

## **WHAT IS A 2x9 CRANK?**

2X9 is the new trend and reference for XC racing MTB's with just two chainrings.

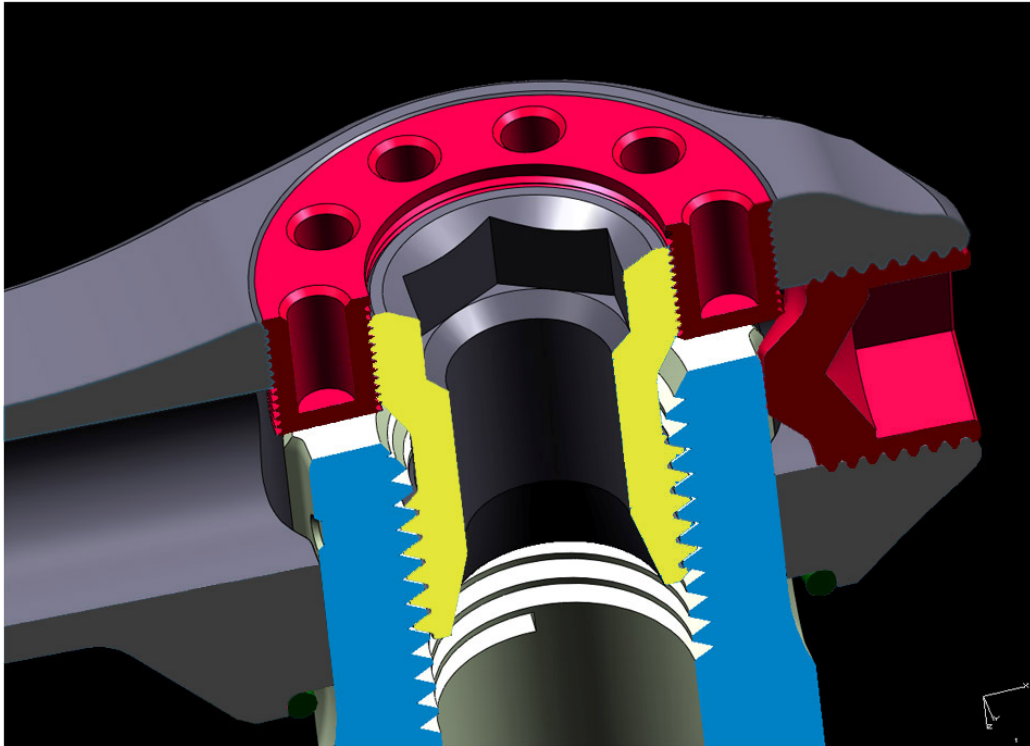
### **PROBLEM DESCRIPTION:**

Most modern-day competitions barely require the use of the inner chainring of the crankset, proven by the a popular trend of removing the inner chainring to save weight. Removing the inner chainring doesn't improve the chainline and shorten the wide MTB crank axle, meaning athletes still pedal with widely spaced feet. Additionally, the risk of the chain falling off the middle chainring also increases, because these chainrings are designed to be "unstable" thus aiding downshifts to the design-intended inner chainring.

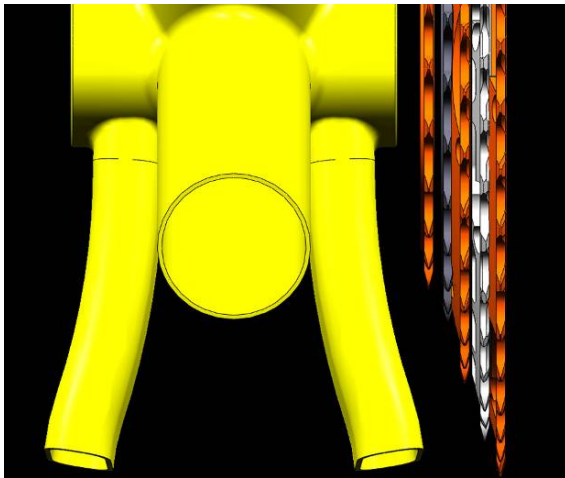
## **WHAT DO AGILIS XC<sup>2</sup> CRANKS HAVE TO OFFER?**

The Agilis XC2 is designed to remove the disadvantages of the described situation, maximizing the advantages:

- 1. Reduced Q-Factor from 163mm axle width.** By removing the inner chainring, the whole crank can be made thinner, allowing Q-Factor of 163mm (compared to 170mm for most MTB3 cranks). Athletes will barely notice the difference between their Road bike cranks and the XC<sup>2</sup> cranks.
- 2. Optimized chainline.** The two chainrings that remain are brought closer to the frame, improving the chainline of these two rings and allowing 8 in most cases 9 use of the full cassette with both chainrings. Because the chainrings are closer to the frame, the chain wears less due to less "crossover" and transmission efficiency increases. The risk of derailment is also reduced, improving race-day reliability of the system.
- 3. Weight savings:** By shortening the length of the axle, removing the inner chainring, it's spider fixation points and making both the axle and the crankarm more hollow a consequence, a significant amount of weight can be saved in regards to a mtb3 crank. A 175mm Agilis XC<sup>2</sup> with it's specific Q-Rings and a ceramic BB1 weighs in at 742g (748 with steel bearings).
- 4. Increased rigidity:** Both the shorter axle and the straighter crank profile cause the XC<sup>2</sup> crankset to be more rigid, minimizing energy loss and improving race day performance.
- 5. 5 arm 110/74 bcd chainrings:** This spider configuration guarantees broad chainring availability to those who do not want to ride Q-Rings and the ability to offer finer Q-Ring OCP adjustment than 4-arm MTB rings (the larger BCD and 5 crank arms allow OCP hole dispersion less than half as great as on MTB Q's)
- 6. DTT EVO axle adjustment** offers easier crank width adjustment with increased reliability. A new steel bolt has replaced the old aluminium one, increasing ease of adjustment and improving reliability of the crankset, with 0 weight penalty.

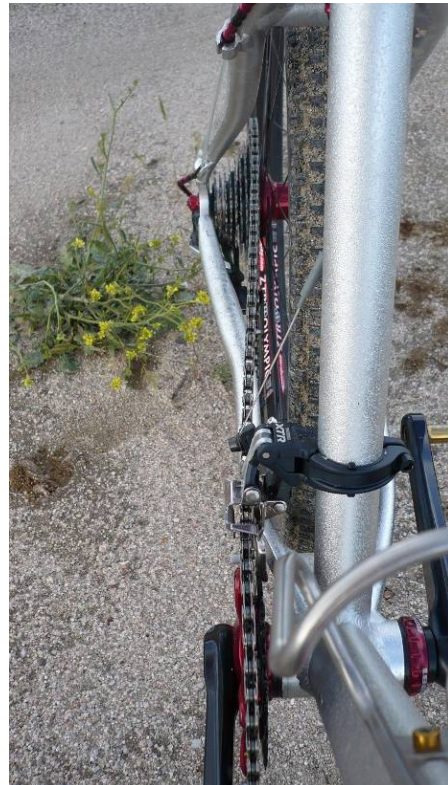


New DTT Evo bolt detailed Picture.



**Above:** Comparative image of Chainline. The orange chainrings are the standard position for XC3 systems, with the grey and white showing the position of the XC<sup>2</sup> chainrings.

**To the right,** The XC<sup>2</sup> crank installed on a Bike.  
*Note:* large chainring to large cog!



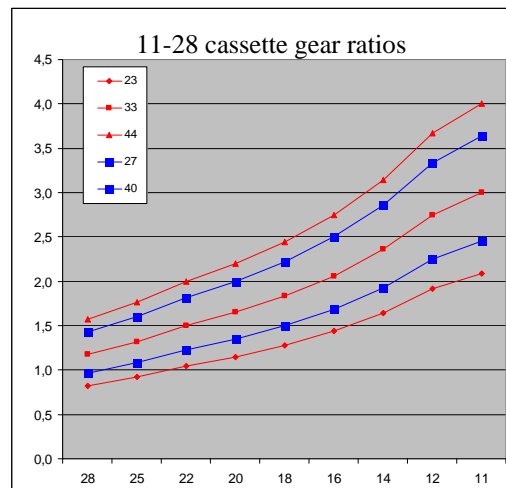
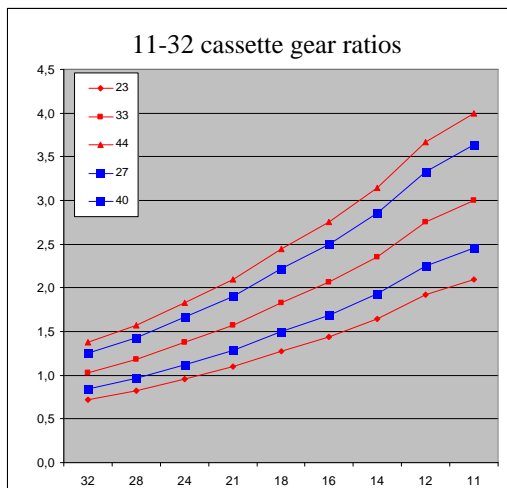
### **WHY 40-27 Q-RINGS?**

Whereas most manufacturers are currently promoting 44 or 42-29 setups, we strongly believe that 40-27 gives the best available compromise package of benefits for *both* the

racer and high level recreational cyclist. This choice was supported by Spain's Jose - Antonio Hermida (currently racing for Merida Multi Van).

