



Stage 4, 5 and 6 Transmission Upgrade Kits

Installation Guide

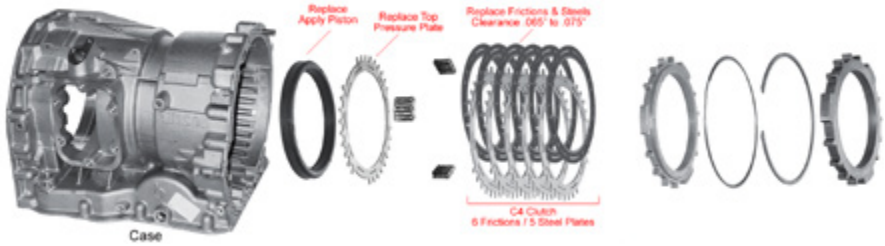
Step 1

After the torque converter is removed, place the transmission into a holder or stand it up in a drain pan on floor. Place transmission with bell housing oriented down. Remove the rear extension housing as an assembly. Remove park pawl pin, park pawl, C5 return spring assembly. Remove P3 sun gear and thrust bearing.

NOTE: Pay attention to the directional install of Torrington bearing. Inverting bearings will result in extreme damage.

Grasp the main shaft splines and lift straight up to remove the main shaft, P2 sun gear, and spacer. Remove P2 planet carrier and thrust bearing. Remove C5 clutch pack and backing plate. Remove P1 planet carrier assembly and thrust bearing. By lifting up with a slight twisting motion will leave the P1 ring gear in place.

We recommend performing all C4 clutch modifications first.



Step 2

Remove the C4 retaining rings while compressing the backing plate. Remove the C4 clutch pack. Remove the C4 piston. Remove 3 spring sets from apply plate. Discard OEM apply plate and clutch pack.

Remove plastic Thrust Washer from the front of the P1 carrier. Using assembly gel install the washer onto the steel shim provided, index tangs on washer to slots in shim. Apply assembly gel to the rear side of the shim and install onto the P1 carrier (shim towards carrier) indexing into the slots on the carrier. Make sure the shim and washer are all the way down (evenly) onto the carrier. Install thrust bearing to the rear of the P1 carrier, retaining with assembly gel. Install the P1 carrier into the P1 ring gear in the case.

Lubricate and install C-4 piston furnished with the Air Bleed hole into line with the top of the case at the 12 o'clock position. Install return springs onto the new .250 Pressure Plate and install with groove side up. Install C-4 clutch pack (furnished). Starting with Friction against Apply Plate and alternating with Kolene® Steel.

(Continued)



Step 2 (Continued)

We recommend soaking Frictions in ATF for a 30 minutes prior to installation. When installing Frictions and Steels, align the slots in each plate with holes in Apply Plate at the 12 o'clock position. Install 6 Frictions and 5 Steels. Install and compress C-4 the backing plate, install Spiral Ring then the Snap Ring. Position gap in Snap Ring should be at the 1:30 position, aligning with the wide gap in the case. Clearance should be from .065" to .075".

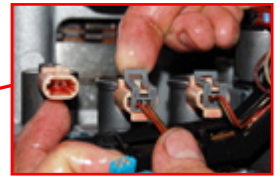
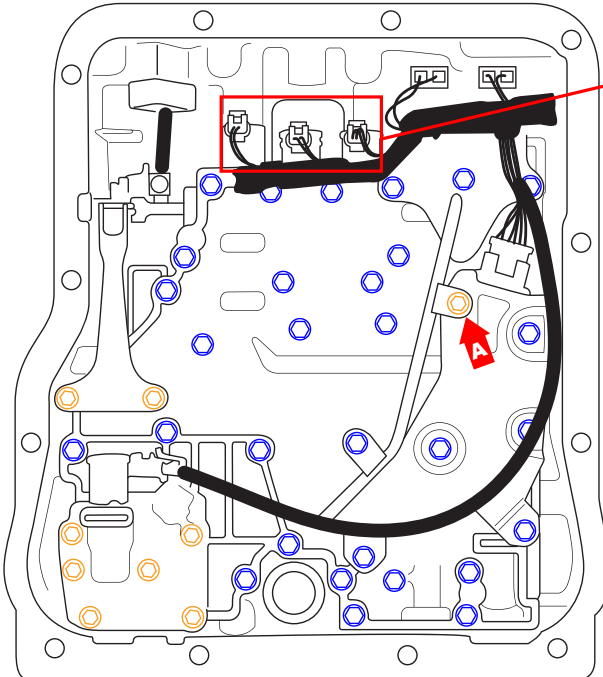
Reassemble the rear section, be sure to align the slot in the Sun Gear Spacer with lube hole in Shaft Shoulder, when installing extension housing. The housing will be spring loaded for the last 1/2" above case. GENTLY pull down evenly with speed handle until flush. Torque to 45 ft.lbs.

Step 3

Remove 12 (13mm) transmission pan bolts

Step 4

After a few years of service, wiring becomes brittle. CAREFULLY disconnect all electrical connections from the Valve Body. Remove bolts. After bolts are out, wiggle the Valve Body to lift it off the dowels. Careful not to lose Manual Valve Link when removing Valve Body.



