Fulcrum® Off-Road

Fulcrum® had an exceptional debut in the off-road world. After its positive experience on the road, it had an attractive challenge to tackle. Fulcrum® gave its all and the results repaid its commitment. Fulcrum® distributes its products in over 30 countries and the arrival of new models attracts even more attention to our brand. The range grows, carbon fibre arrives, but also 29 inch wheels and thru-axle models.
The 2008 season has confirmed the forecasts at the end of 2007. The Orbea Team, with Julien Absalon as the tip of the diamond, revealed its strength and launched the Fulcrum® brand forcefully into the off-road world.

The care taken with the design of our wheels has led to models of maximum reliability: exactly what you want when tackling impervious off-road tracks.

The successes bagged by Absalon and his team-mates underline the constant commitment of athletes of the highest level along with their technical sponsors. Fulcrum® is in constant pursuit of improvements and aims to offer its athletes an extra option with the use of carbon. They are the final test bench for all the models you find on the market.
The hubs designed for Fulcrum® wheels employ a generously dimensioned design for both the central body and for the rotation axis. The diameter of the latter, 20 mm for all the models with disc brakes, guarantees high resistance to transverse and torsional stresses. A contribution is also made to this result by the mechanical architecture of the hub which, in the AFS™ version, is provided with bearings with a double ball-bearing race positioned outside the flange, so that it is aligned with the disc on the respective side. The Red Metal™ Zero and Red Metal™ 1 models are fitted with precision bearings with cones and cups which make fine adjustment possible and with a double gasket to provide a barrier against the infiltration of dust and mud.

Imagine the rim and tyre as a single unit composed of two materials. This is what we wanted to achieve conceptually with Ultra-Fit™ Tubeless technology. The rim was developed during the design stage to obtain perfect adherence with the tyre. The consequent elimination of friction makes it possible to improve performance considerably. Energy dispersion is drastically reduced by the tubeless tyre. The advantages are indisputable even in terms of practicability. Fitting the tyre is facilitated by the form of the rim while two tracks in the rim groove help keep the type perfectly positioned at all times. Ultra-Fit™ Tubeless technology is used in Red Carbon™ and Red Fire™ wheels.

Thru-axle technology is already implemented in mountain bikes dedicated to the most demanding uses. The introduction of this solution, with a 15 mm axle, has made it possible to translate this technology to cross-country. There is a considerable gain in rigidity while leaving the weight unchanged compared with the quick release version. The rigidity of the fork-hub assembly increases considerably. The oversize hub axle has a higher torque. Assembly precision also increases: positioning the disc brakes is easier and quicker.

This new hub is used in the front wheels of Red Metal™ Zero, 1, 3 HH models.
Red Metal™ Zero Il vertice della gamma Fulcrum® off-road è presidiato dalla Red Metal™ Zero, la ruota preferita dai campioni e utilizzata in gara da Julien Absalon e dai compagni del Team Orbea Cross Country. Possiede un cerchio saldato con fianco di 23,5 mm, lavorato con tripla fresatura, brevetto Fulcrum® e con profilo specifico per freni a disco. La configurazione di montaggio prevede dei rag

2:1 TWO-TO-ONE™ Spoke Ratio

The 2:1 Two-to-One™ system has been used for all the rear wheels and for the first time Fulcrum® has also extended their advantages to all the front wheels fitted with disc brakes. The doubling of the spokes on the critical side makes it possible to reduce the unit load borne by each spoke as the spokes themselves are no longer subject to the mechanical stress resulting from the different disc.

Overcoming this drawback, the spokes will be able to transfer the forces exerted at the rear by the pedalling traction and at the front by the torsion torque of braking, and give the front wheel previously unknown stability.

AFS™ The Axial Fixing System™ is the solution developed by Fulcrum® to fix the disc brake to the hub. The constraint granted by the butt area of the release mechanism, greater than in familiar standard ones, makes it possible to obtain greater structural rigidity and therefore more precise and powerful braking. The availability of the International Standard option ensures full compatibility of Fulcrum® wheels even with the most widespread braking systems that use this assembly plan.
**OFF-ROAD TECH**

Unlike normal releases, the eccentric axle in Fulcrum® quick-releases is actuated by the torsion of both ends, and locking becomes easier and more secure.

