



Allison LCT1000



AUTOMATIC TRANSMISSION
REBUILDERS ASSOCIATION

Presented by:
Mike Souza
ATRA Senior Research
Technician



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Generation Changes

2000 to 2005 Gen I Allison LCT1000 are 5 speeds. In 2004 the “G” solenoid was added to lower line pressure in Park & Neutral to reduce pump whine because these units worked on full line pressure. Most pump whine complaints could be heard more on gas vehicles while sitting in park and neutral. There were also several updates to the pump for this concern.

2006-2009 Gen II the Allison transmission became a 6 speed. In 2006 the Trim Solenoids were changed to Pressure Control Solenoids. The neutral start back up switch was changed to an internal mode switch.

2010-13 Gen III Allison is still a 6 speed, the “G” solenoid was eliminated and a Main Modulating Solenoid was added to control line pressure.

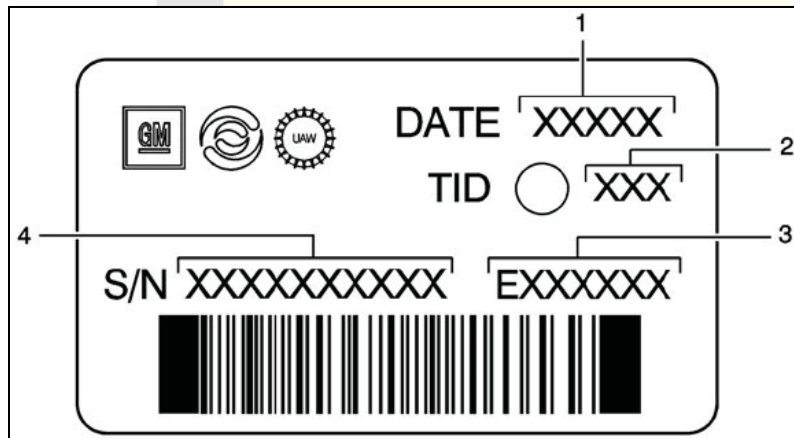
2014 Gen IV the Allison transmission became an 8 speed.

Along with these changes there are many major changes to internal components as well. The some internal components cannot be interchanged, unless as complete assemblies. Other components cannot be interchanged at all.



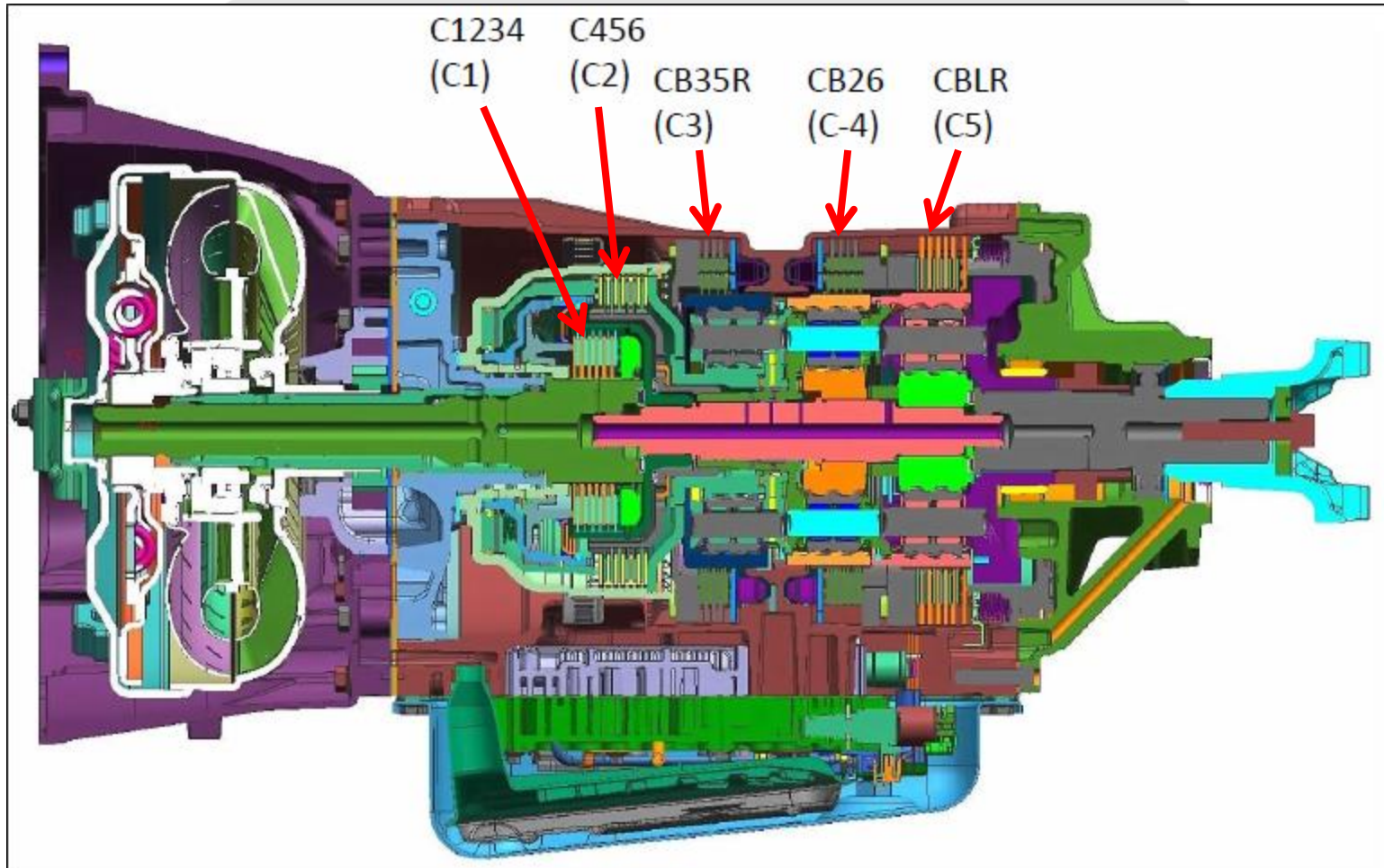
LCT1000 Identification

- (1) Date of Manufacture
- (2) Transmission Identification Number
- (3) Engineering Feature Configuration Number
- (4) Serial Number





Component Identification





5 & 6 Speed Apply Chart

Up to 2005 Gen I Allison LCT1000 are all 5 speeds. In 2006 to acquire six forward gears the C3 Clutch is released and the C4 Clutch is re-applied.

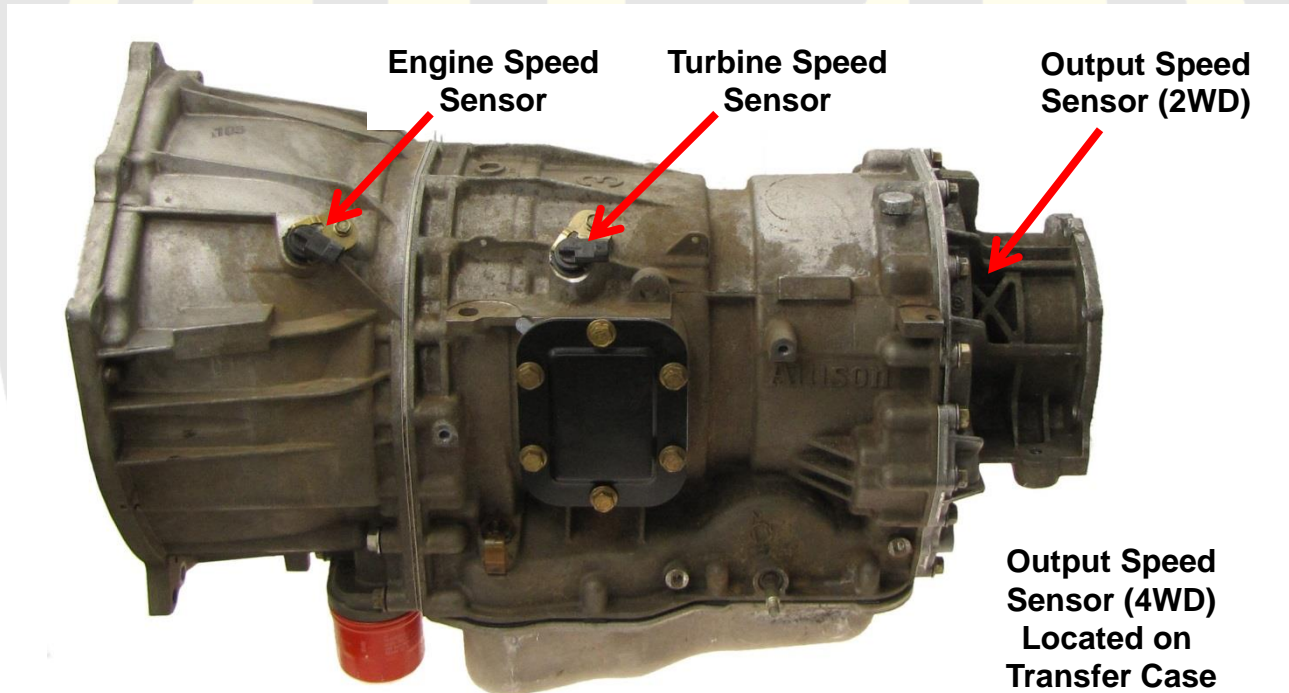
LCT 1000 Clutch Apply Chart					
Gear	C1	C2	C3	C4	C5
Rreverse			X		X
Neutral					X
1st	X				X
2nd	X			X	
3rd	X		X		
4th	X	X			
5th		X	X		
6th		X		X	
6th Gear is 2006 and Up					



Speed Sensors

The three Speed Sensors are two wire pulse generators that produce an A/C pulsed voltage. The generated A/C voltage can vary from 150mV – 15V depending upon RPM.

The wiring to the sensors have a shielded ground to prevent electro magnetic interference EMI.



4 Wheel Drive Case shown

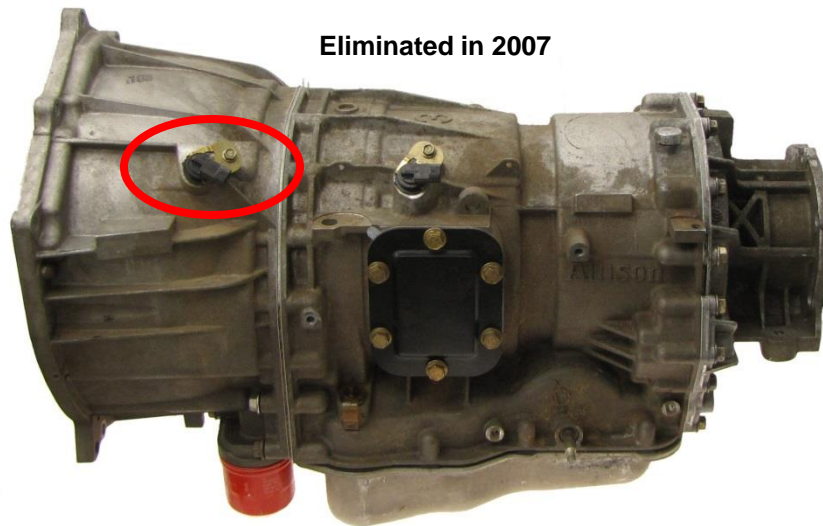


Speed Sensors

The Engine Speed Sensor monitors the protrusions (dimples) on the torque converter. The gap between the engine speed sensor and the converter dimples is approximately 0.033”.

Damage to any of the converter dimples will result in an uneven signal from the engine speed sensor to the TCM causing a complaint of torque converter surge without setting codes.

This drop in signal can be monitored with an oscilloscope and may not be caught on scan tool data. This sensor was eliminated in 2007.



