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2007.5-17 Dodge 6.7L Cummins
BD Electric Electronic Brake

(Uses factory exhaust brake switch & ECU control)

1027346	2007.5-17	4” Exhaust
1027347	2007.5-17	5” Exhaust

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***** Please read this manual before starting installation. *****
OWNER’S MANUAL - LEAVE IN GLOVE BOX

Table of Contents

Introduction

Thank you for purchasing a BD Exhaust Brake.

This exhaust brake kit allows you to keep the exhaust braking feature after the stock VGT turbocharger has been removed. The brake is controlled by ECM just like the stock VGT turbocharger meaning it is controlled by the switch already in your dash. Your new BD exhaust brake keeps all of the features of the original brake including the cold weather warmup feature, cruise control compatibility and the brake release on downshifts to reduce transmission wear. The control module comes with a wiring harness that plugs in where the stock turbocharger connected, this means there is no splicing into stock wiring, no wiring through the firewall and a much cleaner installation.

This exhaust brake has been designed to be used on vehicles with aftermarket upgraded turbochargers such as BDs single and twin turbo kits. It requires the vehicle have engine tuning to account for the turbocharger replacement and cannot be used in conjunction with the stock VGT turbocharger.

To use this kit your vehicle must have been equipped with the factory exhaust brake button on the dash or must have been upgraded to have this feature. If your vehicle was not equipped with a factory exhaust brake this product will not be compatible with your vehicle

2018-2019 Vehicle Applications

2018 and later ECM files will require additional special tuning to prevent the ECM from commanding high % VGT position during normal driving that the module would mistake for exhaust brake activation.

2018 vehicles using earlier model year ECM files do not appear to have this issue.

Kit Contents

Confirm you have all the parts listed in this kit.

1127039	1304569	1304567
		
Valve Assembly	***Brake Control Module***	***EEB Harness***
Qty: 1	**Qty: 1**	**Qty: 1**

1407042	1100404	1300131
		
Adapter Plug for 2013+ Models	***4” S/S Exhaust Clamp***	***6” Tie Wraps***
Qty: 1	**Qty: 2**	**Qty: 12**

Kit 1027342/1027343 Only (4” Pipe)	
1100400	**1100740**
	
4” Pipe Adapter	***4” Marmon Clamp***
Qty: 2	**Qty: 1**

Kit 1027345 Only (5” Pipe)	
1100500	**90368B**
	
5” Pipe Adapter	***5” Exhaust Clamp***
Qty: 2	**Qty: 1**

Tools Required

- Measuring tape or ruler
- Reciprocating saw or hacksaw
- Wire Cutters
- Socket Set
- Welder
- Heat gun or lighter

Accessories

Description		Part #
Brake Pressure Testing Gauge Kit		**1030050**
Cool Down Timer (Turbo Timer)	2006-2009 2010-2012 2013-2019	**1081160-D1** **1081160-D2** **1081160-D3**

Installation

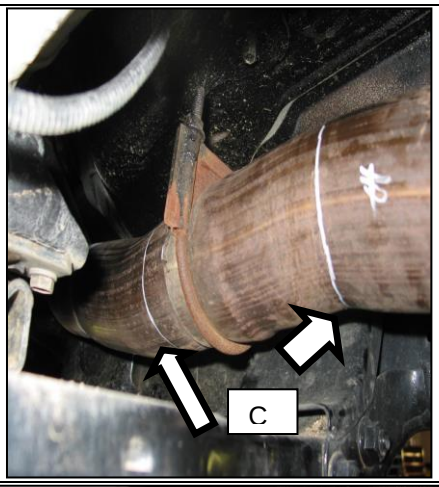
To prevent damage to electronic components, it is recommended that both battery negative terminals be disconnected while working on the vehicle.

Please read this manual thoroughly before installing this exhaust brake.

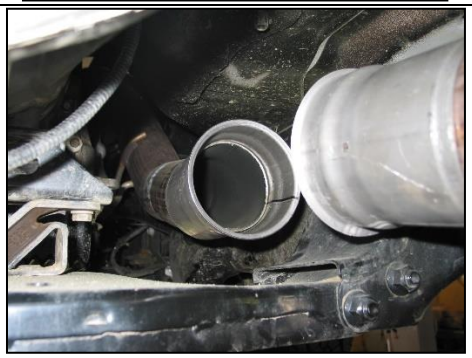
Brake Valve Installation

Raise and support the vehicle with a vehicle hoist or with appropriate jack stands.
Ensure vehicle is safely supported before proceeding to reduce possibility of damage or injury.

