Welcome To Today's Presentation

Sponsored By:

ATRA
AUTOMATIC TRANSMISSION REBUILDERS ASSOCIATION

SEAL AFTERMARKET PRODUCTS

TK TOLEDO TRANS-KIT

GEARS
FOR THE TRANSMISSION REBUILDING INDUSTRY

WIT
WHATEVER IT TAKES
TRANSMISSION PARTS, INC

your source for engineered solutions

TK TOLEDO TRANS-KIT

SEAL AFTERMARKET PRODUCTS

Any Questions Or Comments Please Send Emails To webinars@atra.com

Any Questions That You May Have During The Webinar Please Feel Free To Text Them In At Any Time

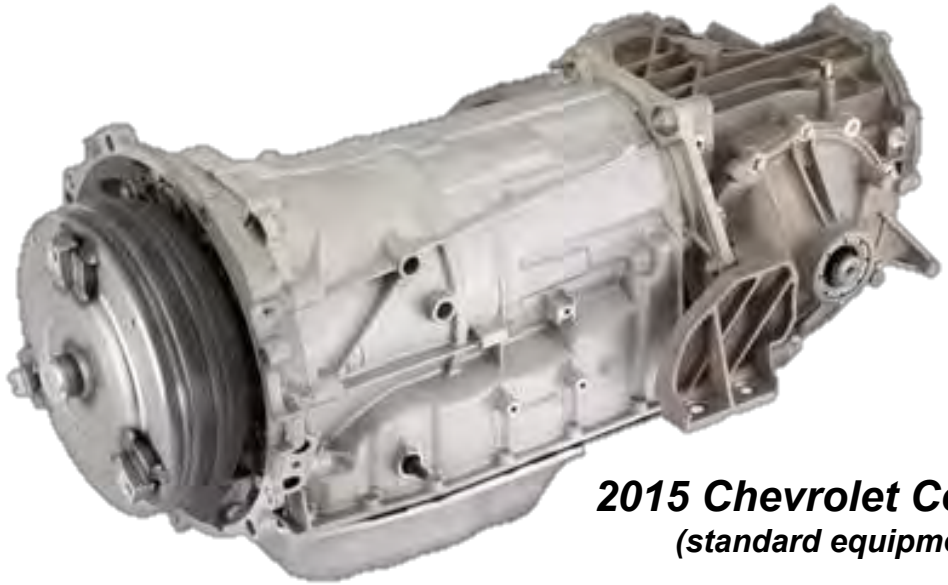
Webinar Schedule

ATRA Webinar Schedule		Description
Feb 10/11	Lineartronic CVT	Introduction
Feb 24/25	ZF8HP	Introduction
March 10/11	DPS6	Introduction
March 24/25	Honda 6	Rebuild
April 7/8	8L90	Introduction
April 21/22	CFT30	Rebuild
May 5/6	948TE	Introduction
May 19/20	Lineartronic CVT	Rebuild
June 2/3	ZF8HP	Rebuild
June 23/24	6R140	Introduction
July 7/8	DPS6	Internal Operation
July 21/22	U660	Introduction and Rebuild
Aug 4/5	8L90	Internal
Aug 18/19	01J	Problems & Fixes
Sept 1/2	948TE	Internal
Sept 15/16	5R110W	Problems & Fixes
Sept 29/30	Lineartronic CVT	Problems & Fixes
Oct 13/14	6R140	Problems & Fixes

your source for engineered solutions

your source for engineered solutions

GM 8L90 Introduction



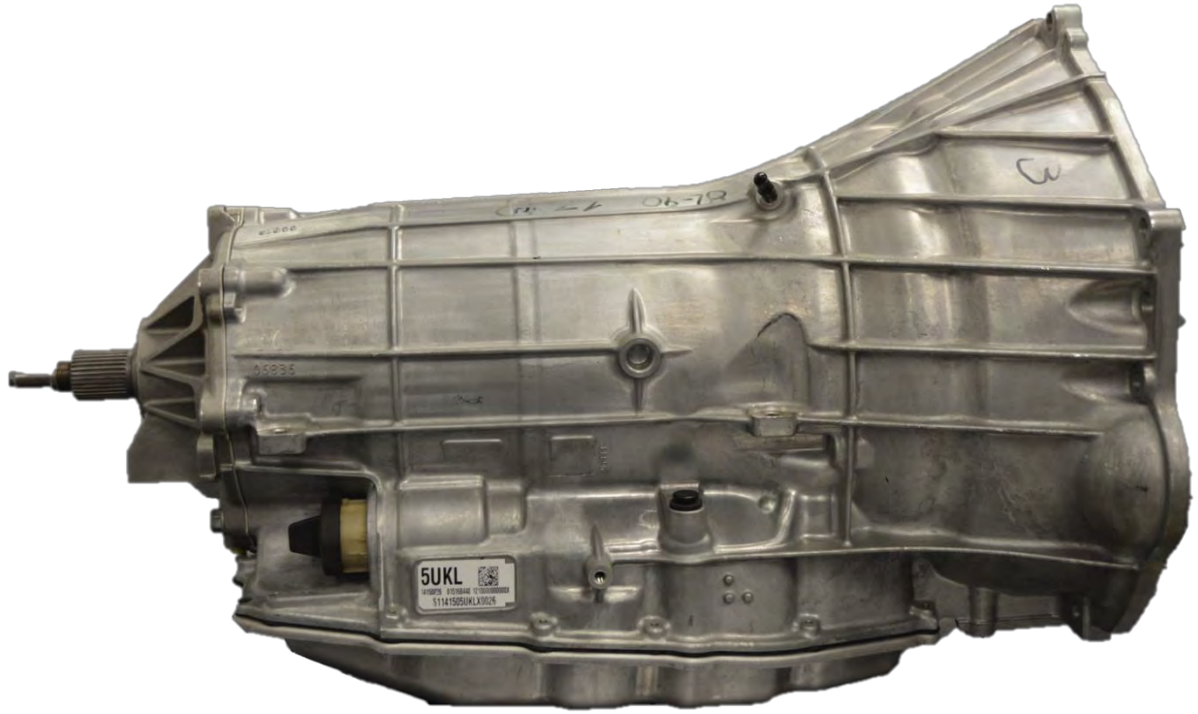
2015 Chevrolet Corvette
(standard equipment)

Presented by:
Mike Souza
ATRA Senior
Research Technician

Available in the 2015 Chevrolet Corvette as standard equipment.

As an upgrade in some full size SUV vehicles.

Shortly after as standard equipment in all full size SUV vehicles.



2015 Yukon Denali / XL Denali L83 / L86 Engine RWD/4WD (upgrade)

2015 Silverado Double Cab / Crew L86 Engine RWD/4WD (standard)

Introduction

- The RPO code for the 8L90 is M5U.
- This new 8 speed transmission will be introduced in the Chevrolet Corvette, then shortly after in full size SUV vehicles.
- In the SUVs, the 8 speed is an up-level transmission option.
- The 6 speed will still be the standard option.
- The 8L90 Hydra-Matic transmission is a fully automatic, 8-speed, rear-wheel drive, electronic-controlled transmission.
- The 8 speed ratios are generated using:
  - 4 planetary gear sets
  - 2 brake clutches
  - 3 rotating clutches
- The three (3) rotating clutches have been located forward of the gear sets to minimize the length of oil feeds which provides for enhanced shift response.
- The 8 speed architecture utilizes a chain driven fluid pump.

Introduction

- Different variants of the 8L90 transmission are all based on torque capacity. The different 8 speed transmission variants use common components. The main differences primarily relate to component size and clutch capacity.
- The 8 speed transmission features a case with integral bellhousing for enhanced powertrain stiffness.
- A unique pump drive design allows for off-axis packaging very low in the transmission. The pump is a binary vane type which effectively allows for two pumps in the packaging size of one. The design and packaging strategy enables low parasitic losses and optimum priming capability and provides for ideal oil routing to the controls system, with the pump located in the valve body itself.
- The transmission control module (TCM) is externally mounted, enabling packaging and powertrain integration flexibility.
- The controller makes use of three (3) speed sensors which provide for enhanced shift response and accuracy.

Remote Off Axis Vane Type Binary Pump

At low speeds, both ports supply pressurized fluid to the transmission to meet demand.

Higher speeds require a lower displacement, and only one discharge port supplies pressurized fluid.

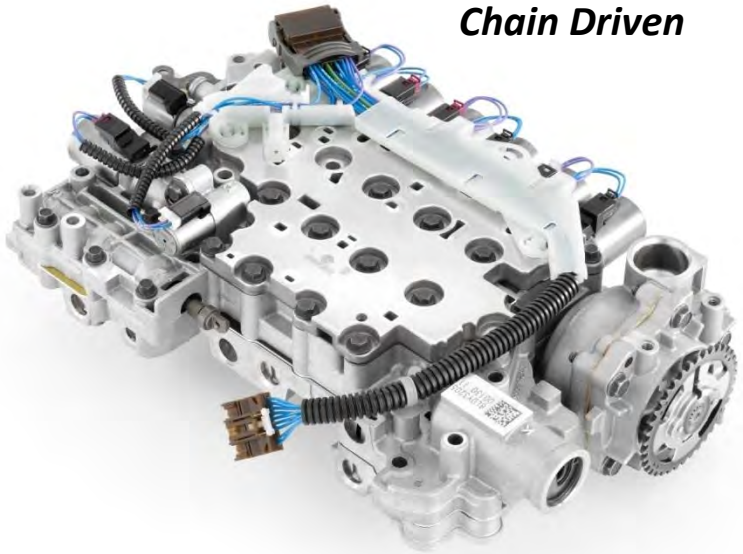
The fluid from the other discharge port recirculates to the suction side, reducing the losses in the system and improving overall efficiency of the transmission.

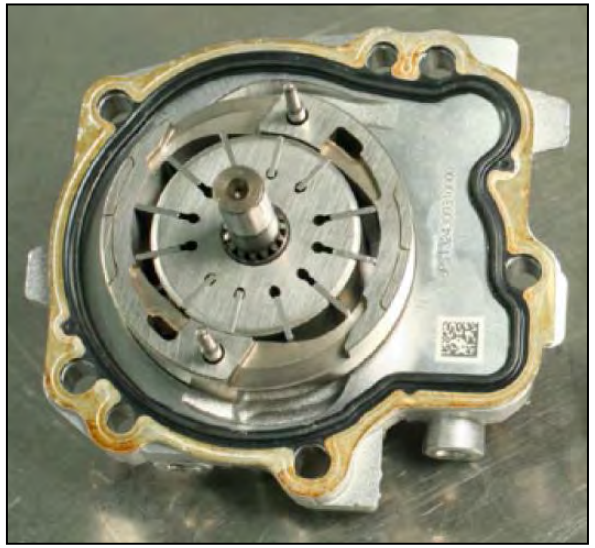
A binary pump also responds quicker to a reduction in engine speed.

The pump adjusts to changes in demand sooner than the slide on a variable displacement pump.

Remote Off Axis Vane Type Binary Pump

Chain Driven





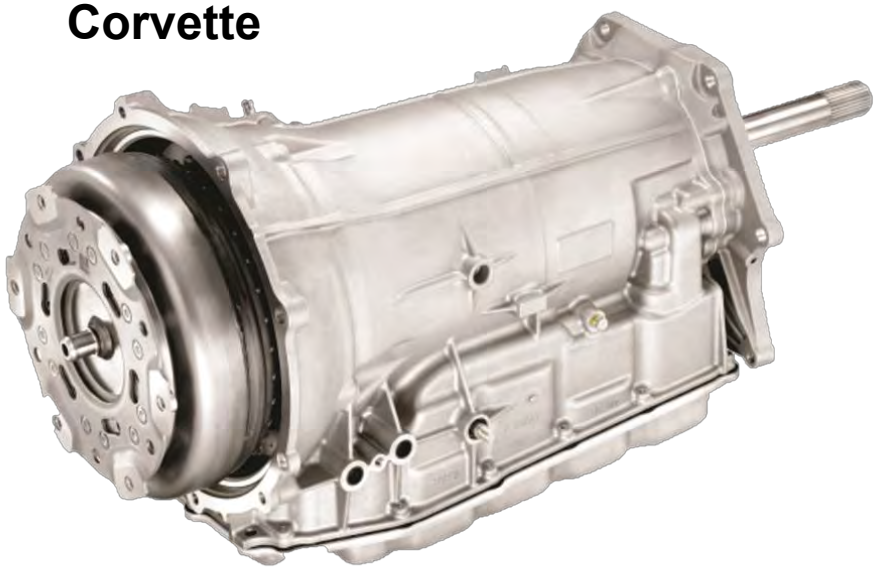
Transmission Case

The transmission case uses an integrated bell housing for added strength in the truck and SUV versions. The Corvette transmission bolts directly to the torque tube. The rear transmission case extension is different from the Corvette and the truck/SUV versions.

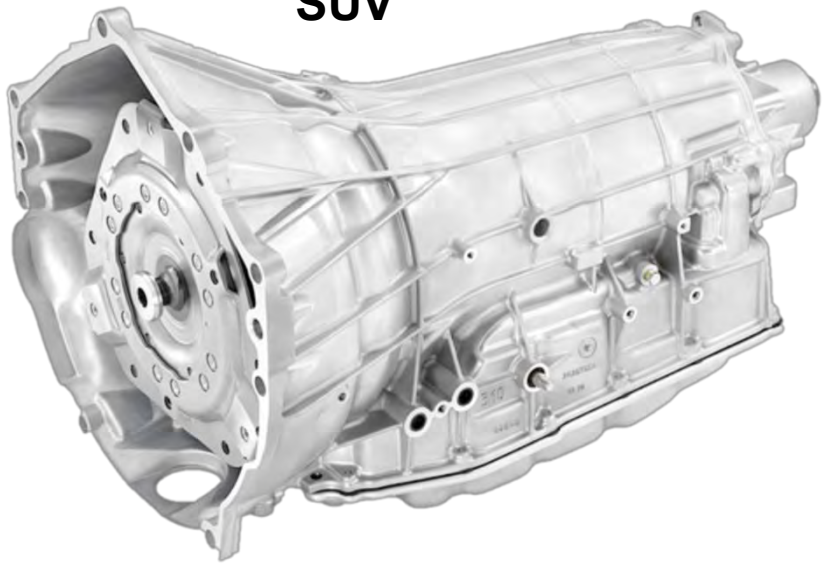
The extension housing will also be different between 2WD and 4WD versions for the truck and SUVs. The transmission case has a 20 way electrical connector to attach the electrical harness, and a fill tube plug for fluid filling, if it is accessible. The transmission label that contains the serial number and transmission identification number is located on the transmission case.

Cooler line connections are also provided just in front of the shift shaft.

