

Do the new frame and suspension ideas *really* work better? The only way to find out was to start with a welding rod and a lot of tubing.

By Rick Valasek

EXPERIMENTAL EL SINORE

Ever since the pro racers began showing up at the starting lines of national and international events with forward-mounted shocks on their works bikes, bike shops have been flooded with requests to perform the necessary surgery to duplicate the works setup.

John Grivins of Honda World in Kalamazoo, Mich., was being harassed by young racers who just had to get on the bandwagon. The main problem was the various ways in which people were moving the shocks forward. The idea of hacking away at the swingarm and welding brackets is definitely the backyard mechanics' method, and one of the prime reasons that some mechanics never make it out of the backyard.

One of the major problems involved in the conversion is the fact that the swingarm will flex if it is not beefed up. The reason for the flex is that the swingarm is a lever (see illustration 1) that is supposed to move in a vertical line. The problem starts because the spinning of the rear wheel becomes a gyroscope that produces lateral torque. With the shocks in the "normal" position, the twisting effect is minimized by having the shocks very close to the axle. The axle being the place where the spinning mass is converted into torque. When you move the shocks forward, the twisting effect of the rear wheel is increased since the axle is not restrained by the shocks. What this all means is, if you moved your shocks forward without attempting to stop this swingarm flex, you would be spitting the chain off the sprocket a lot. As an added bonus, you would also be buying swingarm bushings every week and probably getting gray hairs from the number of cracks in your frame. The final result of a short ride through a series of whoop-de-dooos would be unthinkable for all but the very foolish.

So what do you do? We thought about cutting and altering a stock frame but were worried that the alterations might weaken the frame structure. The only way to go seemed to be a completely new frame and swingarm; but whose?

After a small amount of debate on frame makers, we decided to go over to Red Line and check out our ideas with Linn Castle. Red Line agreed to build the frame and swingarm and to incorporate all of our ideas into the new bike.



