

THE WORLD'S FIRST FWD 8 SPEED TRANSMISSION

AWF8F35-GA8F22AW-8F45-U880F-TG-81SC



The Aisin Group developed the world's first front wheel drive 8-speed transverse mounted automatic transmission called the AWF8F35. This transmission is currently being used in BMW, GM, Toyota/Lexus and Volvo applications. Each manufacturer using this transmission will assign its own designation. BMW calls it the GA8F22AW transmission. GM refers to it as their 8F45. Toyota/Lexus calls it their U880F transmission, while Volvo refers to this transmission as their TG-81SC replacing the TF-80SC.

BMW:

- 2015 BMW 2 Series Active Tourer (F45) and Gran Tourer (F46)
- 2016 BMW X1 (F48)
- 2016 Mini Clubman (F54) with 4-cylinder engines

GM:

- 2016 Chevrolet Malibu

TOYOTA/LEXUS:

- 2013 Lexus RX50 F Sport

VOLVO:

- 2014–2016 Volvo S80 II
- 2014–2016 Volvo V70 III
- 2015–present Volvo S60 II
- 2015–present Volvo V60

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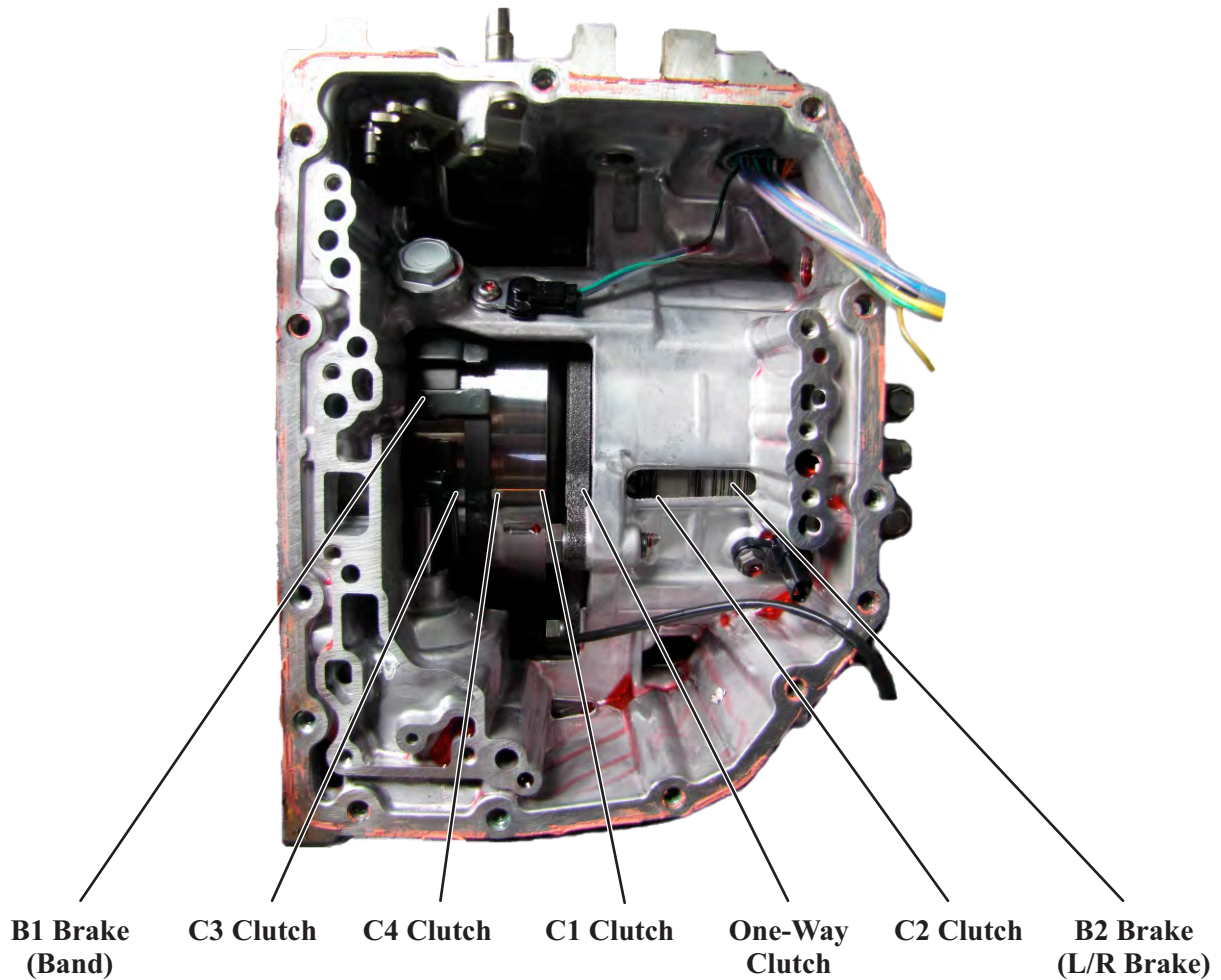
GEAR RATIOS:

1st	2nd	3rd	4th	5th	6th	7th	8th	Rev.	Final Drive
5.200	2.971	1.950	1.469	1.223	1.000	0.817	0.685		4.498
5.250	3.029	1.950	1.457	1.221	1.000	0.809	0.673	4.015	3.075, 3.200

Figure 1

THE WORLD'S FIRST FWD 8 SPEED TRANSMISSION

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Range	C1 Clutch	C2 Clutch	C3 Clutch	C4 Clutch	B1 Brake	B2 Brake	One-Way
P/N							
R			●			●	
1st	●						●
2nd	●				●		
3rd	●		●				
4th	●			●			
5th	●	●					
6th		●		●			
7th		●	●				
8th		●			●		

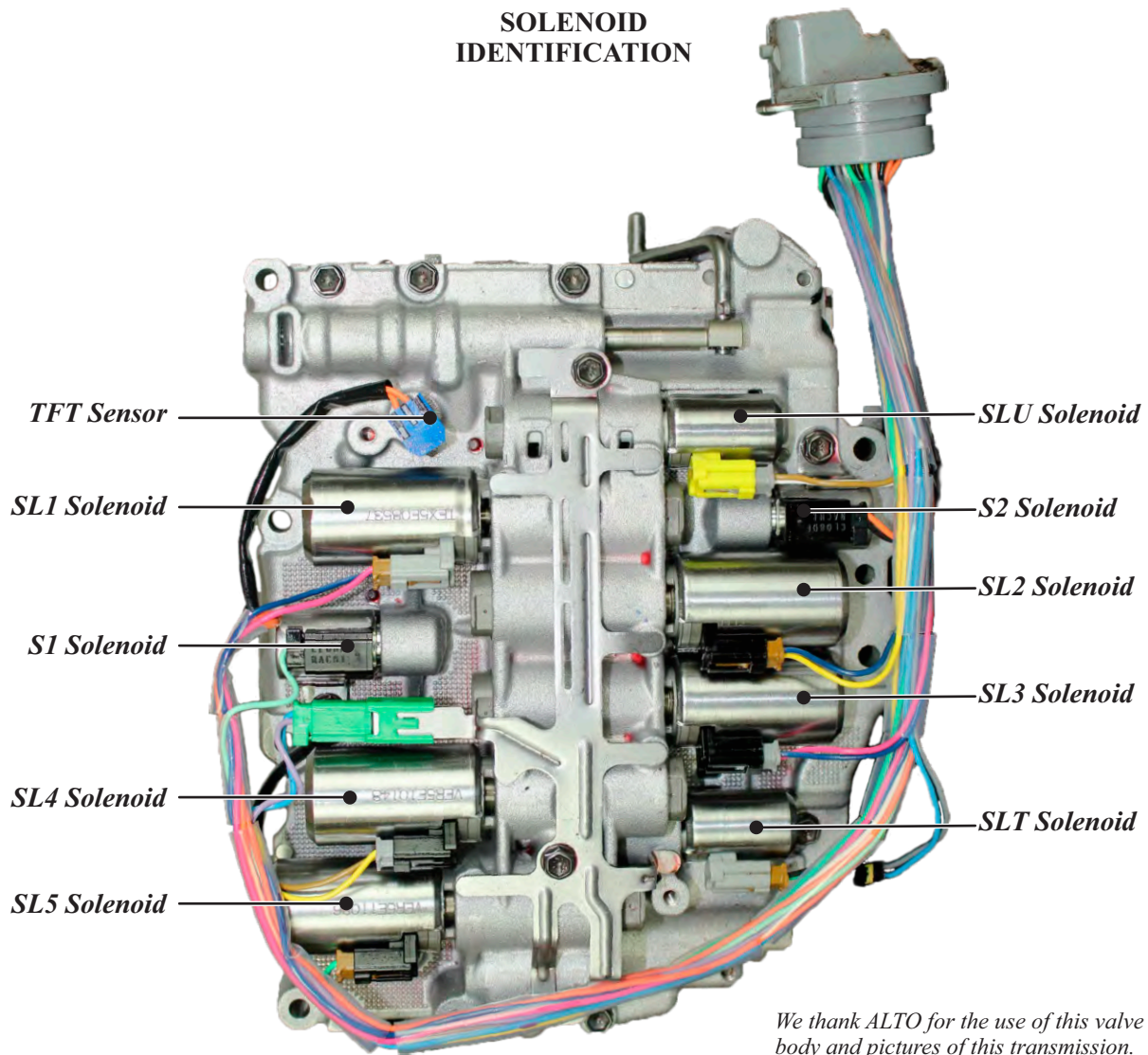
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Figure 2

