

TURBINE

BY

RACEFACE



BEING A COMPANY OF MOUNTAIN BIKERS, WHEN WE SET OUT TO DESIGN A NEW WHEEL,
THE GOAL WAS SIMPLE. "MAKE THE WHEEL WE WANT TO RIDE".

WE PROUDLY INTRODUCE THE TURBINE R WHEELSET. **R IS FOR RALLY.**

AN OPTIMAL BALANCE.

The brief was simple, take everything we had learned about materials and wheel design and ask ourselves: “if we could wipe the slate clean, how would we make the best wheelset possible?” When we say ‘best’ we are not talking about the lightest, or the stiffest, but rather the optimal balance between the features we deemed to be important. In determining the ideal balance each criteria was ranked to streamline the decision-making process:

1. Durability / 2. Stiffness / 3. Serviceability / 4. Engagement / 5. Weight / 6. Cosmetics / 7. Cost.

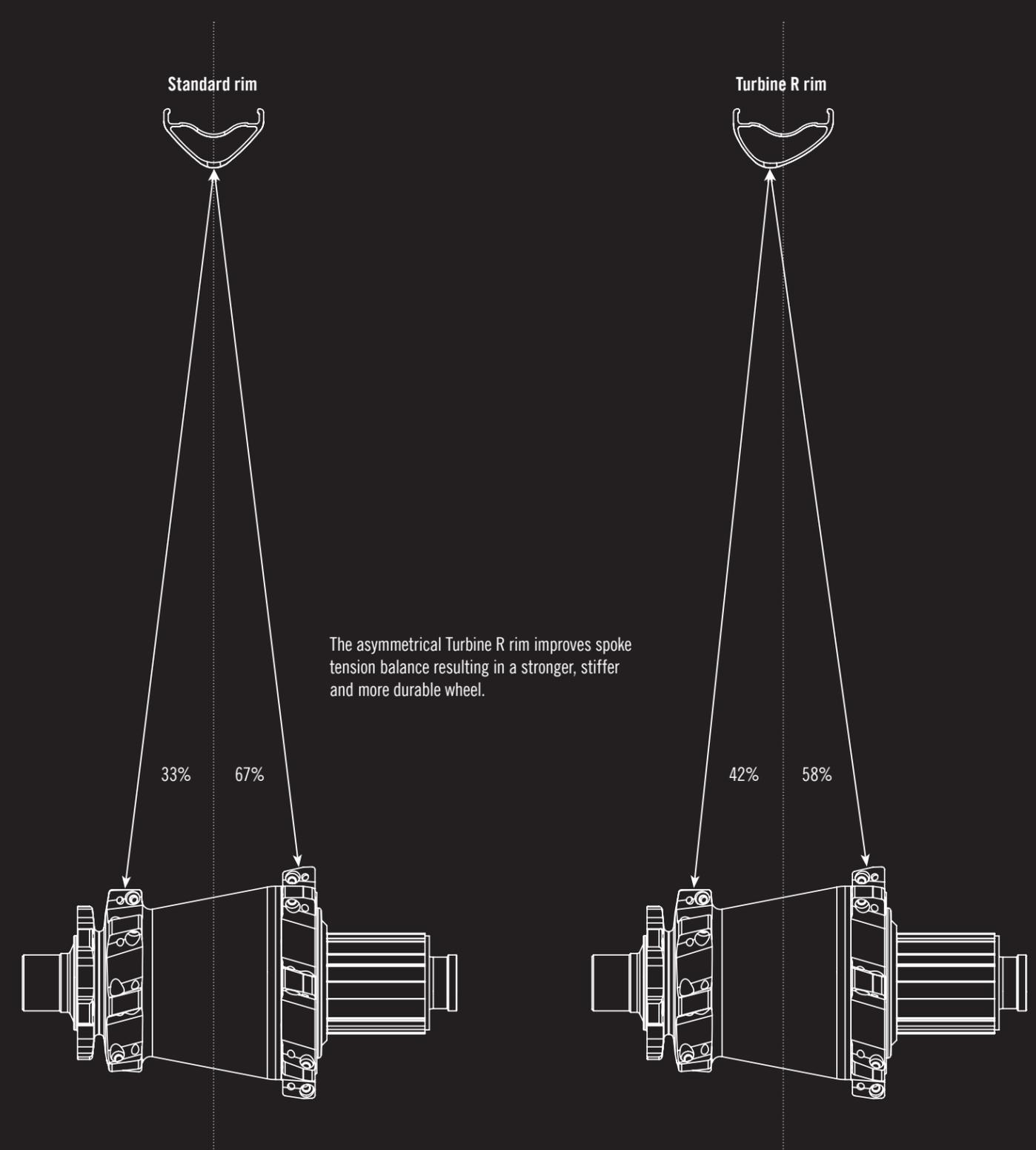
This doesn't mean we weren't concerned with cost or cosmetics, but rather that when a decision arose between say cosmetics or stiffness, we would choose the stiffer option. We knew the hub could not be a boat anchor but, at the same time, durability was a critical goal so the focus was on durability as opposed to weight.