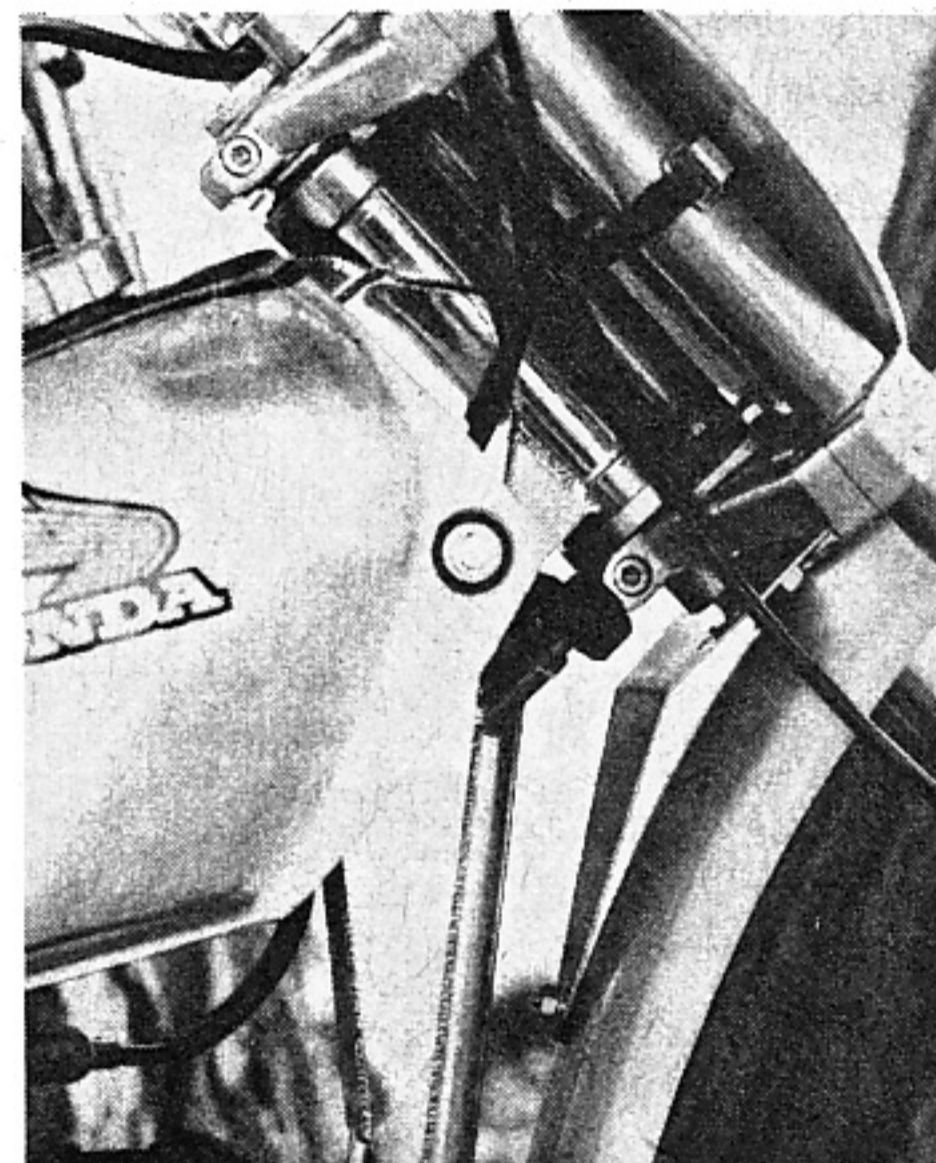
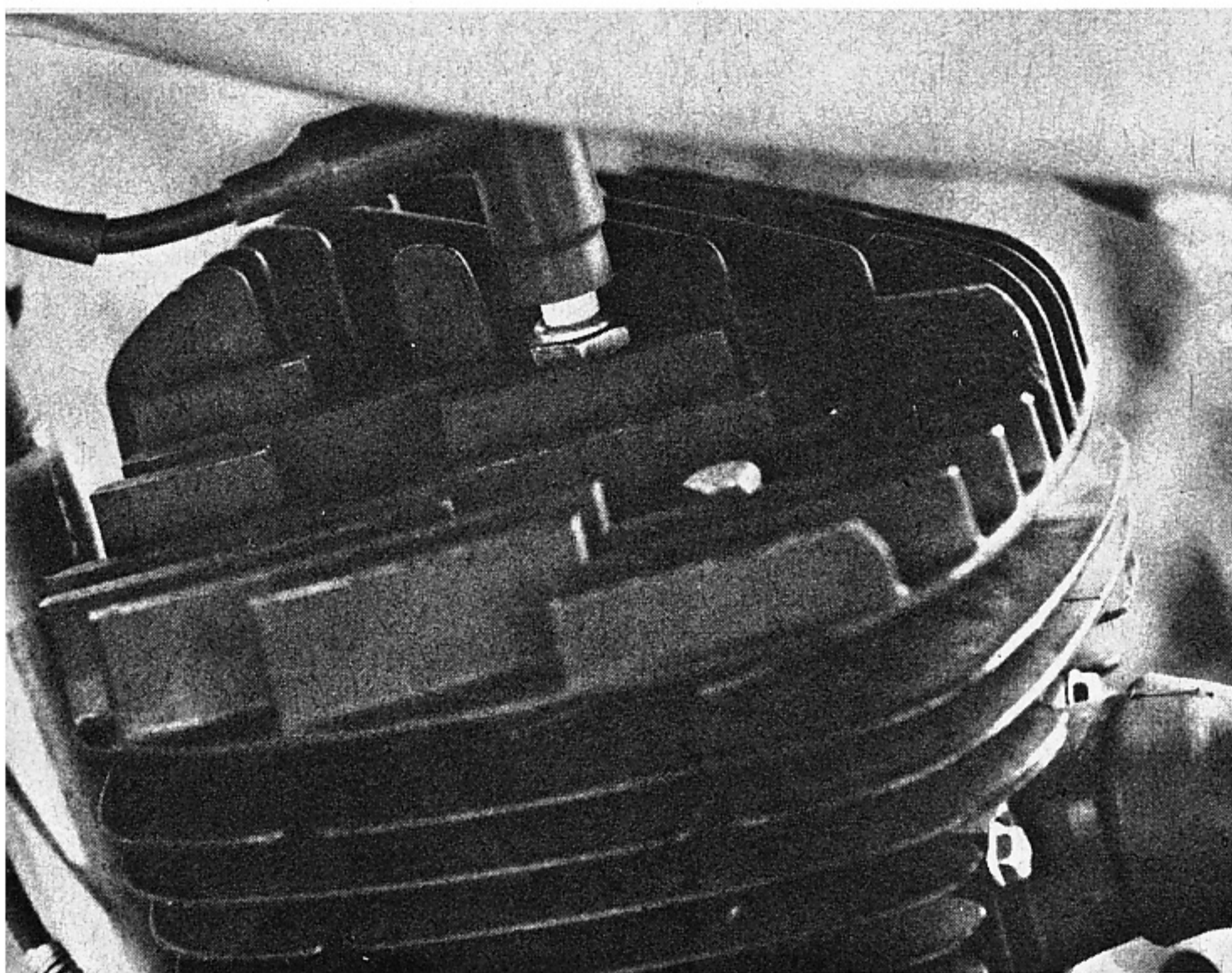
Photos by Steve Reyes



The Honda 250 engine was to be left stock since our main concern was suspension and we were afraid that a super hopped up engine would effect our impressions of the handling. The only thing that was done to the engine was to grind down the left side of the head. This was done so that an up-pipe could be used on the bike.

While the frame construction was going on, we began to look around for new rear shocks. The problem with shocks in the moved up position is that they have to work much harder and tend to have cooling problems. We ended up testing three different types of shocks on

The result of a lot of theory. Now we have to see if it will all work. Notice the amount of rear wheel clearance.



Quality welding is a standard at Red Line. The fork stops on the test bike were adjustable.

The only modification to the engine was to grind away part of the head so that an up pipe could be used.

