

Transmission Report

Volume 7, No. 3

October 2016



Turn Your ZF6 Solenoid Cores into CASH!

Fast Core Returns are Easy with Sonnax

1. Collect Cores

Five or more cores is recommended.

2. Contact Us

We'll set up a Return Authorization.

3. Ship Your Cores

We pre-pay all shipping charges and provide labels.

4. Get Paid!

We'll send you a check in the mail.

Start a core return online today at www.sonnax.com/solenoidreturn or call (800) 843-2600, ext. 379.



Yellow Solenoid



Blue Solenoid



Orange Solenoid

A New Path for ZF

The ZF8HP45 and ZF8HP70 will soon be one of the newer transmissions coming out of OE warranty and entering your shops. This 8-speed RWD unit is used in numerous 2009-later BMWs, 2011-later Chrysler 300s, 2015-later Dodge Challengers, 2012-later Dodge Chargers, Durangos, and Ram 1500 Pickups, 2011-later Jeep Grand Cherokees, as well as some Jaguars and Land Rovers. The ZF8HP45 is used in the V6 applications, while the higher torque ZF8HP70 is for the V8 engines.

When looking at the valve body, the similarities to the 6-speed RWD ZF6HP19/26/32 and ZF6HP21/28/34 series are quite noticeable (Figure 1, ZF8HP45 shown at right, and on pages 4-5). The upper and lower casting halves are similar in shape and valve bore structure to the 6-speeds. The lower casting has a bank of eight familiar-looking orange- and new white-capped EDS solenoids. The upper casting houses the same problematic, rubber-tipped solenoid accumulators for the TCC, EPC and individual clutch/brake solenoids. Mounted on top is the plastic transmission control module assembly (TCMA) that houses the transmission control unit (TCU), input and output speed sensors, and the transmission temperature sensor.

An examination of an oil circuit and individual valve lineups shows that this new ZF 8-speed uses the same type of clutch regulator and clutch holding valves to control fluid flow to

the two brakes (A and B) and three clutches (C, D, E) that combine with the four planetary gear sets to achieve the nine gears: eight Forward, one Reverse (Figure 2).

Focusing in on the converter circuit is where a noticeable difference from previous ZF transmissions emerges. A new TC charge path has been added, making this a three-path converter circuit instead of the typical two-path circuit. *Continued on page 2...*

