



# Welcome To Today's Presentation 6L80/6L90



Steve Garrett  
ATRA Service  
Engineer





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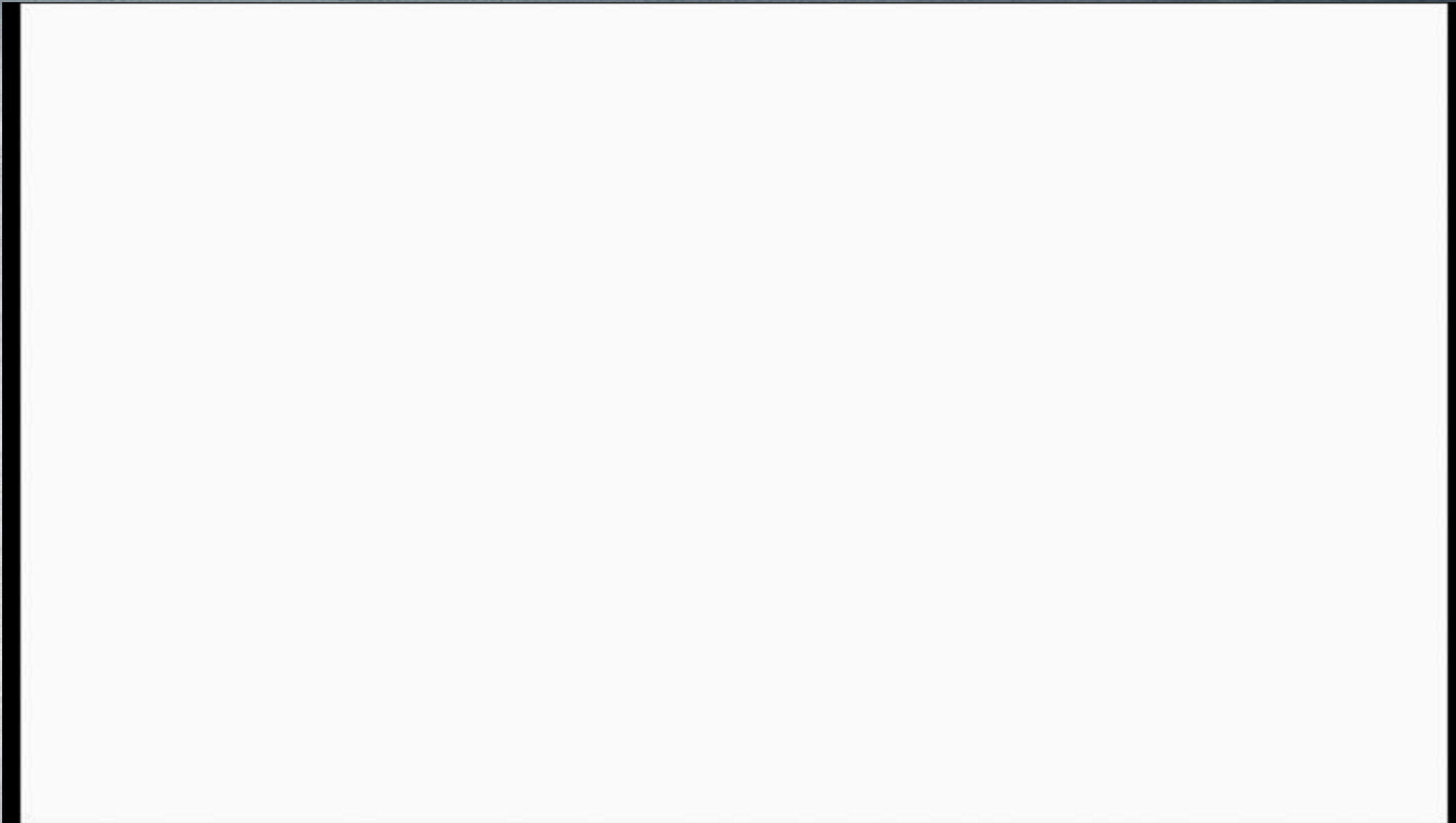
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Webinar Dates		Transmission
February	21	RE0F10A/B (CVT) Internal
March	7	RE0F10D/E (CVT) Internal
March	21	845RE Intro
April	4	Hydraulics T & C
April	18	Fundamentals of Electricity
May	2	6R80 Intro
May	16	LCT 1000 Update
May	30	6R80 Diagnostics
June	13	A761E/960E/AB60E Internal
June	27	845RE Internal
July	11	RE0F11A (CVT) Intro
July	25	6L80/90 Diagnostics
August	8	09G
August	22	RE0F10A/B (CVT) Intro
September	5	68RFE Diagnostics
September	19	6R80 Updates
October	3	RE0F08/09A/B Internal
October	17	6T70/75 T & C



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# And you thought your 6L80 had problems!





## Split Filters

3 pans available 6L45/50, 6L80, 6L90  
Pans are available as shallow and deep designs. If a stand pipe is used 3 different heights are available. 24 different pan part numbers total.



**NOTE:** If the filter is split or broken it is NOT likely a problem with the filter or it's design, unless you are using a cheap import filter. Rather the issue is a pressure spike into the suction side of the pump/filter leading to filter damage. If this is the case, the pump and/or valves will require repair or replacement.





# No Crank, No Communication, PRNDL Inoperative

**Concern:** The vehicle may experience a No Start, or No Crank condition. In addition you may notice that the PRNDL display is blank although the IPC seems to function correctly. When a scan tool is attached to the vehicle you will likely be unable to communicate with any of the main modules such as the ECM, BCM or TCM.

**Cause/Correction:** Unplug the transmission electrical connector. If transmission fluid is present, the concern is likely caused by the fluid leaking into the electrical connector leading to a short to ground in the bus communication circuit. Clean the chassis side transmission electrical connector, replace the TEHCM.





