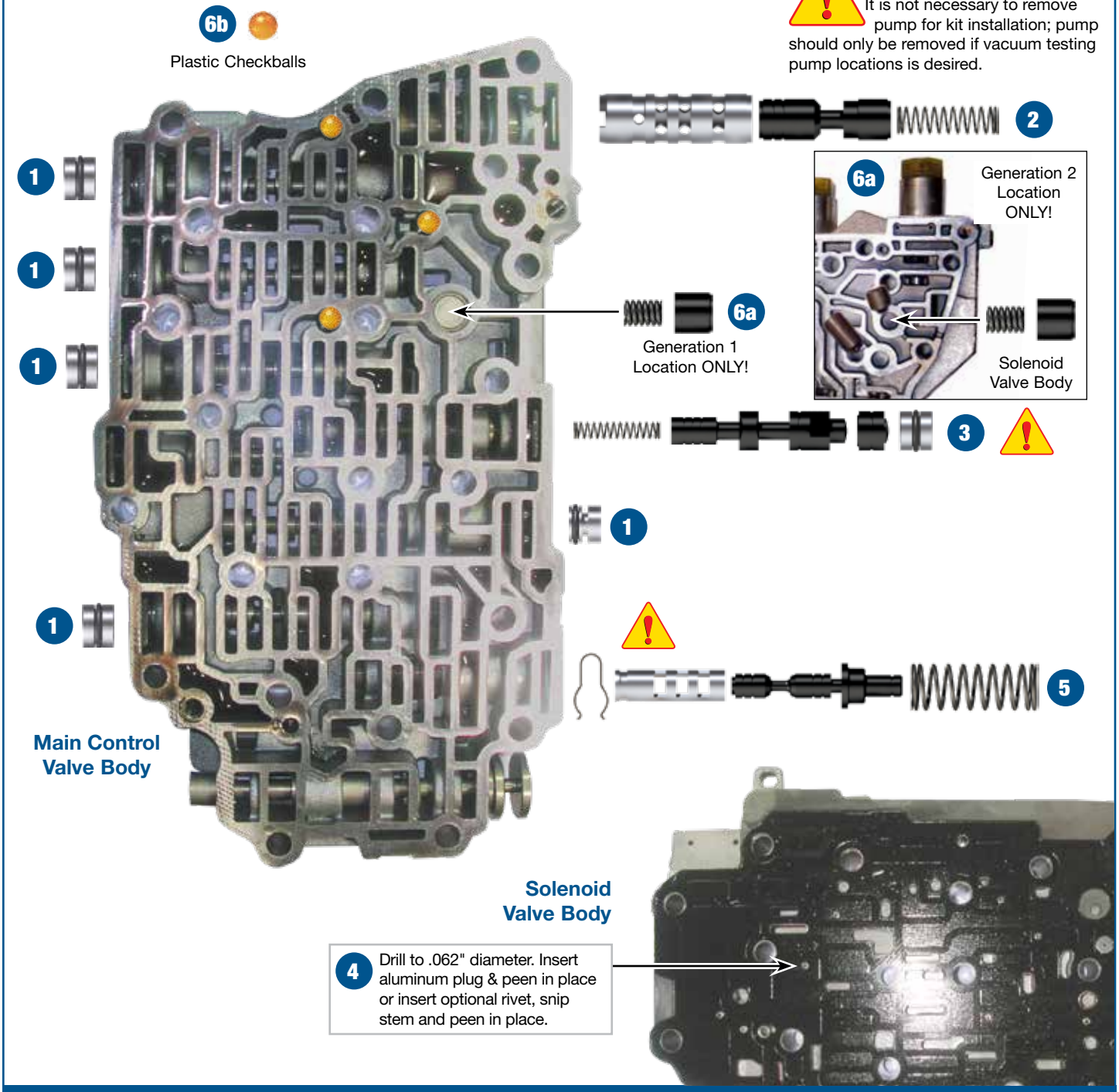
FORD 6F35 (Gen. 1, 2 & 3) ZIP KIT®

PART NUMBER 6F35-ZIP **QUICK GUIDE**

Parts are labeled here in order of installation. See other side of sheet for details on kit contents.

INSTALLATION DIAGRAM

NOTE: The components in this kit are all related to the valve body. It is not necessary to remove pump for kit installation; pump should only be removed if vacuum testing pump locations is desired.



In addition to general rebuilding tips and technical information, the technical booklet included in this kit contains vacuum testing and additional repair options for higher mileage units or for repairing specific complaints which are beyond the scope of this kit.

Kit Contents & Installation Steps

Step 1 Replace 5 OE End Plugs

Place O-ring in groove, lubricate with Sonnax Slippery Stick™ **O-LUBE** and roll on bench to size.

NOTE: The end plug at the clutch bypass valve location is slightly different in design and the O-ring should be installed at the inboard land as illustrated.

Packaging Pocket 1

- End Plugs (5)
- O-Rings (7) 2 Extra

Step 2 Replace OE Control Pressure Regulator Valve

Packaging Pocket 2

- Valve
- Sleeve
- Spring

Step 3 Replace TCC Regulator Valve Bore Lineup

Remove and discard all OE components except the retainer clip. Keep retainer clip for reuse.

Ensure that the shuttle valve between the inboard regulating valve and end plug is installed with the blind bore facing inboard and the rounded end nub facing the end plug.

Packaging Pocket 3

- Spring
- Valve
- Shuttle Valve
- End Plug
- O-Rings (2) 1 Extra

Step 4 Block Solenoid Pressure Regulator Balance Port

Drill indicated separator plate orifice with included .062" dia. drill bit. Remove any burrs. If using straight plug, insert into orifice and peen on both sides of plate. If using optional small rivet, insert into orifice and using wire cutters, snip the stem end of the rivet if/as necessary to provide for a small head once peened in place. Peen the rivet in place on head side of plate also. After peening on both sides of the plate, ensure plate will still flush on mating surfaces.

