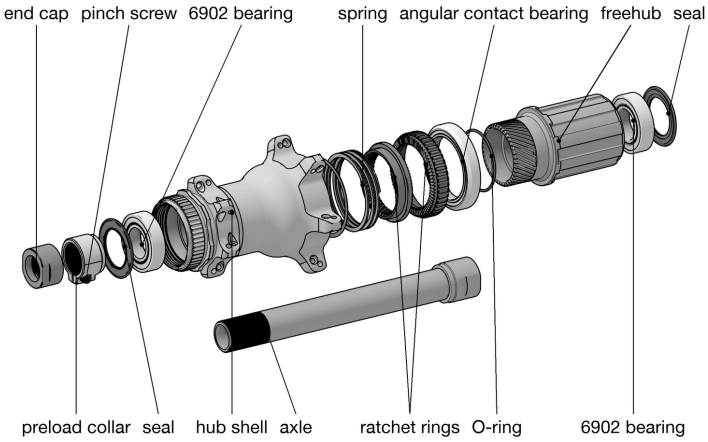
Venn Helix-01 hubs: care and service

service@velocite-bikes.com

2 Your hub in one page



The rear hub, exploded: end cap, preload collar, bearings and seals, spring, ratchet rings, angular contact bearing, freehub, axle

- A 72-tooth helical ratchet: 5° of engagement. It works like tightening a bolt: the harder you pedal, the firmer the two ratchet rings press together, so the drive is stiffest when you push hardest and your power goes into the wheel at once.
- Rear bearings: two 6902 and a 41.5 mm angular contact bearing. Front: one 6902 and one 6802.
- Axles: 12 x 142 mm thru-axle at the rear, 12 x 100 mm at the front.
- Freehubs: Shimano HG or SRAM XDR; Shimano Micro Spline for MTB.
- Weight: rear 243 g, front 105 g.
- Rider weight limit: 110 kg on 24-hole hubs, 130 kg on 28-hole hubs.
- Made in Taiwan.

3 Why the hub has a preload collar

A bicycle hub is loaded awkwardly. Every pedal stroke, sprint and rough road pushes on its bearings from the side as well as from above. Ordinary cartridge bearings spin freely in the hand, but under those side loads their friction rises. So the main bearing on the drive side is an angular contact bearing: its races meet the balls at an angle, so it is made to carry side loads as well as your weight, and it keeps rolling smoothly as you ride. At 41.5 mm it is also large, so hard knocks stay well within what it is rated to carry.

An angular contact bearing needs a light preload: no free play, and no binding.

The bearing's outer race is bevelled and sits in a matching bevelled seat in the hub shell. It is a light fit, never pressed in tight, so the race can bed into its seat. And because the races meet the balls at an angle, the bearing's side-to-side position is set by the preload, not by a fixed stop.

In the first rides, the balls and races bed in: their contact surfaces smooth, and the outer race settles into its seat. A few thousandths of a millimetre is enough to turn a correct preload into slight play. So you check the preload once the hub has settled, and then leave it alone in normal use.

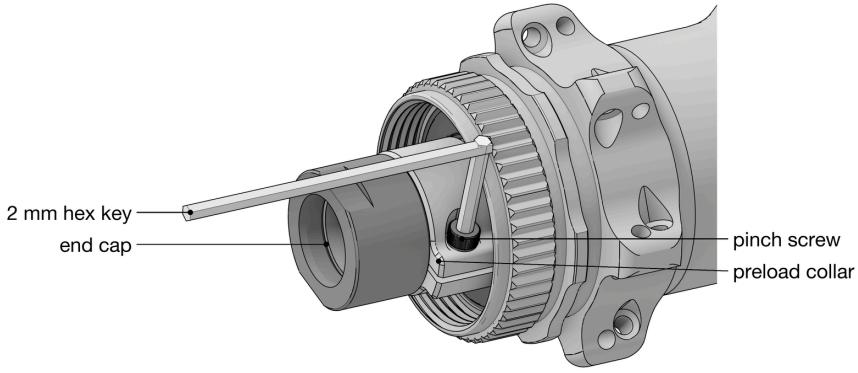
New seals drag a little until they wear in. That is normal and goes away by itself.

4 Setting the preload

Do this with the wheel on the bike and the chain off. The thru-axle can stay tightened.

