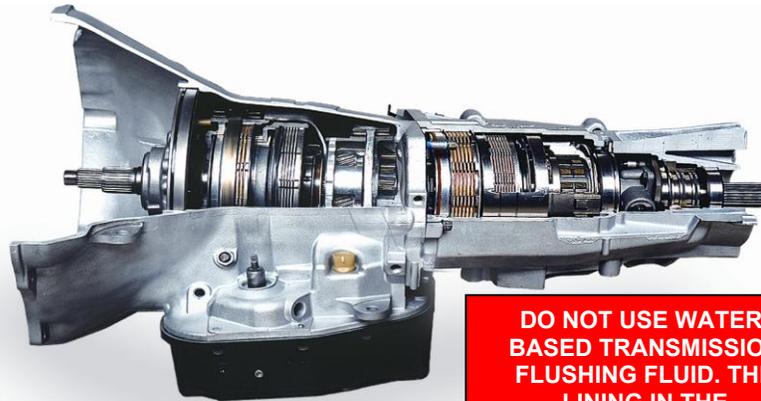




**DOWNLOAD COLOUR
INSTALL MANUALS AT
www.bddiesel.com**



DO NOT USE WATER-BASED TRANSMISSION FLUSHING FLUID. THE LINING IN THE CONVERTOR CLUTCHES WILL DISINTIGRATE.

BD Dodge 4-Speed Transmission

Installation Instructions

	Year	Model	2WD	4WD
TORQUEMASTER <i>TRANSMISSION (500HP)</i>	94-95	47RH	1064152B	1064154B
	96-98	47RE	1064162B	1064164B
	98-99	47RE	1064172B	1064174B
	00-02	47RE	1064182B	1064184B
	03-04	48RE	1064192B	1064194B
	04.5-07	48RE	1064232B	1064234B
TOWMASTER <i>TRANSMISSION (400HP)</i>	91-93	518	1030310	1030311
	94-95	47RH	1064152	1064154
	96-98	47RE	1064162	1064164
	98-99	47RE	1064172	1064174
	00-02	47RE	1064182	1064184
	03-04	48RE	1064192	1064194
	04.5-07	48RE	1064232	1064234
ROADMASTER <i>TRANSMISSION (350HP)</i>	96-98	47RE	1064972	1064974
	98-99	47RE	1064982	1064984
	00-02	47RE	1064992	1064994
	03-04	48RE	1064142	1064144
	04.5-07	48RE	1064202	1064204

Transmission packages with converters are also available

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9

US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295

Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

Table of Contents

Introduction	2
Important Note – Case Saver.....	3
Pre-Installation (TowMaster & TorqueMaster Only)	Error! Bookmark not defined.
Maintenance	3
Transmission Removal	4
Transmission Cooler Flush	5
Transmission Installation.....	6
Kick-down Cable Adjustment	8
Gearshift Cable Adjustment – 48RE	11
Transmission Tuning.....	13
Before you call BD Tech Support.....	14
Questions?.....	14
Band Adjustments.....	15

Introduction

BD's RoadMaster transmission is a stock clutch count transmission. It comes with a BD Valve Body for increased line pressures and improved shifting, a BD Deep Sump Pan for increased fluid capacity, and a billet band strut.

BD's TowMaster transmission adds to the RoadMaster by increasing transmission clutch count in critical areas. The TowMaster also replaces all thrust washers with Torrington roller bearings and adds a billet band lever.

BD's TorqueMaster transmission boasts the same increased clutch count and pressure increase as in the TowMaster transmission but also includes a billet input shaft. The TorqueMaster transmission is designed to withstand rapid acceleration and high torque is the perfect combination for the 3-disc ProForce 3D converter.

Pre-Installation (TowMaster & TorqueMaster Only)

Ensure the vehicle has a BD Filter Kit (PN # 1064017) for the BD Transmission you are about to install. A replacement filter can be ordered through BD using part number 1604008. A cross-reference table has been provided below.

HASTINGS	BALDWIN	DONALDSON	FLEETGUARD	FRAM	LUBER-FINER	WIX
LF364	BT230	P555570	LF3342	PH3519	LFP5570	51268

BD Engine Brake Inc.

