

Transmission Report

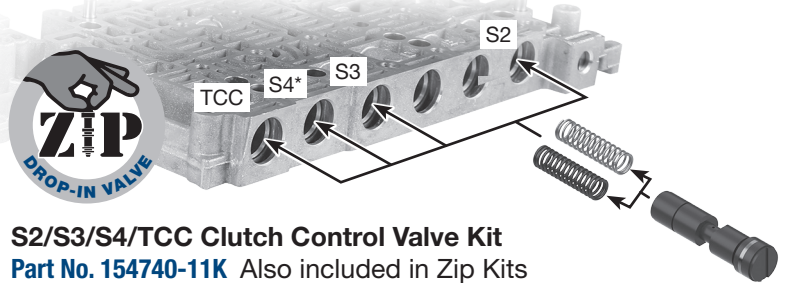
Volume 13, No. 2

August 2022

8L90 Tech Alert! Model Year 2019 S4/23468 Control Valve Changes

Engine controls/management for model year 2019 GM 8L90 transmissions in truck and SUV applications with 5.3 and 6.2L V-8 engines made a change from active fuel management (AFM) to dynamic fuel management (DFM). AFM controls would convert a V-8 engine into a four-cylinder under lighter engine load and cruising conditions. DFM controls allow engine management to deactivate any of the eight cylinders selectively to help improve fuel mileage and emissions. This change also affected the torque converter and the valve body assembly in the 8L90. The torque converter is now equipped with a centrifugal pendulum absorber. GM associates its attributes with a dual-mass flywheel to help dampen noise and vibration.

The valve body in the 8L90 applications also went through a change involving the S4/23468 control solenoid, valve body casting and control valve.



S2/S3/S4/TCC Clutch Control Valve Kit
Part No. 154740-11K Also included in Zip Kits
8L45-8L90-TCC-ZIP & 8L45-8L90-SHIFT-ZIP

- Hardcoat anodized aluminum valve combats premature wear
- Lengthened valve spool utilizes unworn bore section to seal apply oil, while scarf-cut seals prevent leaks at the signal apply end for proper clutch control



***WARNING:** This kit contains a .443" dia. valve that cannot be used in the '19-later S4 location or shift complaints will occur.

Figure 1 - Model Year 2019 8L90

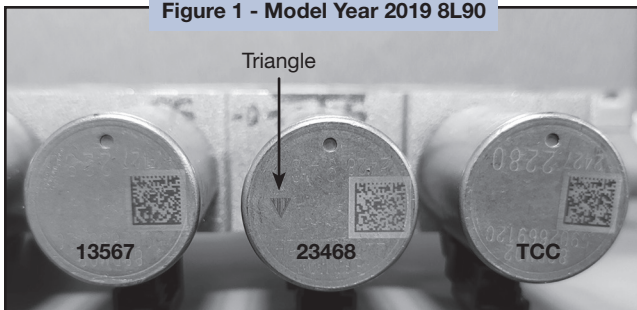


Figure 1 shows an external ID that can be seen without valve body disassembly. Note the triangle on the canister.

Figure 2 shows the previous-design S4 control valve and solenoid compared to the new design. Note the previous-design control valve has two diameters and the new design only has one.

Figure 3 shows an oil circuit from the previous design. The late design valve is still plumbed the same way, but the diameter change and the new-design solenoid may provide better control of the 1-2 upshift especially when DFM is activated.

