

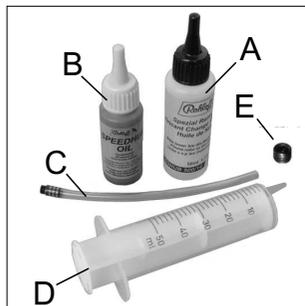
1. Oil change	87
2. Maintenance and care	89
3. Sprocket reversing/replacing	90
4. Changing of brake discs	91
5. Changing the gear mech	
5.1 Removal of one-piece axle ring	92
5.2 Removal of quick-change axle ring	92
5.3 Mounting the external gear mech	93



1. Oil change

An oil change should be annually carried out or at least every 5000km. Through this process it can be safe to say that there will always be enough oil in the hub regardless of oil loss (due to sweat oil) and that any penetrated water will be rinsed out.

For a problem-free oil change we recommend the use of the *Rohloff* Oil Change Kit (Art.N° 8410).



The Oil Change Kit consists of:

- A** 25ml cleaning oil in a 50ml bottle*
 - B** 25ml *Rohloff* SPEEDHUB OIL
 - C** Oil filling tube
 - D** Non returnable syringe 50ml
 - E** Drain screw with new seal
- The oil filling tube should be placed over the syringe and secured with a drop of super-glue before use.

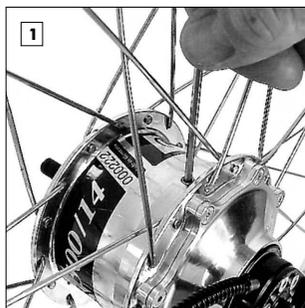
POINTER

* There will already be approx. 25ml fluid in the hub (old oil and any penetrated moisture). After the cleaning oil is also filled into the hub then there will be approx. 50ml fluid to drain out. For this reason the cleaning oil comes in a 50ml bottle so that the old fluid can be drained out into this bottle for safe disposal.

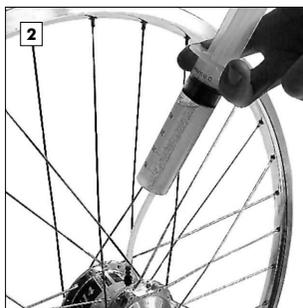
To rinse the hub properly, ride approx. 1km or turn the wheel by hand using the cranks for approx. 3min whilst simultaneously swiching between gears #3 and #5. In these gears all planetary gear sets are in use, making sure that the cleaning fluid is well rinsed through in order to thin out the old oil for easier removal.

TIP

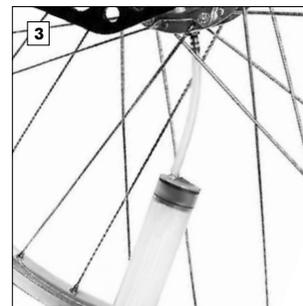
It is important to protect the brake disk/ pads (if mounted) with a clean cloth to minimize the possibility that oil could spray out onto them.



To change the oil, the *Rohloff* SPEEDHUB 500/14 should be left at room temperature (because the oil flows better). Turn the hub, so that the drain screw can be seen on the top. Remove drain screw (3mm allen key).



Draw the 25ml cleaning oil into the syringe, screw the filling tube into the drain screw hole and fill the cleaning oil into the hub. After this, use the syringe to draw out a little air out into the syringe. Remove the filling tube and refit the drain screw.



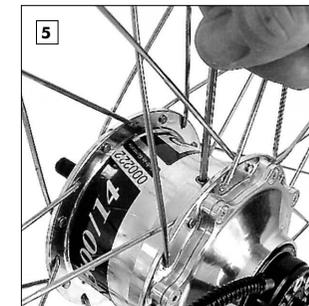
Remove the drain screw (3mm allen key) and refit the filling tube and syringe. Turn the wheel, so that the filling point is underneath the hub. Wait approx. 15mins with the wheel in this position, then use the syringe to draw out the old fluid. Remove the syringe and filling tube, use this to pour the fluid into the 50ml cleaning oil bottle.

ATTENTION

The *Rohloff* SPEEDHUB 500/14 must be filled **exclusively with Rohloff** oils (gear box/cleaning oils). The use of other types of lubricants and/or cleaning fluids could lead to the damage of the inner mechanism's nylon components.

Used oil should be taken to a specialized oil disposal point, so as to keep pollution levels down.

Rohloff SPEEDHUB OIL and cleaning oil can be disposed of together with other motor oils.



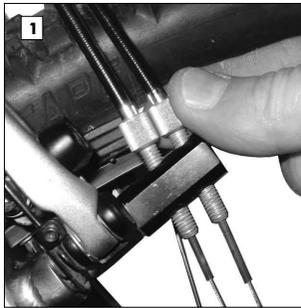
Draw 25ml *SPEEDHUB OIL* into the syringe and insert this into the hub. Draw out approx. 25ml of air to keep the pressure correct inside and therefore, avoid oil seeping back out, when removing the filling tube.

Fit the new drain screw using a drop of loctite (eg Loctite 511) and screw in tight (3mm allen key, tightening torque 0.5Nm/4in.lbs.).

2. Maintenance and care

The shifter cable tension can be altered by the cable adjusters. When winding the cable adjusters out, the cable tension is increased. For the lightest possible gear change, the tension should be just enough, so that on the twist shifter there is approx. 1/2 gear (2mm) rotational play, when in a selected gear. The dot 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.

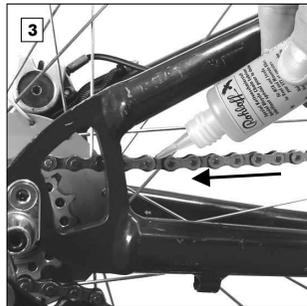
ATTENTION!
Too much cable tension raises the amount of friction within the shifter cables and in turn, raises the force needed on the twist shifter to select other gears.



On the versions with an internal gear mech the cable adjusters can 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.



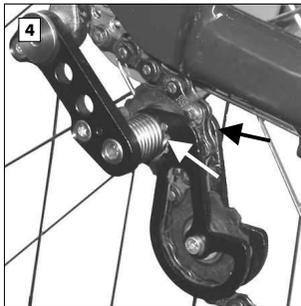
On the versions with an external gear mech the cable adjusters can be found on the cable box. This sits directly on the left hand side of the *Rohloff SPEEDHUB 500/14*. These cables are either routed along the seatstay or the chainstay of the frame.



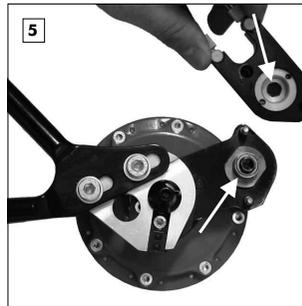
When lubricating the chain, place a thin thread of lubricant on the outside of the chain over the centre rollers. This process is carried out quicker and easier, when running the chain backwards whilst applying the lubricant.

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.



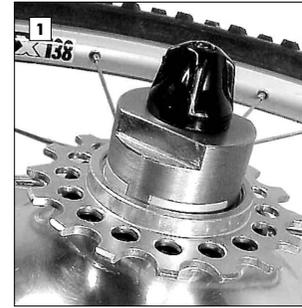
To lubricate the chain tensioner, place a drop of oil on the left and right side of the upper jockey wheel on the pivot point.



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 picture above.

3. Sprocket reversing/replacing

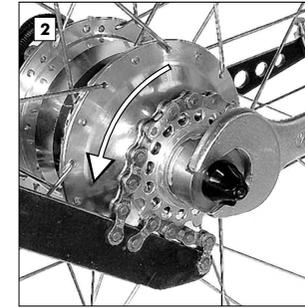
The sprocket sizes 15, 16 and 17 of the *Rohloff SPEEDHUB 500/14* are symmetrical and are therefore reversible, when worn on one side. After reversing the sprocket, fit a new chain. This will now pull on the other, unworn side of the sprocket. Once both sides are worn, the sprocket must be replaced. The 13 tooth sprocket is not reversible, and therefore, must always be replaced once worn.



Check that the seats on the driver are clean so that the tool can be properly seated. Place the sprocket tool over the clean seats of the driver and with a quick release lever (CC) or an axle nut (TS) secure in position, so that the sprocket tool is prevented from springing out of the seats.

POINTER
Make sure that the area around the sprocket and hubshell is free from dirt, so that this cannot penetrate into the gear-unit during this process.

ATTENTION!
Make sure that the sprocket remover tool is properly secured when mounting or dismounting the sprocket, always. The driver could get severely damaged, when attempting this removal/assembly procedure with an unsecured sprocket tool.



Hold the sprocket tool steady with a 24mm wrench and using a chain whip turn the sprocket anticlockwise in the opposite direction to the 24mm wrench.



ATTENTION!
Check the sprocket for signs of damage or wear caused by the hub seal. If needed, reverse or replace it for a sprocket with undamaged seal surfaces immediately. This will in turn reduce the possibility that oil could seep out.

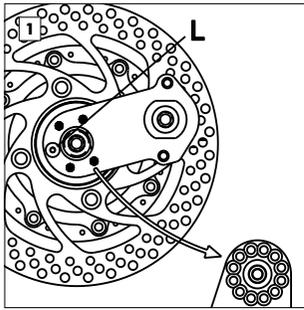


The sprocket can be removed over the sprocket tool. When only reversing the sprocket, clean the sprocket turn it over 180° and screw it back onto the cleaned and regreased thread of the driver in a clockwise direction. Tighten up the sprocket using the chain whip. If the sprocket needs to be replaced, simply screw the new sprocket tightly onto the driver.

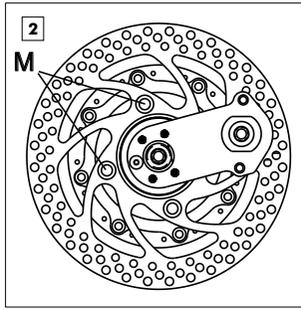
POINTER
Placing the new/reversed sprocket onto the driver over the sprocket tool helps the sprocket to sit evenly on the thread, so as to eliminate the possibility of cross-threading.

4. Changing of brake discs

If the brake disc is worn or needs to be replaced by a different brake type, the rear wheel along with the axle plate will have to be removed before the replacement of the disc can be carried out.



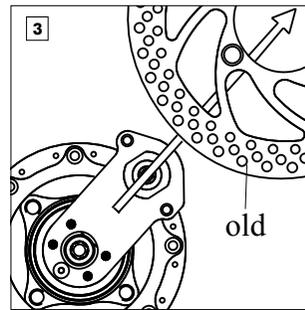
Mark the axle plate, so that it can be replaced later in the same position. Remove the axle plate screws (M4x25 - Torx TX20). Remove the axle plate and secure the external transfer box to the hub with one of these screws **L**.



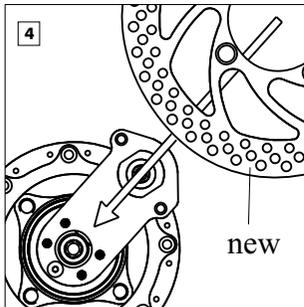
Remove the four mounting bolts **M** (M8x0.75x8.5 - 5mm allen key).

ATTENTION

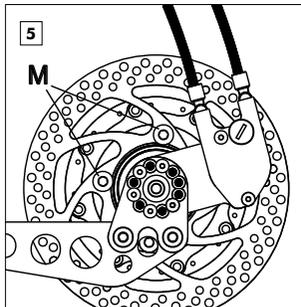
The external transfer box must not be removed as the cogs within the box could fall out of synchronization. See chapter "Service" paragraph 5. "Changing the gear mech".



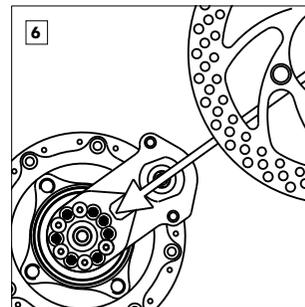
Pull the old brake disc off the center disc mount and remove this over the external transfer box.



Place the new brake disc over the external transfer box and down onto the center disc mount (pay attention to the rotational direction of the brake disc).



Replace the four mounting bolts **M** (M8x0.75x8.5 - 5mm allen key, tightening torque 7Nm/61in.lbs.). Remove the axle plate screw **L** from the external transfer box. Remount the axle plate in the correct position and secure this in place with the five axle plate screws (M4x25 - Torx TX20, tightening torque: 3Nm/25in.lbs.).

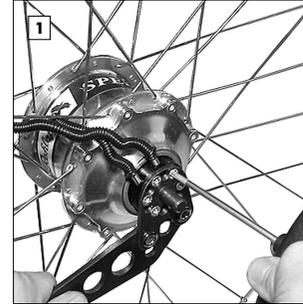


The removal of the axle plate is not necessary on the OEM versions, where the axle plate is secured to the hub in the position shown in the above diagram. The brake disc can simply be removed over the external transfer box and the axle plate together.

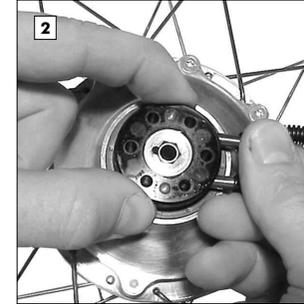
5. Changing the gear mech

The replacement of the gear mech is normally only needed, when mounting the hub on a different bicycle frame. It is not routine work and we advise that this work is carried out by a professional bicycle workshop.

