

BICYCLE COMPONENTS

Replacement of the Cam Plate and Freehub Body is required for all Ritchey WCS Protocol, WCS Carbon, WCS Aero, WCS DS, and WCS Girder rear wheels purchased from Ritchey Design after January 1, 2003.

All repairs should be performed by a Professional Bicycle Mechanic.

Tools: Two 19mm cone wrenches will be needed to complete this repair. We also recommend a degreaser such as Finish Line Citrus BioSolvent and a synthetic waterproof grease such as Pedro's SynGrease. While disassembling the hub we recommend keeping all loose parts organized on a clean rag or paper towel.

Note: All WCS hubs in question are black high flanged hubs measuring 60mm in spoke hole center to spoke hole center diameter.

Disassemble axle assembly and remove old freehub body.

Step 1: Remove the non drive side rubber dust shield. Using two 19mm cone wrenches, loosen the lock nut and adjusting nut (Fig. 1). You will notice that the press fit end cap extracts simultaneously.

Note: You may need to use an axle vise to hold the axle in place while you loosen the nuts.



Fig. 1

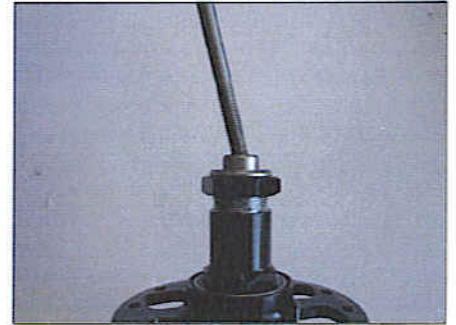


Fig. 2

Step 2: Once the locknut reaches the end of its threads, use the threaded end of your quick release skewer to gently pry the end cap out of the axle (Fig. 2). Once the cap is out, completely remove the cap, locknut, and adjusting nut (Fig. 3).

Step 3: Take hold of the cassette body and gently pull the entire assembly through the drive side of the hub body (Fig. 4). Then remove the axle from the freehub body.

Note: There is one washer between the freehub body bearing and hub shell bearing. Hold onto this washer as you will need it upon re-assembly.



Fig. 3



Fig. 4

Removal of existing Cam Plate



Step 4: Remove large black seal and put on paper towel.



Step 5: Remove pawls and put on paper towel.



Step 6: Remove Cam Plate and throw away.

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Installation of New Cam Plate and Freehub Body

While the hub is apart is a good time to degrease, clean, and re-grease if needed. Be careful and **do not get degreaser in the bearings**. After cleaning and before you re-grease is also a good time to inspect for any damage to the internal moving parts.

Step 7: Note: Some hubs have a thin washer underneath the old cam plate. If you have this washer, remove it. You will not need it (Fig. 5). The washer is very thin, so please check carefully. Apply a thin layer of grease and install the new cam plate (Fig. 6).



Fig. 5



Fig. 6

Step 8: With a thin layer of clean grease coating the top of the new Cam Plate, install all 6 pawls. Refer to the picture for the correct orientation (Fig. 7). Once completed the pawls should freely engage in unison with the Cam

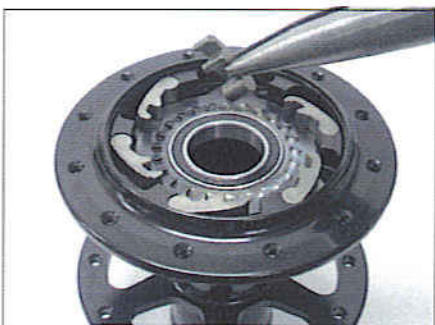


Fig. 7



Fig. 8

Step 9: With a thin layer of clean grease coating the pawls, join the axle, freehub body, and spacer with the hub shell. For Shimano freehub bodies, you need to install 2 spacers between the end cap and freehub body outer bearing. The one spacer (from Step 3) needs to be reinstalled between the freehub body bearing and hub shell bearing (Fig. 8).

Note: Campy freehub bodies will need 4 spacers between the end cap and freehub body bearing instead of two.



Fig. 9



Fig. 10



Fig. 11

Step 10: With the axle pushed completely into the hub shell and the pawls engaged with the freehub body, install the large black seal (Fig. 9). Insure that the seal is securely in the groove in the freehub body, and that the freehub body moves freely without binding. A bit of Tri Flow will help eliminate friction between the groove in the body and the seal.

Step 11: Install the adjusting nut until it is finger tight. Then install the locknut and adjust accordingly (Fig. 10).

Step 12: Once the hub is adjusted properly, using two 19mm cone wrenches, tighten the adjusting nut and lock nut (Fig 11). Reinstall the press fit end cap and dust seal. Apply the TR Quality Assured decal to the rim to identify this as a retrofitted wheel.



If there is no side-to-side play in the bearings, you have over-tightened the bearings, which will result in the bearings wearing out prematurely. The correct amount of play is just slightly more than no play. If you cannot adjust your bearings to "slightly more than no play," call or email for technical assistance.