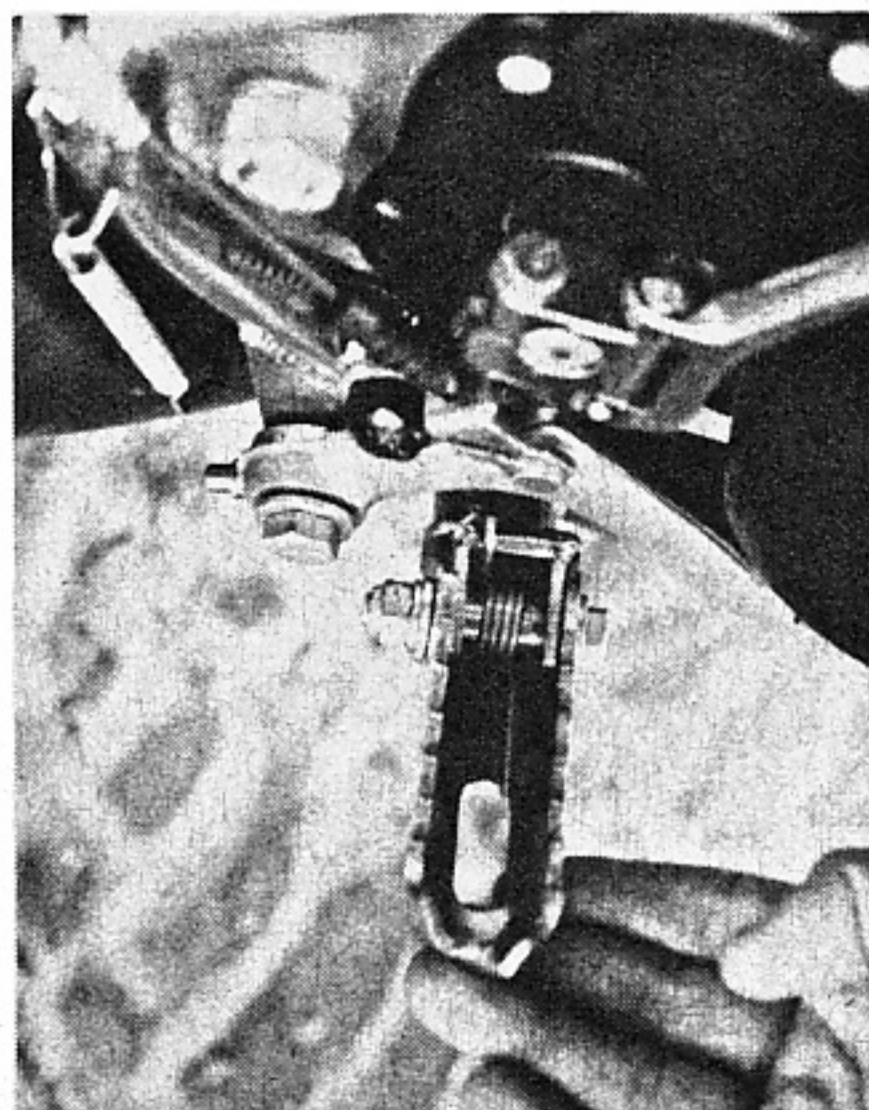
the new bike: a stock conversion model, a Koni/Poppy and a prototype S and W. More about that later.

The front end of the bike was to be tested three ways: stock, with a set of Betor triple clamps, and with a drop-in kit from S and W.

Just about the time that the different suspension parts were rounded up and arrived at our offices, we received a call from Red Line that the frame was ready to go.

The stock engine slipped into place with no problem at all but then you begin to expect that, after working with Red Line for a while. Next the air cleaner was installed. Red Line had designed a special air box constructed of aluminum panels. The side panels incorporated quarter-turn fasteners to ease the operation.

The stock front end was bolted on and



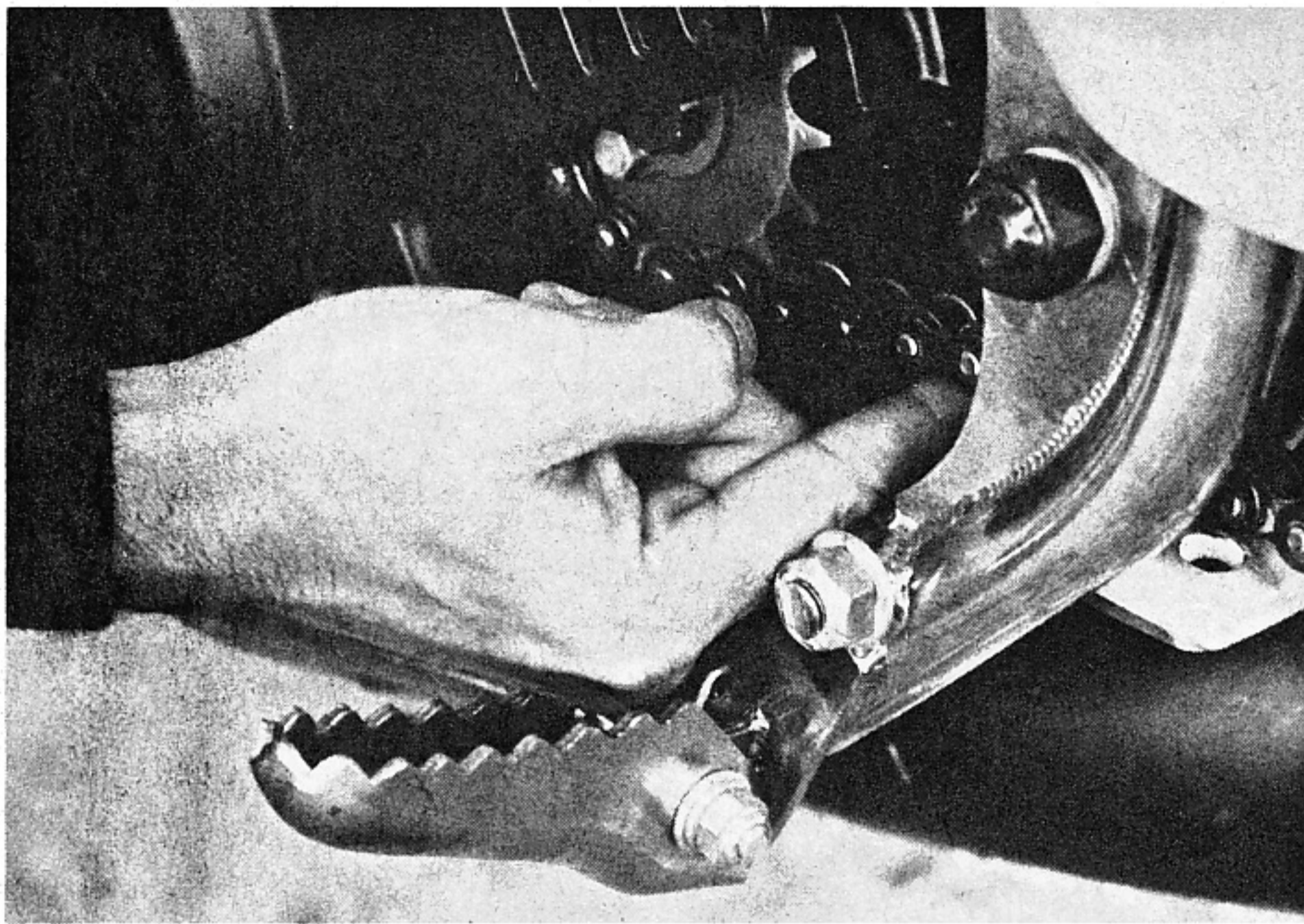
Footpegs are springloaded and designed to grip. Take note Honda!

