

"Quicker than the surf"

France 1994. The atmosphere at the "Tour de France" was exhilarating and working with the teams and mechanics was exciting too. Our *Rohloff S-L-T 99* chain has proven a success with its reliability! So at last, a couple of quiet days on the Atlantic coast. Why not take the Mountain bike on the beach?! Crazy idea, yes! Riding exactly where the surf runs out! After just 200m, total stand still! The rear wheel is stuck fast in the wet sand. Changing the gears impossible! Derailleur gears won't work when you are stuck! The next wave came and both rider and bike received the first salt-water shower. Chain and sprockets are grinding full of fine sand. The next wave came - now nothing works. The waves were rolling in faster than we could change gears.

Still, it must feel great to have the waves roll out under the bottom-bracket. This idea didn't let go of me.

The lights were now burning bright and late into the night. The construction department in the Rohloff Company was working overtime. Successful gear changes and sprocket combinations were investigated. Mountainbike, downhill, touring and everyday riders were asked along with sports physicians: How many gears do you need and what has a gear hub got to be capable of in order to achieve maximum riding fun? 1997: finally we had our answer and put it to the test! Guess where...

The rear wheel is stuck fast in the wet sand. The first wave is coming. Change the gears down while stuck. 1st gear, gentle on the pedals, riding further - 2nd - 3rd - 4th... These gears are quicker than the surf!

30 km of beautiful sandy beach lay ahead of us. It is a great feeling to have the waves roll out under the bottom bracket!

Bernhard Rohloff



This Owners Manual is also available in a variety of other languages. Should you require a different version, you can download it from our homepage under:

www.rohloff.de > Service > Downloads > Documentation

The following languages are available:

- English**
- German**
- Dutch**
- French**
- Italian**
- Russian**



TIP



- Owners Manual - Newest version**
- Videos**

The newest version of this Manual is available on the web under:
www.rohloff.de > service > downloads > documentation > owners manual

Further to the manual, the most important work, service and repairs on the *Rohloff* SPEEDHUB 500/14 are shown in short films on the web.
www.rohloff.de > Technology > Workshop > Videos ...





Rohloff

SPEEDHUB 500/14

Owners Manual

***General Use
Technical Information***

Mounting

Service

Repairs

Appendix





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Rohloff SPEEDHUB 500/14 CC DB OEM mounted in a frame with adjustable Rohloff OEM dropouts

Warranty of the Rohloff SPEEDHUB 500/14

Each *Rohloff SPEEDHUB 500/14* has an individual Serial Number. This can be found printed either on the hub shell sticker (<~ number 74770) or engraved into the hub shell (>~ number. 74771).

ATTENTION

All entitlements to a guarantee are deleted if this serial No. Can not be produced. Warranty claims can only be processed if the guarantee card can be presented with the hub.

Further information on the guarantee card can be found in the appendix under “Pointers on the Serial No.”.

To help us keep tabs on theft, it is advisable to register the Serial No. With us by way of the guarantee card.

A more precise explanation of the guarantee conditions can be found on the guarantee card itself which is included with every *Rohloff SPEEDHUB 500/14* purchased.



With the Rohloff SPEEDHUB 500/14 in the fast lane

This handbook covers everything of interest about the *Rohloff SPEEDHUB 500/14*. It contains important information over the use, the component choice, the mounting, the service and the repairs. Should you still have any questions or queries after reading this handbook than please contact your local dealer or visit us on the web under www.rohloff.de.

Due to us constantly improving our products, the shape of the parts or the contents of the package may vary from those illustrated in this handbook. We kindly ask you to show some consideration.

The first chapter

Riding with the *Rohloff SPEEDHUB 500/14*

you will find everything you need to know about riding with the *Rohloff SPEEDHUB 500/14*.

In the following sections

- **Technical data**
- **Securing to the frame**
- **Shifter cable routing**
- ***Rohloff SPEEDHUB 500/14* variations**
- **The wheel**
- **Which components are recommended**
- **Special applications**

you will find all the technical information needed to select the correct version of the *Rohloff SPEEDHUB 500/14* for your needs.

In the chapters

- **Mounting**
- **Service**
- **Repairs**

you will find all the technical information needed for the mounting and service of the *Rohloff SPEEDHUB 500/14*.

Please read the important safety information carefully.

Every bicycle equipped with a *Rohloff SPEEDHUB 500/14* should come complete with the following:

- A guarantee card (with dealers stamp and Serial Number).
- An owners Manual for the *Rohloff SPEEDHUB 500/14*.
- An oil filling tube.

Please read the important safety information before riding off!



Riding with the SPEEDHUB 500/14

Safety information

Bike riding is fun but it is also tied up with dangers. When your bike is not regularly maintained and kept in good condition, these dangers increase. These dangers, however, can be prevented when you read this handbook and the following safety information carefully. A incorrect fitment of the vital components could result in a crash, with possible life threatening injuries.

Mounting

- We recommend all fitting and assembly of our products should be carried out by a professionally qualified workshop.
- Improper work and customizing may result in malfunction and this in turn could lead to accidents occurring.
- Please make sure that you have the correct *Rohloff SPEEDHUB 500/14* model for your type of bike frame.
- All the bolts must be secured to the given tightening torques.
- The smallest permitted sprocket ratio must not be undercut.
- If a chain tensioner is in use at the rear, a chain guide must be used in conjunction up front to prevent the chain from springing off the chainring.
- On rear suspension frames the chain must be kept at a suitable length that allows the rear triangle to move the full amount of shock travel.
- When filling the *Rohloff SPEEDHUB 500/14* with oil for the first time as well as when changing the oil, make sure you use only *Rohloff SPEEDHUB* oils as recommended for the *Rohloff SPEEDHUB 500/14*.

Usage

Before riding with your *Rohloff SPEEDHUB 500/14* please follow the next few steps in order to truly trust the products service.

- Let your bike be regularly checked by a specialist workshop to make sure that it functions safely.
- When starting off, especially after a gear change, you must check the gear has engaged properly.
- Make sure you carry out the safety checks on all the other mounted components of your bike.
- Before a long journey or tour, a test ride must be taken. Through this process any mounting mistakes or loss of functions can be noticed and corrected. Also see '**Transport/Info for the tour**'.
- When utilizing a bicycle equipped with a '**Gates Carbon Drive**' belt transmission, it is important to adhere to the manufacturers instructions printed within their Owners Manual. Europe: www.carbondrive.net and US: www.gatescarbondrive.com
[Http://www.g-boxx.com/pdf/Gates-Rohloff-manual-en.pdf](http://www.g-boxx.com/pdf/Gates-Rohloff-manual-en.pdf)





Riding with the *SPEEDHUB 500/14*

- Cycling through deep water with a *SPEEDHUB* is not permitted. Do not submerge the *SPEEDHUB* as water will penetrate the gear-unit.
- Unprotected transportation on a motor vehicle through heavy rain can also lead to water penetration and should be avoided.
- An oil change should be completed immediately if you believe water may have penetrated the gear-unit. This will ensure any potentially penetrated moisture is rinsed back out.

Check regularly:

- That the *Rohloff SPEEDHUB 500/14* is correctly and securely mounted in the frame (quick release axle max. 7Nm or threaded axle max. 35Nm).
- That all hub cap screws are correctly tightened, especially on *DB* versions of the *Rohloff SPEEDHUB 500/14* that incorporate the use of a brake disc.
- That the hubs torque securing system is correctly fastened to the frame.
- That the brake surfaces are free from oil and grease.
- That the shifter cables and connectors are correctly and securely connected (bayonet connectors or external gear mech).
- That the parts on your bike are not damaged or failing to function properly as the result of an accident. The use of damaged parts can result in further accidents occurring.



Rohloff SPEEDHUB 500/14 CC DB OEM mounted in a frame with adjustable *Rohloff* OEM dropouts



Riding with the *SPEEDHUB 500/14*

Changing gears

All 14 gears of the *Rohloff SPEEDHUB 500/14* are selectable through one twist shifter, so that in one turn it is possible to change up or down by one or more gears.

The mark on the twist shifter casing next to the gear numbers informs the user of which gear has been selected. The assembly instructions show the twist shifter being fitted to the right hand side of the handlebars, however, in special circumstances it is possible to fit the twist shifter to the left hand side. When rotating the twist shifter in the direction of #14, a harder, faster gear is selected. When rotating the twist shifter in the direction of #1, an easier, slower gear is selected.

In contrast to other gear systems on the market, with the *Rohloff SPEEDHUB 500/14* there is no delay between gear selection on the twist shifter and gear change in the hub. The moment the notch can be felt in the twist shifter, the gear has been changed. Therefore a quick and failure free gear change is possible whilst riding and also when stationary.

When changing, gear coupling elements inside the hub must move and when there is more pressure on the pedals it is obvious there is more pressure on these coupling elements resulting in a harder gear change. Whilst stationary or when there is less pressure on the pedals, the twist shifter has less resistance and therefore a lighter gear change is possible. In a situation whereby it is not possible to reduce the pressure on the pedals (e.g. hill climbing), it is still possible to change gear quickly and smoothly. Simply change gear when the cranks are in a straight up-down position where hardly any pressure is being applied upon the pedals.

ATTENTION

Changing gear with the *Rohloff SPEEDHUB 500/14* with pressure on the pedals is not necessary when being used appropriately. However due to the robust construction of the *Rohloff SPEEDHUB 500/14* changing gear under pressure is possible and is not harmful to the hub. It is however possible that when changing gears under high pressure the hub could accidentally fall into a neutral gear, this is due to the coupling elements not seating correctly into the next elements and therefore rebounding back. If this occurs the rider could lose balance and crash. Changing gears under high pressure is at the riders own risk.

Particulars:

If changing up and down slowly or under high pressure between the gears #7 and #8, it is possible to fall momentarily into gear #11 or #14.





Riding with the SPEEDHUB 500/14

Riding noises

One of two different riding noises could be heard depending upon which gear is selected. A construction characteristic produces a freewheeling noise which is can be heard in most gears - particularly noticeable in gears #5, #6 & #7. A higher frequency is produced when riding with a higher force upon the pedals. This causes the volume of the lower gears to increase towards gear #7 - a typical characteristic of straight-toothed precision gears.

Different frame designs can amplify or deaden these audible noises because the tubes of the frames react as a resonator for the sound waves. Larger diameter tubes offer more room for sound waves thus the noise is amplified. Different noises are noticeable whilst freewheeling depending on which gear is currently selected. This is due to different elements of the gear mechanism rotating within the hub.

Break in period

All the gears and coupling elements of the *Rohloff SPEEDHUB 500/14* are built from specially hardened steel and are precision finished. In the first 1000km use, the *Rohloff SPEEDHUB 500/14* loses microscopic particles from all functioning components as part of the hubs last fine filing. After this process is completed the riding noises quieten and the changing of gears becomes easier. During this process it is not necessary to take extra special care.

Pushing the bike

Should the bike be pushed, it is possible that the cranks could also start to turn. This occurs due to the hub seal automatically activating the sprocket. Bad seals and a very light running bottom bracket make it easier for the cranks to turn. A drop of *Rohloff cleaning oil* (Art. #8402) through the holes in the sprocket onto the hub seal will reduce this activating effect.

Wearable parts

The wearable parts are: The sprocket, chainring, jockey wheels on the chain tensioner, twist shifter rubber grip, shifter cables and the brake disc. How quick the parts wear is down to how the product is used and cared for (pressure, dirt, weather and care). To guarantee the safe function, these parts must be replaced as soon as they are no longer capable of performing correctly. Let the workings of your bike be regularly checked over by a professional bike workshop.





Riding with the SPEEDHUB 500/14

Maintenance and care

The gears of the Rohloff SPEEDHUB 500/14 are protected from dust and harmful moisture due to running in an oil bath. The maintenance and care of the Rohloff system is limited to the following points:

- Chain and chain tensioner (where applicable) should in regard to regular use (at the latest after riding in rain) be cleaned and re-lubricated.
- The cable box of the external gear mech should be demounted approx. every 500km, cleaned and the cable pulley lightly greased from the hub-facing side.
- The shifter cable tension should be regularly checked, and when necessary altered by the cable adjusters.
- The Rohloff shifter cables are made from high-quality stainless steel and run in a nylon lined steel, spiral-wound cable housing which is protected at each end with a sealed ferrule. The cables are routed lubricant free and must not be greased or oiled. The stainless steel/nylon combination runs service-free.

Changing the oil in the Rohloff SPEEDHUB 500/14:

The Rohloff SPEEDHUB 500/14 is filled with 25ml of Rohloff SPEEDHUB OIL. This exact amount of oil is optimum for both the bearings and gears of the Rohloff SPEEDHUB 500/14. The oil must be changed at least once a year or every 5000km. This process enables us to ensure any lost oil is replaced and any penetrated moisture is rinsed back out (see chapter 'Service', paragraph 1. 'Oil change').

Cleaning the Rohloff SPEEDHUB 500/14:

Use only un-pressurized water and gentle cleaning fluids. Do not use a high power jet wash system, brushes or abrasive materials for cleaning purposes.

ATTENTION



Water may pass under the SPEEDHUB seals when using a high pressure wash system, steam cleaner, transporting the bicycle on a car through heavy rain or submerging the rear wheel. For this reason, these situations should be avoided. If not avoidable, we recommend that an oil change is performed immediately after so as to ensure any potentially penetrated moisture is rinsed back out of the SPEEDHUB before it can do any damage.





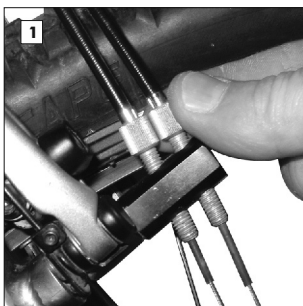
Riding with the *SPEEDHUB 500/14*

Maintenance and care

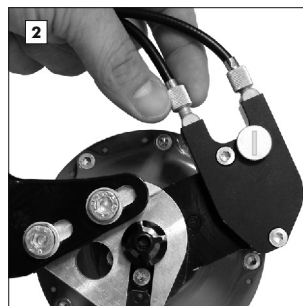
The shifter cable tension can be altered by the cable adjusters. Winding the cable adjusters out increases cable tension. **For the lightest possible gear change, the tension should be just enough that on the twist shifter there is approx. 2mm rotational play when in a selected gear.** The mark on the twist shifter body can be aligned to the correct gear number without altering the cable tension by winding one cable adjuster in and the other out.

ATTENTION

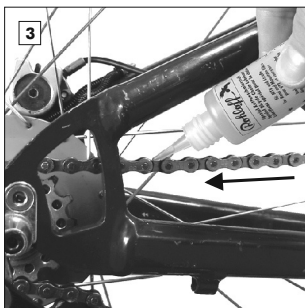
amount of friction within the shifter cables and in turn raises the force needed on the twist shifter to select other gears.



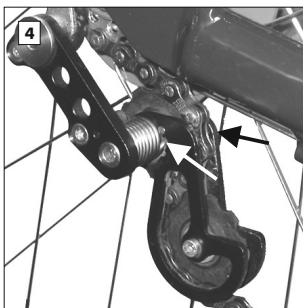
On the versions with an internal gear mech the cable adjusters are to be found on the cable guide. This can be found on the left hand chain stay or attached to the left hand brake boss of the frame.



