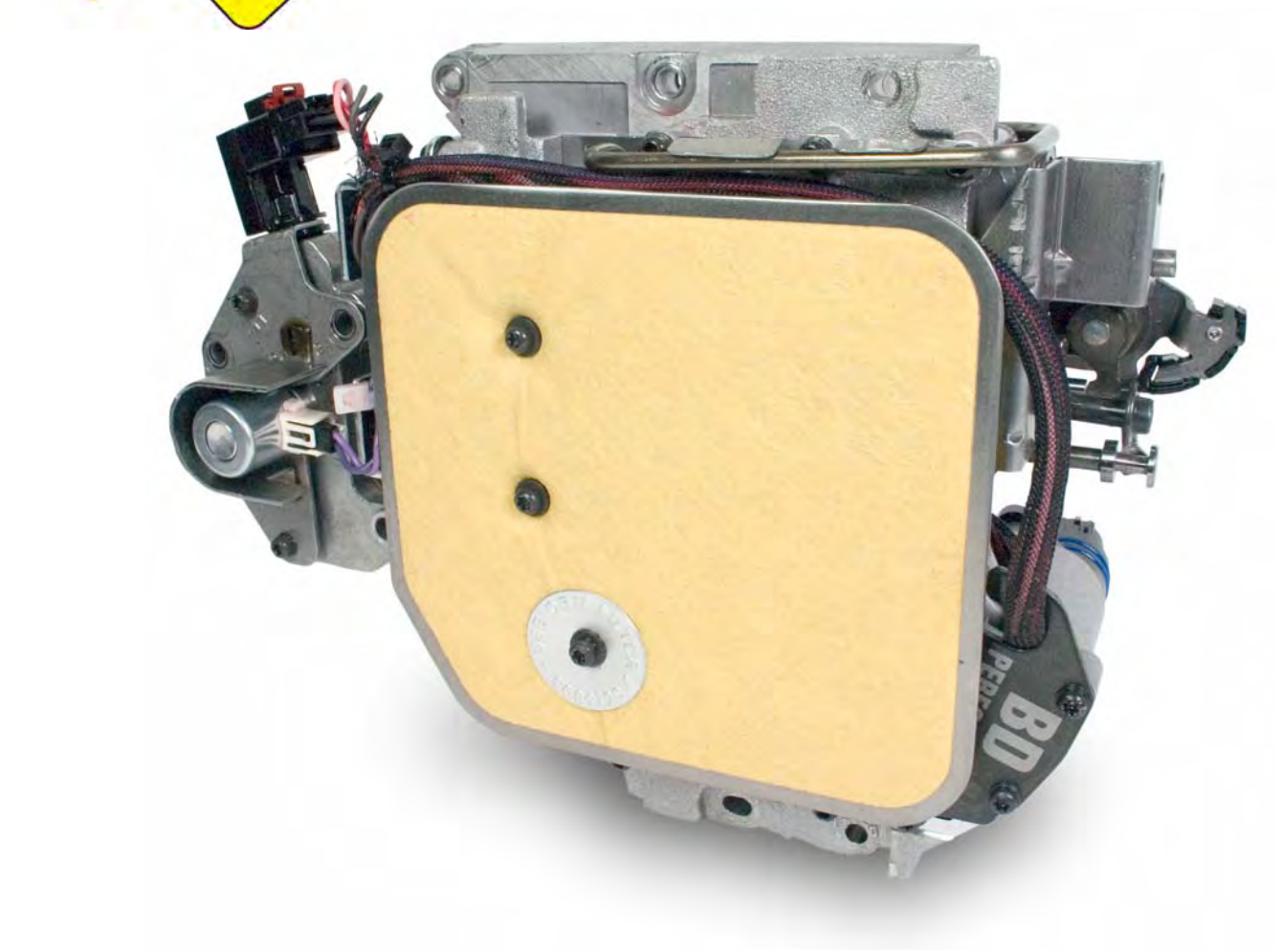

BD VALVE BODY

For 2000-2004 Dodge 5.9L 24V Cummins Trucks

-- Installation Instructions --

	1030418	2000-2002 Dodge 24V	47RE
	1030419	2003-2004 Dodge 24V	47RE/48RE

PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION

BD Engine Brake, Inc.
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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

- Inch Pound Torque Wrench
- 3/8” or 1/2" drive socket sets including 11mm & 13mm sockets
- #25 Torx Bit
- Combination Wrench Set including 7/16” & 3/4”
- 3/16” Allen wrench
- High quality pressure gauge (0-160psi)
- Voltmeter

Additional Parts Required (Not included)

- ATF+3 Transmission Fluid
- 2 Bottles of Red Lube Guard (recommended)

Installation Notes

All Diesel Rams should be tested prior to engine or transmission performance tuning. Check transmission oil level prior to all work. Pressure testing will produce test results that can help to determine the ability of the transmission to prevent the clutch surfaces from slipping. Slippage will result in premature converter and transmission wearing characteristics (soft or severe shifting, high transmission temperature).

