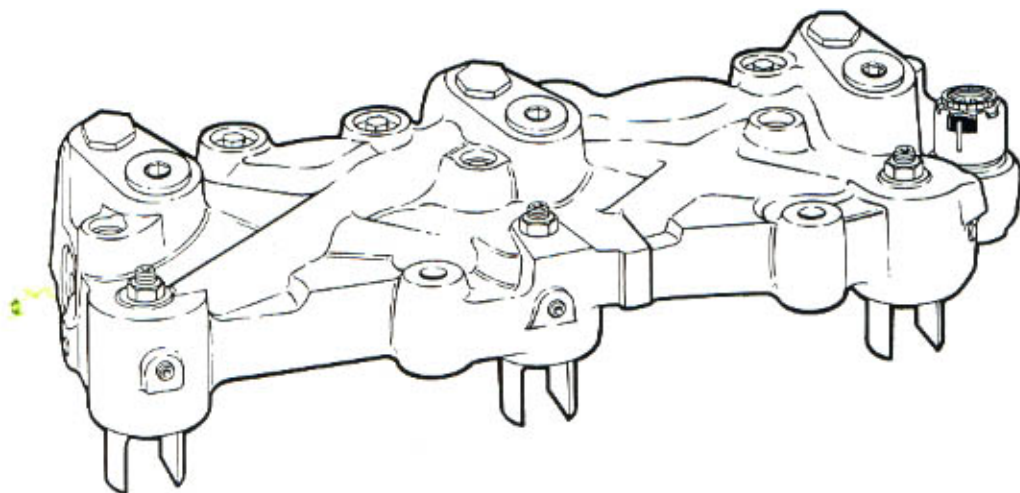


# MODEL 349A NEW TECHNOLOGY



**A Powerful New Era:<sup>TM</sup>**  
**for those who need more retarding HP on**  
**Caterpillar<sup>®</sup> 3406B/C ATAAC engines.**



Introducing the ***Jake Brake New Tech 349A*** Engine Brake. The most powerful engine retarder available for the 350 HP or larger Caterpillar 3406 engine. To see how the New Tech 349A works, read inside.



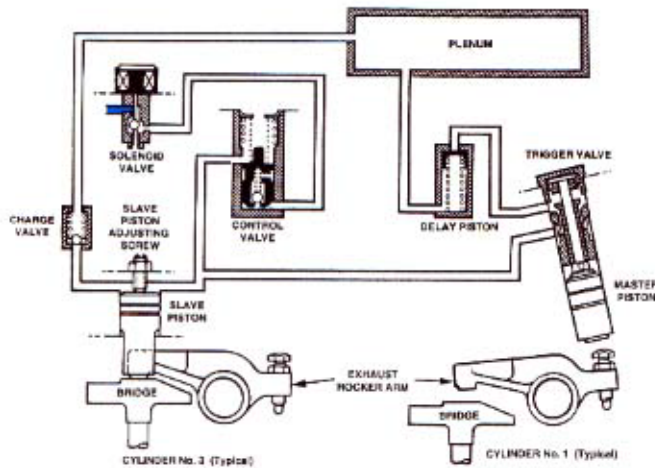
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## How a New Tech 349A Works

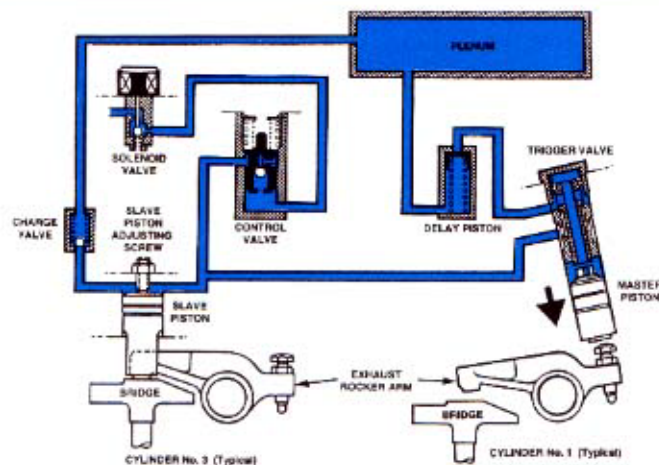
The braking cycle is accomplished by utilizing the pushrod motion of an exhaust valve of another cylinder during its normal exhaust cycle. For example, Cylinder No. 1 exhaust pushrod opens the exhaust valves of Cylinder No. 3 in the following sequences:

## #1 Brake Off



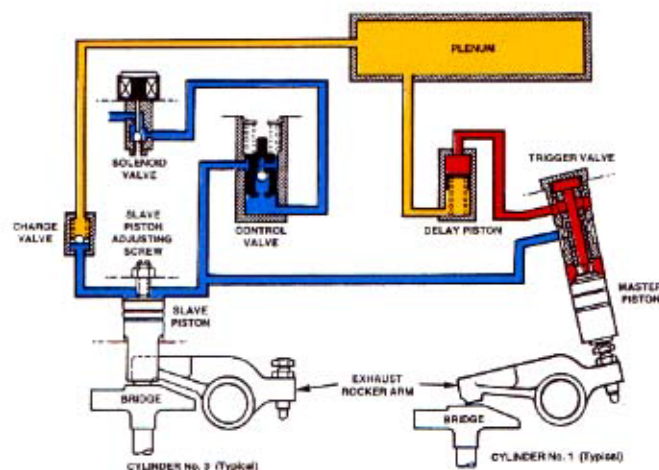
- The volume of oil contained in the 349A engine brake is several times the volume of a standard engine brake. Consequently, the brake should be cycled on-off several times each time the engine is brought up to operating temperature.

## #2 Brake Charging



- The energized solenoid valve permits engine lube oil to flow under pressure through the control valve to both the master piston and the slave piston and through the charge valve to fill the plenum.
- Oil pressure causes the master piston to move down, coming to rest on the corresponding exhaust rocker arm adjusting screw. See the accompanying chart for master/slave operation relationship.

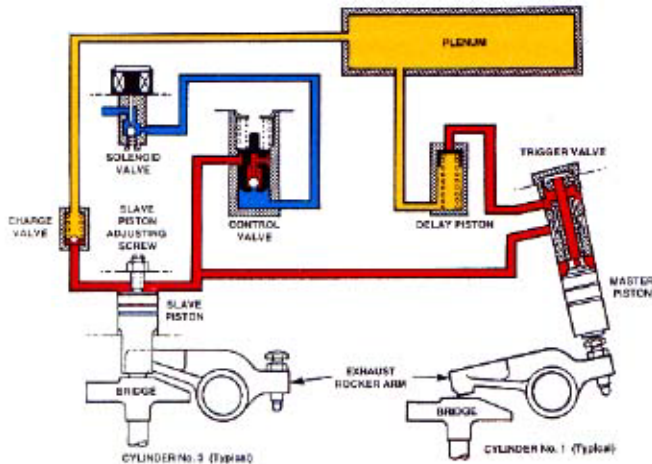
### #3 Brake Pressurizing



- The exhaust rocker pushrod begins upward travel (as in normal exhaust cycle) forcing the master piston upward and creating a high pressure oil flow to the delay piston.
- The delay piston moves and compresses the plenum oil to high pressure. The delay piston and plenum act as a high pressure "spring" to activate the slave piston at the appropriate time.

