AISIN AW 60-41SN (AF-17) ZIP KIT

PART NUMBER AW60-41SN-ZIP **INSTALLATION & TESTING BOOKLET**

Torque Specifications

Manual Shaft Detent Spring Bolt 89 in-lb	**Manual Shift Shaft Detent Lever Bolts** 89 in-lb
Manual Shift Shaft Retaining Nut 61 in-lb	**Park/Neutral Position Switch Bolt** 18 ft-lb
Transmission Speed Sendor Bolt 48 in-lb	**Torque Converter Housing Bolts** 22 ft-lb
Transmission Case Cover Bolts 18 ft-lb	**Transmission Fluid Baffle Bolts** 48 in-lb
Transmission Fluid Drain Plug 29 ft-lb	**Transmission Fluid Pump Cover Bolt** 89 in-lb
Transmission Fluid Pump-to-Case Bolt 18 ft-lb	**Valve-Body-to-Case Bolts** 18 ft-lb

Fluid Chart

Recommended Capacities: Toyota / GM T-IV ATF

Approximate Capacity, Complete Overhaul 7.6 qt (7.2L)	**Approximate Capacity, Drain and Fill** 4.2 qt (4.0L)

Component Apply Chart

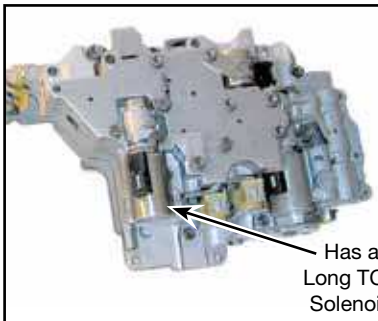
Position		Clutch				Brake		1-Way Clutch	
		C0	C1	C2	C3	B1	B2	F0	F1
P					X				
R	< = 7 mph			X	X		X		
R	> 7 mph			X	X				
N					X				
D	1		X		X			X	X
	2		X		X	X		X	
	N Cont.		X		X	X		X	
	3	X	X		X			X	
	4	X	X			X			
3	1		X		X			X	X
	2		X		X	X		X	
	3	X	X		X			X	
	4	X	X			X			
2	1		X		X			X	X
	2		X		X	X		X	
	(3rd)	X	X		X			X	
1	1		X		X		X	X	X
	(2nd)		X		X	X		X	

NOTE: This Zip Kit **AW60-41SN-ZIP** is designed for 60-41SN (AF-17) applications only. A separate Zip Kit **AW60-40LE-ZIP** is available for 60-40LE (AF-13) applications.

Valve Body Identification

60-41SN (AF-17) Valve Body: Use this kit.

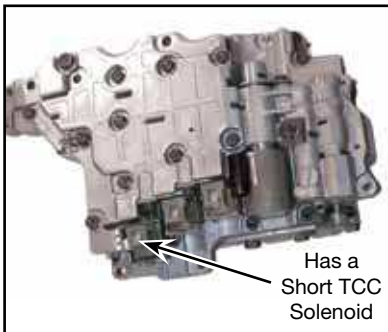
60-41SN (AF-17) Valve Body



60-41SN (AF-17) Valve Body

60-40LE (AF-13) Valve Body: Use AW60-40LE-ZIP kit.

60-40LE (AF-13) Valve Body



60-40LE (AF-13) Valve Body

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Electronic Cautions

Performance Modes

The transmission control module (TCM) programming allows the driver to select among various modes for enhanced performance based upon driving conditions. The TCM itself has the capability to change modes automatically when specific conditions are met. These modes will alter shift feel, and could be confused with shift problems by the driver if they are unaware of the TCM programming.

