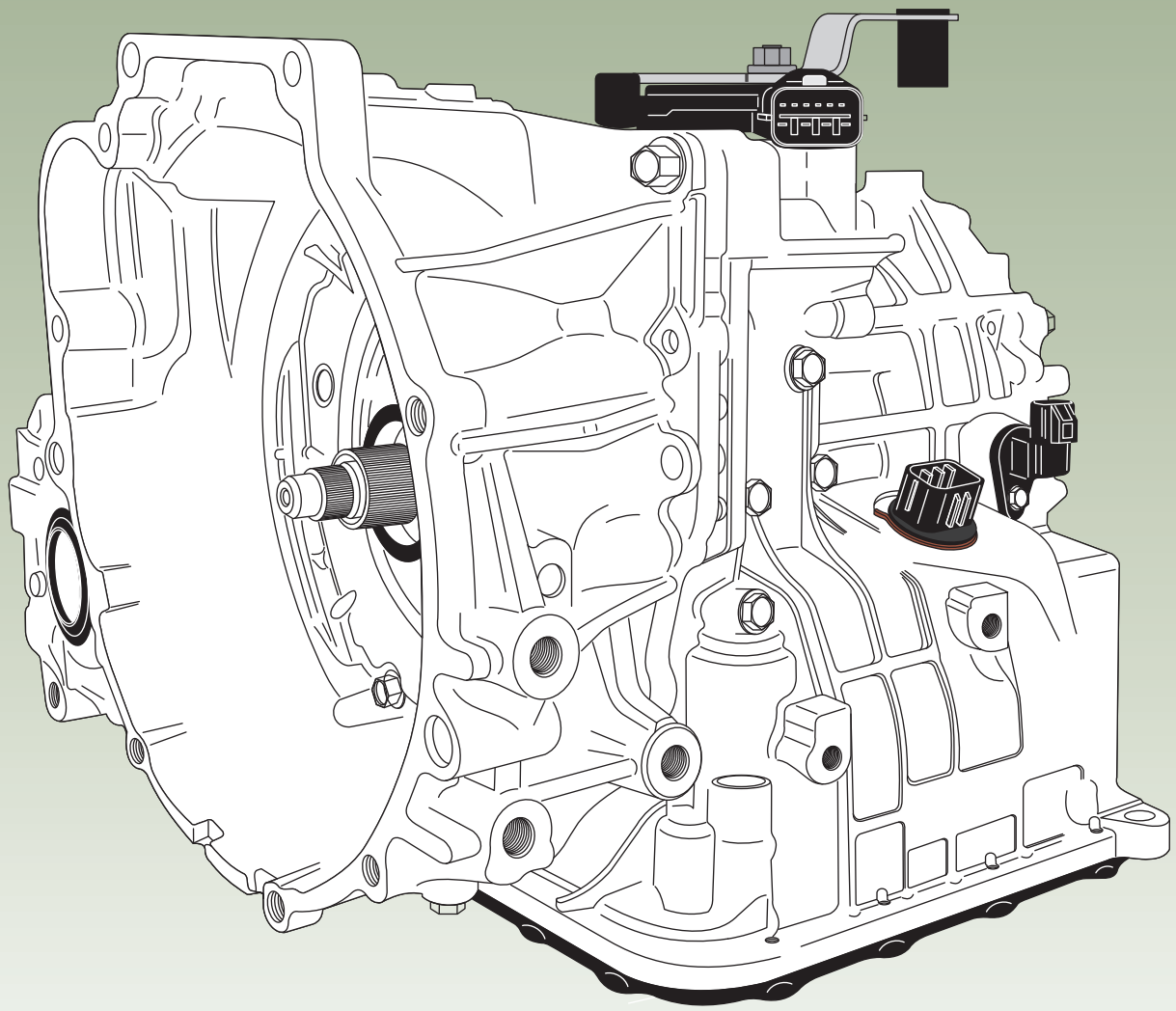
ATSG

KIA/HYUNDAI "A4CF2"

TECHNICIANS DIAGNOSTIC GUIDE



Technical

SERVICE INFORMATION

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INTRODUCTION

HYUNDAI/KIA A4CF2

The A4CF2 is a four speed, Front Wheel Drive transaxle, with fully electronic controls for the upshifts and downshifts, with 4th gear being overdrive. The individual gear ratios are achieved through two planetary gear sets connected one behind the other. The components of the planetary gear sets are driven or held by means of five multiple plate clutch packs and is also equipped with a low sprag.

This unit is currently found in 2006 and later Kia Spectra 2.0L and 2007 and later Hyundai Elantra (HD) 2.0L vehicles. The A4CF2 transmission is much like the F4A51 transmission but with the valve body mounted at the bottom of the transmission rather than the side. ATSG's F4A51 Techtran Manual can be used for the disassembly and reassembly of the A4CF2's internal components. The manufacturer does not provide and information pertaining to the A4CF2 valve body and since it is significantly different to the F4A51, this Technician's Guide will be a tremendous aid as it provides complete and extensive valve body information, solenoid function, operation, specification and identification, electrical information, complete hydraulics and case passage identification. All of it designed to help you diagnose and resolve and transmission malfunctions with the A4CF2.

We wish to thank Mitsubishi Motor Company for the information and illustrations that have made this booklet possible. A special thanks also to ALTO Products for supplying ATSG with an A4CF2 transmission from which this Technician Guide was developed.

The information and part numbers contained in this booklet have been carefully compiled from industry sources known for their reliability, but ATSG does not guarantee its accuracy.

PETER LUBAN
TECHNICAL SUPERVISOR

WAYNE COLONNA
PRESIDENT

JIM DIAL
SENIOR TECHNICAL CONSULTANT

GERALD CAMPBELL
TECHNICAL CONSULTANT

DALE ENGLAND
FIELD SERVICE CONSULTANT

ROLAND ALVAREZ
TECHNICAL CONSULTANT

ED KRUSE
TECHNICAL CONSULTANT

JON GLATSTEIN
TECHNICAL CONSULTANT

DAVID CHALKER
TECHNICAL CONSULTANT

RICHARD GRAHAM
TECHNICAL CONSULTANT

GREGORY LIPNICK
TECHNICAL CONSULTANT

GABE DE LOS REYES
TECHNICAL CONSULTANT

GREG CATANZARO
TECHNICAL CONSULTANT

AUTOMATIC TRANSMISSION SERVICE GROUP
18635 S.W. 107 AVENUE
MIAMI, FLORIDA 33157
(305) 670-4161

HYUNDAI/KIA
A4CF2

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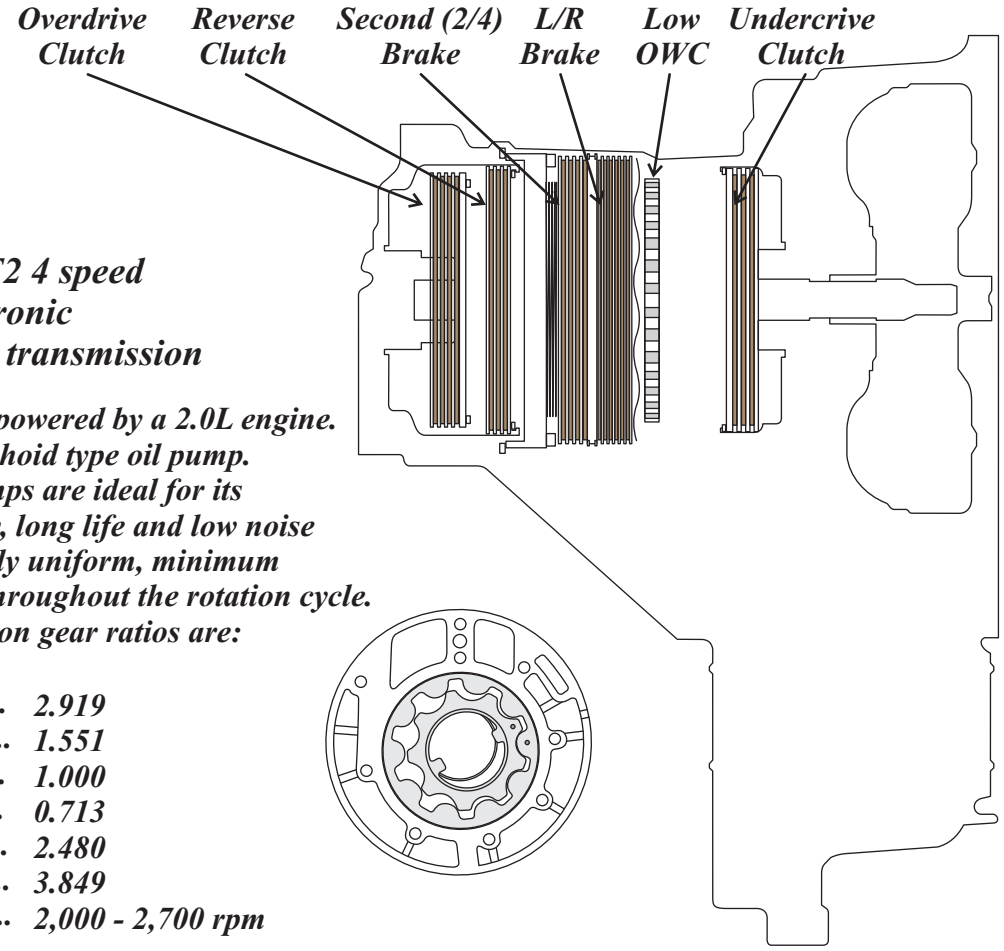
AUTOMATIC TRANSMISSION SERVICE GROUP
18635 S.W. 107 AVENUE
MIAMI, FLORIDA 33157
(305) 670-4161

A4CF2
Diagnostic Information

COMPONENT LOCATION AND APPLICATION CHART



The A4CF2 4 speed fully electronic controlled transmission

The A4CF2 is powered by a 2.0L engine. It uses a Parachoid type oil pump. Parachoid pumps are ideal for its high-efficiency, long life and low noise due to extremely uniform, minimum tip clearance throughout the rotation cycle. The transmission gear ratios are:

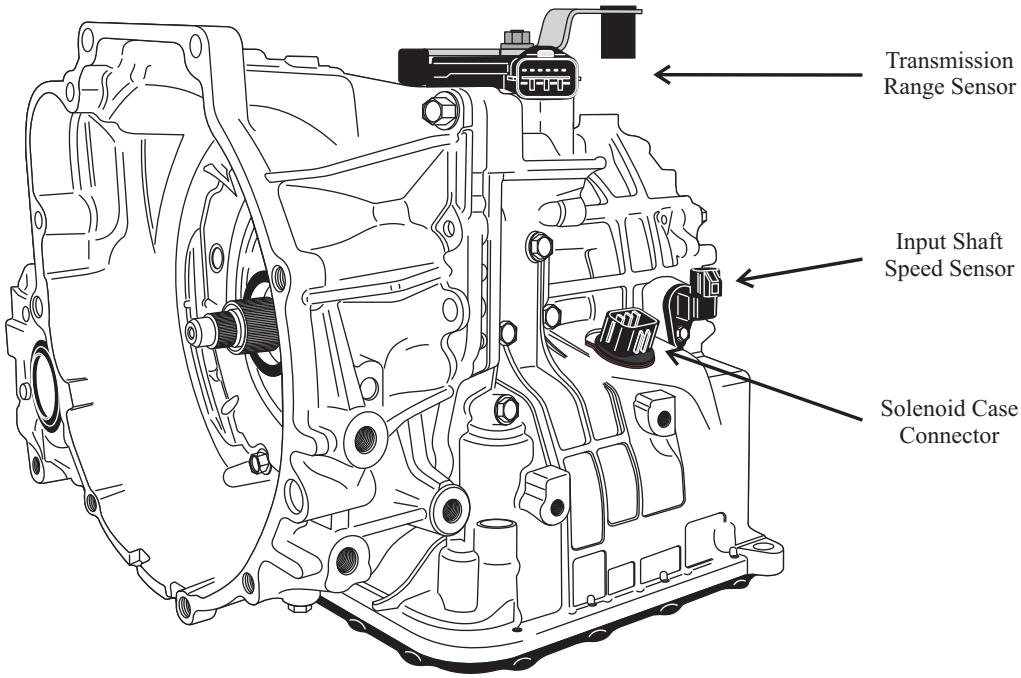
1st.....	*2.919*
2nd.....	*1.551*
3rd.....	*1.000*
4th.....	*0.713*
Reverse.....	*2.480*
Final Gear.....	*3.849*
Stall Speed.....	*2,000 - 2,700 rpm*

Gear / Clutch	UD/C	OD/C	REV/C	2-4/B	L-R/B	OWC
Park					●	
Reverse			●		●	
Neutral					●	
D-1, 3-1 & 2-1	●					●
D-2, 3-2 & 2-2	●			●		
D-3, 3-3	●	●				
D-4		●		●		
L-1	●				●	

Figure 1

A4CF2
Diagnostic Information

SENSOR ID AND LOCATION



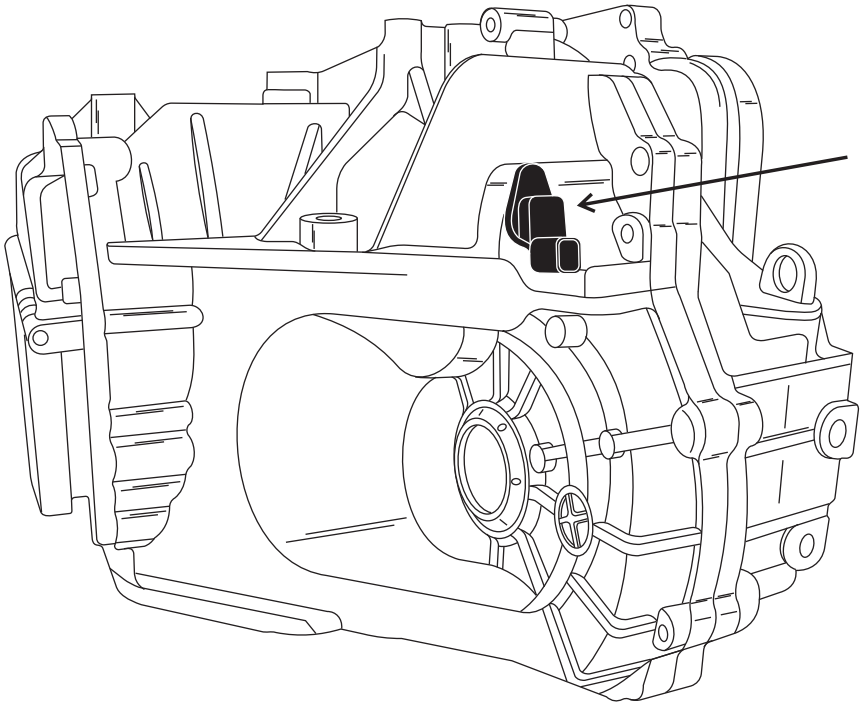
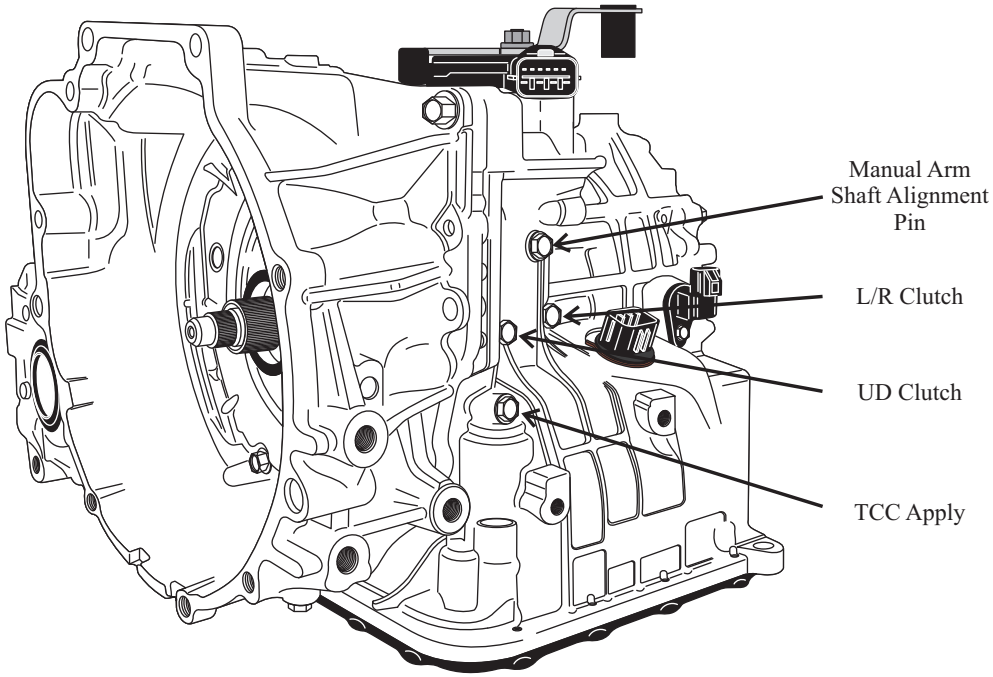


Figure 2

A4CF2
Diagnostic Information

PRESSURE TAP ID



Gear / Clutch	UD/C	OD/C	REV/C	2-4/B	L-R/B
Park					150 ±3
Reverse			250 ±11		250 ±11
Neutral					150 ±3
D-1, 3-1 & 2-1	150 ±3				
D-2, 3-2 & 2-2	150 ±3			150 ±3	
D-3, 3-3	150 ±3	150 ±3			
D-4		150 ±3		150 ±3	
L-1	150 ±3				150 ±3

HYDRAULIC PRESSURE TEST

1. Warm up the engine until the automatic transaxle fluid temperature is 80~100°C(176~212°F).
2. Jack up the vehicle so that the wheels are free to turn.
3. Connect the special tools(09452-21500, 09452-21000) oil pressure gauge to each pressure discharge port.
4. Measure the hydraulic pressure at each port under the conditions given in the standard hydraulic pressure table, and check that the measured values are within the standard value ranges.
5. Oil Pump Revolution: 2500 RPM
6. Specifications above are provided in PSI

Figure 3

A4CF2
Diagnostic Information

PRESSURE TAP ID

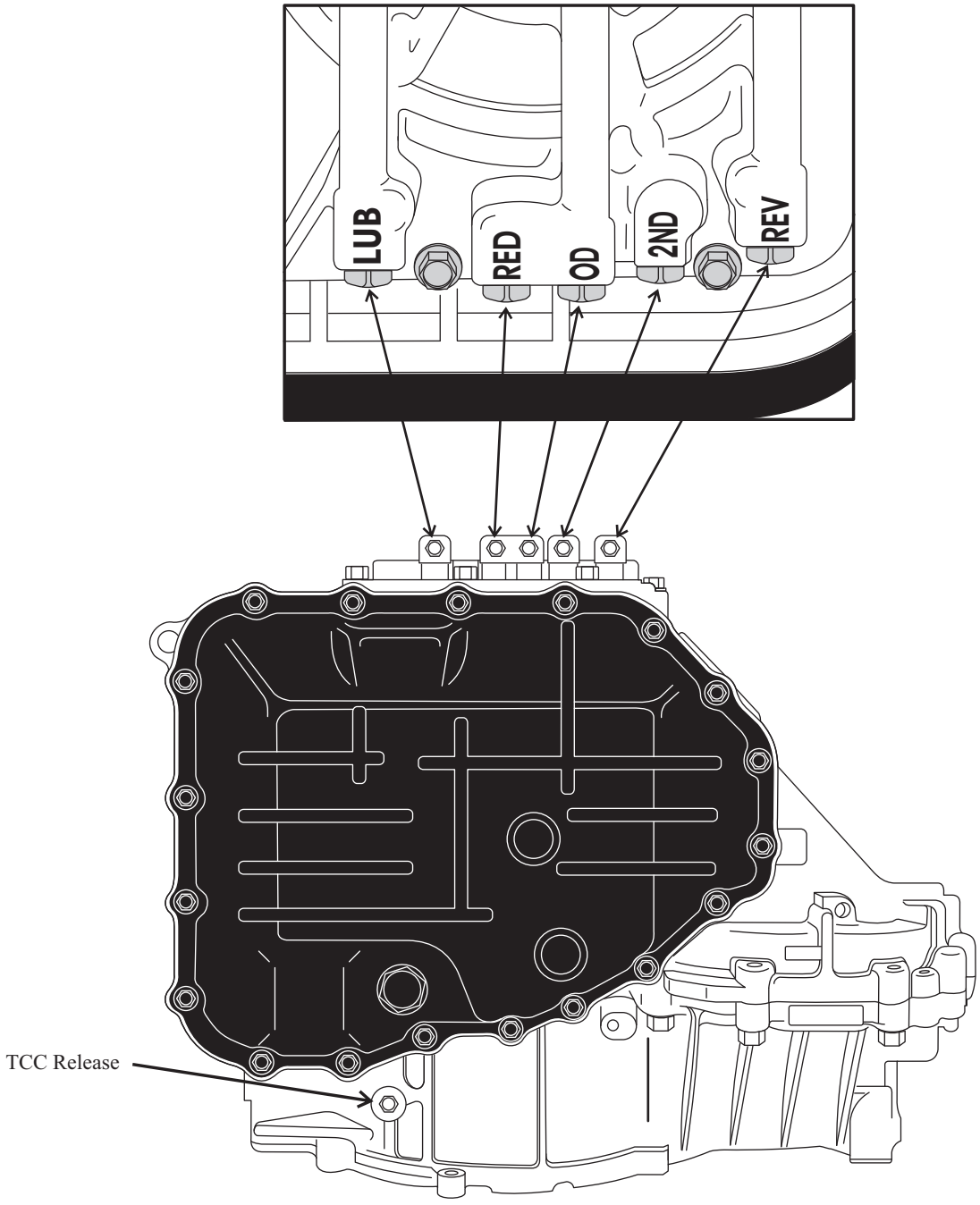
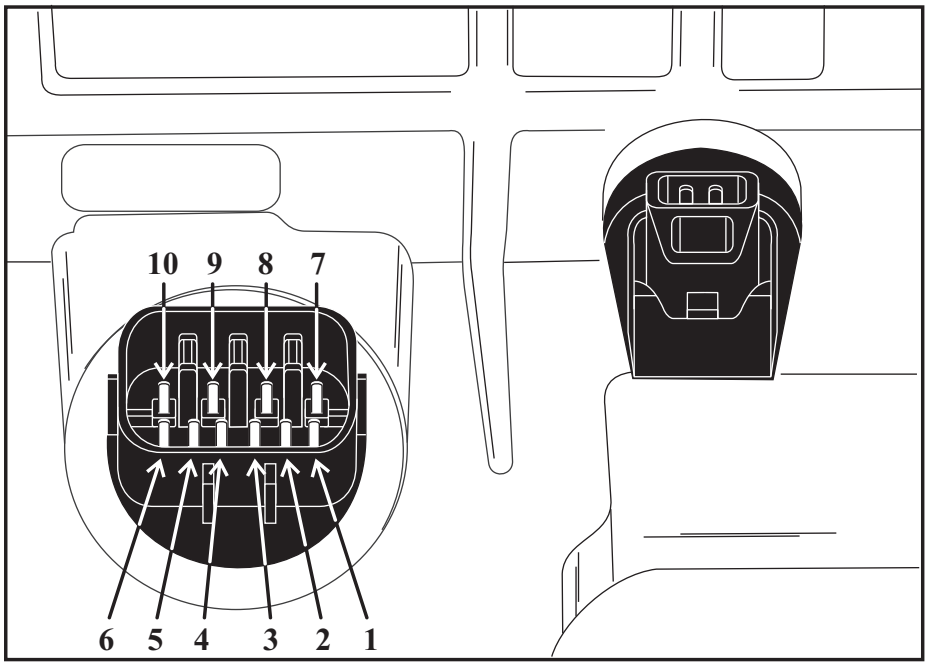


Figure 4

A4CF2
Diagnostic Information

CASE CONNECTOR TERMINAL ID



1 - PCSV A - (OD-L/R Clutch)
2 - PCSV B - (2/4 Clutch)
3 - On-Off - (OD-L/R Switch Valve)
4 - PCSV D (TCC)
5 - TFT Signal
6 - TFT Ground
7 - Solenoid Ground
8 - PCSV C - (UD Clutch)
9 - VFS (Line) Low
10 - VFS (Line) High

