When we introduced the EC90 SL crankset, we knew that many of the dream builds they were going onto would be 1x drivetrains.

1x drivetrain options for road and gravel have many benefits including lower weight and reduced complexity. Easton has been a strong supporter of 1x cranksets but embracing the versatility of the Cinch system and increasingly diverse drop-bar builds and riding applications we determined overall gearing performance could be improved through purpose built 2x gear combinations.

Our new adventure ring combos are a refinement of our proven road doubles. As riders search for better gear inch options, we found benefits of super compacts becoming clear. Engineered for smooth shift transitions, we optimized our ring sizes for the application and reduced overlap in materials - these direct mount gravel and CX combos skip the spider to save up to 45 grams while giving you more range to work with.
Current 2x road combo options leave gravel riders chronically over geared. The current 53/39 Standard, 52/36 Semi-Compact, and 50/34 Compact gear combinations were created for road bikes - pro riders sprinting on pavement in their 53 x 11. Gravel bikes with larger, heavier tires, more rolling resistance, and less aerodynamic rider positions are without a doubt slower than road race bikes, so why are they forced to use road bike gear combinations?

Bigger tires make the effective gearing on the bicycle larger.

Roll out, or outside circumference, of a 24c Schwalbe One tubular on a 700c wheel is 2105mm; the same as the generally accepted number for a 25c clincher.

The roll out of a 38c Schwalbe G-One on a 700c gravel wheel is 2204mm.

2204 / 2105 = 1.047030

The gravel tire has a 4.7% larger circumference than a road tire. Therefore if you take your road bike gearing and put in on your gravel bike your effective gearing instantly becomes 4.7% taller, making your 50T ring on your gravel bike the equivalent of between and 52 and 53T ring

50 x 1.047030 = 52.35

Considering that the gravel bike tends to be a weightier bicycle and is being used on rougher and slower terrain, using road gearing doesn’t make sense. Check your cassette the 11T cog on your gravel bike, it probably looks brand new because it has never seen the chain.
When riding a 52/36 semi-compact combo on the road and shifting from the little ring to the big ring the 16 tooth jump results in a large change in gear ratio (44.4%) and often requires in a couple shifts in the rear to mitigate that large change in gear ratio.

52-36 = 16 teeth
16/36 = 0.444
16/34 = 0.471
16/32 = 0.5
15/32 = 0.469

The semi-compact 52/36 combo is very common among both bike brands and riders and that change in gear ratio is manageable. Moving down to the compact 50/34 gearing which maintains the 16 tooth gap effectively has a larger percentage change (47.1%) in gear ratio when shifting from the 34 to 50T.

The difference between a 44.4% change and a 47.1% change might seem small but to most experienced riders the difference is noticeable. The gearing on the 52/36 just feels tighter than on the 50/34.

Now when you go down to a 48/32 gear combo which maintains the 16 tooth spread the upshift from the 32 to 48 is a 50% change in gear ratio, and on the bike it just feels too big. When cresting a climb and shifting from the 32 to 48, the rider feels bogged down with a drastic drop in cadence even when upshifting multiple gears in the back. The reverse happens on a climb when dropping from the 48 to 32, and you get that frantic resistance free spinning feeling losing power and momentum. Finally with the chain trying to jump across such a large change in gear ratio we were not able to achieve the smooth and effortless shifting performance we have come to except from Easton rings.

OPTIMIZED GEAR RANGE

47/32 - Gravel Racing Combo

After over a year in development with countless iterations we settled on a 47/32 for two main reasons: shifting performance and optimized gear range.

The seemingly small adjustment to the 47/32 ring size with a 15 tooth spread immediately solved our shifting performance concerns. Out in the field in those awkward transition shifts on the front now also felt much smoother with less of a bogged down or spinning feeling.

Crunching the numbers the change to a 15 tooth jump on the 47/32 gets the change in gear ratio down to 46.9%, back in the sweet spot between those of the 52/36 and 50/34 combinations.

Based on the numbers mentioned earlier the 47T ring on a gravel bike is equivalent to a 48.2T ring on a road bike when you consider the increased gravel bike tire size. Ride testing the 47T ring proved sufficiently large and the riders now used the full range of available gears. From pedaling a paved descent to a road sprint even under a professional level riders on a gravel bikes the 47/11 gear didn’t leave anyone asking for a taller gear.

47/11 ratio x 2.204m x 95rpm x 60min = 53,677 m/hour = 53.7kph

Why not 48/32, which seems to be the generally adopted gravel gearing? The 48T ring is equivalent to more than a 50T ring on a road bike which isn’t necessary. In our testing the only time when speeds went above 54kph on a gravel bike was during descents when there was no value in pedaling. There is merit to the 32T small ring size as it gives a very light 13 ratio easiest gear when using an 11-32 cassette. A 11 ratio is generally the preference and is considered the optimal easy-gear for gravel, which is why many riders on 1x drivetrains are using 10-42 or 11-42 mtb cassettes with their 42T front ring.

