

# 4L80E Build Tips and Tricks

Congratulations! You have purchased the best rebuild kit on the market for the 4L80E. It should have all the parts you need to build a 4L80E to our exacting standards and proven methods assuming no hard parts damage.

We have developed some methods for the DIY'er to save money and still build an excellent unit without a "boxed" valve body kit. Our Stage II rebuild kit is complete enough that it includes many of the common upgrades some of these kits do, such as a pump boost valve and pressure regulator spring. The rest is taken care of with some minor hydraulic changes to the internals, valve body separator plate, and pump.

Included in our kit are the necessary parts to rollerize the output shaft to case, set rear endplay, rollerize the forward hub to direct drum interface, perform the "dual feed" modification to the direct (3<sup>rd</sup>) clutches, prevent centrifugal apply in low gear, valve body separator plate orifice modification, accumulator modification, converter charge modification, and line pressure increase.

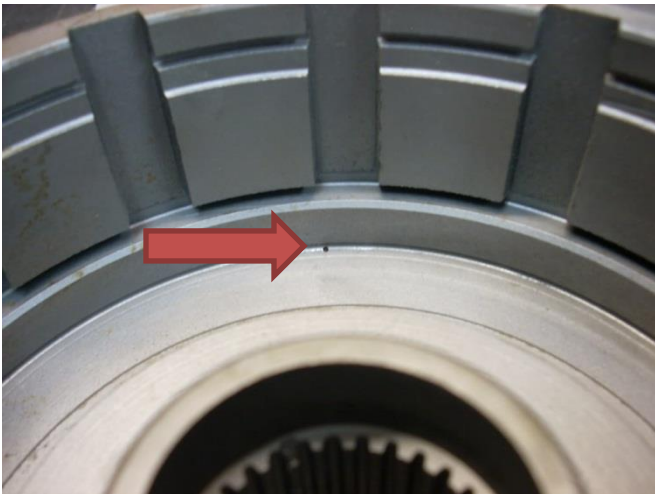
Included in the kit is a Torrington bearing and shims that will fit around the extra capacity case bushing supplied. When installing the case bushing, it is best to install it with the cutouts facing towards the front of the transmission case. It should protrude into the case enough to provide a lip to catch the shim and Torrington, but not so much that it will be rubbing the output shaft flange. Once this bushing is installed and the rear geartrain is ready to be dropped in place, a shim should be set on the case, then the Torrington installed black side down (towards shim/case). Typically, a .020" shim is a good place to start to get rear endplay in the ballpark and check from there.

Our suggestion is to be sure the reaction carrier (front planetary) band surface is smooth without grooves or scoring. Slight grooving should be smoothed using a lathe and stone, then polished. A new Borg Warner band is provided in the kit. It's life and the function of reverse and possibly a transbrake is dependent on proper surface on the reaction carrier as well as setting the servo clearance as described later.

The next modification we suggest and recommend on ALL 4L80E builds is the dual feed modification. This consists of leaving the seal off the direct drum itself. You must keep both seals on piston itself (if using an aluminum piston instead of bonded). You will be removing the seal that divides the piston from the drum. Simply omit it from the build. You also leave the 2<sup>nd</sup> sealing ring from the front of the center support. Both these seals separate the direct from the reverse circuit. We are effectively combining these circuits so the clutches see maximum apply area in 3<sup>rd</sup> gear. When using a stock separator plate a 3/8" cup plug must be installed in the reverse passage feeding the center support as shown.



While the direct drum is apart, we recommend using a 1/16" drill bit to drill a bleed hole at the outer edge of the drum to prevent centrifugal apply of the 3<sup>rd</sup> clutches in low gear and also aid in transbrake release if applicable. Take care not to damage the sealing surface.