**QUICK RELEASE**

The quick-releases make use of the new patented Fulcrum® mechanism: a locking lever centred on the axis of the axle. This lever engages both ends of the axle fitted with a cam that exerts the closing traction on the axis, by means of a fork coupling. The synchrony with which the lever fork exerts the torsion on the ends of the eccentric axle makes the operation for locking and releasing the component more fluid, smooth and secure.

**MO MAG™ SUPER STRONG NO HOLE RIM BED**

The use of MoMag™ technology makes it possible to make a rim with a top bridge without any holes, and therefore guarantee appropriate air tightness for the tubeless tyre.

MoMag™ technology is integrated in wheels which do not have drilling of the top bridge of the rim. The nipples in these wheels are guided to their seat by employing a little magnet. Their accessibility from the outside makes it possible to carry out all the spoke tensioning and replacement operations conveniently. The absence of holes on the rim bed permits all the original strength to be maintained as well as the use of tubeless tyres. The hermetically sealed valve ensures that the tubeless tyre is kept under pressure.

The only hole in the rim is the one for the special valve that makes it possible to obtain the tyre’s working pressure. The special gaskets fitted guarantee its hermetic tightness.

The top bridge without holes for greater torsional rigidity.

Quick-releases for Off-Road wheels

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**OFF-ROAD TECH**

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Reactivity is the key word in Red Carbon™ wheels, which are already present on Julien Absalon’s bike. And given his successes, anyone with off-road in his DNA simply has to use them.

The new top of the range Fulcrum® off-road model implements advanced solutions starting from Ultra-Fit™, Tubeless technology through to the use of carbon fibre.
And it is thanks to this composite that it has been possible to reduce the weight of the rim. Another contribution to weight reduction is also made by the reduction of eight spokes compared with Red Metal™ Zero wheels. Four spokes have been removed from the front wheel and four from the rear: as a result the rotating mass is reduced too. 

And stability? Don’t worry; the 1,450 grams of the Red Carbon™ wheels are an important result but we also know that lightness is no good without strength.

That’s why we designed the carbon rims asymmetrically. The rear wheel sees the rim displaced to the right to recover the dish asymmetry caused by the presence of the sprocket set. At the front, the asymmetry is displaced to the disc brake side in order to obtain a wheel which is absolutely consistent when braking too.
The top of the Fulcrum® range is available both for disk and rim brakes. This year we are also proposing the innovative Red Metal™ Zero HH™ (Hollow Hub) wheels with a thru-axle. This solution guarantees great steering precision, enhanced fork performance, and an extremely high wheel-fork rigidity level.
**Red Metal™ Zero**

This is the top of the Fulcrum® range for users of traditional brakes. The different construction allowed us to reduce the number of spokes and, as a result, keeping the wheel weight down. Red Metal™ Zero wheels for traditional brakes stop the scales at 1,486 grams.

The eighteen front spokes are laced radially while the rear wheel uses the Two-To-One™ system with 14 spokes on the freehub side opposed to the seven facing the quick release.

The rim is lightened between the spoke anchoring points by initially milling the internal diameter, followed by two operations diagonally to the radial axis. Perfectly even braking action and is lightened between the spoke anchoring points.

The front axle has been reduced to 17 millimeters while the rear remains at 20.

The steel freehub uses sealed high-precision bearings.

The hubs have oversize bodies and exploit high-precision adjustable bearings. Compatibility with the UST tubeless systems is ensured in this version too.

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**Rim Brake**

The valve on the rim has special pressure-proof gaskets to ensure tightness at the inflation setting values.

The rim of this wheel is of the welded type. The machined braking tracks ensure fluid gradual braking.

The rim is lightened between the spoke anchoring points by initially milling the internal diameter, followed by two operations diagonally to the radial axis.
These are still at the top of the metal alloy wheels range in the Fulcrum® Red Metal™ Zero series: they are specific for the use of disc brakes. They provide the ideal choice for cross-country races because of the use of the 23.5 millimetre rims machined with triple milling. The maximum lightness has been obtained as a result without weakening the sides. The result is the best compromise for indulging your passion on impervious tracks and steep descents. Compatibility with UST tubeless systems.

The triple milling operation to lighten the rim is carried out to remove the excess material in the sections between one spoke and the next.

