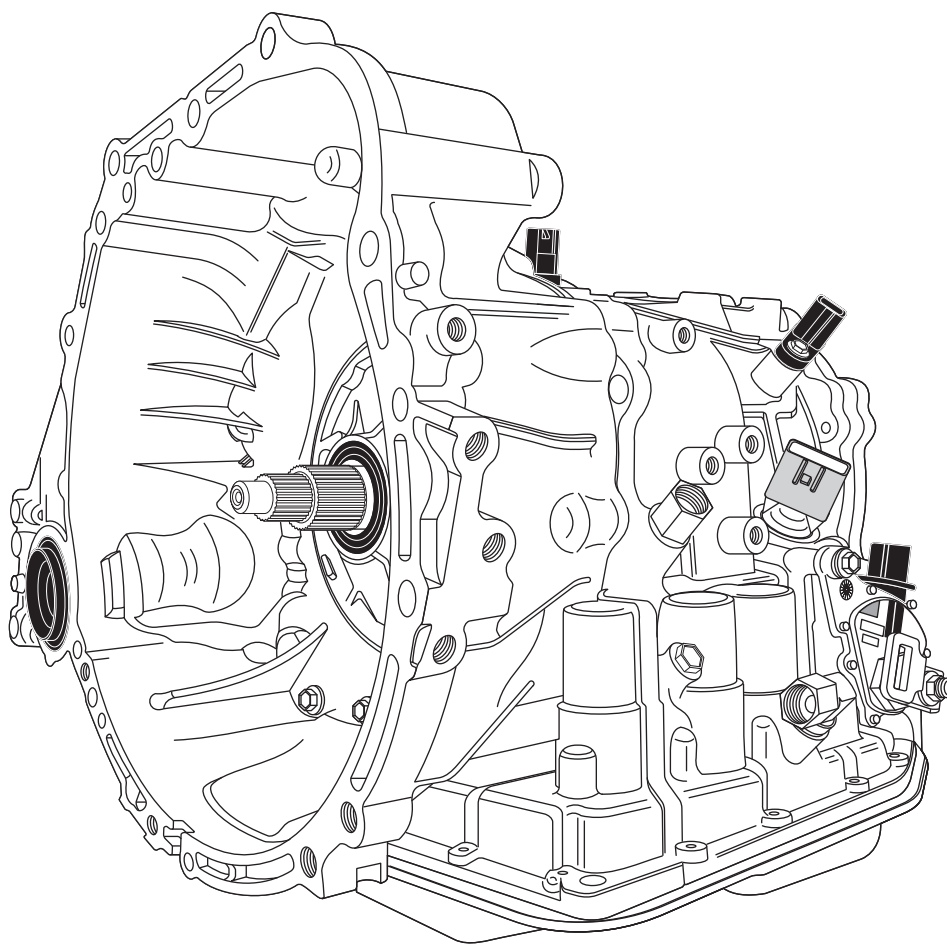


## TOYOTA/LEXUS U150/U250 PRELIMINARY INFORMATION

Starting at the beginning of production for the 2002 model year for Lexus and 2004 for Toyota, a spin-off of the U140/U240 Four speed transaxle, designated as the U150/U250 series was born. This transmission is classified as a 5 speed transmission, although it has 6 ratio's possible in the Drive position. The U150/250 is very similar to it's smaller brother, the U140, and actually uses some of the same parts.

This transaxles shift points, and shift feel are electronically controlled by a Powertrain Control Module. This is accomplished by the PCM monitoring engine load and adjusting solenoid duty cycle to match pressure rise and shift feel. The PCM also monitors the turbine and output speed sensors to calculate gear ratio and the Transmission Range Sensor for gear selection.

### TOYOTA/LEXUS U150/U250 TRANSAXLE



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## TOYOTA/LEXUS U150/U250 PRELIMINARY INFORMATION

*Refer to Figure 1 for a component application chart.*

*Refer to Figure 2 for the Solenoid internal harness and connector I.D.*

*Refer to Figure 3 for the Solenoid ohm values.*

*Refer to Figure 4 for the Internal harness schematic.*

*Refer to Figure 5 for the Solenoid Identification and location.*

*Refer to Figure 6 for the Solenoid Firing Order.*

*Refer to Figure 7 for the SLT Solenoid function.*

*Refer to Figure 8 for the SL1 Solenoid function.*

*Refer to Figure 9 for the SL2 Solenoid function.*

*Refer to Figure 10 for the SL3 Solenoid function.*

*Refer to Figure 11 for the SR Solenoid function.*

*Refer to Figure 12 for the S4 Solenoid function.*

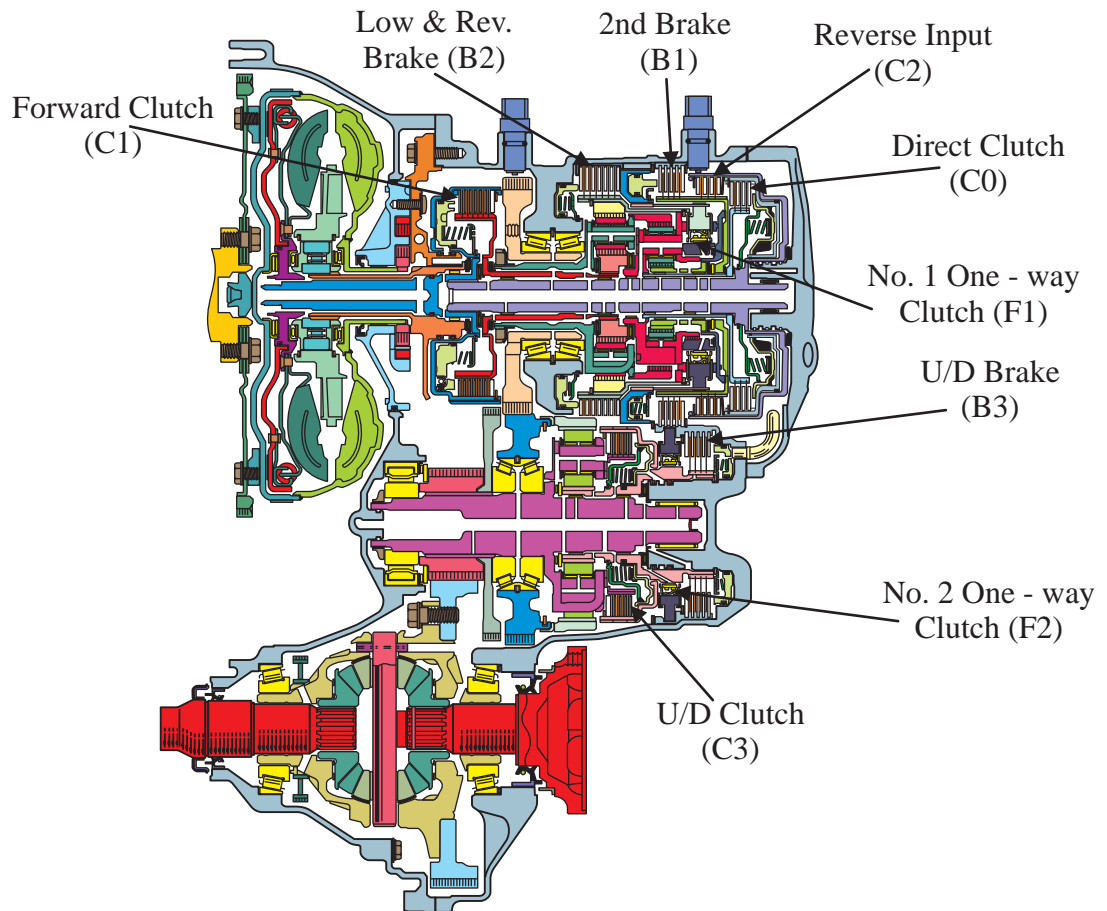
*Refer to Figure 13 for the DSL/TCC Solenoid function.*

*Refer to Figure 14-24 for the complete Valve Body assembly exploded views and valve descriptions.*

*Refer to Figure 25 for case passage I.D. and air Checks.*

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## TOYOTA/LEXUS U150/U250 COMPONENT APPLICATION CHART



Gear Range	Fwd Clutch C1	Rev Input Clutch C2	Dir Clutch C0	U/D Clutch C3	2nd Brake B1	L/R Brake B2	U/D Brake B3	No. 1 One Way Clutch F1	No. 2 One Way Clutch F2
Park							ON		
Reverse		ON				ON	ON		
Neutral							ON		
D-1st. Gear	ON						ON	ON	ON
D-2nd. Gear	ON				ON		ON		ON
D-3rd. Gear Version 1	ON		ON	ON					
D-3rd. Gear Version 2	ON		ON				ON		ON
D-4th. Gear			ON		ON		ON		ON
D-5th. Gear			ON	ON	ON				

3rd Gear Version 1 is a higher ratio, as the Transfer assembly is turning 1:1

3rd Gear Version 2 is a lower ratio, as the Transfer assembly is in reduction

Note: These two versions are controlled by PCM scheduling and Line pressure. Version 2 is used at higher throttle/pressure.