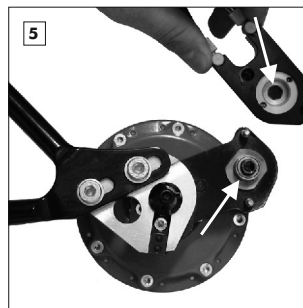
On the versions with an external gear mech the cable adjusters are to be found on the cable box which sits directly on the left hand side of the *Rohloff SPEEDHUB 500/14*.



When lubricating the chain place a thin thread of lubricant on the outside of the chain over the centre rollers, this process is carried out quicker and easier when running the chain backwards whilst applying the lubricant.



To lubricate the chain tensioner place a drop of oil on the left and right side of the upper jockey wheel on the pivot point.



Rohloff SPEEDHUB 500/14 versions with external gear mech: To lubricate the cable pulley bearing remove the cable box and place a little grease on the parts arrowed in the diagram above.

ATTENTION

When using a disc brake in conjunction with the *Rohloff SPEEDHUB 500/14*, the hub cap screws should be checked that they are correctly tightened before every ride. To reduce the chance of a flange breaking due to unequal spoke tension, we recommend that this is regularly checked by a professional bicycle mechanic.



Riding with the SPEEDHUB 500/14

Transportation

If transporting a bike fitted with a *Rohloff SPEEDHUB 500/14*, care should be taken that the rear wheel is transported in an upright position. In a car or an aeroplane, there could be great changes in the air temperature/pressure. When the wheel lies on its side, oil could seep out of the seals because the oil is sitting directly over these seals on either the left or the right side. Transportation in the upright position will prevent the air temperature/pressure in having an effect over the *Rohloff SPEEDHUB 500/14*. If it is not possible to transport the wheel in the upright position due to according packaging requirements, don't worry. The leakage of oil will not cause any damage.

Info for the tour

The Rohloff SPEEDHUB 500/14 immediately proved itself the optimum gear system, especially for tours and long journeys due to its durability, long life and the strength of the final wheel itself. Of course, good materials should always be used, so that the other parts on the bike start out not ruined, dirty, over lubricated, worn, so that their function is impaired or even damaged. Therefore, we suggest that in regard to poor parts on the bike you should always carry a few important tools with you. Our service team is on the net and you can Email us at service@rohloff.de. We endeavor to help with any technical problems and, when necessary, ship spare parts out all over the world. However, due to extremely high postage costs or lack of service in some countries, this is not always possible. You should therefore take consider carrying selected spare parts (in case of accident damage or excessive wear), a range of tools and this Owners Manual along for the tour. Owners manual also available online here: <http://www.rohloff.de/en/service/downloads/documentation/index.html>

Tools for on the go:

- 2mm allen key (male/female connectors, cable pulley screws)
- 2.5mm allen key (twist shifter securing screws)
- 3mm allen key (drain screw)
- 5mm allen key (securing bolts for torque arm/chain tensioner)
- 8mm wrench (for turning the shifting rod)
- 15mm wrench (for axle nuts where applicable)
- Chain lubricant and grease
- Torx TX20 (all other bolts of the *Rohloff SPEEDHUB 500/14*)

For long distance journeys the following should also be taken along:

- Oil change kit (Art. #8410)
- Sprocket tool (Art. #8508)
- Spare chain and sprocket, spokes and shifter cables
- Internal gear mech: spare hub cables (Art. #8271) or with a quick-change axle ring (after Serial Number 25300) Hub cable Easy Set (Art. #8573) or the complete axle ring set (Art. #8572)





Riding with the SPEEDHUB 500/14

Emergency repairs on the go

Several repairs can be improvised in emergency situations

Breaking of a hub cable (internal gear mech):

Remove axleplate and cable pulley, then use an 8mm wrench to select a suitable gear (e.g. gear #7). Riding further is now possible using this one gear.

Breaking of a shifter cable (internal gear mech):

Pull the hub cable until a suitable gear is found (e.g. gear #7). Riding further is now possible using this one gear.

Male or female connector lost or damaged (internal gear mech):

Join the hub cable and shifter cable together using an electrical terminal block.

Breaking of a shifter cable (external gear mech):

Remove the cable box and use an 8mm wrench select a suitable gear (e.g. gear #7). Riding further is now possible using this one gear.

Safety ring (and pin) of the quick release on the torque arm (where applicable):

Use an M6 nut and bolt or improvise by using binding wire.

Loss of oil:

Loss of oil through sweat oil or the light leakage of oil through the seals is harmless. Therefore, travelling further until the next scheduled oil change (every 5000kms or once per Annum) is not harmful to the gear-unit. See point 14 of 'oil leakage' in the appendix.

If you re experiencing any problems, please contact your nearest Rohloff agent:

http://www.rohloff.de/en/company/contact/rohloff_world_wide/index.html

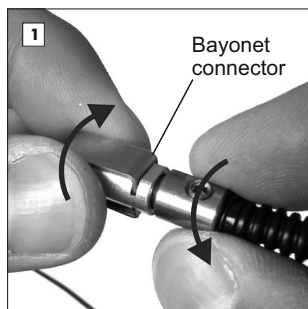


Wheel removal

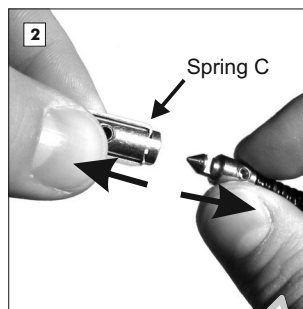
To remove the rear wheel, please take note of the following steps:

1. Separate the gear mech 1.1 or 1.2
2. Loosen axle and where appropriate the torque arm 2.1 or 2.2
3. Removal of the wheel from the frame 3.1 and/or 3.2

1.1 Separating the internal gear mech:



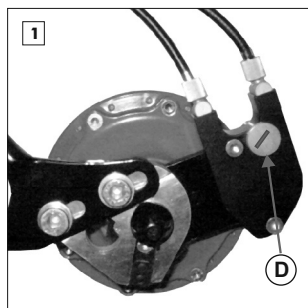
Separating the gear mech involves opening the bayonet connectors. To do this easily, select a middle gear, so that these connectors are in an easily reachable position. Next, to open the connectors, twist the male and female parts 90° in opposite directions whilst pulling them apart.



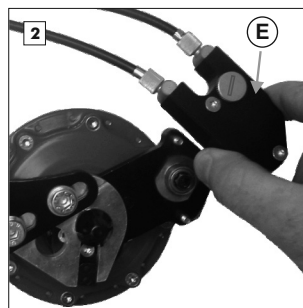
ATTENTION !

When opening the connectors, do not hold the female connector by the spring as this makes separating the connectors considerably more difficult.

1.2 Separating the external gear mech:

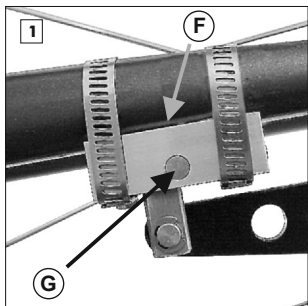


Separating the gear mech involves removing the cable box. Cable box sits over a hexagonal peg which joins it to the external transfer box. The wheel should be removed in gear #14 to make remounting the wheel easier. Loosen knurled head screw **D** and remove cable box **E**.

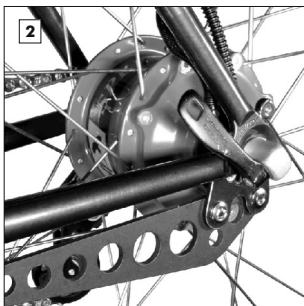


2. Loosening the torque support on versions with a long torque arm

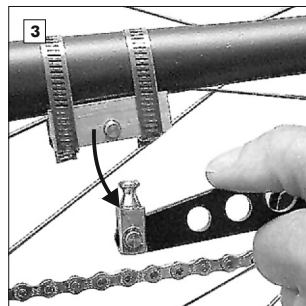
2.1 CC versions



Open the quick release **F** by pushing the locking pin **G** from the inside of the frame in an outward direction away from the wheel.

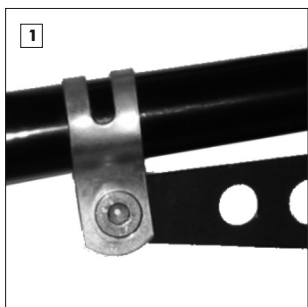


Open the axle quick release lever.

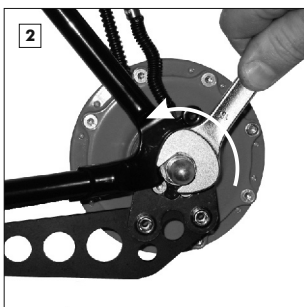


Pull the torque arm down in the direction of the arrow to release it from the frame.

2.2 TS versions

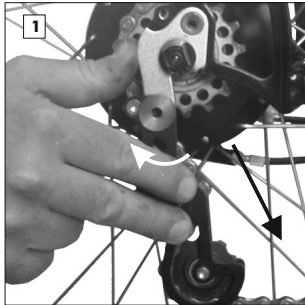


Loosen the torque arm clamp bolt by unscrewing it with a 4mm allen key.



Loosen the axle nuts with a 15mm wrench.

3.1 Removal of the wheel from the frame



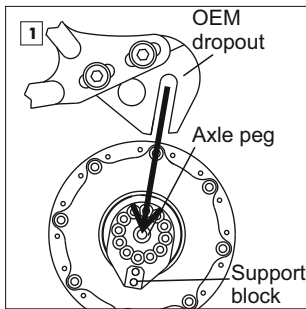
ATTENTION

A chain tensioner prevents the easy removal of the rear wheel (when mounted). The chain tensioner must be pulled backwards in the direction of the arrow to allow the sprocket to pass the chain tensioner. When, however, it is a DH chain tensioner, the mounting bolt must be loosened before the rear wheel can be removed.

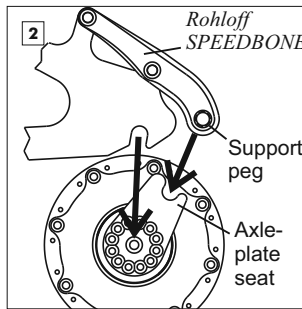
Remove the wheel from the dropouts and the chain from the sprocket.

3.2 Wheel removal - OEM and OEM2 versions

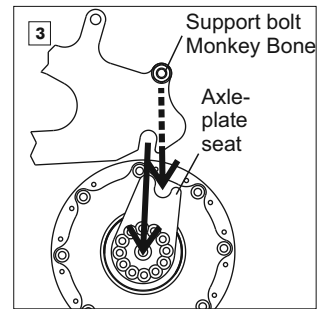
No loosening of a torque arm is necessary with these versions. Simply open the quick release lever (CC versions) or loosen the axle nuts (TS versions).



On the OEM versions, the axle and the support block are released together from the OEM dropout.



On the OEM2 versions with *Rohloff SPEEDBONE*, the axle falls out of the dropouts at the same time as the axle plate seat falls away from the *Rohloff SPEEDBONE* support peg.



On the OEM2 versions with just a support bolt or Money Bone, the axle falls out the dropout at the same time as the axle plate seat falls away from the support bolt/Money Bone.

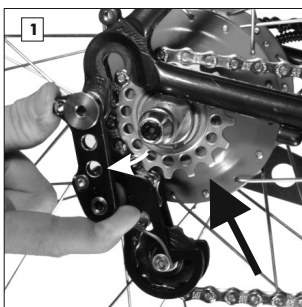
Wheel installation

Please take note of the following steps when mounting the wheel to the frame:

1. Installation of the wheel into the frame 1.1 and/or 1.2
2. Securing of the axle and, where appropriate, the torque arm 2.1 or 2.2
3. Joining of the gear mech 3.1 or 3.2

1.1 Wheel installation

Place the wheel into the dropouts, taking care that the chain is sitting properly on the sprocket and that the hub cables do not get clamped between the dropouts and the axle.

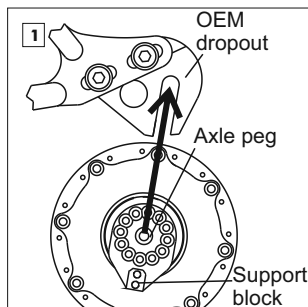


ATTENTION

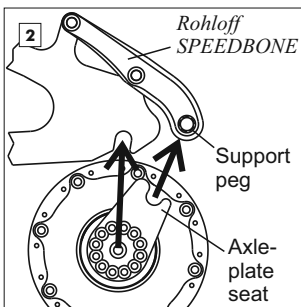
A chain tensioner prevents the easy installation of the rear wheel (when mounted). The chain tensioner must be pulled backwards in the direction of the arrow to allow the sprocket to pass the chain tensioner. When, however, it is a DH chain tensioner, then the mounting bolt must be loosened before the rear wheel can be installed.

1.2 Wheel installation - OEM or OEM2 versions

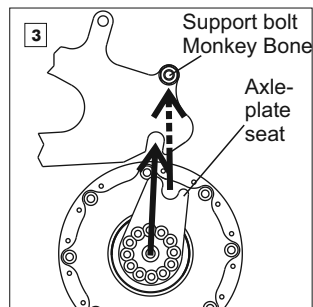
On the OEM or OEM2 versions, the axle and the torque support are installed together.



On the OEM versions, the axle must enter the long OEM dropout first, followed by the support block into the same slot.



On the OEM2 versions with *Rohloff SPEEDBONE*, take care that the *Rohloff SPEEDBONE* support peg lines up with the axle plate seat as the axle is entered into the dropouts.



On the OEM2 versions with just a support bolt or Monkey Bone, take care that the support bolt or Monkey Bone lines up with the axle plate seat as the axle is entered into the dropouts.

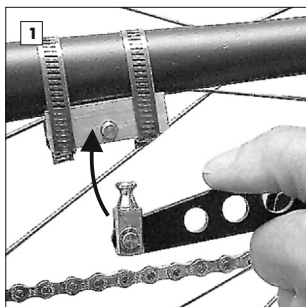
After installing the wheel, close the quick release lever (CC versions - tightening torque: max. 7Nm/62in.lbs.) or tighten the axle nuts (TS versions - tightening torque: max. 35Nm/310in.lbs.).

ATTENTION

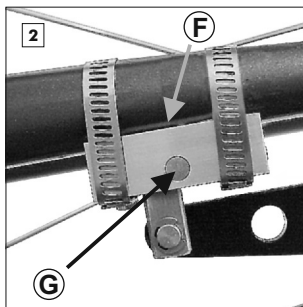
Before closing the quick release lever or tightening the axle nuts, check that both sides of the axle sit properly in the dropouts and that the wheel runs in the center of the frame.

2. Securing the long torque arm

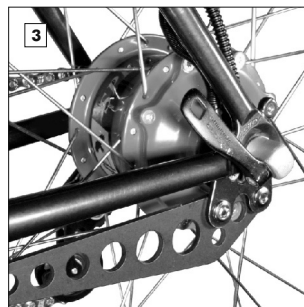
2.1 CC versions



Swing the torque arm into the quick release block in the direction of the arrow shown.



Close the quick release **F** by pushing the quick release pin **G** in the direction of the wheel, so that the outside of the pin is flush with the quick release block.

