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▲ WARNUNG

1. The installation of a shock absorber that has not been tested by the motorcycle manufacturer can change the handling of your motorcycle. BGM cannot be held responsible for personal injuries or damage to property that occur after installing the shock absorber. Contact an authorized BGM dealer or other qualified person for help.
2. Please read the operating instructions and the installation instructions and make sure that you have understood everything before working on the shock absorber. If you have any questions about installation or adjustment, please contact an authorized BGM dealer or other qualified person.
3. The vehicle manufacturer's workshop manual must also be observed when installing the shock absorber.

1. Construction

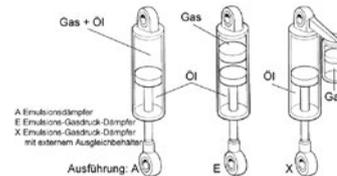


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1.1 Construction

Most BGM shock absorbers work according to the "De Carbon" principle. The oil is pressurized by a gas. But gas and oil are separated by a floating piston. The separating piston is usually located in an external expansion tank that is located directly on the shock absorber (version X).

However, there are also versions in which the compensation chamber and separating piston are integrated in the main housing (version E). Very few dampers work as an emulsion type without a separating piston. Dry nitrogen (N₂) is used as the gas. The pressure prevents cavitation, whereby a constant damping behavior is achieved. An external expansion tank brings better cooling of the oil.

The more complex shock absorbers offer adjustable compression and rebound damping and some also have an adjustable length. However, they all have an adjustable spring preload.

2. Adjusting the landing gear

2.1 Adjusting the chassis - road holding of the scooter

Every scooter is designed with a specific chassis geometry, height and fork angle also play an important role. By exchanging individual components, you can

these values are influenced and the characteristics are changed. It is important to ensure that the front and rear always fit together.

The change to BGM shock absorbers brings an optimal result when the front fork and the rear suspension work together very well.

It is very important that the front and rear ride heights are within a certain range when loaded.

Basic Settings

Please always proceed from the basic setting specified by BGM. This has been tested for your scooter (in its original condition), assuming an average driver weight.

The preload of the spring (s) is very important as it changes the vehicle height and fork angle. The handling can change, also for the negative.

2.1.1 Adjusting the spring preload



Measure:

Please proceed as follows (it is easier for two)

A Put your scooter on the main stand

B Raise the stem until it fully rebounds

C Measure the distance from, for example, the lower edge of the license plate (or a point marked with adhesive tape vertically above the rear axle) to the axle. (*R1*)

D Make a comparable measurement for the fork to the front axle. The fork must be fully extended. (*F1*)

E Take the scooter off the main stand, compress it a few times and repeat the measurements while it is jacked off. (*R2*, *F2*)

F Finally, please carry out the same measurements with the driver including the load. (*R3*, *F3*)

NOTE

It is important that the rider is seated on the scooter in a normal riding position. This ensures that the weight distribution (front - rear) corresponds to that of driving.

The readings should look something like this:

Without a Driver:

Back: 10-20 mm (*R1*, *R2*)

Front: 15-30 mm (*F1*, *F2*)

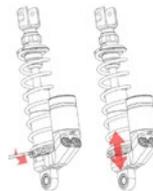
Passengers:

Back: 25-40 mm (*R1*, *R3*)

Front: 35-50 mm (*F1*, *F3*)

Attitude

The preload of the spring can be adjusted using the adjusting ring. Loosen the upper counter ring (or grub screw) and adjust the pre-tension with the lower ring. Then counter it again with the upper ring (or tighten the grub screw).



All BGM shock absorbers offer this setting option for adaptation to different drivers and areas of application.

2.1.2 Adjusting the rebound and compression damping

Damper adjustment

The adjustment options of the BGM struts are very extensive. You can optimally adapt the setting to your weight and load, as well as to your driving style and the road surface.

In order to improve the road holding it is very important that you know and understand the function of your damper. You can "experience" how you can influence driving behavior through tests. Depending on the design of the shock absorber, adjusters for rebound damping, compression damping and strut length are available. All damping adjusters have a right-hand thread. Turning clockwise (to the right) increases the damping. Turning counterclockwise (to the left) reduces the damping.

The adjusters have click stops, which makes it easier to count to the correct setting. Different settings can be memorized quite easily.

The driving behavior is most strongly influenced by changing the rebound stage. The rebound adjustment wheel is located at the (lower) end of the piston rod. (Pic 9)

The pressure stage adjuster is located on the expansion tank (Fig. 10).

Some models also have an adjuster for the high-speed range of the compression stage. (Picture 11)

NOTE

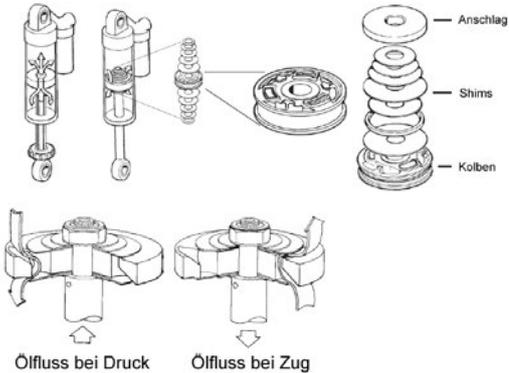
Clicks are always counted starting from fully turned (to the right) adjusters. The adjusters should not be turned too tight.