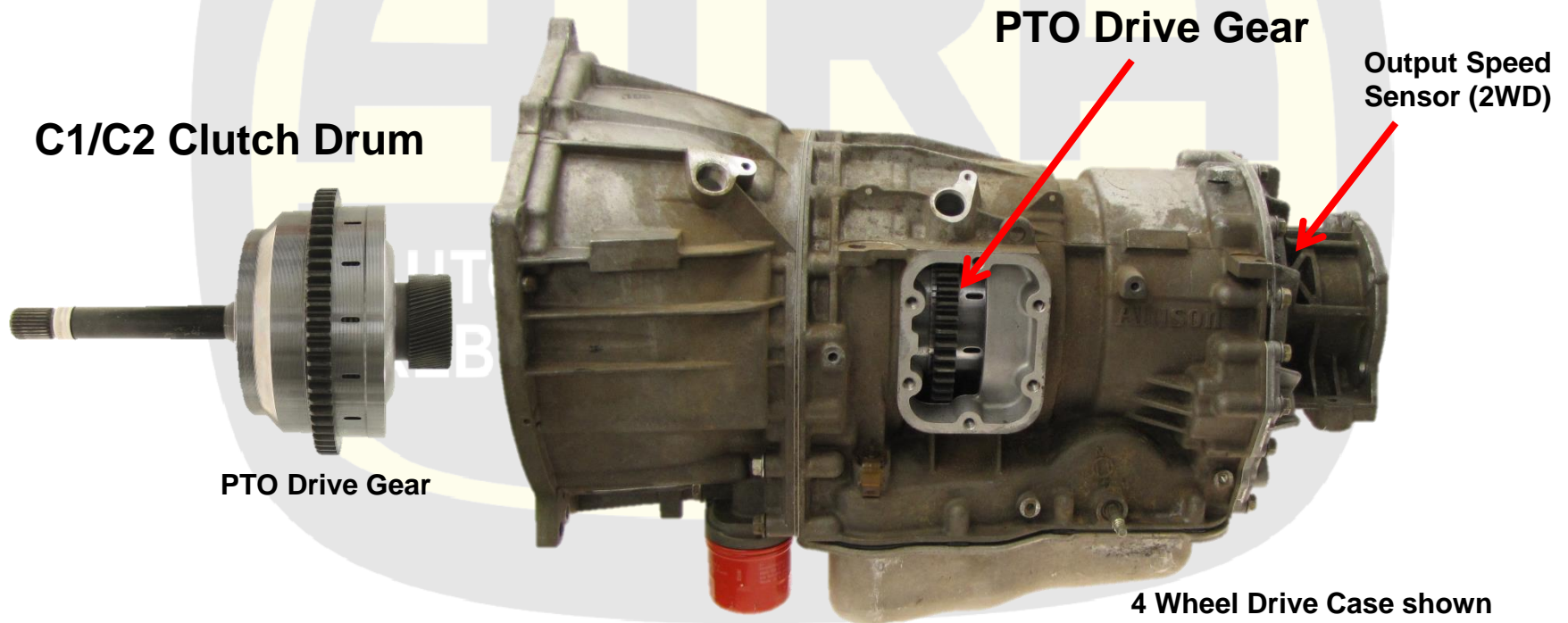
Eliminated in 2007





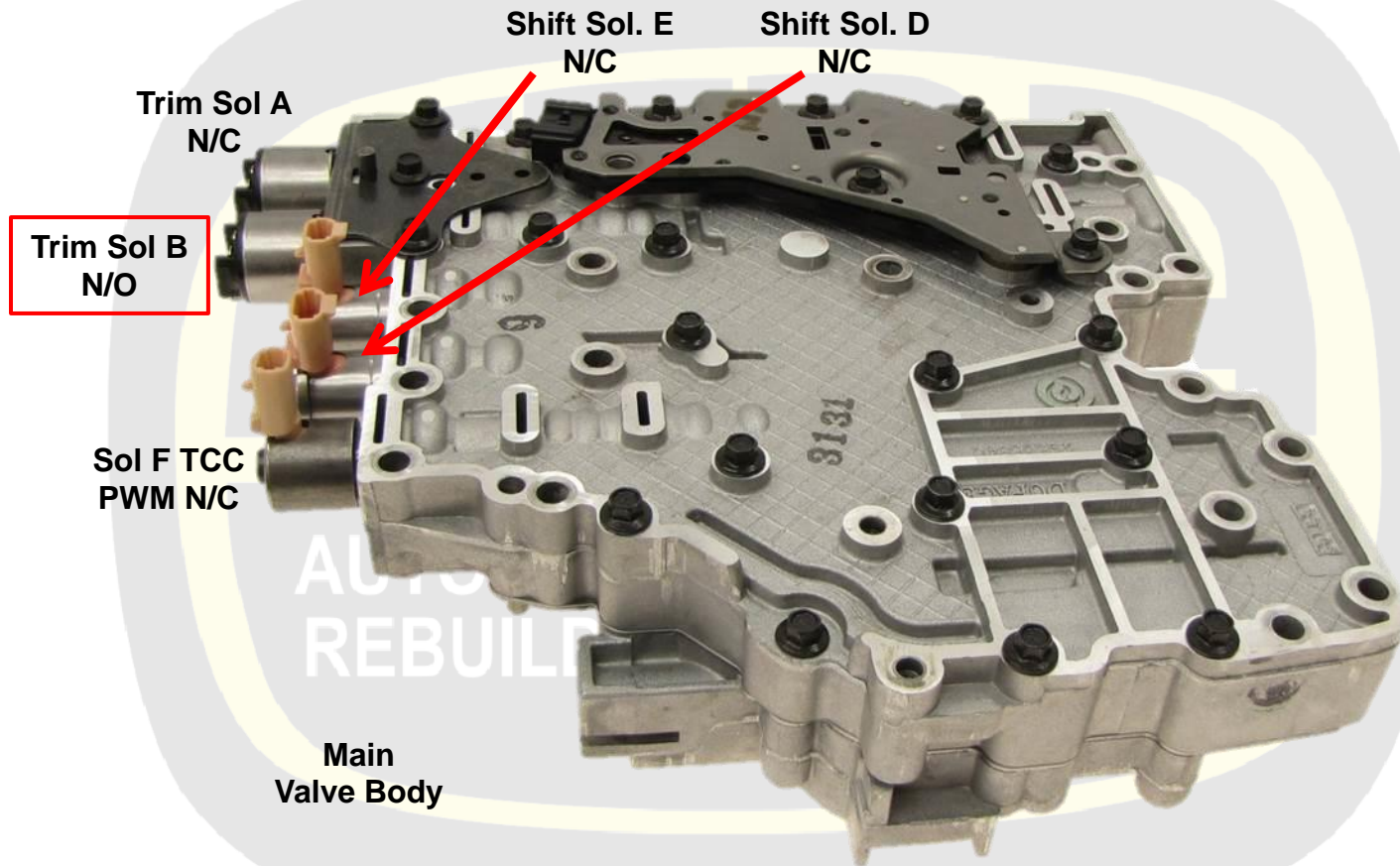
Speed Sensors

The Turbine Speed Sensor monitors the teeth on the PTO drive gear attached to the C1/C2 Clutch Drum. The Output Sensor monitors an exciter wheel located on the output shaft on 2 wheel drive models or on the transfer case on 4 wheel drive units.





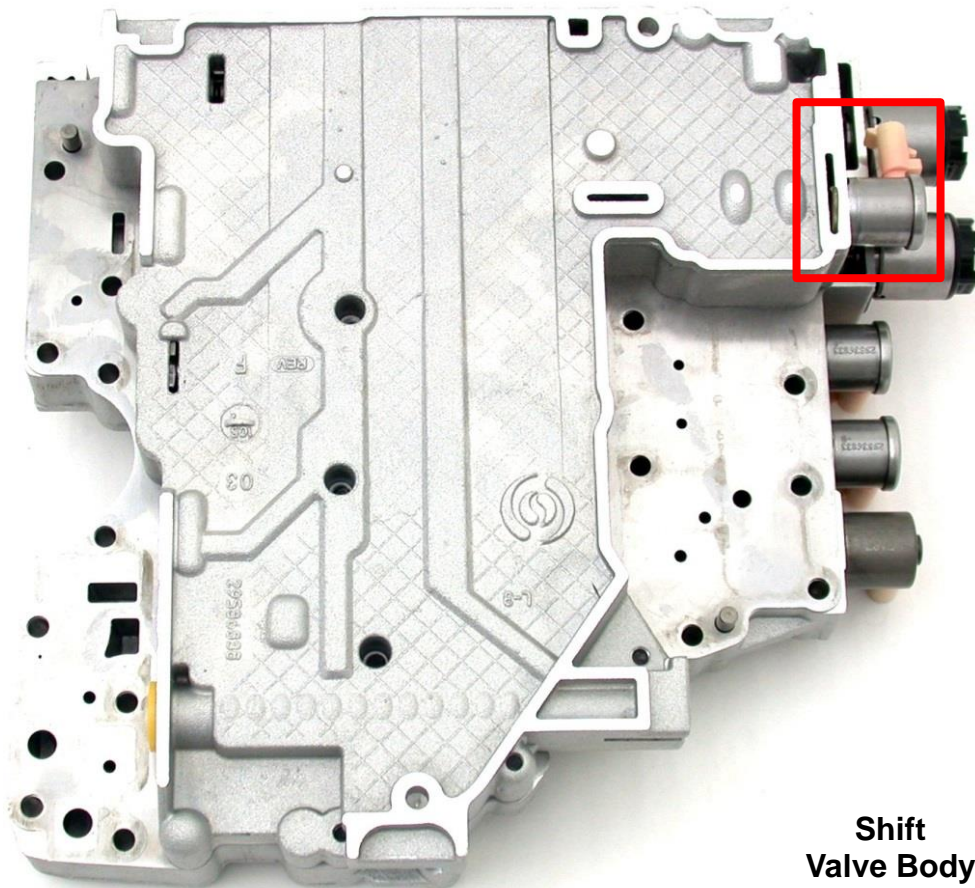
Solenoid Identification 2000-2003



Trim Sol B (N/O) can be used on an AS68RC in place of a normally applied solenoid. Dodge sells the AS68RC linear type solenoids with the valve body only approx. \$3500. On/off solenoids & pressure switches sold separately. The Allison Trim Solenoid B is approx. \$120



Solenoid Identification 2000-2009



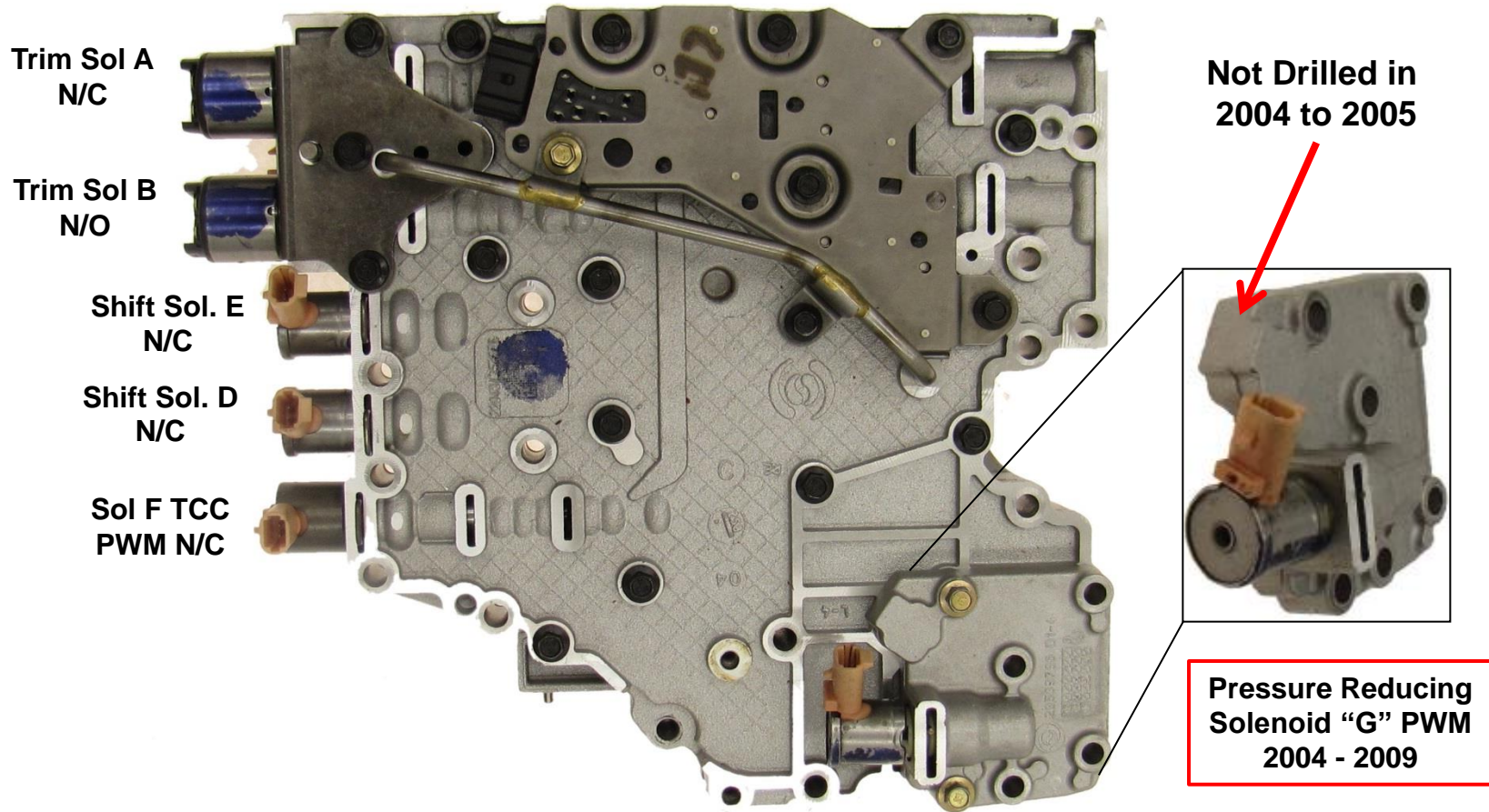
Shift Sol C
N/C

Shift
Valve Body



Solenoid Identification 2004-2005

In 2004 the “G” Solenoid was added to reduce line pressure at a stand still to prevent pump noise.