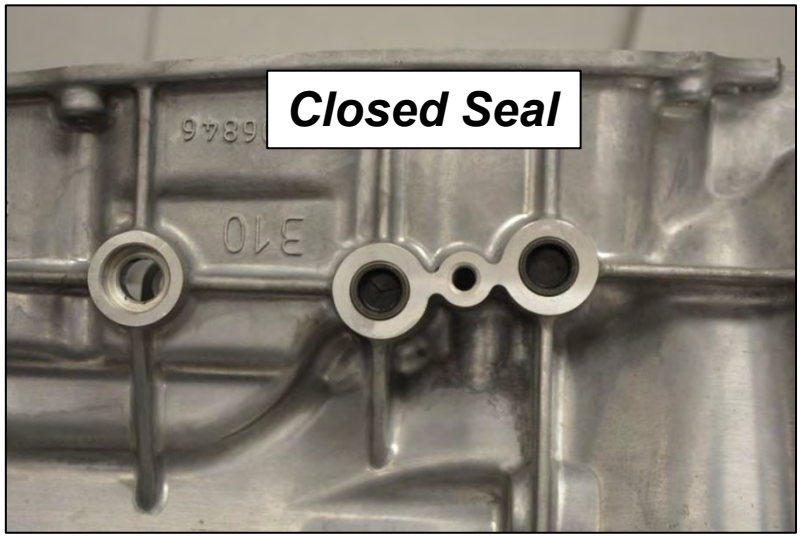
Corvette

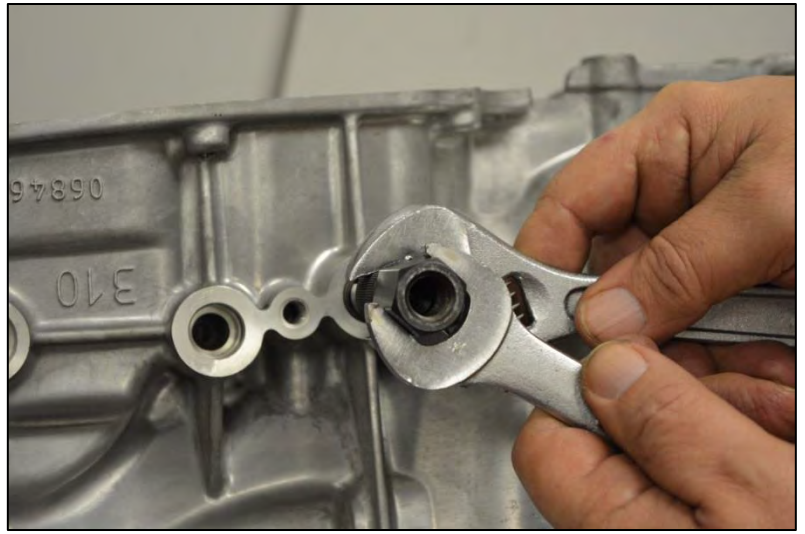


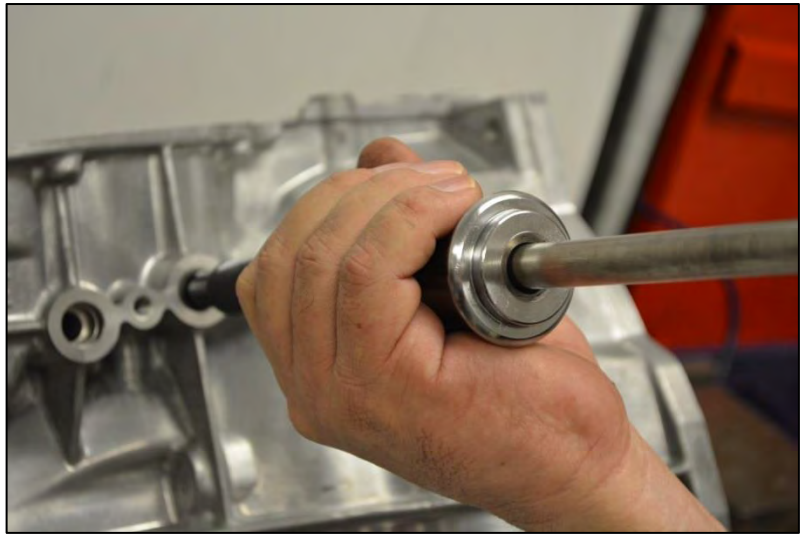
SUV

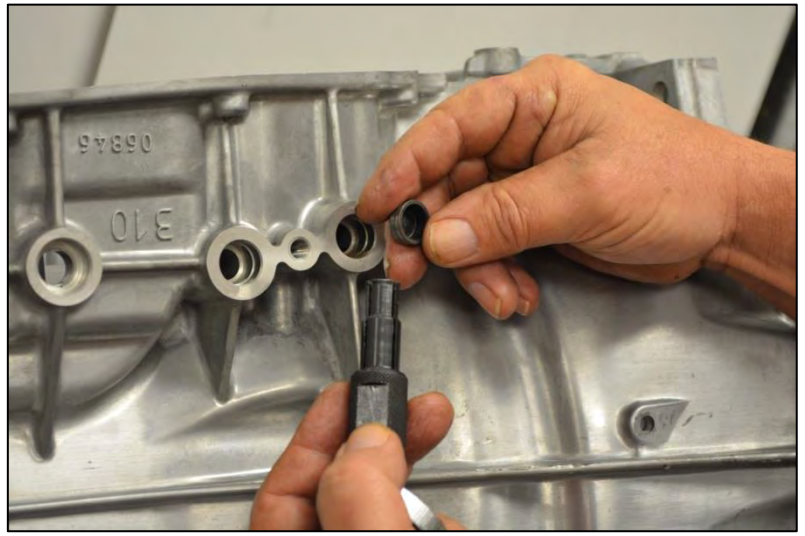


Transmission Case

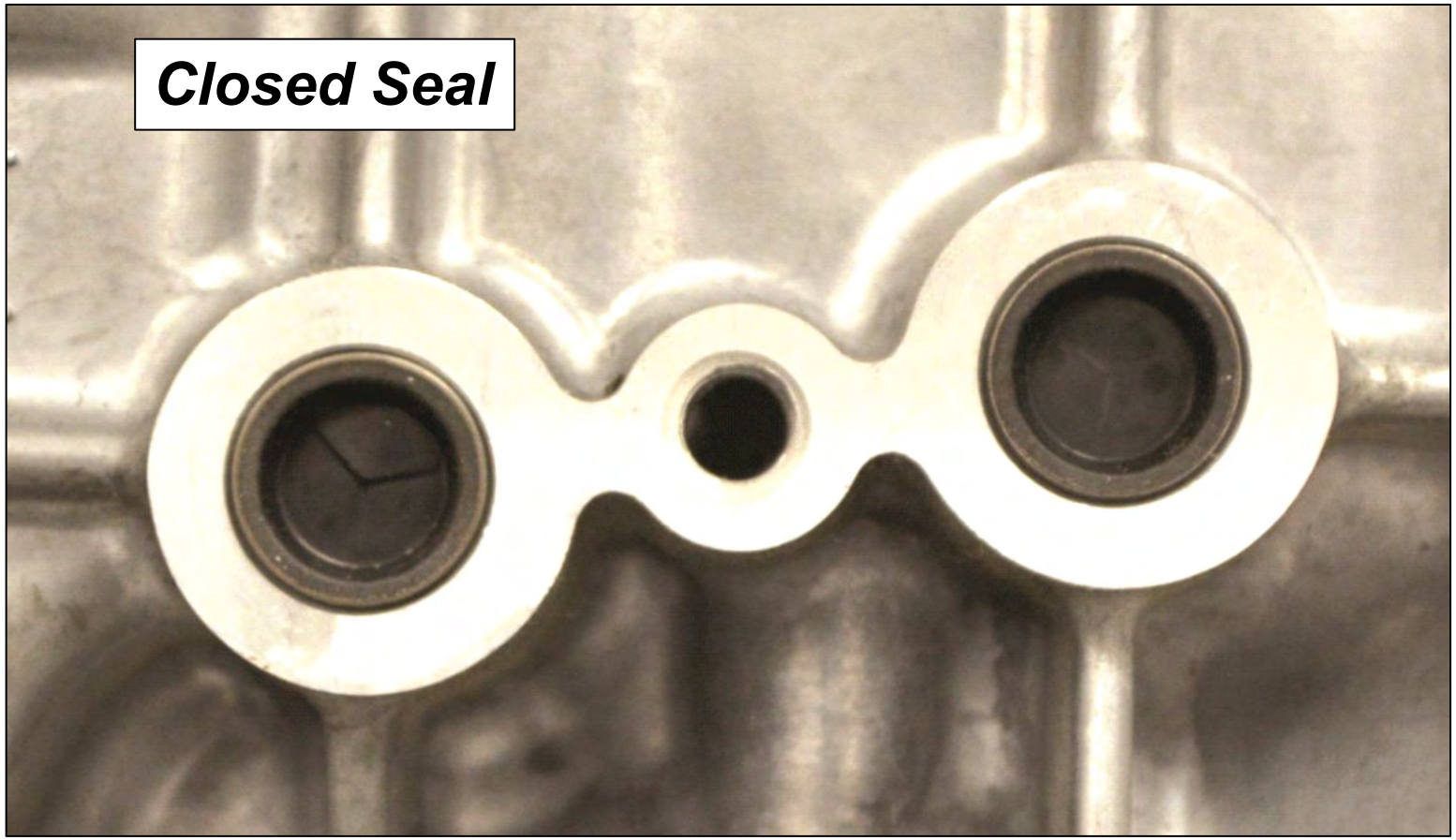








Transmission Case

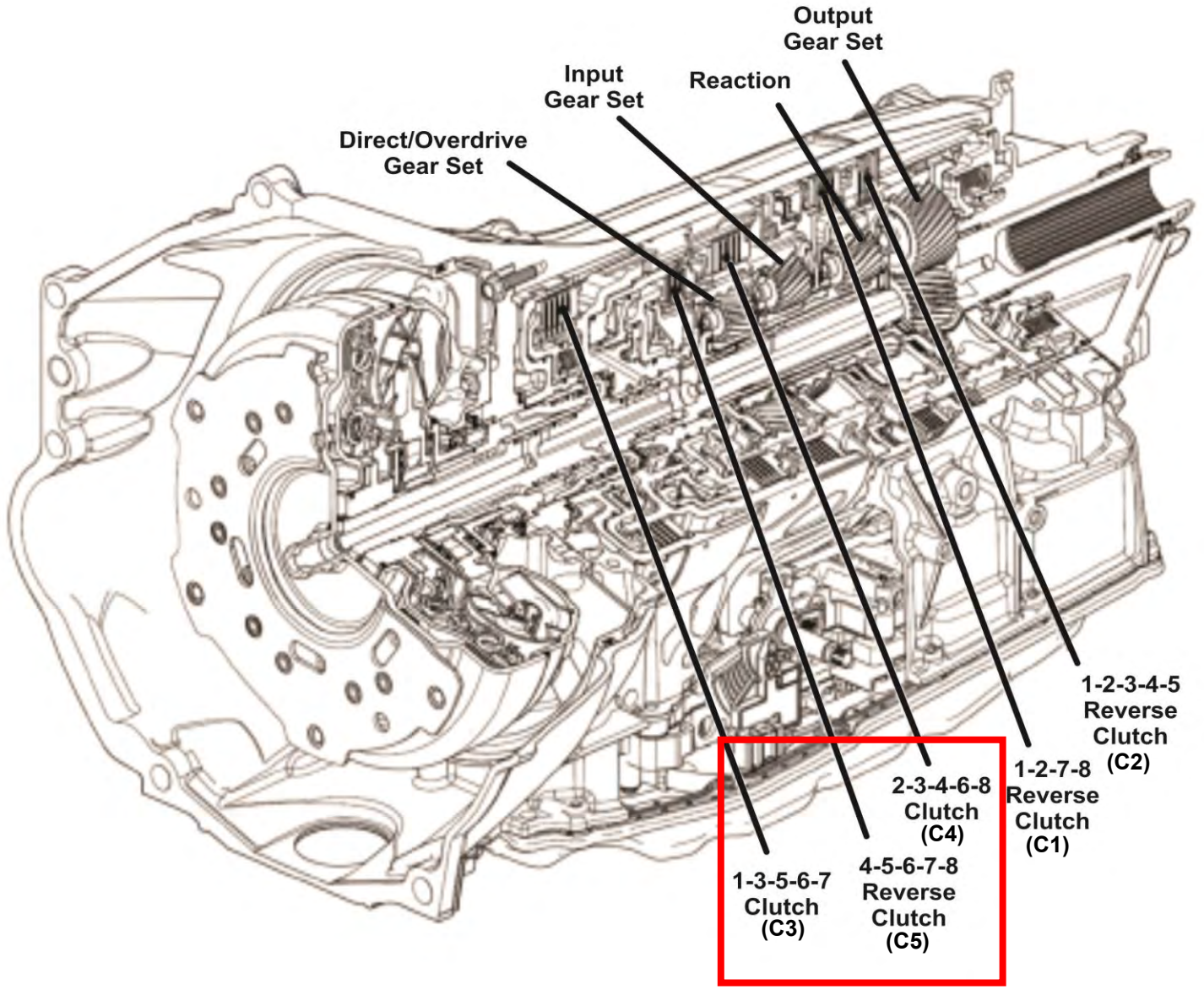


Transmission Components

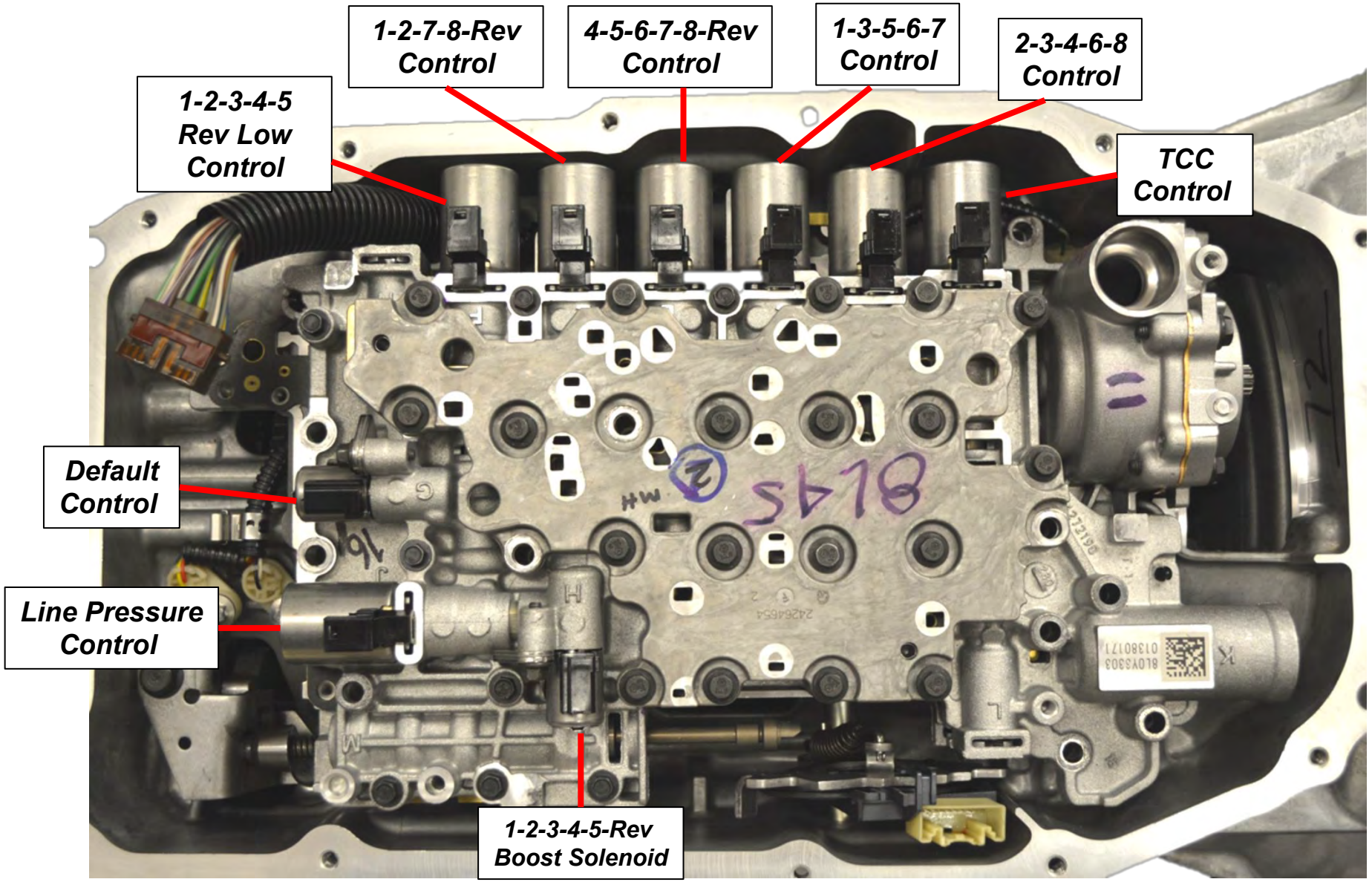
- The planetary gear sets provide the 8 forward gear ratios and reverse.
- Changing gear ratios is fully automatic and is accomplished through the use of a transmission control module (TCM).
- The TCM receives and monitors various electronic sensor inputs and uses this information to shift the transmission at the optimum time.
- The friction components used in the 8L90 transmission consist of 5 multiple disc clutches.
- The multiple disc clutches deliver 8 forward gear ratios and one reverse gear ratio through the gear sets.
- The gear sets then transfer torque and sends it to the output shaft.
- The 4 gear sets are the direct/overdrive gear set, the input gear set, the reaction gear set and the output gear set.
- The 5 clutches are the 1-3-5-6-7 clutch, 4-5-6-7-8 reverse clutch, 2-3-4-6-8 clutch, 1-2-7-8 brake reverse clutch and the 1-2-3-4-5 reverse brake clutch.

Transmission Components

According to the manufacturer all the driving clutches are located in front of the planetary assemblies for a quicker fill time



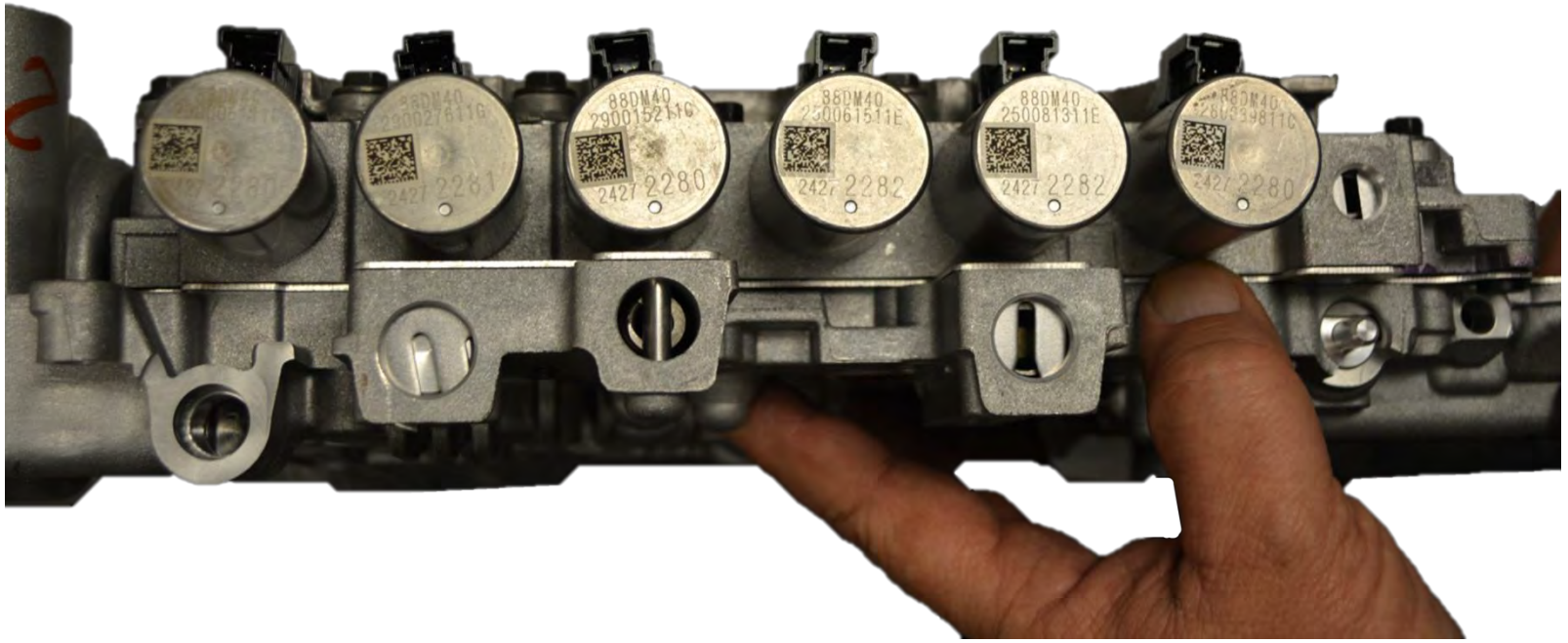
Solenoid Identification



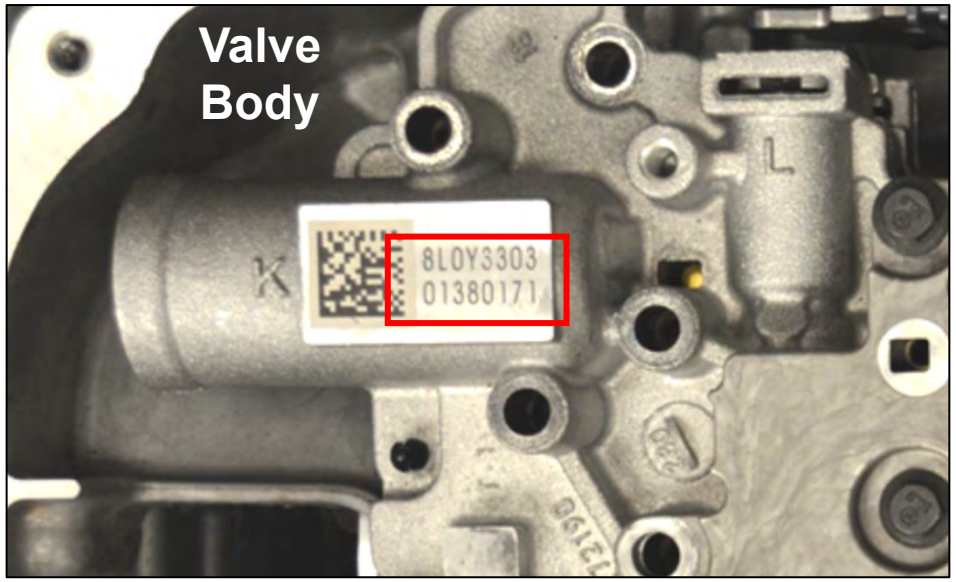
Solenoid Identification

A part unique number (PUN) is located on the valve body and solenoids and a transmission unique number (TUN) is located on the case. The part numbers identify the solenoid unique performance characteristic data, which is stored in the transmission control module (TCM) as part of the TIS2 Web Service Programming System (SPS).

