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47RE/48RE TapShifter

Dodge Transmission Controller Kit

| | |
|----------------|---|
| 1031382 | 2003-2007 Dodge 47RE and 48RE TapShifter Electronics Kit |
|----------------|---|

This kit contains all the electrical parts necessary to install a BD Diesel "TapShift Ready" transmission or valve body.

Kit Contents

| | | |
|---|--|---|
| 1607258 | 5057438AC-P | 1607253 |
|  |  |  |
| Control Module Qty: 1 | Shift Lever (Auto-4) Qty: 1 | Display Module (4spd) Qty: 1 |

| | | |
|--|---|---|
| 1607256 | 1607257 | 1330054 |
|  |  |  |
| Transmission Harness Qty: 1 | Shifter/Display Harness Qty: 1 | Double Sided Tape Qty: 1 |



| | | |
|---|---|---|
| 1607259 | 1607254 | 1300131 |
|  |  |  |
| Harness; Thru-Pan Qty: 1 | Harness; Gov Solenoid Qty: 1 | Tie Wrap Qty: 12 |

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Introduction

BD’s Dodge TapShifter gives you control over your automatic transmission with just the touch of a button.

Dodge 47RE and 48RE transmissions lack the same level of control later model trucks provide over gear selection. This kit gets you back in control of your transmission without the sacrifices associated with manual valve bodies or standalone controllers.

The BD Diesel TapShifter kit comes with a new shift lever which goes in the stock location and a small gear display that tucks in beside the instrument cluster for a sleek install.

The kit comes with a special valve body and a controller kit that gives you a full spectrum of capabilities ranging from simple gear limiting all the way to manual gear selection and lockup control – all with the touch of a button.

NOTE The rear servo does not get applied in first gear in drive, so if holdback is required you must move the shift lever to the manual low position like normal.

Operation

To turn on the TapShifter, tap the - button on the shift lever. The BD TapShifter will detect what gear you are in and will light up the BD gear display with that gear. You can now shift up and down using the + and - buttons as required. Shifting operation and torque converter operation can be configured to be automatic or manual depending on the mode used. See modes below for more details.



To turn off the TapShifter, keep pressing the + button until you go past 4th gear. This will turn off the display and let the TCM control the transmission again.

Automatic Mode (Mode 1)

Mode 1 allows the driver to select the maximum gear to shift up to. This means whatever gear you select on the display will be the highest gear the transmission will reach. This mode also provides convenient downshifting capabilities while retaining automatic shifting. The Tow/Haul or OD OFF button still functions like stock with the shifter turned on. This mode works just like the late model 68RFE trucks shifter. This is the default mode when it leaves the factory.

Automatic Mode with TorqLoc (Mode 2)

Mode 2 works the same as mode 1, except now the Tow/Haul button is re-purposed into a lockup button when the shifter is turned on. This means the stock torque converter lockup strategy is maintained, but at the tap of a button you can achieve lockup (the padlock will illuminate in the display). The TapShifter takes care of the minimum speed engagement and disengage points for you based on the gear you've selected so there is no need to worry about stalling the truck.

Automatic Mode with TorqLoc/TorqUnLoc (Mode 3)

Mode 3 is similar to mode 2 except it keeps the TCM from being able to lock up the torque converter and only engages when the driver commands it.

CAUTION Do not leave the torque converter disengaged for long periods when towing or driving on the highway or it will elevate transmission temperatures.

Full Manual Mode (Mode 7)

Mode 7 mimics the function of a manual valve body. You can drive in any gear at any time and get full control of the torque converter lockup using the Tow/Haul button which will illuminate the padlock symbol. This mode improves on manual valve bodies as it has downshift over-rev protection and torque converter anti-stall protection, plus as soon as you turn off the TapShifter, the truck regains the convenience of automatic shifting.



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

Mode Changes

To change a mode, turn the TapShifter off (if not already). Press and hold the + button on the shifter for a few seconds until the display lights up with a number. This number refers to the mode the TapShifter is set to. For mode 7 it will show a 3+4. To change the mode, keep tapping the + button to cycle through the modes. To select the mode press the - button. The TapShifter will remember modes through power cycles so you only need to set it when you want to make a change.



Tools Required for Installation

- Socket set + Wrenches
- Side cutters
- Pliers
- Punch + Hammer
- Knife
- Pick
- T25 Torx screwdriver/socket
- T27 Torx bit + ratchet
- Trim removal tool

Additional tools required for valve body/transmission install. Refer to the manual included with the valve body or transmission for more information.

Installation

Before starting make sure you have the valve body or transmission installation instructions supplied with your TapShift ready valve body or transmission.

(I-00245 Valve Body Instructions)
(I-00235 Transmission Instructions)

This instruction manual does not cover valve body or transmission installation.

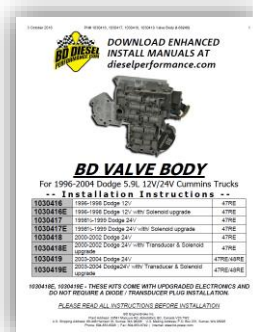
Disconnect both vehicle batteries before installation for safety.

If installing a TapShift Ready transmission, skip the next section as it is for valve body installations only.

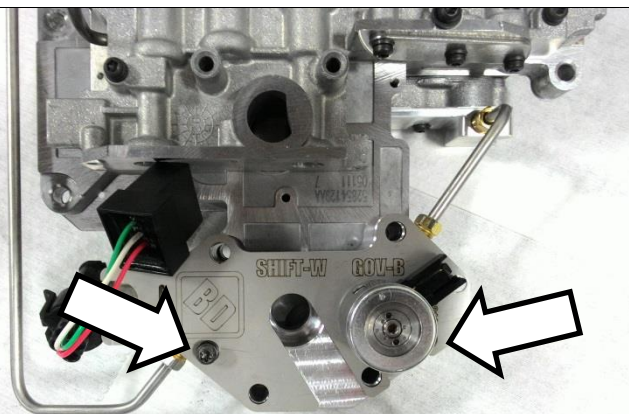
Solenoid Installation – Valve Body Installation

Refer to the instruction manual included with your valve body for detailed installation steps. What follows is only the steps related to the TapShifter kit.

