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Overhauling Shimano Dynamo Hubs

Shimano makes a nice, affordable dynohub used by many commuters. It isn't as light, efficient, or pretty as the Schmidt, but it is less than half the price and has been reliable for me as well as many customers. Unfortunately, Shimano doesn't provide any instructions for overhauling their dynohub, and the technicians at Shimano North America who I have spoken with are unfamiliar with the hub, offering me incorrect advice about its disassembly. The Shimano dynohub uses traditional cup and cone bearings, but there is one hitch—there is a wire running from the internal assembly of the hub to the plug on the drive side of the hub. Care must be taken to remove the wire from the plug assembly so that the hub can be taken apart and the bearings serviced.

Tools

The only special bicycle tool you need for overhauling the hub is a 15mm cone wrench. You'll also need a 17mm wrench, a 32mm wrench (a headset wrench works well) or large crescent wrench that can open to 32mm, and a sharp tool used to pry up a couple of thin pieces connected to the plug. If any of your bearings need to be replaced, the Shimano dynohub uses 3/16" ball bearings on each side of the hub.

Hub Parts

A pdf of Shimano's exploded diagram for the hub can be found [here](#). This diagram is helpful for visualizing the hub, but it won't help you to access all the bearings, because unless the cone from the drive side is removed—which requires the removal of the plug assembly and detachment of the wire from the plug assembly—the drive side bearings cannot be accessed.

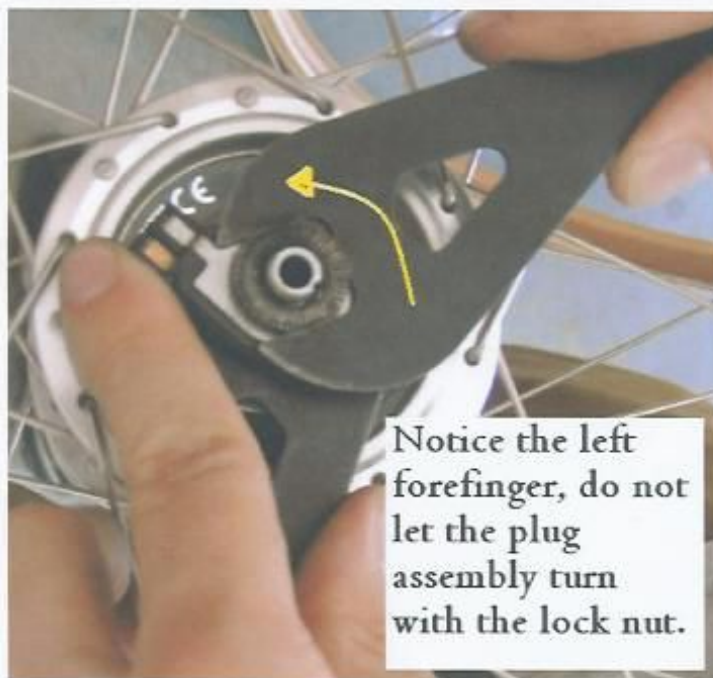
Do I really need to do this?

The dynohub produces electricity by the rotation of magnets inside the hub shell, these magnets give the hub a "notchy" feel when spun in hand. At high speeds, this notchiness can also be felt on the bike. This is perfectly normal. The DH-3N71's bearings are very well protected by two seals on each side of the hub. I have used one of these hubs for several thousand miles before opening up to find the grease was perfectly clean. Of course, your results may vary. Try adjusting your hub using the non drive side cone if you feel the bearings are too tight. If you feel the grease needs to be replaced, or just like to take things apart, use the instructions below.

These instructions assume you know how to overhaul a traditional cup and cone hub. If you need instructions on overhauling a cup and cone hub refer to [these instructions](#) from the Park tool website.

Directions

Place your 15mm cone wrench on the drive side cone in between the plug and the hub body. Place your 17mm wrench on the locknut. **Using your finger to prevent the plug assembly from turning**, break the lock nut from the cone and remove the locknut. The plug assembly will try to turn with the locknut, but if you allow it to rotate while the axle is stationary, the wire which runs from the internal assembly to the plug will break and your hub will be ruined.



Now that the lock nut is removed, you can begin to take apart the plug assembly and remove the current wire from the plug. Below is a picture of the parts on the drive side of the hub. Parts 3 through 8 constitute the plug assembly along with the current wire and the connector that is soldered to the current wire.



