

DEFENSE APPLICATIONS

HYDRO-PNEUMATIC SUSPENSION SYSTEMS



HYDRORIDE™

HIGH PERFORMANCE RANGE OF HYDRO-PNEUMATIC SUSPENSION SYSTEMS

The **KONI HYDRORIDE™** solutions are a range of high performance suspension products offering greater ride and handling for commercial and military vehicles. They combine high performance damping with pneumatic springing to offer a light-weight, compact, affordable and reliable solution for tracked and wheeled vehicles from 2 to 50 tons (external to the vehicle hull).

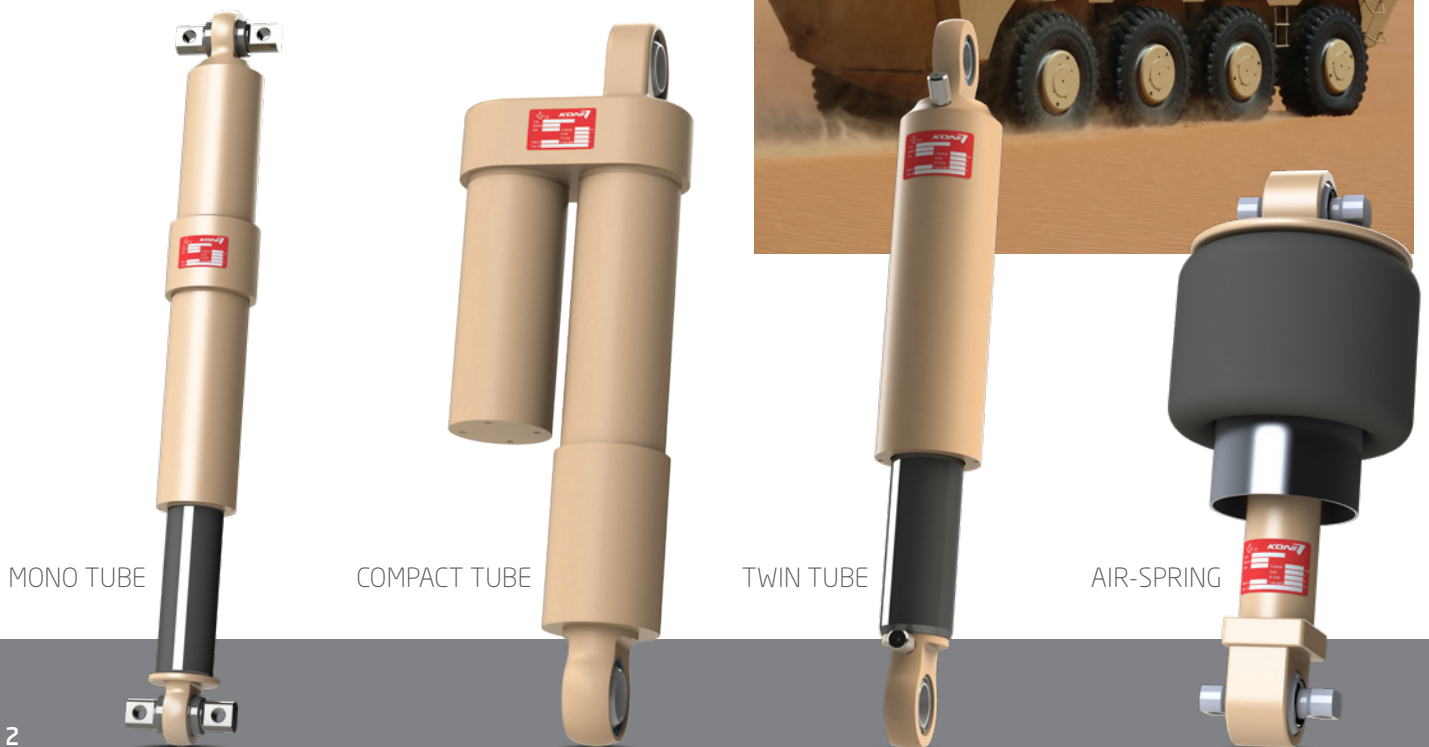
- **The Mono Tube HYDRORIDE™** unit is a single tube arrangement and is similar in concept to that of a mono tube shock absorber except it carries the load along with providing damping. The key elements of the design are a rod end which is connected to the gas spring via an oil column controlled by damper valves. This configuration is ideally suited for applications where the extended length of the unit can be accommodated.
- **The Twin Tube HYDRORIDE™** unit is a two tube arrangement where one cylinder fits into the other. As the cylinders compress, oil is forced through the damper valves and compresses the gas which is separated from the oil by a floating piston. This configuration is ideally suited for applications where the extended length is restricted.