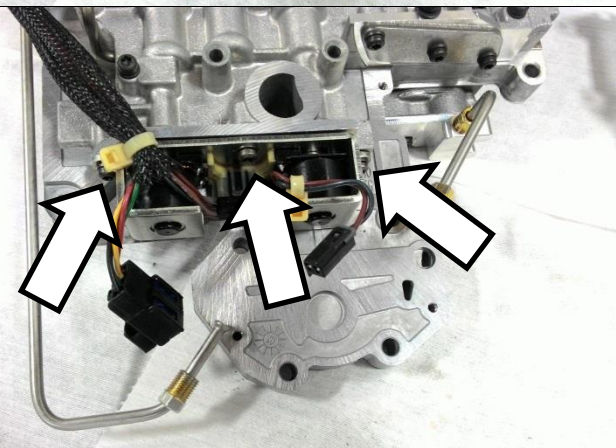
TapShift ready valve bodies have a spare port to accept the additional solenoid included in this kit.



To install your stock transmission wiring harness and OD/TCC solenoids, the governor solenoid aluminum housing must be moved out of the way. Loosen off the two 3/8" nuts on the two tubes connected to the housing. Then remove the two T25 Torx screws.

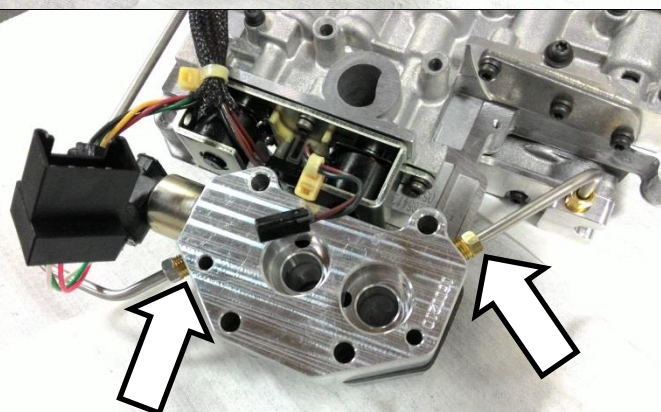


Install your harness and solenoids using the three small T25 screws from the old valve body.

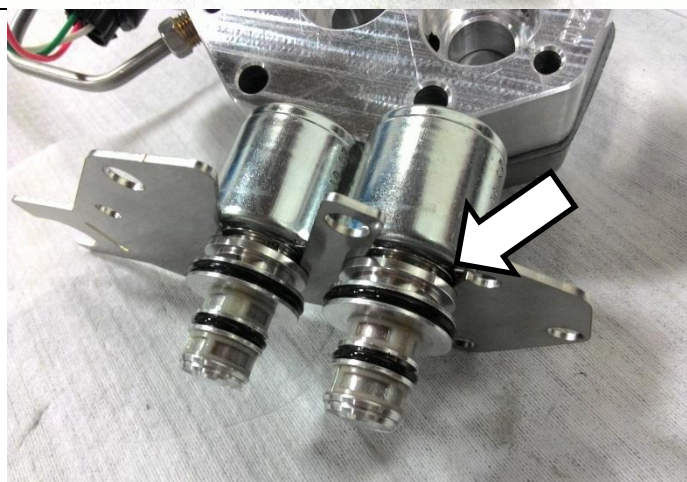


Place the aluminum solenoid block in place with the gasket below it.

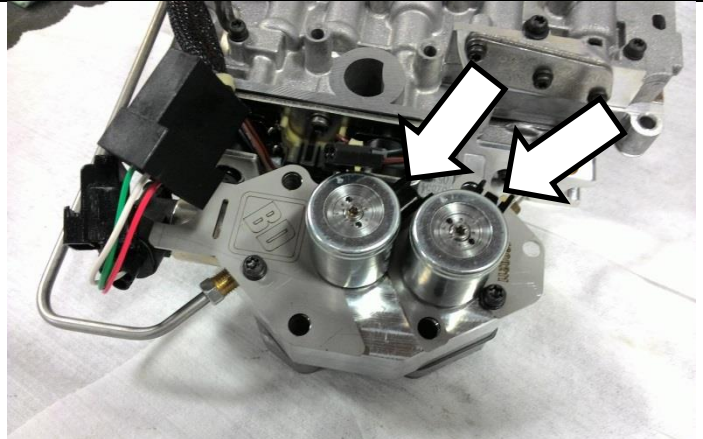
Start the two tube nuts by hand, do not tighten yet.



Locate the two solenoids (4617213) supplied in the valve body kit and slide them in the retainer bracket as shown. The plate goes in the top most land of the solenoid.

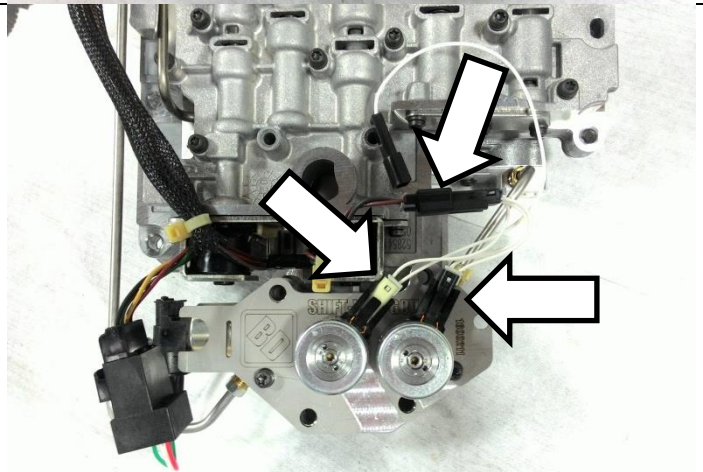


Push the solenoids back down into the governor solenoid housing with the plugs in the orientation shown. Reinstall the two Torx fasteners. Now tighten the two tube nuts with a 3/8 wrench. Do not over torque, they thread into aluminum.



