

**60-HORSE HONDA CRF450: CAN THE OTHERS MEASURE UP?**

**\$25 FREE GIFT INSIDE!**

# **MOTOCROSS**

MX ACTION

CCC 02970

**GIANT TEST ISSUE:**

**CRF270 • YZ125  
TM 450 • CRF450 • RM-Z250  
KTM 500 TWO-STROKE**

**ENTHAL MAGAZINE**

MAY 2013



**HONDA CRF450  
MODIFIED MADNESS**

- **KTM'S ONE-OFF MASTERPIECE**
- **6D HELMET: THE SAFEST LID?**
- **CHEAP SPEED: SAVE \$—GO FAST!**

\$4.99

0 71486 02970 0 05

Attn: retailer: Please display until May 16





# THE BIKE THAT NEVER WAS

A wild design with an even wilder back story

By Jody Weisel

**N**o one can be everywhere, so I consider myself lucky to have been standing in a ramshackle industrial building on Laguna Canyon Road back in 1989. I was lucky because, on that day, I got a chance to see a glimpse of moto-cross' future. It was 23 years ago, but in many ways I remember all the details that my friend Horst Leitner laid out on the large drafting table in his office. What he showed me was a super-secret project bike that he had been commissioned to build for a major motorcycle manufacturer. He didn't want to tell me who had hired him, but I didn't need a deerstalker hat and calabash pipe to deduce that

KTM was his sugar daddy.

He also didn't seem concerned that he had shown his "super-secret" project to me, a magazine test rider. He wanted more input and felt that someone should act as a sounding board in case he got too far afield.

**"AS FOR ME, I WAS A LITTLE MORE MERCENARY. I KNEW THAT, SECRET OR NOT, WHEN THE BIKE WAS DONE, AND BEFORE HE SHIPPED IT TO AUSTRIA, HORST WOULD LET ME RACE IT."**

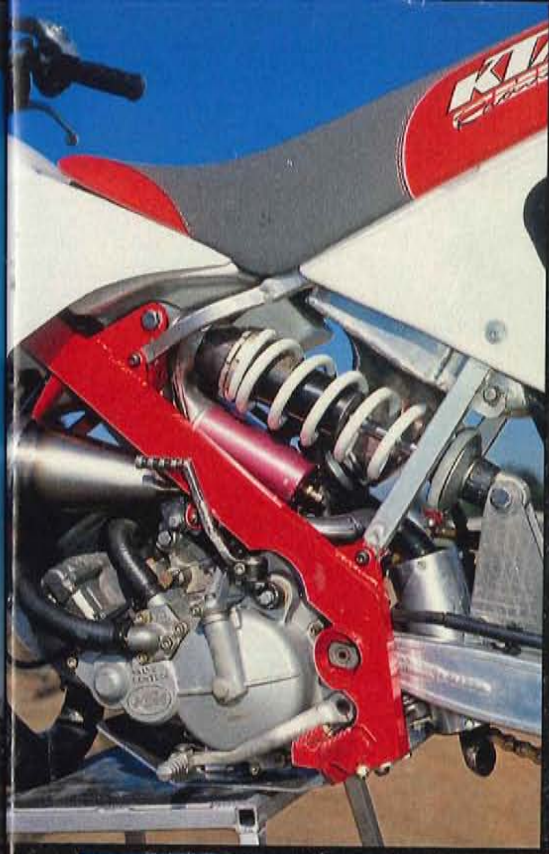
As for me, I was a little more mercenary. I knew that, secret or not,

when the bike was done, and before he shipped it to Austria, Horst would let me race it, then shoot photos of it, and finally do a story on it. But, we are getting ahead of ourselves.

The story began at the 1989 International Motorcycle Exhibition in Milan, Italy. Horst Leitner had flown from Laguna Beach, California, to meet with the new corporate managers of KTM. The Austrian motorcycle firm had been taken over by a large holding company, and the new owners were looking for ways to improve the stodgy, almost nonexistent American image of their new venture.

