

CHRIS KING[®]

PRECISION COMPONENTS



Classic Hub Instructions

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Congratulations

You have just purchased the finest hubs available. With proper care and maintenance you will enjoy many years of the legendary performance you have come to expect from all Chris King Precision Components. This manual is designed to give you the information needed for the set-up, use, and basic maintenance of your new hubs.

As with all Chris King Precision Components, our hubs are superbly designed and manufactured, responsibly light, and meticulously finished. Our hubs feature our patent pending RingDrive™ engagement system spinning around a 20mm aluminum axle on four sets of ball and needle bearings. This combination, housed in an elegant, bomb-proof aluminum shell, offers the solid and reliable performance demanded by serious cyclists. Like all of our components, our classic hubs are 100% user serviceable.

Cautions

Chris King hubs are designed to be used in conjunction with quick-release skewers. It is recommended that the skewer develop a minimum of 1100 lbs. of clamping force when set. For best performance, use a steel skewer. Titanium skewers are not recommended for use with front or rear suspension.

Do not attempt to modify your hub(s) to accept any type of bolt-on retention device. Do not use thread-locking compound on any part of your hub(s).

The aluminum drive shells of the rear hubs are softer than the steel shells, and should only be used in conjunction with the newer “spidered”-style cassettes (e.g., Shimano XT, XTR). Avoid using individual cog styled cog sets with aluminum drive shells.

Chris King hubs feature adjustable bearing preload. The bearings should be kept in proper adjustment for optimum product performance. Do not allow the adjustment to become loose, as this may cause a loss of performance and could lead to damage to the hubs.

Preparation

Wheel building

Chris King hubs are designed to work with 14 or 15 gauge spokes. Due to the increased tension required by titanium spokes, titanium spokes should only be laced in a 3 cross pattern.

Proper wheel building technique is essential in creating a strong wheel. Wheel building is a skill that requires proper training and specialized tools and is best done by a trained professional.

Dimensions for wheel building

<u>Model/flange</u>	<u>Flange diameter</u>	<u>Center to flange</u>
Front (wide)/both	40.0 mm	37.5 mm
Front (narrow)/both	40.0 mm	34.0 mm
Rear 130mm/drive side	53.0 mm	18.5 mm
Rear 130mm/non-drive side	44.0 mm	38.5 mm
Rear 135mm/drive side	53.0 mm	21.0 mm
Rear 135mm/non-drive side	44.0 mm	36.0 mm

Frame preparation

Chris King Classic front hubs are available to work with 100mm fork drop out spacing. Do not attempt to use your hub with drop out spacing different than for which it was intended.

Chris King Classic rear hubs are available to work with 130mm, 135 mm, 140mm, and 145mm frame drop out spacing. Do not attempt to use your hub with drop out spacing different than for which it was intended.

Check frame and fork dropouts to ensure that they are parallel to each other. Use an appropriate tool such as those made by Park or Campagnolo. Unparallel dropouts may compromise the performance of or damage your new hub.

Set-up

The hub(s) come pre-adjusted from the factory. The adjustment has been made anticipating spoke tension and skewer compression. Because of variations in wheel-building practices, a minor adjustment should be performed upon completion of the wheel build. Please see the appropriate "...**Adjustment**" section and check the hub before using.

The grease in your hub will provide optimum performance between 30°-110°F. The bearings and RingDrive™ engagement mechanism come pre-packed with a specially formulated low shear grease. To maintain maximum performance in extreme temperatures see appropriate section under "**Lubrication**", page 3.

Break-in

Once your new hub is placed in service, some settling will occur. Check adjustment by clamping wheel into frame or fork with the quick-release. Ride for 5-10 minutes, check for play or binding, and readjust if necessary. Recheck after the first 5-10 miles of riding. Check cog lock ring on rear hubs after the first 20 hours of use, and tighten if necessary. Continue monitoring for the first 60 hours of use.

During the first 60 hours of use, some break-in drag may occur. This is normal as the seals break in, and will soon diminish. If this causes chain sag while back-pedaling, increase the P-tension (cage tension) on the rear derailleur.

The bearing grease is intentionally overpacked and excess grease may seep at the bearing seals during the break-in period.

Maintenance

Maintenance schedule

Chris King Classic Hubs are designed to provide long life and high performance. Beyond an occasional adjustment, the only maintenance necessary is cleaning, lubricating the RingDrive™ (see "**Maintenance of the RingDrive™ & drive shell**", page 5), and re-lubricating the bearings (see "**Bearing service**", page 8). Riding conditions will determine how often to maintain your hubs. As a beginning guideline, your hubs should be maintained every 6-12 months in normal and dry conditions and every 3 months in wet or muddy conditions.