A. Long bolt goes here.



Gold bolts

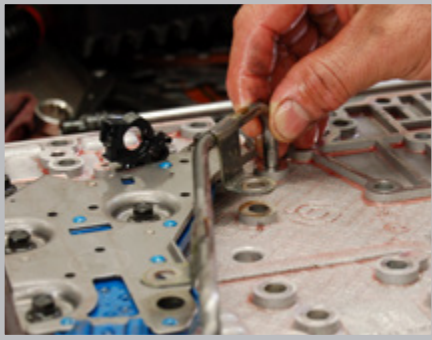


Black bolts

Stage 4, 5 and 6 Transmission Upgrade Kit

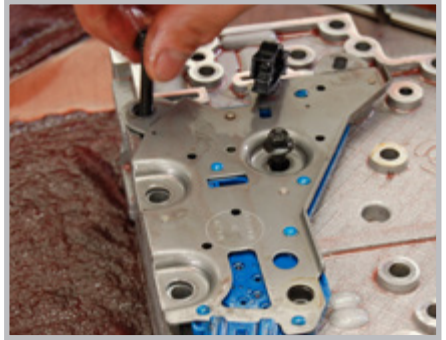
Step 5

Remove tube.



Step 6

Remove Pressure Switch.



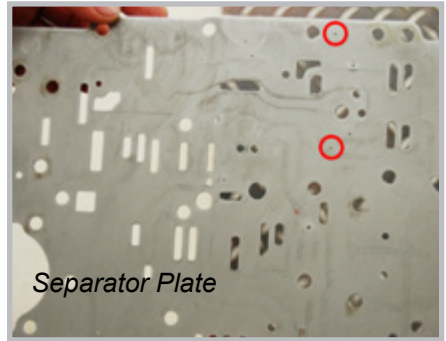
Step 7

Separate the Valve Body to access Separator Plate.



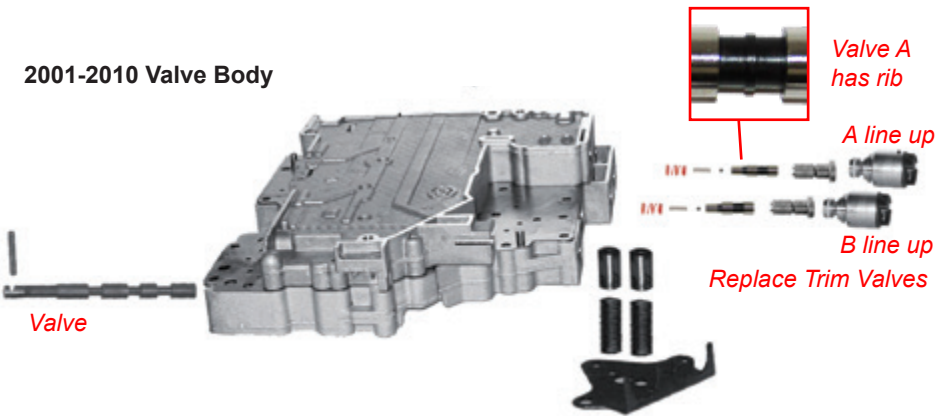
Step 8

Enlarge two holes on separator plate with the smaller drill bit furnished (.125).

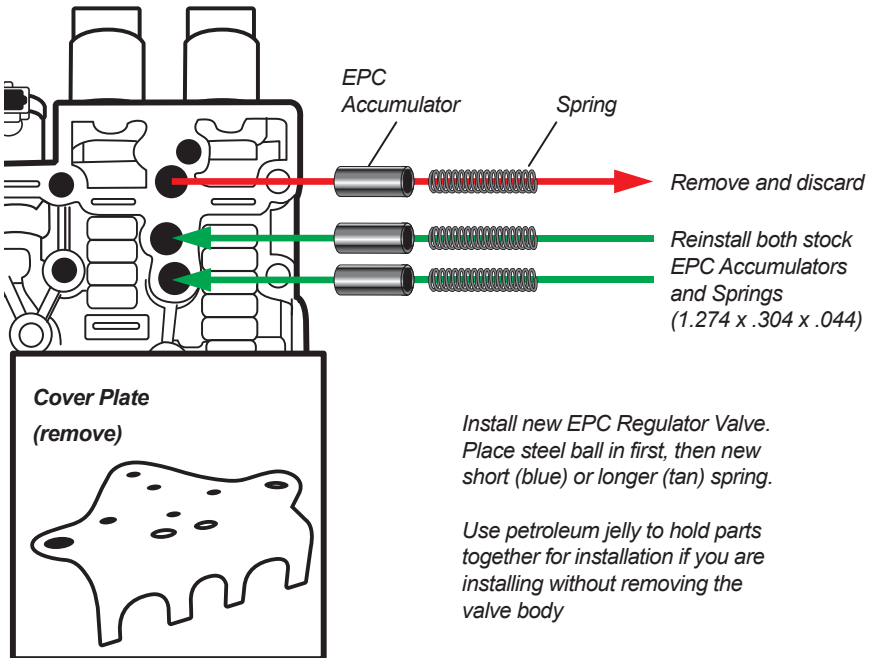


Step 9

Discard original trim valves and the springs from the small end of the valves. Place new ball bearings then the small spring into the hollow end of the new trim valves. Use transmission gel (or petroleum jelly) to hold ball bearing in place. Insert new outer springs over the small end of the trim valves. Install the assembly into the Valve Body. Don't force them, a little wiggle and they will drop in. Install outer spring, solenoid valves and solenoids as shown. Outer spring must be installed in the "A Line up".