- **Economy Mode/Power Mode** The transmission is programmed to start and operate in Economy Mode. This shift strategy sets the shift points to occur at a lower speed than Power Mode to maximize fuel economy. The TCM will automatically switch to Power Mode when the driver accelerates more aggressively (higher engine load), or at higher speed, maximizing performance.
- **Winter Mode** is activated by the driver by a switch on the shifter. This mode starts the vehicle in 3rd gear to reduce tire slip on icy/slippery roads. Once the vehicle is moving, the TCM will automatically shift to the appropriate gear. Shifting into manual 1st or 2nd will cancel Winter Mode.
- **Neutral Control** is automatically activated by the TCM if the vehicle is in Drive and comes to a stop for longer than 2 seconds with the brakes applied. This condition allows the C1 (forward clutch) to be disengaged, placing the vehicle in Neutral, for improved fuel economy. When the brake is released, the C1 clutch is automatically applied and the vehicle will take off in 1st gear.
- **Hill Hold** The TCM monitors vehicle speed to determine if the driver is coming to a stop on a hill. If so, the TCM will automatically apply the B1 (2/4 brake) to prevent vehicle rolling. Upon takeoff, the B1 brake is released, and the vehicle moves forward in 1st gear. The TCM will disable Neutral Control if Hill Hold is activated.

Solenoid Apply Chart

Position		Solenoid			
		S1	S2	SN	SLU
P		X			
R	< = 7 mph	X			
R	> 7 mph		X		
N		X			
D	1	X			
	2	X	X		
	N Cont.	X	X	X	
	3		X		X
	4				X
3	1	X			
	2	X	X		
	3		X		X
	4				X
2	1	X			
	2	X	X		
	(3rd)		X		X
1	1	X			
	(2nd)	X	X		

Solenoids

This 60-41SN unit uses five solenoids (**Figure 1**).

- The S1 solenoid is an on/off style, operated by the TCM to control the 2-3 shift.
- The S2 solenoid is an on/off style, operated by the TCM to control the 1-2 and 3-4 shifts.
- The SN solenoid is an on/off style, operated by the TCM to operate Neutral Control.
- The SLU linear solenoid is pulse width modulated by the TCM to operate the converter clutch.
- The SLT linear solenoid is modulated by the TCM to regulate line pressure.

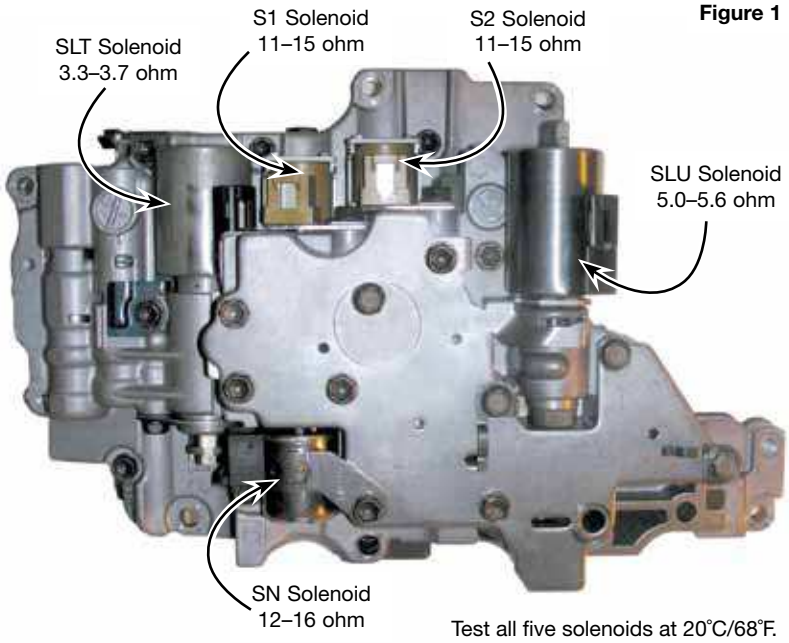


Figure 1

Test all five solenoids at 20˚C/68˚F.

Zip Kit Instructions

1. Valve Body Disassembly

NOTE: See color charts for bolt lengths.

a. Remove the 13 bolts (**Figure 2**).

b. Remove the five solenoids (**Figure 2**).

c. Remove the eight bolts (**Figure 3**).

d. Remove the central (non-pink-coded) bolts (**Figure 4**). The two rear valve body covers can be removed to access bore components by removing the 11 cover bolts (pink-coded).

2. Installation

Install Zip Kit parts as shown on diagram of separate quick guide sheet included in this Zip Kit.

