

# ***G-SPORT RATCHET HUB***

**//////////////////// INSTRUCTION MANUAL**



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# TECHNICAL SPECIFICATIONS

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**SPOKE LENGTHS:** 36-H (3-Cross) = 186mm and 48-H (4-Cross) is coming soon

**SPOKE COMPENSATION:** Tighten the drive-side flange spokes using two extra turns during building to compensate for the uneven flange size and to eliminate dish.

**FLANGE SIZES (P.C.D. HOLES):** 57.5mm / 53.5mm

**FLANGE SIZES OVERALL:** 66mm / 62mm

**FLANGE SPACING (CENTERLINE AT HOLE):** 63.5mm

**DROPOUT SPACING (OVERALL HUB WIDTH):** 110mm

**BOLT SIZE:** M14 x 1.25, 17mm external AF, 6mm internal hex.

**BEARINGS (MAIN HUB):** 6904 2RS

**BEARINGS (DRIVER):** 24 x 28 x 13mm caged needle bearings, 20 x 24 x 16mm inner race, with proprietary thrust bushings.

**RECOMMENDED TIGHTENING TORQUE:** 50 N·m / 37 ft·lb

**MINIMUM TORQUE:** 20 N·m / 15 ft·lb

**MAXIMUM TORQUE:** 100 N·m / 74 ft·lb

**WEIGHT (14mm STEEL AXLE, 10-T DRIVER):** 564g / 19.9 oz.

**WEIGHT (3/8" ALUMINUM AXLE, 10-T DRIVER):** 440g / 15.5 oz. (approximate)

**SUGGESTED RETAIL PRICE (U.S.A.):** \$154.00

**COLORS:** Black, Gold, White, High-polished and limited edition.

**DRIVERS:** 10-T, right and left-hand switch-able. 9-T available, Spring 2009.

**WARRANTY (14mm AXLE):** Lifetime against bending or snapping, discretionary on other issues.

**WARRANTY (OTHER):** Lifetime on defects, discretionary on other issues.

**MAINTENANCE:** Thank you for using the new G-Sport Ratchet Hub. This product is designed to last through the harshest conditions and heaviest landings, but occasionally it will be necessary to clean and re-lubricate some of the parts. Please familiarize yourself with these instructions and refer to them as necessary during the procedures. As usual, Odyssey and G-Sport strongly recommend that all repairs and maintenance procedures be handled by a qualified professional bicycle mechanic only.



# **PART 1: TAKING A LOOK INSIDE THE HUB**

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## **1.1**

Remove the bolt from the driver side of the hub.



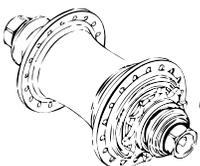
## **1.2**

Remove the driver-side collar. This is a tight fit by design. If the collar cannot be removed by hand, then use a tool (ex. small flathead screwdriver) under the collar's lip to gently pry it off.



## **1.3**

Pull the driver away from the hub while turning the driver backwards (so an audible "clicking" noise is heard). A slight "pop" may be noticed as the seal pulls free of the hub shell. Examine the driver and hub shell as needed.



# PART 1: TAKING A LOOK INSIDE THE HUB

REASSEMBLY



1.4

Check that the black steel-backing washer is still inside the hub.



1.5

Slide the driver down the axle, turning it backwards (the direction it would “click”), pressing the driver firmly into place. The pawls should click into engagement, and the driver should drop home easily. If there is unusual difficulty, hold the pawls closed while sliding the driver down the axle.

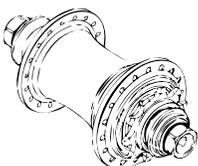


1.6

Replace the collar with the flared end outward. Make sure that the collar is fully seated.

1.7

Place the wheel back in the frame’s drop-outs and tighten the bolts as necessary. Check the bicycle for proper assembly before riding it.



## **PART 2: SWITCHING FROM RIGHT TO LEFT**

Ratchet Hubs are shipped with the driver configured for right hand drive (RHD), but the hub can be easily switched to left hand drive (LHD). To switch the driving direction, it is only necessary to reconfigure the driver. The hub shell does not need modification.



### **2.1**

Remove the driver as described in “Part 1.”

### **2.2**

Lay the driver teeth-side down on a clean rag, towel or piece of paper. Be sure to do this in a neat and organized workspace. The aim here is to prevent the chance of losing small parts.



### **2.3**

Use the tip of a small flathead screwdriver to gently pry the plastic “bash” washer off of the back end of the driver.



### **2.4**

Locate the outermost end of the spiral-pawl retaining ring and use the small flathead screwdriver to gently pry the end up. Slide the screwdriver under the ring and unwind it from the driver's slot.