2800-3000RPM (Wide Open Throttle)	With the transmission at operating temperature, ensure that the shift points are correct before recording pressures.

47RE Transmissions				
Transmission Line Pressure	**OEM Pressure**	**BD Pressure**	**Test #1**	**Test #2**
Transmission in DRIVE w/Engine at idle	55-65psi	70-75psi		
Transmission in DRIVE w/Convertor Locked up @ 1800 - 1900 rpm	64-72psi	84-94psi		

48RE Transmissions				
Transmission Line Pressure	**OEM Pressure**	**BD Pressure**	**Test #1**	**Test #2**
Transmission in DRIVE w/Engine at idle	55-65psi	70-75psi		
Transmission in DRIVE w/Convertor Locked up at 1800 - 1900 rpm	85-95psi	95-105psi		

Transmission Shift Points		
Transmission Shift Point (RPM)	**Before**	**After**
2^{nd} – 3^{rd} Shift point (Normal Driving)		
2^{nd} – 3^{rd} Shift point (Wide Open Throttle)		

IMPORTANT **– IF PRESSURES AND/OR SHIFT POINTS ARE NOT TO SPECS, THE TRANSMISSION MUST BE REPAIRED OR SERVICED BEFORE MODIFICATIONS.**

Pressure Testing

1. Pressure testing is accomplished by inserting a fitting and hose assembly with a good quality gauge into the center 1/8" port on the passenger side of the transmission. Leave the gauge attached for testing later.

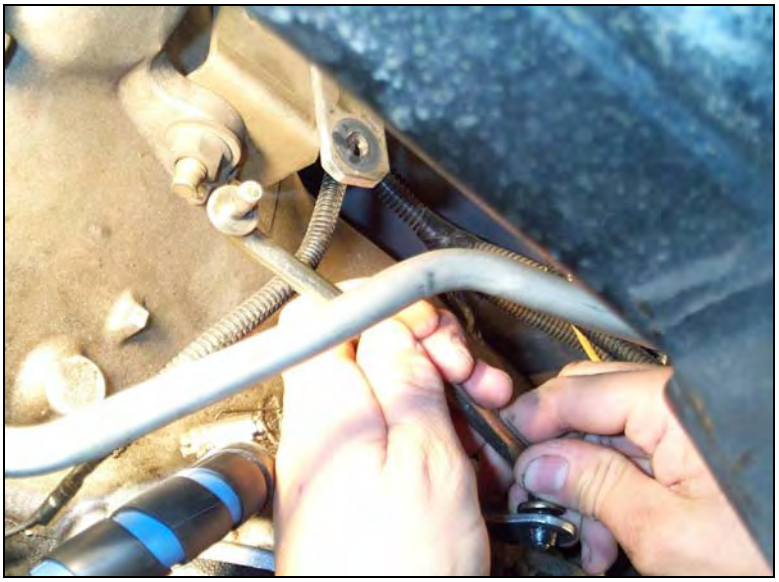
2. **VERY IMPORTANT** – Road test with the pressure gauge in place and record pressures and shift point RPM's **BEFORE** modifications are carried out to determine the condition of the transmission prior to installing this valve body. ***Pressure will only be indicated with the transmission in "Drive".***

