

## **TROUBLESHOOTING FORK DAMPING PROBLEMS**

By: Dave W. Hodges Circuit One Suspension

### **Fork Adjustment Locations:**

Rebound adjustment (if applicable) is located near the top of the fork.

Compression adjustment (if applicable) is located near the bottom of the fork.

Spring preload adjustment (if applicable) is generally hex style and located at the top of the fork.

### **Forks - Lack of Rebound:**

#### ***Symptoms***

Forks are plush, but increasing speed causes loss of control and traction.

The motorcycle wallows exiting the turn causing fading traction and loss of control.

When taking a corner a speed, you experience front-end chatter, loss of traction and control.

Aggressive input at speed lessens control and chassis attitude suffers.

Front end fails to recover after aggressive input over bumpy surfaces.

#### ***Solution***

Insufficient rebound - Increase rebound "gradually" until control and traction are optimized and chatter is gone.

### **Forks - Too Much Rebound:**

#### ***Symptoms***

Front end feels locked up resulting in harsh ride.

Suspension packs in and fails to return, giving a harsh ride.

Typically after the first bump, the bike will skip over subsequent bumps.

With acceleration, the front end will tank slap or shake violently due to lack of front wheel tire contact.

#### ***Solution***

Too much rebound - Decrease rebound "gradually" until control and traction are optimized.

### **Forks - Lack of Compression:**

#### ***Symptoms***

Front-end dives severely, sometimes bottoming out over heavy bumps or during aggressive breaking

Front feels soft or vague similar to lack of rebound.

When bottoming, a clunk is heard. This is due to reaching the bottom of fork travel.

#### ***Solution***

Insufficient compression - Increase "gradually" until control and traction are optimized.

## **Forks - Too Much Compression:**

### ***Symptoms***

Front end rides high through the corners, causing the bike to steer wide. It should ride in the middle of suspension travel.

Front wheel bounces over bumps while ripples and bumps are felt directly in the triple clamps and through the chassis.

Ride is generally hard, and gets even harder when braking or entering turns.

### **Solution**

Too much compression - Decrease compression "gradually" until the bike neither bottoms or rides high, and control and traction are optimized.

### ***Symptom***

Front end chatters or shakes entering turns. This is due to incorrect oil height and/or too much low speed compression damping

### **Solution**

First, verify that oil height is correct. If correct, then decrease compression "gradually" until chattering and shaking ceases.

## **TROUBLESHOOTING SHOCK DAMPING PROBLEMS**

### ***Shock Adjustment Locations:***

**Rebound adjustment** (if applicable) is located at the bottom of the shock.

**Compression adjustment** (if applicable) is located at the top of the shock or on the reservoir.

**Spring preload** is located at the top of the shock.

### **Shock - Lack of Rebound:**

#### ***Symptoms***

The ride will feel soft or vague and as speed increases, the rear end will want to wallow and/or weave over bumpy surfaces and traction suffers.

Loss of traction will cause rear end to pogo or chatter due to shock returning too fast on exiting a corner.

#### **Solution**

Insufficient rebound - Increase rebound until wallowing and weaving disappears and control and traction are optimized.

### **Shock - Too Much Rebound:**

#### ***Symptoms***

Ride is harsh, suspension control is limited and traction is lost.

Rear end will pack down, forcing the bike wide in corners, due to rear squat. It will slow steering because front end is riding high.

When rear end packs in, tires generally will overheat and will skip over bumps.

When chopping throttle, rear end will tend to skip or hop on entries.

#### **Solution**

Too much rebound - Decrease rebound "gradually" until harsh ride is gone and traction is regained. Decrease rebound to keep rear end from packing.

### **Shock - Lack of Compression:**

#### ***Symptoms***

The bike will not turn in entering a turn.

With bottoming, control and traction are lost.

With excessive rear end squat, when accelerating out of corners, the bike will tend to steer wide.

#### **Solution**

Insufficient compression - Increase compression "gradually" until traction and control is optimized and/or excessive rear end squat is gone.

## **Shock - Too Much Compression:**

### ***Symptoms***

Ride is harsh, but not as bad as too much rebound. As speed increases, so does harshness. There is very little rear end squat. This will cause loss of traction/sliding. Tire will overheat. Rear end will want to kick when going over medium to large bumps.

### **Solution**

Too much compression - Decrease compression until harshness is gone. Decrease compression until sliding stops and traction is regained.

## **Tuning Limitations of Stock Parts:**

New motorcycles purchased from the dealership are generally set-up on the soft side, for a rider in the weight range of 140-165 lbs. If you are not in this range, you must retune the suspension for your weight within the internals of forks and shocks, the manufacturer puts valve with small venturis. This, along with shims, creates a damping curve. This works okay at slower speeds, but at higher speeds, when the suspension must react more quickly, the method cannot low enough oil, and you experience hydraulic lock. With hydraulic lock, there is no damping. The fork and/or shock cannot dampen correctly and handling suffers. The solution is to re-valve the active components for the proper damping curve. It does not matter what components you have, (Ohlins, Fox, KYB, Showa). If you can achieve the damping curve that is needed, it does not matter what brand name is on the component. Sometimes with stock components, when you turn the adjusters full in or out, you do not notice a difference. This is due to the fact that the manufacturer has put the damping curve in an area outside of your ideal range. After re-valving, the adjusters will be brought into play, and when you make an adjustment, you will be able to notice that they affect the way the way the fork or shock perform.

One of the problems with stock springs is, in most cases, it is of a progressive rate. This is to say, a spring at sag may be .85 kg per mm, and at 2.5 inches of travel, it may be 1.05 kg per mm, getting progressively stiffer. The ideal solution is to install a spring with a straight rate, specific for your weight, and the weight of your motorcycle. In some cases, the factory installs a straight rate spring, but often the incorrect rate for your weight.

Remember to always make small adjustments, and keep notes! Sometimes more is not better and be patient. Suspension is an art/science.