# Uni-Gear Update



An update occurred to all 6L80/6L90 applications starting in mid 2012. An updated output shaft and ring gear assembly was implemented. The update was a mid year production running change that was not fully implemented in all models until late 2014. 2012/2014 model year units may be equipped with either design output shaft. The updated design uses a different ISS/OSS assembly. The updated design can be interchanged with the earlier design as long as the speed sensor is the correct design for the output shaft assembly being used.

24265535 Previous Design Input & Output Speed Sensor Kit (6L80 and 6L90, All Models)

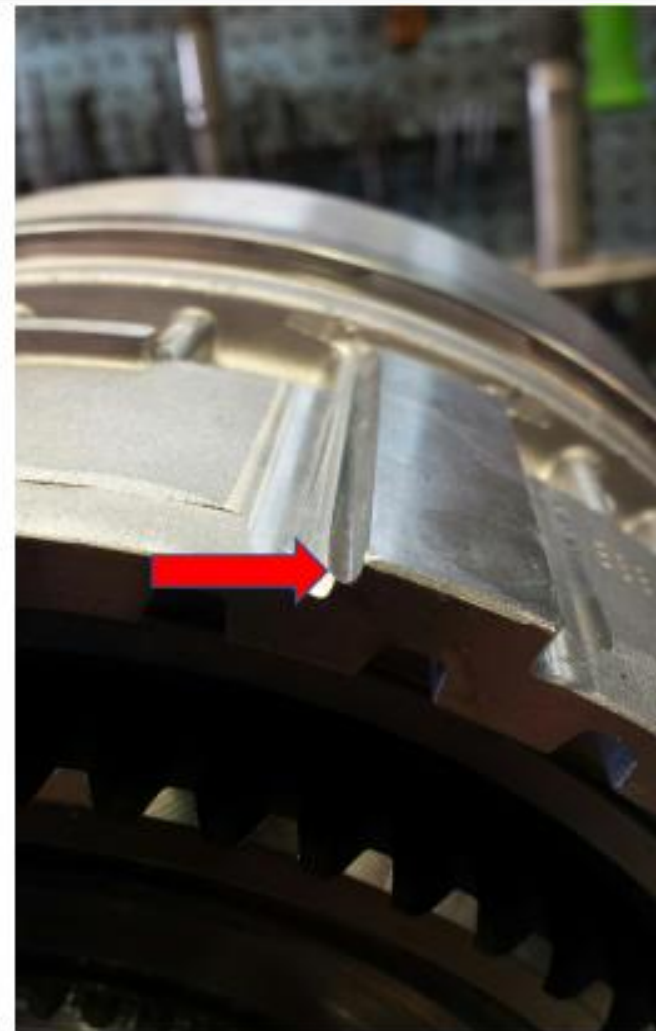
24265536 Uni-gear Design Input & Output Speed Sensor Kit (6L80 and 6L90, All Models)





## Burned 2-6 Clutch, Inspect the Support For Wear

The supports are different  
part numbers for a 6L80  
verses a 6L90.  
And again different in a  
6L45-6L50.





# Intermittently Neutrals On Launch

- **Concern:** Neutrals when you start to move while accelerating from a stop. When the transmission is placed in M1 position the condition is no longer present.
- **Cause/Correction:** Monitor the command for Shift Solenoid 1. During initial launch in OD range, you will note that the solenoid is commanded into the ON position. As soon as the vehicle starts to move, the transmission will go to neutral and your scan tool will indicate the solenoid has been commanded into the OFF position. It should be noted that the command strategy indicated above is correct based on current calibration strategies being used. It should also be noted that the service and technical support information available for this unit does not include information about this solenoid command strategy. The objective of this strategy is to turn on the Low/Reverse clutch during initial launch and then to cycle the clutch off as soon as the vehicle is in motion. This is designed to improve durability of the Low Sprag. If the Low Sprag has failed, the transmission will go into neutral at road speeds above approximately 2 mph. In this instance inspect or replace the Low Sprag.



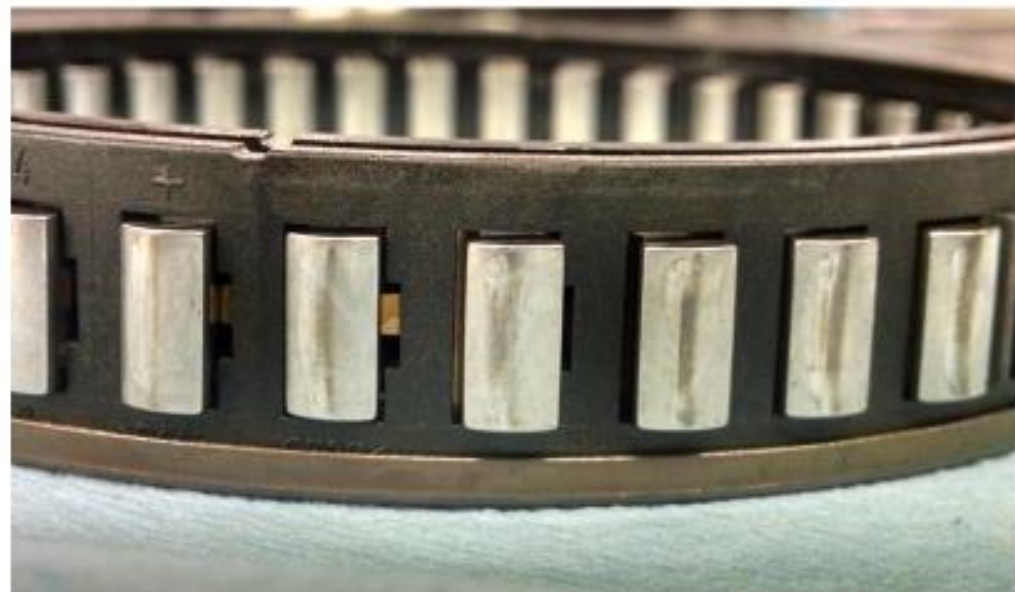


# Intermittently Neutrals On Launch

Gear	SS1
P	ON
R	ON
N	ON
1 <sup>ST</sup> braking	ON
1 <sup>st</sup>	OFF
2 <sup>nd</sup>	OFF
3 <sup>RD</sup>	OFF
4 <sup>TH</sup>	OFF
5 <sup>TH</sup>	OFF
6 <sup>TH</sup>	OFF