Packaging Pocket 4

- Drill Bit, .062" dia.
- Aluminum Plug, .062" dia. (2) 1 Extra
- Rivets (3) 2 Extra

Step 5 Replace OE Solenoid Pressure Regulator Valve Lineup

Ensure Sonnax retainer clip is fully seated in the sleeve groove after installation.

Remove and discard OE valve and spring. Keep outboard retainer clip for reuse. Install Sonnax sleeve and valve as illustrated. Secure sleeve in bore by installing included clip into sleeve groove at inboard port. Install included spring and secure all in bore with OE retainer.

Packaging Pocket 5

- Sleeve
- Valve
- Spring
- Retainer Clip

Step 6a Replace OE Accumulator Piston

Remove and discard OE rubber-tipped damper piston from main control valve body (Gen. 1) or solenoid valve body (Gen. 2). Install Sonnax spring into Sonnax piston bore pocket. Install Sonnax accumulator piston, pocket end over spring.

NOTE: Location for replacement accumulator piston 6a varies from Gen. 1 to Gen. 2. Do NOT place this short piston and spring in the Gen. 2 long piston and spring locations.

NOTE: OE accumulator pistons should be flush or approximately .030" lower than the casting surface. It is common for the rubber insert to lose tension.

Step 6b Install Checkballs

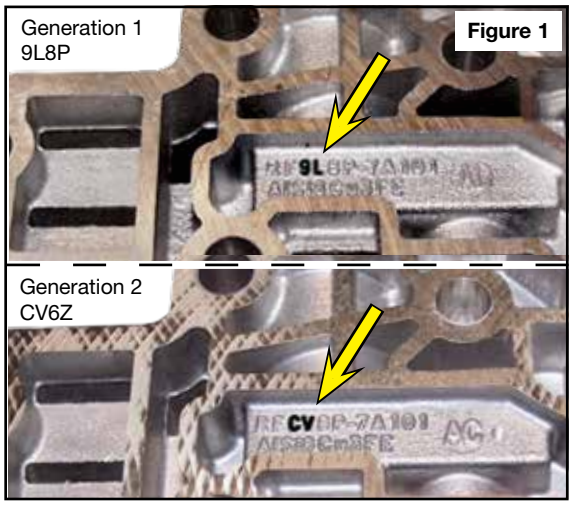
Packaging Pocket 6

- Piston
- Spring
- Checkballs, .250" dia. (3)

The parts listed here may be protected by patent numbers 8,794,108 & 8,919,381.

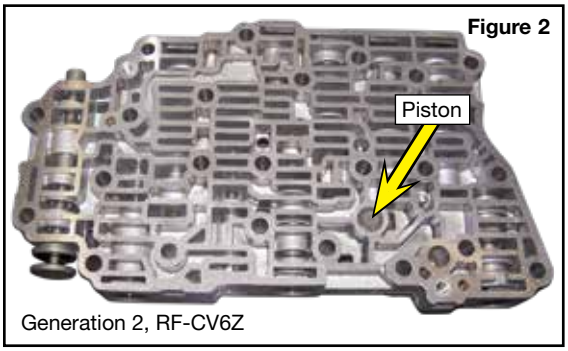
FORD 6F35 (Gen. 1, 2 & 3) ZIP KIT®

PART NUMBER 6F35-ZIP **INSTALLATION & TESTING BOOKLET**



Valve Body Identification

This ZIP Kit will service 6F35 Generation 1 (casting ID 9L) and Generation 2 (casting ID CV) applications (**Figure 1**). Detailed differences between the generations can be found in article "Solenoid Differences Between Ford 6F35 Gen. 1 & Gen. 2 Transmission" on sonnax.com. However for the purposes of installing this ZIP kit, the differences only affect the solenoid dampers. The location of the 1-2-3-4 solenoid damper is the same for Gen. 1 and Gen. 2. (**Figure 2**), but the damper design is different. The Gen. 1 damper is shorter with a rubber tip, while the Gen. 2 damper is a longer piston with a spring. Gen. 2 has added 4 additional dampers to the solenoid body - 3 long pistons with springs, and one short damper with a rubber tip (**Figure 10**).



Technical Tips

Reprogramming

Many transmission performance complaints both prior to and after an overhaul can be addressed by reflashing the PCM or TCM. This includes any shift and/or converter clutch scheduling issues, shift bumps, flares, bangs, etc. Refer to OE reflashing procedure for further information.

NOTE: The TCM on the Ford 6F35 is not part of the valve body or transmission, but located in the engine compartment.

Solenoid Body Identification & Strategy

The solenoid body strategy is a file programmed into the PCM to control the various solenoids to prevent shift concerns. The original solenoid body tag on the transmission case indicates the solenoid strategy and solenoid body ID (**Figure 4**). These must match the numbers on the connector boss on the lead frame (**Figure 3 & 5**).

Anytime a new solenoid body is installed, a new strategy file is downloaded into the PCM with a scan tool. A replacement tag (**Figure 6**) must be placed on the case as well.

NOTE: The solenoid body strategy is always 13 numeric digits. The solenoid body ID is a combination of numeric digits and any letters A–F.

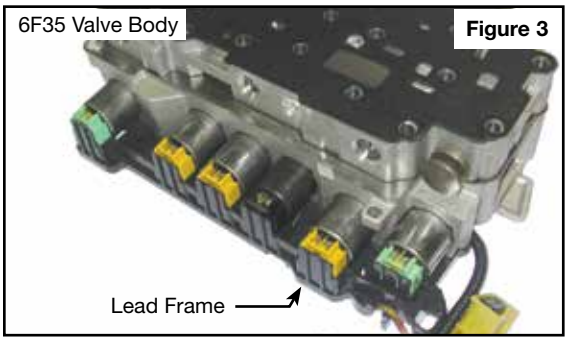
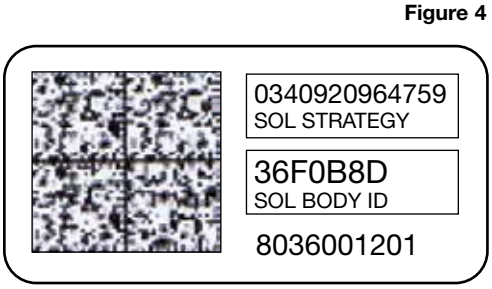


Figure 4



Identification: The original solenoid body tag on transmission case will look like this.

