**DOWNLOAD ENHANCED INSTALL MANUALS AT dieselperformance.com**


# FORD 6.4L POWERSTROKE (2008-2010)

# VARIABLE VANE EXHAUST BRAKE

## Installation Instructions

**P/N# 2001100**

***PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION***

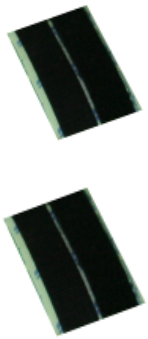
***UNLESS AN EO# IS LISTED, THIS PRODUCT IS LEGAL IN CALIFORNIA FOR RACING VEHICLES ONLY, WHICH MAY NEVER BE USED UPON A HIGHWAY.***

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

## Kit Contents

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

| 2100020 | 1301810 | 2000107 | 1301812 |
|---|---|---|---|
|  |  |  |  |
| *6.4 VVB Module/Harness* | *Push Button Switch* | *Switch Bracket* | *Switch Decal* |
| **Qty: 1** | **Qty: 1** | **Qty: 1** | **Qty: 1** |

| 1330053 | 1800060 | 1300349 | 1300131 | 1330052 | 1330054 | 31880 |
|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |
| *Alcohol Swab* | *Velcro* | *Posi-Tap 12-18awg* | *Cable Ties* | *Screw* | *Tape; DS* | Dielectric Grease |
| **Qty: 1** | **Qty: 2 X 4”** | **Qty: 1** | **Qty: 8** | **Qty: 2** | **Qty: 1** | **Qty: 1** |

## Tools Required

- Socket 8mm or 5/16”
- Utility knife
- Side cutters

Optional tools for switch installation

- Drill & Bits
- Stepper bit or small hole saw
- Small file

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

# Related BD Products

## *TapShifter 6.4L*

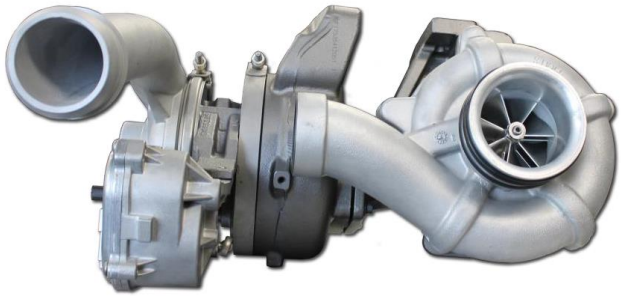
The BD 6.4 TapShifter is a great compliment to the Variable Vane Exhaust Brake. The TapShifter allows you to downshift with ease, disable overdrive or take manual control over gear selection. This aids in engine braking and is very helpful for towing.

| 1031370 | 2008-2010 6.4L Ford |
|---|---|


## Turbo Thruster 6.4L Twins

Ford 6.4 engines have twin turbos from factory. This BD upgraded twins kit supports 600-750hp while maintaining a drop-in factory style turbocharger setup. The turbos have upgraded billet compressor wheels, a built in velocity stack and a new air intake. Compatible with the BD VVB.

| 1047080 | 2008-2010 6.4L Ford |
|---|---|



## Introduction

The BD Variable Vane Exhaust Brake for the Ford 6.4 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.

## Operation

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

| | | |
|---|---|---|
|  | Off | The truck operates normally with no additional holdback. |
|  | Mode 1<br>*Braking Only* | This mode closes the turbocharger vanes during deceleration. This does not alter the transmission gear or turn on tow/haul. To achieve maximum holdback, increase engine RPMs by shifting to lower gears during deceleration. |
|  | *Mode 2*<br>*Braking & Shifting* | This mode closes the turbocharger vanes during deceleration and also down shifts the transmission once the brake pedal is pressed. |

