

Transmission Report

Volume 5, No. 3

October 2014

Money in the Bank - The GM/Ford Joint Venture

Similar to other manufacturers, GM and Ford have made major changes to their transmission lineups over the past few years. Spurred by Federal fuel economy and emissions standards, 6-, 7-, 8-, 9- and 10-speed units are now common in our industry. To help address the needs for these additional designs, GM and Ford entered into a joint venture agreement to engineer and develop transmissions.

The first units to fall under this agreement were the GM Hydramatic 6T70 and the Ford Powertrain 6F50. While these units do share a lot of hard part interchangeability, some of the design differences include:

- Valve Body
- Case
- TCM
- Final Drive

The 6T70 and 6F50 were the first of the co-engineered GM and Ford products to enter the market in 2007. The 6T70 is

available in several different variants, including Generation 1 and Generation 2 designs for both the 6T70 and 6T75. Ford variants include the 6F50 and 6F55.

Another GM front-wheel drive 6-speed also shares its engineering features with a Ford application. The GM Hydramatic 6T40 was co-engineered with the Ford 6F35. Like its cousin the 6T70, the 6T40 also is available in several variants depending on the year and model of the vehicle. These 6T40 variants include the 6T45 and 6T50 (all available in Gen. 1 or Gen. 2 designs) and the newer 6T41 and 6T46 (also known as Gen. 3 of the 6T40 and 6T45). The 6T40/6F35 families of transmissions were released for the 2008 model year, and they have become some of the most widely produced transmissions in service today.

Continued on page 2

Visit Sonnax at ATRA Powertrain Expo & SEMA Show

Sonnax will be exhibiting at two of the hottest back-to-back trade shows in the industry! Visit us on the show floor to get an up-close look at our featured line-up of cutting edge products and talk shop with our team.

ATRA Powertrain Expo

Known as the largest gathering of dedicated transmission professionals in the world, this show takes place at the Rio All-Suite Hotel & Casino in Las Vegas and will be packed with the latest technical information via popular seminars and trusted industry professionals. Get FREE admission with a complimentary pass from Sonnax. Find us on Facebook for more details!

SEMA Show

Featuring more than 2,000 new products on display and 2300+ exhibiting companies filling over a million square feet of the Las Vegas Convention Center, this trade-only event is known as the premier automotive specialty products tradeshow in the world. Enjoy educational seminars, product demonstrations, special events, networking opportunities and more all in one exciting place!



Vegas here we come!

ATRA Powertrain Expo



Oct. 30 to Nov. 2



Booth #421

SEMA Show



Nov. 4 to 7

Booth #20261

Continued from page 2

Let's take a look at the layout of both of these transmission families:

6T70/6T75/6F50/6F55

GM applications mount the TEHCM (transmission electro-hydraulic control module) internal to the transmission, while Ford utilizes an externally mounted TCM. The TEHCM includes:

- Six PWM solenoids (PCS1, PCS2, PCS3, PCS4, PCS5 and TCC)
- Two on/off shift solenoids (SS1/SS2)
- Four pressure switches (Gen. 1 only)

A filter plate is used to protect the TEHCM (GM) and solenoids from contamination on both the Ford and GM applications. The filter plate must be replaced any time the TEHCM/solenoid body is separated from the valve body.

The GM and Ford hydraulic system layout includes 15 valves housed within the upper and lower valve bodies. The Ford solenoid body houses:

- Six PWM solenoids (SSA, SSB, SSC, SSD, Line, TCC)
- One on/off solenoid (SSE)

Both Ford and GM designs service the solenoids as part of the assembly rather than as individual components.

