

Changing the hub cable Art.Nr. 8271

One piece
Axle ring

Quick change
Axle ring

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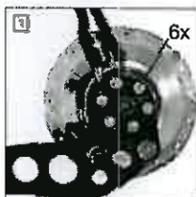
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1. Changing the hub cable

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

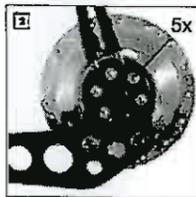
1. Axle ring with pressed-in cable guides (one-piece axle ring)
2. Axle ring with cable guides seated within nylon cylinders (quick-change axle ring)



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 into 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-release 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. To replace 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:

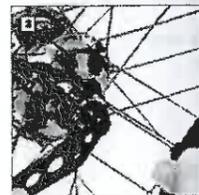
1. False alignment of the axle plate or the cable guide can result in the cable rubbing against the metal of the cable adjusters/guides. (see chapter "Mounting", paragraph 4.1.2).
2. Torque not properly secured. The hub axle rotated and stretched the cables to breaking point.
3. Other physical damage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

1.1 Changing the hub cable with one-piece axle ring and 5 axle screws

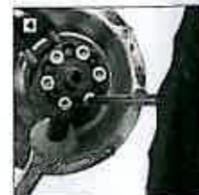
Remove the rear wheel. With good wire cutters, cut off the four cable ties holding the two concertina tubes protecting the hub cables.



Unscrew both 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 first removed. To do this unscrew the six axle plate screws (M4x25 - Torx Tx20).



To hold the axle steady, grip the long torque arm tightly or hold the OEM or OEM2 axle plate with a 10mm wrench.



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 does not loosen by hand, then 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 hub.

ATTENTION

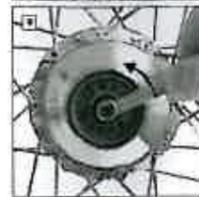


The wheel must not be laid on the axle ring side once the axle ring has been removed because:

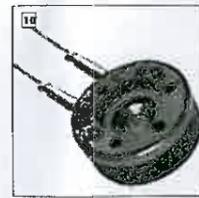
- a. Oil could leak out
- b. The two freewheel springs could fall out of the locating peg holes.



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.



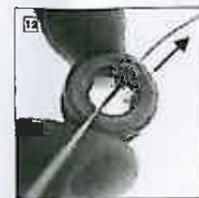
With an 8mm wrench turn the hexagonal peg in an anticlockwise direction until the end stop. Now the hub is in gear #14.



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



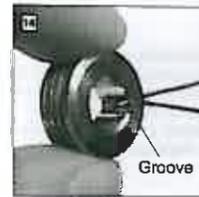
Push the cable pulley out of the axle ring from the rear side. Take care not to tilt the cable pulley for an easier removal. Remove the old hub cable and clean both the cable pulley and the axle ring. Check cable pulley for burrs and deburr if necessary.



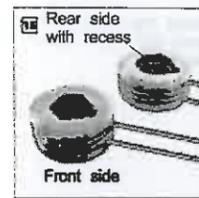
Push the new hub cable approx. half way into the cable pulleys lower hole from the inner side.



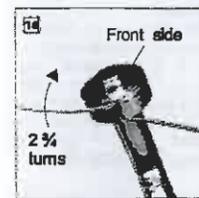
Next push the other end of the cable into the top hole of the cable pulley until both ends of the cable stick approx. the same length out of the other side.



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.



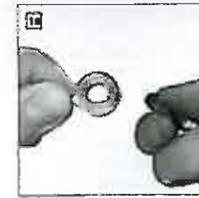
Pay attention to which side of the cable pulley is the mounting side. The back/mounting side has a recess before its hexagonal hole. The front side is without this recess.



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 turns around the cable pulley.



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



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.



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.

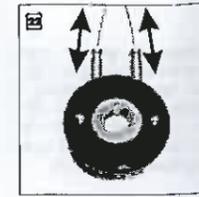


Thread the right end of the hub cable (long end) through the right hand cable guide. Thread the left end of the hub cable (short end) through the left hand cable guide. This procedure works a lot easier when the axle ring is held by a third hand.