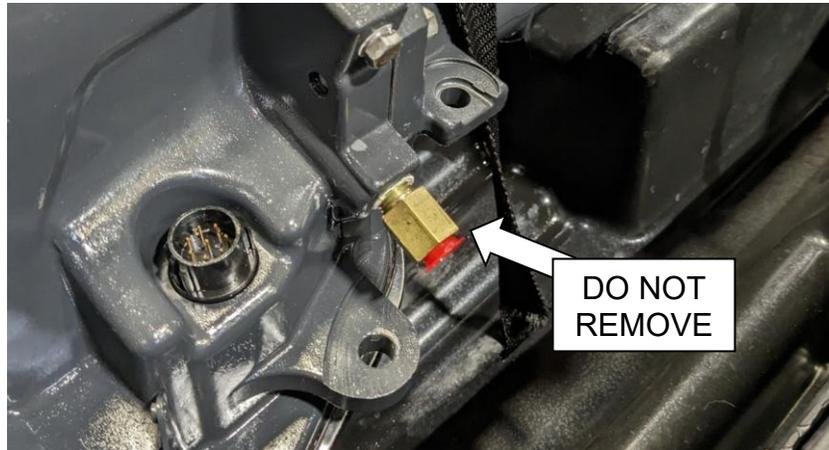
Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9

US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295

Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

Important Note – Case Saver

Your transmission will be equipped with a coolant line adapter known as a case saver. The case saver prevents the coolant line from overtightening and causing a case fracture. **DO NOT REMOVE** this adapter. Instead, screw the OE coolant line fitting directly into the case saver.



Maintenance

BD recommends the first transmission oil and filter change to occur at the 3-month or 5,000 miles/8,000 km interval. This quick interval will not only give you peace of mind but will also rid the transmission of any prior debris. After this OE service intervals are acceptable.

On all Dodge 47/48 transmissions, you will need to do a band adjustment at each service interval. The first interval is the most important. The procedure is located at the end of this manual.

WARNING

It is imperative that the internal BD filter be replaced with the same type. The proper filter is dependent on the year & model of the transmission as seen in the table below. The correct filter will ensure the modified valve body does not leak past the filter seal.



CHRYSLER OEM# 3515996
'91-'98 518/47RH/47RE



CHRYSLER OEM# 52118789
'98-'07 47RE/48RE

BD Engine Brake Inc.

Transmission Removal

1. Disconnect the negative battery cable(s).
2. Remove the torque converter access cover and inspection plate.
3. Remove the transmission pan, drain the fluid, and re-install the pan.
4. Remove the fill tube bracket bolt and pull the tube out of the transmission. Retain the fill tube seal. On 4WD models, it will also be necessary to remove the bolt attached to the transfer case vent tube to the converter housing.
5. Rotate the crankshaft with a pry bar from under the vehicle until the converter bolts are accessible.
6. Mark the drive shaft and pinion yokes for assembly alignment. Disconnect and remove the drive shaft. On 4WD models, remove both drive shafts.
7. Disconnect the electrical wiring from the park/neutral position switch, transmission solenoid, and speed sensor.
8. Disconnect the gearshift rod and shifter shaft assembly from the transmission.
9. Disconnect the TV (throttle valve) cable from the transmission bracket.
10. On 4WD models, disconnect the shifter rod from the transfer case shift lever. For 04.5-07 48RE transmissions, the TTVA motor will need to be removed.
11. Raise the transmission slightly by using a service jack to relieve the load on the cross-member and supports.
12. Remove the bolts securing the rear support and cushion to the transmission and cross-member.
13. Disconnect the vacuum lines and remove the steel line from the cross-member and frame.
14. Remove the bolts attaching the cross-member to the frame. Spread the frame with a Port-A-Power to remove the cross-member.

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

15. On 4WD models, remove the transfer case with a transmission jack or with the aid of a helper.
16. Disconnect the fluid cooler lines at the transmission.
17. Remove all bell housing bolts.
18. Carefully work the transmission and torque converter assembly rearward off the engine block dowels.
19. Lower the transmission and remove the assembly from under the vehicle.
20. Carefully slide the torque converter out of the transmission.

Transmission Cooler Flush

Before installing the transmission, the transmission cooler must be flushed and the filter be changed. After flushing, check the transmission cooler flow at engine idle. This can be accomplished by running the transmission cooler outlet into a bucket. There should be a minimum of 1 GPM of flow.

DO NOT USE WATER-BASED TRANSMISSION FLUSHING FLUID – THE LINING IN THE CONVERTOR CLUTCHES WILL DISINTIGRATE, RENDERING THE CONVERTOR USELESS AND WARRANTY WILL BE VOIDED.

Also, if the transmission being replaced failed or there was excessive debris in the pan, the transmission cooler and check valve assembly will need to be replaced. Failure to follow these procedures may void your warranty.