3. Valve Body Assembly

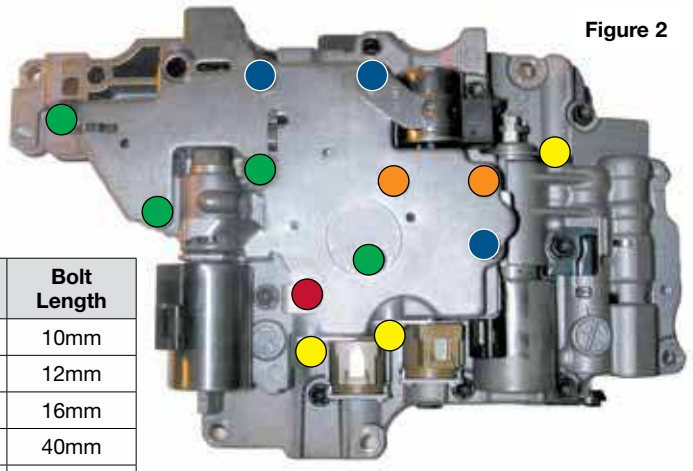
a. Loosely install the central (non-pink-coded) bolts (**Figure 4**), then torque to 59 in-lb. The 11 cover bolts (pink-coded) should be torqued to 89 in-lb.

b. Loosely install the eight bolts (**Figure 3**), then torque to 59 in-lb.

c. Reinstall the five solenoids (**Figure 2**).

d. Loosely install the 13 bolts (**Figure 2**), then torque to 59 in-lb.

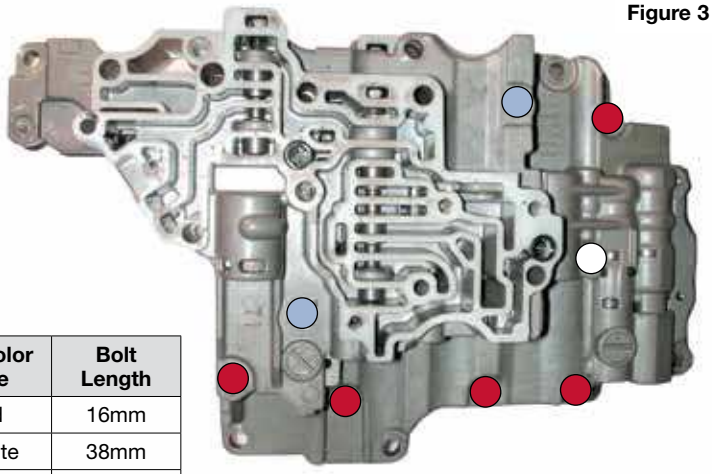
Figure 2



Bolt Color Code	Bolt Length
Yellow	10mm
Orange	12mm
Red	16mm
Green	40mm
Blue	75mm

Bolt installation torque specifications are 59 in-lb.

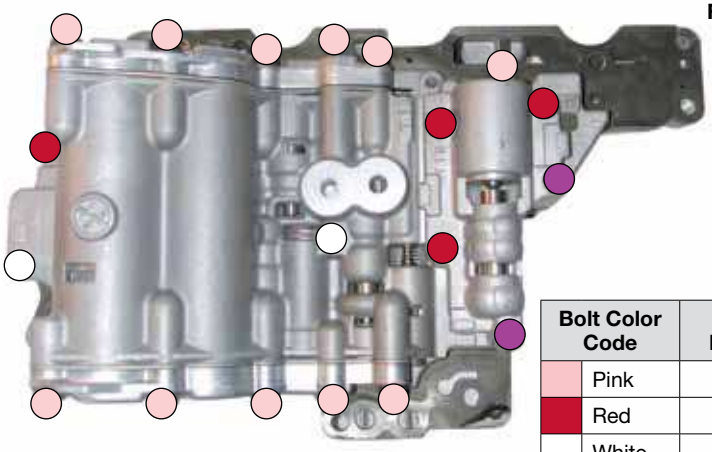
Figure 3



Bolt Color Code	Bolt Length
Red	16mm
White	38mm
Lt Blue	54mm

Bolt installation torque specifications are 59 in-lb.