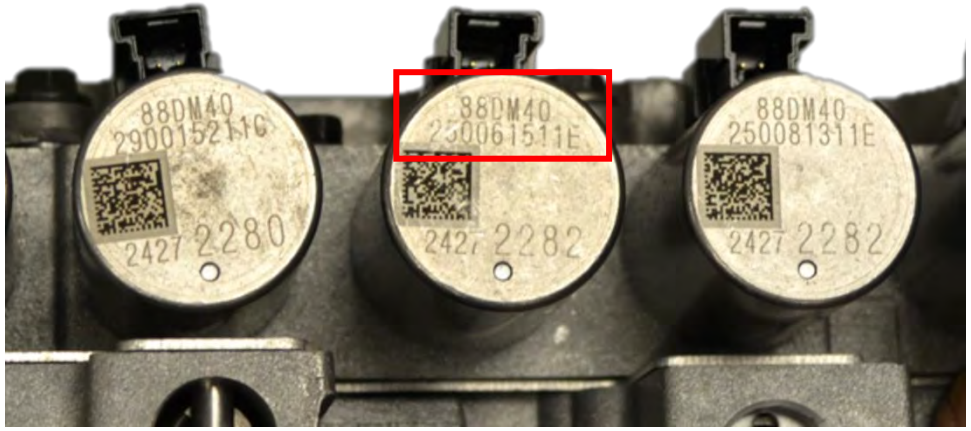
If you change the transmission, valve body, solenoids, or TCM during a repair, the unique performance characteristic data must be downloaded from the web server and reprogrammed into the TCM for the system to function at maximum efficiency.



Solenoid Identification



Part Unique Number (PUN)



Solenoids

Transmission Unique Number (TUN)

Solenoid Resistance

Although the PWM solenoids resistance is the same.

The part unique numbers (PUN) identifies each of the solenoid's different flow rate performance characteristics.

There is no difference between the two on/off solenoids.

8L90 Solenoid Information			
Solenoid Name	Solenoid Type	Controlled Element	Resistance Value
Control Solenoid Valve 1	High Pressure Normally Closed Variable Force	Torque Converter Clutch	4.5 - 5.5 ohms
Control Solenoid Valve 2	High Pressure Normally Open Variable Force	2-3-4-6-8 Clutch	4.5 - 5.5 ohms
Control Solenoid Valve 3	High Pressure Normally Closed Variable Force	1-3-5-6-7 Clutch	4.5 - 5.5 ohms
Control Solenoid Valve 4	Low Pressure Normally Open Variable Force	4-5-6-7-8 Reverse Clutch	4.5 - 5.5 ohms
Control Solenoid Valve 5	Low Pressure Normally Open Variable Force	1-2-7-8 Reverse Clutch	4.5 - 5.5 ohms
Control Solenoid Valve 6	High Pressure Normally Closed Variable Force	1-2-3-4-5 Reverse Clutch	4.5 - 5.5 ohms
Control Solenoid Valve 7	Low Pressure Normally Open Variable Force	Line Pressure	4.5 - 5.5 ohms
Control Solenoid Valve 8	Normally Closed On - Off	Default Value	11.0 - 13.0 ohms
Control Solenoid Valve 9	Normally Closed On - Off	Boost Valve	11.0 - 13.0 ohms

Solenoid & Clutch Application Chart

This is a solenoid working apply chart , not a voltage apply chart along with clutch apply.

When the solenoid state is on it is performing a function whether it's Normally High creating pressure or Normally Low dropping pressure.

Controlled by amperage from the TCM.

Working Chart Not Electrical / Failsafe is 6th Gear

									C3	C5	C4	C1	C2
Range	Gear	4-5-6-7-8 Reverse S1 NH	1-2-7-8 Reverse S2 NH	1-2-3-4 5 Reverse S3 NL	1-3-5-6-7 S5 NL	2-3-4-6-8 S6 NH	1-2-3-4-5 Reverse BST S8	Default Control S9	1-3-5-6-7 Clutch	4-5-6-7-8 Reverse Clutch	2-3-4-6-8 Clutch	1-2-7-8 Reverse Clutch	1-2-3-4-5 Reverse Clutch
Park	P	Off	On	On	Off	Off	Off	Off	—	—	—	Applied*	Applied*
Rev	R	On	On	On	Off	Off	On	Off	—	Applied	—	Applied	Applied
Neu	N	Off	On	On	Off	Off	Off	Off	—	—	—	Applied*	Applied*
D	1st	Off	On	On	On	Off	On	On	Applied	—	—	Applied	Applied
	2nd	Off	On	On	Off	On	On	Off	—	—	Applied	Applied	Applied
	3rd	Off	Off	On	On	On	On	Off	Applied	—	Applied	—	Applied
	4th	On	Off	On	Off	On	On	On	—	Applied	Applied	—	Applied
	5th	On	Off	On	On	Off	On	On	Applied	Applied	—	—	Applied
	6th	On	Off	Off	On	On	Off	On	Applied	Applied	Applied	—	—
	7th	On	On	Off	On	Off	Off	On	Applied	Applied	—	Applied	—
	8th	On	On	Off	Off	On	Off	On	—	Applied	Applied	Applied	—

* Applied with no load

No Sprag Assembly

General Specifications

Name	8L90
RPO Codes	M5U
Production Location	Toledo, OH (USA)
Transmission Drive	Rear Wheel Drive
1st Gear Ratio	4.560
2nd Gear Ratio	2.971
3rd Gear Ratio	2.075
4th Gear Ratio	1.688
5th Gear Ratio	1.270
6th Gear Ratio	1.000
7th Gear Ratio	0.845
8th Gear Ratio	0.652
Reverse	3.818
Torque Converter Size – Diameter of Torque Converter Turbine	258 mm
Pressure Taps	Line Pressure
Transmission Fluid Type	DEXRON®HP
Transmission Type: 8	Eight Forward Gears
Transmission Type: L	Longitude Mount
Transmission Type: 90	Product Series
Position Quadrant	P, R, N, D, M
Case Material	Die Cast Aluminum
Transmission Net Weight (Approximate)	95 kg (210 lb)
Maximum Trailer Towing Capacity	Refer to applicable owner's manual

Transmission Service Fast Learn

- Transmission service fast learn is a procedure that is performed after ***any*** 8L90 transmission repair.
- This procedure performs a series of tests which allow the transmission control module (TCM) to learn individual clutch apply pressures.
- The learn pressure values are used by the TCM for clutch control and timing of shifts.
- The scan tool is used to perform the transmission service fast learn procedure.
- Service fast learn must be performed when any of the following repairs have been made to the transmission:
  - Pressure regulating solenoid replacement
  - Valve body repair or replacement
  - Any service/repair in response to a shift quality concern.
- If service fast learn is not performed after programming the TCM, longer than expected transmission adapt learn values could cause poor shift quality.
- This procedure must also be performed for any internal transmission service, repair, overhaul or replacement, torque converter replacement, TCM replacement, or transmission assembly replacement.

Shift Adaptation

The TCM monitors the A/T input speed sensor, intermediate speed sensor and the A/T output speed sensor during commanded shifts to determine if a shift is occurring too fast (harsh) or too slow (soft) and adjusts the corresponding PC solenoid signal to maintain the set shift feel.

How to Adapt Your Transmission

The Hydra-Matic 8-Speed RWD transmission adaptive learn process can be accomplished by driving in the following manner.

Execute the steps provided in the following pages with the vehicle warmed up on a smooth level road.

The driver may observe a brief pulse behavior or firm shift feel while the transmission is optimizing the clutch learn characteristics.

Perform a test drive and note any soft or harsh shifts.

To improve these complaint shifts, locate the clutches that need to be learned in the following table.

Shift Adaptation

Note: During low vehicle speeds with no accelerator pedal input downshift will most likely be a 3-1 shift.

To Correct The Shift Feel	Learn These Clutches	
	Applying Clutch	Releasing Clutch
1–2	C4	C3
2–3	C3	C1
3–4	C5	C3
4–5	C3	C4
5–6	C4	C2
6–7	C1	C4
7–8	C4	C3
3–1	C1	C4
2–1	C3	C4
N-D	C3 – Perform garage shift adaptive learning	
N-R	C5 – Perform garage shift adaptive learning	
Power Downshifts	Just perform the shifts and they will adapt	

Perform the required learning procedure for each clutch listed on the following pages.

Clutch Learning Procedures

To Learn C1: (1-2-7-8-Reverse Clutch))

Shift the transmission into 6th gear with the PRNDM in the M position. Obtain an engine speed between 1000 and 1750 rpm. Maintain this condition for a total of about 5 miles (8 km).

Cruise control may be used and has been found to result in faster learning of the clutch values.

Try the complaint shift to see if it has improved to an acceptable level. If not, continue with operation in this speed range until the complaint shift improves.

To Learn C2: (1-2-3-4-5-Reverse Clutch)

Note: Perform abbreviated coast down shift adaptive learning procedure listed below to enable learn mode.

Shift the transmission into 8th gear with the PRNDM in the M position. Obtain an engine speed between 1000 and 1750 rpm. Maintain this condition for a total of about 5 miles (8 km).

Cruise control may be used and has been found to result in faster learning of the clutch values.

Try the complaint shift to see if it has improved to an acceptable level. If not, continue with operation in this speed range until the complaint shift improves.

Clutch Learning Procedures

To Learn C3: (1-3-5-6-7 Clutch)

Note: Perform abbreviated coast down shift adaptive learning procedure listed below to enable learn mode.

Shift the transmission into 4th gear with the PRNDM in the M position. Start a slow acceleration at about 1000 rpm and maintain the slow acceleration until you reach about 1650 rpm. Once you reach 1650 rpm, go back down to 1000 rpm and repeat the slow acceleration up to 1650 rpm.

Repeat this a few times and retry the complaint shift to see if it has improved to an acceptable level. If it has not, continue this slow acceleration procedure until the complaint shift improves.

To Learn C4: (2-3-4-6-8 Clutch)

Shift the transmission into 7th gear with the PRNDM in the M position. Obtain an engine speed between 1000 and 1750 rpm.

Maintain this condition for a total of about 5 miles (8 km).

Cruise control may be used and has been found to result in faster learning of the clutch values.

Try the complaint shift to see if it has improved to an acceptable level. If not, continue with operation in this speed range until the complaint shift improves.

Clutch Learning Procedures

<u>To Learn C5</u>: (4-5-6-7-8 Reverse Clutch)
Shift the transmission into 3rd gear with the PRNDM in the M position.

Start a slow acceleration at about 1000 rpm and maintain the slow acceleration until you reach about 2500 rpm. Once you reach 2500 rpm, go back down to 1000 rpm and repeat the slow acceleration up to 2500 rpm.

Repeat this a few times and retry the complaint shift to see if it has improved to an acceptable level. If it has not, continue this slow acceleration procedure until the complaint shift improves.

<u>Abbreviated Coast Down Shift Adaptive Learning</u>:
Lightly accelerate to 65 mph (105 km/h) and coast to 25 mph (40 km/h) (light braking can be applied). Repeat 10 times.

This procedure will enable clutch apply adaptive learning for the C2 and C3.

Note: This only needs to be performed once per drive cycle to enable the adaptive learning for all subsequent C2 and C3 learning maneuvers.

Failure to perform this procedure will result in no learning of these clutches.

Clutch Learning Procedures

Power Downshift Adaptive Learning:
Starting with the vehicle operation in 8th gear, slowly apply pressure to the accelerator pedal until downshift occurs.

Repeat as necessary in each gear.

This procedure will learn the off-going clutch adapts for desired power downshift control.

Garage Shift Adaptive Learning:
Perform abbreviated coast down shift adaptive learning procedure.

Then with the vehicle at a stop, hold foot on brake pedal and move the shifter from Neutral to Drive and Neutral to Reverse.

Repeat as necessary until desired shift quality is achieved.

This procedure will learn the C13567 (C3-Drive) and C45678R (C5 – Reverse) oncoming clutch adapts.

Speed Sensor Locations

There are three (3) speed sensors for the 8L90:

- Input Speed
- Intermediate Speed
- Output speed

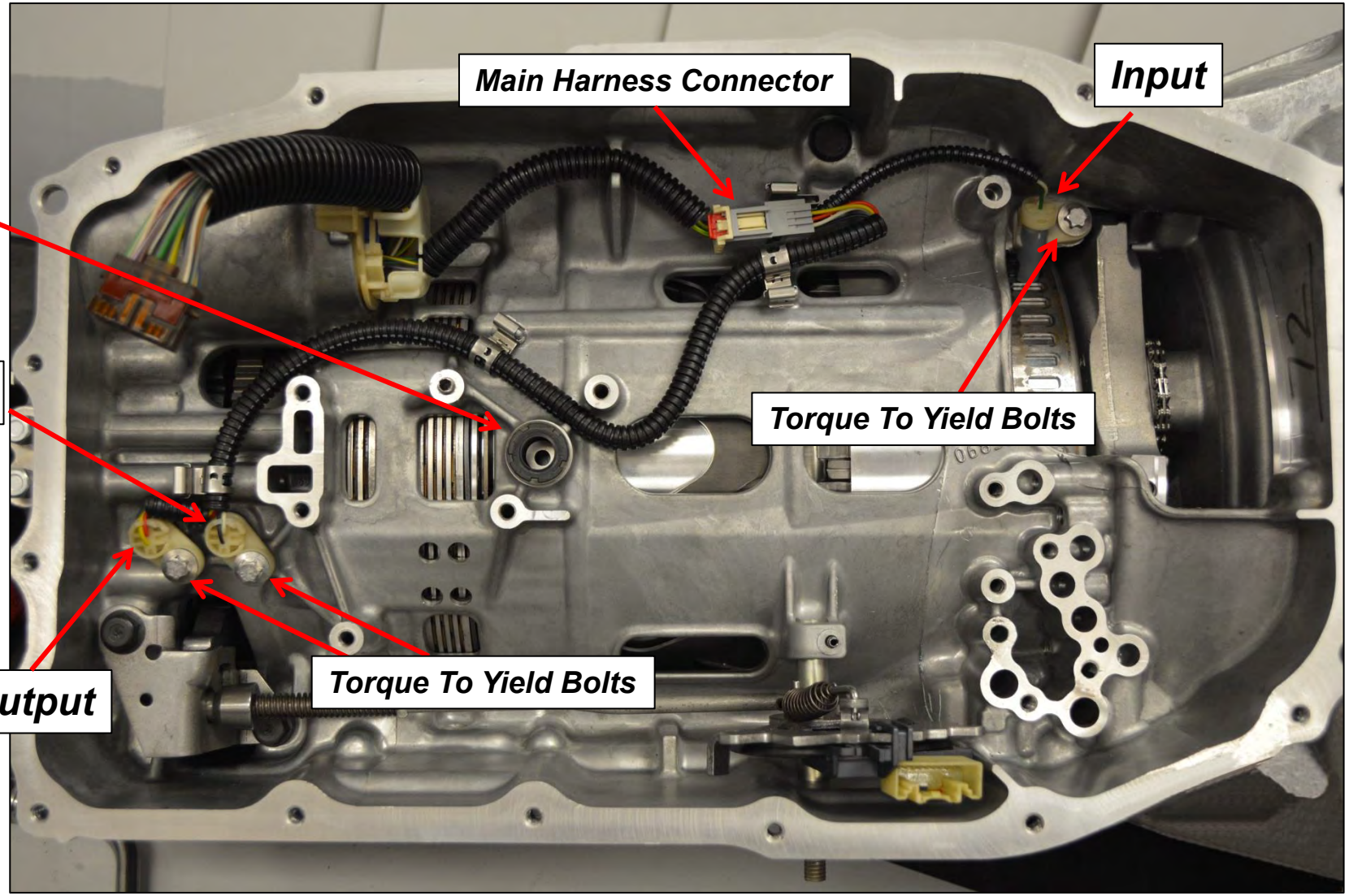
Torque-to-yield bolts are used to retain the speed sensors. If the bolts are removed, discard and replace them with new ones.

All three sensors are part of a wiring harness that connects to the main harness going to the pass-through connector.

NOTE: Torque-to-yield bolts need to be broken loose with a hand tool first before removal with air tools.