The bearings in your new Chris King hubs are of the highest quality available. However,

all bearings will settle and eventually wear with use. Since looseness or “play” in the bearing assembly can develop as a result of wear, Chris King hubs have been designed with an adjustable bearing preload mechanism and any normal play can be eliminated (see the appropriate “...**Adjustment**” section).

RingDrive™ maintenance

Normal preventative maintenance of the RingDrive™ is simple and can be performed using basic tools. (See “**Maintenance of RingDrive™ & drive shell**”, page 5.) In many cases, a minor cleaning and reapplication of lubricant is all that may be necessary. Judging when to perform this basic maintenance is determined by riding style and conditions. As a beginning guideline, your hubs should be maintained every 6-12 months in normal and dry conditions and every 3 months in wet or muddy conditions.

Periodically (every one to two years) or if foreign debris is detectable in the grease and/or the grease looks hard or dry, a complete servicing (removal and cleaning) of the RingDrive™ should be performed. Complete service includes the removal of the RingDrive™ engagement mechanism and requires the use of our Hub Service Tool. See your local Chris King dealer for complete service or you may purchase a Hub Tool Service Kit from your dealer or directly from Chris King Precision Components.

Lubrication

Normal conditions

In normal riding conditions (30°-110°F), our RingDrive™ grease is recommended for the bearings and the RingDrive™. **Do not substitute other brands of grease, as they may be too sticky for the helix of the RingDrive™ inhibiting proper engagement.**

Cold conditions

To ensure proper engagement in colder riding conditions (below 30°F) mix the grease in the RingDrive™ area with 5-10 drops of Tri-flow™ or a quality 10w synthetic oil. **Do not over fill.** If you plan to ride in sub-zero conditions, using oil only is the best set-up.

Wet conditions

Riding in wet conditions necessitates more frequent service. Often this is as simple as removing the axle and drive shell from the hub, removing any moisture from inside the hub shell, and applying more grease to the needle bearing. This should not replace periodic complete disassembly and maintenance, especially in extreme or prolonged wet conditions.

Note: Since it is nearly impossible to seal a hub from water and still have it spin freely, we have designed our hubs to be able to operate normally with some water intrusion. Although the bearings are stainless steel and will resist water induced corrosion, the lubricant will eventually deteriorate, leading to premature bearing wear and possible failure. High-pressure spray washing, transporting or riding the bicycle in the rain, or submersion in water while riding can all lead to lubricant contamination by water. Be aware of these situations and service more frequently when they occur.

In a pinch...

If Chris King RingDrive™ lube is not available, a quality 10w synthetic oil may be substituted. **Do not substitute other brands of grease, as they may be too sticky for the helix of the RingDrive™.** Running the hub on oil will cause the RingDrive™ to be more audible, yet functionally no different.

If you have any additional questions, please call our Technical Services Department at 800.523.6008.

Front hub disassembly (see figure 1)

1. Insert 5 mm hex wrenches into both ends of axle assembly.
2. Hold left hand stationary and turn right hand counterclockwise 1/4 turn until assembly is loose.
3. Loosen and unscrew adjusting cone and axle end until they are free from main axle.
4. Slide out main axle.
5. Both hub shell bearing assemblies can now be accessed.

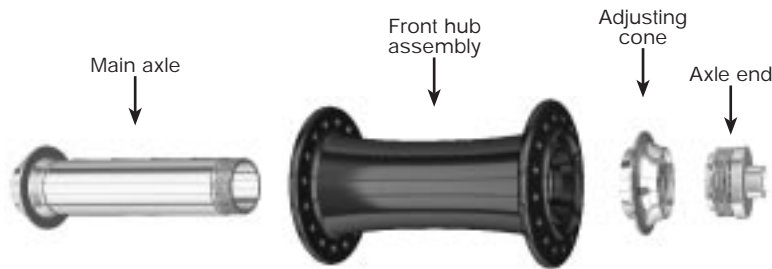


Figure 1

Further disassembly requires specialized tools. These come individually or in the Chris King Hub Tool Service Kit, which is available at your local bicycle dealer or directly from Chris King Precision Components.

For bearing service information see "**Bearing service**", page 8.