Figure 4



Bolt Color Code	Bolt Length
Pink	12mm
Red	16mm
White	38mm
Purple	50mm

Bolt installation torque specifications are 59 in-lb for all except for Pink code, 12mm bolts, which are 89 in-lb.

Critical Wear Areas & Vacuum Test Locations

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.

Front Control Valve Body - Top Side (Bottom Side Inset) Shown Here

Solenoid B-1 Modulator Valve No. 2

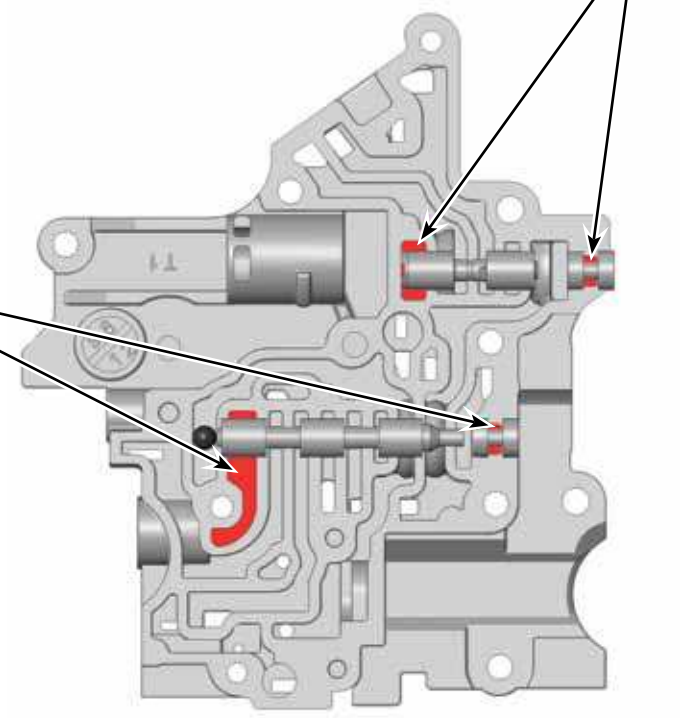
Shift complaints in 2nd & 4th

NOTE: Invert valve (as shown) to test.

Neutral Relay Valve

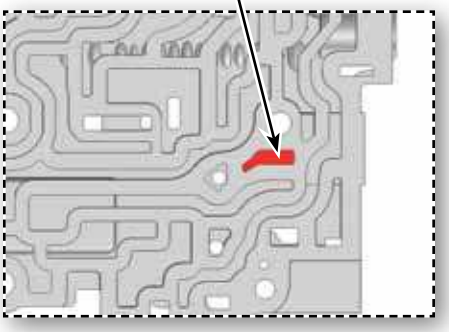
- Delayed engagement
- Loss of neutral control feature

NOTE: Prop valve in outboard position with checkball and seal port on opposite side of casting.



Front Control Valve Body
Top Side

Seal for neutral relay valve vacuum test.