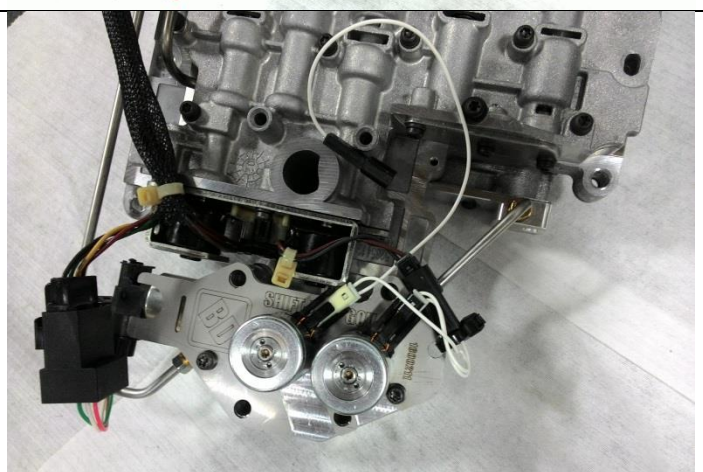
Connect the governor solenoid harness (1607254) with the white connector going to the solenoid labelled SHIFT-W and the black connector going to the solenoid labelled GOV-B.

The remaining two pin plug from this harness connects to the stock valve body wiring harness.

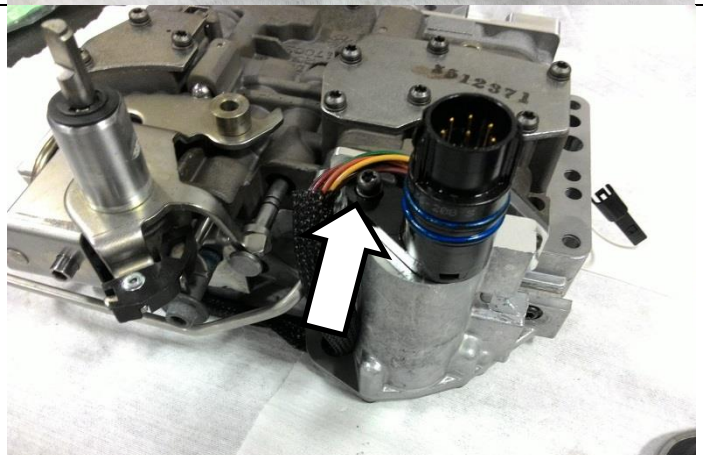


Install a wire tie to support the large black plug to the steel solenoid hold down plate if required.

Do not pinch the white wire against sharp edges where it could possibly chafe through.

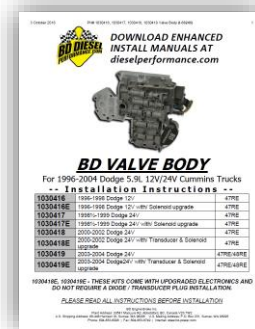


Route the solenoid harness wiring around the valve body and install the screw as shown to hold the connector in place.





Continue with the instructions included in the valve body installation manual to install the valve body into the transmission.



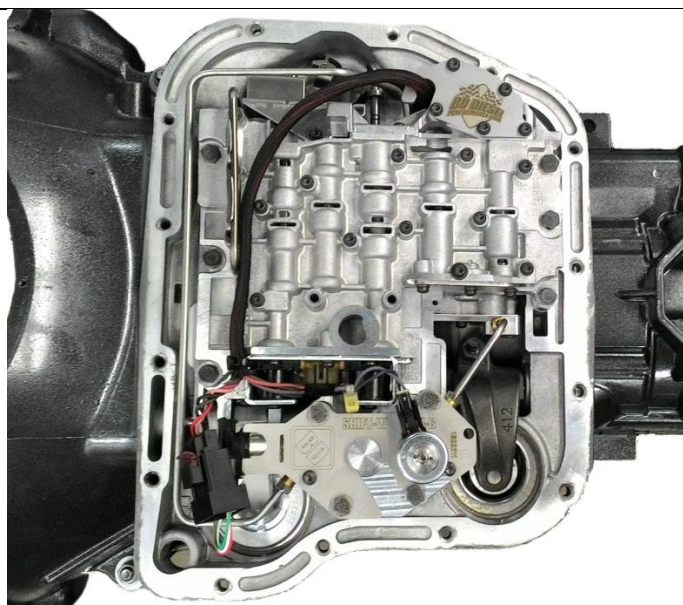
Solenoid Installation – TapShift Ready Transmission

Refer to the instruction manual included with your transmission for detailed installation steps. What follows is only the steps related to the TapShifter kit.

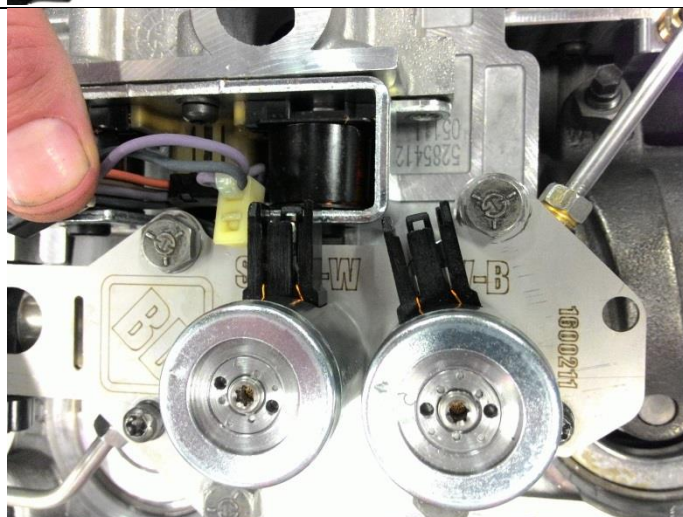
This process is best done once the transmission is installed in the vehicle so that the pan can easily be removed.

Remove the transmission pan from the transmission, revealing the valve body.

Note Transmission fluid filter not shown here for clarity but would be installed. Removal is not required.