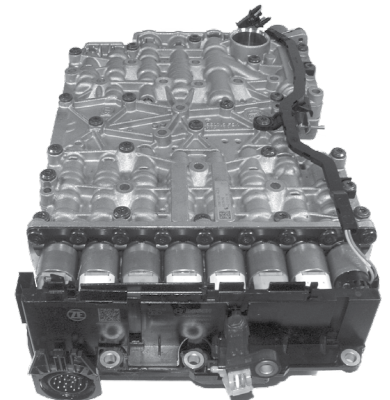


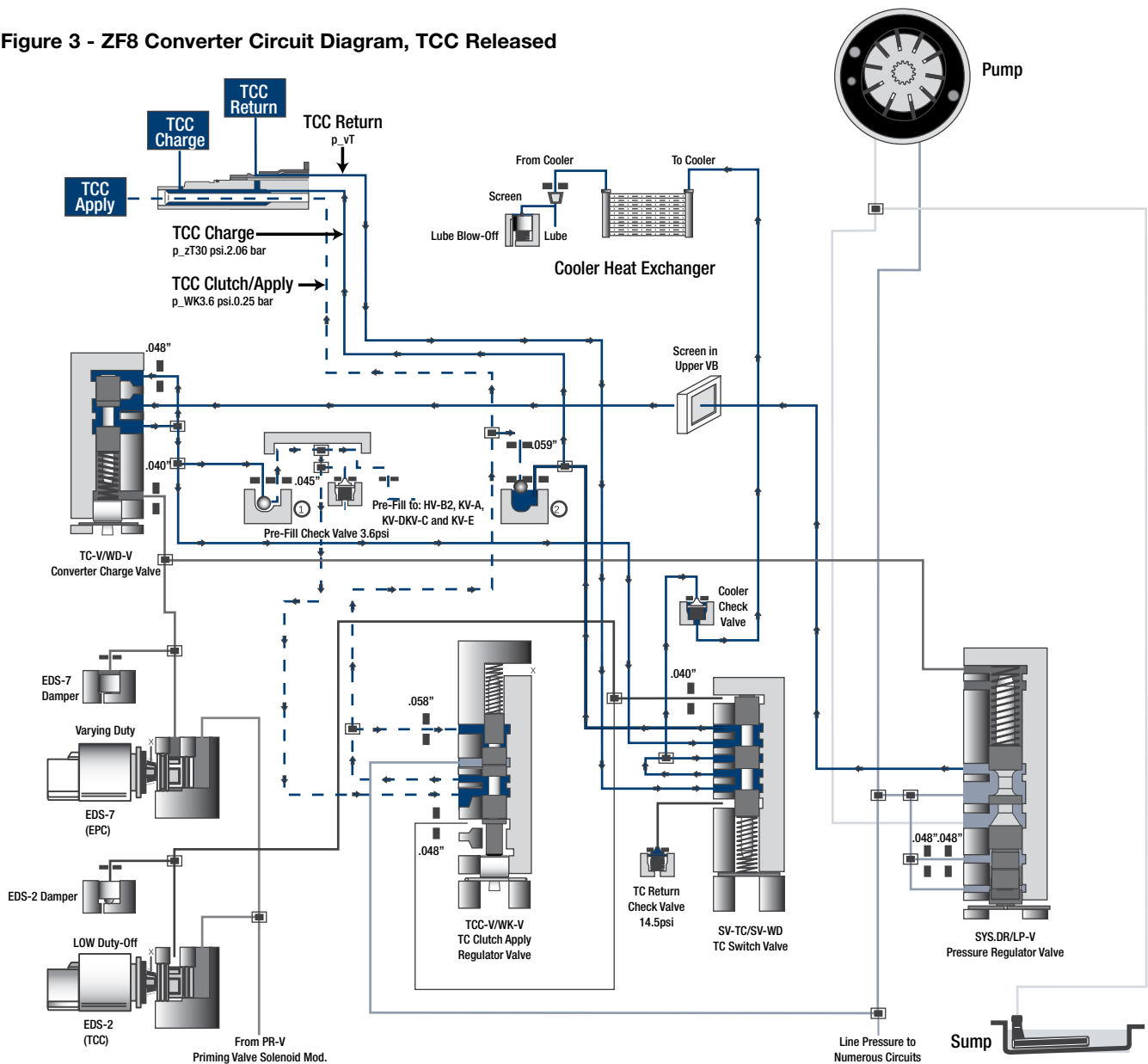
Figure 1 - ZF8HP45

Figure 2 - 8-Speed Clutch Applications

GEAR	Brake A	Brake B	Clutch C	Clutch D	Clutch E
1 st	ON	ON	ON		
2 nd	ON	ON			ON
3 rd		ON	ON		ON
4 th		ON		ON	ON
5 th		ON	ON	ON	
6 th			ON	ON	ON
7 th	ON		ON	ON	
8 th	ON			ON	ON
R	ON	ON		ON	

A New Path for ZF (cont.)

Figure 3 - ZF8 Converter Circuit Diagram, TCC Released



Continued from page 1

During converter release, the pressure regulator valve routes fluid pressure to the torque converter pressure valve, where it is regulated into converter charge pressure (Figure 3). Both of these valves are modulated by EDS-7 (EPC) solenoid pressure. This regulated charge pressure is routed to the converter through the torque converter switch valve, which also directs the return pressure out of the converter to the cooler and lube circuit. A portion of converter charge pressure is also orificed through the torque converter clutch valve and into the converter apply circuit.

