



Ball Bearing Cone Adjustment and Installation

This guide will be a walk through on how to replace the ball bearings in your wheels.

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INTRODUCTION

The ball bearings reduce the friction caused by the rotating wheel by concentrating it on rolling bearings, in this case there are ten on each side of the axle. Well maintained ball bearings will help the wheel spin more freely and allow for an easier and smoother ride.

Notes:

- When cleaning the bearings and cones, solvents like kerosene can be very effective, however, just a wipe down with a rag is sufficient.
- When the wheel is assembled correctly there should be very little resistance between the axle and the wheel and each should spin freely of the other.
- Some of these steps require near-perfect alignment. They may take several tries to get right, so patience is a must.



TOOLS:

- [Cone wrench](#) (1)
 - [Open wrench](#) (1)
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Step 1 — Rear Wheel



- Flip the quick release lever on the wheel.

Step 2



- Squeeze the brake arms together and lift the brake cable from the caliper arms.

Step 3



- Hold the wheel to the ground, and pull the bike frame up and away to remove the wheel from the bike.

Step 4 — Ball Bearing Cone Adjustment and Installation



- Unscrew the quick release nut from the quick release axle. Remove the quick release axle.
- After removing the axle you should notice that there are two springs on it. Be careful not to lose these.

Step 5



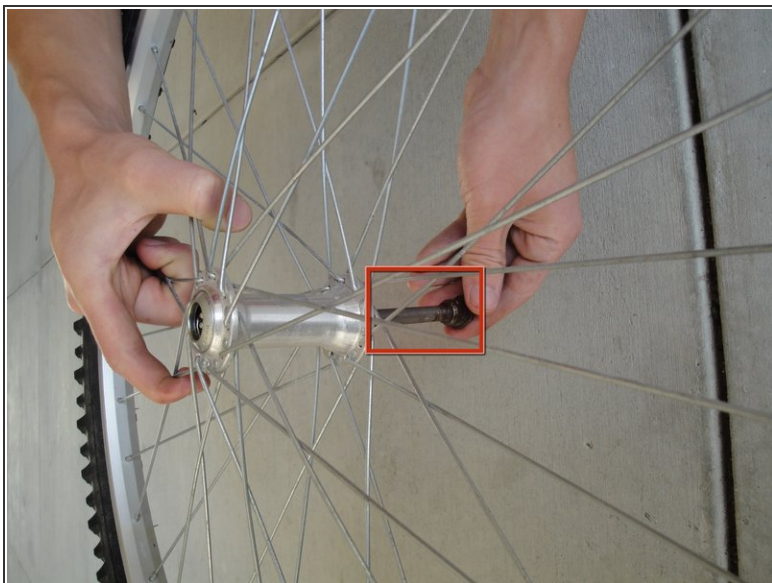
- Fit the cone wrench to the cone, and fit the open end wrench to the top lock nut. Hold the cone in place with the cone wrench and turn the open end wrench to loosen and remove the top lock nut.
- ☑ Keep track of which side each lock nut goes on. The order is important because the threading for each nut is specific for each side.

Step 6



- Unscrew the cone, and set it aside.
- ☑ Keep track of which side each cone goes on. The order is important because the threading for each cone is specific for each side.

Step 7



- Remove the axle and all ball bearings.

⚠ Caution: There are 10 ball bearings on each side, be careful not to lose any if you plan on putting the old ones back in!

Step 8



- Inspect cone surfaces and all ball bearings for dents, cracks or blemishes.
- If any are damaged, replace them.

Step 9



- Clean bearings, the bearing races, and cones by wiping them off with a rag.

Step 10



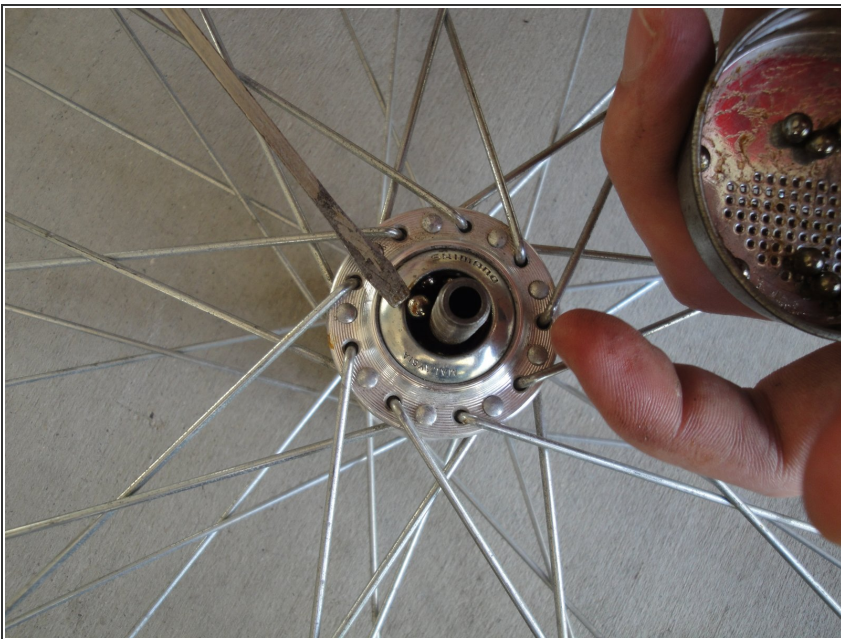
- Liberally apply grease to the bearings, races, and cones.

