

TDCM | Motor Installation

Application | 2014

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1. Introduction

With a hub motor conversion, there is no need for external mounting brackets and drive chains to support a motor and transmission. All of this is contained inside the wheel which mounts on your bike like any other wheel.

2. Wheel Lacing

2.1 Number of Crosses

Spokes are crossed so that the tensioned spokes have a tangential force component that can transmit torque between the hub flange and the rim. On TDCM's hub motors, the flange is large enough that a single cross will usually result in an even larger angle than triple cross in a regular hub. A double cross lace on hub motor looks very cool, but it is an extra challenge to lace and results in spoke nipples coming through the rim at steep angles,

a single cross is therefore recommended.

2.2 Spoke Gauge

TDCM's motor can accommodate up to 12 gauge spokes, and technically this size will provide the greatest strength and support.

In practice, a well built wheel using 14 gauge spokes is more than strong enough to withstand the forces, however the small heads of 14G spokes can sometimes pop through the flange hole.

The best solution to this is to use butted spokes that are 13 gauge at the bend, where they fit through the hub flange, and taper to 14 gauge at the threaded end. Then they can be cut and threaded to any length.

2.3 Seating at Bend

Ideally the distance between the head and the bend in your spoke will match the thickness of the hub flange. 2.8mm

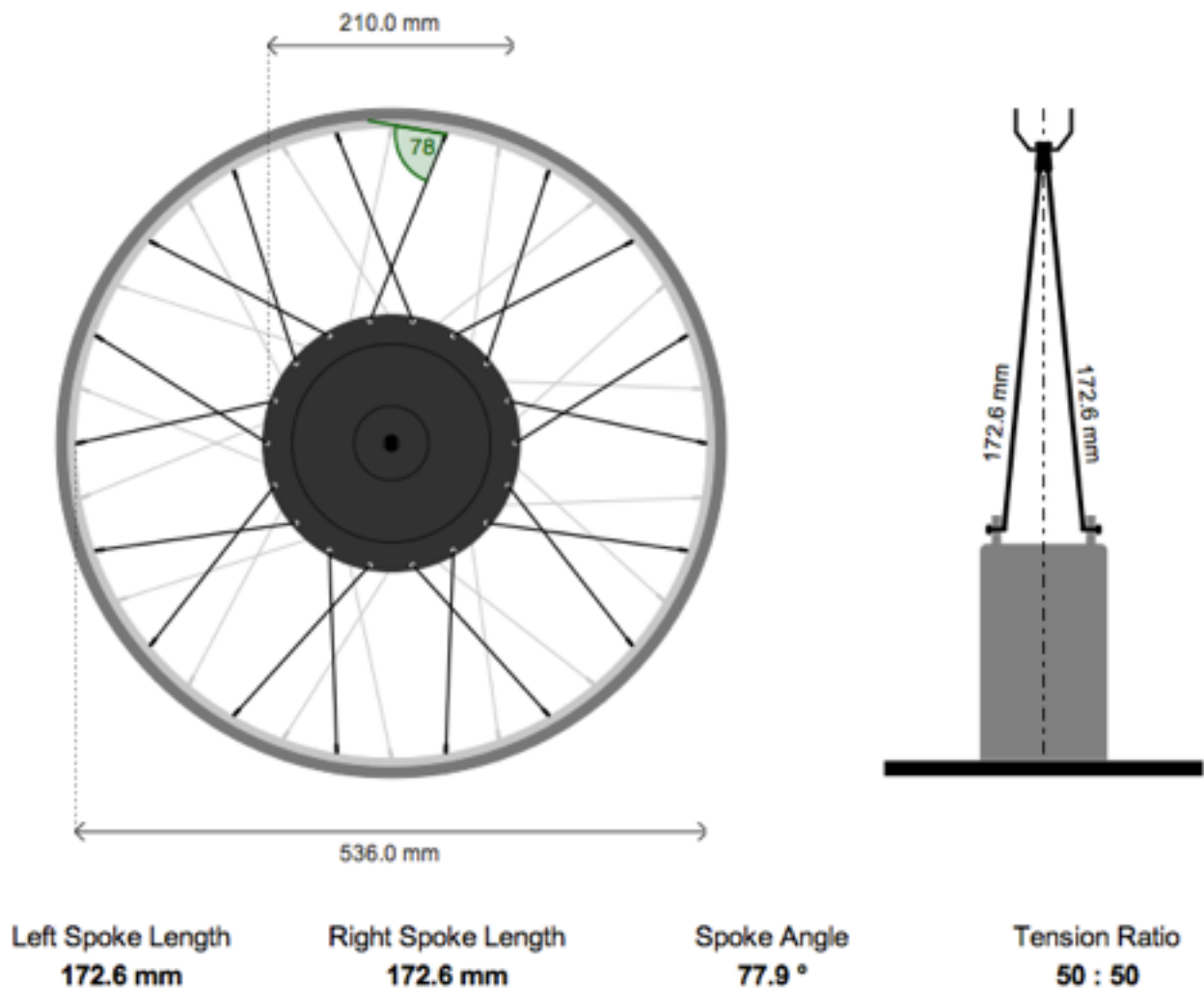
2.4 Dishing

It is standard with rear bicycle hubs that the spokes on the right side are shorter and more vertical than the spokes on the left, because of the space that the freewheel takes up. On a hub motor, this is no different, except that the flanges are closer together, and this results in the freewheel side spoke becoming nearly vertical to centre the rim. This can be addressed by lacing the wheel such that on both the left and right set of spokes, all of the spoke heads come out on the right side of the flange. This will offset the base of all spokes to the right by the flange width.

2.5 Information for lacing on standard rear hub motor

