

BD VALVE BODY

For 1991-1995 Dodge 5.9L 12V Cummins Trucks
-- Installation Instructions --

	1030410	1991-1993 Dodge (4 Spd)	618
	1030415	1994-1995 Dodge 12V	47RH

PLEASE READ ALL INSTRUCTIONS BEFORE INSTALLATION

Tools Required

- Inch Pound Torque Wrench
- 3/8" or 1/2" Dr Socket sets including 7/16" & 1/2" socket
- #25 Torx Bit
- Combination Wrench Set including 7/16" & 3/4"
- High Quality Pressure Gauge (0 - 300 psi)
- Voltmeter
- C-Clamp

Additional Parts Required (Not Included)

- Mopar ATF+4
- 1 Bottle of Red Lubeguard (recommended)

All Diesel Rams must 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 convertor and transmission wearing characteristics (soft or severe shifting, high transmission temperature).

Ensure shift points are correct before recording pressures (transmission at operating temperature).

47RH Transmissions

Transmission Line Pressure	OEM Pressure	BD Pressure	Test #1	Test #2
Transmission in DRIVE w/Engine at idle	55-65psi	90-100psi		
Transmission in DRIVE w/Convertor Locked up @ WOT	110-120psi	170-180psi		

BD Engine Brake, Inc.

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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)		

Installation Notes

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

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 later testing.

VERY IMPORTANT - Road test with 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.

Pressures will only be indicated with transmission in Drive position.

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

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

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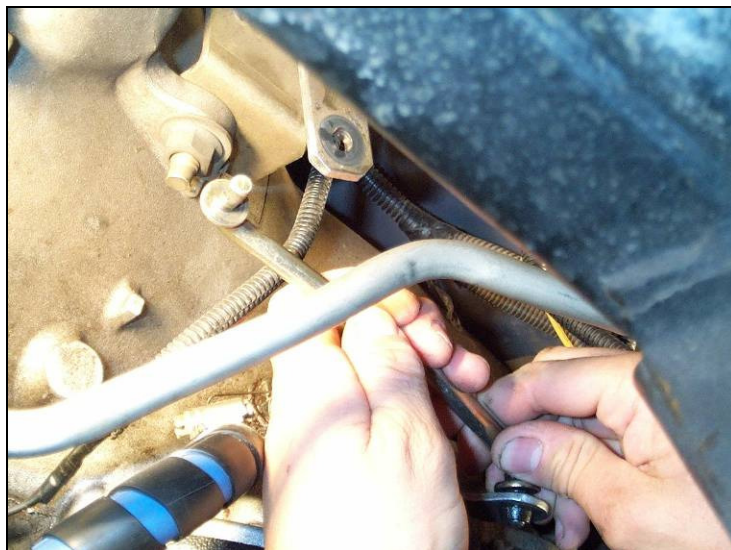
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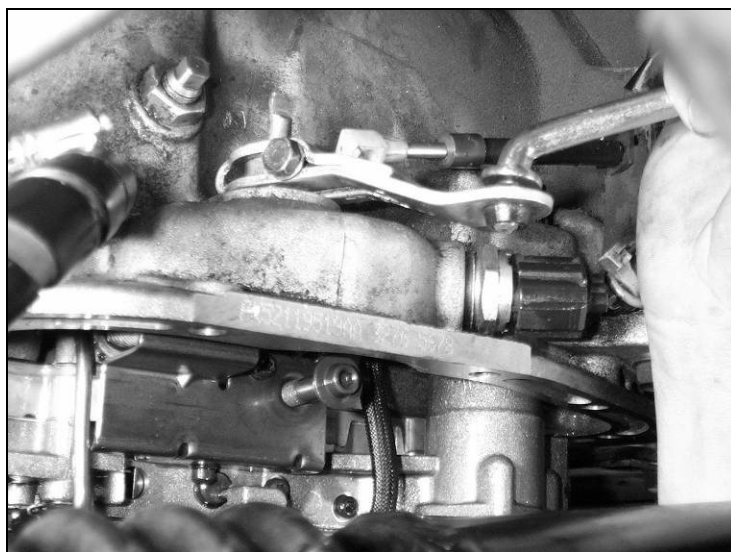
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Installation

1. Starting at the transmission, remove the kick down lever and spring as well as the hitch/clevis pin from the shifter rod. **DO NOT lose the wave washer.**
2. Rotate the shift lever to the rear of the vehicle to place the transmission in the PARK position.