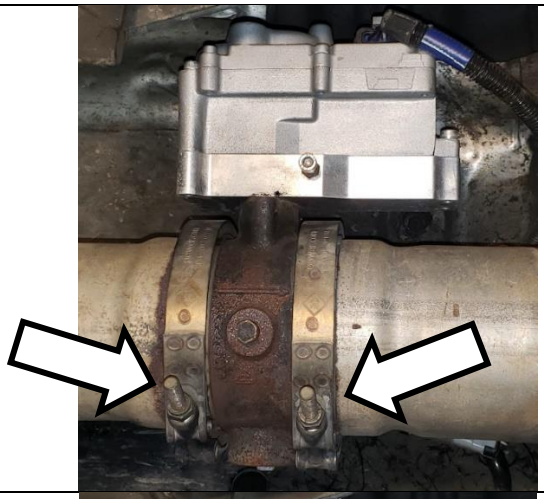
Beneath the vehicle, locate the exhaust downpipe and front exhaust pipe beside the transmission. Choose a section of pipe that is as straight as possible. Mock up the brake valve in this area to ensure it will fit before cutting the pipe. Mark a 7-1/4” section for removal.



Cut out the marked pipe section using a reciprocating saw or cutting disk. Remove any burrs left on the edge of the pipe using a file or similar tool, then slide the pipe adapters onto the two cut ends of the pipe.

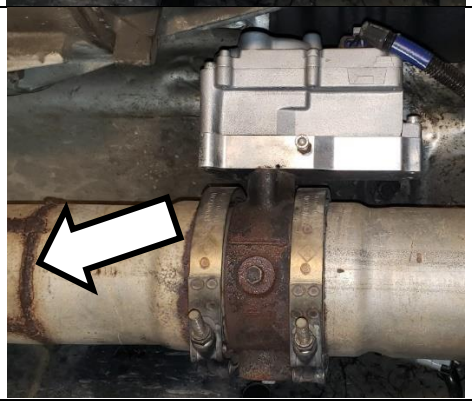


Install the brake valve between the two exhaust pipe adapters using the two supplied V-band clamps. Ensure the exhaust pipe adapters are in line with the brake valve to prevent possible leakage.



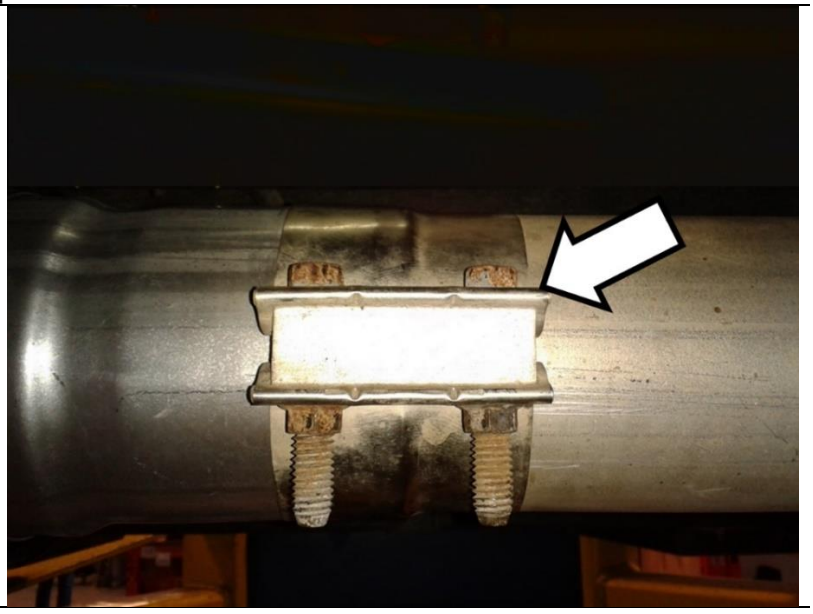
Weld the front adapter to the exhaust pipe. This weld must completely seal the exhaust system as it must retain pressure.