Front hub reassembly (see figure 1)

1. Lightly grease main axle O-rings.
2. Insert main axle into hub shell.
3. If axle end and adjusting cone are assembled as one unit, disassemble by threading axle end out of adjusting cone.
4. Thread adjusting cone onto the protruding threads of main axle.
5. Lightly snug adjusting cone up to bearing.
6. Thread axle end into adjusting cone until it stops.
7. Proceed to "**Front hub adjustment**" (below).

Front hub adjustment

1. Insert 5 mm hex wrenches into both ends of axle assembly.
2. Hold left hand stationary and turn right hand counterclockwise 1/4 turn until assembly is loose.
3. Hold hex wrenches stationary and adjust bearing preload with adjusting cone.
4. Advance adjusting cone until it just contacts bearing, then back off approximately 1/16 turn (this allows for axle compression while under skewer clamp pressure).
5. Once preload is set, tighten axle assembly to 100 inch-pounds.
6. Double check adjustment by clamping wheel into fork with quick-release. Check for play or binding, and readjust if needed.

Rear hub disassembly (see figure 2 next page)

The following instructions assume that the drive shell is facing to the right:

1. Remove cogs per manufacturer's instructions.
2. Insert 5 mm hex wrenches into both ends of axle assembly.
3. Hold left hand stationary and turn right hand counterclockwise 1/4 turn until assembly is loose.
4. Loosen and unscrew adjusting cone and axle end until they are free from the main axle.

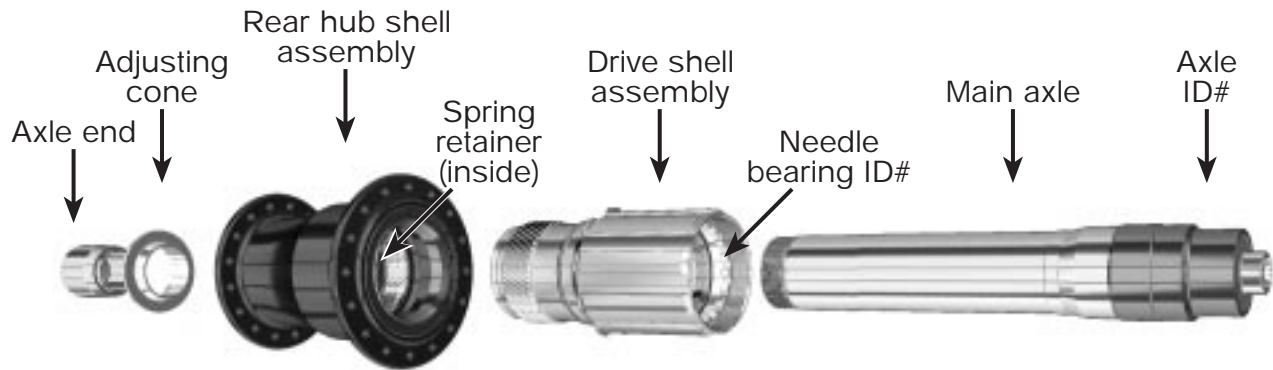


Figure 2

5. Remove main axle by pulling on drive side end of main axle.
6. Hold hub or wheel in one hand and pull drive shell out with the other.
7. Both hub shell and drive shell bearing assemblies can now be accessed.

Further disassembly requires specialized tools. These come individually or in the Chris King Hub Tool Service Kit, which is available at your local bicycle dealer or directly from Chris King Precision Components.

For bearing service information see "**Bearing service**", page 8.

Maintenance of RingDrive™ & drive shell Inspection

Having removed the axle and drive shell (as instructed above), the RingDrive™ is accessible through the large side of the hub shell. Visually inspect the hub's interior. Under normal conditions the grease should look moist and may have darkened slightly. A modest film should coat the moving parts.

As with the rest of the hub, the RingDrive™ is designed to operate with some water contamination. Water intrusion can usually be remedied with basic maintenance.

However, if foreign debris is detectable in the grease and/or the grease looks hard or dry, then a complete removal and servicing of the RingDrive™ is necessary.

Basic maintenance

1. Take a clean, lint free rag and wipe any spent lubricant from inside the hub shell. Be careful not to drag any dirt or debris from outside the hub into the interior area.
2. Once the interior is clean in appearance, locate the helical splines of the drive ring about an inch inside the large bearing.