3. 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 the shift lever.
4. Disconnect the wiring connectors from the Neutral Safety switch and valve body, and then remove the Neutral Safety switch.



5. Place a large drain pan under the transmission, remove the oil pan, drain the transmission oil, and then remove the filter.
6. Carefully remove the E-clip from the park rod, leaving the park rod in the transmission.
7. Remove the 10 valve body bolts, remembering the location of the different bolts.

The valve body mounting bolts are different lengths and MUST be reinstalled in the proper location.

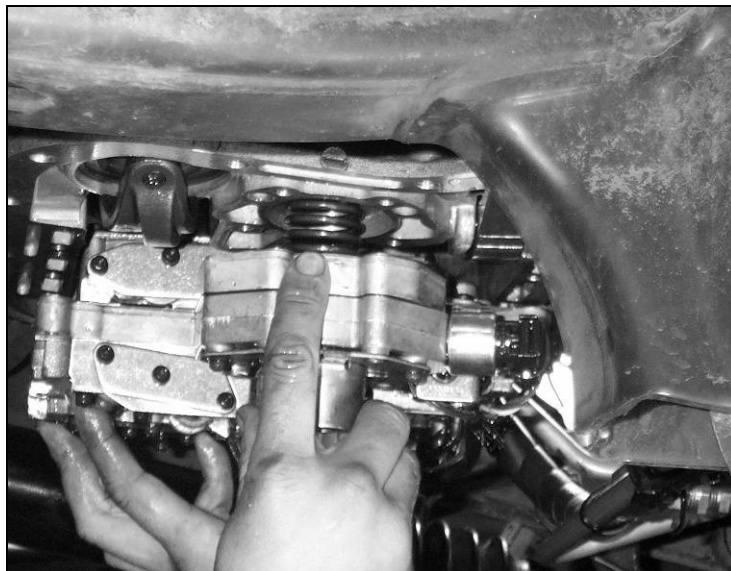
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8. When lowering the valve body, gently work it around so that the park rod lever is left in the transmission, and ensure the electrical plug is not damaged in the removal process.
9. **CAUTION** - As you lower the valve body, watch for the accumulator piston and spring falling out.



10. This is the time to change the 2nd gear band strut to the heavy duty one and install the additional 2nd gear servo spring we supply. First loosen the band adjusting screw lock nut with a 3/4" wrench, and then unscrew the adjuster until the stock strut can be removed.



11. For the next step of the instructions you will need a 6" C Clamp. This 6" C clamp is available from Autozone (#QRCC6) or from Schucks / O'Reilly's (#648641).

The cost on this part is roughly \$10.

12. Using a 6" 'C' Clamp and a 1 5/16" socket (or 32mm), depress servo piston guide into bore of the transmission. *This is a critical step and damage could ruin the transmission.*

DO NOT LET ANYTHING SCORE THE BORE OR THE SHAFT.

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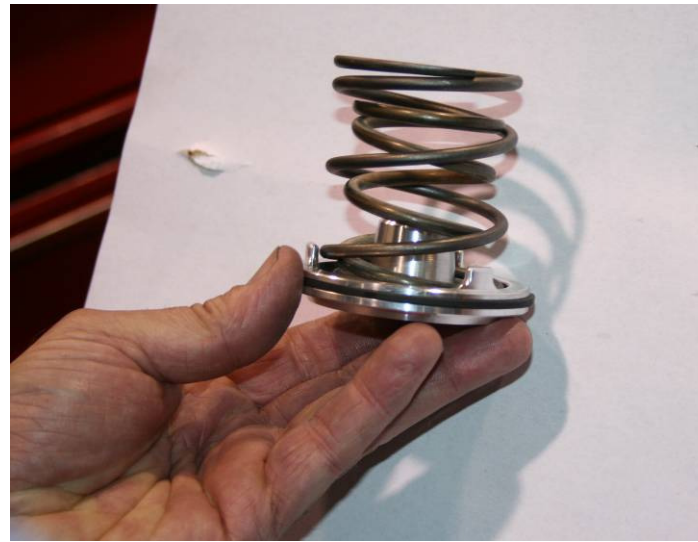
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13. Remove retaining clip. DO NOT LOSE.
14. Loosen C clamp to allow servo piston guide to be removed from bore. Remove clamp, servo piston guide and spring.