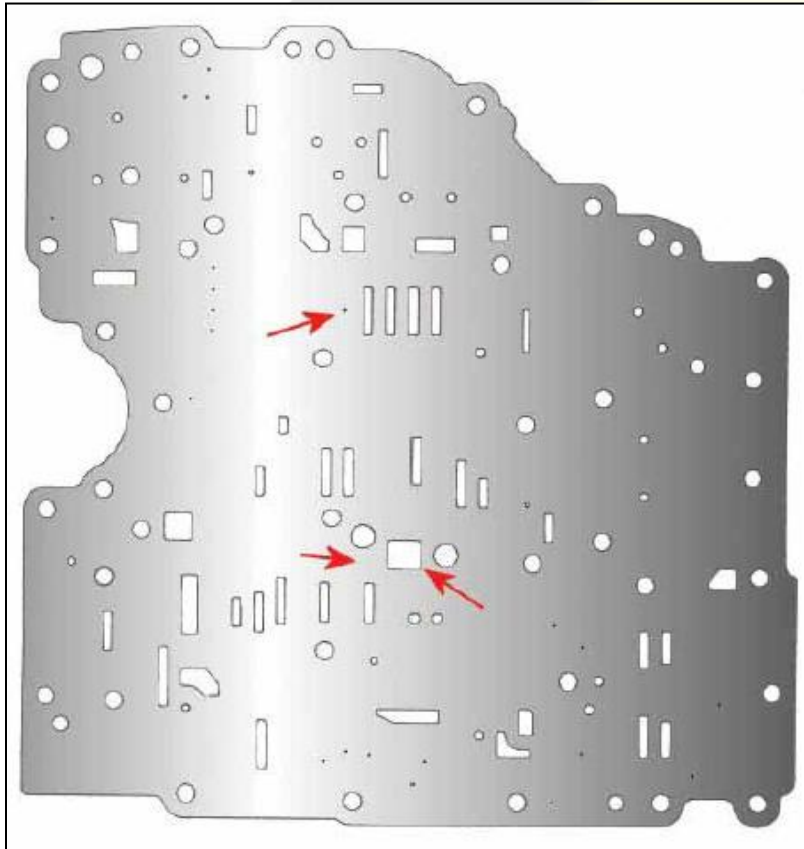


The Internal Harness and TCM also changed with the addition of the “G” solenoid

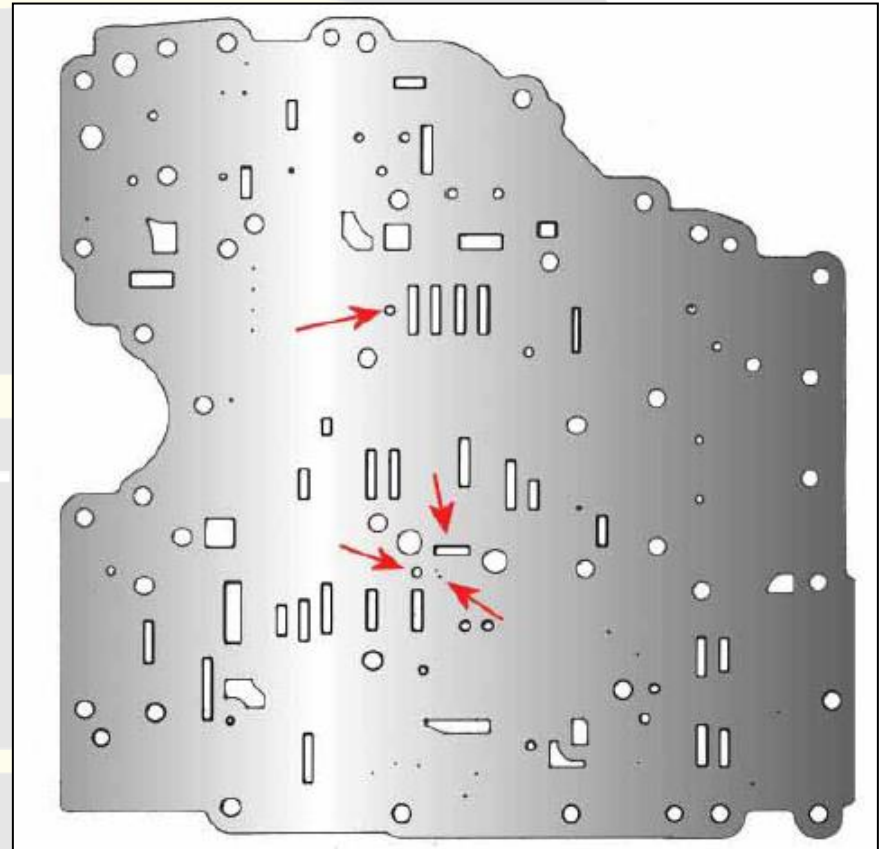


Separator Plate Change

Original Separator Plate 2001-2003



Original Separator Plate 2004-2005





Solenoid Identification 2006 to 2009

Pressure Control Solenoid A

Pressure Control Solenoid B

Shift Sol. E
N/C

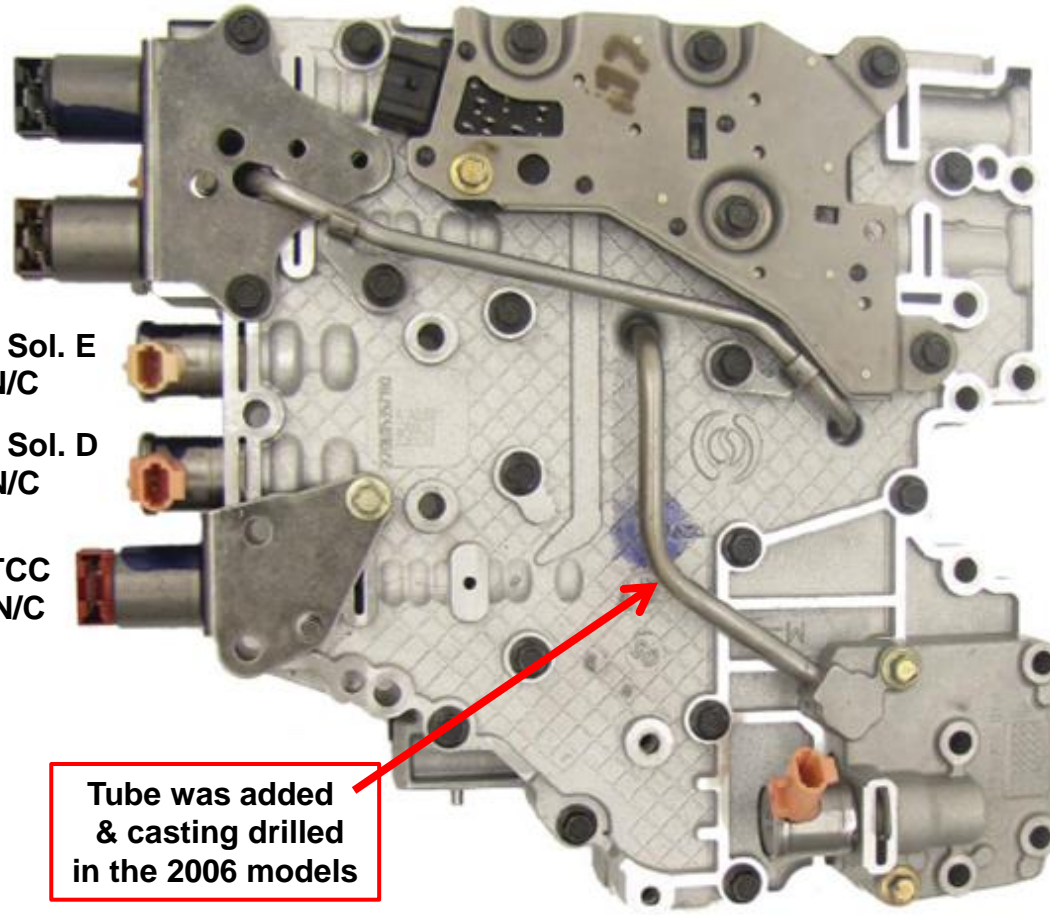
Shift Sol. D
N/C

Sol F TCC
PWM N/C

Tube was added
& casting drilled
in the 2006 models

Pressure Reducing Solenoid "G" PWM
2004 -2009

Changes made to the hydraulics also with the tube added





Other Changes Made In 2006

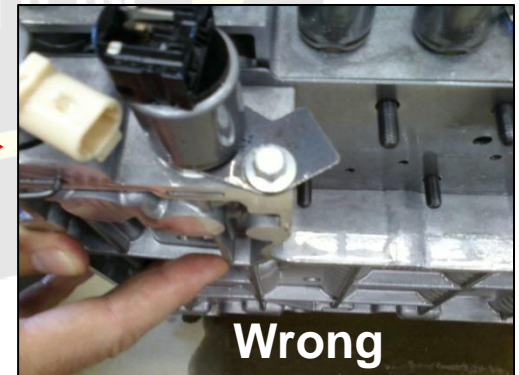
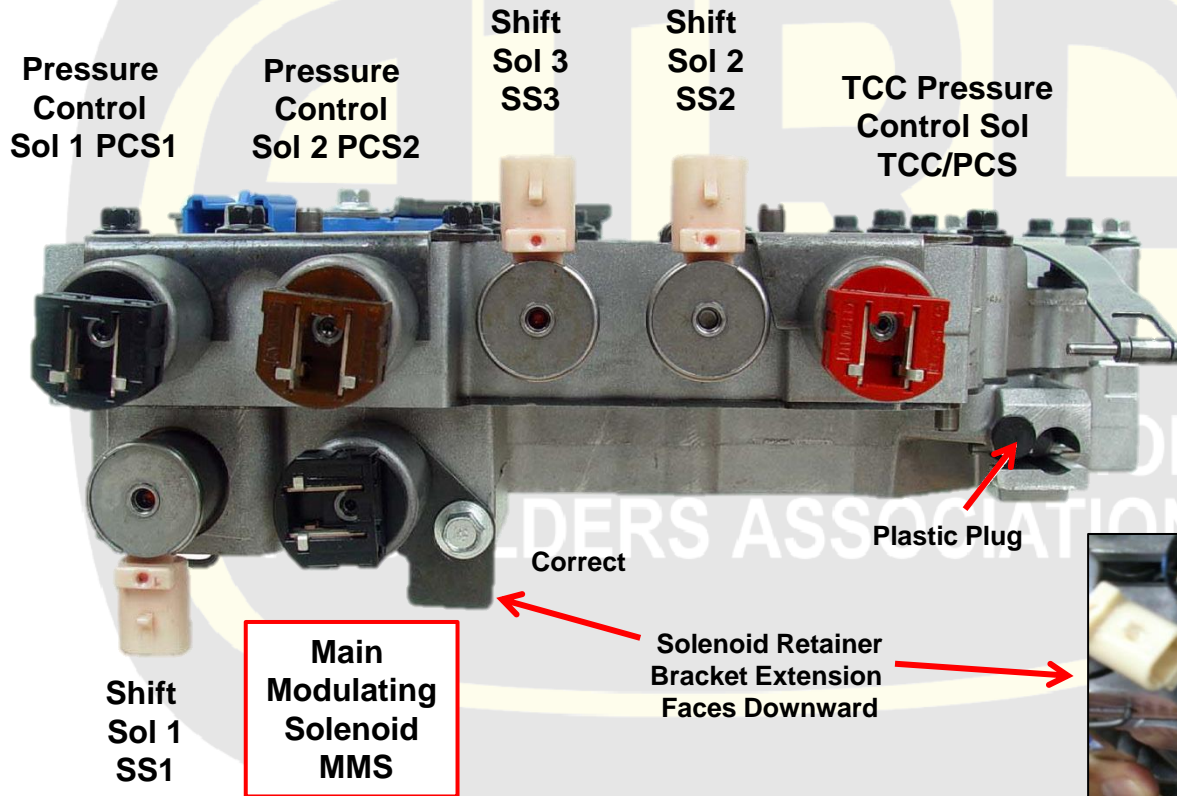
Part Changed	Previous part number	2006 Part number
P1 Carrier Assembly	29531096	29541704
P1 Carrier/Bushing	29531249	29541705
P1 Carrier	29536583	29541708
P2 Ring Gear	29536863	29541707
Snap Ring	29531104	29541011
P2 Carrier Assembly	29536971	29539510
P2 Carrier/Bushing	29536961	29539509
P2 Carrier	29536959	29539502
P2 Pinions	29531113	29541700
P2 Spindle	29537889	29541703
P2 Bearing	29531116	29541706
P3 Ring	29537311	29539499
T-5 Bearing	29531095	29541702
P2 Sun Gear	29536960	29541701
Sun Spacer	29536128	29541728
P3 Sun Gear	29540499	29539498
P3 Carrier and Race Assembly	29540500	29539512
P3 Carrier Assembly	29539575	29539511
P3 Pinion	29531126	29539497
P3 Roller Bearing	29531127	29539500

Part Changed	Previous part number	2006 Part number
Rotating Clutch/Shaft PTO	29539507	29542801
Housing and PTO Gear Assembly	29540518	29542802
Rotating Clutch/Shaft NO PTO	29539508	29542803
Housing with tone wheel	29536097	29542804
Housing and Bushing	29543232	29542699
Housing	29543233	29542700
C2 Piston	29539653	29542807
Seal C1/C2 Outer	29536101	29542809
Seal C2 Inner	29536103	29542808
C2 return spring	29536104	29542810
C1 Housing	29537993	29542811
Seal ring C1, OD		29542812
C1 Piston	29536109	29543239
C1 Piston with Balance hole	29536203	29542815
Retaining ring	29536204	29541011
C1 Return Spring	29536198	29542814
P1 Ring Gear	29531055	29541008
P2 Ring Gear	29536863	29541818
P3 Ring Gear	29537311	29541010
Detent Spring	29536922	29542698
Detent Lever	29537169	29542692
Front Support Assembly	29541134	29542792
Front Support Assembly Ground Sleeve/Bearing	29541135	29542793
Pump	29541145 (31 Tooth)	29542796 (22 Tooth)
Pump Body/Gear Assembly	29541146	29542797
Pump body	29541147	29542798
Pump Wear Plate	29541149	29542799
Pump Kit ****		29543078



Solenoid Identification 2010 – 2013

In 2010 the “G” Solenoid was eliminated and a Main Modulating Solenoid was added to control line pressure like most transmissions.





Trim Solenoid Operation

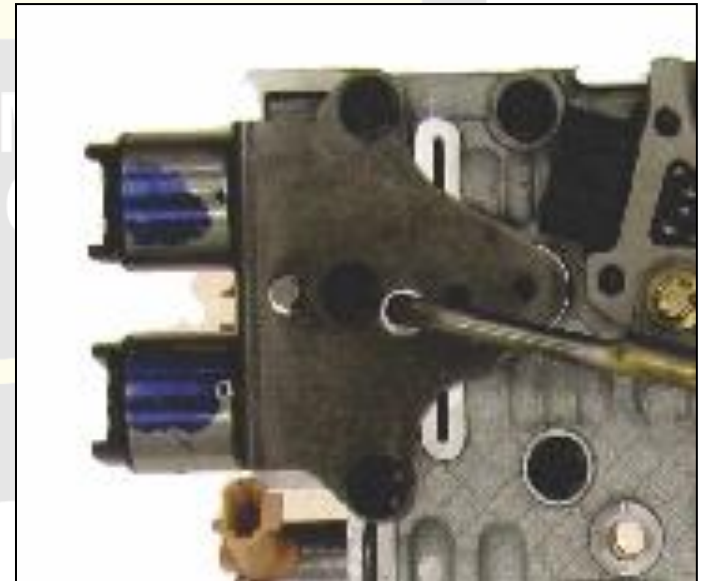
Trim Solenoids A and B control the apply of the oncoming clutch and the release of the off-going clutch as well as the holding pressure to the five clutch assemblies.

The Trim Solenoids are referred to as Pressure Proportional to Current (PPC) solenoids. The hydraulic pressure provided by these solenoids is proportional to the current being commanded.

The Trim Solenoids operate on a frequency of 1000 Hz.

Trim Solenoid A is a Normally Closed solenoid (N/C) supplying 86 psi with no current and no trim pressure at full current. Trim Solenoid A is used for limp-home (failsafe) in the case of a loss of power or TCM failure.

Trim Solenoid B is a Normally Open solenoid (N/O) and supplies no pressure with low current.

