

FORD 6.7L POWERSTROKE (2011-14)

VARIABLE VANE EXHAUST BRAKE

Installation Instructions

P/N# 2001102

NOTE: If installed on trucks with all emission equipment in place it is possible a fault code may be set under prolonged extreme braking conditions relating to the DPF sensor output.

PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION

UNLESS AN EO# IS LISTED, THIS PRODUCT IS LEGAL IN CALIFORNIA FOR RACING VEHICLES ONLY, WHICH MAY NEVER BE USED UPON A HIGHWAY.

BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

K I T C O N T E N T S :

Please check to make sure that you have all the parts listed in this kit **before** you start the disassembly of your truck.

2100021	1800060	1300131	1330054	31880
				
<i>Module; Ford 6.7L VVB</i>	<i>Velcro</i>	<i>Cable Ties</i>	<i>Tape; DS</i>	<i>Dielectric Grease</i>
Qty: 1	Qty: 2 X 4"	Qty: 16	Qty: 1	Qty: 1
1330053	1301810	1301812	1330052	2000107
				
<i>Alcohol Swab</i>	<i>Switch; Push 3 pos</i>	<i>Switch Decal</i>	<i>Screw</i>	<i>Switch Bracket</i>
Qty: 1	Qty: 1	Qty: 1	Qty: 2	Qty: 1

BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

Tools Required

- Sockets, Wrench, ext 5.5,7,8,10mm
- Side cutters
- Small blade screwdriver
- Torque Wrench
- Utility knife

Optional tools for switch installation :

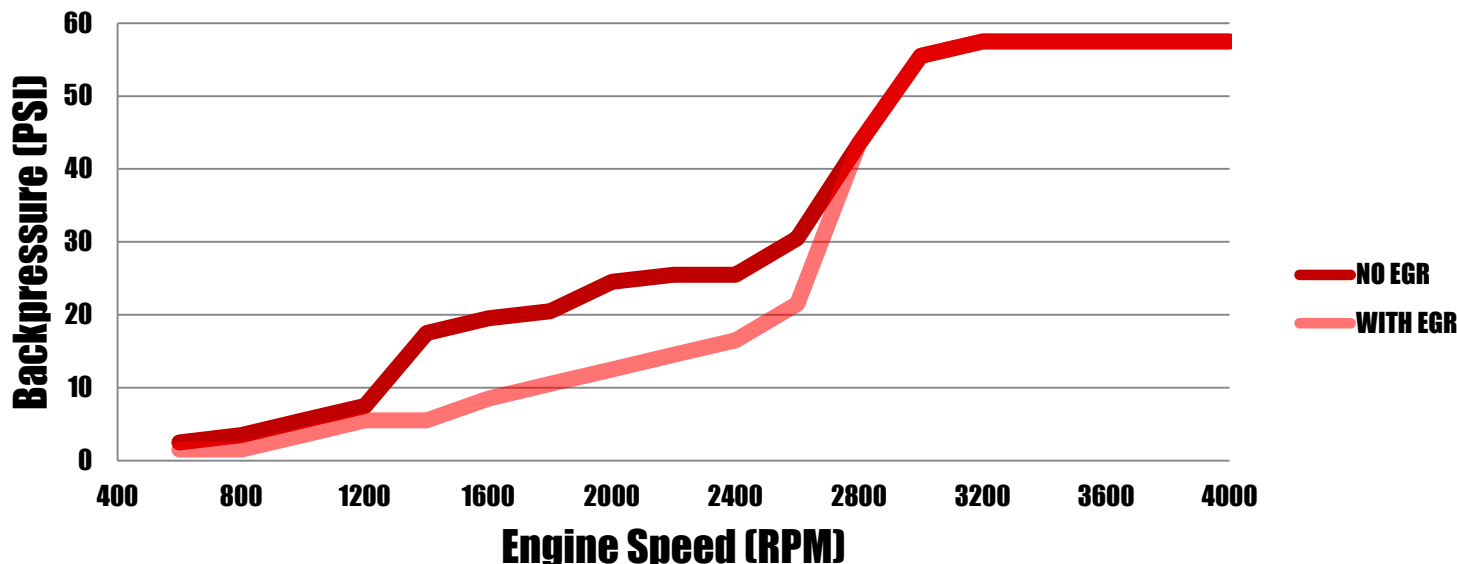
- Drill & Bits
- Small file
- Stepper bit or holesaw

Introduction

The BD Variable Vane Exhaust Brake for the Ford 6.7 utilizes the vehicles stock VGT turbocharger as an engine exhaust brake. The module closes the turbochargers exhaust vanes to restrict exhaust flow, thus building exhaust backpressure and retarding the engine during deceleration conditions. The module also has the ability to command transmission downshifts to improve engine braking capabilities.

The kit installs with a series of plug in connections in the engine bay and in the vehicle cabin. This makes the entire installation process much simpler when compared to conventional exhaust brake installations.

BD VVB - Ford 6.7 PowerStroke



BD Engine Brake Inc.




Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

Operation

The BD Variable Vane Exhaust Brake is fully automatically controlled. There are two different operating modes the driver can select using the push button switch mounted on the dash.

	<p>Off</p> <p>The truck operates normally with no additional holdback.</p>
	<p>Mode 1 <i>Braking Only</i></p> <p>This mode closes the turbocharger vanes during deceleration. This does not alter the transmission gear. To achieve maximum holdback, increase engine RPMs by shifting to lower gears during deceleration.</p>
	<p>Mode 2 <i>Braking & Shifting</i></p> <p>This mode closes the turbocharger vanes during deceleration and also down shifts the transmission as the vehicle speed decreases once the brake pedal is pressed. For more aggressive downshifts, move the shift lever into the manual mode and control shifts manually.</p>

BD Engine Brake Inc.

