

BANKS your '04.5 to 07 **CUMMINS 5.9L**

Banks Brake®
EXHAUST BRAKE SYSTEM



CBC SmartLock®
COMPUTERIZED BRAKE CONTROLLER
(For automatic transmissions)

**ENGINEERING
TEST REPORT**

banks®

BRAKING POWER

Why Banks Brake?

Heavy Load + Steep Grade = Trouble. Your truck's wheel brakes are fine for lightly loaded cruising on the flatlands. But when you rely on them to handle a heavy load or a steep grade, you're tempting fate. Sustained use overheats braking surfaces. Drums or rotors can burn red hot, and composite bindings break down, lubricating surfaces where you want friction. The harder you mash the pedal, the hotter the brakes get and the faster you go.

And it's all downhill from there.

That's why we created the Banks Brake exhaust braking system.

A critical addition to a diesel pickup, Banks Brake utilizes the compression braking characteristics of diesel engines. It works by closing a large, electronically controlled butterfly valve in the exhaust, which creates backpressure. The engine has to work to compress air against this restriction, which slows the truck and saves your bacon!



Banks Brake® EXHAUST BRAKE SYSTEM

After designing and developing the new Banks Brake, the engineers at Banks put it through exhaustive testing. It was tested on the flow bench and on the road, against stock and the competition (BD, Jacobs and PacBrake). Bottom line: Banks Brake is the quickest, strongest, most intelligently designed exhaust brake on the market.

INCLUDES:

- Cast, large-bore brake housing assembly
- High-force 4¼" vacuum actuator
- Belt-driven vacuum pump with serpentine belt for quiet operation
- Computerized Brake Controller with SmartLock® (CBC)
- Enormous, electronically controlled butterfly valve with super-alloy shaft and bearings
- Wire loom
- Mounting hardware

*Banks Brake for automatic transmission shown;
unit without CBC available for manual transmission*

MAJOR BRAKE THROUGH

Total System Solution

Banks created a whole new standard in exhaust braking with the innovative direct-mount, no-maintenance Banks Brake. It's a total system solution with torque converter clutch, transmission and overdrive control. Banks Brake monitors critical engine and transmission parameters to maximize braking power, responsiveness and flexibility when towing or hauling.

Keeps Wheel Brakes Ready for Emergencies

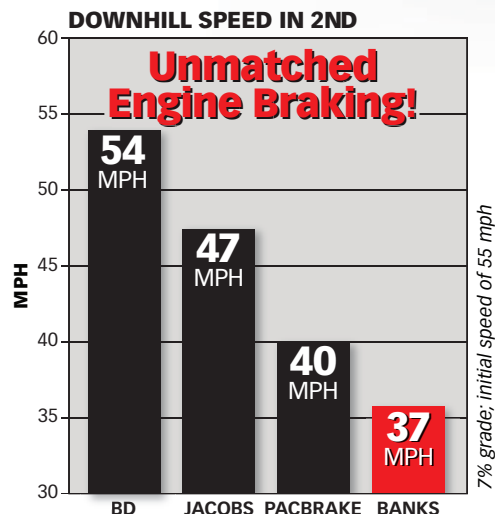
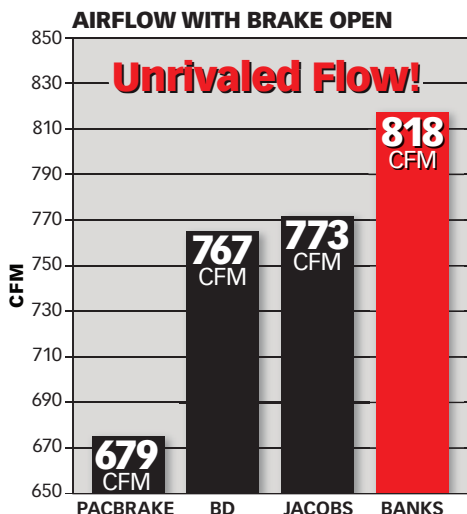
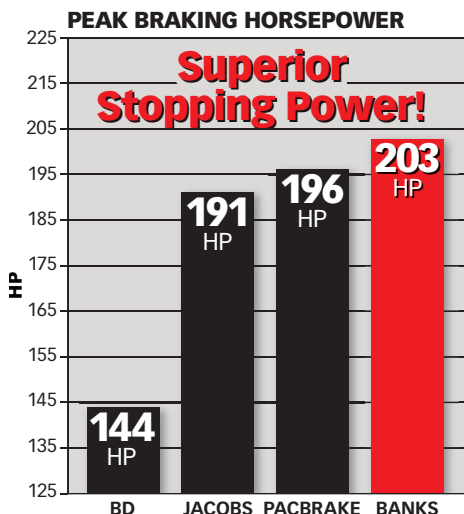
Banks Brake dramatically cuts downhill speeds without using the foot brakes. This keeps them cool and prevents wear and tear of the rotors and pads.