**NOTE:** Once the retaining ring has been removed the pawls and springs will be free to fall out, so keep the teeth-side down in this step to avoid losing them.



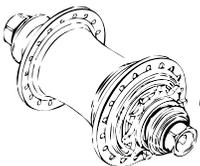
## ***PART 2: SWITCHING FROM RIGHT TO LEFT***

***CONTINUED***



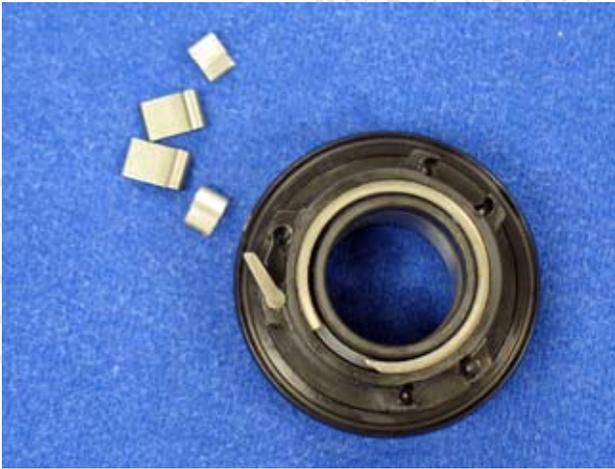
### **2.5**

Remove one pawl and its spring and reposition them for LHD. Be sure to check the spring to make sure that it is correctly seated in cavity's special groove. Also check to make sure that the tip of the pawl is oriented properly for engagement with the hub's tooth ring.



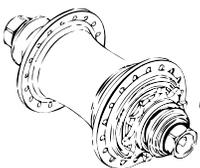
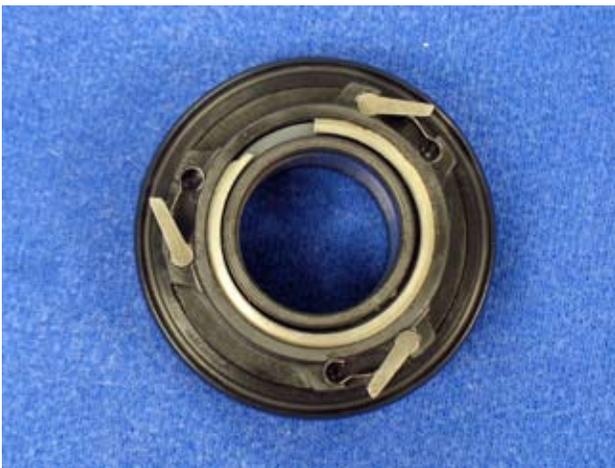
## **PART 2: SWITCHING FROM RIGHT TO LEFT**

**CONTINUED**



### **2.6**

Repeat the previous step for the two remaining pawls. Before replacing the spiral-pawl retaining ring, double check to make sure that all of the pawls are facing in the same direction. Check this by running a finger fully around the driver so that each pawl is folding downward in the same manner.



## **PART 2: SWITCHING FROM RIGHT TO LEFT**

**CONTINUED**



**2.7**

After checking the pawls for their proper direction and tip orientation, replace the driver's spiral retaining ring by tucking one end into the driver's groove and wind the rest of the ring on so it is fully seated in place.



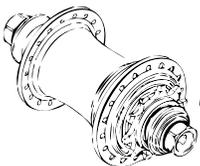
**2.8**

Replace the plastic "bash" washer by pushing it home and checking it for rotation.



**2.9**

Reassemble the hub according to "Part 1."



## ***PART 3: CLEANING AND LUBRICATING THE PAWLS***

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The drive cavity uses a lip seal to keep debris out of the hub shell. To keep the hub as smooth as possible a relatively loose fit between the seal and driver has been used. This means that it is possible for finite amounts of dirt and gunk to make their way into the hub over time (especially in very wet or dusty conditions). If the hub becomes noticeably quieter or skips even slightly, then chances are likely that the pawls need cleaning and re-lubricating. There are two basic ways to accomplish this.

### **3.1**

Remove the driver from the hub shell as described in “Part 1.”

### **3.2**

The first way is the fastest, though it is not as thorough; Lay the driver teeth-side up on an old rag and spray the pawls and springs liberally with a degreaser or thin lubricant like WD-40. Take precautions to prevent this step from washing the grease out of the actual driver bearings. Wipe down all of the exposed areas with a clean rag to remove the excess dirt and gunk.

### **3.3**

The second and more thorough approach is to remove all of the pawls and springs as described in “Part 2” and clean them individually.