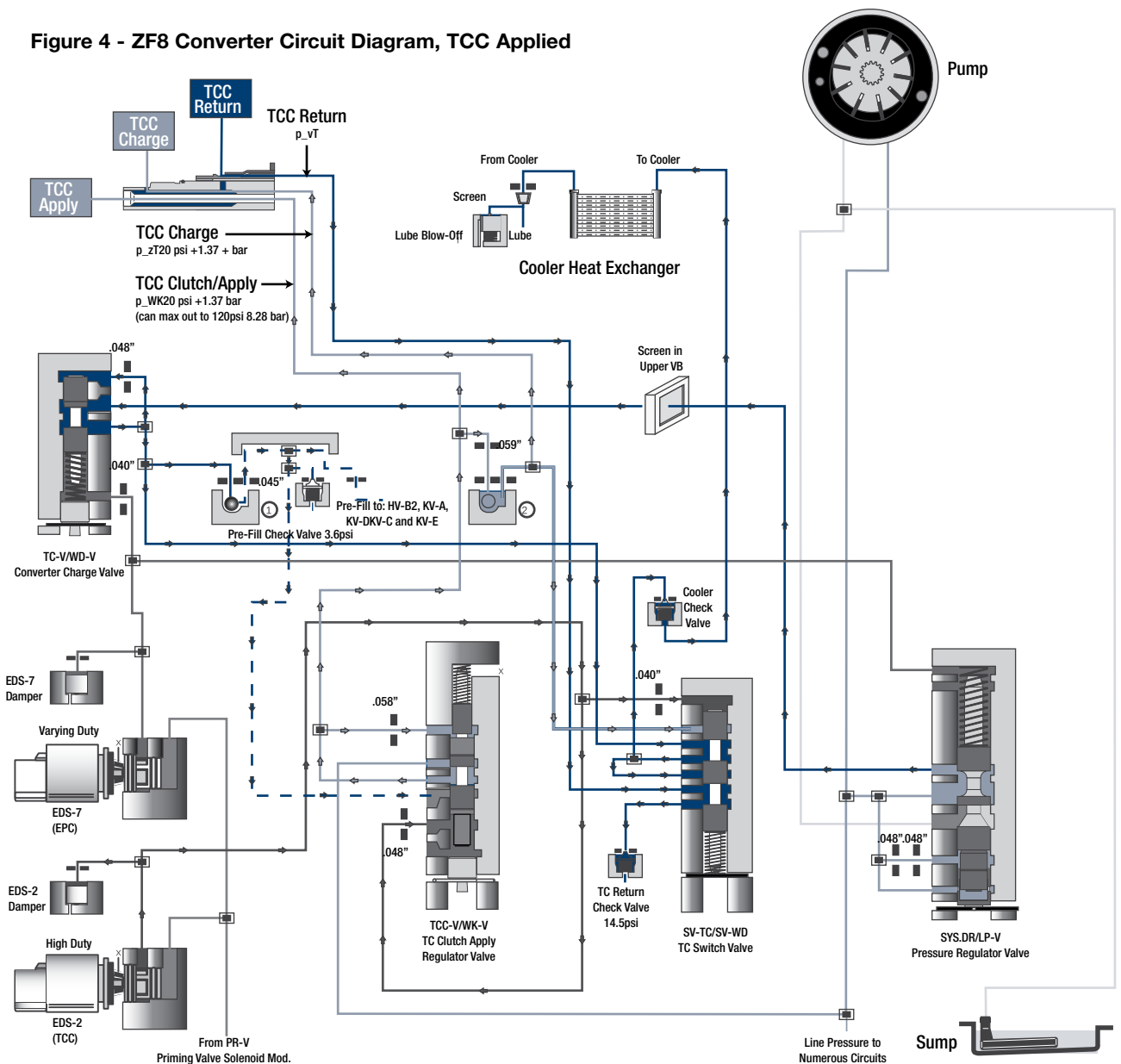
During converter apply, the EDS-2 (TCC) solenoid is energized, modulating both the TC switch valve and the TC clutch valve (Figure 4). This reroutes converter charge pressure directed to the TC switch valve to enter the cooler and lube circuit, and return pressure out of

the converter is exhausted through the TC return check valve, with a minimum of 14.5 psi maintained in the converter. The TC clutch valve now routes regulated line pressure to the converter clutch apply circuit and the converter charge circuit. The converter clutch can be applied in any Forward gear from 1st through 8th.

All four of these valves in the converter circuit are controlled by variable force solenoids, so they are extremely busy and susceptible to wear. The pressure regulator valve is identical in function and design (although not size) to the commonly worn ZF 6-speed variety valve.

The TC switch valve is similar in design and function to the converter release regulator valve, which has been one of the most problematic valves in the ZF 6-speed

Figure 4 - ZF8 Converter Circuit Diagram, TCC Applied



units. The TC clutch valve is similar in function to the ZF 6-speed variety bypass clutch control valve, although designed like the ZF6 Gen. 2 clutch cooling valve, which is not used in the converter circuit. The 8-speed valve that is showing the most severe wear to date, however, is the TC pressure valve due to the EPC control and high activity.

Vacuum testing of the bores can be quickly and easily performed during any rebuild to ensure integrity of the converter circuits. Reference the centerfold of this bulletin for a new ZF8 valve body layout showing the various valves Sonnax has available to refurbish these valuable units. Plus, a free vacuum test guide will be available soon at www.sonnax.com.