All Solenoids 2.5 to 4.5 ohms

Figure 5

A4CF2
Diagnostic Information

TFT AND VFS TO MAIN HARNESS HUB CONNECTOR

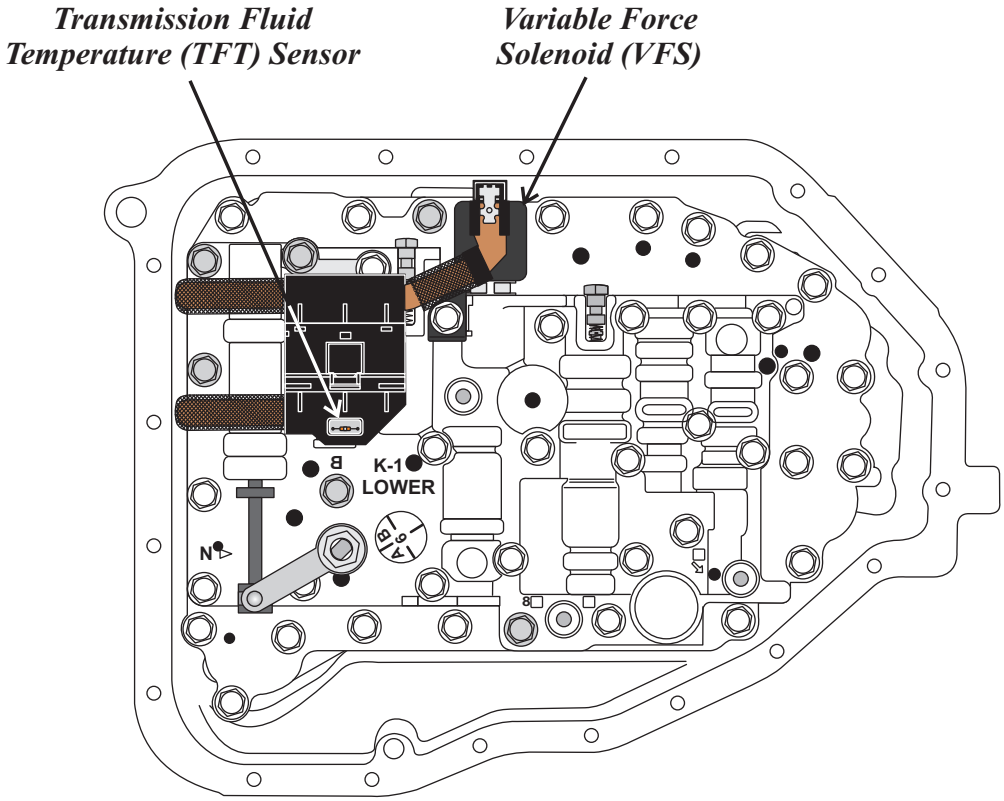


Figure 6

A4CF2
Diagnostic Information

TFT AND VFS TO MAIN HARNESS HUB CONNECTOR UNPLUGGED

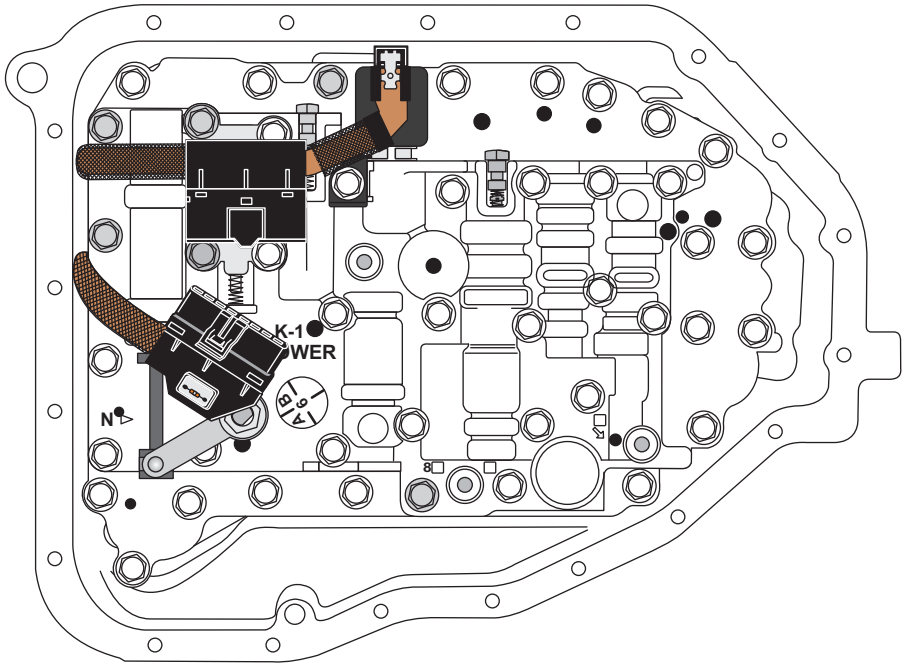
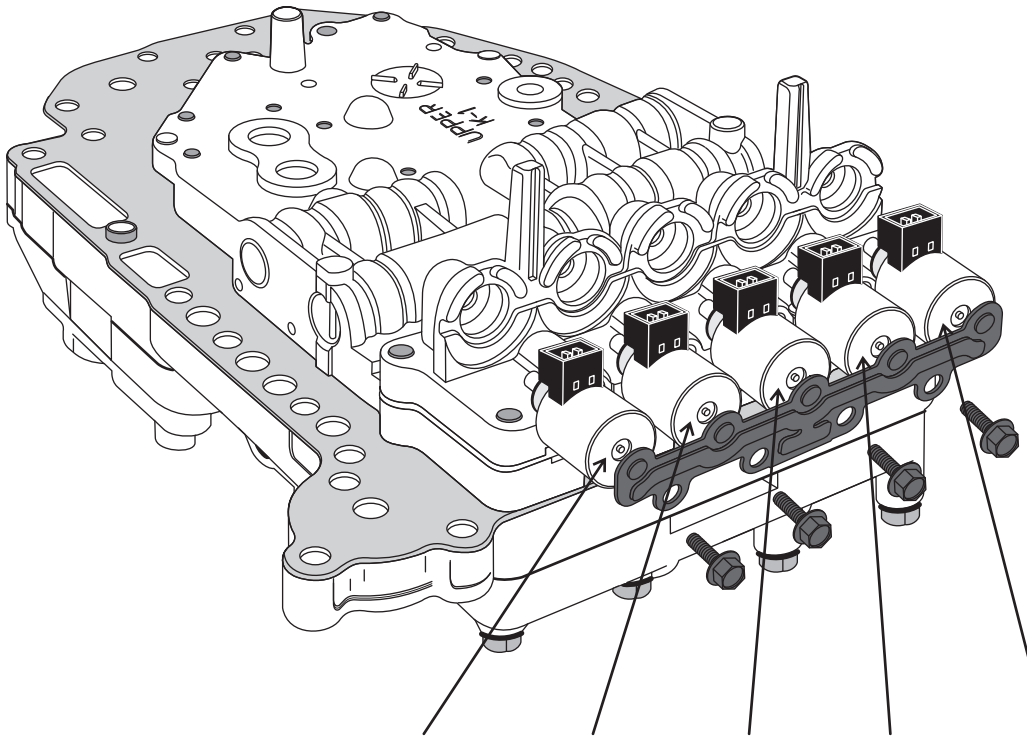


Figure 7

A4CF2
Diagnostic Information

SHIFT AND CONVERTER CLUTCH SOLENOID LOCATION AND IDENTIFICATION



All Solenoids
2.5 to 4.5 ohms

PSCV-A (SCSV-B) OD-L/R Clutch

ON-OFF (SCSV-A) OD-L/R Switch Valve

PSCV-D (TCC-SV)

