

The Art of Suspension

DDA Valve

TRACTIVE

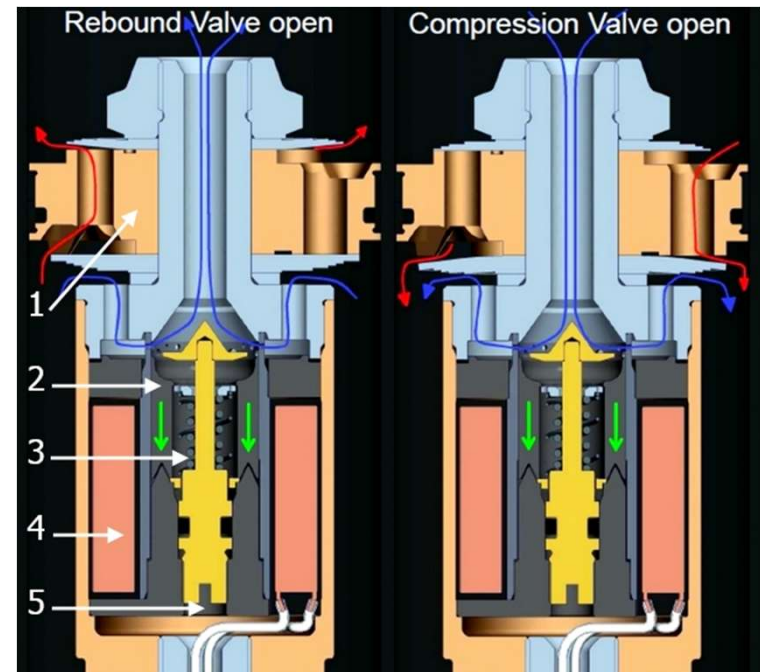
suspension



Dynamic Damping Adjustment DDA

The Tractive dampers are equipped with the Tractive DDA Valve (Dynamic Damping Adjustment). Damping values are dictated from the suspension parameters and the need of the application rather than dictated by the principle. The Damping characteristics of shock absorbers with DDA technology are determined by the main shim stack on a piston with same tuning possibilities as known from other high end aftermarket shock absorbers. The DDA valve is based on a dynamically balanced solenoid valve. When the valve is energized, the bypass opens proportionally to applied current. At full current the Soft curve is achieved.

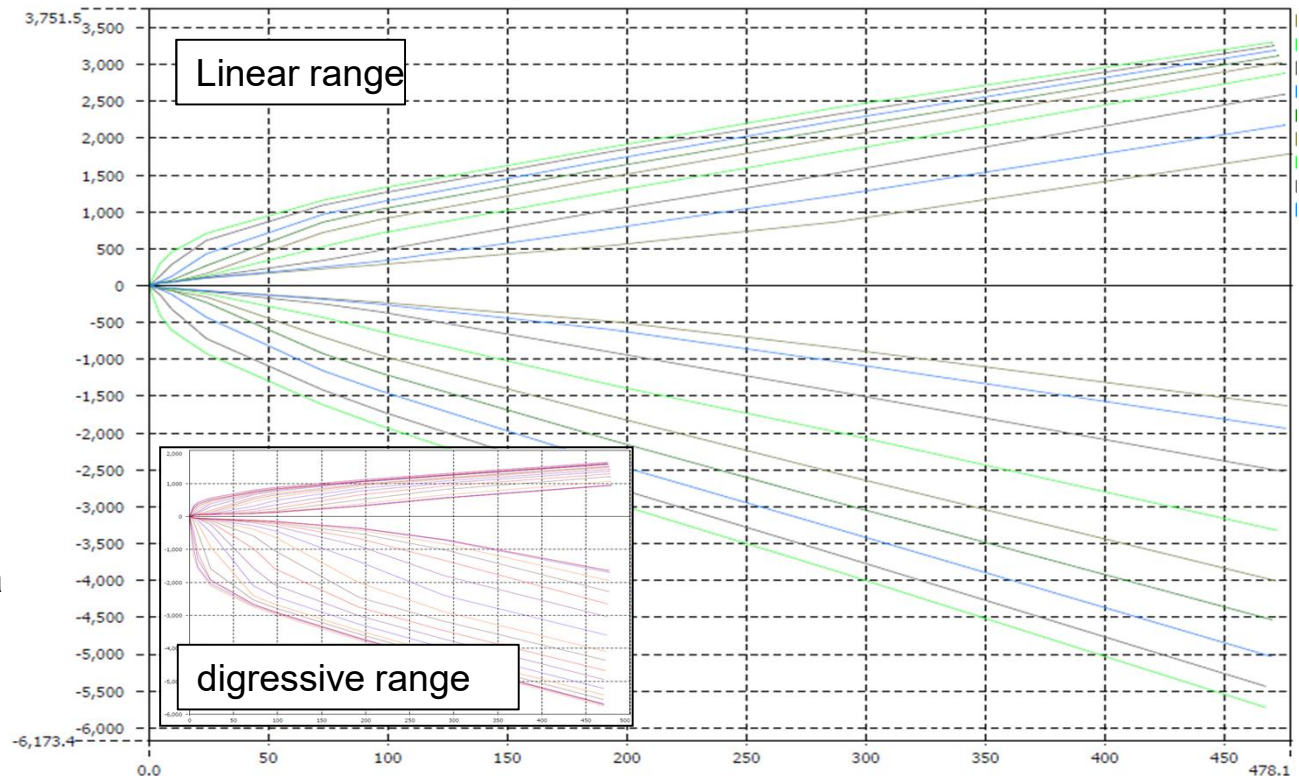
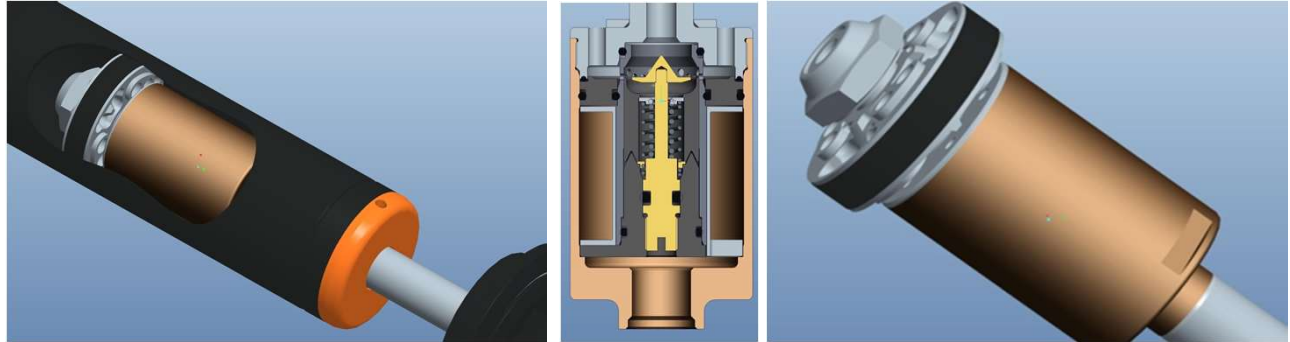
The cross-section of the electromagnetic valve is shown during a rebound stroke (left) and compression stroke (right) to visualize the flow direction of the hydraulic fluid. As commonly seen with hydraulic dampers, rebound and compression flow are separated by different channels in the piston (1). Their respective shim stacks and preload determine the flow hydraulic fluid as function of pressure. The valve allows for the hydraulic fluid to flow through the center of the upper part of the spindle and disperse around the valve body. The valve is normally closed by a set springs (3). By applying a voltage on the solenoid, a current will be generated through the coil (4) as function of its resistance and inductivity