All 3 Speed Sensors are attached to a single harness separate from the main harness

Speed Sensor Locations

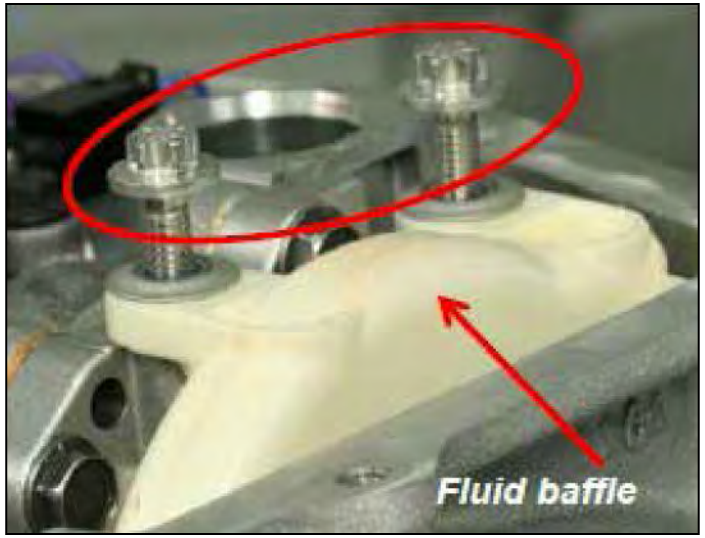


Pump Assembly

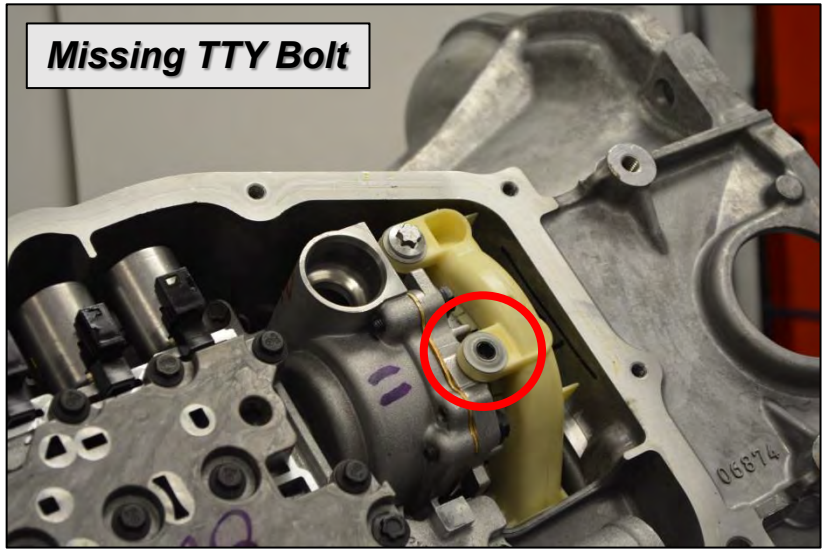
To gain access to the driven pump sprocket, remove the transmission fluid baffle that covers the driven pump sprocket.

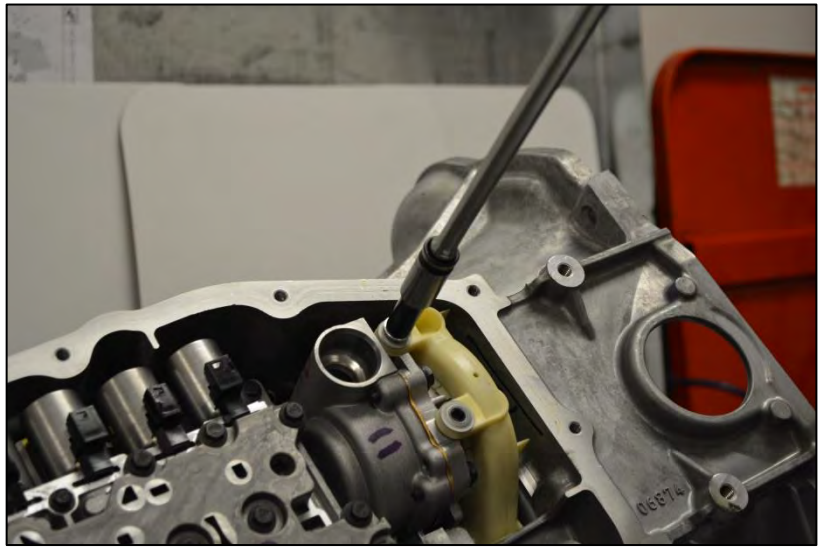
The retaining bolts that secure the baffle to the transmission are torque-to-yield inverted Torx head bolts. The bolts must be discarded and replaced with new ones when reinstalling the fluid baffle back into the transmission.

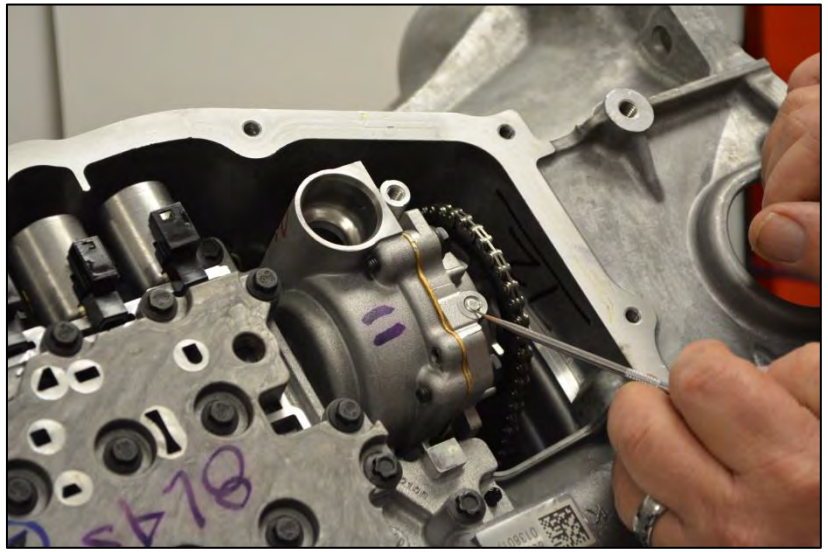
Remove the Torx bolts with the valve body Torx Plus socket. This is the same tool that is used for the 6-speed transmission.



Removing Torque To Yield Bolts







Pump Assembly

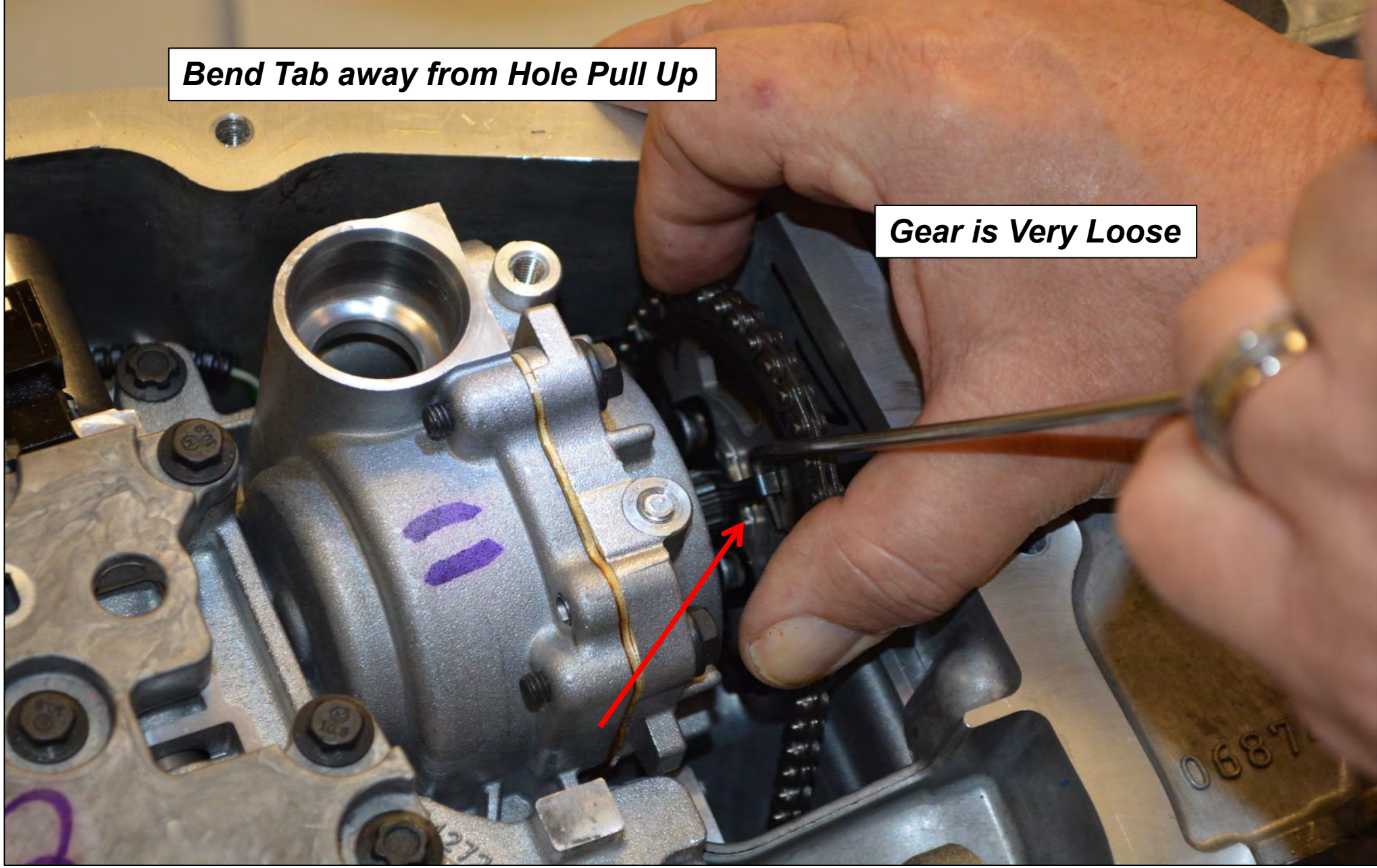
The pump is driven from the pump drive sprocket which is driven directly from the torque converter.

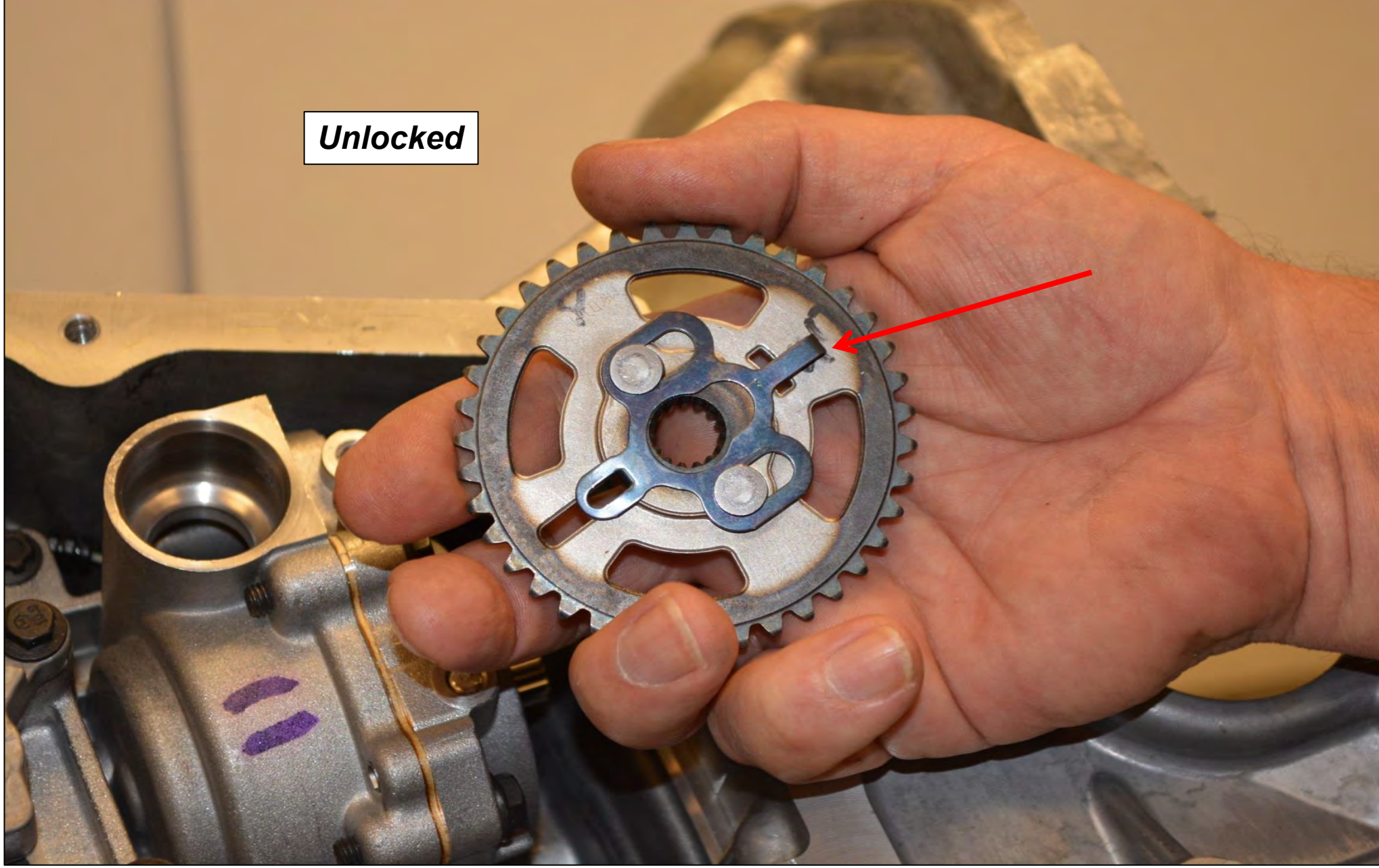
The pump driven sprocket is directly attached to the fluid pump. A drive chain connects the sprocket and the pump.

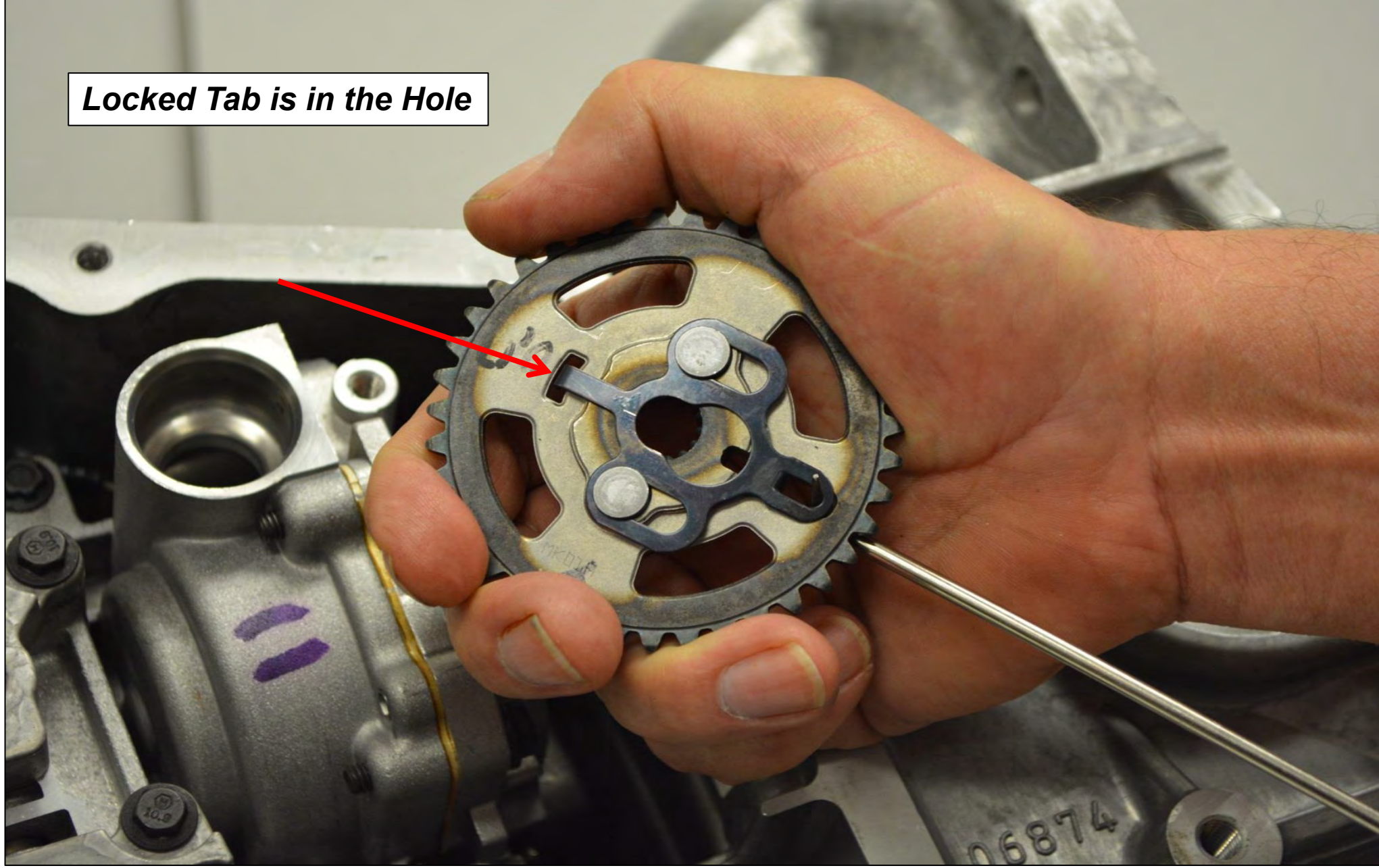
Pay close attention to the position of the locking tab when installing the pump driven sprocket onto the pump shaft.

Make sure the sprocket locking tab is correctly secured to the pump shaft.

Drive gear can go either way


Bend Tab away from Hole Pull Up
Gear is Very Loose


Unlocked


Locked Tab is in the Hole
06874

Pump Assembly

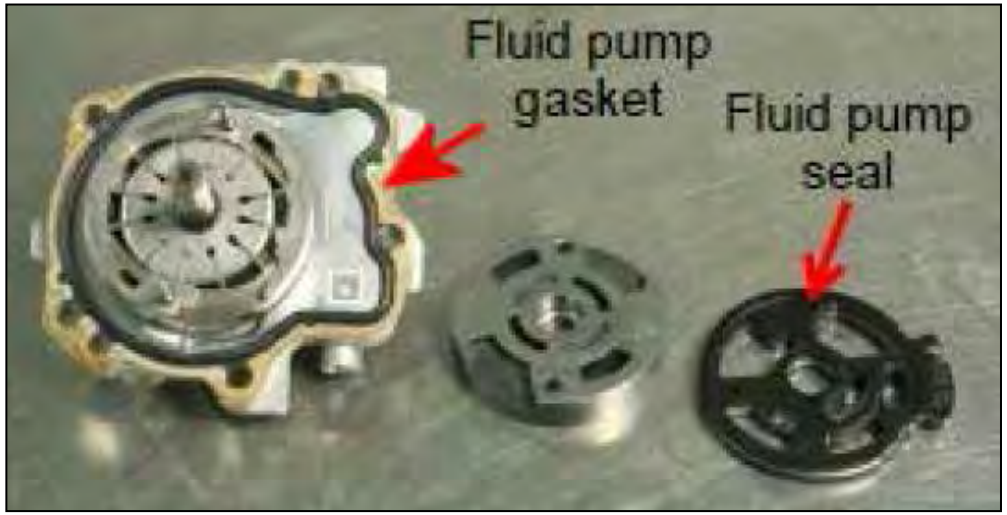
The hydraulic system consists of an off-axis chain-driven binary vane-type pump. The pump is located in the upper valve body.