2011-2019 Valve Body



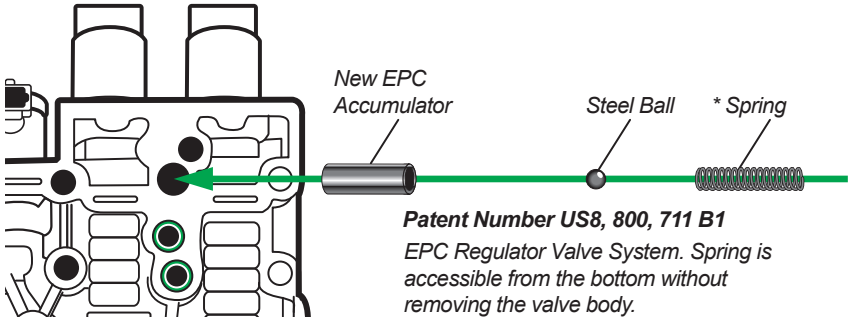
*** EPC Regulator Valve Assembly**

For trucks up to 500HP, use **TAN Spring**.

For trucks over 600HP, use **ORANGE Spring**.

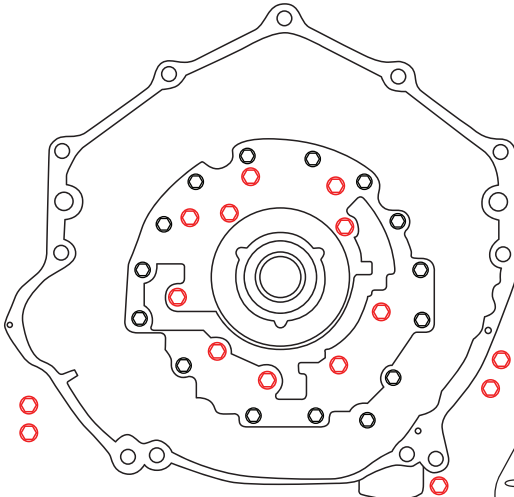
For trucks up to 1000HP, use **BLUE Spring**.

For trucks over 1000HP, use longer **TAN Spring**.



Step 10

With the bell housing off the trans, remove 10 bolts in the bell housing, these bolts have O-Rings under bolt heads.



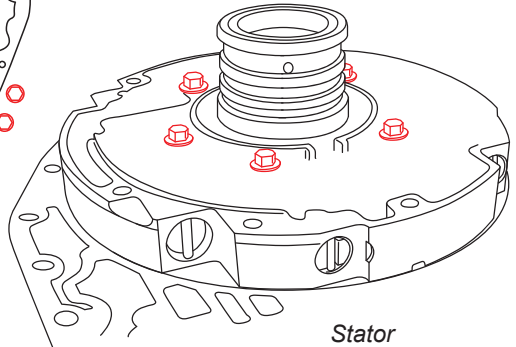
Bell housing - Front View

Remove Bolts



Step 11

Remove 5 bolts from rear.
Lift off stator and flip it over.

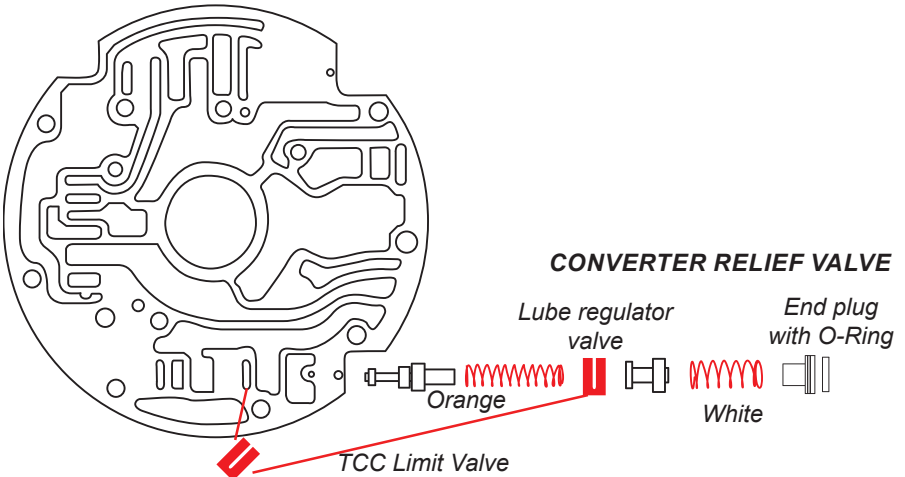


Stator

Step 11

Note: this step is only for 2001-2003 Allison Transmissions. TCC Limit and Lube regulator were redesigned in 2004, no change needed.)

Discard original springs.
Install New springs as shown.