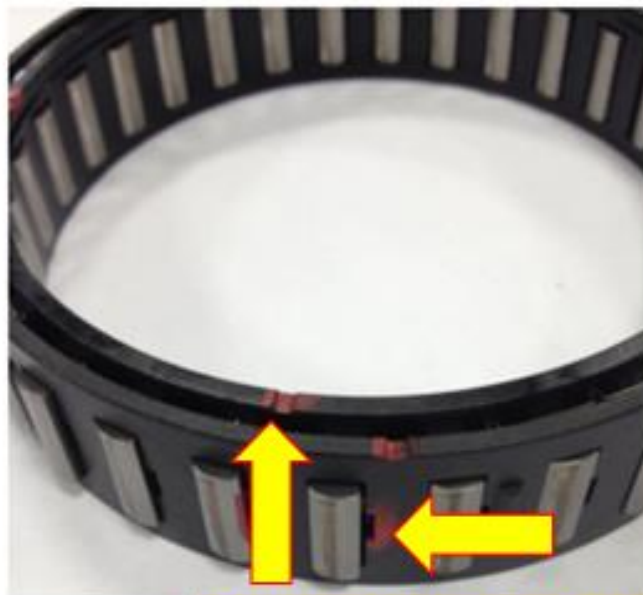
The chart should read ON/OFF in 1<sup>st</sup>.

Failed Low Sprag





# Sprag Direction



Disassemble and inspect the sprag component, The sprag cage notches on the top face Up in the outer race.





# P0796, No 4<sup>th</sup>, 5<sup>th</sup> 6<sup>th</sup>



Concern: No 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup>, Possible P0796 set PCS 3 stuck off, MIL ON

Cause Broken 456 dampener drum

Correction: Replace the 456 dampener  
Inspect all dampeners for cracks





# Burnt 456 Clutch

- As we are aware damage to the 456 clutch is common on 6L series transmissions. While there are several causes, one that is typically over looked is a problem with the cooler bypass valve mounted to the case of some 6L transmissions. If the bypass valve is stuck transmission temperature can climb leading to premature failure of the clutch. Anytime you have a vehicle equipped with the bypass valve you will need to inspect the valve for proper operation. If the valve is found to be faulty it should be replaced.





## 6L90 6L80 Drum Comparison

If you are having problems with clutch stack up and clearance after you replaced the 1234/35R drum it is likely due to someone giving you the wrong drum. The 6L80 uses a different drum than the 6L90 and a different clutch pack stack up.





# 1-2-3-4/3-5-R Clutch Issues



Cracks in the 1<sup>st</sup> design drum were common leading to a burned clutch. To check the drum use air pressure and soapy water. Install the updated drum with the DOT matrix.





## 1-2-3-4/3-5-R Clutch Issues



Clutch piston designs changed in 2008. Clutch piston capacity was reduced by 20% for the 1-2-3-4/3-5 Reverse clutches. This updated piston is designed to limit the amount of oil volume required to stroke the piston. It is not designed to back service as Calibration was also updated with the change

When replacing the 1234/35R clutch drum make sure the bearing is installed in your new housing. Some housings do not include the bearing and it will need to be installed prior to transmission assembly.





# 1-2-3-4 Clutch Issues



2011 models received an updated 1234 piston. The update was due to cracks developing in the piston leading to leakage and failure. (No movement forward/slips going forward, DTC's set) The updated design has the ribbing redesigned to address piston breakage issues. The updated piston has part number 24238700 cast into the piston. The updated design will back service 'most but not all' models and years. NOTE: The updated piston is also cracking, just in a different area, so you may want to consider using the aftermarket billet design piston.





**Always inspect the 1234 piston  
for cracks no matter which  
version piston you have**





# 1234 Piston



A broken or cracked 1234 clutch piston is a common failure leading to burnt 1234 clutches and a slipping or no movement in 1<sup>st</sup> gear. GM redesigned the piston for this issue. The updated piston is still cracking with one exception, rather than a crack in the piston cavity, the updated design may crack where the piston contacts the plates or it can be cracked in both locations.





# Pump Wear Issues, 6L80/90 Slip, Low Line Pressure, Damaged Clutches





## Restricted Orifices are an Issue on the 6L Family of Transmissions



Converter damage can lead to restricted orifices.  
Always check and clean ALL pump orifices





## 6L80/6L90 Converter Failure is Common, Flush/replace the Cooler, Clean the Pump Orifices



One Way Clutch outer splines damaged in the stator clutch pocket.





