



## FORD MOTOR COMPANY

### VEHICLES EQUIPPED WITH THE 4R70W TRANSMISSION NEUTRALS IN FIRST GEAR FROM A STOP 1996 AND UP IN “D” RANGE ONLY

**COMPLAINT:** Some Ford Motor Company 1996 and later vehicles equipped with the 4R70W Transmission may exhibit a neutral condition from a stop when the Shift Selector is in the “D” range. There may also be a Diagnostic Trouble Code P0755 stored. ( Shift Solenoid 2 Electrical Circuit Fault ).

- CAUSE:**
- (1) One cause for this condition may be that the PPL/ORG or VIO/ORG wire, which is model dependant that controls Shift Solenoid 2 may have rubbed on the rear of the engine, causing the circuit to become grounded. When this occurs with the transmission in first gear, Shift Solenoid 2 closes and fluid pressure acts to stroke the 3-4 Shift Valve to the right, causing the Forward Clutch oil to exhaust through the 3-4 Shift Valve, creating the neutral condition. (See Figure 1). Diagnostic Trouble Code P0755 may also be set.
  - (2) Another cause for this condition may be that the Solenoid Regulator Valve has become stuck down in the bottom of the Valve Body bore causing the pressure in the Solenoid Regulator Circuit to become higher than the Shift Solenoid 2 can exhaust, allowing the Shift Solenoid 2 pressure to build up and strokes the 3-4 Shift Valve to the right exhausting the Forward Clutch, creating the neutral condition. ( See Figure 2) No Diagnostic Trouble Codes will be set. See Figures 3 and 4 for valve identification.
  - (3) Cause 3 is almost identical to Cause 2 with the exception being that Shift Solenoid is sticking closed or has debris built up at the Solenoid exhaust hole, which will allow Shift Solenoid 2 pressure to build up and strokes the 3-4 Shift Valve to move to the right exhausting the Forward Clutch, once again creating the neutral condition. (See Figure 2). No Diagnostic Trouble Codes will be set.

**NOTE:** When following proper diagnostic procedure for this problem, attach a pressure gauge to the Forward Clutch Pressure Port which is located on the right hand side of the transmission.(See Figure 5) Normally when the Forward Clutch is applied the pressure will be equal to the Main Line pressure. (See Figure 6) When the above causes take place, the pressure seen at the Forward Clutch will suddenly drop to Zero, and this is when the neutral condition will be felt.

**CORRECTION:**

- (1) Repair or replace the damaged Shift Solenoid 2 wire. Refer to Figures 7 and 8 to locate the proper year and model vehicle that you are working on. Wire Diagrams have been provided in Figures 9, 10, 11 and 12.
- (2) Locate the Solenoid Regulator Valve in the Valve Body. See Figures 3 and 4 To repair a sticking Solenoid Regulator Valve, it may become necessary to replace the valve assembly. There are replacement Solenoid Regulator Valve Kits available in the Aftermarket.
- (3) Replace the Shift Solenoid 1 and 2 assembly.