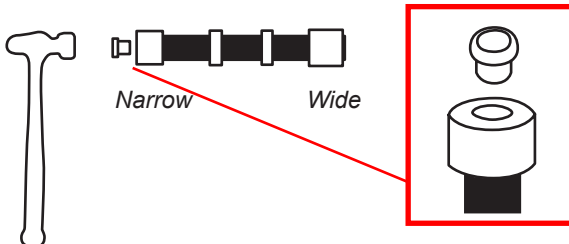
Retainer installs here after
TCC limit valve and spring.

Step 12a (2001-2003 only)

12a 1. Remove and discard original converter flow valve, spring and end plug.



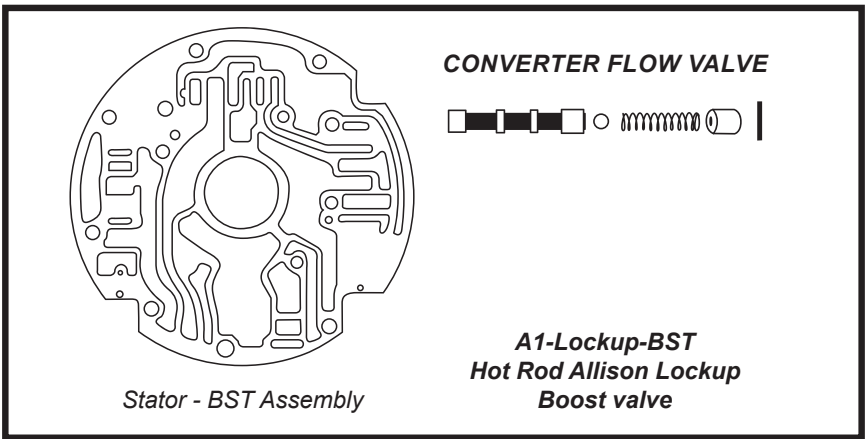
12a 2. Install orifice cup plug in smaller end.



12a 3. Install the New Valve, 3/8" Check Ball, Spring and New End Plug.

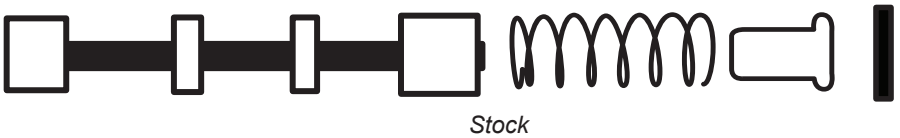


Lockup fluid pressure
White spring = 170 + 20 psi.
Orange spring = 190 + 40 psi.

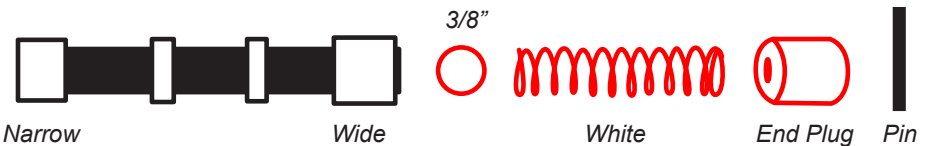


Step 13 (2004-2005 only)

13 1. Remove and discard the original Converter Flow Valve, spring and End Plug.



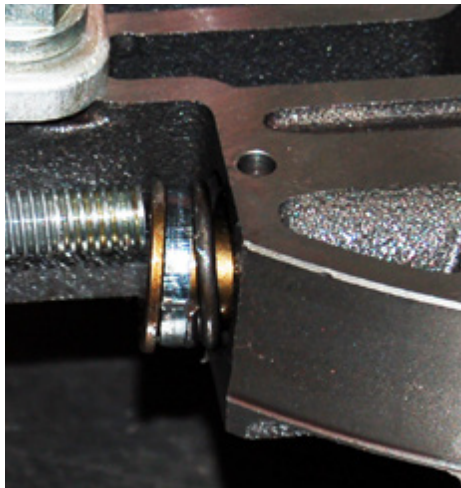
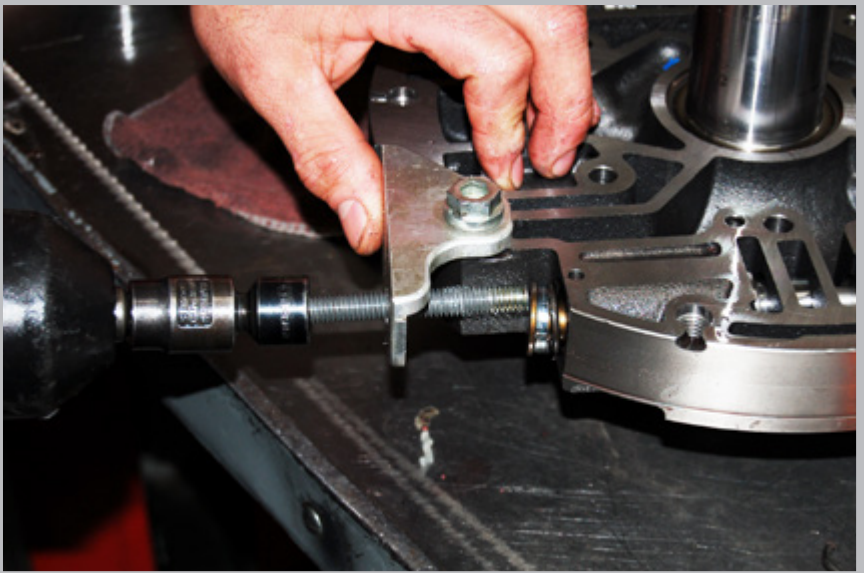
13 2. Install the New Valve, 3/8" Check Ball, Spring, and New End Plug. Reuse pin.