Front Control Valve Body
Bottom Side

Middle Control Valve Body - Top & Bottom Sides Shown Here

Reverse Boost Assembly
- Low reverse pressure
- Delayed reverse

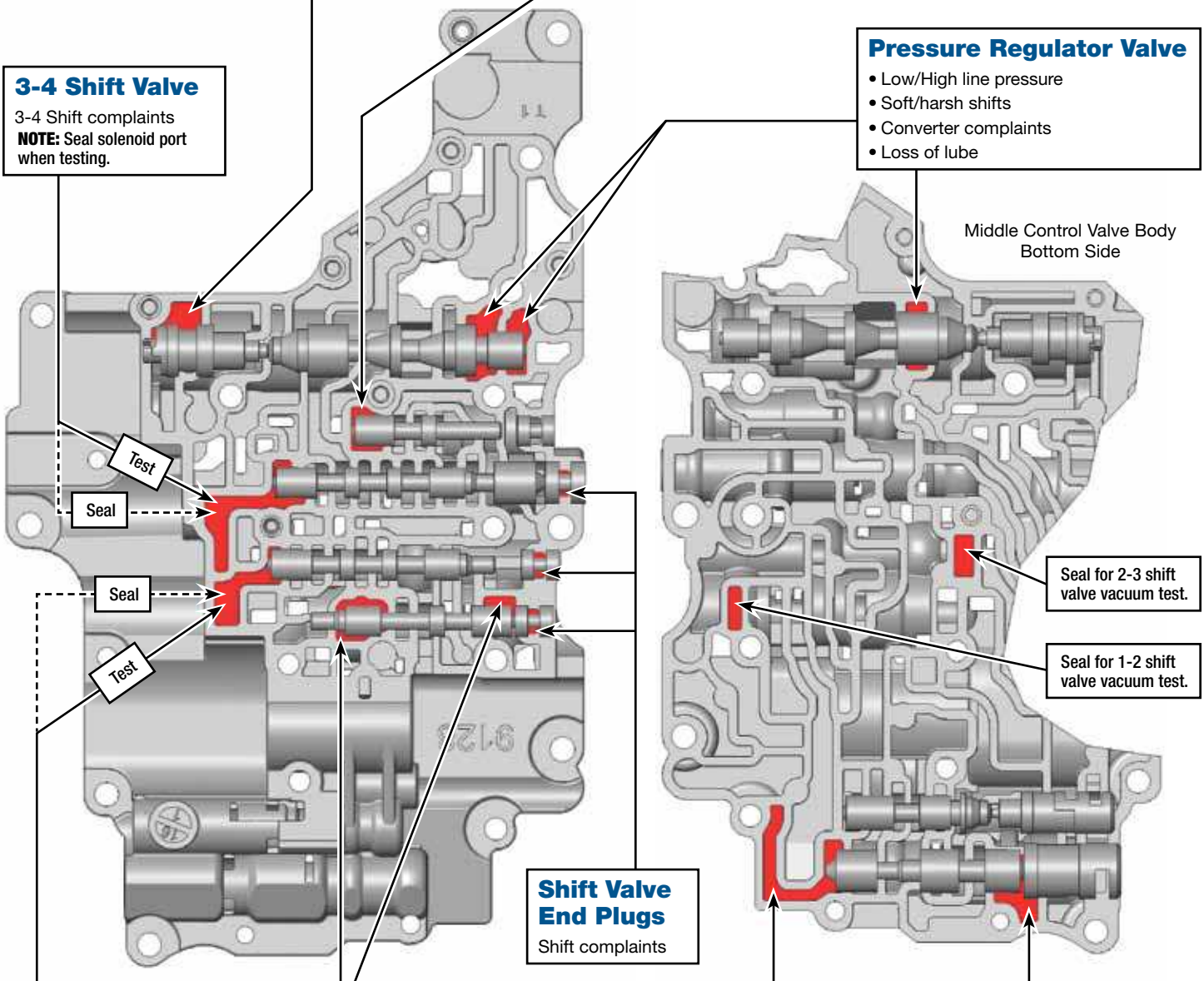
Lockup Control Solenoid Valve
- Converter slip/shudder/codes
- No converter apply

NOTE: Test port by using 3-4 shift valve in bore instead.

3-4 Shift Valve
3-4 Shift complaints

NOTE: Seal solenoid port when testing.

Pressure Regulator Valve
- Low/High line pressure
- Soft/harsh shifts
- Converter complaints
- Loss of lube



Shift Valve End Plugs
Shift complaints

2-3 Shift Valve
2-3 Shift complaints

NOTE: Seal solenoid port as well as port on opposite side of casting.

1-2 Shift Valve
1-2 Shift complaints

NOTE: Seal port on opposite side of casting.

Solenoid B-1 Modulator Valve No. 1
Shift complaints in 2nd & 4th

Solenoid B-1 Modulator Assembly
Shift complaints in 2nd & 4th

Critical Wear Areas & Vacuum Test Locations

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.

Rear Control Valve Body - Top Side (Bottom Side Inset) Shown Here

Secondary Regulator Valve
- TCC complaints
- Loss of lube

NOTE: Seal two ports on opposite side of casting when testing two middle ports.