1. Loosen the pinch screw on the collar at the non-drive side (2 mm hex key).
2. Turn the collar by hand until there is no side-to-side play and the rest of the wheel still turns freely on the axle.
3. Tighten the pinch screw until the collar can no longer move.
4. Check: rock the rim side to side: no knock. Spin the wheel: it rolls on smoothly.

When: after the first three rides, or sooner if the wheel is clearly loose; after that, only if you feel play.



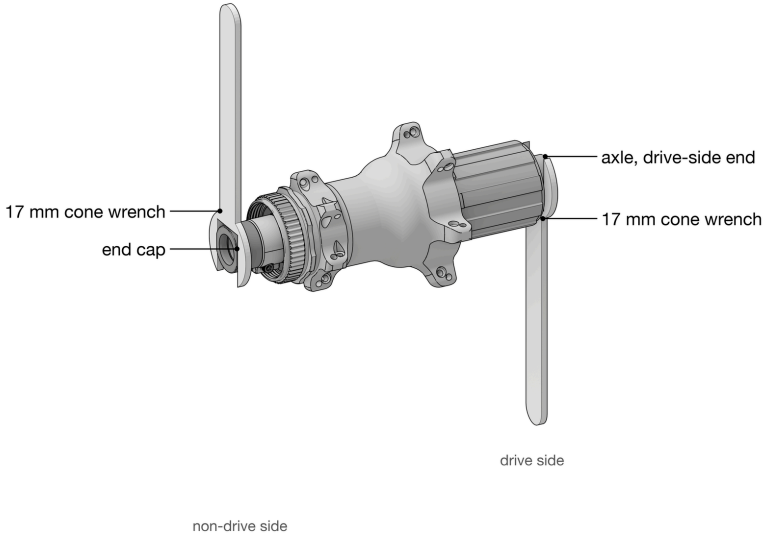
The non-drive end: the preload collar, its pinch screw and the 2 mm hex key

5 Changing the freehub (HG, XDR, Micro Spline)

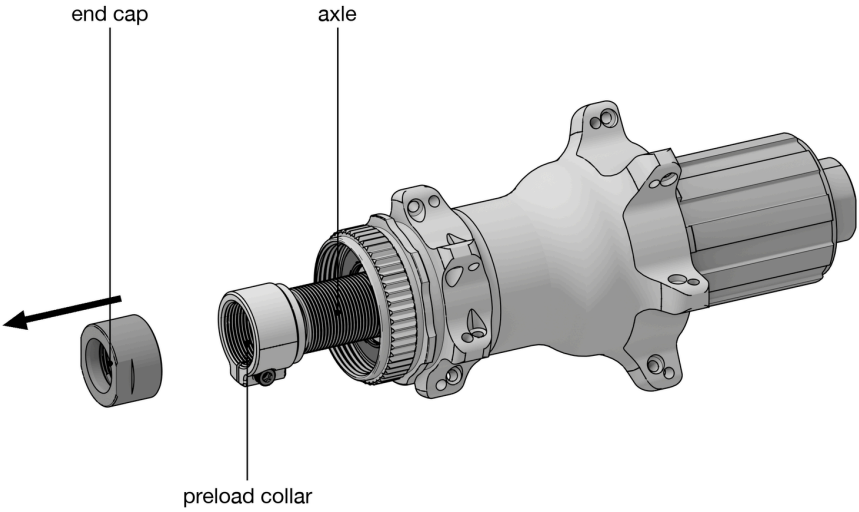
You need two 17 mm cone wrenches, a 2 mm hex key and your cassette tools. Take the wheel out of the bike and the cassette off the freehub. Steps 1 to 5 are drawn on pages 5a to 5c.

1. Hold the axle still with one wrench on the flats of the axle's drive-side end (it is one piece with the axle; there is no separate end cap on that side). With the other, loosen the non-drive-side (disc-side) end cap.
2. Loosen the preload collar's pinch screw (2 mm hex key, page 4). Then take off the non-drive-side end cap and the preload collar.
3. Push the axle out of the hub towards the drive side. The freehub comes out with it, and usually the large angular contact bearing too.
4. Slide the freehub off over the axle's non-drive-side end. If the angular contact bearing is still on the freehub, take it off. The ratchet rings and the spring usually stay in the hub shell, but with the bearing out nothing holds them there: take care they do not fall out. If they do, write to service@velocite-bikes.com before you ride.
5. While the hub is open, clean and lubricate the ratchet rings and the spline (pages 6 and 7). Put the angular contact bearing back into its seat in the hub shell first, then put the new freehub into the shell. HG and XDR freehubs need no washer; a Micro Spline freehub has a washer that sits outside the freehub body.
6. Then reverse the steps: push the axle back in, fit the preload collar by hand with its pinch screw loose, fit the end cap, and tighten the end cap while one wrench holds the axle's drive-side end (20 Nm maximum, page 10).
7. Fit the cassette, put the wheel back in the bike and set the preload (page 4).

