





Peering inside

the heart

of DBR's

Welded

Carbon Fiber

Vertex

# MYSTERIOUS MARRIAGE

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By Joel Smith



The Stealth Bomber, Ronald Reagan's "Star Wars," NASA's space shuttle. All big-buck government programs with one common denominator: giant dollars pursuing even larger doses of technology. In comparison to those projects, the evolution of mountain biking seems relatively slow. Lately, though, fueled by an increase of fat-tire cyclists (read: increased capital) the pace has picked up. New materials are being created, and a twist is thrown in the ones that already exist. Diamond Back Racing's new WCF (Welded Carbon Fiber) Vertex fits into the latter category. Like Trek's 8700 frameset, which features carbon tubes bonded to aluminum lugs, the WCF Vertex features a mixture of carbon and metal, but this time it's chrome-moly and carbon fiber. Welded carbon-fiber frames have carbon-fiber tubes bonded to TIG-welded chrome-moly inserts. This process gives Diamond Back greater flexibility in choosing frame angles, cuts production costs and makes the frame lighter.

In spite of this promise of a new tomorrow from DBR, our basic questions about the WCF Vertex remained: Is it light? Is it inexpensive? And is it strong? Diamond Back answers the first question with the delivery of a sub-4-pound 18-inch frame. To put this in perspective, a similar frame in full chrome-moly weighs nearly three-quarters of a pound more. At any rate, using the lightweight frame as a starting point, Diamond Back's fully assembled Vertex WCF tips the scale at a mere 24 pounds.

While common sense (and the vast number of old chrome-moly bikes still shuffling through the dirt) points to in-



Joel Smith checks the Vertex's low-altitude handling and vertical compliance.

creasing durability by mixing chrome-moly with carbon, the bonding process between the carbon fiber and chrome-moly inserts may hinder some from buying the Vertex. Be assured, though, with three years of actual on-the-bike research and development behind the



A Bontrager bar is the platform for Grip Shift X-Ray shifters and Dia-Comp PS-11 levers.

WCF Vertex, a number of prototypes and engineering updates and a lifetime crash-replacement program and warranty, Diamond Back makes a promise of quality and high standards of production.

From the literature, I figured the WCF Vertex to be an interesting new offering, but at \$1200 I expected the componentry to be the weak link on the bicycle. At best, I guessed the WCF Vertex would sport a full Shimano Deore LX package. To my surprise, the Vertex featured the complementary face of Shimano's Deore XT derailleurs, Grip Shift's SRT800 X-Ray shifters, Answer Products' Manitou Comp fork and a host of other quality ingredients. I must admit, before I even gave the tires a full revolution, the Vertex had proved itself a hearty cycle.

## TROMPING

When the weather's gloomy, the trail mucky and the mood enthusiastic, I'm not merely pedaling down the trail. My two-wheeled call to nature in these conditions is a little more and a little better. It's *tromping*: deriving the maximum amount of pleasure regardless of peril to limb and machine. Riding a bike like the Vertex fits the tromping schedule to the T.

And why? The harder the Vertex is ridden, the more reactive the bike becomes. Slam the rear end, drive hard on the pedals, ram the length of the bike into a discouraging-looking hole and each time the Vertex reacts with



Welded carbon fiber standing patiently



compliant consistency. The first time I rode the Vertex, the bulk of the day was spent sweating up a discouragingly long and steep, rutted road. Because of the considerable elevation gain and lack of smooth track, each pedal stroke only pushed me from one obstacle to another. In that type of terrain, the Vertex is a natural. The chrome-moly rear end provides a stiff platform for making continual hard strokes. Every laborious push provides instant gratification, and the compact wheelbase makes surmounting obstacles a little bit easier.

When push came to shove and the shove part meant tearing my rear off the saddle, the Vertex again displayed its spry climbing abilities. The thick chrome-moly bottom bracket shell, sturdy Shimano LX crank and sealed Shimano bottom bracket suffers minimal flex under the severe weight of my near-200-pound frame. On technical climbs dominated by loose rocks and dry soil, though, the Vertex requires conscious aft weight distribution or a firm rump plant to keep the rubber biting. Pushing the wide Ritchey Vector ProLite saddle back on the rails helps as does the tractability of the Tioga Psycho rear tire, but try standing out of the saddle and the Vertex wants to break loose sooner than many.