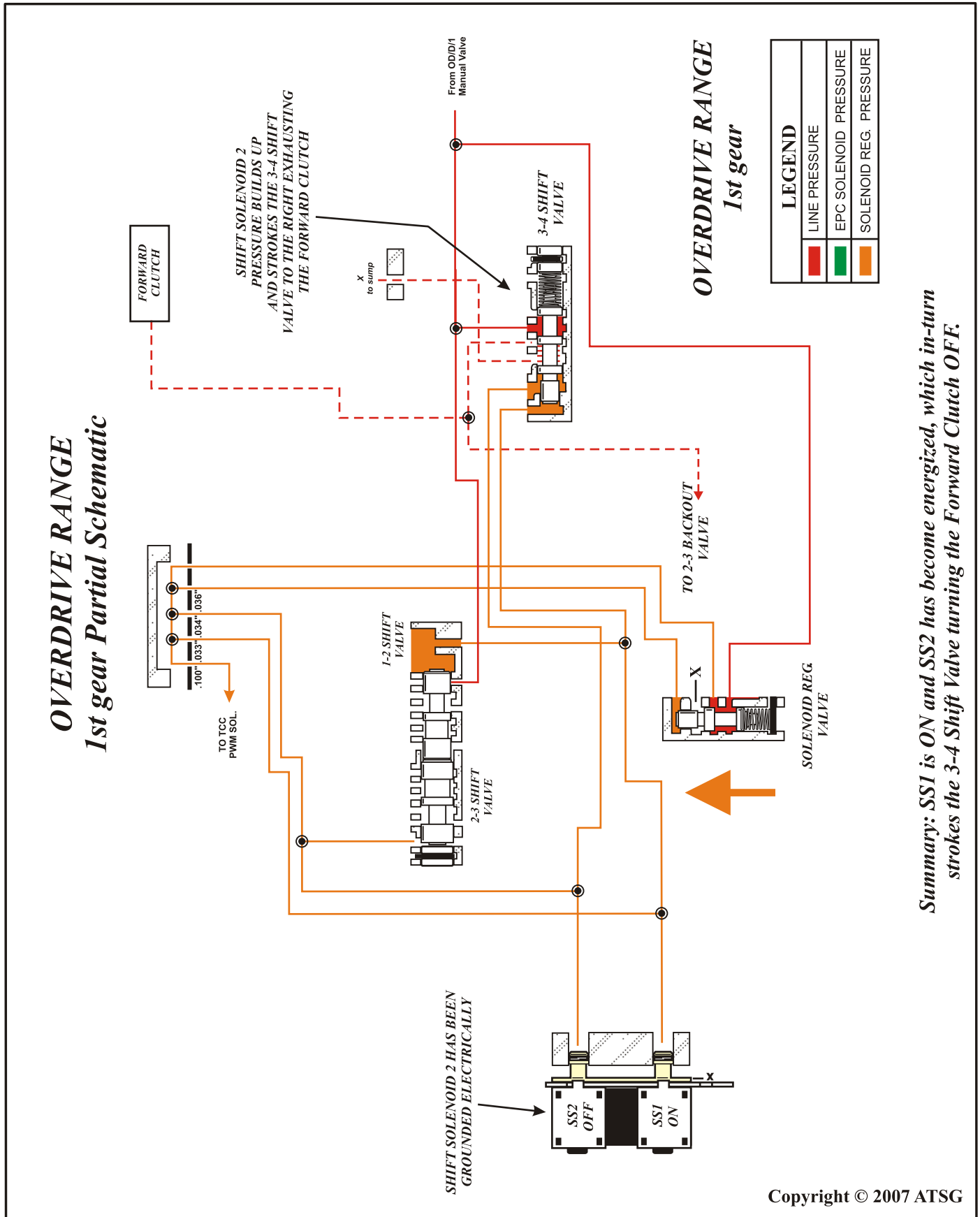
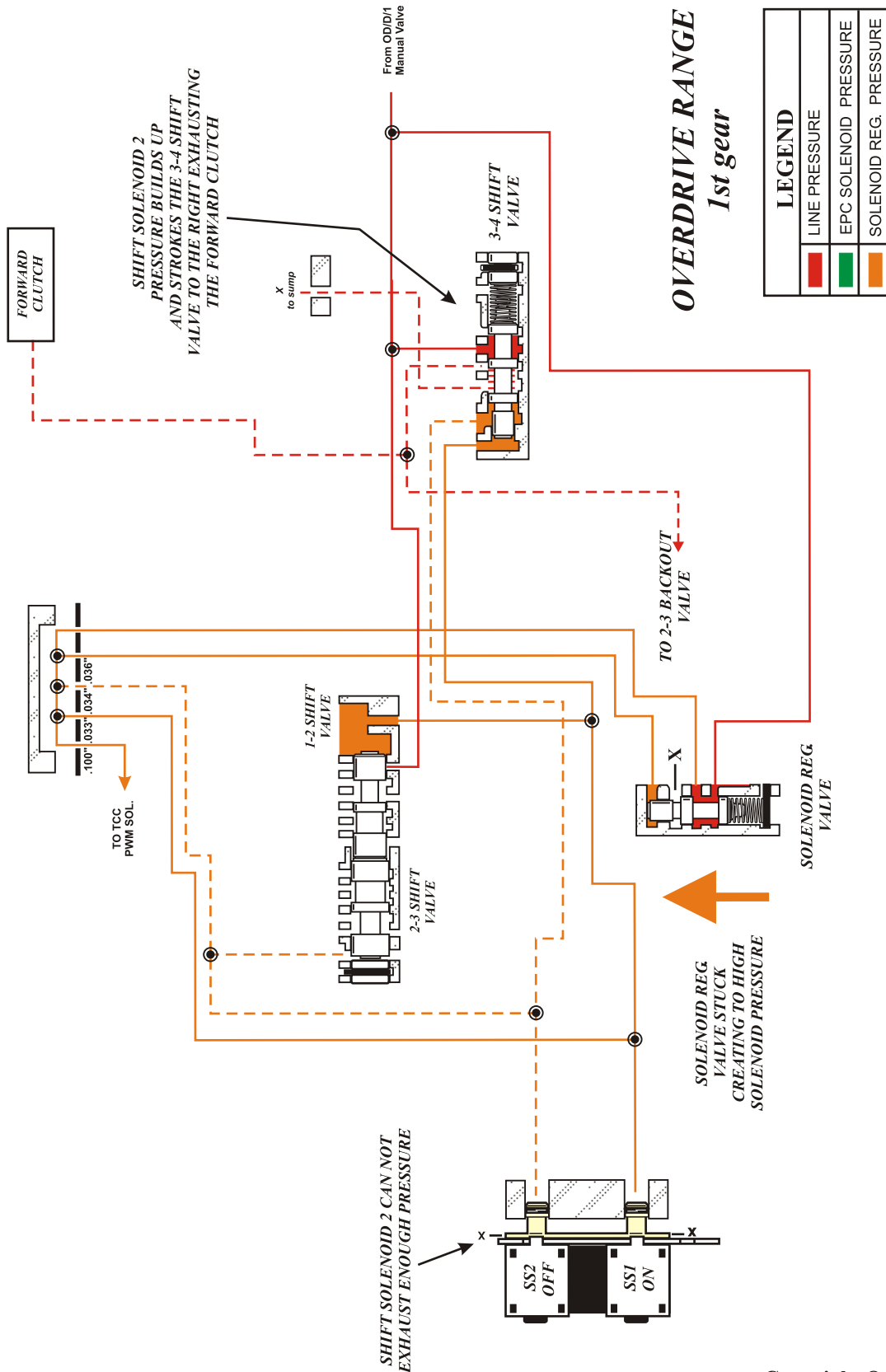


