



# HIGH POWER DENSITY ENGINE BRAKE



## JACOBS' HPD TECHNOLOGY IS THE NEXT LOGICAL STEP IN ENGINE BRAKING

Constant evolution of engine, powertrain, and complete vehicle technology requires an engine brake that can answer increased retarding demands. Developed to complement these technology trends and help further future developments, Jacobs' HPD delivers the retarding power needed to:

- 1 *Compensate for decreased aerodynamic drag and decreased rolling resistance of the latest trucks*
- 2 *Compensate for the trend toward lower engine speed operation and specification of smaller displacement engines*
- 3 *Operate at the engine speeds you use, and avoid downshifting during retarding*

# THE EVOLUTION OF THE ENGINE BRAKE

▲ **100%**

Double the Braking Power at Cruise Speeds

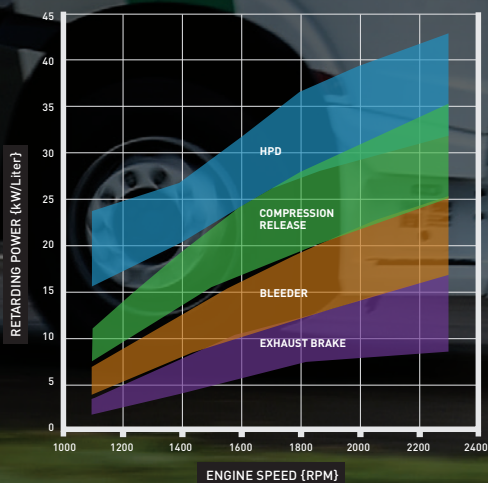
▼ **175 kg**

Increased Payload for the Retarding Performance You Need

▼ **3,500 EURO**

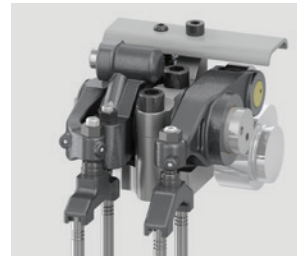
Lower Total Cost of Ownership

## HPD VS CONVENTIONAL SYSTEMS



\* Demonstrated engine brake performance ranges from various engine tests and simulation results

## MODULAR HPD ENGINE BRAKE 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

- ▶ Upgraded Modular 1.5 Stroke HPD braking system
- ▶ 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 technology expanded to the intake system to create full 2 stroke
- ▶ Hardware includes rocker brakes and cylinder deactivation bridges on intake and exhaust, cam design with optimized intake/exhaust events, and full rocker biasing
- ▶ Intake optimization for HPD improves airflow and increases performance especially at low RPM
- ▶ Slightly more complex system to achieve highest performance level possible



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