Leitner, an expatriate Austrian,





had built a reputation as the most successful freelance motorcycle designer in the world. His Laguna Beach-based AMP Research firm had turned out design concepts, ideas and complete motorcycles for a wide range of uses. He had negotiated with Harley-Davidson to build a military motorcycle for them to show to the U.S. Army. He had built a one-off prototype for Can-Am to replace their atrocious private-labeled Armstrong bikes. When Can-Am folded their motorcycle line before the deal was done, he supplied his prototype to the

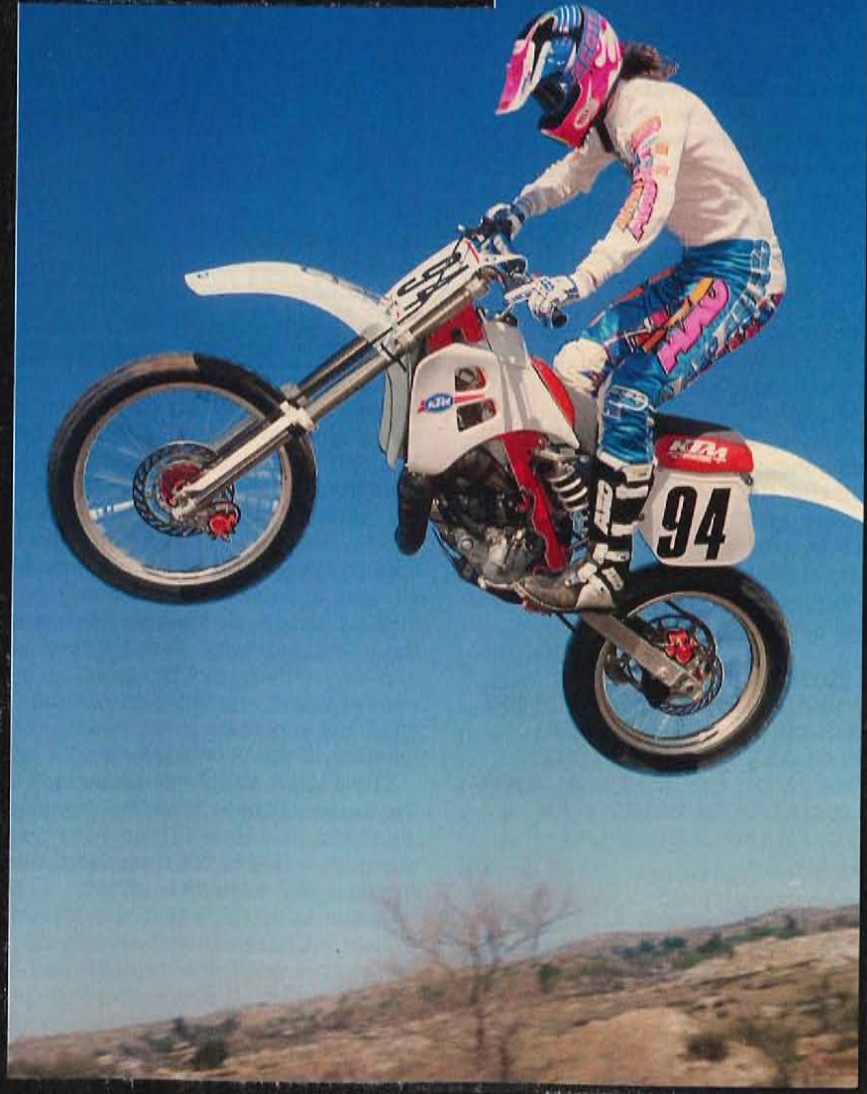
now-defunct Can-Am motorcycle dealers as the ATK 406 two-stroke. Horst's ATK 560 and 604 four-strokes sold in such numbers that his little Laguna Beach factory became the fifth largest manufacturer of motocross bikes sold in the USA. He built kits, a la Rickman, that provided a complete rolling chassis to accept Honda XR engines. He was contracted to build the PBH/Scott RG560 four-stroke for Great Britain, and he eventually went on to pioneer the development of full-suspension mountain bikes, designing the Specialized FSR and later selling his many mountain bike patents to Specialized.