THE WORLD'S FIRST FWD 8 SPEED TRANSMISSION

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SOLENOID IDENTIFICATION



We thank ALTO for the use of this valve body and pictures of this transmission.

Solenoid and TFT Specifications:

The S1 and S2 Solenoids are normally closed solenoids blocking pressure to their respective circuits. These two solenoids measure 11 to 15 ohms at 68° F.

The SL1, SL2, SL3 SL4, S15 and the SLU solenoids are normally vented solenoids venting pressure in their respective circuits. These solenoids measure 5.0 to 5.6 ohms at 68° F.

The SLT solenoid is a normally applied solenoid supplying pressure to its respective circuit. This solenoid measure 5.0 to 5.6 ohms at 68° F.

Basic TFT resistance range will be 5 to 8K at 50°F and 0.22 to 0.28K at 230°F.

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Figure 3

THE WORLD'S FIRST FWD 8 SPEED TRANSMISSION

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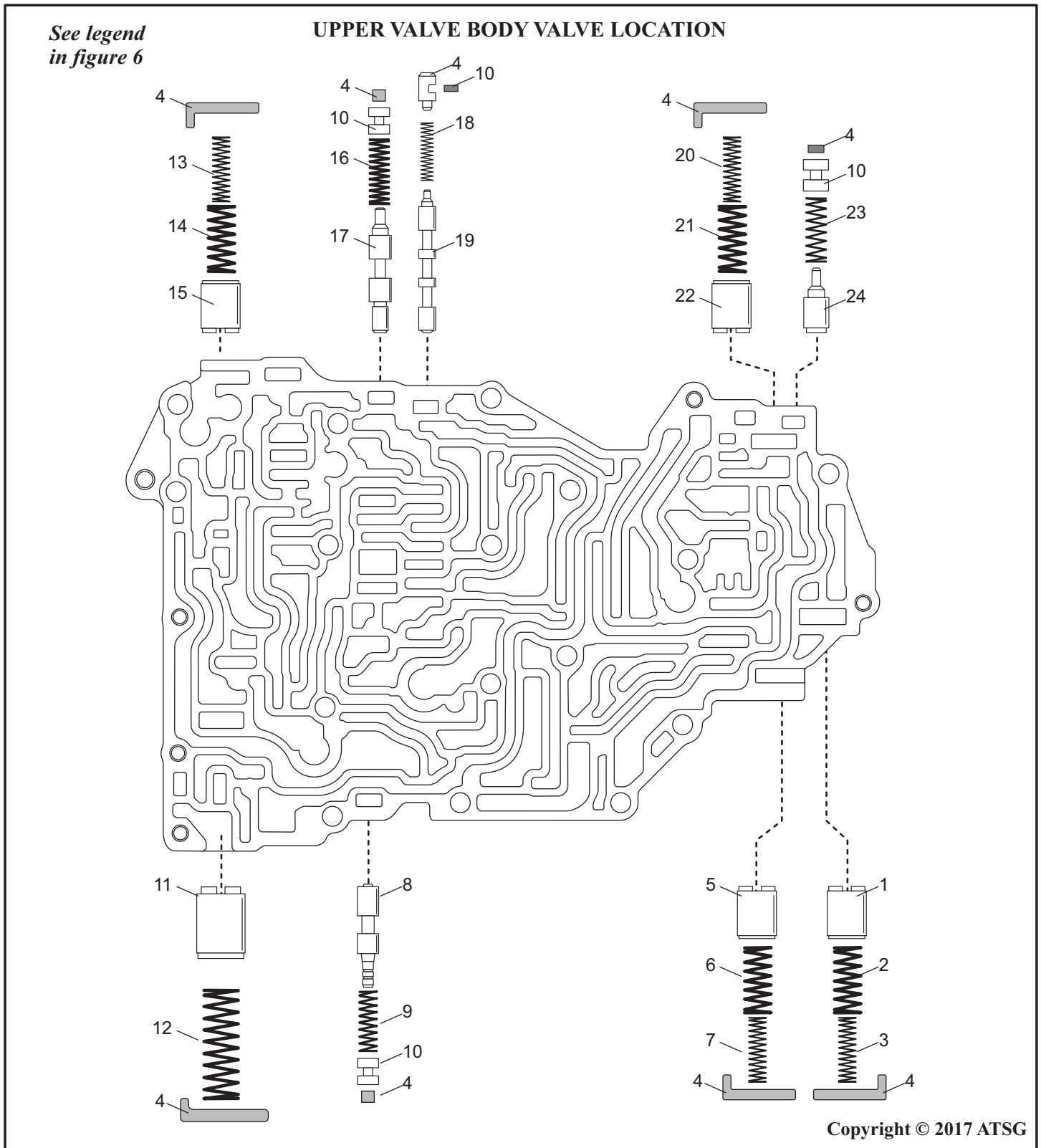
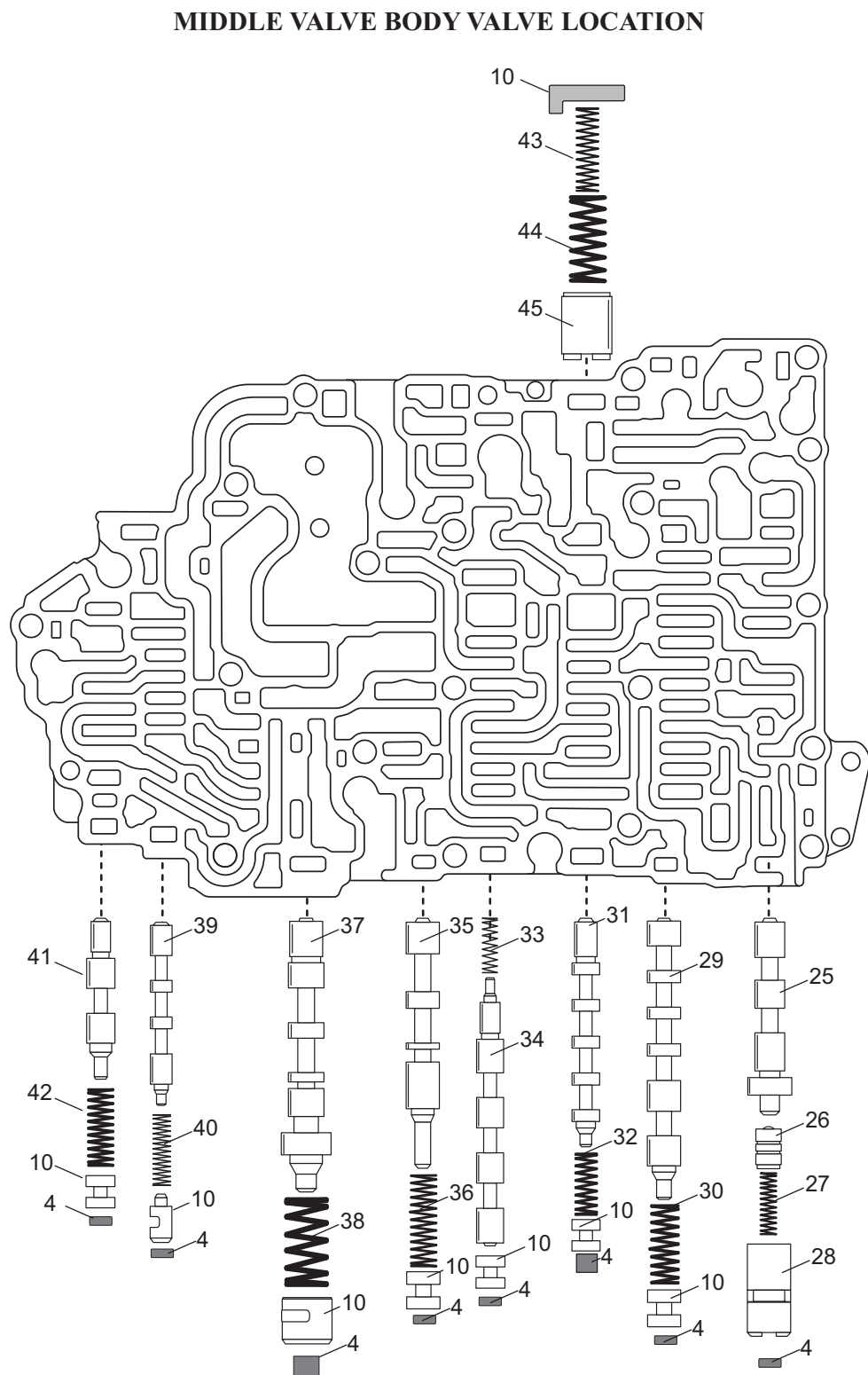