Figure 5

Figure 6

374P-7G342-BA
SOLENOID BODY SERVICE INFORMATION
0340920964759
SOLENOID BODY STRATEGY
36F0B8D
SOLENOID BODY STRATEGY
SEE SHOP MANUAL SECTION 307-31

Identification: The replacement solenoid body tag on transmission case will look like this.

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Clutch Apply Chart

Figure 7

Gear		Direct	Overdrive	Forward	Low/Reverse	Intermediate	One-Way
Reverse		X			X		
Drive	1st			X	X*		X
	2nd			X		X	Overrunning
	3rd	X		X			Overrunning
	4th		X	X			Overrunning
	5th	X	X				Overrunning
	6th		X			X	Overrunning

*Turns off above 4mph.

Solenoid Apply Chart

Figure 8

Gear		SSA (VFS) NL	SSB (VFS) NH	SSC (VFS) NL	SSD (VFS) NH	SSE (on/off) NC	TCC (VFS) NL
Park					X	X	
Reverse			X			X	
Neutral					X	X	
Drive	1st	X			X	X	
	2nd	X		X	X		
	3rd	X	X		X		
	4th	X					X*
	5th		X				X*
	6th			X			X*

KEY: X = On * = Modulating

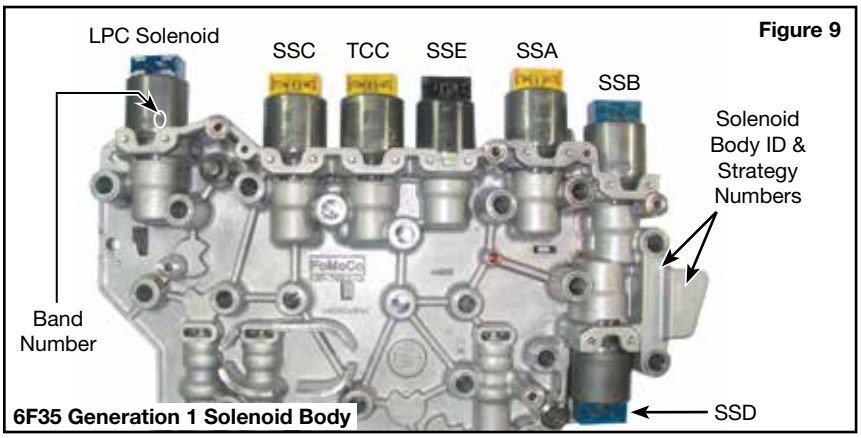

Figure 9

6F35 Generation 1 Solenoid Body

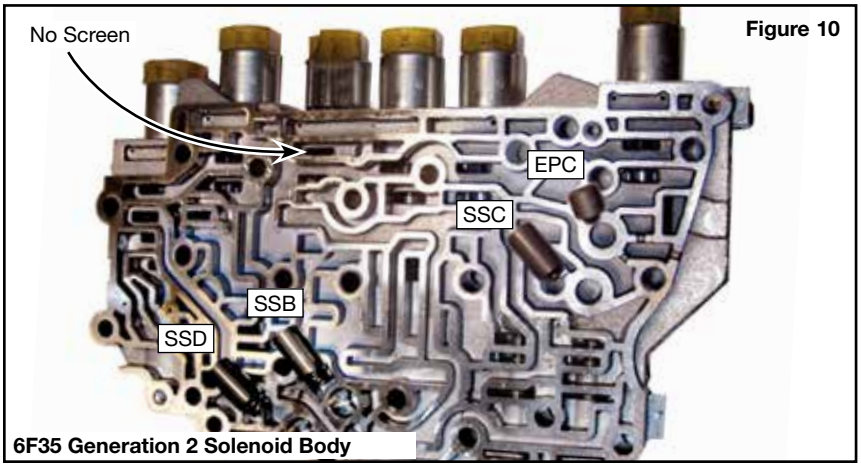

Figure 10

6F35 Generation 2 Solenoid Body

Solenoid Body Identification & Strategy *(continued)*

The solenoid strategy and identification number on the cast aluminum solenoid body (**Figures 9 & 10**) must also match those on the transmission case tag and lead frame (**Figures 4, 5 & 6**).

The solenoids are factory calibrated and vary in flow rate. These solenoids can be replaced separately, but only if the replacement solenoid has the same band number as that which it is replacing (**Figures 9 & 11**). The band number is stamped on the solenoid can, and is the last digit, which is either a 1, 2, 3, 4 or 5.

Generation 2 solenoids (**Figures 10 & 13**) do not have blue and yellow caps like Generation 1 (**Figures 9 & 12**). They instead have clear caps and brown/black snouts similar to the 6R80.

