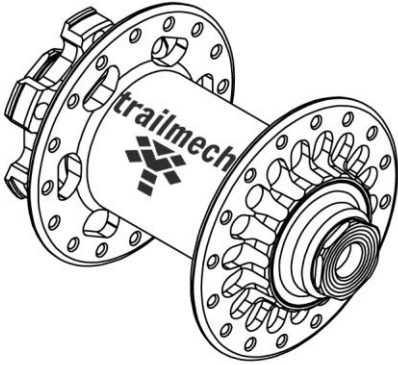
For SRAM's 11 speed MTB cassette (for XD-compatible freehub), the tightening torque should be less than 40 Nm, in order to avoid damaging the freehub.



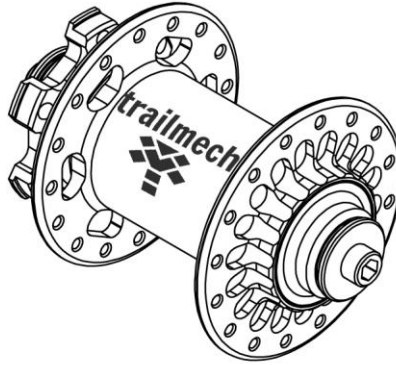


ITEM No	DESCRIPTION	QTY	PART No
1	XG135/142 HUB BODY	1	
2	FREEHUB SHIMANO	1	
3	FREEHUB XD	1	
4	AXLE	1	
5	6903-2RS BEARING	3	
6	6803-2RS BEARING	1	
7	VORTEX RING - FLOATING	1	
8	VORTEX RING - LEADING	1	
9	FREEHUB SEAL	1	
10	VORTEX SEAL	1	
11	END CAP SEAL	1	
12	AXLE SPACER	1	
13	FREEHUB SPACER	1	
14	SPRING	1	
15	QR END CAP, XD - DRIVE SIDE	1	
16	QR END CAP - DRIVE SIDE	1	
17	10MM END CAP, XD - DRIVE SIDE	1	
18	10MM END CAP - DRIVE SIDE	1	
19	12MM END CAP, XD - DRIVE SIDE	1	
20	12MM END CAP - DRIVE SIDE	1	
21	142x12MM END CAP, XD - DRIVE SIDE	1	
22	142x12MM END CAP - DRIVE SIDE	1	
23	10MM END CAP - NON DRIVE SIDE	1	
24	QR END CAP - NON DRIVE SIDE	1	
25	12MM END CAP - NON DRIVE SIDE	1	
26	142x12MM END CAP - NON DRIVE SIDE	1	

