A few technical terms explained
Before you actually start your test rides, it is worthwhile knowing a little shock-absorber jargon. To start with, spring pre-load. This setting influences the height at which your motorcycle will ride. The higher the spring pre-load, the higher the riding height of the motorcycle. The spring pre-load can be adjusted by turning the spring collar/spring retainers, which may also be fitted with a locking ring. When you place the motorcycle on its wheels, the front fork will settle, by several centimetres, under the weight (sprung mass) of the bike. This is known as the "negative spring distance", "sag" or "neutral riding position". This negative spring distance (without rider) should be somewhere between 15% and 35% of the total spring distance (fork or shock stroke). Example: the total spring distance is 120 mm. The negative spring distance therefore should be between 20 and 40 mm. This can be easily measured by winding a cable tie around the shock-absorber spindle(s). With rider, the spring distance should be between 35% and 50%. Example: the total spring distance is 70 mm, so the negative spring distance should vary between 25 and 35 mm.

Compression absorption occurs when a shock-absorber or front fork is compressed, while rebound or bump absorption describes the opposite effect.

From diagnosis to therapy
To help you rapidly find the source of your problems (and then solve them) what follows is a brief total overview of several different suspension problems.

TROUBLE SHOOTING OVERVIEW

REAR SUSPENSION

Complaint

- too little negative suspension travel
- motorcycle shocks through the steering in ruts or when accelerating
- shock absorber appears immobile
- uncomfortable
- overloading on front forks when travelling downhill or braking

Cause

- spring pre load too high

Solution

- reduce spring pre load
- fit a softer spring if necessary

Complaint

- motorcycle dips too deeply on suspension
- too much negative suspension travel (“sag”)
- uncomfortable
- tendency to shocking
- motorcycle wanders on uneven surfaces

Cause

- spring pre load too low

Solution

- increase spring pre load
- fit a harder spring (or springs)

Complaint

- very uncomfortable
- rear wheel tends to bounce in fast bends especially when accelerating
- rear wheel bounces over uneven surfaces

Cause

- compression camping too hard

Solution

- adjust damping to softer level
- have the shock absorber adjusted internally
- have worn shock absorbers repaired or replaced

Complaint

- Rear suspension bottoms out
- motorcycle and rider subject to hard bumps
- Noticeable movements in the frame, particularly when accelerating out of bends

Cause

- compression damping too soft

Solution

- set compression damping harder
- have the shock absorber adjusted internally
- have worn shock absorbers repaired or replaced

Complaint

- motorcycle suspension extremely sluggish
- rear wheel unable to cope well with uneven surfaces
- tendency to bounce on bumpy surfaces
  uncomfortable
- tendency to snake in ruts

Cause

- rebound damping too hard

Solution

- decrease the rebound damping

- possibly increase spring pre-load
- replace shock absorber

Complaint

- motorcycle suspension extremely lively
- constant movement in the rear suspension
- rear wheel has tendency to bounce / wobble

Cause

- rebound damping (rebound) too soft

Solution

- increase the rebound damping
- reduce the spring pretension if necessary
- have worn shock absorbers repaired or replaced

FRONT SUSPENSION

Complaint

- front forks sluggish/nearly immobile
- handlebars “jump” in your hand when accelerating and crossing ruts
- uncomfortable
- front wheel bounces / chatters on poor road surfaces

Cause

- spring pre load too high
- spring too hard
- air chamber too small

Solution

- reduce spring pre load
- fit softer springs or progressive springs with a lighter initial strength
- increase air chamber (reduce oil level in front fork)

Complaint

- motorcycle sags to deeply on the springs
- too much negative suspension travel
- suspension occasionally bottoms out
- front forks shake when braking and travelling downhill

Cause

- spring pre load too low
- springs too soft
- air chamber too large

Solution

- increase spring pre load
- fit stiffer springs or progressive front fork springs with a heavier initial strength
- reduce air chamber (increase oil level in front fork)

Complaint

- front forks sluggish/nearly immobile
- shocks in the steering when accelerating
- front wheel chatters when braking hard

Cause

- ingoing (compression) damping too hard

Solution

- reduce the ingoing (compression) damping
- possibly use lower viscosity fork oil

Complaint

- front forks shock when braking and on uneven road surfaces
  and dips rapidly when braking

Cause

- ingoing (compression) damping too soft

Solution

- increase the ingoing (compression) damping
- possibly use higher viscosity fork oil

Complaint

- front forks spring back slowly
- uncomfortable
- front wheel unable to cope with uneven surfaces
- indirect steering behaviour

Cause

- outgoing (rebound) damping too hard

Solution

- reduce the outgoing (rebound) damping
- possibly use a lower viscosity fork oil

Complaint

- front end is lively
- bouncing and shocking on uneven surfaces
- front forks spring back too quickly

Cause

- outgoing (rebound) damping too soft

Solution

- increase the outgoing (rebound) damping
- possibly use a higher viscosity fork oil

Complaint

- front forks shock
- front wheel shudders
- not enough progressive hardening of the spring towards the end of travel

Cause

- air chamber too large

Solution

- increase the oil level in small steps of 5 to 10 mm

Complaint

- forks hard
- tendency to shock in the steering
- front wheel bounces when braking due to hydraulic stop blocking
- uncomfortable

Cause

- air chamber too small

Solution

- decrease the oil level in small steps of 5 to 10 mm
