

Front Suspension

The front suspension system may be a motorcycle's most frequently overlooked component. I think there are several reasons for this. Many cyclists are simply unaware of all the workings within the front suspension system. For those inclined to tinker with their bikes, front suspensions defy the glamor and brag value of flashy "high-performance" components: dabble with the fork oil, install the latest Kryptonite—impregnated fork springs, re-work the anti-dive mechanism, and absolutely none of those efforts will be externally visible. However, the most likely reason front suspension systems are ignored is the forks represent a sealed system; when "don't fix it if it ain't broke" mentality prevails, the whole mechanism is forgotten until fork oil begins to weep from the fork seals.

Imagine life as the front forks of a motorcycle. Every pothole, railroad track, driveway, intersection, rock, and rut that rolls under the wheels of the bike transmits a distinct series of "shocks," which the damping system within the forks must absorb. Worse, it's got to absorb these pavement irregularities in such a manner that the motorcycle remains stable and under control.

Every mile that passes under the wheels invokes thousands—tens of thousands—of individual up-and-down cycles for the fork sliders against the fork tubes. The internal hydraulic system of the front suspension is calibrated to deal with all this stuff, and, at the top of that system, a lone rubber seal must keep the outside elements (dust, mud, sand, etc.) from contaminating the inner workings of the system. Irregular maintenance, no maintenance, too much air, not enough air, too much oil, or not enough oil can throw the whole system out of whack. Often, the bike continues to be ridden—to the peril of the mechanism.

Life is Hell for the front suspension.

There are two steps to taking care of the front suspension on your motorcycle. First, check that nothing's amiss in the mechanism, coupled with the ritual of changing the fork oil. The second step is beyond the scope of this article, and involves dissecting the front suspension, repairing and replacing damaged compo-

nents, and, perhaps, changing and customizing the mechanism to suit your needs. If actual repair is required, the shop manual for your particular bike outlines the various procedures.

How often should you take the front-suspension inspection tour? In terms of preventative maintenance, too much is not enough, but in the real world, figure running through this procedure every time you replace a front tire.

The Inspection Tour

Put your bike on the centerstand: this will fully extend the front suspension, exposing the area which might be worn by the top of the fork slider. First of all, is there any evidence of an oil leak at the tops of the fork sliders? Look for a dribble of dirty, black oil trailing off the rear of the seals. If the seals are leaking, that's it. They're done, they've served their time. Once the seals begin to leak, they have to be replaced.

Next, take a close look at your bike's chromed fork tubes, particularly in the area directly above the aluminum fork sliders. Does it look like chrome? Or is it worn to a dull, golden sheen, with vertical streaks and gouges? The dull and gouged look means your front suspension has seen a lot of action. You may have a high-mile machine, or the front suspension may have been pounded over miles of Nasty Roads. Dull-looking fork tubes don't necessarily mean it's time for repair, but serve as an indicator: a gauge to determine where the front suspension is with respect to its life cycle.

No dulling? No stripes of wear and abrasion above the fork sliders? Good. The next step is to see how your forks have fared against road debris. Riding a motorcycle on public highways involves exposing them to a barrage of highway shrapnel. With every click of the odometer, the front suspension is exposed to untold horrors: sandstorms, gravel spewing off the backs of construction trucks, rocks kicked up by oncoming cars, etc.

The impact from road debris can nick and scar the surface of the fork tubes. Small pits in the fork tubes can allow oil to leak past the fork seals. Cuts and scars

in the chrome surface of the fork tubes can actually slice the rubber fork seals, paving the way to leaking fork seals.

Unfortunately, cuts and scars that can cause real trouble for the fork seals are often too small to see. An easy check for damage to the surface of the fork tubes is to use an old silk stocking (silk is best, but nylon panty hose will do), and gently buff it (like polishing your shoes) over the exposed chrome of the fork tube. Any cut in the fork tube will make its presence known by "catching" on the stocking. A big cut (from a rock, or from crash damage) will mean replacement of the fork tube. Small cuts, ones that just barely catch on the stocking, can be dressed down with a fine file.

No cuts or scars, but the fork sliders still leak? That could be caused by a couple things. At some point in their life, the sliders may have been overfilled with oil. With air-assisted front suspensions, it's possible some well-intentioned rider tried adding air with the compressor at a local service station: a move that practically guarantees popping the fork seals inside out. No matter—replacement is the only cure for leaking fork seals.

A less obvious peril for the fork seals is—believe it or not—insect buildup. The same bug-splattering found on your helmet's visor (or the bike's windshield) builds onto the surface of the fork tubes. In some sections of the country, where the winged nasties fly in herds, these bug-splatters can form a thick crust on the chromed surface of the forks. Add sunlight on a hot day, and this buildup turns into an abrasive crust that can easily grind through a set of fork seals. Beware: If you find yourself frequently cleaning your windshield or visor, stop and take a minute to clean up the forks as well.

The next stop on the inspection tour is an evaluation of the condition of the fork system. Prop the front wheel off the ground, and remove the wheel. Remove the front fender, and the fork brace (if installed).

The first step is to determine the condition of the bushings: the components in the fork slider that bear against the fork tubes. Ideally, the bushings fit perfectly over the fork tubes: zero clearance, no

slop or play, while still sliding easily over the fork tubes. Release the tension on the fork springs by removing the caps at the top of the fork tubes. Grab the bottom of the fork slider, and push-and-tug it against the fork tube. If all is well, there will be no "play;" the fork tube and its slider will feel like a single, rigid unit, with no clanking back-and-forth against the fork tube. Push the slider up on the fork tube, and push-and-tug it again. Be critical. Your motorcycle inflicts far more force against the fork/slider assembly than you can with your bare hands. If this test reveals the slightest play, your fork bushings are prime candidates for replacement.

The above push-and-tug test can also reveal excessively loose steering-head bearings. If the whole front suspension clanks back-and-forth, try to trace the movement up to the top of the steering head. Follow the procedure in your shop manual to tighten the bearings, and again test for play in the fork sliders.

Next, check that the forks are tight in the triple clamps. Over time, the cinch bolts can become loose (or even fall out!). Check that the castings of the triple clamps aren't cracked—that happens once in a Blue Moon, when the cinch bolts are tightened beyond comprehension.

Everything's tight? No play in the fork sliders? Great! As long as you've got the caps off the top of the fork tubes, go ahead and change the fork oil. Drain the oil into a clean container, and inspect it for dirt, grit, or metal debris (icch). After all the oil has drained, pump the sliders up and down to squeeze out the last bit of oil. Before refilling the sliders, double-check the shop manual for the recommended quantity: frequently, different amounts are specified, depending on whether it's a simple oil change, or whether the forks have been disassembled and cleaned.

Re-install the front fender, and the front wheel. Before tightening the axle (or the cinch bolts for the axle), remove the prop under the engine and heave the bike off its centerstand. Grab the front brake, and pump the front forks through a few cycles. This ensures that the front axle is centered with respect to the two sliders, and frees-up the whole system. Tighten the front axle, and then tighten the pair of cinch bolts at the bottom of the fork sliders. If you're re-installing a fork brace, don't tighten it until after the axle is aligned, tightened and centered.

If your bike is fitted with air-assisted forks, an astonishingly small quantity of air is required to pump up the system. Always use a small hand pump to fill the system; bicycle pumps, or the air hose at the gas station, will immediately overfill forks and damage the fork seals.

That's it. You and your bike are now ready to challenge the highways, face hoards of winged nasties, fend off mud, sleet, hail and snow . . . until the next inspection tour. □
