



Aqua-Cycle International, Inc.

Ride a Tricycle on Water

Large Diameter Rear Axle Replacement Kit for AC4/AC5 models

These instructions are for the replacement of one AC4 or AC5 Aqua-Cycle LARGE DIAMETER rear axle, gear, and bearings. Provided with this kit are all replacement bearings for the large diameter rear axle, bearings for the standard pedal crank, a gear for the large diameter rear axle, and nuts, bolts and washers for the gear and rear bearings. It is very important to replace the pedal crank bearings at this same time.

Even with this large diameter rear axle, replacement of all bearings every 200 hours of use will help protect your new rear axle and pedal crank from fatigue, reverse stress, and eventual breakage that can result from seemingly minor, yet very significant, frame damage. Wear to the bearings and accumulative damage to the rear axle and pedal crank cannot be detected by physical inspection. If you fail to replace these bearings as suggested, the damage will eventually cause the pedal crank and rear axle to break in half.

Parts: This kit consists of the following:

- 1 large diameter rear axle
- 1 rear axle LD gear with nuts, bolts, and washers
- 4 small (pedal crank) bearing halves with grease fittings
- 4 small (pedal crank) bearing halves without grease fittings
- 4 large (axle) LD bearing halves with grease fittings
- 4 large (axle) LD bearing halves without grease fittings
- 8 bolts, nuts and washers for LD bearings

Installation: The Aqua-Cycle must be flipped over (upside down) and resting on the fork handlebar and the top of the seat back.

Remove the plastic belt guard, noting how it came off to make replacement easier when you are done. Never allow the Aqua-Cycle to be used with the belt guard removed for the safety of your riders.

Remove both rear wheels from the old axle and loosen the pedal crank locking collars. Remove the axle bearing bolts, nuts, and washers, the old axle, and the old bearings. Remove the pedal crank bearing bolts and bearing halves.

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Set a new bearing half on each bearing mount (halves without zerker grease fittings).

Carefully inspect the belt for frays, missing or worn teeth, or broken places in the rubber. The belt takes all the strain of pedaling and must be in good shape to keep your Aqua-Cycle operating.

Inspect the pedal crank for excessive wear at the locations where it rotates within the bearings. Wear on the pedal crank can cause the belt to “jump” when pedaling and damage the belt.

To attach the new gear to the axle you must first find the axle's center or center of gravity. Either measure the axle to find the center, or pick up the axle with one hand, putting your hand at the assumed center point. Move your hand until the axle balances in your hand. That is the center.

The center gear plate is now to one side of your hand. While keeping your hand at that location, stand the axle up, leaning it against your shoulder with the center plate below your hand (your hand still in the center). The gear now attaches to the side of the center plate that is upward toward your face.

The gear assembly consists of four parts: two gear halves and two plate halves.

First notice that the gear halves lock together to make one unit. Unlock them and re-lock them a few times to be sure you understand how they lock together.

Now attach the two halves of the gear together **AROUND THE AXLE** with the smooth part of the gear facing the axle center plate (the hollow part of the gear toward your face). Be sure that the halves are locked securely together.

Next, slip the two plate halves between the gear and the center axle plate with the square portion of the plate halves matching the center axle plate. Turn the gear so that the split in the gear halves is perpendicular to the split in the plate halves and all holes match those in the axle center plate.

Put each bolt in from the bottom, with the bolt head against the axle center plate and the washer on the thread end of the bolt and against the gear. Then put on the locking nut. Repeat this for all four bolts before tightening any of them.

Tighten one bolt at a time, keeping the gear halves from pulling apart during the tightening. Be sure that the plate halves are together as much as possible with little or no gap between halves.

Set the axle onto the new bearing halves on the bearing mounts. Be sure that an equal amount of axle extends beyond each side of the Aqua-Cycle frame. Reversing the axle at this point, or installing the gear on the wrong side of the axle center plate will cause one wheel mounting plate to be closer to the frame than the plate on the other side.

Now that you know the position and orientation of the axle, remove it from the bearing halves, slip it through the belt, and place it again on the bearing halves.

Put the top center bearing halves (with zerk fitting toward the back of the Aqua-Cycle) on the axle and install the longer bolts, washers, and nuts, but do not tighten yet.

Insert bolts and washers into the new pedal crank center bearings. Put on the nuts, but do not tighten. Slide the pedal crank and center bearings as far forward (away from the rear axle) as the mounting holes will permit and tighten the nuts.

Adjust the pedal crank so that it is positioned parallel to the rear axle. Insert the bolts and washers for the pedal crank side bearings and tighten the nuts. Be careful that you do not install one pedal crank bearing slightly forward of the other two. All four bearings must be in an exact line with each other and that line must be perpendicular to the sides of the frame.

Slide the rear axle and center bearings away from the pedal crank as far as possible. When the belt is tight, tighten the bearing nuts. Once tightened, carefully align the axle to be parallel with the pedal crank, put on the top side bearing halves, bolts, and washers, and tighten the nuts.

Parallel alignment between the rear axle and pedal crank are as important as perfect alignment of the wheels on a car to it's frame. If the axle is at a slight angle the rear wheels will be aimed slightly to the side. More importantly, the rear axle gear will not be aimed exactly at the pedal crank gear, causing the belt to have a slight turn as it enters and leaves the gear.

Do not attempt to tighten the belt or align the rear axle without adjusting all four rear axle bearings. Do not loosen only the center bearings and attempt to tighten the belt by moving only those bearings. All four bearing positions must be adjusted at the same time. And do not attempt to tighten the belt with wheels attached to the rear axle.

If the belt cannot be tightened by the above process the frame has become damaged and the bolt holes in the rear axle bearing mounts must be enlarged or re-drilled to permit the rear axle, bearings and bolts to be mounted farther away from the pedal crank.

Once the belt is tight, the bearing bolts are tightened, and you are confident that the rear axle and pedal crank are parallel to each other, carefully align the pedal crank gear and rear axle gear (side to side movement) so that they are in an exact line with each other. The belt must move freely from front to back without being pulled slightly to one side or the other.

The pedal crank gear and rear axle gear are held in proper alignment by locking collars on each side of the pedal crank and rear axle. Each lock collar should be positioned against the outside of the bearings and should be tightened when both gears are properly aligned.

Reinstall the rear wheels being careful to not over tighten the wheel bolts and nuts. Only tighten them until one or two threads extend beyond the end of the nuts. Over tightening will cause cracks in the wheels resulting in leaks.

Reinstall the belt guard. It may be necessary to enlarge the rear axle holes in the belt guard to accommodate the larger axle diameter. It may also be necessary to cut new lubrication holes above the grease fittings. A pocket knife, utility knife or other sharp cutting instrument will work fine. Never allow the Aqua-Cycle to be used with the belt guard removed for the safety of your riders.

Once all of the above is completed, grease all bearings with high quality marine grease, and continue to enjoy your Aqua-Cycle.

If you have any questions about this installation, please call our office. We are available and glad to talk you through this process.