15. Add newly supplied spring to back of servo piston guide, along with the original.

16. Re-install servo piston guide into bore with both springs. Hold the servo piston guide in place while slowly tightening the C clamp.

Tighten C clamp very slowly up until the servo piston guide ring touches the bore taper.

Help servo piston guide ring into bore with a small blunt screw driver. **DO NOT DAMAGE SERVO PISTON GUIDE RING.**

If servo piston guide ring binds or catches retaining ring groove lightly tap the servo piston guide to release it.



17. Once servo piston guide is depressed far enough you then can install the retaining ring. Once installed you can remove the C clamp.



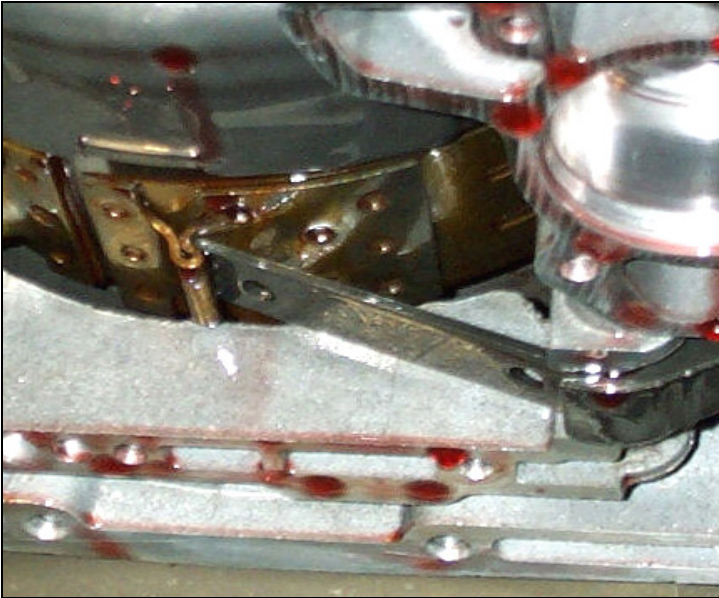
18. Install the new BD strut with the tapered side down, towards the pan, and center into the guides. Torque the band adjustment to 72 lbs-in., then back out 2 1/4 turns and tighten the lock nut. The measurement for the air gap between the band lever and servo piston is 5/16".

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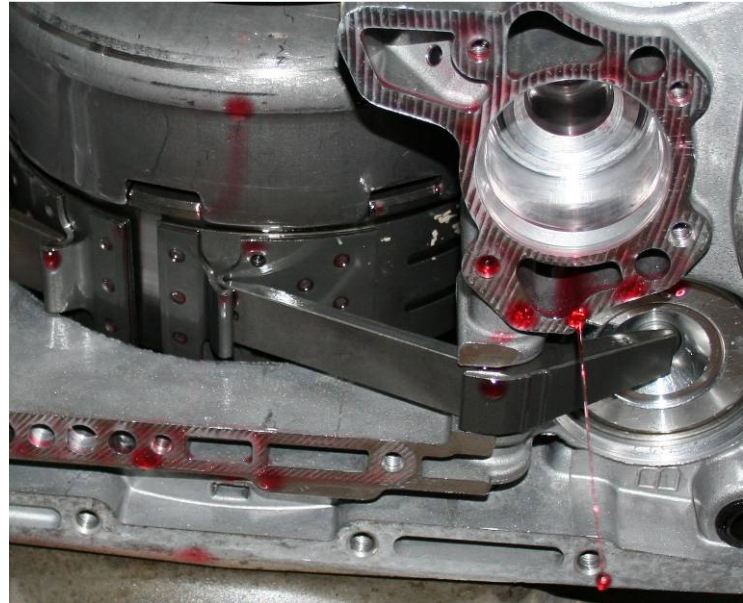
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Stock band strut in place



New BD band strut in place

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

20. **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 in the 1st / Low gear position for later attaching of the park rod and E-clip.

