

## By Max McAllister – Traxxion Dynamics

I'm going to offer some advice that should help you dial in your bike. Understand that you will probably never be completely satisfied, and sometimes you may even be completely disgusted. And if you have followed this series then you will recall how important it is to have a properly-maintained motorcycle. You will need a bike in proper working order before you can ever hope to reach a good set-up.

You should have the best brakes you can get. See the highly controversial Roadracing World brake pad comparison test, (April, 1998) and suffice to say without endorsing any particular product, I concur with the results. However, you should test several brands of pads, and determine what works best for you. I can't understand it, but if you ask two guys with the same bike, doing the same lap times what pads they use, one will proclaim the other's brand as total junk, and their own to be the ultimate product ever created.

The same holds true for tires. Buy what works for you, not what is cheap, or on sale. Free is not necessarily a good thing in the world of tires. Remember that a free turd is still a turd. (Yes, I can be highly philosophical...) Don't ride on worn-out tires that you plan to "just burn up in practice". That is the most stupid statement in road racing. The only thing you learn is how to go slow on old tires. The \$50 worth of rubber you save will frequently turn into a \$1500 crash.

Your motorcycle should carburete cleanly. There are several jet kit manufacturers, and to tell you the truth, I can't tell you what to buy. It's back to the same guy telling you Brand A is simple to use, easy to install and works perfectly with no dyno testing, and the last time he bought Brand B, his bike would never run right again. His buddy will tell you the same story, just reverse the A and the B. If one doesn't work for you, try another kit. It is too important that your bike carburetes properly, to not spend another \$100. I would suggest you start with the brand your local dyno shop endorses, simply because they will be more familiar with the installation and tuning of that product.

The bottom line here is that you have to wade through rivers and mounds of bullshit at the racetrack. Part of your learning curve involves the art of interpreting the "advice" you get. As far as that goes, I'm just another guy giving you advice. You have to take all of the advice you get and sift it down to suit your needs. This may cost you some money. You are going to buy some stuff that doesn't work for you. Don't dwell on it, take the products off that don't work for you, and replace them with parts that do.

Have your suspension components serviced regularly, and set up with the appropriate springs for your weight, and make sure they have adequate damping available to go racing with. If your hand and foot controls are in good working order, then we will proceed towards the track to talk about dialing in your bike.

As far as club-level racing goes, I don't suggest you change anything at all on your bike after first practice, short of something that is failing mechanically, or brakes that don't work properly. Hopefully your engine tuner has your bike set up well enough that it runs cleanly all day. You really shouldn't have to mess with your jetting. If it is set up so close that it runs poorly at different times of the day, then have your tuner change it. You don't need to risk screwing up your carbs at the track. Poor carb performance is a serious distraction from your riding duties, and will frequently upset the chassis of the bike. Pay attention to your gearing. If it is slightly tall, leave it alone, since your lap times will decrease as the day progresses, and as lap times decrease you'll need taller gearing.

When setting up the chassis of your bike, I have come to learn that setting sag is almost completely impossible to get people to do properly, or even similarly. I don't know what goes wrong, but somehow, there is some serious deviation from the explanation that tuners give, and what shows up on the racers' motorcycles. The most common problem is that people bring me their bikes, and proclaim to have "set it up with an inch of sag". I stand on the bike and it doesn't sag at all. Where were they measuring the inch?

Here are some more foolproof ways I have come up with to get it right. These pointers are based on the assumption that you have purchased the appropriate springs for your weight. First of all, it should move, that's why it's called suspension! Should be obvious, but trust me, it's not. Second, take your best stab at setting your sag. You can check yourself by measuring the free sag of your bike. The back of your bike should not "top out". It should sag slightly under its own weight, and 5mm is a good amount. This is slightly less than ¼-inch. Push on the seat, and pull up on the subframe. You should feel the bike lift before it tops out. If it doesn't, then your spring is over-preloaded, and it will make your bike perform poorly in a bunch of ways. If your bike is topped out, I don't care what you measured, or who measured it, let some preload off until it sags as prescribed.

Perform a similar test on your forks, but the numbers are larger. Minimum free sag should be 15mm, but I usually get better results closer to 20mm. You can measure this with a ziptie. Put a ziptie around your fork, and push the fork down and let it rise. Push the zip tie against the dust seal, then pull up on the handlebars (or jack the bike up if you're working by yourself), and measure the amount the ziptie was displaced. Easy.

The net result is that the bike should be plush initially. This year, I have found much more success with running higher sag numbers. I currently work with about 28mm in the rear, and 33mm in the front. Again, your double-check system is the free sag.

From this point in the process we usually hit a barrier. Most riders complain they have no idea how to adjust their chassis, and if they did, they wouldn't know what to change to improve the problems they experience. Even worse, many riders don't even know what is good or bad about their bike's chassis on the racetrack. I don't think it's possible to teach suspension tuning, but I can help you figure out what to be conscious of as you ride, and how to ask the right questions when you consult with a suspension tuner.

Racing is difficult enough to do without having to analyze 1000 things happening with your motorcycle at the same time. I have found a way to break down a track that makes it easier to ride, and easier to analyze your chassis performance.

As a preface, this system of analysis can also be used to make riding easier. As a Novice-class rider, I found that focusing on one duty at a time simplified the whole process of trying to go fast for me. I don't proclaim to be a riding instructor, but this advice has helped many people.