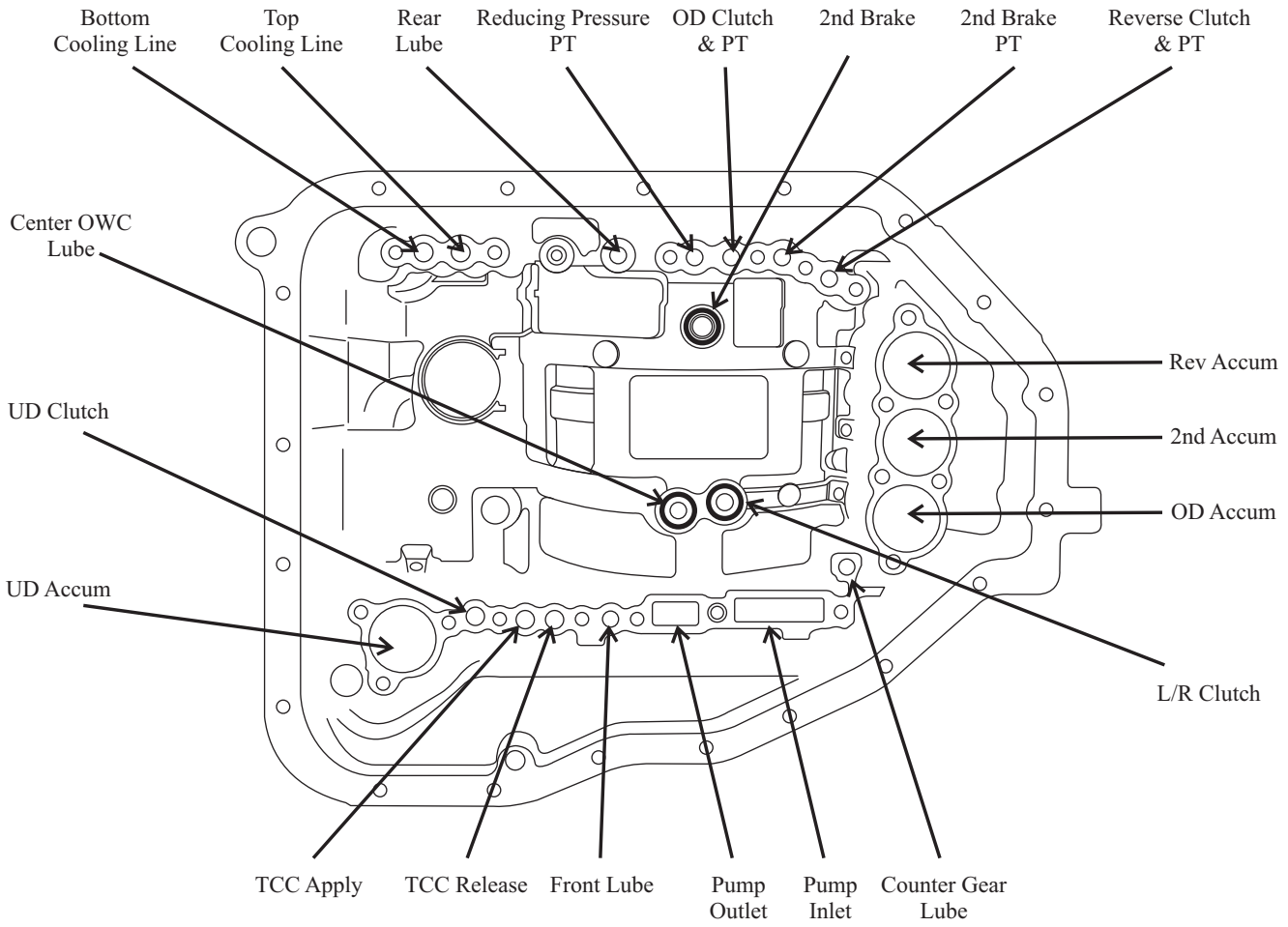
PSCV-C (SCSV-D) UD Clutch

PSCV-B (SCSV-C) 2/4 Clutch

Figure 8

A4CF2
Diagnostic Information

VALVE BODY TO CASE PASSAGE IDENTIFICATION



PT - Pressure Tap

Figure 9

A4CF2
Diagnostic Information

REAR CASE TO COVER PASSAGE IDENTIFICATION

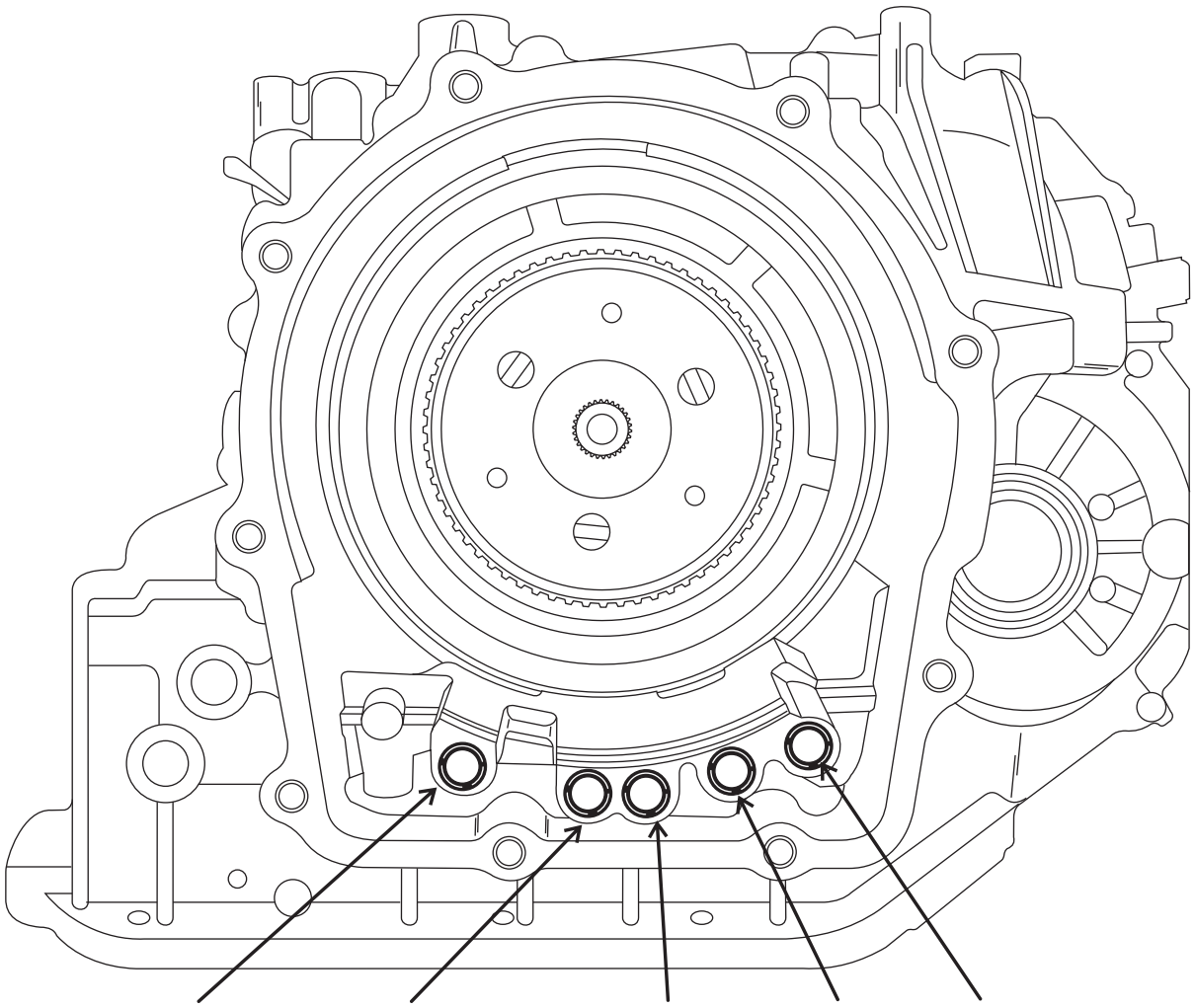


Figure 10

A4CF2
Diagnostic Information

REAR COVER TO CASE PASSAGE IDENTIFICATION

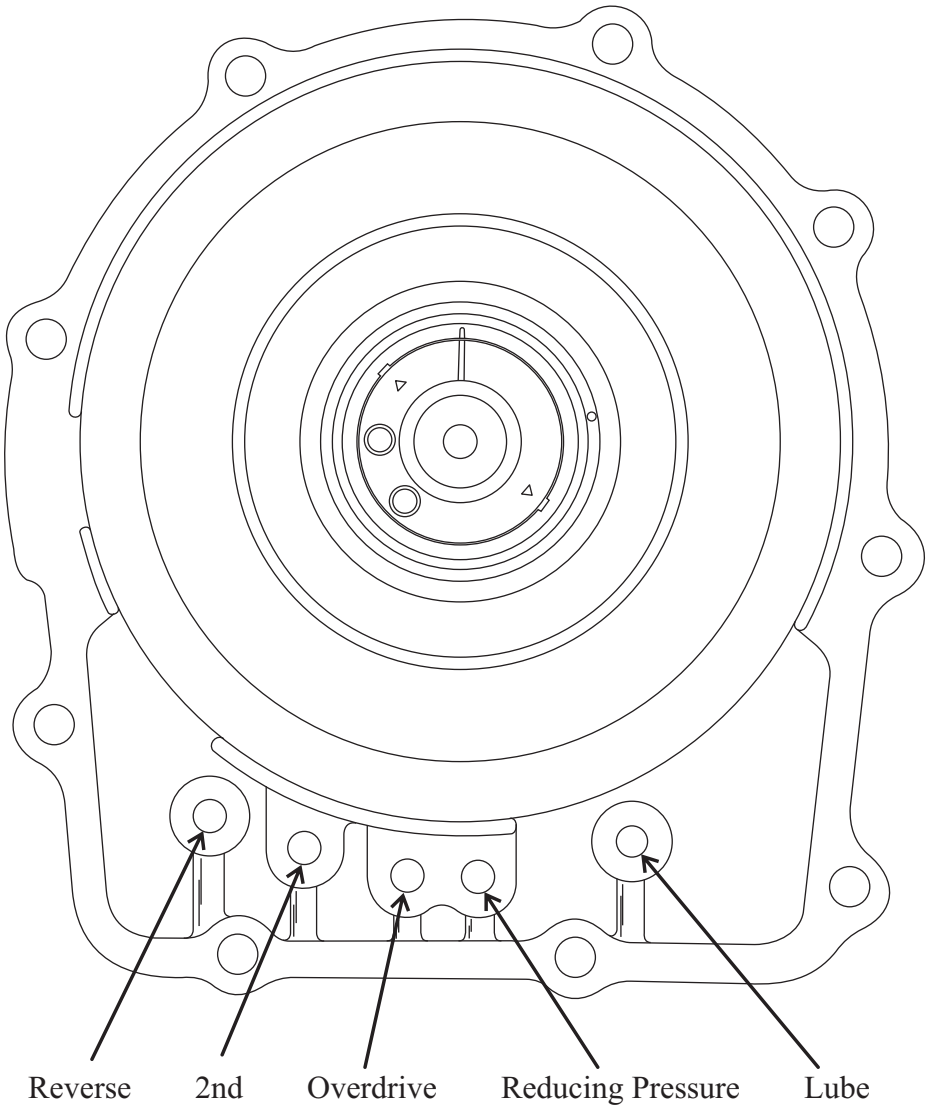


Figure 11

A4CF2
Diagnostic Information

MAIN CASE TO CONVERTER HOUSING CASE PASSAGE IDENTIFICATION

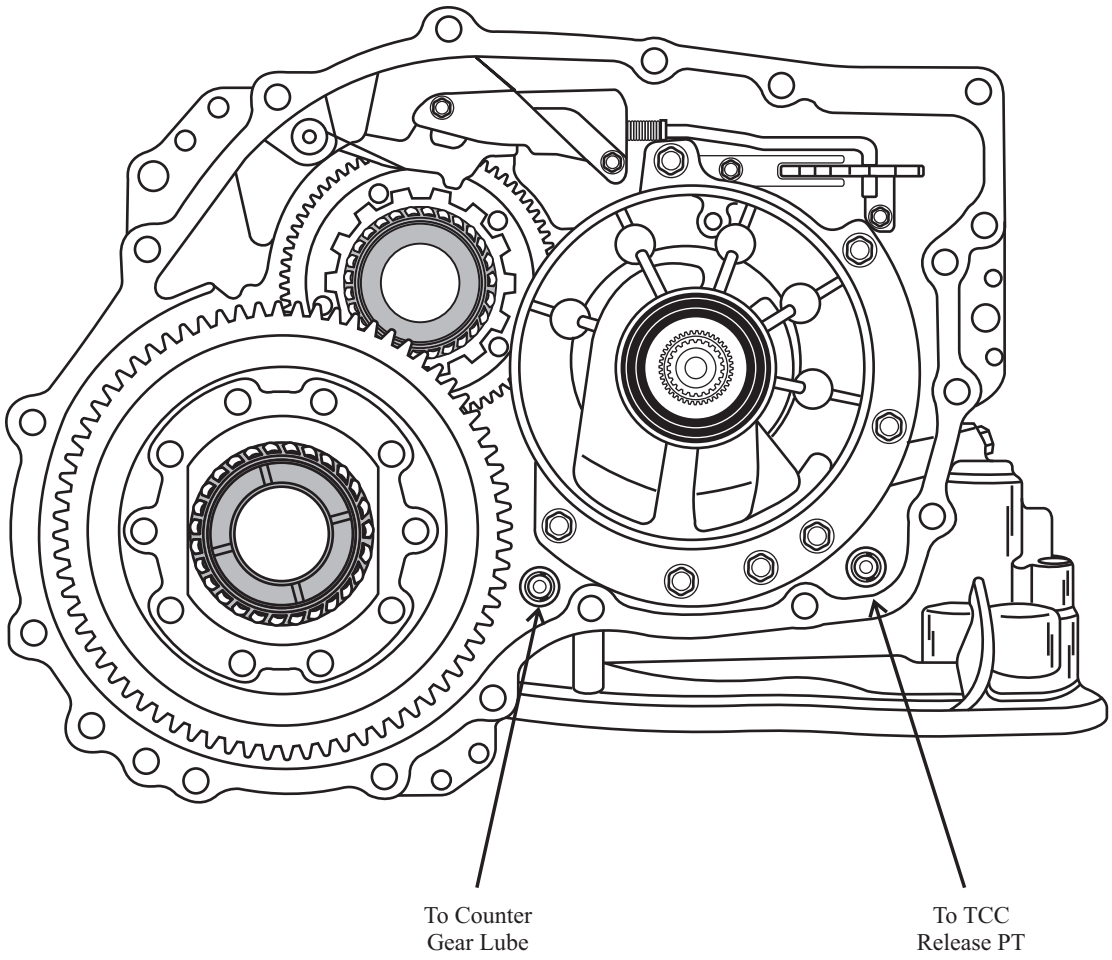


Figure 12

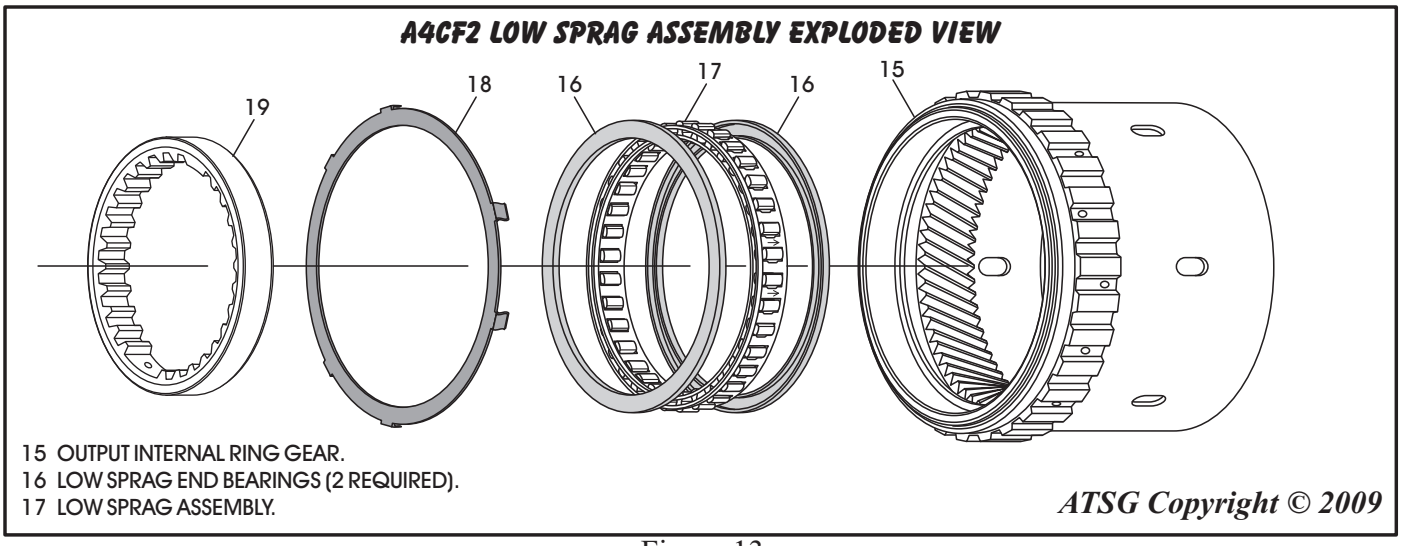


Figure 13

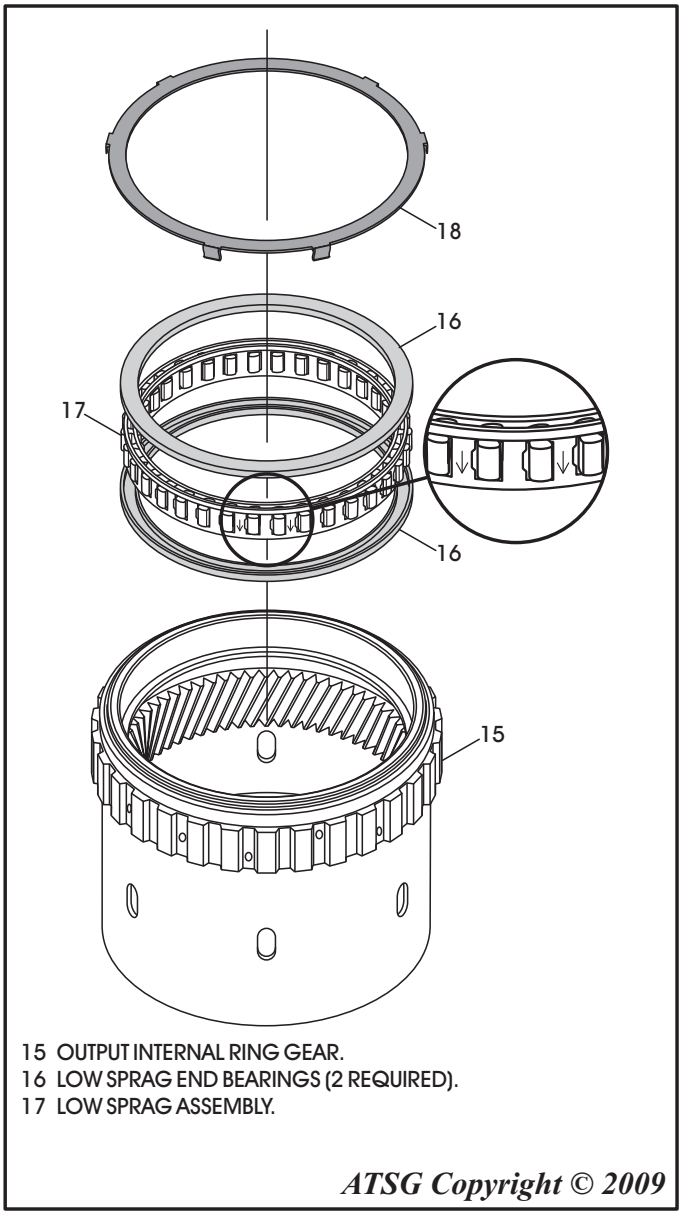


Figure 14

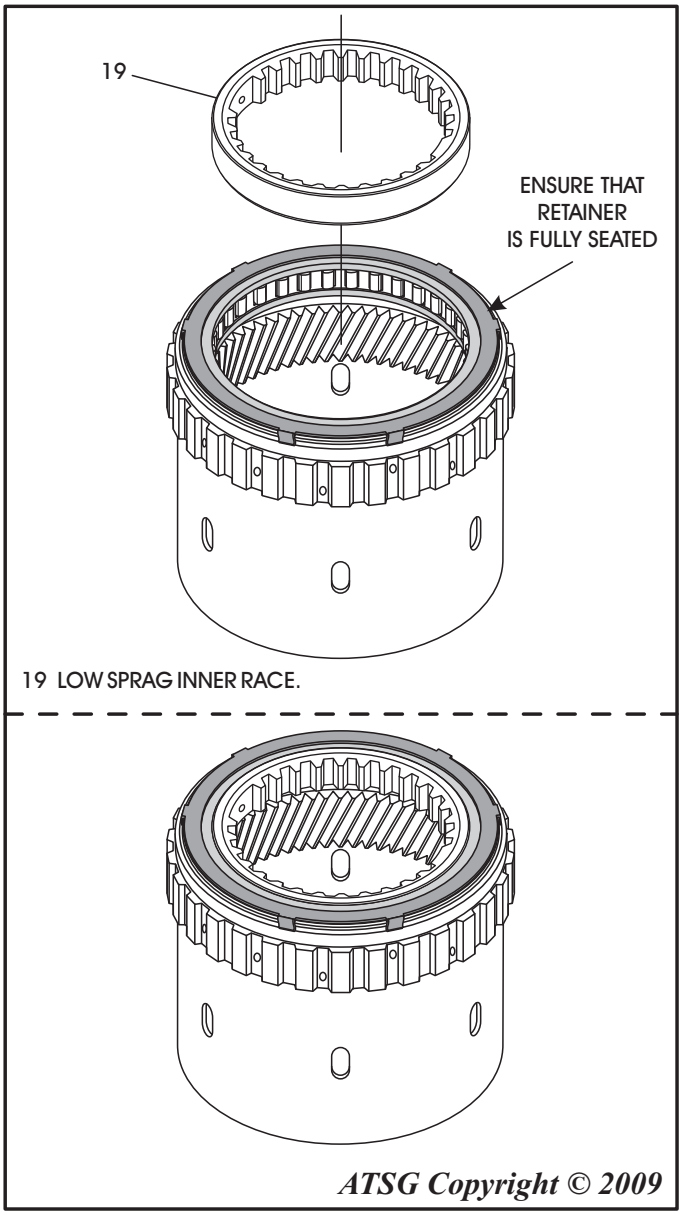


Figure 15

A4CF2
Diagnostic Information

VALVE BODY ASSEMBLY PROCESS

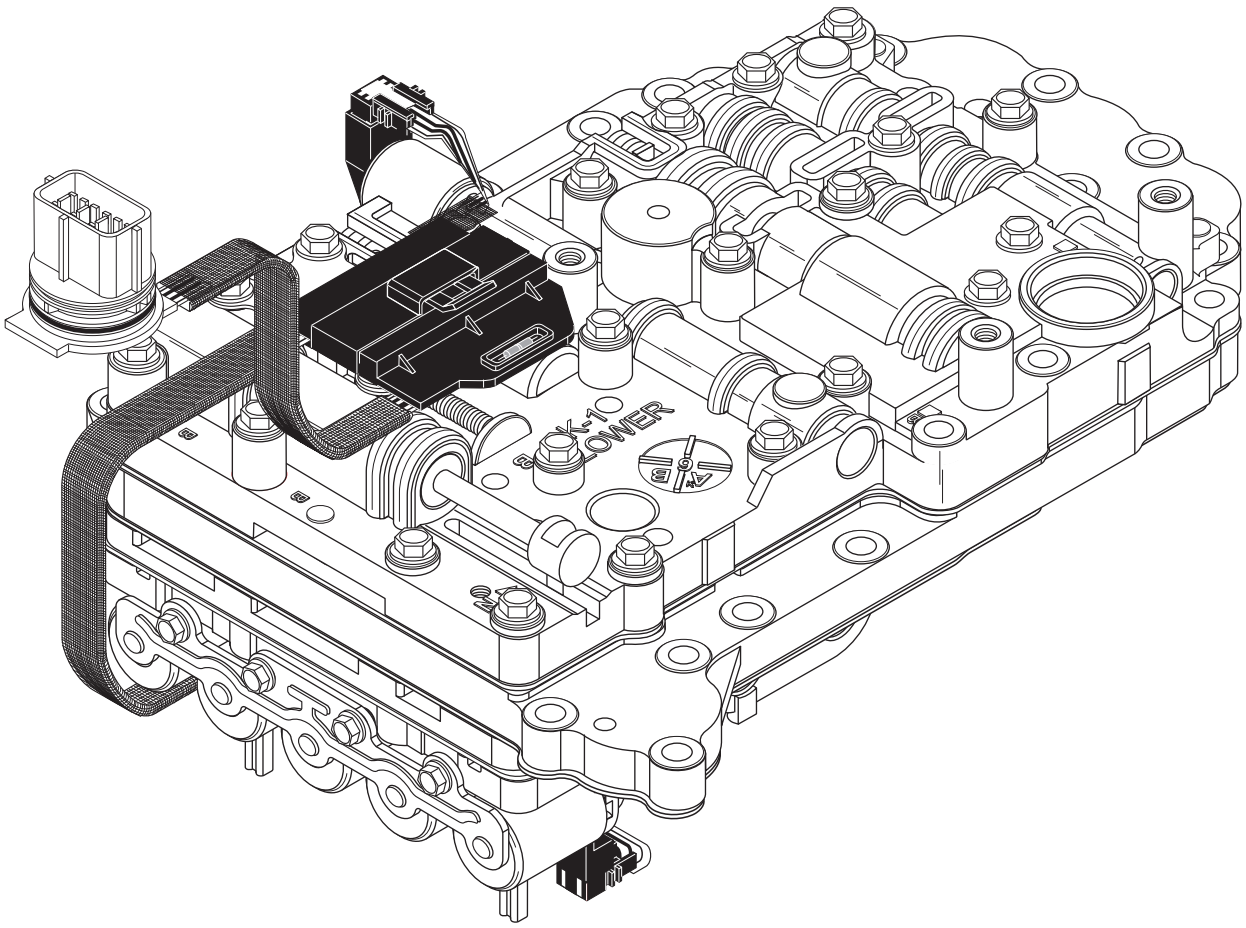
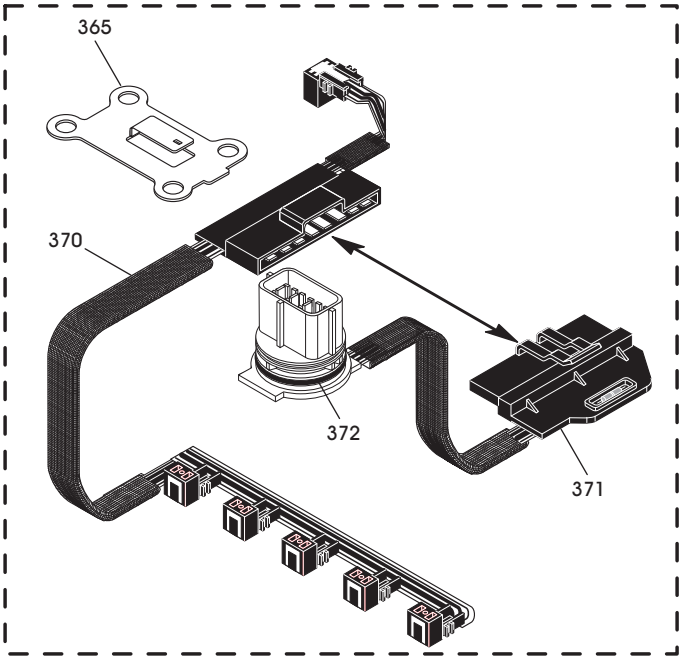


Figure 16

EXTERNAL VALVE BODY PARTS EXPLODED VIEW



365 INTERNAL HARNESS CONNECTOR RETAINING BRACKET.
366 LINE PRESSURE SOLENOID RETAINING BRACKET.
367 VALVE BODY BOLT, 70 MM LENGTH (4 REQUIRED).
368 VALVE BODY BOLT, 55 MM LENGTH (1 REQUIRED).
369 VALVE BODY BOLT, 60 MM LENGTH (19 REQUIRED).
370 INTERNAL SOLENOID HARNESS ASSEMBLY.
371 PASS-THRU CASE CONNECTOR AND HARNESS ASSEMBLY.
372 CASE CONNECTOR "O" RING.

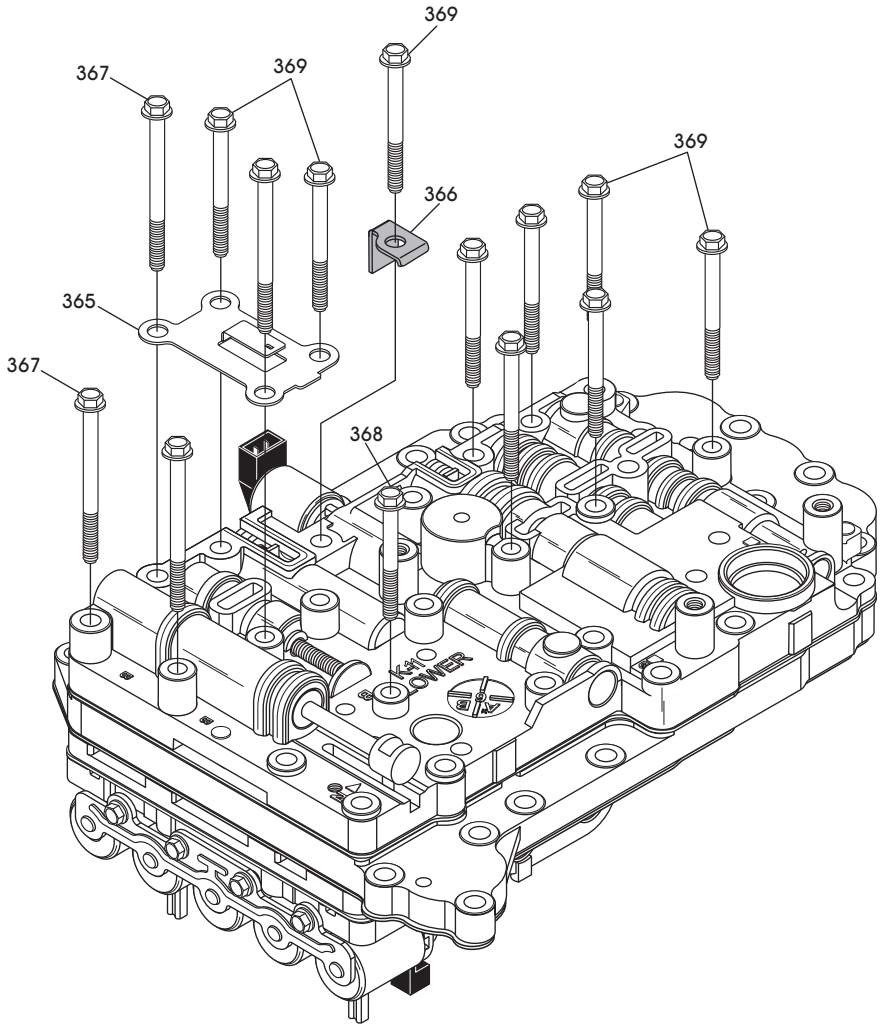
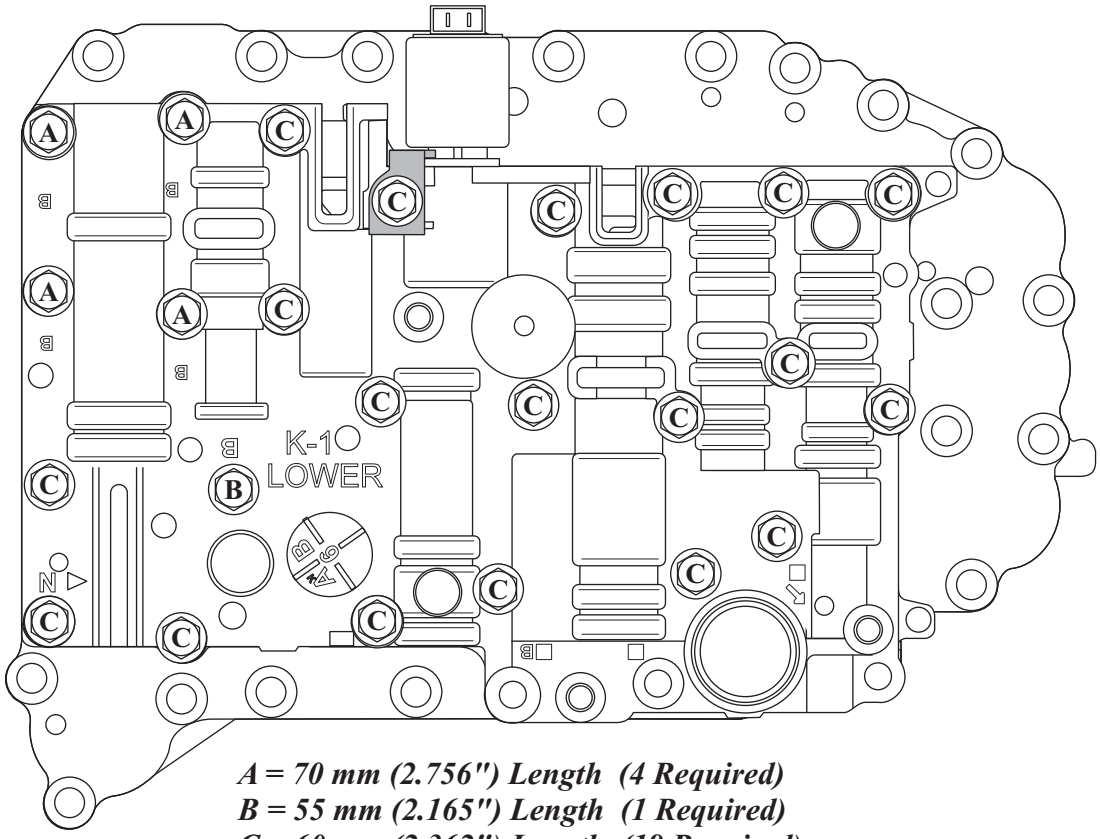


Figure 17

LOWER VALVE BODY TO UPPER VALVE BODY BOLT LOCATIONS AND LENGTH



A = 70 mm (2.756") Length (4 Required)
B = 55 mm (2.165") Length (1 Required)
C = 60 mm (2.362") Length (19 Required)

Figure 18

VALVE BODY DISASSEMBLY

1. Remove pass-thru case connector and harness assembly (371) from the internal solenoid harness assembly (370), as shown in Figure 1.
2. Remove and discard pass-thru case connector "O" ring (See Figure 17).
3. Remove the 24 valve body bolts to separate the individual pieces (See Figure 17 and 18). ***Note: The solenoid body and spacer plate will separate at this time and should be set aside for now, as shown in Figure 19***
4. Remove the lower valve body and the spacer plate as an assembly, leaving the spacer plate in place and set aside for now (See Figure 20). ***Note: The lower valve body spacer plate is held in place with a small retaining bolt.***

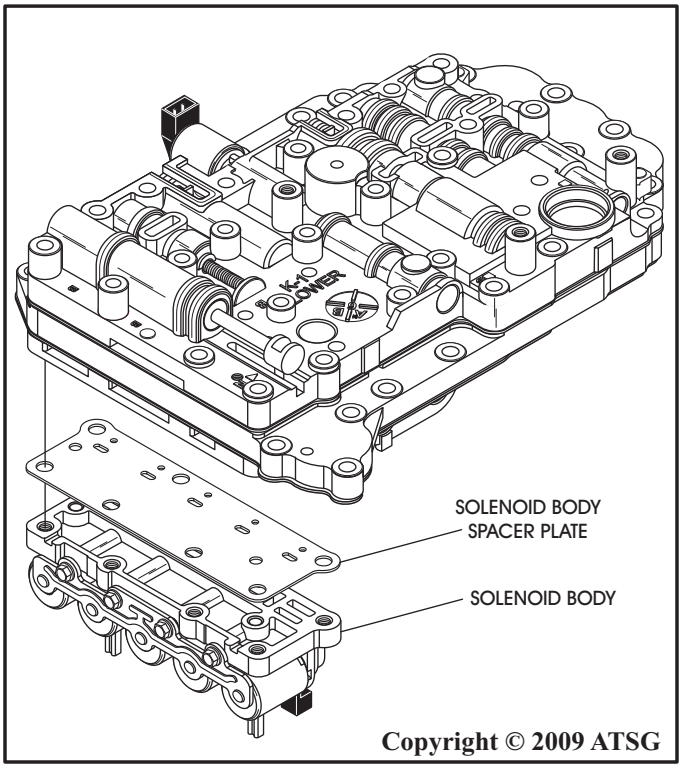
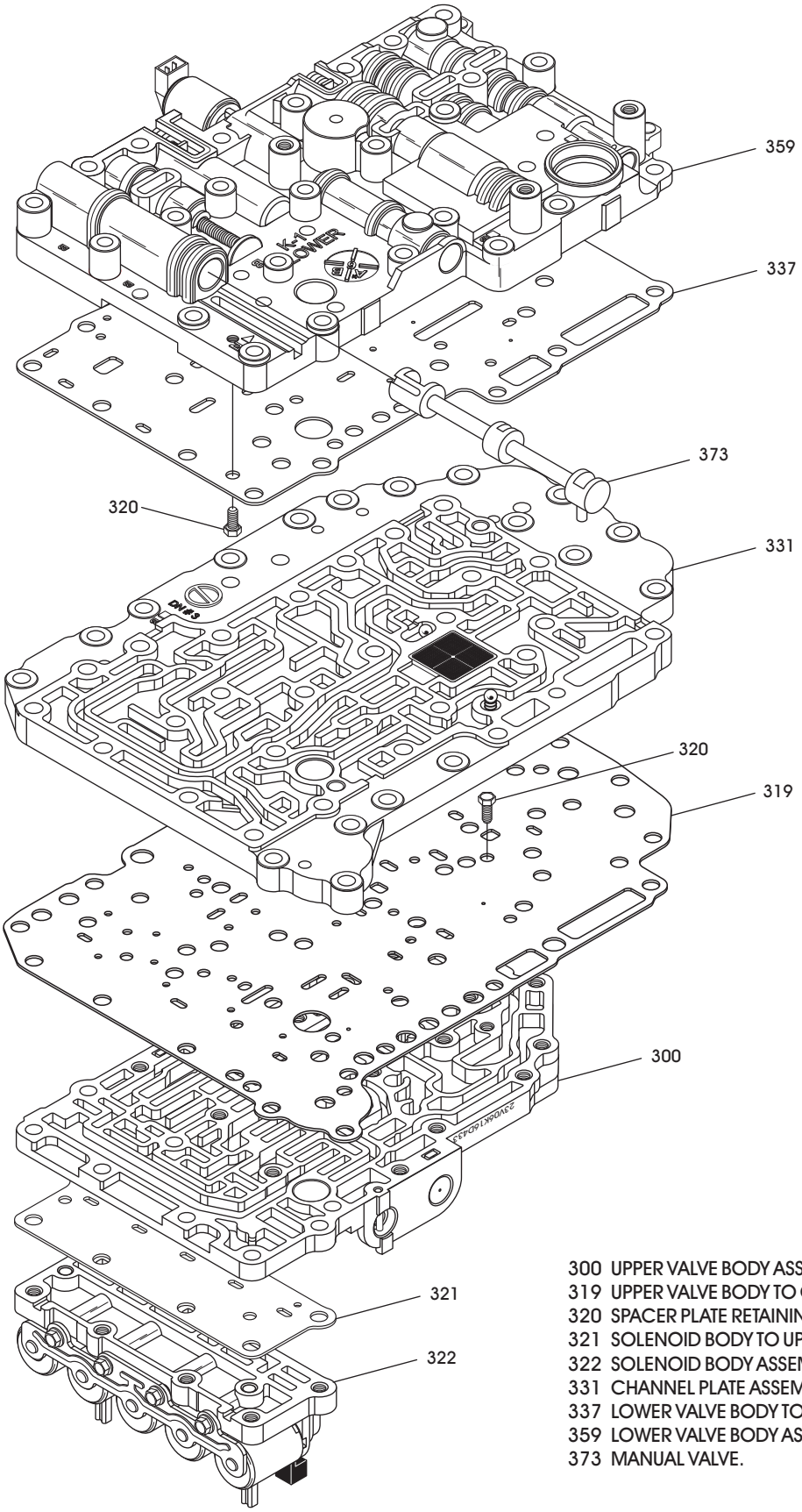


Figure 19

VALVE BODY ASSEMBLY EXPLODED VIEW



300 UPPER VALVE BODY ASSEMBLY.
319 UPPER VALVE BODY TO CHANNEL PLATE SPACER PLATE.
320 SPACER PLATE RETAINING BOLT (2 REQUIRED).
321 SOLENOID BODY TO UPPER VALVE BODY SPACER PLATE.
322 SOLENOID BODY ASSEMBLY.
331 CHANNEL PLATE ASSEMBLY.
337 LOWER VALVE BODY TO CHANNEL PLATE SPACER PLATE.
359 LOWER VALVE BODY ASSEMBLY.
373 MANUAL VALVE.

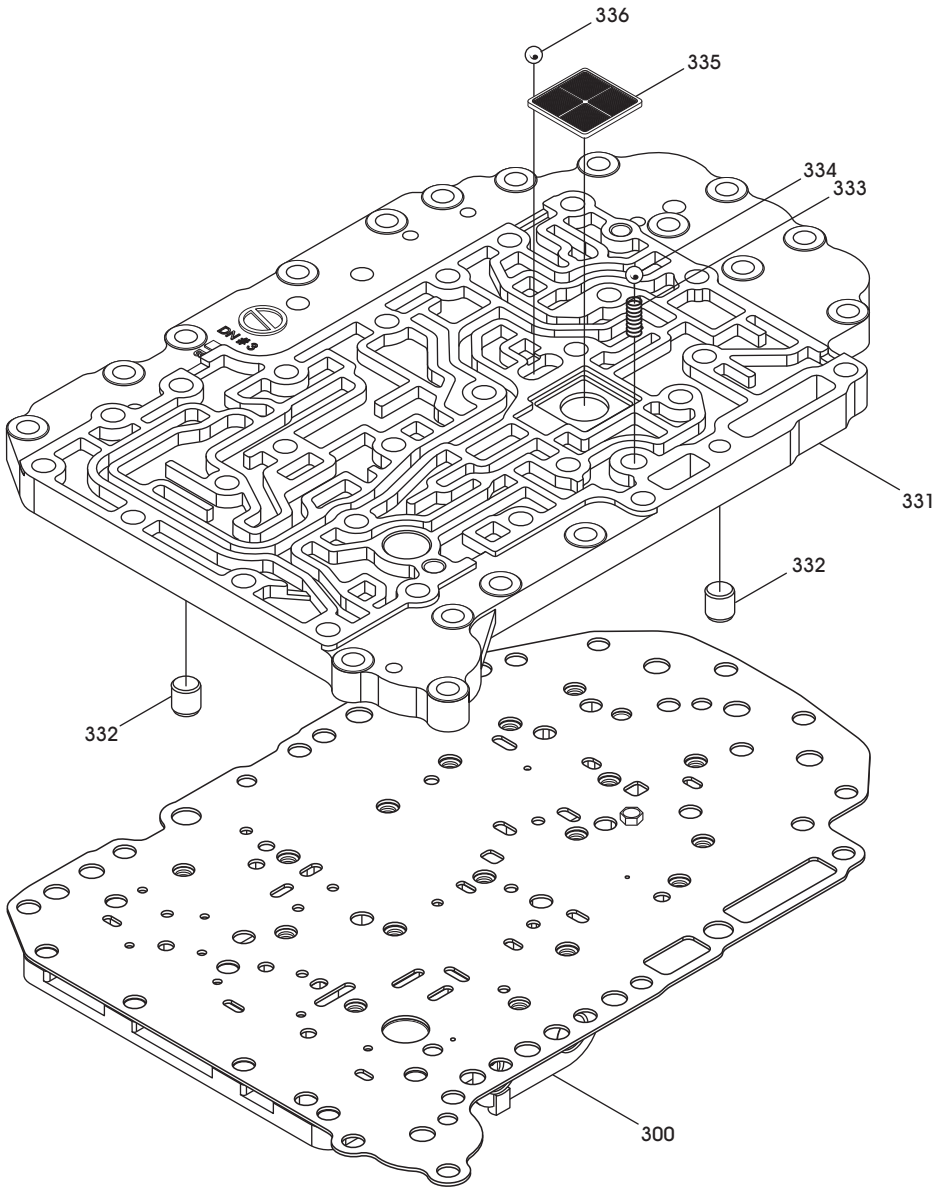
Figure 20

VALVE BODY DISASSEMBLY

5. Remove the check ball and spring, bath tub check ball, and plastic screen from the channel plate as shown in Figure 21, and set them aside.

