



BET ON AL-KO AND WIN!

The head office of **AL-KO** in Spain is located in Abadiano (Biscay). The plant dates back to 1975 and has undergone three refurbishments, between 1995 and 2001, having a surface area over 16,000 m². In these plants, the **AL-KO** shock absorbers follow a manufacturing process of short and medium series based on the criteria of flexibility, efficiency and profitability.

The Abadiano centre has incorporated robots to its automated production processes. An intelligent raw materials warehouse that enables **AL-KO** to control the variety of components and the breadth of its range favouring flexibility of production and an efficient delivery service. This automation enables **AL-KO** in a few minutes to stock pile the parts of a shock absorber (between 30 and 40 depending on the model) for its manufacture.

AL-KO, a pioneer in the manufacturing of shock absorbers in Spain, offers a wide range of shock absorbers and suspension elements, backed by its engineering versatility which provides innovative technical solutions to meet the needs of its customers.

The commitment to customers challenges the design capacity of **AL-KO** and the rationality of its manufacturing processes. To that end, **AL-KO** engineering remarks significant resources to ensure the basic features of its products: accuracy and durability.



Long experience with over 60 years as an engineering supplier, offering customised solutions both with respect to spare parts, and to the original equipment, serving to confirm the reliability and precision of their products. Both the quality system and the manufacturing processes are certified by the major customers of the original equipment. **AL-KO** has laboratories and facilities to enable the manufacture of a precise and long-lasting product..

The **Abadiano Centre for Technical Proficiency** is equipped with research and testing facilities which enable to reproduce in the laboratory the behaviour of the suspension under any circumstances. The manufacturing processes include wide-ranging possibilities from very flexible semi-automatic processes up to a high degree of automation and robotization.



Since 1996 **AL-KO** implements a quality system certified under the ISO 9000 Standard. We also have the “**Green Electricity**” certificate, accrediting that 100% of the energy used by **AL-KO** comes from green energy sources.

The application of the results to product engineering obtained in the laboratory life tests and test tracks are reflected in the continuous product improvement.

All this serves to make **AL-KO** a competent partner in developing effective solutions in the field of suspension.



The **AL-KO Performance** shock absorber product line offers the driver sound driving and a feeling of control over the vehicle far superior than the previous performance, with the originally-fitted shock absorbers. Always bearing in mind that these shock absorbers have settings (valve adjustments), specially-designed and defined for each specific model of car, their sole objective being to guarantee safety and grip, and that they bear no liking to over “sensitive” tuning suspensions.



Main function

Resistance of the fluid (hydraulic resistance), flowing through a narrow orifice is the general concept used for the majority of vehicle shock absorbers. An advantage of the new **AL-KO Performance** product line is that the use of special internal valves makes the shock absorber response stiffer in compression and extension. This increased resistance in compression absorbs the upward movement from cornering or road irregularities while the adjusted rebound improves the tyre contact with the road without having the big hits on poor road surfaces.

Cavitation

Cavitation is the so called foaming of the oil when it's been forced through narrow orifices at high speed. Therefore the concept of the **AL-KO Performance** product line is based on a gas charged twin-tube design. The additional gas pressure suppresses the foaming and oil flow noises.

In order to avoid the gas from entering into the cylinder, special rod guides and seals have been developed.



Piston valve



Base valve

Friction

The construction of the piston with a closed **PTFE** band offers an excellent seal between the high and low pressure chambers, and excellent wear and tear resistance and has very low friction.

The perfect sealing between the high and low pressure chambers is decisive for precision and thermo stability as the oil can only flow through the valves and not through an uncontrolled gap.

That low friction has a positive impact on wear and tear is logical. Additionally, the PTFE band reduces the stiction and therefore the juddering which increases the comfort immensely.

Shock absorbers worm up when subjected to a dynamic way of driving. This natural temperature increase changes the viscosity of the oil, makes it “thinner” and therefore the flow resistance of the oil through the valves orifices reduces.

To optimize this effect after numerous test in laboratories and test rigs, **AL-KO** choose one specific oil which hardly varies its viscosity properties over a wide temperature range and is therefore suitable for the performance requirements.

Spring backing plate, fastening pins and flanges... material from original equipment.

Robotised welding, to guarantee product quality and safety.