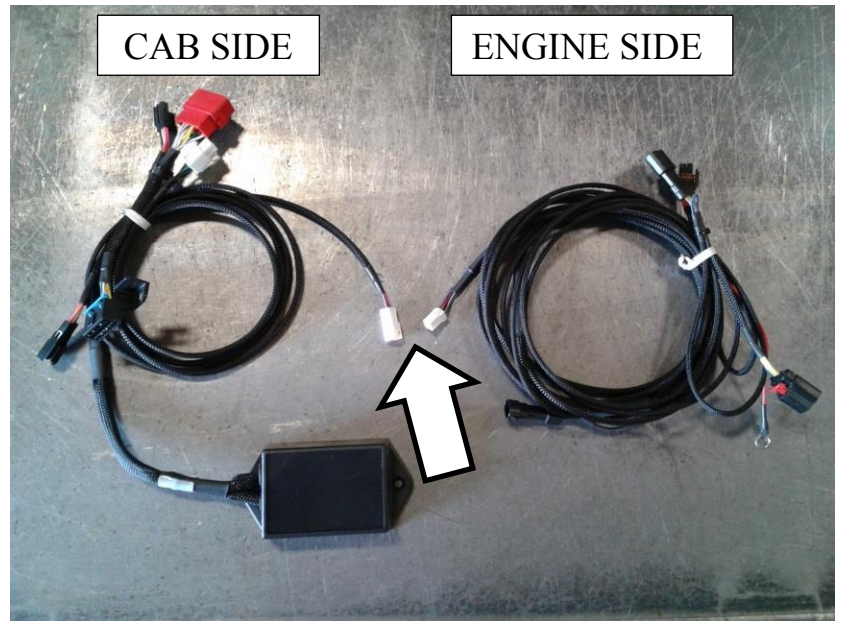
Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

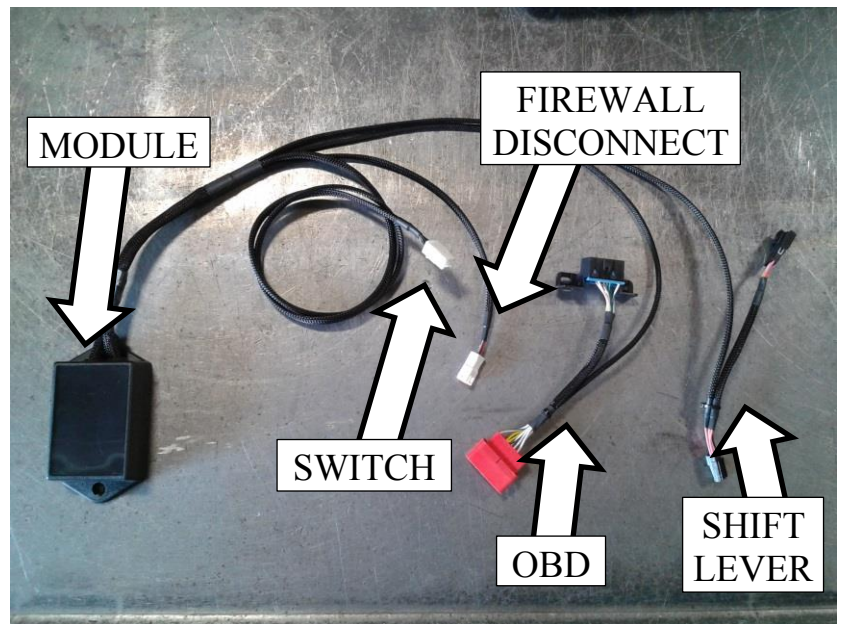
Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

Installation

1. Separate the main wiring harness at the small white connector. The harness and module on the left will be installed in the cabin; the other side will be installed in the engine bay.



2. Familiarize yourself with the connections before continuing.



BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

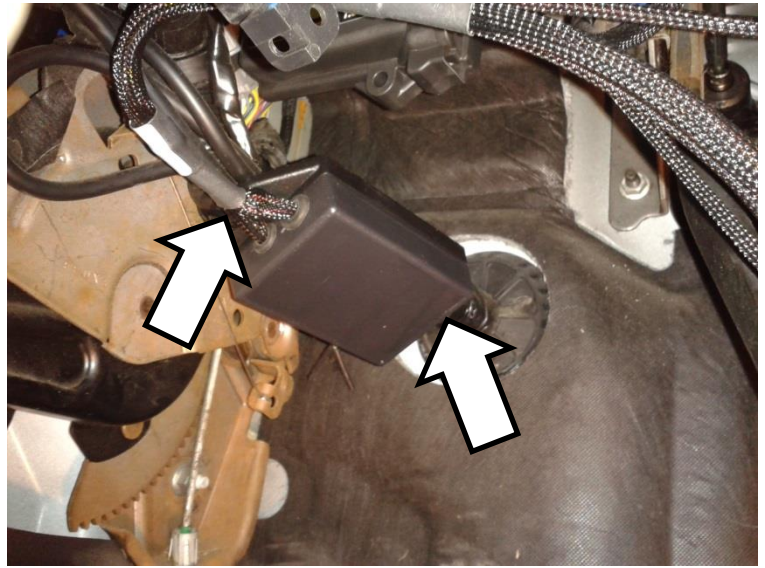
U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

