



**Installation Manual v3.3:  
Triple-Pack™ Kit  
Allison LCT-1000/2000/2400, 5 & 6 speed models**

**Please read all instructions before installation.**

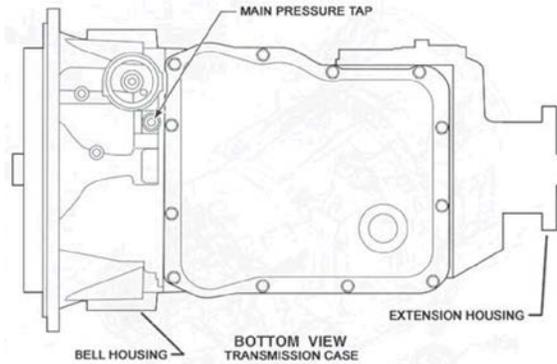
**Items Included with this kit:**

- 1) Five Star™ Viskus Drive Torque Converter
- 2) C-1, C-2, C-3 Clutch Packs
- 3) Ring Gear Spacer
- 4) 6 or 12 mounting bolts (to secure torque converter to flex plate)
- 5) Installation manual for Triple-Pack™ kit
- 6) Thrust Bearing

The Triple-Pack™ kit for the Allison transmission has been designed to correct the failures that are created when power is turned up on the Duramax diesel. The Allison transmission begins to show its weakness in two areas once power is increased over 270 horsepower. The Triple-Pack™ is designed to:

- Eliminate gear slip that can cause fail-safe condition, Neutral condition
- Eliminate torque converter clutch slip that can cause a check engine light and reduce power
- Better match fluid coupling of the converter to the increased torque output of the engine
- Offer much improved torque capacity of the transmission with ATS Clutch packs

In order to replace the factory torque converter with the Five Star™ Viskus Drive Torque Converter, the transmission must be removed from the vehicle. Once the torque converter and transmission have been removed from the vehicle the pump can be accessed. This is the perfect opportunity to install the upgraded clutch packs.



**Figure 1**

- 1) **Stand the transmission on its end, Engine side up.** It is best to tilt the transmission into a drain pan; the pan will catch the excess transmission fluid while the transmission is standing upright.

**DO NOT REMOVE BELL HOUSING WITH UNIT LYING ON PAN.  
Unit MUST be standing up, bell housing up.**

- a. 4 Wheel Drive: Use a flex plate placed inside the drain pan to support the transmission, the output shaft protruding out of the backside of the transmission will prevent the transmission from balancing on it's extension housing. When placing the transmission on the flex plate, the hole in the flex plate will allow the output shaft to protrude through it and the flex plate will support the transmission on the extension housing and allow the transmission to balance, you can remove the bell housing from the transmission without having to support the transmission case.
  - b. 2 Wheel Drive: Use a spacer that is a little bigger than the output shaft diameter of 1<sup>3</sup>/<sub>4</sub>" to balance the transmission on. The transmission will need to be supported on its extension housing from the transmission. This step may require two people. One to balance the transmission and one to remove the bell housing from the transmission housing.
- 2) You are now ready to remove the bell housing (Engine side of the transmission case) from the transmission case.
  - 3) Remove the lower cooler line fitting from the transmission bell housing (Figure 2).



**Figure 2**

- 4) Remove the 20 bolts (marked with X, Y, Z) from the front of the bell housing that attaches it to the transmission case and place them in a convenient place so they can be found later.

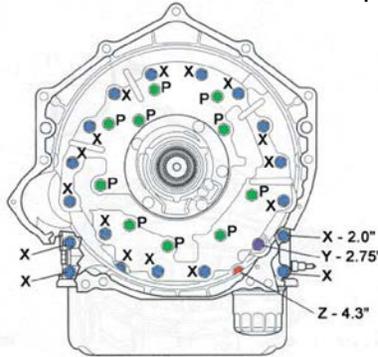


Figure 3

- 5) You are now ready to remove the bell housing from the transmission case. Gently lift the bell housing up off of the transmission case. While lifting upwards on the bell housing, gently twist from side to side. This will help separate the gasket from the bell housing and the transmission case. The bell housing should separate from the transmission freely. **Do NOT use a chisel or pry bar to remove bell housing – it will permanently damage the pump.**
- 6) Remove the input drum (slightly turning the drum as it is lifted out). Place the drum with the turbine shaft down in a hole in your bench.



Figure 4

- 7) Remove the snap ring and set it aside for later use.