Dynamic Damping Adjustment DDA

- Continuously variable damping, any damping curve shape feasible: progressive, linear and digressive
- Fast, linear and proportional damping response to control input
- Wide dynamic range
- Not prone to stability and wear/leakage issues
- Compression and Rebound in a natural relation, can be tuned the traditional way. Possibly in combination with additional soft valving.
- Shock absorbers can be serviced or tuned easily.
- When current is off because of broken cables, damping is hard => this failsafe situation yields a safe situation, maybe uncomfortable, but safe.



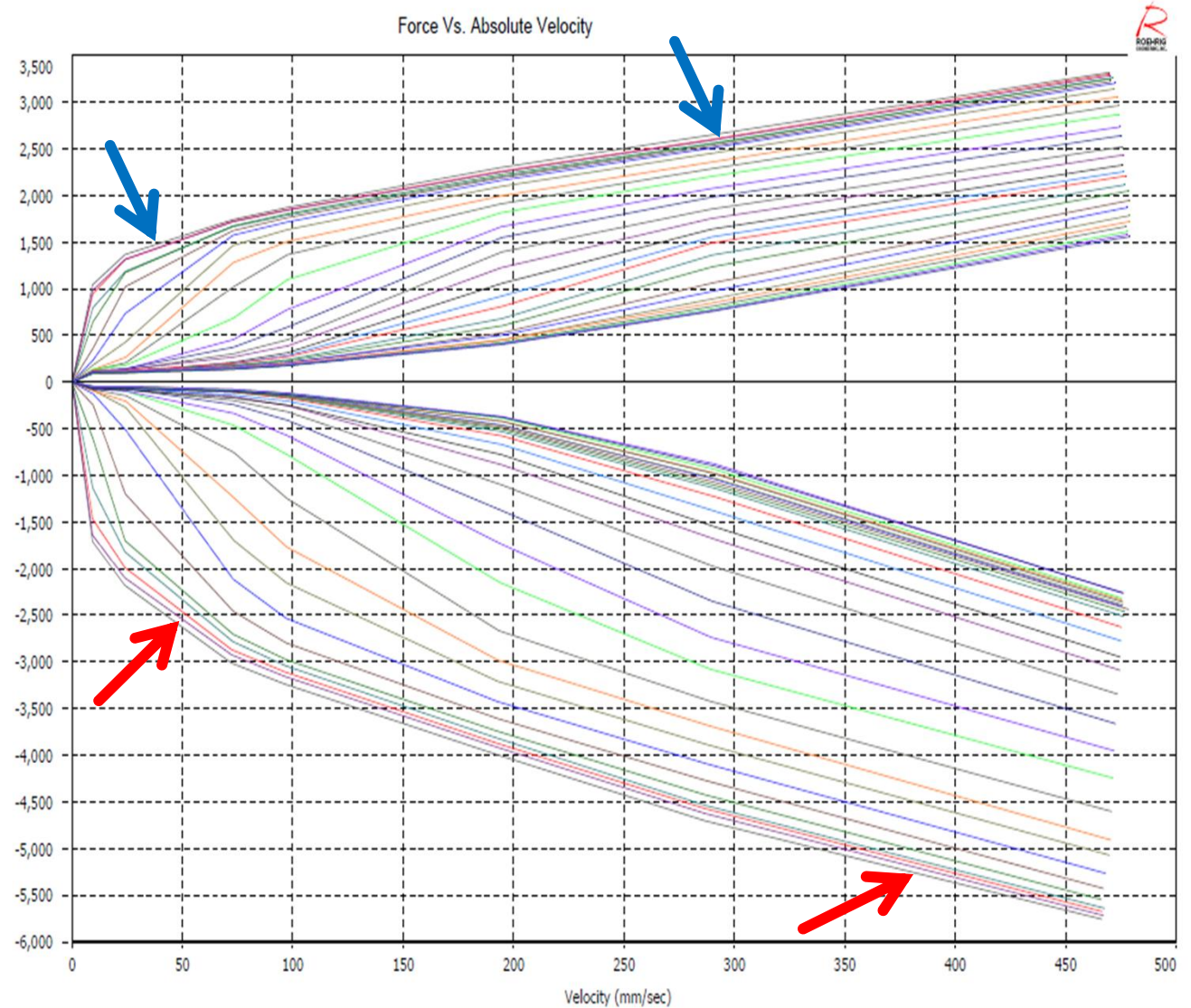
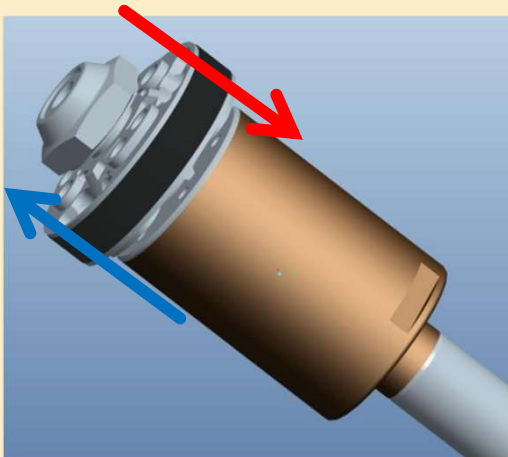
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The DDA solenoid valve controls a bypass oil flow through the piston rod over the piston.

At zero current the bypass is closed ("normally close" or NC). The damping force is generated over the main piston only. The character and level of the FIRM damping curves are 100% determined by the shim stack on the main piston: rebound shim stack, compression shim stack.



