

Transmission Report

Volume 12, No. 2

July 2021

On-Target Accumulator Piston Repair The Advantages of 68RFE Billet Pistons

Accumulator piston scuffing and bore wear are common issues in many Chrysler valve bodies, especially when running increased pressures. Although various fixes have been tried over the years, from changing the seals to improving piston material, testing proves they range from completely ineffective to actually creating new problems. Let's take a close look at seal function so you understand what's at stake and the unique benefits Sonnax heavy duty accumulator pistons bring to your builds.

Continued on page 2...



68RFE Smart-Tech® **NEW!** Overdrive Clutch Housing Kit

Now IMPROVED to Maximize OD Clutch Capacity & Squawk Resistance

Keep hardworking 68RFE trucks on the road with outstanding protection against OD clutch burnup. The original, popular Sonnax housing upgrade now features enhancements in key areas for extra confidence that your builds will perform reliably at ANY power level.

- Modified housing holds physically taller clutch pack for 20% more clutch capacity
- 16% More OD apply area for firmer, more controlled shifts
- 2X Thicker steels and double-sided clutches increase steel mass by 28% for maximum heat dissipation
- BorgWarner clutch frictions customized for the Sonnax kit guarantee max capacity and squawk resistance
- Bolt-on anchor plate eliminates clutch pack flexing and distortion that contribute to heat build-up

Part No. 72960-16K Fits Chrysler 68RFE

- | | |
|---------------------------|--|
| • OD/Reverse Housing | • Friction Clutch Plates (6)
<i>Custom BorgWarner</i> |
| • Lip Seal | • Anchor Plate Shims (2) |
| • Adapter Sleeve | • Bolt-On Anchor Plate |
| • UD/OD Reaction Plate | • Screws (12) |
| • Steel Clutch Plates (5) | • Chisel |



What's New

- **Custom BorgWarner clutches optimized for the 68RFE deliver an unrivaled combination of maximum capacity and state-of-the-art squawk resistance**
- **Longer plate screws for extra secure fit with flange heads for optimal clamping force**

68RFE TECH VIDEOS

Learn more about the Smart-Tech kit PLUS get great OD clutch assembly tips for reliable, consistent builds at www.sonnax.com.

...Continued from page 1.

A unique combination of features allow Sonnax billet aluminum accumulator pistons to safely and reliably address every piston problem. There's no risk of transmission failure from broken, late-model plastic parts thanks to the piston's much stronger material. The relocated, scarf-cut primary seal allows moderately worn bores to be salvaged. And, unlike any other aftermarket piston, durability is further improved by stabilizing the piston with two guide seals to prevent piston-to-bore scuffing. Since these unique pistons from Sonnax are a relatively recent repair option, it's both interesting and educational to understand how we got here.

The accumulator piston in the popular 68RFE transmission is the same basic piston used in other electronically controlled Chrysler units, including the 62TE and the older 41TE/604 models. Over the years as shops have struggled with clutch durability issues, there have been attempts to change the accumulator seals from the original, scarf-cut, PTFE-type seals to rubber O-rings or rubber quad-rings.

When you evaluate the effectiveness of rubber, though, it proves not to be the best solution for the RFE units.

Interestingly, when the scarf-cut seal and OE accumulator are hydraulically leak-checked, they actually seal excellently and are not a significant source of leakage. Unlike many other common accumulators, these RFE accumulators do not have oil pressure on the back side of the piston and rely only on springs for resistance to movement and accumulator action. With less overall resistance, the "compression" of the rubber seals can create enough friction and drag of the piston to adversely affect shifts in these sensitive RFE units.