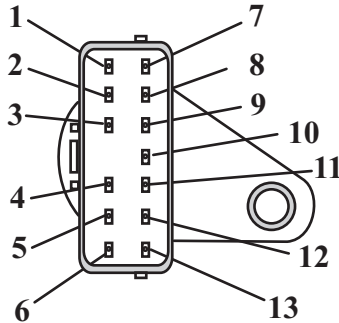
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Figure 1

## TOYOTA/LEXUS U150/U250 PRELIMINARY INFORMATION

### SOLENOID INTERNAL HARNESS AND CONNECTOR I.D.

**13 PIN  
CONNECTOR**



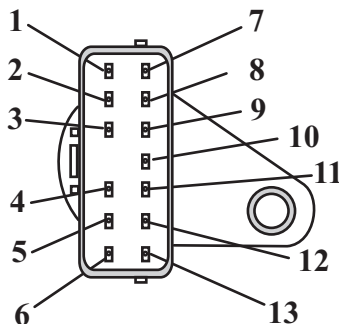
<i>Terminal</i>	<i>Function</i>	<i>Internal wire Color</i>
1	THO (temp +)	Orange
2	SLT +	Green
3	S4 +	Yellow
4	SL3+	Red
5	SL2+	Green
6	SL1+	White
7	E2 (temp -)	Orange
8	SLT -	Grey
9	SR+	Purple
10	DSL+	Light Blue
11	SL3-	Blue
12	SL2-	Brown
13	SL1-	Black

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Figure 2

### SOLENOID OHM VALUES

**13 PIN  
CONNECTOR**

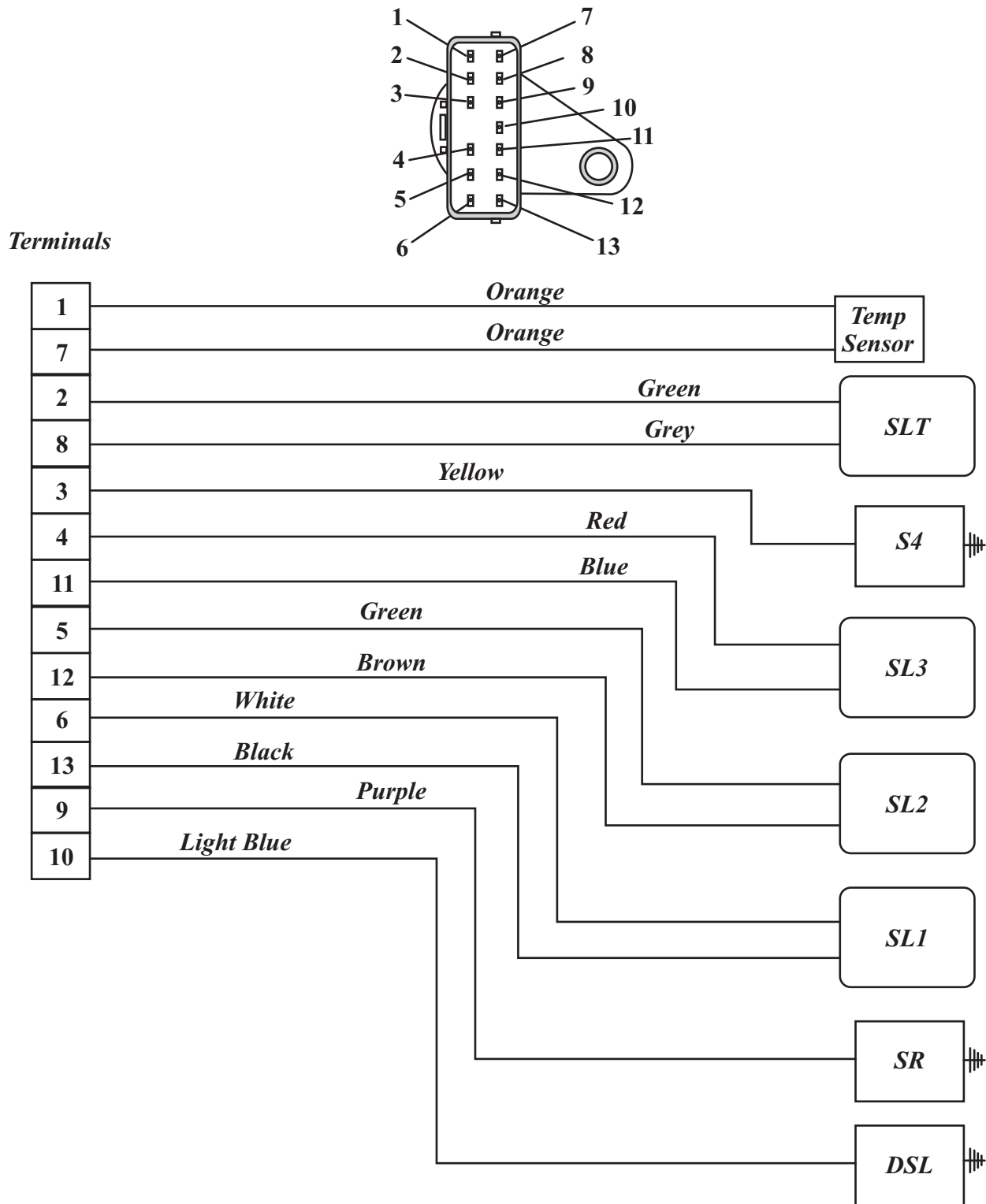


<i>Test</i>	<i>Connect to terminals</i>	<i>Ohm Value</i>
Temp Sensor	1 and 7	3.8k ohms @ 70°F
SLT	2 and 8	4.5 to 6.0
S4	3 and Gnd to the case	11 to 15
SL3	4 and 11	4.5 to 6.0
SL2	5 and 12	4.5 to 6.0
SL1	6 and 13	4.5 to 6.0
SR	9 and Gnd to the case	11 to 15
DSL	10 and Gnd to the case	11 to 15

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Figure 3

## 13 PIN CONNECTOR INTERNAL HARNESS SCHEMATIC



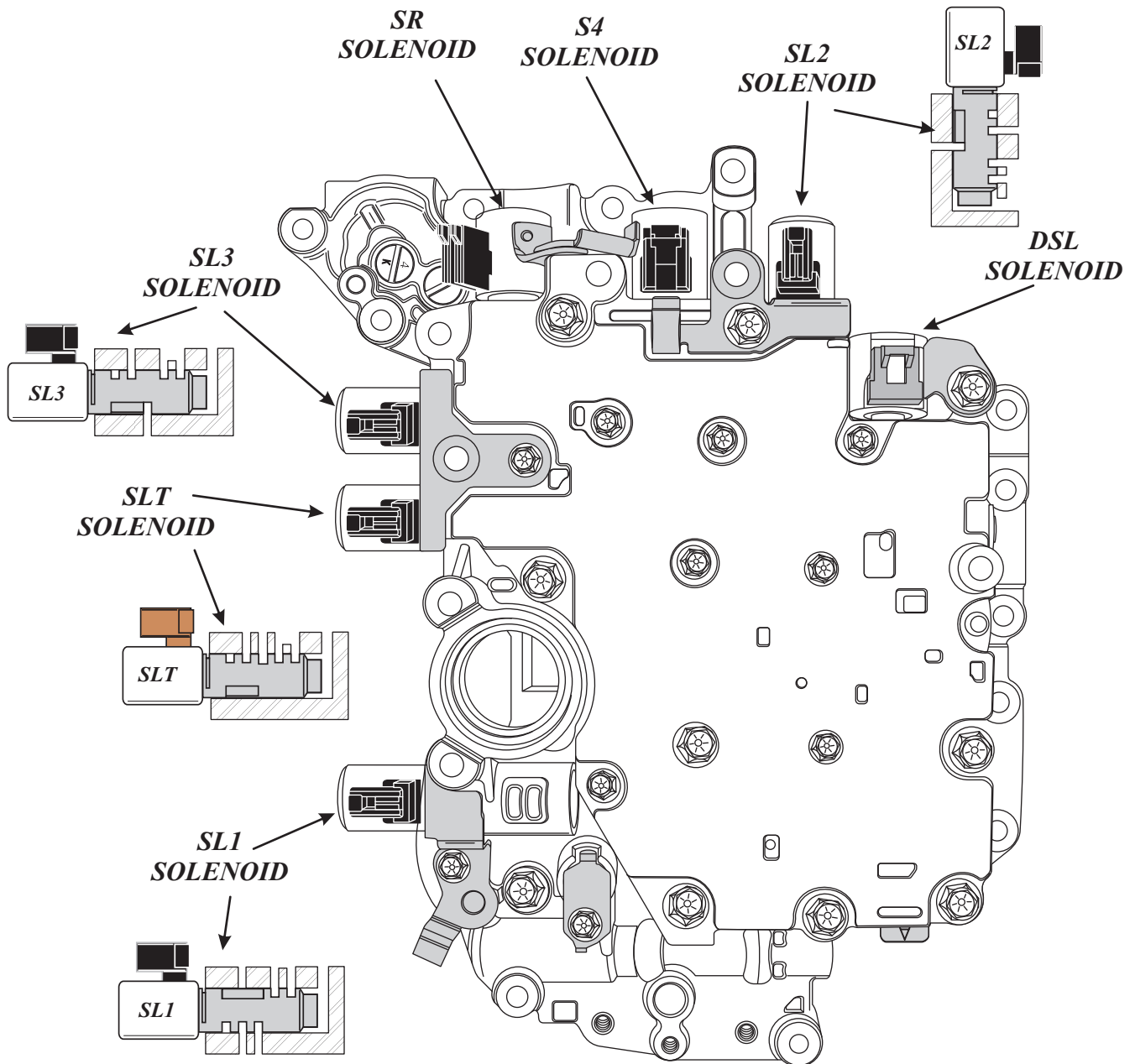
*Note: The DSL ,SR and S4 Solenoid are grounded to the case*

# Technical Service Information

## TOYOTA/LEXUS U150/U250

### PRELIMINARY INFORMATION

#### U150 SERIES SOLENOID I.D.



*Note: The Linear solenoids can be put into the wrong holes in the Valve Body. Refer to the illustration above with the cross-sectional views and verify that the solenoid is in the correct location.*

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Figure 5



Technical Service Information  
**TOYOTA/LEXUS U150/U250**  
**PRELIMINARY INFORMATION**

**TYPICAL SOLENOID FIRING ORDER**

	SL1	SL2	SL3	S4	SR	DSL/TCC	SLT
1st	ON	ON	Off	Off	Off	ON/M1**	Modulates based on engine load
2nd	Off	ON	Off	Off	Off		
3rd	ON	Off	Off	Off	ON*	ON**	
4th	Off	Off	ON	Off	ON*	ON**	
5th	Off	Off	ON	ON	ON*	ON**	

*\*SR- must be ON for TCC apply, and must be OFF to provide the connection for the DSL to the B2 Control Valve for Reverse inhibit. The SR is also Off during the 2-3 upshift transition.*

