



# Technical Service Information

## FORD 6R80 NEW LOW DIODE

**CHANGE:** Vehicles equipped with the 6R80 transmission built after 10/3/10 have been fitted with a New Low Diode. The addition of this Diode has changed numerous components dimensionally. It has also changed the Valve Body and PCM strategy for “D” clutch control.

**REASON:** The reason for this change is for better control, better reliability, and to help eliminate downshift clunk complaints.

### PARTS AFFECTED:

#### LOW DIODE:

- A new Low Diode was added to the Rear Planetary assembly as shown in the cross-sectional view shown in Figure 1. Refer to Figure 3 for a breakdown of the assembly. This new Low Diode changed the application strategy for the D Clutch as seen in the component application chart in Figure 1 and the Solenoid Application chart in Figure 2. Refer to the notes related to D Clutch application and Solenoid D. Note that the D Clutch is used in Reverse and now only used for the engagement into Drive and is turned Off at 3 mph.

#### C AND D SUPPORT:

- The C and D Support was changed to eliminate the D2 feed passage as it is no longer used as shown in Figure 4 under the front side illustration. The rear side, where the D Clutch Piston is housed also had changes made to it in the apply area, as the D2 chamber was eliminated and a alignment notch for the D Piston was added. The check ball assembly has now been replaced by an orifice screen.

#### D PISTON:

- The D Piston had some changes made in the apply area as the previous design D2 chamber was eliminated. The piston also had changes made in the inside diameter as a tab was created to fit into the notch cut into the D Support as shown in Figure 5. Apply fingers were also added to reach thru the inner race of the Low Diode to apply the D Clutch. Refer to Figure 6 for a view of these components compared to a cross-sectional view.

#### D PISTON RETURN SPRING:

- The D Piston Return spring had dimensional changes to accommodate the new D Piston as shown in Figures 5 and 6.

#### D PISTON RETURN SPRING CAP:

- A Return Spring cap was added to accommodate the new designed return spring as shown in Figures 5 and 6.

#### REAR PLANETARY ASSEMBLY:

- The Rear Planetary assembly had changes made in the area of the splined area that connects to the D Clutch. This area of the planetary is now connected to the Low Diode outer race on the inside of the lug as shown in Figure 7.



# Technical Service Information

## PARTS AFFECTED CONTINUED:

### MOLDED LEAD FRAME:

- The Molded Lead Frame now replaces the previous design TCM/Mechatronic control module.  
It now makes individual connections from pins at the case connector to the terminals connected to the solenoids, Transmission range sensor, Turbine and Output sensors and Transmission fluid temp sensor, to accommodate the new external PCM circuitry. See Figure 8 for the location of the Molded Lead Frame with component identification. See Figure 9 for the terminal identification of the case connector. See Figure 10 for a Solenoid ohm test chart.

### POWERTRAIN CONTROL MODULE:

- The Powertrain Control Module now houses controls for the Transmission as well as the Engine.  
Programming has also been modified because of D Clutch strategy changes.

### EXTERNAL WIRING HARNESS:

- The wiring harness also was changed to accommodate the new connection from the Molded Lead Frame to the PCM.

### VALVE BODY ASSEMBLY:

- The Upper Valve Body had casting changes made as the D2 feed and the bore for the D2 Regulator Valve are now cast closed. See Figure 11 for these changes and casting number identification. Figures 11 and 12 also show check ball location and function. Refer to Figure 13 for valve identification and spring specifications.  
The Spacer plate also changed to accommodate the valve body changes, see Figure 14 for the Spacer plate part number and location.  
All the solenoids have had changes indicated in the new part numbers as shown in Figure 15. Refer to Figure 16 for solenoid checks and notice SSE now has a grey snout and the ohm value is now increased to 18 ohms.  
The Lower Valve Body is illustrated in Figures 17-19. See Figure 18 for casting number I.D. and location. Refer to Figure 20 for spring specifications.

### D CLUTCH OIL CIRCUIT:

- Refer to Figures 21 and 22 for a partial oil circuit diagram of the D Clutch apply and release circuit and note the changes in the valve trains.

## SERVICE INFORMATION:

LOW DIODE (Ford Part Number).....BL3Z-7A089-L (G/K)

*Note: There are currently three part numbers for the Low diode as shown above with the suffix Letter differences, they all appear to be the same. The "L" suffix is the least expensive.*

C AND D SUPPORT (Ford Part Number).....BL3Z-7A130-A

*Note: Ford calls this part a bracket.*

D PISTON (Ford Part Number).....BL3Z-7A262-A

D PISTON RETURN SPRING (Ford Part Number).....BL3Z-7B070-A

D PISTON RETURN SPRING CAP (Ford Part Number).....BL3Z-7C122-A

*Note: Ford calls this part a snap ring.*

REAR PLANETARY ASSEMBLY (Ford Part Number).....BL3Z-7D006-A

MOLDED LEAD FRAME.....Consult Dealer

*Note: Currently at the time of this printing the Molded Lead Frame is only sold with the complete Valve Body Assembly and is model dependant.*



## Technical Service Information

### SERVICE INFORMATION CONTINUED:

VALVE BODY ASSEMBLY.. .....Consult Dealer

*Note: Currently at the time of this printing the Valve Body is only sold with the Molded Lead Frame as a complete assembly and is model dependant.*

SPACER PLATE.....CL3Z-7Z490-A

*Note: Consult Dealer with VIN as part numbers may change by model.*

NORMALLY LOW VFS SOLENOID BROWN (Ford Part Number).....AL3Z-7G383-U

AL3Z-7G383-T

AL3Z-7G383-V

AL3Z-7G383-S

*Note: The part numbers listed above refer to a part number based on a stamping number ocated on the canister of the solenoid. Refer to Figure 15 for identification.*

NORMALLY HIGH VFS SOLENOID BLACK (Ford Part Number).....AL3Z-7G383-N

AL3Z-7G383-M

AL3Z-7G383-K

AL3Z-7G383-L

*Note: The part numbers listed above refer to a part number based on a stamping number located on the canister of the solenoid. Refer to Figure 15 for identification.*

SSE SOLENOID (Ford Part Number).....AL3Z-7G484-A

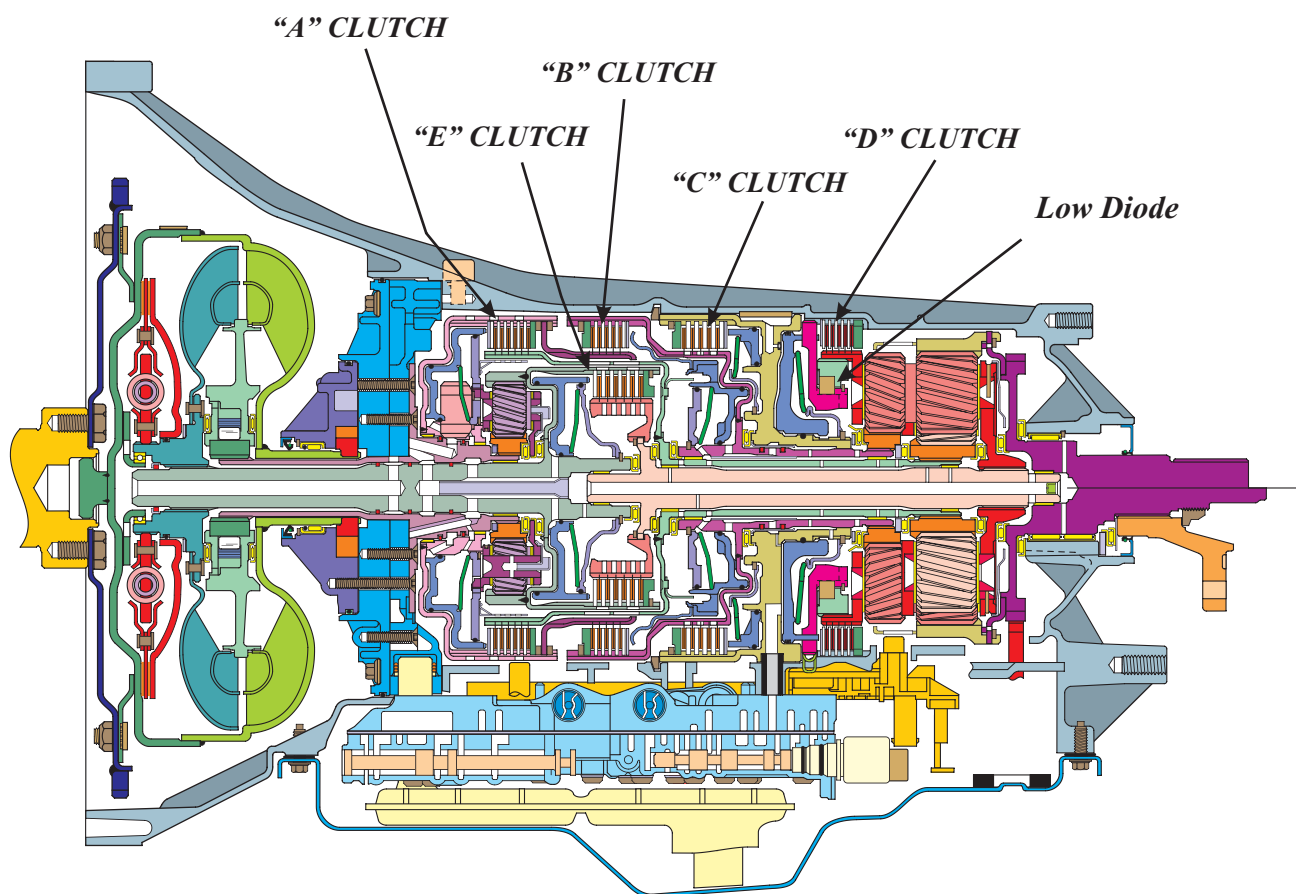
***Special Note: The part numbers listed above have been known to change, verify application with the VIN code.***

### INTERCHANGEABILITY:

None of the hard parts listed above are interchangeable between models that do not utilize the Low Diode.

*Special thanks to Dave Hritsko*

## COMPONENT LOCATIONS



**COMPONENT APPLICATION CHART**

RANGE	A Clutch	B Clutch	E Clutch	C Clutch	D Clutch	Low Diode	Torq Conv Clutch	GEAR RATIO	
Park					Applied				
Reverse		Applied			Applied			3.40	
Neutral					Applied				
"D"-1st	Applied				Applied**	Hold		4.17	
"D"-2nd	Applied			Applied		Free	Applied*	2.34	
"D"-3rd	Applied	Applied				Free	Applied*	1.52	
"D"-4th	Applied		Applied			Free	Applied*	1.14	
"D"-5th		Applied	Applied			Free	Applied*	0.87	
"D"-6th			Applied	Applied		Free	Applied*	0.69	

\* TCC IS AVAILABLE IN 2ND THRU 6TH GEAR, BASED ON THROTTLE POSITION, FLUID TEMP AND VEHICLE SPEED.

