



6081 S. Martin Luther King Blvd.
Lansing, MI 48911
Phone: 517-393-2421
Fax: 517-393-0632
www.enduroeng.com

QUALITY OFF-ROAD MOTORCYCLE PRODUCTS

Off-road Suspension Tuning Guide

We feel that understanding the basic suspension tuning can give you an advantage over your competition, or simply make your riding experience much better. For this reason Enduro Engineering has included a summary of basic suspension tuning and common problems experienced while setting up your bike for different terrain and riding conditions.

Getting started:

Your suspension should have relatively close settings when it arrives at your door! However, there are minor differences in riders from day to day; this unpredictable difference requires set-up by the customer. This should also help get you in the ballpark if you're using stock suspension. If you are having trouble dialing in your re-valved suspension, contact Enduro Engineering immediately for assistance.

REMEMBER:

Different conditions require slightly altered settings. If you happen to run into any set-up problems, you can call us for any help.



Setting Sag

■ STATIC SAG FOR SHOCK:

These next two steps are the MOST IMPORTANT to get the most out of your KTM'S suspension. For this measurement you will start with the bike on a center stand so both wheels are suspended. We have found that it is best to do this after you have ridden the bike and have the shock warm. Find a spot from the center of the rear axle up to the rear fender and measure these two points. (FIG 1) Write that number down. Now set the bike on the ground push on the up and down on the bike a few times to settle the bike (rider not on the bike) take another measurement from the same spot. Now take these two measurements and subtract the bike on the stand number from the bike on the ground number and the difference should be this measurement would be 35-40mm (1-3/8" to 1-5/8) for KTM / Husaberg, if your bike has linkage it should be 30-35mm (1-3/16" to 1-7/8") If not you will need to adjust the spring tension. On a KTM / Husaberg you do this by loosening the pinch bolt on the shock collar (FIG 2) Enduro Engineering builds a special tool that make this job much easier (FIG 3) for bikes with linkage you will need to loosen the locking collar (FIG 4) then increase the spring pre-load by tightening (clockwise) the shock collar or decrease the spring pre-load by loosening (counter clockwise) the shock collar to get the proper measurement.

■ Race sag:

This measurement is taken to determine if you have the proper spring rate for your weight and must be done after setting static sag. With your riding gear on sit on the bike in your riding position. The measurement on a KTM/ Husaberg should be 105-115mm (4-3/16 to 4-9/16) and if your bike has linkage it should be 100-110mm (3-15/16" to 4-5/16") of total sag. (You get this measurement by subtracting rider on the bike measurement from the bike on the center stand measurement) If less the number is less than the listed measurements the spring is too stiff. If is greater than the listed measurements the spring is too soft.



Shock

■ SETTING THE REBOUND:

- 1) Find a relatively fast trail with braking bumps, rocks or roots leading into the entrance of a corner. Reduce the rebound damping by turning the rebound adjuster (bottom adjuster on shock) counter clockwise until the rear end begins to hop or feel loose. Then turn the adjuster back in clockwise a few clicks to increase the rebound damping until the sensation goes away.
- 2) Find a log or ledge that tends to bounce the motorcycle after hitting it. If the rear end bounces up uncontrollably, make sure that the static sag is correct. If the static sag is correct, turn the compression (top) adjuster counter clock wise 3 clicks and turn the rebound adjuster in (clockwise) 3 clicks.
- 3) Find some large whoops. The motorcycle should track straight through the whoops with the rear wheel extending to the ground before the next impact. If it does not perform as described, as above, it is packing and the rebound dampening should be reduced! (Turn clicker out) (Please go to the section for sand set-up, as these rules don't apply for sand.)
- 4) Find a corner with acceleration bumps, rocks, or roots on the exit. The rear of the motorcycle should follow the ground. If the rear end "breaks up", reduce the rebound. (Turn clicker out) (If this fails soften the compression two clicks.) (Turn clicker out)

■ SETTING THE COMPRESSION:

- 1) Find some rough sections, a large jump or a couple of "G-Outs". The shock should bottom on the roughest section but it should not be a slamming sensation. Add compression to reduce bottoming. (Turn clicker in.) But avoid going too far as the suspension's ability to react to small variations of surface and rocks will be sacrificed in the trade. Remember the adjusters have a primary effect on the low speed, so even a large change in setting may only affect bottoming resistance slightly. Remember bottoming your suspension is not necessarily a bad thing. You should strive to bottom off the biggest bottoming load obstacle on the trail. If you don't you are not getting maximum plushness from your suspension. Run your suspension as soft as you can get away with but remember that if the trail has sand sections or lots of g-outs this will work against you.