6. Remove valve body channel plate, as shown in Figure 21, and set aside for now.
Note: It is not necessary to remove the hollow dowels from channel plate.

CHANNEL PLATE ASSEMBLY EXPLODED VIEW



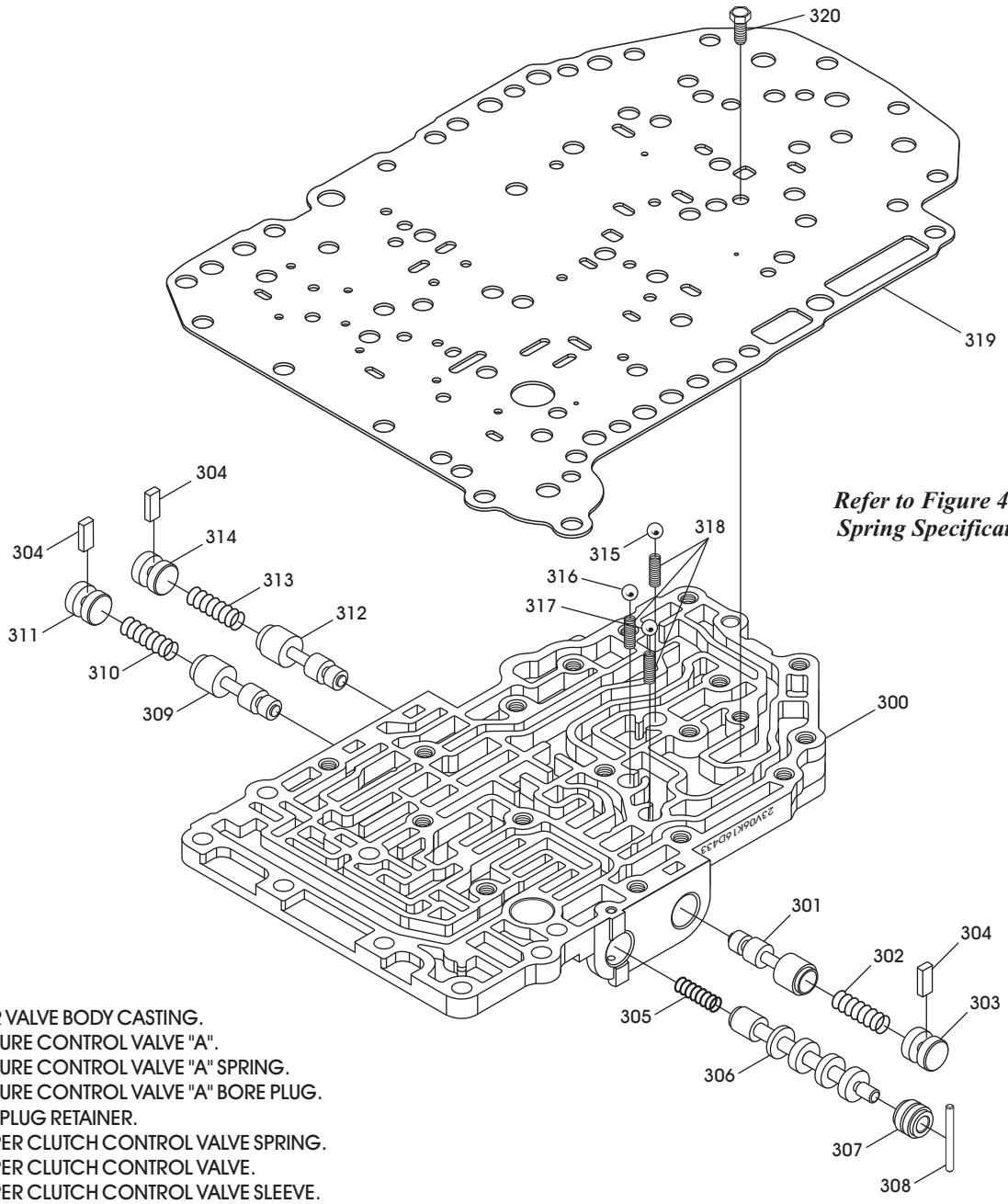
300 UPPER VALVE BODY WITH SPACER PLATE ASSEMBLY.
331 CHANNEL PLATE.
332 CHANNEL PLATE HOLLOW LOCATING DOWELS.
333 CHECK BALL SPRING.
334 1/4" STEEL CHECK BALL (LINE BLOW OFF).
335 PLASTIC SCREEN ASSEMBLY.
336 1/4" STEEL SHUTTLE BALL (REVERSE-LOW/REVERSE CLUTCH).

Figure 21

VALVE BODY DISASSEMBLY

7. Remove spacer plate retaining bolt, as shown in Figure 22, and remove spacer plate.
   Note: No gaskets used in this valve body.

UPPER VALVE BODY ASSEMBLY EXPLODED VIEW



Refer to Figure 42 for Spring Specifications

300 UPPER VALVE BODY CASTING.
301 PRESSURE CONTROL VALVE "A".
302 PRESSURE CONTROL VALVE "A" SPRING.
303 PRESSURE CONTROL VALVE "A" BORE PLUG.
304 BORE PLUG RETAINER.
305 DAMPER CLUTCH CONTROL VALVE SPRING.
306 DAMPER CLUTCH CONTROL VALVE.
307 DAMPER CLUTCH CONTROL VALVE SLEEVE.
308 DAMPER CLUTCH CONTROL VALVE RETAINING PIN.
309 PRESSURE CONTROL VALVE "C".
310 PRESSURE CONTROL VALVE "C" SPRING.
311 PRESSURE CONTROL VALVE "C" BORE PLUG.
312 PRESSURE CONTROL VALVE "B".
313 PRESSURE CONTROL VALVE "B" SPRING.
314 PRESSURE CONTROL VALVE "B" BORE PLUG.

315 1/4" STEEL CB 2 BALL (REV. CLUT. & N/R CONTROL VALVE).
316 1/4" STEEL CB 4 BALL (UD CLUTCH & FAILSAFE VALVE B).
317 1/4" STEEL CB 3 BALL (OD CLUT. & FAILSAFE VALVE A AND B).
318 CHECK BALL SPRINGS (3 REQUIRED).
319 UPPER VALVE BODY TO CHANNEL PLATE SPACER PLATE.
320 SPACER PLATE RETAINING BOLT.

Figure 22

VALVE BODY REBUILD AND ASSEMBLY

1. Disassemble the upper valve body and place the valves, springs, bore plugs and retainers on appropriate trays ***exactly*** as they are removed, using Figure 22 as a guide.
2. Clean all upper valve body parts thoroughly and dry with compressed air.
3. Inspect all upper valve body parts thoroughly for any wear and/or damage.
   Note: Refer to Figure 42 for spring specs.
4. Assemble upper valve body parts ***exactly***, as shown in Figure 22, and lube with the proper ATF as they are installed.
   Note: Use a small amount of Trans-Jel® on retainers, to prevent them from falling out, as all valves are not spring loaded.
5. Install two of the 70 mm length valve body bolts in the locations shown in Figure 23, for temporary alignment dowels.
6. Install the three 1/4" check balls and springs, with the springs going in first, as shown in Figure 24.
7. Install the spacer plate over the temporary dowel bolts, as shown in Figure 25, and slowly lower onto upper valve body ensuring that the check balls remain in position.
8. Install the spacer plate retaining bolt, as shown in Figure 25 and torque to 7 N·m (62 in.lb.).

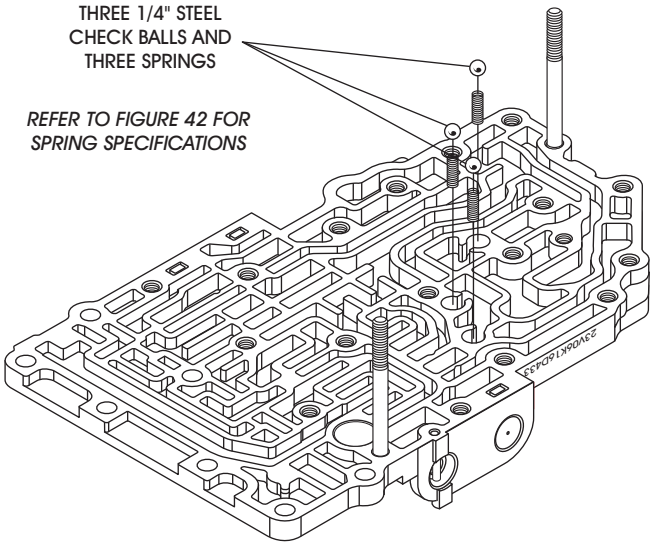
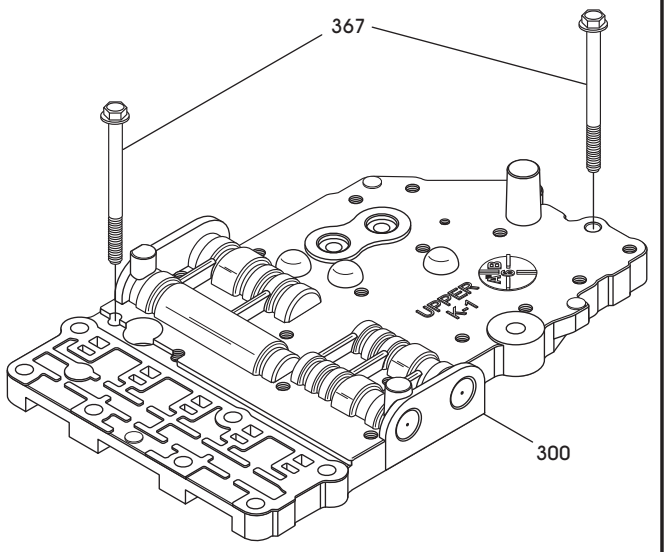
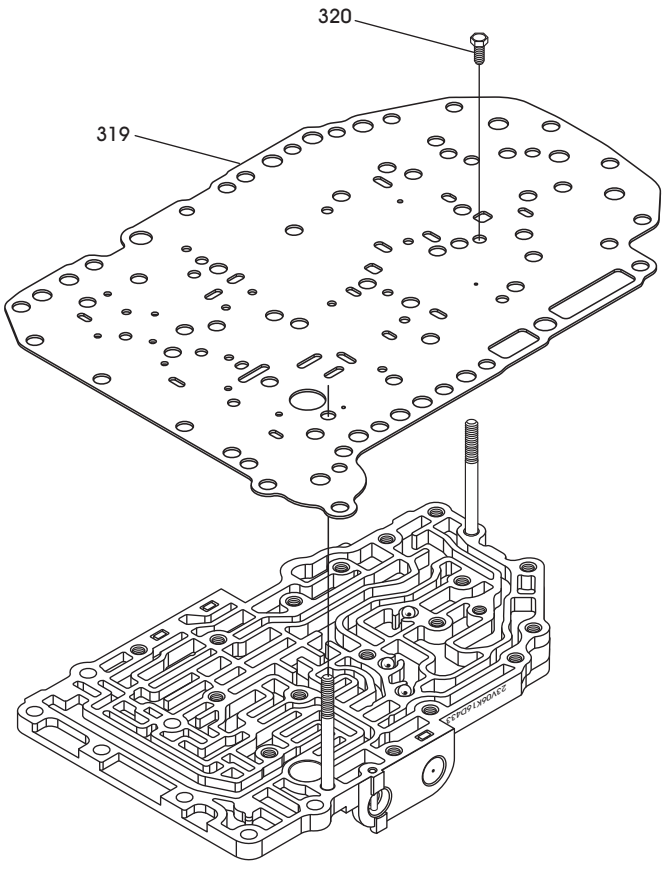


Figure 24



300 UPPER VALVE BODY CASTING.
367 VALVE BODY BOLT, 70 MM LENGTH (4 REQUIRED).

Figure 23

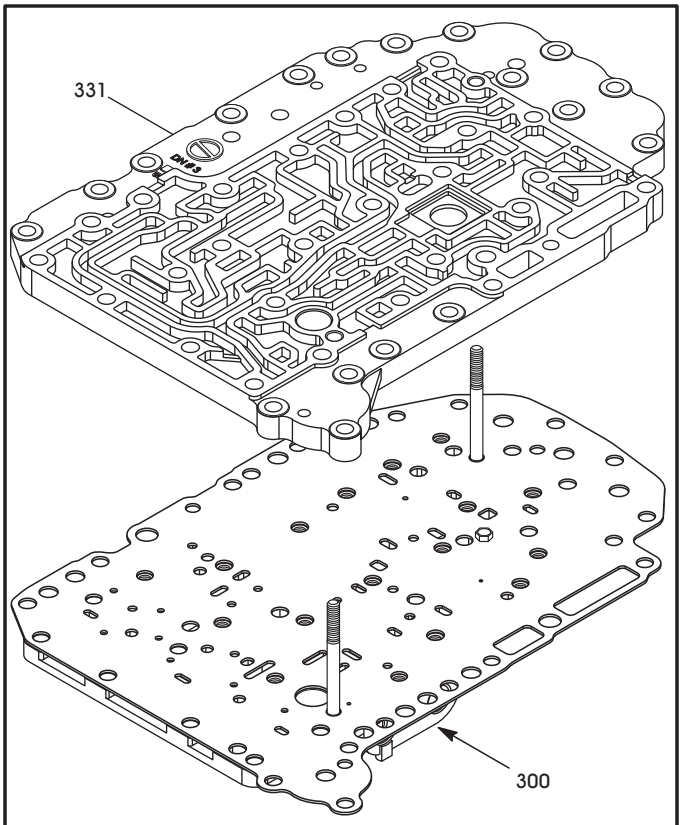


319 UPPER VALVE BODY TO CHANNEL PLATE SPACER PLATE.
320 SPACER PLATE RETAINING BOLT.

Figure 25

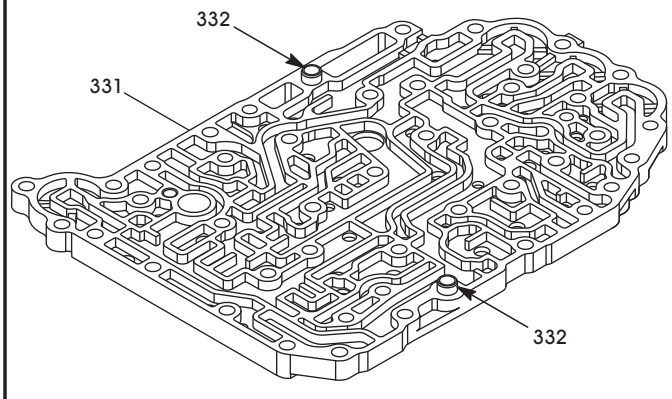
VALVE BODY REBUILD AND ASSEMBLY

9. Ensure that the two hollow alignment dowels are in place in the channel plate, as shown in Figure 26.
10. Install the channel plate over the temporary alignment bolts and lower it into place on the upper valve body and spacer plate, as shown in Figure 27.
11. Install the 1/4" steel check ball into bath-tub in channel plate, as shown in Figure 28.
12. Install the plastic screen into the channel plate, as shown in Figure 28.
13. Install the line pressure blow-off spring and 1/4" steel ball into channel plate, as shown in Figure 28.
    Note: Refer to Figure 42 for spring specs.



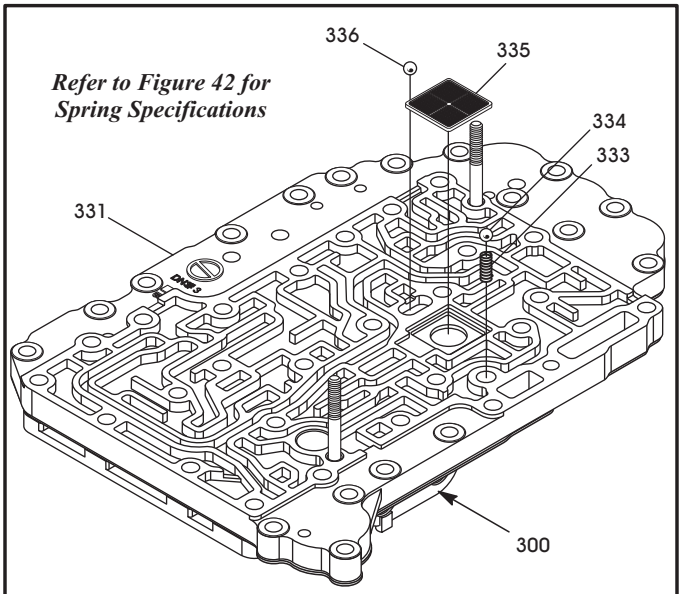
300 UPPER VALVE BODY WITH SPACER PLATE ASSEMBLY.
331 CHANNEL PLATE.

Figure 27



331 CHANNEL PLATE.
332 CHANNEL PLATE HOLLOW LOCATING DOWELS.

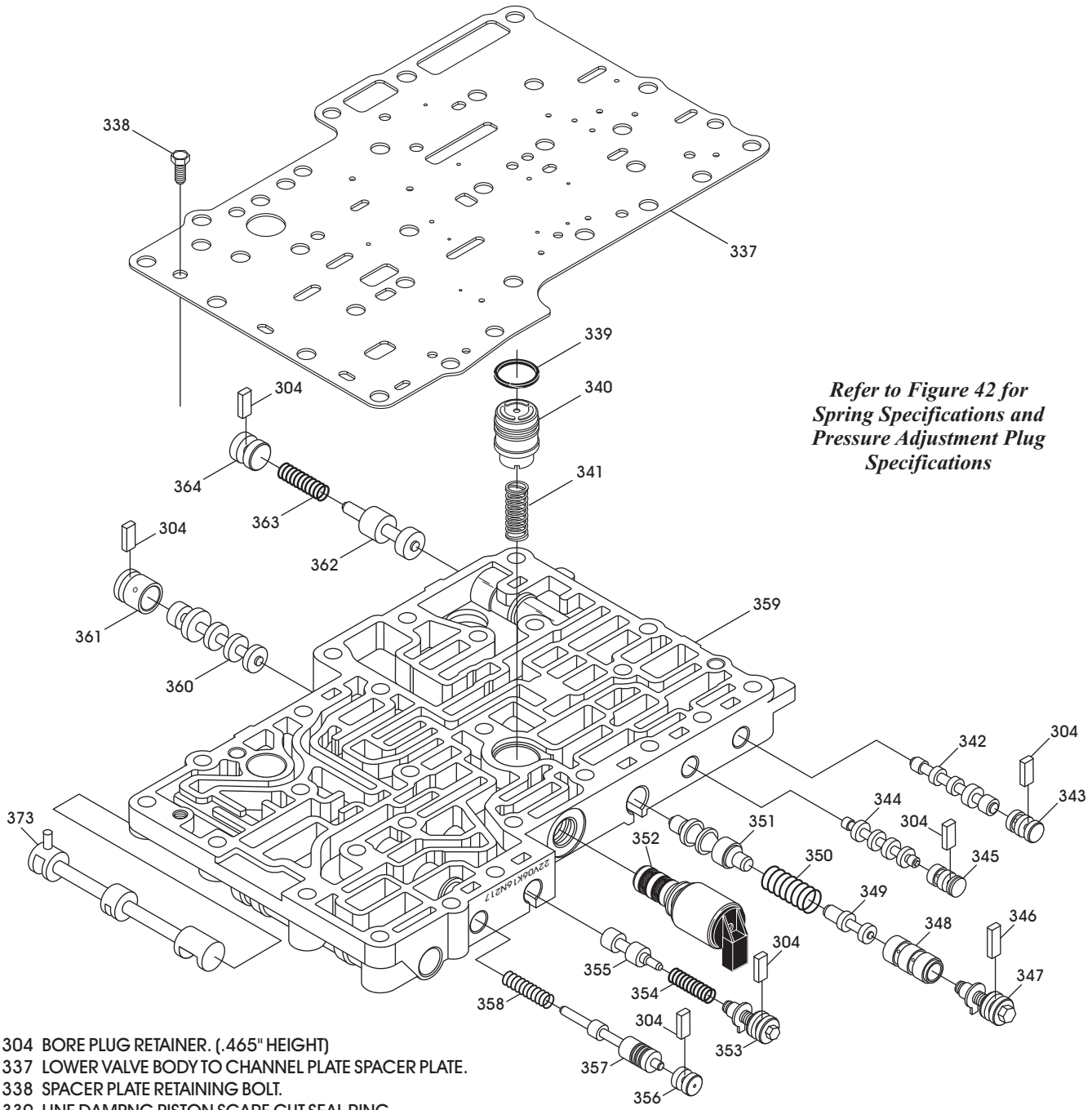
Figure 26



300 UPPER VALVE BODY WITH SPACER PLATE ASSEMBLY.
331 CHANNEL PLATE.
333 CB 1 CHECK BALL SPRING.
334 1/4" STEEL CB 1 CHECK BALL (LINE PRESSURE BLOW OFF).
335 PLASTIC MAIN LINE PRESSURE SCREEN ASSEMBLY.
336 1/4" STEEL CB 5 SHUTTLE BALL (REV & LOW/REV CLUTCH).

Figure 28

LOWER VALVE BODY ASSEMBLY EXPLODED VIEW



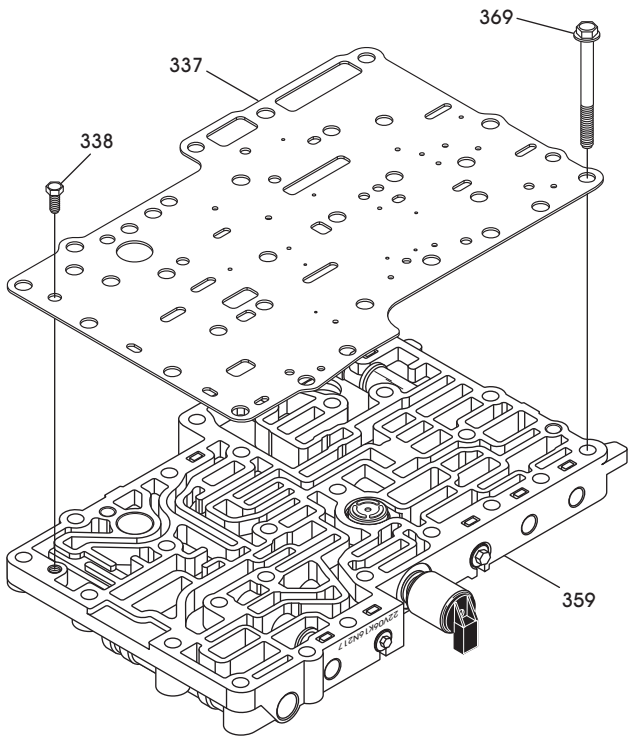
Refer to Figure 42 for Spring Specifications and Pressure Adjustment Plug Specifications

304 BORE PLUG RETAINER. (.465" HEIGHT)
337 LOWER VALVE BODY TO CHANNEL PLATE SPACER PLATE.
338 SPACER PLATE RETAINING BOLT.
339 LINE DAMPNG PISTON SCARF CUT SEAL RING.
340 LINE DAMPING PISTON.
341 LINE DAMPING PISTON SPRING.
342 FAIL-SAFE VALVE "A".
343 FAIL-SAFE VALVE "A" BORE PLUG.
344 FAIL-SAFE VALVE "B".
345 FAIL-SAFE VALVE "B" BORE PLUG.
346 BORE PLUG RETAINER *(LONGER .582" THAN ALL OTHERS).*
347 PRESSURE REGULATOR ADJUSTING PLUG.
348 PRESSURE REGULATOR BOOST VALVE SLEEVE.
349 PRESSURE REGULATOR BOOST VALVE.
350 PRESSURE REGULATOR VALVE SPRING.
351 PRESSURE REGULATOR VALVE.
352 LINE PRESSURE CONTROL SOLENOID (NO "O" RINGS).
353 REDUCING PRESSURE ADJUSTING PLUG.
354 REDUCING PRESSURE VALVE SPRING.
355 REDUCING PRESSURE VALVE.
356 NEUTRAL-REVERSE CONTROL VALVE BORE PLUG.
357 NEUTRAL-REVERSE CONTROL VALVE.
358 NEUTRAL REVERSE CONTROL VALVE SPRING.
359 LOWER VALVE BODY CASTING.
360 OVERDRIVE AND LOW/REVERSE SWITCH VALVE.
361 OVERDRIVE AND LOW/REVERSE SWITCH VALVE SLEEVE.
362 TCC REGULATOR VALVE.
363 TCC REGULATOR VALVE SPRING.
364 TCC REGULATOR VALVE BORE PLUG.
373 MANUAL VALVE.