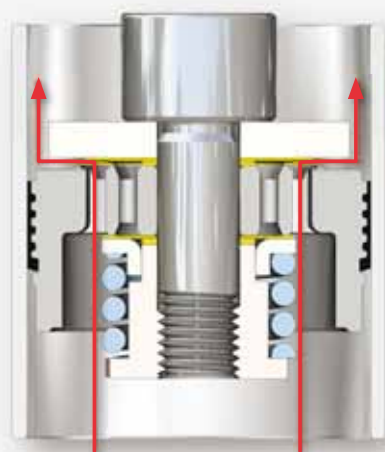


- Chrome-plated and tempered piston rod to prevent stone chipping and corrosion.
- NBR gasket seal from original equipment supplier.
- Sintered rod guide with additional low friction bushing (reduced stiction) and pre-seal (precision).



- Valve design engineered by AL-KO.
- PTFE banded piston to:
 - Reduce friction and stiction.
 - Seal between the high and low pressure chambers to ensure precision.
- Valve springs designed to absorb high-speed impacts.

Oil flow →



Compression

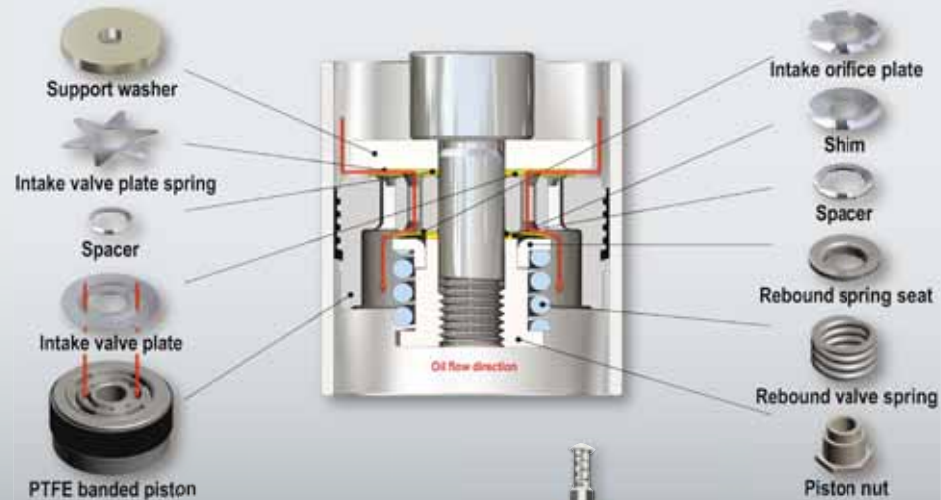


Rebound

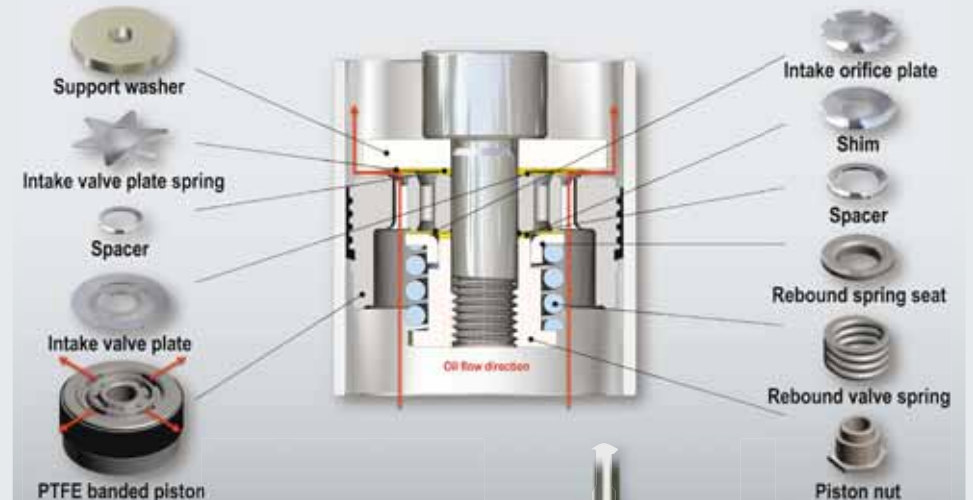


Piston Technology →

Rebound (Piston)



Compression (Piston)



Valve Technology →

Rebound (Valve base)



Compression (Valve base)