5 Changing the freehub (HG, XDR, Micro Spline): the steps

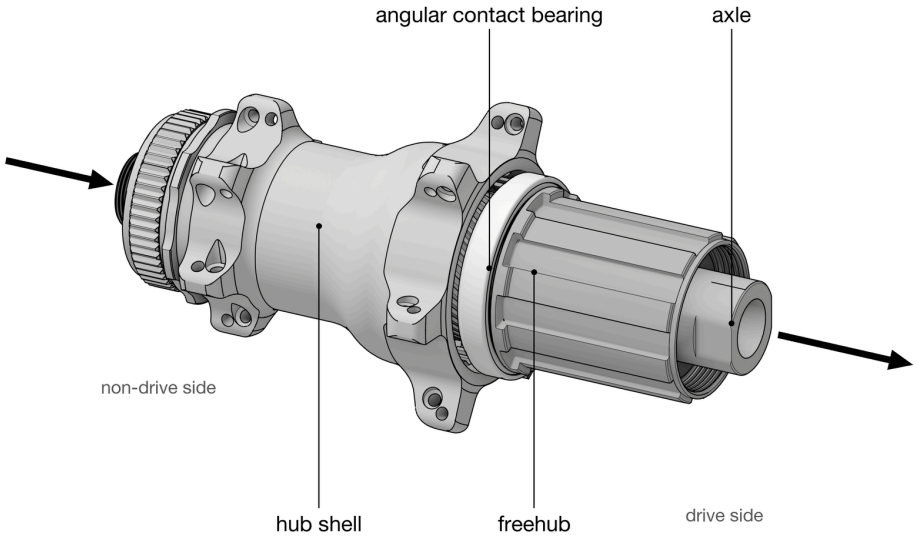


Step 1: one 17 mm wrench holds the drive-side end, the other loosens the non-drive end cap