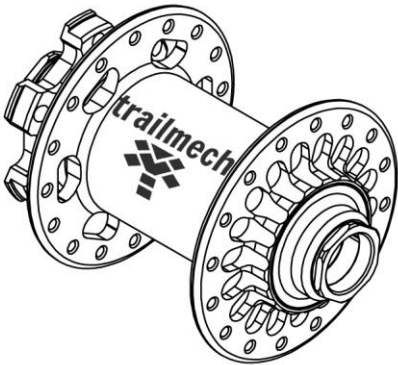
**9mm
Thru Axle**



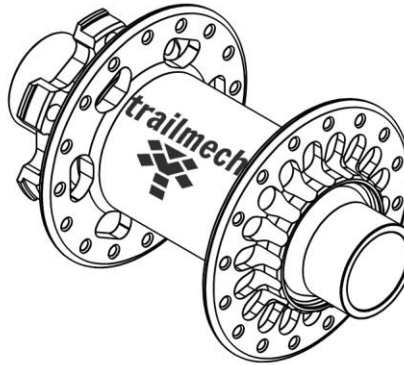
**QR
Axle**



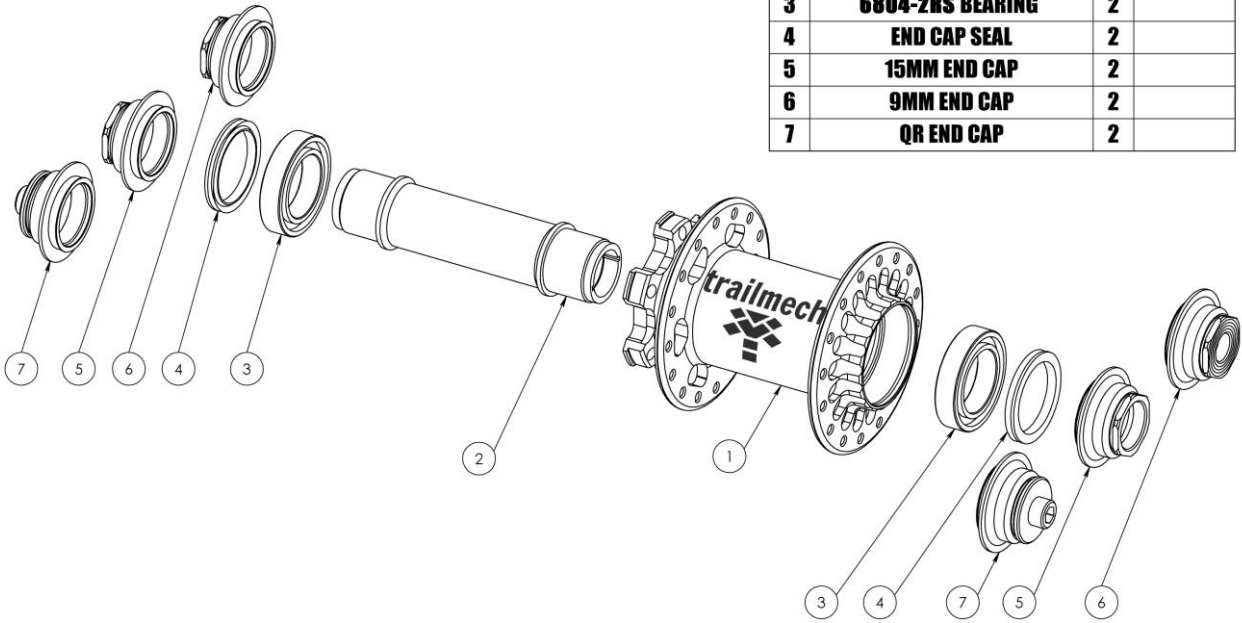
**15mm
Thru Axle**



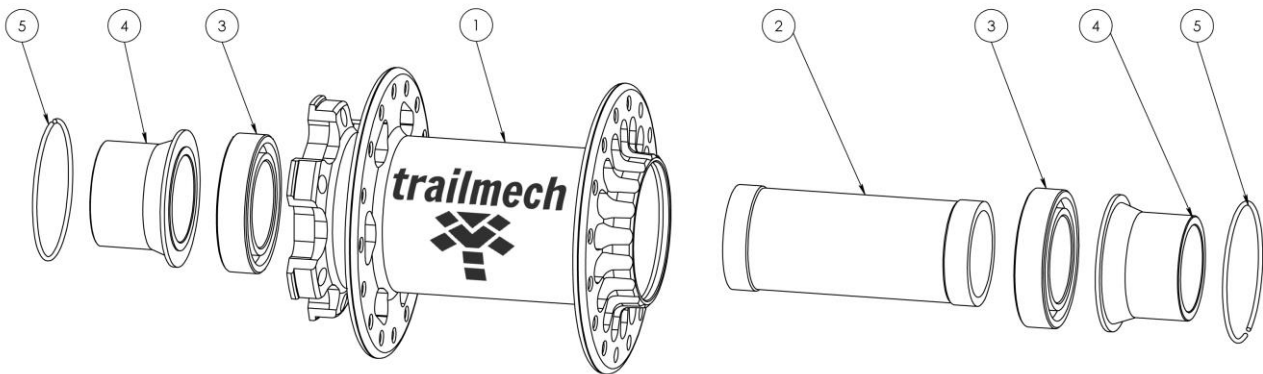
**20mm
Thru Axle**



ITEM No	DESCRIPTION	QTY	PART No
1	XC100 HUB BODY	1	
2	AXLE	1	
3	6804-2RS BEARING	2	
4	END CAP SEAL	2	
5	15MM END CAP	2	
6	9MM END CAP	2	
7	QR END CAP	2	