Figure 1

## OVERDRIVE RANGE 1st gear Partial Schematic

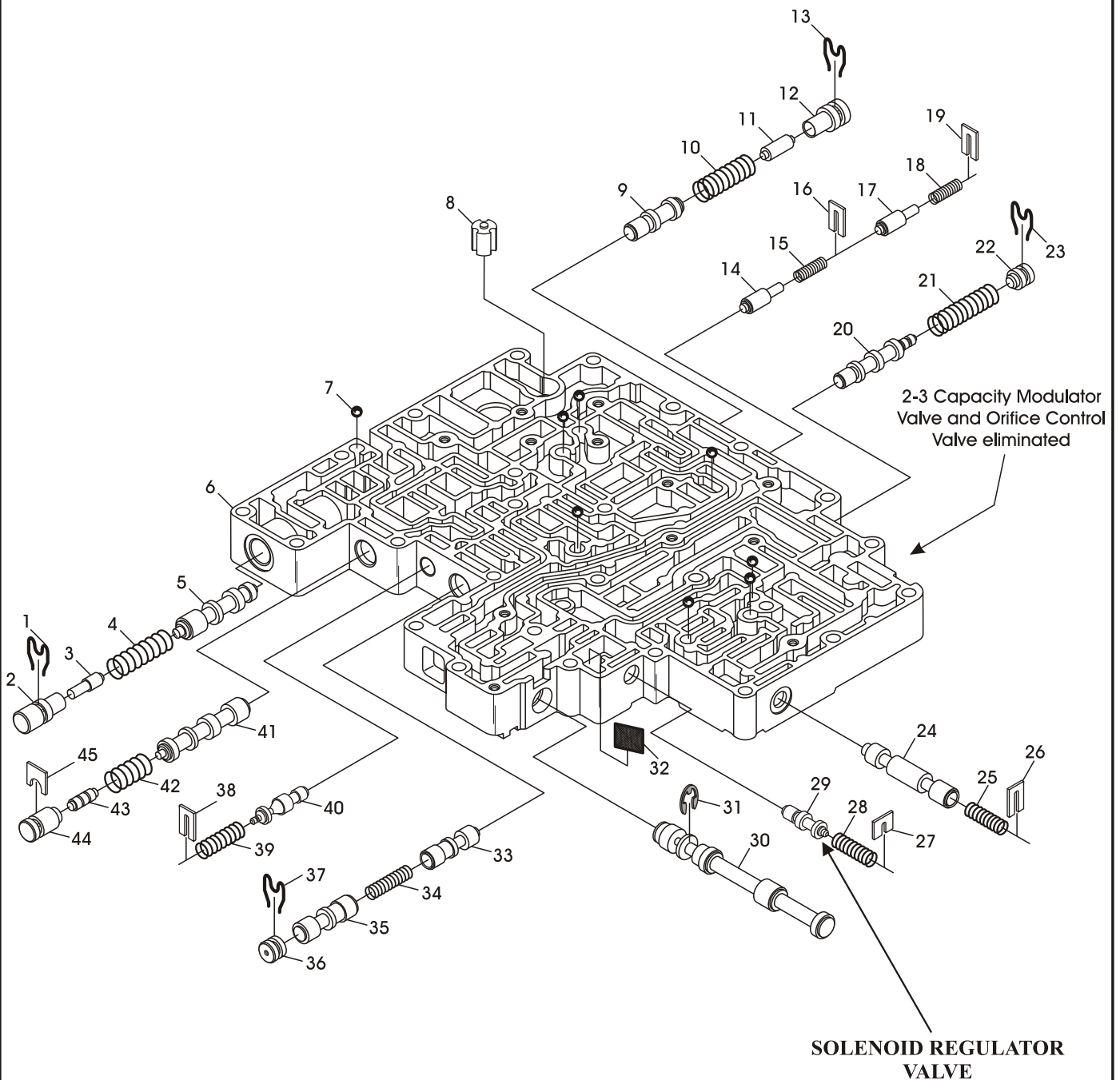


**Summary: SS1 is ON and SS2 can not exhaust the High Solenoid Reg. pressure, which in-turn strokes the 3-4 Shift Valve turning the Forward Clutch OFF.**