Step 11



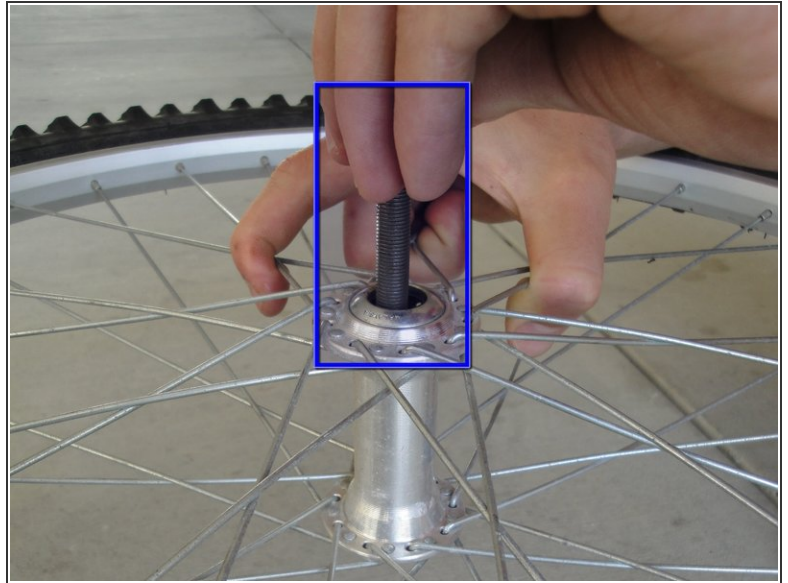
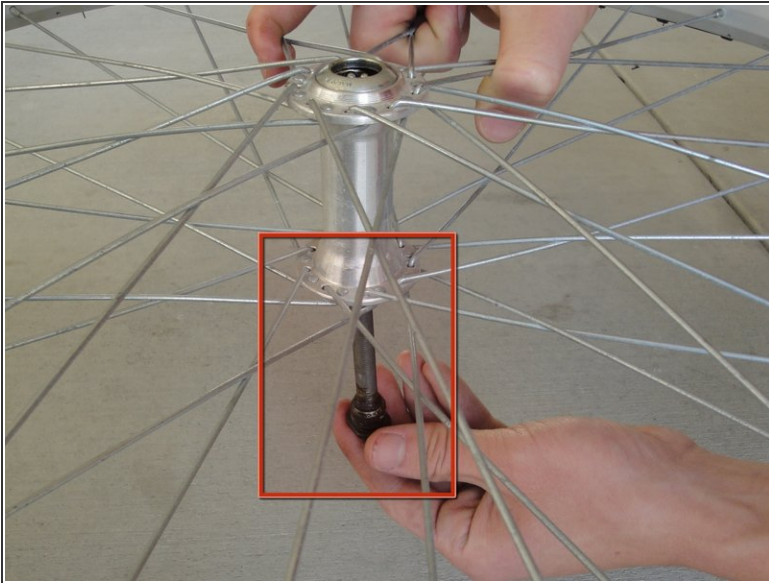
- Insert the axle back into the wheel, with the still attached nut and cone on the bottom side of the wheel.

Step 12



- Insert 10 bearings into the topmost bearing races.
- ⚠ Make sure that you insert exactly 10. If you insert too many or too few, it can damage the bearings.

Step 13



- Carefully drop the axle out from the bottom of the wheel.
- Re-insert the axle from the top side of the wheel, so that the attached nut and bearing and cone set are now sticking out of the top.
- Now flip the wheel upside down.

Step 14



- Insert the remaining 10 bearings into the bearing races on the opposite side.
- ⚠ Caution: make sure you insert exactly 10 bearings into each bearing race.

Step 15



- Hand tighten bearing cone onto the free end of the axle, so that it touches the bearings without putting any pressure on them.
- ⓘ Ideally, there should be no movement or give in the axle when you pull on it or try to wiggle it. Additionally, the axle should be able to spin freely in the wheel, with minimal resistance.

Step 16



- Slide the washer onto the axle.
- Hand tighten the lock nut against the cone and washer.

Step 17



- Once in proper position, use the cone wrench and open wrench to tighten the lock nut.
- ⓘ Tighten the lock nut VERY tightly. Otherwise the wheel can come out of alignment while you are riding.

Step 18



- Check the way that the axle spins in the wheel. The action should be smooth, with virtually no slop when wiggled. If it is too tight or too sloppy then you need to repeat the previous step.

Step 19



- Reinsert the quick release axle, and put the wheel back on the bike.
- The springs should have the smaller tapered end closest to the hub