## Special Note

***Do not use mode 2 in adverse weather conditions***

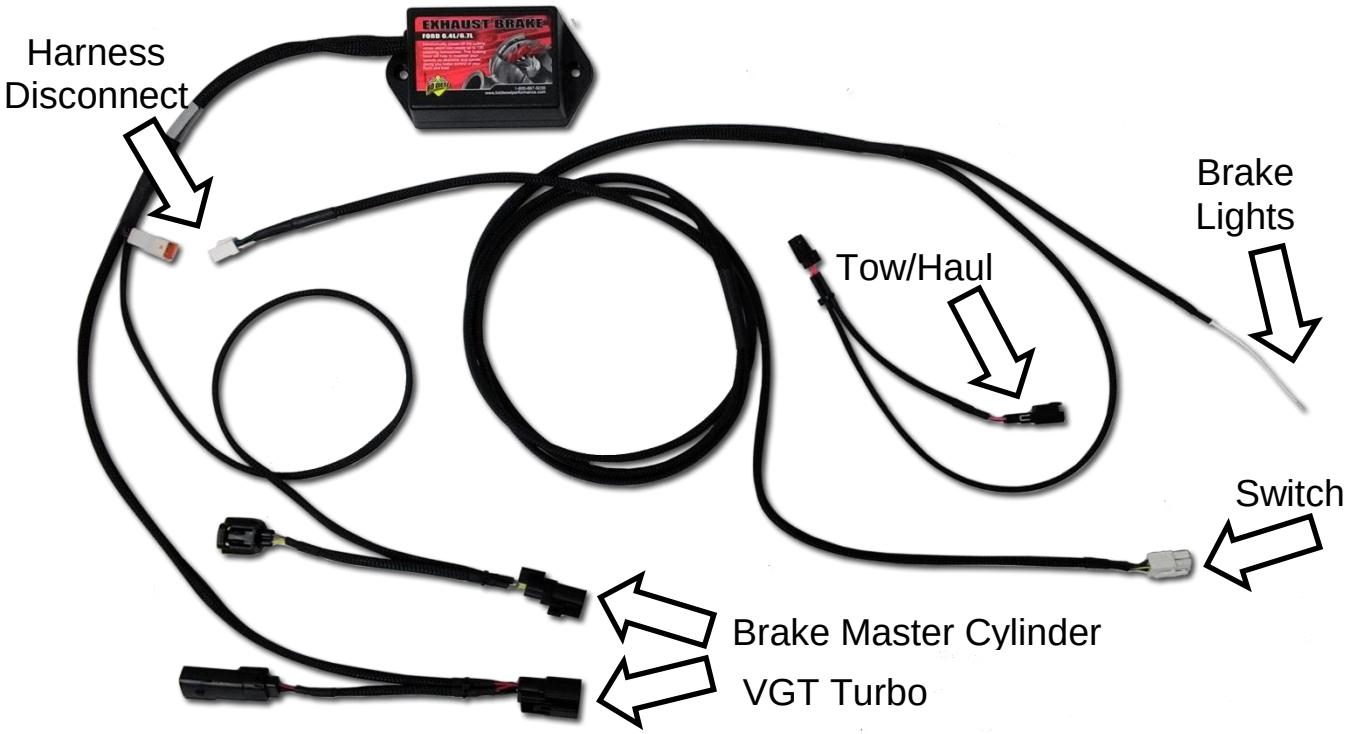
BD Engine Brake Inc.
Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2
U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295
Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

# Installation

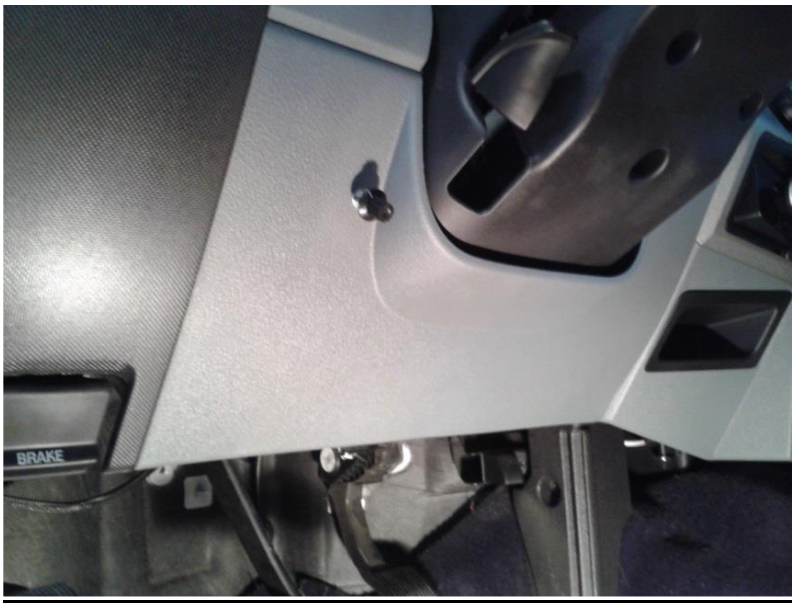
1. Block wheels to secure vehicle and disconnect negative battery cables for safety. (Record radio settings for customer before battery disconnect.)