the stock rear wheel was used with the new swingarm. Stock seat and handlebars were also used. The only thing left to do was to add the fuel and find some dirt.

FIRST IMPRESSIONS

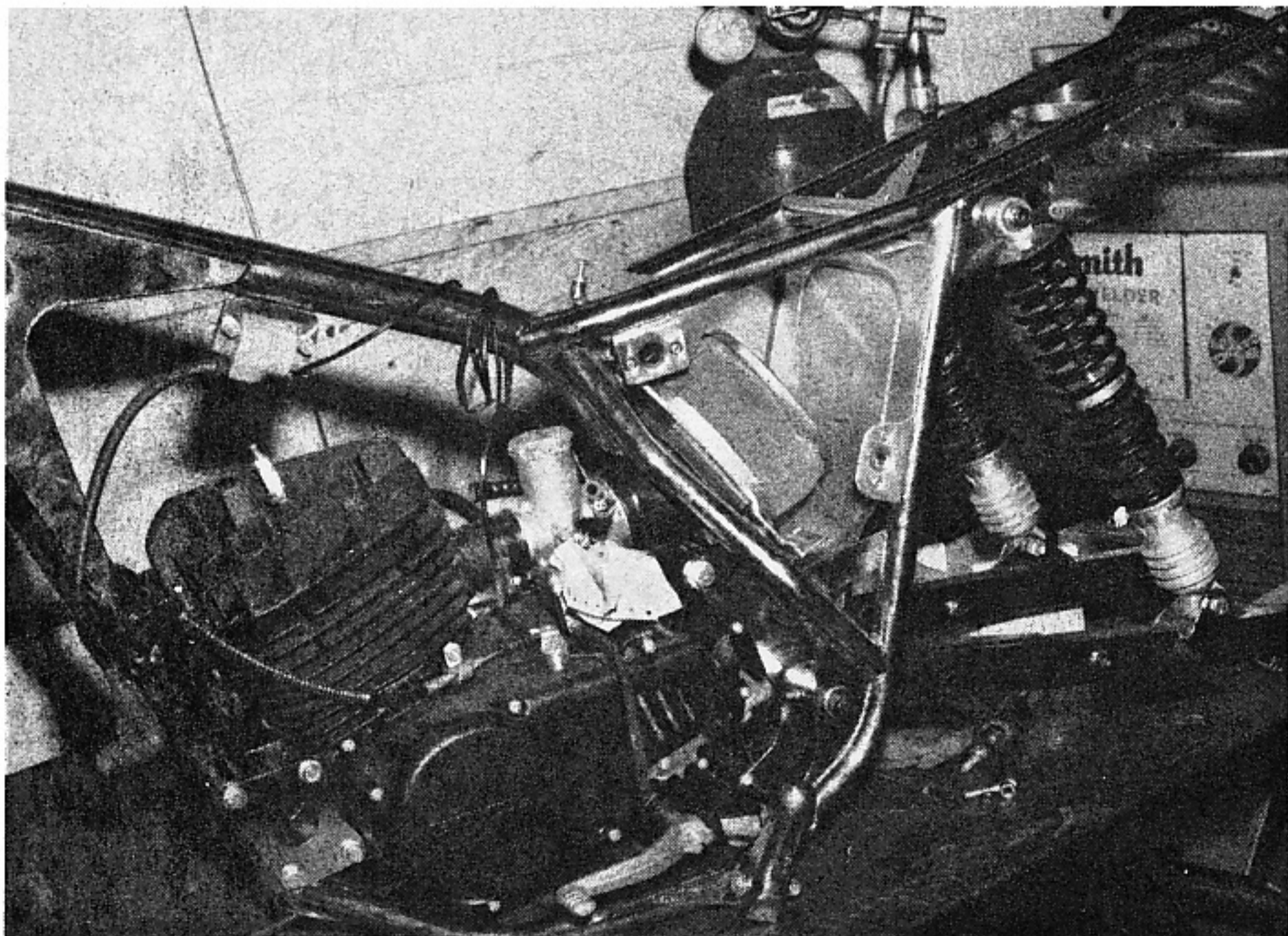
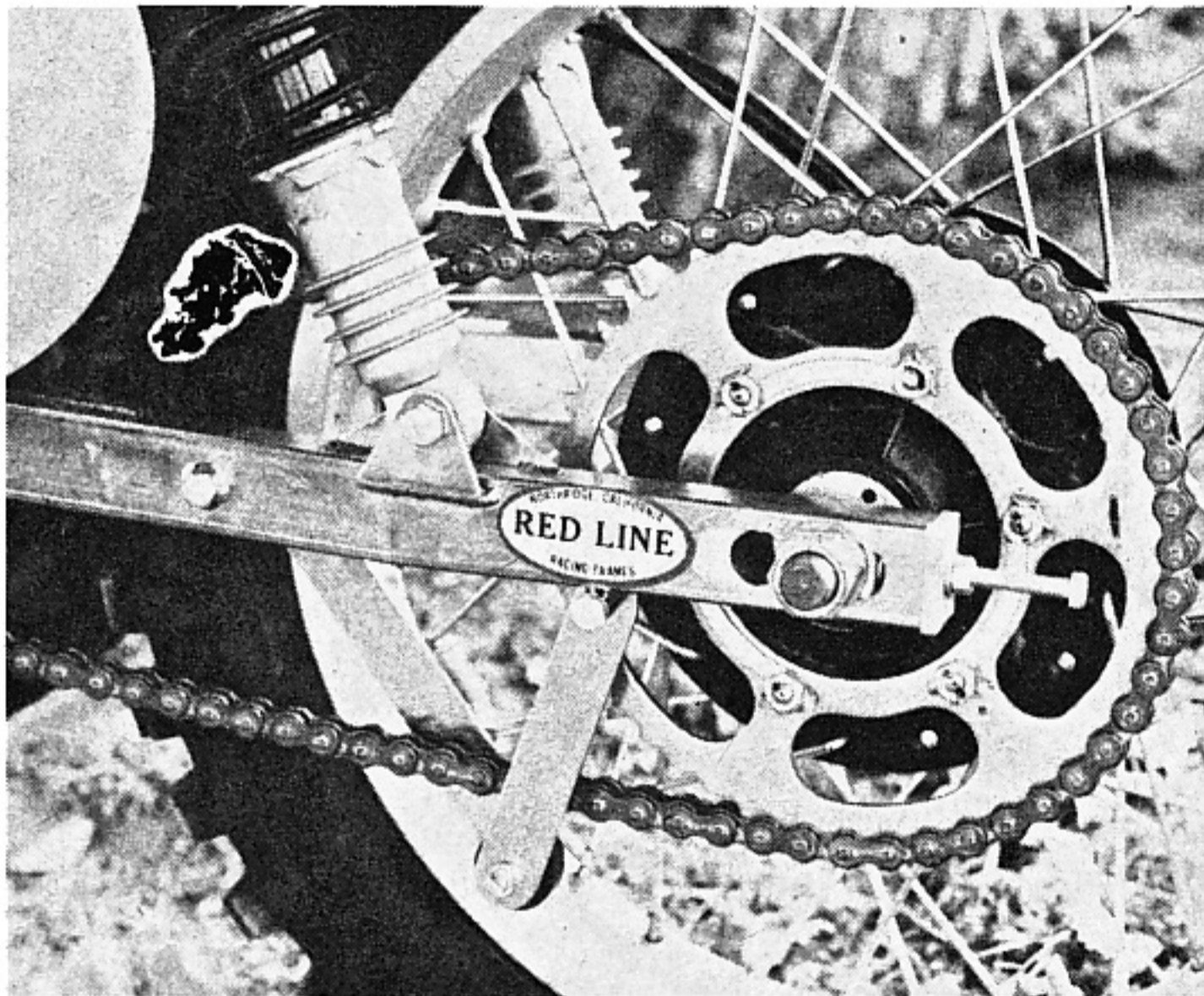
After letting Steve Reyes take pictures of the bike without any dirt on it, we were more than ready to get into the dirt. Our assumption about the stock CR shocks and front end were quickly confirmed and we began to wonder if *any* type of suspension setup would calm down the handling problems. Next we tried the converted stock CR shocks. This helped slow things down, but the front end still was a major problem. After putting on the Betor triple clamps and the drop-in kit in the front forks, things got a lot more predictable. The bike handled and could be pointed wherever the rider wanted to go, with predictable results.

When we added the Koni/Poppy



A chain guide had to be added to the frame so that the chain would not beat the tubing to death.

The heart of the matter—the swing arm. This little number was completely adjustable and is super strong.



shocks to the rear end, things took on an interesting aspect.

FIFTH GEAR TESTING

With the new setup, one of our test riders got out into a sandwash, complete with giant whoop-dees. As he motored away from us, we all watched the rear end of the bike to see if it would pass the front end. The bike flew across the sand tapped in fifth. The rider reported that the bike was very stable and he experienced no frame flex whatsoever.

A number of runs around the track confirmed the sandwash test. The bike would go around the track like it was paved.

Since a number of riders were testing the bike, the shocks heated up a bit. We could tell when the shocks got too hot—the rear end just wouldn't cooperate.

As the Koni/Poppy shocks cooled, we bolted on the prototype S and W shocks. These new shocks hold about 280cc's of oil. That's about twice the amount of a Koni or anything else. The new S and W shock handle about the same as the Koni/Poppy with the exception that they never overheat.