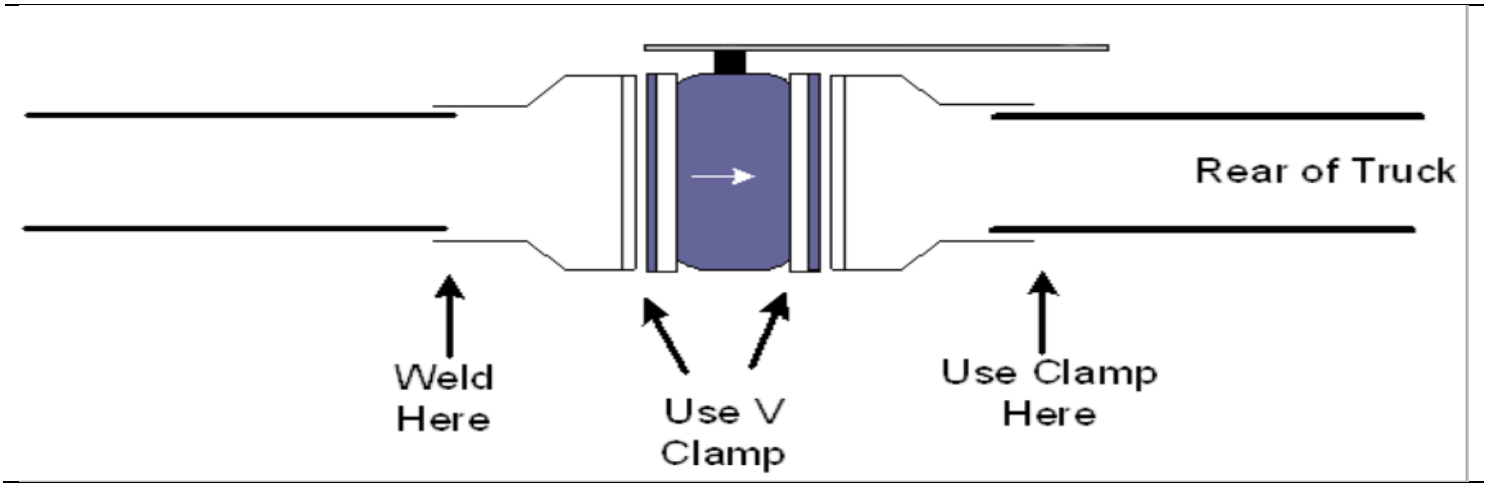
Note It is recommended that the weld be spray painted to slow down corrosion along the weld bead.



IMPORTANT The front exhaust connection MUST be welded. Using a band clamp or conventional exhaust clamp on this joint will cause leaks and will not retain full exhaust brake pressures.

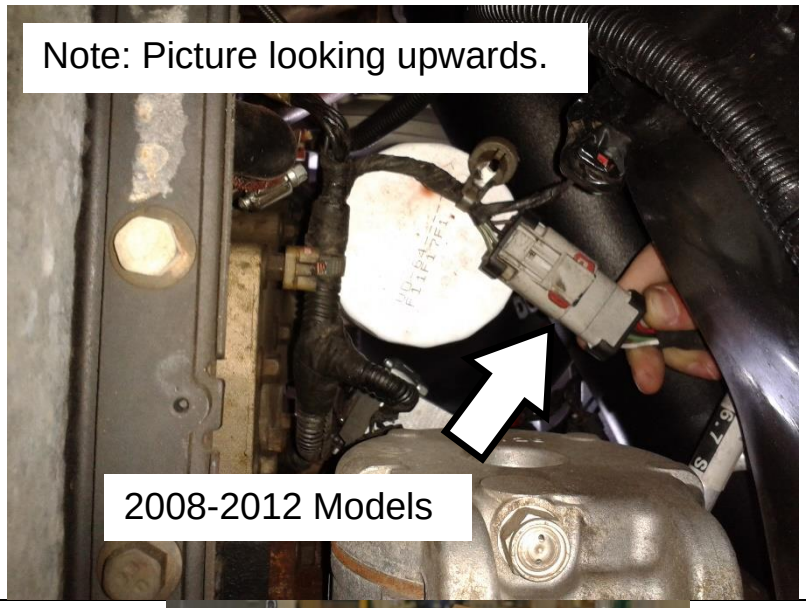
Install the supplied stainless-steel band clamp on the rear exhaust pipe adapter. Tighten bolts until the band fully conforms to both pipes creating a seal.