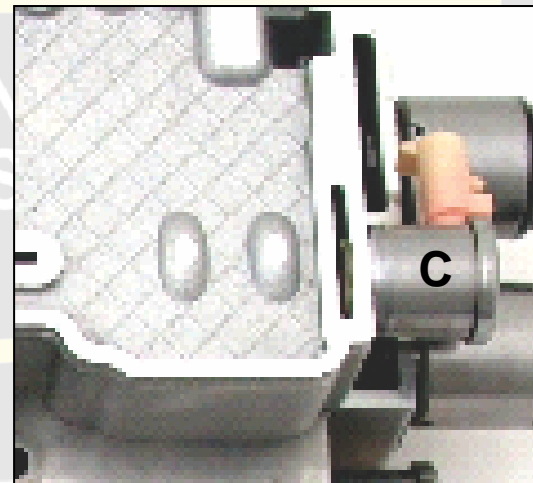
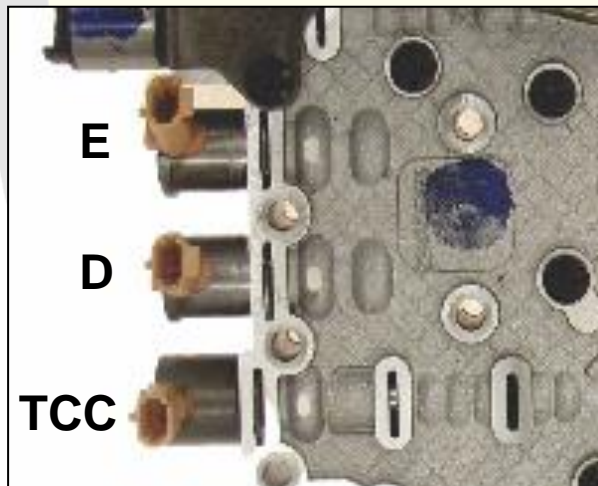




TCC & Shift Solenoid Operation

The TCC solenoid is a normally closed (N/C) pulse width modulated (PWM). It operates at a frequency of 100 Hz during a shift. The percentage of time the voltage is ON during each cycle is called the solenoid duty cycle.

The Shift Solenoids C, D and E are normally closed (N/C) solenoids. They supply full line pressure when on or exhaust line pressure to each of the corresponding Shift Valves C, D, and E.



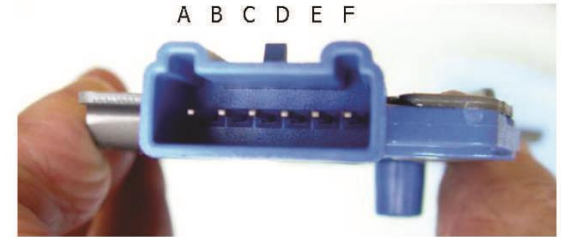


Pressure Switch Manifold PMS

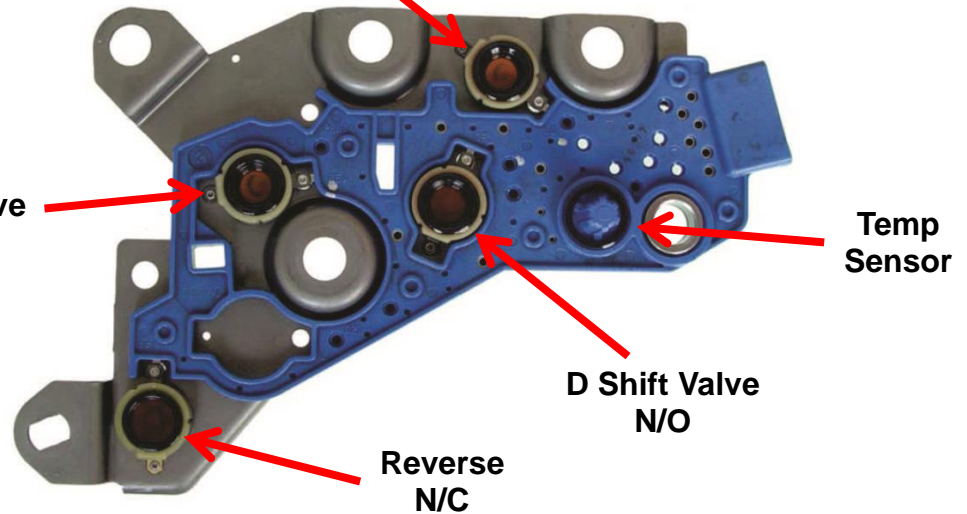
The Pressure Switch Manifold on an Allison transmission works differently than what we are accustomed to on other General Motors transmissions. It sends signals to the PCM when the shift valves move instead of the manual valve movement.

- (A) Shift "C" Signal
- (B) Shift "D" Signal
- (C) Shift "E" Signal
- (D) Reverse Switch Signal
- (E) Temp Sensor High
- (F) Temp Sensor Low

Present PSM
2010 & later



C Shift Valve
N/O



Previous PSM

Not Used



E Shift Valve
N/O



PSM Codes P0842, P0847, P0872

DTC Descriptions:

P0842 – Trans Fluid Pressure Switch 1 Solenoid (C) Circuit Low Voltage

P0877 – Trans Fluid Pressure Switch 2 Solenoid (D) Circuit Low Voltage

P0872 – Trans Fluid Pressure Switch 3 Solenoid (E) Circuit Low Voltage

These codes can be caused by a fault in a clutch circuit, valve body, shift solenoid, or faulty pressure switch circuit.

To verify if a solenoid is at fault, solenoids C-D-E can be swapped. If code transfers with solenoid swap, replace the faulty solenoid. Air test the unit to assure clutch assemblies hold.

The valve body is very sensitive to dirt and the valves are easily stuck. Make sure all magnets are installed (both pan and spin on filter). Flat sand valve body and torque all bolts evenly.

Circuit		Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
PS1 Signal	C	P0752, P0842	P0751, P0843	--	--
PS2 Signal	D	P0757, P0847	P0756, P0848	--	--
PS3 Signal	E	P0762, P0872	P0761, P0873	--	--



Pressure Switch Manifold Logic

Testing the Pressure Switch System; Use the chart as a reference. Turn the ignition key “on with engine off”. Three (3) of the switch’s should read open and one (1) should read closed. Start the engine and the switch’s should read opposite states on scan data.

PS 1 = C
 PS 2 = D
 PS 3 = E
 PS 4 = R

Range	Pressure Switch 1 - N/O		Pressure Switch 2 - N/O		Pressure Switch 3 - N/O		Pressure Switch 4 - N/C	
	Switch Status	Scan Tool Status	Switch Status	Scan Tool Status	Switch Status	Scan Tool Status	Switch Status	Scan Tool Status
R	Open	HIGH*	Closed	LOW	Closed	LOW	Closed	LOW
N	Closed	LOW	Closed	LOW	Closed	LOW	Open	HIGH
1	Open	HIGH	Closed	LOW	Open	HIGH	Open	HIGH
2	Open	HIGH	Open	HIGH	Open	HIGH	Open	HIGH
3	Closed	LOW	Open	HIGH	Open	HIGH	Open	HIGH
4	Closed	LOW	Open	HIGH	Closed	LOW	Open	HIGH
5	Open	HIGH	Open	HIGH	Closed	LOW	Open	HIGH
6	Open	HIGH	Open	HIGH	Closed	LOW	Open	HIGH

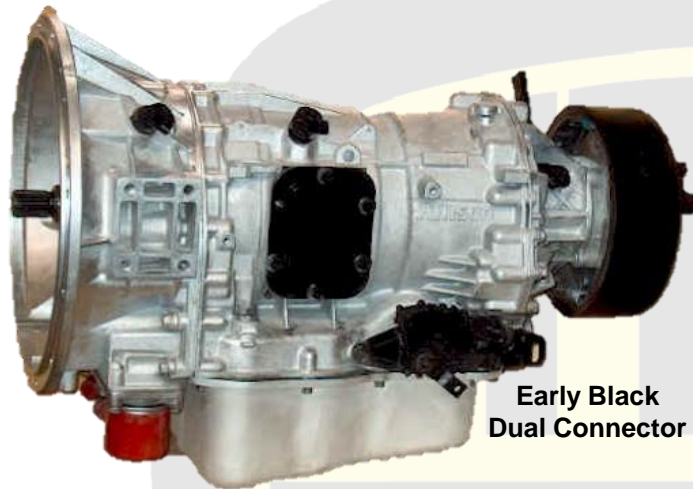
N/C = Normally Closed

N/O = Normally Open

* Pressure switch 1 (PS1) reverts to the Closed/LOW state with throttle applied in REVERSE.



Neutral Start Back Up Switch (NSBU) Wrong Gear Starts / No Back Up Lights / P0705



Update (Tan)
PN 29540479



7 Pin repair pigtail harness (all wires white) w/heat shrink connectors PN 15305887

4 Pin repair pigtail harness (all wires white) w/heat shrink connectors PN 15305925

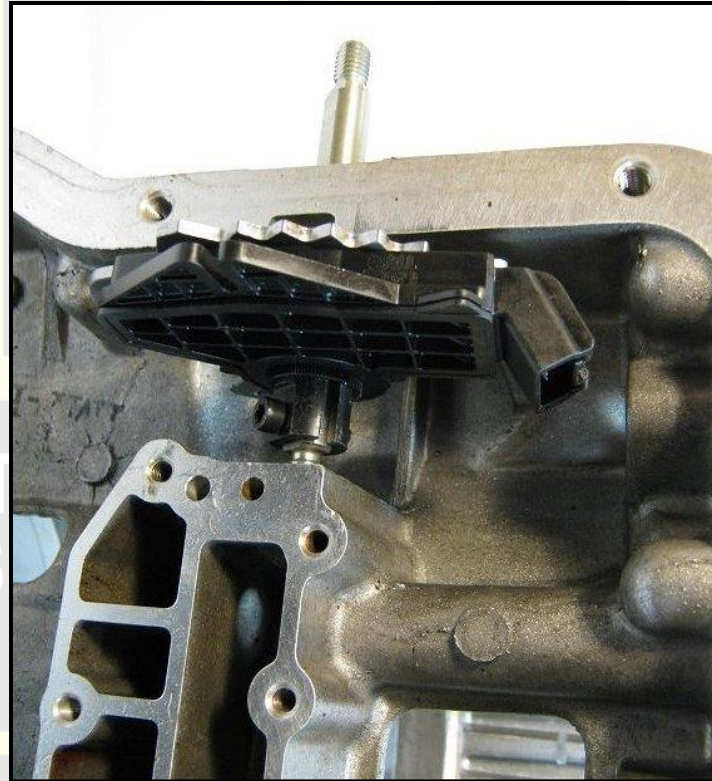
Note: use old connector to match wiring

Park/Neutral Back Up Switch (PNBU)
2004 Changed to Single Connector





2006 Update Internal Mode Switch (IMS)





Internal Mode Switch Logic

Always use scan data when diagnosing the IMS switch. The following chart shows the sequence of “on / off” operations

Range	A	B	C	P
P	OFF	ON	ON	OFF
R Transitional	OFF	OFF	ON	OFF
R	OFF	OFF	ON	ON
N	ON	OFF	ON	OFF
D Transitional	ON	OFF	OFF	OFF
D	ON	OFF	OFF	ON
*M	OFF	OFF	OFF	OFF
D1 Transitional	OFF	ON	OFF	OFF
1	OFF	ON	OFF	ON
Invalid	ON	ON	ON	ON
Invalid	ON	ON	ON	OFF
Invalid	OFF	ON	ON	ON
Invalid	ON	OFF	ON	ON
Invalid	OFF	OFF	OFF	ON
Invalid	ON	ON	OFF	ON

ON = Open Circuit

OFF = Grounded Circuit

*M mode allows TAP Up/TAP Down feature functionally between 1st through 6th ranges.

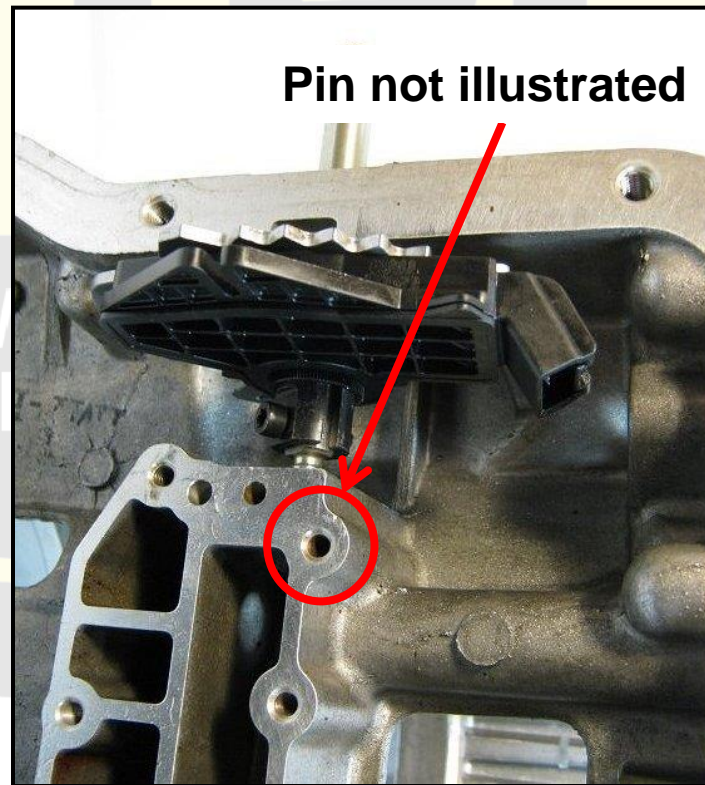
In this range, logic states do not change.



Internal Mode Switch Installation

Care needs to be taken when replacing the Internal Mode Switch (IMS) in the LCT1000 units. The retaining pin holding the manual shaft into the case is set at a specific length/height (measure and record). To prevent damage to the roll pin, insert a drill into the roll pin to prevent the pin from collapsing when being removed. When assembling use the following procedures:

- 1: Place the new IMS in position in the case. Rotate the detent to connect the park rod. Install manual shaft through the IMS
 - 2: Seat the shaft and install the spherical pin (remember pre-set)
 - 3: Torque IMS retaining bolt to 92 lb. in. (T27 bit)
- Install the valve body and pan for fill.
- Important: Fast learn adapt procedure must be performed after switch replacement**



Pin not illustrated

Pin installed height is 0.335" to 0.354" above the surface.
Special tool number J43766



Main Valve Body 2000-2009

The valve and spring dimensions will vary per model year with the changes to solenoids (2004) and added feed pipe (2006) along with other shift related updates.