Figure 4

THE WORLD'S FIRST FWD 8 SPEED TRANSMISSION
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*See legend
in figure 6*

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Figure 5



THE WORLD'S FIRST FWD 8 SPEED TRANSMISSION

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VALVE AND SPRING LEGEND

1. B1 Brake (Band) Accumulator
2. B1 Brake Accumulator Outer Spring - 1.107"x.438"x.068"x8c
3. B1 Brake Accumulator Inner Spring - 1.137"x.308"x.045"x13c
4. Retainer
5. C4 Clutch Accumulator
6. C4 Clutch Accumulator Outer Spring - 1.107"x.438"x.068"x8c
7. C4 Clutch Accumulator Inner Spring - 1.137"x.308"x.045"x13c
8. Pilot Valve (Regulated pressure supply to the SLT, SLU, S1 and S2 solenoids)
9. Pilot Valve Spring - .985"x.337"x.045"x10c
10. Bore Plug
11. N-D Accumulator
12. N-D Accumulator Spring - 2.212"x.618"x.062"x11c
13. C2 Clutch Accumulator Inner Spring - 1.137"x.308"x.045"x13c
14. C2 Clutch Accumulator Outer Spring - 1.107"x.438"x.068"x8c
15. C2 Clutch Accumulator
16. Shift Solenoid 2 Relay Valve Spring- 1.403"x.324"x.025"x12c
17. Shift Solenoid 2 Relay Valve
18. Shift Solenoid 1 Shift Valve 1 Spring - 1.142"x.234"x.021"x.15c
19. Shift Solenoid 1 Shift Valve 1
20. C3 Clutch Accumulator Inner Spring - 1.137"x.308"x.045"x13c
21. C3 Clutch Accumulator Outer Spring - 1.107"x.438"x.068"x8c
22. C3 Clutch Accumulator
23. SLT Damper Valve Spring - .862"x.350"x.045"x9c
24. SLT Damper Valve
25. Lock-Up Control Valve
26. Lock-Up Control Regulating Valve
27. Lock-Up Control Valve Spring - .822"x.215"x.026"x12c
28. Lock-Up Control Valve Sleeve
29. Torque Converter Clutch Switch Valve
30. Torque Converter Clutch Switch Valve Spring - 1.420"x.385"x.023"x.16c
31. C2 Clutch Valve
32. C2 Clutch Valve Spring - .992"x.308"x.021"x10c
33. Clutch Relay Valve Spring - .718"x.210"x.020"x9c
34. Clutch Relay Valve
35. Torque Converter and Cooler Regulator Valve
36. Torque Converter and Cooler Regulator Valve Spring - 1.493"x.391"x.046"x13c
37. Pressure Regulator Valve
38. Pressure Regulator Valve Spring - 1.192"x.559"x.050"x6c
39. Shift Solenoid 1 Shift Valve 2 (B2-C3 Relay Valve)
40. Shift Solenoid 1 Shift Valve 2 (B2-C3 Relay Valve) Spring - 1.134"x.236"x.021"x15c
41. B2 Brake Valve (Low/Reverse Brake)
42. B2 Brake Valve (Low/Reverse Brake) Spring - 1.435"x.325"x.025"x12c
43. C1 Clutch Accumulator Inner Spring - 1.137"x.308"x.045"x13c
44. C1 Clutch Accumulator Outer Spring - 1.107"x.438"x.068"x8c
45. C1 Clutch Accumulator
46. Manual Valve - Not shown (Located in the solenoid outer valve body housing)

Note: Valve names have been identified by their generic function and are subject to a future change expressing their more specific function.