3. Using a soft toothbrush, pull the bristles across the helix in an outward direction. Work your way all the way around the inner circumference to remove any small particles that may be in the spline grooves.
4. Once completed, wipe the area directly in front of the helix to remove any debris. This method should be used to clean the helix on the drive shell as well. (If compressed air is available, blow across the helixes in line with the spline grooves to remove any debris.)

With the interior wiped down and the helixes brushed clean, a fresh application of lubricant should be applied. The RingDrive™ is designed to work with our specially formulated low shear RingDrive™ grease. **Do not substitute other brands of grease, as they may be too sticky for the helix of the RingDrive™.**

5. Lubricate by reopening a gap between the drive rings, and laying a bead of RingDrive™ grease on the teeth between them.
6. Let the rings spring back together and then wipe up any excess grease that squeezes inward.
7. Apply a few drops of Tri-flow™ or a quality 10w synthetic onto both the helical splines of the movable drive ring and the drive shell.
8. **Before reinserting the drive shell into RingDrive™ area of the hub, the helical splines must be clean of any debris.**
9. Reinsert the drive shell and complete the assembly as per the instructions below.

RingDrive™ service

In addition to the basic maintenance of the RingDrive™, a complete removal and servicing may be necessary. Complete service requires our Hub Service Tool Kit and, as a basic guideline, should be performed at least once every 12 to 24 months. Check with your local Chris King dealer for complete service or you may purchase the tool kit at your dealer or directly from Chris King Precision Components.

In a pinch...

If you need to do a RingDrive™ service and don't have the Hub Service Tool Kit or can't make it to a dealer, this method may be used for temporary results:

1. Remove the axle and drive shell to access the interior RingDrive™ area.
2. Push the drive ring with helical splines inward to open a gap, exposing the drive teeth and flush the interior with a light solvent-based spray lubricant (e.g., Bullshot™ aerosol or WD-40™) until the area appears clean. Blow off any remaining solvent until completely dry.
3. If contamination is still apparent, repeat flushing and blow completely dry. A complete service of both hub shell bearings should be performed at the same time.
4. Finish by performing the basic maintenance as instructed above.
5. After assembly, carefully hand test hub for smooth operation of the bearings and consistent, positive engagement of the RingDrive™. If performance is not improved to original quality, a complete RingDrive™ removal service must be performed.

Reinstallation of the drive shell assembly

1. Check the helical splines of the drive shell for any particles or debris before proceeding; **the drive shell must be clean before installing!**
2. Apply several drops of Tri-Flow™ on the helical spline, O-ring, and tapered diameter

directly adjacent the O-ring.

3. Insert drive shell into hub shell, slowly. As the drive shell enters the RingDrive™ area, it will want to mesh the helical splines of the drive ring. As it begins to mesh, a slight clockwise turning motion of the drive shell will help pull it into the hub shell. Continue twisting as the drive shell pulls itself into the hub shell. At the bottom of its inward movement, an audible “click” or “pop” sound indicates that it has found home and is fully seated. The “click” or “pop” is the spring retainer popping onto the drive shell and the drive shell seating on the bearing, indicating the drive shell is fully inserted. Some pushing pressure on the drive shell may be necessary to pop the spring retainer onto the end of the drive shell.

Note: During removal of the drive shell unit the spring retainer plate can become off-centered. Be sure that the spring retainer is properly centered against the back of the spring area before reinstalling the drive shell.

4. Test engagement by spinning drive shell in both directions. If it does not engage, remove drive shell, check cleanliness and re-insert. Re-test.
5. The hub is now ready to have the axle installed.

Rear hub reassembly (see figure 2)

The following instructions assume that the drive shell is facing to the right:

1. Lightly grease all O-rings and bearing contact surfaces.
2. Insert main axle through drive shell. The axle is properly seated when the threaded end appears through the bearing and the end is flush with the end of the hub shell.
3. If axle end and adjusting cone are assembled as one unit, disassemble by threading axle end out of adjusting cone.
4. Thread adjusting cone onto the protruding threads of main axle.
5. Thread axle end into adjusting cone until it stops.
6. Proceed to “**Rear hub adjustment**”, below.

Note: To improve performance, the axles have been precisely matched with the needle bearings in the drive shell. Be sure to combine only like numbered parts, (e.g., #4 axle with #4 needle bearing race).