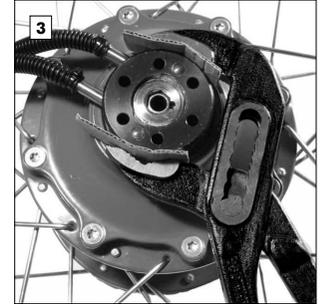
5.1 Removal of one-piece axle ring



Regardless of which axle plate is mounted, the axle plate must be removed by unscrewing all six of the axle plate screws (M4x25 - Torx TX20).

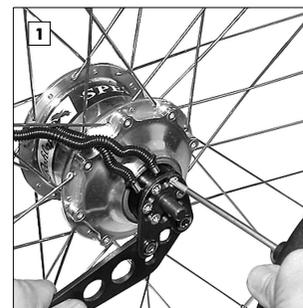


Lie the wheel on a flat surface with the axle ring facing up and the cable guides facing to the right. Rock the axle ring from side to side whilst pulling it upwards in order to loosen it from the hub.

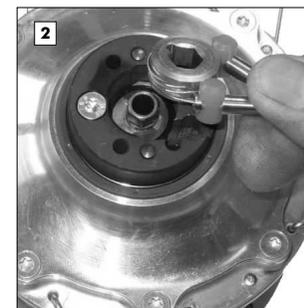


TIP
Should the axle ring not loosen by hand, use a pipe wrench to hold the axle ring tight (place cardboard between the axle ring and the pipe wrench). Rock the axle ring from side to side with the pipe wrench, whilst pulling it upwards in order to loosen it from the hub.

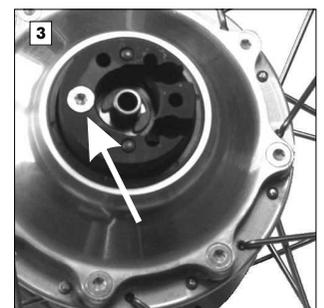
5.2 Removal of quick-change axle ring



Regardless of which axle plate is mounted, the axle plate must be removed by unscrewing all five of the axle plate screws (M4x25 - Torx TX20).

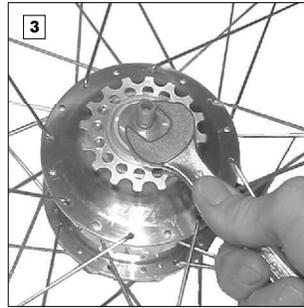
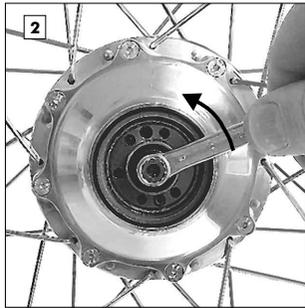
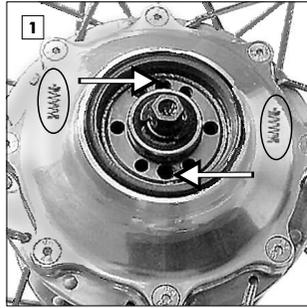


Lie the wheel on a flat surface with the axle ring facing up and the cable guides facing to the right. Pull the cable guides with the nylon cylinders and the cable pulley upwards and out of the axle ring.



Remove the axle ring screw (M4x20 - Torx TX20) and rock the axle ring from side to side, whilst pulling it upwards in order to loosen it from the hub.

5.3 Mounting the external gear mech



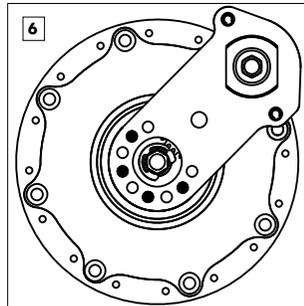
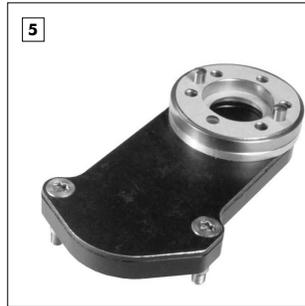
ATTENTION !

The wheel must not be laid on the axle ring side once the axle ring has been removed because:

- Oil could leak out of the holes.
- The two freewheel springs could fall out of the locating peg holes.

Shift the gearbox into gear #14 by turning the hexagonal peg with an 8mm wrench carefully in a clockwise direction to the end stop.

Hold the aluminium nut on the sprocket side with a 17mm wrench to prevent the axle from moving, whilst selecting the gear.

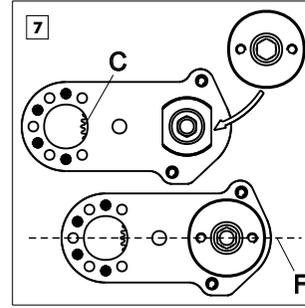


Place a new paper gasket over the locating pegs of the external transfer box, so that all holes meet up with corresponding screw holes of the axle ring. The smaller seal sits in the recess on the rear side of the axle ring.

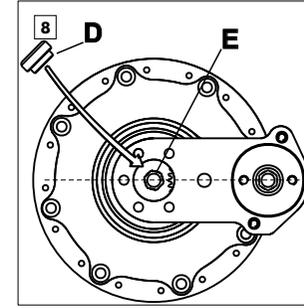
Mount the external transfer box onto the gearbox.

POINTER

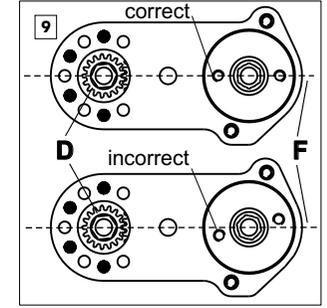
The grub screw under the External Gear Mech should be fitted in the correct position. "Appendix - Grub screw of the External Gear Mech".



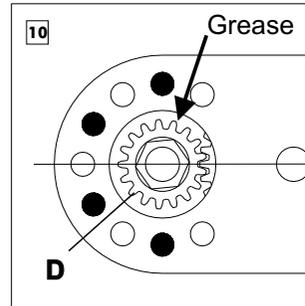
Place the cable pulley over the hexagonal peg of the external transfer box and then rotate it until the two screw holes sit on the center line F, as shown in the diagram above. Hold the cable pulley in this position.



Insert cog D over the hexagonal peg E with the tothing facing outward. There is one mounting position out of the possible six, where the teeth of the cog D and the sprocket C line up. In this position the screw holes of the cable pulley remain as close as possible along the center line F. This position is the correct position. It may be necessary to turn the cable pulley lightly to the left or right to allow for an easier assembly.

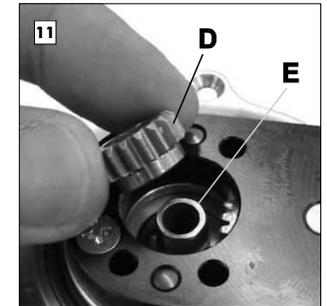


The five other mounting positions result in the screw holes of the cable pulley being substantially more out of line with the center line F. In this case, remove the cog D and try the next mounting position.



Place a small amount of grease between the cog D and the external transfer box. Remount the axle plate and secure it in the correct position with the five axle plate screws (M4x25 - Torx TX20, tightening torque 3Nm/25in.lbs.).

Further steps for mounting the external gear mech can be found in chapter "Mounting", paragraph 7.3 "External gear mech".



ATTENTION !

The smaller side of cog D must always be mounted into the external transfer box facing inwards. When cog D is wrongly mounted, the axle plate will cause functional difficulties within the external transfer box.



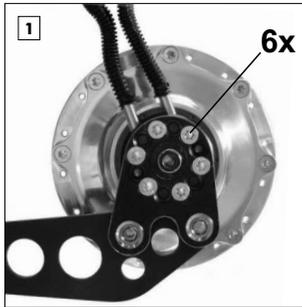
A selection of sprockets and the sprocket tool

1. Changing the hub cable (0.9mm Rohloff special gear cable).....	97
1.1 One-piece axle ring	98
1.2 Quick-change axle ring	104
2. Changing the chain tensioner spring	108
3. Changing the grip rubber	109
4. Exchanging the gear unit	
4.1 Gear unit removal	110
4.2 Gear unit installation	111
5. Hub Seal replacement	
6. Appendix	
Failure Diagnosis	119
Trouble Shooting	120
Tools and Bolts	124
Wheel lacing with a European spoke-hole pattern	125
Wheel lacing with a French spoke-hole pattern	126
Technical Data	127
Reference to Serial-N°	128
Threaded Pin of the External Gear Mech	129
Notices	130

1. Changing the hub cable (0.9mm Rohloff special gear cable)

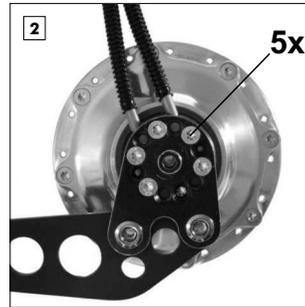
The method of replacement for a worn or broken hub cable can be carried out differently depending on which axle ring type is mounted.

1. Axle ring with pressed-in cable guides (one-piece axle ring)
2. Axle ring with cable guides seated within nylon cylinders (quick-change axle ring)



The one-piece axle ring was mounted on all internal gear mech versions until the beginning of 2003. This type of axle ring is secured to the gearbox with six axle plate screws. The cable guides of the one-piece axle ring remain fixed to the axle ring. This can be seen once the axle plate has been removed. To replace the hub cable, the axle ring complete with the cable pulley must be removed.

Replacement procedure see paragraph 1.1.



The quick-change axle ring is secured to the gear box with five axle plate screws. The axle ring remains secured to the gearbox with one more screw and the cable guides seated within black nylon cylinders rest in the axle ring. This can be seen once the axle plate has been removed. When replacing the hub cable, the axle ring remains attached to the gearbox.

Replacement procedure see paragraph 1.2.

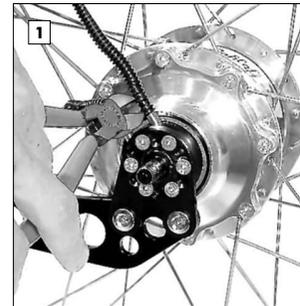
POINTER



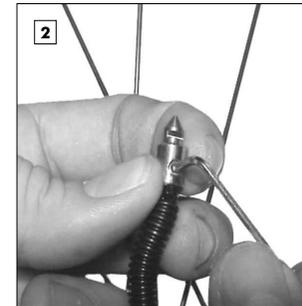
When correctly mounted, the hub cable should last a good 10,000km. Should the cable get damaged and need to be replaced sooner, the reason for this damage should be identified and corrected before mounting a new hub cable. Possible reasons:

1. False alignment of the axle plate or the cable guide can result in the cable rubbing against the metal of the cable adjusters/guides. (see chapter "Mounting", paragraph 4.1.2).
2. Torque not properly secured. The hub axle rotated and stretched the cables to breaking point.
3. Other physical damage (eg crashes, accidents).

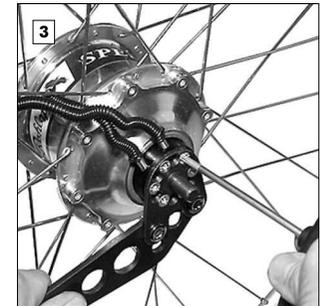
1.1 One-piece axle ring



Remove the rear wheel. With good wire cutters, cut off the four cable ties that hold the concertina tubes over the hub cables.



Unscrew both bayonet male connectors from the hub cables (M4x4 - 2mm allen key) and remove the concertina tubes.



To change the hub cables, the axle plate must be first removed. To do this unscrew the six axle plate screws (M4x25 - Torx TX20).

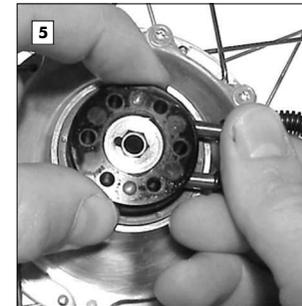
ATTENTION



Take note of the position of the axle plate against the hub cable guides for correct refitment later.



To hold the axle steady, grip the long torque arm tightly or hold the OEM or OEM2 axle plate with a 10mm wrench (see chapter "Mounting", paragraph 4.3).



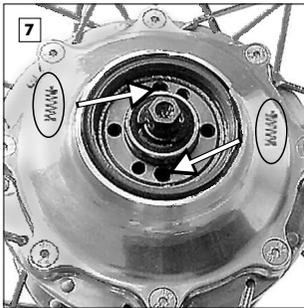
Lie the wheel on a flat surface with the axle ring facing up and the cable guides facing to the right. Rock the axle ring from side to side whilst pulling it upwards in order to loosen it from the hub.



TIP



Should the axle ring not loosen by hand, use a pipe wrench to hold the axle ring tight (place cardboard between the axle ring and the pipe wrench). Rock the axle ring from side to side with the pipe wrench whilst pulling it upwards in order to loosen it from the hub.



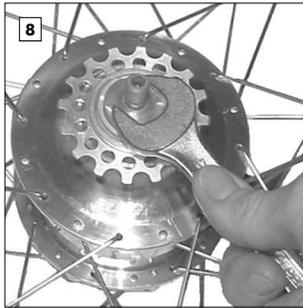
ATTENTION !

The wheel must not be laid on the axle ring side once the axle ring has been removed because:

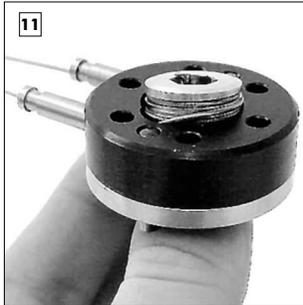
- a. Oil could leak out of the holes.
- b. The two freewheel springs could fall out of the locating peg holes.



