



COMPLETELY
REDESIGNED

PLUG & TRAVEL EVO

HIGHEND ELECTRONIC SUSPENSION
FOR THE BMW GS



- BMW R 1200 GS
- BMW R 1250 GS
- BMW R 1200 GS ADV
- BMW R 1250 GS ADV



THE SUSPENSION (R)EVOLUTION



In 2013, Touratech launched the Plug & Travel suspension system as a high-quality replacement for the electronic suspension elements on the Boxer-GS. The experience gained from millions of kilometres ridden has now been incorporated into the completely redesigned high-end Plug & Travel EVO series, which comes up with some revolutionary technical innovations.

The joy of innovation and the pursuit of perfection are in Touratech's DNA. Resting on one's laurels is therefore not an option for its busy developers. No wonder that, after almost 10 years, the question of a successor system for the Plug & Travel electronic suspension system, which has been tried and tested thousands of times, also arose with regard to the Boxer-GS.

"Touratech Suspension's service staff have meticulously documented customer feedback over the years, providing a broad database based on millions of kilometres ridden," says Jo Glaser, Product Manager at Touratech Suspension. "Our development team has unearthed this wealth of data and identified the potential for further development."

Conceptually, the easy-to-install Touratech Suspension Plug & Travel EVO electronic suspension system, like its predecessor, is tailored precisely to the requirements of adventure riders who demand a finely responsive suspension system with large reserves for trips with a high payload also on unpaved roads. Technically, however, Generation EVO is a completely new design.

STRONG PARTNERS FOR A PERFECT PRODUCT

Equipped with almost a decade of experience in the development and distribution of high-end electronic suspension systems as well as the feedback from millions of kilometres ridden, Touratech has teamed up with two technology companies, lead-

ers in their respective segments, to develop the Plug & Travel EVO. "We were faced with the challenging task of redesigning an excellently functioning electronic suspension system while retaining its proven strengths and opening up new benefits for our customers," explains Glaser, an experienced Africa traveller and Touratech veteran, who has been product manager for Touratech Suspension for ten years.

"Eibach was our chosen partner for the development and production of our springs. And for good reason: the company, based in Finnentrop in the Sauerland region, has not only made a name for itself as a supplier to the automotive industry in its 70-year history; Eibach is also the number one manufacturer of performance suspension systems in high-end tuning.



The "inner workings" of the completely redesigned Plug & Travel EVO rely on the most advanced technologies.

"The electronically controlled valve is the heart of every semi-active suspension element," the Product Manager explains. "In JRZ Suspension Engineering, we found the perfect partner for this area," Glaser continues. "The Dutch specialists look back on almost three decades of suspension system development for top-level racing and have internationally unique expertise when it comes to electronic suspension systems".

JRZ is also the partner for series production. Located in Uden, halfway between the Ruhr and Rotterdam, this company boasts state-of-the-art machinery and quality assurance. From design to series production, JRZ combines all steps under one roof.

WORLDWIDE PATENTED ELECTRONIC VALVE

The Plug & Travel EVO semi-active suspension system adjusts the damping in real time to the current conditions of the ground. For this purpose, the path and speed of the compression and extension movements are recorded by sensors. Based on this data, the electromagnetic valve regulates the oil flow. In the case of fast, vigorous movements, resistance is increased to firm the damping, whereas if movements are slow, the valve opens to allow the suspension system to respond smoothly to the ground conditions.

The result is not only a smooth response with maximum reserves against bottom-

ing out. The permanent adjustment of the damping also ensures the best possible contact between wheel and road, which is essential for riding safety in extreme situations.

The electronic valve used in the new Plug & Travel EVO suspension system line is patented worldwide. It reacts to the electronic control with unprecedented precision. And even when subjected to extreme damping pressures during tough offroad use, the flow, and therefore the damping, remains absolutely constant.

NEW HYPER FLOW DAMPER PISTON

The Hyper Flow damper piston, which modifies the flow performance in the suspension elements of the Plug & Travel EVO series, has been completely redesigned. The oil flow is optimised in such a way that foam formation at very high damper speeds is effectively suppressed.

Cavitation damage caused by collapsing oil bubbles is now a thing of the past.

UNIQUE LOW FRICTION DAMPING

To ensure maximum sealing of the damper with the lowest possible friction, the seal on the piston rod has also been redesigned. Due to the modified shape of the ring and effective support of the sealing lip, the sealing surface and therefore the friction remain constant at all times, regardless of the load. This guarantees the low breakaway torque required for sensitive response and prevents the unpleasant slip-stick (backsliding) effect.