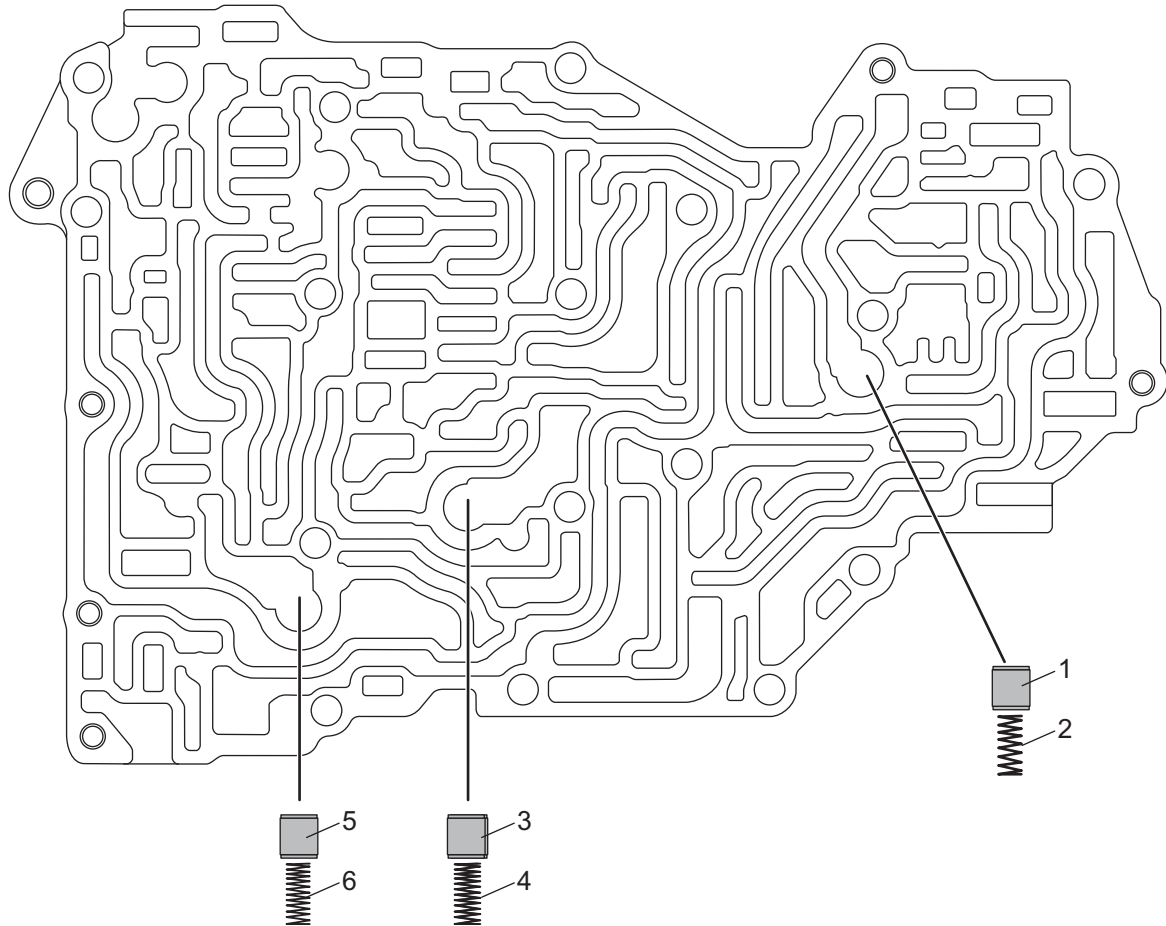
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Figure 6

THE WORLD'S FIRST FWD 8 SPEED TRANSMISSION

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UPPER VALVE BODY SMALL PARTS



1. Cooler By-Pass Check Valve
2. Cooler By-Pass Check Valve Spring - .622"x.248"x.035"x8 coils
3. To Cooler Check Valve
4. Cooler Check Valve - .600"x.246"x.022"x12c
5. SL2 Solenoid Back Pressure Relief Valve
6. SL2 Solenoid Back Pressure Relief Valve Spring - .600"x.246"x.022"x12c