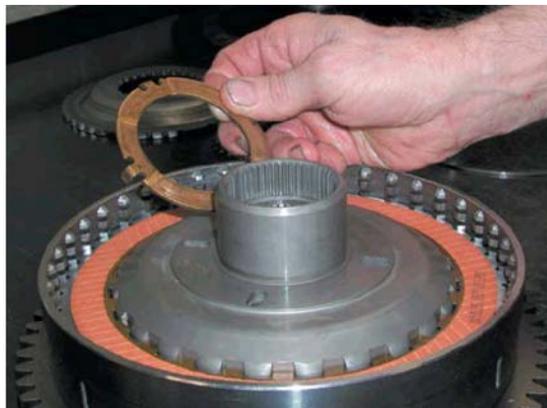
Figure 5

- 8) Remove the sun gear & C-2 clutch cover. Set the sun gear aside for later use. The clutch cover will have other instructions at a later point.



**Figure 6**

- 9) Remove the 4-tab washer (and set aside for use later), and C-2 clutch hub.



**Figure 7**

- 10) Remove and discard the factory Torrington bearing from the top of the C-1 clutch hub. This bearing will not be reused – it is replaced with a bearing supplied in this kit.



**Figure 8**

11) Remove the C-1 clutch hub and set aside for later.



Figure 9

12) Remove the C-2 clutch pack and discard clutches (pressure plate will need to be returned to ATS for core credit).



Figure 10

13) Remove the 2 snap rings for the C-1 clutch pack and set aside for later use. One is a 'roll-in' snap ring and the other is a standard snap ring.



Figure 11

14) Remove the C-1 clutch pack and pressure plate, discarding the clutch pack. Set the pressure plate aside for later use.



Figure 12

15) Install the new C-1 clutch pack. Starting with the thick, apply plate, then an outside spline clutch, then an inside spline clutch, and so on. You will end with an outside clutch on top and will have a total of 14 clutches.



Figure 13

16) Reinstall the C-1 pressure plate and the 2 snap rings. Make sure the top roll-in snap ring seats all the way into the slot.

17) Use .078 to .094 gage pins to check for clutch clearance with the C-1 pack (5/64 to 3/32 drill bits or wire drill numbers 43 thru 48 can also be used as a gauge). The gauges should be able to slide in and out. If clearance needs to be changed, the upper pressure plate must be changed. This clutch pack should NOT be assembled too tight. If set up too tight, the top snap ring cannot be installed. Selective pressure plates can be purchased using the part numbers below from a GM dealer, if required.



Figure 14

Allison Part #'s for C-1 back plate:

- 5.50 mm – 29542420
- 5.94 mm – 29538521
- 6.38 mm – 29538522
- 6.83 mm – 29538523
- 7.28 mm – 29538524
- 7.23 mm – 29538525

18) Reinstall the C-1 clutch hub. You will have to work the hub down as you slide the outer clutches back and forth in order to get them to spline. This operation can be difficult, just keep working the hub and the clutches will eventually spline in.

19) Install the new Torrington bearing (provided) on top of the C-1 clutch hub. Reinstall the C-2 clutch hub.



Figure 15



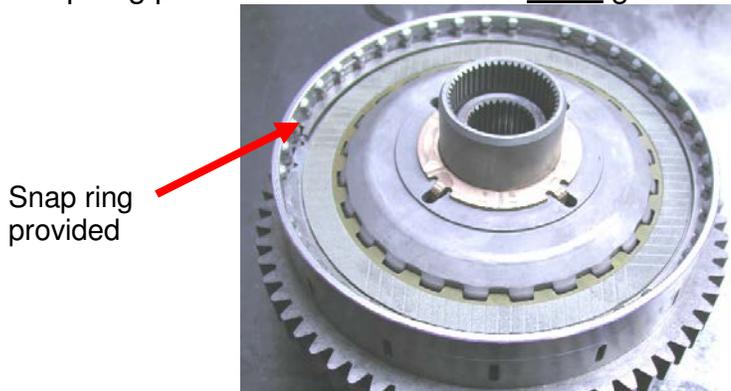
Figure 16

20) Install the ATS C-2 clutch pack (provided) starting with a steel plate, then a clutch, and so on, but do not install the top clutch (Figure 16). Make sure the 4-tab washer is installed on the C-2 clutch hub (Figure 17).



Figure 17

21) Install the snap ring provided in the kit into the lower groove as shown in figure 18.



Snap ring provided

Figure 18

22) Now install the final clutch, then the sun gear and new clutch cover (provided), then the original snap ring.

