

# BONTRAGER OFF-ROAD

• Keith Bontrager believes that steel has a future in bicycle design, and that the methods of constructing frames are antiquated, not the materials. The Bontrager Off-Road frame abounds with innovative, different and sensible approaches to building steel-frame bicycles. Most in-the-know off-road riders recognize Keith Bontrager for his fork design, narrow rims and trend-setting Kestrel Nitro, but Keith is primarily a frame builder—and his frames are something to marvel at.

## THINKING MAN'S CHASSIS

Experienced off-road riders can take one look at the Bontrager Off-Road frame and see the fruits of years of cyclocross, road and mountain bike experimentation. From front to back the Bontrager frame is a lesson in how to use steel to its fullest potential. The frame is constructed out of American-made True Temper ATX 4130 tubing, and Keith goes to extreme efforts to maintain the integrity of the tubing during the building phases. The frame's down tube intersects the head tube higher up than in most frames. Keith does this to isolate the welding heat from the bottom of the head tube (which can oval under hard riding) and to allow for less interference between the forks and down tube during tight turning. Gussets are added to the bottom of the top tube, down tube and chainstays. These gussets increase the strength of the tubes in these high-stress areas by 30 to 60 percent. Cable guides and water bottle bosses aren't brazed onto the frame—they are bonded and either riveted or bulge-fitted to the tube. By not torching the guides and bosses on, the Bontrager frame retains its original strength (unlike frames that have heat applied in these critical areas).

In building his bikes Keith analyzes not only the best way to make something work, but also how it is used. Little details add up to big differences. Even the Bontrager decals add function to the frame. The large decals protect massive areas of the frame from scratches, and the decals can be replaced without having to repaint the frame. All the control cables are top-driven to keep them out of the muck and mire. More intriguing is the roller-operated front derailleur. The roller is mounted in front of the derailleur, instead of behind it, to improve leverage and to allow clearance for a behind-the-seat tube pump. The MBA test crew has been complaining about the bulk of the current crop of seat binder quick-releases—they are too wide. The Bontrager comes with a hand-machined binder release that is narrow, light and ultra-smooth. Kudos.



## ADDED EXTRAS ON THE BONTRAGER

When Keith Bontrager set out to build his off-road bikes he didn't concern himself with marketing, color schemes or loop-de-loop frame designs; he worried the practical problems and came up with solutions that work in the real world.

**Mud clearance:** Nothing can compare to Bontrager forks for mud clearance up front, but at the rear wheel Keith used the experience learned at the National Cyclocross Championships to design a slim set of chainstays that shed mud. By eliminating the chainstay bridge, and replacing it with two small chainstay gussets, mud has a clear path to spray through, and the chainstays are stronger in the process.

**Chainsuck:** The worst part of chainsuck isn't that you have to get off the bike and pull the chain out; it's that the wedged chain gouges the thin-walled tubing, and eventually leads to frame failure. Bontrager repairs enough frames to see chainsuck as a threat to frame strength. The solution was to make a chain deflector, but not just a piece of stamped metal that fills the gap. The distance from chainring to deflector plate is critical, and each chainring tosses the chain from a different perspective. To solve the

*In the saddle: Keith Bontrager builds his off-road model with True Temper ATX tubing and unique construction techniques.*

problems, the Bontrager comes with independently adjustable chainring deflectors. They can be changed for different gearing combinations.

**Seat stay flex:** Another classy touch on the Bontrager Off-Road is the design of the wishbone seat stays. Bontrager takes advantage of the fact that wishbone seat stays (also called monostays) shorten the load path between the brake bosses and offer some structural advantages. On the flip side, they stick the rear end with the excessive wishbone material from the brake bosses to the dropouts. Keith uses beefy tubing for the wishbone and brake bosses and then inserts a doubler of smaller tubing to save weight between the brake bosses and dropouts. Very clean.

**Dropout failures:** Rear dropouts on the Bontrager Off-Road are uniquely different. Carved out of 4130 steel plate, the horizontal dropouts are a cantilever style (they attach mainly to the chainstays). The seat stays have a separate attachment that allows a wide variety of frame sizes to accept the standard parts. Very strong and very different. Horizontal dropouts allow the rider to

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**Manufacturer:** Bontrager Cycles, 342 Morrissey Blvd., Santa Cruz, CA 95062; (408) 462-0270  
**Sizes available:** 12", 14", 16", 18", 20", 22"  
**Finishes available:** Neon gray.

**Suggested retail price:** \$2500

#### COMPONENTS

**Front derailleur:** Shimano Deore XT.  
**Rear derailleur:** Shimano Deore XT.  
**Front brake:** Shimano Deore XT cantilever.

**Rear brake:** Shimano Deore XT cantilever.

**Crank:** Shimano Deore XT, 175mm, 46/36/24.  
**Freehub:** Shimano XT cassette, 12-28 T.  
**FRAME**

**Tubing:** True Temper AXT.  
**Head angle:** 71°.  
**Seat angle:** 73°.  
**Top tube length:** 22.75".  
**Chainstay length:** 16.9".  
**Brake-ons:** Dual water bottle.



#### FROM LEFT TO RIGHT:

**B-17 armor:** Gusseting under the top tube and down tube gives the Bontrager frame an added dose of structural integrity. Bontrager composite forks are housed in a standard 1" headset.

**Driven man:** Keith Bontrager uses the experience learned from his National Cyclocross Championship bikes to refine his off-road bikes. The top-driven cable guide is bonded and riveted to the frame. Keith's hand-made seat quick-release is the sleekest made.

**Beefed-up:** To make the most out of the monostay rear end, the Bontrager seat stays use a doubler to save weight and minimize bulk after the wishbone section. Special brake bosses are the strongest units made.

**Chainsuck:** To lessen the possibility of chainsuck a very special chain deflector is attached to the bottom bracket. The elimination of the chainstay bridge decreases mud buildup in wet weather.

select from a wider range of wheelbases and setups.

#### WHAT'S IT ALL ABOUT?

The best part of a Bontrager is the ride. Keith has produced a balanced package that has its own personal feel. Our 18.5-inch test bike has a 22.75-inch top-tube length and chainstays that are adjustable around a 16.9-inch mean length. The 71/73 head/seat angles hint towards an agile handler. The first thing you notice when you climb on board is that the 18.5-inch chassis is really set up for a larger rider (one who would normally ride a 19- or 20-inch frame). It has a long five-inch-reach stem and that quickens the steering even more than the 71-degree head angle. Ex-road riders were instantly at home on the Bontrager. The riding position mimicked a cyclocross or road position. The sec-

ond thing you notice about the 27-pound Bontrager is its responsiveness. This is a sprinter's dream bike. It leaps at each pedal stroke. The Bontrager/Mavic rims are equipped with Fisher Slimtrax 1.9 tires that accelerate with alacrity. On single track the Bontrager is a dart. The aggressive steering and forward riding style make it the perfect jammer's bike. As a test, we swapped the stock five-inch stem for the lower four-inch model (to bring the chassis specs closer to the physique of an 18.5-inch frame pilot) and rejoiced at the increased predictability. The quickness wasn't traded away, but it was enhanced by accuracy with the stem swap. The Bontrager is a bike with a tunable personality and the ability to accept a wide variety of body sizes.

What Keith Bontrager does with a steel

frame is a mixture of science, experience and American know-how. If you see a Bontrager on the trail, you'll know that it is the most carefully built and well thought-out steel bicycle on the planet. \*