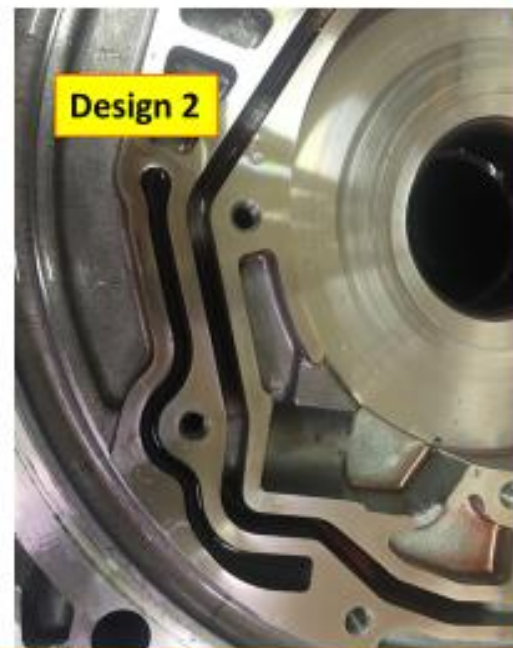
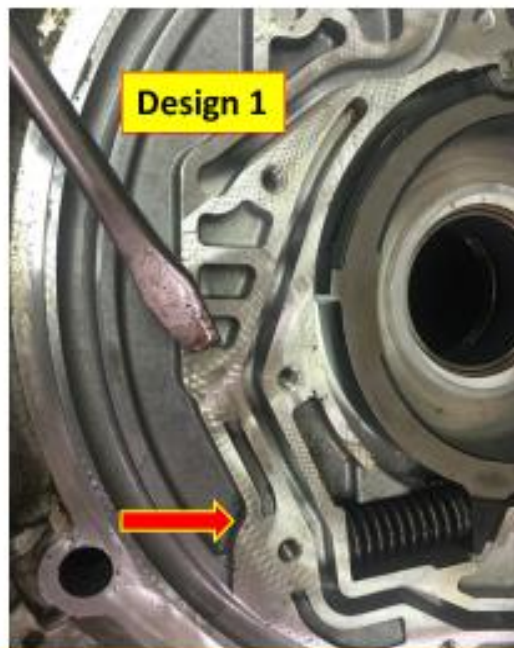
# Pump Specs

- Slide to pump body end play .0008-.0020 inches .020-.051mm
  - Rotor to body end play .0008-.0020 inches .020-.051mm
  - 3 slide, rotor sizes to select from
  - Plasta-gage works well for the measurements
- 
- Rotor size 24248569 17.948mm-17.961mm .7077"-.7071"  
24248570 17.961mm-17.974mm .7071"-.7076"  
24248571 17.974mm-17.987mm .7076"-.7081"  
Slide size 24222668 17.948mm-17.961mm .7077"-.7071"  
24224131 17.961mm-17.974mm .7071"-.7076"  
24224132 17.974mm-17.987mm .7076"-.7081"





## Pump/Bell Housing Differences, Design 1 and 2 Castings Can Be Interchanged



**Note:**  
All new 6L pump components are coated with a corrosion inhibitor. This inhibitor needs to be removed with brake clean. Valve sticking or orifice restriction issues may occur if not removed.

Always inspect the passages in your new pump half for restrictions due to machining issues. We have seen several instances where there is no boost after pump half replacement.





# Bell Housing Differences

- 6L80- 6 different part numbers
- 6L90- 3 different part numbers
- 6L50- 3 different part numbers
- 6L45- 2 different part numbers

Part numbers vary based on: Torque Tube (Early and Late), Diesel, Gen 4 V8 ,Gen 5 V8,Performance 8, V6, Ecotech 4 cyl





# 6L80/6L90 Delayed Engagement, Slip, Shudder, Clutch Damage

Concern: Several customer symptoms may be present depending on where the leak is present, these include;

- Delayed Drive and/or Reverse engagement, shudder or slip on acceleration or on a shift, hard 2-3 shift hot.
- Damage to any or all of the following clutches; 1234,456,35R.
- The concerns may be intermittent in nature and temperature sensitive.

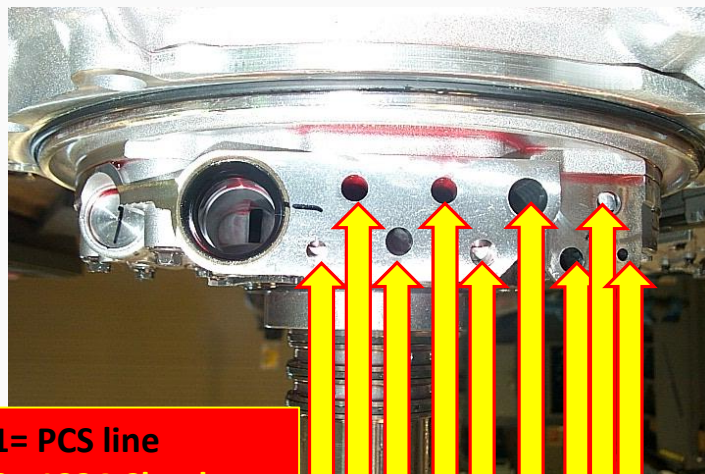
**Cause/Correction:** One of the more likely causes for any of the above concerns is a leak between the pump stator support and the pump cover. The stator to pump cover component mating surface areas are sealed with a gasket. To test for a leak in the gasket, use shop air or vacuum. Apply the air or vacuum to the valve body feed passages on the pump.

The bolts are torqued with multi-spindle torqueing equipment at the plant. The equipment aligns, preloads and torques all the bolts in one step. GM recommends that the gasket not be replaced during overhaul. If the bolts come loose or if the gasket deteriorates, leakage in the 1234/35R/456 clutch circuits may occur. In the aftermarket we are servicing the gasket. We recommend that you preload the support in the CW direction prior to torqueing the bolts.



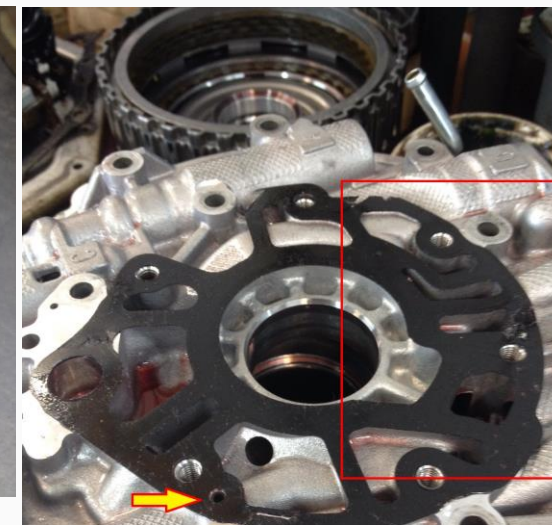


# 6L80/6L90 Delayed Engagement, Slip, Shudder, Clutch Damage



- 1= PCS line
- 2= 1234 Clutch
- 3=Compensator
- 4= 35R Clutch
- 5=Regulator apply
- 6=Line
- 7=456 Clutch
- 8=Center Lube
- 9= PCS TCC

1 2 3 4 5 6 7 8 9



Inspect the gasket in the area shown for damage. Note; Do not lose the orifice shown by the arrow as it can create an overheat condition can occur.