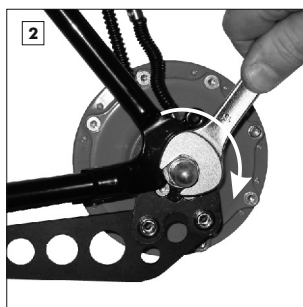


Close the quick release lever (max. 7Nm)

2.2 TS versions



Swing the torque arm in the direction of the securing clamp until it is possible to push the securing bolt through the holes of the clamp and the torque arm. Check that the axle is sitting properly in the dropouts.

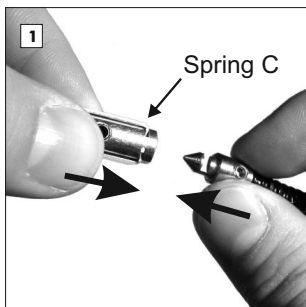


Tighten the axle nuts (tightening torque: 35Nm/310in.lbs.). With the nut and washer, tighten the torque arm securing bolt with 4mm allen key (tightening torque: 6Nm/51in.lbs.).

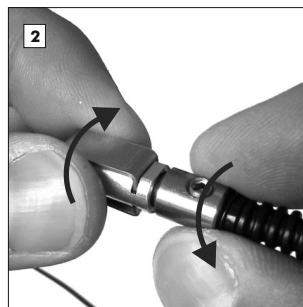
ATTENTION

Before closing the quick release lever (max. 7Nm/62in.lbs.) or tightening the axle nuts (max. 35Nm/310 in.lbs.), check that both sides of the axle sit properly in the dropouts and that the wheel runs in the centre of the frame.

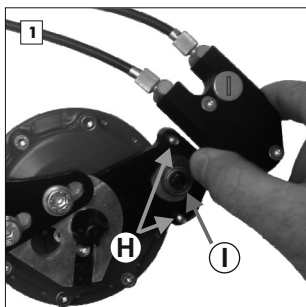
3.1 Joining together of the internal gear mech:



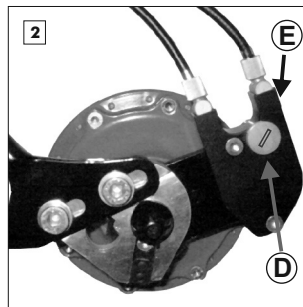
To rejoin the gear mech, the male and female bayonet connectors must be joined back together. Pay attention not to cross these cables over when joining the hub and shifter cables together. Push the male connector into the female connector until the spring locks them together. Take care not to hold the female connector by the spring.



3.2 Joining together of the external gear mech:



Rejoining the gear mech involves remounting the cable box. Place the twist shifter into gear #14 then place cable box **E** over the hexagonal peg **I**, so that the two locating pegs **H** sit into the two holes in the back of the cable box. Turn the twist shifter back and forth around gear #14 until the cable box falls into place over the hexagonal peg. Lastly tighten up the knurled head screw.



ATTENTION

Should all 14 gears not be selectable after fitting the cable box, it will be down to the hub or the twist shifter not being in gear #14. There are two methods to correct this.

Method 1:

Remove cable box and turn the twist shifter into gear #1. Refit cable box and shift until it can no longer be turned. If you are not in gear #14 of the twist shifter then disconnect the cable box and turn the twist shifter into gear #14. Now reconnect the cable box to have access to all 14 gears.

Method 2:

Remove the cable box and turn the twist shifter into gear #14. Take an 8mm wrench and use it to turn the hexagonal peg on the external transfer box anticlockwise until it reaches the end stop. Now the hub is in gear #14, so the cable box can be remounted.



Technical data

Number of gears:	14
Gear increases:	even 13.6%
Range of gears:	526%
Frame spacing:	135mm (XL Version = 170mm/XXL Version = 190mm)
Number of spoke holes:	32/36 (XL/XXL Version = 32 hole only)
Spoke flange distance:	58mm, symmetrical (XL/XXL Version = 93mm)
Spoke hole circle diameter:	Ø100mm
Spoke hole diameter:	Ø2.7mm
Spoke flange width:	3.2mm
Axle diameter at dropout:	9.8mm
Axle overall width CC:	147mm (XL Version = 182mm/XXL Version 202mm)
Hollow axle inner diameter:	Ø5.5mm, for quick release lever
Total axle width TS:	171mm / TS long 179mm
Total axle width TS (XL Version):	206mm / TS long 214mm
Axle thread TS:	M10x1
Center disc mounting diameter:	Ø52mm
Mounting bolt hole circle diameter:	Ø65mm
Brake disc mounting bolts:	4 x M8x0.75
Distance between dropout and center disc mount:	16.3mm (Is1999)
Weight:	1700g (CC), 1800g (CC EX), 1825g (CC DB)
Weight (XL Version/XXL Version)	1980g (XL CC DB OEM2)/ 2005g (XXL CC DB OEM2)
Oil volume:	25ml max.
Sprocket thread:	M34x6 P1, tolerance 6H
Sprocket type:	for bicycle chain 1/2" x 3/32" (ISO Nr. 082)
Number of sprocket teeth (16 standard):	13, 15, 16, 17 threaded- or 13-19 + 21 splined-sprocket
Chainline (135mm/142mm):	55mm (57mm for 13T & all splined sprockets)
Chainline (XL/XXL Version):	73mm (75mm for 13T & all splined sprockets)
Smallest permissible gear ratios: 40/21, 36/19, 34/18, 32/17, 30/16, 28/15, 28/14, 26/13 (transm.-factor ~ 1.90)	
(Riders over 100kg/tandem): 53/21, 48/19, 45/18, 42/17, 40/16, 38/15, 36/14, 34/13 (transm.-factor ~ 2.50)	
Gates Carbondrive beltline:	54.75mm (XL/XXL Version = 73mm)
Smallest permissible belt sprocket ratios (26"): 39/19, 39/20, 42/22, 46/24 (transmission factor ~ 1.90)	
(Riders over 100kg/tandem): 46/19, 50/20, 55/22, 60/24 (transmission factor ~ 2.50)	
Maximum input torque:	130Nm
Gear control:	by twist shifter (version right or left)
Twist shifter angle per gear change:	21°/273°
Gear control transfer:	via two shifter cables (pull-pull system)
Shifter cable movement per gear change:	7.4mm/96,2mm
Inner gear ratios (hub rotation per sprocket rotation):	
Gear #1:	0.279
Gear #2:	0.316
Gear #3:	0.360
Gear #4:	0.409
Gear #5:	0.464
Gear #6:	0.528
Gear #7:	0.600
Gear #8:	0.682
Gear #9:	0.774
Gear #10:	0.881
Gear #11:	1.000
Gear #12:	1.135
Gear #13:	1.292
Gear #14:	1.467

The Rohloff AG reserves the right to change the technical specifications without prior warning.





Weight comparison

The *Rohloff SPEEDHUB 500/14* is with a weight of 120g per gear, the lightest gear hub on the market. The gear range is the same as high quality 27 gear derailleur systems due to the 14 gears within the hub being evenly spaced out at 13.6% increases. With the *Rohloff SPEEDHUB 500/14* there is no longer a need for the following parts:

- Front and rear derailleur
- Two shifters including
- Rear hub with cassette
- Small and middle chainrings
- The total average weight of all these components is approx. 1600g.

The weight of a fitted *Rohloff SPEEDHUB 500/14* CC OEM including twist shifter, shifter cables and cable guide is approx. 1820g.

The comparison between the *Rohloff SPEEDHUB 500/14* and the derailleur system shows only a slight increase in weight. For that, the user receives a:

- Service-free,
- dirt-free full-encapsulated,
- user-friendly gear system and
- high reliability
- alongwith a long life span.

Comparison of mechanical efficiency

The mechanical efficiency* and consequently the size of the loss of the *Rohloff SPEEDHUB 500/14* is entirely comparable with that of the derailleur system.

The losses of a derailleur system consist of the friction caused by the bottom bracket, chain, cassette and the hub bearings. The amount of friction loss depends on the size of the sprockets, the angle of the chain line and condition of wear. In reality this proves to be 1 - 5%, leaving the derailleur system with a working efficiency lying between 95% and 99%.

The losses of the *Rohloff SPEEDHUB 500/14* are caused by the friction coming from the bottom bracket, chain and gearbox. Here, however, the chain runs in a straight line from just one chainring reducing sideways friction on the sprockets. Most of the friction occurs when all the planetary gear sets are used within the gearbox. The overall average loss of the gears within the *Rohloff SPEEDHUB 500/14* is approximately 1 - 5%, leaving the working efficiency between 95% and 99%.

The *Rohloff SPEEDHUB 500/14* is, therefore, consequently an optimum choice for the everyday and sports rider.

* More detailed info over the working efficiency is to be found on the web under www.rohloff.de.



Sprocket ratios

The Rohloff SPEEDHUB 500/14 has a 526% range of gears, that means gear #14 is 5.26 times greater than gear #1. The 14 gears are evenly spaced out over this range in 13.6% increases. Through the choice of chainring and sprocket in use, the Rohloff SPEEDHUB 500/14 can be tuned for the specific riding purpose. The Rohloff SPEEDHUB 500/14 comes standard with a 16 tooth sprocket. 13, 15 and 17 tooth sprockets are available as alternatives.

In the following tables the distance travelled per crank revolution is listed for gears #1 and #14. The listed distance travelled per crank revolution is shown in the tables for a variety of sprocket ratios and wheel sizes (20", 26" and 28" wheels).

When the particular wheel/sprocket/chainring size and gear is not listed in the tables, then the following formula can be used to calculate the exact distance travelled per crank revolution of the Rohloff SPEEDHUB 500/14:

$$\text{Distance travelled per crank revolution} = W \times C, S \times \text{IGR}$$

Formula key:

- W = Wheel circumference
- C = Chainring size
- S = Sprocket size
- IGR = Inner gear ratio listed in the following table

Inner gear ratio IGR = hub revolutions per sprocket revolutions of the Rohloff SPEEDHUB 500/14

gear #	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IGR	0.279	0.316	0.360	0.409	0.464	0.528	0.600	0.682	0.774	0.881	1.000	1.135	1.292	1.467

The tables or the following formula can be used to compare the Rohloff SPEEDHUB 500/14 to a derailleur gear system:

$$\text{Ratio of the derailleur gear system} = C, S$$

$$\text{Ratio of the Rohloff SPEEDHUB 500/14} = \text{IGR} \times C, S$$

Smallest permissible sprocket ratios (solo 100kg)

The sprocket ratio on the Rohloff SPEEDHUB 500/14 (e.g. 42:16) converts the slow rotational speed at the crank into a fast rotational speed at the sprocket and reduces the input torque for the Rohloff SPEEDHUB 500/14 in the same proportion. To prevent overstraining the hub, a **minimum sprocket ratio of 1.90** must be used. With the available sprockets these minimum ratios are achieved by: **40:21, 36:19, 34:18, 32:17, 30:16, 28:15, 28:14, 26:13**. This resembles a derailleur transmission of 22:40. Larger chainrings can be used without exceptions.



If mounted on a tandem or if the rider weighs over 100kg, the following sprocket ratios must not be undercut: 53:21, 48:19, 45:18, 42:17, 40:16, 38:15, 36:14, 34:13. This equates to a transmission factor of 2.50.



Derailleur gears in comparison to Rohloff SPEEDHUB 500/14

The table shows which sprocket ratio on the *Rohloff SPEEDHUB 500/14* must be used to resemble the smallest transmission of a derailleur gear system.

Smallest sprocket ratio of derailleur gears	Gear #1 Rohloff SPEEDHUB 500/14 sprocket ratio			
22/40	26/13	28/15	32/16	34/17
24/40	28/13	32/15	34/16	36/17
26/42	28/13	34/15	36/16	38/17
20/34	28/13	32/15	34/16	36/17
22/34	30/13	34/15	38/16	40/17
24/34	32/13	38/15	40/16	44/17
26/34	36/13	42/15	44/16	46/17
20/32	30/13	34/15	36/16	38/17
22/32	32/13	36/15	40/16	42/17
24/32	34/13	40/15	44/16	46/17
26/32	38/13	44/15	46/16	50/17
20/30	32/13	36/15	38/16	40/17
22/30	34/13	40/15	42/16	44/17
24/30	38/13	44/15	46/16	48/17
26/30	40/13	46/15	50/16	52/17

The table shows which sprocket ratio on the *Rohloff SPEEDHUB 500/14* must be used to resemble the largest transmission of a derailleur gear system.

Largest sprocket ratio of derailleur gears	Gear #14 Rohloff SPEEDHUB 500/14 sprocket ratio			
26/10	-	26/15	28/16	30/17
28/10	24/13	28/15	30/16	32/17
30/10	26/13	30/15	32/16	34/17
32/10	28/13	32/15	34/16	38/17
34/10	30/13	34/15	38/16	40/17
36/10	32/13	36/15	40/16	42/17
38/10	34/13	38/15	42/16	44/17
40/10	36/13	40/15	44/16	46/17
42/10	38/13	44/15	46/16	48/17
32/11	26/13	30/15	32/16	34/17
34/11	28/13	32/15	34/16	36/17
36/11	30/13	34/15	36/16	38/17
38/11	30/13	36/15	38/16	40/17
40/11	32/13	38/15	40/16	42/17
42/11	34/13	40/15	42/16	44/17
44/11	36/13	40/15	44/16	46/17
46/11	38/13	42/15	46/16	48/17
48/11	38/13	44/15	48/16	50/17
50/11	40/13	46/15	50/16	52/17
52/11	42/13	48/15	52/16	54/17
54/11	44/13	50/15	54/16	56/17
38/12	28/13	32/15	34/16	36/17
40/12	30/13	34/15	36/16	38/17
42/12	32/13	36/15	38/16	40/17
44/12	32/13	38/15	40/16	42/17
46/12	34/13	40/15	42/16	44/17
48/12	36/13	40/15	44/16	46/17
50/12	36/13	42/15	46/16	48/17
52/12	38/13	44/15	48/16	50/17
54/12	40/13	46/15	50/16	52/17



Technical Data

Rohloff SPEEDHUB 500/14 in comparison to derailleur gears

The table shows which smallest and largest sprocket ratio of derailleur gears resembles the existing transmission of the Rohloff SPEEDHUB 500/14.