Note: The fluid pump seal and the fluid pump gaskets are not reusable.

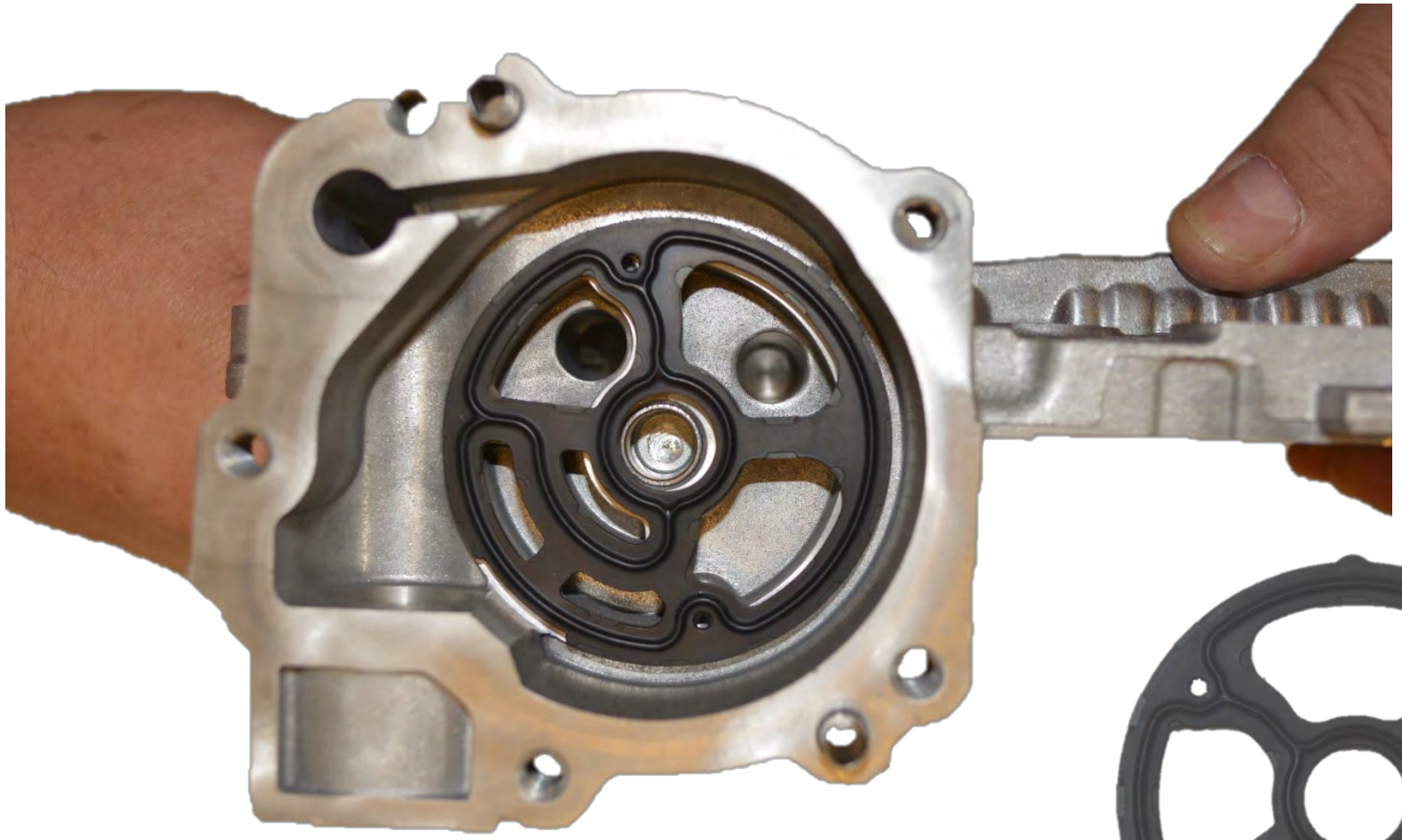
A new gasket and new seal must be installed when the fluid pump has been removed.

The fluid pump uses a fluid passage sleeve. The sleeve is used to direct fluid into the suction of the pump more directly to avoid cavitation within the pump. The sleeve needs to be installing correctly into the pump housing cavity.

Note: The sleeve can only be installed one way.



Remote Off Axis Vane Type Binary Pump



Make sure to align the seal correctly

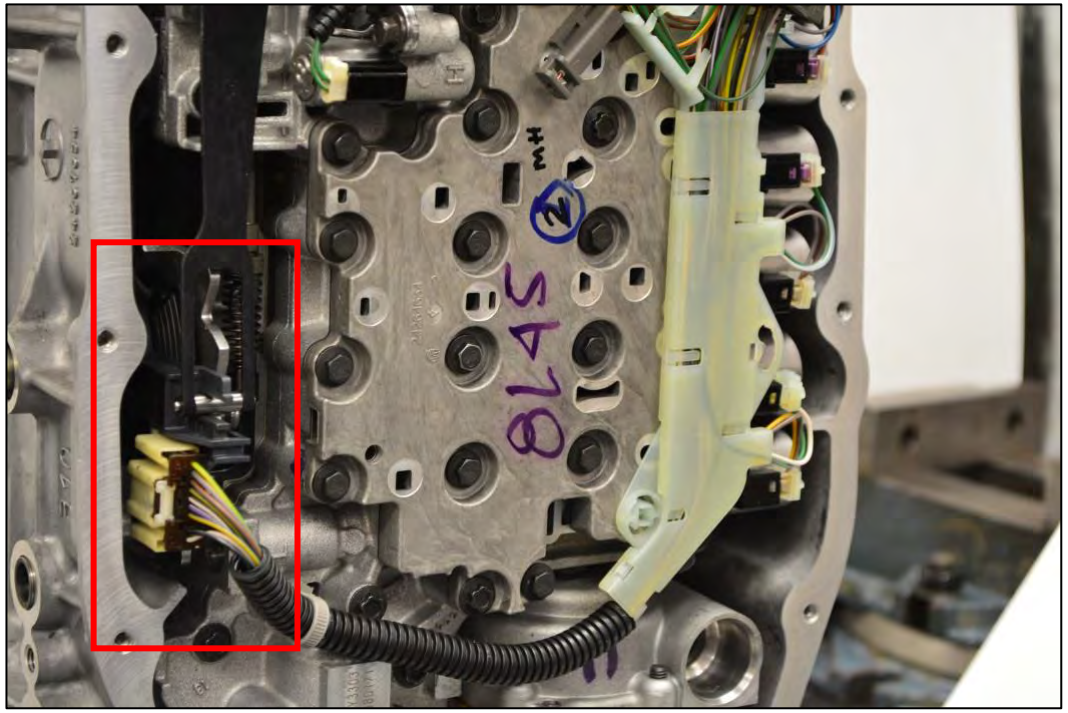
Internal Mode Switch

The Internal Mode Switch (IMS) contains 6 separate switches in one assembly.

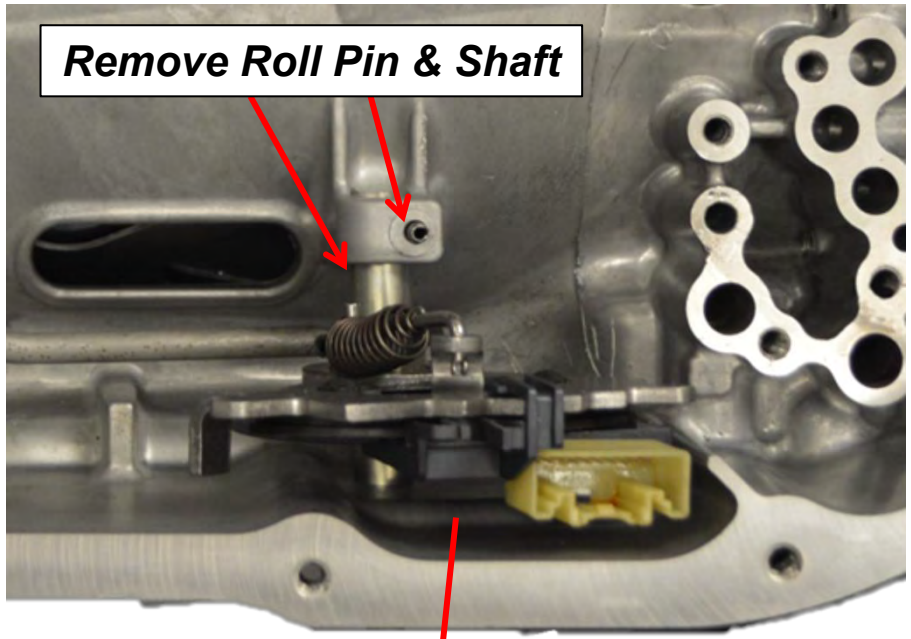
— One mechanical switch circuit is for the Park/Neutral position switch which is used for engine starting.

— The other 5 electronic switches are called the transmission range switches and are used to indicate the gear position the vehicle operator has selected.

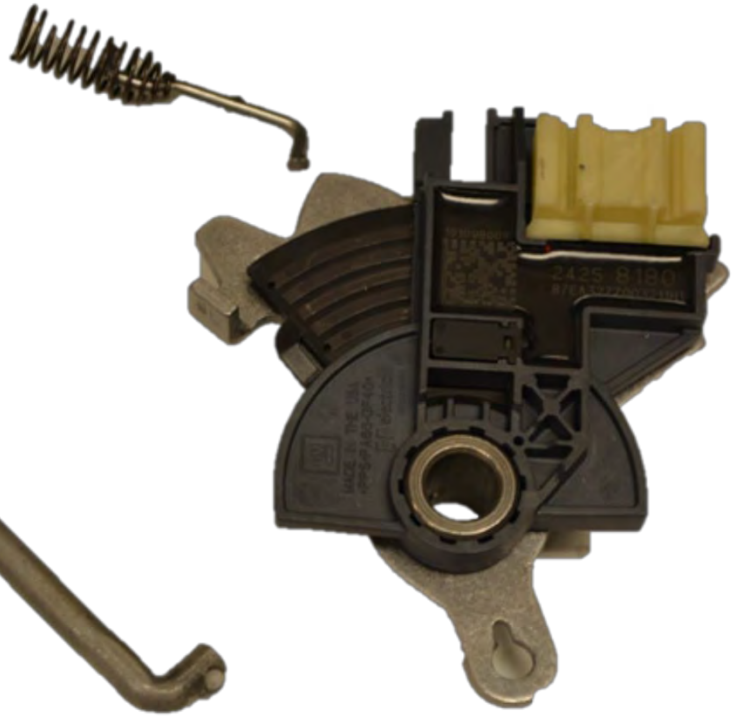
The IMS switch assembly is mounted on the interior left side of the transmission case.



Internal Mode Switch

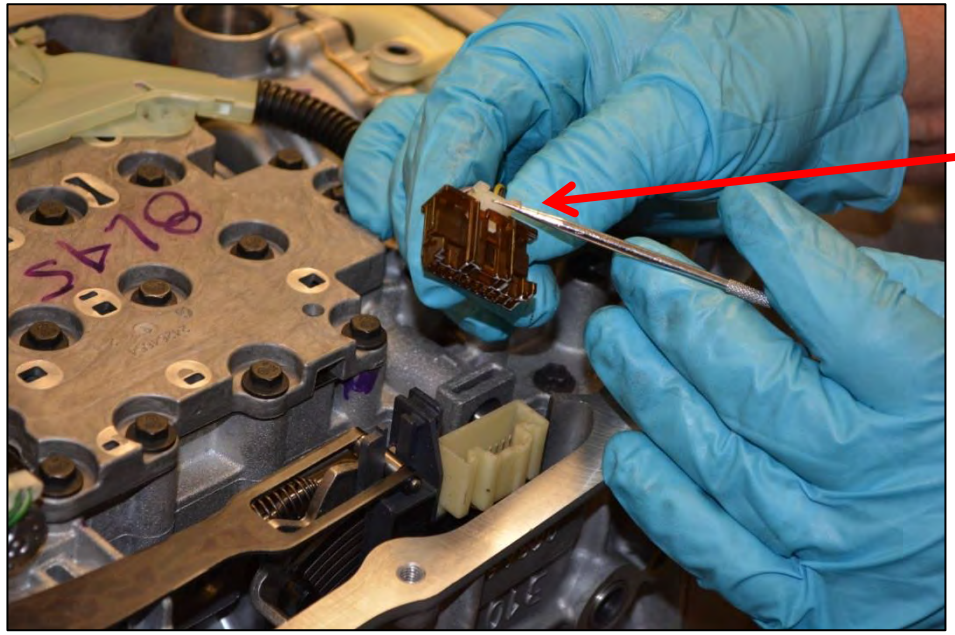


Linkage Rod
& Spring



Park Rod

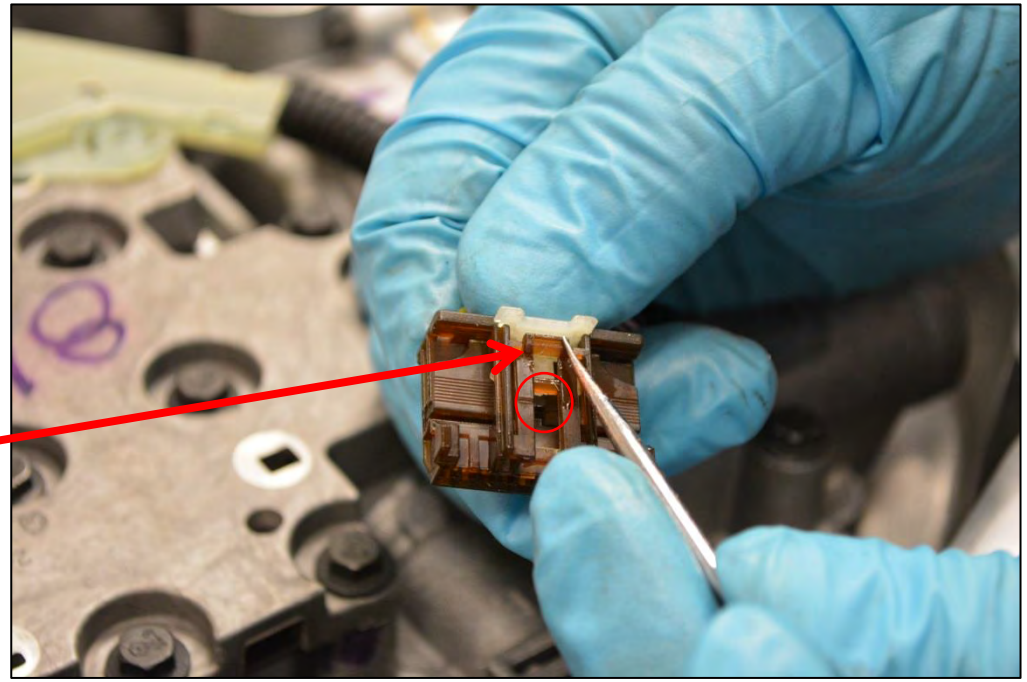
Warning!



You Must Pull Up On
This Tab First

Then Press In Here To Release

To Prevent Breaking
The Locking Tab



Internal Mode Switch

The IMS indicates to the TCM which gear position the vehicle operator has selected. The IMS consists of 5 separate hall-effect switches. Each switch is supplied a 9 volt reference circuit, and a signal circuit from the TCM.

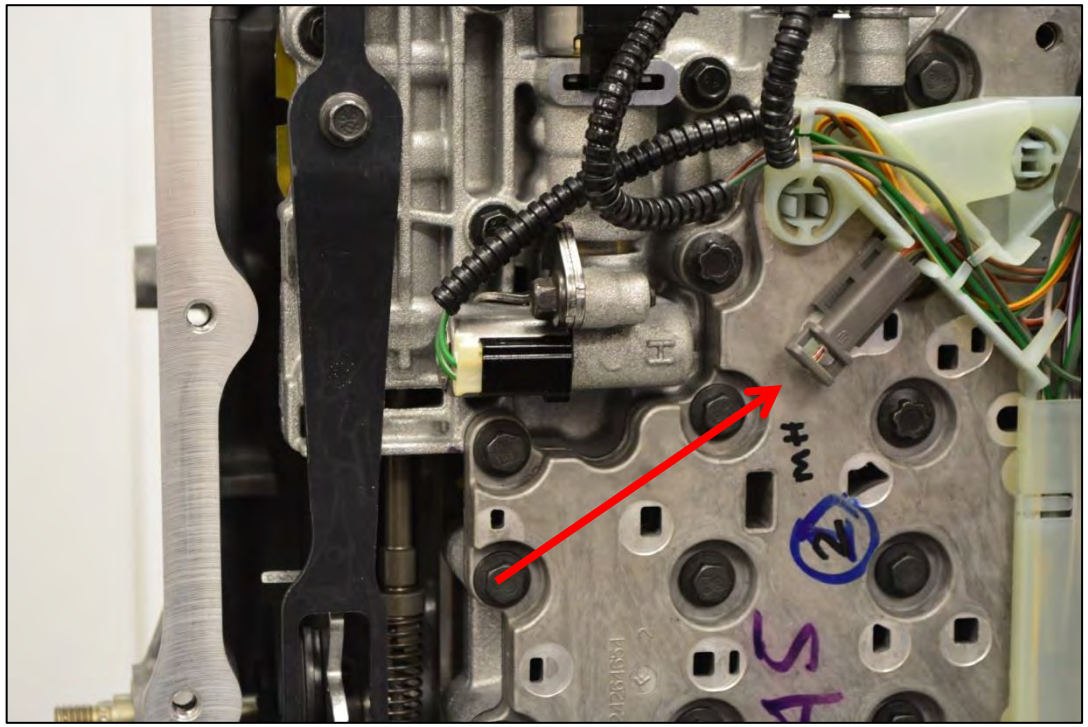
The signal circuit for each gear selector position will have either a voltage reading of 0.70 to 0.96 Volts indicting ON or 1.68 to 2.38 Volts indicating OFF.