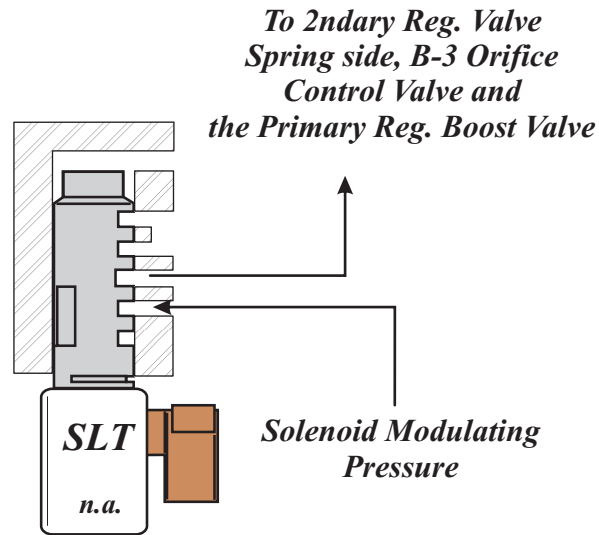
*\*\*DSL - has 3 functions in Manual Low controls B2 brake to provide engine braking in Manual 1, in 3rd, 4th and 5th gear it controls TCC, and if turned on in Reverse will inhibit Reverse application.*

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Figure 6

## SLT LINE PRESSURE CONTROL SOLENOID

4.5-6.0  
Ohms



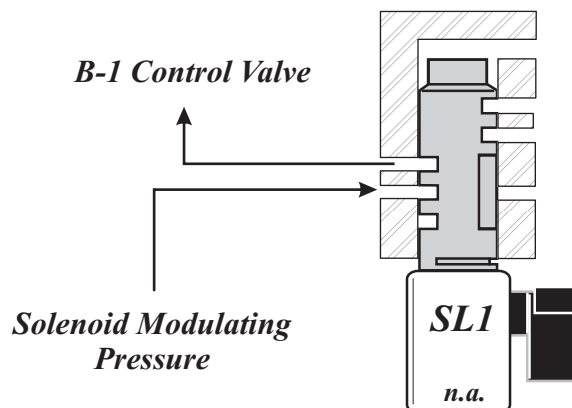
**Normally Applied**

*The SLT or Line Pressure Control Solenoid is a Normally Applied linear type Solenoid. When the Solenoid is OFF Solenoid Modulating Pressure will be connected to the port leading to the 2ndary Reg. Valve Spring side, B-3 Orifice Control Valve and the Primary Reg. Boost Valve causing Pressure to be high in those circuits, as well as Main Line Pressure. When the SLT Solenoid is ON pressure will be low leading to the valves listed above, as well as Line Pressure. This Solenoid is controlled by the PCM which calculates the duty cycle to match Line Pressure to engine load.*

Figure 7

## SL1 SOLENOID

4.5-6.0  
Ohms



**Normally Applied**

*The SL1 Solenoid is a Normally Applied linear type Solenoid. When the Solenoid is OFF Modulating Pressure will be connected to the port leading to the B-1 Control valve, which controls B-1 application. When the Solenoid is ON Modulating pressure will be blocked to the Valve.*

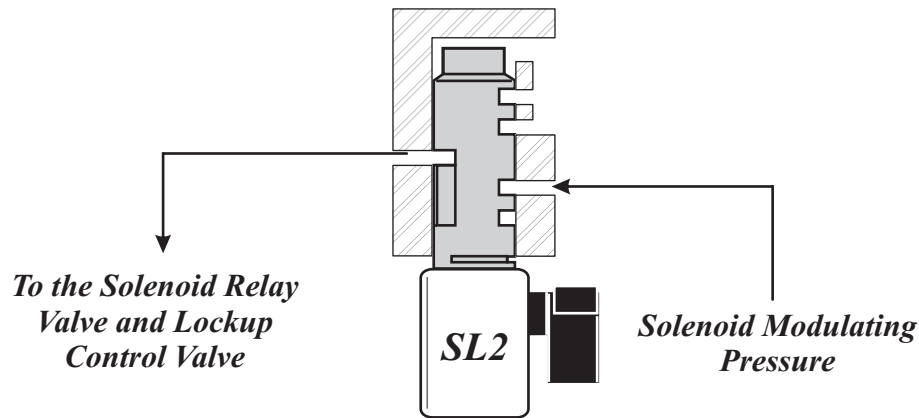
Copyright © 2011 ATSG

Figure 8



## SL2 SOLENOID

4.5-6.0  
Ohms



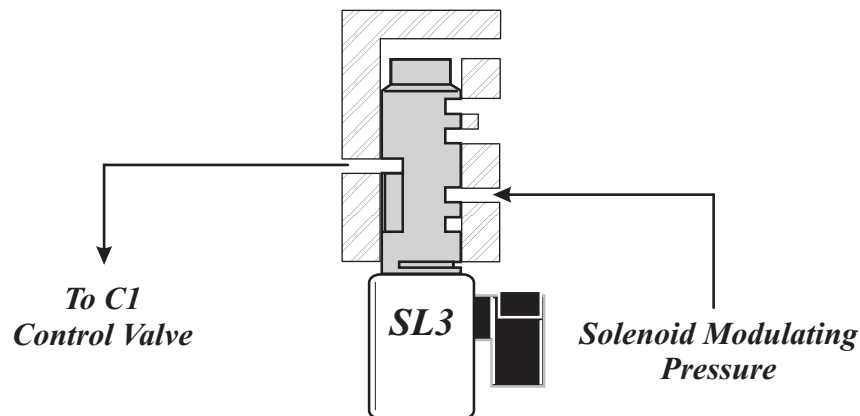
**Normally Applied**

*The SL2 Solenoid is a Normally Applied linear type Solenoid. When the Solenoid is OFF Modulating Pressure will be connected to the port leading to the Solenoid Relay Valve, to control the 2-3 upshift, thru the C0 Control Valve, and the third land of the Lockup Control Valve. When the Solenoid is ON Modulating pressure will be blocked to the Valves listed above.*

Figure 9

## SL3 SOLENOID

4.5-6.0  
Ohms



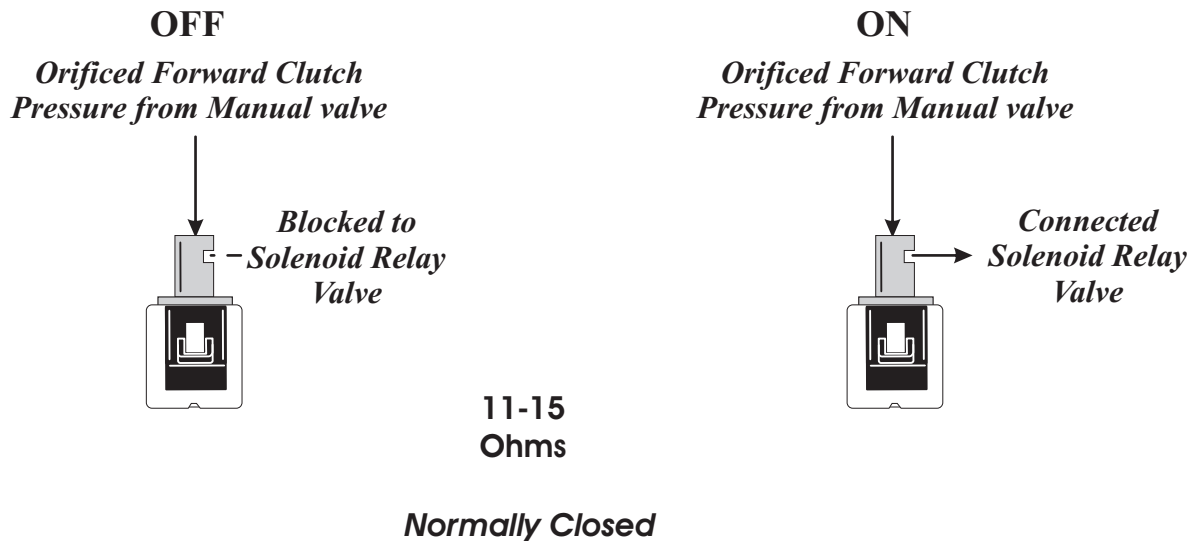
**Normally Applied**

*The SL3 Solenoid is a Normally Applied linear type Solenoid. When the Solenoid is OFF Modulating Pressure will be connected to the port leading to the C1 Control Valve. When the Solenoid is ON Modulating pressure will be blocked to the Valves listed above.*

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Figure 10

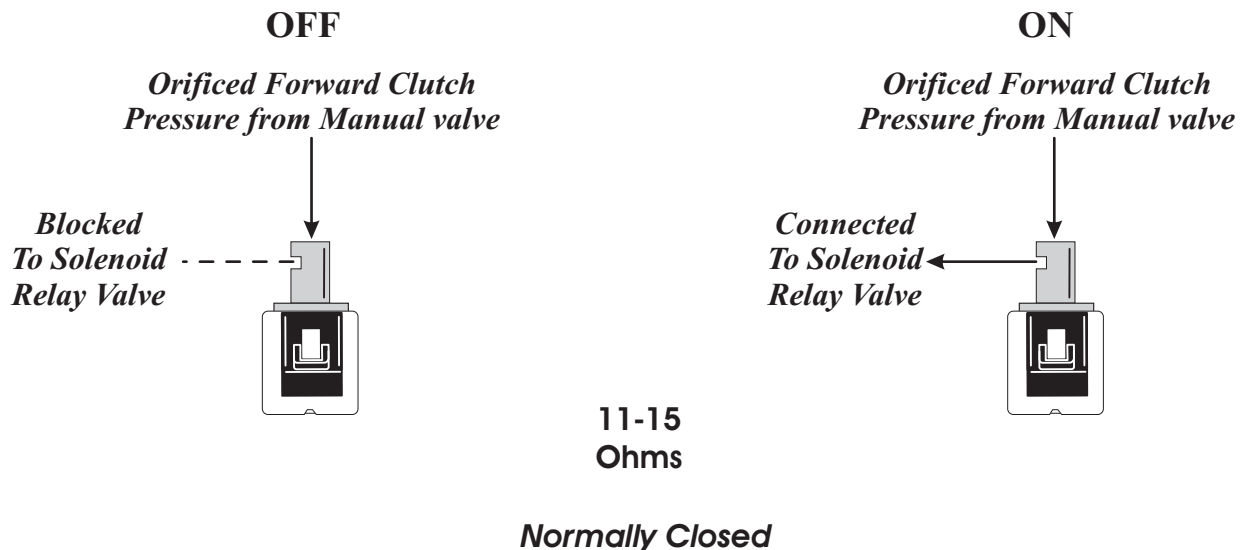
## SR SOLENOID



*The SR Solenoid is a Normally Closed Solenoid. When OFF it blocks orificed Forward Clutch pressure from stroking the Solenoid Relay Valve. When ON it connects orificed Forward Clutch pressure to the First land of the Solenoid Relay Valve stroking the valve.*