EVERY PART TESTED AND PROVEN.

Considering what mountain bikes can do today as opposed to 8 years ago, specifically in terms of wheel size and performance: the 26” era vs the 27.5” - 29” era, it was clear we had to adjust our test environments. Riders today put components through more abuse than ever before with increased chain load and larger tires that provide more traction; something we needed to address and simulate both in the lab and in the field.

We designed new test equipment to create a more accurate representation of ‘real-world’ field testing allowing for results-based fine-tuning earlier in the design process. This provides a quick and consistent feedback loop between design iterations whereas real world testing, though incredibly valuable, can be inconsistent. Throughout the development process, the Turbine R wheel underwent hundreds of hours of lab testing as well as aggressive long term field testing to ensure the wheels perform as designed in all conditions for all riders.





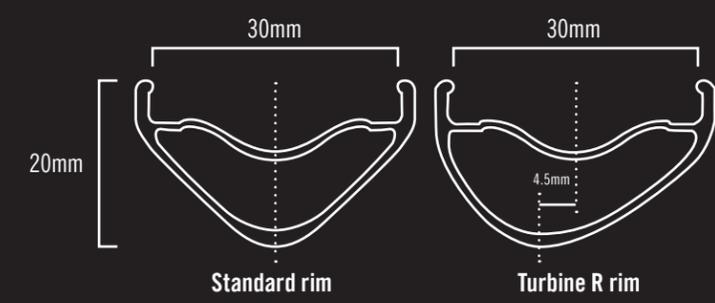
THE SEARCH FOR A BALANCED BICYCLE RIM.

The asymmetric rim design of Turbine R shifts the nipple bed resulting in more balanced spoke tension and a wheel with improved strength, durability and longevity. We chose to off-set the nipple bed by 4.5mm which, when paired with the new Vault hubs, gives an equally balanced spoke tension between driveside and non-driveside spokes on the front wheel and a 50% improvement in tension balance on the rear wheel.

Along with equal tension, we opted for equal spoke length, including 5 spare spokes with every Turbine R wheelset. A single spoke length is a godsend on epic riding trips should something by chance go wrong; one less worry on your adventure so you can focus on the ride.

Drawing on our long lineage with high performance alloys, we knew we had the tools and expertise to fully utilize the lightweight 6069 Aluminum which is 40% stronger than standard 6061. The stronger alloy offers improved durability at the bead hook while allowing us to remove and thin any unnecessary material resulting in an impressive 460g 27.5" rim with 30mm internal width.

Athlete and test rider feedback (including the Devinci Global Racing EWS team) helped us settle on a generous 30mm internal rim width. We find the 30mm to be a good compliment to current trail and all-mountain tires on the market. A wider rim helps improve tire profile and tire sidewall stiffness resulting in a more comfortable, confidence-inspiring ride. Out of the box, the Turbine R comes with tape and valves installed for a hassle-free tubeless installation.