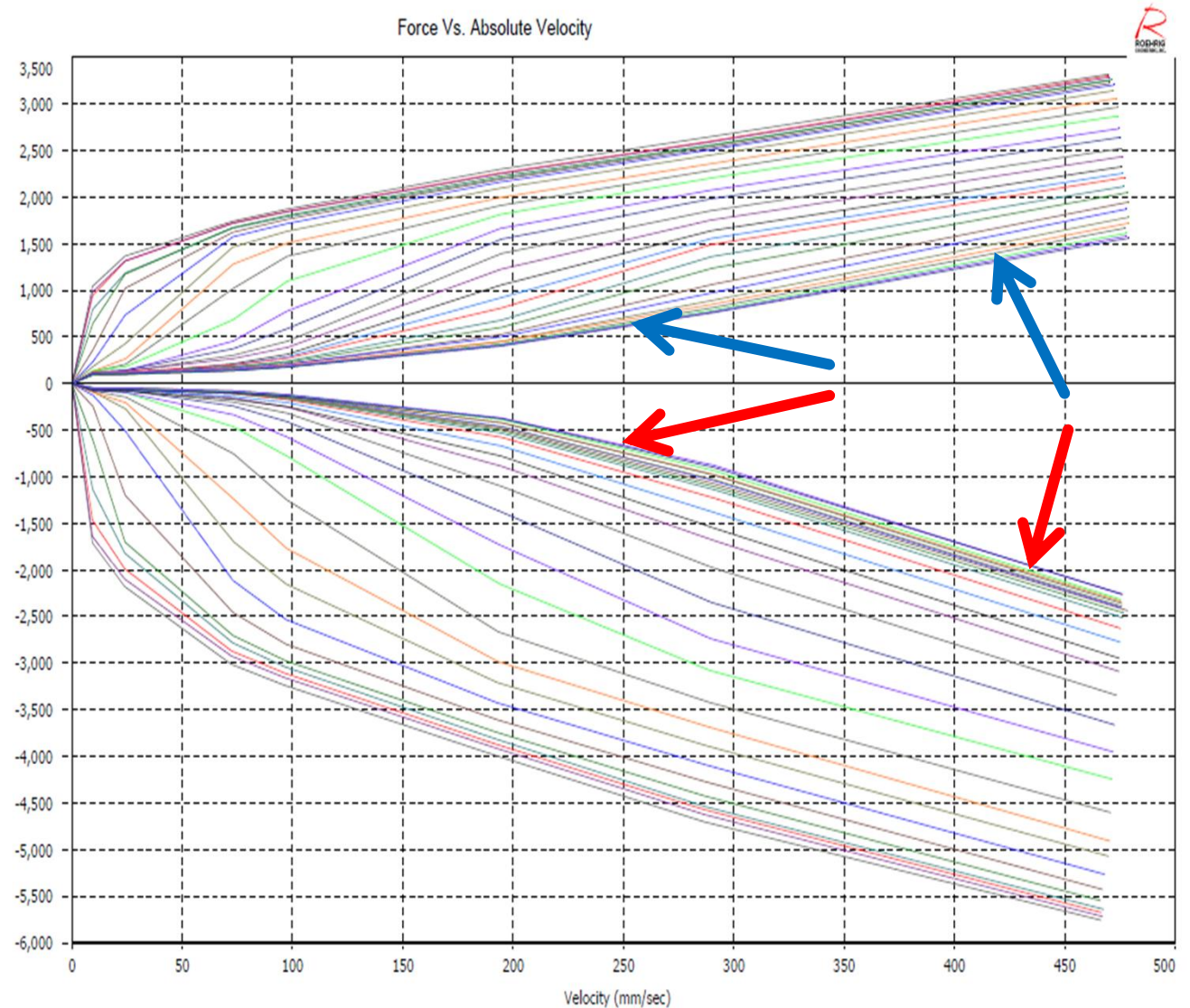
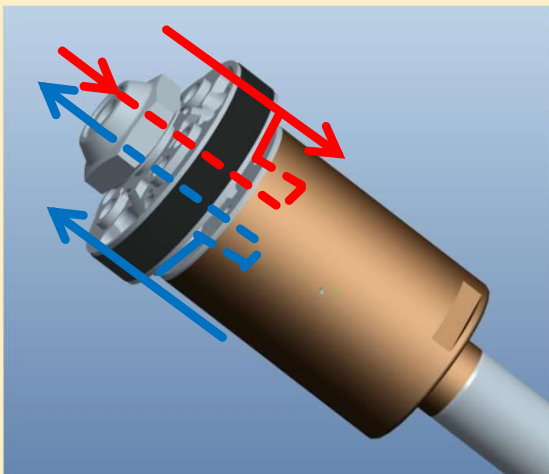
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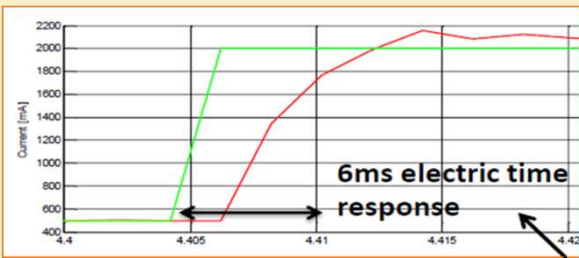
At full current (2.0 Amp) the bypass is fully open. The oil still flows partly over the main piston, but the bypass through the valve results in the SOFT curves.