The Vertex excels in the transitions from one turn to another and where sitting to standing required quick, precise movements. Each time I broke out of the saddle to spring up over the top of a small rise, the Vertex happily delivered a strong dose of boost. Short, hard strokes and then back in the saddle and up once again as the Vertex bit solidly into the dirt. Short-shifting the Shimano XT derailleurs a gear or two gave the Grip Shift X-Ray shifters a good workout, but the smooth function of both components left my hands feeling strong and ready for the next turn despite Diamond Back's super-hard foam grips.



Notice the taper of the seat tube, the riveted cable stops and the rather clean welds.

As speeds increase, the same qualities that make the Vertex a sturdy climber (short wheelbase, chainstays and stiff rear end) give the bike a skittish feel. Although the accurate steering and initial plushness offered by the Manitou Comp fork match the Vertex's ride characteristics, this elastomer fork's bouncy feel and speedy rebound tends to skip the front end around on larger bumps at speed. Unlike the Manitou Four, the Comp utilizes a single elastomer instead of a stack of bumpers. The entire elastomer on the Comp can be changed for different riders' weights and ride tastes.

At low speeds where rhythmless hard braking and rider balance are the difference between maintaining forward momentum and flopping on the trail, the bike again felt joyous. Not only do the Dia-Compe Power Control-11 levers tied to the Shimano Deore LX cantilevers provide a solid base for bringing the Vertex to a halt, but the overall solid-steering Manitou proves to be a more than able low-speed fork. In addition, while the front wheel is a little hard to loft, the whole bike can hop over nasty obstacles with ease.

Seating arrangements are favorable for a variety of riders, with our 18-inch test bike providing a suitable comfort level

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# SPECIFICATIONS

<b>Price:</b>	\$1200
<b>Sizes available:</b>	14, 16, 18, 20 in. (center to center)
<b>Size tested:</b>	18 in.
<b>Total weight:</b>	24 lb
<b>Frame weight:</b>	3 lb 9 oz
<b>Fork weight:</b>	3 lb 3 oz
<b>Front wheel weight:</b>	3 lb 10 oz
<b>Rear wheel weight:</b>	4 lb 5 oz
<b>Front triangle:</b>	Carbon fiber wrapped over chrome-moly inserts
<b>Rear triangle:</b>	TIG-welded chrome-moly
<b>Fork:</b>	Answer Products Manitou Comp
<b>Headset:</b>	Dia-Compe AheadSet, 1 1/4 in.
<b>Rims:</b>	Mavic 230 SBP with eyelets, 32-hole
<b>Spokes:</b>	DT Swiss, stainless steel, 14-gauge
<b>Hubs:</b>	Shimano Deore LX Parallax (front and rear)
<b>Cassette:</b>	Shimano HG-70, 8-speed, 11-28
<b>Tires:</b>	Shimano Psycho K with Kevlar bead, 26 x 1.95 (front and rear)
<b>Crankset:</b>	Shimano Deore LX 175mm, 22/32/42
<b>Bottom bracket:</b>	Shimano cartridge
<b>Shifters:</b>	Grip Shift SRT800 X-Ray
<b>Derailleurs:</b>	Shimano Deore XT (front and rear)
<b>Chain:</b>	Super Shuttle SS-90
<b>Saddle:</b>	Ritchey Vector ProLite with chrome-moly rails
<b>Seat post:</b>	Avenir light alloy with Dial-Adjust clamp, 350mm
<b>Brakes:</b>	Shimano Deore LX cantilevers and pads, Dia-Compe PC-11 levers
<b>Pedals:</b>	Diamond Back with Avenir clips
<b>Handlebar:</b>	Bontrager Titec, 580mm, Diamond Back foam grips
<b>Stem:</b>	Tioga Alchemy, 135mm, 10° rise
<b>Manufacturer:</b>	Diamond Back, 4030 Via Pescador, Camarillo, CA 93012, (800)776-7441
<b>GEOMETRY</b>	
<b>Seat tube:</b>	18 in. (center to center)
<b>Top tube:</b>	22 1/2 in.
<b>Head angle:</b>	71.5°
<b>Seat angle:</b>	74°
<b>Chainstays:</b>	16 1/8 in.
<b>Wheelbase:</b>	41 1/4 in.
<b>Fork offset:</b>	1 1/2 in.
<b>Bottom bracket height:</b>	11 1/2 in.