Step 14

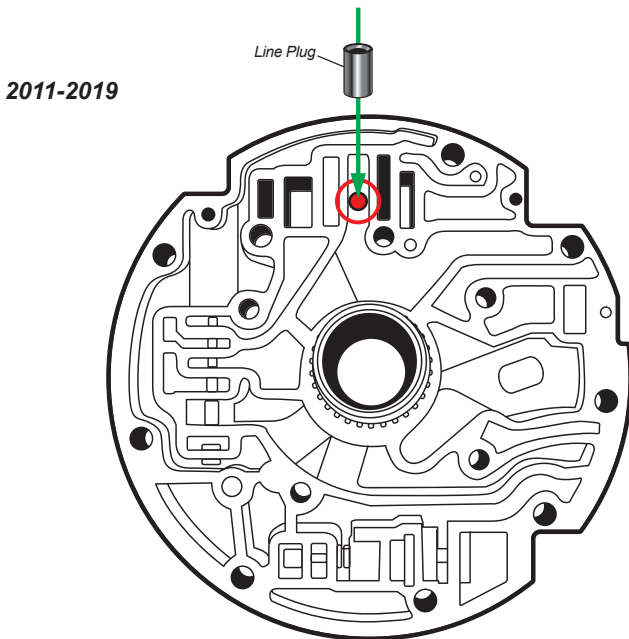
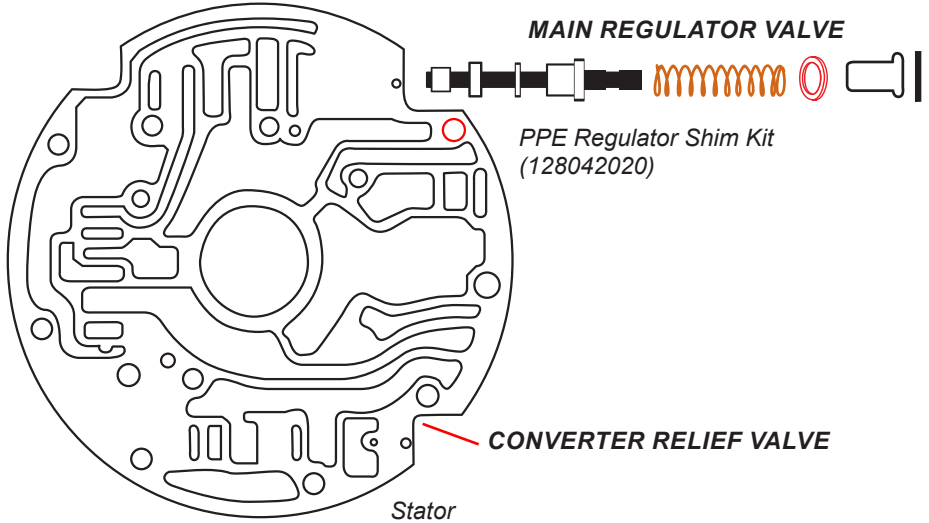
Remove the Converter housing and Stator support assembly. If your Stator has the early style Babbitt bushing, replace it with a new stator support bushing (not furnished).

It is not necessary to remove pump from Converter housing. Using PTO cover bolt, install as illustrated. Depress main regulator valve stop and remove retaining pin. Remove valve stop, no need to remove spring or valve. Install steel shim on spring side of plug, reinstall Plug and Retaining Pin.



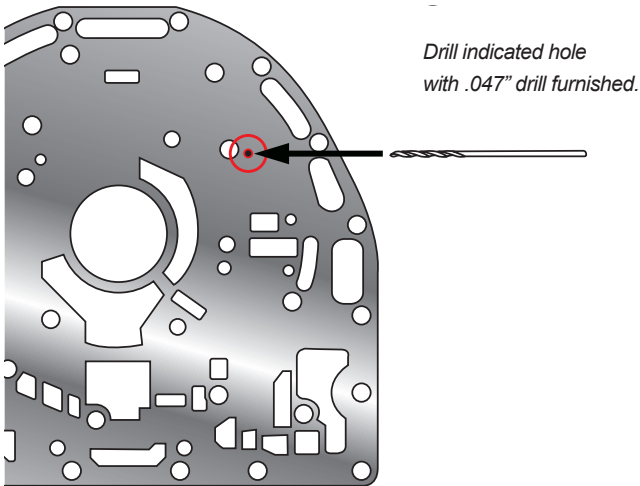
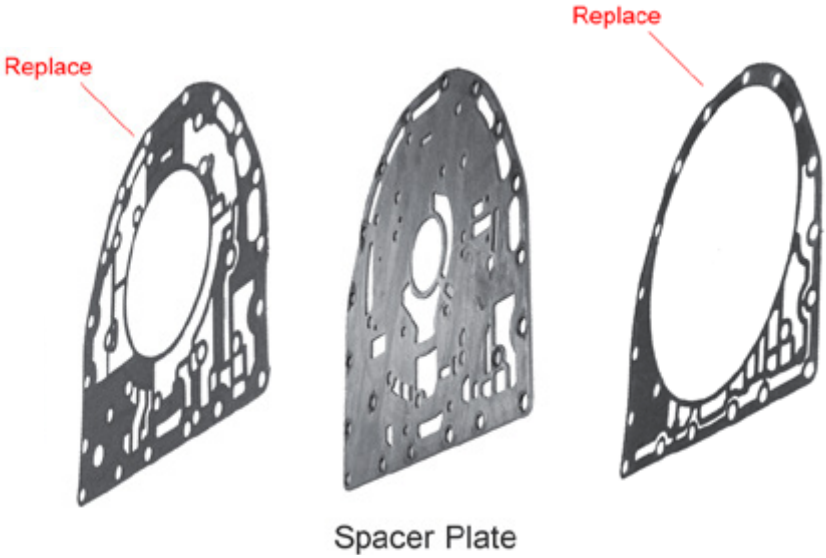
Stage 4, 5 and 6 Transmission Upgrade Kit