A 40t outer chainring allows a more balanced use of the rear cassette than a 44. At its maximum diameter, the 40t Q is equivalent to a 42t chainring. At the weakest point I the pedal stroke, the 40t is equivalent to a 38t chainring, making it significantly easier to keep spinning and more comfortable for pro and amateur alike.

Additionally, a 40-11 combinations rollout, is almost identical to a 44-12, and most will tell you that the difference between 44-11 and 44-12 is limited, as is the real world use of the 44-11 combination.



The XC<sup>2</sup>'s reduced chainline also allows for the outer chainring to be used with the largest cog, and the inner chainring to be used with the smallest cog, making shifting significantly easier.

A 27t inner chainring allows the race to use a 11-32 cassette whilst keeping the low gear ratios s a triple setup with a 11-28 cassette.

	28	25	22	20	18	16	14	12	11
<b>23</b>	0,821	0,920	1,045	1,150	1,278	1,438	1,643	1,917	2,091
<b>33</b>	1,179	1,320	1,500	1,650	1,833	2,063	2,357	2,750	3,000
<b>44</b>	1,571	1,760	2,000	2,200	2,444	2,750	3,143	3,667	4,000
<b>27</b>	0,964	1,080	1,227	1,350	1,500	1,688	1,929	2,250	2,455
<b>40</b>	1,429	1,600	1,818	2,000	2,222	2,500	2,857	3,333	3,636

	32	28	24	21	18	16	14	12	11
<b>23</b>	0,719	0,821	0,958	1,095	1,278	1,438	1,643	1,917	2,091
<b>33</b>	1,031	1,179	1,375	1,571	1,833	2,063	2,357	2,750	3,000
<b>44</b>	1,375	1,571	1,833	2,095	2,444	2,750	3,143	3,667	4,000
<b>27</b>	0,844	0,964	1,125	1,286	1,500	1,688	1,929	2,250	2,455
<b>40</b>	1,250	1,429	1,667	1,905	2,222	2,500	2,857	3,333	3,636

## **WHY A 110 & 74 BCD 5 ARM SPIDER?**

a defining benefit of the current design is the 110 and 74 bcd spider and chainrings. By having a 5 arm setup and fastening points at a larger radius than MTB rings, we were able to put much finer OCP regulation system on them giving superior adaptability to each cyclist's riding style.

Additionally, for those who do not want to ride Q-Rings, the 100 and 74 bcd spider allows for a wide range of alternative chainring choices. This gives the immediate option for different chainring ratios and exact customization to the consumers wishes.

The limits of maximum chainring size are dependant on the specific frame the crankset is being used with. It may be possible to mount chainrings up to 46 teeth on the outer ring if the consumer has a bike with ultra-thin profile chainstays, but most bikes will not allow more than a 44 or 42t. the inner chainring will generally be limited to 32 max.

## **WHO IS THE TARGET MARKET?**

Primarily racers of any level who are searching for simplicity, better efficiency, more reliability and weight savings. Additionally, high level consumers who follow and emulate the top level racers in their bike material choice.

We expect this consumer group to expand beyond racers to the performance oriented general consumer market within a year.

## **TECHNICAL INFO**

- **110/74 spider.** 110bcd is the current road compact Standard and an old MTB Standard. This allows those who do not want Q-Rings to use Specialites TA or Stronglight rings, for example. 74bcd is the Standard RD3 triple inner chainring bolt diameter, allowing the same chainring choices as noted above. Cannondale and Specialized currently use the same configuration, and it looks as if this is the new standard to be confirmed..
- **163mm Q-Factor.**
- **Compatibility:**
  - o As with the rest of the Ágilis line, the XC<sup>2</sup> cranks are compatible with Standard external Shimano MTB BB's.
  - o The 2x9 spider is not compatible with 3x9 cranksets, nor is the 3x9 spider compatible with 2x9 cranks.
  - o They will be available without chainrings. The chainrings will also be available separately.