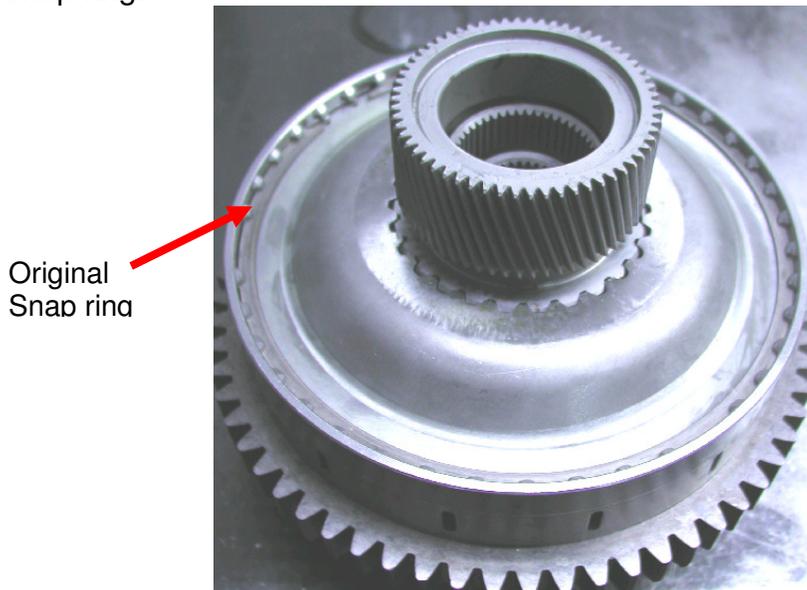


Figure 19

23) Check clutch movement once assembled (as shown). The clutches should move between 0.060" to 0.075". To check precisely, you will need to lift one steel as shown in Figure 20. To check clearance, measure at the adjacent hole using a gauge pins. If using drill bits to check, you can use wire drill numbers 48 thru 52. Use caution not to score or damage the clutch surface while doing this.

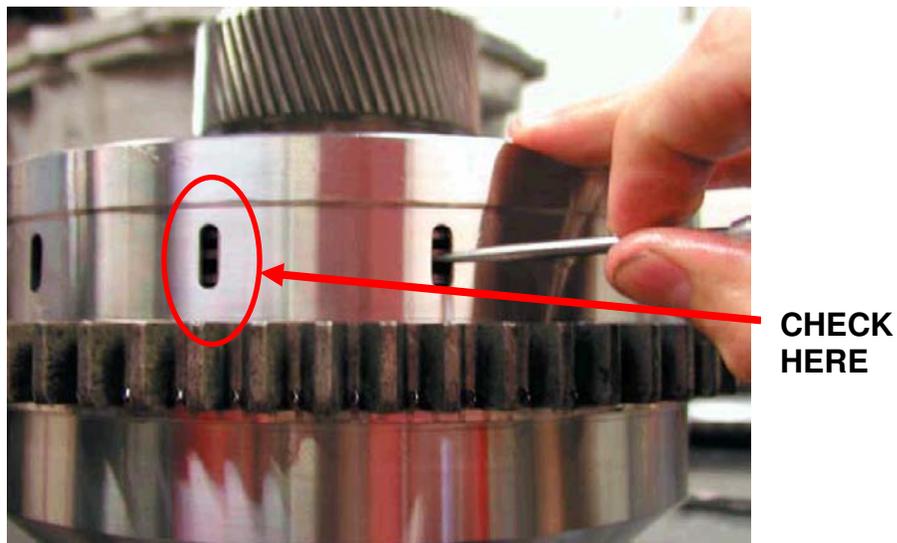


Figure 20

24) Set the input drum aside for later use.

25) With the input drum removed, look down into the case. You will notice a portion of the drive train and the top of the C-3 clutch pack. Locate the snap ring.



Figure 21

26) Remove the snap ring (use care as it is very stiff). The C-3 pressure plate is spring loaded.

27) With the snap ring removed, lift out the C-3 pressure plate and set aside with the factory C-2 cover plate.



**CAUTION:** Do **NOT** lift out the assembly using the shaft. Lift out the assembly as shown in figure 23A shown below.

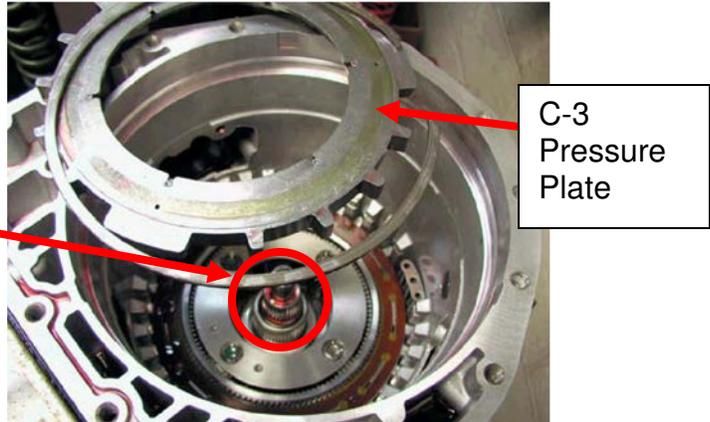


Figure 22

28) Remove the top planetary gear set by lifting it out of the case (Figure 23-A). **Do not pull on the center shaft or C-5 planetary hub (Figure 23-B), as this may dislodge the C-5 clutch pack or the spacer between the two planetary gears on the shaft. If this happens the unit must be taken completely apart to re-spline the pieces back together (Figure 24).**