If no clicks can be heard or felt on the rebound stage, the damper must be checked by an authorized BGM service point. This can be an indication of a lack of gas pressure.

Functionality

When the damper speed is low, the oil flows through the needle valves (Fig. 3).

At higher damper speeds, it flows through a number of openings in the piston (Fig. 4). The oil flow through these openings in the piston is controlled by the shims (thin steel disks). At higher pressure, these will be bent open slightly to allow the oil to flow.



Compression damping

When the scooter compresses slowly, the oil first flows through the needle valve in the piston rod (combined rebound / compression valve) in the piston rod. If the scooter compresses quickly, this oil flow is no longer sufficient and the shims on the underside of the piston open to allow a greater oil flow. (Pic 6)

The oil displaced by the plunging piston rod is pressed into the expansion tank by the separate pressure stage adjuster. This actuator also has a shim package that acts and opens like a pressure relief valve during rapid compression. The separating piston is moved and the gas pressure rises.

Rebound damping

When the spring pulls the damper apart again, the oil flows back through the needle valve in the piston rod. The oil pushed into the expansion tank is pushed back into the main housing by the gas pressure via a separate one-way valve.

With faster rebound, the shims open on top of the damper piston and allow higher oil flow. (Pic 6).

▲ NOTE

Highspeed and lowspeed are terms that refer exclusively to the compression / rebound speed of the piston rod of the damper. It is not directly related to the speed of the scooter.

2.1.3 Tuning your scooter



▲ NOTE

Always keep a record of the changes made, adjust them in small steps (max. 4 clicks) and change only one setting at a time.

By testing the setting options, you can learn how the scooter reacts to the changes.

Always start with a test drive in the basic setting. Choose a short route with different conditions, fast and tight corners, gentle bumps and hard heels. Then always drive the same route and only change one setting per test drive.



Start with the rebound damping

If the scooter feels unstable and spongy, consider increasing the rebound damping.

Start by turning the rebound adjuster 4 clicks to the right (clockwise). Take another test ride and turn back 2 clicks if it feels too tight and hard. If the scooter feels too tight and too hard, especially after a series of bumps, the rebound damping should be reduced. Turn the adjusting wheel 4 clicks counterclockwise and take a test drive.



Compression damping

With an adjustable compression damping, the hydraulic damping can be regulated during compression of the shock absorber. The setting is made using the rotary knob on the expansion tank and the compression speed can be influenced here. The compression damping supports the spring in its effect. The effect of the compression damping on the damping behavior can only be felt while driving.

There is the option of equipping the damper with low and high-speed pressure regulation. There are two setting wheels on the expansion tank.

With the low-speed compression plate, comfort is influenced by small waves and traction. If the traction is poor and the driving experience is very poor on stretches with small waves, the low-speed setting should be reduced.

If the scooter becomes unstable in fast corners or if there is a tendency to skid, the high-speed setting should be increased. If, on the other hand, there is a tendency towards rear wheel jarring or a generally very tight ride, the high-speed setting should be reduced.



Length adjustment of the shock absorber

A longer, rear or a shorter, front suspension strut results in a steeper steering angle and shorter caster. This makes the steering more sensitive and improves handling.

A shorter, rear or a longer front suspension strut results in a flatter steering angle and longer caster. The steering becomes a little slower and the scooter becomes more stable.

⚠ WARNING

If the shock absorber is equipped with a length adjustment, this must never be unscrewed further than until the marking below the lock nut is visible. Make sure that the lock nut is tightened again after the adjustment.

Control and maintenance

Regular cleaning, care and maintenance contribute to perfect function. If a shock absorber service is required, please contact one of the BGM service points.

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- Only clean the outside of the shock absorber with a mild cleaner. (Do not use automatic motorcycle cleaners, thinners, or brake cleaners.)
- Lift the rubber stop and also clean it thoroughly.
- Then clean the piston rod with a soft cloth.
- Lightly mist the shock absorber with spray oil (WD40 or similar).

CONTROL

- Carry out a visual inspection for external damage
- Check rubber parts for perfect condition
- Check the piston rod for leaks and damage
- Check that the damper is securely attached at the top and bottom

⚠ WARNING

The gas pressure must never be changed. Special tools and nitrogen under high pressure are required for filling. The manufacturer cannot be held responsible for damage to property or personal injuries caused by failure to observe the following points:

- Never expose the shock absorber to an open flame or excessive heat. There is a risk of the damper exploding.
- Never try to open the damper or the expansion tank.
- Never try to open the cover of the expansion tank. The container is under pressure.
- The surface of the piston rod must not be damaged, this inevitably leads to leaks.

Disposal

The shock absorber should be forwarded to a suitable disposal company for disposal, as they have the necessary experience to separate the different materials.