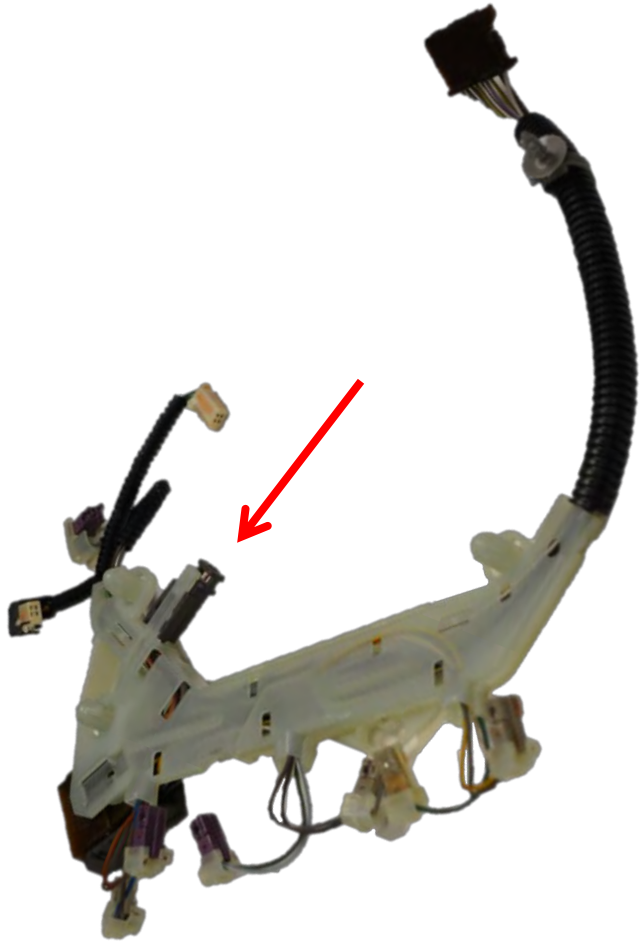
The voltage values on each IMS circuit will change and are dependent on the position of the gear selector. The state of each IMS A/B/C/P/S circuit is displayed on the scan tool.

Transmission Internal Mode Switch Voltage					
Shift Lever Position	Internal Mode Switch A Circuit	Internal Mode Switch B Circuit	Internal Mode Switch C Circuit	Internal Mode Switch P Circuit	Internal Mode Switch S Circuit
Park	1.68 - 2.38 V	0.70 - 0.96 V	1.68 - 2.38 V	0.70 - 0.96 V	0.70 - 0.96 V
Reverse	0.70 - 0.96 V	1.68 - 2.38 V	1.68 - 2.38 V	0.70 - 0.96 V	1.68 - 2.38 V
Neutral	0.70 - 0.96 V	1.68 - 2.38 V	0.70 - 0.96 V	1.68 - 2.38 V	0.70 - 0.96 V
Drive	1.68 - 2.38 V	0.70 - 0.96 V	0.70 - 0.96 V	1.68 - 2.38 V	1.68 - 2.38 V
Manual Mode	1.68 - 2.38 V	0.70 - 0.96 V	0.70 - 0.96 V	1.68 - 2.38 V	0.70 - 0.96 V

Transmission Fluid Temperature Sensor

The transmission fluid temperature sensor is integral to the internal harness.





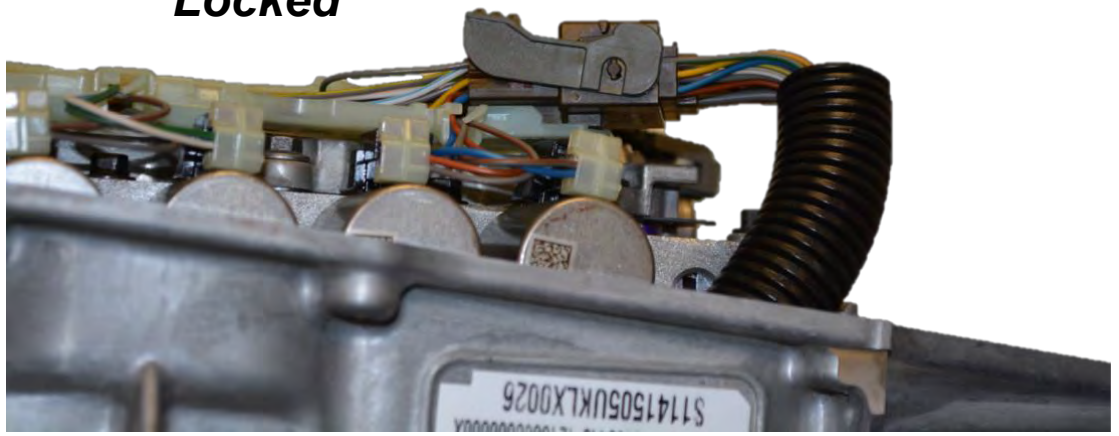
Transmission Fluid Temperature Sensor

The transmission fluid temperature sensor is a thermistor type sensor. The warmer the sensor becomes the lower the resistance drops.

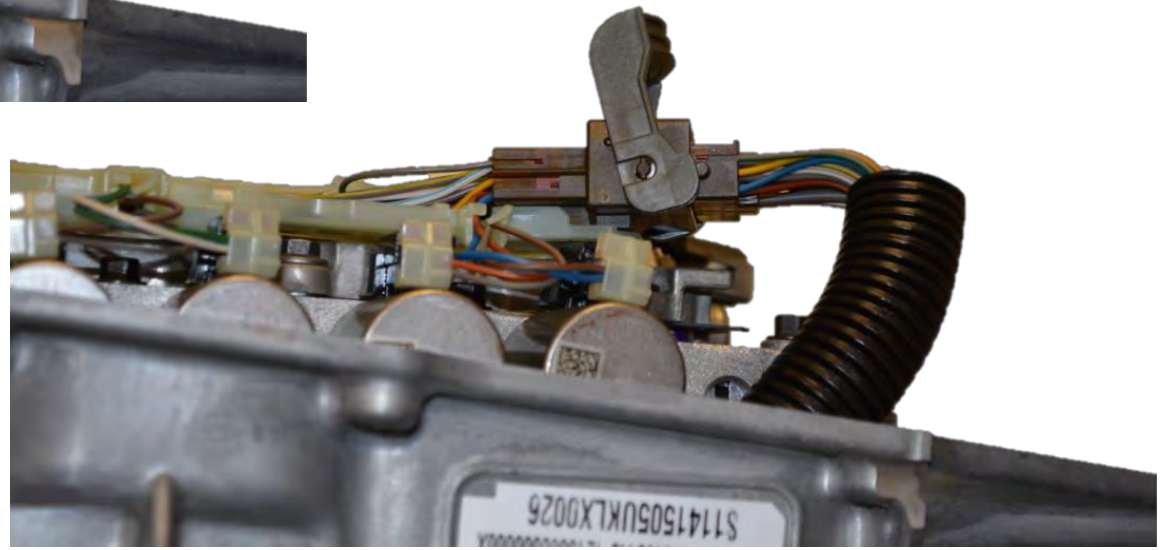
Internal Harness

You must remove the internal harness before removing the valve body. The internal harness has a cam style lever lock.

Locked

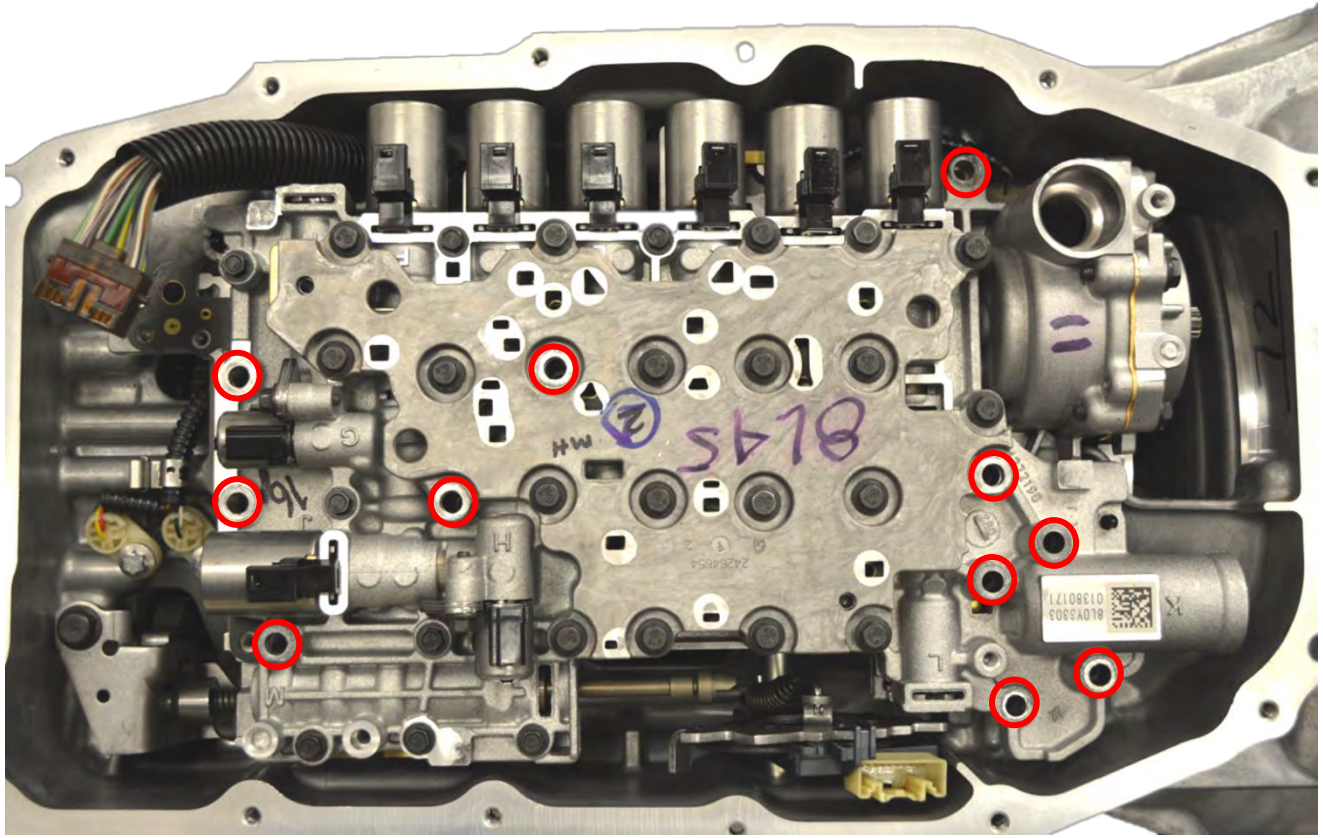


Unlocked



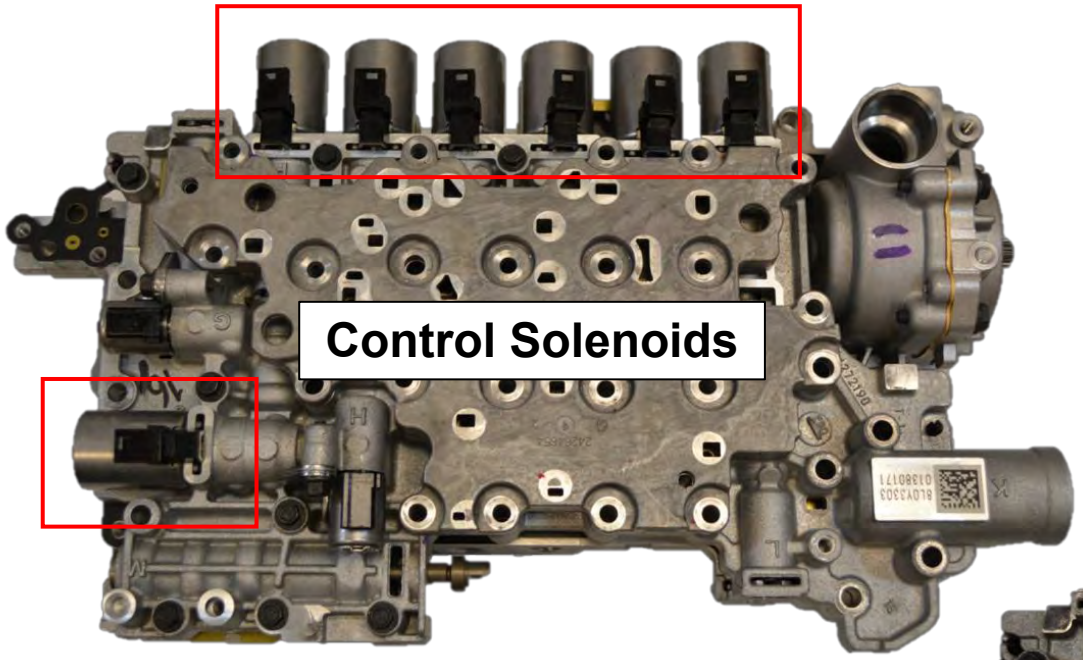
Valve Body

There are eleven bolts that secure the valve body to the case. Seven long and four short bolts.

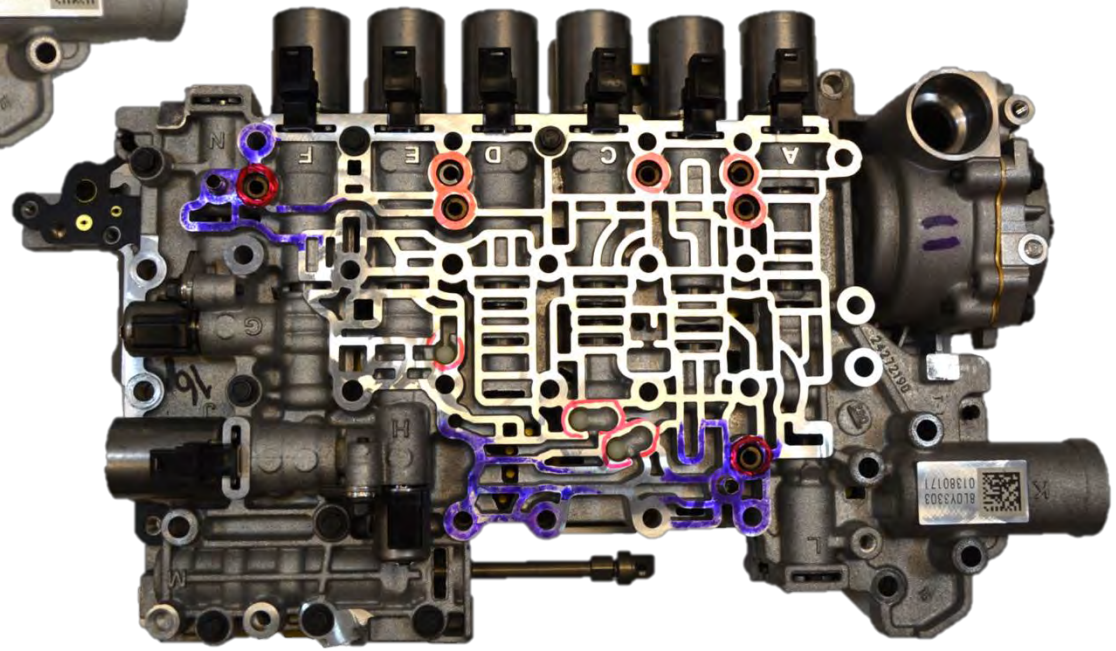


7 Long *4 Short*

Valve Body



.682”X.315”X.060”



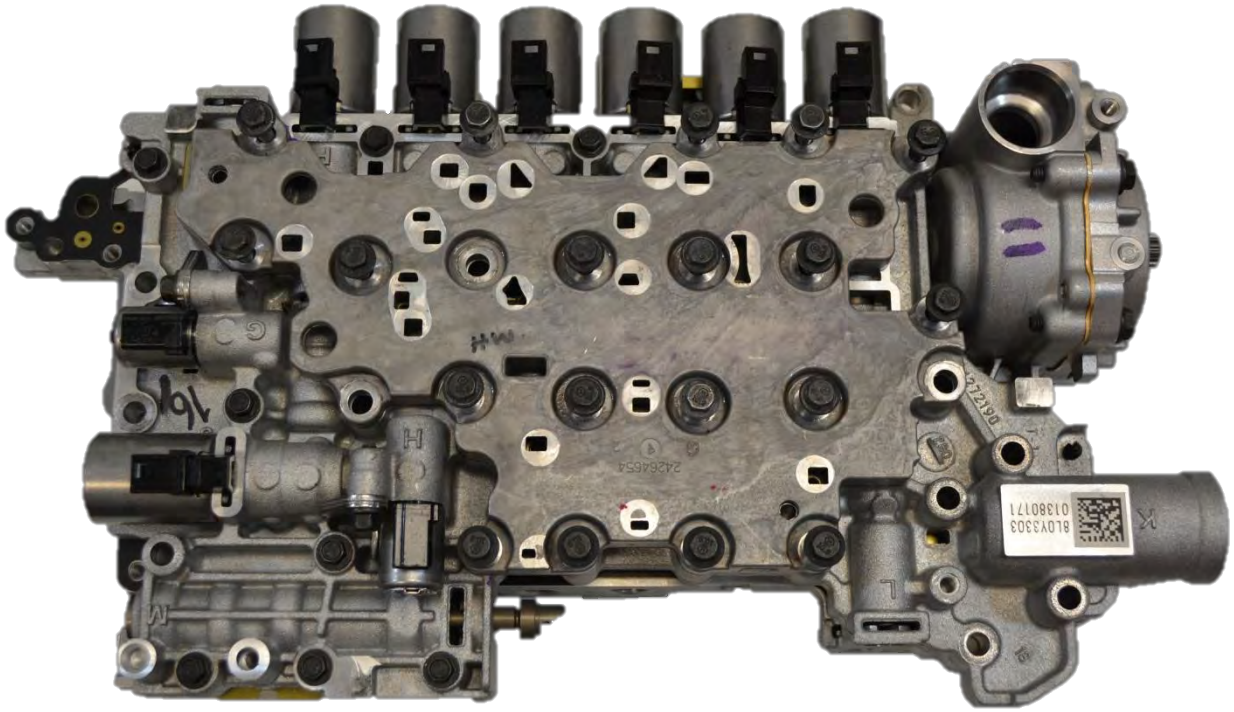
There are seven control solenoid signal accumulators & springs located in the lower valve body.

Signal accumulators are used to dampen the signal fluid apply from each pressure control solenoid before fluid gets to the control valve.

