Taking on the rigid-frame Goliath

SLINGSHOT

In this day and age of mass conformity, where the virtues of being just like everyone else are found in the certainty of uniform thought and action, it's pretty tough to buck the trend and stand out as something different. In the world of large-scale bicycle production and sales, where something different can very quickly be labeled as something wrong and hence unprofitable, there is not too surprisingly a great degree of conservatism to be found in the attitudes of bicycle designers. With road bikes, the headstrong classical European philosophy on what does and doesn't work still directs and limits the sport to some degree. However, as an American creation, mountain bikes luckily do not suffer from such stodgy mentalities. In a country that gave birth to such social phenomena as rap music, Jim and Tammy Bakker and the exploits of Pee Wee Herman, certainly the question of deviance and conformity is no longer one found on the front burner of social thought!

Enter the Slingshot mountain bike. If ever you have the desire to pass yourself off as an unabashed deviant, take a Slingshot out to the next mountain bike race and watch people react. Not since the *MBA* wrecking crew tested the Trimble Carbon Cross have we attracted such attention from both the cycling and non-cycling public. It really says something about a bicycle when people who know nothing about them stop dead in their tracks and stare—trying to figure out what's wrong with the picture. With the Slingshot, there is nothing wrong with the picture; it's just a different picture. The Slingshot mountain bike uses a suspension system unlike that of any other bike on the market today. The concept is an amazingly simple one, but one that needs to be fully explained in order to be fully understood.

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THE MOST COMMON QUESTIONS

MORE THAN MEETS THE EYE

• How many times do you have to look at something before you realize that it's not what you think it is? With the Slingshot it always takes a few looks followed by a few questions, then a few more looks—close up. The Slingshot invites discussion even when it's just leaning up against a wall. The discussion sounds something like this . . .

QUESTION 1:

Why isn't there a down tube?

No, your eyes are not playing games with you. The Slingshot does not have a down tube—a traditional down tube, that is. What it does have is a steel cable which runs from the inside of the top tube and attaches to the bottom bracket. The cable, which employs a spring inside the top tube for tension, works along with a composite joint (or spring plate) that's integrated into the top tube just in front of the seatpost. What's the sense of all of this you ask? Slingshot founder Mark Groendal came upon the concept in a very non-traditional manner, but then what else would you expect for such a non-traditional bicycle? He recalls, "As a kid I had a rigid-frame minibike and all my friends had bikes with suspension. It was a real drag trying to get through the rough stuff, and one day my frame broke. I kept riding it for a while and noticed the suspension quality of the top tube flexing. Years later when a friend of mine got into BMX racing I thought back to my minibike and tried to employ the suspension qualities of the broken frame in a lightweight suspension system for bicycles. At first I cut up an old downhill ski and incorporated it into the top tube without a down tube, but that was too flexible. So to control the flex I installed a pair of cables and springs. Over the years I just kept refining the design to the point I'm at now."

QUESTION 2:

What are the benefits of a shock-absorbing bicycle?

Like off-road motorcycles, mountain bikes are a vehicle that can definitely be benefited by a suspension system to soak up the rough terrain that the bike was intended to travel over. Unfortunately, no one has been able to come up with a workable design that is light enough to make the system worthwhile. The Slingshot offers definite suspension qualities without the added weight or complication of using traditional shock absorbers and linkage systems. The suspension on the Slingshot was most noticeable when hitting the face of steep jumps and on the subsequent landing. The rough edge usually associated with such encounters all but disappears with the working trio of the coil spring, spring plate and (down) cable. After a long ride this will usually leave riders feeling a lot less tired, since they're putting out less energy to control the bike.

The one curious thing about the effects of the suspension system on the Slingshot (which would also occur on a bike with the more common form of rear suspension) was how the frame angles change under load. Due to the tube rotation that occurs when the suspension is loaded, the 73.5-degree seat angle steepened to 74.8 and the 68-degree head slacked off to 67.4. The *MBA* wrecking crew found that despite the slackening of the front end, it was still best to ride with our weight over the front to keep it tracking consistently. The 12-inch bottom bracket may seem high, but again with the suspension loaded it drops to 11.5. It could use another .25 inches of height just to be safe.

QUESTION 3:

Wouldn't flex be a problem with the design?

It's important to remember that the true essence of the Slingshot is found in its function, not its form. "I studied a lot about frame flex and power sources from books on physics," says Mark. "It was tough at first when we would take the bikes to shows and people would walk by and say 'neat idea, but you're wasting your pedaling energy with all the frame flex.' We disagree. There are basically two ideas out there about frame flex. We think the rider is able to store energy by compressing the coil spring at the top of the power stroke and then utilizing the energy returned in the bottom of the power stroke. With no friction on the coil spring, all the energy that's put into it quickly comes back within the same power stroke."