### **3.4**

After cleaning and re-assembling the pawls and springs (if necessary), apply a very small amount of thin lubricant (like Tri-Flow) by wiping it around the pawl and spring areas. Never use grease on the pawls, as it runs the risk of causing the pawls to become stuck in the closed position.



## **PART 4: CLEANING AND LUBRICATING THE DRIVER BEARINGS**

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As with the pawls, the driver bearings may also need cleaning and re-lubricating from time to time.



### **4.1**

Remove the driver as described in “Part 1.”

### **4.2**

Remove the plastic “bash” washer as described in “Part 2.”

### **4.3**

Lay the driver teeth-side up on a clean rag, towel or piece of paper in a clear workspace to prevent part loss.

### **4.4**

Remove the driver’s outermost circlip by using a small flathead screwdriver to gently pry the clip free.

### **4.5**

Take the driver’s internal parts out in order, and lay them on the towel in the order they were removed.

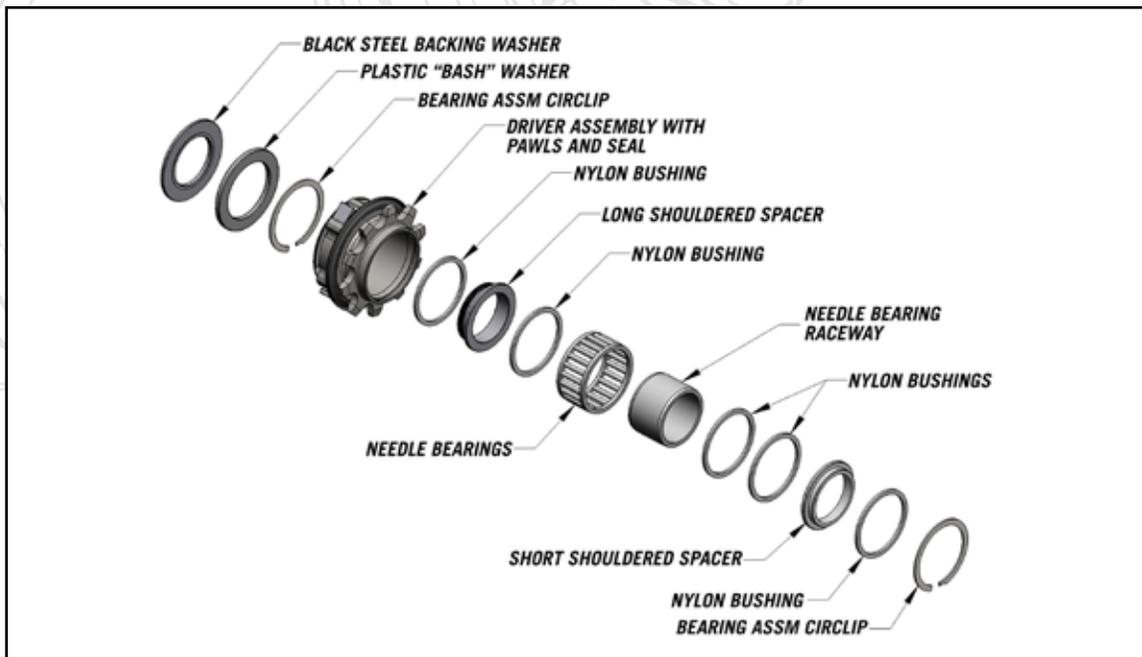
### **4.6**

Clean the inner surface of the driver and each individual part, making sure to remove any excess debris.



# PART 4: CLEANING AND LUBRICATING THE DRIVER BEARINGS

REASSEMBLY



## 4.7

Re-install the driver's innermost nylon bushing.

## 4.8

Apply a thin coating of quality bicycle grease to the face of the nylon bushing and to the inside surface of the driver.

## 4.9

4.9.1.) Re-install the "long" shouldered spacer so the textured section extends from the back of the driver.

4.9.2.) Add another nylon bushing and grease as described in 4.8.

## 4.10

4.10.1.) Apply grease to the needle roller bearings and install them in the driver.

4.10.2.) Install the needle bearing's raceway sleeve.

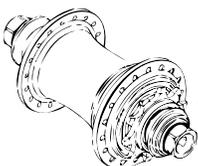
4.10.3.) Install two more nylon bushings and grease their top faces as described in 4.8.

## 4.11

4.11.1.) Replace the outermost (short) shouldered spacer.

4.11.2.) Add the final nylon bushing and the driver's retaining circlip to cap it off.

4.11.3.) Reassemble the driver into the hub as described in "Part 1."



