



Jacobs Vehicle Systems™

The Journey Continues

Jacobs' HPD Brake "Doing More With Less"

Our response to an industry shift
towards higher power density engines

Joao Cullen / Kevin Groth / Steve Ernest / John Schwoerer





Jacobs Vehicle Systems

Current Organization

500 employees worldwide

Manufacturing & Engineering Facilities

- Bloomfield, CT USA
- Suzhou, China

Development Center – Bloomfield, CT USA

- Design & Analysis
- Laboratory & Test Facility

(Largest lab in the world dedicated to the development of retarding technologies)



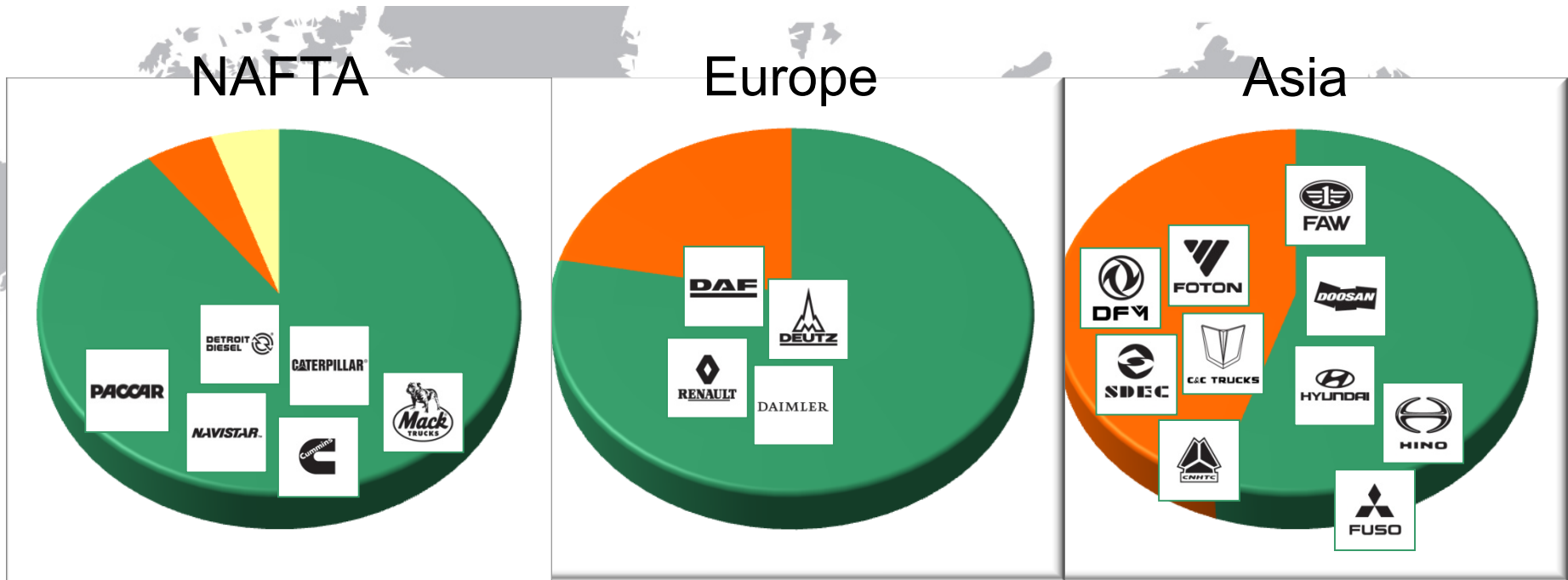
Global Offices – England, Japan, Korea



EXHAUST BRAKE	BLEEDER BRAKE	COMPRESSION RELEASE BRAKE	IEGR	LOST MOTION VVA
<p>Fixed orifice</p> <p>Constant Pressure</p>	<p>Lube oil actuated</p> <p>HP Common Rail</p>	<p>Integrated</p> <p>Bolt-On</p>	<p>IEGR</p> <p>IEGR & Braking</p>	