Rear Control Valve Body Bottom Side

C-3 Modulator Valve
- Burned C3 clutch
- Slips in 1st, 2nd & 3rd

NOTE: Test with 2-3 gear timing valve in bore instead.

Lockup Relay Control Valve
Lockup complaints/codes

NOTE: Seal port on opposite side of casting when testing.

C-1 Damper Piston
- Burned C1 clutch
- Delayed forward

B-1 Modulator Control Valve
- Shift complaints in 2nd & 4th
- Burned B1 brake

2-3 Timing Valve & C2 Accumulator
- 2-3 Shift complaints

NOTE: Test both ports at the same time.

Low Modulator Valve
Delayed forward in Manual 1

NOTE: Test both ports at the same time.

C-1 Control Valve Assembly
- Burned C1 clutch
- Delayed forward

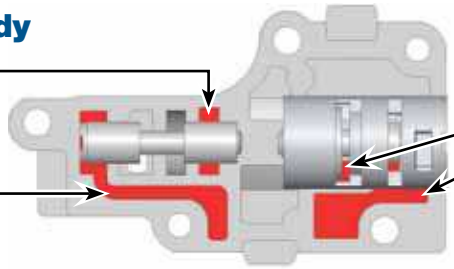
Solenoid Modulator Valve
Shift complaints

NOTE: Test with B-1 modulator valve in bore instead.

C2 & B1 Accumulators
- Burned C2 clutch
- Bang/Delayed reverse
- Burned B1 brake
- Shift complaints in 2nd & 4th

Rear Control Valve Body Top Side

No. 2 Rear Control Valve Body



Lockup Control Valve
- Loss of lockup
- Converter slips/shudder/codes

NOTE: Test with valve blocked inboard (as shown).

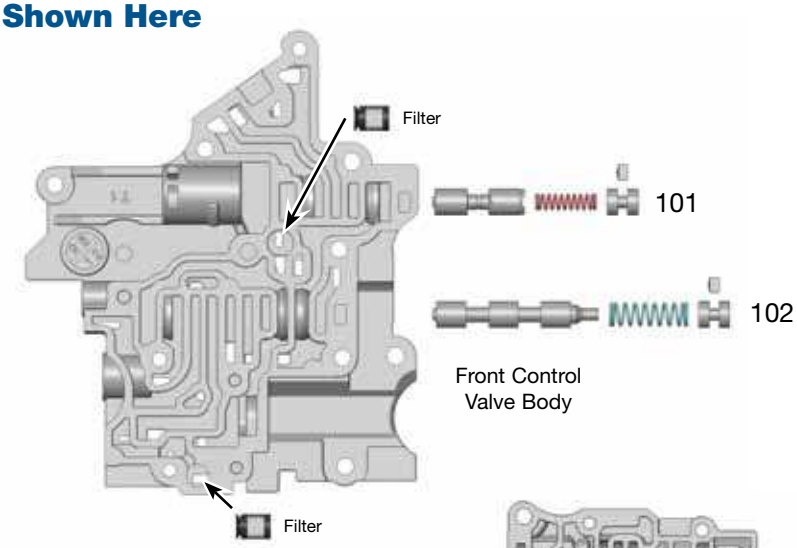
Lockup Control Plunger Valve Assembly
- Loss of lockup
- Converter slips/shudder/codes

