



When we go to the races, to provide trackside support, we always come across riders and parents that are new to the sport. This great thing and we should all welcome them. We need new riders to help our sport grow. All of us that have been doing it for our whole lives take a lot of what we know for granted.

Being we specialize in suspension and motors, that is what we are questioned on. The first thing we should all be looking at is correct chassis set-up. What does that mean? Everything from race sag to tire pressure. You have to look at the chassis as a whole to determine suspension set-up. Make sure that all bearings (linkage, steering head, swingarm, wheel) are greased and in good shape. Check tire psi daily (12-13.5 psi is a good starting point). This is a good time to make sure the forks are not in a bind (see [www.jm-racingmb.com](http://www.jm-racingmb.com) for the proper procedure). Set bars to a comfortable position. All bars can be rotated forward or backwards in the clamps. A good starting position is in line with the fork tube angle and go from there. Most modern bikes have handle bar clamps that are reversible. One way moves the bars forward, in relationship to the triple clamps, and the other moves them rearward. Test each available position and find what is comfortable for you. Have you ever cut a bar down? More than likely you need to. Everyone needs a different width bar to fit their body type and place you in a comfortable riding position (call us for the procedure we use). Set all levers to a comfortable position. Not pointing to the ground or to the sky. Slightly below level, to the ground, is a good place to start. Setting race sag is the most critical setting that is neglected (see [www.jm-racingmb.com](http://www.jm-racingmb.com) for the procedure we use). Can everyone set the sag properly with the stock springs, no, but we can make a valiant attempt. Free Sag is the telltale sign that your spring rate is off. You may find a spring change maybe in order. Always keep at least 3-4mm of pre-load on the rear shock spring. The shock spring retainer relies on spring preload to keep it in place.

Now that we have a good base line setting and we are relatively comfortable on the motorcycle, what's next? A pipe "I need more power"! Wrong! What good is more power if we cannot put it to the ground? What good is more power if the bike will not turn? What good is more power if the front end bottoms every time the bike leaves the ground or only used  $\frac{3}{4}$  of the travel when you came up short? What good is.....well you get it.

That leads us to next step "Suspension". We perform amazing feats on our bikes, things that defy rationality some times. What is the main contributing factor to this? Suspension and chassis set-up (ok...and skill)! Your motorcycle's suspension is not only what keeps you from slamming your face into the bar if you make a mistake, but it is also what keeps your tires on the ground and moving forward. If your tires are not on the ground you cannot stop, accelerate, or change direction with any degree of precision or repeatability. Do you see where we are going with this?" I'm a beginner; I do not need suspension work. "Oh contraire! How do you get faster? You get faster by feeling in control and more comfortable. What is a major factor of that? Yep, you guessed it! Your suspension. You see, the bike manufactures are faced with a

daunting task. They need the bike to be passible for everyone from a beginner to an aspiring pro. How do they do that? Even though every manufacture has different philosophies, they do their best. In the end, it really fits very few. How are they to know your weight, skill level, terrain, etc.? They don't.

The first thing we look at is spring rates. The correct spring rates are the foundation the rest of the system is built off of. Yes, it is a system. The whole motorcycle has to work in unison to be correct. You are part of that system as well. That is why body position and technique is so important in this sport. What are the factors that dictate the proper spring rate and damping characteristics for any one particular rider?

Chassis design: weight bias, linkage curve, triple clamp offset, chassis flex, etc.

Rider: weight, height, riding style, discipline (off-road, mx, Ax, sx, dtx)

Engine: power delivery (modified, stock)

All of these, and more, affect the correct spring rates that are needed. As we mentioned before, you have to look at the complete motorcycle to determine suspension settings. If you look in your owner's manual they will usually list optional spring rates, one stiffer and one softer. That is just the tip of the iceberg. You may need 2, 3, 4 rates in one direction or the other. We have springs manufactured for the complete spectrum of riders, not just a narrow window. With some machines the standard rates are not balanced with each other. One end may be too soft or stiff for the other. Again, each machine is different.

The next step is damping, both compression and rebound. One bike may come off the showroom floor too soft in the beginning, get harder in the middle and blow through the stroke in the end or any combination of things. Some are just plan too stiff or soft. Some are not progressive enough or extremely progressive. Remember, the manufactures are trying to cover all the bases for a wide range of riders. That is why we have to test stock bikes before we can decide what needs done to improve and tailor it to any particular rider. That takes time and money. R&D is a major cost and the one thing that separates suspension tuners. If a tuner gets lazy or cheap, the end product will be sub-par. Tailoring the suspension's spring rate and damping characteristics (revalving) is, by far, the best dollar to performance ratio there is.

Yes, Dorothy the new TAC (triple air chamber) fork benefits (quite a bit I may add) to revalving as well. The air side provides nothing more than your spring characteristic. By adding or reducing pressure in the three chambers you are try to mimic the spring rate that you need based on the parameters listed earlier in the article. Nothing more and nothing less. It would be much easier to just run a standard coil spring would it not? (That is a discussion for another day...) You still need to adjust the damping characteristics to suit "You" and the type of riding that you do. Air spring or steel coil spring, damping rules the suspension performance roost!

I am starting to rant, so this is a good place to stop for today. This is just a glimpse into what can be accomplished with an off the show room floor motorcycle. We haven't even begun to discuss engines! Give us a call (618.455.3152) and we can get into further detail or explain anything you have bike related questions on.