3. Secure the vehicle with wheel chocks and place the transmission in Neutral.

4. Ensure the valve body has not been damaged in shipping and it is the proper part number for your vehicle.

5. Starting at the transmission, remove the kick down lever and spring.

6. Rotate the shift lever to the rear of the vehicle to place the transmission in the PARK position.



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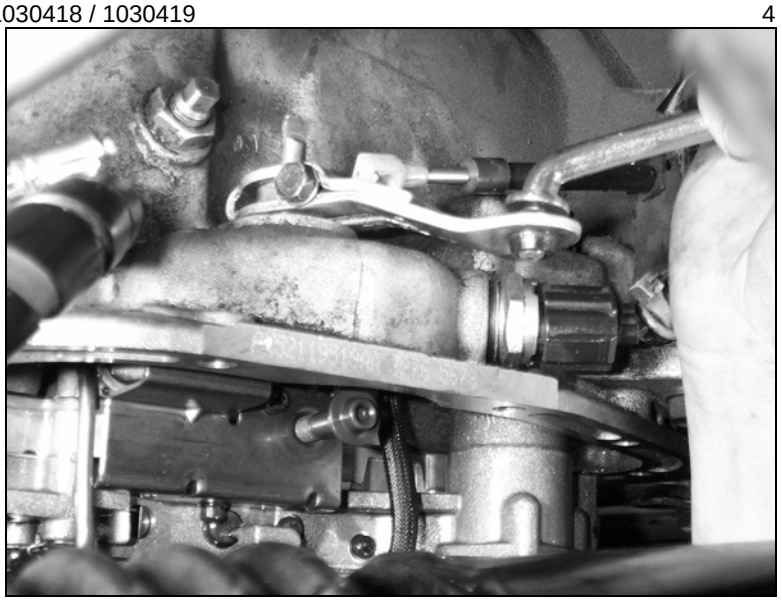
7. Loosen the shift lever bolt then rotate the lever towards the front of the truck shifting the transmission into 1st / LOW position. This allows for the removal of the Park Rod E-clip without dropping the valve body. Remove shift lever.



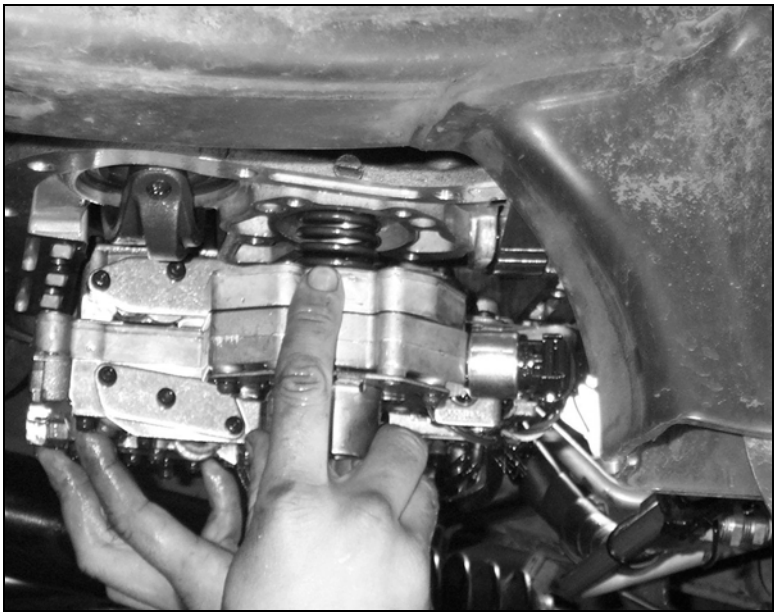
8. Disconnect the wiring connectors from the Neutral Safety switch and Valve Body then remove the Neutral Safety switch from the transmission.

9. Install a large drain pan under the transmission, remove the oil pan, drain the transmission oil and remove the filter.

10. Carefully remove the E-clip from the park rod, leaving the park rod in the transmission.

11. Remove the 10 valve body bolts, remembering the location of the different bolts.

The bolts are different lengths and MUST be re-installed in the proper location.



12. When lowering the valve body, gently work it around so that the park rod lever is left in the transmission and ensure that the electrical plug is not damaged in the removal process.

13. **CAUTION** - As you lower the valve body, watch for the accumulator piston and spring falling out.