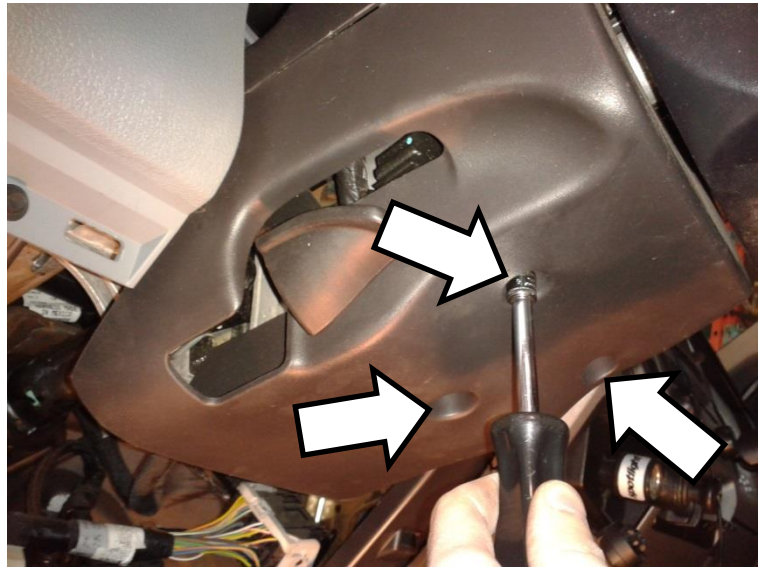
3. Remove the knee bolster by pulling rearward.



4. Attach the module to the main wiring harness below the dashboard using two zip ties.



5. Remove the three 5.5mm screws from the bottom of the steering column cover.



BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

6. Pull the steering column covers apart and remove top cover.



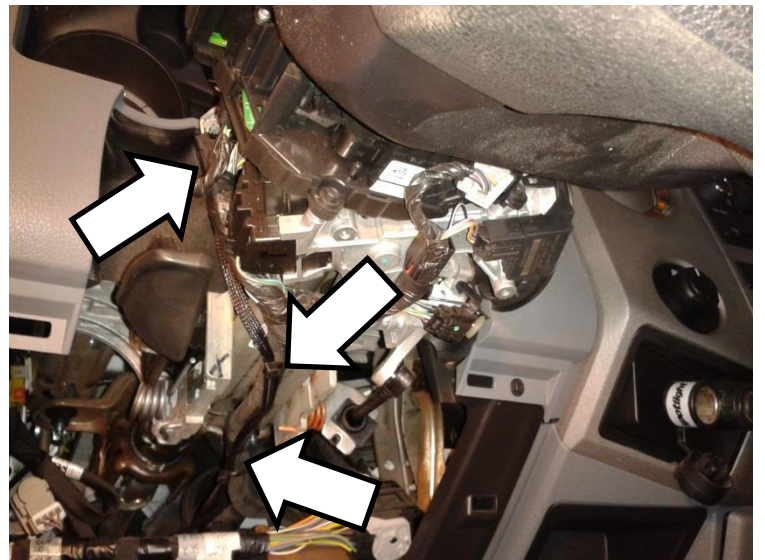
7. Locate the shift lever connector just behind the hazard lamp switch on the top of the steering column.

Feed the shift lever wiring connection from the BD VVB harness up here. Connect the BD VVB harness inline.



8. Use wire ties to secure the wire down the bottom of the steering column beside the OE harness.

Reinstall the steering column covers now.



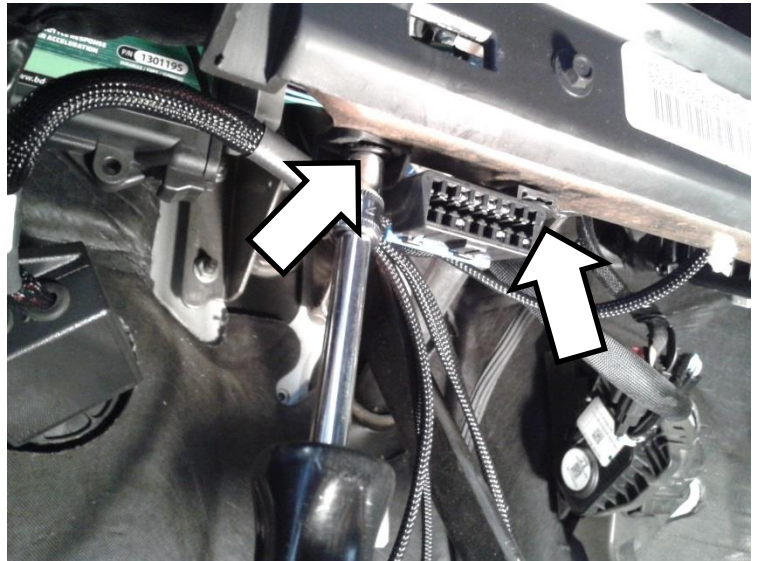
BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

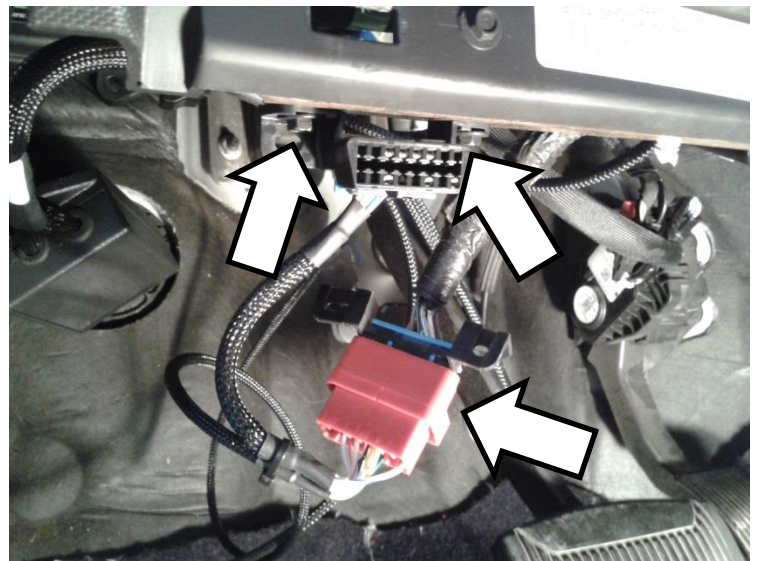
9. Remove the two 7mm screws securing the OBD connector below the dash.