Figure 1 - OE Accumulator Piston

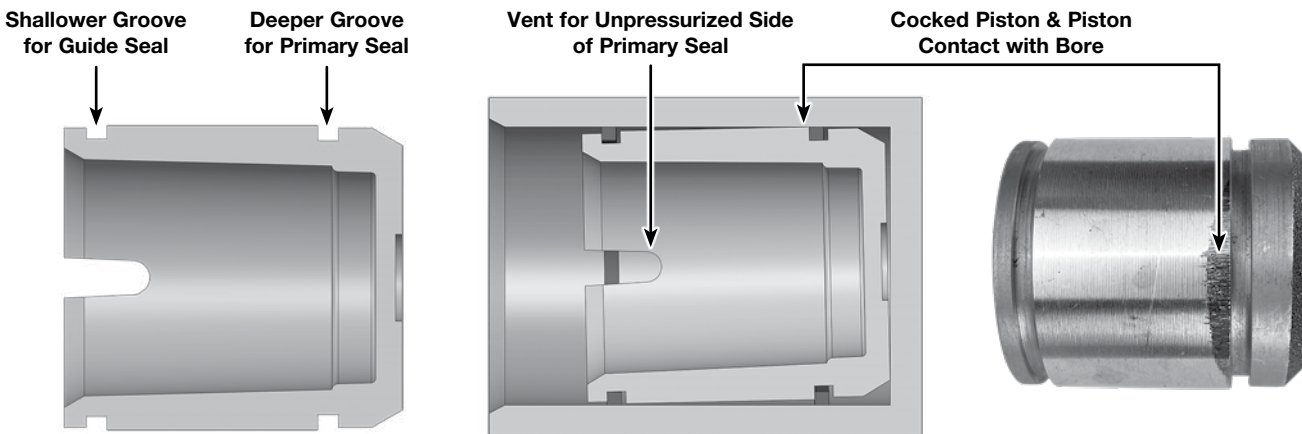
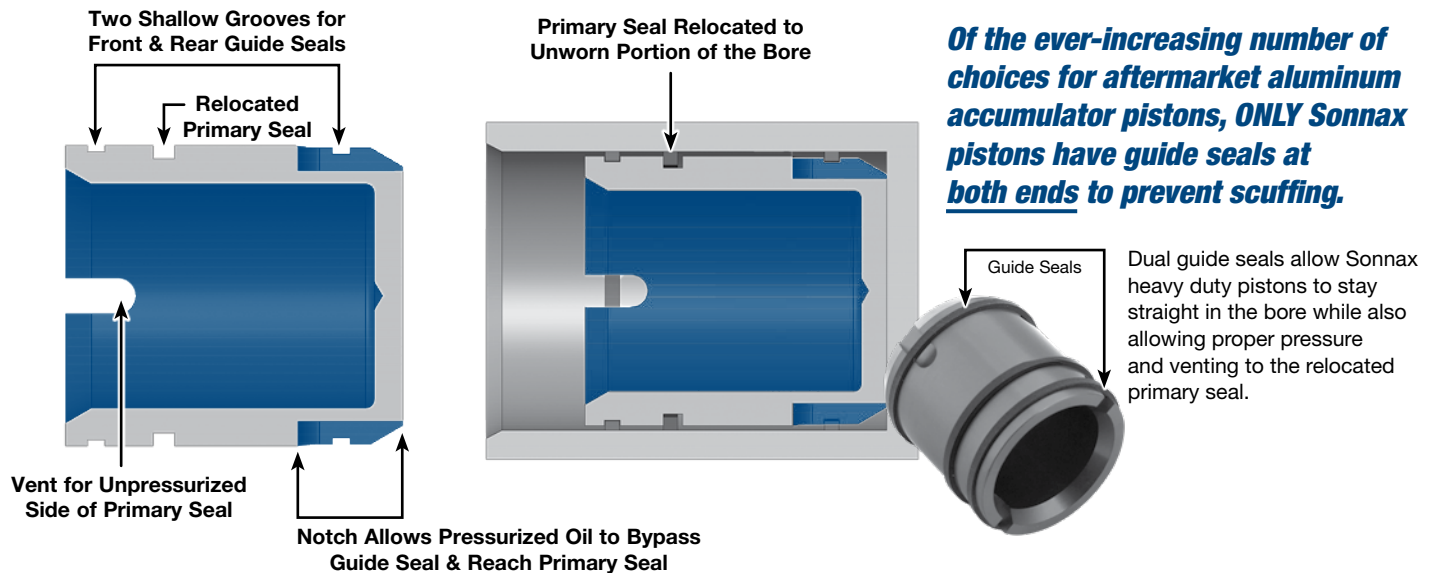