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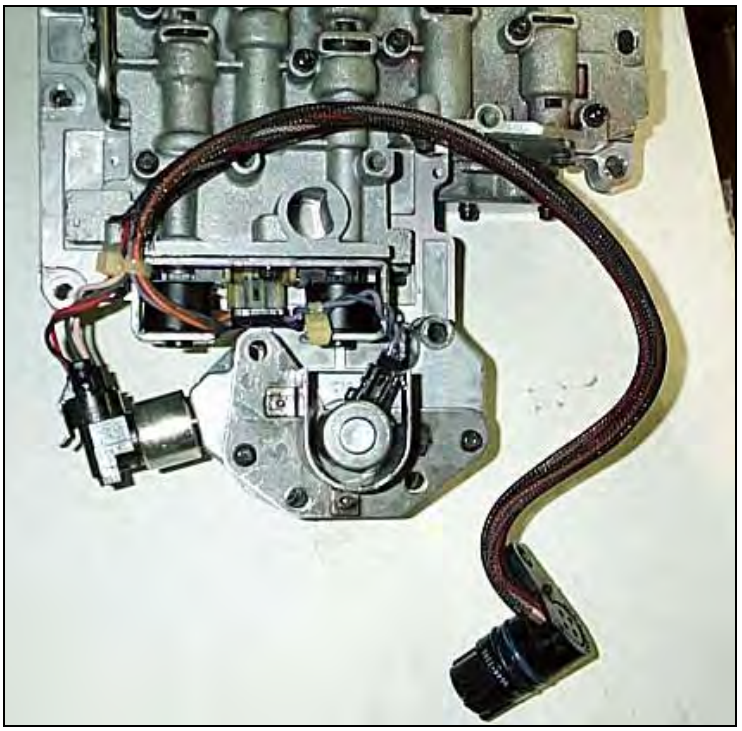
14. This is the time to change the 2nd gear band strut to the heavy duty one we supply. First loosen the band adjusting screw lock nut with a ¾" wrench, and then unscrew the adjuster until the stock strut can be removed.

Stock Band Strut in place

New BD Band Strut in place

15. Install the new BD strut with tapered side down, towards the pan, and center in the guides. Torque the band adjustment to 72 lbs-in., then back out 1 7/8 turns and tighten lock nut. The round end of the enclosed micro-hockey stick tool can also be used as a feeler gauge to set the front band adjustment.

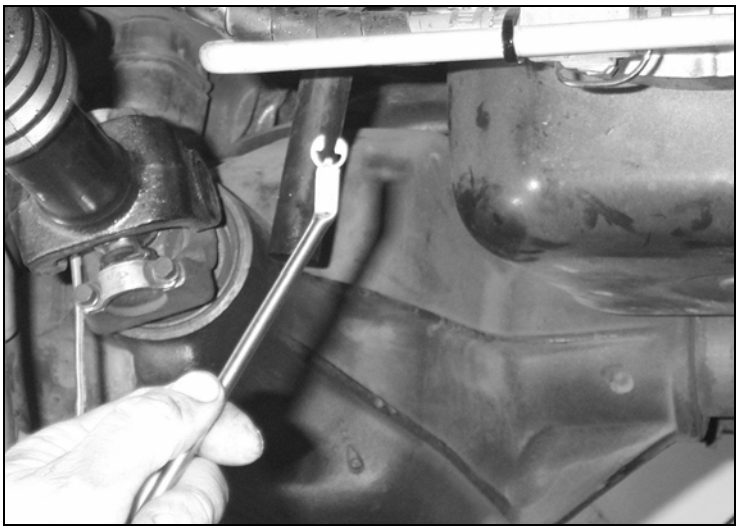
16. From the old valve body, remove the electrical solenoid and sensor and install them on the new BD Valve Body.



17. **IMPORTANT** - Before installing the BD Valve Body, lubricate the manual-shifting shaft and the O-ring on the electrical connector that fits into the transmission case. Rotate the shift lever all the way forward to place the valve body into 1st / Low gear position so that the park rod and E-clip can be attached later.

18. Place the accumulator piston and spring into the BD Valve Body. If you cannot balance these parts on the valve body, hold them in place with a supporting tool or wire until the Valve Body is installed.

19. Once the valve body is in position, insert the park rod into the manual shift lever and hold the valve body in place with a couple of bolts.



20. Install the E-clip on the park rod using the flat, slotted end of the Canadian micro-hockey stick.

"Hockey Stick" Tool

21. Install the valve body mounting bolts, ensuring that the varying length bolts are installed into the proper positions, and then torque evenly to 10 lbs-ft.

22. Install the manual lever on the outside of the transmission and check for full movement of the detent shift. There must be 5 distinct positions that are felt from Low (1st) to Park. Leave the transmission in the neutral position and tighten the retaining bolt. Re-install the kick lever and spring.

23. Install the neutral safety switch and adjust as required, and then tighten. The reverse lights at the rear of vehicle should illuminate when the shift lever is in the reverse position (key on).

24. Install the new filter on the valve body using 3 screws, instead of the 2 that the OEM filter was attached with (stock on the 97-00 trucks).

25. We suggest that you install either a drain plug in the original oil pan or, even better, install a BD HD oil pan, which has extra oil capacity, cooling fins, a magnetic drain plug, and adds strength to the transmission case to prevent flexing.