Remove both paper gaskets from the rear side of the axle ring (where applicable). Always use new paper gaskets when remounting the axle ring.

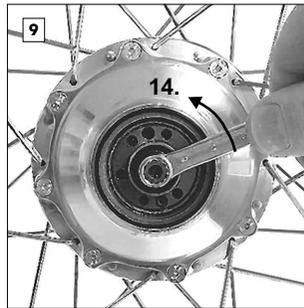


The mounting of the cable pulley must be carried out in gear #14. To do this, the axle has to be held steady with a 17mm wrench on the aluminum nut (sprocket side).

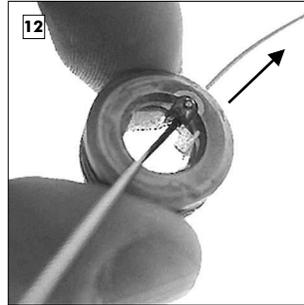


Push the cable pulley out of the axle ring from the rear side. Take care not to tilt the cable pulley for an easier removal. Remove the old hub cable and clean both the cable pulley and the axle ring.

Check cable pulley for burrs and deburr if necessary.



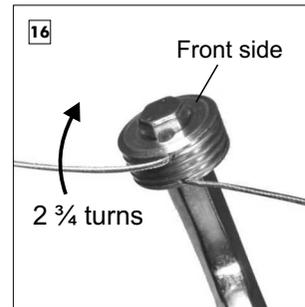
With an 8mm wrench turn the hexagonal peg in an anticlockwise direction until the end stop. Now the hub is in gear #14.



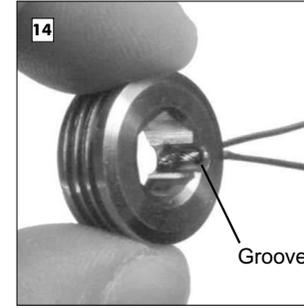
Push the new hub cable approx. half way into the cable pulleys lower hole from the inner side.



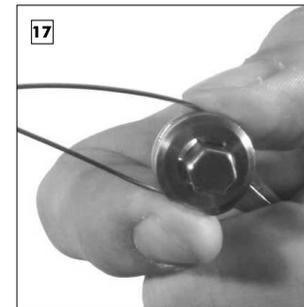
Next push the other end of the cable into the top hole of the cable pulley until both ends of the cable stick approx. the same length out of the other side.



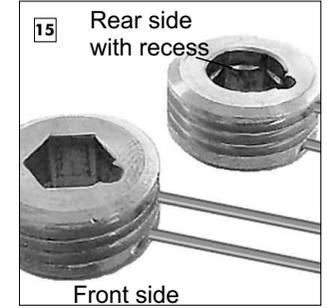
Put the cable pulley onto an 8mm allen key with the front side on top. Bend the hub cables in the direction of the cable runs in the cable pulley. The top cable should be wound approx. 2 3/4 times around the cable pulley.



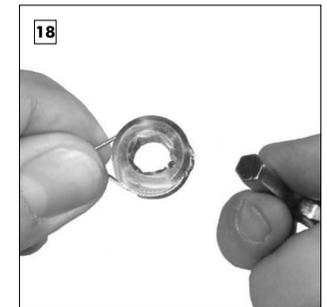
Hold the cable pulley tight and with the other hand grasp the hub cables and pull them quickly until the cable sits properly in the cable pulley without getting kinked.



Hold both ends of the hub cable in position with thumb and index finger.



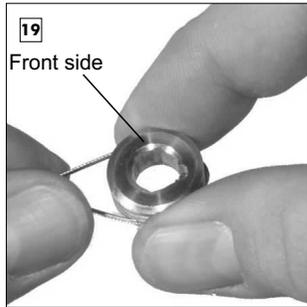
Pay attention to which side of the cable pulley is the mounting side. The back/mounting side has a recess before its hexagonal hole. The front side is without this recess.



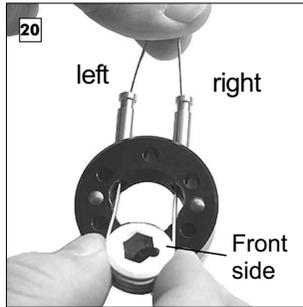
Press both ends of the hub cable together with the thumb and index finger of the other hand. Remove the cable pulley from the 8mm allen key.

POINTER

The inward groove of the cable pulley should be sitting facing in the opposite direction to the gear cable. The runs of the cable pulley must be completely filled by the gear cable.



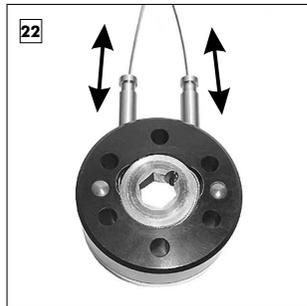
19 Grip the cable pulley with a free hand so that both ends of the hub cable are held in position. Hold this so that front side of the cable pulley faces up.



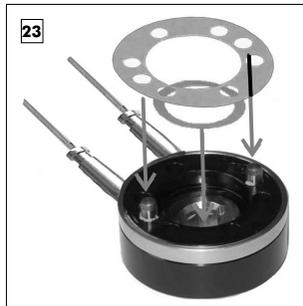
20 Thread the right end of the hub cable (long end) through the right hand cable guide. Thread the left end of the hub cable (short end) through the left hand cable guide. This procedure works a lot easier when the axle ring is held by a third hand.



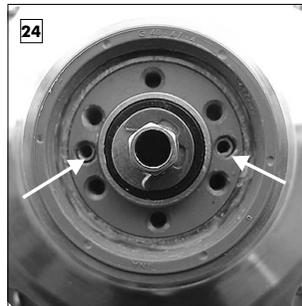
21 Pull the cable pulley up to the axle ring by pulling both ends of the hub cable equally. Push the cable pulley into a parallel position with the axle ring using the thumb (from outside) and index finger (from inside) whilst keeping the tension applied to both hub cable ends. The cable pulley then springs into the axle ring hole.



22 The cable pulley must rotate freely within the axle ring when pulling each end of the hub cable. Prevent the cable pulley from springing out of the axle ring with the thumb and index finger.



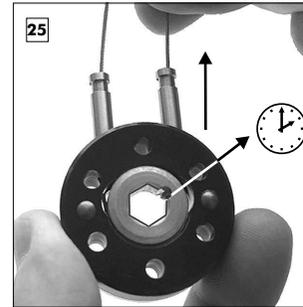
23 Place a new paper gasket over the locating pegs of the axle ring so that all holes meet up with the corresponding screw holes of the axle ring. The smaller gasket sits in the recess on the rear side of the axle ring.



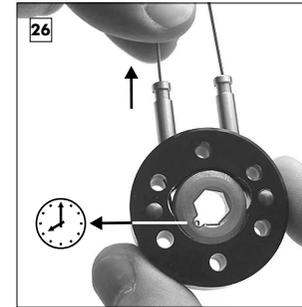
24 Lay the wheel on a flat surface so that the two locating peg holes (not threaded) lay at positions 3 and 9 o'clock (arrowed).

ATTENTION !

Make sure the two freewheel springs remain in the locating peg holes.



25 Hold the axle ring in the left hand and pull the right end of the hub cable until the end stop (groove rotates to about 2 o'clock).



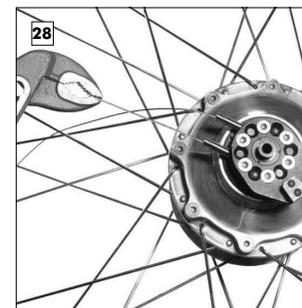
26 Pull the left end of the hub cable so that the groove rotates approx. 1/2 revolution. The groove in the cable pulley should now sit between the 7 and 8 o'clock positions. This is the position of gear #14. Hold the axle ring and the cable pulley securely in this position and place this onto the gearbox with the locating pegs in the correct holes.

POINTER

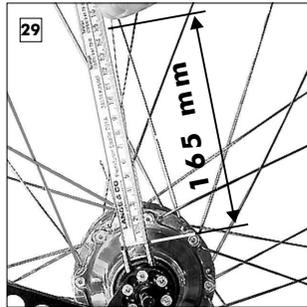
Should one end of the hub cable be pulled completely round to the end stop, the bend in the hub cable (between the cable hole of the cable pulley and the cable run) will straighten out. This bending and straightening of the hub cable will considerably shorten the cable life. Therefore, the cable pulley must always have an end position approx. half a turn away from the cable guides. This way the hub cable is guaranteed to run smoothly as it always sits in the cable run and the bend remains in place.



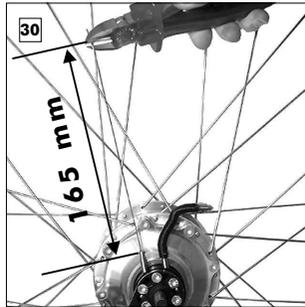
27 Make sure that the hexagonal peg sits correctly within the hole of the cable pulley (groove between the 7 and 8 o'clock positions). It may be necessary to alter the position of the cable pulley by a minimal amount. Place some grease between the cable pulley and the axle ring (arrowed). Replace the axle plate and secure into position with the six axle plate screws, tightening them in cross formation (Torx TX20, tightening torque: 3Nm/25in.lbs.).



28 Check the function of the axle ring by gripping one end of the hub cable with pliers and pulling this out to the end stop. Repeat this process with the other end of the hub cable. At the end stops, both ends of the hub cables should protrude from the cables guides by the same amount.



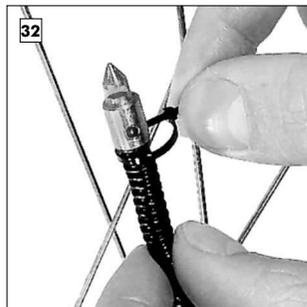
Check the rear (14) side cable is pulled out to its end stop. Measure* this rear (14) cable and cut it at 165mm with sharp wire cutters. Place a new concertina tube carefully over the cable and place the male bayonet connector on to the end of the cable.



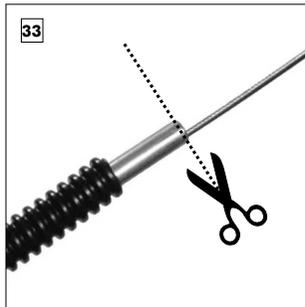
Push the cable up into the male bayonet connector as far as it will go and tighten both 4mm headless screws (2mm allen key, tightening torque: 1.5Nm/12in.lbs.). Pull the front (1) side cable with pliers through the 13 clicks of the gearbox until the endstop (gear #1). Measure* this front (1) cable and cut it at 165mm with sharp wire cutters.



Place a new concertina tube and male bayonet connector over the cable. Tighten up the connector as with the other. Pull the shorter cable until both of the hub cables are approx. the same length. Place the two new concertina tubes over the cable guides and secure with cable ties. Make sure that the cable ties clamp the concertina tubes over the recess in each of the cable guides.



The top ends of the concertina tubes must be placed over the ends of the male bayonet connectors and secured with cable ties. Make sure that the cable ties clamp the concertina tubes over the recesses.



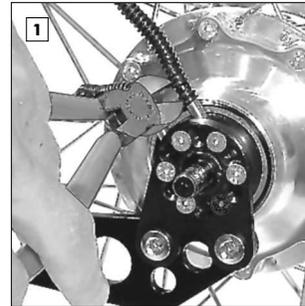
TIP



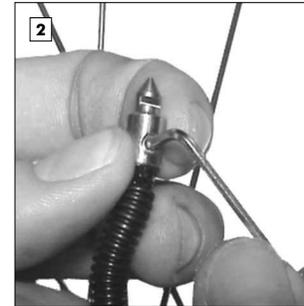
* For easier measurement of the correct cable length the special measuring pipe (Art.No. 8711) can be ordered. Simply place the measuring pipe as far down as possible over the cable. Cut the cable at the end of this pipe, then slide the new concertina tube over the pipe. Remove the measuring pipe, secure the male connector and the concertina tube in the correct positions.

1.2 Quick-change axle ring (from serial N° 25300)

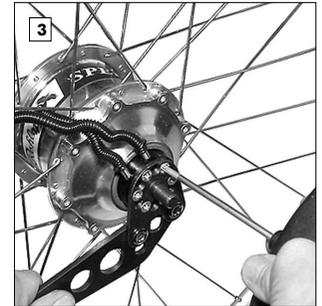
A Hub Cable Easy Set (Art.N° 8573) is available for a quick replacement. A Hub Cable including all needed parts can simply be slotted into the axle ring as a complete unit (See included instruction sheet for mounting instructions).



Remove the rear wheel. With good wire cutters cut off the four cable ties that hold the concertina tubes over the hub cables.



Unscrew the bayonet male connectors from the hub cables (M4x4 - 2mm allen key) and then remove the concertina tubes.

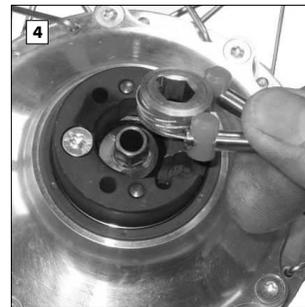


To change the hub cables the axle plate must be firstly removed. To do this, unscrew the five axle plate screws (M4x25 - Torx TX20).