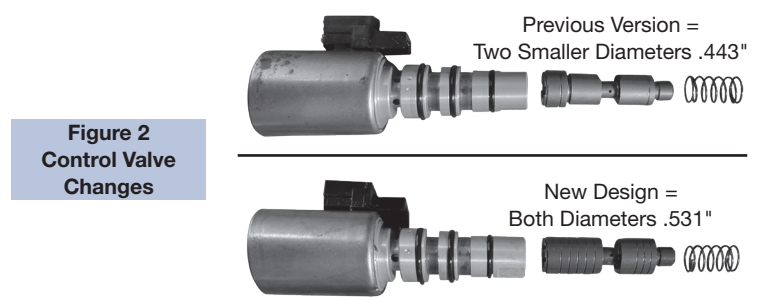
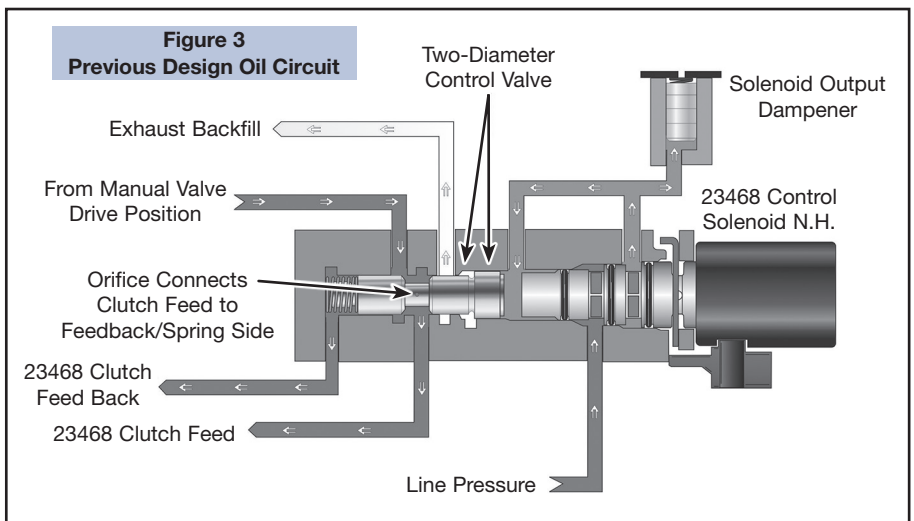


Figure 2
Control Valve
Changes

Figure 3
Previous Design Oil Circuit

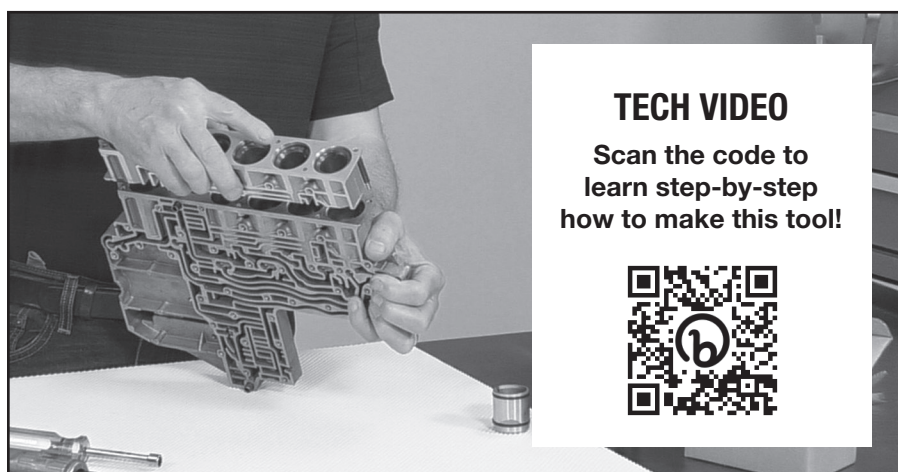


DIY Tool for FAST & EASY RFE Accumulator Piston Installs

Sonnax RFE accumulator pistons feature a dual-seal design for exceptional sealing and improved durability, which is great for keeping the comebacks away, but does make them a little more tedious to install. We've had a lot of requests over the years for an installation tool and recently came up with a great solution that's easy for any shop to make.

As shown here, just cut off the accumulator section of an RFE valve body, then taper and smooth the piston bore edges. Then, slide in the Sonnax pistons and leave them there a bit to allow the seals to size. When you're ready to install, just align the tool to the valve body and push each piston into place!

Learn more about how to make this tool by watching a video on the Sonnax website at <https://bit.ly/3HDI1Ke> or by scanning the code below.



Chrysler Heavy Duty Accumulator Piston Kits

Fit 40TE/S, 41AE, 41TE/S, 42LE, 42RLE, 45/545RFE, 65/66/68RFE

Single Piston Kit **Part No. 44894-01K**

5-Piece Piston Kit **Part No. 44894-01MK**

Replacement Seal Kit **Part No. 44894-01SK**

- Dual-guide seals prevent piston-to-bore scuffing
- Updated seal location allows use in scuffed bores
- Prevents transmission failure from broken plastic pistons
- Drop-in Zip Valve™ parts install quickly and easily

68RFE Pump Gear Upgrades

Heavy Duty Outer Pump Gear Set **Part No. 72530B-04K**

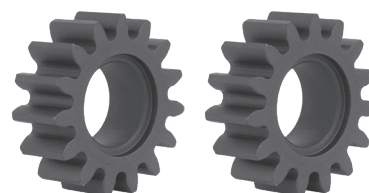
Rebuild worn 68RFE pumps with two premium-quality, high-pressure gears from Sonnax that feature an anti-wear coating to ensure long life.