10. Install the OBD connector from the BD VVB kit in place of the original and reinstall the screws.

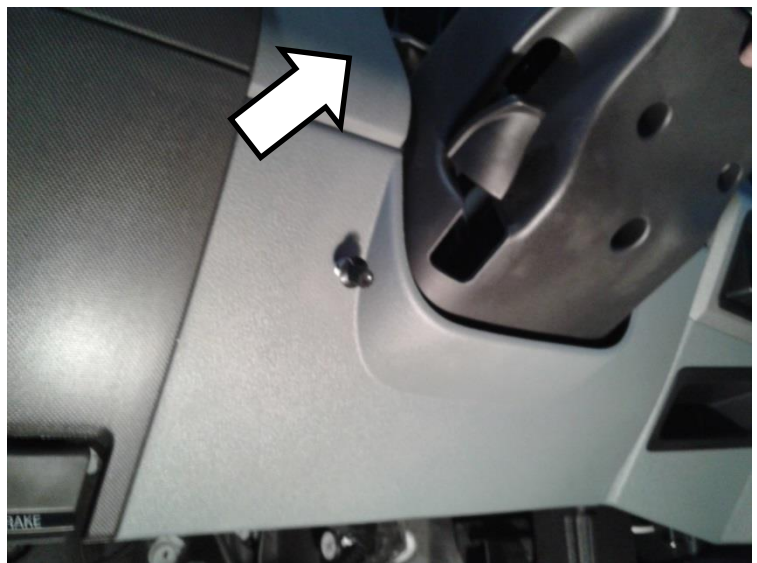
Connect the BD OBD plug to the vehicles original connector.

Use wire ties to secure the wiring.



11. The control switch may be mounted directly in the dashboard. The suggested location is shown, otherwise it can be installed in the knee bolster. Ensure there is room behind the chosen spot for the switch wiring.

Note: If the installer prefers to mount the switch below the dash, a metal bracket is included.



BD Engine Brake Inc.

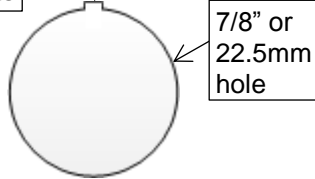
Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

12. Drill a 7/8" hole in the dashboard with a stepper bit or hole-saw. Using a small file, create a notch for the locator tab of the switch. Clean up the edges of the hole as necessary with the file.

Use small file to create notch until switch fits



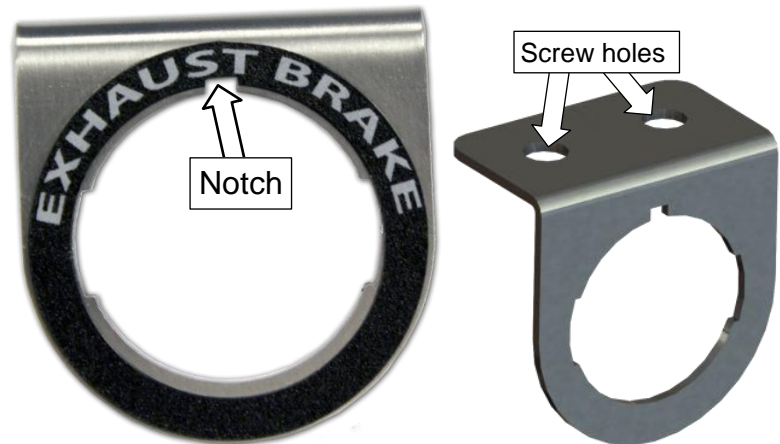
Install supplied switch decal onto the dash aligning the notch on the decal with the notch you created. Then install the switch into the hole.

OPTIONAL SWITCH MOUNTING BRACKET

Install switch decal onto bracket aligning the notch on the decal with the notch on the bracket.

Using the supplied screws; fasten the bracket to the dash in a suitable location.

Finally install the switch into the bracket and connect the harness.



BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

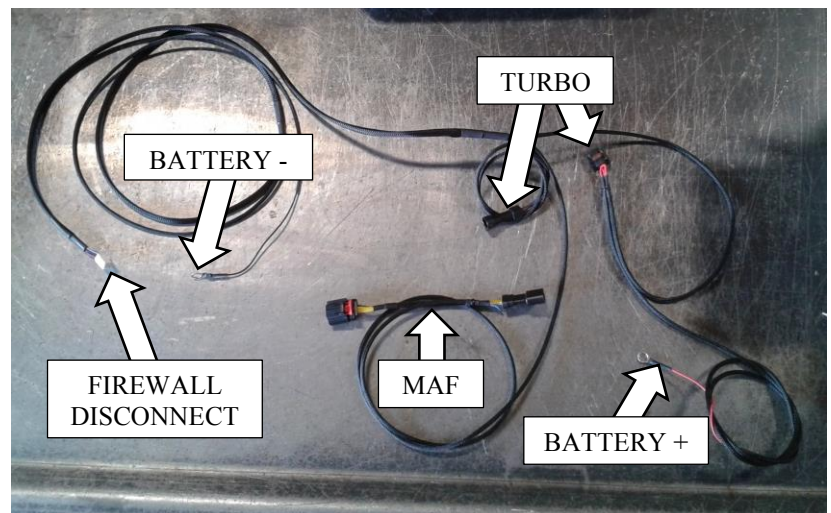
Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

13. Connect the switch to the wiring harness.

Leave the knee bolster off until the wire has been passed through the firewall.