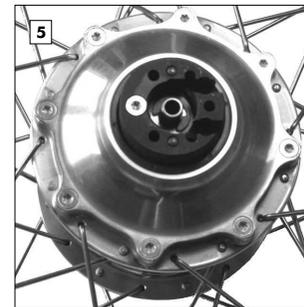
ATTENTION



Take note of the position of the axle plate against the hub cable guides for correct refitment later.



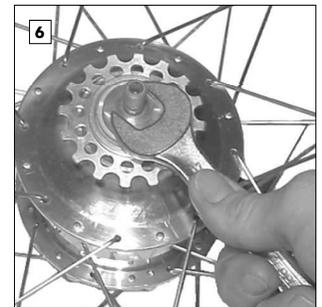
The axle ring remains attached to the axle by one more countersunk head bolt underneath the axle plate. Lie the wheel on a worktop with the axle ring facing upwards. Remove the two cable guides with the nylon cylinders and the cable pulley by rocking the cable guides from side to side until they are released from their seats within the axle ring.



ATTENTION



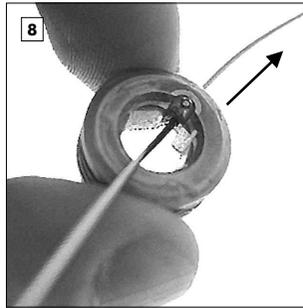
Do not lie the wheel on the axle ring side, as it is possible that oil could leak out of the bolt holes.



The mounting of the cable pulley must be carried out in gear #14. To do this, the axle has to be held steady with a 17mm wrench on the locking nut on the sprocket side.



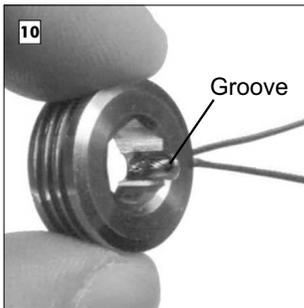
With an 8mm wrench turn the hexagonal peg in an anticlockwise direction until the end stop. Now the hub is in gear #14.



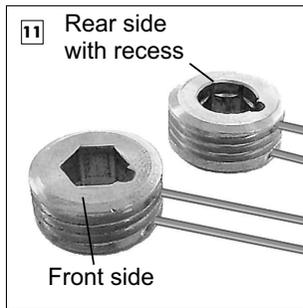
Remove the old hub cable from the cable pulley. **Clean and deburr cable pulley if necessary.** Insert the new hub cable (0.9mm) approx. half way into the cable pulleys lower hole from the inner side.



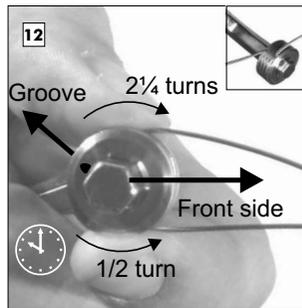
Next push the other end of the cable into the top hole of the cable pulley until both ends of the cable stick approx. the same length out of the other side.



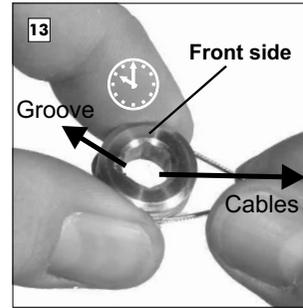
Hold the cable pulley tightly and with the other hand grasp the 0.9mm hub cables and pull them quickly until the cable sits properly in the cable pulley without getting kinked.



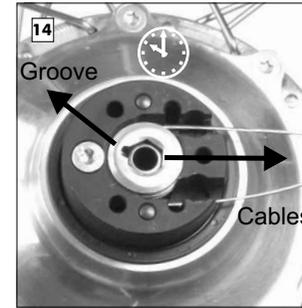
Pay attention to which side of the cable pulley is the mounting side. The back/mounting side has a recess before its hexagonal hole. The front side is without this recess.



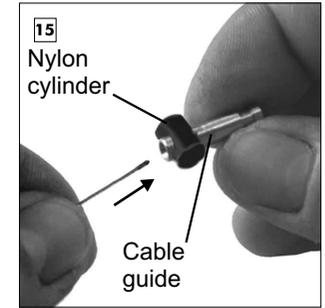
Bend the hub cables in the direction of the cable runs in the cable pulley (this is easily achieved by placing the cable pulley onto an 8mm allen key). The top cable should be wound approx. $2\frac{1}{4}$ times around the pulley. The bottom cable approx. $\frac{1}{2}$ of a turn in the opposite direction.



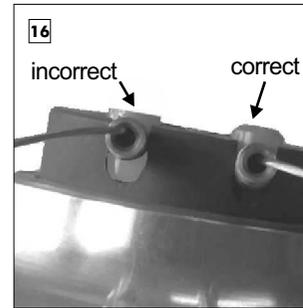
The picture shows the cable pulley with the correctly wound hub cables. The cable runs are completely filled with the gear cable and the groove faces toward the 10 o'clock position.



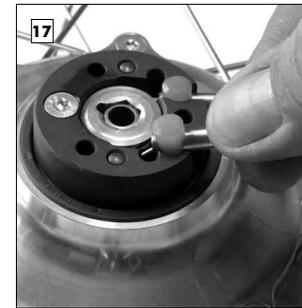
The cable pulley should be placed over the hexagonal peg of the shifting shaft with the groove facing towards the countersunk axle bolt (or as near to it as possible approx. 9-10 o'clock position). Both ends of the hub cable should be placed through the seats of the cable guides.



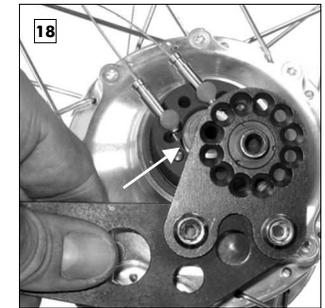
Place the cable guides over the hub cables, nylon cylinder end first!



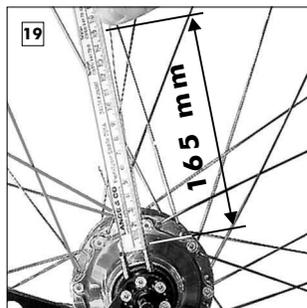
The cable guides are sitting properly in their seats of the axle ring when the rounded top of the nylon cylinder is facing upwards (as shown in the above picture).



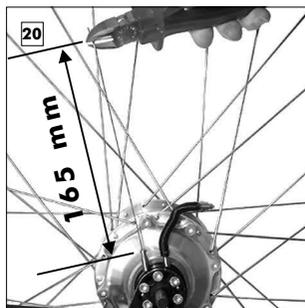
Press the nylon cylinders firmly into their seats of the axle ring.



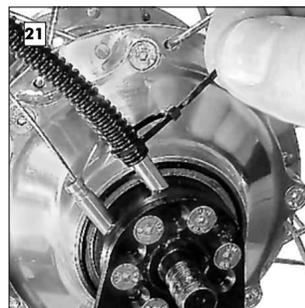
Place a little grease between the axle ring and the cable pulley. Remount the axle plate checking that it is at the same angle against the cables guides as it was before. Tighten up the five countersunk bolts (Torx TX20 - tightening torque: 3Nm/25in.lbs.).



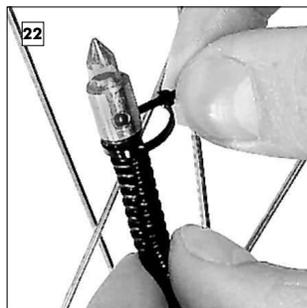
Check the rear (14) side cable is pulled out to its end stop. Measure* this rear (14) cable and cut it at 165mm with sharp wire cutters. Place a new concertina tube carefully over the cable and place the male bayonet connector onto the end of the cable.



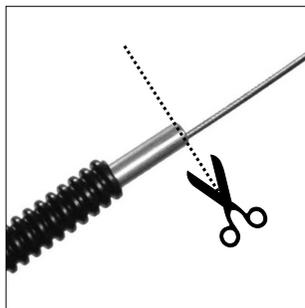
Push the cable up into the male bayonet connector as far as it will go and tighten the two 4mm headless screws with a 2mm allen key (tightening torque 1.5Nm/12in.lbs.). Pull the front (1) side cable with pliers through the 13 clicks of the gearbox until the end stop (gear #1). Measure* this cable and cut it at 165mm with sharp wire cutters.



Place a new concertina tube and male bayonet connector over the cable. Tighten up the connector as with the other. Pull the shorter cable until both of the hub cables are approx. the same length. Place the two new concertina tubes over the cable guides and secure them with cable ties. Make sure that the cable ties clamp the concertina tubes over the recess in each of the cable guides.



The top ends of the concertina tubes must be placed over the ends of the male bayonet connectors and secured with cable ties. Make sure that the cable ties clamp the concertina tubes over the recesses.



TIP
* For easier measurement of the correct cable length the special measuring pipe (Art.N° 8711) can be ordered. Simply place the measuring pipe as far down as possible over the cable. Cut the cable at the end of this pipe, then slide the new concertina tube over the pipe. Remove the measuring pipe, secure the male connector and the concertina tube in the correct positions.

1.3 Bajonet screw joining from Serial N° 43100 onwards

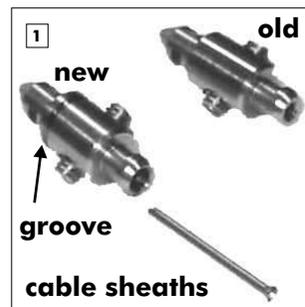
ATTENTION

The new bayonet connector differs from the former as described below:

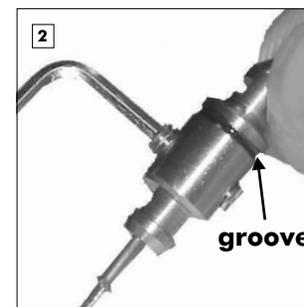
- 3mm Drilling (cable mount)
- ring shaped groove (distinction characteristic)
- cable end sheath (copper)

POINTER

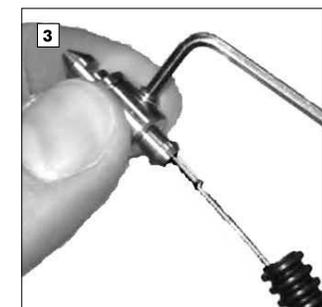
Do not use the new cable sheaths together with the old bayonet connectors (2mm drilling) to clamp the cables. In this case, the cable sheaths will be squeezed flat and it will no longer be possible to remove them from the 2mm bayonet connectors.



The bayonet connectors should be mounted together with the cable sheaths onto the 0.9mm hub cable. This way, damage to the cable by pinching it with the grub screws can be easily prevented.



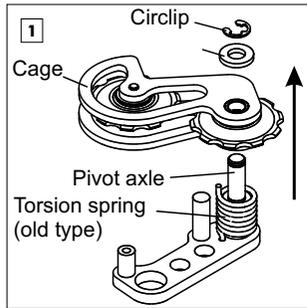
Insert the hub cable including the new cable sheath completely until the bedstop into the bayonet connector (3mm drilling). Fix the grub screws with a 2mm allen key.



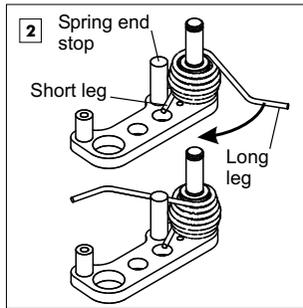
Use the 2mm allen key to secure the cable inside the bayonet connector with 0.8Nm. Secure the concertina tubes with cable ties. For further help, refer to "Repairs" 1.2.

2. Changing the chain tensioner spring

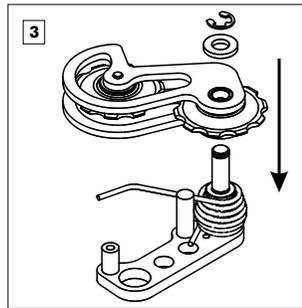
Since the end of 2002 the *Rohloff* chain tensioner has been equipped with a modified spring. With the conversion kit (Art.N° 8248) all the older *Rohloff* chain tensioners can be equipped with the new spring.



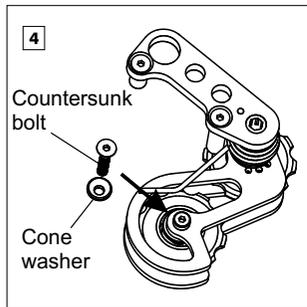
Remove the safety clip from the pivot axle using a flat screwdriver. Do not reuse this clip. Pull the cage and the washer off the pivot axle in the direction of the arrow. Remove the old torsion spring.



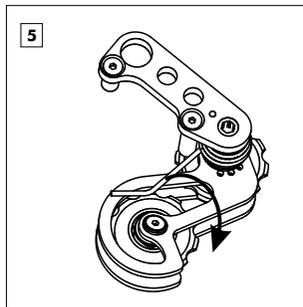
Clean and grease the pivot axle. Mount the new torsion spring over the pivot axle as shown. Turn the torsion spring until its short leg lies against the spring end stop. Hold the torsion spring in its position on the pivot axle whilst swinging the long leg over the spring end stop.



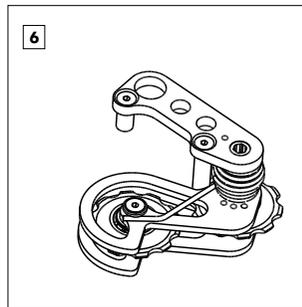
Push the cage completely onto the pivot axle. Replace the washer and fit the new safety clip into position.