Figure 11

## S4 SOLENOID



*The S4 Solenoid is a Normally Closed Solenoid. When OFF it blocks orificed Forward Clutch pressure from the port leading to the Solenoid Relay Valve. When ON it connects orificed Forward Clutch pressure to the Solenoid Relay Valve, which in-turn leads to the 4-5 Shift Valve or Clutch Apply Control Valve, based on the position of the Solenoid Relay Valve..*

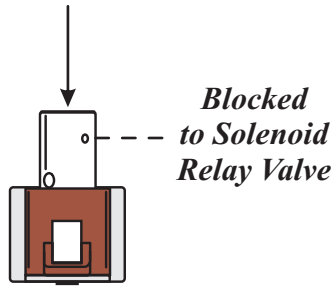
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Figure 12

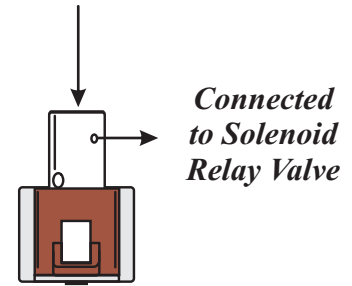
## TOYOTA/LEXUS U150/U250 PRELIMINARY INFORMATION

### DSL - TCC SOLENOID

**OFF**  
*Solenoid Modulating  
Pressure*



**ON**  
*Solenoid Modulating  
Pressure*



11-15  
Ohms

**Normally Closed**

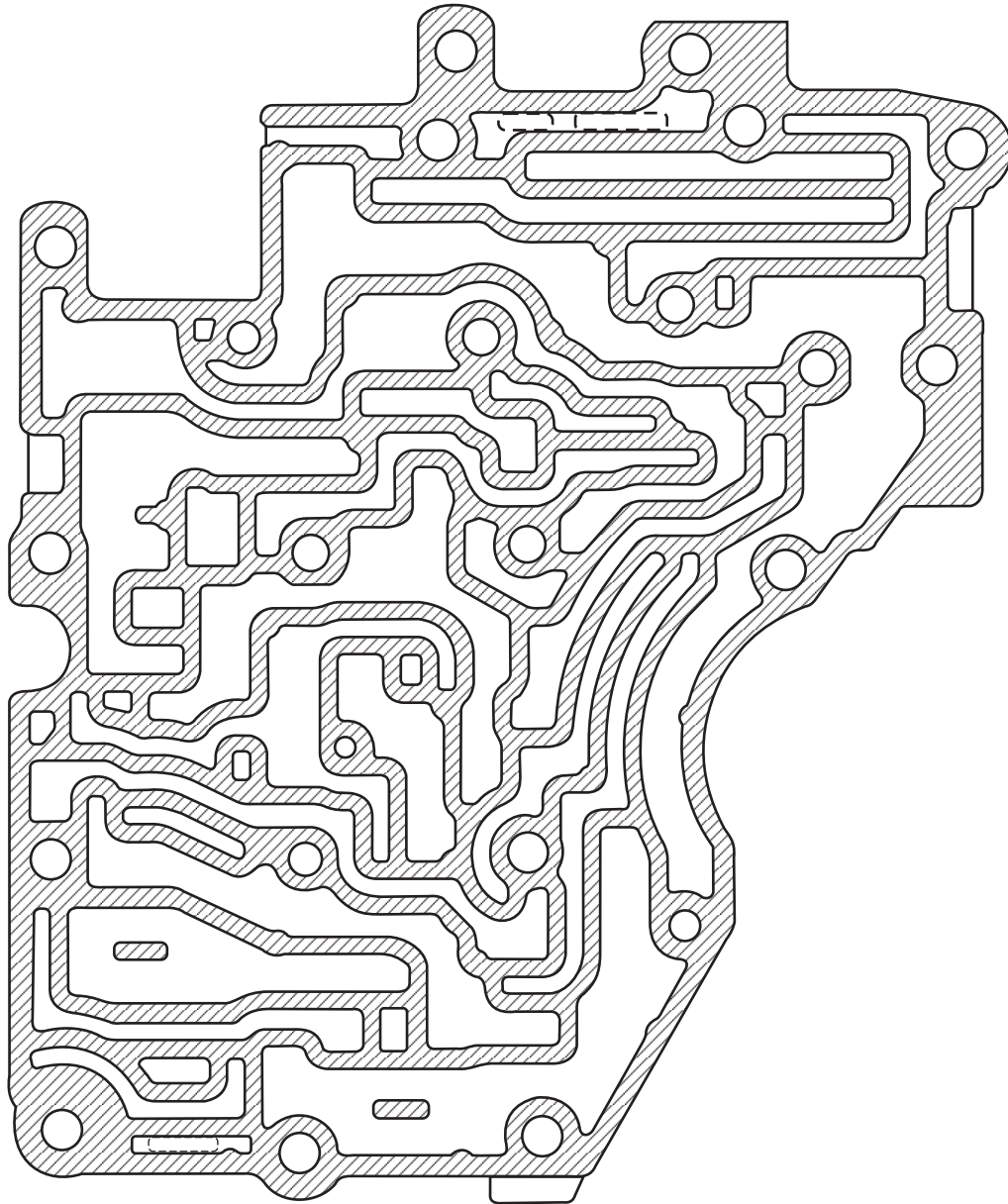
*The DSL/TCC Solenoid is a Normally Closed Solenoid. When OFF it blocks Solenoid modulating pressure from the Solenoid Relay Valve. When ON it connects Solenoid Modulating pressure to the B-2 Control Valve when the Solenoid Relay Valve is not stroked, for Reverse inhibit and for B2 application in Manual Low for engine braking. When On it connects Solenoid Modulating pressure to the Lock-up Relay Valve for TCC application*

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Figure 13

Technical Service Information  
**TOYOTA/LEXUS U150/U250**  
**PRELIMINARY INFORMATION**

**LOWER CHANNEL  
PLATE**



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Figure 14

**TOYOTA/LEXUS U150/U250**  
**PRELIMINARY INFORMATION**

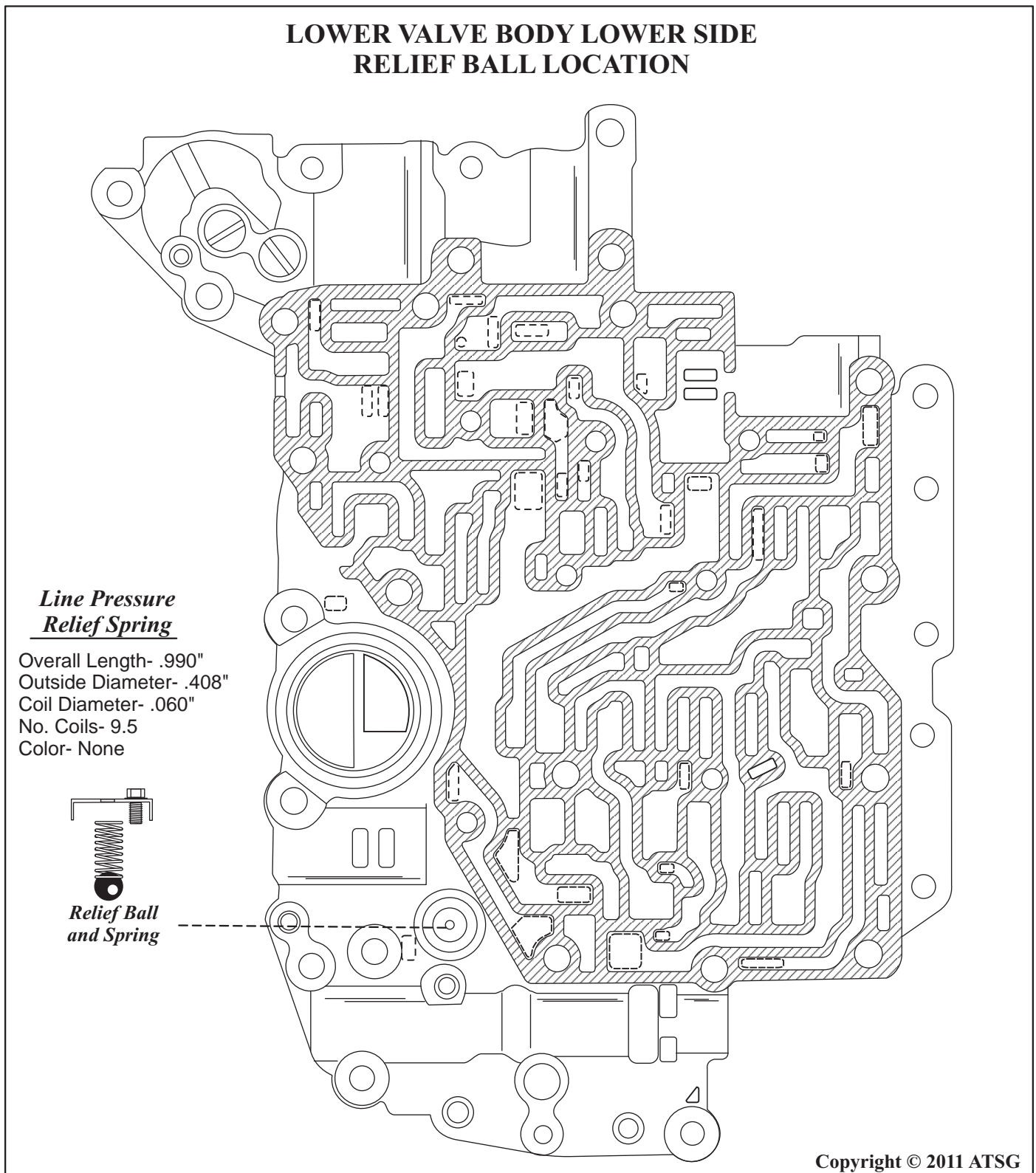
**LOWER BONDED  
SPACER PLATE**



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## TOYOTA/LEXUS U150/U250 PRELIMINARY INFORMATION