Sprocket ratio (chainring/sprocket) <i>Rohloff SPEEDHUB 500/14</i>	Gear #1 resembles a derailleur gear sprocket ratio of		Gear #14 resembles a derailleur gear sprocket ratio of	
38/13	22/26	24/30	48/11	52/12
40/13	22/25	24/27	50/11	54/12
42/13	22/24	24/26	52/11	56/12
44/13	22/23	24/25	54/11	60/12
46/13	22/22	or 24/24	58/11	or 62/12
48/13	22/21	24/23	60/11	64/12
50/13	22/20	24/22	62/11	68/12
52/13	22/19	24/21	64/11	70/12
54/13	22/18	24/20	68/11	74/12
38/15	22/32	24/34	42/11	44/12
40/15	22/30	24/32	44/11	46/12
42/15	22/28	24/30	46/11	50/12
44/15	22/26	24/29	48/11	52/12
46/15	22/25	or 24/28	50/11	or 54/12
48/15	22/24	24/26	52/11	56/12
50/15	22/23	24/25	54/11	58/12
52/15	22/22	24/24	56/11	62/12
54/15	22/21	24/23	60/11	64/12
38/16	22/34	24/36	38/11	42/12
40/16	22/30	24/34	40/11	44/12
42/16	22/30	24/32	42/11	46/12
44/16	22/28	24/32	44/11	48/12
46/16	22/27	or 24/30	46/11	or 50/12
48/16	22/26	24/28	48/11	52/12
50/16	22/25	24/27	50/11	56/12
52/16	22/24	24/26	52/11	58/12
54/16	22/23	24/25	54/11	60/12
40/17	22/34	24/36	38/11	42/12
42/17	22/32	24/34	40/11	44/12
44/17	22/30	24/34	42/11	46/12
46/17	22/29	or 24/32	44/11	or 48/12
48/17	22/27	24/30	46/11	50/12
50/17	22/26	24/29	48/11	52/12
52/17	22/25	24/28	50/11	54/12
54/17	22/24	24/27	52/11	56/12



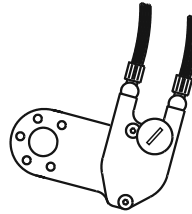
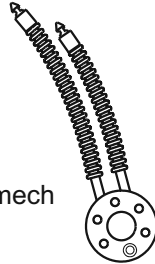
Securing to the frame

Modular parts system

There are basically three different versions of the *Rohloff SPEEDHUB 500/14*. One with a quick release axle (CC versions), one with a threaded axle (TS versions) and one with a 12mm Thru axle frame compatible axle (A12 versions). The only other differences are with regards to the peripheral components. The wide range of these components enable the *Rohloff SPEEDHUB 500/14* to be mounted into nearly every type of bicycle frame.

Gear mech (two options)

Internal gear mech



External gear mech (EX)

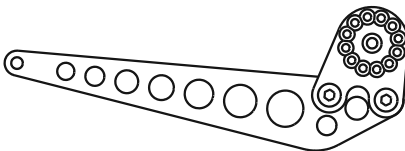
Torque anchoring (4 options)

Long torque arm for mounting to standard frames

OEM mounting for special frames with *Rohloff* OEM dropouts

OEM2 mounting for frames with international standard disc brake mounts (IS2000)

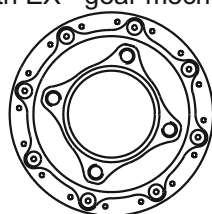
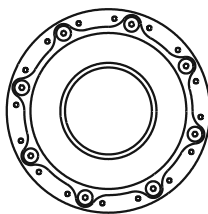
PM mounting for frames with an integrated Postmount brake caliper mount



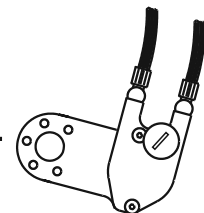
Hub cap (two options)

For bikes using a rim brake type (CC / TS) on the rear wheel

For bikes using a disc brake Type (CC DB / TS DB) on the rear wheel with EX - gear mech



+





Securing to the frame

Axle types

The Rohloff SPEEDHUB 500/14 is available with different axle types. The CC versions come with a hollow axle for use with a quick release lever. The TS versions come with a threaded axle for use with standard M10x1 nuts for securing to the frame and the A12 version are for Thru Axle compatible frames. These are secured via 2x M7x1 bolts and special frame reduction sleeves inserted into the 12mm Thru axle dropouts. The 14 gear mechanism on all versions is primarily the same.



Rohloff SPEEDHUB 500/14 CC (quick release axle)



Rohloff SPEEDHUB 500/14 TS (threaded axle)



Rohloff SPEEDHUB 500/14 A12-PM (for 12x142mm thruaxle frames)



Rohloff SPEEDHUB 500/14 CC XL 170mm (Fatbikes)



Securing to the frame

Torque securing


With all gear hubs the axle tries to rotate whilst cycling. When cycling in a reduction gear, the axle attempts to rotate backwards. When cycling in an increasing gear, the axle attempts to rotate forwards. The force with which the axle tries to turn is referred to as torque. The amount of torque depends upon the force applied on the pedals and the gear selected. This torque must be anchored by some means to the frame in order to create forward drive.

On the simple three-speed hubs a flat sided axle is sufficient to secure the torque within the dropout. On a high performance internal gear hub like the *Rohloff SPEEDHUB 500/14* the method of anchoring the torque must be considerably more stable due to the wide range of gear ratios.

The amount of torque produced is shown in the following table:

Torque in percent of crank torque with a 42/16 sprocket ratio

Gear	1	2	3	4	5	6	7	8	9	10	11	12	13	14
%	98%	82%	68%	55%	44%	34%	25%	18%	11%	5%	0%	5%	9%	12%
Torque	Backward rotation										Forward rotation			

Backwards torque rotation  see picture below or next page, pictures 1, 2 and 3

When the rider applies 20kg onto the pedal, he produces a crank torque of 34Nm. In gear #8 this results in 6Nm torque on the torque arm (18% of crank torque). With the same crank torque of 34Nm in gear #1 this results in 33Nm torque on the torque arm (98% of crank torque). Gear #11 is the direct drive (1:1) the torque on the torque arm is always zero.



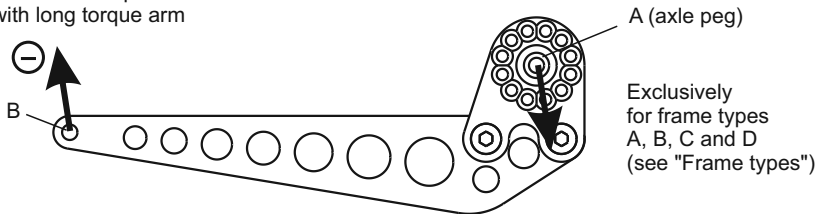
Rohloff SPEEDHUB 500/14 CC OEM mounted in a frame with adjustable *Rohloff* OEM dropouts

Depending on the type of frame one of three options can be used to secure the torque.

- 1) Standard axleplate with long torque arm
- 2) OEM axleplate
- 3) OEM2 axleplate

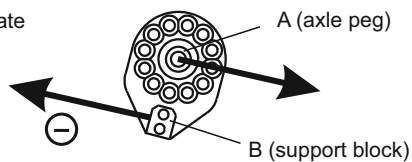
All three anchoring options ensure the axleplate is secured to the frame in two positions to prevent the axle from rotating. The first point **A** is the axle peg that is secured to the left side dropout. This is the same for all three options. The difference between the three options is point **B**. The hole pattern on the axleplates allow for individual adjustment of the gear mechs in steps of 30°, so that nearly every frame type can receive an optimum cable routing.

1) Standard axleplate with long torque arm



The long torque arm is bolted behind the axleplate. The narrow end **B** is secured to the frame by means of a clamp or a quick release block. The axle is prevented from turning through these two points. When removing the wheel, the torque arm must first be released from the frame at the narrow end **B**.

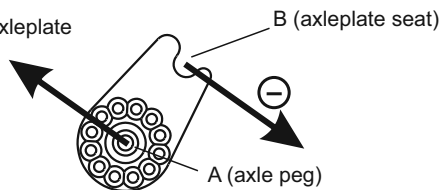
2) OEM axleplate



Exclusively for frame types F and G (see "Frame types")

The mounting of hubs with an OEM axle plate is only possible on frames fitted with *Rohloff* OEM dropouts. The OEM axleplate sits in the dropout slot of the OEM dropout. The axle peg **A** slides in first followed by the support block **B** into the same slot. The dropout itself prevents these two parts from turning. When removing the wheel, the two parts fall out the dropout together once the axle has been loosened.

3) OEM2 axleplate



Exclusively for frame types D and E (see "Frame types")

Mounting the *SPEEDHUB* 500/14 using an OEM2 axleplate is only permitted on frames with international standard (IS1999) disc brake mounts. The OEM2 axleplate sits with its axle peg **A** in the dropout. The axleplate seat **B** secures itself around the supporting peg of the *Rohloff* *SPEEDBONE* or *MonkeyBone* (when mounted on a bike with disc brakes) or around the support bolt fastened through the lower brake caliper mounting hole (when mounted on a bike with rim brakes). When removing the wheel, the axleplate falls away from the support bolt/*Rohloff* *SPEEDBONE* / *MonkeyBone* and out of the dropout once the axle is loosened.

Frame types

The Rohloff SPEEDHUB 500/14 requires a frame spacing of 135mm, all frames with different frame spacing or for thru axles are not suitable for the Rohloff SPEEDHUB 500/14. The inner side of the left hand dropout must be flat in a diameter of 40mm around the center of the axle so that the axle plate can sit firmly and evenly against the dropout. There are different Rohloff SPEEDHUB 500/14 versions available (for the different dropout types) with the suitable axle and axle plate along with the corresponding parts for mounting. The Rohloff SPEEDHUB 500/14 does not include a brake. To mount a brake (disc or rim), the frame must have the correct brake mounts.

Frame types for the long torque arm:

A



Slot length
shorter than 25mm



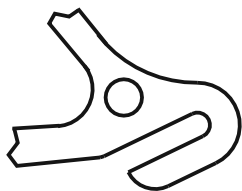
On frames with horizontal dropout slots, it is only possible to mount the Rohloff SPEEDHUB 500/14 in the TS threaded axle versions (TS and TS EX). The CC versions with a quick release lever will not hold the wheel secure enough and the wheel could be pulled crooked whilst riding.

When the slot length is shorter than 25mm (**A**), a chain tensioner (Art. #8250) must be fitted as there is not enough adjustment room within the slot to tension the chain.

The following versions of the Rohloff SPEEDHUB 500/14 are, therefore, suitable:

TS*
TS EX*

B



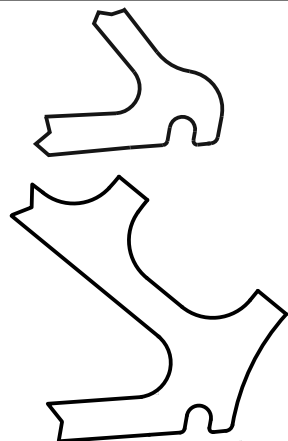
Slot length
larger than 25mm

When the slot length is longer than 25mm (**B**), a chain tensioner does not have to be used as there is enough adjustment room within the slot to tension the chain.

The following versions of the Rohloff SPEEDHUB 500/14 are, therefore, suitable:

TS
TS EX

C



On frames with vertical dropout slots (**C**) the mounting of the Rohloff SPEEDHUB 500/14 normally suggests a CC quick release version (CC or CC EX). This as opposed to the TS versions (TS and TS EX) allows for a quicker wheel removal/installation without the use for tools.

The following versions of the Rohloff SPEEDHUB 500/14 are, therefore, suitable:

CC
CC EX
TS*
TS EX*

* These versions must be used in conjunction with a chain tensioner (Art.No. 8250) except when an eccentric BB is being used.. The chain tensioner should be ordered with the initial product as it is not to be found in the regular package.

Frame types for OEM2 mounting

For frames with vertical dropouts and international standard disc brake mounts (IS 1999), the use of an OEM2 axleplate is highly recommended. With this, the disc brake mount will be used to secure the torque of the hub. Two mounting possibilities are to be decided between:

1) Mounting with a disc brake on the rear wheel

The torque is secured through the *Rohloff SPEEDBONE* (Art. #8550), *MonkeyBone* (160mm= Art. #8553/ 180mm=Art. #8554), then through the disc brake mounts and secured tightly into the brake disc caliper.

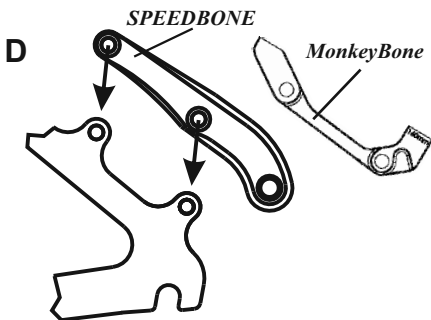
2) Mounting without a disc brake on the rear wheel

The *Rohloff SPEEDBONE/MonkeyBone* is not necessary. A support bolt secured through the lower disc brake mount can be used to support the torque.

ATTENTION

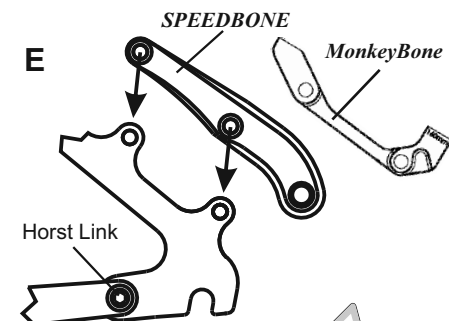


When mounting on Tandems even without the use of a disc brake, the *Rohloff SPEEDBONE/Monkey Bone* must be mounted and its supporting peg used to support the torque of the OEM2 axleplate. A chain tensioner must also be mounted in conjunction with the use of the OEM2 mounting, except on frames built around an eccentric BB system.



On frames (D) with international disc brake mounts (IS 1999), the OEM2 mounting is recommended. As an alternative the long torque arm could also be used (see frame type C).

All *Rohloff SPEEDHUB 500/14* versions can be mounted on this frame type, the only accessory needed is the OEM2 axleplate.



On frame types (E) with a Horst Link, the mounting is only possible with the use of the OEM2 axleplate.

All *Rohloff SPEEDHUB 500/14* versions can be mounted on this frame type, the only accessory needed is the OEM2 axleplate.

Horst Link, named after his inventor Horst Leitner.

ATTENTION

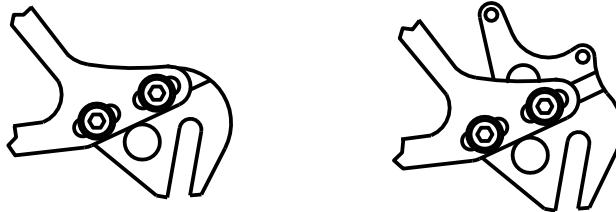


When mounting the hub with the use of the OEM2 axle plate, the disc brake mounts will be used to secure the torque of the hub. Therefore, permission must be obtained from the frame manufacturer to ensure that the guarantee is not affected. The mounting instructions for the OEM2 usage must be read carefully (see "Mounting instructions for OEM2").

Frame types for OEM mounting

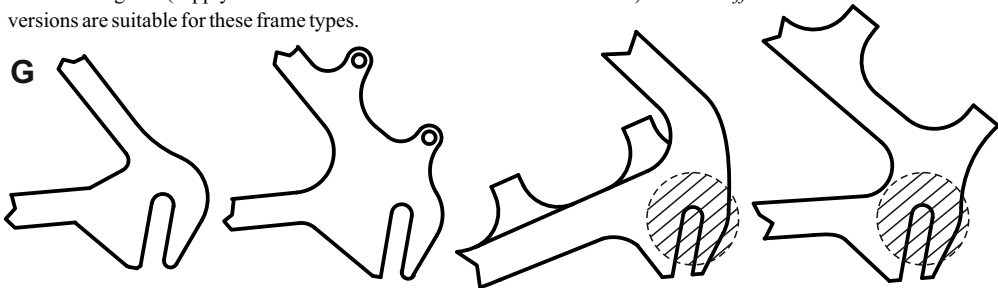
Rigid frames with *Rohloff* OEM dropouts are specially designed for the mounting of all *Rohloff* *SPEEDHUB* 500/14 OEM versions. The long slot in the left hand dropout holds the support block of the OEM axle plate.