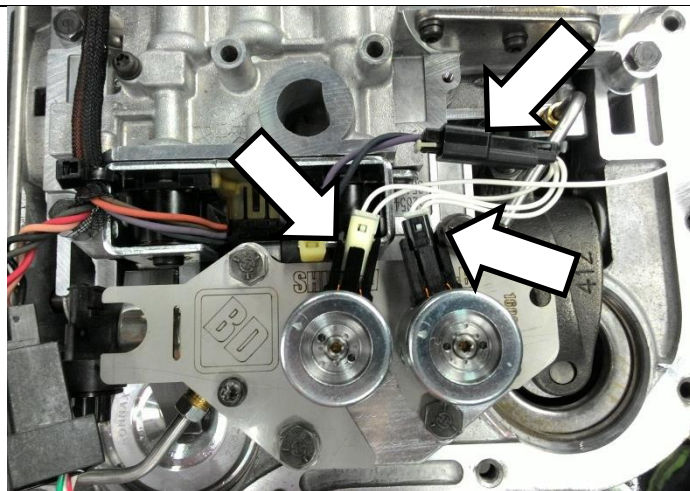


Unplug the transmission wiring harness from the governor solenoid by releasing the tab on the bottom side.



Connect the supplied solenoid harness (1607254) with the white plug going to the solenoid labelled SHIFT-W and the black plug going to GOV-B.

The remaining two pin plug connects to the stock wiring. Be sure the small white wire won't chafe or pinch on any sharp edges.



When you are finished this section, the transmission should have both solenoids connected. The loose single wire will be connected when the pan is reinstalled.



Important Check to ensure the steel tube support bracket is still in place and adequately supporting the tube. It may have been moved the previous steps.



Through-Pan Wiring

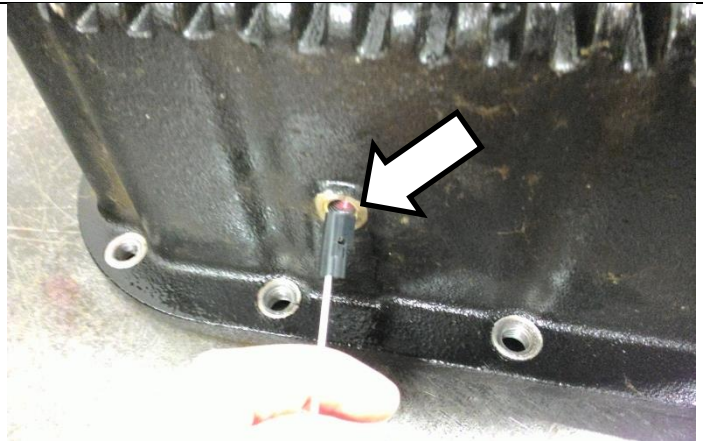
Locate the thru-pan wiring assembly (1607259) supplied with this kit it will be used in this section.



The TapShifter requires a wire run through the transmission pan to control the additional solenoid installed. A BD Transmission will come with an oil pan that has a 1/8" NPT threaded port that can be used for this. Many aftermarket pans will also have a port available. If using a cast aluminum pan with no spare ports, you will need to drill and tap one. If using the stock pan you will need to supply a field installed bung to achieve this.

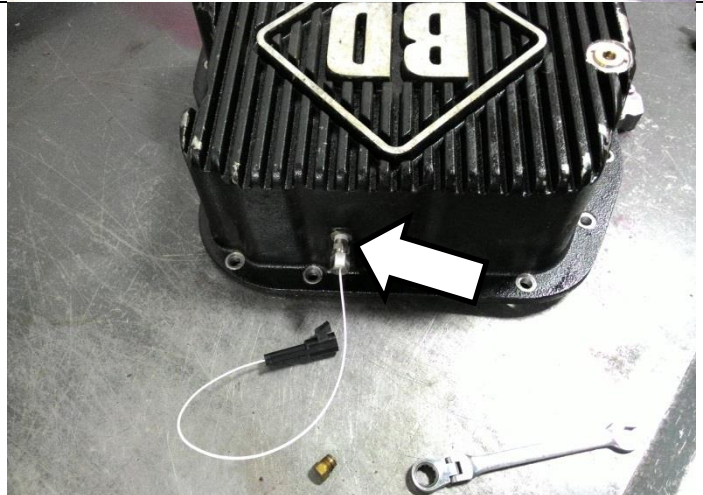


Feed the small end of the wire harness from the outside of the transmission pan to the inside.

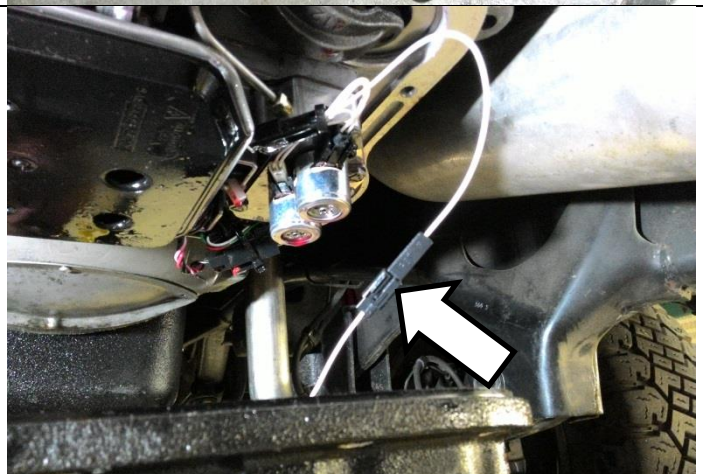


Apply thread sealant to the threads of the supplied harness/fitting and tighten it into the transmission pan.