Spring & piston dimensions are all the same

Valve Body

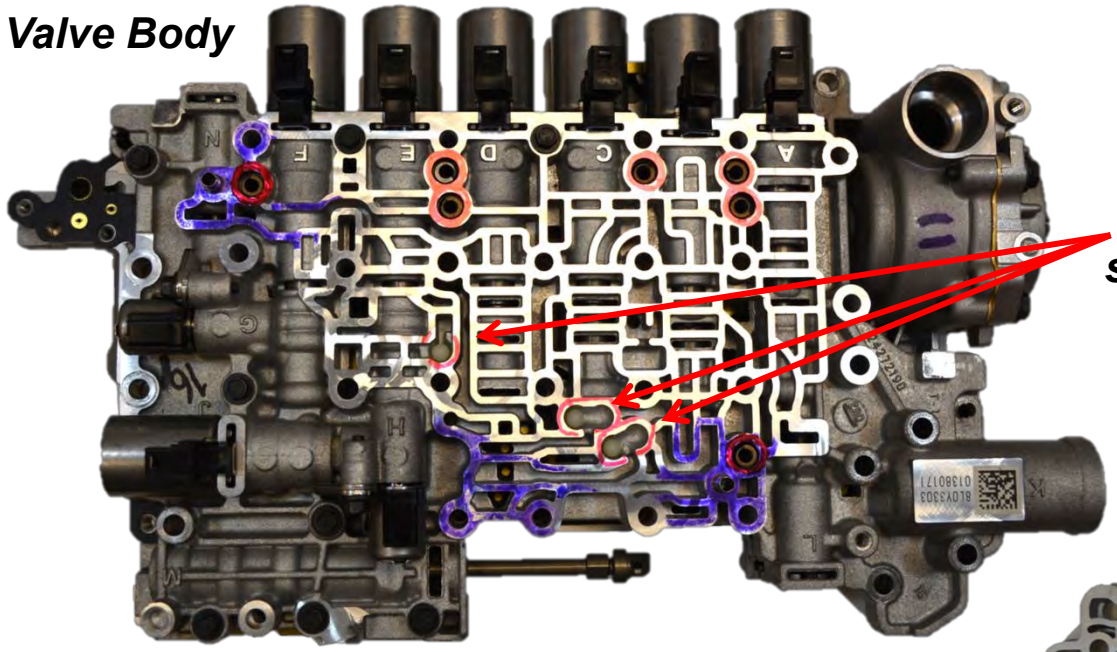
One large 1-3-5-6-7 clutch accumulator
In the main valve body.



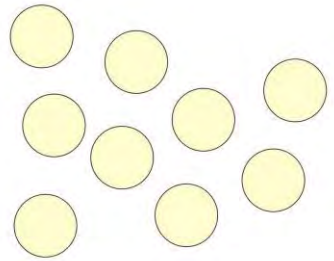
2.40”X.908”X.139”

Valve Body

Lower Valve Body



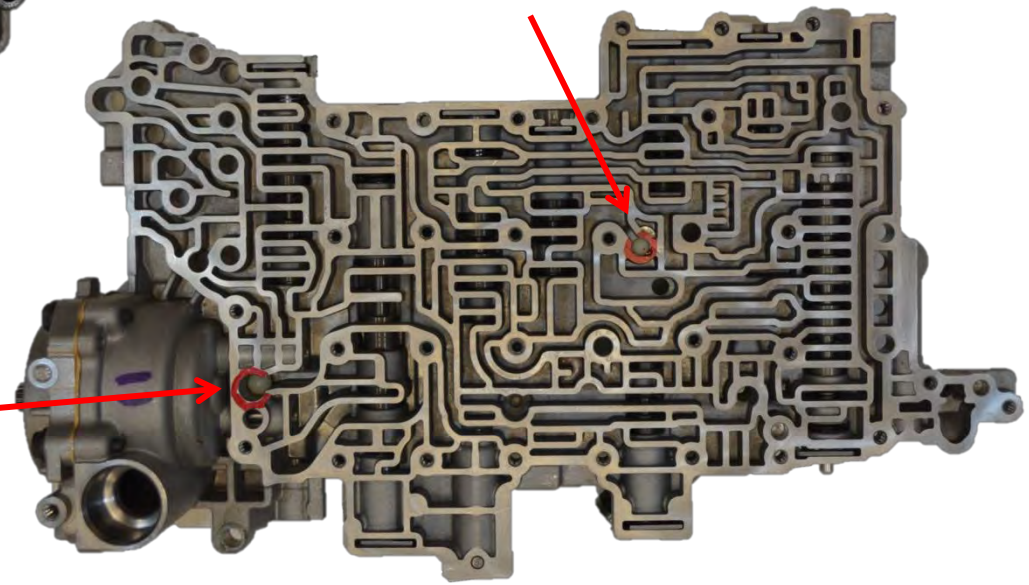
3 small



.250”

Bottom Main Valve Body

1 small

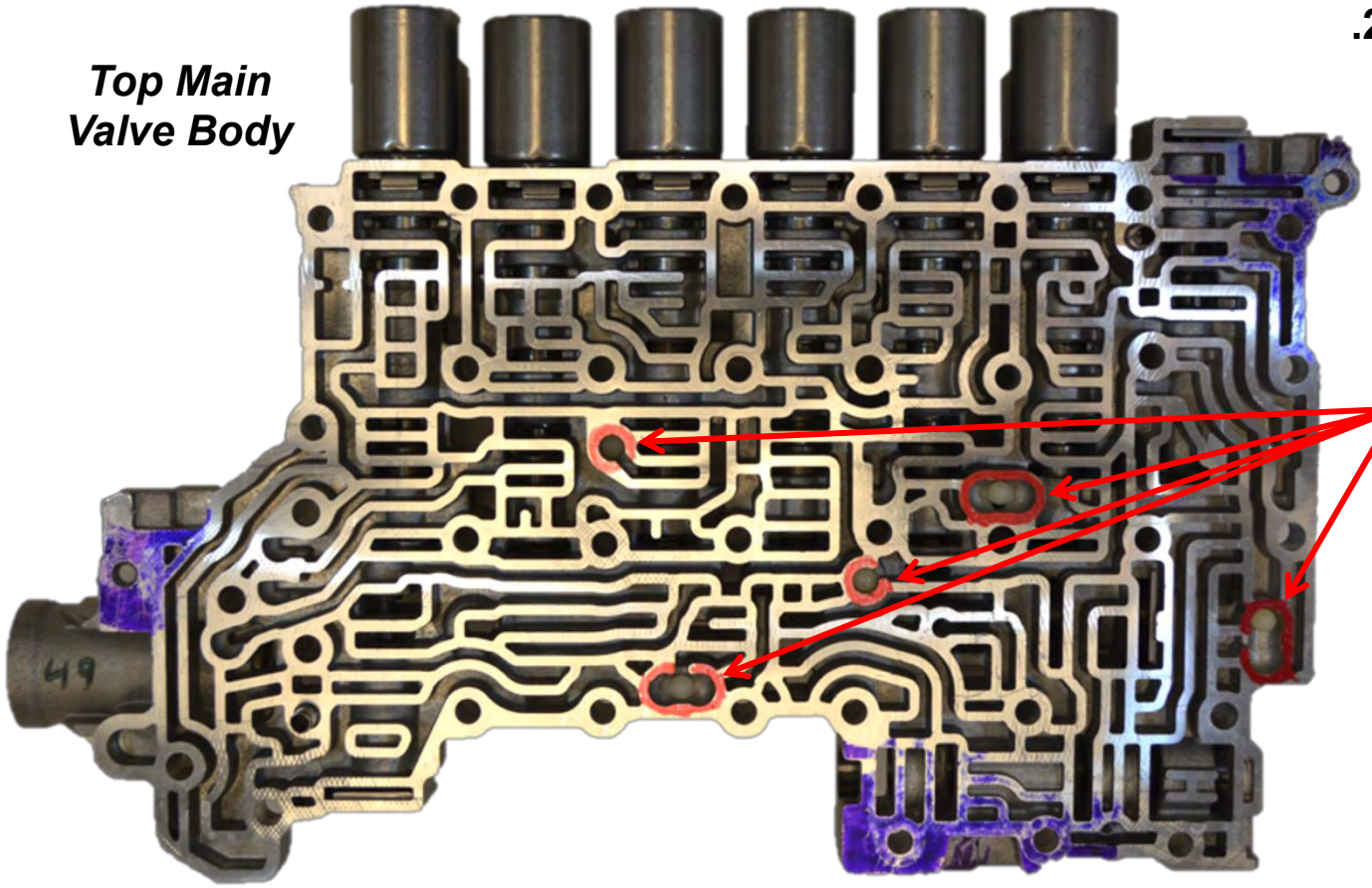


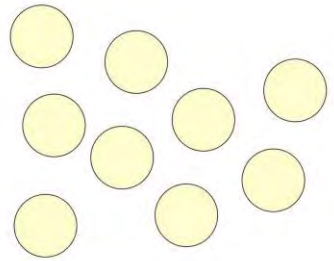
There are ten check balls, nine small one large

.376”

Valve Body

Top Main Valve Body





.250”

5 small

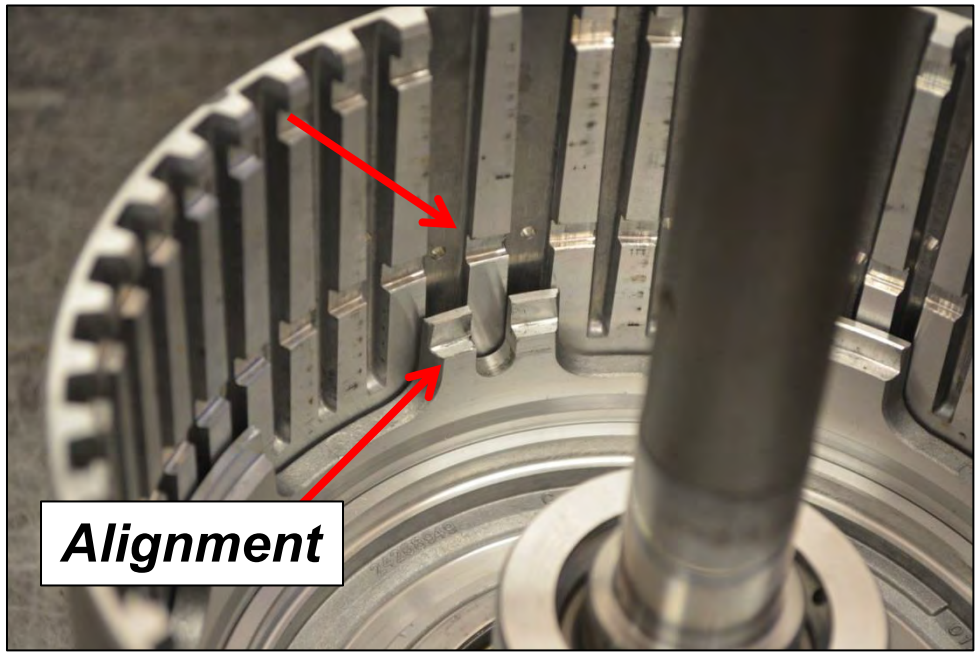
4-5-6-7-8 Clutch Drum Splines

Clutch selective snap rings must be oriented properly in rotating housing. Important: The uncut splines are 180° apart (exactly like the 6L80).

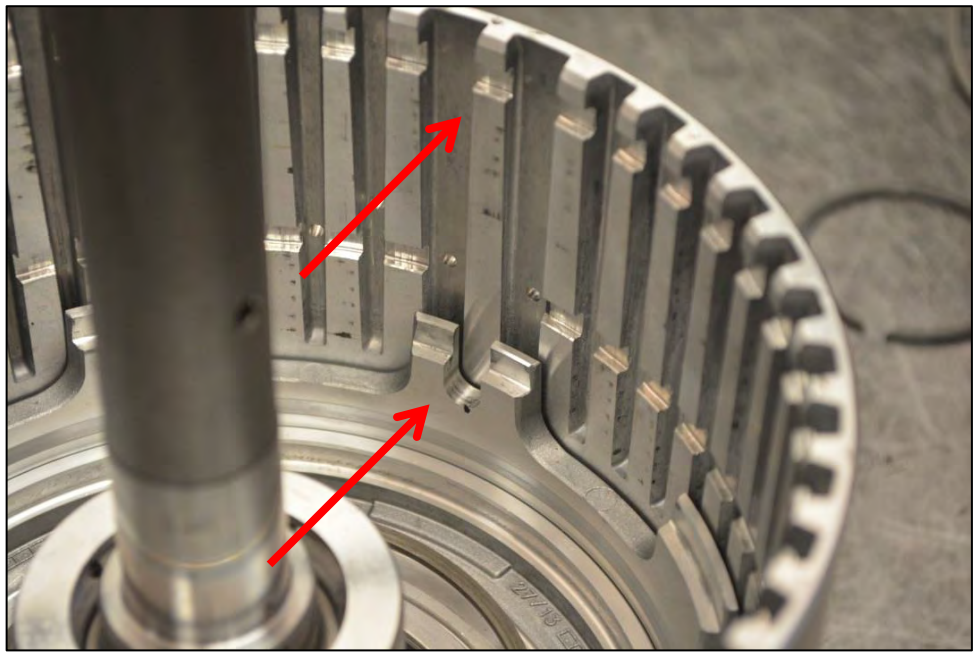
When installing the 4-5-6-7-8 Reverse clutch plates and the 2-3-4-6-8 clutch plates into the housing, the selective snap rings must be oriented properly within the housing.

A blind spline is used to orientate each of the snap rings. The opening of the snap ring must be around the blind spline. Otherwise, the snap ring will not be able to be properly seated in its groove.

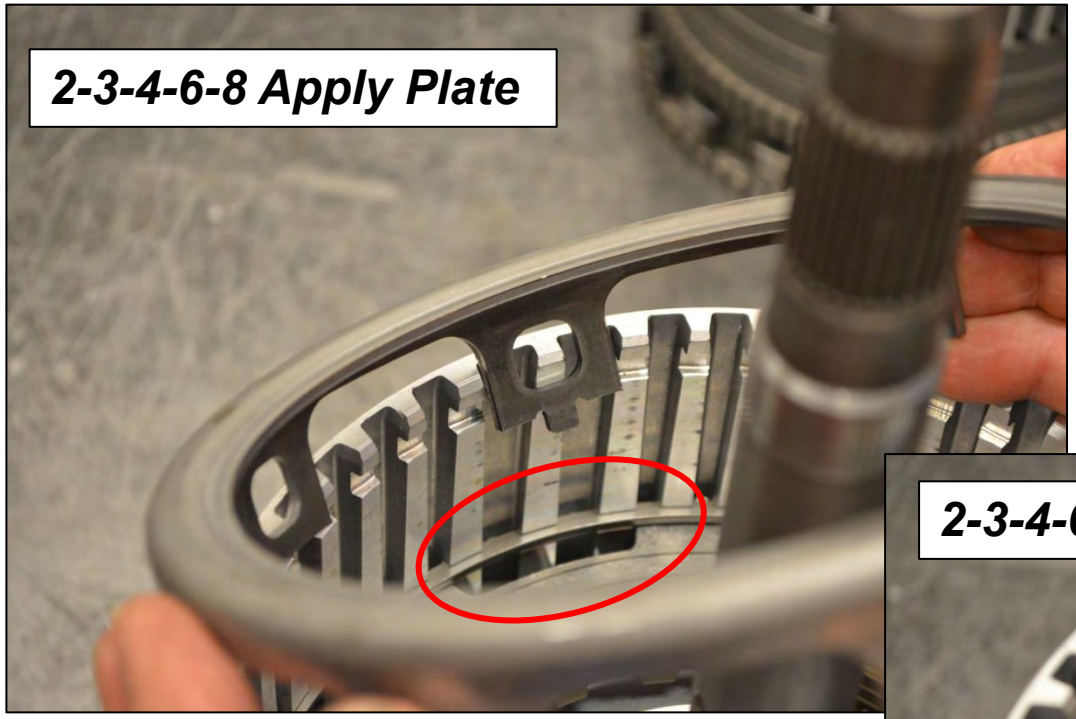
2-3-4-6-8 Clutch

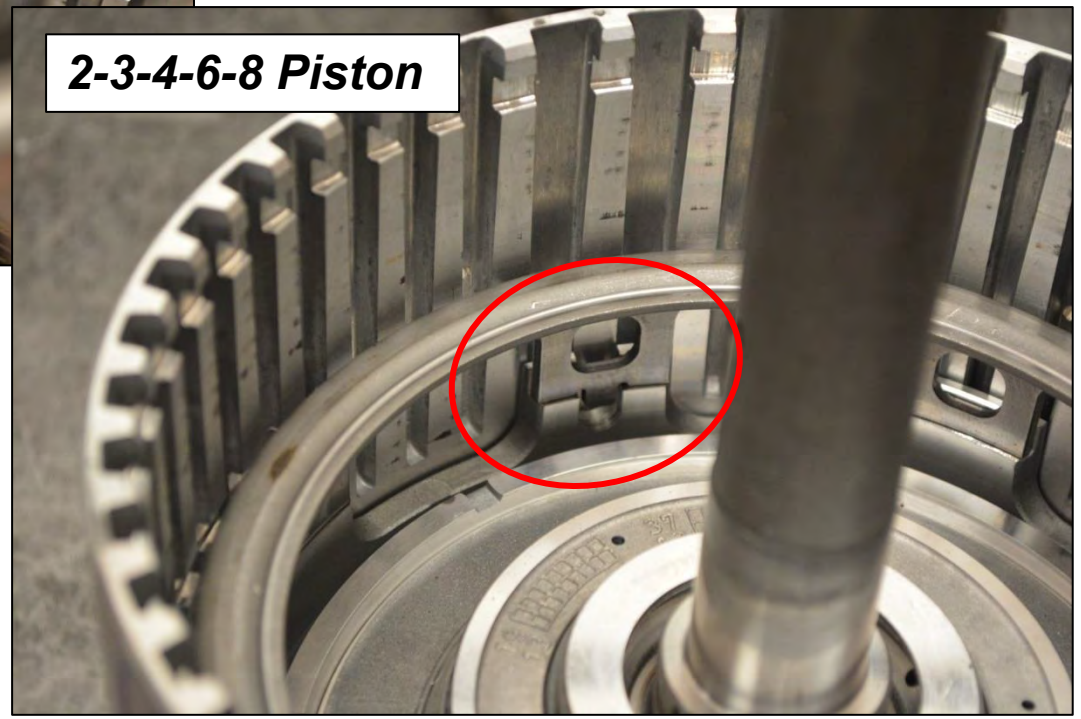


4-5-6-7-8-R Clutch



4-5-6-7-8 Clutch Drum Splines





Fluid Level & Condition Check

This procedure checks both the transmission fluid level and the condition of the fluid.

