



Brand of **NTN Group**

SHOCK ABSORBERS

We don't go with the flow,
we shape it!



SNR SHOCK ABORBERS: THEY'RE OBVIOUSLY NO SURPRISE!

As the leading manufacturer of strut bearings in Europe, NTN wants to provide a global solution to the players on the market. So the group is accelerating the development of its suspension products range with the addition of 100% gas shock absorbers to its SNR brand.

Designed to absorb shock impacts, the "shock absorber and suspension" assembly combines complementary parts that play a basic synergistic role by:

- absorbing shocks and vibrations,
- ensuring vehicle stability,
- providing an exceptionally high-quality driving experience.

SNR shock absorbers combine with strut bearings to assure you of high performance, enhanced safety and optimal comfort.

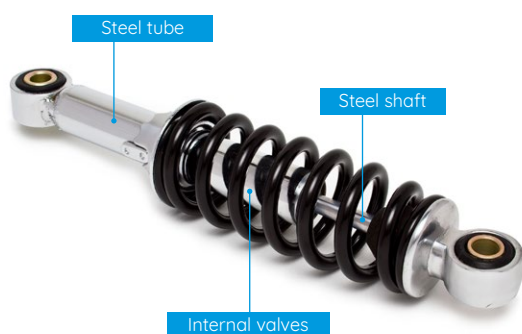
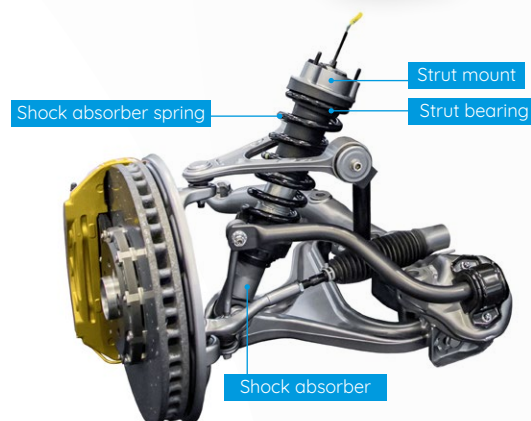


Shock absorbers and suspensions:

Functions

Suspensions play an essential role in vehicle safety and good road handling.

- **Safety:** They help maintain contact between the wheels and the road surface at all times (while accelerating, braking and changing direction).
- **Comfort and performance:** They affect a vehicle's road handling, steering and ride.



Purpose of the shock absorber

Shock absorbers are an essential part of a vehicle's suspension system. By absorbing shocks and reducing vibration in the passenger compartment, they ensure comfortable and perfectly controlled road handling.

In terms of safety, shock absorbers play a vital role: they minimise the risk of losing control on curves or on rough roads.

When they encounter potholes, speed bumps or uneven road surfaces, shock absorbers adapt by compressing and releasing. As a result, this chain reaction maintains continuous contact between the tyres and the road surface, thereby assuring safety and good road handling.

SNR shock absorber range

Market

The European shock absorber market is a core part of the automotive industry. In constant evolution, this dynamic sector is experiencing solid growth that shows no sign of slowing down. In fact, estimates project **nearly 4% expansion per year through 2030.**

Several factors are contributing to this continuous growth:

Increasing number of heavy vehicles and SUVs

With the growing popularity of heavy vehicles and SUVs, the demand for high-performance shock absorbers has increased considerably. These vehicles subject their suspensions to heavier loads, thereby creating new opportunities for shock absorber manufacturers.

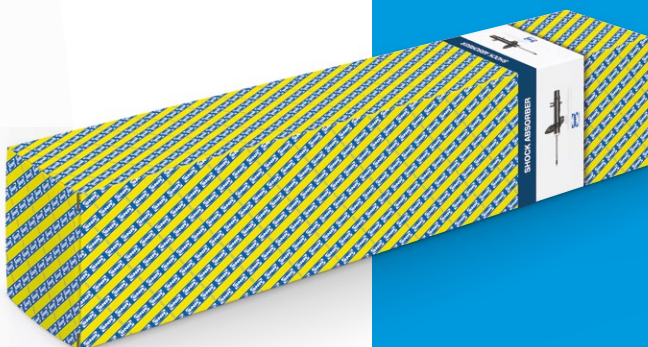
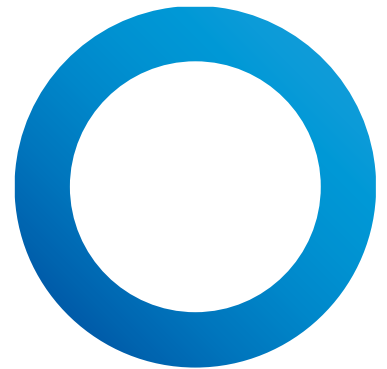
Transition to electric and hybrid vehicles