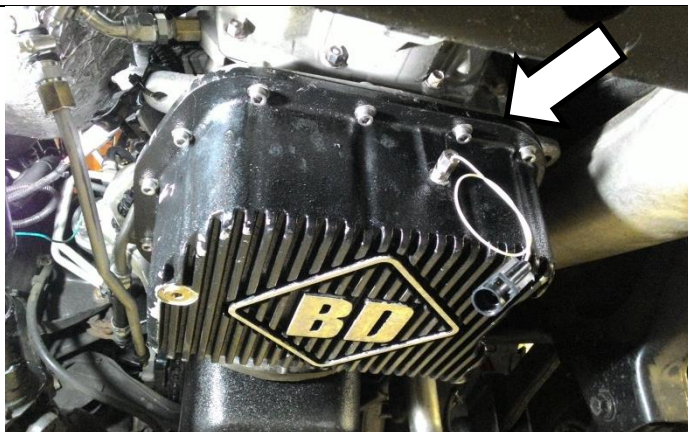
Ensure the compression fitting nut is tight. Gently pull on the wire and ensure it is tightly held in the fitting and does not slide through.



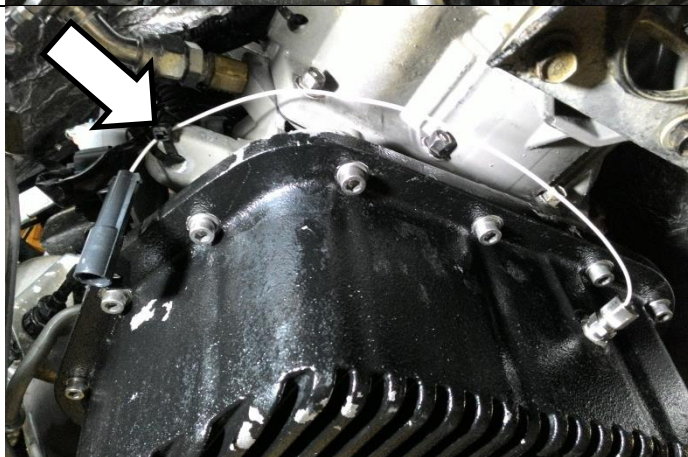
Raise the transmission pan below the transmission and connect the one pin connector from the governor solenoid wiring to the through pan wiring harness.



Ensure when the pan is raised the wire slack will be away from moving parts (like the band struts, etc.) and proceed to raise the transmission pan. Install the pan fasteners.



Install a wire tie around the transmission mounting ear and loosely support this small white wire and connector there for connection in the next section.



Transmission Wiring Harness

Locate the transmission wiring harness supplied in this kit (1607256). This harness will be installed in this section.



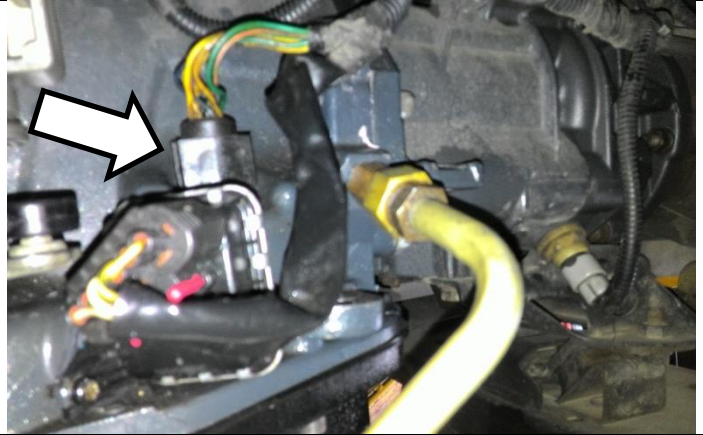
Locate the transmission output speed sensor at the rear driver side of the transmission. Unplug the connector.



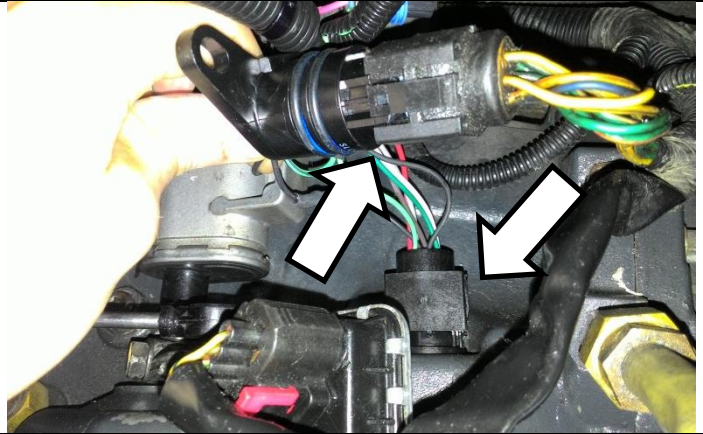
Connect the BD harness to the speed sensor and plug the stock wiring into the BD harness.



Locate the 8 pin electrical solenoid connector for the transmission, ahead of the speed sensor. Unplug the connector.



Connect the BD harness to the transmission connector and plug the stock wiring back into the BD harness.

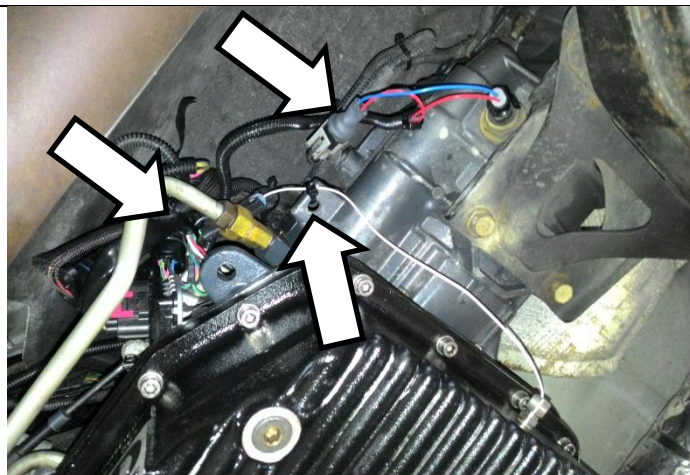


Connect the single pin connector from the BD harness to the wire previously run through the transmission pan. Ensure the small white wire is not strained and is supported.

