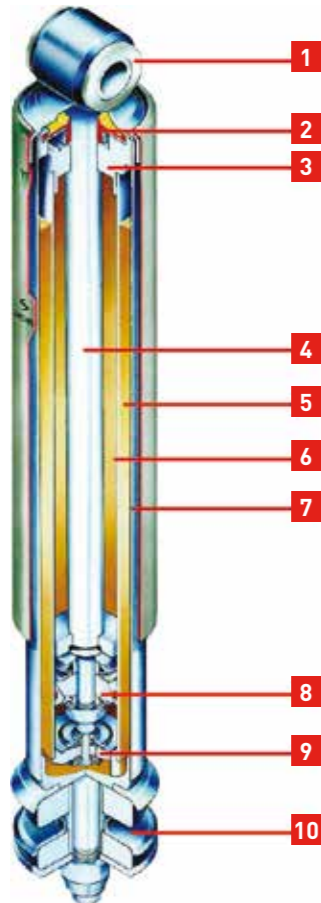


SHOCK ABSORBER COMPONENTS

ALL ABOUT SHOCK ABSORBER

RENAULT
TRUCKS
DELIVER

PRODUCT
COMMERCIAL KNOWLEDGE



THE SHOCK ABSORBER CONSISTS OF THE FOLLOWING COMPONENTS:

- 1 Upper Attachment Lug
- 2 Sealing
- 3 Guide
- 4 Piston Rod
- 5 Hydraulic Oil
- 6 Operating Cylinder (Reserve Cylinder)
- 7 Outer Cylinder
- 8 Piston Valve
- 9 Bottom Valve
- 10 Lower Attachment Lug



IT IS RECOMMENDED THAT THEY BE CHANGED AS A PAIR



PRACTICAL ADVICE

MAXIMISE THE SALE

Don't just sell the shock absorber – look for further opportunities to maximise the sale:

- Fitting bolts.
- While each shock absorber can be replaced individually, it is recommended that they be changed as a pair to maintain equal response on both sides of the vehicle. Failure to replace shock absorbers in pairs could result in dangerous vehicle handling. The probability is high that if one has failed, the other one is also weak.

RENAULT FITTED-PART

- One year warranty.
- Fitted by Renault Trucks trained technicians.

RENAULT TRUCKS 24/7

- Professional roadside assistance 24 hrs a day, 7 days a week, 365 days a year.
- Dedicated to getting customers' trucks back on the road with minimum delay



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Renault Trucks SAS with a capital of 50 000 000 € - 954 506 077 RCS Lyon Crédit photos : © Renault Trucks - 01/2017



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FACT

You can avoid poor road holding by fitting GENUINE Renault Trucks shock absorbers.

Shock absorbers that are too soft make the vehicle difficult to handle and sensitive to side winds. The steering becomes unstable, road holding poor and the braking distance gets longer, shock absorbers that are too hard transfer vibrations to the chassis. This may lead to poor driving conditions and damage to other components.

THE DIAMOND DISTINCTION

1 | Bespoke Manufacture

There are no standard shock absorbers for Renault Trucks. Specific shock absorbers are developed for each model, precisely matched to that particular vehicle, to the way it will be driven, to its load, axle combination and suspension.

2 | Perfect damping

With GENUINE Renault Trucks shock absorbers, the forces are perfectly damped through valve package and flow channels with tolerances of only a few thousandths of a millimetre. They use an exact quantity of high-grade hydraulic oil which does not boil or evaporate prematurely keeping damping properties perfectly maintained.

Maximum safety to the driver and the vehicle, meaning optimum operating efficiencies.

RISKS OF FITTING NON GENUINE



Using an inferior shock absorber can seriously jeopardise the functionality of an operator's truck's suspension system. **Driving with shock absorbers that do not meet Renault Trucks specifications may be both unpleasant and dangerous.** Renault Trucks shock absorbers are developed for each model. It is important that the shock absorbers interact optimally with other components of the suspension system such as springs and air bellows.



TWO PARTS MAY LOOK ALIKE, BUT...

There will always be non-genuine suppliers wanting to sell shock absorbers to Renault Trucks operators. The quality of these non-genuine makes naturally varies as much as their prices.

However, even if a well-known non-genuine Renault Trucks make is chosen – it is by no means certain that the shock absorber is tailored and to the specification of a Renault Truck's suspension system in the same way as a GENUINE Renault Trucks part.

THE RIGHT CHARACTERISTIC

It is important for comfort and road holding that the shock absorber characteristic is correct. This means that the shock absorber must have the correct resistance and rate of expansion and compression. Renault Trucks has carried out tests to determine which shock absorbers are best suited for different spring options. **When changing shock absorbers, always use the type originally fitted to the vehicle.**

HEAT-RESISTANT SEALS AND OIL

Shock absorbers become very hot in use. It is important that the seals are not damaged by the heat, since they must keep out dirt and dust at the same time as preventing the oil from leaking out. GENUINE Renault Trucks shock absorbers therefore have seals made of Viton, a highly heat-resistant material – which **can withstand temperatures of 180°C to deliver longevity.** The oil in the shock absorbers must also be heat-resistant. In GENUINE Renault Trucks shock absorbers, an exact quantity of high-grade hydraulic oil is used. The damping properties are maintained because the oil does not boil or evaporate prematurely.

BUSHING

High strength flexible rubber bushing – accommodating for misalignment in axle and chassis movement **contributing to a smoother ride.**

3 | Minimum downtime

The long life of the GENUINE Renault Trucks shock absorber is achieved by a combination of **3 factors**:

- **the correct thickness of chromium-plate surface treatment** on the hardened steel piston rod **protects against corrosion** thus reducing the risk of oil leakage through seal damage,
- GENUINE Renault Trucks shock absorbers have **seals made of Viton**, a highly heat-resistant material which keeps out dirt and prevents oil from leaking, ultimately giving the shock absorber a **longer life**,
- **correct installation dimensions ensure minimal material stresses** in both the shock absorber and suspension.