Bring the cage and the long leg of the spring together into a position similar to that shown in the diagram. Swap the old jockey wheel bolt for the new countersunk bolt (M4x20 - Torx TX20, tightening torque 3Nm/25in.lbs.) and cone washer.



Push the long leg of the spring in the direction of the arrow over the new bolt and let it spring back.



The long leg of the spring now sits against the cone washer and holds the cage back creating the tension.

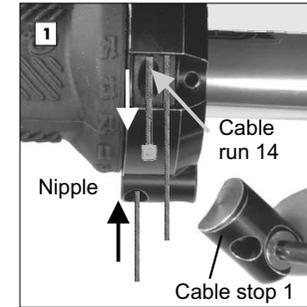
POINTER

To replace the jockey wheels, remove the cage from the pivot axle (as in stage #1). Remove the lower jockey wheel bolt and replace the jockey wheels. Remount the chain tensioner (stages #3 and #4).

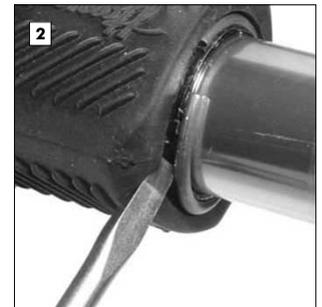
3. Changing the grip rubber

POINTER

The shifter cables have to be removed from the twist shifter first before it is possible to replace the rubber grip. Before the shifter cables are removed, the ends that were clamped in the female connectors (internal gear mech) or the cable pulley (external gear mech) must be cut so that the frayed ends of these cables do not damage the nylon liners when being removed.



Remove cable stop 1 and rotate the twist shifter until the nipple of shifter cable 14 can be seen. Pull the cable out of the twist shifter. Repeat this process for the removal of shifter cable 1.

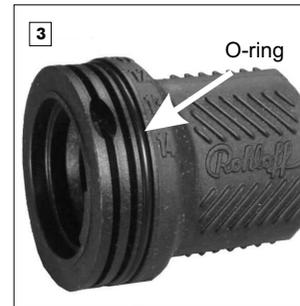


With a flat screwdriver, remove the safety ring. The rubber grip can now be removed. Clean the twist shifter housing.

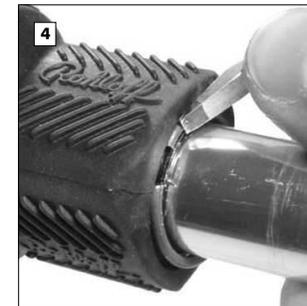
TIP

Should only the rubber grip need to be replaced.

Firstly shift into gear #14. Disconnect the Bayonet Connectors or the External cable box. Screw both of the cable adjusters completely in and remove the two screws on the cable stops of the shifter. Remove the safety circlip and slide the complete rubber grip out of the shifter housing and off of the handlebars. Hook both the cables out of their seats in the rubber grip, transfer these and re-hook them into the new, lightly greased rubber grip (Art.N° 8201). Wind these cables roughly 3/4 (270°) around the new grip in their respective runs and slide this new complete unit back inside the shifter housing and refit both of the cable stops. Replace the safety circlip and lightly test the shifter functions correctly. Reconnect the Gear mech in gear #14.



Lightly grease the twist shifter housing. The arrowed "O ring" must also be lightly greased and checked that it is sitting in the correct position before remounting.



The safety ring can now be remounted. Check that the twist shifter rotates smoothly and freely. Refit new shifter cables (see chapter "Mounting", paragraph 6. "Twist shifter").

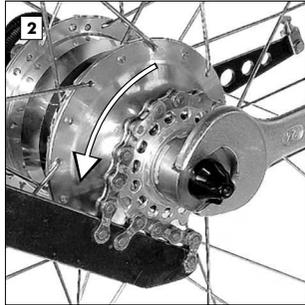
4. Exchanging the gear unit

With the Rohloff SPEEDHUB 500/14, the 14 speed gearbox can be removed completely from the hub casing allowing for a quick and easy replacement of the gearbox.

4.1 Gear unit removal



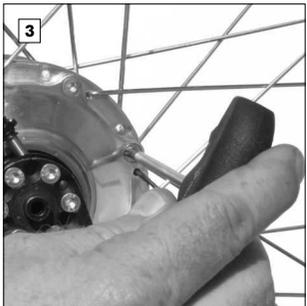
The removal procedure must start with the rinsing and draining of the oil from within the hub (see chapter "Oil change"). The drain screw must not be reused.



Remove the sprocket using a chain whip and the sprocket tool (see chapter "Service", paragraph 3. "Sprocket reversing/replacing").

ATTENTION !

When mounting or dismounting the sprocket, always check that the sprocket tool is properly secured. The driver could get severely damaged, when attempting this removal/assembly procedure with an unsecured sprocket tool.



Remove the axle nuts or Q/R skewer and the sprocket tool. Now remove the 8 hub cap countersunk bolts (M4x10 - Torx TX20).



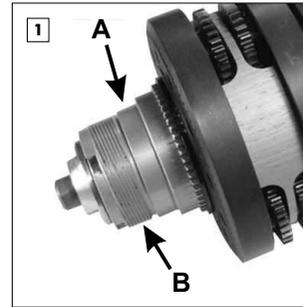
Draw the gearbox out of the hub casing. If this proves to be difficult, than gently tap the sprocket side of the gearbox with a rubber mallet to ease the process. CAREFUL! Excess oil could still leak out of the hub casing!



Lie the gearbox on its side and remove and dispose of the excess oil that is sitting in the hub casing.

4.2 Gear unit installation

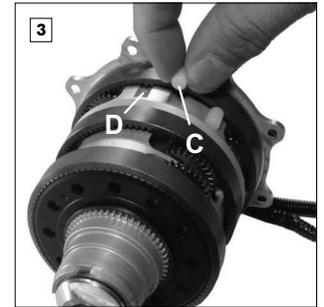
When remounting the gearbox, new joints and a new paper gasket must be fitted.



The bearing seat **A** and the sprocket thread **B** of the driver must be lightly greased before remounting the gearbox.



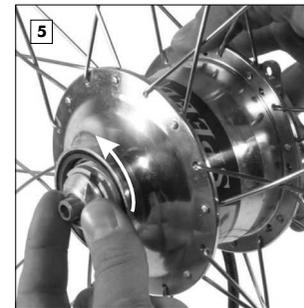
The new paper gasket (arrowed) must be fitted over the centering ridge of the hub cap. This is better accomplished when lightly greased. Align the holes in the paper gasket with those in the hub cap ready for the bolts later.



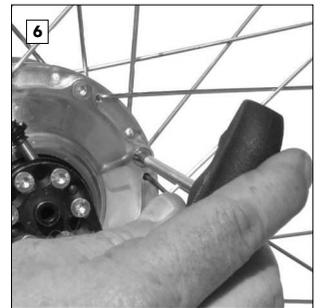
The new joints **C** must also be lightly greased before being placed into their respective seats **D**. These joints are what transfer the power from the gearbox to the hub casing.



Hold the hub cap and the gearbox firmly and feed the gearbox into the hub casing until the hub cap touches the hub casing.



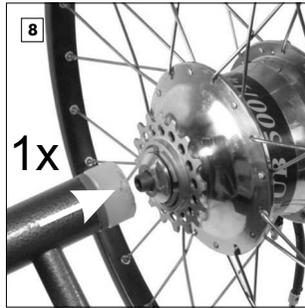
The gearbox only sits properly once the joints sit in their correct positions against the hub casing. To ease the process, rotate the driver in an anticlockwise direction whilst pushing the two parts together.



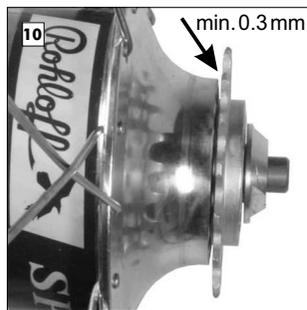
Once the hub casing touches the cap, the 8 countersunk screws can be replaced. Tighten these screws in a cross formation, so as to evenly distribute the pressure between the two parts whilst securing them together (M4x10 - Torx TX20, tightening torque: 3Nm/25in.lbs.).



Refit the sprocket with the use of a chain whip.



Check that the sprocket runs smoothly by spinning the sprocket backwards. If not, then hit the axle peg firmly with a rubber mallet. Once from the sprocket side (right) and once from the axle plate side (left). This will loosen-up the tension on the bearings.



There must be a minimum of 0.3mm between the sprocket and the hub casing. If not, then remove the sprocket and push the hub seal as far back as possible. Refit the sprocket and check that the sprocket runs smoothly.



Refill the Rohloff SPEEDHUB 500/14 with 25ml of Rohloff SPEEDHUB OIL (see chapter "Service", paragraph 1. "Oil change") and refit a new drain screw (3mm allen key, tightening torque: 0.5Nm/4in.lbs.).



POINTER

The hub bearing within the hubshell is a fixed bearing and the hub bearing on the sprocket side is a movable bearing. During the replacement of the gearbox, the movable bearing could get strained (the outer race does not move parallel with the inner race due to friction created against the hub casing). By hitting the axle pegs with a rubber mallet, the inner and outer races of the bearing will be brought back into line. The sprocket should spin freely when rotated backwards once it is correctly seated.

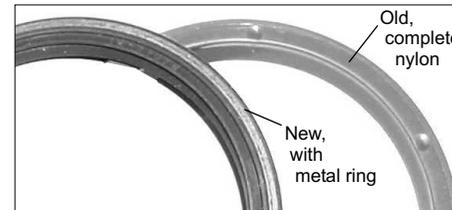
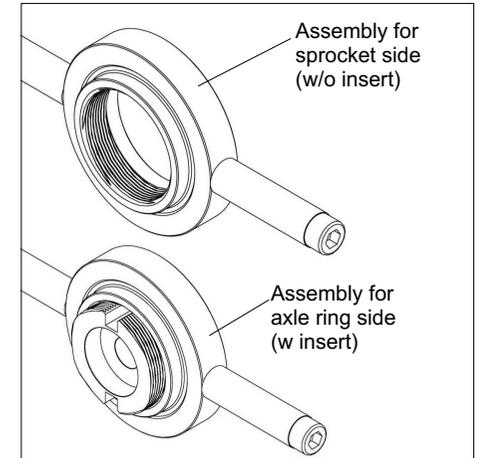
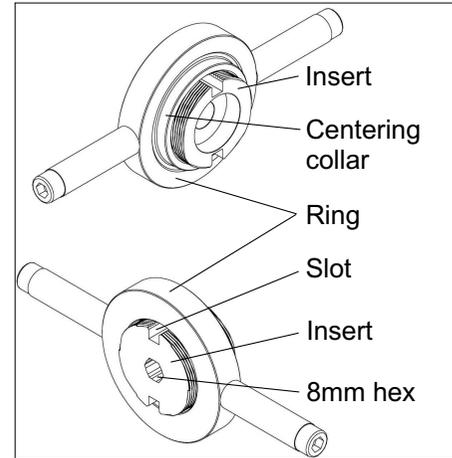
POINTER

Further disassembly past the removal of the gear unit from the hub shell is not permitted. Failure to comply will result in the loss of warranty/guarantee.

5. Hub seal replacement with Shaft seal replacement tool (Art N° 8503) and removal hook (Art N° 8507)

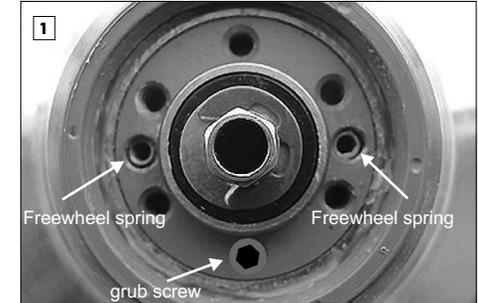
The hub seals should only be replaced in the case of an oil leak and the replacement should be carried out by a professional bicycle workshop. The new hub seals (after serial N° 25400) with an outer metal ring can only be replaced by Rohloff dealers with the hub seal replacement

Shaft seal press-in tool



Check which type of hub seal is mounted within your hub. Hubs produced after No 25400 are equipped with the new hub seal. To be sure: The new hub seals have an outer metal ring and can therefore be replaced with the tools shown. The older types are completely formed from nylon, hubs needing these types of seals to be replaced, must be sent back to Rohloff Service department to be replaced.

5.1 Axle ring side:



Lie the wheel on a flat surface with the sprocket side facing down. Remove the axle plate and the corresponding gear mech.

ATTENTION

Make sure the two freewheel springs stay in the locating peg holes.

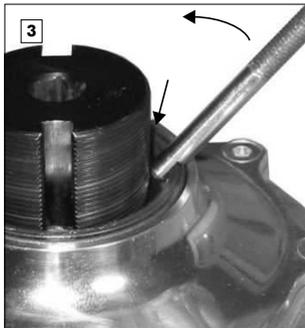
The threaded pin mounted on hubs produced after the Serial N° 47000. This must be removed before replacing the hub seals and replaced again afterwards. See "Appendix" Threaded pin, external gear mech.



Groove

ATTENTION !

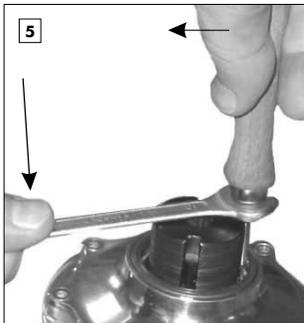
If the rub-ring of the axle ring shows signs of damage (grooves within the outer surface, noticeable with a fingernail), then please post the axle ring to the Rohloff service department so that a new rub-ring can be mounted.