Figure 29

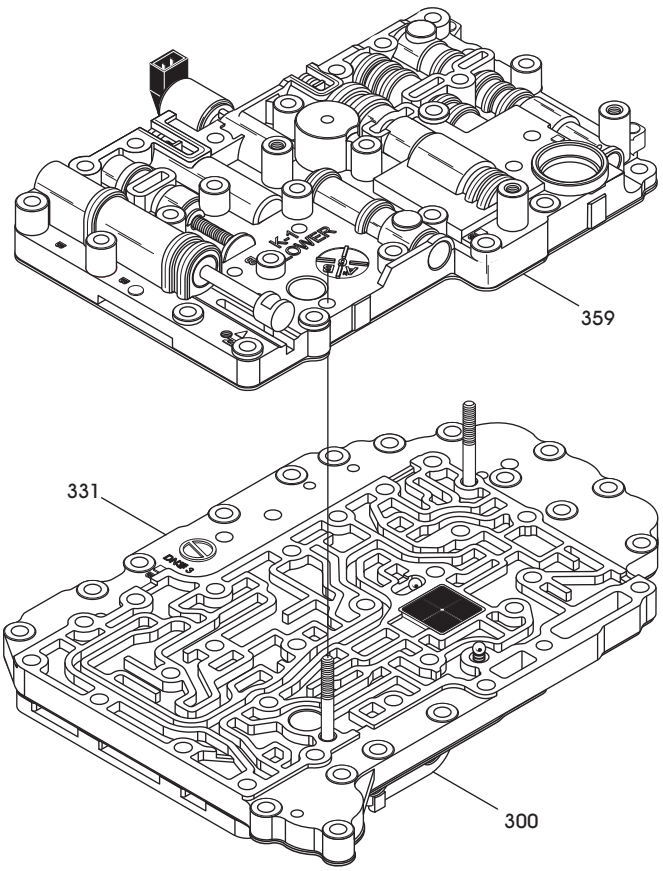
VALVE BODY REBUILD AND ASSEMBLY

14. Disassemble the lower valve body and place the valves, springs, bore plugs and retainers on appropriate trays ***exactly*** as they are removed, using Figure 29 as a guide.
15. Clean all lower valve body parts thoroughly and dry with compressed air.
16. Inspect all lower valve body parts thoroughly for any wear and/or damage.
17. Assemble lower valve body parts ***exactly***, as shown in Figure 29, and lube with the proper ATF as they are installed.
    Note: Use a small amount of Trans-Jel® on retainers, to prevent them from falling out, as all valves are not spring loaded. Refer to Figure 42 for spring and pressure adjustment plug specifications.
18. Install the lower valve body spacer plate, as shown in Figure 30, and install one 60 mm valve body bolt for alignment.
19. Install the spacer plate retaining bolt, as shown in Figure 30 and torque to 7 N·m (62 in.lb.).
20. Remove the 60 mm valve body bolt that was used for alignment.
21. Install completed lower valve body assembly over the alignment bolts and onto the channel plate, as shown in Figure 31, ensuring that line blow-off ball and spring remain in proper position.



337 LOWER VALVE BODY TO CHANNEL PLATE SPACER PLATE.
338 SPACER PLATE RETAINING BOLT.
359 COMPLETED LOWER VALVE BODY WITH DAMPING PISTON.
369 TEMPORARY 60 MM LENGTH VALVE BODY BOLT.

Figure 30

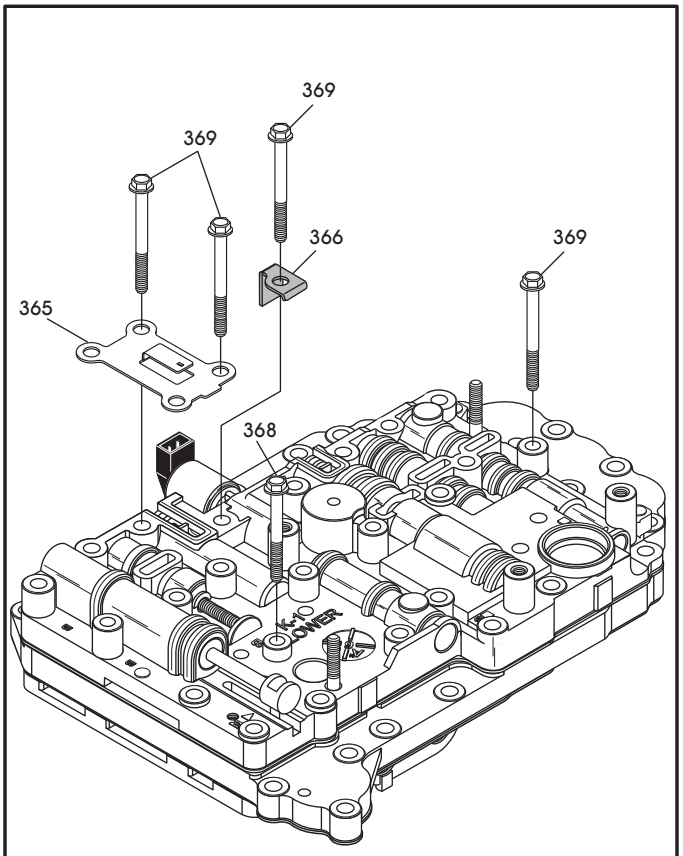


300 COMPLETED UPPER VALVE BODY WITH SPACER PLATE.
331 COMPLETED CHANNEL PLATE.
359 COMPLETED LOWER VALVE BODY WITH SPACER PLATE.

Figure 31

VALVE BODY REBUILD AND ASSEMBLY

22. Install the 55 mm valve body bolt (368) in the position shown in Figure 32, and hand tighten only at this time.
23. Install line pressure solenoid retaining bracket (366), as shown in Figure 32, install 60 mm valve body bolt and hand tighten only.
    Note: Ensure that solenoid connector is facing up, as shown in Figure 32, and test VFS solenoid as shown in Figure 33.
24. Install the internal solenoid harness connector retaining bracket (365), as shown in Figure 32.
25. Install two 60 mm valve body bolts through the bracket in the positions shown in Figure 32, and hand tighten only.
26. Install one 60 mm valve body bolt at the rear of valve body, as shown in Figure 32, and hand tighten only.
27. You can now remove the two 70 mm valve body bolts that were used for alignment bolts, as shown in Figure 34.



365 INTERNAL HARNESS CONNECTOR RETAINING BRACKET.
366 LINE PRESSURE SOLENOID RETAINING BRACKET.
368 VALVE BODY BOLT, 55 MM LENGTH (1 REQUIRED).
369 VALVE BODY BOLT, 60 MM LENGTH (19 REQUIRED).

Figure 32

VFS LINE PRESSURE SOLENOID

Resistance Check
3 - 5 Ohms

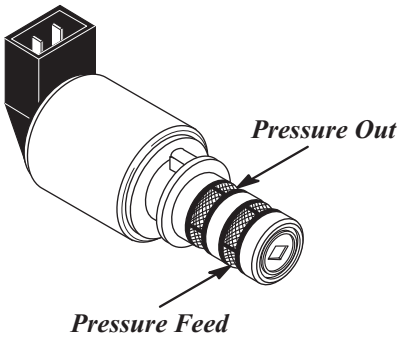
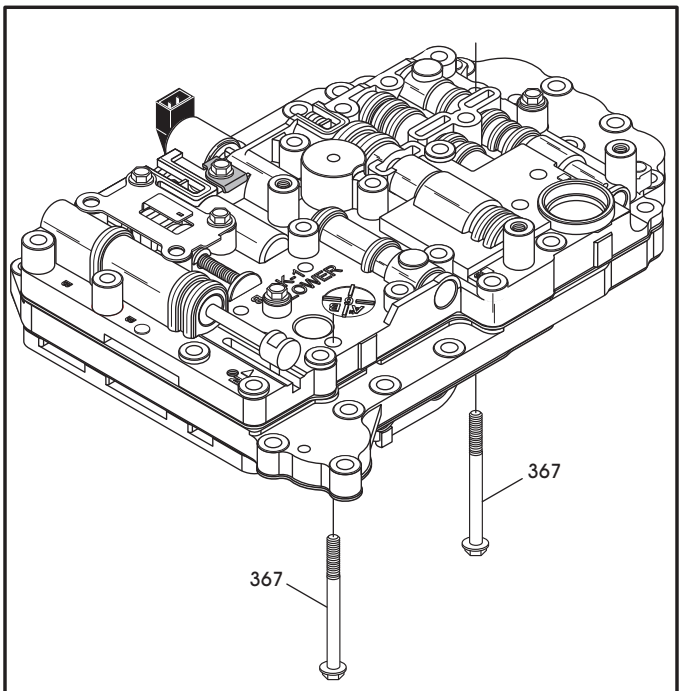


Figure 33



367 VALVE BODY BOLT, 70 MM LENGTH.

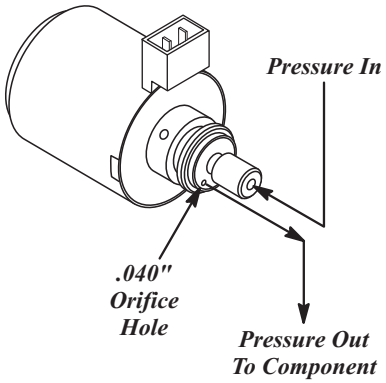
Figure 34

VALVE BODY REBUILD AND ASSEMBLY

28. Disassemble the shift solenoid body and place the solenoids in order as they are removed, as shown in Figure 36.
29. Clean all solenoid body parts thoroughly and dry with compressed air.
30. Inspect all solenoid body parts thoroughly for any wear and/or damage.
    Note: Check all shift solenoids, as shown in Figure 35 for 3-5 Ohms resistance.
31. Install new "O" rings on all solenoids and lube with a small amount of Trans-Jel®, as shown in Figure 36.
32. Install solenoids into the solenoid body, as shown in Figure 36, with the connectors facing down.
    Note: Solenoids should be installed in same positions that they were originally.
33. Install the solenoid retainer plate and torque the four retaining bolts to 7 N·m (62 in.lb.).

PCSV SOLENOID OPERATION

Resistance Check
3 - 5 Ohms

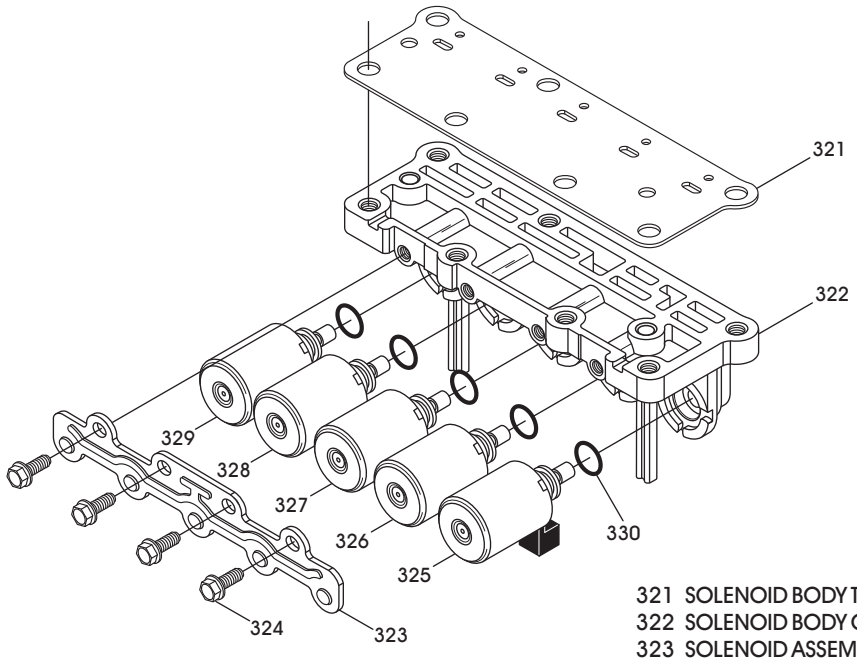


Off (De-Energized) = Flow Through Solenoid
On (Energized) = No Flow Through Solenoid

All Five Shift Solenoids Operate Identical

Figure 35

SOLENOID BODY ASSEMBLY EXPLODED VIEW

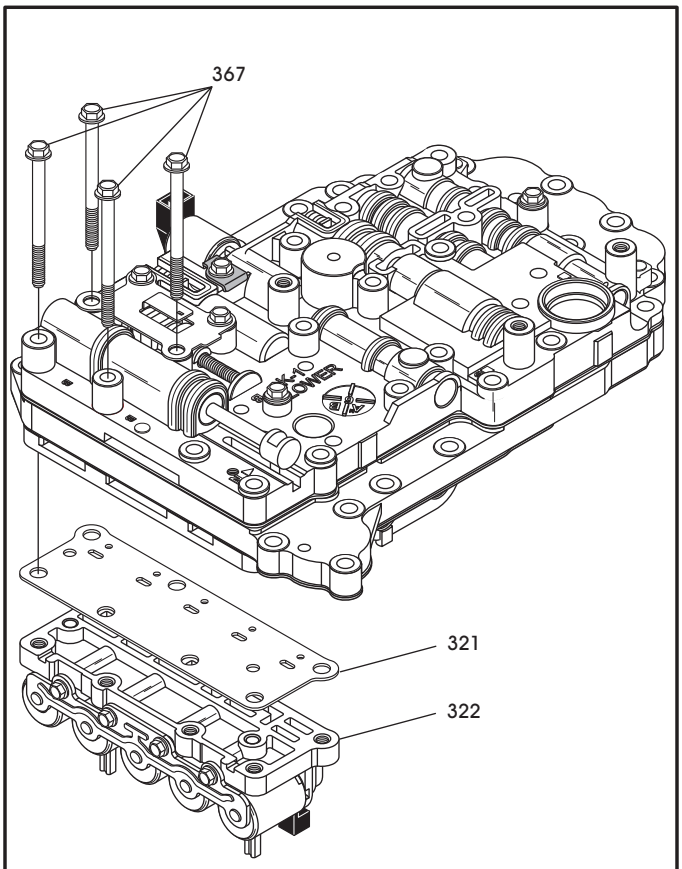


321 SOLENOID BODY TO UPPER VALVE BODY SPACER PLATE.
322 SOLENOID BODY CASTING.
323 SOLENOID ASSEMBLY RETAINING PLATE.
324 SOLENOID RETAINING PLATE BOLT (4 REQUIRED).
325 PSCV-A SOLENOID (OVERDRIVE & LOW/REVERSE).
326 PSCV-ON/OFF SOLENOID (OD & L/R SWITCH VALVE).
327 PSCV-D SOLENOID (TORQUE CONVERTER CLUTCH).
328 PSCV-C SOLENOID (UNDERDRIVE).
329 PSCV-B SOLENOID (2-4 BRAKE).
330 SOLENOID "O" RING (5 REQUIRED).

Figure 36

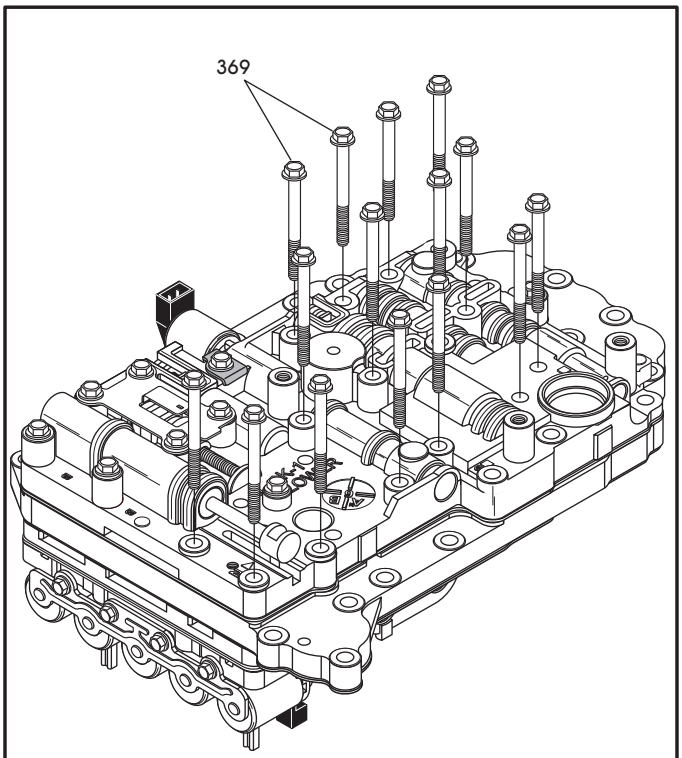
VALVE BODY REBUILD AND ASSEMBLY

34. Holding the completed solenoid body and the spacer plate together up against the bottom of valve body assembly, install the four 70 mm valve body bolts in the positions shown in Figure 37.
    Note: Hand tighten only at this time.
35. Instal the remaining fifteen 60 mm valve body bolts, as shown in Figure 38, and hand tighten only at this time.
36. Torque all 24 valve body bolts, beginning in the center and working outward in a circle, to 11 N·m (97 in.lb.) (See Figure 39).



321 SOLENOID BODY TO UPPER VALVE BODY SPACER PLATE.
322 COMPLETED SOLENOID BODY ASSEMBLY.
367 VALVE BODY BOLT, 70 MM LENGTH (4 REQUIRED).

Figure 37



367 VALVE BODY BOLT, 70 MM LENGTH (15 MORE REQUIRED).

Figure 38

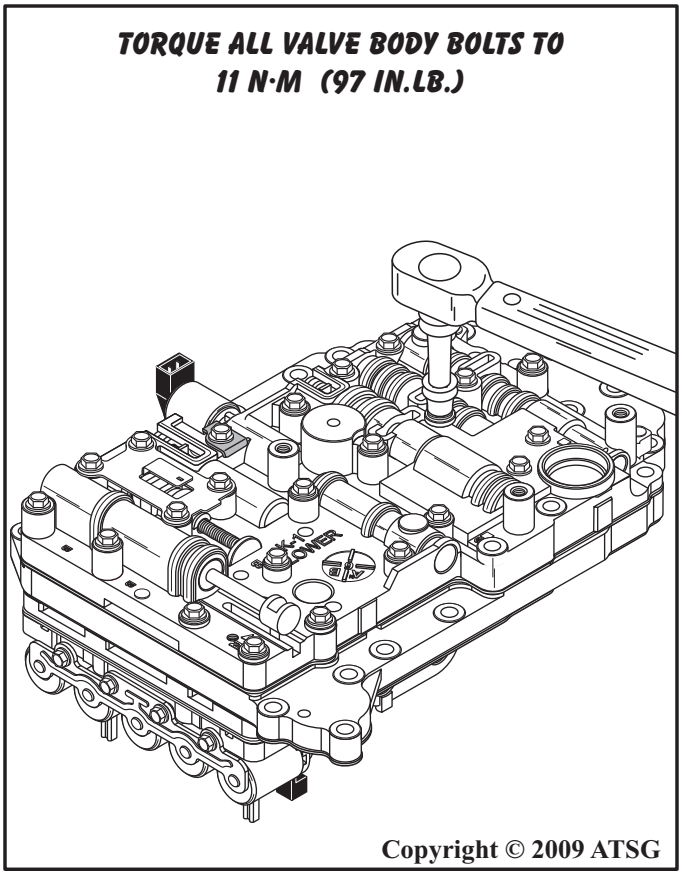
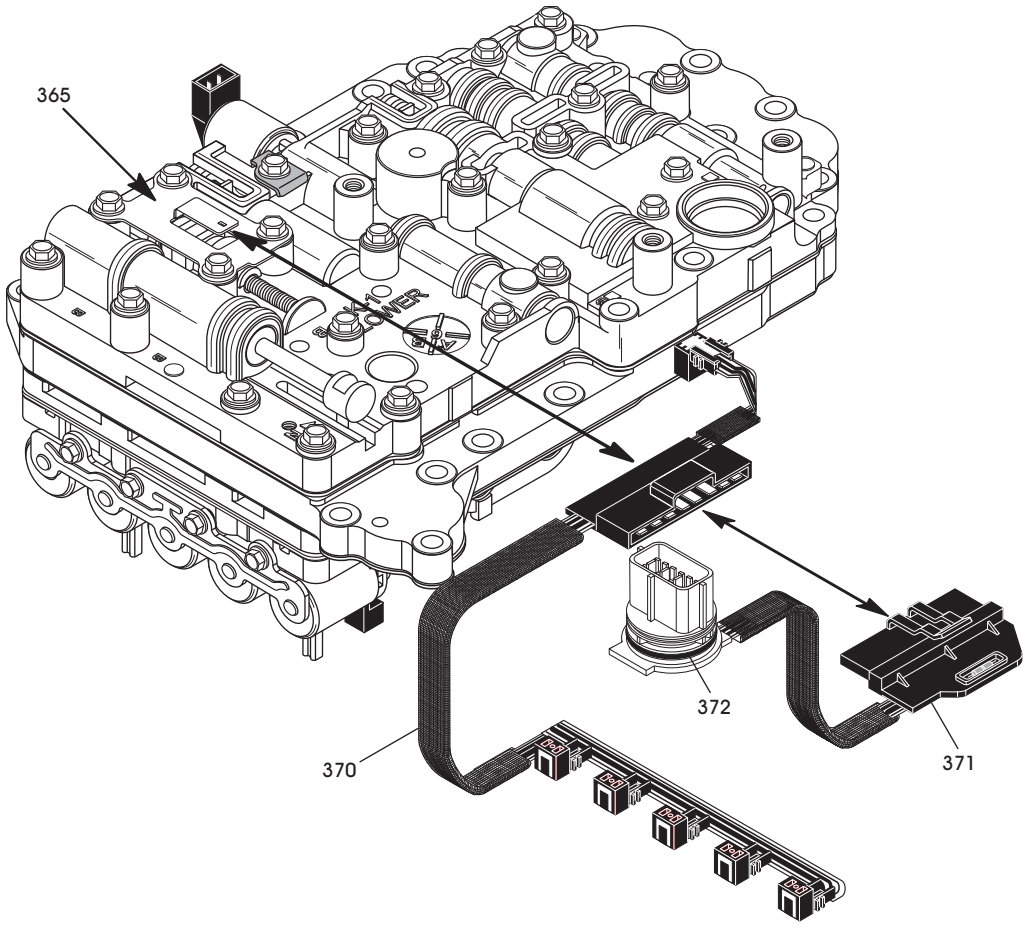


Figure 39

VALVE BODY REBUILD AND ASSEMBLY

37. Install the internal solenoid harness assembly (370), by snapping into place on the harness retaining bracket (365), as shown in Figure 40.
38. Connect the five shift solenoids connectors to the solenoids.
39. Connect VFS line pressure solenoid connector to the solenoid.
40. Install new "O" ring on the pass-thru case connector, as shown in Figure 24, and lube with a small amount of Trans-Jel®.
41. Install the pass-thru case connector and harness assembly, as shown in Figure 40, by snapping into place.
42. Set the completed valve body assembly aside for the final assembly process, as shown in Figure 41.



365 INTERNAL HARNESS CONNECTOR RETAINING BRACKET.
370 INTERNAL SOLENOID HARNESS ASSEMBLY.
371 PASS-THRU CASE CONNECTOR AND HARNESS ASSEMBLY.
372 CASE CONNECTOR "O" RING.

