

# ***MOTO-XPERTS SUSPENSION TUNING GUIDE***

## **FORK INSTALLATION**

*The correct installation of the front forks is essential for proper suspension operation.*

1. Put bike on a stand that will enable front tire to be off the ground.
2. Install forks in triple clamps. Ensure that both forks are the same height in the triple clamps (refer to your owners manual for the correct dimension). Also, make sure that the bleed screws are towards the front - this will make bleeding the air from your forks easier.
3. Tighten each bolt (in an alternating fashion) in the top clamps to 16 ft/lbs.
4. Tighten the lower clamp pinch bolts to 14 ft/lbs. (Over tightening of the lower pinch bolts may result in a mid-stroke harshness condition).
5. Install front wheel assembly. (Sometimes it helps to pry the brake pads apart a little with a screw driver before bringing the wheel into position).
6. BEFORE tightening any pinch bolts go ahead and fully tighten the axle nut. (If you cannot hold the axle to tighten the nut, go ahead and tighten the right side pinch bolts just to hold the axle while you tighten the nut. MAKE sure you loosen the right side axle nut pinch bolts before you proceed any further).
7. Spin the front wheel and abruptly apply front brake. Repeat this a few times.
8. Let off of the front brake and tighten the left side (caliper side) pinch bolts to manufacturer recommended torque rating.
9. Again, spin the front wheel and abruptly apply front brake. Repeat a few times.
10. Tighten right side pinch bolt to recommended torque value.

**This procedure will ensure that the front forks are parallel and that no binding will occur. Ride and Enjoy!!**

## **SETTING RACE SAG**

*Static Sag or Race Sag is the amount the bike compresses from fully extended, with the rider on board.*

### **Here's how to measure it.**

1. First extend the forks or shock completely and measure from the wiper to the bottom of the triple clamp on forks, or from the axle to a vertical reference point on the chassis. This is L1.
2. Take the bike off the stand. Put the rider on board in riding position. Get an assistant to balance the bike or have the rider hold onto something, compress the suspension about 25 mm (1") and let it extend very slowly (slowly is the critical term). Where it stops, measure the distance between the wiper and the bottom of the triple clamp or the axle and the reference point on the chassis again. Do not bounce. This is L2. (If there were no friction in the seals the bike would come up a little further.)
3. Next lift up on the suspension and let it drop very slowly. Where it stops, measure again. Do not bounce. This is L3. The reason L2 and L3 are different is due to stiction or drag in the seals and bushings. (If there were no friction in the seals or the linkage the bike would drop a little further.)
4. Half way between L1 and L2 is where it would come to rest with no friction. Therefore L2 and L3 must be averaged and subtracted from L1 to calculate true Static Sag.  
Static Sag =  $L1 - (L3 + L2)/2$
5. To adjust Static Sag make longer or shorter preload spacers or use the preload adjusters, if available. It is important to note that there are no magic Sag numbers. However, here are some guidelines to use as starting points.

<b>Bike Type</b>	<b>Front %</b>	<b>Front mm</b>	<b>Rear %</b>	<b>Rear mm</b>	<b>Rear Free Sag mm</b>
Off-Road Bikes	22-25%	65-75mm	30-33%	95-100mm	15-25mm
Off-Road 80cc Mini's	22-25%	55-65mm	30-33%	75-80mm	10-20mm
Street Bikes	28-33%	30-35mm	28-33%	30-35mm	0-5mm
Road Race Bikes	23-27%	25-30mm	23-27%	25-30mm	0-5mm

## **SHOCK TUNING**

### ***Setting the rebound:***

1. Find a relatively fast straight with braking bumps leading into the entrance of a corner. Reduce (Turn clicker out) the rebound damping until the rear end begins to hop or feel loose. Finally, increase (Turn clicker in) the rebound damping until the sensation goes away.
2. Find a jump that tends to launch the motorcycle out. The rear end should absorb and then smoothly lift the motorcycle into the air. If the rear end bounces up, add rebound. (Turn clicker in)
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 damping should be reduced! (Turn clicker out) (Please note the guide for sand set-up, as these rules don't apply for sand.)

### ***Setting the compression:***

1. Find a corner with acceleration bumps on the exit. The rear of the motorcycle should follow the ground. If the rear end "breaks up", soften the compression. (Turn clicker out) (If this fails, soften the rebound two clicks.) (Turn clicker out)
2. Find some rough sections, a large jump, and a couple of "G-Outs". The shock should bottom on the roughest section but it should not be a slamming sensation. Add compression to fight bottoming. (Turn clicker in) Avoid going too far as small bump ride 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 track. If you don't, you're not getting maximum plushness from your suspension.

## **FORKS TUNING**

### ***Setting the compression:***

1. The forks should react to all track variations. If the forks seem harsh on small bumps or holes, soften the compression. (Turn clicker out) If they aren't, stiffen (Turn clicker in) until they feel harsh, and then turn back a click or two.

2. Now find the rough part of the track again. The forks should bottom over the worst obstacle. If harsh bottoming occurs, add oil in 5 mm increments.

### ***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. Find the appropriate balance for each track.
2. With the bike turning well, the wheel should return to the ground quickly yet not deflect off berms or bounce off jumps.

### **GOING TO DIFFERENT TRACKS/TERRAIN:**

#### ***Hard packed/Intermediate:***

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

#### ***Sand tracks:***

For 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)

Supplementary sand set-up techniques: 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. Don't be concerned if your clickers are nearly maxed out in sand conditions, unless of course you had your bike revalved for sand.

#### ***Supercross:***

G-load, curb hits: G-loads produce slow piston speeds. This means that less dampening is produced by the shock and forks in a situation that causes more of a bottoming load. To set your bike up for Supercross, adjust the compression stiffer (Turn clicker in) on the suspension 2-6 clicks, and in some circumstances raise oil level and/or change to stiffer springs.

## COMPLAINTS/PROBLEMS

### Headshake:

Adjust the forks lower in the triple clamps.

### 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 cannot 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 different settings if you race different tracks. That way you can start at a point that worked well the previous times.*

TRACK \_\_\_\_\_ CONDITION \_\_\_\_\_

FORK- C \_\_\_\_\_ R \_\_\_\_\_

OIL HIEGHT \_\_\_\_\_ cc

SHOCK- HC \_\_\_\_\_ LC \_\_\_\_\_ R \_\_\_\_\_

RACE SAG \_\_\_\_\_ mm

TRACK \_\_\_\_\_ CONDITION \_\_\_\_\_

FORK- C \_\_\_\_\_ R \_\_\_\_\_

OIL HIEGHT \_\_\_\_\_ cc

SHOCK- HC \_\_\_\_\_ LC \_\_\_\_\_ R \_\_\_\_\_

RACE SAG \_\_\_\_\_ mm

TRACK \_\_\_\_\_ CONDITION \_\_\_\_\_

FORK- C \_\_\_\_\_ R \_\_\_\_\_

OIL HIEGHT \_\_\_\_\_ cc

SHOCK- HC \_\_\_\_\_ LC \_\_\_\_\_ R \_\_\_\_\_

RACE SAG \_\_\_\_\_ mm

TRACK \_\_\_\_\_ CONDITION \_\_\_\_\_

FORK- C \_\_\_\_\_ R \_\_\_\_\_

OIL HIEGHT \_\_\_\_\_ cc

SHOCK- HC \_\_\_\_\_ LC \_\_\_\_\_ R \_\_\_\_\_

RACE SAG \_\_\_\_\_ mm

*More questions? Don't hesitate to call for more info and tuning tips.....765-230-0514*

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