Center Pump Gear **Part No. 72530B-02**

- Allows salvage of pump bodies scored at center gear bearing surface
- Redesigned drive flange reduces turbine hub engagement play & noise
- Use with Sonnax steel-backed, aluminum alloy precision bushing **72530B-03** to extend pump life

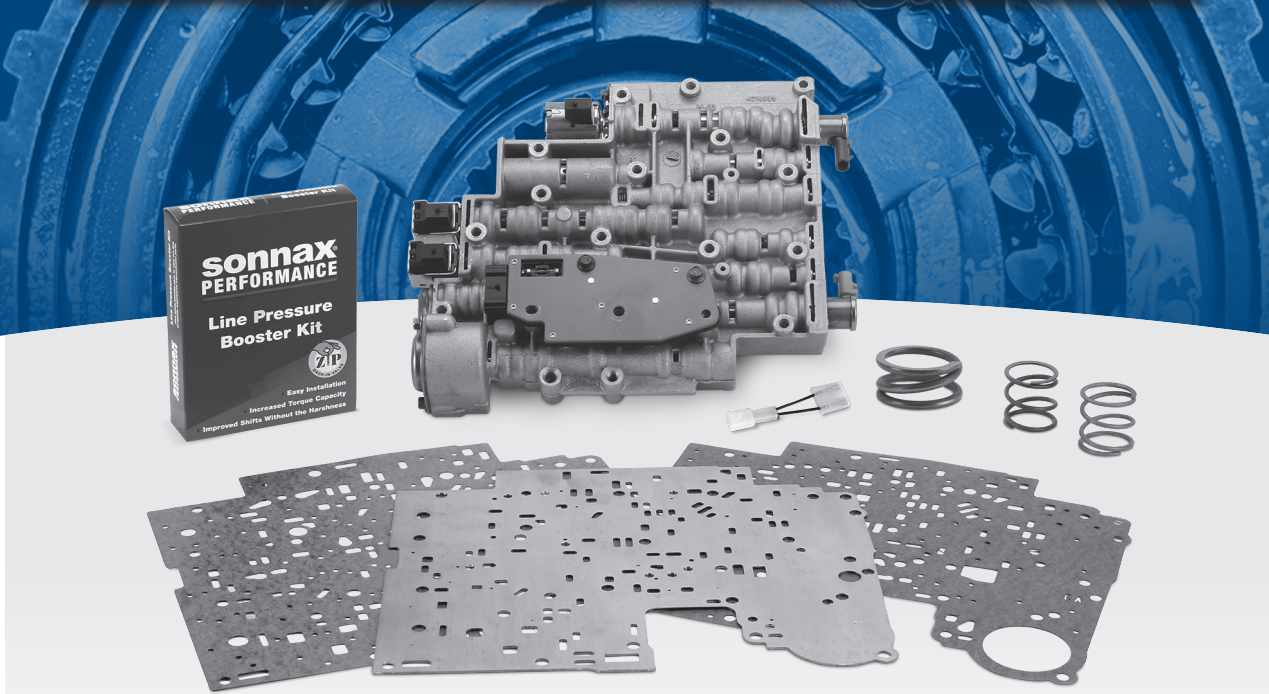


WARNING: Inspect pump bore and pump pocket face below the center gear. Damaged bores CAN be corrected using Sonnax center pump gear bushing. Damaged pockets CANNOT be repaired using these parts. Replace the pump.



NEW! **SONNAX 4L60-E, 4L65-E**
HEAVY DUTY VALVE BODIES

Built-in Forward Sprag & Clutch Protection



EXCLUSIVELY FROM SONNAX: Two Levels of Overrun Clutch Control

Choose an upgraded valve body with improved sprag/clutch durability in D3 1st and 2nd Gears or — for the **ULTIMATE** in reliability — a valve body that adds overrun clutch control to those gears **PLUS** D4 1st, 2nd and 3rd.