CBC with SmartLock®

COMPUTERIZED BRAKE CONTROLLER WITH SMARTLOCK
(AUTO TRANS. ONLY)

Optimizes braking performance. CBC automatically senses throttle position, controls brake engagement, provides a fast warm-up function and improves brake efficiency. With CBC, the driver can *cancel overdrive at any time—even in Tow/Haul mode*. At the same time, the unit signals the transmission to engage the torque converter lockup clutch and increase hydraulic line pressure. This prevents clutch slippage under extreme braking conditions. When you hit the throttle, the CBC immediately disengages, and you're back to diesel pulling. What's more, *only Banks Brake performs—and gives you control—in first gear*.

Results may vary with Banks Brake for manual transmission



Easy to install; needs no cutting or modifications to stock wiring

Elbow shaped by engineers to maximize flow and improve performance

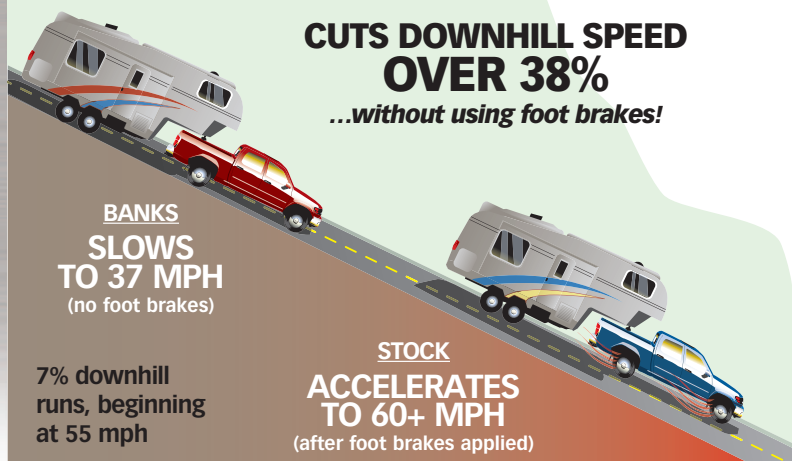
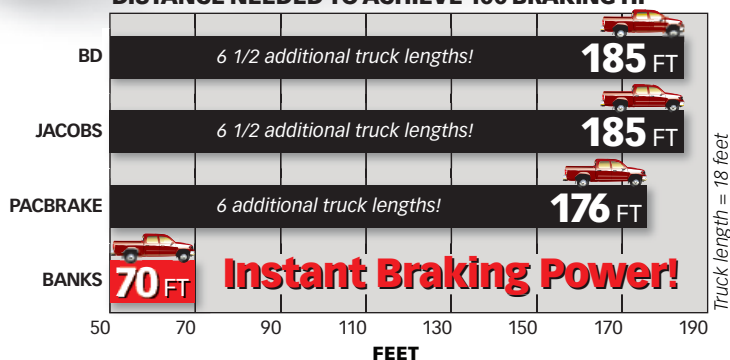
Brake housing mated directly to turbocharger outlet for immediate response

Nonrestrictive design promotes good turbo response upon acceleration

Butterfly valve automatically exercised during engine startups; prevents sticking and eliminates maintenance



DISTANCE NEEDED TO ACHIEVE 100 BRAKING HP



Test vehicle: 2006 Dodge Cummins crewcab short bed, single rear wheel with 48RE automatic transmission, equipped with a data acquisition system and Banks Brake

Mode: Towing @ 19,000-lb combined weight (added weight to truck bed + weight trailer)

Course: Steep 7% grade

Test Setup BANKS BRAKE

An '06 Dodge Cummins pickup was equipped with the Banks DynaFact® data acquisition system to measure vehicle speed, engine RPM, exhaust backpressure, transmission line pressure and braking horsepower.