Flange Diameter:	210mm
Flange Spacing:	40mm
Dishing Offset:	0mm
Number of Spokes:	36
Axle Length:	135mm
Hole Diameter:	2.5mm
Paired Holes:	36.7mm

2.6 Spoke Requirements based on 26" Wheel



3. Torque Piece

TDCM's motor torque pieces are designed to be universal and should integrate into ~85% of all frame dropouts.

4. IGH Motor Gear Box Installation

4.1.1 Scope of this leaflet

Congratulations on your purchase of a Sturmey-Archer internal gear hub. For the best performance, please follow instructions in this leaflet. Please contact your local Sturmey-Archer dealer if any problems are experienced with the product.

Riding the gear hub out of the adjustment may cause damage to the internal parts and possible malfunction.

1.2 Lubrication

No routine lubrication is required. During a major service, the hub greases should be replenished or replaced especially for transmission parts of the hub. Please contact your Sturmey-Archer dealer who is equipped to carry this out.

Under no circumstances should any lubricant be applied to the brake drum or drum brake shoes, as this may prevent the brake from functioning.

1.3 Gear changing

Easy pedaling and select the gear required, and then resume pedaling. If the bicycle is stationary simply select the gear required.

1.4 Gear ratios

Sturmey-Archer C50 5-speed hub gears have the following ratios:

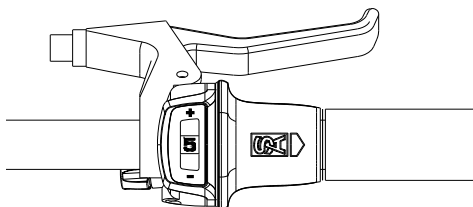
1 st gear	0.64	2 nd gear	0.8
3 rd gear	1.0	4 th gear	1.25
5 th gear	1.56		

1.5 Brake operation

To activate the brake, pull the appropriate brake lever on the handlebar. If the brake is rubbing or cannot be locked by a full application of the lever, then brake adjustment is necessary (See section 5).

2. SHIFTER INSTALLATION

- (1) Select 5th gear. Position the shifter onto the right side of the handlebar. Ensure enough space is left to fit the end grip and leave a 0.5mm space between the sleeve spacer and the end grip.
- (2) Fix the twist shifter using a 3mm Allen key to tighten the clamp bolt to a torque of **1.5-2.5 Nm**. Mount the end grip and leave a gap to allow free rotation.



- (3) Pass through the inner cable into outer casing and connect to the gear hub (See section 3).