Figure 40

COMPLETED VALVE BODY ASSEMBLY

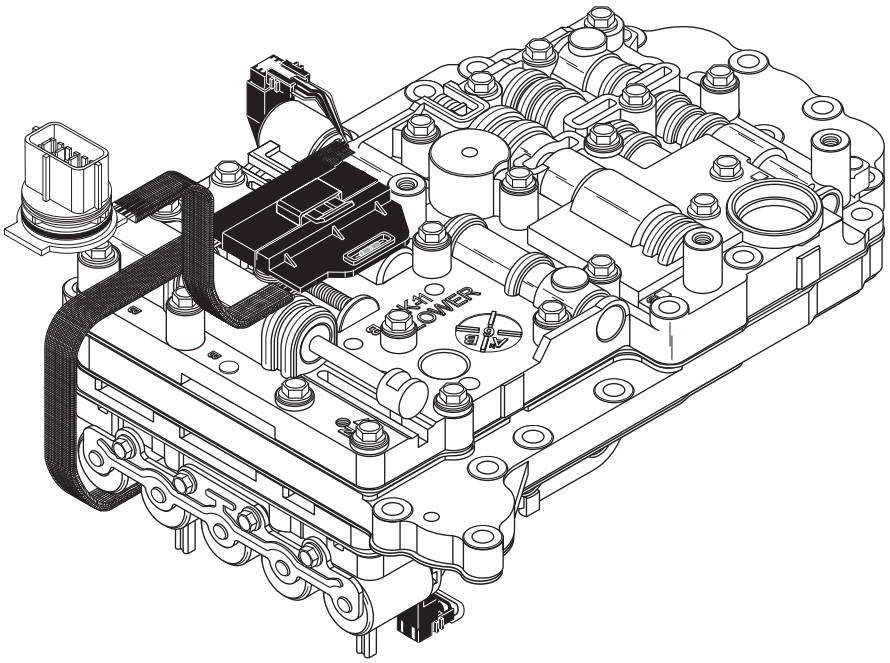


Figure 41

OBSERVED VALVE BODY SPRING SPECIFICATIONS AND PRESSURE PLUG SPECIFICATIONS

SPRING NUMBER 302
Free Length = .878"
Spring Diameter = .298"
Wire Diameter = .019"
Approx Coils = 8

SPRING NUMBER 305
Free Length = .628"
Spring Diameter = .246"
Wire Diameter = .029"
Approx Coils = 10

SPRING NUMBER 310 & 313
Free Length = .878"
Spring Diameter = .298"
Wire Diameter = .019"
Approx Coils = 8

SPRING NUMBER 318
(3 REQUIRED)
Free Length = .670"
Spring Diameter = .178"
Wire Diameter = .020"
Approx Coils = 15

SPRING NUMBER 333
Free Length = .685"
Spring Diameter = .278"
Wire Diameter = .042"
Approx Coils = 10

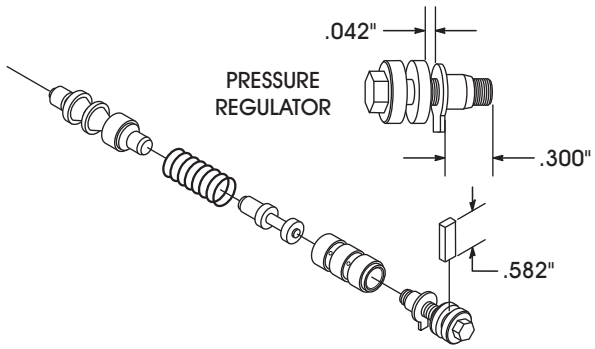
SPRING NUMBER 341
Free Length = 1.150"
Spring Diameter = .388"
Wire Diameter = .065"
Approx Coils = 9

SPRING NUMBER 350
Free Length = 1.422"
Spring Diameter = .634"
Wire Diameter = .065"
Approx Coils = 9

SPRING NUMBER 354
Free Length = 1.158"
Spring Diameter = .349"
Wire Diameter = .049"
Approx Coils = 12

SPRING NUMBER 358
Free Length = 1.420"
Spring Diameter = .354"
Wire Diameter = .028"
Approx Coils = 12

SPRING NUMBER 363
Free Length = .920"
Spring Diameter = .371"
Wire Diameter = .056"
Approx Coils = 9



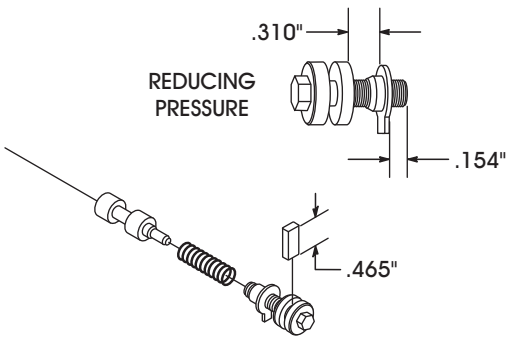
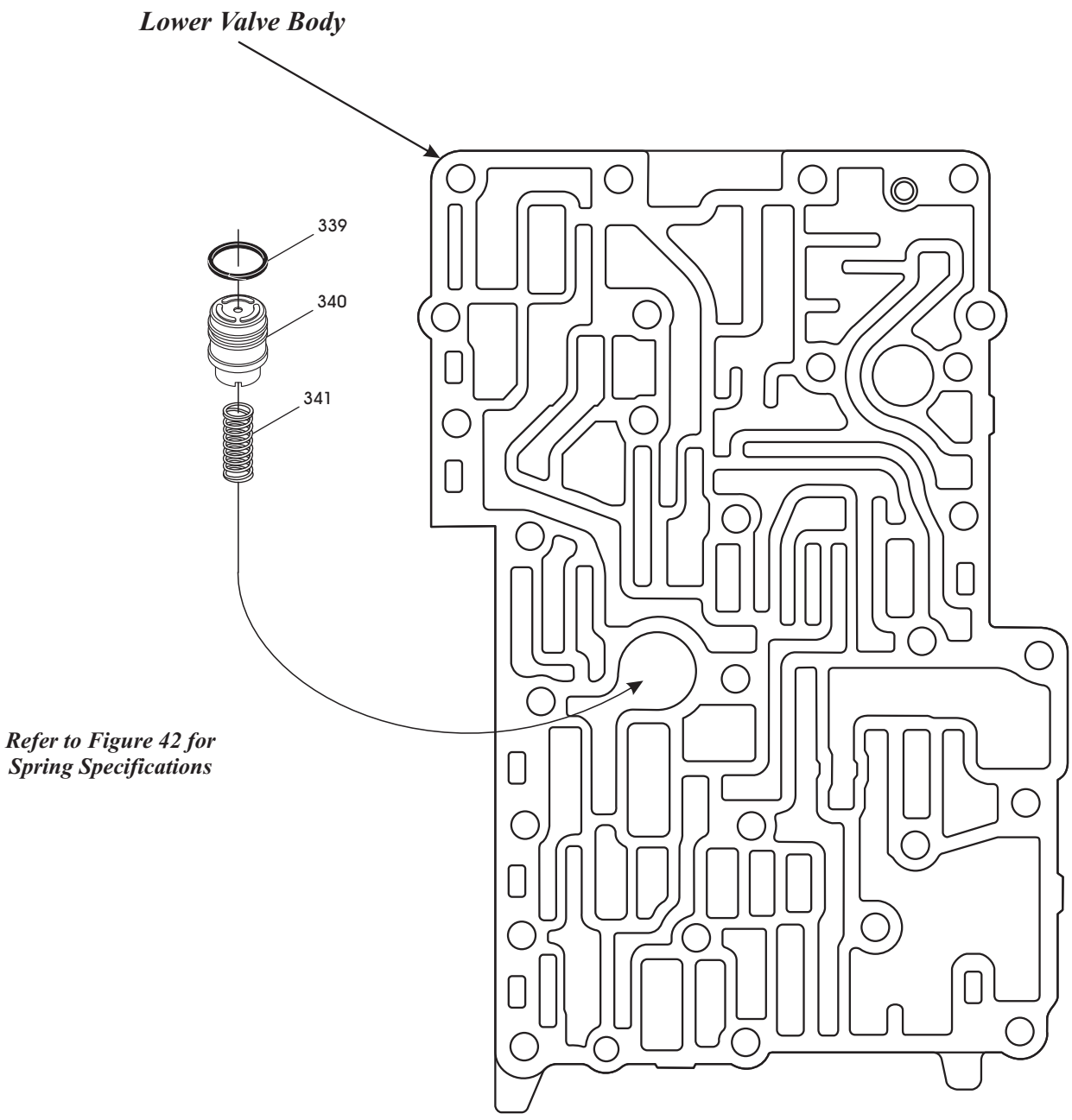


Figure 42

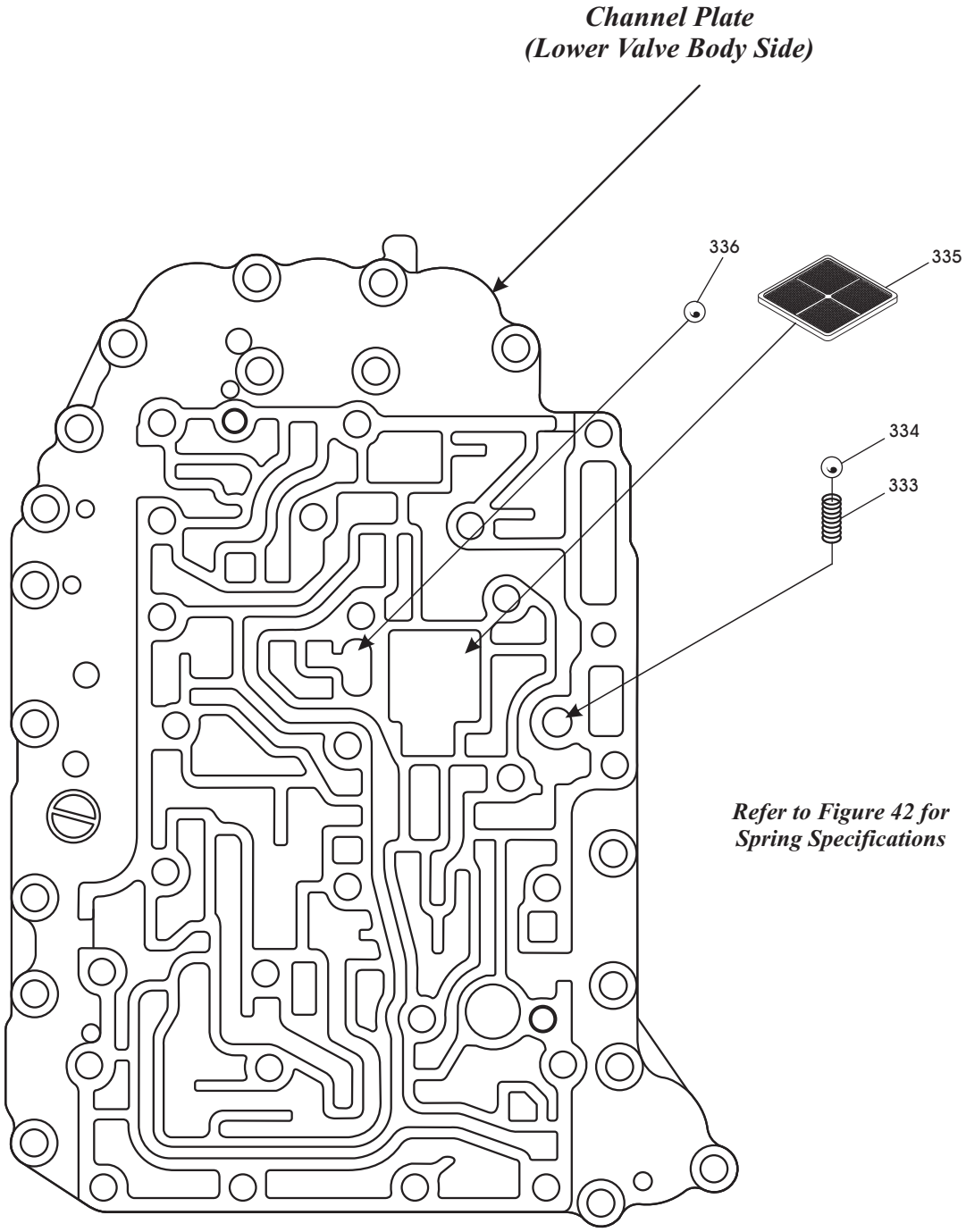
LOWER VALVE BODY WORM TRACK COMPONENTS



339 LINE DAMPNG PISTON SCARF CUT SEAL RING.
340 LINE DAMPING PISTON.
341 LINE DAMPING PISTON SPRING.

Figure 43

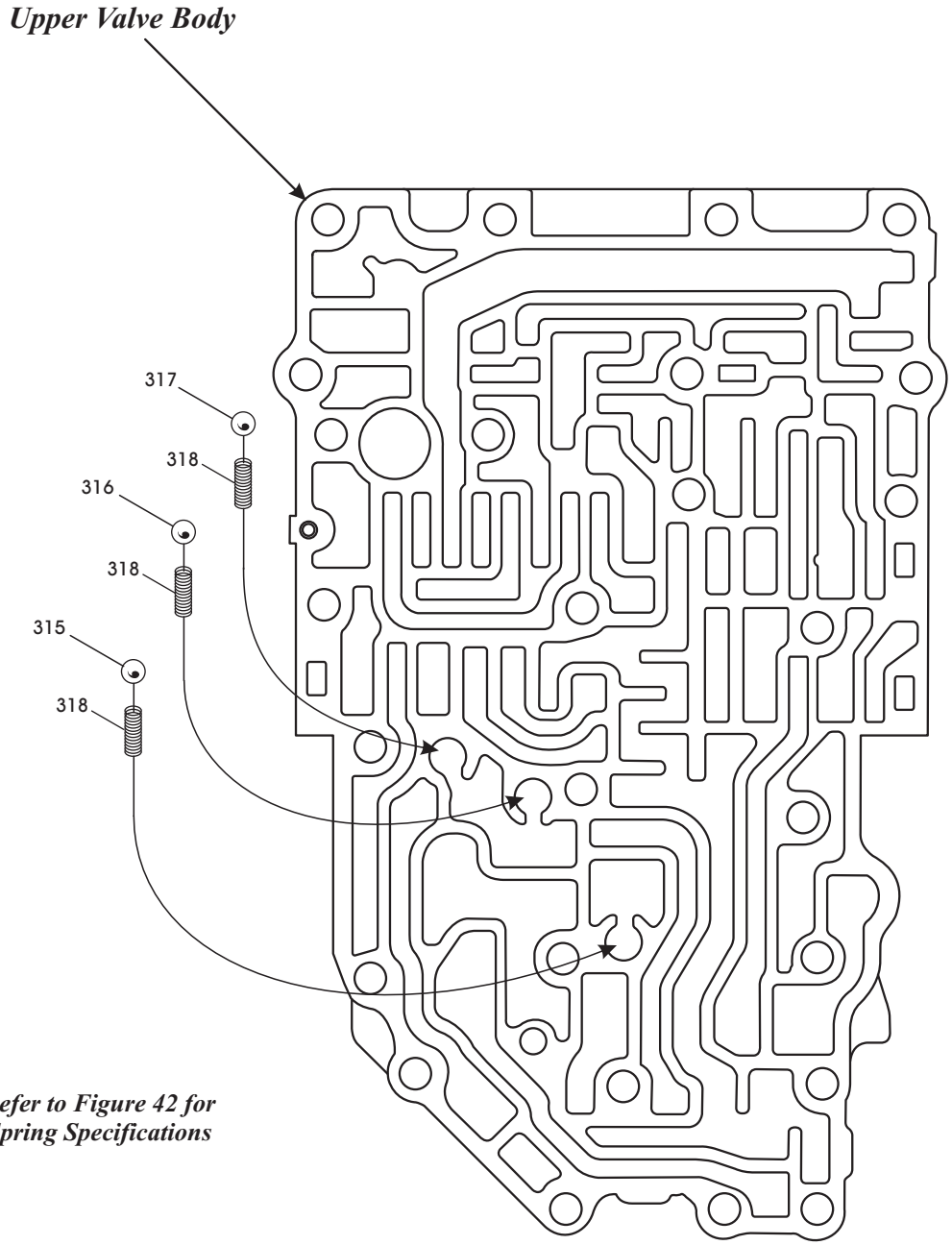
CHANNEL PLATE WORM TRACK COMPONENTS



333 CHECK BALL SPRING.
334 1/4" STEEL CHECK BALL (LINE BLOW OFF).
335 PLASTIC SCREEN ASSEMBLY.
336 1/4" STEEL SHUTTLE BALL (REVERSE-LOW/REVERSE CLUTCH).

Figure 44

UPPER VALVE BODY WORM TRACK COMPONENTS



315 1/4" STEEL CB 2 BALL (REVERSE CLUTCH & NEUTRAL/REVERSE CONTROL VALVE).
316 1/4" STEEL CB 4 BALL (UNDERDRIVE CLUTCH & FAILSAFE VALVE B).
317 1/4" STEEL CB 3 BALL (OVERDRIVE CLUTCH & FAILSAFE VALVE A AND B).
318 CHECK BALL SPRINGS (3 REQUIRED).

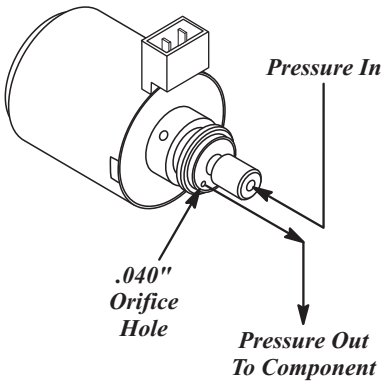
Figure 45

A4CF2
Diagnostic Information

PCSV APPLICATION AND OPERATION

Range	PWM Shift Pressure Control Solenoids				
	PCSV-A (SCSV-B)	PCSV-B (SCSV-C)	PCSV-C (SCSV-D)	PCSV-D (TCC-SV)	ON - OFF (SCSV-A)
N/P	Off	On	On	Off	On
1st	On	On	Off	Off	On
2nd	On	Off	Off	On	Off
3rd	Off	On	Off	On	Off
4th	Off	Off	On	On	Off
Reverse	Off	Off	On	Off	On
Low	Off	On	On	On	On

PCSV SOLENOID OPERATION

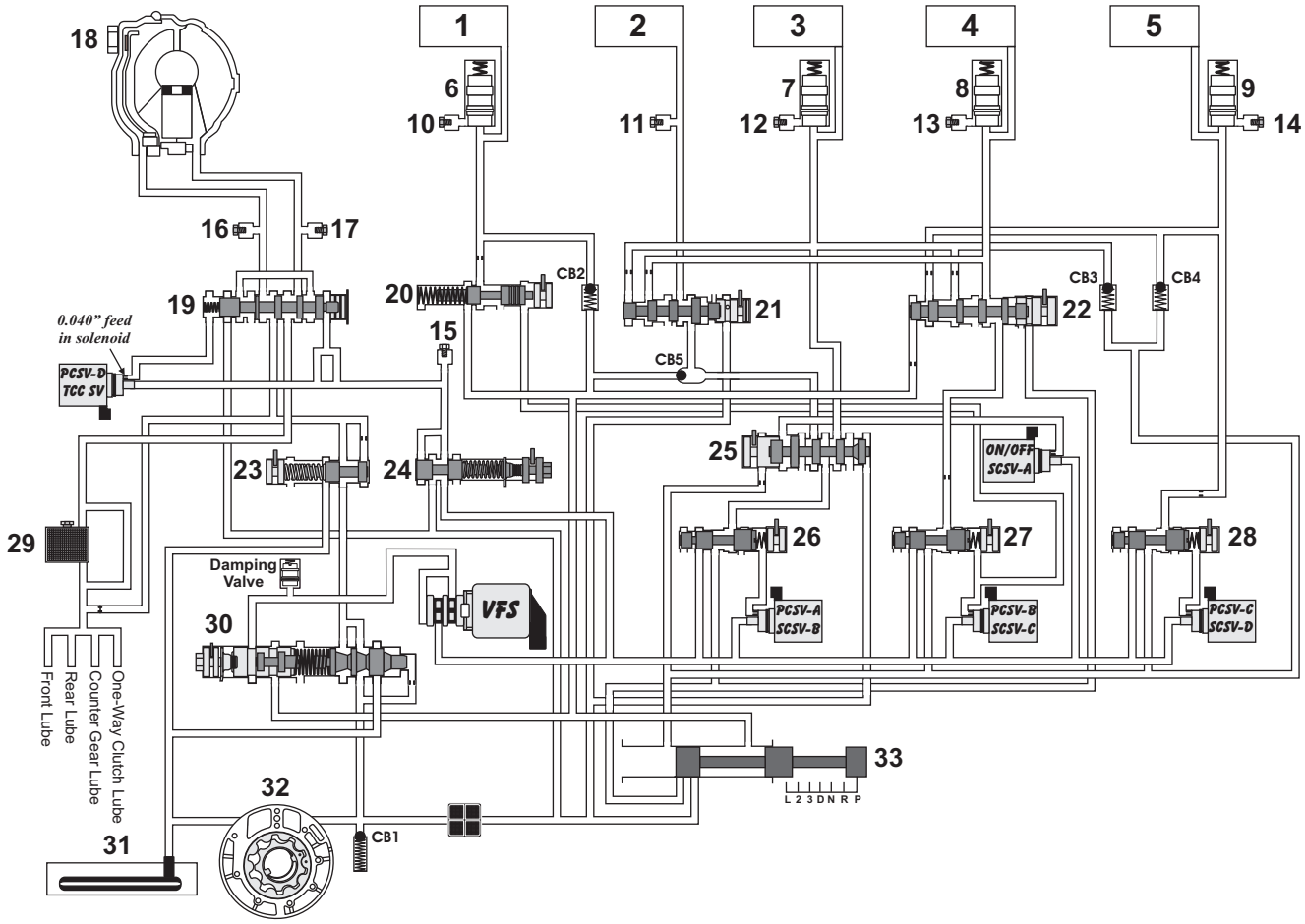


Off (De-Energized) = Flow Through Solenoid
On (Energized) = No Flow Through Solenoid

All Five Shift Solenoids Operate Identical

Figure 46

A4CF2
Diagnostic Information



1	Rev. Clutch	12	OD Clutch P.T.	23	TCC Regulator Valve
2	L/R Brake	13	2-4 Brake P.T.	24	Reducing Pressure Valve
3	OD Clutch	14	UD Clutch P.T.	25	OD & L/R Switch Valve
4	2-4 Brake	15	Reducing Press. P.T.	26	Pressure Control Valve A
5	UD Clutch	16	TCC Release Press. P.T.	27	Pressure Control Valve B
6	Rev. Clutch Accum.	17	TCC Apply Press. P.T.	28	Pressure Control Valve C
7	OD Clutch Accum.	18	Torque Converter	29	Cooler
8	2-4 Brake Accum.	19	Damper Clutch Control Valve	30	Pressure Regulator Valve
9	UD Clutch Accum.	20	N-R Control Valve	31	Sump & Filter
10	Rev. Clutch P.T.	21	Fail Safe Valve A	32	Pharacoid Oil Pump
11	L/R Brake P.T.	22	Fail Safe Valve B	33	Manual Valve