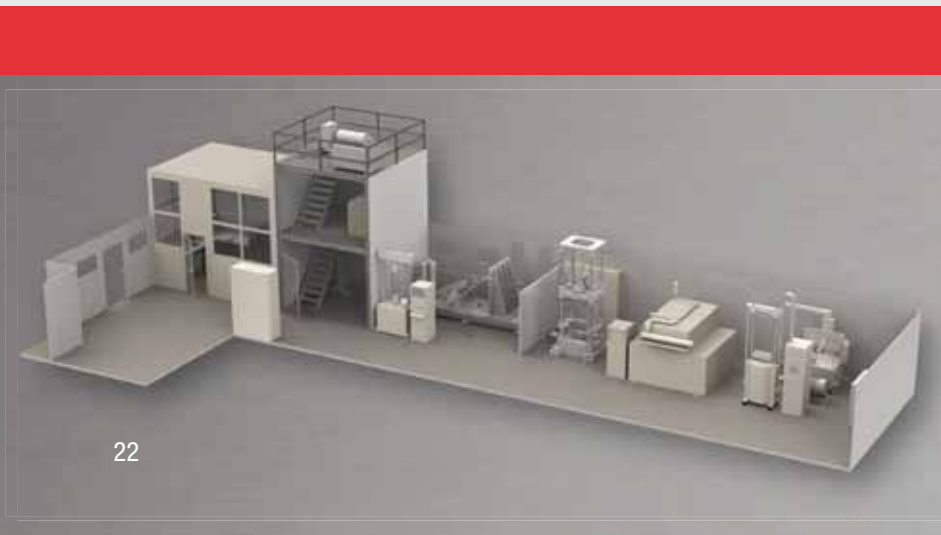


Thanks to their versatile design, **AL-KO Performance** offers shock absorbers which can be installed either with the original springs or with lowered springs, up to 25-30 mm.

AL-KO Performance is not required to pass a MOT, as the shock absorbers have the same external measurements and materials resistance as those originally fitted, with the guarantee of having been manufactured by **AL-KO**.

AL-KO Performance is manufactured entirely in Europe, from the design stage to the completion of the manufacture and distribution. Each shock absorber is tested individually in a suspension simulator machine prior to the final closing of the shock absorber and its subsequent dispatch to the user.

Customers of **AL-KO Performance**, as is known all users of the AL-KO shock absorbers are offered a technical service by the manufacture, for any query which may arise as regards the installation, operation or identification of applications.





Igor Urien

The shock absorbers, a key factor in competition

I have been racing since I was seven years old. My father introduced me to the exciting world of competition at an early age and today, more than ten years later, I have turned this passion into the fuel of my dreams.

Right from my first steps in the karting world, it became clear to me how important it was to have the best equipment. The fine-tuning of a vehicle is essential for good performance in any discipline. The precision obtained with good suspension may mark the difference between victory and defeat. And, in the world of competition, no-one wants to go back home without having made it to the top in his/her field.

Today, **AL-KO** is with me in my sports career. Thanks to **AL-KO** shock absorbers, the tuning of my vehicle is a little easier. This is thanks to the excellence that **AL-KO** applies in all its processes that gives me the reassurance I need to achieve my goal: fighting for victory in each race.

All the work performed in the world of high competition is reflected in the excellent products that **AL-KO** markets and sells worldwide. **AL-KO** shock absorbers can be found in over 70 countries on the five continents. In passenger vehicles, buses, railways, industry and, of course, in my competition vehicle, the difference between winning and losing is marked by good suspension. **AL-KO, on and off the track, always makes a difference.**

AS A RACING DRIVER, I ONLY TRUST THE BEST PRODUCTS. SO, IN MY RACES, AND IN MY EVERYDAY LIFE, I ONLY TRUST IN AL-KO

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| 2002 | Kart Social and Leisure Championship – Runner-up |
| 2005 | Euskadi Karting Championship. Two races: second and third place. |
| 2006 | Challenge Yamaha – Champion (Masquekarting Circuit, Villarcayo) |
| 2007 | Masquekarting Championship– Champion Cantabria Karting Championship – Champion Castile and León Championship – Two races: two victories Catalonia Championship Spanish Championship – Zuera (Zaragoza), Cartaya (Huelva) and Alcañiz (Aragon) |
| 2008 | Winter Karting Championship in Villarcayo – Champion Catalonia Championship – Seventh place Creation of the AKT (Abadiño Karting Taldea) team |

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| 2009 | Catalonia Karting Championship – One race: third place Valencia Karting Championship – Fifth place Castile and León Championship – One race: second place El Vendrell Karting Champions' Cup – Tenth place GP4 Test CM Test |
| 2010 | Spanish Runner-up – Spanish Prototypes Open (cat. CM) Champions' Cup Open Formula Sub-18 of Catalonia (BMW Formula in the Emilio de Villota team) |
| 2011 | Champion of the Spanish Prototypes Open (cat. Radical) / European Radical Masters |
| 2012 | European Radical Masters |