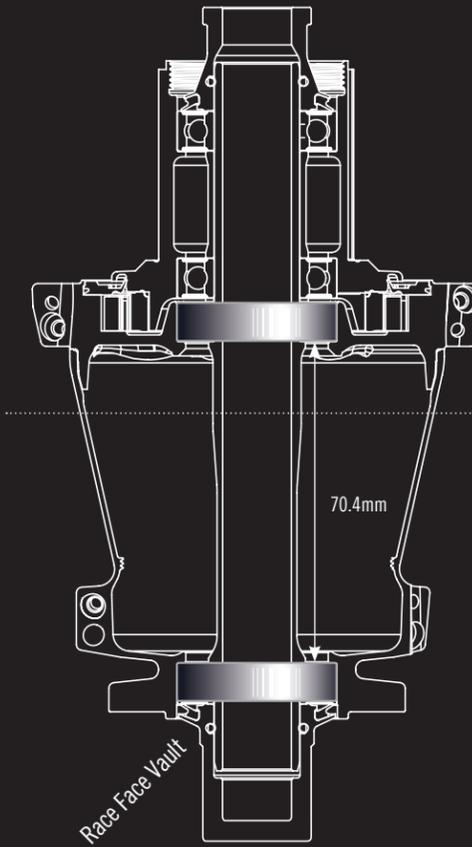
The diagram on the left shows an asymmetrical Turbine rim with a 4.5mm off-set nipple bed compared with a more traditional symmetrical rim with a centered nipple bed.

THE ULTIMATE HUB.

The Vault hub is the first Race Face branded Hub built from the ground up. The engineering team set out to design the best hub on the market, one that would stand up to the performance and quality the Race Face brand is known for.