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Figure 2

## FORD 4R70W 2001-UP MAIN VALVE BODY EXPLODED VIEW



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Figure 3



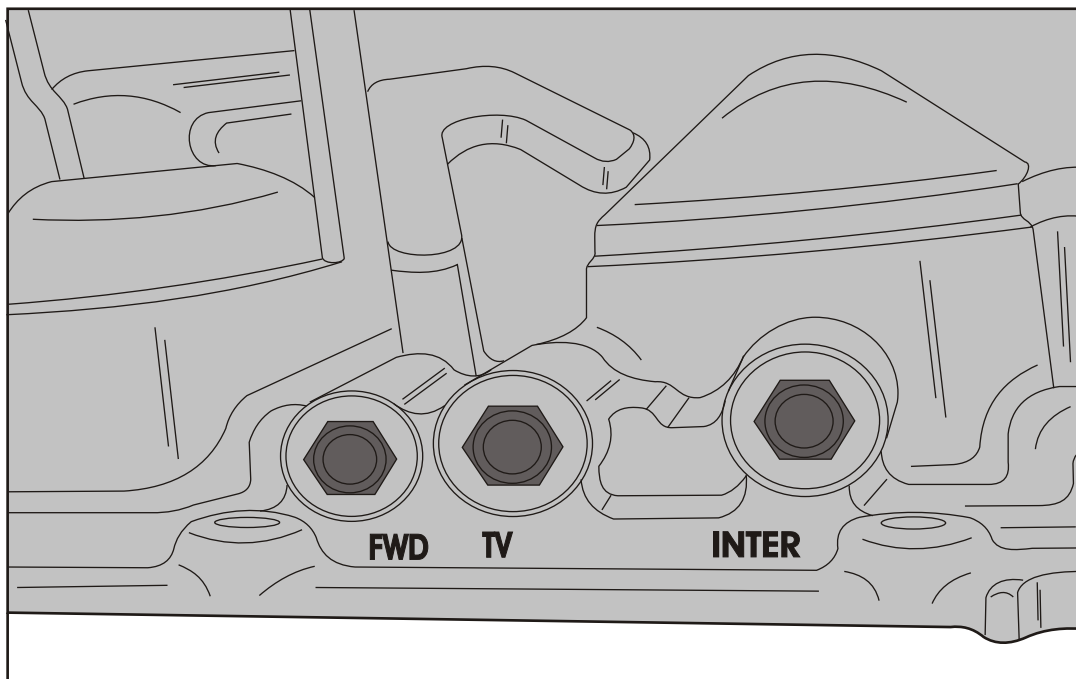
## FORD 4R70W MAIN VALVE BODY LEGEND

- |  |  |
|--|--|
| 1 MAIN PRESSURE REGULATOR BOOST VALVE SLEEVE RETAINER. | 24 2-3 BACKOUT VALVE.                                  |
| 2 MAIN PRESSURE REGULATOR BOOST VALVE SLEEVE.          | 25 2-3 BACKOUT VALVE SPRING.                           |
| 3 MAIN PRESSURE REGULATOR BOOST VALVE.                 | 26 2-3 BACKOUT VALVE SPRING RETAINER.                  |
| 4 MAIN PRESSURE REGULATOR VALVE SPRING.                | 27 SOLENOID PRESSURE REGULATOR VALVE SPRING RETAINER.  |
| 5 MAIN PRESSURE REGULATOR VALVE.                       | 28 SOLENOID PRESSURE REGULATOR VALVE SPRING.           |
| 6 MAIN VALVE BODY CASTING.                             | 29 SOLENOID PRESSURE REGULATOR VALVE.                  |
| 7 CHECK BALL, 1/4" DIAMETER (8 REQUIRED).              | 30 MANUAL CONTROL VALVE.                               |
| 8 CONVERTER DRAIN BACK VALVE.                          | 31 MANUAL CONTROL VALVE "E" CLIP.                      |
| 9 O.D. SERVO PRESSURE REGULATOR VALVE.                 | 32 EPC SOLENOID SCREEN.                                |
| 10 O.D. SERVO PRESSURE REGULATOR VALVE SPRING.         | 33 1-2 SHIFT VALVE.                                    |
| 11 O.D. SERVO PRESSURE REGULATOR BOOST VALVE.          | 34 2-3 SHIFT VALVE SPRING.                             |
| 12 O.D. SERVO PRESSURE REGULATOR BOOST VALVE SLEEVE.   | 35 2-3 SHIFT VALVE.                                    |
| 13 BOOST VALVE SLEEVE RETAINER.                        | 36 2-3 SHIFT VALVE BORE PLUG.                          |
| 14 3-4 CAPACITY MODULATOR VALVE.                       | 37 2-3 SHIFT VALVE BORE PLUG RETAINER.                 |
| 15 3-4 CAPACITY MODULATOR VALVE SPRING.                | 38 CONVERTER PRESSURE REGULATOR VALVE SPRING RETAINER. |
| 16 3-4 CAPACITY MODULATOR VALVE SPRING RETAINER.       | 39 CONVERTER PRESSURE REGULATOR VALVE SPRING.          |
| 17 LOW SERVO CAPACITY MODULATOR VALVE.                 | 40 CONVERTER PRESSURE REGULATOR VALVE.                 |
| 18 LOW SERVO CAPACITY MODULATOR VALVE SPRING.          | 41 BYPASS CLUTCH CONTROL VALVE.                        |
| 19 LOW SERVO CAPACITY MODULATOR VALVE SPRING RETAINER. | 42 BYPASS CLUTCH CONTROL VALVE SPRING.                 |
| 20 3-4 SHIFT VALVE.                                    | 43 BYPASS CLUTCH CONTROL BOOST VALVE.                  |
| 21 3-4 SHIFT VALVE SPRING.                             | 44 BYPASS CLUTCH CONTROL BOOST VALVE SLEEVE.           |
| 22 3-4 SHIFT VALVE SPRING BORE PLUG.                   | 45 BYPASS CLUTCH CONTROL VALVE SLEEVE RETAINER.        |
| 23 3-4 SHIFT VALVE BORE PLUG RETAINER.                 |  |