If you were looking for one man with the knowledge, track record and workshop capable of building a prototype motorcycle, Horst Leitner was the man to see in 1989. I had been friends with the previous KTM owners and had spent time at the Mattighofen factory, but heading into 1989, KTM was floundering financially. They were bought by GIT Trust in the first of what would prove to be a series of disastrous takeovers. Eventually, Stefan Pierer's Cross Industries got control and turned them around. It was the GIT Trust that approached Horst Leitner in Milan.

**"THE NEW INVESTORS DIDN'T WANT TO TRUST THEIR SIZABLE INVESTMENT TO THE SAME MEN WHO HAD FAILED TO DELIVER FOR THE OLD OWNERS."**

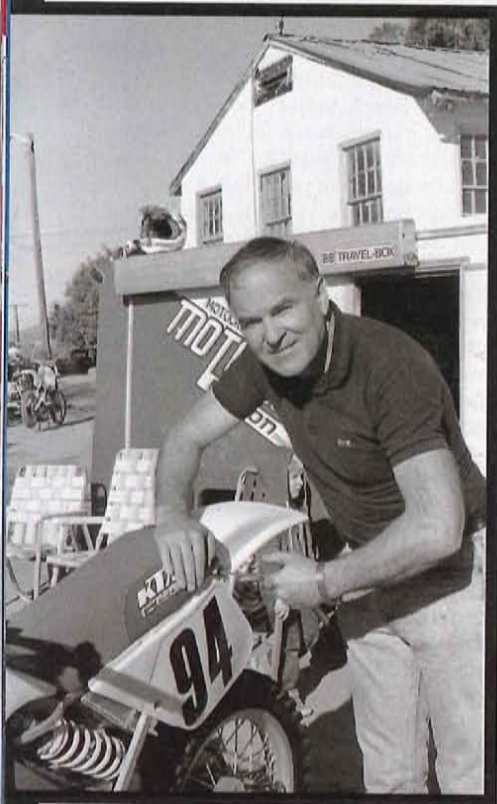
Given that Horst Leitner was a former Grand Prix motocross racer, holder of four ISDT gold medals, owner of a casting company that did business with other European motorcycle manufacturers, and was part of a family of racers who were also the Suzuki car importers in Austria, he was the best choice for KTM's new bosses to approach with an offer. He was an outsider who was an insider. So, in Milan, GIT Trust's managers asked AMP Research to build them a prototype for possible production in 1991. The carrot at the end of the stick wasn't the money that KTM agreed to pay Horst for the one-off machine, but the chance to design future KTM models.

The logical question was, why was KTM's management going outside of their own corporation to hire an independent motorcycle designer? After all, they had designers and engineers in their employ in Mattighofen. But,





# THE BIKE THAT NEVER WAS



*Horst Leitner has designed more motocross bikes than any other freelance designer. Here, he puts some finishing touches on the AMP KTM 125.*

the new investors had every reason to be suspect of KTM's in-house staff. After all, they had purchased the company after it failed because of less-than-stellar products. They didn't want to trust their sizable investment in the company to the same men who had failed to deliver for the old owners. So, they wanted to bring in a Pro from Dover, a ringer.

It is possible that they chose Horst Leitner as a way of showing the in-house designers that their jobs weren't safe. The new owners thought their designers were lethargic and reasoned that outside competition would wake up the Austrian design team. The decision to ask Horst Leitner to design a totally new bike had more to do with bureaucratic politics than a search for creativity. Better than anyone, Horst understood that his hiring was a slap in the face of the workers at the factory—and that he would be making enemies of his former friends at Mattighofen. But motorcycle designers live for the opportunity to design, and the lure of building a prototype on someone else's dime was too hard to resist.