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21. Place the accumulator piston and spring in 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.

22. 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.



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



“Hockey Stick” Tool



24. Install the valve body mounting bolts, ensuring the different length bolts are installed in the proper positions, and torque evenly to **10 lbs-ft**.

25. 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 to Park. Leave in the neutral position and tighten the retaining bolt.

26. Install the neutral start switch and tighten.

27. Install the new filter on the valve body using 3 screws.

28. We suggest you 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.

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

30. When removing the oil flow lines on newer vehicles, you will note that some of these have quick-disconnect, Teflon type fittings.

These fittings are prone to premature failure and should be replaced to prevent them from blowing off. This would cause all fluid to be lost and subsequent damage to the transmission and torque converter.

P/N **1400127** Heat Exchange Fitting (X2)

P/N **1400099** Transmission Line Fitting (X2)



New Fitting



Teflon Fitting

31. When just the valve body is replaced, the transmission will need approximately 8-9 quarts of ATF+3. When both the valve body and torque converter are being replaced, approximately 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!**

32. After a test drive, check the oil levels again. Air locks are common in this transmission.
33. Road test the vehicle and check for the wide-open shift points to ensure they are correct and to verify pressures. 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.

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WARNING

WHEN YOUR TRANSMISSION IS SERVICED AT A DEALER OR SERVICE CENTRE IT IS IMPERATIVE THAT THE BD FILTER BE REPLACED WITH THE SAME TYPE. THE PROPER FILTER IS CHRYSLER OEM PART # 3515996 WHICH WILL ENSURE THE MODIFIED VALVE BODY DOES NOT LEAK PAST THE FILTER SEAL.

Kick Down Cable Adjustment

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

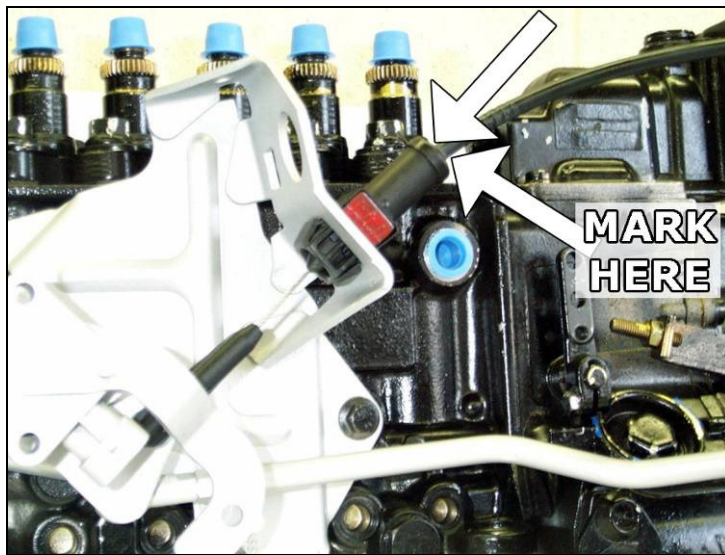
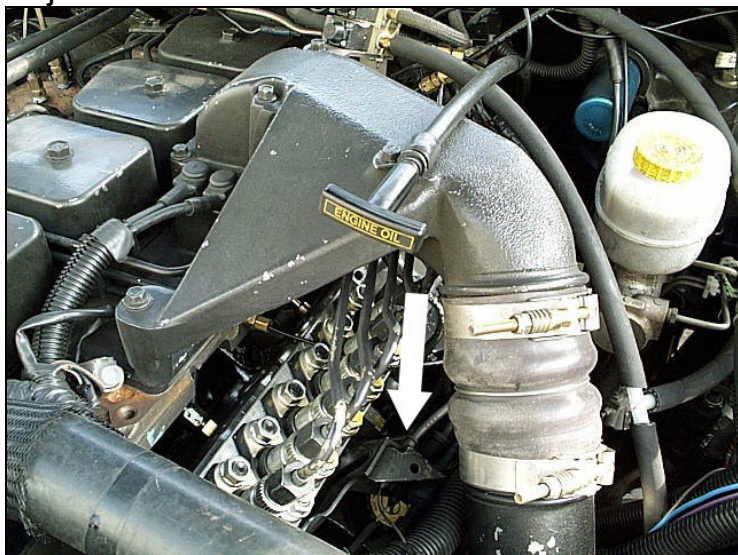
The BD Performance Valve Body is a performance product and not stock, therefore the factory specifications for this adjustment are used only as a guide.