Upon installation ensure the plug is in the torque converter and preload the torque converter with 2 quarts of Mopar ATF +4 or aftermarket ATF +4.

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

Transmission Installation

1. *****NOTE:** If new bolts are supplied with the converter, be sure to remove the bolts before installing the transmission.
2. Lubricate the converter drive hub and oil pump seal lip with petroleum jelly.
3. Lubricate the converter pilot hub with transmission fluid.
4. Align and install the torque converter into the oil pump.
5. Carefully insert the converter into the oil pump. Rotate the converter back and forth until it's fully seated in the pump gears. Two loud "clunks" should be heard to ensure it is seated properly. When fully seated, the torque converter bolt pad surface should protrude 0.7" (just under $\frac{3}{4}$ ") from the bellhousing surface.
6. Position the transmission on a service jack and secure it with chains.
7. Check the condition of the converter drive plate. If the plate is cracked, distorted, or damaged, it must be replaced before installation can continue. **Also, be sure the transmission dowel pins are seated in the engine block and protrude far enough to hold the transmission in alignment.**
8. Raise the transmission and align the torque converter with the drive plate, and the bell housing with the engine block.
9. Move the transmission forward. Raise, lower, or tilt the transmission to align the bell housing with the engine block dowels.
10. Carefully work the transmission forward and over the engine block dowels until the converter hub is seated in the crankshaft.
11. Install the bolts attaching the bell housing to the engine.
12. Tighten the bolts and check the torque converter rotation.
13. Install the rear support. Lower the transmission onto the cross-member and install the bolts attaching the transmission mount to the cross-member.
14. Reconnect the vacuum lines and re-install the steel line to the cross-member and frame.

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

15. Reconnect the shift linkages.
16. Connect the gearshift and throttle cable to the transmission.
 - a. For 2004.5 –2007 48RE transmissions reinstall the TTVA motor.
17. Connect the electrical wires to the park/neutral position switch and transmission solenoid(s). Be sure the transmission harnesses are properly routed.

CAUTION: It is essential that correct length bolts be used to attach the converter to the drive plate. Bolts that are too long will damage the clutch surface inside the converter.

18. Install the torque converter to drive plate bolts using Loctite. On models with a 12.2" converter, tighten bolts to 47 Nm (35 ft. lbs.).
19. Install the torque converter housing access covers.
20. Install the cooler line bracket.
21. Connect the cooler lines to the transmission.
22. Install the transmission fill tube. Install a new seal on the tube before installation.
23. Align and connect the drive shaft.
24. Adjust the gearshift linkage and throttle valve cable if necessary.
25. Lower the vehicle.
26. Reconnect the negative ground cable(s) to your battery(s).
27. Fill the transmission with vehicle manufacturer's suggested fluid.
 - a. **NOTE: Fill capacities listed only as a guide. Correct fluid level should always be determined by marks on the dipstick. Capacities listed are total system capacity including torque converter and BD pan.**

<u>Application</u>	<u>First Fill Quarts (Liters)</u>	<u>Secondary Fill Quarts (Liters)</u> <u>(Includes TC Preload)</u>	<u>Total Capacity</u> <u>(Liters)</u>
1988-2007	10 (9.5)	Approx 7 (6.6)	Approx 17 (16.1)

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
 US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
 Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

Mainline Pressures

	<i>At Idle</i>	<i>Wide Open Throttle</i>	<i>In Reverse (Idle)</i>	<i>In Reverse (WOT)</i>
Dodge 47RH	90-100 psi	170-180 psi	250 psi	350 psi
Dodge 47RE	90-100 psi	170-180 psi	250 psi	350 psi
Dodge 48RE	90-100 psi	170-180 psi	250 psi	350 psi

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 a performance product and not stock, therefore the factory specifications for this adjustment are used only as a guide.