I spent a lot of time at the AMP Research factory in

Laguna Beach. First, because it was at the beach, and second, because Horst was always building something unique. What he had planned for KTM was something very special, way ahead of its time, and a precursor of what was to come to the world of motocross racing a few years later. Today, the bike looks dated, as any bike manufactured in 1990 would; however, if you look closely, you can see that Horst Leitner wasn't operating by the same playbook that everyone else was using.

He told me that his goal was to "build a motorcycle that was cheaper to manufacture, 10 pounds lighter, better-handling, easier to work on, incredibly narrow, and advanced enough to stay contemporary for a decade or more." Since Horst Leitner raced every weekend at the same tracks as the MXA gang, we soon knew more about the AMP Research KTM 125 prototype than anyone at KTM.

Horst was under several constraints in his deal with KTM. He had to use as many existing KTM components as possible, and that included the forks, wheels, swingarm, brakes, ignition and complete KTM 125 two-stroke engine. These were nonnegotiable parts, but everything else was fair game—and Horst played fast and loose with the rules.

**"HORST CALLED IT A 'PARALLAX' FRAME, BECAUSE THE TWO TUBES SEEMED SO CLOSE TO EACH OTHER THAT YOU COULDN'T ALWAYS DISTINGUISH WHAT WAS THE FRAME AND WHAT WASN'T."**

The AMP Research KTM 125 was incredibly small. Not small as in petite, but every aspect of the AMP Research bike was considerably smaller than comparable parts on other 125s. The frame was something that Horst called a "parallax" frame.



*This cardboard mock-up is what the AMP Research 125 was supposed to look like when it was completed. At this stage it lacks most of the finishing touches.*



*This is the finished product before it was shipped to Mattighofen. Although it bears a resemblance to the mock-up, virtually every part was tweaked.*

It was made up of only three main tubes, plus the stock KTM head tube. The two backbone tubes were large-diameter, rectangular, chromoly spars that were straight and true—sans any bends. Why was it called a parallax frame? Because the two tubes seemed so close to each other that you couldn't always distinguish what was the frame and what wasn't. There was very little frame, but what existed was triangulated to use the KTM 125 engine as a stressed member of the overall layout.

The engine actually hung under the frame and was protected by an aluminum skid plate. There were no downtubes on Horst's frame, and the footpegs and swingarm pivots mounted to uprights that also served to hold a CNC-machined aluminum bridge that tied the bottom of the frame together. It was a simple design, but it was complex engineering. To remove the complete engine from the AMP Research 125,





*In motion the AMP Research 125 prototype was sleek, slim and trim. Although it was a full-size race bike, the bike was only 10 inches wide at the gas tank/seat juncture. Leitner built the bike as a design exercise, but it could be ridden.*

all a mechanic had to do was pull the swingarm pivot bolt and front motor-mount bolts. Gravity took care of the rest.

The unique chromoly frame came seven years before the era of Twin Spar aluminum frames. Ahead of its time, the parallax frame was the most visible part of the 125 prototype, but not the most inventive. Here is a list of other creative ideas.

**Design.** The bike itself was space-age. There was no other bike like it on the market. It was wild. It was weird. It was cutting-edge. The AMP Research KTM 125 prototype was incredibly narrow, and almost every aspect of the bike had been downsized to make it sleeker.

**Dimensions.** The complete bodywork was only 10 inches wide at the rider's knees.

**Gas tank.** The hand-made aluminum gas tank plugged down into the main tubes of the chromoly frame and carried more gas than the conventional tanks of the era but looked smaller. It did use a KTM gas cap per edict.

**Radiators.** There was only one radiator—on the right side of the bike. On the prototype, it was small, but the design called for a longer radiator if the bike went any further than the one-off stage.