2. Separate the VVB wiring harness at the small white connector. The harness and module on the left will be installed in the engine bay. The harness on the right will be installed in the vehicle cabin.

   Familiarize yourself with the connections before beginning installation.




3. Remove the knee bolster by pulling rearward.



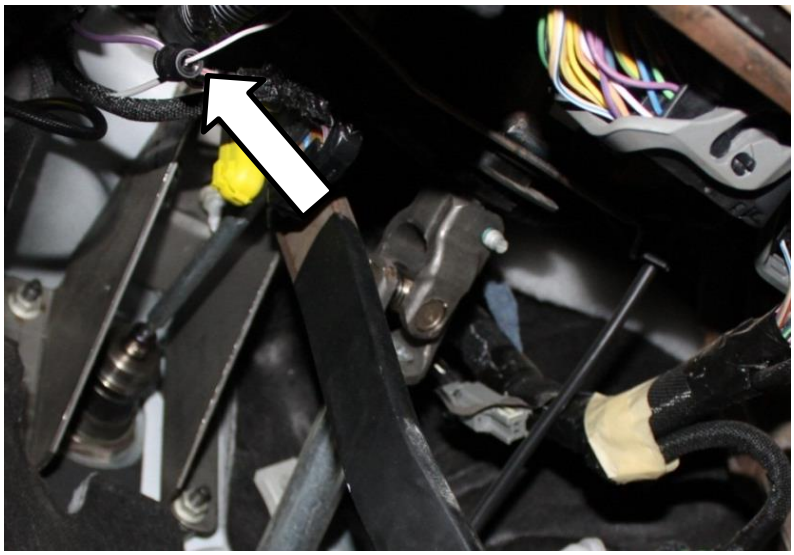

BD Engine Brake Inc.
Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2
U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295
Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

4. Remove the top cover on steering wheel column, locate and disconnect tow/haul connector. Feed the BD harness connectors up from behind the dash and Install the BD harness between the OEM connectors. Replace top cover onto steering column.

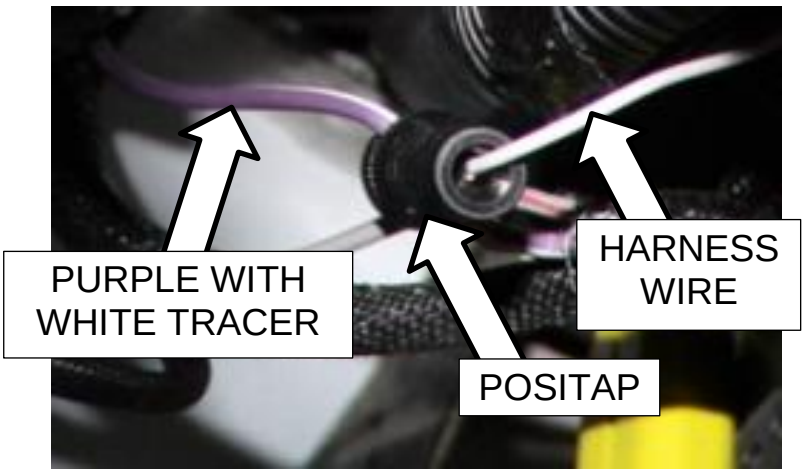
If your truck is equipped with a manual transmission skip this step as the tow/haul function does not apply to your vehicle. The VVBs tow/haul harness is not used in a manual transmission application so simply secure it out of the way under the dash and proceed to step 5.



5. Locate the factory purple w/ white tracer wire that connects to the brake pedal switch below the dash. Attach the white wire from the BD harness to it using one of the supplied posi-tap.



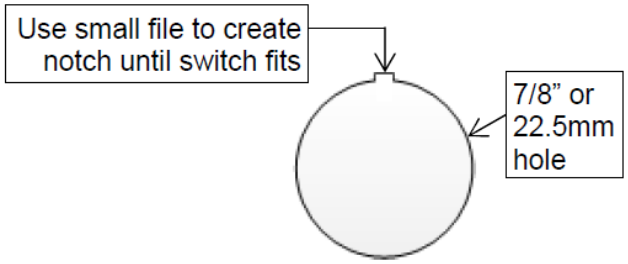
BD Engine Brake Inc.
Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2
U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295
Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com