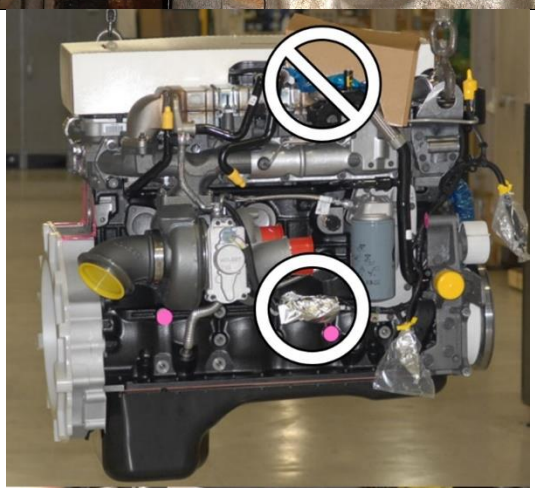


Electrical Connections

Locate the factory turbocharger actuator electrical connector. For 2008-2012 this is a light gray connector located near the oil pan on the passenger side of the engine. For 2013-2018 this is a black 4 pin connector that previously plugged into the turbo. It will have been disconnected when the VGT turbocharger was removed. Connect this to the supplied wiring harness with the kit. (2013+ use adapter 1407042)

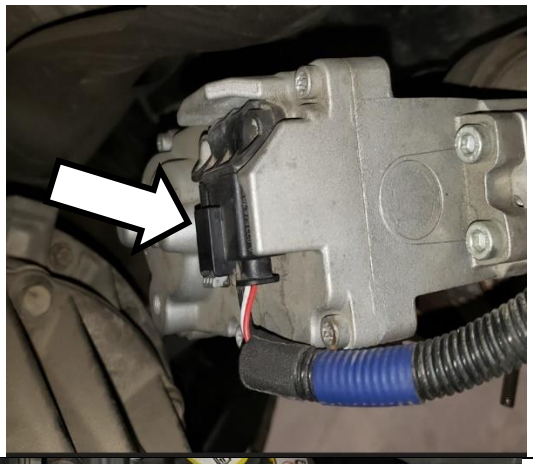


IMPORTANT Do not connect the harness to the EGR valve connector by mistake, it uses the same gray plug! Make sure the harness is connected to the VGT connector at the bottom of the motor.



Route the electrical harness grey 12 pin connector up to the top rear of the passenger side battery.

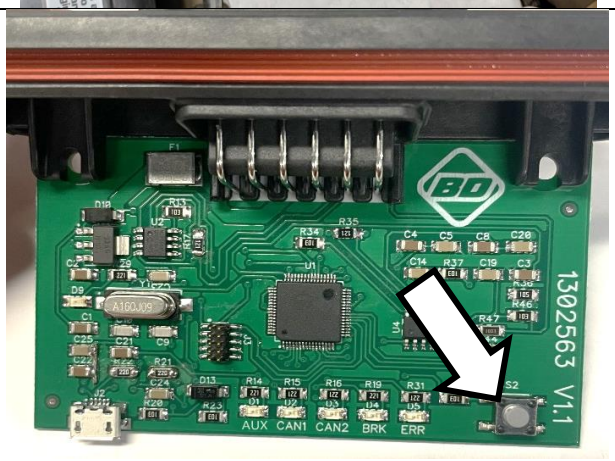
Connect the wiring harness to the module and secure the harness with wire ties to keep it well clear of the turbocharger(s).