Note: The 8L90 transmission is NOT equipped with a fill tube and dipstick. A tube attached to the inside of the transmission fluid pan, called a stand pipe, is used to set the fluid level.

Caution: The transmission fluid level must be checked when the transmission fluid temperature (TFT) is between 35–45°C (95–113°F) on scan tool data. If the TFT is not within this range, operate the vehicle or allow the fluid to cool as required.

Setting the fluid level with a TFT outside this range will result in either an under or over-filled transmission. TFT>45°C = under-filled, TFT<35°C=over-filled. An under-filled transmission will cause premature component wear or damage.

An over-filled transmission will cause fluid to discharge out the vent tube, fluid foaming, or pump cavitation.

Fluid Level & Condition Check

1. Observe the Transmission Fluid Temperature (TFT) using the Driver Information Center (DIC), or a scan tool.
2. Start and idle the engine.
3. Depress the brake pedal and move the shift lever through each gear range. Pause for at least 3 seconds in each range.
4. Move the shift lever back to PARK.
5. Ensure the engine RPM is low at 500 to 800 RPM.
6. Allow the engine to idle for at least 1 minute.
7. Raise the vehicle on a hoist.

The vehicle must be level, with the engine running and the shift lever in the PARK range.

Caution: THE ENGINE MUST BE RUNNING when the trans oil level check plug is removed or excessive fluid loss will occur, resulting in an under-filled condition. An under-filled transmission will cause premature component wear or damage.

Note: Continue to monitor the TFT. If the TFT is not within the specified values, reinstall the trans oil level check plug and repeat the previous steps.

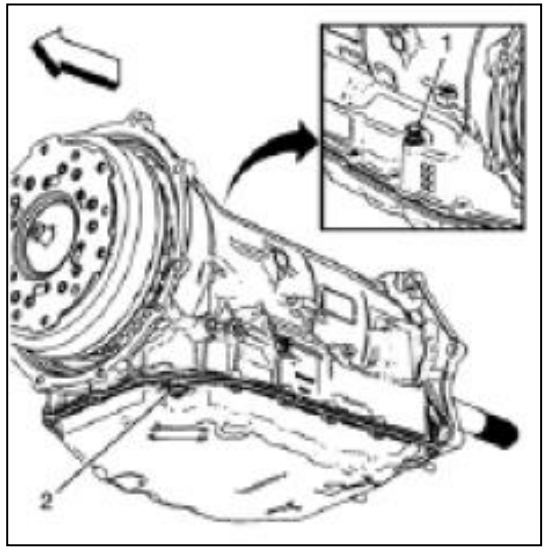
Fluid Level & Condition Check

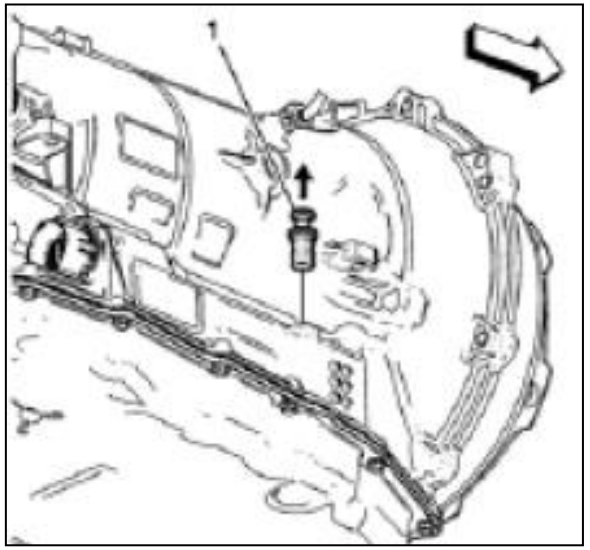
Without the Factory Service Tool

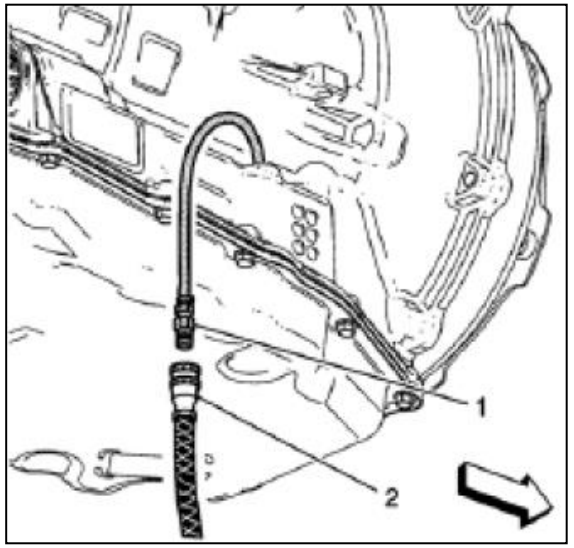
1. Based on accessibility, transmission fluid may be added through the fluid fill tube plug assembly (1) hole or through the oil level check plug (2) hole in the bottom of the transmission fluid pan.
2. Clean around the fluid fill tube plug (1).

3. Unlock the fill tube plug by lifting the plunger. Once the plunger is lifted, remove the entire plug assembly (1).

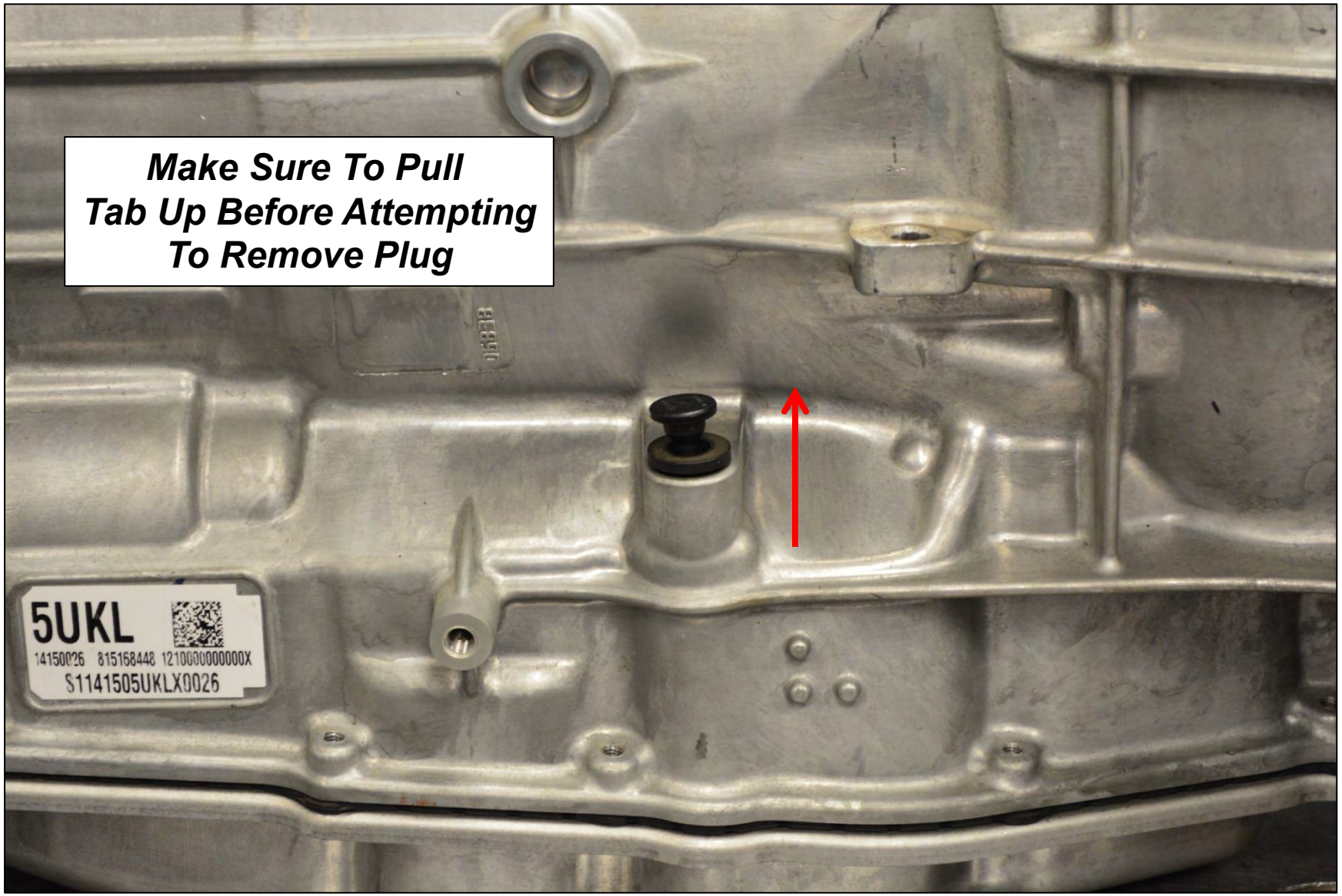
Use Dexron HP Fluid







Fluid Level & Condition Check

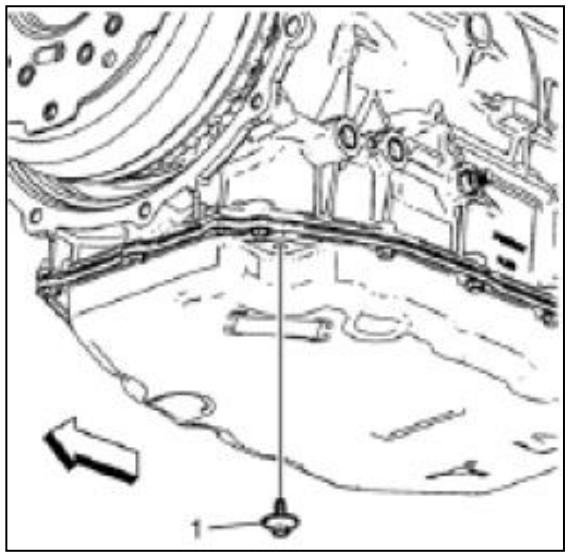


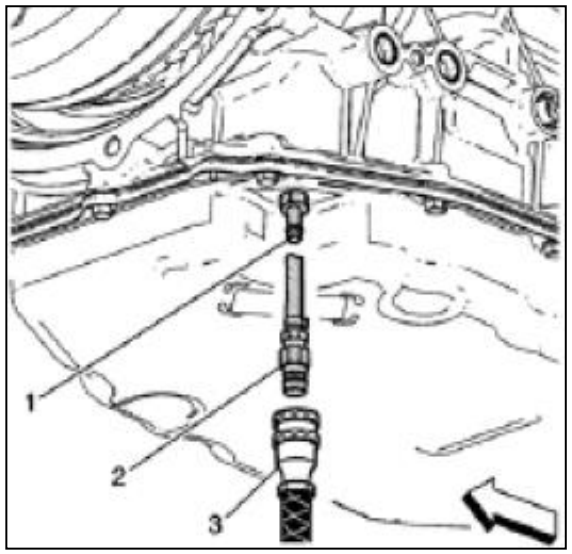
Fluid Level & Condition Check

With the Factory Service Tool

1. Remove the oil level check plug.
2. Install the DT-51190 fluid fill pan adapter (1) and, if necessary, one adapter from the DT 45096-30 cooler flush adapters (2).
3. Determine the approximate amount of fluid needed to fill the transmission, based on the repair performed.

Refer to Approximate Fluid Capacities. To avoid an under-fill condition, slightly overfill the transmission, and then allow the extra fluid to drain out through the oil level check plug during the transmission fluid level and condition check procedure.





Fluid Capacities Chevrolet Corvette

Approximate Fluid Capacities Application	Specifications Metric	English
Pan Removal and Filter Replacement; Approximate Capacity	3.25 liters	3.43 quarts
Overhaul; Approximate Capacity (Transmission Volume Only)	10.7 liters	11.30 quarts
Complete Trans System; Approximate Capacity (Including Cooler Volume) with LT1 Engine	11.1 liters	11.73 quarts
Complete Trans System; Approximate Capacity (Including Cooler Volume) with LT4 Engine	11.2 liters	11.83 quarts

Fluid Capacities Truck & SUV

Approximate Fluid Capacities Application	Specifications Metric	English
Pan Removal and Filter Replacement; Approximate Capacity	3.3 liters	3.49 quarts
Overhaul; Approximate Capacity (Transmission Volume Only)	10.3 liters	10.88 quarts
Complete Trans System; Approximate Capacity (Including Cooler Volume) with LT1 Engine	10.8 liters	11.41 quarts

Line Pressure Check

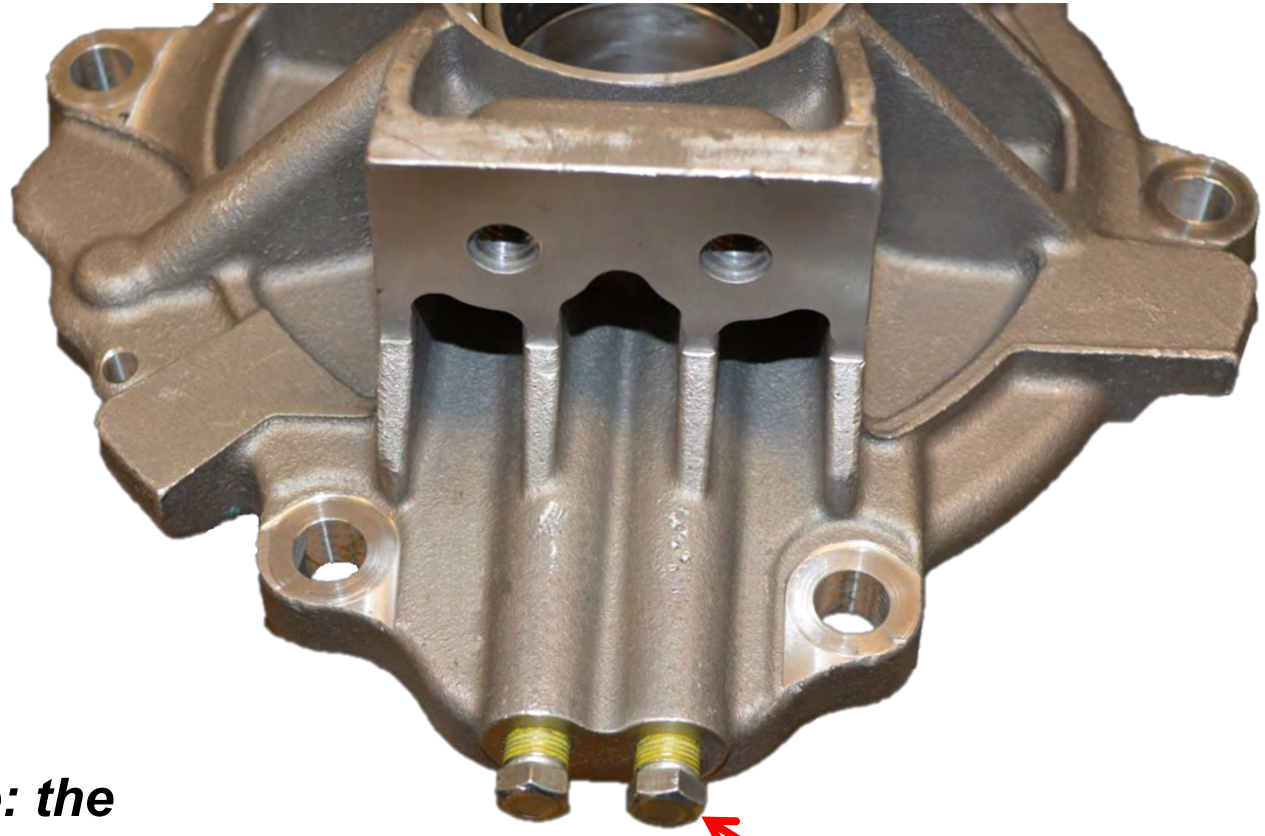
Warning: Keep the brakes applied at all times in order to prevent unexpected vehicle motion. Personal injury may result if the vehicle moves unexpectedly.

1. *Install a scan tool.*
2. *Start the engine.*
3. *Inspect the transmission for the proper fluid level. Refer to Transmission Fluid Level and Condition Check.*
4. *Use the scan tool to inspect for any active or stored diagnostic trouble codes.*
5. *Inspect the manual linkage at the transmission for proper function.*
6. *Turn the engine OFF.*

Note: You may need to remove or disconnect components in order to gain access to the transmission case extension hole plug.

7. *Remove the case extension hole plug.*
8. *Install the GE-21867 pressure gauge.*
9. *Access the Scan Tool Transmission Output Controls for the Line PC Solenoid.*

Line Pressure Check



Line Pressure

Note: the threaded port on the left is for the 1-2-3-4-5-R Brake Clutch

Special thanks to Robert Bateman at Seal Aftermarket for all his help compiling this information & pictures.

Line Pressure Check

10. Start the engine.

Note: In order to achieve accurate line pressure readings, the following procedure should be performed at least three times. The values displayed on the scan tool screen will not match the actual pressures indicated on the pressure gauge.

Control the Line PC Solenoid in PARK or NEUTRAL with the engine speed at approximately 1500 RPM and the TFT between 35–55°C (95–131°F). This protects the clutches from extreme high or low line pressures and ensures a consistent pump capacity.

11. Use the scan tool to increase and decrease line pressure, allowing the pressure to stabilize between increments.
12. Compare the pressure readings on the gauge with the table shown on next page.
13. If the pressure readings on the gauge are erratic, or are more than 10% greater or less than the range specified in the table below, refer to Fluid Pressure High or Low.
14. Turn the engine OFF.
15. Remove the GE-21867 pressure gauge. Caution: Refer to Fastener Caution.
16. Install the case extension hole plug (1). Tighten the plug to 97 lb. in.

Line Pressure Check

Scan Tool Line PC Solenoid Commanded State (Kpa)	Approximate Line Pressure Shown on Pressure Gauge @ 1500 RPM	
	KPa	PSI
None	310 - 550	45 - 80
200	655 - 900	95 - 130
400	1100 - 1310	160 - 190
600	1520 - 1725	220 - 250
800	1860 - 2070	270 - 300
1000	1860 - 2070	270 - 300
1200	1860 - 2070	270 - 300
1400	1860 - 2070	270 - 300
1600	1860 - 2070	270 - 300
1800	1860 - 2070	270 - 300
2000	1860 - 2070	270 - 300

Today's Presentation Sponsored By:

Any Questions?

Thank You For Attending