\*\* THE D CLUTCH IS APPLIED UNTIL 3 MPH THEN IT IS RELEASED

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Figure 1

## SOLENOID APPLICATION CHART

<b>RANGE</b>	<b>SSE</b>	<b>SSA</b>	<b>SSB</b>	<b>SSC</b>	<b>SSD</b>	<b>PCA</b>	<b>TCC</b>
<b>(Component)</b>	<b>SS1</b>	<b>VFS1</b>	<b>VFS2</b>	<b>VFS3</b>	<b>VFS4</b>	<b>VFS5</b>	<b>VFS6</b>
<b>Park</b>						<b>X*</b>	
<b>Reverse</b>						<b>X*</b>	
<b>Neutral</b>						<b>X*</b>	
<b>D 1st gear</b>		<b>X</b>	<b>X</b>		<b>*X</b>	<b>X*</b>	<b>X*</b>
<b>D 2nd gear</b>		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X*</b>	<b>X*</b>
<b>D 3rd gear</b>		<b>X</b>			<b>X</b>	<b>X*</b>	<b>X*</b>
<b>D 4th gear</b>	<b>ON</b>	<b>X</b>	<b>X</b>			<b>X*</b>	<b>X*</b>
<b>D 5th gear</b>	<b>ON</b>					<b>X*</b>	<b>X*</b>
<b>D 6th gear</b>	<b>ON</b>		<b>X</b>	<b>X</b>		<b>X*</b>	<b>X*</b>

**X = Solenoid at high duty cycle approximately 850 mA**  
**No "X"= Solenoid at low duty cycle is approximately 50mA**

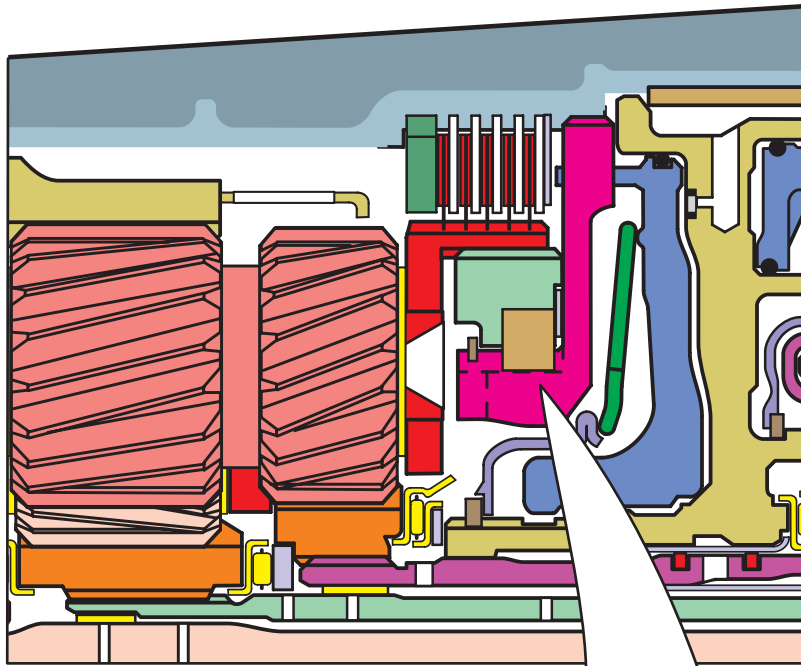
**X\* = Modulated by the TCM based on engine load and driving conditions**

**\*X = Solenoid at 50mA then to 850mA**  
**(D Clutch is ON during engagement then it is released at 3 mph)**

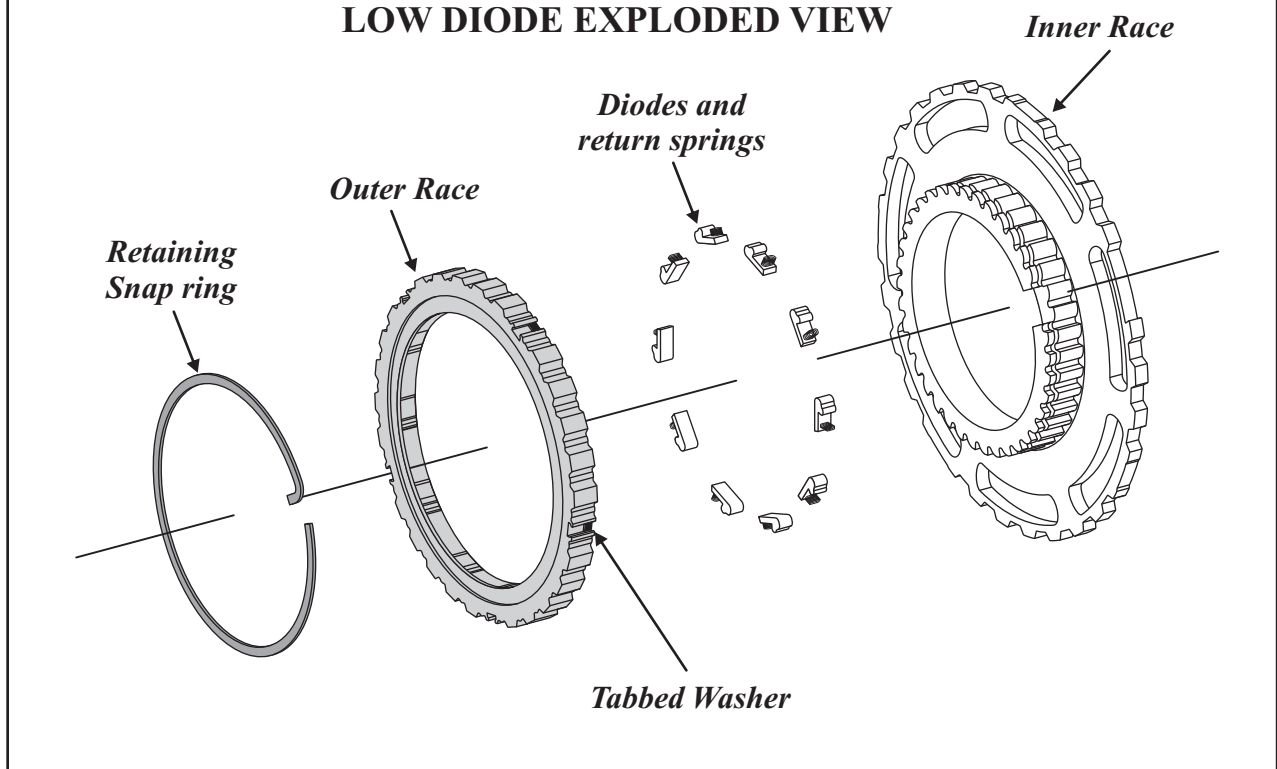
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Figure 2

## LOW DIODE ASSEMBLY



### LOW DIODE EXPLODED VIEW



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Figure 3

# Technical Service Information

## C AND D CLUTCH SUPPORT CHANGES

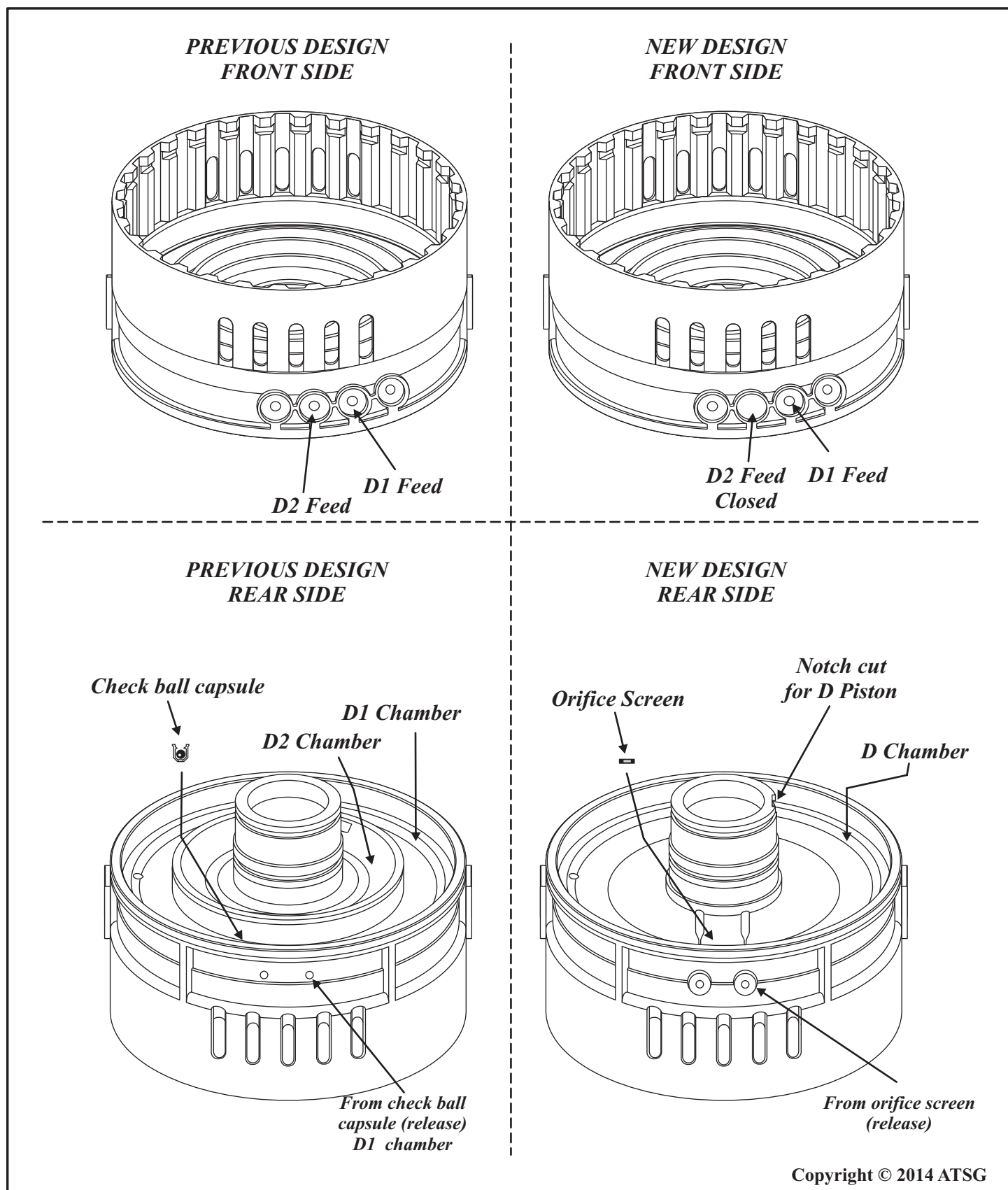
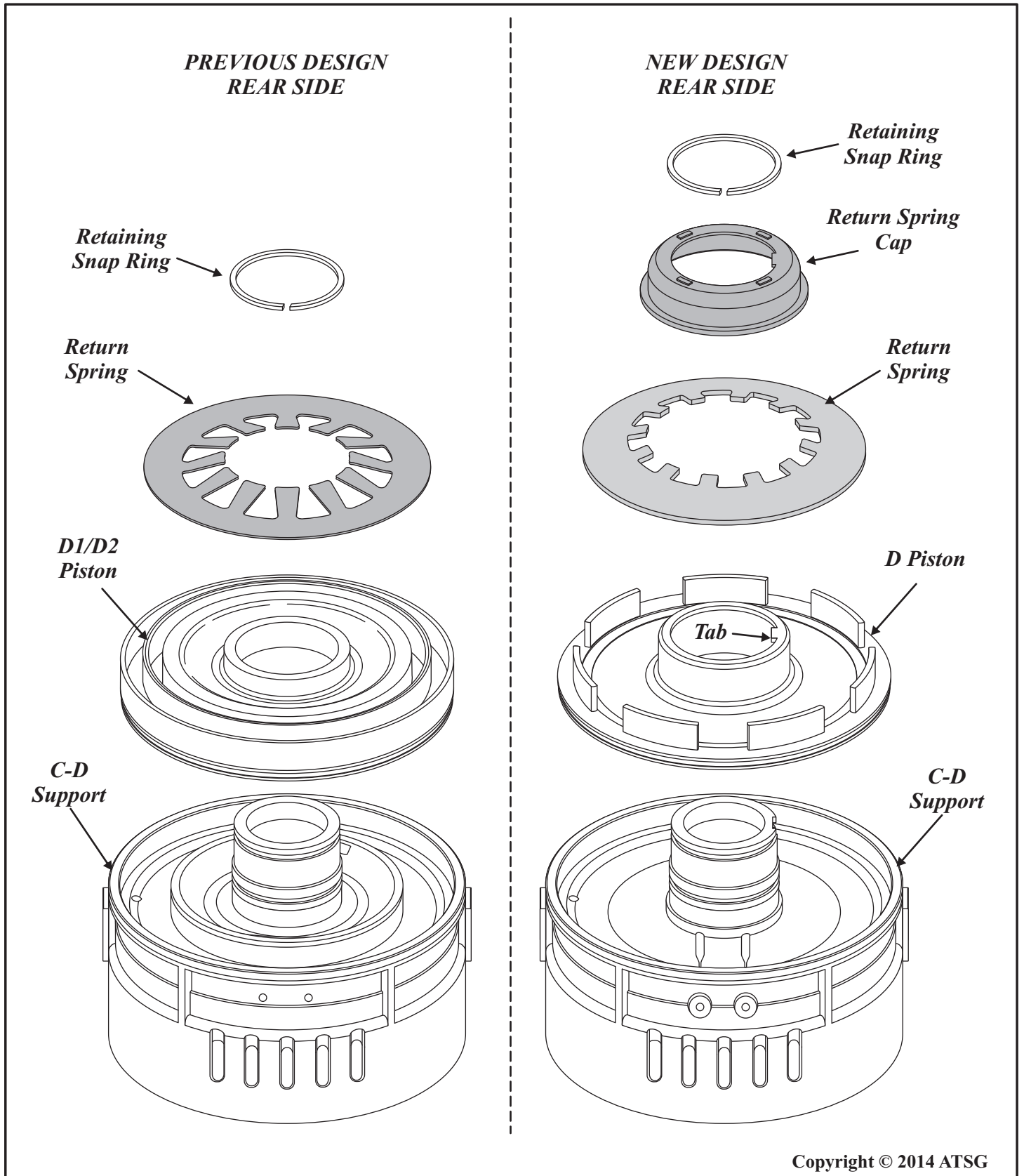


