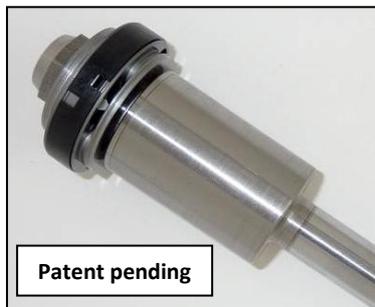




The Tractive Suspension DDA technology.

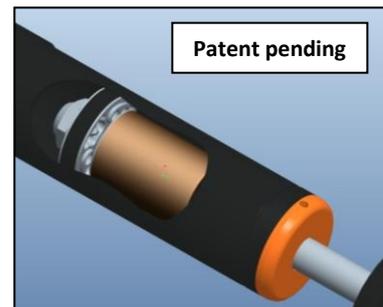
More and more motorcycle manufacturers start to explore ways to offer their customers damping adjustment of damping on the fly. In some cases manufacturers make it possible for the customers to adjust spring preload or even spring rate by touch of a button. The people of Tractive R&D have been actively involved with the development of many of the latest technology in this area. We have all witnessed the growth of the popularity of such systems and we are convinced that within a few years screwdrivers will no longer be necessary to adjust suspension for personal needs.

Based on this profound know how and experience Tractive Suspension created also their own Adaptive and Semi Active technology. Tractive developed a valve not to be just compatible with the current technology but aiming far ahead on functionality and reliability.



It has taken Tractive Suspension three years of extensive calculation, simulation and engineering to create a "State of the Art" bi-directional, internal valve to adjust compression and rebound damping. The Tractive DDA Valve is normally closed and based on a direct flowing, electromagnetic proportional valve principle.

The position of the Tractive DDA valve has been carefully chosen. Ideal environment for the fastest moving parts with respect to cooling, lubrication and corrosive, environmental influences. The valve has been designed to take all appearing side loads without being functionally stressed under the most severe mechanical conditions.



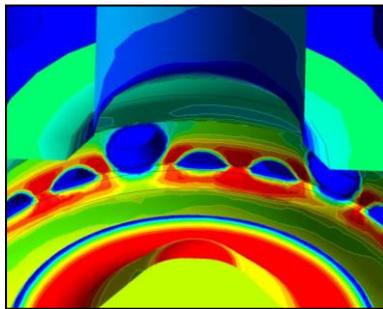
Countless calculations have been performed before the first prototype of the Tractive DDA valve was put to the test. The aim was high, the fastest and most stable bi – directional, internal proportional, damping valve with the utmost linear adjustment behavior. A valve that wouldn't be impressed by working temperatures below minus 30 degrees Centigrade or above 140 degrees Centigrade.

Calculation and simulation of magnetic force to achieve highest magnetic force at the lowest possible electrical power consumption, the best possible magnetic linearity and lowest possible inductivity. The Tractive DDA Valve has been constructed using only the best magnetically conducting materials and machining processes to achieve the highest possible efficiency.

Designing the magnetic loop of the Tractive DDA valve according to basic magnetic technology like dictated by well known physicists like Nikola Tesla using the most modern simulation tools.