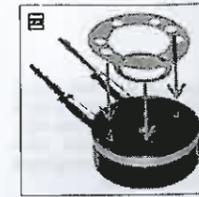


Pull the cable pulley up to the axle ring by pulling both ends of the hub cable equally. Push the cable pulley into a parallel position with the axle ring using the thumb (from outside) and index finger (from inside) whilst keeping the tension applied to both hub cable

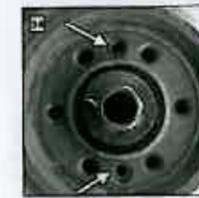
ends. The cable pulley then springs into the axle ring hole.



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



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



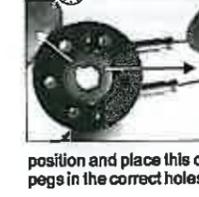
Lay the wheel on a flat surface so that the two locating peg holes (not threaded) lay at positions 12 and 6 o'clock (arrowed).



ATTENTION
The two freewheel springs must stay in the locating peg holes.



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 5 o'clock).



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 10 and 11 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.

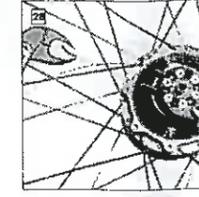
POINTER

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 cables life span. 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 bend remains in place.

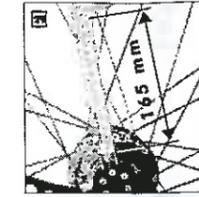


Make sure that the hexagonal peg sits correctly within the hole of the cable pulley (groove between the 10 and 11 o'clock positions). It may be necessary to alter the position of the cable pulley a minimal amount. Place some grease between the cable pulley

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.).



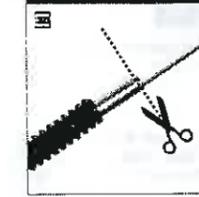
Check the function of the axle ring by gripping one end of the hub cable with pliers and pulling this out to the end stop. Repeat this process with the other end of the hub cable. At the end stops, both ends of the hub cables should protrude from the cables guides by the same amount.



Check the right side cable is pulled out to its endstop. Measure this cable and cut it at 165mm with sharp wire cutters*. Place a new concertina tube carefully over the cable. Push the cable up into the male bayonet connector as far as it will go and tighten the two 4mm head-

less screws with a 2mm allen key (tightening torque 1.5Nm/12in.lbs.).

TIP

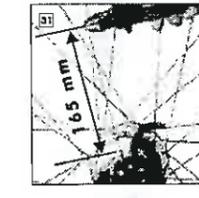


* For easier measurement of the correct cable length the special measuring pipe (Art.Nr. 8711) can be ordered. Simply place the measuring pipe as far down as possible over the cable. Cut the cable at the end of this pipe, then slide the new concertina tube over the

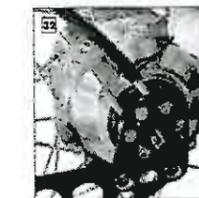
pipe. Remove the measuring pipe, secure the male connector and the concertina tube in the correct positions.

ATTENTION

** By using the new bayonets with 3mm holes (at middle of year 2005 / hub n° 43100) please mount like point 1.3!



Pull the left 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.



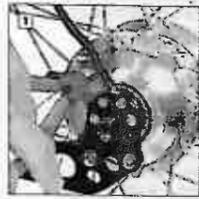
Tighten up the connector as with the other. Pull the shorter cable until both of the hub cables are approx. the same length. Place the two new concertina tubes over the cable guides and secure them with cable ties. Make sure that the cable ties clamp the concertina tubes



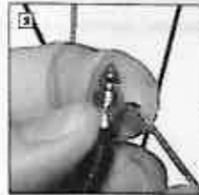
over the recesses in each of the cable guides.

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.

1.2 Hub cable change (quick change axle ring) with 5 axle screws



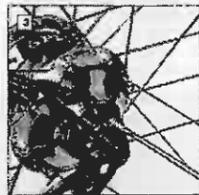
Remove the rear wheel. With good wire cutters, cut off the four cable ties holding the concertina tubes over the hub cables.