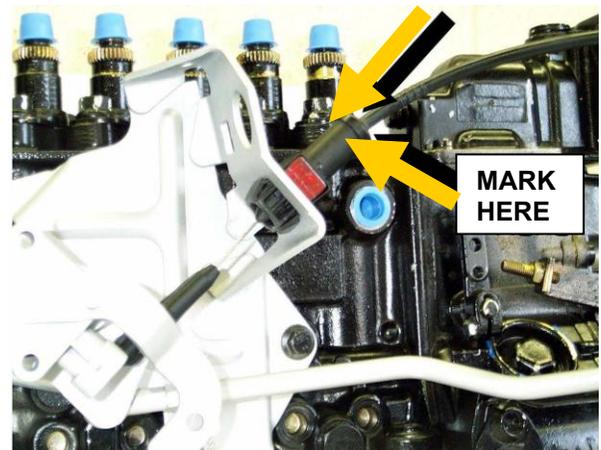
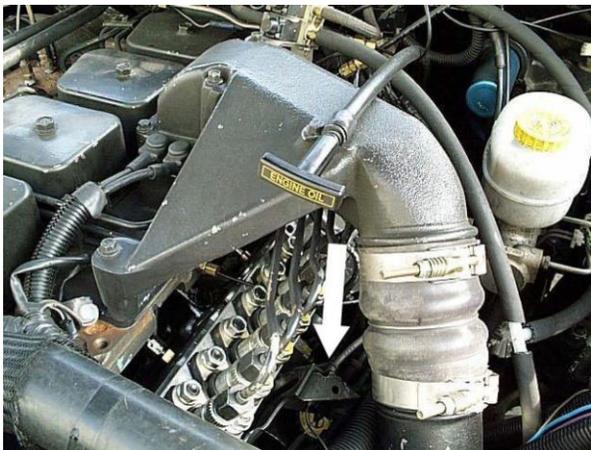
Your drivability and performance demands will determine your shift points and pressure adjustments.

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

12 VALVE ADJUSTMENTS

On trucks equipped with the **12-valve 5.9 6BTA**, full throttle shift between second and third should occur between 2400 – 2500RPM (OEM) with the transmission at operating temperature.

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



NOTE: Disconnecting the cable from the support bracket and the throttle lever is a difficult task; it may be easier to adjust without removing the cable.

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
 US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
 Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

24 VALVE ADJUSTMENTS

On trucks equipped with Cummins ISB engines, full throttle shift between second and third should occur between 2800 – 3000 rpm (OEM) with transmission at operating temp. The kick-down cable will be located underneath the plastic cover as indicated below.



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. Remove the cable from the throttle linkage and support bracket.



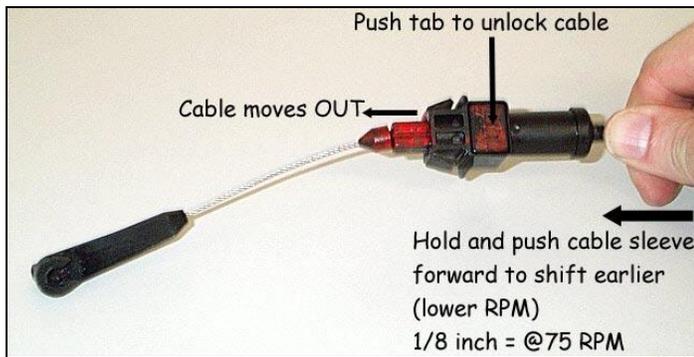
****IMPORTANT: MARK THE CABLE** at the original setting before any adjustments are made.

Remove the white-colored locking clip from the cable.

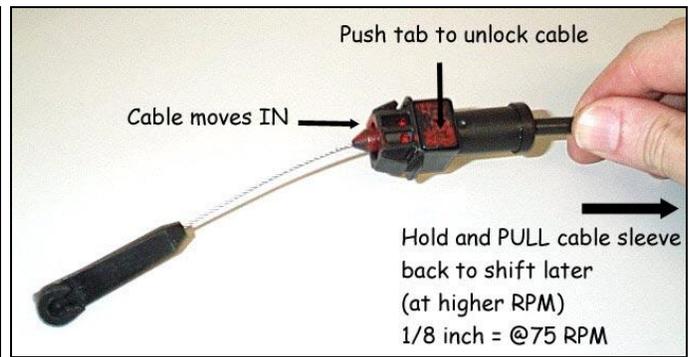
Press the lock tab (this will take considerable force) to release the locking mechanism.

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com



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



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

****CAUTION** DO NOT USE A SCREWDRIVER TO REMOVE THE CLIP, IF THE CLIP BREAKS THE CABLE WILL HAVE TO BE REPLACED!**

(Adjustment spec - 1/8 inch movement = ~75 rpm)



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

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
 US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
 Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

Gearshift Cable Adjustment – 48RE

Do not take this adjustment lightly -- it is very important. Failure to perform the adjustment can void your warranty.

Check adjustment by starting the engine in PARK and NEUTRAL. Adjustment is CORRECT if the engine starts only in these positions. Adjustment is INCORRECT if the engine starts in one but not both positions. If the engine starts in any position other than PARK or NEUTRAL, or if the engine will not start at all, the transmission range sensor may be faulty.