# **PART 5: REPLACING THE HUB SHELL BEARINGS**

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The Ratchet Hub runs on two standard-size 6904 cartridge bearings (20mm bore, 37mm outer diameter, 9mm wide). This bearing size is readily available from local ball bearing suppliers, and it has already proven itself in previous G-Sport hubs (Homer, Vandal, Monkey), where they've been known to last for five years or more. Under unusually harsh conditions the bearings may become dirty or could have the grease washed out, in which case, they may need replacing. Ask the bearing supplier for 6904 2RS, since the replacements will need to have two rubber seals.

## **5.1**

5.1.1.) Remove the driver as described in "Part 1."

5.1.2.) Remove the black steel backing-washer from the drive cavity.

5.1.3.) Remove the non-drive side collar by pulling it off the axle. Use a small flathead screwdriver to gently pry it free, if necessary.

## **5.2**

Place the hub drive-side down on an open bench vise (with strips of wood or plastic to protect the hub from damage). If no bench vise is available, simply use two blocks of wood for support. Leave enough room underneath the support for the axle to be removed from the hub.

## **5.3**

Install one of the bolts in the non-drive side end of the axle. Thread it in at least half way.

## **5.4**

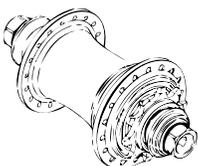
To drive the axle and bearing out of the hub, hit the end of the axle bolt with a wooden or rubber mallet or by using an ordinary hammer and a block of wood to protect the bolt.

## **5.5**

Remove the drive side bearing from the axle, flip the hub over and re-insert the axle into the bearing to perform the same removal operation on the non drive-side bearing. Make sure that the support being used is capable of allowing the bearing to clear so it is free to exit the hub shell.

## **5.6**

Place the new non-drive-side bearing over the hub shell's bearing seat. Mount the bearing into the hub shell seat by using a bearing press. If a bearing press is not available then the bearing can be reseated using the same mallet (or block of wood + hammer) used to knock the axle out. Please note that using the non-press method requires significant mechanical skill to perform the procedure properly. To seat the bearing without the press, tap the bearing in slowly by using small hits around the outside edge to keep the bearing moving into the shell with a consistently straight alignment. Stop when the bearing is left with 2mm sticking out of the shell. If the bearing press is being used, fully seat the bearing into the shell now.



## **PART 5: REPLACING THE HUB SHELL BEARINGS**

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**CONTINUED**

### **5.7**

Install the axle, making sure that the “long” end is situated on the drive-side.

### **5.8**

Press the drive-side bearing into position using a bearing press. If a bearing press is not available, the bearing can be fully seated by using the hub’s axle in combination with a stack of ordinary M20 FORM-A washers (approx. 20mm inner diameter, 37mm outer diameter, 3mm thickness). This size is readily available at many good hardware stores and industrial fastener suppliers. Place two washers on the non-drive side of the axle, followed by the non-drive side axle collar. Next, place ten washers over the drive-side of the axle, placing the collar on the axle at the end of the stack, followed by the axle bolt and its washer. Tighten the drive-side bolt until the axle has been fully pulled over to this side. At this stage, the non drive-side bolt should be threaded into the axle and tightened as needed to fully seat the bearings in the hub shell.

### **5.9**

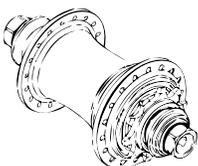
Remove the bolts and washers and check for play in the axle. If there is significant movement, repeat step 5.8 until the bearings are seated properly. Small amounts of play (0.1mm or less) or slight tightness will resolve itself during normal riding.

### **5.10**

Install the non-drive-side collar and the black steel backing-washer for the driver.

### **5.11**

Install the driver as described in “Part 1.”



# **GENERAL PROBLEM SOLVING**

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## **Axle bolt is stuck.**

A bolt will not un-thread from the axle, and the axle rotates in the hub.

- 1.) Tighten the bolt on the opposite side into a dropout (with wheel positioned outside of the frame).
- 2.) Loosen the bolt that is stuck in the axle.
- 3.) Inspect the bolt for damage and replace it as necessary.

## **Helicoil damage or loss.**

Damaged helicoils can be removed by prying the end up with a sharp tool and pulling the coil outward by clamping the end with a Vise-Grip (aka Mole Grip).

The helicoil is an M14 x 1.25, which is commonly used for repairing automobile spark plug socket threads.

The purpose of the helicoil is to protect the axle from damage. It is easier and cheaper to replace the helicoil instead of the whole axle. If the helicoil has a problem, check the bolts carefully for damage before rebuilding the repaired hub to prevent the problem from happening again in the future.

## **Other issues.**

Please contact Odyssey for assistance if the hub has a problem that has not been addressed here or if replacement parts are needed. ALL parts are available as spares and the hub should not be used if any parts are missing or damaged.

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