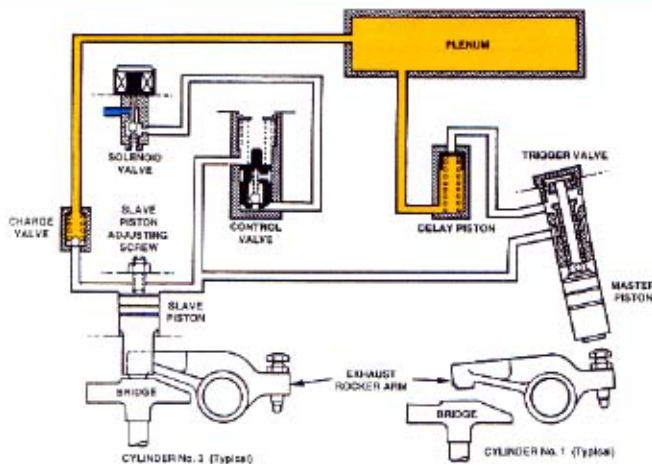


## #4 Brake Triggering



- The master piston moves upward and at the appropriate time, opens the trigger valve.
- High pressure oil flows from the delay piston through the trigger valve to the slave piston.
- The slave piston moves down, contacts the exhaust valve bridge and opens the exhaust valves releasing compressed cylinder air to the exhaust manifold.
- Compressed air escapes to atmosphere completing a compression braking cycle.

## #5 Brake off (Pre-charged)



- When the engine brake is de-energized, i.e. clutch disengaged, throttle depressed or turned off at the dash, pressure in the plenum very slowly bleeds down to lube oil pressure.
- Plenum remains filled with oil and "brake on" response time is much quicker than initial response of "brake off."

### Master/Slave Circuit Relationship Listed In Engine Firing Order



Location of Master Piston	Location of Slave Piston
Actuates	
No. 1 Pushrod	No. 3 Exhaust Valve
No. 5 Pushrod	No. 6 Exhaust Valve
No. 3 Pushrod	No. 2 Exhaust Valve
No. 6 Pushrod	No. 4 Exhaust Valve
No. 2 Pushrod	No. 1 Exhaust Valve
No. 4 Pushrod	No. 5 Exhaust Valve

# Why Is 400 HP Important?

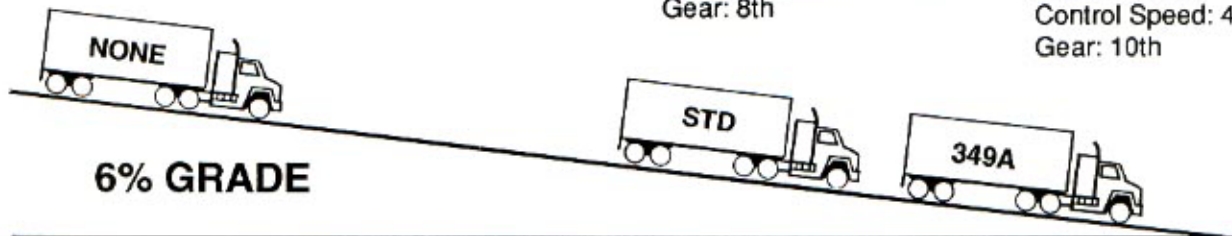


- Less wear and tear on equipment
- Shortened trip time
- Improved driver safety

No Retarder  
Control Speed: 7 MPH  
Gear: 2nd

Standard  
Engine Retarder  
Control Speed: 34 MPH  
Gear: 8th

New Technology  
Model 349A  
Control Speed: 45 MPH  
Gear: 10th



**Control Speed:** The constant speed at which a vehicle can descend a given grade without the use of the vehicle service brakes.

% Grade	MPH based on Gross Combined Weight*			
	60,000 lbs.	80,000 lbs.	100,000 lbs.	120,000 lbs.
4	55 (55)	55 (55)	55 (55)	55 (39)
5	55 (55)	55 (53)	53 (34)	39 (28)
6	55 (55)	45 (34)	34 (25)	28 (18)
7	55 (39)	39 (28)	28 (18)	25 (18)
8	45 (34)	34 (25)	25 (18)	18 (13)
9	39 (28)	25 (18)	18 (13)	18 (13)

\* Control Speed on Grade: New Tech MPH (Std Tech MPH)

## Time and Distance to Slow from 55 MPH to 45 MPH



	Slowing Time (seconds)	Distance Travelled (feet)
No Retarder	19.4	1423
Standard Retarder	10.0	733
New Technology	8.4	616

NOTE: Calculations based on identically spec'ed vehicles except for the retarder. Individual results will vary based on road conditions, optional equipment, tire inflation pressure and driver experience.