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Figure 4

## 4R70W PRESSURE TAP LOCATIONS



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Figure 5

## OVERDRIVE RANGE 1st gear Partial Schematic

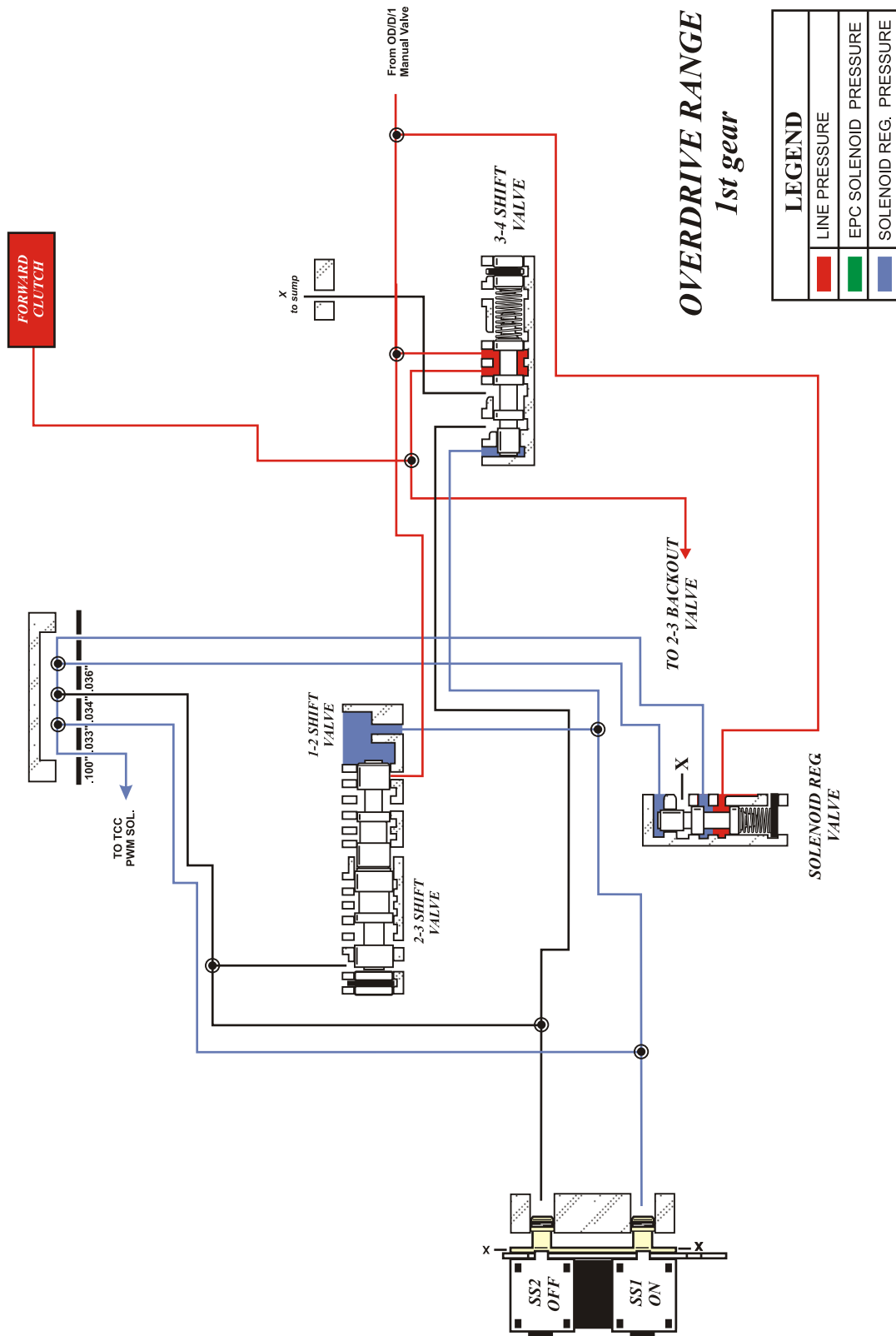


Figure 6



# Technical Service Information

## SHIFT SOLENOID 2 WIRE DIAGRAM TABLE OF CONTENTS

1996 Cougar 3.8 4.6 See Figure 9	1999 Mustang 3.8 See Figure 11
1996 Thunderbird 3.8 4.6 See Figure 9	1999 Mustang 4.6 See Figure 12
1996 Crown Victoria 4.6 See Figure 9	199 F Series 4.2 4.6 See Figure 11
1996 Grand Marquis 4.6 See Figure 9	199 F Series 5.4 See Figure 12
1996 Lincoln Town Car 4.6 See Figure 9	
1996 Lincoln Mark 8 See Figure 9	2000 Crown Victoria 4.6 See Figure 12
1996 Bronco 5.0 See Figure 9	2000 Grand Marquis 4.6 See Figure 12
1996 F Series 5.0 See Figure 9	2000 Expedition 4.6 See Figure 12
1996 Mustang 3.8 4.6 See Figure 9	2000 Explorer 5.0 See Figure 11
1996 E Series 5.0 See Figure 9	2000 Mountaineer 5.0 Figure 11
1996 Explorer 5.0 See Figure 9	2000 E Van 4.2 See Figure 11
	2000 E Van 4.6 5.4 See Figure 12
1997 Cougar 3.8 4.6 See Figure 9	2000 Lincoln Town Car 4.6 See Figure 12
1997 Thunderbird 3.8 4.6 See Figure 9	2000 Mustang 3.8 See Figure 11
1997 Crown Victoria 4.6 See Figure 9	2000 Mustang 4.6 See Figure 12
1997 Grand Marquis 4.6 See Figure 9	2000 F Series 4.2 See Figure 11
1997 Expedition 4.6 See Figure 9	2000 F Series 4.6 5.4 See Figure 12
1997 Explorer 5.0 See Figure 9	
1997 Mountaineer 5.0 See Figure 9	2001 Crown Victoria 4.6 See Figure 12
1997 E Van 4.2 4.6 See Figure 9	2001 Grand Marquis 4.6 See Figure 12
1997 Lincoln Mark 8 4.6 See Figure 10	2001 Expedition 4.6 See Figure 12
1997 Lincoln Town Car 4.6 See Figure 9	2001 Explorer 5.0 See Figure 11
1997 Mustang 3.8 4.6 See Figure 9	2001 Mountaineer 5.0 See Figure 11
1997 F Series 4.2 4.6 See Figure 9	2001 E Van 4.2 4.6 5.4 See Figure 11
	2001 Lincoln Town Car 4.6 See Figure 12
1998 Crown Victoria 4.6 See Figure 10	2001 Mustang 3.8 See Figure 11
1998 Grand Marquis 4.6 See Figure 10	2001 Mustang 4.6 See Figure 12
1998 Expedition 4.6 See Figure 9	2001 F Series 4.2 See Figure 11
1998 Explorer 5.0 See Figure 9	2001 F Series 4.6 5.4 See Figure 12
1998 Mountaineer 5.0 See Figure 9	
1998 E Van 4.2 4.6 See Figure 9	2002 Crown Victoria 4.6 See Figure 12
1998 Lincoln Mark 8 4.6 See Figure 10	2002 Grand Marquis 4.6 See Figure 12
1998 Lincoln Town Car 4.6 See Figure 10	2002 Expedition 4.6 5.4 See Figure 12
1998 Mustang 3.8 4.6 See Figure 9	2002 E Van 4.2 See Figure 11
1998 F Series 4.2 4.6 See Figure 9	2002 E Van 4.6 5.4 See Figure 12
	2002 Navigator 5.4 See Figure 12
1999 Crown Victoria 4.6 See Figure 12	2002 Lincoln Town Car 4.6 See Figure 12
1999 Grand Marquis 4.6 See Figure 12	2002 Mustang 3.8 See Figure 11
1999 Expedition 4.6 See Figure 11	2002 Mustang 4.6 See Figure 12
1999 Explorer 5.0 See Figure 11	2002 F Series 4.2 See Figure 11
1999 Mountaineer 5.0 See Figure 11	2002 F Series 4.6 5.4 See Figure 12
1999 E Van 4.2 4.6 See Figure 11	
1999 E Van 5.4 See Figure 12	
1999 Lincoln Town Car 4.6 See Figure 12	