More and more electric and hybrid vehicles are populating our roads. Their unique road handling characteristics and greater weight subject shock absorbers to more pressure. That increased pressure accelerates shock absorber wear, thereby underscoring the need for stronger parts to address this growing demand.



Safety requirements

Safety remains a major priority for automotive manufacturers and drivers. Shock absorbers play a critical role in maintaining vehicle stability, thereby reducing the risk of accidents.



In pursuit of comfort

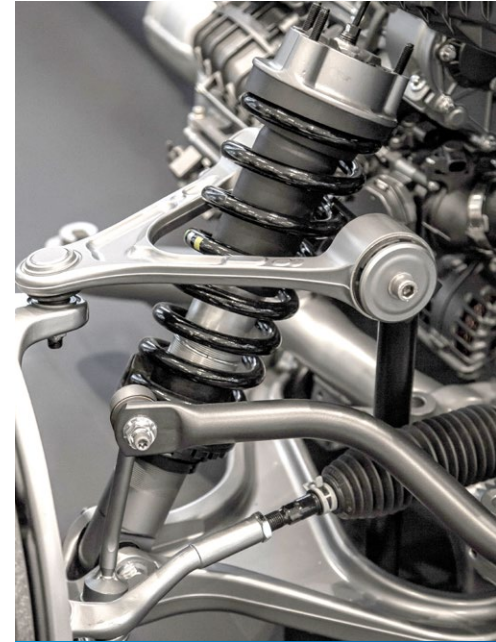
Drivers' expectations with regard to comfort have increased over the years. Shock absorbers play a key role in ensuring a smooth, stable and pleasant ride, which contributes directly to customer satisfaction.

Various types of shock absorbers

Various types of shock absorbers are available on the market, the most common of which are hydraulic, gas-filled and pneumatic.

How to tell them apart?

- **Hydraulic shock absorbers:** As part of the most widespread technologies, they use hydraulic fluid to absorb the kinetic energy generated by the movement of the suspension system. When the vehicle encounters a bump or a hole in the road, fluid is forced through the internal valves, dissipating the energy and reducing excess rebound.
- **Gas shock absorbers:** They include a manufacturing process that carefully incorporates oil and nitrogen to optimise performance. Initially filled with oil, these shock absorbers undergo a second stage in which the nitrogen is added to the circuit under pressure. This combination of oil and nitrogen enhances the characteristics of the shock absorber. The compressed nitrogen in the circuit plays a key role by minimising the formation of air bubbles in the fluid, thereby ensuring the shock absorber's responsiveness and durability. This advanced technology enhances the driving experience by efficiently absorbing shocks and vibrations."
- **Pneumatic shock absorbers:** A pneumatic suspension using air cushions replaces classic suspension springs to better absorb shocks. Designed for off-road or high-end vehicles, and more and more widely used in recent years, pneumatic suspensions offer the major advantage of being adjustable, making it possible alter the ride height.



Our commitment to performance led us to offer a full range of gas shock absorbers in response to their continuous growth on the original equipment market.



SNR shock absorber range



At NTN Europe, we master every stage of the manufacturing process. This expertise enables us to offer a comprehensive range of nearly 800 shock absorber part numbers, covering 80% of the European automotive fleet park.

The SNR range comprises:

- **Conventional (tubular) shock absorbers:** using a piston and cylinder system to absorb the kinetic energy generated when the suspension system moves. Their design provides for efficient heat dissipation, thereby ensuring steady performance and greater durability.
- **Shock absorbers with a spring cup:** including a spring cap to optimise load distribution and enhance stability. They provide higher load capacity while maintaining smooth road handling thanks to a control system that regulates compression and release.
- **McPherson struts:** using a strut support system to combine shock absorption and load bearing functions. Their design provides for better force distribution, thereby reducing stresses on other suspension components, which results in better stability and road handling characteristics.
- **Cartridge shock absorbers:** providing more precise control of suspension movement thanks to their compact design.