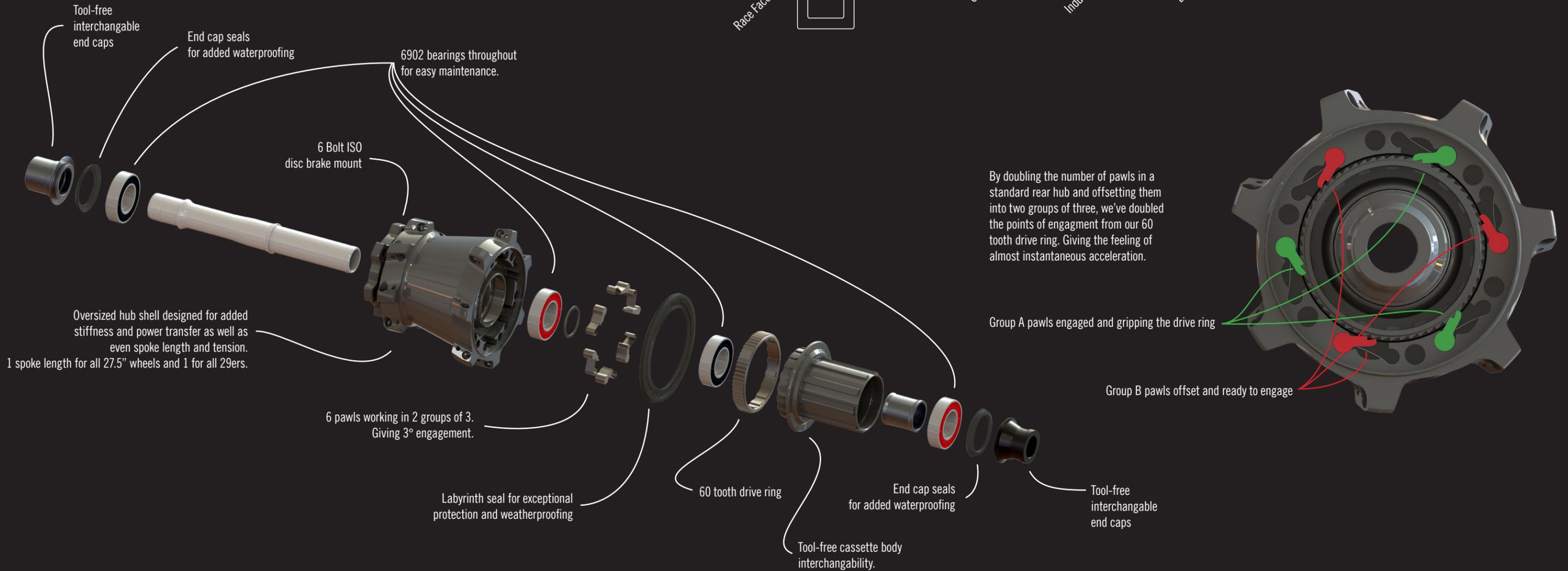
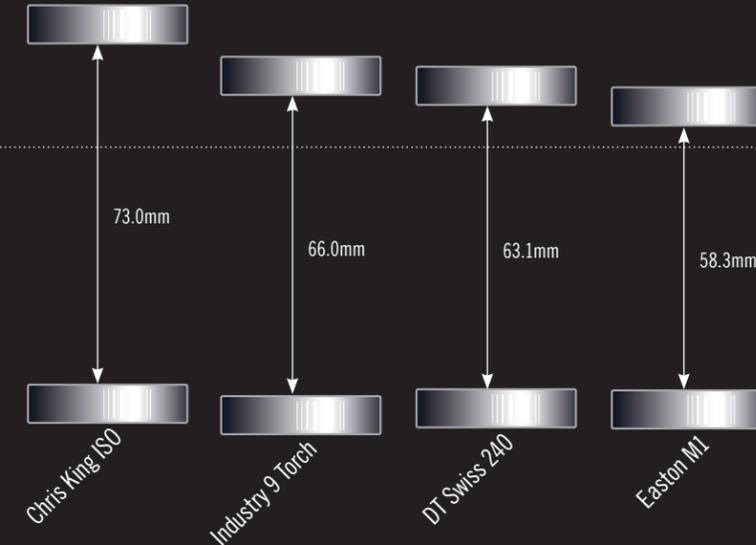
The over-sized hub shell provides opportunity for performance gains: increased rear drive torsional stiffness by up to 20%, and increased lateral stiffness. Perfecting engagement was a priority at the outset of the Vault hub design. The hub features a 60 tooth drive ring with six pawls which have two teeth per pawl. There are two sets of three pawls offset from each other resulting in 3 degree engagement for almost instant power transfer. All pawls feature low-drag springs to ensure quick and positive engagement while retaining low coast drag.

Proven 6902 bearings were selected due to their large ball diameter and durability. Wide bearing placement was designed to decrease load on the bearings improving lifespan. Protecting internals from the elements is key to hub longevity. To ensure product durability and less service over time, we designed low-drag labyrinth seals specifically for the Vault hubs.



BEARING SPACING.