Figure 4



# Technical Service Information

## D PISTON AND RETURN SPRING CHANGES

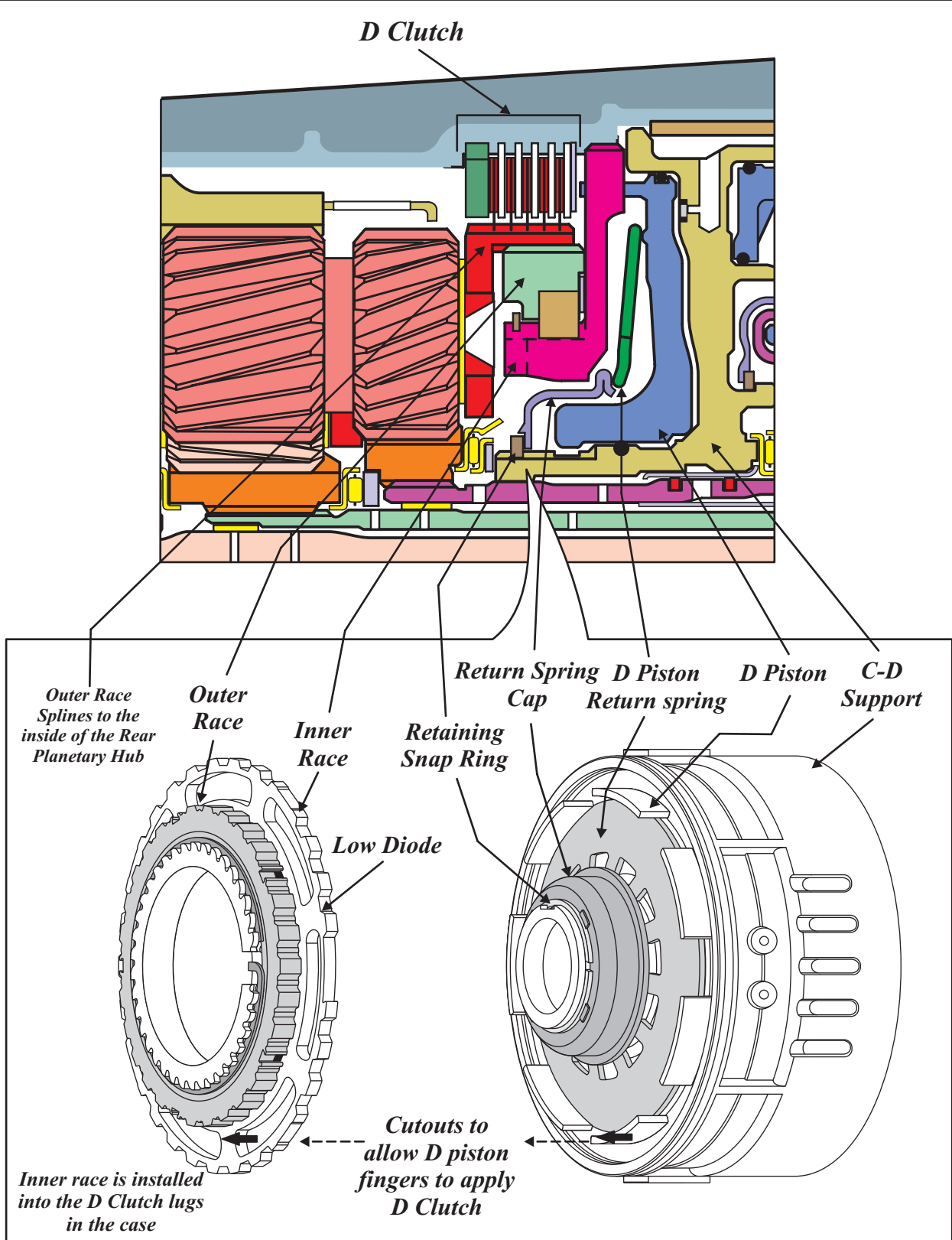


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Figure 5



## LOW DIODE AND D CLUTCH COMPONENT LOCATIONS



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Figure 6

# Technical Service Information

## REAR PLANETARY ASSEMBLY CHANGES

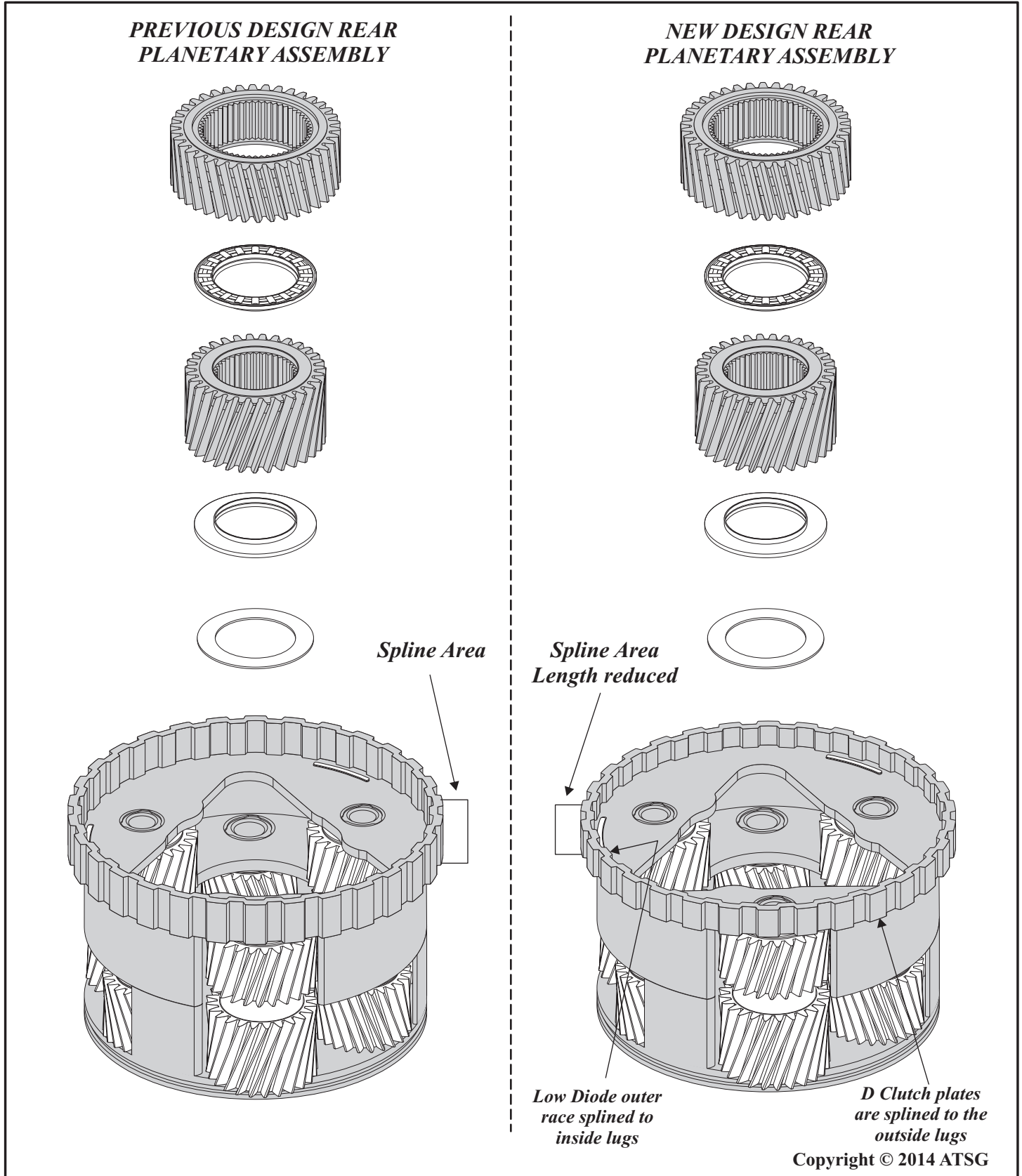
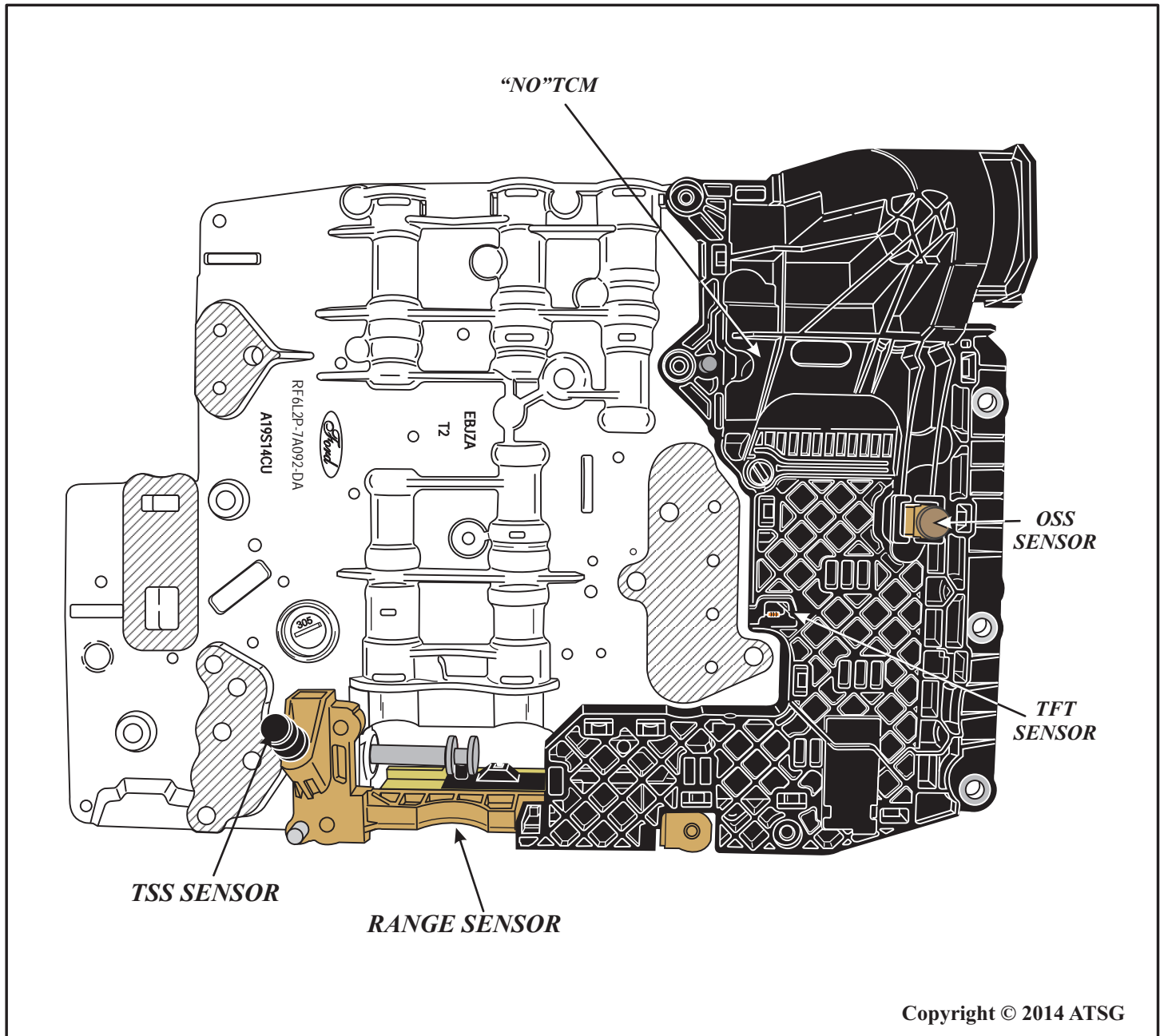