Figure 2 - Sonnax Heavy Duty Accumulator Piston



A close look at the OE piston reveals the primary seal has a deeper (smaller diameter) groove that allows oil underneath the seal (**Figure 1**). There is also a vent slot/hole between the seals so the primary seal only has pressure on one side. The guide seal is the same scarf-cut part, but the groove diameter is larger — this holds the seal up so it protrudes above the piston diameter and prevents piston-to-bore scuffing. The problem with this OE design is that the piston is only fully supported at one end. When the piston is side loaded, the primary seal can sink into its deeper groove and allow the piston to contact the bore. This results in scuffing and a breakdown of the whole system.

Of the ever-increasing number of choices for aftermarket aluminum accumulator pistons, ONLY Sonnax heavy duty pistons have guide seals at both ends to prevent scuffing (**Figure 2**). These unique pistons also maintain a deep groove primary seal that is properly vented on the non-pressure side and relocate the primary seal to an un-worn portion of the valve body bore, all the while keeping the low-friction benefits of the OE-style seals.

Keep these great features in mind when you're considering the options for improving 68RFE accumulator piston performance — the most reliable parts are those that truly improve transmission durability without introducing new problems or concerns. ◀

Don't Forget to Upgrade the Accumulator Cover Plate

Sonnax accumulator cover plate kit **44892-01K** is an upgrade over OE that prevents plate failure and allows salvage of valve bodies with damaged plates. This patented kit features:

- Stronger, thicker material to prevent flexing
- Three additional mounting holes and high torque-rated screws prevent the plate/screws from coming loose from normal vibration
- A specially graded tap **44892-TL** for higher torque yield threads is required to meet Sonnax recommended torque specifications



Accumulator Cover Plate Kit
Part No. **44892-01K**

Fits 45/545RFE, 65/66/68RFE



Thread Tap
Part No. **44892-TL**



Chrysler Heavy Duty Accumulator Piston Kits

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

- 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



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



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



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



Repair and Prevent Signal Accumulator Problems in 8L45/90 Units *Without Reaming*



- Drop-in Zip Valve™ parts install quickly and easily
- Improved design and material guarantee the best protection against future wear
- Positive sealing O-ringed plug prevents leakage in already worn bores
- Mating spring re-establishes OE dampening action

One of the main wear issues of the GM 8L45 and 8L90 valve bodies are the seven signal accumulators that eventually wear into the casting bore. Symptoms such as shift feel issues, low line pressure, converter issues and burnt clutches are the result.

While Sonnax does offer oversized signal accumulator piston kit **154740-01K** to eliminate these problems, many are looking for an equally as effective approach that doesn't require reaming. You can now quickly recondition worn bores and build in long-term reliability with the new, drop-in signal accumulator signal kit **154740-06K**.

This patent-pending kit includes four sets of pistons, sleeves and springs for use in any of the seven casting locations. To prevent future wear, the pistons — manufactured from hardcoat anodized aluminum with added annular grooves — and spring operate inside a sleeve made from highly wear-resistant material. The assembly is held in place by an O-ringed end plug, the key to preventing leakage in already worn bores. There is a central through-hole in the plug to prevent any hydraulic binding of the piston from occurring. If needed, you can make future repairs using the same components and achieve the same results.



