



**While many mountain bikes are based on tried and tired formulas, our four test bikes beg to differ.**

One of the surest current barometers of the vibrancy of mountain biking is the proliferation of ways to go off-road. In addition to seasonal and regional differences in terrain, there is a widening range of available mountain bikes. Granted, the selection doesn't really branch out until the price starts approaching four figures, whereupon something happens: From the common thread of fat tires and interchange-

able component groups, today's high-end mountain bikes weave a rich tapestry of divergent frame designs and compositions. The bikes themselves—and all their varying characteristics—have to be ridden to be believed.

And that's where we come in. As curators of this space, we've been pursuing the search for the mythical perfect mountain bike for some time now. This month, our newly expanded squad of ride-hard-

but-smart testers renewed the elusive quest by gathering four delectable mountain bikes: the Alpinestars Ti-Mega, Bontrager OR Race Lite, Rocky Mountain Experience and Trimble 140 Unlimited. We hoped to snare at least one bike that could dodge every rock, clear every log, avoid all crashes and flats and last forever. Once again, we quickly realized that we were a trifle too optimistic.

And so we settled for the more realistic objective of reveling in the diversity that makes expensive mountain bikes such an interesting genre. Most notably, our gang of four test bikes encompasses each major frame material: steel, aluminum, titanium and carbon fiber.

But we're resisting the obvious temptation to anoint this package as a materials showdown, or even as a battle o' bikes. It's not that simple. Each bike uses its given material to achieve the designer's goal, and it is these ends, not the means, that really matter.

In the following pages, you'll read about uncanny comfort, beautifully balanced geometry, indomitable durability and record-setting low weight. No single bike can lay claim to all these attributes, of course, and a significant feature—suspension—is missing from the entire group. Still, each bike is the product of someone's ambitious design, and that, so to speak, makes all the difference.

—Keith Mills

# The Uses of DIVERSITY

# BONTRAGER *OR RACE LITE*

There is low weight and there is longevity, and Keith Bontrager's flagship bike shows that the right framebuilder can provide both.

*By Keith Mills*

KEITH BONTRAGER HAS A THING ABOUT durability. "I consider durability a part of performance," he declares. "When I think of making a frame, compromising its strength below a certain level in order to make it light is just not acceptable. Broken or fussy equipment will do much more harm to the general plan of becoming a better rider than any possible benefit of the weight savings."

It is a sore point with the Santa Cruz, California, framebuilder because he thinks his bikes are durable and many other low-weight, high-end bikes are not.



"It is a sad thing when someone comes back from their nth ride—where n is a small number—and has a bent frame or a chainstay cut by a sucked chain. Having observed a bunch of those sorts of things, we've taken steps to avoid them," he claims.

Those steps—mostly joint-reinforcing gussets—are showcased on Bontrager's own OR Race Lite frame. Individually, these measures underscore Bontrager's claim of "justifying every single construction feature with sound engineering." Collectively, they fulfill Bontrager's ideal of genuine durability.

Though he has a rich decade-long background in building custom cyclocross, road and mountain bikes, Bontrager has offered his OR production frame for only three years. And already it has acquired a reputation for immortality. That's because not a single OR frame has suffered a fatigue-related failure, he reports. Where other builders might disavow customers who tend to be hard on equipment, Bontrager says, "Our OR Race frame is designed with this rider in mind and is virtually the only frame available that has even odds at surviving 'normal' use for this rider."

As stout as it is purported to be, the OR Race Lite's most impressive trait could be its weight. Our test model has a frame weight of just four pounds, two ounces, one of the lowest figures we've ever seen for steel and flat-out light for any material—never mind for a bike that practically dares you to hammer on it.

What's the secret? Simple applied engineering, says Bontrager. Heat-treated steel—like the True Temper chrome-moly in the OR Race Lite—can be very strong, even when it is drawn into tubes with thin walls. According to Bontrager, however, connecting those tubes into a frame



weakens the areas nearest the joint. His solution is reinforcing the "heat-affected zones" at the welded joints. "Without the reinforcements," he claims, "all the critical joints are very weak and can fatigue. So although I advocate TIG welding, it's only in the sense that the person using the process has figured out why it works and has taken steps to alleviate its problems."

On the OR Race Lite, all the joints are TIG welded, as are most of the requisite reinforcements, including gussets at both head tube intersections, a seat collar and, in a distinctive touch, sleeves radiating from the bottom bracket along each chainstay. There is even a bolted-on

**The OR Race Lite is indeed very light, which shows up immediately on the trail. But the bike is most renowned for its durability, which is the sort of virtue that could take years for you to appreciate.**



The Race Lite's quest for strength avoids oversized dimensions. Even with the requisite reinforcements, the frame is very light, weighing just over four pounds.

chainsuck plate that saves the underside of the right stay from getting chowed in the event of an errant shift.

Interestingly, and tellingly, the Race Lite's quest for strength avoids any association with oversized design. The frame sticks with standard 1½-inch main-tube and one-inch headset diameters, which is one reason it is not unconscionably stiff. Even with the robust reinforcements at every turn, there is plenty of give in the way the Race Lite responds to bumps and pedaling forces.

