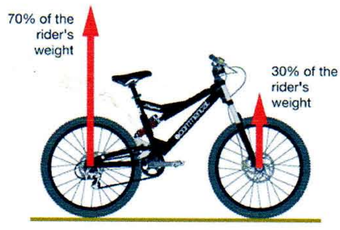
The "Contact System" explained...

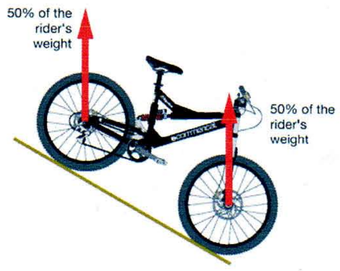
The 'Contact System' is the geometric and kinetic platform that determines the motion, operation and efficiency of our rear suspension, as well as the rider's pedalling efficiency.

Our main goal is to deliver maximum grip while retaining pedalling efficiency by filtering out pedalling induced suspension motion. Both the Meta and Supreme frames are built using the two essential 'Contact System' design principles; a **Single Pivot Link** and the **Connecting rod – Rocker link.**

The Single Pivot Link - The location of the pivot point connecting the front triangle and the rear triangle influences the balance of the bike and its ability to avoid bobbing and kickback. (These are pitching and bouncing instabilities that cause loss of wheel contact, poor traction, loss of control balance and poor pedalling efficiency).

The horizontal position of the pivot point directly effects the weight distribution applied on the front and rear wheels. This location is changed depending on the bikes intended use. An XC frame such as the Meta 4, which will cover all kinds of terrain including climbing and descending, needs a horizontal weight balance of 55% on the rear wheel and 45% on the front. At the opposite end of the spectrum, a down hill frame such as the Supreme DH, which is designed for steep descents, needs a front to back weight balance close to 70% on the rear wheel and 30% on the front. This balance is also influenced by the quality of the front and rear suspension units and by the frame geometry.





The vertical position of the pivot point location affects the ability of the bike to filter out pedalling feedback. The solution is to find a pivot location that least affects suspension function. The action of pedalling creates torque that affects the suspension. This effect depends on pivot location in relation to the chain line. If the pivot is located under the chain line it will create a bobbing motion. If the pivot is located above the chain line it will give a kickback motion. In both situations there is a loss of control and pedalling efficiency. The challenge is made harder by the fact that a standard transmission has 3 chain rings with 3 different chain line positions.

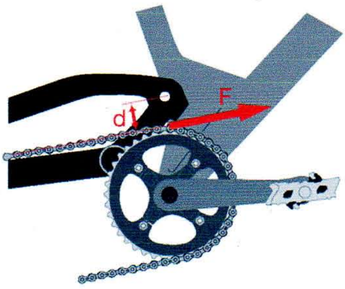
The small chain ring is used to climb at low speed. Because the gear ratio is so low you don't feel the pedalling effect on the suspension performance

The middle chain ring is the most frequently used, especially on flat terrain so it's essential to not feel the pedalling motion (bobbing). Therefore it's necessary to locate the pivot point above the middle chain ring.

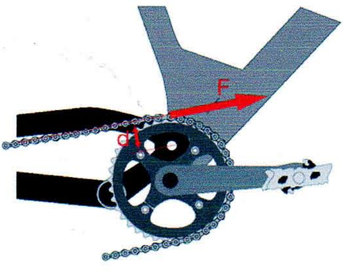
The big chain ring is used at top speed and in downhill where increased grip and suspension function is the priority over and above pedalling efficiency. The pedalling motion does not have to affect the suspension performance so the pivot point needs to be located under the big chain ring.

Therefore on the Meta 4, Meta 5 and Supreme FR, the pivot point location is 1/3 above the distance between the middle and big chain ring.

dF torque locks the suspension function.



dF torque creates a "bobbing" motion



On the Supreme DH, the pivot point is located at the same level as the top of a 42T chain ring (which is the most popular size in downhill).

Usually, a single pivot system using classical construction (front and rear triangle) gives the best compromise in term of stiffness and reliability and will greatly increase longevity.

The Connecting rod – Rocker link system.The addition of a connecting rod - rocker link system between the frame and rear shock is essential to control the progressive response of the rear suspension by changing the wheel movement / shock ratio. The 'Contact System' allows us to perfectly control suspension function, and offers multiple possibilities according to the use of the bike.

The principle is the same on Meta and Supreme. A connecting rod fixed on the rear triangle pushes the rear shock via a rocker link fixed on the front triangle. Each pivot point is calculated with precision to affect the progressive reponse of the rear suspension and improving its function.

The goal for the designers was to calculate suspension locations that provide the best traction through the rear wheel during turning, braking, climbing and sprinting while still retaining an excellent feel at the end of the travel, especially on big impacts.

Because the bike is a live machine with changing applications the study and understanding of suspension function is essential during design process. Commencal use the services and experience of BOS Engineering and their F1 inspired data-log technology to achieve this at all stages of the design process. This allows the design team not only to find the best location for all suspension components and an excellent structure but to also perfect the understanding of the interaction between rider and bike.