Signal Accumulator Kit

Part No. 154740-06K

- Sleeves (4)
- O-Rings (6) 2 Extra
- Pistons (4)
- End Plugs (4)
- Springs (4)

How to Detect Bore Wear

The control solenoid valve body is easily checked for accumulator problems by vacuum testing. You will find that the pistons associated with the more active clutches are the most prone to wear.

Initial testing of the OE lineup should use the test plate included with Sonnax vacuum test stand kit **VACTEST-01K**. An acceptable bore will test at 18 in-Hg or above.

Post-installation testing doesn't require the test plate. For the most accurate reading, install a small test tip into the plug hole (**Figure 2**). The result should be 24 or 24.5 in-Hg, as 25 in-Hg typically means something is too jammed.

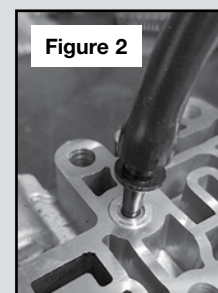
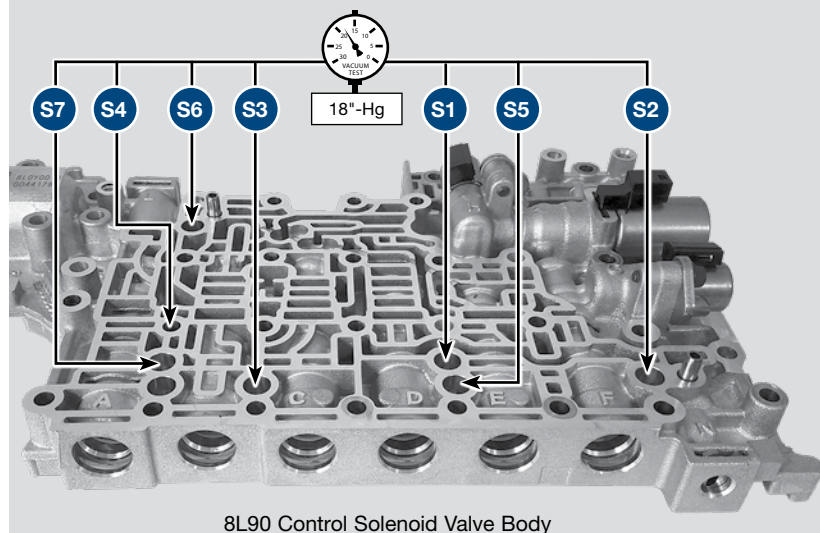
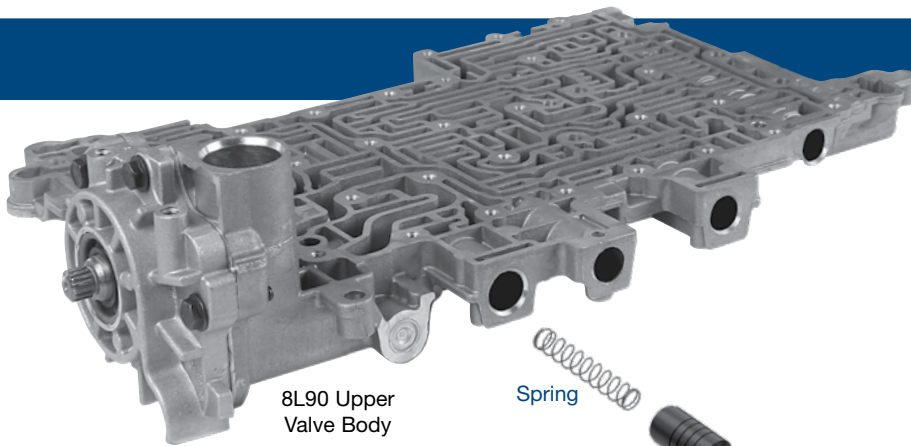