6T40/6T45/6T41/6T46/6T50/6F35

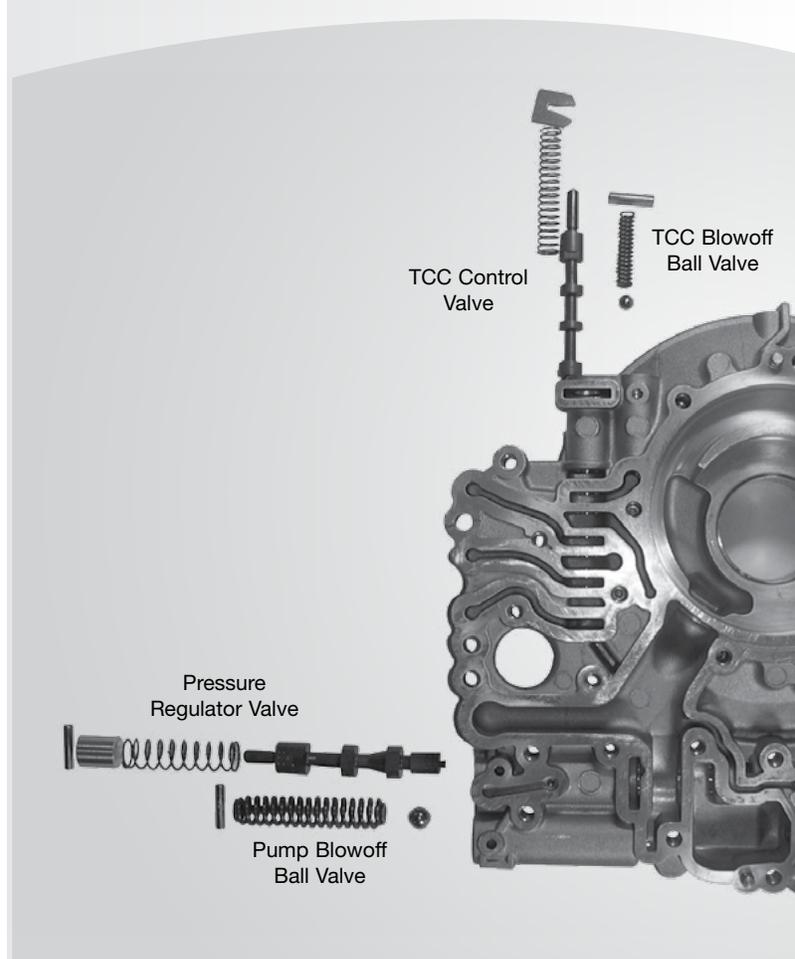
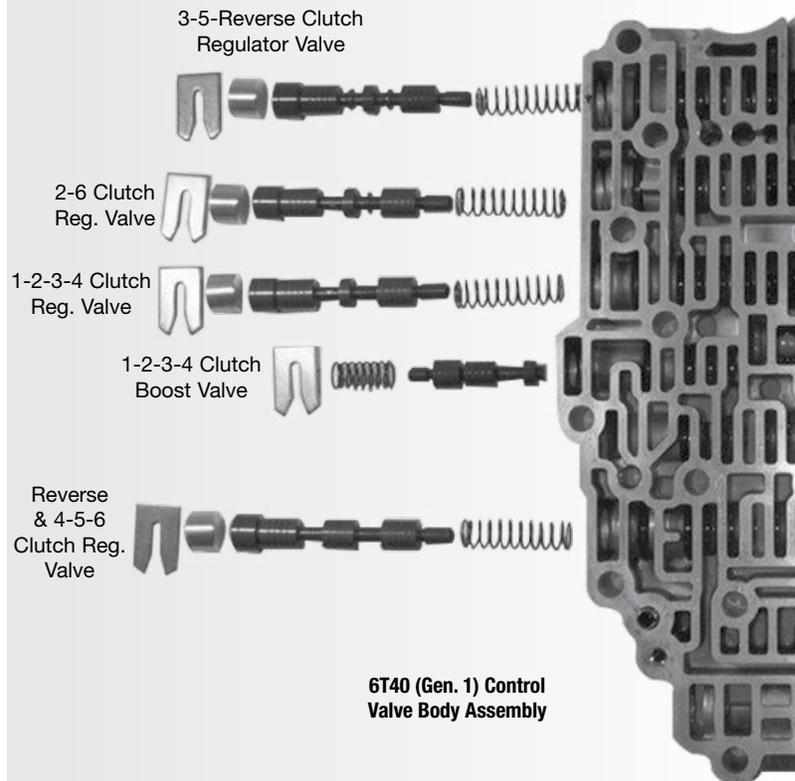
GM applications mount the TEHCM internal to the transmission while Ford uses an externally mounted TCM. The TEHCM (GM)/solenoid body (Ford) includes:

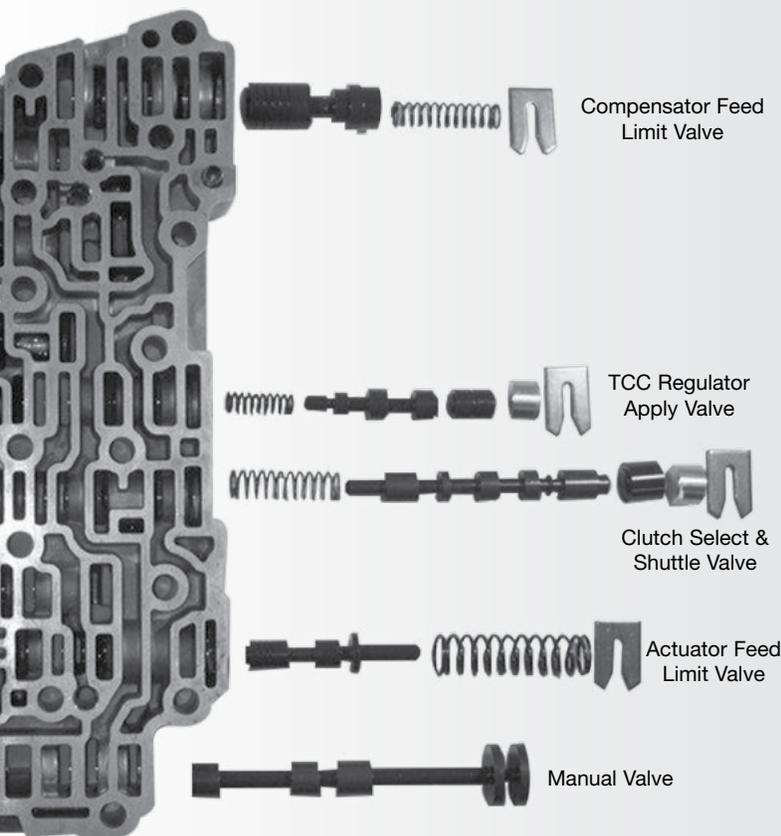
- Six PWM solenoids (PCS1, PCS2, PCS3, PCS4, PCS5 and TCC)
- One on/off shift solenoid (SS1)

The GM Gen. 1 TEHCM is also equipped with pressure switches for adaptive control functions. A filter plate is used to protect the TEHCM and solenoids from contamination on both the GM and Ford applications. The filter plate must be replaced any time the TEHCM/solenoid body is separated from the valve body. See chart on page 6 for details.

The GM hydraulic system layout includes 11 valves housed in the upper and lower valve bodies. Ford application hydraulic systems include 10 valves and six solenoids. Unlike the GM applications, the solenoids are designed to be replaced and are available with different flow characteristics, similar to other Ford applications.

Both the Ford and GM pumps for these lower torque transmissions house two valves each.





Sonnax has a range of parts available for these units. For details, see application chart on page 6.

6T40 (Gen. 1)
Pump Body

Clutch Select & Clutch Regulator Valves

The Ford and GM designs include two additional families of valves first seen in the GM 6L series transmissions: “Clutch Select Valves and Clutch Regulator Valves.” The clutch select valves control which clutches are allowed to apply/release, while the clutch regulator valves control the actual shift and the aggressiveness of that shift.

Product Concerns/Issues

These transmissions represent a very large and growing segment of the transmission repair market. Wear issues with the valve body components and multiple DTC's are common at mileages above 50K.

Once again, Sonnax comes to the rescue by producing an innovative product line-up to address common concerns such as:

- P0741, P0742, P0752, P0872, P0877 or P0989 codes
- Delayed/Harsh engagements
- No/Slipping 4/5/6
- No TCC
- TCC Shudder/slip
- Transmission overheat,
- 1-2, 2-3, 3-4, 4-5 or 5-6 Shift flare
- Lack of lube flow
- No/Slipping 3/5
- Burnt 3/5/R or 4/5/6 clutches
- Binding on the shift
- Erratic shift timing
- Low line pressure

Rest assured, Sonnax components target the root cause of the concerns including:

- Compensator, AFL, PR, TCC, boost/latch, isolator and clutch regulator valves
- Pressure switch rebuild kits (which will save you hundreds of dollars on each repair)
- End plug leakage
- Accumulator leakage

Repair parts are conveniently available either in a Zip Kit®, or as individual repair kits based on your specific needs. See the chart on page 6, contact your Sonnax distributor or visit www.sonnax.com for details.