Figure 23

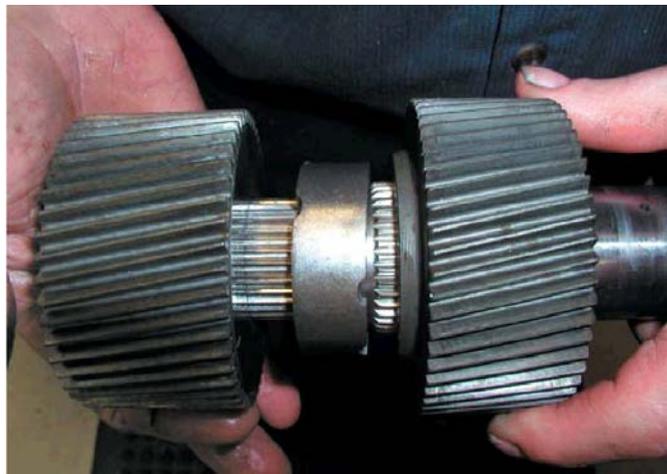


Figure 24

29) The C-3 clutch pack will lift out with the planet assembly.

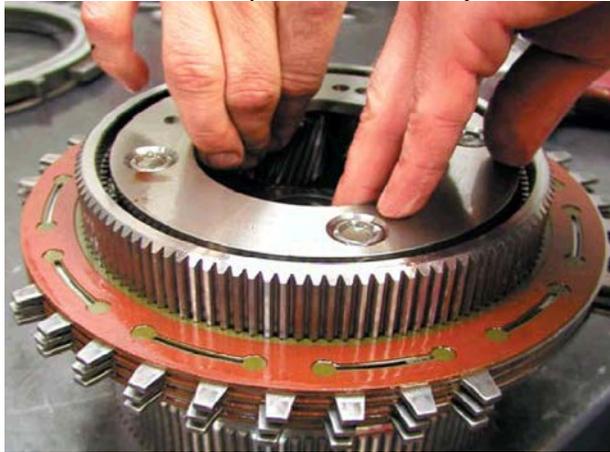


Figure 25

30) Remove the C-3 clutch pack from the assembly and discard (**hold onto the C-3 pressure plate for core return to ATS**)

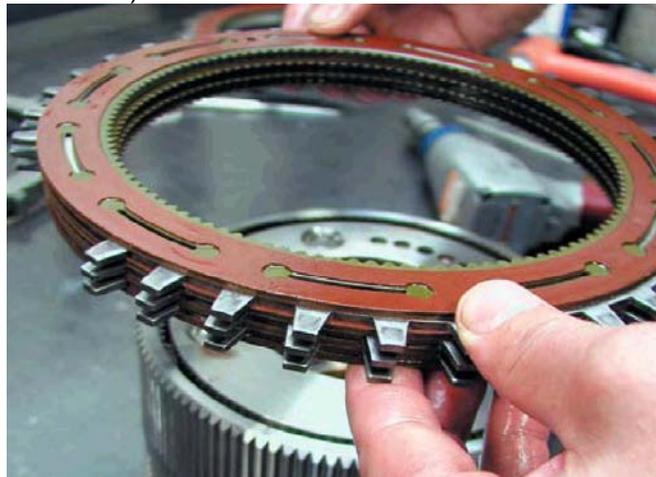


Figure 26

31) Remove the bottom apply plate and springs (Figure 27-A), setting the springs aside for later use. Remove the apply piston (Figure 27-B) and set aside with the old C-2 and C-3 pressure plates (**You will need to return these parts to ATS for core credit**).

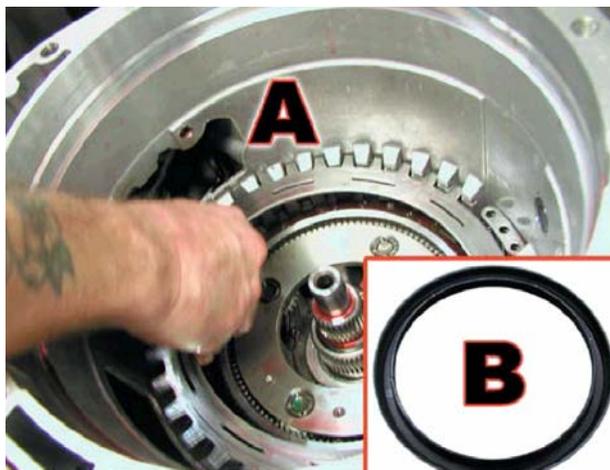


Figure 27

32) Remove the C-3 clutch hub from the planet assembly.