Intermediate currents (0-2Amp) result in intermediate curves



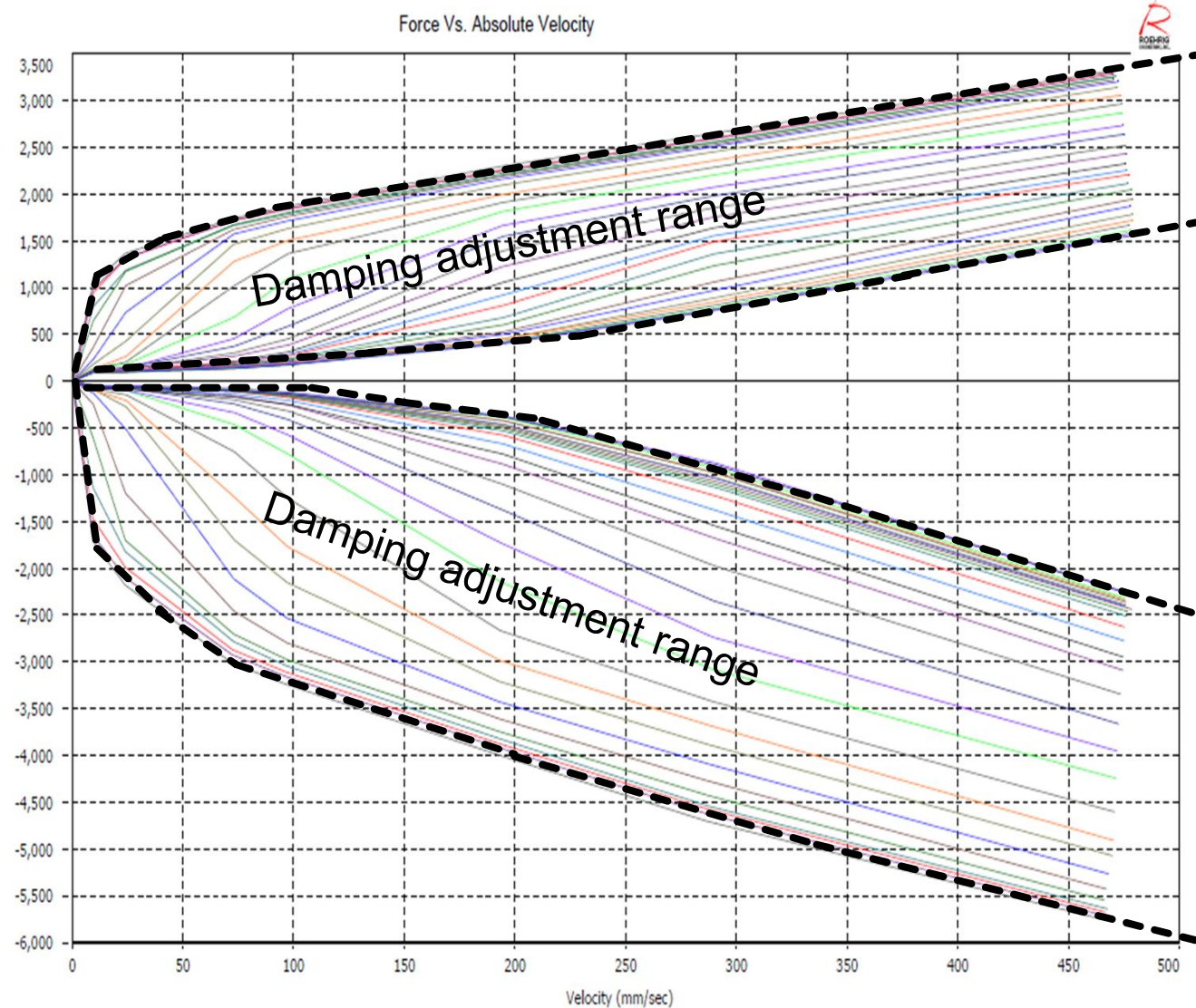
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Because of very short step response, very low hysteresis and high reproducibility, the full damping range is available for continuous damping control.