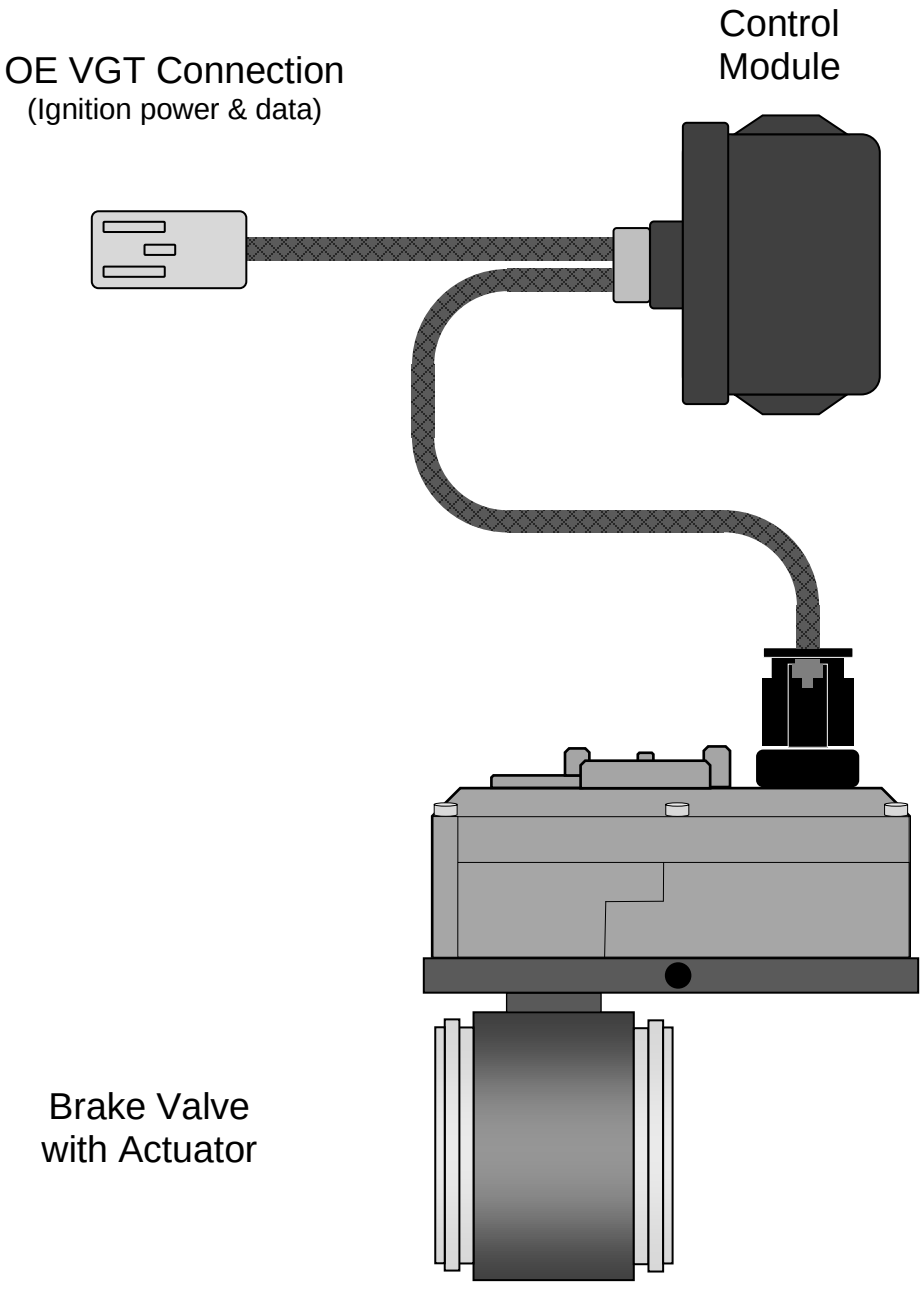
Lastly, route the harness with the black 4 pin connector down the firewall, along the frame rail to the exhaust brake actuator. Connect to the actuator and secure harness along frame.

This is a perfect opportunity to test the exhaust brake function.

To turn the brake on for testing, remove the cover from the control module and press the “TEST” button inside. Pressing this button will activate the brake actuator.



Wiring Diagram



Maintenance

The wires and clamps should be inspected on a regular basis for any deterioration, damage or leaks.

To increase the life of your exhaust brake, we recommend daily operation. By simply switching the brake on and off a couple times a day, it will prevent the butterfly valve from sticking due to carbon build-up.

If you have any problems or need replacement parts, call us at 1-800-887-5030, between 8:30am and 5:00pm Pacific Time.

