



# LASHLESS

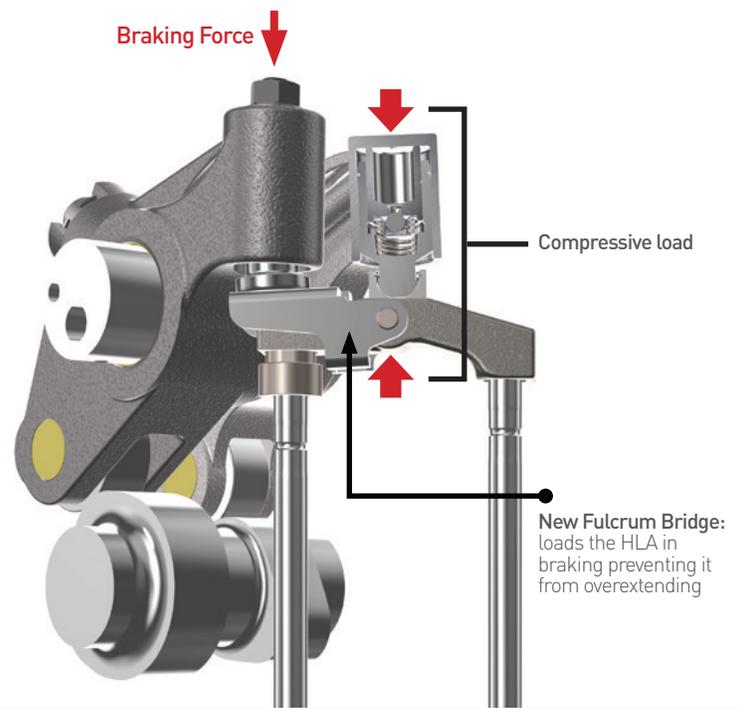
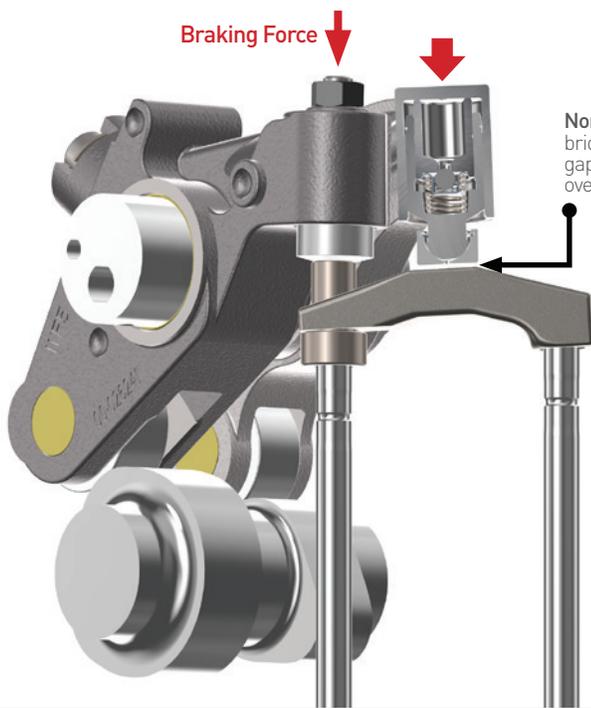
LASHLESS VALVETRAIN  
WITH ENGINE BRAKING



## JACOBS FULCRUM TECHNOLOGY ENABLES THE USE OF HLA AND A JAKE BRAKE

Hydraulic Lash Adjusters (HLA) technology has been desired on heavy-duty engines to eliminate the need to set and adjust lash as well as to optimize the cam design to enhance engine performance and efficiency. Conventional engine brakes and HLA's are incompatible because the HLA will over-extend during braking causing possible valve to piston contact. Jacobs Vehicle Systems' Fulcrum bridge technology applies a reactive load to the HLA during an engine braking event to prevent over extension.

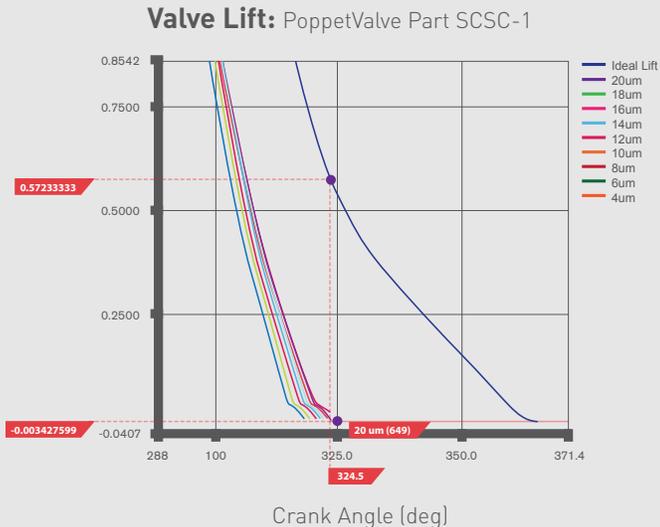
- ▶ Eliminate the need to adjust valve lash
- ▶ Cut production time and cost at the manufacturer's assembly line
- ▶ Increase vehicle uptime with reduced maintenance time and cost for operators
- ▶ Cam design optimization for improved performance and efficiency by optimizing seating ramps
- ▶ Reduce noise, vibration, and harshness due to improved valve seating
- ▶ Fulcrum bridge offers simple, cost effective solution without compromise



## BENEFITS

### Optimization of hydraulic cam design for improved performance and efficiency

A hydraulic cam design allows for optimization in the seating ramp areas which can lead to improvements in fuel economy and emissions. HLA's with Jacobs Fulcrum bridge technology also allow for more consistent valve motions throughout all engine operating conditions.



### Cut production time and cost at the manufacturer's assembly line

Many times, setting lash on the assembly line is the bottleneck for engine production. This process is eliminated with the use of HLA's and the JVS Fulcrum bridge.

### Increase vehicle uptime with reduced maintenance time and cost for operators

Eliminating the need for setting lash in service will improve vehicle uptime for the operator, thereby improving TCO. This is especially important for applications where valvetrain access is challenging.

### Reduce noise, vibration, and harshness (NVH) with improved valve seating

HLA's allow for better control of the valve seating event, thereby reducing the NVH associated with the valvetrain.

### Fulcrum bridge offers simple, cost-effective solution without compromise

Jacobs Fulcrum bridge is designed to work with conventional HLA's and various engine brake types.