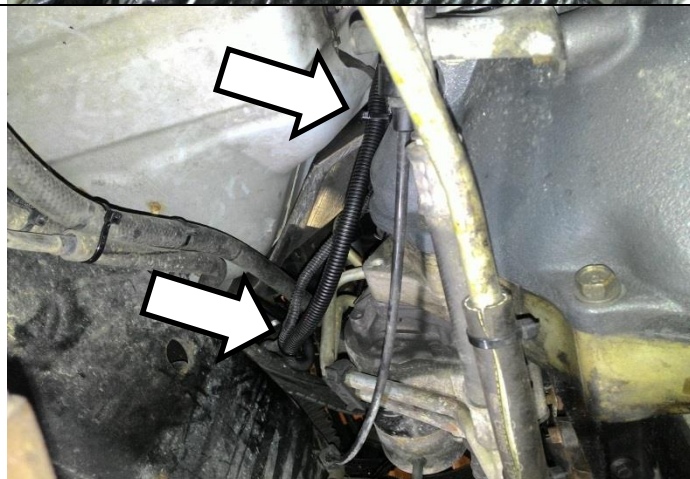


The BD transmission harness should be supported along the same route as the factory wiring harness and should be attached with wire ties to ensure it does not get near any moving parts and does not put significant strain on any of the wiring connectors.

Note Pay attention that the thin white wire is supported and will not be broken.



Route the remaining end of the BD transmission wiring harness towards the engine bay. Support it with wire ties to the stock wiring harnesses.

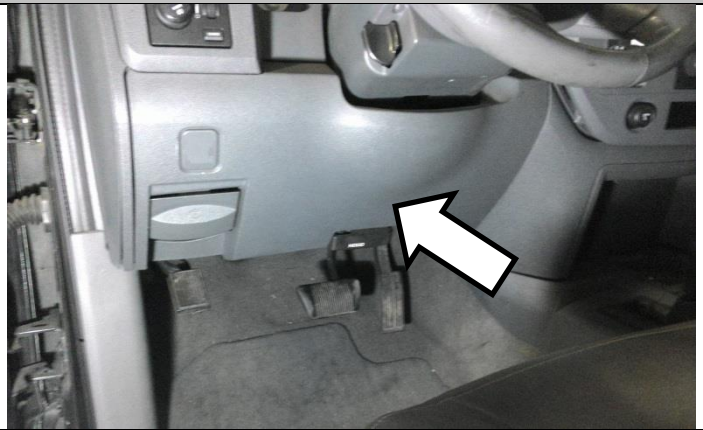


Bring the harness up by the driver side battery near the firewall and leave it here for now, it will be connected to the module later.



Shift Lever Installation

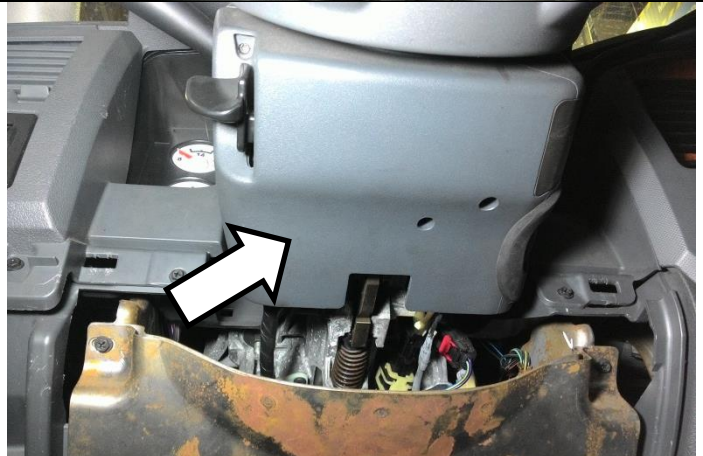
Inside the truck, remove the driver's side knee bolster below the steering column.



Remove the steering wheel tilt lever using a T20 screwdriver.



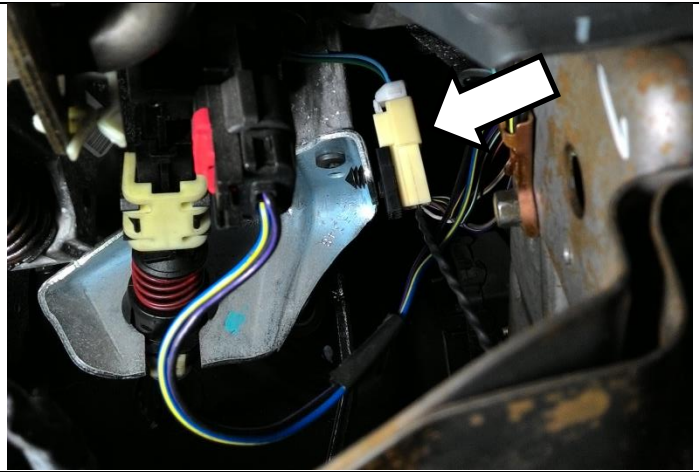
Remove the screws from the bottom of the steering column covers and remove the plastic covers.



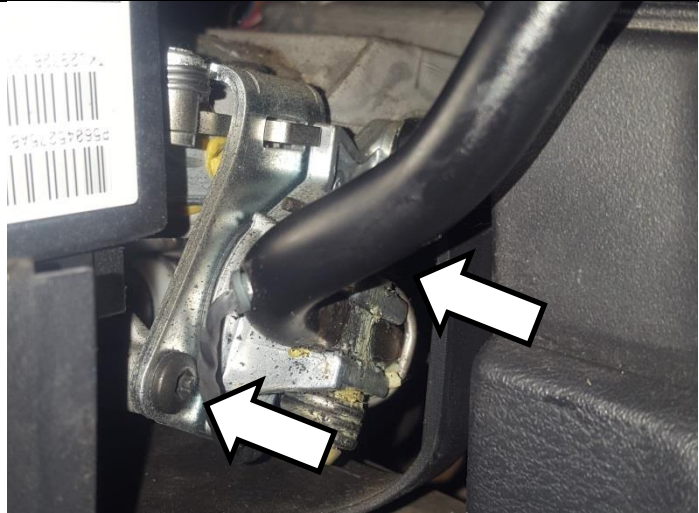
Using a trim removal tool, pop off the transmission shift cable from the shift lever.