In developing new doubles we determined that shifting performance is impacted by mechanics of how the chain moves between the two rings and by the size of the spread between the two gears. Our front shifting methodology determines the optimal placement for shifting features between the small and large rings the chain will shift in locations where the change in ring size aligns with the chain links. The mathematic model is applied to each ring combination for optimal tooth alignment and shift feature placement. This is why an Easton 52T large ring for example must be used with an Easton 36T small ring; there is purpose to how the teeth align with the bolt pattern and other ring.

This approach has worked for every Easton double ring set except the 48/32 combination, which has a unique 3:2 tooth ratio. The normal Easton design model produced two options, one that shifted perfectly for the chain in one phase (wide plate) and horribly in the other phase (narrow plate), and another option that did the opposite. Creating a ring-set that shifted well half the time and, poorly for the other have was an unacceptable compromise. Close examination of competitors with 48/32 ring combos suggests that they have accepted this compromise.

Moving to a 47T outer ring, gave sufficient choices in shift locations to allow the same seamless shifting between rings as in our highly regarded standard (53/39T), mid-compact (52/36T) and subcompact (50/34T). Furthermore, when testing the 48/32 and hitting the “good” shift phase the large 16T spread had an uncomfortably large change in cadence and this sparked the evaluation of smaller jumps in tooth count.

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SHIFTING PERFORMANCE

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MORE THAN GRAVEL

46/36 - Cyclocross Combo

Easton sponsors some of the top cyclocross racers in the world and while we have had huge success with the EC90 SL crankset with 1x rings there was a common request for a 46/36 cyclocross combo. The tight 10T gear range give quick and precise shifting with a minimized impact on cadence, requiring fewer if any counter shifts in the rear. The 36T small ring still provides relatively easy gearing for steep muddy climbs and a natural dismount movement to change to running when bogged down in the 36T. The 46T is large enough for paved starts and sprint finishes while still insuring the entire cassette is usable gears.

46/30 - Adventure Combo

From loaded down touring bikes to exploring the most rugged terrain the 46/30 Adventure gearing provides easier than 1:1 gear for ultra-low speed riding and a tall enough gear to catch the ferry or descent KOM. The 16T spread works with all major derailleurs providing maximum range. When celebrating the shifting characteristics of the 47/32 and the optimal change in gear ratios when shifting, we criticized the 16T jump for small size sub-compact gear combos. This change is cadence when shifting between the 30 and 46T rings is very large, with a 53.33% increase in gear ratio there is no denying that large change.

$$16/30 = 0.5333$$

We applied our mathematical model to the 46/30 rings and the shifting in both chain phases is perfect, one ride on this ring set and the precision is apparent. When powering over a climb or downshifting at a start of a climb the performance rider will feel the large change in gear ratio and will make multiple counter shifting with the rear derailleur. This was a conscious trade-off where we decided to give up some cadence smoothness while shifting for maximum gear range, and is why the 46/30 is named out adventure combo.
Cadence, gear jumps and applicable riding styles

The gravel market is adopting 1x drivetrains with the use of wide range 11-speed MTB cassettes, typically 11-42 or 10-42 cassettes. This allows the rider to get close to or at the one-to-one gear combination needed for sustained steep gravel climbs. The tall gear is somewhat compromised but works for most applications aside from a paved pedaling descent or sprint finish.

\[
42 - 11 = 31
\]

\[
\frac{31}{10 \text{ jumps between gears}} = 3.1 \text{ teeth between shifts.}
\]

A potential drawback of 1x wide range cassette configuration for gravel is the large jump between gears. Many riders, while riding in a group or at a sustained grade, have experienced shifting down a gear because they feel like their cadence is a little fast, only to find their cadence feels a little slow in the new, harder gear, causing them to quickly shift back. This discrepancy tends to be exacerbated with 1x drivetrains.

\[
32 - 11 = 21
\]

\[
\frac{21}{10} = 2.1 \text{ teeth between shifts.}
\]

On an 11-32 cassette the jump between gears is an average of 21 teeth compared to 3.1 teeth on an 11-42 cassette. The 50% larger jump between gears on the wide range cassette makes the situation of wishing a gear in-between available options much more common. This large jump between gears is why 1x with wide range cassettes has seen very limited adoption in professional road cycling.

Like many components, 1x drivetrains have their home. Prominently, we will see them under the heels of critium pros and cyclocross racers – short format events where the larger shifts may be less noticeable.

While 1x serves as a great option for some, the reimaging of 2x options for gravel, cyclocross and adventure makes a lot of sense for many riders looking to go further.