**Exhaust pipe.** The exhaust pipe went up into the space where the left-side radiator would have been—if there had been one. The exhaust system did not extend out of the rear of the bike. Instead, it snaked over the left side of the engine, and the stinger and silencer were tucked down through the opening in the swingarm where the shock would normally sit. The silencer wasn't exposed to any damage, and the exhaust note was directed straight down into the dirt. Horst even did deep-water testing to ensure that the exhaust pipe would work under water. It did.

**Shock.** There was no shock linkage. Instead, the WP shock was mounted on the left side of the parallax frame and to aluminum bosses welded on the stock KTM swingarm. It was a no-link, single-shock design that obviously affected future KTM suspension designs. As with all no-link, single-shock designs—of which this was the first major effort—the shock could be removed by loosening two bolts.

**Drivetrain.** The stock KTM engine had right-side drive, with the chain on the opposite side of the bike compared to modern machines. This layout is what gave Horst room to run

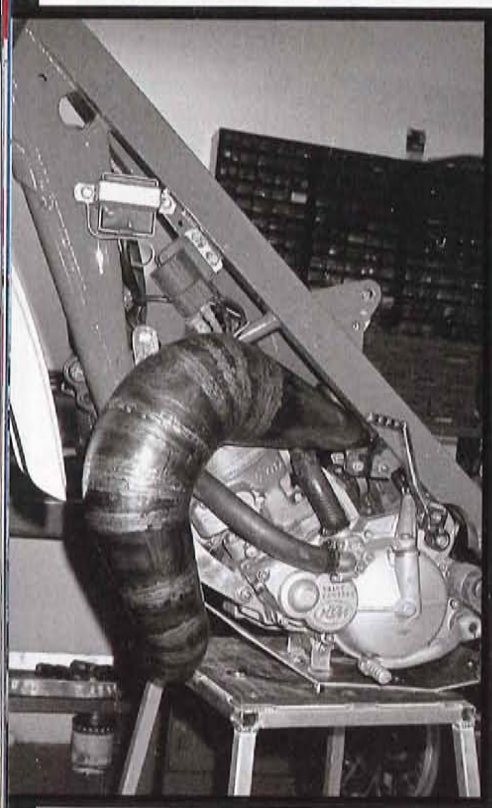
the exhaust pipe down the left side of the engine and to install his anti-chain torque AMP link chain rollers. The science behind reducing chain torque is complex. Only the late Eyvind Boyesen and Horst Leitner had any experience with trying to defeat chain snatch. For KTM he built the bike so that the AMP link could be used or disabled.

**"FINALLY, I TOOK A PIECE OF CARDBOARD, CUT IT INTO SHAPE, AND THEN USED A MAGIC MARKER TO DRAW IN VENT HOLES."**

I was there the day the rolling chassis came out of Horst's workshop and into the sun for the first time. Horst liked to work from large blueprints, and they showed that he intended to use the KTM's stock radiator wings. I told him that the small radiator and snake-style pipe might require bigger radiator wings to draw more air into the engine. He loved his blueprints, and we argued back and forth. Finally, we went outside to look at the bike. I took a piece of cardboard and cut it into the shape of wraparound radiator shrouds. Then, I used a Magic Marker to draw vent holes on it. He looked at it for a few