Test runs on a 7% grade in the vicinity of southern California's daunting Cajon Pass were done with the gear selector in both Drive and 2nd. Tow/Haul mode was used in all cases, per Dodge's recommendations. 55 mph was established at the top of the hill, and the foot brake was applied only if it became necessary to keep the vehicle at a safe speed (no greater than 65 mph). Multiple configurations were tested: stock, Banks Brake with Computerized Brake Controller and SmartLock® (CBC), PacBrake, Jacobs and BD.

All of the brakes tested have a direct mount configuration. Each of the competitive brakes was controlled by the vehicle ECM option that became available starting in the 2006 model year. In addition to road testing, flow bench testing was conducted on each of the brake assemblies.

BANKS STOPS STOCK

Gear	Start Speed	Speed without Banks Brake	Speed with Banks Brake
3rd	55 mph	65+ mph (excessive use of foot brakes required)	62 mph (no foot brakes)
2nd	55 mph	60+ mph (use of foot brakes required)	37 mph (no foot brakes)

TEST RESULTS

Banks Stops the Competition

FEATURE	BANKS	BD	PACBRAKE	JACOBS	COMMENTS
Brake Delay	1	4	2	3	1=Best, 4=Worst See Instant Braking Power chart
Braking Power	1	4	2	3	1=Best, 4=Worst See Superior Stopping Power chart
Open Flow	1	3	4	2	1=Best, 4=Worst See Unrivaled Flow chart
Overdrive Cancel in Tow/Haul Mode	✓	NO!	NO!	NO!	Increases RPM for better braking
Brakes in all Gears and Locks Torque Converter	✓	NO!	NO!	NO!	Added safety when low speed must be maintained while descending steep grades
Free from Wire Tapping or Splicing	✓	NO!	NO!	NO!	Far easier to install, Banks Brake needs no modifications to stock wiring
Maintenance-Free	✓	NO!	NO!	NO!	Calibrated at the factory, Banks Brake never needs adjustment or maintenance
Boosts Transmission Line Pressure	✓	NO!	NO!	NO!	Protects the transmission under higher braking loads
High Temp Sealed Bearing System	✓	NO!	NO!	NO!	Added durability and reliability; zero maintenance.
Lowest Operating Speed*	14mph	24 mph	24 mph	24 mph	Only Banks Brake provides critical control at lower speeds

*As tested on a 2006 vehicle

STOCK

- Excessive use of foot brake required during descents in Drive: indication of possible runaway condition
- Heavy use of foot brake required in 2nd gear to prevent excessive redlining and consequent engine damage

BANKS BRAKE®

- Smooth, controlled downhill descents
- The only exhaust brake that didn't require use of the foot brake in Drive
- Highest peak braking horsepower
- By far, the quickest braking response time
- Provides control in 1st gear
- Transmission line pressure around 133 psi during descent
 - This added line pressure keeps transmission clutches firmly applied
 - Protects the transmission
 - Over 50% more protective line pressure than the others provide
- Vacuum pump produces no audible noise over normal engine sound
- Superior airflow with brake open



BD BRAKE

- Uses a noisy electric pressure pump
- Insufficient braking power: had to use foot brake during descents in Drive
- Slow reaction time
- Weakest of all exhaust brakes tested
- Doesn't operate in 1st gear
- More restrictive when open; hurts performance
- Automatic-equipped trucks prior to '06 require BD's programmable Tow Loc and Pressure Loc kits to electronically control torque converter clutch engagement
- Transmission line pressure just 83 psi during descent



PACBRAKE

- On/Off brake activity while in cruise condition results in noisy release of air pressure
- Insufficient braking power: had to use foot brake during descents in Drive
- Slow reaction time
- Doesn't operate in 1st gear
- Most restrictive of all brakes when open; hurts performance
- Exhaust pressure regulation requires multiple moving parts that could stick or fail
- Transmission line pressure just 83 psi during descent



JACOBS BRAKE

- Insufficient braking power: had to use foot brake during descents in Drive
- Doesn't operate in 1st gear
- More restrictive when open; hurts performance
- Transmission line pressure just 83 psi during descent
- Slow reaction time



See previous page for test setup details.



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