For '96-'08 4L60-E & 4L65-E Units

Part No. GM053-HD Improves Forward Sprag & Clutch Durability in D3 1st, 2nd Gears

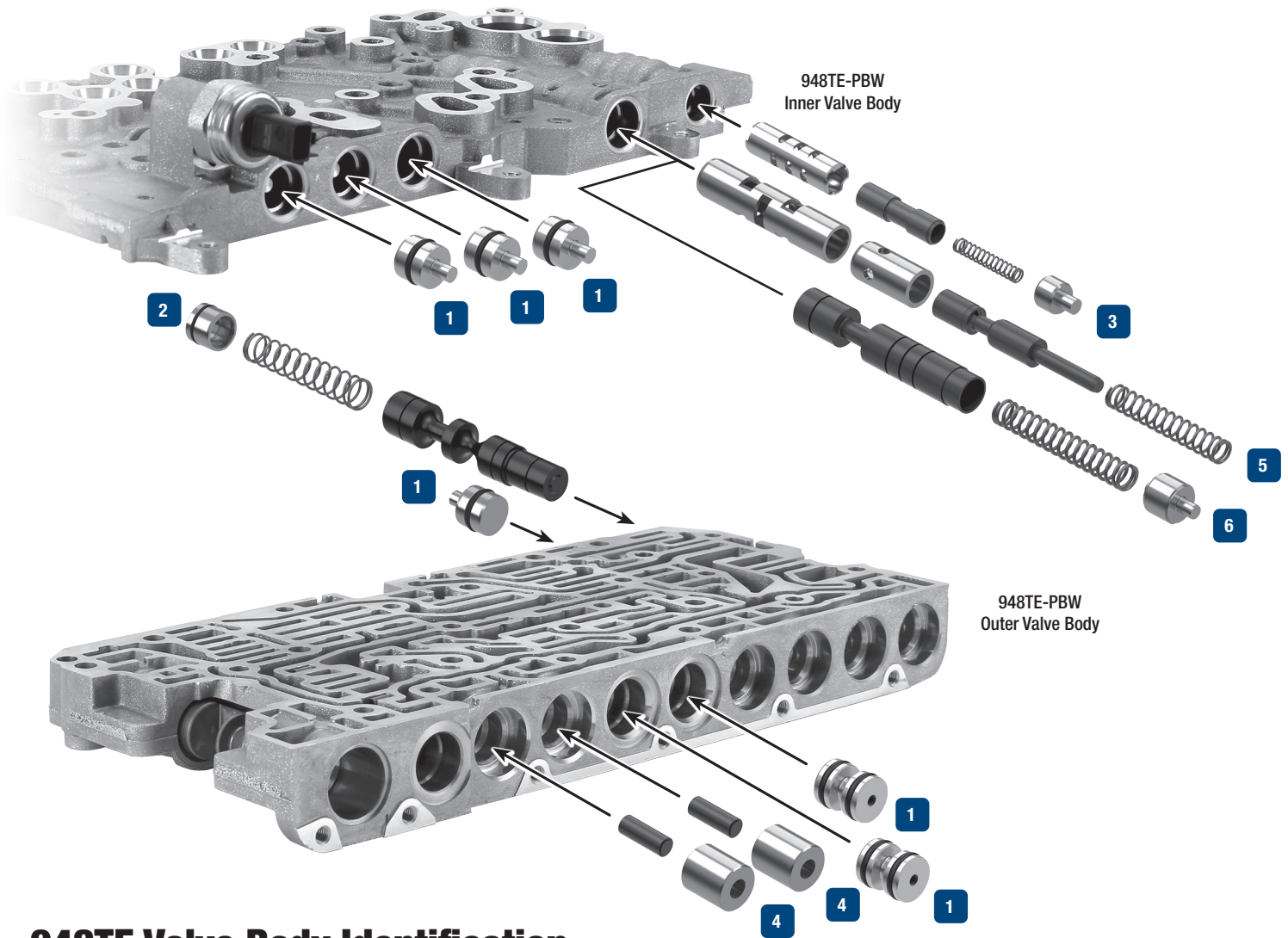
Part No. GM054-HD Improves Forward Sprag & Clutch Durability in D4 1st-3rd Gears & D3 1st, 2nd Gears

Included with each valve body:

- Sonnax line pressure booster kit
- New separator plate & gaskets
- Two new accumulator piston springs
- Sonnax EPC harness adapter for '03-later units

Ideal for truck and towing applications, these upgraded Sonnax valve bodies also feature:

- Firmer shifts under load & moderately increased line pressure to improve transmission performance & durability
- All the most popular Sonnax valve repairs, new electronics & updates to improve shifts & firm TCC apply:
 - Oversized TCC regulator valve, sleeve & limit valve spring
 - O-Ringed bore plugs & abuse plugs
 - New accumulator control valve, sleeve & spring
 - Oversized AFL lineup
 - New FWD accumulator piston & seal
 - New pressure switch manifold
 - New EPC & TCC PWM solenoids
 - Heavy duty 2-3 shift valve (GM053-HD only)
 - New servo cushion spring to help reduce downshift clunk (GM054-HD only)

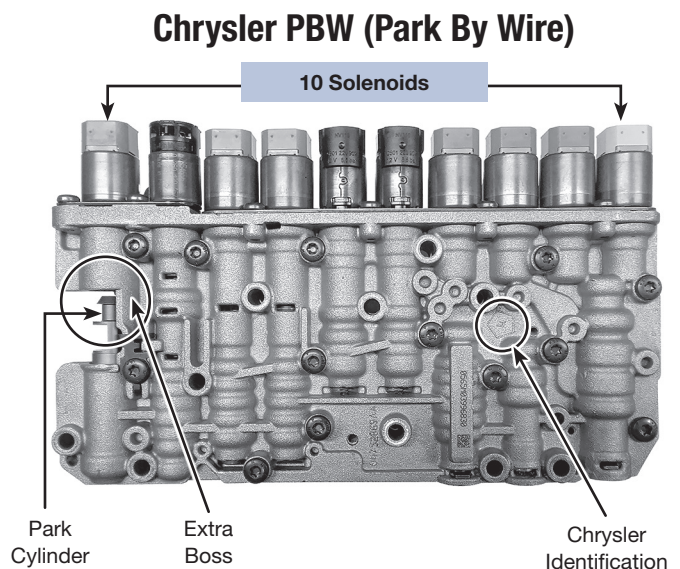


948TE Valve Body Identification

There are two variations of the 948TE valve body. The main differences are how the Park position is selected:

- **Park By Wire (PBW)** The first variation is referred to as Park By Wire. This type has full electronic control. There is an external cable that connects to the Park release lever, but it is only used for emergency use or for towing. There is an emergency pull inside the vehicle that releases the parking pawl manually when this cable is engaged.
- **Park By Cable (PBC)** The second variation is referred to as Park By Cable. This type utilizes a cable to move the manual valve, from the driver, input to engage or disengage the parking pawl.

The simplest way to ID these valve bodies is to count the solenoids: note the PBW has 10 and the PBC has nine. The PBW and PBC valve bodies are not interchangeable, as the solenoid configuration is different as well as the internal components and small parts. The Honda applications use the ZF9HP48 PBW design. The pictures here also show differences in the manual valve and the cover that is used in the PBC.



948TE, ZF9HP48, Honda 9-Speed Zip Kit®

Part No. 948TE-ZF9-HONDA-ZIP




The First Step in Correcting Common Shift Problems

- Drop-in Zip Valve™ parts install quickly and easily, no reaming or special tools required
- Uniquely designed parts address root causes of valve body complaints by sealing critical pressure circuits
- Detailed technical booklet included with in-depth rebuild and inspection tips for comprehensive valve body repair

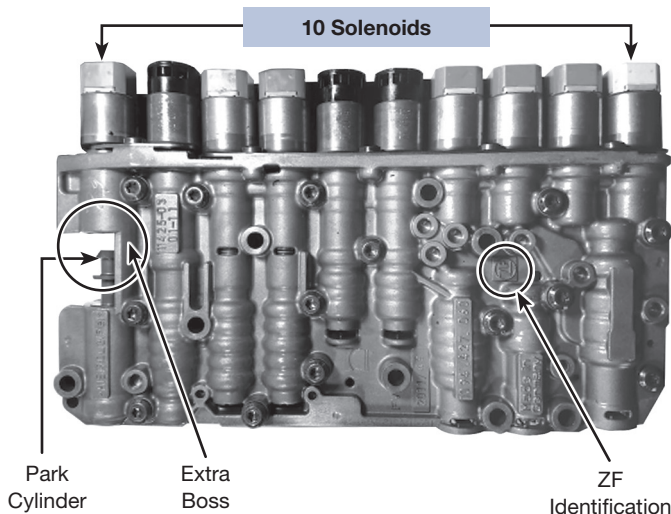
Kit includes:

- 4 A & F Dog Clutch Plunger Valve Kit
- 1 O-Ringed End Plug Kit
- 3 Shift Valve System Pressure Valve Kit
- 5 Solenoid Pressure Regulator Valve Kit