# THE BIKE THAT NEVER WAS

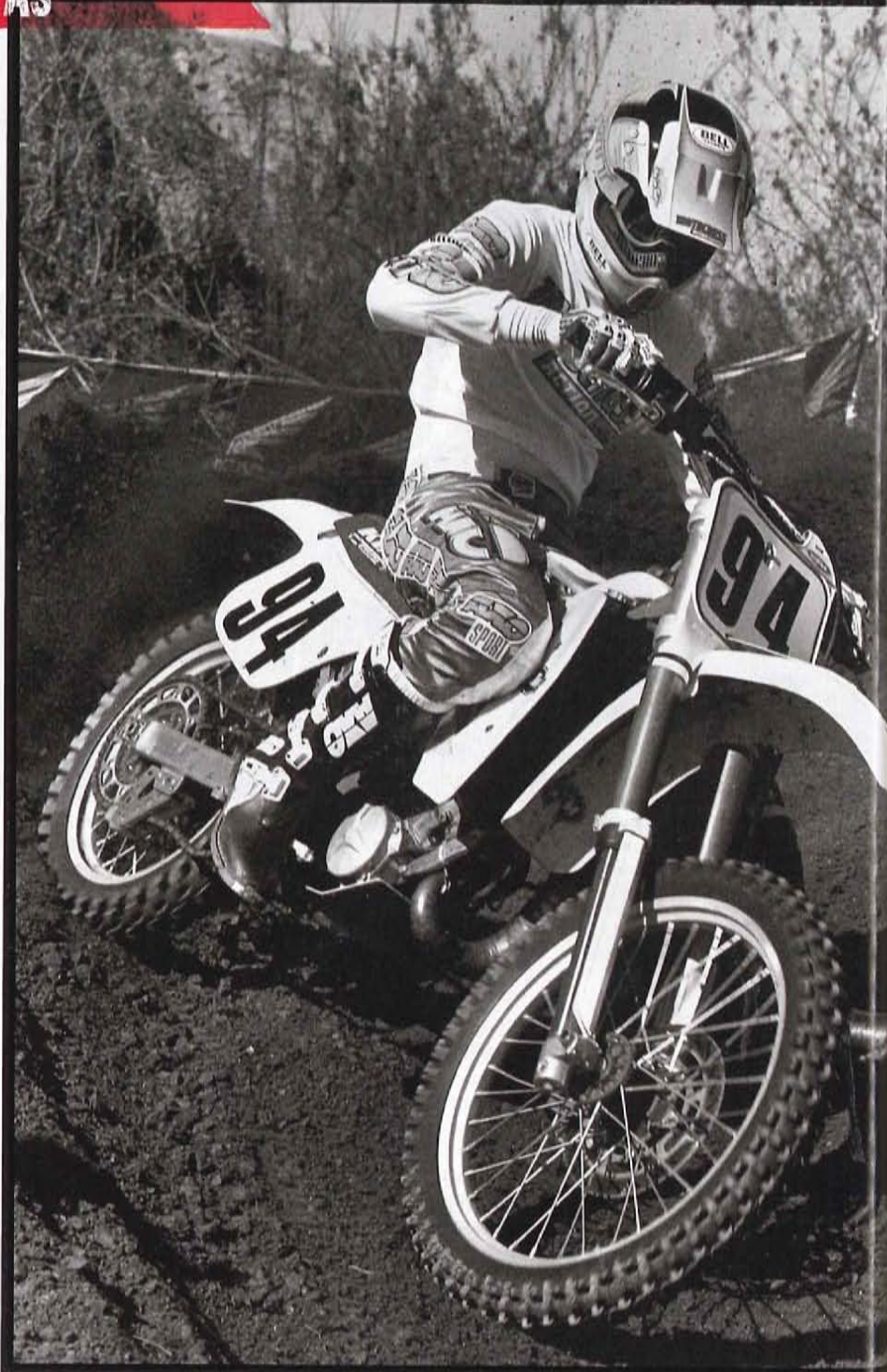


*Horst Leitner used the stock head/down tube and made the rest of the frame out of straight, rectangular, chromoly tubing. It was light and strong.*

seconds before setting off to have it molded in plastic. That was my only contribution to the project, and two decades later, I know that the radiator wings are what ruined the lines of the sparse chassis.

The deadline to put the bike on the plane for Salzburg was closing in. I still wanted to race the bike before it was shipped off to a destination it would never return from. Former New England NESC Champion Joe Waddington, who worked for Horst, was AMP's test rider of record, but, of course, the whole MXA gang showed up to ride the bike on the special day. It is important to note that we had to discount the stock KTM 125 engine and WP forks, because they were grandfathered into the bike. We also had to be careful, because this was a one-off bike that had been built as a design exercise. It could have achieved the same effect even if it didn't run, but that is not Horst's style. Still, he wanted us to wring it out.