SLIM DESIGN, MAXIMUM FUNCTIONALITY

The slimmer damper design also contributes to the sensitive response. "We rely on a one-piece, milled bottom part for the new Plug & Travel EVO line," Jo Glaser explains. "Compared to the



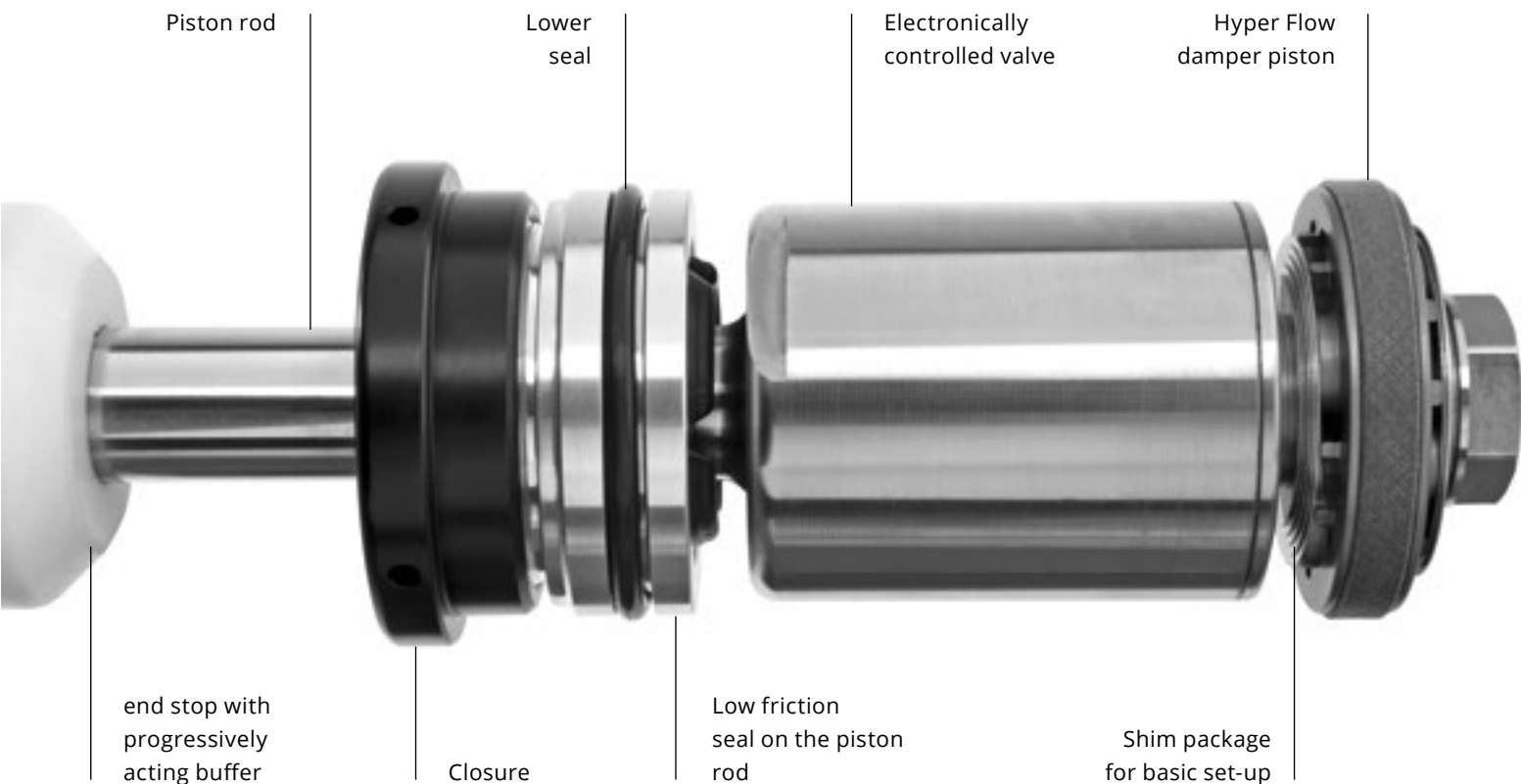
Uniball bearing for highest loads



Super light: Aluminium alloy bushes



Fig. shows test prototypes



two-piece constructions that are often used, this solution not only gives us a good deal of additional strength, but we are also able to save a lot of material thanks to the elaborate shaping that is precisely matched to the load," the expert says. "This has allowed us to noticeably reduce the weight of the suspension elements, which reduces the unsprung masses and has a positive effect on the riding characteristics."

And the new design of the electronic shock absorbers offers yet another fundamental advantage. Despite the smaller dimensions, the EVO elements realise the maximum possible stroke. This means: more spring travel than that is not possible with the standard suspension geometry of the BMW R 1250 GS.

SEAMLESS INTEGRATION INTO YOUR VEHICLE

In line with Touratech Suspension's Plug & Travel philosophy, superior functionality is complemented by seamless integration into your vehicle. This means that the electronic suspension elements from Touratech Suspension can simply replace the standard

THE TOP 10 BENEFITS OF THE TOURATECH SUSPENSION PLUG & TRAVEL EVO

- **One-piece milled bottom part**
Maximum stiffness meets low weight
- **Convenient pressure stage adjuster**
Simple setup in ten steps with only one controller
- **Hyper Flow damper piston**
Optimises oil flow and suppresses foam formation
- **Low friction seal**
Low breakaway torque for sensitive response behaviour
- **Newly developed electromagnetic valve**
Precise response and highest control quality even under extreme continuous load
- **End stop with progressively acting buffer**
The safety plus for extreme situations
- **Robust electric preload adjuster**
Faster adaptation with improved durability
- **Maximum possible spring travel**
The geometry of the GS does not allow for more spring travel than that!
- **New, lighter design**
Lower unsprung masses with increased strength
- **High-quality Uniball bearings**
Minimum tolerances and highest wear resistance for a long service life

The elaborately milled aluminium housing offers maximum strength with minimum weight.