NEW for 2014

9 First Generation 6T40, 6T45, 6T50 Transmission Solutions

1 144740-16K



Oversized TCC Regulator Valve Kit

Helps cure:

- Harsh/No TCC Apply
- Codes 741, 742

Note: Requires tool kit F-144740-TL16 & the VB-FIX reaming fixture.

2 144510-05K



Oversized TCC Control Valve Kit

Helps cure:

- TCC apply/release complaints
- Low cooler flow

Note: Requires tool kit F-144510-TL5C & the VB-FIX reaming fixture.

3 144510-01K



Oversized Pressure Regulator Valve Kit

Helps cure:

- Harsh/Soft shifts
- Burnt clutches

Note: Requires tool kit F-144510-TLC & the VB-FIX reaming fixture.

4 144740-22



Oversized Clutch Boost Valve

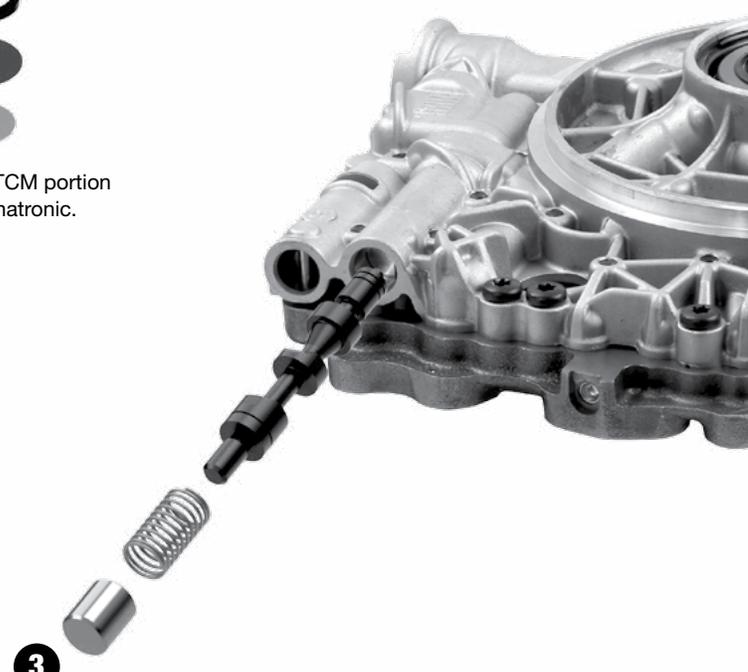
Helps cure:

- Slips/Flares/Burnt clutches
- Delayed engagement

Note: Requires tool kit F-144740-TL22 & the VB-FIX reaming fixture.



Goes into the TCM portion of the Mechatronic.





Main Control Valve Body



6T40-ZIP

Parts Not Shown

Zip Kit®

It's easy to restore and extend vehicle shift quality with Zip Kits. Uniquely designed Sonnax parts target the root cause of valve body complaints and stop critical circuit pressure losses in the most common problem areas of the transmission.

Note: Patent Pending

5 144510-09K

Patent Pending

Pressure Switch Rebuild Kit

Helps cure:

- Codes 0752, 0872, 0877, 0989
- Shift concerns

6 104740-09K

Compensator Feed Regulator Valve Kit

Helps cure:

- Bump/Flare/Harsh shifts
- Burnt clutches

7 144740-02K

Fits 6 locations

O-Ringed End Plug Kit

Helps cure:

- Shift concerns
- Burnt clutches

8 144740-01

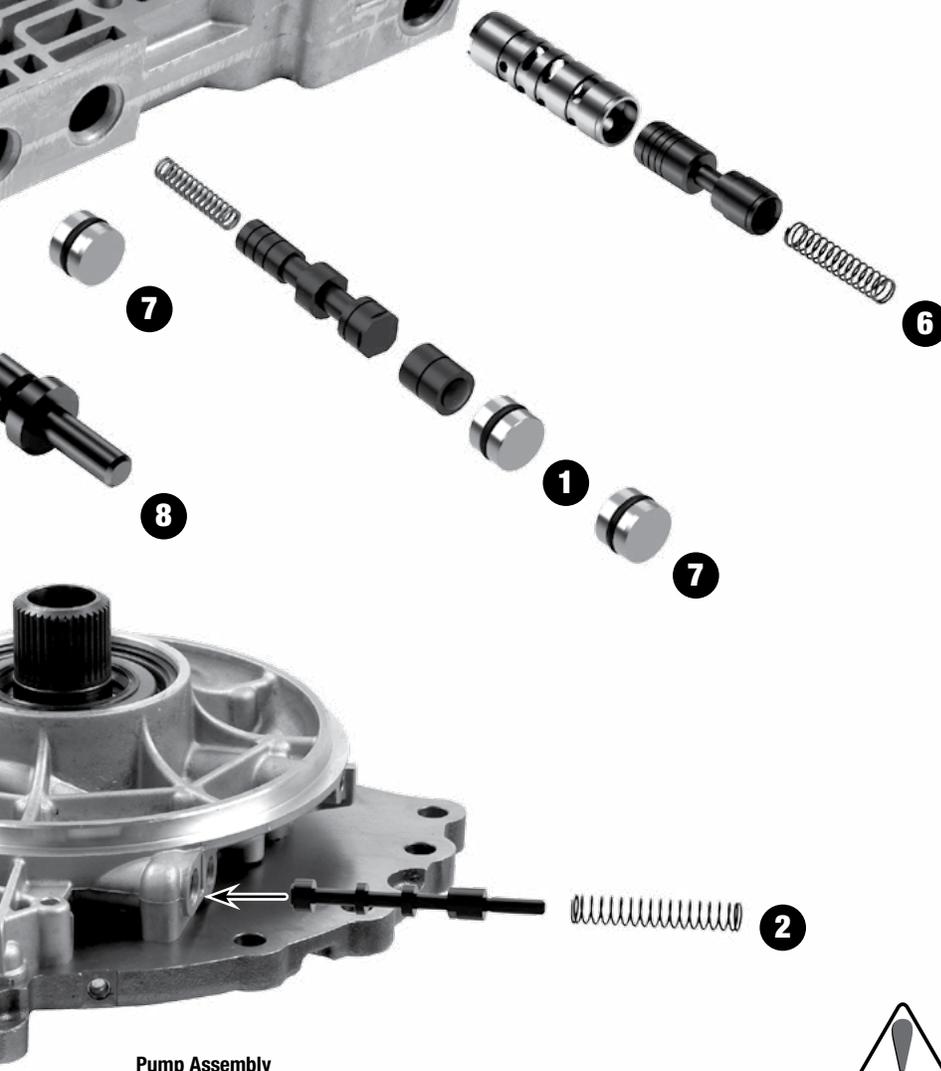


Oversized Solenoid Regulator Valve

Helps cure:

- Solenoid codes
- Harsh/Slipping shifts

Note: Requires tool kit 144740-TL.



Pump Assembly



Proper identification of this valve body and pump is critical! See pages 104–105 of the new Sonnax Transmission Product Catalog (Vol. 9) for details or view the valve body ID guide online at www.sonnax.com.



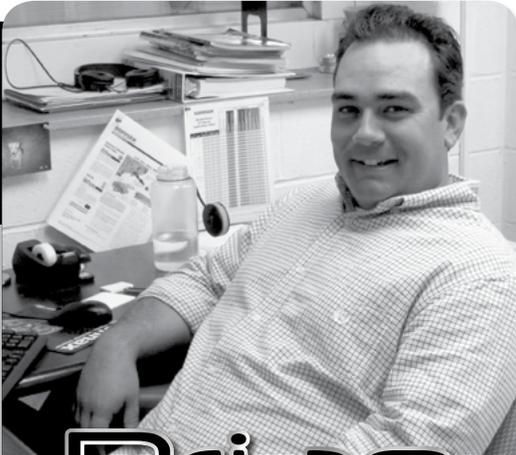
Scan code with Smartphone to view valve body ID guide.

GM and Ford agreed to a joint venture agreement to engineer and develop transmissions. Use this chart to find Sonnax parts for each of the resulting units.