1.680" X .552" X .059"

1.869" X .496" X .035"

2 Accumulator Valves
1.244" X .308" X .045"

.919" X .596" X .051"

.810" X .387" X .029"

.810" X .387" X .029"

.810" X .387" X .029"

.810" X .387" X .029"

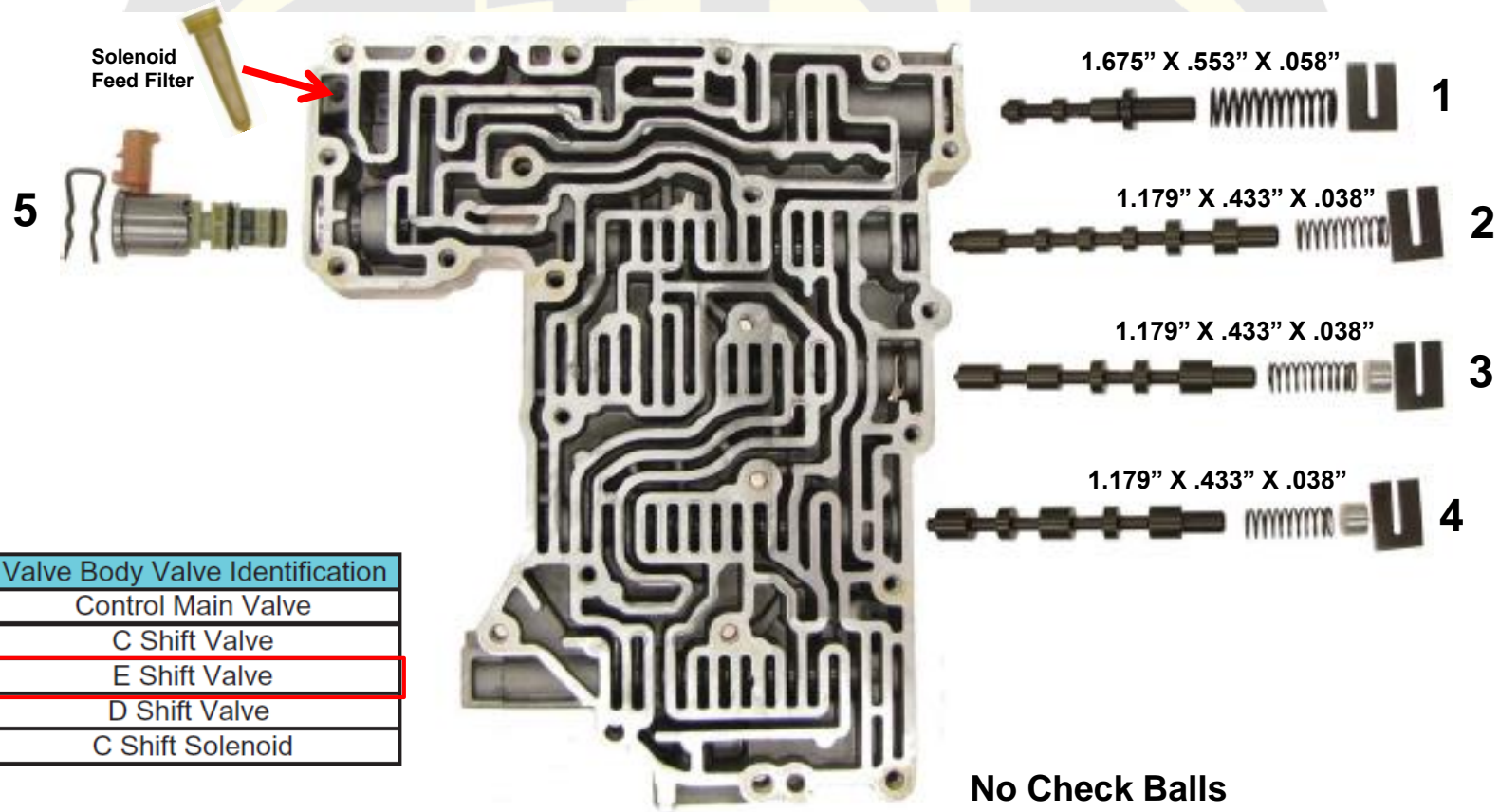
No Check Balls

Main Valve Body Valve Identification	
1	A Gain Valve
2	A Trim Valve
3	B Gain Valve
4	B Trim Valve
5	F Trim Valve
6	Exhaust Backfill Valve
7	Control Relief Valve



Shift Valve Body 2000-2009

A restricted Solenoid Feed Filter will cause a no movement condition without setting any codes. The PRNDL message on the dash will read "Shift Inhibited". Range signal will read correctly on scan tool data. Always remove and clean or replace the filter.



Shift Valve Body Valve Identification	
1	Control Main Valve
2	C Shift Valve
3	E Shift Valve
4	D Shift Valve
5	C Shift Solenoid

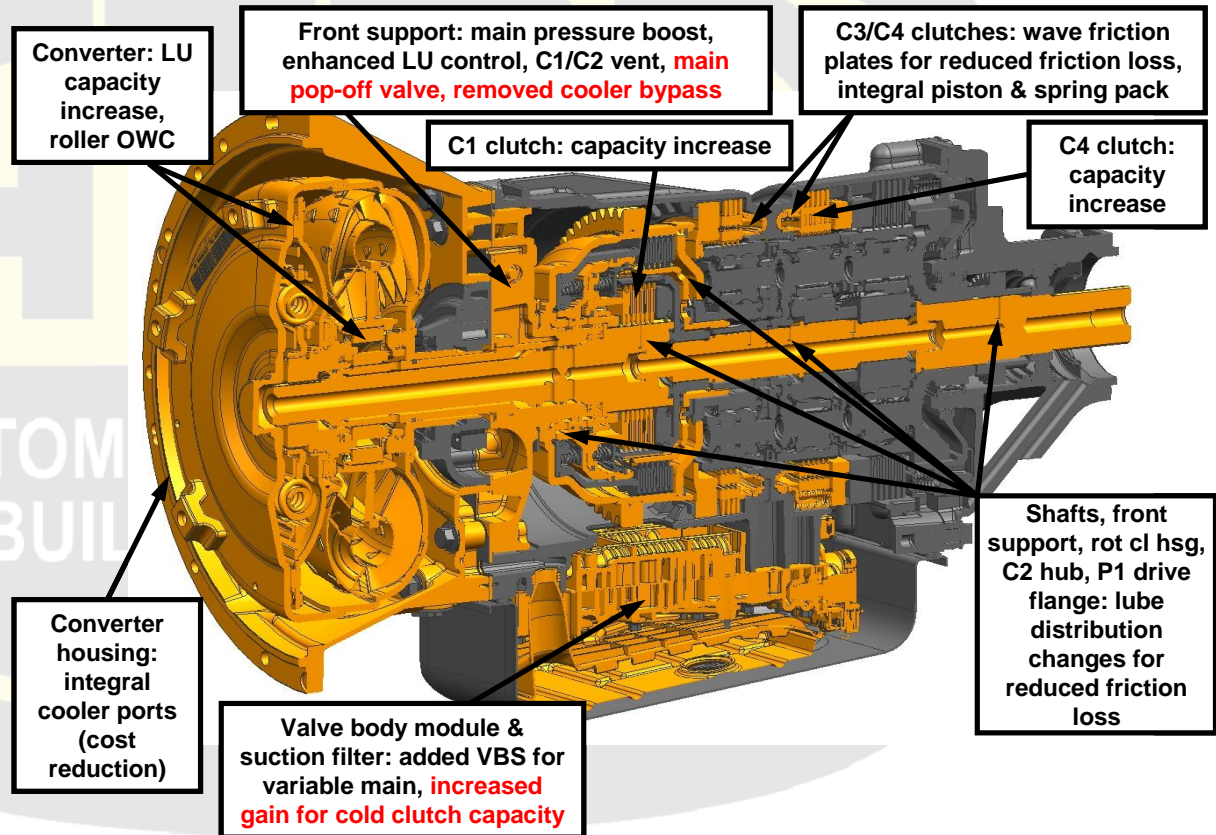


2010-11 Updates

The LCT 1000 has undergone a major update for the 2010-2011 model years. The updates were designed to address the increased engine torque available from the updated Dura Max Diesel engine, improve fuel economy and to address some common concerns.

CAUTION: 2010 updated shaft parts must be used as a set. Replacing individual shafts with 2010 updated shaft parts to service pre 2010 transmissions, so that a mix of pre 2010 and 2010 shafts are operating together, may cause transmission damage.

All 2010 updated shafts must be operated in sets to achieve reduced spin losses and maintain balanced lube pressure. The set includes ground sleeve, turbine shaft assembly, main shaft, and output shaft assembly.



All of the updates listed did not occur at the same time so you may find some included while other are not present in the transmission you are working on. The updates started implementation in July of 2009 (2010 model year) and were completed during the 2011 model year.



2010-11 Updates

***** May not be serviced as an individual part, may be included as part of another component or package.**

**** Check with your Allison Distributor before ordering.**

*** Not recommended by Allison, But it will interchange if all the associated parts are also replaced.**

Part Name	Pre update part #	Update Part #	Description of Change	Back serviceable To 2006
C3/C4 Piston	29543321	29546697	Orifice size change and new design	No **
C3/C4 Spring/ Plate Assembly	29542192 / 29542191	29546698	Integral spring assembly	No **
C3/C4 Friction Plates	29531049 (C3 requires 4) (C4 requires 5)	29546270 (C3 requires 4) (C4 requires 6)	Friction plates are a wave plate design of narrower thickness. Increased number of friction plates are required for C4.	No **
C3/C4 Reaction Plates	29531048 (C3 requires 3) (C4 requires 4)	29546701 (C3 requires 4) (C4 requires 6)	Quantity change required for C3/C4 Clearance for integral spring assembly	Yes
C3 Backing Plate Assembly	29535648	29546702	Thicker	No **
C4 Backing Plate	29535640	29546271	Thinner	No **
C1 Friction Plate	29538468 (6)	29546276 (7)	Changes to accommodate increased horsepower and torque ratings (thinner friction plate thickness)	No **
C1 Reaction Plate	29530314 (6)	29530314 (7)	Changes to accommodate increased horsepower and torque ratings	Yes
Housing C1 Clutch	29542811	29546277	Bleed hole relocated from C1 piston	No
Piston C1	29543239	29549579	Bleed hole removed	No
C2 Hub	29536962	29546705	Vent holes added	Yes*
P1 Drive Flange	29531094	29546706	Vent holes added	Yes*
Turbine Shaft Assembly	29539506	29548947	Reduced size lube orifice	Yes *
Torque Converter	Varies with application	Varies with application	Dual friction Lockup Clutch	No
Converter Housing SAE #3 (#12, #8)	29536810	29547463	SAE #12 Integral Cooler Ports	Yes
Converter Housing SAE #2	29536810	29547462	SAE #12 Integral Cooler Ports	Yes
Output Shaft 2WD	29536845	29546744	Lube orifice size change	No **
Main Shaft	29536984	29546284	Lube orifice size change	Yes *
Suction Filter Shallow Pan	29537965	29542833	Increased filtration capacity and lower flow restriction	Yes *
Suction Filter Standard Pan	29537966	29542824	Increased filtration capacity and lower flow restriction	Yes
Clutch and Shaft Assembly	29548811	29546281	Changes to accommodate increased horsepower and torque ratings	Yes *
— Rotating, PTO	29549726			



2010-11 Updates

*** May not be serviced as an individual part, may be included as part of another component or package.

** Check with your Allison Distributor before ordering.

* Not recommended by Allison, But it will interchange if all the associated parts are also replaced.

Part Name	Pre update part #	Update Part #	Description of Change	Back serviceable To 2006
Housing and PTO Gear Assembly	29542802	29547424	Reduced size lube orifice	Yes *
Clutch and Shaft Assembly---	29545812	29546282	Changes to accommodate increased horsepower and torque ratings	Yes *
Rotating non PTO	29549727			
Housing and Tone Wheel Assembly	29542804	29547425	Reduced size lube orifice	Yes*
Housing Assembly and Bushing	29542699	29546704	Reduced size lube orifice	Yes *
Rotating Clutch Housing	29542700	29546585	Reduced size lube orifice	Yes *
Support Assembly Front (Pump)	29547605 29549723	29547715	Part of pump update to VBS system	No
Pump Ground Sleeve and Bushing (Stator)	29531309	29546302	Lube orifice size change	Yes *
Pump Ground Sleeve (Stator)	29531015	29546283	Lube orifice size change	Yes *
Main Pressure Regulator Valve	29541138 29547600	29547716	Part of pump update to VBS system	No
Spring Main Pressure Regulator	29544465	29546317	Part of pump update to VBS system	No
Main Regulator Stop	29531018	29546318	Part of pump update to VBS system	No
Converter Flow Valve	29541144 29547604	29547719	Part of pump update to VBS system	No
Converter Flow Valve Spring	29531024	29546320	Part of pump update to VBS system	No
Converter Flow Valve Stop	29531028	29546321	Part of pump update to VBS system	No
Pump Seal Ring (3)	29538940	29546763	Improve sealing	
Pressure relief Ball	NONE USED	453614	Part of pump update to VBS system	No
Pressure relief cap	NONE USED	8661701	Part of pump update to VBS system	No
Relief Spring	NONE USED	29541228	Part of pump update to VBS system	No
Housing Separator Plate	29541148	29546315	Hole and slot change	Yes
Valve Body Assembly 24 Way Connector	29543335	29545979	Valve Body redesign to the PCS1 and PCS2 trim systems and Variable Modulated Main system. Removal of the Main Modulation Body and reverse and 6th Speed Tube.	No



2010-11 Updates

***** May not be serviced as an individual part, may be included as part of another component or package.**

**** Check with your Allison Distributor before ordering.**

*** Not recommended by Allison, But it will interchange if all the associated parts are also replaced.**

Part Name	Pre update part #	Update Part #	Description of Change	Back serviceable To 2006
Main Valve Body Assembly	29543342	29545997	Valve Body redesign to the PCS1 and PCS2 trim systems and Variable Modulated Main system. Removal of the Main Modulation Body and reverse and 6th Speed Tube.	No
Main Valve Body Assembly with Dowels Pressed	29543341	29545996	Valve Body redesign to the PCS1 and PCS2 trim systems and Variable Modulated Main system. Removal of the Main Modulation Body and reverse and 6th Speed Tube.	No
Main Valve Body	29543340	29550271	Valve Body redesign to the PCS1 and PCS2 trim systems and Variable Modulated Main system. Removal of the Main Modulation Body and reverse and 6th Speed Tube.	No
Check Ball Capsule	NONE USED	29549893 (2)	Valve Body redesign to the PCS1 and PCS2 trim systems and Variable Modulated Main system. Removal of the Main Modulation Body and reverse and 6th Speed Tube.	No ***
TCC Valve	29542979	29545994	Part of VB hydraulic update	No ***
PCV1 Valve	29537260	29550069	Part of VB hydraulic update	No ***
PCV2 Valve	29537261	29550069	Part of VB hydraulic update	No ***
Spring PCV1, PCV2, TCC	29536313	29550070	Move to a common spring	No ***
Spring Gain Valve	29537230	NONE USED	Part of VB hydraulic update	No ***
Gain Valve (PCV)	29537229	NONE USED	Part of VB hydraulic update	No ***
PCS1, PCS2 Solenoid Retainer	29542974	29545991	Add hole for new accumulator	No
TCC Solenoid Retainer	29542973	29545990	Part of VB hydraulic update	Yes
Shift Valve Body Assembly	29542972	29545989	Part of VB hydraulic update	No ***
Shift Valve Body	29542971	29545983	Part of VB hydraulic update	No ***
Shift Valve SV1	29531173	29545988	Part of VB hydraulic update	No ***
Shift Valve SV2	29536398	29545987	Part of VB hydraulic update	No ***
Shift Valve SV3	29536944	29545986	Part of VB hydraulic update	No ***
Spring - SV1, SV2, SV3	29531176	29545966	Move to a common spring	No ***