Remove the old hub seal from the hub shell. To do this place the insert onto the hub and hook the removal tool under the old hub seal. Lever the removal tool into the upright position as shown in the picture.



Remove the old hub seal by sharply pulling the removal tool upwards. If this doesn't remove the seal from the hub shell, then follow the method shown below.



Lay a 10mm wrench flat over the insert with the open end hooked under the wooden grip of the removal tool. Secure the removal tool by pushing it against the insert. Force the wrench down onto the insert in order to lever the removal tool with the old hub seal upwards and out of the hub shell. Remove the insert.



Use a cottonbud to clean and degrease (petroleum/brake cleaner) the mating surface ready for the new hub seal.



One thread visible

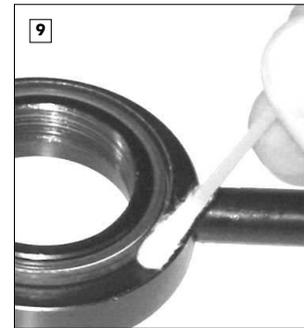
Prepare the hub seal press tool as shown in the picture.



Place the new hub seal around the centering collar of the press tool.

POINTER

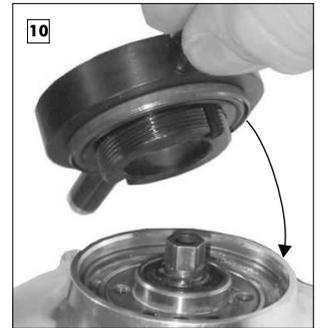
The closed side of the new hub seal faces towards the tool itself, the open side is visible.



Using a cottonbud, cover the outside edge of the new hub seal with a thin coat of Loctite 641.

ATTENTION !

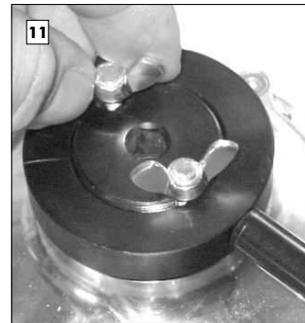
Make sure that none of the Loctite finds its way into the groove of the new hub seal.



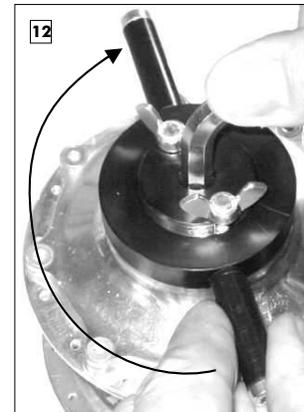
Place the press tool onto the hub with the new hub seal facing inwards.

POINTER

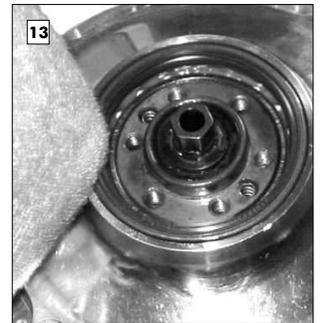
The grub screw on hubs after Serial N° 47000 must be removed in order to guarantee a flush mounting of the Hub Seal.



Thread the two included wingbolts through the square slots on opposite sides of the press tool, secure these in the holes of the hub left and right of the axle.

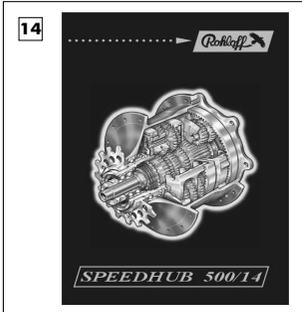


Turn the press tool clockwise as far as possible whilst holding the insert still with an 8mm allen key. The new hub seal will now be pressed firmly into the correct position.



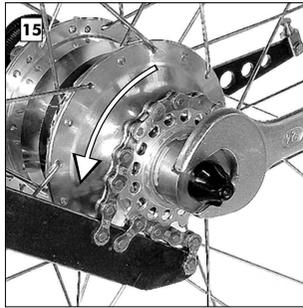
Wind the press tool back to its normal position. Remove the press tool and wing bolts. Clean away any Loctite that has overspilled onto the hub shell.

5.2 Sprocket side:



Replace the axle plate and the gear mech using new paper gaskets as shown in the Owners Manual.

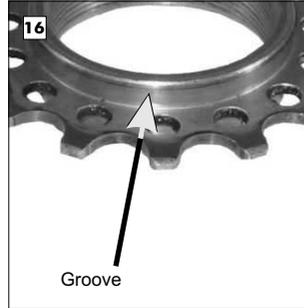
Axle plate position
 "Mounting 4"
 Internal gear mech
 "Repair 1.1 + 1.2"
 External gear mech
 "Service 5.3"



Remove the sprocket as shown in the Owners Manual. Lie the wheel on a flat surface with the sprocket side facing up (Service 5.3)

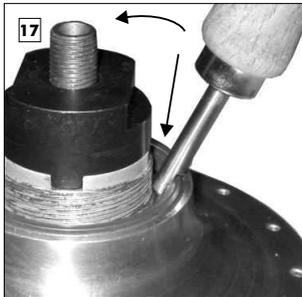
ATTENTION !

Oil could leak out once the sprocket is removed.

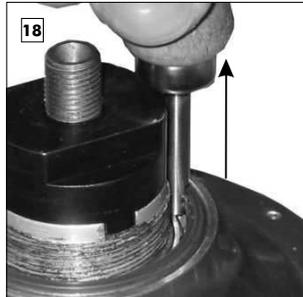


ATTENTION !

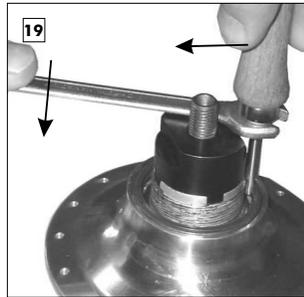
Check the sprocket for signs of wear. If it is worn then rotate it before remounting (see Owners Manual). When both sides are worn then replace it for an unworn sprocket with undamaged seal surfaces.



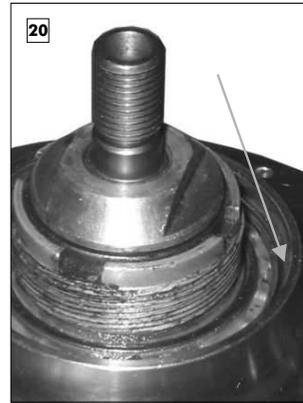
Remove the old hub seal from the hub shell. To do this place the sprocket tool onto the driver and hook the removal tool under the old hub seal. Lever the removal tool into the upright position as shown in the picture.



Remove the old hub seal by sharply pulling the removal tool upwards. If this doesn't remove the seal from the hub shell, then follow the method shown below.



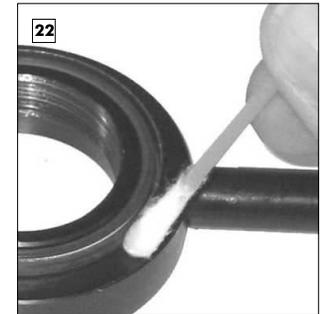
Lay a 10mm wrench flat over the sprocket tool with the open end hooked under the wooden grip of the removal tool. Secure the removal tool by pushing it against the sprocket tool. Force the wrench down onto the sprocket tool in order to lever the removal tool with the old hub seal upwards and out of the hub shell. Remove the insert.



Clean and degrease (petroleum/brake cleaner) the mating surface ready for the new hub seal.



Place the new hub seal around the centering collar of the press tool. The closed side of the new hub seal faces towards the tool itself, the open side is visible.



Using a cottonbud, cover the outside edge of the new hub seal with a thin coat of Loctite 641.

ATTENTION !

Make sure that none of the Loctite finds its way into the groove of the new hub seal.



Place the sprocket tool onto the driver and secure it in position with the Q/R skewer or an axle nut. Set the ring over the sprocket tool and thread it clockwise as far as possible over the thread of the driver whilst holding the sprocket tool still with an 24mm wrench. The new hub seal will now be pressed firmly into the correct position.



Remove the ring and the sprocket tool.



Replace the new/rotated sprocket (with undamaged seal surfaces) as shown in the Owners Manual.

POINTER !

The metal part of the hub seals should be flush with the edge of the hub shell and/or hub cap

Trouble shooting

Problems and possible reasons	Solution
<p>①. Too much play in the twist shifter (more than 2mm)</p>	<p>Readjust the cable tension, see "Service" 2.</p>
<p>②. Gear display is not aligned correctly</p>	<p>Alter the cable adjusters, see "Service" 2.</p>
<p>③. Twist shifter will not turn through all 14 gears (14 gears = 13 clicks)</p>	<p>Cut cables to the correct length: - Internal gear mech, see "Mounting" 7.2.1 - External gear mech, see "Mounting" 7.3.1</p>
<p>3.1 Shifter cables cut at the wrong length</p>	
<p>3.2 Falsely altered cable adjusters</p>	<p>Alter the cable adjusters, see "Service" 2.</p>
<p>3.3 For external gear mech: Hexagonal peg of the gear transfer box in an incorrect position</p>	<p>Correctly align the hexagonal peg see "Riding with the SPEEDHUB 500/14" 3.2</p>
<p>④. Twist shifter does not turn freely</p>	<p>Reduce the shifter cable tension, see "Service" 2.</p>
<p>4.1 Cable tension is too high</p>	<p>Check the internal gear mech: Open the bayonet connectors and (holding a cable in each hand) pull the cables in turn. They run smoothly, see points 4.2 - 4.6. They do not run smoothly, see point 4.7.</p> <p>Check the external gear mech: Select gear #14. Remove the cable box just enough so that the twist shifter can be turned without force and the cables keep their normal routing bends. Turn the twist shifter back and forth. It does not turn smoothly, see points 4.2 - 4.6. It turns smoothly, see point 4.8.</p>

Problems and possible reasons	Solution
<p>4.2 Shifter cables worn, dirty or damaged</p>	<p>Fit new shifter cables: - Internal gear mech, see "Mounting" 7.2 - External gear mech, see "Service" 2.</p>
<p>4.3 Incorrect shifter cables fitted (not original Rohloff)</p>	
<p>4.4 Cable routing has too many bends or kinks</p>	
<p>4.5 Inner nylon liners have penetrated into the twist shifter or the cable box (due to a false fitment)</p>	
<p>4.6 Twist shifter rubs against the grip itself</p>	
<p>4.6.1 Twist shifter degreased by weather</p>	<p>Leave a small gap between the twist shifter and the grip or insert a teflon washer between the two parts.</p> <p>Remove the twist shifter grip rubber, clean it, and regrease it. See "Repairs" 3.</p>
<p>4.7 Hub cable broken and frayed</p>	<p>Check the shifter cables: Loosen the concertina tubes at the hub and pull them up towards the bayonet connectors. Check the condition of these cables in gear positions 1 and 14. If the hub cable is damaged, it will need replacing: - One-piece axle ring, see "Repairs" 1.1 - Quick-change axle ring, see "Repairs" 1.2</p>
<p>4.8 Gear transfer box (external gear mech) is bent</p>	<p>Replace the gear transfer box</p> <p>Mounting, see "Service" 5.3</p>
<p>4.8.1 Changing between gears 8 and 14 is not possible or only possible with extreme force</p>	<p>Grub screw (after hub Nr 47000 with an external gear mech) is threaded too far into the axle. This must be unscrewed approx. 2mm. See "Appendix".</p>
<p>4.9 Hexagonal peg of the external gear mech does not turn freely (due to corrosion)</p>	<p>Checking: Place an 8mm wrench over the hexagonal peg of the external transfer box. When using the wrench to switch gears, the changing of gears must have a light and positive feel. If not, remove the external transfer box. Regrease the hexagonal peg and the sprocket ("Service" 5.3).</p>
<p>4.9.1 The cable pulley of the external gear mech doesn't turn freely (after the conversion from an internal to an external gear mech)</p>	<p>Check: The correct position of the cog D over the hexagonal peg E. See "Service" 5.3</p>

Problems and possible reasons

Solution

5.) Twist shifter fails to turn in 0° temperatures.

- 5.1 Water has penetrated into the twist shifter and has frozen
- 5.2 Water has penetrated into the shifter cables and has frozen
- 5.3 Water has penetrated into the cable box and has frozen

Remove the rubber grip. Clean, regrease this and when necessary replace the seal, see "Repairs" 3.

Replace the shifter cables and the nylon liners:
 - Internal gear mech, see "Mounting" 7.2
 - External gear mech, see "Mounting" 7.3

Open the cable box, clean this and replace the cable pulley with a little light grease.
 Fitment, see "Mounting" 7.3.1

Cut off the frayed ends of the shifter cable and trim the cable housing/nylon liner by the same amount. Alternative: fit new cables:
 - Internal gear mech, see "Mounting" 7.2
 - External gear mech, see "Mounting" 7.3

Replace hub cable:
 - One-piece axle ring, see "Repairs" 1.1
 - Quick-change axle ring, see "Repairs" 1.2

Loosen up the stiff link or replace the chain

Rotate or replace the sprocket, replace the chain, see "Service" 3.

Correct the chain length/tension, see "Mounting" 5.3

Grease the chain tensioner or replace the jockey wheels, see "Service" 2. or "Repairs" 2.