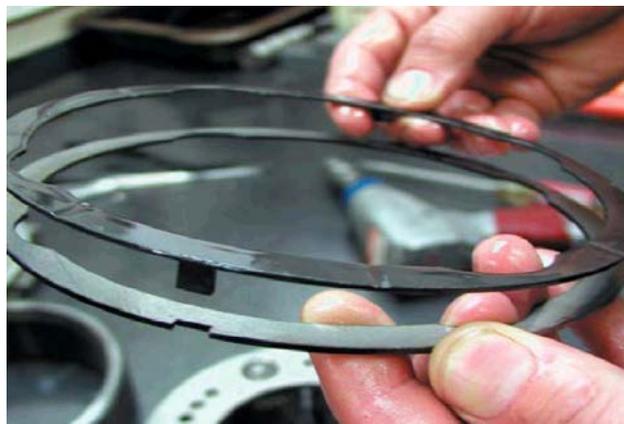
**Figure 28**

33) Remove the C-3 ring gear thrust washer.



**Figure 29**

34) Install the ATS C-3 ring gear thrust washer spacer provided.



**Figure 30**

35) Reinstall the C-3 ring gear thrust washer (making sure to line up the slots on all three pieces). You can use the C-3 clutch hub to snap the thrust washer back into place.



Figure 31

36) Install the new ATS apply piston with the lube hole facing the top of the case using plenty of assembly lube into the case (make sure that it is seated all the way down into the case). NOTE: The piston will squirt oil out of the lube hole as it is pushed into position.

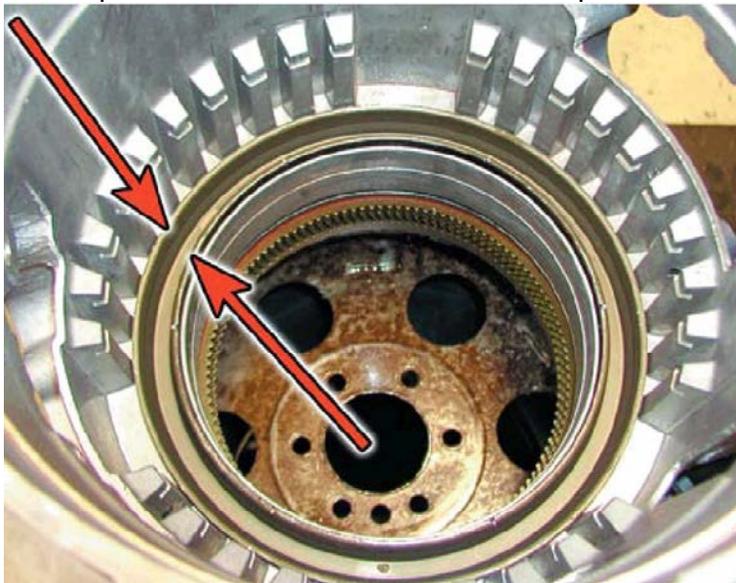


Figure 32



**Warning:** Caution must be used when installing the piston. Improper installation can damage the seal, C-3 and/or C-4 clutch packs. Damage to these items from installation will not be replaced under warranty. The transmission techs at ATS use STP® Oil Treatment in the blue bottle as assembly lube.

37) Install the bottom planetary (C-4) Torrington bearing into place on the planetary. Use a small amount of Vaseline or gel to hold the bearing in place.



**Figure 33**

38) Reinstall the planetary carrier into the case. Use care to fully spline the planetary all the way down. NOTE: If the planetary is not splined all the way down, installation of the C-3 pressure plate and snap ring will be impossible.



**Figure 34**

39) Install the top Torrington Bearing on the planetary.



**Figure 35**

40) To check for clearance, **temporarily** install all clutches. Install the ATS apply plate (Figure 36), thin steels & clutches (Figure 37), pressure plate & snap ring (Figure 38). Then using a filler gauge, measure clearance between snap ring and pressure plate. Clearance should be .075–.085. If clearance is too much, install a thick steel (provided) in place of a thin one, and re-measure.

**Note:** It is easiest to check this clearance with the valve body removed. Pin gages or feeler gages work best, however, drill bits can be used as well (wire drill numbers 44 thru 48).

Once clearance is checked, remove all clutches and proceed with step 41.