Figure 1 - Vacuum Test Locations for Detecting Accumulator Problems



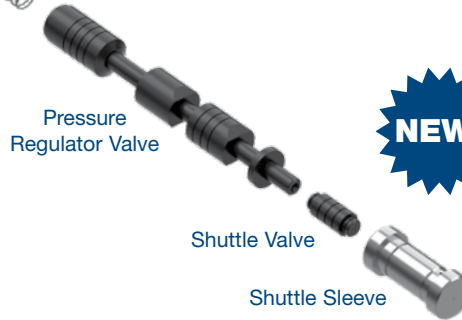
8L90 Control Solenoid Valve Body



8L90 Upper Valve Body



Spring



Pressure Regulator Valve

Shuttle Valve

Shuttle Sleeve



Pressure Regulator & Shuttle Valve Kit

Part No. 154740-02K

- Pressure Regulator Valve
- Spring
- Shuttle Valve
- Shuttle Sleeve



Shuttle Valve Kit

Part No. 154740-09K

- Valve
- Sleeve

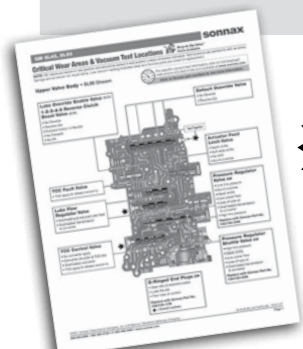
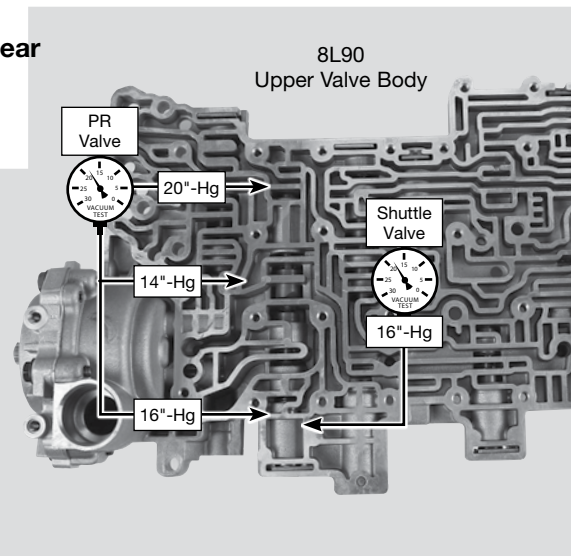
8L45/90 Drop-In Pressure & Shuttle Valve Kits to Improve Sealing & Guard Against Wear

- Drop-in Zip Valve™ parts install quickly and easily
- Improved valve designs significantly enhance sealing and durability
 - PR valve VFS signal spool is 200% longer than OE and operates in unworn area of the bore
 - Critical shuttle valve spool is 30% longer than OE
- Hardcoat anodized aluminum valves combat premature wear
- Shuttle sleeve made from highly wear-resistant billet aluminum to prevent wear

How to Detect Valve & Bore Wear

Common symptoms of problems in these areas include low/high line pressure, burnt clutches, harsh shifts, low cooler flow, loss of lube oil and an overheated transmission and converter.

Repairs are needed if vacuum testing at the port(s) indicated fails to hold the recommended minimum in-Hg, or if wear is visually detected.



New! 8L45/8L90 Vacuum Test Guide

Learn Locations to Test • Identify Common Problems • Select Parts for Repairs

View, download and print in full color the NEWEST vacuum test guide from Sonnax at www.sonnax.com/vactest — one of 40+ FREE valve body diagnostic guides!