The DDA valve is used for OEM, aftermarket and racing applications in motorbike, snowmobile, ATV and car applications.



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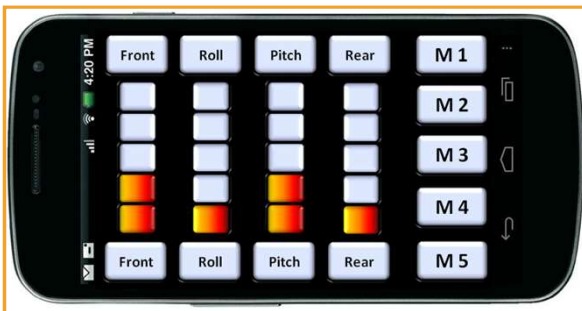


Industrialized Tractive Valve

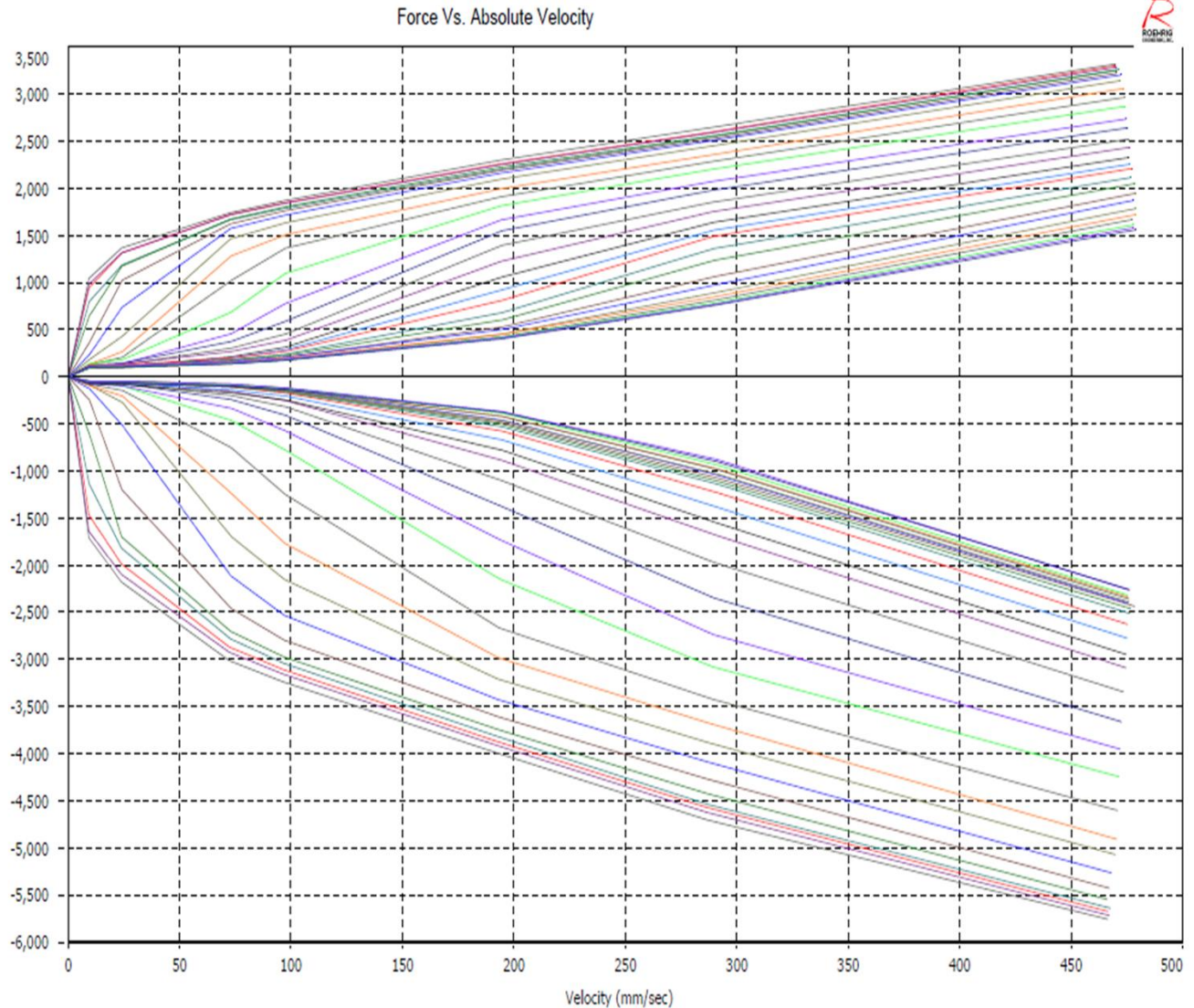
- Calculated magnetic force versus position @ specified current.
- Magnetic Force versus spring rate = slider displacement.
- Slider displacement versus flow area
- Flow Area vs Current vs Shock velocity.