2010-11 Updates

***** May not be serviced as an individual part, may be included as part of another component or package.**

**** Check with your Allison Distributor before ordering.**

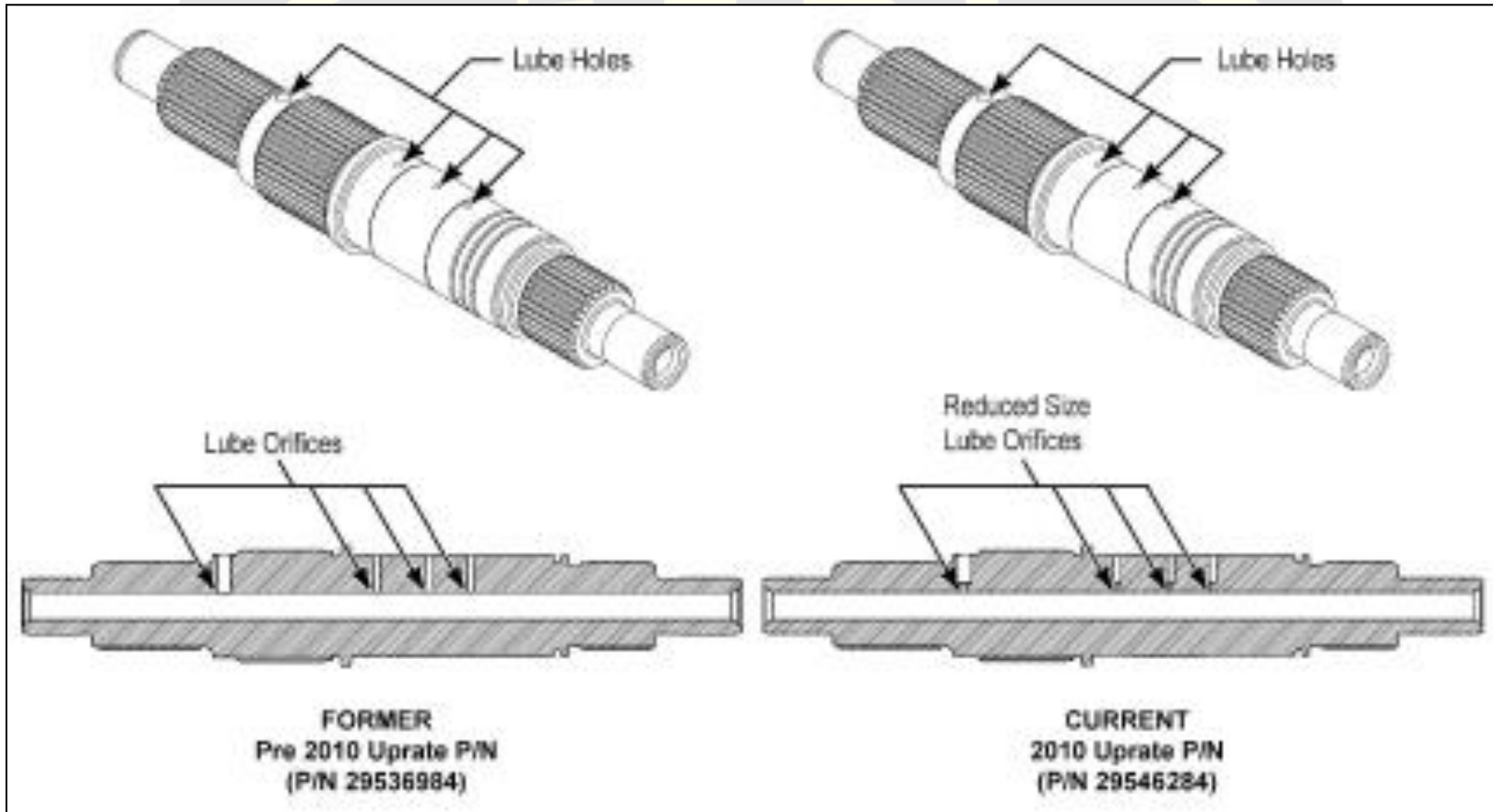
*** Not recommended by Allison, But it will interchange if all the associated parts are also replaced.**

Part Name	Pre update part #	Update Part #	Description of Change	Back serviceable To 2006
Control Main Valve	29541152	29545965	Part of VB hydraulic update	No ***
Solenoid Variable Modulated Main (Same as Gen IV PCS1) OENH	NONE USED	29541895	Valve Body redesign to the PCS1 and PCS2 trim systems and Variable Modulated Main system.	No
Modulated Main Solenoid Retainer	NONE USED	29545982	Valve Body redesign to the PCS1 and PCS2 trim systems and Variable Modulated Main system.	No
Valve Body Separator Plate	29542962	29545980	Valve Body redesign to the PCS1 and PCS2 trim systems and Variable Modulated Main system.	Yes
24 Way Internal Harness	29543334	29545308	Relocate wires and connectors to match new solenoid and component positioning	No
Clip – Valve Stop, Converter Relief/Lube Regulation	29531022 (2)	29531022 (5)	The numbers of clips increases from 2 to 5 in the Main Valve Body but the total number in the Complete Valve Body Assembly is 9	Yes
Modulated Main Body	29543338	NONE USED	All former modulated Main Valve Body parts, are deleted for the 2010/2011 Update configuration.	No
Modulated Main Solenoid On/Off	29536833	NONE USED	All former modulated Main Valve Body parts, are deleted for the 2010/2011 Update configuration	No
Solenoid Retainer	29534518	NONE USED	All former modulated Main Valve Body parts, are deleted for the 2010/2011 Update configuration	No
Reverse Signal Tube	29542964	NONE USED	All former modulated Main Valve Body parts, are deleted for the 2010/2011 Update configuration	No
Six Speed Feed Tube	29543337	NONE USED	All former modulated Main Valve Body parts, are deleted for the 2010/2011 Update configuration	No



2010-11 Updates

Turbine Shaft: The size of the lube orifices were reduced. The updated Turbine Shaft Assembly P/N 29548947 and is backwards compatible as long as replaced as a set with the Main Shaft.

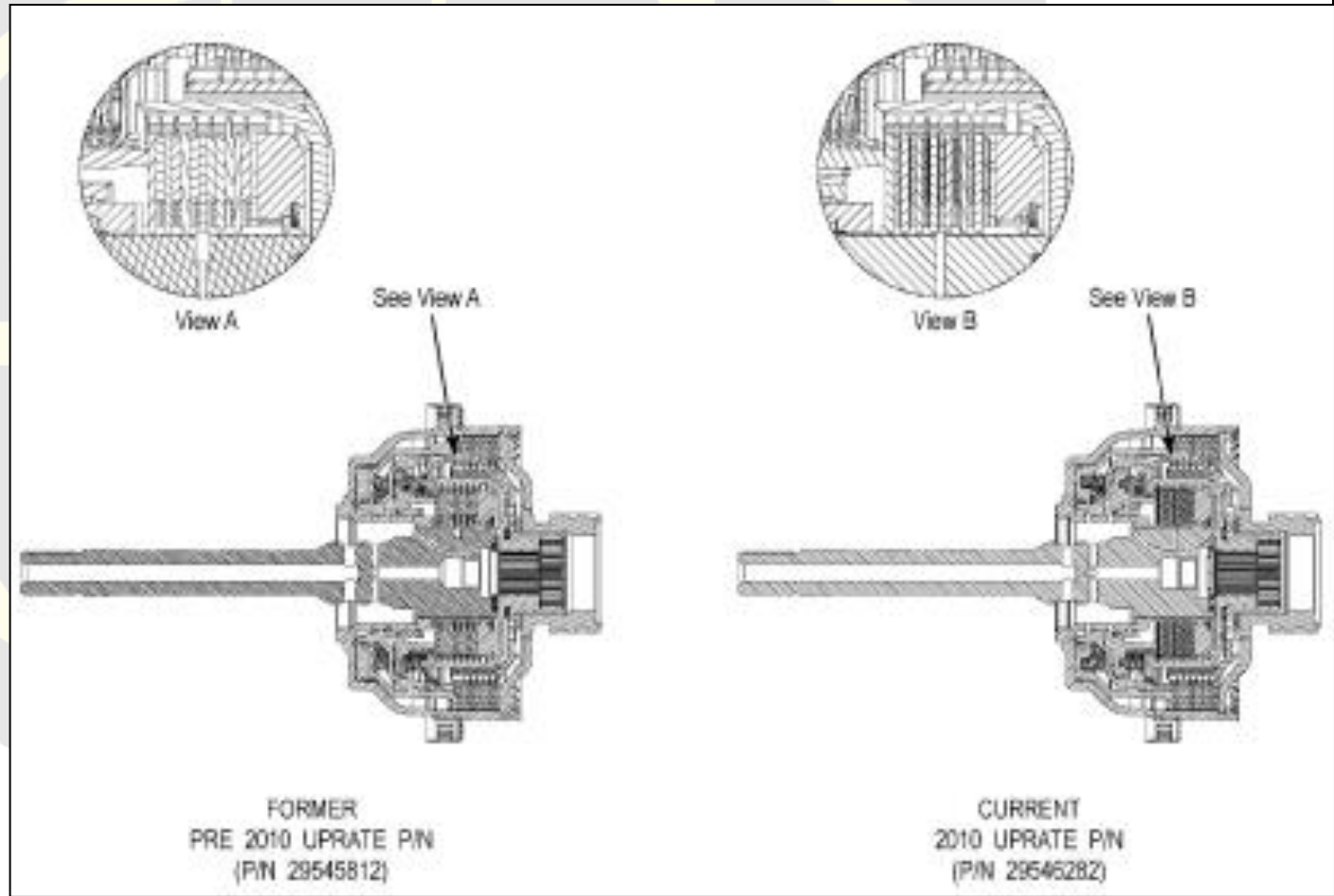




2010-11 Updates

Main Shaft: The size of the lube orifice in this shaft was reduced also. P/N 29546284 and is backwards compatible as long as replaced as a set.

**Shafts, Pump
(Front Support)**
Hydraulic and valve updates including channeling, reduced lube orifice size and design changes to the valves and shafts were made to help improve fuel economy.



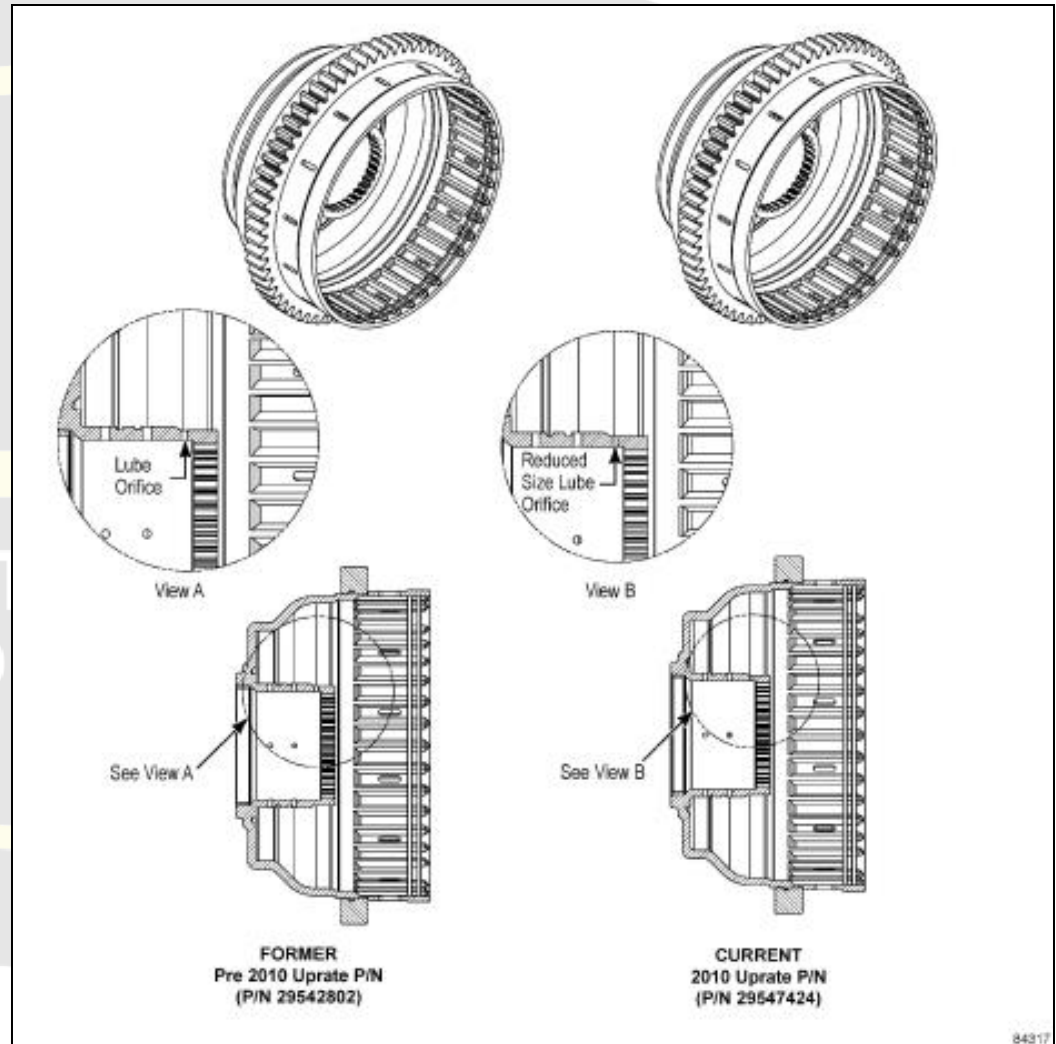


2010-11 Updates

C1/C2 Clutch Housing: The lube orifice size in the housing was reduced.