14. Before proceeding with the engine bay portion of the installation, familiarize yourself with the connections in this harness.



15. Locate the wiring harness grommet on the driver side of the firewall.

Cut a small slit in the grommet and pass the engine bay connector through into the cabin.



BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

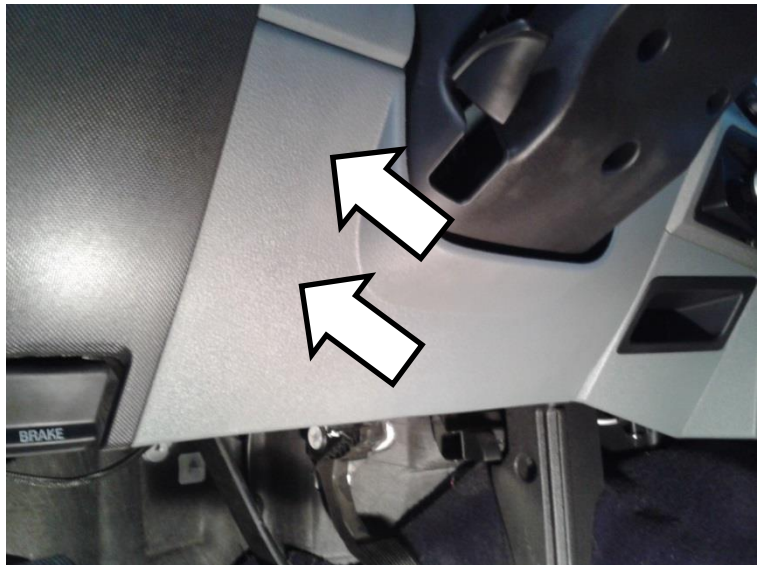
U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

16. Connect the engine bay wiring disconnect to the in-cab wiring harness.

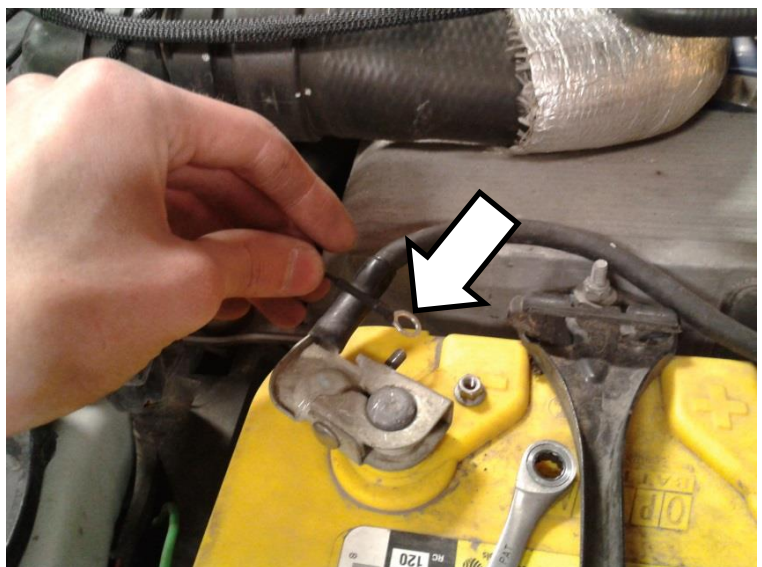


17. Now that all the work under the dash is complete, the knee bolster may be reinstalled.



18. Route the black wire with ring terminal to the driver side battery negative terminal.

Connect this wire under the battery clamp screw by removing the 8mm nut.



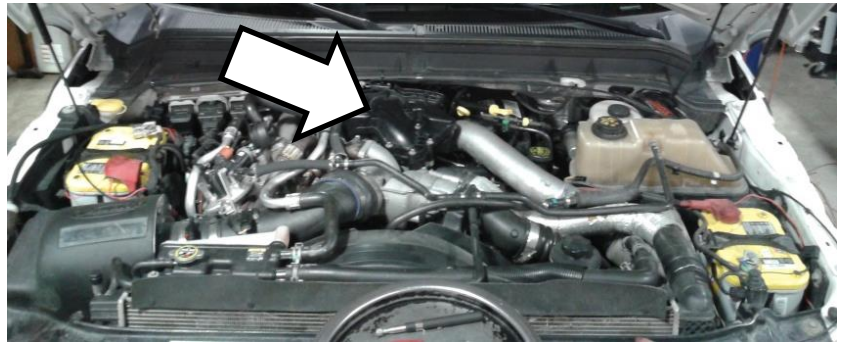
BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

19. To access the turbocharger solenoid electrical connector requires removal of the upper plastic intake manifold for access.



20. Disconnect the wire connection from the MAP sensor on the top of the intake manifold.

Undo the push in wire retainer clip.



21. Disconnect the coolant tube hold down clip from the intake manifold.

Note: Some models may also have a vacuum line fastened to the intake manifold. If equipped, remove this retainer also.



