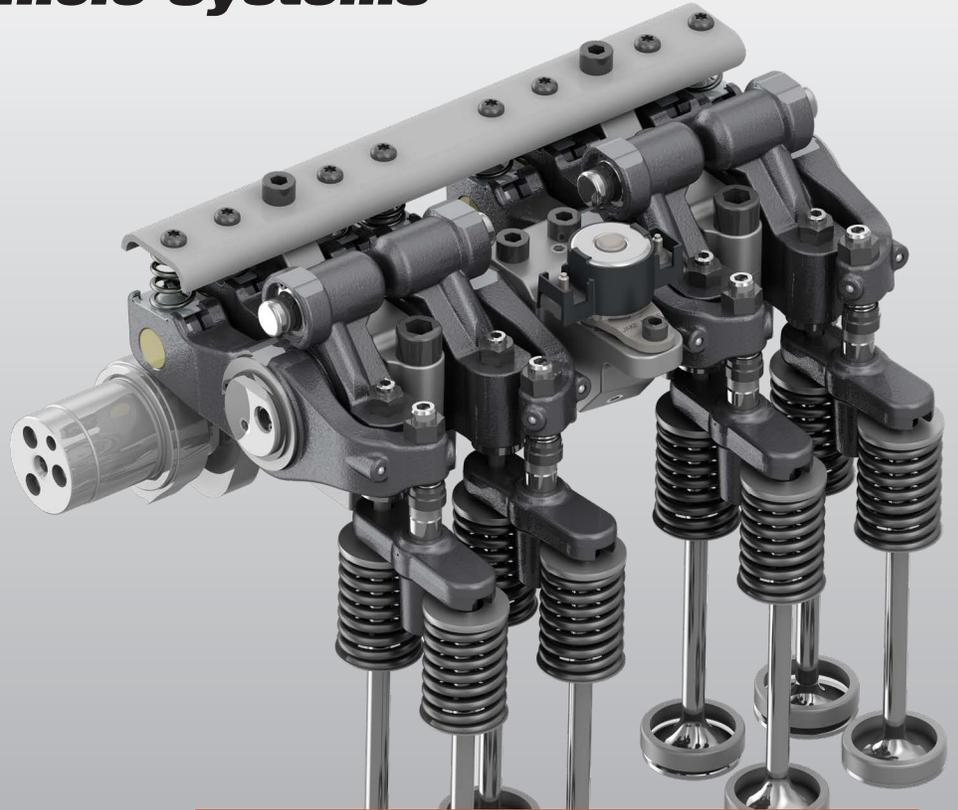




Jacobs Vehicle Systems®

HPD

**High Power
Density®**



BENEFITS

- ▶ World-class engine braking power with double the braking power compared to traditional compression release brakes
- ▶ Makes up for decreased aerodynamic drag and decreased rolling resistance of the latest trucks
- ▶ Compensates for the trend toward lower engine speed operation and specification of smaller displacement engines
- ▶ Operates at the engine speeds drivers use, avoiding downshifting during retarding
- ▶ An alternative to a driveline retarder with lower cost and weight, no maintenance, low impact to the vehicle, and without thermal fade
- ▶ A modular system to fit your application needs
- ▶ Compatible with Jacobs Cylinder Deactivation
- ▶ Fully integrated into the engine ECM and compatible with the latest cruise control and safety features
- ▶ Increases engine brake performance on Natural Gas vehicles

HPD: THE EVOLUTION OF THE ENGINE BRAKE

Constant evolution of engine, powertrain, and complete vehicle technology requires an engine brake that can answer increased retarding demands. Jacobs' High Power Density (HPD®) technology provides the lightest, most cost-effective, highest power retarding technology available.

HIGH POWER DENSITY ENGINE BRAKE

▲ 100%

Double the braking power at cruise speeds verses conventional compression release engine brakes.

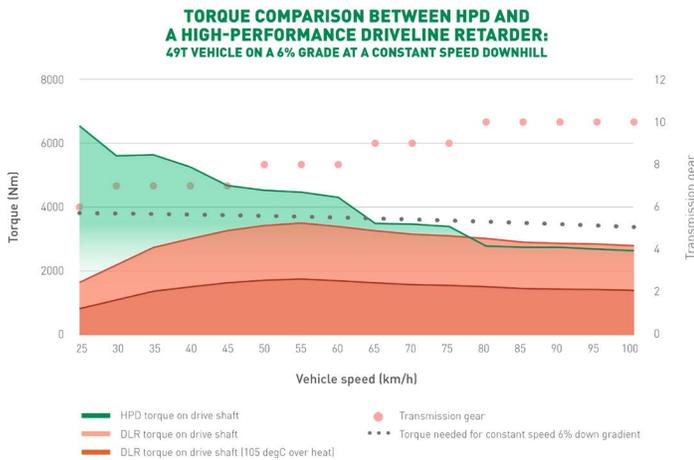
▼ 175 kg

Increased payload for the retarding performance you need. The integrated design allows for reduced package and mass compared to driveline retarders.

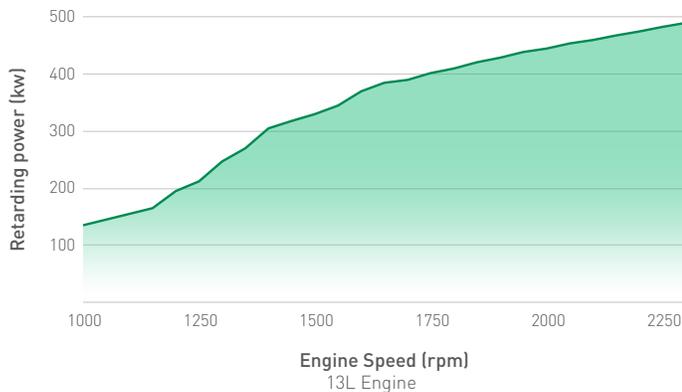
▼ €3.500

Lower total cost of ownership than a vehicle with a driveline retarder with similar power.

HPD VS. DRIVELINE RETARDER



RETARDING PERFORMANCE



MODULAR HPD SYSTEM



STANDARD COMPRESSION RELEASE

- ▶ Standard dedicated cam compression release braking system
- ▶ Hardware includes rocker brake, normal exhaust and intake bridges, BGR/CR cam, and brake rocker biasing
- ▶ Standard performance based on the air handling and load carrying capability of the engine



1.5 STROKE HPD

- ▶ Hardware includes the same standard rocker brake, cylinder deactivation bridge on exhaust main event, cam design with multiple CR/BGR events, and exhaust biasing
- ▶ Performance throughout the full RPM range is significantly improved
- ▶ Cost efficient upgrade that does not require significant changes to the overall valvetrain



FULL 2 STROKE HPD

- ▶ HPD expanded to the intake system to create full 2 stroke
- ▶ Includes rocker brakes and cylinder deactivation bridges on intake and exhaust, cam design with optimized intake/exhaust events, and full rocker biasing
- ▶ Intake optimization improves airflow and performance increases especially at low RPM
- ▶ Slightly more complex system to achieve highest performance level possible

LEARN MORE HPD ENGINE BRAKE