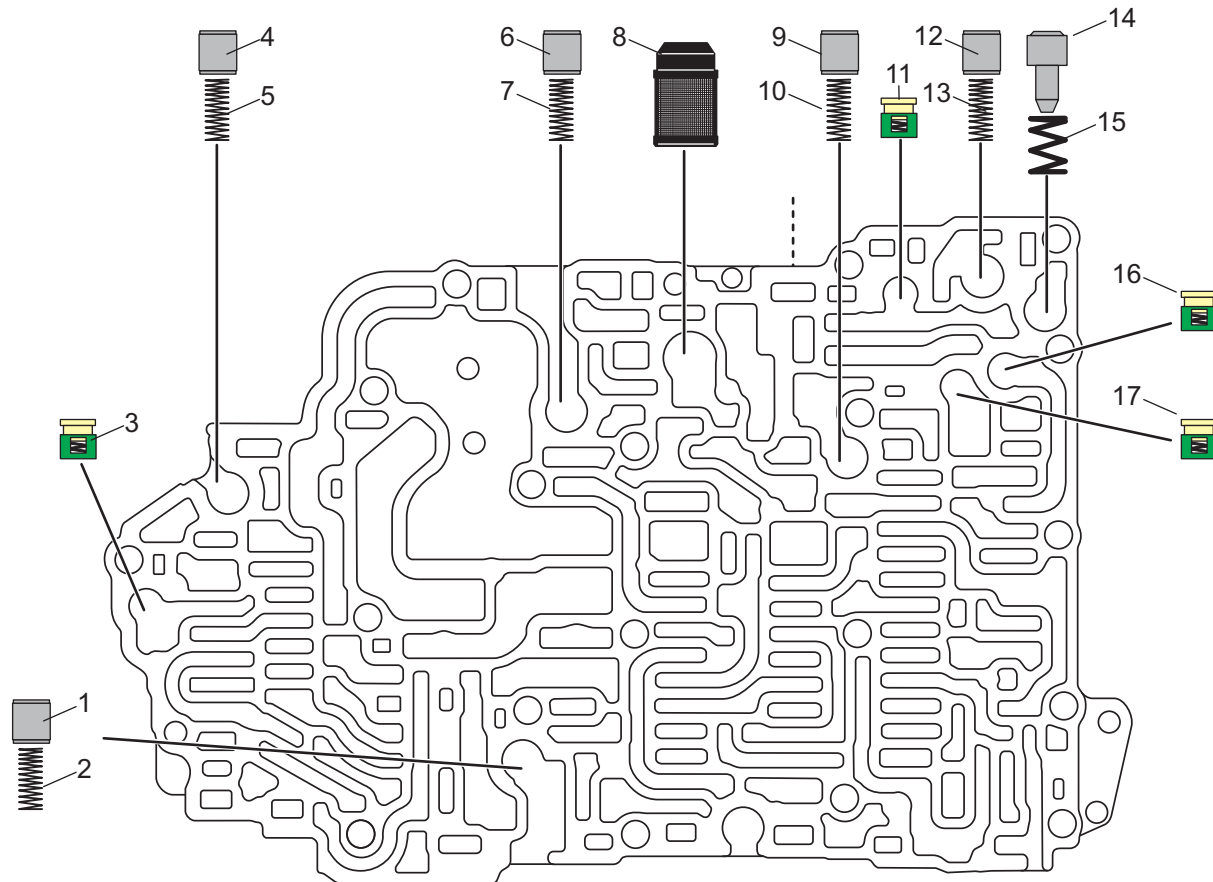
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Figure 7

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MIDDLE VALVE BODY SMALL PARTS



1. SL3 Solenoid Back Pressure Relief Valve
2. SL3 Solenoid Back Pressure Relief Valve Spring - .600"x.246"x.022"x12c
3. SL5 Solenoid Circuit Pre-Fill Check Valve
4. SL5 Solenoid Back Pressure Relief Valve
5. SL5 Solenoid Back Pressure Relief Valve Spring - .600"x.246"x.022"x12c
6. SL4 Solenoid Back Pressure Relief Valve
7. SL4 Solenoid Back Pressure Relief Valve Spring - .600"x.246"x.022"x12c
8. Filter - Filters line pressure to the Pilot Valve and the Clutch Relay Valve
9. SL1 Solenoid Back Pressure Relief Valve
10. SL1 Solenoid Back Pressure Relief Valve Spring - .600"x.246"x.022"x12c
11. B2 Brake (Low/Reverse) Check Valve
12. Reverse Engagement Check Valve
13. Reverse Engagement Check Valve Spring - .600"x.246"x.022"x12c
14. Line Pressure Relief Valve
15. Line Pressure Relief Valve Spring - .438"x.369"x.050"x4c
16. Manual Valve Check Valve
17. N-D Pre-Fill Check Valve