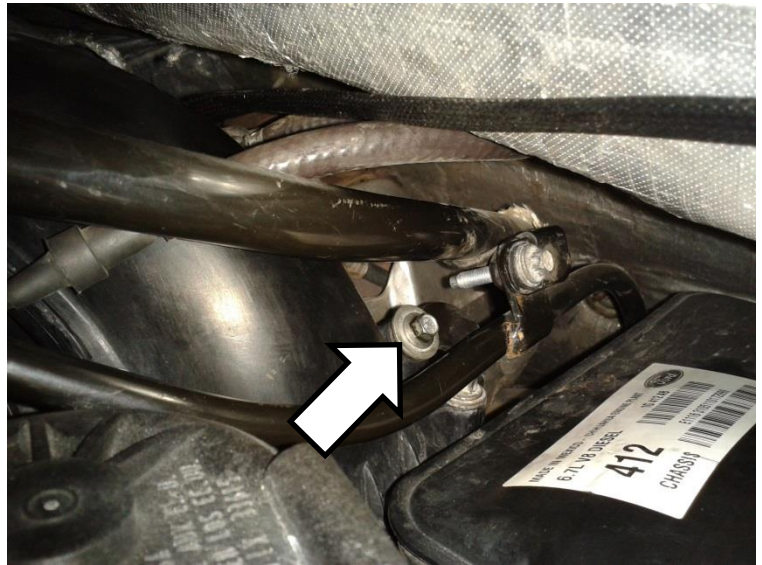
BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

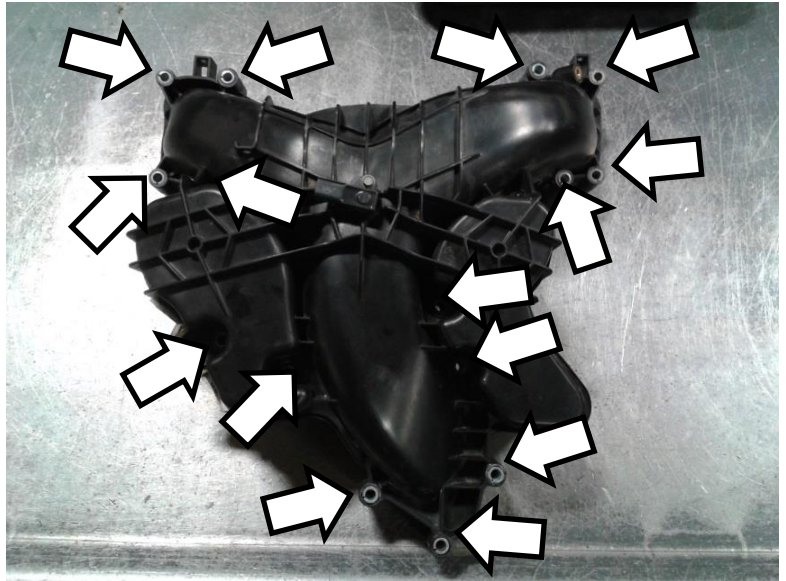
Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

22. Undo the transmission and engine oil dipstick tube bracket from the intake manifold by removing the 8mm fastener.

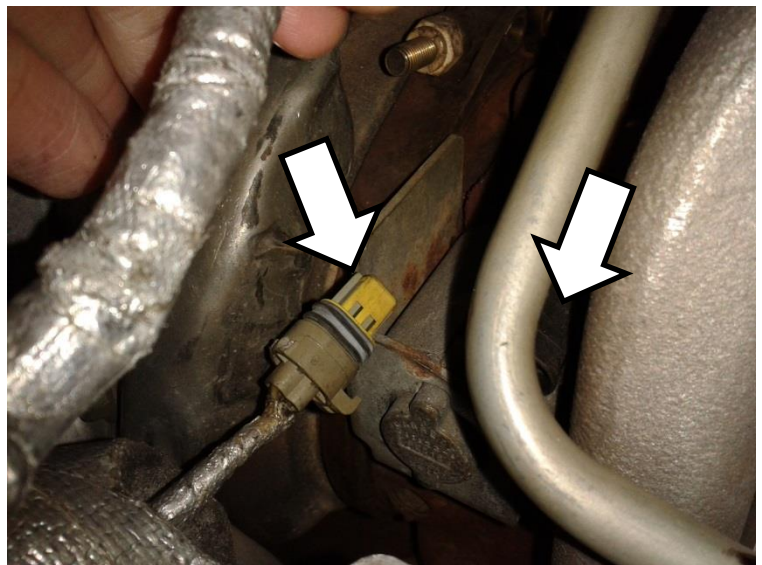


23. Remove the 15 fasteners from the intake manifold. These are 8mm screws. Remove the manifold from the engine.

Note: Some of the rear screws are hidden below the wiper cowl, this picture shows the locations for reference.



24. Disconnect the turbocharger oil control solenoid electrical connector. This is located on the passenger side of the turbocharger.



BD Engine Brake Inc.