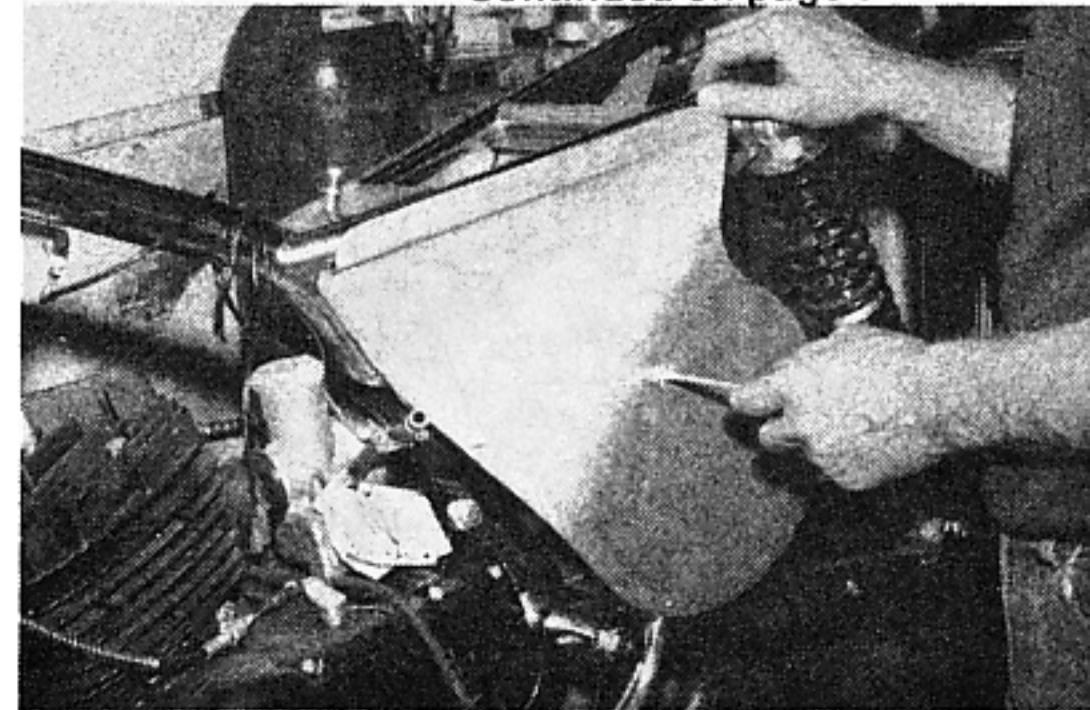
SO NOW WHAT?

First the bad news. At the time of our testing, the drop-in kit for the front forks was not available to the public. In fact, S and W would not let us disassemble the tube to see what it looked like. By the time this article hits the stands, we should be preparing another article on the specifics of the kit and it should be available soon after. The new S and W rear shocks will also be available soon. The Koni/Poppy shocks are available now.

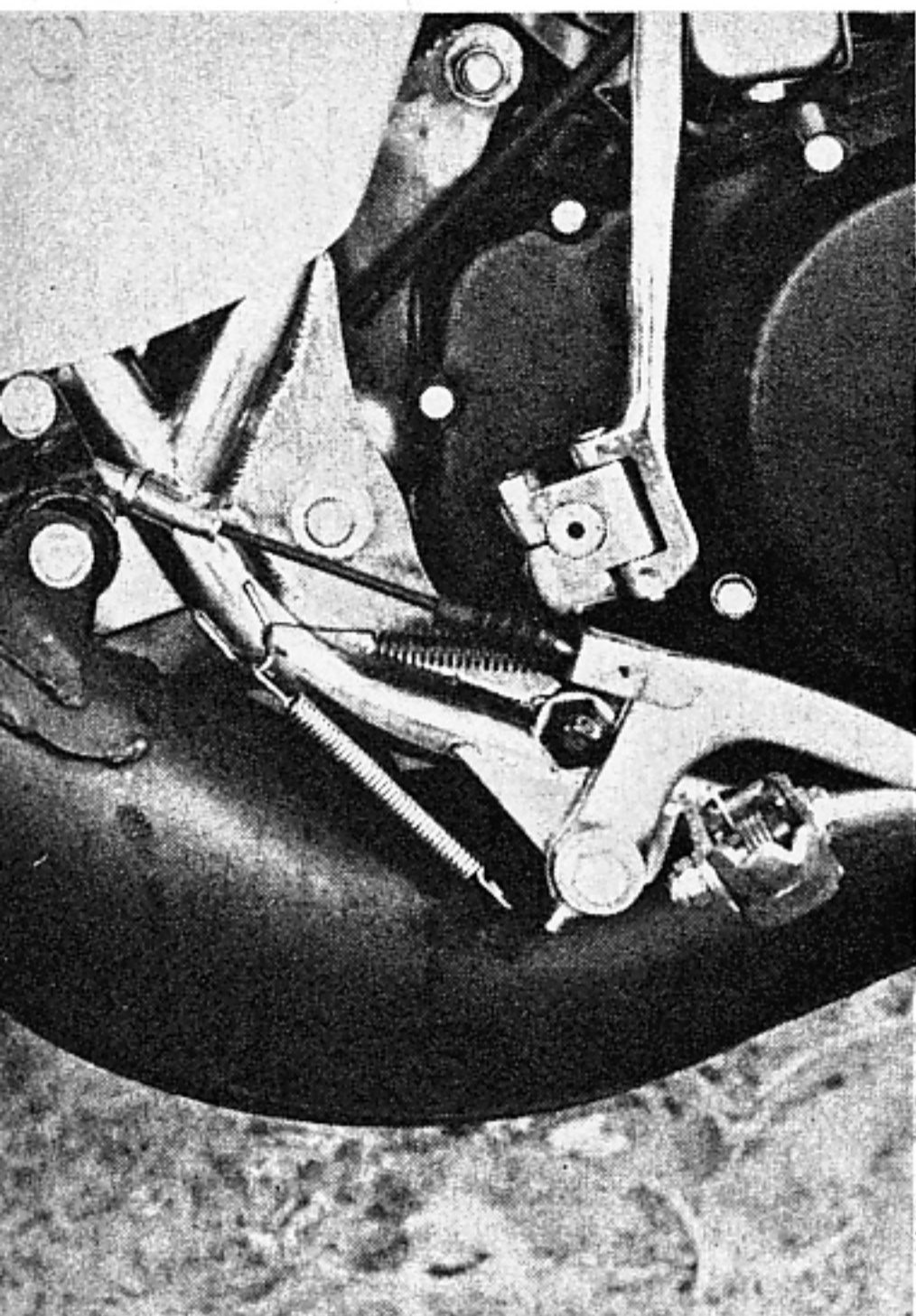
We found that with the three different types of shocks, you have to do a lot of experimenting with various springs. The forward-mounted position seem to make the action of the springs very critical. If you put on too weak of a spring, the shocks won't work at all, and if the spring is too stiff, they will launch you over the bars.