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Figure 7



## SHIFT SOLENOID 2 WIRE DIAGRAM TABLE OF CONTENTS

2003 Crown Victoria 4.6 See Figure 12  
2003 Grand Marquis 4.6 See Figure 12  
2003 Mercury Marauder 4.6 See Figure 12  
2003 Expedition 4.6 5.4 See Figure 12  
2003 E Van 4.2 See Figure 11  
2003 E Van 4.6 5.4 See Figure 12  
2003 Lincoln Town Car 4.6 See Figure 12  
2003 Mustang 3.8 See Figure 11  
2003 Mustang 4.6 See Figure 12  
2003 F Series 4.2 See Figure 11  
2003 F Series 4.6 5.4 See Figure 12

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Figure 8



## SHIFT SOLENOID 2 ELECTRICAL DIAGRAMS

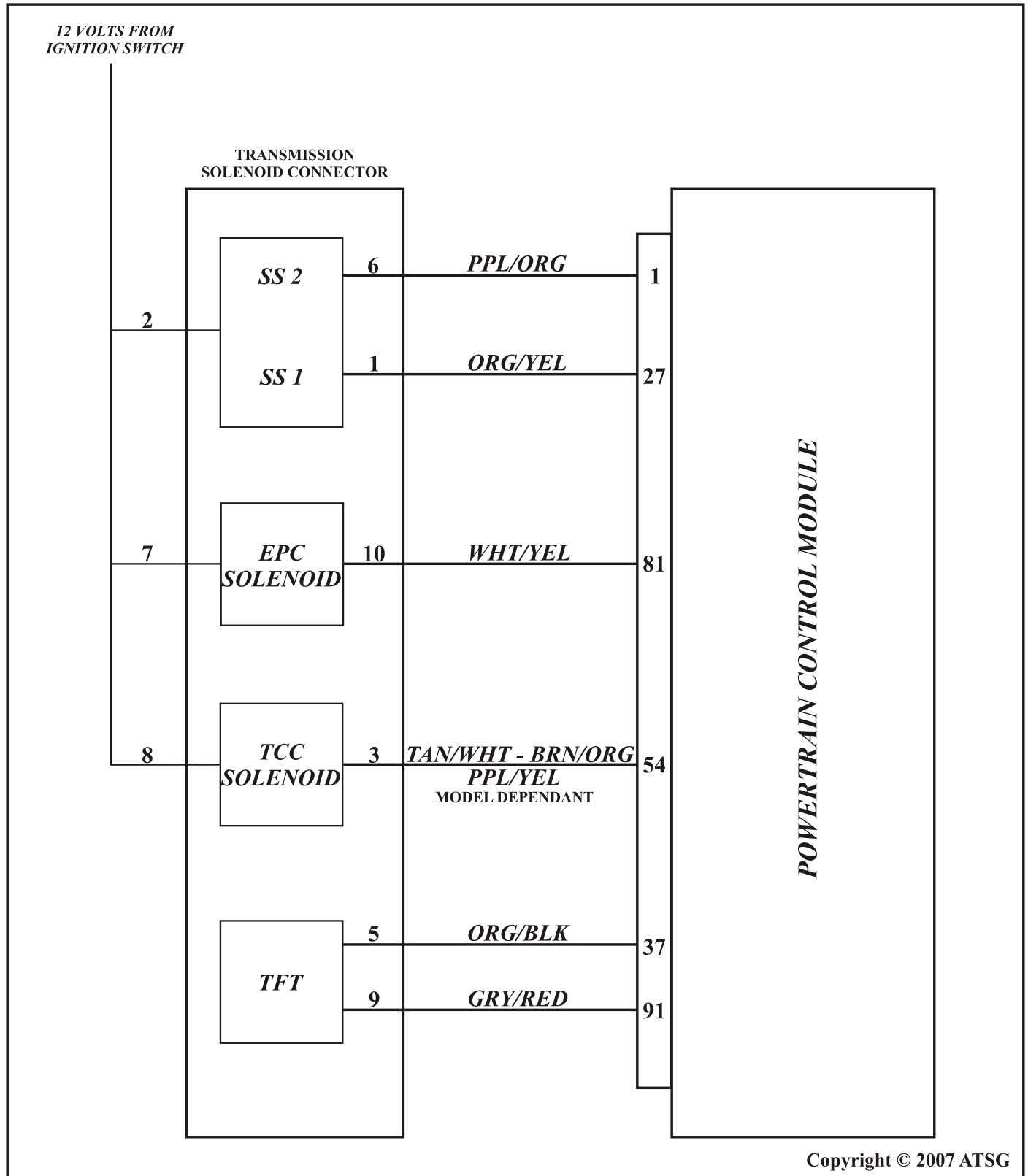
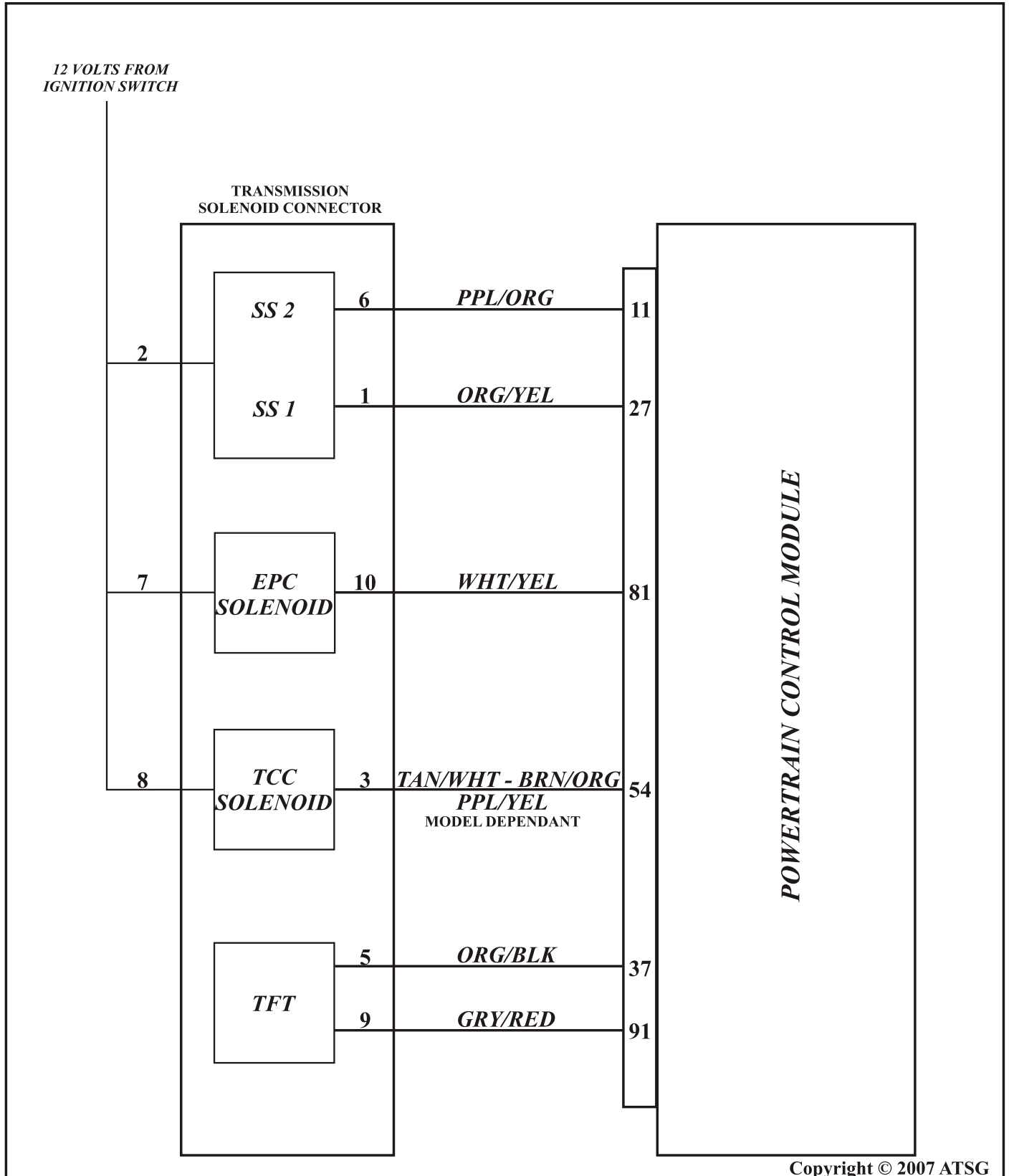