Looking at my test notes from that day at Perris Raceway, I had written, "The bike is so light that it feels like a toy. It was narrow, so narrow that you couldn't always grip it with your knees through the whoops, but very

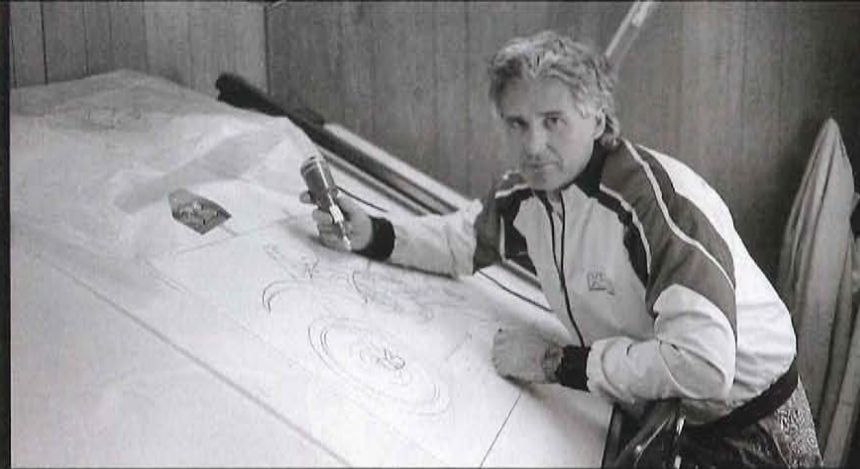


*The requirements of the contract with KTM were to use as many stock parts as possible, which meant the engine, swingarm, forks, wheels, ignition and brakes.*

easy to move around on. Although the KTM 125 engine was just okay, the bike accelerated quickly, helped by the anti-chain-torque suspension under drive. It had a very flat saddle. And, with the exhaust exiting under the frame, it was amazingly quiet. With some production niceties, this bike would be better-handling and better-performing than anything KTM has now."

**"IN ONE OF THOSE CATCH-22s THAT CAN ONLY HAPPEN IN THE CORPORATE WORLD, KTM'S MANAGEMENT ASSIGNED THE IN-HOUSE DESIGN DEPARTMENT, THE ONE THEY WERE TRYING TO EMBARRASS, TO EVALUATE THE PROTOTYPE."**

