

## Mountain BIKE

**Top Grade: Outstanding**  
„An aluminium dream come true... so lightweight, good pedalling efficiency and dynamic handling like an All-Mountain but even more versatile.“



„The huge addition to any enduro racer's arsenal.“



„... we say a pioneer of the coming era of Enduro Bikes.“

# LITEVILLE 601

Our new long travel do-everything weapon:

It will take you anywhere from normal MTB tours to „Vert-Riding“ or Gravity Enduro Racing.

It combines the characteristics of an all-rounder trail bike with those of a long travel trail bike and handles like a DH bike on the descents.

Thanks to the separated pedalling forces and optimized climbing geometry the Liteville 601 will also climb like a mountain goat.



## bike

„With the safety of an Enduro, but accelerating far and away superior: Allrounder on the highest level.“

## Mountain BIKE

„Unbeatably versatile, extraordinarily stiff and full of innovative details - few bikes set so many standards as the Liteville 301.“

## MOUNTAIN BIKE

„The Liteville's sophistication is phenomenal.“

## MOUNTAIN BIKE ACTION

„This bike stands out from the crowd.“

## mountainflyer

„An engineering masterpiece.“

## Mountain Biking

„... the best all around bike I've ridden; period.“



„Light, fast and uber capable.“

# LITEVILLE 301

The reference full-suspension bike with the patented suspension system.

Winner of many tests and a bike with an unmatched wide spectrum of applications.

Instead of back and forth in development and design with permanently „new“ seat-of-the-pants models the Liteville 301 takes advantage of the principle of continuous, untiring evolution.



## THEORY AND PRACTICE

You want to test a Liteville to its ultimate limits?

This is where you are in the right spot.

## TESTZENTRUM TORBOLE

Via Matteotti 76

38069 Torbole, Trentino

[www.testzentrumtorbole.de](http://www.testzentrumtorbole.de)

Convince yourself of the philosophy behind our products and find the perfect wheel size for your riding style in the heart of the biggest and most astonishing test area in the world.

# SCALED SIZING



THIS IS THE ONLY WAY  
AN AGILE BIKE CAN BOAST  
WITH THIS MUCH TRAVEL

## Liteville

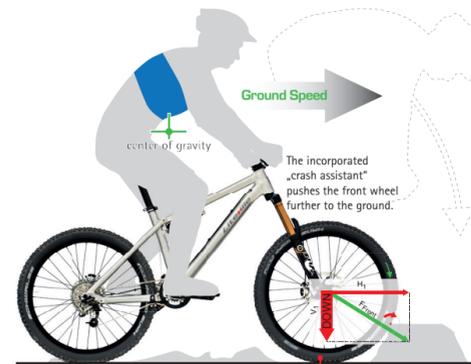
# Problem

Front wheel versus rear wheel, two entirely different workstations.

## At an downward angle

In the front axle two forces act when the bike is in motion: downwards the weight force (consisting of weight of rider and bike plus gravitational acceleration) and in the direction of travel the inertia force (resulting from the impulse of the rolling system, a combination of both mass and the speed). Both combined create a **resulting reaction force** when impacting an obstacle, indicated in green. When looking at the front wheel this reaction force unfortunately has a forward and downward direction! The force component action downward is trying very hard to prevent the wheel from lifting up and over obstacles the front wheel encounters.

Hence this is the perfect workplace for a wheel with larger diameter, which has an increased ability of rolling over obstacles such as roots and rocks with ease and stability.



Physics up front

The front wheel is pushed by the force ( $F_{front}$ ) in both a forward and downward direction. The force can be split into a horizontally acting component ( $H_x$ ) and a vertically acting component ( $V_x$ ). The vertically acting component ( $V_x$ ) acts downwards and hence creates an unfavourable moment acting against the direction of the moment created by the horizontal force component. The resulting moment is, in comparison to that of the rear wheel, much smaller in magnitude and hence the front wheel is more resistant to moving over that obstacle.

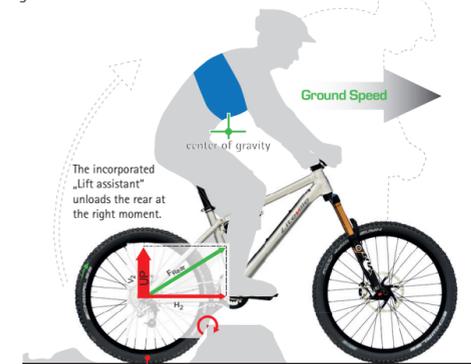
If we consider a larger front wheel, then the position of the wheel axle is higher and the head angle of the force is flatter and hence the effect of the resulting moment is increased. Maybe this sounds somewhat complicated, but it is easily experienced by yourself on the trail.

## Descending with the front up high: that is how you rock!

In the rear axle we also have the downwards acting weight force (comprised of the weight of the bike plus rider and the gravitational acceleration), but the resulting green **reaction force** acts in the opposite direction as with the front wheel. Its direction is forwards and up!

The upwards component of the force helps the rear wheel considerably when climbing over obstacles and hence the rear wheel has a much easier job than the front wheel.

It will do this completely without any assistance, such as that of increased diameter, which as we know also has the disadvantage of increased inertia. A larger wheel would also require more space, not only in height but also in terms of length of the bike.



Physics in the rear

When we consider the „pulled“ rear wheel, the force ( $F_{rear}$ ) acts in a forward and – would you believe it – in an upwards direction! The horizontally ( $H_x$ ) and vertically ( $V_x$ ) acting components combine to give a powerful resulting forward moment applied at the contact point of the obstacle and in doing so, virtually lift the rear wheel axle over the obstacle in cooperation. Because they do this continuously, the rear wheel has a much easier job rolling over obstacles than the heavily disadvantaged front wheel.