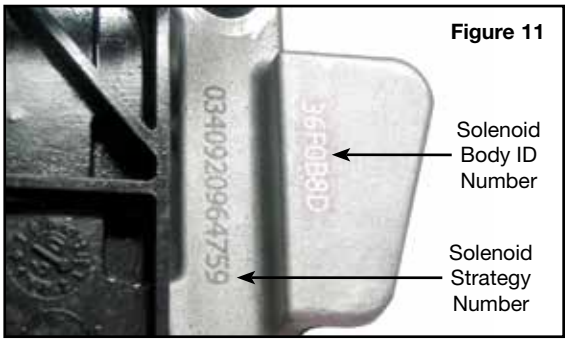

Figure 11

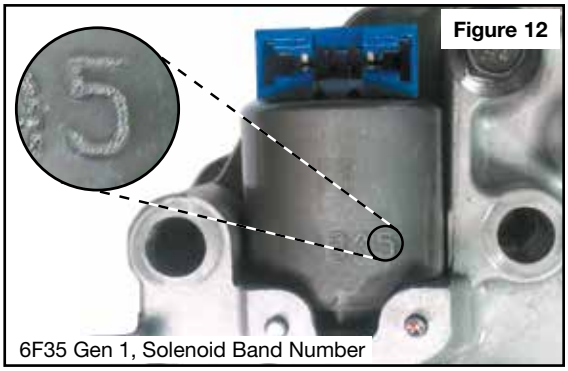

Figure 12

6F35 Gen 1, Solenoid Band Number

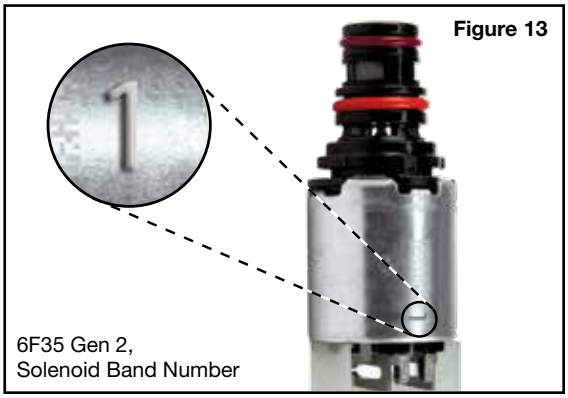

Figure 13

6F35 Gen 2, Solenoid Band Number

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Zip Kit Instructions

1. Valve Body Removal from Case
(**Figure 14**)

a. Disconnect the transmission range senor.

b. Disconnect the output speed sensor (OSS).

c. Remove the main control cover grommet.

d. Remove the case-to-valve body nut (yellow).

e. Remove the 22 valve body-to-case bolts (red).

f. Remove the valve body from the transmission.

2. Disassembly

a. To remove lead frame from valve body, remove five small screws (green), (**Figure 15**).

CAUTION: Be careful not to bend or twist the lead frame or solenoid terminals during removal, as damage can occur.

b. There are 14 solenoid retaining pins (two per solenoid) that keep the solenoids in the casting. Handle the casting with care so these do not fall out and allow solenoids to come out and become mixed up (**Figure 16**).

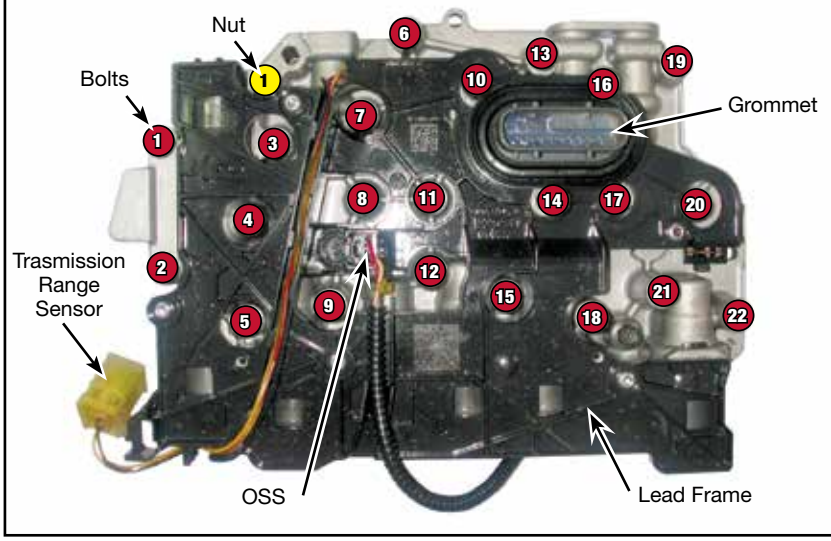
c. To remove solenoid body from valve body, remove two bolts (pink), (**Figure 16**).

d. To remove separator plate from solenoid body, remove two bolts (blue), (**Figure 18**).

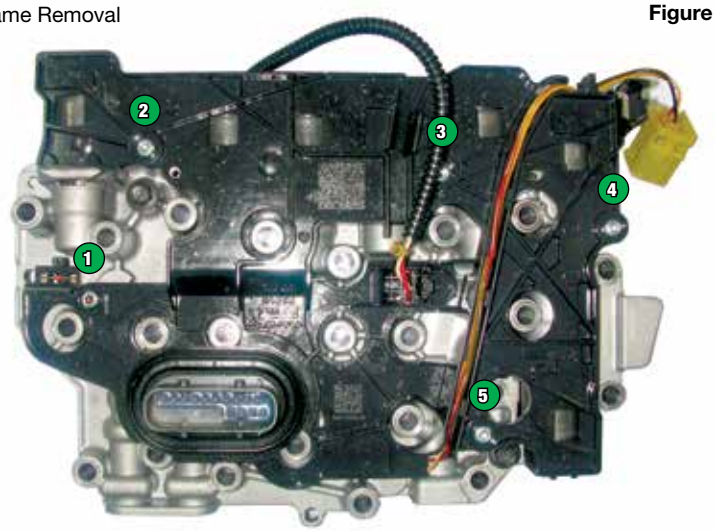
3. Installation

Install Zip Kit parts as shown on diagram of separate quick guide sheet included in this Zip Kit. Sonnax recommends vacuum testing critical wear areas not covered by this kit to determine whether additional Sonnax parts are required (see page 4 & 5).