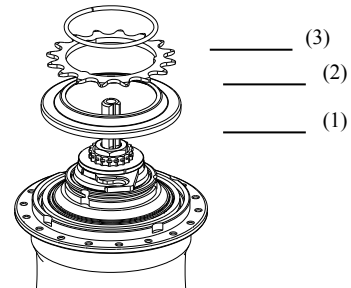
◆**Note: Avoid sharp bends and kinks in the inner cable.**

- (4) Readjust the relative position between the brake lever and the shifter to allow optimum function..

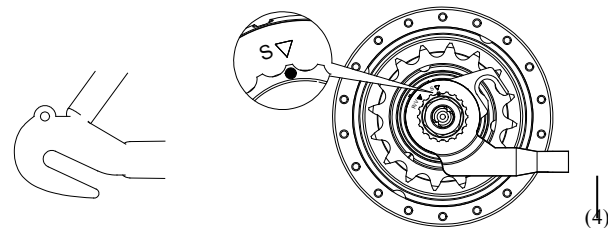
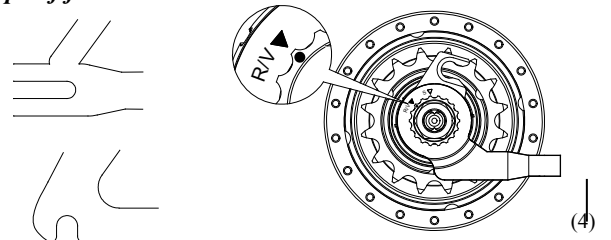
3. GEAR HUB INSTALLATION

3.1 RX-RD5 with drum brake.

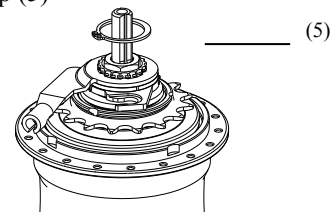
- (1) Fit the dust cap (1), sprocket (2), and circlip (3) onto the driver.



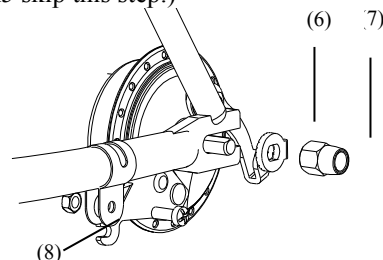
- (2) Align the red mark and then fit the fulcrum lever (4)
◆**Note: There are two ways of fitting, depending upon type of fork ends.**



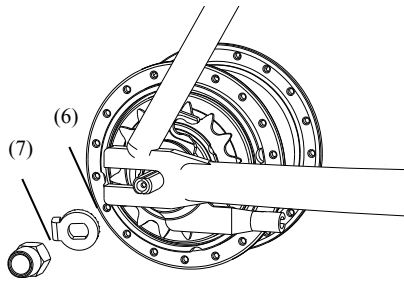
- (3) Fit the C-clip (5)



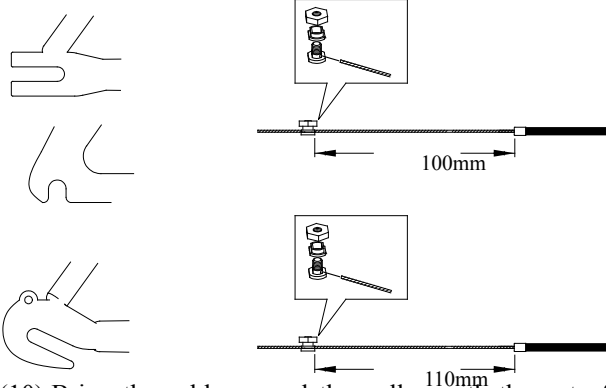
- (4) Put the hub axle into the rear fork ends and place the chain around the sprocket.
- (5) Fit the lock-washer (6) and dome-nut (7) on the left of the axle. **Screw the nut finger tight.**
- (6) Fit brake arm into brake clip (8) with nut and bolt. **Do not tighten at this point.** (RX-RF5 and RX-RK5 skip this step.)



