The Orbea Racing Team will not just live the racing season in the light reflected by the feats of their captain, Julien Absalon: the team manager Ixio Barandiarán also expects flattering results from other outstanding team athletes such as Rubén Kuatta, Jean-Christophe Peraud and Itzaki Lejarreta.

Fulcrum® takes to the new off-road tracks

Three intense and demanding years have seen Fulcrum® achieving positive results in market terms and flattering sporting successes in the world’s most important road races. But our great passion for cycling means that we never stop testing ourselves and continually tackle new situations. The 2008 season will be remembered as the one in which Fulcrum® took up the off-road challenge without making a secret out of the competitive ambitions we nourish and confident that we will rise to the level already achieved in the road framework. That is why we have signed a partnership with athletes of supreme competitive calibre such as those of the Orbea Racing Team and its captain, Julien Absalon, an athlete the specialist press defines as “the best MTB rider in history”.

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**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.

If traction and torque transfer are entrusted to a single spoke in a traditional wheel, they are distributed to two spokes in a Fulcrum® 2:1 wheel for greater reliability, performance and longer life.

**AFS™ Axial Fixing System**

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.

Simple and effective: Fulcrum®'s Axial Fixing System™ makes it possible to fix the rotor disc to the hub with a simple ring. The AFS™ is perfectly compatible with the Shimano Inc. Center-Lock system.
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.

Quick-releases for Off-Road wheels

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.

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.

The assembly of the locking lever, practically aligned with the axis of the locking pin, makes it possible to actuate the release more easily even when there are forks with liners with a particularly large diameter.
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.

A wheel’s resistance to transverse loads largely depends on the dimension of the axle. For this reason our hubs feature 20 mm oversize axles combined with greater distancing of the bearings.
Red Metal™ Zero The top of the off-road Fulcrum® range is dominated by the preferred wheel of champions Red Metal™ Zero, used in competitions by Julien Absalon and his companions in the Orbea Cross Country Team. It has a welded rim with a 23.5 mm side, worked with a triple milling operation, a Fulcrum® patent, and with a specific profile for disk brakes. The assembly configuration uses aluminium spokes with an aerodynamic profile and stainless steel nipples arranged in a 2:1 Two-to-One™ configuration; 16+8 for both wheels, with the 16 spokes located on the disc side of the front wheel and on the sprocket set side of the rear one for greater performance.

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.

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.

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The hubs have an oversize aluminium body that rotates by means of adjustable bearings on a 20 mm axle. This wheel is compatible with UST Tubeless tyres and with the AFS™ Fulcrum® systems or the International Standard as far as the disc brakes are concerned.
Red Metal™ Zero

The most prestigious wheel in the Fulcrum® range is also available for cantilever brakes. The limitation of the number of spokes and the disc-free hub make it possible to obtain a decisive weight reduction: 1486 g. 18 radial spokes are fitted on the front wheel while the rear employs the Fulcrum® 2:1 Two-to-One™ system and envisages 14+7 spokes on the drive side. Given the use of the specific braking system it was possible to reduce the front axle diameter to 17 mm, while the diameter of the rear remains at 20 mm.

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

The hub also has an oversize body with adjustable high-precision bearings with cones and cups. The freewheel, with a steel body, also turns on two sealed bearings. The rim is compatible with UST Tubeless tyres.
Red Metal™ 1 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. 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 hubs run on high-precision bearings that can be adjusted by cones and cups.

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™.

The fluidity and operability of the release is guaranteed by the double joint on both ends of the cam pin.

The wheel is fitted with stainless steel spokes, with double 2.0-1.8-2.0 thickness and aerodynamic profile, tensioned by brass nipples.
Red Metal™ 3 The Red Metal™ 3, the solid and reliable wheels for everyday use, distinguished by an enviable quality-price ratio, are in the middle of the Fulcrum® range. 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 AFS™ versions means that they can be combined with the main disc braking systems on the market.

The rim side height is 25 mm. Specific use with disc brakes makes it possible to reduce the wall thicknesses and provide greater peripheral lightness.

The freewheel body of the rear hub is made of steel while the entire mechanism runs on two sealed bearings.

The design of the quick-releases aimed for secure locking, obtained by an optimum lever-closure ratio.
Red Metal™ 5 wheels allow all enthusiasts to enter the Fulcrum® Off-Road universe. 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. 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.
<table>
<thead>
<tr>
<th>Model</th>
<th>Rim Brake Type</th>
<th>Front Hub</th>
<th>Rear Hub</th>
<th>Spoke Material</th>
<th>Number of Spokes</th>
<th>Type of Spokes</th>
<th>Hub Material (Body-Side/Hubbery)</th>
<th>O.L.D.</th>
<th>Braking System Compatibility</th>
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<tbody>
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<td>Disk Brake</td>
<td>633</td>
<td>823</td>
<td>Stainless Steel</td>
<td>16</td>
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<td>Aluminum/Aluminum-Steel</td>
<td>100mm</td>
<td>Linear Pull/ISO INTL 6 Bolts</td>
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<tr>
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<td>Disk Brake</td>
<td>766</td>
<td>862</td>
<td>Stainless Steel</td>
<td>16</td>
<td>Aero, Variable Section</td>
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<td>135mm</td>
<td>ISO INTL 6 Bolts AFC™</td>
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<td>Disk Brake</td>
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<td>1000</td>
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<td>Stainless Steel/Aluminum/Steel</td>
<td>100mm</td>
<td>ISO INTL 6 Bolts AFC™</td>
</tr>
</tbody>
</table>

* The weight of the wheels does not include the quick release, and it refers to the lightest configuration.