F



Frame types (**F**) have adjustable *Rohloff* OEM dropouts. With these dropouts on a hardtail frame, the need for a chain tensioner is eliminated because the wheel (once secured into the dropout inserts) can be pulled backwards to tension the chain. The dropout inserts are available from a variety of manufacturers with or without disc brake mounts and are all interchangeable (supply information is available under www.rohloff.de). All *Rohloff* *SPEEDHUB* 500/14 OEM versions are suitable for these frame types.

G



Frame types (**G**) have unadjustable *Rohloff* OEM dropout and are specially designed for rear suspension models. A chain tensioner must be mounted, because the distance between the chainring and sprocket varies as the rear suspension is activated. All *Rohloff* *SPEEDHUB* 500/14 OEM versions are suitable for these frame types.

ATTENTION

All versions mounted to frame types **G** must be used in conjunction with a chain tensioner (Art.No. 8250) except when an eccentric BB is being used. A chain tensioner should be ordered with the initial product as it is not to be found in the regular OEM package.

ATTENTION

No matter what shape the left-hand dropout is, a surface of 40mm diameter around the center of the axle must be flat to allow the axle plate to sit firmly and evenly against the inner side of the left-hand dropout. This area is shown in the diagram below.

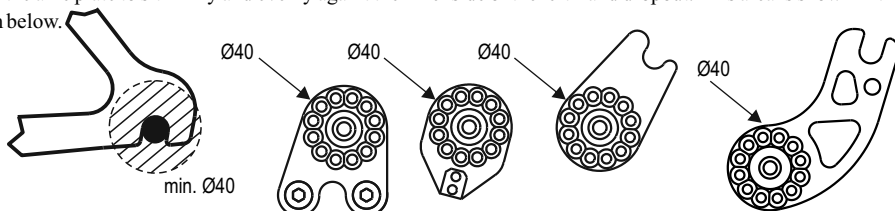


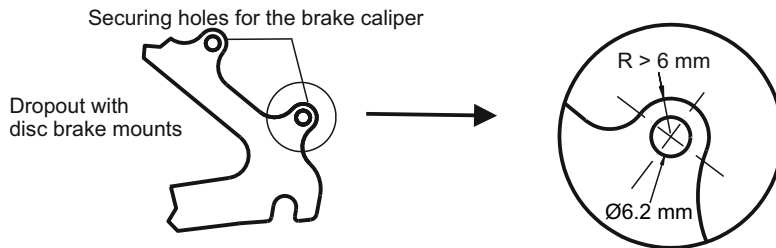
Diagram 1: Flat left dropout surface and three different axle plates

Mounting necessities OEM2

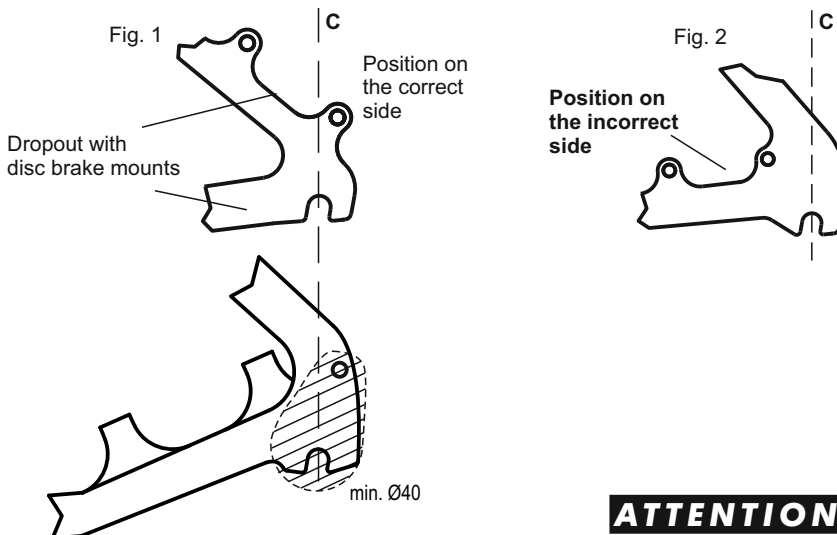
ATTENTION

For safe OEM2 mounting with the support bolt or the *Rohloff SPEEDBONE / MonkeyBone*, the following points must be well noted:

The disc brake mounts must be one piece with the dropout itself, be of international standard (IS1999) and have the following minimum dimension requirements:



Requirement for the OEM2 mounting of the *Rohloff SPEEDHUB 500/14* with a support bolt is the position of the disc brake mounts. When the mount hole nearest the axle is behind a vertical line **C** up from the axle center (diagram 1), then the support bolt can be used. When the hole is in front of the vertical line **C** (diagram 2), then the use of the support bolt is not permitted.



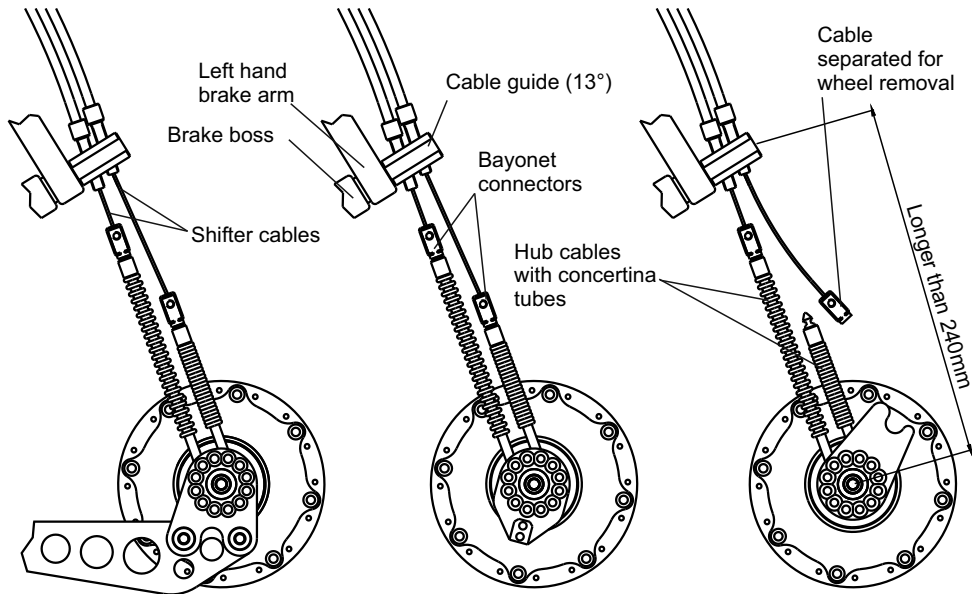
ATTENTION

When permission has not been granted by the frame manufacturer to mount the *Rohloff SPEEDBONE / MonkeyBone* or the support bolt through the disc brake mount, then mounting of the OEM2 versions is at your own risk.

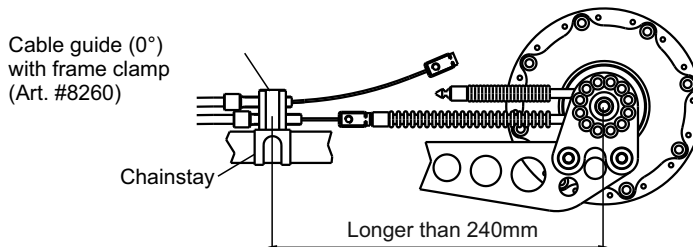
Further compatibility information can be found under:
www.rohloff.de > FAQ > SPEEDHUB > Axleplates and Dropouts

Internal gear mech

With the internal gear mech the shifter cables run from the twist shifter to the cable guide, which can be mounted to the left hand brake boss or clamped to the left hand chainstay. The internal gear mech involves the use of two hub cables. They must be connected to the shifter cables by the use of bayonet connectors which allow a quick separation for wheel removal. The internal gear mech is not compatible with the use of a rear disc brake as the hub cables and bayonet connectors may rub on the disc. The hole pattern in the axle plate allows the adjustment of the gear mech in steps of 30°. Therefore, an optimum cable routing can be achieved for nearly all frame types.



The diagrams show examples of the internal gear mech routed via the brake boss with standard, OEM and OEM2 axle plates.



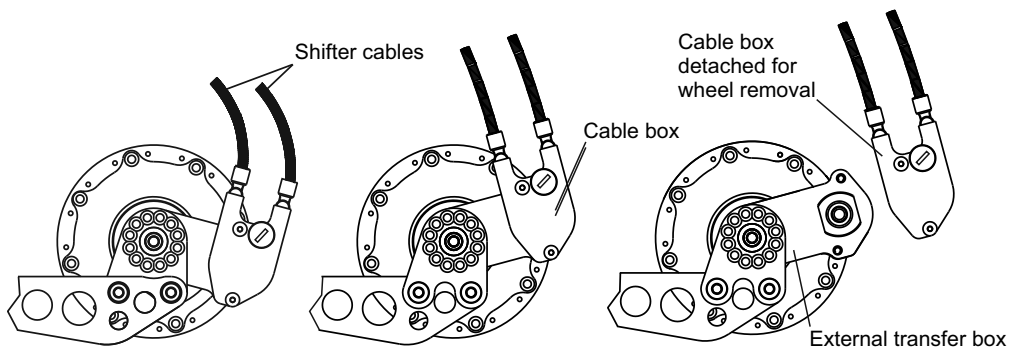
The diagram shows an example of the internal gear mech routed via the chainstay with the standard axle plate and long torque arm using the 0° cable guide and frame clamp.



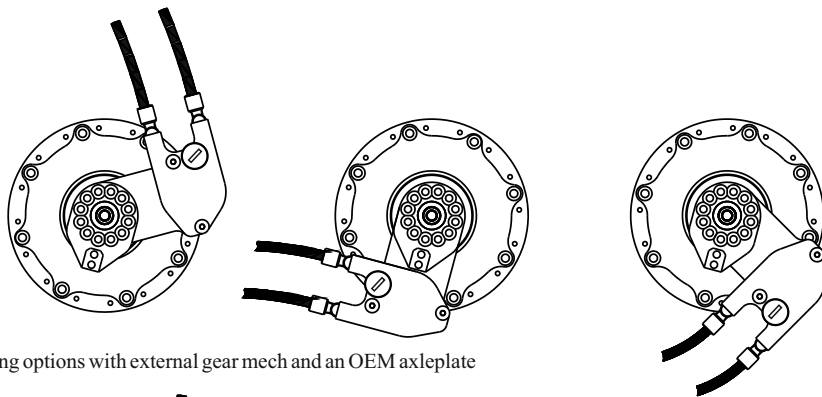
Cable routing

External gear mech

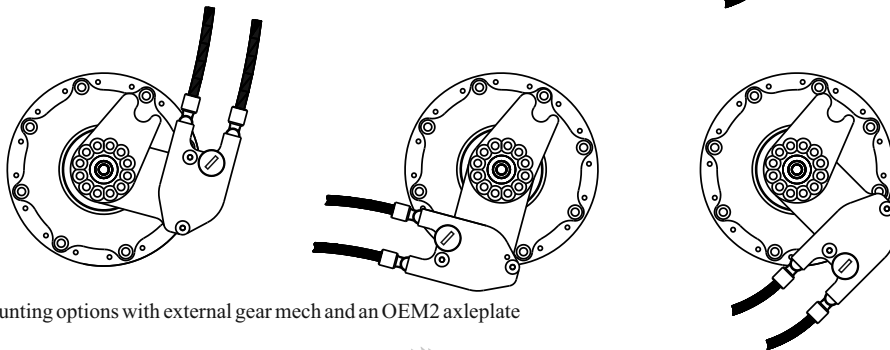
With the external gear mech the shifter cables run directly from the twist shifter to the cable box. There is no separate cable stop necessary. For quick and easy removal of the rear wheel, the cable box can be removed from the external transfer box. All disc brake versions (DB) of the *Rohloff SPEEDHUB 500/14* are equipped with the external gear mech. The hole pattern in the axle plate allows the adjustment of the gear mech in steps of 30°. Therefore, an optimum cable routing can be achieved for nearly all frame types.



Mounting options with external gear mech and the standard axleplate with long torque arm



Mounting options with external gear mech and an OEM axleplate



Mounting options with external gear mech and an OEM2 axleplate



SPEEDHUB 500/14 versions

Explaining the model codes

The first part of the model codes (*CC/TS*) refers to the axle type. Two different axle types are available:

- CC:** - Cross Country
Hollow axle for use with a quick release lever (quick release axle)
(axle as shown in pictures 1 and 2*).
- TS:** - Threaded Spindle axle
Threaded axle with axle nuts M10x1 (axle as shown in picture 3*).
- A12:** - *Thru Axle frame compatible. Secured via 2x M7x1 bolts and special frame reduction sleeves inserted into the 12mm Thru axle dropouts.*
Dropout thickness test necessary using the special measurement kit - Art.#8600.

The following part of the model codes refers to additional hub specifications:

- EX:** - External gear mech
With external gear mech (gear mech as shown in pictures 2 and 3*).
- DB:** - Disc Brake
With a disc brake hub cap and external gear mech EX
(hub cap and gear mech as shown in picture 2*).
- OEM:** - OEM version (Official Equipped Manufacturer)
With CC OEM or TS OEM axleplate according axle type
only for frames with *Rohloff* OEM dropouts
(axleplate as shown in picture 2*).
- OEM2:** - OEM2 version
With CC OEM2 or TS OEM2 axleplate according axle type
for frames with international standard (IS1999) disc brake mounts
(axleplate as shown in picture 3*).
- PM:** - *PostMount version*
Axleplate available for both CC and A12 axle types. Anchors the SPEEDHUB torque via a 'PM Bone' to the frames direct Postmount brake caliper mount.
- T:** - Tandem version.
With longer shifter cables (2.5m) for tandem or recumbent use.
- XL:** - *Xtra Large* - For frames with a 170/177mm spacing. Only available as a disc brake version finished in anodized black with 32 spoke holes.
- XXL:** - *Xtra Xtra Large* - For frames with a 190/197mm spacing. Only available as a disc brake version, finished in anodized black with 32 spoke holes.