Figure 7

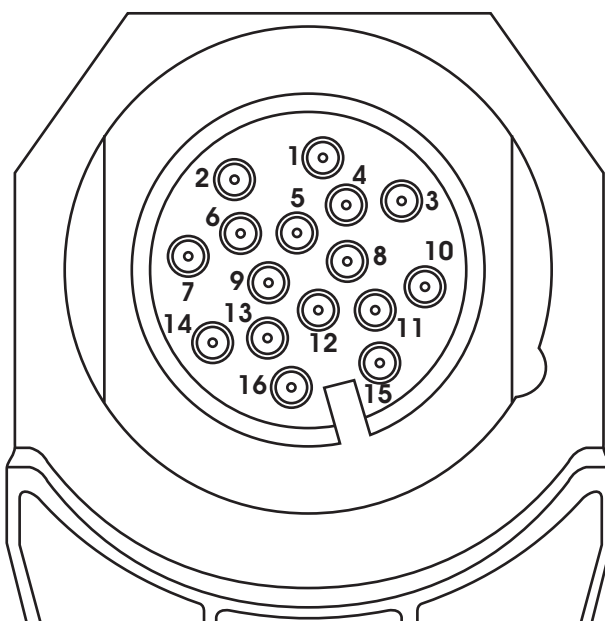
## MOLDED LEAD FRAME LOCATED ON TOP OF VALVE BODY



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Figure 8

## CASE CONNECTOR TERMINAL FUNCTION WITH MOLDED LEAD FRAME-EXTERNAL PCM



PIN #	DESCRIPTION AND FUNCTION
1	TURBINE SHAFT SPEED SENSOR (TSS)
2	NOT USED
3	TCC SOLENOID CONTROL (GROUND)
4	TRANSMISSION RANGE SENSOR (TR)
5	SIGNAL RETURN (TFT-GROUND)
6	TRANSMISSION FLUID TEMPERATURE (TFT) POWER SUPPLY
7	IGNITION VOLTAGE (POWER SUPPLY FOR SOLENOIDS)
8	SHIFT SOLENOID E CONTROL "SSE" (GROUND)
9	SHIFT SOLENOID A CONTROL "SSA" (GROUND)
10	SHIFT SOLENOID D CONTROL "SSD" (GROUND)
11	TRANSMISSION RANGE SENSOR (TR) GROUND
12	BATTERY VOLTAGE (TSS AND OSS)
13	SHIFT SOLENOID C CONTROL "SSC" (GROUND)
14	SHIFT SOLENOID B CONTROL "SSB" (GROUND)
15	OUTPUT SHAFT SPEED SENSOR (OSS)
16	PRESSURE CONTROL SOLENOID A "PCA" (GROUND)

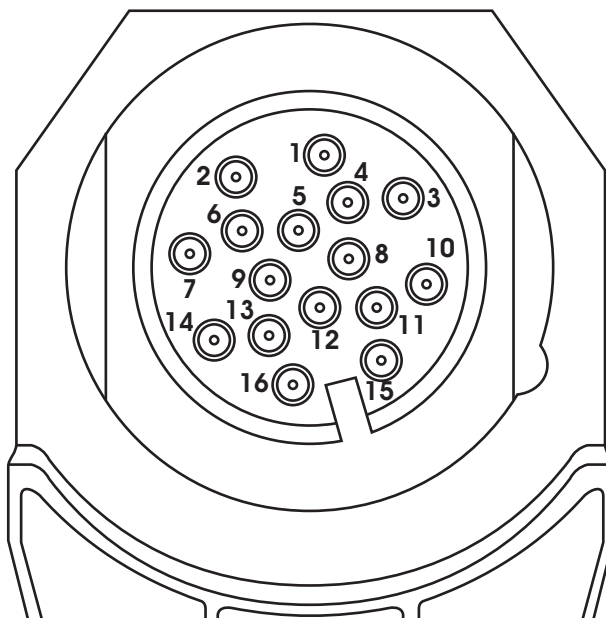
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Figure 9



# Technical Service Information

## MOLDED LEAD FRAME-EXTERNAL PCM COMPONENT OHM TESTS



PINS	COMPONENT	OHM VALUE
3&7	TCC SOLENOID	Approx. 5.5 Ohms
5&6	TRANSMISSION FLUID TEMPERATURE	30k @ 68°-drops with temp increase
8&7	SHIFT SOLENOID E CONTROL “SSE”	Approx. 18 Ohms
9&7	SHIFT SOLENOID A CONTROL “SSA”	Approx. 5.5 Ohms
10&7	SHIFT SOLENOID D CONTROL “SSD”	Approx. 5.5 Ohms
13&7	SHIFT SOLENOID C CONTROL “SSC”	Approx. 5.5 Ohms
14&7	SHIFT SOLENOID B CONTROL “SSB”	Approx. 5.5 Ohms
16&7	PRESSURE CONTROL SOLENOID A “PCA”	Approx. 5.5 Ohms

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## UPPER VALVE BODY RETAINER AND SMALL PART LOCATIONS

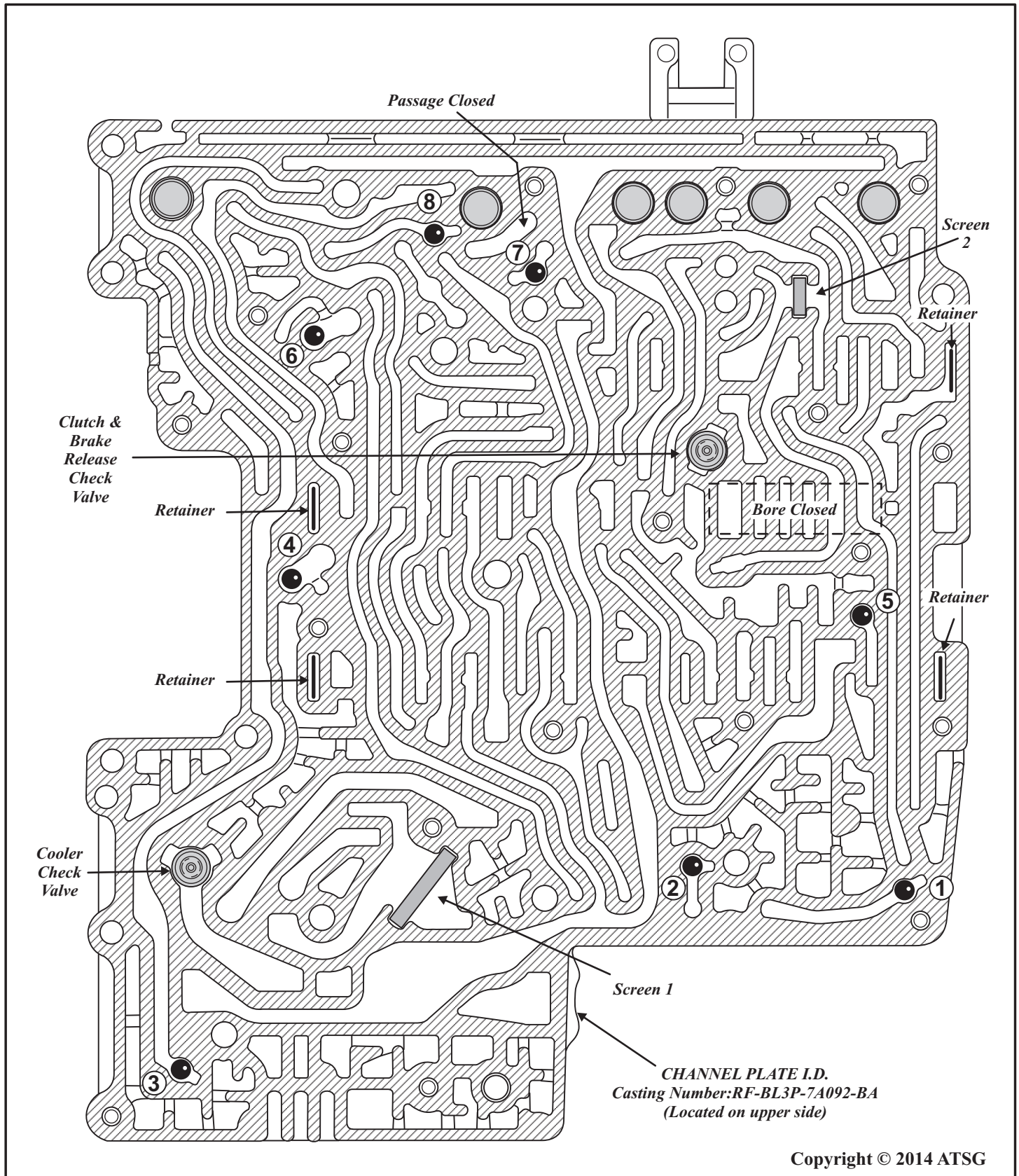


Figure 11



## Technical Service Information

### CHECK BALL, SCREEN, AND CHECK VALVE FUNCTION

- Check Ball ① In the “A” Forward Clutch Apply/Release Circuit**
- Check Ball ② In the “E” Overdrive Clutch Apply/Release Circuit**
- Check Ball ③ Orifice Ball Line from Manual Valve to B Direct (Reverse)**
- Check Ball ④ Forward-Reverse Shuttle Ball**
- Check Ball ⑤ Orifice Ball Line from Manual Valve to Clutch Valve A (Forward)**
- Check Ball ⑥ Shift solenoid E (SS1) Shuttle Ball**
- Check Ball ⑦ In the “B” Direct Clutch Apply/Release Circuit**
- Check Ball ⑧ In the “C” Intermediate Brake Apply/Release Circuit**