Replace the chain tensioner spring, see "Repairs" 2.
 Check the min. chain length on full suspension bikes, see "Mounting" 5.3.1

Mount a chain guide, see "Mounting" 5.4
 All bikes fitted with a chain tensioner need to be fitted with a chain guide (eg Rohloff chain guide CC Art.No. 8290). This prevents the chain from springing off the chainring.

6.) Shifter cable is loose from the cable clamp
 (Bayonet connectors on internal gear mech or cable pulley on external gear mech)

7.) Male bayonet connector is loose from the hub cable

8.) Chain springs over the teeth of the sprocket

- 8.1 Chain defect (stiff chain link)
- 8.2 Worn sprocket or chain
- 8.3 Not enough tension in the chain

9.) On bikes with a chain tensioner, the chain springs off the sprockets

- 9.1 Chain tensioner runs dry and turns with difficulty
- 9.2 Chain tensioner spring is defect
- 9.3 No chain guide in use

Problems and possible reasons

Solution

10.) Freespinning (after a gear change)

- 10.1 Axle nuts (TS axle) too firmly tightened
- 10.2 Shifter cable tension is too high. No positive feel to the gear change
- 10.3 Gearbox oil too thick
- 10.4 Axle fixation with a PITLOCK or allen key system
- 10.5 None of the above: Contact the Rohloff Service team

Tighten axle nuts to the correct tightening torque (35Nm/310in.lbs.)

Adjust shifter cable tension, see "Service" 2.

Test: Add Rohloff special oil change assistent fluid to the oil within the hub and go for a test ride
 No more freespinning? Carry out an oil change, see "Service" 1.

Tighten the axle to 7Nm /60 in.lbs.max. torque (pay attention to the manufacturers advice)

11.) Freespinning (after a gear change) below 0°C

- 11.1 Gearbox oil too thick
- 11.2 Riding the bike below -15°C

Carry out an oil change with an intensive rinsing, see "Service" 1.

Rinse the hub intensively and fill the hub with 25ml of Rohloff special gear change assistent fluid

12.) Freespinning of gears #1 to #7 after removing the axle ring or the external transfer box

Check that the two freewheeling springs are there and sitting in the correct holes, see "Repairs" 1.1 and "Service" 5.3

13.) Freewheel does not rotate smoothly

- 13.1 Hub seal rubs against the sprocket
- 13.2 Strained hub bearings (crash or accidents)
- 13.3 Chain Tension too high

Test: The sprocket must rotate backwards freely without restriction

Push the hub seal back (until Serial.No. 25299 possible) see "Repairs" 4.2

Destrain the hub bearings, see "Repairs" 4.2

Reduce the chain tension to about 5mm of vertical slack, replace or reverse untrue chainrings.

Problems and possible reasons

Solution

- 14. Oil leaks
 - 14.1 Oil traces (no droplets)
 - 14.2 Oil leaks following horizontal transportation
 - 14.3 Oil traces on the quick release skewer
 - 14.4 Oil drops out of the hollow quick release axle
 - 14.5 Oil droplets on the axle ring, the axle plate or the concertina tubes
 - 14.6 Oil droplets between the hub casing and the hub cap
 - 14.7 Oil traces around the oil drain screw
 - 14.8 Oil droplets on the hub bearings (Both ends of the hub smeared with oil)

This is not an oil leak. This is sweat oil, which forms around the hub bearing, the paper gasket and the oil drain screw due to variations in air temperature and pressure.

See "Riding with the SPEEDHUB 500/14"

The ventilation functions through the axle hole for the quick release skewer. Oil traces on the quick release skewer are, therefore, normal

Please contact the Rohloff Service team

Check the axle plate screws are all in place and tightened to the correct tightening torque. (see "Mounting" 4.3) Renew the paper gaskets between the axle ring and the axle (see "Service" 5.3 or "Repairs" 1.1) Only use Rohloff axle plate screws with thread sealant

Check the hub cap screws are all in place and tightened to the correct tightening torque, see "Repairs" 4.2

Use new thread sealant on the oil drain screw (Loctite thread sealant 511) or a new oil drain screw with Rohloff thread sealant, see "Service" 1.

Please contact the Rohloff Service team

15. Complete blockage of the gear system after working on the external gear mech

The grub screw (mounted in hubs after No 47000 with an external gear mech) is screwed too far into the axle. This must be unscrewed approx. 2mm. See "Appendix", Grub screw external gear mech.

ATTENTION

Too much oil within the gearbox increases the risk of oil leaks. Therefore, when an oil leak is discovered, new replacement oil must not be added (risk of overfilling). Reduced oil level by leakage through the seals will not cause problems and riding further until the next oil change (annually or every 5000km) is possible (see "Service" 1).

Tools and bolts

Below is a list of all tools and bolts (along with their corresponding tightening torques) for the mounting of the Rohloff SPEEDHUB 500/14 and all of its accessories.

- Torx TX20 wrench (Art.Nr. 8504)***
 Rohloff SPEEDHUB 500/14:
 8 Hub cap screws: M4x10 (3Nm/25in.lbs.)
 5 or 6 Axle plate screws: M4x25 (3Nm/25in.lbs.)
 2 Cable box cover bolts: M4x10 (3Nm/25in.lbs.)
- External gear mech:*
 2 Guide pin bolts: M4 (3Nm/25in.lbs.)
- Twist shifter:*
 2 Cable guide bolts: M4x16 (3Nm/25in.lbs.)
- Rohloff chain tensioner/DH chain tensioner:*
 2 End stop bolts (DH: just one): M4x10 (3Nm/25in.lbs.)
 Jockey wheel axle bolt: M4 (3Nm/25in.lbs.)
- Rohloff chain guide CC:*
 Bolt (rear distance bush): M4x20 (3Nm/25in.lbs.)
 Bolt (rear threaded bush): M4x20 (3Nm/25in.lbs.)
 Bolt (rear threaded bush): M4x35 (3Nm/25in.lbs.)
 2 Clamp bolts: M4x35 (3Nm/25in.lbs.)
- 2mm allen key**
Internal gear mech:
 8 Bayonet connector bolts: M4x4 (1.5Nm/12in.lbs.)
- External gear mech:*
 2 Cable pulley bolts: M4x4 (1.5Nm/12in.lbs.)
- Rohloff DH chain guide:*
 3 Mounting bolts: M4x8 (1.5Nm/12in.lbs.)
- 2.5mm allen key**
 Rohloff SPEEDHUB 500/14:
 Oil drain screw (0,5Nm/4in.lbs.)
- 3mm allen key**
 Rohloff SPEEDHUB 500/14:
 Oil drain screw (0,5Nm/4in.lbs.)
- 4mm allen key**
 Rohloff SPEEDHUB 500/14:
 Cable guide mounting bolt: M6 (6Nm/51in.lbs.)
- TS versions:*
 Torque arm clamp bolt: M6x12 (6Nm/51in.lbs.)
- Rohloff SPEEDBONE:*
 2 Mounting bolts: M6x25
- 5mm allen key**
 Rohloff SPEEDHUB 500/14:
 4 or 5 Chainring bolts: M8x0.75 (7Nm/61in.lbs.)
- DB versions:*
 4 brake disc mounting bolts: M8x0.75 (7Nm/61in.lbs.)
- Retrofit versions (not OEM or OEM2):*
 2 Torque arm mounting bolts: M8 (7Nm/61in.lbs.)
- Rohloff chain tensioner/DH chain tensioner:*
 Mounting bolt (8Nm/70in.lbs.)
 Pivot axle (8Nm/70in.lbs.)
 (Attention: Turning clockwise unscrews)

- 7mm wrench**
 Rohloff chain guide CC:
 M4 Nut, rear distance bush
- 8mm wrench**
 Shifting shaft
- 10mm wrench**
TS versions:
 Torque arm clamp nut
 Cable guide straight type
 Frame clamp nut
- 13mm wrench**
Internal gear mech:
 Cable guide
- 15mm wrench**
TS versions:
 2 TS axle nuts: M10 (35Nm/310in.lbs.)
- Screw driver**
CC versions:
 2 clamps (5Nm/43in.lbs.)
- 17mm wrench**
 Locking nut (holding the axle steady)
- 24mm wrench**
 for sprocket tool
- Sprocket tool (Art.No. 8501)**
 Sprocket removal
- Chain whip**
 Sprocket removal
- Brass tube 165mm (Art.No. 8711)**
 Cutting hub cables (internal gear mech)
- Brass tube 200mm (Art.No. 8712)**
 Cutting shifter cables (external gear mech)
- Shifter cable measurement tool (Art.No. 8506)**
 Cutting shifter cables (internal gear mech)

POINTER

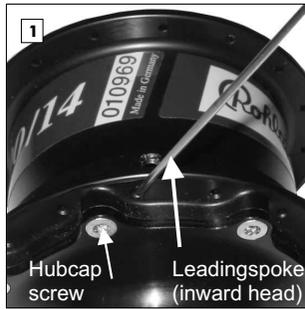
* The use of Torx screws/bolts as opposed to the common allen key bolts allows a more safe and nondestructive mounting and dismantling without the heads rounding out after several times usage. To avoid damaging the heads of the screws/bolts, the Torx key must be securely pressed into the head. We suggest the use of a T-grip key to keep the pressure central over the bolt (the use of other tools could result in damage to the bolts).

Wheel lacing for rims with a European spoke-hole pattern

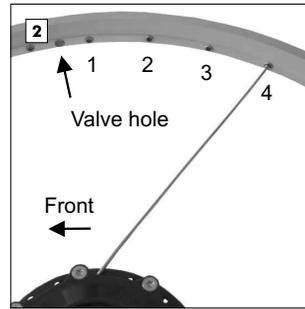
The following written wheel lacing method always concentrates itself around the directional rotation of the wheel, the method also only applies to wheels with a two cross lacing pattern. For simple one cross lacing patterns, pay attention to the numbers in brackets.

POINTER

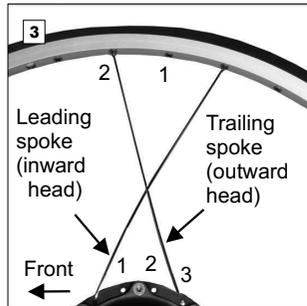
Trailing spokes cross in front of Leading spokes.
Leading spokes cross behind the Trailing spokes.



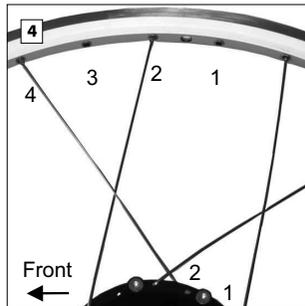
Start to lace up the wheel from the hubcap side of the hub. The first leading spoke should be inserted from the inside of the hub flange behind a hubcap screw (spoke head facing inwards).



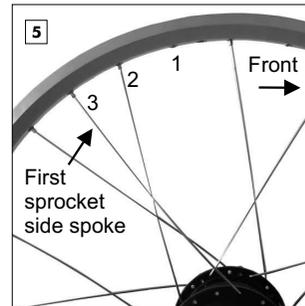
The end of this spoke should be inserted into the nipple hole of the rim that is 4 holes away from the valve hole.



Three holes (one hole) behind this first spoke is where the trailing spoke should be inserted, this spoke is to be inserted from the outside of the hub flange (spoke head facing outwards). This spoke is to be crossed over the first spoke and inserted into the nipple hole of the rim that is two holes before that of the first spoke.



The next trailing and leading spokes are laced into the rim in exactly the same way. The only difference being that they enter the hub flange two holes away from the last respective leading or trailing spoke, and that they enter the rim four holes away from the last respective spokes. Continue this process in pairs of leading and trailing spokes until all the spokes have been laced into the hubcap side of the wheel. Turn the wheel over.



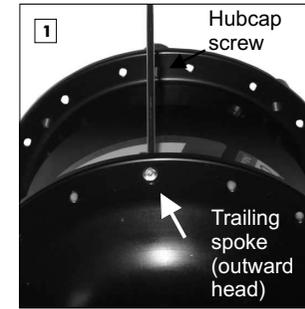
The valve hole is to be found opposite from a hubcap screw. The spoke hole of the flange opposite from this is where the first spoke on the sprocket side is to be inserted from the inside (spoke head facing inwards). This spoke is to be inserted into the nipple hole of the rim that is 3 holes behind the valve hole. Lace all the remaining spokes in the same pattern as with the other side of the wheel (Pic 3 and 4).

Wheel lacing for rims with a French spoke-hole pattern

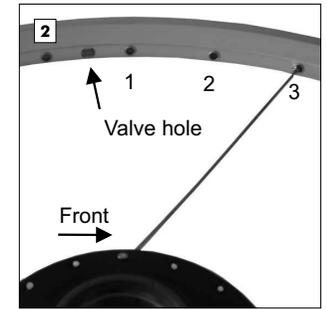
The following written wheel lacing method always concentrates itself around the directional rotation of the wheel, the method also only applies to wheels with a two cross lacing pattern. For simple one cross lacing patterns, pay attention to the numbers in brackets.

POINTER

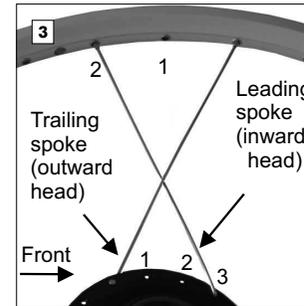
Trailing spokes cross in front of Leading spokes.
Leading spokes cross behind the Trailing spokes.



