

# Zero Friction Cycling

## 12 Speed Chain Compatibility Guide

*\*Scroll to compatibility table at bottom of document if you wish to skip the waffle!*

### Chain Standards

Alrighty – before we get to brands / chains / groupsets – to help understand why some chains MAY be compatible with some groupsets and not with others, it helps to know just a teensy bit about chain standards. I won't bore you too much I promise I will be as brief as I can on that section.

**5 to 8 speed chains** – these are known as 3/32 chains – which means the distance between the INNER LINK PLATES is 3/32 of an inch (2.38mm). The reason why an 8spd chain is EXTERNALLY thinner than a 5spd chain is because the link plates themselves were made physically thinner and pins shorter to match. Internal width of an 8spd chain is the same as a 5spd chain.

**9 to 12speed chains – Mostly.** – There are exceptions that will be covered shortly, but mostly these are known as 11/128 standard chains. So, the INTERNAL width of the chain was narrowed to 11/128 of an inch (2.18mm). Again, the reason why a 12spd chain is EXTERNALLY thinner than a 9spd chain, is the link plates are again made thinner, and pins shortened to match.

Yes – Link plates have become VERY THIN on our modern 11, 12 (and even 13spd) chains vs the old days. Yes, this means the metal is higher grade steel. A 5spd chain costing \$8 is absolutely cheaper steel than a T-Type XXSL chain costing \$250.

### **Why do we need a 12speed compatibility document?**

Unlike the 9, 10 & 11 speed days, where as long as you bought the correct SPEED chain for your groupset you were sweet, for 12 speed, there are some very important differences between some 12 speed groupset systems. In some cases, this may mean considering the potential impact of these differences if you try to run a different 12speed chain, and sometimes the differences are such that going outside of the specific correct chain will really be a NO GO.

## Why would one want to run a different chain vs the “correct” chain for their groupset?

- 1) Speed – some chains are not very fast, or simply – not as fast as the fastest known 12spd chains. Racers may wish to race on a faster chain.
- 2) Durability – Some chains have a relatively average wear lifespan, some have exceptional wear lifespan. Especially for hard training miles / winter training – a very wear durable chain can be a great option.
- 3) Aesthetics – sometimes you just get bored of grey or silver chains. Maybe you want stealth black. Maybe you want bling gold. Maybe you want the understated sophistication of a copper chain (man I love srams xx1 copper chain).
- 4) Price – It may be tempting to purchase what appears to be a similar / suitable chain that is a more attractive price. Ie – did I want to spend \$250 on that T-Type chain or will the sram Force for \$70 be just fine.

## Key differences for some 12 speed chains.

Whilst the days of 12spd started just like previous days of 9 to 11spd where the campagnolo 12spd chains and sram eagle 12spd chains (first 12spd's to market) were the venerable 11/128 standard, just yet again a little EXTERNALLY thinner, things soon became more complicated.

**Shimano 12spd** – This heralded Shimano's "Hyperglide+" - yet another new benchmark in shifting performance. As part of this system, Shimano 12spd chains have special inner link plates that extend PAST the roller. Paired with the new profile teeth of Shimano cassettes and rings – we have "Hyperglide+" level shifting.



A compatibility table is just a little further down in this document so don't stress re remembering ins and outs here – but – I will quickly cover some key bits in relevant section to help understand the compatibility table.



Shimano 12 speed chains are still an 11/128 standard chain. Other 11/128 standard 12spd chains such as YBN SLA, KMC X12, Campagnolo 12, Sram Eagle – are all broadly compatible with shimano 12s road or mtb groupsets – but you will be giving up Hyperglide+ level shifting. They should still shift like your 11spd groupset did, they should still shift very well, just not hyperglide+ well.

The higher level shimano 12s chains are very wear durable, and are not a slow chain, but not the fastest either. For really most people, they should not move from shimano 12s chain if you have a shimano 12s groupset, however some avid racers do like to run a very fast chain like the ybn sla 12spd, or to move away from boring as dull grey to something more visually groovy for their hardest working drivetrain component.

When looking to do things the other way, Shimano 12spd chains are sort of compatible on SOME other 12spd systems. This will be covered better in the compatibility table, but broadly – you cannot run a shimano 12s chain on Narrow wide chain rings (common with mtb cranks and also with some AERO time trial 1x chain rings) as the extended inner link plates just do not play, chain will easily jump off such rings especially during a shift – so you need to ensure your chainring is shimano 12spd chain compatible. You may also need to change your pulleys wheels as well to shimano 12s compatible. Even then, it is possible on higher chain line angles that the extended inner link plates may rub on side of cassette / ring teeth. Some have experienced this, some not – final chain line angles for big / big or largest cog on a 1x system do vary quite a bit from one bike to another.