**Screen 1 - Filters Line pressure from the Pressure Regulator Valve to the Converter Release regulating Valve and the Lubrication Valve**

**Screen 2 - Filters pressure fed to the B Clutch**

**Cooler Check Valve- Drain back valve**

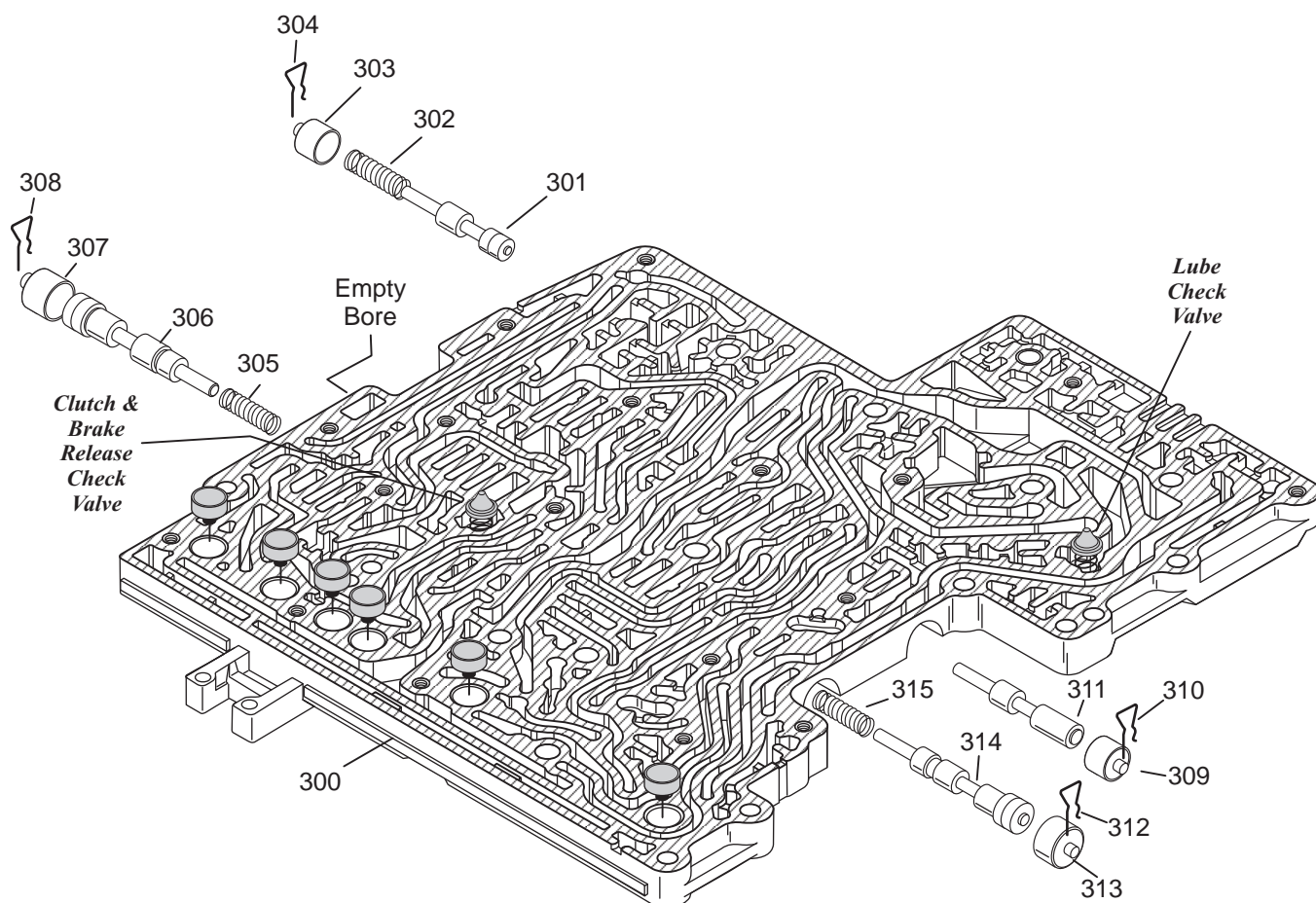
**Clutch Release Check Valve- Meters Clutch and Brake release**

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Figure 12



## UPPER VALVE BODY



### **LEGEND FOR UPPER VALVE BODY**

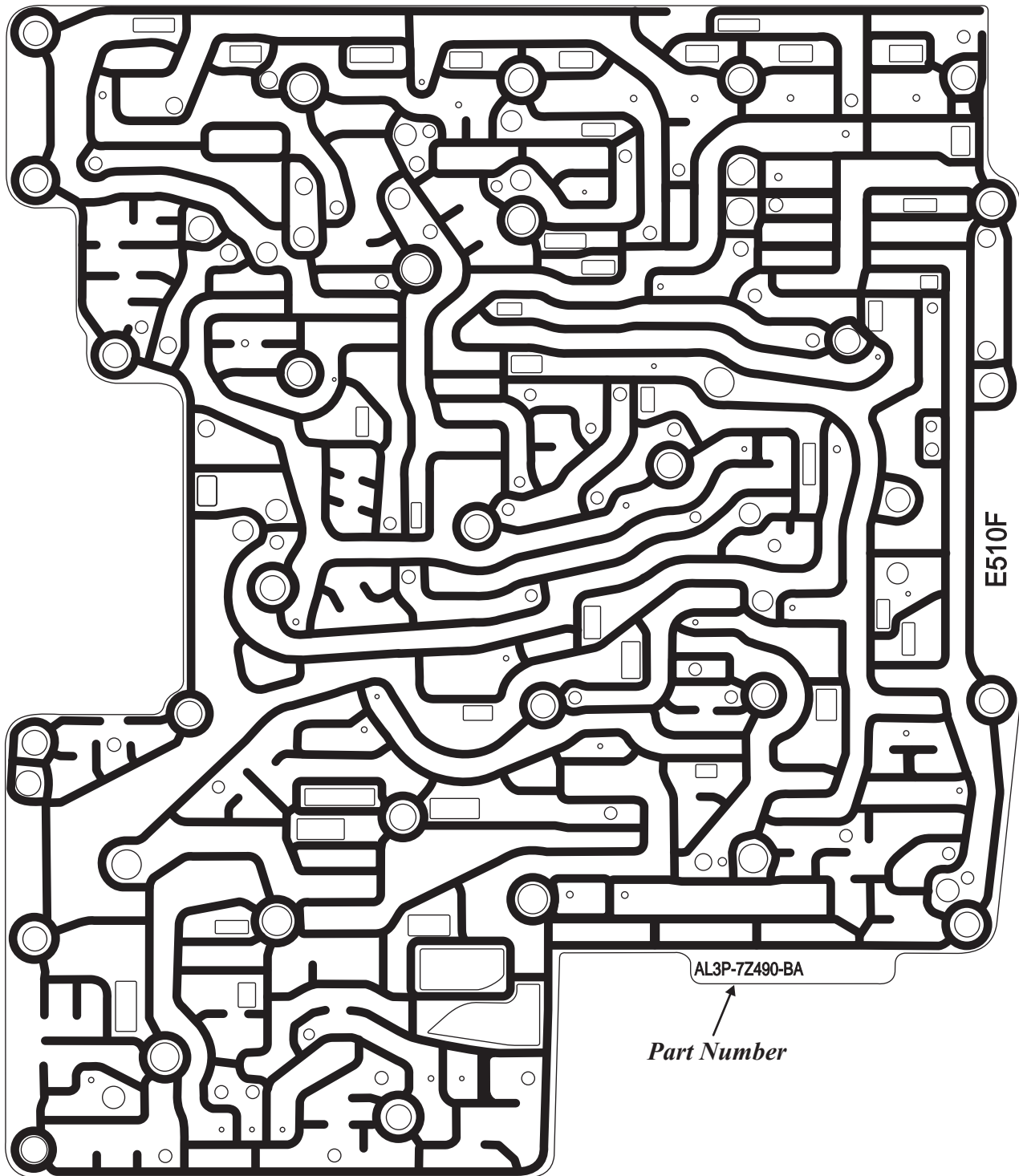
- 300 UPPER VALVE BODY CASTING.
- 301 LOW REVERSE CLUTCH LATCH VALVE (D1)
- 302 LOW REVERSE CLUTCH LATCH VALVE SPRING
- 303 BORE PLUG
- 304 RETAINER
- 305 DIRECT CLUTCH REGULATOR VALVE SPRING
- 306 DIRECT CLUTCH REGULATOR VALVE (B)
- 307 BORE PLUG
- 308 RETAINER
- 309 BORE PLUG
- 310 RETAINER
- 311 LOW REVERSE REGULATOR VALVE (D1)
- 312 RETAINER
- 313 BORE PLUG
- 314 INTERMEDIATE CLUTCH REGULATOR VALVE (C)
- 315 INTERMEDIATE CLUTCH REGULATOR VALVE SPRING

### **UPPER VALVE BODY SPRING SPECIFICATIONS**

SPRING NUMBER 302, 305, 315  
 Free Length = 1.550"  
 Spring Diameter = .355"  
 Wire Diameter = .023"  
 Approx Coils = 12  
 Color = (NONE)