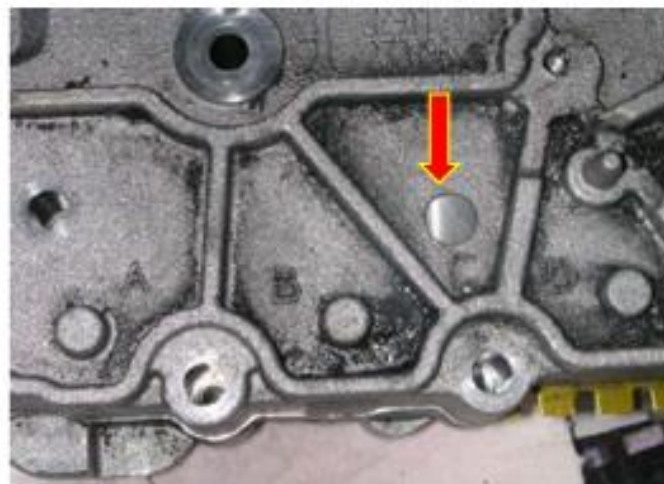


## Why You Should Never Skip The Inspection Of the 6L Series Valve Body





# 6L45/6L50/6L80/6L90 Valve Body Id



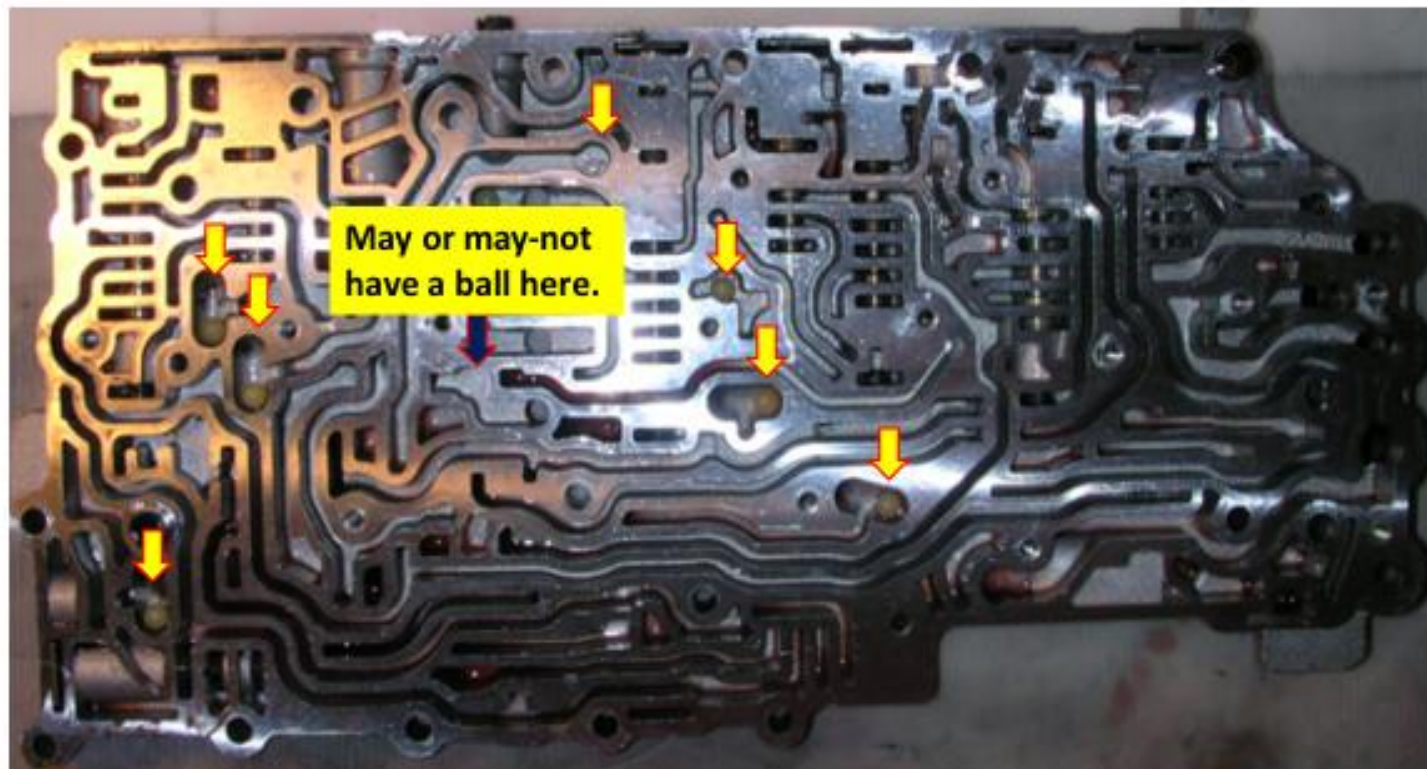
Machined boss on upper VB casting IDs transmission

- A = MYA / 6L45
- B = MYB / 6L50
- C = MYC / 6L80
- D = MYD / 6L90
- E = MYC / 6L80 (2010)