In essence, the rider is using the flex of the frame to his advantage by storing the energy of the pedal stroke. The Slingshot frame has controlled flex by varying the tension of the coil spring and cable with three different-weight coil springs that are available for different-weight riders. There is also a metal plate that is welded into the inside of the seat tube to decrease lateral flex. Our test bike was set up with a coil spring that would work with a rider in the 150-pound range, and the frame flex was barely noticeable under hard pedaling. A springing sensation could be felt, but it wasn't distracting. However, when a rider who weighed upwards of

SPECIFICATIONS

Model: Slingshot single cable.
Manufacturer: Greendale Bicycle Co., 41 Commerce S.W., Grand Rapids, MI 49503; (616) 451-9828.
Sizes available: 16", 17", 18", 19", 20", 21", 22".
Finishes available: Custom splatter.
Suggested retail price: $1700.
COMPONENTS
Front derailleur: Shimano Deore XT.
Rear derailleur: Shimano Deore XT.
Front brake: Shimano Deore XT cantilever.
Rear brake: U-brake, seat stay-mounted.
Cranks: Shimano Deore XT-175mm, 48, 38, 28.
Freewheel: Shimano cassette 13, 15, 18, 21, 25, 28.
FRAME
Tubing: True temper 4130 chromoly.
Head angle: 70°.
Other head angles available on request.
Seat angle: 72°.
Top tube length: 22-3/4".
Chainstay length: 16-3/8".
Braze-ons: Single water-bottle bosses, rear rack eyelets, pump pegs available on request.

NOTE: The MOUNTAIN BIKE ACTION test crew rides its test bikes under controlled circumstances, on private property and with respect for the environment. No wilderness or environmentally sensitive areas are used.

Keep it in line: Some MBA test riders were bothered by the flex of the Slingshot though it wasn't bad enough to keep them from taking chances riding it! At times the rebound of the suspension did put the bike into unplanned situations. If you have the time to get used to the bikes handling characteristics it would make a good race bike, but it's best suited for recreational riders who could better appreciate the plush ride without sacrificing performance.

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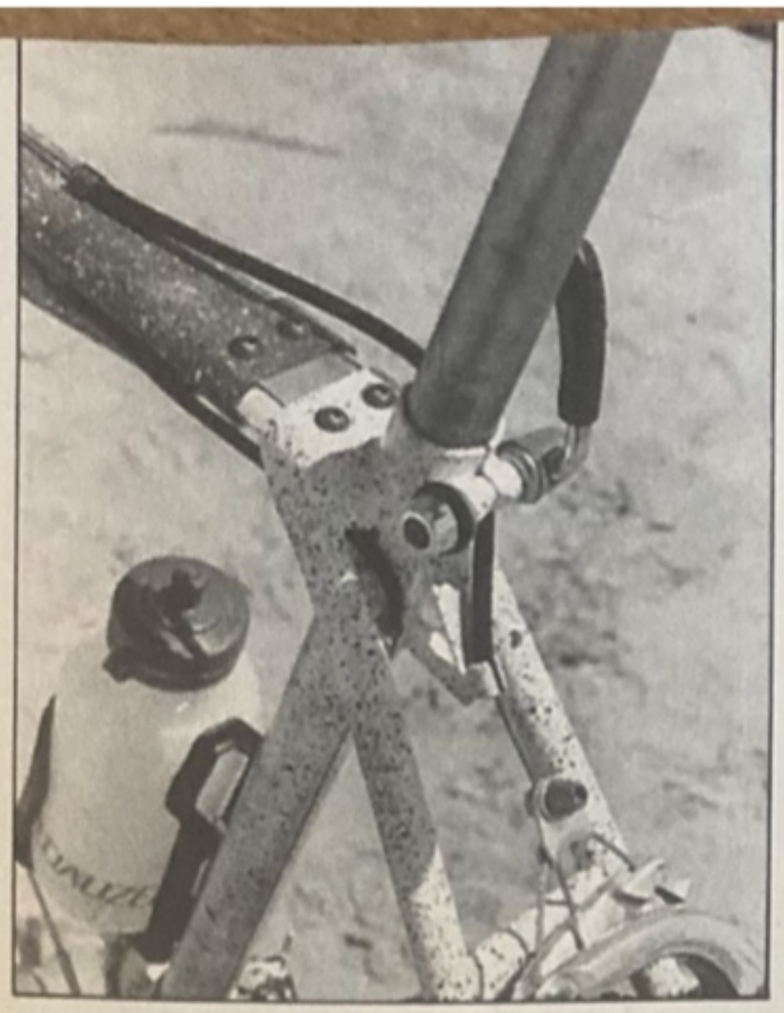
200 pounds rode the bike, there was a noticeable amount of frame flex and springiness.