Fork

■ Installing your forks:

This is the most common mistake that we see made, improper installation of the forks. You need to make sure that your fork tubes are not in a bind. There are many ways that are used to do this and they may all work but here at E.E. this is what we have found that works best. First slid the fork tubes into to the clamps. Make sure you have the pinch bolts loose, the tubes should slid in easily (if they do not make sure that you do not have a damaged or bent clamp) after sliding the fork tubes into the clamp set the fork height that you want (FIG 1) now using a torque wrench tighten pinch bolts to proper settings (see manual) your clamps have two or three bolts move from one bolt to the next until all are at the proper torque setting. Now it time to install the wheel, make sure your axel is clean and has a light coating of lube. Slid the axel in, this is where we need to make sure we do not have the forks in a bind. Using a screw driver we need to spread the pinch bolts (FIG 2) this allows the fork leg to move freely on the axel to make sure we have proper alignment. Now tighten pinch bolts per your owner's manual.



FIG 1



FIG 2

■ Setting the compression:

1) The forks should react to all trail variations. If the forks seem harsh on small bumps, holes, rocks, or roots soften the compression. (Turn clicker out) If they are relatively smooth, stiffen (Turn clicker in.) until they do feel harsh and then turn back a click or two.

2) Now find the rough part of the trail again. The forks should bottom over the worst g-out or jump.

■ Setting the rebound:

The rebound damping is responsible for the stability and the cornering characteristics of the motorcycle.

1) Find a short sweeper. When the forks compress for the turn, the speed at which the forks return is the energy that pushes your front wheel into the ground. If the forks rebound too quickly, the energy will be used up and the bike will drift wide, or wash. If the rebound is too slow, the bike will tuck under and turn too soon to the inside.

2). With the bike turning well, the wheel should return to the ground quickly and not deflect off successive impacts. If it does, reduce the rebound. (Turn out)

■ Guidelines for different conditions:

For hard-pack to intermediate:

Set the compression softer, (Turn clicker out) front and rear to help get maximum wheel contact and plushness.

Sand conditions:

(Non-square edged bumps); More low speed compression and rebound are necessary. Start by adding 1-2 clicks (Turn clicker in.) of rebound and as the track gets rough, add compression 1-4 clicks. (Turn clicker in. Harshness is a result of packing in forks. Remember to add compression (Turn clicker in) to help keep the front end from packing The rear suspension will exhibit packing by swapping. To eliminate swapping begin adding compression (Turn clicker in) until the bike tracks straight and then add rebound (Turn clicker in) to keep the rear following the terrain of each whoop.

Rocks and Roots:

Rocks and roots will make your suspension work at its worst. Try reducing compression and rebound so the suspension can react and not deflect off every impact.

■ Unpleasanties?

Head shake:

Adjust the forks lower in the triple clamps. If that does not improve the suspension then reduce the rebound on the front fork. (Turn out)

Excessive rear end kick:

Check for packing, which is identified by kick to side in hard to loam conditions. If you observe packing, soften rebound. (Turn clicker out.) This can not be avoided if you brake improperly and lock the rear wheel up and/or pull in the clutch, on the entrance to corners.

Keep a record of the conditions and the different settings if you ride in different areas. That way you can start at a point that worked well the previous times.

■ General Ideas:

Remember that if you make the suspension too soft you will use lots of energy just maintaining direction, and control. Be careful when you set it, there is a difference between soft and plush. Soft is often hard to control and harsh, while plush is smooth and controlled. The goal is to maximize control and comfort. Think about the entire section of trail or the average conditions of the trail. Factor in your skills as a rider and then select the setting that will provide the best overall ride characteristics. Consider that in off road riding you will encounter an incredibly wide range of conditions and you'll need to shoot for the middle ground or your suspension will be very good in some sections and average in others.

■ Maintenance:

The dampening of suspension changes as the components are used. This is caused by wear and oil viscosity breakdown. It is important that your suspension has regular maintenance. Improper assembly or inadequate fluids will drastically alter the way these components were designed to perform.

The shock's oil should be changed every 3-6 months under heavy usage. Seals will generally last a season, so once a year we recommend replacing them. For the forks, we recommend that you bleed off the air pressure before each ride. A complete service is suggested every 6-8 months depending on how much sand you ride in. Don't wash anywhere around your seals with power washer (including the chrome.) Also we do not recommend removing dust scrapper for internal cleaning. This typically frees up dirt caught in the scrapper, which will attack the oil seal.