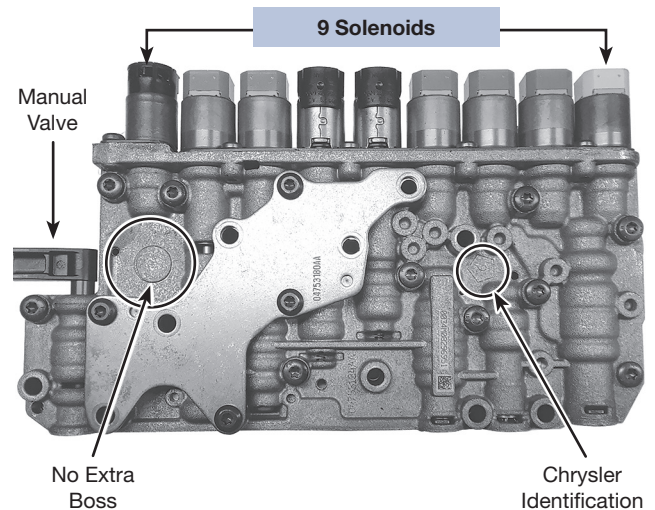
Symptoms/Benefits	Product Name	Part No.	Details  Drop-In Zip Valve™ Parts	Tooling
Multiple Symptoms				
Poor shift quality, Damaged A/F dog clutch, Gear ratio & solenoid codes, Burnt clutches, TCC slip, Delayed engagement, Poor line pressure control	Zip Kit®	948TE-ZF9-HONDA-ZIP	ZIP	
Pressure Problems				
Soft shifts, Flare shifts, Harsh shifts, Burnt clutches, Pressure loss	O-Ringed End Plug Kit	1 85740-01K	ZIP Includes 4 end plugs & 2 internal end plugs	
Low line pressure, High line pressure, Clutch failure, Erratic line pressure	Oversized PR Valve Kit	2 85740-15K	Fits valves with overall length of 2.67" & outer spool length of .51"	F-85740-TL15*
Poor line pressure control, Poor shift quality, Burnt clutches	Shift Valve System Pressure Valve Kit	3 85740-07K	ZIP Replaces valves with 1.157" overall length, .435" inner spool length & end plug with wire retainer	
Shift/Engagement Concerns				
Loss of higher gears, Damaged A dog clutch, Damaged F dog clutch, Input shaft damage	A & F Dog Clutch Plunger Valve Kit	4 85740-05K	ZIP Fits .227" dia. plunger valve only	
Delayed engagement, Harsh up/downshifts, Neutral shifts, High line pressure	Solenoid PR Valve Kit	5 85740-09K	ZIP	
Harsh downshifts, Neutral shifts, High line pressure, Harsh upshifts, Wrong gear starts	Oversized Solenoid PR Valve Kit	6 85740-11K		F-68942-TL14*
Component Damage/Failure				
Low clutch oil pressure, Low pressure	Valve Body Separator Plate	85740-238	ZF9HP48, VB code A/B only, OE plate code 1094-394-238	

*VB-FIX Required

ZF PBW (Park By Wire)



PBC (Park By Cable)



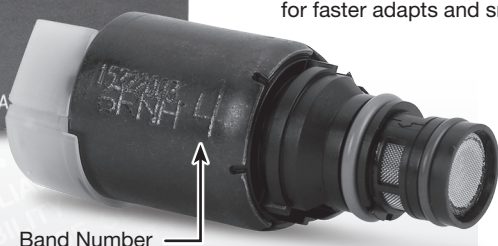


Rostra Solenoids for Ford 6R80, 6R100, 6R140

- Rigorously tested to meet OE performance specs
- Improved Rostra design increases reliability & durability

Starting in 2010, Ford built the 6R80 valve body using NH and NL variable bleed solenoids (VBS) banded with numbers between 1 and 5 to indicate flow and pressure rate variances. Ford released the 6R140 in 2011 and the 6R100 in 2017, both using these same solenoids. Fast forward to 2022, and there are well over 7 million vehicles utilizing these transmissions on North American roads.

Most builders are now familiar with the intent of this solenoid banding practice, which is to compensate for manufacturing tolerances by categorizing the solenoid into five different performance buckets (Figure 1). This lets the TCM be programmed accordingly and allows for faster adapts and smoother shifts.