26. Install the shift linkage to the manual lever on the transmission using the wave washer and hitch pin. Tighten the nut securely and install the kick-down linkage and return spring. The kick-down cable can now be attached to the ball socket. Ensure that the wiring harness has some dielectric grease on it and connect it. Ensure not to bend the pins when attaching the plug.

27. When just the valve body is being replaced, the transmission will need ~8-9 quarts of ATF+3. When both the valve body and torque converter are being replaced, ~15-17 quarts are required.

IMPORTANT: After 8 quarts have been added, start the engine and shift through all gears, and then check the transmission oil level with the shifter in neutral. Top up and check as required. **DO NOT OVERFILL!**

28. After your test drive, check the oil levels again. Air locks are common in this transmission.

29. Road test the vehicle to verify pressures and to check for the wide-open shift points to ensure that they are correct.

These pressures will vary according to the position of the kick down cable adjustment and the lock-up boost valve. Engine RPM DOES NOT affect line pressure.

CAUTION – PRESSURE SETTINGS THAT ARE TOO HIGH CAN RESULT IN SEVERE SHIFTS, LIMP MODE, or 2ND OR 3RD GEAR STARTS.

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Kick Down Cable Adjustment

The adjustment of the kick down cable is one of the most critical adjustments that affect the operation of the transmission.

The BD Performance Valve Body is not stock, therefore the factory specifications for this adjustment are used only as a guide.

Your drivability and performance demands will determine your shift points and pressure adjustments.

Kick down cable adjustments are for Full Throttle shift points & passing gear only. Light throttle shift points should be adjusted on the valve body throttle valve stop.

The kick down cable is located underneath the plastic cover as indicated above.

The plastic cover is held in place by 2 plastic Phillips head screws. Only light pressure is required to remove them. Do not lose the screws or washers when you remove them.

Full throttle shifts between 2nd and 3rd should occur between 2800 - 3000 rpm (OEM) at operating temperature.

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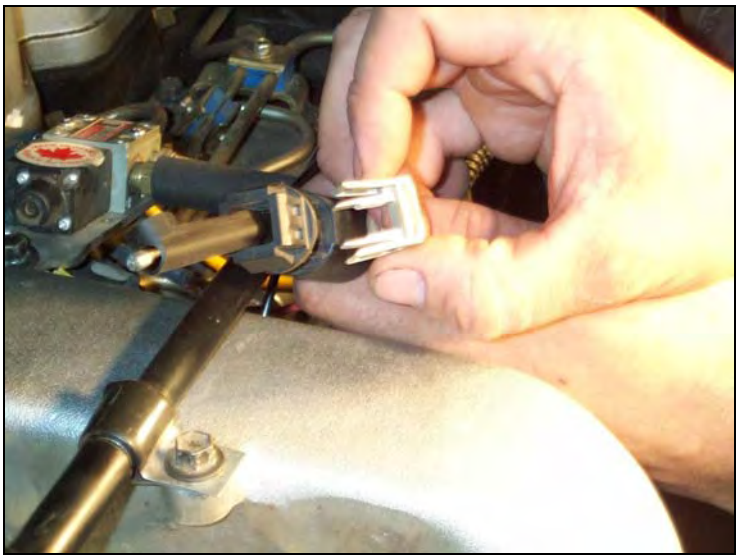
Locate the kick down cable and remove it from the throttle linkage and support bracket.

<u>IMPORTANT</u> – Before any adjustments are made, **MARK THE CABLE** at its original setting.

Remove the white colored locking clip.

****CAUTION** DO NOT USE A SCREWDRIVER TO PERFORM THIS FUNCTION. IF THE CLIP BREAKS, THE CABLE WILL HAVE TO BE REPLACED.**



Adjust the cable forward (towards the radiator), to make the transmission shift earlier.

Adjust the cable back to the rear (towards the firewall), to make the transmission shift later.