OE Valve Names

Chrysler and ZF use different names for some valves:

Valve	ZF Name	Chrysler Name
Pressure Regulator	SYS.DR-V	LP-V
TC Pressure	WD-V	TC-V
TC Switch	SV-WD	SV-TC
TC Clutch	WK-V	TCC-V

Looking for More ZF8 Tech?

Visit www.sonnax.com/webinars for this recent two-part webinar featuring Sonnax tech specialist Jim Dial:

- Dodge TorqueFlite® 8 (ZF8) Features & 2015 Challenger Test Drive
- A Look Inside Dodge TorqueFlite® 8 (ZF8) Transmission & Torque Converter

sonnax® ZF8HP45, ZF8HP70 Valve Body Repairs

1 35740-13K

Oversized Torque Converter Clutch Valve Kit

Helps cure:

- Converter shudder & TCC slip
- TCC codes
- Overheated converter

Note: Requires tool kit **F-35740-TL13** & the **VB-FIX** reaming fixture.



NOTE: All parts listed also fit the ZF8HP55, but bore location may be different. Please see individual part pages for details.

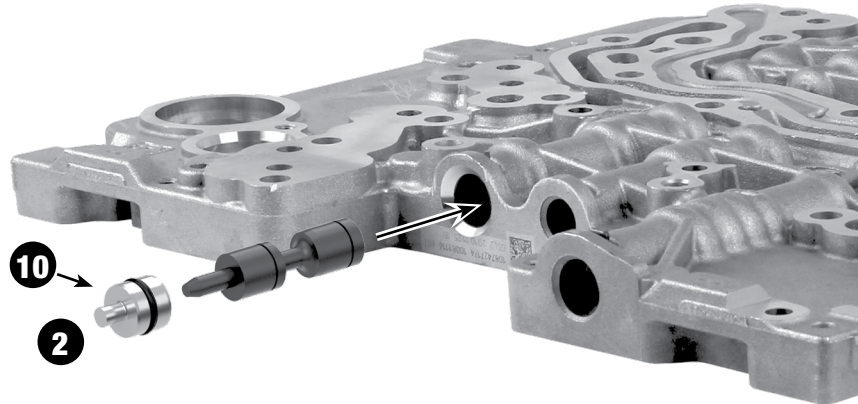
2 35740-18K

Oversized TC Pressure Valve Kit

Helps cure:

- TCC codes & overheating
- Harsh TCC apply
- Excess TCC slip
- Coastdown clunk

Note: Requires tool kit **F-35740-TL5** & the **VB-FIX** reaming fixture.



ZF8HP45
Upper
Valve Body

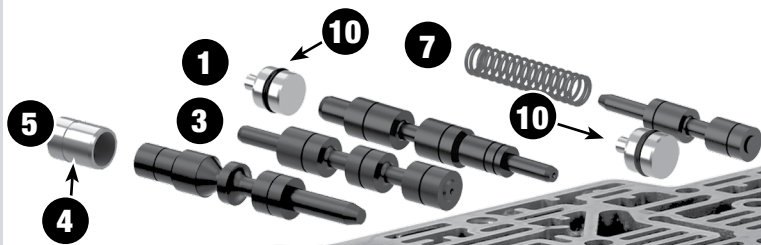
3 35740-05

Oversized TC Switch Valve

Helps cure:

- No lockup
- Soft & harsh TCC apply
- Excess TCC slip
- TCC codes

Note: Requires tool kit **F-35740-TL5** & the **VB-FIX** reaming fixture.



ZF8HP45
Lower
Valve Body

4 35740-03

Pressure Regulator Sleeve

Helps cure:

- Harsh/Erratic line pressure
- Restricted converter/lube flow

5 35740-01K

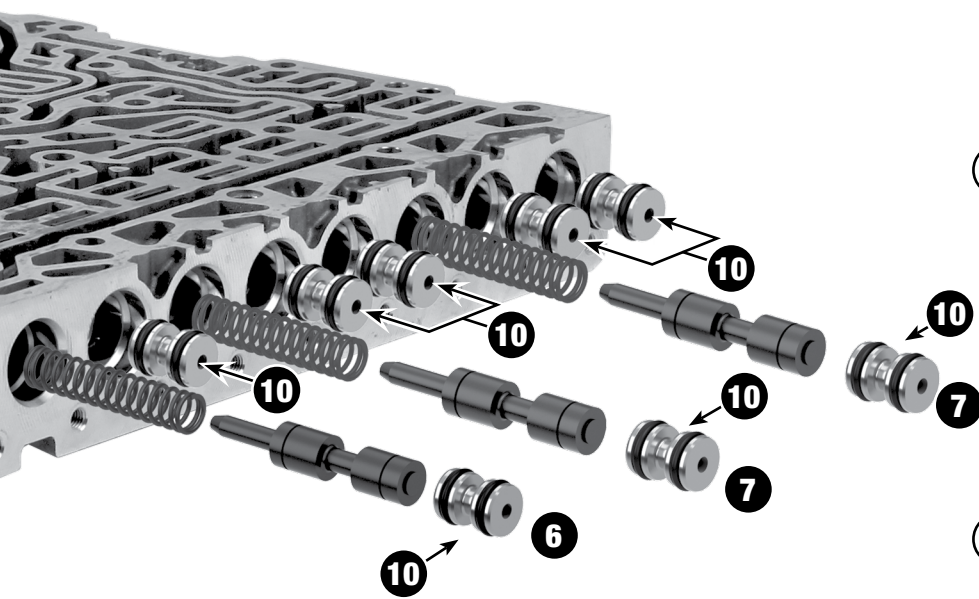
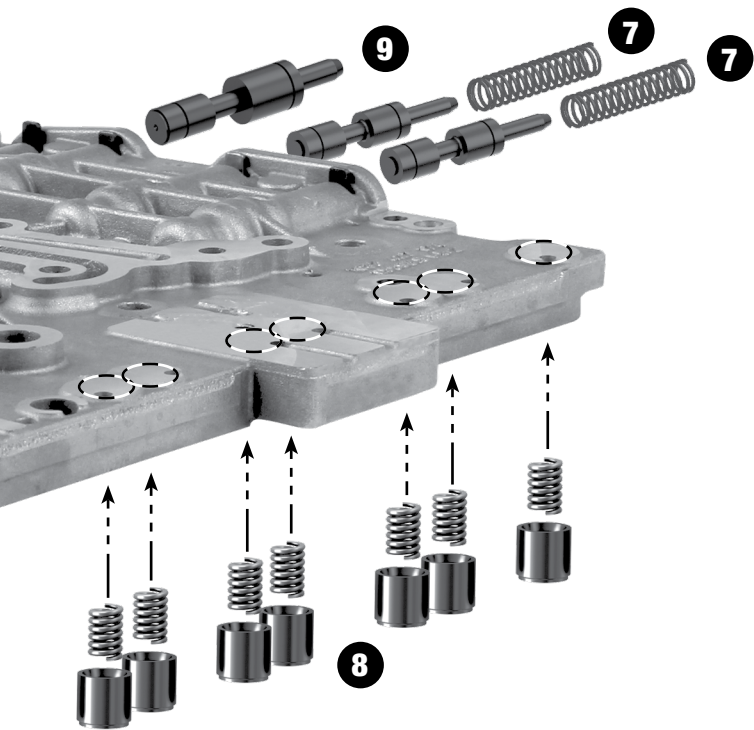
Oversized Pressure Regulator Valve Kit

Helps cure:

- Harsh/Soft shifts
- High line pressure
- Burnt clutches
- Restricted converter/lube flow

Note: Requires tool kit **F-35740-TL** & the **VB-FIX** reaming fixture.





6 35740-21K
Oversized Priming Valve Kit



Helps cure:

- Harsh/Flare/Neutral shifts
- Gear ratio & solenoid codes
- Wrong gear starts
- Delayed engagement

Note: Requires tool kit **F-35740-TL20** & the **VB-FIX** reaming fixture.

7 35740-20K
Oversized Clutch Holding Valve Kit



Fits 5 Locations

Helps cure:

- Bump/Flare shifts
- Burnt clutch
- Gear ratio & solenoid codes
- Gear loss

Note: Requires tool kit **F-35740-TL20** & the **VB-FIX** reaming fixture.

8 95740-15K

Accumulator Piston Kit

Contains 7 Sets

Helps cure:

- EDS codes
- Firm shifts
- Harsh engagement

9 35740-22



Oversized B2 Clutch NIC Valve

Helps cure:

- B Clutch burned
- Delayed/No Forward & Reverse
- NIC concerns

Note: Requires tool kit **F-35740-TL22** & the **VB-FIX** reaming fixture.