Figure 9

## SHIFT SOLENOID 2 ELECTRICAL DIAGRAMS



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Figure 10

## SHIFT SOLENOID 2 ELECTRICAL DIAGRAMS

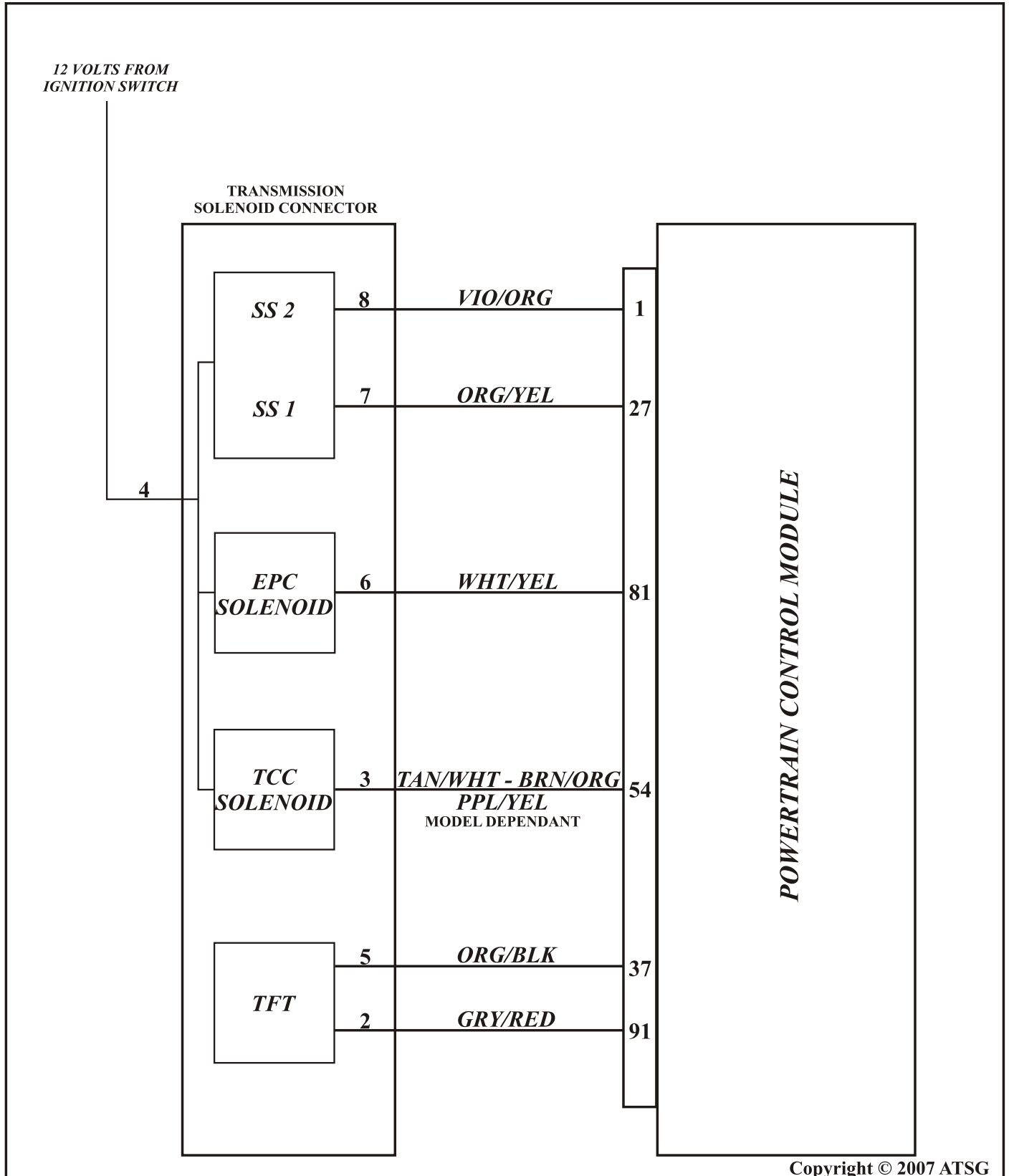


Figure 11



## SHIFT SOLENOID 2 ELECTRICAL DIAGRAMS

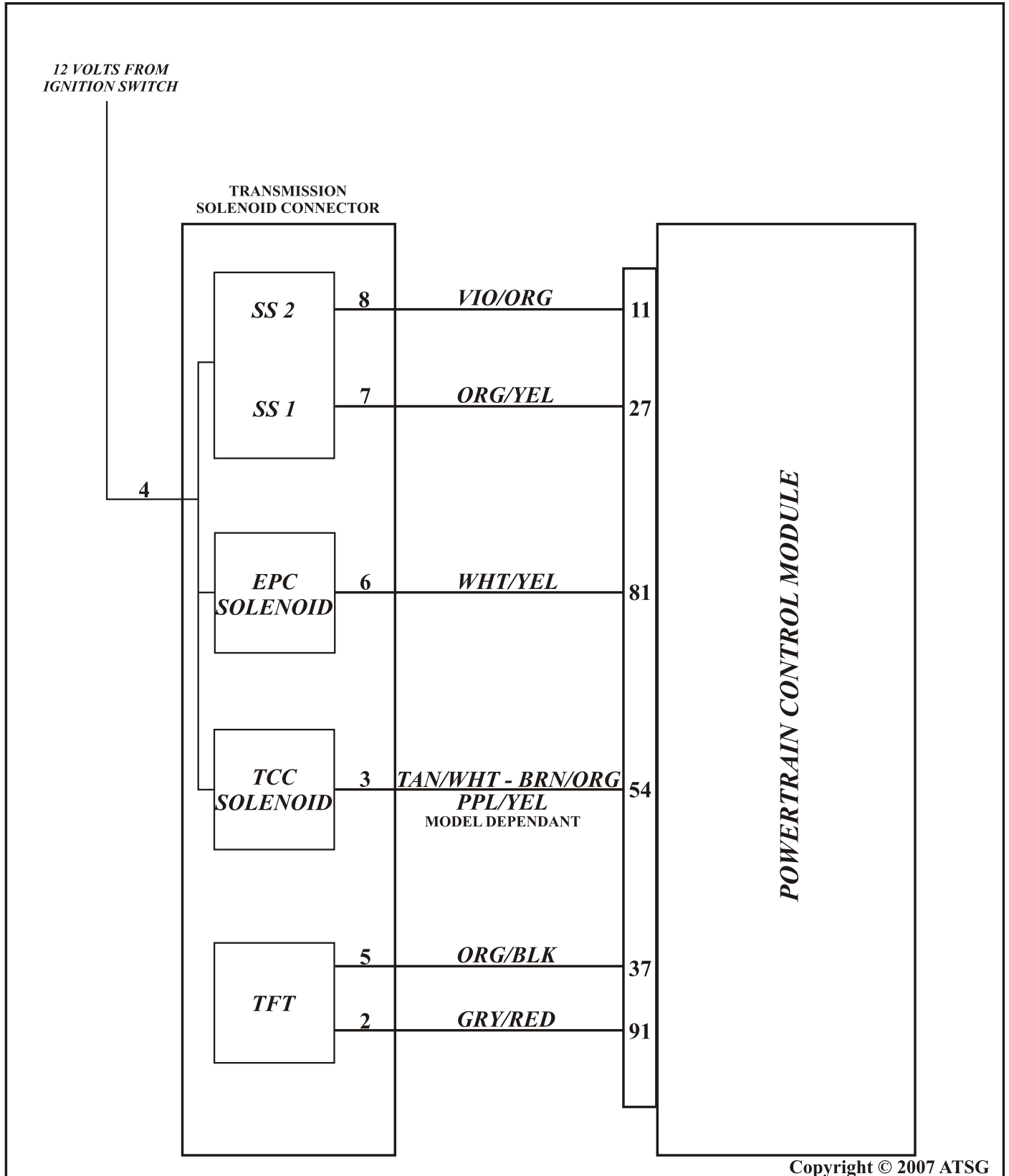


Figure 12