### LOWER VALVE BODY LOWER SIDE RELIEF BALL LOCATION

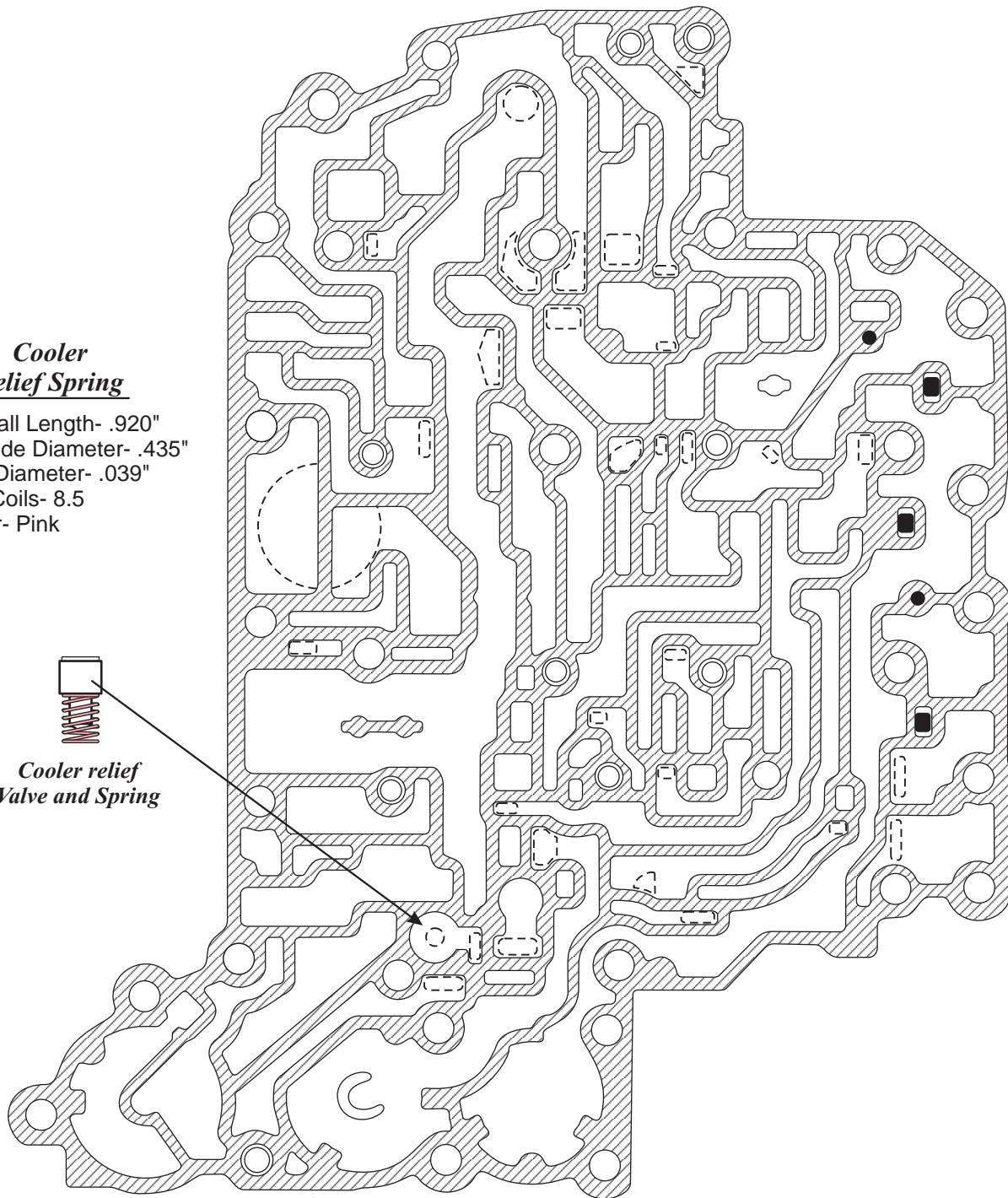
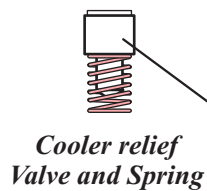


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Figure 16

**TOYOTA/LEXUS U150/U250  
PRELIMINARY INFORMATION****LOWER VALVE BODY UPPER SIDE RELIEF VALVE  
AND RETAINER LOCATIONS*****Cooler  
Relief Spring***

Overall Length- .920"  
Outside Diameter- .435"  
Coil Diameter- .039"  
No. Coils- 8.5  
Color- Pink

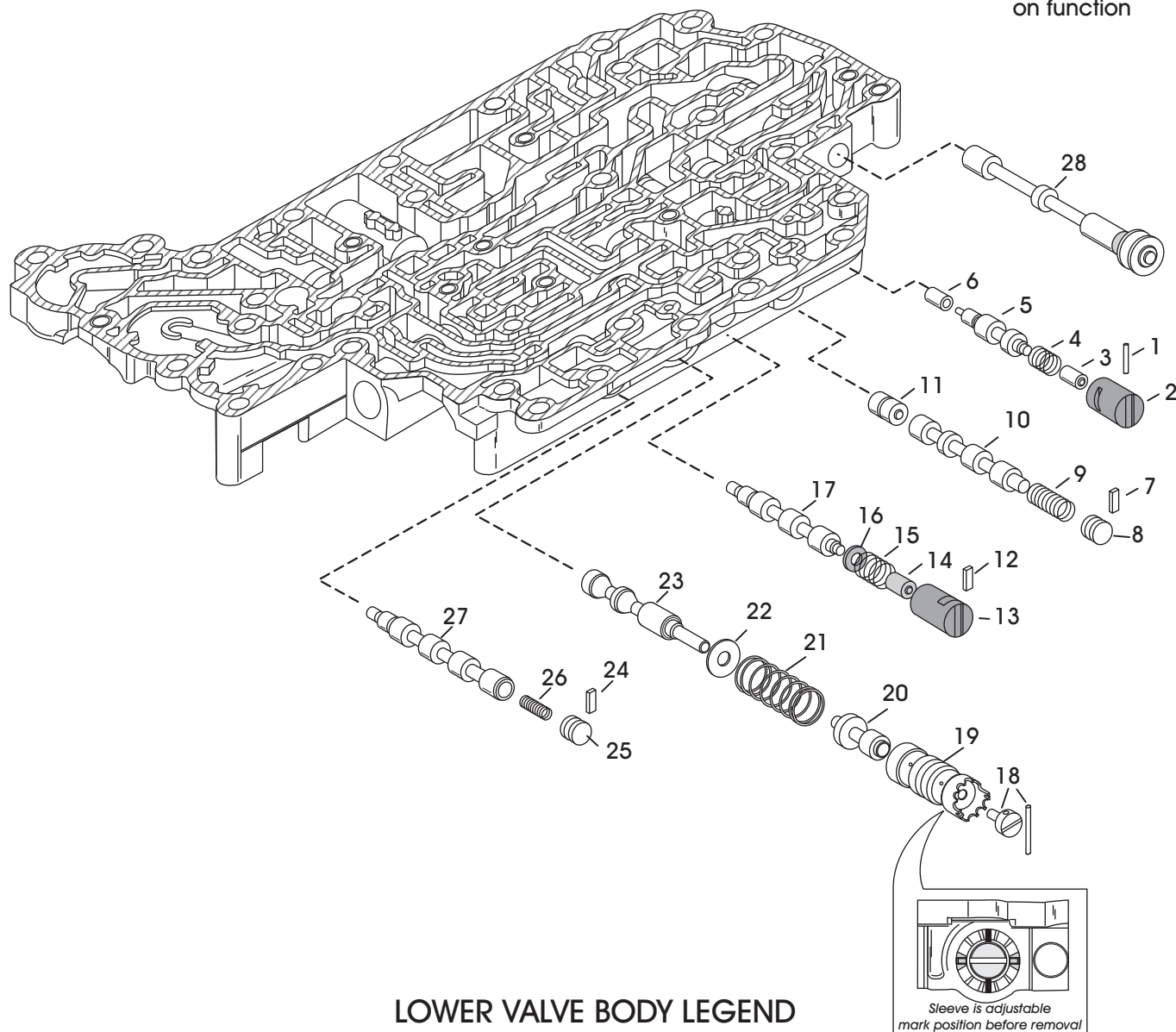


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Figure 17

## LOWER VALVE BODY VALVE DESCRIPTIONS

Note: Some Valve names are ATSG's interpretation based on function



## LOWER VALVE BODY LEGEND

- |                                  |  |
|----------------------------------|--|
| 1. B2 Switch Valve Retainer      | 15. B1 Switch Valve Spring                 |
| 2. B2 Switch Valve Boost Sleeve  | 16. B1 Switch Valve Spring Shim .040"      |
| 3. B2 Switch Valve Boost Valve   | 17. B1 Switch Valve                        |
| 4. B2 Switch Valve Spring        | 18. Main Regulator Valve Plug and retainer |
| 5. B2 Switch Valve               | 19. Main Regulator Valve Boost Sleeve      |
| 6. B2 Switch Valve Plug          | 20. Main Regulator Valve Boost Valve       |
| 7. 4-5 Shift Valve Retainer      | 21. Main Regulator Valve Spring            |
| 8. 4-5 Shift Valve Bore Plug     | 22. Main Regulator Valve Washer            |
| 9. 4-5 Shift Valve Spring        | 23. Main Regulator Valve                   |
| 10. 4-5 Shift Valve              | 24. Clutch Apply Control Valve Retainer    |
| 11. 4-5 Shift Valve Plug         | 25. Clutch Apply Control Valve Bore Plug   |
| 12. B1 Switch Valve Retainer     | 26. Clutch Apply Control Valve Spring      |
| 13. B1 Switch Valve Boost Sleeve | 27. Clutch Apply Control Valve             |
| 14. B1 Switch Valve Boost Valve  | 28. Manual Valve                           |