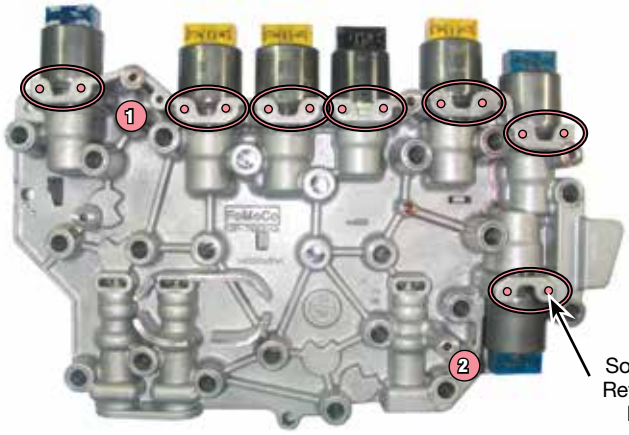
6F35 Assembled Valve Body **Figure 14**



Lead Frame Removal **Figure 15**



Assembled Valve Body with Lead Frame Removed **Figure 16**



Separator Plate

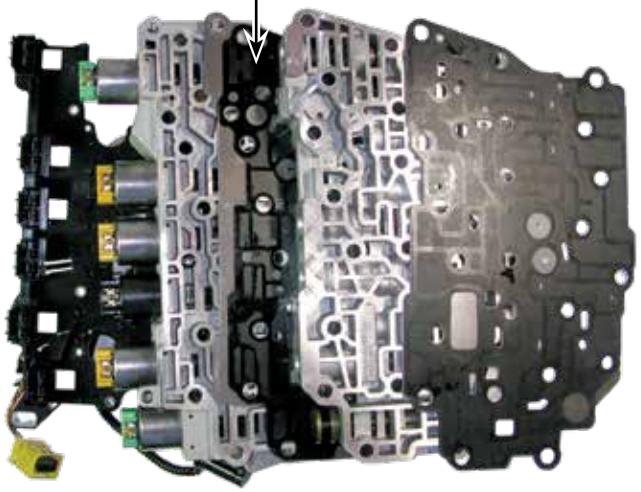


Figure 17

Separator Plate Removal

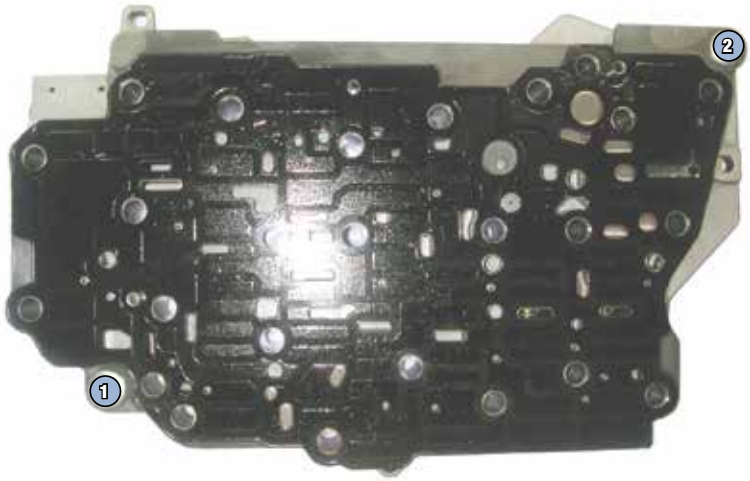


Figure 18

4. Reassembly

NOTE: OE checkballs often damage the separator plate (**Figure 13**), preventing proper sealing. Replace the separator plate if necessary, available through Ford (P/N DV6Z-7Z490-B) Generation 1 ONLY.

a. Bolt separator plate to solenoid body using two bolts. Torque to 89 in-lb (**Figure 18**).

b. Bolt solenoid body to valve body with two bolts. Torque to 89 in-lb (**Figure 16**).

c. Attach lead frame to solenoid body assembly using five small screws (**Figure 15**).

5. Valve Body Reinstall into Case

(**Figure 14**)

a. Install the 22 valve body-to-case bolts. Torque to 89 in-lb in the sequence indicated.

b. Install case-to-valve body nut and tighten to 89 in-lb.

c. Install the main control cover grommet.

d. Reconnect the output speed sendor (OSS).

e. Reconnect the transmission range sensor.

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Critical Wear Areas & Vacuum Test Locations

Drop-In Zip Valve™ Parts Available

NOTE: OE valves are shown in rest position and should be tested in rest position unless otherwise indicated. Test locations are pointed to with an arrow. Springs are not shown for visual clarity. Low vacuum reading indicates wear and Sonnax parts are noted for replacement.

Main Control Valve Body – Front • 6F35, Gen. 1 Shown

For specific vacuum test information, refer to individual part instructions included in kits and available at **www.sonnax.com**.

***Note:** Plug bore opening with thumb when vacuum testing end plug ports.

Direct (3-5-R) Clutch Regulator Valve
- Burnt 3-5 Reverse clutch
- Delayed Reverse
- 3rd & 5th Shift concerns
- 2-3 & 4-5 Flare

Plug port on back

Forward (1-2-3-4) Clutch Regulator Valve
- Burnt 1-2-3-4 clutch
- Delayed Forward
- 1-2-3-4 Shift concerns

Forward (1-2-3-4) Clutch Latch Valve
- Slips & flares • Slip codes
- Delayed engagement
- Shift quality is not load sensitive
- Harsh/Slide shifts • Burnt clutches

Replace with Sonnax Part No. **144740-21**
Requires F-144740-TL21 & VB-FIX

Note: Plug casting valley with foam, putty or appropriately sized O-ring coated in assembly lube to isolate circuit.

Low Reverse/Overdrive (4-5-6) Clutch Regulator Valve
- 3-4 Flare • Delayed Reverse • 4th Slip
- Burnt Low/Reverse clutch
- OD clutch burned • 4-5-6 Slip

Replace with Sonnax Part No. **144740-43K**
Requires F-144740-TL43 & VB-FIX

Plug port on back

Control Pressure Regulator Valve
- Bump/Flare/Harsh/Erratic Shifts
- Burnt clutches • Overheated fluid

Replace with Sonnax Part No. **144740-04K**

Intermediate (2-6) Clutch Regulator Valve
- Burnt 2-6 clutch
- 2nd & 6th Shift concerns
- 1-2 & 5-6 Flare

Test Generation 1: Invert OE dampener piston and test off center of the rubber tip.

TCC Regulator Valve
- Code P0741, 742 • No lockup
- TCC slip • Harsh TCC apply
- Loss of fuel economy

Replace with Sonnax Part Nos. **144740-36K** ***or*** **144740-19K** Requires F-144740-TL19 & VB-FIX

Clutch Select Valve
- Various shift concerns
- Shift codes

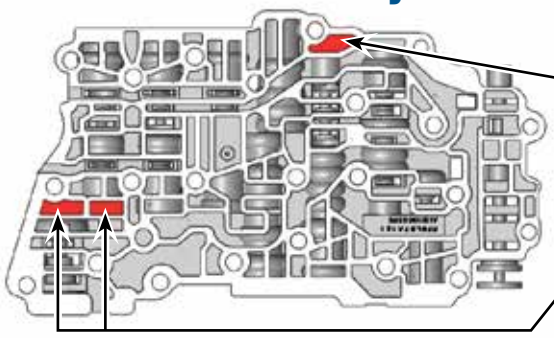
Note: Plug casting valley with foam, putty or appropriately sized O-ring coated in assembly lube to isolate circuit.