Figure 13

## SPACER PLATE

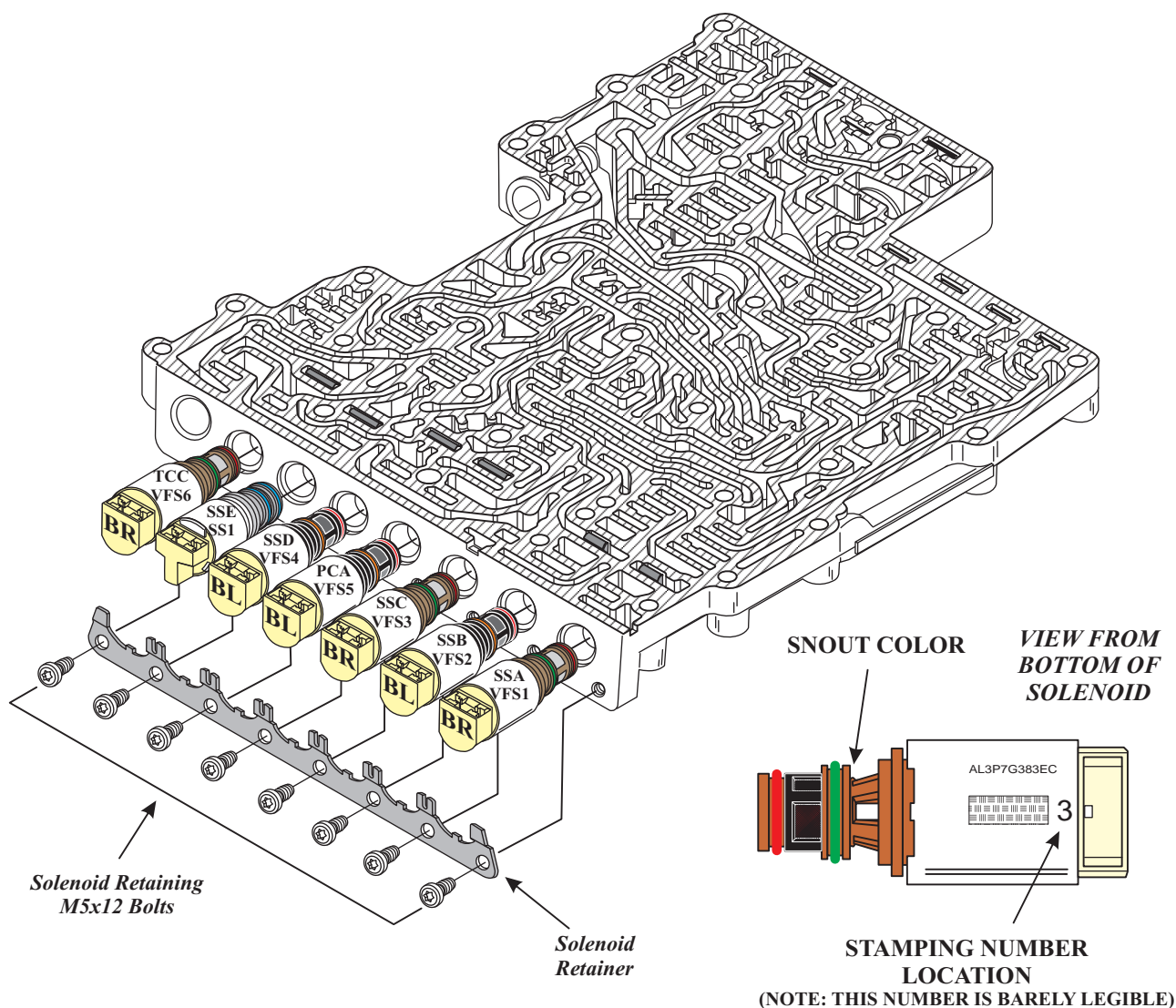


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Figure 14

# Technical Service Information

## SOLENOID IDENTIFICATION



<b>CURRENT FORD PART NUMBERS* FOR PRESSURE CONTROL SOLENOIDS</b>				
SNOUT COLOR	TYPE	BASIC No.	STAMPING NUMBER I.D.	O.E. PART NUMBER
BR (brown)	NL	7G383A	4	AL3Z-7G383-U
BR (brown)	NL	7G383A	3	AL3Z-7G383-T
BR (brown)	NL	7G383A	5	AL3Z-7G383-V
BR (brown)	NL	7G383A	2	AL3Z-7G383-S
BL (black)	NH	7G383B	5	AL3Z-7G383-N
BL (black)	NH	7G383B	4	AL3Z-7G383-M
BL (black)	NH	7G383B	2	AL3Z-7G383-K
BL (black)	NH	7G383B	3	AL3Z-7G383-L

\*Built after 03-Nov-2010

### CURRENT FORD PART NUMBER\* FOR SSE SOLENOID

AL3Z-7G484-A

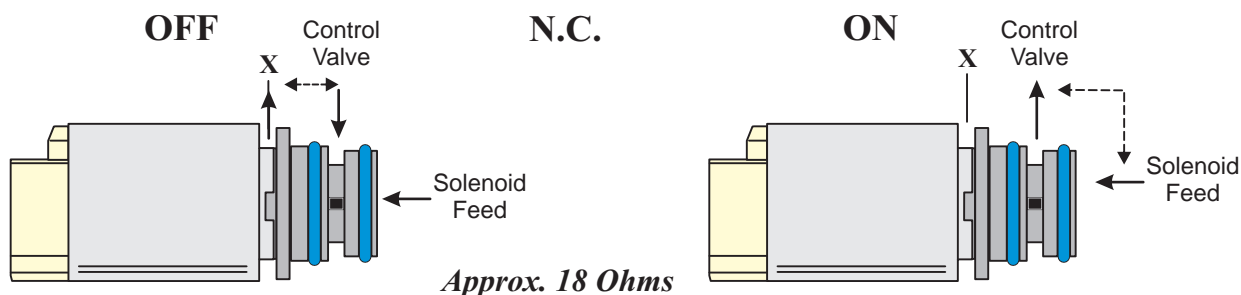
\*Built after 03-Nov-2010

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Figure 15

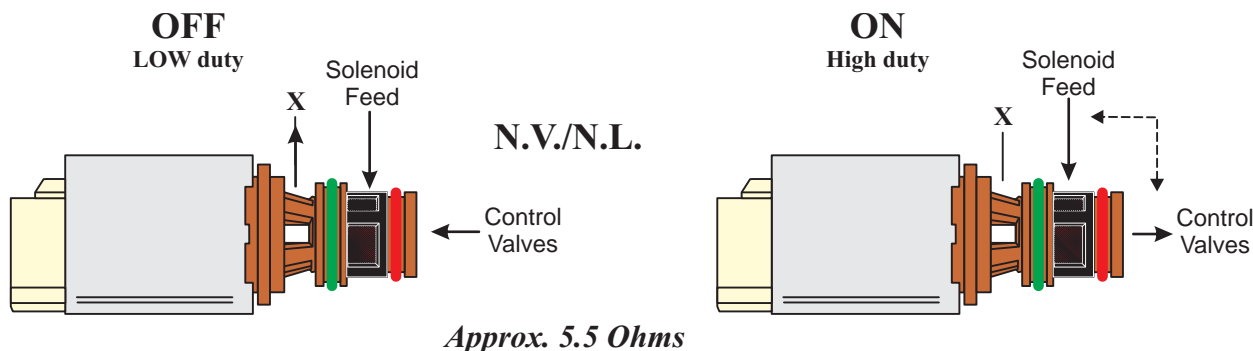
## SOLENOID CHECKS

### SSE ON-OFF SOLENOID



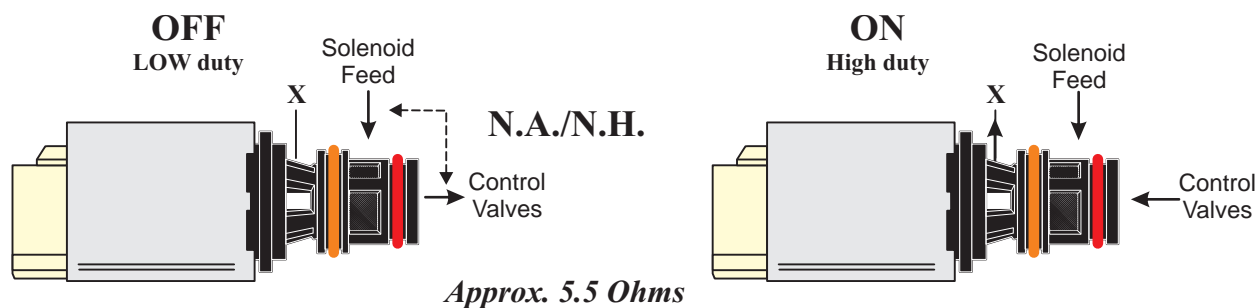
*The SSE Solenoid is Normally closed. When the solenoid is OFF, pressure from the valves it is in control of are connected to the exhaust. When the Solenoid is ON, Solenoid Feed is connected thru the Solenoid to the valves it is in control of.*

### SSA (VFS1), SSC (VFS 3), TCC (VFS 6) PRESSURE CONTROL SOLENOIDS



*SSA, SSC, and the TCC are Normally Vented/Normally Low variable Pressure Control Solenoids. When the solenoids are OFF, or at Low Duty cycle, pressure from the valves they are in control of are connected to the exhaust. When the Solenoids are ON, or at High Duty cycle, Solenoid Feed is connected thru the Solenoid to the valves they are in control of.*

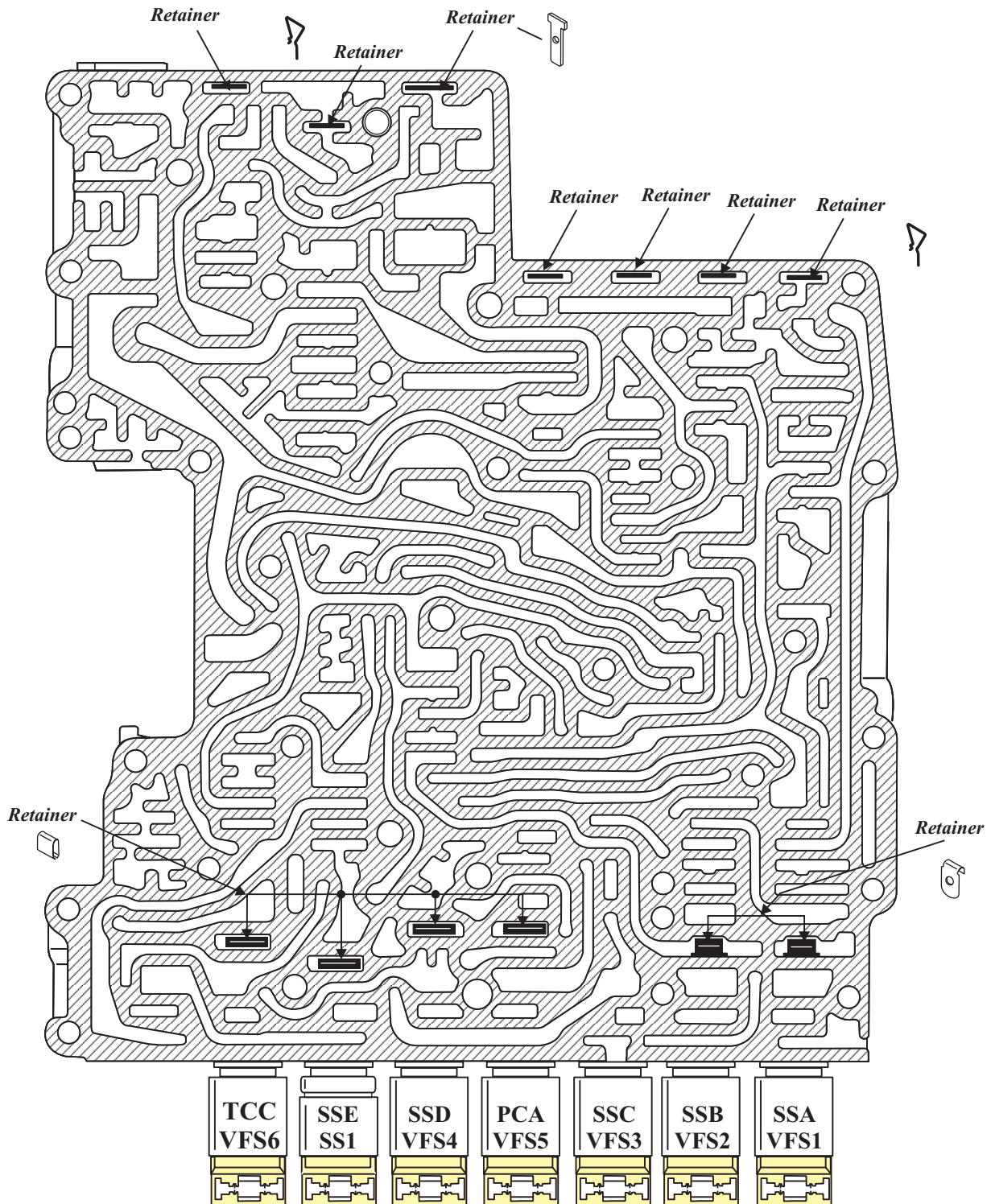
### SSB (VFS 2), SSD (VFS 4), PCA(VFS) 5 PRESSURE CONTROL SOLENOIDS



*SSB, SSD and the PCA are Normally Applied/Normally High variable Pressure Control Solenoids. When the Solenoids are OFF, or at Low Duty cycle, Solenoid Feed is connected thru the Solenoid to the valves they are in control of. When the solenoids are ON, or at High Duty cycle, pressure from the valves they are in control of are connected to the exhaust.* Copyright © 2014 ATSG