HD Engine Braking's Global Customer Base



■ Engine Brake ■ Exhaust Brake & Other ■ None





Engine Retarding Technology Drivers

Increased Retarding Requirements

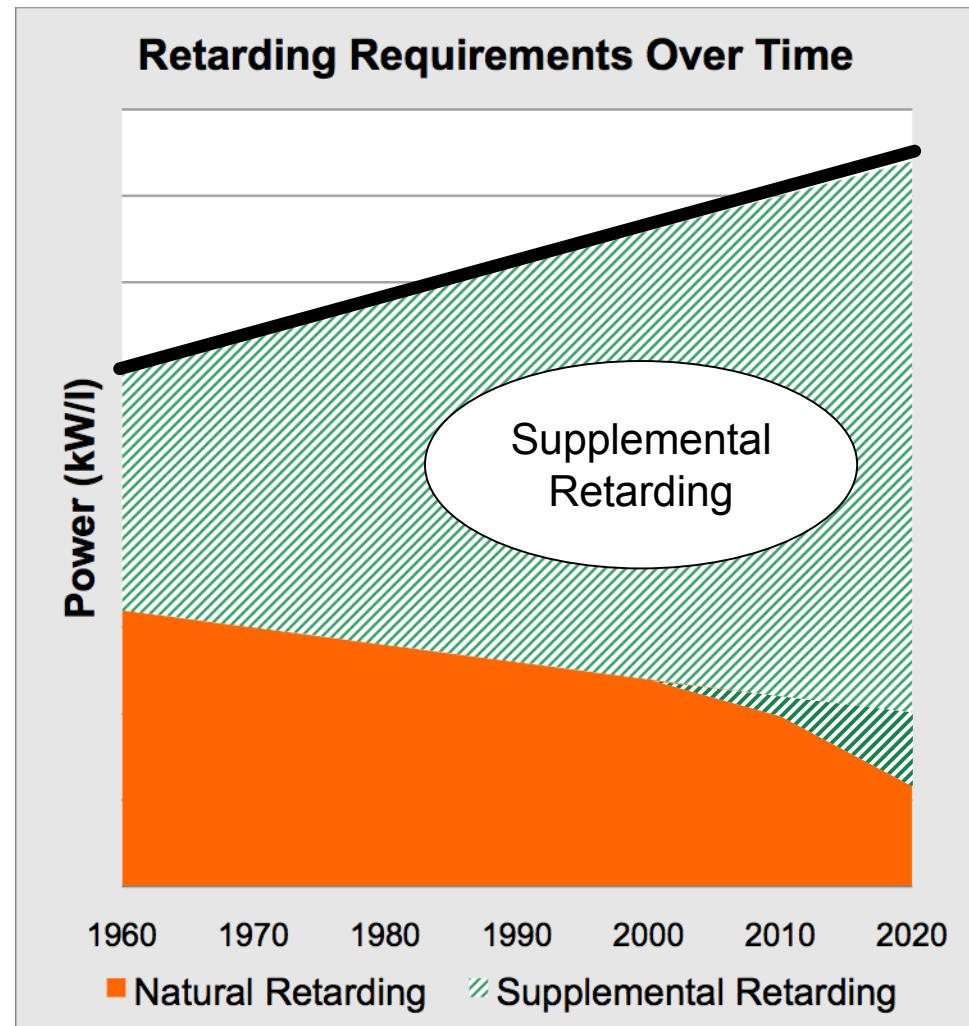
- Legislated reduced stopping distances
- Legislated downhill speed control
- Increased Gross Vehicle Weight