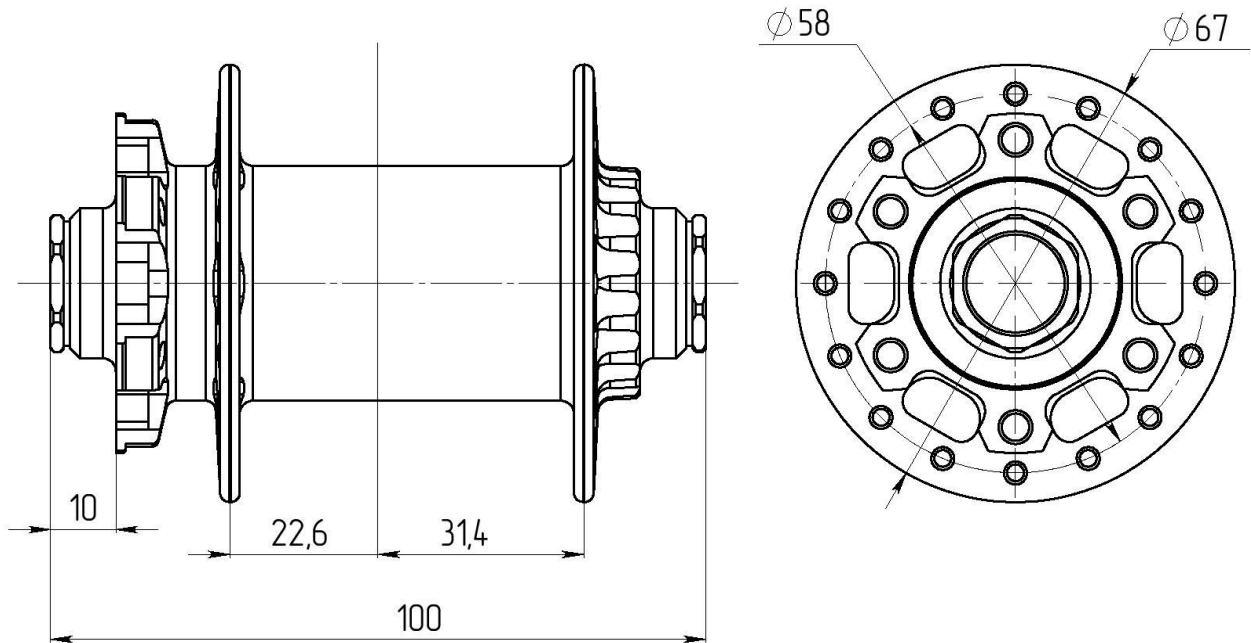
ITEM No	DESCRIPTION	QTY	PART No
1	XC100 HUB BODY	1	
2	AXLE	1	
3	6804-2RS BEARING	2	
4	20MM END CAP	2	
5	SNAP RING	2	