Gen. 1 Only

Solenoid Pressure Regulator Valve
- Harsh/Flare shifts • No 4th, 5th or 6th
- Low clutch oil pressure

Replace with Sonnax Part Nos. **144740-37K** ***or*** **144740A-01** Requires 144740-TL

Main Control Valve Body • Back



Clutch Select Valve
- Various shift concerns
- Shift codes

Plug these ports (as noted above) while vacuum testing.

End Plugs
- Shift concerns • Burnt clutches
- Pressure loss •TCC apply concerns

NOTE: Vacuum test end plugs at outboard port while sealing bore opening with thumb.

Replace with Sonnax Part No. **144740-03K**
★ = Several Locations

*Part numbers with an asterisk (*) are included in this Zip Kit.

Critical Wear Areas & Vacuum Test Locations

ZIP Drop-In Zip Valve™ Parts Available

NOTE: OE valves are shown in rest position and should be tested in rest position unless otherwise indicated. Test locations are pointed to with an arrow. Springs are not shown for visual clarity. Low vacuum reading indicates wear and Sonnax parts are noted for replacement.

For specific vacuum test information, refer to individual part instructions included in kits and available at **www.sonnax.com**.

Solenoid Valve Body • 6F35, Gen. 1 Shown

Low Reverse/Overdrive (4-5-6) Clutch Latch Valve

- Slips & flares • Delayed engagement
- Shift quality is not load sensitive • Slip codes
- Harsh/Slide shifts • Burnt clutches

Replace with Sonnax Part No.
144740-21 Requires F-144740-TL21 & VB-FIX

Intermediate (2-6) Clutch Latch Valve

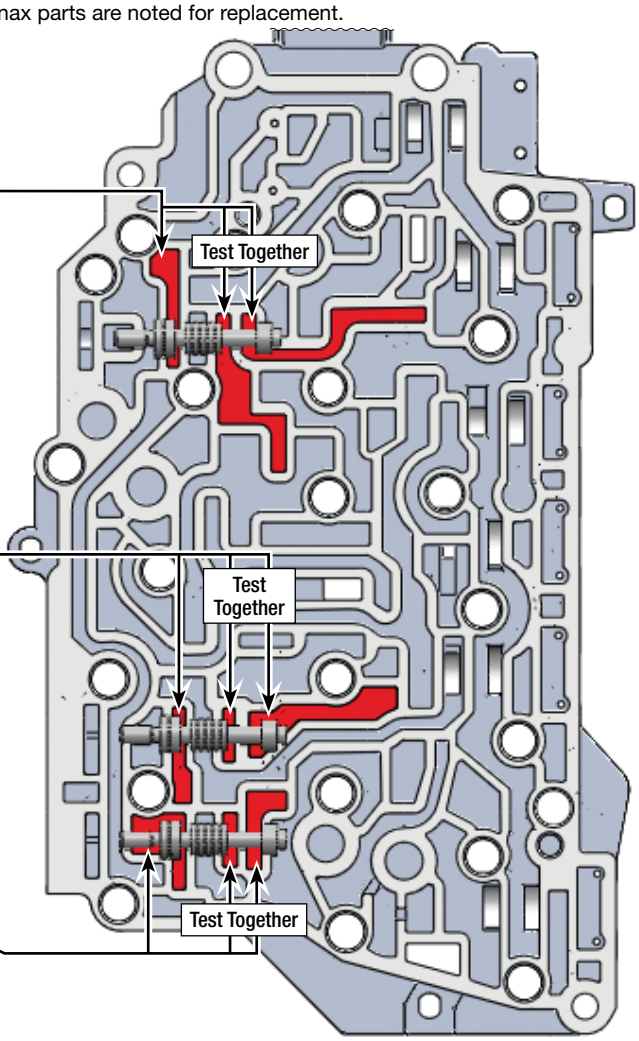
- Slips & flares • Delayed engagement
- Shift quality is not load sensitive • Slip codes
- Harsh/Slide shifts • Burnt clutches

Replace with Sonnax Part No.
144740-21 Requires F-144740-TL21 & VB-FIX

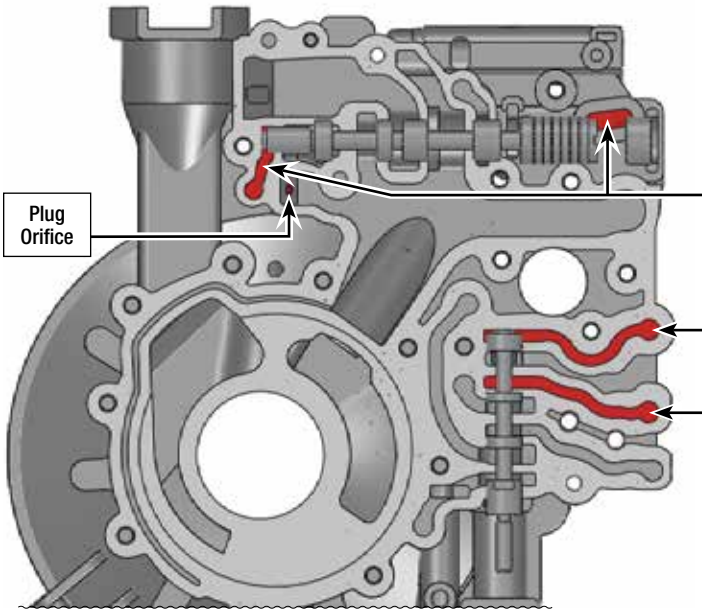
Direct (3-5-R) Clutch Latch Valve

- Slips & flares • Delayed engagement
- Shift quality is not load sensitive • Slip codes
- Harsh/Slide shifts • Burnt clutches