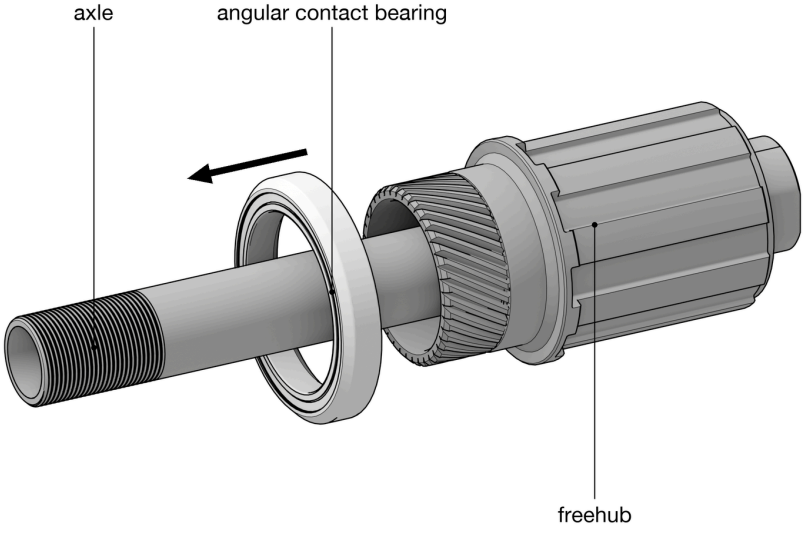


Step 2: the end cap and the preload collar off

5 Changing the freehub (HG, XDR, Micro Spline): the steps

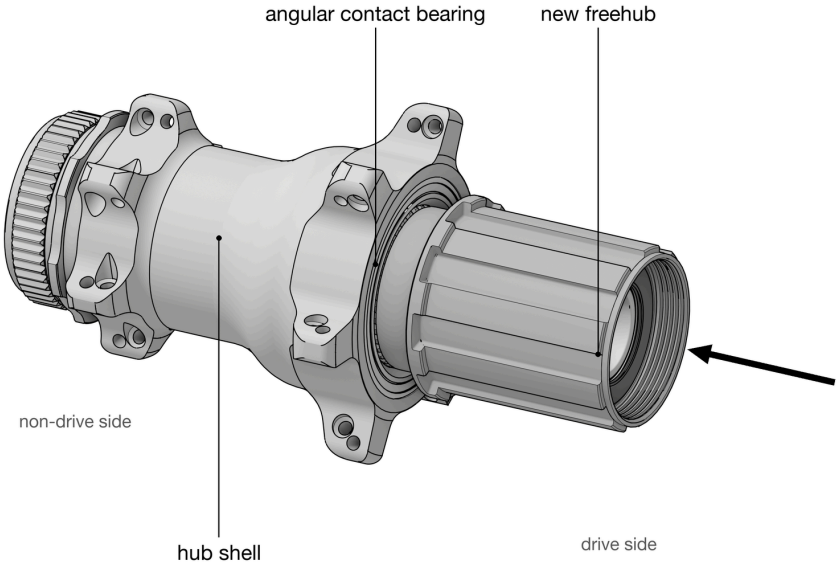


Step 3: the axle out towards the drive side, with the freehub and usually the bearing



Step 4: the freehub off the axle, the angular contact bearing off the freehub

5 Changing the freehub (HG, XDR, Micro Spline): the steps



Step 5: the angular contact bearing in its seat first, then the new freehub into the hub shell

6 Cleaning

Clean the outside of the hub only with a damp cloth.

- Never wet the hub with running water, a hose or a pressure washer: water gets past the seals.
- Use no acids (wheel or rust cleaners) and no strong alkaline degreasers.
- No abrasives on the anodised shell and freehub: no steel wool, wire brushes or scouring pads.
- Keep acetone, brake cleaner and brake fluid away from the seals and the O-ring.
- Inside the hub (opened as on page 5), wipe the ratchet rings and the spline clean, then lubricate them straight away (page 7): the ratchet rings' phosphate coating protects best with lubricant on it.

7 Lubrication

Use a lithium-based grease (NLGI 2, such as Beslux Plex 778A) on the ratchet rings and the helical spline, as a thin film: too much grease can stop the ratchet rings engaging.

If the hub internals are regularly maintained, viscous motorbike gearbox lubricant can be used for a quieter ride.

The bearings are sealed: they are not re-greased, they are replaced when worn (page 8).

8 Service interval and wear parts

- Clean the hub internals after riding in wet conditions (pages 6 and 7).
- Bearings are wear parts. Replace them when they no longer roll smoothly. Spare angular contact bearings are available now, and a full bearing kit will follow: write to service@velocite-bikes.com.
- The freehub's O-ring has no service interval: it lasts the life of the freehub.
- The angular contact bearing can be replaced by hand. The other bearings need tools to pull them out and press them in, so a workshop is the simpler route for those.

9 Troubleshooting

WHAT YOU NOTICE	WHAT TO DO
Play or a knock at the rim	Set the preload (page 4).
The ratchet slips or engages late	Clean and lubricate the ratchet rings (pages 5, 6 and 7).
The wheel does not roll smoothly	Clean inside the hub (pages 5 and 6); if it is still rough, replace the bearings (page 8).
Anything else, or visible damage	Stop riding the wheel and write to service@velocite-bikes.com.

10 Torque and tools

PART	TOOL	TORQUE
Non-drive-side end cap	two 17 mm cone wrenches (one holds the axle's drive-side end)	20 Nm maximum
Collar pinch screw (M2.5)	2 mm hex key	until the collar can no longer move
Thru-axle, brake rotor, cassette lockring	as their makers specify	as their makers specify

11 For wheel builders

24-hole straight pull, mm. Front 12 x 100, OLD 100: disc side spoke circle 44.5, centre to flange 22.2, spoke offset 1.9; open side 35.2, 31.2, 2.0. Rear 12 x 142, OLD 142: disc side 40.5, 32.7, 2.3; drive side 57.5, 17.2, 2.5. Spoke holes 2.6 mm, head seat 4.2 mm. Offsets measured at the spoke-head seat. Lacing: 2-cross.

12 Warranty and contact

Hubs carry a 2-year limited warranty; bearings are not covered, as they are maintenance parts. Before you send anything back, write to service@velocite-bikes.com for a return authorisation; transport both ways and labour are at the purchaser's cost.

Notes