Follow the twisted black wire from the stock shift lever under the column to the two pin connector. Disconnect the plug and remove the push in retainer.



Remove the three T27 Torx fasteners securing the shift lever to the steering column. Two of the fasteners are located on the lower right side of the column.



The remaining fastener is located on the top of the column. If you do not have a small T27 bit and ratchet, removal of the instrument cluster surround may be necessary to remove this screw.



Remove the shift lever assembly from the column. The shifter assembly needs to be rotated to release it from the shifter locking mechanism.

Note You may need to move the lever to various positions until it will come out. Do not pry on it or break the linkage.



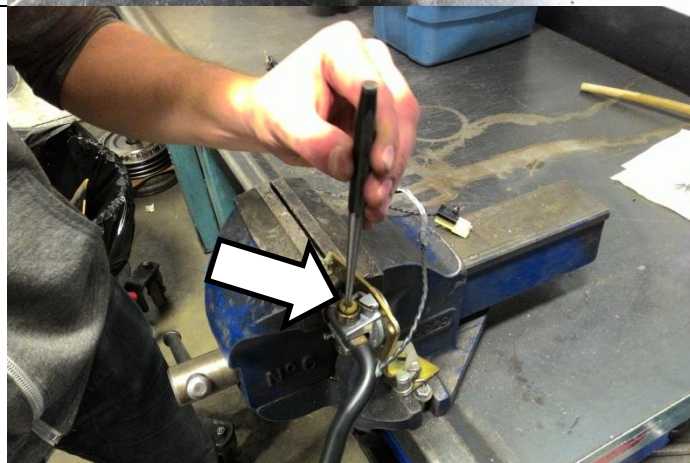
Take the shift lever over to a work bench with a vice. The next steps will involve transferring the new handle (5057438AC-P) into the original bracket.



Mount the old shifter bracket in a vice and use a punch or other suitable tool to drive the shifter pin out.

Make note of the orientation of the spring and bushings prior to disassembly.

Set the pin, bushing and spring aside.



Remove the shift lever from the bracket.



Apply a small amount of grease to the new shift lever in the area that it will contact the shifter bracket and slide it into the bracket in the same orientation as the old lever.



Reposition the spring and bushings for installation.

Note orientation of the spring and bushings relative to the lever and bracket should match the picture.



To start the pin you must squeeze the spring, moving the bushing into alignment.



Tap the roll pin through the lever until it reaches the bottom bushing, then squeeze it into position and continue until the pin is driven in flush.



Reinstall the shift lever in the truck. Rotate the lever into place so that the shifter lock mechanism is in place. Install the three Torx fasteners removed earlier.



Connect the shifter linkage by pushing the socket back onto the ball.



Route the thin twisted wire from the shift handle in the same routing as the original shift lever. Put the wire in the original support clip and push in the Christmas tree clip. Ensure the wire does not impede shift lever movement and that the wire will not become chaffed.



Shifter/Display Wiring Harness

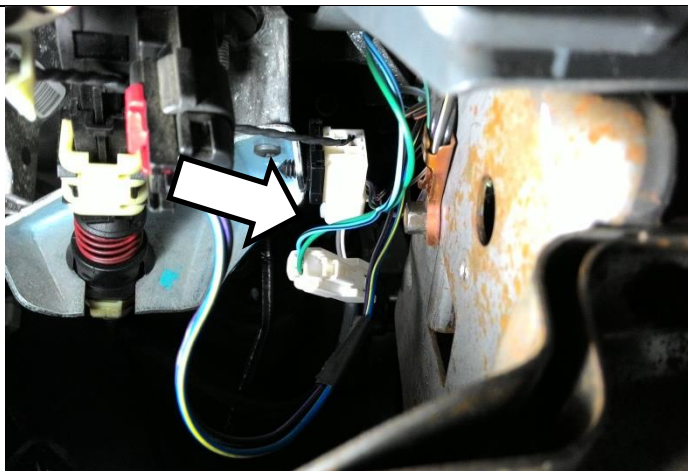
Locate the remaining wiring harness supplied in the kit (1607257). This harness will connect to the shift lever and the gear indicator display.



Route the wire harness through the firewall so the gray plug is located in the engine bay and the other connectors are under the dash. You may either cut a slit in a boot to accomplish this or put the wire through the knock out that would be used for the clutch master cylinder. Here we are going through the hood release cable boot.



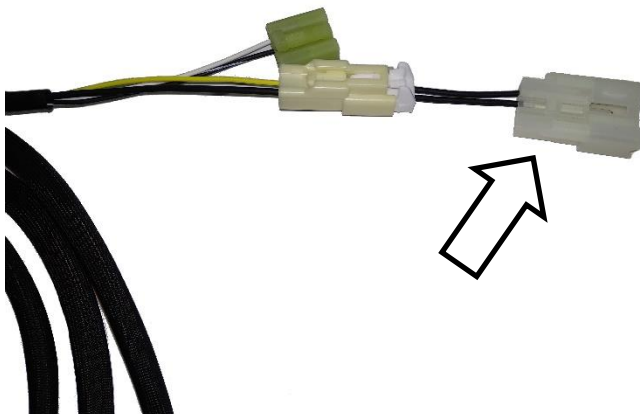
Route the two white plugs behind the dash to the shift lever connectors. Connect the harness to the shift lever and to the trucks stock wiring harness.



NOTE

2003-2006 trucks have a factory 2 pin shifter connector. For these vehicles, remove and discard the supplied adapter.