Ask your distributor for these new Rostra VBS solenoids and learn more at www.rostrapowertrain.com

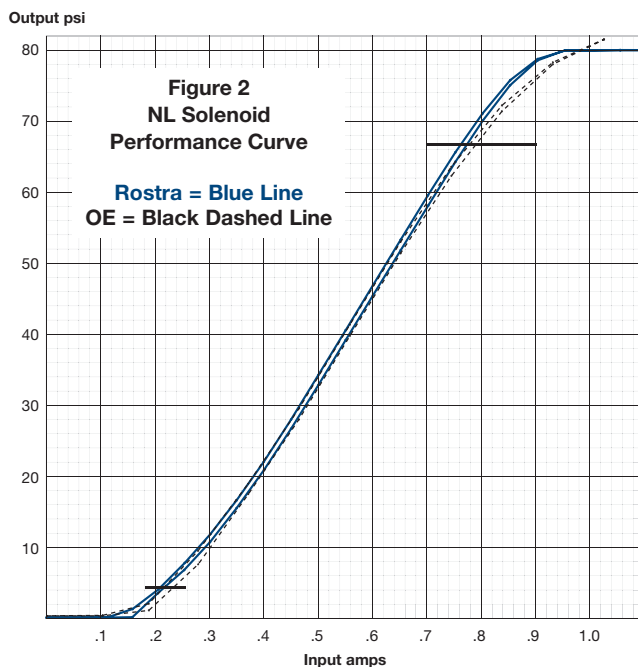
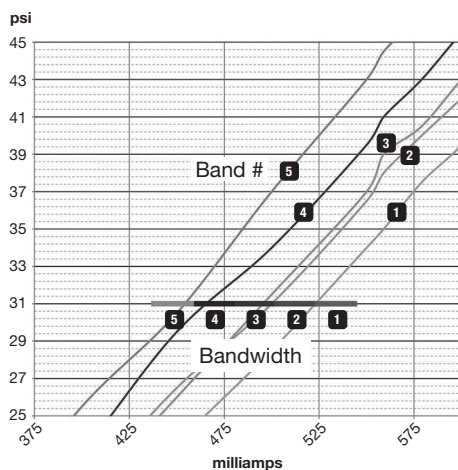
Solenoid Type	Band No.	Rostra Part No.
NH BLACK	5	52-0765
	4	52-0764
	3	52-0763
	2	52-0762
	1	52-0761
NL BROWN	5	52-0760
	4	52-0759
	3	52-0758
	2	52-0757
	1	52-0756

Most builders are also familiar with how difficult and time consuming it can be to obtain replacement solenoids for those which have drifted in performance over time or failed. Many hours can be lost trying to locate these from a dealer or sorting through core for a NH or NL solenoid of the same band number that works well.

Verified OE Performance Rostra now offers replacement 6R80, 6R100, 6R140 banded VBSs that meet the exacting performance criteria of the original design (Figure 2). The Rostra design has gone through hundreds of hours and thousands of miles of vehicle testing as well as extensive durability testing. Each solenoid is tested to meet four different pressure gates, as well as multiple pressure targets to ensure quick vehicle adaptation will occur.

Improved Reliability Because the Rostra design has no permanent magnet like the OE, there will be less drift over time. Another advantage is that the internal seat has been made from stainless steel versus plastic, which provides greater long-term durability.

Figure 1 NL Solenoid Bandwidth at 31 psi

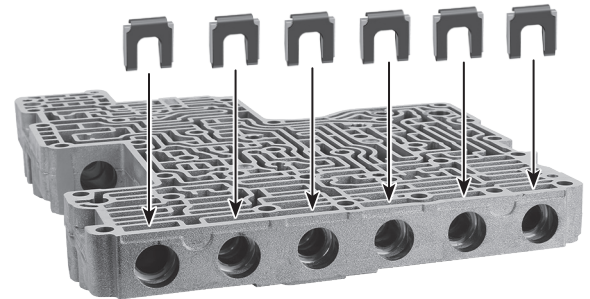
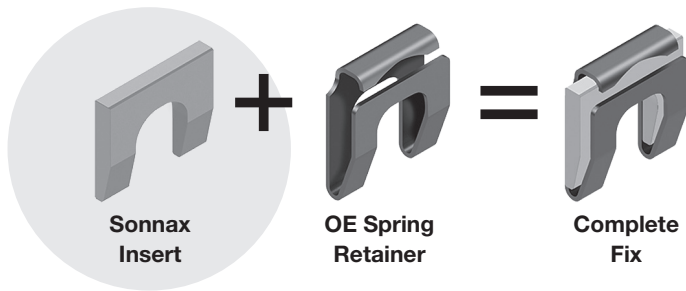