**Figure 36****Figure 37****Figure 38****Figure 39****Figure 40**

If you are installing a C-4 clutch pack it will measure 1.040 to 1.050 and will not need to be measured for clearance as it is a pre-set pack.

41) Install the C-3 ring gear over the planetary.

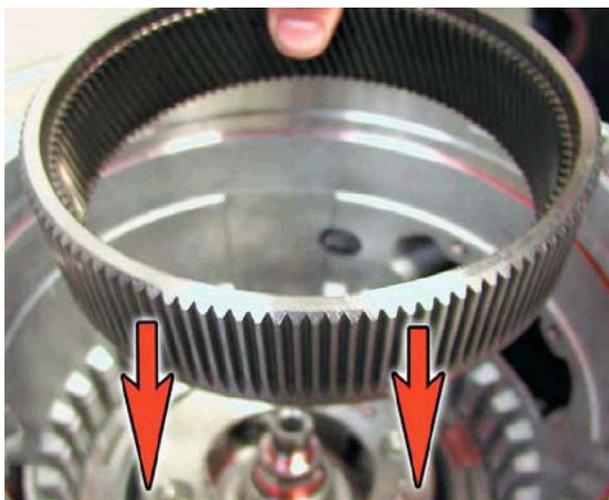


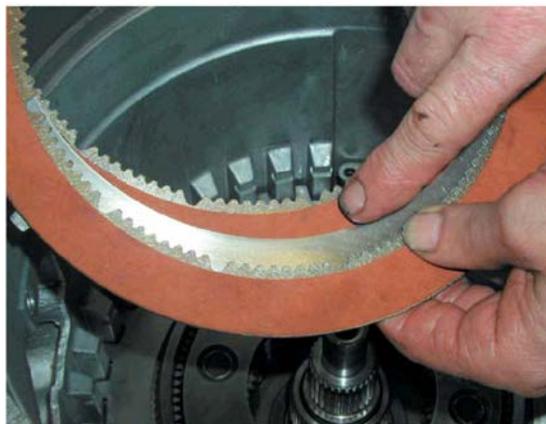
Figure 41

42) Install the ATS bottom apply plate with the springs installed.



Figure 42

43) Install the new ATS C-3 clutch pack into the case. Start with a clutch, then steel, making sure the slots or notches line up on the clutches, ending with a clutch on top.



**Figure 43**

44) Install the new ATS pressure plate and snap ring. Use care to seat the snap ring firmly into place.

**Figure 44**

**Note:** If the snap ring will not go in, the C-4 planet is not splined down all the way.

45) Reinstall the input drum back into the case, (slightly turning the drum as it is placed back into position).

**Figure 45**

46) Reinstall the front pump and bell housing assembly (making sure that pump modifications are complete). Reference steps 3-9 for reassembly. Torque bolts to 38-45 ft-lb. After installing the bellhousing onto the transmission, and bolts are snug, you must be able to turn the input shaft. If you can't turn the input shaft, then something is not splined up, or is incorrectly assembled inside the transmission.

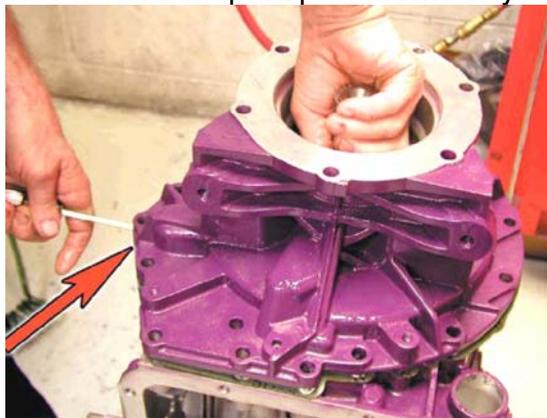
47) If installing C-4 and C-5 clutch packs you will turn the transmission over at this point and stand it on its bell housing to access the tail housing.



**Figure 46**

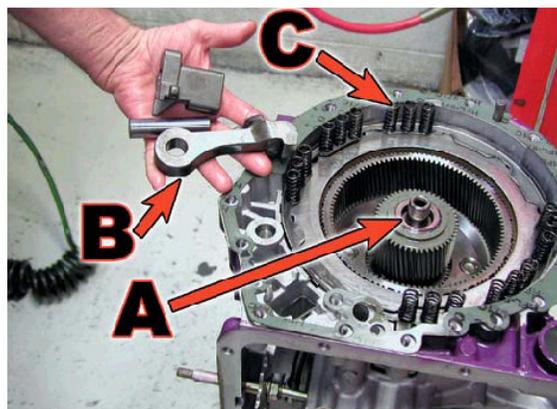
48) Remove the 16 bolts holding the tail housing to the case. The housing should separate from the case slightly.