Compatibility Requirements

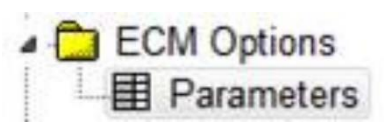
Depending on tuning style, all years of trucks may require the exhaust backpressure (EBP) sensor and tube to be plugged in and connected or the ECM could disable the exhaust brake. This is not normally an issue on 2007-2012 trucks as the sensor is mounted on the thermostat housing and is normally left in that spot and not removed from the vehicle. 2013-2017 trucks often have the EBP sensor removed from the truck however this sensor should be to be plugged in and connected to the exhaust manifold for this kit to function correctly.

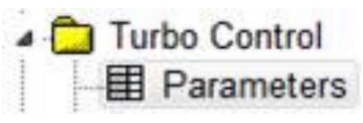
Tuning Requirements

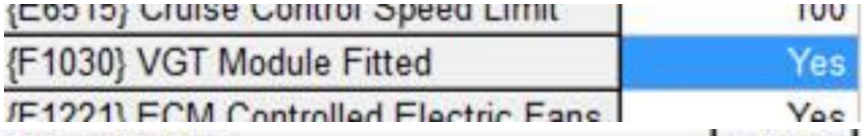
It is important that the engine tuning not fully disable ECM VGT control for this exhaust brake kit to work. This kit relies on the VGT turbo data link to determine when the exhaust brake turns on and off.

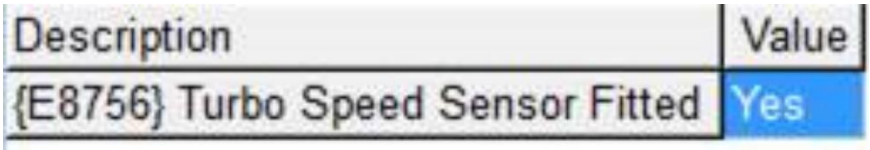
BD Diesel has tested this kit with H&S, Bully Dog and Smarty box tuners.
EFI Live and other custom tuning must not disable the VGT operation. See information below.

The following is an example from a 2009 truck, others will be similar.
EFI Live: F1030 VGT Module Fitted must be set to YES, E8756 Turbo Speed Sensor Fitted must be set to YES. All relevant P-trouble codes must be disabled.









Troubleshooting

This guide assumes that your exhaust brake system is using a "Dodge 6.7L Brake Control Module" rather than a DFIV or micro-switch on the throttle. For other systems see the appropriate instruction manual.

Brake does not engage	No	Yes
Is the control module powered?	Check fuse box for blown fuse: • 2007-2009 MY Fuse #37 - 15A • 2010-2012 MY Fuse M51 – 20A • 2013-2018 MY Fuse 78 – 10A • 2019 MY Fuse F22 – 25A Check wiring harness for connection or for damage.	Test brake function using the test button on the module.
Does the brake activate when the test button is pushed?	Indicates a mechanical or electronic issue with the brake. Open module and observe the "BRAKE" LED, this will light when the module activates the output.	Indicates the brake is mechanically sound, and the issue is related to the command signal between the ECM and the module.
Is the Error LED on and flashing?	If the error LED is on then there is a connection error between the module and the ECM/actuator. Use the test button to see if the actuator opens and closes.	If the error LED is on and flashing then there was a temporary loss in communication between the ECM/actuator and the module. Cycle the power and check if the problem persists.
Is the CAN light on the module PCB flashing consistently? CAN 1 - Truck to Brake Module CAN 2 - Brake module to Brake Valve Actuator	Check wiring harness for shorts or exposed wires. It is common for the harness to rub against the transmission bell housing. Temporarily remove the NOx sensor and try again to check for internal shorts.	Indicates module is working correctly. Check the actual and desired brake positioning using a scan tool.
Do the actual and desired VGT positions match on the scan tool?	Indicates a communication error between the vehicle ECM and the module.	Check that the ECM commands the correct VGT position for a given engine RPM as per the table below.

Brake command table.

The first two columns are showing the EEB trigger point to close the exhaust brake vs engine rpm.

The following two columns represent the ECM calibration conversion that is the scan tool would see vs the value set in the calibration.

If your ECM is commanding less than the minimum VGT position for the given RPM while braking, you may need to contact your tuning provider to verify settings.