Make sure all valves are free. Remove rotating clutch module from transmission by lifting and wiggle as you lift to avoid disturbing main shaft lube to spacer position. Do not lift up on main shaft. Disassemble rotating module and modify as per Valve body kit instructions. Converter housing on bench provides a nice stand for working on and testing module.



Step 15

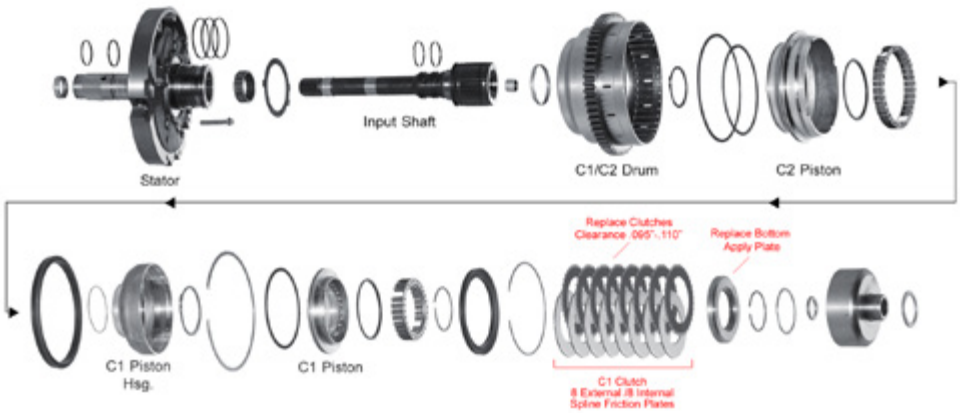
Re-assemble the Stator support to housing with a new gaskets and install into transmission. There have been a few of these leaking from the bell housing bolts due to roughness in the casting. A little silicone under the bolt heads is highly recommended.



Spacer Plate

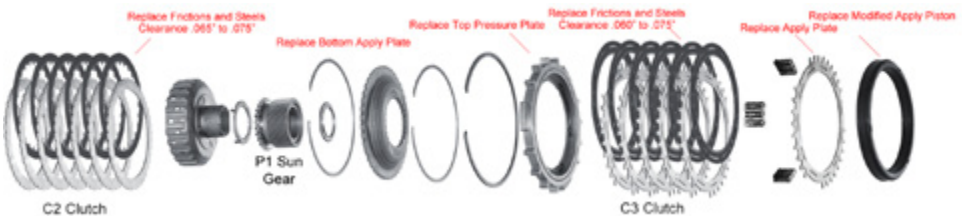
Step 16

Assemble Stator, C1/C2 using the diagram below. Replace C1 clutches and Bottom Apply Plate. (Clearance .095"-.110")



Step 17

Install the stepped Apply Plate flat side up. Make sure the bearing is on the top of the C-1 hub. Install the C-2 hub and start clutch with Friction against Apply Plate. Alternate Kolene® Steel and Frictions (8 Frictions and 8 Steels), ending with Steel Plate on the top. Install the Bronze Washer on C2 hub. Install the P1 Plate, Sun Gear and Snap Ring. Clearance should be from .065" to .075". With the rotating module in the converter housing you may air check both C-1 and C-2 with a rubber tipped blow gun. 3/8" hole at the 7 o'clock position is C1, C2 at 5 o'clock.



Step 18

Depress C3 Top Plate and remove Snap Ring, Top Plate, Clutch Pack, Apply Plate, Springs and C3 Piston. Install C3 Piston furnished, (bleed hole at the 12 o'clock position) install return springs onto new .250" apply plate furnished. Install the Apply Plate groove side up. Install the Frictions and Steels in same manner as C4 (6 frictions and 5 Kolene® steels). Aligning slots with a 12 o'clock hole position. Install the C3 Pressure Plate furnished. Depress Plate and install Snap Ring with gap at the 1:30 position. Clearance should be from .065" to .075".

Retain the bearing with assembly gel. Install the rotating module, making sure the module is fully seated. Install Converter housing with new gasket and torque to 45 ft.lbs. Check end play @ turbine shaft (.011" - .060"). Perform Valve Body modifications per Valve Body Kit instructions.

NOTE: Retain the C1, C3 Pressure Plates and C3, C4 Apply Pistons for core deposit refund.