FEATURES	BENEFITS
The right characteristic.	The forces are correctly damped, giving optimum comfort, stable steering and good road holding. No consequential damage due to vibration in the chassis and other components.
Heat-resistant seals.	Reduce the risk of leaks. Keep out dust. Give long shock absorber life.
Correct installation dimensions.	Minimal material stresses in both shock absorber and suspension. Easy to install, so less time off the road.
Correct stroke.	The shock absorber is not damaged by bottoming. The shock absorber does not damage other components.
Chromium-plated piston rod.	The correct thickness of surface treatment protects against corrosion. Reduced risk of leakage.

DOUBLE WALLED OPERATING CYLINDER

Doubled walled operating cylinder of **1.5 mm steel capable of withstanding high pressures.**

HIGH PRECISION VALVE PACKAGE

High precision valve package and flow channels with tolerances of only a few thousandths of a millimetre guarantees perfect damping.

CORRECT INSTALLATION DIMENSIONS

The correct installation dimensions mean minimal material stresses in both shock absorber and suspension. And the shock absorber is **easier to install**, so the vehicle spends **less time off the road.**

CORRECT STROKE

The correct stroke is another important factor for the installation and operation of the shock absorber. Having the correct working range ensures that the shock absorber does not bottom and suffer damage. Other components may also be damaged if a shock absorber fails.

CHROMIUM-PLATED PISTON ROD

The correct thickness of surface treatment **protects against corrosion**, so is important for the life of the shock absorbers. Rust attack may mean that the seals are damaged so that the shock absorber begins to leak oil and has to be replaced.

SHOCK ABSORBER HOW IT WORKS

- Unless a dampening structure is present, a truck's leaf springs will extend and release the energy it absorbs at an uncontrolled rate – and continue to bounce at its natural frequency until all of the energy is used – making for an extremely bouncy ride and an uncontrollable truck.
- A shock absorber controls that unwanted leaf spring motion – a process known as dampening. **Shock absorbers slow down and reduce the magnitude of vibratory motions** by turning the kinetic energy of suspension movement into heat energy that can be dissipated through hydraulic fluid.
- A shock absorber is basically **an oil pump placed between the chassis frame of the truck and the axle.** The upper mount of the shock connects to the frame (sprung weight), while the lower mount connects to the axle (unsprung weight).
- **A twin-tube design**, the upper attachment lug is connected to a piston rod, which in turn is connected to a piston – which sits in a tube filled with hydraulic fluid. The inner tube is known as **the pressure tube**, and the outer tube is known as **the reserve tube**. The reserve tube stores excess hydraulic fluid.
- When the truck's wheels encounter a bump in the road the energy of the leaf spring is transferred to the shock absorber through the upper attachment lug, down through the piston rod and into the piston. Orifices perforate the piston and allow fluid to leak through as the piston moves up and down in the pressure tube. Because the orifices are relatively tiny, only a small amount of fluid, under great pressure, passes through. This slows down the piston, which in turn slows down the spring.



SHOCK ABSORBER DESIGN

Shock absorbers are double acting hydraulic telescopic dampers. They cannot be dismantled and must be replaced as a complete unit – replacement on both sides of the vehicle.

THE BENEFITS OF SHOCK ABSORBERS

SAFETY

- It is important for comfort and road holding that the shock absorber characteristic is correct – with correct resistance and rate of expansion and compression.
- Shock absorbers and other suspension components must interact properly, otherwise the steering will become unstable, road holding poor and the braking distance longer.

ECONOMY

- GENUINE Renault Trucks shock absorbers optimise the performance of the truck and driver combination. Due to excellent road holding, tyres will last for thousands of extra miles.

COMFORT

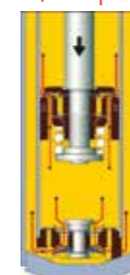
- Shock absorbers contribute to driver comfort and good ride characteristics.

DRIVER FATIGUE

- Inferior or worn shock absorbers make the vehicle difficult to handle. The driver must then be extremely focused and make continuous small corrections. This will make the driver tired and thus become a safety risk

SHOCK ABSORBERS WORK IN TWO CYCLES

1 | Compression Cycle



The compression cycle occurs as the piston moves downward, compressing the hydraulic fluid in the chamber below the piston. During compression the fluid is pressed partly through the bottom valve to the outer cylinder and partly through the piston valve to the area above the piston. In this case the size of the damping force is mainly determined by the bottom valve. Since the ducts are very narrow a resistance builds up against the fluid flowing through. In this way the movement of the piston is braked. In the event of a sudden compression or extension the braking effect is increased further by means of swirl formation in the fluid flows through the ducts. The compression cycle controls the motion of the vehicle's unsprung weight.

2 | Extension Cycle



The extension cycle occurs as the piston moves toward the top of the pressure tube, compressing the fluid in the chamber above the piston. During extension the fluid is pressed into the area above the piston through the piston valve at the same time as fluid from the outer cylinder is drawn through the bottom valve. In this case the size of the damping force is mainly determined by the piston valve. The shock absorbers have a hydraulic brake device that starts to operate approx. 15mm before they are fully extended. The extension cycle controls the heavier- sprung weight. **All modern shock absorbers are velocity-sensitive – the faster the suspension moves, the more resistance the shock absorber provides.** This enables shocks to adjust to road conditions and to control all of the unwanted motions that can occur in a moving vehicle, including bounce, sway, brake dive and acceleration squat.

