CHAIN WEAR CHECKER's - Your most important Tool may not be accurate!

What is chain wear?

The lifespan of your cassette, chain rings and pulley wheels is HUGELY dependent on your chain wear. Replace by a recommended replacement mark of 0.5%, and you can usually expect 2 to 3 chains to a cassette, and 4 to 6 chains through a set of chain rings. What does 0.5% elongation wear mark (or chain stretch) mean?
Basically as the pins of the chain wear down, and the inner link plate bore around the pin wears larger - each link can be pulled a little bit further apart. It is NOT the chain link plates stretching.
Why 0.5%? Basically there is some level of tolerance for the rollers to slot neatly into the troughs of your cassette and chain ring teeth. However too much "stretch" or elongation wear, and the rollers will start to catch the Tip of one tooth and the slide down the face of the tooth. Basically if you take a chain to 0.6%, the chain will eat out the teeth on your components to suit that new length. Wear a chain to 0.8%, and you will again just eat through the metal teeth on all your cogs and rings to suit that new length between each link.
What happens when you put a new chain one components worn out by running a worn chain? Well - nothing good. If the wear is mild, a new chain will often just run rough with a grindy / rumbly feel and sound.
However if the wear is more than mild, there is risk of the chain jumping / slipping under load. If very worn it can be mild load, if moderate - it can be high load. Chain jumping off chain rings under stand up sprinting....
Well that can be exciting for you and those around you.

How to check chain wear?

Quite simply you need an accurate chain wear checker. An accurate checker makes the job of staying on top of chain wear super quick and easy. And that means it gets done. And that means you don't get caught out.
And that means you save a ton of money not having to replace expensive cassettes and chain rings when this could have been easily avoided.
The more expensive your components, and or the harsher the riding conditions you typically do - the more you need to be all over this simple check - regularly.
Note - especially for drip lubricants, chains often do not wear at a linear rate. New high quality chains have some type of low friction coating and wear protection. And initially, the lubricant is less abrasive.
Over time, these wear protections are compromised, and the lubricant on the chain more contaminated and abrasive. So one might check after 3 months and see things looking good. Check 3 months later to find that the chain is well past 0.5% wear mark which can then be costly.
Note - Chains do not wear evenly. Multiple sections of chain need to be check measures. One section might be around 0.4%, another might be over 0.5%. Use the most worn measure as your replacement guide.
This is one reason why as a general rule I don't recommend checking chain wear via removing and measuring full length. If you prefer this method, then use a more conservative number ie 0.3 or 0.4% vs 0.5%
By the time the chain is at 0.5% as a whole, there WILL be sections of chain with wear great than that, which will be accelerating wear to the drivetrain.

In summary - the best way to check your chain wear is with an accurate and easy + quick to use chain wear checker.

However - there are many brands and models out there, and sadly many of them do not seem to be mfg to the tolerances and accuracy need. Over the typical span of chain being measured, literally every 0.1mm really matters
So over time, ZFC will be working its way through the most common chain checkers available and checking their accuracy, and updating the table below with recommended or not models.

Best Practice chain wear checking;

> Do not check freshly wax lubed or re waxed chains. They will be packed with wax between parts of the chain and may mask wear giving a false low wear measure. Always check before re-lube or re wax.
> If on wet or other drip lubricants - be aware if lubricant on chain dirty. Some wet lubricants attract and retain a lot of contamination. This can fill in the parts between chain and give false low wear measure. You may need to undertake some quick flush cleaning before check measure if your chain is dirty.

> To check measure - Put chain onto large chain ring, and large-ish cog on cassette. This will have the rear mech place good tension on bottom span of chain.
> Use your drop in chain checker from recommended list below. Take care of any instructions on the first insert end (ie- CC-4, pedro's - you must squeeze chain towards tool).
> The drop in end is DROP IN. Force should not be used to get that end to insert into chain. Most tools can be forced into even brand new chains if one really tries. But that is not how you use, no force should be used.
> Often / with some practice and experience with that tool, and checking chain from early in its life - you will be able to observe that initially the drop in end clearly hits a nice bit of roller, then less and less until that end "Drops in" past the roller for your replacement wear measure. Seeing how much roller it is catching from new - you can get a good sense re when it is starting to approach the replacement mark.
> Remember to check multiple spans of chain. At least 3 is good, 5 is great, and the most worn section is your guide. Ie if tool DROPS IN on any section checked, that chain is at replacment mark.

Further information and demonstration of the above can be found on this video here;

chain wear checking take 2 (youtube.com)

Chain Checker	Measure	Comment	Recommended?
Recommended Replacment	**0.50%**	***Testing on chain worn to very close to exact 0.5% wear measure***	
KMC Digital Checker	**0.45**	Reference- Accurate measure. However - differences between tools has been seen (I have 3, they are all different. And they are expensive)	**No**
Shimano TL - CN - 42	**0.5**	Reference - Accurate measure. To a degree self adjusting to differing roller sizes (ie Flat Top chains).	**YES**
Park Tool CC-2	**0.75**	That is 50% out. You will lose half your wear life. Also how much force do you use? This has been a very problematic tool	**NO**
Unior - Wheel / Dial	**0.77**	Over 50% out. You willlose half your wear life. Previously owned another one that measure new chains at 1.0%.	**NO**
Cyclus	**0.05**	Cyclus tool was on the first graduation mark out of 10 to the replace mark. So the 0.5% worn chain was measuring as basically new.	
		You would need to wear your chain to around 2% before this tool would advise to replace. Very disappointing.	**NO**
Ice Toolz	**0.3**	No way was the 0.5 end dropping in. Under measuring wear by around 40%, risking wear damage to drivetrain by time you replace chain	**NO**
Park Tool CC-4	**0.5**	Dead on. Take note to use correctly or will over measure wear. Designed to adjust to different roller sizes (ie Flat top chains)	**YES**
Super B	**0.3**	No way was the 0.5 end dropping in. Under measuring wear by around 40%, risking wear damage to drivetrain by time you replace chain	**NO**
Lezyne	**0.4**	Close - but close the wrong way, under measuring wear risks wear damaging expensive components by time replace chain	**NO**
Pedro's	**0.5**	Dead on.	**YES**
Unior - Drop in	**0.7**	Around 30 to 40% out so you would miss a lot of wear lifespan from your chain	**NO**
Abbey Tools Prototype	**0.45**	Basically Dead on. More exciting details re this tool will be forthcoming after their launch	**YES**
Sram Chain checker	**0.6?**	Difficult tool to use for 0.5%. The official graduation mark is 0.8%, which is far too late. You are guessing what earlier insert level is 0.5	**NO**
BBB	**0.5?**	First graduation mark is 0.75% which is too late. You are guessing what earlier insert level is 0.5	**NO**
Digital Calipers	**0.5**	Rounding to 0.5 from the caliper measure. Calipers are fine but can be difficult to use easily, quickly and accurately across multiple spans of chain	**Maybe**
Variance	140%		