Step 19

IMPORTANT: Do not start the engine unless the transmission has been filled with transmission fluid, minimum 16 quarts with shallow pan. 18 quarts with heavy duty deep panslike the optional PPE DEEP Transmission Pan.



**PPE DEEP
TRANSMISSION PAN
(128051000)**
Includes Allison DEEP
Pan Filter and Hardware.

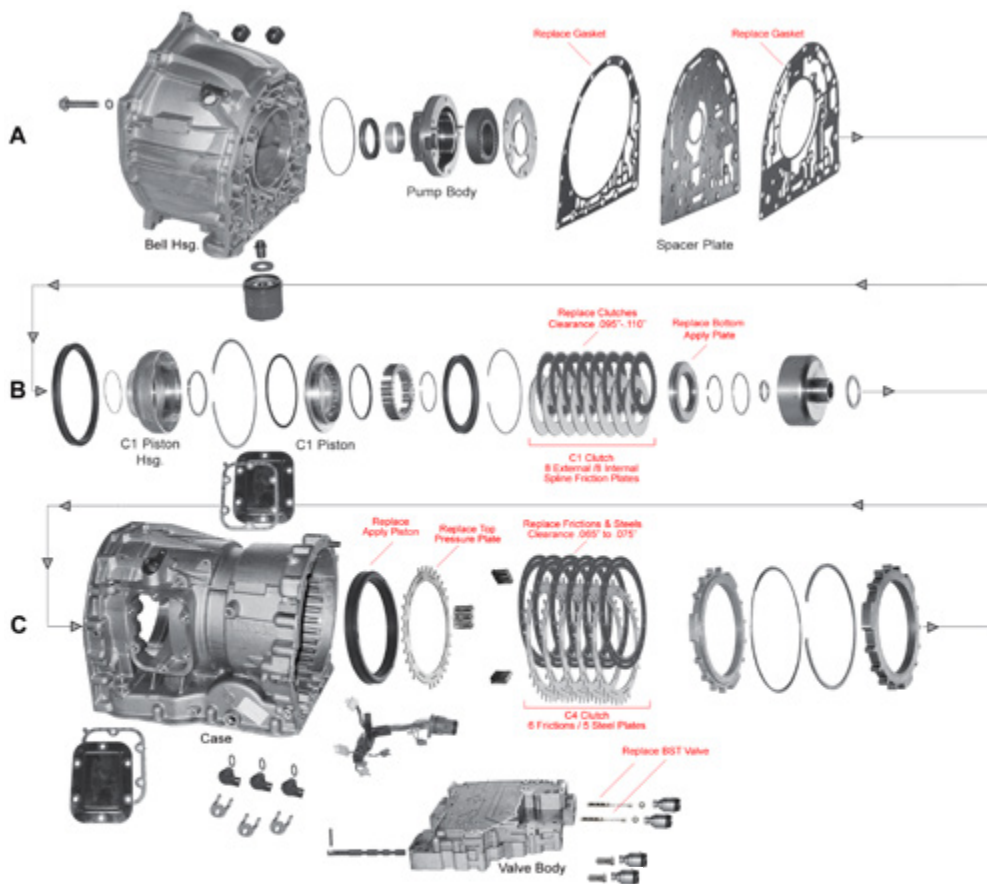
NOTE: To read and clear codes use PPE's Xcelerator Tuner. The transmission relearn procedure will take up to 2 hours, PPE's Xcelerator Tuner can speed up this process by using the re-set transmission procedure.

Allison TCM Fast Learn (with GM Tech 2 scan tool)

Note: Required after installing VBR upgrade kit, transmission upgrade kit or complete transmission .

Note: Engine and transmission need to be at operating temperature (105 – 210 F) or (40 - 120 C)