# Solution

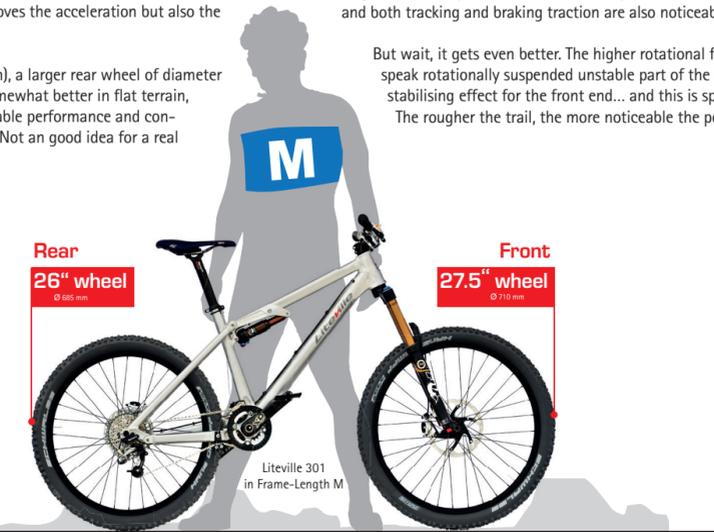
Rear wheel as big as necessary, front wheel as big as possible.

## Rear: Light, stiff, highly agile

Moderate wheel size on the rear: enables a sufficiently short rear end without suspension limitations for easier lifting of the front wheel, i.e. rolling over obstacles of any size is made effortless.

In comparison to a bike with two large wheels, the herewith reduced inertia (rotational forces) not only improves the acceleration but also the control of the bike.

Of course, with shorter riders (say 1.6 m), a larger rear wheel of diameter 650b or 29" would theoretically roll somewhat better in flat terrain, but in practice would also bring noticeable performance and confidence drawbacks in technical terrain. Not an good idea for a real mountainbike.



## Higher curve pace due to grip balance

With its different wheel sizes, Scaled Sizing prevents you from loosing the front end of your bike in fast switching sections and in slippery conditions. How is this possible? It is because it keeps you from a sudden loss of grip as a result of relatively more grip in the front. Oversteering, the moment your rear wheel loses grip, is way easier to control than understeering, the moment the grip on your front wheel gives way.

Curve pace increases in comparison to a conventional mountain bike as you are able to control drifting safely with the rear wheel.

## Front: Rolling smoothly and safely

The front wheel has the worst workplace on the bike when riding off-road. That's why the front wheel diameter must be large... as large as is technically possible without any significant suspension compromises.

This significantly improves the ability of the poor front wheel to roll over obstacles and both tracking and braking traction are also noticeably improved.

But wait, it gets even better. The higher rotational forces cause, in the so-called rotationally suspended unstable part of the frame, a welcoming stabilising effect for the front end... and this is speed sensitive! The rougher the trail, the more noticeable the positive effect.

## Two things to consider after installing Scaled Sizing

We recommend handlebars in between 740 mm and 800 mm. The bigger front wheel increases the leverage and therefore requires a wider handlebar.

We also recommend to lower the handlebar. The height of the handlebar needs to be adapted; the original height is to be rearranged and lowered by another 10 mm by removing spacers, by switching the stem or installing a flatter handlebar. When installing a 27.5" front wheel instead of a 26" one, the handlebar needs to be lowered by 35 mm. With a 29" front wheel by 70 mm. Doing this, you will profit from even more effective uphill and downhill ergonomics.

Advice: The bottom bracket is raised only by 3 to 5 mm due to the bigger distance to the front wheel, the more shallow seat angle and the increased SAG.

# Scaled Sizing

Frame, rider and wheel size adapted to each other: Scaled Sizing



24" wheel 26" wheel



26" wheel 27.5" wheel



27.5" wheel 29" wheel

## Small riders gain even more advantages while tall riders get the chance to close up

Rather than fanatically increasing wheel sizes as competitors on the market, Syn-tace Scaled Sizing is adapted to individual requirements of small and tall riders and their riding purposes. Liteville frames are designed for the wheel sizes as recommended below. Changing the wheel sizes, the height of the bottom bracket is raised within a tolerance range that does not affect the ergonomics of the bike negatively and can therefore be adapted to individual needs and wishes

## Mass times 3

Looking at the weight again, make sure you ride a rear wheel that is as small as possible. An increased rotary mass of 0.5 kg affects the performance of the bike as negatively as a frame that is 1.5 kg heavier.

## Scaled Sizing recommendations

As opposed to conventional standard sizes on the market, Scaled Sizing is adapted individually to the rider's height as well as the intended riding purposes.

Find the recommended wheel sizes in the table below; rear wheel/ front wheel

		XS	S	M	L	XL	XXL
XC	(100-120 mm travel)	26" / 26"	27.5" / 29" 26" / 27.5"	29" / 29" 27.5" / 29"	29" / 29" 27.5" / 29"	29" / 29" 27.5" / 29"	29" / 29"
All Mountain	(120-140 mm travel)	24" / 26" 26" / 26"	26" / 26" 26" / 27.5"	27.5" / 27.5" 27.5" / 29"	27.5" / 27.5" 27.5" / 29"	27.5" / 27.5" 27.5" / 29"	27.5" / 29" 29" / 29"
Enduro	(160-180 mm travel)	24" / 26" 26" / 26"	24" / 26" 26" / 26"	26" / 27.5" 27.5" / 27.5"	26" / 27.5" 27.5" / 27.5"	26" / 27.5" 27.5" / 27.5"	27.5" / 29" 29" / 29"