DODGE RAM
47RE TRANSMISSION (#1030418)
48RE TRANSMISSION (#1030419)

BD VALVE BODY INSTALLATION MANUAL

IMPORTANT – READ ALL INSTRUCTIONS BEFORE INSTALLATION

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Installing the BD Valve Body

2000-04 Dodge Ram

**TOOL LIST:** Inch Pound Torque Wrench
- 3/8” or ½” Dr Socket sets including 11mm & 13mm socket
- #25 Torx Bit
- Combination Wrench Set including 7/16” & ¾”
- 3/16” Allen wrench
- High Quality Pressure Gauge (0 - 160 psi)
- Voltmeter

**Additional Parts (not included in kit):**
- Transmission pan gasket
- Type PLUS 3 ATF (Recommended)
- 2 Bottles of Red Lubeguard (Recommended)

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).

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

### 47RE

<table>
<thead>
<tr>
<th>Transmission Line Pressure</th>
<th>OEM Pressure</th>
<th>BD Pressures</th>
<th>Test #1</th>
<th>Test #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission in DRIVE w/Engine at idle</td>
<td>55-65 psi</td>
<td>70-75 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission in DRIVE w/Convertor Locked up at 1800 - 1900 rpm</td>
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Transmission Shift Point (RPM) | Before | After
---|---|---
2\textsuperscript{nd} – 3\textsuperscript{rd} Shift point (Normal Driving) | | |
2\textsuperscript{nd} – 3\textsuperscript{rd} Shift point (Wide Open Throttle) | | |

\textbf{IMPORTANT} – IF PRESSURES AND/OR SHIFT POINTS ARE NOT TO SPECS THE TRANSMISSION MUST BE REPAIRED OR SERVICED \textbf{BEFORE} MODIFICATIONS.

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

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 as well as the hitch/clevis pin from the shifter rod. \textbf{NOTE: DO NOT lose the wave washer.}

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

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

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 transmission, remove oil pan, drain 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.

**NOTE** Attaching bolts are different lengths and MUST be reinstalled 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 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.

14. This is the time to change to 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 adjuster until the stock strut can be removed.
15. Install the new BD strut with taper side down, towards the pan, and centered in the guides. Torque the band adjustment to 72 inch pounds, then back out 2 ¼ 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 on the new BD Performance Valve Body.

17. **IMPORTANT** - Before installing the BD valve body, lubricate the manual-shifting shaft and the O-ring on the electrical connector that fit 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.

18. 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.

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.

21. Install the valve body mounting bolts, ensuring the different length bolts are installed in the proper positions, and torque evenly to 100 inch pounds.
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 to Park. Leave in the Neutral position and tighten the retaining bolt.

23. Install neutral safety switch and adjust as required, then tighten. Backup lights at rear of vehicle should light when shift lever is in 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 you install either a drain plug in the original oil pan or, even better, install a MAG HY-TEC cast aluminum 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 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 it. Ensure not to bend the pins when attaching the plug.

27. When just the valve body is replaced, fill the transmission with 8 - 9 quarts of ATF. When both the valve body and torque convertor are replaced, 15 - 17 quarts are required. **IMPORTANT:** After 8 quarts have been added, start engine and shift thru all gears, then check transmission oil level with shifter in Neutral. Then top up and check as required. **DO NOT OVERFILL!**

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

29. Road test 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.

**CAUTION – PRESSURE SETTINGS TOO HIGH CAN RESULT IN SEVERE SHIFTS, LIMP MODE, or 2\textsuperscript{ND} OR 3\textsuperscript{RD} GEAR STARTS.**
Kick down cable Adjustment

Kick down cable adjustment 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 removed.

On trucks equipped with Cummins ISB, full throttle shift between 2\textsuperscript{nd} and 3\textsuperscript{rd} should occur between 2800 - 3000 rpm (OEM) at operating temperature.
Locate kick down cable and remove from the throttle linkage and support bracket.

**IMPORTANT** – 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 CLIP BREAKS THE CABLE WILL HAVE TO BE REPLACED

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

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

*(Adjustment spec – 1/8 inch movement = @75 rpm)*

Install the white locking clip and re-install the cable thru the support bracket and then on the throttle lever.

Install the plastic cover when job is complete.
**Pressure adjustments**

Valve Body pressure adjustment and Throttle valve cable adjustment affect each other, (ie: if you raise pressure, the transmission may shift sooner and vise versa).

TAKE YOUR TIME WHEN MAKING THESE ADJUSTMENTS TO ENSURE 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 / 2\textsuperscript{ND} or 3\textsuperscript{RD} GEAR STARTS - DECREASE PRESSURE

LIGHT SHIFTING / STACK SHIFTS - INCREASE PRESSURE
**RAM TRUCK TROUBLE CODE**

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

![PCM Connectors: Under hood on fire wall](image1)

Remove air box for easy access

![Remove middle cover and locate Orange wire at pin # 31](image2)

Isolate wire and install resistor
Resistor can be installed either way

Solder and use shrink tubing

**IMPORTANT** - Dodge requires that Pin 31 on the connector should have a signal of \( @ +5.0 \text{ V} \). Because some vehicles produced have a signal voltage higher than this (5.1 - 5.3 V), this modification allows the voltage to remain below \( @ 5.0 \text{ V} \) as required to ensure a trouble code of "Gov pressure out of limit" causing limp mode (stuck in 3\textsuperscript{rd} gear).

If the voltage at Pin 31 is HIGHER than +5.1 V then install a 100 Ohm, \( \frac{1}{4} \) watt resistor to bring the voltage below +5 V.
2004 Vehicles

For 2004 vehicles due to the single ECM 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.
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.