# Technical Service Information

## LOWER VALVE BODY RETAINER LOCATIONS

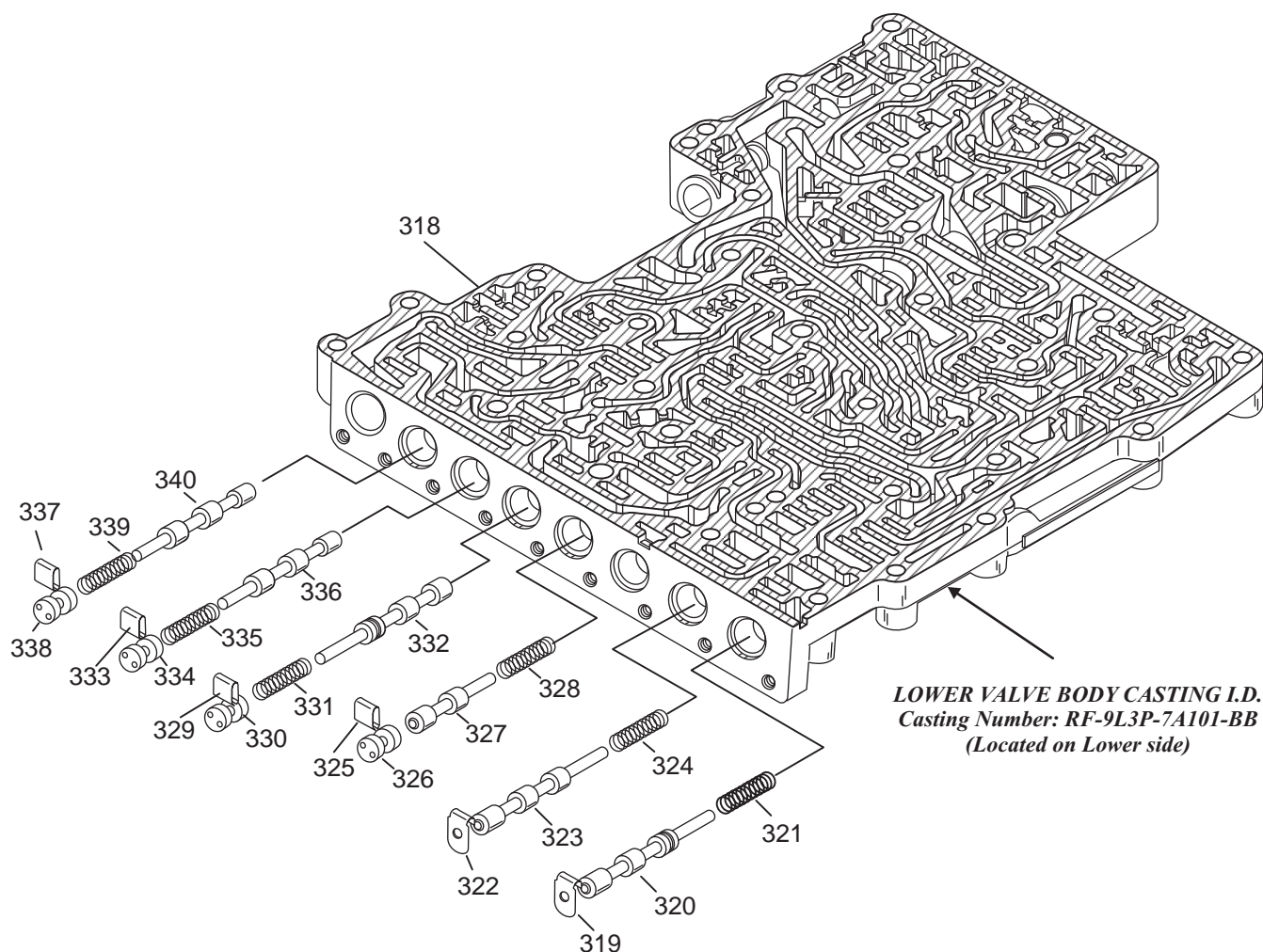


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Figure 17



## LOWER VALVE BODY REAR SIDE



### LEGEND FOR LOWER VALVE BODY REAR SIDE

318 LOWER VALVE BODY CASTING.  
319 RETAINER  
320 FORWARD CLUTCH LATCH VALVE (A)  
321 FORWARD CLUTCH LATCH VALVE SPRING  
322 RETAINER  
323 DIRECT CLUTCH LATCH VALVE (B)  
324 DIRECT CLUTCH LATCH VALVE SPRING  
325 RETAINER  
326 BORE PLUG  
327 SOLENOID REGULATING VALVE  
328 SOLENOID REGULATING VALVE SPRING  
329 RETAINER  
330 BORE PLUG  
331 LOW REVERSE BRAKE LATCH VALVE SPRING  
332 LOW REVERSE BRAKE LATCH VALVE (D)  
333 RETAINER  
334 BORE PLUG  
335 DRIVE ENABLE VALVE SPRING  
336 DRIVE ENABLE VALVE

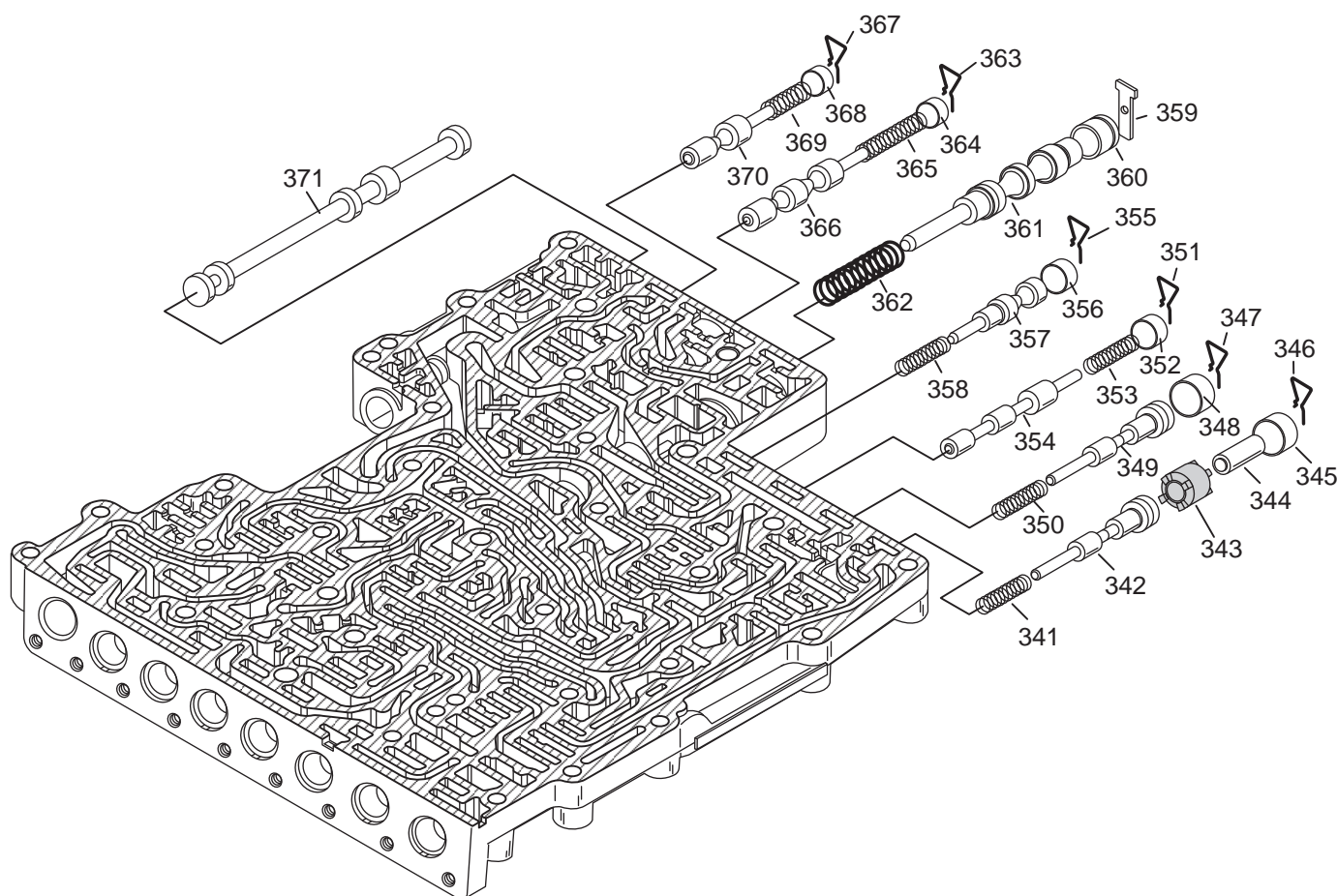
337 RETAINER  
338 BORE PLUG  
339 SOLENOID MULTIPLEX VALVE SPRING  
340 SOLENOID MULTIPLEX VALVE