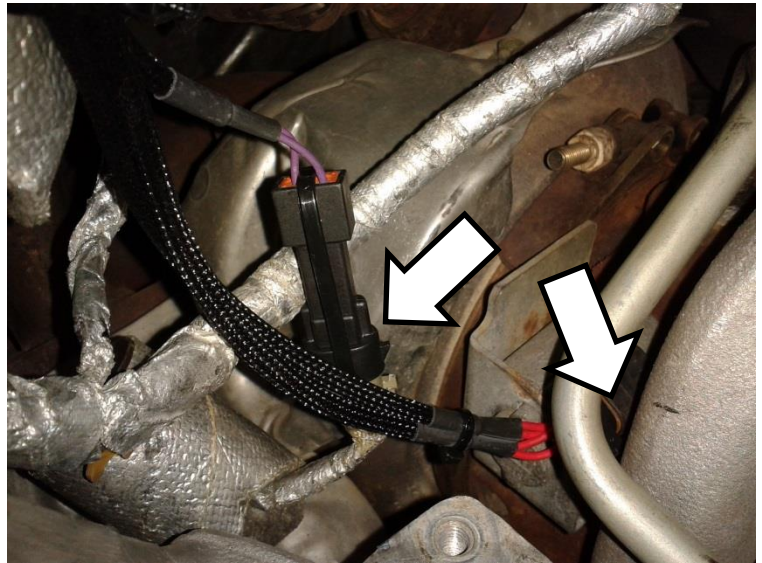
Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

25. Connect the BD VVB wiring harness to the turbo solenoid and to the OE wiring.

Note: If the locking tabs on the vehicles original connector are damaged, secure it together with an additional wire tie.

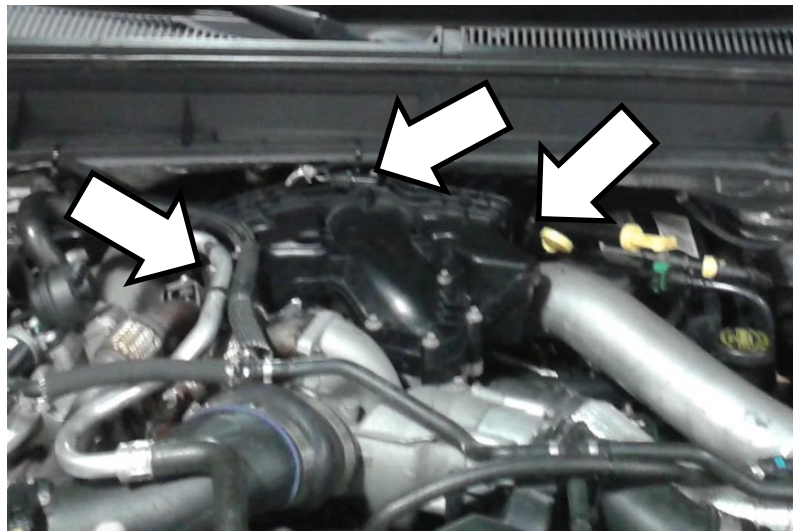


26. Reinstall the intake manifold.
The old gasket may be reused if it has not been damaged.

Start all of the fasteners by hand.
Ensure the correct length fastener is in the correct location.

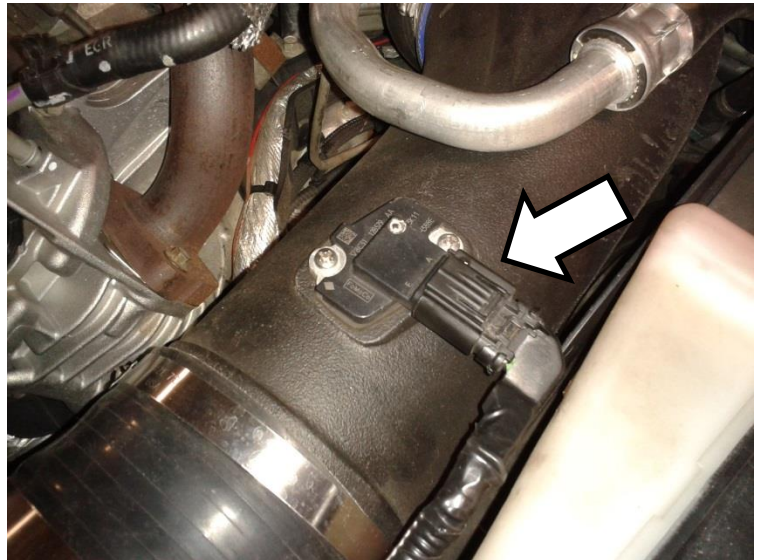
Torque to 89 IN-LB (7 FT-LB).

Reattach the dipstick tube, coolant tube and MAP sensor wire connection.



27. Route the MAF connector towards the MAF sensor on the air intake.

Pull back the red locking tab and then disconnect the stock MAF sensor connector.



BD Engine Brake Inc.

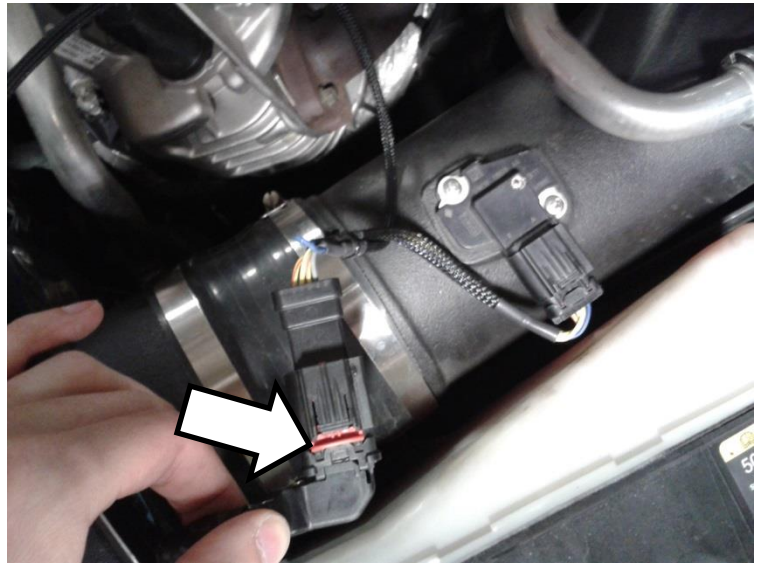
Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

28. Connect the BD VVB harness inline to the MAF sensor and to the stock wiring harness.

IMPORTANT: Ensure the red connector lock tab on the OE harness is in the locked position or the connector will come apart. If it is missing, transfer it from the BD harness to the OE connector.