Aluminium spokes with an aerodynamic profile and stainless steel nipples are used for assembly. The Two-to-One™ configuration has been chosen for both wheels with 16 spokes on one side and 8 on the other. Doubling is on the disc brake side of the front wheel and on the freehub side of the rear one. The oversize hubs feature a 20 millimetre axle running on high-precision bearings. Today there is also a Red/Black version having a red rim, black spokes, and red hub.

The quick-release employs the special patented double pivot lever, with reduced lateral bulk.

The hubs have been designed with oversize bodies and flanges to increase the resistance to torsion.
Red Metal™ Zero HH™

Those who want absolute performance will find what they’re looking for in the new Red Metal™ Zero HH™ (Hollow Hub) front wheel. The use of the thru-axle is a guarantee of rigidity.

The wheel hub closes the fork structure perfectly to form an extremely strong single body.

The adoption of the 15 millimetre axle combines rigidity and lightness which a wheel of this level must have to provide the maximum performance. The oversize axle ensures remarkable torsional strength which translates into greater steering precision and better performance on every kind of track. Hence, the rod torsion is reduced and the fork performance is increased.
Red Metal™ wheels represent the top end of the Fulcrum® range. These wheels are only available in the disc brake version and are aimed at professional racers and high-level users with very high quality demands. Red Metal™ wheels are also available in the new HH™ (Hollow Hub) version which guarantees greater rigidity thanks to the thru-axle system.
**Red Metal™ 1**

They use an aluminium rim with a welded joint, lightened in the spaces between the spokes and with a calibrated profile without a braking track. They are fitted with aerodynamic stainless steel spokes, with variable 2.1-8.2 mm thickness, and with a 2:1 Two-to-One™ configuration at both the front and rear in a 16+8 unit combination.

The hub features an oversize body with both axles measuring 20 mm and adjustable precision bearings with cones and cups. The wheel is available in versions for International Standard disc and AFS™.

**Red Metal™ 1 HH™**

Precision steering and consistent fork behaviour are a feature of thru-axle systems. The introduction of the 15 millimetre thru-axle on the front wheel allowed us to make this version of Red Metal™ 1 wheels even more versatile. The HH™ (Hollow Hub) solution improves the rigidity of the system and makes fitting the wheel even easier and more precise. Pedalling off-road becomes even more fun: the bikes will react promptly to your commands!
Red Metal™ Zero Il vertice della gamma Fulcrum® off-road è presidiato dalla Red Metal™ Zero, la ruota preferita dai campioni e utilizzata in gara da Julien Absalon e dai compagni del Team Orbea Cross Country. Possiede un cerchio saldato con fianco di 23,5 mm, lavorato con tripla fresatura, brevetto Fulcrum® e con profilo specifico per freni a disco. La configurazione di montaggio prevede dei rag...
Red Metal™ 3

Available in the disc version only, with welded joints and anodized black, they weigh 1853 g overall. They employ stainless steel spokes with a 2 mm thickness in the 2:1 Two-to-One™ assembly configuration on both wheels, with 16 elements on the sprocket set side of the rear wheel and on the disc side of the front, and 8 on the opposite side. The hubs fitted are of the aluminium oversize type fitted with a 20 mm axle front and rear. These wheels are compatible with Tubeless UST tyres whose availability in International Standard and AFST™ versions means that they can be combined with the main disc braking systems on the market.

Red Metal™ 3 HH™

After use in motorcycles and in downhill and freeride mountain bikes, the thru-axle now comes to the cross-country world. The Fulcrum® medium range is also enriched by the version with a 15 millimetre thru-axle front wheel which makes avant-garde technology available to everyone.
Red Metal™ Zero Il vertice della gamma Fulcrum® off-road è presidiato dalla Red Metal™ Zero, la ruota preferita dai campioni e utilizzata in gara da Julien Absalon e dai compagni del Team Orbea Cross Country. Possiede un cerchio saldato con fianco di 23,5 mm, lavorato con tripla fresatura, brevetto Fulcrum® e con profilo specifico per freni a disco. La configurazione di montaggio prevede dei rag...
Red Metal™ 5

Their rim has a specific profile for disc brakes with a height of 19 mm, a bonded joint and black anodized finish. This is the same finish that distinguishes the spokes mounted in a 2:1 Two-to-One™ configuration with 16 elements on the sprocket set and disc side and eight elements on the other. The axles, with a 20 mm diameter both front and rear, run on sealed bearings. The freewheel, with a steel body, turns on sealed bearings.