1/8” movement = ~75RPM

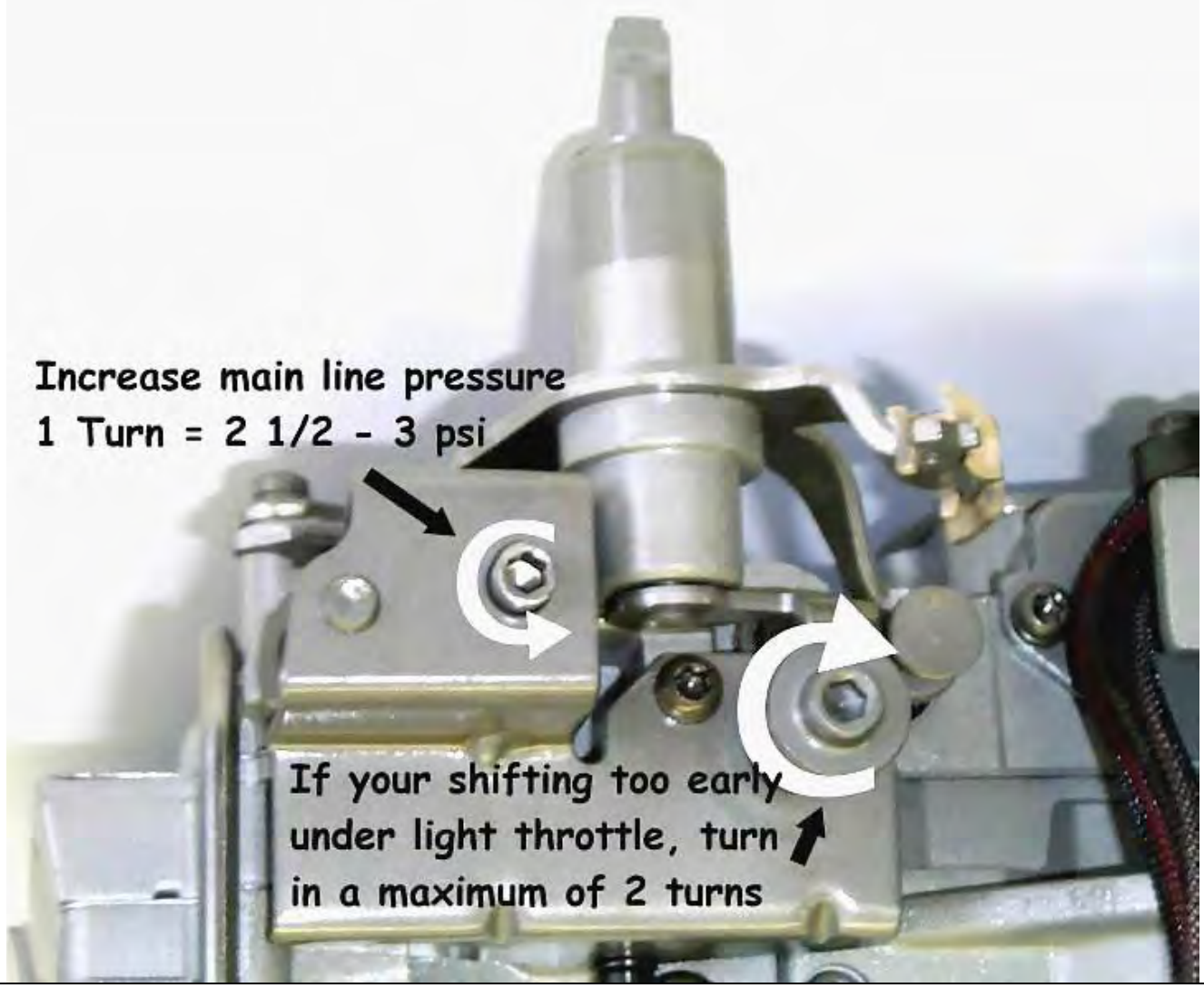
Re-install the white locking clip and re-install the cable through the support bracket and then onto the throttle lever. Install the plastic cover when complete.

Pressure Adjustments

Valve Body pressure adjustments and throttle valve cable adjustments affect each other. For example, if you raise pressure, the transmission may shift sooner and vice versa).

TAKE YOUR TIME WHEN MAKING THESE ADJUSTMENTS TO ENSURE THAT THE TRANSMISSION PERFORMS TO YOUR PREFERRED DRIVING STYLE.

If the pressures are not according to specifications, please call our Transmission Technical department for assistance. The valve body is designed and tested with a specified pump volume. Different pressures are due to non-standard pump characteristics, which is why you must check the pressures before performing this modification.