6. Install push button switch and connect to the BD wiring harness.

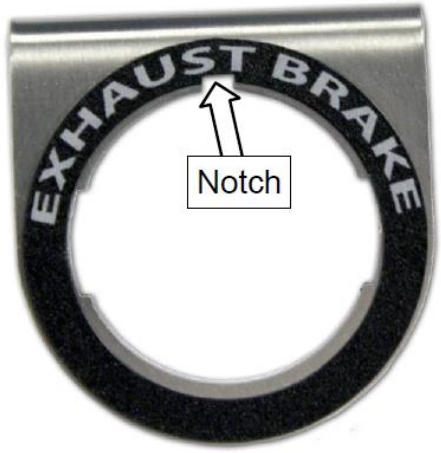
**OPTION 1 – SWITCH IN DASH**

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. Mount supplied switch decal onto the dash, aligning the notch on the decal with the notch you created. Install switch into the hole and connect to the BD harness.




**OPTION 2 – SWITCH BRACKET**

Install the switch decal onto the bracket, aligning the notch on the decal with the notch on the bracket. Using supplied scews; fasten the bracket to the dash in a suitable location. Finally, install the switch into the bracket and connect to the BD harness.



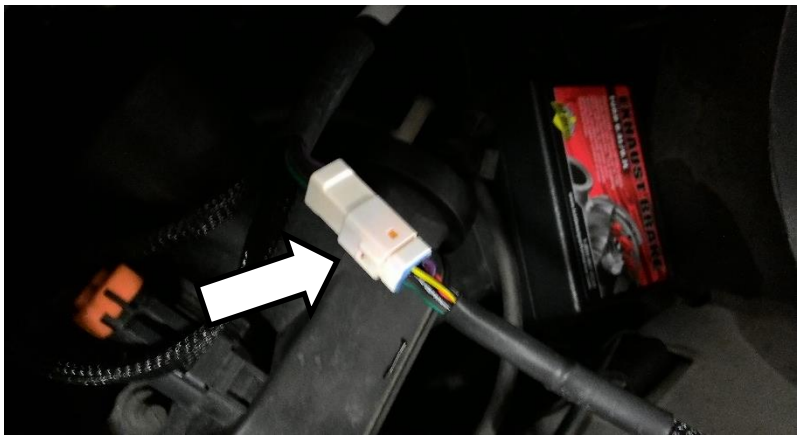


7. Feed the remaining end of the in-cabin wiring harness through the firewall into the engine bay. If additional wires have already been routed through the firewall, follow these wires. Otherwise use the existing rubber grommet.

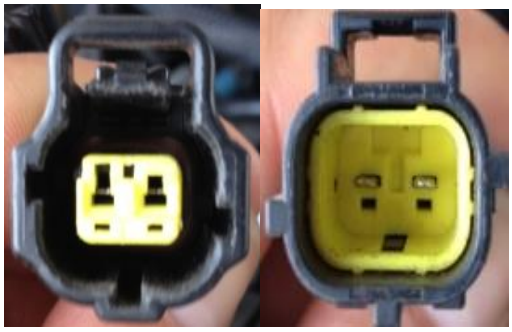
BD Engine Brake Inc.
Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2
U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295
Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

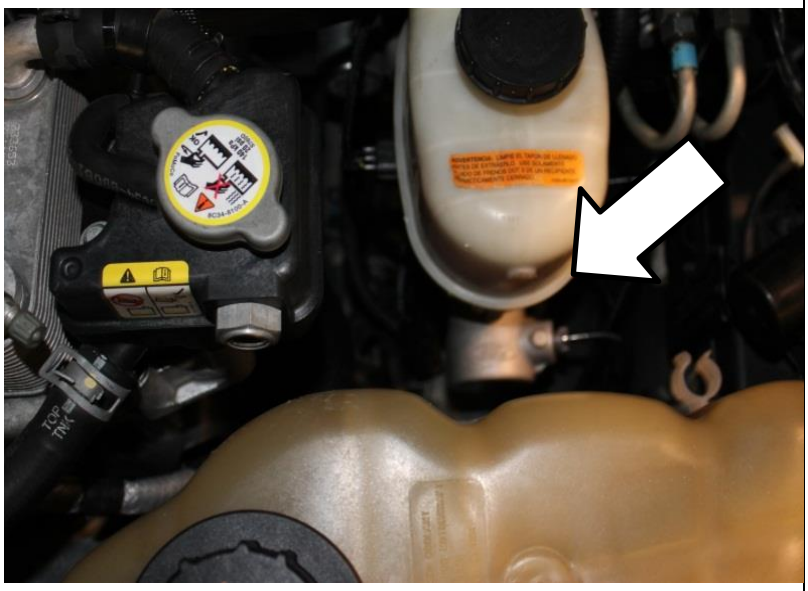
8. Clean the back of the module and top of fuse cover with the supplied alcohol swab. Secure the module to fuse cover lid using supplied Velcro.