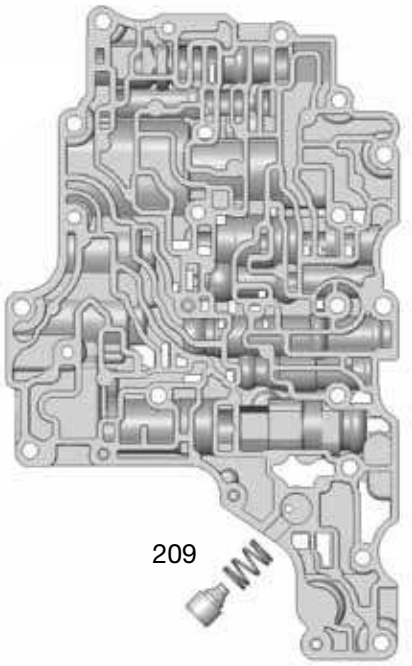
OE Exploded View

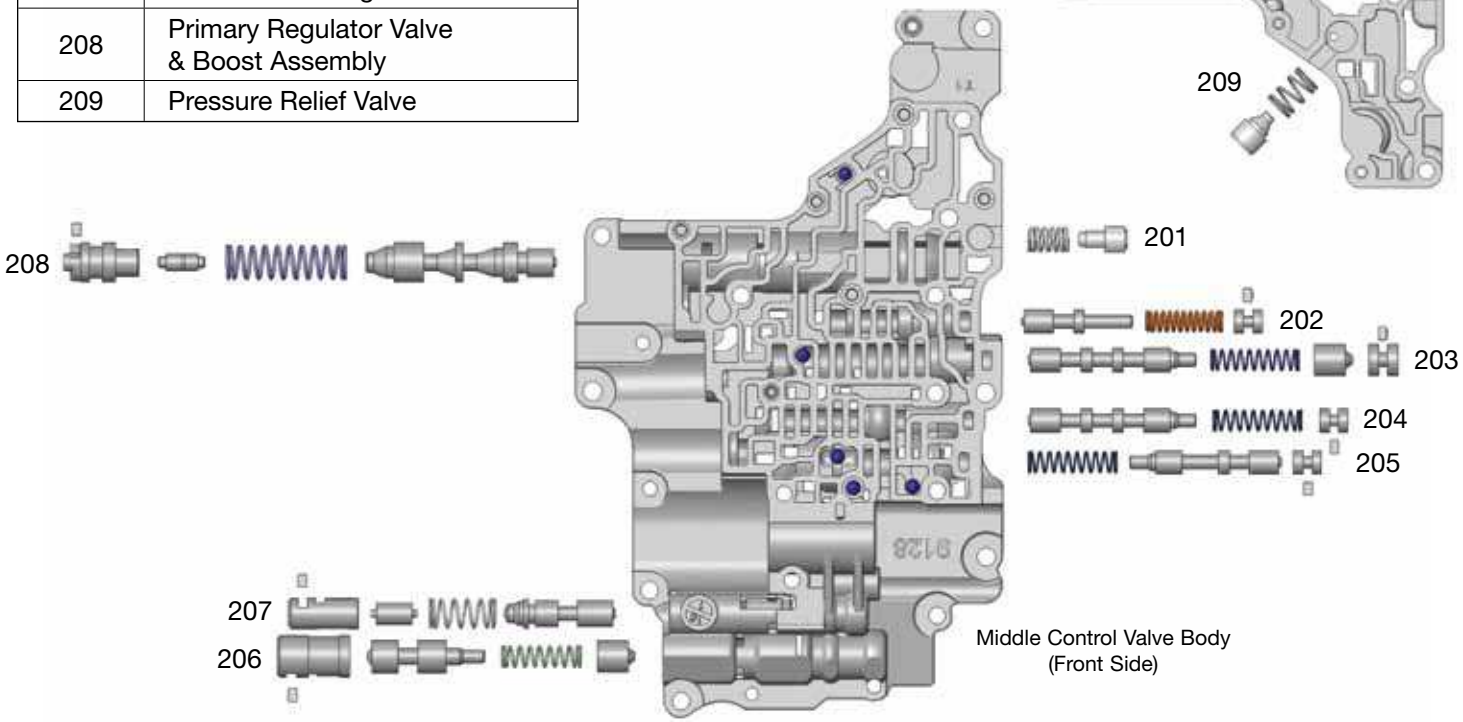
Front & Middle Control Valve Bodies Shown Here

Front Control Valve Body Descriptions	
I.D. No.	**Description**
101	Solenoid B-1 Modulator Valve No. 2
102	Neutral Relay Valve

Middle Control Valve Body Descriptions	
I.D. No.	**Description**
201	Pressure Relief Valve
202	Lockup Control Solenoid Valve
203	3-4 Shift Valve
204	2-3 Shift Valve
205	1-2 Shift Valve
206	Solenoid B-1 Modulator Valve No.1
207	Accumulator Regulator Valve
208	Primary Regulator Valve & Boost Assembly
209	Pressure Relief Valve