1 full turn = ~75 rpm	
HARD SHIFTING / 2nd or 3rd GEAR STARTS	DECREASE PRESSURE
LIGHT SHIFTING / STACK SHIFTS	INCREASE PRESSURE

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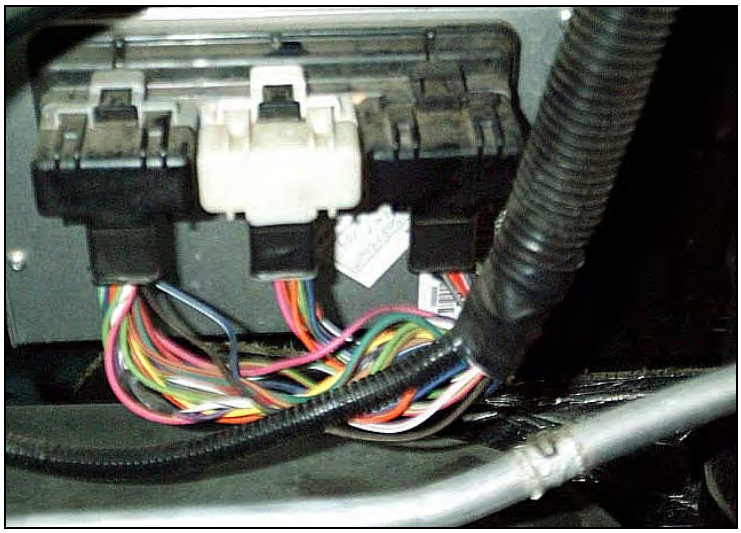
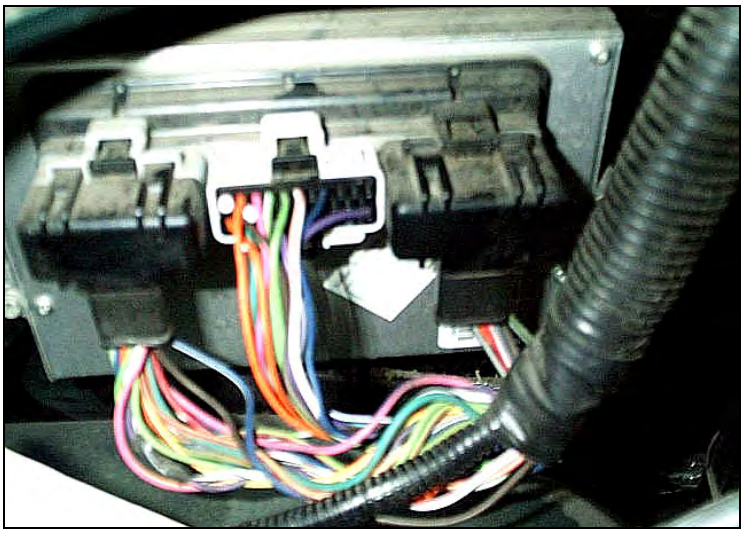
Governor Pressure Out Of Limit Trouble Code

If you receive a "***GOV PRESSURE OUT OF LIMIT***" causing LIMP MODE (stuck in 3rd gear) trouble code, then you must check the voltage at Pin # 31 at the PCM.

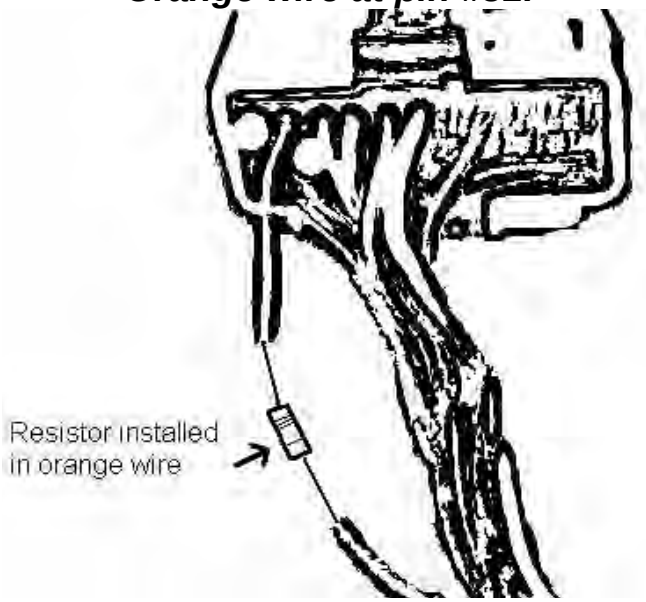


PCM Connectors: Under hood on fire wall. Remove air box for easy access.



Remove middle cover and locate Orange wire at pin #31.

Isolate wire and install resistor. Resistor can be installed either way.



Solder and use shrink tubing.

IMPORTANT - Dodge requires that Pin 31 on the PCM connector has a signal of ~+5.0 V. Because some vehicles produced have a signal voltage higher than this (5.1 – 5.3V), this modification allows the voltage to remain below @ 5.0 V as required to ensure a trouble code of "Gov Pressure Out Of Limit" causing limp mode (stuck in 3rd gear).