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.

12 VALVE ADJUSTMENTS

Locate the kick down cable and MARK THE CABLE at the original setting before any adjustments are made.



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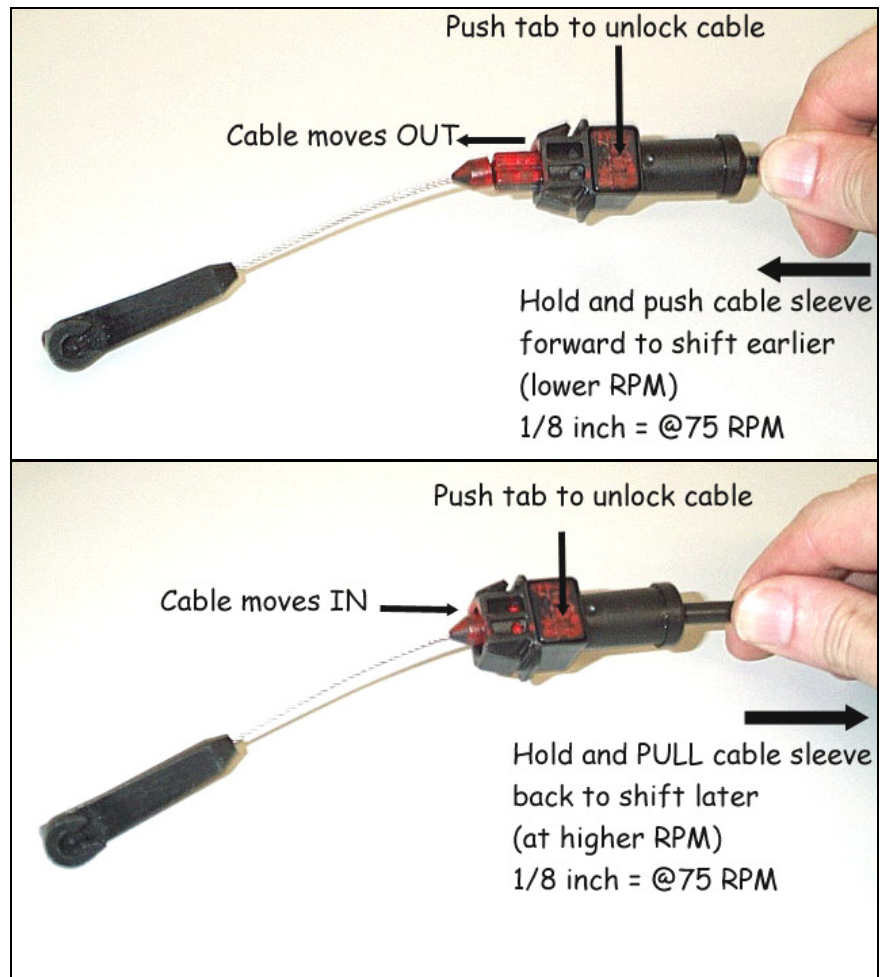
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Press the lock tab (this will take considerable force) to release the locking mechanism.

Adjusting the cable forward, towards the radiator, will make transmission shift sooner.

Adjusting the cable rearward, towards the firewall, will make transmission shift later.



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