Since the lack of flex is so important in this type of frame design, we would highly recommend the Red Line frame and swingarm. If you have another way of making the frame as rigid as a custom

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Air box was constructed of aluminum and was designed to fit together with quarter turn fasteners.

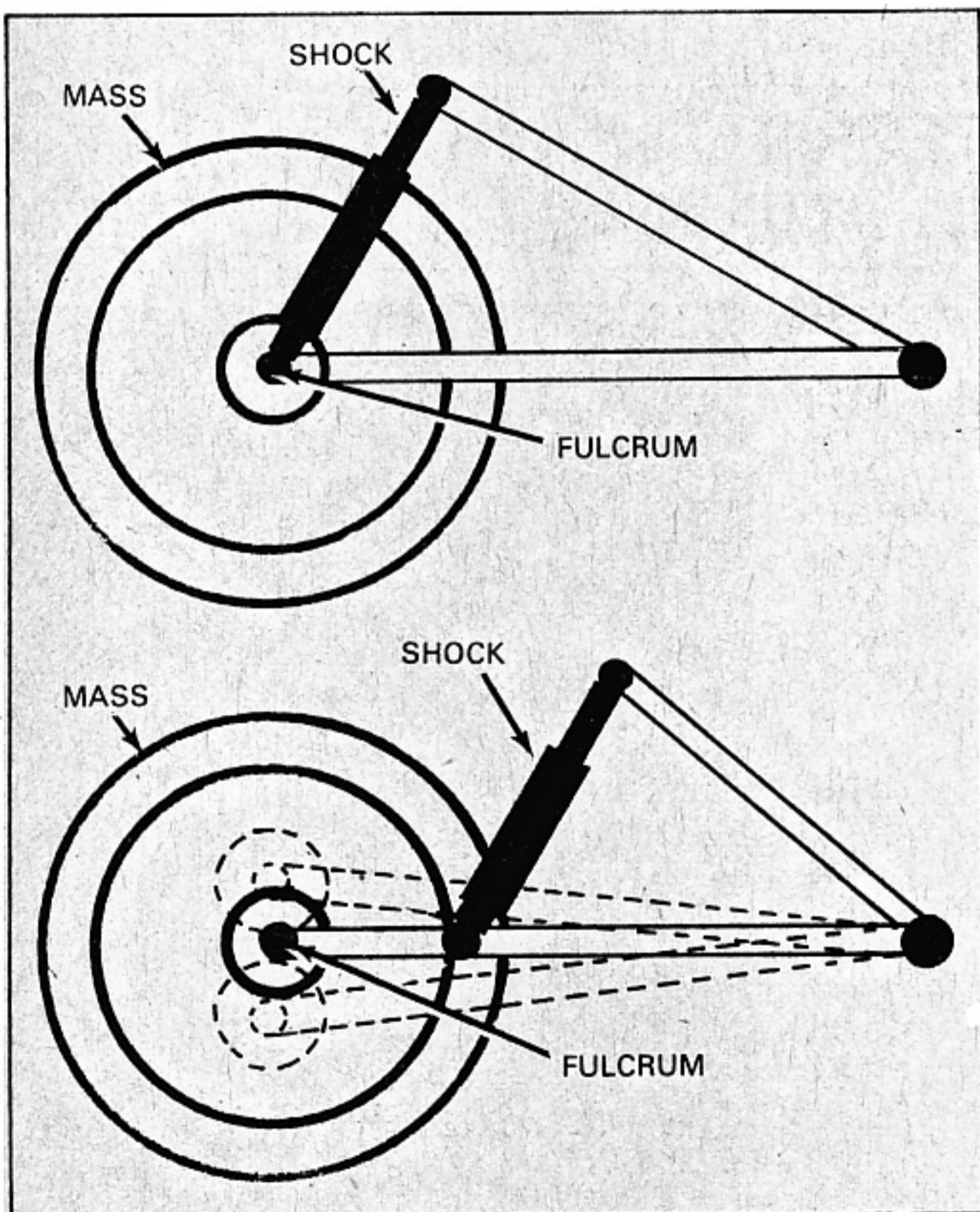


The stock cable brake was retained. We found that the amount of feedback from the Honda setup was adequate for just about any rider.