EQUALS

Linearity and ultimate stability



PATENTED TECHNOLOGY

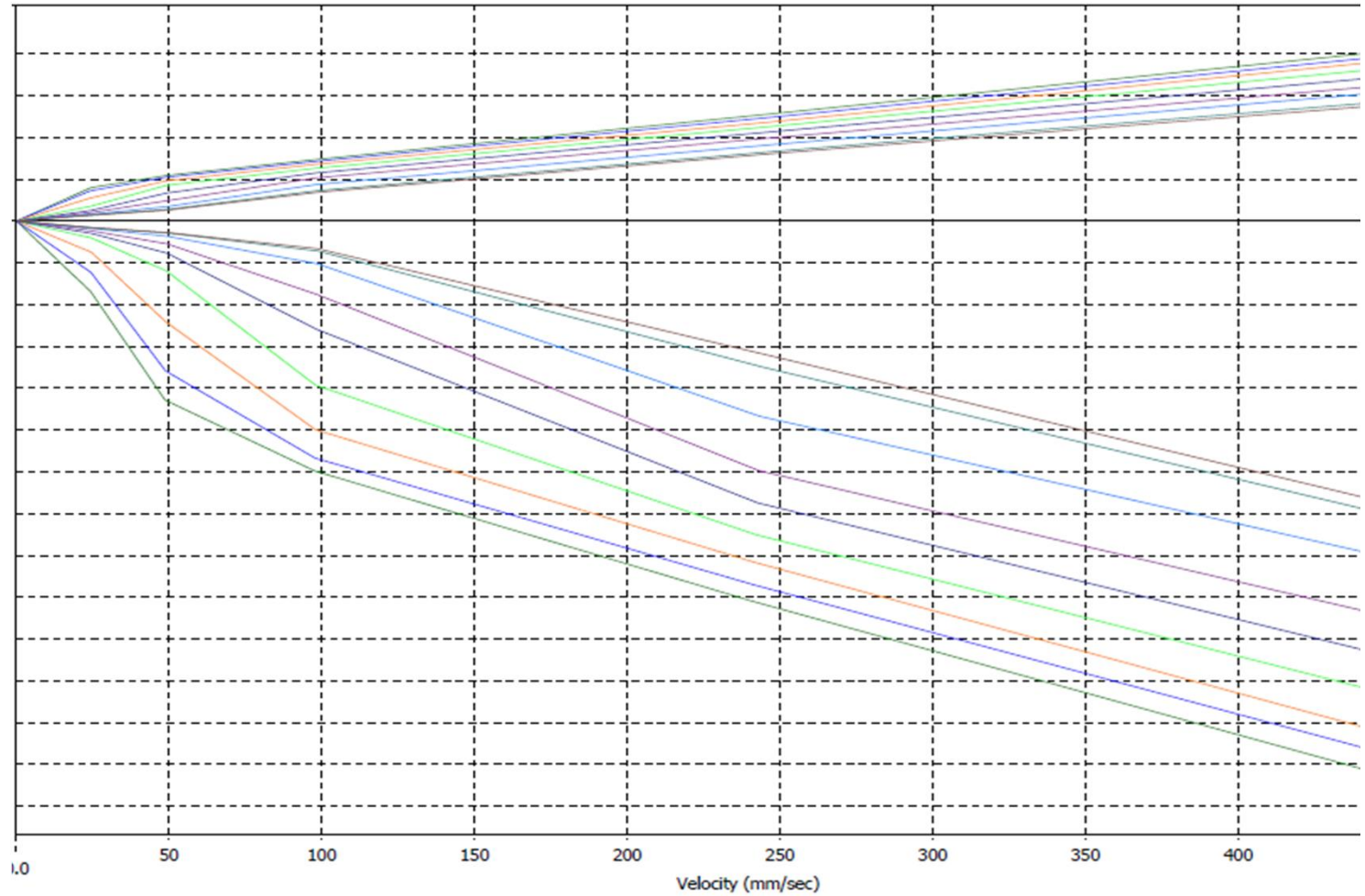


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Tractive DDA Specifications

Force Vs. Absolute Velocity



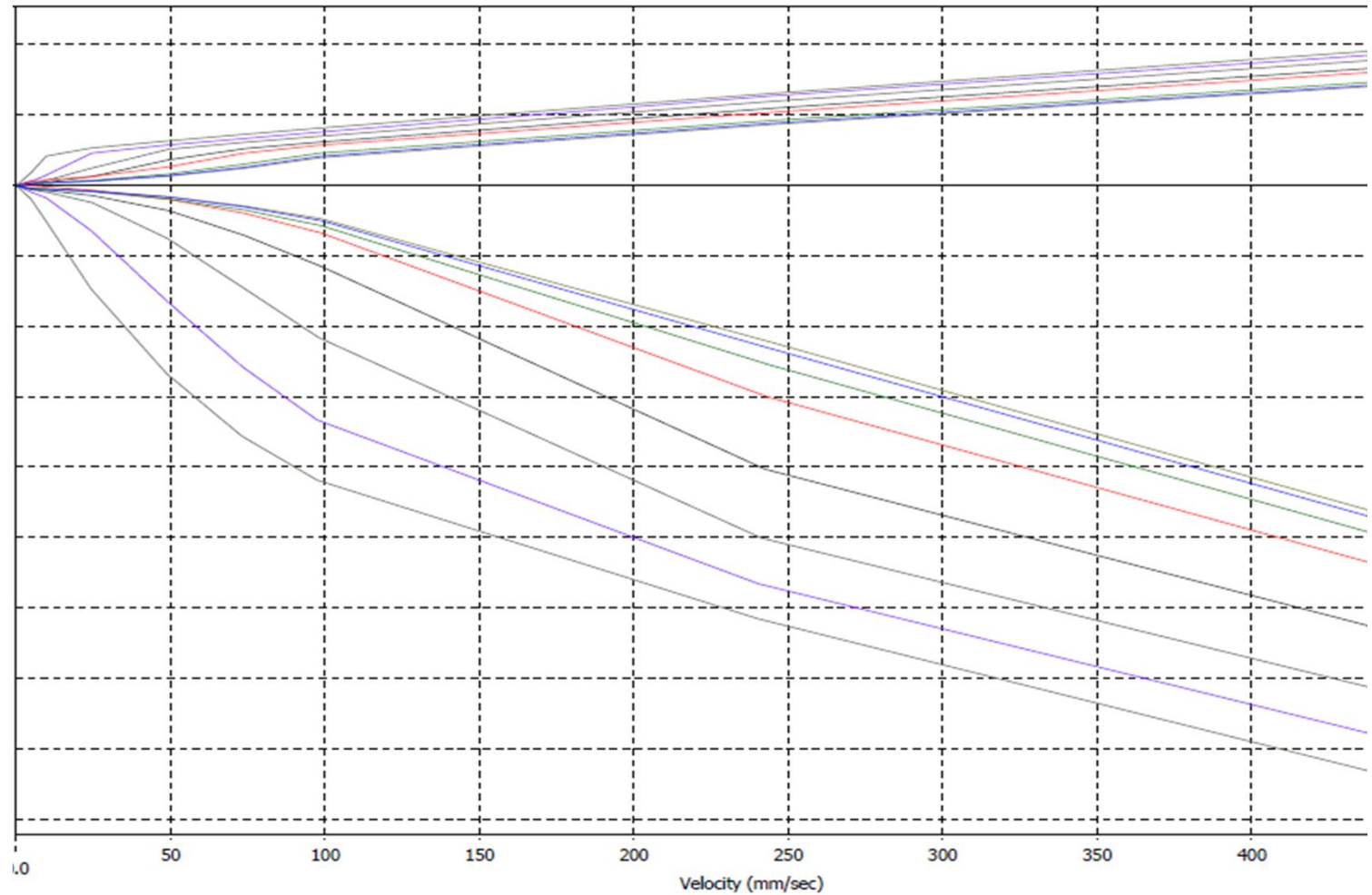
K50 PnP 4x3

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Tractive DDA specifications

Force Vs. Absolute Velocity



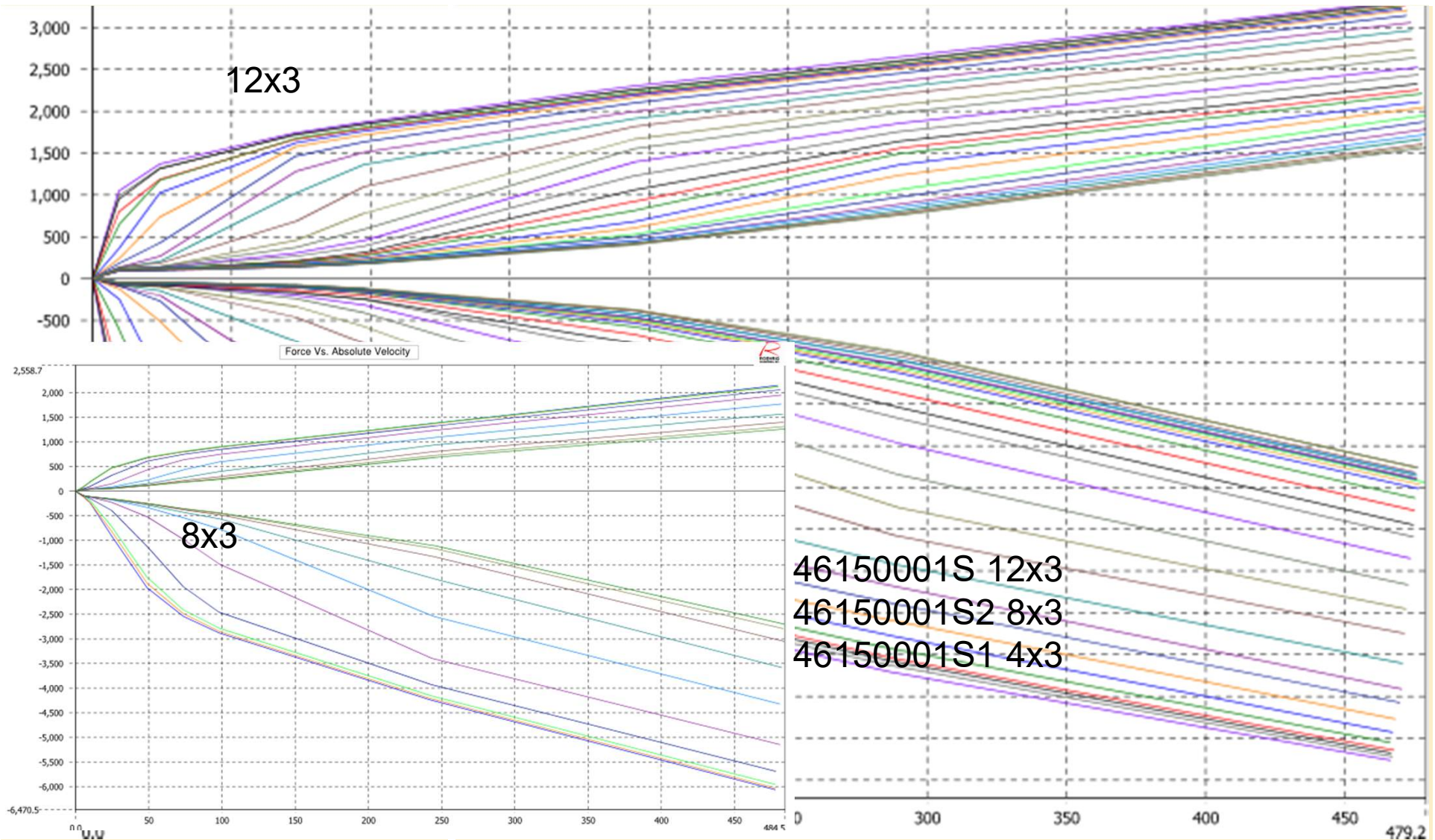
K50 PnP 8x3