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Figure 18



# Technical Service Information

## TOYOTA/LEXUS U150/U250

### PRELIMINARY INFORMATION

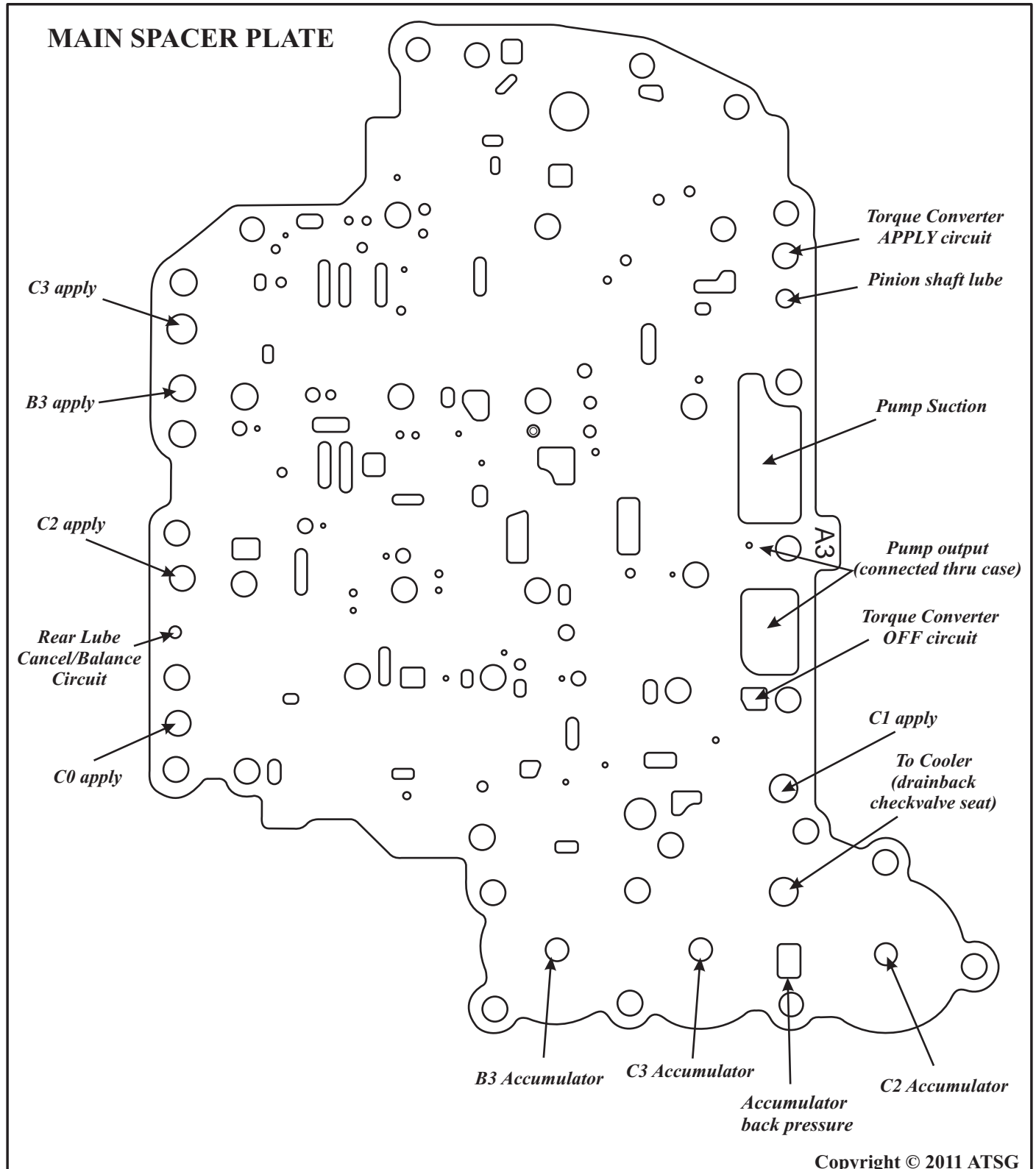
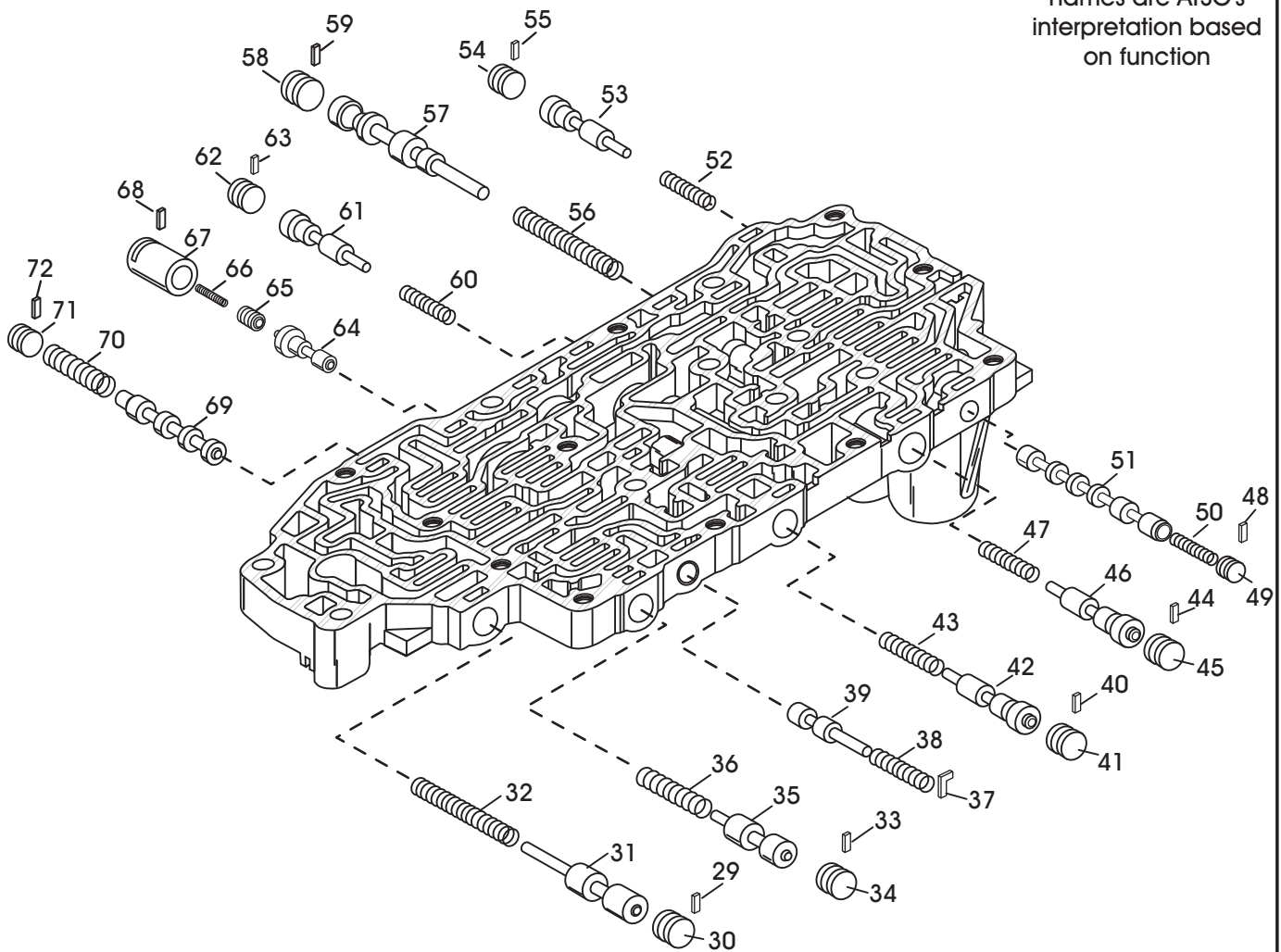


Figure 19

## UPPER VALVE BODY VALVE DESCRIPTIONS

Note: Some Valve names are ATSG's interpretation based on function



### UPPER VALVE BODY LEGEND

- |   |   |
|---|---|
| 29. Solenoid Modulating Valve retainer  | 52. C1 Control Valve Spring             |
| 30. Solenoid Modulating Valve Bore Plug | 53. C1 Control Valve                    |
| 31. Solenoid Modulating Valve           | 54. C1 Control Valve Bore Plug          |
| 32. Solenoid Modulating Valve Spring    | 55. C1 Control Valve retainer           |
| 33. B2 Control Valve retainer           | 56. Secondary Regulator Valve Spring    |
| 34. B2 Control Valve Bore Plug          | 57. Secondary Regulator Valve           |
| 35. B2 Control Valve                    | 58. Secondary Regulator Valve Bore Plug |
| 36. B2 Control Valve Spring             | 59. Secondary Regulator Valve retainer  |
| 37. B3 Orifice Control Valve retainer   | 60. B1 Control Valve Spring             |
| 38. B3 Orifice Control Valve Spring     | 61. B1 Control Valve                    |
| 39. B3 Orifice Control Valve            | 62. B1 Control Valve Bore Plug          |
| 40. Accumulator Control Valve retainer  | 63. B1 Control Valve retainer           |
| 41. Accumulator Control Valve Bore plug | 64. Lock-up Control Valve               |
| 42. Accumulator Control Valve           | 65. Lock-up Control Valve Plunger       |
| 43. Accumulator Control Valve Spring    | 66. Lock-up Control Valve Spring        |
| 44. C0 Control Valve retainer           | 67. Lock-up Control Valve Sleeve        |
| 45. C0 Control Valve Bore Plug          | 68. Lock-up Control Valve retainer      |
| 46. C0 Control Valve                    | 69. Lock-up Relay Valve                 |
| 47. C0 Control Valve Spring             | 70. Lock-up Relay Valve Spring          |
| 48. Solenoid Relay Valve retainer       | 71. Lock-up Relay Valve Bore Plug       |
| 49. Solenoid Relay Valve Bore Plug      | 72. Lock-up Relay Valve retainer        |
| 50. Solenoid Relay Valve Spring         |   |
| 51. Solenoid Relay Valve                |   |