# Check Ball Location 6L80/90

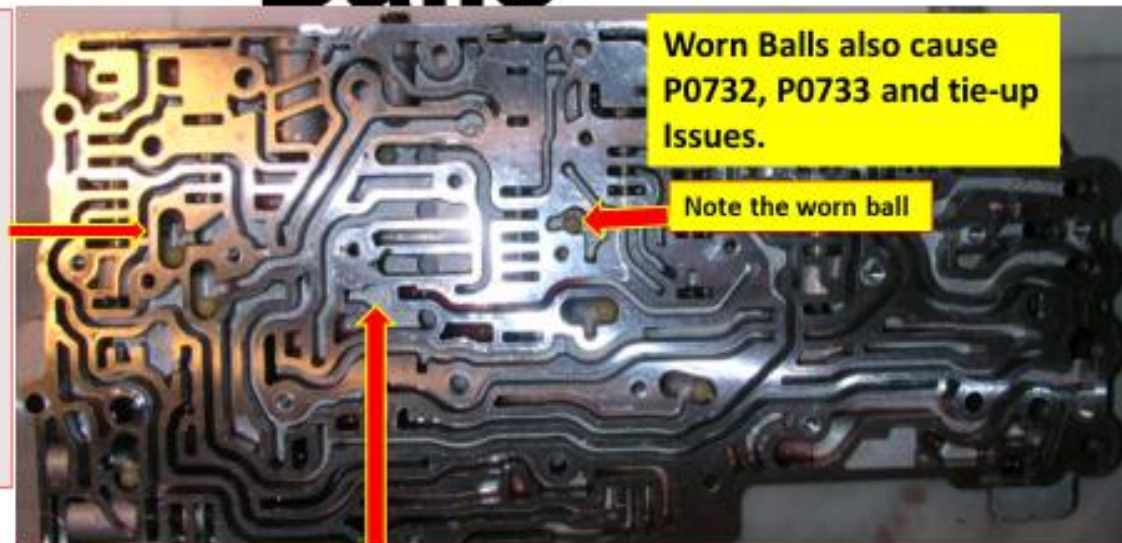




# 6L80/6L90 Check Balls

Check ball wear is common on the 6L series applications. Wear may cause the ball to stick in the spacer plate hole. The most common ball to wear is check ball #1. This may lead the transmission to a neutral on the 1-2 shift, no forward or a slip during forward operation. The conditions may be intermittent.

Plate 24245720  
Should be used on  
09 and earlier  
applications.



Check ball #8 Update. #8 ball was added for the 2014 model year. The valve body contains a pocket where the #8 ball was placed, although on previous model year applications the pocket never housed a ball. To utilize the ball, the spacer plate was also updated. This update is designed to address a acceleration/deceleration clunk, garage shift engagement and DTC issues that some customers may find objectionable. 4 different plates were produced, 1<sup>st</sup> design, 2<sup>nd</sup> design P0751, 3<sup>rd</sup> design, glue change, 4<sup>th</sup> design 35R volume reduction. Updated plate 24272467 will fit 2010-2016

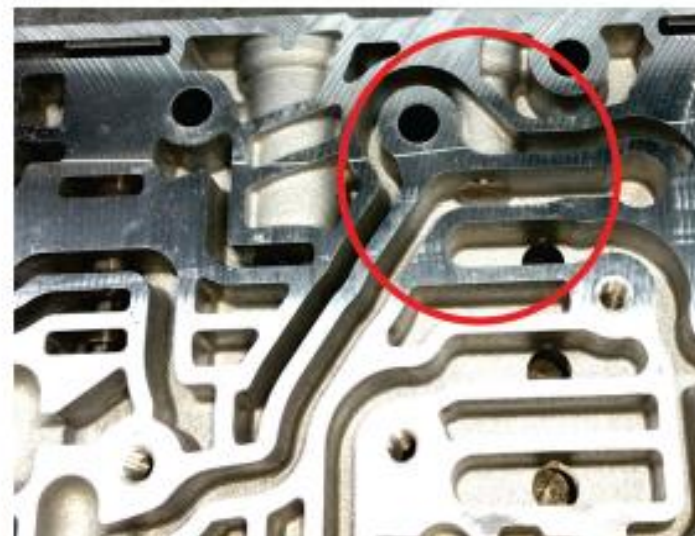




# Delayed 3<sup>rd</sup> or Reverse After Repair

The 2 bolts that mount to the “Side” of the TEHCM are a different length as compared to the other attaching bolts. Using the wrong length bolts in this location may lead to problems with clamping the TEHCM and Valve body tightly together leading to a slight leak and possible VB channel damage.

The 2 side bolts are 53mm (2.08”) long, while the other TEHCM mounting bolts are 55mm (2.16”) long.





# P0751

**Concern:** P1751, P0751 set, 3-4,4-3, 4-5,5-4 busy shifts, possible intermittent 4<sup>th</sup> gear start/lack of acceleration complaint.

**Cause:** An under sized hole in the spacer plate

**Correction:** Replace the spacer plate with the updated plate, Clear and relearn the adapts. If the transmission already has the updated plate, a sticking clutch select valve 2 or a sticking clutch select solenoid 2 may be the cause.





## 6L80/6L90 Hesitation on Acceleration

**Concern:** During some driving maneuvers the customer may complain that the transmission is failing to shift and a hesitation occurs. This typically occurs during the following driving scenarios:

- \* The customer is driving at low speeds, closed throttle, typically 15 mph or less. The customer then aggressively applies the throttle for a lane change or a rolling stop/reacceleration.
- \* The customer makes and aggressive stop (0 Mph), then immediately reapplies the throttle to accelerate from a stop.

**Cause/Correction:** All 6L applications are drive by wire. During the low speed maneuvers the ECM opens the throttle plate slowly even though the customer has aggressively opened the throttle. The ECM delays the throttle plate movement .7 seconds depending on the driving maneuver. This feature is designed to minimize drivetrain clunk due to powertrain stack-up backlash.

During an aggressive stop, acceleration driving scenario, time is needed for the transmission to downshift. To allow for this, the ECM will command 0 torque to the transmission for .5 seconds. If the shift is not completed by the time the throttle is moved, a hesitation will occur.

Both scenarios are considered normal conditions.