Figure 47

A4CF2
Diagnostic Information

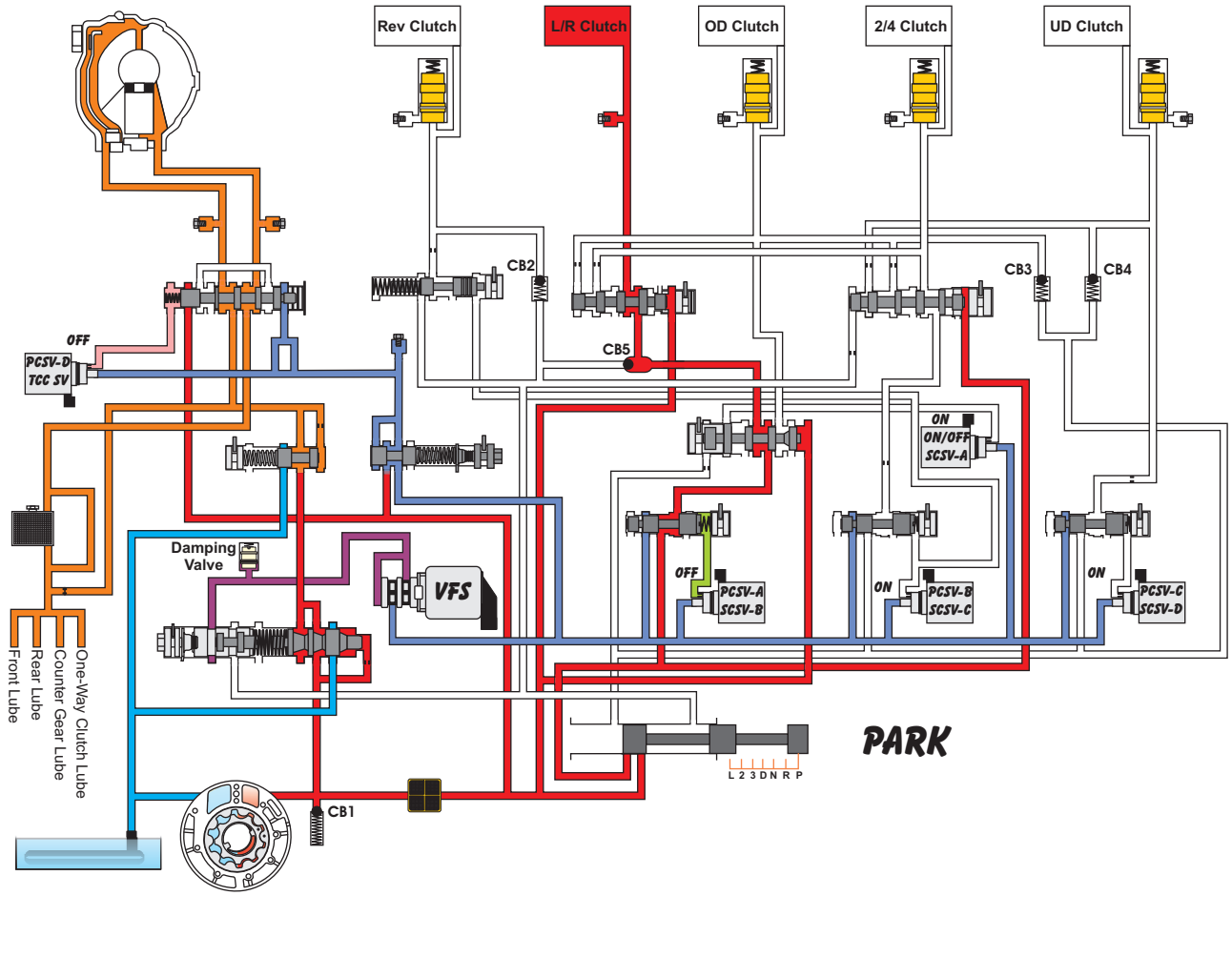


Figure 48

A4CF2
Diagnostic Information

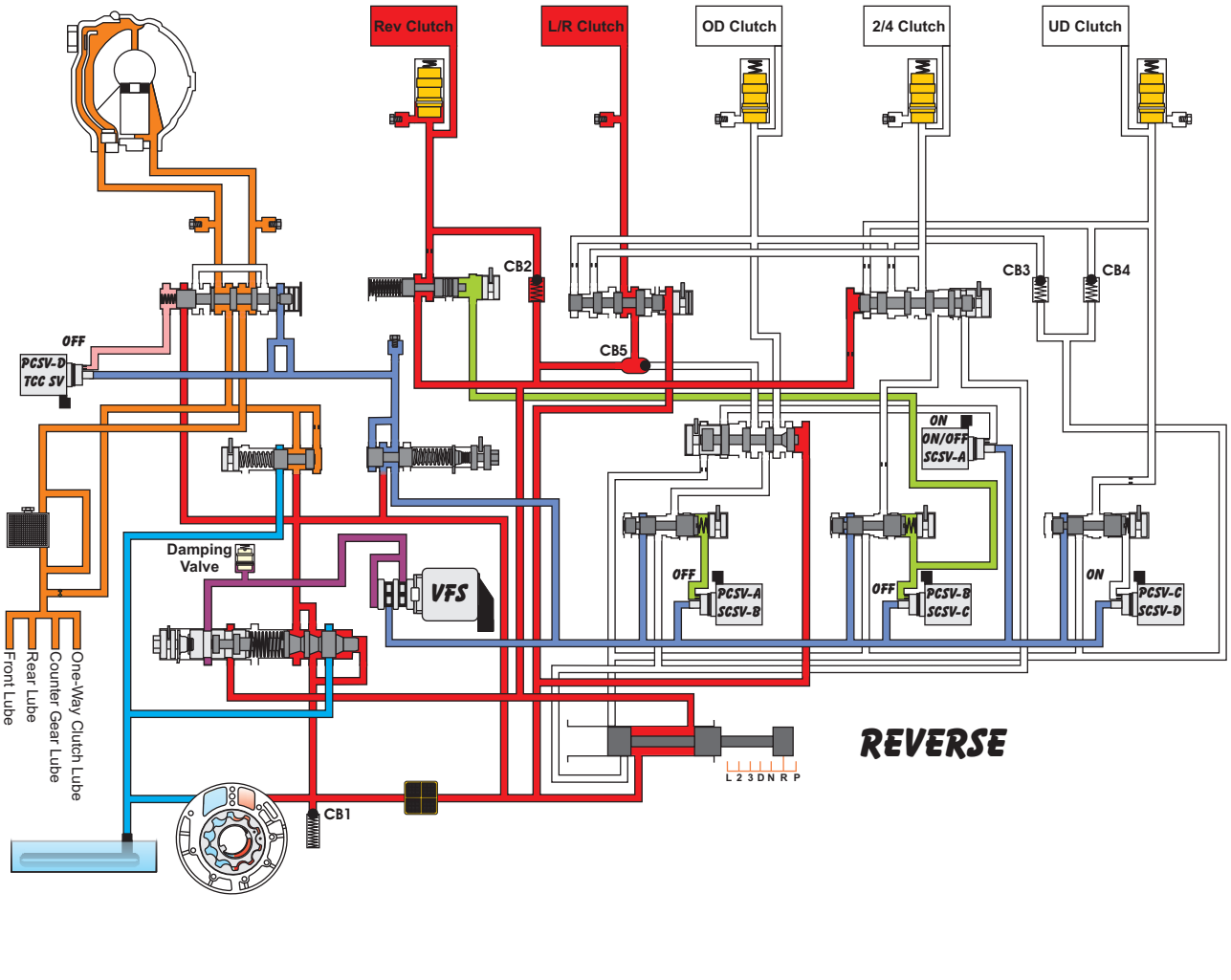


Figure 49

A4CF2
Diagnostic Information

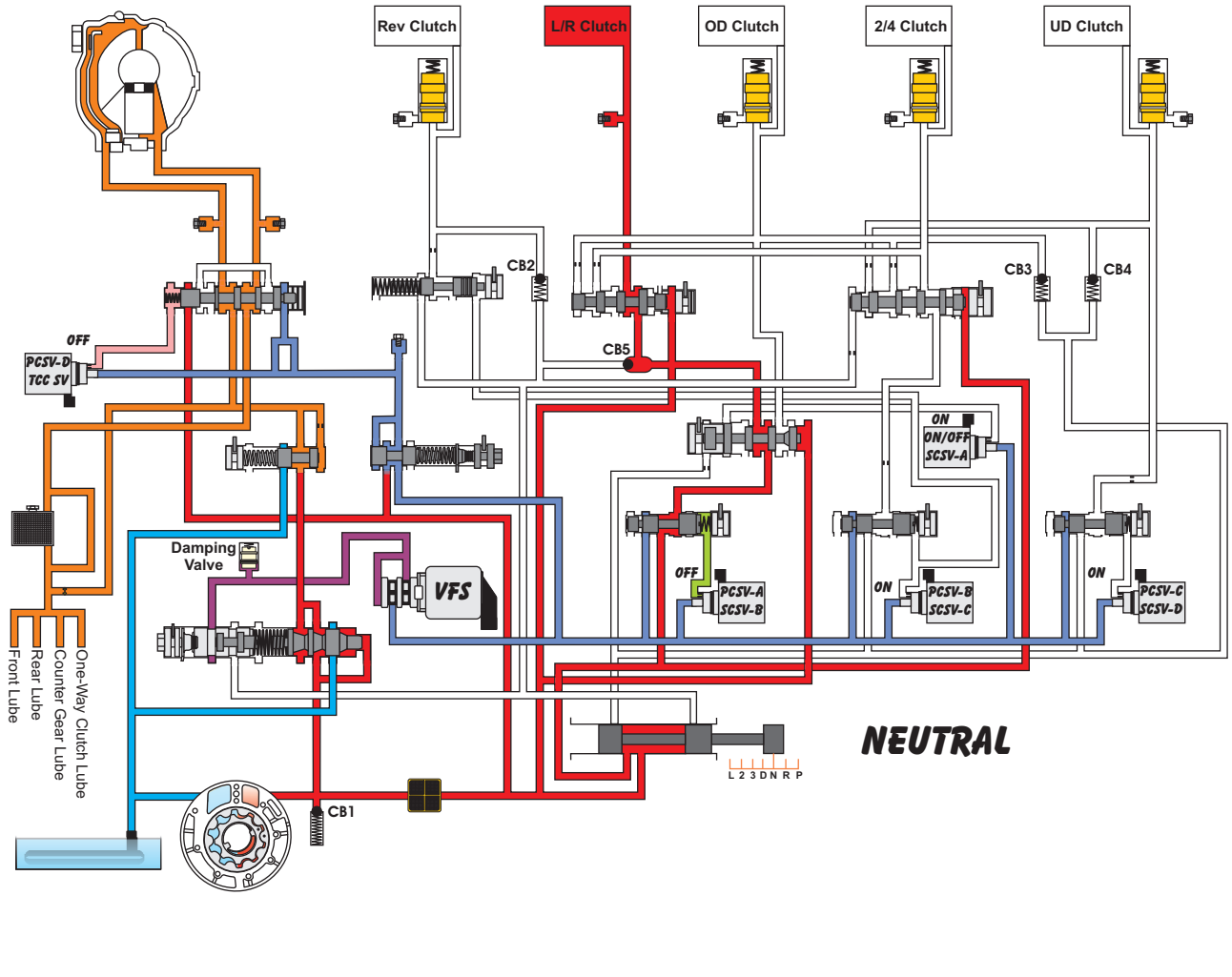


Figure 50

A4CF2
Diagnostic Information

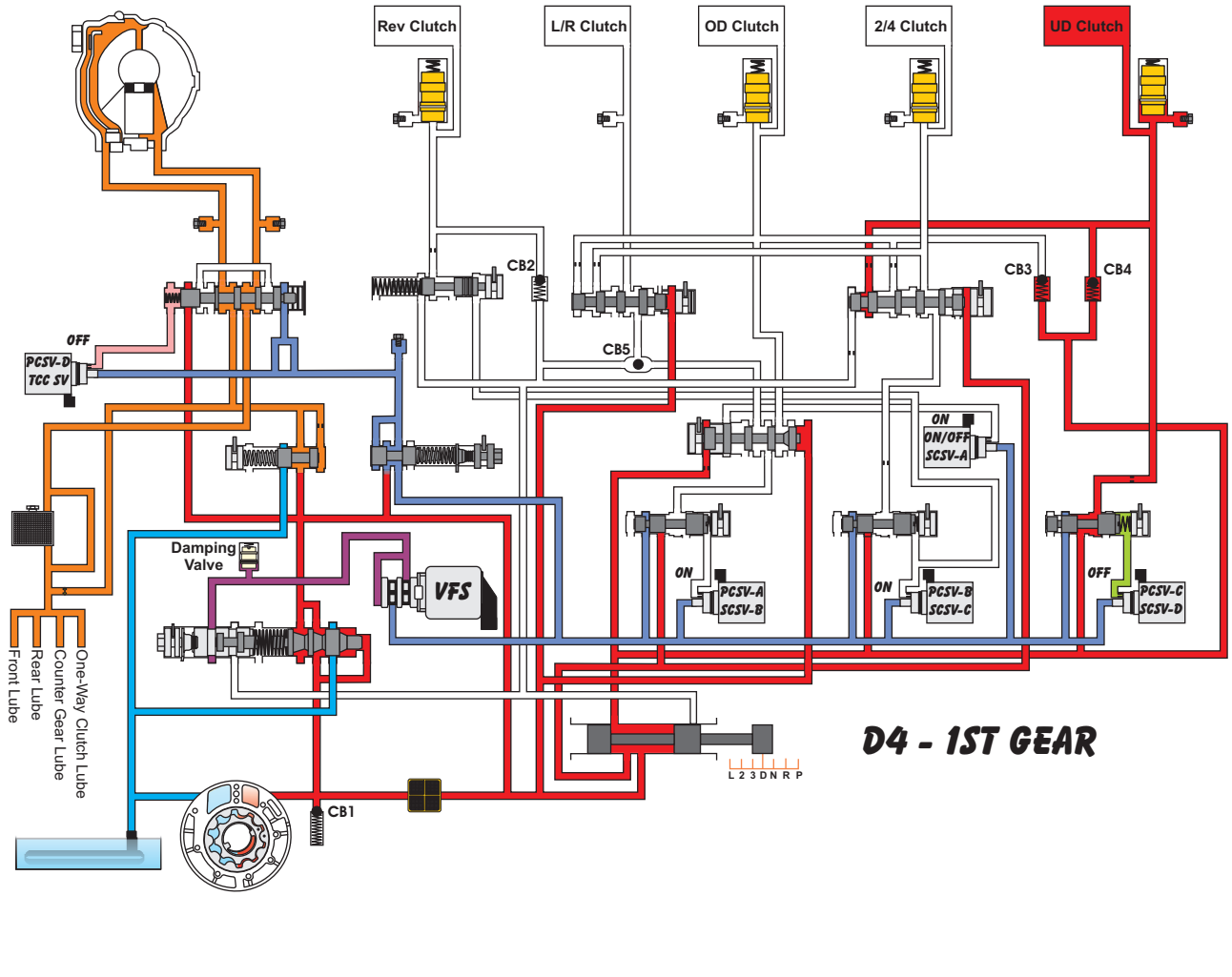


Figure 51

A4CF2
Diagnostic Information

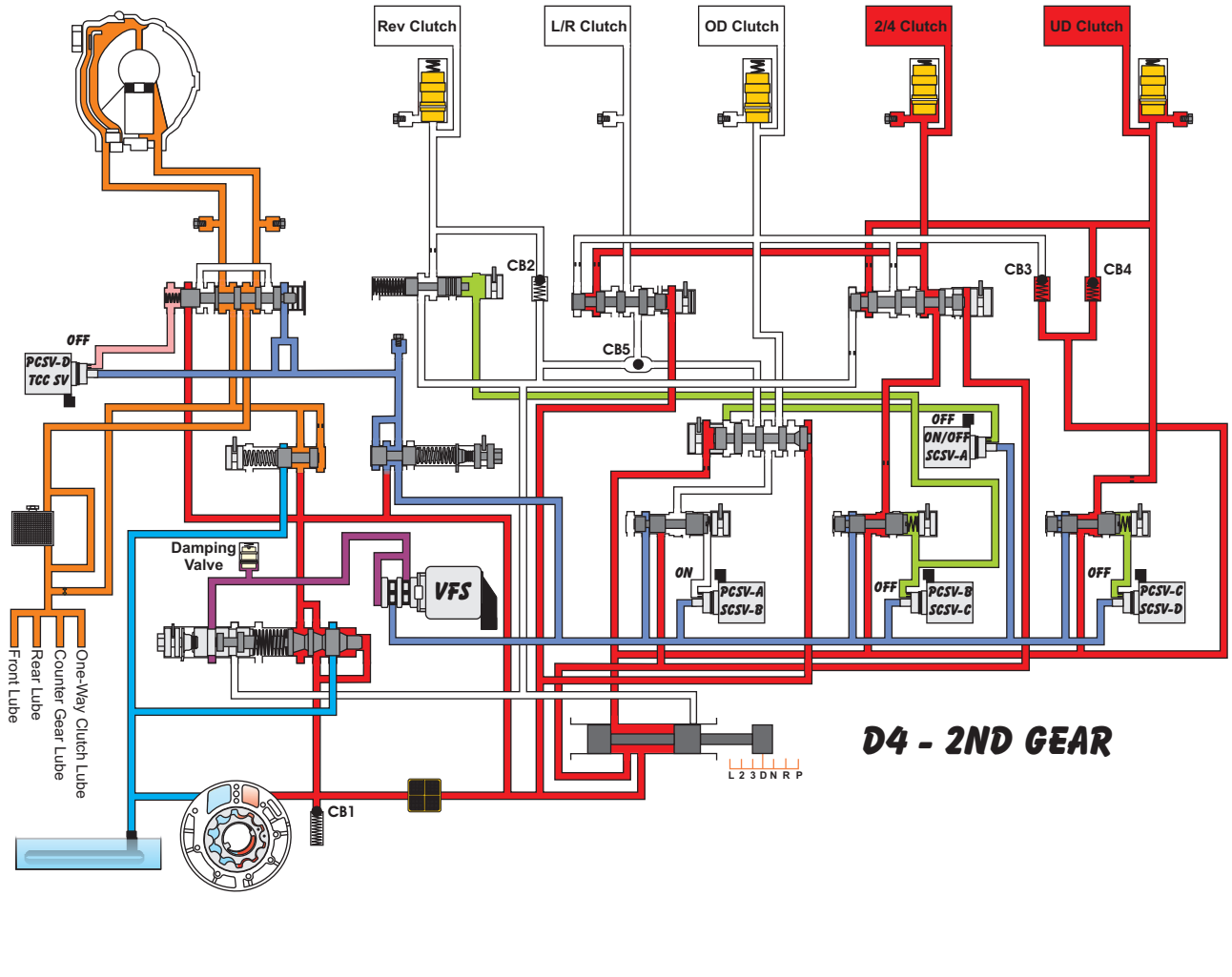


Figure 52

A4CF2
Diagnostic Information

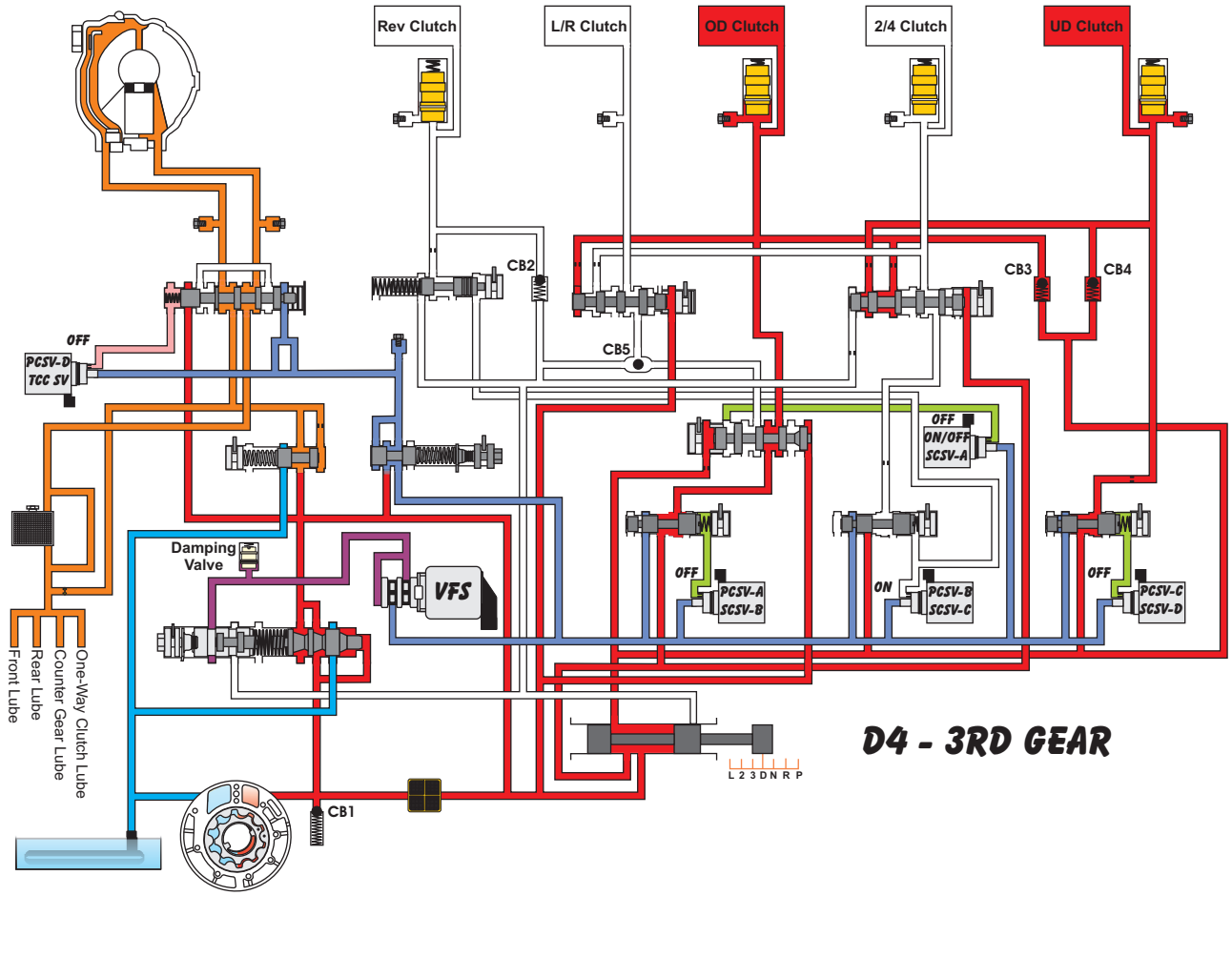


Figure 53

A4CF2
Diagnostic Information

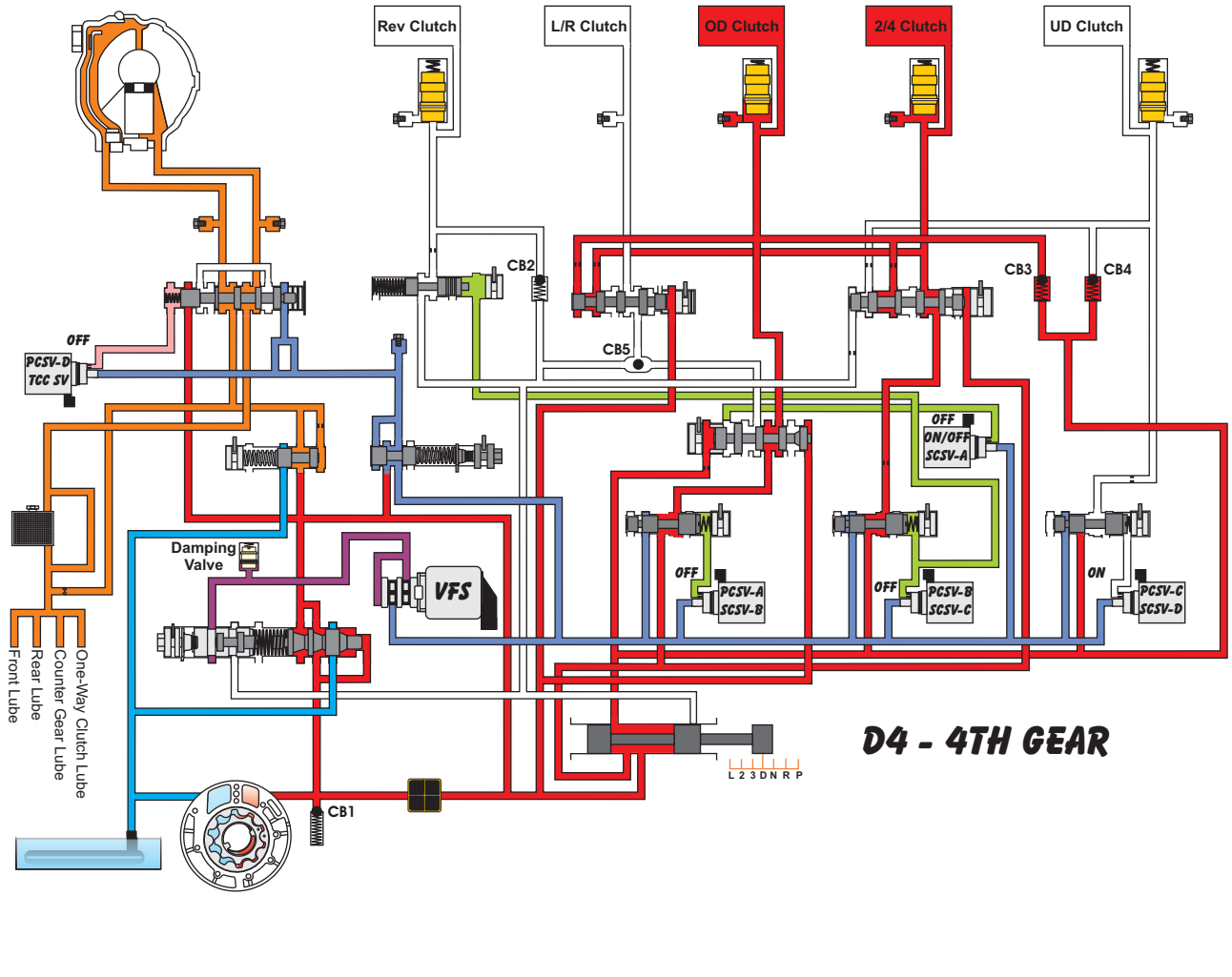


Figure 54

A4CF2
Diagnostic Information

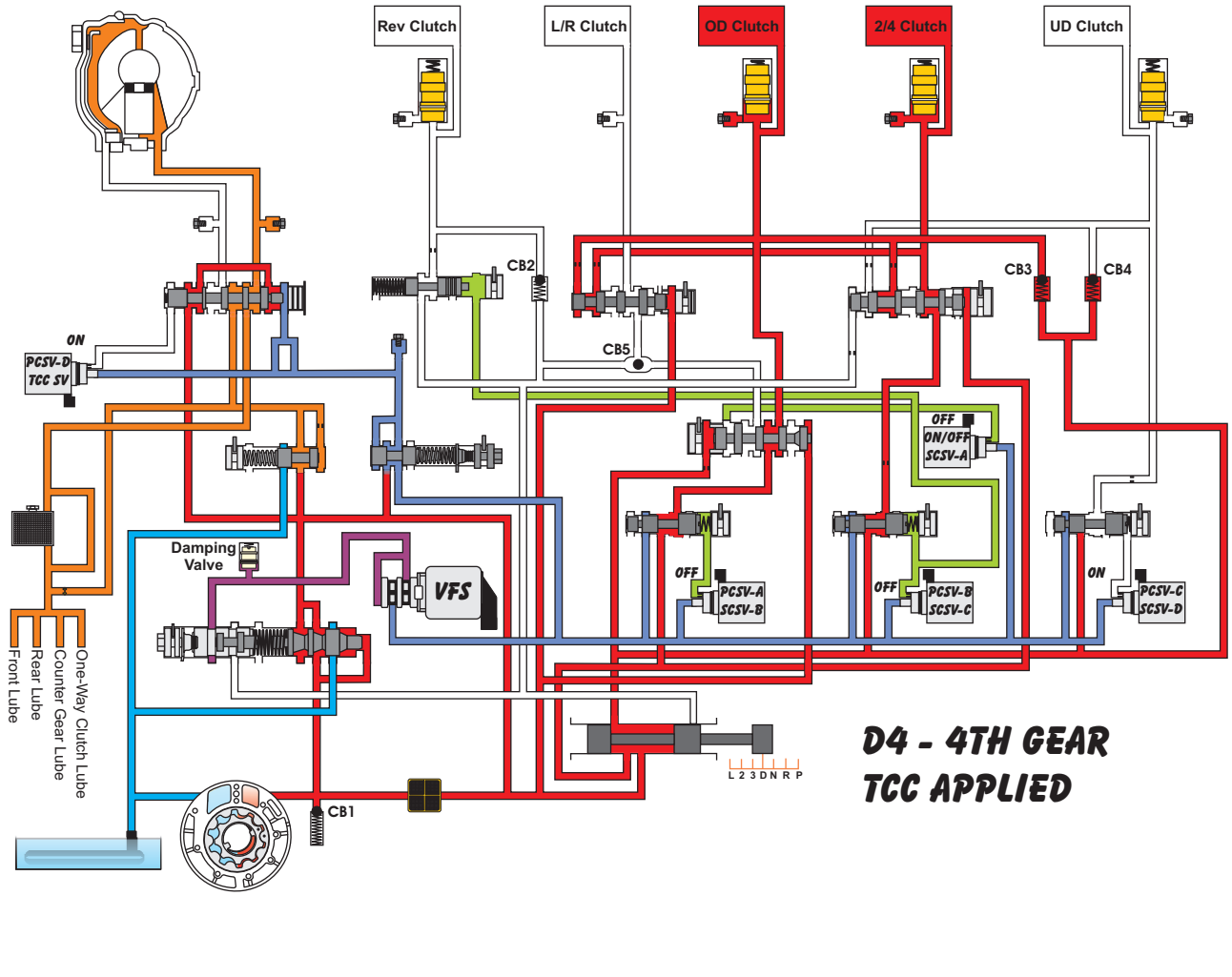


Figure 56

A4CF2
Diagnostic Information

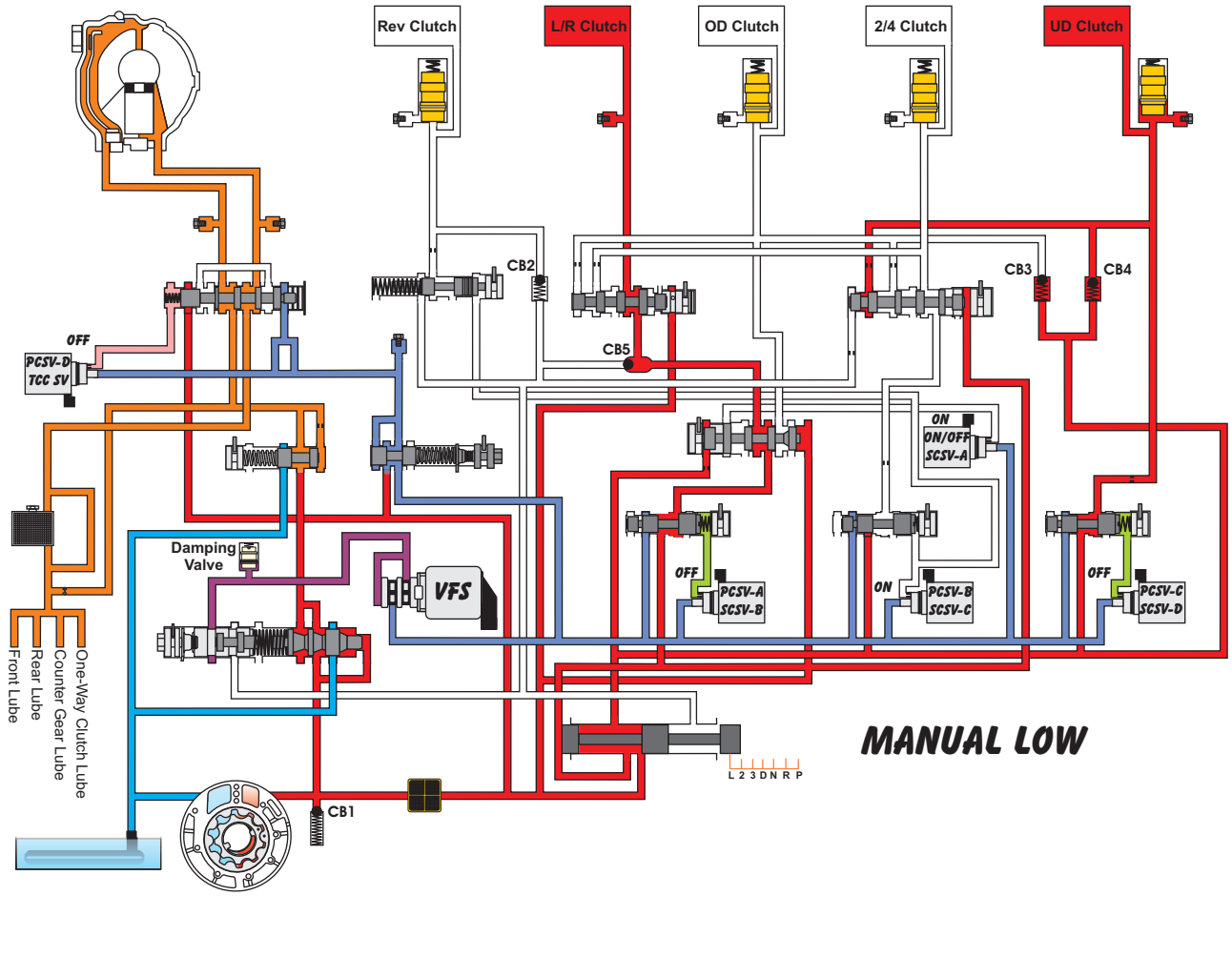


Figure 57

Code	Description
P0605	Internal Control Module Read Only Memory (RAM) Error
P0707	Transaxle Range Switch Circuit Low Input
P0708	Transaxle Range Switch Circuit High Input
P0711	Transaxle Fluid Temperature Sensor Rationality
P0712	Transaxle Fluid Temperature Sensor Circuit Low Input
P0713	Transaxle Fluid Temperature Sensor Circuit High Input
P0716	A/T Input Speed Sensor Rationality
P0717	A/T Input Speed Sensor Circuit - Open or short (GND)
P0722	A/T Output Speed Sensor Circuit - Open or short (GND)
P0731	Gear 1 Incorrect Ratio
P0732	Gear 2 Incorrect Ratio
P0733	Gear 3 Incorrect Ratio
P0734	Gear 4 Incorrect Ratio
P0741	Torque Converter Clutch Stuck Off
P0742	Torque Converter Clutch Stuck On
P0742	(TCC-SV/PCSV-D) Torque Converter Clutch Control Solenoid Circuit Open or Shorted to Ground
P0748	VFS Solenoid Circuit Open or Shorted to Ground
P0750	(SCSV-A) Shift Control Solenoid Valve A (OD-LR Switch Valve/ On-Off) Circuit Open or Shorted to Ground
P0755	(SCSV-B/PCSV-A) Shift Control Solenoid Valve B (OD-LR Clutch) Circuit Open or Shorted to Ground
P0760	(SCSV-C/PCSV-B) Shift Control Solenoid Valve C (2/4 Clutch) Circuit Open or Shorted to Ground
P0765	(SCSV-D/PCSV-C) Shift Control Solenoid Valve D (UD Clutch) Circuit Open or Shorted to Ground
P0880	TCM Power Signal Error
U0001	CAN Communication Malfunction
U0100	CAN Miss-communication or Circuit Malfunction

Figure 58

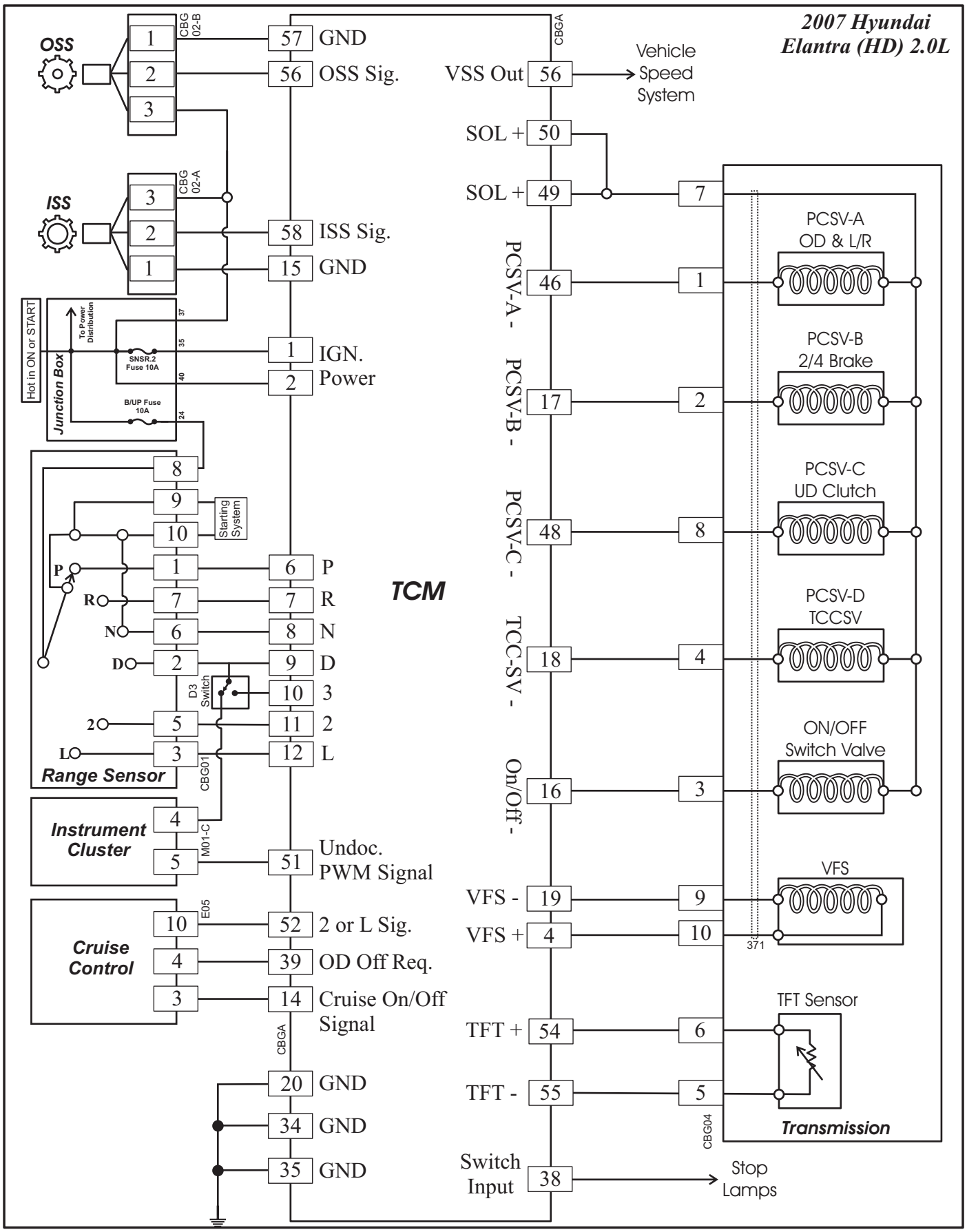
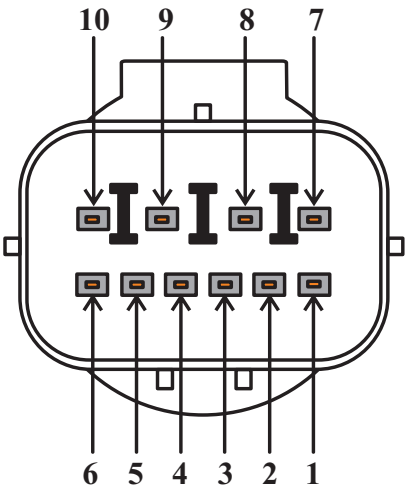


Figure 59

Transmission Connector CBG04



1 - PCSV A - (OD-L/R Clutch)
2 - PCSV B - (2/4 Clutch)
3 - On-Off - (OD-L/R Switch Valve)
4 - PCSV D (TCC)
5 - TFT Signal
6 - TFT Ground
7 - Solenoid Ground
8 - PCSV C - (UD Clutch)
9 - VFS (Line) Low
10 - VFS (Line) High

Transmission Internal Harness with Connector 371

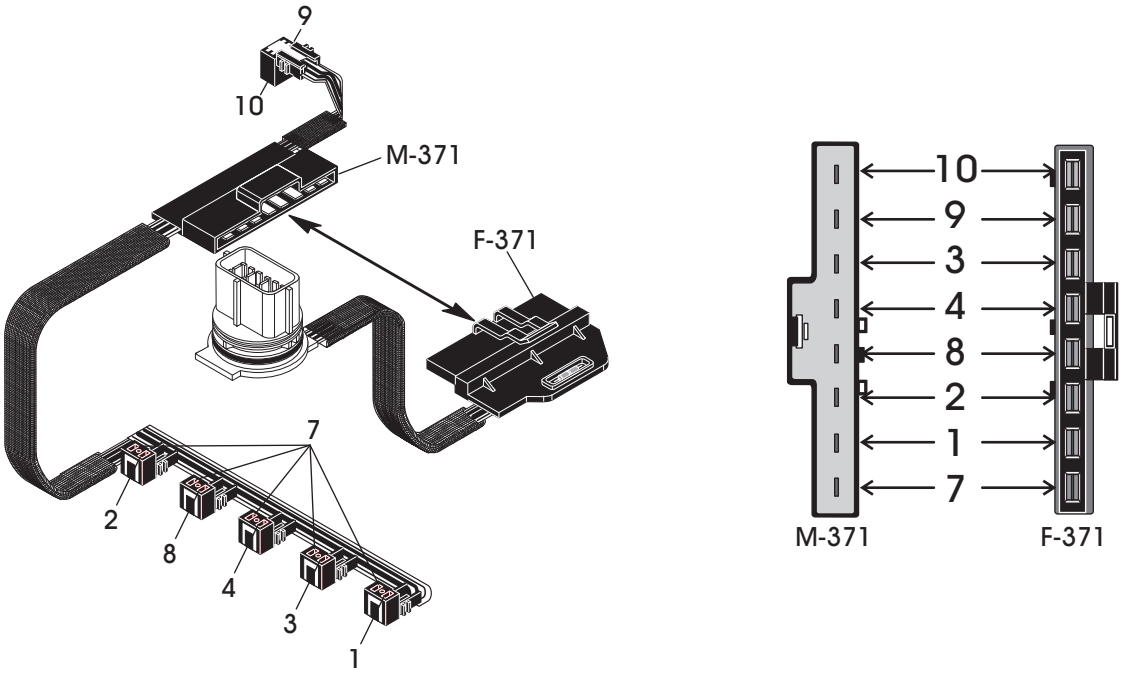
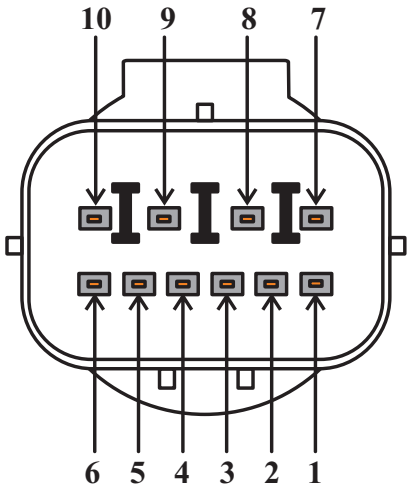


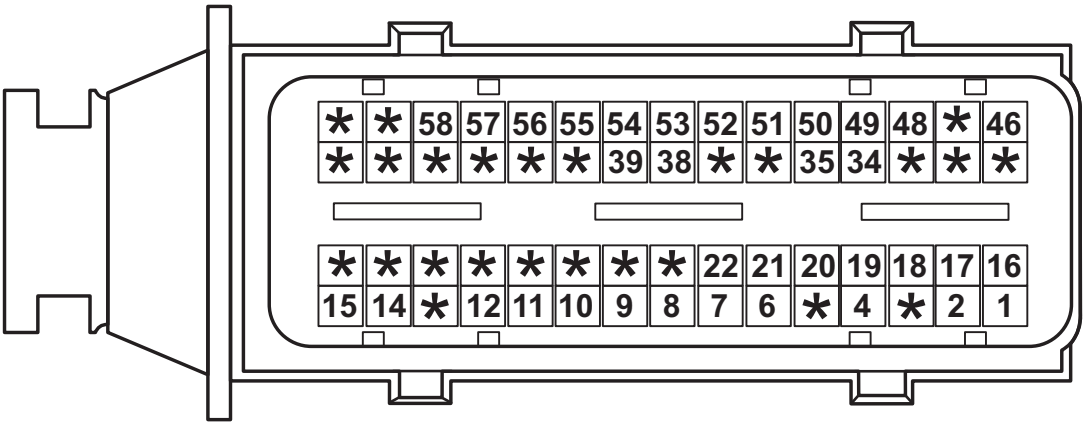
Figure 60



View Looking into the Face of the Transmission Case Connector CBG04

Solenoid	Positive Meter Lead Terminal #	Negative Meter Lead Terminal #	Resistance (Ω Ohms)
Variable Force Solenoid (VFS)	10	9	2.5 to 4.5
On/Off Shift Control Solenoid Valve A (SCSV-A)	7	3	2.5 to 4.5