The updated C1/C2 Clutch Housing P/N 29546585, included in part numbers P/N 29546704, 29547425, 29546282, 29547424, and 29546281, will service previous models.

AUTOMATIC
REBUILD





2010-11 Updates

Updated shaft parts must be used as a complete set. Ground Sleeve and Bushing (stator support) 29546302 used in the previous design Front Support (Pump) Assembly 29549725, 29549724, 29549723 and also used in the Updated Front Support (Pump) Assemblies 29546324, 29546323, 29547715 must be used with the following updated shafts, Turbine Shaft Assembly, 29548947, Main Shaft 29546284, and Output Shaft Assembly 29546744.

Torque Converter

The updated converter uses a dual friction clutch for TCC operation. In addition the stator clutch was changed to a one way roller clutch for improved durability. The torque converter is not designed to back service previous applications. The updated torque converter can be identified by “Swedge” marks located between the converter pads.

2011 Software Changes

- Exhaust Brake Shift Control
- Variable Main Pressure Modulation
- Enhanced Fast Learn
- TCC and Main Modulation Learn
- Enhanced Loss of Prime Detection
- Isolate Causes of a P0701 (No Follow on Codes)
- Typical DTC's = P0843, P0877, P0847, P0872, P0894
- Service Tool Valve Test



Ground Sleeve
(Stator Support)



2010-11 Updates

Valve Body

Numerous valve body updates were implemented for the LCT 1000. These include:

- Various passage changes.
- Valve design changes for many of the valves.
- The addition of two (2) encapsulated check balls in the valve body.
- PCS1/PCS2 trim circuits were redesigned.
- Removal of the 6th gear pipe.
- Removal of the Reverse Signal pipe.
- Elimination of the Modulated Main Valve Body and solenoid.
- A new Bosch Variable Bleed Solenoid (VBS) for line pressure control was installed.
- A Variable Modulated Main Accumulator was added.
- The internal wiring harness was updated.
- The PCS1 and PCS2 trim circuits have been redesigned with the addition of check ball capsules and commonizing of new PCV1 and PCV2 valves and springs.
- Retaining clips have been added to retain the PCV1 and PCV2 valves in the bore.
- The PCS1 and PCS2 solenoids remain the same, but the PCS1 and PCS2 Solenoid Retainers were redesigned to allow for the new Variable Modulated Main Accumulator and Spring.
- Fully Variable Modulated Main pressure is a new feature for the 2010 update. The Mod Main Valve Body Assembly has been removed from the Control Module Assembly.
- The passages and new Variable Modulated Main VBS were added to the Shift Valve Body Assembly. This VBS is the same solenoid type as used in PCS1.
- A new Modulated Main Solenoid Retainer holds the solenoid in its bore.
- The Shift Valve Body Assembly also includes redesigned SV1, SV2, SV3, and Control Main valves. The SS1 remains the same.
- The Main Valve Body was redesigned and includes new passages. Pockets were added so that all of the valves are now retained in the bore using retaining clips and a new bore was added for the Variable Modulated Main Accumulator.
- The new passages have allowed the removal of the six (6) Feed Tubes and the Reverse Signal Tube.
- The SS2 and SS3 solenoids remain the same.



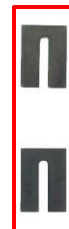
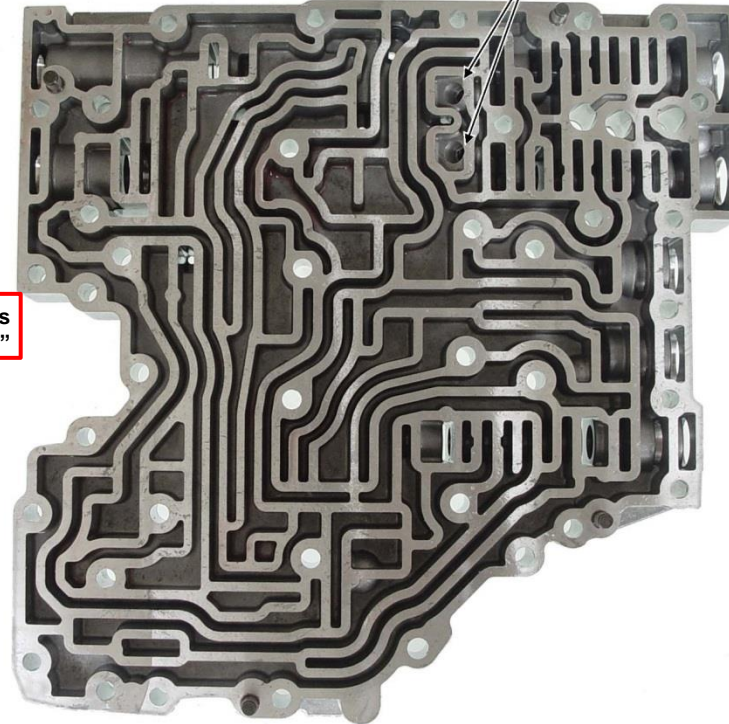
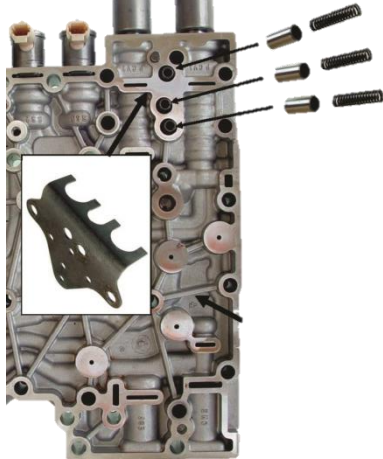
2010-2013 Main Valve Body

The PCS1 and PCS2 trim circuits have been redesigned with the addition of Check Ball Capsules with the new PCV1 and PCV2 valves and Springs. The valve body was not designed to back service previous applications. Retaining clips have been added to retain the PCV1 and PCV2 valves in the bore.

Check Ball and Capsule Assemblies
Rough or flaring shifts if balls not sealing in capsules.



3 Accumulator Valves
1.274" X .304" X .044"



Pressure Control Solenoid 1
PCS1



Pressure Control Solenoid 2
PCS2



Shift Solenoid 3
SS3



Shift Solenoid 2
SS2



TCC Pressure Control
Solenoid
TCCPCS



2010-2013 Main Valve Body

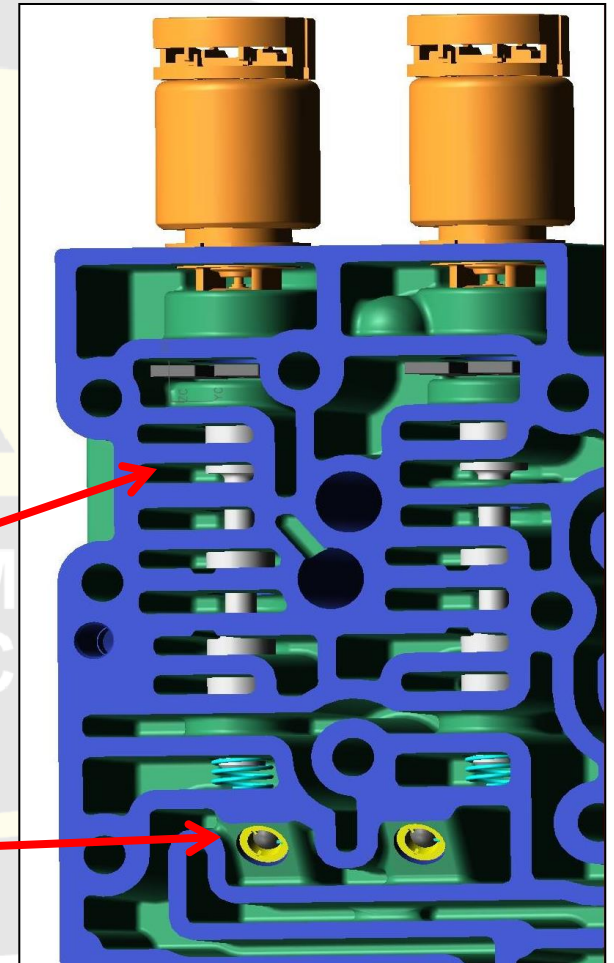
A & B Trim System (PCS1 & PCS2) Redesign.

Solenoids remained the same.

Check Ball Boost higher clutch pressure after trim completed.

Permits lower Trim Valve Gain

Check Ball Capsule defeats feedback pressure above control pressure





2010-2013 Shift Valve Body



Shift Solenoid 1
SS1



Main Mod Solenoid
MMS

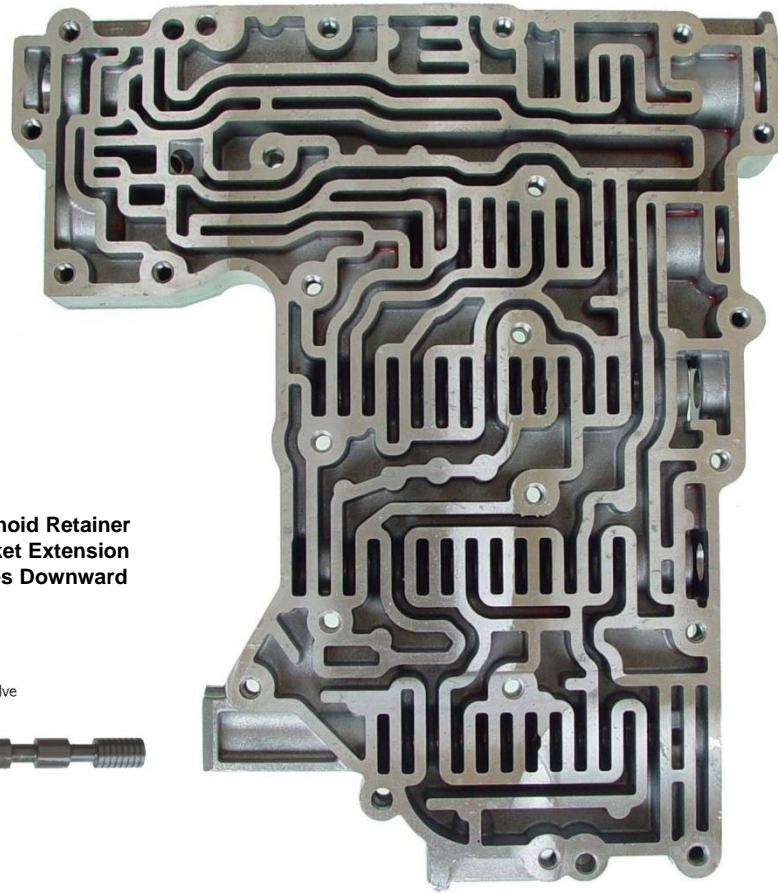


**Solenoid Retainer
Bracket Extension
Faces Downward**

Plastic Plug



Manual Selector Valve
MSV



Control Main Valve
CMV

1.738" x .555" x .057"



Shift Valve 1
SV1

1.296" x .415" x .037"



Shift Valve 3
SV3

1.296" x .415" x .037"



Shift Valve 2
SV2

1.296" x .415" x .037"





2010-2013 Shift Valve Body Updated Spring Dimensions

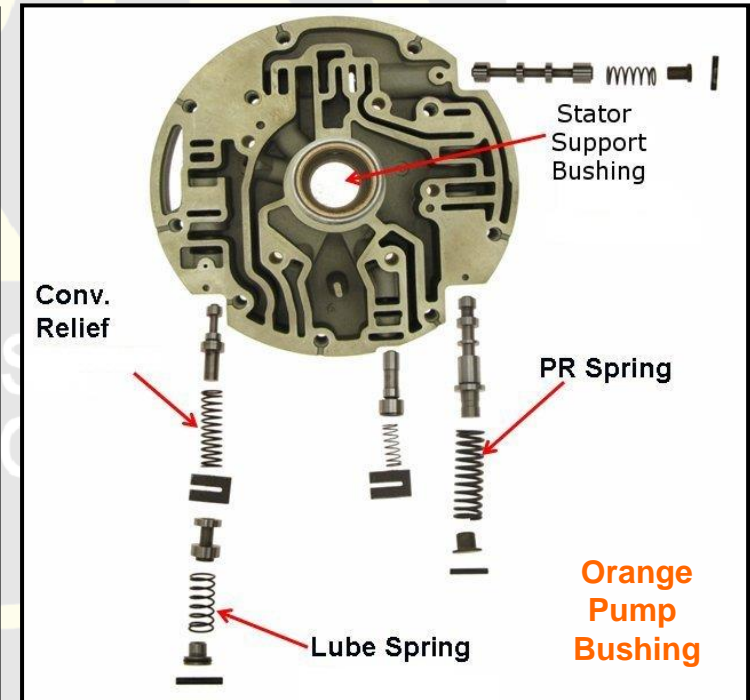
Spring	Part Number	Number of Coils	Wire Dia. mm (in.)	Spring OD mm (in.)	Approximate Free length mm (in.)
Main Regulator Spring	29546317	10.42	1.93 (0.076)	21.25 (0.837)	47.70 (1.878)
Converter Flow Spring	29546320	10.75	1.47 (0.058)	17.25 (0.679)	37.48 (1.476)
Pop off Spring (Lube Regulator Spring)	29541228	12.38	1.47 (0.058)	11.68 (0.460)	39.22 (1.544)
PCV1, PCV2, TCC Spring (3)	29550070	7.93	0.94 (0.037)	9.80 (0.386)	20.64 (0.813)
SV1, SV2, SV3 Spring (3)	29545966	10.79	0.97 (0.038)	10.60 (0.417)	32.28 (1.271)
Control Main/Relief Spring (2)	29546994	11.12	1.47 (0.058)	14.00 (0.551)	41.28 (1.625)



Oil Pump Updates and Specifications

The oil pump has been a problem area due to the high pressures. Always look for updated parts when rebuilding. Converter bushing and seals have been improved. Lube Regulator spring and Converter Relief Springs have been updated. Use chart for specifications

Part Measured	Specification	
	Metric	English
Bushing, Maximum ID	58.391 mm	2.3015 in
Important: The pump bushing must have a complete burnt-orange color Teflon® coating. If any portion of the Teflon® coating is worn and bronze material is visible, replace the pump.		
Drive Gear, Maximum Distance Between Flats	52.165 mm	2.0537 in
Drive Gear, Maximum Side Clearance	0.068 mm	0.0026 in
Driven Gear, Minimum OD	109.987 mm	4.3302 in
Driven Gear, Maximum Side Clearance	0.056 mm	0.0022 in
Driven Gear/Crescent Tooth, Maximum Clearance	0.455 mm	0.0179 in
Driven Gear to Oil Pump Body, Maximum Diametrical Clearance	0.204 mm	0.0080 in
Oil Pump Body Gear Cavity, Maximum Depth	22.245 mm	0.8758 in
Oil Pump Body Gear Cavity, Maximum ID	110.191 mm	4.3382 in
Wear Plate, Minimum Thickness	2.950 mm	0.1161 in





Oil Pump Updates and Specifications

Updates to the pump were implemented to address the pump whine issue so be sure to check the part number of the pump you are purchasing. There are some pumps still in stock with the updated part number taped over the old part number.