9. Connect the in-cab wiring harness to the control module in the engine bay by plugging in the small eight pin white connector.



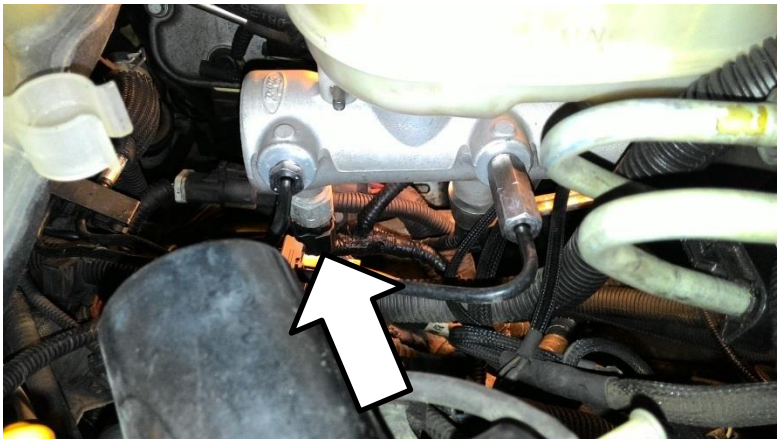
10. Route the BD harness towards the brake hydro-booster. Disconnect the two wire master cylinder pressure switch. The connector is on the bottom of the master cylinder.



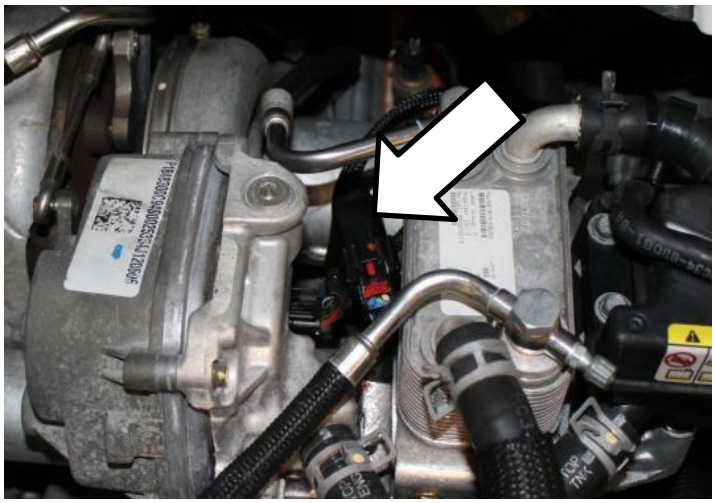


BD Engine Brake Inc.
Plant Address: 33541 MacLure Rd. Abbotsford, BC, Canada V2S 7W2
U.S. Shipping Address: 88-446 Harrison St, Sumas, WA 98295 U.S. Mailing Address: P.O. Box 231, Sumas, WA 98295
Phone: 604-853-6096 | Fax: 604-853-8749 | Internet: www.bd-power.com

**Note** There are two connectors on the bottom of the master cylinder. The correct connection is the one towards the front of the vehicle.



11. Disconnect the turbo vane actuator. Connect the BD harness to actuator and OE plug.



12. Secure wiring harness away from moving parts and heat sources using the supplied cable ties.

13. Reconnect negative battery terminals and ready vehicle for road test.

14. Road test vehicle to verify operation of VVB.

# Troubleshooting

VVB Malfunction

Does the switch light up?

NO → No power to module. Check BD harness at turbo connector for damaged pins or wires.

YES

Are there DTCs (Fault Codes)?

YES → DTCs for Service Brakes

YES → Inspect and correct white wire to brake lights AND the two pin master cylinder connector.

NO → DTCs for Turbocharger/ CAN network

YES → Check connector at turbo is fully mated. Check for broken pins or wires.

NO

Does downshift function work in mode 2?

NO → Tow/Haul mode comes on when brake pressed?


YES

Using scanner, monitor backpressure at 3000RPM in 3rd or 4th gear with brake on and off.

You should see an increase in backpressure. If not turbo vanes may be sticking. Follow Ford procedure for this.

NO → Check connection at shift lever. If the Tow/Haul button no longer works, wiring is damaged.

YES → Check BOTH the white brake light wire connection and the two pin master cylinder 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