Parts for Faster, Easier & More Reliable Builds

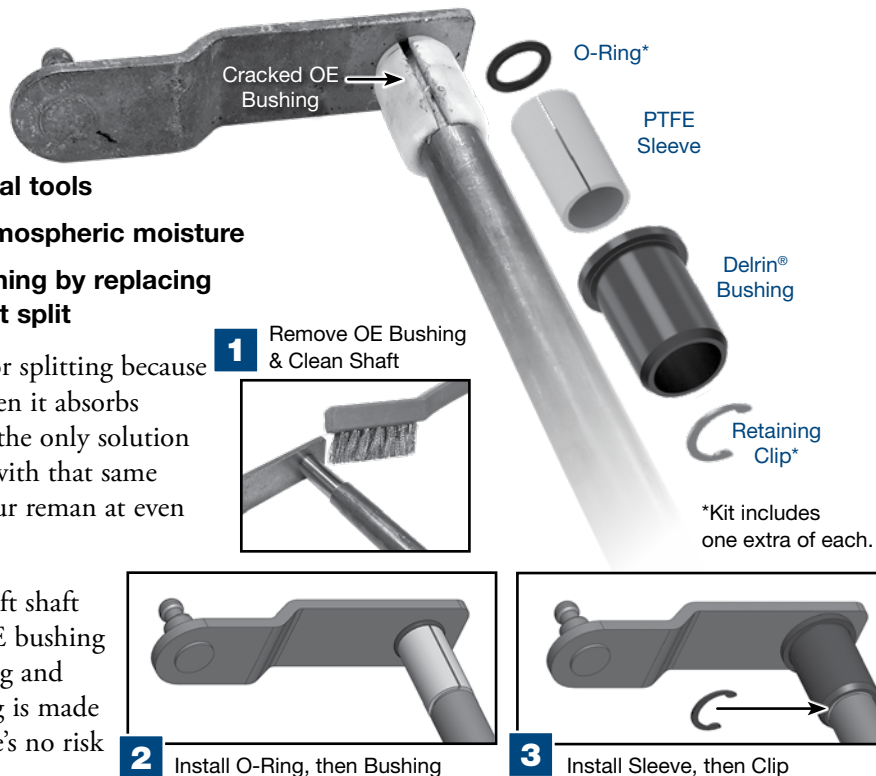
62TE Shift Shaft Saver Kit

Part No. 262991-04K Fits Chrysler 62TE

- Salvage the OE manual shaft without special tools
- Upgraded Delrin® bushing won't absorb atmospheric moisture
- Avoid the ticking time bomb of the OE bushing by replacing every one, including those that have not yet split

Chrysler 62TE shift shaft bushings are notorious for splitting because they're made of nylon, a material that swells up when it absorbs moisture from the air. Once they fail, traditionally the only solution was to buy an expensive new OE shaft...outfitted with that same nylon bushing. Those that haven't failed yet put your reman at even more risk for a comeback.

Simple, but highly effective, the patent-pending shift shaft saver kit **262991-04K** allows you to replace the OE bushing with improved components — all without removing and re-welding the shift lever. Since the Sonnax bushing is made from upgraded material, you can be confident there's no risk of a comeback.



SHIFT SHAFT TECH & INSTALL VIDEO Learn more about shift shaft failure and see how easy it is to install the Sonnax kit at www.sonnax.com.

6L80 Output Planetary Lube Dam

Part No. 104584LP
Fits GM 6L80, 6L90

Prevent Comebacks from Planetary Assembly Failure

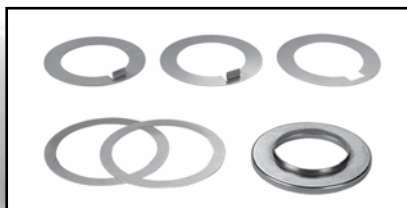
The output planetary assembly in GM 6L80 and 90 units has a lube dam, or cover, that directs lube oil flow to the planetary lube feed passages. This dam causes sludge to build up and choke off lubrication — a common problem after overhaul that results in comebacks due to failed planetary assemblies. Cleaning the passages requires dam removal, which also destroys it. Guard against problems by cleaning these passages and replacing OE dams with the Sonnax output planetary lube dam **104584LP**.