Replace with Sonnax Part No.
144740-21 Requires F-144740-TL21 & VB-FIX



Pump Body • 6F35, Gen. 1 Shown



Pressure Regulator Valve

- Poor shift quality • Erratic line pressure
- TCC apply & release concerns
- Burnt clutches • Overheating
- Low converter & lube flow

Replace with Sonnax Part No.
144510-03K Requires F-144510-TL3C & VB-FIX

TCC Control Valve

- Excess TCC slip • TCC codes
- TCC lining failure • Shudder
- TCC apply & release concerns
- Low cooler flow • Overheating
- Low converter & lube flow

Replace with Sonnax Part No.
144510-07K Requires F-144510-TL7C & VB-FIX

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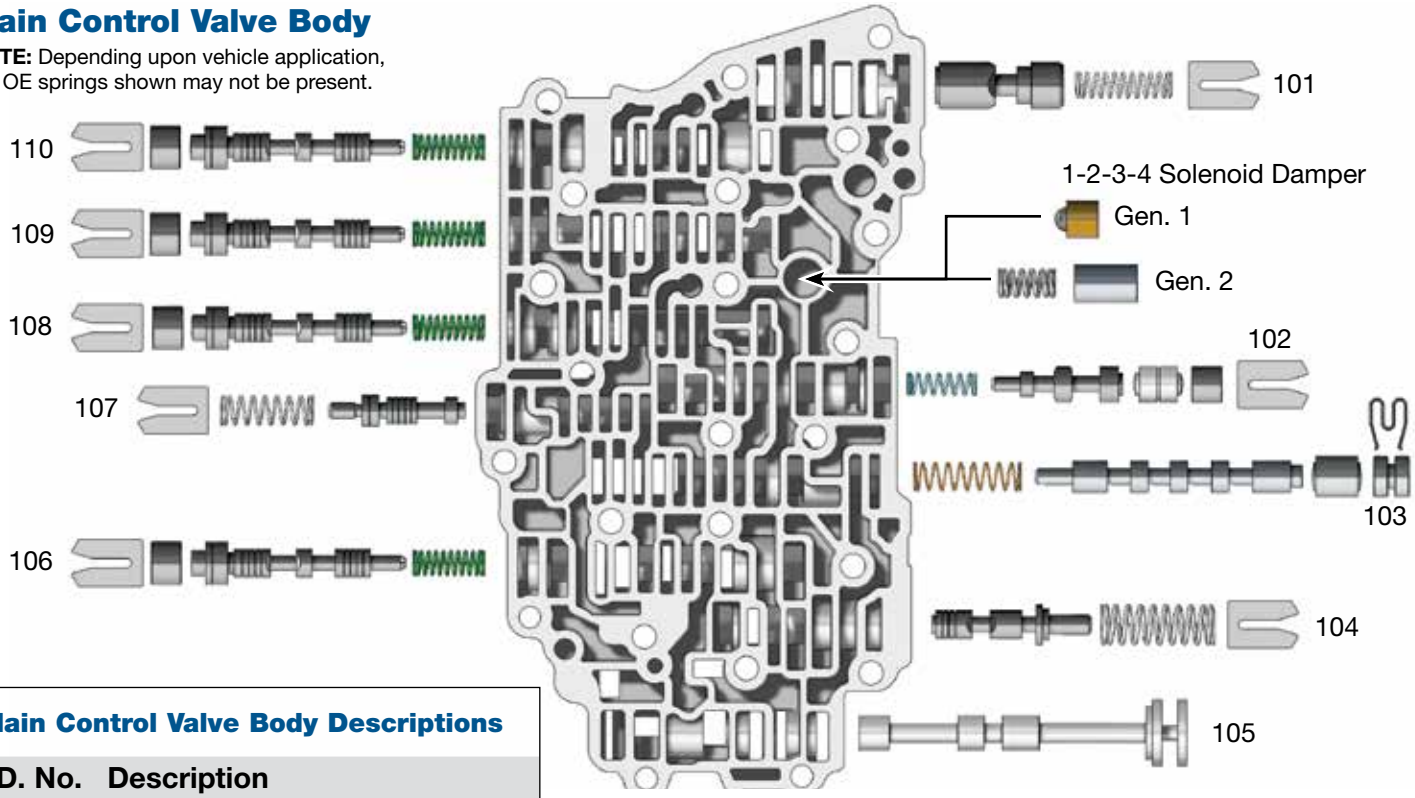
OE Exploded View