If the voltage at Pin 31 is HIGHER than +5.1V, then install a 100 Ohm, ¼ watt resistor to bring the voltage below +5 V.

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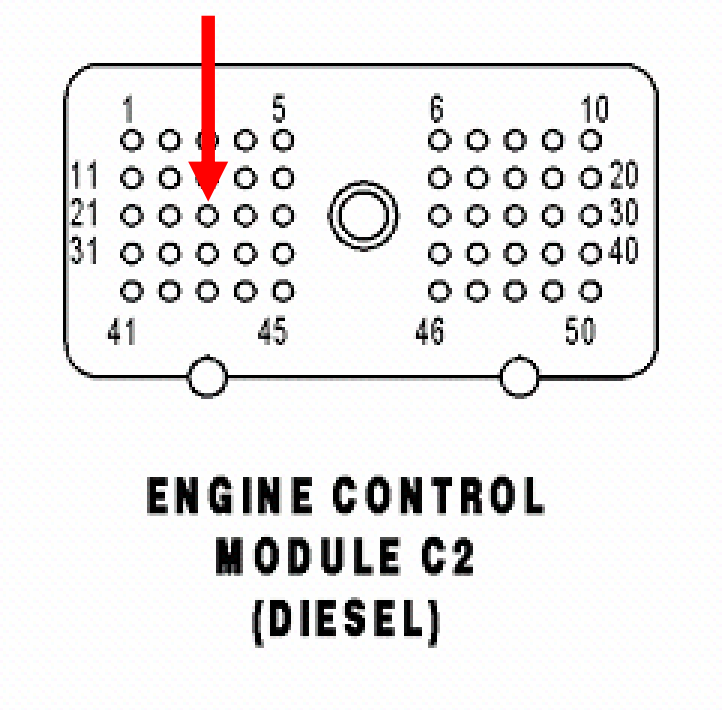
2004 Vehicles

Due to the single ECM in 2004 vehicles, the location of the 5 Volt supply wire has changed. It is now located at Pin 23 which is a Yellow wire with a Pink tracer.



Questions?

If you require assistance with this kit, please call our Transmission Technical Support Line at (800) 887-5030, Monday to Friday from 8:00-4:00pm Pacific Standard Time (PST). As an alternative, you can post a support question on our technical forum, located at http://www.bd-power.com/forum/ .

BD ENGINE BRAKE, INC.
WARRANTY STATEMENT

BD Engine Brake, Inc. (BD) warrants to the original purchaser that any products purchased shall be free from defective parts and workmanship. A defect is defined as a condition that would render the product inoperable. BD limits the liability to the repair or replacement, at BD's option, of any warrantable product returned with a complete service history and proof of purchase. A valid proof of purchase is a dated bill of sale. Repaired or replaced products shall be returned to the customer freight collect. Accepted warranty units, which have been replaced, become the sole property of BD.

A Return Material Authorization (RMA) number obtained in advance from a BD customer service representative must accompany product returned, with shipping prepaid by the purchaser, for warranty determination. BD will be the final authority on all warranty decisions.

Labor costs incurred by the removal and replacement of a BD product, while performing warranty work, will be covered for 6 months at authorized service centers. Until the product has been approved at the original installing dealer or at one of our distributors, the consumer shall be responsible for these costs.

NOT COVERED UNDER THIS WARRANTY

This warranty shall not apply to any product that has been improperly stored or installed; or to misapplication, improper operation conditions, accidents, or neglect, or which has been improperly repaired or altered or otherwise mistreated by the owner or his agent. This product warranty shall terminate at the end of 12 months or 24,000 miles of service, which ever comes first, with the original purchaser.

The nature of this product is PERFORMANCE and is designed to perform above OEM specifications. This product was designed with this in mind and should NOT be used in RACING and/or HIGH HORSEPOWER applications and will only be considered for warranty on vehicles with a maximum of 300 REAR WHEEL HORSEPOWER. Using this product on vehicles with a higher rating will cause premature failure and therefore BD will not consider such claims.

Except as set forth in our product outline, BD disclaims any implied warranties of merchantability and fitness for a particular purpose. BD also disclaims any liability for incidental or consequential damages including but not limited to, repair labor, rental vehicles, hotel cost or any other inconvenience costs. This warranty is in lieu of all other warranties or guaranties, either expressed or implied, and shall not extend to any consumer or to any person other than the original purchaser residing within the boundaries of the continental U.S. or Canada.

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