# Torque signal scan values 2015 Chevrolet Tahoe



Global Diagnostic System 2

Idle,  
transmission  
in neutral

Control Module	Parameter Name	Value	Unit
Engine	Torque Delivered Signal	22.69	Lb.ft.
Engine	Torque Management Engine Timing Retard	13.4	Degrees
Engine	Engine Timing	16	Degrees

Idle,  
transmission  
in OD range

Control Module	Parameter Name	Value	Unit
Engine	Torque Delivered Signal	36.35	Lb.ft.
Engine	Torque Management Engine Timing Retard	11.3	Degrees
Engine	Engine Timing	16	Degrees





# Unwanted Grade Braking, Shift Busyness

- **Concern:** The vehicle may display any/all of the following symptoms:
  - \* Grade braking activates when the vehicle is not on a hill. The transmission will downshift, engine rpm will increase due to grade braking being active even though your foot is not on the brake and you are not decelerating down an incline.
  - \* The transmission upshifts and downshifts even though the load is remaining steady.
  - \* Lack of power, as the "brake pedal override software feature" is active.
  - \* No DTC's are set
- **Cause/Correction:** The brake pedal position sensor (BPP) is indicating the brake is applied. This can be due to a faulty sensor or a wiring concern. Up to 3 different BPP values can be displayed on your scan tool depending on the vehicle software used:
  - \* BPP signal- This parameter will read applied or released. It should read released unless your foot is on the brake.
  - \* BPP sensor- This parameter will read 0-100%. It should be reading 0% when the brake is released.
  - \* BPP sensor voltage- This parameter will read typically read 1 volt +/- .3 volts with the pedal released.





# Unwanted Grade Braking, Shift Busyness

If any of the parameters indicate the pedal is applied, monitor the "BPP Learned Release Position Voltage" value. The ECM learns the lowest BPP voltage value during the key cycle. If the BPP Learned Release Position Voltage is LOWER than the BPP sensor voltage value you see on your scan tool, a problem with the sensor or wiring has occurred at some time during operation. Due to the learn process the ECM utilizes for these applications, the ECM will learn the lowest value it sees. The ECM then compares the learned value to the current value. If the current value is higher than the learned value (due to a connection issue or sensor problem) the ECM will think your foot is on the brake even though the brake has not been applied.

If a problem is indicated inspect the sensor 5 V reference, circuit 5359 and the sensor signal circuit 5361 for opens and shorts to ground prior to replacing the sensor.

An example of circuit operation is as follows:

## Proper operation

BPP Learned Release Voltage 1.0V

BPP Sensor Voltage 1.0V

BPP Sensor % 0%





# Unwanted Grade Braking, Shift Busyness

## Problem Indicated

BPP Learned Release Voltage .5V

BPP Sensor Voltage 1.0V

BPP Sensor % 22%

The above parameters indicate the current BPP sensor voltage is now 1 volt and at some time it has been as low as .5 volts. Since the ECM compares the learned value to the current sensor voltage value the ECM thinks the brake pedal is partially depressed (22%).



BPP Sensor





# Downshifts in Tow Haul, 0 Throttle





# Brake Pressure Sensor Scan Values 2015 Chevrolet Tahoe



Global Diagnostic System 2

Normal Values Shown

Idle,  
brake pedal  
released



Control Module	Parameter Name	Value	Unit
Engine	TCC/Cruise Control Brake	Released	Apply/Released
Engine	Brake Pedal Position Circuit	Released	Apply/Released
Engine	Brake Pedal Position Sensor	Released	Apply/Released
Engine	Extended Travel Pedal Position Signal	Released	Apply/Released
Engine	Brake Pedal Position Sensor	0	%
Engine	Brake Pedal Position Sensor	1.18	Volts
Engine	Brake Pedal Position Sensor Learned Released Position	1.18	Volts
Engine	Brake Pedal Position Sensor Learned Released Status	Complete	



# Brake Pressure Sensor Scan Values 2015 Chevrolet Tahoe



Global Diagnostic System 2

Normal Values Shown

Idle,  
brake pedal  
FULLY  
applied



Control Module	Parameter Name	Value	Unit
Engine	TCC/Cruise Control Brake	Applied	Apply/Released
Engine	Brake Pedal Position Circuit	Applied	Apply/Released
Engine	Brake Pedal Position Sensor	Applied	Apply/Released
Engine	Extended Travel Pedal Position Signal	Applied	Apply/Released
Engine	Brake Pedal Position Sensor	85	%
Engine	Brake Pedal Position Sensor	2.74	Volts
Engine	Brake Pedal Position Sensor Learned Released Position	1.18	Volts
Engine	Brake Pedal Position Sensor Learned Released Status	Complete	



# Locating Aftermarket Calibrations

<https://tis2web.service.gm.com/tis2web>

Home S/W/L SPS SPS Info Security Snap GDS 2



To obtain the latest electronic controller calibration information for your vehicle, enter the vehicle's 17 character Vehicle Identification Number (VIN) and select 'Get CAL ID'.

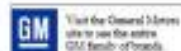
To obtain the Calibration Verification Number (CVN) for any calibration part number, enter the part number of the calibration ID and select 'Get CVN.'

