



# WILD & WEIRD BIKES



## PROTOTYPE PASSIONS HORST LEITNER'S WERKS FSR

● By now, everyone has heard about the growing relationship between the sport of motocross and mountain biking. We have seen many former motocrossers turn to pedals, bringing with them their own ideas of what a mountain bike should look like and how it should perform. For some, the invasion is the answer to their prayers, while for others, it is tantamount to an attack by the Mongol hordes.

Of all the historical institutions that have been revered in the sport of motocross, few have attained such levels of idolatry as the exotic machinery known as the "works" bikes. These were the bikes used by the best factory riders, and got their name from the German word *werks*, which refers to the inner sanctum of the factory. At every motocross race the fans would gather at the fence surrounding the pits, waiting for the factory exotica to be wheeled out of the box vans. Stealing a glimpse of one of these bikes was like getting a chance to look into the future. The works bike played a role as the rolling test bed of those technical innovations that had yet to appear on the dealer's floor. They differed from what everyone else rode in almost every category: styling, engine modifications, suspension designs and braking systems.

Despite the significant role that each individual works bike played in developing new technologies, their final days, like the dinosaurs', were predetermined by outside forces. Secrets, both good and bad, were hidden in each works bike, secrets that couldn't be allowed to get out. Obligated to the future, the manufacturers felt no need to preserve the past, and inter-factory rivalry left no room for sentimental attachment; at the end of each season the works bikes were unceremoniously demolished in a crusher. Eventually, the works bike disappeared for good when many of the factories grew tired of spending huge sums of money developing technology for a dwindling market.

### THE SENTIMENTAL DESIGNER

Horst Leitner is one of those motocross guys who has moved into the world of mountain biking, and he has undoubtedly brought more throttle-twisting baggage with him than any other of his ilk. His company, AMP Research, has designed bikes or parts for such manufacturers as Mongoose, Rocky Mountain, Univega and Specialized. A motorcycle designer, Horst is well-versed in the history of works bikes and what eventually becomes of them. Lucky for us, he doesn't have access to a crusher!

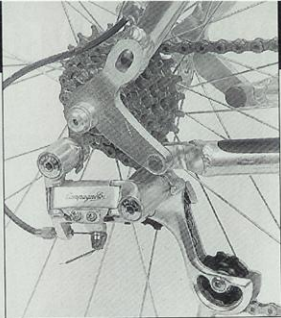
Horst played a big role in helping Specialized design its latest full-suspension bike, the S-Works FSR. While developing the suspension concepts for Specialized in his Laguna Beach (California) design stu-

*Works FSR: Suspension designer Horst Leitner built himself a super-sano, lightweight, all-aluminum, prototype Specialized FSR while he was designing the suspension system for them. Weighing in at 26 lb., the ultra-trick FSR is the full expression of the designer's wish list.*

dio, he decided to build his own *werks* version of the bike. He wasn't sure just how the production Specialized would turn out, but he knew what he would like it to look like. Horst's *werks* FSR is as close to the original concept as possible—it is the ultimate expression of what went through the inventor's mind. For him, the task was simply to build a bike so that there would be some record of what he envisioned. Seldom does the buying public get the chance to see the seed that their own bike sprouted from, but that is not true in this case.

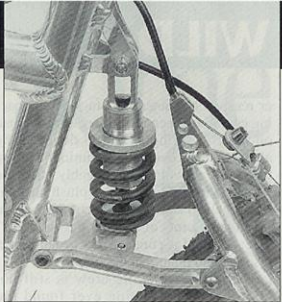
### DEFINING THE BIKE

The major difference between Horst's bike and the one that Specialized is planning to release is that the *werks* frame is made entirely from aluminum. The S-Works FSR is slated to have a Prestige chromoly front triangle mated to an aluminum rear section. The unique rear-suspension system springs from several sources, including Formula I cars and Grand Prix motocross bikes. The rear swingarm (chainstays) attach to the seat stays via the pivoting "Horst Link." As the seat stays move up they compress a wishbone-shaped A-arm linkage, which



**Horst link:** Perhaps the most imitated element of a Horst Leitner suspension design is the "Horst Link." By pivoting the seat and chainstays at the rear dropout, the link eliminates the torque forces of braking and pedaling from the suspension system.

could be compared to the rising-rate linkage on a motocross bike or the coil spring/damper suspension arms of a race car. By careful positioning of the linkage Horst was able to obtain a straight rate curve for the oil-damped thru-shaft shock. The coil spring comes from Eibach, spring supplier to the Ferrari Formula I team, and the complete shock (built by AMP Research) is positioned behind the seat tube so as not to interfere with port-



**AMP shock:** The rear triangle gets its rigidity from the wide mounting and multiple pivots of the machined aluminum A-arm shock linkage. The shock is an oil-damped, thru-shaft shock that is operated by the straight-rate suspension linkage. The seatpost QR is machined out of a solid block of 6061. Very trick.

aging, water bottle placement or the rider.

The system is both deceptively simple and complex.

### ON THE TRAIL

How would we describe the ride? Initially skeptical about all the pivot points, test riders came away very impressed with the bike's solid handling.

The straight-rate shock provided three inches of active suspension, and though it biopaced at times in the middle ring, it nev-

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# WILD

er reached an unnerving stage (as biopacing could be lessened by increasing preload on the coil spring). Due no doubt to the abundance of oversized aluminum tubes, the frame provided a noticeably stiff ride which, with the aid of the plush suspension, enabled some test riders to talk about the bike in terms of it being the "ultimate" bike: stiff and accurate when pedaling, yet resilient and pliable in the rough.

While the wrecking crew is still not laying claim to having ever found the "ultimate" bike, the search is no doubt starting to pay off. Horst's 26-pound *works* bike is a good example of the evolution of mountain bike technology, and it's most evident in the design improvements that have come from the most prolific suspension guru. Not only has he advanced and improved with each design, but so has the suspension bike as a whole. We are not sure what the flower this seed gave rise to will look like when it arrives in production form, but at least we have an idea from where it came. Lucky for us, Horst recognizes the importance of holding on to artifacts of the past, to show what might have been and from whence it came. This is one *works* bike that won't find its way to an unceremonious demise in the crusher. ●