Procedure:

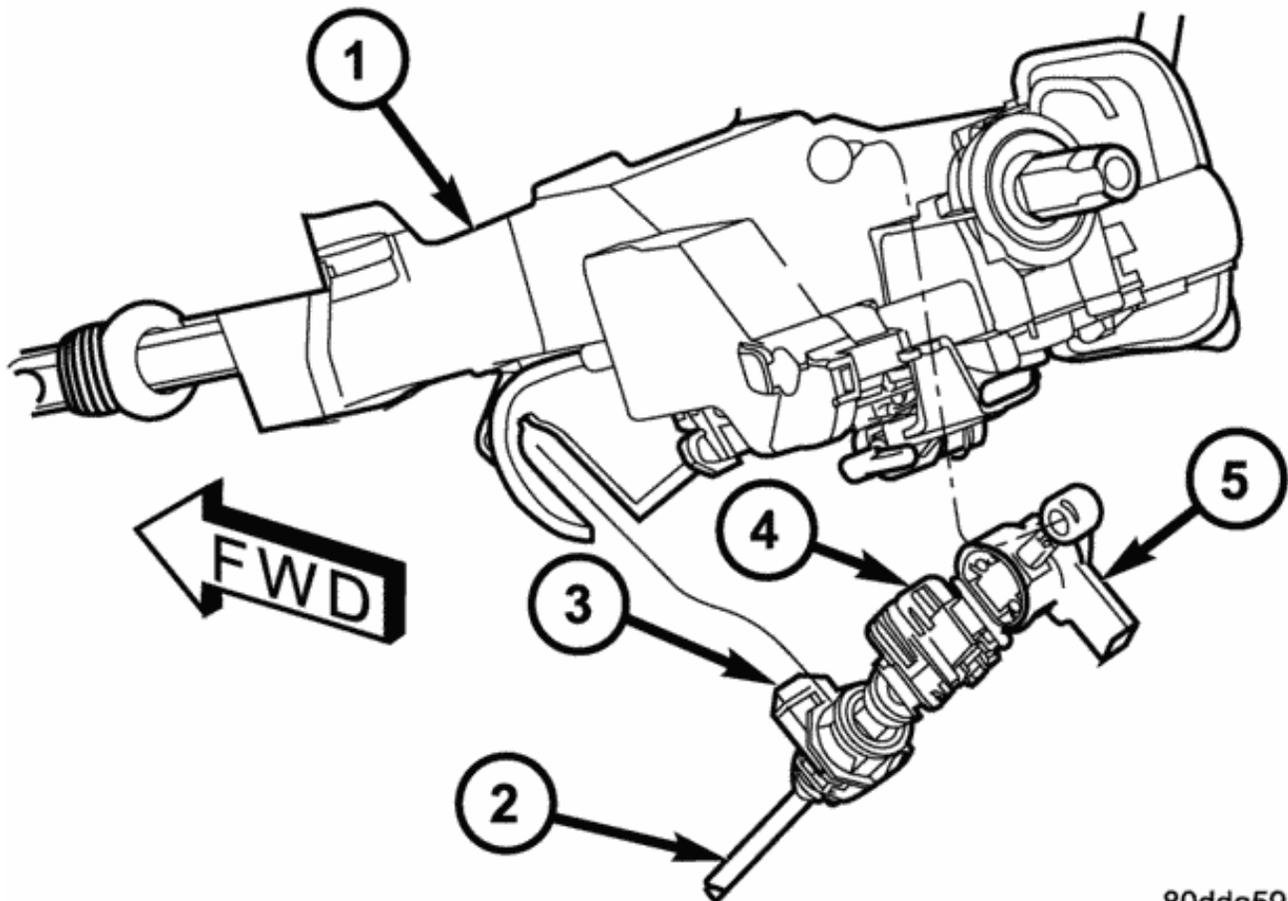
1. Shift the transmission into PARK.
2. Release the cable adjuster lock tab (3) (underneath the steering column) to unlock the cable.
3. Raise vehicle.
4. Disengage the cable eyelet from the transmission manual shift lever.
5. Verify transmission shift lever is in PARK detent by moving the lever fully rearward. Last rearward detent is PARK position.
6. Verify positive engagement of the transmission park lock by attempting to rotate the propeller shaft. The shaft will not rotate when the park lock is engaged.
7. Snap the cable eyelet onto the transmission manual shift lever.
8. Lower vehicle.
9. Lock the shift cable by pressing the cable adjuster lock tab (3) downward until it snaps into place.
10. Check engine starting. The engine should start only in PARK and NEUTRAL.