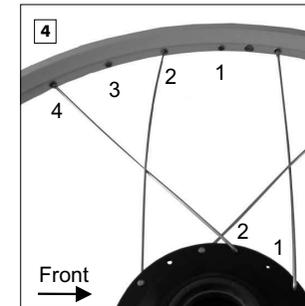
Start to lace up the wheel from the sprocket side of the hub. The first trailing spoke should be inserted from the outside of the hub flange opposite a hubcap screw (spoke head facing outwards).



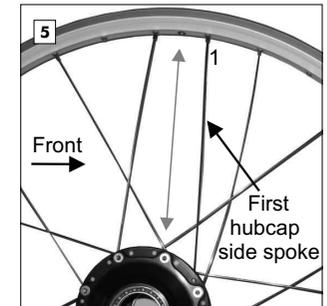
The end of this spoke should be inserted into the nipple hole of the rim that is 3 holes away from the valve hole.



Three holes (one hole) behind this first spoke is where the leading spoke should be inserted, this spoke is to be inserted from the inside of the hub flange (spoke head facing inwards). This spoke is to be crossed over the first spoke and inserted into the nipple hole of the rim that is two holes behind that of the first spoke.



The next trailing and leading spokes are laced into the rim in exactly the same way. The only difference being that they enter the hub flange two holes away from the last respective pull or cross spoke, and that they enter the rim four holes away from the last respective spokes. Continue this process in pairs of leading and trailing spokes until all the spokes have been laced into the sprocket side of the wheel. Turn the wheel over.



The valve hole is to be found opposite from a hubcap screw. The spoke hole of the flange that is two holes behind this, is where the first spoke on the hubcap side is to be inserted from the outside (spoke head facing outwards). This spoke is to be inserted into the first nipple hole of the rim that lies behind the valve hole. Lace all the remaining spokes in the same pattern as with the other side of the wheel (Pic 3 and 4).

Technical data

Number of gears:	14
Gear increases:	even 13.6%
Range of gears:	526%
Frame spacing:	135mm
Number of spoke holes:	32
Spoke flange distance:	60mm, symmetrical
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
Hollow axle inner diameter:	Ø5.5mm, for quick release lever
Axle overall width TS:	171mm (with axle plate TS long 179mm)
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:	15.3mm (IS2000)
Weight:	1700g (CC), 1800g (CC EX), 1825g (CC DB)
Oil amount:	25ml max.
Sprocket thread:	M34x6 P6, tolerance 6H
Sprocket type:	for bicycle chain 1/2 x 3/32" (ISO Nr. 082)
Number of sprocket teeth:	16 (optional: 13, 15 and 17)
Chainline:	54mm (58mm with 13tooth sprocket)
Smallest permissible gear ratios (normal):	40/17, 38/16, 36/15, 32/13 (transmission ratio ~2.35)
(Riders over 100kg/tandem):	42/17, 40/16, 38/15, 34/13 (transmission ratio ~2.50)
Maximum input torque:	100Nm
Gear control:	by twist shifter
Twist shifter angle per gear change:	21°
Gear control transfer:	over two shifter cables (pull-pull system)
Shifter cable movement per gear change:	7.4mm

Inner gear ratios (hub rotation per sprocket rotation):

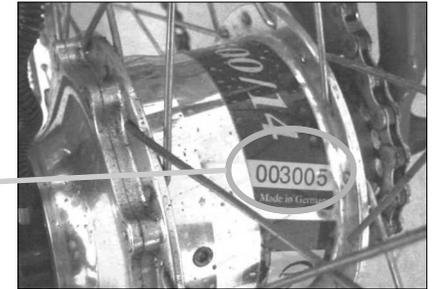
Gear #1:	0.279
Gear #2:	0.316
Gear #3:	0.360
Gear #4:	0.409
Gear #5:	0.464
Gear #6:	0.528
Gear #7:	0.600
Gear #8:	0.682
Gear #9:	0.774
Gear #10:	0.881
Gear #11:	1.000
Gear #12:	1.135
Gear #13:	1.292
Gear #14:	1.467

We reserve the right to change the technical specifications without prior warning.

Reference to Serial N° of the **Rohloff SPEEDHUB 500/14**

ATTENTION **Serial Number**

Each **Rohloff SPEEDHUB 500/14** is provided with a **consecutive Serial N°**, which is found on the tape around the hub shell.



Onwards of Serial N° 75000, the serial numbers are engraved directly onto the hub shell.

TIP **Sticker**

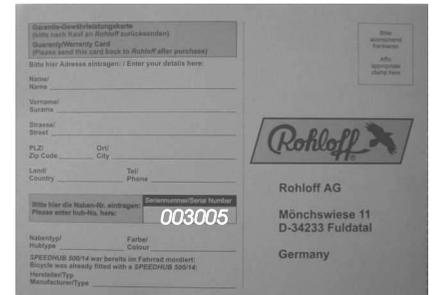
If the tape around the hub shell should be removed at any time, we recommend to separate first the Serial N° with a sharp carpet knife from the tape and then to leave only the Serial N° on the hub. If the tape should be removed completely, the Serial N° should be saved and/or stuck onto the warranty card. Alternatively, the Serial N° can also be engraved on the hub cap!

POINTER **Guaranty Card**

Each **SPEEDHUB 500/14** and each complete bicycle equipped with the **SPEEDHUB 500/14** comes complete with an orange **Rohloff** warranty card attached.

This orange **Rohloff** warranty card must be:

- completely filled in (with Serial N°.!))
- stamped by the dealer
- returned to **Rohloff AG**, Germany



Only with this original Rohloff warranty card we can guarantee the best service for your hub.

ATTENTION **Warranty**

This serial-No informs us about the production year and is important for guarantee or warranty claims, as well as a acting as proof of ownership.

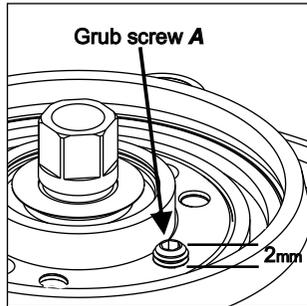
Only with knowledge of the appropriate serial-No can an optimal service be carried out by **Rohloff**.

Consecutive Serial N° - Production Year
000000 - 000300.....1998
000301 - 002415.....1999
002416 - 005502.....2000
005503 - 010812.....2001
010813 - 017603.....2002
017604 - 027008.....2003
027009 - 037183.....2004
037184 - 050049.....2005
050050 - 064512.....2006
064513 - 080499.....2007
080500 ~2008

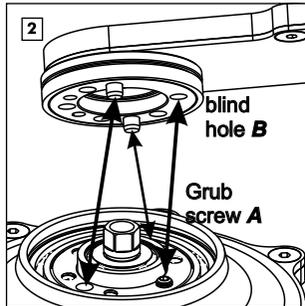
We expressly point out that the Rohloff AG does not accept any warranty/warranty claims for Rohloff SPEEDHUB 500/14 gearhubs without a Serial N°. Service, repairs, and the spare parts service will also only be carried out on hubs when the hub is shown with the corresponding Serial N° (either on the sticker, engraved into the hub shell, or on the guarantee card).

Grub screw of the External Gear Mech

All gear hubs built after Serial No 47000 and equipped with an external gear mech have an M4x8 grub screw mounted into the sixth threaded hole of the axle (it helps to prevent potential oil leaks). Therefore, the external gear mech can only be properly fitted in one position (Pic 2) over the axle.

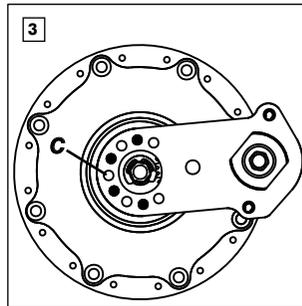


The grub screw on hubs with a Serial No between 47000 and 48500 lies flush (external gear mech without a blind hole). On hubs with the Serial No 48501 and over, this grub screw protrudes by approx. 2mm (external gear mech with a blind hole).



The blind hole (B) must be located directly over the grub screw (A). When using an external gear mech without a blind hole (B), the grub screw must be screwed flush into the axle.

The paper gaskets should then be fitted so that all the holes meet up with the corresponding screw holes of the axle.



To control that the mounting is correct, the screw (C) must be screwed smoothly approx. 4 complete turns into the hub without force. Afterwards, the installation of the axle plate complete with screws can be finished (3Nm).

POINTER



If an axle plate screw cannot or only with force be screwed into hole (C), then it must be checked that the grub screw (A) is not sitting directly behind this hole. If this is the case, then the external gear mech must be disassembled turned around 180° and mounted again in this position. The grub screw stays in its original position (2mm protruding).

ATTENTION



If the external gear mech should be falsely mounted, then the fitting of an axle plate screw into hole (C) would cause the grub screw (A) to be forced into the axle. This in turn will lead to a complete blockage of the gearbox.

The removal of the grub screw is only necessary when converting the external to an internal gear mech, or when working with the hub seal replacement tools. The external gear mech should never be removed from the gearbox without good reason!

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 > download > description > owners manual

The following languages are available:

- English
- German
- French
- Dutch



- Owners Manual - Newest version
- Films
- Technology Presentation CD

The newest version of this Manual is available on the web under:
www.rohloff.de > download > description > 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 > videos > workshop ...

The technology Presentation CD (Art.N° 8296) explains the function and build of the *Rohloff* SPEEDHUB 500/14 with the use of various animations and further in-depth technical details

	Key word	Page	
A	Advantages of the options	38	
	Axle plate alignment	64	
	Axle plates	46	
	Axle ring - One-piece / Quick-change	98, 104	
B	Axle types	24	
	Bolt/tool info	124	
	Brake disc - replacement	60, 91	
	Brake discs / rotors	37	
C	Break-in period	6	
	Cable routing via the brake boss - Internal gear mech	76	
	Cable routing via the chainstay - External gear mech	80	
	Cable routing via the chainstay - Internal gear mech	79	
	Cable routing via the top tube - External gear mech	83	
	Carbon handlebars	48	
	Chain guide - DH (accessory for downhill)	45, 58	
	Chain guide - CC	71	
	Chain tensioner - DH (accessory for downhill)	45, 68, 69	
	Chain tensioner - mounting	70	
	Chain tensioner spring - changing	109	
	Chainguard enclosed	48	
	Chainring - two chainrings	45, 47	
	Cleaning the Rohloff SPEEDHUB 500/14	7	
	Colors	33	
	Comparison - Derailleur gears and Rohloff SPEEDHUB 500/14	21	
	Comparison to derailleur gears	22	
Components that we recommend	45		
D	Cranks, Crankset	45, 57	
	Distance travelled per crank revolution (20", 26" and 28")	20	
	E	Emergency repairs	10
		External gear mech - grub screw	129
External gear mech - mounting		32, 93	
F	External gear mech - OEM / OEM2 / long torque arm	63	
	Failure Diagnosis	119	
	Filling with oil	84	
	Frame mounted gear box	47	
G	Frame types - OEM / OEM2 / long torque arm	27-29	
	Gear display	83	
	Gear mech - replacement	92	
	Gear unit - installation - removal	112, 111	
H	Grub screw of the External gear mech	129	
	Guarantee information	1, 128	
	Hub cable - replacement	97	
	Hub seal - replacement	114	
I	Index	132	
	Inner rim diameter - calculating	44	
	Internal gear mech	31	
	Internal gear mech - via brake boss / via chainstay	61, 62	
L	Long torque arm	56	
	M	Maintenance and care	7, 8, 89
Mechanical efficiency - comparison		18	
Model codes - explanation		33	
Model variations		39	
Modular system		23	
Mounting (CC / TS versions) with a long torque arm		65, 66	
Mounting necessities OEM2		30	
Mounting processes		49	

	Key word	Page	
N	Noises	6	
	Notices	130	
O	OEM axle plate	67	
	OEM2 - mounting with a support bolt / SPEEDBONE	59	
	OEM2 axle plate	67	
	Oil change	7, 87	
	One-piece axle ring - removal	92	
	Options	38	
P	Package contents - checking	51	
	Particular components	45, 46, 47	
	Pushing the bike	6	
Q	Quick-change axle ring - removal	92	
R	Racing bike / drop handlebars	46	
	Reference to Serial N°	128	
	Removal of the wheel from the frame	13	
	Replacing the gear unit	92	
	Reversing / Replacing of the sprocket	90	
	Riding noises	6	
	Rims	46	
	Rubber grip - replacement	110	
	S	Safety information	3
		Schlumpf Speed-drive, High Speed-drive	47
		Securing to the frame	23-30
		Serial N° - Pointers	128
		Service procedures	96
		Shifter - mounting	73
		Shifter cables	75
		Shifting gears	5
		Small parts bag - checking the contents	53
Small wheels		47	
Smallest permitted sprocket ratios		19	
Special applications		47, 48	
SPEEDBONE		46	
Spoke length - calculating		42, 43	
Spokes		46	
Sprocket ratios - smallest		19	
Sprocket reversing/replacement		90	
Sprockets		45	
Stand - axle mounted		47	
T		Tandem use	47
		Technical data	17, 127
		Tools and Bolts / Tools for the tour	124, 9
		Torque securing	25
	Tour info	9	
	Trailer use	47	
	Transport - Info for the tour	9	
	Trouble shooting	119	
	Twist shifter - mounting	73	
	W	Warranty information	1, 128
		Wearable parts	6
Weight comparison		18	
Wheel installation		14	
Wheel lacing for rims with a European spoke hole pattern		125	
Wheel lacing for rims with a French spoke hole pattern		126	
Wheel removal (internal, external gear mech)		11	
Wheel stability		41	
Wheel lacing		55	