VIN: 3GCPKTE73C0111464

Get CAL ID

Part Number:

Get CVN



Home S/W/L SPS SPS Info Security Snap GDS 2



< Back Next > Cancel

Controller:

- PDM Passenger Door Module (If equipped)
- RAD Radio
- RCDLR Remote Control Door Lock Receiver (Pass-Thru Only)
- SCM Sensing and Diagnostic Module
- TCM Transfer Case Control Module (RPO NQH or NQF or NPD)
- TCM Transmission Control Module
- Thief Deterrent Module
- Parking Assist Control Module
- ID Vehicle Theft Deterrent Learn
- See OnStar Recommendations (See OnStar near R1666)

Selected Options:

VIN:

3GCPKTE73C0111464

< Back Next > Cancel



# Locating Aftermarket Calibrations

<https://tis2web.service.gm.com/tis2web>

Home | TIS2Web | SPS Info | Downloads | Help | TIS2Web

Complete History < Back Next > Cancel

Operating System: **Linux/Windows**  
Module: Transmission diagnosis System

24257957 - Transmission  
24270483

Part Number	CUN	Description
24270483	00006DFB	Addreses customer complaints of 2-3 Cold Upshift Flares
24257957	00000FDD	Transmission

Selected Options:

VIN:	3GCPKTE73CG111464
Controller:	TCM Transmission Control Module

Complete History < Back Next > Cancel

Vehicle Information

Engine VIN 3GCPKTE73CG111464

Calibration ID	Verification No.
Trans. 24261871	00005546
Trans. 24263533	00000813
Trans. 24257957	00000FDD
Trans. 24257970	00000B65

Print Table



## Using Engine Torque to Locate an Aftermarket Calibration

Transmission Data	
Engine Torque	-30 ft-lbs
Calc. Throttle Position	0 %
Engine Speed	0 RPM
Transmission ISS	0 RPM
Transmission OSS	0 RPM
ISS/OSS Supply Voltage	OK
Commanded Gear	1
Shift Solenoid 1	Off
Shift Solenoid 2	Off
1. / 44 -	
Engine Torque	
Select Items	DTC
Quick Snapshot	
More	





# Today's Presentation Sponsored By:

## Any Questions? Thank You For Attending



### PISTON KITS

(Individual pistons are also available)

SAP #	Description	Pcs.	Brand
Chrysler	222 435E 4-cyl. Over low and reverse 24 diam 2004hp	3	OE
	221 435E 4-cyl. Over low and reverse 24 diam 2004hp	3	OE
	4851 435E 1999hp	2	OE
	4859 5-435E 2004hp	5	OE/AM
	4856 435E 2007hp	6	Hi-Per/OE
Ford	4860 435E 2007hp	5	OE/AM
	323800 435E 2004hp	7	OE/AM
	788 500NM 2005hp	8	OE
	45188 500NM 1999hp	3	Hi-Per/OE
	4863 435E 2004hp	5	OE
	4867 435E 2004hp (Reman. I)	5	OE
	483809 435E 1999hp	5	OE
	4850 435E 1999hp	5	OE
	4850 435E 1999hp	5	Hi-Per/OE
	765A 435E 1999hp	3	OE
Ford/GM	765B 435E 2004hp	3	OE
	32380E 435E 1999hp	7	OE/AM
	32380E 435E 2004hp	9	AM/Hi-Per
	4861 435E 2004hp	5	OE
	798 435E 2004hp	4	OE
General Motors	797 435E 1999hp	3	OE
	94089 435E 1999hp	3	OE
	310 435E 1999hp	7	OE
	4864 435E 2004hp	9	Hi-Per
	247 435E 2004hp	9	OE
	4869 435E 2004hp (Reman. I)	3	Hi-Per
	4867 435E 2004hp	5	OE
	4858 435E 2004hp	5	Hi-Per
	764 435E 1999hp	4	OE
	20580 435E 2004hp	2	AM
Mazda	796 435E 2004hp	4	OE
	32380E 435E 2004hp	9	AM/Hi-Per
	4855 435E 2004hp	2	Hi-Per
Mitsubishi	21110 435E 2004hp	9	OE
	17388 435E 2004hp	3	Hi-Per
	29080C 435E 1999hp	5	AM
Nissan	252080 435E 1999hp	7	Hi-Per
	252080A 435E 1999hp w/o Sero Riser	5	Hi-Per
Renault	26288A 435E 1999hp	6	Hi-Per/OE
	26288B 435E 1999hp	6	Hi-Per/OE
	26288C 435E 1999hp	6	Hi-Per/OE
	26288D 435E 1999hp	6	Hi-Per/OE
	26288E 435E 1999hp	6	Hi-Per/OE
Toyota	26288F 435E 1999hp	6	Hi-Per/OE
	26288G 435E 1999hp	6	Hi-Per/OE
	26288H 435E 1999hp	6	Hi-Per/OE
	26288I 435E 1999hp	6	Hi-Per/OE
	26288J 435E 1999hp	6	Hi-Per/OE
Volkswagen	4865 435E 1999hp	7	AM/Hi-Per
	4866 435E 1999hp	3	Hi-Per/OE
	8404 435E 1999hp	7	AM
	8405 435E 1999hp	5	AM
	8406 435E 1999hp	7	AM
ZF	4871 435E 1999hp	7	Hi-Per
	4862 435E 1999hp	2	Hi-Per

### Automatic Transmission Pistons and Piston Kits

Seal Aftermarket Products offers a complete line of foreign and domestic pistons and piston kits; including:

- Original equipment
- Reengineered **Hi-Per Blue** pistons
- Aftermarket alternatives

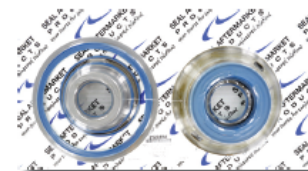
### Reengineered **Hi-Per Blue** Pistons:

Hi-Per Blue™ pistons are reengineered original equipment design, manufactured with upgraded high performance blue AEM (ethylene acrylic elastomer) for superior thermal and chemical resistance, with better fit and performance. Other aftermarket pistons are made of a less-tolerant alkyl acrylate copolymer (ACM).

Hi-Per Blue™ pistons are available exclusively through Seal Aftermarket Products.

### Hi-Per Blue™ Features and Benefits:

- Engineered utilizing best-in-class materials
- Meets or exceeds OEM specifications
- Better temperature range
- Higher tear strength
- Better bonding characteristics
- SAP-designed for better seal support
- Available separately, or in kits



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### 2013 SFMA & MAF Manufacturer of the Year recipient.

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