Rear hub adjustment

The following instructions assume that the drive shell is facing to the right:

1. Insert 5 mm hex wrenches into both ends of the axle assembly.
2. Hold left hand stationary and turn right hand counterclockwise 1/4 turn until the assembly is loose.
3. Hold hex wrenches stationary and adjust bearing preload with the adjusting cone. You may use the hub cone adjusting tool if necessary.
4. Advance adjusting cone until it contacts bearing. The rear hub takes a slightly higher amount of preload than “no play”, since some settling may occur while riding.
5. Once preload is set, tighten axle assembly together to 100 inch-pounds.
6. Check adjustment by clamping wheel into frame with quick-release. Ride for 5-10 minutes, check for play or binding, and readjust as necessary. Double check adjustment after the first 5-10 miles of riding.

Note: Correct adjustment of the rear hub is necessary for proper engagement of the RingDrive™. If the hub is run loose, the RingDrive™ may not engage properly and could lead to permanent damage of the internal parts.

Bearing service (see figure 3)

1. Chris King sealed bearings have removable snap rings that hold the rubber seals in place.
2. Carefully, using a small screwdriver, pick, or penknife, remove the snap ring by inserting tool into split of snap ring. Gently work one end of the snap ring toward bearing center until it is out of its groove. Follow the ring around with the tool until the snap ring is completely dislodged.
3. Lift and remove exposed rubber seal to access the interior of the bearing.
4. Thoroughly flush the bearing with a light spray lubricant (e.g., Bullshot™ aerosol or WD-40™) and blow dry.

Note: Some solvents, synthetic lubricants, and greases with high-pressure additives may attack and damage seals and other nonmetallic materials. Minimize exposure to these substances and thoroughly dry hub after cleaning.

5. Wipe dirt and other contaminants from the seals and snap rings. Avoid cleaning the seals with solvent, which could cause deterioration.
6. Lay a bead of our RingDrive™ grease (see “**Lubrication**”, page 3), filling the gap between the inner and outer races 3/4 the way around bearing. Rotate the inner race to work grease throughout the ball area.
7. Replace rubber seal between inner and outer bearing race.
8. Insert one edge of snap ring into groove of outer bearing race. Press along entire groove until snap ring is fully seated; a small gap should be visible between both ends of the snap ring.
9. Turn inner race of bearing by hand to test for binding. If bearings do not run smooth, repeat steps 1-9. Binding is often a result of improperly seated seals and/or snap rings.

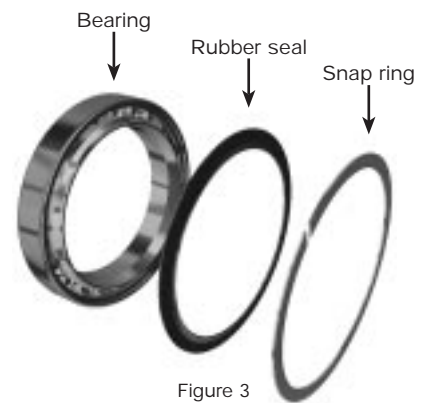


Figure 3

Used snap rings and seals can be reinstalled unless warped, punctured, or otherwise damaged. If damaged, replacement seals and snap rings are available from your local bike shop or directly from Chris King Precision Components.

Specifications

Cassette compatibility: Shimano 7, 8, and 9 speed (for 7-speed use 4.5 mm spacer available from Chris King Precision Components)

Total weight (rear): Alloy drive shell: 263 grams; Steel drive shell: 311 grams

Total weight (front): 112 grams

Axle diameter: 19.5 mm

Axle width: Front: 100mm; Rear: 130mm, 135 mm, or 140mm

Spoke hole diameter: 2.5 mm

Available hole drilling: 28, 32, and 36 – other drilling is available upon request

Warranty

Chris King Precision Components warrants its bicycle components to be free from defects in materials or workmanship for a period of 5 years from the original date of purchase. Any Chris King product that is found by Chris King Precision Components to be defective in materials or workmanship will be repaired or replaced at the discretion of Chris King Precision Components providing it is returned to the factory freight prepaid. This warranty does not cover damage or failure resulting from misuse, abuse, alteration, neglect, normal and reasonable wear and tear, crash or impact, failure to perform routine maintenance as instructed, or use other than that for which the product was intended.

If a defect is found, our entire liability and your sole remedy shall be, at our option, free repair or replacement. Chris King Precision Components shall not be held liable for any indirect, special or consequential damages. The warranty does not cover any Chris King Precision Components product where the serial number has been altered or removed. This written express warranty is in lieu of all other warranties, implied or expressed, and does not cover any representation or warranty made by dealers beyond the provisions of this warranty. This warranty gives you specific legal rights, and you may also have other rights which vary state to state.

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