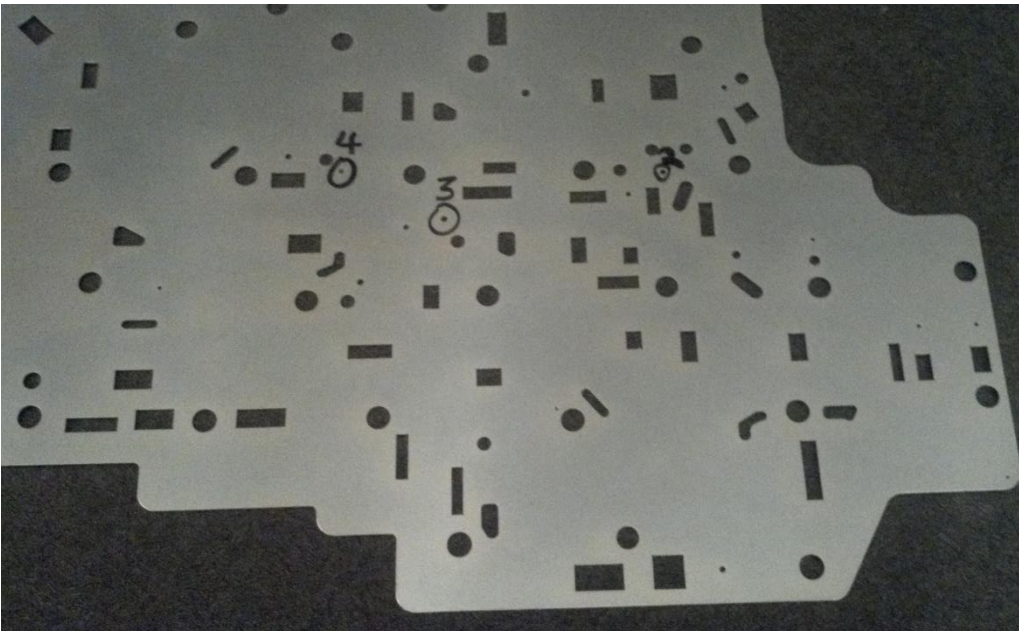


Once all these mods are done, during assembly, install the extra heavy intermediate pressure plate snap ring provided. It may be necessary to sand it with a DA sander or similar to make it fit. Leave the open end or gap at the 3 o'clock position, opposite of the intermediate band anchor for maximum support.

We also have included a pre-machined forward hub assembly with Torrington bearing. It should be installed using TransGel or other assembly gel as shown.



We recommend drilling a .093" hole from the line pressure to converter charge circuit in the pump as shown. This prevents the converter from suffering charge loss during max line pressure situations. The valve body separator plate and accumulator mods have a large part in the shift feel of the unit and also affect long term reliability of hard parts and clutch packs. For stock or towing applications, leave all accumulators functional, maintaining all the stock checkball positions, making only small changes to the orifice sizing.



2<sup>nd</sup> feed at .086-.096"

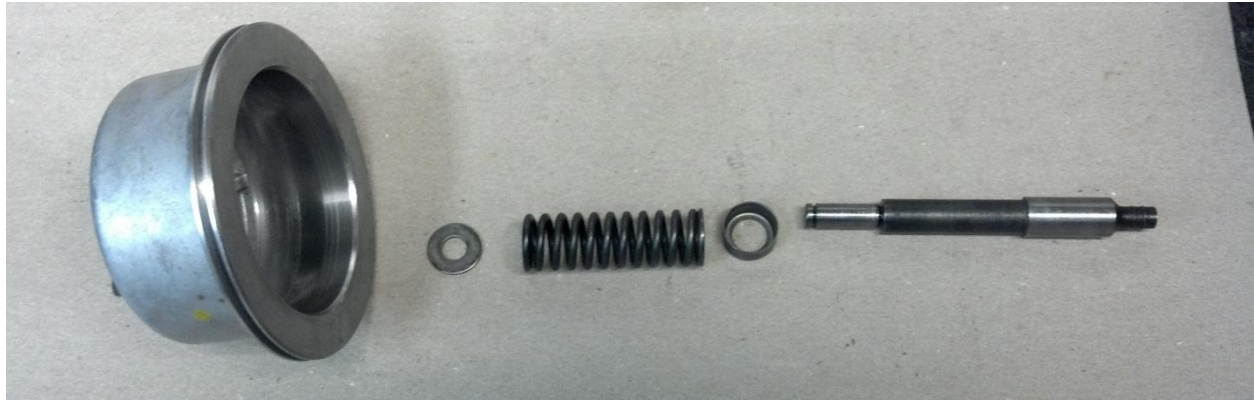
3<sup>rd</sup> feed at .096-.125"  
depending on desired feel.

4<sup>th</sup> feed at .082-.096"

For most combos with aftermarket converters, block the accumulators in the accumulator housing using the block off plate provided, 2<sup>nd</sup> feed to .110-.125", 3<sup>rd</sup> feed to .125-.140", 4<sup>th</sup> feed to .093-.125".

Provided with the kit is a new Sonnax Boost Valve Kit. This kit provides enhanced line pressure. Please follow the instructions included with the kit.

To check rear servo clearance, disassemble the servo as shown. When complete, reassemble by following specific valve body instructions for normal assembly.



Temporarily assemble the servo apply pin, washer, and servo piston together to check servo/band clearance. You are leaving the spring off to be able to feel the band tension as it clamps the reaction carrier.

The servo bore seen here has a sealing surface for the o-ring on the servo piston. The lip shown in red is the beginning of the sealing surface. This is where you want the piston to be and allow rotation of the output shaft in both directions. (Note: It will be easier to turn one way than the other). You want minimal travel from this point to apply the band. Preferably less than .100" of servo travel by hand. This prevents loss of reverse as the band wears. Use a longer/shorter pin or weld to lengthen the pin and grind to shorten.