SA6 : Front shock absorber

SA9 : Rear shock absorber

SNR gas shock absorber benefits

Quality at the heart of our commitment

As a leading manufacturer of original equipment and aftermarket components, NTN invests its expertise at the very core of every product. The manufacture of our shock absorbers reflects that ambition and relies on decades of development and on the performance of high-quality suspension parts. That tradition carries over into every shock absorber that we sell, guaranteeing a smooth ride, enhanced safety and optimal comfort.

Improved performance

Gas shock absorbers are a guarantee of performance. Replacing the air with compressed nitrogen enables the assembly to react more rapidly, ensures good road handling and reduces heating sensitivity.

A range that meets your needs

The list of part numbers is often very long: to simplify your administrative tasks, the SNR range has been standardised. This approach makes it possible to cover multiple applications with a single part number, which provides significant benefits:

- **Simplification of product identification:** the shock absorber identification process facilitates your operations and your administrative functions.
- **Easier part number management:** the standardised approach simplifies the administration of multiple part numbers, which saves you time, reduces complexity and minimises the risk of error (stock problems, better quality control, etc.).
- **Warehouse space optimization:** the product range standardisation enables you to manage your storage space more efficiently.

Ease of installation

Gas shock absorbers make repairs simpler. Basically, the pressure inside the shock absorber makes it much easier to extend the shaft (initially compressed in the tube). Compared with hydraulic shock absorbers, there is no longer any need to apply high compressive force.

Choosing an SNR shock absorber means:

- **Multiple applications covered by a single part number,**
- **Easier utilisation by the garage,**
- **Enhanced safety, optimum comfort and better road handling for the driver.**



We don't follow trends, we set them!

Quality control and recommendations

Tests and test benches

NTN Europe positions itself among the major automotive manufacturers with regard to suspension systems. Product quality and quality control are our core concerns, in the interest of ensuring performance and optimising safety for our customers.

Accordingly, the group applies extensive human and technical resources to guarantee that the shock absorbers manufactured in its factories conform with quality standards.

Quality control procedures are carried out meticulously, from receipt of the raw materials to delivery of the finished products and throughout all the production stages in between. As they leave the production line, every SNR gas shock absorber undergoes testing on a test bench (compression and release).

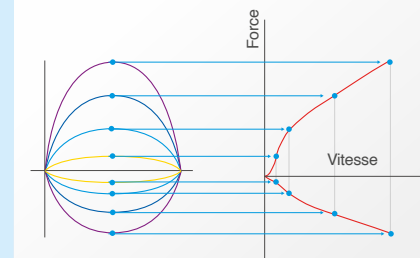


Primary tests performed:

- Deflection test
- Calibration diagram
- Spring bracket dynamic test
- Endurance test
- Spring mount break test
- Stabiliser bar bracket dynamic test
- Stabiliser bar bracket break test
- Rebound break test
- Saline environment corrosion test
- Paint strength test

Technical advice and maintenance intervals

NTN experts recommend to inspect shock absorbers every 20,000 km and to replace them every 80,000 km. When replacing the shock absorber (always in pairs), NTN Europe's specifications also call for replacing the suspension kit.



Dyno diagram: Test enabling determination of damping force as a function of shock absorber speed.

Why replace shock absorbers?

Shock absorbers gradually become less effective in proportion to the demands to which they are subjected day in and day out:

- Pollution
- Long vehicle life
- Undetected leaks
- Heavy and frequent loads
- Poor road conditions
- Sporty driving

If the shock absorbers are not replaced, the driver may face several risks:

- Ineffective ABS if the wheels lose contact with the ground
- Extended braking distance: a worn shock absorber increases braking distance by 15%"
- Skidding on slippery roads
- Loss of control of the vehicle
- Accelerated wear of related parts such as brakes, tyres or other suspension components

Replacing the shock absorbers helps:

- **Improve road handling and maintain braking distances**
- **Ensure steering agility and precision**
- **Reduce vibrations**
- **Enhance manoeuvrability in curves**

NTN

Make the world **NAMERAKA**



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NTN Europe - 1 rue des Usines - 74000 Annecy
RCS ANNECY B 325 821 072 - Code APE 2815Z - Code NACE 28.15
www.ntn-europe.com

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