

TECHNICAL

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FORK TUNE-UP

(Editor's note- From time to time we run across articles that may be of particular interest to club members. One such article is the Fork Tune Up printed below. It was first published in Cycle, May 1977. It is used with the permission of the editor.)

By Phil Schilling

You say you know a lot - and very little - about motorcycle forks. Yes fork springs live inside tubes, and you can get the springs out. You know where to drain out the old fork oil, and where to put the new stuff in. You can also identify a leaking fork seal because there's this great mess that goes trickling down the front of the afflicted leg. You know that dampers damp by running oil from one chamber to another, and passing it through little holes on the way. But beyond that, you say, fork damping might as well be controlled by four mice and a giraffe residing in each slider and stepping on hydraulic valves and gates therein.

This is a pictorial stroll through a Marzocchi fork, but there isn't anything in here about how the fork actually works. You need not feel threatened by some techno-information overload. On the other hand, if you're interested in how a fork unit comes apart, how to clean up the metallic garbage inside, how to prevent the dampers from binding in the sliders and how to set up the front end properly in the triple clamps, then read on.

A Marzocchi fork is shown here for good reasons. First, it was handy; second, the fork needed a good clean-up; and third, we were going to do it anyway. Most conventional forks come apart in a similiar fashion. Japanese axles may be held in place by end caps on the legs, and the individual pieces in the damper units may look different, but fundamentally the basics are pretty much the same.

Fork internals suffer from all the imperfections of mass production. Manufacturers stick damper assemblies together quickly, leave machining chips in the parts, fail to seat damper units accurately in the legs, install springs of unequal lengths, put various amounts of fork oil into identical legs, and mis-shim the front wheel or tighten down the front end in the wrong sequence. Among other things, these errors can produce a certain amount of binding in the fork, but fork springs can mask all sorts of maladies. A rider may not notice any malfunction unless the condition is really severe.

Is your front end in such a bind? Situate your motorcycle in such a way that you can move the fork from full extension to full compression. You'll have to put the bike on a centerstand and a block. Pull out the fork springs and then see how easily the front wheel goes up and down. The fork legs will probably travel in a series of glitches, hitches, and stalls. Too bad. They shouldn't.

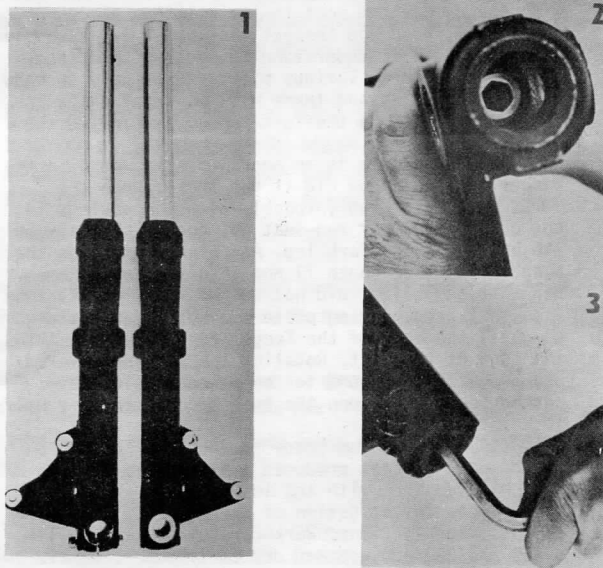
Assuming you can drain the old fork oil (dirty, ugly stuff isn't it?), pull the axle out, keep accurate track of the spacers, remove the fork springs, pull off the brake caliper(s), and take the fork tubes out of the triple clamps, then you have arrived at our starting point. You say you don't want the full tour. Okay, there's a short walk available. Skip through photos 1 to 18. By that time the dampers will be back inside, where they belong. By picking up at photo 19 you can at least set up your front end so that the axle will not bind the fork legs.

(1) Here's where the fun begins. At this point the top caps have been screwed out, the springs removed, and the fork oil dumped. Just for fun you might run the sliders to the top of the tubes. Lay them down side by side. You may find that one slider/tube is longer than the other. Take the longer unit

and rotate the tube in the slider. At some point in the tube it may drop another half-inch or so into the slider. That happened with one leg here. An enormous hitch in the slider get-along is sure evidence of poor assembly. If you bought a new fork at Porsche prices, don't kid yourself about fine-old-world craftsmen, who build special racing units one at a time with great patience. All of their money- and yours-probably went into careful machining; the assembly is still only average.

(2) This is a worm's eye view of the bottom of the fork slider. The allen-head screw holds the damper rod in place inside the slider. Note that the screw is almost buried in the slider. You must have the correct allen-head key wrench just to reach the screw. Alternatively you'll need a socket-style allen-head wrench which snaps on a 3/8-inch drive, so that you can use the snap-on allen-head, an extension, and a ratchet.

(3) In the best of all possible worlds, an allen-head key wrench will suffice, and as everyone knows, it's always easy when they do it in the magazines. Just insert and turn with a snap. You may want to turn the screw initially with an impact blow. This may require a tube extension slipped over the end of the key wrench, and a hammer. Smack the tube extension smartly with the hammer, or do likewise to the ratchet handle if you're using more sophisticated tools. Once broken loose, you can then turn the screw out without further hammer heroics. But sometimes life can be difficult. You unlucky mechanics will turn the screws, but fell the damper rod turning inside the slider, matching your rotation degree-for-degree. Result? The great go-around, and you can't get the damn thing out unless you hold the top of the damper rod.



Usually the tops of the damper rods are slotted as if for huge screwdrivers. With flashlight in hand peer down the fork tube from the top and look for the slot. Having found it, all you need is the world's longest meanest screwdriver or similiar device (sometimes a hardware-store metal strap, about 1/8-inch thick and a couple of feet long will work). Then you'll be able to keep the damper rod from rotating as you turn out the screw.

Before chasing off to the hardware store, you might try re-inserting the fork spring and top cap. The spring may exert enough pressure on the damper rod assembly to keep it from turning. It's worth a try, even if you have to pre-load the spring by inserting a spacer (like a half-inch drive socket) between the spring and top cap.

If all normal ploys fail, there is a high-technology solution: a pneumatic tool. Armed with a snap on allen-head socket and an extension, a pneumatic wrench will spin the screw right out. Most of the time, however, simple hand tools, applied to the damper rod screw only, will be sufficient.