We know this for sure, because we had a problem with the right crankarm hitting the chainstay on climbs. It seems the SunTour MicroDrive crank is very compact and not wholly compatible with our Race Lite's chainstay bend—at least not when the crank is being turned with some force and deflecting

the stays. Once we tired of hearing a definitive thud on climbs—and of watching the right chainstay get scraped down to the bare metal—we installed some spacers in behind the bottom bracket's fixed cup to shove the spindle a little further outboard. Bontrager's solution was changing the bend of the Race Lite's chainstays so that using a MicroDrive crank no longer ranks as a contact sport.

Other than the annoyance of the tight squeeze around the crank—which is offset by voluminous tire clearance for unimpeded navigation through mud—there are no troubles to report from the test-riding department. The Race Lite is a good all-around mountain bike, capable of climbing and descending the same ridge equally well. The low weight and moderately supple ride help out here, but not as much as Bontrager's expert geometry, which contributes superb front-to-rear balance and ideal, accurate steering. Our test bike—listed as a size large—has the familiar angular combination of 71-degree head and 73-degree seat. And the long 59-centimeter top tube and 150-millimeter stem let you stretch out and get into the steering—the sort of position that lets you cruise fast trails in style.

Bontrager's Comp fork also figures into the steering. Its rake is a shallow 38 millimeters, reining in the front end just as the top tube threatens to push it out. With its massive aluminum crown and big steel blades, the Comp fork draws a lot of attention—as well as some criticism for weighing an impolitic two pounds,

Bontrager also offers a modified Race Lite with a Rock Shox fork.

two ounces. But unlike other stiff, heavy forks we've tried, the Comp doesn't leaden the handling; it merely anchors it.

Not surprisingly, Bontrager focuses on his fork's durability. "For those who ride hard enough to punish their fork over bumps, Unicrown forks have a fairly limited service life. Our fork has an unlimited service life." He's referring to the design's interchangeability—in the event of a catastrophic encounter that bends a fork blade or two, you can bolt a new one into the Comp's crown.

If you want an alternate fork, Bontrager will sell you a Race Lite with a RockShox. Of course, it's not that simple: The RockShox-endowed OR Race frame is tailored for the marriage. To compensate for the extra front-end lift of the suspension fork, Bontrager varies the geometry to arrive at 71/74-degree angles. And he shortens the top tubes by a half-centimeter to get more rider weight on the front wheel—a reasonable goal when a shock-absorbing fork is there too.

The RockShox also has the effect of raising the price of a frameset. Our test Race Lite sells for about \$1200 (frame and fork); a RockShox jacks the price to \$1400. If both those figures are too much, Bontrager offers a standard OR Race model that isn't as Lite—thicker tubes push the weight to around 4½ pounds—but is, says Bontrager, even more durable. Prices there are \$1000 with a RockShox, \$850 with a Comp fork.

While you're shopping, be aware that Bontrager's seat tubes are deliberately short—our "large" frame, for instance, has a 17-inch (center to center) seat tube. In most cases, this sizing necessitates using a long 330-mm seatpost, but it fulfills Bontrager's goal of increased stand-over clearance and allows the the smallest two models to have tiny 11- and 13-inch seat tubes.

Bontrager has a reason for everything, and if you become his customer, you get a full 20 pages of reasons and explanations in one of the bike industry's most thorough owner's manuals. But it all seems to come back to a fundamental principle: While racing bikes are built to go fast, they should also be built to last. With the OR Race Lite, Bontrager has skillfully executed his admirable conviction. □

Bontrager's reinforcements include gussets in high-stress areas like the bottom bracket. Collectively, these measures fulfill the builder's ideal of genuine durability.

## Bontrager OR Race Lite

<b>Price</b>	\$1200 (frame and fork)
<b>Sizes Available</b>	XS, S, M, L, XL
<b>Size Tested</b>	Large
<b>Frame Weight</b>	4 lbs, 4 oz
<b>Fork Weight</b>	2 lbs, 0 oz
<b>Front-wheel Weight</b>	3 lbs, 11 ½ oz
<b>Rear-wheel Weight</b>	4 lbs, 7 ½ oz
<b>Total Weight</b>	23 lbs, 12 ½ oz
<b>Frame material</b>	True Temper double-butted chrome-moly; forged horizontal dropouts
<b>Fork (and headset)</b>	Bontrager Comp chrome-moly fork; SunTour XC Pro headset
<b>Wheels and Tires</b>	Bontrager/Weinmann BCR rims; SunTour XC Pro hubs; 32 14/15-ga spokes; Panaracer Smoke 2.1/1.9-inch tires, Presta valves
<b>Drivetrain</b>	SunTour XC Pro MicroDrive; 175-mm arms; 20/32/42 rings; 11-24 freehub; thumbshifters
<b>Brakes</b>	SunTour XC Pro cantilevers with XC levers
<b>Other Components</b>	SunTour XC Pro pedals; Salsa cr-mo 15-cm stem; True Temper 56-cm steel bar; Quary grips; San Marco Titanio 200 saddle; SunTour XC 26.8 x 300 seatpost
<b>For More Information</b>	Bontrager Cycles, 104 Bronson St. #5, Santa Cruz, CA 95062; 408-427-2121