All *Rohloff* SPEEDHUB 500/14 versions are available in three different colors:

Silver: - anodized (polished aluminum up to 10/2013)

Red: - anodized

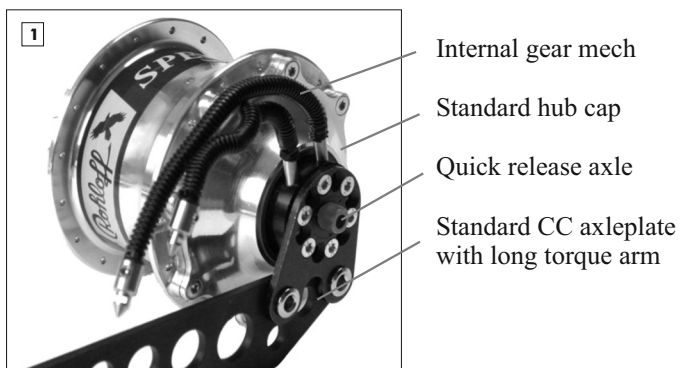
Black: - anodized

* see next page

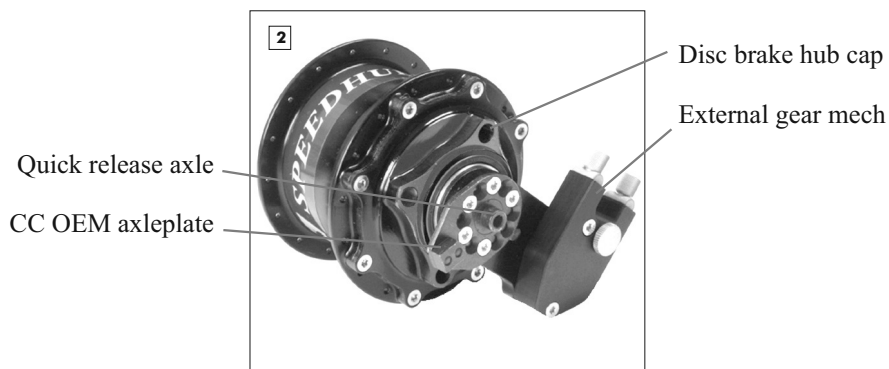


SPEEDHUB 500/14 versions

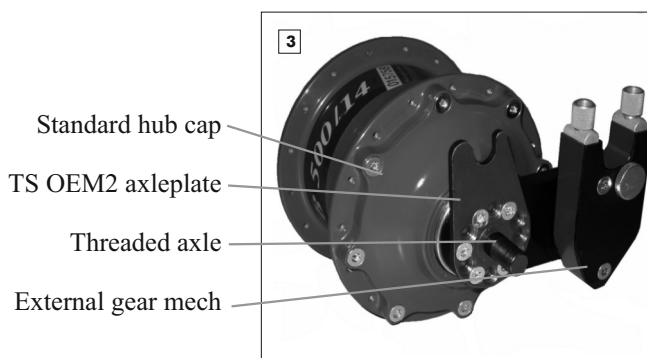
The Rohloff SPEEDHUB 500/14 is available in different versions in accordance to the individual requirements. Pictures 1 to 3 show examples of three possible versions.



Rohloff SPEEDHUB 500/14 CC silver



Rohloff SPEEDHUB 500/14 CC DB OEM black



Rohloff SPEEDHUB 500/14 TS EX OEM2 red



SPEEDHUB 500/14 versions



Rohloff SPEEDHUB 500/14 CC mounted with a long torque arm



Rohloff SPEEDHUB 500/14 CC OEM mounted in a frame with adjustable Rohloff OEM dropouts



Rohloff SPEEDHUB 500/14 CC OEM2 mounted with the support bolt



Rohloff SPEEDHUB 500/14 CC DB OEM2 mounted with the Rohloff SPEEDBONE and a disc brake



SPEEDHUB 500/14 versions



Rohloff SPEEDHUB 500/14 A12 DB PM
mounted with the *Rohloff PM BONE* (PM-PM Adapter) and a PM disc brake



Rohloff SPEEDHUB 500/14 TS DB OEM2
mounted with the *Rohloff MONKEY BONE* (IS-PM Adapter) and a IS 2000 disc brake



Rohloff SPEEDHUB 500/14 XXL A12 DB OEM2
mounted with the *Rohloff FAT BONE* and a disc brake



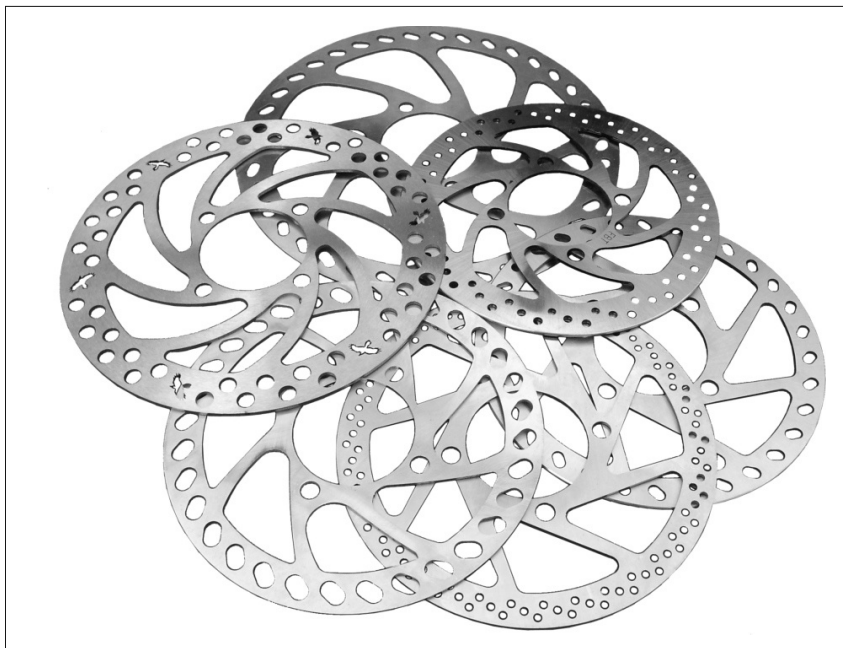
SPEEDHUB 500/14 versions

Rohloff SPEEDHUB 500/14 with a disc brake

The mounting of the *Rohloff SPEEDHUB 500/14* with the use of a disc brake requires a frame with disc brake mounts of international standard (Is1999) or Direct Postmount Standard. The hubs are available with the choice of axle, quick release (CC DB versions) or threaded axle (TS DB versions) or with 12mm reduction sleeves and M7 bolts (A12 DB versions). The particulars of the DB versions are:

- 1) The hub cap includes a center disc mount. It is on this side that the external gear mech is also to be found. Normal 6-bolt brake discs of international standard are not mountable, a special 4-bolt *Rohloff* disc with only four securing holes for bolts M8x0.75 must be fitted due to the large diameter of the hub seal. *Rohloff* offers a range of discs from 160mm to 203mm for nearly every type of disc brake currently on the market. More details are to be found on the web under www.rohloff.de > FAQ > SPEEDHUB > disc brake
- 2) The disc brake versions of the *Rohloff SPEEDHUB 500/14* are only available with the external gear mech, because the brake disc/caliper could interfere with the hub cables of the internal gear mech.

The interchangeable parts system allows the conversion of any *Rohloff SPEEDHUB 500/14* to a disc brake version (DB versions). The conversion of a hub to a DB version can only be carried out by the *Rohloff* service department.



Rohloff 4-hole discs



SPEEDHUB 500/14 versions

Advantages of the separate options

Threaded axle TS

The *Rohloff SPEEDHUB 500/14* versions with a threaded axle are required for frames with horizontal dropout slots. It is, however, also possible to mount this hub in dropouts with vertical slots. For downhill riders the possibility of using a more secure TS threaded axle will increase rear wheel stability much like a thru axle.

Quick release axle CC

The *Rohloff SPEEDHUB 500/14* versions with quick release axles are exclusively for use on frames with vertical dropout slots. They allow for a quick removal/installation of the wheel without the need for tools.

Thru axle compatible system A12

The *Rohloff SPEEDHUB 500/14* Versions with an A12 axle are specifically designed to fit 12mm thru axle frames. The use of special adapter sleeves (available for DT/Maxle, Syntace, Shimano thru axle styles) enable these SPEEDHUBs to be retrofitted to a great number of current production frames.

Internal gear mech

The internal gear mech is on all *Rohloff SPEEDHUB 500/14* versions with the exception of EX and DB models. It requires a minimum distance of 240mm between the axle and the cable guide mounting point. To prevent the possibility of the bayonet connectors coming into contact with the brake disc, a combination of disc brake and internal gear mech is not available. The internal gear mech model is the lightest of the two gear mech versions with the *Rohloff SPEEDHUB 500/14 CC* weighing approx. 1700g.

External gear mech EX

The models with an external gear mech allow the shifter cables to run uninterrupted from the twist shifter to the cable box, so the need for a separate cable stop is also eliminated. Because of this, the external gear mech is especially useful for frames with a short chainstay length (20" wheels) or uncommon rear triangles.

The external gear mech is approx. 100g heavier than the internal gear mech, but, therefore, more robust as no separate hub cables are in use. Should a shift cable should break, this system allows the user to select any gear from the outside of the external transfer box making this especially useful for the everyday and the touring rider.

The disc brake versions (DB) of the *Rohloff SPEEDHUB 500/14* are equipped with the external gear mech as the hub cables of the internal gear mech would come into contact with the brake disc.

OEM

The *Rohloff SPEEDHUB 500/14* OEM versions require the use of *Rohloff* OEM dropouts where the left hand dropout slot is elongated to house the support block of the OEM axle plate. Hardtail frames with adjustable *Rohloff* OEM dropouts, eliminate the need for a chain tensioner and chain guide thus offering a cleaner, tidier aesthetic and a higher level of functional safety, ideal for extreme riding situations.

OEM2

The OEM2 axleplate uses the frames lower disc brake mounting hole to prevent the axle from turning (torque anchor). The OEM2 axleplate offers a cleaner, tidier aesthetic to the system. Only compatible with international standard (IS 1999) mount or when a specially drilled hole is present.. An OEM2 axleplate uses the disc brake mount to secure the torque of the hub. Therefore, permission must be obtained from the frame manufacturer to ensure that frame warranty is not affected.

PM

The use of a PM axleplate in combination with a PM Bone enables the *SPEEDHUB 500/14* models to be retrofitted to frames with an integrated Postmount brake mount. The *SPEEDHUB* torque is anchored to the frame directly via the brake mount.

XL/XXL

XL versions are specially lengthened hubs designed for frames with a 170/177mm (XXL = 190/197mm spacing). These hubs enable fatbikes the opportunity to run a strong, symmetrically laced *SPEEDHUB* with the fattest tires available. XL Versions (CC/TS/A12) are only available as disc brake versions with 32 spoke holes, finished in anodized black. XXL Versions (CC/A12) are only available as disc brake versions with 32 spoke holes, finished in anodized black.



SPEEDHUB 500/14 versions

Model variations

For a better summary of what comes with each model, below is a list of the model variations and the parts included in the respective package.

Rohloff SPEEDHUB 500/14 CC (silver Art. #8000, red Art. #8001, black Art. #8002)

Contents: Hub with quick release axle, twist shifter, cables, quick release parts, long torque arm and a chain tensioner.

Rohloff SPEEDHUB 500/14 CC OEM (silver Art. #8005, red Art. #8006, black Art. #8007)

Contents: Hub with quick release axle, twist shifter, cables and a CC OEM axle plate for torque support.

Rohloff SPEEDHUB 500/14 CC OEM2 (silver Art. #8005Z, red Art. #8006Z, black Art. #8007Z)

Contents: Hub with quick release axle, twist shifter, cables and a CC OEM2 axle plate and screw for torque support.

Rohloff SPEEDHUB 500/14 CC EX (silver Art. #8010, red Art. #8011, black Art. #8012)

Contents: Hub with quick release axle, twist shifter, cables, quick release parts, external gear mech, CC axle plate with long torque arm and a chain tensioner.

Rohloff SPEEDHUB 500/14 CC EX OEM (silver Art. #8015, red Art. #8016, black Art. #8017)

Contents: Hub with quick release axle, twist shifter, external gear mech, cables and a CC OEM axle plate for torque support.

Rohloff SPEEDHUB 500/14 CC EX OEM2 (silver Art. #8015Z, red Art. #8016Z, black Art. #8017Z)

Contents: Hub with quick release axle, twist shifter, external gear mech, cables and a CC OEM2 axle plate and screw for torque support.

Rohloff SPEEDHUB 500/14 CC DB (silver Art. #8020, red Art. #8021, black Art. #8022)

Contents: Hub with quick release axle, hub cap with mounting for *Rohloff* special brake discs (compatible with Is1999), external gear mech, cables, twist shifter, chain tensioner, quick release parts and a CC axle plate with a long torque arm.

Rohloff SPEEDHUB 500/14 CC DB OEM (silver Art. #8025, red Art. #8026, black Art. #8027)

Contents: Hub with quick release axle, hub cap with mounting for *Rohloff* special brake discs (compatible with Is1999), external gear mech, cables, twist shifter and a CC OEM axle plate for torque support.

Rohloff SPEEDHUB 500/14 CC DB OEM2 (silver Art. #8025Z, red Art. #8026Z, black Art. #8027Z)

Contents: Hub with quick release axle, hub cap with mounting for *Rohloff* special brake discs (compatible with Is1999), external gear mech, cables, twist shifter and a CC OEM2 axle plate and screw for torque support.

Rohloff SPEEDHUB 500/14 TS (silver Art. #8040, red Art. #8041, black Art. #8042)

Contents: Hub with threaded axle, twist shifter, cables and a TS axle plate with long torque arm.

Rohloff SPEEDHUB 500/14 TS OEM (silver Art. #8045, red Art. #8046, black Art. #8047)

Contents: Hub with threaded axle, twist shifter, cables and a TS OEM axle plate for torque support.

Rohloff SPEEDHUB 500/14 TS EX (silver Art. #8050, red Art. #8051, black Art. #052)

Contents: Hub with threaded axle, twist shifter, cables, external gear mech and a TS axle plate with long torque arm.

Rohloff SPEEDHUB 500/14 TS EX OEM (silver Art. #8055, red Art. #8056, black Art. #8057)

Contents: Hub with threaded axle, twist shifter, cables, external gear mech and a TS OEM axle plate for torque support.

Rohloff SPEEDHUB 500/14 TS DB (silver Art. #8060, red Art. #8061, black Art. #8062)

Contents: Hub with threaded axle, hub cap with mounting for *Rohloff* special brake discs (compatible with Is1999), twist shifter, cables, external gear mech and a TS axle plate with long torque arm.

Rohloff SPEEDHUB 500/14 TS DB OEM (silver Art. #8065, red Art. #8066, black Art. #8067)

Contents: Hub with threaded axle, hub cap with mounting for *Rohloff* special brake discs (compatible with Is1999), twist shifter, cables, external gear mech and a TS OEM axle plate for torque support.



SPEEDHUB 500/14 versions

All 135mm O.L.D. models are available as both 32 & 36-spoke versions and/or tandem versions with cables of 2.5m in length. The 36 spoke versions receive an additional number '6' before the article number. Tandem hubs receive the letter 'T' after the article number (e.g. 68025 or 8025T).

upgradable/additional parts that can be ordered:

CC OEM2 axle plate (Art. #8227)
TS OEM2 axle plate (Art. #8228)
CC PM axleplate (Art. #8225)

Chain tensioner (Art. #8250)
Chain guide CC (Art. #8290)

Rohloff SPEEDBONE (Art. #8550)
Monkey Bone IS-PM Adapter (160mm = Art. #8553 / 180mm = Art. #8554)
PM Bone (Art. #8555)

Splined sprockets: 13t-Art.#8541, 14t-Art.#8542, 15t-Art.#8543, 16t-Art.#8544,
17t-Art.#8545, 18t-Art.#8546, 19t-Art.#8547, 21t-Art.#8549

Splined Carrier smal (#8540S) for Splined Sprockets 15t - 19t + 21t (not for 13t and 14t)
Splined Carrier normal (#8540) for Splined Sprockets 13t - 19t + 21t
Splines Carrier Lock-Ring (#8540L for Gates Splined System + Splined Sprockets 15t-19t + 21t

Downhill-Kit (Art. #8293) consisting of:

DH chain tensioner (Art. #8245) DH chain guide (Art. #8291) (also available separately)

Cable guide 0° (straight) type with frame clamp (Art. #8260)

DD spokes (2.0/1.8/2.0mm) spoke bend length 2.9mm for 26" - 29" wheels.
Spokes between 146-154/198mm. 222mm - 282mm in increments of 2mm.