	GM 6T40/45/50 Generation 1	Ford 6F35	GM 6T70/75 Generation 1	Ford 6F50/55
Compensator Feed Regulator Valve				
Bump shifts; CPC codes; Erratic shift quality; Harsh shifts	104740-09K	144740-04K		
Oversized Solenoid Regulator or AFL Valve				
Harsh shifts; Low clutch oil pressure; No 4th, 5th or 6th gear; Slipping shifts	144740-01 144740-TL	144740A-01 144740-TL	124740-01; F-104740-TL12	
Oversized TCC Regulator Valve Kit				
Codes 741, 742; Harsh TCC apply; Loss of fuel economy; Low TCC apply pressure; No lock-up; TCC slip; Overheated fluid & TCC lining	144740-16K F-144740-TL16	144740-19K F-144740-TL19	124740-24K; F-124740-TL24	
O-Ringed End Plug Kit				
Burnt clutches; Pressure loss; Shift concerns; TCC apply concerns	144740-02K	144740-03K	124740-02K	
Oversized Clutch Latch or Boost Valve				
Burnt clutches; Delayed engagement; Harsh shifts; Shift quality is not load sensitive; Slide shifts; Slip codes; Slips & flares	144740-22 F-144740-TL22	144740-21 F-144740-TL21	144740-23; F-144740-TL22	
4-5-6 Accumulator Piston Kit				
3-4 Flare/harsh; 4-5-6 Clutch burned; Ratio codes; Slipping			124740-04K	
Isolator Valve Spring				
Line pressure instability; No line rise			124740-16	
Isolator Valve Kit				
Burnt clutches; Harsh shifts; Line pressure instability; Low line pressure; No line rise; Shift concerns			124740-03K	
Oversized Pressure Regulator Valve Kit				
Burnt clutches; Erratic line pressure; Low converter & lube flow; Overheating; Poor shift quality; TCC apply & release concerns	144510-01K F-144510-TLC	144510-03K F-144510-TL3C	124740-12K; F-124740-TL12	
Pressure Switch Rebuild Kit				
DTC's P0752, P0872, P0877, P0989; Loss of shift control; Replacement of TEHCM necessary	144510-09K †		124740-28K*†; 124740-TL30*†; 124740-30K*;	
Oversized TCC Control Valve Kit				
Excess TCC slip; TCC apply & release complaints; TCC codes; Low converter & lube flow; Low cooler flow; Overheating; TCC lining failure; Shudder	144510-05K; F-144510-TL5C	144510-07K; F-144510-TL7C	124740-14K; F-124740-TL14	
Oversized 3-5-R Clutch Regulator Valve Kit, 1.35 Ratio				
2-3 Flare; 4-5 Flare; Slips in Reverse; Delayed Reverse; Slips in 3rd gear; Slips in 5th gear; 3-5-Reverse clutch burned; Ratio codes; Bind-ups			124740-26K; F-124740-TL26	
Oversized 3-5-R Clutch Regulator Valve Kit, 1.83 Ratio				
2-3 Flare; 4-5 Flare; Slips in Reverse; Delayed Reverse; Slips in 3rd gear; Slips in 5th gear; 3-5-Reverse clutch burned; Ratio codes; Bind-ups			124740-21K; F-124740-TL21	
Oversized 2-6 Clutch Regulator Valve Kit				
1-2 Flare; 5-6 Flare; Slips in 2nd gear; Slips in 6th gear; No 2nd gear; No 6th gear; Ratio codes; 2-6 Clutch burned; Erratic shift timing			124740-17K; F-124740-TL17	
Zip Kit®				
Burnt brake clutches; Burnt clutches; Delayed engagement; Inadequate lubrication; Low pressure; Slips & flares; Soft shifts; TCC apply & release concerns; TCC codes	6T40-ZIP†	6F35-ZIP	6T70-ZIP*†	6F50-ZIP

Note: Sonnax F-Tool kits designed to service a specific bore require the **VB-FIX**, a self-aligning valve body reaming fixture.

*Available late 2014
†Patent Pending



Brian

Technical Writer/Tech Support Representative

Brian's Years on the Team: 1

Brian Wing arrived in the Sonnax family last year, bringing 20 years of automotive diagnostic and repair experience with him.

A factory-trained BMW Master technician and erstwhile shop foreman, he eventually left the dealer to open a general repair shop, which he operated for nine years before coming to Sonnax.

He enjoys many of the outdoor activities Vermont has to offer, including snowboarding, camping and shooting. Brian's duties include technical writing and providing technical assistance to diagnosticians and builders in support of the installation of Sonnax parts.