Decreased Natural Vehicle Retarding

- Decreased Aerodynamic Drag
- Decreased Rolling Resistance

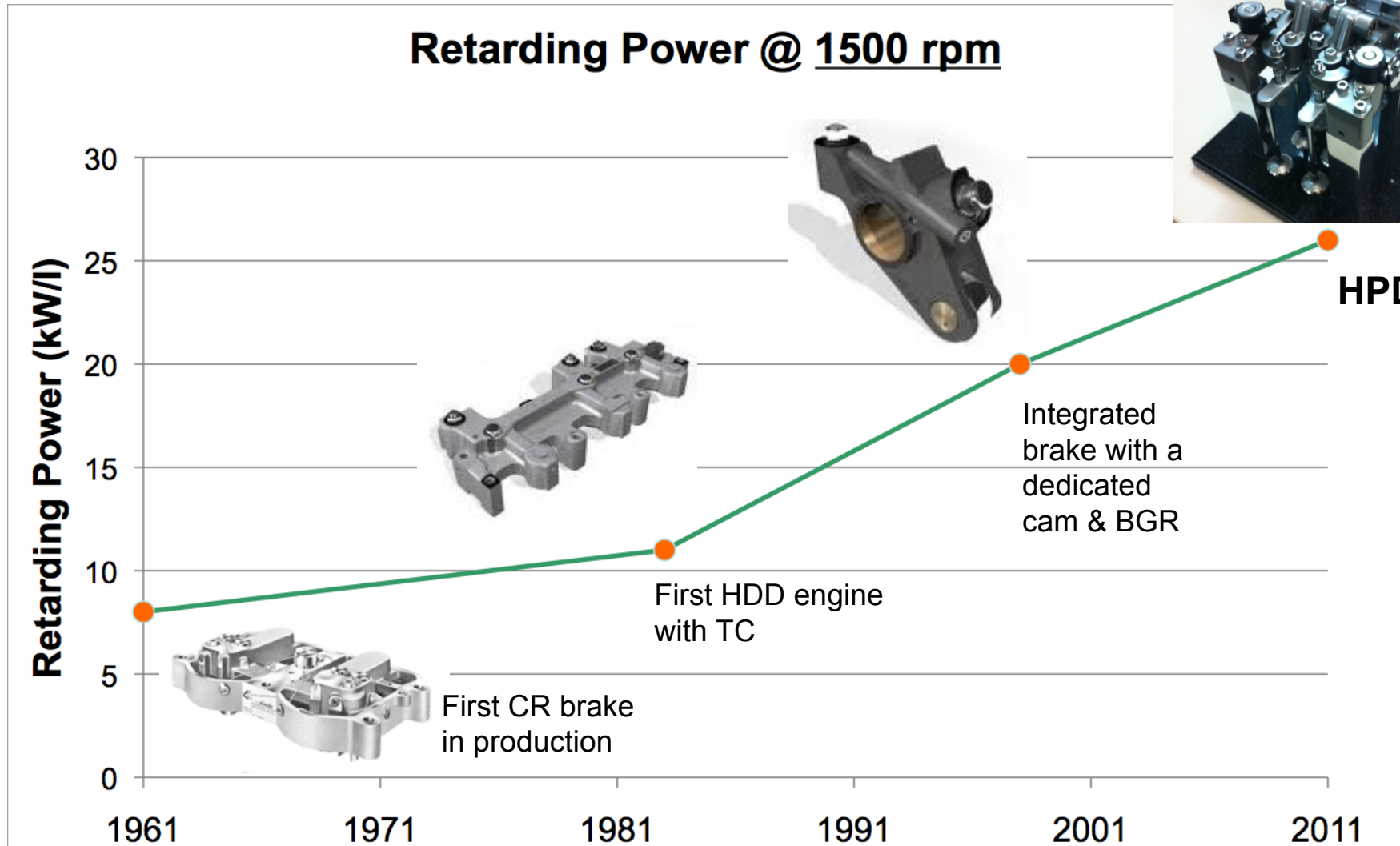
Increased Focus on Fuel Economy

- Downsized engines
- Lower Engine RPM





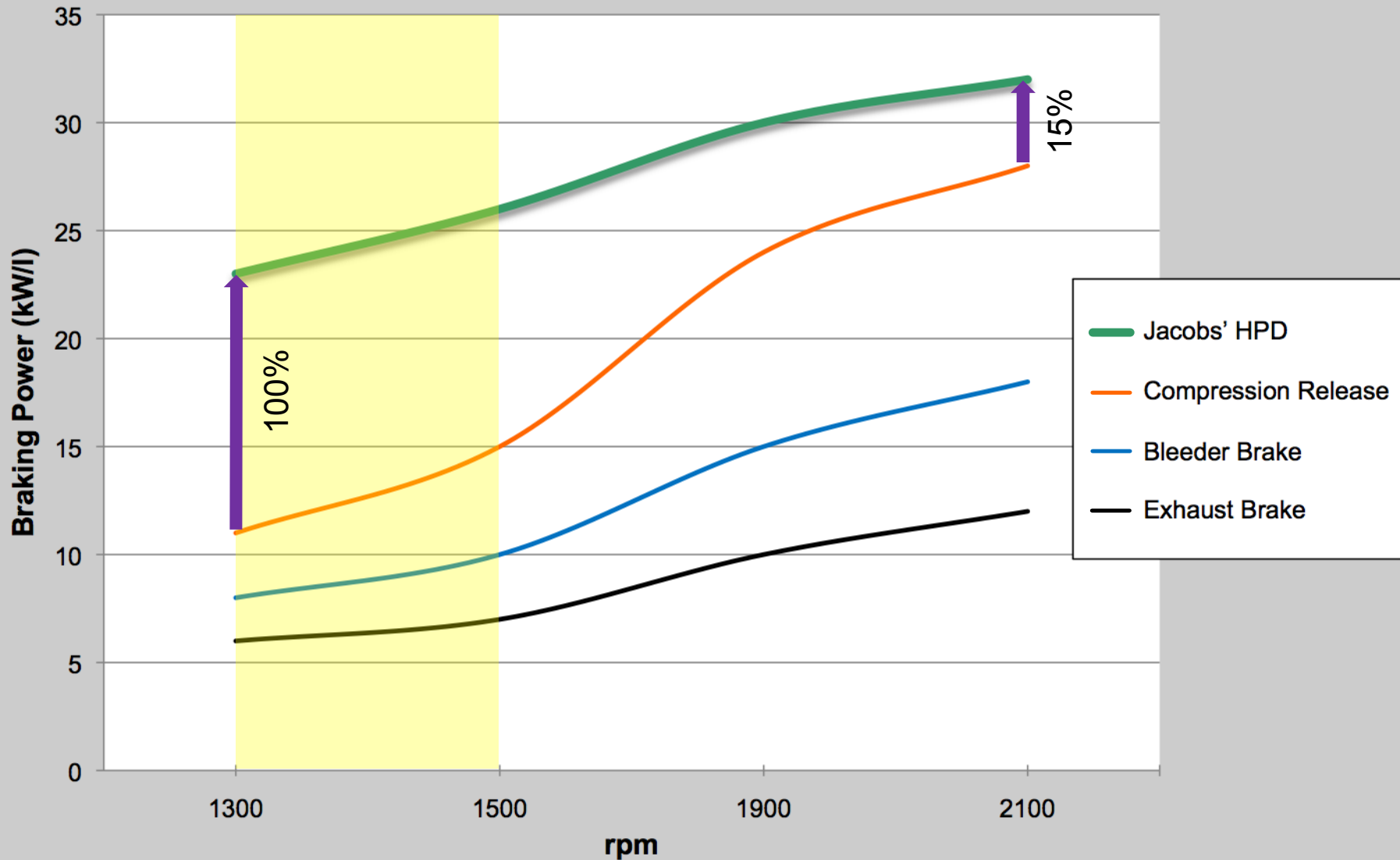