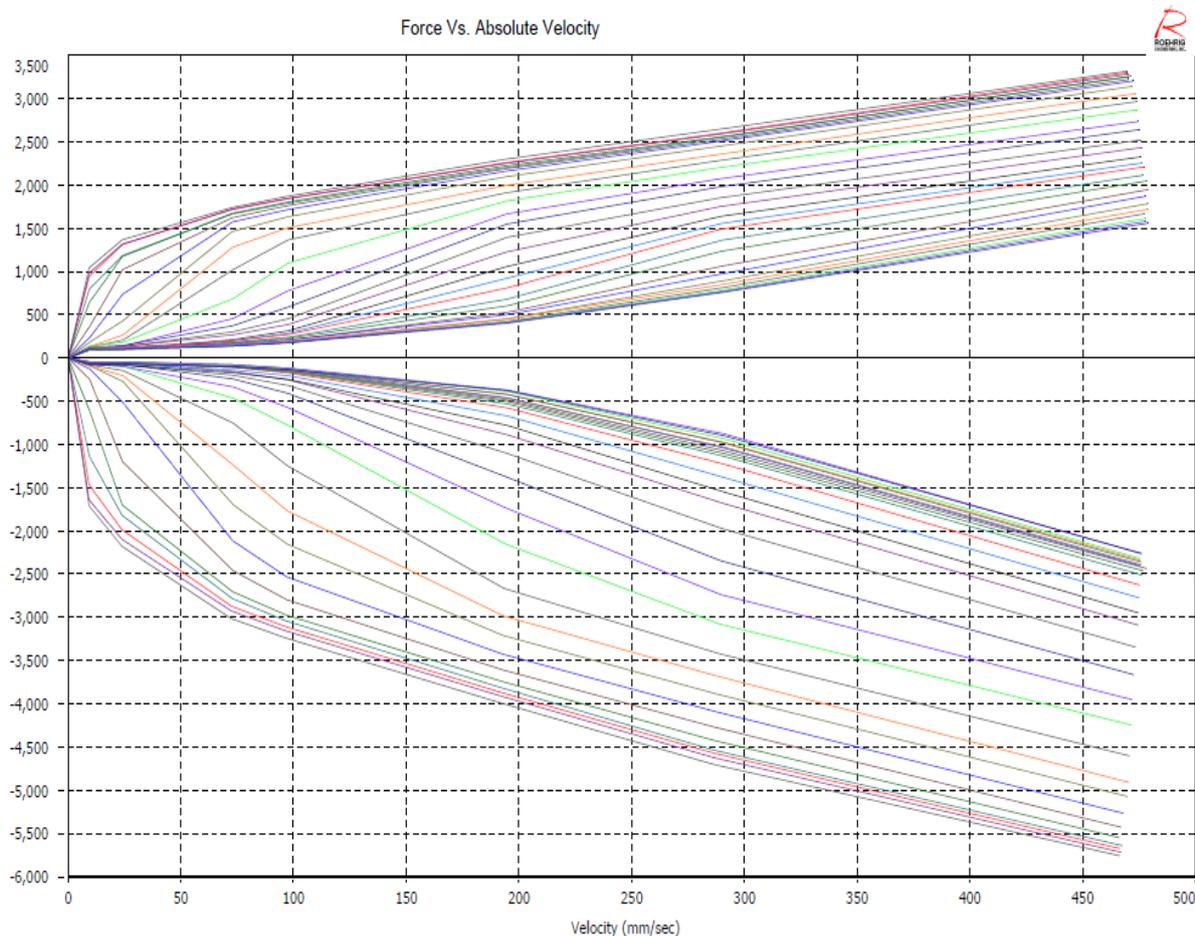


Being able to cope with mechanical stress and having a linear, proportional magnetic behavior alone still doesn't guarantee a stable proportional damping adjustment. The medium often used inside shock absorbers can easily turn all the good work done like described above upside down under stressed conditions. The Tractive DDA valve has been designed to be insensitive to oil pressure, oil flow and the direction of the oil flow. Everybody who has pinched his shampoo bottle slightly too hard will know what is meant here. Huge oil flows passing an orifice can cause serious forces one needs to reckon with.



Multiple fluid flow calculations have been performed on the Tractive DDA Valve to ensure slider stability and linear oil flow adjustment under all occurring situations and temperatures. A responsive slider under all, including most severe turbulent oil conditions guarantees the superb functionality of the Tractive DDA valve.

The Tractive DDA valve has been designed to be integrated in a Tractive ACE Controlled Semi Active Suspension system but can also be used inside an existing Semi Active or Adaptive suspension system like present on the new R1200 GS.



Typical adjustment range of the Tractive DDA valve.