Ford & GM 10-Speed Solenoid Stabilization Clip Insert

sonnax®

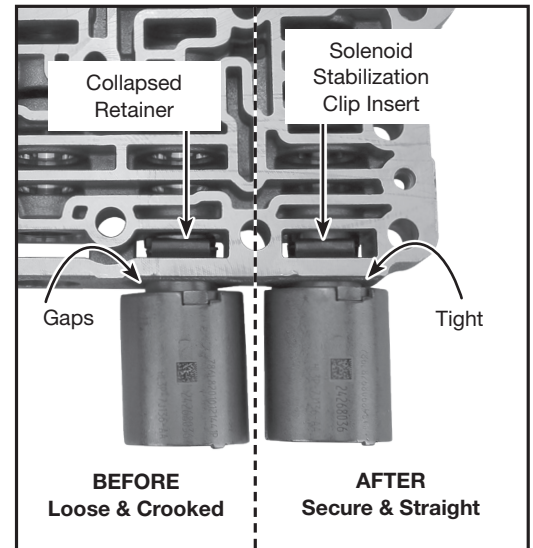
Part No. 105740-01K 6/Bag Fits Ford 10R80/140 & GM 10L80/90



Prevent Retainer Collapse & Restore Solenoid Stability

In Ford 10R80/140 and GM 10L80/90 10-speed units, heavy linear force solenoids (LFS) are held in place by small spring retainers. These spring retainers are prone to collapse, allowing the solenoid to wobble and become off-center with the inboard valve and damage the casting at the clutch valve bore opening. The results are shift complaints and converter issues, plus possible valve body damage if the LFSs remain loose during a rebuild.

The patent-pending solenoid stabilization clip insert **105740-01K** is used with OE spring retainers to secure the solenoids back in place. These solid steel clip inserts force the OE spring retainers to completely fill the casting and solenoid groove gap and prevent the retainers from future collapse. If the spring retainer has already collapsed, the clip insert can be used to reform the retainer to its proper size. Simply place it inside the retainer to expand it to appropriate retention dimensions.



Tech Team Shop Talk

By Technical Communications Specialist Jim Mobley



GM 8L Transmissions – Watch that Pressure Regulator Assembly!

The GM 8L transmissions have been plagued with symptoms of no pressure and/or no movement out in the field, even though they have a state-of-the-art, off-axis pump assembly setting in a pan of ATF. This pump assembly also has great self-priming capabilities even though, in some cases, it may not seem so.

Improper assembly of the pressure regulator assembly has emerged lately as a cause of no pressure and/or no movement. Shops have had reports of all four pieces installed incorrectly in some cases, such as the spring on the wrong side of the valve or the main pressure regulator valve backwards

in the bore. Other times we have seen the inner shuttle boost valve and bushing installed facing outboard. Anything other than the image shown above is incorrect.

To verify pump priming capabilities and pressure regulator function on the bench, assemble valve body and place face down in a medium-sized clean drain pan. Then place manual valve in Park, insert 1-quart funnel into suction of pump and fill with ATF. Then rotate pump shaft clockwise with 1/2" chuck drill to prime pump. Sonnax offers drop-in PR and shuttle valve kit **154740-02K** for the OE lineup in instances of worn valves/sleeve/casting.

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- 948TE Valve Body Repairs & ID Guide
- Rostra 6R80/100/140 Solenoids
- Ford/GM 10-Speed Solenoid Stabilizer

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Sonnax is an industry leader in the cutting edge design, manufacture and distribution of the highest quality products to the automotive aftermarket, commercial vehicle industries, and industrial sectors utilizing drivetrain technology.



ROSTRA®

Powertrain Controls

6R80 | 6R100 | 6R140 SOLENOIDS



- 10 NH/NL variable bleed solenoids for bands 1–5
- Rigorously tested to meet OE performance specs
- Improved design increases reliability & durability

Learn more on page 6
or visit www.rostrapowertrain.com

In 2021, Sonnax Transmission Company integrated Rostra Powertrain Controls into the company's Vermont- and North Carolina-based Sonnax operations. This concluded several years of internal moves aligning teams and resources to better serve the automotive aftermarket.

Today, Rostra and Sonnax are a single, transmission-focused organization committed to synchronized product development and continual quality and delivery improvements to our shared customers.