

Handling Improvements - 101

Hello Mike, as you know I am new to the V-Max having purchased my first one about 6 months ago. I have read numerous articles on how to improve the bike. One of the recommendations is to get rid of the undersized front forks, and this is my problem. Some recommend using the emulators and heavier oil to reduce the road effects, others recommend using just bigger springs. Is there a best way to go? Also, will lowering the Max help the performance? Thanks Mike for your help, Joe #4240

Keep in mind this is just my opinion and not to be considered mechanical advice, with that said....

The best handling improvement would be to brace up the frame across the engine and around the swingarm bearings (or build a new frame), change to upside-down front forks, better rear shocks and a stiffer swingarm, and replace the wheels with wider ones and radial tires. However, this is prohibitively expensive; we're talking upwards of \$5000.

I will answer this question assuming we're restrained to a reasonable budget.

The Vmax's stock handling is not as bad as some make out, but it does have some problems, especially if you push it hard. Primarily these problems are flex in various places and being over-damped and under-sprung. The reasons for these problems go back to the old-fashioned forks and frame design which date from the 1960s.

The frame has long spans of unsupported curved tubing, and the steering head is too high. Short of a new frame, there's not a lot you can do about it besides brace it up as much as possible. I highly recommend the frame braces such as those sold by Blue Ridge Mountain SportMax (610-509-8629), which weld to the frame at the rear. A good machine shop will weld them on for a minimal charge.

The height of the steering head makes for long forks which allow a lot of flex.

Just think about it, is it easier to bend a long pipe or a short one? The 93-up forks are larger diameter which helps a little. Changing to a thick fork

brace such as the one the VMOA sells makes an improvement, especially in low speed maneuvering. Lowering the triple trees on the forks also helps by reducing the flex load leverage. This can only be done on 93-up forks, and should be limited to about an inch at the most. Going more will result in the fender contacting the radiator and reduces the rake too much resulting in squirrely handling. It also reduces ground clearance which can be an issue on hard cornering, particularly lefts which will make the sidestand mounting tab contact the ground first; this is not a good thing. It can break the front tire loose from the pavement if it hits hard enough.

Lowering the rear is easy, looks cool and is good for drag racing, but is very bad for handling. It reduces ground clearance with no benefit and increases rake and trail which makes the steering less responsive. For best handling, you'll want to raise it some by using 13-14 inch shocks. Obviously this is a compromise on looks.

This brings us to springing and damping. The forks use a fixed damping rod with no valving other than an anti-bottoming feature. This makes them softer at low velocity but stiffer the harder the bump. In order to reduce the resulting rough ride, they use very soft springs, and air pressure to supplement the insufficient springs. The rear shocks are sprung and damped in a similar way to balance it out. This results in a suspension that is both mushy and rough. The rear shocks also seem to wear out rapidly, often becoming useless before 20,000 miles.

Fixing the rear suspension is simply a matter of replacing the shocks with something with better valving and stiffer progressive springs. Progressively wound springs are superior in my opinion because they're better at maintaining proper ride height under varying conditions. I use 90/130 rate; if you are under 200 lbs and always ride solo you may want lighter ones.

The best solution I've found for the stock forks is to use Progressive brand springs combined with Race Tech cartridge emulators. Installing the latter requires removing and drilling the damper rod to bypass it.

Don't drill below the existing holes as this would disable the anti-bottoming. The blow-off spring on the emulators should be set to around 2 - 3 turns of preload on the screw depending on how aggressively you ride and your weight. When you get the damper rods back in and reassemble, before installing the springs and oil, reinstall the wheel and fork brace slightly loose, and loosen the triple clamps. Now wiggle, twist and tweak everything while gradually tightening all of the bolts and axle, with a goal of making the fork up-and-down movement as free as possible. This makes a tremendous difference in ride and handling. I like 5 weight oil; use 10 or a mixture of 5 and 10 if you want a stiffer ride.

Fill to the recommended oil height with the springs in place, making sure both levels are exactly equal. An easy way is to overfill and then draw the excess out with a turkey baster marked at the proper distance. The main spring preload is adjusted by cutting spacers that go on top of them. These should be as short as possible without bottoming under hard braking. No air pressure should be needed. Check the steering head bearing tension while you have it jacked up as well.

Don't forget the tires; the front is especially critical. A worn, cupped front tire will cause all sorts of woes, as will lack of balance. Very often handling complaints are actually caused by front tire wear. Front tires are often ruined long before the tread is gone. Something with small tread blocks like the Metzeler Lasertec will reduce the tendency to cup. More obviously, a squared-off rear has an effect on cornering as well.

That's it, good luck, double-check everything, and always be cautious testing new modifications. If you lack the confidence or tools to do it yourself, ask around. There are plenty of VMOA members and vendors who can do these sorts of things at a reasonable price or even less.

Mike Sayers
Membership Coordinator