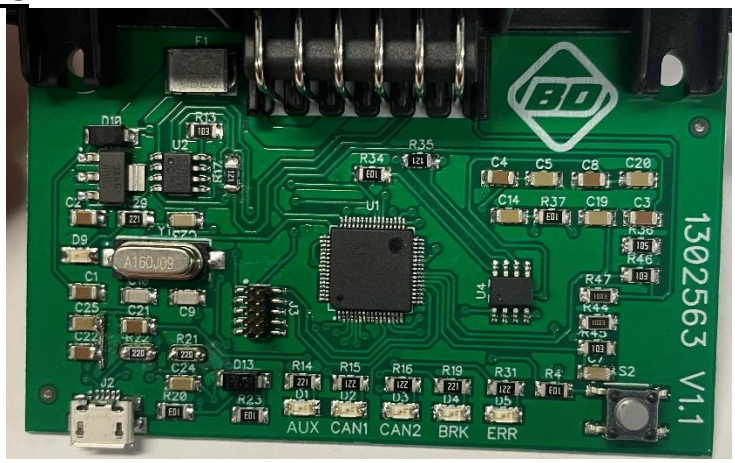
NOTE: The EEB programming is based off of the ECM calibration values, not the scan tool values.

Engine RPM in exhaust braking conditions	Minimum VGT position		Turbo/EEB Position Conversion ECM Calibration	Scan tool Value
500	94.1%<		0	0
1000	94.1%<		5	34
1250	94.1%<		10	50.5
1500	94.1%<		15	59.5
1750	95.3%<		20	66
2000	91.1%<		25	70
2250	90.8%<		30	74.5
2500	89.2%<		35	78
2750	87.7%<		40	81
3000	73.5%<		50	85.5
			60	90
			70	93
			80	96
			90	98
			100	100

	If your ECM is commanding less than the minimum VGT position for the given RPM while braking, contact your tuning provider.	
The brake comes on but there's little or no holdback	**No**	**Yes**
Check off idle brake pressure. (See back pressure chart) Are you getting maximum allowable back pressure at full RPM?	Check for exhaust leaks. A small leak can result in a significant decrease in back pressure. If no leaks are found try adjusting air regulator. Check for air leaks in brake system.	Try down shifting more aggressively. More RPM will give more holdback. Transmission or torque converter could be slipping internally.

Firmware V1.1: This version changes the error detection to prevent erroneous error detection. If a temporary fault occurs the error LED will flash on and off at 1-second intervals.

LED Flashing Patterns



CAN1 and CAN2 LEDs are flashing	The Module is communicating with the vehicle and the brake actuator
BRK LED is on	The brake shut signal is sent to the brake actuator
ERR LED is solid	There is currently an unresolved error. • Communication with the the actuator has been lost • The actuator is not able to open or close fully
ERR LED is flashing (1 time per second)	There was an error which has been resolved. eg: the actuator stopped communicating with the module but resumed communication. Turning the vehicle off and on again will clear the error.
Only CAN1 is flashing (Truck to Brake Module) ERR LED should be on as well	The module lost communication with the brake valve actuator.

Only CAN2 is flashing (Brake Module to Brake Valve Actuator)	The module has lost communication with the vehicle

Exhaust Back Pressure Testing

To test exhaust brake system pressure, a minimum 0-100psi pressure gauge is required.

We recommend purchase of a BD brake pressure gauge kit #1030050.