Rohloff special 4-hole brake discs for the corresponding brake type.

ATTENTION

When ordering the *Rohloff SPEEDHUB 500/14* variation needed, it is necessary to pay attention to which additional parts are needed to mount the *Rohloff SPEEDHUB 500/14* to the bike. Example: *Rohloff* chain tensioner, *Rohloff SPEEDBONE*, *Monkey Bone*, spokes in the correct length and the correct *Rohloff* special brake disc for the brake type in use.

These include for example:

- *Rohloff* chain tensioner,
- *Rohloff SPEEDBONE* / *MonkeyBone* / *PM Bone*
- spokes in the correct length,
- the correct *Rohloff* special brake disc for the brake type in use,
- *Rohloff* Chain guide for either CC or DH,
- Cable guide 0° with frame clamp,
- Long chain tensioner bolt for use with the 13 tooth threaded Sprocket,
- TS axle plate 'long', for use in conjunction with a trailer mount from the company Weber, Pitlocks, or stands which are mounted directly on the axle.
- Flange Support Rings (mounted)



The wheel

Wheel stability

When the *Rohloff SPEEDHUB 500/14* is built up into a 32/36 spoke wheel, it is considerably more robust than the common 36 spoke wheels. The stability is approx. the same as a 48 spoke tandem wheel.

The spoke flanges of the *Rohloff SPEEDHUB 500/14* are built symmetrically. This allows the spokes to be at the same angle on both sides of the finished wheel, this in turn leads to a much stronger wheel due to the evenly distributed spoke tension.

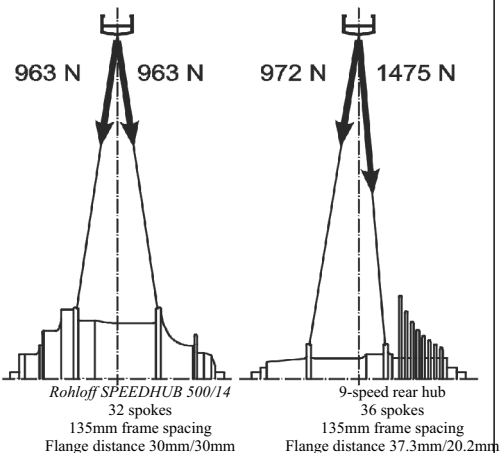
To build up a strong wheel, the spokes must be tensioned to a **minimum 1000N**. The spoke tension on the cassette side of normal derailleur hubs, is considerably higher (over 1200N) due to the dishd way the wheel must be laced. This can also lead to problems with the nipple seat of the rim (see MTB comparison below, the pretension in the 9-speed cassette here is reduced to just 600N).

Due to the increased diameter of the hub flanges used by the *Rohloff SPEEDHUB 500/14*, spokes laced in a two-cross pattern enter the rim at roughly the same angle as a three-cross lacing pattern on smaller flanged hubs. There is less load on the spokes because of the large spoke hole PCD. The spokes pull further away from the axle center, therefore the hub flange has a better lever to pull the wheel around (torque = force x lever length).

The comparison below shows the maximum spoke loads. The numbers in brackets are the pretensioned min. force of the spokes after lacing, truing and tensioning with an inflated tire (tire pressure 60p.s.i.):

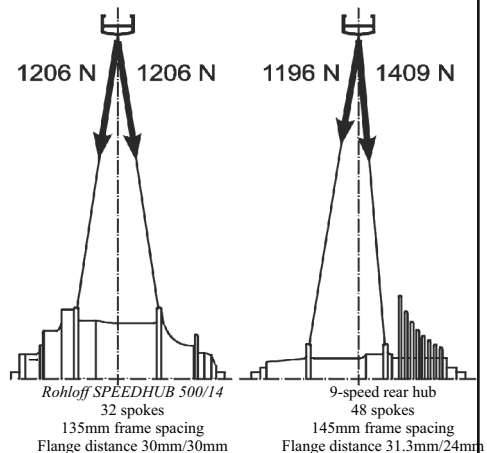
MTB:

Wheel with *Rohloff SPEEDHUB 500/14*, 32 spokes
Wheel with 9-speed derailleur gears, 36 spokes
Rider 80kg, riding whilst standing
Transmission *SPEEDHUB 500/14*: - gear #4 (48/16)
Distance travelled per crank revolution: - 2.52m
Transmission derailleur gears: - 36/30
Distance travelled per crank revolution: - 2.47m
Tire Pressure: - 60 P.S.I.



Tandem:

Wheel with *Rohloff SPEEDHUB 500/14*, 32 spokes
Wheel with 9-speed derailleur gears, 48 spokes
Two riders 80kg each, riding whilst standing
Transmission *SPEEDHUB 500/14*: - gear #4 (48/16)
Distance travelled per crank revolution: - 2.52m
Transmission derailleur gears: - 36/30
Distance travelled per crank revolution: - 2.47m
Tire Pressure: - 60 P.S.I.



The figures for the 9-speed tandem wheel are better than those of the solo MTB wheel due to the fact that the spokes are not at so steep of an angle and there are 48 of them regardless that there are two riders on the tandem. But even here, the *Rohloff SPEEDHUB 500/14* wheel with 1206N against 1409N is the better option.

Spoke lengths 32/36 spoke hole rims

The Rohloff SPEEDHUB 500/14 uses a spoke hole circle diameter of 100mm with 2.7mm diameter spoke holes (2.5mm up until Serial No.44321). When lacing the Rohloff SPEEDHUB 500/14 into a wheel, the spoke sizes required will usually prove fairly difficult to find in the average bike shop. For this reason silver/black 'Sapim Race' spokes 2.0/1.8/2.0mm with Secure 14mm nipples are available from Rohloff in lengths of 128/146-154/198mm and 222-282mm. Below is a table showing the required spoke lengths for 32/36 spoke rims. Due to the symmetrical hub flanges of the SPEEDHUB 500/14, the spokes are the same length on both sides of the wheel:

135mm / 142mm / 148mm

32-Loch Gehäuse Speichenlänge
32-hole Hub-shell Spoke lengths

Lauf- rad größe / Wheel Size	Anzahl Kreuzungen / Number of Spoke Crosses	ERD*	32-Loch Speichen- länge / 32- hole Spoke lengths		
18"	1-X	341-343	128		
		344	130		
20"	1-X	372-373	142		
		374-377	144		
		378-381	146		
		382-385	148		
		386-389	150		
		390-394	152		
		24"	1-X	472-476	192
477-480	194				
481-484	196				
485-489	198				
490-493	200				
494-497	202				
498-501	204				
502-503	206				
26"	2-X			516-519	226
				520-523	228
		524-527	230		
		528-531	232		
		532-535	234		
	650B	2-X	536-539	236	
			540-543	238	
			544-547	240	
			548-551	242	
			552-555	244	
		2-X	556-559	246	
			560-563	248	
			564-567	250	
			568-571	252	
			572-575	254	
28"	2-X	576-579	256		
		580-583	258		
		584-587	260		
		588-592	262		
		593-596	264		
		597-600	266		
		601-604	268		
29"	2-X	605-608	270		
		609-612	272		
		613-616	274		
		617-620	276		
		621-624	278		
		625-628	280		
		629-632	282		

36-Loch Gehäuse Speichenlänge
36-hole Hub-shell Spoke lengths

Lauf- rad größe / Wheel Size	Anzahl Kreuzungen / Number of Spoke Crosses	ERD*	36-Loch Speichen- länge / 36- hole Spoke lengths		
18"	1-X	341-342	126		
		343-344	128		
20"	1-X	372-375	142		
		376-379	144		
		380-383	146		
		384-387	148		
		388-392	150		
		393-396	152		
		24"	1-X	472-474	190
475-478	192				
479-482	194				
483-486	196				
487-490	198				
491-494	200				
495-498	202				
499-502	204				
26"	2-X			503	206
				516-517	222
		518-522	224		
		523-526	226		
		527-530	228		
	650B	2-X	531-534	230	
			535-538	232	
			539-542	234	
			543-546	236	
			547-550	238	
		2-X	551-554	240	
			555-558	242	
			559-562	244	
			563-566	246	
			567-570	248	
28"	2-X	571-574	250		
		575-578	252		
		579-582	254		
		583-586	256		
		587-590	258		
		591-594	260		
		595-598	262		
29"	2-X	599-602	264		
		603-607	266		
		608-611	268		
		612-615	270		
		616-619	272		
		620-623	274		
		624-627	276		
628-631	278				

empfohlene Größe / recommended rim size

On wheel sizes 26" and 28" the wheel must always be laced in a two cross pattern. Therefore, the table above shows the spoke lengths for a two cross lacing pattern. On wheel sizes 24" and under, the spokes must only be laced in a one cross lacing pattern. For this reason, the table above shows the spoke lengths for a one cross lacing pattern.

A constantly updated list of spoke lengths can be found on the internet under:

<https://www.rohloff.de/en/service/handbook/documentation/>



The wheel

Spoke lengths 32 spoke hole rims for XL/XXL hubshell (Fatbike)



Framespacing 170mm/177mm/190mm/197mm

Laufradgröße / Wheel Size	Anzahl Kreuzungen / Number of Spoke Crosses	ERD*	32-Loch Speichenlänge / 32-hole Spoke lengths 7mm Offset	32-Loch Speichenlänge / 32-hole Spoke lengths 12.5mm Offset	32-Loch Speichenlänge / 32-hole Spoke lengths 20mm Offset	
			ERD*	12.5mm Offset	20mm Offset	
26"	2-X	516-519	228	228	226	
		520-523	230	230	228	
		524-527	232	232	230	
		528-531	234	234	232	
		532-535	236	236	234	
		536-539	238	238	236	
		540-544	240	240	238	
	650B	2-X	545-548	242	242	240
			549-552	244	244	242
			553-556	246	246	244
			557-560	248	248	246
			561-564	250	258-250	248
			565-568	252	250-252	250
			569-572	254	252-254	252
650B	2-X	573-576	256	254-256	254	
		577-580	258	256-258	256	
		581-584	260	258-260	258	

ATTENTION



Nipple eyelets are currently being reduced in size to save as much heavy steel as possible in the construction. In cases such as these, the nipple is however hindered from aligning itself correctly for lacing large flange hubs and this results in a small kink in the spoke where it joins the nipple. This will lead to premature spoke failures at the kink.

For this reason, rims should be used where the rim eyelet has an inner diameter of at least 4.4mm, or if possible, rims should be used which are angularly drilled.

Calculating the spoke length (32 + 36):

The formula below can be used to calculate the correct spoke length should your rim ERD not listed in the table.

$$\text{Spoke length: } L = \sqrt{(0.25 \times d^2) + 3400 - (50 \times d \times c)}$$

d: effective rim diameter in mm

c = 0.924 with 1 cross pattern (32 hole) c = 0.707 with 2 cross pattern (32 hole)

c = 0.940 with 1 cross pattern (36 hole) c = 0.770 with 2 cross pattern (36 hole)

Calculation example with 32 spokes:

Effective rim diameter: d = 539mm; 2 cross pattern: c = 0,707

$$\text{Spoke length: } L = \sqrt{(0.25 \times 539^2) + 3400 - (50 \times 539 \times 0.707)}$$

L = 238,69mm (always round up/down to the nearest even number. Here: 238mm)

ATTENTION



It is not permitted to radially lace wheels built with a *Rohloff SPEEDHUB 500/14*, because the drive force is delivered through this wheel.

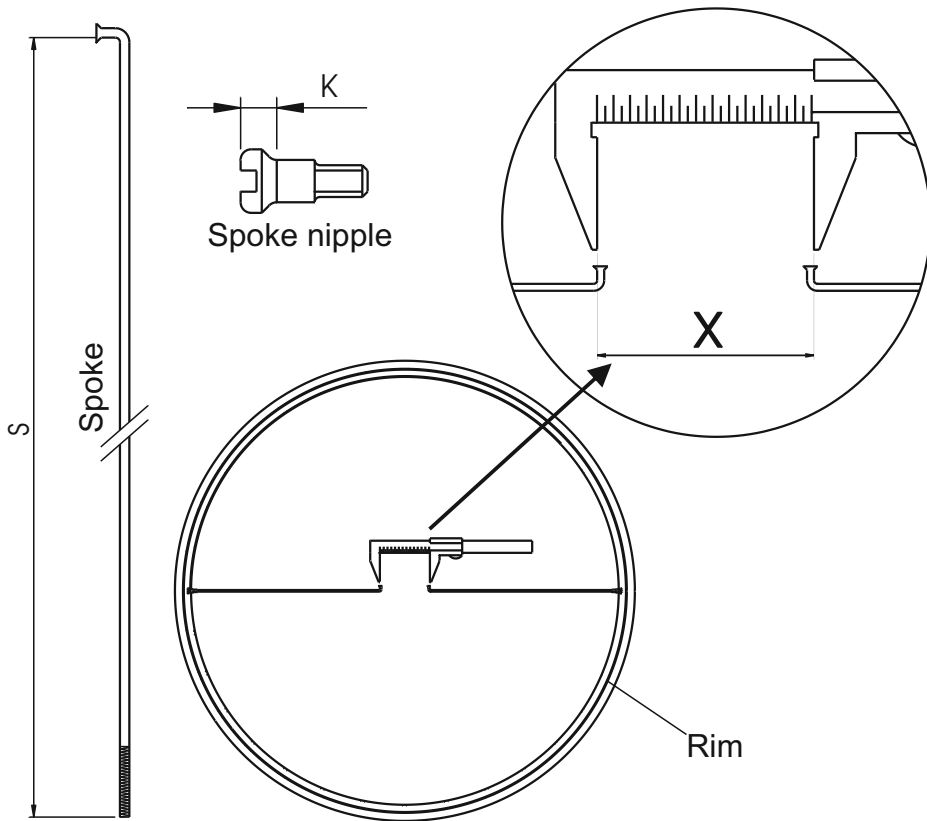
Due to the large spoke hole circle diameter of the *Rohloff SPEEDHUB 500/14*, the entrance angle between the spokes and the rim is considerably small. All 26" - 29" wheels must not be built in more than a 2x lacing pattern. All wheels smaller than 26" (18" - 24") are only permitted to be laced in a 1x pattern.

Determining the effective rim diameter (ERD)

Should the effective rim diameter need to be measured because the rim was not listed in the previous table, the following steps can be used to determine this:

- Measure the head height **K** of the spoke nipples that are intended for use.
- Measure the spoke length **S** from beginning of the thread to the inside of the 90° bend.
- Thread a spoke through the rim and screw the nipple onto this so that the end of the spoke is level with the head of the spoke nipple.
- Place a second spoke through the spoke hole of the opposing side of the rim and screw the nipple onto this spoke in the same way.
- Pull these two spokes together and measure the distance **X**.

The effective rim diameter can now be determined using the formula: $d = 2 \times S + X - 2 \times K$





Which components are recommended?