49) Using caution not to stretch the park pawl spring, lift the housing and planet assembly off of the case. Use a screwdriver to hold the park pawl down as you lift the housing off.



**Figure 47**

50) Remove the thrust bearing from the P3 planet or sun gear; note the direction that it seats in on the sun gear (Figure 48-A).



**Figure 48**

51) Remove the P3 sun gear, main shaft, spacer, and P2 sun gear (there is a thrust bearing between the P2 sun gear and the planet).



**Figure 49**

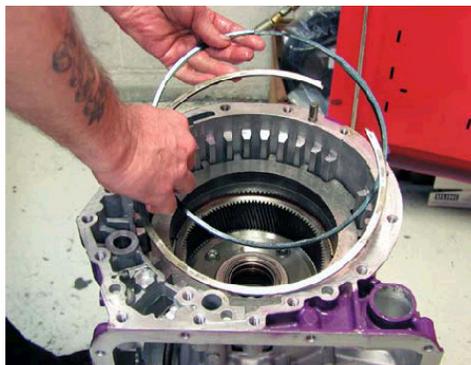
52) Remove the park pawl assembly pin, followed by the park pawl, spring, and apply glide. Be sure not to stretch the spring out of shape it will need to be replaced if this happens (Figure 48-B).

53) Remove the P2 planet and the C5 clutch pack with its backing plate.



**Figure 50**

54) Remove the snap rings holding the C-4 pressure plate in place (there are two). One is the same as the C-3 snap ring; the other is a roll-in style.



**Figure 51**

55) You can now lift out the P1 planet and C-4 clutch pack. This is done the same way as the C-3 clutch pack.



Figure 52

56) Remove the old C-4 apply piston.

57) Install the new ATS piston (provided) with the C-4 clutch pack kit. Refer to steps 34-40 for piston and clutch installation and clutch clearance.

58) Make sure that the thrust bearing is on top of the input drum sun gear and that it did not stick to the bottom of the P1 planet.

59) Reinstall the P1 planet, making sure that the spacer and plastic washer are still in place from the C-3 clutch pack installation.

60) Make sure that the thrust bearing is on top of the P1 planet and install the C-4 clutch pack. This is similar to how the C-3 clutch pack was installed.

61) Install the inner snap ring.

62) Install the outer snap ring.

63) Reinstall the P2 planet, making sure that the sun gear thrust bearing is on top of the planet.

64) Install the main shaft first, then the P2 sun gear with recessed side facing down.

65) The side of the main shaft has a hole that is located above the P2 sun gear. This is a lube hole for the P2 and P3 planets, which must be aligned for proper lubrication of the planets. Install the spacer, making sure that one of the wide slots is positioned at the hole on the main shaft (Figure 23).

66) Install the P3 sun gear with the recessed side up with the thrust bearing on top.

67) The C5 clutch steels will have numbers stamped near the outside. Most, if not all, will have a number '2' stamped on them. Sometimes they will be stamped with the number '3'. If the steels have the '3' stamped on them they will need to be set aside for later.

68) When reinstalling the factory C5's or new C5 clutches from ATS, begin with the backing plate, then a clutch, then steel and so on. If there is a steel with the number '3' it will go on top.

- 69) Reinstall the C5 return spring (it will only install one direction, as there is an ear at the bottom of the spring housing that fits into a slot in the bottom of the case (Figure 46-C).
- 70) Reinstall the park apply guide, spring, park pawl, and pin. Make sure that the spring is holding the park pawl back to the apply guide tightly. If it is not, it will need to be replaced at this point (when not installed the coils in the spring should be tight).
- 71) Reinstall the tail housing assembly back onto the case. A pair of channel style locking pliers works well on the output shaft to re-spline the P3 to P2 planet. NOTE: The housing will not drop all the way down and will be raised about one half inch due to the C5 return spring.
- 72) Reinstall the 16 bolts to reattach the housing, using a star pattern to tighten the bolts. Work around the housing using this pattern in order to pull it down and draw the seams together evenly.

**Special Notes:**

Fluid type: TransSynd™ transmission fluid or DEXRON™ III transmission fluid is recommended. Allison recommends TransSynd™ for extreme applications.

Transmission fluid level is critical; there is most commonly a check engine light that will accompany a torque converter change. The check engine light will set due to the low transmission fluid level when filling the transmission. Do not be alarmed by the light, it will reset with a few ignition cycles. If you have a scan tool you can also reset it at the end of your final road test.

Standard refill after service is as follows:

After torque converter replacement and pan drop – approximately 15 quarts

After pan drop or valve body replacement – approximately 10.5 quarts

If you are installing our Co-Pilot at the same time it will save you some time to perform the main valve body modifications when the transmission is on the ground.