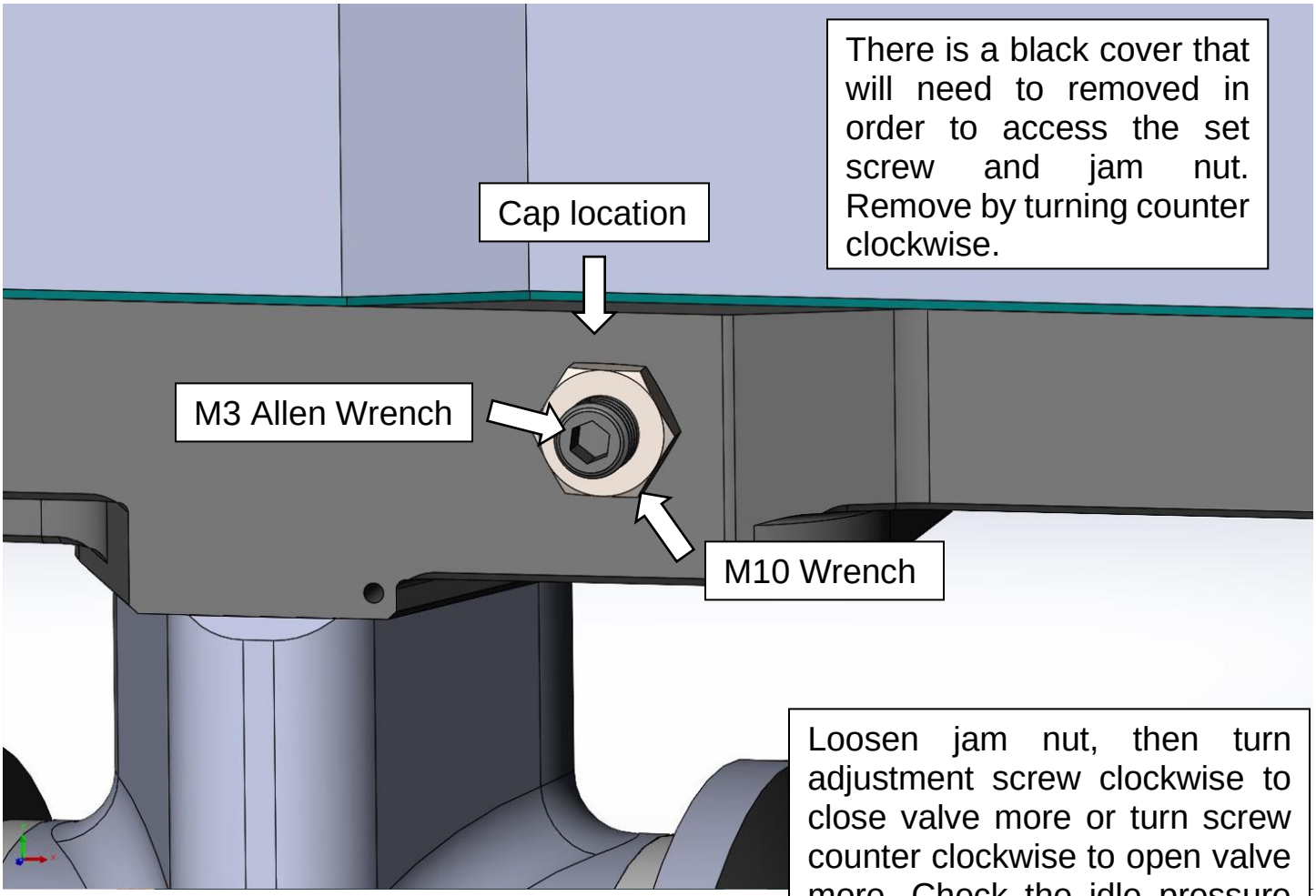
Off-Idle Pressure Test & Adjustment

Get the truck up to speed (a downhill grade or a load in the truck is helpful) and activate the exhaust brake. Note the maximum backpressure achieved. You should get peak backpressure at higher RPM (try 3000 RPM in Drive). If you cannot reach the desired backpressure (compare table below) you can begin troubleshooting, the first step is to look for exhaust leaks either from the clamps, exhaust manifolds or feed pipes. Also look for leaks at the clamps located at the back of the turbo and also at the down pipe. If all connections are sealed, you can then use the adjusting regulator to increase the backpressure. Note that small regulator adjustments can have a significant effect on off-idle backpressure.

NOTE: Over the next two weeks, the backpressure at idle may rise due to initial carbon build up on the inside of the brake housing and on the butterfly. The stop bolt may need to be adjusted again to compensate.

Application	Maximum Back Pressure
Dodge Cummins 2007.5 to 2017	65 psi

We generally do not recommend adjusting the stop bolt, please consult BD before doing this as it may void your warranty.



Loosen jam nut, then turn adjustment screw clockwise to close valve more or turn screw counter clockwise to open valve more. Check the idle pressure by pressing the test button on the module and reading the manual pressure gauge which would be installed to the test port of the brake valve.

Serial # _____

Date Purchased _____

Purchased from _____

Installed by _____