for most people over 5 feet 7 inches. The Tioga Alchemy forged-alloy stem offers a nice 10-degree rise, and with the nearly 9 inches of seat-height adjustment on the Avenir post, the Vertex will fit larger riders who like a top tube a fair distance from spearing range. The Avenir Dial-Adjust clamp for the wide Ritchey Vector seat is there for you to make nose-height adjustments on the fly, but the small indexed knob requires Herculean strength to budge.

## ABOUT THE VERTEX

With mysterious metals multiplying in the bicycle marketplace like mosquitoes on a squalid pond, it's no surprise to hear of additional technowizardry coming from Diamond Back. Essentially, the Vertex follows the basic mold of Trek's 8700-series bicycle. Except where the 8700 uses carbon-fiber tubing bonded to aluminum lugs, Diamond Back bonds the chrome-moly inserts to the carbon-fiber tube and TIG-welds the fully built tube together. According to Vertex designer Brent Graves, making entire lengths of homogenous tubing and then welding gives the Vertex its strength and vibration-soaking capabilities.

Construction of the carbon-fiber main tubes begins with weaving three consecutive levels of fiber. The first level is weaved at 90 degrees, the second is weaved unilaterally and the third is weaved again at a

While not the lightest boy on the block at 24 pounds, the Vertex tucks easily under arm for portage.





90-degree angle. In effect, the unilateral weave provides a pure strength factor while the angled weaves increase impact resistance. The hardening resins are then vacuumed through the tubing under constant pressure and heat.

After the weaving and resinating process, the tubes are cut and machined at the ends to fit the insert. Since the tubes are bonded to the chrome-moly insert, we were concerned initially with frontal impacts forcing the chrome-moly inserts through the carbon fiber like a splitter through a log. "Since the bond is stronger than the surrounding material, the carbon or the metal will give before the bond does," Graves claimed. In addition, because of the three-weave process, the carbon is unlikely to fracture or splinter.

Diamond Back initially had to overcome a barrage of obstacles, including finding the proper chrome-moly insert length to dissipate heat from welding (which would scorch or weaken the carbon fiber), perfecting the bonding process on the insert to the carbon fiber and producing the straightest frame possible because the alignment cannot be cold-set after welding has occurred.

## BUDGE IT

In general, the Vertex would best suit an amateur or expert-level racer on a budget (or someone who wants to spend the extra money on components). Usually, buy-



The DBR welded carbon-fiber frameset combines the weight savings and stiffness of a composite with the ease of assembly and versatility of TIG-welded chrome-moly joints.

ing a bike in this category has serious deficiencies. The derailleurs will be scrap-metal quality, the tires a less vulcanized version of inner tube, and the entire bike will weigh more than a Japanese four-door sedan. The Vertex sports a nice combination of quality (Shimano 8-speed XT derailleurs) and durability (Mavic's 230 rims with DT stainless steel spokes) and still packs a relatively light punch. Buying a set of bar-ends and upgrading from the Diamond Back clip pedals to clipless will assuredly raise the level of performance but isn't altogether necessary.

Although I hate to admit it, not too long ago I took zeal in ridiculing big bicycle companies like Diamond Back. I admired the garage builder who made one bike a year as the moral and intellectual equivalent of Albert Einstein. But the reality of the situation is this: Big bicycle companies are good. No. They're great! Not only do they have the money to develop better products for us, they can create a great frame, throw on top-notch components and still sell it at a smokin' price. Such is the case with the Vertex, where you get more than your money's worth from a new twist in the mixture of dissimilar materials. ■

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