Shift Control Solenoid Valve B (SCSV-B/PCSV-A)	7	1	2.5 to 4.5
Shift Control Solenoid Valve C (SCSV-C/PCSV-B)	7	2	2.5 to 4.5
Shift Control Solenoid Valve D (SCSV-D/PCSV-C)	7	8	2.5 to 4.5
TCC-Shift Control Solenoid Valve (TCC-SV/PCSV-D)	7	4	2.5 to 4.5
Transmission Fluid Temperature Sensor (TFT)	6	5	See chart in figure 63

Figure 61

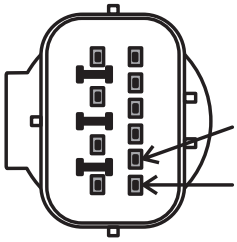


View Looking into the Face of the Transmission Controller Harness Connector CBG-A

Solenoid	Positive Meter Lead Terminal #	Negative Meter Lead Terminal #	Resistance (Ω Ohms)
Variable Force Solenoid (VFS)	4	19	2.5 to 4.5
On/Off Shift Control Solenoid Valve A (SCSV-A)	49 or 50	16	2.5 to 4.5
Shift Control Solenoid Valve B (SCSV-B/PCSV-A)	49 or 50	46	2.5 to 4.5
Shift Control Solenoid Valve C (SCSV-C/PCSV-B)	49 or 50	17	2.5 to 4.5
Shift Control Solenoid Valve D (SCSV-D/PCSV-C)	49 or 50	48	2.5 to 4.5
TCC-Shift Control Solenoid Valve (TCC-SV/PCSV-D)	49 or 50	18	2.5 to 4.5
Transmission Fluid Temperature Sensor (TFT)	54	55	See chart in figure 63

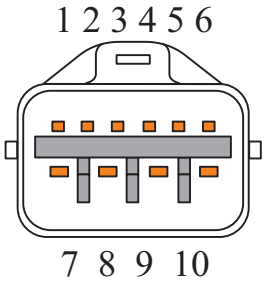
Figure 62

TFT Sensor Check Chart



TEMP. [°C(°F)]	Resistance (kO)	TEMP. [°C(°F)]	Resistance (kO)
-40 (-40)	139.5	80 (176)	1.08
-20 (-4)	47.7	100 (212)	0.63
0 (32)	18.6	120 (248)	0.38
20 (68)	8.1	140 (284)	0.25
40 (104)	3.8	160 (320)	0.16
60 (140)	1.98		

Transmission Range Sensor Connector CBG01 with Continuity Check Chart



1. P Range
2. D Range
3. L Range
5. 2 Range
6. N Range
7. R Range
8. Ign. Power
9. Start Circuit
10. Start Circuit

Shift Lever / Terminal No.	P	R	N	D	2	L
1	●					
2				●		
3						●
4						
5					●	
6			●			
7		●				
8	●	●	●	●	●	●
9	●		●			
10	●		●			

Figure 63

ISS and OSS
Hall Effect Sensors

Both the Input Shaft Speed and Output Shaft Speed (ISS and OSS) Sensors are Hall Effect Sensors. Each are supplied with ignition voltage (approx. 12 volts) on terminal 3 and are both grounded via terminal 1. The number 2 terminal receives a 5 volt supply from the TCM.

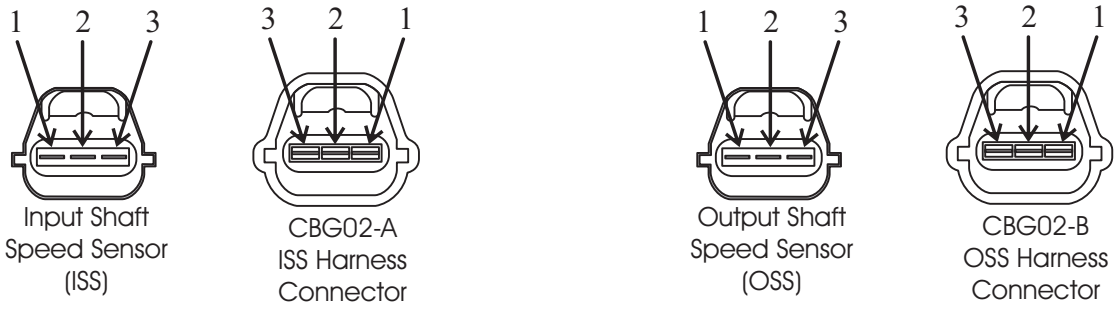
Input shaft speed sensor details：

1. Detect the input shaft rotation at the OD &REV retainer side to control oil pressure when shifting .
2. Feedback control clutch control damper clutch control shift range control incorrect ratio control and sensor trouble detection signal .

Output shaft speed sensor details：

1. Detect the output shaft rpm (T F DRIVE GEAR RPM)at the T F drive gear.
2. Feedback control clutch control damper clutch control shift range control incorrect ratio control and sensor trouble detection signal .

The air gap for the ISS Sensor to its signal wheel is 1.3 mm (0.051") while the OSS sensor is 0.85 mm (0.033").

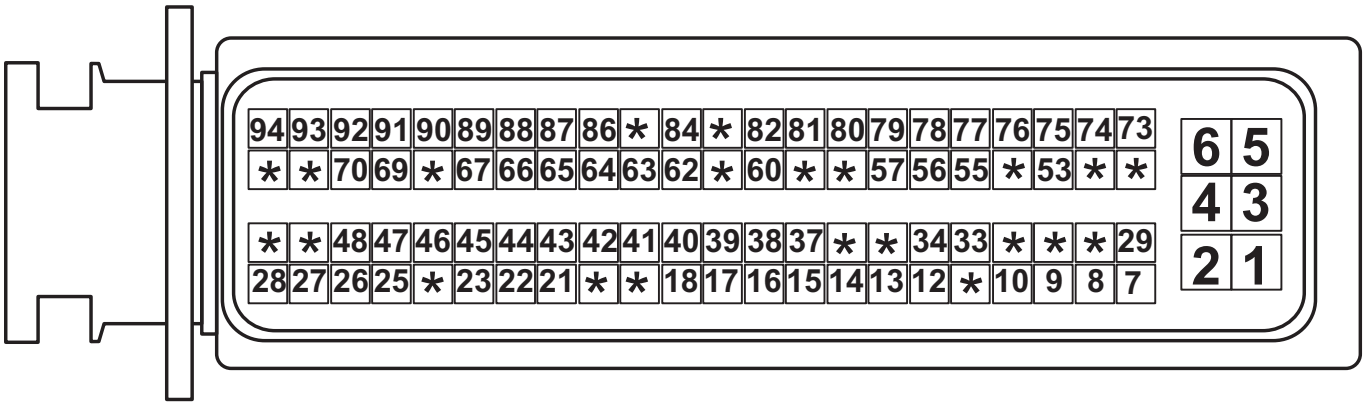


ISS ***OSS***

1. Sensor Ground
2. Sensor Signal -
3. Ignition Power Supply

Figure 64

Engine Controller
Harness Connector CBG-K



Transmission Controller
Harness Connector CBG-A

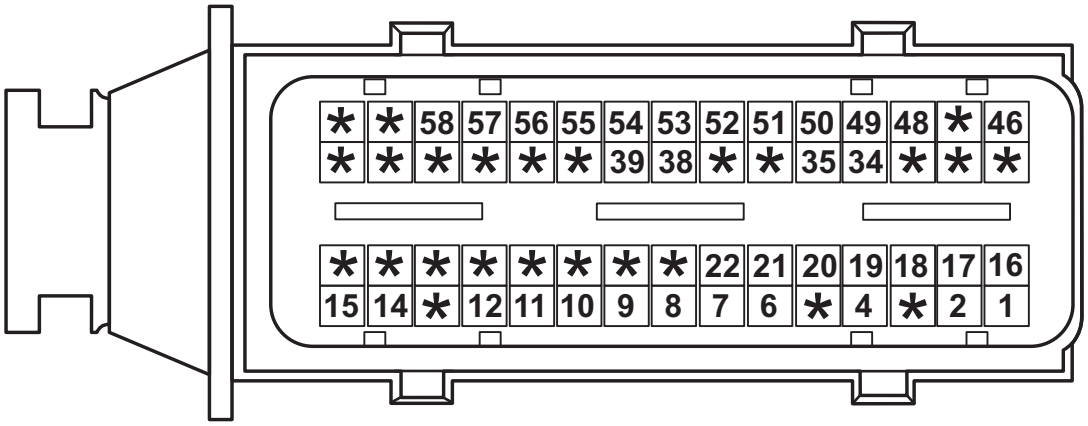


Figure 65