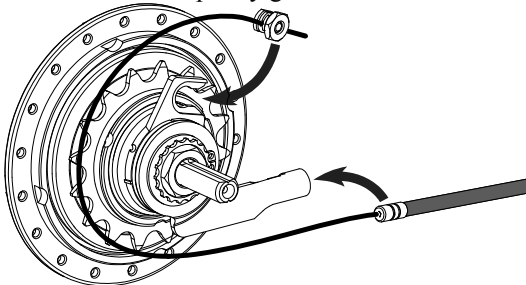
- (7) Locate the lock-washer (6) and dome-nut (7) on the right side. **Do not tighten axle nuts at this point.** Align the wheel and tension the chain.



- (8) Tighten the two domed-nuts (7) to **28Nm** and tighten the brake arm clip screw to **7Nm**.
- (9) Fix the cable with the cable-anchorage unit (9) and tighten it to torque **3-4 Nm**. Fix the correct distance as shown, according to fork end type.



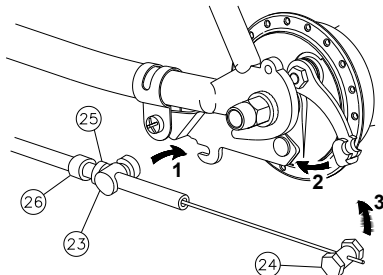
- (10) Bring the cable around the pulley with the nut of the cable-anchorage unit facing to the outside (toward the fork end) and then slide the flat section of the cable-anchorage unit into the slot of the pulley. Insert the cable outer casing into the notch of the fulcrum lever. Check the cable is correctly seated inside the pulley groove.



There is an auxiliary hole by the groove. You can insert a 2mm Allen key or a #14 spoke in the pulley and then turn the pulley clockwise to help fit the cable-anchorage unit.

- (11) Locate the brake-adjusting spigot (23) into brake arm. Depress the hub brake lever and then put the brake cable nipple (24) into the brake lever.

◆*Note: To maintain good braking efficiency avoid sharp bends and kinks in the brake cable.*

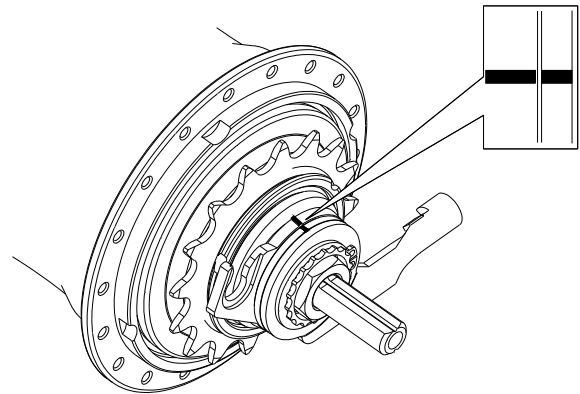


3.2 Hub types RX-RF5, RX-RK5

See section 3.1. Step 6 and step 11 do not apply.

4. GEAR ADJUSTMENT

- (1) Move the shifter from gear number 5 to gear number 2.
- (2) Turn the cable adjuster of shifter until the **two yellow indicators are aligned with each other**.
- (3) Re-select gear number 5 and then change back to gear number 2. Rotate the pedal crank a full turn. **Check again if two yellow indicators are aligned with each other.**
- (4) Repeat instructions 1 to 3 if yellow indicators are not aligned.



◆*Note: If all 5 gears cannot be obtained after following above instructions, contact your Sturmey-Archer dealer for assistance.*

5. BRAKE ADJUSTMENT

5.1 RX-RD5

- (1) Loosen the brake adjuster locknut (25).
- (2) Turn the adjuster (26) until the brake is applied.
- (3) Loosen the adjuster until the wheel just spins freely.
- (4) Tighten the locknut.

The brake adjustment must be checked before first using the bicycle and after removing or replacing the wheel.

◆*Note: After riding the first few miles brake linings "bed-in" and may require re-adjustment. Should braking efficiency become impaired beyond adjustment, brake shoes or linings may need replacement. Contact your Sturmey-Archer dealer who is equipped to replace these*

5.2 Hub types RX-RF5, RX-RK5

Check and adjust brakes according to the original brake manufacturer's manual.