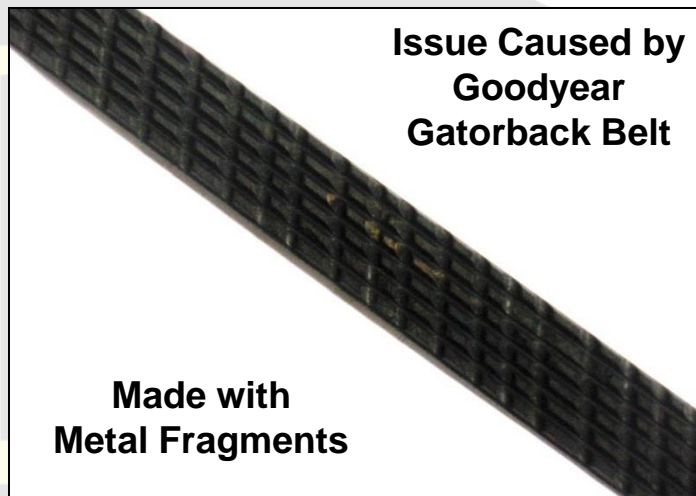
Although the pump plates are different, the pump bodies can be identified by casting numbers

The latest 2005 and later update has 26 teeth on the outer and 22 on the inner pump gear and the pump plate is slightly different.



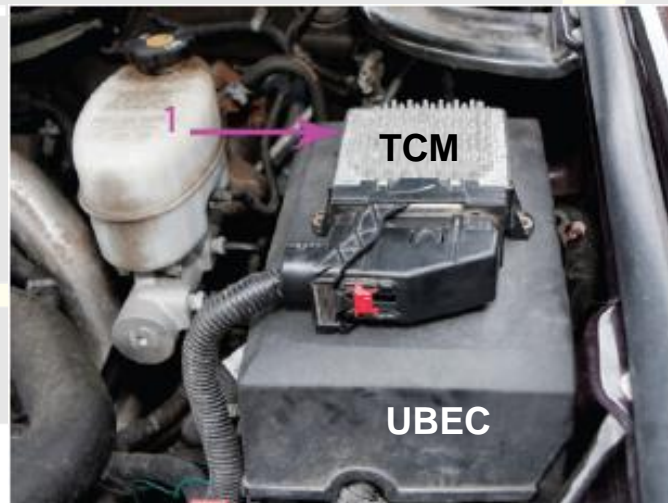


Codes, Shift or Engagement Complaints Caused by Electrostatic Discharge (ESD)



If problem persists; Inspect and Relocate the TCM to the top of the Underhood Bussed Electrical Center (UBEC).

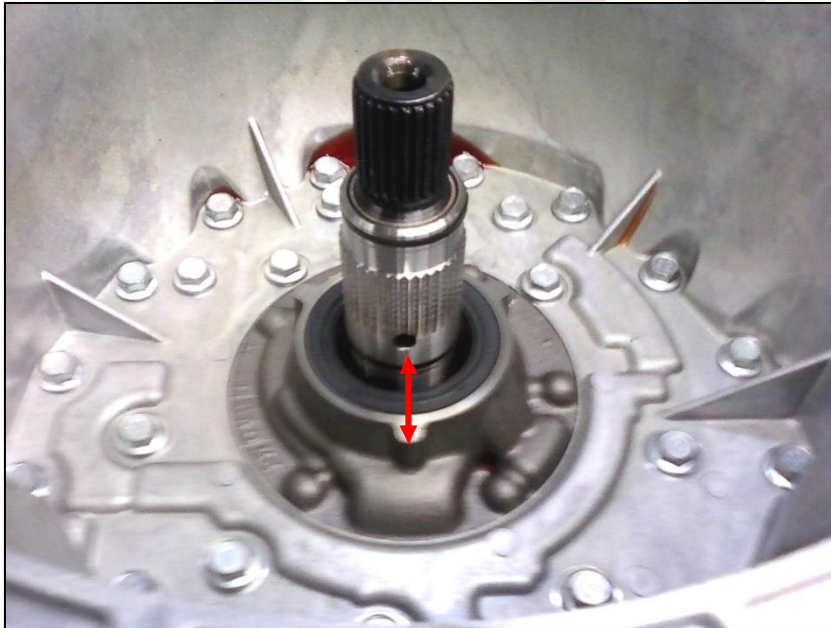
This may help prevent Electromagnetic Interference (EMI) issues caused by bad grounds or (ESD) from the alternator.



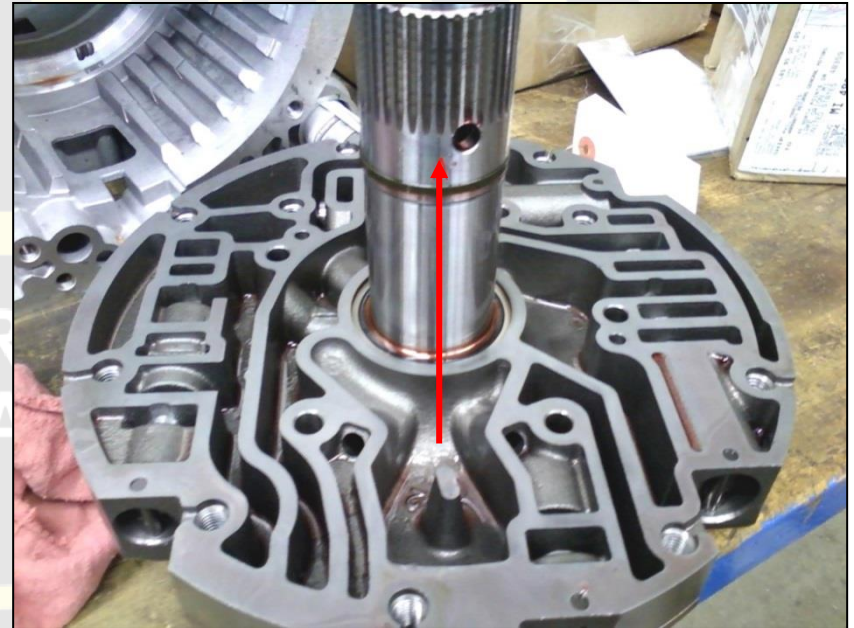


TCC Slip P0741 / Transmission Temp P0218

CORRECT – Holes in stator shaft are oriented properly at 12 and 6 O'clock.



WRONG – Holes in stator shaft are twisted CCW from original position. Improper internal flows result in P0741 and possible P0218.





Turbine Shaft Quench Crack Defect

Broken turbine shaft. Examine failure mode. This break was material flaw due to the longitudinal quench crack. A smooth break at the end small spline may indicate *overpower.*



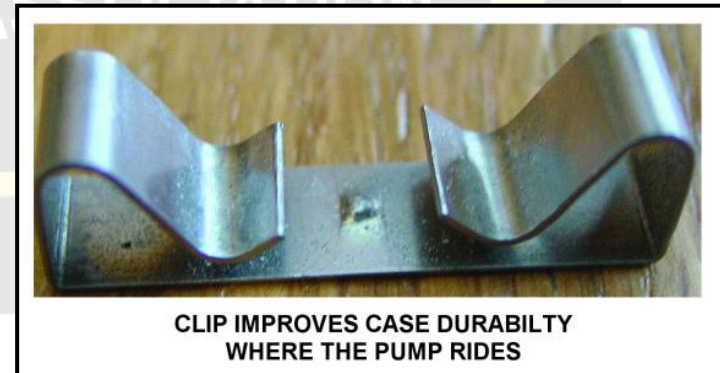
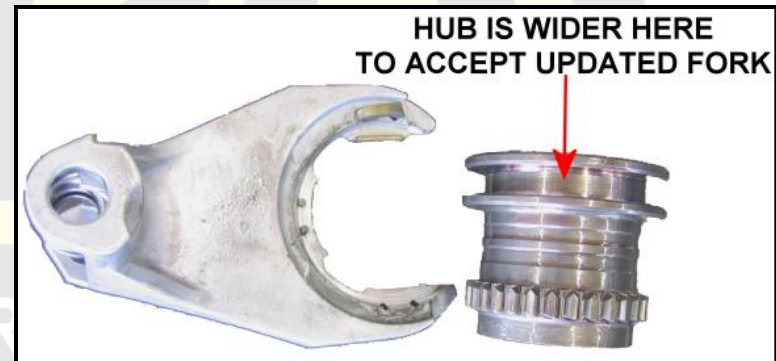
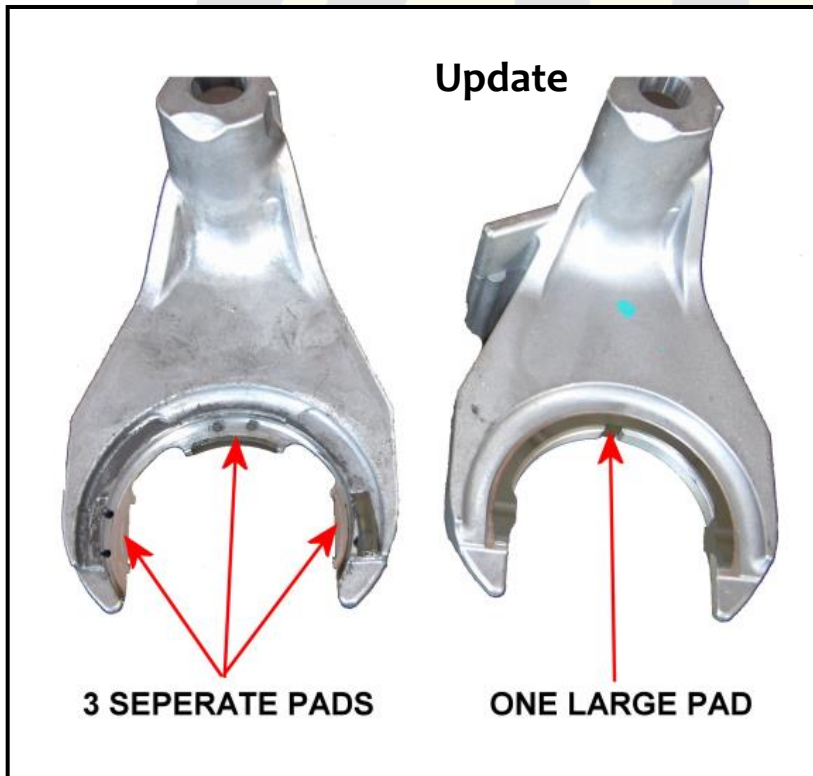
Broken input shaft will record a high max torque value.





Gear Ratio Error in 5th or 6th P0735 / P0736

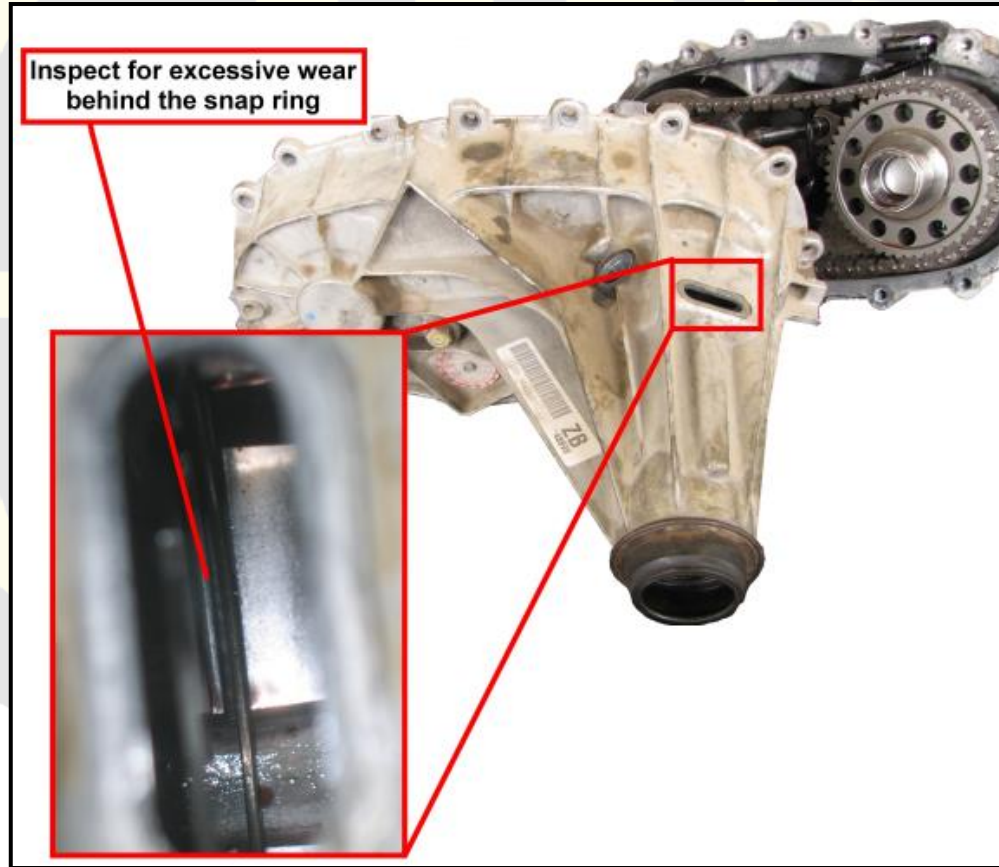
Ratio errors on the LCT1000 often cause neutral shifts and/or no upshifts. Depending on the model LCT1000 this may happen in 5th gear (2001-2005) or 6th gear (2006-On). The main cause of this is wear in the transfer case assemblies causing “erratic VSS signals”. Typical wear areas include the Slider and Fork assemblies, Bearing and Rear case assemblies, Chain and pump retainers in the case. ATRA TSB #1256





Gear Ratio Error in 5th or 6th P0735 / P0736

The snap ring groove in the rear case half for the output bearing is also wearing out. Make sure the snap ring does not have excessive clearance allowing the shaft to move back in forth causing erratic speed signal references.





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