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Technical Q&A with Lennard Zinn - Chain issues

By Lennard Zinn, VeloNews technical writer
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Fixing the unfixable

Dear Lennard,

All Shimano chains now come with connection pin. Can a chain be safely joined with a regular pin? I have done that in the past by not pushing the pin all the way through then pressing it back in when I had to replace a bent link or two. Is that safe with a 10-speed Shimano chain?

Lloyd

Dear Loyd,

No, it is not safe with any 10-speed chain. The Shimano or Campagnolo connector pin is double-length, with a front tip section designed to keep the pin lined up straight while slowly opening up the two holes in anticipation of the part of the pin that will remain lodged in the chain. The Shimano pin can be used on an undamaged link that has been opened, but the Campy pin can only be used on an unused hole in the end outer-link pair on the chain.

I have fixed 10-speed chains on the road before in order to get riders who have broken their chains back home. But then you want to replace the chain before the next ride on the bike. 10-speed chains are simply too narrow to repair without using a special connector pin or master link because there is almost no pin protrusion from the plates on either side and hence no margin for error. The mushroomed end of the pin enlarges the hole going out and pushing back in, and then it hardly protrudes out of its now-oversized hole, making the retention of the side plates tenuous at best. And then, since you have no way of mushrooming the heads of the pin to create a tiny overlapping edge to keep the outer side plates from popping off of the ends of the pin, the chain can be pried open easily by shifting under pressure when the weak link is going over the top of the cog set, engaging two cogs at once and creating a huge side force on that link.

If a 10-speed chain breaks out on a ride and you do not have a Wippermann 10-speed master link with you (which I do recommend bringing along), you need to shorten the chain by a full link (one outer/inner link pair) to eliminate the bent, damaged side plates where the chain pulled apart. Push the pin out just enough from the outer plate set you are keeping on one end of the chain that you can pry the inner plate set out of it, leaving a protruding stub sticking out to the inside to engage the hole in the new inner link pair you will hook onto it.



The handy little Wippermann tool...

Once you have snapped the ends of the chain together by pushing the end inner link over the stub protruding within the end outer link, get out your chain tool. You do have one, right? Until the advent of 10-speed chains, there was almost no reason whatsoever to bring a chain

tool on a road ride, chain breakage was so rare. But that is no longer true with 10-speed chains. If you ride with enough other people, sooner or later you are going to be on a ride where somebody breaks a chain. Thing is, the chain tool you bring along is unlikely to have the features necessary to hold a 10-speed chain securely enough to ensure that the old pin you are pushing back in goes in straight. Even with a shop chain tool for a 10-speed chain, it is hard to get an old link pin going in straight (it can even be problematic with the proper connector pin). And a portable chain tool is often unlikely to have the teeth close enough to the back plate to hold a 10-speed chain without it tipping as you push its pin with the rivet driver.

I just got a new compact, solid, folding portable chain tool from Wippermann that is supposed to work for all chains up to 10-speed. That may be the ticket, but having done this enough on the road, all the while being super careful to hold the chain down while driving the old pin pack in with a standard portable tool, I am not optimistic that this new chain tool is going to be foolproof at keeping the pin going in straight. One thing this tool does have is a Wippermann master link folded within it, and that could be what makes the difference, though.

Repairing a chain on the road with a portable tool on an existing link pin, I often must keep opening the tool as the pin starts going in at angle, flipping it over on the chain to push from a different angle to straighten it out. And even when the pin pops through the hole on the outer link plate of the end link, it often bulges and deforms the link plate in the area around the pin. Then you have to use the push rod of the chain tool to push back on the plate itself around the periphery of the pin in order to flatten the plate flush with the end of the pin so it does not pop off of the pin with the first pedal stroke. But this chain will always be dangerous to ride because it can break on any hard shift under load.

The best way to deal with a broken chain is to have the master link I mentioned. Then you simply remove the damaged outer link pair where the chain broke by pushing a single pin completely out. Replace the outer link pair with the 10-speed master link, and you now have a secure connection and a chain of the original length. When you get home, check the chain for wear with a chain elongation gauge (see any of my "Zinn and the Art of" maintenance books or DVDs for how to check for chain wear and for how to install a master link). If the chain is not worn out, the master link allows you to continue to use it worry-free until it does get worn out. This is way cheaper than throwing out an expensive 10-speed chain that has broken and that you performed an emergency on-road repair on without using a master link.

Lennard



...holds a special gem inside.



Checking elongation with one of these is critical