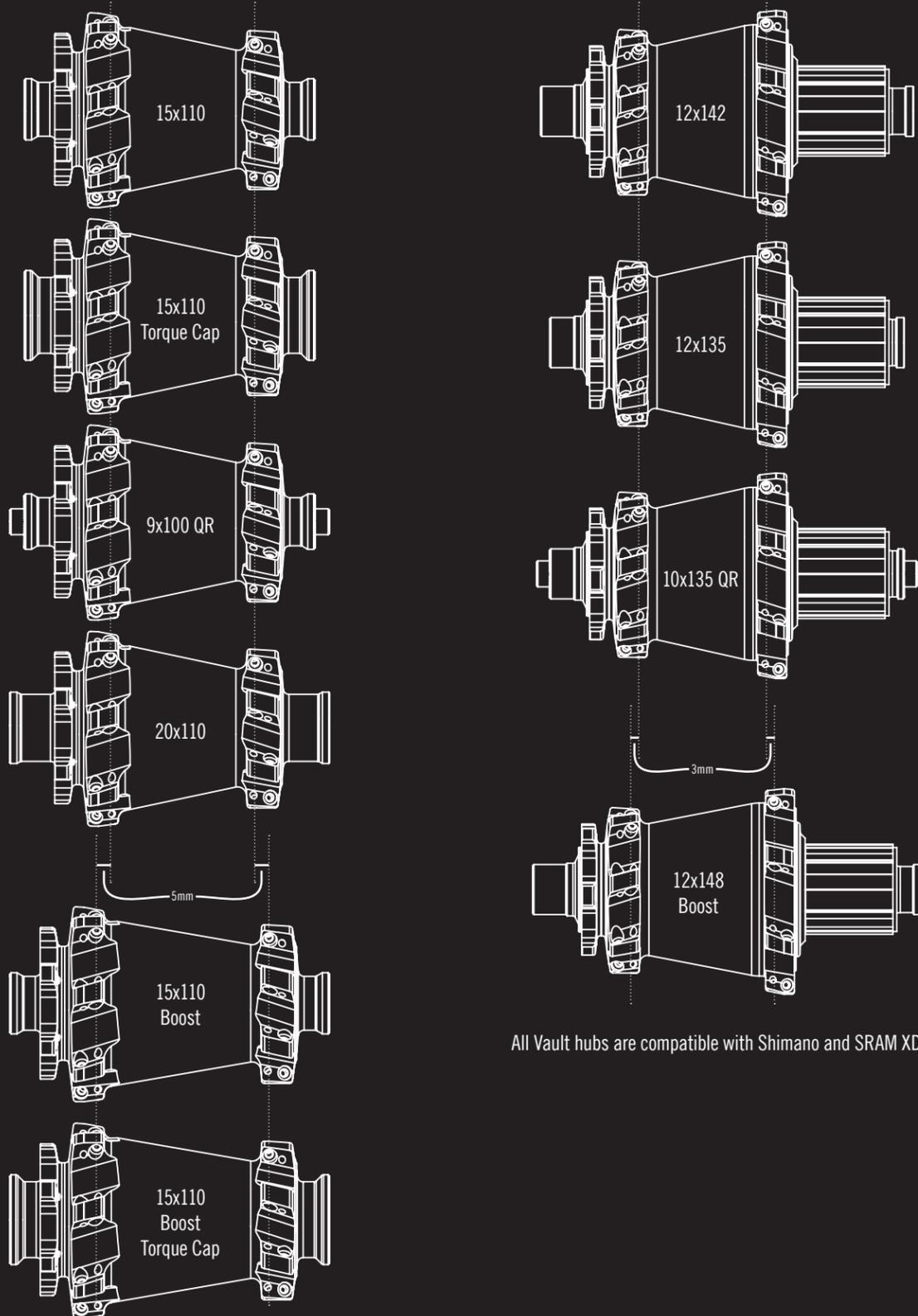
Rear mountain bike hubs have two sets of bearings. One set is the load bearings that supports the rider and allows the wheel to rotate; the second set the freehub bearings allows the cassette to freewheel. The wider the load bearings can be spaced, the more durable they will be. The Vault hub features a 70.4mm wide spacing for its load bearings, this helps to decrease the load on the bearings improving their life span.



SPACING EXPLAINED.