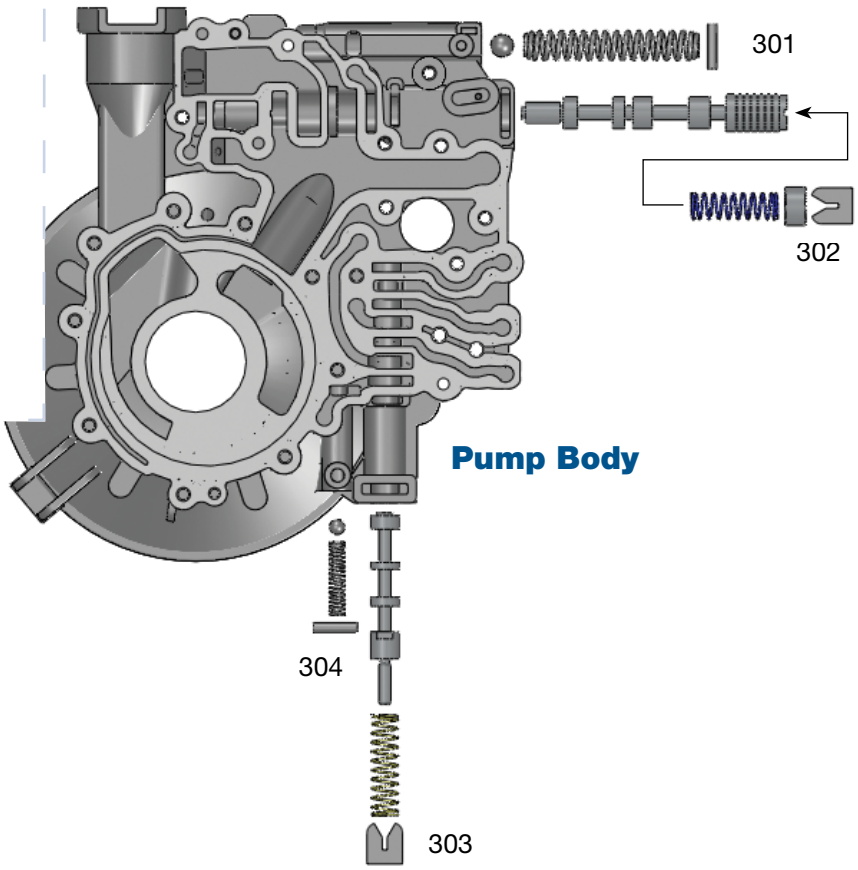
Main Control Valve Body

NOTE: Depending upon vehicle application, the OE springs shown may not be present.



Main Control Valve Body Descriptions	
I.D. No.	**Description**
101	Control Pressure Regulator Valve
102	TCC Regulator Valve
103	Clutch Bypass Valve
104	Solenoid Pressure Regulator Valve
105	Manual Valve
106	Low Reverse/Overdrive (4-5-6) Clutch Regulator Valve
107	FWD (1-2-3-4) Clutch Latch Valve
108	FWD (1-2-3-4) Clutch Reg. Valve
109	Intermediate (2-6) Clutch Reg. Valve
110	Direct (3-5-R) Clutch Reg. Valve

Pump Body



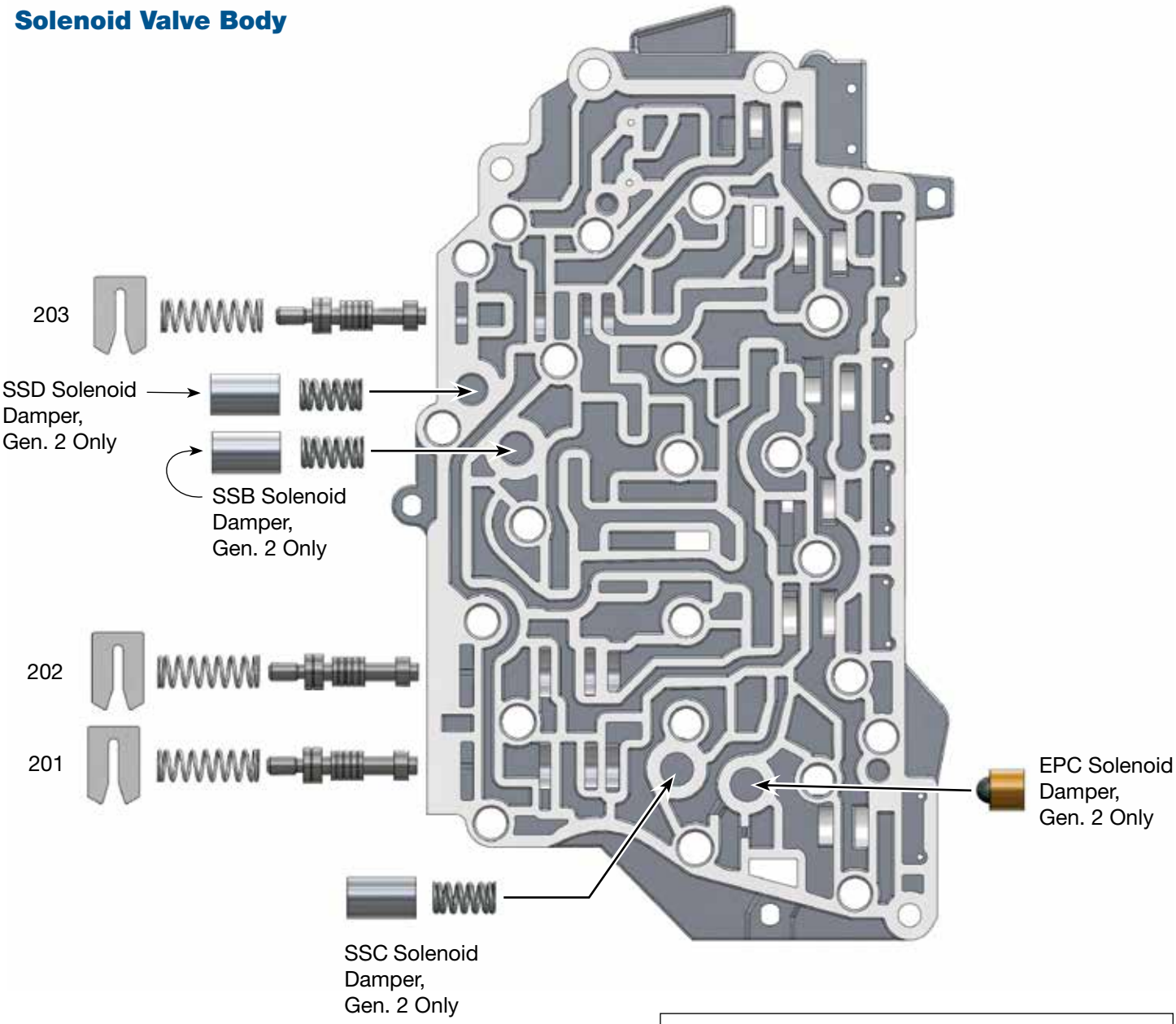
Pump Body Descriptions	
I.D. No.	**Description**
301	Line Pressure Relief
302	Pressure Regulator Valve
303	TCC Control Valve
304	TCC Relief Ball

OE Exploded View

Solenoid Valve Body

NOTE: Depending upon vehicle application, the OE springs shown may not be present.

Solenoid Valve Body



Solenoid Valve Body Descriptions

I.D. No.	Description
201	Direct (3-5-R) Clutch Latch Valve
202	Intermediate (2-6) Clutch Latch Valve
203	Low Reverse/Overdrive (4-5-6) Clutch Latch Valve

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