The slim design also facilitates installation in your vehicle.



Dynamic ESA shock absorbers on the BMW R 1250 GS.

Installation is now even easier due to the slimmer layout. All standard plug connections are retained and operated as usual via the GS's standard switches.

In line with this philosophy, the new EVO line does without an intermediate control unit and now processes the data from the central function unit (CFU) directly. Time-consuming teaching of the electronics is therefore not necessary. In addition, the integrated control system is able to immediately take into account all software updates installed via the BMW service, so that no additional suspension element update is required.

ELECTRIC PRELOAD ADJUSTER WITH MORE POWER

The electric preload adjuster for electronic adjustment of the spring preload has also been completely redesigned. The engineers have succeeded in achieving a

higher torque for rapid compression of the spring at a lower operating pressure. This puts less stress on the seals, which results in even longer durability.

COMFORTABLE SUSPENSION SYSTEM SET-UP

The pre-setting of the compression damping on the new EVO line is intuitive, using a single element. Adjustment is carried out in 10 steps with an easy-to-use rotary knob, equipped with an easily readable scale. This also enables less experienced users to reliably implement individual suspension system setups.

END STOP FOR THE TOUGHEST APPLICATIONS

To meet the demands of the most extreme trails, the suspension elements of the Plug & Travel EVO series have an innovative end stop made of a foam-like plastic. This material deforms progressively under pressure, so that a gentle braking of ex-

MERCILESS TEST BENCH TESTING

Before the new suspension elements went into extensive field testing, a comprehensive test procedure was carried out on the test bench. A test device was specially developed for internal durability tests. Even lateral loads were simulated with weights, and the cooling of the damper was carried out using a fan to replace the airstream. To obtain the most realistic environment possible, the electronic valve of the damper was connected to a complete motorcycle electronic system. On the test bench, the dampers had to withstand one million strokes at full compression and an additional 30 kilograms of lateral force.

The result:
not a single one leaked!

treme compression movement at the end of the working stroke can be achieved.

HIGH-QUALITY UNIBALL BEARINGS

The high-quality Uniball bearings are distinguished by minimal tolerances. The surface-treated steel used for the robust and smooth-running swivel bearings also guarantees maximum durability. The new rubber seals are particularly pressure-resistant, so that they effectively keep out dirt and water, preventing premature wear.

The bushes for bolting them to the vehicle are made of a special aluminium alloy, providing an additional contribution to the reduction of weight.

"With the Touratech Suspension Plug & Travel EVO, we can offer demanding GS riders an electronic suspension system that retains all the advantages of the predecessor model," Product Manager Glaser says with satisfaction. "In this



Noticeably improved operating comfort thanks to the pressure stage adjuster with ten-stage scale and the extremely powerful electric preload adjuster.

TOUGH PRACTICAL TESTING

Parallel to the endurance tests on the test benches, extensive riding tests were also carried out. This is why ready-to-ride pre-production samples were created at the beginning of development process, allowing the new Plug & Travel EVO to be put through its paces using a wide variety of basic set-ups over thousands of kilometres.

And intensive tests were not only carried out on the "normal" versions of the R 1250 GS and its sister model Adventure – the Touratech development workshop also built a special version with a 21-inch front wheel, suitable for offroad use, and increased spring travel. With this prototype, the new material could be tested at the limit under the toughest conditions.

With the input of the winner of the Dakar car ranking and Hellas Rally winner, Dirk von Zitzewitz, Touratech was able to develop a special offroad set-up on the basis of the new Plug & Travel EVO – in addition to the traditionally available one – which turns the multitool R 1250 GS into an offroad capable adventure bike that is unparalleled in this weight class.



In addition to the testing carried out in the production vehicle, pre-production variants of the new Plug & Travel EVO were subjected to extreme tests in the Touratech R 1250 GS Rallye.

new design, however, we've taken all the experience gained over the past ten years into account, meaning that our customers receive a product with unprecedented performance whose advantages they will love on every trip.”

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Fig. shows test prototype



PLUG & TRAVEL EVO

Touratech Suspension Plug & Travel EVO
for BMW R 1200 GS / R 1250 GS and ADV

Model	Version	Item no.
R 1200 GS / R 1250 GS	front	038-5859
R 1200 GS / R 1250 GS	rear	038-5860
R 1200 GS / R 1250 GS	set	038-5861
R 1200 GS / R 1250 GS, height lowering	set	038-5862
R 1200 GS / R 1250 GS ADV	front	038-5863
R 1200 GS / R 1250 GS ADV	rear	038-5864
R 1200 GS / R 1250 GS ADV	set	038-5865
R 1200 GS / R 1250 GS ADV, height lowering	set	038-5866

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