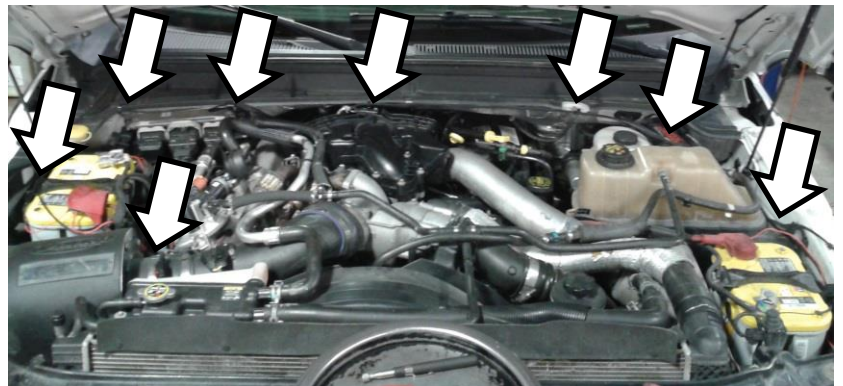
29. Route the red wire with ring terminal to the passenger side battery positive terminal.

Remove the 10mm nut on the battery terminal stud and connect the ring terminal on this stud.



30. Carefully secure the wiring around the engine bay with zip ties to ensure it does not come in contact with hot surfaces.

Suggested minimum wire tie usage is shown.



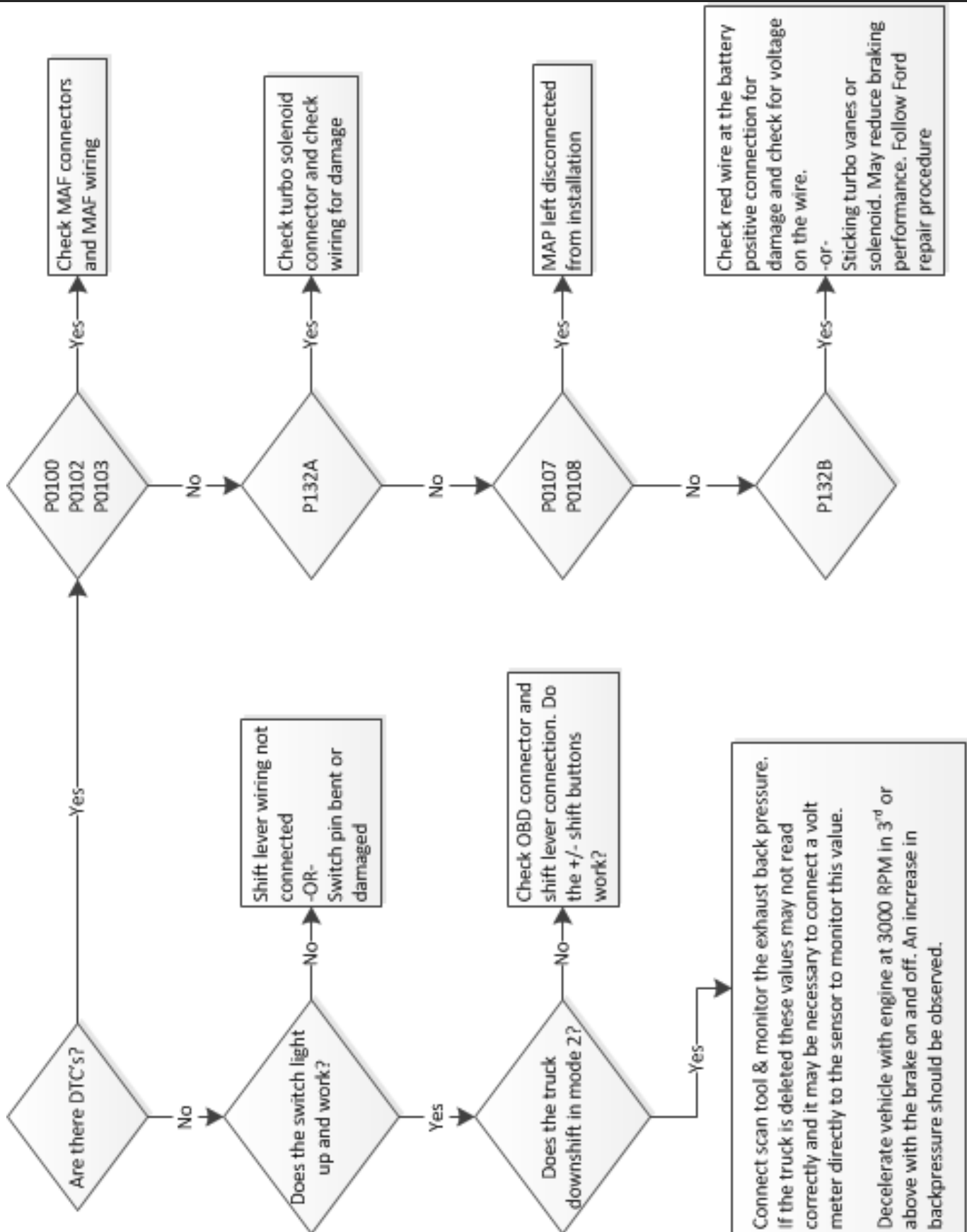
BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

Troubleshooting



BD Engine Brake Inc.

Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2

U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295

Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com