Red Metal™ 5 wheels are provided with a normal rim with the drilling required for spoke insertion. The tyres therefore must have standard rim tapes.

Two bearings sealed to prevent the infiltration of dust and dirt, for the rotation of the 20 mm oversize axle; plus another two for the freewheel body.

The total weight is 1805 g. Compatibility is guaranteed with standard tyres with rim tape, and the disc assembly option is envisaged in the International Standard and with AFS™, and therefore with the most common braking system.

The double fulcrum of the quick-release guarantees easy locking and more secure fastening.

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Fulcrum® confirms its innovations and ups the stakes: twenty-nine inches for tearing across rough ground, twenty-nine inches for pedalling in comfort. From a dynamic standpoint 29” wheels are able to give the bike greater steering stability thanks to the amplified gyroscopic effect. Our tests also demonstrate that the 29” wheels sink less and have more traction on soft terrain.
**Red Metal™ 29 XLR**

The wheels of the future. We're ready!

In the United States 29" wheels make up 15 percent of the market and the average height increase of the population is another point in favour of this size wheels.

At the top of the Fulcrum® range are the Red Metal™ 29 XLR wheels: a total of 1,850 grams. The rim has a height of 25 millimetres and is finished with a top bridge with no holes: no rim tape and guaranteed tubeless compatibility. Our in-depth dynamic studies led us to develop spokes with differentiated thicknesses and different tapers for the freehub side. The aerodynamics and strength have been optimized by using slimmed spokes.

The stability of Red Metal 29™ XLR wheels is accompanied by the aluminium oversize hubs fitted with 20 millimetre axles. The high-precision sealed bearings ensure incisive operation over a long time and even in the most difficult conditions.

Their use is only produced with six-hole disc brakes according to the ISO standard.
**Red Metal™ 29 SL**

They are placed in the middle of the range, but Red Metal™ 29 SL wheels have a marked personality which leaves them still to be desired compared with their bigger sisters. The 29" standard will become increasingly successful, especially among tall cyclists, also because they make it possible to obtain a bike with better proportions.

The weight of Red Metal™ 29 SL wheels is just thirty grams over two kilos. We have created a rim for this model with a height of 19 millimetres compatible only with tyres with tubes.

The front and rear wheel are fitted with 28 aerodynamic spokes with differentiated thicknesses. This model also exploits the strength of oversize aluminium 20 millimetre hubs and sealed bearings for maximum life and precision.

It can only be used with six-holed disc brakes according to the ISO standard.
Freeride wheels

Have some fun everyone: here’s freeride. The discipline which gets its kicks from the most daring descents but does not disdain pedalling uphill without suffering too much, the discovery of new trails and itineraries, and going in search of paths at the extreme limits where ascent and descent have the same importance. Wheels for freeride lovers must therefore be strong, but also versatile and ready for different types of terrain.
Fulcrum® debuts in Freeride biking with a wheel conceived for the most daring, but without forgetting that the bike’s lightness is important, even going downhill, hence the Red Fire™. The anodized red rim made only for tubeless tyres which, thanks to the UltraFit™ Tubeless system, can adhere perfectly. Therefore eliminating the dispersion of energy to the complete benefit of speed and performance.

Weight is saved by milling the rim. Very great attention was focussed on the wheel’s dynamic behaviour: it is no coincidence that asymmetrical drilling was chosen to permit better spoke balancing, leaving sufficient space for the disc brake and sprocket set.

A freeride wheel like the Red Fire™ certainly cannot overlook strength. That is why we chose a sole solution: the adoption of the thru-axle for the rear wheel too.

The two axles are 20 and 12 millimetres, respectively.
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<thead>
<tr>
<th>Spoke Material</th>
<th>Number of Spokes</th>
<th>Type of Spokes</th>
<th>Tub Material</th>
<th>O.L.D.</th>
<th>Breaking System</th>
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<tr>
<td>Aluminum/Aluminum</td>
<td>10 left/10 right</td>
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*The weight of the wheels does not include the quick release, and it refers to the lightest configuration.*