**SRAM AXS Road / XPLR –** Unlike srams EAGLE mountain bike groupset and thus Sram EAGLE chains – their Road and gravel groupset saw SRAM unveil a new “FLAT TOP” chain – so called because the tops of the links are not curved like all other chains before it (mostly) – but it has a flat top.

These chains are NOT an 11/128 standard chain, marking the first true departure from this standard in 12spd. The chains are INTERNALLY thinner, they are EXTERNALLY thinner as well than other 12spd chains, and to ensure groovy tensile strength with this new even thinner chain, the plates were made TALLER. This required a very important change to note, which is that the chains rollers were made larger diameter to match the taller link plates.

The larger diameter rollers really play the biggest role in what you can and cannot do with regards to chain options on Srams AXS road & XPLR groupsets.

“Normal” 11/128 chains such as ybn sla 12, kmc, sram eagle etc – when put onto a Sram axs road / xplr cassette & chain rings that are machined for the oversize rollers of the system correct “Flat top” chains – to the 11/128 standard chain those components will look like worn components.

It is well known, and you may have experience it yourself – but putting a new chain on a worn cassette or chain rings can be very problematic. It may be a poor mesh – giving a grinding sound and feel, or it may simply not hold under load, and chain can jump under higher loads on cogs, or worse – it can jump off the chain ring.

If the latter happens under stand up sprint power in a race, things can get like heaps exciting for you and those around you. Sadly, every year I hear of people who have put a new chain on worn bits, had the above happen, and it ends up with a hot

date with asphalt. And let me tell you, asphalt makes for a crap date. Likely worse than the worst you ever had from tinder unless that date also gave you broken bones and road rash, which should be super uncommon, and rate them accordingly.

The strict line from SRAM is you MUST NOT run any other chain on the above systems other than Flat top chains. ZFC position is in large agreement with this. Whilst I am more comfortable with say Triathletes moving to different chain due to generally lower and steady state power vs road racing – due to the potential outcome – ZFC also advises to stay with the Flat top chain.

Having said that – lots of people from lots of places over the last couple years ish that have tried YBN or kmc chains on Sram Axs Road / XPLR – have reported all is super. However just be aware – there is physically less metal there on those cogs & rings for those teeth. They will look worn to non Flat top chains. Things may be ok for a time, but the point at which the chain may jump under load is likely to be earlier than if running correct chain. At some point of wear to those teeth – jumping under load may occur, and it may occur sooner to a chain where those parts were already looking worn.

The reason why some do move to chains like the ybn sla or kmc is speed. Srams Flat top Red or Force level chains are not slow per se, but they are not matching the blisteringly fast ybn sla or kmc or campy super record 12s chains.

Going the other way – it is pretty much a flat out no – you cannot run Srams Flat top chains on other 12s systems like shimano or campy or sram eagle. The oversize rollers will not fit into the cog or chain ring teeth. Easy one - it's a no.

## Srams' Special Department of Confusion.

But we are not yet! Sram has embarked on a special project to MAXIMIZE customer confusion with regards to their 12speed chains by introducing a new groupset, that also uses a Flat top chain – most of which look exactly like the prior existing Flat top chains, but for which they are officially not cross compatible.

This department appears to have been highly motivated to achieve great things. They decided to also give the new “T-Type” Flat top chains model names extremely similar to their existing sram eagle groupset chains, but they are not compatible at all with sram eagle mtb groupsets either.

This way, they ensured that for existing Sram Axs Road / XPLR customers, or existing sram Eagle MTB customers, as well as customers on the new “T-Type” transmission – That all could experience the best chance possible to be confused and purchase the incorrect chain for their system.

Ok – to add some balance – SRAM – I luv you, I think you brought a lot of amazingness to cycling, and your rollout of UDH and then to T-Type transmission is masterclass. Just from my tiny little niche spot in cycling focussed on chains and lubricants – The current situation created WILL cause customer confusion, customers purchasing the incorrect chain for their system, potentially suffering failures, or at least inconvenience, and inconvenience for retailers to sort refunds / exchanges.