When you are traveling down the straight, the only thing you need to be concerned with is your brakemarker. Once you reach that, your focus moves to your turn-in point. When you initiate your turn, look to your apex. (For the most part, this will also serve as a throttle-on point.) From the minute you get on the gas, your focus should be on the edge of the track at the exit of the turn.

Of course, there will most likely be other things going on around you. Regardless of what is going on around you, for each of those segments of the track, there is a job you need to get done, and that should be your primary focus. When you turn in, your job is to get to the apex. If you start to ride in this fashion, then you will find it easier to analyze the performance of your bike, since you will be able to say "my engine stumbles just after I get on the gas, and my bike seems to run wide at the exit of the turns." This is good information to people who will help you dial your bike in.

The most useful advice I ever received came from Ed Bargy, noted and respected instructor and track design consultant. It echoes my philosophy. He said, "No matter what is happening, when you reach your turn point, turn!" It doesn't matter if someone has bumped you, if your brakes fail, whatever. When you get there, turn! If you are on the pavement, you have a chance to save it. Once you leave the track, you have little to say about what the future holds for you. Brakes work way better on pavement than on wet grass or sand.

The classic example of this is the "false neutral". If you haven't had this happen to you, it will happen. A false neutral occurs (usually) downshifting, and your trans doesn't quite make it all of the way into the next lower gear. It "pops out" of the lower gear, and sort of hovers in tranny limbo. The net effect to the rider is that the bike feels like it has accelerated at the very moment that you need that sucker to stop. Most people usually stand the bike up, run off the track, and then ball up their prized racebike. This doesn't have to occur.

Just stay calm, pull in the clutch, and turn! You will enter the turn all ugly, you'll run way wide, your lap time will suffer, you will lose about three positions, but you will still be on the track and in the race. Way better than being off the track, in the weeds, and on the meat wagon! One last note, always upshift! Motorcycle trannys don't like to be "re-downshifted" after they drop into a false neutral. In fact, you can make the bike sort of lock up, and then your save can become a highside.

**Let me explain what you need to look for as you ride.**

**HIGH SPEED STABILITY:** This should be self explanatory, and is the easiest to analyze. Go fast in a straight line and your bike should never scare you. If it does, you've got some adjusting to do.

**PERFORMANCE UNDER BRAKING:** Is the bike stable? Does it squirm underneath you? Does the front wheel bounce? Does the rear wheel bounce? Do the forks bottom? How does the bike behave when you're trail-braking?

**PERFORMANCE IN THE CORNERS:** This needs to be analyzed in three segments: Turn-in, mid-corner, and exit. Be conscious of these things within each of these segments: Overall stability, steering effort, ground clearance, front-wheel action, and rear-wheel action. That's a bunch of stuff to think about, especially when you're just trying to circulate and learn to ride. If any of these things are out of whack, they'll usually let you know. In each segment of the turn:

**OVERALL STABILITY:** The main thing to look for here is wallowing action. There shouldn't be any. This is a mushy, spongy feeling that usually indicates a need for more spring.

**STEERING EFFORT:** Does the bike turn in easily? Does the bike track well in the corners? Do you have to fight to keep it on the racing line? Are your arms completely worn out after practice? You can make your bike steer more quickly by raising the forks up in the triple clamps. This can also be accomplished by raising the rear ride height. Adjusting the forks will make a more dramatic change. Move them in 5mm increments, until you get close, then do it in 2mm or 3mm increments. If your bike "runs wide" at the exits of the turns, you should raise the ride height in the rear. This will keep the geometry sharp as you get on the gas. If your bike has been crashed, and you find it turns easily one way, and is hard to turn the other way, then you may have bent your frame, and a call to G.M.D. Computrack is in order.

**GROUND CLEARANCE:** If you have anything dragging the ground, you have a problem that could result in injury. Some guys think they're cool because they're dragging stuff around the track. These people are a hazard to themselves and to others. If you have anything dragging, fix it! Raise your footpegs, bend your pipe in, or whatever it takes. If you lean in hard enough on a bike that's scraping the ground you will lift a tire off the ground, and then you will immediately take its place on the pavement. This is serious business.

**FRONT WHEEL ACTION:** The wheel should roll smoothly through the corner and inspire confidence. Does the wheel bounce? If it does, you need to pay close attention to the way it bounces. If the wheel is bouncing and you can't really feel it in the bars, then this is a lack of rebound damping. If the handlebars are jarring you, then you may have a spring or compression-damping-related problem.

**REAR WHEEL ACTION:** Your rear wheel can exhibit many of the same symptoms as the front wheel. If your bike feels like a pogo stick then this is a lack of rebound damping. This condition will also cause a bunch of wheelspin on exit and tear up your tire. Wheelspin also fools guys into believing that they are going fast. For the most part, it just means you are tearing up a good tire, and not going forward. Too much damping will cause the rear wheel to hover and squirm under hard braking. When you hit a bump, the wheel is hanging in the air instead of going back to the racing surface. Too much compression damping will make the bike kick-up. This can also cause excessive wheelspin.

When you notice a flaw in your chassis performance, note where it occurred in the turn. Was it as you rolled into the turn, was it in the middle of the corner, or was it as you accelerated out of the turn? This is critical information to help you decide what the correct changes should be. This is a lot of info, but I hope it helps!