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

NOTICE

The Transmission Throttle Valve Actuator (TTVA) does not require any mechanical adjustments. All changes in throttle valve position are controlled by the Engine Control Module (ECM). The TTVA does require an initialization period after the actuator has been removed or replaced. After the actuator has been removed or replaced, move the ignition to the ON position for thirty (30) seconds. This will allow the ECM sufficient time to perform the internal calibration procedures to learn the TTVA's current "zero" position. Once this is done, check the ECM for diagnostic trouble codes (DTCs). If no DTCs are set relating to the TTVA, the TTVA is fully calibrated and ready for use.



80dda591

1 - STEERING COLUMN
2 - GEARSHIFT CABLE
3 - GEARSHIFT CABLE LOCK TAB
4 - BTSI SOLENOID LOCK TAB
5 - BTSI CONNECTOR

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
 US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
 Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

Transmission Tuning

Once the installation is completed you can now check the main line pressure. This 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.

47RE Transmissions

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

48RE Transmissions

Transmission Line Pressure	OEM Pressure	BD Pressure	Test #1	Test #2
Transmission in DRIVE w/Engine at idle	55-65psi	90-110psi		
Transmission in DRIVE w/Convertor Locked up @ WOT	110-120psi	170-200psi		

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.

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

Transmission / Converter failures require that the remote filter be returned for inspection before any claim is considered, as well you will be required to submit the cooler flow rate in GPM measured at the outlet of the Oil/Air transmission cooler.

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
 US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
 Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

Before you call BD Tech Support

Please ensure you have the following information completed for your specific transmission issue, as the results may be required during the tech call.

2-3 STACK SHIFT / 2nd & 3rd GEAR STARTS

- TTVA relearn procedure completed?
- Governor Pressure @ 0 MPH = _____
- Governor PSI @ idle? _____
- Governor PSI @ 10 MPH? _____
- Transmission Governor pressure = Mainline pressure after 2-3 shift? _____
- Mainline Pressure = _____
- Checked to see if transmission has power? _____

LAZY SHIFT

- Line Pressure @ IDLE = _____
- Band adjustment checked? _____
- Band adjustment nut turns @ 72 in/lbs = _____ (# of turns)

Questions?

If you require assistance with this kit, please call our Transmission Technical Support Line at (800) 887-5030, Monday to Friday from 7:00-3:30pm Pacific Standard Time (PST).

BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9
 US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295
 Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com

Band Adjustments

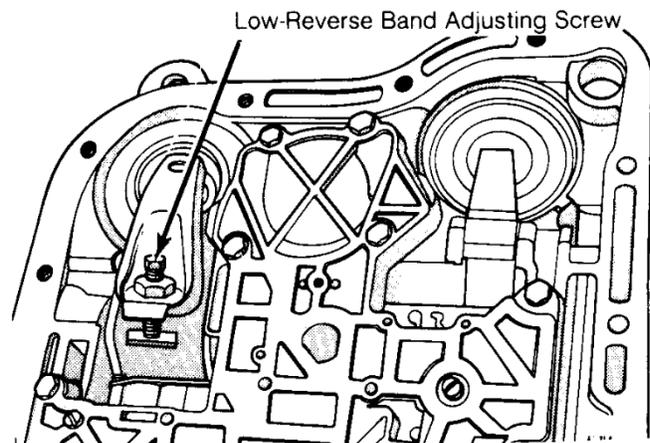
Set the 2nd gear band adjustment. Torque the T40 band adjuster screw to 72in-lb, then back out 2-1/4 turns. Tighten the lock nut while keeping the adjuster screw from turning.



To confirm adjustment, pull the servo lever outwards. The air gap should measure 5/16". The flattened end of the supplied E-clip installer can be used as a feeler for this measurement.



Set the low reverse gear band adjustment. Loosen the nut with a 14mm wrench then back off the adjuster screw 5 turns. Next, tighten the adjuster screw to 72in-lb, then back screw off 3 turns and tighten the jam nut.



BD Engine Brake Inc.

Plant Address: #A10 – 33733 King Road, Abbotsford, BC, Canada V2S 7M9

US Shipping: #88 – 446 Harrison St., Sumas, WA, USA 98295 | US Mailing Address: P.O. Box 231, Sumas, WA, USA, 98295

Phone#: (604) 853-6096 | Fax: (604) 853-8749 | Web: www.bddiesel.com