## Compatibility Table – you may need to use zoom on your screen.

12spd Groupset Compatibility							
Chain	Campy	Shimano	Sram eagle	Sram Axs Road	Sram T-Type	Speed	Wear life
Campagnolo Record 12spd		Giving up Hyperglide+ Shifting	Anecdotal reports of clunky shifting			Very Fast	Normal
Shimano M9100 12s	Extended inner link plates MAY rub on sides of teeth on high chain line angles. May need shimano 12s pulleys		Need Shimano 12s chain ring, not Narrow wide ring. May need Shim 12s pulleys. Extended inner link plates may rub on side of teeth on high chain line angles			Medium	High
YBN SLA 12s		Giving up Hyperglide+ Shifting				Very Fast	Normal
Sram Eagle Xo1 / xx1 12s <i>(GX level have VERY poor wear life, do not buy)</i>		Giving up Hyperglide+ Shifting				Slow	Exceptional
Sram axs road Flat top (Red / Force ) <i>*Expected Force level has much lower wear life</i>					Official line from Sram contact is Axs Road Red / Force / Rival chains are not strong enough for T-Type Transmission.	Medium	Expected High
Sram T-Type Chains				Official line from Sram contact is the slight extra thickness of T-Type chains for strength may impact gear indexing. ZFC does not believe this.		Medium	Expected high
KMC 12spd		Giving up Hyperglide+ Shifting				Very Fast	Low
Campagnolo Ekar 13s						unknown	unknown
Legend							
	100% compatible	highly compatible	Expected Compatible	Potential issues	Not compatible		

## 12spd Master Link Compatibility Guide.

What to do if you wish to immersive wax, but the master link for your chain is single use only? Further guidance below table.

Master link Guide					
Chain	Campy	Shimano	Sram eagle	Sram Axs Road	Sram T-Type
<b>Campagnolo 12spd links</b>	where are they campy?				
<b>Shimano 12spd link</b> <small>*Officially single use</small>			May fit a little tight		
<b>YBN QRS 12 link</b> <small>*Officially 5x Re-useable.</small>					
<b>Sram Eagle Powerlock Links</b> <small>*Officially single use</small>					
<b>Sram axs Flat Top Powerlock links - <u>SILVER IN COLOUR</u></b> <small>*Officially single use</small>					SRAM contact wax ADAMANT that road Flat top power lock links present a high risk of failure on T-Type transmission, DO NOT USE
<b>Sram T-Type Powerlock links -BLACK IN COLOUR</b> <small>*Officially single use</small>				Official line from Sram contact is the slight extra thickness of T-Type chains for strength may impact gear indexing. ZFC does not believe this.	
<b>KMC 12spd Missing Link</b> <small>*Officially single use</small>					
Legend					
	100% compatible	highly compatible	Expected Compatible	Potential issues	Not compatible

## Officially single use links.

This is the norm. Ybn's QRS links being 5 times re-useable (officially) is not the norm. At the moment there is no wippermann connex link available for 12speed chains (their other speed links are re useable for the life of the chain. Sort of. Mostly.)

Why are links from Sram / shimano etc officially single use? Is it just a commercial play to get you to buy more links, or is there a genuine risk of failure issue on multiple use?

When a link is used (pins locked into locking channel, and then unlock from this channel to remove link and chain) – the locking channel suffers wear, and it will not lock as securely on subsequent use. For those that have re-used master links, you feel that difference pretty easily, where a link takes quite some force to lock in the first use, and after multiple uses, it may need not much force at all.

As the channel wears, the link will be less secure.

Is that safety buffer one use however? Or are there more?

I CANNOT advise you to go against manufacturing instructions and say you will be fine to re-use single use links. This information is for your own decision making / risk tolerance.

To date, at time of composing this document, at over 7 years of ZFC operation with thousands of waxing customers across all systems;

- We have had a total of 2 reported link failures for Sram eagle waxers re using master links approx. 5x (or whatever people were doing)
- We have had same re users of YBN QRS links approx. 5x. (or whatever people were doing)
- We have had zero reported failures for shimano links re used approx. 5x . (or whatever people were doing)
- I do not believe the YBN QRS links are any more secure after 5 uses vs single use links after 5 uses – it is simply that YBN is giving more leeway on use.
- Total master link failures overall for 12speed waxers re using links is sitting at 4.
- Some further consideration should be given if you ride e-bikes.
- Some further consideration should be given if you race – always new link for races.

Due to the cost of most master links, if you are planning to immersive wax (which for most will save you A LOT of \$\$ in component wear), you really have to make a choice of two paths.

- Take the risk of re-using master links approx. 5x – even if the link you need to use is officially single use.
- Use the increasingly popular “Combo” or “Hybrid” system – Started immersive waxed, then next approx. 5 re lubrications use one of the approved drip lubricants that work perfectly with the top immersive waxes – Being Silca Super Secret Drip, Ceramic Speed UFO All conditions, or Tru-Tension Tungsten All weather. Next re lube after the 5<sup>th</sup> re lube is a Re- WAX to reset any contamination starting to build up in chain and use new master link after the Re-Wax.
- If using one of the above lubricants, NO CLEANING is needed prior to re-wax, just re wax as normal. Hopefully over time more lubricants will be found to add to the immersive wax compatible list for more options.



Alrighty – Hope the above information helps you be on the correct chain for your training and racing and using the correct link and link re use or not path!

Have fun out there and STAY LOW FRICTION!