6F35 Case Saver Kit

Part No. 144281-01K Fits Ford Gen. 1 & 2 6F35

- Quickly repair units with worn axle bushings without sourcing an expensive new case
- Non-rotating shims correct differential endplay and prevent future wear
- Prevents repeat bushing failure caused by excess endplay



- .020" Shim with Tab 2.50" O.D.
- .040" Shim with Tab 2.50" O.D.
- .010" Shim with Notch 2.50" O.D.
- .010" Shims w/o Notch (2) 2.78" O.D.
- Thrust Bearing Driven Sprocket/Case

PERFORMANCE

4L80-E Extreme Duty Input Shaft



TOUGHEST Shaft Rated for 1,000+ HP

Part No. 34670-02 Fits GM 4L80-E, 4L85-E

- Heat-treated Aermet steel outperforms all other shaft materials in strength and toughness
- Hobbed O.D. carrier spline eliminates deep undercut where other shafts fail
- Advanced torsional design with spline, seal ring groove and cross-hole refinements deliver additional strength



Find Great Deals on Vacuum Test Equipment in the Sonnax Tool Shop

- **LOW MSRP** prices on 70+ popular vacuum testing & F-Tool products
- **1-2 DAY DELIVERY** in the U.S. or Canada

TRANSMISSION
TOOLS

TOP 10

TOOLS
2021

www.sonnax.com/tool-shop

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The prices shown below are what you pay at all participating Sonnax distributors. Contact your distributor today to order and visit www.sonnax.com/tool-shop for dozens more tools.

Make	Unit	Part No.	MSRP
Valve Body Vacuum Test Plate Kits Use with VACTEST-01K .			
Allison®	1000/2000/2400	37000-VTP	\$326.93
Ford	4R70E/W, 4R75E/W, AODE	76948-VTP	\$145.12
Ford	5R55S, 5R55W	56947J-VTP	\$142.55
Ford, GM	Gen. 1 & 2 6F35, Gen. 1 6T30/40/45/50	144740-VTP	\$137.17
Ford, GM	6F50/6F55, Gen. 1 & 2 6T70/75	124740-VTP	\$247.83
Ford, ZF	6R60/75, 6R80 ('09-'14), ZF6HP19/26/32	95740-VTP1	\$289.46
GM	4L60-E, 4L65-E, 4L70-E	77754-VTP	\$145.84
GM	4L80-E, 4L85-E	34994-VTP	\$145.04
GM	4T65-E	84754-VTP	\$146.19
GM	6L45, 6L50, 6L80, 6L90	104740-VTP	\$241.86
Toyota/Lexus	U660E/F, U760E/F	47740-VTP	\$278.32

Vacuum Test Stand Kit	
Part No.	MSRP
VACTEST-01K	\$185.27

Solenoid Test Manifold Kit	
Part No.	MSRP
95430-VTK	\$29.90

Use with **VACTEST-01K** to test these Ford & ZF solenoids: 6R100, 6R60, 6R75, 6R80 ('09-'14), 6R80 ('15-later), ZF6HP19/21/26, ZF6HP28/32/34.

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Featured in this Issue

- **68RFE Upgrades & Accumulator Piston Options You Need to Know About**
- **New 8L45/90 Drop-In Zip Valves**
- **New Parts for Faster, Easier, More Reliable 6L80, 62TE & 6F35 Builds**
- **1000+HP Rated Input Shaft for 4L80-E**
- **Get Great Deals on Vacuum Test Equipment**

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Vacuum Test Equipment Tool Shop Deals

Prices on
Page 7

Get low MSRP pricing on essential Sonnax vacuum testing equipment, including the original, award-winning test stand and growing lineup of valve body test plates. See page 7 for details or visit www.sonnax.com/tool-shop today!



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NEW!

If Volume 1 is on your bench — and especially if it's not — then this new catalog is for you! Its been updated for 2021 with a full listing of every top-quality remanufactured valve body available from Sonnax.

Choose from 140+ units for domestic and import transmissions, including upgraded valve bodies with extra durability and performance features for work/sport vehicles.

Request your free catalog **TODAY** at www.sonnax.com.