QUESTION 4:

Is the bike best suited for any specific types of riding?

Although the Slingshot has enjoyed some success in racing circles, we think the bike is ideally suited for recreational riders/racers. The bike takes some getting used to, and a rigid frame would probably be a better choice for a serious racer who depends on consistent handling. The suspension does provide a smoother ride, which translates into a faster ride, but *MBA's* Expert and Pro class test riders were bothered by the springing encountered, especially in aggressive downhill situations. They also admitted that they were accustomed to the ride of a rigid bike and could better rely on the learned traits of a non-suspended ride.

For the recreational rider the Slingshot is a great bike. Hitting bumps and holes is made much more livable by the suspension system. There is a reason that only 100 of these bikes are made each year—they are all custom-made to the buyer's specifications. Color, head and seat angles, top-tube lengths, and components are the buyer's choice. If we had our choice, we'd like to see the bike come equipped with more than one water bottle mount, which, due to the frame's design, may be the bike's only serious limitation, especially when it comes to the touring market where the Slingshot should be a serious consideration.



The backbone of the system: Originally made out of an old snow ski, the carbon fiber spring plate is both flexible and strong—it has to be for the frame to work. Craftsmanship and detail work on the Slingshot are first-rate and the bikes enjoy a lifetime guarantee against breakage. The only inherent flaw with the Slingshot is there is only room for one water bottle mount.

Pin it down: The downtube cable attaches to the bottom bracket of the True Temper chromoly frame. Slingshots are also available in a two cable model which is both heavier and springier than the single cable model. We never encountered any problems with any of the specialized frame parts—the only thing to be careful of would be an errant pair of cable cutters!

QUESTION 5:

How well is the rest of the bike laid out?

If American cars are being built with the same level of craftsmanship as the Slingshots, they should have no problem selling. The 4130 True Temper chromoly frame enjoys excellent welds and finishing of the suspension parts. The one-inch-diameter straight blade forks provided a solid feel with precise steering and excellent tire clearance. Un-

What goes in the hole? Resting out of view inside the top tube is a heavy coil spring which is available in different weights to accommodate various weight riders. The suspension system is incredibly simple in its operation. All the cables use slotted guides for easy maintenance.

Have it your way: Since each bike is custom made to the buyer's specifications all of the components will vary. Our test bike was equipped with a Shimano U-brake in the rear and it worked well. Rear wheel clearance was very good at the seat stays, but only minimal at the chainstays. ►

fortunately, the same can't be said of the rear tire clearance. Even with the seat-stay-mounted U-brake, tire clearance was minimal behind the bottom bracket. Part of this problem may be owed to the extremely short (16.25-inch) chainstays. With the short chainstays and a 23-inch top tube (on a 20-inch bike), the rider would have a tendency to keep his weight back, but again should try to keep it forward to avoid oversteer.

QUESTION 6:

What does the top tube hinge accomplish?

The hinge is actually a spring plate which is integral as both a stress relief and component of the suspension system. The composite piece is made with an epoxy resin with fiberglass and Kevlar layers wrapped with stainless steel. The hinge absorbs shock from all directions and the wrecking crew never encountered any problems with it. If we had, the plate, like the rest of the frame, enjoys a lifetime guarantee.

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QUESTION 7:

How different is different?

The Slingshot may look radically different from any other mountain bike available today, but in practice it's really very much the same. The suspension works and was nice to have, especially when landing from jumps crooked. These were instances when we would've most likely been thrown off the bike, but instead were saved by the system soaking up the landing. Ironically, some testers felt that the same suspension which saved them from crooked landings would also on occasion cause them, when the bike would spring off a jump and kick the rear end out. This was exactly the phenomenon that our more experienced riders complained about.

As noted psychologist B.F. Skinner once noted, "The race advances only by the extra achievements of the individual. You are the individual." If Dr. Skinner was talking about mountain bikes, the individual he speaks of could most assuredly be the Slingshot bicycle. It is a positive step in the re-engineering of mountain bike design, a positive step in what many people predict there will be a growing foot race to bring workable suspension systems to the world of off-road cycling. □