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DDA valve adjustment range: three adjustment ranges available: 12x3, 8x3, 4x3



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General information Tractive DDA Valve

Design for manufacturing

All parts have been developed with focus on functionality and ability to be easily produced.

Design for assembly

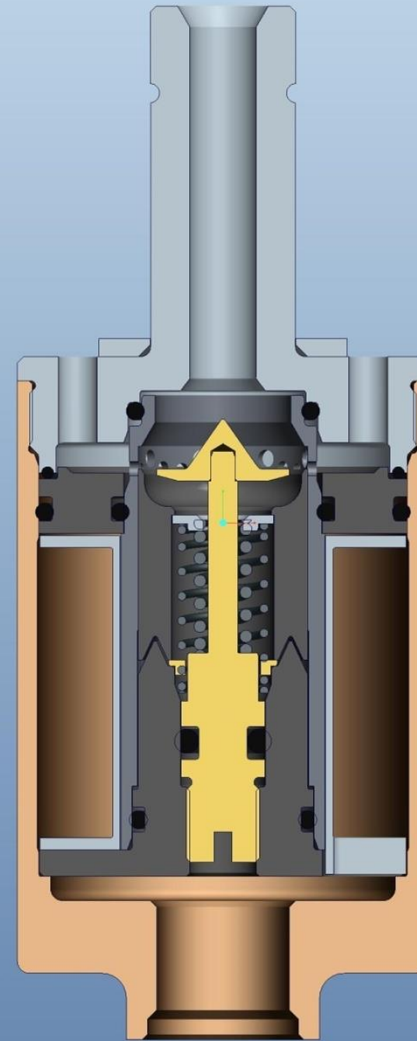
All parts are easy to assemble and the valve is easy to calibrate on the end of line test.

Already in use in aftermarket, prototype and OEM applications in motorcycle, snowmobile, ATV, Side by Side and car shocks

Released for OEM by BMW, BRP

Design freeze since 2012

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For more information, please check our website regularly

[www .tractivesuspension.com](http://www.tractivesuspension.com)

Email info@tractivesuspension.com

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