- **The Compact Tube HYDRORIDE™** is a twin tube arrangement where the second adjacent cylinder contains the damper valves and the gas spring. As the rod end enters the main cylinder, oil passes through the damper valves into the second cylinder and compresses the gas which is separated from the oil by a floating piston. This configuration is ideally suited for applications where the shortest possible extended length is required.

- **The Air-Spring HYDRORIDE™** is an air-spring and shock absorber arrangement where the air spring is fitted to the top of the shock absorber and provides the spring function. This light weight – low cost solution is ideally suited to lighter weight vehicles needing exceptional off road capability with the option for ride height control using existing vehicle air systems. The **HYDRORIDE™** has options for vehicle ride height and load control together with wheel lift, lockout, active damping and diagnostic output. Each solution is external to the vehicle and does not require any internal space or penetration into the hull.

HYDRORIDE™

by KONI



KONI Damping Technology

KONI shock absorbers have a reputation for high performance. That reputation is born out of extensive R&D for Formula 1, off road racing, railway and military products. This existing proven damping technology is applied in the **HYDRORIDE™** range ensuring that the manufacturing cost has the benefit of mass production volumes as well as proven solutions for extremely arduous and safety critical environments.

In order to maintain that reputation, KONI relies on quality, both in technology as well as manufacturing, to assure their products achieve and maintain their performance. All through the manufacturing process the evidence of quality is found: produced from the finest materials, surfaces machined to the narrowest tolerances, strict quality-control standards incorporated in all production steps and a 100% dyno-test at the end of the production line to assure that every single product delivers its optimum performance.

The KONI patented frequency selective damping system (FSD) can also be incorporated into the **HYDRORIDE™** suspensions. KONI suspensions with FSD technology combine the ultimate in comfort and road-holding. It is a purely mechanical solution and so is independent of electronic control components. It also helps to significantly reduce "over" damping and therefore over heating of the suspension elements.

Applications, vehicle types, weights and options.

Applications of the **HYDRORIDE™** suspension include vehicles and trailers from 2 to 50 tons, whether wheeled and tracked, for commercial and military applications requiring great on road and off road performance.

HYDRORIDE™	MONO TUBE	TWIN TUBE	COMPACT TUBE	AIR-SPRING
Light weight	✓✓✓	✓✓	✓	✓✓
Low cost	✓✓✓	✓✓	✓	✓✓✓
Compact	✓	✓✓	✓✓✓	✓
Performance	✓✓	✓✓✓	✓✓✓	✓✓
Dual Rate Spring	X	✓	✓✓✓	X
Height Adjustment	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Light Vehicles	✓✓✓	✓✓	✓	✓✓✓
Heavy Vehicles	✓	✓✓✓	✓✓✓	✓

Why HYDRORIDE™ and why KONI?

HYDRORIDE™ combines effective damping with a rising rate spring relative to the linear rate of a torsion bar or standard coil spring. Together with tuned damping, the rising rate means that the **HYDRORIDE™** suspension can absorb more energy as the vehicle travels fast over rough ground without hitting bumps, resulting in lower shock loads for the vehicle and crew.

The spring force can be changed by adjusting the gas pressure allowing different wheel loads to be easily accommodated without having to change any hardware.

KONI has been developing and manufacturing suspension solutions for more than 70 years. KONI is renowned for its extensive research and development into engineered solutions plus the design of cost effective manufacturing processes which keeps KONI competitive across commercial, military and rail markets. KONI supply suspension solutions for the US Army's Bradley, the British Army's Foxhound, the Nimr 4x4, the PARS 8x8, M113, Supacat HMT 400 and many commercial vehicles with off road capability.

KONI has invested in a powerful test rig that can simulate the forces that are seen on the actual vehicles. This rig has enabled KONI to develop high performance solutions that meet the challenging requirements of the military and commercial customers across wide load capabilities and extreme temperatures.



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