JVS Technology Timeline



HPD

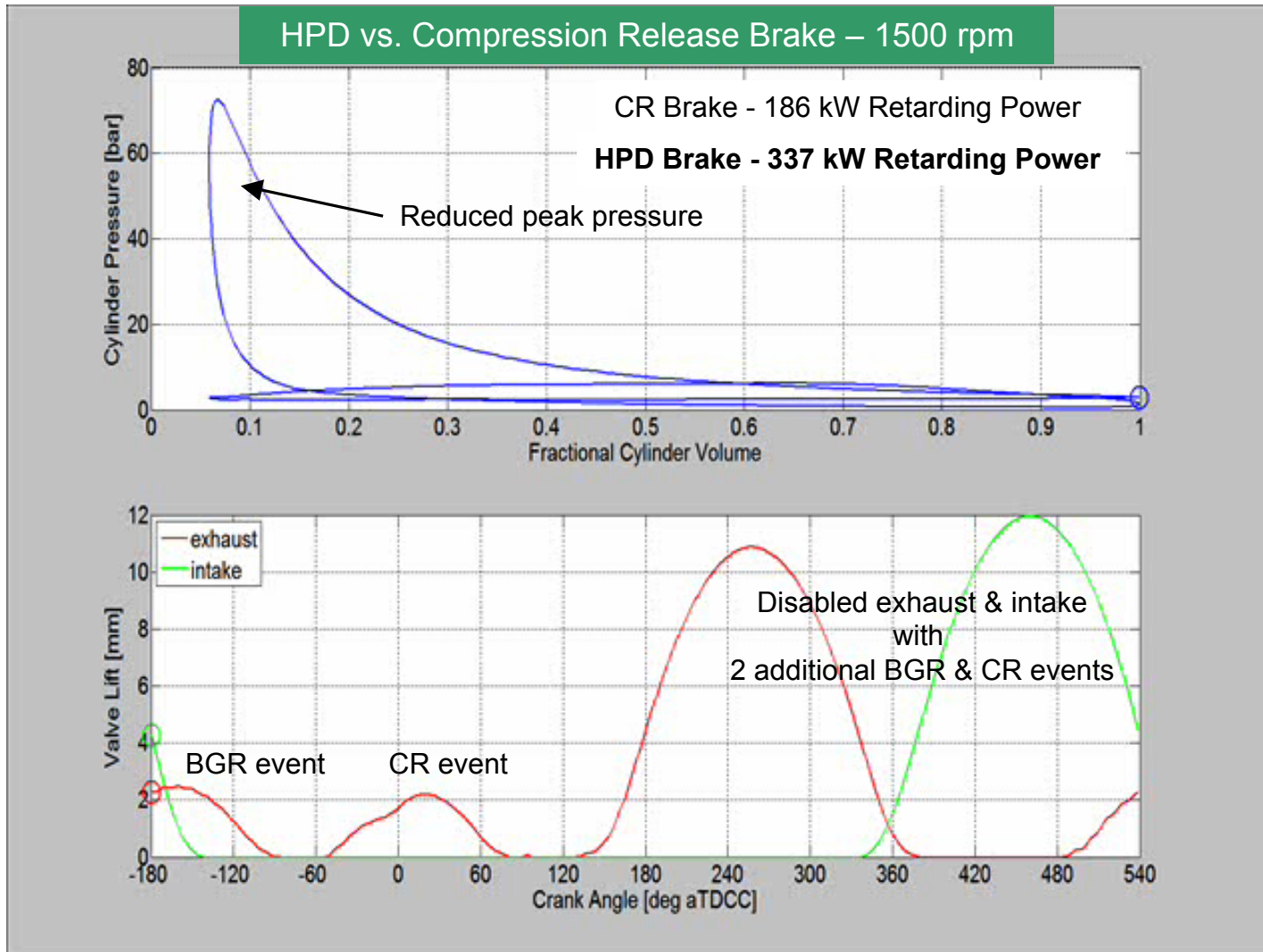


Engine Brake Technology Braking Power Comparison



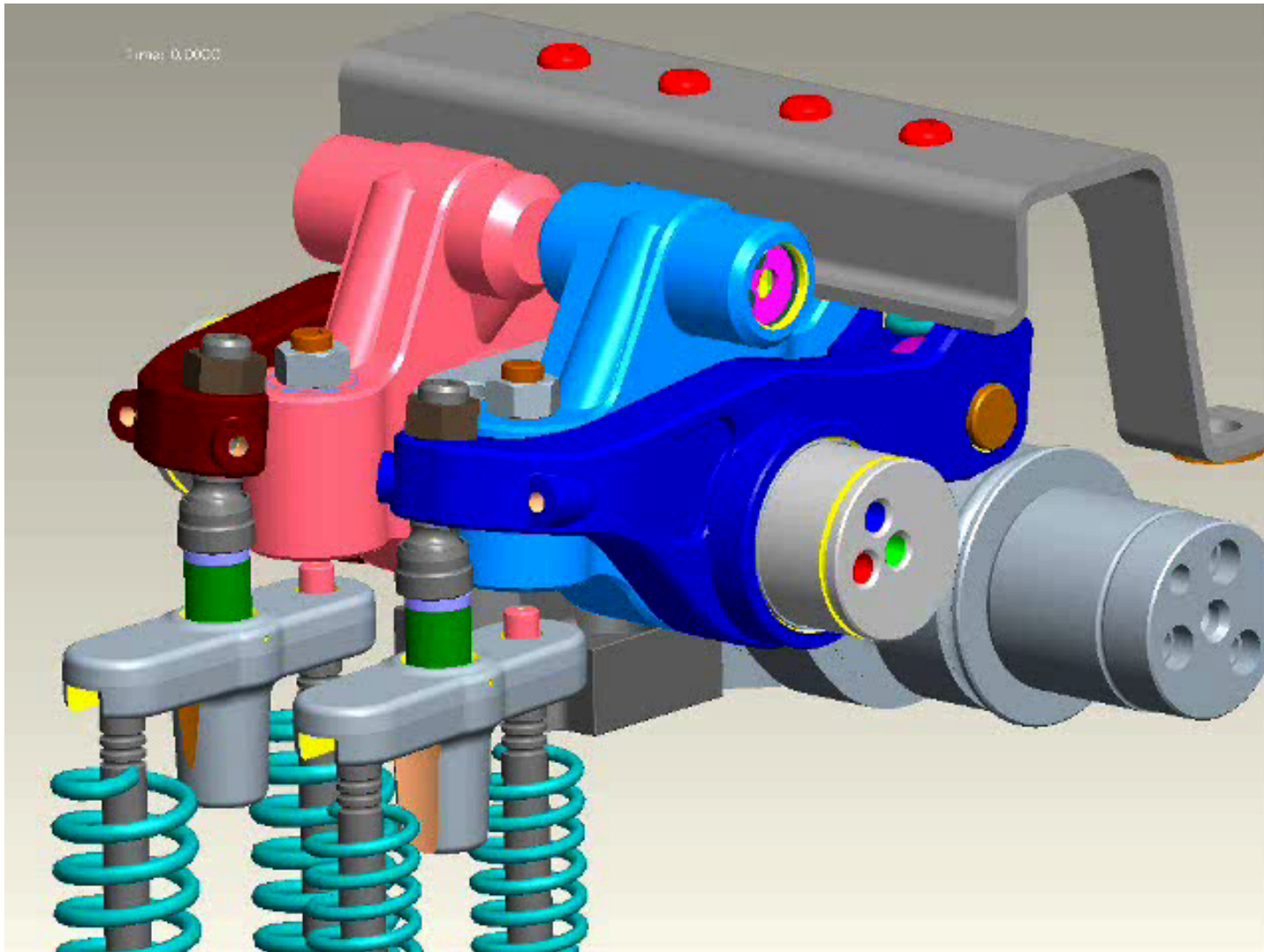


Engine Braking Overview



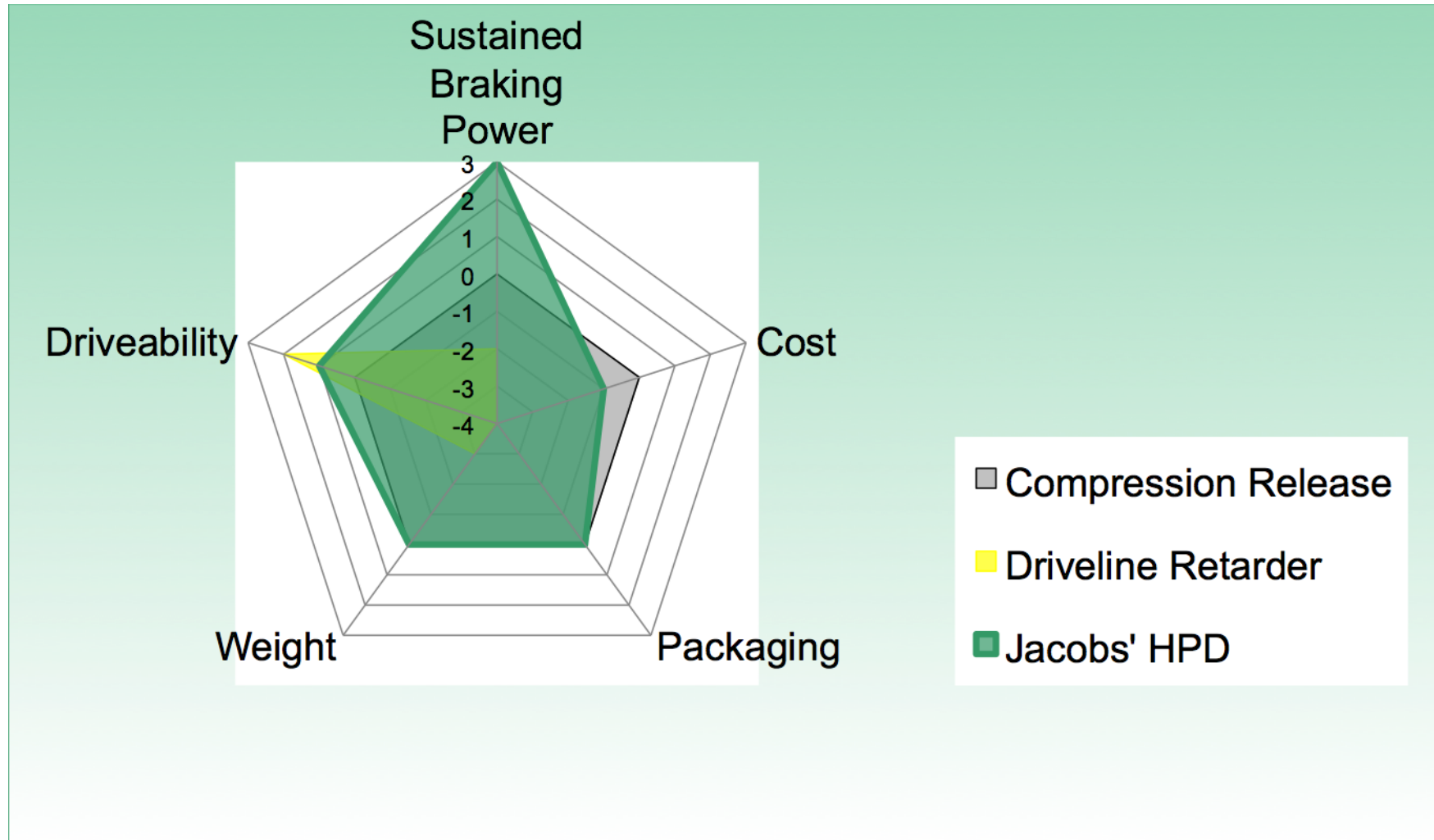


Uses Well-Established Jacobs' Componentry





Braking Technology Comparison





HPD Summary

HPD Benefits:

- Over 2x braking power at low end rpm over compression release technology
- Average of 1.5x more braking power over the entire rpm range
- Retarding power that exceeds positive power rating
- Lower peak loading on the engine valve train
- Reduced peak pulses into the turbo

“Fuel economy” is the new “emissions”

- Allows for driving at lower rpm
- Increased downhill speed control
- Provides large engine retarding power in downsized engines



Come to our booth to see actual hardware and talk with JVS engineers to learn more

Thank You



Jacobs Vehicle Systems™

www.Jacobsvehiclesystems.com



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