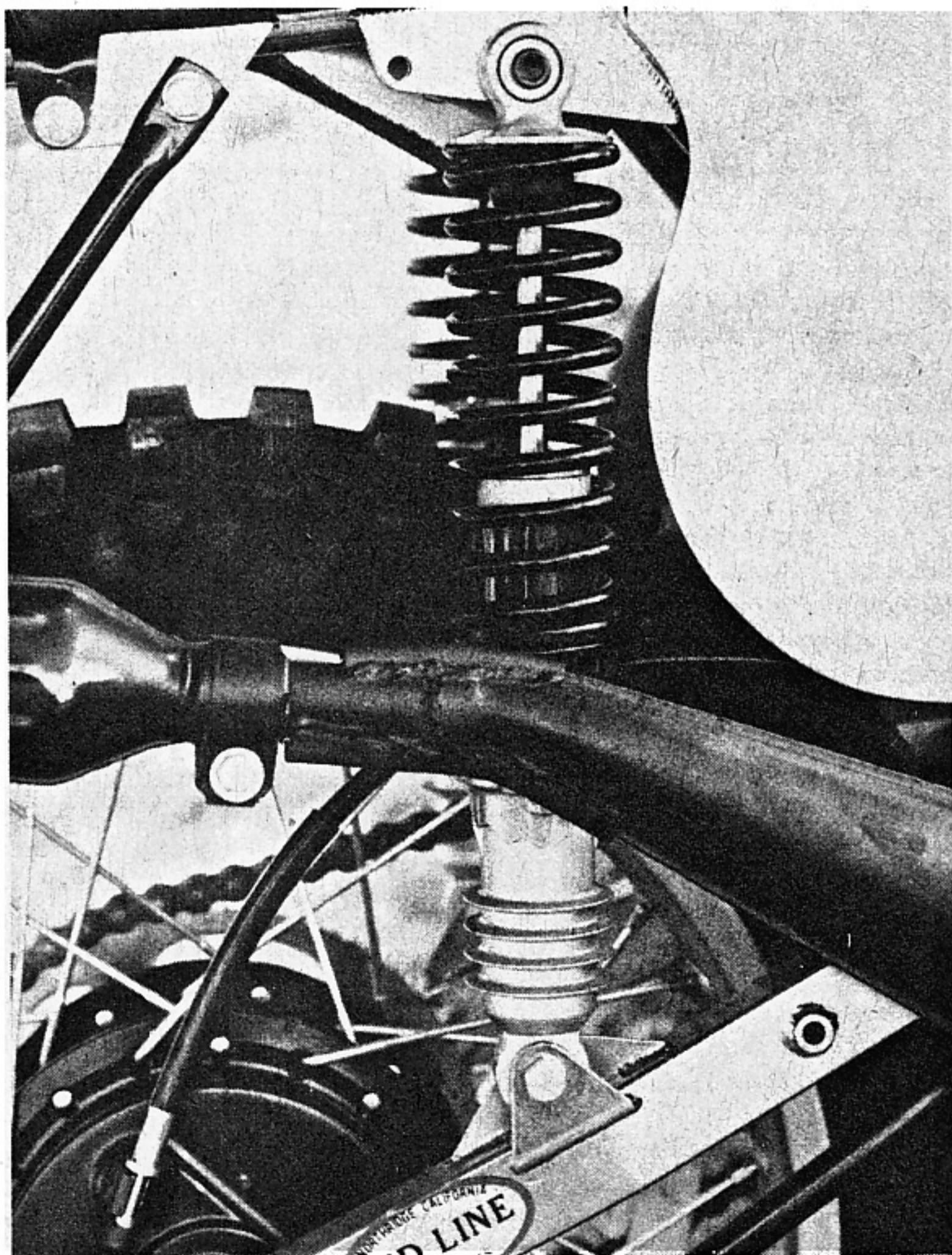
All you had to do to get the bike going straight after a slide was point it and hang on.



The Koni/Poppy units. Good shocks—the aluminum Poppy shock bodies kept things more or less cool throughout our testing.



The converted stock CR units. Their performance was a little better than stock.



EXP. ELSINORE



The prototype SW shock. Don't be fooled by this picture, the shock *does* use a spring. These shocks hold 280ccs of oil.



Stock forks are on the bike. The only way we could tell the SW tubes was by the black tape and the fantastic performance.

racing frame, it might end up being very heavy. Our test bike was eight pounds lighter than a stock Elsinore.

FOR OUR NEXT TRICK . . .

We have only tested three different types of rear shocks. We're sure that there are other types of shocks on the market that will work, and as soon as we are able to test and evaluate them, we will pass this information on. The test bike is now with Honda World, in Michigan, and is going through some race testing. John Grivins will be giving us an update on the experimental Elsinore as soon as the bike has had a few races on the Midwest turf.

As soon as we have a complete test on all types of suspensions, we will publish an article which will rate the various components in different applications. For now we know that the forward-mounted shocks on the Elsinore can work with excellent results.

If you want to know more about the components of this test bike, get in touch with: Red Line Engineering, 18257 Parthenia, Northridge, California 91324, (213) 886-1728; or John Grivins, Honda World, 3717 Stadium Dr., Kalamazoo, Michigan 49008, (616) 375-6700; or Poppy, 320 N. Hollywood Way, Burbank, California 91505, (213) 845-6766.

Watch for race test results of our experimental Elsinore in upcoming issues of P.C.