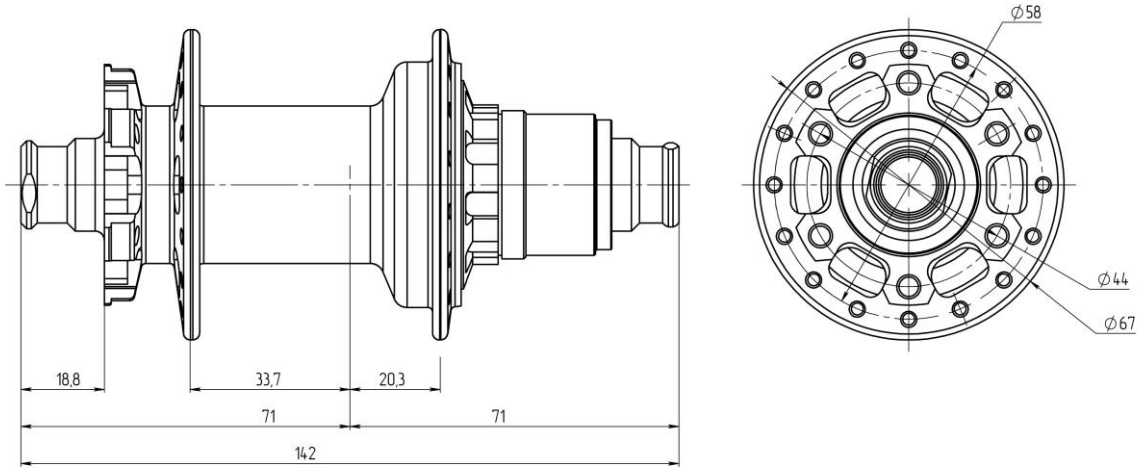
HUBS DIMENSIONS FOR WHEELBUILDING

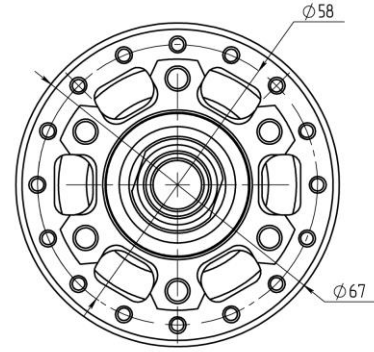
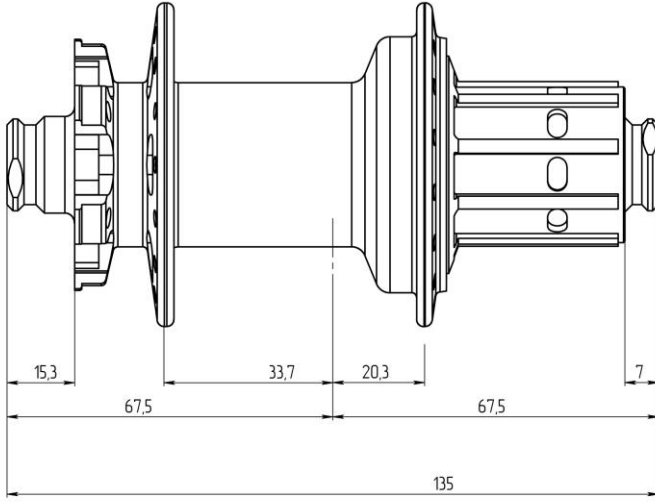
Trailmech hubs manufactured prior to 2016 have different dimensions than those provided below. Those dimensions are available on the following link <http://trailmech.com/documents/>, under the "Archive" section.

FRONT HUB



OPTION – 142X12MM:



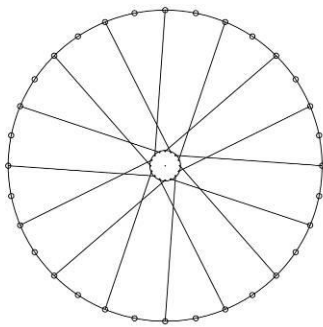


LACING UP THE WHEELS

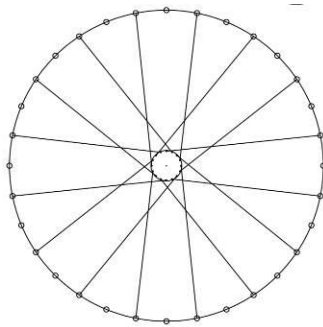
Only 2 or 3-cross lacing schemes are permitted.

Trailmech hubs are **NOT** designed for radial lacing. Lacing them in this manner will lead to damage of the hub flanges.

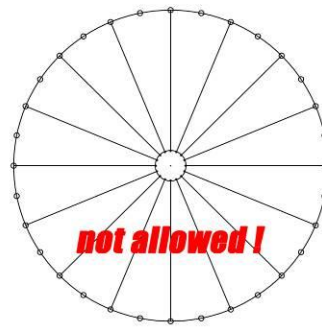
Supported lacing schemes:



2x



3x



Radial

Maximum spoke tension: 130 kgf

MAINTENANCE RECOMMENDATIONS

Tasks	Periodicity
<p>Initial (first) maintenance – TO-0</p> <p>Objective of the maintenance TO-0 is the replacement of factory lube in rear hub mechanism after its initial “wear-in”. Follow steps 1 – 12, 17 – 20, 26, and 44 – 59 to perform this task.</p>	<p>First 100 – 200 km, depending upon riding conditions. In wet and muddy environments, it is recommended to decrease the interval to 100 km.</p>
<p>Periodic maintenance - TO</p> <p>For regular periodic maintenance perform steps 1 – 12, 17 – 20, 26, and 44 – 59.</p>	<p>Every six months, if riding in dry conditions.</p> <p>Every three months in wet and/or muddy conditions.</p>
<p>Bearings replacement</p> <p>Before replacing bearings perform steps 1 – 12. Follow with steps 13 – 16, 21 – 26, and 27 – 43. Finally, complete steps 44 – 59.</p>	<p>As needed.</p>

Do not use high pressure cleaning equipment with Trailmech hubs, as such practice may lead to degradation of the lube/grease, including that in the bearings, and significantly shorten the lifetime of the hub and/or its components.

Symptoms	Recommendations
<p>Skips occur when the rear hub engages. When switching to pedaling from freewheeling, the hub may not lock-in immediately, but following one or several skips. The hub produces sharp clicks when skips occur.</p>	<p>Possible reasons:</p> <ol style="list-style-type: none"> 1. Thick oil or grease was used to lubricate the Vortex. This may lead to the floating part “sticking”, and thus not engaging correctly. Replace lube in the mechanism. See OILS & LUBES 2. Loose drive side endcap. This may lead to axel play in the freehub. Because of the increased space between Vortex rings, the floating part may not lock-in reliably and skip. Ensure that endcaps are properly tightened to the recommended torque. 3. There are elements on mechanism’s splines inside the hub shell. Dust and other particulates, together with lube gradually accumulate inside the hub shell, including on its splines. The particulate obscures the free movement of the floating Vortex ring along the splines. Perform regular maintenance procedures.