- 1 Rubber Seal
- 2 Cone with Dust Cover and Seal Ring
- 3 Back Plate of Plug Assembly
- 4 Metal Spacer with Wire Slot
- 5 Metal Spacer with Wire Slot (identical to part 4)
- 6 Plug Assembly Body
- 7 Plastic Plug Assembly Cover
- 8 Ground Plate
- 9 Lock Nut

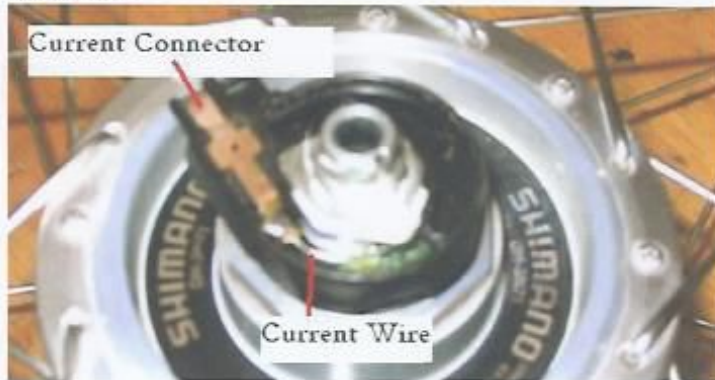
Begin to take apart the plug assembly. First, use a sharp tool to lift off the ground plate.



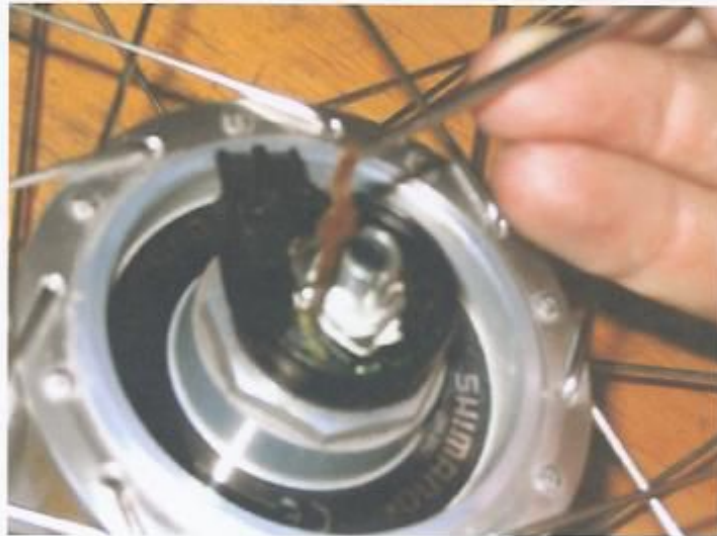
Do the same with the plastic cover to the plug assembly.



Now the current connector and current wire are exposed. Sorry for some of the blurry pictures below.



Use your sharp tool to lift up the current connector and wire. Be careful not to stress the soldered connection between the two.



You'll notice an opening on the bottom of the plug assembly body. This opening is large enough for the current connector to pass through. Carefully work the plug assembly body off the hub.



If this is the first time your hub has been opened, there will be a mess of white, semi-solid substance (which I assume is Teflon) slathered around the wire where it passes through an opening in the silver metal spacer at the triangular end. You'll probably need to pick away some of the Teflon to remove the spacers. Below the spacers, the wire runs in the groove on the hub axle. After you've removed the spacers (parts 4 and 5), the hub will look like this:



Place the wire along the groove in the hub so that the back plate (part 3) can be removed and the cone screwed off the axle without damaging the wire.

Notice the groove visible at the end of the axle, the wire must be placed in this groove when threading and unthreading the cone to prevent damage to the wire.



At this point the ball bearings on the drive side are exposed, but they're not easily accessible and you'll find it hard to clean the cups of the hub well unless we remove the axle.



Break the lock nut from the cone on the non drive side of the hub and remove both. Then using a 32mm wrench grab the large nut on the drive side of the hub pictured below and turn counterclockwise. This will take a little force, brace the wheel against your body for a good grip.



Now the inner assembly of the dynamo can be removed.



With the axle out of the way, the bearings on each side of the hub can easily be removed and the cups cleaned and inspected. Remove all the old grease and repack, replacing bearings as necessary.

When reassembling the hub, remember to prevent the plug assembly from turning as you cinch down the locknut. Clearly, allowing the plug assembly to rotate while holding the axle stationary can break the wire.

Design by Christopher Brown
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