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

ATTENTION

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



To change the hub cables the axle plate must be first removed. To do this unscrew the five axle plate screws (M4x25 - Torx Tx20).



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.



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



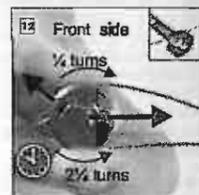
Next push the other end of the cable into the top hole of the cable pulley until both ends of the cable stick approx. the same length out of the other side.



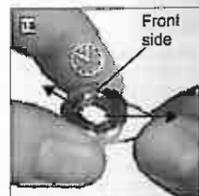
Hold the cable pulley tightly and with the other hand grasp the hub cables and pull them quickly until the cable sits properly in the cable pulley without getting kinked.



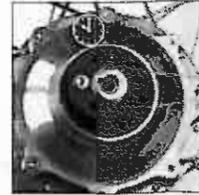
Pay attention to which side of the cable pulley is the mounting side. The back/mounting side has a recess before its hexagonal hole. The front side is without this recess.



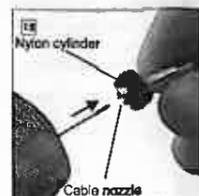
Bend the hub cables in the direction of the cable runs in the cable pulley (this is easily achieved by putting the cable pulley onto an 8mm allen key). The top cable should be wound approx. 2 1/4 times around the pulley. The bottom cable approx. 1/4 of a turn in the opposite direction.



The picture shows the cable pulley with the correctly wound hub cables.



The cable pulley should be placed over the hexagonal peg of the shifting shaft with the groove facing the countersunk axle bolt or as near to it as possible. The two hub cables should be placed through the seats of the cable guides.



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



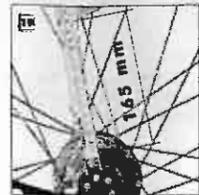
The cable guides are sitting properly in their seats of the axle ring when the rounded top of the nylon cylinder is facing upwards (as shown in the above picture).



Press the nylon cylinders firmly into their seats of the axlering.



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 right side cable is pulled out to its endstop. Measure this 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.



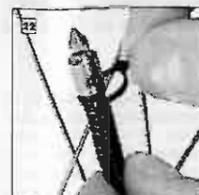
Push the cable up into the male bayonet connector as far as it will go and tighten the two 4mm headless screws with a 2mm allen key (tightening torque 1.5Nm/12in.lbs.). Pull the left side cable with pliers through the 13 clicks of the hub until the endstop (gear

#1). Measure this cable and cut it at 165mm with sharp wire cutters.



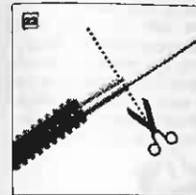
Place a new concertina tube and male bayonet connector over the cable. Tighten up the connector as with the other. Pull the shorter cable until both of the hub cables are approx. the same length. Place the two new concertina tubes over the

cable guides and secure with cable ties. Make sure that the cable ties clamp the concertina tubes over the recess in 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.Nr. 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 Bayonet screw joining From Hub no. 43100 onwards

ATTENTION

The new bayonet is different from the former through:

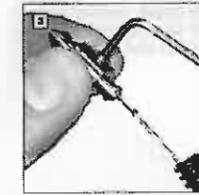
- 3mm drilling (cable mount)
- ring shaped groove (distinction characteristic)
- cable end housing (copper)



The mounting of the bayonets should be made together with a cable end housing onto the 0,9mm cable. This way, while pinching the cable with the headless screw, a damage of the cable can be prevented effectively.



Use the second headless screw Inbus SW2 to fix the cable inside the bayonet with 1,5 Nm. Secure the concertina tubes with cable ties.



Further mounting instruction on picture 22/23. Insert cable combined with cable end sheaths until stop inside the bayonet (3mm drilling)! Fix the headless screws with Inbus SW2.

POINTER

Don't use the new cable end sheaths together with the old bayonets (2mm drilling) to clamp the cables, in this case the cable end sheaths will be squeezed flat and cannot be removed from the 2mm bayonets.