*See Figure 20 for Spring Specifications*

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Figure 18

## LOWER VALVE BODY FRONT SIDE



### **LEGEND FOR LOWER VALVE BODY FRONT SIDE**

- |  |   |
|--|---|
| 341 FORWARD CLUTCH REGULATING VALVE SPRING       | 362 MAIN PRESSURE REGULATOR VALVE SPRING      |
| 342 FORWARD CLUTCH REGULATING VALVE (A)          | 363 RETAINER                                  |
| 343 FORWARD CLUTCH REGULATING VALVE SLEEVE       | 364 BORE PLUG                                 |
| 344 FORWARD CLUTCH REGULATING INNER VALVE        | 365 CONVERTER RELEASE REGULATING VALVE SPRING |
| 345 BORE PLUG                                    | 366 CONVERTER RELEASE REGULATING VALVE        |
| 346 RETAINER                                     | 367 RETAINER                                  |
| 347 RETAINER                                     | 368 BORE PLUG                                 |
| 348 BORE PLUG                                    | 369 LUBRICATION CONTROL VALVE SPRING          |
| 349 OVERDRIVE CLUTCH REGULATING VALVE (E)        | 370 LUBRICATION CONTROL VALVE                 |
| 350 OVERDRIVE CLUTCH REGULATING VALVE SPRING     | 371 MANUAL VALVE                              |
| 351 RETAINER                                     |   |
| 352 BORE PLUG                                    |   |
| 353 OVERDRIVE CLUTCH LATCH VALVE SPRING          |   |
| 354 OVERDRIVE CLUTCH LATCH VALVE (E)             |   |
| 355 RETAINER                                     |   |
| 356 BORE PLUG                                    |   |
| 357 BYPASS CLUTCH CONTROL REGULATOR VALVE        |   |
| 358 BYPASS CLUTCH CONTROL REGULATOR VALVE SPRING |   |
| 359 RETAINER                                     |   |
| 360 MAIN PRESSURE REGULATOR VALVE SLEEVE         |   |
| 361 MAIN PRESSURE REGULATOR VALVE                |   |

*See Figure 20 for Spring Specifications*

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Figure 19





# Technical Service Information

## SPRING SPECIFICATIONS

### ***LOWER VALVE BODY REAR SIDE SPRING SPECIFICATIONS***

SPRING NUMBER 321  
Free Length = 1.490"  
Spring Diameter = .383"  
Wire Diameter = .044"  
Approx Coils = 13  
Color = WHITE

SPRING NUMBER 331  
Free Length = 1.490"  
Spring Diameter = .383"  
Wire Diameter = .044"  
Approx Coils = 13  
Color = WHITE

SPRING NUMBER 324  
Free Length = 1.490"  
Spring Diameter = .383"  
Wire Diameter = .044"  
Approx Coils = 13  
Color = WHITE

SPRING NUMBER 335  
Free Length = 1.240"  
Spring Diameter = .393"  
Wire Diameter = .028"  
Approx Coils = 9  
Color = RED/ORANGE

SPRING NUMBER 328  
Free Length = 1.660"  
Spring Diameter = .355"  
Wire Diameter = .044"  
Approx Coils = 15  
Color = WHITE

SPRING NUMBER 339  
Free Length = 1.240"  
Spring Diameter = .393"  
Wire Diameter = .028"  
Approx Coils = 9  
Color = RED/ORANGE

### ***LOWER VALVE BODY FRONT SIDE SPRING SPECIFICATIONS***

SPRING NUMBER 341  
Free Length = 1.540"  
Spring Diameter = .357"  
Wire Diameter = .024"  
Approx Coils = 12  
Color = (NONE)

SPRING NUMBER 362  
Free Length = 2.230"  
Spring Diameter = .508"  
Wire Diameter = .055"  
Approx Coils = 11  
Color = (NONE)

SPRING NUMBER 350  
Free Length = 1.530"  
Spring Diameter = .360"  
Wire Diameter = .024"  
Approx Coils = 12  
Color = (NONE)

SPRING NUMBER 365  
Free Length = 1.725"  
Spring Diameter = .447"  
Wire Diameter = .035"  
Approx Coils = 15  
Color = YELLOW

SPRING NUMBER 353  
Free Length = 1.556"  
Spring Diameter = .404"  
Wire Diameter = .044"  
Approx Coils = 14  
Color = GREY

SPRING NUMBER 369  
Free Length = 1.145"  
Spring Diameter = .484"  
Wire Diameter = .048"  
Approx Coils = 9  
Color = PINK

SPRING NUMBER 358  
Free Length = 1.375"  
Spring Diameter = .336"  
Wire Diameter = .031"  
Approx Coils = 10  
Color = YELLOW

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Figure 20

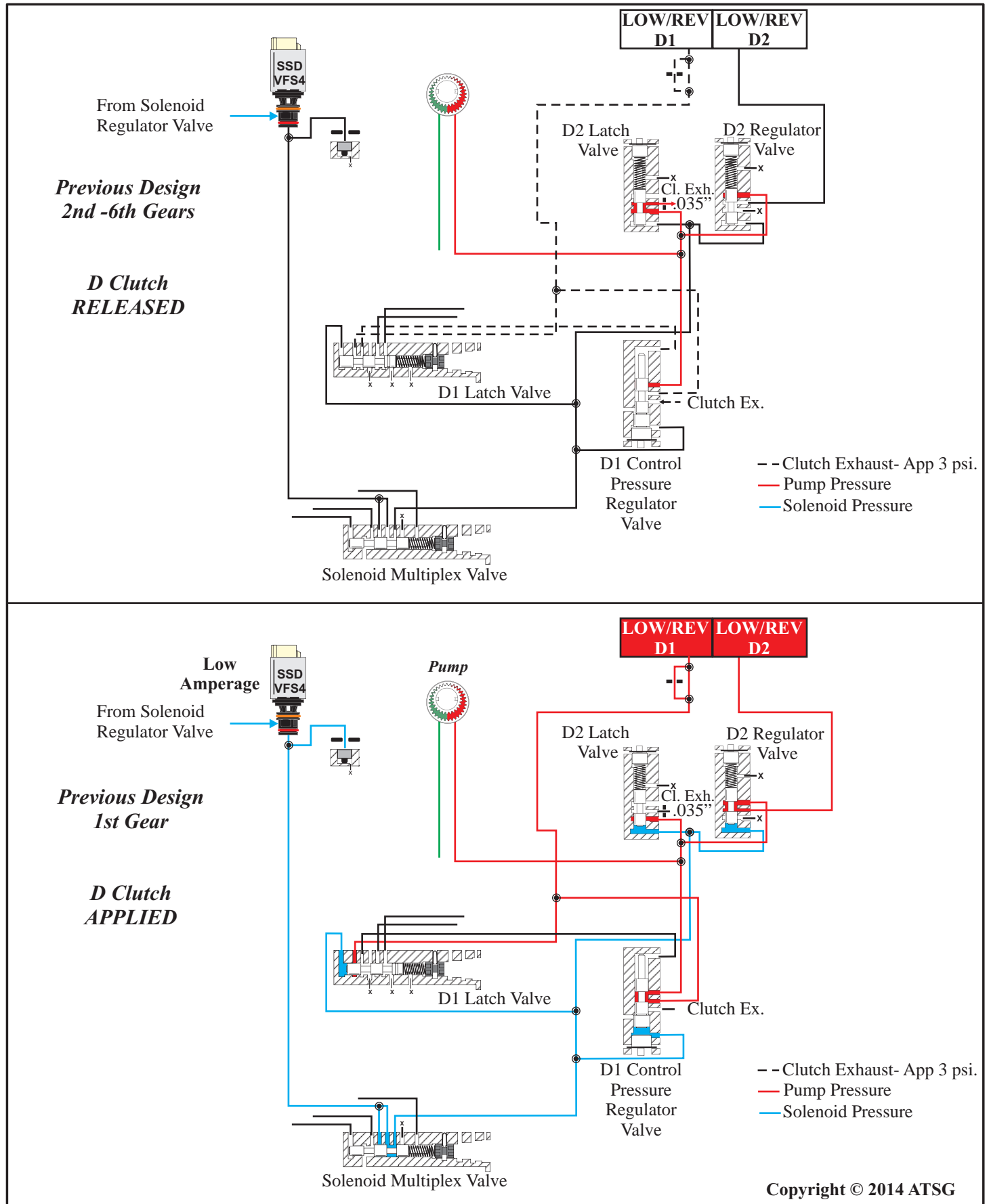


Figure 21

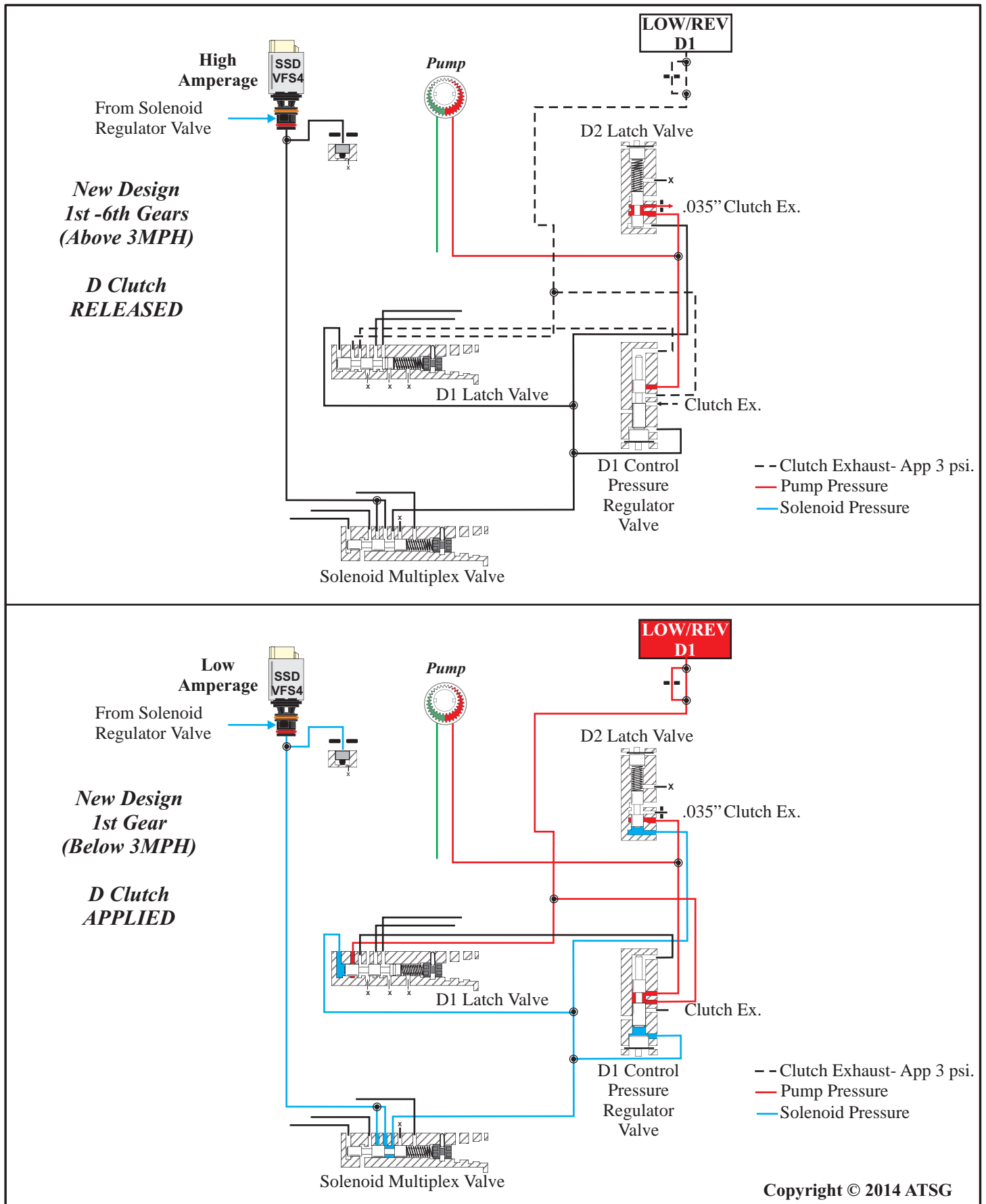


Figure 22