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Figure 20



## Technical Service Information

### TOYOTA/LEXUS U150/U250

#### PRELIMINARY INFORMATION

#### LOWER VALVE BODY SPRING SPECS

##### ***4. B2 Switch Valve Spring***

No. Coils-5.5  
Overall Length-.958"  
Outside Diameter-.412"  
Coil Diameter-.029"  
Color- Lt. Blue

##### ***9. 4-5 Shift Valve Spring***

No. Coils-10.5  
Overall Length-1.120"  
Outside Diameter-.380"  
Coil Diameter-.035"  
Color- none

##### ***15. B-1 Switch Valve Spring***

No. Coils-4.5  
Overall Length-.645"  
Outside Diameter-.505"  
Coil Diameter-.037"  
Color- Blue

##### ***21. Main Regulator Valve Spring***

No. Coils-7.5  
Overall Length-2.260"  
Outside Diameter-.784"  
Coil Diameter-.063"  
Color- none

##### ***26. Clutch Apply Control Valve Spring***

No. Coils-16.5  
Overall Length-1.110"  
Outside Diameter-.290"  
Coil Diameter-.025"  
Color- none

#### UPPER VALVE BODY SPRING SPECS

##### ***32. Solenoid Modulating Valve Spring***

No. Coils-14  
Overall Length-1.888"  
Outside Diameter-.433"  
Coil Diameter-.063"  
Color- none

##### ***36. B2 Control Valve Spring***

No. Coils-14.5  
Overall Length-2.270"  
Outside Diameter-.392"  
Coil Diameter-.023"  
Color- pink

##### ***38. B-3 Orifice Control Valve Spring***

No. Coils-19  
Overall Length-2.400"  
Outside Diameter-.305"  
Coil Diameter-.019"  
Color- White

##### ***43. Accumulator Control Valve Spring***

No. Coils-19  
Overall Length-2.400"  
Outside Diameter-.305"  
Coil Diameter-.019"  
Color- none

##### ***47. C0 Control Valve Spring***

No. Coils-12.5  
Overall Length-1.180"  
Outside Diameter-.312"  
Coil Diameter-.037"  
Color- none

##### ***50. Solenoid Relay Valve Spring***

No. Coils-10.5  
Overall Length-1.000"  
Outside Diameter-.264"  
Coil Diameter-.027"  
Color- White

##### ***52. C1 Control Valve Spring***

No. Coils-12  
Overall Length-1.190"  
Outside Diameter-.313"  
Coil Diameter-.029"  
Color- none

##### ***56. Secondary Reg. Valve Spring***

No. Coils-20  
Overall Length-2.290"  
Outside Diameter-.346"  
Coil Diameter-.048"  
Color- Blue

##### ***60. B-1 Control Valve Spring***

No. Coils-12  
Overall Length-1.180"  
Outside Diameter-.313"  
Coil Diameter-.029"  
Color- none

##### ***66. Lock-up Control Valve Spring***

No. Coils-12  
Overall Length-.835"  
Outside Diameter-.218"  
Coil Diameter-.023"  
Color- White

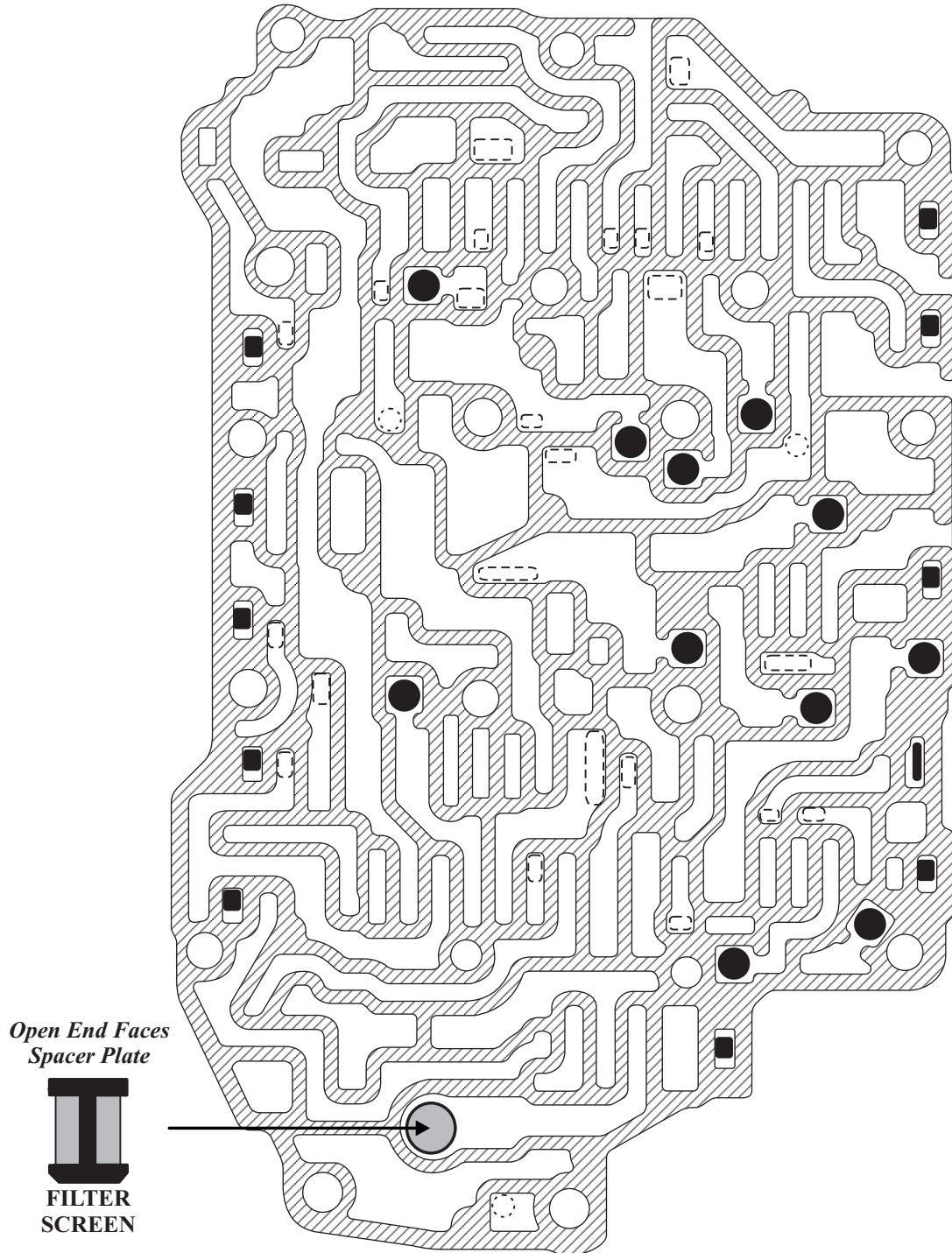
##### ***70. Lock-up Relay Valve Spring***

No. Coils-10  
Overall Length-1.120"  
Outside Diameter-.380"  
Coil Diameter-.035"  
Color- Blue