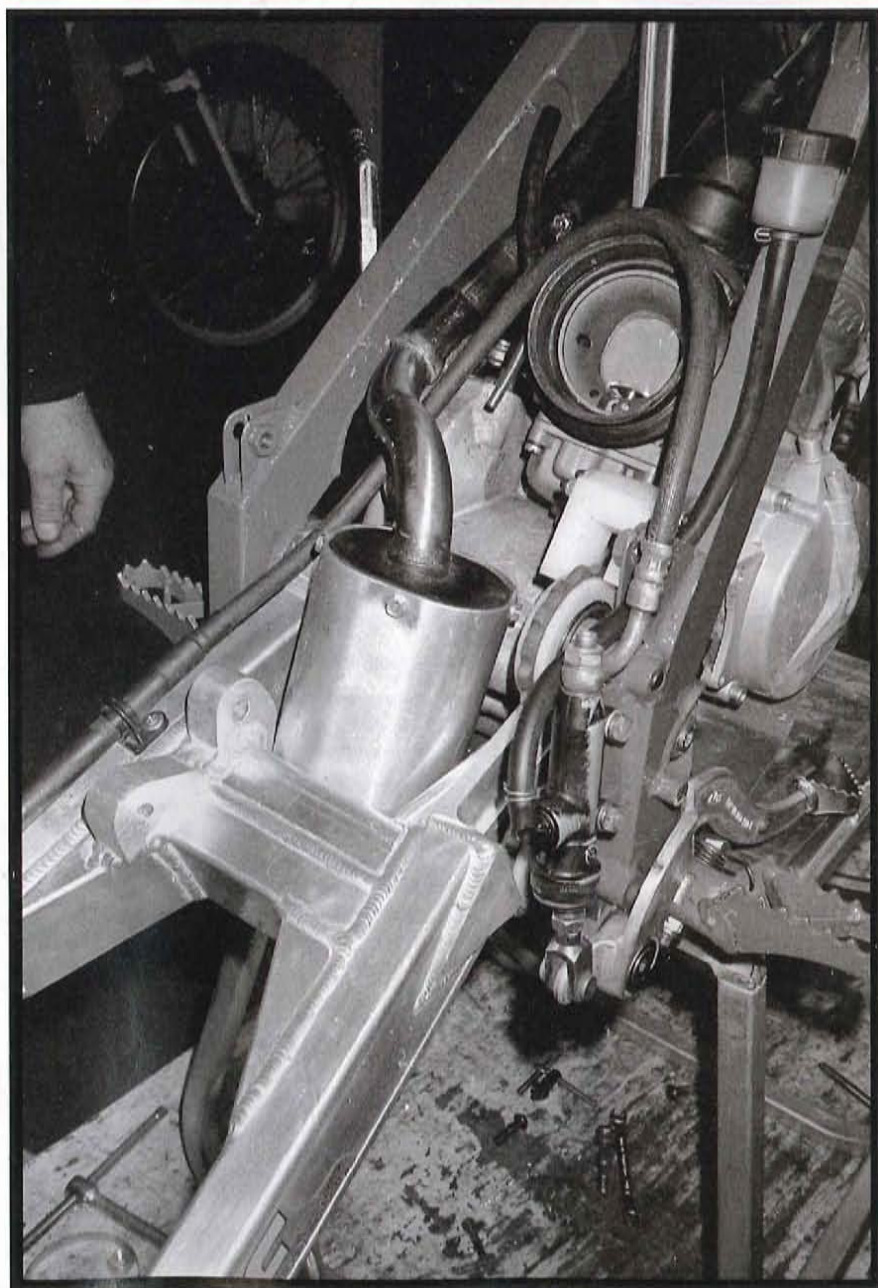




**KTM's management would have keeled over if they knew that a magazine editor was poring over the blueprints. Here, Jody makes a few changes to the secret bike.**



**The handmade aluminum gas tank looked small, but held more fuel than most stock 125s of the day. Plus, it sat very low in the frame.**



**The exhaust pipe was tucked in so tight that the muffler was routed down through the swingarm. It was immune from crash damage and the bark was reduced.**

The bike was shipped from AMP's Laguna Beach design studio to Austria for testing. But, it never really stood a chance of going into production. Why not? In one of those catch-22s that can only happen in the corporate world, KTM's management assigned the in-house design department, the one they were trying to embarrass, to evaluate the prototype. This fail-safe was all the threatened engineers needed to ensure job security. They nitpicked the AMP Research prototype to death and took the time to photograph every interference fit, crack in the aluminum airbox mount and even a head tube crack (even though it was their head tube). In the end, the AMP Research prototype was rolled into a dark warehouse to languish and eventually disappear.

As for KTM, without new products, new ideas or new sales, they were insolvent by 1992. The banks and courts divided the company into four separate entities. While it is unlikely that the AMP Research prototype could have done much to save KTM from bankruptcy, it does point to the fact that the men who ran KTM in 1990 couldn't see far enough into the future to stay in business. Luckily for KTM, they eventually found forward-thinking management that embraced new ideas and turned them into profit.

As for Horst Leitner, he turned his attention to mountain bike design and automotive parts, and AMP Research is now a multimillion-dollar company. □