Chains:

All 8 (1/2"x3/32") speed and 9 (1/2"x11/128") speed chains are compatible with *Rohloff SPEEDHUB 500/14* sprockets. 1/2"x1/8" chains can also be used with all *Rohloff SPEEDHUB 500/14* sprockets however although these thicker chains may be slightly stronger, they do not offer any improvement regarding durability or lifespan and are therefore not recommended for use with the *Rohloff SPEEDHUB 500/14*. In addition, these 1/2"x1/8" chains are incompatible with the *Rohloff* chain tensioner due to their width. When using a 15 tooth sprocket, it is important to make sure that the chain does not measure more than 8.5mm in height (over the joint), otherwise it is possible that rub/wear marks could appear on the hub shell.



Chain rings:

All derailleur gear chainrings can be used for the *Rohloff SPEEDHUB 500/14*.

It is important to check the concentricity of the mounted chainring when utilizing an eccentric BB or adjustable dropouts so that the tension of the chain is correct in all crank positions.

Cranks (chain line):

The use of thread sprockets 15, 16 or 17 teeth on the *Rohloff SPEEDHUB 500/14* require a chain line of approx. 54mm from the frame and Splined Sprocktes with 13-19 + 21 teeth = 57mm center. This needs the use of the outer chainring from triple cranksets such as standard Shimano (Largest chainring: 54mm, middle chainring 47.5mm). The middle and smallest chainrings are usable. After the disassembly of the middle and smallest chainrings, the bolts for securing the largest chainring are now too long, because they are now only securing one chainring to the crank. For this reason the *Rohloff SPEEDHUB 500/14* small parts bag includes five chainring spacers to distance the original bolts. For retrofitting with double chainring cranksets, the outer chainring should definitely be used.

Reversible sprocket with 13, 14, 15, 16, 17, 18, 19 and 21 teeth

The *Rohloff SPEEDHUB 500/14* comes fitted with a 16 tooth sprocket. 13-19 and 21 tooth reversible sprockets are available as alternatives. Hereby, an individual sprocket/chainring combination can be applied (see "Technical data" - "chainrings"). The sprockets are reversible, and therefore, can be used from both drive sides. For sprocket removal, a special *Rohloff* sprocket removal tool (Art. #8508) is needed. When using a 15 tooth threaded sprocket, it is important to make sure that the chain does not measure more than 8.5mm in height (over the joint), otherwise it is possible that rub/wear marks could appear on the hub shell.

Sprocket with 13 teeth (Art. #8219)

For the use of the *Rohloff SPEEDHUB 500/14* on small wheeled bicycles (e.g. 20" folding bikes and recumbants) the special 13 tooth sprocket is needed. It uses a different chain line (58mm instead of 55mm) and is not reversible. When using a *Rohloff* chain tensioner on frames with dropouts thinner than 7mm, the longer chain tensioner mounting bolt (Art. #8255) must be separately ordered. For sprocket removal, a special *Rohloff* sprocket removal tool (Art. #8501 or Art. #8508) is needed.

Rohloff chain tensioner (Art. #8250)

Mounting a chain tensioner is necessary on frame types A, C, D, E and G (see "frame types"), because the chain is not tensionable by simply sliding the wheel within the dropouts. The chain tensioner is just as necessary on frames with rear suspension, this is because the distance between the chainring and sprocket varies as the rear suspension is activated. The span capacity of the *Rohloff* chain tensioner is 10 links or 20 teeth. The use of the *Rohloff* chain tensioner also requires the use of a chain guide up front.

Rohloff DH chain tensioner (Art. #8245)

The *Rohloff DH* chain tensioner is specially designed for extreme downhill use. As opposed to the regular *Rohloff* chain tensioner it has a shorter link arm that is not able to swing on the mounting point. This keeps the chain securely in position against the sprocket, guaranteeing a positive run from the chain onto the sprocket even in extreme riding conditions. The use of the *Rohloff DH* chain tensioner also requires the use of a chain guide up front.

Rohloff chain guide CC (Art. #8290)

The *Rohloff* chain guide CC prevents the chain from springing off the chainring on all bikes fitted with a chain tensioner. The *Rohloff* chain guide is adjustable depending on the chain line (distance between chainring and frame center) between 52mm and 62mm. The chain springing off the chainring in extreme riding conditions is not preventable by a chain tensioner alone.



Particular options

Rohloff DH chain guide (Art. #8291)

The *Rohloff* DH chain guide is specially designed for extreme downhill use. It eliminates the chain from falling off the sprocket and onto the hub casing which could happen in extreme riding conditions.

Rims

The *Rohloff* SPEEDHUB 500/14 is only available in a 32/36 spoke version. The ideal rims to be used are triple hollow aluminum rims from known manufacturers with reinforced spoke eyelets (min. 4,4mm) or alternatively, rims which are diagonally drilled or with countersunk nipple seats (e.g. ANDRA, Taurus, GRIZZLY and EDGE 7 from Rigida/Ryde or the Ex19 rim from Exal).

Spokes/nipples

Because the spokes have a large say over the stability of the overall wheel, exclusive quality spokes from well known manufacturers should be used. Double thickness spokes (2,0-1,8-2,0mm) from DT-Swiss and Sapim (with spoke bend length BL 2,9mm) are good examples. When applying a lot of force on the wheel (pannier bags, tandem use, extreme use), the spokes should be fitted with self-locking spoke nipples (lock nipples) during the wheelbuilding process. This reduces the risk of the spokes loosening whilst riding. On rims without reinforced nipple holes, only spoke nipples with rounded heads should be used (Sapim Polymax or DT swiss Prohead), this spreads the spoke tension evenly through the nipple head against the rim.

Quick release lever

The CC versions of the *Rohloff* SPEEDHUB 500/14 are supplied with a hollow Q/R axle to secure the hub to the frame. To be sure that the hub is correctly secured into the frame, it is advisable to use a Q/R lever with a steel skewer. The use of lightweight Q/R levers with aluminium or titanium skewers is at the riders own risk! Make sure that the maximum 7Nm closure torque is not exceeded when using a Pitlick or other Q/R systems!

Racing handlebars

The twist shifter of the *Rohloff* SPEEDHUB 500/14 can only be used on straight handlebars with a diameter of 22.2mm and, therefore, is not compatible with regular racing handlebars. Special racing bars (eg racing bars from the firm Norwid (www.norwid.de) or Van Nicholas (www.van-nicholas.com) allow the mounting of the twist shifter. Further information can be found in the FAQs under www.rohloff.de. Another alternative is a special seperatable twist shifter for racing handlebars. Gilles Bertoud (www.gillesberthoud.fr) and Co-Motion cycles (www.co-motion.com) both produce such shifters. Further information over this can be found on our homepage in the FAQ section.

Use of a rear disc brake

The *Rohloff* SPEEDHUB 500/14 DB versions are equipped with an external gear mech and a special hub cap for the mounting of a brake disc. Only brake discs with a *Rohloff* mounting hole diameter of 65mm and a center hole diameter of 52mm can be used. Information about the various brake discs currently available can be found on the web under www.rohloff.de.

Axle plates

The various axle plates are all available separately, and therefore, making it easy to change any version of the *Rohloff* SPEEDHUB 500/14 over to a different method of torque support. When a longer axle thread (TS) is required, simply add an "L" to the Art. No.

Axle plate CC	(Art. #8232)	Axle plate TS	(Art. #8233)	-long	(Art. #8233L)
Axle plate CC OEM	(Art. #8234)	Axle plate TS OEM	(Art. #8235)	-long	(Art. #8235L)
Axle plate CC OEM2	(Art. #8227)	Axle plate TS OEM2	(Art. #8228)	-long	(Art. #8228L)
Axle plate CC PM	(Art. #8225)				

The CC/TS OEM axle plates are also available as stronger tandem versions (T) with only one mounting option.

Rohloff Speedbone (Art. #8550) or IS-PM Adapter MonkeyBone (160mm Art. #8553 / 180mm Art. #8554)

The *Rohloff* Speedbone is an adapter that allows bikes that are fitted with disc brakes to also use the OEM2 method of torque support. The *Rohloff* Speedbone is compatible with all disc brake types of international standard (IS 1999). The Speedbone is required when using an IS brake caliper with an IS frame. IS frames using PM brake calipers can use either a Speedbone (Art. #8550) or Monkeybone (160mm = Art. #8553 / 180mm = Art. #8554).

The PM Axleplate/PM Bone (Art. #8555) combination is recommended when mounting a SPEEDHUB in all frames with an integrated Postmount direct calliper mount

Gear mech

The external gear mech (Art. #8213) and the internal gear mech (Art. #8572) can be ordered separately. This allows an easy change of the gear mech.



Particulars

Rohloff SPEEDHUB 500/14 on tandems

All versions of the *Rohloff SPEEDHUB 500/14* are available for tandem use (assuming that the frame spacing is 135mm). The **typical coding of a tandem version is the letter "T"** (eg CC-T or TS EX-T). The *Rohloff SPEEDHUB 500/14* tandem versions come with shifter cables of 2.5m in length. The number of spoke holes is still 32 or 36 (see wheel stability). For stability reasons the use of double butted DD spokes 2.0/1.8/2.0mm is recommended.

The correct spoke lengths for 26" wheels are readily available from Rohloff dealers. Spokes for 28" are available from a number of quality manufacturers (Sapim /DT Swiss):

Small wheels

Wheels with a smaller diameter than 26" should only use a one cross lacing pattern, because this helps to keep the spoke at the correct angle against the rim. Radial lacing of the *Rohloff SPEEDHUB 500/14* is not permitted. The *Rohloff SPEEDHUB 500/14* should not be laced into a wheel smaller than 18" in diameter, because, due to the hubs large flange diameter, the spokes would enter the rim at a too acute of an angle.

Halfstep

Through the use of two chainrings with a size difference of approx. 7% (racing cranksets with 39 and 34 tooth chainrings) the change in gear ratio increases could reduce from 13.6% by approx. half. This additional feature is interesting for road racing applications.

Usage of two chainrings

In extreme riding conditions, where the use of a greater gear range is necessary, it is possible to use the *Rohloff SPEEDHUB 500/14* in conjunction with two chainrings. This increases the number of actual gears by about two.

When applying this feature, make sure that there is a difference of approx. 13% between chainring sizes for one additional gear and approx 29% for two additional gears (eg 50/39 chainrings).

Using the Schlumpf/Haberstock "Speed-drive" or the "High Speed drive"

The Haberstock Schlumpf Speed-drive/High Speed drive works like two chainrings with a large difference in size. With the additional transmission of 1:1.65 or 1:2.5 the gear ratio of the *Rohloff SPEEDHUB 500/14* used in conjunction with the Haberstock/Schlumpf Speed-drive will be increased to 868% or 1315%. It is still important not to undercut the smallest permitted sprocket ratios (see "sprocket ratios").

The Haberstock/Schlumpf Mountain-drive is not permitted for use with the *Rohloff SPEEDHUB 500/14*.

Using the *Rohloff SPEEDHUB 500/14* as an intermediate frame mounted gear-unit

Should the *Rohloff SPEEDHUB 500/14* be mounted within the frame itself, the smallest permitted sprocket ratios from the cranks to the gearbox must not be undercut (see 'sprocket ratios'). Sprockets used for the transmission from the gearbox to the rear wheel can be of any size.

Using a Bicycle trailer in conjunction with the *Rohloff SPEEDHUB 500/14*

The use of a trailer mount in conjunction with the *Rohloff SPEEDHUB 500/14* is normally not a problem!

However, the problem could arise with different types of trailer models where the long torque arm (when in use) must be carefully adapted. In case of queries please refer back to the manufacturer of the bicycle trailer to find out if they have any experience or special adapters for the mounting in conjunction with the *Rohloff SPEEDHUB 500/14*. Alternately refer to www.rohloff.de - FAQ > SPEEDHUB > TRAILER.

Using an axle mounted bicycle stand with the *Rohloff SPEEDHUB 500/14*

A bicycle stand which is mounted directly on the rear axle of the *Rohloff SPEEDHUB 500/14* is available from the company Point bike innovation GmbH, phone 0049 2206 95800. (Bicycle stand Cd93 black, adjustable for 26" - 28"). The SPEEDHUB axleplate "TS long" with the longer thread should be used together with this sort of bicycle stand.

www.rohloff.de > FAQ > SPEEDHUB > TORQUE SUPPORT > AXLE PLATES.





Particulars

Use of an enclosed chainguard.

The chainguard **must not** rub against the hub shell. This rubbing effect could result in deep brush marks appearing upon the hub shell, possibly eventually wearing completely through it! This damage could lead to accidents through oil leakage or even a complete blockage of the gear unit itself.

Sprockets used with on a bicycle fitted with a 'Hebie Chainglider' may not be reversed. The Chainglider uses the exposed seal surface to support itself. This use may have caused damage or wear which would lead to excessive oil loss if then rotated and used as a seal surface.

Use of a carbon handlebar in conjunction with the Rohloff shifter

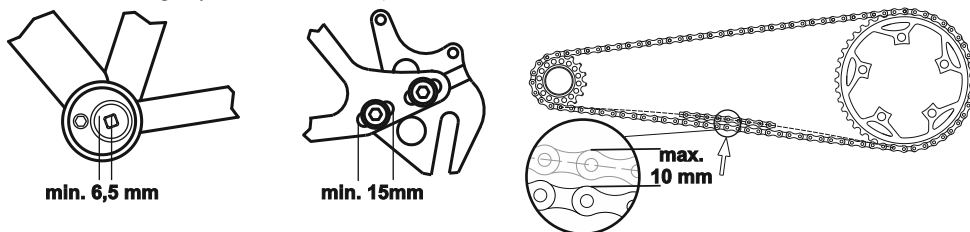
The Rohloff Shifter (Art. #8200) is not approved for installation on any sort of carbon handlebar. **The Rohloff AG will not be held responsible for accidents resulting from the mounting of the Rohloff shifter on carbon handlebars.**

The Rohloff Shifter (Art. #8206 / 8207) is approved for carbon handelbar use.

Eccentric BB or adjustable dropouts on frames with the Rohloff SPEEDHUB

It is especially important to use a concentric mounted chainring when utilizing an eccentric BB or adjustable dropouts, otherwise the chain tension could vary extremely. The chain tension should be set so that the chain has approximately 10mm play when lightly pushed from underneath and under no pressure.

If using adjustable dropouts in collaboration with the internal gear mech, then it is important to check that there is enough room for the cable adjusters to accommodate the moving of the rear wheel as the chain wears/stretches.(if not, the housing may have to be shortened).



Use of Tuning parts

http://www.rohloff.de/en/technology/tuning_parts/index.html

Belt drive transmission system 'Gates Carbondrive':

When utilizing a bicycle equipped with a 'Gates Carbondrive' belt transmission, it is important to adhere to the manufacturers instructions printed within their owners manual. Furtehr information can be obtained from:

www.gatescarbdrive.com/resources/manuals-and-tech

'MonkeyBone' IS to PM adapter:

Compatible with the OEM2 axleplate in combination with a Postmount disc brake caliper.

160mm disc = Art. #8553 / 180mm disc = Art. #8554

'PM Bone' (PM-PM Adapter) + 'PM Axleplate':

The Rohloff PM Axleplate (PM CC Art. #8225) in combination with the PM Bone (Art. #8555) is recommended when mounting a SPEEDHUB in all frames with an integrated Postmount direct calliper mount.

Further information over these parts and many others is available on our Homepage under: www.rohloff.de/en/service/download/documentation