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Figure 21

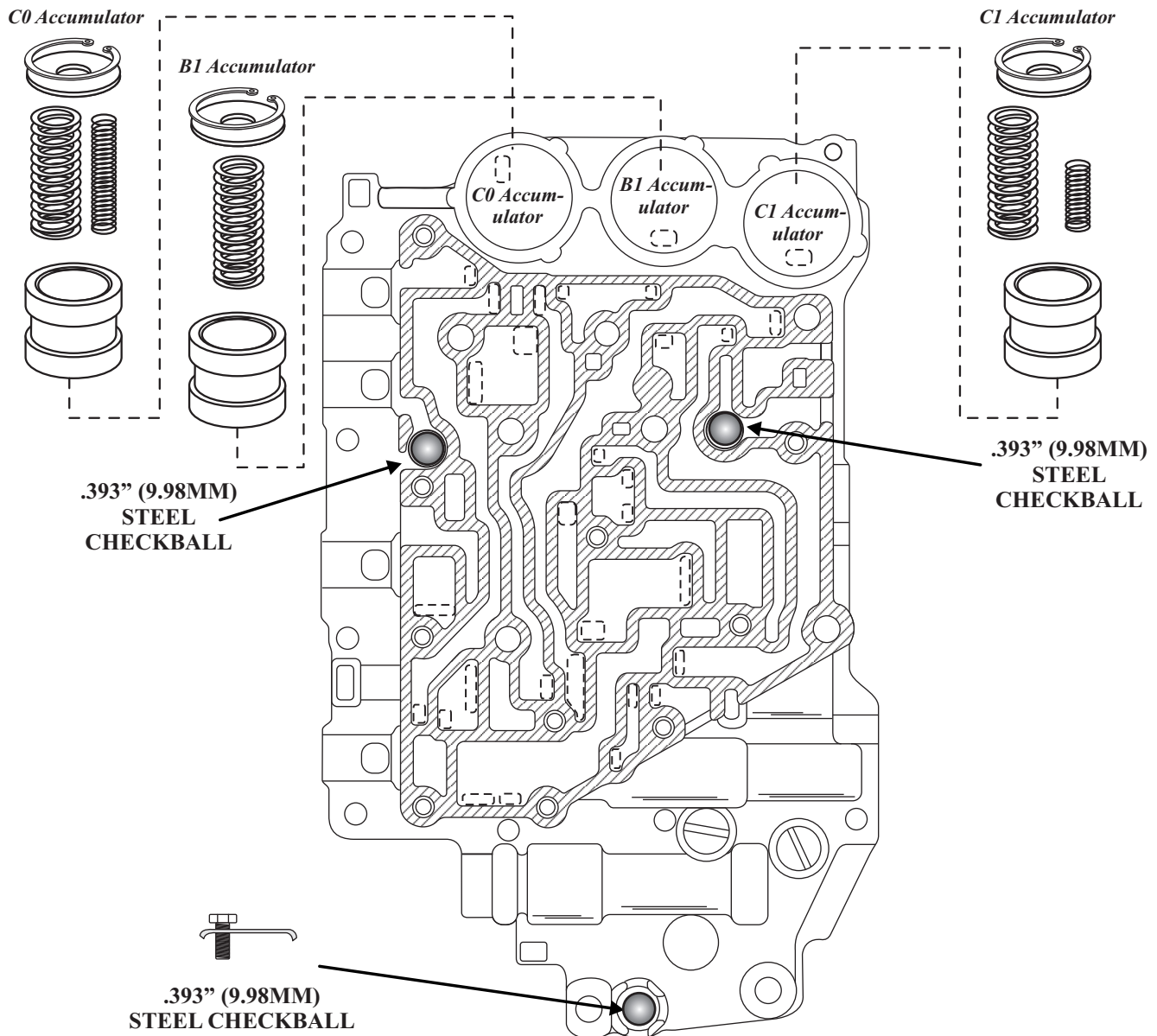
**UPPER VALVE BODY LOWER SIDE  
CHECK BALL AND RETAINER LOCATIONS**



**NOTE: All 11 Plastic Checkballs Are .218" (5.5MM)** Copyright © 2011 ATSG

Figure 22

## UPPER VALVE BODY UPPER SIDE CHECK BALL AND ACCUMULATOR LOCATIONS



## UPPER VALVE BODY ACCUMULATOR SPRING SPECS

### **C0 Accumulator Outer Spring**

No. Coils-10  
Overall Length-2.000"  
Outside Diameter- .630"  
Coil Diameter- .085"  
Color- Light Green

### **C0 Accumulator Inner Spring**

No. Coils-15.5  
Overall Length-2.175"  
Outside Diameter- .420"  
Coil Diameter- .051"  
Color- Light Green

### **B1 Accumulator Spring**

No. Coils-10  
Overall Length-1.966"  
Outside Diameter- .620"  
Coil Diameter- .083"  
Color- Green

### **C1 Accumulator Outer Spring**

No. Coils-11.5  
Overall Length-2.160"  
Outside Diameter- .635"  
Coil Diameter- .077"  
Color- Red

### **C1 Accumulator Inner Spring**

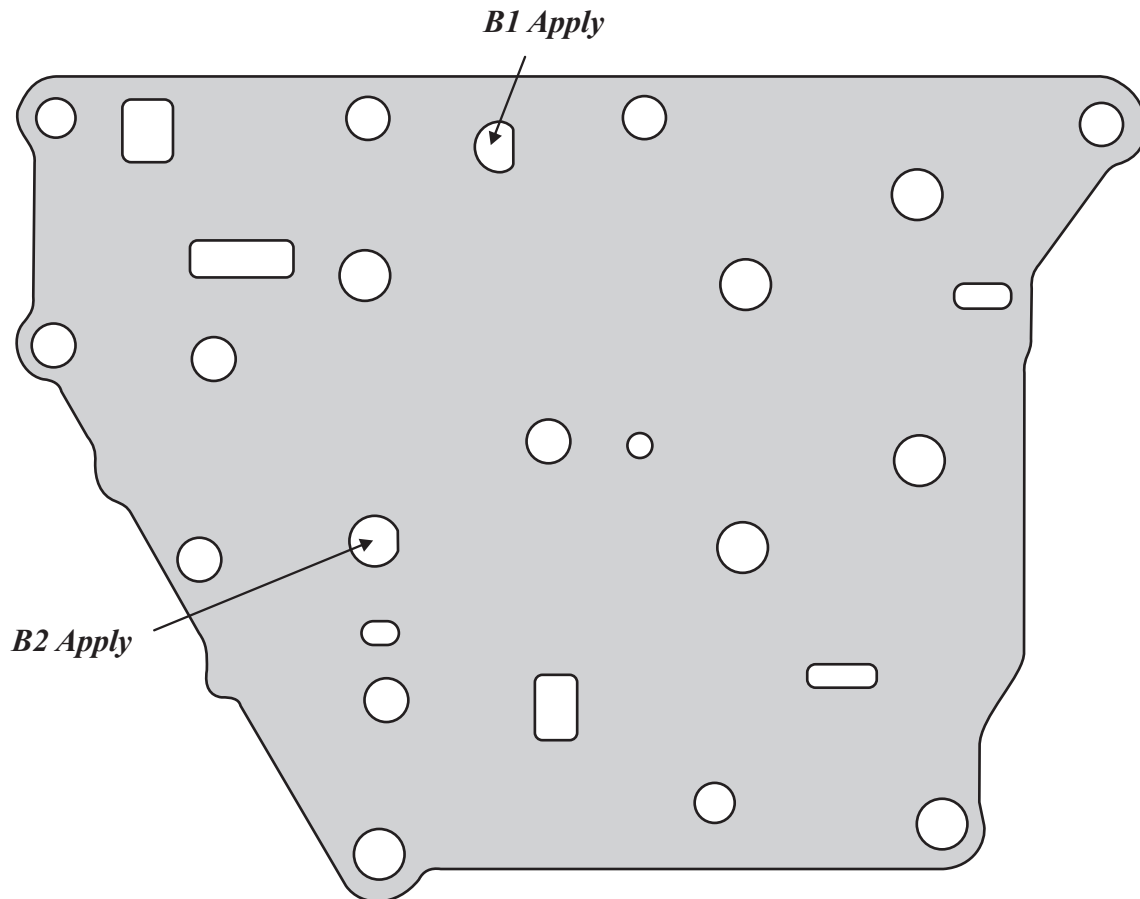
No. Coils-11  
Overall Length-1.185"  
Outside Diameter- .430"  
Coil Diameter- .055"  
Color- Red

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Figure 23

**TOYOTA/LEXUS U150/U250**  
**PRELIMINARY INFORMATION**

**UPPER VALVE BODY UPPER SIDE PLATE**



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Figure 24

## TOYOTA/LEXUS U150/U250 PRELIMINARY INFORMATION

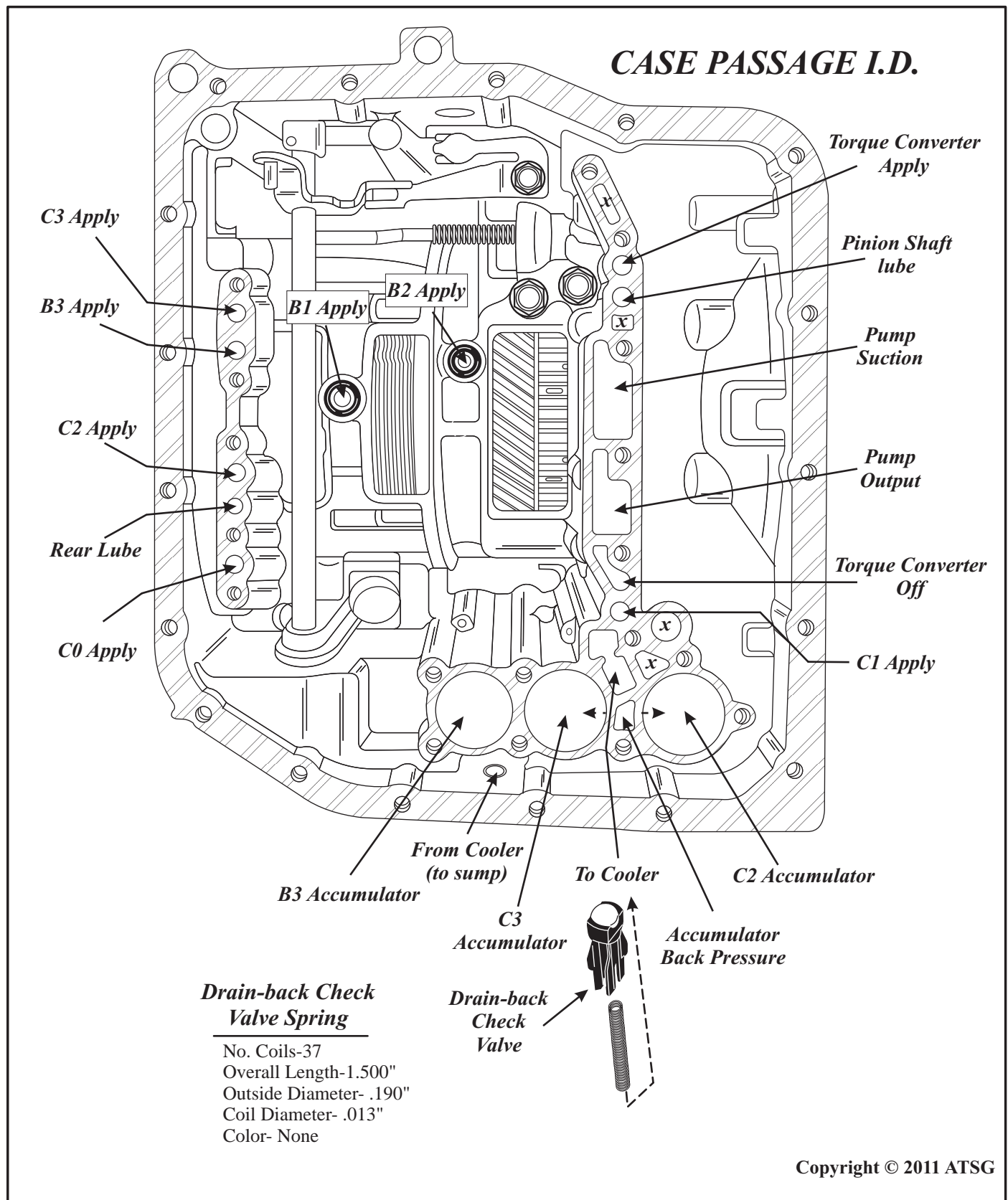


Figure 25