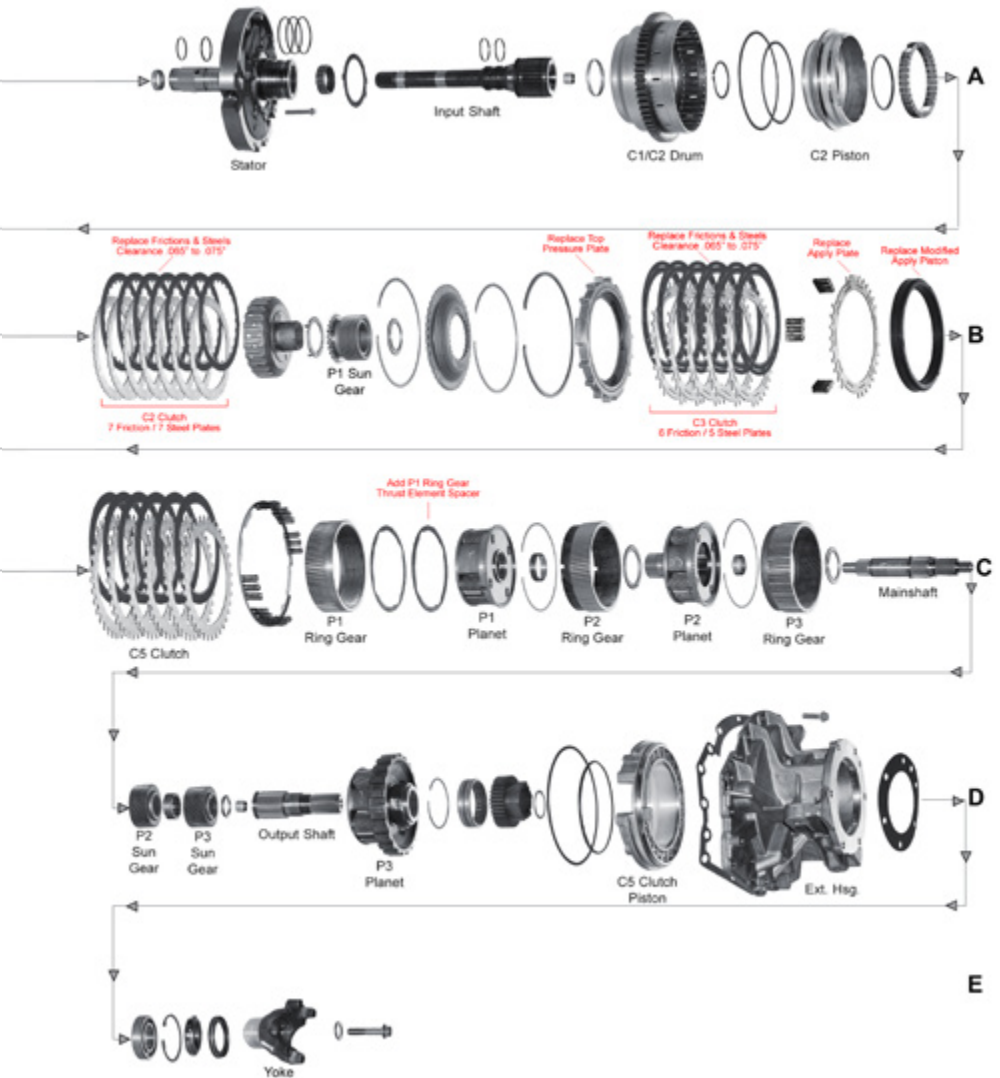
- 1) *Plug Tech 2 into OBD2 port*
- 2) *Power on Tech 2*
- 3) *Select F0: Diagnostics*
- 4) *Select Vehicle Identification for Vehicle Year – for example “2007”*
- 5) *Select Vehicle Identification for Vehicle Type – for example “Light Duty Truck”*
- 6) *Select Vehicle Identification for Product Make – for example “GMC Truck”*
- 7) *Select Vehicle Identification for Product Line – for example “K” for 4WD*
- 8) *Select Vehicle Identification for Product Series – for example “Sierra Classic”*
- 9) *Select F0: Powertrain*
- 10) *Select Vehicle Identification for Engine Type – for example “(D) 6.6L V8 LBZ Diesel”*
- 11) *Select Vehicle Identification for Automatic Transfer Case – for example “YES”*
- 12) *Select F0: Transmission Control Module*
- 13) *Select F4: Module Setup*
- 14) *Select F0: Fast Learn Adapt. Process*
- 15) *Follow screen prompts as directed.*



****NOTE: RETAIN C1/C3 TOP PRESSURE PLATES AND C3/C4 APPLY PISTONS FOR CORE DEPOSIT REFUND!****

*****NOTE- Use the torque converter bolts that are supplied.*****

Stage 4, 5 and 6 Transmission Upgrade Kit



DISCLAIMER OF LIABILITY

Performance products can increase horsepower above and beyond factory specifications. Additional horsepower creates more stress on the drive-train components, which could result in drive-train failure.

Note regarding emissions-related, non-E.O.-legal products: THESE PRODUCTS ARE LEGAL IN CALIFORNIA ONLY FOR RACING VEHICLES THAT MAY NEVER BE USED, OR REGISTERED OR LICENSED FOR HIGHWAY OR OFF-ROAD USE.

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LIMITATION OF WARRANTY

The Seller gives Limited Warranty as to description, quality, merchantability, and fitness for a particular purpose, productiveness, or any other matter of Seller's product sold herewith. The Seller shall not be responsible for the products proper use and service and the Buyer hereby waives all rights other than those expressly written herein. This warranty shall not be extended, altered or varied except by a written instrument signed by Seller and Buyer.

Limited lifetime warranty on all PPE cast aluminum products, and PPE Transmission Coolers. Three (3) year limited warranty on PPE Manifolds and Up-Pipes Kits, and OEM-Length Up-Pipes. One (1) year limited warranty on all other PPE products from the date of sale to original buyer and limited solely to the parts contained within the products kit. All products that are in question of Warranty must be returned prepaid to the Seller and must be accompanied by a dated proof of purchase receipt. All Warranty claims are subject to approval by Seller. Under no circumstances will the Seller be liable for any labor charged or travel time incurred in diagnosis for defects, removal, or re-installation - of this product or any other contingent expenses. Under no circumstances will the Seller be liable for any damage or expenses incurred by reason of the use or sale of any such equipment. In the event that the buyer does not agree with this agreement: the buyer may promptly return this product, in a new and unused condition in its original packaging, with a dated proof of purchase to the place of purchase within ten (10) days from date of purchase for a full refund. The installation of this product indicates that the buyer has read and understands this agreement and accepts its terms and conditions.



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