10 35740-30K

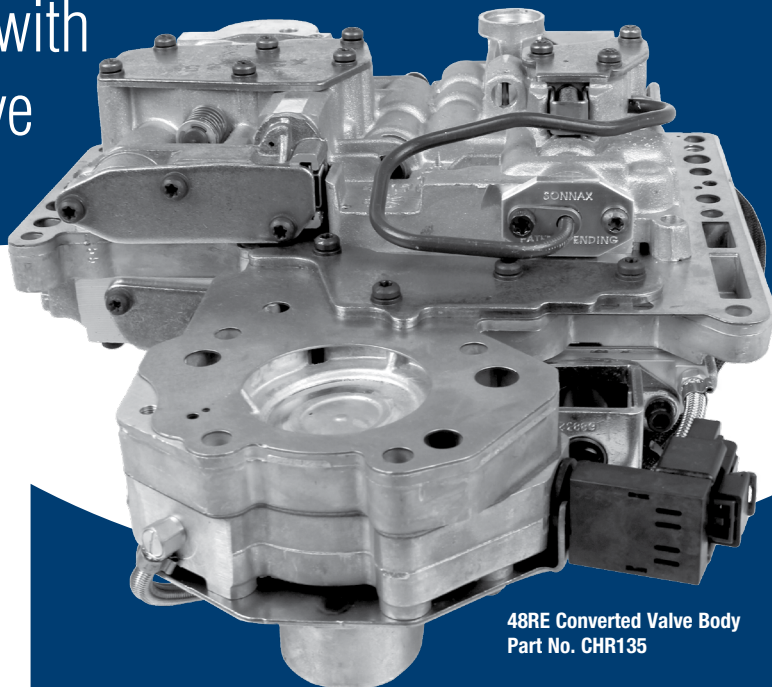
O-Ringed End Plug Kit

3 End Plugs, 8 Internal End Plugs

Helps cure:

- Burnt clutches
- Harsh/Soft/Flare shifts
- Pressure loss

Save Time and Money with a Premium Rebuilt Valve Body from Sonnax



48RE Converted Valve Body
Part No. CHR135

Sonnax transmission products are the number one choice of large transmission remanufacturers, quality valve body rebuilders and veteran independent specialists around the world. To better meet the repair challenges of increasingly sophisticated modern transmissions, Sonnax acquired Valve Body Xpress in 2014. Now, rebuilders and shops alike have one trusted source of quality solutions for every transmission job.

Quality You Can Trust

Every premium valve body is completely disassembled, cleaned and updated, with solenoids tested and replaced as needed. Each remanufactured unit is then hydraulically and electronically tested so it's ready to bolt up!

Rebuilds feature genuine Sonnax parts and are backed by a Limited Lifetime Warranty*. During the first year, defective valve bodies will be replaced, free of charge. After the first year, valve bodies may be returned for repair or replacement, with the only cost to the customer being shipping charges.

Product Support You Can Count On

Contact Sonnax anytime for comprehensive assistance with Sonnax products. Our top-notch tech team of seasoned automotive professionals and product specialists is dedicated to helping you get the most out of Sonnax transmission, torque converter and driveline solutions.

Product support specialists are available by phone and email, and the Sonnax website includes detailed valve body identification guides, tech articles and important installation tips and techniques.

***CAUTION:** Installation of a Sonnax valve body for diagnostic purposes will void the warranty; valve bodies subjected to such misuse and returned under warranty will receive core credit only.

Find these & 200+ more valve bodies at www.sonnax.com!

Sonnax also offers R&R Service. If your distributor doesn't have the valve body you need in stock, R&R service may be available. Visit www.sonnax.com/randr for more information.