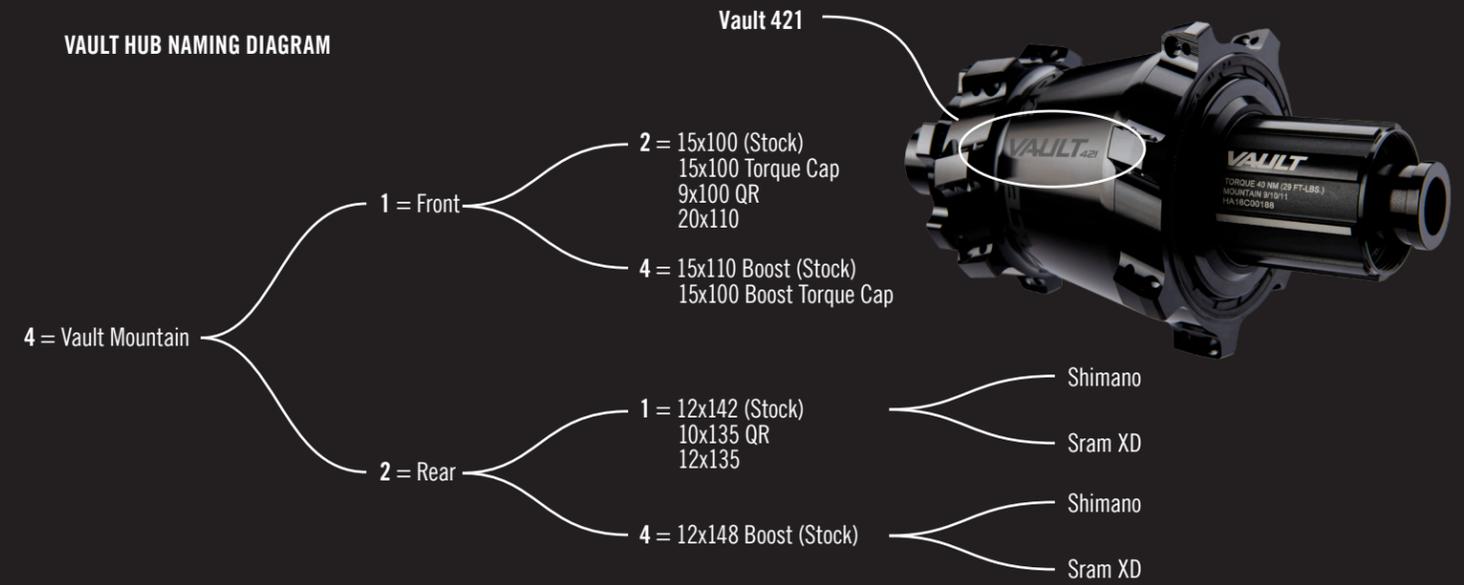
The Turbine R wheelset was built with compatibility in mind; the vault hub designed around tool-free end cap swaps to work with current standards like 12x142 and quick release, but separate hub optimized for the emerging

12x148 boost spacing. Boost adds distance in the center of the hub between the drive-side and non-drive-side spoke flanges. This added width makes for a wider bracing angle improving wheel stiffness.



All Vault hubs are compatible with Shimano and SRAM XD

VAULT HUB NAMING DIAGRAM



WHEELSET WEIGHT	27.5" 1730G 29" 1815G
HUB SPECIFICATIONS	
FRONT HUB CONFIGURATIONS	15x100+ or 15x110 Boost++
REAR HUB CONFIGURATIONS	12x142* or 12x148 Boost / Shimano and XD Freehubs
HUB FINISH	HIGH GLOSS BLACK LASER ETCHED LOGOS
BEARING TYPE	SEALED CARTRIDGE BEARINGS
RIM SPECIFICATIONS	
FRONT SPOKE	28 SPOKE, 3X, STRAIGHT PULL DOUBLE BUTTED 2.0-1.5, BLACK 284MM (27.5) 303MM (29)
REAR SPOKE	28 SPOKE, 3X, STRAIGHT PULL DOUBLE BUTTED 2.0-1.5, BLACK 284MM (27.5) 303MM (29)
INTERNAL RIM WIDTH	30mm
RIM FINISH	MATTE ALUMINIUM / HIGH GLOSS WATER TRANSFER GRAPHICS
RIM MATERIAL	6069 ALUMINIUM

+Convertible to: 9x100QR, 20x110, 15x100 Torque Cap

++ Convertible to: 15x110 Torque Cap

*Convertible to: 10x135QR, 12x135

SO GET OUT THERE AND RIDE.

Understanding the development story and decision making process behind any highly engineered product is interesting but, ultimately, we just want you on your bike! So, get out there and ride with confidence in the new Turbine R wheels and the Race Face brand behind them.