We also recommend the installation of an ATS high capacity aluminum pan at the same time the ATS Triple-Pack Kit or Co-Pilot kit is installed.

Be sure to visit [www.ATSDiesel.com](http://www.ATSDiesel.com) for other products for you or your customers!

**Notes about Startup procedure after Installation**

Keep the vehicle in park during first ten minutes of startup. This will allow any debris in the cooling system to fall into the sump instead of going into the valve body.

To avoid a fail-safe condition and/or check engine light, the recommended procedure is to fill the transmission with a minimum of 6 quarts (with stock pan) of fluid before startup. With the high capacity pan you will want to fill with 11 to 12 quarts before startup.

Once the engine is started, allow it to run for 4-5 seconds and then shut off the ignition. Allow the vehicle to sit for 5-10 seconds and then restart the engine. This will purge the air from the

system before the OEM computer detects the low pressure (therefore setting the check engine light and trouble code). **It is recommended to let the vehicle idle for 5-10 minutes, in park, before putting into gear, to let oil circulate, and purge air from the system.**

### **Scan Tools**

Different scan tools can often be misleading. The only scan tool that ATS has found to be completely effective at thoroughly clearing trouble codes in the computer is the GM Tech II scanner and the Viewtronics hand-held scanner. Many other scan tools on the market display to the user that they are clearing the codes, when in fact they are not. This condition of not completely clearing the codes has been exhibited repeatedly with the SnapOn scanners. Disconnecting the battery cables from the battery terminals WILL NOT clear the codes or the adaptive strategy that governs shift behavior. Feel free to contact our tech department for questions or details.

### **Diagnostics**

If a no engagement condition exists after installing the transmission, the 20-pin connector can be unplugged from the back of the unit with the engine running. With the 20-pin connector disconnected from the transmission, the transmission will engage forward and reverse. This ensures the integrity of the internals on the transmission.

### **Have Any Questions?**

Thank you for purchasing the Allison LCT-1000/2000/2400Triple-Pack™ Kit. Please check our website at <http://www.atsdiesel.com> for technical support and other performance products such as the 5-Star™ torque converter, ATS High Performance Valve Body and ATS High Performance Transmission along with our full line of power enhancers. Please call or e-mail our Technical Service Department, 8:00am to 5:30pm Mountain Time, Monday through Friday.

#### Contact Information

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We strive to make our instructions as clear and complete as possible. To achieve this, our instructions are under constant construction. We encourage you to visit our website to check for the most up-to-date manuals and diagrams as well as other information. If you have any suggestions as to how we can improve this installation manual, let us know at <mailto:Suggestions@ATSDiesel.com>.

ATS Diesel Performance  
Limited Warranty Statement

ATS Diesel Performance warrants the original purchaser that any parts purchased shall be free from defects in material and workmanship. ATS Diesel Performance is the warrantor of this product, in the event this product is purchased from a distributor or retailer other than ATS Diesel Performance, the customer must contact ATS Diesel Performance for any warranty concerns, not the purchasing dealer. A defect is defined as a condition that would render the product inoperable. This warranty does not cover deteriorating of plating, paint or any other coating. ATS liability is limited to the repair or replacement, at ATS's option, of any warrantable product returned prepaid with a complete service history and proof of purchase to the factory. A valid proof of purchase is a dated bill of sale. Repaired or replaced product will be returned to the customer, freight collect on a like-for-like part number basis. Accepted warranty units, which have been replaced, become the sole property of ATS.

A Return Product Authorization number, obtained in advance from an ATS customer service representative, must accompany products returned for warranty determination. ATS will be the final authority on all warranty decisions.

This warranty shall not apply to any unit which has been improperly stored or installed, subjected to misapplication, improper operating conditions, accidents, or neglect; or which has been improperly repaired, altered or otherwise mistreated by the owner or his agent.

This warranty shall terminate at the end of 12 months in service with the original user. Labor cost incurred by the removal and replacement of an ATS product, while performing warranty work, will be the responsibility of the vehicle owner; in no case does the obligation of ATS Diesel Performance exceed the original purchase price of the product as indicated on the original bill of sale.

**Except as set forth in this warranty, ATS disclaims any implied warranty, including implied warranties of merchantability and fitness for a particular purpose. ATS also disclaims any liability for incidental or consequential damages including, but not limited to, repair labor, rental vehicles, hotel costs or any other inconvenience costs. This warranty is in lieu of all warranties or guarantees, either expressed or implied, and shall not extend to any customer or to any person other than the original purchaser residing within the boundaries of the continental US or Canada.**

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