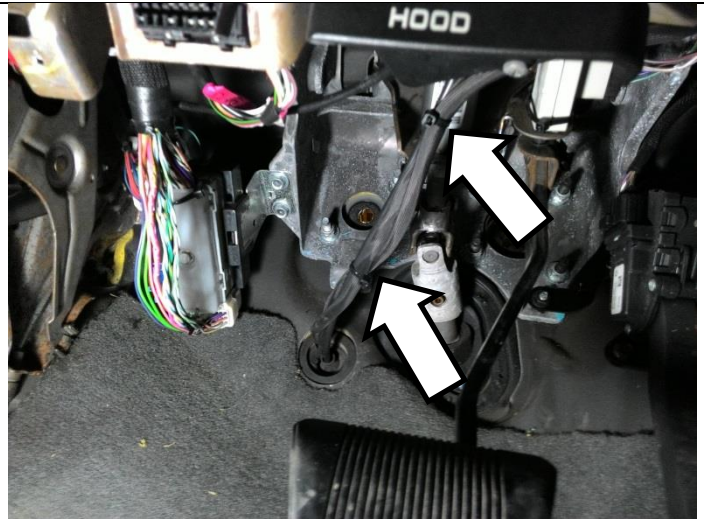
2007 trucks must make use of the supplied 6 pin adapter wire.



Route the small black plug to the location desired for installation of the gear display. This can go anywhere that the wire will reach and is up to the drivers preference. We suggest the lower right corner of the instrument cluster bezel, the wire may be run between the cluster and the bezel.



Install wire ties under the dash to support the harness to the existing vehicle wire harnesses.



Now that the wire harness has been installed the steering column covers may be reinstalled and the knee bolster reinstalled.



Display Module Mounting

Locate the gear display (1607253) and double sided mounting tape (1330054) supplied in this kit.



Clean the surface where the display will be mounted with alcohol or other cleaner to ensure the adhesive sticker will adhere correctly. Plug in the module and stick it down in the chosen location.

Ensure the display is visible to the driver of the vehicle.



Control Module Installation

Locate the control module (1607258) supplied in the kit. This will be installed in the engine bay.



Plug in the gray and black connectors to the module.

Install wire ties on the remainder of these wires to keep them away from the steering shaft or other moving parts.



Mount the module using wire ties in the engine bay. Here we show it attached to the engine wiring harness on the driver's side of the firewall.



Installation should now be complete. Ensure all wiring is correctly secured. Refill the transmission fluid and check for leaks. Reconnect vehicle batteries.

Proceed to functional checks below to verify operation.



Functional Checks – Complete prior to vehicle delivery

Preliminary Check

Start the engine and drive the vehicle.

Keep the TapShifter turned off and check for normal operation of the transmission. The transmission should shift through the gears and the TCC should engage normally with no fault codes.

Check that pressing the Tow/Haul button on the shifter still toggles the Tow/Haul or OD OFF state of the truck.

If transmission does not function normally with the TapShifter turned off, diagnose this first as the transmission must operate normally for the TapShifter to control it.

If the TapShifter kit is suspected to exhibit a defect, disconnect the BD transmission harness from the 8 pin transmission connector and 2 pin speed sensor connector, this would eliminate possible TapShifter kit issues. TapShift Ready transmissions and valve bodies will work with stock control so they are backwards compatible for testing purposes.

Gear Shifting Check

With the engine running, change the operation mode to “Automatic – Mode 1” (refer to operation section).

Put the truck in “D” and while stationary press the - button on the shifter. The gear display should light up with “1” and the truck should now stay in first gear as the truck is accelerated and not shift up. Now, press the + button to put the TapShifter in “2”. Accelerate and observe that the transmission does not shift *above* 2nd gear. Repeat the test for 3rd and 4th gear. Once in top gear, use the shifter to command downshifts to slow the vehicle down.

If this works it confirms the gear control portion of the TapShifter is functional.

To check manual mode functions, change the operation mode to “Manual – Mode 7”. Like before, put the truck in D and press the - button to turn the shifter on. Unlike before, try gearing up earlier than the stock TCM would allow. Then confirm downshifting capability.

If both automatic and manual modes are working, this confirms all functions of the TapShifter.

TCC Lockup Check

With the engine running, change the operation mode to “Automatic – Mode 2” (refer to operation section).

Put the truck in “D” and turn the TapShifter on. Press the Tow/Haul button on the shift lever and observe that the pad lock symbol lights up on the display. If the vehicle is going fast enough the transmission should lock up the torque converter. Confirm this in the lower gears and at speeds low enough that the stock TCM would not engage the TCC to confirm operation.

Troubleshooting

The TapShifter kit is fairly complex as it interfaces with the factory TCM and also can control the transmission. The TapShifter has LED indicators on the PCB for diagnostic purposes and the TapShifter display can show some error codes as well.

POWER Lit when the module is powered. The module power comes from the transmission power only when the engine is running and not in limp mode.

STATUS Will be illuminated solid when the shifter is turned on and controlling the transmission. It will flash if the module detects an error in vehicle speed and governor pressure correlation. The light will be off if the TapShifter is turned off.

SHIFT This light will momentarily flash every time one of the three buttons on the shift lever is pressed. This is used to confirm operation of the shift lever buttons.

VSS Lit when the VSS detects output shaft speed over 500RPM, flashing when speed is over 5RPM. Off otherwise. Used to confirm VSS input.

| | |
|--|---|
| Can't turn on shifter AND can't change modes Gear display never lights up | No power to the module – open cover and check for POWER LED. Engine needs to run and transmission cannot be in limp. Power is from trans power, ground is through OE shifter wiring. Shift lever problem – open module cover and check the SHIFT LED. If it is not blinking when the buttons are pressed check the wiring to the shifter and the shift lever resistance. |
| Gear display flashes lock symbol and won't turn on when pressing the - button | The shifter is disabling operation intentionally due to an observed fault. The padlock flashes 4 times followed by the error number: Error 1 – Module sees 0 VSS with non 0psi governor pressure. Indicates module is not getting VSS signal or the governor pressure sensor is reading too high for zero speed. Error 2 – Governor pressure sensor showing low voltage, likely due to a problem with the sensor or wiring. |
| Torque converter never locks up when TapShifter is on | Check what mode the TapShifter is in. Mode 3 and mode 7 disable the TCC until the driver commands it. For normal daily driving use mode 1 which uses stock TCC control. If using mode 2, 3 or 7: The TapShifter may not be getting a VSS signal, check the VSS LED in the module to confirm operation. In mode 1 the TapShifter follows the OE computer. |
| | |

Wiring Diagram