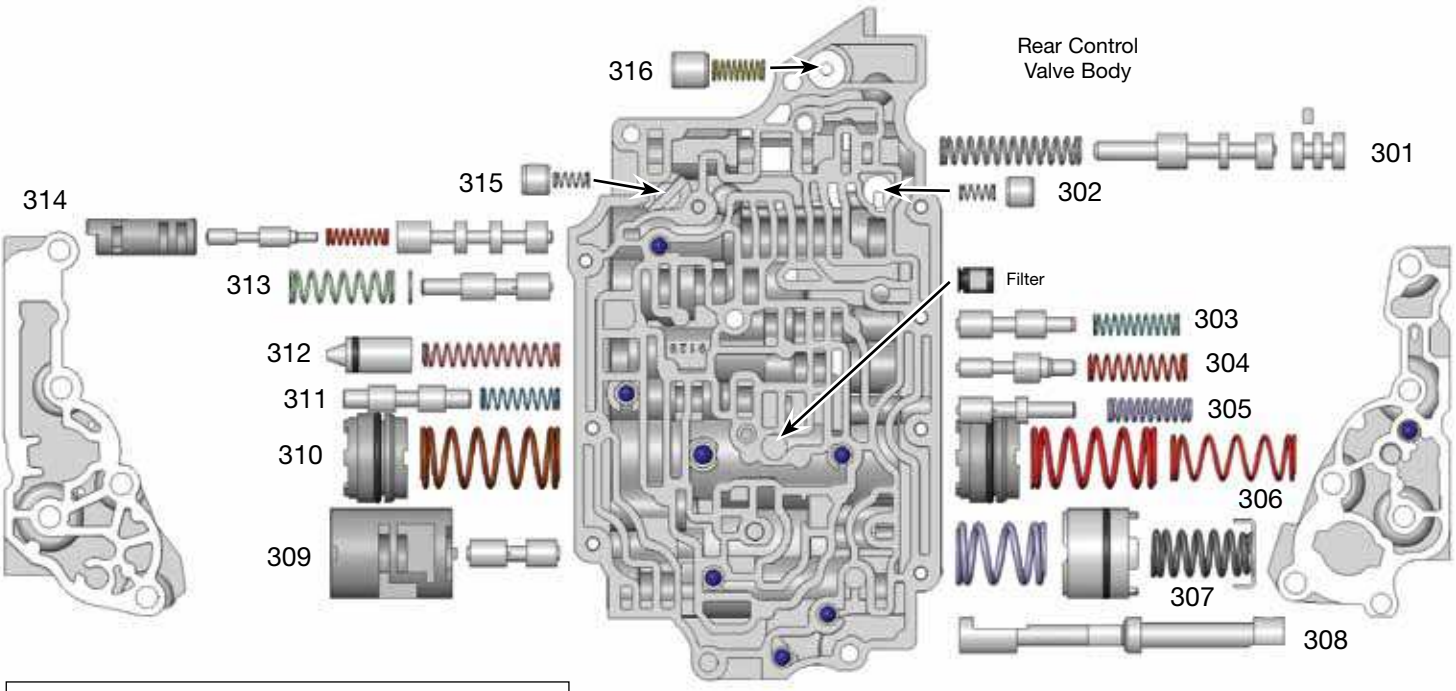






OE Exploded View

Rear & No. 2 Rear Control Valve Bodies Shown Here



Rear Control Valve Body Descriptions

I.D No.	Description
301	Secondary Regulator Valve
302	Check Valve
303	B-1 Modulator Control Valve
304	Low Modulator Valve
305	Solenoid Modulator Valve
306	C-2 Accumulator
307	B-1 Accumulator
308	Manual Valve
309	C-1 Control Valve Assembly
310	C-0 Accumulator
311	2-3 Timing Valve
312	C-1 Damper Piston
313	C-3 Modulator Valve
314	Lockup Relay Control Valve & Plunger Assembly
315	Check Valve
316	Check Valve

No. 2 Rear Control Valve Body Descriptions

I.D. No.	Description
401	Lockup Control Valve & Plunger Valve Assembly