Sonnax employs a team of skilled technicians dedicated to working one-on-one with industry professionals.

Whether you're trying to identify the right Sonnax part for a problem unit, build a powerhouse performance tranny or find help with reaming and diagnostics, Sonnax is here for you!

Tech Team

Shop Talk

A common call we get on the tech assistance line concerns **AW 55-50SN troubles**. Flares, harsh shifts, bind-ups, slipping, burnt clutches, you name it. As you know, these valve bodies are complex and much of the hydraulic circuitry is interdependent, which can make diagnosis sketchy.

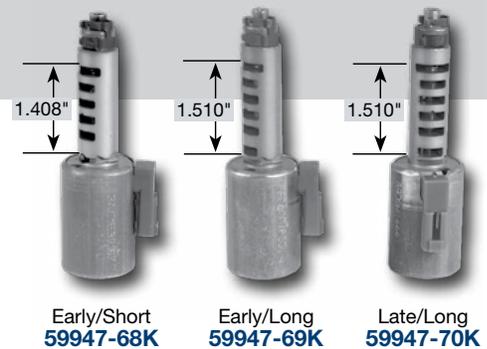
Fortunately, we've found that a majority of these issues can be traced to common root causes and we've got you covered with solutions. Installing a **remanufactured linear solenoid kit** along with a **Zip Kit®** will cure many of these symptoms in short order so you can get your customer back on the road with confidence.

Remember, after replacing any parts or making adjustments to these units, the adaptations must be reset. As always, we're here to answer any questions you might have, so feel free to call.



AW55-50SN-ZIP

Remanufactured Linear Solenoid Kits



Each kit includes an SLT, SLU and SLS Solenoid

Technical Questions?

- Call **(800) 843-2600**
- E-mail info@sonnax.com or use the "Contact Us" form at www.sonnax.com
- Visit the Sonnax **Facebook** page
- Tweet **@SonnaxVT**

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Featured in this issue

GM/Ford Joint Venture

Sonnax at 2014 Expo & SEMA

1st Gen. 6T40/45/50 Sonnax Solutions

Troubleshooting 55-50SN Tip

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Free Tech Resources,
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Is this newsletter getting into the right hands?

To update an address or request we stop this mailing to you, please call (800) 843-2600, 8:30 a.m. to 5 p.m. ET, or send an e-mail to news@sonnax.com.

Valve Body Xpress Now a Division of Sonnax

Sonnax recently purchased Valve Body Xpress (VBX) and



Valve Body Xpress
A Remanufacturing Division of Sonnax Industries

Valve Body Xtras of Paulsboro, N.J. Founded in 2002, Valve Body Xpress (VBX) is a leading remanufacturer of automatic transmission valve bodies and solenoids, while Valve Body Xtras is a VBX subsidiary focused on valve body components. This exciting acquisition combines the extensive resources of two successful companies to better meet the numerous repair challenges of increasingly sophisticated modern transmissions.

Sonnax is well-known worldwide in the industry for its innovative engineering, exceptional quality and outstanding technical support and training. The volume of valve bodies rebuilt by VBX and the company's hands-on remanufacturing expertise opens the door to expanded Sonnax product development and testing capabilities. The transmission aftermarket will benefit from this collaboration, whether a shop chooses to rebuild their valve bodies with Sonnax parts or purchase a VBX rebuilt unit. Visit www.sonnax.com to learn more.

Sonnax designs, manufactures, tests and distributes a wide variety of components used to remanufacture torque converters, rebuild automatic transmissions, upgrade driveshafts and protect the driveline from over-torque damage.

Sonnax is a 100% Employee-Owned Company

New Transmission Products Catalog Coming Soon!

The much-anticipated **Transmission Products Catalog – Vol. 9** is jam-packed with 500+ new part listings, 12 new units featuring full valve body illustrations, valuable tech tips and more!

There are several easy ways to get your copy:

- If you are a subscriber to *Transmission Digest* magazine, a catalog will be mailed directly to you with the November issue. *Gears* subscribers will receive a copy at a later date.
- Catalogs will be available at both the ATRA Powertrain Expo and SEMA Show in Las Vegas.
- Visit www.sonnax.com and fill out the catalog request form to receive a copy by mail.