Unit	Application Details	Part No.
01M, 01N, 01P	'99-Later	VW204
09G, 09K, 09M, TF-60SN	Large Cans, Cooler on Case with Switches	AW6VWF1
	Large Cans, Cooler on Case without Switches	AW6VWF3
45RFE, 545RFE	'08-Earlier	CHR140
	'09-Later	CHR141
4R70W, 4R75E, 4R75W	'01-'08	F095
55-50SN, 55-51SN	Volvo, Early, No Letter or "A" Casting, No B5 Spring	AW55VE
	Volvo/Nissan, Late, "B" or "C" Casting, No B5 Spring	AW55VL
	Volvo/Nissan, '05-Later, with B-5 Spring	AW55NL
5R55E	'97-Later with 4.0L	F056
5R55S, 5R55W	'01-'08	F032
68RFE	'08-Earlier	CHR143†
	'09-Later	CHR144†
FNR5		F025
6R60	'06-'09	FZR60
6R75		FZR75†
6R80		FZR80†
U151E, U151F, U250E	'04-'14	TOY181
ZF6HP19		BMW619†
ZF6HP26		BMW626†

†R&R Only

Hydraulic Kits



Ford

- **4R100, E40D**
Part No. 4R100-LB1
- **4R70E, 4R70W, 4R75E, 4R75W, A0DE**
Part No. 4R70W-LB1
- **5R55S, 5R55W** Part No. 5R55WS-LB1

GM

- **200-4R, 4L60** Part No. 700R4-LB1
- **350, 350C** Part No. 350-LB1
- **400** Part No. 400-LB1
- **4L60-E, 4L65-E, 4L70-E (Early-Style Pump)**
Part No. 4L60E-LB1
- **4L60-E, 4L65-E, 4L70-E (Late-Style Pump)**
Part No. 4L60E-LB2
- **4L80-E, 4L85-E** Part No. 4L80E-LB1
- **4T65-E** Part No. 4T65E-LB1
- **6L45, 6L50, 6L80, 6L90**
Part No. 6L80-LB1

Toyota

- **NEW A750E/F, A760E/F/H, A761E, A960E/F, AB60E/F**
Part No. A750-LB1

Electronic Kit

Chrysler

- **NEW 45/545/65/66/68RFE**
Part No. RFE-LB1

"I just received my line pressure booster for my 2012 Ram and wow! The CPU gets the new pressure signal very fast...30 seconds of slow-medium driving...and when I floor it...yihaaa! It shifts aggressively and I can feel the tranny grab the clutches with more power when it changes gear...great product! Thumbs up!!!"

J. Martel
Senneterre, Québec

Line Pressure Booster Kits

Peace of mind for everyday customers pushing vehicles to the limit



Sonnax booster kit components are uniquely designed for precision pressure control. At low-end pressures, they deliver normal engagements, normal light throttle shifts and smooth coastdown shifts. When vehicles are pushed harder, components progressively increase pressure for improved clutch holding capacity and increased durability.

- Simple, effective parts install with no special tools required
- Ideal for heavy duty and modified vehicles as well as hard-working daily drivers
- Improved shift feel and durability for fewer comebacks and complaints

NEW Electronic Line Pressure Booster Kit

The electronic booster kit is a unique Sonnax product that modifies the sensor signal in gas and diesel Chrysler RFE units, causing the computer to create a pressure increase. The harness plugs into the outside of the transmission, making it very easy to install. If additional transmission work is being done that requires pump disassembly, the optional PR spring should be installed. The kit is an improved design that replaces previous Sonnax kits 44957-LB1 and 44957-LB1.



- Progressively increases pressure (~10 psi at lower pressure ranges and ~25 psi at higher pressure ranges).
- Greater sensor voltage range compared to old design reduces potential for trouble codes.
- Can be used in both gas and diesel 545RFE, 65RFE, 66RFE and 68RFE applications.



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Featured in this issue

Turn Your Solenoid Cores into Cash

New ZF8 Tech Article

ZF8HP45/70 Valve Body Layout

Remanufactured Valve Bodies

New Toyota & Chrysler

Line Pressure Booster Kits

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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



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Powertrain
expo
2016

October 28-29
Paris Hotel & Casino
Booth #601

SEMA
SHOW

November 1-4
Las Vegas Convention Center
Booth #20049

Talk shop with the Sonnax team and explore the latest and greatest in cutting-edge transmission, driveline and torque converter products. View live demonstrations of vacuum testing, reaming and pressure switch rebuild kit installation. Check out our famous Roadshow van and enter for a chance to win cool prizes!

Get a **FREE Powertrain Expo show pass** at www.sonnax.com!

Get an up-close look at the hottest performance products including innovative Smart-Tech[®] kits, Powerglide gear sets, chromoly slip yokes, racekits, heavy duty input shafts and more. From a gearhead's hot rod to a workhorse diesel truck, stop by and discover the wide range of innovative solutions and upgrades Sonnax has to offer for transmissions, drivelines and torque converters.