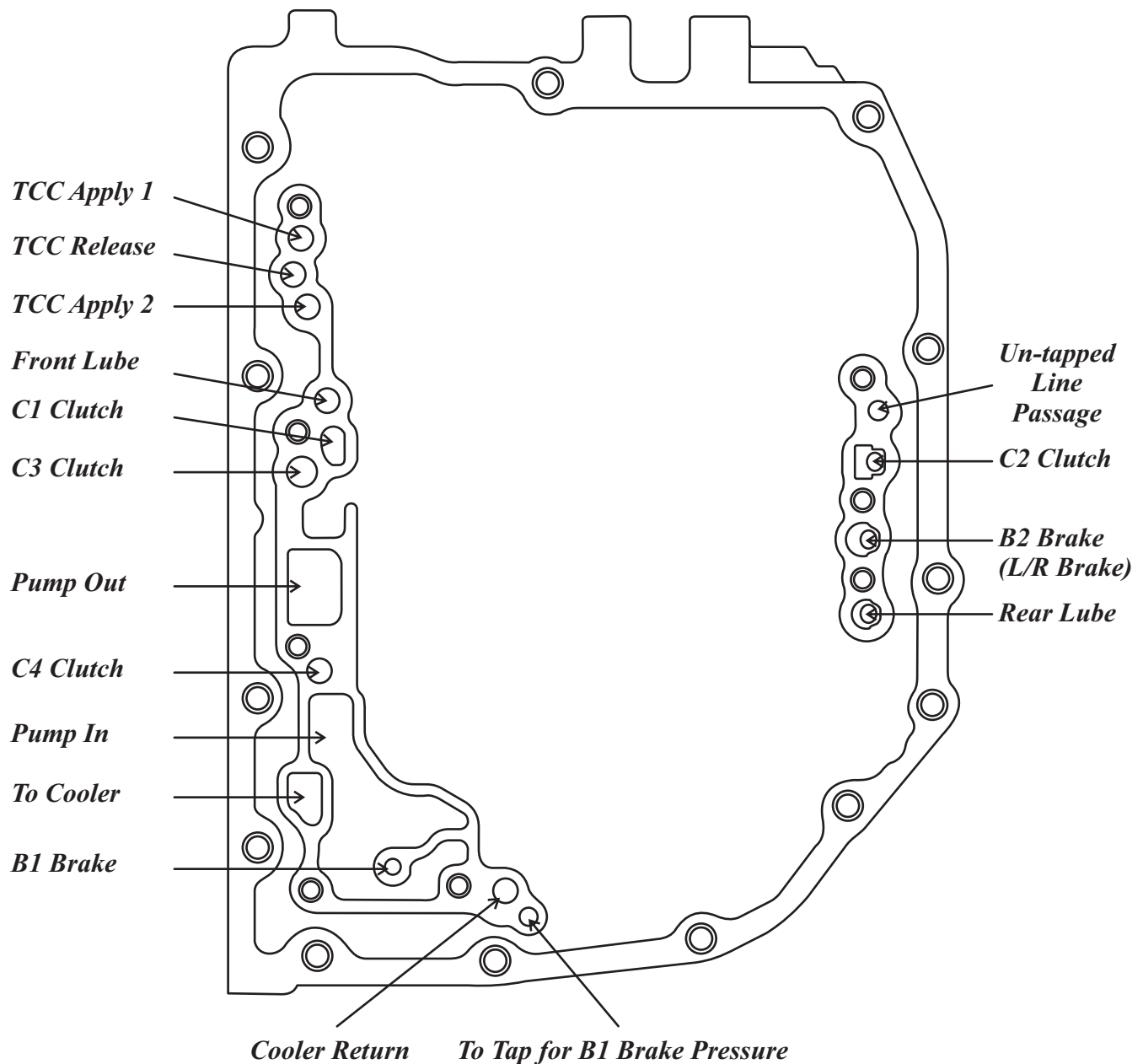
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Figure 8

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CASE PASSAGE IDENTIFICATION



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Figure 9